



## Full wwPDB EM Validation Report ⓘ

Sep 28, 2024 – 05:57 PM EDT

PDB ID : 8TAS  
EMDB ID : EMD-41141  
Title : PRC2 monomer bound to nucleosome  
Authors : Sauer, P.V.; Pavlenko, E.; Nogales, E.; Poepsel, S.  
Deposited on : 2023-06-27  
Resolution : 4.10 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.dev113  
Mogul : 2022.3.0, CSD as543be (2022)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.39

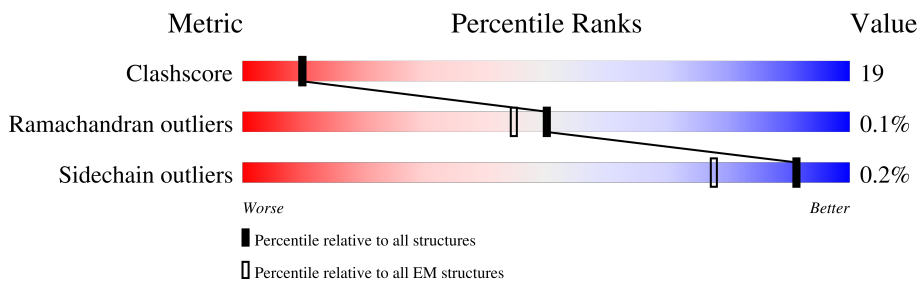
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 4.10 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.









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

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   | D     | 619    |                  |
| 2   | E     | 753    |                  |
| 3   | G     | 441    |                  |
| 4   | I     | 136    |                  |
| 4   | W     | 136    |                  |
| 5   | H     | 215    |                  |
| 6   | J     | 106    |                  |
| 6   | X     | 106    |                  |

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| Mol | Chain | Length | Quality of chain   |
|-----|-------|--------|--|
| 7   | R     | 133    |  |
| 7   | U     | 133    |  |
| 8   | S     | 123    |  |
| 8   | V     | 123    |  |
| 9   | T     | 215    |  |
| 10  | O     | 425    |  |
| 11  | Y     | 303    |  |

## 2 Entry composition i

There are 12 unique types of molecules in this entry. The entry contains 29440 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called Polycomb protein SUZ12.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
|     |       |          | Total | C    | N   | O   | S  |         |       |
| 1   | D     | 439      | 3633  | 2309 | 652 | 645 | 27 | 0       | 0     |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment               | Reference  |
|-------|---------|----------|--------|-----------------------|------------|
| D     | 67      | MET      | -      | initiating methionine | UNP Q15022 |

- Molecule 2 is a protein called Histone-lysine N-methyltransferase EZH2.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
|     |       |          | Total | C    | N   | O   | S  |         |       |
| 2   | E     | 570      | 4580  | 2871 | 821 | 846 | 42 | 0       | 0     |

There are 5 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment        | Reference  |
|-------|---------|----------|--------|----------------|------------|
| E     | -1      | SER      | -      | expression tag | UNP Q15910 |
| E     | 0       | ASN      | -      | expression tag | UNP Q15910 |
| E     | 1       | ALA      | -      | expression tag | UNP Q15910 |
| E     | 14      | ALA      | CYS    | conflict       | UNP Q15910 |
| E     | 15      | CYS      | TRP    | conflict       | UNP Q15910 |

- Molecule 3 is a protein called Polycomb protein EED.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
|     |       |          | Total | C    | N   | O   | S  |         |       |
| 3   | G     | 362      | 2930  | 1855 | 513 | 541 | 21 | 0       | 0     |

- Molecule 4 is a protein called Histone H3.2.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 4   | I     | 114      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 917   | 576 | 179 | 159 | 3 |         |       |
| 4   | W     | 99       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 817   | 515 | 158 | 141 | 3 |         |       |

There are 2 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment  | Reference  |
|-------|---------|----------|--------|----------|------------|
| I     | 102     | ALA      | GLY    | conflict | UNP P84233 |
| W     | 102     | ALA      | GLY    | conflict | UNP P84233 |

- Molecule 5 is a DNA chain called DNA (226-MER).

| Mol | Chain | Residues | Atoms |      |     |      |     | AltConf | Trace |
|-----|-------|----------|-------|------|-----|------|-----|---------|-------|
| 5   | H     | 193      | Total | C    | N   | O    | P   | 0       | 0     |
|     |       |          | 3972  | 1873 | 761 | 1145 | 193 |         |       |

- Molecule 6 is a protein called Histone H4.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 6   | J     | 83       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 661   | 418 | 129 | 113 | 1 |         |       |
| 6   | X     | 87       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 666   | 419 | 129 | 117 | 1 |         |       |

There are 6 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment        | Reference  |
|-------|---------|----------|--------|----------------|------------|
| J     | 103     | SER      | -      | expression tag | UNP P62799 |
| J     | 104     | SER      | -      | expression tag | UNP P62799 |
| J     | 105     | GLY      | -      | expression tag | UNP P62799 |
| X     | 103     | SER      | -      | expression tag | UNP P62799 |
| X     | 104     | SER      | -      | expression tag | UNP P62799 |
| X     | 105     | GLY      | -      | expression tag | UNP P62799 |

- Molecule 7 is a protein called Histone H2A.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 7   | R     | 108      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 829   | 522 | 162 | 144 | 1 |         |       |
| 7   | U     | 108      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 825   | 519 | 161 | 144 | 1 |         |       |

There are 8 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment        | Reference  |
|-------|---------|----------|--------|----------------|------------|
| R     | -3      | SER      | -      | expression tag | UNP Q6AZJ8 |
| R     | -2      | ASN      | -      | expression tag | UNP Q6AZJ8 |
| R     | -1      | ALA      | -      | expression tag | UNP Q6AZJ8 |
| R     | 119     | CYS      | LYS    | conflict       | UNP Q6AZJ8 |
| U     | -3      | SER      | -      | expression tag | UNP Q6AZJ8 |
| U     | -2      | ASN      | -      | expression tag | UNP Q6AZJ8 |
| U     | -1      | ALA      | -      | expression tag | UNP Q6AZJ8 |
| U     | 119     | CYS      | LYS    | conflict       | UNP Q6AZJ8 |

- Molecule 8 is a protein called Histone H2B 1.1.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 8   | S     | 96       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 742   | 466 | 133 | 141 | 2 |         |       |
| 8   | V     | 95       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 737   | 463 | 132 | 140 | 2 |         |       |

There are 4 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment               | Reference  |
|-------|---------|----------|--------|-----------------------|------------|
| S     | 0       | MET      | -      | initiating methionine | UNP P02281 |
| S     | 29      | THR      | SER    | conflict              | UNP P02281 |
| V     | 0       | MET      | -      | initiating methionine | UNP P02281 |
| V     | 29      | THR      | SER    | conflict              | UNP P02281 |

- Molecule 9 is a DNA chain called DNA (226-MER).

| Mol | Chain | Residues | Atoms |      |     |      |     | AltConf | Trace |
|-----|-------|----------|-------|------|-----|------|-----|---------|-------|
|     |       |          | Total | C    | N   | O    | P   |         |       |
| 9   | T     | 193      | Total | C    | N   | O    | P   | 0       | 0     |
|     |       |          | 3919  | 1853 | 724 | 1149 | 193 |         |       |

- Molecule 10 is a protein called Histone-binding protein RBBP4.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
|     |       |          | Total | C    | N   | O   | S  |         |       |
| 10  | O     | 395      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3139  | 1981 | 535 | 613 | 10 |         |       |

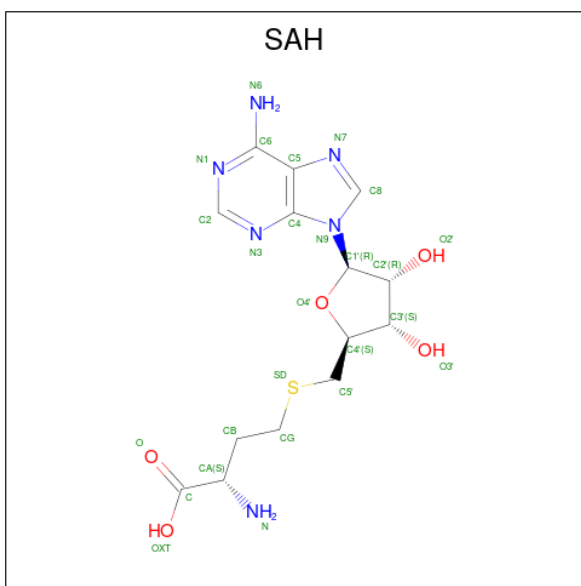
- Molecule 11 is a protein called Zinc finger protein AEBP2.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 11  | Y     | 126      | 1047  | 664 | 206 | 174 | 3 | 0       | 0     |

There are 9 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment        | Reference  |
|-------|---------|----------|--------|----------------|------------|
| Y     | 7       | SER      | -      | expression tag | UNP Q6ZN18 |
| Y     | 8       | ASN      | -      | expression tag | UNP Q6ZN18 |
| Y     | 9       | ALA      | -      | expression tag | UNP Q6ZN18 |
| Y     | 10      | TYR      | -      | expression tag | UNP Q6ZN18 |
| Y     | 11      | THR      | -      | expression tag | UNP Q6ZN18 |
| Y     | 12      | ARG      | -      | expression tag | UNP Q6ZN18 |
| Y     | 13      | ARG      | -      | expression tag | UNP Q6ZN18 |
| Y     | 14      | TYR      | -      | expression tag | UNP Q6ZN18 |
| Y     | 15      | SER      | -      | expression tag | UNP Q6ZN18 |

- Molecule 12 is S-ADENOSYL-L-HOMOCYSTEINE (three-letter code: SAH) (formula:  $C_{14}H_{20}N_6O_5S$ ) (labeled as "Ligand of Interest" by depositor).

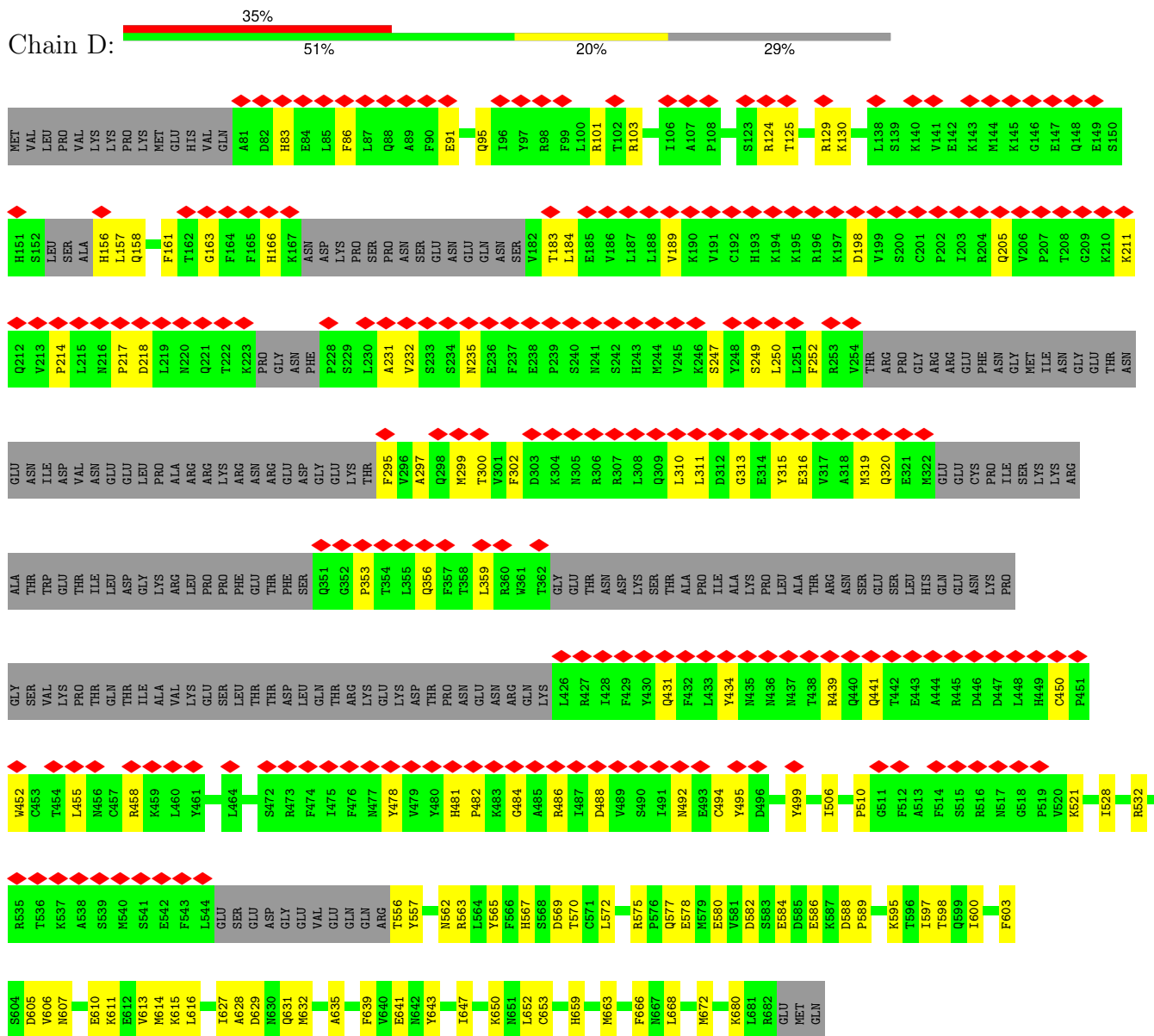


| Mol | Chain | Residues | Atoms |    |   |   |   | AltConf |
|-----|-------|----------|-------|----|---|---|---|---------|
|     |       |          | Total | C  | N | O | S |         |
| 12  | E     | 1        | 26    | 14 | 6 | 5 | 1 | 0       |

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

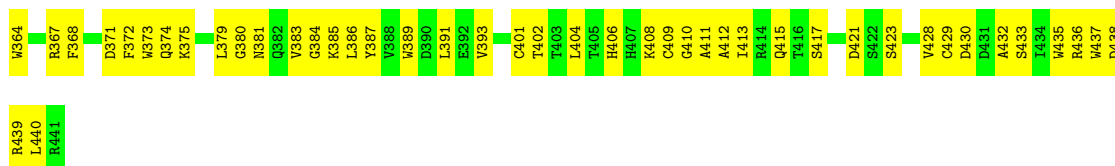
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

#### ● Molecule 1: Polycomb protein SUZ12

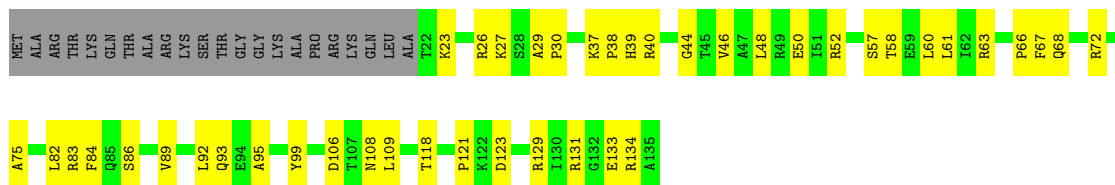




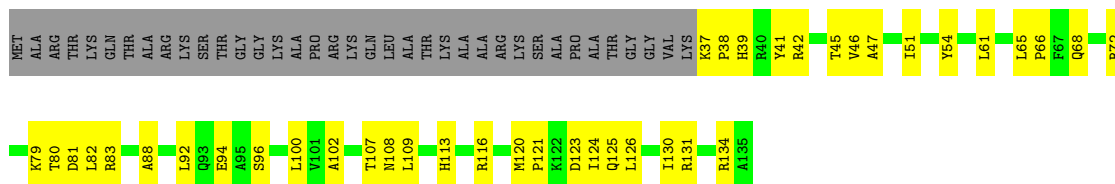




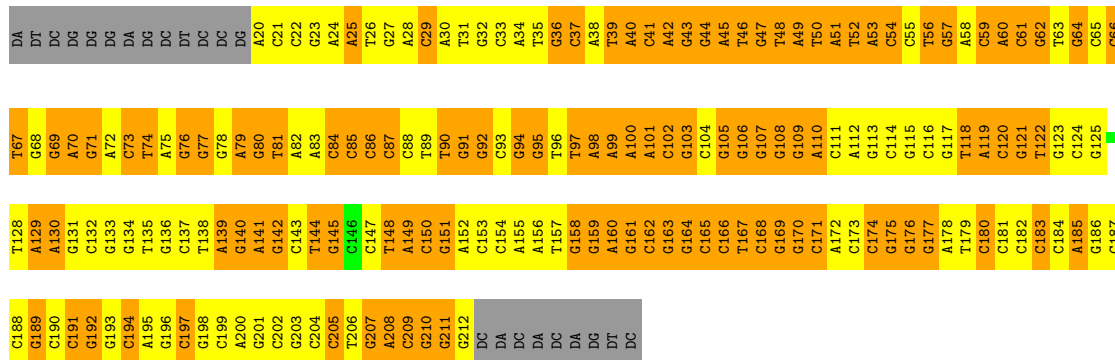
● Molecule 4: Histone H3.2



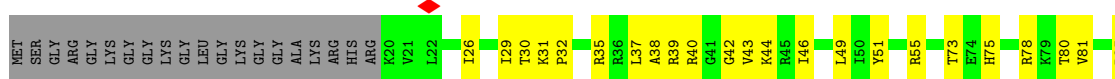
● Molecule 4: Histone H3.2

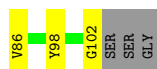


● Molecule 5: DNA (226-MER)

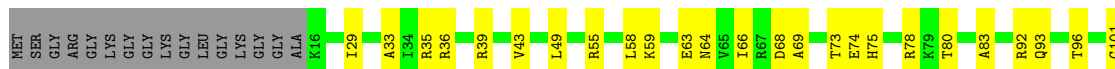


● Molecule 6: Histone H4





• Molecule 6: Histone H4



• Molecule 7: Histone H2A



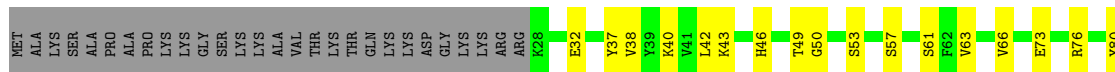
• Molecule 7: Histone H2A



• Molecule 8: Histone H2B 1.1



• Molecule 8: Histone H2B 1.1





|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| SER | ASN | ALA | TYR | THR | ARG | ARG | TYR | SER | SER | ILE | ILE | SER | SER | ALA | ARG | VAL | THR | THR | ILE | MET | ASN | ASP | ARG | VAL | GLY | GLY | VAL | ASP | THR | SER | GLN | GLN | ASP | GLY | VAL | GLN | THR | SER | THR | GLN | ALA | ALA | THR | THR | MET | ASN | THR | ASN | PRO | GLY | GLN | GLY | GLY | GLY | THR | GLN | THR | THR | THR | SER | THR | GLN | THR | THR | SER | GLN | GLY | ALA | ALA | GLY | GLY | GLY | MET | HIS | ASN | ILE | ALA | ALA | TYR | THR | THR | HIS | HIS | ASN | CYS | CYS | TRP | ASP | ASP | PRO | GLN | CYS | CYS | GLN | GLN | ALA | CYS | ALA | PHE | VAL | VAL | PHE | ASN | GLY | GLY | SER | SER | CYS | ASN | ASN | ASN | ALA | ALA | GLY | GLY | ALA | ALA | TYR | R172 | R173 | K174 | L175 | K176 | N177 | R180 | R181 | S182 | L183 | P184 | R185 | P186 | H187 | F190 | D191 | A192 | Q193 | T194 | L195 | I198 | R199 | H200 | R201 | A202 | I203 | C204 | F205 | N206 | L207 | S208 | A209 | H210 | I211 | E212 | S213 | L214 | G215 | K216 | G217 | H218 | S219 | V220 | V221 | F222 | H223 | S224 | T225 | V226 | I227 | A228 | K229 | R230 | K231 | E232 | D233 | S234 | G235 | K236 | I237 | K238 | L239 | L240 | L241 | H242 | W243 | M244 | P245 | E246 | D247 | I248 | L249 | P250 | D251 | V252 | W253 | V254 | N255 | E256 | S257 | E258 | R259 | H260 | Q261 | L262 | K263 | T264 | K265 | V266 | V267 | H268 | L269 | S270 | K271 | L272 | P273 | K274 | D275 | T276 | A277 | L278 | L279 | L280 | D281 | P282 | N283 | I284 | Y285 | R286 | T287 | M288 | P289 | Q290 | K291 | R292 | L293 | K294 | R295 | THR | LEU | ILE | ARG | LYS | VAL | PHE | ASN | LEU | TYR | LEU | SER | LYS | GLN | THR | LEU | ILE | ARG | LYS | VAL | PHE | ASN | LEU | TYR | LEU | SER | LYS | GLN |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|



## 4 Experimental information

| Property                             | Value                                   | Source    |
|--------------------------------------|---|-----------|
| EM reconstruction method             | SINGLE PARTICLE                         | Depositor |
| Imposed symmetry                     | POINT, Not provided                     |           |
| Number of particles used             | 69000                                   | Depositor |
| Resolution determination method      | FSC 0.143 CUT-OFF                       | Depositor |
| CTF correction method                | PHASE FLIPPING AND AMPLITUDE CORRECTION | Depositor |
| Microscope                           | FEI TITAN KRIOS                         | Depositor |
| Voltage (kV)                         | 300                                     | Depositor |
| Electron dose ( $e^-/\text{\AA}^2$ ) | 40                                      | Depositor |
| Minimum defocus (nm)                 | 1500                                    | Depositor |
| Maximum defocus (nm)                 | 3500                                    | Depositor |
| Magnification                        | Not provided                            |           |
| Image detector                       | GATAN K2 SUMMIT (4k x 4k)               | Depositor |
| Maximum map value                    | 0.135                                   | Depositor |
| Minimum map value                    | -0.069                                  | Depositor |
| Average map value                    | 0.000                                   | Depositor |
| Map value standard deviation         | 0.002                                   | Depositor |
| Recommended contour level            | 0.01                                    | Depositor |
| Map size (Å)                         | 505.88998, 505.88998, 505.88998         | wwPDB     |
| Map dimensions                       | 330, 330, 330                           | wwPDB     |
| Map angles (°)                       | 90.0, 90.0, 90.0                        | wwPDB     |
| Pixel spacing (Å)                    | 1.533, 1.533, 1.533                     | Depositor |

## 5 Model quality i

### 5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: SAH

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   | D     | 0.25         | 0/3713  | 0.49        | 0/4992           |
| 2   | E     | 0.30         | 0/4682  | 0.50        | 0/6308           |
| 3   | G     | 0.26         | 0/3005  | 0.52        | 0/4070           |
| 4   | I     | 0.38         | 0/930   | 0.60        | 0/1246           |
| 4   | W     | 0.44         | 0/829   | 0.62        | 0/1111           |
| 5   | H     | 0.65         | 0/4463  | 1.55        | 276/6888 (4.0%)  |
| 6   | J     | 0.50         | 0/668   | 0.64        | 0/894            |
| 6   | X     | 0.51         | 0/673   | 0.60        | 0/904            |
| 7   | R     | 0.47         | 0/839   | 0.61        | 0/1132           |
| 7   | U     | 0.44         | 0/835   | 0.62        | 0/1128           |
| 8   | S     | 0.47         | 0/753   | 0.55        | 0/1014           |
| 8   | V     | 0.49         | 0/748   | 0.57        | 0/1007           |
| 9   | T     | 0.66         | 0/4391  | 1.59        | 276/6763 (4.1%)  |
| 10  | O     | 0.24         | 0/3225  | 0.47        | 0/4394           |
| 11  | Y     | 0.23         | 0/1070  | 0.52        | 0/1437           |
| All | All   | 0.45         | 0/30824 | 0.98        | 552/43288 (1.3%) |

There are no bond length outliers.

All (552) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-----------|-------|-------------|----------|
| 9   | T     | 67  | DC   | OP1-P-O3' | 10.30 | 127.86      | 105.20   |
| 9   | T     | 46  | DG   | OP1-P-O3' | 9.92  | 127.03      | 105.20   |
| 9   | T     | 150 | DC   | OP1-P-O3' | 9.89  | 126.96      | 105.20   |
| 5   | H     | 104 | DC   | OP1-P-O3' | 9.77  | 126.69      | 105.20   |
| 9   | T     | 120 | DC   | OP1-P-O3' | 9.68  | 126.50      | 105.20   |
| 9   | T     | 109 | DA   | OP1-P-O3' | 9.65  | 126.43      | 105.20   |
| 5   | H     | 174 | DC   | OP1-P-O3' | 9.39  | 125.86      | 105.20   |
| 9   | T     | 80  | DG   | OP1-P-O3' | 9.23  | 125.51      | 105.20   |
| 9   | T     | 61  | DG   | OP1-P-O3' | 9.22  | 125.49      | 105.20   |

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| Mol | Chain | Res | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-----------|-------|-------------|----------|
| 9   | T     | 58  | DC   | OP1-P-O3' | 9.21  | 125.47      | 105.20   |
| 9   | T     | 104 | DC   | OP1-P-O3' | 9.20  | 125.44      | 105.20   |
| 9   | T     | 68  | DC   | OP1-P-OP2 | -9.17 | 105.85      | 119.60   |
| 9   | T     | 47  | DA   | OP1-P-OP2 | -9.13 | 105.91      | 119.60   |
| 9   | T     | 151 | DC   | OP1-P-OP2 | -9.03 | 106.06      | 119.60   |
| 9   | T     | 110 | DC   | OP1-P-OP2 | -8.98 | 106.14      | 119.60   |
| 9   | T     | 57  | DC   | OP1-P-O3' | 8.67  | 124.28      | 105.20   |
| 9   | T     | 93  | DC   | OP1-P-O3' | 8.64  | 124.20      | 105.20   |
| 9   | T     | 105 | DA   | OP1-P-OP2 | -8.62 | 106.67      | 119.60   |
| 9   | T     | 62  | DG   | OP1-P-OP2 | -8.55 | 106.78      | 119.60   |
| 9   | T     | 82  | DC   | OP1-P-O3' | 8.50  | 123.91      | 105.20   |
| 5   | H     | 175 | DG   | OP1-P-OP2 | -8.41 | 106.98      | 119.60   |
| 9   | T     | 117 | DT   | OP1-P-O3' | 8.40  | 123.69      | 105.20   |
| 9   | T     | 83  | DA   | OP1-P-OP2 | -8.37 | 107.05      | 119.60   |
| 9   | T     | 59  | DG   | OP1-P-OP2 | -8.31 | 107.14      | 119.60   |
| 5   | H     | 105 | DG   | OP1-P-OP2 | -8.30 | 107.15      | 119.60   |
| 9   | T     | 133 | DC   | OP1-P-O3' | 8.29  | 123.43      | 105.20   |
| 9   | T     | 98  | DT   | OP1-P-O3' | 8.28  | 123.41      | 105.20   |
| 9   | T     | 94  | DC   | OP1-P-OP2 | -8.25 | 107.23      | 119.60   |
| 9   | T     | 171 | DA   | OP1-P-OP2 | -8.20 | 107.30      | 119.60   |
| 9   | T     | 58  | DC   | OP1-P-OP2 | -8.18 | 107.33      | 119.60   |
| 9   | T     | 99  | DA   | OP1-P-OP2 | -8.15 | 107.37      | 119.60   |
| 9   | T     | 81  | DA   | OP1-P-OP2 | -8.07 | 107.49      | 119.60   |
| 9   | T     | 170 | DC   | OP1-P-O3' | 8.07  | 122.96      | 105.20   |
| 9   | T     | 118 | DC   | OP1-P-OP2 | -8.02 | 107.57      | 119.60   |
| 9   | T     | 59  | DG   | OP1-P-O3' | 8.01  | 122.83      | 105.20   |
| 9   | T     | 134 | DG   | OP1-P-OP2 | -7.95 | 107.68      | 119.60   |
| 5   | H     | 93  | DC   | OP1-P-OP2 | -7.79 | 107.92      | 119.60   |
| 5   | H     | 87  | DC   | OP1-P-O3' | 7.78  | 122.31      | 105.20   |
| 5   | H     | 107 | DG   | OP1-P-O3' | 7.72  | 122.18      | 105.20   |
| 5   | H     | 92  | DG   | OP1-P-O3' | 7.71  | 122.15      | 105.20   |
| 9   | T     | 121 | DC   | OP1-P-OP2 | -7.69 | 108.07      | 119.60   |
| 9   | T     | 60  | DA   | OP1-P-OP2 | -7.63 | 108.15      | 119.60   |
| 5   | H     | 109 | DG   | OP1-P-O3' | 7.60  | 121.92      | 105.20   |
| 5   | H     | 131 | DG   | OP1-P-OP2 | -7.59 | 108.21      | 119.60   |
| 5   | H     | 110 | DA   | OP1-P-OP2 | -7.59 | 108.22      | 119.60   |
| 9   | T     | 170 | DC   | OP1-P-OP2 | -7.59 | 108.22      | 119.60   |
| 9   | T     | 168 | DG   | OP1-P-OP2 | -7.58 | 108.22      | 119.60   |
| 5   | H     | 88  | DC   | OP1-P-OP2 | -7.53 | 108.30      | 119.60   |
| 5   | H     | 51  | DA   | OP1-P-OP2 | -7.50 | 108.35      | 119.60   |
| 5   | H     | 50  | DT   | OP1-P-O3' | 7.46  | 121.60      | 105.20   |
| 5   | H     | 108 | DG   | OP1-P-OP2 | -7.44 | 108.43      | 119.60   |

