



## Full wwPDB EM Validation Report ⓘ

Dec 2, 2025 – 04:17 am GMT

PDB ID : 8RDJ / pdb\_00008rdj  
EMDB ID : EMD-19023  
Title : Plastid-encoded RNA polymerase transcription elongation complex (Integrated model)  
Authors : Webster, M.W.; Pramanick, I.; Vergara-Cruces, A.  
Deposited on : 2023-12-08  
Resolution : 2.62 Å(reported)

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

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

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>  
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

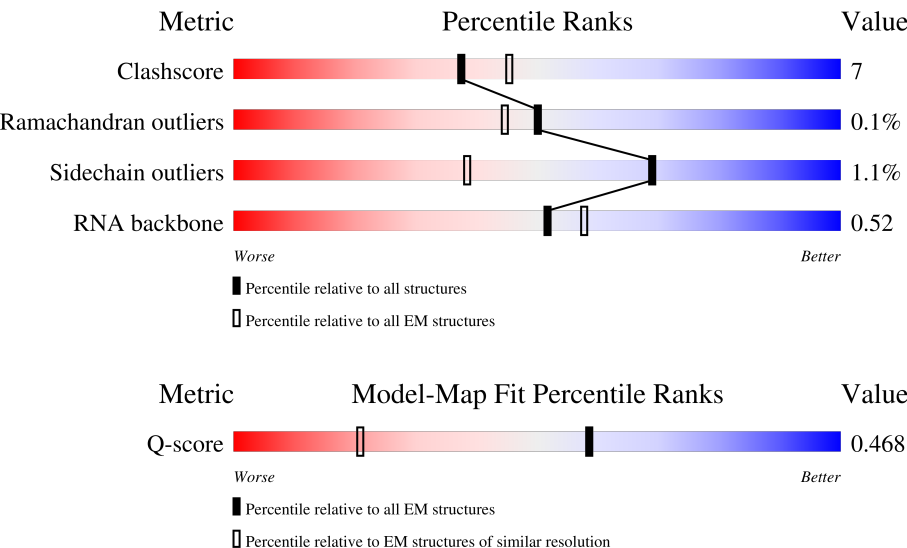
EMDB validation analysis : 0.0.1.dev129  
Mogul : 1.8.4, CSD as541be (2020)  
MolProbity : 4-5-2 with Phenix2.0  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.46

# 1 Overall quality at a glance i

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

The reported resolution of this entry is 2.62 Å.

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



| Metric                | Whole archive<br>(#Entries) | EM structures<br>(#Entries) | Similar EM resolution<br>(#Entries, resolution range(Å)) |
|-----------------------|-----------------------------|-----------------------------|----------------------------------------------------------|
| Clashscore            | 210492                      | 15764                       | -                                                        |
| Ramachandran outliers | 207382                      | 16835                       | -                                                        |
| Sidechain outliers    | 206894                      | 16415                       | -                                                        |
| RNA backbone          | 6643                        | 2191                        | -                                                        |
| Q-score               | -                           | 25397                       | 8810 ( 2.12 - 3.12 )                                     |

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   | A     | 327    | <div> <div>22%</div> <div>80%</div> <div>11%</div> <div>8%</div> </div> |
| 1   | B     | 327    | <div> <div>28%</div> <div>77%</div> <div>9%</div> <div>13%</div> </div> |
| 2   | C     | 1072   | <div> <div>22%</div> <div>78%</div> <div>18%</div> <div>••</div> </div> |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 3   | D     | 680    |                  |
| 4   | E     | 1373   |                  |
| 5   | F     | 911    |                  |
| 6   | G     | 862    |                  |
| 7   | H     | 675    |                  |
| 8   | I     | 263    |                  |
| 9   | J     | 529    |                  |
| 10  | K     | 460    |                  |
| 11  | L     | 483    |                  |
| 12  | M     | 334    |                  |
| 13  | N     | 297    |                  |
| 14  | O     | 185    |                  |
| 14  | P     | 185    |                  |
| 15  | Q     | 768    |                  |
| 16  | R     | 162    |                  |
| 17  | S     | 611    |                  |
| 18  | T     | 140    |                  |
| 19  | U     | 187    |                  |
| 20  | X     | 81     |                  |
| 21  | Y     | 81     |                  |
| 22  | Z     | 40     |                  |

## 2 Entry composition

There are 27 unique types of molecules in this entry. The entry contains 70206 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 DNA-directed RNA polymerase subunit alpha.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 1   | A     | 301      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 2449  | 1571 | 422 | 446 | 10 |         |       |
| 1   | B     | 283      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 2292  | 1461 | 395 | 425 | 11 |         |       |

There are 2 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment  | Reference      |
|-------|---------|----------|--------|----------|----------------|
| A     | 67      | PHE      | SER    | conflict | UNP A0A6C0M610 |
| B     | 67      | PHE      | SER    | conflict | UNP A0A6C0M610 |

- Molecule 2 is a protein called DNA-directed RNA polymerase subunit beta.

| Mol | Chain | Residues | Atoms |      |      |      |    | AltConf | Trace |
|-----|-------|----------|-------|------|------|------|----|---------|-------|
| 2   | C     | 1040     | Total | C    | N    | O    | S  | 0       | 0     |
|     |       |          | 8287  | 5278 | 1462 | 1517 | 30 |         |       |

There are 2 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment  | Reference      |
|-------|---------|----------|--------|----------|----------------|
| C     | 113     | PHE      | SER    | conflict | UNP A0A6C0M5W1 |
| C     | 657     | VAL      | ILE    | conflict | UNP A0A6C0M5W1 |

- Molecule 3 is a protein called DNA-directed RNA polymerase subunit beta'.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 3   | D     | 611      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 4983  | 3200 | 880 | 876 | 27 |         |       |

- Molecule 4 is a protein called DNA-directed RNA polymerase subunit beta''.

| Mol | Chain | Residues | Atoms |      |      |      |    | AltConf | Trace |
|-----|-------|----------|-------|------|------|------|----|---------|-------|
| 4   | E     | 1091     | Total | C    | N    | O    | S  | 0       | 0     |
|     |       |          | 8758  | 5612 | 1554 | 1561 | 31 |         |       |

- Molecule 5 is a protein called PAP1.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 5   | F     | 660      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 5307  | 3355 | 929 | 990 | 33 |         |       |

- Molecule 6 is a protein called PAP2.

| Mol | Chain | Residues | Atoms |      |     |      |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|------|----|---------|-------|
| 6   | G     | 748      | Total | C    | N   | O    | S  | 0       | 0     |
|     |       |          | 5887  | 3723 | 994 | 1131 | 39 |         |       |

- Molecule 7 is a protein called PAP3.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 7   | H     | 549      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 4607  | 2937 | 799 | 854 | 17 |         |       |

- Molecule 8 is a protein called PAP4.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 8   | I     | 215      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1771  | 1141 | 300 | 324 | 6 |         |       |

- Molecule 9 is a protein called PAP5.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 9   | J     | 234      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 1970  | 1247 | 350 | 363 | 10 |         |       |

- Molecule 10 is a protein called PAP6.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 10  | K     | 384      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3103  | 1985 | 520 | 583 | 15 |         |       |

- Molecule 11 is a protein called PAP7.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 11  | L     | 416      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3403  | 2183 | 580 | 620 | 20 |         |       |

- Molecule 12 is a protein called PAP8.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 12  | M     | 215      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1803  | 1142 | 312 | 341 | 8 |         |       |

- Molecule 13 is a protein called PAP9.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 13  | N     | 224      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1819  | 1168 | 309 | 338 | 4 |         |       |

- Molecule 14 is a protein called PAP10.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 14  | O     | 114      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 923   | 588 | 148 | 178 | 9 |         |       |
| 14  | P     | 108      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 865   | 550 | 139 | 167 | 9 |         |       |

- Molecule 15 is a protein called PAP11.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 15  | Q     | 539      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 4148  | 2584 | 706 | 833 | 25 |         |       |

- Molecule 16 is a protein called PAP12.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 16  | R     | 128      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1069  | 672 | 193 | 201 | 3 |         |       |

- Molecule 17 is a protein called FLN2.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 17  | S     | 386      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3056  | 1941 | 516 | 578 | 21 |         |       |

- Molecule 18 is a protein called PTAC18.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 18  | T     | 104      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 881   | 572 | 148 | 157 | 4 |         |       |

- Molecule 19 is a protein called PRIN2.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 19  | U     | 109      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 877   | 561 | 144 | 169 | 3 |         |       |

- Molecule 20 is a DNA chain called DNA (81-MER).

| Mol | Chain | Residues | Atoms |     |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| 20  | X     | 31       | Total | C   | N   | O   | P  | 0       | 0     |
|     |       |          | 638   | 304 | 122 | 182 | 30 |         |       |

- Molecule 21 is a DNA chain called DNA (81-MER).

| Mol | Chain | Residues | Atoms |     |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| 21  | Y     | 40       | Total | C   | N   | O   | P  | 0       | 0     |
|     |       |          | 813   | 386 | 145 | 242 | 40 |         |       |

- Molecule 22 is a RNA chain called RNA (40-MER).

| Mol | Chain | Residues | Atoms |    |    |    |    | AltConf | Trace |
|-----|-------|----------|-------|----|----|----|----|---------|-------|
| 22  | Z     | 10       | Total | C  | N  | O  | P  | 0       | 0     |
|     |       |          | 215   | 95 | 40 | 70 | 10 |         |       |

- Molecule 23 is MAGNESIUM ION (CCD ID: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

| Mol | Chain | Residues | Atoms |    | AltConf |
|-----|-------|----------|-------|----|---------|
| 23  | D     | 1        | Total | Mg | 0       |
|     |       |          | 1     | 1  |         |

- Molecule 24 is ZINC ION (CCD ID: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

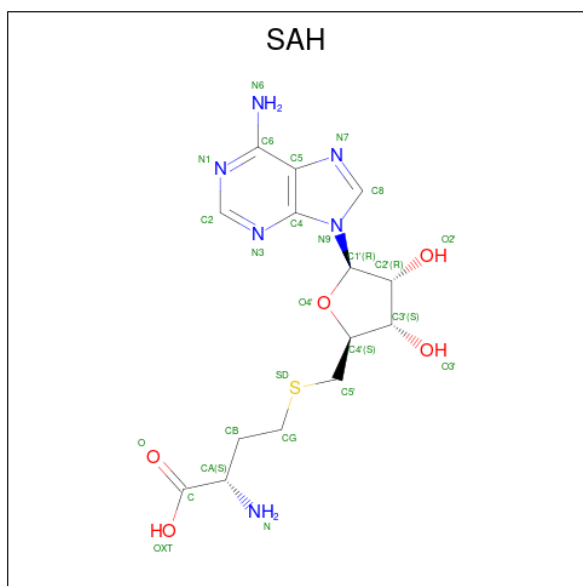
| Mol | Chain | Residues | Atoms |    | AltConf |
|-----|-------|----------|-------|----|---------|
| 24  | E     | 1        | Total | Zn | 0       |
|     |       |          | 1     | 1  |         |

- Molecule 25 is FE (III) ION (CCD ID: FE) (formula: Fe) (labeled as "Ligand of Interest"

by depositor).

| Mol | Chain | Residues | Atoms |    | AltConf |
|-----|-------|----------|-------|----|---------|
| 25  | I     | 1        | Total | Fe | 0       |
|     |       |          | 1     | 1  |         |
| 25  | N     | 1        | Total | Fe | 0       |
|     |       |          | 1     | 1  |         |

- Molecule 26 is S-ADENOSYL-L-HOMOCYSTEINE (CCD ID: SAH) (formula:  $C_{14}H_{20}N_6O_5S$ ) (labeled as "Ligand of Interest" by depositor).



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

- Molecule 27 is water.

| Mol | Chain | Residues | Atoms |    | AltConf |
|-----|-------|----------|-------|----|---------|
| 27  | A     | 17       | Total | O  | 0       |
|     |       |          | 17    | 17 |         |
| 27  | B     | 12       | Total | O  | 0       |
|     |       |          | 12    | 12 |         |
| 27  | C     | 54       | Total | O  | 0       |
|     |       |          | 54    | 54 |         |
| 27  | D     | 17       | Total | O  | 0       |
|     |       |          | 17    | 17 |         |
| 27  | E     | 24       | Total | O  | 0       |
|     |       |          | 24    | 24 |         |

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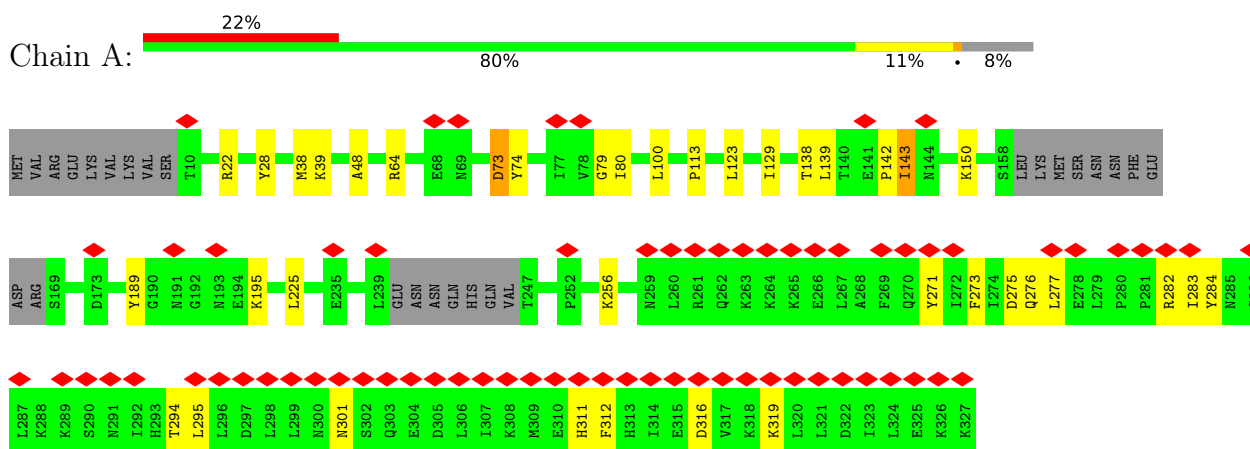
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| Mol | Chain | Residues | Atoms       |         | AltConf |
|-----|-------|----------|-------------|---------|---------|
| 27  | F     | 2        | Total<br>2  | O<br>2  | 0       |
| 27  | H     | 6        | Total<br>6  | O<br>6  | 0       |
| 27  | I     | 3        | Total<br>3  | O<br>3  | 0       |
| 27  | J     | 31       | Total<br>31 | O<br>31 | 0       |
| 27  | K     | 17       | Total<br>17 | O<br>17 | 0       |
| 27  | L     | 19       | Total<br>19 | O<br>19 | 0       |
| 27  | M     | 16       | Total<br>16 | O<br>16 | 0       |
| 27  | N     | 4        | Total<br>4  | O<br>4  | 0       |
| 27  | O     | 2        | Total<br>2  | O<br>2  | 0       |
| 27  | P     | 2        | Total<br>2  | O<br>2  | 0       |
| 27  | R     | 3        | Total<br>3  | O<br>3  | 0       |
| 27  | S     | 23       | Total<br>23 | O<br>23 | 0       |

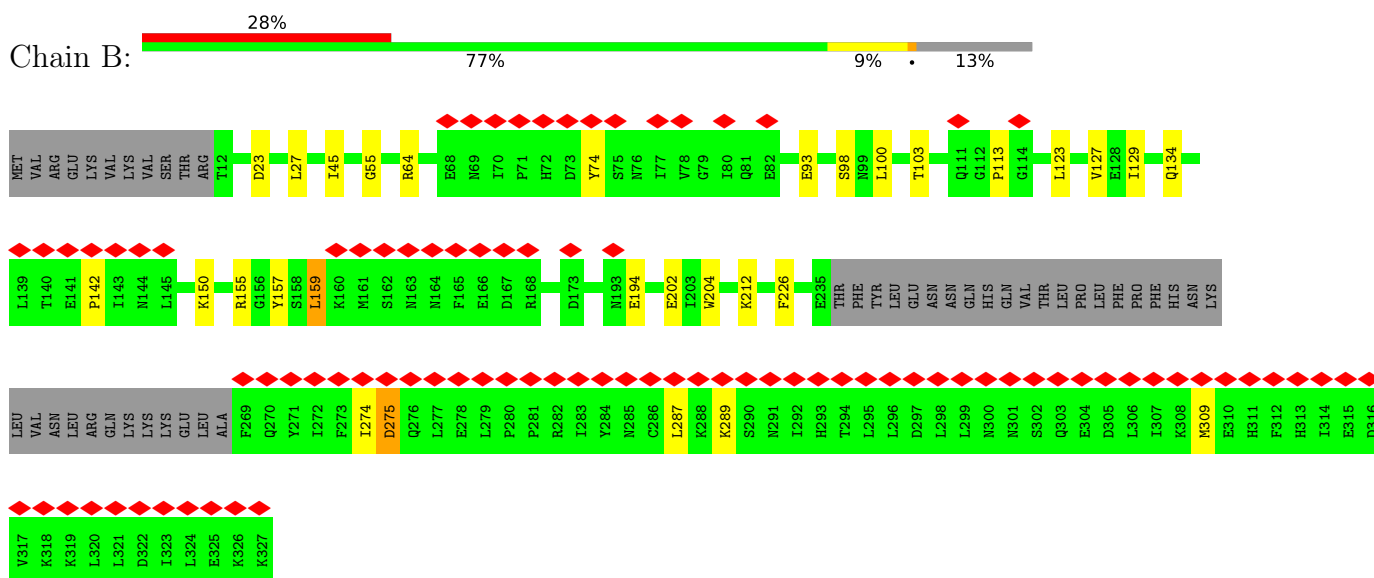
### 3 Residue-property plots

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

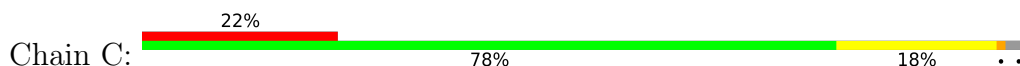
- Molecule 1: DNA-directed RNA polymerase subunit alpha

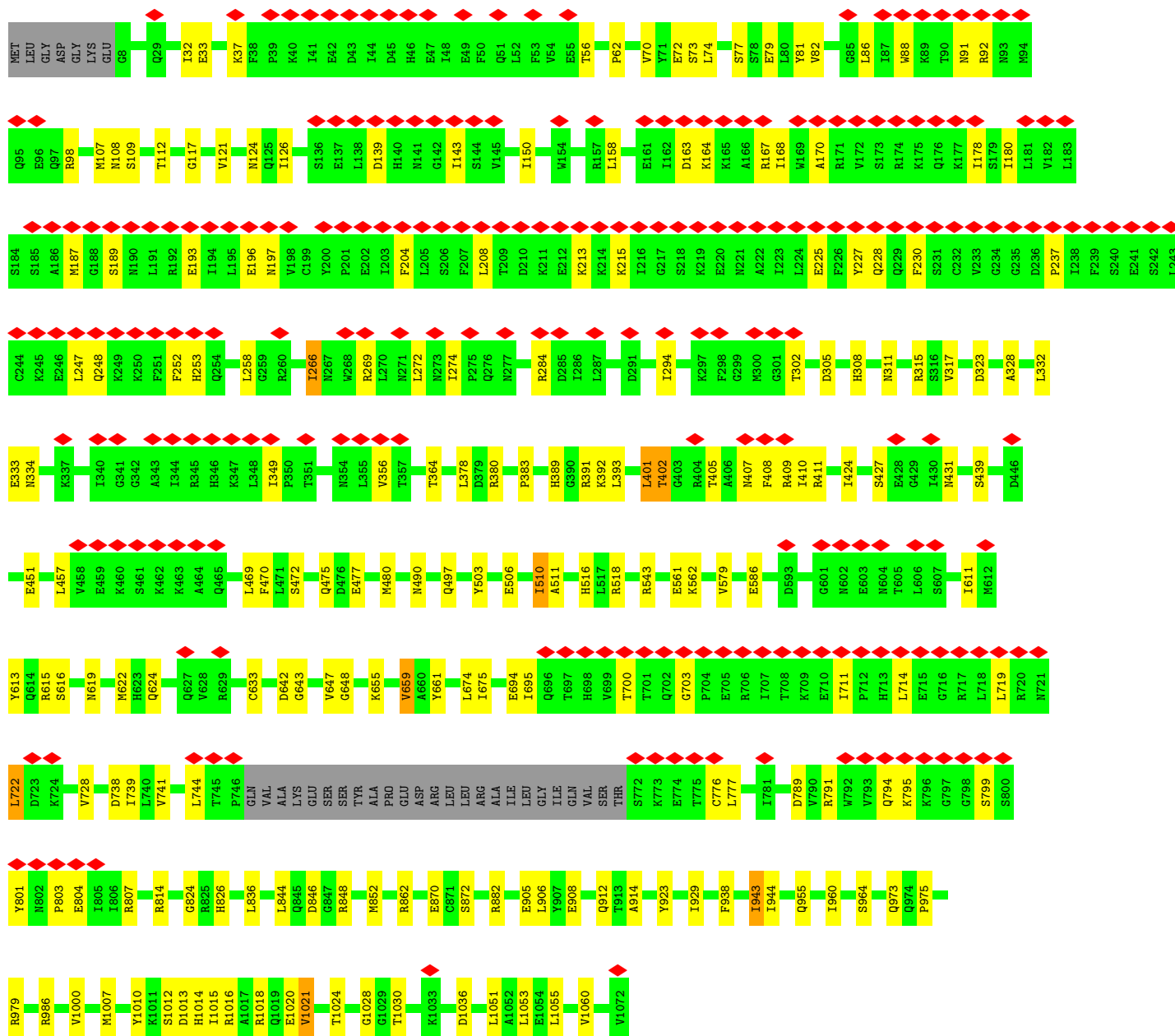


- Molecule 1: DNA-directed RNA polymerase subunit alpha

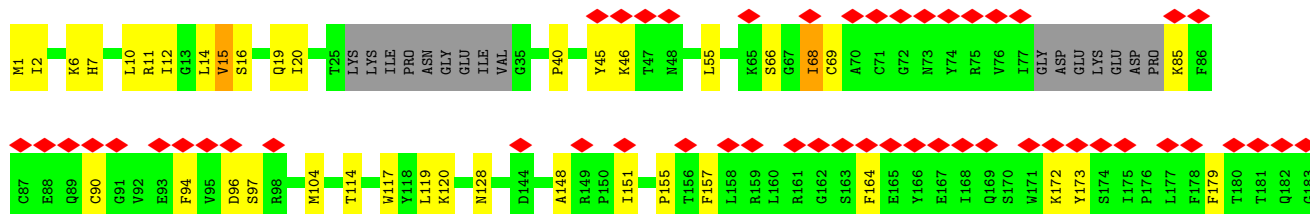


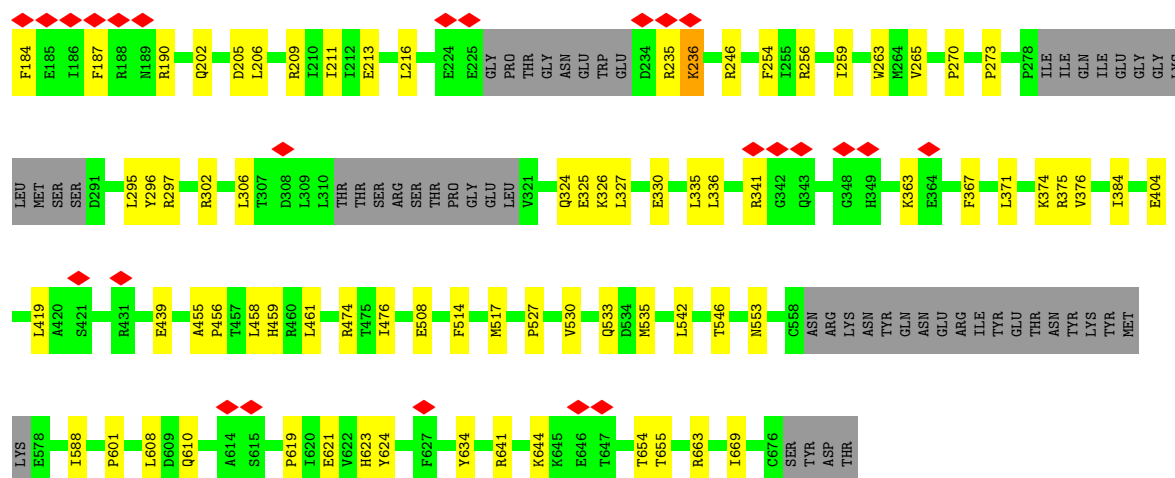
- Molecule 2: DNA-directed RNA polymerase subunit beta



