



## Full wwPDB EM Validation Report ⓘ

Jun 26, 2026 – 12:26 AM EDT

PDB ID : 9MOR / pdb\_00009mor  
EMDB ID : EMD-48479  
Title : Damaged 70S ribosome with PrfH bound  
Authors : Tian, Y.; Li, Q.; Jin, H.; Fatma, S.; Zeng, F.; Huang, R.H.  
Deposited on : 2024-12-27  
Resolution : 2.65 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.dev132  
Mogul : 2022.3.0, CSD as543be (2022)  
MolProbity : 4-5-2 with Phenix2.0  
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)  
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) : 2.49

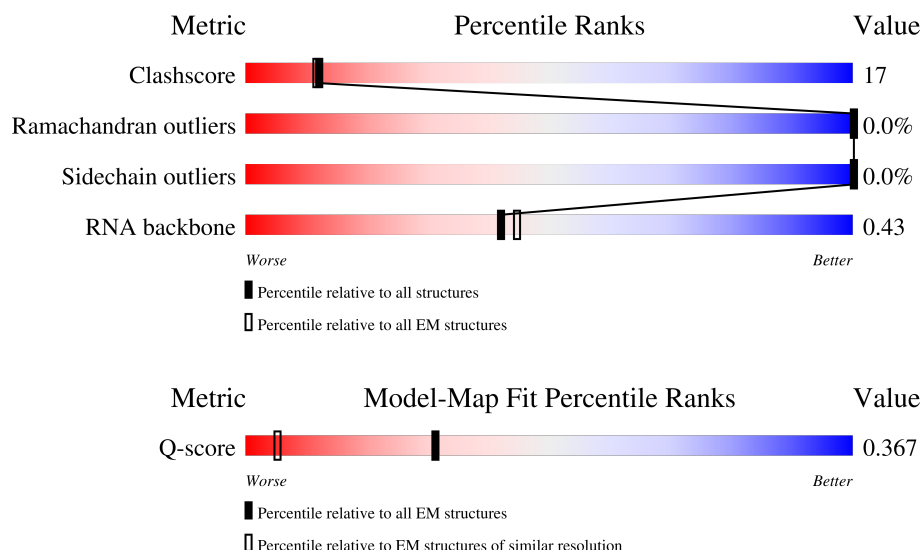
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 2.65 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            | 229148                      | 23984                       | -                                                        |
| Ramachandran outliers | 224038                      | 23583                       | -                                                        |
| Sidechain outliers    | 223484                      | 23102                       | -                                                        |
| RNA backbone          | 8273                        | 3508                        | -                                                        |
| Q-score               | -                           | 25397                       | 9050 ( 2.15 - 3.15 )                                     |

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     | 2903   |                  |
| 2   | 2     | 1534   |                  |
| 3   | 4     | 120    |                  |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 4   | 5     | 77     |                  |
| 4   | 6     | 77     |                  |
| 5   | 7     | 25     |                  |
| 6   | A     | 231    |                  |
| 7   | B     | 273    |                  |
| 8   | C     | 209    |                  |
| 9   | D     | 201    |                  |
| 10  | E     | 179    |                  |
| 11  | F     | 177    |                  |
| 12  | G     | 149    |                  |
| 13  | H     | 165    |                  |
| 14  | I     | 142    |                  |
| 15  | J     | 142    |                  |
| 16  | K     | 123    |                  |
| 17  | L     | 144    |                  |
| 18  | M     | 136    |                  |
| 19  | N     | 127    |                  |
| 20  | O     | 117    |                  |
| 21  | P     | 115    |                  |
| 22  | Q     | 118    |                  |
| 23  | R     | 103    |                  |
| 24  | S     | 110    |                  |
| 25  | T     | 100    |                  |
| 26  | U     | 104    |                  |
| 27  | V     | 94     |                  |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 28  | W     | 85     |                  |
| 29  | X     | 78     |                  |
| 30  | Y     | 63     |                  |
| 31  | Z     | 59     |                  |
| 32  | a     | 70     |                  |
| 33  | b     | 57     |                  |
| 34  | c     | 55     |                  |
| 35  | d     | 46     |                  |
| 36  | e     | 65     |                  |
| 37  | f     | 38     |                  |
| 38  | g     | 241    |                  |
| 39  | h     | 233    |                  |
| 40  | i     | 206    |                  |
| 41  | j     | 167    |                  |
| 42  | k     | 135    |                  |
| 43  | l     | 179    |                  |
| 44  | m     | 130    |                  |
| 45  | n     | 130    |                  |
| 46  | o     | 103    |                  |
| 47  | p     | 129    |                  |
| 48  | q     | 124    |                  |
| 49  | r     | 118    |                  |
| 50  | s     | 101    |                  |
| 51  | t     | 89     |                  |
| 52  | u     | 82     |                  |

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| Mol | Chain | Length | Quality of chain                                                                   |
|-----|-------|--------|------------------------------------------------------------------------------------|
| 53  | v     | 84     |  |
| 54  | w     | 75     |  |
| 55  | x     | 92     |  |
| 56  | y     | 87     |  |
| 57  | z     | 71     |  |

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

| Mol | Type | Chain | Res  | Chirality | Geometry | Clashes | Electron density |
|-----|------|-------|------|-----------|----------|---------|------------------|
| 1   | G7M  | 1     | 2069 | X         | -        | -       | -                |
| 2   | A3P  | 2     | 1493 | X         | -        | -       | -                |

## 2 Entry composition

There are 60 unique types of molecules in this entry. The entry contains 150119 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called 23S ribosomal RNA.

| Mol | Chain | Residues | Atoms |       |       |       |      | AltConf | Trace |
|-----|-------|----------|-------|-------|-------|-------|------|---------|-------|
| 1   | 1     | 2903     | Total | C     | N     | O     | P    | 0       | 0     |
|     |       |          | 62336 | 27816 | 11470 | 20147 | 2903 |         |       |

- Molecule 2 is a RNA chain called 16S ribosomal RNA.

| Mol | Chain | Residues | Atoms |       |      |       |      | AltConf | Trace |
|-----|-------|----------|-------|-------|------|-------|------|---------|-------|
| 2   | 2     | 1534     | Total | C     | N    | O     | P    | 0       | 0     |
|     |       |          | 32930 | 14693 | 6041 | 10662 | 1534 |         |       |

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

| Mol | Chain | Residues | Atoms |      |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|-----|---------|-------|
| 3   | 4     | 120      | Total | C    | N   | O   | P   | 0       | 0     |
|     |       |          | 2569  | 1144 | 468 | 837 | 120 |         |       |

- Molecule 4 is a RNA chain called P-tRNA, E-tRNA.

| Mol | Chain | Residues | Atoms |     |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| 4   | 5     | 77       | Total | C   | N   | O   | P  | 0       | 0     |
|     |       |          | 1643  | 732 | 297 | 537 | 77 |         |       |
| 4   | 6     | 77       | Total | C   | N   | O   | P  | 0       | 0     |
|     |       |          | 1640  | 732 | 297 | 535 | 76 |         |       |

- Molecule 5 is a RNA chain called mRNA.

| Mol | Chain | Residues | Atoms |     |    |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|----|---------|-------|
| 5   | 7     | 13       | Total | C   | N  | O  | P  | 0       | 0     |
|     |       |          | 275   | 124 | 49 | 89 | 13 |         |       |

- Molecule 6 is a protein called Peptide chain release factor H.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 6   | A     | 208      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1660  | 1041 | 305 | 310 | 4 |         |       |

- Molecule 7 is a protein called 50S ribosomal protein L2.

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

- Molecule 8 is a protein called 50S ribosomal protein L3.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 8   | C     | 209      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1565  | 979 | 288 | 294 | 4 |         |       |

- Molecule 9 is a protein called Large ribosomal subunit protein uL4.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 9   | D     | 201      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1552  | 974 | 283 | 290 | 5 |         |       |

- Molecule 10 is a protein called Large ribosomal subunit protein uL5.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 10  | E     | 177      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1410  | 899 | 249 | 256 | 6 |         |       |

- Molecule 11 is a protein called Large ribosomal subunit protein uL6.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 11  | F     | 175      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1313  | 826 | 241 | 244 | 2 |         |       |

- Molecule 12 is a protein called Large ribosomal subunit protein bL9.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 12  | G     | 149      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1111  | 699 | 197 | 214 | 1 |         |       |

- Molecule 13 is a protein called 50S ribosomal protein L10.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 13  | H     | 130      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 980   | 620 | 174 | 182 | 4 |         |       |

- Molecule 14 is a protein called 50S ribosomal protein L11.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 14  | I     | 135      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 984   | 622 | 171 | 185 | 6 |         |       |

- Molecule 15 is a protein called Large ribosomal subunit protein uL13.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 15  | J     | 142      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1129  | 714 | 212 | 199 | 4 |         |       |

- Molecule 16 is a protein called Large ribosomal subunit protein uL14.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 16  | K     | 123      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 946   | 593 | 181 | 166 | 6 |         |       |

- Molecule 17 is a protein called Large ribosomal subunit protein uL15.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 17  | L     | 144      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1053  | 654 | 207 | 190 | 2 |         |       |

- Molecule 18 is a protein called 50S ribosomal protein L16.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 18  | M     | 136      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1074  | 686 | 205 | 177 | 6 |         |       |

- Molecule 19 is a protein called Large ribosomal subunit protein bL17.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 19  | N     | 119      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 951   | 588 | 195 | 163 | 5 |         |       |

- Molecule 20 is a protein called Large ribosomal subunit protein uL18.

| Mol | Chain | Residues | Atoms |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| 20  | O     | 116      | Total | C   | N   | O   | 0       | 0     |
|     |       |          | 892   | 552 | 178 | 162 |         |       |

- Molecule 21 is a protein called Large ribosomal subunit protein bL19.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 21  | P     | 114      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 917   | 574 | 179 | 163 | 1 |         |       |

- Molecule 22 is a protein called 50S ribosomal protein L20.

| Mol | Chain | Residues | Atoms |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| 22  | Q     | 117      | Total | C   | N   | O   | 0       | 0     |
|     |       |          | 947   | 604 | 192 | 151 |         |       |

- Molecule 23 is a protein called Large ribosomal subunit protein bL21.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 23  | R     | 103      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 816   | 516 | 153 | 145 | 2 |         |       |

- Molecule 24 is a protein called Large ribosomal subunit protein uL22.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 24  | S     | 110      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 857   | 532 | 166 | 156 | 3 |         |       |

- Molecule 25 is a protein called 50S ribosomal protein L23.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 25  | T     | 94       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 746   | 470 | 140 | 134 | 2 |         |       |

- Molecule 26 is a protein called 50S ribosomal protein L24.

| Mol | Chain | Residues | Atoms |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| 26  | U     | 103      | Total | C   | N   | O   | 0       | 0     |
|     |       |          | 788   | 498 | 148 | 142 |         |       |

- Molecule 27 is a protein called Large ribosomal subunit protein bL25.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 27  | V     | 94       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 753   | 479 | 137 | 134 | 3 |         |       |

- Molecule 28 is a protein called Large ribosomal subunit protein bL27.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 28  | W     | 76       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 582   | 360 | 117 | 104 | 1 |         |       |

- Molecule 29 is a protein called 50S ribosomal protein L28.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 29  | X     | 77       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 625   | 388 | 129 | 106 | 2 |         |       |

- Molecule 30 is a protein called Large ribosomal subunit protein uL29.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 30  | Y     | 62       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 501   | 308 | 98 | 94 | 1 |         |       |

- Molecule 31 is a protein called 50S ribosomal protein L30.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 31  | Z     | 58       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 448   | 281 | 87 | 78 | 2 |         |       |

- Molecule 32 is a protein called 50S ribosomal protein L31.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 32  | a     | 66       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 522   | 323 | 99 | 94 | 6 |         |       |

- Molecule 33 is a protein called 50S ribosomal protein L32.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 33  | b     | 56       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 444   | 269 | 94 | 80 | 1 |         |       |

- Molecule 34 is a protein called 50S ribosomal protein L33.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 34  | c     | 52       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 426   | 275 | 78 | 73 |         |       |

- Molecule 35 is a protein called 50S ribosomal protein L34.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 35  | d     | 46       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 377   | 228 | 90 | 57 | 2 |         |       |

- Molecule 36 is a protein called 50S ribosomal protein L35.

| Mol | Chain | Residues | Atoms |     |     |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|----|---|---------|-------|
| 36  | e     | 64       | Total | C   | N   | O  | S | 0       | 0     |
|     |       |          | 504   | 323 | 105 | 74 | 2 |         |       |

- Molecule 37 is a protein called 50S ribosomal protein L36.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 37  | f     | 38       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 302   | 185 | 65 | 48 | 4 |         |       |

- Molecule 38 is a protein called 30S ribosomal protein S2.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 38  | g     | 225      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1760  | 1113 | 316 | 323 | 8 |         |       |

- Molecule 39 is a protein called 30S ribosomal protein S3.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 39  | h     | 208      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1636  | 1036 | 307 | 290 | 3 |         |       |

- Molecule 40 is a protein called 30S ribosomal protein S4.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 40  | i     | 205      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1643  | 1026 | 315 | 298 | 4 |         |       |

- Molecule 41 is a protein called 30S ribosomal protein S5.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 41  | j     | 156      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1152  | 717 | 217 | 212 | 6 |         |       |

- Molecule 42 is a protein called 30S ribosomal protein S6.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 42  | k     | 104      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 848   | 536 | 153 | 152 | 7 |         |       |

- Molecule 43 is a protein called 30S ribosomal protein S7.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 43  | l     | 151      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1181  | 735 | 227 | 215 | 4 |         |       |

- Molecule 44 is a protein called Small ribosomal subunit protein uS8.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 44  | m     | 129      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 979   | 616 | 173 | 184 | 6 |         |       |

- Molecule 45 is a protein called Small ribosomal subunit protein uS9.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 45  | n     | 127      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1022  | 634 | 206 | 179 | 3 |         |       |

- Molecule 46 is a protein called Small ribosomal subunit protein uS10.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 46  | o     | 99       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 790   | 495 | 151 | 143 | 1 |         |       |

- Molecule 47 is a protein called 30S ribosomal protein S11.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 47  | p     | 117      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 877   | 540 | 174 | 160 | 3 |         |       |

- Molecule 48 is a protein called Small ribosomal subunit protein uS12.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 48  | q     | 123      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 957   | 591 | 196 | 165 | 5 |         |       |

- Molecule 49 is a protein called 30S ribosomal protein S13.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 49  | r     | 116      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 900   | 558 | 181 | 158 | 3 |         |       |

- Molecule 50 is a protein called Small ribosomal subunit protein uS14.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 50  | s     | 100      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 805   | 499 | 164 | 139 | 3 |         |       |

- Molecule 51 is a protein called Small ribosomal subunit protein uS15.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 51  | t     | 88       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 714   | 439 | 144 | 130 | 1 |         |       |

- Molecule 52 is a protein called 30S ribosomal protein S16.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 52  | u     | 82       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 649   | 406 | 128 | 114 | 1 |         |       |

- Molecule 53 is a protein called Small ribosomal subunit protein uS17.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 53  | v     | 80       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 648   | 411 | 121 | 113 | 3 |         |       |

- Molecule 54 is a protein called 30S ribosomal protein S18.

| Mol | Chain | Residues | Atoms |     |     |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|----|---|---------|-------|
| 54  | w     | 66       | Total | C   | N   | O  | S | 0       | 0     |
|     |       |          | 544   | 344 | 102 | 97 | 1 |         |       |

- Molecule 55 is a protein called Small ribosomal subunit protein uS19.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 55  | x     | 83       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 663   | 424 | 126 | 111 | 2 |         |       |

- Molecule 56 is a protein called 30S ribosomal protein S20.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 56  | y     | 86       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 669   | 414 | 138 | 114 | 3 |         |       |

- Molecule 57 is a protein called 30S ribosomal protein S21.

| Mol | Chain | Residues | Atoms |     |     |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|----|---|---------|-------|
| 57  | z     | 70       | Total | C   | N   | O  | S | 0       | 0     |
|     |       |          | 589   | 366 | 125 | 97 | 1 |         |       |

- Molecule 58 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

| Mol | Chain | Residues | Atoms |     | AltConf |
|-----|-------|----------|-------|-----|---------|
| 58  | 1     | 285      | Total | Mg  | 0       |
|     |       |          | 285   | 285 |         |
| 58  | 2     | 126      | Total | Mg  | 0       |
|     |       |          | 126   | 126 |         |
| 58  | 4     | 8        | Total | Mg  | 0       |
|     |       |          | 8     | 8   |         |
| 58  | 5     | 5        | Total | Mg  | 0       |
|     |       |          | 5     | 5   |         |
| 58  | A     | 1        | Total | Mg  | 0       |
|     |       |          | 1     | 1   |         |
| 58  | C     | 1        | Total | Mg  | 0       |
|     |       |          | 1     | 1   |         |
| 58  | D     | 2        | Total | Mg  | 0       |
|     |       |          | 2     | 2   |         |
| 58  | L     | 3        | Total | Mg  | 0       |
|     |       |          | 3     | 3   |         |
| 58  | M     | 1        | Total | Mg  | 0       |
|     |       |          | 1     | 1   |         |
| 58  | N     | 1        | Total | Mg  | 0       |
|     |       |          | 1     | 1   |         |
| 58  | b     | 1        | Total | Mg  | 0       |
|     |       |          | 1     | 1   |         |
| 58  | e     | 1        | Total | Mg  | 0       |
|     |       |          | 1     | 1   |         |

*Continued on next page...*

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| Mol | Chain | Residues | Atoms      |         | AltConf |
|-----|-------|----------|------------|---------|---------|
| 58  | f     | 1        | Total<br>1 | Mg<br>1 | 0       |
| 58  | h     | 1        | Total<br>1 | Mg<br>1 | 0       |
| 58  | i     | 1        | Total<br>1 | Mg<br>1 | 0       |
| 58  | s     | 1        | Total<br>1 | Mg<br>1 | 0       |

- Molecule 59 is ZINC ION (CCD ID: ZN) (formula: Zn).

| Mol | Chain | Residues | Atoms      |         | AltConf |
|-----|-------|----------|------------|---------|---------|
| 59  | a     | 1        | Total<br>1 | Zn<br>1 | 0       |
| 59  | f     | 1        | Total<br>1 | Zn<br>1 | 0       |

- Molecule 60 is water.

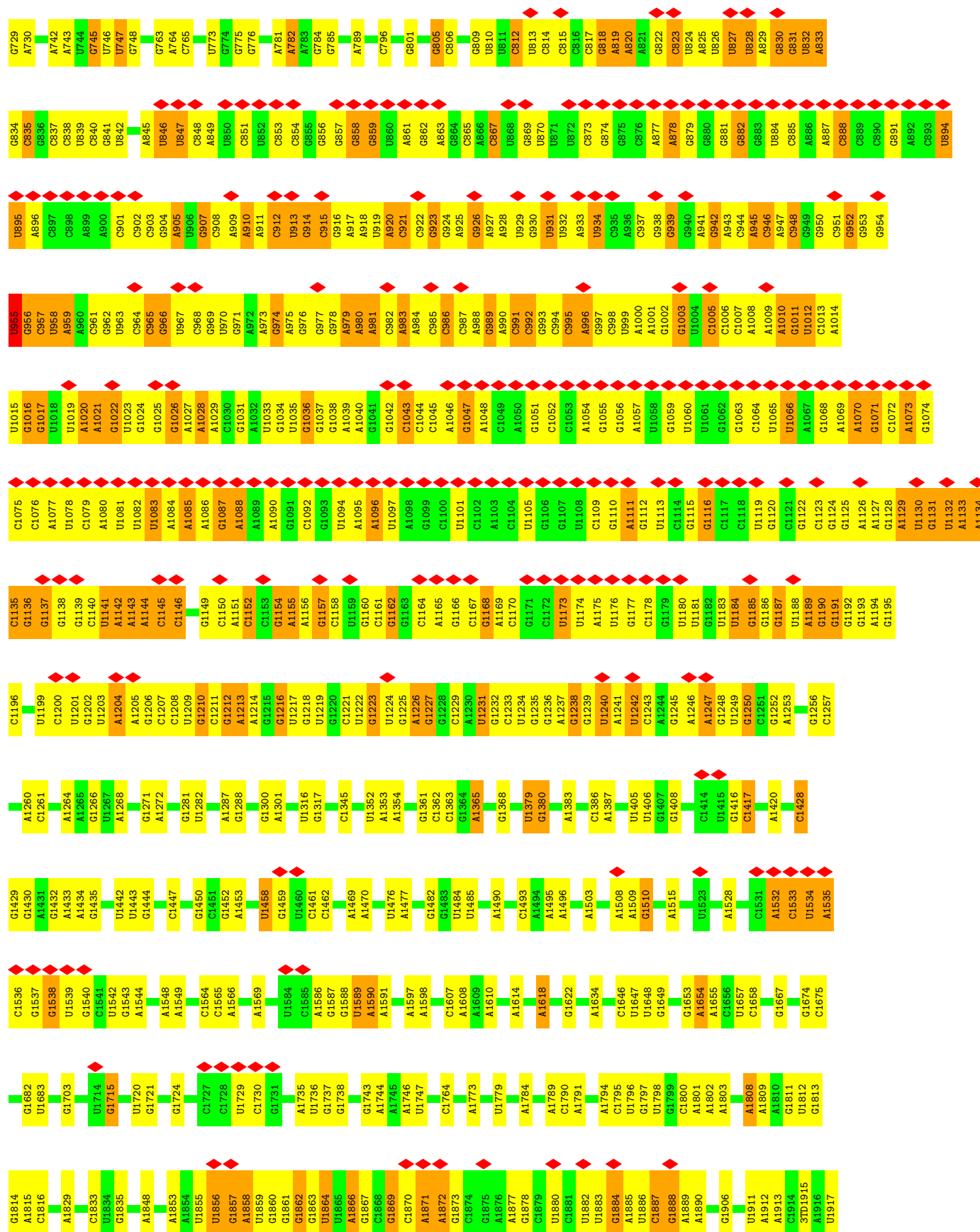
| Mol | Chain | Residues | Atoms      |        | AltConf |
|-----|-------|----------|------------|--------|---------|
| 60  | B     | 2        | Total<br>2 | O<br>2 | 0       |

### 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: 23S ribosomal RNA

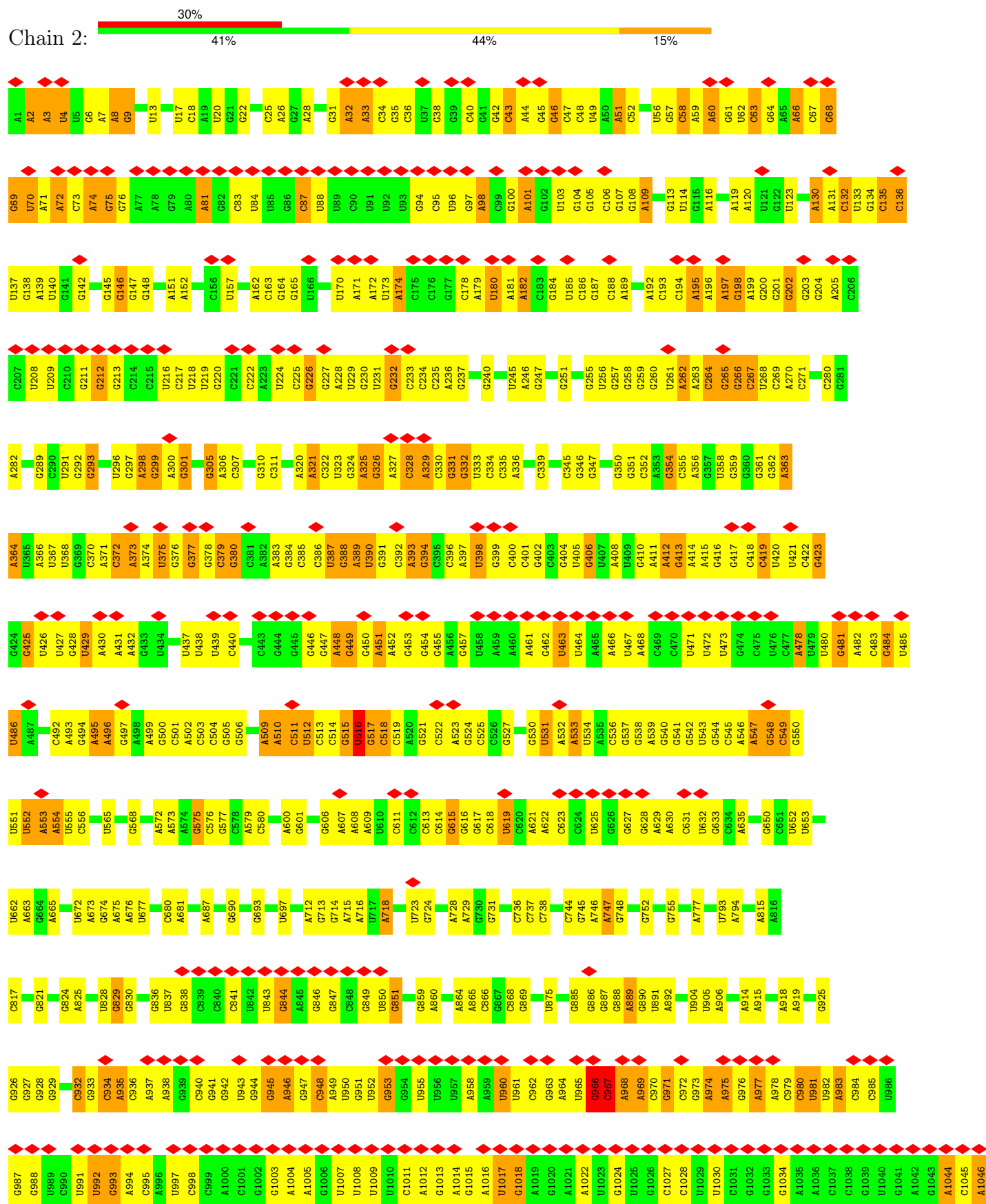






• Molecule 2: 16S ribosomal RNA

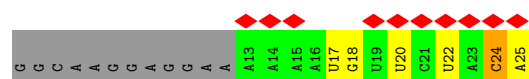
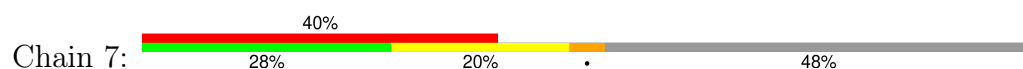
Chain 2:



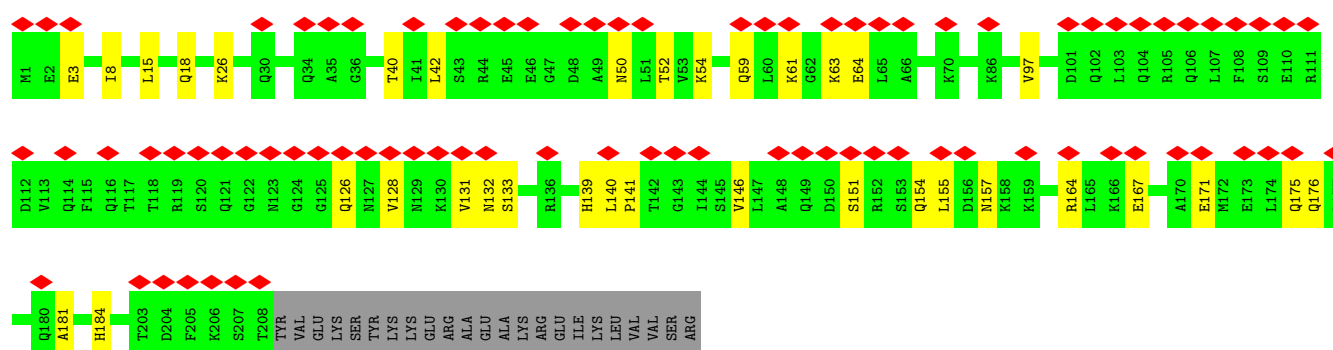
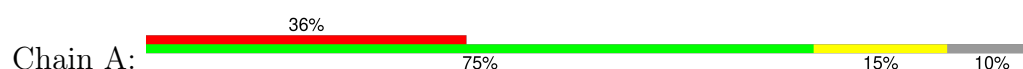




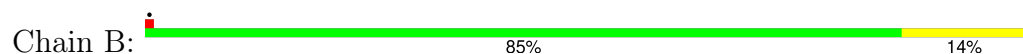
• Molecule 5: mRNA



• Molecule 6: Peptide chain release factor H

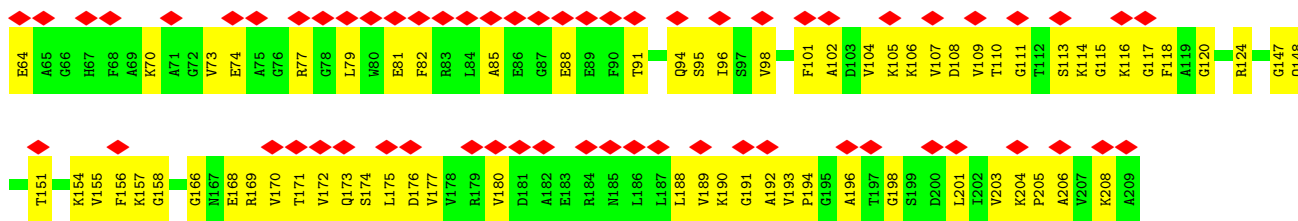


• Molecule 7: 50S ribosomal protein L2

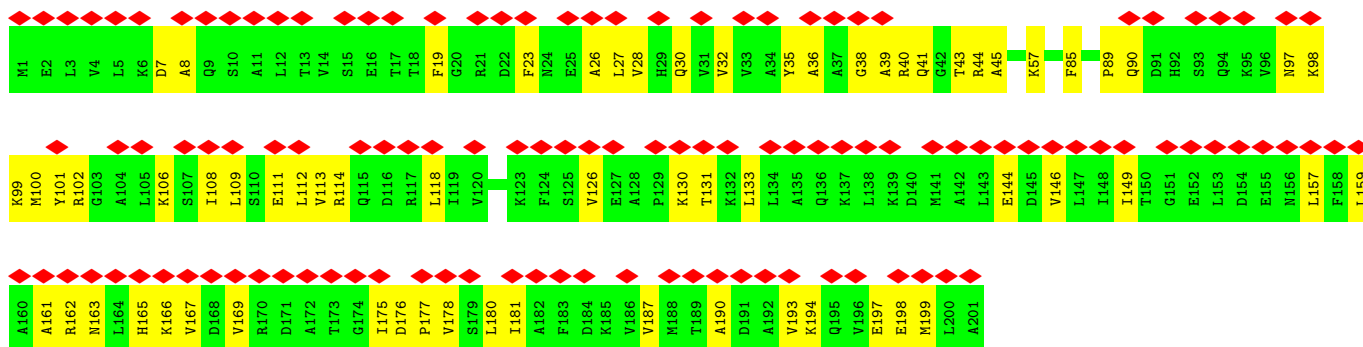


• Molecule 8: 50S ribosomal protein L3

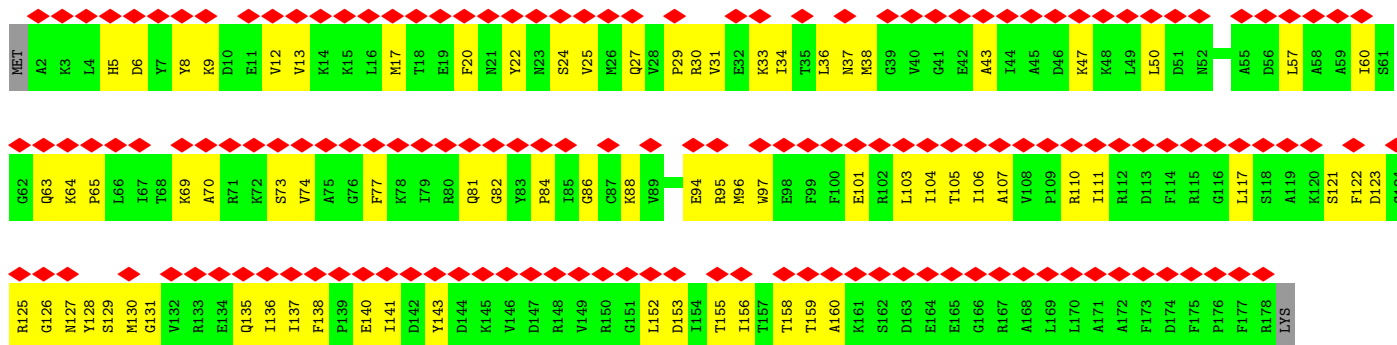
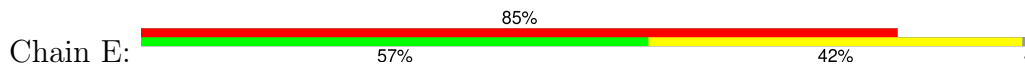




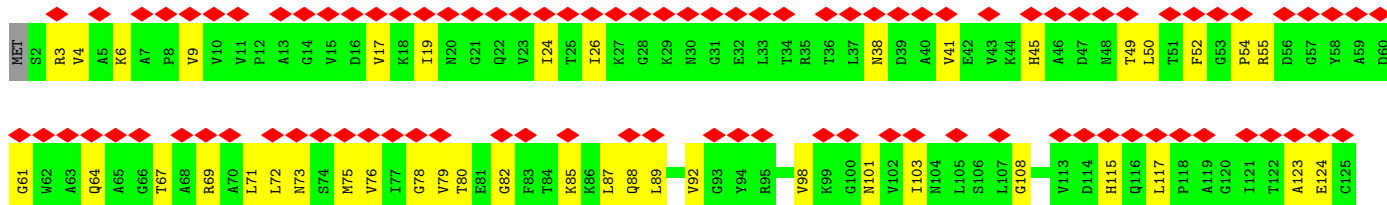
• Molecule 9: Large ribosomal subunit protein uL4

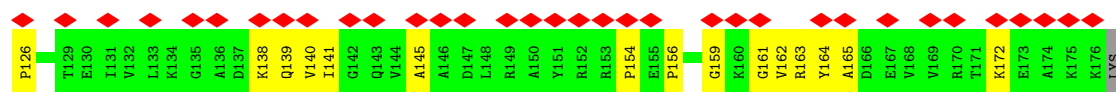


• Molecule 10: Large ribosomal subunit protein uL5

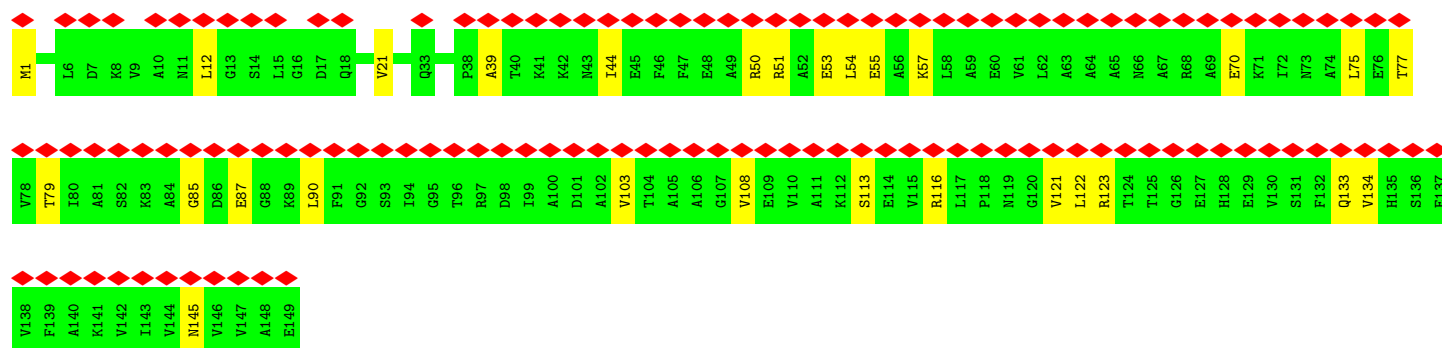
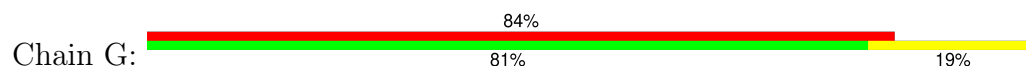


• Molecule 11: Large ribosomal subunit protein uL6

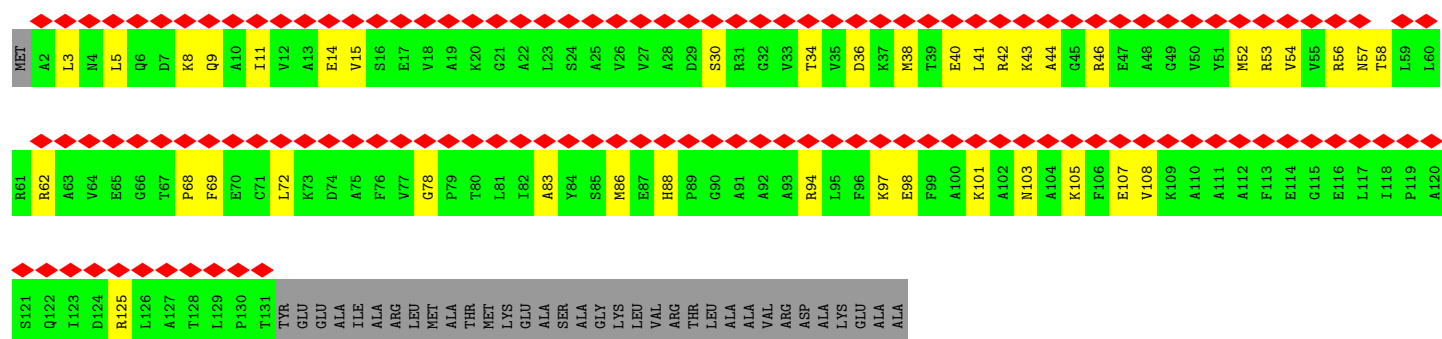
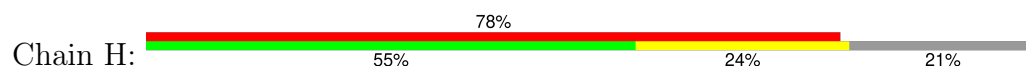




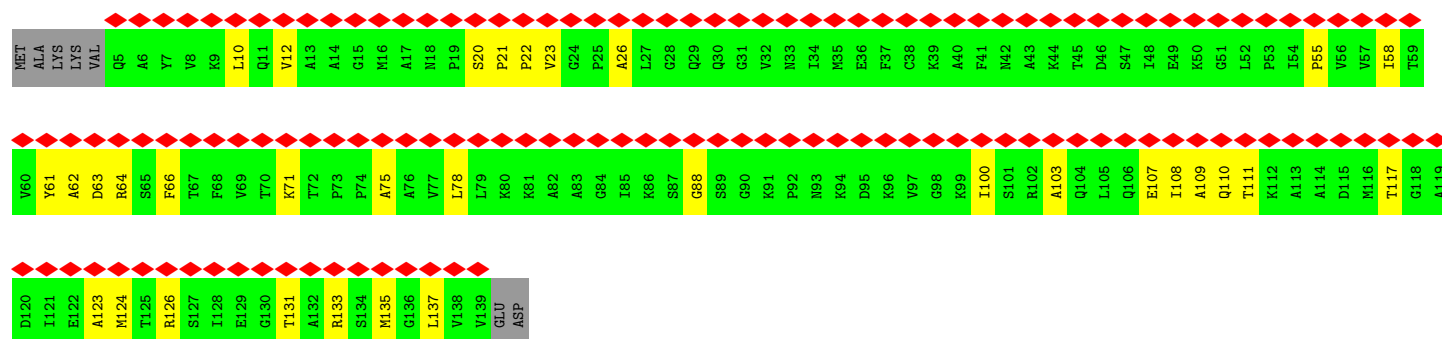
- Molecule 12: Large ribosomal subunit protein bL9



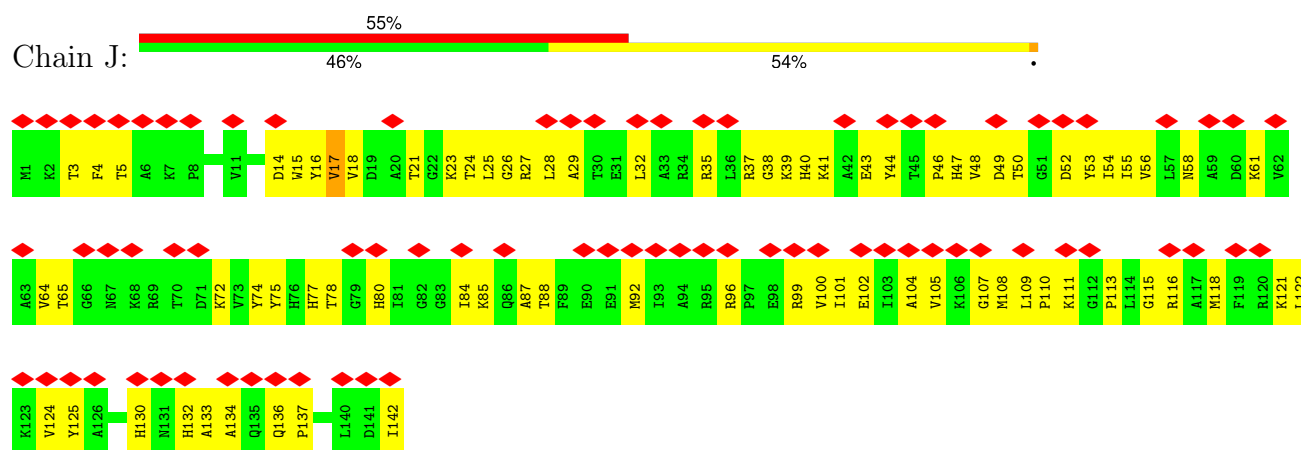
- Molecule 13: 50S ribosomal protein L10



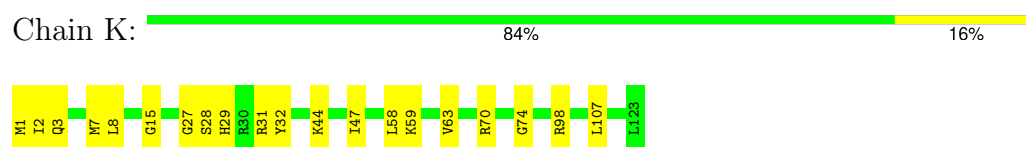
- Molecule 14: 50S ribosomal protein L11



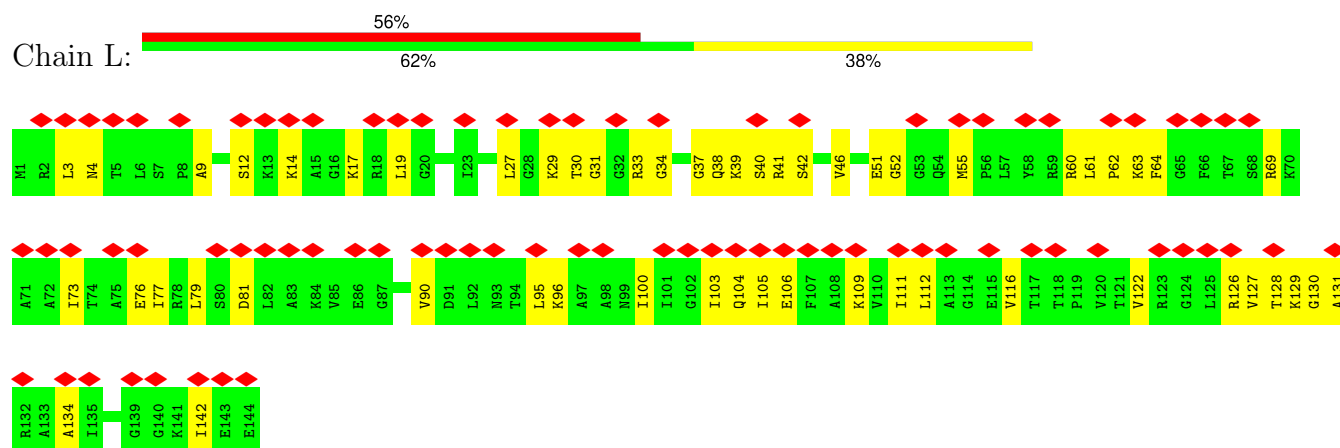
- Molecule 15: Large ribosomal subunit protein uL13



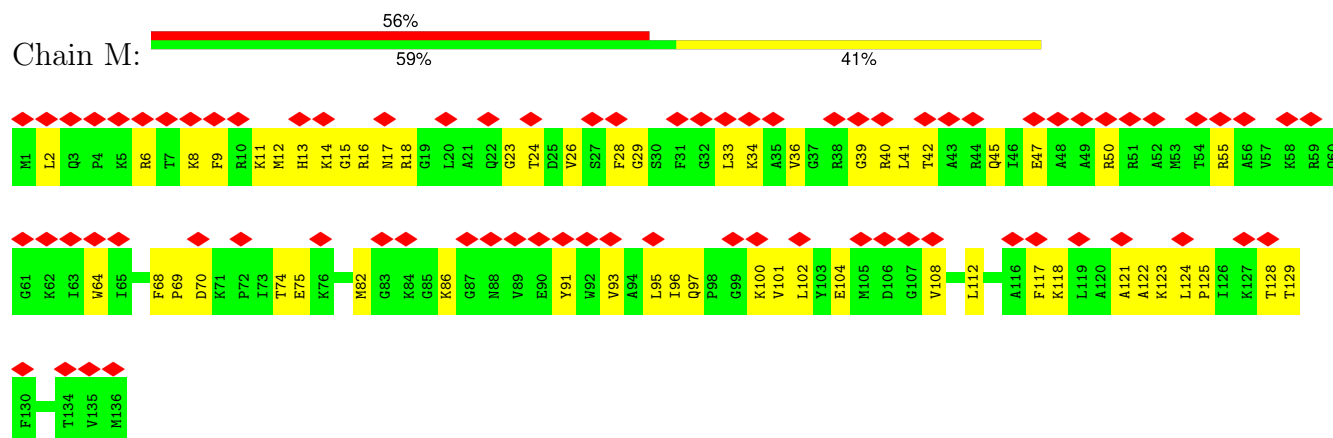
- Molecule 16: Large ribosomal subunit protein uL14



- Molecule 17: Large ribosomal subunit protein uL15

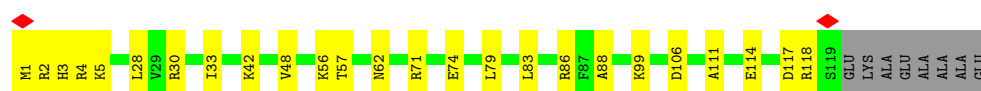


- Molecule 18: 50S ribosomal protein L16



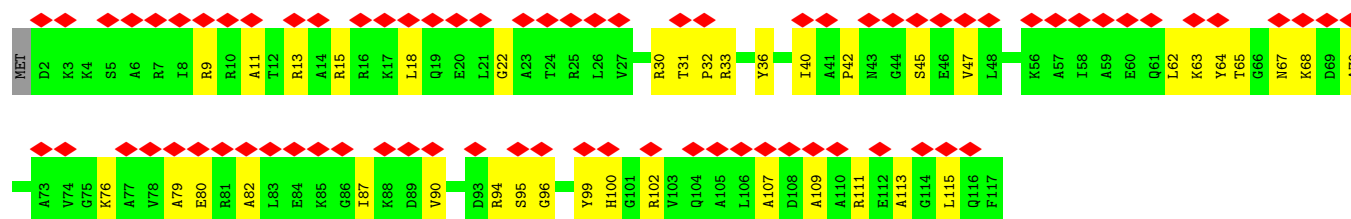
- Molecule 19: Large ribosomal subunit protein bL17

Chain N: 



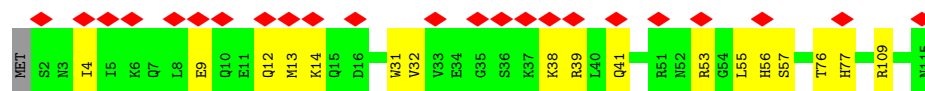
- Molecule 20: Large ribosomal subunit protein uL18

Chain O: 



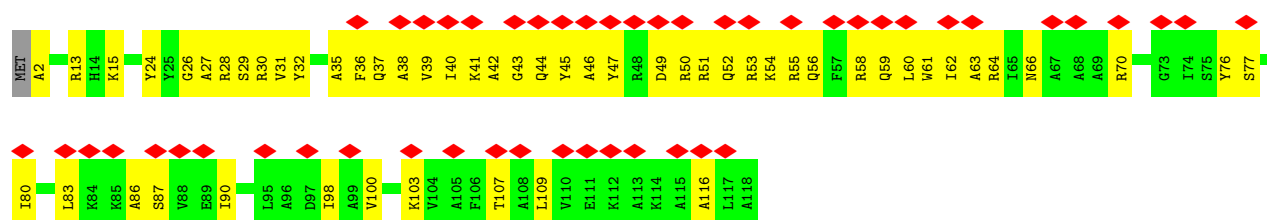
- Molecule 21: Large ribosomal subunit protein bL19

Chain P: 



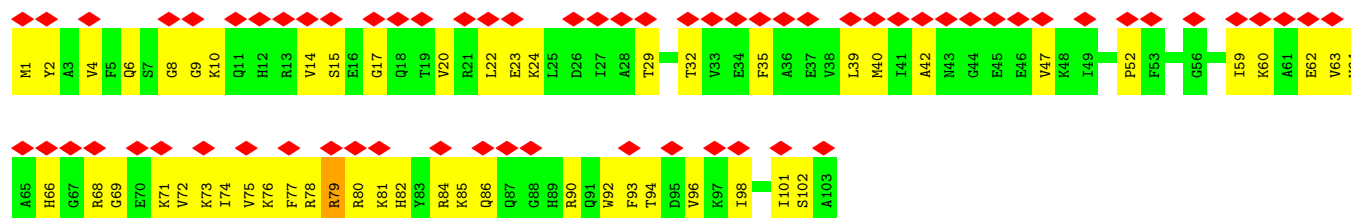
- Molecule 22: 50S ribosomal protein L20

Chain Q: 



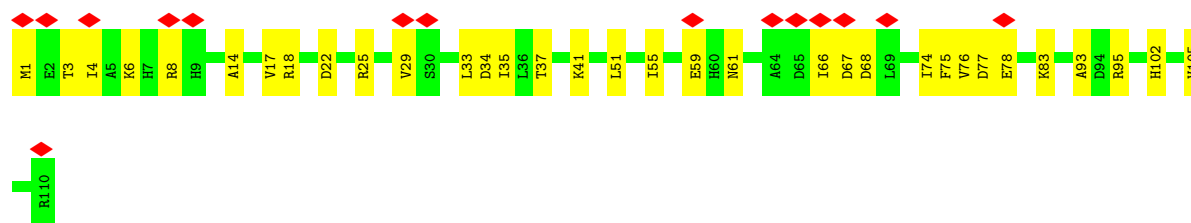
- Molecule 23: Large ribosomal subunit protein bL21

Chain R: 

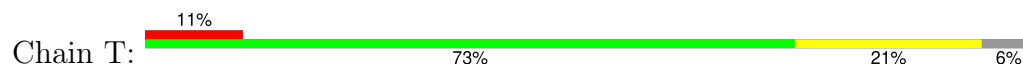


- Molecule 24: Large ribosomal subunit protein uL22

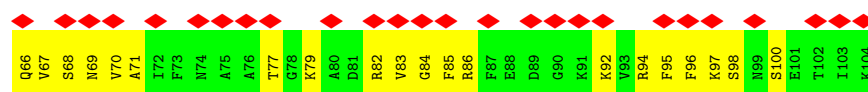
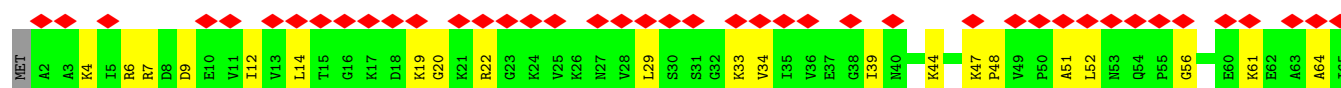
Chain S: 



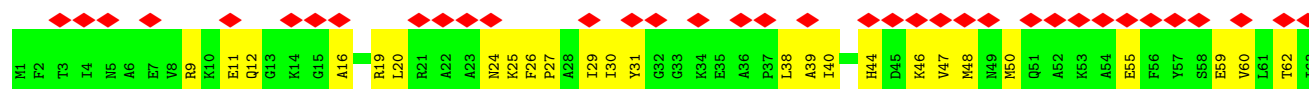
- Molecule 25: 50S ribosomal protein L23



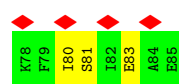
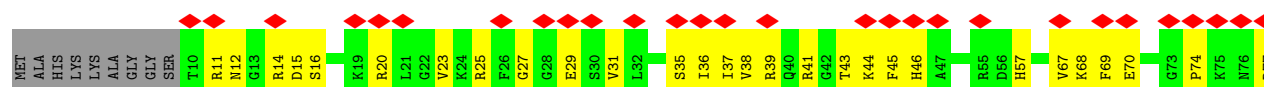
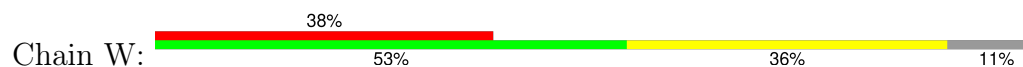
- Molecule 26: 50S ribosomal protein L24



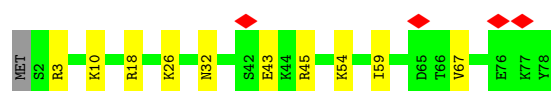
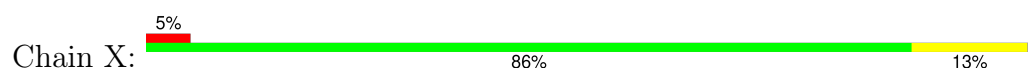
- Molecule 27: Large ribosomal subunit protein bL25



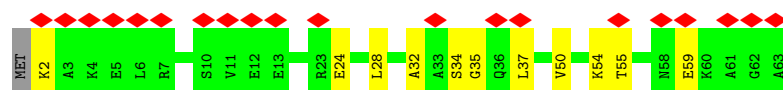
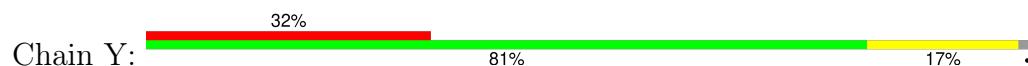
- Molecule 28: Large ribosomal subunit protein bL27



- Molecule 29: 50S ribosomal protein L28



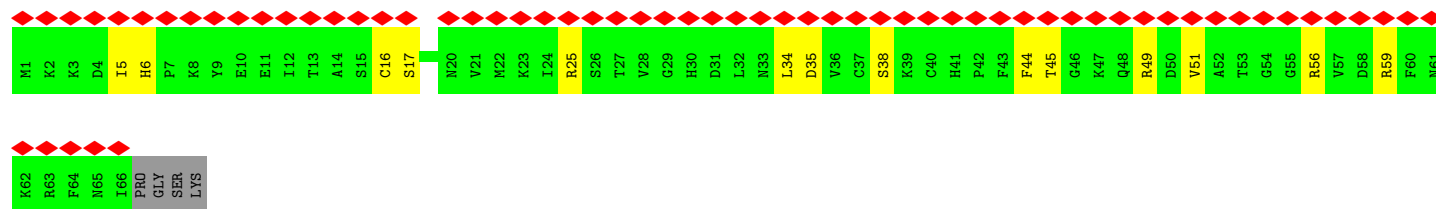
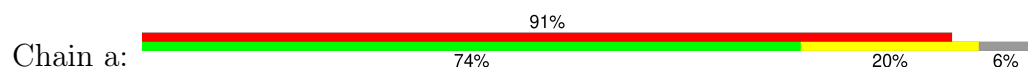
- Molecule 30: Large ribosomal subunit protein uL29



- Molecule 31: 50S ribosomal protein L30



- Molecule 32: 50S ribosomal protein L31



- Molecule 33: 50S ribosomal protein L32

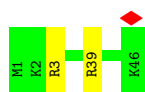


- Molecule 34: 50S ribosomal protein L33

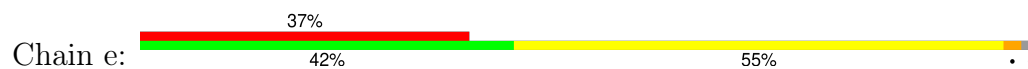


- Molecule 35: 50S ribosomal protein L34

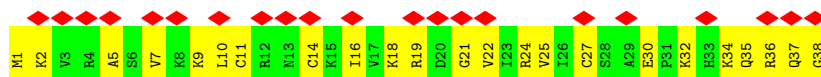




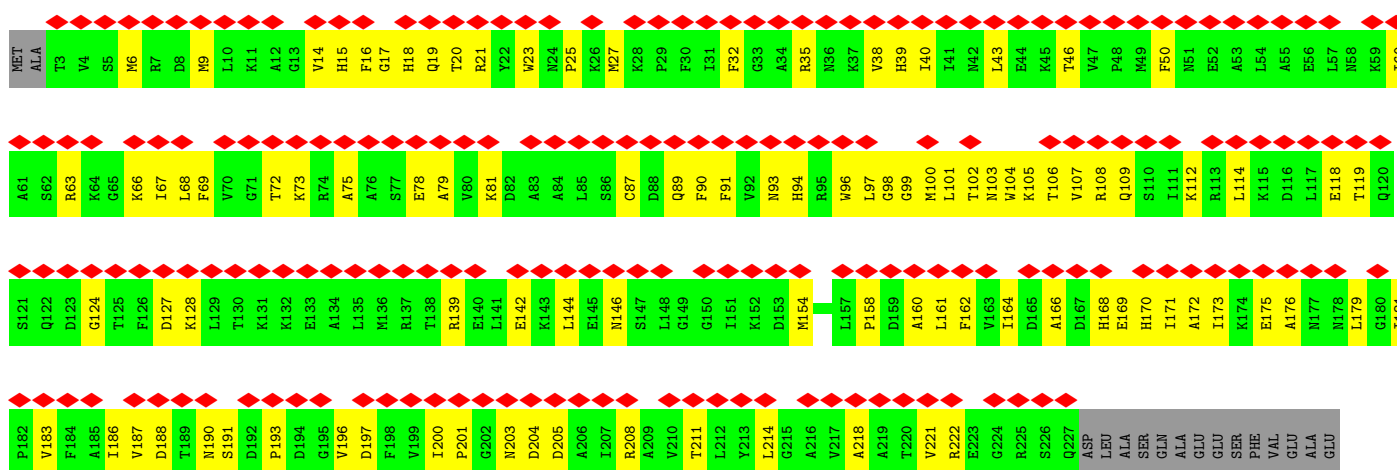
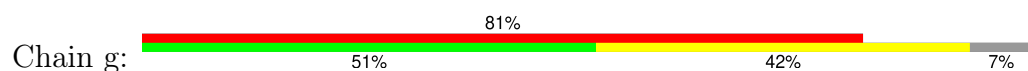
- Molecule 36: 50S ribosomal protein L35



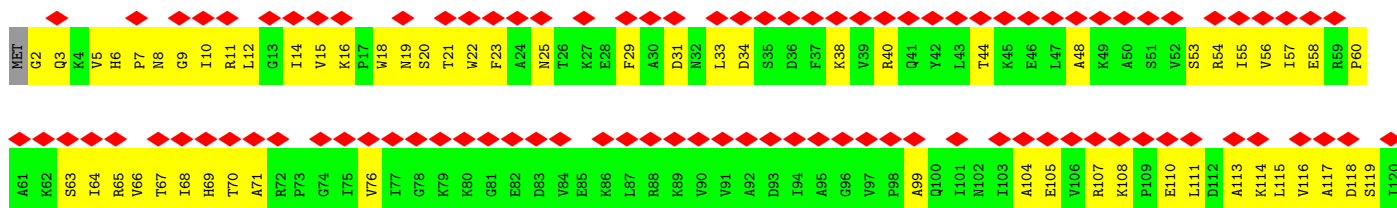
- Molecule 37: 50S ribosomal protein L36

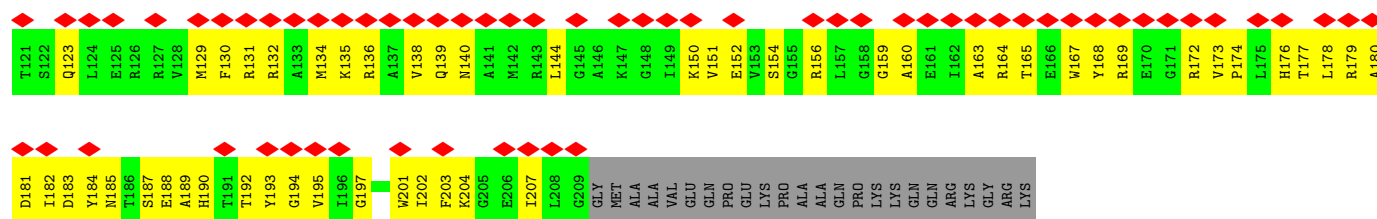


- Molecule 38: 30S ribosomal protein S2

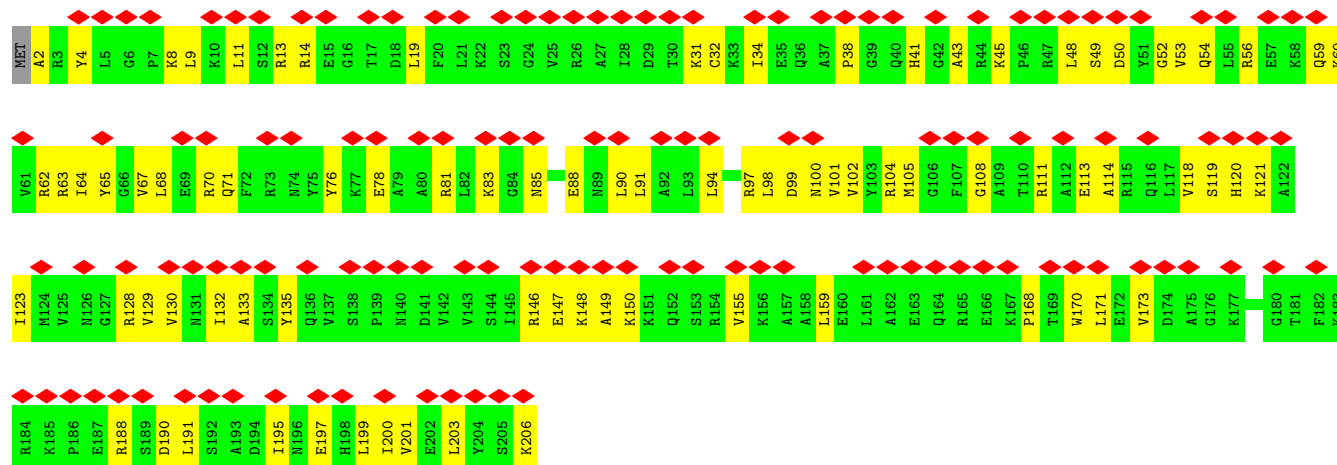


- Molecule 39: 30S ribosomal protein S3

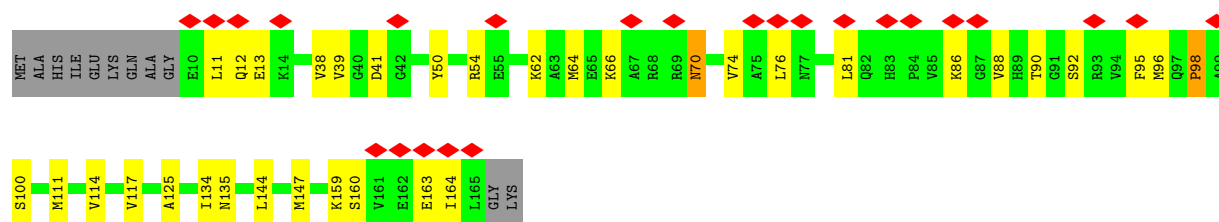




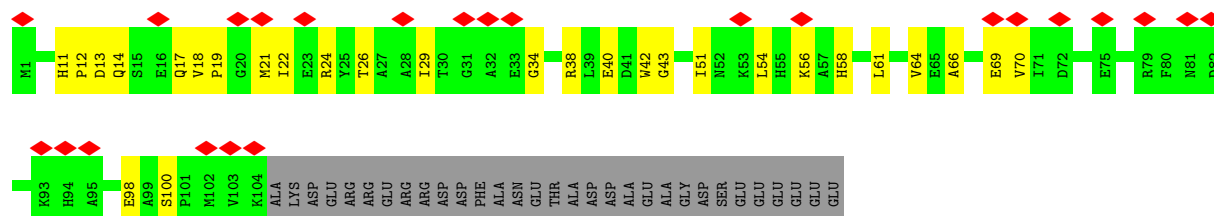
• Molecule 40: 30S ribosomal protein S4



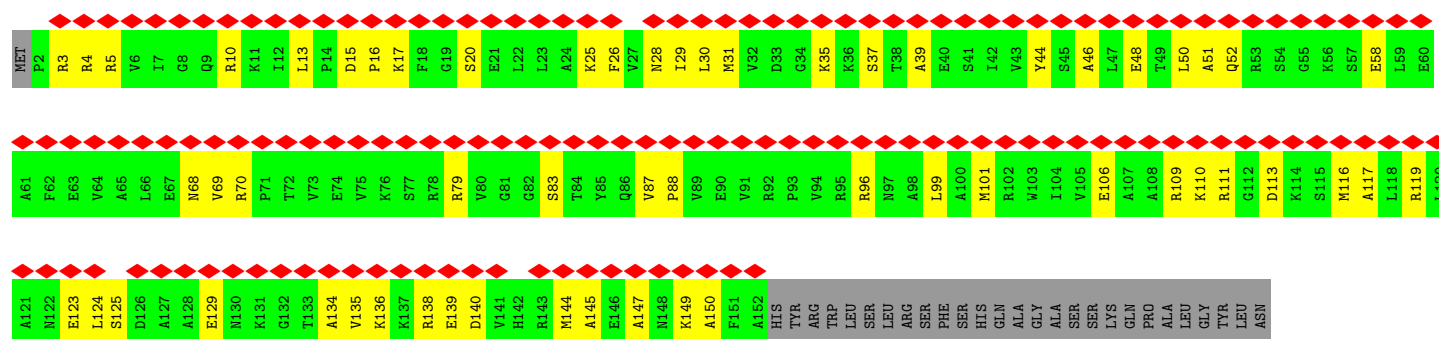
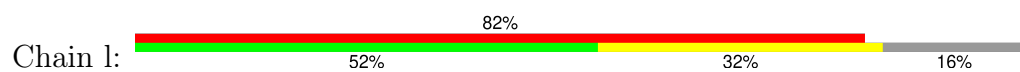
• Molecule 41: 30S ribosomal protein S5



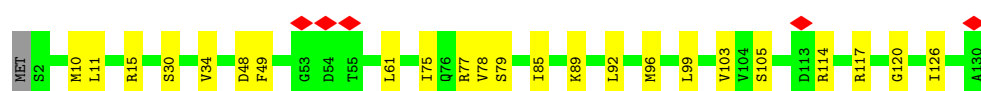
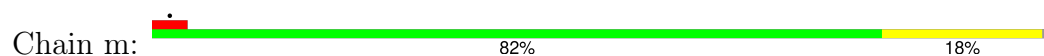
• Molecule 42: 30S ribosomal protein S6



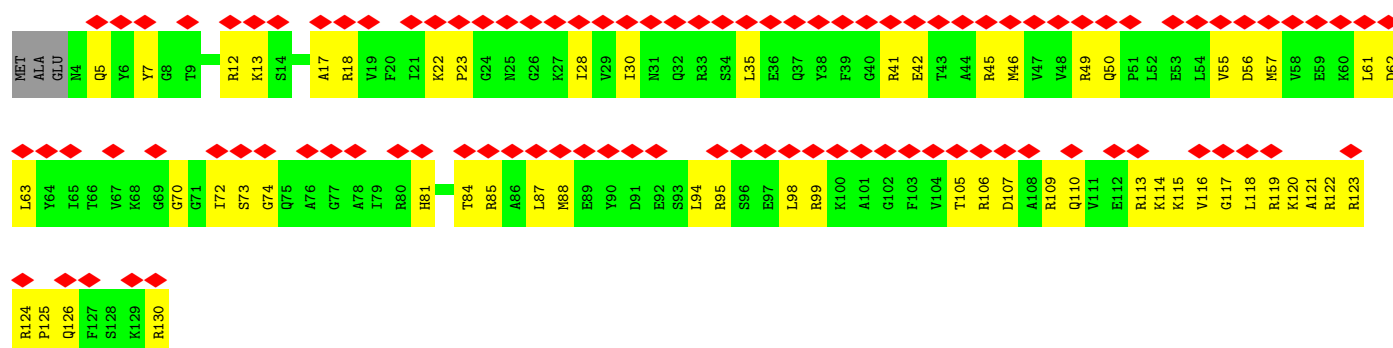
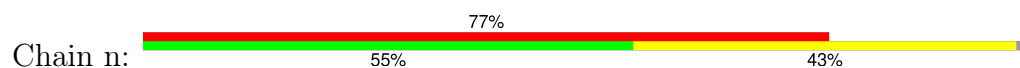
• Molecule 43: 30S ribosomal protein S7



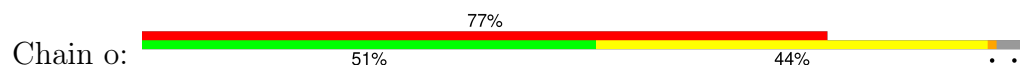
• Molecule 44: Small ribosomal subunit protein uS8



• Molecule 45: Small ribosomal subunit protein uS9

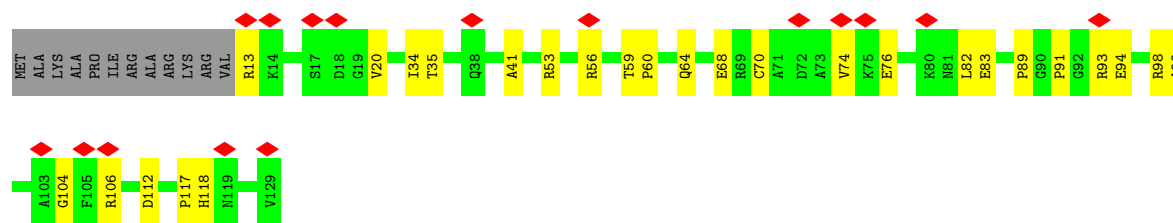


• Molecule 46: Small ribosomal subunit protein uS10

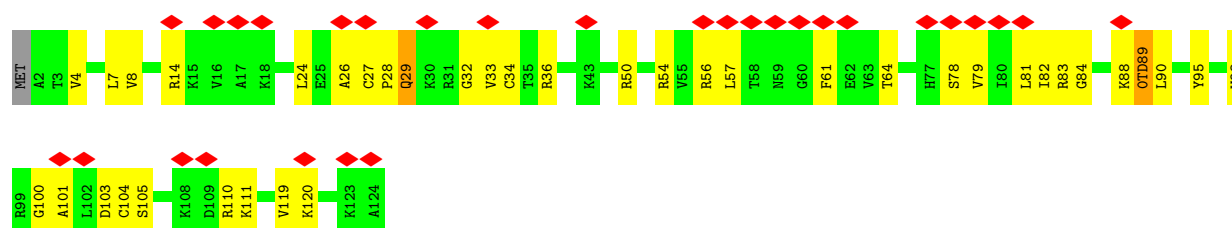


• Molecule 47: 30S ribosomal protein S11

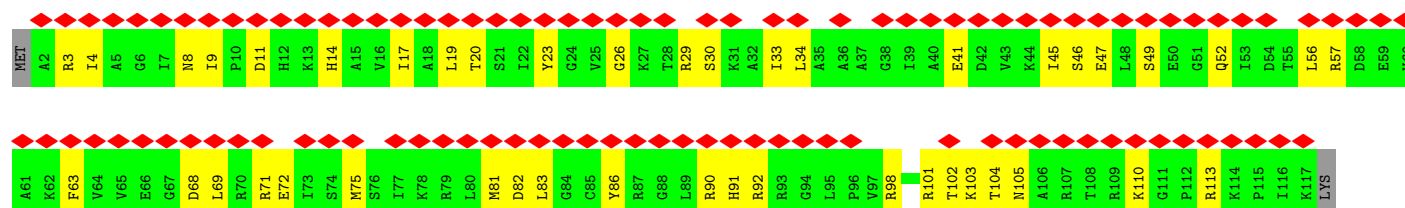
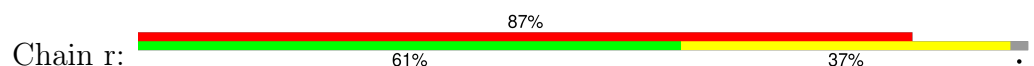




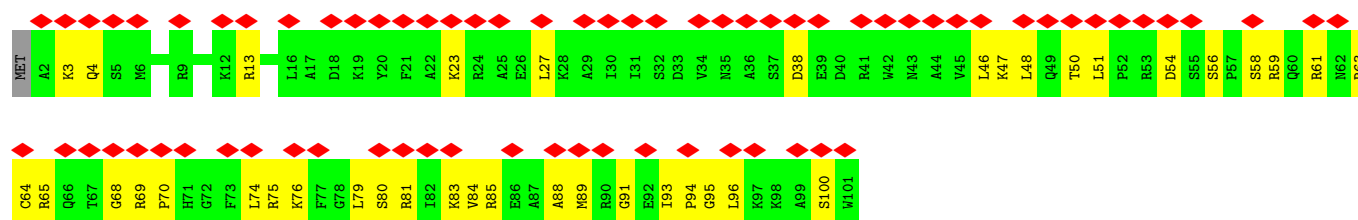
- Molecule 48: Small ribosomal subunit protein uS12



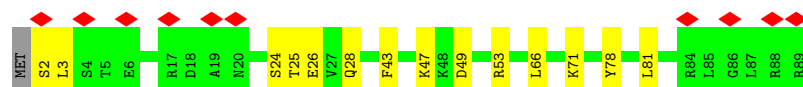
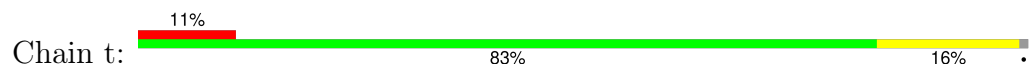
- Molecule 49: 30S ribosomal protein S13



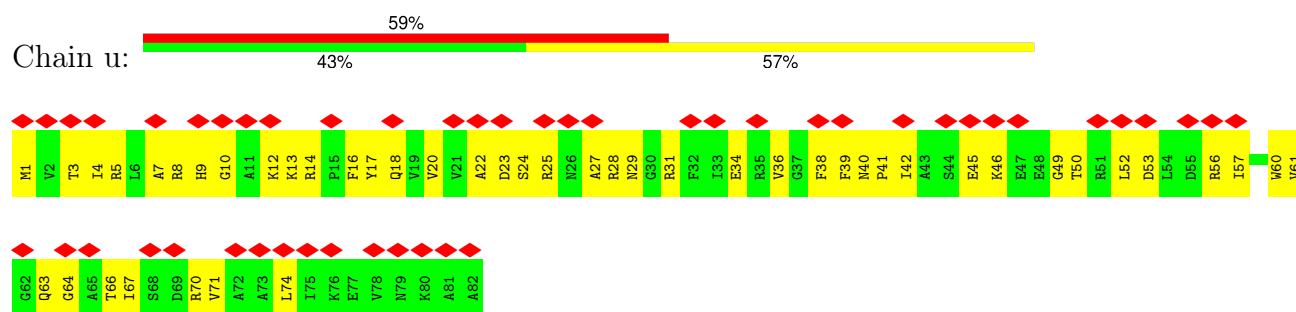
- Molecule 50: Small ribosomal subunit protein uS14



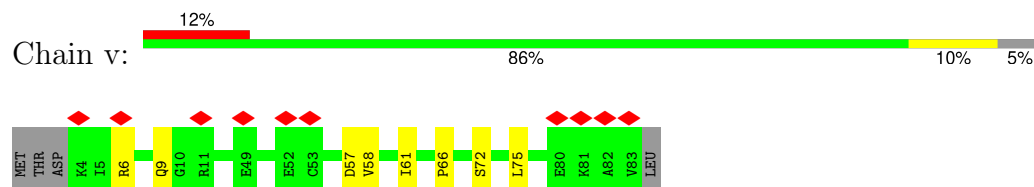
- Molecule 51: Small ribosomal subunit protein uS15



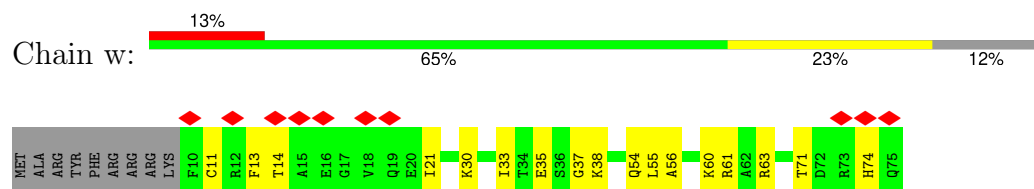
- Molecule 52: 30S ribosomal protein S16



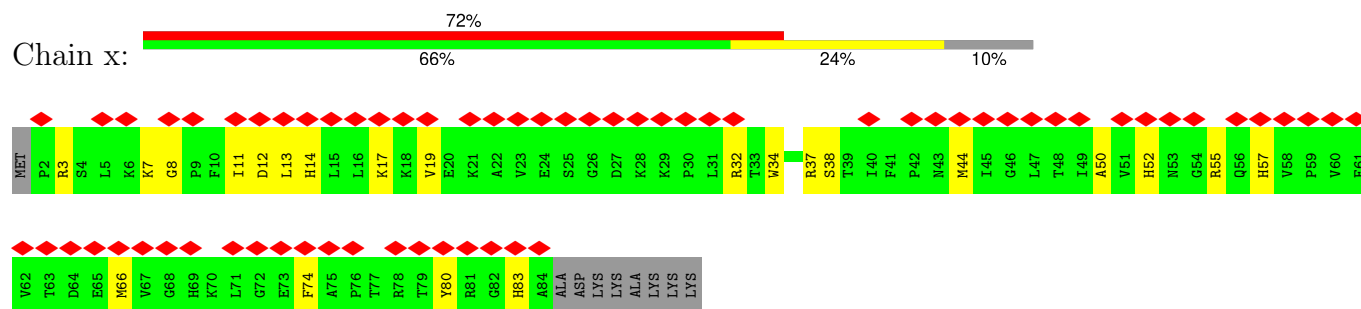
- Molecule 53: Small ribosomal subunit protein uS17



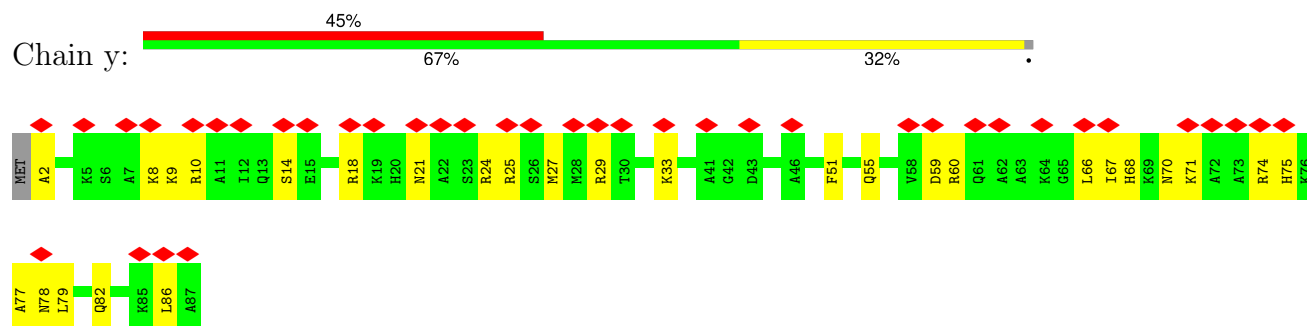
- Molecule 54: 30S ribosomal protein S18



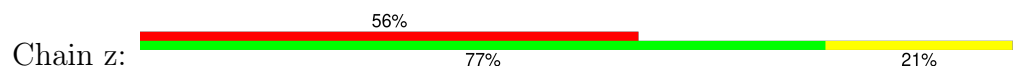
- Molecule 55: Small ribosomal subunit protein uS19



- Molecule 56: 30S ribosomal protein S20



- Molecule 57: 30S ribosomal protein S21





## 4 Experimental information

| Property                             | Value                                   | Source    |
|--------------------------------------|-----------------------------------------|-----------|
| EM reconstruction method             | SINGLE PARTICLE                         | Depositor |
| Imposed symmetry                     | POINT, Not provided                     |           |
| Number of particles used             | 330925                                  | Depositor |
| Resolution determination method      | FSC 0.143 CUT-OFF                       | Depositor |
| CTF correction method                | PHASE FLIPPING AND AMPLITUDE CORRECTION | Depositor |
| Microscope                           | TFS KRIOS                               | Depositor |
| Voltage (kV)                         | 300                                     | Depositor |
| Electron dose ( $e^-/\text{\AA}^2$ ) | 30.0                                    | Depositor |
| Minimum defocus (nm)                 | 1000                                    | Depositor |
| Maximum defocus (nm)                 | 2500                                    | Depositor |
| Magnification                        | Not provided                            |           |
| Image detector                       | FEI FALCON III (4k x 4k)                | Depositor |
| Maximum map value                    | 7.386                                   | Depositor |
| Minimum map value                    | -3.925                                  | Depositor |
| Average map value                    | 0.010                                   | Depositor |
| Map value standard deviation         | 0.215                                   | Depositor |
| Recommended contour level            | 0.701                                   | Depositor |
| Map size (Å)                         | 420.48, 420.48, 420.48                  | wwPDB     |
| Map dimensions                       | 384, 384, 384                           | wwPDB     |
| Map angles (°)                       | 90.0, 90.0, 90.0                        | wwPDB     |
| Pixel spacing (Å)                    | 1.095, 1.095, 1.095                     | Depositor |

## 5 Model quality ⓘ

### 5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: 1MG, PSU, 0TD, MA6, OMG, ZN, G7M, A3P, 2MG, OMC, 3TD, 6MZ, 4OC, 5MC, OMU, 2MA, MG, UR3, 5MU

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     | 0.18         | 1/69285 (0.0%) | 0.35        | 0/108083       |
| 2   | 2     | 0.17         | 0/36561        | 0.34        | 1/57027 (0.0%) |
| 3   | 4     | 0.16         | 0/2872         | 0.33        | 0/4478         |
| 4   | 5     | 0.11         | 0/1835         | 0.26        | 0/2859         |
| 4   | 6     | 0.10         | 0/1832         | 0.23        | 0/2855         |
| 5   | 7     | 0.13         | 0/307          | 0.20        | 0/475          |
| 6   | A     | 0.15         | 0/1686         | 0.42        | 0/2271         |
| 7   | B     | 0.16         | 0/2121         | 0.33        | 0/2852         |
| 8   | C     | 0.24         | 0/1586         | 0.53        | 0/2134         |
| 9   | D     | 0.16         | 0/1571         | 0.43        | 0/2113         |
| 10  | E     | 0.16         | 0/1434         | 0.40        | 0/1926         |
| 11  | F     | 0.17         | 0/1333         | 0.41        | 0/1805         |
| 12  | G     | 0.15         | 0/1122         | 0.40        | 0/1515         |
| 13  | H     | 0.18         | 0/993          | 0.43        | 0/1340         |
| 14  | I     | 0.15         | 0/998          | 0.36        | 0/1348         |
| 15  | J     | 0.21         | 0/1152         | 0.58        | 0/1551         |
| 16  | K     | 0.17         | 0/955          | 0.35        | 0/1279         |
| 17  | L     | 0.22         | 0/1062         | 0.47        | 0/1413         |
| 18  | M     | 0.19         | 0/1093         | 0.52        | 0/1460         |
| 19  | N     | 0.19         | 0/964          | 0.42        | 0/1289         |
| 20  | O     | 0.15         | 0/902          | 0.41        | 0/1209         |
| 21  | P     | 0.21         | 0/929          | 0.44        | 0/1242         |
| 22  | Q     | 0.25         | 0/960          | 0.51        | 0/1278         |
| 23  | R     | 0.22         | 0/829          | 0.54        | 0/1107         |
| 24  | S     | 0.21         | 0/864          | 0.48        | 0/1156         |
| 25  | T     | 0.12         | 0/752          | 0.31        | 0/1005         |
| 26  | U     | 0.17         | 0/796          | 0.47        | 0/1062         |
| 27  | V     | 0.17         | 0/766          | 0.42        | 0/1025         |
| 28  | W     | 0.20         | 0/589          | 0.54        | 0/779          |
| 29  | X     | 0.14         | 0/635          | 0.34        | 0/848          |
| 30  | Y     | 0.13         | 0/502          | 0.32        | 0/667          |

| Mol | Chain | Bond lengths |                 | Bond angles |                 |
|-----|-------|--------------|-----------------|-------------|-----------------|
|     |       | RMSZ         | # Z  >5         | RMSZ        | # Z  >5         |
| 31  | Z     | 0.25         | 0/452           | 0.56        | 0/605           |
| 32  | a     | 0.13         | 0/531           | 0.34        | 0/709           |
| 33  | b     | 0.27         | 0/450           | 0.52        | 0/599           |
| 34  | c     | 0.16         | 0/433           | 0.49        | 0/576           |
| 35  | d     | 0.13         | 0/380           | 0.34        | 0/498           |
| 36  | e     | 0.23         | 0/513           | 0.57        | 0/676           |
| 37  | f     | 0.23         | 0/303           | 0.56        | 0/397           |
| 38  | g     | 0.17         | 0/1791          | 0.44        | 0/2413          |
| 39  | h     | 0.19         | 0/1663          | 0.44        | 0/2241          |
| 40  | i     | 0.19         | 0/1665          | 0.42        | 0/2227          |
| 41  | j     | 0.27         | 0/1165          | 0.60        | 2/1568 (0.1%)   |
| 42  | k     | 0.17         | 0/867           | 0.42        | 0/1171          |
| 43  | l     | 0.15         | 0/1195          | 0.37        | 0/1602          |
| 44  | m     | 0.15         | 0/989           | 0.38        | 0/1326          |
| 45  | n     | 0.15         | 0/1034          | 0.44        | 0/1375          |
| 46  | o     | 0.16         | 0/800           | 0.49        | 2/1082 (0.2%)   |
| 47  | p     | 0.15         | 0/893           | 0.34        | 0/1205          |
| 48  | q     | 0.20         | 0/960           | 0.49        | 0/1286          |
| 49  | r     | 0.15         | 0/909           | 0.38        | 0/1215          |
| 50  | s     | 0.17         | 0/817           | 0.38        | 0/1088          |
| 51  | t     | 0.15         | 0/722           | 0.34        | 0/964           |
| 52  | u     | 0.19         | 0/659           | 0.46        | 0/884           |
| 53  | v     | 0.14         | 0/657           | 0.35        | 0/881           |
| 54  | w     | 0.14         | 0/553           | 0.33        | 0/743           |
| 55  | x     | 0.13         | 0/680           | 0.35        | 0/915           |
| 56  | y     | 0.22         | 0/675           | 0.52        | 0/895           |
| 57  | z     | 0.12         | 0/597           | 0.34        | 0/792           |
| All | All   | 0.18         | 1/161639 (0.0%) | 0.37        | 5/241384 (0.0%) |