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| Mol | Chain | Res | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-----------|-------|-------------|----------|
| 5   | H     | 98  | DA   | OP1-P-OP2 | -7.41 | 108.49      | 119.60   |
| 9   | T     | 129 | DT   | OP1-P-O3' | 7.39  | 121.46      | 105.20   |
| 5   | H     | 151 | DG   | OP1-P-OP2 | -7.38 | 108.53      | 119.60   |
| 9   | T     | 80  | DG   | OP1-P-OP2 | -7.36 | 108.56      | 119.60   |
| 5   | H     | 100 | DA   | OP1-P-OP2 | -7.35 | 108.58      | 119.60   |
| 9   | T     | 160 | DA   | OP1-P-O3' | 7.30  | 121.25      | 105.20   |
| 5   | H     | 108 | DG   | OP1-P-O3' | 7.29  | 121.24      | 105.20   |
| 5   | H     | 109 | DG   | OP1-P-OP2 | -7.29 | 108.67      | 119.60   |
| 5   | H     | 87  | DC   | OP1-P-OP2 | -7.27 | 108.69      | 119.60   |
| 5   | H     | 97  | DT   | OP1-P-O3' | 7.27  | 121.20      | 105.20   |
| 5   | H     | 80  | DG   | OP1-P-OP2 | -7.25 | 108.72      | 119.60   |
| 9   | T     | 112 | DC   | OP1-P-OP2 | -7.24 | 108.73      | 119.60   |
| 9   | T     | 57  | DC   | OP1-P-OP2 | -7.23 | 108.75      | 119.60   |
| 5   | H     | 101 | DA   | OP1-P-OP2 | -7.22 | 108.76      | 119.60   |
| 9   | T     | 130 | DA   | OP1-P-OP2 | -7.16 | 108.86      | 119.60   |
| 9   | T     | 56  | DG   | OP1-P-O3' | 7.15  | 120.94      | 105.20   |
| 9   | T     | 125 | DG   | OP1-P-OP2 | -7.15 | 108.87      | 119.60   |
| 5   | H     | 28  | DA   | OP1-P-OP2 | -7.12 | 108.93      | 119.60   |
| 9   | T     | 172 | DG   | OP1-P-OP2 | -7.12 | 108.93      | 119.60   |
| 5   | H     | 59  | DC   | OP1-P-O3' | 7.10  | 120.82      | 105.20   |
| 9   | T     | 70  | DA   | OP1-P-OP2 | -7.10 | 108.96      | 119.60   |
| 9   | T     | 154 | DG   | OP1-P-OP2 | -7.08 | 108.98      | 119.60   |
| 9   | T     | 161 | DG   | OP1-P-OP2 | -7.04 | 109.03      | 119.60   |
| 5   | H     | 86  | DC   | OP1-P-OP2 | -7.03 | 109.05      | 119.60   |
| 5   | H     | 171 | DC   | OP1-P-OP2 | -7.02 | 109.06      | 119.60   |
| 9   | T     | 195 | DC   | OP1-P-OP2 | -7.02 | 109.06      | 119.60   |
| 5   | H     | 26  | DT   | OP1-P-OP2 | -7.01 | 109.08      | 119.60   |
| 5   | H     | 163 | DG   | OP1-P-OP2 | -7.00 | 109.09      | 119.60   |
| 9   | T     | 77  | DG   | OP1-P-OP2 | -7.00 | 109.09      | 119.60   |
| 9   | T     | 111 | DG   | OP1-P-OP2 | -7.00 | 109.09      | 119.60   |
| 9   | T     | 124 | DC   | OP1-P-OP2 | -7.00 | 109.10      | 119.60   |
| 5   | H     | 22  | DC   | OP1-P-OP2 | -6.99 | 109.12      | 119.60   |
| 5   | H     | 164 | DG   | OP1-P-OP2 | -6.99 | 109.12      | 119.60   |
| 5   | H     | 150 | DC   | OP1-P-OP2 | -6.98 | 109.13      | 119.60   |
| 9   | T     | 84  | DG   | OP1-P-OP2 | -6.97 | 109.14      | 119.60   |
| 5   | H     | 203 | DG   | OP1-P-OP2 | -6.95 | 109.17      | 119.60   |
| 5   | H     | 33  | DC   | OP1-P-OP2 | -6.94 | 109.19      | 119.60   |
| 5   | H     | 94  | DG   | OP1-P-OP2 | -6.93 | 109.20      | 119.60   |
| 9   | T     | 52  | DC   | OP1-P-OP2 | -6.93 | 109.21      | 119.60   |
| 5   | H     | 130 | DA   | OP1-P-O3' | 6.93  | 120.44      | 105.20   |
| 5   | H     | 119 | DA   | OP1-P-OP2 | -6.91 | 109.24      | 119.60   |
| 5   | H     | 76  | DG   | OP1-P-OP2 | -6.90 | 109.25      | 119.60   |

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| Mol | Chain | Res | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-----------|-------|-------------|----------|
| 9   | T     | 21  | DA   | OP1-P-OP2 | -6.90 | 109.25      | 119.60   |
| 9   | T     | 38  | DC   | OP1-P-OP2 | -6.89 | 109.26      | 119.60   |
| 9   | T     | 66  | DC   | OP1-P-OP2 | -6.89 | 109.27      | 119.60   |
| 9   | T     | 30  | DG   | OP1-P-OP2 | -6.89 | 109.27      | 119.60   |
| 5   | H     | 86  | DC   | OP1-P-O3' | 6.88  | 120.35      | 105.20   |
| 9   | T     | 201 | DA   | OP1-P-OP2 | -6.88 | 109.28      | 119.60   |
| 9   | T     | 85  | DC   | OP1-P-OP2 | -6.88 | 109.29      | 119.60   |
| 5   | H     | 92  | DG   | OP1-P-OP2 | -6.87 | 109.29      | 119.60   |
| 5   | H     | 197 | DC   | OP1-P-OP2 | -6.87 | 109.30      | 119.60   |
| 5   | H     | 25  | DA   | OP1-P-OP2 | -6.86 | 109.31      | 119.60   |
| 5   | H     | 77  | DG   | OP1-P-OP2 | -6.86 | 109.31      | 119.60   |
| 9   | T     | 39  | DG   | OP1-P-OP2 | -6.86 | 109.31      | 119.60   |
| 5   | H     | 130 | DA   | OP1-P-OP2 | -6.86 | 109.31      | 119.60   |
| 9   | T     | 107 | DG   | OP1-P-OP2 | -6.86 | 109.32      | 119.60   |
| 5   | H     | 68  | DG   | OP1-P-OP2 | -6.85 | 109.32      | 119.60   |
| 9   | T     | 160 | DA   | OP1-P-OP2 | -6.85 | 109.33      | 119.60   |
| 9   | T     | 26  | DC   | OP1-P-OP2 | -6.84 | 109.34      | 119.60   |
| 5   | H     | 117 | DG   | OP1-P-OP2 | -6.84 | 109.34      | 119.60   |
| 9   | T     | 28  | DG   | OP1-P-OP2 | -6.83 | 109.35      | 119.60   |
| 9   | T     | 140 | DG   | OP1-P-OP2 | -6.83 | 109.35      | 119.60   |
| 9   | T     | 206 | DA   | OP1-P-OP2 | -6.83 | 109.35      | 119.60   |
| 9   | T     | 153 | DA   | OP1-P-OP2 | -6.83 | 109.36      | 119.60   |
| 5   | H     | 209 | DC   | OP1-P-OP2 | -6.82 | 109.37      | 119.60   |
| 9   | T     | 180 | DC   | OP1-P-OP2 | -6.82 | 109.37      | 119.60   |
| 5   | H     | 133 | DG   | OP1-P-OP2 | -6.82 | 109.37      | 119.60   |
| 5   | H     | 34  | DA   | OP1-P-OP2 | -6.82 | 109.38      | 119.60   |
| 9   | T     | 165 | DC   | OP1-P-OP2 | -6.81 | 109.38      | 119.60   |
| 9   | T     | 25  | DG   | OP1-P-OP2 | -6.81 | 109.38      | 119.60   |
| 9   | T     | 37  | DG   | OP1-P-OP2 | -6.81 | 109.38      | 119.60   |
| 9   | T     | 27  | DT   | OP1-P-OP2 | -6.81 | 109.39      | 119.60   |
| 9   | T     | 150 | DC   | OP1-P-OP2 | -6.81 | 109.39      | 119.60   |
| 5   | H     | 202 | DC   | OP1-P-OP2 | -6.80 | 109.39      | 119.60   |
| 9   | T     | 96  | DC   | OP1-P-OP2 | -6.80 | 109.39      | 119.60   |
| 9   | T     | 136 | DC   | OP1-P-OP2 | -6.80 | 109.40      | 119.60   |
| 5   | H     | 199 | DC   | OP1-P-OP2 | -6.80 | 109.41      | 119.60   |
| 5   | H     | 193 | DG   | OP1-P-OP2 | -6.79 | 109.41      | 119.60   |
| 5   | H     | 20  | DA   | OP1-P-OP2 | -6.79 | 109.41      | 119.60   |
| 9   | T     | 36  | DG   | OP1-P-OP2 | -6.79 | 109.41      | 119.60   |
| 5   | H     | 36  | DG   | OP1-P-OP2 | -6.79 | 109.42      | 119.60   |
| 5   | H     | 114 | DC   | OP1-P-OP2 | -6.79 | 109.42      | 119.60   |
| 9   | T     | 190 | DG   | OP1-P-OP2 | -6.79 | 109.42      | 119.60   |
| 5   | H     | 46  | DT   | OP1-P-OP2 | -6.79 | 109.42      | 119.60   |

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| Mol | Chain | Res | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-----------|-------|-------------|----------|
| 5   | H     | 184 | DC   | OP1-P-OP2 | -6.79 | 109.42      | 119.60   |
| 9   | T     | 142 | DG   | OP1-P-OP2 | -6.79 | 109.42      | 119.60   |
| 5   | H     | 37  | DC   | OP1-P-OP2 | -6.78 | 109.43      | 119.60   |
| 5   | H     | 201 | DG   | OP1-P-OP2 | -6.78 | 109.43      | 119.60   |
| 5   | H     | 32  | DG   | OP1-P-OP2 | -6.78 | 109.43      | 119.60   |
| 5   | H     | 145 | DG   | OP1-P-OP2 | -6.78 | 109.43      | 119.60   |
| 9   | T     | 29  | DC   | OP1-P-OP2 | -6.78 | 109.43      | 119.60   |
| 5   | H     | 198 | DG   | OP1-P-OP2 | -6.78 | 109.44      | 119.60   |
| 5   | H     | 53  | DA   | OP1-P-OP2 | -6.77 | 109.44      | 119.60   |
| 5   | H     | 62  | DG   | OP1-P-OP2 | -6.77 | 109.44      | 119.60   |
| 5   | H     | 212 | DG   | OP1-P-OP2 | -6.77 | 109.44      | 119.60   |
| 9   | T     | 123 | DG   | OP1-P-O3' | 6.77  | 120.10      | 105.20   |
| 5   | H     | 172 | DA   | OP1-P-OP2 | -6.77 | 109.45      | 119.60   |
| 5   | H     | 41  | DC   | OP1-P-OP2 | -6.77 | 109.45      | 119.60   |
| 5   | H     | 196 | DG   | OP1-P-OP2 | -6.77 | 109.45      | 119.60   |
| 9   | T     | 22  | DG   | OP1-P-OP2 | -6.76 | 109.45      | 119.60   |
| 9   | T     | 103 | DG   | OP1-P-OP2 | -6.76 | 109.46      | 119.60   |
| 9   | T     | 205 | DG   | OP1-P-OP2 | -6.76 | 109.46      | 119.60   |
| 9   | T     | 179 | DA   | OP1-P-OP2 | -6.75 | 109.47      | 119.60   |
| 5   | H     | 191 | DC   | OP1-P-OP2 | -6.75 | 109.47      | 119.60   |
| 9   | T     | 45  | DA   | OP1-P-OP2 | -6.75 | 109.48      | 119.60   |
| 5   | H     | 48  | DT   | OP1-P-OP2 | -6.75 | 109.48      | 119.60   |
| 5   | H     | 143 | DC   | OP1-P-OP2 | -6.75 | 109.48      | 119.60   |
| 9   | T     | 23  | DA   | OP1-P-OP2 | -6.75 | 109.48      | 119.60   |
| 9   | T     | 87  | DC   | OP1-P-OP2 | -6.75 | 109.48      | 119.60   |
| 9   | T     | 93  | DC   | OP1-P-OP2 | -6.75 | 109.48      | 119.60   |
| 5   | H     | 30  | DA   | OP1-P-OP2 | -6.74 | 109.49      | 119.60   |
| 9   | T     | 24  | DC   | OP1-P-OP2 | -6.74 | 109.49      | 119.60   |
| 9   | T     | 198 | DA   | OP1-P-OP2 | -6.74 | 109.49      | 119.60   |
| 9   | T     | 35  | DC   | OP1-P-OP2 | -6.74 | 109.50      | 119.60   |
| 5   | H     | 61  | DC   | OP1-P-OP2 | -6.73 | 109.50      | 119.60   |
| 9   | T     | 16  | DC   | OP1-P-OP2 | -6.73 | 109.50      | 119.60   |
| 9   | T     | 43  | DG   | OP1-P-OP2 | -6.73 | 109.50      | 119.60   |
| 5   | H     | 189 | DG   | OP1-P-OP2 | -6.73 | 109.50      | 119.60   |
| 9   | T     | 33  | DG   | OP1-P-OP2 | -6.73 | 109.50      | 119.60   |
| 9   | T     | 204 | DC   | OP1-P-OP2 | -6.73 | 109.51      | 119.60   |
| 9   | T     | 166 | DG   | OP1-P-OP2 | -6.72 | 109.51      | 119.60   |
| 9   | T     | 15  | DC   | OP1-P-OP2 | -6.72 | 109.52      | 119.60   |
| 5   | H     | 208 | DA   | OP1-P-OP2 | -6.72 | 109.52      | 119.60   |
| 9   | T     | 102 | DC   | OP1-P-OP2 | -6.72 | 109.52      | 119.60   |
| 5   | H     | 83  | DA   | OP1-P-OP2 | -6.72 | 109.53      | 119.60   |
| 5   | H     | 195 | DA   | OP1-P-OP2 | -6.72 | 109.53      | 119.60   |

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| Mol | Chain | Res | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-----------|-------|-------------|----------|
| 5   | H     | 211 | DG   | OP1-P-OP2 | -6.72 | 109.52      | 119.60   |
| 5   | H     | 23  | DG   | OP1-P-OP2 | -6.71 | 109.53      | 119.60   |
| 5   | H     | 116 | DC   | OP1-P-OP2 | -6.71 | 109.54      | 119.60   |
| 9   | T     | 40  | DG   | OP1-P-OP2 | -6.71 | 109.54      | 119.60   |
| 5   | H     | 185 | DA   | OP1-P-OP2 | -6.70 | 109.54      | 119.60   |
| 5   | H     | 194 | DC   | OP1-P-OP2 | -6.70 | 109.55      | 119.60   |
| 9   | T     | 53  | DG   | OP1-P-OP2 | -6.70 | 109.54      | 119.60   |
| 5   | H     | 124 | DC   | OP1-P-OP2 | -6.70 | 109.55      | 119.60   |
| 5   | H     | 192 | DG   | OP1-P-OP2 | -6.70 | 109.56      | 119.60   |
| 5   | H     | 200 | DA   | OP1-P-OP2 | -6.70 | 109.56      | 119.60   |
| 9   | T     | 137 | DA   | OP1-P-OP2 | -6.69 | 109.56      | 119.60   |
| 5   | H     | 64  | DG   | OP1-P-OP2 | -6.69 | 109.56      | 119.60   |
| 9   | T     | 64  | DC   | OP1-P-OP2 | -6.69 | 109.56      | 119.60   |
| 5   | H     | 205 | DC   | OP1-P-OP2 | -6.69 | 109.57      | 119.60   |
| 9   | T     | 138 | DA   | OP1-P-OP2 | -6.69 | 109.57      | 119.60   |
| 5   | H     | 142 | DG   | OP1-P-OP2 | -6.68 | 109.57      | 119.60   |
| 5   | H     | 159 | DG   | OP1-P-OP2 | -6.68 | 109.57      | 119.60   |
| 9   | T     | 95  | DG   | OP1-P-OP2 | -6.68 | 109.58      | 119.60   |
| 9   | T     | 114 | DC   | OP1-P-OP2 | -6.68 | 109.58      | 119.60   |
| 9   | T     | 54  | DG   | OP1-P-OP2 | -6.68 | 109.58      | 119.60   |
| 9   | T     | 191 | DC   | OP1-P-OP2 | -6.68 | 109.58      | 119.60   |
| 5   | H     | 132 | DC   | OP1-P-OP2 | -6.68 | 109.58      | 119.60   |
| 9   | T     | 156 | DC   | OP1-P-OP2 | -6.68 | 109.59      | 119.60   |
| 9   | T     | 34  | DC   | OP1-P-OP2 | -6.67 | 109.59      | 119.60   |
| 5   | H     | 178 | DA   | OP1-P-OP2 | -6.67 | 109.59      | 119.60   |
| 5   | H     | 45  | DA   | OP1-P-OP2 | -6.67 | 109.60      | 119.60   |
| 9   | T     | 42  | DC   | OP1-P-OP2 | -6.67 | 109.60      | 119.60   |
| 9   | T     | 50  | DC   | OP1-P-OP2 | -6.67 | 109.60      | 119.60   |
| 5   | H     | 134 | DG   | OP1-P-OP2 | -6.67 | 109.60      | 119.60   |
| 9   | T     | 139 | DG   | OP1-P-OP2 | -6.67 | 109.60      | 119.60   |
| 9   | T     | 186 | DG   | OP1-P-OP2 | -6.66 | 109.61      | 119.60   |
| 9   | T     | 200 | DC   | OP1-P-OP2 | -6.66 | 109.61      | 119.60   |
| 9   | T     | 163 | DC   | OP1-P-OP2 | -6.66 | 109.62      | 119.60   |
| 9   | T     | 194 | DG   | OP1-P-OP2 | -6.65 | 109.62      | 119.60   |
| 5   | H     | 115 | DG   | OP1-P-OP2 | -6.65 | 109.62      | 119.60   |
| 9   | T     | 32  | DC   | OP1-P-OP2 | -6.65 | 109.62      | 119.60   |
| 5   | H     | 59  | DC   | OP1-P-OP2 | -6.65 | 109.63      | 119.60   |
| 5   | H     | 166 | DC   | OP1-P-OP2 | -6.65 | 109.63      | 119.60   |
| 5   | H     | 38  | DA   | OP1-P-OP2 | -6.65 | 109.63      | 119.60   |
| 5   | H     | 125 | DG   | OP1-P-OP2 | -6.65 | 109.63      | 119.60   |
| 9   | T     | 135 | DC   | OP1-P-OP2 | -6.64 | 109.64      | 119.60   |
| 5   | H     | 49  | DA   | OP1-P-OP2 | -6.64 | 109.64      | 119.60   |

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| Mol | Chain | Res | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-----------|-------|-------------|----------|
| 5   | H     | 82  | DA   | OP1-P-OP2 | -6.64 | 109.64      | 119.60   |
| 5   | H     | 57  | DG   | OP1-P-OP2 | -6.64 | 109.64      | 119.60   |
| 9   | T     | 61  | DG   | OP1-P-OP2 | -6.63 | 109.65      | 119.60   |
| 9   | T     | 177 | DA   | OP1-P-OP2 | -6.63 | 109.65      | 119.60   |
| 5   | H     | 40  | DA   | OP1-P-OP2 | -6.63 | 109.65      | 119.60   |
| 9   | T     | 104 | DC   | OP1-P-OP2 | -6.63 | 109.66      | 119.60   |
| 5   | H     | 21  | DC   | OP1-P-OP2 | -6.63 | 109.66      | 119.60   |
| 9   | T     | 17  | DC   | OP1-P-OP2 | -6.62 | 109.67      | 119.60   |
| 9   | T     | 106 | DC   | OP1-P-OP2 | -6.62 | 109.67      | 119.60   |
| 5   | H     | 173 | DC   | OP1-P-OP2 | -6.62 | 109.67      | 119.60   |
| 5   | H     | 50  | DT   | OP1-P-OP2 | -6.61 | 109.69      | 119.60   |
| 5   | H     | 187 | DC   | OP1-P-OP2 | -6.61 | 109.69      | 119.60   |
| 5   | H     | 58  | DA   | OP1-P-OP2 | -6.60 | 109.69      | 119.60   |
| 9   | T     | 158 | DC   | OP1-P-OP2 | -6.60 | 109.69      | 119.60   |
| 9   | T     | 192 | DA   | OP1-P-OP2 | -6.60 | 109.69      | 119.60   |
| 5   | H     | 75  | DA   | OP1-P-OP2 | -6.60 | 109.70      | 119.60   |
| 5   | H     | 95  | DG   | OP1-P-OP2 | -6.60 | 109.70      | 119.60   |
| 5   | H     | 165 | DC   | OP1-P-OP2 | -6.60 | 109.70      | 119.60   |
| 5   | H     | 156 | DA   | OP1-P-OP2 | -6.60 | 109.70      | 119.60   |
| 5   | H     | 102 | DC   | OP1-P-OP2 | -6.59 | 109.72      | 119.60   |
| 5   | H     | 207 | DG   | OP1-P-OP2 | -6.59 | 109.72      | 119.60   |
| 9   | T     | 196 | DA   | OP1-P-OP2 | -6.59 | 109.72      | 119.60   |
| 9   | T     | 31  | DC   | OP1-P-OP2 | -6.58 | 109.72      | 119.60   |
| 5   | H     | 181 | DC   | OP1-P-OP2 | -6.58 | 109.72      | 119.60   |
| 5   | H     | 113 | DG   | OP1-P-OP2 | -6.58 | 109.73      | 119.60   |
| 5   | H     | 43  | DG   | OP1-P-OP2 | -6.58 | 109.73      | 119.60   |
| 5   | H     | 57  | DG   | OP1-P-O3' | 6.58  | 119.67      | 105.20   |
| 9   | T     | 143 | DA   | OP1-P-OP2 | -6.58 | 109.74      | 119.60   |
| 5   | H     | 186 | DG   | OP1-P-OP2 | -6.57 | 109.75      | 119.60   |
| 5   | H     | 24  | DA   | OP1-P-OP2 | -6.57 | 109.75      | 119.60   |
| 5   | H     | 149 | DA   | OP1-P-O3' | 6.57  | 119.65      | 105.20   |
| 9   | T     | 18  | DG   | OP1-P-OP2 | -6.56 | 109.75      | 119.60   |
| 9   | T     | 48  | DA   | OP1-P-OP2 | -6.56 | 109.75      | 119.60   |
| 5   | H     | 79  | DA   | OP1-P-OP2 | -6.56 | 109.76      | 119.60   |
| 9   | T     | 19  | DT   | OP1-P-OP2 | -6.56 | 109.75      | 119.60   |
| 9   | T     | 147 | DC   | OP1-P-OP2 | -6.56 | 109.76      | 119.60   |
| 9   | T     | 65  | DG   | OP1-P-OP2 | -6.56 | 109.76      | 119.60   |
| 5   | H     | 55  | DC   | OP1-P-OP2 | -6.55 | 109.77      | 119.60   |
| 9   | T     | 51  | DC   | OP1-P-OP2 | -6.55 | 109.77      | 119.60   |
| 5   | H     | 60  | DA   | OP1-P-OP2 | -6.55 | 109.78      | 119.60   |
| 9   | T     | 116 | DG   | OP1-P-OP2 | -6.55 | 109.78      | 119.60   |
| 9   | T     | 141 | DG   | OP1-P-O3' | 6.54  | 119.60      | 105.20   |

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| Mol | Chain | Res | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-----------|-------|-------------|----------|
| 5   | H     | 121 | DG   | OP1-P-OP2 | -6.54 | 109.79      | 119.60   |
| 5   | H     | 70  | DA   | OP1-P-OP2 | -6.54 | 109.79      | 119.60   |
| 5   | H     | 65  | DC   | OP1-P-OP2 | -6.53 | 109.80      | 119.60   |
| 5   | H     | 169 | DG   | OP1-P-OP2 | -6.53 | 109.81      | 119.60   |
| 5   | H     | 177 | DG   | OP1-P-OP2 | -6.53 | 109.81      | 119.60   |
| 9   | T     | 76  | DC   | OP1-P-OP2 | -6.53 | 109.81      | 119.60   |
| 5   | H     | 139 | DA   | OP1-P-OP2 | -6.52 | 109.81      | 119.60   |
| 5   | H     | 168 | DC   | OP1-P-OP2 | -6.52 | 109.81      | 119.60   |
| 9   | T     | 63  | DC   | OP1-P-OP2 | -6.52 | 109.82      | 119.60   |
| 9   | T     | 44  | DG   | OP1-P-OP2 | -6.52 | 109.82      | 119.60   |
| 5   | H     | 27  | DG   | OP1-P-OP2 | -6.52 | 109.83      | 119.60   |
| 9   | T     | 183 | DC   | OP1-P-OP2 | -6.51 | 109.83      | 119.60   |
| 5   | H     | 155 | DA   | OP1-P-OP2 | -6.51 | 109.84      | 119.60   |
| 9   | T     | 167 | DT   | OP1-P-O3' | 6.51  | 119.52      | 105.20   |
| 5   | H     | 73  | DC   | OP1-P-OP2 | -6.51 | 109.84      | 119.60   |
| 5   | H     | 170 | DG   | OP1-P-OP2 | -6.50 | 109.84      | 119.60   |
| 5   | H     | 152 | DA   | OP1-P-OP2 | -6.50 | 109.85      | 119.60   |
| 5   | H     | 190 | DC   | OP1-P-OP2 | -6.50 | 109.85      | 119.60   |
| 9   | T     | 188 | DA   | OP1-P-OP2 | -6.50 | 109.85      | 119.60   |
| 9   | T     | 173 | DA   | OP1-P-OP2 | -6.50 | 109.86      | 119.60   |
| 5   | H     | 91  | DG   | OP1-P-OP2 | -6.49 | 109.86      | 119.60   |
| 9   | T     | 149 | DC   | OP1-P-OP2 | -6.49 | 109.86      | 119.60   |
| 5   | H     | 136 | DG   | OP1-P-OP2 | -6.49 | 109.86      | 119.60   |
| 9   | T     | 82  | DC   | OP1-P-OP2 | -6.49 | 109.86      | 119.60   |
| 9   | T     | 175 | DA   | OP1-P-OP2 | -6.49 | 109.87      | 119.60   |
| 5   | H     | 176 | DG   | OP1-P-OP2 | -6.49 | 109.87      | 119.60   |
| 9   | T     | 56  | DG   | OP1-P-OP2 | -6.48 | 109.88      | 119.60   |
| 9   | T     | 89  | DA   | OP1-P-O3' | 6.48  | 119.45      | 105.20   |
| 5   | H     | 42  | DA   | OP1-P-OP2 | -6.47 | 109.89      | 119.60   |
| 9   | T     | 120 | DC   | OP1-P-OP2 | -6.47 | 109.90      | 119.60   |
| 5   | H     | 129 | DA   | OP1-P-OP2 | -6.46 | 109.90      | 119.60   |
| 5   | H     | 103 | DG   | OP1-P-OP2 | -6.46 | 109.91      | 119.60   |
| 5   | H     | 112 | DA   | OP1-P-OP2 | -6.46 | 109.91      | 119.60   |
| 5   | H     | 107 | DG   | OP1-P-OP2 | -6.46 | 109.91      | 119.60   |
| 9   | T     | 79  | DA   | OP1-P-OP2 | -6.46 | 109.91      | 119.60   |
| 9   | T     | 69  | DT   | OP1-P-O3' | 6.45  | 119.40      | 105.20   |
| 9   | T     | 73  | DG   | OP1-P-OP2 | -6.45 | 109.92      | 119.60   |
| 9   | T     | 181 | DA   | OP1-P-OP2 | -6.45 | 109.93      | 119.60   |
| 9   | T     | 92  | DA   | OP1-P-OP2 | -6.44 | 109.94      | 119.60   |
| 9   | T     | 113 | DG   | OP1-P-OP2 | -6.44 | 109.95      | 119.60   |
| 9   | T     | 141 | DG   | OP1-P-OP2 | -6.43 | 109.95      | 119.60   |
| 5   | H     | 106 | DG   | OP1-P-OP2 | -6.43 | 109.95      | 119.60   |