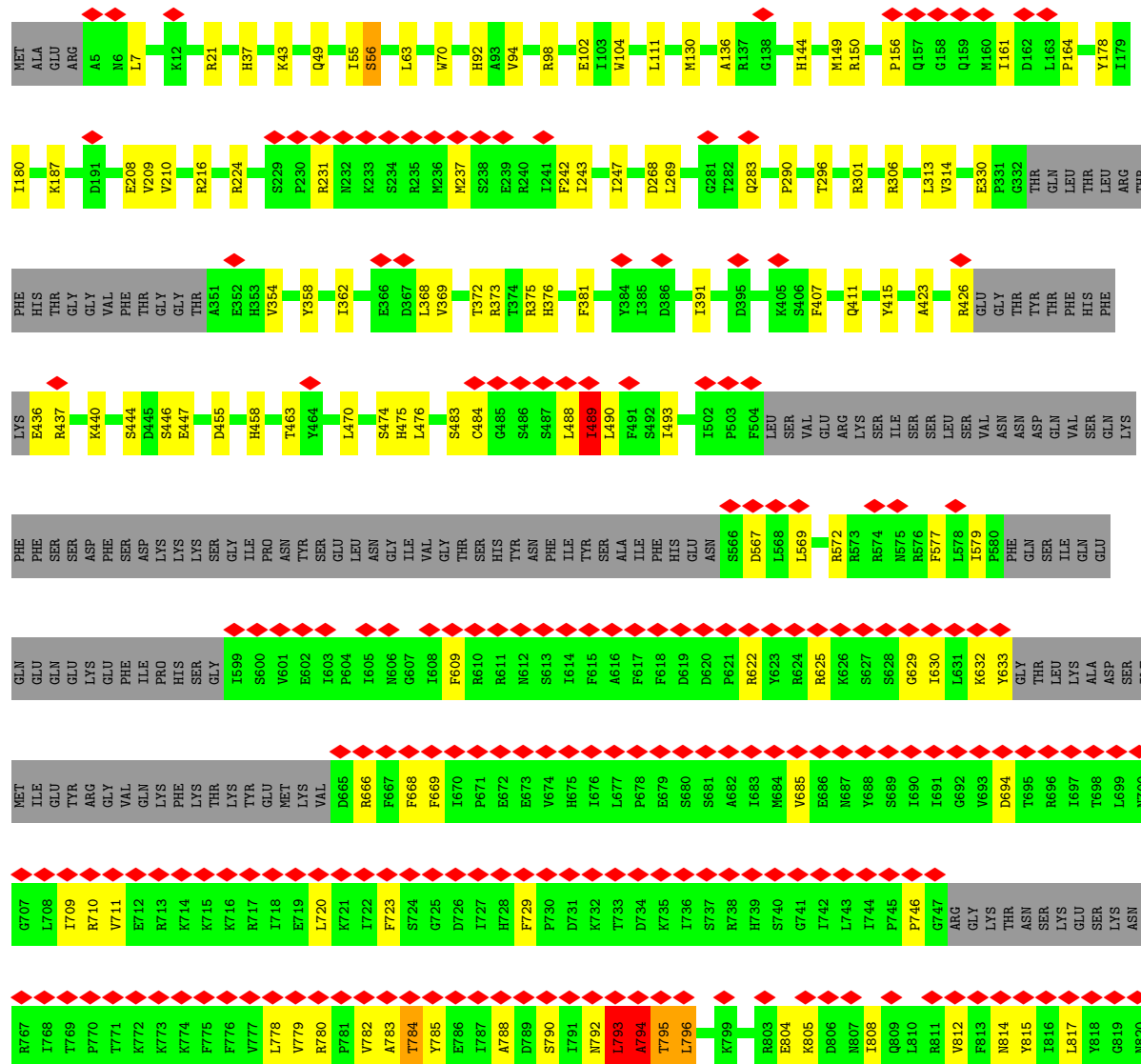


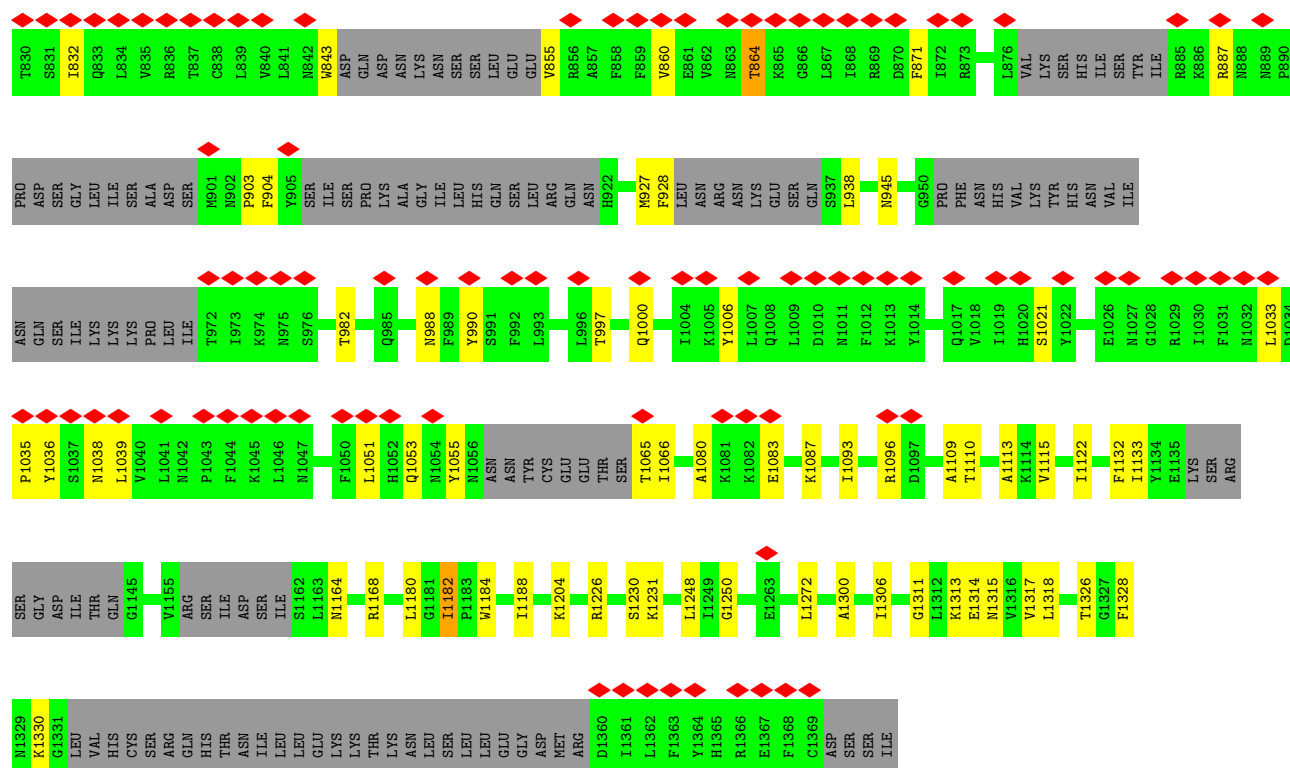
• Molecule 3: DNA-directed RNA polymerase subunit beta'



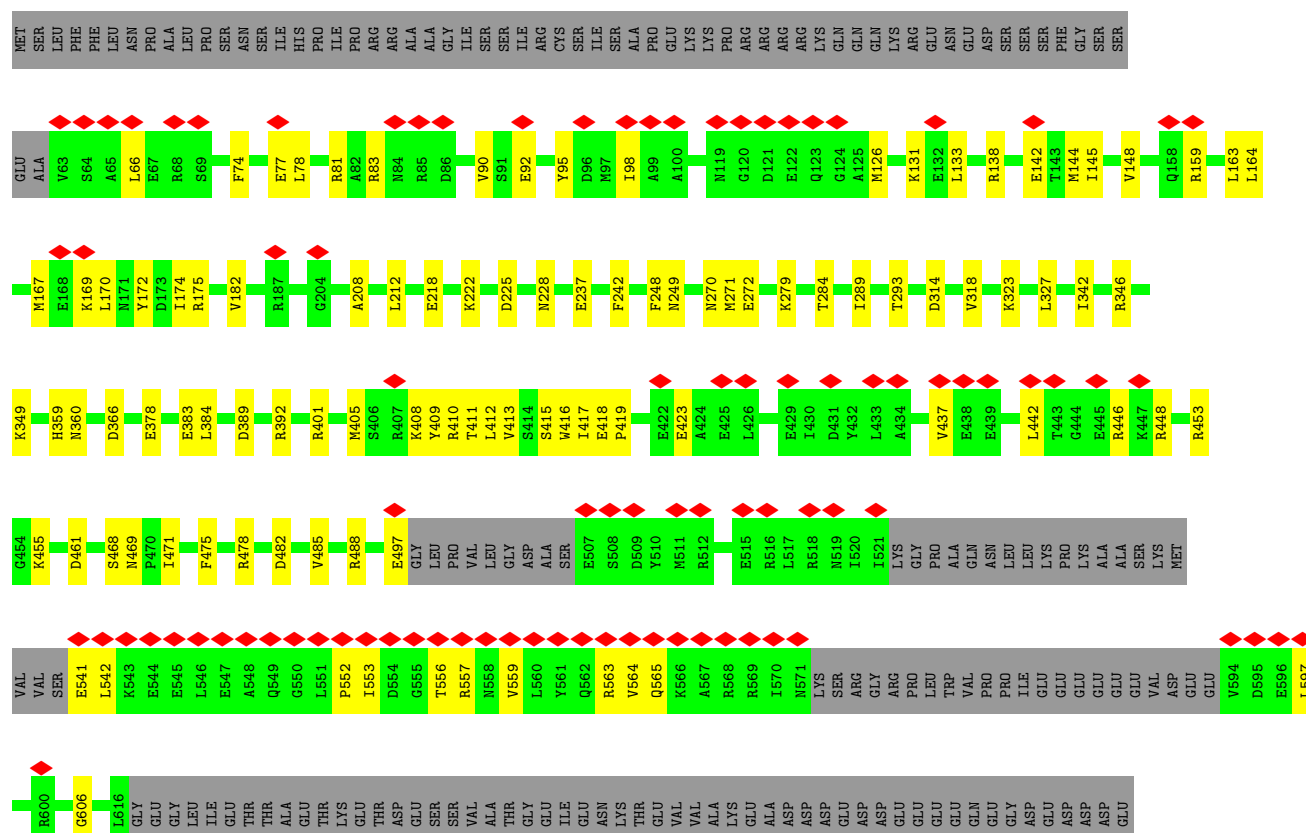


• Molecule 4: DNA-directed RNA polymerase subunit beta”

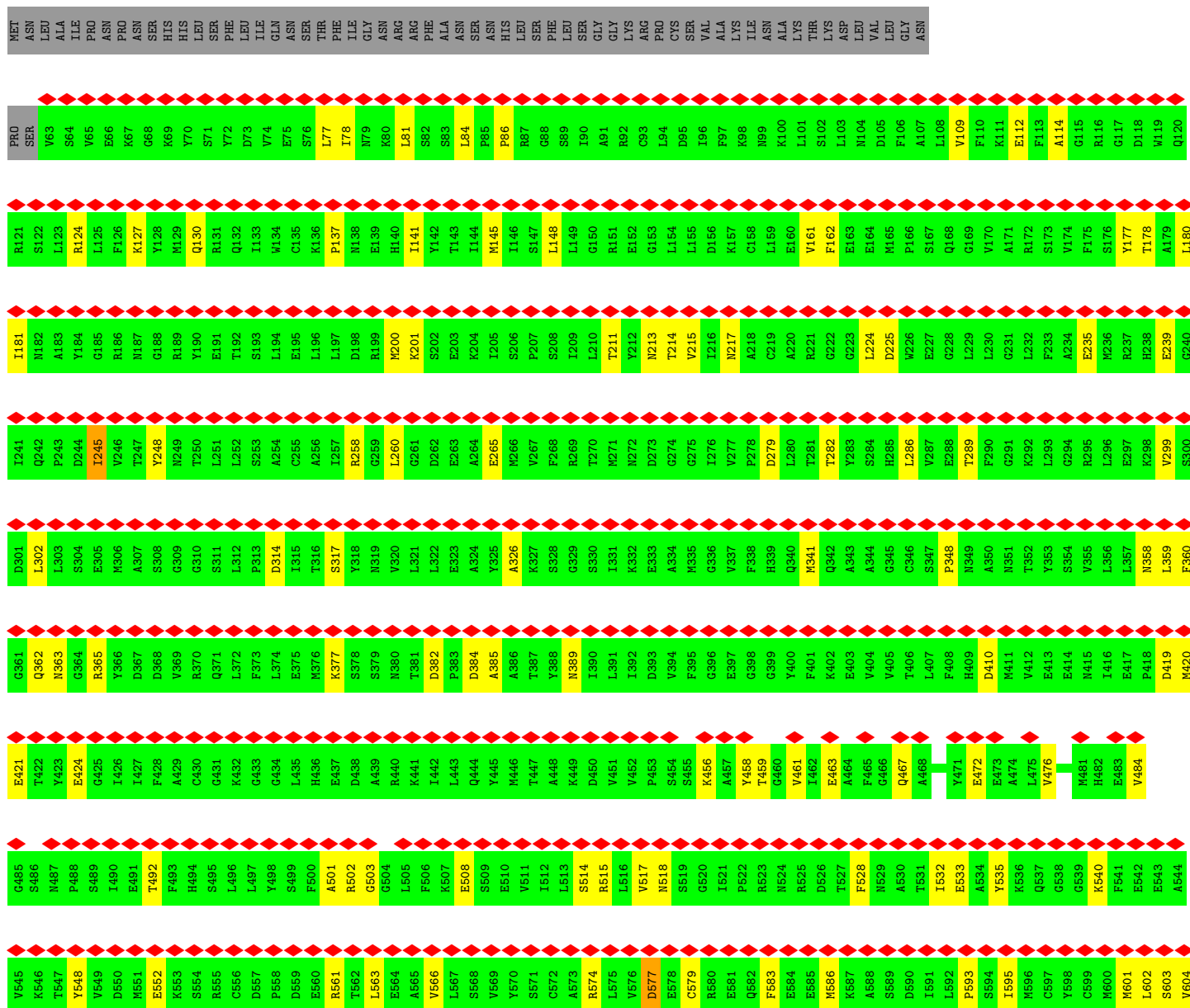
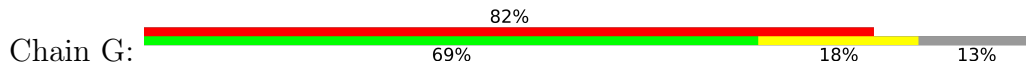




# Molecule 5: PAP1

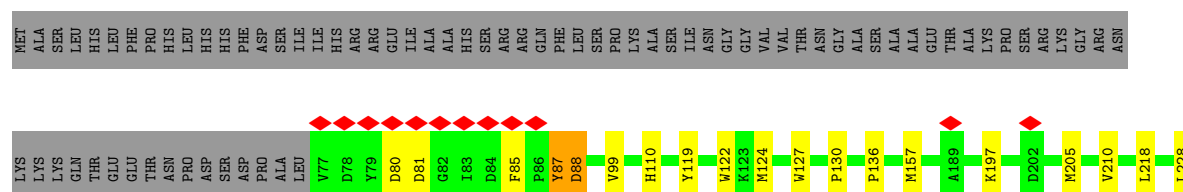


- Molecule 6: PAP2

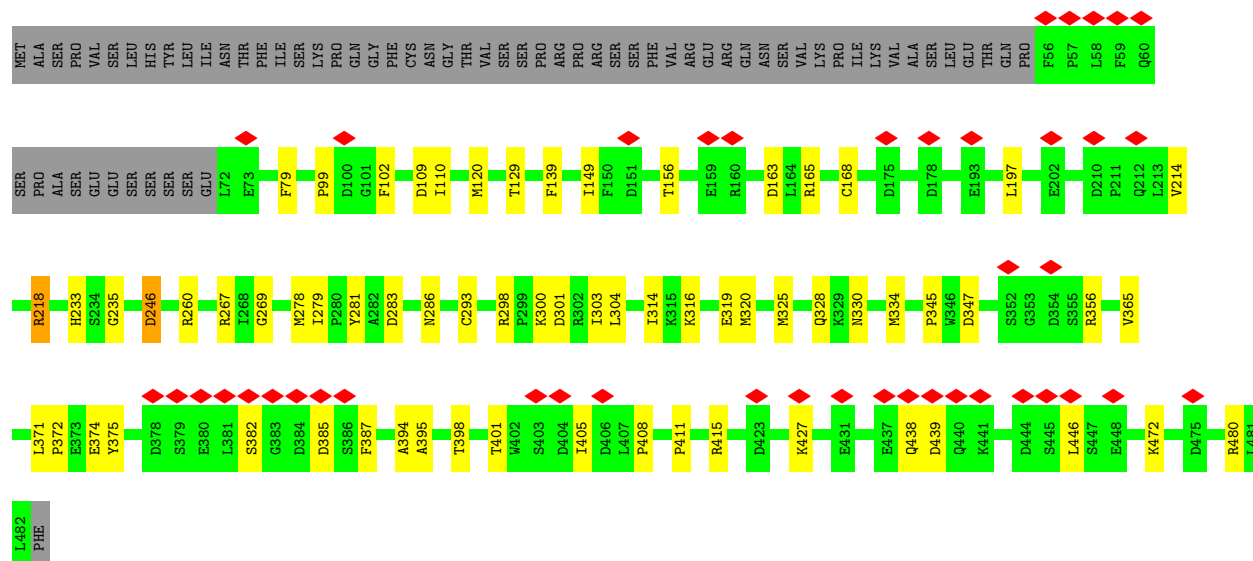




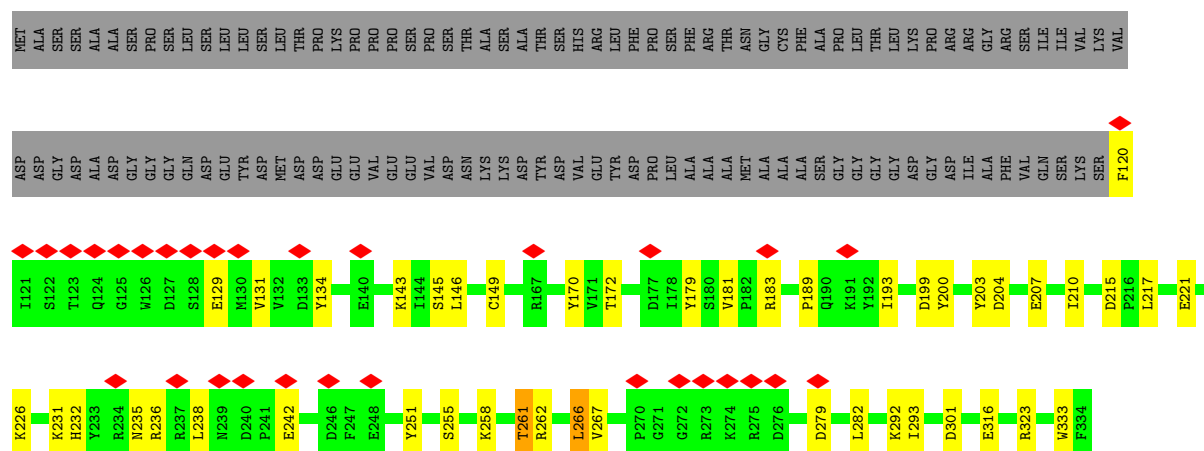
Chain I: 