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

| Mol | Chain | #Chirality outliers | #Planarity outliers |
|-----|-------|---------------------|---------------------|
| 1   | 1     | 3                   | 0                   |
| 2   | 2     | 1                   | 0                   |
| 15  | J     | 0                   | 1                   |
| 23  | R     | 0                   | 1                   |
| 36  | e     | 0                   | 1                   |
| 48  | q     | 0                   | 1                   |
| All | All   | 4                   | 4                   |

All (1) bond length outliers are listed below:

| Mol | Chain | Res  | Type | Atoms | Z    | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|-------|------|-------------|----------|
| 1   | 1     | 2069 | G7M  | O3'-P | 5.70 | 1.61        | 1.56     |

All (5) bond angle outliers are listed below:

| Mol | Chain | Res  | Type | Atoms      | Z      | Observed(°) | Ideal(°) |
|-----|-------|------|------|------------|--------|-------------|----------|
| 41  | j     | 98   | PRO  | CA-N-CD    | -10.23 | 97.68       | 112.00   |
| 41  | j     | 98   | PRO  | N-CD-CG    | -5.20  | 95.39       | 103.20   |
| 2   | 2     | 1462 | C    | N1-C1'-C2' | 5.18   | 119.77      | 112.00   |
| 46  | o     | 56   | HIS  | CA-C-N     | -5.03  | 118.18      | 122.96   |
| 46  | o     | 56   | HIS  | C-N-CA     | -5.03  | 118.18      | 122.96   |

All (4) chirality outliers are listed below:

| Mol | Chain | Res  | Type | Atom        |
|-----|-------|------|------|-------------|
| 1   | 1     | 2069 | G7M  | C2',C3',C4' |
| 2   | 2     | 1493 | A3P  | C2'         |

All (4) planarity outliers are listed below:

| Mol | Chain | Res | Type | Group     |
|-----|-------|-----|------|-----------|
| 15  | J     | 17  | VAL  | Peptide   |
| 23  | R     | 79  | ARG  | Peptide   |
| 36  | e     | 31  | HIS  | Peptide   |
| 48  | q     | 36  | ARG  | Sidechain |

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

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

| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 1   | 1     | 62336 | 0        | 31365    | 1744    | 0            |
| 2   | 2     | 32930 | 0        | 16581    | 1005    | 0            |
| 3   | 4     | 2569  | 0        | 1300     | 102     | 0            |
| 4   | 5     | 1643  | 0        | 836      | 36      | 0            |
| 4   | 6     | 1640  | 0        | 837      | 46      | 0            |
| 5   | 7     | 275   | 0        | 140      | 3       | 0            |
| 6   | A     | 1660  | 0        | 1677     | 25      | 0            |

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| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 7   | B     | 2082  | 0        | 2154     | 24      | 0            |
| 8   | C     | 1565  | 0        | 1616     | 123     | 0            |
| 9   | D     | 1552  | 0        | 1619     | 57      | 0            |
| 10  | E     | 1410  | 0        | 1444     | 61      | 0            |
| 11  | F     | 1313  | 0        | 1358     | 47      | 0            |
| 12  | G     | 1111  | 0        | 1148     | 18      | 0            |
| 13  | H     | 980   | 0        | 1013     | 31      | 0            |
| 14  | I     | 984   | 0        | 1035     | 22      | 0            |
| 15  | J     | 1129  | 0        | 1162     | 83      | 0            |
| 16  | K     | 946   | 0        | 1023     | 16      | 0            |
| 17  | L     | 1053  | 0        | 1128     | 86      | 0            |
| 18  | M     | 1074  | 0        | 1157     | 56      | 0            |
| 19  | N     | 951   | 0        | 994      | 22      | 0            |
| 20  | O     | 892   | 0        | 923      | 33      | 0            |
| 21  | P     | 917   | 0        | 962      | 21      | 0            |
| 22  | Q     | 947   | 0        | 1019     | 69      | 0            |
| 23  | R     | 816   | 0        | 839      | 51      | 0            |
| 24  | S     | 857   | 0        | 922      | 25      | 0            |
| 25  | T     | 746   | 0        | 811      | 14      | 0            |
| 26  | U     | 788   | 0        | 844      | 39      | 0            |
| 27  | V     | 753   | 0        | 780      | 32      | 0            |
| 28  | W     | 582   | 0        | 599      | 28      | 0            |
| 29  | X     | 625   | 0        | 652      | 8       | 0            |
| 30  | Y     | 501   | 0        | 531      | 7       | 0            |
| 31  | Z     | 448   | 0        | 488      | 26      | 0            |
| 32  | a     | 522   | 0        | 520      | 10      | 0            |
| 33  | b     | 444   | 0        | 458      | 30      | 0            |
| 34  | c     | 426   | 0        | 464      | 17      | 0            |
| 35  | d     | 377   | 0        | 418      | 2       | 0            |
| 36  | e     | 504   | 0        | 572      | 52      | 0            |
| 37  | f     | 302   | 0        | 340      | 28      | 0            |
| 38  | g     | 1760  | 0        | 1787     | 88      | 0            |
| 39  | h     | 1636  | 0        | 1710     | 106     | 0            |
| 40  | i     | 1643  | 0        | 1707     | 94      | 0            |
| 41  | j     | 1152  | 0        | 1196     | 28      | 0            |
| 42  | k     | 848   | 0        | 846      | 18      | 0            |
| 43  | l     | 1181  | 0        | 1238     | 54      | 0            |
| 44  | m     | 979   | 0        | 1031     | 13      | 0            |
| 45  | n     | 1022  | 0        | 1070     | 62      | 0            |
| 46  | o     | 790   | 0        | 831      | 42      | 0            |
| 47  | p     | 877   | 0        | 887      | 21      | 0            |
| 48  | q     | 957   | 0        | 1017     | 35      | 0            |

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| Mol | Chain | Non-H  | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|--------|----------|----------|---------|--------------|
| 49  | r     | 900    | 0        | 965      | 43      | 0            |
| 50  | s     | 805    | 0        | 844      | 49      | 0            |
| 51  | t     | 714    | 0        | 734      | 7       | 0            |
| 52  | u     | 649    | 0        | 666      | 48      | 0            |
| 53  | v     | 648    | 0        | 691      | 6       | 0            |
| 54  | w     | 544    | 0        | 560      | 12      | 0            |
| 55  | x     | 663    | 0        | 688      | 21      | 0            |
| 56  | y     | 669    | 0        | 719      | 30      | 0            |
| 57  | z     | 589    | 0        | 629      | 11      | 0            |
| 58  | 1     | 285    | 0        | 0        | 0       | 0            |
| 58  | 2     | 126    | 0        | 0        | 0       | 0            |
| 58  | 4     | 8      | 0        | 0        | 0       | 0            |
| 58  | 5     | 5      | 0        | 0        | 0       | 0            |
| 58  | A     | 1      | 0        | 0        | 0       | 0            |
| 58  | C     | 1      | 0        | 0        | 0       | 0            |
| 58  | D     | 2      | 0        | 0        | 0       | 0            |
| 58  | L     | 3      | 0        | 0        | 0       | 0            |
| 58  | M     | 1      | 0        | 0        | 0       | 0            |
| 58  | N     | 1      | 0        | 0        | 0       | 0            |
| 58  | b     | 1      | 0        | 0        | 0       | 0            |
| 58  | e     | 1      | 0        | 0        | 0       | 0            |
| 58  | f     | 1      | 0        | 0        | 0       | 0            |
| 58  | h     | 1      | 0        | 0        | 0       | 0            |
| 58  | i     | 1      | 0        | 0        | 0       | 0            |
| 58  | s     | 1      | 0        | 0        | 0       | 0            |
| 59  | a     | 1      | 0        | 0        | 0       | 0            |
| 59  | f     | 1      | 0        | 0        | 0       | 0            |
| 60  | B     | 2      | 0        | 0        | 0       | 0            |
| All | All   | 150119 | 0        | 101545   | 4184    | 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 (4184) 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) |
|----------------|----------------|--------------------------|-------------------|
| 1:1:861:A:H62  | 1:1:916:G:N2   | 1.18                     | 1.42              |
| 1:1:861:A:N6   | 1:1:916:G:H21  | 1.21                     | 1.36              |
| 1:1:2047:C:O2  | 1:1:2048:G:N7  | 1.58                     | 1.34              |
| 1:1:2834:G:N2  | 1:1:2883:A:H62 | 1.27                     | 1.29              |
| 1:1:2834:G:H21 | 1:1:2883:A:N6  | 1.30                     | 1.28              |