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| Mol | Chain | Res | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-----------|-------|-------------|----------|
| 5   | H     | 44  | DG   | OP1-P-OP2 | -6.42 | 109.96      | 119.60   |
| 5   | H     | 137 | DC   | OP1-P-OP2 | -6.42 | 109.96      | 119.60   |
| 5   | H     | 188 | DC   | OP1-P-OP2 | -6.42 | 109.97      | 119.60   |
| 5   | H     | 149 | DA   | OP1-P-OP2 | -6.41 | 109.98      | 119.60   |
| 9   | T     | 20  | DC   | OP1-P-OP2 | -6.41 | 109.99      | 119.60   |
| 5   | H     | 47  | DG   | OP1-P-OP2 | -6.40 | 109.99      | 119.60   |
| 9   | T     | 169 | DC   | OP1-P-O3' | 6.40  | 119.29      | 105.20   |
| 5   | H     | 72  | DA   | OP1-P-OP2 | -6.40 | 110.00      | 119.60   |
| 9   | T     | 119 | DC   | OP1-P-OP2 | -6.38 | 110.03      | 119.60   |
| 9   | T     | 41  | DC   | OP1-P-OP2 | -6.38 | 110.03      | 119.60   |
| 9   | T     | 184 | DC   | OP1-P-OP2 | -6.38 | 110.03      | 119.60   |
| 5   | H     | 160 | DA   | OP1-P-OP2 | -6.37 | 110.04      | 119.60   |
| 9   | T     | 51  | DC   | OP1-P-O3' | 6.37  | 119.22      | 105.20   |
| 5   | H     | 153 | DC   | OP1-P-OP2 | -6.37 | 110.05      | 119.60   |
| 5   | H     | 120 | DC   | OP1-P-O3' | 6.36  | 119.20      | 105.20   |
| 5   | H     | 111 | DC   | OP1-P-OP2 | -6.36 | 110.07      | 119.60   |
| 5   | H     | 78  | DG   | OP1-P-OP2 | -6.35 | 110.08      | 119.60   |
| 5   | H     | 85  | DC   | OP1-P-OP2 | -6.34 | 110.08      | 119.60   |
| 5   | H     | 210 | DG   | OP1-P-OP2 | -6.34 | 110.08      | 119.60   |
| 9   | T     | 89  | DA   | OP1-P-OP2 | -6.34 | 110.08      | 119.60   |
| 5   | H     | 104 | DC   | OP1-P-OP2 | -6.34 | 110.09      | 119.60   |
| 9   | T     | 18  | DG   | OP1-P-O3' | 6.34  | 119.14      | 105.20   |
| 5   | H     | 154 | DC   | OP1-P-OP2 | -6.34 | 110.09      | 119.60   |
| 9   | T     | 38  | DC   | OP1-P-O3' | 6.34  | 119.14      | 105.20   |
| 5   | H     | 147 | DC   | OP1-P-OP2 | -6.32 | 110.11      | 119.60   |
| 9   | T     | 79  | DA   | OP1-P-O3' | 6.32  | 119.09      | 105.20   |
| 5   | H     | 71  | DG   | OP1-P-OP2 | -6.30 | 110.14      | 119.60   |
| 5   | H     | 60  | DA   | OP1-P-O3' | 6.30  | 119.06      | 105.20   |
| 9   | T     | 133 | DC   | OP1-P-OP2 | -6.30 | 110.15      | 119.60   |
| 5   | H     | 118 | DT   | OP1-P-O3' | 6.30  | 119.06      | 105.20   |
| 9   | T     | 74  | DG   | OP1-P-OP2 | -6.29 | 110.16      | 119.60   |
| 9   | T     | 146 | DA   | OP1-P-OP2 | -6.29 | 110.16      | 119.60   |
| 9   | T     | 164 | DA   | OP1-P-OP2 | -6.29 | 110.17      | 119.60   |
| 5   | H     | 93  | DC   | OP1-P-O3' | 6.29  | 119.03      | 105.20   |
| 5   | H     | 61  | DC   | OP1-P-O3' | 6.27  | 119.00      | 105.20   |
| 9   | T     | 172 | DG   | OP1-P-O3' | 6.27  | 118.99      | 105.20   |
| 5   | H     | 66  | DC   | OP1-P-OP2 | -6.25 | 110.22      | 119.60   |
| 5   | H     | 132 | DC   | OP1-P-O3' | 6.24  | 118.92      | 105.20   |
| 9   | T     | 65  | DG   | OP1-P-O3' | 6.23  | 118.90      | 105.20   |
| 9   | T     | 46  | DG   | OP1-P-OP2 | -6.20 | 110.30      | 119.60   |
| 5   | H     | 183 | DC   | OP1-P-OP2 | -6.20 | 110.31      | 119.60   |
| 9   | T     | 109 | DA   | OP1-P-OP2 | -6.20 | 110.31      | 119.60   |

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| Mol | Chain | Res | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-----------|-------|-------------|----------|
| 9   | T     | 37  | DG   | OP1-P-O3' | 6.19  | 118.83      | 105.20   |
| 5   | H     | 33  | DC   | OP1-P-O3' | 6.19  | 118.82      | 105.20   |
| 5   | H     | 172 | DA   | OP1-P-O3' | 6.18  | 118.80      | 105.20   |
| 9   | T     | 90  | DG   | OP1-P-OP2 | -6.17 | 110.34      | 119.60   |
| 9   | T     | 42  | DC   | OP1-P-O3' | 6.17  | 118.77      | 105.20   |
| 9   | T     | 153 | DA   | OP1-P-O3' | 6.16  | 118.74      | 105.20   |
| 5   | H     | 141 | DA   | OP1-P-OP2 | -6.15 | 110.37      | 119.60   |
| 5   | H     | 75  | DA   | OP1-P-O3' | 6.14  | 118.71      | 105.20   |
| 5   | H     | 77  | DG   | OP1-P-O3' | 6.13  | 118.70      | 105.20   |
| 5   | H     | 120 | DC   | OP1-P-OP2 | -6.13 | 110.41      | 119.60   |
| 9   | T     | 122 | DC   | OP1-P-OP2 | -6.11 | 110.44      | 119.60   |
| 9   | T     | 21  | DA   | OP1-P-O3' | 6.10  | 118.63      | 105.20   |
| 5   | H     | 150 | DC   | OP1-P-O3' | 6.09  | 118.61      | 105.20   |
| 5   | H     | 174 | DC   | OP1-P-OP2 | -6.08 | 110.48      | 119.60   |
| 9   | T     | 132 | DC   | OP1-P-OP2 | -6.08 | 110.48      | 119.60   |
| 9   | T     | 34  | DC   | OP1-P-O3' | 6.07  | 118.56      | 105.20   |
| 9   | T     | 135 | DC   | OP1-P-O3' | 6.07  | 118.56      | 105.20   |
| 5   | H     | 32  | DG   | OP1-P-O3' | 6.07  | 118.55      | 105.20   |
| 9   | T     | 92  | DA   | OP1-P-O3' | 6.07  | 118.55      | 105.20   |
| 5   | H     | 45  | DA   | OP1-P-O3' | 6.07  | 118.55      | 105.20   |
| 5   | H     | 22  | DC   | OP1-P-O3' | 6.06  | 118.52      | 105.20   |
| 5   | H     | 44  | DG   | OP1-P-O3' | 6.06  | 118.52      | 105.20   |
| 5   | H     | 29  | DC   | OP1-P-OP2 | -6.05 | 110.52      | 119.60   |
| 5   | H     | 79  | DA   | OP1-P-O3' | 6.05  | 118.52      | 105.20   |
| 5   | H     | 99  | DA   | OP1-P-OP2 | -6.05 | 110.53      | 119.60   |
| 9   | T     | 159 | DC   | OP1-P-OP2 | -6.04 | 110.55      | 119.60   |
| 9   | T     | 139 | DG   | OP1-P-O3' | 6.03  | 118.47      | 105.20   |
| 9   | T     | 174 | DT   | OP1-P-O3' | 6.03  | 118.46      | 105.20   |
| 5   | H     | 202 | DC   | OP1-P-O3' | 6.02  | 118.44      | 105.20   |
| 9   | T     | 200 | DC   | OP1-P-O3' | 6.02  | 118.44      | 105.20   |
| 9   | T     | 95  | DG   | OP1-P-O3' | 6.01  | 118.43      | 105.20   |
| 5   | H     | 52  | DT   | OP1-P-O3' | 6.01  | 118.42      | 105.20   |
| 9   | T     | 36  | DG   | OP1-P-O3' | 5.98  | 118.36      | 105.20   |
| 9   | T     | 101 | DA   | OP1-P-OP2 | -5.97 | 110.64      | 119.60   |
| 9   | T     | 43  | DG   | OP1-P-O3' | 5.97  | 118.33      | 105.20   |
| 9   | T     | 47  | DA   | OP1-P-O3' | 5.97  | 118.33      | 105.20   |
| 9   | T     | 149 | DC   | OP1-P-O3' | 5.96  | 118.32      | 105.20   |
| 5   | H     | 100 | DA   | OP1-P-O3' | 5.96  | 118.32      | 105.20   |
| 5   | H     | 69  | DG   | OP1-P-OP2 | -5.94 | 110.69      | 119.60   |
| 5   | H     | 91  | DG   | OP1-P-O3' | 5.93  | 118.25      | 105.20   |
| 5   | H     | 67  | DT   | OP1-P-O3' | 5.93  | 118.24      | 105.20   |
| 9   | T     | 86  | DC   | OP1-P-O3' | 5.93  | 118.24      | 105.20   |

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| Mol | Chain | Res | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-----------|-------|-------------|----------|
| 9   | T     | 190 | DG   | OP1-P-O3' | 5.92  | 118.23      | 105.20   |
| 9   | T     | 32  | DC   | OP1-P-O3' | 5.91  | 118.21      | 105.20   |
| 5   | H     | 167 | DT   | OP1-P-O3' | 5.90  | 118.19      | 105.20   |
| 9   | T     | 136 | DC   | OP1-P-O3' | 5.90  | 118.19      | 105.20   |
| 5   | H     | 110 | DA   | OP1-P-O3' | 5.89  | 118.17      | 105.20   |
| 5   | H     | 197 | DC   | OP1-P-O3' | 5.88  | 118.13      | 105.20   |
| 9   | T     | 25  | DG   | OP1-P-O3' | 5.88  | 118.13      | 105.20   |
| 5   | H     | 140 | DG   | OP1-P-OP2 | -5.88 | 110.79      | 119.60   |
| 9   | T     | 49  | DT   | OP1-P-O3' | 5.87  | 118.12      | 105.20   |
| 5   | H     | 152 | DA   | OP1-P-O3' | 5.87  | 118.12      | 105.20   |
| 9   | T     | 113 | DG   | OP1-P-O3' | 5.87  | 118.11      | 105.20   |
| 5   | H     | 113 | DG   | OP1-P-O3' | 5.87  | 118.11      | 105.20   |
| 5   | H     | 200 | DA   | OP1-P-O3' | 5.87  | 118.11      | 105.20   |
| 9   | T     | 197 | DC   | OP1-P-O3' | 5.86  | 118.08      | 105.20   |
| 5   | H     | 162 | DC   | OP1-P-OP2 | -5.85 | 110.82      | 119.60   |
| 9   | T     | 193 | DC   | OP1-P-O3' | 5.85  | 118.07      | 105.20   |
| 5   | H     | 54  | DC   | OP1-P-O3' | 5.85  | 118.07      | 105.20   |
| 9   | T     | 100 | DA   | OP1-P-OP2 | -5.85 | 110.83      | 119.60   |
| 9   | T     | 103 | DG   | OP1-P-O3' | 5.84  | 118.05      | 105.20   |
| 5   | H     | 142 | DG   | OP1-P-O3' | 5.83  | 118.03      | 105.20   |
| 9   | T     | 176 | DT   | OP1-P-O3' | 5.83  | 118.03      | 105.20   |
| 9   | T     | 27  | DT   | OP1-P-O3' | 5.82  | 117.99      | 105.20   |
| 9   | T     | 171 | DA   | OP2-P-O3' | 5.82  | 117.99      | 105.20   |
| 9   | T     | 84  | DG   | OP1-P-O3' | 5.81  | 117.99      | 105.20   |
| 5   | H     | 123 | DG   | OP1-P-OP2 | -5.80 | 110.89      | 119.60   |
| 9   | T     | 203 | DT   | OP1-P-O3' | 5.79  | 117.94      | 105.20   |
| 5   | H     | 124 | DC   | OP1-P-O3' | 5.78  | 117.90      | 105.20   |
| 5   | H     | 81  | DT   | OP1-P-O3' | 5.76  | 117.88      | 105.20   |
| 9   | T     | 28  | DG   | OP1-P-O3' | 5.75  | 117.86      | 105.20   |
| 9   | T     | 187 | DT   | OP1-P-O3' | 5.75  | 117.86      | 105.20   |
| 9   | T     | 179 | DA   | OP1-P-O3' | 5.75  | 117.85      | 105.20   |
| 5   | H     | 194 | DC   | OP1-P-O3' | 5.74  | 117.84      | 105.20   |
| 9   | T     | 41  | DC   | OP1-P-O3' | 5.74  | 117.83      | 105.20   |
| 9   | T     | 110 | DC   | OP1-P-O3' | 5.74  | 117.83      | 105.20   |
| 5   | H     | 141 | DA   | OP1-P-O3' | 5.74  | 117.83      | 105.20   |
| 5   | H     | 193 | DG   | OP1-P-O3' | 5.74  | 117.83      | 105.20   |
| 5   | H     | 161 | DG   | OP1-P-OP2 | -5.73 | 111.00      | 119.60   |
| 5   | H     | 138 | DT   | OP1-P-O3' | 5.73  | 117.80      | 105.20   |
| 9   | T     | 39  | DG   | OP1-P-O3' | 5.73  | 117.80      | 105.20   |
| 5   | H     | 162 | DC   | OP1-P-O3' | 5.72  | 117.79      | 105.20   |
| 9   | T     | 88  | DC   | OP1-P-O3' | 5.72  | 117.79      | 105.20   |
| 5   | H     | 43  | DG   | OP1-P-O3' | 5.71  | 117.76      | 105.20   |

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| Mol | Chain | Res | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-----------|-------|-------------|----------|
| 5   | H     | 82  | DA   | OP1-P-O3' | 5.71  | 117.76      | 105.20   |
| 5   | H     | 185 | DA   | OP1-P-O3' | 5.70  | 117.74      | 105.20   |
| 5   | H     | 196 | DG   | OP1-P-O3' | 5.69  | 117.72      | 105.20   |
| 5   | H     | 176 | DG   | OP1-P-O3' | 5.68  | 117.69      | 105.20   |
| 9   | T     | 162 | DG   | OP1-P-OP2 | -5.67 | 111.09      | 119.60   |
| 5   | H     | 111 | DC   | OP1-P-O3' | 5.67  | 117.68      | 105.20   |
| 5   | H     | 180 | DC   | OP1-P-O3' | 5.67  | 117.67      | 105.20   |
| 9   | T     | 123 | DG   | OP1-P-OP2 | -5.67 | 111.10      | 119.60   |
| 9   | T     | 131 | DA   | OP1-P-OP2 | -5.67 | 111.10      | 119.60   |
| 5   | H     | 199 | DC   | OP1-P-O3' | 5.67  | 117.67      | 105.20   |
| 5   | H     | 209 | DC   | OP1-P-O3' | 5.67  | 117.66      | 105.20   |
| 5   | H     | 129 | DA   | OP1-P-O3' | 5.66  | 117.65      | 105.20   |
| 5   | H     | 94  | DG   | OP1-P-O3' | 5.65  | 117.63      | 105.20   |
| 5   | H     | 70  | DA   | OP1-P-O3' | 5.65  | 117.62      | 105.20   |
| 5   | H     | 168 | DC   | OP1-P-O3' | 5.64  | 117.60      | 105.20   |
| 5   | H     | 189 | DG   | OP1-P-O3' | 5.63  | 117.59      | 105.20   |
| 5   | H     | 78  | DG   | OP1-P-O3' | 5.63  | 117.59      | 105.20   |
| 5   | H     | 46  | DT   | OP1-P-O3' | 5.63  | 117.59      | 105.20   |
| 5   | H     | 76  | DG   | OP1-P-O3' | 5.63  | 117.58      | 105.20   |
| 9   | T     | 106 | DC   | OP1-P-O3' | 5.62  | 117.58      | 105.20   |
| 5   | H     | 112 | DA   | OP1-P-O3' | 5.62  | 117.57      | 105.20   |
| 9   | T     | 31  | DC   | OP1-P-O3' | 5.62  | 117.57      | 105.20   |
| 9   | T     | 81  | DA   | OP1-P-O3' | 5.62  | 117.57      | 105.20   |
| 5   | H     | 158 | DG   | OP1-P-O3' | 5.61  | 117.55      | 105.20   |
| 9   | T     | 53  | DG   | OP1-P-O3' | 5.61  | 117.55      | 105.20   |
| 5   | H     | 74  | DT   | OP1-P-O3' | 5.61  | 117.54      | 105.20   |
| 5   | H     | 36  | DG   | OP1-P-O3' | 5.61  | 117.53      | 105.20   |
| 9   | T     | 132 | DC   | OP1-P-O3' | 5.60  | 117.51      | 105.20   |
| 5   | H     | 56  | DT   | OP1-P-O3' | 5.58  | 117.48      | 105.20   |
| 9   | T     | 15  | DC   | OP1-P-O3' | 5.58  | 117.48      | 105.20   |
| 5   | H     | 190 | DC   | OP1-P-O3' | 5.58  | 117.47      | 105.20   |
| 5   | H     | 154 | DC   | OP1-P-O3' | 5.57  | 117.46      | 105.20   |
| 9   | T     | 121 | DC   | OP1-P-O3' | 5.56  | 117.43      | 105.20   |
| 9   | T     | 101 | DA   | OP1-P-O3' | 5.56  | 117.42      | 105.20   |
| 5   | H     | 186 | DG   | OP1-P-O3' | 5.55  | 117.41      | 105.20   |
| 9   | T     | 75  | DT   | OP1-P-O3' | 5.55  | 117.41      | 105.20   |
| 9   | T     | 17  | DC   | OP1-P-O3' | 5.54  | 117.40      | 105.20   |
| 5   | H     | 64  | DG   | OP1-P-O3' | 5.52  | 117.34      | 105.20   |
| 9   | T     | 134 | DG   | OP1-P-O3' | 5.52  | 117.33      | 105.20   |
| 5   | H     | 47  | DG   | OP1-P-O3' | 5.51  | 117.33      | 105.20   |
| 5   | H     | 188 | DC   | OP1-P-O3' | 5.51  | 117.33      | 105.20   |
| 5   | H     | 155 | DA   | OP1-P-O3' | 5.51  | 117.32      | 105.20   |

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| Mol | Chain | Res | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-----------|-------|-------------|----------|
| 5   | H     | 201 | DG   | OP1-P-O3' | 5.51  | 117.32      | 105.20   |
| 9   | T     | 102 | DC   | OP1-P-O3' | 5.49  | 117.28      | 105.20   |
| 9   | T     | 195 | DC   | OP1-P-O3' | 5.49  | 117.29      | 105.20   |
| 9   | T     | 112 | DC   | OP1-P-O3' | 5.49  | 117.28      | 105.20   |
| 5   | H     | 135 | DT   | OP1-P-O3' | 5.49  | 117.27      | 105.20   |
| 9   | T     | 165 | DC   | OP1-P-O3' | 5.49  | 117.27      | 105.20   |
| 9   | T     | 115 | DC   | OP1-P-O3' | 5.49  | 117.27      | 105.20   |
| 5   | H     | 63  | DT   | OP1-P-O3' | 5.48  | 117.25      | 105.20   |
| 5   | H     | 123 | DG   | OP1-P-O3' | 5.48  | 117.25      | 105.20   |
| 5   | H     | 58  | DA   | OP1-P-O3' | 5.47  | 117.24      | 105.20   |
| 9   | T     | 142 | DG   | OP1-P-O3' | 5.47  | 117.24      | 105.20   |
| 9   | T     | 22  | DG   | OP1-P-O3' | 5.47  | 117.24      | 105.20   |
| 5   | H     | 40  | DA   | OP1-P-O3' | 5.47  | 117.23      | 105.20   |
| 9   | T     | 78  | DT   | OP2-P-O3' | 5.46  | 117.21      | 105.20   |
| 9   | T     | 40  | DG   | OP1-P-O3' | 5.45  | 117.20      | 105.20   |
| 5   | H     | 148 | DT   | OP1-P-O3' | 5.45  | 117.18      | 105.20   |
| 9   | T     | 64  | DC   | OP1-P-O3' | 5.45  | 117.18      | 105.20   |
| 5   | H     | 183 | DC   | OP1-P-O3' | 5.44  | 117.17      | 105.20   |
| 9   | T     | 26  | DC   | OP1-P-O3' | 5.44  | 117.17      | 105.20   |
| 9   | T     | 72  | DT   | OP1-P-O3' | 5.44  | 117.17      | 105.20   |
| 9   | T     | 16  | DC   | OP1-P-O3' | 5.44  | 117.17      | 105.20   |
| 9   | T     | 30  | DG   | OP1-P-O3' | 5.44  | 117.17      | 105.20   |
| 5   | H     | 103 | DG   | OP1-P-O3' | 5.43  | 117.15      | 105.20   |
| 5   | H     | 72  | DA   | OP1-P-O3' | 5.43  | 117.14      | 105.20   |
| 9   | T     | 118 | DC   | OP1-P-O3' | 5.42  | 117.13      | 105.20   |
| 9   | T     | 146 | DA   | OP1-P-O3' | 5.42  | 117.13      | 105.20   |
| 9   | T     | 105 | DA   | OP1-P-O3' | 5.42  | 117.13      | 105.20   |
| 9   | T     | 50  | DC   | OP1-P-O3' | 5.42  | 117.12      | 105.20   |
| 9   | T     | 191 | DC   | OP1-P-O3' | 5.41  | 117.11      | 105.20   |
| 5   | H     | 164 | DG   | OP1-P-O3' | 5.39  | 117.06      | 105.20   |
| 9   | T     | 23  | DA   | OP1-P-O3' | 5.38  | 117.05      | 105.20   |
| 5   | H     | 84  | DC   | OP1-P-O3' | 5.38  | 117.04      | 105.20   |
| 5   | H     | 49  | DA   | OP1-P-O3' | 5.38  | 117.03      | 105.20   |
| 9   | T     | 91  | DC   | OP1-P-OP2 | -5.36 | 111.57      | 119.60   |
| 5   | H     | 165 | DC   | OP1-P-O3' | 5.35  | 116.97      | 105.20   |
| 5   | H     | 151 | DG   | OP1-P-O3' | 5.34  | 116.95      | 105.20   |
| 5   | H     | 191 | DC   | OP1-P-O3' | 5.34  | 116.95      | 105.20   |
| 9   | T     | 178 | DT   | OP1-P-O3' | 5.34  | 116.94      | 105.20   |
| 5   | H     | 41  | DC   | OP1-P-O3' | 5.33  | 116.94      | 105.20   |
| 9   | T     | 194 | DG   | OP1-P-O3' | 5.33  | 116.93      | 105.20   |
| 5   | H     | 39  | DT   | OP1-P-O3' | 5.33  | 116.92      | 105.20   |
| 9   | T     | 140 | DG   | OP1-P-O3' | 5.33  | 116.92      | 105.20   |

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| Mol | Chain | Res | Type | Atoms     | Z    | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-----------|------|-------------|----------|
| 5   | H     | 122 | DT   | OP1-P-O3' | 5.31 | 116.88      | 105.20   |
| 9   | T     | 155 | DT   | OP1-P-O3' | 5.27 | 116.80      | 105.20   |
| 9   | T     | 159 | DC   | OP1-P-O3' | 5.26 | 116.77      | 105.20   |
| 9   | T     | 145 | DT   | OP1-P-O3' | 5.25 | 116.75      | 105.20   |
| 9   | T     | 60  | DA   | OP1-P-O3' | 5.24 | 116.72      | 105.20   |
| 5   | H     | 144 | DT   | OP1-P-O3' | 5.22 | 116.69      | 105.20   |
| 9   | T     | 148 | DC   | OP1-P-O3' | 5.22 | 116.69      | 105.20   |
| 5   | H     | 31  | DT   | OP1-P-O3' | 5.21 | 116.67      | 105.20   |
| 5   | H     | 170 | DG   | OP1-P-O3' | 5.21 | 116.67      | 105.20   |
| 5   | H     | 195 | DA   | OP1-P-O3' | 5.21 | 116.67      | 105.20   |
| 5   | H     | 169 | DG   | OP1-P-O3' | 5.21 | 116.65      | 105.20   |
| 9   | T     | 91  | DC   | OP1-P-O3' | 5.21 | 116.65      | 105.20   |
| 9   | T     | 119 | DC   | OP1-P-O3' | 5.20 | 116.64      | 105.20   |
| 5   | H     | 37  | DC   | OP1-P-O3' | 5.19 | 116.62      | 105.20   |
| 5   | H     | 116 | DC   | OP1-P-O3' | 5.18 | 116.60      | 105.20   |
| 9   | T     | 20  | DC   | OP1-P-O3' | 5.18 | 116.59      | 105.20   |
| 9   | T     | 52  | DC   | OP1-P-O3' | 5.17 | 116.56      | 105.20   |
| 5   | H     | 26  | DT   | OP1-P-O3' | 5.15 | 116.53      | 105.20   |
| 9   | T     | 199 | DT   | OP1-P-O3' | 5.14 | 116.51      | 105.20   |
| 9   | T     | 44  | DG   | OP1-P-O3' | 5.13 | 116.49      | 105.20   |
| 9   | T     | 55  | DT   | OP1-P-O3' | 5.12 | 116.46      | 105.20   |
| 9   | T     | 122 | DC   | OP1-P-O3' | 5.11 | 116.44      | 105.20   |
| 9   | T     | 137 | DA   | OP1-P-O3' | 5.10 | 116.42      | 105.20   |
| 9   | T     | 35  | DC   | OP1-P-O3' | 5.10 | 116.42      | 105.20   |
| 5   | H     | 90  | DT   | OP1-P-O3' | 5.08 | 116.39      | 105.20   |
| 9   | T     | 183 | DC   | OP1-P-O3' | 5.08 | 116.37      | 105.20   |
| 5   | H     | 106 | DG   | OP1-P-O3' | 5.08 | 116.37      | 105.20   |
| 9   | T     | 164 | DA   | OP1-P-O3' | 5.07 | 116.36      | 105.20   |
| 5   | H     | 48  | DT   | OP1-P-O3' | 5.06 | 116.33      | 105.20   |
| 5   | H     | 65  | DC   | OP1-P-O3' | 5.06 | 116.33      | 105.20   |
| 5   | H     | 101 | DA   | OP1-P-O3' | 5.05 | 116.32      | 105.20   |
| 5   | H     | 160 | DA   | OP1-P-O3' | 5.04 | 116.28      | 105.20   |
| 5   | H     | 198 | DG   | OP1-P-O3' | 5.03 | 116.27      | 105.20   |
| 9   | T     | 157 | DC   | OP1-P-O3' | 5.03 | 116.27      | 105.20   |
| 5   | H     | 25  | DA   | OP1-P-O3' | 5.02 | 116.25      | 105.20   |
| 9   | T     | 152 | DC   | OP1-P-O3' | 5.02 | 116.25      | 105.20   |
| 5   | H     | 192 | DG   | OP1-P-O3' | 5.02 | 116.24      | 105.20   |
| 9   | T     | 182 | DT   | OP1-P-O3' | 5.02 | 116.24      | 105.20   |
| 5   | H     | 133 | DG   | OP1-P-O3' | 5.01 | 116.21      | 105.20   |

There are no chirality outliers.

There are no planarity outliers.

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

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

| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 1   | D     | 3633  | 0        | 3628     | 94      | 0            |
| 2   | E     | 4580  | 0        | 4483     | 168     | 0            |
| 3   | G     | 2930  | 0        | 2839     | 147     | 0            |
| 4   | I     | 917   | 0        | 971      | 44      | 0            |
| 4   | W     | 817   | 0        | 858      | 36      | 0            |
| 5   | H     | 3972  | 0        | 2154     | 133     | 0            |
| 6   | J     | 661   | 0        | 709      | 29      | 0            |
| 6   | X     | 666   | 0        | 679      | 20      | 0            |
| 7   | R     | 829   | 0        | 887      | 39      | 0            |
| 7   | U     | 825   | 0        | 876      | 39      | 0            |
| 8   | S     | 742   | 0        | 753      | 22      | 0            |
| 8   | V     | 737   | 0        | 751      | 30      | 0            |
| 9   | T     | 3919  | 0        | 2153     | 133     | 0            |
| 10  | O     | 3139  | 0        | 2986     | 97      | 0            |
| 11  | Y     | 1047  | 0        | 1102     | 22      | 0            |
| 12  | E     | 26    | 0        | 19       | 5       | 0            |
| All | All   | 29440 | 0        | 25848    | 873     | 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 19.