- Molecule 11: PAP7

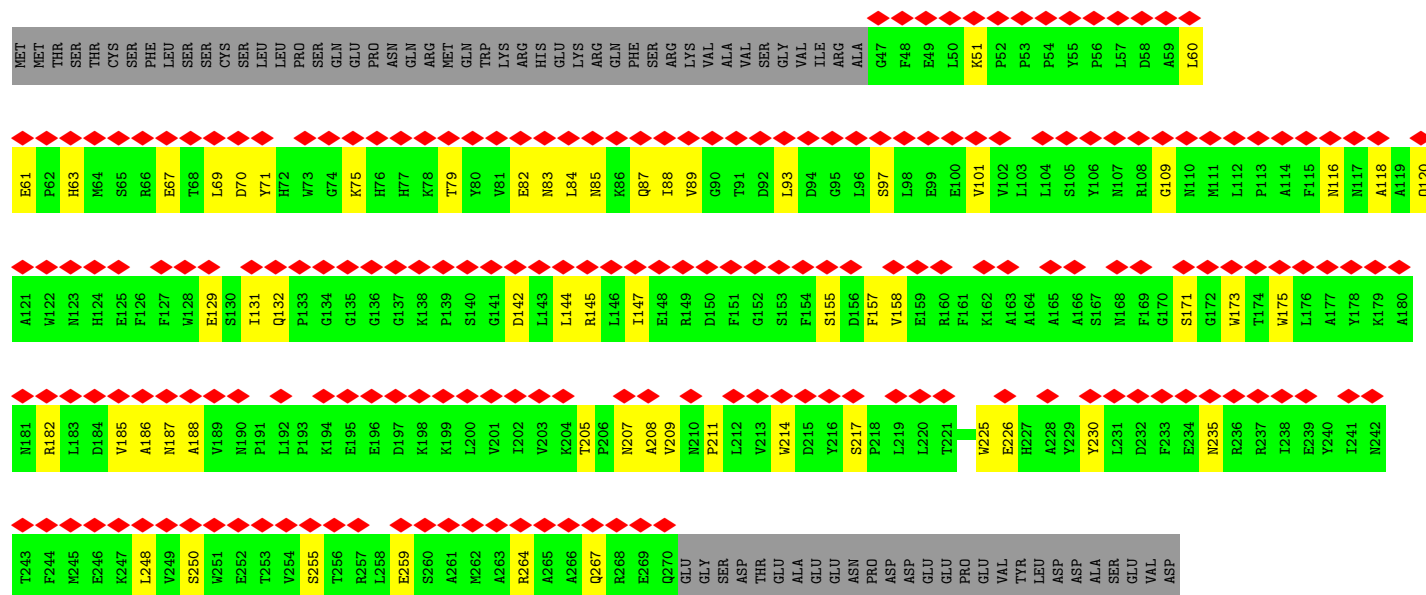


- Molecule 12: PAP8

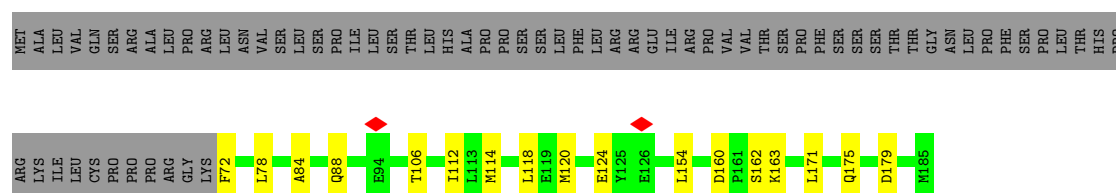


- Molecule 13: PAP9

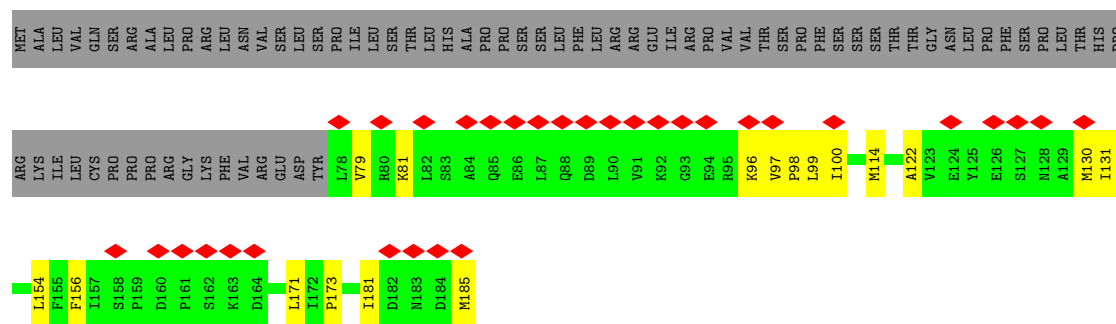




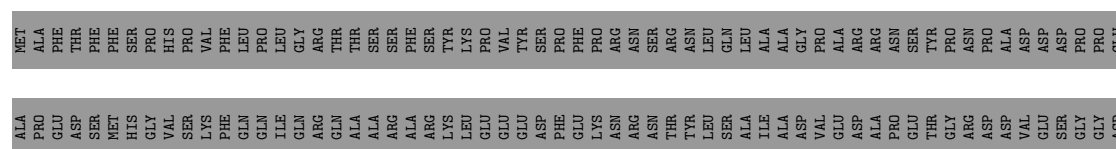
- Molecule 14: PAP10



- Molecule 14: PAP10



- Molecule 15: PAP11

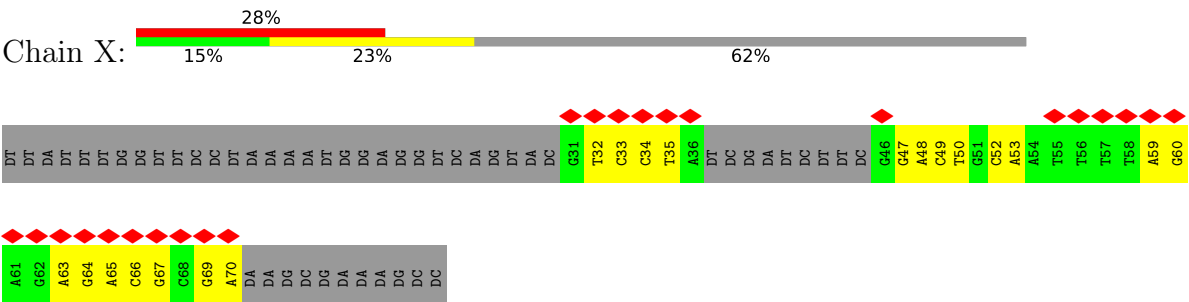




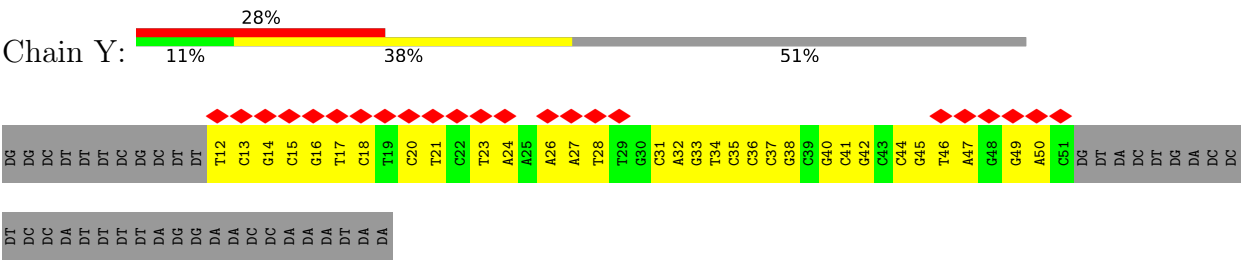
Chain S:  7% 56% 7% 37%



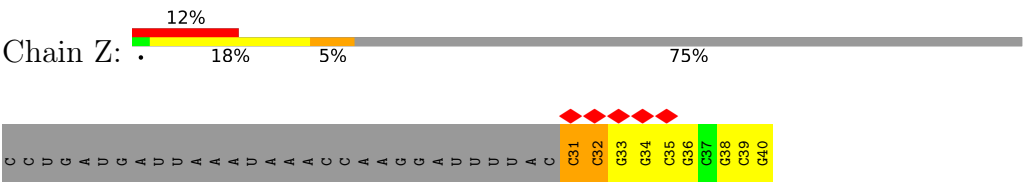
● Molecule 20: DNA (81-MER)



● Molecule 21: DNA (81-MER)



● Molecule 22: RNA (40-MER)



## 4 Experimental information

| Property                             | Value                                   | Source    |
|--------------------------------------|-----------------------------------------|-----------|
| EM reconstruction method             | SINGLE PARTICLE                         | Depositor |
| Imposed symmetry                     | POINT, Not provided                     |           |
| Number of particles used             | 417374                                  | 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 ( $e^-/\text{\AA}^2$ ) | 40.48                                   | Depositor |
| Minimum defocus (nm)                 | 800                                     | Depositor |
| Maximum defocus (nm)                 | 2000                                    | Depositor |
| Magnification                        | Not provided                            |           |
| Image detector                       | GATAN K3 (6k x 4k)                      | Depositor |
| Maximum map value                    | 5.127                                   | Depositor |
| Minimum map value                    | -0.951                                  | Depositor |
| Average map value                    | 0.140                                   | Depositor |
| Map value standard deviation         | 0.155                                   | Depositor |
| Recommended contour level            | 0.8                                     | Depositor |
| Map size (Å)                         | 300.0, 300.0, 300.0                     | wwPDB     |
| Map dimensions                       | 600, 600, 600                           | wwPDB     |
| Map angles (°)                       | 90.0, 90.0, 90.0                        | wwPDB     |
| Pixel spacing (Å)                    | 0.5, 0.5, 0.5                           | Depositor |

## 5 Model quality

### 5.1 Standard geometry

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

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

| Mol | Chain | Bond lengths |         | Bond angles |                |
|-----|-------|--------------|---------|-------------|----------------|
|     |       | RMSZ         | # Z  >5 | RMSZ        | # Z  >5        |
| 1   | A     | 0.12         | 0/2498  | 0.25        | 0/3377         |
| 1   | B     | 0.12         | 0/2336  | 0.28        | 0/3159         |
| 2   | C     | 0.12         | 0/8458  | 0.26        | 0/11422        |
| 3   | D     | 0.12         | 0/5093  | 0.26        | 0/6878         |
| 4   | E     | 0.13         | 0/8932  | 0.27        | 1/12058 (0.0%) |
| 5   | F     | 0.11         | 0/5410  | 0.26        | 0/7306         |
| 6   | G     | 0.08         | 0/5997  | 0.23        | 0/8096         |
| 7   | H     | 0.10         | 0/4736  | 0.23        | 0/6386         |
| 8   | I     | 0.09         | 0/1825  | 0.27        | 1/2481 (0.0%)  |
| 9   | J     | 0.13         | 0/2021  | 0.25        | 0/2724         |
| 10  | K     | 0.14         | 0/3184  | 0.27        | 0/4320         |
| 11  | L     | 0.11         | 0/3492  | 0.23        | 0/4727         |
| 12  | M     | 0.11         | 0/1848  | 0.23        | 0/2502         |
| 13  | N     | 0.09         | 0/1873  | 0.26        | 0/2549         |
| 14  | O     | 0.12         | 0/939   | 0.23        | 0/1268         |
| 14  | P     | 0.10         | 0/879   | 0.22        | 0/1187         |
| 15  | Q     | 0.11         | 0/4218  | 0.27        | 0/5720         |
| 16  | R     | 0.12         | 0/1089  | 0.25        | 0/1462         |
| 17  | S     | 0.11         | 0/3123  | 0.25        | 0/4226         |
| 18  | T     | 0.10         | 0/906   | 0.29        | 0/1225         |
| 19  | U     | 0.08         | 0/900   | 0.21        | 0/1219         |
| 20  | X     | 0.16         | 0/716   | 0.34        | 0/1102         |
| 21  | Y     | 0.18         | 0/909   | 0.37        | 0/1399         |
| 22  | Z     | 0.12         | 0/239   | 0.31        | 0/371          |
| All | All   | 0.11         | 0/71621 | 0.26        | 2/97164 (0.0%) |

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

| Mol | Chain | #Chirality outliers | #Planarity outliers |
|-----|-------|---------------------|---------------------|
| 4   | E     | 0                   | 2                   |

There are no bond length outliers.

All (2) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms   | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|---------|-------|-------------|----------|
| 4   | E     | 794 | ALA  | N-CA-C  | -7.86 | 103.69      | 112.57   |
| 8   | I     | 195 | ASN  | CB-CA-C | -5.31 | 110.47      | 116.63   |

There are no chirality outliers.

All (2) planarity outliers are listed below:

| Mol | Chain | Res  | Type | Group   |
|-----|-------|------|------|---------|
| 4   | E     | 1182 | ILE  | Peptide |
| 4   | E     | 794  | ALA  | Peptide |

## 5.2 Too-close contacts

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

| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 1   | A     | 2449  | 0        | 2490     | 26      | 0            |
| 1   | B     | 2292  | 0        | 2311     | 25      | 0            |
| 2   | C     | 8287  | 0        | 8381     | 126     | 0            |
| 3   | D     | 4983  | 0        | 5052     | 92      | 0            |
| 4   | E     | 8758  | 0        | 8895     | 160     | 0            |
| 5   | F     | 5307  | 0        | 5267     | 81      | 0            |
| 6   | G     | 5887  | 0        | 5803     | 106     | 0            |
| 7   | H     | 4607  | 0        | 4464     | 87      | 0            |
| 8   | I     | 1771  | 0        | 1696     | 39      | 0            |
| 9   | J     | 1970  | 0        | 1923     | 25      | 0            |
| 10  | K     | 3103  | 0        | 3026     | 30      | 0            |
| 11  | L     | 3403  | 0        | 3348     | 42      | 0            |
| 12  | M     | 1803  | 0        | 1756     | 29      | 0            |
| 13  | N     | 1819  | 0        | 1746     | 40      | 0            |
| 14  | O     | 923   | 0        | 917      | 13      | 0            |
| 14  | P     | 865   | 0        | 867      | 14      | 0            |
| 15  | Q     | 4148  | 0        | 4046     | 101     | 0            |

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| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 16  | R     | 1069  | 0        | 1058     | 16      | 0            |
| 17  | S     | 3056  | 0        | 3042     | 31      | 0            |
| 18  | T     | 881   | 0        | 860      | 18      | 0            |
| 19  | U     | 877   | 0        | 840      | 12      | 0            |
| 20  | X     | 638   | 0        | 351      | 26      | 0            |
| 21  | Y     | 813   | 0        | 450      | 33      | 0            |
| 22  | Z     | 215   | 0        | 111      | 10      | 0            |
| 23  | D     | 1     | 0        | 0        | 0       | 0            |
| 24  | E     | 1     | 0        | 0        | 0       | 0            |
| 25  | I     | 1     | 0        | 0        | 0       | 0            |
| 25  | N     | 1     | 0        | 0        | 0       | 0            |
| 26  | L     | 26    | 0        | 19       | 1       | 0            |
| 27  | A     | 17    | 0        | 0        | 0       | 0            |
| 27  | B     | 12    | 0        | 0        | 0       | 0            |
| 27  | C     | 54    | 0        | 0        | 1       | 0            |
| 27  | D     | 17    | 0        | 0        | 1       | 0            |
| 27  | E     | 24    | 0        | 0        | 1       | 0            |
| 27  | F     | 2     | 0        | 0        | 0       | 0            |
| 27  | H     | 6     | 0        | 0        | 0       | 0            |
| 27  | I     | 3     | 0        | 0        | 1       | 0            |
| 27  | J     | 31    | 0        | 0        | 1       | 0            |
| 27  | K     | 17    | 0        | 0        | 0       | 0            |
| 27  | L     | 19    | 0        | 0        | 0       | 0            |
| 27  | M     | 16    | 0        | 0        | 0       | 0            |
| 27  | N     | 4     | 0        | 0        | 0       | 0            |
| 27  | O     | 2     | 0        | 0        | 0       | 0            |
| 27  | P     | 2     | 0        | 0        | 0       | 0            |
| 27  | R     | 3     | 0        | 0        | 0       | 0            |
| 27  | S     | 23    | 0        | 0        | 3       | 0            |
| All | All   | 70206 | 0        | 68719    | 1009    | 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 7.