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| Atom-1         | Atom-2         | Interatomic distance (Å) | Clash overlap (Å) |
|----------------|----------------|--------------------------|-------------------|
| 1:1:2675:A:N6  | 1:1:2732:G:H1  | 1.32                     | 1.27              |
| 2:2:322:C:N4   | 2:2:329:A:H62  | 1.34                     | 1.23              |
| 1:1:2472:G:H21 | 1:1:2478:A:N6  | 1.38                     | 1.18              |
| 1:1:2741:A:H62 | 1:1:2763:G:N2  | 1.40                     | 1.18              |
| 1:1:227:A:H61  | 1:1:410:G:N2   | 1.40                     | 1.18              |
| 2:2:68:G:N2    | 2:2:151:A:C2   | 2.11                     | 1.17              |
| 1:1:2741:A:N6  | 1:1:2763:G:H21 | 1.41                     | 1.17              |
| 2:2:322:C:H42  | 2:2:329:A:N6   | 1.42                     | 1.17              |
| 1:1:227:A:N6   | 1:1:410:G:H21  | 1.44                     | 1.15              |
| 2:2:68:G:N2    | 2:2:151:A:H2   | 1.44                     | 1.15              |
| 1:1:2047:C:C2  | 1:1:2048:G:N7  | 2.15                     | 1.13              |
| 2:2:68:G:H1    | 2:2:101:A:N6   | 1.46                     | 1.13              |
| 2:2:1349:A:H62 | 2:2:1373:G:N2  | 1.45                     | 1.12              |
| 1:1:2469:A:H62 | 1:1:2481:G:N2  | 1.49                     | 1.10              |
| 1:1:1857:G:N2  | 1:1:1885:A:H62 | 1.49                     | 1.10              |
| 1:1:975:A:H62  | 1:1:989:G:N2   | 1.50                     | 1.08              |
| 2:2:1088:G:N2  | 2:2:1167:A:H61 | 1.50                     | 1.08              |
| 1:1:2472:G:N2  | 1:1:2478:A:H62 | 1.51                     | 1.08              |
| 1:1:2472:G:N2  | 1:1:2478:A:N6  | 2.01                     | 1.07              |
| 2:2:1349:A:N6  | 2:2:1373:G:H21 | 1.50                     | 1.07              |
| 2:2:372:C:N4   | 2:2:389:A:H62  | 1.51                     | 1.07              |
| 1:1:2469:A:N6  | 1:1:2481:G:H21 | 1.52                     | 1.06              |
| 1:1:975:A:N6   | 1:1:989:G:H21  | 1.53                     | 1.05              |
| 2:2:1088:G:H21 | 2:2:1167:A:N6  | 1.55                     | 1.04              |
| 2:2:372:C:H42  | 2:2:389:A:N6   | 1.56                     | 1.01              |
| 1:1:606:U:H3   | 1:1:622:G:H1   | 1.05                     | 0.99              |
| 8:C:110:THR:HA | 8:C:171:THR:HA | 1.43                     | 0.99              |
| 1:1:813:U:O2   | 1:1:1225:G:N2  | 1.96                     | 0.98              |
| 1:1:826:U:H3   | 1:1:831:G:H1   | 1.00                     | 0.98              |
| 2:2:1160:G:H1  | 2:2:1176:A:N6  | 1.60                     | 0.97              |
| 1:1:641:U:H3   | 1:1:647:G:H1   | 1.12                     | 0.97              |
| 1:1:1724:G:H1  | 1:1:1736:U:H3  | 1.12                     | 0.97              |
| 1:1:1857:G:H21 | 1:1:1885:A:H62 | 1.02                     | 0.97              |
| 2:2:182:A:H62  | 2:2:194:C:H42  | 1.03                     | 0.96              |
| 3:4:78:A:H62   | 3:4:98:G:N2    | 1.62                     | 0.96              |
| 1:1:2484:G:N2  | 18:M:122:ALA:O | 1.99                     | 0.95              |
| 1:1:2524:G:H21 | 1:1:2741:A:H2  | 1.15                     | 0.95              |
| 2:2:1109:C:H2' | 2:2:1110:A:C8  | 2.01                     | 0.95              |
| 1:1:1029:A:H62 | 1:1:1125:G:N2  | 1.65                     | 0.94              |
| 3:4:77:U:O2    | 3:4:99:A:N7    | 2.00                     | 0.94              |
| 2:2:201:G:H1   | 2:2:216:U:H3   | 1.15                     | 0.94              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:1:594:U:H3     | 1:1:663:G:H1     | 0.95                     | 0.94              |
| 1:1:2047:C:O2    | 1:1:2048:G:C8    | 2.20                     | 0.93              |
| 2:2:372:C:H42    | 2:2:389:A:H62    | 0.98                     | 0.93              |
| 2:2:950:U:H3     | 2:2:1231:G:H1    | 1.14                     | 0.93              |
| 17:L:33:ARG:HB3  | 17:L:40:SER:HA   | 1.50                     | 0.93              |
| 45:n:120:LYS:HD3 | 45:n:121:ALA:H   | 1.32                     | 0.93              |
| 37:f:14:CYS:SG   | 37:f:27:CYS:HB2  | 2.09                     | 0.93              |
| 3:4:73:A:H8      | 3:4:103:U:H3     | 1.17                     | 0.93              |
| 1:1:2483:C:H42   | 18:M:123:LYS:HE3 | 1.33                     | 0.92              |
| 1:1:819:A:H62    | 1:1:1188:U:H3    | 1.13                     | 0.92              |
| 1:1:1217:U:O2    | 1:1:1232:G:N2    | 2.01                     | 0.92              |
| 2:2:157:U:H3     | 2:2:164:G:H1     | 1.14                     | 0.91              |
| 1:1:1029:A:N6    | 1:1:1125:G:H21   | 1.69                     | 0.91              |
| 1:1:2648:G:H1    | 1:1:2672:U:H3    | 1.12                     | 0.91              |
| 1:1:2519:U:O2    | 1:1:2521:C:N4    | 2.02                     | 0.91              |
| 1:1:2482:A:N1    | 18:M:55:ARG:NH1  | 2.19                     | 0.91              |
| 1:1:2675:A:N1    | 1:1:2732:G:N2    | 2.18                     | 0.90              |
| 17:L:96:LYS:NZ   | 17:L:105:ILE:O   | 2.04                     | 0.90              |
| 2:2:1232:U:H5''  | 45:n:126:GLN:HB2 | 1.54                     | 0.90              |
| 2:2:60:A:OP1     | 2:2:331:G:N2     | 2.04                     | 0.90              |
| 1:1:2540:C:O2'   | 1:1:2740:A:N3    | 2.04                     | 0.89              |
| 3:4:73:A:C8      | 3:4:103:U:N3     | 2.39                     | 0.89              |
| 1:1:2472:G:H21   | 1:1:2478:A:H62   | 0.90                     | 0.89              |
| 1:1:2824:C:H3'   | 1:1:2825:G:H21   | 1.37                     | 0.89              |
| 1:1:540:C:H42    | 1:1:554:U:H3     | 1.18                     | 0.88              |
| 2:2:1107:C:OP2   | 2:2:1109:C:N4    | 2.05                     | 0.88              |
| 8:C:107:VAL:HA   | 8:C:205:PRO:HA   | 1.55                     | 0.88              |
| 39:h:44:THR:O    | 39:h:48:ALA:HB2  | 1.74                     | 0.88              |
| 1:1:2830:C:H3'   | 8:C:59:ARG:HE    | 1.38                     | 0.87              |
| 46:o:9:ARG:HG2   | 46:o:73:LEU:HG   | 1.55                     | 0.87              |
| 1:1:284:U:H3     | 1:1:356:G:H1     | 1.20                     | 0.87              |
| 3:4:78:A:H62     | 3:4:98:G:H21     | 1.20                     | 0.87              |
| 17:L:55:MET:O    | 17:L:60:ARG:NH1  | 2.07                     | 0.87              |
| 1:1:970:U:H5'    | 31:Z:15:GLY:HA2  | 1.57                     | 0.86              |
| 1:1:1218:G:OP2   | 22:Q:15:LYS:NZ   | 2.09                     | 0.86              |
| 43:l:31:MET:HE2  | 43:l:35:LYS:HB2  | 1.55                     | 0.86              |
| 1:1:1264:A:OP1   | 33:b:16:ARG:NH2  | 2.09                     | 0.86              |
| 1:1:1129:A:O2'   | 1:1:2515:C:O2    | 1.92                     | 0.86              |
| 3:4:18:G:H1      | 3:4:65:U:H3      | 0.86                     | 0.86              |
| 31:Z:9:GLN:HB2   | 31:Z:29:LEU:HD22 | 1.58                     | 0.86              |
| 1:1:982:C:H1'    | 1:1:2029:G:H5'   | 1.58                     | 0.85              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:1:1029:A:N6     | 1:1:1125:G:N2     | 2.22                     | 0.85              |
| 1:1:2107:G:H1     | 1:1:2182:U:H3     | 1.23                     | 0.85              |
| 1:1:13:A:O2'      | 1:1:15:G:N7       | 2.09                     | 0.85              |
| 2:2:1088:G:H21    | 2:2:1167:A:H61    | 0.87                     | 0.85              |
| 1:1:639:U:O4      | 1:1:649:G:O6      | 1.95                     | 0.85              |
| 2:2:373:A:N3      | 2:2:451:A:N6      | 2.25                     | 0.85              |
| 2:2:928:G:H2'     | 2:2:929:G:H8      | 1.42                     | 0.85              |
| 1:1:1133:A:N6     | 1:1:2025:C:O2     | 2.09                     | 0.84              |
| 1:1:2618:G:H21    | 8:C:155:VAL:HG21  | 1.42                     | 0.84              |
| 2:2:375:U:H1'     | 52:u:8:ARG:HE     | 1.39                     | 0.84              |
| 1:1:805:G:N3      | 1:1:831:G:O2'     | 2.09                     | 0.84              |
| 1:1:1860:G:H1     | 1:1:1882:U:H3     | 1.25                     | 0.84              |
| 2:2:300:A:C5      | 2:2:301:G:H1'     | 2.13                     | 0.84              |
| 1:1:832:U:H2'     | 1:1:833:A:C8      | 2.12                     | 0.84              |
| 2:2:1305:G:HO2'   | 2:2:1306:A:H8     | 1.26                     | 0.84              |
| 1:1:2472:G:C2     | 1:1:2478:A:N6     | 2.46                     | 0.84              |
| 2:2:454:G:H1      | 2:2:478:A:H61     | 1.21                     | 0.84              |
| 47:p:64:GLN:NE2   | 47:p:68:GLU:OE2   | 2.11                     | 0.84              |
| 1:1:524:G:H5''    | 1:1:539:G:H22     | 1.43                     | 0.84              |
| 1:1:954:G:H22     | 1:1:2250:G:H1     | 1.26                     | 0.84              |
| 1:1:1223:G:N2     | 1:1:1226:A:OP2    | 2.11                     | 0.84              |
| 39:h:53:SER:HB2   | 39:h:114:LYS:HB3  | 1.60                     | 0.84              |
| 1:1:826:U:O4      | 1:1:831:G:O6      | 1.95                     | 0.83              |
| 1:1:1187:G:N2     | 1:1:1188:U:O4     | 2.09                     | 0.83              |
| 1:1:2469:A:H62    | 1:1:2481:G:H21    | 0.84                     | 0.83              |
| 39:h:105:GLU:OE1  | 39:h:107:ARG:NH1  | 2.11                     | 0.83              |
| 39:h:167:TRP:HZ3  | 39:h:169:ARG:HB2  | 1.43                     | 0.83              |
| 1:1:1857:G:H21    | 1:1:1885:A:N6     | 1.77                     | 0.83              |
| 1:1:1217:U:H3     | 1:1:1232:G:H1     | 1.20                     | 0.83              |
| 1:1:833:A:H2'     | 1:1:834:G:C8      | 2.13                     | 0.83              |
| 1:1:1131:G:O6     | 8:C:154:LYS:NZ    | 2.10                     | 0.83              |
| 1:1:2471:A:N6     | 1:1:2480:C:O2     | 2.10                     | 0.83              |
| 2:2:1377:A:H61    | 43:l:10:ARG:HE    | 1.26                     | 0.83              |
| 40:i:101:VAL:HG12 | 40:i:105:MET:HE1  | 1.61                     | 0.83              |
| 2:2:552:U:H2'     | 2:2:553:A:H8      | 1.44                     | 0.83              |
| 2:2:1074:G:H1     | 2:2:1082:A:H61    | 1.25                     | 0.83              |
| 2:2:182:A:H62     | 2:2:194:C:N4      | 1.76                     | 0.82              |
| 18:M:17:ASN:ND2   | 18:M:97:GLN:OE1   | 2.11                     | 0.82              |
| 1:1:600:G:H1      | 1:1:657:U:H3      | 0.83                     | 0.82              |
| 2:2:1367:C:H5''   | 45:n:116:VAL:HG23 | 1.61                     | 0.82              |
| 1:1:2467:C:O2'    | 18:M:118:LYS:NZ   | 2.12                     | 0.82              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:1:227:A:H61    | 1:1:410:G:H21     | 0.83                     | 0.82              |
| 1:1:870:U:O2     | 1:1:907:G:N2      | 2.14                     | 0.81              |
| 38:g:166:ALA:HB3 | 38:g:191:SER:HB3  | 1.61                     | 0.81              |
| 2:2:355:C:H1'    | 2:2:388:G:H1'     | 1.62                     | 0.81              |
| 1:1:16:C:O2'     | 33:b:11:SER:OG    | 1.97                     | 0.81              |
| 2:2:68:G:H21     | 2:2:151:A:H2      | 0.95                     | 0.81              |
| 38:g:23:TRP:HA   | 38:g:190:ASN:HA   | 1.62                     | 0.81              |
| 2:2:1178:G:H5''  | 45:n:95:ARG:HH21  | 1.45                     | 0.80              |
| 1:1:2345:G:H4'   | 1:1:2346:A:H5''   | 1.62                     | 0.80              |
| 2:2:375:U:H3'    | 2:2:376:G:C8      | 2.16                     | 0.80              |
| 48:q:29:GLN:HB3  | 48:q:81:LEU:HD22  | 1.63                     | 0.80              |
| 2:2:33:A:H2'     | 2:2:34:C:H6       | 1.46                     | 0.80              |
| 36:e:14:PHE:HB3  | 36:e:22:PHE:HB3   | 1.61                     | 0.80              |
| 1:1:2638:G:O2'   | 1:1:2639:A:N7     | 2.14                     | 0.80              |
| 38:g:183:VAL:HB  | 38:g:197:ASP:H    | 1.45                     | 0.80              |
| 2:2:542:G:H5''   | 40:i:38:PRO:HB2   | 1.62                     | 0.80              |
| 1:1:1008:A:H3'   | 15:J:37:ARG:HH12  | 1.47                     | 0.79              |
| 2:2:937:A:N6     | 2:2:1345:U:O4     | 2.14                     | 0.79              |
| 3:4:22:U:H3      | 3:4:61:G:H1       | 1.30                     | 0.79              |
| 39:h:56:VAL:HB   | 39:h:67:THR:HB    | 1.64                     | 0.79              |
| 1:1:600:G:O6     | 1:1:657:U:O4      | 2.00                     | 0.79              |
| 2:2:1157:A:C2    | 2:2:1178:G:N2     | 2.50                     | 0.79              |
| 2:2:1349:A:H62   | 2:2:1373:G:H21    | 0.82                     | 0.79              |
| 2:2:1015:G:N2    | 2:2:1218:C:O2     | 2.16                     | 0.79              |
| 39:h:11:ARG:NH2  | 39:h:177:THR:O    | 2.16                     | 0.79              |
| 1:1:2519:U:O2'   | 1:1:2541:A:N6     | 2.15                     | 0.79              |
| 1:1:1133:A:N1    | 1:1:2038:G:N2     | 2.30                     | 0.79              |
| 2:2:151:A:N7     | 2:2:170:U:O2      | 2.16                     | 0.79              |
| 2:2:374:A:N6     | 2:2:390:U:O2      | 2.15                     | 0.79              |
| 2:2:1072:G:O6    | 2:2:1084:G:N2     | 2.14                     | 0.79              |
| 2:2:1229:A:OP2   | 49:r:113:ARG:NH1  | 2.16                     | 0.79              |
| 1:1:815:C:H4'    | 1:1:1165:A:H1'    | 1.64                     | 0.78              |
| 1:1:1008:A:N3    | 1:1:1010:A:N6     | 2.30                     | 0.78              |
| 2:2:966:2MG:N2   | 4:5:34:C:H4'      | 1.97                     | 0.78              |
| 1:1:2230:G:H1'   | 29:X:32:ASN:HB3   | 1.66                     | 0.78              |
| 1:1:2513:A:H2'   | 1:1:2514:U:H6     | 1.48                     | 0.78              |
| 1:1:2883:A:HO2'  | 33:b:41:HIS:HE2   | 1.28                     | 0.78              |
| 1:1:82:U:O2      | 1:1:104:A:N6      | 2.15                     | 0.78              |
| 1:1:257:C:O2     | 17:L:104:GLN:NE2  | 2.15                     | 0.78              |
| 52:u:4:ILE:HG22  | 52:u:71:VAL:HG21  | 1.64                     | 0.78              |
| 39:h:10:ILE:HG13 | 39:h:178:LEU:HD11 | 1.65                     | 0.78              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:1:2645:G:H4'   | 1:1:2646:C:OP2   | 1.82                     | 0.78              |
| 1:1:2830:C:O2'   | 1:1:2836:U:O4'   | 2.02                     | 0.78              |
| 3:4:78:A:N6      | 3:4:98:G:H21     | 1.80                     | 0.78              |
| 2:2:393:A:H4'    | 2:2:483:C:H4'    | 1.66                     | 0.78              |
| 1:1:991:C:H5'    | 1:1:1186:G:H5'   | 1.66                     | 0.78              |
| 1:1:1160:G:O2'   | 23:R:6:GLN:NE2   | 2.17                     | 0.78              |
| 47:p:117:PRO:O   | 57:z:35:ARG:NH1  | 2.15                     | 0.78              |
| 1:1:570:G:N2     | 1:1:2030:6MZ:O5' | 2.16                     | 0.78              |
| 1:1:1912:A:HO2'  | 2:2:1494:G:HO2'  | 1.31                     | 0.78              |
| 31:Z:17:LEU:HD12 | 31:Z:18:PRO:HD2  | 1.66                     | 0.78              |
| 1:1:1028:A:H2'   | 1:1:1029:A:C8    | 2.19                     | 0.78              |
| 39:h:156:ARG:HD3 | 39:h:194:GLY:HA3 | 1.66                     | 0.77              |
| 40:i:71:GLN:OE1  | 40:i:97:ARG:NH1  | 2.17                     | 0.77              |
| 1:1:60:G:N2      | 1:1:88:G:OP2     | 2.17                     | 0.77              |
| 1:1:667:U:O4     | 1:1:668:A:N6     | 2.16                     | 0.77              |
| 1:1:2354:C:N4    | 1:1:2355:G:O6    | 2.17                     | 0.77              |
| 8:C:148:GLN:HE22 | 8:C:156:PHE:HZ   | 1.31                     | 0.77              |
| 11:F:50:LEU:HD13 | 11:F:72:LEU:HD21 | 1.66                     | 0.77              |
| 20:O:15:ARG:HH21 | 20:O:95:SER:HB3  | 1.49                     | 0.77              |
| 1:1:2356:U:O2    | 1:1:2361:G:N2    | 2.17                     | 0.77              |
| 1:1:2377:A:N1    | 20:O:94:ARG:NH2  | 2.32                     | 0.77              |
| 1:1:2426:A:H5''  | 1:1:2427:C:H5    | 1.48                     | 0.77              |
| 2:2:63:C:OP1     | 2:2:383:A:N6     | 2.16                     | 0.77              |
| 1:1:527:C:H5''   | 1:1:2779:U:H3    | 1.49                     | 0.77              |
| 2:2:416:G:H2'    | 2:2:417:G:H8     | 1.49                     | 0.77              |
| 2:2:544:G:OP1    | 40:i:63:ARG:NH2  | 2.17                     | 0.77              |
| 2:2:1116:U:O2    | 2:2:1184:G:O6    | 2.03                     | 0.77              |
| 1:1:535:G:N2     | 22:Q:56:GLN:OE1  | 2.16                     | 0.77              |
| 1:1:2006:C:O2'   | 1:1:2823:A:N3    | 2.15                     | 0.77              |
| 2:2:68:G:N2      | 2:2:101:A:N1     | 2.31                     | 0.77              |
| 2:2:1083:U:O2    | 2:2:1102:A:N6    | 2.18                     | 0.77              |
| 1:1:2682:A:N3    | 8:C:13:ARG:NH2   | 2.33                     | 0.77              |
| 2:2:829:G:H4'    | 38:g:25:PRO:HG2  | 1.67                     | 0.77              |
| 1:1:617:G:H4'    | 9:D:199:MET:HE3  | 1.66                     | 0.77              |
| 2:2:137:U:O2     | 2:2:226:G:O6     | 2.02                     | 0.77              |
| 2:2:966:2MG:HN2  | 4:5:34:C:H4'     | 1.49                     | 0.76              |
| 1:1:1055:G:H4'   | 13:H:34:THR:HB   | 1.67                     | 0.76              |
| 1:1:2831:G:H8    | 8:C:59:ARG:HH22  | 1.33                     | 0.76              |
| 2:2:1315:U:O2'   | 2:2:1360:A:N3    | 2.16                     | 0.76              |
| 26:U:33:LYS:HD3  | 26:U:64:ALA:HB1  | 1.67                     | 0.76              |
| 43:l:113:ASP:HB2 | 43:l:119:ARG:HG2 | 1.68                     | 0.76              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:1:2261:C:H41   | 28:W:14:ARG:HG2   | 1.50                     | 0.76              |
| 1:1:2569:G:H2'   | 1:1:2570:G:H8     | 1.50                     | 0.76              |
| 1:1:2679:A:H4'   | 8:C:194:PRO:HG3   | 1.66                     | 0.76              |
| 52:u:16:PHE:HZ   | 52:u:38:PHE:HB2   | 1.50                     | 0.76              |
| 1:1:957:C:H42    | 1:1:2494:G:H21    | 1.33                     | 0.76              |
| 1:1:2372:U:OP1   | 34:c:45:GLN:NE2   | 2.19                     | 0.76              |
| 2:2:324:G:H21    | 2:2:326:G:H8      | 1.31                     | 0.76              |
| 40:i:147:GLU:HA  | 40:i:150:LYS:HG3  | 1.68                     | 0.76              |
| 1:1:567:U:OP1    | 17:L:29:LYS:NZ    | 2.17                     | 0.76              |
| 2:2:412:A:H62    | 2:2:431:A:H2      | 1.33                     | 0.76              |
| 2:2:618:C:N4     | 2:2:621:A:OP2     | 2.17                     | 0.76              |
| 50:s:13:ARG:HH21 | 50:s:59:ARG:HE    | 1.32                     | 0.76              |
| 57:z:10:GLU:OE2  | 57:z:18:ARG:NH1   | 2.17                     | 0.76              |
| 1:1:2658:C:N4    | 1:1:2659:G:O6     | 2.18                     | 0.76              |
| 2:2:1127:G:N2    | 2:2:1148:U:O4     | 2.19                     | 0.76              |
| 47:p:64:GLN:HG2  | 47:p:99:ALA:HB2   | 1.67                     | 0.76              |
| 1:1:2134:A:N6    | 1:1:2156:G:N2     | 2.33                     | 0.76              |
| 1:1:951:C:N4     | 1:1:952:G:O6      | 2.18                     | 0.76              |
| 1:1:1028:A:OP2   | 1:1:1126:A:N6     | 2.18                     | 0.76              |
| 26:U:34:VAL:HG13 | 26:U:67:VAL:HG12  | 1.68                     | 0.76              |
| 1:1:247:G:O2'    | 1:1:250:G:N7      | 2.19                     | 0.75              |
| 1:1:2405:G:O2'   | 1:1:2411:A:N6     | 2.19                     | 0.75              |
| 2:2:439:U:O4     | 2:2:496:A:N6      | 2.18                     | 0.75              |
| 11:F:154:PRO:HB3 | 11:F:161:GLY:HA3  | 1.67                     | 0.75              |
| 41:j:11:LEU:HD23 | 41:j:41:ASP:HB3   | 1.67                     | 0.75              |
| 2:2:553:A:H2'    | 2:2:554:A:H5'     | 1.68                     | 0.75              |
| 2:2:1160:G:N2    | 2:2:1176:A:N1     | 2.32                     | 0.75              |
| 37:f:19:ARG:HD2  | 37:f:24:ARG:HG3   | 1.67                     | 0.75              |
| 1:1:24:G:H2'     | 1:1:25:U:H6       | 1.52                     | 0.75              |
| 1:1:443:A:H5'    | 1:1:1201:U:H4'    | 1.68                     | 0.75              |
| 1:1:2478:A:OP2   | 37:f:2:LYS:NZ     | 2.17                     | 0.75              |
| 45:n:123:ARG:NH1 | 45:n:124:ARG:O    | 2.19                     | 0.75              |
| 1:1:537:G:H5''   | 15:J:5:THR:HG21   | 1.69                     | 0.75              |
| 1:1:2296:U:OP2   | 20:O:9:ARG:NH2    | 2.20                     | 0.75              |
| 2:2:690:G:N2     | 2:2:697:U:O4      | 2.19                     | 0.75              |
| 28:W:11:ARG:O    | 28:W:14:ARG:NH1   | 2.20                     | 0.75              |
| 1:1:2391:G:H1    | 1:1:2424:C:H3'    | 1.50                     | 0.75              |
| 2:2:619:U:O2'    | 40:i:128:ARG:NH1  | 2.20                     | 0.75              |
| 2:2:1047:G:H21   | 2:2:1215:G:H5'    | 1.50                     | 0.75              |
| 41:j:12:GLN:HB3  | 41:j:117:VAL:HG23 | 1.69                     | 0.75              |
| 1:1:17:G:H5''    | 33:b:10:ARG:HG3   | 1.69                     | 0.75              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 1:1:647:G:H21     | 1:1:2351:G:H5'   | 1.51                     | 0.75              |
| 17:L:33:ARG:NH1   | 17:L:39:LYS:O    | 2.18                     | 0.75              |
| 17:L:112:LEU:HD12 | 17:L:134:ALA:HB2 | 1.67                     | 0.75              |
| 1:1:974:G:O4'     | 1:1:990:A:N6     | 2.19                     | 0.74              |
| 2:2:983:A:N1      | 2:2:1222:G:N2    | 2.34                     | 0.74              |
| 1:1:641:U:O4      | 1:1:647:G:O6     | 2.04                     | 0.74              |
| 1:1:2530:A:H4'    | 1:1:2535:G:H1    | 1.52                     | 0.74              |
| 4:5:54:U:H3       | 4:5:58:A:H62     | 1.36                     | 0.74              |
| 1:1:245:G:H2'     | 1:1:246:C:C6     | 2.23                     | 0.74              |
| 1:1:819:A:N7      | 1:1:1188:U:O4    | 2.21                     | 0.74              |
| 1:1:993:G:H4'     | 23:R:72:VAL:HG21 | 1.68                     | 0.74              |
| 13:H:5:LEU:O      | 13:H:9:GLN:NE2   | 2.21                     | 0.74              |
| 2:2:1375:A:H4'    | 43:l:29:ILE:HG12 | 1.68                     | 0.74              |
| 1:1:1864:U:H4'    | 1:1:2410:G:H21   | 1.53                     | 0.74              |
| 2:2:543:U:H5''    | 40:i:14:ARG:HG2  | 1.70                     | 0.74              |
| 52:u:5:ARG:NH2    | 52:u:23:ASP:O    | 2.20                     | 0.74              |
| 1:1:1860:G:N2     | 1:1:1882:U:O2    | 2.21                     | 0.74              |
| 2:2:260:G:N7      | 56:y:74:ARG:NH1  | 2.35                     | 0.73              |
| 28:W:68:LYS:HB2   | 28:W:83:GLU:HG3  | 1.69                     | 0.73              |
| 1:1:606:U:O2      | 1:1:622:G:N2     | 2.21                     | 0.73              |
| 2:2:416:G:O6      | 2:2:427:U:O4     | 2.05                     | 0.73              |
| 1:1:2748:A:H5''   | 11:F:4:VAL:HG21  | 1.71                     | 0.73              |
| 37:f:5:ALA:O      | 37:f:37:GLN:NE2  | 2.21                     | 0.73              |
| 1:1:847:U:H1'     | 1:1:934:U:H1'    | 1.70                     | 0.73              |
| 1:1:2836:U:H2'    | 1:1:2837:A:H8    | 1.54                     | 0.73              |
| 18:M:42:THR:HA    | 18:M:93:VAL:HG12 | 1.71                     | 0.73              |
| 1:1:2362:C:N4     | 1:1:2363:G:O6    | 2.21                     | 0.73              |
| 1:1:993:G:OP2     | 22:Q:51:ARG:NH2  | 2.21                     | 0.73              |
| 52:u:8:ARG:O      | 52:u:29:ASN:ND2  | 2.14                     | 0.73              |
| 1:1:2355:G:H2'    | 1:1:2356:U:C6    | 2.24                     | 0.73              |
| 1:1:2390:U:H2'    | 1:1:2391:G:H5''  | 1.70                     | 0.73              |
| 2:2:68:G:N3       | 2:2:151:A:N1     | 2.36                     | 0.73              |
| 1:1:601:C:O2'     | 9:D:99:LYS:NZ    | 2.17                     | 0.73              |
| 1:1:976:G:HO2'    | 1:1:1155:A:HO2'  | 1.34                     | 0.73              |
| 2:2:1015:G:N3     | 2:2:1218:C:O2'   | 2.21                     | 0.73              |
| 8:C:193:VAL:HG21  | 8:C:201:LEU:HD11 | 1.71                     | 0.73              |
| 7:B:29:PRO:HG2    | 7:B:34:LEU:HD11  | 1.70                     | 0.73              |
| 1:1:25:U:H3       | 1:1:515:A:H61    | 1.36                     | 0.73              |
| 1:1:177:G:OP2     | 1:1:177:G:N2     | 2.19                     | 0.73              |
| 1:1:243:U:H2'     | 1:1:244:A:H8     | 1.53                     | 0.73              |
| 1:1:587:C:C2      | 17:L:19:LEU:HD12 | 2.24                     | 0.73              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:2:182:A:N6     | 2:2:194:C:H42     | 1.85                     | 0.72              |
| 2:2:1249:C:O2    | 2:2:1288:A:N6     | 2.22                     | 0.72              |
| 12:G:116:ARG:HG3 | 12:G:133:GLN:HG2  | 1.72                     | 0.72              |
| 1:1:966:G:O2'    | 1:1:2267:A:N7     | 2.23                     | 0.72              |
| 1:1:1779:U:OP2   | 1:1:1784:A:N6     | 2.22                     | 0.72              |
| 1:1:590:A:H2'    | 1:1:591:U:O4'     | 1.89                     | 0.72              |
| 1:1:2779:U:H4'   | 1:1:2780:G:H3'    | 1.70                     | 0.72              |
| 1:1:2883:A:O2'   | 33:b:41:HIS:NE2   | 2.22                     | 0.72              |
| 2:2:38:G:N1      | 2:2:397:A:OP1     | 2.22                     | 0.72              |
| 2:2:994:A:H1'    | 2:2:1217:C:H5'    | 1.72                     | 0.72              |
| 7:B:78:VAL:HG21  | 7:B:110:LEU:HD11  | 1.71                     | 0.72              |
| 23:R:63:VAL:HA   | 23:R:96:VAL:HG12  | 1.70                     | 0.72              |
| 2:2:1249:C:O2'   | 45:n:70:GLY:O     | 2.08                     | 0.72              |
| 1:1:648:G:H4'    | 1:1:2352:A:H5'    | 1.71                     | 0.72              |
| 1:1:958:U:H2'    | 3:4:89:U:H1'      | 1.72                     | 0.72              |
| 2:2:1368:A:OP1   | 45:n:113:ARG:NH2  | 2.23                     | 0.72              |
| 17:L:33:ARG:NH1  | 17:L:41:ARG:O     | 2.23                     | 0.72              |
| 46:o:8:ILE:HG22  | 46:o:100:ILE:HG12 | 1.71                     | 0.72              |
| 2:2:6:G:O6       | 41:j:100:SER:OG   | 2.06                     | 0.72              |
| 55:x:3:ARG:HH21  | 55:x:7:LYS:HB3    | 1.54                     | 0.72              |
| 1:1:859:G:H21    | 1:1:917:A:H8      | 1.38                     | 0.72              |
| 1:1:978:G:OP1    | 1:1:1002:G:N2     | 2.22                     | 0.72              |
| 2:2:509:A:H5''   | 40:i:48:LEU:HD11  | 1.72                     | 0.72              |
| 2:2:1064:G:N2    | 2:2:1190:G:O3'    | 2.22                     | 0.72              |
| 2:2:1144:G:H21   | 2:2:1146:A:H62    | 1.38                     | 0.72              |
| 23:R:35:PHE:HB2  | 23:R:59:ILE:HB    | 1.71                     | 0.72              |
| 1:1:31:C:H5''    | 1:1:1239:G:H5'    | 1.70                     | 0.72              |
| 1:1:250:G:OP2    | 36:e:13:ARG:NH1   | 2.22                     | 0.72              |
| 1:1:608:A:OP2    | 1:1:619:G:N2      | 2.23                     | 0.72              |
| 2:2:33:A:O2'     | 2:2:363:A:N3      | 2.20                     | 0.72              |
| 31:Z:45:ARG:NH1  | 31:Z:45:ARG:O     | 2.23                     | 0.72              |
| 1:1:320:A:H2'    | 9:D:131:THR:HB    | 1.71                     | 0.71              |
| 1:1:980:A:O2'    | 1:1:2037:A:N3     | 2.23                     | 0.71              |
| 1:1:2648:G:N2    | 1:1:2672:U:O2     | 2.20                     | 0.71              |
| 2:2:363:A:N6     | 48:q:27:CYS:SG    | 2.62                     | 0.71              |
| 21:P:14:LYS:HG3  | 21:P:77:HIS:HA    | 1.72                     | 0.71              |
| 1:1:1789:A:OP2   | 7:B:221:ARG:NH1   | 2.22                     | 0.71              |
| 1:1:2683:C:H2'   | 1:1:2684:U:H5'    | 1.71                     | 0.71              |
| 1:1:2348:U:H2'   | 1:1:2349:G:H8     | 1.53                     | 0.71              |
| 39:h:14:ILE:HD13 | 39:h:178:LEU:HD12 | 1.73                     | 0.71              |
| 1:1:989:G:H4'    | 1:1:1157:G:H4'    | 1.72                     | 0.71              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:2:299:G:H21    | 2:2:565:U:H3     | 1.36                     | 0.71              |
| 2:2:513:C:H2'    | 2:2:514:C:C6     | 2.25                     | 0.71              |
| 1:1:245:G:H2'    | 1:1:246:C:H6     | 1.56                     | 0.71              |
| 1:1:2521:C:H2'   | 1:1:2522:U:C6    | 2.25                     | 0.71              |
| 1:1:2723:C:OP1   | 8:C:114:LYS:NZ   | 2.23                     | 0.71              |
| 7:B:142:HIS:ND1  | 7:B:193:GLY:O    | 2.22                     | 0.71              |
| 1:1:1128:G:N3    | 1:1:2516:A:O2'   | 2.20                     | 0.71              |
| 8:C:176:ASP:HB3  | 8:C:190:LYS:HE2  | 1.72                     | 0.71              |
| 1:1:2473:U:OP1   | 1:1:2475:C:N4    | 2.23                     | 0.71              |
| 1:1:2741:A:H62   | 1:1:2763:G:H21   | 0.75                     | 0.71              |
| 2:2:1440:U:O2'   | 2:2:1442:G:N7    | 2.23                     | 0.71              |
| 15:J:18:VAL:HG21 | 15:J:54:ILE:HD11 | 1.71                     | 0.71              |
| 1:1:2818:U:O2    | 1:1:2828:G:N2    | 2.19                     | 0.71              |
| 2:2:195:A:N3     | 2:2:222:C:O2'    | 2.24                     | 0.71              |
| 11:F:38:ASN:ND2  | 11:F:64:GLN:OE1  | 2.23                     | 0.71              |
| 48:q:57:LEU:HD12 | 48:q:61:PHE:HB2  | 1.73                     | 0.71              |
| 1:1:99:U:H5''    | 1:1:100:U:H5'    | 1.73                     | 0.71              |
| 1:1:2462:C:H2'   | 1:1:2463:C:H6    | 1.55                     | 0.71              |
| 2:2:1110:A:H2'   | 2:2:1111:A:C8    | 2.26                     | 0.71              |
| 2:2:936:C:H2'    | 2:2:937:A:H8     | 1.55                     | 0.70              |
| 2:2:987:G:N2     | 2:2:1015:G:H22   | 1.89                     | 0.70              |
| 22:Q:66:ASN:HD21 | 22:Q:70:ARG:HH21 | 1.37                     | 0.70              |
| 1:1:659:G:N3     | 9:D:30:GLN:NE2   | 2.37                     | 0.70              |
| 9:D:106:LYS:HA   | 9:D:109:LEU:HD12 | 1.72                     | 0.70              |
| 1:1:1252:G:H1    | 22:Q:37:GLN:HB3  | 1.55                     | 0.70              |
| 2:2:233:C:H2'    | 2:2:234:C:H5'    | 1.74                     | 0.70              |
| 40:i:11:LEU:HB3  | 40:i:63:ARG:HE   | 1.56                     | 0.70              |
| 1:1:322:A:H5'    | 1:1:340:A:H1'    | 1.72                     | 0.70              |
| 1:1:856:G:O6     | 1:1:920:A:N6     | 2.23                     | 0.70              |
| 1:1:1143:A:N6    | 15:J:27:ARG:HG3  | 2.06                     | 0.70              |
| 39:h:135:LYS:O   | 39:h:139:GLN:NE2 | 2.23                     | 0.70              |
| 1:1:255:A:H1'    | 1:1:384:A:OP1    | 1.91                     | 0.70              |
| 1:1:2037:A:H2'   | 1:1:2038:G:C8    | 2.27                     | 0.70              |
| 1:1:306:U:O2'    | 1:1:1211:C:OP2   | 2.09                     | 0.70              |
| 1:1:952:G:OP1    | 18:M:18:ARG:NH1  | 2.25                     | 0.70              |
| 2:2:980:C:O2'    | 50:s:13:ARG:NH1  | 2.23                     | 0.70              |
| 24:S:55:ILE:HG23 | 24:S:66:ILE:HD12 | 1.74                     | 0.70              |
| 1:1:929:U:O2'    | 31:Z:26:GLY:O    | 2.08                     | 0.70              |
| 1:1:1019:U:H2'   | 1:1:1020:A:N7    | 2.06                     | 0.70              |
| 1:1:1039:A:H2    | 1:1:1116:G:H1    | 1.38                     | 0.70              |
| 2:2:927:G:H2'    | 2:2:928:G:H8     | 1.56                     | 0.70              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 47:p:60:PRO:HD3   | 47:p:91:PRO:HB2   | 1.72                     | 0.70              |
| 1:1:1131:G:N2     | 1:1:1132:U:O4     | 2.23                     | 0.70              |
| 17:L:127:VAL:HG11 | 17:L:142:ILE:HD13 | 1.74                     | 0.70              |
| 2:2:263:A:H5'     | 56:y:70:ASN:HB3   | 1.74                     | 0.70              |
| 2:2:481:G:N3      | 2:2:482:A:N6      | 2.39                     | 0.70              |
| 2:2:1317:C:OP1    | 50:s:56:SER:OG    | 2.06                     | 0.70              |
| 9:D:45:ALA:HB2    | 9:D:89:PRO:HG3    | 1.74                     | 0.70              |
| 33:b:15:MET:O     | 33:b:18:SER:OG    | 2.09                     | 0.70              |
| 39:h:156:ARG:H    | 39:h:163:ALA:HA   | 1.57                     | 0.70              |
| 11:F:45:HIS:ND1   | 11:F:49:THR:O     | 2.25                     | 0.70              |
| 40:i:53:VAL:HA    | 40:i:56:ARG:HE    | 1.56                     | 0.70              |
| 1:1:957:C:N4      | 1:1:2494:G:H21    | 1.90                     | 0.69              |
| 1:1:2131:U:H5'    | 1:1:2132:U:H5''   | 1.73                     | 0.69              |
| 2:2:1348:U:N3     | 2:2:1374:A:C8     | 2.60                     | 0.69              |
| 3:4:49:C:OP2      | 20:O:30:ARG:NH2   | 2.25                     | 0.69              |
| 2:2:1179:A:OP2    | 45:n:99:ARG:NH2   | 2.25                     | 0.69              |
| 12:G:113:SER:O    | 12:G:116:ARG:NH1  | 2.25                     | 0.69              |
| 50:s:61:ARG:NH2   | 50:s:70:PRO:O     | 2.25                     | 0.69              |
| 1:1:254:G:O2'     | 1:1:384:A:OP2     | 2.08                     | 0.69              |
| 1:1:671:C:H5      | 17:L:33:ARG:HE    | 1.40                     | 0.69              |
| 1:1:878:A:H3'     | 1:1:879:G:H8      | 1.56                     | 0.69              |
| 2:2:1249:C:N4     | 2:2:1288:A:OP2    | 2.26                     | 0.69              |
| 3:4:78:A:N6       | 3:4:98:G:N2       | 2.38                     | 0.69              |
| 14:I:55:PRO:HG2   | 14:I:71:LYS:HB2   | 1.74                     | 0.69              |
| 15:J:49:ASP:HB2   | 15:J:118:MET:HE1  | 1.72                     | 0.69              |
| 1:1:828:U:O4      | 1:1:2246:G:N2     | 2.16                     | 0.69              |
| 2:2:1012:A:H2'    | 2:2:1013:G:C8     | 2.28                     | 0.69              |
| 40:i:13:ARG:HH21  | 40:i:38:PRO:HA    | 1.57                     | 0.69              |
| 1:1:1079:C:H2'    | 1:1:1080:A:H8     | 1.57                     | 0.69              |
| 2:2:1348:U:C2     | 2:2:1374:A:N7     | 2.61                     | 0.69              |
| 1:1:572:A:C2      | 1:1:2029:G:N2     | 2.60                     | 0.69              |
| 2:2:673:A:H2'     | 2:2:674:G:C8      | 2.28                     | 0.69              |
| 2:2:1247:U:O2     | 2:2:1290:G:O6     | 2.11                     | 0.69              |
| 28:W:23:VAL:HA    | 28:W:38:VAL:HG23  | 1.74                     | 0.69              |
| 1:1:2513:A:H2'    | 1:1:2514:U:C6     | 2.28                     | 0.69              |
| 2:2:1251:A:N3     | 2:2:1369:C:O2'    | 2.22                     | 0.69              |
| 2:2:1253:G:H2'    | 2:2:1254:A:H8     | 1.56                     | 0.69              |
| 2:2:1309:G:H2'    | 2:2:1310:G:H8     | 1.57                     | 0.69              |
| 1:1:2116:G:N7     | 1:1:2165:C:N4     | 2.41                     | 0.68              |
| 2:2:204:G:H2'     | 2:2:205:A:H8      | 1.58                     | 0.68              |
| 10:E:63:GLN:OE1   | 10:E:95:ARG:NH1   | 2.26                     | 0.68              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 1:1:2286:G:N3     | 1:1:2287:A:N6    | 2.41                     | 0.68              |
| 2:2:1359:C:O2'    | 2:2:1361:G:N7    | 2.27                     | 0.68              |
| 1:1:2623:G:H3'    | 1:1:2624:G:H8    | 1.58                     | 0.68              |
| 2:2:955:U:OP1     | 6:A:50:ASN:ND2   | 2.26                     | 0.68              |
| 1:1:516:C:N3      | 1:1:517:C:N4     | 2.41                     | 0.68              |
| 1:1:1027:A:N3     | 1:1:2487:G:O2'   | 2.27                     | 0.68              |
| 2:2:541:G:H2'     | 2:2:542:G:C8     | 2.28                     | 0.68              |
| 3:4:95:U:H2'      | 3:4:96:G:C8      | 2.28                     | 0.68              |
| 1:1:639:U:H3      | 1:1:649:G:H1     | 0.82                     | 0.68              |
| 2:2:447:G:H22     | 2:2:486:U:H3'    | 1.58                     | 0.68              |
| 1:1:77:G:O2'      | 30:Y:59:GLU:OE2  | 2.12                     | 0.68              |
| 1:1:2282:G:N2     | 1:1:2390:U:O2    | 2.25                     | 0.68              |
| 2:2:522:C:N4      | 48:q:89:0TD:OD2  | 2.26                     | 0.68              |
| 1:1:2047:C:H2'    | 1:1:2048:G:H8    | 1.58                     | 0.68              |
| 39:h:111:LEU:HD22 | 39:h:204:LYS:HE2 | 1.74                     | 0.68              |
| 1:1:243:U:H2'     | 1:1:244:A:C8     | 2.29                     | 0.68              |
| 1:1:519:U:H2'     | 1:1:520:G:C8     | 2.28                     | 0.68              |
| 1:1:618:G:OP2     | 9:D:98:LYS:NZ    | 2.25                     | 0.68              |
| 1:1:2369:A:H2'    | 1:1:2370:G:C8    | 2.29                     | 0.68              |
| 1:1:2756:U:H1'    | 1:1:2757:A:H5''  | 1.75                     | 0.68              |
| 2:2:1074:G:H1     | 2:2:1082:A:N6    | 1.90                     | 0.68              |
| 13:H:54:VAL:O     | 13:H:56:ARG:NH1  | 2.27                     | 0.68              |
| 1:1:2730:C:O2'    | 8:C:173:GLN:O    | 2.12                     | 0.68              |
| 20:O:99:TYR:OH    | 20:O:111:ARG:NH2 | 2.25                     | 0.68              |
| 1:1:857:G:O6      | 1:1:920:A:N1     | 2.26                     | 0.68              |
| 1:1:1001:A:OP2    | 1:1:1154:G:N1    | 2.17                     | 0.68              |
| 1:1:2361:G:OP1    | 36:e:26:HIS:ND1  | 2.26                     | 0.68              |
| 1:1:2673:G:N2     | 1:1:2674:G:O6    | 2.26                     | 0.68              |
| 2:2:339:C:OP2     | 16:K:98:ARG:NH1  | 2.27                     | 0.68              |
| 2:2:1238:A:OP2    | 2:2:1300:G:N2    | 2.26                     | 0.67              |
| 2:2:1377:A:O2'    | 2:2:1379:G:N7    | 2.26                     | 0.67              |
| 1:1:390:U:H1'     | 1:1:391:A:C8     | 2.29                     | 0.67              |
| 1:1:830:G:H4'     | 1:1:831:G:OP1    | 1.92                     | 0.67              |
| 40:i:102:VAL:HA   | 40:i:105:MET:HE2 | 1.76                     | 0.67              |
| 1:1:16:C:H5''     | 33:b:14:GLY:HA3  | 1.75                     | 0.67              |
| 1:1:2529:G:N7     | 37:f:32:LYS:NZ   | 2.37                     | 0.67              |
| 2:2:451:A:N6      | 2:2:481:G:OP2    | 2.21                     | 0.67              |
| 2:2:1216:A:H2'    | 2:2:1217:C:C6    | 2.28                     | 0.67              |
| 3:4:51:G:OP2      | 20:O:63:LYS:NZ   | 2.27                     | 0.67              |
| 23:R:78:ARG:HH21  | 23:R:81:LYS:HG3  | 1.58                     | 0.67              |
| 34:c:6:ARG:NH1    | 34:c:24:THR:OG1  | 2.28                     | 0.67              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 37:f:9:LYS:NZ    | 37:f:11:CYS:O    | 2.27                     | 0.67              |
| 50:s:64:CYS:HB3  | 50:s:69:ARG:H    | 1.59                     | 0.67              |
| 1:1:263:G:O2'    | 1:1:429:A:N3     | 2.27                     | 0.67              |
| 1:1:826:U:C4     | 1:1:831:G:O6     | 2.48                     | 0.67              |
| 1:1:2623:G:HO2'  | 1:1:2825:G:H8    | 1.42                     | 0.67              |
| 3:4:48:U:OP1     | 20:O:30:ARG:NH1  | 2.28                     | 0.67              |
| 31:Z:5:ILE:HG12  | 31:Z:40:ASP:HB2  | 1.76                     | 0.67              |
| 1:1:600:G:N2     | 1:1:657:U:O2     | 2.25                     | 0.67              |
| 1:1:2784:U:H4'   | 8:C:43:ASP:HA    | 1.75                     | 0.67              |
| 3:4:73:A:N7      | 3:4:103:U:O2     | 2.27                     | 0.67              |
| 4:6:51:U:H3      | 4:6:65:G:H1      | 1.41                     | 0.67              |
| 1:1:18:U:OP1     | 22:Q:30:ARG:NH1  | 2.28                     | 0.67              |
| 1:1:1047:G:OP2   | 13:H:62:ARG:NH1  | 2.28                     | 0.67              |
| 2:2:523:A:H62    | 48:q:88:LYS:H    | 1.40                     | 0.67              |
| 2:2:553:A:H4'    | 48:q:26:ALA:HA   | 1.77                     | 0.67              |
| 2:2:1293:C:H2'   | 2:2:1294:G:H8    | 1.60                     | 0.67              |
| 2:2:1179:A:OP2   | 45:n:95:ARG:NH2  | 2.28                     | 0.67              |
| 3:4:9:G:O6       | 3:4:111:U:O2     | 2.13                     | 0.67              |
| 37:f:2:LYS:HD2   | 37:f:35:GLN:HG2  | 1.75                     | 0.67              |
| 1:1:1008:A:H5''  | 15:J:37:ARG:HH22 | 1.60                     | 0.67              |
| 2:2:1235:U:O2'   | 2:2:1305:G:O5'   | 2.12                     | 0.67              |
| 2:2:1356:G:H2'   | 2:2:1357:A:C8    | 2.30                     | 0.67              |
| 38:g:94:HIS:ND1  | 38:g:146:ASN:O   | 2.27                     | 0.67              |
| 1:1:307:G:N2     | 1:1:310:A:OP2    | 2.23                     | 0.67              |
| 1:1:540:C:N4     | 1:1:554:U:H3     | 1.92                     | 0.67              |
| 1:1:587:C:C6     | 17:L:19:LEU:HB2  | 2.30                     | 0.67              |
| 1:1:609:A:H62    | 1:1:619:G:N2     | 1.93                     | 0.67              |
| 1:1:1039:A:N1    | 1:1:1116:G:O6    | 2.28                     | 0.67              |
| 1:1:2528:U:H3'   | 1:1:2530:A:C8    | 2.30                     | 0.67              |
| 2:2:327:A:N6     | 2:2:329:A:N3     | 2.42                     | 0.67              |
| 19:N:86:ARG:NH2  | 19:N:117:ASP:O   | 2.28                     | 0.67              |
| 28:W:68:LYS:NZ   | 28:W:69:PHE:O    | 2.26                     | 0.67              |
| 1:1:533:G:N2     | 22:Q:49:ASP:OD2  | 2.28                     | 0.66              |
| 1:1:839:U:O2     | 1:1:939:G:O6     | 2.13                     | 0.66              |
| 1:1:1084:A:N7    | 13:H:56:ARG:NH2  | 2.43                     | 0.66              |
| 39:h:156:ARG:NH2 | 39:h:159:GLY:O   | 2.29                     | 0.66              |
| 1:1:370:G:OP1    | 1:1:423:A:N6     | 2.28                     | 0.66              |
| 1:1:523:C:H2'    | 1:1:524:G:C8     | 2.30                     | 0.66              |
| 1:1:1857:G:N2    | 1:1:1885:A:N6    | 2.34                     | 0.66              |
| 1:1:2024:G:O6    | 1:1:2039:U:O2    | 2.12                     | 0.66              |
| 2:2:454:G:H1     | 2:2:478:A:N6     | 1.93                     | 0.66              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 7:B:6:CYS:SG     | 7:B:18:LYS:NZ     | 2.68                     | 0.66              |
| 14:I:12:VAL:HG11 | 14:I:22:PRO:HG2   | 1.76                     | 0.66              |
| 1:1:1168:G:O6    | 1:1:1181:U:O4     | 2.13                     | 0.66              |
| 1:1:2574:G:H2'   | 1:1:2575:C:C6     | 2.30                     | 0.66              |
| 2:2:746:A:H2'    | 2:2:747:A:C8      | 2.30                     | 0.66              |
| 2:2:1309:G:OP2   | 49:r:98:ARG:NH2   | 2.28                     | 0.66              |
| 10:E:24:SER:HB3  | 10:E:27:GLN:HB2   | 1.77                     | 0.66              |
| 41:j:163:GLU:O   | 44:m:114:ARG:NH2  | 2.29                     | 0.66              |
| 56:y:29:ARG:O    | 56:y:33:LYS:HG3   | 1.96                     | 0.66              |
| 1:1:2585:U:O4    | 6:A:126:GLN:NE2   | 2.28                     | 0.66              |
| 24:S:22:ASP:OD1  | 24:S:25:ARG:NH1   | 2.25                     | 0.66              |
| 1:1:102:U:O4     | 30:Y:2:LYS:N      | 2.28                     | 0.66              |
| 1:1:978:G:H2'    | 1:1:979:A:O4'     | 1.95                     | 0.66              |
| 1:1:2467:C:N3    | 18:M:123:LYS:NZ   | 2.37                     | 0.66              |
| 2:2:1323:G:H2'   | 2:2:1324:A:C8     | 2.30                     | 0.66              |
| 11:F:89:LEU:HG   | 11:F:162:VAL:HG12 | 1.78                     | 0.66              |
| 43:l:145:ALA:O   | 43:l:149:LYS:HB2  | 1.96                     | 0.66              |
| 1:1:1040:A:N1    | 1:1:1115:G:O6     | 2.29                     | 0.66              |
| 2:2:322:C:H42    | 2:2:329:A:H62     | 0.71                     | 0.66              |
| 2:2:501:C:H2'    | 2:2:502:A:C8      | 2.31                     | 0.66              |
| 2:2:1064:G:H21   | 2:2:1190:G:H1'    | 1.61                     | 0.66              |
| 4:5:32:C:O5'     | 45:n:130:ARG:NH2  | 2.29                     | 0.66              |
| 11:F:98:VAL:HG21 | 11:F:123:ALA:HB3  | 1.78                     | 0.66              |
| 15:J:4:PHE:O     | 22:Q:64:ARG:NH2   | 2.19                     | 0.66              |
| 22:Q:86:ALA:HB2  | 22:Q:116:ALA:HB2  | 1.78                     | 0.66              |
| 22:Q:87:SER:HB3  | 23:R:52:PRO:HB3   | 1.76                     | 0.66              |
| 32:a:16:CYS:SG   | 32:a:17:SER:N     | 2.66                     | 0.66              |
| 39:h:117:ALA:HB1 | 39:h:187:SER:HB3  | 1.77                     | 0.66              |
| 1:1:2453:A:H2    | 1:1:2504:PSU:HN3  | 1.43                     | 0.66              |
| 2:2:376:G:H2'    | 2:2:377:G:C8      | 2.30                     | 0.66              |
| 41:j:13:GLU:HG2  | 41:j:64:MET:HE2   | 1.76                     | 0.66              |
| 1:1:77:G:H2'     | 1:1:78:U:H6       | 1.61                     | 0.66              |
| 1:1:242:G:O2'    | 1:1:254:G:O6      | 2.07                     | 0.66              |
| 1:1:1224:U:N3    | 1:1:1225:G:O6     | 2.29                     | 0.66              |
| 2:2:33:A:H2'     | 2:2:34:C:C6       | 2.31                     | 0.66              |
| 2:2:1344:C:H5'   | 45:n:122:ARG:HB3  | 1.77                     | 0.66              |
| 9:D:23:PHE:CZ    | 9:D:28:VAL:HG21   | 2.31                     | 0.66              |
| 10:E:60:ILE:HD11 | 10:E:138:PHE:HB3  | 1.76                     | 0.66              |
| 39:h:156:ARG:NH1 | 39:h:193:TYR:O    | 2.29                     | 0.66              |
| 1:1:781:A:OP1    | 7:B:217:ARG:NH2   | 2.28                     | 0.66              |
| 1:1:1130:U:O4    | 1:1:2032:G:N2     | 2.15                     | 0.66              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:1:1853:A:N3     | 1:1:2233:U:O2'    | 2.29                     | 0.66              |
| 1:1:2362:C:H2'    | 1:1:2363:G:H8     | 1.61                     | 0.66              |
| 1:1:2393:U:O3'    | 17:L:62:PRO:HA    | 1.96                     | 0.66              |
| 2:2:1073:U:H2'    | 2:2:1074:G:C8     | 2.31                     | 0.66              |
| 10:E:8:TYR:HA     | 10:E:12:VAL:HB    | 1.78                     | 0.66              |
| 40:i:197:GLU:OE1  | 40:i:201:VAL:HG23 | 1.95                     | 0.66              |
| 1:1:26:G:H4'      | 1:1:1260:A:H4'    | 1.77                     | 0.66              |
| 1:1:810:U:N3      | 17:L:29:LYS:O     | 2.28                     | 0.66              |
| 1:1:2723:C:O3'    | 8:C:116:LYS:NZ    | 2.28                     | 0.66              |
| 8:C:106:LYS:HB3   | 8:C:174:SER:HA    | 1.78                     | 0.66              |
| 16:K:3:GLN:HE21   | 16:K:32:TYR:HE1   | 1.43                     | 0.66              |
| 18:M:34:LYS:HB3   | 18:M:129:THR:HB   | 1.78                     | 0.66              |
| 38:g:20:THR:HG22  | 38:g:39:HIS:HD2   | 1.61                     | 0.66              |
| 1:1:243:U:OP2     | 1:1:254:G:N1      | 2.27                     | 0.65              |
| 1:1:667:U:H1'     | 36:e:2:PRO:HD2    | 1.78                     | 0.65              |
| 1:1:2729:G:H21    | 8:C:172:VAL:HG13  | 1.61                     | 0.65              |
| 13:H:57:ASN:HB2   | 13:H:62:ARG:HD3   | 1.78                     | 0.65              |
| 15:J:118:MET:HA   | 15:J:121:LYS:HE2  | 1.78                     | 0.65              |
| 2:2:100:G:N2      | 2:2:152:A:O2'     | 2.29                     | 0.65              |
| 1:1:31:C:O2'      | 1:1:1238:G:OP1    | 2.13                     | 0.65              |
| 1:1:927:A:H2'     | 1:1:928:A:C8      | 2.31                     | 0.65              |
| 17:L:19:LEU:HD23  | 17:L:27:LEU:HD13  | 1.77                     | 0.65              |
| 19:N:1:MET:HE3    | 19:N:3:HIS:HE1    | 1.61                     | 0.65              |
| 38:g:43:LEU:HA    | 38:g:46:THR:HB    | 1.77                     | 0.65              |
| 1:1:2836:U:H2'    | 1:1:2837:A:C8     | 2.31                     | 0.65              |
| 2:2:346:G:OP1     | 21:P:39:ARG:NH1   | 2.29                     | 0.65              |
| 2:2:371:A:H2      | 2:2:374:A:H62     | 1.45                     | 0.65              |
| 2:2:417:G:N2      | 2:2:540:G:O2'     | 2.29                     | 0.65              |
| 2:2:1206:G:O2'    | 39:h:192:THR:O    | 2.14                     | 0.65              |
| 17:L:63:LYS:HE3   | 36:e:12:LYS:HD3   | 1.76                     | 0.65              |
| 1:1:285:G:O6      | 1:1:355:U:O2      | 2.15                     | 0.65              |
| 1:1:594:U:O2      | 1:1:663:G:N2      | 2.22                     | 0.65              |
| 1:1:2104:C:H41    | 1:1:2186:G:H21    | 1.42                     | 0.65              |
| 38:g:187:VAL:HG13 | 38:g:191:SER:HB2  | 1.79                     | 0.65              |
| 52:u:3:THR:O      | 52:u:22:ALA:N     | 2.22                     | 0.65              |
| 1:1:2370:G:C4     | 1:1:2371:G:H1'    | 2.31                     | 0.65              |
| 2:2:186:C:H5''    | 56:y:77:ALA:HB2   | 1.78                     | 0.65              |
| 8:C:34:VAL:HG22   | 8:C:50:VAL:HG12   | 1.78                     | 0.65              |
| 1:1:630:G:N2      | 1:1:633:A:OP2     | 2.28                     | 0.65              |
| 1:1:2380:C:H2'    | 1:1:2381:A:C8     | 2.32                     | 0.65              |
| 1:1:2571:U:H4'    | 8:C:151:THR:HG21  | 1.77                     | 0.65              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:2:1005:A:OP2   | 2:2:1024:G:N2     | 2.29                     | 0.65              |
| 1:1:535:G:O3'    | 22:Q:53:ARG:NH2   | 2.28                     | 0.65              |
| 1:1:827:U:H5'    | 1:1:828:U:C6      | 2.32                     | 0.65              |
| 4:6:4:G:H2'      | 4:6:5:G:H8        | 1.61                     | 0.65              |
| 23:R:8:GLY:HA3   | 23:R:22:LEU:HD22  | 1.79                     | 0.65              |
| 36:e:38:THR:HB   | 36:e:42:ARG:HH21  | 1.62                     | 0.65              |
| 43:l:106:GLU:HG2 | 43:l:110:LYS:HE2  | 1.78                     | 0.65              |
| 45:n:13:LYS:O    | 45:n:110:GLN:NE2  | 2.29                     | 0.65              |
| 1:1:881:G:H1     | 1:1:895:U:H3      | 1.43                     | 0.65              |
| 2:2:949:A:OP2    | 49:r:101:ARG:NH1  | 2.29                     | 0.65              |
| 12:G:1:MET:N     | 12:G:21:VAL:O     | 2.29                     | 0.65              |
| 1:1:196:A:H61    | 1:1:832:U:H1'     | 1.61                     | 0.65              |
| 1:1:659:G:H1'    | 9:D:100:MET:HE1   | 1.79                     | 0.65              |
| 2:2:1230:C:H2'   | 2:2:1231:G:C8     | 2.32                     | 0.65              |
| 2:2:1239:A:O2'   | 2:2:1297:G:N2     | 2.29                     | 0.65              |
| 3:4:14:U:OP2     | 3:4:70:C:O2'      | 2.15                     | 0.65              |
| 50:s:23:LYS:HG2  | 50:s:51:LEU:HD21  | 1.79                     | 0.65              |
| 1:1:2361:G:H2'   | 1:1:2362:C:C6     | 2.32                     | 0.64              |
| 1:1:2898:U:H2'   | 1:1:2899:A:H8     | 1.62                     | 0.64              |
| 2:2:552:U:H2'    | 2:2:553:A:C8      | 2.31                     | 0.64              |
| 2:2:613:C:H2'    | 2:2:614:C:C6      | 2.32                     | 0.64              |
| 43:l:15:ASP:OD1  | 43:l:20:SER:N     | 2.22                     | 0.64              |
| 1:1:1245:G:H2'   | 1:1:1246:A:H8     | 1.62                     | 0.64              |
| 1:1:2830:C:H3'   | 8:C:59:ARG:NE     | 2.11                     | 0.64              |
| 2:2:1045:C:H2'   | 2:2:1046:A:H5''   | 1.79                     | 0.64              |
| 3:4:95:U:H2'     | 3:4:96:G:H8       | 1.60                     | 0.64              |
| 15:J:54:ILE:HG22 | 15:J:122:LEU:HB2  | 1.79                     | 0.64              |
| 43:l:30:LEU:O    | 43:l:109:ARG:NH2  | 2.30                     | 0.64              |
| 1:1:84:A:OP1     | 26:U:6:ARG:NH2    | 2.30                     | 0.64              |
| 1:1:531:C:P      | 1:1:561:G:H22     | 2.21                     | 0.64              |
| 1:1:976:G:O2'    | 1:1:1155:A:O2'    | 2.12                     | 0.64              |
| 1:1:2183:A:H2'   | 1:1:2184:A:C8     | 2.32                     | 0.64              |
| 1:1:2680:U:O3'   | 8:C:8:LYS:NZ      | 2.30                     | 0.64              |
| 3:4:73:A:N7      | 3:4:103:U:C2      | 2.65                     | 0.64              |
| 5:7:25:A:N7      | 39:h:164:ARG:NH2  | 2.45                     | 0.64              |
| 8:C:8:LYS:O      | 8:C:198:GLY:N     | 2.25                     | 0.64              |
| 38:g:176:ALA:HA  | 38:g:181:ILE:HD12 | 1.80                     | 0.64              |
| 1:1:1168:G:N2    | 1:1:1181:U:O2     | 2.17                     | 0.64              |
| 1:1:1203:U:H3    | 1:1:1242:U:H3     | 1.45                     | 0.64              |
| 1:1:2047:C:H2'   | 1:1:2048:G:C8     | 2.31                     | 0.64              |
| 1:1:2271:G:H2'   | 1:1:2272:U:C6     | 2.32                     | 0.64              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:2:264:C:H2'     | 2:2:265:G:O4'     | 1.97                     | 0.64              |
| 38:g:97:LEU:HB2   | 38:g:100:MET:HB2  | 1.79                     | 0.64              |
| 1:1:1028:A:H2'    | 1:1:1029:A:H8     | 1.61                     | 0.64              |
| 1:1:2355:G:H2'    | 1:1:2356:U:H6     | 1.61                     | 0.64              |
| 1:1:2883:A:HO2'   | 33:b:41:HIS:CD2   | 2.13                     | 0.64              |
| 2:2:1159:U:N3     | 2:2:1172:C:OP2    | 2.31                     | 0.64              |
| 8:C:157:LYS:HB2   | 15:J:80:HIS:HA    | 1.78                     | 0.64              |
| 15:J:77:HIS:HD2   | 15:J:84:ILE:HD12  | 1.63                     | 0.64              |
| 48:q:110:ARG:HB3  | 48:q:119:VAL:HG21 | 1.79                     | 0.64              |
| 1:1:242:G:C8      | 36:e:5:LYS:HG2    | 2.33                     | 0.64              |
| 2:2:1222:G:OP2    | 2:2:1322:C:N4     | 2.30                     | 0.64              |
| 8:C:55:LYS:HB2    | 8:C:77:ARG:HA     | 1.79                     | 0.64              |
| 26:U:82:ARG:O     | 26:U:97:LYS:N     | 2.29                     | 0.64              |
| 1:1:242:G:N2      | 1:1:254:G:OP2     | 2.31                     | 0.64              |
| 1:1:833:A:OP2     | 1:1:944:C:N4      | 2.30                     | 0.64              |
| 2:2:171:A:H2'     | 2:2:172:A:H8      | 1.62                     | 0.64              |
| 3:4:9:G:O2'       | 20:O:45:SER:OG    | 2.14                     | 0.64              |
| 39:h:190:HIS:HA   | 39:h:195:VAL:HG22 | 1.79                     | 0.64              |
| 46:o:42:LEU:HD12  | 46:o:73:LEU:HD13  | 1.79                     | 0.64              |
| 1:1:2315:G:H21    | 10:E:125:ARG:HH12 | 1.43                     | 0.64              |
| 1:1:2341:G:H22    | 1:1:2375:G:P      | 2.21                     | 0.64              |
| 2:2:387:U:O2'     | 2:2:389:A:N7      | 2.30                     | 0.64              |
| 3:4:78:A:N6       | 3:4:98:G:C2       | 2.65                     | 0.64              |
| 13:H:42:ARG:HD2   | 14:I:117:THR:HB   | 1.80                     | 0.64              |
| 1:1:563:A:OP1     | 22:Q:45:TYR:OH    | 2.15                     | 0.64              |
| 8:C:111:GLY:N     | 8:C:170:VAL:O     | 2.30                     | 0.64              |
| 10:E:117:LEU:HD22 | 10:E:130:MET:HG2  | 1.80                     | 0.64              |
| 1:1:1129:A:N1     | 1:1:2569:G:O2'    | 2.26                     | 0.64              |
| 11:F:124:GLU:HG3  | 11:F:126:PRO:HD3  | 1.80                     | 0.64              |
| 48:q:34:CYS:N     | 48:q:78:SER:O     | 2.22                     | 0.64              |
| 1:1:301:G:OP2     | 26:U:82:ARG:NH1   | 2.29                     | 0.63              |
| 1:1:635:C:OP2     | 17:L:126:ARG:NH1  | 2.31                     | 0.63              |
| 1:1:651:G:H2'     | 1:1:652:U:H5'     | 1.80                     | 0.63              |
| 1:1:979:A:N6      | 1:1:983:A:OP2     | 2.31                     | 0.63              |
| 1:1:987:C:O2'     | 1:1:1000:A:N3     | 2.31                     | 0.63              |
| 1:1:2392:A:H2'    | 1:1:2393:U:C6     | 2.34                     | 0.63              |
| 1:1:2527:C:H3'    | 1:1:2528:U:H6     | 1.63                     | 0.63              |
| 1:1:2818:U:H3     | 1:1:2828:G:H1     | 1.46                     | 0.63              |
| 2:2:375:U:H5''    | 52:u:70:ARG:HH11  | 1.62                     | 0.63              |
| 2:2:553:A:C2'     | 2:2:554:A:H5'     | 2.28                     | 0.63              |
| 57:z:34:ARG:HH21  | 57:z:35:ARG:HE    | 1.45                     | 0.63              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:1:2287:A:N7    | 1:1:2346:A:N6     | 2.47                     | 0.63              |
| 1:1:2392:A:O2'   | 17:L:60:ARG:O     | 2.14                     | 0.63              |
| 1:1:2822:G:H2'   | 1:1:2823:A:H5''   | 1.80                     | 0.63              |
| 2:2:1052:U:O2'   | 2:2:1055:A:OP2    | 2.11                     | 0.63              |
| 15:J:88:THR:O    | 15:J:92:MET:CB    | 2.46                     | 0.63              |
| 49:r:83:LEU:HD22 | 55:x:66:MET:HB3   | 1.78                     | 0.63              |
| 52:u:50:THR:HG21 | 52:u:74:LEU:HD13  | 1.79                     | 0.63              |
| 1:1:242:G:N7     | 36:e:3:LYS:HB2    | 2.12                     | 0.63              |
| 1:1:826:U:C5     | 1:1:828:U:H1'     | 2.34                     | 0.63              |
| 1:1:2639:A:N1    | 1:1:2775:G:O2'    | 2.31                     | 0.63              |
| 1:1:2649:C:H2'   | 1:1:2650:U:H6     | 1.63                     | 0.63              |
| 2:2:406:G:OP2    | 2:2:406:G:H8      | 1.80                     | 0.63              |
| 2:2:1199:U:O2'   | 2:2:1202:U:OP2    | 2.10                     | 0.63              |
| 2:2:1346:A:O2'   | 43:l:10:ARG:NH1   | 2.30                     | 0.63              |
| 2:2:1516:2MG:N2  | 2:2:1519:MA6:OP2  | 2.28                     | 0.63              |
| 7:B:108:LYS:HA   | 7:B:196:GLY:HA2   | 1.80                     | 0.63              |
| 18:M:36:VAL:HG22 | 27:V:82:TYR:HB2   | 1.79                     | 0.63              |
| 27:V:9:ARG:HH21  | 27:V:16:ALA:HB1   | 1.63                     | 0.63              |
| 27:V:44:HIS:O    | 27:V:48:MET:HG2   | 1.98                     | 0.63              |
| 38:g:20:THR:HG22 | 38:g:39:HIS:CD2   | 2.33                     | 0.63              |
| 2:2:492:C:H2'    | 2:2:493:A:C8      | 2.33                     | 0.63              |
| 2:2:1193:G:N7    | 39:h:3:GLN:NE2    | 2.42                     | 0.63              |
| 8:C:51:THR:HB    | 8:C:79:LEU:HD23   | 1.81                     | 0.63              |
| 1:1:632:A:O2'    | 1:1:2403:C:O2'    | 2.11                     | 0.63              |
| 1:1:986:C:H1'    | 1:1:1001:A:H1'    | 1.79                     | 0.63              |
| 1:1:2746:U:H5''  | 11:F:138:LYS:HE2  | 1.80                     | 0.63              |
| 2:2:108:G:H5''   | 2:2:109:A:H5'     | 1.81                     | 0.63              |
| 39:h:19:ASN:HB2  | 50:s:91:GLY:HA3   | 1.80                     | 0.63              |
| 40:i:98:LEU:HD21 | 40:i:123:ILE:HG21 | 1.78                     | 0.63              |
| 1:1:833:A:H2'    | 1:1:834:G:H8      | 1.60                     | 0.63              |
| 1:1:2266:A:O2'   | 1:1:2272:U:O4     | 2.15                     | 0.63              |
| 1:1:2289:G:H2'   | 1:1:2290:G:C8     | 2.34                     | 0.63              |
| 1:1:2547:A:H4'   | 16:K:29:HIS:HE1   | 1.63                     | 0.63              |
| 1:1:2642:G:H2'   | 1:1:2643:G:C8     | 2.33                     | 0.63              |
| 27:V:62:THR:OG1  | 27:V:71:LYS:NZ    | 2.24                     | 0.63              |
| 37:f:10:LEU:HG   | 37:f:25:VAL:HG11  | 1.78                     | 0.63              |
| 43:l:111:ARG:HB3 | 43:l:119:ARG:HD2  | 1.81                     | 0.63              |
| 1:1:1206:G:N2    | 1:1:1240:U:O2     | 2.30                     | 0.63              |
| 1:1:2528:U:H3'   | 1:1:2530:A:H8     | 1.64                     | 0.63              |
| 2:2:509:A:N3     | 2:2:543:U:O2'     | 2.32                     | 0.63              |
| 2:2:713:G:H2'    | 2:2:714:G:C8      | 2.33                     | 0.63              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 2:2:1072:G:N2     | 38:g:106:THR:OG1 | 2.31                     | 0.63              |
| 2:2:1077:G:N2     | 2:2:1080:A:OP2   | 2.28                     | 0.63              |
| 4:6:40:C:H4'      | 47:p:56:ARG:HH22 | 1.63                     | 0.63              |
| 11:F:54:PRO:HB3   | 11:F:61:GLY:HA3  | 1.81                     | 0.63              |
| 36:e:22:PHE:HB2   | 36:e:50:VAL:HB   | 1.80                     | 0.63              |
| 39:h:6:HIS:HD2    | 39:h:184:TYR:HD2 | 1.47                     | 0.63              |
| 40:i:188:ARG:HH12 | 40:i:195:ILE:HB  | 1.63                     | 0.63              |
| 1:1:832:U:H2'     | 1:1:833:A:H8     | 1.61                     | 0.63              |
| 1:1:946:C:H2'     | 1:1:947:A:C8     | 2.33                     | 0.63              |
| 1:1:1157:G:H1'    | 31:Z:32:ILE:HD12 | 1.80                     | 0.63              |
| 1:1:2674:G:H21    | 16:K:28:SER:HB2  | 1.64                     | 0.63              |
| 1:1:2821:A:H2'    | 1:1:2822:G:O4'   | 1.98                     | 0.63              |
| 2:2:108:G:N2      | 2:2:326:G:H1     | 1.95                     | 0.63              |
| 2:2:427:U:OP2     | 2:2:428:G:O2'    | 2.13                     | 0.63              |
| 2:2:552:U:O4      | 2:2:553:A:N6     | 2.32                     | 0.63              |
| 2:2:993:G:O2'     | 2:2:994:A:N7     | 2.32                     | 0.63              |
| 5:7:24:C:O2'      | 39:h:164:ARG:NH1 | 2.29                     | 0.63              |
| 9:D:111:GLU:OE2   | 9:D:114:ARG:NH2  | 2.31                     | 0.63              |
| 44:m:96:MET:HG2   | 44:m:99:LEU:HB2  | 1.80                     | 0.63              |
| 4:6:44:A:H2'      | 4:6:45:A:H8      | 1.64                     | 0.62              |
| 9:D:178:VAL:HG13  | 17:L:3:LEU:HD11  | 1.81                     | 0.62              |
| 48:q:78:SER:HB3   | 48:q:103:ASP:OD2 | 1.99                     | 0.62              |
| 1:1:846:U:H1'     | 1:1:847:U:H5     | 1.64                     | 0.62              |
| 1:1:1222:U:O2     | 1:1:1227:G:O6    | 2.16                     | 0.62              |
| 17:L:30:THR:HB    | 17:L:33:ARG:HB2  | 1.80                     | 0.62              |
| 39:h:11:ARG:NE    | 39:h:180:ALA:O   | 2.32                     | 0.62              |
| 39:h:15:VAL:HG21  | 39:h:181:ASP:HA  | 1.81                     | 0.62              |
| 1:1:296:U:H2'     | 1:1:297:G:C8     | 2.33                     | 0.62              |
| 1:1:2748:A:OP2    | 1:1:2753:A:N6    | 2.33                     | 0.62              |
| 2:2:373:A:H2'     | 2:2:374:A:H8     | 1.63                     | 0.62              |
| 2:2:1126:U:O4     | 46:o:7:ARG:NH1   | 2.32                     | 0.62              |
| 39:h:6:HIS:CD2    | 50:s:89:MET:HG2  | 2.34                     | 0.62              |
| 39:h:53:SER:HB3   | 39:h:115:LEU:HG  | 1.80                     | 0.62              |
| 1:1:1040:A:H2     | 1:1:1115:G:H1    | 1.46                     | 0.62              |
| 1:1:2261:C:H1'    | 1:1:2388:A:H1'   | 1.81                     | 0.62              |
| 1:1:2348:U:H2'    | 1:1:2349:G:C8    | 2.34                     | 0.62              |
| 1:1:2831:G:H8     | 8:C:59:ARG:NH2   | 1.96                     | 0.62              |
| 2:2:327:A:C6      | 2:2:329:A:H1'    | 2.34                     | 0.62              |
| 2:2:539:A:H2'     | 2:2:540:G:O4'    | 2.00                     | 0.62              |
| 15:J:77:HIS:HA    | 15:J:85:LYS:HB2  | 1.82                     | 0.62              |
| 26:U:86:ARG:NH1   | 26:U:100:SER:OG  | 2.33                     | 0.62              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:1:495:G:N3     | 24:S:61:ASN:ND2   | 2.41                     | 0.62              |
| 1:1:2033:A:H2'   | 1:1:2036:C:H41    | 1.64                     | 0.62              |
| 1:1:2385:C:H2'   | 1:1:2386:A:C8     | 2.34                     | 0.62              |
| 2:2:1092:A:H5'   | 43:l:5:ARG:HH21   | 1.65                     | 0.62              |
| 4:6:68:C:OP1     | 34:c:28:ARG:NH2   | 2.32                     | 0.62              |
| 10:E:123:ASP:HB2 | 10:E:127:ASN:HB2  | 1.79                     | 0.62              |
| 1:1:1224:U:H2'   | 1:1:1225:G:C8     | 2.35                     | 0.62              |
| 1:1:2189:U:O2'   | 1:1:2190:G:H5''   | 2.00                     | 0.62              |
| 1:1:2313:C:H5''  | 10:E:88:LYS:HD3   | 1.81                     | 0.62              |
| 1:1:2750:A:H5''  | 11:F:3:ARG:HH22   | 1.64                     | 0.62              |
| 2:2:946:A:H2'    | 2:2:947:G:C8      | 2.35                     | 0.62              |
| 1:1:560:C:H2'    | 1:1:561:G:O4'     | 2.00                     | 0.62              |
| 2:2:745:G:OP1    | 2:2:851:G:O2'     | 2.16                     | 0.62              |
| 3:4:14:U:H5      | 3:4:71:C:H1'      | 1.65                     | 0.62              |
| 10:E:30:ARG:NH1  | 10:E:31:VAL:O     | 2.32                     | 0.62              |
| 15:J:25:LEU:HD13 | 15:J:100:VAL:HG12 | 1.82                     | 0.62              |
| 23:R:72:VAL:HG13 | 23:R:74:ILE:HD11  | 1.80                     | 0.62              |
| 1:1:296:U:H2'    | 1:1:297:G:H8      | 1.64                     | 0.62              |
| 1:1:618:G:H2'    | 1:1:619:G:O4'     | 1.98                     | 0.62              |
| 1:1:1026:G:OP1   | 1:1:1134:A:O2'    | 2.18                     | 0.62              |
| 1:1:1245:G:H2'   | 1:1:1246:A:C8     | 2.34                     | 0.62              |
| 2:2:227:G:N2     | 52:u:64:GLY:HA3   | 2.15                     | 0.62              |
| 2:2:1071:C:OP1   | 41:j:54:ARG:NH2   | 2.33                     | 0.62              |
| 2:2:1338:G:N3    | 4:5:41:C:O2'      | 2.32                     | 0.62              |
| 3:4:5:U:OP2      | 3:4:61:G:O2'      | 2.16                     | 0.62              |
| 6:A:140:LEU:HG   | 6:A:141:PRO:HD3   | 1.82                     | 0.62              |
| 15:J:78:THR:HG22 | 15:J:85:LYS:HE3   | 1.82                     | 0.62              |
| 1:1:518:G:O2'    | 24:S:18:ARG:NH2   | 2.33                     | 0.62              |
| 1:1:1130:U:O2    | 1:1:2025:C:H5''   | 2.00                     | 0.62              |
| 1:1:2640:G:H2'   | 1:1:2641:G:C8     | 2.35                     | 0.62              |
| 4:6:43:G:H4'     | 43:l:136:LYS:HE2  | 1.81                     | 0.62              |
| 15:J:77:HIS:CD2  | 15:J:84:ILE:HA    | 2.34                     | 0.62              |
| 26:U:84:GLY:N    | 26:U:95:PHE:O     | 2.19                     | 0.62              |
| 43:l:111:ARG:NH2 | 43:l:123:GLU:OE1  | 2.31                     | 0.62              |
| 1:1:1166:G:O6    | 1:1:1183:U:O2     | 2.18                     | 0.62              |
| 1:1:1209:U:O2'   | 1:1:1237:A:N1     | 2.31                     | 0.62              |
| 1:1:2030:6MZ:O3' | 1:1:2499:C:H4'    | 2.00                     | 0.62              |
| 2:2:376:G:H2'    | 2:2:377:G:H8      | 1.63                     | 0.62              |
| 2:2:946:A:H1'    | 2:2:1333:A:C2     | 2.35                     | 0.62              |
| 2:2:950:U:O4     | 2:2:1231:G:O6     | 2.16                     | 0.62              |
| 2:2:972:C:H4'    | 46:o:59:LYS:HB2   | 1.80                     | 0.62              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 17:L:90:VAL:HB   | 17:L:122:VAL:HG13 | 1.82                     | 0.62              |
| 40:i:132:ILE:HB  | 40:i:135:TYR:HB2  | 1.80                     | 0.62              |
| 52:u:5:ARG:NH2   | 52:u:27:ALA:O     | 2.33                     | 0.62              |
| 1:1:512:G:OP1    | 1:1:1234:U:O2'    | 2.17                     | 0.61              |
| 1:1:531:C:O5'    | 1:1:561:G:N2      | 2.32                     | 0.61              |
| 1:1:2360:G:O6    | 1:1:2361:G:N2     | 2.33                     | 0.61              |
| 2:2:375:U:H5''   | 52:u:70:ARG:NH1   | 2.15                     | 0.61              |
| 2:2:1059:C:O3'   | 50:s:85:ARG:NH1   | 2.33                     | 0.61              |
| 2:2:1253:G:H2'   | 2:2:1254:A:C8     | 2.34                     | 0.61              |
| 22:Q:52:GLN:HA   | 22:Q:55:ARG:HE    | 1.65                     | 0.61              |
| 49:r:81:MET:O    | 49:r:92:ARG:NH2   | 2.33                     | 0.61              |
| 1:1:572:A:H61    | 1:1:2029:G:H1'    | 1.64                     | 0.61              |
| 1:1:599:A:H5'    | 17:L:9:ALA:HB2    | 1.82                     | 0.61              |
| 1:1:1196:C:O2    | 1:1:1226:A:O2'    | 2.14                     | 0.61              |
| 1:1:2544:G:H1'   | 1:1:2646:C:H4'    | 1.81                     | 0.61              |
| 17:L:95:LEU:HD22 | 17:L:100:ILE:HG21 | 1.82                     | 0.61              |
| 1:1:45:G:H5''    | 1:1:46:G:H5'      | 1.82                     | 0.61              |
| 1:1:632:A:H2'    | 1:1:633:A:C8      | 2.36                     | 0.61              |
| 1:1:954:G:O6     | 1:1:963:U:O2      | 2.19                     | 0.61              |
| 1:1:1242:U:O2    | 17:L:4:ASN:ND2    | 2.31                     | 0.61              |
| 1:1:2133:G:O2'   | 1:1:2157:G:N2     | 2.33                     | 0.61              |
| 1:1:2356:U:O4    | 1:1:2361:G:O6     | 2.18                     | 0.61              |
| 2:2:323:U:OP1    | 56:y:21:ASN:ND2   | 2.33                     | 0.61              |
| 2:2:372:C:N4     | 2:2:389:A:N6      | 2.27                     | 0.61              |
| 2:2:372:C:N3     | 2:2:375:U:O4      | 2.33                     | 0.61              |
| 2:2:890:G:O2'    | 2:2:906:A:N6      | 2.33                     | 0.61              |
| 28:W:15:ASP:OD1  | 28:W:16:SER:N     | 2.32                     | 0.61              |
| 1:1:2467:C:H3'   | 1:1:2468:A:C8     | 2.35                     | 0.61              |
| 1:1:2569:G:H2'   | 1:1:2570:G:C8     | 2.33                     | 0.61              |
| 1:1:2830:C:H5''  | 8:C:56:LYS:HD2    | 1.80                     | 0.61              |
| 2:2:75:G:H2'     | 2:2:76:G:H8       | 1.64                     | 0.61              |
| 2:2:260:G:OP1    | 56:y:75:HIS:NE2   | 2.32                     | 0.61              |
| 2:2:1073:U:O2    | 38:g:103:ASN:ND2  | 2.33                     | 0.61              |
| 2:2:1442:G:H2'   | 2:2:1443:C:C6     | 2.35                     | 0.61              |
| 7:B:132:MET:HE2  | 7:B:188:CYS:HB2   | 1.83                     | 0.61              |
| 52:u:8:ARG:N     | 52:u:29:ASN:OD1   | 2.34                     | 0.61              |
| 1:1:589:U:H2'    | 1:1:590:A:H8      | 1.66                     | 0.61              |
| 1:1:973:A:H4'    | 1:1:1187:G:H1'    | 1.83                     | 0.61              |
| 1:1:2023:C:O2'   | 1:1:2617:U:O2'    | 2.19                     | 0.61              |
| 1:1:2041:U:H2'   | 1:1:2042:A:C8     | 2.36                     | 0.61              |
| 2:2:693:G:N3     | 43:l:83:SER:OG    | 2.33                     | 0.61              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:2:943:U:H3'    | 2:2:944:G:C8      | 2.35                     | 0.61              |
| 2:2:993:G:H5''   | 2:2:995:C:H41     | 1.64                     | 0.61              |
| 1:1:15:G:H4'     | 33:b:18:SER:HB3   | 1.82                     | 0.61              |
| 1:1:2273:A:H2'   | 1:1:2274:A:C8     | 2.36                     | 0.61              |
| 1:1:2363:G:H21   | 28:W:39:ARG:HD2   | 1.65                     | 0.61              |
| 1:1:2732:G:H3'   | 1:1:2733:A:O4'    | 2.00                     | 0.61              |
| 2:2:1060:U:H2'   | 2:2:1061:G:C8     | 2.36                     | 0.61              |
| 2:2:1309:G:H2'   | 2:2:1310:G:C8     | 2.35                     | 0.61              |
| 2:2:1412:C:H2'   | 2:2:1413:A:C8     | 2.36                     | 0.61              |
| 3:4:5:U:H2'      | 3:4:6:G:C8        | 2.35                     | 0.61              |
| 47:p:35:THR:HG22 | 47:p:41:ALA:HA    | 1.81                     | 0.61              |
| 1:1:988:A:H5''   | 31:Z:32:ILE:HD11  | 1.81                     | 0.61              |
| 1:1:994:C:O2     | 23:R:10:LYS:NZ    | 2.22                     | 0.61              |
| 1:1:2404:U:O4    | 1:1:2413:G:O6     | 2.19                     | 0.61              |
| 2:2:948:C:H5''   | 49:r:101:ARG:HH12 | 1.65                     | 0.61              |
| 2:2:1171:A:H2'   | 2:2:1172:C:H6     | 1.65                     | 0.61              |
| 2:2:1319:A:H4'   | 2:2:1320:C:H5     | 1.66                     | 0.61              |
| 17:L:63:LYS:HG2  | 17:L:64:PHE:N     | 2.15                     | 0.61              |
| 52:u:1:MET:O     | 52:u:24:SER:N     | 2.30                     | 0.61              |
| 1:1:636:G:O2'    | 1:1:638:G:O2'     | 2.14                     | 0.61              |
| 1:1:1232:G:H2'   | 1:1:1233:C:C6     | 2.35                     | 0.61              |
| 1:1:2047:C:N3    | 1:1:2048:G:O6     | 2.34                     | 0.61              |
| 1:1:2358:A:H3'   | 1:1:2359:C:C6     | 2.36                     | 0.61              |
| 2:2:546:A:H61    | 40:i:4:TYR:HA     | 1.65                     | 0.61              |
| 2:2:885:G:H2'    | 2:2:886:G:H8      | 1.65                     | 0.61              |
| 4:5:34:C:H2'     | 4:5:35:A:C8       | 2.35                     | 0.61              |
| 16:K:7:MET:HE1   | 16:K:44:LYS:HG3   | 1.82                     | 0.61              |
| 36:e:33:LEU:HB3  | 36:e:41:LYS:HE3   | 1.82                     | 0.61              |
| 1:1:988:A:H2'    | 1:1:989:G:C4      | 2.35                     | 0.61              |
| 1:1:1015:U:H2'   | 1:1:1016:G:H5'    | 1.83                     | 0.61              |
| 1:1:1036:G:O6    | 1:1:1119:U:O2     | 2.19                     | 0.61              |
| 2:2:109:A:N7     | 2:2:326:G:H2'     | 2.15                     | 0.61              |
| 2:2:235:C:H2'    | 2:2:236:A:C8      | 2.36                     | 0.61              |
| 2:2:556:C:OP1    | 48:q:14:ARG:NH2   | 2.33                     | 0.61              |
| 2:2:1229:A:H5''  | 4:5:29:G:H4'      | 1.83                     | 0.61              |
| 2:2:1321:U:H2'   | 2:2:1322:C:C4     | 2.36                     | 0.61              |
| 2:2:1346:A:N3    | 45:n:109:ARG:NH1  | 2.46                     | 0.61              |
| 3:4:5:U:H2'      | 3:4:6:G:H8        | 1.65                     | 0.61              |
| 18:M:41:LEU:HD11 | 18:M:102:LEU:HD13 | 1.82                     | 0.61              |
| 45:n:72:ILE:HG13 | 45:n:73:SER:H     | 1.65                     | 0.61              |
| 45:n:87:LEU:HB3  | 45:n:94:LEU:HD11  | 1.81                     | 0.61              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:1:1858:A:H2'   | 1:1:1859:U:O4'    | 2.00                     | 0.61              |
| 1:1:2543:G:H22   | 1:1:2647:U:P      | 2.23                     | 0.61              |
| 2:2:398:U:H2'    | 2:2:399:G:H8      | 1.66                     | 0.61              |
| 2:2:615:G:O6     | 2:2:625:U:O2      | 2.19                     | 0.61              |
| 8:C:33:ARG:NH2   | 8:C:53:GLY:O      | 2.34                     | 0.61              |
| 36:e:26:HIS:NE2  | 36:e:46:PRO:O     | 2.33                     | 0.61              |
| 38:g:108:ARG:O   | 38:g:112:LYS:HG2  | 2.01                     | 0.61              |
| 40:i:11:LEU:HB3  | 40:i:63:ARG:NE    | 2.15                     | 0.61              |
| 1:1:540:C:N3     | 1:1:554:U:O2      | 2.34                     | 0.60              |
| 1:1:587:C:N4     | 17:L:30:THR:O     | 2.33                     | 0.60              |
| 1:1:640:C:H2'    | 1:1:641:U:C5      | 2.35                     | 0.60              |
| 1:1:1194:A:H2    | 1:1:1225:G:H22    | 1.49                     | 0.60              |
| 2:2:974:A:H4'    | 2:2:975:A:H3'     | 1.83                     | 0.60              |
| 20:O:31:THR:O    | 20:O:102:ARG:NH1  | 2.32                     | 0.60              |
| 1:1:500:G:N1     | 1:1:503:A:OP2     | 2.33                     | 0.60              |
| 1:1:2031:A:C2    | 1:1:2498:OMC:H6   | 2.19                     | 0.60              |
| 1:1:2326:C:O2'   | 1:1:2388:A:N6     | 2.34                     | 0.60              |
| 2:2:1017:U:O2'   | 2:2:1018:G:O4'    | 2.19                     | 0.60              |
| 2:2:1227:A:OP2   | 49:r:110:LYS:NZ   | 2.34                     | 0.60              |
| 17:L:17:LYS:HB3  | 17:L:27:LEU:HD11  | 1.82                     | 0.60              |
| 23:R:69:GLY:O    | 23:R:90:ARG:NH2   | 2.34                     | 0.60              |
| 1:1:1218:G:O6    | 1:1:1231:U:O2     | 2.18                     | 0.60              |
| 2:2:232:G:C2     | 2:2:233:C:C4      | 2.89                     | 0.60              |
| 9:D:146:VAL:HG21 | 9:D:187:VAL:HG23  | 1.83                     | 0.60              |
| 10:E:36:LEU:HD21 | 10:E:152:LEU:HD22 | 1.83                     | 0.60              |
| 1:1:1653:G:H4'   | 1:1:2822:G:H1     | 1.67                     | 0.60              |
| 1:1:2028:U:H2'   | 1:1:2029:G:C8     | 2.36                     | 0.60              |
| 1:1:2048:G:O4'   | 1:1:2823:A:N6     | 2.35                     | 0.60              |
| 1:1:2463:C:C2    | 1:1:2488:G:N2     | 2.69                     | 0.60              |
| 2:2:8:A:O2'      | 2:2:9:G:O5'       | 2.19                     | 0.60              |
| 2:2:42:G:H2'     | 2:2:43:C:C6       | 2.37                     | 0.60              |
| 2:2:106:C:O3'    | 2:2:134:G:N2      | 2.34                     | 0.60              |
| 4:6:29:C:H2'     | 4:6:30:G:H8       | 1.66                     | 0.60              |
| 8:C:25:THR:HG21  | 8:C:193:VAL:HG22  | 1.82                     | 0.60              |
| 11:F:9:VAL:HG21  | 11:F:52:PHE:HE1   | 1.66                     | 0.60              |
| 19:N:28:LEU:HD23 | 19:N:48:VAL:HG21  | 1.82                     | 0.60              |
| 38:g:119:THR:O   | 38:g:124:GLY:N    | 2.31                     | 0.60              |
| 40:i:13:ARG:HD2  | 40:i:32:CYS:HB2   | 1.83                     | 0.60              |
| 1:1:2134:A:C6    | 1:1:2156:G:N2     | 2.68                     | 0.60              |
| 1:1:2291:U:O2    | 1:1:2374:C:O2'    | 2.16                     | 0.60              |
| 2:2:203:G:N2     | 2:2:204:G:O6      | 2.34                     | 0.60              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 2:2:227:G:H21     | 52:u:64:GLY:HA3  | 1.66                     | 0.60              |
| 2:2:299:G:H2'     | 2:2:300:A:H8     | 1.65                     | 0.60              |
| 2:2:693:G:H1'     | 43:l:83:SER:H    | 1.66                     | 0.60              |
| 2:2:1402:4OC:HM22 | 2:2:1403:C:H5'   | 1.83                     | 0.60              |
| 1:1:255:A:H3'     | 1:1:256:A:H8     | 1.66                     | 0.60              |
| 1:1:870:U:OP1     | 18:M:6:ARG:NH2   | 2.34                     | 0.60              |
| 1:1:2848:G:O2'    | 1:1:2867:G:N2    | 2.31                     | 0.60              |
| 46:o:55:PRO:O     | 50:s:81:ARG:NH2  | 2.34                     | 0.60              |
| 47:p:93:ARG:NH2   | 47:p:112:ASP:OD2 | 2.35                     | 0.60              |
| 1:1:1022:G:O6     | 1:1:1140:C:H3'   | 2.02                     | 0.60              |
| 2:2:299:G:C2      | 2:2:300:A:C5     | 2.89                     | 0.60              |
| 2:2:1075:U:C2     | 2:2:1076:U:C5    | 2.90                     | 0.60              |
| 8:C:8:LYS:HG3     | 8:C:25:THR:HG23  | 1.83                     | 0.60              |
| 1:1:1128:G:N2     | 1:1:2518:A:O2'   | 2.35                     | 0.60              |
| 1:1:1858:A:N6     | 1:1:1884:G:H1'   | 2.15                     | 0.60              |
| 1:1:2039:U:H2'    | 1:1:2040:G:C8    | 2.36                     | 0.60              |
| 1:1:2139:U:H2'    | 1:1:2140:G:C8    | 2.36                     | 0.60              |
| 1:1:2528:U:OP1    | 11:F:172:LYS:NZ  | 2.35                     | 0.60              |
| 1:1:2682:A:H2'    | 8:C:13:ARG:HH21  | 1.67                     | 0.60              |
| 2:2:1160:G:H1     | 2:2:1176:A:H61   | 0.77                     | 0.60              |
| 2:2:1215:G:H2'    | 2:2:1216:A:O4'   | 2.02                     | 0.60              |
| 12:G:75:LEU:HD12  | 12:G:77:THR:H    | 1.67                     | 0.60              |
| 52:u:16:PHE:CZ    | 52:u:38:PHE:HB2  | 2.34                     | 0.60              |
| 1:1:861:A:H2      | 3:4:78:A:H2      | 1.47                     | 0.60              |
| 1:1:2461:A:O2'    | 6:A:154:GLN:OE1  | 2.17                     | 0.60              |
| 1:1:2462:C:H2'    | 1:1:2463:C:C6    | 2.36                     | 0.60              |
| 2:2:178:C:OP2     | 56:y:60:ARG:NH2  | 2.35                     | 0.60              |
| 11:F:103:ILE:HB   | 11:F:115:HIS:HB3 | 1.82                     | 0.60              |
| 22:Q:38:ALA:O     | 22:Q:42:ALA:CB   | 2.49                     | 0.60              |
| 1:1:2393:U:H5''   | 17:L:62:PRO:HB3  | 1.84                     | 0.60              |
| 1:1:2532:G:OP2    | 1:1:2534:A:N6    | 2.34                     | 0.60              |
| 2:2:32:A:H61      | 2:2:553:A:N6     | 2.00                     | 0.60              |
| 1:1:14:A:N1       | 1:1:2624:G:N2    | 2.47                     | 0.59              |
| 1:1:408:G:O6      | 1:1:419:U:O4     | 2.19                     | 0.59              |
| 1:1:598:U:O2      | 1:1:659:G:O6     | 2.20                     | 0.59              |
| 1:1:2292:U:H5'    | 1:1:2378:A:N6    | 2.17                     | 0.59              |
| 1:1:2562:U:H3     | 1:1:2566:A:H62   | 1.48                     | 0.59              |
| 2:2:505:G:H5'     | 2:2:534:U:O2     | 2.02                     | 0.59              |
| 18:M:33:LEU:HD13  | 18:M:117:PHE:HB3 | 1.84                     | 0.59              |
| 41:j:70:ASN:O     | 41:j:70:ASN:ND2  | 2.25                     | 0.59              |
| 45:n:84:THR:HG22  | 45:n:88:MET:HE1  | 1.84                     | 0.59              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:1:77:G:H2'      | 1:1:78:U:C6       | 2.37                     | 0.59              |
| 1:1:848:C:H2'     | 1:1:849:A:C8      | 2.37                     | 0.59              |
| 1:1:970:U:H5''    | 31:Z:14:ILE:HG22  | 1.83                     | 0.59              |
| 1:1:1135:C:H41    | 1:1:1137:G:H3'    | 1.67                     | 0.59              |
| 1:1:1365:A:OP1    | 29:X:3:ARG:NH1    | 2.35                     | 0.59              |
| 1:1:2278:A:N7     | 28:W:12:ASN:HB3   | 2.17                     | 0.59              |
| 2:2:429:U:H5'     | 40:i:9:LEU:HD12   | 1.83                     | 0.59              |
| 2:2:927:G:N2      | 2:2:1532:U:OP1    | 2.35                     | 0.59              |
| 4:5:33:U:N3       | 4:5:36:U:OP2      | 2.35                     | 0.59              |
| 25:T:69:ARG:HH12  | 25:T:74:ILE:HG12  | 1.66                     | 0.59              |
| 41:j:74:VAL:HG11  | 41:j:144:LEU:HG   | 1.83                     | 0.59              |
| 44:m:11:LEU:HD22  | 44:m:75:ILE:HD11  | 1.84                     | 0.59              |
| 1:1:599:A:H4'     | 9:D:26:ALA:HB3    | 1.83                     | 0.59              |
| 1:1:954:G:OP1     | 18:M:15:GLY:N     | 2.27                     | 0.59              |
| 1:1:2296:U:O2'    | 1:1:2333:A:N1     | 2.33                     | 0.59              |
| 2:2:393:A:H4'     | 2:2:483:C:C4'     | 2.31                     | 0.59              |
| 2:2:405:U:O2      | 2:2:499:A:N7      | 2.35                     | 0.59              |
| 4:5:14:G:H2'      | 4:5:59:A:H61      | 1.65                     | 0.59              |
| 8:C:113:SER:HA    | 8:C:194:PRO:HB3   | 1.83                     | 0.59              |
| 10:E:31:VAL:HG22  | 10:E:158:THR:HG22 | 1.84                     | 0.59              |
| 39:h:114:LYS:NZ   | 39:h:118:ASP:OD1  | 2.35                     | 0.59              |
| 45:n:119:ARG:N    | 45:n:125:PRO:HD3  | 2.17                     | 0.59              |
| 1:1:80:G:H4'      | 1:1:346:A:H1'     | 1.83                     | 0.59              |
| 1:1:2312:U:H4'    | 10:E:86:GLY:HA3   | 1.84                     | 0.59              |
| 7:B:17:VAL:HB     | 7:B:204:VAL:HG12  | 1.84                     | 0.59              |
| 9:D:175:ILE:HB    | 9:D:180:LEU:HD11  | 1.82                     | 0.59              |
| 11:F:87:LEU:HD11  | 11:F:145:ALA:HA   | 1.83                     | 0.59              |
| 46:o:52:LEU:HB2   | 50:s:81:ARG:HD2   | 1.84                     | 0.59              |
| 1:1:248:G:O2'     | 1:1:2432:A:OP1    | 2.19                     | 0.59              |
| 1:1:2025:C:H2'    | 1:1:2026:U:C6     | 2.37                     | 0.59              |
| 1:1:2466:C:H5''   | 37:f:5:ALA:HB3    | 1.84                     | 0.59              |
| 1:1:2544:G:H2'    | 1:1:2545:G:C8     | 2.38                     | 0.59              |
| 1:1:2682:A:H4'    | 21:P:56:HIS:NE2   | 2.17                     | 0.59              |
| 2:2:1143:G:H2'    | 2:2:1144:G:C8     | 2.38                     | 0.59              |
| 2:2:1391:U:O2'    | 2:2:1392:G:H5'    | 2.02                     | 0.59              |
| 50:s:69:ARG:HD2   | 50:s:80:SER:HB2   | 1.84                     | 0.59              |
| 1:1:605:G:O2'     | 1:1:657:U:O2'     | 2.19                     | 0.59              |
| 1:1:2347:C:O2'    | 34:c:21:TYR:OH    | 2.20                     | 0.59              |
| 1:1:2498:OMC:HM21 | 1:1:2500:U:C5     | 2.37                     | 0.59              |
| 1:1:2528:U:H5'    | 37:f:32:LYS:HE3   | 1.84                     | 0.59              |
| 1:1:2623:G:O5'    | 1:1:2826:A:O2'    | 2.21                     | 0.59              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 10:E:104:ILE:HG13 | 10:E:105:THR:HG23 | 1.83                     | 0.59              |
| 39:h:114:LYS:HB2  | 39:h:185:ASN:ND2  | 2.17                     | 0.59              |
| 42:k:29:ILE:HG12  | 42:k:34:GLY:HA3   | 1.83                     | 0.59              |
| 1:1:591:U:H2'     | 1:1:592:A:C8      | 2.38                     | 0.59              |
| 1:1:977:G:O2'     | 1:1:1000:A:N6     | 2.36                     | 0.59              |
| 1:1:1038:G:H2'    | 1:1:1039:A:C8     | 2.38                     | 0.59              |
| 1:1:2729:G:O2'    | 8:C:190:LYS:O     | 2.10                     | 0.59              |
| 2:2:68:G:C2       | 2:2:151:A:N1      | 2.71                     | 0.59              |
| 2:2:107:G:OP1     | 2:2:325:A:N6      | 2.36                     | 0.59              |
| 2:2:108:G:O2'     | 2:2:331:G:N7      | 2.35                     | 0.59              |
| 2:2:235:C:H2'     | 2:2:236:A:H8      | 1.68                     | 0.59              |
| 2:2:1065:U:O2'    | 2:2:1067:A:N1     | 2.30                     | 0.59              |
| 2:2:1097:C:O3'    | 38:g:139:ARG:NH1  | 2.35                     | 0.59              |
| 2:2:1130:A:H61    | 2:2:1144:G:H1'    | 1.66                     | 0.59              |
| 9:D:130:LYS:HB2   | 9:D:133:LEU:HG    | 1.85                     | 0.59              |
| 17:L:33:ARG:HG2   | 17:L:39:LYS:O     | 2.03                     | 0.59              |
| 19:N:79:LEU:HD23  | 19:N:83:LEU:HD12  | 1.84                     | 0.59              |
| 46:o:59:LYS:HE3   | 46:o:62:ARG:HH21  | 1.66                     | 0.59              |
| 50:s:63:ARG:HE    | 50:s:68:GLY:HA2   | 1.68                     | 0.59              |
| 52:u:1:MET:H3     | 52:u:24:SER:HB3   | 1.67                     | 0.59              |
| 1:1:1597:A:H5''   | 1:1:1598:A:H5'    | 1.84                     | 0.59              |
| 1:1:1654:A:N1     | 1:1:2048:G:O2'    | 2.36                     | 0.59              |
| 2:2:321:A:N6      | 2:2:329:A:N7      | 2.50                     | 0.59              |
| 2:2:1345:U:H4'    | 2:2:1346:A:H8     | 1.68                     | 0.59              |
| 8:C:104:VAL:HG11  | 8:C:205:PRO:HB3   | 1.85                     | 0.59              |
| 1:1:434:U:O2      | 1:1:435:C:N4      | 2.30                     | 0.59              |
| 1:1:561:G:O2'     | 1:1:563:A:OP1     | 2.20                     | 0.59              |
| 1:1:1226:A:O2'    | 1:1:1250:G:N2     | 2.36                     | 0.59              |
| 2:2:927:G:H2'     | 2:2:928:G:C8      | 2.38                     | 0.59              |
| 2:2:1229:A:H4'    | 4:5:29:G:O3'      | 2.02                     | 0.59              |
| 27:V:79:ARG:HA    | 27:V:87:GLN:H     | 1.67                     | 0.59              |
| 38:g:170:HIS:HA   | 38:g:173:ILE:HB   | 1.85                     | 0.59              |
| 41:j:38:VAL:HG21  | 41:j:114:VAL:HG23 | 1.85                     | 0.59              |
| 1:1:2385:C:O2     | 28:W:57:HIS:NE2   | 2.32                     | 0.59              |
| 2:2:1058:G:H2'    | 2:2:1059:C:H5'    | 1.84                     | 0.59              |
| 50:s:27:LEU:HD21  | 50:s:47:LYS:HD2   | 1.83                     | 0.59              |
| 1:1:305:C:H2'     | 1:1:306:U:C6      | 2.38                     | 0.58              |
| 1:1:1111:A:OP1    | 11:F:6:LYS:NZ     | 2.35                     | 0.58              |
| 1:1:1458:U:H4'    | 1:1:1459:G:C4     | 2.38                     | 0.58              |
| 2:2:70:U:H2'      | 2:2:94:G:N7       | 2.18                     | 0.58              |
| 18:M:26:VAL:HG22  | 18:M:101:VAL:HG21 | 1.84                     | 0.58              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 19:N:1:MET:HE3   | 19:N:3:HIS:CE1   | 2.37                     | 0.58              |
| 38:g:72:THR:N    | 38:g:169:GLU:OE2 | 2.31                     | 0.58              |
| 40:i:78:GLU:OE2  | 40:i:81:ARG:NE   | 2.33                     | 0.58              |
| 1:1:475:C:O2     | 1:1:480:A:N6     | 2.36                     | 0.58              |
| 1:1:581:C:H2'    | 1:1:582:A:H8     | 1.68                     | 0.58              |
| 1:1:2134:A:N6    | 1:1:2156:G:H21   | 2.00                     | 0.58              |
| 2:2:201:G:H2'    | 2:2:202:G:C8     | 2.38                     | 0.58              |
| 4:6:63:C:H2'     | 4:6:64:G:H8      | 1.68                     | 0.58              |
| 8:C:157:LYS:HB2  | 15:J:80:HIS:CG   | 2.38                     | 0.58              |
| 10:E:110:ARG:NH2 | 10:E:136:ILE:O   | 2.36                     | 0.58              |
| 20:O:79:ALA:HB3  | 20:O:113:ALA:HB3 | 1.85                     | 0.58              |
| 24:S:83:LYS:HG2  | 24:S:95:ARG:HH21 | 1.67                     | 0.58              |
| 26:U:9:ASP:OD2   | 26:U:94:ARG:NH1  | 2.35                     | 0.58              |
| 1:1:382:A:H2'    | 1:1:383:C:C6     | 2.39                     | 0.58              |
| 1:1:2289:G:H2'   | 1:1:2290:G:H8    | 1.67                     | 0.58              |
| 2:2:1071:C:H2'   | 2:2:1072:G:H8    | 1.67                     | 0.58              |
| 2:2:1124:G:H5''  | 46:o:37:ARG:HB3  | 1.85                     | 0.58              |
| 2:2:1147:C:H2'   | 2:2:1148:U:C6    | 2.38                     | 0.58              |
| 4:5:14:G:H22     | 4:5:48:C:H42     | 1.48                     | 0.58              |
| 43:l:70:ARG:HD3  | 43:l:96:ARG:HD3  | 1.86                     | 0.58              |
| 55:x:50:ALA:HB1  | 55:x:57:HIS:HB3  | 1.85                     | 0.58              |
| 1:1:80:G:H2'     | 1:1:81:G:C8      | 2.37                     | 0.58              |
| 1:1:833:A:H1'    | 17:L:52:GLY:N    | 2.19                     | 0.58              |
| 1:1:954:G:N2     | 1:1:2250:G:H1    | 1.98                     | 0.58              |
| 1:1:1123:C:O2'   | 37:f:21:GLY:O    | 2.21                     | 0.58              |
| 1:1:2655:G:N2    | 1:1:2665:A:OP2   | 2.27                     | 0.58              |
| 1:1:2675:A:H5''  | 16:K:31:ARG:NH1  | 2.18                     | 0.58              |
| 2:2:81:A:N6      | 2:2:88:U:O4      | 2.35                     | 0.58              |
| 2:2:607:A:H3'    | 2:2:608:A:H8     | 1.67                     | 0.58              |
| 2:2:1047:G:H3'   | 2:2:1048:G:C8    | 2.38                     | 0.58              |
| 2:2:1193:G:H8    | 2:2:1193:G:OP2   | 1.85                     | 0.58              |
| 14:I:10:LEU:HB3  | 14:I:23:VAL:HG11 | 1.85                     | 0.58              |
| 14:I:109:ALA:HB1 | 14:I:124:MET:SD  | 2.43                     | 0.58              |
| 38:g:69:PHE:H    | 38:g:91:PHE:HA   | 1.67                     | 0.58              |
| 42:k:38:ARG:NH1  | 42:k:98:GLU:O    | 2.30                     | 0.58              |
| 1:1:100:U:O4     | 26:U:6:ARG:NH2   | 2.36                     | 0.58              |
| 1:1:1054:A:H2'   | 1:1:1055:G:H8    | 1.69                     | 0.58              |
| 2:2:970:C:N4     | 45:n:130:ARG:OXT | 2.37                     | 0.58              |
| 38:g:73:LYS:NZ   | 38:g:204:ASP:O   | 2.34                     | 0.58              |
| 1:1:416:U:H2'    | 1:1:417:C:O4'    | 2.03                     | 0.58              |
| 1:1:418:C:H2'    | 1:1:419:U:C6     | 2.38                     | 0.58              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:1:534:U:H3'    | 1:1:535:G:H8     | 1.68                     | 0.58              |
| 1:1:553:G:C6     | 1:1:554:U:C4     | 2.92                     | 0.58              |
| 1:1:965:C:H2'    | 1:1:966:G:C8     | 2.38                     | 0.58              |
| 1:1:1141:U:H5'   | 15:J:27:ARG:NH2  | 2.18                     | 0.58              |
| 1:1:2891:U:H2'   | 1:1:2892:G:C8    | 2.38                     | 0.58              |
| 2:2:269:C:H2'    | 2:2:270:A:H8     | 1.68                     | 0.58              |
| 2:2:404:G:H2'    | 2:2:405:U:C6     | 2.38                     | 0.58              |
| 2:2:606:G:N2     | 2:2:631:C:OP2    | 2.36                     | 0.58              |
| 2:2:1064:G:H22   | 2:2:1191:A:P     | 2.26                     | 0.58              |
| 2:2:1305:G:O2'   | 2:2:1306:A:H8    | 1.83                     | 0.58              |
| 2:2:1357:A:H2    | 2:2:1365:G:H22   | 1.51                     | 0.58              |
| 15:J:15:TRP:HB3  | 15:J:137:PRO:HB3 | 1.84                     | 0.58              |
| 25:T:6:ARG:O     | 25:T:10:VAL:HG23 | 2.04                     | 0.58              |
| 38:g:81:LYS:HD2  | 38:g:93:ASN:HD21 | 1.67                     | 0.58              |
| 1:1:2656:U:O2    | 1:1:2665:A:N7    | 2.36                     | 0.58              |
| 49:r:83:LEU:HB3  | 55:x:74:PHE:HE2  | 1.68                     | 0.58              |
| 1:1:1127:A:H2'   | 1:1:2518:A:C2    | 2.39                     | 0.58              |
| 1:1:1186:G:OP1   | 1:1:1186:G:H3'   | 2.04                     | 0.58              |
| 1:1:2732:G:OP1   | 1:1:2733:A:H1'   | 2.04                     | 0.58              |
| 8:C:73:VAL:HG22  | 8:C:74:GLU:H     | 1.68                     | 0.58              |
| 20:O:30:ARG:HE   | 20:O:102:ARG:HD3 | 1.68                     | 0.58              |
| 46:o:44:THR:HG23 | 46:o:70:HIS:HA   | 1.85                     | 0.58              |
| 1:1:463:G:N2     | 1:1:466:A:OP2    | 2.27                     | 0.58              |
| 1:1:569:U:OP1    | 1:1:945:A:O2'    | 2.20                     | 0.58              |
| 1:1:1059:G:N3    | 14:I:131:THR:OG1 | 2.35                     | 0.58              |
| 1:1:2623:G:O2'   | 1:1:2825:G:H8    | 1.87                     | 0.58              |
| 2:2:327:A:O2'    | 2:2:328:C:O4'    | 2.21                     | 0.58              |
| 10:E:6:ASP:OD1   | 10:E:9:LYS:NZ    | 2.31                     | 0.58              |
| 14:I:88:GLY:HA3  | 14:I:135:MET:HE2 | 1.85                     | 0.58              |
| 1:1:340:A:O2'    | 9:D:162:ARG:NH2  | 2.35                     | 0.58              |
| 1:1:980:A:H2'    | 1:1:981:A:C4     | 2.39                     | 0.58              |
| 1:1:2048:G:C6    | 1:1:2621:G:C2    | 2.92                     | 0.58              |
| 1:1:2391:G:OP2   | 36:e:35:LYS:NZ   | 2.25                     | 0.58              |
| 2:2:147:G:H21    | 2:2:1447:A:H2    | 1.51                     | 0.58              |
| 2:2:524:G:H2'    | 2:2:525:C:C6     | 2.37                     | 0.58              |
| 2:2:830:G:O2'    | 38:g:21:ARG:O    | 2.22                     | 0.58              |
| 2:2:928:G:H2'    | 2:2:929:G:C8     | 2.31                     | 0.58              |
| 4:6:63:C:H2'     | 4:6:64:G:C8      | 2.39                     | 0.58              |
| 18:M:33:LEU:HD11 | 18:M:128:THR:HB  | 1.86                     | 0.58              |
| 48:q:98:VAL:HB   | 48:q:101:ALA:HB2 | 1.86                     | 0.58              |
| 1:1:2024:G:H2'   | 1:1:2025:C:C6    | 2.39                     | 0.57              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 4:5:7:U:H5'      | 4:5:49:G:H5'     | 1.86                     | 0.57              |
| 1:1:116:C:O2'    | 1:1:126:A:N3     | 2.35                     | 0.57              |
| 1:1:913:U:H4'    | 1:1:914:G:OP2    | 2.04                     | 0.57              |
| 1:1:1042:G:H1    | 1:1:1113:U:H3    | 0.76                     | 0.57              |
| 1:1:2729:G:N2    | 8:C:172:VAL:HG13 | 2.20                     | 0.57              |
| 2:2:33:A:H5''    | 2:2:364:A:H1'    | 1.86                     | 0.57              |
| 2:2:35:G:H2'     | 2:2:36:C:C6      | 2.39                     | 0.57              |
| 2:2:398:U:H2'    | 2:2:399:G:C8     | 2.40                     | 0.57              |
| 2:2:628:G:H2'    | 2:2:629:A:C8     | 2.39                     | 0.57              |
| 2:2:1097:C:H2'   | 2:2:1098:C:C6    | 2.40                     | 0.57              |
| 2:2:1300:G:H1'   | 2:2:1303:C:N4    | 2.19                     | 0.57              |
| 21:P:9:GLU:HG2   | 21:P:55:LEU:HB2  | 1.86                     | 0.57              |
| 1:1:15:G:O6      | 1:1:525:U:O2     | 2.21                     | 0.57              |
| 1:1:531:C:H3'    | 1:1:561:G:H21    | 1.69                     | 0.57              |
| 1:1:1028:A:N3    | 1:1:2486:C:O2'   | 2.36                     | 0.57              |
| 1:1:2391:G:O2'   | 1:1:2424:C:N4    | 2.35                     | 0.57              |
| 1:1:2644:G:O2'   | 1:1:2645:G:H5'   | 2.03                     | 0.57              |
| 1:1:2831:G:N2    | 1:1:2883:A:O2'   | 2.33                     | 0.57              |
| 4:6:10:G:H2'     | 4:6:11:A:H8      | 1.69                     | 0.57              |
| 10:E:122:PHE:HB3 | 10:E:126:GLY:H   | 1.70                     | 0.57              |
| 28:W:27:GLY:HA2  | 28:W:67:VAL:HB   | 1.84                     | 0.57              |
| 43:l:136:LYS:O   | 43:l:139:GLU:HG2 | 2.04                     | 0.57              |
| 45:n:56:ASP:O    | 45:n:57:MET:HE2  | 2.04                     | 0.57              |
| 1:1:244:A:H3'    | 1:1:245:G:C8     | 2.39                     | 0.57              |
| 1:1:573:U:O4     | 1:1:2029:G:O2'   | 2.11                     | 0.57              |
| 1:1:671:C:H5     | 17:L:33:ARG:NE   | 2.02                     | 0.57              |
| 1:1:828:U:O2'    | 1:1:831:G:O6     | 2.22                     | 0.57              |
| 1:1:2064:C:H2'   | 1:1:2065:C:C6    | 2.39                     | 0.57              |
| 1:1:2682:A:N1    | 1:1:2727:A:O2'   | 2.38                     | 0.57              |
| 2:2:393:A:OP1    | 2:2:483:C:O2'    | 2.15                     | 0.57              |
| 2:2:1003:G:N2    | 2:2:1005:A:O5'   | 2.37                     | 0.57              |
| 26:U:22:ARG:O    | 26:U:39:ILE:HD11 | 2.04                     | 0.57              |
| 39:h:60:PRO:O    | 39:h:63:SER:OG   | 2.18                     | 0.57              |
| 1:1:145:C:H2'    | 1:1:146:A:H8     | 1.69                     | 0.57              |
| 1:1:833:A:O2'    | 17:L:51:GLU:HA   | 2.04                     | 0.57              |
| 1:1:865:C:N4     | 1:1:909:A:OP2    | 2.38                     | 0.57              |
| 2:2:199:A:H2'    | 2:2:200:G:C8     | 2.40                     | 0.57              |
| 2:2:299:G:N2     | 2:2:565:U:H3     | 2.02                     | 0.57              |
| 2:2:427:U:H1'    | 2:2:541:G:H5''   | 1.85                     | 0.57              |
| 2:2:448:A:H3'    | 2:2:449:G:C8     | 2.40                     | 0.57              |
| 2:2:575:G:O2'    | 2:2:821:G:OP2    | 2.16                     | 0.57              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:2:1228:C:OP2   | 49:r:110:LYS:NZ  | 2.30                     | 0.57              |
| 8:C:25:THR:OG1   | 8:C:192:ALA:HA   | 2.04                     | 0.57              |
| 14:I:62:ALA:HA   | 14:I:64:ARG:HH21 | 1.69                     | 0.57              |
| 24:S:59:GLU:HB2  | 24:S:66:ILE:HD11 | 1.85                     | 0.57              |
| 37:f:22:VAL:HG11 | 37:f:36:ARG:HD2  | 1.86                     | 0.57              |
| 39:h:167:TRP:CZ3 | 39:h:169:ARG:HB2 | 2.31                     | 0.57              |
| 43:l:134:ALA:O   | 43:l:138:ARG:HG3 | 2.04                     | 0.57              |
| 1:1:370:G:O2'    | 1:1:424:G:OP1    | 2.20                     | 0.57              |
| 1:1:2280:G:N2    | 1:1:2388:A:O2'   | 2.38                     | 0.57              |
| 1:1:2283:C:O5'   | 1:1:2389:G:O2'   | 2.21                     | 0.57              |
| 1:1:2421:G:H2'   | 4:6:77:A:C8      | 2.40                     | 0.57              |
| 2:2:232:G:H2'    | 2:2:233:C:C5     | 2.39                     | 0.57              |
| 2:2:1176:A:H2'   | 2:2:1177:G:C8    | 2.38                     | 0.57              |
| 3:4:116:G:H2'    | 3:4:117:G:H8     | 1.70                     | 0.57              |
| 4:6:11:A:H2'     | 4:6:12:G:C8      | 2.39                     | 0.57              |
| 11:F:52:PHE:HZ   | 11:F:72:LEU:HD23 | 1.69                     | 0.57              |
| 1:1:18:U:C5'     | 22:Q:30:ARG:HH12 | 2.18                     | 0.57              |
| 1:1:942:G:H3'    | 1:1:943:A:H8     | 1.70                     | 0.57              |
| 1:1:1217:U:O2    | 1:1:1232:G:C2    | 2.58                     | 0.57              |
| 2:2:34:C:H3'     | 2:2:35:G:H8      | 1.70                     | 0.57              |
| 2:2:523:A:H61    | 48:q:88:LYS:HB3  | 1.68                     | 0.57              |
| 2:2:947:G:O2'    | 2:2:1306:A:O2'   | 2.16                     | 0.57              |
| 36:e:4:ILE:HG22  | 36:e:5:LYS:H     | 1.70                     | 0.57              |
| 45:n:12:ARG:O    | 45:n:106:ARG:NH2 | 2.33                     | 0.57              |
| 55:x:34:TRP:O    | 55:x:37:ARG:NH1  | 2.37                     | 0.57              |
| 1:1:587:C:N4     | 17:L:31:GLY:HA3  | 2.20                     | 0.57              |
| 1:1:2625:G:H2'   | 1:1:2626:C:O4'   | 2.05                     | 0.57              |
| 1:1:2719:G:O3'   | 21:P:53:ARG:NH2  | 2.38                     | 0.57              |
| 2:2:44:A:C4      | 2:2:45:G:C8      | 2.93                     | 0.57              |
| 2:2:60:A:N6      | 2:2:107:G:O2'    | 2.35                     | 0.57              |
| 2:2:427:U:OP1    | 40:i:13:ARG:NH2  | 2.38                     | 0.57              |
| 3:4:97:C:H2'     | 3:4:98:G:O4'     | 2.04                     | 0.57              |
| 16:K:58:LEU:HD12 | 16:K:59:LYS:H    | 1.68                     | 0.57              |
| 25:T:54:GLU:N    | 25:T:54:GLU:OE2  | 2.38                     | 0.57              |
| 51:t:26:GLU:HG3  | 51:t:81:LEU:HD11 | 1.87                     | 0.57              |
| 1:1:645:C:H5''   | 1:1:647:G:N7     | 2.20                     | 0.57              |
| 1:1:1168:G:H1    | 1:1:1181:U:H3    | 0.70                     | 0.57              |
| 1:1:2322:A:H2'   | 1:1:2323:G:O4'   | 2.05                     | 0.57              |
| 1:1:2406:A:O4'   | 17:L:69:ARG:NH1  | 2.35                     | 0.57              |
| 1:1:2524:G:N2    | 1:1:2741:A:H2    | 1.95                     | 0.57              |
| 1:1:2729:G:O2'   | 8:C:175:LEU:HA   | 2.04                     | 0.57              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:2:201:G:H2'    | 2:2:202:G:H8      | 1.69                     | 0.57              |
| 8:C:37:VAL:HG22  | 8:C:48:ILE:HG22   | 1.87                     | 0.57              |
| 40:i:54:GLN:HG2  | 40:i:199:LEU:HB3  | 1.86                     | 0.57              |
| 41:j:70:ASN:HD22 | 41:j:70:ASN:C     | 2.11                     | 0.57              |
| 1:1:219:A:N3     | 1:1:234:U:O2'     | 2.36                     | 0.57              |
| 1:1:2512:C:C4    | 1:1:2513:A:C8     | 2.93                     | 0.57              |
| 2:2:291:U:OP2    | 2:2:305:G:N1      | 2.37                     | 0.57              |
| 2:2:378:G:H2'    | 2:2:379:C:C6      | 2.39                     | 0.57              |
| 40:i:118:VAL:HA  | 40:i:123:ILE:HG12 | 1.87                     | 0.57              |
| 1:1:1085:A:H2'   | 1:1:1086:A:C4     | 2.40                     | 0.56              |
| 1:1:1434:A:H2'   | 1:1:1435:G:H8     | 1.69                     | 0.56              |
| 1:1:2572:A:H4'   | 1:1:2573:C:H5''   | 1.86                     | 0.56              |
| 1:1:2657:A:H2'   | 1:1:2658:C:O4'    | 2.04                     | 0.56              |
| 4:6:1:C:H2'      | 4:6:2:G:H8        | 1.69                     | 0.56              |
| 45:n:30:ILE:HD12 | 45:n:35:LEU:HA    | 1.86                     | 0.56              |
| 1:1:851:C:O2'    | 31:Z:43:ALA:O     | 2.21                     | 0.56              |
| 1:1:2369:A:H2'   | 1:1:2370:G:H8     | 1.70                     | 0.56              |
| 1:1:2528:U:OP2   | 1:1:2530:A:N6     | 2.39                     | 0.56              |
| 2:2:171:A:H2'    | 2:2:172:A:C8      | 2.39                     | 0.56              |
| 2:2:712:A:H2'    | 2:2:713:G:C8      | 2.40                     | 0.56              |
| 2:2:1320:C:H42   | 55:x:37:ARG:HG3   | 1.69                     | 0.56              |
| 2:2:1367:C:O2'   | 46:o:64:GLN:OE1   | 2.19                     | 0.56              |
| 22:Q:43:GLY:HA3  | 23:R:75:VAL:HB    | 1.86                     | 0.56              |
| 22:Q:59:GLN:HA   | 22:Q:62:ILE:HD12  | 1.88                     | 0.56              |
| 26:U:12:ILE:N    | 26:U:71:ALA:O     | 2.28                     | 0.56              |
| 39:h:11:ARG:HH21 | 39:h:180:ALA:HB3  | 1.70                     | 0.56              |
| 1:1:1509:A:O2'   | 1:1:1510:G:O5'    | 2.23                     | 0.56              |
| 1:1:2134:A:H62   | 1:1:2156:G:N2     | 2.00                     | 0.56              |
| 1:1:2426:A:H5''  | 1:1:2427:C:C5     | 2.34                     | 0.56              |
| 1:1:2526:G:H2'   | 1:1:2527:C:H6     | 1.70                     | 0.56              |
| 1:1:2527:C:H3'   | 1:1:2528:U:C6     | 2.40                     | 0.56              |
| 1:1:2762:C:H2'   | 1:1:2763:G:H8     | 1.69                     | 0.56              |
| 1:1:2831:G:OP2   | 8:C:59:ARG:NE     | 2.38                     | 0.56              |
| 1:1:2834:G:N2    | 1:1:2883:A:N6     | 2.09                     | 0.56              |
| 2:2:68:G:H1      | 2:2:101:A:H61     | 0.69                     | 0.56              |
| 2:2:291:U:OP2    | 2:2:305:G:N2      | 2.37                     | 0.56              |
| 2:2:405:U:C2     | 2:2:499:A:N7      | 2.73                     | 0.56              |
| 2:2:975:A:O3'    | 2:2:1358:U:O2'    | 2.23                     | 0.56              |
| 2:2:994:A:N6     | 2:2:1215:G:O2'    | 2.37                     | 0.56              |
| 2:2:1028:C:H1'   | 2:2:1034:G:H22    | 1.69                     | 0.56              |
| 2:2:1053:G:H4'   | 2:2:1054:C:H3'    | 1.87                     | 0.56              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:2:1060:U:H5''   | 39:h:2:GLY:O      | 2.05                     | 0.56              |
| 2:2:1225:A:OP1    | 49:r:102:THR:OG1  | 2.22                     | 0.56              |
| 3:4:18:G:N2       | 3:4:65:U:O2       | 2.27                     | 0.56              |
| 4:5:6:G:O2'       | 4:5:49:G:O4'      | 2.23                     | 0.56              |
| 15:J:23:LYS:HZ3   | 15:J:142:ILE:HB   | 1.70                     | 0.56              |
| 26:U:67:VAL:O     | 26:U:70:VAL:HG22  | 2.05                     | 0.56              |
| 38:g:164:ILE:HD11 | 38:g:214:LEU:HD21 | 1.86                     | 0.56              |
| 45:n:23:PRO:HA    | 45:n:61:LEU:HA    | 1.85                     | 0.56              |
| 49:r:14:HIS:HB2   | 49:r:17:ILE:HG12  | 1.86                     | 0.56              |
| 49:r:68:ASP:OD1   | 49:r:71:ARG:NH2   | 2.35                     | 0.56              |
| 49:r:105:ASN:OD1  | 49:r:113:ARG:NH2  | 2.36                     | 0.56              |
| 1:1:535:G:H2'     | 1:1:536:G:H8      | 1.70                     | 0.56              |
| 1:1:662:G:H1'     | 17:L:14:LYS:HD3   | 1.87                     | 0.56              |
| 1:1:833:A:H1'     | 17:L:52:GLY:H     | 1.71                     | 0.56              |
| 1:1:1127:A:H2'    | 1:1:2518:A:N3     | 2.21                     | 0.56              |
| 1:1:2114:A:N7     | 1:1:2167:U:O2'    | 2.33                     | 0.56              |
| 8:C:98:VAL:HG23   | 8:C:101:PHE:HD2   | 1.69                     | 0.56              |
| 17:L:40:SER:OG    | 17:L:41:ARG:NE    | 2.39                     | 0.56              |
| 20:O:22:GLY:C     | 20:O:42:PRO:HB3   | 2.31                     | 0.56              |
| 23:R:32:THR:HA    | 23:R:62:GLU:HA    | 1.86                     | 0.56              |
| 43:l:135:VAL:HG13 | 43:l:138:ARG:HH21 | 1.70                     | 0.56              |
| 47:p:104:GLY:HA2  | 47:p:106:ARG:HH22 | 1.70                     | 0.56              |
| 1:1:589:U:H2'     | 1:1:590:A:C8      | 2.40                     | 0.56              |
| 1:1:815:C:O2'     | 1:1:1165:A:O2'    | 2.13                     | 0.56              |
| 1:1:870:U:O2      | 1:1:907:G:C2      | 2.59                     | 0.56              |
| 1:1:1022:G:N2     | 1:1:1023:U:O4     | 2.18                     | 0.56              |
| 1:1:1869:G:N2     | 1:1:1871:A:O2'    | 2.38                     | 0.56              |
| 1:1:2461:A:H3'    | 1:1:2462:C:C6     | 2.41                     | 0.56              |
| 1:1:2729:G:OP1    | 8:C:22:ILE:HG23   | 2.06                     | 0.56              |
| 2:2:966:2MG:C2    | 4:5:34:C:H4'      | 2.40                     | 0.56              |
| 2:2:992:U:O2      | 2:2:1044:A:N7     | 2.38                     | 0.56              |
| 8:C:107:VAL:HG21  | 8:C:189:VAL:HG12  | 1.88                     | 0.56              |
| 12:G:79:THR:HA    | 12:G:145:ASN:HB3  | 1.87                     | 0.56              |
| 22:Q:53:ARG:HA    | 22:Q:56:GLN:HG3   | 1.86                     | 0.56              |
| 38:g:60:ILE:HA    | 38:g:63:ARG:HG2   | 1.86                     | 0.56              |
| 1:1:306:U:H2'     | 1:1:307:G:O4'     | 2.04                     | 0.56              |
| 1:1:335:C:O2'     | 26:U:68:SER:O     | 2.22                     | 0.56              |
| 2:2:61:G:H2'      | 2:2:62:U:C6       | 2.41                     | 0.56              |
| 2:2:72:A:H61      | 2:2:98:A:H2       | 1.53                     | 0.56              |
| 8:C:46:ARG:NH1    | 8:C:85:ALA:O      | 2.39                     | 0.56              |
| 8:C:147:GLY:HA2   | 8:C:156:PHE:CZ    | 2.40                     | 0.56              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 20:O:90:VAL:HG21  | 20:O:115:LEU:HD23 | 1.86                     | 0.56              |
| 23:R:75:VAL:HG13  | 23:R:86:GLN:HG2   | 1.87                     | 0.56              |
| 43:l:135:VAL:HA   | 43:l:138:ARG:HE   | 1.71                     | 0.56              |
| 1:1:927:A:C6      | 1:1:928:A:C6      | 2.93                     | 0.56              |
| 1:1:968:C:H2'     | 1:1:969:G:O4'     | 2.05                     | 0.56              |
| 1:1:2394:C:H5''   | 17:L:63:LYS:HB3   | 1.87                     | 0.56              |
| 2:2:32:A:H2'      | 2:2:33:A:C8       | 2.40                     | 0.56              |
| 2:2:194:C:H1'     | 56:y:59:ASP:HB3   | 1.87                     | 0.56              |
| 2:2:502:A:H2'     | 2:2:503:C:C6      | 2.41                     | 0.56              |
| 2:2:510:A:H4'     | 40:i:14:ARG:NH2   | 2.20                     | 0.56              |
| 14:I:107:GLU:OE1  | 14:I:110:GLN:NE2  | 2.39                     | 0.56              |
| 26:U:85:PHE:HD2   | 26:U:92:LYS:HD3   | 1.71                     | 0.56              |
| 38:g:105:LYS:HA   | 38:g:108:ARG:HE   | 1.71                     | 0.56              |
| 39:h:113:ALA:HB3  | 39:h:185:ASN:HB3  | 1.87                     | 0.56              |
| 46:o:10:LEU:HD11  | 46:o:92:LEU:HD22  | 1.88                     | 0.56              |
| 1:1:573:U:H2'     | 1:1:575:A:C8      | 2.40                     | 0.56              |
| 1:1:1054:A:H2'    | 1:1:1055:G:C8     | 2.41                     | 0.56              |
| 1:1:1158:C:H5'    | 31:Z:31:ARG:HD3   | 1.86                     | 0.56              |
| 1:1:1434:A:H2'    | 1:1:1435:G:C8     | 2.40                     | 0.56              |
| 1:1:2633:G:O2'    | 8:C:64:GLU:OE2    | 2.24                     | 0.56              |
| 2:2:233:C:N4      | 2:2:234:C:C5      | 2.74                     | 0.56              |
| 2:2:1222:G:H3'    | 2:2:1322:C:H42    | 1.69                     | 0.56              |
| 3:4:2:G:H2'       | 3:4:3:C:C6        | 2.40                     | 0.56              |
| 9:D:19:PHE:HB3    | 9:D:113:VAL:HG21  | 1.87                     | 0.56              |
| 37:f:7:VAL:HG22   | 37:f:37:GLN:NE2   | 2.21                     | 0.56              |
| 40:i:102:VAL:HG23 | 40:i:114:ALA:HB1  | 1.87                     | 0.56              |
| 41:j:81:LEU:HD23  | 41:j:147:MET:HE3  | 1.88                     | 0.56              |
| 45:n:72:ILE:HG13  | 45:n:73:SER:N     | 2.21                     | 0.56              |
| 1:1:990:A:N3      | 22:Q:47:TYR:OH    | 2.38                     | 0.56              |
| 1:1:1199:U:H2'    | 1:1:1200:C:C6     | 2.40                     | 0.56              |
| 1:1:2265:U:C6     | 1:1:2266:A:H2'    | 2.40                     | 0.56              |
| 1:1:2305:U:H2'    | 1:1:2306:C:O4'    | 2.05                     | 0.56              |
| 1:1:2328:A:H2'    | 1:1:2329:U:C6     | 2.41                     | 0.56              |
| 2:2:1303:C:H3'    | 2:2:1304:G:H8     | 1.71                     | 0.56              |
| 15:J:16:TYR:OH    | 15:J:35:ARG:NH2   | 2.38                     | 0.56              |
| 22:Q:46:ALA:HB1   | 22:Q:50:ARG:CZ    | 2.35                     | 0.56              |
| 26:U:44:LYS:HG3   | 26:U:61:LYS:HD3   | 1.88                     | 0.56              |
| 49:r:46:SER:OG    | 49:r:47:GLU:OE1   | 2.21                     | 0.56              |
| 52:u:20:VAL:HG23  | 52:u:22:ALA:HB2   | 1.87                     | 0.56              |
| 52:u:34:GLU:HG3   | 52:u:60:TRP:HE1   | 1.71                     | 0.56              |
| 1:1:826:U:C4      | 1:1:828:U:H1'     | 2.41                     | 0.56              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:2:978:A:N6     | 2:2:1316:G:H1'    | 2.21                     | 0.56              |
| 2:2:1060:U:OP1   | 50:s:85:ARG:NH2   | 2.39                     | 0.56              |
| 2:2:1317:C:H3'   | 2:2:1318:A:C8     | 2.41                     | 0.56              |
| 39:h:108:LYS:HB3 | 39:h:144:LEU:HD12 | 1.88                     | 0.56              |
| 40:i:99:ASP:OD1  | 40:i:100:ASN:N    | 2.39                     | 0.56              |
| 45:n:99:ARG:NH1  | 45:n:105:THR:OG1  | 2.39                     | 0.56              |
| 1:1:921:C:H2'    | 1:1:922:C:O4'     | 2.06                     | 0.55              |
| 1:1:944:C:OP1    | 1:1:945:A:H8      | 1.89                     | 0.55              |
| 1:1:1025:G:H4'   | 1:1:1026:G:OP2    | 2.05                     | 0.55              |
| 1:1:1084:A:N3    | 1:1:1105:U:O2'    | 2.32                     | 0.55              |
| 2:2:927:G:H21    | 2:2:1532:U:H5''   | 1.71                     | 0.55              |
| 2:2:946:A:H2'    | 2:2:947:G:H8      | 1.71                     | 0.55              |
| 2:2:1011:C:H2'   | 2:2:1012:A:C8     | 2.41                     | 0.55              |
| 9:D:144:GLU:OE2  | 9:D:166:LYS:NZ    | 2.32                     | 0.55              |
| 52:u:7:ALA:HB1   | 52:u:29:ASN:HA    | 1.87                     | 0.55              |
| 1:1:523:C:H4'    | 1:1:540:C:O2      | 2.07                     | 0.55              |
| 1:1:878:A:H3'    | 1:1:879:G:C8      | 2.40                     | 0.55              |
| 1:1:2543:G:N2    | 1:1:2646:C:H5''   | 2.20                     | 0.55              |
| 1:1:2896:C:H2'   | 1:1:2897:U:C6     | 2.41                     | 0.55              |
| 2:2:270:A:H2'    | 2:2:271:C:C6      | 2.41                     | 0.55              |
| 2:2:987:G:H22    | 2:2:1015:G:H22    | 1.53                     | 0.55              |
| 2:2:1048:G:H2'   | 2:2:1050:G:C8     | 2.40                     | 0.55              |
| 2:2:1391:U:C2'   | 2:2:1392:G:H5'    | 2.36                     | 0.55              |
| 3:4:73:A:H8      | 3:4:103:U:N3      | 1.90                     | 0.55              |
| 22:Q:35:ALA:O    | 22:Q:39:VAL:HG23  | 2.06                     | 0.55              |
| 27:V:30:ILE:HD11 | 27:V:40:ILE:HG23  | 1.88                     | 0.55              |
| 38:g:114:LEU:HB2 | 38:g:144:LEU:HD23 | 1.87                     | 0.55              |
| 52:u:39:PHE:CE2  | 52:u:41:PRO:HD3   | 2.41                     | 0.55              |
| 1:1:95:A:H2'     | 1:1:96:C:O4'      | 2.06                     | 0.55              |
| 1:1:1139:G:H2'   | 1:1:1140:C:C6     | 2.41                     | 0.55              |
| 1:1:1227:G:OP1   | 22:Q:13:ARG:NH1   | 2.40                     | 0.55              |
| 2:2:266:G:OP1    | 2:2:266:G:N2      | 2.39                     | 0.55              |
| 2:2:387:U:O2'    | 2:2:388:G:H5''    | 2.06                     | 0.55              |
| 2:2:513:C:H2'    | 2:2:514:C:H6      | 1.68                     | 0.55              |
| 2:2:1202:U:H3    | 50:s:83:LYS:HE2   | 1.72                     | 0.55              |
| 3:4:85:G:H2'     | 3:4:86:G:H8       | 1.71                     | 0.55              |
| 9:D:161:ALA:HB3  | 9:D:169:VAL:HG23  | 1.87                     | 0.55              |
| 45:n:42:GLU:OE2  | 45:n:45:ARG:NH1   | 2.38                     | 0.55              |
| 1:1:407:G:H2'    | 1:1:408:G:C8      | 2.41                     | 0.55              |
| 1:1:590:A:N6     | 1:1:668:A:N1      | 2.55                     | 0.55              |
| 1:1:1886:U:C2    | 1:1:1887:C:H1'    | 2.42                     | 0.55              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:1:2678:C:O2'    | 8:C:171:THR:O     | 2.19                     | 0.55              |
| 2:2:60:A:OP2      | 2:2:386:C:O2'     | 2.20                     | 0.55              |
| 2:2:511:C:H1'     | 40:i:41:HIS:NE2   | 2.22                     | 0.55              |
| 2:2:635:A:O2'     | 53:v:6:ARG:NH2    | 2.39                     | 0.55              |
| 10:E:60:ILE:HD13  | 10:E:141:ILE:HG12 | 1.88                     | 0.55              |
| 15:J:88:THR:O     | 15:J:92:MET:HB2   | 2.07                     | 0.55              |
| 21:P:13:MET:HA    | 21:P:77:HIS:ND1   | 2.21                     | 0.55              |
| 1:1:535:G:O2'     | 22:Q:53:ARG:NE    | 2.26                     | 0.55              |
| 1:1:573:U:H5''    | 1:1:575:A:N7      | 2.21                     | 0.55              |
| 1:1:1720:U:H2'    | 1:1:1721:G:O4'    | 2.07                     | 0.55              |
| 1:1:2354:C:H4'    | 28:W:25:ARG:HH21  | 1.71                     | 0.55              |
| 1:1:2487:G:C2     | 1:1:2488:G:H1'    | 2.42                     | 0.55              |
| 1:1:2547:A:N7     | 1:1:2566:A:C5     | 2.74                     | 0.55              |
| 1:1:2816:G:O3'    | 19:N:42:LYS:NZ    | 2.39                     | 0.55              |
| 1:1:2823:A:C4     | 1:1:2824:C:C6     | 2.95                     | 0.55              |
| 2:2:2:A:H1'       | 2:2:613:C:O2'     | 2.07                     | 0.55              |
| 2:2:108:G:N2      | 2:2:108:G:OP2     | 2.36                     | 0.55              |
| 15:J:109:LEU:HD13 | 15:J:118:MET:HB2  | 1.87                     | 0.55              |
| 39:h:152:GLU:HG3  | 39:h:167:TRP:HB3  | 1.88                     | 0.55              |
| 39:h:156:ARG:NE   | 39:h:160:ALA:O    | 2.39                     | 0.55              |
| 42:k:19:PRO:HA    | 42:k:22:ILE:HD12  | 1.87                     | 0.55              |
| 47:p:13:ARG:NH2   | 47:p:76:GLU:OE1   | 2.39                     | 0.55              |
| 1:1:20:C:H2'      | 1:1:21:A:C8       | 2.41                     | 0.55              |
| 1:1:245:G:C4      | 1:1:246:C:C5      | 2.94                     | 0.55              |
| 1:1:537:G:O2'     | 1:1:538:A:O4'     | 2.24                     | 0.55              |
| 1:1:672:C:OP1     | 1:1:801:G:N2      | 2.40                     | 0.55              |
| 1:1:915:C:O2      | 3:4:100:G:H4'     | 2.07                     | 0.55              |
| 1:1:2303:G:H2'    | 1:1:2304:G:C8     | 2.41                     | 0.55              |
| 1:1:2333:A:H4'    | 1:1:2334:U:H5''   | 1.89                     | 0.55              |
| 1:1:2359:C:H2'    | 1:1:2360:G:O4'    | 2.07                     | 0.55              |
| 1:1:2802:G:H2'    | 1:1:2803:G:H8     | 1.72                     | 0.55              |
| 2:2:8:A:N7        | 40:i:206:LYS:HD2  | 2.22                     | 0.55              |
| 2:2:936:C:H2'     | 2:2:937:A:C8      | 2.40                     | 0.55              |
| 2:2:1240:U:C4     | 43:l:116:MET:HE2  | 2.42                     | 0.55              |
| 3:4:108:A:OP1     | 3:4:109:A:O2'     | 2.23                     | 0.55              |
| 9:D:112:LEU:HB3   | 9:D:118:LEU:HB2   | 1.89                     | 0.55              |
| 12:G:39:ALA:HB1   | 12:G:44:ILE:HD11  | 1.89                     | 0.55              |
| 15:J:38:GLY:HA2   | 15:J:40:HIS:CD2   | 2.41                     | 0.55              |
| 33:b:54:VAL:HG23  | 33:b:55:ILE:H     | 1.72                     | 0.55              |
| 39:h:8:ASN:O      | 39:h:12:LEU:HD22  | 2.07                     | 0.55              |
| 39:h:23:PHE:HZ    | 46:o:11:LYS:HE2   | 1.70                     | 0.55              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 48:q:100:GLY:H   | 48:q:104:CYS:HB3  | 1.70                     | 0.55              |
| 1:1:553:G:C6     | 1:1:554:U:N3      | 2.75                     | 0.55              |
| 1:1:573:U:O2'    | 1:1:574:A:H3'     | 2.07                     | 0.55              |
| 1:1:1070:A:O2'   | 1:1:1097:U:O3'    | 2.24                     | 0.55              |
| 1:1:1860:G:H2'   | 1:1:1861:G:C8     | 2.42                     | 0.55              |
| 1:1:2343:U:H4'   | 1:1:2373:G:H4'    | 1.89                     | 0.55              |
| 1:1:2885:G:N7    | 33:b:40:ARG:NH1   | 2.43                     | 0.55              |
| 2:2:270:A:H2'    | 2:2:271:C:H6      | 1.72                     | 0.55              |
| 14:I:58:ILE:HD11 | 14:I:66:PHE:HB2   | 1.88                     | 0.55              |
| 56:y:67:ILE:HB   | 56:y:71:LYS:HD3   | 1.88                     | 0.55              |
| 1:1:372:G:O2'    | 29:X:54:LYS:NZ    | 2.39                     | 0.55              |
| 1:1:384:A:OP1    | 1:1:384:A:H8      | 1.90                     | 0.55              |
| 1:1:1094:U:H2'   | 1:1:1095:A:H2'    | 1.89                     | 0.55              |
| 1:1:1866:A:H3'   | 1:1:1867:G:H8     | 1.72                     | 0.55              |
| 1:1:1889:A:H2'   | 1:1:1890:A:C8     | 2.41                     | 0.55              |
| 1:1:2396:G:C2    | 1:1:2397:G:N7     | 2.74                     | 0.55              |
| 1:1:2461:A:H3'   | 1:1:2462:C:H6     | 1.71                     | 0.55              |
| 1:1:2463:C:H2'   | 1:1:2464:G:H8     | 1.72                     | 0.55              |
| 2:2:61:G:H2'     | 2:2:62:U:H6       | 1.72                     | 0.55              |
| 2:2:68:G:O2'     | 2:2:151:A:N6      | 2.40                     | 0.55              |
| 2:2:374:A:H4'    | 2:2:452:A:N6      | 2.21                     | 0.55              |
| 2:2:662:U:H2'    | 2:2:663:A:C8      | 2.42                     | 0.55              |
| 2:2:1108:G:OP1   | 39:h:176:HIS:ND1  | 2.40                     | 0.55              |
| 30:Y:32:ALA:HB2  | 30:Y:37:LEU:HD23  | 1.89                     | 0.55              |
| 52:u:40:ASN:N    | 52:u:49:GLY:O     | 2.39                     | 0.55              |
| 1:1:443:A:H4'    | 1:1:444:C:H5'     | 1.89                     | 0.55              |
| 1:1:516:C:H2'    | 1:1:517:C:C5      | 2.42                     | 0.55              |
| 1:1:1201:U:H2'   | 1:1:1202:G:C8     | 2.41                     | 0.55              |
| 1:1:1443:U:H2'   | 1:1:1444:G:H8     | 1.72                     | 0.55              |
| 1:1:2274:A:H2'   | 1:1:2275:C:H2'    | 1.88                     | 0.55              |
| 1:1:2540:C:H2'   | 1:1:2541:A:C8     | 2.42                     | 0.55              |
| 2:2:17:U:H2'     | 2:2:18:C:C6       | 2.41                     | 0.55              |
| 2:2:146:G:H2'    | 2:2:147:G:C8      | 2.42                     | 0.55              |
| 2:2:511:C:H1'    | 40:i:41:HIS:CE1   | 2.41                     | 0.55              |
| 2:2:662:U:O2'    | 2:2:836:G:OP1     | 2.24                     | 0.55              |
| 2:2:1066:C:H4'   | 2:2:1386:G:H2'    | 1.89                     | 0.55              |
| 2:2:1102:A:H2    | 38:g:103:ASN:HD22 | 1.55                     | 0.55              |
| 3:4:83:G:OP1     | 31:Z:16:ARG:HD2   | 2.07                     | 0.55              |
| 8:C:3:GLY:HA3    | 8:C:204:LYS:HA    | 1.89                     | 0.55              |
| 8:C:114:LYS:HD3  | 8:C:116:LYS:HZ1   | 1.72                     | 0.55              |
| 26:U:48:PRO:HG3  | 26:U:56:GLY:HA3   | 1.88                     | 0.55              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:1:12:U:H3'     | 1:1:13:A:C8       | 2.42                     | 0.55              |
| 1:1:1042:G:O6    | 1:1:1113:U:O4     | 2.24                     | 0.55              |
| 2:2:366:A:O2'    | 2:2:394:G:N2      | 2.40                     | 0.55              |
| 2:2:1462:C:O2'   | 2:2:1463:U:OP1    | 2.23                     | 0.55              |
| 2:2:1463:U:O2'   | 2:2:1464:U:H5'    | 2.06                     | 0.55              |
| 34:c:8:LYS:HA    | 34:c:24:THR:HG22  | 1.89                     | 0.55              |
| 39:h:132:ARG:HD3 | 39:h:136:ARG:HH21 | 1.72                     | 0.55              |
| 40:i:43:ALA:O    | 40:i:45:LYS:NZ    | 2.35                     | 0.55              |
| 45:n:55:VAL:HG21 | 45:n:94:LEU:HD12  | 1.88                     | 0.55              |
| 54:w:13:PHE:HE2  | 54:w:55:LEU:HD12  | 1.71                     | 0.55              |
| 1:1:1447:C:O2'   | 1:1:1544:A:N3     | 2.37                     | 0.54              |
| 1:1:2265:U:H2'   | 1:1:2266:A:C4     | 2.42                     | 0.54              |
| 1:1:2394:C:OP1   | 17:L:63:LYS:N     | 2.24                     | 0.54              |
| 1:1:2543:G:N2    | 1:1:2647:U:OP2    | 2.38                     | 0.54              |
| 9:D:27:LEU:HD11  | 9:D:100:MET:HG2   | 1.89                     | 0.54              |
| 1:1:1128:G:O6    | 1:1:2489:U:O2'    | 2.25                     | 0.54              |
| 2:2:501:C:H2'    | 2:2:502:A:H8      | 1.71                     | 0.54              |
| 3:4:106:G:H2'    | 3:4:107:G:C8      | 2.43                     | 0.54              |
| 24:S:1:MET:HE1   | 24:S:3:THR:OG1    | 2.06                     | 0.54              |
| 34:c:47:VAL:HG22 | 34:c:48:ILE:H     | 1.72                     | 0.54              |
| 43:l:17:LYS:HD3  | 43:l:44:TYR:CE2   | 2.42                     | 0.54              |
| 46:o:67:ILE:HG13 | 50:s:96:LEU:HD12  | 1.89                     | 0.54              |
| 1:1:6:A:H1'      | 15:J:134:ALA:HB3  | 1.89                     | 0.54              |
| 1:1:242:G:H2'    | 36:e:5:LYS:HG2    | 1.89                     | 0.54              |
| 1:1:245:G:OP2    | 1:1:245:G:H8      | 1.91                     | 0.54              |
| 1:1:311:A:N6     | 1:1:329:G:OP1     | 2.36                     | 0.54              |
| 1:1:561:G:H2'    | 1:1:562:U:H5''    | 1.88                     | 0.54              |
| 1:1:832:U:H5''   | 17:L:38:GLN:HB2   | 1.88                     | 0.54              |
| 1:1:2317:A:H2'   | 1:1:2318:G:H8     | 1.71                     | 0.54              |
| 1:1:2345:G:O6    | 1:1:2371:G:O6     | 2.24                     | 0.54              |
| 1:1:2362:C:C4    | 1:1:2363:G:O6     | 2.59                     | 0.54              |
| 1:1:2732:G:H5''  | 1:1:2733:A:C8     | 2.42                     | 0.54              |
| 2:2:145:G:C2     | 2:2:146:G:H1'     | 2.43                     | 0.54              |
| 2:2:1293:C:H2'   | 2:2:1294:G:C8     | 2.41                     | 0.54              |
| 15:J:43:GLU:OE1  | 15:J:43:GLU:N     | 2.37                     | 0.54              |
| 20:O:68:LYS:HA   | 20:O:102:ARG:HG2  | 1.88                     | 0.54              |
| 38:g:66:LYS:HB3  | 38:g:90:PHE:HE2   | 1.72                     | 0.54              |
| 46:o:92:LEU:HB2  | 46:o:96:VAL:HG11  | 1.89                     | 0.54              |
| 1:1:64:A:H2'     | 1:1:65:U:C6       | 2.42                     | 0.54              |
| 1:1:145:C:H2'    | 1:1:146:A:C8      | 2.41                     | 0.54              |
| 1:1:226:A:H2'    | 1:1:227:A:H4'     | 1.89                     | 0.54              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:1:1798:U:OP2    | 7:B:270:ARG:NH2   | 2.41                     | 0.54              |
| 1:1:2565:A:C5     | 1:1:2566:A:C6     | 2.95                     | 0.54              |
| 2:2:376:G:O2'     | 2:2:377:G:H5'     | 2.07                     | 0.54              |
| 2:2:630:A:H2'     | 2:2:631:C:H6      | 1.73                     | 0.54              |
| 2:2:1412:C:H2'    | 2:2:1413:A:H8     | 1.71                     | 0.54              |
| 6:A:175:GLN:NE2   | 6:A:176:GLN:OE1   | 2.41                     | 0.54              |
| 10:E:104:ILE:O    | 32:a:38:SER:OG    | 2.24                     | 0.54              |
| 11:F:145:ALA:HB1  | 11:F:164:TYR:HE1  | 1.73                     | 0.54              |
| 29:X:43:GLU:OE1   | 29:X:45:ARG:NE    | 2.32                     | 0.54              |
| 38:g:32:PHE:N     | 38:g:40:ILE:O     | 2.38                     | 0.54              |
| 39:h:54:ARG:HB3   | 39:h:69:HIS:HB2   | 1.87                     | 0.54              |
| 1:1:227:A:N6      | 1:1:410:G:N2      | 2.19                     | 0.54              |
| 1:1:305:C:N3      | 1:1:313:G:N2      | 2.55                     | 0.54              |
| 1:1:527:C:O2'     | 1:1:528:A:OP2     | 2.25                     | 0.54              |
| 1:1:2264:C:O5'    | 1:1:2264:C:H6     | 1.90                     | 0.54              |
| 2:2:227:G:O2'     | 52:u:63:GLN:OE1   | 2.11                     | 0.54              |
| 2:2:1250:A:N3     | 2:2:1370:G:O2'    | 2.32                     | 0.54              |
| 2:2:1339:A:H3'    | 2:2:1340:A:C8     | 2.42                     | 0.54              |
| 2:2:1346:A:H1'    | 45:n:109:ARG:HH11 | 1.73                     | 0.54              |
| 10:E:135:GLN:HE22 | 10:E:152:LEU:HD23 | 1.73                     | 0.54              |
| 11:F:52:PHE:CZ    | 11:F:72:LEU:HD23  | 2.43                     | 0.54              |
| 15:J:88:THR:O     | 15:J:92:MET:HB3   | 2.06                     | 0.54              |
| 22:Q:44:GLN:CD    | 23:R:77:PHE:HB3   | 2.32                     | 0.54              |
| 28:W:43:THR:O     | 28:W:46:HIS:NE2   | 2.39                     | 0.54              |
| 39:h:40:ARG:HG3   | 39:h:57:ILE:HD12  | 1.89                     | 0.54              |
| 1:1:482:A:H5''    | 26:U:47:LYS:HE2   | 1.89                     | 0.54              |
| 1:1:581:C:H2'     | 1:1:582:A:C8      | 2.43                     | 0.54              |
| 1:1:659:G:N2      | 9:D:30:GLN:OE1    | 2.27                     | 0.54              |
| 1:1:910:A:H2'     | 1:1:911:A:C8      | 2.43                     | 0.54              |
| 1:1:942:G:H5'     | 17:L:34:GLY:HA3   | 1.89                     | 0.54              |
| 1:1:2398:U:H2'    | 1:1:2399:G:C8     | 2.42                     | 0.54              |
| 1:1:2802:G:H2'    | 1:1:2803:G:C8     | 2.41                     | 0.54              |
| 1:1:2820:A:P      | 19:N:4:ARG:H      | 2.30                     | 0.54              |
| 2:2:142:G:O2'     | 2:2:196:A:N1      | 2.30                     | 0.54              |
| 2:2:418:C:H2'     | 2:2:419:C:C6      | 2.42                     | 0.54              |
| 2:2:1098:C:H2'    | 2:2:1099:G:O4'    | 2.07                     | 0.54              |
| 2:2:1178:G:H5''   | 45:n:95:ARG:NH2   | 2.21                     | 0.54              |
| 2:2:1464:U:H2'    | 2:2:1465:A:H8     | 1.71                     | 0.54              |
| 34:c:38:LYS:HB2   | 34:c:49:TYR:CG    | 2.43                     | 0.54              |
| 46:o:39:PRO:HA    | 46:o:74:VAL:HG22  | 1.88                     | 0.54              |
| 1:1:647:G:N2      | 1:1:2351:G:H5'    | 2.21                     | 0.54              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:1:944:C:H5''    | 1:1:945:A:H5''    | 1.89                     | 0.54              |
| 1:1:1225:G:H2'    | 1:1:1226:A:O4'    | 2.07                     | 0.54              |
| 1:1:2675:A:N6     | 1:1:2732:G:N1     | 2.10                     | 0.54              |
| 2:2:227:G:H2'     | 2:2:228:A:C8      | 2.42                     | 0.54              |
| 2:2:929:G:O6      | 2:2:1389:C:N4     | 2.36                     | 0.54              |
| 4:6:2:G:H2'       | 4:6:3:C:H6        | 1.72                     | 0.54              |
| 16:K:70:ARG:HH21  | 16:K:74:GLY:HA2   | 1.72                     | 0.54              |
| 24:S:29:VAL:O     | 24:S:33:LEU:HG    | 2.08                     | 0.54              |
| 39:h:174:PRO:HG2  | 39:h:177:THR:HB   | 1.88                     | 0.54              |
| 44:m:48:ASP:OD1   | 44:m:49:PHE:N     | 2.36                     | 0.54              |
| 1:1:535:G:H2'     | 1:1:536:G:C8      | 2.43                     | 0.54              |
| 1:1:865:C:H1'     | 1:1:867:C:N4      | 2.22                     | 0.54              |
| 1:1:2392:A:H2'    | 1:1:2393:U:H6     | 1.70                     | 0.54              |
| 1:1:2623:G:H3'    | 1:1:2624:G:C8     | 2.40                     | 0.54              |
| 2:2:1101:A:H8     | 38:g:171:ILE:HG23 | 1.73                     | 0.54              |
| 2:2:1303:C:H3'    | 2:2:1304:G:C8     | 2.42                     | 0.54              |
| 31:Z:17:LEU:HG    | 31:Z:19:LYS:H     | 1.72                     | 0.54              |
| 39:h:64:ILE:HG22  | 39:h:99:ALA:HA    | 1.89                     | 0.54              |
| 1:1:2647:U:O2'    | 1:1:2648:G:H5'    | 2.07                     | 0.54              |
| 1:1:2898:U:H2'    | 1:1:2899:A:C8     | 2.43                     | 0.54              |
| 2:2:530:G:H5''    | 2:2:531:U:H5''    | 1.90                     | 0.54              |
| 2:2:674:G:H21     | 47:p:118:HIS:HB2  | 1.72                     | 0.54              |
| 4:6:1:C:H2'       | 4:6:2:G:C8        | 2.43                     | 0.54              |
| 24:S:6:LYS:HD3    | 24:S:8:ARG:HG2    | 1.89                     | 0.54              |
| 1:1:38:A:H1'      | 9:D:43:THR:HB     | 1.89                     | 0.54              |
| 1:1:321:U:OP2     | 9:D:130:LYS:HA    | 2.08                     | 0.54              |
| 1:1:957:C:H42     | 1:1:2494:G:N2     | 2.04                     | 0.54              |
| 1:1:1539:U:H2'    | 1:1:1540:G:H8     | 1.73                     | 0.54              |
| 1:1:2064:C:H2'    | 1:1:2065:C:H6     | 1.71                     | 0.54              |
| 2:2:13:U:H3       | 2:2:915:A:H62     | 1.56                     | 0.54              |
| 2:2:384:G:H2'     | 2:2:385:C:O4'     | 2.08                     | 0.54              |
| 2:2:630:A:H2'     | 2:2:631:C:C6      | 2.42                     | 0.54              |
| 2:2:1532:U:O4     | 2:2:1533:C:N4     | 2.41                     | 0.54              |
| 8:C:15:PHE:CE2    | 21:P:77:HIS:HB2   | 2.43                     | 0.54              |
| 14:I:100:ILE:HG13 | 14:I:137:LEU:HB3  | 1.90                     | 0.54              |
| 40:i:118:VAL:HG22 | 40:i:123:ILE:HG13 | 1.90                     | 0.54              |
| 43:l:51:ALA:HB2   | 43:l:58:GLU:OE2   | 2.08                     | 0.54              |
| 48:q:33:VAL:HG22  | 48:q:79:VAL:HG22  | 1.90                     | 0.54              |
| 1:1:1242:U:H2'    | 1:1:1243:C:C6     | 2.42                     | 0.53              |
| 1:1:2385:C:N3     | 1:1:2386:A:N6     | 2.56                     | 0.53              |
| 1:1:2642:G:H2'    | 1:1:2643:G:H8     | 1.71                     | 0.53              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:2:103:U:OP2    | 56:y:9:LYS:HG3    | 2.08                     | 0.53              |
| 2:2:1071:C:H2'   | 2:2:1072:G:C8     | 2.43                     | 0.53              |
| 2:2:1184:G:H2'   | 2:2:1185:G:H8     | 1.73                     | 0.53              |
| 2:2:1233:G:H5'   | 45:n:119:ARG:HH11 | 1.73                     | 0.53              |
| 11:F:88:GLN:HG2  | 11:F:165:ALA:HA   | 1.89                     | 0.53              |
| 23:R:24:LYS:HA   | 23:R:94:THR:HB    | 1.90                     | 0.53              |
| 45:n:119:ARG:N   | 45:n:123:ARG:O    | 2.40                     | 0.53              |
| 1:1:99:U:O2      | 26:U:7:ARG:NH1    | 2.40                     | 0.53              |
| 1:1:974:G:OP2    | 23:R:78:ARG:HD2   | 2.09                     | 0.53              |
| 1:1:1966:A:N3    | 1:1:2592:G:O2'    | 2.38                     | 0.53              |
| 1:1:2666:C:H42   | 11:F:108:GLY:C    | 2.16                     | 0.53              |
| 2:2:200:G:H2'    | 2:2:201:G:C8      | 2.43                     | 0.53              |
| 2:2:405:U:H3     | 2:2:499:A:H62     | 1.55                     | 0.53              |
| 2:2:1060:U:H4'   | 46:o:53:ILE:HB    | 1.89                     | 0.53              |
| 2:2:1101:A:H5'   | 38:g:171:ILE:HD13 | 1.90                     | 0.53              |
| 2:2:1226:C:H4'   | 55:x:80:TYR:CZ    | 2.43                     | 0.53              |
| 2:2:1342:C:H2'   | 2:2:1343:G:C8     | 2.43                     | 0.53              |
| 8:C:14:ILE:O     | 8:C:21:SER:HA     | 2.08                     | 0.53              |
| 15:J:41:LYS:NZ   | 15:J:50:THR:O     | 2.36                     | 0.53              |
| 15:J:92:MET:SD   | 15:J:99:ARG:HB2   | 2.48                     | 0.53              |
| 40:i:9:LEU:HD11  | 40:i:31:LYS:HE3   | 1.90                     | 0.53              |
| 1:1:668:A:N1     | 1:1:670:A:N6      | 2.56                     | 0.53              |
| 1:1:1954:G:O2'   | 1:1:1956:U:O4     | 2.25                     | 0.53              |
| 1:1:2333:A:OP1   | 28:W:77:ARG:NH1   | 2.41                     | 0.53              |
| 2:2:113:G:H1'    | 2:2:354:G:H5'     | 1.89                     | 0.53              |
| 2:2:356:A:N3     | 2:2:368:U:O2'     | 2.27                     | 0.53              |
| 2:2:1377:A:H61   | 43:l:10:ARG:NE    | 2.00                     | 0.53              |
| 8:C:154:LYS:HZ2  | 8:C:157:LYS:HE2   | 1.73                     | 0.53              |
| 15:J:105:VAL:HA  | 15:J:108:MET:SD   | 2.47                     | 0.53              |
| 17:L:19:LEU:HD23 | 17:L:27:LEU:HB3   | 1.91                     | 0.53              |
| 50:s:56:SER:HB3  | 50:s:59:ARG:HG3   | 1.90                     | 0.53              |
| 1:1:533:G:C8     | 1:1:533:G:H3'     | 2.44                     | 0.53              |
| 1:1:538:A:N6     | 1:1:556:A:C8      | 2.77                     | 0.53              |
| 1:1:861:A:N6     | 1:1:916:G:N2      | 2.03                     | 0.53              |
| 1:1:969:G:O2'    | 31:Z:15:GLY:O     | 2.23                     | 0.53              |
| 1:1:1206:G:H1    | 1:1:1240:U:H3     | 1.56                     | 0.53              |
| 1:1:1417:C:O5'   | 1:1:1587:G:N2     | 2.36                     | 0.53              |
| 1:1:1432:G:H2'   | 1:1:1433:A:C8     | 2.44                     | 0.53              |
| 1:1:2033:A:H2'   | 1:1:2036:C:N4     | 2.24                     | 0.53              |
| 1:1:2453:A:H2    | 1:1:2504:PSU:N3   | 2.05                     | 0.53              |
| 1:1:2824:C:C6    | 1:1:2825:G:C2     | 2.96                     | 0.53              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:2:69:G:H3'     | 2:2:70:U:H6      | 1.73                     | 0.53              |
| 2:2:1077:G:O2'   | 2:2:1079:G:N7    | 2.30                     | 0.53              |
| 6:A:63:LYS:HG2   | 6:A:64:GLU:OE1   | 2.08                     | 0.53              |
| 1:1:810:U:C5     | 17:L:29:LYS:HB2  | 2.44                     | 0.53              |
| 1:1:833:A:H5''   | 17:L:46:VAL:HG21 | 1.89                     | 0.53              |
| 1:1:859:G:N2     | 1:1:917:A:H8     | 2.06                     | 0.53              |
| 1:1:954:G:C8     | 1:1:955:PSU:C6   | 2.97                     | 0.53              |
| 1:1:1029:A:C6    | 1:1:1125:G:N2    | 2.76                     | 0.53              |
| 1:1:1871:A:O2'   | 1:1:1872:A:N7    | 2.41                     | 0.53              |
| 1:1:2786:U:H5'   | 8:C:70:LYS:HD2   | 1.91                     | 0.53              |
| 2:2:224:U:H2'    | 2:2:225:C:C6     | 2.44                     | 0.53              |
| 2:2:555:U:H2'    | 2:2:556:C:C6     | 2.43                     | 0.53              |
| 2:2:937:A:H3'    | 2:2:938:A:H8     | 1.72                     | 0.53              |
| 3:4:42:C:O2'     | 10:E:63:GLN:HB3  | 2.09                     | 0.53              |
| 4:5:56:C:O4'     | 10:E:73:SER:OG   | 2.24                     | 0.53              |
| 15:J:110:PRO:O   | 15:J:115:GLY:HA3 | 2.08                     | 0.53              |
| 38:g:99:GLY:N    | 38:g:175:GLU:OE2 | 2.29                     | 0.53              |
| 51:t:71:LYS:HE2  | 51:t:78:TYR:CZ   | 2.44                     | 0.53              |
| 1:1:24:G:C4      | 1:1:25:U:C5      | 2.97                     | 0.53              |
| 1:1:391:A:C2     | 1:1:392:U:C4     | 2.95                     | 0.53              |
| 1:1:975:A:H2'    | 1:1:976:G:O4'    | 2.07                     | 0.53              |
| 1:1:2316:G:H2'   | 1:1:2317:A:H8    | 1.73                     | 0.53              |
| 1:1:2530:A:OP2   | 1:1:2535:G:N2    | 2.40                     | 0.53              |
| 1:1:2556:C:H5'   | 1:1:2557:G:OP2   | 2.09                     | 0.53              |
| 1:1:2622:U:N3    | 1:1:2623:G:C8    | 2.76                     | 0.53              |
| 2:2:201:G:O6     | 2:2:216:U:O4     | 2.27                     | 0.53              |
| 2:2:967:5MC:H3'  | 2:2:968:A:H8     | 1.74                     | 0.53              |
| 2:2:1187:G:H1'   | 50:s:100:SER:HB2 | 1.90                     | 0.53              |
| 3:4:80:U:H2'     | 3:4:81:G:O4'     | 2.07                     | 0.53              |
| 8:C:22:ILE:HG21  | 8:C:190:LYS:HG3  | 1.90                     | 0.53              |
| 15:J:64:VAL:HG11 | 15:J:72:LYS:HE2  | 1.89                     | 0.53              |
| 46:o:6:ILE:HG13  | 46:o:76:ILE:HB   | 1.90                     | 0.53              |
| 1:1:225:C:O2'    | 1:1:258:G:OP1    | 2.25                     | 0.53              |
| 1:1:536:G:H21    | 15:J:47:HIS:CE1  | 2.26                     | 0.53              |
| 1:1:2339:C:O2'   | 3:4:41:G:N2      | 2.42                     | 0.53              |
| 2:2:379:C:H2'    | 2:2:380:G:C8     | 2.43                     | 0.53              |
| 2:2:744:C:H2'    | 2:2:745:G:H8     | 1.72                     | 0.53              |
| 2:2:836:G:H2'    | 2:2:837:U:O4'    | 2.08                     | 0.53              |
| 6:A:131:VAL:HG22 | 6:A:133:SER:H    | 1.74                     | 0.53              |
| 20:O:82:ALA:HB1  | 20:O:87:ILE:HB   | 1.89                     | 0.53              |
| 22:Q:38:ALA:O    | 22:Q:42:ALA:HB3  | 2.09                     | 0.53              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 47:p:20:VAL:HG22 | 47:p:83:GLU:HB2  | 1.91                     | 0.53              |
| 1:1:548:G:H5'    | 1:1:549:G:C8     | 2.44                     | 0.53              |
| 1:1:1056:G:H4'   | 1:1:1086:A:H8    | 1.74                     | 0.53              |
| 1:1:1211:C:H5''  | 1:1:1212:G:C8    | 2.44                     | 0.53              |
| 1:1:2273:A:H2'   | 1:1:2274:A:C4    | 2.44                     | 0.53              |
| 1:1:2622:U:H2'   | 1:1:2623:G:H5''  | 1.91                     | 0.53              |
| 2:2:551:U:O2'    | 48:q:83:ARG:O    | 2.26                     | 0.53              |
| 2:2:552:U:C2     | 2:2:553:A:N7     | 2.77                     | 0.53              |
| 2:2:875:U:O2'    | 44:m:15:ARG:NH1  | 2.39                     | 0.53              |
| 2:2:988:G:N3     | 2:2:1016:A:H2    | 2.07                     | 0.53              |
| 11:F:26:ILE:HG12 | 11:F:79:VAL:HG21 | 1.91                     | 0.53              |
| 45:n:17:ALA:C    | 45:n:18:ARG:HD3  | 2.34                     | 0.53              |
| 46:o:55:PRO:HA   | 50:s:81:ARG:HH22 | 1.74                     | 0.53              |
| 52:u:39:PHE:HE1  | 52:u:74:LEU:HD21 | 1.73                     | 0.53              |
| 1:1:1045:C:H41   | 1:1:1111:A:H2'   | 1.74                     | 0.53              |
| 1:1:1078:U:O2'   | 1:1:1088:A:OP1   | 2.26                     | 0.53              |
| 1:1:1133:A:H4'   | 1:1:1134:A:H5''  | 1.91                     | 0.53              |
| 1:1:2344:U:P     | 34:c:37:LYS:HB3  | 2.49                     | 0.53              |
| 2:2:325:A:H2'    | 2:2:326:G:O4'    | 2.09                     | 0.53              |
| 2:2:1056:U:O2'   | 39:h:195:VAL:HB  | 2.09                     | 0.53              |
| 2:2:1377:A:N1    | 43:l:10:ARG:NH2  | 2.55                     | 0.53              |
| 7:B:133:ARG:O    | 7:B:167:ARG:NH2  | 2.41                     | 0.53              |
| 31:Z:7:ILE:HB    | 31:Z:36:VAL:HG23 | 1.91                     | 0.53              |
| 41:j:159:LYS:HG2 | 41:j:160:SER:H   | 1.73                     | 0.53              |
| 1:1:1071:G:H22   | 1:1:1090:A:N6    | 2.07                     | 0.53              |
| 1:1:1082:U:H3'   | 1:1:1083:U:H5''  | 1.91                     | 0.53              |
| 1:1:1129:A:H1'   | 1:1:2516:A:H1'   | 1.91                     | 0.53              |
| 1:1:2193:G:H2'   | 1:1:2194:U:C6    | 2.44                     | 0.53              |
| 1:1:2847:U:H2'   | 1:1:2848:G:O4'   | 2.08                     | 0.53              |
| 2:2:59:A:O3'     | 2:2:386:C:O2'    | 2.27                     | 0.53              |
| 10:E:64:LYS:HG2  | 10:E:65:PRO:HD2  | 1.91                     | 0.53              |
| 24:S:77:ASP:O    | 24:S:102:HIS:N   | 2.42                     | 0.53              |
| 37:f:24:ARG:NH1  | 37:f:36:ARG:HH11 | 2.06                     | 0.53              |
| 42:k:11:HIS:CD2  | 42:k:13:ASP:HB2  | 2.44                     | 0.53              |
| 47:p:89:PRO:HG3  | 57:z:32:VAL:HG11 | 1.91                     | 0.53              |
| 49:r:83:LEU:HB3  | 55:x:74:PHE:CE2  | 2.43                     | 0.53              |
| 56:y:71:LYS:HG2  | 56:y:75:HIS:HE1  | 1.74                     | 0.53              |
| 1:1:255:A:OP1    | 1:1:255:A:H4'    | 2.10                     | 0.52              |
| 1:1:475:C:H4'    | 1:1:510:C:H5'    | 1.91                     | 0.52              |
| 1:1:524:G:H5''   | 1:1:539:G:N2     | 2.17                     | 0.52              |
| 1:1:1607:C:N4    | 1:1:1622:G:OP2   | 2.31                     | 0.52              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:1:2386:A:O2'   | 28:W:41:ARG:NH1   | 2.42                     | 0.52              |
| 1:1:2403:C:H2'   | 1:1:2404:U:C6     | 2.44                     | 0.52              |
| 1:1:2640:G:H2'   | 1:1:2641:G:H8     | 1.73                     | 0.52              |
| 1:1:2729:G:H1'   | 8:C:191:GLY:HA3   | 1.90                     | 0.52              |
| 2:2:60:A:H1'     | 2:2:61:G:O4'      | 2.09                     | 0.52              |
| 2:2:1112:C:O2'   | 39:h:179:ARG:HD3  | 2.09                     | 0.52              |
| 2:2:1238:A:N7    | 2:2:1301:U:O2     | 2.42                     | 0.52              |
| 8:C:102:ALA:HB2  | 8:C:180:VAL:HG11  | 1.90                     | 0.52              |
| 8:C:154:LYS:NZ   | 8:C:157:LYS:HE2   | 2.24                     | 0.52              |
| 38:g:17:GLY:HA2  | 38:g:203:ASN:ND2  | 2.25                     | 0.52              |
| 38:g:69:PHE:HD2  | 38:g:91:PHE:HB3   | 1.73                     | 0.52              |
| 39:h:16:LYS:NZ   | 39:h:181:ASP:OD1  | 2.42                     | 0.52              |
| 39:h:108:LYS:HD2 | 39:h:111:LEU:HD12 | 1.90                     | 0.52              |
| 50:s:63:ARG:HB2  | 50:s:68:GLY:HA2   | 1.90                     | 0.52              |
| 52:u:7:ALA:HA    | 52:u:28:ARG:HG2   | 1.92                     | 0.52              |
| 1:1:1007:C:OP2   | 1:1:1008:A:O2'    | 2.23                     | 0.52              |
| 1:1:1129:A:N6    | 1:1:2491:U:O5'    | 2.42                     | 0.52              |
| 1:1:1143:A:C6    | 15:J:27:ARG:HG3   | 2.44                     | 0.52              |
| 1:1:1379:U:O2'   | 1:1:1380:G:OP1    | 2.22                     | 0.52              |
| 1:1:2488:G:C2    | 1:1:2489:U:C4     | 2.97                     | 0.52              |
| 2:2:32:A:N6      | 2:2:553:A:N6      | 2.56                     | 0.52              |
| 2:2:419:C:H2'    | 2:2:420:U:O4'     | 2.08                     | 0.52              |
| 2:2:944:G:N1     | 2:2:1338:G:OP2    | 2.24                     | 0.52              |
| 2:2:953:G:O6     | 49:r:103:LYS:HE2  | 2.10                     | 0.52              |
| 2:2:1172:C:C2    | 2:2:1173:U:C5     | 2.98                     | 0.52              |
| 2:2:1463:U:O5'   | 21:P:109:ARG:NH2  | 2.42                     | 0.52              |
| 4:6:42:C:O2'     | 43:l:140:ASP:OD1  | 2.28                     | 0.52              |
| 9:D:149:ILE:HG12 | 9:D:175:ILE:HG22  | 1.91                     | 0.52              |
| 10:E:30:ARG:H    | 10:E:159:THR:HG1  | 1.57                     | 0.52              |
| 1:1:1200:C:N4    | 1:1:1201:U:O4     | 2.42                     | 0.52              |
| 1:1:2029:G:C4    | 1:1:2031:A:H5''   | 2.43                     | 0.52              |
| 2:2:976:G:C8     | 2:2:1358:U:H2'    | 2.44                     | 0.52              |
| 2:2:1229:A:O2'   | 4:5:30:G:OP1      | 2.19                     | 0.52              |
| 1:1:531:C:OP2    | 1:1:561:G:N1      | 2.36                     | 0.52              |
| 1:1:805:G:H4'    | 17:L:38:GLN:HA    | 1.90                     | 0.52              |
| 1:1:1131:G:N2    | 15:J:77:HIS:HB3   | 2.25                     | 0.52              |
| 1:1:1239:G:H8    | 1:1:1239:G:O5'    | 1.92                     | 0.52              |
| 1:1:2742:G:P     | 37:f:24:ARG:HH12  | 2.33                     | 0.52              |
| 1:1:2820:A:OP1   | 19:N:3:HIS:HA     | 2.09                     | 0.52              |
| 1:1:2857:G:N2    | 1:1:2860:A:OP2    | 2.26                     | 0.52              |
| 2:2:43:C:H2'     | 2:2:44:A:H8       | 1.73                     | 0.52              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 10:E:94:GLU:HA    | 10:E:97:TRP:HD1  | 1.73                     | 0.52              |
| 10:E:103:LEU:HD12 | 10:E:107:ALA:HB3 | 1.91                     | 0.52              |
| 14:I:133:ARG:NE   | 14:I:133:ARG:O   | 2.42                     | 0.52              |
| 20:O:76:LYS:HZ2   | 20:O:109:ALA:HA  | 1.73                     | 0.52              |
| 28:W:27:GLY:H     | 28:W:69:PHE:HE1  | 1.57                     | 0.52              |
| 54:w:11:CYS:HB3   | 54:w:14:THR:HG22 | 1.91                     | 0.52              |
| 1:1:495:G:N2      | 24:S:61:ASN:OD1  | 2.42                     | 0.52              |
| 1:1:1042:G:HO2'   | 1:1:1043:C:H6    | 1.57                     | 0.52              |
| 1:1:2025:C:H2'    | 1:1:2026:U:H6    | 1.73                     | 0.52              |
| 2:2:693:G:H21     | 4:6:36:A:H61     | 1.55                     | 0.52              |
| 2:2:1051:C:H2'    | 2:2:1052:U:C6    | 2.43                     | 0.52              |
| 2:2:1242:G:O2'    | 2:2:1302:C:O2'   | 2.24                     | 0.52              |
| 4:6:4:G:H2'       | 4:6:5:G:C8       | 2.44                     | 0.52              |
| 38:g:32:PHE:HE2   | 38:g:35:ARG:HH12 | 1.57                     | 0.52              |
| 39:h:14:ILE:HG22  | 39:h:15:VAL:HG13 | 1.92                     | 0.52              |
| 1:1:17:G:C5'      | 33:b:10:ARG:HG3  | 2.37                     | 0.52              |
| 1:1:2194:U:H2'    | 1:1:2195:U:H6    | 1.75                     | 0.52              |
| 1:1:2356:U:H3     | 1:1:2361:G:H1    | 0.68                     | 0.52              |
| 1:1:2362:C:H2'    | 1:1:2363:G:C8    | 2.42                     | 0.52              |
| 1:1:2513:A:C4     | 1:1:2514:U:C5    | 2.97                     | 0.52              |
| 2:2:354:G:O2'     | 2:2:389:A:OP2    | 2.26                     | 0.52              |
| 2:2:374:A:H4'     | 2:2:452:A:H61    | 1.74                     | 0.52              |
| 2:2:613:C:H2'     | 2:2:614:C:H6     | 1.73                     | 0.52              |
| 2:2:946:A:H1'     | 2:2:1333:A:H2    | 1.73                     | 0.52              |
| 3:4:74:U:O2       | 27:V:29:ILE:HD13 | 2.09                     | 0.52              |
| 4:5:67:C:H2'      | 4:5:68:C:C6      | 2.44                     | 0.52              |
| 56:y:25:ARG:HA    | 56:y:66:LEU:HD21 | 1.92                     | 0.52              |
| 1:1:647:G:H3'     | 1:1:648:G:C8     | 2.44                     | 0.52              |
| 1:1:827:U:H2'     | 1:1:2430:A:N6    | 2.24                     | 0.52              |
| 1:1:2362:C:OP1    | 36:e:40:ARG:HG3  | 2.09                     | 0.52              |
| 1:1:2516:A:H2'    | 1:1:2517:C:C6    | 2.45                     | 0.52              |
| 2:2:323:U:O2      | 56:y:10:ARG:NH1  | 2.42                     | 0.52              |
| 2:2:393:A:H3'     | 2:2:394:G:C8     | 2.45                     | 0.52              |
| 2:2:736:C:OP1     | 54:w:61:ARG:NH1  | 2.43                     | 0.52              |
| 3:4:14:U:C5       | 3:4:71:C:H1'     | 2.45                     | 0.52              |
| 17:L:61:LEU:HD13  | 36:e:24:HIS:CE1  | 2.45                     | 0.52              |
| 23:R:4:VAL:HG12   | 23:R:39:LEU:HD12 | 1.91                     | 0.52              |
| 1:1:527:C:N4      | 1:1:2777:G:O2'   | 2.34                     | 0.52              |
| 1:1:1145:C:H2'    | 1:1:1146:C:C6    | 2.45                     | 0.52              |
| 1:1:1224:U:H2'    | 1:1:1225:G:N7    | 2.25                     | 0.52              |
| 1:1:1802:A:H2'    | 1:1:1803:A:C8    | 2.45                     | 0.52              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:1:1889:A:H2'    | 1:1:1890:A:H8     | 1.74                     | 0.52              |
| 1:1:2542:A:OP1    | 1:1:2766:A:O2'    | 2.28                     | 0.52              |
| 1:1:2731:G:H4'    | 8:C:208:LYS:NZ    | 2.24                     | 0.52              |
| 1:1:2830:C:H2'    | 8:C:59:ARG:HH21   | 1.75                     | 0.52              |
| 2:2:324:G:N2      | 2:2:326:G:O5'     | 2.43                     | 0.52              |
| 2:2:393:A:H3'     | 2:2:394:G:H8      | 1.74                     | 0.52              |
| 2:2:1068:G:N3     | 2:2:1068:G:H2'    | 2.25                     | 0.52              |
| 2:2:1439:G:H2'    | 2:2:1440:U:O4'    | 2.10                     | 0.52              |
| 11:F:41:VAL:O     | 11:F:55:ARG:NE    | 2.42                     | 0.52              |
| 19:N:99:LYS:HA    | 19:N:111:ALA:HA   | 1.92                     | 0.52              |
| 36:e:45:ARG:O     | 36:e:47:LYS:NZ    | 2.42                     | 0.52              |
| 1:1:865:C:O2      | 1:1:908:C:N4      | 2.43                     | 0.52              |
| 1:1:968:C:H4'     | 31:Z:17:LEU:HD13  | 1.92                     | 0.52              |
| 1:1:2029:G:N7     | 1:1:2031:A:H4'    | 2.25                     | 0.52              |
| 1:1:2300:C:H2'    | 1:1:2301:C:H6     | 1.75                     | 0.52              |
| 2:2:837:U:H2'     | 2:2:838:G:H8      | 1.75                     | 0.52              |
| 2:2:932:C:H4'     | 43:l:4:ARG:CZ     | 2.39                     | 0.52              |
| 10:E:29:PRO:HB3   | 10:E:160:ALA:HA   | 1.91                     | 0.52              |
| 15:J:96:ARG:HB3   | 15:J:99:ARG:HG2   | 1.91                     | 0.52              |
| 19:N:33:ILE:HD11  | 19:N:118:ARG:CZ   | 2.40                     | 0.52              |
| 36:e:58:VAL:HA    | 36:e:61:CYS:HB2   | 1.91                     | 0.52              |
| 39:h:138:VAL:HG22 | 39:h:151:VAL:HG21 | 1.92                     | 0.52              |
| 45:n:5:GLN:OE1    | 45:n:22:LYS:HE3   | 2.09                     | 0.52              |
| 46:o:13:PHE:CD1   | 50:s:95:GLY:HA3   | 2.44                     | 0.52              |
| 52:u:17:TYR:HB2   | 52:u:39:PHE:HD2   | 1.75                     | 0.52              |
| 1:1:9:G:H1'       | 1:1:2800:A:N6     | 2.25                     | 0.52              |
| 1:1:458:G:H1'     | 1:1:469:G:O6      | 2.09                     | 0.52              |
| 1:1:541:A:H2'     | 1:1:542:C:O4'     | 2.10                     | 0.52              |
| 1:1:607:U:OP1     | 9:D:97:ASN:ND2    | 2.41                     | 0.52              |
| 1:1:963:U:H2'     | 1:1:964:C:C5      | 2.44                     | 0.52              |
| 1:1:1128:G:O2'    | 1:1:1129:A:H5''   | 2.10                     | 0.52              |
| 1:1:1649:G:O2'    | 19:N:106:ASP:OD2  | 2.20                     | 0.52              |
| 2:2:135:C:N3      | 52:u:1:MET:HG2    | 2.25                     | 0.52              |
| 2:2:940:C:O2'     | 2:2:1349:A:N3     | 2.43                     | 0.52              |
| 2:2:1236:A:H4'    | 2:2:1304:G:H4'    | 1.92                     | 0.52              |
| 2:2:1268:G:H21    | 2:2:1327:C:H1'    | 1.73                     | 0.52              |
| 3:4:116:G:H2'     | 3:4:117:G:C8      | 2.44                     | 0.52              |
| 14:I:23:VAL:HB    | 14:I:26:ALA:HB3   | 1.91                     | 0.52              |
| 15:J:39:LYS:HE2   | 22:Q:63:ALA:HA    | 1.92                     | 0.52              |
| 26:U:14:LEU:HD21  | 26:U:71:ALA:HB2   | 1.91                     | 0.52              |
| 40:i:13:ARG:HG3   | 40:i:34:ILE:HD12  | 1.92                     | 0.52              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 56:y:14:SER:O    | 56:y:18:ARG:CB   | 2.58                     | 0.52              |
| 1:1:528:A:H2'    | 1:1:2042:A:C2    | 2.44                     | 0.51              |
| 1:1:533:G:H5'    | 22:Q:28:ARG:CZ   | 2.40                     | 0.51              |
| 1:1:582:A:H2'    | 1:1:583:G:H8     | 1.75                     | 0.51              |
| 1:1:1143:A:H61   | 15:J:27:ARG:HG3  | 1.75                     | 0.51              |
| 1:1:1194:A:H2    | 1:1:1225:G:N2    | 2.08                     | 0.51              |
| 1:1:2266:A:N6    | 1:1:2273:A:OP2   | 2.37                     | 0.51              |
| 1:1:2363:G:H2'   | 1:1:2364:C:H5'   | 1.92                     | 0.51              |
| 1:1:2618:G:N2    | 8:C:155:VAL:HG21 | 2.20                     | 0.51              |
| 1:1:2824:C:O5'   | 1:1:2825:G:N2    | 2.43                     | 0.51              |
| 2:2:64:G:H4'     | 2:2:66:A:H5''    | 1.91                     | 0.51              |
| 2:2:928:G:C4     | 2:2:929:G:N7     | 2.78                     | 0.51              |
| 2:2:1090:U:O3'   | 2:2:1171:A:O2'   | 2.28                     | 0.51              |
| 4:6:10:G:H2'     | 4:6:11:A:C8      | 2.44                     | 0.51              |
| 9:D:7:ASP:OD1    | 9:D:8:ALA:N      | 2.43                     | 0.51              |
| 38:g:67:ILE:HD13 | 38:g:160:ALA:HB3 | 1.91                     | 0.51              |
| 1:1:24:G:H2'     | 1:1:25:U:C6      | 2.39                     | 0.51              |
| 1:1:65:U:H2'     | 1:1:66:C:H6      | 1.75                     | 0.51              |
| 1:1:1079:C:H2'   | 1:1:1080:A:C8    | 2.41                     | 0.51              |
| 1:1:2048:G:H21   | 8:C:118:PHE:HE2  | 1.58                     | 0.51              |
| 1:1:2261:C:N4    | 28:W:14:ARG:HG2  | 2.23                     | 0.51              |
| 1:1:2356:U:C2    | 1:1:2357:G:H1'   | 2.46                     | 0.51              |
| 2:2:292:G:N7     | 2:2:293:G:H1'    | 2.25                     | 0.51              |
| 3:4:22:U:O2      | 3:4:61:G:N2      | 2.43                     | 0.51              |
| 4:5:43:A:H2'     | 4:5:44:A:C8      | 2.44                     | 0.51              |
| 17:L:29:LYS:HB3  | 23:R:82:HIS:CE1  | 2.46                     | 0.51              |
| 31:Z:9:GLN:NE2   | 31:Z:11:ARG:O    | 2.37                     | 0.51              |
| 39:h:180:ALA:HA  | 39:h:203:PHE:CE1 | 2.45                     | 0.51              |
| 1:1:86:G:H2'     | 1:1:87:U:C6      | 2.45                     | 0.51              |
| 1:1:1208:C:H2'   | 1:1:1209:U:O4'   | 2.10                     | 0.51              |
| 1:1:2333:A:P     | 28:W:77:ARG:HH22 | 2.33                     | 0.51              |
| 1:1:2557:G:H2'   | 1:1:2558:C:C6    | 2.45                     | 0.51              |
| 2:2:212:G:H2'    | 2:2:213:G:H8     | 1.75                     | 0.51              |
| 2:2:218:U:H2'    | 2:2:219:U:H6     | 1.75                     | 0.51              |
| 2:2:234:C:H2'    | 2:2:235:C:H6     | 1.75                     | 0.51              |
| 2:2:260:G:H5''   | 56:y:71:LYS:NZ   | 2.25                     | 0.51              |
| 2:2:1253:G:OP1   | 46:o:48:ARG:NH1  | 2.44                     | 0.51              |
| 2:2:1391:U:H2'   | 2:2:1392:G:H8    | 1.75                     | 0.51              |
| 6:A:151:SER:O    | 6:A:157:ASN:ND2  | 2.42                     | 0.51              |
| 8:C:27:ILE:HD11  | 8:C:189:VAL:HG22 | 1.91                     | 0.51              |
| 8:C:175:LEU:HD22 | 8:C:191:GLY:HA3  | 1.91                     | 0.51              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 22:Q:103:LYS:O   | 22:Q:107:THR:OG1  | 2.20                     | 0.51              |
| 39:h:15:VAL:HG12 | 39:h:207:ILE:HB   | 1.92                     | 0.51              |
| 44:m:77:ARG:NH1  | 44:m:79:SER:O     | 2.43                     | 0.51              |
| 44:m:92:LEU:HD12 | 44:m:117:ARG:HB3  | 1.92                     | 0.51              |
| 1:1:358:U:H2'    | 1:1:359:G:C8      | 2.45                     | 0.51              |
| 1:1:635:C:H3'    | 1:1:636:G:H8      | 1.75                     | 0.51              |
| 1:1:812:C:H5''   | 1:1:1250:G:O2'    | 2.09                     | 0.51              |
| 1:1:991:C:H2'    | 1:1:992:C:C6      | 2.45                     | 0.51              |
| 1:1:1069:A:O2'   | 1:1:1073:A:N6     | 2.44                     | 0.51              |
| 1:1:2547:A:C8    | 1:1:2566:A:C6     | 2.99                     | 0.51              |
| 1:1:2679:A:H5''  | 8:C:113:SER:HB3   | 1.93                     | 0.51              |
| 1:1:2730:C:O2'   | 8:C:174:SER:HB2   | 2.11                     | 0.51              |
| 2:2:542:G:O2'    | 40:i:14:ARG:NH2   | 2.40                     | 0.51              |
| 2:2:1224:U:N3    | 2:2:1322:C:O4'    | 2.44                     | 0.51              |
| 2:2:1442:G:H2'   | 2:2:1443:C:H6     | 1.74                     | 0.51              |
| 18:M:108:VAL:HB  | 18:M:112:LEU:HD23 | 1.92                     | 0.51              |
| 33:b:13:ARG:HD2  | 33:b:17:ARG:CZ    | 2.41                     | 0.51              |
| 38:g:183:VAL:H   | 38:g:197:ASP:HB2  | 1.75                     | 0.51              |
| 38:g:203:ASN:OD1 | 38:g:204:ASP:N    | 2.44                     | 0.51              |
| 50:s:64:CYS:SG   | 50:s:80:SER:N     | 2.82                     | 0.51              |
| 1:1:322:A:H3'    | 9:D:163:ASN:OD1   | 2.11                     | 0.51              |
| 1:1:562:U:P      | 1:1:2036:C:H4'    | 2.51                     | 0.51              |
| 1:1:1002:G:H8    | 1:1:1002:G:O5'    | 1.94                     | 0.51              |
| 1:1:1213:A:H2'   | 1:1:1214:A:H8     | 1.76                     | 0.51              |
| 1:1:2193:G:H2'   | 1:1:2194:U:H6     | 1.76                     | 0.51              |
| 1:1:2376:A:H1'   | 20:O:111:ARG:HH22 | 1.74                     | 0.51              |
| 2:2:1152:A:OP1   | 46:o:72:ARG:NH2   | 2.43                     | 0.51              |
| 8:C:11:MET:HB3   | 8:C:25:THR:HA     | 1.91                     | 0.51              |
| 8:C:60:VAL:HG13  | 8:C:64:GLU:HB2    | 1.92                     | 0.51              |
| 17:L:63:LYS:HB2  | 36:e:13:ARG:CZ    | 2.40                     | 0.51              |
| 32:a:35:ASP:OD1  | 49:r:57:ARG:NH2   | 2.43                     | 0.51              |
| 40:i:98:LEU:HB2  | 40:i:135:TYR:O    | 2.11                     | 0.51              |
| 50:s:74:LEU:HD12 | 50:s:84:VAL:HG21  | 1.92                     | 0.51              |
| 56:y:2:ALA:HB3   | 56:y:8:LYS:HG3    | 1.92                     | 0.51              |
| 1:1:592:A:H1'    | 36:e:3:LYS:HA     | 1.92                     | 0.51              |
| 1:1:2404:U:C4    | 1:1:2413:G:O6     | 2.64                     | 0.51              |
| 2:2:186:C:N4     | 2:2:187:G:O6      | 2.43                     | 0.51              |
| 2:2:257:G:H2'    | 2:2:258:G:H8      | 1.75                     | 0.51              |
| 2:2:439:U:O2'    | 40:i:119:SER:O    | 2.29                     | 0.51              |
| 2:2:499:A:H1'    | 2:2:500:G:C8      | 2.44                     | 0.51              |
| 2:2:1144:G:H22   | 2:2:1147:C:N4     | 2.08                     | 0.51              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:2:1247:U:C2    | 2:2:1290:G:O6     | 2.64                     | 0.51              |
| 5:7:17:U:H2'     | 5:7:18:G:C8       | 2.45                     | 0.51              |
| 17:L:9:ALA:HB3   | 17:L:12:SER:HB3   | 1.91                     | 0.51              |
| 25:T:69:ARG:HH22 | 25:T:74:ILE:HG23  | 1.76                     | 0.51              |
| 1:1:18:U:O2'     | 1:1:554:U:H5''    | 2.11                     | 0.51              |
| 1:1:538:A:N6     | 1:1:556:A:N7      | 2.58                     | 0.51              |
| 1:1:955:PSU:H3'  | 1:1:956:G:C8      | 2.45                     | 0.51              |
| 1:1:1001:A:H8    | 1:1:1154:G:N2     | 2.09                     | 0.51              |
| 1:1:2101:A:H2'   | 1:1:2102:G:C8     | 2.46                     | 0.51              |
| 1:1:2292:U:H5'   | 1:1:2378:A:H61    | 1.74                     | 0.51              |
| 2:2:511:C:O3'    | 40:i:41:HIS:ND1   | 2.43                     | 0.51              |
| 2:2:1086:U:H2'   | 2:2:1087:G:H8     | 1.76                     | 0.51              |
| 8:C:148:GLN:HB2  | 8:C:151:THR:O     | 2.10                     | 0.51              |
| 29:X:10:LYS:HE3  | 29:X:54:LYS:HD3   | 1.93                     | 0.51              |
| 49:r:11:ASP:HB3  | 49:r:46:SER:HB3   | 1.93                     | 0.51              |
| 1:1:528:A:H2'    | 1:1:2042:A:N1     | 2.26                     | 0.51              |
| 1:1:636:G:C2     | 17:L:111:ILE:HD13 | 2.46                     | 0.51              |
| 1:1:2029:G:C5    | 1:1:2031:A:H5''   | 2.46                     | 0.51              |
| 1:1:2307:G:OP1   | 1:1:2308:G:N1     | 2.44                     | 0.51              |
| 1:1:2341:G:N2    | 1:1:2375:G:OP1    | 2.43                     | 0.51              |
| 2:2:56:U:H2'     | 2:2:57:G:H8       | 1.75                     | 0.51              |
| 2:2:1067:A:OP1   | 2:2:1386:G:N2     | 2.44                     | 0.51              |
| 2:2:1324:A:H2'   | 2:2:1325:C:C6     | 2.45                     | 0.51              |
| 8:C:109:VAL:HG22 | 8:C:203:VAL:HG22  | 1.93                     | 0.51              |
| 9:D:108:ILE:HG21 | 9:D:180:LEU:HB3   | 1.93                     | 0.51              |
| 21:P:32:VAL:HB   | 21:P:39:ARG:HG2   | 1.91                     | 0.51              |
| 38:g:14:VAL:HG13 | 38:g:43:LEU:HG    | 1.93                     | 0.51              |
| 1:1:19:A:H2'     | 1:1:20:C:C5       | 2.46                     | 0.51              |
| 1:1:524:G:H5''   | 1:1:539:G:H1      | 1.75                     | 0.51              |
| 1:1:1152:C:H5'   | 22:Q:80:ILE:HG21  | 1.91                     | 0.51              |
| 1:1:2565:A:C6    | 1:1:2566:A:N1     | 2.78                     | 0.51              |
| 1:1:2623:G:H21   | 33:b:19:HIS:HE1   | 1.59                     | 0.51              |
| 1:1:2776:A:N3    | 1:1:2778:A:O2'    | 2.40                     | 0.51              |
| 1:1:2829:A:H2'   | 1:1:2830:C:C6     | 2.45                     | 0.51              |
| 2:2:417:G:H21    | 2:2:540:G:H4'     | 1.75                     | 0.51              |
| 2:2:448:A:O2'    | 2:2:449:G:OP1     | 2.25                     | 0.51              |
| 2:2:1445:U:O2    | 2:2:1457:G:O6     | 2.29                     | 0.51              |
| 23:R:17:GLY:N    | 23:R:98:ILE:O     | 2.39                     | 0.51              |
| 39:h:154:SER:HA  | 39:h:165:THR:HA   | 1.92                     | 0.51              |
| 45:n:35:LEU:HG   | 45:n:45:ARG:HG2   | 1.92                     | 0.51              |
| 45:n:115:LYS:HD3 | 45:n:118:LEU:HD12 | 1.93                     | 0.51              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:1:568:U:O4     | 23:R:81:LYS:NZ   | 2.44                     | 0.51              |
| 1:1:818:G:H21    | 1:1:1189:A:H62   | 1.59                     | 0.51              |
| 1:1:990:A:H5'    | 1:1:1157:G:H5''  | 1.93                     | 0.51              |
| 1:1:1081:U:H4'   | 14:I:123:ALA:HB1 | 1.92                     | 0.51              |
| 1:1:2488:G:C2    | 1:1:2489:U:O4    | 2.64                     | 0.51              |
| 2:2:1064:G:O3'   | 2:2:1190:G:N2    | 2.44                     | 0.51              |
| 8:C:106:LYS:O    | 8:C:206:ALA:N    | 2.44                     | 0.51              |
| 10:E:43:ALA:HB1  | 10:E:50:LEU:HD12 | 1.93                     | 0.51              |
| 15:J:15:TRP:CD1  | 15:J:53:TYR:HB2  | 2.45                     | 0.51              |
| 21:P:39:ARG:CZ   | 21:P:41:GLN:HB2  | 2.41                     | 0.51              |
| 23:R:23:GLU:HA   | 23:R:93:PHE:HA   | 1.93                     | 0.51              |
| 38:g:68:LEU:HA   | 38:g:90:PHE:O    | 2.11                     | 0.51              |
| 40:i:85:ASN:HB3  | 40:i:88:GLU:OE1  | 2.11                     | 0.51              |
| 40:i:146:ARG:HG2 | 40:i:149:ALA:H   | 1.76                     | 0.51              |
| 40:i:147:GLU:OE1 | 40:i:150:LYS:NZ  | 2.32                     | 0.51              |
| 42:k:21:MET:HB3  | 42:k:24:ARG:NH2  | 2.25                     | 0.51              |
| 1:1:12:U:N3      | 1:1:2626:C:O2'   | 2.44                     | 0.50              |
| 2:2:322:C:N4     | 2:2:329:A:N6     | 2.19                     | 0.50              |
| 2:2:964:A:H5''   | 2:2:1198:G:H5''  | 1.93                     | 0.50              |
| 4:6:59:A:H1'     | 4:6:61:U:H5      | 1.76                     | 0.50              |
| 13:H:36:ASP:O    | 13:H:40:GLU:HG2  | 2.11                     | 0.50              |
| 17:L:96:LYS:HD3  | 17:L:103:ILE:HA  | 1.93                     | 0.50              |
| 36:e:36:LYS:HG2  | 36:e:40:ARG:HD3  | 1.93                     | 0.50              |
| 1:1:65:U:H2'     | 1:1:66:C:C6      | 2.46                     | 0.50              |
| 1:1:80:G:H2'     | 1:1:81:G:H8      | 1.76                     | 0.50              |
| 1:1:155:A:H2'    | 1:1:156:A:C8     | 2.45                     | 0.50              |
| 1:1:305:C:C4     | 1:1:313:G:N2     | 2.80                     | 0.50              |
| 1:1:437:U:H2'    | 1:1:438:G:H8     | 1.76                     | 0.50              |
| 1:1:648:G:H2'    | 1:1:649:G:C8     | 2.47                     | 0.50              |
| 1:1:1005:C:N4    | 1:1:1139:G:H21   | 2.09                     | 0.50              |
| 1:1:2646:C:C4    | 1:1:2647:U:C2    | 3.00                     | 0.50              |
| 2:2:269:C:H2'    | 2:2:270:A:C8     | 2.47                     | 0.50              |
| 2:2:1064:G:OP2   | 2:2:1385:G:O2'   | 2.23                     | 0.50              |
| 31:Z:18:PRO:HA   | 31:Z:21:LYS:HB2  | 1.93                     | 0.50              |
| 38:g:104:TRP:HZ2 | 38:g:154:MET:SD  | 2.34                     | 0.50              |
| 39:h:6:HIS:CE1   | 39:h:8:ASN:HB3   | 2.46                     | 0.50              |
| 48:q:50:ARG:HG3  | 48:q:90:LEU:HD21 | 1.94                     | 0.50              |
| 1:1:308:G:H2'    | 1:1:309:A:C8     | 2.47                     | 0.50              |
| 1:1:528:A:N6     | 1:1:2043:C:OP2   | 2.42                     | 0.50              |
| 1:1:856:G:N1     | 1:1:857:G:O6     | 2.45                     | 0.50              |
| 1:1:1021:A:H4'   | 1:1:1123:C:OP1   | 2.11                     | 0.50              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:1:1248:G:C8    | 22:Q:2:ALA:HB3    | 2.45                     | 0.50              |
| 1:1:1405:U:H2'   | 1:1:1406:U:C6     | 2.46                     | 0.50              |
| 1:1:2279:G:N2    | 1:1:2327:A:N3     | 2.59                     | 0.50              |
| 2:2:148:G:O6     | 2:2:174:A:N1      | 2.45                     | 0.50              |
| 2:2:516:PSU:H4'  | 2:2:517:G:OP1     | 2.11                     | 0.50              |
| 2:2:718:A:H2     | 54:w:38:LYS:HE3   | 1.76                     | 0.50              |
| 2:2:1414:U:H2'   | 2:2:1415:G:H8     | 1.75                     | 0.50              |
| 10:E:5:HIS:HB2   | 10:E:97:TRP:CD1   | 2.45                     | 0.50              |
| 10:E:74:VAL:HG21 | 10:E:77:PHE:HD2   | 1.76                     | 0.50              |
| 10:E:138:PHE:HZ  | 10:E:152:LEU:HD11 | 1.76                     | 0.50              |
| 13:H:94:ARG:NH1  | 13:H:98:GLU:OE2   | 2.36                     | 0.50              |
| 26:U:66:GLN:HB2  | 26:U:69:ASN:HD22  | 1.76                     | 0.50              |
| 45:n:12:ARG:HG3  | 45:n:13:LYS:H     | 1.76                     | 0.50              |
| 1:1:12:U:H1'     | 1:1:2627:G:OP1    | 2.12                     | 0.50              |
| 1:1:16:C:O3'     | 33:b:11:SER:HA    | 2.10                     | 0.50              |
| 1:1:591:U:H2'    | 1:1:592:A:H8      | 1.76                     | 0.50              |
| 1:1:626:A:N6     | 17:L:81:ASP:OD2   | 2.44                     | 0.50              |
| 1:1:882:G:H1     | 1:1:894:U:H3      | 1.58                     | 0.50              |
| 1:1:1590:A:H2'   | 1:1:1591:A:H8     | 1.76                     | 0.50              |
| 1:1:2134:A:C5    | 1:1:2156:G:N2     | 2.79                     | 0.50              |
| 1:1:2266:A:N6    | 1:1:2273:A:N7     | 2.59                     | 0.50              |
| 2:2:401:C:OP1    | 40:i:70:ARG:NH1   | 2.43                     | 0.50              |
| 2:2:1255:G:N1    | 2:2:1283:U:O4     | 2.45                     | 0.50              |
| 2:2:1347:G:H1'   | 2:2:1348:U:H5     | 1.77                     | 0.50              |
| 4:6:2:G:H2'      | 4:6:3:C:C6        | 2.45                     | 0.50              |
| 10:E:60:ILE:HD12 | 10:E:140:GLU:HB2  | 1.94                     | 0.50              |
| 15:J:37:ARG:NE   | 15:J:44:TYR:OH    | 2.39                     | 0.50              |
| 27:V:29:ILE:HA   | 27:V:39:ALA:HA    | 1.94                     | 0.50              |
| 36:e:58:VAL:O    | 36:e:62:LEU:HD23  | 2.11                     | 0.50              |
| 39:h:176:HIS:O   | 39:h:178:LEU:HD22 | 2.12                     | 0.50              |
| 40:i:62:ARG:HH21 | 40:i:68:LEU:HA    | 1.76                     | 0.50              |
| 40:i:67:VAL:HG13 | 40:i:71:GLN:HB3   | 1.94                     | 0.50              |
| 48:q:24:LEU:HB3  | 48:q:27:CYS:O     | 2.10                     | 0.50              |
| 1:1:573:U:H2'    | 1:1:575:A:H8      | 1.76                     | 0.50              |
| 1:1:668:A:N6     | 1:1:670:A:N7      | 2.60                     | 0.50              |
| 1:1:1361:G:H2'   | 1:1:1362:C:C6     | 2.47                     | 0.50              |
| 1:1:2193:G:O2'   | 1:1:2194:U:OP1    | 2.28                     | 0.50              |
| 1:1:2417:C:H5'   | 36:e:45:ARG:CZ    | 2.41                     | 0.50              |
| 1:1:2420:C:N4    | 1:1:2421:G:O6     | 2.44                     | 0.50              |
| 1:1:2753:A:H2'   | 1:1:2754:U:C6     | 2.46                     | 0.50              |
| 1:1:2764:A:C5    | 1:1:2766:A:C6     | 3.00                     | 0.50              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:2:972:C:H5'     | 46:o:59:LYS:HZ2   | 1.77                     | 0.50              |
| 2:2:1216:A:H2'    | 2:2:1217:C:H6     | 1.74                     | 0.50              |
| 17:L:33:ARG:CB    | 17:L:40:SER:HA    | 2.34                     | 0.50              |
| 17:L:64:PHE:CD1   | 36:e:25:LYS:HB2   | 2.46                     | 0.50              |
| 18:M:121:ALA:HB2  | 18:M:128:THR:HG21 | 1.93                     | 0.50              |
| 22:Q:52:GLN:HG3   | 22:Q:55:ARG:NE    | 2.27                     | 0.50              |
| 25:T:56:GLU:HB2   | 25:T:86:THR:HG23  | 1.94                     | 0.50              |
| 37:f:30:GLU:HG3   | 37:f:32:LYS:HB2   | 1.93                     | 0.50              |
| 39:h:20:SER:HB3   | 39:h:22:TRP:CD1   | 2.46                     | 0.50              |
| 39:h:182:ILE:HD13 | 39:h:203:PHE:HB2  | 1.93                     | 0.50              |
| 52:u:10:GLY:HA3   | 52:u:16:PHE:H     | 1.76                     | 0.50              |
| 56:y:24:ARG:HA    | 56:y:27:MET:HG3   | 1.92                     | 0.50              |
| 1:1:628:G:H2'     | 1:1:629:G:H8      | 1.76                     | 0.50              |
| 1:1:2104:C:H41    | 1:1:2186:G:N2     | 2.08                     | 0.50              |
| 1:1:2139:U:H2'    | 1:1:2140:G:H8     | 1.77                     | 0.50              |
| 1:1:2489:U:H4'    | 1:1:2518:A:H62    | 1.76                     | 0.50              |
| 2:2:1452:C:H1'    | 2:2:1453:G:C2     | 2.46                     | 0.50              |
| 3:4:72:G:N2       | 3:4:104:A:H62     | 2.09                     | 0.50              |
| 23:R:14:VAL:HG11  | 23:R:20:VAL:HG22  | 1.92                     | 0.50              |
| 31:Z:51:VAL:O     | 31:Z:55:VAL:HG22  | 2.11                     | 0.50              |
| 39:h:29:PHE:HB3   | 50:s:76:LYS:O     | 2.10                     | 0.50              |
| 49:r:4:ILE:HB     | 49:r:9:ILE:HG13   | 1.94                     | 0.50              |
| 1:1:8:C:H5'       | 15:J:53:TYR:HE2   | 1.77                     | 0.50              |
| 1:1:587:C:C5      | 17:L:19:LEU:HB2   | 2.46                     | 0.50              |
| 1:1:599:A:H2'     | 1:1:600:G:C8      | 2.47                     | 0.50              |
| 1:1:616:A:H4'     | 9:D:101:TYR:CE2   | 2.46                     | 0.50              |
| 1:1:2376:A:H1'    | 20:O:111:ARG:NH2  | 2.27                     | 0.50              |
| 1:1:2528:U:O2     | 1:1:2536:G:C2     | 2.65                     | 0.50              |
| 1:1:2764:A:N7     | 1:1:2766:A:N6     | 2.60                     | 0.50              |
| 3:4:33:G:H2'      | 3:4:34:A:O4'      | 2.11                     | 0.50              |
| 4:5:23:C:H2'      | 4:5:24:U:C6       | 2.47                     | 0.50              |
| 4:6:29:C:H2'      | 4:6:30:G:C8       | 2.46                     | 0.50              |
| 8:C:31:ALA:HB1    | 8:C:95:SER:OG     | 2.12                     | 0.50              |
| 13:H:3:LEU:HD12   | 13:H:5:LEU:H      | 1.77                     | 0.50              |
| 13:H:8:LYS:O      | 13:H:11:ILE:HG22  | 2.11                     | 0.50              |
| 26:U:29:LEU:HD12  | 26:U:33:LYS:HB2   | 1.93                     | 0.50              |
| 38:g:6:MET:HA     | 38:g:9:MET:HE3    | 1.93                     | 0.50              |
| 44:m:103:VAL:HG23 | 44:m:126:ILE:HB   | 1.94                     | 0.50              |
| 50:s:63:ARG:NH2   | 50:s:64:CYS:O     | 2.45                     | 0.50              |
| 1:1:227:A:H5''    | 1:1:2407:A:H4'    | 1.93                     | 0.50              |
| 1:1:582:A:H2'     | 1:1:583:G:C8      | 2.47                     | 0.50              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:1:921:C:C4     | 1:1:922:C:C4     | 3.00                     | 0.50              |
| 1:1:1016:G:H2'   | 1:1:1017:G:O4'   | 2.12                     | 0.50              |
| 1:1:1019:U:H5'   | 1:1:1120:G:N2    | 2.27                     | 0.50              |
| 1:1:1141:U:O2    | 1:1:1142:A:N6    | 2.45                     | 0.50              |
| 1:1:1746:A:H2'   | 1:1:1747:U:C6    | 2.47                     | 0.50              |
| 1:1:2046:G:C2    | 1:1:2047:C:H1'   | 2.46                     | 0.50              |
| 1:1:2270:A:H2'   | 1:1:2271:G:C8    | 2.46                     | 0.50              |
| 1:1:2467:C:HO2'  | 18:M:118:LYS:NZ  | 2.10                     | 0.50              |
| 1:1:2529:G:O6    | 37:f:32:LYS:NZ   | 2.45                     | 0.50              |
| 1:1:2662:A:H3'   | 1:1:2663:G:H8    | 1.77                     | 0.50              |
| 2:2:147:G:H2'    | 2:2:148:G:C8     | 2.46                     | 0.50              |
| 2:2:417:G:N3     | 2:2:540:G:H4'    | 2.26                     | 0.50              |
| 2:2:1251:A:H2'   | 2:2:1252:A:C8    | 2.46                     | 0.50              |
| 20:O:11:ALA:HB2  | 20:O:96:GLY:HA3  | 1.94                     | 0.50              |
| 27:V:75:GLN:HB2  | 27:V:92:VAL:HG13 | 1.92                     | 0.50              |
| 32:a:49:ARG:NH1  | 49:r:68:ASP:OD2  | 2.44                     | 0.50              |
| 39:h:70:THR:HG21 | 39:h:76:VAL:HG21 | 1.94                     | 0.50              |
| 49:r:86:TYR:O    | 49:r:90:ARG:HG2  | 2.12                     | 0.50              |
| 53:v:61:ILE:HA   | 53:v:75:LEU:HA   | 1.94                     | 0.50              |
| 55:x:52:HIS:HB2  | 55:x:57:HIS:CE1  | 2.46                     | 0.50              |
| 1:1:411:G:OP2    | 1:1:2406:A:O2'   | 2.30                     | 0.50              |
| 1:1:557:C:H5'    | 15:J:113:PRO:HG2 | 1.94                     | 0.50              |
| 1:1:857:G:H21    | 1:1:2269:G:H5'   | 1.77                     | 0.50              |
| 1:1:927:A:H1'    | 31:Z:41:THR:HG21 | 1.94                     | 0.50              |
| 1:1:2460:U:H4'   | 6:A:155:LEU:HD11 | 1.94                     | 0.50              |
| 2:2:25:C:H2'     | 2:2:26:A:C8      | 2.47                     | 0.50              |
| 2:2:44:A:N1      | 2:2:399:G:C6     | 2.79                     | 0.50              |
| 2:2:425:G:C2     | 2:2:426:U:C4     | 3.00                     | 0.50              |
| 32:a:51:VAL:O    | 49:r:75:MET:HE1  | 2.12                     | 0.50              |
| 36:e:26:HIS:CD2  | 36:e:47:LYS:HA   | 2.47                     | 0.50              |
| 1:1:527:C:H2'    | 1:1:2779:U:O2    | 2.12                     | 0.49              |
| 1:1:572:A:H2'    | 1:1:573:U:O4'    | 2.12                     | 0.49              |
| 1:1:1005:C:H41   | 1:1:1139:G:H21   | 1.59                     | 0.49              |
| 2:2:414:A:H2'    | 2:2:415:A:O4'    | 2.12                     | 0.49              |
| 2:2:714:G:H2'    | 2:2:715:A:C8     | 2.46                     | 0.49              |
| 2:2:1014:A:O2'   | 2:2:1219:A:H4'   | 2.12                     | 0.49              |
| 2:2:1316:G:H4'   | 50:s:58:SER:OG   | 2.11                     | 0.49              |
| 8:C:109:VAL:O    | 8:C:172:VAL:N    | 2.45                     | 0.49              |
| 10:E:69:LYS:HA   | 10:E:84:PRO:HA   | 1.94                     | 0.49              |
| 13:H:41:LEU:HD12 | 13:H:42:ARG:HE   | 1.77                     | 0.49              |
| 17:L:73:ILE:HD12 | 17:L:106:GLU:H   | 1.77                     | 0.49              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 22:Q:46:ALA:HB1  | 22:Q:50:ARG:NH1   | 2.27                     | 0.49              |
| 31:Z:23:THR:HG21 | 31:Z:51:VAL:HG11  | 1.94                     | 0.49              |
| 38:g:6:MET:HA    | 38:g:9:MET:HG2    | 1.94                     | 0.49              |
| 54:w:30:LYS:HA   | 54:w:33:ILE:HG12  | 1.94                     | 0.49              |
| 1:1:336:C:P      | 26:U:82:ARG:HD2   | 2.52                     | 0.49              |
| 1:1:532:A:H4'    | 1:1:533:G:C8      | 2.47                     | 0.49              |
| 1:1:541:A:O5'    | 1:1:541:A:H8      | 1.95                     | 0.49              |
| 1:1:1281:G:H2'   | 1:1:1282:U:C6     | 2.47                     | 0.49              |
| 1:1:2461:A:C6    | 1:1:2492:U:N3     | 2.80                     | 0.49              |
| 1:1:2831:G:N2    | 33:b:41:HIS:HE2   | 2.10                     | 0.49              |
| 2:2:463:U:H5''   | 2:2:464:U:H5      | 1.76                     | 0.49              |
| 2:2:1186:G:H2'   | 2:2:1187:G:C8     | 2.47                     | 0.49              |
| 3:4:76:G:OP1     | 27:V:27:PRO:HG3   | 2.12                     | 0.49              |
| 9:D:112:LEU:HD13 | 9:D:118:LEU:HD13  | 1.94                     | 0.49              |
| 10:E:73:SER:HB3  | 10:E:81:GLN:HB2   | 1.94                     | 0.49              |
| 11:F:9:VAL:HG21  | 11:F:52:PHE:CE1   | 2.47                     | 0.49              |
| 11:F:9:VAL:HG13  | 11:F:73:ASN:ND2   | 2.26                     | 0.49              |
| 15:J:46:PRO:HD3  | 22:Q:60:LEU:HD13  | 1.93                     | 0.49              |
| 22:Q:36:PHE:O    | 22:Q:40:ILE:HG12  | 2.11                     | 0.49              |
| 24:S:33:LEU:O    | 24:S:37:THR:HG23  | 2.12                     | 0.49              |
| 48:q:54:ARG:NH1  | 48:q:64:THR:OG1   | 2.40                     | 0.49              |
| 49:r:49:SER:OG   | 49:r:52:GLN:OE1   | 2.28                     | 0.49              |
| 1:1:382:A:C5     | 1:1:383:C:C4      | 3.00                     | 0.49              |
| 1:1:536:G:H5'    | 22:Q:53:ARG:NE    | 2.26                     | 0.49              |
| 1:1:981:A:H1'    | 1:1:2027:G:N2     | 2.27                     | 0.49              |
| 1:1:2291:U:O2'   | 1:1:2380:C:O2     | 2.31                     | 0.49              |
| 1:1:2469:A:H1'   | 18:M:55:ARG:NE    | 2.27                     | 0.49              |
| 1:1:2489:U:H4'   | 1:1:2518:A:N7     | 2.27                     | 0.49              |
| 1:1:2515:C:H2'   | 1:1:2516:A:H8     | 1.77                     | 0.49              |
| 1:1:2742:G:P     | 37:f:24:ARG:HH22  | 2.35                     | 0.49              |
| 15:J:56:VAL:O    | 15:J:125:TYR:HB2  | 2.12                     | 0.49              |
| 38:g:179:LEU:HB3 | 38:g:181:ILE:HG13 | 1.93                     | 0.49              |
| 43:l:125:SER:O   | 43:l:129:GLU:HG2  | 2.13                     | 0.49              |
| 1:1:609:A:H62    | 1:1:619:G:H21     | 1.56                     | 0.49              |
| 1:1:819:A:N6     | 1:1:1188:U:H3     | 1.96                     | 0.49              |
| 1:1:915:C:H2'    | 1:1:916:G:O4'     | 2.12                     | 0.49              |
| 1:1:2675:A:N6    | 1:1:2732:G:C6     | 2.73                     | 0.49              |
| 2:2:151:A:N7     | 2:2:170:U:C2      | 2.80                     | 0.49              |
| 2:2:232:G:C6     | 2:2:233:C:N4      | 2.80                     | 0.49              |
| 2:2:449:G:N2     | 2:2:486:U:O2      | 2.45                     | 0.49              |
| 13:H:43:LYS:O    | 13:H:46:ARG:HG3   | 2.11                     | 0.49              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:1:113:U:H5''    | 1:1:114:U:O5'     | 2.13                     | 0.49              |
| 1:1:539:G:H2'     | 1:1:540:C:H5'     | 1.95                     | 0.49              |
| 1:1:1055:G:H2'    | 1:1:1056:G:O4'    | 2.13                     | 0.49              |
| 1:1:1095:A:O2'    | 1:1:1096:A:H8     | 1.95                     | 0.49              |
| 1:1:1212:G:H21    | 1:1:1237:A:H62    | 1.59                     | 0.49              |
| 1:1:2317:A:H2'    | 1:1:2318:G:C8     | 2.47                     | 0.49              |
| 1:1:2675:A:O4'    | 16:K:29:HIS:HB2   | 2.10                     | 0.49              |
| 1:1:2683:C:N4     | 16:K:70:ARG:HD3   | 2.27                     | 0.49              |
| 2:2:193:C:H2'     | 2:2:194:C:H6      | 1.77                     | 0.49              |
| 2:2:200:G:H2'     | 2:2:201:G:H8      | 1.77                     | 0.49              |
| 2:2:232:G:H2'     | 2:2:233:C:C6      | 2.47                     | 0.49              |
| 2:2:673:A:H2'     | 2:2:674:G:H8      | 1.77                     | 0.49              |
| 8:C:4:LEU:HD11    | 8:C:96:ILE:HG22   | 1.94                     | 0.49              |
| 19:N:30:ARG:NH1   | 19:N:74:GLU:OE2   | 2.45                     | 0.49              |
| 23:R:69:GLY:HA2   | 23:R:93:PHE:HE2   | 1.77                     | 0.49              |
| 39:h:114:LYS:HD3  | 39:h:185:ASN:OD1  | 2.13                     | 0.49              |
| 40:i:118:VAL:HG11 | 40:i:133:ALA:HA   | 1.94                     | 0.49              |
| 40:i:168:PRO:HG2  | 40:i:171:LEU:HB2  | 1.95                     | 0.49              |
| 40:i:188:ARG:HH22 | 40:i:195:ILE:H    | 1.61                     | 0.49              |
| 45:n:12:ARG:HG2   | 45:n:74:GLY:HA2   | 1.93                     | 0.49              |
| 1:1:17:G:P        | 1:1:17:G:H8       | 2.34                     | 0.49              |
| 1:1:320:A:H5''    | 1:1:321:U:OP2     | 2.11                     | 0.49              |
| 1:1:480:A:H3'     | 1:1:481:G:H5''    | 1.95                     | 0.49              |
| 1:1:2293:G:OP1    | 20:O:94:ARG:NH2   | 2.45                     | 0.49              |
| 1:1:2622:U:C2     | 1:1:2623:G:H8     | 2.31                     | 0.49              |
| 2:2:1046:A:N6     | 2:2:1047:G:O2'    | 2.45                     | 0.49              |
| 2:2:1125:U:N3     | 2:2:1127:G:N7     | 2.61                     | 0.49              |
| 3:4:13:G:H1'      | 3:4:16:G:H1'      | 1.93                     | 0.49              |
| 8:C:46:ARG:NH2    | 8:C:88:GLU:O      | 2.45                     | 0.49              |
| 8:C:113:SER:OG    | 8:C:166:GLY:HA2   | 2.12                     | 0.49              |
| 10:E:110:ARG:HE   | 10:E:137:ILE:C    | 2.20                     | 0.49              |
| 14:I:78:LEU:HG    | 14:I:108:ILE:HD12 | 1.94                     | 0.49              |
| 45:n:12:ARG:NH1   | 45:n:13:LYS:HG3   | 2.28                     | 0.49              |
| 46:o:66:GLU:CD    | 46:o:68:ARG:HE    | 2.21                     | 0.49              |
| 47:p:94:GLU:HG3   | 57:z:16:LEU:HD21  | 1.94                     | 0.49              |
| 1:1:954:G:OP1     | 18:M:13:HIS:HB3   | 2.13                     | 0.49              |
| 2:2:292:G:H1'     | 2:2:609:A:C2      | 2.48                     | 0.49              |
| 2:2:438:U:H4'     | 2:2:439:U:O2      | 2.13                     | 0.49              |
| 3:4:15:A:O2'      | 3:4:16:G:O4'      | 2.22                     | 0.49              |
| 25:T:39:THR:O     | 25:T:43:ILE:HG12  | 2.13                     | 0.49              |
| 40:i:13:ARG:NH2   | 40:i:38:PRO:HA    | 2.27                     | 0.49              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:1:244:A:P      | 36:e:8:ARG:HH21   | 2.35                     | 0.49              |
| 1:1:2770:G:HO2'  | 1:1:2771:C:P      | 2.35                     | 0.49              |
| 1:1:2799:A:N6    | 1:1:2801:G:O6     | 2.46                     | 0.49              |
| 2:2:108:G:C5'    | 2:2:109:A:H5'     | 2.42                     | 0.49              |
| 2:2:608:A:H3'    | 2:2:609:A:C8      | 2.48                     | 0.49              |
| 2:2:1188:A:C5    | 2:2:1189:U:H1'    | 2.48                     | 0.49              |
| 2:2:1518:MA6:H92 | 2:2:1519:MA6:N6   | 2.27                     | 0.49              |
| 4:6:3:C:H2'      | 4:6:4:G:C8        | 2.47                     | 0.49              |
| 22:Q:32:TYR:O    | 22:Q:36:PHE:N     | 2.45                     | 0.49              |
| 22:Q:51:ARG:HA   | 22:Q:54:LYS:HD2   | 1.94                     | 0.49              |
| 36:e:22:PHE:HZ   | 36:e:59:ILE:HG12  | 1.78                     | 0.49              |
| 54:w:21:ILE:HD12 | 54:w:54:GLN:HB2   | 1.95                     | 0.49              |
| 1:1:249:C:OP2    | 1:1:2394:C:H1'    | 2.13                     | 0.49              |
| 1:1:274:C:H2'    | 1:1:275:C:C2      | 2.47                     | 0.49              |
| 1:1:670:A:OP1    | 17:L:42:SER:OG    | 2.21                     | 0.49              |
| 1:1:865:C:H1'    | 1:1:867:C:H41     | 1.77                     | 0.49              |
| 1:1:1212:G:N2    | 1:1:1237:A:H62    | 2.10                     | 0.49              |
| 1:1:2285:C:OP2   | 34:c:6:ARG:NE     | 2.46                     | 0.49              |
| 2:2:28:A:O2'     | 2:2:296:U:OP1     | 2.29                     | 0.49              |
| 2:2:228:A:H4'    | 52:u:60:TRP:HH2   | 1.78                     | 0.49              |
| 2:2:320:A:H2'    | 2:2:321:A:C8      | 2.48                     | 0.49              |
| 2:2:674:G:H2'    | 2:2:675:A:H8      | 1.78                     | 0.49              |
| 3:4:5:U:OP1      | 3:4:61:G:H1'      | 2.12                     | 0.49              |
| 4:5:4:G:H2'      | 4:5:5:G:C8        | 2.48                     | 0.49              |
| 11:F:85:LYS:HB2  | 11:F:141:ILE:HG13 | 1.95                     | 0.49              |
| 12:G:70:GLU:HB2  | 12:G:134:VAL:HG21 | 1.94                     | 0.49              |
| 15:J:78:THR:HA   | 15:J:85:LYS:HE3   | 1.95                     | 0.49              |
| 39:h:57:ILE:HG12 | 39:h:66:VAL:HG22  | 1.95                     | 0.49              |
| 40:i:98:LEU:HD22 | 40:i:135:TYR:HB3  | 1.94                     | 0.49              |
| 43:l:140:ASP:O   | 43:l:144:MET:HG2  | 2.12                     | 0.49              |
| 50:s:64:CYS:H    | 50:s:69:ARG:N     | 2.09                     | 0.49              |
| 51:t:2:SER:OG    | 51:t:3:LEU:N      | 2.45                     | 0.49              |
| 1:1:647:G:H3'    | 1:1:648:G:H8      | 1.77                     | 0.49              |
| 1:1:1715:G:O2'   | 1:1:1743:G:O6     | 2.24                     | 0.49              |
| 2:2:96:U:H2'     | 2:2:97:G:C8       | 2.46                     | 0.49              |
| 2:2:438:U:H1'    | 2:2:439:U:H3      | 1.78                     | 0.49              |
| 2:2:548:G:H2'    | 2:2:549:C:C6      | 2.48                     | 0.49              |
| 2:2:965:U:H5''   | 2:2:966:2MG:H5'   | 1.94                     | 0.49              |
| 22:Q:51:ARG:O    | 22:Q:54:LYS:HB2   | 2.13                     | 0.49              |
| 39:h:11:ARG:NH2  | 39:h:174:PRO:O    | 2.44                     | 0.49              |
| 40:i:120:HIS:O   | 40:i:146:ARG:NH1  | 2.45                     | 0.49              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 50:s:27:LEU:HD11 | 50:s:47:LYS:HG2   | 1.95                     | 0.49              |
| 57:z:40:LYS:O    | 57:z:44:GLU:HG3   | 2.12                     | 0.49              |
| 1:1:954:G:H2'    | 1:1:955:PSU:O4'   | 2.13                     | 0.48              |
| 1:1:979:A:H61    | 1:1:982:C:H3'     | 1.77                     | 0.48              |
| 1:1:1450:G:N2    | 1:1:1452:G:O6     | 2.40                     | 0.48              |
| 1:1:2728:U:O2'   | 1:1:2729:G:H8     | 1.96                     | 0.48              |
| 2:2:44:A:O3'     | 2:2:307:C:O2'     | 2.31                     | 0.48              |
| 2:2:386:C:C2'    | 2:2:387:U:H5'     | 2.43                     | 0.48              |
| 2:2:950:U:H1'    | 2:2:971:G:N7      | 2.28                     | 0.48              |
| 2:2:1222:G:C8    | 2:2:1322:C:N4     | 2.81                     | 0.48              |
| 3:4:6:G:H1'      | 20:O:36:TYR:HE2   | 1.78                     | 0.48              |
| 3:4:78:A:H8      | 3:4:78:A:P        | 2.36                     | 0.48              |
| 15:J:28:LEU:HD21 | 15:J:101:ILE:HD11 | 1.95                     | 0.48              |
| 15:J:55:ILE:HD13 | 15:J:132:HIS:CG   | 2.48                     | 0.48              |
| 17:L:33:ARG:HD3  | 17:L:40:SER:HA    | 1.95                     | 0.48              |
| 26:U:4:LYS:HE2   | 26:U:83:VAL:O     | 2.12                     | 0.48              |
| 39:h:15:VAL:HG23 | 39:h:16:LYS:HG2   | 1.94                     | 0.48              |
| 40:i:170:TRP:CZ3 | 40:i:190:ASP:HB3  | 2.48                     | 0.48              |
| 43:l:16:PRO:HA   | 45:n:46:MET:SD    | 2.53                     | 0.48              |
| 46:o:28:THR:HA   | 46:o:31:ARG:HE    | 1.78                     | 0.48              |
| 1:1:25:U:H2'     | 1:1:26:G:O4'      | 2.13                     | 0.48              |
| 1:1:414:C:H2'    | 1:1:415:A:C8      | 2.48                     | 0.48              |
| 1:1:516:C:H5''   | 33:b:10:ARG:NH2   | 2.29                     | 0.48              |
| 1:1:538:A:H2'    | 1:1:539:G:C8      | 2.48                     | 0.48              |
| 1:1:2297:A:H62   | 1:1:2318:G:H21    | 1.61                     | 0.48              |
| 1:1:2831:G:H21   | 1:1:2883:A:C2'    | 2.26                     | 0.48              |
| 2:2:377:G:H5''   | 52:u:5:ARG:HH11   | 1.77                     | 0.48              |
| 2:2:437:U:O2     | 2:2:495:A:N7      | 2.46                     | 0.48              |
| 2:2:865:A:H2'    | 2:2:866:C:C6      | 2.48                     | 0.48              |
| 2:2:1239:A:H62   | 2:2:1299:A:H62    | 1.60                     | 0.48              |
| 4:6:3:C:H2'      | 4:6:4:G:H8        | 1.78                     | 0.48              |
| 4:6:53:G:H2'     | 4:6:54:G:H8       | 1.77                     | 0.48              |
| 15:J:78:THR:C    | 15:J:80:HIS:H     | 2.20                     | 0.48              |
| 22:Q:98:ILE:HG21 | 22:Q:109:LEU:HD12 | 1.94                     | 0.48              |
| 25:T:34:VAL:HG11 | 25:T:43:ILE:HD12  | 1.95                     | 0.48              |
| 38:g:106:THR:HA  | 38:g:109:GLN:HG2  | 1.93                     | 0.48              |
| 1:1:86:G:O2'     | 1:1:87:U:H5'      | 2.14                     | 0.48              |
| 1:1:418:C:H2'    | 1:1:419:U:H6      | 1.78                     | 0.48              |
| 1:1:910:A:N7     | 18:M:13:HIS:N     | 2.56                     | 0.48              |
| 1:1:948:C:H1'    | 1:1:984:A:C8      | 2.48                     | 0.48              |
| 1:1:2341:G:N3    | 1:1:2341:G:H2'    | 2.28                     | 0.48              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:1:2547:A:C8    | 1:1:2566:A:C5     | 3.01                     | 0.48              |
| 1:1:2762:C:H2'   | 1:1:2763:G:C8     | 2.47                     | 0.48              |
| 2:2:32:A:H2'     | 2:2:33:A:H8       | 1.75                     | 0.48              |
| 2:2:411:A:C4     | 2:2:431:A:N6      | 2.80                     | 0.48              |
| 2:2:1107:C:H5'   | 39:h:173:VAL:C    | 2.38                     | 0.48              |
| 2:2:1230:C:H2'   | 2:2:1231:G:H8     | 1.76                     | 0.48              |
| 2:2:1316:G:H5'   | 2:2:1360:A:H1'    | 1.94                     | 0.48              |
| 3:4:116:G:C2     | 3:4:117:G:C5      | 3.01                     | 0.48              |
| 6:A:128:VAL:HA   | 6:A:131:VAL:HG12  | 1.95                     | 0.48              |
| 6:A:139:HIS:ND1  | 6:A:141:PRO:HD2   | 2.29                     | 0.48              |
| 8:C:148:GLN:NE2  | 8:C:156:PHE:HZ    | 2.03                     | 0.48              |
| 10:E:138:PHE:CZ  | 10:E:152:LEU:HD11 | 2.46                     | 0.48              |
| 15:J:104:ALA:HB1 | 15:J:108:MET:HE1  | 1.94                     | 0.48              |
| 22:Q:41:LYS:HD2  | 22:Q:45:TYR:CE1   | 2.48                     | 0.48              |
| 39:h:130:PHE:CD2 | 39:h:131:ARG:HG3  | 2.48                     | 0.48              |
| 39:h:152:GLU:HA  | 39:h:167:TRP:HA   | 1.95                     | 0.48              |
| 42:k:29:ILE:HD11 | 42:k:66:ALA:HB2   | 1.94                     | 0.48              |
| 54:w:71:THR:H    | 54:w:74:HIS:CE1   | 2.31                     | 0.48              |
| 1:1:888:C:C5     | 49:r:81:MET:HB3   | 2.49                     | 0.48              |
| 1:1:947:A:H2'    | 1:1:948:C:C6      | 2.48                     | 0.48              |
| 1:1:971:G:O2'    | 1:1:983:A:N3      | 2.38                     | 0.48              |
| 1:1:981:A:N7     | 1:1:982:C:C5      | 2.82                     | 0.48              |
| 1:1:1059:G:O3'   | 14:I:75:ALA:HB3   | 2.13                     | 0.48              |
| 1:1:1443:U:H2'   | 1:1:1444:G:C8     | 2.48                     | 0.48              |
| 1:1:2071:A:H2'   | 1:1:2072:C:C6     | 2.48                     | 0.48              |
| 1:1:2149:U:H2'   | 1:1:2150:C:C6     | 2.48                     | 0.48              |
| 1:1:2451:A:O2'   | 6:A:126:GLN:HB2   | 2.13                     | 0.48              |
| 1:1:2824:C:H2'   | 1:1:2825:G:O4'    | 2.14                     | 0.48              |
| 2:2:373:A:C6     | 2:2:482:A:N6      | 2.81                     | 0.48              |
| 2:2:399:G:H2'    | 2:2:400:C:O4'     | 2.14                     | 0.48              |
| 2:2:962:C:H2'    | 2:2:963:G:O4'     | 2.14                     | 0.48              |
| 9:D:98:LYS:O     | 9:D:102:ARG:HG3   | 2.13                     | 0.48              |
| 32:a:56:ARG:HA   | 32:a:59:ARG:HG2   | 1.94                     | 0.48              |
| 38:g:186:ILE:HA  | 38:g:200:ILE:O    | 2.13                     | 0.48              |
| 56:y:71:LYS:O    | 56:y:75:HIS:ND1   | 2.46                     | 0.48              |
| 1:1:572:A:P      | 1:1:572:A:H8      | 2.36                     | 0.48              |
| 1:1:992:C:H2'    | 1:1:993:G:C8      | 2.47                     | 0.48              |
| 1:1:1667:G:O2'   | 1:1:1991:U:O4     | 2.25                     | 0.48              |
| 1:1:2014:A:H2'   | 1:1:2015:A:C8     | 2.48                     | 0.48              |
| 1:1:2146:C:O2'   | 1:1:2147:A:O5'    | 2.30                     | 0.48              |
| 2:2:260:G:H5''   | 56:y:71:LYS:HZ1   | 1.79                     | 0.48              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:2:1219:A:H2'   | 2:2:1220:G:O4'    | 2.13                     | 0.48              |
| 2:2:1377:A:N6    | 43:l:10:ARG:HE    | 2.02                     | 0.48              |
| 4:6:59:A:H1'     | 4:6:61:U:C5       | 2.48                     | 0.48              |
| 23:R:77:PHE:CD1  | 23:R:84:ARG:HA    | 2.48                     | 0.48              |
| 33:b:16:ARG:O    | 33:b:19:HIS:HB2   | 2.13                     | 0.48              |
| 39:h:110:GLU:HG3 | 39:h:116:VAL:HG21 | 1.94                     | 0.48              |
| 52:u:7:ALA:O     | 52:u:18:GLN:N     | 2.40                     | 0.48              |
| 1:1:562:U:H5'    | 1:1:2036:C:H5''   | 1.96                     | 0.48              |
| 1:1:2007:U:H4'   | 1:1:2824:C:O2'    | 2.12                     | 0.48              |
| 1:1:2162:G:O2'   | 1:1:2163:A:N7     | 2.45                     | 0.48              |
| 1:1:2273:A:H2'   | 1:1:2274:A:C5     | 2.49                     | 0.48              |
| 1:1:2356:U:C5    | 1:1:2357:G:C8     | 3.02                     | 0.48              |
| 1:1:2420:C:H5'   | 34:c:8:LYS:HE2    | 1.96                     | 0.48              |
| 2:2:216:U:H2'    | 2:2:217:C:C6      | 2.48                     | 0.48              |
| 2:2:427:U:C1'    | 2:2:541:G:H5''    | 2.43                     | 0.48              |
| 2:2:950:U:H2'    | 2:2:951:G:C8      | 2.48                     | 0.48              |
| 2:2:1053:G:N7    | 2:2:1200:C:H5''   | 2.29                     | 0.48              |
| 2:2:1179:A:P     | 45:n:95:ARG:HH22  | 2.35                     | 0.48              |
| 3:4:33:G:O6      | 3:4:50:A:N6       | 2.47                     | 0.48              |
| 4:5:68:C:H2'     | 4:5:69:C:C6       | 2.48                     | 0.48              |
| 4:6:44:A:H2'     | 4:6:45:A:C8       | 2.47                     | 0.48              |
| 4:6:64:G:H2'     | 4:6:65:G:H8       | 1.78                     | 0.48              |
| 13:H:44:ALA:HB1  | 13:H:52:MET:HB3   | 1.95                     | 0.48              |
| 15:J:43:GLU:HG3  | 22:Q:100:VAL:HG13 | 1.93                     | 0.48              |
| 27:V:60:VAL:HG22 | 27:V:73:LYS:HD2   | 1.96                     | 0.48              |
| 39:h:23:PHE:CZ   | 46:o:11:LYS:HE2   | 2.48                     | 0.48              |
| 54:w:56:ALA:O    | 54:w:60:LYS:HG3   | 2.13                     | 0.48              |
| 1:1:84:A:N1      | 1:1:98:G:O2'      | 2.47                     | 0.48              |
| 1:1:307:G:H2'    | 1:1:309:A:OP2     | 2.13                     | 0.48              |
| 1:1:507:A:N3     | 1:1:507:A:H2'     | 2.28                     | 0.48              |
| 1:1:517:C:C2     | 1:1:518:G:H1'     | 2.48                     | 0.48              |
| 1:1:627:A:N6     | 17:L:111:ILE:HD12 | 2.29                     | 0.48              |
| 1:1:815:C:H1'    | 1:1:1193:G:N2     | 2.29                     | 0.48              |
| 1:1:1653:G:H4'   | 1:1:2822:G:H22    | 1.79                     | 0.48              |
| 1:1:2371:G:H2'   | 1:1:2372:U:C6     | 2.49                     | 0.48              |
| 1:1:2683:C:H42   | 16:K:70:ARG:HD3   | 1.79                     | 0.48              |
| 1:1:2774:C:H2'   | 1:1:2775:G:O4'    | 2.13                     | 0.48              |
| 2:2:396:C:H2'    | 2:2:397:A:H5''    | 1.95                     | 0.48              |
| 2:2:493:A:H2'    | 2:2:494:G:C8      | 2.49                     | 0.48              |
| 2:2:1315:U:H2'   | 2:2:1316:G:O4'    | 2.13                     | 0.48              |
| 2:2:1332:A:H2'   | 2:2:1333:A:C8     | 2.49                     | 0.48              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 4:5:58:A:O2'     | 4:5:59:A:H5''     | 2.14                     | 0.48              |
| 17:L:33:ARG:HD3  | 17:L:40:SER:C     | 2.39                     | 0.48              |
| 38:g:105:LYS:HA  | 38:g:108:ARG:HH21 | 1.78                     | 0.48              |
| 41:j:74:VAL:HG12 | 41:j:76:LEU:HD12  | 1.96                     | 0.48              |
| 41:j:96:MET:HG2  | 41:j:125:ALA:HA   | 1.96                     | 0.48              |
| 43:l:13:LEU:HD13 | 45:n:50:GLN:HE22  | 1.76                     | 0.48              |
| 49:r:81:MET:HE1  | 49:r:91:HIS:HB2   | 1.94                     | 0.48              |
| 1:1:155:A:H2'    | 1:1:156:A:H8      | 1.78                     | 0.48              |
| 1:1:309:A:H1'    | 1:1:329:G:C6      | 2.48                     | 0.48              |
| 1:1:532:A:N7     | 1:1:2021:C:O2'    | 2.44                     | 0.48              |
| 1:1:817:C:O2     | 1:1:839:U:H4'     | 2.14                     | 0.48              |
| 1:1:862:G:H2'    | 1:1:863:A:O4'     | 2.14                     | 0.48              |
| 1:1:957:C:H5'    | 18:M:75:GLU:HG2   | 1.95                     | 0.48              |
| 1:1:1316:U:H2'   | 1:1:1317:G:H8     | 1.79                     | 0.48              |
| 1:1:2373:G:H2'   | 1:1:2374:C:O4'    | 2.14                     | 0.48              |
| 1:1:2421:G:H2'   | 4:6:77:A:H8       | 1.77                     | 0.48              |
| 1:1:2471:A:H61   | 1:1:2480:C:H1'    | 1.79                     | 0.48              |
| 1:1:2649:C:H2'   | 1:1:2650:U:C6     | 2.47                     | 0.48              |
| 1:1:2764:A:C6    | 1:1:2766:A:C6     | 3.02                     | 0.48              |
| 2:2:3:A:N1       | 2:2:628:G:O2'     | 2.35                     | 0.48              |
| 2:2:299:G:H8     | 2:2:299:G:OP2     | 1.97                     | 0.48              |
| 2:2:452:A:C5     | 2:2:453:G:H1'     | 2.48                     | 0.48              |
| 2:2:1057:G:O2'   | 39:h:188:GLU:HG2  | 2.13                     | 0.48              |
| 2:2:1124:G:H1'   | 2:2:1125:U:H5     | 1.77                     | 0.48              |
| 2:2:1530:G:O6    | 57:z:46:LYS:NZ    | 2.30                     | 0.48              |
| 11:F:72:LEU:HA   | 11:F:75:MET:HG2   | 1.96                     | 0.48              |
| 19:N:114:GLU:OE1 | 33:b:52:ARG:NH2   | 2.46                     | 0.48              |
| 21:P:76:THR:O    | 21:P:76:THR:HG22  | 2.14                     | 0.48              |
| 23:R:77:PHE:HD1  | 23:R:84:ARG:HA    | 1.79                     | 0.48              |
| 48:q:100:GLY:HA2 | 48:q:104:CYS:O    | 2.14                     | 0.48              |
| 1:1:356:G:H2'    | 1:1:357:C:C6      | 2.48                     | 0.48              |
| 1:1:1353:A:H2'   | 1:1:1354:A:C8     | 2.49                     | 0.48              |
| 1:1:1862:G:O6    | 1:1:1880:U:O2     | 2.32                     | 0.48              |
| 1:1:2039:U:H2'   | 1:1:2040:G:N7     | 2.29                     | 0.48              |
| 1:1:2547:A:H2'   | 1:1:2548:U:C6     | 2.48                     | 0.48              |
| 1:1:2637:U:H3'   | 1:1:2638:G:C8     | 2.49                     | 0.48              |
| 2:2:8:A:C8       | 40:i:206:LYS:HA   | 2.49                     | 0.48              |
| 2:2:44:A:C6      | 2:2:45:G:C5       | 3.01                     | 0.48              |
| 2:2:517:G:N2     | 2:2:533:A:OP1     | 2.42                     | 0.48              |
| 2:2:1319:A:H4'   | 2:2:1320:C:C5     | 2.48                     | 0.48              |
| 6:A:42:LEU:HD11  | 6:A:59:GLN:HB2    | 1.95                     | 0.48              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 17:L:40:SER:C    | 17:L:41:ARG:HD3   | 2.39                     | 0.48              |
| 18:M:47:GLU:OE2  | 18:M:50:ARG:NH2   | 2.46                     | 0.48              |
| 22:Q:60:LEU:HG   | 22:Q:64:ARG:HE    | 1.79                     | 0.48              |
| 53:v:57:ASP:OD1  | 53:v:58:VAL:N     | 2.47                     | 0.48              |
| 1:1:9:G:H1'      | 1:1:2800:A:H62    | 1.79                     | 0.48              |
| 1:1:81:G:H2'     | 1:1:82:U:O4'      | 2.14                     | 0.48              |
| 1:1:332:A:O2'    | 1:1:333:G:H5''    | 2.13                     | 0.48              |
| 1:1:926:G:N1     | 1:1:927:A:N6      | 2.61                     | 0.48              |
| 1:1:996:A:H2'    | 1:1:996:A:N3      | 2.29                     | 0.48              |
| 1:1:2192:U:H2'   | 1:1:2193:G:H8     | 1.78                     | 0.48              |
| 1:1:2526:G:H2'   | 1:1:2527:C:C6     | 2.49                     | 0.48              |
| 1:1:2829:A:OP1   | 8:C:55:LYS:NZ     | 2.47                     | 0.48              |
| 2:2:1073:U:OP2   | 41:j:62:LYS:HE2   | 2.14                     | 0.48              |
| 3:4:73:A:H5'     | 3:4:74:U:OP2      | 2.13                     | 0.48              |
| 4:5:10:A:H2'     | 4:5:11:G:C8       | 2.49                     | 0.48              |
| 7:B:144:VAL:HG21 | 7:B:162:VAL:HG11  | 1.95                     | 0.48              |
| 11:F:17:VAL:HG22 | 11:F:26:ILE:HG13  | 1.95                     | 0.48              |
| 12:G:51:ARG:HH22 | 12:G:54:LEU:HD13  | 1.78                     | 0.48              |
| 23:R:77:PHE:CE2  | 23:R:79:ARG:HA    | 2.49                     | 0.48              |
| 39:h:60:PRO:HB3  | 46:o:94:ALA:HA    | 1.94                     | 0.48              |
| 45:n:106:ARG:NH1 | 45:n:107:ASP:O    | 2.47                     | 0.48              |
| 47:p:34:ILE:HG21 | 47:p:74:VAL:HG21  | 1.95                     | 0.48              |
| 48:q:104:CYS:SG  | 48:q:105:SER:N    | 2.87                     | 0.48              |
| 1:1:249:C:O2     | 17:L:63:LYS:NZ    | 2.41                     | 0.47              |
| 1:1:980:A:H8     | 1:1:980:A:OP1     | 1.97                     | 0.47              |
| 1:1:2393:U:H2'   | 1:1:2394:C:O4'    | 2.13                     | 0.47              |
| 2:2:43:C:N4      | 2:2:44:A:N6       | 2.62                     | 0.47              |
| 2:2:297:G:C2     | 2:2:299:G:OP2     | 2.66                     | 0.47              |
| 2:2:397:A:C8     | 2:2:547:A:O2'     | 2.66                     | 0.47              |
| 2:2:405:U:O4     | 40:i:2:ALA:N      | 2.48                     | 0.47              |
| 2:2:537:G:H2'    | 2:2:538:G:C8      | 2.49                     | 0.47              |
| 2:2:997:U:H2'    | 2:2:998:C:C6      | 2.49                     | 0.47              |
| 8:C:3:GLY:O      | 8:C:4:LEU:HG      | 2.14                     | 0.47              |
| 30:Y:34:SER:OG   | 30:Y:35:GLY:N     | 2.47                     | 0.47              |
| 32:a:44:PHE:HD2  | 32:a:45:THR:HG23  | 1.78                     | 0.47              |
| 36:e:24:HIS:O    | 36:e:47:LYS:HB3   | 2.14                     | 0.47              |
| 39:h:183:ASP:N   | 39:h:202:ILE:O    | 2.31                     | 0.47              |
| 40:i:121:LYS:HE3 | 40:i:129:VAL:HG12 | 1.96                     | 0.47              |
| 45:n:55:VAL:O    | 45:n:57:MET:N     | 2.43                     | 0.47              |
| 52:u:40:ASN:OD1  | 52:u:42:ILE:HG12  | 2.14                     | 0.47              |
| 1:1:357:C:H2'    | 1:1:358:U:C6      | 2.49                     | 0.47              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:1:848:C:H2'    | 1:1:849:A:H8      | 1.78                     | 0.47              |
| 1:1:1109:C:H3'   | 1:1:1110:G:H8     | 1.79                     | 0.47              |
| 1:1:2740:A:C6    | 1:1:2764:A:C4     | 3.03                     | 0.47              |
| 1:1:2774:C:C4    | 1:1:2775:G:C4     | 3.01                     | 0.47              |
| 2:2:138:G:H2'    | 2:2:139:A:C8      | 2.49                     | 0.47              |
| 2:2:139:A:H2'    | 2:2:140:U:C6      | 2.49                     | 0.47              |
| 2:2:1046:A:N6    | 2:2:1047:G:HO2'   | 2.11                     | 0.47              |
| 2:2:1148:U:H5'   | 45:n:7:TYR:OH     | 2.14                     | 0.47              |
| 2:2:1157:A:H2    | 2:2:1178:G:N2     | 2.07                     | 0.47              |
| 2:2:1173:U:H2'   | 2:2:1174:G:C8     | 2.49                     | 0.47              |
| 4:6:41:C:O2      | 43:l:144:MET:HE1  | 2.14                     | 0.47              |
| 15:J:96:ARG:NH1  | 15:J:102:GLU:OE1  | 2.47                     | 0.47              |
| 17:L:37:GLY:O    | 17:L:40:SER:OG    | 2.15                     | 0.47              |
| 56:y:71:LYS:HG2  | 56:y:75:HIS:CE1   | 2.49                     | 0.47              |
| 1:1:250:G:OP1    | 36:e:13:ARG:NH2   | 2.47                     | 0.47              |
| 1:1:325:G:H2'    | 1:1:326:G:C8      | 2.49                     | 0.47              |
| 1:1:1022:G:H1    | 1:1:1140:C:H2'    | 1.77                     | 0.47              |
| 1:1:1190:G:OP1   | 17:L:34:GLY:HA2   | 2.15                     | 0.47              |
| 2:2:358:U:H2'    | 2:2:359:G:H8      | 1.79                     | 0.47              |
| 2:2:966:2MG:H4'  | 2:2:969:A:C8      | 2.49                     | 0.47              |
| 2:2:1169:A:H2'   | 2:2:1170:A:C8     | 2.49                     | 0.47              |
| 2:2:1267:C:O2'   | 2:2:1268:G:OP1    | 2.28                     | 0.47              |
| 6:A:18:GLN:HB2   | 6:A:52:THR:HB     | 1.97                     | 0.47              |
| 12:G:53:GLU:O    | 12:G:57:LYS:HG2   | 2.13                     | 0.47              |
| 17:L:95:LEU:HB3  | 17:L:100:ILE:HB   | 1.95                     | 0.47              |
| 22:Q:58:ARG:HA   | 22:Q:61:TRP:CE3   | 2.49                     | 0.47              |
| 38:g:15:HIS:O    | 38:g:40:ILE:HG23  | 2.15                     | 0.47              |
| 38:g:69:PHE:HE2  | 38:g:89:GLN:HB2   | 1.78                     | 0.47              |
| 1:1:381:G:OP1    | 29:X:18:ARG:NH1   | 2.47                     | 0.47              |
| 1:1:645:C:H5''   | 1:1:647:G:C8      | 2.50                     | 0.47              |
| 1:1:861:A:H2     | 3:4:78:A:C2       | 2.31                     | 0.47              |
| 1:1:1130:U:P     | 1:1:2570:G:H21    | 2.37                     | 0.47              |
| 1:1:2540:C:H2'   | 1:1:2541:A:H8     | 1.78                     | 0.47              |
| 1:1:2622:U:C2    | 1:1:2623:G:C8     | 3.02                     | 0.47              |
| 2:2:552:U:O2     | 48:q:28:PRO:HB3   | 2.15                     | 0.47              |
| 3:4:37:C:O2      | 20:O:100:HIS:NE2  | 2.46                     | 0.47              |
| 8:C:168:GLU:HG3  | 8:C:170:VAL:HG23  | 1.96                     | 0.47              |
| 36:e:22:PHE:O    | 36:e:50:VAL:N     | 2.34                     | 0.47              |
| 39:h:22:TRP:HZ2  | 39:h:33:LEU:HD13  | 1.78                     | 0.47              |
| 40:i:65:TYR:CE1  | 40:i:94:LEU:HB3   | 2.50                     | 0.47              |
| 44:m:105:SER:HB2 | 44:m:126:ILE:HD11 | 1.95                     | 0.47              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 1:1:561:G:C2'     | 1:1:562:U:H5''   | 2.44                     | 0.47              |
| 1:1:1590:A:H2'    | 1:1:1591:A:C8    | 2.48                     | 0.47              |
| 1:1:2493:U:H5''   | 6:A:132:ASN:H    | 1.79                     | 0.47              |
| 1:1:2681:C:H5'    | 8:C:8:LYS:NZ     | 2.29                     | 0.47              |
| 1:1:2739:U:O2     | 1:1:2740:A:N7    | 2.48                     | 0.47              |
| 1:1:2771:C:O2'    | 8:C:173:GLN:OE1  | 2.33                     | 0.47              |
| 1:1:2780:G:H4'    | 1:1:2781:A:OP2   | 2.11                     | 0.47              |
| 1:1:2820:A:OP1    | 19:N:4:ARG:N     | 2.35                     | 0.47              |
| 2:2:68:G:C2       | 2:2:151:A:C2     | 2.96                     | 0.47              |
| 2:2:391:G:N2      | 2:2:482:A:C4     | 2.82                     | 0.47              |
| 2:2:546:A:N7      | 40:i:68:LEU:HD21 | 2.30                     | 0.47              |
| 2:2:1162:C:H2'    | 2:2:1163:A:H8    | 1.80                     | 0.47              |
| 10:E:122:PHE:CD2  | 10:E:126:GLY:HA2 | 2.50                     | 0.47              |
| 15:J:48:VAL:HG12  | 15:J:50:THR:HG23 | 1.96                     | 0.47              |
| 21:P:55:LEU:HD12  | 21:P:55:LEU:HA   | 1.74                     | 0.47              |
| 23:R:74:ILE:HG22  | 23:R:76:LYS:HG3  | 1.96                     | 0.47              |
| 26:U:51:ALA:C     | 26:U:52:LEU:HD23 | 2.39                     | 0.47              |
| 47:p:94:GLU:O     | 47:p:98:ARG:HG3  | 2.15                     | 0.47              |
| 1:1:1532:A:N6     | 1:1:1540:G:O6    | 2.47                     | 0.47              |
| 1:1:2683:C:H6     | 8:C:13:ARG:NH2   | 2.12                     | 0.47              |
| 2:2:267:C:C4      | 2:2:268:U:C4     | 3.01                     | 0.47              |
| 2:2:1463:U:C2     | 2:2:1464:U:H5    | 2.33                     | 0.47              |
| 3:4:73:A:H3'      | 3:4:74:U:C6      | 2.50                     | 0.47              |
| 9:D:165:HIS:CD2   | 9:D:166:LYS:HE3  | 2.49                     | 0.47              |
| 11:F:76:VAL:O     | 11:F:80:THR:HG23 | 2.15                     | 0.47              |
| 15:J:14:ASP:O     | 15:J:52:ASP:HB3  | 2.15                     | 0.47              |
| 38:g:161:LEU:HD22 | 38:g:176:ALA:HB2 | 1.97                     | 0.47              |
| 1:1:151:C:H2'     | 1:1:152:A:H8     | 1.80                     | 0.47              |
| 1:1:247:G:H4'     | 1:1:386:G:N1     | 2.29                     | 0.47              |
| 1:1:284:U:O2      | 1:1:356:G:N2     | 2.35                     | 0.47              |
| 1:1:298:G:H21     | 1:1:340:A:H62    | 1.61                     | 0.47              |
| 1:1:609:A:N6      | 1:1:619:G:C2     | 2.77                     | 0.47              |
| 1:1:928:A:H2'     | 1:1:929:U:O4'    | 2.14                     | 0.47              |
| 1:1:955:PSU:O4    | 1:1:962:G:N2     | 2.39                     | 0.47              |
| 1:1:958:U:O2      | 3:4:89:U:O2'     | 2.26                     | 0.47              |
| 1:1:1808:A:H3'    | 1:1:1809:A:C8    | 2.49                     | 0.47              |
| 1:1:2134:A:O2'    | 1:1:2159:G:N2    | 2.43                     | 0.47              |
| 1:1:2300:C:H2'    | 1:1:2301:C:C6    | 2.50                     | 0.47              |
| 1:1:2421:G:C5     | 4:6:77:A:C5      | 3.02                     | 0.47              |
| 1:1:2564:A:N7     | 1:1:2648:G:H5''  | 2.30                     | 0.47              |
| 1:1:2747:G:H2'    | 1:1:2754:U:O4    | 2.14                     | 0.47              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:1:2823:A:C5    | 1:1:2824:C:C4     | 3.03                     | 0.47              |
| 2:2:108:G:H4'    | 2:2:331:G:O6      | 2.15                     | 0.47              |
| 2:2:255:G:H2'    | 2:2:256:U:C6      | 2.50                     | 0.47              |
| 2:2:328:C:H4'    | 2:2:329:A:H5'     | 1.96                     | 0.47              |
| 2:2:510:A:H4'    | 40:i:14:ARG:HH22  | 1.79                     | 0.47              |
| 2:2:941:G:H4'    | 2:2:1350:A:H4'    | 1.96                     | 0.47              |
| 2:2:958:A:N6     | 55:x:55:ARG:HB2   | 2.30                     | 0.47              |
| 2:2:969:A:H2'    | 2:2:970:C:O4'     | 2.14                     | 0.47              |
| 2:2:973:G:H1'    | 46:o:56:HIS:HD2   | 1.79                     | 0.47              |
| 2:2:984:C:H2'    | 2:2:985:C:C6      | 2.50                     | 0.47              |
| 2:2:1066:C:N4    | 2:2:1191:A:C5     | 2.82                     | 0.47              |
| 2:2:1129:C:O2'   | 2:2:1139:G:N7     | 2.46                     | 0.47              |
| 2:2:1287:A:H2    | 2:2:1353:G:H1'    | 1.79                     | 0.47              |
| 2:2:1316:G:O6    | 55:x:7:LYS:NZ     | 2.38                     | 0.47              |
| 3:4:15:A:H5''    | 3:4:108:A:H4'     | 1.97                     | 0.47              |
| 4:5:5:G:H2'      | 4:5:6:G:C8        | 2.49                     | 0.47              |
| 6:A:40:THR:HG22  | 6:A:59:GLN:HB3    | 1.97                     | 0.47              |
| 6:A:139:HIS:CE1  | 6:A:141:PRO:HD2   | 2.49                     | 0.47              |
| 9:D:35:TYR:CE1   | 9:D:176:ASP:HB2   | 2.50                     | 0.47              |
| 10:E:13:VAL:O    | 10:E:17:MET:HG2   | 2.14                     | 0.47              |
| 10:E:94:GLU:OE2  | 32:a:25:ARG:NH1   | 2.47                     | 0.47              |
| 10:E:101:GLU:HA  | 10:E:104:ILE:HG12 | 1.97                     | 0.47              |
| 23:R:78:ARG:NH2  | 23:R:81:LYS:HG3   | 2.25                     | 0.47              |
| 33:b:17:ARG:O    | 33:b:20:ASP:HB2   | 2.14                     | 0.47              |
| 34:c:13:SER:HA   | 34:c:49:TYR:CD1   | 2.50                     | 0.47              |
| 38:g:19:GLN:HG2  | 38:g:38:VAL:HG22  | 1.96                     | 0.47              |
| 38:g:139:ARG:O   | 38:g:142:GLU:HG3  | 2.14                     | 0.47              |
| 42:k:42:TRP:HZ2  | 42:k:61:LEU:HD22  | 1.79                     | 0.47              |
| 45:n:120:LYS:CD  | 45:n:121:ALA:H    | 2.16                     | 0.47              |
| 50:s:54:ASP:HA   | 50:s:59:ARG:HD3   | 1.97                     | 0.47              |
| 51:t:25:THR:HG23 | 51:t:66:LEU:HG    | 1.97                     | 0.47              |
| 1:1:364:C:H2'    | 1:1:365:U:C6      | 2.50                     | 0.47              |
| 1:1:629:G:H1'    | 1:1:639:U:O2'     | 2.14                     | 0.47              |
| 1:1:942:G:H3'    | 1:1:943:A:C8      | 2.48                     | 0.47              |
| 1:1:2029:G:C2'   | 1:1:2030:6MZ:H5'1 | 2.45                     | 0.47              |
| 1:1:2286:G:N2    | 1:1:2344:U:O2     | 2.35                     | 0.47              |
| 1:1:2321:U:H5'   | 1:1:2322:A:OP2    | 2.14                     | 0.47              |
| 2:2:1156:G:O2'   | 2:2:1180:A:N1     | 2.48                     | 0.47              |
| 2:2:1464:U:H2'   | 2:2:1465:A:C8     | 2.49                     | 0.47              |
| 4:6:22:A:O2'     | 4:6:47:G:O6       | 2.30                     | 0.47              |
| 9:D:146:VAL:HG12 | 9:D:167:VAL:HG22  | 1.95                     | 0.47              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 11:F:19:ILE:HG12 | 11:F:24:ILE:HG12  | 1.96                     | 0.47              |
| 19:N:56:LYS:HE3  | 19:N:88:ALA:HA    | 1.97                     | 0.47              |
| 28:W:44:LYS:HB2  | 28:W:44:LYS:HE2   | 1.75                     | 0.47              |
| 45:n:84:THR:HG23 | 45:n:98:LEU:HD13  | 1.96                     | 0.47              |
| 52:u:61:VAL:HG22 | 52:u:67:ILE:HD11  | 1.97                     | 0.47              |
| 1:1:367:G:H2'    | 1:1:367:G:N3      | 2.29                     | 0.47              |
| 1:1:956:G:H4'    | 18:M:82:MET:HE1   | 1.96                     | 0.47              |
| 1:1:1238:G:H2'   | 1:1:1239:G:C8     | 2.50                     | 0.47              |
| 1:1:2243:U:H2'   | 1:1:2244:U:C6     | 2.50                     | 0.47              |
| 2:2:181:A:N6     | 2:2:195:A:OP2     | 2.47                     | 0.47              |
| 2:2:1338:G:O2'   | 4:5:41:C:H4'      | 2.14                     | 0.47              |
| 4:6:28:U:H2'     | 4:6:29:C:C6       | 2.50                     | 0.47              |
| 40:i:97:ARG:O    | 40:i:101:VAL:HG23 | 2.15                     | 0.47              |
| 45:n:85:ARG:HA   | 45:n:88:MET:HE2   | 1.97                     | 0.47              |
| 56:y:14:SER:O    | 56:y:18:ARG:HB2   | 2.14                     | 0.47              |
| 1:1:84:A:OP2     | 1:1:101:A:N6      | 2.45                     | 0.47              |
| 1:1:524:G:O2'    | 1:1:556:A:OP1     | 2.28                     | 0.47              |
| 1:1:814:C:OP1    | 23:R:85:LYS:HE2   | 2.15                     | 0.47              |
| 1:1:1083:U:OP1   | 13:H:53:ARG:NH1   | 2.33                     | 0.47              |
| 1:1:1173:U:H4'   | 1:1:1174:U:H5'    | 1.97                     | 0.47              |
| 1:1:2290:G:H2'   | 1:1:2291:U:H6     | 1.80                     | 0.47              |
| 1:1:2623:G:C3'   | 1:1:2624:G:H8     | 2.24                     | 0.47              |
| 2:2:60:A:N3      | 2:2:61:G:H1'      | 2.30                     | 0.47              |
| 2:2:579:A:H2'    | 2:2:580:C:C6      | 2.49                     | 0.47              |
| 2:2:629:A:H2'    | 2:2:630:A:O4'     | 2.15                     | 0.47              |
| 11:F:72:LEU:HD13 | 11:F:75:MET:HE3   | 1.97                     | 0.47              |
| 24:S:6:LYS:HE2   | 24:S:8:ARG:NH1    | 2.30                     | 0.47              |
| 43:l:68:ASN:O    | 43:l:138:ARG:NH1  | 2.48                     | 0.47              |
| 43:l:150:ALA:HB1 | 47:p:59:THR:OG1   | 2.15                     | 0.47              |
| 49:r:3:ARG:HG3   | 49:r:8:ASN:HA     | 1.97                     | 0.47              |
| 1:1:225:C:H41    | 1:1:419:U:H4'     | 1.80                     | 0.46              |
| 1:1:253:C:OP2    | 36:e:5:LYS:NZ     | 2.47                     | 0.46              |
| 1:1:391:A:H2'    | 1:1:392:U:C5      | 2.50                     | 0.46              |
| 1:1:2470:G:O6    | 1:1:2476:A:O2'    | 2.21                     | 0.46              |
| 1:1:2638:G:N2    | 1:1:2775:G:H2'    | 2.30                     | 0.46              |
| 2:2:130:A:N6     | 2:2:233:C:O2'     | 2.48                     | 0.46              |
| 2:2:197:A:N3     | 2:2:198:G:H1'     | 2.31                     | 0.46              |
| 2:2:227:G:H2'    | 2:2:228:A:H8      | 1.80                     | 0.46              |
| 2:2:298:A:C6     | 2:2:299:G:C2      | 3.02                     | 0.46              |
| 2:2:452:A:N7     | 2:2:453:G:H1'     | 2.31                     | 0.46              |
| 2:2:979:C:N4     | 50:s:58:SER:HB3   | 2.30                     | 0.46              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:2:1118:U:H1'   | 2:2:1179:A:C4     | 2.51                     | 0.46              |
| 2:2:1173:U:C2    | 2:2:1174:G:C8     | 3.03                     | 0.46              |
| 3:4:27:C:H2'     | 3:4:28:C:C5       | 2.50                     | 0.46              |
| 3:4:47:C:H2'     | 3:4:48:U:O4'      | 2.15                     | 0.46              |
| 3:4:96:G:H2'     | 3:4:97:C:H5'      | 1.96                     | 0.46              |
| 4:5:66:C:H2'     | 4:5:67:C:C6       | 2.51                     | 0.46              |
| 15:J:24:THR:HB   | 15:J:27:ARG:HD3   | 1.97                     | 0.46              |
| 15:J:48:VAL:CG1  | 15:J:50:THR:HG23  | 2.45                     | 0.46              |
| 22:Q:80:ILE:HD13 | 22:Q:83:LEU:HD12  | 1.95                     | 0.46              |
| 23:R:71:LYS:N    | 23:R:90:ARG:HH21  | 2.12                     | 0.46              |
| 1:1:304:U:H2'    | 1:1:305:C:H5      | 1.78                     | 0.46              |
| 1:1:536:G:H21    | 15:J:47:HIS:CG    | 2.33                     | 0.46              |
| 1:1:552:U:H2'    | 1:1:553:G:N7      | 2.30                     | 0.46              |
| 1:1:574:A:C6     | 1:1:2033:A:H4'    | 2.50                     | 0.46              |
| 1:1:590:A:C6     | 1:1:668:A:N1      | 2.83                     | 0.46              |
| 1:1:964:C:H3'    | 1:1:965:C:H5''    | 1.96                     | 0.46              |
| 1:1:1189:A:H3'   | 1:1:1190:G:C8     | 2.51                     | 0.46              |
| 1:1:2370:G:N3    | 1:1:2371:G:H1'    | 2.30                     | 0.46              |
| 1:1:2455:G:H2'   | 1:1:2456:C:C6     | 2.51                     | 0.46              |
| 1:1:2474:U:H5''  | 1:1:2475:C:H5     | 1.79                     | 0.46              |
| 1:1:2571:U:C2    | 1:1:2574:G:H1'    | 2.50                     | 0.46              |
| 1:1:2823:A:C5    | 1:1:2824:C:C5     | 3.02                     | 0.46              |
| 2:2:376:G:OP1    | 52:u:70:ARG:HG3   | 2.14                     | 0.46              |
| 2:2:1074:G:H4'   | 38:g:102:THR:HG22 | 1.97                     | 0.46              |
| 2:2:1229:A:H62   | 49:r:104:THR:CG2  | 2.28                     | 0.46              |
| 17:L:77:ILE:HD13 | 17:L:109:LYS:H    | 1.80                     | 0.46              |
| 38:g:78:GLU:HG2  | 38:g:79:ALA:N     | 2.30                     | 0.46              |
| 48:q:4:VAL:O     | 48:q:8:VAL:HG13   | 2.16                     | 0.46              |
| 50:s:88:ALA:HB2  | 50:s:93:ILE:HD12  | 1.97                     | 0.46              |
| 1:1:610:C:H2'    | 1:1:611:C:C6      | 2.51                     | 0.46              |
| 1:1:1029:A:C5    | 1:1:1125:G:N2     | 2.83                     | 0.46              |
| 1:1:2657:A:O3'   | 11:F:92:VAL:HG21  | 2.15                     | 0.46              |
| 1:1:2822:G:C8    | 8:C:117:GLY:HA2   | 2.50                     | 0.46              |
| 2:2:43:C:H2'     | 2:2:44:A:C8       | 2.50                     | 0.46              |
| 2:2:448:A:HO2'   | 2:2:449:G:P       | 2.36                     | 0.46              |
| 2:2:978:A:H61    | 2:2:1316:G:H1'    | 1.80                     | 0.46              |
| 39:h:31:ASP:CG   | 50:s:65:ARG:HH12  | 2.23                     | 0.46              |
| 1:1:272:A:H2'    | 1:1:273:G:C8      | 2.51                     | 0.46              |
| 1:1:622:G:H2'    | 1:1:623:C:C6      | 2.51                     | 0.46              |
| 1:1:910:A:H2'    | 1:1:911:A:N9      | 2.30                     | 0.46              |
| 1:1:967:U:H2'    | 1:1:968:C:C5      | 2.49                     | 0.46              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:1:1019:U:H2'   | 1:1:1020:A:C8     | 2.49                     | 0.46              |
| 1:1:1035:U:O2    | 1:1:1120:G:O6     | 2.32                     | 0.46              |
| 1:1:1190:G:H2'   | 1:1:1191:G:O4'    | 2.15                     | 0.46              |
| 1:1:1796:U:H2'   | 1:1:1797:G:C8     | 2.51                     | 0.46              |
| 1:1:2288:A:O2'   | 1:1:2289:G:H5'    | 2.15                     | 0.46              |
| 1:1:2622:U:H2'   | 1:1:2623:G:C5'    | 2.45                     | 0.46              |
| 1:1:2746:U:H4'   | 11:F:138:LYS:HG2  | 1.97                     | 0.46              |
| 2:2:32:A:C4      | 2:2:33:A:C8       | 3.03                     | 0.46              |
| 2:2:174:A:H8     | 2:2:174:A:OP2     | 1.98                     | 0.46              |
| 2:2:179:A:H2'    | 2:2:180:U:H5'     | 1.98                     | 0.46              |
| 2:2:322:C:C4     | 2:2:329:A:N6      | 2.71                     | 0.46              |
| 2:2:397:A:O2'    | 2:2:398:U:O5'     | 2.25                     | 0.46              |
| 3:4:62:C:H2'     | 3:4:63:C:H6       | 1.81                     | 0.46              |
| 23:R:15:SER:HA   | 23:R:101:ILE:HD11 | 1.98                     | 0.46              |
| 38:g:81:LYS:HD2  | 38:g:93:ASN:ND2   | 2.31                     | 0.46              |
| 40:i:91:LEU:HB3  | 40:i:191:LEU:HD12 | 1.98                     | 0.46              |
| 1:1:72:U:O2      | 30:Y:55:THR:OG1   | 2.34                     | 0.46              |
| 1:1:171:U:H2'    | 1:1:172:A:H8      | 1.80                     | 0.46              |
| 1:1:810:U:O4     | 17:L:29:LYS:HG3   | 2.16                     | 0.46              |
| 1:1:1009:A:H1'   | 22:Q:59:GLN:CD    | 2.40                     | 0.46              |
| 1:1:1853:A:N7    | 1:1:1889:A:N6     | 2.63                     | 0.46              |
| 1:1:2391:G:N1    | 1:1:2424:C:H3'    | 2.27                     | 0.46              |
| 1:1:2417:C:H5'   | 36:e:45:ARG:NE    | 2.31                     | 0.46              |
| 1:1:2574:G:C2    | 1:1:2575:C:O2     | 2.68                     | 0.46              |
| 1:1:2719:G:H5''  | 21:P:53:ARG:HH22  | 1.81                     | 0.46              |
| 1:1:2725:A:O2'   | 1:1:2727:A:N7     | 2.44                     | 0.46              |
| 2:2:471:U:H2'    | 2:2:472:U:C6      | 2.50                     | 0.46              |
| 2:2:553:A:N6     | 2:2:554:A:C5      | 2.84                     | 0.46              |
| 2:2:891:U:H2'    | 2:2:892:A:H8      | 1.81                     | 0.46              |
| 2:2:1200:C:O5'   | 2:2:1201:A:O2'    | 2.34                     | 0.46              |
| 2:2:1252:A:H2'   | 2:2:1253:G:O4'    | 2.15                     | 0.46              |
| 49:r:34:LEU:HD13 | 49:r:41:GLU:HG2   | 1.96                     | 0.46              |
| 49:r:72:GLU:HA   | 49:r:75:MET:HG2   | 1.97                     | 0.46              |
| 55:x:11:ILE:HA   | 55:x:38:SER:HB3   | 1.97                     | 0.46              |
| 1:1:13:A:H8      | 1:1:13:A:OP2      | 1.99                     | 0.46              |
| 1:1:44:A:H2'     | 1:1:45:G:O4'      | 2.16                     | 0.46              |
| 1:1:107:G:H4'    | 1:1:293:U:O2'     | 2.16                     | 0.46              |
| 1:1:321:U:C2     | 9:D:159:LEU:HD13  | 2.50                     | 0.46              |
| 1:1:536:G:H5''   | 1:1:995:C:N4      | 2.31                     | 0.46              |
| 1:1:955:PSU:H3'  | 1:1:956:G:H8      | 1.81                     | 0.46              |
| 1:1:2391:G:O2'   | 1:1:2392:A:OP2    | 2.29                     | 0.46              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:1:2395:C:H41   | 36:e:30:ARG:HG2   | 1.79                     | 0.46              |
| 2:2:136:C:H2'    | 2:2:137:U:C6      | 2.51                     | 0.46              |
| 2:2:321:A:N6     | 2:2:329:A:C8      | 2.84                     | 0.46              |
| 2:2:393:A:H2'    | 2:2:393:A:N3      | 2.30                     | 0.46              |
| 2:2:1102:A:H2'   | 2:2:1103:C:H6     | 1.81                     | 0.46              |
| 2:2:1179:A:H2'   | 2:2:1180:A:C8     | 2.51                     | 0.46              |
| 2:2:1303:C:C2'   | 2:2:1304:G:H5'    | 2.45                     | 0.46              |
| 2:2:1349:A:H5''  | 45:n:123:ARG:HB2  | 1.98                     | 0.46              |
| 3:4:57:A:O4'     | 10:E:27:GLN:HG3   | 2.15                     | 0.46              |
| 7:B:145:GLU:HG2  | 7:B:151:GLY:C     | 2.41                     | 0.46              |
| 22:Q:52:GLN:O    | 22:Q:56:GLN:HG3   | 2.16                     | 0.46              |
| 27:V:46:LYS:O    | 27:V:50:MET:HG3   | 2.15                     | 0.46              |
| 38:g:81:LYS:HB2  | 38:g:93:ASN:ND2   | 2.31                     | 0.46              |
| 49:r:23:TYR:CD2  | 49:r:69:LEU:HD23  | 2.50                     | 0.46              |
| 55:x:32:ARG:HA   | 55:x:50:ALA:HB3   | 1.98                     | 0.46              |
| 1:1:331:C:N4     | 1:1:1210:G:H22    | 2.14                     | 0.46              |
| 1:1:347:A:H2'    | 1:1:348:A:C8      | 2.50                     | 0.46              |
| 1:1:443:A:H5'    | 1:1:1201:U:C4'    | 2.43                     | 0.46              |
| 1:1:529:A:OP1    | 15:J:113:PRO:HD3  | 2.15                     | 0.46              |
| 1:1:536:G:H2'    | 1:1:537:G:H5'     | 1.98                     | 0.46              |
| 1:1:654:A:N1     | 36:e:19:LYS:NZ    | 2.55                     | 0.46              |
| 1:1:1161:C:O2'   | 23:R:23:GLU:HB2   | 2.16                     | 0.46              |
| 1:1:2151:U:H2'   | 1:1:2152:G:H8     | 1.80                     | 0.46              |
| 1:1:2331:G:H2'   | 1:1:2332:C:O4'    | 2.15                     | 0.46              |
| 1:1:2362:C:C2    | 1:1:2363:G:N7     | 2.84                     | 0.46              |
| 1:1:2772:C:H2'   | 1:1:2773:C:C6     | 2.51                     | 0.46              |
| 1:1:2846:G:H5''  | 21:P:53:ARG:HH12  | 1.81                     | 0.46              |
| 1:1:2888:C:C2    | 1:1:2889:C:C5     | 3.04                     | 0.46              |
| 2:2:888:G:OP2    | 2:2:889:A:H3'     | 2.15                     | 0.46              |
| 3:4:29:A:P       | 20:O:32:PRO:HD2   | 2.56                     | 0.46              |
| 8:C:91:THR:OG1   | 8:C:94:GLN:HG3    | 2.15                     | 0.46              |
| 18:M:16:ARG:CG   | 18:M:18:ARG:HG2   | 2.45                     | 0.46              |
| 20:O:64:TYR:CD2  | 20:O:67:ASN:HB3   | 2.51                     | 0.46              |
| 23:R:71:LYS:O    | 23:R:73:LYS:HE3   | 2.15                     | 0.46              |
| 25:T:4:GLU:OE2   | 25:T:49:LYS:NZ    | 2.48                     | 0.46              |
| 26:U:86:ARG:HB3  | 26:U:95:PHE:HE2   | 1.80                     | 0.46              |
| 36:e:13:ARG:O    | 36:e:15:LYS:N     | 2.48                     | 0.46              |
| 41:j:88:VAL:HG23 | 41:j:92:SER:C     | 2.41                     | 0.46              |
| 53:v:9:GLN:OE1   | 53:v:9:GLN:N      | 2.49                     | 0.46              |
| 1:1:636:G:N7     | 17:L:128:THR:HG21 | 2.31                     | 0.46              |
| 1:1:992:C:H2'    | 1:1:993:G:H8      | 1.81                     | 0.46              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:1:1459:G:C5    | 1:1:1461:C:C4    | 3.04                     | 0.46              |
| 1:1:1539:U:H2'   | 1:1:1540:G:C8    | 2.49                     | 0.46              |
| 1:1:2571:U:N3    | 1:1:2574:G:H1'   | 2.31                     | 0.46              |
| 1:1:2738:A:H2'   | 1:1:2739:U:O4'   | 2.16                     | 0.46              |
| 2:2:415:A:H2'    | 2:2:416:G:O4'    | 2.16                     | 0.46              |
| 2:2:428:G:H4'    | 2:2:429:U:O5'    | 2.15                     | 0.46              |
| 2:2:652:U:O4     | 2:2:752:G:O2'    | 2.32                     | 0.46              |
| 2:2:904:U:H2'    | 2:2:905:U:C6     | 2.50                     | 0.46              |
| 2:2:1056:U:H2'   | 2:2:1057:G:H8    | 1.81                     | 0.46              |
| 2:2:1074:G:N1    | 2:2:1075:U:C4    | 2.84                     | 0.46              |
| 2:2:1240:U:O4    | 43:l:109:ARG:NH2 | 2.37                     | 0.46              |
| 24:S:67:ASP:OD1  | 24:S:68:ASP:N    | 2.48                     | 0.46              |
| 44:m:78:VAL:HG12 | 44:m:85:ILE:HD11 | 1.98                     | 0.46              |
| 48:q:29:GLN:HG3  | 48:q:82:ILE:O    | 2.15                     | 0.46              |
| 1:1:414:C:H1'    | 1:1:1864:U:O2'   | 2.15                     | 0.46              |
| 1:1:479:A:H1'    | 1:1:480:A:H5''   | 1.97                     | 0.46              |
| 1:1:1081:U:H2'   | 1:1:1082:U:C6    | 2.51                     | 0.46              |
| 1:1:1084:A:H62   | 13:H:56:ARG:NH2  | 2.14                     | 0.46              |
| 1:1:1239:G:H8    | 1:1:1239:G:P     | 2.38                     | 0.46              |
| 1:1:1790:C:H2'   | 1:1:1791:A:C8    | 2.50                     | 0.46              |
| 1:1:2342:C:H2'   | 1:1:2343:U:O4'   | 2.15                     | 0.46              |
| 2:2:68:G:H5'     | 2:2:69:G:OP2     | 2.15                     | 0.46              |
| 2:2:195:A:H5''   | 56:y:60:ARG:HG3  | 1.98                     | 0.46              |
| 2:2:386:C:H2'    | 2:2:387:U:H5'    | 1.98                     | 0.46              |
| 2:2:973:G:H2'    | 2:2:974:A:N7     | 2.31                     | 0.46              |
| 3:4:75:G:H22     | 27:V:78:GLN:CD   | 2.24                     | 0.46              |
| 8:C:107:VAL:HG22 | 8:C:175:LEU:O    | 2.16                     | 0.46              |
| 12:G:50:ARG:HG3  | 12:G:51:ARG:HG2  | 1.96                     | 0.46              |
| 27:V:38:LEU:HD12 | 27:V:39:ALA:H    | 1.81                     | 0.46              |
| 44:m:10:MET:HE3  | 44:m:61:LEU:HD11 | 1.97                     | 0.46              |
| 1:1:990:A:C6     | 1:1:1186:G:H1'   | 2.50                     | 0.46              |
| 1:1:1657:U:H2'   | 1:1:1658:C:H6    | 1.81                     | 0.46              |
| 1:1:1883:U:H2'   | 1:1:1884:G:O4'   | 2.16                     | 0.46              |
| 1:1:2140:G:H2'   | 1:1:2141:G:H8    | 1.81                     | 0.46              |
| 1:1:2370:G:C2    | 1:1:2371:G:H1'   | 2.51                     | 0.46              |
| 2:2:416:G:C4     | 2:2:417:G:N7     | 2.84                     | 0.46              |
| 2:2:511:C:H2'    | 2:2:534:U:O2     | 2.16                     | 0.46              |
| 2:2:546:A:OP2    | 40:i:68:LEU:HD23 | 2.16                     | 0.46              |
| 2:2:600:A:H2'    | 2:2:601:G:H8     | 1.81                     | 0.46              |
| 2:2:1195:C:H2'   | 2:2:1197:A:C8    | 2.51                     | 0.46              |
| 3:4:69:G:H1      | 3:4:107:G:N2     | 2.14                     | 0.46              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 23:R:42:ALA:HA   | 23:R:47:VAL:HA    | 1.98                     | 0.46              |
| 26:U:95:PHE:HD1  | 26:U:96:PHE:O     | 1.99                     | 0.46              |
| 40:i:105:MET:HG3 | 40:i:173:VAL:HG22 | 1.97                     | 0.46              |
| 41:j:86:LYS:HG2  | 41:j:95:PHE:HD1   | 1.81                     | 0.46              |
| 1:1:374:A:H62    | 1:1:400:G:H21     | 1.64                     | 0.45              |
| 1:1:383:C:N3     | 1:1:385:C:N4      | 2.63                     | 0.45              |
| 1:1:1008:A:H1'   | 1:1:1010:A:N6     | 2.31                     | 0.45              |
| 1:1:1796:U:H2'   | 1:1:1797:G:H8     | 1.81                     | 0.45              |
| 1:1:1863:G:H2'   | 1:1:1864:U:C6     | 2.51                     | 0.45              |
| 1:1:2315:G:O4'   | 10:E:127:ASN:ND2  | 2.49                     | 0.45              |
| 1:1:2355:G:C4    | 1:1:2356:U:C5     | 3.04                     | 0.45              |
| 2:2:34:C:H3'     | 2:2:35:G:C8       | 2.50                     | 0.45              |
| 2:2:259:G:H2'    | 2:2:260:G:O4'     | 2.16                     | 0.45              |
| 2:2:554:A:H2'    | 2:2:555:U:C6      | 2.50                     | 0.45              |
| 2:2:1124:G:N2    | 2:2:1125:U:O4     | 2.40                     | 0.45              |
| 2:2:1130:A:H4'   | 45:n:5:GLN:NE2    | 2.31                     | 0.45              |
| 2:2:1229:A:H62   | 49:r:104:THR:HG23 | 1.81                     | 0.45              |
| 3:4:61:G:H2'     | 3:4:62:C:H6       | 1.81                     | 0.45              |
| 11:F:139:GLN:NE2 | 11:F:140:VAL:HG23 | 2.31                     | 0.45              |
| 16:K:63:VAL:HG22 | 16:K:107:LEU:HD11 | 1.98                     | 0.45              |
| 17:L:64:PHE:HD1  | 36:e:25:LYS:HB2   | 1.81                     | 0.45              |
| 23:R:79:ARG:O    | 23:R:80:ARG:HG2   | 2.16                     | 0.45              |
| 39:h:130:PHE:O   | 39:h:134:MET:HG2  | 2.15                     | 0.45              |
| 52:u:53:ASP:CG   | 52:u:56:ARG:HG2   | 2.41                     | 0.45              |
| 1:1:242:G:C4     | 36:e:5:LYS:HE2    | 2.51                     | 0.45              |
| 1:1:445:C:OP1    | 22:Q:2:ALA:N      | 2.49                     | 0.45              |
| 1:1:495:G:H5'    | 24:S:4:ILE:O      | 2.16                     | 0.45              |
| 1:1:835:C:H4'    | 1:1:2358:A:H4'    | 1.98                     | 0.45              |
| 1:1:1548:A:H2'   | 1:1:1549:A:C8     | 2.50                     | 0.45              |
| 1:1:1682:G:H2'   | 1:1:1683:U:C6     | 2.52                     | 0.45              |
| 1:1:2682:A:H61   | 1:1:2727:A:C2'    | 2.28                     | 0.45              |
| 2:2:132:C:H2'    | 2:2:133:U:O4'     | 2.16                     | 0.45              |
| 2:2:193:C:H2'    | 2:2:194:C:C6      | 2.50                     | 0.45              |
| 2:2:299:G:H2'    | 2:2:300:A:C8      | 2.48                     | 0.45              |
| 2:2:1254:A:O4'   | 2:2:1356:G:H5''   | 2.16                     | 0.45              |
| 2:2:1391:U:C2    | 2:2:1392:G:N7     | 2.84                     | 0.45              |
| 11:F:78:GLY:HA2  | 11:F:82:GLY:HA2   | 1.98                     | 0.45              |
| 22:Q:41:LYS:HD3  | 22:Q:44:GLN:HB2   | 1.99                     | 0.45              |
| 37:f:16:ILE:HD13 | 37:f:25:VAL:HG22  | 1.98                     | 0.45              |
| 38:g:27:MET:HE1  | 38:g:187:VAL:O    | 2.16                     | 0.45              |
| 38:g:218:ALA:O   | 38:g:222:ARG:HG3  | 2.16                     | 0.45              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 39:h:12:LEU:HD12 | 39:h:18:TRP:CD1  | 2.51                     | 0.45              |
| 55:x:12:ASP:HB3  | 55:x:14:HIS:CD2  | 2.52                     | 0.45              |
| 1:1:242:G:H5''   | 36:e:5:LYS:HA    | 1.98                     | 0.45              |
| 1:1:308:G:H21    | 1:1:329:G:H21    | 1.63                     | 0.45              |
| 1:1:518:G:N3     | 1:1:518:G:H2'    | 2.30                     | 0.45              |
| 1:1:519:U:O2'    | 24:S:75:PHE:HB3  | 2.15                     | 0.45              |
| 1:1:566:U:H5     | 23:R:80:ARG:HB2  | 1.81                     | 0.45              |
| 1:1:600:G:H4'    | 9:D:27:LEU:HD22  | 1.97                     | 0.45              |
| 1:1:1184:U:H2'   | 1:1:1185:G:H5'   | 1.97                     | 0.45              |
| 1:1:1779:U:H5    | 1:1:1784:A:N7    | 2.15                     | 0.45              |
| 1:1:2425:A:H4'   | 1:1:2426:A:O5'   | 2.16                     | 0.45              |
| 1:1:2427:C:H5''  | 1:1:2429:G:H5'   | 1.97                     | 0.45              |
| 1:1:2446:G:HO2'  | 1:1:2448:A:H8    | 1.62                     | 0.45              |
| 1:1:2641:G:H2'   | 1:1:2642:G:O4'   | 2.15                     | 0.45              |
| 2:2:45:G:C6      | 2:2:46:G:C6      | 3.04                     | 0.45              |
| 2:2:418:C:O2'    | 2:2:419:C:H5'    | 2.16                     | 0.45              |
| 2:2:430:A:H2'    | 2:2:431:A:H5'    | 1.97                     | 0.45              |
| 2:2:927:G:H21    | 2:2:1532:U:C5'   | 2.29                     | 0.45              |
| 2:2:1097:C:H2'   | 2:2:1098:C:H6    | 1.80                     | 0.45              |
| 12:G:12:LEU:HD11 | 12:G:21:VAL:HG12 | 1.99                     | 0.45              |
| 15:J:78:THR:CG2  | 15:J:85:LYS:HE3  | 2.46                     | 0.45              |
| 23:R:60:LYS:NZ   | 23:R:102:SER:HB2 | 2.32                     | 0.45              |
| 38:g:69:PHE:CD1  | 38:g:162:PHE:HB3 | 2.51                     | 0.45              |
| 52:u:8:ARG:HD2   | 52:u:28:ARG:NH1  | 2.31                     | 0.45              |
| 54:w:71:THR:O    | 54:w:74:HIS:ND1  | 2.49                     | 0.45              |
| 1:1:23:G:C6      | 1:1:24:G:C5      | 3.04                     | 0.45              |
| 1:1:327:G:N2     | 26:U:68:SER:OG   | 2.48                     | 0.45              |
| 1:1:831:G:H2'    | 1:1:832:U:O4'    | 2.16                     | 0.45              |
| 1:1:975:A:H62    | 1:1:989:G:H21    | 0.68                     | 0.45              |
| 1:1:1042:G:N2    | 1:1:1113:U:O2    | 2.29                     | 0.45              |
| 1:1:1059:G:H2'   | 1:1:1060:U:C5    | 2.52                     | 0.45              |
| 1:1:1199:U:C4    | 1:1:1200:C:C4    | 3.04                     | 0.45              |
| 1:1:1225:G:H8    | 1:1:1225:G:O5'   | 1.99                     | 0.45              |
| 1:1:1794:A:H2'   | 1:1:1795:C:C6    | 2.51                     | 0.45              |
| 1:1:1858:A:C6    | 1:1:1885:A:C8    | 3.04                     | 0.45              |
| 1:1:2140:G:H2'   | 1:1:2141:G:C8    | 2.50                     | 0.45              |
| 1:1:2175:C:H2'   | 1:1:2176:A:H8    | 1.81                     | 0.45              |
| 1:1:2547:A:C8    | 1:1:2566:A:C4    | 3.04                     | 0.45              |
| 1:1:2830:C:HO2'  | 1:1:2836:U:C4'   | 2.29                     | 0.45              |
| 2:2:46:G:H2'     | 2:2:366:A:H62    | 1.80                     | 0.45              |
| 2:2:105:G:H2'    | 2:2:106:C:O4'    | 2.16                     | 0.45              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:2:195:A:H2'     | 2:2:196:A:O4'     | 2.15                     | 0.45              |
| 2:2:324:G:N2      | 2:2:326:G:H8      | 2.09                     | 0.45              |
| 2:2:1148:U:H2'    | 2:2:1149:C:O4'    | 2.15                     | 0.45              |
| 2:2:1181:G:H4'    | 2:2:1182:G:H5'    | 1.99                     | 0.45              |
| 2:2:1273:C:H2'    | 2:2:1274:A:O4'    | 2.16                     | 0.45              |
| 2:2:1357:A:H2'    | 2:2:1358:U:O4'    | 2.17                     | 0.45              |
| 3:4:72:G:H21      | 3:4:104:A:H62     | 1.65                     | 0.45              |
| 15:J:15:TRP:NE1   | 15:J:53:TYR:HB2   | 2.31                     | 0.45              |
| 20:O:18:LEU:HD23  | 20:O:18:LEU:HA    | 1.74                     | 0.45              |
| 20:O:64:TYR:HD2   | 20:O:67:ASN:HB3   | 1.82                     | 0.45              |
| 34:c:21:TYR:OH    | 34:c:39:PHE:O     | 2.28                     | 0.45              |
| 39:h:189:ALA:O    | 39:h:195:VAL:HG13 | 2.16                     | 0.45              |
| 41:j:81:LEU:HD22  | 41:j:96:MET:HE1   | 1.97                     | 0.45              |
| 45:n:81:HIS:O     | 45:n:85:ARG:HG2   | 2.17                     | 0.45              |
| 45:n:106:ARG:NH1  | 45:n:110:GLN:OE1  | 2.49                     | 0.45              |
| 54:w:35:GLU:OE2   | 54:w:35:GLU:N     | 2.42                     | 0.45              |
| 1:1:573:U:O2      | 1:1:2029:G:N2     | 2.50                     | 0.45              |
| 1:1:652:U:O2'     | 1:1:653:U:O4'     | 2.34                     | 0.45              |
| 1:1:2642:G:H5'    | 8:C:158:GLY:HA3   | 1.98                     | 0.45              |
| 2:2:928:G:O2'     | 2:2:1533:C:OP1    | 2.34                     | 0.45              |
| 2:2:1048:G:P      | 50:s:4:GLN:HB2    | 2.56                     | 0.45              |
| 2:2:1074:G:N2     | 2:2:1075:U:C2     | 2.85                     | 0.45              |
| 2:2:1530:G:H2'    | 2:2:1531:A:C8     | 2.51                     | 0.45              |
| 3:4:43:C:O4'      | 10:E:63:GLN:NE2   | 2.50                     | 0.45              |
| 43:l:26:PHE:CD1   | 43:l:101:MET:HB2  | 2.51                     | 0.45              |
| 49:r:19:LEU:HD11  | 49:r:56:LEU:HD11  | 1.98                     | 0.45              |
| 1:1:15:G:H2'      | 1:1:16:C:C6       | 2.52                     | 0.45              |
| 1:1:112:U:H2'     | 1:1:113:U:H5'     | 1.97                     | 0.45              |
| 1:1:323:C:OP2     | 1:1:324:A:H8      | 1.99                     | 0.45              |
| 1:1:444:C:OP2     | 9:D:44:ARG:HB3    | 2.17                     | 0.45              |
| 1:1:587:C:H5''    | 9:D:85:PHE:CE2    | 2.52                     | 0.45              |
| 1:1:615:U:H3      | 9:D:38:GLY:HA3    | 1.82                     | 0.45              |
| 1:1:668:A:C2      | 1:1:670:A:N6      | 2.84                     | 0.45              |
| 1:1:874:G:C6      | 1:1:904:G:C6      | 3.04                     | 0.45              |
| 1:1:920:A:C6      | 1:1:921:C:N4      | 2.85                     | 0.45              |
| 1:1:1141:U:OP2    | 15:J:65:THR:OG1   | 2.25                     | 0.45              |
| 1:1:2684:U:H2'    | 1:1:2685:G:O4'    | 2.17                     | 0.45              |
| 2:2:979:C:C2      | 2:2:980:C:C5      | 3.04                     | 0.45              |
| 2:2:1218:C:H2'    | 2:2:1219:A:C8     | 2.51                     | 0.45              |
| 20:O:33:ARG:O     | 20:O:65:THR:OG1   | 2.28                     | 0.45              |
| 48:q:119:VAL:HG12 | 48:q:120:LYS:O    | 2.17                     | 0.45              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 1:1:911:A:OP1     | 1:1:912:C:H5     | 1.99                     | 0.45              |
| 1:1:979:A:N6      | 1:1:982:C:OP2    | 2.45                     | 0.45              |
| 1:1:984:A:O2'     | 1:1:985:C:H5'    | 2.16                     | 0.45              |
| 1:1:1005:C:O2'    | 1:1:1012:U:O4    | 2.34                     | 0.45              |
| 1:1:2519:U:H2'    | 1:1:2519:U:OP2   | 2.17                     | 0.45              |
| 1:1:2623:G:H2'    | 1:1:2624:G:C8    | 2.51                     | 0.45              |
| 1:1:2751:G:P      | 11:F:3:ARG:HH21  | 2.40                     | 0.45              |
| 2:2:33:A:C4       | 2:2:34:C:C5      | 3.05                     | 0.45              |
| 2:2:164:G:H2'     | 2:2:165:G:C8     | 2.51                     | 0.45              |
| 2:2:542:G:H4'     | 40:i:38:PRO:O    | 2.16                     | 0.45              |
| 2:2:1062:U:H2'    | 2:2:1063:C:C6    | 2.52                     | 0.45              |
| 2:2:1151:A:O2'    | 2:2:1152:A:H8    | 1.99                     | 0.45              |
| 2:2:1316:G:H2'    | 2:2:1318:A:N7    | 2.31                     | 0.45              |
| 2:2:1360:A:OP2    | 50:s:75:ARG:NH2  | 2.49                     | 0.45              |
| 2:2:1372:U:H2'    | 2:2:1373:G:O4'   | 2.17                     | 0.45              |
| 2:2:1438:G:H5'    | 56:y:33:LYS:HE2  | 1.99                     | 0.45              |
| 3:4:107:G:O5'     | 3:4:107:G:H8     | 1.99                     | 0.45              |
| 4:6:24:C:H2'      | 4:6:25:U:C6      | 2.51                     | 0.45              |
| 8:C:107:VAL:HG23  | 8:C:175:LEU:HB2  | 1.98                     | 0.45              |
| 9:D:32:VAL:HG11   | 9:D:181:ILE:HD12 | 1.98                     | 0.45              |
| 10:E:37:ASN:OD1   | 10:E:38:MET:N    | 2.49                     | 0.45              |
| 10:E:121:SER:HB3  | 10:E:129:SER:O   | 2.16                     | 0.45              |
| 12:G:103:VAL:HG22 | 12:G:108:VAL:H   | 1.81                     | 0.45              |
| 14:I:123:ALA:HA   | 14:I:126:ARG:HE  | 1.81                     | 0.45              |
| 15:J:17:VAL:HA    | 15:J:55:ILE:O    | 2.17                     | 0.45              |
| 20:O:80:GLU:HG3   | 20:O:113:ALA:HB1 | 1.98                     | 0.45              |
| 1:1:18:U:P        | 22:Q:30:ARG:HH12 | 2.39                     | 0.45              |
| 1:1:64:A:H2'      | 1:1:65:U:H6      | 1.81                     | 0.45              |
| 1:1:239:C:OP1     | 36:e:3:LYS:NZ    | 2.41                     | 0.45              |
| 1:1:533:G:O4'     | 22:Q:28:ARG:NH2  | 2.49                     | 0.45              |
| 1:1:586:A:O2'     | 1:1:671:C:O2     | 2.33                     | 0.45              |
| 1:1:805:G:H1'     | 1:1:831:G:O2'    | 2.17                     | 0.45              |
| 1:1:953:G:C2      | 1:1:954:G:N7     | 2.85                     | 0.45              |
| 1:1:1245:G:C2     | 1:1:1246:A:C5    | 3.05                     | 0.45              |
| 1:1:1812:U:H2'    | 1:1:1813:G:H8    | 1.81                     | 0.45              |
| 1:1:2286:G:C8     | 34:c:34:LEU:HD11 | 2.51                     | 0.45              |
| 1:1:2297:A:N6     | 1:1:2318:G:H21   | 2.15                     | 0.45              |
| 1:1:2372:U:C2'    | 1:1:2373:G:H5'   | 2.46                     | 0.45              |
| 1:1:2526:G:N1     | 1:1:2538:C:N3    | 2.65                     | 0.45              |
| 2:2:6:G:H5''      | 2:2:298:A:H4'    | 1.98                     | 0.45              |
| 2:2:38:G:H1       | 2:2:397:A:P      | 2.37                     | 0.45              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:2:363:A:C5'    | 48:q:81:LEU:HD11  | 2.47                     | 0.45              |
| 2:2:543:U:C5'    | 40:i:14:ARG:HE    | 2.30                     | 0.45              |
| 2:2:1170:A:C4    | 2:2:1171:A:C8     | 3.05                     | 0.45              |
| 2:2:1208:C:H2'   | 2:2:1209:C:C6     | 2.51                     | 0.45              |
| 2:2:1304:G:N2    | 2:2:1334:G:O6     | 2.50                     | 0.45              |
| 2:2:1375:A:OP1   | 43:l:28:ASN:ND2   | 2.50                     | 0.45              |
| 22:Q:66:ASN:OD1  | 22:Q:76:TYR:HB2   | 2.16                     | 0.45              |
| 23:R:69:GLY:HA2  | 23:R:93:PHE:CE2   | 2.52                     | 0.45              |
| 36:e:39:LYS:HA   | 36:e:42:ARG:NE    | 2.32                     | 0.45              |
| 39:h:19:ASN:OD1  | 39:h:54:ARG:NE    | 2.48                     | 0.45              |
| 52:u:57:ILE:O    | 52:u:61:VAL:HG23  | 2.16                     | 0.45              |
| 1:1:23:G:C4      | 1:1:24:G:C8       | 3.05                     | 0.45              |
| 1:1:253:C:H2'    | 1:1:254:G:C8      | 2.52                     | 0.45              |
| 1:1:629:G:N3     | 1:1:639:U:O2'     | 2.49                     | 0.45              |
| 1:1:649:G:H2'    | 1:1:650:C:C5      | 2.51                     | 0.45              |
| 1:1:782:A:C2     | 7:B:225:MET:HG2   | 2.52                     | 0.45              |
| 1:1:1534:U:H4'   | 1:1:1535:A:H2     | 1.81                     | 0.45              |
| 1:1:2052:A:C4    | 8:C:155:VAL:HG23  | 2.51                     | 0.45              |
| 1:1:2177:C:H2'   | 1:1:2178:C:C6     | 2.52                     | 0.45              |
| 1:1:2362:C:O5'   | 1:1:2362:C:H6     | 1.99                     | 0.45              |
| 1:1:2370:G:H2'   | 1:1:2371:G:H4'    | 1.98                     | 0.45              |
| 1:1:2463:C:H2'   | 1:1:2464:G:C8     | 2.51                     | 0.45              |
| 1:1:2468:A:OP2   | 1:1:2476:A:N6     | 2.44                     | 0.45              |
| 1:1:2824:C:H3'   | 1:1:2825:G:N2     | 2.17                     | 0.45              |
| 1:1:2895:G:H2'   | 1:1:2896:C:C6     | 2.52                     | 0.45              |
| 2:2:6:G:H3'      | 2:2:6:G:N3        | 2.32                     | 0.45              |
| 2:2:44:A:C5      | 2:2:45:G:N7       | 2.85                     | 0.45              |
| 2:2:157:U:O2     | 2:2:164:G:N2      | 2.33                     | 0.45              |
| 2:2:184:G:C2     | 2:2:185:U:C4      | 3.04                     | 0.45              |
| 2:2:292:G:O2'    | 2:2:609:A:N1      | 2.46                     | 0.45              |
| 2:2:416:G:H2'    | 2:2:417:G:C8      | 2.39                     | 0.45              |
| 2:2:1049:U:H2'   | 50:s:3:LYS:HD2    | 1.99                     | 0.45              |
| 2:2:1130:A:O2'   | 45:n:5:GLN:NE2    | 2.50                     | 0.45              |
| 3:4:73:A:H3'     | 3:4:74:U:H6       | 1.82                     | 0.45              |
| 6:A:167:GLU:O    | 6:A:171:GLU:HG2   | 2.17                     | 0.45              |
| 12:G:90:LEU:HD13 | 12:G:123:ARG:O    | 2.17                     | 0.45              |
| 15:J:24:THR:HG22 | 15:J:26:GLY:H     | 1.82                     | 0.45              |
| 20:O:107:ALA:O   | 20:O:111:ARG:HG3  | 2.17                     | 0.45              |
| 22:Q:40:ILE:HA   | 23:R:75:VAL:HG11  | 1.98                     | 0.45              |
| 26:U:98:SER:C    | 26:U:100:SER:H    | 2.25                     | 0.45              |
| 39:h:140:ASN:O   | 39:h:144:LEU:HD23 | 2.17                     | 0.45              |