All (873) 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) |
|------------------|-------------------|--------------------------|-------------------|
| 3:G:191:ASN:HB3  | 3:G:211:LYS:HB3   | 1.50                     | 0.92              |
| 3:G:175:ILE:HG13 | 3:G:182:CYS:HB2   | 1.54                     | 0.90              |
| 7:U:84:GLN:HE21  | 7:U:88:ARG:HE     | 1.19                     | 0.87              |
| 11:Y:243:TRP:HB2 | 11:Y:248:ILE:HG21 | 1.60                     | 0.84              |
| 10:O:293:SER:HG  | 10:O:297:THR:HG1  | 1.28                     | 0.80              |
| 5:H:169:DG:N2    | 9:T:58:DC:O2      | 2.15                     | 0.79              |
| 4:W:61:LEU:HD12  | 6:X:36:ARG:HB3    | 1.64                     | 0.79              |
| 7:R:78:ILE:HG22  | 8:S:51:ILE:HA     | 1.65                     | 0.79              |
| 2:E:326:GLY:O    | 2:E:328:GLN:N     | 2.17                     | 0.78              |
| 3:G:145:GLU:HB2  | 3:G:168:SER:HB2   | 1.66                     | 0.77              |
| 10:O:180:GLY:HA3 | 10:O:197:SER:HA   | 1.65                     | 0.77              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 5:H:205:DC:O2    | 9:T:22:DG:N2      | 2.14                     | 0.77              |
| 3:G:330:CYS:H    | 3:G:354:GLY:HA3   | 1.48                     | 0.76              |
| 2:E:682:ALA:O    | 2:E:690:ARG:NH1   | 2.19                     | 0.75              |
| 5:H:182:DC:H42   | 9:T:45:DA:H61     | 1.32                     | 0.75              |
| 7:R:25:PHE:HE2   | 7:R:56:GLU:HA     | 1.52                     | 0.74              |
| 7:U:87:VAL:HG11  | 7:U:97:LEU:HD12   | 1.67                     | 0.74              |
| 1:D:319:MET:HB2  | 1:D:353:PRO:HB2   | 1.69                     | 0.74              |
| 2:E:512:GLN:HA   | 2:E:516:ASP:HB2   | 1.68                     | 0.74              |
| 5:H:97:DT:H4'    | 5:H:98:DA:H5'     | 1.69                     | 0.74              |
| 5:H:64:DG:O6     | 9:T:163:DC:N4     | 2.20                     | 0.73              |
| 10:O:160:LYS:HD3 | 10:O:161:PRO:HD2  | 1.70                     | 0.73              |
| 4:W:121:PRO:O    | 4:W:125:GLN:NE2   | 2.21                     | 0.73              |
| 5:H:54:DC:H42    | 9:T:173:DA:H61    | 1.33                     | 0.73              |
| 9:T:153:DA:OP2   | 7:U:35:ARG:NH2    | 2.22                     | 0.73              |
| 2:E:448:LEU:HD13 | 2:E:459:ILE:HD12  | 1.69                     | 0.72              |
| 7:U:42:ARG:HB2   | 8:V:85:THR:HG22   | 1.70                     | 0.72              |
| 1:D:650:LYS:HB2  | 1:D:652:LEU:HD22  | 1.71                     | 0.72              |
| 3:G:172:ILE:HB   | 3:G:186:TYR:HB2   | 1.72                     | 0.71              |
| 5:H:80:DG:N2     | 9:T:148:DC:O2     | 2.24                     | 0.71              |
| 2:E:60:TRP:HE1   | 3:G:105:SER:H     | 1.39                     | 0.71              |
| 6:J:98:TYR:OH    | 8:S:65:ASP:OD2    | 2.07                     | 0.71              |
| 2:E:181:TYR:HH   | 2:E:220:SER:HG    | 1.31                     | 0.71              |
| 4:I:106:ASP:HA   | 4:I:109:LEU:HD12  | 1.73                     | 0.70              |
| 5:H:194:DC:O2    | 9:T:33:DG:N2      | 2.17                     | 0.70              |
| 1:D:613:VAL:HG12 | 1:D:652:LEU:HD12  | 1.74                     | 0.69              |
| 2:E:575:GLN:NE2  | 9:T:44:DG:O3'     | 2.21                     | 0.69              |
| 5:H:109:DG:N2    | 9:T:119:DC:O2     | 2.26                     | 0.69              |
| 2:E:585:CYS:HB2  | 2:E:590:CYS:HB2   | 1.73                     | 0.69              |
| 3:G:176:ASN:HB3  | 3:G:179:THR:HG22  | 1.75                     | 0.69              |
| 9:T:152:DC:H5''  | 7:U:44:GLY:HA2    | 1.74                     | 0.69              |
| 5:H:179:DT:H2''  | 5:H:180:DC:H5'    | 1.75                     | 0.68              |
| 6:X:64:ASN:O     | 6:X:93:GLN:NE2    | 2.25                     | 0.68              |
| 1:D:158:GLN:HE22 | 1:D:232:VAL:HG13  | 1.58                     | 0.68              |
| 3:G:210:SER:OG   | 3:G:212:ASP:OD1   | 2.11                     | 0.68              |
| 5:H:84:DC:H42    | 9:T:143:DA:H61    | 1.41                     | 0.68              |
| 5:H:37:DC:O2     | 9:T:190:DG:N2     | 2.20                     | 0.68              |
| 3:G:264:ARG:NH2  | 3:G:340:ILE:O     | 2.27                     | 0.68              |
| 8:V:116:THR:HA   | 8:V:119:THR:HG22  | 1.74                     | 0.68              |
| 10:O:386:GLU:HB3 | 10:O:389:VAL:HG12 | 1.76                     | 0.67              |
| 7:R:62:ILE:HG13  | 7:R:93:LEU:HD21   | 1.76                     | 0.67              |
| 10:O:318:ASP:OD2 | 10:O:338:THR:OG1  | 2.10                     | 0.67              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 10:O:77:ASN:ND2  | 10:O:125:GLY:O    | 2.26                     | 0.67              |
| 5:H:189:DG:N2    | 9:T:38:DC:O2      | 2.19                     | 0.67              |
| 3:G:99:VAL:HG11  | 3:G:428:VAL:HG21  | 1.77                     | 0.66              |
| 3:G:281:ASN:HB3  | 3:G:284:LYS:HG2   | 1.77                     | 0.66              |
| 5:H:189:DG:N1    | 9:T:38:DC:N3      | 2.36                     | 0.66              |
| 4:I:37:LYS:NZ    | 4:I:38:PRO:O      | 2.24                     | 0.66              |
| 4:I:67:PHE:CD2   | 4:I:93:GLN:HG3    | 2.31                     | 0.66              |
| 6:J:51:TYR:O     | 6:J:55:ARG:NH2    | 2.29                     | 0.66              |
| 5:H:57:DG:O6     | 9:T:169:DC:N4     | 2.28                     | 0.66              |
| 10:O:198:ASP:HA  | 10:O:229:VAL:HG13 | 1.76                     | 0.66              |
| 2:E:586:ASP:HB3  | 2:E:589:LEU:HB2   | 1.78                     | 0.66              |
| 6:J:39:ARG:NH1   | 6:J:44:LYS:O      | 2.28                     | 0.66              |
| 3:G:86:ASN:ND2   | 3:G:130:GLY:O     | 2.28                     | 0.66              |
| 4:I:123:ASP:OD1  | 4:W:113:HIS:NE2   | 2.28                     | 0.66              |
| 5:H:51:DA:N6     | 9:T:176:DT:O4     | 2.20                     | 0.66              |
| 10:O:204:LEU:O   | 10:O:220:LYS:N    | 2.26                     | 0.66              |
| 3:G:211:LYS:HA   | 3:G:238:GLU:HG3   | 1.77                     | 0.66              |
| 4:I:60:LEU:HD13  | 4:I:93:GLN:OE1    | 1.96                     | 0.66              |
| 1:D:521:LYS:HD3  | 1:D:577:GLN:HG3   | 1.77                     | 0.65              |
| 2:E:541:CYS:SG   | 2:E:560:ASN:ND2   | 2.68                     | 0.65              |
| 5:H:192:DG:O6    | 9:T:34:DC:N4      | 2.29                     | 0.65              |
| 2:E:236:THR:O    | 2:E:240:LEU:N     | 2.29                     | 0.65              |
| 7:U:79:ILE:HG22  | 7:U:82:HIS:HD2    | 1.61                     | 0.65              |
| 2:E:521:HIS:O    | 2:E:545:GLN:NE2   | 2.30                     | 0.65              |
| 2:E:501:HIS:HA   | 2:E:504:TRP:CD1   | 2.32                     | 0.65              |
| 7:R:25:PHE:HD2   | 7:R:56:GLU:HG2    | 1.61                     | 0.65              |
| 8:V:106:HIS:O    | 8:V:109:SER:OG    | 2.12                     | 0.65              |
| 10:O:93:PHE:HB2  | 11:Y:171:LYS:HD3  | 1.79                     | 0.64              |
| 2:E:71:LEU:HB2   | 3:G:136:GLN:HG2   | 1.78                     | 0.64              |
| 2:E:330:TYR:HE1  | 2:E:457:CYS:HB2   | 1.63                     | 0.64              |
| 3:G:242:ALA:O    | 3:G:313:ARG:NH2   | 2.31                     | 0.64              |
| 6:J:78:ARG:NH2   | 6:J:85:ASP:OD2    | 2.28                     | 0.64              |
| 3:G:245:ASP:OD2  | 3:G:250:LYS:N     | 2.24                     | 0.64              |
| 5:H:80:DG:OP2    | 8:V:83:ARG:NH2    | 2.29                     | 0.64              |
| 7:U:20:ARG:NH1   | 8:V:121:ALA:O     | 2.30                     | 0.64              |
| 4:W:102:ALA:O    | 4:W:131:ARG:NH2   | 2.29                     | 0.64              |
| 2:E:620:LEU:HD11 | 2:E:634:LYS:HB3   | 1.80                     | 0.64              |
| 2:E:624:SER:N    | 2:E:628:GLY:O     | 2.31                     | 0.64              |
| 7:R:29:ARG:NH1   | 8:S:32:GLU:OE2    | 2.31                     | 0.64              |
| 10:O:188:ASN:HB2 | 10:O:240:GLU:HB3  | 1.79                     | 0.64              |
| 10:O:85:GLN:HB2  | 10:O:114:LYS:HB3  | 1.79                     | 0.63              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:E:288:ARG:NH2  | 2:E:709:GLY:O     | 2.25                     | 0.63              |
| 3:G:207:LEU:HB2  | 3:G:217:LEU:HD12  | 1.80                     | 0.63              |
| 10:O:106:GLY:N   | 10:O:109:GLY:O    | 2.30                     | 0.63              |
| 2:E:567:CYS:O    | 2:E:592:THR:OG1   | 2.10                     | 0.63              |
| 7:R:64:GLU:HA    | 8:S:46:HIS:HE1    | 1.61                     | 0.63              |
| 5:H:41:DC:H2''   | 5:H:42:DA:C8      | 2.34                     | 0.63              |
| 11:Y:224:SER:OG  | 11:Y:259:ARG:NH1  | 2.31                     | 0.63              |
| 6:J:44:LYS:HB2   | 7:R:115:LEU:HD13  | 1.81                     | 0.62              |
| 1:D:586:GLU:HG2  | 1:D:588:ASP:H     | 1.64                     | 0.62              |
| 1:D:125:THR:HB   | 10:O:410:ASN:HD21 | 1.65                     | 0.62              |
| 10:O:292:GLY:HA2 | 10:O:298:VAL:HA   | 1.79                     | 0.62              |
| 1:D:641:GLU:HA   | 1:D:680:LYS:HE2   | 1.82                     | 0.62              |
| 6:X:29:ILE:O     | 6:X:55:ARG:NH1    | 2.33                     | 0.62              |
| 3:G:89:LYS:HA    | 3:G:433:SER:HA    | 1.82                     | 0.61              |
| 5:H:37:DC:N3     | 9:T:190:DG:N1     | 2.36                     | 0.61              |
| 2:E:671:LEU:HD13 | 2:E:681:ASP:HB3   | 1.82                     | 0.61              |
| 5:H:142:DG:N2    | 9:T:86:DC:O2      | 2.33                     | 0.61              |
| 2:E:160:ASP:HA   | 3:G:306:ARG:HE    | 1.66                     | 0.61              |
| 10:O:81:ILE:HB   | 10:O:119:ILE:HB   | 1.83                     | 0.61              |
| 2:E:653:GLN:OE1  | 4:I:26:ARG:NE     | 2.33                     | 0.61              |
| 2:E:664:ASP:OD1  | 2:E:741:TYR:OH    | 2.16                     | 0.61              |
| 2:E:528:CYS:HB2  | 2:E:540:PRO:HD2   | 1.83                     | 0.61              |
| 6:J:38:ALA:HB1   | 6:J:43:VAL:HB     | 1.83                     | 0.61              |
| 1:D:556:THR:OG1  | 11:Y:173:ARG:NH2  | 2.34                     | 0.61              |
| 2:E:529:ASP:HA   | 2:E:553:GLN:HB2   | 1.82                     | 0.61              |
| 2:E:701:TYR:CZ   | 2:E:716:PHE:HB2   | 2.36                     | 0.61              |
| 3:G:86:ASN:HB3   | 3:G:436:ARG:HB3   | 1.82                     | 0.61              |
| 10:O:251:LYS:HE2 | 10:O:268:SER:HB3  | 1.83                     | 0.61              |
| 2:E:502:ARG:NH1  | 4:I:39:HIS:O      | 2.33                     | 0.61              |
| 9:T:32:DC:H2'    | 9:T:33:DG:C8      | 2.36                     | 0.60              |
| 9:T:193:DC:H2'   | 9:T:194:DG:C8     | 2.36                     | 0.60              |
| 10:O:281:PHE:CD1 | 10:O:289:LEU:HD13 | 2.36                     | 0.60              |
| 2:E:86:THR:HA    | 2:E:93:THR:HG23   | 1.83                     | 0.60              |
| 2:E:100:THR:HG23 | 3:G:141:ALA:HB3   | 1.83                     | 0.60              |
| 2:E:554:CYS:HB3  | 2:E:558:CYS:HB2   | 1.84                     | 0.60              |
| 3:G:201:ARG:NH1  | 3:G:247:LEU:O     | 2.34                     | 0.60              |
| 5:H:182:DC:O2    | 9:T:46:DG:N2      | 2.35                     | 0.60              |
| 9:T:98:DT:H2''   | 9:T:99:DA:C8      | 2.37                     | 0.60              |
| 9:T:122:DC:H2'   | 9:T:123:DG:C8     | 2.38                     | 0.59              |
| 10:O:79:LEU:HD21 | 10:O:140:ILE:HD11 | 1.83                     | 0.59              |
| 2:E:556:SER:O    | 2:E:561:ARG:NH2   | 2.34                     | 0.59              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 8:S:73:GLU:HG3    | 8:S:98:LEU:HD21   | 1.84                     | 0.59              |
| 2:E:660:GLY:O     | 2:E:664:ASP:N     | 2.29                     | 0.59              |
| 4:I:108:ASN:ND2   | 6:J:42:GLY:O      | 2.36                     | 0.59              |
| 4:I:61:LEU:HD12   | 6:J:37:LEU:HD23   | 1.83                     | 0.59              |
| 3:G:389:TRP:HE1   | 3:G:401:CYS:HG    | 1.51                     | 0.59              |
| 5:H:40:DA:N6      | 9:T:186:DG:O6     | 2.36                     | 0.59              |
| 2:E:587:PRO:HA    | 2:E:595:ALA:HB1   | 1.83                     | 0.59              |
| 2:E:610:SER:O     | 2:E:614:GLY:N     | 2.35                     | 0.59              |
| 2:E:693:ASN:OD1   | 12:E:801:SAH:N6   | 2.35                     | 0.59              |
| 5:H:50:DT:H2'     | 5:H:51:DA:C8      | 2.37                     | 0.59              |
| 7:R:97:LEU:HD22   | 7:R:100:VAL:HG11  | 1.84                     | 0.59              |
| 6:J:29:ILE:O      | 6:J:55:ARG:NH1    | 2.36                     | 0.59              |
| 2:E:336:ALA:HB1   | 2:E:472:TYR:HE2   | 1.68                     | 0.58              |
| 1:D:247:SER:HB2   | 1:D:302:PHE:HB3   | 1.84                     | 0.58              |
| 7:U:79:ILE:HG22   | 7:U:82:HIS:CD2    | 2.37                     | 0.58              |
| 10:O:127:VAL:HG13 | 10:O:142:THR:HG23 | 1.84                     | 0.58              |
| 1:D:189:VAL:HG23  | 1:D:205:GLN:HG3   | 1.84                     | 0.58              |
| 10:O:61:PHE:HB2   | 10:O:85:GLN:HB3   | 1.83                     | 0.58              |
| 10:O:65:ARG:HA    | 10:O:83:SER:HA    | 1.85                     | 0.58              |
| 8:S:92:GLN:NE2    | 8:S:96:ARG:HH12   | 2.02                     | 0.58              |
| 8:V:90:GLU:N      | 8:V:90:GLU:OE2    | 2.36                     | 0.58              |
| 2:E:52:ARG:HD3    | 3:G:246:LEU:HB2   | 1.86                     | 0.58              |
| 2:E:289:CYS:HB2   | 2:E:297:HIS:NE2   | 2.19                     | 0.58              |
| 2:E:470:GLN:HA    | 2:E:473:GLU:HB2   | 1.86                     | 0.58              |
| 2:E:647:CYS:SG    | 2:E:687:ASN:ND2   | 2.75                     | 0.58              |
| 3:G:338:ASP:HA    | 3:G:342:LYS:HE2   | 1.84                     | 0.58              |
| 1:D:157:LEU:HD11  | 1:D:359:LEU:HD11  | 1.85                     | 0.58              |
| 3:G:240:LEU:O     | 3:G:367:ARG:NH2   | 2.37                     | 0.58              |
| 7:U:84:GLN:NE2    | 7:U:88:ARG:HE     | 1.97                     | 0.58              |
| 10:O:236:HIS:HA   | 10:O:281:PHE:CD2  | 2.38                     | 0.58              |
| 1:D:632:MET:HE3   | 1:D:668:LEU:HB2   | 1.86                     | 0.58              |
| 5:H:47:DG:H2'     | 5:H:48:DT:H71     | 1.86                     | 0.58              |
| 7:U:34:LEU:HB3    | 7:U:43:VAL:HG21   | 1.84                     | 0.58              |
| 1:D:103:ARG:NH1   | 11:Y:283:ASN:O    | 2.37                     | 0.57              |
| 3:G:383:VAL:HG23  | 3:G:385:LYS:HG3   | 1.85                     | 0.57              |
| 6:X:73:THR:HG23   | 6:X:78:ARG:HB2    | 1.86                     | 0.57              |
| 1:D:572:LEU:HD11  | 3:G:225:LEU:HD22  | 1.86                     | 0.57              |
| 2:E:624:SER:HB3   | 2:E:630:GLY:HA3   | 1.86                     | 0.57              |
| 9:T:89:DA:H1'     | 9:T:90:DG:C8      | 2.39                     | 0.57              |
| 5:H:29:DC:H42     | 9:T:197:DC:H42    | 1.50                     | 0.57              |
| 9:T:163:DC:H2''   | 9:T:164:DA:H8     | 1.69                     | 0.57              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:E:163:CYS:SG   | 2:E:167:ASN:ND2   | 2.77                     | 0.57              |
| 7:R:25:PHE:CE2   | 7:R:56:GLU:HA     | 2.38                     | 0.57              |
| 1:D:605:ASP:HA   | 2:E:257:PRO:HD3   | 1.85                     | 0.57              |
| 10:O:36:MET:HB3  | 10:O:401:VAL:HB   | 1.87                     | 0.57              |
| 1:D:570:THR:O    | 3:G:216:ARG:NH1   | 2.38                     | 0.57              |
| 7:R:31:HIS:HD2   | 7:R:48:PRO:HG3    | 1.70                     | 0.57              |
| 10:O:341:ARG:HE  | 10:O:371:GLY:HA3  | 1.69                     | 0.57              |
| 1:D:569:ASP:N    | 1:D:584:GLU:OE1   | 2.37                     | 0.57              |
| 5:H:168:DC:H2''  | 5:H:169:DG:C8     | 2.40                     | 0.56              |
| 7:U:16:THR:HG22  | 7:U:18:SER:H      | 1.70                     | 0.56              |
| 3:G:119:ASN:HB2  | 3:G:140:ASP:HB3   | 1.87                     | 0.56              |
| 5:H:46:DT:O3'    | 4:W:41:TYR:OH     | 2.23                     | 0.56              |
| 10:O:148:ASP:OD2 | 10:O:172:ARG:NH1  | 2.32                     | 0.56              |
| 1:D:647:ILE:HA   | 1:D:652:LEU:HD21  | 1.87                     | 0.56              |
| 3:G:160:HIS:HB3  | 3:G:178:ILE:HD13  | 1.87                     | 0.56              |
| 5:H:207:DG:H2''  | 5:H:208:DA:C8     | 2.39                     | 0.56              |
| 3:G:145:GLU:OE1  | 3:G:168:SER:N     | 2.38                     | 0.56              |
| 2:E:228:SER:HB3  | 2:E:234:LYS:HB2   | 1.88                     | 0.56              |
| 2:E:501:HIS:HA   | 2:E:504:TRP:HD1   | 1.69                     | 0.56              |
| 2:E:675:ASN:OD1  | 2:E:678:PHE:N     | 2.31                     | 0.56              |
| 3:G:406:HIS:HB2  | 3:G:437:TRP:CZ2   | 2.41                     | 0.56              |
| 4:I:92:LEU:HD22  | 6:J:86:VAL:HG11   | 1.87                     | 0.56              |
| 7:R:79:ILE:HB    | 7:R:82:HIS:HD1    | 1.71                     | 0.56              |
| 3:G:193:ILE:HG12 | 3:G:210:SER:HB3   | 1.87                     | 0.56              |
| 10:O:49:TRP:NE1  | 10:O:391:CYS:SG   | 2.79                     | 0.56              |
| 2:E:433:GLU:H    | 2:E:470:GLN:HG2   | 1.70                     | 0.56              |
| 9:T:88:DC:H2''   | 9:T:89:DA:C8      | 2.40                     | 0.56              |
| 1:D:214:PRO:HD2  | 1:D:217:PRO:HG3   | 1.87                     | 0.56              |
| 10:O:196:ALA:HB1 | 10:O:230:VAL:HG13 | 1.86                     | 0.56              |
| 10:O:24:TRP:CE2  | 10:O:372:GLY:HA3  | 2.40                     | 0.56              |
| 3:G:116:VAL:HG12 | 3:G:121:VAL:HG12  | 1.87                     | 0.55              |
| 11:Y:243:TRP:HD1 | 11:Y:248:ILE:HD12 | 1.72                     | 0.55              |
| 4:W:79:LYS:HD3   | 6:X:74:GLU:OE2    | 2.06                     | 0.55              |
| 2:E:663:TYR:O    | 2:E:667:MET:N     | 2.40                     | 0.55              |
| 3:G:311:CYS:HB2  | 3:G:322:LYS:HB2   | 1.88                     | 0.55              |
| 1:D:184:LEU:HD22 | 1:D:211:LYS:HE2   | 1.88                     | 0.55              |
| 1:D:431:GLN:HG2  | 1:D:441:GLN:HG3   | 1.89                     | 0.55              |
| 3:G:423:SER:HA   | 3:G:439:ARG:HB3   | 1.89                     | 0.55              |
| 9:T:50:DC:H2''   | 9:T:51:DC:H5''    | 1.87                     | 0.55              |
| 6:X:59:LYS:NZ    | 6:X:63:GLU:OE2    | 2.38                     | 0.55              |
| 10:O:382:TRP:HE3 | 10:O:390:ILE:HG12 | 1.71                     | 0.55              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 9:T:153:DA:OP1   | 7:U:35:ARG:NH1    | 2.40                     | 0.55              |
| 2:E:121:MET:HA   | 2:E:650:ILE:HB    | 1.88                     | 0.55              |
| 5:H:56:DT:H2''   | 5:H:57:DG:N7      | 2.22                     | 0.55              |
| 9:T:133:DC:H2'   | 9:T:134:DG:C8     | 2.42                     | 0.55              |
| 10:O:132:TYR:HB3 | 10:O:140:ILE:HG22 | 1.88                     | 0.55              |
| 5:H:148:DT:H3    | 9:T:79:DA:H61     | 1.53                     | 0.55              |
| 3:G:226:VAL:HG12 | 3:G:227:ALA:H     | 1.71                     | 0.55              |
| 7:R:31:HIS:CD2   | 7:R:48:PRO:HG3    | 2.42                     | 0.55              |
| 1:D:450:CYS:HB3  | 1:D:455:LEU:H     | 1.72                     | 0.54              |
| 2:E:631:ILE:HG13 | 2:E:689:ILE:HA    | 1.90                     | 0.54              |
| 3:G:118:SER:OG   | 3:G:146:ASN:ND2   | 2.41                     | 0.54              |
| 2:E:673:ASN:N    | 4:I:27:LYS:O      | 2.32                     | 0.54              |
| 9:T:126:DT:H2''  | 9:T:127:DT:H5'    | 1.89                     | 0.54              |
| 10:O:281:PHE:CE1 | 10:O:289:LEU:HD13 | 2.42                     | 0.54              |
| 1:D:481:HIS:ND1  | 1:D:486:ARG:HD3   | 2.23                     | 0.54              |
| 2:E:46:ARG:NH1   | 3:G:391:LEU:O     | 2.40                     | 0.54              |
| 2:E:562:PHE:CD1  | 2:E:583:ARG:HG3   | 2.43                     | 0.54              |
| 7:R:22:GLY:HA3   | 8:S:117:LYS:NZ    | 2.23                     | 0.54              |
| 3:G:389:TRP:NE1  | 3:G:401:CYS:SG    | 2.76                     | 0.54              |
| 10:O:327:PRO:HD3 | 10:O:382:TRP:CD1  | 2.43                     | 0.54              |
| 2:E:643:ILE:HG22 | 2:E:644:SER:H     | 1.72                     | 0.54              |
| 3:G:412:ALA:O    | 3:G:430:ASP:N     | 2.34                     | 0.54              |
| 4:W:100:LEU:HD11 | 6:X:58:LEU:HD13   | 1.89                     | 0.54              |
| 1:D:631:GLN:HG2  | 2:E:599:TRP:CE2   | 2.43                     | 0.54              |
| 2:E:39:LYS:NZ    | 3:G:393:VAL:O     | 2.40                     | 0.54              |
| 2:E:105:ALA:O    | 3:G:169:ARG:NH2   | 2.41                     | 0.54              |
| 2:E:331:GLN:O    | 2:E:469:ARG:NH2   | 2.41                     | 0.54              |
| 3:G:379:LEU:O    | 3:G:387:TYR:N     | 2.33                     | 0.54              |
| 2:E:296:LEU:HD23 | 2:E:296:LEU:H     | 1.73                     | 0.53              |
| 1:D:562:ASN:OD1  | 1:D:563:ARG:N     | 2.41                     | 0.53              |
| 3:G:90:GLU:HG3   | 3:G:92:HIS:H      | 1.73                     | 0.53              |
| 3:G:127:HIS:HB2  | 3:G:131:GLU:HB3   | 1.90                     | 0.53              |
| 3:G:384:GLY:HA2  | 3:G:413:ILE:HG12  | 1.91                     | 0.53              |
| 5:H:54:DC:N4     | 9:T:173:DA:H61    | 2.05                     | 0.53              |
| 6:J:75:HIS:HB2   | 8:V:93:THR:HG21   | 1.91                     | 0.53              |
| 2:E:599:TRP:HA   | 2:E:613:ARG:NH2   | 2.23                     | 0.53              |
| 5:H:77:DG:H1     | 9:T:150:DC:H42    | 1.57                     | 0.53              |
| 4:I:39:HIS:NE2   | 5:H:183:DC:H4'    | 2.23                     | 0.53              |
| 4:I:57:SER:O     | 6:J:40:ARG:NH2    | 2.38                     | 0.53              |
| 9:T:17:DC:H1'    | 9:T:18:DG:H5'     | 1.89                     | 0.53              |
| 3:G:406:HIS:HB2  | 3:G:437:TRP:HZ2   | 1.74                     | 0.53              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 5:H:150:DC:H1'   | 5:H:151:DG:C8     | 2.44                     | 0.53              |
| 2:E:659:ARG:NH1  | 2:E:681:ASP:OD2   | 2.42                     | 0.53              |
| 2:E:700:CYS:HA   | 2:E:717:ALA:HA    | 1.90                     | 0.53              |
| 1:D:607:ASN:HB2  | 1:D:610:GLU:HG2   | 1.91                     | 0.53              |
| 2:E:570:GLN:HB2  | 2:E:606:CYS:HA    | 1.89                     | 0.53              |
| 2:E:657:ASP:OD1  | 4:I:26:ARG:NH1    | 2.31                     | 0.53              |
| 3:G:153:THR:HG21 | 3:G:174:ILE:HD11  | 1.91                     | 0.53              |
| 3:G:169:ARG:NH1  | 3:G:171:ILE:HD12  | 2.24                     | 0.53              |
| 10:O:271:ALA:HB3 | 10:O:276:VAL:HG21 | 1.90                     | 0.53              |
| 3:G:80:TYR:HA    | 3:G:402:THR:HG21  | 1.91                     | 0.53              |
| 3:G:164:ALA:HA   | 3:G:174:ILE:HA    | 1.91                     | 0.53              |
| 9:T:76:DC:H2''   | 9:T:77:DG:C8      | 2.44                     | 0.53              |
| 1:D:532:ARG:HH21 | 10:O:93:PHE:HZ    | 1.57                     | 0.52              |
| 5:H:66:DC:H2''   | 5:H:67:DT:C5      | 2.44                     | 0.52              |
| 5:H:139:DA:H2''  | 5:H:140:DG:C8     | 2.44                     | 0.52              |
| 10:O:274:ALA:HB3 | 10:O:295:ASP:HB2  | 1.91                     | 0.52              |
| 3:G:96:LEU:HG    | 3:G:432:ALA:HA    | 1.90                     | 0.52              |
| 9:T:68:DC:H4'    | 9:T:69:DT:OP1     | 2.08                     | 0.52              |
| 10:O:177:GLN:N   | 10:O:199:ASP:OD2  | 2.42                     | 0.52              |
| 1:D:499:TYR:HB3  | 1:D:506:ILE:HD11  | 1.90                     | 0.52              |
| 4:W:125:GLN:HA   | 4:W:134:ARG:NH1   | 2.24                     | 0.52              |
| 10:O:316:HIS:NE2 | 10:O:335:SER:OG   | 2.43                     | 0.52              |
| 1:D:643:TYR:O    | 1:D:647:ILE:HG12  | 2.09                     | 0.52              |
| 7:R:57:TYR:HB2   | 8:S:110:GLU:HG3   | 1.90                     | 0.52              |
| 10:O:170:ASP:HA  | 10:O:215:LYS:HE2  | 1.91                     | 0.52              |
| 10:O:313:PHE:HB3 | 10:O:345:TRP:CZ2  | 2.44                     | 0.52              |
| 1:D:575:ARG:NH1  | 1:D:578:GLU:OE1   | 2.41                     | 0.52              |
| 2:E:221:ASP:HA   | 2:E:224:PHE:CD2   | 2.43                     | 0.52              |
| 2:E:224:PHE:HB3  | 2:E:237:ALA:H     | 1.75                     | 0.52              |
| 11:Y:225:THR:N   | 11:Y:242:HIS:O    | 2.42                     | 0.52              |
| 5:H:101:DA:OP2   | 6:J:30:THR:OG1    | 2.28                     | 0.52              |
| 2:E:507:HIS:ND1  | 2:E:559:GLN:O     | 2.41                     | 0.52              |