All (1009) 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) |
|-----------------|-------------------|--------------------------|-------------------|
| 5:F:565:GLN:NE2 | 20:X:65:DA:OP1    | 1.65                     | 1.27              |
| 4:E:729:PHE:HE1 | 19:U:147:ILE:HD11 | 1.42                     | 0.84              |
| 3:D:45:TYR:CG   | 20:X:34:DC:H3'    | 2.15                     | 0.82              |
| 21:Y:45:DG:H1   | 22:Z:32:C:H42     | 1.29                     | 0.81              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 3:D:45:TYR:HD1    | 20:X:34:DC:H5'    | 1.45                     | 0.81              |
| 4:E:567:ASP:HB3   | 4:E:795:THR:C     | 2.07                     | 0.79              |
| 4:E:729:PHE:CE1   | 19:U:147:ILE:CD1  | 2.67                     | 0.78              |
| 4:E:790:SER:HB2   | 7:H:607:ALA:HA    | 1.66                     | 0.77              |
| 15:Q:531:LEU:HD21 | 15:Q:560:LEU:HB3  | 1.66                     | 0.76              |
| 1:B:202:GLU:OE2   | 16:R:73:ARG:NH2   | 2.22                     | 0.73              |
| 5:F:131:LYS:NZ    | 6:G:472:GLU:OE1   | 2.21                     | 0.73              |
| 4:E:729:PHE:CE1   | 19:U:147:ILE:HD11 | 2.24                     | 0.73              |
| 8:I:119:ASN:OD1   | 27:I:8101:HOH:O   | 2.06                     | 0.73              |
| 3:D:302:ARG:HD3   | 3:D:327:LEU:HB3   | 1.71                     | 0.72              |
| 3:D:45:TYR:CD1    | 20:X:34:DC:H3'    | 2.24                     | 0.72              |
| 7:H:519:ARG:NH1   | 7:H:522:GLU:OE2   | 2.23                     | 0.72              |
| 11:L:99:PRO:HB2   | 16:R:44:ARG:NH1   | 2.03                     | 0.72              |
| 11:L:446:LEU:O    | 16:R:38:ARG:NH1   | 2.23                     | 0.72              |
| 5:F:413:VAL:HG21  | 5:F:809:PRO:HB3   | 1.72                     | 0.72              |
| 1:A:195:LYS:HG3   | 1:B:159:LEU:HD13  | 1.71                     | 0.71              |
| 4:E:792:ASN:O     | 4:E:794:ALA:N     | 2.22                     | 0.71              |
| 4:E:792:ASN:C     | 4:E:794:ALA:H     | 1.97                     | 0.71              |
| 9:J:251:ARG:NH1   | 9:J:276:PRO:O     | 2.23                     | 0.71              |
| 13:N:182:ARG:NH1  | 13:N:188:ALA:O    | 2.23                     | 0.71              |
| 6:G:359:LEU:O     | 6:G:363:ASN:ND2   | 2.23                     | 0.71              |
| 3:D:45:TYR:CD1    | 20:X:34:DC:H5'    | 2.25                     | 0.71              |
| 15:Q:647:SER:O    | 15:Q:697:ARG:NH1  | 2.24                     | 0.70              |
| 3:D:179:PHE:HA    | 15:Q:698:ARG:HH12 | 1.55                     | 0.70              |
| 4:E:793:LEU:HD12  | 7:H:604:TYR:CE1   | 2.27                     | 0.70              |
| 4:E:455:ASP:HB2   | 4:E:474:SER:HB2   | 1.74                     | 0.69              |
| 15:Q:510:PRO:HA   | 15:Q:524:VAL:HA   | 1.74                     | 0.69              |
| 3:D:46:LYS:HD3    | 20:X:34:DC:OP1    | 1.93                     | 0.69              |
| 15:Q:268:SER:HB3  | 15:Q:287:VAL:HG13 | 1.73                     | 0.69              |
| 8:I:77:LYS:HB3    | 13:N:235:ASN:HD21 | 1.56                     | 0.68              |
| 4:E:1006:TYR:CB   | 8:I:247:ALA:HB2   | 2.24                     | 0.68              |
| 15:Q:759:GLU:OE2  | 15:Q:763:ARG:NH2  | 2.27                     | 0.68              |
| 21:Y:15:DC:H2''   | 21:Y:16:DG:C8     | 2.28                     | 0.68              |
| 4:E:208:GLU:OE1   | 4:E:1313:LYS:NZ   | 2.22                     | 0.68              |
| 2:C:92:ARG:HH12   | 4:E:817:LEU:HB3   | 1.58                     | 0.68              |
| 2:C:305:ASP:O     | 2:C:311:ASN:ND2   | 2.27                     | 0.68              |
| 17:S:481:THR:HG22 | 17:S:483:PHE:H    | 1.58                     | 0.68              |
| 21:Y:20:DC:H2''   | 21:Y:21:DT:H5'    | 1.75                     | 0.68              |
| 3:D:455:ALA:HB1   | 21:Y:38:DG:H1'    | 1.75                     | 0.67              |
| 4:E:1182:ILE:O    | 4:E:1184:TRP:N    | 2.27                     | 0.67              |
| 4:E:1096:ARG:HH21 | 7:H:283:THR:HG22  | 1.59                     | 0.67              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:C:272:LEU:HB3   | 2:C:274:ILE:HD13  | 1.77                     | 0.67              |
| 1:A:39:LYS:O      | 1:B:155:ARG:NH2   | 2.27                     | 0.66              |
| 2:C:960:ILE:HG21  | 3:D:474:ARG:HD3   | 1.77                     | 0.66              |
| 3:D:45:TYR:HB2    | 20:X:34:DC:H5"    | 1.78                     | 0.66              |
| 6:G:341:MET:HE1   | 6:G:348:PRO:HG3   | 1.77                     | 0.66              |
| 7:H:433:LEU:HB3   | 7:H:474:LEU:HD13  | 1.78                     | 0.66              |
| 19:U:99:ARG:HA    | 19:U:102:MET:HE3  | 1.77                     | 0.65              |
| 4:E:761:ASN:HA    | 4:E:784:THR:HG21  | 1.79                     | 0.65              |
| 2:C:228:GLN:HE21  | 2:C:237:PRO:HD2   | 1.61                     | 0.65              |
| 4:E:209:VAL:HG13  | 4:E:210:VAL:HG13  | 1.78                     | 0.65              |
| 6:G:265:GLU:HG3   | 6:G:302:LEU:HD21  | 1.79                     | 0.65              |
| 20:X:70:DA:N1     | 21:Y:12:DT:O4     | 2.30                     | 0.65              |
| 18:T:50:GLU:HB3   | 18:T:111:LEU:HB3  | 1.79                     | 0.65              |
| 3:D:179:PHE:CA    | 15:Q:698:ARG:HH12 | 2.10                     | 0.64              |
| 4:E:415:TYR:HB2   | 9:J:227:THR:HG21  | 1.79                     | 0.64              |
| 1:B:289:LYS:HE2   | 10:K:88:ASP:HB3   | 1.79                     | 0.64              |
| 2:C:112:THR:HG21  | 2:C:378:LEU:HD22  | 1.79                     | 0.64              |
| 4:E:778:LEU:HD13  | 4:E:780:ARG:HE    | 1.63                     | 0.64              |
| 15:Q:696:VAL:HG22 | 15:Q:698:ARG:H    | 1.62                     | 0.64              |
| 1:B:123:LEU:HD11  | 1:B:129:ILE:HG13  | 1.78                     | 0.64              |
| 2:C:163:ASP:OD1   | 2:C:167:ARG:N     | 2.30                     | 0.64              |
| 4:E:290:PRO:O     | 4:E:1226:ARG:NH1  | 2.31                     | 0.64              |
| 15:Q:331:SER:HG   | 15:Q:336:HIS:HD1  | 1.45                     | 0.64              |
| 15:Q:372:MET:HB2  | 15:Q:379:TYR:H    | 1.63                     | 0.64              |
| 15:Q:617:VAL:HG22 | 15:Q:644:MET:HB2  | 1.80                     | 0.64              |
| 17:S:291:ARG:NH2  | 17:S:339:GLU:OE1  | 2.30                     | 0.64              |
| 10:K:388:ASP:HB2  | 10:K:435:ILE:HD13 | 1.78                     | 0.64              |
| 8:I:77:LYS:HB3    | 13:N:235:ASN:ND2  | 2.13                     | 0.63              |
| 4:E:567:ASP:HB3   | 4:E:795:THR:HA    | 1.80                     | 0.63              |
| 5:F:819:ARG:HH22  | 5:F:848:LEU:HD11  | 1.63                     | 0.63              |
| 13:N:93:LEU:HD11  | 13:N:101:VAL:HG13 | 1.79                     | 0.63              |
| 3:D:236:LYS:NZ    | 21:Y:24:DA:OP2    | 2.32                     | 0.63              |
| 15:Q:642:VAL:HG22 | 15:Q:690:ARG:HB2  | 1.81                     | 0.63              |
| 5:F:138:ARG:NH2   | 5:F:170:LEU:O     | 2.31                     | 0.62              |
| 6:G:377:LYS:NZ    | 6:G:410:ASP:OD2   | 2.31                     | 0.62              |
| 5:F:832:LYS:HA    | 5:F:835:GLN:HE21  | 1.63                     | 0.62              |
| 3:D:157:PHE:HD2   | 15:Q:694:HIS:HE2  | 1.45                     | 0.62              |
| 4:E:358:TYR:HD1   | 12:M:323:ARG:HE   | 1.47                     | 0.62              |
| 21:Y:45:DG:H1     | 22:Z:32:C:N4      | 1.97                     | 0.62              |
| 2:C:738:ASP:OD1   | 2:C:739:ILE:N     | 2.32                     | 0.62              |
| 11:L:279:ILE:HD13 | 11:L:304:LEU:HD22 | 1.81                     | 0.62              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 14:P:96:LYS:H     | 14:P:96:LYS:HD3   | 1.63                     | 0.62              |
| 15:Q:360:LYS:NZ   | 15:Q:370:THR:O    | 2.31                     | 0.62              |
| 1:A:123:LEU:HD11  | 1:A:129:ILE:HG12  | 1.81                     | 0.62              |
| 4:E:224:ARG:NH2   | 5:F:762:ASP:OD2   | 2.32                     | 0.62              |
| 15:Q:405:LYS:O    | 15:Q:409:ASN:ND2  | 2.32                     | 0.62              |
| 4:E:437:ARG:HH21  | 4:E:1133:ILE:HG21 | 1.64                     | 0.62              |
| 2:C:586:GLU:HG3   | 14:O:78:LEU:HD11  | 1.81                     | 0.62              |
| 18:T:80:TRP:O     | 18:T:117:TRP:N    | 2.33                     | 0.62              |
| 15:Q:344:ILE:HB   | 15:Q:415:VAL:HG22 | 1.82                     | 0.61              |
| 2:C:480:MET:H     | 2:C:516:HIS:HD2   | 1.48                     | 0.61              |
| 1:A:73:ASP:OD1    | 1:A:73:ASP:N      | 2.33                     | 0.61              |
| 2:C:659:VAL:HG22  | 2:C:852:MET:HB2   | 1.82                     | 0.61              |
| 10:K:88:ASP:OD1   | 10:K:88:ASP:N     | 2.32                     | 0.61              |
| 3:D:259:ILE:O     | 5:F:455:LYS:NZ    | 2.26                     | 0.61              |
| 3:D:206:LEU:HD22  | 3:D:211:ILE:HD11  | 1.83                     | 0.61              |
| 6:G:503:GLY:HA2   | 6:G:715:ARG:HG2   | 1.81                     | 0.61              |
| 13:N:217:SER:OG   | 13:N:264:ARG:NH2  | 2.32                     | 0.61              |
| 4:E:63:LEU:HD11   | 9:J:285:ARG:HD2   | 1.82                     | 0.61              |
| 2:C:794:GLN:HG3   | 2:C:804:GLU:HG2   | 1.82                     | 0.61              |
| 5:F:225:ASP:OD2   | 5:F:228:ASN:ND2   | 2.34                     | 0.60              |
| 14:P:99:LEU:HD13  | 14:P:130:MET:HE3  | 1.83                     | 0.60              |
| 3:D:439:GLU:HG2   | 16:R:157:LEU:HD21 | 1.83                     | 0.60              |
| 10:K:323:ALA:HB1  | 10:K:328:GLN:HB3  | 1.83                     | 0.60              |
| 15:Q:283:GLU:HB3  | 15:Q:287:VAL:HG21 | 1.83                     | 0.60              |
| 17:S:284:ASN:ND2  | 17:S:290:THR:OG1  | 2.35                     | 0.60              |
| 19:U:102:MET:HE1  | 19:U:120:VAL:HG13 | 1.83                     | 0.60              |
| 20:X:34:DC:H2''   | 20:X:35:DT:H5'    | 1.83                     | 0.60              |
| 2:C:139:ASP:OD1   | 2:C:143:ILE:N     | 2.34                     | 0.60              |
| 4:E:685:VAL:HG21  | 4:E:709:ILE:HG13  | 1.84                     | 0.60              |
| 15:Q:615:ILE:HB   | 15:Q:714:VAL:HG12 | 1.84                     | 0.60              |
| 16:R:75:ILE:HG23  | 16:R:80:LYS:HB2   | 1.83                     | 0.60              |
| 7:H:188:GLU:HB3   | 7:H:221:ARG:HE    | 1.67                     | 0.60              |
| 5:F:218:GLU:HG2   | 5:F:222:LYS:HE2   | 1.84                     | 0.60              |
| 12:M:172:THR:HG22 | 12:M:179:TYR:HA   | 1.83                     | 0.60              |
| 5:F:389:ASP:OD1   | 5:F:392:ARG:NH2   | 2.35                     | 0.60              |
| 7:H:81:TRP:O      | 7:H:308:ASN:ND2   | 2.35                     | 0.60              |
| 7:H:436:LEU:O     | 7:H:470:LYS:NZ    | 2.35                     | 0.60              |
| 7:H:73:ARG:NH2    | 8:I:257:GLU:OE1   | 2.35                     | 0.59              |
| 5:F:66:LEU:HD21   | 6:G:793:MET:CE    | 2.33                     | 0.59              |
| 5:F:83:ARG:NH1    | 11:L:408:PRO:O    | 2.36                     | 0.59              |
| 20:X:49:DC:H2'    | 20:X:50:DT:H71    | 1.85                     | 0.59              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 3:D:624:TYR:HB3   | 12:M:282:LEU:HB3  | 1.84                     | 0.59              |
| 15:Q:356:THR:HG23 | 15:Q:415:VAL:HB   | 1.83                     | 0.59              |
| 15:Q:379:TYR:OH   | 15:Q:385:LYS:NZ   | 2.35                     | 0.59              |
| 15:Q:537:LEU:HD13 | 15:Q:542:ASN:HB3  | 1.84                     | 0.59              |
| 21:Y:33:DG:H2'    | 21:Y:34:DT:H71    | 1.84                     | 0.59              |
| 21:Y:31:DC:H2''   | 21:Y:32:DA:H5'    | 1.83                     | 0.59              |
| 2:C:694:GLU:HG2   | 2:C:807:ARG:HG2   | 1.84                     | 0.59              |
| 8:I:180:VAL:HG11  | 8:I:199:PRO:HG2   | 1.85                     | 0.59              |
| 15:Q:466:MET:HG3  | 15:Q:494:VAL:HG21 | 1.83                     | 0.59              |
| 1:A:113:PRO:HD3   | 1:A:142:PRO:HG3   | 1.85                     | 0.59              |
| 11:L:99:PRO:HB2   | 16:R:44:ARG:HH12  | 1.65                     | 0.59              |
| 15:Q:325:VAL:HG12 | 15:Q:329:LEU:HG   | 1.85                     | 0.59              |
| 21:Y:41:DC:H2'    | 21:Y:42:DG:H8     | 1.68                     | 0.59              |
| 1:B:274:ILE:HD13  | 1:B:287:LEU:HD13  | 1.85                     | 0.59              |
| 2:C:391:ARG:NH2   | 2:C:439:SER:O     | 2.36                     | 0.59              |
| 14:O:114:MET:HE2  | 14:O:171:LEU:HD23 | 1.85                     | 0.59              |
| 15:Q:351:GLY:HA3  | 15:Q:545:ASN:HD21 | 1.67                     | 0.59              |
| 15:Q:354:THR:HG23 | 15:Q:573:VAL:HG21 | 1.84                     | 0.59              |
| 6:G:213:ASN:O     | 6:G:217:ASN:ND2   | 2.36                     | 0.58              |
| 6:G:742:LEU:HD21  | 6:G:799:LEU:HB3   | 1.84                     | 0.58              |
| 14:O:175:GLN:NE2  | 14:O:179:ASP:OD1  | 2.36                     | 0.58              |
| 2:C:332:LEU:HD11  | 2:C:356:VAL:HG13  | 1.85                     | 0.58              |
| 4:E:793:LEU:HB3   | 4:E:796:LEU:HB2   | 1.84                     | 0.58              |
| 3:D:45:TYR:CD1    | 20:X:34:DC:C5'    | 2.86                     | 0.58              |
| 4:E:567:ASP:HB3   | 4:E:795:THR:CA    | 2.32                     | 0.58              |
| 6:G:326:ALA:HA    | 6:G:359:LEU:HD13  | 1.85                     | 0.58              |
| 1:A:282:ARG:NH1   | 1:A:311:HIS:O     | 2.37                     | 0.58              |
| 2:C:383:PRO:HG3   | 2:C:579:VAL:HG21  | 1.85                     | 0.58              |
| 6:G:642:ASP:OD2   | 6:G:684:ARG:NH2   | 2.33                     | 0.58              |
| 1:B:113:PRO:HD3   | 1:B:142:PRO:HA    | 1.84                     | 0.58              |
| 2:C:661:TYR:HB2   | 2:C:943:ILE:HG23  | 1.86                     | 0.58              |
| 6:G:419:ASP:OD1   | 6:G:420:MET:N     | 2.37                     | 0.58              |
| 8:I:180:VAL:HG12  | 8:I:206:PRO:HA    | 1.84                     | 0.58              |
| 12:M:231:LYS:NZ   | 12:M:235:ASN:OD1  | 2.32                     | 0.58              |
| 1:A:48:ALA:HB3    | 1:B:226:PHE:HZ    | 1.69                     | 0.58              |
| 3:D:2:ILE:HA      | 5:F:270:ASN:HD21  | 1.68                     | 0.58              |
| 3:D:588:ILE:HD12  | 3:D:663:ARG:HH11  | 1.68                     | 0.58              |
| 4:E:632:LYS:HB2   | 4:E:668:PHE:HB2   | 1.84                     | 0.58              |
| 6:G:583:PHE:HB2   | 6:G:601:MET:HE3   | 1.86                     | 0.58              |
| 8:I:126:ASN:HD21  | 8:I:198:ASN:HB3   | 1.68                     | 0.58              |
| 2:C:72:GLU:HG3    | 2:C:74:LEU:HD13   | 1.85                     | 0.58              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:C:150:ILE:HB   | 2:C:158:LEU:HB3   | 1.85                     | 0.58              |
| 4:E:150:ARG:NH1  | 27:E:8105:HOH:O   | 2.37                     | 0.58              |
| 5:F:416:TRP:HB2  | 5:F:475:PHE:H     | 1.68                     | 0.58              |
| 4:E:766:GLN:HB3  | 4:E:778:LEU:HD11  | 1.86                     | 0.58              |
| 2:C:108:ASN:OD1  | 2:C:109:SER:N     | 2.37                     | 0.57              |
| 10:K:119:TYR:HB2 | 14:O:112:ILE:HG23 | 1.85                     | 0.57              |
| 3:D:10:LEU:HD21  | 4:E:1318:LEU:HD11 | 1.85                     | 0.57              |
| 5:F:126:MET:HE3  | 5:F:159:ARG:HD2   | 1.85                     | 0.57              |
| 6:G:224:LEU:O    | 6:G:258:ARG:NH2   | 2.37                     | 0.57              |
| 11:L:325:MET:HE2 | 11:L:328:GLN:HG3  | 1.86                     | 0.57              |
| 3:D:644:LYS:HG2  | 12:M:238:LEU:HD22 | 1.85                     | 0.57              |
| 5:F:98:ILE:O     | 6:G:791:ARG:NH1   | 2.36                     | 0.57              |
| 9:J:367:ARG:NH2  | 27:J:605:HOH:O    | 2.36                     | 0.57              |
| 15:Q:331:SER:OG  | 15:Q:336:HIS:ND1  | 2.37                     | 0.57              |
| 17:S:287:GLN:O   | 27:S:701:HOH:O    | 2.18                     | 0.57              |
| 2:C:960:ILE:O    | 2:C:979:ARG:NH1   | 2.37                     | 0.57              |
| 9:J:239:LYS:HD2  | 9:J:240:PRO:HD2   | 1.86                     | 0.57              |
| 10:K:389:ARG:O   | 10:K:392:SER:OG   | 2.20                     | 0.57              |
| 15:Q:659:LEU:HG  | 15:Q:693:LEU:HD11 | 1.85                     | 0.57              |
| 3:D:11:ARG:HB3   | 4:E:1306:ILE:HG12 | 1.85                     | 0.57              |
| 3:D:254:PHE:O    | 5:F:455:LYS:NZ    | 2.24                     | 0.57              |
| 5:F:66:LEU:HD21  | 6:G:793:MET:HE1   | 1.85                     | 0.57              |
| 5:F:175:ARG:NH1  | 11:L:374:GLU:OE2  | 2.38                     | 0.56              |
| 6:G:86:PRO:O     | 6:G:124:ARG:NH1   | 2.38                     | 0.56              |
| 4:E:111:LEU:HB2  | 4:E:144:HIS:HE1   | 1.69                     | 0.56              |
| 3:D:66:SER:HB3   | 3:D:96:ASP:HA     | 1.87                     | 0.56              |
| 4:E:814:ASN:HB3  | 7:H:599:TRP:HB3   | 1.87                     | 0.56              |
| 13:N:205:THR:HB  | 13:N:209:VAL:HB   | 1.86                     | 0.56              |
| 18:T:97:PRO:HA   | 18:T:120:ALA:HA   | 1.86                     | 0.56              |
| 21:Y:31:DC:H2''  | 21:Y:32:DA:H8     | 1.70                     | 0.56              |
| 5:F:556:THR:O    | 21:Y:13:DC:H5'    | 2.06                     | 0.56              |
| 8:I:129:PHE:HD2  | 8:I:209:ASN:HB2   | 1.71                     | 0.56              |
| 3:D:45:TYR:HD1   | 20:X:34:DC:C5'    | 2.16                     | 0.56              |
| 22:Z:32:C:H2'    | 22:Z:33:G:C8      | 2.41                     | 0.56              |
| 5:F:461:ASP:OD2  | 5:F:469:ASN:ND2   | 2.39                     | 0.56              |
| 6:G:586:MET:HE1  | 6:G:593:PRO:HB3   | 1.87                     | 0.56              |
| 6:G:602:LEU:HB3  | 6:G:679:LEU:HD11  | 1.87                     | 0.56              |
| 6:G:514:SER:O    | 6:G:518:ASN:ND2   | 2.38                     | 0.56              |
| 8:I:89:GLN:OE1   | 8:I:120:ASN:ND2   | 2.32                     | 0.56              |
| 8:I:79:HIS:HD2   | 8:I:131:TRP:HE1   | 1.53                     | 0.56              |
| 2:C:193:GLU:O    | 2:C:197:ASN:ND2   | 2.33                     | 0.56              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:C:633:CYS:SG    | 14:O:124:GLU:HG2  | 2.46                     | 0.56              |
| 7:H:187:ARG:NH2   | 8:I:94:ASP:OD2    | 2.39                     | 0.56              |
| 11:L:387:PHE:HE1  | 11:L:472:LYS:HE2  | 1.71                     | 0.56              |
| 15:Q:345:GLY:N    | 15:Q:435:ILE:O    | 2.29                     | 0.56              |
| 7:H:196:ARG:HH11  | 8:I:53:LYS:HG2    | 1.70                     | 0.55              |
| 20:X:66:DC:H2"    | 20:X:67:DG:N7     | 2.20                     | 0.55              |
| 1:A:100:LEU:HD13  | 17:S:575:SER:HB3  | 1.88                     | 0.55              |
| 2:C:248:GLN:HG3   | 2:C:252:PHE:HB3   | 1.89                     | 0.55              |
| 4:E:763:ILE:HG23  | 4:E:779:VAL:HG13  | 1.87                     | 0.55              |
| 2:C:180:ILE:HD13  | 2:C:204:PHE:HE2   | 1.69                     | 0.55              |
| 8:I:208:ILE:HD11  | 8:I:242:ALA:HB2   | 1.89                     | 0.55              |
| 12:M:129:GLU:OE2  | 12:M:183:ARG:NH1  | 2.40                     | 0.55              |
| 15:Q:285:ASP:HA   | 15:Q:288:LEU:HD12 | 1.87                     | 0.55              |
| 2:C:333:GLU:HG3   | 2:C:334:ASN:HD22  | 1.71                     | 0.55              |
| 5:F:448:ARG:NH1   | 15:Q:661:ASP:OD2  | 2.39                     | 0.55              |
| 13:N:142:ASP:HA   | 13:N:145:ARG:HG2  | 1.88                     | 0.55              |
| 2:C:579:VAL:HG12  | 2:C:643:GLY:HA3   | 1.89                     | 0.55              |
| 2:C:795:LYS:HB2   | 2:C:803:PRO:HG2   | 1.89                     | 0.55              |
| 1:A:195:LYS:HB2   | 1:B:159:LEU:HD22  | 1.89                     | 0.55              |
| 4:E:793:LEU:HD13  | 4:E:796:LEU:HG    | 1.88                     | 0.55              |
| 6:G:785:THR:OG1   | 6:G:788:ASN:O     | 2.24                     | 0.55              |
| 12:M:134:TYR:HH   | 12:M:170:TYR:HH   | 1.50                     | 0.55              |
| 5:F:809:PRO:O     | 5:F:842:TYR:OH    | 2.21                     | 0.55              |
| 17:S:378:ASN:OD1  | 27:S:702:HOH:O    | 2.18                     | 0.55              |
| 6:G:286:LEU:HD13  | 6:G:302:LEU:HD13  | 1.87                     | 0.54              |
| 15:Q:236:ARG:NH1  | 15:Q:260:GLU:OE2  | 2.39                     | 0.54              |
| 18:T:66:TRP:O     | 18:T:131:ARG:NH2  | 2.40                     | 0.54              |
| 21:Y:31:DC:H2"    | 21:Y:32:DA:C8     | 2.42                     | 0.54              |
| 4:E:625:ARG:NH1   | 4:E:785:TYR:OH    | 2.41                     | 0.54              |
| 6:G:798:GLN:O     | 6:G:801:GLN:NE2   | 2.41                     | 0.54              |
| 13:N:88:ILE:HG21  | 13:N:93:LEU:HD22  | 1.90                     | 0.54              |
| 16:R:36:ILE:HG23  | 16:R:44:ARG:HH21  | 1.72                     | 0.54              |
| 15:Q:365:ALA:O    | 15:Q:565:ARG:NH2  | 2.40                     | 0.54              |
| 4:E:569:LEU:HD21  | 7:H:415:GLN:HG3   | 1.89                     | 0.54              |
| 6:G:755:LEU:HB3   | 6:G:761:ALA:HB2   | 1.90                     | 0.54              |
| 7:H:196:ARG:NH1   | 8:I:53:LYS:HG2    | 2.23                     | 0.54              |
| 1:B:103:THR:HG21  | 1:B:150:LYS:HE3   | 1.89                     | 0.54              |
| 2:C:112:THR:HG22  | 2:C:121:VAL:HG22  | 1.88                     | 0.54              |
| 2:C:1055:LEU:HD13 | 3:D:12:ILE:HG23   | 1.90                     | 0.54              |
| 4:E:805:LYS:HE3   | 13:N:186:ALA:HB3  | 1.89                     | 0.54              |
| 4:E:812:VAL:N     | 7:H:602:MET:O     | 2.39                     | 0.54              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:C:227:TYR:HD1   | 2:C:247:LEU:HD21  | 1.73                     | 0.54              |