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| Atom-1          | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-----------------|------------------|--------------------------|-------------------|
| 40:i:59:GLN:OE1 | 40:i:62:ARG:NH1  | 2.50                     | 0.45              |
| 40:i:64:ILE:O   | 40:i:111:ARG:NE  | 2.49                     | 0.45              |
| 40:i:88:GLU:HG3 | 40:i:188:ARG:HB2 | 1.98                     | 0.45              |
| 52:u:45:GLU:HG2 | 52:u:46:LYS:HE2  | 1.98                     | 0.45              |
| 53:v:72:SER:O   | 53:v:72:SER:OG   | 2.30                     | 0.45              |
| 1:1:595:C:H2'   | 1:1:596:U:C6     | 2.51                     | 0.45              |
| 1:1:742:A:H2'   | 1:1:743:A:C8     | 2.51                     | 0.45              |
| 1:1:888:C:N4    | 49:r:82:ASP:OD1  | 2.48                     | 0.45              |
| 1:1:954:G:OP1   | 18:M:14:LYS:N    | 2.50                     | 0.45              |
| 1:1:958:U:OP2   | 18:M:40:ARG:NH2  | 2.49                     | 0.45              |
| 1:1:1016:G:H2'  | 1:1:1017:G:C4'   | 2.46                     | 0.45              |
| 1:1:1614:A:N1   | 24:S:93:ALA:HB2  | 2.31                     | 0.45              |
| 1:1:2402:U:O2   | 1:1:2402:U:H2'   | 2.17                     | 0.45              |
| 1:1:2538:C:O2'  | 37:f:1:MET:O     | 2.31                     | 0.45              |
| 1:1:2543:G:O4'  | 1:1:2766:A:H5''  | 2.16                     | 0.45              |
| 1:1:2888:C:N3   | 1:1:2889:C:N4    | 2.65                     | 0.45              |
| 2:2:419:C:H5''  | 2:2:513:C:C1'    | 2.47                     | 0.45              |
| 2:2:511:C:O2    | 40:i:41:HIS:NE2  | 2.50                     | 0.45              |
| 2:2:517:G:N2    | 2:2:530:G:OP1    | 2.50                     | 0.45              |
| 2:2:886:G:C4    | 2:2:887:G:C8     | 3.04                     | 0.45              |
| 2:2:1150:A:H2'  | 2:2:1151:A:C8    | 2.52                     | 0.45              |
| 2:2:1196:A:O2'  | 2:2:1197:A:OP1   | 2.29                     | 0.45              |
| 4:5:1:G:H2'     | 4:5:2:C:C6       | 2.52                     | 0.45              |
| 9:D:146:VAL:O   | 9:D:167:VAL:HA   | 2.17                     | 0.45              |
| 15:J:77:HIS:CD2 | 15:J:84:ILE:HD12 | 2.49                     | 0.45              |
| 29:X:26:LYS:HD3 | 29:X:26:LYS:HA   | 1.83                     | 0.45              |
| 32:a:5:ILE:HG13 | 32:a:6:HIS:N     | 2.32                     | 0.45              |
| 1:1:25:U:O2     | 1:1:1261:C:H5'   | 2.17                     | 0.44              |
| 1:1:97:C:H2'    | 1:1:98:G:O4'     | 2.18                     | 0.44              |
| 1:1:191:A:H2'   | 1:1:192:C:C6     | 2.52                     | 0.44              |
| 1:1:408:G:O6    | 1:1:419:U:C4     | 2.70                     | 0.44              |
| 1:1:964:C:H1'   | 1:1:2274:A:C2    | 2.52                     | 0.44              |
| 1:1:981:A:C2    | 1:1:2027:G:N3    | 2.85                     | 0.44              |
| 1:1:2259:U:H4'  | 1:1:2428:G:P     | 2.57                     | 0.44              |
| 1:1:2309:A:H2'  | 1:1:2310:C:C6    | 2.52                     | 0.44              |
| 1:1:2482:A:H61  | 18:M:55:ARG:NH2  | 2.14                     | 0.44              |
| 1:1:2565:A:N7   | 1:1:2566:A:C6    | 2.85                     | 0.44              |
| 1:1:2648:G:H2'  | 1:1:2649:C:O4'   | 2.17                     | 0.44              |
| 1:1:2651:C:C2   | 1:1:2652:C:C5    | 3.05                     | 0.44              |
| 2:2:260:G:O3'   | 56:y:71:LYS:NZ   | 2.49                     | 0.44              |
| 2:2:1067:A:C4   | 2:2:1108:G:N2    | 2.85                     | 0.44              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:2:1114:C:H2'   | 2:2:1115:U:C6     | 2.52                     | 0.44              |
| 2:2:1140:C:HO2'  | 2:2:1141:C:P      | 2.40                     | 0.44              |
| 2:2:1212:U:H5'   | 2:2:1213:A:C5     | 2.52                     | 0.44              |
| 9:D:194:LYS:O    | 9:D:198:GLU:OE1   | 2.36                     | 0.44              |
| 25:T:37:ASP:OD1  | 25:T:37:ASP:N     | 2.46                     | 0.44              |
| 31:Z:9:GLN:HG3   | 31:Z:29:LEU:HD13  | 1.99                     | 0.44              |
| 38:g:27:MET:SD   | 38:g:201:PRO:HB3  | 2.57                     | 0.44              |
| 45:n:22:LYS:O    | 45:n:62:ASP:N     | 2.43                     | 0.44              |
| 1:1:246:C:N4     | 1:1:247:G:C8      | 2.85                     | 0.44              |
| 1:1:745:1MG:HO2' | 1:1:748:G:HO2'    | 1.65                     | 0.44              |
| 1:1:904:G:C6     | 1:1:905:A:C8      | 3.05                     | 0.44              |
| 1:1:904:G:C2     | 1:1:905:A:H1'     | 2.52                     | 0.44              |
| 1:1:980:A:N7     | 1:1:1136:G:H5'    | 2.32                     | 0.44              |
| 1:1:1227:G:P     | 22:Q:13:ARG:HD3   | 2.58                     | 0.44              |
| 1:1:2314:A:H1'   | 10:E:155:THR:HG21 | 1.98                     | 0.44              |
| 1:1:2889:C:H2'   | 1:1:2890:G:O4'    | 2.16                     | 0.44              |
| 2:2:106:C:O2'    | 2:2:379:C:O5'     | 2.30                     | 0.44              |
| 2:2:186:C:N3     | 2:2:192:A:N6      | 2.64                     | 0.44              |
| 2:2:390:U:H2'    | 2:2:391:G:C8      | 2.52                     | 0.44              |
| 2:2:553:A:C3'    | 2:2:554:A:H5'     | 2.47                     | 0.44              |
| 2:2:934:C:H2'    | 2:2:1345:U:OP2    | 2.17                     | 0.44              |
| 2:2:983:A:H5'    | 2:2:984:C:OP2     | 2.17                     | 0.44              |
| 2:2:1107:C:OP1   | 39:h:172:ARG:HB2  | 2.17                     | 0.44              |
| 2:2:1268:G:O2'   | 2:2:1326:U:O2'    | 2.24                     | 0.44              |
| 7:B:137:VAL:HG21 | 7:B:167:ARG:HG2   | 1.99                     | 0.44              |
| 15:J:58:ASN:HD22 | 15:J:61:LYS:HE3   | 1.82                     | 0.44              |
| 18:M:16:ARG:HG3  | 18:M:18:ARG:HG2   | 2.00                     | 0.44              |
| 18:M:64:TRP:HB2  | 18:M:104:GLU:HB2  | 2.00                     | 0.44              |
| 18:M:69:PRO:HA   | 18:M:93:VAL:O     | 2.17                     | 0.44              |
| 38:g:18:HIS:CD2  | 38:g:205:ASP:HB2  | 2.52                     | 0.44              |
| 40:i:114:ALA:O   | 40:i:118:VAL:HG23 | 2.16                     | 0.44              |
| 54:w:37:GLY:O    | 54:w:63:ARG:NH2   | 2.50                     | 0.44              |
| 1:1:25:U:O2'     | 1:1:1261:C:OP1    | 2.33                     | 0.44              |
| 1:1:552:U:N3     | 1:1:553:G:O6      | 2.50                     | 0.44              |
| 1:1:567:U:H2'    | 1:1:568:U:C6      | 2.52                     | 0.44              |
| 1:1:589:U:C2     | 1:1:590:A:N7      | 2.85                     | 0.44              |
| 1:1:839:U:H2'    | 1:1:840:C:C6      | 2.53                     | 0.44              |
| 1:1:858:G:N3     | 1:1:2268:A:H2'    | 2.33                     | 0.44              |
| 1:1:977:G:H21    | 1:1:1000:A:H2     | 1.63                     | 0.44              |
| 1:1:2271:G:C5    | 1:1:2272:U:C4     | 3.05                     | 0.44              |
| 1:1:2286:G:H21   | 1:1:2287:A:H61    | 1.63                     | 0.44              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 1:1:2297:A:H8     | 1:1:2297:A:OP2   | 2.00                     | 0.44              |
| 1:1:2329:U:H2'    | 1:1:2330:G:C8    | 2.53                     | 0.44              |
| 1:1:2897:U:H2'    | 1:1:2898:U:C6    | 2.52                     | 0.44              |
| 2:2:58:C:H2'      | 2:2:59:A:H5'     | 1.98                     | 0.44              |
| 2:2:843:U:O5'     | 2:2:844:G:N2     | 2.50                     | 0.44              |
| 2:2:849:G:N2      | 2:2:850:U:C2     | 2.86                     | 0.44              |
| 2:2:935:A:N6      | 43:l:3:ARG:HG3   | 2.32                     | 0.44              |
| 2:2:991:U:O2      | 2:2:1213:A:N7    | 2.51                     | 0.44              |
| 2:2:1083:U:C2     | 2:2:1102:A:N6    | 2.84                     | 0.44              |
| 14:I:61:TYR:HD2   | 14:I:63:ASP:OD1  | 2.01                     | 0.44              |
| 23:R:68:ARG:HA    | 23:R:92:TRP:HA   | 1.99                     | 0.44              |
| 36:e:31:HIS:O     | 36:e:33:LEU:HG   | 2.17                     | 0.44              |
| 40:i:104:ARG:HD2  | 40:i:104:ARG:HA  | 1.82                     | 0.44              |
| 40:i:130:VAL:HG11 | 40:i:135:TYR:CG  | 2.52                     | 0.44              |
| 41:j:111:MET:SD   | 41:j:125:ALA:HB1 | 2.57                     | 0.44              |
| 42:k:40:GLU:OE1   | 42:k:100:SER:OG  | 2.34                     | 0.44              |
| 51:t:43:PHE:HE1   | 51:t:49:ASP:HB3  | 1.82                     | 0.44              |
| 52:u:45:GLU:HG2   | 52:u:46:LYS:HG2  | 2.00                     | 0.44              |
| 56:y:78:ASN:O     | 56:y:82:GLN:OE1  | 2.35                     | 0.44              |
| 1:1:16:C:H2'      | 1:1:17:G:C8      | 2.53                     | 0.44              |
| 1:1:558:U:H6      | 1:1:558:U:O5'    | 2.01                     | 0.44              |
| 1:1:1011:G:OP1    | 22:Q:76:TYR:HB3  | 2.18                     | 0.44              |
| 1:1:1076:C:H2'    | 1:1:1077:A:C8    | 2.52                     | 0.44              |
| 1:1:1141:U:H1'    | 1:1:1142:A:C5    | 2.52                     | 0.44              |
| 1:1:1204:A:N6     | 1:1:1242:U:O4    | 2.51                     | 0.44              |
| 1:1:2478:A:C2     | 1:1:2479:U:H5    | 2.35                     | 0.44              |
| 1:1:2514:U:H1'    | 8:C:148:GLN:CD   | 2.43                     | 0.44              |
| 1:1:2515:C:O2'    | 1:1:2516:A:H5'   | 2.18                     | 0.44              |
| 1:1:2572:A:H4'    | 1:1:2573:C:C5'   | 2.46                     | 0.44              |
| 2:2:60:A:H1'      | 2:2:61:G:C1'     | 2.47                     | 0.44              |
| 2:2:219:U:H2'     | 2:2:220:G:C8     | 2.52                     | 0.44              |
| 2:2:1162:C:H2'    | 2:2:1163:A:C8    | 2.51                     | 0.44              |
| 2:2:1249:C:N4     | 2:2:1287:A:H3'   | 2.31                     | 0.44              |
| 4:6:22:A:O2'      | 4:6:23:G:OP2     | 2.36                     | 0.44              |
| 9:D:41:GLN:O      | 9:D:43:THR:HG23  | 2.18                     | 0.44              |
| 10:E:57:LEU:HA    | 10:E:60:ILE:HG22 | 2.00                     | 0.44              |
| 13:H:56:ARG:HG3   | 13:H:83:ALA:HB2  | 1.99                     | 0.44              |
| 18:M:74:THR:OG1   | 18:M:86:LYS:HE3  | 2.18                     | 0.44              |
| 36:e:54:ASP:HB3   | 36:e:58:VAL:HG23 | 1.99                     | 0.44              |
| 43:l:48:GLU:O     | 43:l:52:GLN:NE2  | 2.42                     | 0.44              |
| 43:l:69:VAL:HA    | 43:l:138:ARG:CD  | 2.47                     | 0.44              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 45:n:114:LYS:HE2 | 45:n:119:ARG:O   | 2.17                     | 0.44              |
| 52:u:39:PHE:CE1  | 52:u:74:LEU:HD21 | 2.51                     | 0.44              |
| 1:1:856:G:C2     | 1:1:857:G:C5     | 3.06                     | 0.44              |
| 1:1:1011:G:N2    | 1:1:1151:A:H1'   | 2.32                     | 0.44              |
| 1:1:1164:C:C2    | 1:1:1165:A:N7    | 2.85                     | 0.44              |
| 1:1:1532:A:H2'   | 1:1:1533:C:C6    | 2.52                     | 0.44              |
| 1:1:2032:G:O6    | 1:1:2454:G:H5'   | 2.18                     | 0.44              |
| 1:1:2480:C:H2'   | 1:1:2481:G:C8    | 2.52                     | 0.44              |
| 1:1:2785:C:H2'   | 1:1:2786:U:O4'   | 2.17                     | 0.44              |
| 2:2:358:U:H2'    | 2:2:359:G:C8     | 2.53                     | 0.44              |
| 2:2:1160:G:C6    | 2:2:1161:C:C4    | 3.06                     | 0.44              |
| 2:2:1234:C:H2'   | 2:2:1235:U:C6    | 2.53                     | 0.44              |
| 2:2:1347:G:N7    | 45:n:13:LYS:HE2  | 2.33                     | 0.44              |
| 3:4:59:A:H2'     | 3:4:60:C:C6      | 2.52                     | 0.44              |
| 4:6:14:A:H2'     | 4:6:14:A:N3      | 2.32                     | 0.44              |
| 8:C:6:GLY:O      | 8:C:201:LEU:N    | 2.51                     | 0.44              |
| 16:K:2:ILE:HD13  | 16:K:8:LEU:HD21  | 2.00                     | 0.44              |
| 18:M:40:ARG:HA   | 18:M:95:LEU:HA   | 2.00                     | 0.44              |
| 21:P:12:GLN:O    | 21:P:55:LEU:HD11 | 2.18                     | 0.44              |
| 23:R:1:MET:N     | 23:R:42:ALA:O    | 2.41                     | 0.44              |
| 1:1:226:A:N6     | 1:1:418:C:O2'    | 2.50                     | 0.44              |
| 1:1:279:A:N6     | 1:1:361:G:H1'    | 2.32                     | 0.44              |
| 1:1:321:U:OP2    | 9:D:130:LYS:HD2  | 2.17                     | 0.44              |
| 1:1:827:U:H5'    | 1:1:828:U:C5     | 2.53                     | 0.44              |
| 1:1:956:G:H2'    | 1:1:957:C:H2'    | 2.00                     | 0.44              |
| 1:1:1151:A:O2'   | 22:Q:77:SER:O    | 2.35                     | 0.44              |
| 1:1:1246:A:C6    | 1:1:1247:A:C4    | 3.06                     | 0.44              |
| 1:1:1442:U:H2'   | 1:1:1443:U:C6    | 2.52                     | 0.44              |
| 1:1:1814:G:OP2   | 1:1:1815:A:O2'   | 2.29                     | 0.44              |
| 1:1:2246:G:H2'   | 1:1:2247:A:C8    | 2.52                     | 0.44              |
| 1:1:2641:G:H3'   | 1:1:2642:G:H8    | 1.83                     | 0.44              |
| 1:1:2679:A:H2'   | 1:1:2680:U:C6    | 2.51                     | 0.44              |
| 1:1:2681:C:H4'   | 8:C:11:MET:HG2   | 2.00                     | 0.44              |
| 1:1:2766:A:C6    | 1:1:2767:C:C2    | 3.05                     | 0.44              |
| 2:2:4:U:H1'      | 40:i:83:LYS:HE3  | 1.99                     | 0.44              |
| 2:2:104:G:H4'    | 2:2:174:A:H5'    | 1.99                     | 0.44              |
| 2:2:229:U:H2'    | 2:2:230:G:C8     | 2.53                     | 0.44              |
| 2:2:484:G:C5     | 2:2:486:U:H1'    | 2.53                     | 0.44              |
| 2:2:554:A:O2'    | 2:2:555:U:O4'    | 2.28                     | 0.44              |
| 2:2:1137:C:O2    | 2:2:1138:G:N2    | 2.48                     | 0.44              |
| 2:2:1189:U:H2'   | 39:h:176:HIS:CD2 | 2.53                     | 0.44              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 6:A:146:VAL:HG21 | 6:A:164:ARG:HB3   | 1.99                     | 0.44              |
| 7:B:247:PRO:HG2  | 7:B:248:TRP:CZ3   | 2.52                     | 0.44              |
| 39:h:131:ARG:O   | 39:h:135:LYS:HG2  | 2.17                     | 0.44              |
| 40:i:197:GLU:HA  | 40:i:200:ILE:HD13 | 1.98                     | 0.44              |
| 46:o:10:LEU:C    | 46:o:18:ILE:HD11  | 2.43                     | 0.44              |
| 1:1:22:C:H2'     | 1:1:23:G:H5''     | 2.00                     | 0.44              |
| 1:1:477:A:H2'    | 1:1:478:A:C8      | 2.53                     | 0.44              |
| 1:1:1063:G:H1'   | 14:I:135:MET:HE1  | 1.98                     | 0.44              |
| 1:1:1144:A:H3'   | 1:1:1145:C:C5     | 2.53                     | 0.44              |
| 1:1:1161:C:O4'   | 23:R:9:GLY:HA3    | 2.18                     | 0.44              |
| 1:1:1165:A:C2    | 1:1:1166:G:C8     | 3.05                     | 0.44              |
| 1:1:2333:A:H4'   | 1:1:2334:U:H2'    | 2.00                     | 0.44              |
| 1:1:2342:C:O2'   | 1:1:2374:C:OP1    | 2.35                     | 0.44              |
| 1:1:2488:G:H2'   | 1:1:2489:U:H5     | 1.82                     | 0.44              |
| 1:1:2745:C:H2'   | 1:1:2746:U:C6     | 2.53                     | 0.44              |
| 2:2:87:C:H2'     | 2:2:88:U:C6       | 2.52                     | 0.44              |
| 2:2:371:A:H2     | 2:2:374:A:N6      | 2.14                     | 0.44              |
| 2:2:949:A:H2'    | 2:2:950:U:O4'     | 2.17                     | 0.44              |
| 2:2:966:2MG:H4'  | 2:2:969:A:N7      | 2.33                     | 0.44              |
| 2:2:1105:A:H2'   | 2:2:1106:G:H5'    | 2.00                     | 0.44              |
| 2:2:1150:A:N3    | 46:o:41:PRO:HG2   | 2.33                     | 0.44              |
| 2:2:1153:G:C2    | 2:2:1154:G:H1'    | 2.52                     | 0.44              |
| 2:2:1410:A:H2'   | 2:2:1411:C:H6     | 1.81                     | 0.44              |
| 4:6:43:G:H2'     | 4:6:44:A:H8       | 1.83                     | 0.44              |
| 11:F:54:PRO:HB3  | 11:F:61:GLY:CA    | 2.47                     | 0.44              |
| 11:F:87:LEU:HD21 | 11:F:145:ALA:HA   | 1.99                     | 0.44              |
| 18:M:28:PHE:HB2  | 18:M:104:GLU:OE1  | 2.17                     | 0.44              |
| 18:M:75:GLU:OE2  | 18:M:91:TYR:OH    | 2.35                     | 0.44              |
| 39:h:58:GLU:O    | 39:h:65:ARG:N     | 2.49                     | 0.44              |
| 39:h:114:LYS:HA  | 39:h:117:ALA:HB3  | 1.99                     | 0.44              |
| 40:i:49:SER:O    | 40:i:53:VAL:HG13  | 2.17                     | 0.44              |
| 40:i:76:TYR:HA   | 40:i:90:LEU:HD13  | 1.98                     | 0.44              |
| 49:r:26:GLY:O    | 49:r:30:SER:HB3   | 2.18                     | 0.44              |
| 1:1:96:C:C2      | 1:1:97:C:H5       | 2.35                     | 0.44              |
| 1:1:257:C:H2'    | 17:L:104:GLN:HE22 | 1.82                     | 0.44              |
| 1:1:557:C:H2'    | 1:1:558:U:O4'     | 2.17                     | 0.44              |
| 1:1:623:C:H2'    | 1:1:624:C:C5      | 2.53                     | 0.44              |
| 1:1:953:G:C2     | 1:1:954:G:C5      | 3.05                     | 0.44              |
| 1:1:1429:G:H2'   | 1:1:1430:G:H8     | 1.83                     | 0.44              |
| 1:1:2530:A:H4'   | 1:1:2535:G:N1     | 2.28                     | 0.44              |
| 1:1:2831:G:C8    | 8:C:59:ARG:NH2    | 2.74                     | 0.44              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:2:231:U:H2'    | 2:2:232:G:O4'     | 2.17                     | 0.44              |
| 2:2:393:A:OP2    | 52:u:12:LYS:HD2   | 2.18                     | 0.44              |
| 2:2:514:C:H2'    | 2:2:515:G:H8      | 1.82                     | 0.44              |
| 2:2:888:G:H5''   | 2:2:1488:G:H4'    | 1.99                     | 0.44              |
| 2:2:1074:G:H4'   | 38:g:102:THR:CG2  | 2.48                     | 0.44              |
| 3:4:70:C:H2'     | 3:4:71:C:H6       | 1.83                     | 0.44              |
| 7:B:51:THR:HG23  | 7:B:54:ILE:HD12   | 1.99                     | 0.44              |
| 8:C:27:ILE:HG22  | 8:C:29:VAL:HG13   | 1.99                     | 0.44              |
| 11:F:101:ASN:HB2 | 11:F:117:LEU:HB2  | 2.00                     | 0.44              |
| 26:U:19:LYS:HG2  | 26:U:20:GLY:H     | 1.83                     | 0.44              |
| 27:V:70:ILE:HG22 | 27:V:72:VAL:HG13  | 2.00                     | 0.44              |
| 35:d:3:ARG:HD3   | 35:d:3:ARG:HA     | 1.70                     | 0.44              |
| 38:g:160:ALA:HA  | 38:g:181:ILE:HG23 | 1.98                     | 0.44              |
| 39:h:31:ASP:HA   | 50:s:65:ARG:NH2   | 2.33                     | 0.44              |
| 49:r:11:ASP:HA   | 49:r:45:ILE:HB    | 2.00                     | 0.44              |
| 1:1:87:U:O5'     | 1:1:88:G:H5'      | 2.17                     | 0.44              |
| 1:1:392:U:N3     | 1:1:393:C:C5      | 2.86                     | 0.44              |
| 1:1:657:U:H2'    | 1:1:658:U:C6      | 2.53                     | 0.44              |
| 1:1:693:A:O2'    | 1:1:1353:A:N3     | 2.46                     | 0.44              |
| 1:1:846:U:H1'    | 1:1:847:U:C5      | 2.48                     | 0.44              |
| 1:1:1476:U:H2'   | 1:1:1477:A:H8     | 1.83                     | 0.44              |
| 1:1:1736:U:H2'   | 1:1:1737:G:O4'    | 2.18                     | 0.44              |
| 1:1:2006:C:H2'   | 1:1:2007:U:C6     | 2.53                     | 0.44              |
| 1:1:2286:G:H4'   | 1:1:2287:A:O4'    | 2.17                     | 0.44              |
| 1:1:2463:C:C2    | 1:1:2464:G:C8     | 3.06                     | 0.44              |
| 1:1:2544:G:H2'   | 1:1:2545:G:H8     | 1.80                     | 0.44              |
| 2:2:56:U:H2'     | 2:2:57:G:C8       | 2.52                     | 0.44              |
| 2:2:450:G:O6     | 2:2:481:G:C2      | 2.71                     | 0.44              |
| 2:2:494:G:H2'    | 2:2:496:A:H8      | 1.83                     | 0.44              |
| 2:2:546:A:H61    | 40:i:4:TYR:CA     | 2.29                     | 0.44              |
| 2:2:554:A:H2'    | 2:2:555:U:H6      | 1.82                     | 0.44              |
| 2:2:927:G:C4     | 2:2:928:G:N7      | 2.86                     | 0.44              |
| 2:2:1146:A:N3    | 2:2:1146:A:H2'    | 2.32                     | 0.44              |
| 2:2:1410:A:H2'   | 2:2:1411:C:C6     | 2.53                     | 0.44              |
| 6:A:181:ALA:HA   | 6:A:184:HIS:HD2   | 1.83                     | 0.44              |
| 13:H:86:MET:HB3  | 13:H:88:HIS:CE1   | 2.53                     | 0.44              |
| 13:H:101:LYS:O   | 13:H:105:LYS:HG2  | 2.18                     | 0.44              |
| 15:J:54:ILE:CG2  | 15:J:122:LEU:HB2  | 2.46                     | 0.44              |
| 24:S:41:LYS:HE3  | 33:b:22:LEU:HD11  | 1.99                     | 0.44              |
| 24:S:74:ILE:HG12 | 24:S:105:VAL:HG13 | 1.99                     | 0.44              |
| 38:g:161:LEU:HB2 | 38:g:181:ILE:HG21 | 2.00                     | 0.44              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 42:k:26:THR:HA   | 42:k:29:ILE:HG22 | 2.00                     | 0.44              |
| 42:k:29:ILE:HD11 | 42:k:64:VAL:HG13 | 1.99                     | 0.44              |
| 45:n:45:ARG:HB3  | 45:n:49:ARG:HH22 | 1.83                     | 0.44              |
| 46:o:59:LYS:HD2  | 46:o:62:ARG:HE   | 1.83                     | 0.44              |
| 54:w:13:PHE:CE2  | 54:w:55:LEU:HD12 | 2.53                     | 0.44              |
| 1:1:17:G:H5'     | 33:b:11:SER:CA   | 2.48                     | 0.43              |
| 1:1:571:U:P      | 23:R:80:ARG:HH22 | 2.38                     | 0.43              |
| 1:1:1026:G:P     | 1:1:1026:G:H8    | 2.40                     | 0.43              |
| 1:1:1206:G:H2'   | 1:1:1207:C:C5    | 2.52                     | 0.43              |
| 1:1:2325:G:H2'   | 1:1:2326:C:C6    | 2.53                     | 0.43              |
| 1:1:2329:U:H2'   | 1:1:2330:G:O4'   | 2.18                     | 0.43              |
| 1:1:2363:G:H1'   | 28:W:39:ARG:NH2  | 2.33                     | 0.43              |
| 1:1:2526:G:N3    | 37:f:1:MET:N     | 2.66                     | 0.43              |
| 1:1:2623:G:H21   | 33:b:19:HIS:CE1  | 2.35                     | 0.43              |
| 1:1:2796:U:O2'   | 1:1:2798:U:OP2   | 2.36                     | 0.43              |
| 2:2:311:C:OP1    | 52:u:31:ARG:HD2  | 2.18                     | 0.43              |
| 2:2:1090:U:H4'   | 2:2:1171:A:H1'   | 1.99                     | 0.43              |
| 3:4:39:A:H2'     | 3:4:40:U:C6      | 2.53                     | 0.43              |
| 12:G:121:VAL:O   | 12:G:122:LEU:HG  | 2.17                     | 0.43              |
| 22:Q:27:ALA:HB1  | 22:Q:31:VAL:HG22 | 1.99                     | 0.43              |
| 22:Q:52:GLN:O    | 22:Q:55:ARG:HG2  | 2.17                     | 0.43              |
| 23:R:66:HIS:HA   | 23:R:94:THR:HA   | 2.00                     | 0.43              |
| 36:e:23:LYS:HA   | 36:e:49:MET:HA   | 2.00                     | 0.43              |
| 38:g:16:PHE:O    | 38:g:203:ASN:ND2 | 2.49                     | 0.43              |
| 45:n:28:ILE:HG23 | 45:n:63:LEU:HD11 | 2.00                     | 0.43              |
| 49:r:19:LEU:HD11 | 49:r:56:LEU:HD21 | 1.99                     | 0.43              |
| 1:1:18:U:P       | 22:Q:30:ARG:NH1  | 2.91                     | 0.43              |
| 1:1:144:A:H2'    | 1:1:145:C:C6     | 2.52                     | 0.43              |
| 1:1:223:A:H2'    | 1:1:408:G:N2     | 2.32                     | 0.43              |
| 1:1:1021:A:H2'   | 1:1:1022:G:H4'   | 2.01                     | 0.43              |
| 1:1:1484:U:H2'   | 1:1:1485:U:C6    | 2.54                     | 0.43              |
| 1:1:1735:A:H2'   | 1:1:1736:U:C6    | 2.53                     | 0.43              |
| 1:1:1887:C:H3'   | 1:1:1888:G:H8    | 1.83                     | 0.43              |
| 1:1:2324:U:H5''  | 1:1:2326:C:OP1   | 2.17                     | 0.43              |
| 1:1:2497:A:N3    | 1:1:2498:OMC:N3  | 2.65                     | 0.43              |
| 1:1:2571:U:P     | 1:1:2572:A:H5'   | 2.58                     | 0.43              |
| 2:2:2:A:H2       | 2:2:614:C:H1'    | 1.82                     | 0.43              |
| 2:2:63:C:H5'     | 2:2:383:A:H61    | 1.84                     | 0.43              |
| 2:2:918:A:H2'    | 2:2:919:A:C8     | 2.53                     | 0.43              |
| 2:2:933:G:OP2    | 43:l:3:ARG:HB2   | 2.18                     | 0.43              |
| 2:2:940:C:H2'    | 2:2:941:G:C8     | 2.53                     | 0.43              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:2:1013:G:C2    | 2:2:1015:G:H8     | 2.36                     | 0.43              |
| 2:2:1065:U:O2    | 2:2:1066:C:N4     | 2.33                     | 0.43              |
| 2:2:1190:G:OP2   | 39:h:5:VAL:HG22   | 2.18                     | 0.43              |
| 2:2:1254:A:H4'   | 2:2:1357:A:OP1    | 2.18                     | 0.43              |
| 2:2:1339:A:H4'   | 4:5:40:C:O2'      | 2.18                     | 0.43              |
| 4:6:28:U:H2'     | 4:6:29:C:H6       | 1.84                     | 0.43              |
| 7:B:25:HIS:HB3   | 7:B:82:GLU:HG2    | 1.99                     | 0.43              |
| 8:C:25:THR:HG21  | 8:C:193:VAL:CG2   | 2.48                     | 0.43              |
| 14:I:108:ILE:O   | 14:I:111:THR:HG22 | 2.18                     | 0.43              |
| 18:M:70:ASP:OD1  | 18:M:70:ASP:N     | 2.50                     | 0.43              |
| 23:R:32:THR:OG1  | 23:R:62:GLU:OE1   | 2.25                     | 0.43              |
| 1:1:71:A:OP2     | 1:1:112:U:O2'     | 2.35                     | 0.43              |
| 1:1:590:A:H5''   | 9:D:90:GLN:OE1    | 2.18                     | 0.43              |
| 1:1:922:C:C4     | 1:1:923:G:C8      | 3.06                     | 0.43              |
| 1:1:954:G:O3'    | 18:M:86:LYS:NZ    | 2.49                     | 0.43              |
| 1:1:2355:G:C5    | 1:1:2356:U:C4     | 3.06                     | 0.43              |
| 1:1:2530:A:N6    | 11:F:156:PRO:HG3  | 2.33                     | 0.43              |
| 1:1:2739:U:O4    | 1:1:2763:G:H3'    | 2.18                     | 0.43              |
| 1:1:2742:G:OP1   | 37:f:24:ARG:NH2   | 2.48                     | 0.43              |
| 2:2:44:A:C6      | 2:2:45:G:N7       | 2.86                     | 0.43              |
| 2:2:162:A:H2'    | 2:2:163:C:O4'     | 2.19                     | 0.43              |
| 2:2:418:C:H2'    | 2:2:419:C:H6      | 1.82                     | 0.43              |
| 2:2:536:C:H2'    | 2:2:537:G:C8      | 2.52                     | 0.43              |
| 2:2:1218:C:H2'   | 2:2:1219:A:H8     | 1.83                     | 0.43              |
| 2:2:1226:C:N4    | 49:r:103:LYS:HG3  | 2.34                     | 0.43              |
| 2:2:1279:G:O2'   | 2:2:1281:C:OP2    | 2.36                     | 0.43              |
| 2:2:1314:C:H2'   | 2:2:1315:U:C6     | 2.53                     | 0.43              |
| 10:E:34:ILE:HD12 | 10:E:96:MET:HA    | 2.00                     | 0.43              |
| 10:E:70:ALA:HB3  | 10:E:82:GLY:H     | 1.83                     | 0.43              |
| 23:R:2:TYR:CZ    | 23:R:42:ALA:HB3   | 2.53                     | 0.43              |
| 23:R:35:PHE:O    | 23:R:59:ILE:N     | 2.41                     | 0.43              |
| 36:e:26:HIS:HB3  | 36:e:44:LEU:HD22  | 2.00                     | 0.43              |
| 43:l:79:ARG:HG3  | 43:l:79:ARG:O     | 2.19                     | 0.43              |
| 52:u:3:THR:HG1   | 52:u:66:THR:HG1   | 1.63                     | 0.43              |
| 1:1:6:A:H2'      | 1:1:7:G:C8        | 2.54                     | 0.43              |
| 1:1:399:U:H2'    | 1:1:400:G:O4'     | 2.18                     | 0.43              |
| 1:1:493:G:O2'    | 24:S:6:LYS:O      | 2.37                     | 0.43              |
| 1:1:597:G:H21    | 17:L:12:SER:HA    | 1.83                     | 0.43              |
| 1:1:621:A:H2'    | 1:1:621:A:N3      | 2.33                     | 0.43              |
| 1:1:685:A:O2'    | 1:1:773:U:O4      | 2.31                     | 0.43              |
| 1:1:841:G:H2'    | 1:1:842:U:C6      | 2.53                     | 0.43              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:1:988:A:C8      | 31:Z:14:ILE:HD13  | 2.53                     | 0.43              |
| 1:1:1386:C:H2'    | 1:1:1387:A:H8     | 1.83                     | 0.43              |
| 1:1:1538:G:H2'    | 1:1:1539:U:C6     | 2.54                     | 0.43              |
| 1:1:2167:U:H2'    | 1:1:2169:A:OP2    | 2.18                     | 0.43              |
| 1:1:2334:U:H1'    | 20:O:13:ARG:HD2   | 2.00                     | 0.43              |
| 1:1:2336:A:H1'    | 1:1:2385:C:O4'    | 2.18                     | 0.43              |
| 1:1:2345:G:C6     | 1:1:2381:A:C6     | 3.06                     | 0.43              |
| 1:1:2682:A:H4'    | 21:P:56:HIS:CE1   | 2.53                     | 0.43              |
| 1:1:2821:A:OP2    | 8:C:115:GLY:N     | 2.50                     | 0.43              |
| 2:2:472:U:H2'     | 2:2:473:U:C6      | 2.54                     | 0.43              |
| 2:2:693:G:O2'     | 43:l:83:SER:HB2   | 2.19                     | 0.43              |
| 2:2:728:A:H2'     | 2:2:729:A:C8      | 2.53                     | 0.43              |
| 2:2:979:C:O2'     | 50:s:59:ARG:NH2   | 2.46                     | 0.43              |
| 6:A:18:GLN:OE1    | 6:A:54:LYS:HA     | 2.17                     | 0.43              |
| 10:E:107:ALA:O    | 10:E:111:ILE:HG13 | 2.19                     | 0.43              |
| 13:H:38:MET:HA    | 13:H:41:LEU:HG    | 2.00                     | 0.43              |
| 41:j:134:ILE:HG13 | 41:j:135:ASN:N    | 2.33                     | 0.43              |
| 48:q:83:ARG:HG3   | 48:q:84:GLY:N     | 2.33                     | 0.43              |
| 52:u:70:ARG:O     | 52:u:74:LEU:HG    | 2.18                     | 0.43              |
| 1:1:303:G:C6      | 1:1:315:G:C6      | 3.06                     | 0.43              |
| 1:1:576:U:H2'     | 1:1:577:G:C8      | 2.53                     | 0.43              |
| 1:1:822:G:H2'     | 1:1:823:C:C6      | 2.52                     | 0.43              |
| 1:1:937:C:H2'     | 1:1:938:G:C8      | 2.54                     | 0.43              |
| 1:1:996:A:H5'     | 22:Q:61:TRP:CH2   | 2.54                     | 0.43              |
| 1:1:1168:G:N1     | 1:1:1181:U:N3     | 2.27                     | 0.43              |
| 1:1:1528:A:OP2    | 1:1:1543:G:N2     | 2.44                     | 0.43              |
| 1:1:2033:A:C2'    | 1:1:2036:C:H41    | 2.28                     | 0.43              |
| 1:1:2766:A:N6     | 1:1:2767:C:N3     | 2.66                     | 0.43              |
| 1:1:2773:C:C4     | 1:1:2774:C:N4     | 2.87                     | 0.43              |
| 2:2:181:A:C5      | 2:2:194:C:C5      | 3.06                     | 0.43              |
| 2:2:481:G:C4      | 2:2:483:C:N4      | 2.86                     | 0.43              |
| 2:2:1055:A:H62    | 2:2:1200:C:H42    | 1.67                     | 0.43              |
| 2:2:1170:A:C5     | 2:2:1171:A:C5     | 3.06                     | 0.43              |
| 3:4:46:A:H2'      | 3:4:47:C:C6       | 2.54                     | 0.43              |
| 4:5:23:C:H2'      | 4:5:24:U:H6       | 1.83                     | 0.43              |
| 4:5:50:U:H2'      | 4:5:51:C:C6       | 2.53                     | 0.43              |
| 15:J:56:VAL:HB    | 15:J:124:VAL:HA   | 2.01                     | 0.43              |
| 15:J:74:TYR:HB2   | 15:J:87:ALA:HB3   | 2.01                     | 0.43              |
| 18:M:23:GLY:O     | 18:M:100:LYS:HA   | 2.17                     | 0.43              |
| 56:y:86:LEU:HD23  | 56:y:86:LEU:HA    | 1.83                     | 0.43              |
| 1:1:113:U:H5''    | 1:1:114:U:C5'     | 2.49                     | 0.43              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:1:451:U:C4      | 1:1:453:A:C8      | 3.06                     | 0.43              |
| 1:1:533:G:C8      | 1:1:533:G:C3'     | 3.02                     | 0.43              |
| 1:1:666:A:H2'     | 1:1:667:U:C6      | 2.54                     | 0.43              |
| 1:1:967:U:H2'     | 1:1:968:C:C6      | 2.54                     | 0.43              |
| 1:1:1019:U:H5'    | 1:1:1120:G:H21    | 1.82                     | 0.43              |
| 1:1:1186:G:H5''   | 1:1:1187:G:OP2    | 2.17                     | 0.43              |
| 1:1:2069:G7M:HO2' | 1:1:2070:A:C5'    | 2.30                     | 0.43              |
| 1:1:2461:A:C4     | 1:1:2492:U:C2     | 3.06                     | 0.43              |
| 1:1:2479:U:H3'    | 1:1:2480:C:C5'    | 2.48                     | 0.43              |
| 1:1:2755:C:O3'    | 1:1:2756:U:H6     | 2.01                     | 0.43              |
| 1:1:2774:C:C4     | 1:1:2775:G:C5     | 3.07                     | 0.43              |
| 2:2:108:G:H22     | 2:2:326:G:H1      | 1.63                     | 0.43              |
| 2:2:123:U:OP1     | 2:2:311:C:O2'     | 2.35                     | 0.43              |
| 2:2:350:G:H2'     | 2:2:351:G:C8      | 2.54                     | 0.43              |
| 2:2:972:C:H5'     | 46:o:59:LYS:NZ    | 2.33                     | 0.43              |
| 2:2:1130:A:C8     | 2:2:1146:A:C6     | 3.07                     | 0.43              |
| 2:2:1447:A:O2'    | 2:2:1448:C:O5'    | 2.28                     | 0.43              |
| 3:4:14:U:H1'      | 3:4:107:G:H1'     | 2.01                     | 0.43              |
| 7:B:132:MET:HG2   | 7:B:188:CYS:O     | 2.19                     | 0.43              |
| 10:E:128:TYR:HD2  | 10:E:156:ILE:HD12 | 1.83                     | 0.43              |
| 13:H:3:LEU:HD12   | 13:H:5:LEU:N      | 2.34                     | 0.43              |
| 21:P:57:SER:OG    | 21:P:77:HIS:CE1   | 2.71                     | 0.43              |
| 37:f:25:VAL:O     | 37:f:34:LYS:HA    | 2.19                     | 0.43              |
| 38:g:96:TRP:HH2   | 38:g:101:LEU:HD21 | 1.83                     | 0.43              |
| 39:h:119:SER:O    | 39:h:123:GLN:HG3  | 2.18                     | 0.43              |
| 40:i:4:TYR:HD2    | 40:i:8:LYS:NZ     | 2.16                     | 0.43              |
| 40:i:53:VAL:HB    | 40:i:56:ARG:HH21  | 1.84                     | 0.43              |
| 41:j:11:LEU:HB3   | 41:j:39:VAL:HG22  | 2.01                     | 0.43              |
| 42:k:11:HIS:HB3   | 42:k:14:GLN:HB3   | 2.00                     | 0.43              |
| 46:o:54:SER:HB2   | 46:o:58:ASN:HB2   | 2.01                     | 0.43              |
| 52:u:13:LYS:O     | 52:u:14:ARG:NE    | 2.50                     | 0.43              |
| 1:1:857:G:N2      | 1:1:2269:G:H5'    | 2.33                     | 0.43              |
| 1:1:922:C:O2'     | 28:W:29:GLU:OE2   | 2.22                     | 0.43              |
| 1:1:1538:G:H2'    | 1:1:1539:U:H6     | 1.84                     | 0.43              |
| 1:1:2114:A:H61    | 1:1:2170:A:N6     | 2.17                     | 0.43              |
| 1:1:2241:A:H2'    | 1:1:2242:G:C8     | 2.54                     | 0.43              |
| 1:1:2280:G:H1'    | 1:1:2388:A:H2     | 1.83                     | 0.43              |
| 1:1:2385:C:H2'    | 1:1:2386:A:H8     | 1.80                     | 0.43              |
| 1:1:2681:C:H5'    | 8:C:8:LYS:HZ1     | 1.82                     | 0.43              |
| 2:2:859:G:H2'     | 2:2:860:A:C8      | 2.54                     | 0.43              |
| 2:2:960:U:H2'     | 2:2:1225:A:H62    | 1.83                     | 0.43              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:2:1144:G:N2    | 2:2:1146:A:H62   | 2.10                     | 0.43              |
| 3:4:18:G:O6      | 3:4:65:U:O4      | 2.37                     | 0.43              |
| 3:4:76:G:O2'     | 27:V:87:GLN:OE1  | 2.37                     | 0.43              |
| 3:4:79:G:H5''    | 18:M:18:ARG:NH2  | 2.33                     | 0.43              |
| 3:4:108:A:H3'    | 3:4:109:A:H4'    | 2.01                     | 0.43              |
| 7:B:37:ASN:HB2   | 7:B:62:TYR:HB2   | 2.01                     | 0.43              |
| 9:D:181:ILE:HG22 | 17:L:3:LEU:HA    | 2.01                     | 0.43              |
| 15:J:29:ALA:HA   | 15:J:32:LEU:HB2  | 2.01                     | 0.43              |
| 40:i:128:ARG:NH2 | 40:i:135:TYR:OH  | 2.51                     | 0.43              |
| 52:u:36:VAL:HG12 | 52:u:52:LEU:HA   | 2.00                     | 0.43              |
| 1:1:326:G:H2'    | 1:1:327:G:C8     | 2.54                     | 0.43              |
| 1:1:511:U:H4'    | 1:1:1235:G:H4'   | 1.99                     | 0.43              |
| 1:1:548:G:H3'    | 1:1:549:G:C8     | 2.53                     | 0.43              |
| 1:1:557:C:C5'    | 15:J:113:PRO:HG2 | 2.48                     | 0.43              |
| 1:1:1125:G:H5'   | 37:f:38:GLY:HA2  | 1.99                     | 0.43              |
| 2:2:552:U:C2'    | 2:2:553:A:H5'    | 2.49                     | 0.43              |
| 2:2:1066:C:H5''  | 2:2:1386:G:H21   | 1.84                     | 0.43              |
| 2:2:1238:A:OP2   | 2:2:1335:U:H1'   | 2.18                     | 0.43              |
| 3:4:94:A:H5''    | 27:V:19:ARG:NH1  | 2.34                     | 0.43              |
| 25:T:58:VAL:HG22 | 25:T:85:VAL:HG23 | 2.01                     | 0.43              |
| 36:e:24:HIS:ND1  | 36:e:25:LYS:O    | 2.48                     | 0.43              |
| 38:g:166:ALA:O   | 38:g:170:HIS:HB3 | 2.19                     | 0.43              |
| 40:i:19:LEU:HD12 | 40:i:19:LEU:O    | 2.19                     | 0.43              |
| 41:j:50:TYR:O    | 41:j:66:LYS:HD2  | 2.18                     | 0.43              |
| 1:1:552:U:H2'    | 1:1:553:G:C8     | 2.53                     | 0.43              |
| 1:1:1096:A:H2'   | 1:1:1097:U:O4'   | 2.18                     | 0.43              |
| 1:1:1428:C:OP2   | 7:B:28:LYS:NZ    | 2.48                     | 0.43              |
| 1:1:1588:G:O2'   | 1:1:1589:U:H5'   | 2.19                     | 0.43              |
| 1:1:1657:U:H2'   | 1:1:1658:C:C6    | 2.54                     | 0.43              |
| 1:1:1812:U:H2'   | 1:1:1813:G:C8    | 2.54                     | 0.43              |
| 1:1:2345:G:H5''  | 1:1:2347:C:H5''  | 2.01                     | 0.43              |
| 1:1:2466:C:C5'   | 37:f:5:ALA:HB3   | 2.48                     | 0.43              |
| 1:1:2482:A:H61   | 18:M:55:ARG:HH22 | 1.67                     | 0.43              |
| 1:1:2729:G:O2'   | 8:C:175:LEU:HD23 | 2.18                     | 0.43              |
| 2:2:180:U:H2'    | 2:2:181:A:C8     | 2.53                     | 0.43              |
| 2:2:363:A:H2'    | 2:2:364:A:C8     | 2.53                     | 0.43              |
| 2:2:373:A:C2     | 2:2:481:G:N2     | 2.87                     | 0.43              |
| 2:2:1049:U:OP2   | 2:2:1050:G:H5''  | 2.19                     | 0.43              |
| 2:2:1267:C:H42   | 49:r:29:ARG:CZ   | 2.32                     | 0.43              |
| 2:2:1443:C:H2'   | 2:2:1444:U:O4'   | 2.19                     | 0.43              |
| 7:B:35:GLU:HG2   | 7:B:36:LYS:N     | 2.34                     | 0.43              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 15:J:3:THR:HG21  | 22:Q:61:TRP:HE1   | 1.84                     | 0.43              |
| 18:M:16:ARG:HH11 | 18:M:18:ARG:HD2   | 1.83                     | 0.43              |
| 18:M:33:LEU:O    | 18:M:101:VAL:HA   | 2.18                     | 0.43              |
| 33:b:43:ILE:HD12 | 33:b:47:GLY:HA2   | 2.00                     | 0.43              |
| 47:p:82:LEU:N    | 47:p:106:ARG:O    | 2.51                     | 0.43              |
| 55:x:19:VAL:HG11 | 55:x:44:MET:HE1   | 2.01                     | 0.43              |
| 1:1:240:C:H2'    | 1:1:256:A:N6      | 2.34                     | 0.43              |
| 1:1:479:A:N6     | 1:1:481:G:H21     | 2.16                     | 0.43              |
| 1:1:630:G:H2'    | 1:1:631:A:H5''    | 2.01                     | 0.43              |
| 1:1:650:C:C4     | 1:1:651:G:C5      | 3.07                     | 0.43              |
| 1:1:956:G:O2'    | 1:1:959:A:N7      | 2.35                     | 0.43              |
| 1:1:968:C:H4'    | 31:Z:17:LEU:CD1   | 2.48                     | 0.43              |
| 1:1:1043:C:H2'   | 1:1:1044:C:O4'    | 2.19                     | 0.43              |
| 1:1:1138:G:C6    | 1:1:1139:G:H1'    | 2.54                     | 0.43              |
| 1:1:2028:U:O2    | 1:1:2033:A:N7     | 2.52                     | 0.43              |
| 1:1:2052:A:O2'   | 8:C:148:GLN:O     | 2.22                     | 0.43              |
| 1:1:2303:G:H2'   | 1:1:2304:G:H8     | 1.81                     | 0.43              |
| 1:1:2356:U:H4'   | 28:W:20:ARG:NE    | 2.34                     | 0.43              |
| 1:1:2698:U:H2'   | 1:1:2699:C:C6     | 2.54                     | 0.43              |
| 2:2:109:A:C8     | 2:2:326:G:H2'     | 2.53                     | 0.43              |
| 2:2:674:G:H2'    | 2:2:675:A:C8      | 2.53                     | 0.43              |
| 2:2:937:A:C4     | 2:2:938:A:C8      | 3.07                     | 0.43              |
| 2:2:1056:U:H2'   | 2:2:1057:G:C8     | 2.54                     | 0.43              |
| 2:2:1076:U:H2'   | 2:2:1077:G:H5'    | 2.01                     | 0.43              |
| 2:2:1227:A:H5'   | 49:r:110:LYS:NZ   | 2.34                     | 0.43              |
| 2:2:1454:G:H2'   | 2:2:1455:G:C8     | 2.54                     | 0.43              |
| 3:4:104:A:H1'    | 27:V:31:TYR:CE1   | 2.53                     | 0.43              |
| 4:5:32:C:H3'     | 45:n:130:ARG:HH22 | 1.84                     | 0.43              |
| 4:5:54:U:O4      | 4:5:58:A:N7       | 2.52                     | 0.43              |
| 8:C:82:PHE:CD2   | 8:C:204:LYS:HE3   | 2.53                     | 0.43              |
| 18:M:12:MET:SD   | 18:M:13:HIS:N     | 2.92                     | 0.43              |
| 18:M:29:GLY:N    | 18:M:104:GLU:OE1  | 2.52                     | 0.43              |
| 19:N:57:THR:HG23 | 19:N:62:ASN:ND2   | 2.33                     | 0.43              |
| 20:O:40:ILE:HG12 | 20:O:47:VAL:HG12  | 2.00                     | 0.43              |
| 27:V:24:ASN:O    | 27:V:25:LYS:HG3   | 2.19                     | 0.43              |
| 34:c:13:SER:HB2  | 34:c:49:TYR:CE1   | 2.54                     | 0.43              |
| 1:1:479:A:H62    | 1:1:481:G:N2      | 2.18                     | 0.42              |
| 1:1:572:A:H8     | 1:1:572:A:O5'     | 2.01                     | 0.42              |
| 1:1:641:U:O5'    | 1:1:641:U:H6      | 2.01                     | 0.42              |
| 1:1:805:G:O4'    | 17:L:38:GLN:HG3   | 2.19                     | 0.42              |
| 1:1:882:G:N2     | 1:1:895:U:O4'     | 2.52                     | 0.42              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 1:1:1166:G:N2     | 1:1:1184:U:H1'   | 2.33                     | 0.42              |
| 1:1:1469:A:H2'    | 1:1:1470:A:C8    | 2.54                     | 0.42              |
| 1:1:1794:A:H2'    | 1:1:1795:C:H6    | 1.84                     | 0.42              |
| 1:1:2246:G:H2'    | 1:1:2247:A:H8    | 1.83                     | 0.42              |
| 1:1:2396:G:N1     | 1:1:2421:G:C6    | 2.87                     | 0.42              |
| 1:1:2571:U:H2'    | 1:1:2574:G:O2'   | 2.19                     | 0.42              |
| 1:1:2633:G:H4'    | 8:C:61:THR:HG21  | 2.00                     | 0.42              |
| 1:1:2884:U:O2     | 33:b:49:TYR:OH   | 2.18                     | 0.42              |
| 2:2:45:G:H2'      | 2:2:46:G:C8      | 2.54                     | 0.42              |
| 2:2:374:A:H4'     | 2:2:452:A:C6     | 2.54                     | 0.42              |
| 2:2:378:G:N1      | 2:2:386:C:N4     | 2.67                     | 0.42              |
| 2:2:414:A:P       | 2:2:428:G:H22    | 2.40                     | 0.42              |
| 2:2:431:A:H2'     | 2:2:432:A:C8     | 2.54                     | 0.42              |
| 3:4:18:G:H2'      | 3:4:19:C:C6      | 2.54                     | 0.42              |
| 3:4:49:C:H2'      | 3:4:50:A:H8      | 1.83                     | 0.42              |
| 6:A:3:GLU:OE2     | 6:A:61:LYS:HG3   | 2.19                     | 0.42              |
| 8:C:110:THR:HG21  | 8:C:169:ARG:HG2  | 2.01                     | 0.42              |
| 9:D:19:PHE:CE1    | 9:D:109:LEU:HB3  | 2.54                     | 0.42              |
| 22:Q:41:LYS:HD2   | 22:Q:45:TYR:CD1  | 2.54                     | 0.42              |
| 38:g:179:LEU:HD23 | 38:g:179:LEU:O   | 2.18                     | 0.42              |
| 39:h:11:ARG:HB3   | 39:h:15:VAL:HG22 | 2.00                     | 0.42              |
| 39:h:25:ASN:O     | 39:h:29:PHE:HB2  | 2.19                     | 0.42              |
| 40:i:52:GLY:O     | 40:i:56:ARG:HG3  | 2.19                     | 0.42              |
| 51:t:24:SER:O     | 51:t:28:GLN:HG3  | 2.19                     | 0.42              |
| 1:1:305:C:N4      | 1:1:313:G:N1     | 2.67                     | 0.42              |
| 1:1:307:G:N2      | 1:1:309:A:H3'    | 2.34                     | 0.42              |
| 1:1:1073:A:H2'    | 1:1:1074:G:C8    | 2.54                     | 0.42              |
| 1:1:1166:G:H2'    | 1:1:1167:C:O4'   | 2.19                     | 0.42              |
| 1:1:2028:U:O5'    | 1:1:2028:U:H6    | 2.03                     | 0.42              |
| 1:1:2192:U:H2'    | 1:1:2193:G:C8    | 2.54                     | 0.42              |
| 1:1:2394:C:H2'    | 1:1:2395:C:O4'   | 2.19                     | 0.42              |
| 1:1:2461:A:C4     | 1:1:2492:U:O2    | 2.72                     | 0.42              |
| 1:1:2513:A:C2     | 1:1:2574:G:C2    | 3.07                     | 0.42              |
| 1:1:2524:G:C2     | 1:1:2525:G:N7    | 2.87                     | 0.42              |
| 1:1:2545:G:H2'    | 1:1:2546:U:O4'   | 2.18                     | 0.42              |
| 1:1:2619:C:H4'    | 8:C:157:LYS:HA   | 1.99                     | 0.42              |
| 1:1:2819:G:P      | 19:N:2:ARG:HH12  | 2.42                     | 0.42              |
| 2:2:109:A:C5      | 2:2:327:A:N7     | 2.88                     | 0.42              |
| 2:2:979:C:O2      | 2:2:979:C:H2'    | 2.19                     | 0.42              |
| 2:2:1014:A:H5''   | 55:x:14:HIS:HB2  | 2.01                     | 0.42              |
| 2:2:1227:A:H5''   | 55:x:83:HIS:CE1  | 2.54                     | 0.42              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:2:1259:C:O2'   | 2:2:1283:U:O2     | 2.37                     | 0.42              |
| 7:B:145:GLU:HB2  | 7:B:188:CYS:HB3   | 2.01                     | 0.42              |
| 9:D:126:VAL:HG13 | 9:D:157:LEU:HD21  | 2.01                     | 0.42              |
| 12:G:51:ARG:O    | 12:G:55:GLU:HG3   | 2.19                     | 0.42              |
| 14:I:103:ALA:O   | 14:I:107:GLU:HG2  | 2.19                     | 0.42              |
| 15:J:78:THR:OG1  | 15:J:80:HIS:O     | 2.37                     | 0.42              |
| 15:J:130:HIS:HE1 | 15:J:133:ALA:HB2  | 1.85                     | 0.42              |
| 27:V:55:GLU:HB2  | 27:V:59:GLU:HG3   | 2.01                     | 0.42              |
| 38:g:162:PHE:HE2 | 38:g:214:LEU:HD23 | 1.83                     | 0.42              |
| 39:h:151:VAL:O   | 39:h:168:TYR:N    | 2.37                     | 0.42              |
| 43:l:25:LYS:O    | 43:l:29:ILE:HG13  | 2.19                     | 0.42              |
| 43:l:31:MET:HB2  | 43:l:39:ALA:HB2   | 2.00                     | 0.42              |
| 43:l:147:ALA:O   | 47:p:56:ARG:HD2   | 2.19                     | 0.42              |
| 45:n:88:MET:HG3  | 45:n:95:ARG:HB2   | 2.00                     | 0.42              |
| 55:x:13:LEU:HD11 | 55:x:17:LYS:HE2   | 2.01                     | 0.42              |
| 56:y:79:LEU:HD23 | 56:y:79:LEU:HA    | 1.93                     | 0.42              |
| 1:1:535:G:H2'    | 1:1:536:G:O4'     | 2.18                     | 0.42              |
| 1:1:1433:A:H2'   | 1:1:1434:A:H8     | 1.84                     | 0.42              |
| 1:1:2342:C:H1'   | 1:1:2374:C:H5''   | 2.00                     | 0.42              |
| 1:1:2451:A:H2'   | 1:1:2452:C:H5''   | 2.01                     | 0.42              |
| 1:1:2602:A:H8    | 4:5:74:C:H5''     | 1.84                     | 0.42              |
| 2:2:59:A:H3'     | 2:2:60:A:C5'      | 2.50                     | 0.42              |
| 2:2:105:G:H21    | 2:2:380:G:H5'     | 1.84                     | 0.42              |
| 2:2:321:A:H2'    | 2:2:322:C:C6      | 2.54                     | 0.42              |
| 2:2:600:A:H2'    | 2:2:601:G:C8      | 2.54                     | 0.42              |
| 2:2:864:A:H5''   | 41:j:90:THR:HG23  | 1.99                     | 0.42              |
| 2:2:927:G:C6     | 2:2:928:G:C6      | 3.07                     | 0.42              |
| 2:2:1066:C:O2    | 2:2:1066:C:H2'    | 2.19                     | 0.42              |
| 2:2:1250:A:H2    | 2:2:1370:G:H1'    | 1.84                     | 0.42              |
| 2:2:1251:A:N6    | 2:2:1354:U:O2'    | 2.35                     | 0.42              |
| 2:2:1444:U:H2'   | 2:2:1445:U:C6     | 2.54                     | 0.42              |
| 4:6:51:U:H2'     | 4:6:52:C:C6       | 2.53                     | 0.42              |
| 26:U:84:GLY:C    | 26:U:85:PHE:HD1   | 2.27                     | 0.42              |
| 27:V:72:VAL:HB   | 27:V:91:PHE:HB3   | 2.00                     | 0.42              |
| 39:h:68:ILE:C    | 39:h:104:ALA:HB3  | 2.44                     | 0.42              |
| 39:h:105:GLU:CD  | 39:h:107:ARG:NH1  | 2.77                     | 0.42              |
| 40:i:98:LEU:HD23 | 40:i:132:ILE:O    | 2.19                     | 0.42              |
| 1:1:26:G:H21     | 1:1:514:A:H62     | 1.67                     | 0.42              |
| 1:1:216:A:C8     | 1:1:432:A:N6      | 2.87                     | 0.42              |
| 1:1:651:G:H4'    | 36:e:18:GLY:HA3   | 2.01                     | 0.42              |
| 1:1:809:G:C5     | 1:1:810:U:C4      | 3.08                     | 0.42              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 1:1:817:C:H5''    | 1:1:818:G:OP2    | 2.20                     | 0.42              |
| 1:1:1021:A:H5'    | 1:1:1022:G:OP2   | 2.19                     | 0.42              |
| 1:1:1075:C:H2'    | 1:1:1076:C:C6    | 2.54                     | 0.42              |
| 1:1:1154:G:O2'    | 1:1:1155:A:OP1   | 2.35                     | 0.42              |
| 1:1:1405:U:H2'    | 1:1:1406:U:H6    | 1.84                     | 0.42              |
| 1:1:2487:G:N3     | 1:1:2488:G:H1'   | 2.35                     | 0.42              |
| 1:1:2523:G:H1'    | 1:1:2765:A:H62   | 1.84                     | 0.42              |
| 1:1:2674:G:H1'    | 16:K:27:GLY:HA3  | 2.01                     | 0.42              |
| 2:2:73:C:O2'      | 2:2:74:A:H5'     | 2.19                     | 0.42              |
| 2:2:262:A:H8      | 2:2:262:A:OP1    | 2.02                     | 0.42              |
| 2:2:451:A:H4'     | 2:2:452:A:C8     | 2.55                     | 0.42              |
| 2:2:454:G:H2'     | 2:2:455:G:C8     | 2.54                     | 0.42              |
| 2:2:606:G:H2'     | 2:2:631:C:C4     | 2.55                     | 0.42              |
| 2:2:627:G:H2'     | 2:2:628:G:O4'    | 2.19                     | 0.42              |
| 2:2:925:G:N1      | 2:2:927:G:N7     | 2.67                     | 0.42              |
| 2:2:1125:U:O2'    | 2:2:1126:U:O5'   | 2.32                     | 0.42              |
| 2:2:1171:A:H2'    | 2:2:1172:C:C6    | 2.51                     | 0.42              |
| 12:G:51:ARG:NH2   | 12:G:54:LEU:HD13 | 2.34                     | 0.42              |
| 17:L:111:ILE:HA   | 17:L:131:ALA:HB2 | 2.01                     | 0.42              |
| 38:g:187:VAL:HG21 | 38:g:193:PRO:HB3 | 2.02                     | 0.42              |
| 40:i:65:TYR:CZ    | 40:i:94:LEU:HB3  | 2.55                     | 0.42              |
| 40:i:97:ARG:HG2   | 40:i:99:ASP:OD1  | 2.19                     | 0.42              |
| 44:m:89:LYS:HG3   | 44:m:120:GLY:HA2 | 2.02                     | 0.42              |
| 1:1:23:G:H21      | 24:S:77:ASP:HB3  | 1.83                     | 0.42              |
| 1:1:351:C:C2      | 1:1:352:A:C8     | 3.07                     | 0.42              |
| 1:1:636:G:H5''    | 17:L:129:LYS:HG2 | 2.02                     | 0.42              |
| 1:1:640:C:H2'     | 1:1:641:U:H5     | 1.83                     | 0.42              |
| 1:1:1021:A:O2'    | 1:1:1023:U:H5'   | 2.19                     | 0.42              |
| 1:1:1131:G:H21    | 15:J:77:HIS:HB3  | 1.84                     | 0.42              |
| 1:1:1184:U:C4     | 1:1:1185:G:N7    | 2.87                     | 0.42              |
| 1:1:1216:G:H3'    | 1:1:1217:U:C6    | 2.55                     | 0.42              |
| 1:1:1564:C:H2'    | 1:1:1565:C:C6    | 2.54                     | 0.42              |
| 1:1:1855:U:O2'    | 1:1:1856:U:H5'   | 2.19                     | 0.42              |
| 1:1:2069:G7M:O2'  | 1:1:2070:A:O5'   | 2.30                     | 0.42              |
| 1:1:2345:G:C6     | 1:1:2381:A:C5    | 3.07                     | 0.42              |
| 1:1:2530:A:O2'    | 1:1:2535:G:O6    | 2.28                     | 0.42              |
| 1:1:2572:A:OP1    | 1:1:2572:A:C8    | 2.72                     | 0.42              |
| 1:1:2633:G:H2'    | 1:1:2634:A:O4'   | 2.19                     | 0.42              |
| 1:1:2649:C:O2'    | 1:1:2650:U:O4'   | 2.19                     | 0.42              |
| 1:1:2674:G:N3     | 1:1:2674:G:H2'   | 2.33                     | 0.42              |
| 2:2:51:A:N7       | 2:2:114:U:O2'    | 2.51                     | 0.42              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:2:503:C:H2'    | 2:2:504:C:C6      | 2.54                     | 0.42              |
| 2:2:539:A:C6     | 2:2:540:G:C5      | 3.08                     | 0.42              |
| 2:2:1074:G:H8    | 2:2:1074:G:O5'    | 2.02                     | 0.42              |
| 3:4:45:A:N3      | 3:4:45:A:H2'      | 2.34                     | 0.42              |
| 8:C:1:MET:HE1    | 8:C:205:PRO:HG2   | 2.00                     | 0.42              |
| 8:C:104:VAL:HG22 | 8:C:105:LYS:H     | 1.85                     | 0.42              |
| 13:H:11:ILE:O    | 13:H:14:GLU:HG3   | 2.20                     | 0.42              |
| 13:H:15:VAL:HG13 | 13:H:69:PHE:CG    | 2.55                     | 0.42              |
| 18:M:2:LEU:HB3   | 18:M:68:PHE:CE1   | 2.54                     | 0.42              |
| 19:N:1:MET:O     | 19:N:5:LYS:HE3    | 2.20                     | 0.42              |
| 21:P:9:GLU:O     | 21:P:13:MET:HG2   | 2.20                     | 0.42              |
| 26:U:4:LYS:HG2   | 26:U:83:VAL:HB    | 2.01                     | 0.42              |
| 26:U:22:ARG:C    | 26:U:39:ILE:HD11  | 2.44                     | 0.42              |
| 38:g:87:CYS:HB2  | 38:g:221:VAL:HB   | 2.01                     | 0.42              |
| 38:g:166:ALA:HB2 | 38:g:187:VAL:HG22 | 2.00                     | 0.42              |
| 39:h:40:ARG:NH2  | 39:h:55:ILE:O     | 2.46                     | 0.42              |
| 46:o:28:THR:O    | 46:o:31:ARG:HG2   | 2.20                     | 0.42              |
| 1:1:246:C:OP2    | 1:1:249:C:N4      | 2.52                     | 0.42              |
| 1:1:458:G:O2'    | 35:d:39:ARG:HD3   | 2.20                     | 0.42              |
| 1:1:636:G:C5     | 17:L:111:ILE:HG21 | 2.54                     | 0.42              |
| 1:1:1149:G:H2'   | 1:1:1150:C:H5'    | 2.02                     | 0.42              |
| 1:1:1200:C:C4    | 1:1:1201:U:C5     | 3.07                     | 0.42              |
| 1:1:1386:C:H2'   | 1:1:1387:A:C8     | 2.55                     | 0.42              |
| 1:1:2260:C:O2'   | 1:1:2389:G:OP1    | 2.37                     | 0.42              |
| 1:1:2346:A:H5'   | 1:1:2383:G:O4'    | 2.20                     | 0.42              |
| 1:1:2640:G:C6    | 1:1:2641:G:O6     | 2.73                     | 0.42              |
| 1:1:2683:C:C5    | 1:1:2684:U:C6     | 3.07                     | 0.42              |
| 1:1:2748:A:H2'   | 1:1:2749:A:O4'    | 2.20                     | 0.42              |
| 1:1:2834:G:H4'   | 8:C:56:LYS:HE2    | 2.02                     | 0.42              |
| 2:2:60:A:P       | 2:2:386:C:O2'     | 2.77                     | 0.42              |
| 2:2:419:C:OP1    | 2:2:513:C:O2'     | 2.37                     | 0.42              |
| 2:2:523:A:N6     | 48:q:88:LYS:HB3   | 2.34                     | 0.42              |
| 2:2:737:C:H2'    | 2:2:738:C:H6      | 1.83                     | 0.42              |
| 2:2:945:G:N3     | 2:2:945:G:H2'     | 2.34                     | 0.42              |
| 2:2:1125:U:N3    | 2:2:1127:G:C8     | 2.87                     | 0.42              |
| 2:2:1181:G:H1'   | 2:2:1182:G:C4     | 2.54                     | 0.42              |
| 2:2:1308:U:H2'   | 2:2:1309:G:C8     | 2.55                     | 0.42              |
| 2:2:1321:U:H2'   | 2:2:1322:C:C5     | 2.54                     | 0.42              |
| 2:2:1442:G:C6    | 2:2:1461:G:C2     | 3.08                     | 0.42              |
| 2:2:1465:A:H2'   | 2:2:1466:C:C6     | 2.54                     | 0.42              |
| 2:2:1477:U:H2'   | 2:2:1478:U:C6     | 2.54                     | 0.42              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 20:O:62:LEU:HD13 | 20:O:70:ALA:HA    | 2.01                     | 0.42              |
| 24:S:51:LEU:O    | 24:S:55:ILE:HG13  | 2.19                     | 0.42              |
| 28:W:36:ILE:HG22 | 28:W:37:ILE:N     | 2.34                     | 0.42              |
| 39:h:180:ALA:O   | 39:h:182:ILE:N    | 2.51                     | 0.42              |
| 42:k:18:VAL:HG12 | 42:k:22:ILE:HD11  | 2.00                     | 0.42              |
| 42:k:43:GLY:HA2  | 42:k:58:HIS:CE1   | 2.54                     | 0.42              |
| 49:r:26:GLY:O    | 49:r:30:SER:CB    | 2.67                     | 0.42              |
| 52:u:9:HIS:O     | 52:u:16:PHE:HB3   | 2.19                     | 0.42              |
| 55:x:3:ARG:NE    | 55:x:8:GLY:O      | 2.52                     | 0.42              |
| 1:1:830:G:O3'    | 1:1:831:G:H8      | 2.03                     | 0.42              |
| 1:1:918:A:C8     | 1:1:2268:A:N6     | 2.88                     | 0.42              |
| 1:1:921:C:N4     | 1:1:922:C:N4      | 2.68                     | 0.42              |
| 1:1:1199:U:H2'   | 1:1:1200:C:H6     | 1.84                     | 0.42              |
| 1:1:1246:A:H2'   | 1:1:1247:A:O4'    | 2.20                     | 0.42              |
| 1:1:1877:A:H2'   | 1:1:1878:G:C8     | 2.54                     | 0.42              |
| 1:1:2514:U:H1'   | 8:C:148:GLN:NE2   | 2.35                     | 0.42              |
| 2:2:246:A:C2     | 2:2:282:A:C5      | 3.07                     | 0.42              |
| 2:2:330:C:H2'    | 2:2:331:G:C8      | 2.53                     | 0.42              |
| 2:2:374:A:O2'    | 2:2:375:U:H5'     | 2.20                     | 0.42              |
| 2:2:413:G:H21    | 2:2:428:G:H1'     | 1.83                     | 0.42              |
| 2:2:427:U:C4     | 2:2:428:G:C6      | 3.07                     | 0.42              |
| 4:5:15:C:H1'     | 4:5:59:A:H2       | 1.84                     | 0.42              |
| 8:C:49:GLN:HG3   | 8:C:81:GLU:HG2    | 2.01                     | 0.42              |
| 11:F:92:VAL:O    | 11:F:92:VAL:HG23  | 2.19                     | 0.42              |
| 12:G:122:LEU:O   | 12:G:122:LEU:HD12 | 2.19                     | 0.42              |
| 22:Q:41:LYS:HD2  | 22:Q:45:TYR:CZ    | 2.55                     | 0.42              |
| 28:W:70:GLU:OE2  | 28:W:81:SER:HB3   | 2.20                     | 0.42              |
| 40:i:59:GLN:O    | 40:i:63:ARG:HG3   | 2.20                     | 0.42              |
| 40:i:203:LEU:O   | 40:i:206:LYS:HG2  | 2.19                     | 0.42              |
| 57:z:4:ILE:HG21  | 57:z:19:PHE:HB2   | 2.01                     | 0.42              |
| 1:1:259:G:H2'    | 1:1:260:G:C8      | 2.54                     | 0.42              |
| 1:1:386:G:O3'    | 1:1:388:G:N2      | 2.53                     | 0.42              |
| 1:1:598:U:H2'    | 1:1:599:A:H8      | 1.84                     | 0.42              |
| 1:1:1027:A:N3    | 1:1:1027:A:H2'    | 2.35                     | 0.42              |
| 1:1:1029:A:H62   | 1:1:1125:G:H21    | 1.34                     | 0.42              |
| 1:1:2267:A:N1    | 1:1:2271:G:N1     | 2.68                     | 0.42              |
| 1:1:2744:G:OP2   | 1:1:2755:C:N4     | 2.53                     | 0.42              |
| 1:1:2774:C:N4    | 1:1:2775:G:C2     | 2.88                     | 0.42              |
| 2:2:13:U:O4      | 2:2:20:U:O4       | 2.37                     | 0.42              |
| 2:2:236:A:H2'    | 2:2:237:G:C8      | 2.54                     | 0.42              |
| 2:2:298:A:H2'    | 2:2:299:G:C8      | 2.54                     | 0.42              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:2:512:U:O4'    | 40:i:41:HIS:HE1  | 2.02                     | 0.42              |
| 2:2:523:A:N6     | 48:q:88:LYS:H    | 2.11                     | 0.42              |
| 2:2:864:A:H2'    | 2:2:865:A:C8     | 2.54                     | 0.42              |
| 2:2:868:C:H2'    | 2:2:869:G:O4'    | 2.20                     | 0.42              |
| 2:2:1113:C:H2'   | 2:2:1114:C:H6    | 1.85                     | 0.42              |
| 2:2:1115:U:H2'   | 2:2:1116:U:O4'   | 2.20                     | 0.42              |
| 2:2:1220:G:OP1   | 55:x:37:ARG:NH2  | 2.53                     | 0.42              |
| 2:2:1289:A:N6    | 2:2:1371:G:O2'   | 2.52                     | 0.42              |
| 3:4:12:C:O2'     | 28:W:74:PRO:HA   | 2.20                     | 0.42              |
| 3:4:51:G:H2'     | 3:4:52:A:C8      | 2.55                     | 0.42              |
| 3:4:56:G:P       | 3:4:56:G:H8      | 2.43                     | 0.42              |
| 8:C:105:LYS:O    | 8:C:177:VAL:N    | 2.50                     | 0.42              |
| 9:D:32:VAL:HG12  | 9:D:177:PRO:HB2  | 2.01                     | 0.42              |
| 15:J:21:THR:OG1  | 15:J:61:LYS:HD2  | 2.19                     | 0.42              |
| 17:L:129:LYS:HG3 | 17:L:130:GLY:N   | 2.35                     | 0.42              |
| 22:Q:90:ILE:HD11 | 23:R:40:MET:CE   | 2.50                     | 0.42              |
| 26:U:29:LEU:N    | 26:U:33:LYS:O    | 2.50                     | 0.42              |
| 38:g:25:PRO:C    | 38:g:27:MET:H    | 2.28                     | 0.42              |
| 38:g:105:LYS:HG3 | 38:g:106:THR:N   | 2.34                     | 0.42              |
| 38:g:188:ASP:HB3 | 38:g:190:ASN:OD1 | 2.19                     | 0.42              |
| 40:i:60:LYS:O    | 40:i:64:ILE:HG13 | 2.19                     | 0.42              |
| 43:l:116:MET:HG2 | 43:l:119:ARG:NH2 | 2.35                     | 0.42              |
| 47:p:53:ARG:HB2  | 47:p:56:ARG:NH2  | 2.34                     | 0.42              |
| 1:1:78:U:H2'     | 1:1:79:C:C6      | 2.55                     | 0.42              |
| 1:1:87:U:OP1     | 1:1:88:G:H5'     | 2.20                     | 0.42              |
| 1:1:533:G:H2'    | 1:1:534:U:O4'    | 2.19                     | 0.42              |
| 1:1:641:U:H2'    | 1:1:642:U:C2     | 2.55                     | 0.42              |
| 1:1:721:A:H2'    | 1:1:722:A:C8     | 2.55                     | 0.42              |
| 1:1:856:G:C2     | 1:1:857:G:C6     | 3.08                     | 0.42              |
| 1:1:901:C:H2'    | 1:1:902:C:C6     | 2.55                     | 0.42              |
| 1:1:2420:C:C2    | 1:1:2421:G:N7    | 2.88                     | 0.42              |
| 1:1:2659:G:N2    | 1:1:2662:A:C8    | 2.87                     | 0.42              |
| 1:1:2773:C:H2'   | 1:1:2774:C:C6    | 2.55                     | 0.42              |
| 2:2:192:A:H2'    | 2:2:193:C:O4'    | 2.20                     | 0.42              |
| 2:2:231:U:H2'    | 2:2:232:G:C1'    | 2.50                     | 0.42              |
| 2:2:232:G:N3     | 2:2:233:C:C5     | 2.88                     | 0.42              |
| 2:2:325:A:HO2'   | 2:2:326:G:P      | 2.42                     | 0.42              |
| 2:2:980:C:H3'    | 2:2:981:U:C6     | 2.55                     | 0.42              |
| 2:2:1013:G:C2    | 2:2:1015:G:C8    | 3.08                     | 0.42              |
| 2:2:1113:C:H2'   | 2:2:1114:C:C6    | 2.55                     | 0.42              |
| 4:6:4:G:C2       | 4:6:71:G:C2      | 3.08                     | 0.42              |