| 5:H:166:DC:N3    | 9:T:60:DA:N6      | 2.58                     | 0.52              |
| 1:D:607:ASN:ND2  | 2:E:261:THR:O     | 2.36                     | 0.52              |
| 3:G:252:MET:SD   | 3:G:262:LEU:HB3   | 2.50                     | 0.52              |
| 4:I:48:LEU:HB3   | 4:I:52:ARG:NH2    | 2.24                     | 0.52              |
| 2:E:683:THR:O    | 2:E:690:ARG:NH1   | 2.43                     | 0.51              |
| 2:E:704:VAL:HG22 | 2:E:713:ILE:HG22  | 1.92                     | 0.51              |
| 5:H:35:DT:H2''   | 5:H:36:DG:C8      | 2.45                     | 0.51              |
| 7:R:104:GLN:HE22 | 8:S:54:LYS:NZ     | 2.07                     | 0.51              |
| 5:H:194:DC:H42   | 9:T:32:DC:H42     | 1.56                     | 0.51              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:250:LEU:N    | 1:D:299:MET:O    | 2.36                     | 0.51              |
| 4:I:46:VAL:HB    | 9:T:123:DG:OP2   | 2.10                     | 0.51              |
| 10:O:43:PRO:O    | 10:O:71:HIS:N    | 2.43                     | 0.51              |
| 6:J:35:ARG:HG3   | 6:J:46:ILE:HD12  | 1.90                     | 0.51              |
| 9:T:69:DT:H2''   | 9:T:70:DA:C8     | 2.46                     | 0.51              |
| 4:W:107:THR:HG21 | 4:W:124:ILE:HG12 | 1.92                     | 0.51              |
| 10:O:68:LEU:HB2  | 10:O:80:VAL:HG13 | 1.93                     | 0.51              |
| 1:D:311:LEU:HD12 | 1:D:313:GLY:H    | 1.75                     | 0.51              |
| 1:D:629:ASP:HA   | 1:D:632:MET:HE1  | 1.93                     | 0.51              |
| 2:E:273:GLN:HA   | 2:E:446:ARG:HD2  | 1.91                     | 0.51              |
| 2:E:475:ARG:HA   | 2:E:478:GLU:HB2  | 1.93                     | 0.51              |
| 7:U:100:VAL:HG12 | 6:X:96:THR:OG1   | 2.10                     | 0.51              |
| 6:X:39:ARG:NH1   | 6:X:43:VAL:O     | 2.44                     | 0.51              |
| 2:E:29:LEU:HA    | 2:E:32:PHE:CE2   | 2.46                     | 0.51              |
| 2:E:500:LYS:HG3  | 2:E:502:ARG:H    | 1.75                     | 0.51              |
| 2:E:503:LEU:O    | 2:E:507:HIS:N    | 2.33                     | 0.51              |
| 9:T:66:DC:H2''   | 9:T:67:DC:C5     | 2.45                     | 0.51              |
| 2:E:236:THR:HG23 | 2:E:239:GLU:H    | 1.75                     | 0.51              |
| 2:E:628:GLY:HA3  | 12:E:801:SAH:C   | 2.40                     | 0.51              |
| 3:G:406:HIS:NE2  | 3:G:408:LYS:HB2  | 2.25                     | 0.51              |
| 5:H:191:DC:H2''  | 5:H:192:DG:C8    | 2.45                     | 0.51              |
| 4:W:83:ARG:O     | 6:X:80:THR:HA    | 2.10                     | 0.51              |
| 2:E:437:TRP:HE1  | 2:E:466:LYS:HG2  | 1.76                     | 0.51              |
| 2:E:643:ILE:HG12 | 2:E:716:PHE:HA   | 1.92                     | 0.51              |
| 4:I:37:LYS:HD2   | 4:I:38:PRO:HD2   | 1.92                     | 0.51              |
| 7:R:25:PHE:CD2   | 7:R:56:GLU:HG2   | 2.45                     | 0.51              |
| 9:T:172:DG:H4'   | 7:U:77:ARG:HH21  | 1.76                     | 0.51              |
| 4:W:116:ARG:NH2  | 4:W:123:ASP:OD1  | 2.43                     | 0.51              |
| 7:R:80:PRO:HD3   | 8:S:55:ALA:HB2   | 1.94                     | 0.50              |
| 2:E:54:GLU:O     | 2:E:58:GLN:NE2   | 2.26                     | 0.50              |
| 3:G:237:ASP:HB2  | 3:G:257:ASP:HB2  | 1.92                     | 0.50              |
| 5:H:79:DA:OP1    | 8:V:84:SER:OG    | 2.23                     | 0.50              |
| 7:U:79:ILE:HG13  | 7:U:80:PRO:HD2   | 1.92                     | 0.50              |
| 10:O:118:GLU:O   | 10:O:159:SER:OG  | 2.29                     | 0.50              |
| 3:G:82:PHE:HB2   | 3:G:404:LEU:HD21 | 1.92                     | 0.50              |
| 3:G:90:GLU:HB3   | 3:G:432:ALA:HB1  | 1.94                     | 0.50              |
| 3:G:222:THR:HG21 | 3:G:278:TYR:HA   | 1.93                     | 0.50              |
| 3:G:386:LEU:HB2  | 3:G:404:LEU:HB2  | 1.93                     | 0.50              |
| 3:G:387:TYR:HB3  | 3:G:389:TRP:CZ3  | 2.46                     | 0.50              |
| 5:H:25:DA:N6     | 9:T:201:DA:N1    | 2.59                     | 0.50              |
| 9:T:124:DC:H2''  | 9:T:125:DG:H8    | 1.77                     | 0.50              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 7:U:31:HIS:HD1   | 7:U:48:PRO:HG3    | 1.75                     | 0.50              |
| 1:D:652:LEU:H    | 1:D:652:LEU:HD23  | 1.75                     | 0.50              |
| 9:T:77:DG:H4'    | 9:T:78:DT:H5'     | 1.94                     | 0.50              |
| 3:G:230:GLY:O    | 3:G:295:HIS:ND1   | 2.27                     | 0.50              |
| 5:H:166:DC:H1'   | 5:H:167:DT:C6     | 2.47                     | 0.50              |
| 8:V:40:LYS:O     | 8:V:43:LYS:N      | 2.44                     | 0.50              |
| 8:V:76:ARG:O     | 8:V:80:TYR:N      | 2.39                     | 0.50              |
| 10:O:350:ILE:HA  | 10:O:365:GLU:HB3  | 1.94                     | 0.50              |
| 3:G:239:VAL:HA   | 3:G:255:GLY:HA3   | 1.93                     | 0.50              |
| 1:D:569:ASP:OD1  | 1:D:570:THR:N     | 2.45                     | 0.50              |
| 3:G:206:LEU:HB3  | 3:G:220:ILE:HD11  | 1.94                     | 0.50              |
| 3:G:311:CYS:O    | 3:G:322:LYS:N     | 2.43                     | 0.50              |
| 3:G:332:LYS:HD3  | 3:G:336:MET:HA    | 1.93                     | 0.50              |
| 7:R:79:ILE:HG22  | 7:R:81:ARG:H      | 1.76                     | 0.50              |
| 7:U:58:LEU:HD23  | 8:V:66:VAL:HG11   | 1.94                     | 0.50              |
| 4:W:109:LEU:O    | 4:W:113:HIS:N     | 2.40                     | 0.50              |
| 2:E:108:PRO:HG2  | 2:E:629:TRP:CE2   | 2.46                     | 0.50              |
| 3:G:169:ARG:HH12 | 3:G:171:ILE:HD12  | 1.76                     | 0.50              |
| 4:I:40:ARG:HD2   | 9:T:124:DC:H5''   | 1.94                     | 0.50              |
| 9:T:77:DG:H1'    | 9:T:78:DT:C6      | 2.47                     | 0.50              |
| 9:T:108:DT:H2''  | 9:T:109:DA:C8     | 2.47                     | 0.50              |
| 1:D:156:HIS:CE1  | 1:D:235:ASN:HB2   | 2.47                     | 0.49              |
| 9:T:171:DA:H2''  | 9:T:172:DG:C8     | 2.47                     | 0.49              |
| 10:O:404:MET:SD  | 10:O:404:MET:N    | 2.84                     | 0.49              |
| 5:H:52:DT:H2'    | 5:H:53:DA:C8      | 2.48                     | 0.49              |
| 5:H:106:DG:H2''  | 5:H:107:DG:N7     | 2.27                     | 0.49              |
| 7:R:63:LEU:HA    | 7:R:66:ALA:HB3    | 1.94                     | 0.49              |
| 1:D:295:PHE:HA   | 1:D:320:GLN:O     | 2.13                     | 0.49              |
| 2:E:470:GLN:O    | 2:E:474:PHE:HB2   | 2.12                     | 0.49              |
| 10:O:178:LYS:NZ  | 10:O:199:ASP:OD1  | 2.29                     | 0.49              |
| 2:E:649:GLU:O    | 2:E:680:VAL:HA    | 2.13                     | 0.49              |
| 5:H:161:DG:OP1   | 8:S:37:TYR:OH     | 2.24                     | 0.49              |
| 5:H:185:DA:N6    | 9:T:42:DC:H42     | 2.10                     | 0.49              |
| 11:Y:229:LYS:HG2 | 11:Y:239:LEU:HD22 | 1.94                     | 0.49              |
| 1:D:249:SER:HA   | 1:D:300:THR:HA    | 1.94                     | 0.49              |
| 2:E:99:LYS:HB3   | 3:G:138:TYR:CD1   | 2.47                     | 0.49              |
| 2:E:437:TRP:NE1  | 2:E:466:LYS:HG2   | 2.27                     | 0.49              |
| 2:E:619:LEU:HD13 | 2:E:631:ILE:HG21  | 1.93                     | 0.49              |
| 3:G:99:VAL:O     | 3:G:417:SER:OG    | 2.20                     | 0.49              |
| 3:G:207:LEU:HA   | 3:G:217:LEU:HA    | 1.94                     | 0.49              |
| 10:O:173:LEU:HB3 | 10:O:205:TRP:CE2  | 2.47                     | 0.49              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 11:Y:205:PHE:HE1 | 11:Y:280:LEU:HD12 | 1.78                     | 0.49              |
| 3:G:114:ALA:HA   | 3:G:123:LEU:HA    | 1.95                     | 0.49              |
| 3:G:171:ILE:HG12 | 3:G:187:VAL:HG23  | 1.94                     | 0.49              |
| 1:D:481:HIS:CG   | 1:D:482:PRO:HD2   | 2.47                     | 0.49              |
| 7:U:73:ASN:HB3   | 7:U:82:HIS:HE1    | 1.78                     | 0.49              |
| 1:D:631:GLN:O    | 1:D:635:ALA:N     | 2.40                     | 0.49              |
| 2:E:636:PRO:HB3  | 2:E:722:GLN:HA    | 1.94                     | 0.49              |
| 5:H:56:DT:H1'    | 5:H:57:DG:C5      | 2.47                     | 0.49              |
| 7:R:88:ARG:HB2   | 7:R:108:LEU:HD21  | 1.94                     | 0.49              |
| 1:D:627:ILE:HD13 | 2:E:612:GLN:NE2   | 2.28                     | 0.49              |
| 3:G:304:ILE:HD11 | 3:G:350:VAL:HG11  | 1.94                     | 0.49              |
| 5:H:141:DA:H2''  | 5:H:142:DG:C8     | 2.48                     | 0.49              |
| 4:W:120:MET:N    | 4:W:123:ASP:OD2   | 2.35                     | 0.49              |
| 10:O:215:LYS:HD3 | 10:O:215:LYS:O    | 2.11                     | 0.49              |
| 2:E:84:SER:HA    | 2:E:95:VAL:HA     | 1.95                     | 0.49              |
| 3:G:113:PHE:CZ   | 3:G:124:TYR:HB2   | 2.48                     | 0.49              |
| 7:R:88:ARG:NH2   | 7:R:100:VAL:O     | 2.46                     | 0.49              |
| 1:D:565:TYR:HA   | 2:E:622:ALA:HB2   | 1.94                     | 0.48              |
| 3:G:82:PHE:CE1   | 3:G:439:ARG:HB2   | 2.47                     | 0.48              |
| 4:I:118:THR:N    | 5:H:110:DA:OP1    | 2.42                     | 0.48              |
| 1:D:458:ARG:NE   | 10:O:357:GLU:OE2  | 2.43                     | 0.48              |
| 5:H:73:DC:H2'    | 5:H:74:DT:C6      | 2.48                     | 0.48              |
| 5:H:121:DG:H2'   | 5:H:122:DT:H71    | 1.95                     | 0.48              |
| 9:T:127:DT:H1'   | 9:T:128:DT:C5     | 2.47                     | 0.48              |
| 7:U:79:ILE:O     | 7:U:82:HIS:N      | 2.46                     | 0.48              |
| 1:D:606:VAL:HG13 | 1:D:610:GLU:HG3   | 1.94                     | 0.48              |
| 2:E:622:ALA:HB3  | 2:E:632:PHE:CE1   | 2.48                     | 0.48              |
| 10:O:278:CYS:HB2 | 10:O:323:VAL:HG22 | 1.95                     | 0.48              |
| 2:E:695:SER:HB3  | 2:E:698:PRO:HB3   | 1.95                     | 0.48              |
| 3:G:86:ASN:HB3   | 3:G:436:ARG:HD3   | 1.94                     | 0.48              |
| 4:I:67:PHE:HD2   | 4:I:93:GLN:HG3    | 1.75                     | 0.48              |
| 5:H:185:DA:H61   | 9:T:42:DC:H42     | 1.61                     | 0.48              |
| 9:T:191:DC:H2''  | 9:T:192:DA:C8     | 2.49                     | 0.48              |
| 10:O:169:PRO:HG2 | 10:O:215:LYS:HZ3  | 1.78                     | 0.48              |
| 1:D:627:ILE:HD13 | 2:E:612:GLN:HE21  | 1.78                     | 0.48              |
| 1:D:666:PHE:HB2  | 1:D:668:LEU:HD23  | 1.95                     | 0.48              |
| 2:E:180:GLN:HE22 | 2:E:223:ILE:HG21  | 1.79                     | 0.48              |
| 3:G:199:HIS:CE1  | 3:G:201:ARG:HB2   | 2.49                     | 0.48              |
| 4:I:68:GLN:HG2   | 4:I:72:ARG:HE     | 1.79                     | 0.48              |
| 4:I:72:ARG:HH12  | 5:H:90:DT:P       | 2.36                     | 0.48              |
| 10:O:120:LYS:HB2 | 10:O:161:PRO:HD3  | 1.93                     | 0.48              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 10:O:253:MET:SD   | 10:O:268:SER:OG  | 2.70                     | 0.48              |
| 10:O:302:ASP:OD1  | 10:O:303:LEU:N   | 2.47                     | 0.48              |
| 10:O:380:PHE:HA   | 10:O:392:SER:HA  | 1.96                     | 0.48              |
| 1:D:567:HIS:HB3   | 1:D:569:ASP:OD1  | 2.12                     | 0.48              |
| 2:E:52:ARG:HD2    | 3:G:246:LEU:HD12 | 1.95                     | 0.48              |
| 2:E:287:ARG:HA    | 2:E:290:PHE:HA   | 1.95                     | 0.48              |
| 2:E:670:PHE:HD2   | 2:E:683:THR:HA   | 1.79                     | 0.48              |
| 5:H:175:DG:O6     | 9:T:51:DC:N4     | 2.46                     | 0.48              |
| 4:W:37:LYS:HB3    | 4:W:38:PRO:HD3   | 1.96                     | 0.48              |
| 10:O:298:VAL:O    | 10:O:313:PHE:N   | 2.44                     | 0.48              |
| 10:O:318:ASP:CG   | 10:O:319:GLU:H   | 2.17                     | 0.48              |
| 3:G:219:ASN:O     | 3:G:223:ASP:N    | 2.46                     | 0.48              |
| 3:G:260:LEU:O     | 3:G:300:SER:HA   | 2.13                     | 0.48              |
| 6:J:78:ARG:HH22   | 6:J:85:ASP:CG    | 2.13                     | 0.48              |
| 9:T:150:DC:H4'    | 9:T:151:DC:OP1   | 2.10                     | 0.48              |
| 6:X:68:ASP:OD2    | 6:X:92:ARG:NH2   | 2.42                     | 0.48              |
| 3:G:245:ASP:HB3   | 3:G:314:TRP:CD2  | 2.48                     | 0.48              |
| 4:I:23:LYS:NZ     | 4:I:26:ARG:HD2   | 2.29                     | 0.48              |
| 1:D:91:GLU:HB3    | 1:D:95:GLN:NE2   | 2.29                     | 0.48              |
| 7:U:93:LEU:HD22   | 8:V:103:LEU:HD11 | 1.96                     | 0.48              |
| 1:D:510:PRO:HG2   | 3:G:183:ILE:HG23 | 1.94                     | 0.48              |
| 2:E:160:ASP:HA    | 3:G:306:ARG:HH21 | 1.79                     | 0.48              |
| 5:H:45:DA:H2'     | 5:H:46:DT:H71    | 1.95                     | 0.48              |
| 5:H:86:DC:H2''    | 5:H:87:DC:C5     | 2.49                     | 0.48              |
| 7:R:64:GLU:HA     | 8:S:46:HIS:CE1   | 2.47                     | 0.48              |
| 9:T:48:DA:H2'     | 9:T:49:DT:C6     | 2.49                     | 0.48              |
| 9:T:168:DG:H2''   | 9:T:169:DC:C6    | 2.49                     | 0.48              |
| 10:O:49:TRP:CG    | 10:O:383:ASN:HB3 | 2.48                     | 0.47              |
| 2:E:224:PHE:HB3   | 2:E:236:THR:HA   | 1.96                     | 0.47              |
| 2:E:598:HIS:ND1   | 2:E:601:SER:HB2  | 2.28                     | 0.47              |
| 4:W:92:LEU:O      | 4:W:96:SER:N     | 2.46                     | 0.47              |
| 11:Y:293:LEU:HG   | 11:Y:294:LYS:HG2 | 1.96                     | 0.47              |
| 7:R:71:ARG:O      | 7:R:74:LYS:HD2   | 2.14                     | 0.47              |
| 3:G:320:LEU:HA    | 3:G:330:CYS:HA   | 1.95                     | 0.47              |
| 3:G:358:TYR:HE2   | 3:G:361:CYS:HB3  | 1.78                     | 0.47              |
| 5:H:79:DA:H2''    | 5:H:80:DG:C8     | 2.49                     | 0.47              |
| 8:V:61:SER:OG     | 6:X:101:GLY:O    | 2.21                     | 0.47              |
| 10:O:393:VAL:HG13 | 10:O:399:MET:HE3 | 1.97                     | 0.47              |
| 2:E:171:PHE:HE2   | 2:E:243:LYS:HZ3  | 1.62                     | 0.47              |
| 4:I:86:SER:OG     | 5:H:89:DT:OP2    | 2.23                     | 0.47              |
| 5:H:40:DA:H61     | 9:T:187:DT:H3    | 1.63                     | 0.47              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 10:O:175:GLY:HA3  | 10:O:219:ALA:HB2  | 1.97                     | 0.47              |
| 5:H:165:DC:H2''   | 5:H:166:DC:H5'    | 1.96                     | 0.47              |
| 5:H:194:DC:N3     | 9:T:33:DG:N1      | 2.55                     | 0.47              |
| 9:T:163:DC:H2''   | 9:T:164:DA:C8     | 2.48                     | 0.47              |
| 4:W:126:LEU:O     | 4:W:130:ILE:HD12  | 2.14                     | 0.47              |
| 3:G:193:ILE:HA    | 3:G:210:SER:HA    | 1.97                     | 0.47              |
| 3:G:195:GLU:HB3   | 3:G:209:VAL:HB    | 1.97                     | 0.47              |
| 5:H:176:DG:H2''   | 5:H:177:DG:C8     | 2.50                     | 0.47              |
| 7:R:62:ILE:O      | 7:R:66:ALA:N      | 2.45                     | 0.47              |
| 7:R:82:HIS:O      | 7:R:86:ALA:N      | 2.46                     | 0.47              |
| 8:S:93:THR:HG21   | 6:X:75:HIS:HB2    | 1.97                     | 0.47              |
| 9:T:16:DC:C2      | 9:T:17:DC:C4      | 3.03                     | 0.47              |
| 9:T:90:DG:C4      | 9:T:91:DC:C5      | 3.03                     | 0.47              |
| 9:T:122:DC:H4'    | 9:T:123:DG:OP1    | 2.14                     | 0.47              |
| 7:U:77:ARG:HA     | 8:V:50:GLY:O      | 2.15                     | 0.47              |
| 2:E:681:ASP:OD1   | 2:E:681:ASP:N     | 2.46                     | 0.47              |
| 6:J:73:THR:HG21   | 6:J:81:VAL:HA     | 1.96                     | 0.47              |
| 9:T:149:DC:H2''   | 9:T:150:DC:C6     | 2.49                     | 0.47              |
| 4:W:121:PRO:HG2   | 6:X:49:LEU:HD23   | 1.95                     | 0.47              |
| 10:O:194:LEU:HD13 | 10:O:233:VAL:HG22 | 1.96                     | 0.47              |
| 3:G:197:LYS:HE2   | 3:G:243:ASP:HA    | 1.97                     | 0.47              |
| 10:O:343:ASN:HD22 | 10:O:369:ILE:HG12 | 1.79                     | 0.47              |
| 3:G:90:GLU:N      | 3:G:432:ALA:O     | 2.41                     | 0.47              |
| 4:I:129:ARG:HD2   | 4:W:109:LEU:HD11  | 1.96                     | 0.47              |
| 9:T:152:DC:H2''   | 9:T:153:DA:H8     | 1.80                     | 0.47              |
| 10:O:327:PRO:HD3  | 10:O:382:TRP:NE1  | 2.30                     | 0.47              |
| 2:E:696:VAL:HG22  | 2:E:745:GLU:HG3   | 1.98                     | 0.46              |
| 2:E:704:VAL:HG23  | 4:I:29:ALA:HB3    | 1.95                     | 0.46              |
| 9:T:17:DC:C4      | 9:T:18:DG:C6      | 3.03                     | 0.46              |
| 8:V:73:GLU:OE2    | 8:V:76:ARG:NH2    | 2.48                     | 0.46              |
| 1:D:431:GLN:NE2   | 1:D:439:ARG:HH12  | 2.13                     | 0.46              |
| 2:E:333:LEU:HD12  | 2:E:469:ARG:NH1   | 2.30                     | 0.46              |
| 5:H:79:DA:H61     | 9:T:148:DC:H42    | 1.63                     | 0.46              |
| 5:H:98:DA:C6      | 5:H:99:DA:C6      | 3.03                     | 0.46              |
| 5:H:108:DG:N2     | 9:T:120:DC:O2     | 2.48                     | 0.46              |
| 9:T:104:DC:H4'    | 9:T:105:DA:OP1    | 2.14                     | 0.46              |
| 1:D:478:TYR:OH    | 1:D:484:GLY:O     | 2.27                     | 0.46              |
| 1:D:582:ASP:OD1   | 1:D:582:ASP:N     | 2.44                     | 0.46              |
| 1:D:589:PRO:HG2   | 2:E:116:LEU:HA    | 1.96                     | 0.46              |
| 2:E:673:ASN:HB2   | 4:I:26:ARG:HB3    | 1.97                     | 0.46              |
| 2:E:734:SER:O     | 2:E:738:ALA:N     | 2.47                     | 0.46              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 5:H:206:DT:O2     | 9:T:22:DG:N2      | 2.48                     | 0.46              |
| 9:T:133:DC:H2''   | 9:T:134:DG:O5'    | 2.15                     | 0.46              |
| 9:T:170:DC:H2''   | 9:T:171:DA:N9     | 2.30                     | 0.46              |
| 11:Y:191:ASP:OD1  | 11:Y:192:ALA:N    | 2.48                     | 0.46              |
| 2:E:524:ASN:HA    | 2:E:711:HIS:CD2   | 2.51                     | 0.46              |
| 2:E:635:ASP:N     | 2:E:635:ASP:OD1   | 2.47                     | 0.46              |
| 2:E:700:CYS:SG    | 2:E:715:ILE:HG22  | 2.56                     | 0.46              |
| 3:G:371:ASP:OD1   | 3:G:375:LYS:N     | 2.39                     | 0.46              |
| 2:E:98:LEU:HD23   | 3:G:139:VAL:HB    | 1.97                     | 0.46              |
| 1:D:492:ASN:HB3   | 1:D:495:TYR:HB2   | 1.96                     | 0.46              |
| 2:E:249:GLU:O     | 2:E:251:GLN:N     | 2.48                     | 0.46              |
| 3:G:387:TYR:HB3   | 3:G:389:TRP:CH2   | 2.51                     | 0.46              |
| 5:H:164:DG:N2     | 9:T:64:DC:O2      | 2.49                     | 0.46              |
| 5:H:206:DT:O2     | 9:T:21:DA:H2      | 1.98                     | 0.46              |
| 7:U:55:LEU:HD22   | 8:V:63:VAL:HG13   | 1.98                     | 0.46              |
| 10:O:237:LEU:HG   | 10:O:281:PHE:HB2  | 1.98                     | 0.46              |
| 1:D:218:ASP:OD1   | 1:D:218:ASP:N     | 2.49                     | 0.46              |
| 2:E:701:TYR:CE1   | 2:E:703:LYS:HG3   | 2.51                     | 0.46              |
| 5:H:162:DC:H2''   | 5:H:163:DG:C8     | 2.51                     | 0.46              |
| 2:E:713:ILE:O     | 2:E:713:ILE:HG13  | 2.15                     | 0.46              |
| 3:G:213:HIS:CD2   | 3:G:238:GLU:HA    | 2.51                     | 0.46              |
| 3:G:261:LYS:HA    | 3:G:299:PHE:O     | 2.16                     | 0.46              |
| 8:V:42:LEU:O      | 8:V:46:HIS:N      | 2.45                     | 0.46              |
| 10:O:138:CYS:HA   | 10:O:154:TYR:CZ   | 2.51                     | 0.46              |
| 5:H:54:DC:H42     | 9:T:173:DA:N6     | 2.09                     | 0.46              |
| 9:T:168:DG:H2''   | 9:T:169:DC:N1     | 2.31                     | 0.46              |
| 10:O:346:ASP:N    | 10:O:365:GLU:O    | 2.34                     | 0.46              |
| 11:Y:214:LEU:HD12 | 11:Y:221:VAL:HG21 | 1.97                     | 0.46              |
| 7:U:70:ALA:HA     | 7:U:82:HIS:CE1    | 2.51                     | 0.46              |
| 1:D:528:ILE:HB    | 1:D:557:TYR:HB3   | 1.97                     | 0.45              |
| 2:E:329:CYS:HA    | 2:E:468:CYS:HB3   | 1.98                     | 0.45              |
| 2:E:625:ASP:HB2   | 2:E:746:ARG:NH1   | 2.31                     | 0.45              |
| 5:H:52:DT:H2'     | 5:H:53:DA:H8      | 1.80                     | 0.45              |
| 5:H:103:DG:H5'    | 5:H:103:DG:H8     | 1.81                     | 0.45              |
| 7:R:97:LEU:HB3    | 7:R:100:VAL:CG1   | 2.46                     | 0.45              |
| 3:G:83:LYS:HD3    | 3:G:440:LEU:HD21  | 1.98                     | 0.45              |
| 5:H:118:DT:H2''   | 5:H:119:DA:N7     | 2.32                     | 0.45              |
| 10:O:43:PRO:HG2   | 10:O:71:HIS:HB3   | 1.97                     | 0.45              |
| 1:D:488:ASP:OD1   | 1:D:488:ASP:N     | 2.48                     | 0.45              |
| 3:G:153:THR:HB    | 3:G:162:LEU:HB2   | 1.98                     | 0.45              |
| 7:U:26:PRO:HD3    | 8:V:37:TYR:CG     | 2.51                     | 0.45              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 5:H:122:DT:H3'   | 4:W:46:VAL:HG21  | 1.98                     | 0.45              |
| 10:O:375:ALA:HB1 | 10:O:395:GLU:HB2 | 1.98                     | 0.45              |
| 1:D:161:PHE:HZ   | 1:D:231:ALA:HB2  | 1.82                     | 0.45              |
| 3:G:311:CYS:SG   | 3:G:367:ARG:HA   | 2.56                     | 0.45              |
| 8:S:94:ALA:O     | 8:S:98:LEU:HG    | 2.16                     | 0.45              |
| 9:T:20:DC:C4     | 9:T:21:DA:C6     | 3.04                     | 0.45              |
| 10:O:300:LEU:HG  | 10:O:310:LEU:HB2 | 1.99                     | 0.45              |
| 5:H:76:DG:H1'    | 5:H:77:DG:C4     | 2.52                     | 0.45              |
| 9:T:134:DG:C5    | 9:T:135:DC:C4    | 3.04                     | 0.45              |
| 10:O:318:ASP:HB3 | 10:O:339:ASP:HB3 | 1.99                     | 0.45              |
| 1:D:565:TYR:CG   | 2:E:620:LEU:HD23 | 2.52                     | 0.45              |
| 2:E:646:TYR:HB3  | 2:E:713:ILE:HD11 | 1.99                     | 0.45              |
| 3:G:267:SER:O    | 3:G:270:MET:HG3  | 2.17                     | 0.45              |
| 5:H:211:DG:N2    | 9:T:17:DC:N3     | 2.65                     | 0.45              |
| 6:J:30:THR:OG1   | 6:J:32:PRO:HD2   | 2.17                     | 0.45              |
| 1:D:161:PHE:CZ   | 1:D:231:ALA:HB2  | 2.52                     | 0.45              |
| 1:D:311:LEU:HD12 | 1:D:313:GLY:N    | 2.31                     | 0.45              |
| 1:D:632:MET:CE   | 1:D:668:LEU:HB2  | 2.47                     | 0.45              |
| 2:E:737:ASP:HA   | 2:E:740:LYS:HB3  | 1.99                     | 0.45              |
| 3:G:379:LEU:N    | 3:G:387:TYR:O    | 2.50                     | 0.45              |
| 4:W:51:ILE:HD11  | 6:X:39:ARG:HD2   | 1.98                     | 0.45              |
| 7:U:92:GLU:OE2   | 8:V:102:GLU:N    | 2.48                     | 0.45              |
| 4:W:47:ALA:O     | 4:W:51:ILE:HG12  | 2.17                     | 0.45              |
| 1:D:494:CYS:SG   | 11:Y:180:ARG:NH2 | 2.90                     | 0.45              |
| 5:H:48:DT:H2''   | 5:H:49:DA:C8     | 2.51                     | 0.45              |
| 5:H:71:DG:C8     | 5:H:71:DG:H5'    | 2.52                     | 0.45              |
| 5:H:98:DA:H61    | 9:T:129:DT:H3    | 1.65                     | 0.45              |
| 5:H:99:DA:H2''   | 5:H:100:DA:H8    | 1.82                     | 0.45              |
| 5:H:208:DA:H2    | 9:T:19:DT:H3     | 1.65                     | 0.45              |
| 8:V:53:SER:O     | 8:V:57:SER:N     | 2.46                     | 0.45              |
| 1:D:163:GLY:HA2  | 1:D:217:PRO:HG2  | 1.99                     | 0.44              |
| 2:E:565:CYS:HB3  | 2:E:590:CYS:CB   | 2.47                     | 0.44              |
| 2:E:670:PHE:HB2  | 2:E:683:THR:OG1  | 2.17                     | 0.44              |
| 5:H:39:DT:H2''   | 5:H:40:DA:C8     | 2.51                     | 0.44              |
| 5:H:174:DC:H2'   | 5:H:175:DG:C8    | 2.52                     | 0.44              |
| 9:T:162:DG:OP1   | 8:V:37:TYR:OH    | 2.19                     | 0.44              |
| 9:T:176:DT:O4    | 9:T:177:DA:N6    | 2.50                     | 0.44              |