| 2:C:1024:THR:O    | 2:C:1028:GLY:N    | 2.40                     | 0.54              |
| 3:D:363:LYS:NZ    | 21:Y:36:DC:OP1    | 2.30                     | 0.54              |
| 4:E:102:GLU:OE1   | 4:E:376:HIS:NE2   | 2.34                     | 0.54              |
| 4:E:778:LEU:HD22  | 4:E:780:ARG:HH21  | 1.72                     | 0.54              |
| 15:Q:580:ILE:HB   | 15:Q:588:VAL:HB   | 1.90                     | 0.54              |
| 1:B:275:ASP:N     | 1:B:275:ASP:OD1   | 2.41                     | 0.54              |
| 2:C:562:LYS:HG3   | 2:C:647:VAL:HB    | 1.90                     | 0.54              |
| 21:Y:49:DG:H2"    | 21:Y:50:DA:N7     | 2.23                     | 0.54              |
| 4:E:887:ARG:NH2   | 7:H:523:GLU:OE2   | 2.41                     | 0.54              |
| 4:E:1006:TYR:HB2  | 8:I:247:ALA:HB2   | 1.90                     | 0.54              |
| 15:Q:618:ILE:HD13 | 15:Q:632:MET:HB3  | 1.90                     | 0.54              |
| 4:E:1038:ASN:HB2  | 4:E:1051:LEU:HB2  | 1.88                     | 0.54              |
| 7:H:474:LEU:HD12  | 7:H:475:GLU:HG2   | 1.89                     | 0.54              |
| 3:D:46:LYS:HD2    | 20:X:34:DC:OP2    | 2.08                     | 0.53              |
| 3:D:533:GLN:HA    | 4:E:136:ALA:HB1   | 1.89                     | 0.53              |
| 4:E:98:ARG:NH1    | 4:E:375:ARG:O     | 2.41                     | 0.53              |
| 4:E:493:ILE:O     | 7:H:380:ARG:NH1   | 2.41                     | 0.53              |
| 4:E:1080:ALA:HB3  | 4:E:1083:GLU:HG3  | 1.90                     | 0.53              |
| 11:L:260:ARG:HB2  | 11:L:278:MET:HE1  | 1.90                     | 0.53              |
| 17:S:380:PRO:HD2  | 17:S:383:LEU:HD22 | 1.89                     | 0.53              |
| 4:E:440:LYS:HB3   | 4:E:1132:PHE:HB2  | 1.89                     | 0.53              |
| 6:G:574:ARG:HE    | 6:G:607:LYS:HB3   | 1.73                     | 0.53              |
| 11:L:356:ARG:NH2  | 11:L:401:THR:O    | 2.40                     | 0.53              |
| 15:Q:406:MET:HE1  | 15:Q:414:LEU:HD13 | 1.90                     | 0.53              |
| 6:G:742:LEU:HD23  | 6:G:796:ARG:HG3   | 1.90                     | 0.53              |
| 8:I:58:PRO:HG2    | 8:I:61:ALA:HB2    | 1.90                     | 0.53              |
| 11:L:246:ASP:N    | 11:L:246:ASP:OD1  | 2.40                     | 0.53              |
| 11:L:382:SER:HB2  | 11:L:385:ASP:HB2  | 1.91                     | 0.53              |
| 2:C:70:VAL:HA     | 2:C:117:GLY:HA2   | 1.90                     | 0.53              |
| 2:C:124:ASN:HB2   | 2:C:393:LEU:HD23  | 1.90                     | 0.53              |
| 5:F:289:ILE:O     | 5:F:293:THR:HG23  | 2.09                     | 0.53              |
| 16:R:38:ARG:HG2   | 16:R:44:ARG:HG2   | 1.90                     | 0.53              |
| 4:E:231:ARG:HB2   | 4:E:283:GLN:HE21  | 1.74                     | 0.53              |
| 14:P:114:MET:HE2  | 14:P:171:LEU:HD12 | 1.90                     | 0.53              |
| 1:B:93:GLU:O      | 1:B:134:GLN:NE2   | 2.40                     | 0.53              |
| 2:C:1000:VAL:HG12 | 3:D:508:GLU:HB3   | 1.91                     | 0.53              |
| 15:Q:673:TYR:OH   | 15:Q:693:LEU:N    | 2.41                     | 0.53              |
| 5:F:541:GLU:OE1   | 5:F:541:GLU:N     | 2.41                     | 0.53              |
| 6:G:384:ASP:OD1   | 6:G:385:ALA:N     | 2.38                     | 0.53              |
| 7:H:315:HIS:O     | 7:H:318:ARG:NH2   | 2.41                     | 0.53              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 3:D:40:PRO:O      | 3:D:297:ARG:NH1   | 2.42                     | 0.53              |
| 4:E:609:PHE:HB2   | 4:E:855:VAL:HB    | 1.90                     | 0.53              |
| 17:S:387:LEU:HD11 | 17:S:391:LYS:HE3  | 1.91                     | 0.53              |
| 3:D:20:ILE:HD13   | 3:D:270:PRO:HD3   | 1.91                     | 0.53              |
| 15:Q:307:ILE:HG22 | 15:Q:311:LEU:HD12 | 1.89                     | 0.53              |
| 15:Q:562:ASP:OD1  | 15:Q:565:ARG:NH2  | 2.42                     | 0.53              |
| 1:A:277:LEU:HD11  | 1:A:295:LEU:HD13  | 1.90                     | 0.52              |
| 2:C:107:MET:HE1   | 2:C:317:VAL:HG11  | 1.91                     | 0.52              |
| 15:Q:584:GLN:HG2  | 15:Q:586:PHE:H    | 1.73                     | 0.52              |
| 6:G:669:TYR:HD1   | 6:G:672:LEU:HD11  | 1.74                     | 0.52              |
| 11:L:129:THR:OG1  | 11:L:139:PHE:O    | 2.24                     | 0.52              |
| 6:G:459:THR:OG1   | 6:G:492:THR:OG1   | 2.20                     | 0.52              |
| 10:K:383:THR:HG1  | 10:K:386:THR:HG1  | 1.44                     | 0.52              |
| 18:T:63:VAL:HG22  | 18:T:131:ARG:HD3  | 1.91                     | 0.52              |
| 4:E:21:ARG:NH1    | 12:M:207:GLU:OE1  | 2.27                     | 0.52              |
| 7:H:370:ASN:HD22  | 7:H:373:GLU:HG3   | 1.75                     | 0.52              |
| 8:I:79:HIS:CD2    | 8:I:131:TRP:HE1   | 2.28                     | 0.52              |
| 9:J:216:ILE:HD11  | 12:M:323:ARG:HH12 | 1.74                     | 0.52              |
| 11:L:330:ASN:ND2  | 11:L:347:ASP:OD2  | 2.43                     | 0.52              |
| 2:C:1014:HIS:CE1  | 2:C:1036:ASP:HB2  | 2.45                     | 0.52              |
| 5:F:66:LEU:HD22   | 6:G:795:GLN:HE21  | 1.75                     | 0.52              |
| 6:G:603:SER:HB3   | 6:G:678:TRP:HE3   | 1.74                     | 0.52              |
| 6:G:735:ILE:HG23  | 6:G:736:LEU:HD12  | 1.91                     | 0.52              |
| 2:C:164:LYS:NZ    | 21:Y:28:DT:OP1    | 2.38                     | 0.52              |
| 4:E:1033:LEU:HD23 | 4:E:1039:LEU:HD13 | 1.92                     | 0.52              |
| 5:F:437:VAL:HG13  | 5:F:442:LEU:HD11  | 1.91                     | 0.52              |
| 4:E:1182:ILE:HD13 | 5:F:606:GLY:H     | 1.74                     | 0.52              |
| 8:I:230:ASN:OD1   | 8:I:234:ASN:ND2   | 2.43                     | 0.52              |
| 11:L:120:MET:HE1  | 11:L:281:TYR:HB3  | 1.92                     | 0.52              |
| 21:Y:41:DC:H2'    | 21:Y:42:DG:C8     | 2.43                     | 0.52              |
| 3:D:306:LEU:HD21  | 3:D:325:GLU:HG2   | 1.90                     | 0.52              |
| 3:D:619:PRO:HG3   | 3:D:634:TYR:CZ    | 2.44                     | 0.52              |
| 6:G:579:CYS:HB3   | 6:G:601:MET:HE1   | 1.91                     | 0.52              |
| 9:J:329:GLN:HE21  | 9:J:333:GLU:HG3   | 1.75                     | 0.52              |
| 11:L:365:VAL:HG13 | 11:L:480:ARG:HE   | 1.75                     | 0.52              |
| 15:Q:707:MET:HA   | 15:Q:707:MET:HE2  | 1.92                     | 0.52              |
| 22:Z:33:G:H2'     | 22:Z:34:G:H8      | 1.73                     | 0.52              |
| 1:A:275:ASP:OD2   | 1:A:284:TYR:OH    | 2.26                     | 0.52              |
| 7:H:154:ASP:OD1   | 7:H:154:ASP:N     | 2.40                     | 0.52              |
| 3:D:184:PHE:HA    | 3:D:187:PHE:CE1   | 2.44                     | 0.52              |
| 5:F:237:GLU:HG2   | 5:F:242:PHE:HA    | 1.92                     | 0.52              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 6:G:81:LEU:HD23   | 6:G:84:LEU:HD12   | 1.92                     | 0.52              |
| 15:Q:599:LEU:HD13 | 15:Q:618:ILE:HD11 | 1.92                     | 0.52              |
| 3:D:669:ILE:HD12  | 4:E:7:LEU:HD11    | 1.92                     | 0.51              |
| 4:E:988:ASN:ND2   | 7:H:200:GLU:OE2   | 2.43                     | 0.51              |
| 6:G:127:LYS:HA    | 6:G:130:GLN:HE21  | 1.75                     | 0.51              |
| 15:Q:590:VAL:HG21 | 15:Q:737:ARG:HG3  | 1.92                     | 0.51              |
| 2:C:91:ASN:OD1    | 4:E:825:ARG:NH1   | 2.42                     | 0.51              |
| 4:E:815:TYR:CZ    | 7:H:593:VAL:HB    | 2.46                     | 0.51              |
| 2:C:739:ILE:HD11  | 2:C:776:CYS:HB3   | 1.92                     | 0.51              |
| 4:E:1006:TYR:HE2  | 8:I:250:GLU:HG3   | 1.75                     | 0.51              |
| 2:C:389:HIS:HD2   | 2:C:392:LYS:HE2   | 1.76                     | 0.51              |
| 2:C:543:ARG:CZ    | 2:C:862:ARG:HG3   | 2.40                     | 0.51              |
| 2:C:611:ILE:H     | 2:C:624:GLN:HE21  | 1.56                     | 0.51              |
| 8:I:105:ILE:HD13  | 8:I:198:ASN:HD21  | 1.75                     | 0.51              |
| 21:Y:34:DT:H2'    | 21:Y:35:DC:C6     | 2.46                     | 0.51              |
| 2:C:126:ILE:HD11  | 2:C:393:LEU:HB3   | 1.91                     | 0.51              |
| 3:D:6:LYS:HB2     | 4:E:1330:LYS:HD2  | 1.91                     | 0.51              |
| 3:D:209:ARG:HD3   | 5:F:468:SER:HB3   | 1.92                     | 0.51              |
| 9:J:415:ASN:HB3   | 9:J:418:SER:HB2   | 1.92                     | 0.51              |
| 11:L:197:LEU:HD11 | 11:L:334:MET:HE3  | 1.91                     | 0.51              |
| 14:P:100:ILE:HD11 | 14:P:181:ILE:HD11 | 1.91                     | 0.51              |
| 4:E:407:PHE:HE1   | 4:E:426:ARG:HD3   | 1.76                     | 0.51              |
| 4:E:569:LEU:HD22  | 7:H:412:VAL:HG12  | 1.93                     | 0.51              |
| 5:F:126:MET:HE1   | 5:F:163:LEU:HD21  | 1.93                     | 0.51              |
| 15:Q:580:ILE:N    | 15:Q:588:VAL:O    | 2.39                     | 0.51              |
| 15:Q:658:ILE:HG22 | 15:Q:662:MET:HE2  | 1.93                     | 0.51              |
| 2:C:1051:LEU:HD23 | 3:D:336:LEU:HD22  | 1.93                     | 0.51              |
| 3:D:459:HIS:CD2   | 3:D:461:LEU:HB2   | 2.46                     | 0.51              |
| 7:H:395:GLU:O     | 7:H:524:ARG:NH1   | 2.33                     | 0.51              |
| 17:S:581:PRO:HA   | 17:S:586:VAL:HG11 | 1.93                     | 0.51              |
| 6:G:603:SER:O     | 6:G:607:LYS:HG3   | 2.11                     | 0.51              |
| 11:L:286:ASN:ND2  | 11:L:319:GLU:OE2  | 2.28                     | 0.51              |
| 18:T:49:VAL:HG11  | 18:T:51:ARG:HH21  | 1.76                     | 0.51              |
| 2:C:503:TYR:O     | 2:C:506:GLU:HG2   | 2.11                     | 0.50              |
| 4:E:694:ASP:O     | 4:E:702:ARG:NH2   | 2.43                     | 0.50              |
| 4:E:1311:GLY:O    | 4:E:1315:ASN:ND2  | 2.44                     | 0.50              |
| 7:H:411:HIS:NE2   | 7:H:503:LEU:HD12  | 2.26                     | 0.50              |
| 13:N:147:ILE:HD11 | 13:N:157:PHE:CD2  | 2.46                     | 0.50              |
| 3:D:608:LEU:HD22  | 16:R:60:TYR:HB3   | 1.93                     | 0.50              |
| 5:F:249:ASN:OD1   | 5:F:284:THR:OG1   | 2.23                     | 0.50              |
| 7:H:196:ARG:NH2   | 8:I:132:GLU:OE2   | 2.44                     | 0.50              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 13:N:97:SER:O     | 13:N:101:VAL:HG23 | 2.12                     | 0.50              |
| 15:Q:540:ARG:HA   | 15:Q:543:ILE:HG12 | 1.94                     | 0.50              |
| 15:Q:572:ALA:HB1  | 15:Q:578:GLU:HA   | 1.93                     | 0.50              |
| 15:Q:680:ASP:HB2  | 15:Q:761:PRO:HG3  | 1.92                     | 0.50              |
| 2:C:451:GLU:HB3   | 2:C:470:PHE:HB3   | 1.92                     | 0.50              |
| 2:C:973:GLN:HG3   | 2:C:1015:ILE:HD11 | 1.92                     | 0.50              |
| 3:D:96:ASP:OD1    | 3:D:97:SER:N      | 2.45                     | 0.50              |
| 3:D:151:ILE:HD11  | 3:D:190:ARG:HG2   | 1.93                     | 0.50              |
| 4:E:444:SER:OG    | 4:E:446:SER:O     | 2.30                     | 0.50              |
| 5:F:175:ARG:NH1   | 11:L:371:LEU:HD23 | 2.26                     | 0.50              |
| 3:D:542:LEU:HD13  | 4:E:49:GLN:HG3    | 1.93                     | 0.50              |
| 20:X:69:DG:H2''   | 20:X:70:DA:C8     | 2.47                     | 0.50              |
| 4:E:369:VAL:HB    | 4:E:381:PHE:HB3   | 1.92                     | 0.50              |
| 4:E:694:ASP:OD2   | 4:E:702:ARG:NH2   | 2.44                     | 0.50              |
| 11:L:110:ILE:HB   | 11:L:314:ILE:HB   | 1.92                     | 0.50              |
| 15:Q:696:VAL:HG13 | 15:Q:699:VAL:HG12 | 1.93                     | 0.50              |
| 17:S:459:SER:OG   | 17:S:476:GLU:OE1  | 2.25                     | 0.50              |
| 18:T:81:GLN:O     | 18:T:116:LYS:NZ   | 2.43                     | 0.50              |
| 2:C:642:ASP:OD2   | 2:C:648:GLY:N     | 2.38                     | 0.50              |
| 5:F:78:LEU:HG     | 5:F:90:VAL:HG13   | 1.92                     | 0.50              |
| 9:J:284:TYR:O     | 9:J:288:ARG:HB3   | 2.12                     | 0.50              |
| 15:Q:374:SER:OG   | 15:Q:377:SER:O    | 2.30                     | 0.50              |
| 15:Q:406:MET:HE2  | 15:Q:411:THR:HG21 | 1.94                     | 0.50              |
| 2:C:1013:ASP:OD1  | 2:C:1013:ASP:N    | 2.43                     | 0.50              |
| 4:E:484:CYS:HB3   | 4:E:938:LEU:HD22  | 1.94                     | 0.50              |
| 4:E:1065:THR:OG1  | 4:E:1066:ILE:N    | 2.35                     | 0.50              |
| 6:G:501:ALA:HB1   | 6:G:533:GLU:HG3   | 1.93                     | 0.50              |
| 1:B:23:ASP:HB2    | 1:B:27:LEU:HD23   | 1.94                     | 0.50              |
| 2:C:929:ILE:HG13  | 2:C:938:PHE:HD2   | 1.77                     | 0.50              |
| 6:G:114:ALA:HA    | 6:G:148:LEU:HD13  | 1.93                     | 0.50              |
| 8:I:164:PHE:HA    | 8:I:190:VAL:HG11  | 1.94                     | 0.50              |
| 15:Q:635:ILE:HA   | 15:Q:638:GLU:HG2  | 1.94                     | 0.50              |
| 17:S:501:MET:HB2  | 17:S:518:THR:HG23 | 1.94                     | 0.50              |
| 1:A:79:GLY:HA3    | 1:A:143:ILE:HD11  | 1.94                     | 0.49              |
| 5:F:342:ILE:HD13  | 5:F:383:GLU:HG2   | 1.93                     | 0.49              |
| 15:Q:273:SER:HA   | 15:Q:295:GLY:HA3  | 1.93                     | 0.49              |
| 21:Y:26:DA:H2''   | 21:Y:27:DA:H5'    | 1.92                     | 0.49              |
| 2:C:427:SER:OG    | 2:C:431:ASN:O     | 2.29                     | 0.49              |
| 4:E:622:ARG:HH22  | 4:E:788:ALA:HB2   | 1.77                     | 0.49              |
| 11:L:267:ARG:NH1  | 11:L:269:GLY:O    | 2.45                     | 0.49              |
| 12:M:204:ASP:HB3  | 12:M:221:GLU:HG2  | 1.94                     | 0.49              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 18:T:76:LEU:HD23  | 18:T:122:LEU:HD12 | 1.95                     | 0.49              |
| 11:L:156:THR:OG1  | 11:L:165:ARG:NH1  | 2.41                     | 0.49              |
| 12:M:143:LYS:NZ   | 12:M:145:SER:OG   | 2.45                     | 0.49              |
| 17:S:227:GLU:OE1  | 17:S:227:GLU:N    | 2.44                     | 0.49              |
| 19:U:105:LYS:HG2  | 19:U:171:TRP:HZ2  | 1.77                     | 0.49              |
| 5:F:272:GLU:O     | 5:F:279:LYS:NZ    | 2.31                     | 0.49              |
| 5:F:346:ARG:HA    | 5:F:349:LYS:HD3   | 1.93                     | 0.49              |
| 6:G:548:TYR:O     | 6:G:552:GLU:HG2   | 2.13                     | 0.49              |
| 12:M:210:ILE:HG23 | 12:M:215:ASP:HB2  | 1.93                     | 0.49              |
| 5:F:77:GLU:OE1    | 5:F:81:ARG:NE     | 2.43                     | 0.49              |
| 7:H:480:GLU:OE2   | 7:H:484:HIS:NE2   | 2.46                     | 0.49              |
| 6:G:648:GLN:HA    | 6:G:651:GLU:HG2   | 1.93                     | 0.49              |
| 1:A:316:ASP:HA    | 1:A:319:LYS:HG2   | 1.95                     | 0.49              |
| 2:C:695:ILE:HG21  | 2:C:741:VAL:HG11  | 1.95                     | 0.49              |
| 5:F:145:ILE:HA    | 5:F:148:VAL:HG22  | 1.93                     | 0.49              |
| 5:F:811:ILE:HD13  | 5:F:842:TYR:HB3   | 1.95                     | 0.49              |
| 7:H:196:ARG:NH1   | 8:I:54:THR:O      | 2.46                     | 0.49              |
| 10:K:271:PRO:HD2  | 10:K:274:LEU:HD12 | 1.95                     | 0.49              |
| 14:O:160:ASP:HB3  | 14:O:163:LYS:HE3  | 1.95                     | 0.49              |
| 3:D:546:THR:HG21  | 3:D:601:PRO:HB3   | 1.94                     | 0.49              |
| 6:G:577:ASP:OD1   | 6:G:577:ASP:N     | 2.33                     | 0.49              |
| 4:E:928:PHE:HZ    | 4:E:1122:ILE:HD11 | 1.78                     | 0.49              |
| 6:G:178:THR:OG1   | 6:G:211:THR:OG1   | 2.25                     | 0.49              |
| 15:Q:338:SER:HB2  | 15:Q:403:MET:HE1  | 1.94                     | 0.49              |
| 15:Q:516:SER:OG   | 15:Q:519:GLU:O    | 2.24                     | 0.49              |
| 1:A:80:ILE:HG12   | 1:A:139:LEU:HD23  | 1.95                     | 0.48              |
| 11:L:372:PRO:HA   | 11:L:375:TYR:CZ   | 2.48                     | 0.48              |
| 11:L:438:GLN:NE2  | 11:L:439:ASP:OD1  | 2.45                     | 0.48              |
| 15:Q:466:MET:HE3  | 15:Q:474:LYS:HG2  | 1.94                     | 0.48              |
| 1:A:276:GLN:CD    | 17:S:280:LEU:HD21 | 2.38                     | 0.48              |
| 4:E:723:PHE:HB3   | 4:E:780:ARG:NH2   | 2.29                     | 0.48              |
| 6:G:672:LEU:HD12  | 6:G:673:LEU:N     | 2.28                     | 0.48              |
| 7:H:385:ARG:HE    | 7:H:546:ARG:HD2   | 1.78                     | 0.48              |
| 20:X:59:DA:H2'    | 20:X:60:DG:H8     | 1.78                     | 0.48              |
| 2:C:1010:TYR:CD1  | 2:C:1021:VAL:HG21 | 2.48                     | 0.48              |
| 4:E:411:GLN:HE22  | 9:J:234:TRP:H     | 1.60                     | 0.48              |
| 4:E:1021:SER:OG   | 4:E:1039:LEU:O    | 2.30                     | 0.48              |
| 19:U:143:VAL:HA   | 19:U:146:PHE:HD2  | 1.77                     | 0.48              |
| 21:Y:36:DC:H2'    | 21:Y:37:DC:C6     | 2.48                     | 0.48              |
| 1:A:189:TYR:O     | 9:J:308:PRO:HB3   | 2.14                     | 0.48              |
| 3:D:371:LEU:HD13  | 4:E:1317:VAL:HG13 | 1.94                     | 0.48              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 4:E:778:LEU:HD13  | 4:E:780:ARG:NE    | 2.26                     | 0.48              |
| 4:E:793:LEU:C     | 4:E:796:LEU:H     | 2.22                     | 0.48              |
| 5:F:408:LYS:HB3   | 5:F:423:GLU:HG2   | 1.95                     | 0.48              |
| 7:H:148:ASP:OD1   | 7:H:149:LYS:N     | 2.46                     | 0.48              |
| 15:Q:359:ILE:HG23 | 15:Q:363:TYR:CE1  | 2.48                     | 0.48              |
| 2:C:308:HIS:NE2   | 2:C:477:GLU:OE2   | 2.41                     | 0.48              |
| 4:E:630:ILE:HD12  | 4:E:821:GLY:HA2   | 1.95                     | 0.48              |
| 2:C:561:GLU:HG2   | 2:C:655:LYS:HD3   | 1.95                     | 0.48              |
| 2:C:616:SER:HB3   | 2:C:622:MET:HE3   | 1.94                     | 0.48              |
| 7:H:205:ASP:OD1   | 7:H:207:LYS:NZ    | 2.36                     | 0.48              |
| 10:K:124:MET:HG2  | 10:K:127:TRP:CZ2  | 2.48                     | 0.48              |
| 20:X:32:DT:H2''   | 20:X:33:DC:C4     | 2.48                     | 0.48              |
| 21:Y:17:DT:H2''   | 21:Y:18:DC:H5     | 1.79                     | 0.48              |
| 1:A:273:PHE:HA    | 1:A:294:THR:HA    | 1.95                     | 0.48              |
| 6:G:137:PRO:HA    | 6:G:141:ILE:HD12  | 1.95                     | 0.48              |
| 6:G:279:ASP:O     | 6:G:282:THR:OG1   | 2.31                     | 0.48              |
| 13:N:185:VAL:HG23 | 13:N:188:ALA:HB2  | 1.94                     | 0.48              |
| 18:T:63:VAL:HA    | 18:T:66:TRP:CD2   | 2.48                     | 0.48              |
| 2:C:170:ALA:N     | 2:C:178:ILE:O     | 2.40                     | 0.48              |
| 3:D:114:THR:HA    | 3:D:265:VAL:HA    | 1.95                     | 0.48              |
| 5:F:323:LYS:HE2   | 5:F:327:LEU:HD11  | 1.94                     | 0.48              |
| 13:N:132:GLN:HG2  | 13:N:250:SER:HB2  | 1.94                     | 0.48              |
| 17:S:448:ASN:OD1  | 17:S:448:ASN:N    | 2.45                     | 0.48              |
| 2:C:975:PRO:HD3   | 2:C:1012:SER:O    | 2.13                     | 0.48              |
| 4:E:746:PRO:HD3   | 4:E:762:TRP:HA    | 1.96                     | 0.48              |
| 13:N:60:LEU:HD12  | 13:N:69:LEU:HD11  | 1.96                     | 0.48              |
| 4:E:488:LEU:O     | 4:E:489:ILE:HG13  | 2.13                     | 0.48              |
| 5:F:749:PHE:HA    | 5:F:752:MET:HE2   | 1.95                     | 0.48              |
| 6:G:774:LEU:HD13  | 6:G:792:ILE:HG21  | 1.94                     | 0.48              |
| 7:H:82:ALA:HB2    | 7:H:308:ASN:HD22  | 1.79                     | 0.48              |
| 11:L:233:HIS:HD2  | 11:L:235:GLY:H    | 1.62                     | 0.48              |
| 15:Q:330:ALA:HB2  | 15:Q:397:VAL:HG22 | 1.96                     | 0.48              |
| 19:U:87:ILE:HG22  | 19:U:90:PHE:H     | 1.77                     | 0.48              |
| 21:Y:46:DT:O3'    | 21:Y:47:DA:H8     | 1.97                     | 0.48              |
| 2:C:92:ARG:NH2    | 4:E:817:LEU:O     | 2.46                     | 0.47              |
| 7:H:559:ASP:OD1   | 7:H:559:ASP:N     | 2.41                     | 0.47              |
| 10:K:81:ASP:O     | 10:K:229:LYS:HE3  | 2.14                     | 0.47              |
| 15:Q:734:TYR:OH   | 15:Q:739:GLU:OE1  | 2.22                     | 0.47              |
| 1:A:64:ARG:HB3    | 1:A:150:LYS:HB2   | 1.95                     | 0.47              |
| 6:G:631:GLN:O     | 6:G:635:GLN:HG2   | 2.13                     | 0.47              |
| 11:L:79:PHE:O     | 11:L:281:TYR:OH   | 2.18                     | 0.47              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 13:N:83:ASN:O    | 13:N:87:GLN:HG2   | 2.13                     | 0.47              |
| 3:D:155:PRO:HD2  | 15:Q:695:ASP:OD2  | 2.14                     | 0.47              |
| 3:D:179:PHE:HD1  | 15:Q:698:ARG:HH11 | 1.63                     | 0.47              |
| 4:E:470:LEU:HD13 | 4:E:1113:ALA:HB3  | 1.97                     | 0.47              |
| 4:E:792:ASN:C    | 4:E:794:ALA:N     | 2.65                     | 0.47              |
| 4:E:804:GLU:OE2  | 7:H:399:SER:N     | 2.45                     | 0.47              |
| 4:E:904:PHE:CE1  | 18:T:94:ARG:HD2   | 2.49                     | 0.47              |