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| Atom-1          | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-----------------|------------------|--------------------------|-------------------|
| 6:A:26:LYS:HE2  | 6:A:26:LYS:HB2   | 1.67                     | 0.42              |
| 27:V:31:TYR:OH  | 27:V:90:ASP:HB3  | 2.20                     | 0.42              |
| 31:Z:9:GLN:NE2  | 31:Z:12:SER:HA   | 2.35                     | 0.42              |
| 42:k:69:GLU:HG2 | 42:k:70:VAL:N    | 2.35                     | 0.42              |
| 48:q:82:ILE:HB  | 48:q:95:TYR:HB3  | 2.02                     | 0.42              |
| 1:1:23:G:C5     | 1:1:24:G:N7      | 2.87                     | 0.42              |
| 1:1:528:A:H2    | 15:J:116:ARG:NH2 | 2.17                     | 0.42              |
| 1:1:824:U:H2'   | 1:1:825:A:O4'    | 2.20                     | 0.42              |
| 1:1:980:A:O2'   | 1:1:2037:A:H1'   | 2.20                     | 0.42              |
| 1:1:1002:G:C5   | 1:1:1003:G:H1'   | 2.55                     | 0.42              |
| 1:1:2023:C:H4'  | 1:1:2617:U:O2'   | 2.19                     | 0.42              |
| 1:1:2344:U:O5'  | 34:c:37:LYS:HB3  | 2.19                     | 0.42              |
| 1:1:2743:U:H5'' | 1:1:2755:C:N4    | 2.34                     | 0.42              |
| 1:1:2772:C:N3   | 1:1:2773:C:N4    | 2.68                     | 0.42              |
| 2:2:43:C:C2     | 2:2:44:A:C8      | 3.08                     | 0.42              |
| 2:2:299:G:C2    | 2:2:300:A:N7     | 2.88                     | 0.42              |
| 2:2:399:G:C6    | 2:2:400:C:C4     | 3.08                     | 0.42              |
| 2:2:538:G:H5''  | 48:q:111:LYS:HB3 | 2.02                     | 0.42              |
| 2:2:1128:C:H2'  | 2:2:1129:C:C6    | 2.55                     | 0.42              |
| 2:2:1320:C:H42  | 55:x:37:ARG:CG   | 2.33                     | 0.42              |
| 2:2:1392:G:H5'' | 2:2:1531:A:H5'   | 2.01                     | 0.42              |
| 8:C:13:ARG:HG3  | 8:C:15:PHE:CZ    | 2.54                     | 0.42              |
| 10:E:37:ASN:HB3 | 10:E:153:ASP:OD1 | 2.20                     | 0.42              |
| 14:I:20:SER:HB3 | 14:I:21:PRO:HD3  | 2.01                     | 0.42              |
| 26:U:84:GLY:O   | 26:U:95:PHE:N    | 2.38                     | 0.42              |
| 39:h:9:GLY:HA2  | 39:h:12:LEU:CD2  | 2.49                     | 0.42              |
| 40:i:155:VAL:O  | 40:i:159:LEU:HG  | 2.20                     | 0.42              |
| 50:s:46:LEU:O   | 50:s:50:THR:HG23 | 2.20                     | 0.42              |
| 1:1:18:U:H5''   | 22:Q:30:ARG:HH12 | 1.85                     | 0.41              |
| 1:1:414:C:H2'   | 1:1:415:A:H8     | 1.86                     | 0.41              |
| 1:1:572:A:N6    | 1:1:2029:G:H1'   | 2.33                     | 0.41              |
| 1:1:647:G:H21   | 1:1:2351:G:C5'   | 2.26                     | 0.41              |
| 1:1:2194:U:H2'  | 1:1:2195:U:C6    | 2.53                     | 0.41              |
| 1:1:2324:U:O2'  | 1:1:2385:C:H5    | 2.02                     | 0.41              |
| 1:1:2428:G:H5'  | 1:1:2429:G:OP1   | 2.20                     | 0.41              |
| 1:1:2471:A:H2'  | 1:1:2472:G:H5'   | 2.02                     | 0.41              |
| 1:1:2514:U:H2'  | 1:1:2515:C:C6    | 2.55                     | 0.41              |
| 1:1:2821:A:H2   | 1:1:2826:A:H61   | 1.68                     | 0.41              |
| 2:2:260:G:H8    | 2:2:260:G:O5'    | 2.03                     | 0.41              |
| 2:2:364:A:OP2   | 2:2:364:A:H8     | 2.03                     | 0.41              |
| 2:2:466:A:H2'   | 2:2:468:A:C2     | 2.54                     | 0.41              |