| 1:D:101:ARG:HD3  | 1:D:452:TRP:O    | 2.17                     | 0.44              |
| 6:J:98:TYR:CZ    | 7:R:100:VAL:HG21 | 2.52                     | 0.44              |
| 8:S:38:VAL:HG11  | 8:S:59:MET:HG3   | 2.00                     | 0.44              |
| 1:D:86:PHE:CE1   | 1:D:434:TYR:HB2  | 2.51                     | 0.44              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:E:21:SER:O     | 2:E:25:ARG:HG2   | 2.16                     | 0.44              |
| 5:H:105:DG:C2    | 5:H:106:DG:C2    | 3.05                     | 0.44              |
| 6:J:31:LYS:HG3   | 6:J:51:TYR:CE1   | 2.52                     | 0.44              |
| 6:J:73:THR:HG21  | 6:J:81:VAL:HG22  | 1.98                     | 0.44              |
| 7:U:103:ALA:HB1  | 4:W:94:GLU:OE1   | 2.17                     | 0.44              |
| 4:W:88:ALA:HB2   | 6:X:83:ALA:N     | 2.33                     | 0.44              |
| 1:D:597:ILE:HA   | 1:D:600:ILE:HD12 | 2.00                     | 0.44              |
| 3:G:429:CYS:HB3  | 3:G:433:SER:OG   | 2.18                     | 0.44              |
| 9:T:67:DC:H4'    | 9:T:68:DC:OP1    | 2.16                     | 0.44              |
| 9:T:143:DA:H2'   | 9:T:144:DT:H71   | 1.99                     | 0.44              |
| 7:U:29:ARG:CZ    | 8:V:32:GLU:HG2   | 2.48                     | 0.44              |
| 2:E:289:CYS:O    | 2:E:291:LYS:HG3  | 2.17                     | 0.44              |
| 2:E:616:LYS:HG3  | 2:E:617:LYS:O    | 2.17                     | 0.44              |
| 3:G:360:GLN:HG2  | 3:G:381:ASN:HD21 | 1.83                     | 0.44              |
| 4:I:121:PRO:HG2  | 6:J:49:LEU:HB3   | 2.00                     | 0.44              |
| 5:H:71:DG:H5'    | 5:H:71:DG:H8     | 1.82                     | 0.44              |
| 5:H:171:DC:OP1   | 7:R:76:THR:N     | 2.50                     | 0.44              |
| 9:T:97:DC:H2'    | 9:T:98:DT:C6     | 2.53                     | 0.44              |
| 9:T:206:DA:H2''  | 9:T:207:DT:C6    | 2.52                     | 0.44              |
| 4:W:42:ARG:O     | 4:W:45:THR:HG22  | 2.17                     | 0.44              |
| 2:E:120:PHE:O    | 2:E:650:ILE:N    | 2.24                     | 0.44              |
| 9:T:92:DA:C5     | 9:T:93:DC:C4     | 3.06                     | 0.44              |
| 9:T:133:DC:H2'   | 9:T:134:DG:H8    | 1.82                     | 0.44              |
| 9:T:197:DC:H2'   | 9:T:198:DA:C8    | 2.53                     | 0.44              |
| 7:U:29:ARG:NH2   | 8:V:32:GLU:HG2   | 2.32                     | 0.44              |
| 11:Y:259:ARG:HG3 | 11:Y:260:HIS:ND1 | 2.32                     | 0.44              |
| 1:D:663:MET:O    | 1:D:668:LEU:HG   | 2.17                     | 0.44              |
| 2:E:626:VAL:HG22 | 2:E:746:ARG:HD3  | 2.00                     | 0.44              |
| 3:G:147:PHE:HA   | 3:G:167:GLY:HA3  | 1.99                     | 0.44              |
| 4:W:54:TYR:HE2   | 6:X:36:ARG:HD2   | 1.82                     | 0.44              |
| 10:O:126:GLU:O   | 10:O:145:PRO:HD3 | 2.18                     | 0.44              |
| 10:O:147:SER:HB3 | 10:O:176:HIS:O   | 2.17                     | 0.44              |
| 11:Y:225:THR:O   | 11:Y:242:HIS:N   | 2.44                     | 0.44              |
| 1:D:83:HIS:HA    | 1:D:86:PHE:HB3   | 1.99                     | 0.44              |
| 1:D:607:ASN:O    | 1:D:611:LYS:N    | 2.51                     | 0.44              |
| 1:D:647:ILE:HG22 | 1:D:653:CYS:SG   | 2.58                     | 0.44              |
| 2:E:701:TYR:CD1  | 2:E:703:LYS:HG3  | 2.53                     | 0.44              |
| 3:G:384:GLY:HA3  | 3:G:410:GLY:HA2  | 1.99                     | 0.44              |
| 9:T:142:DG:C2    | 9:T:143:DA:C4    | 3.06                     | 0.44              |
| 1:D:659:HIS:O    | 1:D:663:MET:HG2  | 2.17                     | 0.44              |
| 2:E:565:CYS:HB3  | 2:E:590:CYS:HA   | 1.99                     | 0.44              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:E:573:THR:HG23 | 2:E:575:GLN:HG2  | 1.99                     | 0.44              |
| 4:I:44:GLY:N     | 9:T:123:DG:OP1   | 2.43                     | 0.44              |
| 5:H:59:DC:H2'    | 5:H:60:DA:C8     | 2.52                     | 0.44              |
| 9:T:119:DC:H2''  | 9:T:120:DC:C6    | 2.53                     | 0.44              |
| 10:O:287:PHE:HB3 | 10:O:302:ASP:OD1 | 2.18                     | 0.44              |
| 1:D:632:MET:HA   | 1:D:635:ALA:HB3  | 2.00                     | 0.43              |
| 4:I:83:ARG:O     | 6:J:80:THR:HA    | 2.18                     | 0.43              |
| 5:H:79:DA:H61    | 9:T:148:DC:N4    | 2.16                     | 0.43              |
| 3:G:97:PHE:C     | 3:G:415:GLN:HG3  | 2.38                     | 0.43              |
| 3:G:189:HIS:CE1  | 3:G:216:ARG:HB2  | 2.53                     | 0.43              |
| 4:W:82:LEU:HD23  | 4:W:82:LEU:HA    | 1.72                     | 0.43              |
| 6:X:35:ARG:O     | 6:X:39:ARG:HG2   | 2.18                     | 0.43              |
| 2:E:584:GLU:HG2  | 2:E:608:ASN:O    | 2.18                     | 0.43              |
| 5:H:94:DG:H2''   | 5:H:95:DG:H8     | 1.83                     | 0.43              |
| 5:H:171:DC:H3'   | 7:R:75:LYS:NZ    | 2.32                     | 0.43              |
| 9:T:161:DG:C6    | 9:T:162:DG:C6    | 3.07                     | 0.43              |
| 1:D:316:GLU:HB2  | 1:D:356:GLN:NE2  | 2.33                     | 0.43              |
| 2:E:336:ALA:O    | 2:E:472:TYR:OH   | 2.18                     | 0.43              |
| 2:E:660:GLY:HA2  | 2:E:663:TYR:CD1  | 2.54                     | 0.43              |
| 3:G:264:ARG:HH22 | 3:G:343:ILE:HG22 | 1.84                     | 0.43              |
| 3:G:371:ASP:CG   | 3:G:375:LYS:H    | 2.19                     | 0.43              |
| 4:I:63:ARG:HB2   | 4:I:66:PRO:HG2   | 2.00                     | 0.43              |
| 5:H:61:DC:C2     | 5:H:62:DG:C8     | 3.06                     | 0.43              |
| 5:H:76:DG:N2     | 9:T:152:DC:N3    | 2.63                     | 0.43              |
| 7:R:65:LEU:HD23  | 7:R:65:LEU:HA    | 1.82                     | 0.43              |
| 9:T:75:DT:H2''   | 9:T:76:DC:C6     | 2.53                     | 0.43              |
| 7:U:76:THR:O     | 8:V:49:THR:HG23  | 2.19                     | 0.43              |
| 10:O:232:ASP:OD1 | 10:O:233:VAL:N   | 2.51                     | 0.43              |
| 2:E:102:ASN:O    | 3:G:173:ARG:NH1  | 2.48                     | 0.43              |
| 2:E:575:GLN:NE2  | 9:T:44:DG:H4'    | 2.33                     | 0.43              |
| 3:G:380:GLY:HA3  | 3:G:413:ILE:HG21 | 2.00                     | 0.43              |
| 4:I:108:ASN:ND2  | 6:J:43:VAL:HA    | 2.33                     | 0.43              |
| 6:J:102:GLY:O    | 8:S:64:ASN:ND2   | 2.23                     | 0.43              |
| 9:T:80:DG:H2''   | 9:T:81:DA:H8     | 1.83                     | 0.43              |
| 2:E:85:VAL:N     | 2:E:94:GLN:O     | 2.51                     | 0.43              |
| 3:G:271:MET:HA   | 3:G:274:ILE:HB   | 2.00                     | 0.43              |
| 3:G:326:ASN:HA   | 3:G:358:TYR:CZ   | 2.53                     | 0.43              |
| 6:J:31:LYS:HE3   | 6:J:51:TYR:CE2   | 2.54                     | 0.43              |
| 9:T:118:DC:H2''  | 9:T:119:DC:C5    | 2.54                     | 0.43              |
| 11:Y:288:MET:HG2 | 11:Y:289:PRO:HD3 | 1.99                     | 0.43              |
| 1:D:310:LEU:HD23 | 1:D:315:TYR:CE2  | 2.53                     | 0.43              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:D:616:LEU:HG    | 1:D:639:PHE:HZ    | 1.84                     | 0.43              |
| 2:E:502:ARG:HH21  | 9:T:47:DA:H5''    | 1.84                     | 0.43              |
| 2:E:699:ASN:HB3   | 2:E:721:ILE:HD11  | 2.01                     | 0.43              |
| 4:I:61:LEU:HD11   | 6:J:40:ARG:HD2    | 2.00                     | 0.43              |
| 5:H:70:DA:H61     | 9:T:157:DC:H42    | 1.67                     | 0.43              |
| 5:H:130:DA:OP1    | 4:W:66:PRO:HG3    | 2.18                     | 0.43              |
| 8:S:84:SER:O      | 8:S:84:SER:OG     | 2.30                     | 0.43              |
| 9:T:83:DA:C6      | 9:T:84:DG:C6      | 3.06                     | 0.43              |
| 11:Y:230:ARG:NE   | 11:Y:232:GLU:OE2  | 2.51                     | 0.43              |
| 2:E:731:TYR:OH    | 12:E:801:SAH:H8   | 2.18                     | 0.43              |
| 2:E:732:ARG:HD2   | 4:I:30:PRO:HD3    | 1.99                     | 0.43              |
| 3:G:85:VAL:HG21   | 3:G:438:ASP:HB2   | 1.99                     | 0.43              |
| 3:G:404:LEU:HD23  | 3:G:437:TRP:CZ3   | 2.54                     | 0.43              |
| 5:H:85:DC:H2'     | 5:H:86:DC:C2      | 2.53                     | 0.43              |
| 5:H:101:DA:H1'    | 5:H:102:DC:H5'    | 2.01                     | 0.43              |
| 7:U:64:GLU:HG2    | 8:V:46:HIS:HE1    | 1.82                     | 0.43              |
| 4:W:39:HIS:HE1    | 4:W:41:TYR:CD1    | 2.36                     | 0.43              |
| 2:E:458:ALA:O     | 2:E:461:ARG:HG3   | 2.19                     | 0.43              |
| 2:E:470:GLN:N     | 2:E:473:GLU:OE1   | 2.46                     | 0.43              |
| 4:I:58:THR:OG1    | 7:R:104:GLN:O     | 2.33                     | 0.43              |
| 5:H:119:DA:H2''   | 5:H:120:DC:C5     | 2.53                     | 0.43              |
| 10:O:24:TRP:O     | 10:O:28:THR:OG1   | 2.24                     | 0.43              |
| 1:D:628:ALA:HB2   | 2:E:587:PRO:HB2   | 2.00                     | 0.43              |
| 5:H:97:DT:H1'     | 5:H:98:DA:C8      | 2.54                     | 0.43              |
| 5:H:128:DT:H2''   | 5:H:129:DA:C8     | 2.53                     | 0.43              |
| 5:H:149:DA:H2''   | 5:H:150:DC:C5     | 2.54                     | 0.43              |
| 8:S:30:ARG:NH2    | 9:T:69:DT:OP1     | 2.34                     | 0.43              |
| 9:T:61:DG:H4'     | 9:T:62:DG:OP1     | 2.19                     | 0.43              |
| 10:O:236:HIS:HA   | 10:O:281:PHE:HD2  | 1.83                     | 0.43              |
| 1:D:183:THR:OG1   | 1:D:211:LYS:O     | 2.35                     | 0.42              |
| 3:G:216:ARG:HE    | 3:G:228:ILE:HD12  | 1.84                     | 0.42              |
| 3:G:333:PRO:HG2   | 3:G:340:ILE:HG22  | 2.01                     | 0.42              |
| 4:I:131:ARG:HG3   | 4:W:130:ILE:HG22  | 2.01                     | 0.42              |
| 5:H:157:DT:H2''   | 5:H:158:DG:C8     | 2.53                     | 0.42              |
| 5:H:168:DC:H42    | 9:T:59:DG:H1      | 1.67                     | 0.42              |
| 7:U:115:LEU:HD11  | 4:W:108:ASN:HD21  | 1.84                     | 0.42              |
| 1:D:600:ILE:HD13  | 1:D:615:LYS:HG2   | 2.00                     | 0.42              |
| 5:H:144:DT:H2''   | 5:H:145:DG:H5'    | 2.01                     | 0.42              |
| 9:T:119:DC:H2''   | 9:T:120:DC:C5     | 2.54                     | 0.42              |
| 10:O:279:LEU:HD12 | 10:O:291:THR:HG22 | 2.01                     | 0.42              |
| 2:E:60:TRP:HA     | 2:E:63:ARG:HD3    | 2.00                     | 0.42              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:E:612:GLN:OE1  | 2:E:613:ARG:NH1  | 2.46                     | 0.42              |
| 2:E:704:VAL:HA   | 2:E:713:ILE:HA   | 2.01                     | 0.42              |
| 3:G:103:TRP:CH2  | 3:G:372:PHE:HA   | 2.54                     | 0.42              |
| 3:G:235:HIS:CD2  | 3:G:259:SER:HB2  | 2.53                     | 0.42              |
| 4:W:39:HIS:HE1   | 4:W:41:TYR:CE1   | 2.37                     | 0.42              |
| 4:W:68:GLN:NE2   | 4:W:72:ARG:HH21  | 2.17                     | 0.42              |
| 1:D:252:PHE:HB2  | 1:D:297:ALA:HB3  | 2.00                     | 0.42              |
| 2:E:456:PHE:HA   | 2:E:459:ILE:HG12 | 2.02                     | 0.42              |
| 2:E:699:ASN:O    | 2:E:718:LYS:N    | 2.47                     | 0.42              |
| 3:G:150:CYS:HB2  | 3:G:163:LEU:HD21 | 2.01                     | 0.42              |
| 7:R:37:GLY:HA3   | 7:R:39:TYR:CE2   | 2.55                     | 0.42              |
| 7:R:92:GLU:HG3   | 8:S:103:LEU:CD1  | 2.49                     | 0.42              |
| 6:X:66:ILE:HA    | 6:X:69:ALA:HB3   | 2.01                     | 0.42              |
| 10:O:49:TRP:HZ2  | 10:O:391:CYS:HB3 | 1.85                     | 0.42              |
| 10:O:232:ASP:OD2 | 10:O:279:LEU:N   | 2.52                     | 0.42              |
| 1:D:557:TYR:CZ   | 10:O:106:GLY:HA3 | 2.55                     | 0.42              |
| 2:E:108:PRO:HG2  | 2:E:629:TRP:CD2  | 2.55                     | 0.42              |
| 2:E:502:ARG:NH2  | 4:I:39:HIS:HB3   | 2.34                     | 0.42              |
| 3:G:191:ASN:OD1  | 3:G:192:ALA:N    | 2.51                     | 0.42              |
| 4:I:129:ARG:HB2  | 4:I:134:ARG:HD2  | 2.02                     | 0.42              |
| 5:H:207:DG:N2    | 9:T:21:DA:O4'    | 2.53                     | 0.42              |
| 6:J:35:ARG:HH11  | 6:J:39:ARG:NH2   | 2.17                     | 0.42              |
| 8:V:116:THR:O    | 8:V:120:SER:N    | 2.51                     | 0.42              |
| 3:G:151:ALA:O    | 3:G:163:LEU:HG   | 2.20                     | 0.42              |
| 3:G:201:ARG:NH2  | 3:G:247:LEU:HD22 | 2.35                     | 0.42              |
| 5:H:120:DC:N4    | 9:T:107:DG:H1    | 2.17                     | 0.42              |
| 7:R:84:GLN:HE21  | 7:R:88:ARG:HG3   | 1.84                     | 0.42              |
| 7:R:84:GLN:HG2   | 7:R:105:GLY:O    | 2.19                     | 0.42              |
| 9:T:82:DC:H2''   | 9:T:83:DA:C8     | 2.55                     | 0.42              |
| 7:U:63:LEU:HD11  | 8:V:38:VAL:HG13  | 2.01                     | 0.42              |
| 10:O:49:TRP:CZ2  | 10:O:391:CYS:HB3 | 2.54                     | 0.42              |
| 10:O:178:LYS:HE2 | 10:O:198:ASP:HB2 | 2.01                     | 0.42              |
| 5:H:210:DG:C2    | 5:H:211:DG:C4    | 3.07                     | 0.42              |
| 10:O:174:ARG:HG2 | 10:O:175:GLY:N   | 2.35                     | 0.42              |
| 10:O:294:ALA:HA  | 10:O:319:GLU:HG2 | 2.01                     | 0.42              |
| 2:E:110:MET:HB3  | 2:E:629:TRP:HE1  | 1.84                     | 0.42              |
| 3:G:340:ILE:HG13 | 3:G:341:ASP:N    | 2.35                     | 0.42              |
| 1:D:603:PHE:HE2  | 1:D:605:ASP:HB2  | 1.85                     | 0.42              |
| 2:E:318:THR:HG23 | 2:E:320:LEU:HG   | 2.02                     | 0.42              |
| 5:H:191:DC:O2    | 9:T:37:DG:N2     | 2.53                     | 0.42              |
| 9:T:180:DC:H2''  | 9:T:181:DA:H8    | 1.85                     | 0.42              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 7:U:55:LEU:O      | 7:U:59:THR:HG22   | 2.20                     | 0.42              |
| 10:O:393:VAL:HA   | 10:O:399:MET:HE1  | 2.01                     | 0.42              |
| 2:E:25:ARG:O      | 2:E:28:GLN:N      | 2.53                     | 0.42              |
| 2:E:620:LEU:N     | 2:E:632:PHE:O     | 2.44                     | 0.42              |
| 4:I:50:GLU:OE1    | 6:J:39:ARG:NE     | 2.50                     | 0.42              |
| 4:I:75:ALA:HB1    | 4:I:82:LEU:HD12   | 2.02                     | 0.42              |
| 5:H:43:DG:C6      | 5:H:44:DG:C6      | 3.08                     | 0.42              |
| 5:H:80:DG:H2''    | 5:H:81:DT:C6      | 2.55                     | 0.42              |
| 5:H:163:DG:OP1    | 8:S:31:LYS:N      | 2.51                     | 0.42              |
| 5:H:208:DA:C5     | 5:H:209:DC:C4     | 3.08                     | 0.42              |
| 6:J:26:ILE:HD11   | 6:J:55:ARG:O      | 2.19                     | 0.42              |
| 9:T:93:DC:H2''    | 9:T:94:DC:H6      | 1.85                     | 0.42              |
| 8:V:113:LYS:HA    | 8:V:116:THR:HG22  | 2.01                     | 0.42              |
| 1:D:130:LYS:HB3   | 10:O:348:SER:HB2  | 2.02                     | 0.41              |
| 2:E:273:GLN:HE21  | 2:E:276:GLN:HG3   | 1.85                     | 0.41              |
| 5:H:159:DG:H1'    | 5:H:160:DA:C8     | 2.54                     | 0.41              |
| 9:T:45:DA:H2'     | 9:T:46:DG:C8      | 2.55                     | 0.41              |
| 6:X:33:ALA:HA     | 6:X:36:ARG:NH2    | 2.35                     | 0.41              |
| 11:Y:287:THR:HG22 | 11:Y:289:PRO:HD2  | 2.02                     | 0.41              |
| 1:D:198:ASP:N     | 1:D:198:ASP:OD1   | 2.53                     | 0.41              |
| 1:D:595:LYS:O     | 1:D:598:THR:OG1   | 2.35                     | 0.41              |
| 1:D:663:MET:SD    | 1:D:668:LEU:HD21  | 2.60                     | 0.41              |
| 3:G:102:ASN:HB2   | 3:G:152:TRP:CH2   | 2.55                     | 0.41              |
| 3:G:226:VAL:HG12  | 3:G:227:ALA:N     | 2.33                     | 0.41              |
| 3:G:311:CYS:HB3   | 3:G:368:PHE:CE1   | 2.55                     | 0.41              |
| 7:R:62:ILE:HD12   | 7:R:62:ILE:H      | 1.85                     | 0.41              |
| 9:T:17:DC:H2''    | 9:T:18:DG:H8      | 1.85                     | 0.41              |
| 7:U:26:PRO:HB3    | 8:V:37:TYR:CZ     | 2.55                     | 0.41              |
| 2:E:584:GLU:OE2   | 2:E:609:CYS:HA    | 2.19                     | 0.41              |
| 5:H:91:DG:C4      | 5:H:92:DG:C8      | 3.08                     | 0.41              |
| 9:T:118:DC:H4'    | 9:T:119:DC:H5'    | 2.01                     | 0.41              |
| 7:U:112:GLN:H     | 7:U:115:LEU:HD12  | 1.85                     | 0.41              |
| 10:O:150:LEU:HB3  | 10:O:169:PRO:HB3  | 2.03                     | 0.41              |
| 10:O:373:HIS:HD2  | 10:O:375:ALA:O    | 2.03                     | 0.41              |
| 11:Y:243:TRP:H    | 11:Y:248:ILE:HD13 | 1.84                     | 0.41              |
| 1:D:166:HIS:CD2   | 1:D:353:PRO:HG3   | 2.56                     | 0.41              |
| 3:G:228:ILE:HG23  | 3:G:293:LYS:HA    | 2.02                     | 0.41              |
| 3:G:269:ARG:HD3   | 3:G:292:GLN:OE1   | 2.20                     | 0.41              |
| 4:I:95:ALA:O      | 4:I:99:TYR:N      | 2.43                     | 0.41              |
| 5:H:122:DT:P      | 4:W:46:VAL:HB     | 2.60                     | 0.41              |
| 5:H:185:DA:H61    | 9:T:42:DC:N4      | 2.17                     | 0.41              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 9:T:170:DC:H2''   | 9:T:171:DA:O4'    | 2.21                     | 0.41              |
| 4:W:80:THR:OG1    | 4:W:81:ASP:OD1    | 2.35                     | 0.41              |
| 1:D:575:ARG:NH1   | 3:G:286:ASN:O     | 2.53                     | 0.41              |
| 2:E:558:CYS:HB3   | 2:E:561:ARG:NE    | 2.36                     | 0.41              |
| 3:G:115:THR:HB    | 3:G:122:THR:HG23  | 2.02                     | 0.41              |
| 7:U:85:LEU:O      | 7:U:89:ASN:HB2    | 2.20                     | 0.41              |
| 10:O:56:PRO:HD2   | 10:O:62:SER:HA    | 2.02                     | 0.41              |
| 5:H:61:DC:H2''    | 5:H:62:DG:H8      | 1.85                     | 0.41              |
| 10:O:246:VAL:HG11 | 10:O:276:VAL:HG12 | 2.01                     | 0.41              |
| 1:D:613:VAL:HG23  | 1:D:614:MET:SD    | 2.60                     | 0.41              |
| 2:E:104:VAL:HG21  | 3:G:171:ILE:HG21  | 2.01                     | 0.41              |
| 3:G:179:THR:HG23  | 3:G:181:GLN:H     | 1.86                     | 0.41              |
| 3:G:229:PHE:HE2   | 3:G:251:ILE:HD12  | 1.86                     | 0.41              |
| 5:H:160:DA:C6     | 5:H:161:DG:C6     | 3.08                     | 0.41              |
| 10:O:257:THR:O    | 10:O:258:ARG:HG2  | 2.20                     | 0.41              |
| 2:E:629:TRP:N     | 12:E:801:SAH:OXT  | 2.43                     | 0.41              |
| 3:G:95:PRO:HA     | 3:G:430:ASP:O     | 2.20                     | 0.41              |
| 3:G:219:ASN:HB3   | 3:G:224:THR:HG22  | 2.01                     | 0.41              |
| 3:G:240:LEU:HD23  | 3:G:255:GLY:HA2   | 2.01                     | 0.41              |
| 5:H:89:DT:H6      | 5:H:89:DT:H2'     | 1.72                     | 0.41              |
| 5:H:189:DG:C2     | 9:T:39:DG:C2      | 3.09                     | 0.41              |
| 5:H:205:DC:N4     | 9:T:21:DA:H61     | 2.19                     | 0.41              |
| 5:H:205:DC:H42    | 9:T:21:DA:H61     | 1.67                     | 0.41              |
| 7:R:92:GLU:OE2    | 8:S:100:PRO:HG2   | 2.20                     | 0.41              |
| 11:Y:244:MET:O    | 11:Y:246:GLU:HG3  | 2.21                     | 0.41              |
| 1:D:650:LYS:HB2   | 1:D:652:LEU:CD2   | 2.44                     | 0.41              |
| 2:E:624:SER:OG    | 2:E:627:ALA:O     | 2.38                     | 0.41              |
| 2:E:636:PRO:HD3   | 2:E:723:THR:OG1   | 2.20                     | 0.41              |
| 3:G:324:CYS:SG    | 3:G:364:TRP:HB3   | 2.61                     | 0.41              |
| 3:G:326:ASN:HA    | 3:G:358:TYR:CE2   | 2.56                     | 0.41              |
| 3:G:374:GLN:O     | 3:G:391:LEU:HD12  | 2.21                     | 0.41              |
| 5:H:139:DA:H2''   | 5:H:140:DG:H8     | 1.84                     | 0.41              |
| 5:H:197:DC:H42    | 9:T:29:DC:N4      | 2.19                     | 0.41              |
| 7:R:53:ALA:O      | 7:R:56:GLU:HB2    | 2.20                     | 0.41              |
| 9:T:93:DC:H4'     | 9:T:94:DC:OP1     | 2.19                     | 0.41              |
| 9:T:122:DC:H2''   | 9:T:123:DG:O5'    | 2.21                     | 0.41              |
| 7:U:50:TYR:OH     | 8:V:108:VAL:HA    | 2.21                     | 0.41              |
| 10:O:183:LEU:HG   | 10:O:193:LEU:HD11 | 2.02                     | 0.41              |
| 10:O:281:PHE:HD1  | 10:O:289:LEU:HD13 | 1.83                     | 0.41              |
| 10:O:379:ASP:HB3  | 10:O:393:VAL:HB   | 2.03                     | 0.41              |
| 11:Y:190:PHE:CE2  | 11:Y:195:LEU:HB2  | 2.56                     | 0.41              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 1:D:580:GLU:N     | 1:D:580:GLU:OE1  | 2.54                     | 0.41              |
| 1:D:663:MET:SD    | 1:D:668:LEU:HD11 | 2.61                     | 0.41              |
| 2:E:539:CYS:HB3   | 2:E:542:VAL:HG23 | 2.02                     | 0.41              |
| 3:G:373:TRP:CZ3   | 3:G:421:ASP:HA   | 2.56                     | 0.41              |
| 3:G:411:ALA:HB3   | 3:G:429:CYS:SG   | 2.60                     | 0.41              |
| 4:I:63:ARG:O      | 4:I:66:PRO:HD2   | 2.21                     | 0.41              |
| 5:H:69:DG:H2''    | 5:H:70:DA:H8     | 1.85                     | 0.41              |
| 8:S:111:GLY:O     | 8:S:114:ALA:N    | 2.54                     | 0.41              |
| 9:T:78:DT:H2''    | 9:T:79:DA:C8     | 2.56                     | 0.41              |
| 4:W:65:LEU:HB3    | 4:W:66:PRO:HD3   | 2.03                     | 0.41              |
| 2:E:659:ARG:HB3   | 2:E:663:TYR:CZ   | 2.56                     | 0.40              |
| 3:G:220:ILE:HD12  | 3:G:220:ILE:H    | 1.85                     | 0.40              |
| 5:H:96:DT:H4'     | 5:H:97:DT:OP1    | 2.21                     | 0.40              |
| 5:H:128:DT:H6     | 5:H:128:DT:H2'   | 1.72                     | 0.40              |
| 5:H:204:DC:H2''   | 5:H:205:DC:C6    | 2.56                     | 0.40              |
| 9:T:172:DG:H4'    | 7:U:77:ARG:HE    | 1.86                     | 0.40              |
| 10:O:10:ASP:O     | 10:O:14:GLU:HG2  | 2.21                     | 0.40              |
| 2:E:600:ASP:OD1   | 2:E:600:ASP:N    | 2.53                     | 0.40              |
| 5:H:105:DG:C5     | 5:H:106:DG:C6    | 3.09                     | 0.40              |
| 5:H:169:DG:H1'    | 5:H:170:DG:C8    | 2.56                     | 0.40              |
| 4:W:61:LEU:HD13   | 4:W:61:LEU:HA    | 1.95                     | 0.40              |
| 10:O:79:LEU:N     | 10:O:121:ILE:O   | 2.34                     | 0.40              |
| 2:E:634:LYS:O     | 2:E:723:THR:HG23 | 2.21                     | 0.40              |
| 3:G:250:LYS:HG2   | 3:G:264:ARG:HG2  | 2.03                     | 0.40              |
| 3:G:275:LYS:HD3   | 3:G:275:LYS:HA   | 1.73                     | 0.40              |
| 4:I:84:PHE:HD1    | 4:I:89:VAL:HG22  | 1.86                     | 0.40              |
| 5:H:206:DT:H1'    | 5:H:207:DG:C8    | 2.55                     | 0.40              |
| 9:T:100:DA:C2     | 9:T:101:DA:C4    | 3.09                     | 0.40              |
| 9:T:158:DC:H6     | 9:T:158:DC:H2'   | 1.74                     | 0.40              |
| 7:U:63:LEU:HA     | 7:U:63:LEU:HD23  | 1.84                     | 0.40              |
| 2:E:83:CYS:HB3    | 2:E:98:LEU:HD11  | 2.04                     | 0.40              |
| 3:G:230:GLY:N     | 3:G:294:ILE:O    | 2.54                     | 0.40              |
| 3:G:409:CYS:HB2   | 3:G:435:TRP:CD2  | 2.57                     | 0.40              |
| 4:I:99:TYR:OH     | 4:I:133:GLU:OE1  | 2.30                     | 0.40              |
| 7:R:58:LEU:HD23   | 7:R:58:LEU:HA    | 1.92                     | 0.40              |
| 9:T:65:DG:C5      | 9:T:66:DC:C4     | 3.09                     | 0.40              |
| 11:Y:240:LEU:HD13 | 11:Y:253:TRP:CE2 | 2.56                     | 0.40              |
| 2:E:472:TYR:O     | 2:E:476:VAL:HG23 | 2.21                     | 0.40              |
| 2:E:629:TRP:H     | 12:E:801:SAH:C   | 2.33                     | 0.40              |
| 3:G:308:TYR:HB2   | 3:G:324:CYS:SG   | 2.62                     | 0.40              |
| 10:O:129:ARG:N    | 10:O:143:LYS:HB2 | 2.36                     | 0.40              |