| 2:C:248:GLN:O    | 2:C:253:HIS:N     | 2.42                     | 0.47              |
| 2:C:711:ILE:HG23 | 2:C:744:LEU:HD21  | 1.96                     | 0.47              |
| 4:E:710:ARG:HB3  | 4:E:723:PHE:HE2   | 1.80                     | 0.47              |
| 4:E:1000:GLN:HB3 | 7:H:154:ASP:OD1   | 2.14                     | 0.47              |
| 6:G:618:LEU:HD13 | 6:G:638:LYS:HE2   | 1.94                     | 0.47              |
| 17:S:445:TRP:NE1 | 17:S:466:LYS:HD3  | 2.29                     | 0.47              |
| 2:C:872:SER:HB3  | 2:C:906:LEU:HD11  | 1.95                     | 0.47              |
| 3:D:621:GLU:OE2  | 3:D:623:HIS:NE2   | 2.34                     | 0.47              |
| 4:E:458:HIS:HE1  | 7:H:81:TRP:CE2    | 2.32                     | 0.47              |
| 8:I:181:LEU:HD11 | 8:I:255:LEU:HD21  | 1.95                     | 0.47              |
| 11:L:411:PRO:O   | 11:L:415:ARG:HG2  | 2.15                     | 0.47              |
| 20:X:69:DG:H1    | 21:Y:13:DC:H42    | 1.60                     | 0.47              |
| 6:G:595:ILE:HG21 | 6:G:668:PHE:HE1   | 1.79                     | 0.47              |
| 22:Z:33:G:H2'    | 22:Z:34:G:C8      | 2.50                     | 0.47              |
| 2:C:33:GLU:O     | 2:C:37:LYS:NZ     | 2.33                     | 0.47              |
| 3:D:235:ARG:HD2  | 21:Y:26:DA:C8     | 2.50                     | 0.47              |
| 5:F:417:ILE:HG21 | 5:F:820:ALA:HB2   | 1.97                     | 0.47              |
| 5:F:833:ILE:HG23 | 5:F:834:LEU:HD12  | 1.96                     | 0.47              |
| 6:G:637:ILE:O    | 6:G:684:ARG:NH1   | 2.47                     | 0.47              |
| 7:H:137:GLU:O    | 7:H:141:LYS:N     | 2.48                     | 0.47              |
| 7:H:518:ARG:HA   | 7:H:521:LEU:HD23  | 1.96                     | 0.47              |
| 14:P:173:PRO:HA  | 17:S:562:ASN:HD21 | 1.79                     | 0.47              |
| 1:B:64:ARG:HB3   | 1:B:150:LYS:HB2   | 1.95                     | 0.47              |
| 2:C:73:SER:HA    | 2:C:117:GLY:HA3   | 1.96                     | 0.47              |
| 3:D:553:ASN:ND2  | 27:D:804:HOH:O    | 2.47                     | 0.47              |
| 4:E:161:ILE:HD12 | 4:E:180:ILE:HG23  | 1.96                     | 0.47              |
| 6:G:424:GLU:HG2  | 6:G:456:LYS:HD2   | 1.96                     | 0.47              |
| 8:I:156:SER:OG   | 8:I:159:ASN:OD1   | 2.21                     | 0.47              |
| 8:I:172:PHE:CE1  | 13:N:116:ASN:HB3  | 2.50                     | 0.47              |
| 3:D:120:LYS:HE2  | 3:D:341:ARG:HA    | 1.97                     | 0.47              |
| 4:E:243:ILE:O    | 4:E:247:ILE:HG12  | 2.15                     | 0.47              |
| 5:F:208:ALA:HB1  | 5:F:212:LEU:HD23  | 1.97                     | 0.47              |
| 6:G:514:SER:HA   | 6:G:517:VAL:HG12  | 1.96                     | 0.47              |
| 2:C:986:ARG:HA   | 3:D:375:ARG:HA    | 1.97                     | 0.47              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 3:D:148:ALA:HB2   | 3:D:164:PHE:HE1   | 1.80                     | 0.47              |
| 11:L:300:LYS:HD2  | 16:R:91:LEU:HA    | 1.97                     | 0.47              |
| 15:Q:266:HIS:HB3  | 15:Q:326:LEU:HD11 | 1.97                     | 0.47              |
| 15:Q:591:ASP:N    | 15:Q:591:ASP:OD1  | 2.47                     | 0.47              |
| 20:X:65:DA:H1'    | 20:X:66:DC:H5'    | 1.97                     | 0.47              |
| 2:C:88:TRP:CE2    | 2:C:349:ILE:HG23  | 2.50                     | 0.46              |
| 2:C:227:TYR:HD2   | 2:C:237:PRO:HG3   | 1.80                     | 0.46              |
| 4:E:301:ARG:NE    | 4:E:314:VAL:O     | 2.41                     | 0.46              |
| 12:M:267:VAL:HG22 | 12:M:293:ILE:HD12 | 1.96                     | 0.46              |
| 20:X:47:DG:H2''   | 20:X:48:DA:C8     | 2.50                     | 0.46              |
| 6:G:177:TYR:HB3   | 6:G:200:MET:HE2   | 1.96                     | 0.46              |
| 7:H:70:GLU:OE1    | 7:H:74:ARG:NH2    | 2.48                     | 0.46              |
| 15:Q:581:ASP:HA   | 15:Q:584:GLN:HE22 | 1.81                     | 0.46              |
| 2:C:661:TYR:O     | 4:E:56:SER:OG     | 2.29                     | 0.46              |
| 5:F:359:HIS:ND1   | 5:F:366:ASP:OD1   | 2.47                     | 0.46              |
| 5:F:384:LEU:HD23  | 5:F:798:LEU:HD11  | 1.97                     | 0.46              |
| 5:F:401:ARG:NH2   | 5:F:461:ASP:O     | 2.49                     | 0.46              |
| 6:G:712:ASP:OD1   | 6:G:714:HIS:ND1   | 2.33                     | 0.46              |
| 10:K:80:ASP:OD1   | 10:K:80:ASP:N     | 2.48                     | 0.46              |
| 14:P:79:VAL:HG12  | 14:P:133:LYS:HG2  | 1.97                     | 0.46              |
| 15:Q:710:GLU:CD   | 15:Q:710:GLU:H    | 2.24                     | 0.46              |
| 19:U:99:ARG:HH11  | 19:U:120:VAL:HG12 | 1.80                     | 0.46              |
| 3:D:295:LEU:HD13  | 3:D:335:LEU:HA    | 1.97                     | 0.46              |
| 4:E:633:TYR:OH    | 7:H:597:ASN:OD1   | 2.32                     | 0.46              |
| 6:G:358:ASN:OD1   | 6:G:362:GLN:NE2   | 2.48                     | 0.46              |
| 6:G:463:GLU:O     | 6:G:467:GLN:HG2   | 2.16                     | 0.46              |
| 7:H:385:ARG:HH21  | 7:H:546:ARG:HD2   | 1.79                     | 0.46              |
| 1:A:225:LEU:HD22  | 1:B:45:ILE:HD11   | 1.97                     | 0.46              |
| 2:C:86:LEU:HD23   | 2:C:88:TRP:CZ2    | 2.50                     | 0.46              |
| 4:E:982:THR:HB    | 7:H:166:ILE:HD12  | 1.98                     | 0.46              |
| 7:H:508:GLU:O     | 7:H:511:GLU:HG2   | 2.15                     | 0.46              |
| 16:R:85:ASP:HB3   | 16:R:133:VAL:HG21 | 1.98                     | 0.46              |
| 7:H:207:LYS:HD2   | 7:H:211:ASP:HB3   | 1.96                     | 0.46              |
| 15:Q:302:SER:HB3  | 15:Q:322:THR:HG23 | 1.98                     | 0.46              |
| 15:Q:605:SER:O    | 15:Q:608:GLU:HG2  | 2.16                     | 0.46              |
| 18:T:92:GLU:HG3   | 18:T:107:LEU:HD13 | 1.97                     | 0.46              |
| 2:C:611:ILE:HB    | 2:C:624:GLN:HE21  | 1.81                     | 0.46              |
| 7:H:141:LYS:HE3   | 7:H:141:LYS:HB3   | 1.81                     | 0.46              |
| 10:K:358:ASP:HB3  | 10:K:362:ARG:HB2  | 1.98                     | 0.46              |
| 10:K:416:VAL:O    | 10:K:420:GLN:HG2  | 2.15                     | 0.46              |
| 14:P:81:LYS:HA    | 14:P:133:LYS:HG3  | 1.98                     | 0.46              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 5:F:819:ARG:HA    | 5:F:819:ARG:HH11  | 1.80                     | 0.46              |
| 6:G:655:ASP:OD1   | 6:G:695:ARG:NH2   | 2.48                     | 0.46              |
| 15:Q:673:TYR:CZ   | 15:Q:693:LEU:HB3  | 2.51                     | 0.46              |
| 5:F:552:PRO:HG2   | 5:F:563:ARG:HD3   | 1.98                     | 0.46              |
| 7:H:133:ILE:HB    | 7:H:137:GLU:OE2   | 2.16                     | 0.46              |
| 7:H:331:ARG:NH1   | 7:H:341:GLU:OE1   | 2.45                     | 0.46              |
| 13:N:144:LEU:O    | 13:N:147:ILE:HG22 | 2.16                     | 0.46              |
| 13:N:173:TRP:HB2  | 13:N:175:TRP:NE1  | 2.31                     | 0.46              |
| 16:R:66:PRO:HG2   | 16:R:67:PHE:CE2   | 2.51                     | 0.46              |
| 1:A:74:TYR:HB3    | 2:C:613:TYR:CD2   | 2.51                     | 0.46              |
| 2:C:799:SER:OG    | 2:C:801:TYR:O     | 2.31                     | 0.46              |
| 4:E:55:ILE:HD12   | 4:E:130:MET:HE3   | 1.98                     | 0.46              |
| 4:E:1109:ALA:HA   | 4:E:1132:PHE:HZ   | 1.81                     | 0.46              |
| 5:F:378:GLU:HB3   | 5:F:478:ARG:HH21  | 1.81                     | 0.46              |
| 5:F:411:THR:O     | 5:F:415:SER:OG    | 2.28                     | 0.46              |
| 18:T:135:LYS:HE2  | 18:T:140:ASP:HB2  | 1.98                     | 0.46              |
| 6:G:563:LEU:HA    | 6:G:566:VAL:HG12  | 1.97                     | 0.45              |
| 8:I:148:GLU:HA    | 8:I:151:GLU:HG2   | 1.98                     | 0.45              |
| 21:Y:49:DG:H2''   | 21:Y:50:DA:C5     | 2.51                     | 0.45              |
| 2:C:215:LYS:HD3   | 2:C:225:GLU:HB2   | 1.97                     | 0.45              |
| 7:H:125:LYS:O     | 7:H:128:ILE:HG13  | 2.15                     | 0.45              |
| 13:N:226:GLU:O    | 13:N:230:TYR:HB2  | 2.16                     | 0.45              |
| 1:A:283:ILE:HG23  | 1:A:312:PHE:HE1   | 1.81                     | 0.45              |
| 2:C:490:ASN:OD1   | 2:C:497:GLN:NE2   | 2.44                     | 0.45              |
| 3:D:128:ASN:HD22  | 3:D:246:ARG:HD2   | 1.82                     | 0.45              |
| 4:E:447:GLU:OE1   | 4:E:483:SER:HB2   | 2.16                     | 0.45              |
| 11:L:102:PHE:N    | 26:L:8001:SAH:OXT | 2.37                     | 0.45              |
| 15:Q:626:ARG:HH12 | 15:Q:653:GLU:CD   | 2.23                     | 0.45              |
| 17:S:242:TYR:OH   | 17:S:476:GLU:OE2  | 2.33                     | 0.45              |
| 4:E:102:GLU:OE2   | 4:E:375:ARG:NH2   | 2.50                     | 0.45              |
| 4:E:729:PHE:CE1   | 19:U:147:ILE:HD13 | 2.47                     | 0.45              |
| 6:G:389:ASN:ND2   | 6:G:421:GLU:OE2   | 2.49                     | 0.45              |
| 6:G:618:LEU:O     | 6:G:622:LEU:HG    | 2.16                     | 0.45              |
| 12:M:189:PRO:HG3  | 12:M:251:TYR:OH   | 2.16                     | 0.45              |
| 15:Q:626:ARG:NH1  | 15:Q:653:GLU:OE1  | 2.49                     | 0.45              |
| 1:B:204:TRP:HE1   | 16:R:69:GLU:CD    | 2.24                     | 0.45              |
| 2:C:457:LEU:HD11  | 2:C:518:ARG:HG3   | 1.99                     | 0.45              |
| 6:G:561:ARG:HH22  | 6:G:667:ARG:HD3   | 1.81                     | 0.45              |
| 5:F:446:ARG:NH1   | 15:Q:661:ASP:OD1  | 2.49                     | 0.45              |
| 2:C:380:ARG:CZ    | 2:C:622:MET:HE1   | 2.47                     | 0.45              |
| 3:D:202:GLN:O     | 3:D:206:LEU:HG    | 2.17                     | 0.45              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 4:E:812:VAL:HG21  | 7:H:607:ALA:HB2   | 1.99                     | 0.45              |
| 6:G:145:MET:HE1   | 6:G:161:VAL:HG21  | 1.98                     | 0.45              |
| 11:L:233:HIS:CD2  | 11:L:235:GLY:H    | 2.33                     | 0.45              |
| 13:N:71:TYR:O     | 13:N:75:LYS:HB2   | 2.17                     | 0.45              |
| 13:N:211:PRO:HA   | 13:N:214:TRP:CE3  | 2.51                     | 0.45              |
| 21:Y:36:DC:H2'    | 21:Y:37:DC:H6     | 1.81                     | 0.45              |
| 4:E:354:VAL:HB    | 4:E:423:ALA:HB3   | 1.98                     | 0.45              |
| 4:E:1053:GLN:C    | 4:E:1055:TYR:H    | 2.25                     | 0.45              |
| 6:G:260:LEU:O     | 6:G:289:THR:OG1   | 2.34                     | 0.45              |
| 7:H:187:ARG:HH22  | 8:I:94:ASP:CG     | 2.24                     | 0.45              |
| 12:M:193:ILE:HA   | 12:M:235:ASN:HD21 | 1.82                     | 0.45              |
| 13:N:264:ARG:O    | 13:N:267:GLN:HG2  | 2.17                     | 0.45              |
| 20:X:47:DG:H2''   | 20:X:48:DA:H8     | 1.82                     | 0.45              |
| 20:X:63:DA:H2''   | 20:X:64:DG:N7     | 2.32                     | 0.45              |
| 22:Z:35:C:H2'     | 22:Z:36:G:H8      | 1.82                     | 0.45              |
| 3:D:55:LEU:HD21   | 3:D:296:TYR:HB3   | 1.99                     | 0.45              |
| 5:F:142:GLU:O     | 5:F:145:ILE:HG13  | 2.17                     | 0.45              |
| 7:H:534:ARG:O     | 7:H:538:GLY:N     | 2.49                     | 0.45              |
| 14:P:98:PRO:HB3   | 14:P:185:MET:HG2  | 1.99                     | 0.45              |
| 15:Q:355:THR:OG1  | 15:Q:545:ASN:ND2  | 2.50                     | 0.45              |
| 2:C:674:LEU:HD11  | 2:C:836:LEU:HG    | 1.99                     | 0.45              |
| 4:E:98:ARG:HD3    | 4:E:375:ARG:NH2   | 2.32                     | 0.45              |
| 6:G:245:ILE:HA    | 6:G:248:TYR:HB2   | 1.99                     | 0.45              |
| 7:H:535:GLN:HE22  | 7:H:541:LEU:HD11  | 1.82                     | 0.45              |
| 11:L:149:ILE:HD11 | 11:L:168:CYS:HB3  | 1.97                     | 0.45              |
| 22:Z:31:C:H4'     | 22:Z:32:C:O5'     | 2.17                     | 0.45              |
| 2:C:424:ILE:HD11  | 4:E:178:TYR:HE2   | 1.82                     | 0.44              |
| 9:J:212:PRO:HA    | 12:M:333:TRP:O    | 2.16                     | 0.44              |
| 9:J:305:LYS:HE3   | 9:J:305:LYS:HB3   | 1.85                     | 0.44              |
| 14:O:118:LEU:HD11 | 14:O:154:LEU:HD21 | 2.00                     | 0.44              |
| 17:S:372:VAL:HG11 | 17:S:509:MET:HE1  | 1.99                     | 0.44              |
| 2:C:408:PHE:HD2   | 2:C:409:ARG:HH21  | 1.65                     | 0.44              |
| 3:D:69:CYS:HB3    | 3:D:90:CYS:SG     | 2.57                     | 0.44              |
| 4:E:98:ARG:HD3    | 4:E:375:ARG:HH21  | 1.82                     | 0.44              |
| 4:E:668:PHE:HB3   | 4:E:782:VAL:HG11  | 1.99                     | 0.44              |
| 4:E:793:LEU:O     | 4:E:796:LEU:HB2   | 2.17                     | 0.44              |
| 6:G:515:ARG:HA    | 6:G:518:ASN:HD21  | 1.80                     | 0.44              |
| 6:G:742:LEU:HD12  | 6:G:743:PRO:HD2   | 1.99                     | 0.44              |
| 15:Q:501:MET:SD   | 15:Q:510:PRO:HG2  | 2.58                     | 0.44              |
| 17:S:534:ALA:HB2  | 27:S:712:HOH:O    | 2.17                     | 0.44              |
| 19:U:112:PHE:HE1  | 19:U:160:GLY:HA3  | 1.82                     | 0.44              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:A:38:MET:HE2    | 1:B:155:ARG:HE    | 1.80                     | 0.44              |
| 2:C:472:SER:H     | 2:C:475:GLN:HE21  | 1.65                     | 0.44              |
| 6:G:684:ARG:HA    | 6:G:687:ARG:HG2   | 1.99                     | 0.44              |
| 12:M:200:TYR:HB3  | 12:M:226:LYS:HB2  | 1.99                     | 0.44              |
| 15:Q:469:PRO:HG3  | 15:Q:491:ASN:ND2  | 2.33                     | 0.44              |
| 6:G:214:THR:HA    | 6:G:217:ASN:HD21  | 1.83                     | 0.44              |
| 7:H:85:GLU:OE2    | 7:H:314:ARG:NH2   | 2.50                     | 0.44              |
| 7:H:343:ARG:NH2   | 7:H:350:ASP:OD2   | 2.49                     | 0.44              |
| 8:I:113:ASN:HB2   | 18:T:117:TRP:CZ3  | 2.52                     | 0.44              |
| 9:J:397:ALA:HB3   | 9:J:400:ALA:HB2   | 1.99                     | 0.44              |
| 15:Q:654:ASP:OD2  | 15:Q:656:LEU:HB2  | 2.18                     | 0.44              |
| 17:S:438:PRO:HA   | 17:S:441:VAL:HG22 | 1.98                     | 0.44              |
| 2:C:1060:VAL:HB   | 3:D:7:HIS:HB2     | 1.99                     | 0.44              |
| 3:D:641:ARG:NH1   | 12:M:199:ASP:OD1  | 2.47                     | 0.44              |
| 4:E:1006:TYR:HB3  | 8:I:247:ALA:HB2   | 2.00                     | 0.44              |
| 4:E:1248:LEU:HD21 | 4:E:1272:LEU:HD11 | 1.99                     | 0.44              |
| 2:C:675:ILE:HG22  | 2:C:852:MET:HG2   | 2.00                     | 0.44              |
| 4:E:711:VAL:HG22  | 4:E:720:LEU:HG    | 2.00                     | 0.44              |
| 5:F:744:GLU:HB3   | 5:F:747:GLU:HB2   | 1.99                     | 0.44              |
| 6:G:360:PHE:HA    | 6:G:363:ASN:HD21  | 1.82                     | 0.44              |
| 6:G:467:GLN:CD    | 6:G:502:ARG:HH12  | 2.26                     | 0.44              |
| 6:G:508:GLU:OE1   | 6:G:508:GLU:N     | 2.46                     | 0.44              |
| 7:H:76:TRP:CZ2    | 7:H:308:ASN:HB3   | 2.53                     | 0.44              |
| 9:J:421:LYS:HE2   | 14:O:72:PHE:CE1   | 2.53                     | 0.44              |
| 16:R:85:ASP:OD2   | 16:R:144:TYR:OH   | 2.32                     | 0.44              |
| 1:A:22:ARG:HG3    | 1:A:28:TYR:CE1    | 2.53                     | 0.44              |
| 2:C:74:LEU:O      | 2:C:117:GLY:N     | 2.46                     | 0.44              |
| 2:C:168:ILE:HD11  | 2:C:294:ILE:HD11  | 1.98                     | 0.44              |
| 2:C:882:ARG:NH1   | 2:C:905:GLU:OE1   | 2.50                     | 0.44              |
| 3:D:85:LYS:O      | 3:D:94:PHE:N      | 2.51                     | 0.44              |
| 6:G:382:ASP:OD1   | 6:G:382:ASP:N     | 2.44                     | 0.44              |
| 13:N:84:LEU:HD22  | 13:N:118:ALA:HA   | 1.99                     | 0.44              |
| 15:Q:469:PRO:HA   | 15:Q:494:VAL:HG22 | 1.99                     | 0.44              |
| 2:C:208:LEU:HB3   | 2:C:213:LYS:HE3   | 2.00                     | 0.44              |
| 5:F:169:LYS:HE3   | 5:F:169:LYS:HB2   | 1.84                     | 0.44              |
| 13:N:71:TYR:HA    | 13:N:75:LYS:HG3   | 1.98                     | 0.44              |
| 13:N:171:SER:HB3  | 13:N:225:TRP:CE2  | 2.53                     | 0.44              |
| 13:N:255:SER:O    | 13:N:259:GLU:HG2  | 2.18                     | 0.44              |
| 14:P:156:PHE:HB3  | 14:P:185:MET:HE1  | 2.00                     | 0.44              |
| 2:C:1013:ASP:OD2  | 3:D:374:LYS:NZ    | 2.47                     | 0.44              |
| 2:C:1016:ARG:O    | 2:C:1020:GLU:HG2  | 2.18                     | 0.44              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 3:D:157:PHE:HD2   | 15:Q:694:HIS:NE2 | 2.15                     | 0.44              |
| 4:E:903:PRO:HB2   | 18:T:94:ARG:HD3  | 1.99                     | 0.44              |
| 5:F:144:MET:HB3   | 5:F:167:MET:HE2  | 2.00                     | 0.44              |
| 5:F:818:LEU:O     | 5:F:822:ILE:HG12 | 2.17                     | 0.44              |
| 11:L:293:CYS:SG   | 11:L:320:MET:HE3 | 2.58                     | 0.44              |
| 15:Q:725:GLN:O    | 15:Q:732:GLU:N   | 2.51                     | 0.44              |
| 15:Q:749:GLU:HA   | 15:Q:752:GLN:HG3 | 2.00                     | 0.44              |
| 17:S:386:SER:O    | 17:S:389:GLU:HG2 | 2.17                     | 0.44              |
| 2:C:269:ARG:NH2   | 2:C:302:THR:O    | 2.49                     | 0.43              |
| 2:C:328:ALA:HB2   | 2:C:364:THR:HG21 | 2.00                     | 0.43              |
| 8:I:79:HIS:NE2    | 8:I:128:ASP:OD1  | 2.51                     | 0.43              |
| 9:J:186:PHE:CG    | 12:M:262:ARG:HD3 | 2.53                     | 0.43              |
| 13:N:70:ASP:OD1   | 13:N:71:TYR:N    | 2.51                     | 0.43              |
| 21:Y:13:DC:H2"    | 21:Y:14:DG:H8    | 1.83                     | 0.43              |
| 1:B:74:TYR:OH     | 12:M:279:ASP:OD1 | 2.30                     | 0.43              |
| 2:C:722:LEU:HD12  | 2:C:728:VAL:HA   | 2.00                     | 0.43              |
| 2:C:1053:LEU:HD11 | 3:D:117:TRP:HZ3  | 1.83                     | 0.43              |
| 4:E:630:ILE:HG22  | 4:E:823:PRO:HA   | 1.99                     | 0.43              |
| 4:E:808:ILE:HA    | 4:E:843:TRP:HB3  | 1.99                     | 0.43              |
| 10:K:110:HIS:CD2  | 10:K:130:PRO:HB3 | 2.53                     | 0.43              |
| 2:C:81:TYR:HB3    | 2:C:98:ARG:HE    | 1.82                     | 0.43              |
| 4:E:458:HIS:N     | 7:H:68:GLU:OE2   | 2.33                     | 0.43              |
| 5:F:95:TYR:OH     | 6:G:472:GLU:OE2  | 2.32                     | 0.43              |
| 6:G:181:ILE:HD13  | 6:G:215:VAL:HB   | 2.00                     | 0.43              |
| 6:G:535:TYR:HD1   | 6:G:540:LYS:HB2  | 1.84                     | 0.43              |
| 6:G:700:GLU:OE1   | 6:G:715:ARG:NH2  | 2.51                     | 0.43              |
| 9:J:319:TRP:CG    | 9:J:346:MET:HG3  | 2.54                     | 0.43              |
| 15:Q:522:VAL:HG23 | 15:Q:533:ILE:HB  | 1.99                     | 0.43              |
| 2:C:914:ALA:HB3   | 9:J:356:ARG:HH21 | 1.82                     | 0.43              |
| 4:E:268:ASP:OD1   | 4:E:268:ASP:N    | 2.51                     | 0.43              |
| 4:E:572:ARG:HG3   | 4:E:577:PHE:HB3  | 2.00                     | 0.43              |
| 4:E:864:THR:HG21  | 7:H:413:ALA:HB1  | 2.00                     | 0.43              |
| 5:F:138:ARG:NH1   | 5:F:172:TYR:OH   | 2.51                     | 0.43              |
| 6:G:669:TYR:HA    | 6:G:672:LEU:HG   | 2.00                     | 0.43              |
| 11:L:427:LYS:HE3  | 11:L:427:LYS:HB3 | 1.75                     | 0.43              |
| 13:N:131:ILE:HA   | 13:N:248:LEU:O   | 2.18                     | 0.43              |
| 2:C:700:THR:OG1   | 2:C:703:GLY:O    | 2.31                     | 0.43              |
| 4:E:92:HIS:CE1    | 4:E:94:VAL:HB    | 2.54                     | 0.43              |
| 4:E:579:ILE:HD11  | 4:E:796:LEU:HD22 | 1.99                     | 0.43              |
| 15:Q:473:ARG:NH1  | 15:Q:555:ALA:O   | 2.51                     | 0.43              |
| 2:C:407:ASN:HB3   | 2:C:410:ILE:HG13 | 2.00                     | 0.43              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:C:410:ILE:HG22  | 2:C:411:ARG:H     | 1.82                     | 0.43              |
| 3:D:419:LEU:HD12  | 3:D:419:LEU:HA    | 1.85                     | 0.43              |
| 4:E:296:THR:HG21  | 4:E:1230:SER:HB2  | 1.99                     | 0.43              |
| 4:E:306:ARG:HA    | 4:E:313:LEU:HA    | 2.00                     | 0.43              |
| 5:F:131:LYS:HG2   | 6:G:476:VAL:HG21  | 2.01                     | 0.43              |
| 5:F:248:PHE:HB3   | 5:F:271:MET:SD    | 2.59                     | 0.43              |
| 6:G:797:SER:HA    | 6:G:800:LYS:HE2   | 2.00                     | 0.43              |
| 13:N:79:THR:O     | 13:N:82:GLU:HG2   | 2.19                     | 0.43              |
| 15:Q:396:ALA:HB2  | 15:Q:427:LYS:HA   | 2.01                     | 0.43              |
| 15:Q:725:GLN:HB2  | 15:Q:734:TYR:HB3  | 2.01                     | 0.43              |
| 17:S:481:THR:HG21 | 17:S:538:GLY:O    | 2.18                     | 0.43              |
| 18:T:67:SER:HB2   | 18:T:132:TYR:HE1  | 1.83                     | 0.43              |
| 1:A:256:LYS:HE2   | 1:A:271:TYR:CE2   | 2.54                     | 0.43              |
| 1:B:55:GLY:HA3    | 1:B:157:TYR:CZ    | 2.54                     | 0.43              |