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| Atom-1          | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-----------------|------------------|--------------------------|-------------------|
| 2:2:628:G:H2'   | 2:2:629:A:H8     | 1.85                     | 0.41              |
| 2:2:1269:A:O2'  | 2:2:1325:C:O2    | 2.38                     | 0.41              |
| 8:C:24:VAL:HG21 | 8:C:188:LEU:HG   | 2.01                     | 0.41              |
| 9:D:190:ALA:O   | 9:D:194:LYS:HG2  | 2.20                     | 0.41              |
| 11:F:67:THR:O   | 11:F:71:LEU:HG   | 2.19                     | 0.41              |
| 16:K:15:GLY:O   | 16:K:47:ILE:HG12 | 2.19                     | 0.41              |
| 25:T:54:GLU:HG2 | 25:T:88:LYS:HG3  | 2.02                     | 0.41              |
| 42:k:51:ILE:O   | 42:k:54:LEU:HG   | 2.20                     | 0.41              |
| 46:o:40:ILE:H   | 46:o:40:ILE:HD12 | 1.84                     | 0.41              |
| 1:1:17:G:H5'    | 33:b:11:SER:N    | 2.35                     | 0.41              |
| 1:1:617:G:H2'   | 1:1:618:G:O4'    | 2.20                     | 0.41              |
| 1:1:820:A:H4'   | 1:1:837:C:O2'    | 2.20                     | 0.41              |
| 1:1:856:G:H2'   | 1:1:857:G:C8     | 2.55                     | 0.41              |
| 1:1:927:A:N6    | 1:1:928:A:N6     | 2.68                     | 0.41              |
| 1:1:1008:A:H5'' | 15:J:37:ARG:NH2  | 2.32                     | 0.41              |
| 1:1:1084:A:OP2  | 13:H:53:ARG:NE   | 2.53                     | 0.41              |
| 1:1:1207:C:H6   | 1:1:1207:C:O5'   | 2.03                     | 0.41              |
| 1:1:1542:U:H2'  | 1:1:1543:G:O4'   | 2.20                     | 0.41              |
| 1:1:2216:G:H2'  | 1:1:2217:G:H8    | 1.85                     | 0.41              |
| 1:1:2336:A:C2   | 28:W:57:HIS:HE1  | 2.39                     | 0.41              |
| 1:1:2395:C:H2'  | 1:1:2396:G:C8    | 2.56                     | 0.41              |
| 2:2:137:U:O2    | 2:2:226:G:C6     | 2.72                     | 0.41              |
| 2:2:205:A:N6    | 2:2:213:G:H1     | 2.19                     | 0.41              |
| 2:2:545:C:H2'   | 2:2:546:A:C8     | 2.55                     | 0.41              |
| 2:2:715:A:H2'   | 2:2:716:A:C8     | 2.55                     | 0.41              |
| 2:2:824:G:H2'   | 2:2:825:A:H8     | 1.85                     | 0.41              |
| 2:2:1392:G:O2'  | 2:2:1502:A:O5'   | 2.38                     | 0.41              |
| 24:S:14:ALA:HB2 | 24:S:78:GLU:HG3  | 2.03                     | 0.41              |
| 27:V:44:HIS:ND1 | 27:V:48:MET:HE3  | 2.34                     | 0.41              |
| 36:e:36:LYS:HE2 | 36:e:44:LEU:HD11 | 2.01                     | 0.41              |
| 39:h:22:TRP:H   | 50:s:94:PRO:HG3  | 1.85                     | 0.41              |
| 50:s:63:ARG:NH1 | 50:s:65:ARG:HA   | 2.35                     | 0.41              |
| 1:1:238:C:H1'   | 1:1:608:A:C2     | 2.55                     | 0.41              |
| 1:1:479:A:N7    | 1:1:481:G:C2     | 2.89                     | 0.41              |
| 1:1:1014:A:C6   | 1:1:1149:G:C6    | 3.08                     | 0.41              |
| 1:1:1072:C:H42  | 1:1:1092:C:H42   | 1.67                     | 0.41              |
| 1:1:1161:C:C2   | 1:1:1162:G:H1'   | 2.56                     | 0.41              |
| 1:1:2355:G:C6   | 1:1:2356:U:C4    | 3.09                     | 0.41              |
| 1:1:2393:U:H4'  | 17:L:61:LEU:C    | 2.45                     | 0.41              |
| 1:1:2485:G:O2'  | 18:M:125:PRO:HB3 | 2.19                     | 0.41              |
| 1:1:2757:A:OP1  | 37:f:18:LYS:NZ   | 2.30                     | 0.41              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:2:35:G:H4'     | 48:q:98:VAL:HG11  | 2.01                     | 0.41              |
| 2:2:132:C:H4'    | 56:y:68:HIS:CE1   | 2.55                     | 0.41              |
| 2:2:331:G:H5''   | 2:2:332:G:H5'     | 2.02                     | 0.41              |
| 2:2:1007:U:H2'   | 2:2:1008:U:C6     | 2.56                     | 0.41              |
| 2:2:1045:C:C2'   | 2:2:1046:A:H5''   | 2.48                     | 0.41              |
| 2:2:1065:U:N3    | 2:2:1108:G:O2'    | 2.53                     | 0.41              |
| 2:2:1233:G:OP1   | 45:n:126:GLN:HG3  | 2.20                     | 0.41              |
| 2:2:1250:A:H2'   | 2:2:1251:A:C8     | 2.55                     | 0.41              |
| 2:2:1413:A:H2    | 2:2:1487:G:H22    | 1.67                     | 0.41              |
| 3:4:3:C:H2'      | 3:4:4:C:H6        | 1.85                     | 0.41              |
| 3:4:75:G:H21     | 27:V:88:HIS:CG    | 2.39                     | 0.41              |
| 9:D:193:VAL:O    | 9:D:197:GLU:HG3   | 2.20                     | 0.41              |
| 11:F:72:LEU:HD12 | 11:F:72:LEU:O     | 2.20                     | 0.41              |
| 13:H:58:THR:OG1  | 13:H:78:GLY:O     | 2.28                     | 0.41              |
| 21:P:31:TRP:HB3  | 21:P:38:LYS:HE2   | 2.01                     | 0.41              |
| 25:T:33:LYS:HG3  | 25:T:80:TRP:CE3   | 2.54                     | 0.41              |
| 27:V:26:PHE:HZ   | 27:V:47:VAL:HG11  | 1.85                     | 0.41              |
| 38:g:18:HIS:NE2  | 38:g:205:ASP:HB2  | 2.36                     | 0.41              |
| 38:g:208:ARG:HA  | 38:g:211:THR:HG22 | 2.02                     | 0.41              |
| 39:h:134:MET:HA  | 39:h:134:MET:HE2  | 2.01                     | 0.41              |
| 40:i:108:GLY:HA2 | 40:i:113:GLU:OE2  | 2.20                     | 0.41              |
| 41:j:160:SER:O   | 41:j:164:ILE:HG13 | 2.19                     | 0.41              |
| 1:1:117:G:OP2    | 1:1:119:A:O2'     | 2.26                     | 0.41              |
| 1:1:336:C:OP1    | 26:U:82:ARG:HB3   | 2.21                     | 0.41              |
| 1:1:527:C:N4     | 1:1:2779:U:OP2    | 2.50                     | 0.41              |
| 1:1:651:G:N1     | 1:1:652:U:C5      | 2.89                     | 0.41              |
| 1:1:729:G:O2'    | 1:1:763:G:H4'     | 2.20                     | 0.41              |
| 1:1:826:U:N3     | 1:1:831:G:C6      | 2.72                     | 0.41              |
| 1:1:930:G:H5''   | 1:1:931:U:OP2     | 2.21                     | 0.41              |
| 1:1:984:A:H2'    | 1:1:984:A:N3      | 2.35                     | 0.41              |
| 1:1:1086:A:O2'   | 1:1:1087:G:N7     | 2.47                     | 0.41              |
| 1:1:1132:U:O2    | 15:J:75:TYR:HB3   | 2.19                     | 0.41              |
| 1:1:1287:A:H3'   | 1:1:1288:G:N2     | 2.36                     | 0.41              |
| 1:1:2048:G:H2'   | 1:1:2049:G:O4'    | 2.21                     | 0.41              |
| 1:1:2328:A:H2'   | 1:1:2329:U:H6     | 1.84                     | 0.41              |
| 1:1:2820:A:OP1   | 19:N:2:ARG:NH2    | 2.53                     | 0.41              |
| 2:2:45:G:H5''    | 2:2:307:C:H4'     | 2.01                     | 0.41              |
| 2:2:62:U:H2'     | 2:2:63:C:C6       | 2.55                     | 0.41              |
| 2:2:676:A:H2'    | 2:2:677:U:H6      | 1.86                     | 0.41              |
| 2:2:932:C:H4'    | 43:l:4:ARG:NH2    | 2.36                     | 0.41              |
| 2:2:1061:G:H5'   | 46:o:61:ALA:HB2   | 2.02                     | 0.41              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:2:1239:A:HO2'  | 2:2:1297:G:H21    | 1.66                     | 0.41              |
| 2:2:1348:U:O2    | 2:2:1374:A:N7     | 2.52                     | 0.41              |
| 2:2:1350:A:P     | 45:n:123:ARG:HG2  | 2.61                     | 0.41              |
| 2:2:1510:C:H2'   | 2:2:1511:G:C8     | 2.55                     | 0.41              |
| 3:4:8:C:OP1      | 20:O:15:ARG:NH1   | 2.53                     | 0.41              |
| 4:6:76:C:H5''    | 4:6:77:A:H5''     | 2.02                     | 0.41              |
| 6:A:8:ILE:HG12   | 6:A:97:VAL:HG22   | 2.02                     | 0.41              |
| 7:B:30:PHE:HD2   | 7:B:33:LEU:HG     | 1.85                     | 0.41              |
| 10:E:94:GLU:HA   | 10:E:97:TRP:CD1   | 2.55                     | 0.41              |
| 13:H:103:ASN:HA  | 13:H:107:GLU:HB2  | 2.02                     | 0.41              |
| 33:b:10:ARG:HB2  | 33:b:13:ARG:CZ    | 2.51                     | 0.41              |
| 33:b:40:ARG:HA   | 33:b:40:ARG:HD2   | 1.95                     | 0.41              |
| 37:f:2:LYS:HD2   | 37:f:35:GLN:HA    | 2.02                     | 0.41              |
| 38:g:73:LYS:HD2  | 38:g:168:HIS:CD2  | 2.56                     | 0.41              |
| 39:h:31:ASP:OD1  | 50:s:65:ARG:NH1   | 2.53                     | 0.41              |
| 40:i:50:ASP:O    | 40:i:53:VAL:HG22  | 2.20                     | 0.41              |
| 42:k:12:PRO:HG3  | 42:k:56:LYS:HB2   | 2.02                     | 0.41              |
| 43:l:50:LEU:HD22 | 43:l:124:LEU:HD13 | 2.03                     | 0.41              |
| 46:o:7:ARG:O     | 46:o:100:ILE:HA   | 2.20                     | 0.41              |
| 46:o:77:VAL:HG12 | 46:o:78:GLU:HG2   | 2.01                     | 0.41              |
| 56:y:51:PHE:O    | 56:y:55:GLN:HG3   | 2.19                     | 0.41              |
| 1:1:227:A:N6     | 1:1:410:G:C2      | 2.78                     | 0.41              |
| 1:1:253:C:H6     | 36:e:5:LYS:NZ     | 2.19                     | 0.41              |
| 1:1:310:A:O2'    | 1:1:312:G:O6      | 2.28                     | 0.41              |
| 1:1:514:A:N3     | 1:1:581:C:O2'     | 2.49                     | 0.41              |
| 1:1:571:U:H2'    | 23:R:80:ARG:CZ    | 2.51                     | 0.41              |
| 1:1:631:A:O5'    | 17:L:64:PHE:HE2   | 2.03                     | 0.41              |
| 1:1:982:C:O4'    | 1:1:2028:U:O2'    | 2.37                     | 0.41              |
| 1:1:1186:G:N3    | 1:1:1186:G:H2'    | 2.35                     | 0.41              |
| 1:1:1363:C:O2'   | 1:1:1809:A:N3     | 2.46                     | 0.41              |
| 1:1:2011:U:H2'   | 1:1:2012:G:O4'    | 2.20                     | 0.41              |
| 1:1:2376:A:H8    | 1:1:2376:A:OP1    | 2.03                     | 0.41              |
| 1:1:2386:A:H2'   | 1:1:2387:U:O4'    | 2.20                     | 0.41              |
| 1:1:2624:G:H2'   | 1:1:2625:G:H8     | 1.84                     | 0.41              |
| 1:1:2650:U:C2    | 1:1:2651:C:C5     | 3.08                     | 0.41              |
| 2:2:450:G:H4'    | 52:u:42:ILE:HG22  | 2.02                     | 0.41              |
| 2:2:1320:C:H2'   | 2:2:1321:U:C6     | 2.55                     | 0.41              |
| 4:5:14:G:H2'     | 4:5:59:A:N6       | 2.34                     | 0.41              |
| 13:H:68:PRO:HA   | 13:H:72:LEU:HG    | 2.03                     | 0.41              |
| 15:J:58:ASN:HD22 | 15:J:61:LYS:CE    | 2.33                     | 0.41              |
| 27:V:76:ASP:H    | 27:V:90:ASP:HB2   | 1.85                     | 0.41              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 38:g:67:ILE:CD1  | 38:g:160:ALA:HB3  | 2.51                     | 0.41              |
| 46:o:23:ALA:O    | 46:o:27:GLU:HG2   | 2.21                     | 0.41              |
| 1:1:247:G:H5'    | 1:1:386:G:C5      | 2.56                     | 0.41              |
| 1:1:259:G:N3     | 1:1:621:A:O2'     | 2.51                     | 0.41              |
| 1:1:360:U:H2'    | 1:1:361:G:C5      | 2.55                     | 0.41              |
| 1:1:374:A:C2     | 1:1:401:A:N7      | 2.89                     | 0.41              |
| 1:1:516:C:H2'    | 1:1:517:C:C6      | 2.55                     | 0.41              |
| 1:1:572:A:N1     | 1:1:2029:G:C2     | 2.89                     | 0.41              |
| 1:1:615:U:O4     | 9:D:39:ALA:N      | 2.54                     | 0.41              |
| 1:1:837:C:O5'    | 1:1:837:C:H6      | 2.04                     | 0.41              |
| 1:1:862:G:C5     | 1:1:863:A:C5      | 3.08                     | 0.41              |
| 1:1:1232:G:H2'   | 1:1:1233:C:C5     | 2.55                     | 0.41              |
| 1:1:2193:G:HO2'  | 1:1:2194:U:P      | 2.42                     | 0.41              |
| 1:1:2748:A:H62   | 1:1:2754:U:H3     | 1.68                     | 0.41              |
| 1:1:2820:A:N3    | 8:C:196:ALA:HB3   | 2.36                     | 0.41              |
| 2:2:323:U:H3'    | 2:2:324:G:C8      | 2.56                     | 0.41              |
| 2:2:462:G:H2'    | 2:2:463:U:C6      | 2.56                     | 0.41              |
| 2:2:680:C:H2'    | 2:2:681:A:H8      | 1.86                     | 0.41              |
| 2:2:1059:C:OP1   | 50:s:89:MET:HE2   | 2.20                     | 0.41              |
| 3:4:55:U:H4'     | 10:E:25:VAL:HG12  | 2.03                     | 0.41              |
| 3:4:75:G:H4'     | 27:V:12:GLN:NE2   | 2.36                     | 0.41              |
| 4:6:37:U:H2'     | 4:6:38:A:H5'      | 2.03                     | 0.41              |
| 9:D:146:VAL:CG2  | 9:D:187:VAL:HG23  | 2.50                     | 0.41              |
| 17:L:79:LEU:HD13 | 17:L:116:VAL:HG12 | 2.01                     | 0.41              |
| 27:V:9:ARG:NE    | 27:V:11:GLU:O     | 2.54                     | 0.41              |
| 28:W:45:PHE:HB3  | 28:W:80:ILE:HG13  | 2.02                     | 0.41              |
| 37:f:24:ARG:HH11 | 37:f:36:ARG:HH11  | 1.68                     | 0.41              |
| 40:i:53:VAL:CB   | 40:i:56:ARG:HH21  | 2.33                     | 0.41              |
| 41:j:88:VAL:HA   | 41:j:92:SER:O     | 2.20                     | 0.41              |
| 43:l:99:LEU:HD23 | 43:l:99:LEU:HA    | 1.92                     | 0.41              |
| 49:r:20:THR:HG22 | 49:r:26:GLY:C     | 2.46                     | 0.41              |
| 49:r:33:ILE:HD11 | 49:r:63:PHE:HD2   | 1.86                     | 0.41              |
| 50:s:38:ASP:OD1  | 50:s:38:ASP:N     | 2.52                     | 0.41              |
| 50:s:69:ARG:NH2  | 50:s:81:ARG:HH21  | 2.18                     | 0.41              |
| 1:1:96:C:C2      | 1:1:97:C:C5       | 3.09                     | 0.41              |
| 1:1:524:G:H8     | 1:1:524:G:O5'     | 2.04                     | 0.41              |
| 1:1:650:C:O5'    | 1:1:650:C:H6      | 2.02                     | 0.41              |
| 1:1:857:G:H4'    | 28:W:45:PHE:CZ    | 2.56                     | 0.41              |
| 1:1:987:C:C4     | 1:1:988:A:C2      | 3.09                     | 0.41              |
| 1:1:1130:U:OP2   | 1:1:2570:G:N2     | 2.44                     | 0.41              |
| 1:1:1655:A:H1'   | 8:C:118:PHE:CD1   | 2.56                     | 0.41              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:1:2026:U:H2'    | 1:1:2027:G:O4'    | 2.21                     | 0.41              |
| 1:1:2770:G:C8     | 1:1:2771:C:H5     | 2.39                     | 0.41              |
| 2:2:1170:A:C6     | 2:2:1171:A:C4     | 3.08                     | 0.41              |
| 8:C:28:GLU:HB3    | 21:P:4:ILE:CD1    | 2.51                     | 0.41              |
| 10:E:106:ILE:HG12 | 32:a:34:LEU:HD11  | 2.03                     | 0.41              |
| 10:E:131:GLY:HA2  | 10:E:153:ASP:HA   | 2.03                     | 0.41              |
| 10:E:136:ILE:HG21 | 10:E:143:TYR:HD1  | 1.84                     | 0.41              |
| 13:H:30:SER:HB2   | 13:H:108:VAL:HG11 | 2.02                     | 0.41              |
| 21:P:57:SER:HG    | 21:P:77:HIS:CE1   | 2.39                     | 0.41              |
| 25:T:43:ILE:O     | 25:T:47:VAL:HG12  | 2.20                     | 0.41              |
| 29:X:59:ILE:HG12  | 29:X:67:VAL:HG21  | 2.03                     | 0.41              |
| 38:g:114:LEU:O    | 38:g:118:GLU:HG2  | 2.21                     | 0.41              |
| 38:g:183:VAL:HG11 | 38:g:196:VAL:HA   | 2.03                     | 0.41              |
| 44:m:30:SER:O     | 44:m:34:VAL:HG23  | 2.20                     | 0.41              |
| 1:1:258:G:O2'     | 17:L:103:ILE:HG12 | 2.20                     | 0.41              |
| 1:1:370:G:H2'     | 1:1:370:G:OP2     | 2.20                     | 0.41              |
| 1:1:534:U:H5''    | 1:1:535:G:OP2     | 2.21                     | 0.41              |
| 1:1:944:C:OP1     | 1:1:945:A:H5''    | 2.21                     | 0.41              |
| 1:1:1012:U:P      | 22:Q:70:ARG:HH22  | 2.44                     | 0.41              |
| 1:1:1022:G:O2'    | 1:1:1024:G:O6     | 2.24                     | 0.41              |
| 1:1:2259:U:H5''   | 1:1:2427:C:OP2    | 2.20                     | 0.41              |
| 1:1:2531:A:H3'    | 1:1:2532:G:C8     | 2.56                     | 0.41              |
| 1:1:2640:G:C2     | 1:1:2641:G:C5     | 3.09                     | 0.41              |
| 2:2:130:A:N6      | 53:v:66:PRO:HG2   | 2.36                     | 0.41              |
| 2:2:258:G:H2'     | 2:2:259:G:C8      | 2.56                     | 0.41              |
| 2:2:420:U:O2'     | 2:2:423:G:O6      | 2.25                     | 0.41              |
| 2:2:674:G:N2      | 47:p:118:HIS:HB2  | 2.35                     | 0.41              |
| 2:2:1239:A:O2'    | 2:2:1298:U:O4     | 2.32                     | 0.41              |
| 2:2:1320:C:H2'    | 2:2:1321:U:C5     | 2.56                     | 0.41              |
| 3:4:36:C:N4       | 3:4:37:C:H41      | 2.19                     | 0.41              |
| 8:C:116:LYS:HA    | 8:C:116:LYS:HD3   | 1.91                     | 0.41              |
| 17:L:109:LYS:HD3  | 17:L:126:ARG:HE   | 1.85                     | 0.41              |
| 19:N:33:ILE:HD11  | 19:N:118:ARG:NE   | 2.35                     | 0.41              |
| 38:g:50:PHE:HD1   | 38:g:200:ILE:HG21 | 1.86                     | 0.41              |
| 38:g:66:LYS:HB2   | 38:g:158:PRO:HA   | 2.02                     | 0.41              |
| 38:g:127:ASP:C    | 38:g:128:LYS:HD2  | 2.46                     | 0.41              |
| 39:h:7:PRO:O      | 39:h:11:ARG:HB2   | 2.20                     | 0.41              |
| 43:l:46:ALA:HB2   | 43:l:117:ALA:HA   | 2.01                     | 0.41              |
| 48:q:83:ARG:HB3   | 48:q:98:VAL:CG2   | 2.50                     | 0.41              |
| 1:1:283:G:H2'     | 1:1:284:U:C6      | 2.55                     | 0.41              |
| 1:1:308:G:N2      | 1:1:329:G:H21     | 2.19                     | 0.41              |

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| Atom-1          | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-----------------|------------------|--------------------------|-------------------|
| 1:1:524:G:H2'   | 1:1:525:U:O4'    | 2.21                     | 0.41              |
| 1:1:529:A:H2'   | 1:1:530:G:C2     | 2.56                     | 0.41              |
| 1:1:532:A:OP1   | 1:1:533:G:C5     | 2.73                     | 0.41              |
| 1:1:552:U:C4    | 1:1:553:G:O6     | 2.74                     | 0.41              |
| 1:1:553:G:N1    | 1:1:554:U:C2     | 2.89                     | 0.41              |
| 1:1:600:G:C4'   | 9:D:27:LEU:HD22  | 2.50                     | 0.41              |
| 1:1:636:G:N2    | 17:L:76:GLU:OE1  | 2.52                     | 0.41              |
| 1:1:672:C:H2'   | 1:1:673:C:C6     | 2.56                     | 0.41              |
| 1:1:823:C:H2'   | 1:1:824:U:C6     | 2.56                     | 0.41              |
| 1:1:954:G:H5''  | 18:M:13:HIS:HA   | 2.02                     | 0.41              |
| 1:1:1001:A:C8   | 1:1:1154:G:N2    | 2.89                     | 0.41              |
| 1:1:1003:G:N2   | 1:1:1010:A:O2'   | 2.53                     | 0.41              |
| 1:1:1065:U:O2'  | 1:1:1066:U:O5'   | 2.37                     | 0.41              |
| 1:1:1083:U:O5'  | 13:H:53:ARG:NH2  | 2.54                     | 0.41              |
| 1:1:1495:A:H2'  | 1:1:1496:A:C8    | 2.55                     | 0.41              |
| 1:1:1863:G:H2'  | 1:1:1864:U:C5    | 2.55                     | 0.41              |
| 1:1:2047:C:N3   | 1:1:2048:G:N7    | 2.62                     | 0.41              |
| 1:1:2332:C:H2'  | 1:1:2335:A:N3    | 2.36                     | 0.41              |
| 1:1:2454:G:O5'  | 1:1:2454:G:H8    | 2.03                     | 0.41              |
| 1:1:2547:A:C8   | 1:1:2566:A:C2    | 3.09                     | 0.41              |
| 1:1:2731:G:C2'  | 1:1:2732:G:H5'   | 2.51                     | 0.41              |
| 1:1:2735:G:C6   | 1:1:2770:G:H1'   | 2.56                     | 0.41              |
| 1:1:2738:A:H2   | 1:1:2764:A:H62   | 1.69                     | 0.41              |
| 1:1:2822:G:H2'  | 1:1:2823:A:C5'   | 2.47                     | 0.41              |
| 2:2:109:A:N3    | 2:2:109:A:H5''   | 2.35                     | 0.41              |
| 2:2:174:A:OP2   | 2:2:174:A:C8     | 2.74                     | 0.41              |
| 2:2:300:A:C4    | 2:2:301:G:H1'    | 2.54                     | 0.41              |
| 2:2:361:G:H2'   | 2:2:362:G:O4'    | 2.20                     | 0.41              |
| 2:2:428:G:H8    | 2:2:428:G:OP1    | 2.04                     | 0.41              |
| 2:2:672:U:H2'   | 2:2:673:A:C8     | 2.56                     | 0.41              |
| 2:2:948:C:H5''  | 49:r:101:ARG:NH1 | 2.33                     | 0.41              |
| 2:2:971:G:H4'   | 2:2:972:C:H5''   | 2.02                     | 0.41              |
| 2:2:977:A:O2'   | 2:2:979:C:OP2    | 2.38                     | 0.41              |
| 2:2:1125:U:C2   | 2:2:1127:G:N7    | 2.89                     | 0.41              |
| 2:2:1171:A:C4   | 2:2:1172:C:C5    | 3.09                     | 0.41              |
| 2:2:1181:G:H1'  | 2:2:1182:G:C5    | 2.55                     | 0.41              |
| 2:2:1367:C:OP1  | 45:n:117:GLY:N   | 2.49                     | 0.41              |
| 3:4:61:G:H2'    | 3:4:62:C:C6      | 2.55                     | 0.41              |
| 3:4:101:A:H5''  | 3:4:102:G:OP2    | 2.20                     | 0.41              |
| 3:4:114:C:H2'   | 3:4:115:A:O4'    | 2.21                     | 0.41              |
| 8:C:176:ASP:OD1 | 8:C:177:VAL:N    | 2.54                     | 0.41              |