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| Atom-1         | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|----------------|-------------------|--------------------------|-------------------|
| 10:O:224:THR:O | 10:O:224:THR:HG22 | 2.22                     | 0.40              |

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

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

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

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

| Mol | Chain | Analysed        | Favoured   | Allowed  | Outliers | Percentiles |     |
|-----|-------|-----------------|------------|----------|----------|-------------|-----|
| 1   | D     | 423/619 (68%)   | 403 (95%)  | 20 (5%)  | 0        | 100         | 100 |
| 2   | E     | 560/753 (74%)   | 511 (91%)  | 47 (8%)  | 2 (0%)   | 30          | 67  |
| 3   | G     | 360/441 (82%)   | 329 (91%)  | 31 (9%)  | 0        | 100         | 100 |
| 4   | I     | 112/136 (82%)   | 107 (96%)  | 5 (4%)   | 0        | 100         | 100 |
| 4   | W     | 97/136 (71%)    | 92 (95%)   | 5 (5%)   | 0        | 100         | 100 |
| 6   | J     | 81/106 (76%)    | 76 (94%)   | 5 (6%)   | 0        | 100         | 100 |
| 6   | X     | 85/106 (80%)    | 78 (92%)   | 7 (8%)   | 0        | 100         | 100 |
| 7   | R     | 106/133 (80%)   | 101 (95%)  | 5 (5%)   | 0        | 100         | 100 |
| 7   | U     | 106/133 (80%)   | 103 (97%)  | 3 (3%)   | 0        | 100         | 100 |
| 8   | S     | 94/123 (76%)    | 84 (89%)   | 10 (11%) | 0        | 100         | 100 |
| 8   | V     | 93/123 (76%)    | 85 (91%)   | 8 (9%)   | 0        | 100         | 100 |
| 10  | O     | 391/425 (92%)   | 376 (96%)  | 15 (4%)  | 0        | 100         | 100 |
| 11  | Y     | 124/303 (41%)   | 114 (92%)  | 9 (7%)   | 1 (1%)   | 16          | 53  |
| All | All   | 2632/3537 (74%) | 2459 (93%) | 170 (6%) | 3 (0%)   | 50          | 82  |

All (3) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2   | E     | 327 | PRO  |
| 11  | Y     | 187 | HIS  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2   | E     | 492 | THR  |

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

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

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

| Mol | Chain | Analysed        | Rotameric   | Outliers | Percentiles |     |
|-----|-------|-----------------|-------------|----------|-------------|-----|
| 1   | D     | 411/575 (72%)   | 408 (99%)   | 3 (1%)   | 81          | 86  |
| 2   | E     | 507/672 (75%)   | 507 (100%)  | 0        | 100         | 100 |
| 3   | G     | 324/392 (83%)   | 324 (100%)  | 0        | 100         | 100 |
| 4   | I     | 95/111 (86%)    | 95 (100%)   | 0        | 100         | 100 |
| 4   | W     | 86/111 (78%)    | 86 (100%)   | 0        | 100         | 100 |
| 6   | J     | 68/81 (84%)     | 68 (100%)   | 0        | 100         | 100 |
| 6   | X     | 64/81 (79%)     | 64 (100%)   | 0        | 100         | 100 |
| 7   | R     | 85/104 (82%)    | 85 (100%)   | 0        | 100         | 100 |
| 7   | U     | 84/104 (81%)    | 84 (100%)   | 0        | 100         | 100 |
| 8   | S     | 79/103 (77%)    | 79 (100%)   | 0        | 100         | 100 |
| 8   | V     | 79/103 (77%)    | 79 (100%)   | 0        | 100         | 100 |
| 10  | O     | 351/375 (94%)   | 350 (100%)  | 1 (0%)   | 91          | 92  |
| 11  | Y     | 117/271 (43%)   | 116 (99%)   | 1 (1%)   | 75          | 83  |
| All | All   | 2350/3083 (76%) | 2345 (100%) | 5 (0%)   | 91          | 94  |

All (5) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | D     | 124 | ARG  |
| 1   | D     | 129 | ARG  |
| 1   | D     | 672 | MET  |
| 10  | O     | 264 | LYS  |
| 11  | Y     | 180 | ARG  |

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

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | D     | 156 | HIS  |
| 1   | D     | 166 | HIS  |
| 1   | D     | 356 | GLN  |
| 1   | D     | 449 | HIS  |
| 1   | D     | 517 | ASN  |
| 2   | E     | 45  | ASN  |
| 2   | E     | 102 | ASN  |
| 2   | E     | 119 | ASN  |
| 2   | E     | 180 | GLN  |
| 2   | E     | 273 | GLN  |
| 2   | E     | 520 | ASN  |
| 2   | E     | 560 | ASN  |
| 3   | G     | 146 | ASN  |
| 3   | G     | 185 | HIS  |
| 3   | G     | 272 | ASN  |
| 3   | G     | 283 | ASN  |
| 3   | G     | 360 | GLN  |
| 4   | I     | 108 | ASN  |
| 7   | R     | 31  | HIS  |
| 7   | R     | 84  | GLN  |
| 7   | R     | 104 | GLN  |
| 8   | S     | 92  | GLN  |
| 8   | S     | 106 | HIS  |
| 7   | U     | 82  | HIS  |
| 7   | U     | 84  | GLN  |
| 8   | V     | 46  | HIS  |
| 8   | V     | 92  | GLN  |
| 4   | W     | 39  | HIS  |
| 4   | W     | 125 | GLN  |
| 10  | O     | 48  | GLN  |
| 10  | O     | 329 | ASN  |
| 10  | O     | 383 | ASN  |
| 10  | O     | 403 | GLN  |
| 10  | O     | 410 | ASN  |

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

1 ligand is 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 |
| 12  | SAH  | E     | 801 | -    | 23,28,28     | 1.27 | 3 (13%)  | 22,40,40    | 1.86 | 3 (13%)  |

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

| Mol | Type | Chain | Res | Link | Chirals | Torsions   | Rings   |
|-----|------|-------|-----|------|---------|------------|---------|
| 12  | SAH  | E     | 801 | -    | -       | 4/11/31/31 | 0/3/3/3 |

All (3) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|-------|-------|-------------|----------|
| 12  | E     | 801 | SAH  | C2-N3 | 4.11  | 1.38        | 1.32     |
| 12  | E     | 801 | SAH  | C2-N1 | 2.51  | 1.38        | 1.33     |
| 12  | E     | 801 | SAH  | OXT-C | -2.32 | 1.23        | 1.30     |

All (3) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-----------|-------|-------------|----------|
| 12  | E     | 801 | SAH  | N3-C2-N1  | -6.18 | 120.28      | 128.67   |
| 12  | E     | 801 | SAH  | C5'-SD-CG | -4.16 | 89.91       | 102.26   |
| 12  | E     | 801 | SAH  | OXT-C-O   | -2.61 | 118.17      | 124.08   |

There are no chirality outliers.

All (4) torsion outliers are listed below:

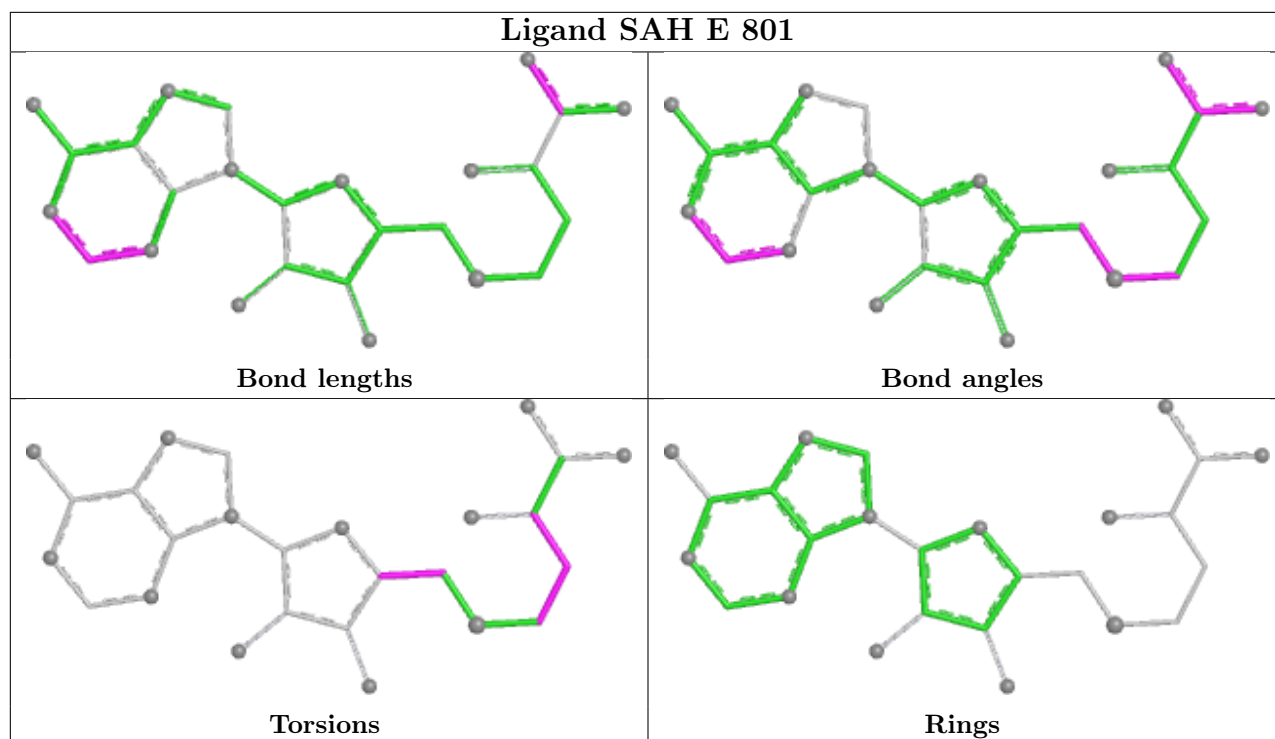
| Mol | Chain | Res | Type | Atoms          |
|-----|-------|-----|------|----------------|
| 12  | E     | 801 | SAH  | C3'-C4'-C5'-SD |
| 12  | E     | 801 | SAH  | O4'-C4'-C5'-SD |
| 12  | E     | 801 | SAH  | C-CA-CB-CG     |
| 12  | E     | 801 | SAH  | CA-CB-CG-SD    |

There are no ring outliers.

1 monomer is involved in 5 short contacts:

| Mol | Chain | Res | Type | Clashes | Symm-Clashes |
|-----|-------|-----|------|---------|--------------|
| 12  | E     | 801 | SAH  | 5       | 0            |

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



## 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

There are no chain breaks in this entry.



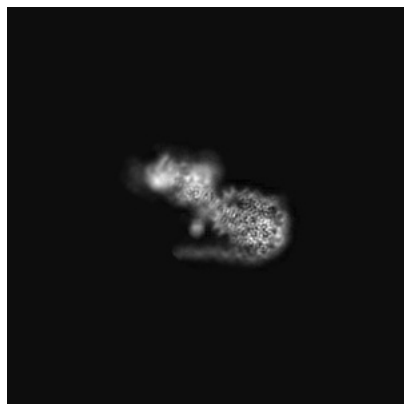
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-41141. These allow visual inspection of the internal detail of the map and identification of artifacts.

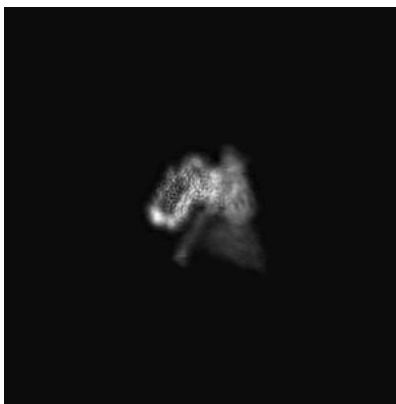
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

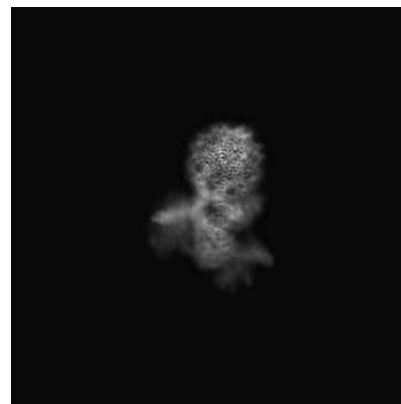
#### 6.1.1 Primary map



X

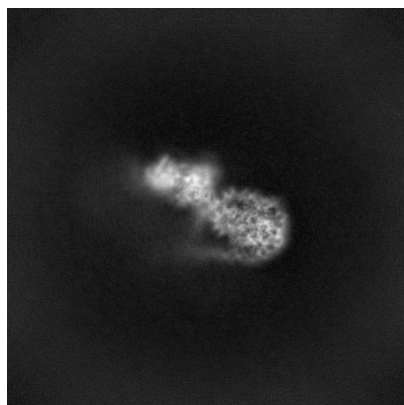


Y

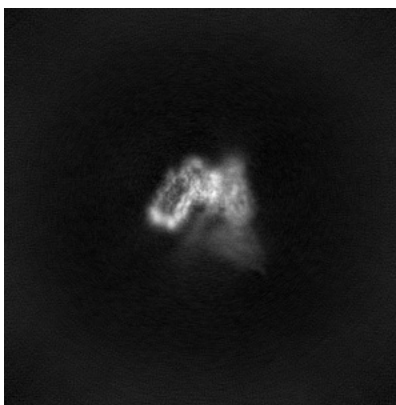


Z

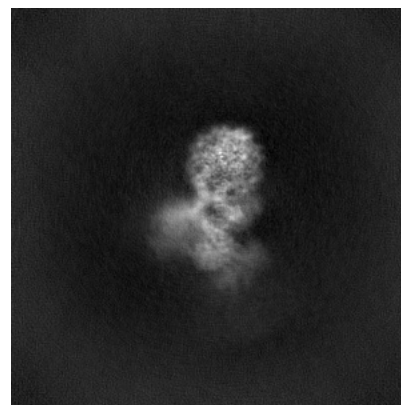
#### 6.1.2 Raw map



X



Y

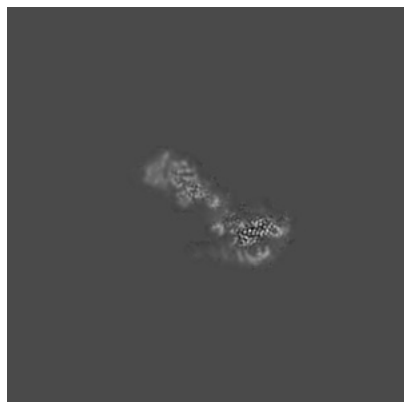


Z

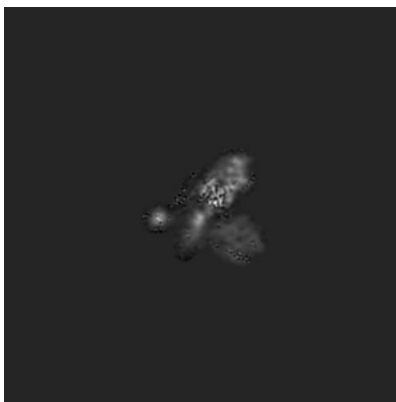
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

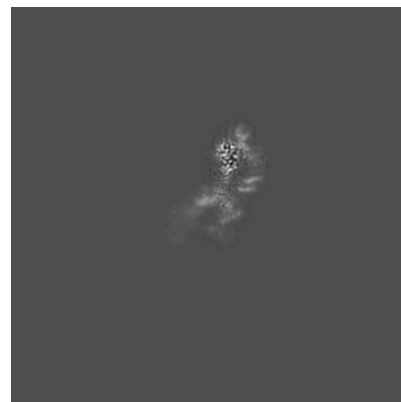
### 6.2.1 Primary map



X Index: 165



Y Index: 165

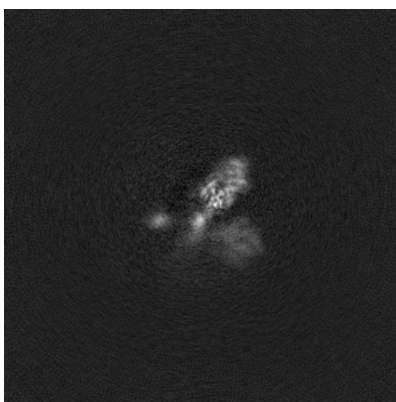


Z Index: 165

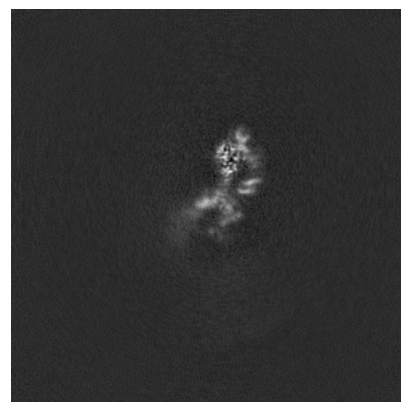
### 6.2.2 Raw map



X Index: 165



Y Index: 165

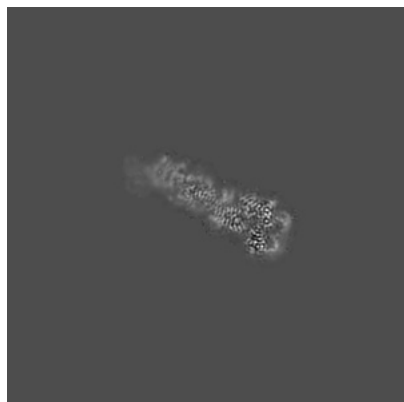


Z Index: 165

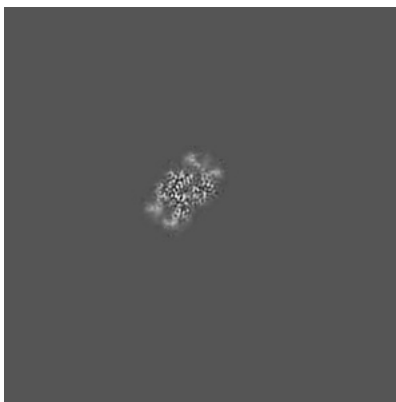
The images above show central slices of the map in three orthogonal directions.

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

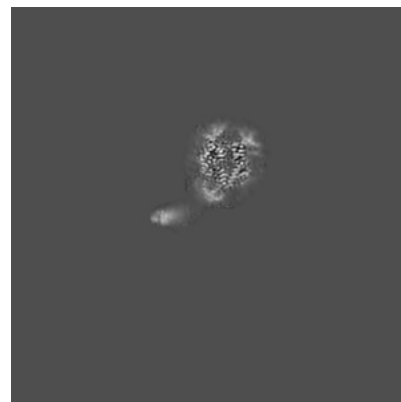
### 6.3.1 Primary map



X Index: 175

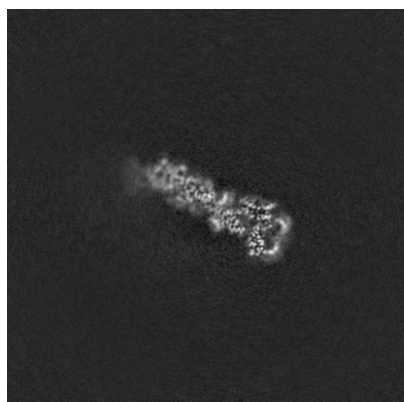


Y Index: 207

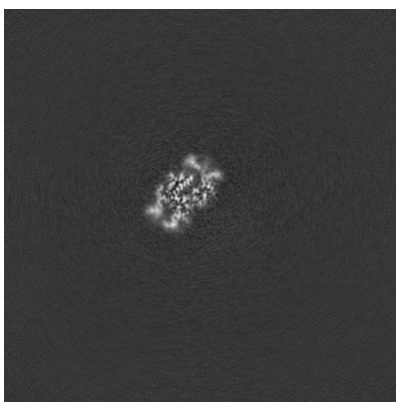


Z Index: 148

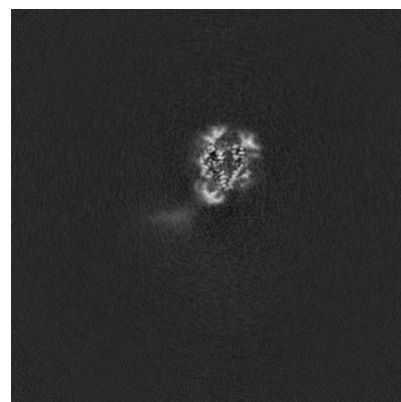
### 6.3.2 Raw map



X Index: 174



Y Index: 207

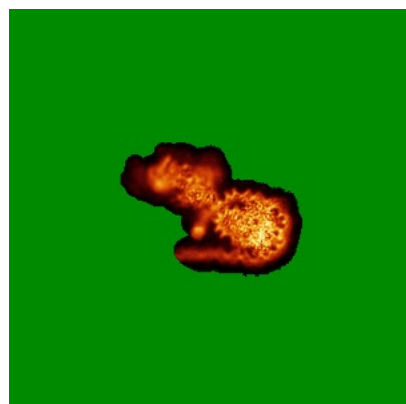


Z Index: 148

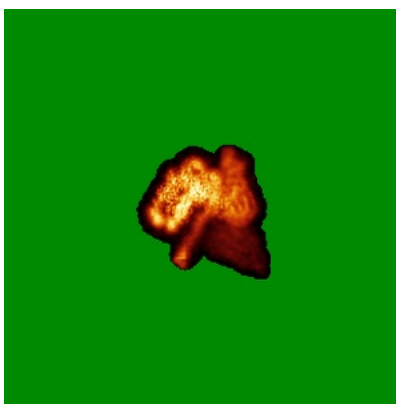
The images above show the largest variance slices of the map in three orthogonal directions.

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

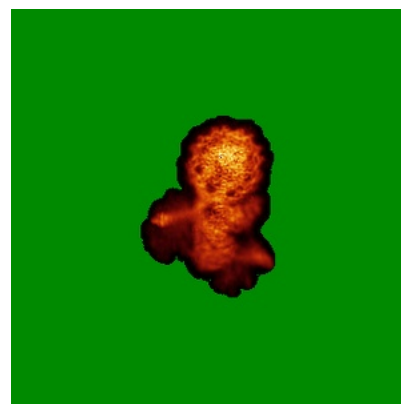
### 6.4.1 Primary map



X

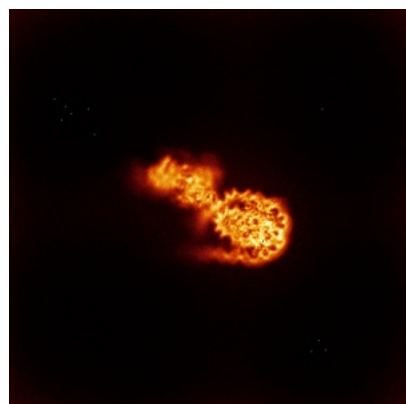


Y

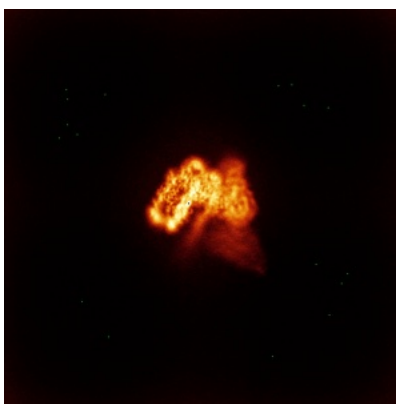


Z

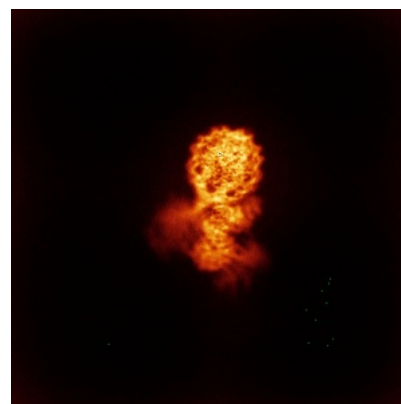
### 6.4.2 Raw map



X



Y

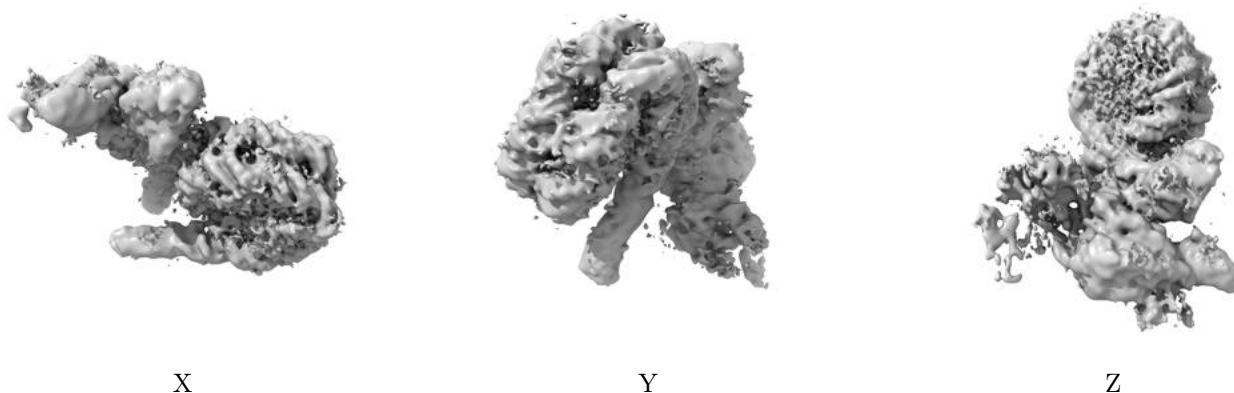


Z

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.