| 4:E:70:TRP:CZ2    | 9:J:278:LEU:HD12  | 2.54                     | 0.43              |
| 4:E:216:ARG:HG2   | 4:E:1328:PHE:HE1  | 1.84                     | 0.43              |
| 5:F:788:GLN:NE2   | 5:F:820:ALA:HB1   | 2.33                     | 0.43              |
| 7:H:318:ARG:HG2   | 7:H:321:MET:HE3   | 2.01                     | 0.43              |
| 8:I:62:LEU:HB3    | 8:I:66:MET:HB3    | 2.01                     | 0.43              |
| 12:M:261:THR:HG22 | 12:M:262:ARG:H    | 1.83                     | 0.43              |
| 2:C:284:ARG:NH1   | 7:H:556:ASP:OD1   | 2.52                     | 0.43              |
| 2:C:964:SER:HB2   | 3:D:404:GLU:O     | 2.19                     | 0.43              |
| 4:E:156:PRO:HA    | 4:E:187:LYS:NZ    | 2.34                     | 0.43              |
| 5:F:175:ARG:HH12  | 11:L:371:LEU:HD23 | 1.84                     | 0.43              |
| 12:M:236:ARG:NH1  | 12:M:242:GLU:O    | 2.47                     | 0.43              |
| 13:N:61:GLU:OE1   | 13:N:61:GLU:N     | 2.52                     | 0.43              |
| 14:P:96:LYS:HG2   | 14:P:97:VAL:HG13  | 1.99                     | 0.43              |
| 15:Q:337:PRO:HG2  | 15:Q:403:MET:HE2  | 2.00                     | 0.43              |
| 21:Y:44:DC:H2''   | 21:Y:45:DG:O4'    | 2.18                     | 0.43              |
| 2:C:315:ARG:NH2   | 2:C:323:ASP:OD2   | 2.51                     | 0.43              |
| 2:C:615:ARG:NH2   | 2:C:619:ASN:OD1   | 2.51                     | 0.43              |
| 4:E:104:TRP:CD1   | 4:E:164:PRO:HG3   | 2.53                     | 0.43              |
| 4:E:362:ILE:HD13  | 4:E:391:ILE:HG12  | 1.99                     | 0.43              |
| 4:E:783:ALA:HB1   | 4:E:785:TYR:CD2   | 2.54                     | 0.43              |
| 4:E:1035:PRO:HG2  | 4:E:1036:TYR:CE2  | 2.54                     | 0.43              |
| 5:F:74:PHE:CZ     | 6:G:707:LEU:HB3   | 2.54                     | 0.43              |
| 6:G:615:ASN:O     | 6:G:619:GLU:HG2   | 2.19                     | 0.43              |
| 9:J:203:PHE:C     | 9:J:205:LEU:H     | 2.27                     | 0.43              |
| 10:K:312:GLU:OE1  | 10:K:316:ASN:ND2  | 2.51                     | 0.43              |
| 12:M:146:LEU:HB3  | 12:M:255:SER:HB3  | 1.99                     | 0.43              |
| 15:Q:618:ILE:HG12 | 15:Q:619:GLY:H    | 1.83                     | 0.43              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 21:Y:23:DT:H2''  | 21:Y:24:DA:C8     | 2.52                     | 0.43              |
| 2:C:739:ILE:HD11 | 2:C:776:CYS:CB    | 2.48                     | 0.43              |
| 2:C:1014:HIS:O   | 2:C:1018:ARG:HG3  | 2.19                     | 0.43              |
| 4:E:625:ARG:O    | 4:E:832:ILE:N     | 2.51                     | 0.43              |
| 4:E:927:MET:HE3  | 4:E:938:LEU:HD12  | 1.99                     | 0.43              |
| 7:H:276:MET:HB2  | 7:H:327:ILE:HD12  | 2.00                     | 0.43              |
| 7:H:368:ASP:HB3  | 7:H:374:ILE:HD11  | 2.01                     | 0.43              |
| 8:I:246:MET:O    | 8:I:250:GLU:HG2   | 2.18                     | 0.43              |
| 10:K:205:MET:HB2 | 14:O:88:GLN:HG2   | 2.00                     | 0.43              |
| 13:N:155:SER:HA  | 13:N:158:VAL:HG22 | 2.01                     | 0.43              |
| 3:D:256:ARG:HA   | 3:D:256:ARG:HD2   | 1.83                     | 0.42              |
| 4:E:1006:TYR:CE2 | 8:I:250:GLU:HG3   | 2.53                     | 0.42              |
| 7:H:137:GLU:HA   | 7:H:140:ALA:HB3   | 2.01                     | 0.42              |
| 9:J:232:GLU:OE1  | 9:J:232:GLU:N     | 2.51                     | 0.42              |
| 3:D:114:THR:HG21 | 3:D:119:LEU:HD22  | 2.01                     | 0.42              |
| 6:G:162:PHE:CG   | 6:G:180:LEU:HD22  | 2.54                     | 0.42              |
| 11:L:109:ASP:OD1 | 11:L:316:LYS:N    | 2.50                     | 0.42              |
| 14:P:122:ALA:HB2 | 14:P:131:ILE:HD12 | 2.00                     | 0.42              |
| 15:Q:372:MET:HB2 | 15:Q:379:TYR:N    | 2.33                     | 0.42              |
| 17:S:267:MET:HE1 | 17:S:337:LEU:HD21 | 2.01                     | 0.42              |
| 1:B:212:LYS:HB2  | 1:B:212:LYS:HE3   | 1.82                     | 0.42              |
| 3:D:306:LEU:HD13 | 3:D:324:GLN:HB3   | 2.00                     | 0.42              |
| 3:D:514:PHE:HB2  | 3:D:517:MET:HE3   | 2.02                     | 0.42              |
| 6:G:458:TYR:HA   | 6:G:461:VAL:HG22  | 2.01                     | 0.42              |
| 7:H:535:GLN:HG2  | 13:N:109:GLY:O    | 2.19                     | 0.42              |
| 10:K:136:PRO:HD2 | 10:K:389:ARG:O    | 2.19                     | 0.42              |
| 12:M:200:TYR:N   | 12:M:226:LYS:O    | 2.51                     | 0.42              |
| 15:Q:737:ARG:H   | 15:Q:737:ARG:HD3  | 1.84                     | 0.42              |
| 21:Y:37:DC:H2'   | 21:Y:38:DG:C8     | 2.54                     | 0.42              |
| 1:B:55:GLY:HA3   | 1:B:157:TYR:CE2   | 2.54                     | 0.42              |
| 4:E:629:GLY:O    | 4:E:824:THR:N     | 2.34                     | 0.42              |
| 4:E:1164:ASN:HB3 | 4:E:1168:ARG:NH1  | 2.35                     | 0.42              |
| 4:E:1314:GLU:OE1 | 4:E:1314:GLU:N    | 2.50                     | 0.42              |
| 5:F:405:MET:HG2  | 5:F:409:TYR:HA    | 2.01                     | 0.42              |
| 6:G:601:MET:HA   | 6:G:604:VAL:HG12  | 2.01                     | 0.42              |
| 6:G:650:VAL:O    | 6:G:653:VAL:HG12  | 2.19                     | 0.42              |
| 7:H:370:ASN:ND2  | 7:H:373:GLU:HG3   | 2.35                     | 0.42              |
| 11:L:283:ASP:N   | 11:L:283:ASP:OD1  | 2.52                     | 0.42              |
| 20:X:52:DC:H2''  | 20:X:53:DA:C8     | 2.54                     | 0.42              |
| 2:C:187:MET:SD   | 2:C:189:SER:OG    | 2.61                     | 0.42              |
| 2:C:908:GLU:OE2  | 2:C:912:GLN:NE2   | 2.42                     | 0.42              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 4:E:476:LEU:HD11  | 4:E:1115:VAL:HG22 | 2.01                     | 0.42              |
| 5:F:81:ARG:NH1    | 5:F:92:GLU:OE1    | 2.50                     | 0.42              |
| 6:G:235:GLU:O     | 6:G:239:GLU:HG2   | 2.19                     | 0.42              |
| 6:G:793:MET:HE3   | 6:G:793:MET:HB3   | 1.98                     | 0.42              |
| 11:L:163:ASP:OD1  | 11:L:163:ASP:N    | 2.51                     | 0.42              |
| 11:L:345:PRO:HA   | 11:L:394:ALA:HB2  | 2.01                     | 0.42              |
| 15:Q:624:ASN:C    | 15:Q:625:GLU:HG3  | 2.45                     | 0.42              |
| 15:Q:673:TYR:CE2  | 15:Q:693:LEU:HB3  | 2.54                     | 0.42              |
| 20:X:59:DA:H2''   | 20:X:60:DG:C8     | 2.54                     | 0.42              |
| 3:D:172:LYS:HE3   | 3:D:173:TYR:CE2   | 2.55                     | 0.42              |
| 5:F:482:ASP:HA    | 5:F:485:VAL:HG22  | 2.00                     | 0.42              |
| 9:J:256:GLU:OE1   | 9:J:256:GLU:N     | 2.47                     | 0.42              |
| 10:K:457:PRO:HA   | 10:K:460:TRP:CE2  | 2.54                     | 0.42              |
| 13:N:85:ASN:O     | 13:N:89:VAL:HG23  | 2.19                     | 0.42              |
| 2:C:979:ARG:N     | 21:Y:40:DG:OP1    | 2.53                     | 0.42              |
| 4:E:1093:ILE:HG12 | 7:H:286:HIS:CD2   | 2.55                     | 0.42              |
| 7:H:401:HIS:HB3   | 7:H:404:VAL:HG23  | 2.01                     | 0.42              |
| 15:Q:341:MET:HG3  | 15:Q:407:LEU:HD13 | 2.02                     | 0.42              |
| 15:Q:628:LYS:O    | 15:Q:631:VAL:HG22 | 2.20                     | 0.42              |
| 17:S:445:TRP:CD2  | 17:S:449:LEU:HD23 | 2.55                     | 0.42              |
| 18:T:58:LEU:HD22  | 18:T:63:VAL:HG11  | 2.02                     | 0.42              |
| 18:T:85:LEU:HD23  | 18:T:113:ARG:HB2  | 2.00                     | 0.42              |
| 2:C:510:ILE:HD12  | 2:C:511:ALA:O     | 2.20                     | 0.42              |
| 4:E:904:PHE:CD1   | 18:T:94:ARG:HD2   | 2.54                     | 0.42              |
| 6:G:472:GLU:H     | 6:G:472:GLU:HG3   | 1.64                     | 0.42              |
| 10:K:279:ASN:O    | 10:K:283:LYS:HG2  | 2.20                     | 0.42              |
| 12:M:210:ILE:HD11 | 12:M:217:LEU:HD23 | 2.02                     | 0.42              |
| 13:N:120:GLN:HG2  | 13:N:208:ALA:HB2  | 2.00                     | 0.42              |
| 15:Q:345:GLY:O    | 15:Q:437:VAL:N    | 2.50                     | 0.42              |
| 17:S:446:HIS:CE1  | 17:S:449:LEU:HB2  | 2.55                     | 0.42              |
| 19:U:130:PHE:CD1  | 19:U:134:GLU:HB2  | 2.54                     | 0.42              |
| 2:C:789:ASP:OD2   | 2:C:791:ARG:NE    | 2.48                     | 0.42              |
| 3:D:458:LEU:HB3   | 4:E:330:GLU:HG2   | 2.02                     | 0.42              |
| 6:G:459:THR:HG23  | 6:G:492:THR:HA    | 2.02                     | 0.42              |
| 10:K:122:TRP:CE2  | 14:O:106:THR:HG22 | 2.55                     | 0.42              |
| 17:S:484:THR:HG22 | 17:S:537:ARG:HD2  | 2.01                     | 0.42              |
| 1:B:309:MET:HE2   | 1:B:309:MET:HB2   | 1.75                     | 0.42              |
| 2:C:402:THR:H     | 2:C:405:THR:HB    | 1.84                     | 0.42              |
| 2:C:844:LEU:HB2   | 2:C:846:ASP:OD1   | 2.19                     | 0.42              |
| 4:E:1110:THR:HG22 | 7:H:99:LEU:HD13   | 2.01                     | 0.42              |
| 10:K:234:PHE:HB3  | 10:K:264:ILE:HD13 | 2.02                     | 0.42              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 21:Y:26:DA:H2''   | 21:Y:27:DA:C8     | 2.55                     | 0.42              |
| 21:Y:37:DC:H2'    | 21:Y:38:DG:H8     | 1.84                     | 0.42              |
| 1:B:194:GLU:N     | 1:B:194:GLU:OE1   | 2.52                     | 0.41              |
| 4:E:1087:LYS:HE2  | 10:K:326:PHE:CG   | 2.54                     | 0.41              |
| 6:G:528:PHE:O     | 6:G:532:ILE:HG12  | 2.20                     | 0.41              |
| 6:G:691:GLU:OE1   | 6:G:695:ARG:NH1   | 2.48                     | 0.41              |
| 15:Q:615:ILE:HA   | 15:Q:642:VAL:O    | 2.20                     | 0.41              |
| 3:D:326:LYS:O     | 3:D:330:GLU:HG2   | 2.20                     | 0.41              |
| 3:D:527:PRO:HB2   | 3:D:530:VAL:HG23  | 2.02                     | 0.41              |
| 4:E:1204:LYS:HD3  | 4:E:1204:LYS:HA   | 1.91                     | 0.41              |
| 7:H:337:ARG:HA    | 7:H:363:PHE:CE2   | 2.55                     | 0.41              |
| 2:C:1007:MET:HB3  | 3:D:376:VAL:HG11  | 2.02                     | 0.41              |
| 4:E:237:MET:SD    | 4:E:242:PHE:HB2   | 2.61                     | 0.41              |
| 8:I:86:LEU:HD22   | 8:I:121:ALA:HA    | 2.02                     | 0.41              |
| 11:L:395:ALA:HA   | 11:L:398:THR:HG22 | 2.02                     | 0.41              |
| 15:Q:692:PHE:CZ   | 15:Q:759:GLU:HB2  | 2.55                     | 0.41              |
| 17:S:505:GLN:HB2  | 17:S:514:TYR:CZ   | 2.55                     | 0.41              |
| 20:X:32:DT:H2''   | 20:X:33:DC:C5     | 2.55                     | 0.41              |
| 22:Z:39:C:H2'     | 22:Z:40:G:C8      | 2.55                     | 0.41              |
| 1:A:48:ALA:HB3    | 1:B:226:PHE:CZ    | 2.53                     | 0.41              |
| 4:E:104:TRP:CG    | 4:E:164:PRO:HG3   | 2.55                     | 0.41              |
| 4:E:860:VAL:O     | 4:E:871:PHE:N     | 2.52                     | 0.41              |
| 4:E:1231:LYS:HD3  | 4:E:1250:GLY:HA2  | 2.03                     | 0.41              |
| 5:F:413:VAL:HA    | 5:F:798:LEU:HD22  | 2.02                     | 0.41              |
| 7:H:399:SER:HB3   | 7:H:517:TRP:HD1   | 1.86                     | 0.41              |
| 8:I:106:LYS:HE2   | 8:I:106:LYS:HB3   | 1.89                     | 0.41              |
| 10:K:218:LEU:O    | 10:K:249:THR:OG1  | 2.32                     | 0.41              |
| 12:M:149:CYS:HB3  | 12:M:258:LYS:HE2  | 2.02                     | 0.41              |
| 15:Q:359:ILE:HG21 | 15:Q:415:VAL:HG21 | 2.02                     | 0.41              |
| 17:S:498:LEU:HD23 | 17:S:518:THR:HG22 | 2.02                     | 0.41              |
| 2:C:826:HIS:NE2   | 2:C:870:GLU:OE1   | 2.47                     | 0.41              |
| 3:D:68:ILE:HD12   | 3:D:69:CYS:O      | 2.21                     | 0.41              |
| 3:D:508:GLU:OE2   | 4:E:1326:THR:OG1  | 2.33                     | 0.41              |
| 4:E:269:LEU:HD23  | 4:E:269:LEU:HA    | 1.89                     | 0.41              |
| 5:F:542:LEU:HD21  | 5:F:564:VAL:HG11  | 2.03                     | 0.41              |
| 6:G:77:LEU:HD23   | 6:G:109:VAL:HG21  | 2.02                     | 0.41              |
| 6:G:225:ASP:HA    | 6:G:258:ARG:HH22  | 1.86                     | 0.41              |
| 6:G:574:ARG:HE    | 6:G:607:LYS:HE2   | 1.85                     | 0.41              |
| 6:G:796:ARG:HG2   | 6:G:800:LYS:NZ    | 2.36                     | 0.41              |
| 7:H:273:TYR:OH    | 8:I:98:GLY:O      | 2.30                     | 0.41              |
| 10:K:356:VAL:HB   | 10:K:364:HIS:HB2  | 2.01                     | 0.41              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 11:L:334:MET:HE3  | 11:L:334:MET:HB3  | 1.98                     | 0.41              |
| 13:N:51:LYS:NZ    | 13:N:129:GLU:OE2  | 2.38                     | 0.41              |
| 15:Q:362:LEU:O    | 15:Q:365:ALA:N    | 2.53                     | 0.41              |
| 2:C:32:ILE:HD13   | 2:C:32:ILE:HA     | 1.96                     | 0.41              |
| 2:C:407:ASN:OD1   | 2:C:408:PHE:N     | 2.54                     | 0.41              |
| 2:C:714:LEU:HD13  | 2:C:719:LEU:HD21  | 2.02                     | 0.41              |
| 3:D:205:ASP:HB3   | 5:F:453:ARG:CZ    | 2.50                     | 0.41              |
| 3:D:384:ILE:HG22  | 3:D:476:ILE:HB    | 2.02                     | 0.41              |
| 4:E:372:THR:OG1   | 4:E:373:ARG:N     | 2.53                     | 0.41              |
| 6:G:458:TYR:HE2   | 6:G:484:VAL:HG21  | 1.84                     | 0.41              |
| 8:I:110:ASN:HB3   | 8:I:113:ASN:O     | 2.20                     | 0.41              |
| 13:N:217:SER:HG   | 13:N:264:ARG:HH21 | 1.65                     | 0.41              |
| 14:P:146:MET:SD   | 17:S:314:LEU:HB3  | 2.60                     | 0.41              |
| 15:Q:706:ALA:HA   | 15:Q:747:VAL:HG23 | 2.03                     | 0.41              |
| 2:C:824:GLY:O     | 27:C:1101:HOH:O   | 2.22                     | 0.41              |
| 4:E:111:LEU:HD12  | 4:E:149:MET:HG2   | 2.03                     | 0.41              |
| 4:E:666:ARG:N     | 7:H:599:TRP:HZ2   | 2.19                     | 0.41              |
| 4:E:1180:LEU:HD13 | 4:E:1188:ILE:HD12 | 2.02                     | 0.41              |
| 6:G:201:LYS:NZ    | 6:G:235:GLU:OE2   | 2.48                     | 0.41              |
| 6:G:644:ASP:OD1   | 6:G:644:ASP:N     | 2.51                     | 0.41              |
| 7:H:170:ASP:OD1   | 7:H:170:ASP:N     | 2.48                     | 0.41              |
| 7:H:414:GLU:HG3   | 7:H:472:LEU:HD22  | 2.02                     | 0.41              |
| 22:Z:39:C:H2'     | 22:Z:40:G:H8      | 1.86                     | 0.41              |
| 3:D:367:PHE:HA    | 3:D:371:LEU:HD12  | 2.03                     | 0.41              |
| 4:E:669:PHE:H     | 4:E:782:VAL:HG12  | 1.86                     | 0.41              |
| 7:H:298:VAL:HG13  | 7:H:299:HIS:CD2   | 2.56                     | 0.41              |
| 7:H:536:ALA:O     | 13:N:207:ASN:ND2  | 2.53                     | 0.41              |
| 10:K:197:LYS:HG3  | 10:K:210:VAL:HG21 | 2.01                     | 0.41              |
| 11:L:298:ARG:HD2  | 11:L:301:ASP:OD1  | 2.21                     | 0.41              |
| 1:B:98:SER:HB3    | 1:B:127:VAL:HA    | 2.03                     | 0.41              |
| 2:C:178:ILE:HD11  | 2:C:230:PHE:HB2   | 2.03                     | 0.41              |
| 2:C:258:LEU:HD13  | 2:C:266:ILE:HD12  | 2.03                     | 0.41              |
| 2:C:846:ASP:OD2   | 2:C:848:ARG:NE    | 2.52                     | 0.41              |
| 3:D:15:VAL:HG22   | 3:D:19:GLN:HB3    | 2.03                     | 0.41              |
| 3:D:120:LYS:HB3   | 3:D:120:LYS:HE3   | 1.85                     | 0.41              |
| 3:D:213:GLU:CD    | 5:F:471:ILE:HG21  | 2.46                     | 0.41              |
| 5:F:314:ASP:O     | 5:F:318:VAL:HG12  | 2.21                     | 0.41              |
| 5:F:488:ARG:HA    | 5:F:488:ARG:HD3   | 1.76                     | 0.41              |
| 6:G:467:GLN:O     | 6:G:715:ARG:NH1   | 2.35                     | 0.41              |
| 6:G:617:LEU:HD23  | 6:G:617:LEU:HA    | 1.93                     | 0.41              |
| 7:H:126:LYS:HA    | 7:H:126:LYS:HD3   | 1.81                     | 0.41              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 7:H:236:ASN:CG    | 7:H:239:ARG:HH12  | 2.29                     | 0.41              |
| 7:H:449:GLU:N     | 7:H:466:LYS:HZ1   | 2.19                     | 0.41              |
| 10:K:383:THR:OG1  | 10:K:386:THR:OG1  | 2.16                     | 0.41              |
| 10:K:430:ILE:HG13 | 10:K:450:LEU:HD22 | 2.03                     | 0.41              |
| 13:N:60:LEU:HD12  | 13:N:69:LEU:HD21  | 2.03                     | 0.41              |
| 14:O:84:ALA:O     | 14:O:88:GLN:HG3   | 2.20                     | 0.41              |
| 14:O:120:MET:HE3  | 14:O:120:MET:HA   | 2.03                     | 0.41              |
| 14:P:114:MET:SD   | 14:P:154:LEU:HD11 | 2.61                     | 0.41              |
| 15:Q:437:VAL:HA   | 15:Q:475:VAL:HB   | 2.03                     | 0.41              |
| 17:S:446:HIS:ND1  | 17:S:448:ASN:OD1  | 2.52                     | 0.41              |
| 22:Z:35:C:H2'     | 22:Z:36:G:C8      | 2.55                     | 0.41              |
| 1:A:150:LYS:HD3   | 1:A:150:LYS:HA    | 1.82                     | 0.41              |
| 3:D:104:MET:SD    | 3:D:273:PRO:HD3   | 2.61                     | 0.41              |
| 3:D:455:ALA:HB3   | 3:D:456:PRO:HD3   | 2.03                     | 0.41              |
| 4:E:475:HIS:ND1   | 7:H:96:ARG:HD2    | 2.36                     | 0.41              |
| 4:E:579:ILE:HD13  | 4:E:579:ILE:HA    | 1.95                     | 0.41              |
| 7:H:528:LEU:HB3   | 13:N:214:TRP:CD1  | 2.56                     | 0.41              |
| 15:Q:301:ALA:O    | 15:Q:318:ILE:HA   | 2.20                     | 0.41              |
| 15:Q:614:ILE:O    | 15:Q:640:SER:OG   | 2.28                     | 0.41              |
| 4:E:43:LYS:HE2    | 4:E:43:LYS:HB3    | 1.87                     | 0.40              |
| 5:F:410:ARG:HD3   | 5:F:816:VAL:HG21  | 2.04                     | 0.40              |
| 6:G:162:PHE:CD1   | 6:G:180:LEU:HD22  | 2.56                     | 0.40              |
| 6:G:299:VAL:HA    | 6:G:302:LEU:HD12  | 2.03                     | 0.40              |
| 9:J:415:ASN:HD22  | 9:J:416:MET:N     | 2.19                     | 0.40              |
| 10:K:124:MET:HA   | 10:K:127:TRP:CE2  | 2.56                     | 0.40              |
| 10:K:157:MET:HE1  | 10:K:228:LEU:HG   | 2.03                     | 0.40              |
| 15:Q:614:ILE:HB   | 15:Q:640:SER:HA   | 2.02                     | 0.40              |
| 7:H:121:PRO:HB3   | 7:H:124:ARG:NH2   | 2.36                     | 0.40              |
| 10:K:85:PHE:HD2   | 10:K:87:TYR:H     | 1.69                     | 0.40              |
| 12:M:266:LEU:HD22 | 12:M:292:LYS:HE2  | 2.04                     | 0.40              |
| 14:P:173:PRO:CA   | 17:S:562:ASN:HD21 | 2.35                     | 0.40              |
| 16:R:66:PRO:HG2   | 16:R:67:PHE:CD2   | 2.56                     | 0.40              |
| 2:C:814:ARG:HH11  | 2:C:955:GLN:HE21  | 1.70                     | 0.40              |
| 5:F:164:LEU:HD22  | 5:F:174:ILE:HB    | 2.04                     | 0.40              |
| 7:H:164:ARG:HG2   | 7:H:166:ILE:HG13  | 2.03                     | 0.40              |
| 7:H:415:GLN:OE1   | 7:H:481:ARG:NH2   | 2.51                     | 0.40              |
| 7:H:502:LYS:HE2   | 7:H:502:LYS:HB3   | 1.83                     | 0.40              |
| 7:H:517:TRP:NE1   | 13:N:187:ASN:O    | 2.44                     | 0.40              |
| 15:Q:659:LEU:HD12 | 15:Q:659:LEU:HA   | 1.80                     | 0.40              |
| 20:X:47:DG:OP1    | 20:X:47:DG:H8     | 2.04                     | 0.40              |
| 2:C:62:PRO:HB3    | 2:C:77:SER:O      | 2.21                     | 0.40              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 2:C:695:ILE:HB    | 2:C:777:LEU:HD22 | 2.02                     | 0.40              |
| 3:D:16:SER:HB3    | 3:D:263:TRP:CZ2  | 2.56                     | 0.40              |
| 3:D:610:GLN:HG2   | 12:M:203:TYR:CD2 | 2.56                     | 0.40              |
| 3:D:654:THR:OG1   | 3:D:655:THR:N    | 2.53                     | 0.40              |
| 5:F:182:VAL:HG21  | 5:F:212:LEU:HD21 | 2.02                     | 0.40              |
| 5:F:418:GLU:HG2   | 5:F:419:PRO:HD3  | 2.03                     | 0.40              |
| 5:F:557:ARG:C     | 5:F:559:VAL:H    | 2.28                     | 0.40              |
| 6:G:78:ILE:HD13   | 6:G:112:GLU:HG2  | 2.02                     | 0.40              |
| 6:G:365:ARG:HD3   | 6:G:365:ARG:HA   | 1.89                     | 0.40              |
| 6:G:785:THR:HG22  | 6:G:793:MET:HB2  | 2.02                     | 0.40              |
| 2:C:401:LEU:H     | 2:C:401:LEU:HG   | 1.74                     | 0.40              |
| 3:D:12:ILE:HD11   | 4:E:1300:ALA:HB3 | 2.02                     | 0.40              |
| 4:E:37:HIS:CE1    | 16:R:75:ILE:HD11 | 2.57                     | 0.40              |
| 4:E:436:GLU:OE1   | 4:E:436:GLU:N    | 2.55                     | 0.40              |
| 6:G:314:ASP:O     | 6:G:317:SER:OG   | 2.36                     | 0.40              |
| 7:H:590:LYS:HD3   | 7:H:590:LYS:HA   | 1.87                     | 0.40              |
| 9:J:212:PRO:HB2   | 9:J:270:LYS:HG2  | 2.03                     | 0.40              |
| 9:J:291:PHE:O     | 9:J:295:ARG:HG3  | 2.21                     | 0.40              |
| 11:L:214:VAL:HG12 | 11:L:218:ARG:NE  | 2.37                     | 0.40              |
| 12:M:231:LYS:HG2  | 12:M:232:HIS:O   | 2.21                     | 0.40              |
| 14:O:160:ASP:OD2  | 14:O:162:SER:OG  | 2.39                     | 0.40              |