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| Atom-1          | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-----------------|-------------------|--------------------------|-------------------|
| 9:D:36:ALA:O    | 9:D:40:ARG:HG3    | 2.21                     | 0.41              |
| 10:E:33:LYS:O   | 10:E:156:ILE:HG23 | 2.21                     | 0.41              |
| 11:F:69:ARG:HD3 | 11:F:73:ASN:OD1   | 2.21                     | 0.41              |
| 11:F:85:LYS:HA  | 11:F:85:LYS:HD2   | 1.80                     | 0.41              |
| 12:G:85:GLY:O   | 12:G:87:GLU:N     | 2.54                     | 0.41              |
| 18:M:39:GLY:N   | 18:M:96:ILE:HB    | 2.36                     | 0.41              |
| 18:M:45:GLN:HB3 | 18:M:124:LEU:HD21 | 2.03                     | 0.41              |
| 18:M:95:LEU:O   | 18:M:97:GLN:NE2   | 2.51                     | 0.41              |
| 24:S:34:ASP:OD1 | 24:S:35:ILE:N     | 2.53                     | 0.41              |
| 26:U:9:ASP:CG   | 26:U:94:ARG:HH12  | 2.29                     | 0.41              |
| 26:U:77:THR:HB  | 26:U:79:LYS:HG3   | 2.02                     | 0.41              |
| 30:Y:50:VAL:O   | 30:Y:54:LYS:HG2   | 2.21                     | 0.41              |
| 31:Z:16:ARG:HG3 | 31:Z:54:MET:CE    | 2.51                     | 0.41              |
| 39:h:34:ASP:O   | 39:h:38:LYS:HG3   | 2.21                     | 0.41              |
| 39:h:129:MET:SD | 39:h:129:MET:N    | 2.94                     | 0.41              |
| 39:h:154:SER:O  | 39:h:197:GLY:N    | 2.35                     | 0.41              |
| 41:j:81:LEU:CD2 | 41:j:96:MET:HE1   | 2.50                     | 0.41              |
| 41:j:96:MET:CG  | 41:j:125:ALA:HA   | 2.51                     | 0.41              |
| 43:l:37:SER:HB3 | 45:n:41:ARG:NH1   | 2.35                     | 0.41              |
| 46:o:22:THR:HA  | 46:o:25:ILE:HG22  | 2.03                     | 0.41              |
| 50:s:23:LYS:HG3 | 50:s:51:LEU:HD11  | 2.03                     | 0.41              |
| 50:s:79:LEU:HB2 | 50:s:84:VAL:HG23  | 2.03                     | 0.41              |
| 57:z:17:ARG:O   | 57:z:21:ARG:HG2   | 2.21                     | 0.41              |
| 1:1:19:A:OP2    | 22:Q:30:ARG:NH2   | 2.54                     | 0.41              |
| 1:1:2264:C:C4   | 1:1:2265:U:O2     | 2.73                     | 0.41              |
| 1:1:2273:A:H2'  | 1:1:2274:A:N9     | 2.35                     | 0.41              |
| 1:1:2287:A:OP1  | 34:c:30:LYS:NZ    | 2.50                     | 0.41              |
| 1:1:2376:A:H2'  | 1:1:2377:A:O4'    | 2.21                     | 0.41              |
| 1:1:2420:C:H5   | 36:e:31:HIS:HA    | 1.86                     | 0.41              |
| 1:1:2517:C:O2   | 1:1:2518:A:O2'    | 2.33                     | 0.41              |
| 1:1:2572:A:H8   | 1:1:2572:A:OP2    | 2.04                     | 0.41              |
| 1:1:2726:A:H4'  | 16:K:1:MET:HE1    | 2.02                     | 0.41              |
| 1:1:2820:A:C2   | 19:N:4:ARG:HD2    | 2.56                     | 0.41              |
| 2:2:109:A:H2'   | 2:2:326:G:N2      | 2.36                     | 0.41              |
| 2:2:260:G:H2'   | 2:2:261:U:C6      | 2.55                     | 0.41              |
| 2:2:260:G:C8    | 56:y:74:ARG:NH1   | 2.88                     | 0.41              |
| 2:2:333:U:H2'   | 2:2:334:C:H6      | 1.86                     | 0.41              |
| 2:2:547:A:OP1   | 2:2:547:A:H4'     | 2.21                     | 0.41              |
| 2:2:616:G:H2'   | 2:2:617:G:C8      | 2.56                     | 0.41              |
| 2:2:964:A:O4'   | 46:o:56:HIS:HE1   | 2.04                     | 0.41              |
| 2:2:1140:C:O2'  | 2:2:1141:C:O5'    | 2.37                     | 0.41              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:2:1349:A:H2'    | 2:2:1350:A:O4'    | 2.21                     | 0.41              |
| 4:6:68:C:H2'      | 4:6:69:C:C6       | 2.55                     | 0.41              |
| 6:A:15:LEU:HA     | 6:A:18:GLN:HG2    | 2.03                     | 0.41              |
| 10:E:43:ALA:CB    | 10:E:50:LEU:HD12  | 2.51                     | 0.41              |
| 10:E:47:LYS:O     | 10:E:50:LEU:HB3   | 2.21                     | 0.41              |
| 15:J:37:ARG:HE    | 15:J:44:TYR:HH    | 1.65                     | 0.41              |
| 26:U:85:PHE:CD2   | 26:U:92:LYS:HD3   | 2.55                     | 0.41              |
| 34:c:43:VAL:HG23  | 34:c:45:GLN:H     | 1.85                     | 0.41              |
| 36:e:4:ILE:HG22   | 36:e:5:LYS:N      | 2.35                     | 0.41              |
| 40:i:130:VAL:HG12 | 40:i:132:ILE:H    | 1.85                     | 0.41              |
| 42:k:19:PRO:O     | 42:k:22:ILE:N     | 2.53                     | 0.41              |
| 47:p:70:CYS:O     | 47:p:74:VAL:HG12  | 2.21                     | 0.41              |
| 1:1:27:G:O2'      | 1:1:512:G:N2      | 2.54                     | 0.40              |
| 1:1:587:C:C4      | 17:L:31:GLY:HA3   | 2.56                     | 0.40              |
| 1:1:650:C:H3'     | 1:1:651:G:H8      | 1.86                     | 0.40              |
| 1:1:1038:G:H2'    | 1:1:1039:A:H8     | 1.84                     | 0.40              |
| 1:1:1056:G:H4'    | 1:1:1086:A:C8     | 2.53                     | 0.40              |
| 1:1:1155:A:H2'    | 1:1:1156:A:H2'    | 2.04                     | 0.40              |
| 1:1:1433:A:H2'    | 1:1:1434:A:C8     | 2.55                     | 0.40              |
| 1:1:2371:G:C4     | 1:1:2372:U:C5     | 3.09                     | 0.40              |
| 1:1:2809:A:N6     | 1:1:2890:G:H2'    | 2.35                     | 0.40              |
| 2:2:130:A:C6      | 2:2:263:A:H2      | 2.38                     | 0.40              |
| 2:2:229:U:O2'     | 52:u:25:ARG:NH2   | 2.54                     | 0.40              |
| 2:2:518:C:H2'     | 2:2:530:G:H1'     | 2.03                     | 0.40              |
| 2:2:1102:A:H1'    | 38:g:98:GLY:HA3   | 2.03                     | 0.40              |
| 2:2:1130:A:N6     | 2:2:1144:G:H1'    | 2.35                     | 0.40              |
| 10:E:37:ASN:O     | 10:E:152:LEU:HA   | 2.20                     | 0.40              |
| 13:H:53:ARG:HD3   | 13:H:53:ARG:HA    | 1.70                     | 0.40              |
| 26:U:51:ALA:O     | 26:U:52:LEU:HD23  | 2.21                     | 0.40              |
| 39:h:71:ALA:HB2   | 39:h:115:LEU:HD13 | 2.01                     | 0.40              |
| 43:l:87:VAL:HA    | 43:l:88:PRO:HD3   | 1.95                     | 0.40              |
| 48:q:32:GLY:HA2   | 48:q:56:ARG:O     | 2.21                     | 0.40              |
| 1:1:317:G:H2'     | 1:1:318:C:H6      | 1.87                     | 0.40              |
| 1:1:320:A:H4'     | 1:1:322:A:N7      | 2.36                     | 0.40              |
| 1:1:796:C:OP1     | 9:D:57:LYS:HE2    | 2.21                     | 0.40              |
| 1:1:813:U:O2'     | 1:1:1225:G:H1'    | 2.21                     | 0.40              |
| 1:1:956:G:O2'     | 1:1:959:A:N6      | 2.52                     | 0.40              |
| 1:1:1027:A:O2'    | 1:1:2487:G:H4'    | 2.21                     | 0.40              |
| 1:1:1124:G:H2'    | 1:1:1125:G:O4'    | 2.21                     | 0.40              |
| 1:1:1142:A:O2'    | 1:1:1143:A:OP2    | 2.34                     | 0.40              |
| 1:1:1160:G:O2'    | 23:R:9:GLY:HA2    | 2.21                     | 0.40              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:1:2277:G:H4'   | 18:M:11:LYS:HB2  | 2.04                     | 0.40              |
| 1:1:2700:A:H2'   | 1:1:2701:U:C6    | 2.57                     | 0.40              |
| 1:1:2727:A:O2'   | 1:1:2728:U:H5'   | 2.22                     | 0.40              |
| 1:1:2785:C:OP1   | 8:C:42:ASN:ND2   | 2.42                     | 0.40              |
| 1:1:2820:A:C2    | 8:C:196:ALA:HB3  | 2.56                     | 0.40              |
| 1:1:2834:G:H2'   | 1:1:2879:A:H61   | 1.86                     | 0.40              |
| 2:2:260:G:N2     | 2:2:267:C:C4     | 2.89                     | 0.40              |
| 2:2:335:C:H2'    | 2:2:336:A:H8     | 1.85                     | 0.40              |
| 2:2:516:PSU:H2'  | 2:2:517:G:C8     | 2.56                     | 0.40              |
| 2:2:552:U:N3     | 2:2:553:A:N7     | 2.69                     | 0.40              |
| 2:2:718:A:O2'    | 57:z:35:ARG:NH2  | 2.54                     | 0.40              |
| 2:2:934:C:O2'    | 2:2:1344:C:H5''  | 2.20                     | 0.40              |
| 2:2:1181:G:H1'   | 2:2:1182:G:C8    | 2.56                     | 0.40              |
| 2:2:1229:A:H2'   | 2:2:1230:C:C6    | 2.56                     | 0.40              |
| 2:2:1323:G:H2'   | 2:2:1324:A:H8    | 1.81                     | 0.40              |
| 3:4:5:U:N3       | 3:4:116:G:C6     | 2.89                     | 0.40              |
| 4:6:10:G:OP1     | 4:6:46:G:O2'     | 2.39                     | 0.40              |
| 4:6:43:G:H2'     | 4:6:44:A:C8      | 2.56                     | 0.40              |
| 15:J:54:ILE:HG22 | 15:J:122:LEU:CB  | 2.48                     | 0.40              |
| 18:M:64:TRP:HE3  | 18:M:104:GLU:HB2 | 1.86                     | 0.40              |
| 19:N:71:ARG:HA   | 19:N:71:ARG:HD2  | 1.76                     | 0.40              |
| 22:Q:24:TYR:HB2  | 22:Q:29:SER:HB3  | 2.02                     | 0.40              |
| 24:S:17:VAL:HB   | 24:S:76:VAL:HG11 | 2.03                     | 0.40              |
| 36:e:38:THR:HB   | 36:e:42:ARG:NH2  | 2.32                     | 0.40              |
| 39:h:150:LYS:HB3 | 39:h:201:TRP:CE3 | 2.56                     | 0.40              |
| 39:h:183:ASP:HB3 | 39:h:202:ILE:HB  | 2.03                     | 0.40              |
| 1:1:18:U:H5''    | 22:Q:26:GLY:H    | 1.84                     | 0.40              |
| 1:1:184:C:H2'    | 1:1:185:G:H8     | 1.85                     | 0.40              |
| 1:1:245:G:C2     | 1:1:246:C:C4     | 3.10                     | 0.40              |
| 1:1:319:G:H2'    | 1:1:320:A:O4'    | 2.20                     | 0.40              |
| 1:1:384:A:H2'    | 1:1:385:C:C6     | 2.56                     | 0.40              |
| 1:1:523:C:H5''   | 1:1:540:C:O2'    | 2.20                     | 0.40              |
| 1:1:697:G:H2'    | 1:1:698:C:C6     | 2.56                     | 0.40              |
| 1:1:806:C:H5     | 17:L:41:ARG:HG3  | 1.87                     | 0.40              |
| 1:1:1001:A:H2'   | 1:1:1002:G:H5'   | 2.02                     | 0.40              |
| 1:1:1051:G:H2'   | 1:1:1052:C:O4'   | 2.21                     | 0.40              |
| 1:1:1132:U:H1'   | 15:J:75:TYR:CD1  | 2.57                     | 0.40              |
| 1:1:2046:G:O5'   | 33:b:16:ARG:HG2  | 2.21                     | 0.40              |
| 1:1:2488:G:N1    | 1:1:2489:U:O4    | 2.54                     | 0.40              |
| 1:1:2641:G:C6    | 1:1:2642:G:C5    | 3.10                     | 0.40              |
| 1:1:2810:A:H62   | 1:1:2890:G:H21   | 1.69                     | 0.40              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:2:265:G:C5     | 2:2:267:C:C5      | 3.09                     | 0.40              |
| 2:2:370:C:H2'    | 2:2:371:A:C8      | 2.57                     | 0.40              |
| 2:2:461:A:H2'    | 2:2:462:G:H8      | 1.86                     | 0.40              |
| 2:2:672:U:H2'    | 2:2:673:A:H8      | 1.86                     | 0.40              |
| 2:2:1193:G:OP1   | 39:h:167:TRP:NE1  | 2.54                     | 0.40              |
| 2:2:1271:A:H2'   | 2:2:1272:G:C8     | 2.56                     | 0.40              |
| 2:2:1462:C:H2'   | 2:2:1463:U:O4'    | 2.21                     | 0.40              |
| 3:4:109:A:H2'    | 3:4:110:C:O4'     | 2.20                     | 0.40              |
| 10:E:20:PHE:HB3  | 10:E:22:TYR:CE1   | 2.56                     | 0.40              |
| 11:F:159:GLY:HA2 | 11:F:163:ARG:NH2  | 2.37                     | 0.40              |
| 13:H:97:LYS:HB2  | 13:H:125:ARG:HH12 | 1.86                     | 0.40              |
| 23:R:29:THR:OG1  | 23:R:64:VAL:O     | 2.39                     | 0.40              |
| 27:V:16:ALA:O    | 27:V:20:LEU:HG    | 2.20                     | 0.40              |
| 33:b:26:THR:HG23 | 33:b:27:SER:H     | 1.86                     | 0.40              |
| 36:e:13:ARG:HB3  | 36:e:24:HIS:HB2   | 2.03                     | 0.40              |
| 40:i:88:GLU:CG   | 40:i:188:ARG:HB2  | 2.52                     | 0.40              |
| 40:i:146:ARG:HG3 | 40:i:148:LYS:H    | 1.86                     | 0.40              |
| 42:k:17:GLN:O    | 42:k:21:MET:HG2   | 2.21                     | 0.40              |
| 46:o:12:ALA:HB3  | 46:o:18:ILE:HD12  | 2.03                     | 0.40              |
| 50:s:48:LEU:HD12 | 50:s:51:LEU:HD12  | 2.03                     | 0.40              |
| 51:t:47:LYS:O    | 51:t:53:ARG:NH2   | 2.55                     | 0.40              |
| 57:z:58:LYS:O    | 57:z:62:ARG:HG2   | 2.21                     | 0.40              |
| 1:1:98:G:H2'     | 1:1:99:U:C6       | 2.57                     | 0.40              |
| 1:1:321:U:O2'    | 1:1:340:A:H2'     | 2.21                     | 0.40              |
| 1:1:637:A:H4'    | 1:1:638:G:H4'     | 2.04                     | 0.40              |
| 1:1:858:G:H3'    | 1:1:859:G:C8      | 2.56                     | 0.40              |
| 1:1:923:G:H2'    | 1:1:924:G:C8      | 2.57                     | 0.40              |
| 1:1:1129:A:H4'   | 1:1:2515:C:O2'    | 2.22                     | 0.40              |
| 1:1:1132:U:O2'   | 1:1:1133:A:H5'    | 2.21                     | 0.40              |
| 1:1:1227:G:OP1   | 22:Q:13:ARG:HD3   | 2.21                     | 0.40              |
| 1:1:1241:A:N6    | 17:L:4:ASN:HD21   | 2.19                     | 0.40              |
| 1:1:1861:G:C6    | 1:1:1862:G:C8     | 3.09                     | 0.40              |
| 1:1:2283:C:H2'   | 1:1:2284:A:C8     | 2.57                     | 0.40              |
| 1:1:2307:G:H5'   | 1:1:2308:G:C2     | 2.57                     | 0.40              |
| 1:1:2345:G:C5'   | 1:1:2347:C:H5''   | 2.52                     | 0.40              |
| 1:1:2663:G:H2'   | 1:1:2664:G:O4'    | 2.22                     | 0.40              |
| 2:2:181:A:N6     | 2:2:194:C:H3'     | 2.37                     | 0.40              |
| 2:2:419:C:O3'    | 2:2:513:C:H4'     | 2.22                     | 0.40              |
| 2:2:973:G:H2'    | 2:2:974:A:C8      | 2.56                     | 0.40              |
| 2:2:1126:U:O2'   | 2:2:1280:A:O2'    | 2.31                     | 0.40              |
| 2:2:1237:C:H4'   | 2:2:1303:C:O2     | 2.21                     | 0.40              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:2:1314:C:H2'    | 2:2:1315:U:O4'    | 2.21                     | 0.40              |
| 3:4:22:U:O4       | 3:4:61:G:O6       | 2.39                     | 0.40              |
| 3:4:29:A:H2'      | 3:4:30:C:H6       | 1.85                     | 0.40              |
| 8:C:108:ASP:N     | 8:C:204:LYS:O     | 2.45                     | 0.40              |
| 11:F:141:ILE:HD12 | 11:F:141:ILE:HA   | 1.91                     | 0.40              |
| 25:T:48:GLN:HG2   | 25:T:53:VAL:O     | 2.22                     | 0.40              |
| 28:W:31:VAL:HG13  | 28:W:35:SER:HB2   | 2.04                     | 0.40              |
| 38:g:73:LYS:C     | 38:g:75:ALA:H     | 2.30                     | 0.40              |
| 39:h:21:THR:HA    | 50:s:94:PRO:HB3   | 2.03                     | 0.40              |
| 48:q:7:LEU:HD23   | 48:q:7:LEU:HA     | 1.93                     | 0.40              |
| 1:1:246:C:H3'     | 1:1:247:G:C5'     | 2.50                     | 0.40              |
| 1:1:528:A:N3      | 1:1:528:A:H3'     | 2.36                     | 0.40              |
| 1:1:839:U:C2      | 1:1:939:G:O6      | 2.74                     | 0.40              |
| 1:1:958:U:O4      | 18:M:39:GLY:HA2   | 2.20                     | 0.40              |
| 1:1:1461:C:C2     | 1:1:1462:C:C5     | 3.10                     | 0.40              |
| 2:2:44:A:C5       | 2:2:45:G:C8       | 3.09                     | 0.40              |
| 2:2:64:G:N2       | 2:2:69:G:N7       | 2.70                     | 0.40              |
| 2:2:327:A:O2'     | 2:2:328:C:O5'     | 2.37                     | 0.40              |
| 2:2:373:A:N1      | 2:2:482:A:N6      | 2.69                     | 0.40              |
| 2:2:496:A:N3      | 2:2:496:A:H2'     | 2.35                     | 0.40              |
| 2:2:925:G:H1'     | 2:2:1502:A:C4     | 2.57                     | 0.40              |
| 2:2:1116:U:C2     | 2:2:1184:G:O6     | 2.72                     | 0.40              |
| 4:5:1:G:H2'       | 4:5:2:C:H6        | 1.87                     | 0.40              |
| 4:6:7:G:OP2       | 4:6:16:C:N4       | 2.54                     | 0.40              |
| 8:C:109:VAL:HG22  | 8:C:203:VAL:HG13  | 2.04                     | 0.40              |
| 8:C:110:THR:CG2   | 8:C:169:ARG:HG2   | 2.51                     | 0.40              |
| 8:C:120:GLY:O     | 8:C:124:ARG:HB2   | 2.22                     | 0.40              |
| 15:J:107:GLY:O    | 15:J:111:LYS:HE3  | 2.22                     | 0.40              |
| 15:J:134:ALA:C    | 15:J:136:GLN:H    | 2.29                     | 0.40              |
| 18:M:8:LYS:HE3    | 18:M:9:PHE:CE2    | 2.56                     | 0.40              |
| 18:M:24:THR:CG2   | 27:V:81:PRO:HA    | 2.51                     | 0.40              |
| 27:V:29:ILE:HG22  | 27:V:88:HIS:CE1   | 2.56                     | 0.40              |
| 27:V:76:ASP:O     | 27:V:90:ASP:HB2   | 2.21                     | 0.40              |
| 30:Y:24:GLU:O     | 30:Y:28:LEU:HD23  | 2.22                     | 0.40              |
| 38:g:100:MET:HA   | 38:g:107:VAL:HG21 | 2.03                     | 0.40              |
| 38:g:161:LEU:HD21 | 38:g:172:ALA:HB1  | 2.04                     | 0.40              |
| 41:j:70:ASN:ND2   | 41:j:70:ASN:C     | 2.74                     | 0.40              |
| 48:q:29:GLN:HE21  | 48:q:29:GLN:HB2   | 1.69                     | 0.40              |

There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone

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

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

| Mol | Chain | Analysed      | Favoured  | Allowed  | Outliers | Percentiles |     |
|-----|-------|---------------|-----------|----------|----------|-------------|-----|
| 6   | A     | 204/231 (88%) | 200 (98%) | 4 (2%)   | 0        | 100         | 100 |
| 7   | B     | 269/273 (98%) | 261 (97%) | 8 (3%)   | 0        | 100         | 100 |
| 8   | C     | 207/209 (99%) | 183 (88%) | 24 (12%) | 0        | 100         | 100 |
| 9   | D     | 199/201 (99%) | 194 (98%) | 5 (2%)   | 0        | 100         | 100 |
| 10  | E     | 175/179 (98%) | 164 (94%) | 11 (6%)  | 0        | 100         | 100 |
| 11  | F     | 173/177 (98%) | 163 (94%) | 10 (6%)  | 0        | 100         | 100 |
| 12  | G     | 147/149 (99%) | 138 (94%) | 9 (6%)   | 0        | 100         | 100 |
| 13  | H     | 128/165 (78%) | 117 (91%) | 11 (9%)  | 0        | 100         | 100 |
| 14  | I     | 133/142 (94%) | 124 (93%) | 9 (7%)   | 0        | 100         | 100 |
| 15  | J     | 140/142 (99%) | 125 (89%) | 15 (11%) | 0        | 100         | 100 |
| 16  | K     | 121/123 (98%) | 119 (98%) | 2 (2%)   | 0        | 100         | 100 |
| 17  | L     | 142/144 (99%) | 129 (91%) | 13 (9%)  | 0        | 100         | 100 |
| 18  | M     | 134/136 (98%) | 130 (97%) | 4 (3%)   | 0        | 100         | 100 |
| 19  | N     | 117/127 (92%) | 114 (97%) | 3 (3%)   | 0        | 100         | 100 |
| 20  | O     | 114/117 (97%) | 110 (96%) | 4 (4%)   | 0        | 100         | 100 |
| 21  | P     | 112/115 (97%) | 108 (96%) | 4 (4%)   | 0        | 100         | 100 |
| 22  | Q     | 115/118 (98%) | 111 (96%) | 4 (4%)   | 0        | 100         | 100 |
| 23  | R     | 101/103 (98%) | 93 (92%)  | 8 (8%)   | 0        | 100         | 100 |
| 24  | S     | 108/110 (98%) | 104 (96%) | 4 (4%)   | 0        | 100         | 100 |
| 25  | T     | 92/100 (92%)  | 90 (98%)  | 2 (2%)   | 0        | 100         | 100 |
| 26  | U     | 101/104 (97%) | 90 (89%)  | 11 (11%) | 0        | 100         | 100 |
| 27  | V     | 92/94 (98%)   | 88 (96%)  | 4 (4%)   | 0        | 100         | 100 |
| 28  | W     | 74/85 (87%)   | 65 (88%)  | 9 (12%)  | 0        | 100         | 100 |
| 29  | X     | 75/78 (96%)   | 74 (99%)  | 1 (1%)   | 0        | 100         | 100 |
| 30  | Y     | 60/63 (95%)   | 59 (98%)  | 1 (2%)   | 0        | 100         | 100 |

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| Mol | Chain | Analysed        | Favoured   | Allowed  | Outliers | Percentiles |     |
|-----|-------|-----------------|------------|----------|----------|-------------|-----|
| 31  | Z     | 56/59 (95%)     | 52 (93%)   | 4 (7%)   | 0        | 100         | 100 |
| 32  | a     | 64/70 (91%)     | 62 (97%)   | 2 (3%)   | 0        | 100         | 100 |
| 33  | b     | 54/57 (95%)     | 50 (93%)   | 4 (7%)   | 0        | 100         | 100 |
| 34  | c     | 50/55 (91%)     | 48 (96%)   | 2 (4%)   | 0        | 100         | 100 |
| 35  | d     | 44/46 (96%)     | 44 (100%)  | 0        | 0        | 100         | 100 |
| 36  | e     | 62/65 (95%)     | 54 (87%)   | 8 (13%)  | 0        | 100         | 100 |
| 37  | f     | 36/38 (95%)     | 33 (92%)   | 3 (8%)   | 0        | 100         | 100 |
| 38  | g     | 223/241 (92%)   | 205 (92%)  | 18 (8%)  | 0        | 100         | 100 |
| 39  | h     | 206/233 (88%)   | 189 (92%)  | 17 (8%)  | 0        | 100         | 100 |
| 40  | i     | 203/206 (98%)   | 195 (96%)  | 8 (4%)   | 0        | 100         | 100 |
| 41  | j     | 154/167 (92%)   | 143 (93%)  | 10 (6%)  | 1 (1%)   | 21          | 34  |
| 42  | k     | 102/135 (76%)   | 97 (95%)   | 5 (5%)   | 0        | 100         | 100 |
| 43  | l     | 149/179 (83%)   | 141 (95%)  | 8 (5%)   | 0        | 100         | 100 |
| 44  | m     | 127/130 (98%)   | 123 (97%)  | 4 (3%)   | 0        | 100         | 100 |
| 45  | n     | 125/130 (96%)   | 112 (90%)  | 13 (10%) | 0        | 100         | 100 |
| 46  | o     | 97/103 (94%)    | 89 (92%)   | 8 (8%)   | 0        | 100         | 100 |
| 47  | p     | 115/129 (89%)   | 111 (96%)  | 4 (4%)   | 0        | 100         | 100 |
| 48  | q     | 120/124 (97%)   | 108 (90%)  | 12 (10%) | 0        | 100         | 100 |
| 49  | r     | 114/118 (97%)   | 107 (94%)  | 7 (6%)   | 0        | 100         | 100 |
| 50  | s     | 98/101 (97%)    | 92 (94%)   | 6 (6%)   | 0        | 100         | 100 |
| 51  | t     | 86/89 (97%)     | 85 (99%)   | 1 (1%)   | 0        | 100         | 100 |
| 52  | u     | 80/82 (98%)     | 73 (91%)   | 7 (9%)   | 0        | 100         | 100 |
| 53  | v     | 78/84 (93%)     | 73 (94%)   | 5 (6%)   | 0        | 100         | 100 |
| 54  | w     | 64/75 (85%)     | 64 (100%)  | 0        | 0        | 100         | 100 |
| 55  | x     | 81/92 (88%)     | 78 (96%)   | 3 (4%)   | 0        | 100         | 100 |
| 56  | y     | 84/87 (97%)     | 82 (98%)   | 2 (2%)   | 0        | 100         | 100 |
| 57  | z     | 68/71 (96%)     | 68 (100%)  | 0        | 0        | 100         | 100 |
| All | All   | 6073/6451 (94%) | 5731 (94%) | 341 (6%) | 1 (0%)   | 100         | 100 |

All (1) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 41  | j     | 98  | PRO  |

### 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 |     |
|-----|-------|----------------|------------|----------|-------------|-----|
| 6   | A     | 180/201 (90%)  | 180 (100%) | 0        | 100         | 100 |
| 7   | B     | 216/218 (99%)  | 216 (100%) | 0        | 100         | 100 |
| 8   | C     | 164/164 (100%) | 164 (100%) | 0        | 100         | 100 |
| 9   | D     | 165/165 (100%) | 165 (100%) | 0        | 100         | 100 |
| 10  | E     | 148/150 (99%)  | 148 (100%) | 0        | 100         | 100 |
| 11  | F     | 136/138 (99%)  | 136 (100%) | 0        | 100         | 100 |
| 12  | G     | 114/114 (100%) | 114 (100%) | 0        | 100         | 100 |
| 13  | H     | 99/123 (80%)   | 99 (100%)  | 0        | 100         | 100 |
| 14  | I     | 104/110 (94%)  | 104 (100%) | 0        | 100         | 100 |
| 15  | J     | 116/116 (100%) | 116 (100%) | 0        | 100         | 100 |
| 16  | K     | 104/104 (100%) | 104 (100%) | 0        | 100         | 100 |
| 17  | L     | 103/103 (100%) | 103 (100%) | 0        | 100         | 100 |
| 18  | M     | 109/109 (100%) | 109 (100%) | 0        | 100         | 100 |
| 19  | N     | 99/103 (96%)   | 99 (100%)  | 0        | 100         | 100 |
| 20  | O     | 86/87 (99%)    | 86 (100%)  | 0        | 100         | 100 |
| 21  | P     | 99/100 (99%)   | 99 (100%)  | 0        | 100         | 100 |
| 22  | Q     | 89/90 (99%)    | 89 (100%)  | 0        | 100         | 100 |
| 23  | R     | 84/84 (100%)   | 84 (100%)  | 0        | 100         | 100 |
| 24  | S     | 93/93 (100%)   | 93 (100%)  | 0        | 100         | 100 |
| 25  | T     | 81/84 (96%)    | 81 (100%)  | 0        | 100         | 100 |
| 26  | U     | 84/85 (99%)    | 84 (100%)  | 0        | 100         | 100 |
| 27  | V     | 78/78 (100%)   | 78 (100%)  | 0        | 100         | 100 |
| 28  | W     | 58/63 (92%)    | 58 (100%)  | 0        | 100         | 100 |
| 29  | X     | 67/68 (98%)    | 67 (100%)  | 0        | 100         | 100 |
| 30  | Y     | 54/55 (98%)    | 54 (100%)  | 0        | 100         | 100 |
| 31  | Z     | 48/49 (98%)    | 48 (100%)  | 0        | 100         | 100 |

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| Mol | Chain | Analysed        | Rotameric   | Outliers | Percentiles |     |
|-----|-------|-----------------|-------------|----------|-------------|-----|
| 32  | a     | 59/62 (95%)     | 59 (100%)   | 0        | 100         | 100 |
| 33  | b     | 47/48 (98%)     | 47 (100%)   | 0        | 100         | 100 |
| 34  | c     | 47/49 (96%)     | 47 (100%)   | 0        | 100         | 100 |
| 35  | d     | 38/38 (100%)    | 38 (100%)   | 0        | 100         | 100 |
| 36  | e     | 51/52 (98%)     | 51 (100%)   | 0        | 100         | 100 |
| 37  | f     | 34/34 (100%)    | 34 (100%)   | 0        | 100         | 100 |
| 38  | g     | 187/199 (94%)   | 187 (100%)  | 0        | 100         | 100 |
| 39  | h     | 171/190 (90%)   | 171 (100%)  | 0        | 100         | 100 |
| 40  | i     | 172/173 (99%)   | 172 (100%)  | 0        | 100         | 100 |
| 41  | j     | 119/126 (94%)   | 118 (99%)   | 1 (1%)   | 73          | 85  |
| 42  | k     | 91/116 (78%)    | 91 (100%)   | 0        | 100         | 100 |
| 43  | l     | 124/147 (84%)   | 124 (100%)  | 0        | 100         | 100 |
| 44  | m     | 104/105 (99%)   | 104 (100%)  | 0        | 100         | 100 |
| 45  | n     | 105/107 (98%)   | 105 (100%)  | 0        | 100         | 100 |
| 46  | o     | 86/90 (96%)     | 86 (100%)   | 0        | 100         | 100 |
| 47  | p     | 90/99 (91%)     | 90 (100%)   | 0        | 100         | 100 |
| 48  | q     | 102/103 (99%)   | 101 (99%)   | 1 (1%)   | 68          | 81  |
| 49  | r     | 94/96 (98%)     | 94 (100%)   | 0        | 100         | 100 |
| 50  | s     | 83/84 (99%)     | 83 (100%)   | 0        | 100         | 100 |
| 51  | t     | 76/77 (99%)     | 76 (100%)   | 0        | 100         | 100 |
| 52  | u     | 65/65 (100%)    | 65 (100%)   | 0        | 100         | 100 |
| 53  | v     | 74/78 (95%)     | 74 (100%)   | 0        | 100         | 100 |
| 54  | w     | 57/65 (88%)     | 57 (100%)   | 0        | 100         | 100 |
| 55  | x     | 72/79 (91%)     | 72 (100%)   | 0        | 100         | 100 |
| 56  | y     | 65/66 (98%)     | 65 (100%)   | 0        | 100         | 100 |
| 57  | z     | 60/61 (98%)     | 60 (100%)   | 0        | 100         | 100 |
| All | All   | 5051/5263 (96%) | 5049 (100%) | 2 (0%)   | 100         | 100 |

All (2) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 41  | j     | 70  | ASN  |
| 48  | q     | 29  | GLN  |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (50) such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 6   | A     | 59  | GLN  |
| 6   | A     | 129 | ASN  |
| 6   | A     | 132 | ASN  |
| 6   | A     | 184 | HIS  |
| 7   | B     | 46  | ASN  |
| 7   | B     | 53  | HIS  |
| 8   | C     | 140 | HIS  |
| 10  | E     | 27  | GLN  |
| 10  | E     | 52  | ASN  |
| 10  | E     | 135 | GLN  |
| 11  | F     | 104 | ASN  |
| 12  | G     | 11  | ASN  |
| 12  | G     | 18  | GLN  |
| 12  | G     | 66  | ASN  |
| 12  | G     | 133 | GLN  |
| 13  | H     | 9   | GLN  |
| 14  | I     | 11  | GLN  |
| 14  | I     | 110 | GLN  |
| 15  | J     | 80  | HIS  |
| 16  | K     | 29  | HIS  |
| 16  | K     | 88  | ASN  |
| 17  | L     | 104 | GLN  |
| 19  | N     | 3   | HIS  |
| 19  | N     | 107 | ASN  |
| 20  | O     | 61  | GLN  |
| 22  | Q     | 44  | GLN  |
| 23  | R     | 6   | GLN  |
| 23  | R     | 89  | HIS  |
| 24  | S     | 7   | HIS  |
| 27  | V     | 12  | GLN  |
| 29  | X     | 20  | HIS  |
| 29  | X     | 34  | HIS  |
| 29  | X     | 36  | HIS  |
| 30  | Y     | 15  | ASN  |
| 32  | a     | 20  | ASN  |
| 35  | d     | 26  | ASN  |
| 37  | f     | 35  | GLN  |
| 38  | g     | 146 | ASN  |
| 39  | h     | 139 | GLN  |
| 39  | h     | 140 | ASN  |
| 40  | i     | 140 | ASN  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 41  | j     | 61  | GLN  |
| 42  | k     | 17  | GLN  |
| 43  | l     | 68  | ASN  |
| 45  | n     | 5   | GLN  |
| 45  | n     | 50  | GLN  |
| 47  | p     | 15  | GLN  |
| 47  | p     | 118 | HIS  |
| 52  | u     | 26  | ASN  |
| 56  | y     | 20  | HIS  |

### 5.3.3 RNA ⓘ

| Mol | Chain | Analysed        | Backbone Outliers | Pucker Outliers |
|-----|-------|-----------------|-------------------|-----------------|
| 1   | 1     | 2901/2903 (99%) | 774 (26%)         | 23 (0%)         |
| 2   | 2     | 1530/1534 (99%) | 354 (23%)         | 9 (0%)          |
| 3   | 4     | 119/120 (99%)   | 30 (25%)          | 0               |
| 4   | 5     | 76/77 (98%)     | 14 (18%)          | 1 (1%)          |
| 4   | 6     | 76/77 (98%)     | 19 (25%)          | 0               |
| 5   | 7     | 12/25 (48%)     | 3 (25%)           | 0               |
| All | All   | 4714/4736 (99%) | 1194 (25%)        | 33 (0%)         |

All (1194) RNA backbone outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | 1     | 10  | A    |
| 1   | 1     | 12  | U    |
| 1   | 1     | 13  | A    |
| 1   | 1     | 14  | A    |
| 1   | 1     | 15  | G    |
| 1   | 1     | 19  | A    |
| 1   | 1     | 20  | C    |
| 1   | 1     | 21  | A    |
| 1   | 1     | 23  | G    |
| 1   | 1     | 24  | G    |
| 1   | 1     | 27  | G    |
| 1   | 1     | 34  | U    |
| 1   | 1     | 35  | G    |
| 1   | 1     | 42  | A    |
| 1   | 1     | 46  | G    |
| 1   | 1     | 50  | U    |
| 1   | 1     | 51  | G    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | 1     | 60  | G    |
| 1   | 1     | 71  | A    |
| 1   | 1     | 74  | A    |
| 1   | 1     | 75  | G    |
| 1   | 1     | 84  | A    |
| 1   | 1     | 85  | G    |
| 1   | 1     | 86  | G    |
| 1   | 1     | 87  | U    |
| 1   | 1     | 88  | G    |
| 1   | 1     | 101 | A    |
| 1   | 1     | 102 | U    |
| 1   | 1     | 103 | A    |
| 1   | 1     | 114 | U    |
| 1   | 1     | 118 | A    |
| 1   | 1     | 120 | U    |
| 1   | 1     | 138 | U    |
| 1   | 1     | 139 | U    |
| 1   | 1     | 140 | C    |
| 1   | 1     | 165 | A    |
| 1   | 1     | 181 | A    |
| 1   | 1     | 196 | A    |
| 1   | 1     | 199 | A    |
| 1   | 1     | 215 | G    |
| 1   | 1     | 216 | A    |
| 1   | 1     | 222 | A    |
| 1   | 1     | 225 | C    |
| 1   | 1     | 227 | A    |
| 1   | 1     | 228 | C    |
| 1   | 1     | 241 | A    |
| 1   | 1     | 243 | U    |
| 1   | 1     | 245 | G    |
| 1   | 1     | 247 | G    |
| 1   | 1     | 248 | G    |
| 1   | 1     | 249 | C    |
| 1   | 1     | 255 | A    |
| 1   | 1     | 256 | A    |
| 1   | 1     | 259 | G    |
| 1   | 1     | 264 | C    |
| 1   | 1     | 265 | A    |
| 1   | 1     | 266 | G    |
| 1   | 1     | 271 | G    |
| 1   | 1     | 275 | C    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | 1     | 276 | U    |
| 1   | 1     | 279 | A    |
| 1   | 1     | 285 | G    |
| 1   | 1     | 291 | G    |
| 1   | 1     | 294 | A    |
| 1   | 1     | 299 | A    |
| 1   | 1     | 301 | G    |
| 1   | 1     | 302 | C    |
| 1   | 1     | 305 | C    |
| 1   | 1     | 308 | G    |
| 1   | 1     | 311 | A    |
| 1   | 1     | 312 | G    |
| 1   | 1     | 313 | G    |
| 1   | 1     | 314 | C    |
| 1   | 1     | 317 | G    |
| 1   | 1     | 321 | U    |
| 1   | 1     | 322 | A    |
| 1   | 1     | 329 | G    |
| 1   | 1     | 330 | A    |
| 1   | 1     | 331 | C    |
| 1   | 1     | 335 | C    |
| 1   | 1     | 338 | G    |
| 1   | 1     | 341 | C    |
| 1   | 1     | 352 | A    |
| 1   | 1     | 353 | C    |
| 1   | 1     | 360 | U    |
| 1   | 1     | 361 | G    |
| 1   | 1     | 362 | A    |
| 1   | 1     | 368 | A    |
| 1   | 1     | 369 | U    |
| 1   | 1     | 370 | G    |
| 1   | 1     | 371 | A    |
| 1   | 1     | 372 | G    |
| 1   | 1     | 383 | C    |
| 1   | 1     | 384 | A    |
| 1   | 1     | 386 | G    |
| 1   | 1     | 387 | U    |
| 1   | 1     | 388 | G    |
| 1   | 1     | 391 | A    |
| 1   | 1     | 392 | U    |
| 1   | 1     | 396 | G    |
| 1   | 1     | 399 | U    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | 1     | 401 | A    |
| 1   | 1     | 403 | U    |
| 1   | 1     | 405 | U    |
| 1   | 1     | 411 | G    |
| 1   | 1     | 412 | A    |
| 1   | 1     | 417 | C    |
| 1   | 1     | 424 | G    |
| 1   | 1     | 444 | C    |
| 1   | 1     | 454 | A    |
| 1   | 1     | 457 | A    |
| 1   | 1     | 458 | G    |
| 1   | 1     | 479 | A    |
| 1   | 1     | 480 | A    |
| 1   | 1     | 481 | G    |
| 1   | 1     | 482 | A    |
| 1   | 1     | 490 | C    |
| 1   | 1     | 491 | G    |
| 1   | 1     | 505 | A    |
| 1   | 1     | 507 | A    |
| 1   | 1     | 508 | A    |
| 1   | 1     | 509 | C    |
| 1   | 1     | 510 | C    |
| 1   | 1     | 518 | G    |
| 1   | 1     | 521 | U    |
| 1   | 1     | 522 | A    |
| 1   | 1     | 525 | U    |
| 1   | 1     | 527 | C    |
| 1   | 1     | 529 | A    |
| 1   | 1     | 530 | G    |
| 1   | 1     | 531 | C    |
| 1   | 1     | 532 | A    |
| 1   | 1     | 533 | G    |
| 1   | 1     | 534 | U    |
| 1   | 1     | 535 | G    |
| 1   | 1     | 537 | G    |
| 1   | 1     | 542 | C    |
| 1   | 1     | 543 | G    |
| 1   | 1     | 546 | U    |
| 1   | 1     | 547 | A    |
| 1   | 1     | 548 | G    |
| 1   | 1     | 549 | G    |
| 1   | 1     | 550 | C    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | 1     | 551 | G    |
| 1   | 1     | 552 | U    |
| 1   | 1     | 556 | A    |
| 1   | 1     | 559 | G    |
| 1   | 1     | 562 | U    |
| 1   | 1     | 563 | A    |
| 1   | 1     | 564 | C    |
| 1   | 1     | 568 | U    |
| 1   | 1     | 569 | U    |
| 1   | 1     | 570 | G    |
| 1   | 1     | 572 | A    |
| 1   | 1     | 573 | U    |
| 1   | 1     | 575 | A    |
| 1   | 1     | 590 | A    |
| 1   | 1     | 592 | A    |
| 1   | 1     | 603 | A    |
| 1   | 1     | 604 | G    |
| 1   | 1     | 605 | G    |
| 1   | 1     | 607 | U    |
| 1   | 1     | 609 | A    |
| 1   | 1     | 611 | C    |
| 1   | 1     | 612 | G    |
| 1   | 1     | 614 | A    |
| 1   | 1     | 615 | U    |
| 1   | 1     | 616 | A    |
| 1   | 1     | 621 | A    |
| 1   | 1     | 622 | G    |
| 1   | 1     | 623 | C    |
| 1   | 1     | 625 | G    |
| 1   | 1     | 627 | A    |
| 1   | 1     | 628 | G    |
| 1   | 1     | 631 | A    |
| 1   | 1     | 632 | A    |
| 1   | 1     | 633 | A    |
| 1   | 1     | 635 | C    |
| 1   | 1     | 637 | A    |
| 1   | 1     | 640 | C    |
| 1   | 1     | 643 | A    |
| 1   | 1     | 646 | U    |
| 1   | 1     | 647 | G    |
| 1   | 1     | 649 | G    |
| 1   | 1     | 650 | C    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | 1     | 652 | U    |
| 1   | 1     | 654 | A    |
| 1   | 1     | 655 | A    |
| 1   | 1     | 662 | G    |
| 1   | 1     | 668 | A    |
| 1   | 1     | 669 | G    |
| 1   | 1     | 670 | A    |
| 1   | 1     | 671 | C    |
| 1   | 1     | 686 | U    |
| 1   | 1     | 730 | A    |
| 1   | 1     | 747 | 5MU  |
| 1   | 1     | 764 | A    |
| 1   | 1     | 765 | C    |
| 1   | 1     | 775 | G    |
| 1   | 1     | 776 | G    |
| 1   | 1     | 782 | A    |
| 1   | 1     | 784 | G    |
| 1   | 1     | 785 | G    |
| 1   | 1     | 789 | A    |
| 1   | 1     | 805 | G    |
| 1   | 1     | 812 | C    |
| 1   | 1     | 818 | G    |
| 1   | 1     | 819 | A    |
| 1   | 1     | 820 | A    |
| 1   | 1     | 823 | C    |
| 1   | 1     | 827 | U    |
| 1   | 1     | 828 | U    |
| 1   | 1     | 829 | A    |
| 1   | 1     | 831 | G    |
| 1   | 1     | 832 | U    |
| 1   | 1     | 833 | A    |
| 1   | 1     | 835 | C    |
| 1   | 1     | 838 | C    |
| 1   | 1     | 845 | A    |
| 1   | 1     | 846 | U    |
| 1   | 1     | 847 | U    |
| 1   | 1     | 853 | C    |
| 1   | 1     | 854 | C    |
| 1   | 1     | 858 | G    |
| 1   | 1     | 859 | G    |
| 1   | 1     | 867 | C    |
| 1   | 1     | 869 | G    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | 1     | 873 | C    |
| 1   | 1     | 877 | A    |
| 1   | 1     | 878 | A    |
| 1   | 1     | 882 | G    |
| 1   | 1     | 884 | U    |
| 1   | 1     | 885 | C    |
| 1   | 1     | 887 | A    |
| 1   | 1     | 888 | C    |
| 1   | 1     | 891 | G    |
| 1   | 1     | 895 | U    |
| 1   | 1     | 896 | A    |
| 1   | 1     | 903 | C    |
| 1   | 1     | 905 | A    |
| 1   | 1     | 907 | G    |
| 1   | 1     | 910 | A    |
| 1   | 1     | 912 | C    |
| 1   | 1     | 914 | G    |
| 1   | 1     | 915 | C    |
| 1   | 1     | 919 | U    |
| 1   | 1     | 920 | A    |
| 1   | 1     | 921 | C    |
| 1   | 1     | 923 | G    |
| 1   | 1     | 925 | A    |
| 1   | 1     | 926 | G    |
| 1   | 1     | 931 | U    |
| 1   | 1     | 932 | U    |
| 1   | 1     | 933 | A    |
| 1   | 1     | 934 | U    |
| 1   | 1     | 939 | G    |
| 1   | 1     | 941 | A    |
| 1   | 1     | 942 | G    |
| 1   | 1     | 945 | A    |
| 1   | 1     | 946 | C    |
| 1   | 1     | 948 | C    |
| 1   | 1     | 950 | G    |
| 1   | 1     | 952 | G    |
| 1   | 1     | 955 | PSU  |
| 1   | 1     | 956 | G    |
| 1   | 1     | 957 | C    |
| 1   | 1     | 958 | U    |
| 1   | 1     | 959 | A    |
| 1   | 1     | 961 | C    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | 1     | 965  | C    |
| 1   | 1     | 966  | G    |
| 1   | 1     | 974  | G    |
| 1   | 1     | 979  | A    |
| 1   | 1     | 980  | A    |
| 1   | 1     | 981  | A    |
| 1   | 1     | 983  | A    |
| 1   | 1     | 986  | C    |
| 1   | 1     | 989  | G    |
| 1   | 1     | 991  | C    |
| 1   | 1     | 992  | C    |
| 1   | 1     | 995  | C    |
| 1   | 1     | 996  | A    |
| 1   | 1     | 997  | G    |
| 1   | 1     | 998  | C    |
| 1   | 1     | 999  | U    |
| 1   | 1     | 1003 | G    |
| 1   | 1     | 1005 | C    |
| 1   | 1     | 1006 | C    |
| 1   | 1     | 1010 | A    |
| 1   | 1     | 1011 | G    |
| 1   | 1     | 1012 | U    |
| 1   | 1     | 1013 | C    |
| 1   | 1     | 1016 | G    |
| 1   | 1     | 1017 | G    |
| 1   | 1     | 1020 | A    |
| 1   | 1     | 1021 | A    |
| 1   | 1     | 1022 | G    |
| 1   | 1     | 1026 | G    |
| 1   | 1     | 1028 | A    |
| 1   | 1     | 1031 | G    |
| 1   | 1     | 1033 | U    |
| 1   | 1     | 1034 | G    |
| 1   | 1     | 1036 | G    |
| 1   | 1     | 1037 | G    |
| 1   | 1     | 1043 | C    |
| 1   | 1     | 1046 | A    |
| 1   | 1     | 1047 | G    |
| 1   | 1     | 1048 | A    |
| 1   | 1     | 1057 | A    |
| 1   | 1     | 1064 | C    |
| 1   | 1     | 1066 | U    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | 1     | 1068 | G    |
| 1   | 1     | 1070 | A    |
| 1   | 1     | 1071 | G    |
| 1   | 1     | 1073 | A    |
| 1   | 1     | 1083 | U    |
| 1   | 1     | 1085 | A    |
| 1   | 1     | 1087 | G    |
| 1   | 1     | 1088 | A    |
| 1   | 1     | 1096 | A    |
| 1   | 1     | 1101 | U    |
| 1   | 1     | 1111 | A    |
| 1   | 1     | 1112 | G    |
| 1   | 1     | 1116 | G    |
| 1   | 1     | 1122 | G    |
| 1   | 1     | 1129 | A    |
| 1   | 1     | 1130 | U    |
| 1   | 1     | 1131 | G    |
| 1   | 1     | 1132 | U    |
| 1   | 1     | 1133 | A    |
| 1   | 1     | 1134 | A    |
| 1   | 1     | 1135 | C    |
| 1   | 1     | 1136 | G    |
| 1   | 1     | 1137 | G    |
| 1   | 1     | 1141 | U    |
| 1   | 1     | 1142 | A    |
| 1   | 1     | 1143 | A    |
| 1   | 1     | 1144 | A    |
| 1   | 1     | 1145 | C    |
| 1   | 1     | 1146 | C    |
| 1   | 1     | 1152 | C    |
| 1   | 1     | 1154 | G    |
| 1   | 1     | 1155 | A    |
| 1   | 1     | 1157 | G    |
| 1   | 1     | 1162 | G    |
| 1   | 1     | 1168 | G    |
| 1   | 1     | 1169 | A    |
| 1   | 1     | 1170 | C    |
| 1   | 1     | 1173 | U    |
| 1   | 1     | 1175 | A    |
| 1   | 1     | 1176 | U    |
| 1   | 1     | 1177 | G    |
| 1   | 1     | 1178 | C    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | 1     | 1180 | U    |
| 1   | 1     | 1184 | U    |
| 1   | 1     | 1185 | G    |
| 1   | 1     | 1187 | G    |
| 1   | 1     | 1189 | A    |
| 1   | 1     | 1190 | G    |
| 1   | 1     | 1191 | G    |
| 1   | 1     | 1192 | G    |
| 1   | 1     | 1195 | G    |
| 1   | 1     | 1204 | A    |
| 1   | 1     | 1205 | A    |
| 1   | 1     | 1210 | G    |
| 1   | 1     | 1212 | G    |
| 1   | 1     | 1213 | A    |
| 1   | 1     | 1216 | G    |
| 1   | 1     | 1219 | U    |
| 1   | 1     | 1221 | C    |
| 1   | 1     | 1223 | G    |
| 1   | 1     | 1226 | A    |
| 1   | 1     | 1227 | G    |
| 1   | 1     | 1229 | C    |
| 1   | 1     | 1231 | U    |
| 1   | 1     | 1236 | G    |
| 1   | 1     | 1238 | G    |
| 1   | 1     | 1240 | U    |
| 1   | 1     | 1242 | U    |
| 1   | 1     | 1247 | A    |
| 1   | 1     | 1249 | U    |
| 1   | 1     | 1250 | G    |
| 1   | 1     | 1253 | A    |
| 1   | 1     | 1256 | G    |
| 1   | 1     | 1257 | C    |
| 1   | 1     | 1266 | G    |
| 1   | 1     | 1268 | A    |
| 1   | 1     | 1271 | G    |
| 1   | 1     | 1272 | A    |
| 1   | 1     | 1300 | G    |
| 1   | 1     | 1301 | A    |
| 1   | 1     | 1345 | C    |
| 1   | 1     | 1352 | U    |
| 1   | 1     | 1365 | A    |
| 1   | 1     | 1368 | G    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | 1     | 1379 | U    |
| 1   | 1     | 1380 | G    |
| 1   | 1     | 1383 | A    |
| 1   | 1     | 1408 | G    |
| 1   | 1     | 1416 | G    |
| 1   | 1     | 1417 | C    |
| 1   | 1     | 1420 | A    |
| 1   | 1     | 1428 | C    |
| 1   | 1     | 1453 | A    |
| 1   | 1     | 1458 | U    |
| 1   | 1     | 1482 | G    |
| 1   | 1     | 1490 | A    |
| 1   | 1     | 1493 | C    |
| 1   | 1     | 1503 | A    |
| 1   | 1     | 1508 | A    |
| 1   | 1     | 1510 | G    |
| 1   | 1     | 1515 | A    |
| 1   | 1     | 1532 | A    |
| 1   | 1     | 1533 | C    |
| 1   | 1     | 1534 | U    |
| 1   | 1     | 1535 | A    |
| 1   | 1     | 1536 | C    |
| 1   | 1     | 1537 | G    |
| 1   | 1     | 1538 | G    |
| 1   | 1     | 1566 | A    |
| 1   | 1     | 1569 | A    |
| 1   | 1     | 1586 | A    |
| 1   | 1     | 1589 | U    |
| 1   | 1     | 1590 | A    |
| 1   | 1     | 1608 | A    |
| 1   | 1     | 1610 | A    |
| 1   | 1     | 1618 | 6MZ  |
| 1   | 1     | 1634 | A    |
| 1   | 1     | 1646 | C    |
| 1   | 1     | 1647 | U    |
| 1   | 1     | 1648 | U    |
| 1   | 1     | 1654 | A    |
| 1   | 1     | 1674 | G    |
| 1   | 1     | 1675 | C    |
| 1   | 1     | 1703 | G    |
| 1   | 1     | 1715 | G    |
| 1   | 1     | 1729 | U    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | 1     | 1730 | C    |
| 1   | 1     | 1738 | G    |
| 1   | 1     | 1744 | A    |
| 1   | 1     | 1764 | C    |
| 1   | 1     | 1773 | A    |
| 1   | 1     | 1800 | C    |
| 1   | 1     | 1801 | A    |
| 1   | 1     | 1808 | A    |
| 1   | 1     | 1811 | G    |
| 1   | 1     | 1816 | C    |
| 1   | 1     | 1829 | A    |
| 1   | 1     | 1833 | C    |
| 1   | 1     | 1848 | A    |
| 1   | 1     | 1856 | U    |
| 1   | 1     | 1857 | G    |
| 1   | 1     | 1858 | A    |
| 1   | 1     | 1862 | G    |
| 1   | 1     | 1864 | U    |
| 1   | 1     | 1866 | A    |
| 1   | 1     | 1869 | G    |
| 1   | 1     | 1870 | C    |
| 1   | 1     | 1871 | A    |
| 1   | 1     | 1872 | A    |
| 1   | 1     | 1873 | G    |
| 1   | 1     | 1884 | G    |
| 1   | 1     | 1887 | C    |
| 1   | 1     | 1888 | G    |
| 1   | 1     | 1906 | G    |
| 1   | 1     | 1913 | A    |
| 1   | 1     | 1924 | C    |
| 1   | 1     | 1929 | G    |
| 1   | 1     | 1930 | G    |
| 1   | 1     | 1935 | G    |
| 1   | 1     | 1936 | A    |
| 1   | 1     | 1937 | A    |
| 1   | 1     | 1938 | A    |
| 1   | 1     | 1955 | U    |
| 1   | 1     | 1964 | G    |
| 1   | 1     | 1967 | C    |
| 1   | 1     | 1970 | A    |
| 1   | 1     | 1971 | U    |
| 1   | 1     | 1972 | G    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | 1     | 1991 | U    |
| 1   | 1     | 1992 | G    |
| 1   | 1     | 1993 | U    |
| 1   | 1     | 1997 | C    |
| 1   | 1     | 2007 | U    |
| 1   | 1     | 2022 | U    |
| 1   | 1     | 2023 | C    |
| 1   | 1     | 2024 | G    |
| 1   | 1     | 2027 | G    |
| 1   | 1     | 2029 | G    |
| 1   | 1     | 2030 | 6MZ  |
| 1   | 1     | 2031 | A    |
| 1   | 1     | 2032 | G    |
| 1   | 1     | 2033 | A    |
| 1   | 1     | 2035 | G    |
| 1   | 1     | 2036 | C    |
| 1   | 1     | 2037 | A    |
| 1   | 1     | 2038 | G    |
| 1   | 1     | 2039 | U    |
| 1   | 1     | 2040 | G    |
| 1   | 1     | 2043 | C    |
| 1   | 1     | 2047 | C    |
| 1   | 1     | 2048 | G    |
| 1   | 1     | 2049 | G    |
| 1   | 1     | 2050 | C    |
| 1   | 1     | 2052 | A    |
| 1   | 1     | 2055 | C    |
| 1   | 1     | 2056 | G    |
| 1   | 1     | 2060 | A    |
| 1   | 1     | 2061 | G    |
| 1   | 1     | 2062 | A    |
| 1   | 1     | 2069 | G7M  |
| 1   | 1     | 2070 | A    |
| 1   | 1     | 2093 | G    |
| 1   | 1     | 2100 | G    |
| 1   | 1     | 2102 | G    |
| 1   | 1     | 2111 | U    |
| 1   | 1     | 2112 | G    |
| 1   | 1     | 2115 | G    |
| 1   | 1     | 2116 | G    |
| 1   | 1     | 2117 | A    |
| 1   | 1     | 2118 | U    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | 1     | 2119 | A    |
| 1   | 1     | 2125 | G    |
| 1   | 1     | 2128 | G    |
| 1   | 1     | 2131 | U    |
| 1   | 1     | 2132 | U    |
| 1   | 1     | 2133 | G    |
| 1   | 1     | 2134 | A    |
| 1   | 1     | 2136 | G    |
| 1   | 1     | 2146 | C    |
| 1   | 1     | 2147 | A    |
| 1   | 1     | 2158 | A    |
| 1   | 1     | 2159 | G    |
| 1   | 1     | 2164 | C    |
| 1   | 1     | 2165 | C    |
| 1   | 1     | 2167 | U    |
| 1   | 1     | 2170 | A    |
| 1   | 1     | 2171 | A    |
| 1   | 1     | 2172 | U    |
| 1   | 1     | 2173 | A    |
| 1   | 1     | 2180 | U    |
| 1   | 1     | 2183 | A    |
| 1   | 1     | 2187 | U    |
| 1   | 1     | 2189 | U    |
| 1   | 1     | 2190 | G    |
| 1   | 1     | 2191 | A    |
| 1   | 1     | 2194 | U    |
| 1   | 1     | 2198 | A    |
| 1   | 1     | 2204 | G    |
| 1   | 1     | 2211 | A    |
| 1   | 1     | 2212 | A    |
| 1   | 1     | 2225 | A    |
| 1   | 1     | 2238 | G    |
| 1   | 1     | 2239 | G    |
| 1   | 1     | 2250 | G    |
| 1   | 1     | 2252 | G    |
| 1   | 1     | 2259 | U    |
| 1   | 1     | 2260 | C    |
| 1   | 1     | 2262 | U    |
| 1   | 1     | 2263 | C    |
| 1   | 1     | 2265 | U    |
| 1   | 1     | 2266 | A    |
| 1   | 1     | 2267 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | 1     | 2269 | G    |
| 1   | 1     | 2273 | A    |
| 1   | 1     | 2275 | C    |
| 1   | 1     | 2277 | G    |
| 1   | 1     | 2283 | C    |
| 1   | 1     | 2287 | A    |
| 1   | 1     | 2290 | G    |
| 1   | 1     | 2293 | G    |
| 1   | 1     | 2294 | G    |
| 1   | 1     | 2305 | U    |
| 1   | 1     | 2307 | G    |
| 1   | 1     | 2309 | A    |
| 1   | 1     | 2311 | A    |
| 1   | 1     | 2314 | A    |
| 1   | 1     | 2319 | G    |
| 1   | 1     | 2322 | A    |
| 1   | 1     | 2324 | U    |
| 1   | 1     | 2325 | G    |
| 1   | 1     | 2327 | A    |
| 1   | 1     | 2331 | G    |
| 1   | 1     | 2334 | U    |
| 1   | 1     | 2335 | A    |
| 1   | 1     | 2336 | A    |
| 1   | 1     | 2342 | C    |
| 1   | 1     | 2344 | U    |
| 1   | 1     | 2345 | G    |
| 1   | 1     | 2347 | C    |
| 1   | 1     | 2355 | G    |
| 1   | 1     | 2357 | G    |
| 1   | 1     | 2361 | G    |
| 1   | 1     | 2363 | G    |
| 1   | 1     | 2367 | G    |
| 1   | 1     | 2372 | U    |
| 1   | 1     | 2373 | G    |
| 1   | 1     | 2375 | G    |
| 1   | 1     | 2380 | C    |
| 1   | 1     | 2382 | G    |
| 1   | 1     | 2383 | G    |
| 1   | 1     | 2385 | C    |
| 1   | 1     | 2389 | G    |
| 1   | 1     | 2391 | G    |
| 1   | 1     | 2392 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | 1     | 2397 | G    |
| 1   | 1     | 2400 | G    |
| 1   | 1     | 2401 | U    |
| 1   | 1     | 2402 | U    |
| 1   | 1     | 2405 | G    |
| 1   | 1     | 2408 | U    |
| 1   | 1     | 2416 | C    |
| 1   | 1     | 2417 | C    |
| 1   | 1     | 2418 | A    |
| 1   | 1     | 2420 | C    |
| 1   | 1     | 2422 | C    |
| 1   | 1     | 2423 | U    |
| 1   | 1     | 2425 | A    |
| 1   | 1     | 2426 | A    |
| 1   | 1     | 2427 | C    |
| 1   | 1     | 2428 | G    |
| 1   | 1     | 2429 | G    |
| 1   | 1     | 2430 | A    |
| 1   | 1     | 2431 | U    |
| 1   | 1     | 2435 | A    |
| 1   | 1     | 2441 | U    |
| 1   | 1     | 2448 | A    |
| 1   | 1     | 2449 | U    |
| 1   | 1     | 2452 | C    |
| 1   | 1     | 2454 | G    |
| 1   | 1     | 2455 | G    |
| 1   | 1     | 2456 | C    |
| 1   | 1     | 2462 | C    |
| 1   | 1     | 2464 | G    |
| 1   | 1     | 2467 | C    |
| 1   | 1     | 2468 | A    |
| 1   | 1     | 2469 | A    |
| 1   | 1     | 2470 | G    |
| 1   | 1     | 2471 | A    |
| 1   | 1     | 2472 | G    |
| 1   | 1     | 2475 | C    |
| 1   | 1     | 2476 | A    |
| 1   | 1     | 2478 | A    |
| 1   | 1     | 2479 | U    |
| 1   | 1     | 2480 | C    |
| 1   | 1     | 2488 | G    |
| 1   | 1     | 2489 | U    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | 1     | 2490 | G    |
| 1   | 1     | 2491 | U    |
| 1   | 1     | 2498 | OMC  |
| 1   | 1     | 2499 | C    |
| 1   | 1     | 2502 | G    |
| 1   | 1     | 2505 | G    |
| 1   | 1     | 2513 | A    |
| 1   | 1     | 2515 | C    |
| 1   | 1     | 2517 | C    |
| 1   | 1     | 2518 | A    |
| 1   | 1     | 2519 | U    |
| 1   | 1     | 2520 | C    |
| 1   | 1     | 2521 | C    |
| 1   | 1     | 2522 | U    |
| 1   | 1     | 2523 | G    |
| 1   | 1     | 2526 | G    |
| 1   | 1     | 2529 | G    |
| 1   | 1     | 2532 | G    |
| 1   | 1     | 2534 | A    |
| 1   | 1     | 2535 | G    |
| 1   | 1     | 2537 | U    |
| 1   | 1     | 2539 | C    |
| 1   | 1     | 2547 | A    |
| 1   | 1     | 2549 | G    |
| 1   | 1     | 2554 | U    |
| 1   | 1     | 2555 | U    |
| 1   | 1     | 2556 | C    |
| 1   | 1     | 2563 | U    |
| 1   | 1     | 2566 | A    |
| 1   | 1     | 2567 | G    |
| 1   | 1     | 2570 | G    |
| 1   | 1     | 2572 | A    |
| 1   | 1     | 2573 | C    |
| 1   | 1     | 2574 | G    |
| 1   | 1     | 2577 | A    |
| 1   | 1     | 2582 | G    |
| 1   | 1     | 2585 | U    |
| 1   | 1     | 2602 | A    |
| 1   | 1     | 2603 | G    |
| 1   | 1     | 2609 | U    |
| 1   | 1     | 2613 | U    |
| 1   | 1     | 2615 | U    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | 1     | 2623 | G    |
| 1   | 1     | 2624 | G    |
| 1   | 1     | 2627 | G    |
| 1   | 1     | 2628 | C    |
| 1   | 1     | 2629 | U    |
| 1   | 1     | 2638 | G    |
| 1   | 1     | 2639 | A    |
| 1   | 1     | 2640 | G    |
| 1   | 1     | 2646 | C    |
| 1   | 1     | 2647 | U    |
| 1   | 1     | 2648 | G    |
| 1   | 1     | 2650 | U    |
| 1   | 1     | 2653 | U    |
| 1   | 1     | 2661 | G    |
| 1   | 1     | 2665 | A    |
| 1   | 1     | 2667 | C    |
| 1   | 1     | 2669 | G    |
| 1   | 1     | 2670 | A    |
| 1   | 1     | 2673 | G    |
| 1   | 1     | 2675 | A    |
| 1   | 1     | 2680 | U    |
| 1   | 1     | 2683 | C    |
| 1   | 1     | 2684 | U    |
| 1   | 1     | 2685 | G    |
| 1   | 1     | 2689 | U    |
| 1   | 1     | 2690 | U    |
| 1   | 1     | 2714 | G    |
| 1   | 1     | 2716 | C    |
| 1   | 1     | 2726 | A    |
| 1   | 1     | 2728 | U    |
| 1   | 1     | 2730 | C    |
| 1   | 1     | 2732 | G    |
| 1   | 1     | 2733 | A    |
| 1   | 1     | 2736 | A    |
| 1   | 1     | 2741 | A    |
| 1   | 1     | 2743 | U    |
| 1   | 1     | 2744 | G    |
| 1   | 1     | 2747 | G    |
| 1   | 1     | 2751 | G    |
| 1   | 1     | 2755 | C    |
| 1   | 1     | 2756 | U    |
| 1   | 1     | 2757 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | 1     | 2761 | A    |
| 1   | 1     | 2765 | A    |
| 1   | 1     | 2766 | A    |
| 1   | 1     | 2768 | U    |
| 1   | 1     | 2770 | G    |
| 1   | 1     | 2771 | C    |
| 1   | 1     | 2772 | C    |
| 1   | 1     | 2773 | C    |
| 1   | 1     | 2774 | C    |
| 1   | 1     | 2776 | A    |
| 1   | 1     | 2777 | G    |
| 1   | 1     | 2778 | A    |
| 1   | 1     | 2780 | G    |
| 1   | 1     | 2781 | A    |
| 1   | 1     | 2782 | G    |
| 1   | 1     | 2791 | G    |
| 1   | 1     | 2793 | C    |
| 1   | 1     | 2796 | U    |
| 1   | 1     | 2798 | U    |
| 1   | 1     | 2800 | A    |
| 1   | 1     | 2801 | G    |
| 1   | 1     | 2805 | C    |
| 1   | 1     | 2809 | A    |
| 1   | 1     | 2817 | U    |
| 1   | 1     | 2820 | A    |
| 1   | 1     | 2823 | A    |
| 1   | 1     | 2832 | U    |
| 1   | 1     | 2833 | U    |
| 1   | 1     | 2834 | G    |
| 1   | 1     | 2835 | A    |
| 1   | 1     | 2836 | U    |
| 1   | 1     | 2849 | U    |
| 1   | 1     | 2861 | U    |
| 1   | 1     | 2867 | G    |
| 1   | 1     | 2873 | A    |
| 1   | 1     | 2880 | C    |
| 1   | 1     | 2884 | U    |
| 1   | 1     | 2885 | G    |
| 1   | 1     | 2888 | C    |
| 1   | 1     | 2893 | A    |
| 1   | 1     | 2895 | G    |
| 1   | 1     | 2899 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | 1     | 2901 | C    |
| 2   | 2     | 2    | A    |
| 2   | 2     | 3    | A    |
| 2   | 2     | 4    | U    |
| 2   | 2     | 7    | A    |
| 2   | 2     | 8    | A    |
| 2   | 2     | 9    | G    |
| 2   | 2     | 22   | G    |
| 2   | 2     | 31   | G    |
| 2   | 2     | 32   | A    |
| 2   | 2     | 33   | A    |
| 2   | 2     | 40   | C    |
| 2   | 2     | 43   | C    |
| 2   | 2     | 46   | G    |
| 2   | 2     | 47   | C    |
| 2   | 2     | 48   | C    |
| 2   | 2     | 49   | U    |
| 2   | 2     | 51   | A    |
| 2   | 2     | 52   | C    |
| 2   | 2     | 58   | C    |
| 2   | 2     | 60   | A    |
| 2   | 2     | 63   | C    |
| 2   | 2     | 66   | A    |
| 2   | 2     | 67   | C    |
| 2   | 2     | 68   | G    |
| 2   | 2     | 69   | G    |
| 2   | 2     | 70   | U    |
| 2   | 2     | 71   | A    |
| 2   | 2     | 72   | A    |
| 2   | 2     | 74   | A    |
| 2   | 2     | 75   | G    |
| 2   | 2     | 81   | A    |
| 2   | 2     | 83   | C    |
| 2   | 2     | 84   | U    |
| 2   | 2     | 87   | C    |
| 2   | 2     | 95   | C    |
| 2   | 2     | 98   | A    |
| 2   | 2     | 101  | A    |
| 2   | 2     | 109  | A    |
| 2   | 2     | 116  | A    |
| 2   | 2     | 119  | A    |
| 2   | 2     | 120  | A    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2   | 2     | 130 | A    |
| 2   | 2     | 131 | A    |
| 2   | 2     | 132 | C    |
| 2   | 2     | 135 | C    |
| 2   | 2     | 136 | C    |
| 2   | 2     | 146 | G    |
| 2   | 2     | 173 | U    |
| 2   | 2     | 174 | A    |
| 2   | 2     | 180 | U    |
| 2   | 2     | 182 | A    |
| 2   | 2     | 188 | C    |
| 2   | 2     | 189 | A    |
| 2   | 2     | 195 | A    |
| 2   | 2     | 197 | A    |
| 2   | 2     | 198 | G    |
| 2   | 2     | 202 | G    |
| 2   | 2     | 208 | U    |
| 2   | 2     | 209 | U    |
| 2   | 2     | 211 | G    |
| 2   | 2     | 212 | G    |
| 2   | 2     | 226 | G    |
| 2   | 2     | 232 | G    |
| 2   | 2     | 240 | G    |
| 2   | 2     | 245 | U    |
| 2   | 2     | 247 | G    |
| 2   | 2     | 251 | G    |
| 2   | 2     | 262 | A    |
| 2   | 2     | 264 | C    |
| 2   | 2     | 265 | G    |
| 2   | 2     | 266 | G    |
| 2   | 2     | 267 | C    |
| 2   | 2     | 280 | C    |
| 2   | 2     | 289 | G    |
| 2   | 2     | 293 | G    |
| 2   | 2     | 298 | A    |
| 2   | 2     | 299 | G    |
| 2   | 2     | 301 | G    |
| 2   | 2     | 305 | G    |
| 2   | 2     | 306 | A    |
| 2   | 2     | 310 | G    |
| 2   | 2     | 321 | A    |
| 2   | 2     | 325 | A    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2   | 2     | 326 | G    |
| 2   | 2     | 328 | C    |
| 2   | 2     | 329 | A    |
| 2   | 2     | 331 | G    |
| 2   | 2     | 332 | G    |
| 2   | 2     | 345 | C    |
| 2   | 2     | 347 | G    |
| 2   | 2     | 352 | C    |
| 2   | 2     | 354 | G    |
| 2   | 2     | 363 | A    |
| 2   | 2     | 364 | A    |
| 2   | 2     | 367 | U    |
| 2   | 2     | 372 | C    |
| 2   | 2     | 373 | A    |
| 2   | 2     | 375 | U    |
| 2   | 2     | 377 | G    |
| 2   | 2     | 379 | C    |
| 2   | 2     | 380 | G    |
| 2   | 2     | 387 | U    |
| 2   | 2     | 388 | G    |
| 2   | 2     | 389 | A    |
| 2   | 2     | 390 | U    |
| 2   | 2     | 392 | C    |
| 2   | 2     | 393 | A    |
| 2   | 2     | 394 | G    |
| 2   | 2     | 398 | U    |
| 2   | 2     | 402 | G    |
| 2   | 2     | 406 | G    |
| 2   | 2     | 408 | A    |
| 2   | 2     | 410 | G    |
| 2   | 2     | 412 | A    |
| 2   | 2     | 413 | G    |
| 2   | 2     | 419 | C    |
| 2   | 2     | 421 | U    |
| 2   | 2     | 422 | C    |
| 2   | 2     | 423 | G    |
| 2   | 2     | 425 | G    |
| 2   | 2     | 429 | U    |
| 2   | 2     | 440 | C    |
| 2   | 2     | 446 | G    |
| 2   | 2     | 448 | A    |
| 2   | 2     | 449 | G    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2   | 2     | 451 | A    |
| 2   | 2     | 457 | G    |
| 2   | 2     | 463 | U    |
| 2   | 2     | 467 | U    |
| 2   | 2     | 478 | A    |
| 2   | 2     | 480 | U    |
| 2   | 2     | 481 | G    |
| 2   | 2     | 484 | G    |
| 2   | 2     | 485 | U    |
| 2   | 2     | 486 | U    |
| 2   | 2     | 495 | A    |
| 2   | 2     | 496 | A    |
| 2   | 2     | 497 | G    |
| 2   | 2     | 506 | G    |
| 2   | 2     | 509 | A    |
| 2   | 2     | 510 | A    |
| 2   | 2     | 511 | C    |
| 2   | 2     | 512 | U    |
| 2   | 2     | 515 | G    |
| 2   | 2     | 517 | G    |
| 2   | 2     | 518 | C    |
| 2   | 2     | 519 | C    |
| 2   | 2     | 521 | G    |
| 2   | 2     | 531 | U    |
| 2   | 2     | 532 | A    |
| 2   | 2     | 533 | A    |
| 2   | 2     | 547 | A    |
| 2   | 2     | 548 | G    |
| 2   | 2     | 549 | C    |
| 2   | 2     | 550 | G    |
| 2   | 2     | 552 | U    |
| 2   | 2     | 553 | A    |
| 2   | 2     | 554 | A    |
| 2   | 2     | 568 | G    |
| 2   | 2     | 572 | A    |
| 2   | 2     | 573 | A    |
| 2   | 2     | 575 | G    |
| 2   | 2     | 576 | C    |
| 2   | 2     | 577 | G    |
| 2   | 2     | 611 | C    |
| 2   | 2     | 615 | G    |
| 2   | 2     | 619 | U    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2   | 2     | 622 | A    |
| 2   | 2     | 623 | C    |
| 2   | 2     | 632 | U    |
| 2   | 2     | 633 | G    |
| 2   | 2     | 650 | G    |
| 2   | 2     | 653 | U    |
| 2   | 2     | 665 | A    |
| 2   | 2     | 687 | A    |
| 2   | 2     | 718 | A    |
| 2   | 2     | 723 | U    |
| 2   | 2     | 724 | G    |
| 2   | 2     | 731 | G    |
| 2   | 2     | 747 | A    |
| 2   | 2     | 748 | G    |
| 2   | 2     | 755 | G    |
| 2   | 2     | 777 | A    |
| 2   | 2     | 793 | U    |
| 2   | 2     | 794 | A    |
| 2   | 2     | 815 | A    |
| 2   | 2     | 817 | C    |
| 2   | 2     | 828 | U    |
| 2   | 2     | 829 | G    |
| 2   | 2     | 841 | C    |
| 2   | 2     | 844 | G    |
| 2   | 2     | 846 | G    |
| 2   | 2     | 847 | G    |
| 2   | 2     | 851 | G    |
| 2   | 2     | 889 | A    |
| 2   | 2     | 914 | A    |
| 2   | 2     | 926 | G    |
| 2   | 2     | 932 | C    |
| 2   | 2     | 934 | C    |
| 2   | 2     | 935 | A    |
| 2   | 2     | 942 | G    |
| 2   | 2     | 945 | G    |
| 2   | 2     | 946 | A    |
| 2   | 2     | 948 | C    |
| 2   | 2     | 952 | U    |
| 2   | 2     | 953 | G    |
| 2   | 2     | 960 | U    |
| 2   | 2     | 961 | U    |
| 2   | 2     | 966 | 2MG  |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | 2     | 967  | 5MC  |
| 2   | 2     | 968  | A    |
| 2   | 2     | 969  | A    |
| 2   | 2     | 971  | G    |
| 2   | 2     | 974  | A    |
| 2   | 2     | 975  | A    |
| 2   | 2     | 977  | A    |
| 2   | 2     | 980  | C    |
| 2   | 2     | 981  | U    |
| 2   | 2     | 982  | U    |
| 2   | 2     | 983  | A    |
| 2   | 2     | 992  | U    |
| 2   | 2     | 993  | G    |
| 2   | 2     | 1004 | A    |
| 2   | 2     | 1009 | U    |
| 2   | 2     | 1017 | U    |
| 2   | 2     | 1018 | G    |
| 2   | 2     | 1022 | A    |
| 2   | 2     | 1027 | C    |
| 2   | 2     | 1030 | U    |
| 2   | 2     | 1044 | A    |
| 2   | 2     | 1046 | A    |
| 2   | 2     | 1047 | G    |
| 2   | 2     | 1048 | G    |
| 2   | 2     | 1049 | U    |
| 2   | 2     | 1051 | C    |
| 2   | 2     | 1053 | G    |
| 2   | 2     | 1058 | G    |
| 2   | 2     | 1060 | U    |
| 2   | 2     | 1064 | G    |
| 2   | 2     | 1065 | U    |
| 2   | 2     | 1067 | A    |
| 2   | 2     | 1073 | U    |
| 2   | 2     | 1074 | G    |
| 2   | 2     | 1075 | U    |
| 2   | 2     | 1088 | G    |
| 2   | 2     | 1094 | G    |
| 2   | 2     | 1095 | U    |
| 2   | 2     | 1099 | G    |
| 2   | 2     | 1101 | A    |
| 2   | 2     | 1104 | G    |
| 2   | 2     | 1105 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | 2     | 1107 | C    |
| 2   | 2     | 1113 | C    |
| 2   | 2     | 1130 | A    |
| 2   | 2     | 1136 | C    |
| 2   | 2     | 1137 | C    |
| 2   | 2     | 1138 | G    |
| 2   | 2     | 1139 | G    |
| 2   | 2     | 1140 | C    |
| 2   | 2     | 1141 | C    |
| 2   | 2     | 1142 | G    |
| 2   | 2     | 1143 | G    |
| 2   | 2     | 1145 | A    |
| 2   | 2     | 1146 | A    |
| 2   | 2     | 1152 | A    |
| 2   | 2     | 1154 | G    |
| 2   | 2     | 1158 | C    |
| 2   | 2     | 1159 | U    |
| 2   | 2     | 1164 | G    |
| 2   | 2     | 1167 | A    |
| 2   | 2     | 1168 | U    |
| 2   | 2     | 1176 | A    |
| 2   | 2     | 1180 | A    |
| 2   | 2     | 1184 | G    |
| 2   | 2     | 1189 | U    |
| 2   | 2     | 1190 | G    |
| 2   | 2     | 1191 | A    |
| 2   | 2     | 1196 | A    |
| 2   | 2     | 1197 | A    |
| 2   | 2     | 1201 | A    |
| 2   | 2     | 1203 | C    |
| 2   | 2     | 1212 | U    |
| 2   | 2     | 1213 | A    |
| 2   | 2     | 1216 | A    |
| 2   | 2     | 1222 | G    |
| 2   | 2     | 1224 | U    |
| 2   | 2     | 1225 | A    |
| 2   | 2     | 1236 | A    |
| 2   | 2     | 1238 | A    |
| 2   | 2     | 1239 | A    |
| 2   | 2     | 1240 | U    |
| 2   | 2     | 1241 | G    |
| 2   | 2     | 1250 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | 2     | 1252 | A    |
| 2   | 2     | 1253 | G    |
| 2   | 2     | 1256 | A    |
| 2   | 2     | 1258 | G    |
| 2   | 2     | 1268 | G    |
| 2   | 2     | 1270 | G    |
| 2   | 2     | 1275 | A    |
| 2   | 2     | 1278 | G    |
| 2   | 2     | 1279 | G    |
| 2   | 2     | 1280 | A    |
| 2   | 2     | 1283 | U    |
| 2   | 2     | 1285 | A    |
| 2   | 2     | 1287 | A    |
| 2   | 2     | 1298 | U    |
| 2   | 2     | 1299 | A    |
| 2   | 2     | 1300 | G    |
| 2   | 2     | 1301 | U    |
| 2   | 2     | 1302 | C    |
| 2   | 2     | 1304 | G    |
| 2   | 2     | 1305 | G    |
| 2   | 2     | 1317 | C    |
| 2   | 2     | 1318 | A    |
| 2   | 2     | 1319 | A    |
| 2   | 2     | 1322 | C    |
| 2   | 2     | 1323 | G    |
| 2   | 2     | 1327 | C    |
| 2   | 2     | 1336 | C    |
| 2   | 2     | 1337 | G    |
| 2   | 2     | 1344 | C    |
| 2   | 2     | 1346 | A    |
| 2   | 2     | 1350 | A    |
| 2   | 2     | 1363 | A    |
| 2   | 2     | 1370 | G    |
| 2   | 2     | 1374 | A    |
| 2   | 2     | 1375 | A    |
| 2   | 2     | 1378 | C    |
| 2   | 2     | 1379 | G    |
| 2   | 2     | 1386 | G    |
| 2   | 2     | 1387 | G    |
| 2   | 2     | 1389 | C    |
| 2   | 2     | 1391 | U    |
| 2   | 2     | 1392 | G    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | 2     | 1394 | A    |
| 2   | 2     | 1398 | A    |
| 2   | 2     | 1432 | G    |
| 2   | 2     | 1438 | G    |
| 2   | 2     | 1442 | G    |
| 2   | 2     | 1446 | A    |
| 2   | 2     | 1448 | C    |
| 2   | 2     | 1453 | G    |
| 2   | 2     | 1463 | U    |
| 2   | 2     | 1464 | U    |
| 2   | 2     | 1487 | G    |
| 2   | 2     | 1497 | G    |
| 2   | 2     | 1499 | A    |
| 2   | 2     | 1503 | A    |
| 2   | 2     | 1506 | U    |
| 2   | 2     | 1517 | G    |
| 2   | 2     | 1529 | G    |
| 2   | 2     | 1530 | G    |
| 2   | 2     | 1534 | A    |
| 3   | 4     | 2    | G    |
| 3   | 4     | 8    | C    |
| 3   | 4     | 13   | G    |
| 3   | 4     | 15   | A    |
| 3   | 4     | 17   | C    |
| 3   | 4     | 24   | G    |
| 3   | 4     | 26   | C    |
| 3   | 4     | 35   | C    |
| 3   | 4     | 36   | C    |
| 3   | 4     | 51   | G    |
| 3   | 4     | 56   | G    |
| 3   | 4     | 66   | A    |
| 3   | 4     | 73   | A    |
| 3   | 4     | 75   | G    |
| 3   | 4     | 83   | G    |
| 3   | 4     | 88   | C    |
| 3   | 4     | 89   | U    |
| 3   | 4     | 90   | C    |
| 3   | 4     | 92   | C    |
| 3   | 4     | 94   | A    |
| 3   | 4     | 97   | C    |
| 3   | 4     | 99   | A    |
| 3   | 4     | 100  | G    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 3   | 4     | 102 | G    |
| 3   | 4     | 105 | G    |
| 3   | 4     | 106 | G    |
| 3   | 4     | 108 | A    |
| 3   | 4     | 109 | A    |
| 3   | 4     | 119 | A    |
| 3   | 4     | 120 | U    |
| 4   | 5     | 8   | G    |
| 4   | 5     | 13  | A    |
| 4   | 5     | 15  | C    |
| 4   | 5     | 16  | C    |
| 4   | 5     | 17  | U    |
| 4   | 5     | 18  | G    |
| 4   | 5     | 21  | A    |
| 4   | 5     | 22  | G    |
| 4   | 5     | 47  | U    |
| 4   | 5     | 48  | C    |
| 4   | 5     | 59  | A    |
| 4   | 5     | 70  | G    |
| 4   | 5     | 75  | C    |
| 4   | 5     | 76  | A    |
| 4   | 6     | 6   | G    |
| 4   | 6     | 17  | C    |
| 4   | 6     | 18  | U    |
| 4   | 6     | 19  | G    |
| 4   | 6     | 21  | U    |
| 4   | 6     | 22  | A    |
| 4   | 6     | 26  | C    |
| 4   | 6     | 36  | A    |
| 4   | 6     | 37  | U    |
| 4   | 6     | 38  | A    |
| 4   | 6     | 47  | G    |
| 4   | 6     | 48  | U    |
| 4   | 6     | 49  | C    |
| 4   | 6     | 50  | G    |
| 4   | 6     | 59  | A    |
| 4   | 6     | 62  | C    |
| 4   | 6     | 72  | C    |
| 4   | 6     | 73  | A    |
| 4   | 6     | 77  | A    |
| 5   | 7     | 20  | U    |
| 5   | 7     | 22  | U    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 5   | 7     | 24  | C    |

All (33) RNA pucker outliers are listed below:

| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | 1     | 320  | A    |
| 1   | 1     | 404  | A    |
| 1   | 1     | 479  | A    |
| 1   | 1     | 620  | G    |
| 1   | 1     | 784  | G    |
| 1   | 1     | 830  | G    |
| 1   | 1     | 894  | U    |
| 1   | 1     | 913  | U    |
| 1   | 1     | 1154 | G    |
| 1   | 1     | 1184 | U    |
| 1   | 1     | 1379 | U    |
| 1   | 1     | 2146 | C    |
| 1   | 1     | 2193 | G    |
| 1   | 1     | 2264 | C    |
| 1   | 1     | 2308 | G    |
| 1   | 1     | 2425 | A    |
| 1   | 1     | 2428 | G    |
| 1   | 1     | 2602 | A    |
| 1   | 1     | 2645 | G    |
| 1   | 1     | 2756 | U    |
| 1   | 1     | 2770 | G    |
| 1   | 1     | 2780 | G    |
| 1   | 1     | 2800 | A    |
| 2   | 2     | 188  | C    |
| 2   | 2     | 325  | A    |
| 2   | 2     | 448  | A    |
| 2   | 2     | 516  | PSU  |
| 2   | 2     | 547  | A    |
| 2   | 2     | 980  | C    |
| 2   | 2     | 1109 | C    |
| 2   | 2     | 1145 | A    |
| 2   | 2     | 1267 | C    |
| 4   | 5     | 17   | U    |

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

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

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

| Mol | Type | Chain | Res  | Link | Bond lengths |      |             | Bond angles |      |             |
|-----|------|-------|------|------|--------------|------|-------------|-------------|------|-------------|
|     |      |       |      |      | Counts       | RMSZ | # $ Z  > 2$ | Counts      | RMSZ | # $ Z  > 2$ |
| 1   | 2MG  | 1     | 2445 | 1    | 23,26,27     | 1.29 | 4 (17%)     | 33,38,41    | 2.15 | 5 (15%)     |
| 2   | PSU  | 2     | 516  | 2,58 | 18,21,22     | 1.09 | 1 (5%)      | 21,30,33    | 1.86 | 4 (19%)     |
| 1   | PSU  | 1     | 2504 | 1    | 18,21,22     | 1.08 | 1 (5%)      | 21,30,33    | 1.76 | 4 (19%)     |
| 1   | 2MA  | 1     | 2503 | 1,58 | 22,25,26     | 1.47 | 4 (18%)     | 32,37,40    | 2.33 | 9 (28%)     |
| 1   | G7M  | 1     | 2069 | 1    | 23,26,27     | 1.55 | 3 (13%)     | 34,39,42    | 1.81 | 5 (14%)     |
| 1   | PSU  | 1     | 1917 | 1    | 18,21,22     | 1.11 | 1 (5%)      | 21,30,33    | 1.83 | 4 (19%)     |
| 1   | 2MG  | 1     | 1835 | 1    | 23,26,27     | 1.26 | 4 (17%)     | 33,38,41    | 2.23 | 7 (21%)     |
| 2   | 2MG  | 2     | 1207 | 2    | 23,26,27     | 1.24 | 4 (17%)     | 33,38,41    | 2.19 | 7 (21%)     |
| 1   | 1MG  | 1     | 745  | 1    | 23,26,27     | 1.18 | 3 (13%)     | 33,39,42    | 1.75 | 5 (15%)     |
| 1   | PSU  | 1     | 2457 | 1    | 18,21,22     | 1.06 | 1 (5%)      | 21,30,33    | 1.98 | 6 (28%)     |
| 1   | OMC  | 1     | 2498 | 1    | 19,22,23     | 0.84 | 0           | 25,31,34    | 1.72 | 5 (20%)     |
| 2   | 5MC  | 2     | 967  | 2    | 19,22,23     | 1.61 | 3 (15%)     | 26,32,35    | 1.20 | 3 (11%)     |
| 2   | 4OC  | 2     | 1402 | 2    | 20,23,24     | 0.75 | 0           | 25,32,35    | 0.96 | 2 (8%)      |
| 1   | PSU  | 1     | 746  | 1,58 | 18,21,22     | 1.09 | 1 (5%)      | 21,30,33    | 1.88 | 5 (23%)     |
| 1   | 5MC  | 1     | 1962 | 1    | 19,22,23     | 1.55 | 3 (15%)     | 26,32,35    | 1.12 | 2 (7%)      |
| 2   | 2MG  | 2     | 966  | 2    | 23,26,27     | 1.18 | 4 (17%)     | 33,38,41    | 2.29 | 8 (24%)     |
| 2   | A3P  | 2     | 1493 | 2    | 25,28,29     | 3.83 | 10 (40%)    | 37,42,45    | 2.17 | 10 (27%)    |
| 2   | 5MC  | 2     | 1407 | 2    | 19,22,23     | 1.55 | 3 (15%)     | 26,32,35    | 1.14 | 3 (11%)     |
| 1   | 6MZ  | 1     | 2030 | 1,58 | 22,25,26     | 1.50 | 5 (22%)     | 29,36,39    | 2.37 | 11 (37%)    |
| 1   | PSU  | 1     | 955  | 1    | 18,21,22     | 0.96 | 1 (5%)      | 21,30,33    | 1.72 | 4 (19%)     |
| 1   | PSU  | 1     | 2605 | 1    | 18,21,22     | 1.04 | 1 (5%)      | 21,30,33    | 1.89 | 3 (14%)     |
| 1   | OMU  | 1     | 2552 | 1    | 19,22,23     | 1.24 | 3 (15%)     | 25,31,34    | 1.84 | 5 (20%)     |
| 1   | 3TD  | 1     | 1915 | 1    | 19,22,23     | 2.82 | 4 (21%)     | 23,32,35    | 7.24 | 5 (21%)     |
| 48  | 0TD  | q     | 89   | 48   | 8,9,10       | 1.58 | 2 (25%)     | 6,11,13     | 1.58 | 1 (16%)     |
| 2   | 2MG  | 2     | 1516 | 2    | 23,26,27     | 1.25 | 4 (17%)     | 33,38,41    | 2.18 | 7 (21%)     |
| 1   | PSU  | 1     | 2580 | 1    | 18,21,22     | 1.06 | 2 (11%)     | 21,30,33    | 2.00 | 6 (28%)     |
| 2   | UR3  | 2     | 1498 | 2    | 19,22,23     | 0.95 | 0           | 26,32,35    | 1.77 | 2 (7%)      |
| 1   | OMG  | 1     | 2251 | 1,4  | 23,26,27     | 1.19 | 3 (13%)     | 32,38,41    | 2.05 | 7 (21%)     |
| 1   | 6MZ  | 1     | 1618 | 1    | 22,25,26     | 1.45 | 4 (18%)     | 29,36,39    | 2.19 | 9 (31%)     |

| Mol | Type | Chain | Res  | Link | Bond lengths |      |          | Bond angles |      |          |
|-----|------|-------|------|------|--------------|------|----------|-------------|------|----------|
|     |      |       |      |      | Counts       | RMSZ | # Z  > 2 | Counts      | RMSZ | # Z  > 2 |
| 1   | 5MU  | 1     | 1939 | 1    | 19,22,23     | 1.40 | 5 (26%)  | 27,32,35    | 2.08 | 6 (22%)  |
| 1   | 5MU  | 1     | 747  | 1    | 19,22,23     | 1.41 | 6 (31%)  | 27,32,35    | 2.04 | 6 (22%)  |
| 2   | G7M  | 2     | 527  | 2    | 23,26,27     | 2.39 | 5 (21%)  | 34,39,42    | 3.02 | 10 (29%) |
| 2   | MA6  | 2     | 1519 | 2    | 23,26,27     | 1.48 | 4 (17%)  | 33,38,41    | 2.44 | 13 (39%) |
| 2   | MA6  | 2     | 1518 | 2    | 23,26,27     | 1.47 | 4 (17%)  | 33,38,41    | 2.44 | 13 (39%) |
| 1   | PSU  | 1     | 1911 | 1    | 18,21,22     | 1.07 | 1 (5%)   | 21,30,33    | 1.89 | 4 (19%)  |

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   |
|-----|------|-------|------|------|---------|------------|---------|
| 1   | 2MG  | 1     | 2445 | 1    | -       | 2/9/27/28  | 0/3/3/3 |
| 2   | PSU  | 2     | 516  | 2,58 | -       | 2/7/25/26  | 0/2/2/2 |
| 1   | PSU  | 1     | 2504 | 1    | -       | 2/7/25/26  | 0/2/2/2 |
| 1   | 2MA  | 1     | 2503 | 1,58 | -       | 2/7/25/26  | 0/3/3/3 |
| 1   | G7M  | 1     | 2069 | 1    | 3/3/5/5 | 0/7/25/26  | 0/3/3/3 |
| 1   | PSU  | 1     | 1917 | 1    | -       | 0/7/25/26  | 0/2/2/2 |
| 1   | 2MG  | 1     | 1835 | 1    | -       | 0/9/27/28  | 0/3/3/3 |
| 2   | 2MG  | 2     | 1207 | 2    | -       | 0/9/27/28  | 0/3/3/3 |
| 1   | 1MG  | 1     | 745  | 1    | -       | 0/7/25/26  | 0/3/3/3 |
| 1   | PSU  | 1     | 2457 | 1    | -       | 0/7/25/26  | 0/2/2/2 |
| 1   | OMC  | 1     | 2498 | 1    | -       | 8/9/27/28  | 0/2/2/2 |
| 2   | 5MC  | 2     | 967  | 2    | -       | 2/7/25/26  | 0/2/2/2 |
| 2   | 4OC  | 2     | 1402 | 2    | -       | 3/9/29/30  | 0/2/2/2 |
| 1   | PSU  | 1     | 746  | 1,58 | -       | 2/7/25/26  | 0/2/2/2 |
| 1   | 5MC  | 1     | 1962 | 1    | -       | 2/7/25/26  | 0/2/2/2 |
| 2   | 2MG  | 2     | 966  | 2    | -       | 3/9/27/28  | 0/3/3/3 |
| 2   | A3P  | 2     | 1493 | 2    | 1/1/6/6 | 0/12/30/31 | 0/3/3/3 |
| 2   | 5MC  | 2     | 1407 | 2    | -       | 0/7/25/26  | 0/2/2/2 |
| 1   | 6MZ  | 1     | 2030 | 1,58 | -       | 1/9/27/28  | 0/3/3/3 |
| 1   | PSU  | 1     | 955  | 1    | -       | 1/7/25/26  | 0/2/2/2 |
| 1   | PSU  | 1     | 2605 | 1    | -       | 0/7/25/26  | 0/2/2/2 |
| 1   | OMU  | 1     | 2552 | 1    | -       | 0/9/27/28  | 0/2/2/2 |
| 1   | 3TD  | 1     | 1915 | 1    | -       | 4/7/25/26  | 0/2/2/2 |
| 48  | 0TD  | q     | 89   | 48   | -       | 1/7/12/14  | -       |
| 2   | 2MG  | 2     | 1516 | 2    | -       | 0/9/27/28  | 0/3/3/3 |