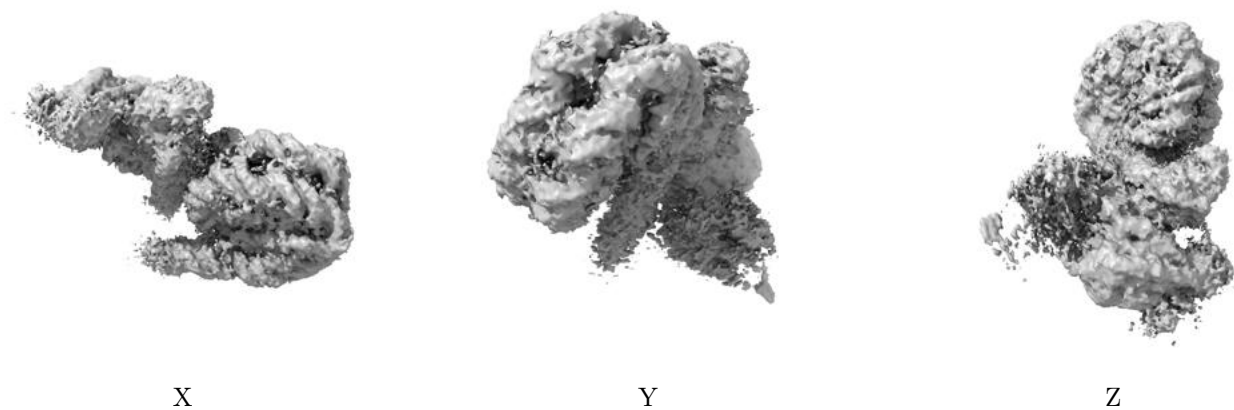
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.01. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

### 6.5.2 Raw map



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

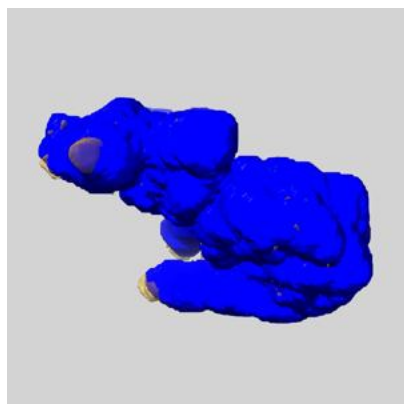
## 6.6 Mask visualisation [i](#)

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

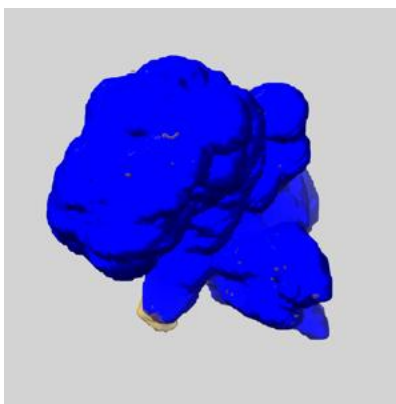
A mask typically either:

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

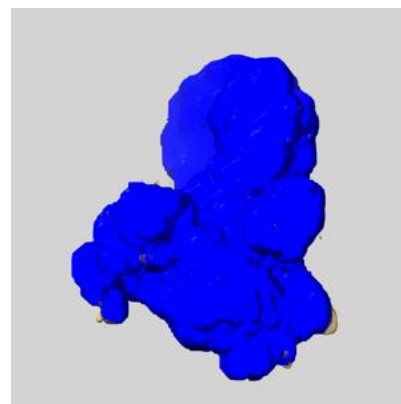
### 6.6.1 emd\_41141\_msk\_1.map [i](#)



X



Y

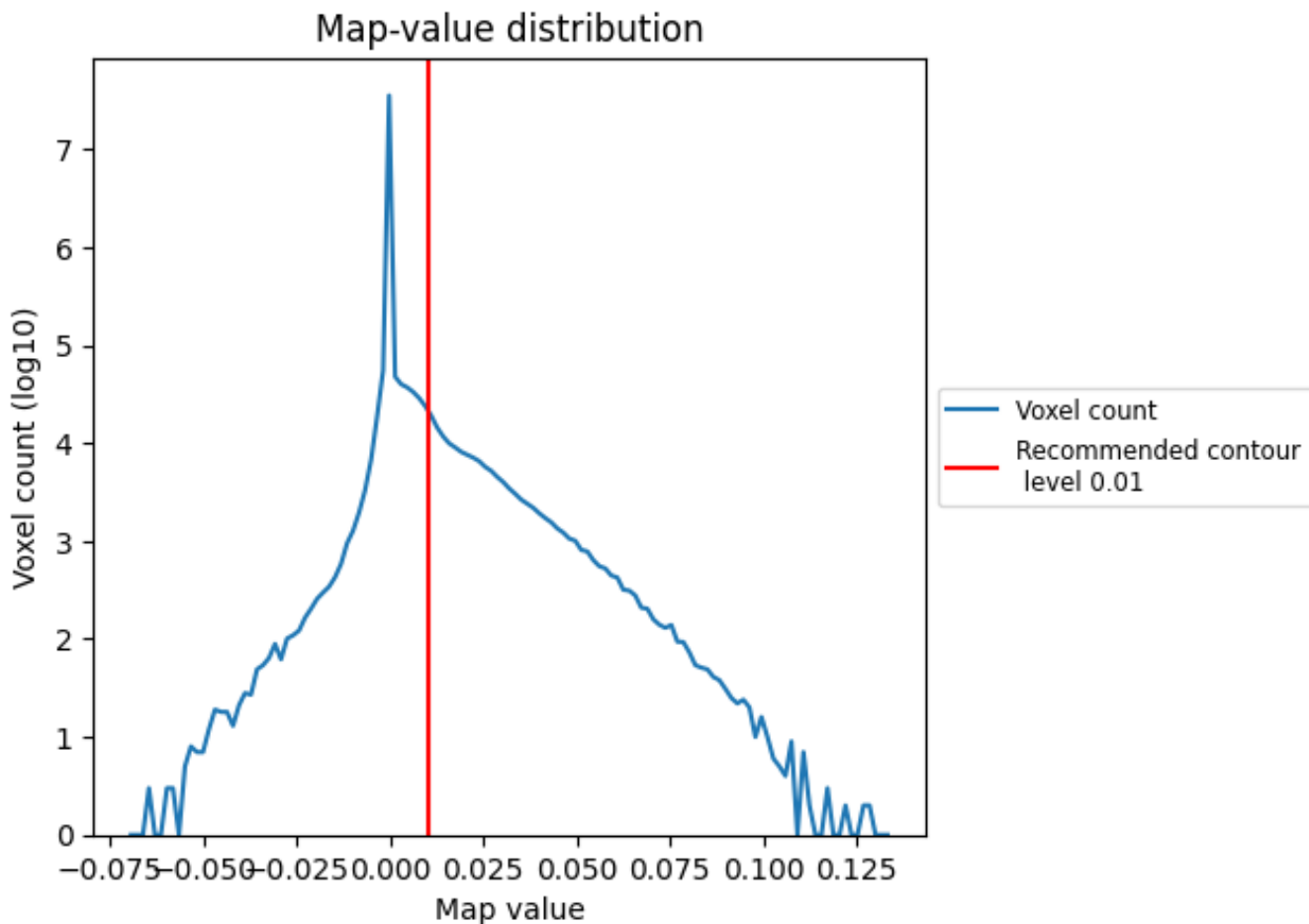


Z

## 7 Map analysis [i](#)

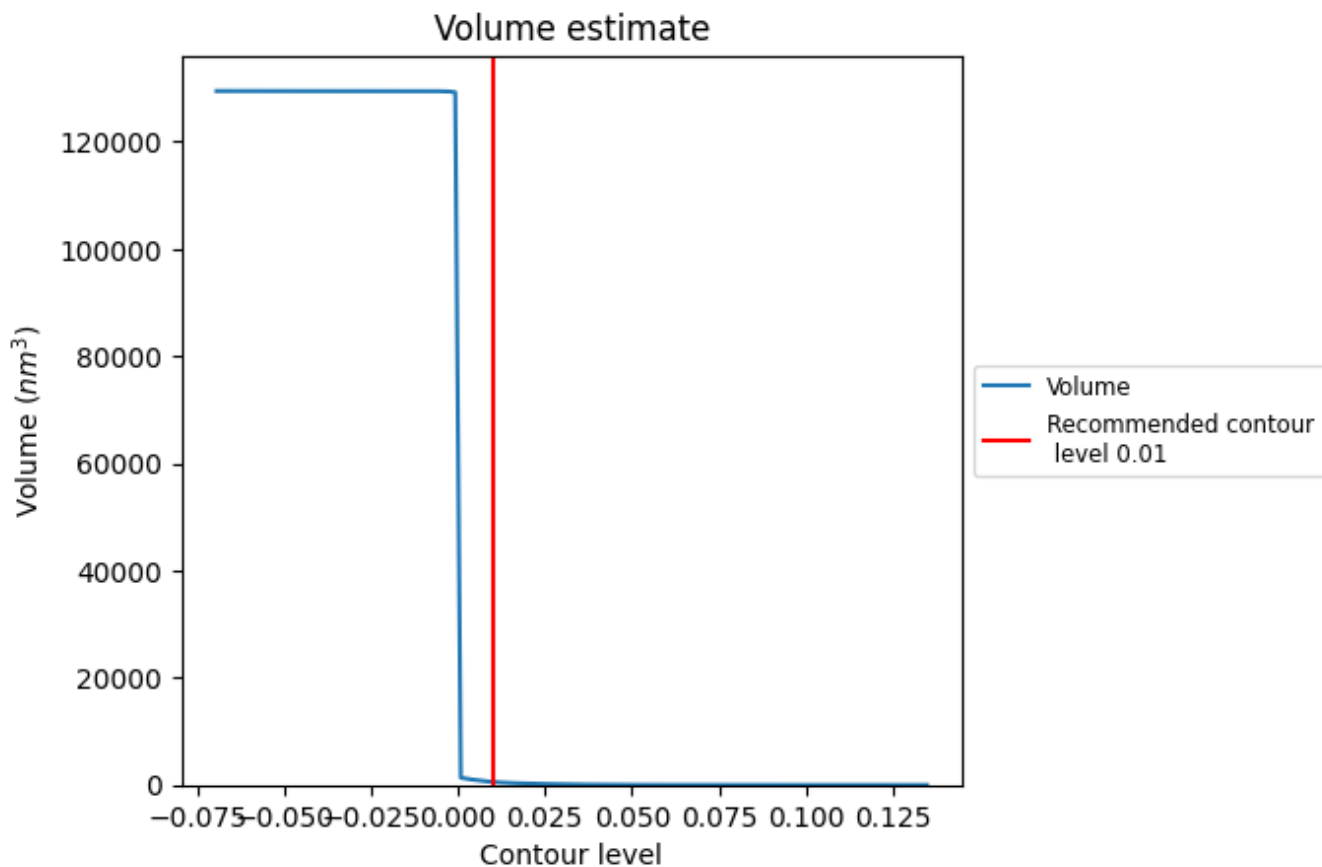
This section contains the results of statistical analysis of the map.

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



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

## 7.2 Volume estimate [\(i\)](#)

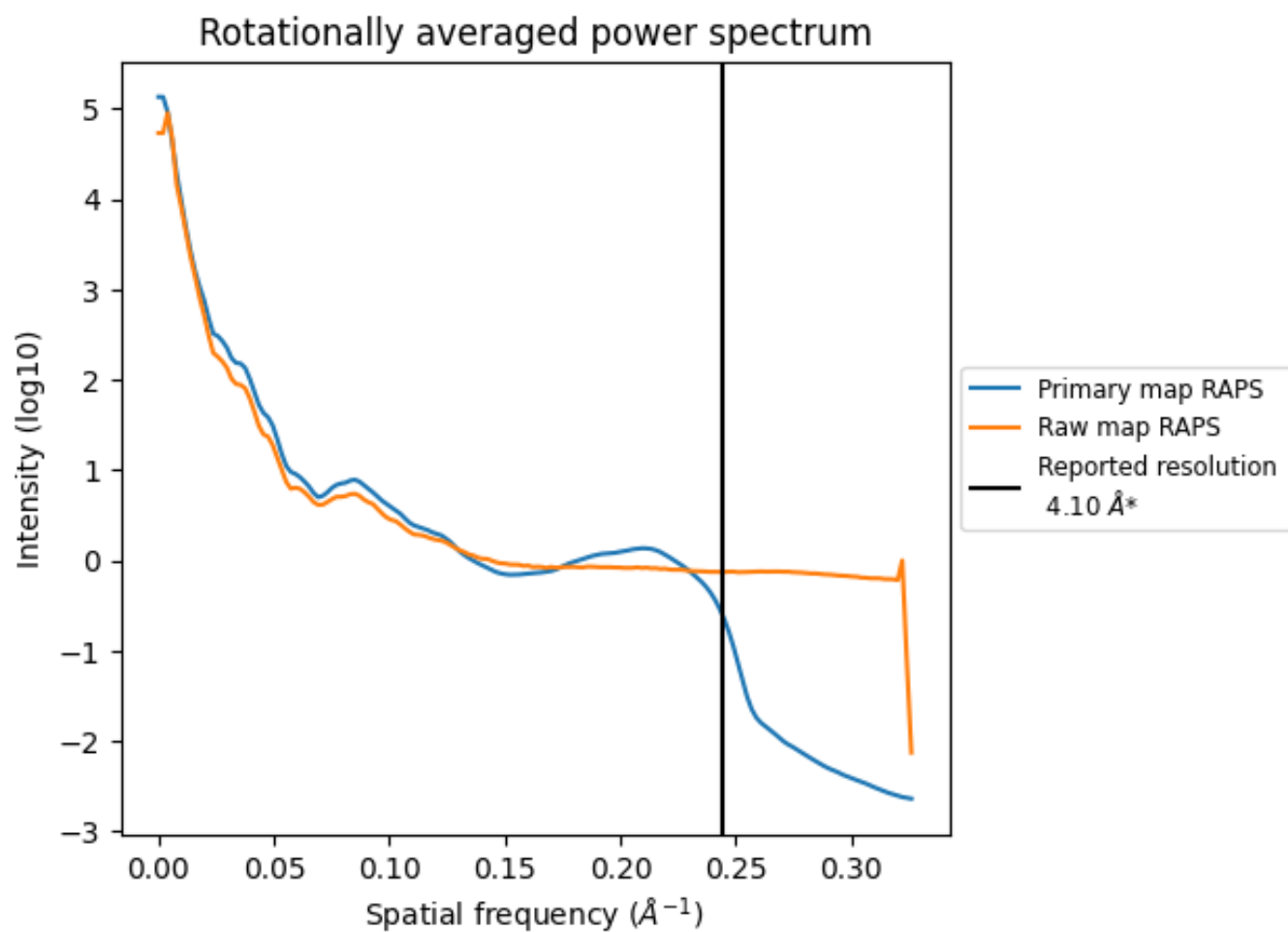


The volume at the recommended contour level is 570 nm<sup>3</sup>; this corresponds to an approximate mass of 515 kDa.

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



### 7.3 Rotationally averaged power spectrum i

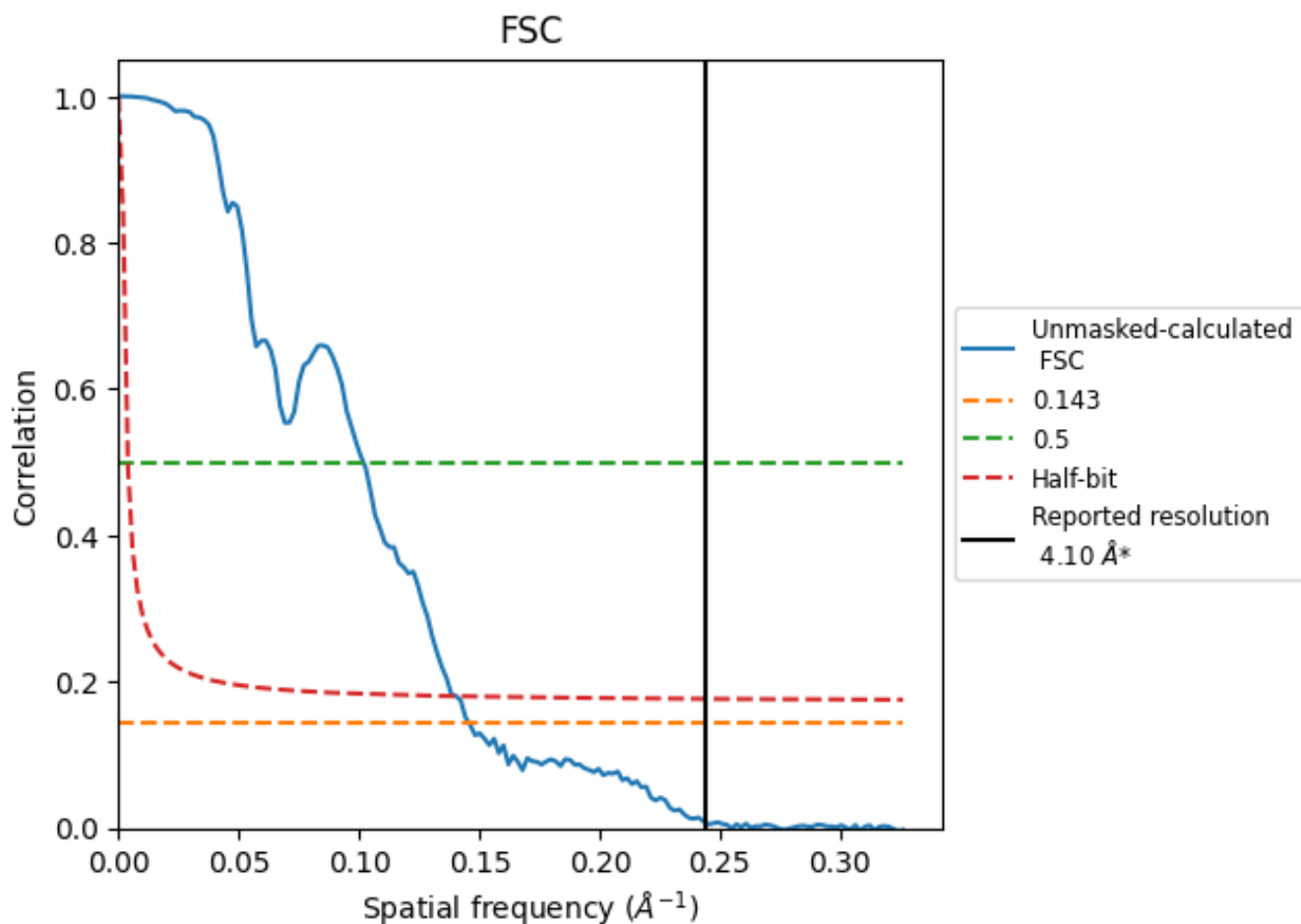


\*Reported resolution corresponds to spatial frequency of  $0.244 \text{ \AA}^{-1}$

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

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

### 8.1 FSC [i](#)



\*Reported resolution corresponds to spatial frequency of 0.244 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

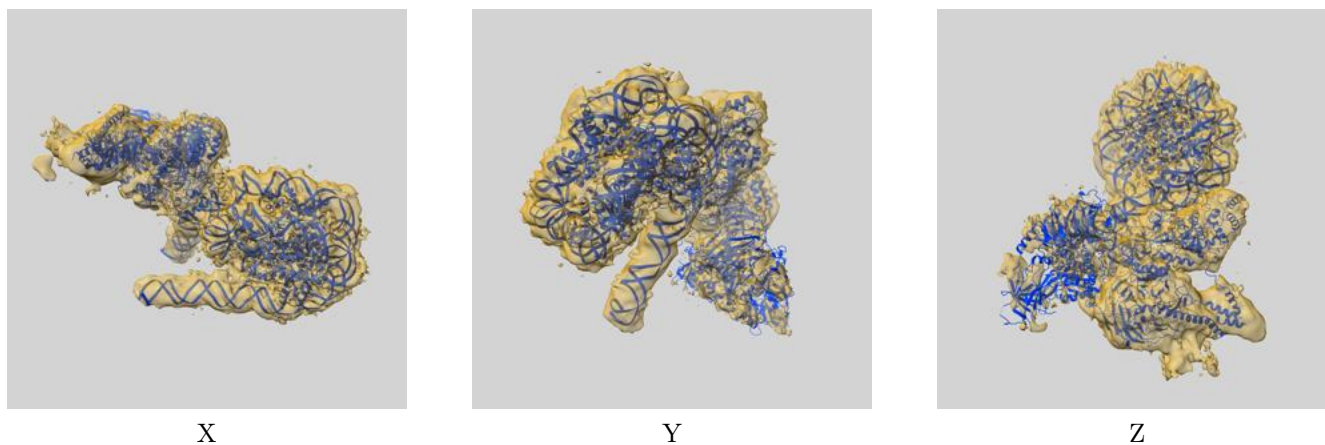
| Resolution estimate (Å)   | Estimation criterion (FSC cut-off) |      |          |
|---------------------------|------------------------------------|------|----------|
|                           | 0.143                              | 0.5  | Half-bit |
| Reported by author        | 4.10                               | -    | -        |
| Author-provided FSC curve | -                                  | -    | -        |
| Unmasked-calculated*      | 6.86                               | 9.82 | 7.12     |

\*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 6.86 differs from the reported value 4.1 by more than 10 %

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

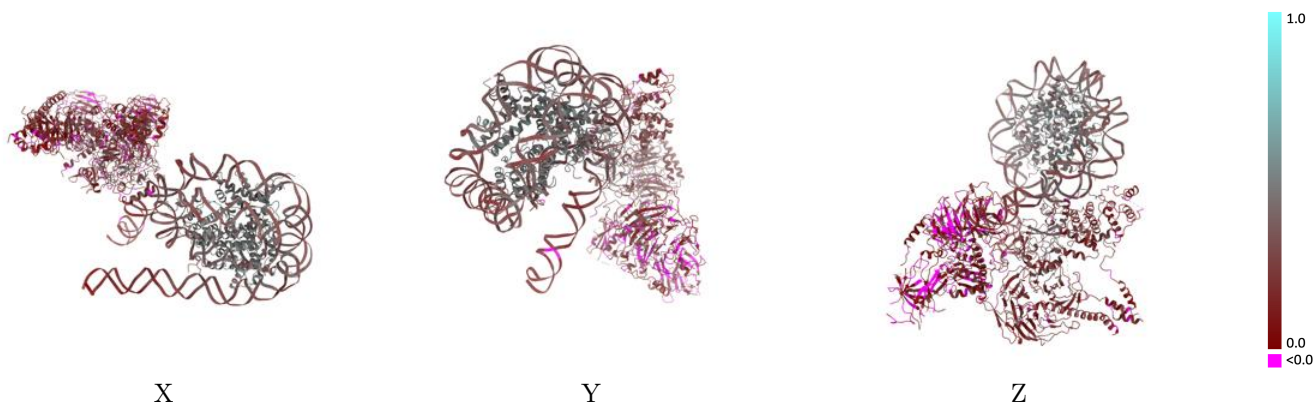
This section contains information regarding the fit between EMDB map EMD-41141 and PDB model 8TAS. Per-residue inclusion information can be found in section 3 on page 8.

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



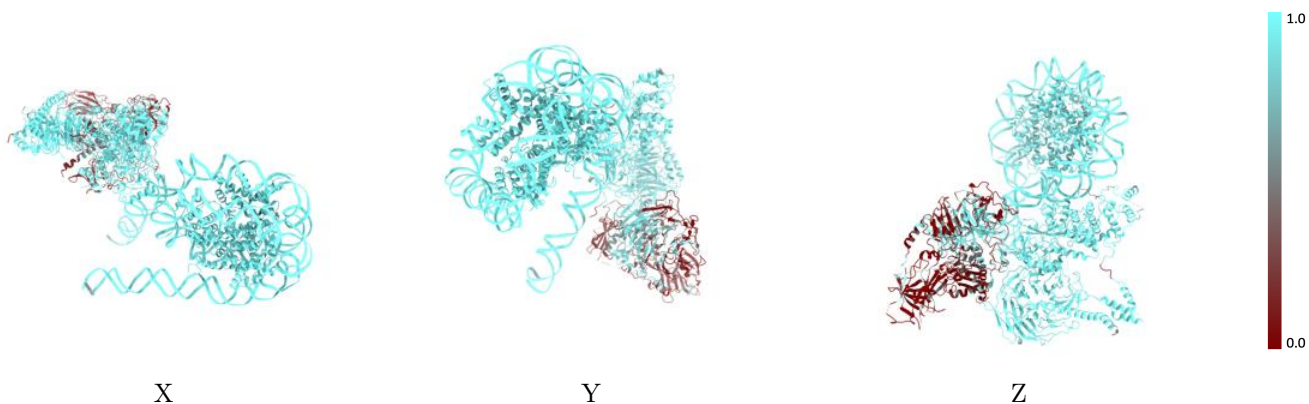
The images above show the 3D surface view of the map at the recommended contour level 0.01 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



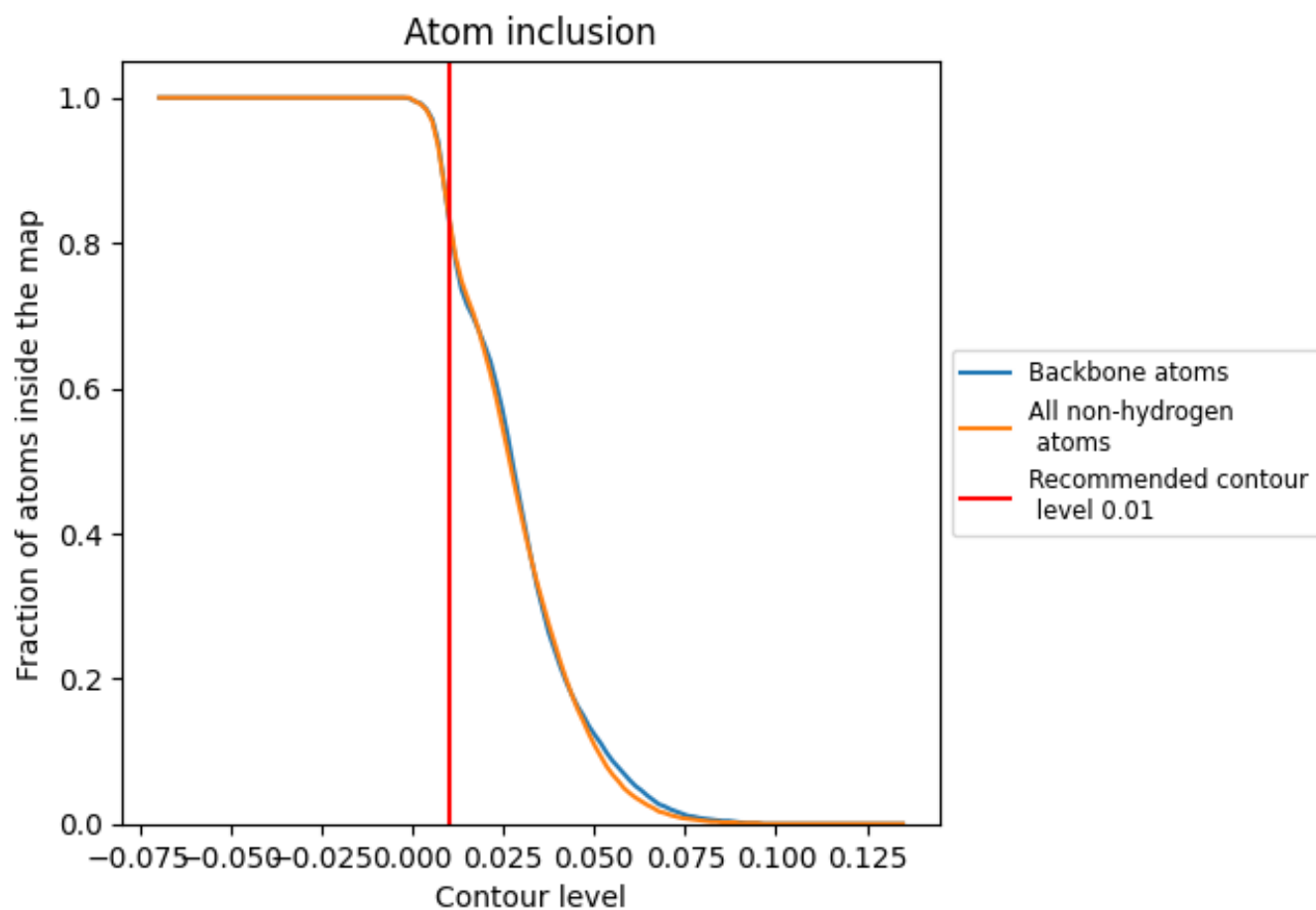
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.01).

































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 84% of all backbone atoms, 84% 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 (0.01) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion   | Q-score  |
|-------|--|--|
| All   |  0.8410   |  0.2590   |
| D     |  0.4870   |  0.1280   |
| E     |  0.9630   |  0.2310   |
| G     |  0.9910   |  0.2000   |
| H     |  0.9900   |  0.2930   |
| I     |  0.9920   |  0.4530   |
| J     |  0.9780   |  0.4400   |
| O     |  0.4800   |  0.0920   |
| R     |  0.9910   |  0.4540   |
| S     |  0.9960   |  0.4590   |
| T     |  0.9940   |  0.2910   |
| U     |  0.9880   |  0.4640   |
| V     |  0.9890   |  0.4610   |
| W     |  0.9920   |  0.4520   |
| X     |  0.9920  |  0.4630  |
| Y     |  0.1680 |  0.1000 |