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| Mol | Type | Chain | Res  | Link | Chirals | Torsions   | Rings   |
|-----|------|-------|------|------|---------|------------|---------|
| 1   | PSU  | 1     | 2580 | 1    | -       | 0/7/25/26  | 0/2/2/2 |
| 2   | UR3  | 2     | 1498 | 2    | -       | 0/7/25/26  | 0/2/2/2 |
| 1   | OMG  | 1     | 2251 | 1,4  | -       | 1/9/27/28  | 0/3/3/3 |
| 1   | 6MZ  | 1     | 1618 | 1    | -       | 2/9/27/28  | 0/3/3/3 |
| 1   | 5MU  | 1     | 1939 | 1    | -       | 0/7/25/26  | 0/2/2/2 |
| 1   | 5MU  | 1     | 747  | 1    | -       | 0/7/25/26  | 0/2/2/2 |
| 2   | G7M  | 2     | 527  | 2    | -       | 3/7/25/26  | 0/3/3/3 |
| 2   | MA6  | 2     | 1519 | 2    | -       | 3/11/29/30 | 0/3/3/3 |
| 2   | MA6  | 2     | 1518 | 2    | -       | 2/11/29/30 | 0/3/3/3 |
| 1   | PSU  | 1     | 1911 | 1    | -       | 0/7/25/26  | 0/2/2/2 |

All (104) bond length outliers are listed below:

| Mol | Chain | Res  | Type | Atoms   | Z      | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|---------|--------|-------------|----------|
| 2   | 2     | 1493 | A3P  | C2'-C3' | -12.47 | 1.25        | 1.53     |
| 1   | 1     | 1915 | 3TD  | C6-C5   | -8.90  | 1.25        | 1.35     |
| 2   | 2     | 527  | G7M  | C8-N7   | 7.79   | 1.46        | 1.33     |
| 2   | 2     | 1493 | A3P  | O4'-C4' | -7.07  | 1.29        | 1.45     |
| 1   | 1     | 1915 | 3TD  | C6-N1   | -6.21  | 1.26        | 1.36     |
| 2   | 2     | 1493 | A3P  | C1'-N9  | -5.79  | 1.30        | 1.46     |
| 2   | 2     | 1493 | A3P  | C3'-C4' | 5.72   | 1.67        | 1.52     |
| 2   | 2     | 967  | 5MC  | C5-C4   | 5.67   | 1.48        | 1.44     |
| 2   | 2     | 1407 | 5MC  | C5-C4   | 5.53   | 1.48        | 1.44     |
| 2   | 2     | 1493 | A3P  | O4'-C1' | 5.52   | 1.54        | 1.42     |
| 1   | 1     | 1962 | 5MC  | C5-C4   | 5.51   | 1.48        | 1.44     |
| 1   | 1     | 2069 | G7M  | C5-N7   | -5.08  | 1.33        | 1.39     |
| 2   | 2     | 527  | G7M  | C5-N7   | -4.79  | 1.33        | 1.39     |
| 2   | 2     | 1518 | MA6  | C5-C4   | 4.60   | 1.47        | 1.39     |
| 2   | 2     | 1519 | MA6  | C5-C4   | 4.49   | 1.47        | 1.39     |
| 1   | 1     | 1618 | 6MZ  | C5-C4   | 4.47   | 1.47        | 1.39     |
| 1   | 1     | 2030 | 6MZ  | C5-C4   | 4.46   | 1.47        | 1.39     |
| 1   | 1     | 2503 | 2MA  | C5-C4   | 4.37   | 1.46        | 1.39     |
| 2   | 2     | 1493 | A3P  | C6-N6   | 4.24   | 1.45        | 1.34     |
| 2   | 2     | 527  | G7M  | C8-N9   | 4.10   | 1.46        | 1.35     |
| 1   | 1     | 1915 | 3TD  | C4-C5   | -4.09  | 1.38        | 1.47     |
| 2   | 2     | 516  | PSU  | C6-C5   | 3.64   | 1.39        | 1.35     |
| 2   | 2     | 527  | G7M  | C5-C4   | 3.63   | 1.47        | 1.38     |
| 1   | 1     | 1917 | PSU  | C6-C5   | 3.61   | 1.39        | 1.35     |
| 1   | 1     | 2504 | PSU  | C6-C5   | 3.48   | 1.39        | 1.35     |
| 1   | 1     | 1911 | PSU  | C6-C5   | 3.45   | 1.39        | 1.35     |
| 1   | 1     | 746  | PSU  | C6-C5   | 3.41   | 1.39        | 1.35     |

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| Mol | Chain | Res  | Type | Atoms   | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|---------|-------|-------------|----------|
| 1   | 1     | 2457 | PSU  | C6-C5   | 3.19  | 1.38        | 1.35     |
| 2   | 2     | 1493 | A3P  | C8-N9   | -3.16 | 1.32        | 1.37     |
| 1   | 1     | 2580 | PSU  | C6-C5   | 3.13  | 1.38        | 1.35     |
| 1   | 1     | 745  | 1MG  | C5-C4   | 3.12  | 1.47        | 1.38     |
| 1   | 1     | 2605 | PSU  | C6-C5   | 3.12  | 1.38        | 1.35     |
| 1   | 1     | 2069 | G7M  | C5-C4   | 3.10  | 1.46        | 1.38     |
| 2   | 2     | 966  | 2MG  | C5-C4   | 3.08  | 1.47        | 1.38     |
| 1   | 1     | 1835 | 2MG  | C5-C4   | 3.05  | 1.47        | 1.38     |
| 2   | 2     | 1207 | 2MG  | C5-C4   | 3.05  | 1.47        | 1.38     |
| 1   | 1     | 2445 | 2MG  | C5-C4   | 3.03  | 1.47        | 1.38     |
| 2   | 2     | 1516 | 2MG  | C5-C4   | 2.99  | 1.47        | 1.38     |
| 1   | 1     | 2251 | OMG  | C5-C4   | 2.97  | 1.46        | 1.38     |
| 1   | 1     | 955  | PSU  | C6-C5   | 2.94  | 1.38        | 1.35     |
| 2   | 2     | 967  | 5MC  | C6-C5   | 2.92  | 1.39        | 1.34     |
| 1   | 1     | 2030 | 6MZ  | C5-C6   | 2.86  | 1.48        | 1.41     |
| 1   | 1     | 2552 | OMU  | C4-N3   | -2.85 | 1.33        | 1.38     |
| 1   | 1     | 2445 | 2MG  | C6-N1   | -2.84 | 1.33        | 1.38     |
| 1   | 1     | 1939 | 5MU  | C4-N3   | -2.83 | 1.33        | 1.38     |
| 2   | 2     | 1519 | MA6  | C5-C6   | 2.76  | 1.48        | 1.41     |
| 1   | 1     | 747  | 5MU  | C6-C5   | 2.76  | 1.39        | 1.34     |
| 1   | 1     | 747  | 5MU  | C4-N3   | -2.76 | 1.33        | 1.38     |
| 1   | 1     | 1618 | 6MZ  | C5-C6   | 2.72  | 1.48        | 1.41     |
| 2   | 2     | 1493 | A3P  | C5-N7   | -2.69 | 1.34        | 1.39     |
| 1   | 1     | 1835 | 2MG  | C6-N1   | -2.66 | 1.33        | 1.38     |
| 2   | 2     | 1407 | 5MC  | C6-C5   | 2.66  | 1.38        | 1.34     |
| 1   | 1     | 1962 | 5MC  | C6-C5   | 2.65  | 1.38        | 1.34     |
| 1   | 1     | 1939 | 5MU  | C6-C5   | 2.64  | 1.38        | 1.34     |
| 1   | 1     | 2251 | OMG  | C6-N1   | -2.63 | 1.33        | 1.38     |
| 1   | 1     | 1915 | 3TD  | C2-N3   | 2.63  | 1.44        | 1.38     |
| 2   | 2     | 1493 | A3P  | O2'-C2' | 2.62  | 1.49        | 1.43     |
| 1   | 1     | 2503 | 2MA  | C5-C6   | 2.61  | 1.48        | 1.41     |
| 2   | 2     | 1518 | MA6  | C5-C6   | 2.59  | 1.48        | 1.41     |
| 2   | 2     | 1516 | 2MG  | C6-N1   | -2.56 | 1.34        | 1.38     |
| 2   | 2     | 1207 | 2MG  | C6-N1   | -2.55 | 1.34        | 1.38     |
| 1   | 1     | 2069 | G7M  | C6-N1   | -2.53 | 1.34        | 1.38     |
| 48  | q     | 89   | 0TD  | CB-CA   | -2.52 | 1.53        | 1.54     |
| 2   | 2     | 1518 | MA6  | C5-N7   | -2.52 | 1.34        | 1.39     |
| 1   | 1     | 2552 | OMU  | C2-N3   | -2.51 | 1.33        | 1.38     |
| 1   | 1     | 2030 | 6MZ  | C8-N7   | 2.50  | 1.36        | 1.31     |
| 2   | 2     | 1493 | A3P  | P1-O3'  | 2.48  | 1.63        | 1.59     |
| 2   | 2     | 527  | G7M  | C6-N1   | -2.48 | 1.34        | 1.38     |
| 1   | 1     | 1939 | 5MU  | C6-N1   | -2.39 | 1.33        | 1.38     |

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| Mol | Chain | Res  | Type | Atoms   | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|---------|-------|-------------|----------|
| 1   | 1     | 2503 | 2MA  | C5-N7   | -2.37 | 1.34        | 1.39     |
| 1   | 1     | 1962 | 5MC  | C6-N1   | -2.35 | 1.34        | 1.38     |
| 1   | 1     | 747  | 5MU  | C6-N1   | -2.34 | 1.34        | 1.38     |
| 2   | 2     | 1519 | MA6  | C5-N7   | -2.34 | 1.34        | 1.39     |
| 1   | 1     | 745  | 1MG  | C2-N1   | 2.33  | 1.41        | 1.37     |
| 1   | 1     | 2030 | 6MZ  | C4-N9   | -2.32 | 1.32        | 1.37     |
| 2   | 2     | 1519 | MA6  | C8-N7   | 2.31  | 1.36        | 1.31     |
| 1   | 1     | 1939 | 5MU  | C2-N3   | -2.29 | 1.34        | 1.38     |
| 2   | 2     | 1407 | 5MC  | C6-N1   | -2.28 | 1.34        | 1.38     |
| 1   | 1     | 1618 | 6MZ  | C5-N7   | -2.28 | 1.34        | 1.39     |
| 1   | 1     | 1618 | 6MZ  | C8-N7   | 2.27  | 1.36        | 1.31     |
| 2   | 2     | 967  | 5MC  | C6-N1   | -2.25 | 1.34        | 1.38     |
| 1   | 1     | 2251 | OMG  | C5-N7   | -2.23 | 1.34        | 1.39     |
| 1   | 1     | 1835 | 2MG  | C5-N7   | -2.22 | 1.34        | 1.39     |
| 1   | 1     | 2503 | 2MA  | C8-N7   | 2.21  | 1.35        | 1.31     |
| 1   | 1     | 2445 | 2MG  | C5-N7   | -2.21 | 1.34        | 1.39     |
| 1   | 1     | 747  | 5MU  | C4-C5   | 2.18  | 1.48        | 1.44     |
| 1   | 1     | 747  | 5MU  | C2-N3   | -2.17 | 1.34        | 1.38     |
| 1   | 1     | 2030 | 6MZ  | C5-N7   | -2.17 | 1.35        | 1.39     |
| 1   | 1     | 747  | 5MU  | C2-N1   | 2.17  | 1.41        | 1.38     |
| 1   | 1     | 2580 | PSU  | O4'-C1' | -2.17 | 1.40        | 1.43     |
| 1   | 1     | 2445 | 2MG  | C2-N3   | 2.14  | 1.36        | 1.32     |
| 1   | 1     | 745  | 1MG  | C5-N7   | -2.14 | 1.34        | 1.39     |
| 1   | 1     | 1835 | 2MG  | C2-N3   | 2.13  | 1.36        | 1.32     |
| 1   | 1     | 1939 | 5MU  | C4-C5   | 2.13  | 1.48        | 1.44     |
| 2   | 2     | 966  | 2MG  | C6-N1   | -2.11 | 1.34        | 1.38     |
| 2   | 2     | 1516 | 2MG  | C5-N7   | -2.11 | 1.34        | 1.39     |
| 2   | 2     | 1207 | 2MG  | C5-N7   | -2.10 | 1.34        | 1.39     |
| 2   | 2     | 1518 | MA6  | C8-N7   | 2.08  | 1.35        | 1.31     |
| 1   | 1     | 2552 | OMU  | C5-C4   | -2.06 | 1.39        | 1.43     |
| 2   | 2     | 1207 | 2MG  | C2-N3   | 2.03  | 1.35        | 1.32     |
| 2   | 2     | 966  | 2MG  | C5-N7   | -2.03 | 1.35        | 1.39     |
| 2   | 2     | 966  | 2MG  | C4-N9   | -2.02 | 1.32        | 1.38     |
| 2   | 2     | 1516 | 2MG  | C2-N3   | 2.01  | 1.35        | 1.32     |
| 48  | q     | 89   | 0TD  | CSB-SB  | -2.00 | 1.75        | 1.79     |

All (206) bond angle outliers are listed below:

| Mol | Chain | Res  | Type | Atoms    | Z      | Observed(°) | Ideal(°) |
|-----|-------|------|------|----------|--------|-------------|----------|
| 1   | 1     | 1915 | 3TD  | C5-C6-N1 | 24.86  | 156.66      | 122.14   |
| 1   | 1     | 1915 | 3TD  | C6-C5-C4 | -20.67 | 104.34      | 118.19   |
| 1   | 1     | 2503 | 2MA  | C5-C4-N3 | -8.28  | 118.46      | 127.18   |

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| Mol | Chain | Res  | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-----------|-------|-------------|----------|
| 1   | 1     | 1915 | 3TD  | C1'-C5-C4 | 8.26  | 130.14      | 117.61   |
| 1   | 1     | 1915 | 3TD  | C6-N1-C2  | -7.91 | 101.66      | 121.80   |
| 2   | 2     | 527  | G7M  | CN7-N7-C8 | -7.79 | 112.98      | 124.79   |
| 1   | 1     | 1835 | 2MG  | C2-N3-C4  | 7.34  | 121.18      | 112.00   |
| 2   | 2     | 966  | 2MG  | C2-N3-C4  | 7.27  | 121.09      | 112.00   |
| 1   | 1     | 2445 | 2MG  | C2-N3-C4  | 7.18  | 120.98      | 112.00   |
| 2   | 2     | 1516 | 2MG  | C2-N3-C4  | 7.05  | 120.81      | 112.00   |
| 2   | 2     | 1207 | 2MG  | C2-N3-C4  | 7.03  | 120.79      | 112.00   |
| 2   | 2     | 1498 | UR3  | C4-N3-C2  | -7.03 | 118.93      | 124.58   |
| 2   | 2     | 527  | G7M  | N9-C8-N7  | -6.95 | 95.60       | 112.48   |
| 2   | 2     | 527  | G7M  | C8-N7-C5  | 6.65  | 116.09      | 107.78   |
| 1   | 1     | 2503 | 2MA  | N3-C4-N9  | 6.49  | 135.23      | 126.99   |
| 1   | 1     | 2251 | OMG  | C5-C4-N3  | -6.49 | 118.06      | 128.39   |
| 1   | 1     | 1835 | 2MG  | C5-C4-N3  | -6.39 | 118.21      | 128.39   |
| 2   | 2     | 527  | G7M  | N9-C4-N3  | 6.34  | 138.63      | 125.95   |
| 1   | 1     | 2445 | 2MG  | C5-C4-N3  | -6.33 | 118.31      | 128.39   |
| 2   | 2     | 1207 | 2MG  | C5-C4-N3  | -6.07 | 118.72      | 128.39   |
| 2   | 2     | 1518 | MA6  | C5-C4-N3  | -5.97 | 118.49      | 126.72   |
| 2   | 2     | 1516 | 2MG  | C5-C4-N3  | -5.95 | 118.92      | 128.39   |
| 2   | 2     | 1493 | A3P  | C5-C4-N3  | -5.74 | 118.81      | 126.72   |
| 2   | 2     | 1519 | MA6  | C5-C4-N3  | -5.73 | 118.83      | 126.72   |
| 1   | 1     | 1618 | 6MZ  | C5-C4-N3  | -5.71 | 118.86      | 126.72   |
| 2   | 2     | 966  | 2MG  | C5-C4-N3  | -5.67 | 119.37      | 128.39   |
| 1   | 1     | 2069 | G7M  | C5-C4-N3  | -5.41 | 117.92      | 128.15   |
| 2   | 2     | 527  | G7M  | C5-C4-N3  | -5.41 | 117.92      | 128.15   |
| 1   | 1     | 2069 | G7M  | N9-C4-N3  | 5.41  | 136.76      | 125.95   |
| 1   | 1     | 745  | 1MG  | C5-C4-N3  | -5.36 | 119.85      | 128.39   |
| 1   | 1     | 2251 | OMG  | C2-N3-C4  | 5.26  | 121.35      | 112.30   |
| 1   | 1     | 747  | 5MU  | N3-C2-N1  | 5.13  | 121.57      | 114.89   |
| 1   | 1     | 1939 | 5MU  | C4-N3-C2  | -5.11 | 120.64      | 127.34   |
| 1   | 1     | 2030 | 6MZ  | C5-C4-N3  | -5.09 | 119.71      | 126.72   |
| 1   | 1     | 2030 | 6MZ  | C9-N6-C6  | -5.06 | 118.16      | 122.85   |
| 1   | 1     | 2605 | PSU  | C4-N3-C2  | -5.06 | 119.41      | 126.37   |
| 1   | 1     | 1939 | 5MU  | N3-C2-N1  | 5.03  | 121.44      | 114.89   |
| 1   | 1     | 2457 | PSU  | C4-N3-C2  | -5.02 | 119.46      | 126.37   |
| 1   | 1     | 2552 | OMU  | C4-N3-C2  | -4.99 | 120.42      | 126.61   |
| 1   | 1     | 747  | 5MU  | C4-N3-C2  | -4.98 | 120.82      | 127.34   |
| 1   | 1     | 746  | PSU  | C4-N3-C2  | -4.96 | 119.53      | 126.37   |
| 1   | 1     | 2457 | PSU  | N1-C2-N3  | 4.90  | 120.33      | 115.17   |
| 2   | 2     | 1518 | MA6  | N3-C4-N9  | 4.87  | 135.45      | 127.17   |
| 1   | 1     | 1911 | PSU  | C4-N3-C2  | -4.86 | 119.67      | 126.37   |
| 1   | 1     | 1835 | 2MG  | N9-C4-N3  | 4.86  | 135.67      | 125.95   |

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| Mol | Chain | Res  | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-----------|-------|-------------|----------|
| 1   | 1     | 2445 | 2MG  | N9-C4-N3  | 4.85  | 135.66      | 125.95   |
| 1   | 1     | 2251 | OMG  | N9-C4-N3  | 4.84  | 135.62      | 125.95   |
| 2   | 2     | 516  | PSU  | C4-N3-C2  | -4.82 | 119.73      | 126.37   |
| 1   | 1     | 2069 | G7M  | C2-N3-C4  | 4.80  | 120.56      | 112.30   |
| 1   | 1     | 2580 | PSU  | C4-N3-C2  | -4.78 | 119.79      | 126.37   |
| 1   | 1     | 2580 | PSU  | N1-C2-N3  | 4.75  | 120.18      | 115.17   |
| 2   | 2     | 1493 | A3P  | N3-C4-N9  | 4.74  | 135.23      | 127.17   |
| 1   | 1     | 746  | PSU  | N1-C2-N3  | 4.73  | 120.15      | 115.17   |
| 1   | 1     | 1911 | PSU  | N1-C2-N3  | 4.66  | 120.08      | 115.17   |
| 2   | 2     | 1519 | MA6  | C10-N6-C6 | -4.62 | 108.78      | 120.52   |
| 1   | 1     | 1917 | PSU  | C4-N3-C2  | -4.61 | 120.02      | 126.37   |
| 1   | 1     | 2030 | 6MZ  | C6-C5-N7  | 4.60  | 137.45      | 132.43   |
| 2   | 2     | 516  | PSU  | N1-C2-N3  | 4.59  | 120.01      | 115.17   |
| 1   | 1     | 955  | PSU  | C4-N3-C2  | -4.59 | 120.05      | 126.37   |
| 1   | 1     | 1917 | PSU  | N1-C2-N3  | 4.58  | 120.00      | 115.17   |
| 2   | 2     | 1493 | A3P  | N3-C2-N1  | -4.57 | 121.67      | 128.58   |
| 2   | 2     | 1207 | 2MG  | N9-C4-N3  | 4.53  | 135.02      | 125.95   |
| 2   | 2     | 1519 | MA6  | C9-N6-C6  | -4.53 | 108.99      | 120.52   |
| 1   | 1     | 2605 | PSU  | N1-C2-N3  | 4.50  | 119.91      | 115.17   |
| 2   | 2     | 527  | G7M  | C2-N3-C4  | 4.48  | 120.02      | 112.30   |
| 1   | 1     | 1939 | 5MU  | C5-C4-N3  | 4.45  | 119.19      | 115.32   |
| 1   | 1     | 745  | 1MG  | C2-N3-C4  | 4.44  | 121.97      | 111.98   |
| 2   | 2     | 527  | G7M  | C8-N9-C4  | 4.43  | 118.06      | 107.09   |
| 1   | 1     | 2504 | PSU  | N1-C2-N3  | 4.43  | 119.84      | 115.17   |
| 1   | 1     | 2498 | OMC  | C1'-N1-C2 | 4.43  | 128.22      | 118.44   |
| 1   | 1     | 1618 | 6MZ  | N3-C4-N9  | 4.40  | 134.66      | 127.17   |
| 2   | 2     | 1519 | MA6  | N3-C4-N9  | 4.38  | 134.62      | 127.17   |
| 2   | 2     | 966  | 2MG  | N1-C2-N2  | 4.35  | 121.00      | 116.56   |
| 2   | 2     | 1518 | MA6  | C10-N6-C6 | -4.35 | 109.46      | 120.52   |
| 2   | 2     | 1516 | 2MG  | N9-C4-N3  | 4.34  | 134.64      | 125.95   |
| 1   | 1     | 2552 | OMU  | N3-C2-N1  | 4.31  | 120.50      | 114.89   |
| 2   | 2     | 1518 | MA6  | N1-C6-N6  | 4.18  | 121.95      | 116.86   |
| 1   | 1     | 747  | 5MU  | C5-C4-N3  | 4.18  | 118.95      | 115.32   |
| 1   | 1     | 1915 | 3TD  | N1-C2-N3  | 4.15  | 119.15      | 116.13   |
| 2   | 2     | 1519 | MA6  | C2-N1-C6  | 4.14  | 121.94      | 111.83   |
| 2   | 2     | 1518 | MA6  | C2-N1-C6  | 4.06  | 121.75      | 111.83   |
| 1   | 1     | 955  | PSU  | N1-C2-N3  | 4.02  | 119.41      | 115.17   |
| 1   | 1     | 2504 | PSU  | C4-N3-C2  | -4.01 | 120.84      | 126.37   |
| 1   | 1     | 745  | 1MG  | N9-C4-N3  | 3.98  | 133.91      | 125.95   |
| 1   | 1     | 2552 | OMU  | C5-C4-N3  | 3.96  | 120.35      | 114.80   |
| 2   | 2     | 966  | 2MG  | N9-C4-N3  | 3.95  | 133.85      | 125.95   |
| 1   | 1     | 2030 | 6MZ  | N3-C4-N9  | 3.95  | 133.88      | 127.17   |

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| Mol | Chain | Res  | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-----------|-------|-------------|----------|
| 2   | 2     | 1493 | A3P  | N9-C8-N7  | -3.91 | 108.39      | 113.94   |
| 1   | 1     | 1939 | 5MU  | O4-C4-C5  | -3.90 | 120.46      | 124.92   |
| 2   | 2     | 527  | G7M  | C1'-N9-C8 | -3.90 | 113.57      | 126.74   |
| 2   | 2     | 1493 | A3P  | C2-N3-C4  | 3.86  | 121.27      | 111.83   |
| 1   | 1     | 2030 | 6MZ  | N1-C2-N3  | -3.86 | 122.74      | 128.58   |
| 1   | 1     | 2030 | 6MZ  | C2-N3-C4  | 3.81  | 121.13      | 111.83   |
| 2   | 2     | 967  | 5MC  | C5-C6-N1  | -3.79 | 119.20      | 123.31   |
| 2   | 2     | 1518 | MA6  | C9-N6-C6  | -3.78 | 110.90      | 120.52   |
| 2   | 2     | 1519 | MA6  | C2-N3-C4  | 3.77  | 121.04      | 111.83   |
| 2   | 2     | 1493 | A3P  | C4-N9-C8  | 3.76  | 109.69      | 105.74   |
| 1   | 1     | 747  | 5MU  | O4-C4-C5  | -3.74 | 120.64      | 124.92   |
| 1   | 1     | 1618 | 6MZ  | C2-N3-C4  | 3.72  | 120.91      | 111.83   |
| 2   | 2     | 1518 | MA6  | C2-N3-C4  | 3.69  | 120.86      | 111.83   |
| 1   | 1     | 1618 | 6MZ  | C6-C5-N7  | 3.68  | 136.44      | 132.43   |
| 1   | 1     | 1939 | 5MU  | C5-C6-N1  | -3.62 | 119.38      | 123.31   |
| 2   | 2     | 1519 | MA6  | C4-C5-N7  | -3.57 | 106.50      | 110.58   |
| 1   | 1     | 2030 | 6MZ  | C4-C5-N7  | -3.55 | 106.53      | 110.58   |
| 1   | 1     | 1618 | 6MZ  | C4-C5-N7  | -3.54 | 106.53      | 110.58   |
| 2   | 2     | 966  | 2MG  | C6-C5-N7  | 3.52  | 136.70      | 130.29   |
| 1   | 1     | 2503 | 2MA  | C4-C5-N7  | -3.49 | 106.59      | 110.58   |
| 1   | 1     | 1962 | 5MC  | C5-C6-N1  | -3.48 | 119.53      | 123.31   |
| 1   | 1     | 2498 | OMC  | C1'-N1-C6 | -3.46 | 113.39      | 120.78   |
| 2   | 2     | 1498 | UR3  | C5-C4-N3  | 3.40  | 119.52      | 115.04   |
| 1   | 1     | 1618 | 6MZ  | C9-N6-C6  | -3.39 | 119.70      | 122.85   |
| 2   | 2     | 1519 | MA6  | N1-C2-N3  | -3.37 | 123.47      | 128.58   |
| 2   | 2     | 1516 | 2MG  | C6-C5-N7  | 3.36  | 136.41      | 130.29   |
| 2   | 2     | 1407 | 5MC  | C5-C6-N1  | -3.33 | 119.69      | 123.31   |
| 2   | 2     | 527  | G7M  | CN7-N7-C5 | 3.31  | 130.92      | 126.80   |
| 2   | 2     | 966  | 2MG  | N2-C2-N3  | -3.30 | 116.30      | 120.51   |
| 1   | 1     | 1618 | 6MZ  | N1-C2-N3  | -3.29 | 123.59      | 128.58   |
| 1   | 1     | 747  | 5MU  | C5-C6-N1  | -3.28 | 119.75      | 123.31   |
| 1   | 1     | 2504 | PSU  | O2-C2-N1  | -3.23 | 119.45      | 122.79   |
| 1   | 1     | 2580 | PSU  | O2-C2-N1  | -3.22 | 119.47      | 122.79   |
| 2   | 2     | 1207 | 2MG  | C6-C5-N7  | 3.21  | 136.12      | 130.29   |
| 2   | 2     | 1518 | MA6  | N1-C2-N3  | -3.19 | 123.75      | 128.58   |
| 1   | 1     | 2030 | 6MZ  | C4-N9-C8  | 3.18  | 109.08      | 105.74   |
| 2   | 2     | 1493 | A3P  | C5-N7-C8  | 3.17  | 108.43      | 103.45   |
| 48  | q     | 89   | 0TD  | OD2-CG-CB | 3.15  | 119.96      | 113.15   |
| 1   | 1     | 2251 | OMG  | C6-C5-N7  | 3.12  | 135.97      | 130.29   |
| 2   | 2     | 1518 | MA6  | C4-C5-N7  | -3.10 | 107.03      | 110.58   |
| 1   | 1     | 2445 | 2MG  | C6-C5-N7  | 3.05  | 135.84      | 130.29   |
| 2   | 2     | 1518 | MA6  | C5-C6-N6  | -3.04 | 120.53      | 125.33   |

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| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 2   | 2     | 1519 | MA6  | N1-C6-N6    | 3.01  | 120.52      | 116.86   |
| 1   | 1     | 1835 | 2MG  | C6-C5-N7    | 3.01  | 135.76      | 130.29   |
| 2   | 2     | 1493 | A3P  | P1-O3'-C3'  | -2.94 | 115.58      | 123.43   |
| 1   | 1     | 2504 | PSU  | C6-N1-C2    | -2.91 | 119.99      | 122.69   |
| 1   | 1     | 2552 | OMU  | O4-C4-C5    | -2.88 | 120.20      | 125.16   |
| 1   | 1     | 2503 | 2MA  | N6-C6-N1    | 2.87  | 120.90      | 117.03   |
| 1   | 1     | 745  | 1MG  | C6-C5-N7    | 2.85  | 135.70      | 129.36   |
| 1   | 1     | 2498 | OMC  | CM2-O2'-C2' | -2.84 | 107.19      | 114.47   |
| 1   | 1     | 1962 | 5MC  | C5-C4-N3    | -2.76 | 118.92      | 121.75   |
| 1   | 1     | 745  | 1MG  | C4-C5-N7    | -2.76 | 106.30      | 110.67   |
| 1   | 1     | 2503 | 2MA  | C4-N9-C8    | 2.73  | 108.61      | 105.74   |
| 2   | 2     | 967  | 5MC  | C5-C4-N3    | -2.69 | 119.00      | 121.75   |
| 2   | 2     | 1493 | A3P  | C4-C5-N7    | -2.67 | 107.53      | 110.58   |
| 1   | 1     | 955  | PSU  | O2-C2-N1    | -2.67 | 120.04      | 122.79   |
| 2   | 2     | 966  | 2MG  | C4-C5-N7    | -2.64 | 106.48      | 110.67   |
| 1   | 1     | 2503 | 2MA  | C2-N1-C6    | 2.64  | 122.16      | 118.10   |
| 1   | 1     | 2580 | PSU  | O4'-C1'-C2' | 2.63  | 108.78      | 105.15   |
| 1   | 1     | 746  | PSU  | O2-C2-N1    | -2.61 | 120.09      | 122.79   |
| 2   | 2     | 1407 | 5MC  | C5-C4-N3    | -2.61 | 119.08      | 121.75   |
| 2   | 2     | 516  | PSU  | O2-C2-N1    | -2.61 | 120.09      | 122.79   |
| 2   | 2     | 527  | G7M  | O6-C6-C5    | -2.60 | 122.21      | 128.01   |
| 1   | 1     | 1911 | PSU  | O2-C2-N1    | -2.60 | 120.11      | 122.79   |
| 1   | 1     | 2457 | PSU  | O2-C2-N1    | -2.59 | 120.12      | 122.79   |
| 1   | 1     | 2503 | 2MA  | C5-N7-C8    | 2.59  | 107.51      | 103.45   |
| 1   | 1     | 2605 | PSU  | O2-C2-N1    | -2.58 | 120.13      | 122.79   |
| 1   | 1     | 1618 | 6MZ  | C4-N9-C8    | 2.56  | 108.42      | 105.74   |
| 2   | 2     | 1516 | 2MG  | C4-C5-N7    | -2.56 | 106.62      | 110.67   |
| 1   | 1     | 2251 | OMG  | C4-C5-N7    | -2.53 | 106.66      | 110.67   |
| 2   | 2     | 1519 | MA6  | C10-N6-C9   | -2.53 | 108.05      | 116.18   |
| 1   | 1     | 1618 | 6MZ  | C5-N7-C8    | 2.53  | 107.42      | 103.45   |
| 1   | 1     | 2030 | 6MZ  | C5-N7-C8    | 2.52  | 107.41      | 103.45   |
| 1   | 1     | 2498 | OMC  | O2-C2-N3    | -2.52 | 118.36      | 122.33   |
| 2   | 2     | 1519 | MA6  | C4-N9-C8    | 2.52  | 108.38      | 105.74   |
| 2   | 2     | 1207 | 2MG  | C4-C5-N7    | -2.51 | 106.70      | 110.67   |
| 2   | 2     | 1519 | MA6  | C5-N7-C8    | 2.51  | 107.39      | 103.45   |
| 1   | 1     | 1917 | PSU  | O2-C2-N1    | -2.50 | 120.21      | 122.79   |
| 2   | 2     | 516  | PSU  | C6-N1-C2    | -2.49 | 120.38      | 122.69   |
| 1   | 1     | 2552 | OMU  | O2-C2-N1    | -2.49 | 119.56      | 122.80   |
| 1   | 1     | 1917 | PSU  | C6-N1-C2    | -2.48 | 120.39      | 122.69   |
| 1   | 1     | 2069 | G7M  | O6-C6-C5    | -2.44 | 122.56      | 128.01   |
| 1   | 1     | 1939 | 5MU  | O2-C2-N1    | -2.42 | 119.64      | 122.80   |
| 1   | 1     | 1835 | 2MG  | C4-C5-N7    | -2.39 | 106.88      | 110.67   |

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| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 1   | 1     | 2445 | 2MG  | C4-C5-N7    | -2.39 | 106.88      | 110.67   |
| 2   | 2     | 1518 | MA6  | C4-N9-C8    | 2.38  | 108.24      | 105.74   |
| 1   | 1     | 2030 | 6MZ  | N9-C8-N7    | -2.37 | 110.58      | 113.94   |
| 1   | 1     | 2498 | OMC  | O2-C2-N1    | 2.34  | 123.49      | 118.90   |
| 1   | 1     | 2580 | PSU  | C6-N1-C2    | -2.34 | 120.52      | 122.69   |
| 2   | 2     | 1518 | MA6  | C5-N7-C8    | 2.30  | 107.07      | 103.45   |
| 2   | 2     | 1519 | MA6  | C5-C6-N6    | -2.27 | 121.74      | 125.33   |
| 1   | 1     | 2069 | G7M  | C5-C6-N1    | 2.25  | 116.48      | 111.84   |
| 1   | 1     | 747  | 5MU  | O2-C2-N1    | -2.24 | 119.88      | 122.80   |
| 1   | 1     | 2251 | OMG  | O6-C6-C5    | -2.22 | 120.67      | 126.53   |
| 1   | 1     | 2457 | PSU  | C6-C5-C4    | 2.21  | 119.67      | 118.17   |
| 2   | 2     | 1207 | 2MG  | N1-C2-N2    | 2.21  | 118.82      | 116.56   |
| 1   | 1     | 2457 | PSU  | C6-N1-C2    | -2.21 | 120.64      | 122.69   |
| 2   | 2     | 1516 | 2MG  | N1-C2-N2    | 2.21  | 118.81      | 116.56   |
| 2   | 2     | 1402 | 4OC  | C6-C5-C4    | 2.20  | 119.65      | 117.00   |
| 2   | 2     | 1407 | 5MC  | O2-C2-N3    | -2.20 | 118.86      | 122.33   |
| 1   | 1     | 2503 | 2MA  | C6-C5-N7    | 2.17  | 136.28      | 132.09   |
| 1   | 1     | 2580 | PSU  | C6-C5-C4    | 2.15  | 119.62      | 118.17   |
| 2   | 2     | 1493 | A3P  | C2'-C3'-C4' | 2.14  | 106.99      | 103.24   |
| 1   | 1     | 746  | PSU  | C6-C5-C4    | 2.14  | 119.62      | 118.17   |
| 1   | 1     | 746  | PSU  | C6-N1-C2    | -2.14 | 120.70      | 122.69   |
| 2   | 2     | 1518 | MA6  | C10-N6-C9   | -2.14 | 109.31      | 116.18   |
| 1   | 1     | 1911 | PSU  | C6-N1-C2    | -2.13 | 120.72      | 122.69   |
| 1   | 1     | 2457 | PSU  | O4'-C1'-C2' | 2.12  | 108.09      | 105.15   |
| 2   | 2     | 1516 | 2MG  | O6-C6-C5    | -2.12 | 120.94      | 126.53   |
| 2   | 2     | 966  | 2MG  | O6-C6-C5    | -2.11 | 120.96      | 126.53   |
| 2   | 2     | 1207 | 2MG  | O6-C6-C5    | -2.11 | 120.96      | 126.53   |
| 1   | 1     | 2030 | 6MZ  | C2-N1-C6    | 2.10  | 122.19      | 115.24   |
| 2   | 2     | 1402 | 4OC  | O2-C2-N3    | -2.10 | 119.02      | 122.33   |
| 1   | 1     | 2503 | 2MA  | N9-C8-N7    | -2.09 | 110.97      | 113.94   |
| 1   | 1     | 955  | PSU  | O4'-C1'-C2' | 2.05  | 107.98      | 105.15   |
| 1   | 1     | 2251 | OMG  | C5-C6-N1    | 2.03  | 118.43      | 113.25   |
| 1   | 1     | 1835 | 2MG  | O6-C6-C5    | -2.03 | 121.19      | 126.53   |
| 1   | 1     | 1835 | 2MG  | CM2-N2-C2   | -2.02 | 119.31      | 123.65   |
| 2   | 2     | 967  | 5MC  | O2-C2-N3    | -2.01 | 119.16      | 122.33   |

All (4) chirality outliers are listed below:

| Mol | Chain | Res  | Type | Atom |
|-----|-------|------|------|------|
| 2   | 2     | 1493 | A3P  | C2'  |
| 1   | 1     | 2069 | G7M  | C2'  |
| 1   | 1     | 2069 | G7M  | C3'  |

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| Mol | Chain | Res  | Type | Atom |
|-----|-------|------|------|------|
| 1   | 1     | 2069 | G7M  | C4'  |

All (46) torsion outliers are listed below:

| Mol | Chain | Res  | Type | Atoms           |
|-----|-------|------|------|-----------------|
| 2   | 2     | 516  | PSU  | O4'-C1'-C5-C4   |
| 2   | 2     | 516  | PSU  | O4'-C1'-C5-C6   |
| 2   | 2     | 966  | 2MG  | O4'-C4'-C5'-O5' |
| 2   | 2     | 966  | 2MG  | C3'-C4'-C5'-O5' |
| 2   | 2     | 1519 | MA6  | C5-C6-N6-C9     |
| 1   | 1     | 1915 | 3TD  | C2'-C1'-C5-C4   |
| 1   | 1     | 1915 | 3TD  | O4'-C1'-C5-C4   |
| 1   | 1     | 1915 | 3TD  | O4'-C1'-C5-C6   |
| 1   | 1     | 2445 | 2MG  | N1-C2-N2-CM2    |
| 1   | 1     | 2445 | 2MG  | N3-C2-N2-CM2    |
| 1   | 1     | 2498 | OMC  | C4'-C5'-O5'-P   |
| 1   | 1     | 2504 | PSU  | O4'-C4'-C5'-O5' |
| 2   | 2     | 967  | 5MC  | O4'-C4'-C5'-O5' |
| 2   | 2     | 967  | 5MC  | C3'-C4'-C5'-O5' |
| 1   | 1     | 1618 | 6MZ  | O4'-C4'-C5'-O5' |
| 1   | 1     | 2498 | OMC  | C3'-C4'-C5'-O5' |
| 2   | 2     | 1519 | MA6  | N1-C6-N6-C9     |
| 1   | 1     | 2498 | OMC  | C2'-C1'-N1-C2   |
| 2   | 2     | 527  | G7M  | C3'-C4'-C5'-O5' |
| 1   | 1     | 2504 | PSU  | C3'-C4'-C5'-O5' |
| 2   | 2     | 1518 | MA6  | C5-C6-N6-C9     |
| 1   | 1     | 2498 | OMC  | O4'-C4'-C5'-O5' |
| 2   | 2     | 1402 | 4OC  | O4'-C4'-C5'-O5' |
| 2   | 2     | 966  | 2MG  | C4'-C5'-O5'-P   |
| 1   | 1     | 2498 | OMC  | C2'-C1'-N1-C6   |
| 1   | 1     | 1618 | 6MZ  | C3'-C4'-C5'-O5' |
| 2   | 2     | 527  | G7M  | O4'-C4'-C5'-O5' |
| 1   | 1     | 2503 | 2MA  | O4'-C4'-C5'-O5' |
| 48  | q     | 89   | 0TD  | CG-CB-SB-CSB    |
| 1   | 1     | 2498 | OMC  | O4'-C1'-N1-C6   |
| 2   | 2     | 1518 | MA6  | N1-C6-N6-C9     |
| 2   | 2     | 1519 | MA6  | O4'-C4'-C5'-O5' |
| 1   | 1     | 2498 | OMC  | O4'-C1'-N1-C2   |
| 1   | 1     | 2030 | 6MZ  | C3'-C4'-C5'-O5' |
| 1   | 1     | 1962 | 5MC  | C2'-C1'-N1-C6   |
| 1   | 1     | 955  | PSU  | C4'-C5'-O5'-P   |
| 1   | 1     | 1962 | 5MC  | O4'-C1'-N1-C6   |

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| Mol | Chain | Res  | Type | Atoms           |
|-----|-------|------|------|-----------------|
| 1   | 1     | 2503 | 2MA  | C3'-C4'-C5'-O5' |
| 1   | 1     | 746  | PSU  | O4'-C1'-C5-C6   |
| 1   | 1     | 2251 | OMG  | C3'-C2'-O2'-CM2 |
| 1   | 1     | 2498 | OMC  | C3'-C2'-O2'-CM2 |
| 1   | 1     | 746  | PSU  | C2'-C1'-C5-C6   |
| 1   | 1     | 1915 | 3TD  | C2'-C1'-C5-C6   |
| 2   | 2     | 1402 | 4OC  | C3'-C2'-O2'-CM2 |
| 2   | 2     | 527  | G7M  | C4'-C5'-O5'-P   |
| 2   | 2     | 1402 | 4OC  | C3'-C4'-C5'-O5' |

There are no ring outliers.

14 monomers are involved in 29 short contacts:

| Mol | Chain | Res  | Type | Clashes | Symm-Clashes |
|-----|-------|------|------|---------|--------------|
| 2   | 2     | 516  | PSU  | 2       | 0            |
| 1   | 1     | 2504 | PSU  | 2       | 0            |
| 1   | 1     | 2069 | G7M  | 2       | 0            |
| 1   | 1     | 745  | 1MG  | 1       | 0            |
| 1   | 1     | 2498 | OMC  | 3       | 0            |
| 2   | 2     | 967  | 5MC  | 1       | 0            |
| 2   | 2     | 1402 | 4OC  | 1       | 0            |
| 2   | 2     | 966  | 2MG  | 6       | 0            |
| 1   | 1     | 2030 | 6MZ  | 3       | 0            |
| 1   | 1     | 955  | PSU  | 5       | 0            |
| 48  | q     | 89   | 0TD  | 1       | 0            |
| 2   | 2     | 1516 | 2MG  | 1       | 0            |
| 2   | 2     | 1519 | MA6  | 2       | 0            |
| 2   | 2     | 1518 | MA6  | 1       | 0            |

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 441 ligands modelled in this entry, 441 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

The following chains have linkage breaks:

| Mol | Chain | Number of breaks |
|-----|-------|------------------|
| 1   | 1     | 1                |
| 6   | A     | 1                |

All chain breaks are listed below:

| Model | Chain | Residue-1 | Atom-1 | Residue-2 | Atom-2 | Distance (Å) |
|-------|-------|-----------|--------|-----------|--------|--------------|
| 1     | 1     | 2314:A    | O3'    | 2315:G    | P      | 3.96         |
| 1     | A     | 108:PHE   | C      | 109:SER   | N      | 3.24         |

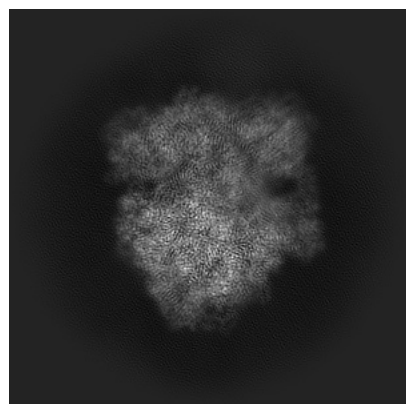
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-48479. These allow visual inspection of the internal detail of the map and identification of artifacts.

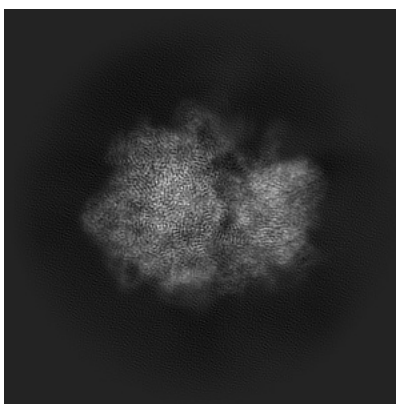
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

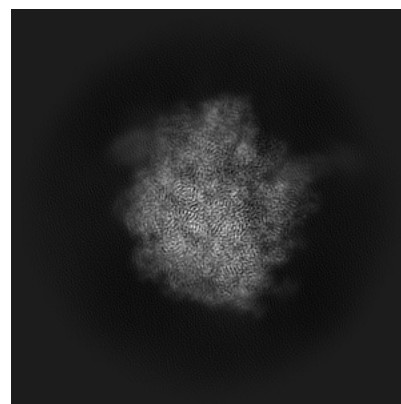
#### 6.1.1 Primary map



X

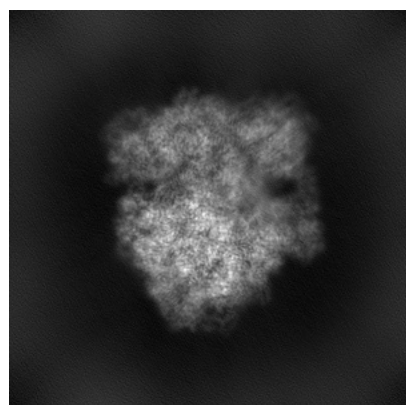


Y

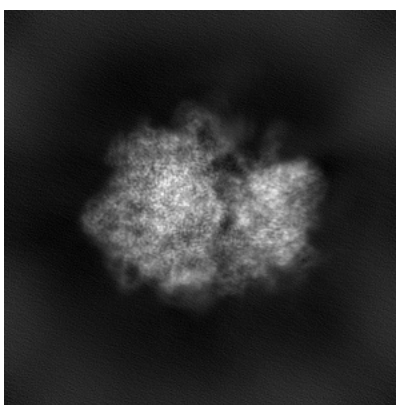


Z

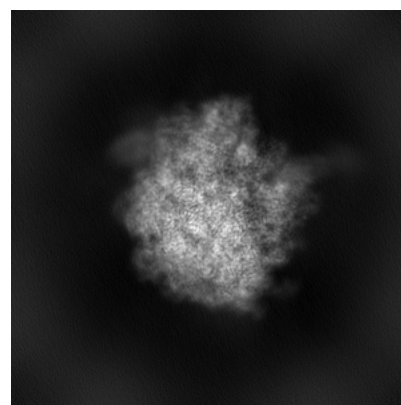
#### 6.1.2 Raw map



X



Y

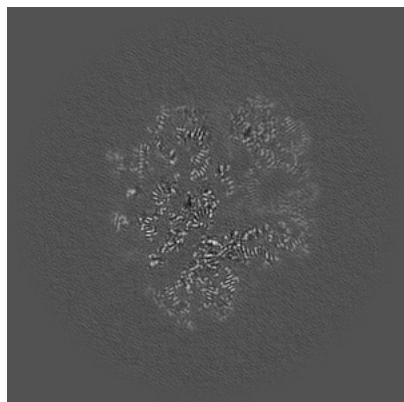


Z

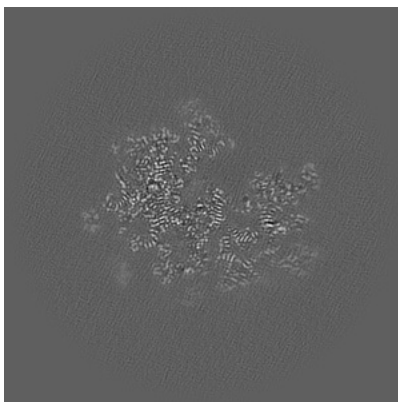
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

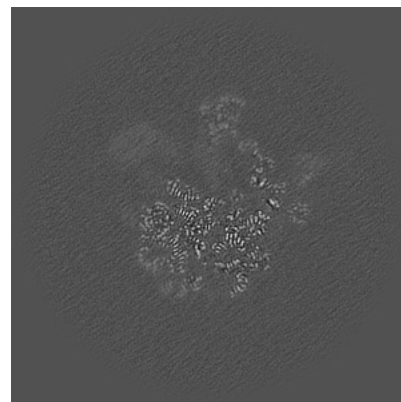
### 6.2.1 Primary map



X Index: 192

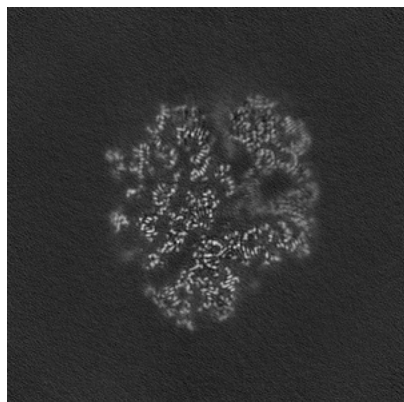


Y Index: 192

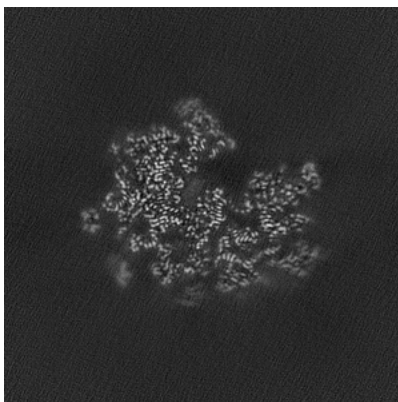


Z Index: 192

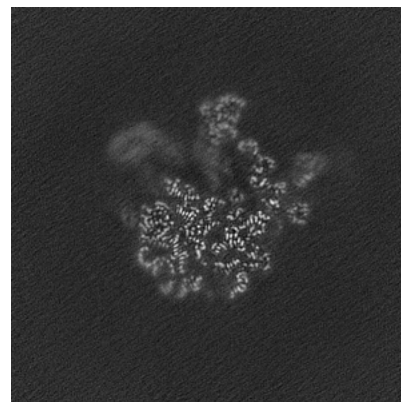
### 6.2.2 Raw map



X Index: 192



Y Index: 192

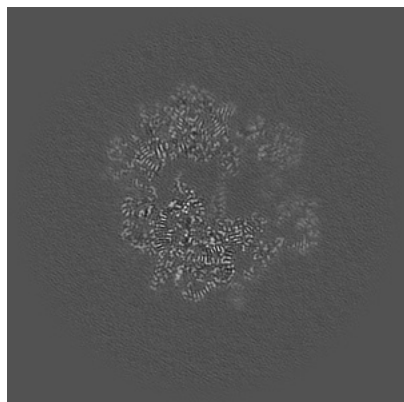


Z Index: 192

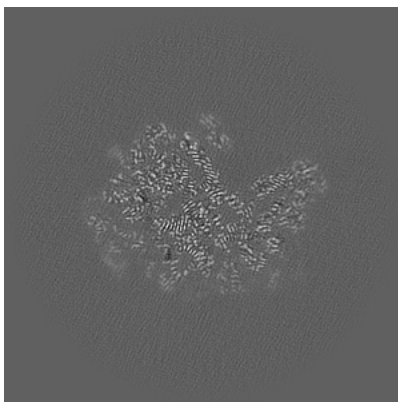
The images above show central slices of the map in three orthogonal directions.

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

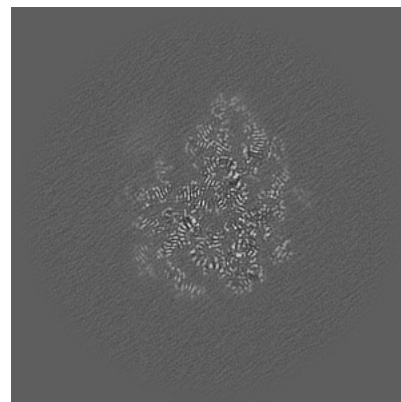
### 6.3.1 Primary map



X Index: 215

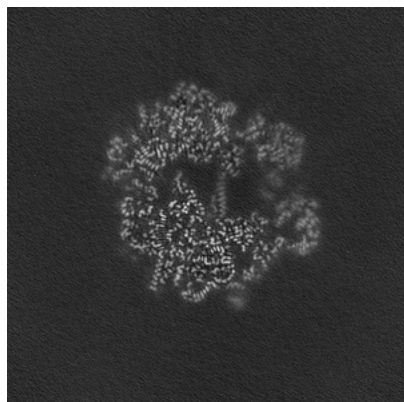


Y Index: 179

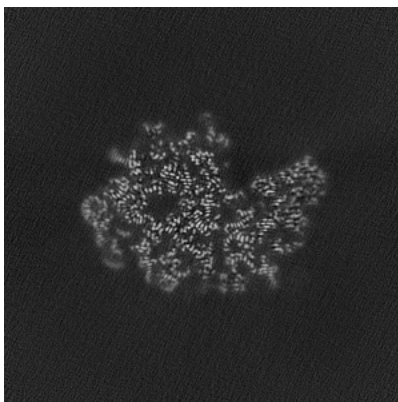


Z Index: 164

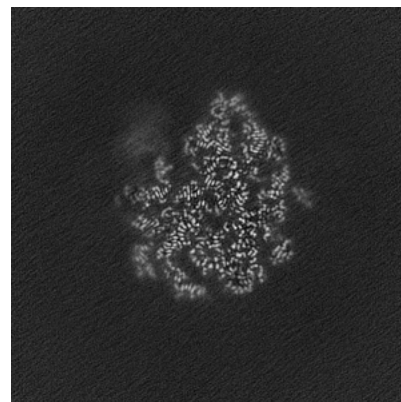
### 6.3.2 Raw map



X Index: 215



Y Index: 175

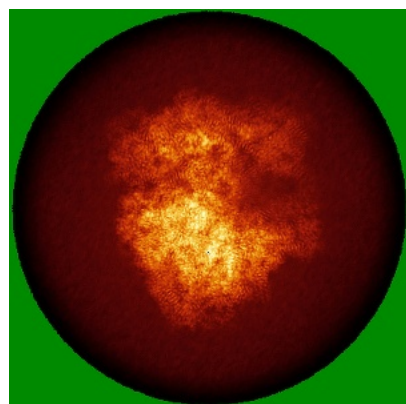


Z Index: 164

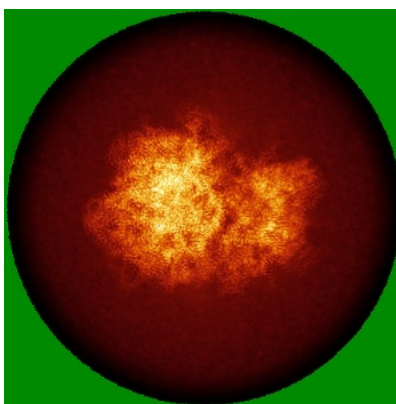
The images above show the largest variance slices of the map in three orthogonal directions.

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

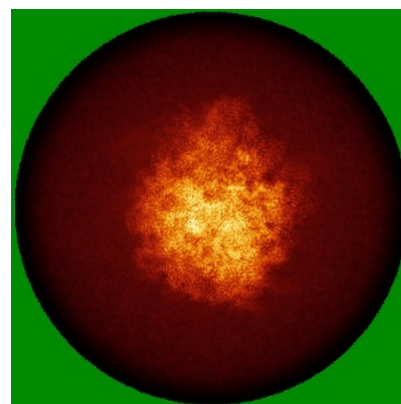
### 6.4.1 Primary map



X

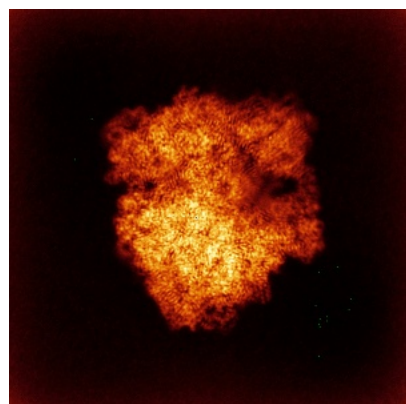


Y

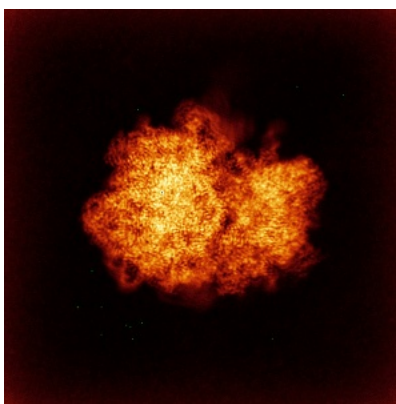


Z

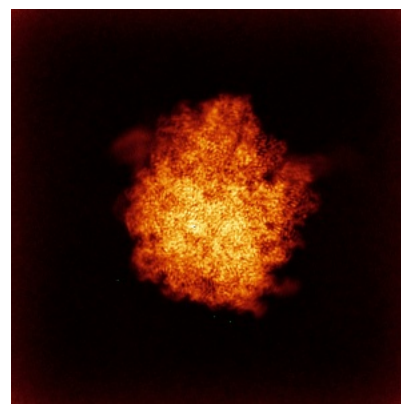
### 6.4.2 Raw map



X



Y

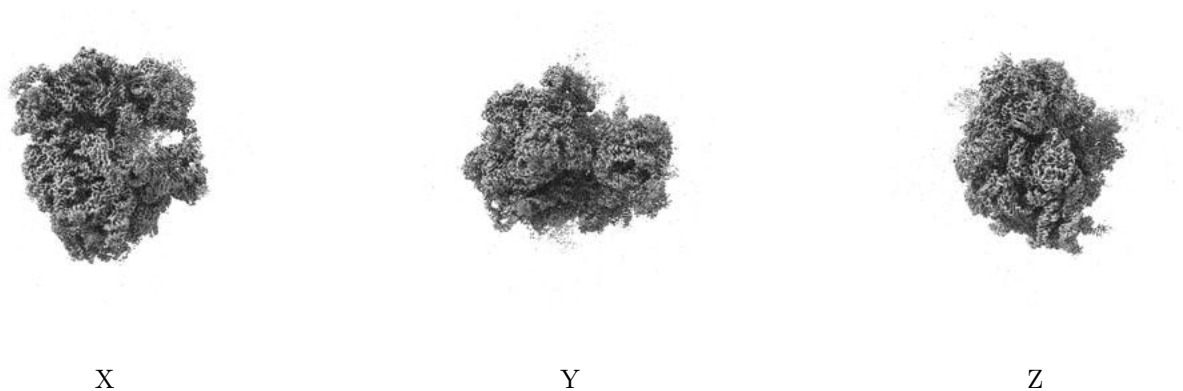


Z

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 0.701. 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.

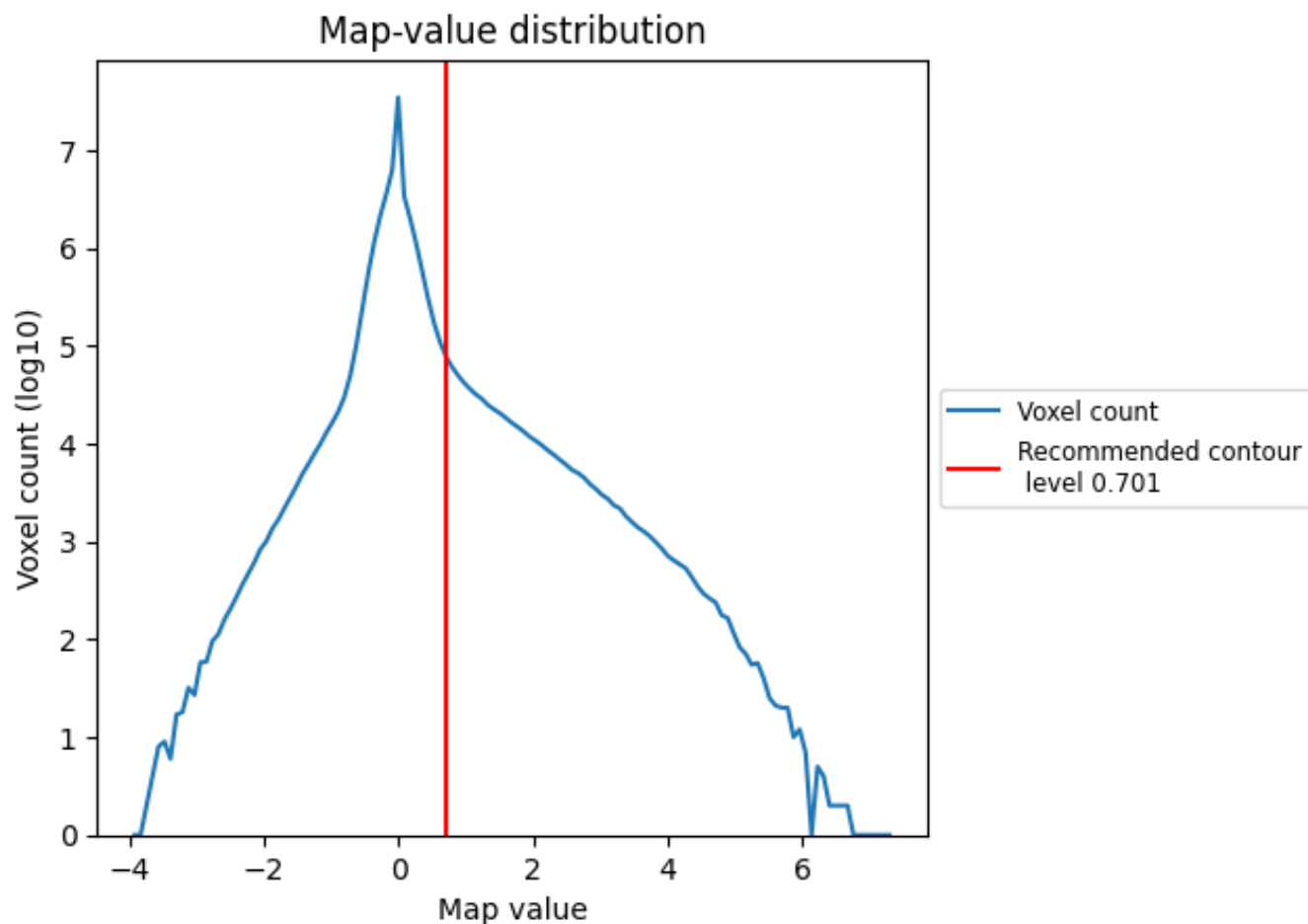
## 6.6 Mask visualisation [i](#)

This section was not generated. No masks/segmentation were deposited.

## 7 Map analysis [i](#)

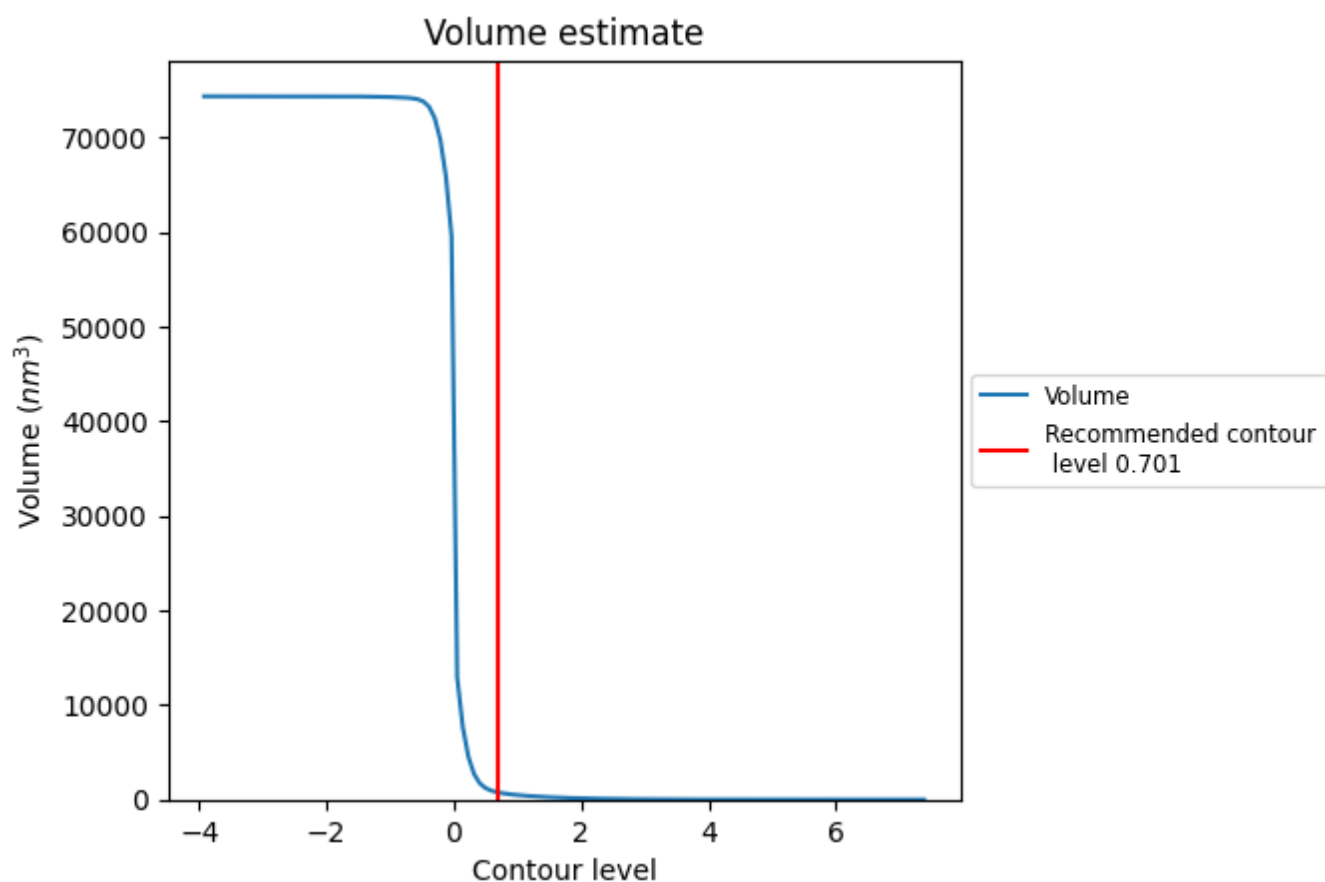
This section contains the results of statistical analysis of the map.

### 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.

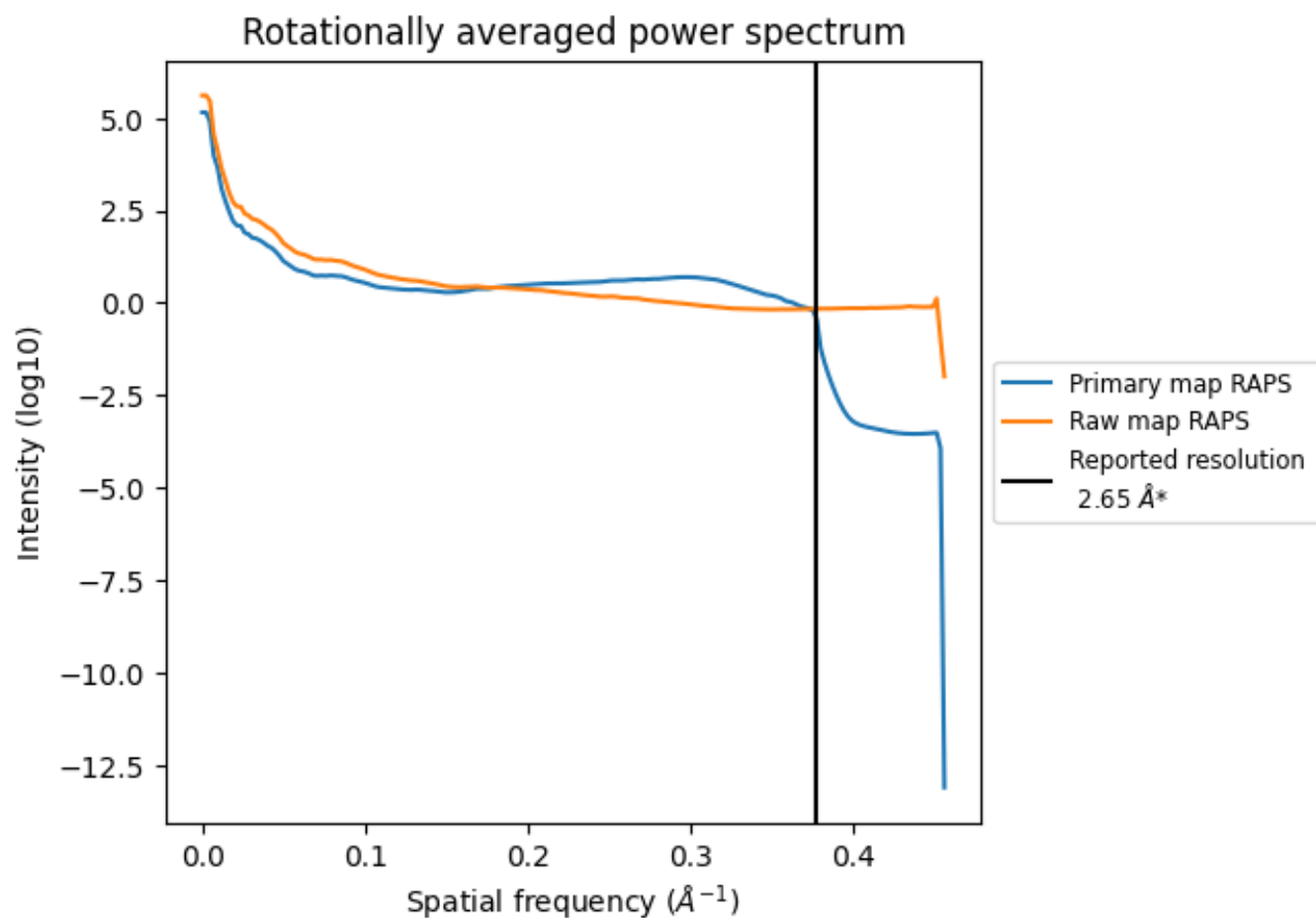
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 749 nm<sup>3</sup>; this corresponds to an approximate mass of 677 kDa.

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

### 7.3 Rotationally averaged power spectrum ⓘ

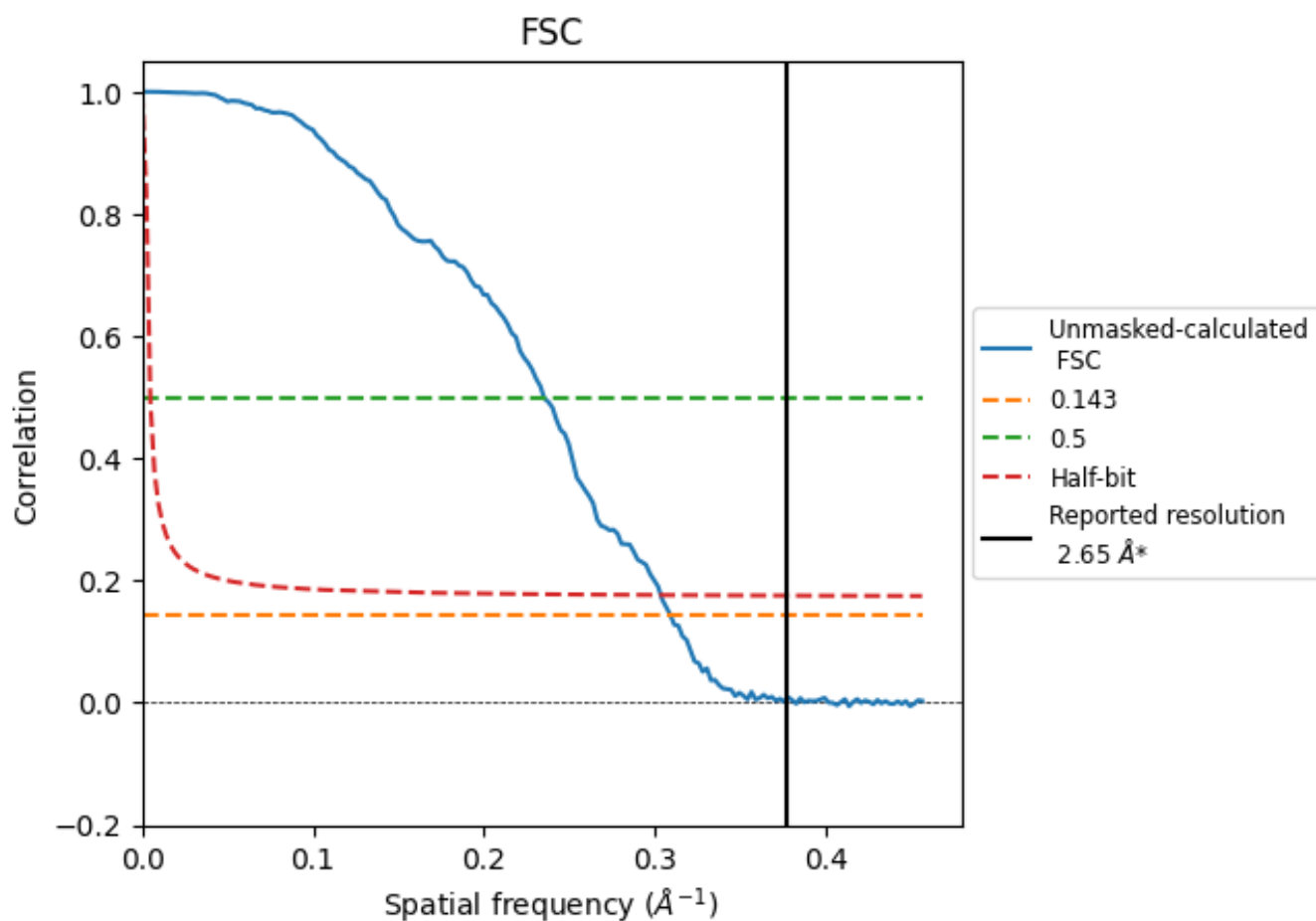


\*Reported resolution corresponds to spatial frequency of 0.377 Å<sup>-1</sup>

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

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

### 8.1 FSC [i](#)



\*Reported resolution corresponds to spatial frequency of 0.377  $\text{\AA}^{-1}$

## 8.2 Resolution estimates [i](#)

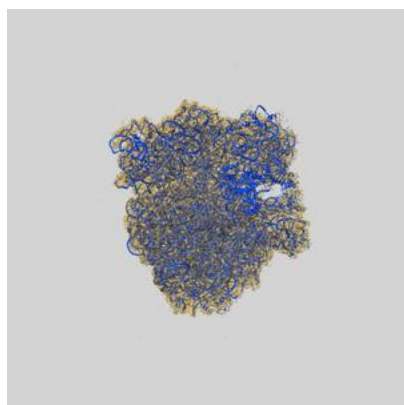
| Resolution estimate (Å)   | Estimation criterion (FSC cut-off) |      |          |
|---------------------------|------------------------------------|------|----------|
|                           | 0.143                              | 0.5  | Half-bit |
| Reported by author        | 2.65                               | -    | -        |
| Author-provided FSC curve | -                                  | -    | -        |
| Unmasked-calculated*      | 3.23                               | 4.25 | 3.29     |

\*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 3.23 differs from the reported value 2.65 by more than 10 %

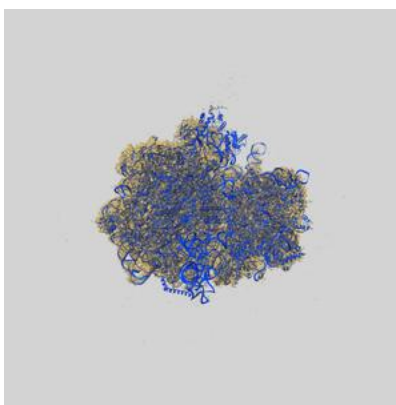
## 9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-48479 and PDB model 9MOR. Per-residue inclusion information can be found in section [3](#) on page [16](#).

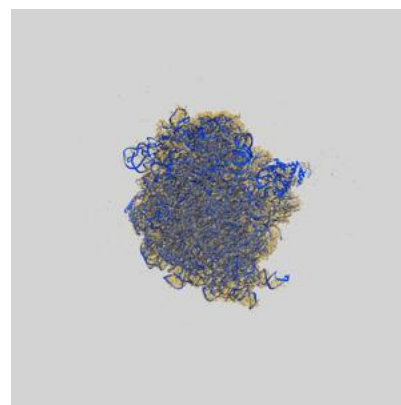
### 9.1 Map-model overlay [i](#)



X



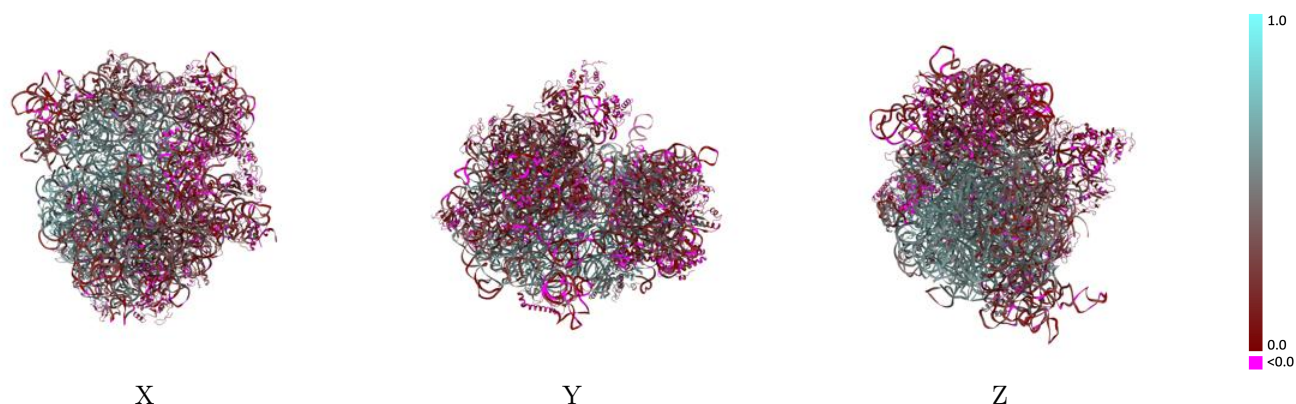
Y



Z

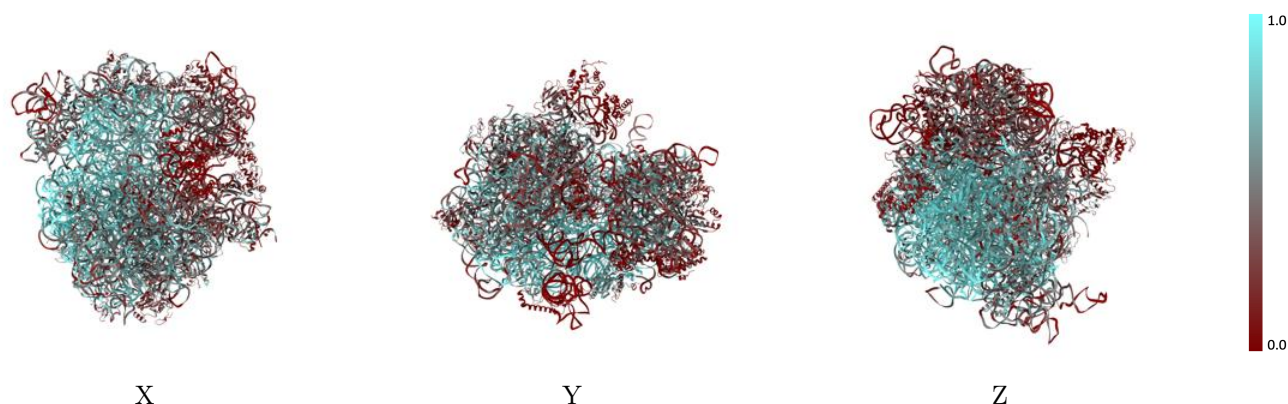
The images above show the 3D surface view of the map at the recommended contour level 0.701 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



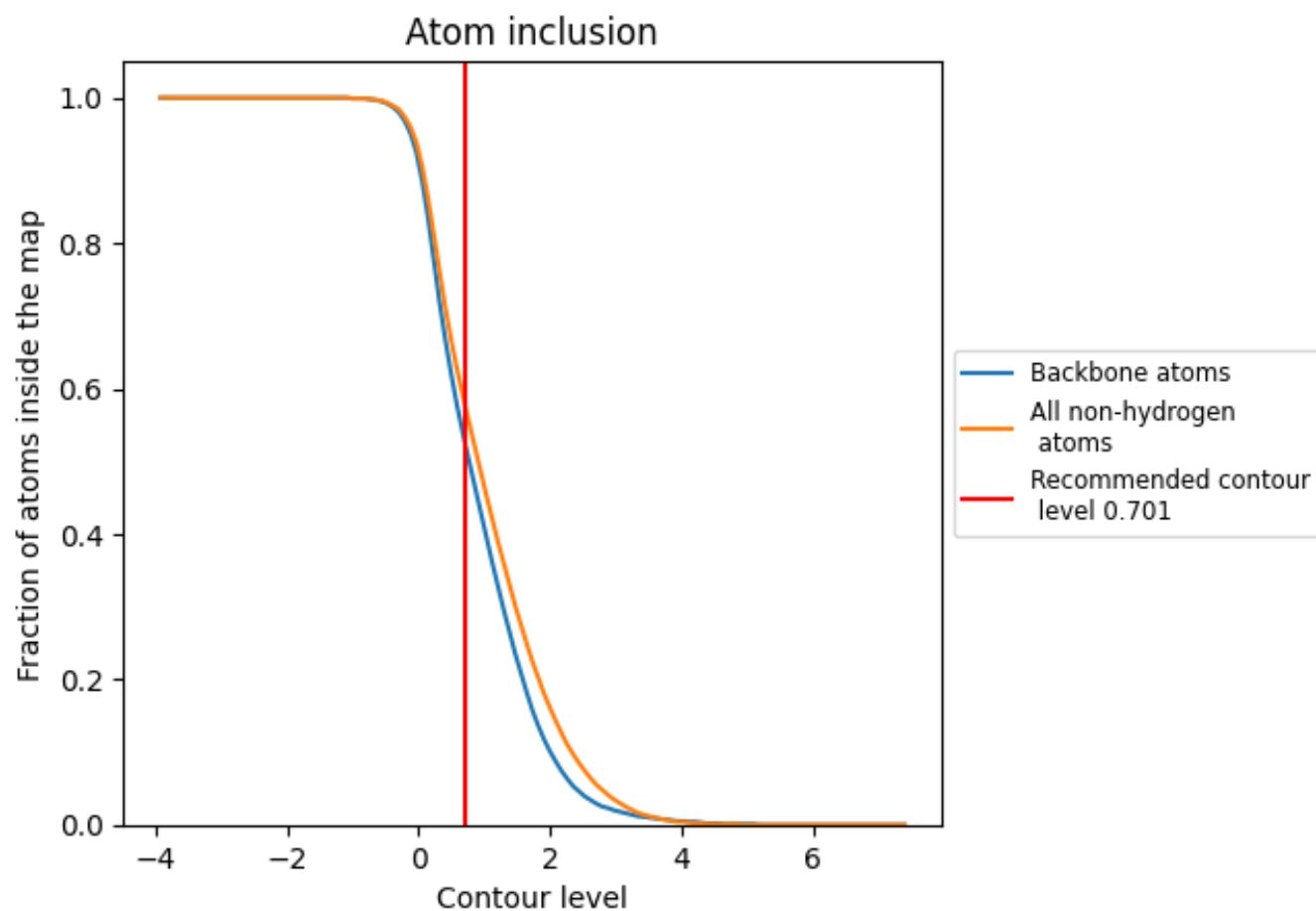
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.701).

## 9.4 Atom inclusion [i](#)



At the recommended contour level, 53% of all backbone atoms, 58% 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 (0.701) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion                                                                             | Q-score                                                                                    |
|-------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| All   |  0.5780   |  0.3670   |
| 1     |  0.6940   |  0.4300   |
| 2     |  0.6280   |  0.3860   |
| 4     |  0.3620   |  0.1770   |
| 5     |  0.2170   |  0.2640   |
| 6     |  0.0070   |  0.0730   |
| 7     |  0.3270   |  0.2910   |
| A     |  0.5010   |  0.4590   |
| B     |  0.9090   |  0.6230   |
| C     |  0.4940   |  0.2600   |
| D     |  0.3910   |  0.2370   |
| E     |  0.1650   |  0.1220   |
| F     |  0.2790   |  0.1670   |
| G     |  0.1300   |  0.1820   |
| H     |  0.0230  |  0.0970  |
| I     |  0.0050 |  0.0610 |
| J     |  0.4030 |  0.2090 |
| K     |  0.8580 |  0.6080 |
| L     |  0.3800 |  0.1640 |
| M     |  0.3480 |  0.1770 |
| N     |  0.8980 |  0.6060 |
| O     |  0.3060 |  0.1500 |
| P     |  0.7200 |  0.4830 |
| Q     |  0.5180 |  0.2480 |
| R     |  0.3510 |  0.1780 |
| S     |  0.7400 |  0.4850 |
| T     |  0.7040 |  0.5270 |
| U     |  0.3070 |  0.1750 |
| V     |  0.3310 |  0.1810 |
| W     |  0.4520 |  0.2230 |
| X     |  0.8290 |  0.6010 |
| Y     |  0.5480 |  0.4400 |
| Z     |  0.4080 |  0.1970 |
| a     |  0.0860 |  0.0950 |
| b     |  0.6250 |  0.4030 |



*Continued on next page...*

*Continued from previous page...*

| Chain | Atom inclusion                                                                             | Q-score                                                                                    |
|-------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| c     |  0.2440   |  0.1170   |
| d     |  0.9100   |  0.6220   |
| e     |  0.4710   |  0.2280   |
| f     |  0.4660   |  0.2330   |
| g     |  0.1500   |  0.1000   |
| h     |  0.2370   |  0.1400   |
| i     |  0.3210   |  0.2190   |
| j     |  0.6680   |  0.4410   |
| k     |  0.6160   |  0.4850   |
| l     |  0.0870   |  0.0920   |
| m     |  0.7870   |  0.5550   |
| n     |  0.2010   |  0.1420   |
| o     |  0.2380   |  0.1950   |
| p     |  0.6710   |  0.5180   |
| q     |  0.6630   |  0.4510   |
| r     |  0.1590   |  0.1290   |
| s     |  0.2890   |  0.1750   |
| t     |  0.7410  |  0.5340  |
| u     |  0.3640 |  0.2000 |
| v     |  0.7150 |  0.5200 |
| w     |  0.6920 |  0.5190 |
| x     |  0.1960 |  0.1570 |
| y     |  0.4360 |  0.2510 |
| z     |  0.3780 |  0.3680 |