There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone

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

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

| Mol | Chain | Analysed        | Favoured   | Allowed | Outliers | Percentiles |     |
|-----|-------|-----------------|------------|---------|----------|-------------|-----|
| 1   | A     | 295/327 (90%)   | 284 (96%)  | 11 (4%) | 0        | 100         | 100 |
| 1   | B     | 279/327 (85%)   | 273 (98%)  | 6 (2%)  | 0        | 100         | 100 |
| 2   | C     | 1036/1072 (97%) | 1016 (98%) | 19 (2%) | 1 (0%)   | 48          | 70  |
| 3   | D     | 597/680 (88%)   | 571 (96%)  | 26 (4%) | 0        | 100         | 100 |

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| Mol | Chain | Analysed         | Favoured   | Allowed  | Outliers | Percentiles |     |
|-----|-------|------------------|------------|----------|----------|-------------|-----|
| 4   | E     | 1057/1373 (77%)  | 1011 (96%) | 44 (4%)  | 2 (0%)   | 44          | 65  |
| 5   | F     | 650/911 (71%)    | 631 (97%)  | 18 (3%)  | 1 (0%)   | 44          | 65  |
| 6   | G     | 744/862 (86%)    | 730 (98%)  | 14 (2%)  | 0        | 100         | 100 |
| 7   | H     | 547/675 (81%)    | 536 (98%)  | 11 (2%)  | 0        | 100         | 100 |
| 8   | I     | 213/263 (81%)    | 204 (96%)  | 9 (4%)   | 0        | 100         | 100 |
| 9   | J     | 230/529 (44%)    | 224 (97%)  | 6 (3%)   | 0        | 100         | 100 |
| 10  | K     | 382/460 (83%)    | 370 (97%)  | 11 (3%)  | 1 (0%)   | 37          | 57  |
| 11  | L     | 412/483 (85%)    | 400 (97%)  | 11 (3%)  | 1 (0%)   | 44          | 65  |
| 12  | M     | 213/334 (64%)    | 210 (99%)  | 3 (1%)   | 0        | 100         | 100 |
| 13  | N     | 222/297 (75%)    | 216 (97%)  | 6 (3%)   | 0        | 100         | 100 |
| 14  | O     | 112/185 (60%)    | 110 (98%)  | 2 (2%)   | 0        | 100         | 100 |
| 14  | P     | 106/185 (57%)    | 105 (99%)  | 1 (1%)   | 0        | 100         | 100 |
| 15  | Q     | 537/768 (70%)    | 522 (97%)  | 15 (3%)  | 0        | 100         | 100 |
| 16  | R     | 126/162 (78%)    | 121 (96%)  | 5 (4%)   | 0        | 100         | 100 |
| 17  | S     | 382/611 (62%)    | 369 (97%)  | 13 (3%)  | 0        | 100         | 100 |
| 18  | T     | 102/140 (73%)    | 96 (94%)   | 6 (6%)   | 0        | 100         | 100 |
| 19  | U     | 107/187 (57%)    | 106 (99%)  | 1 (1%)   | 0        | 100         | 100 |
| All | All   | 8349/10831 (77%) | 8105 (97%) | 238 (3%) | 6 (0%)   | 50          | 70  |

All (6) Ramachandran outliers are listed below:

| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 4   | E     | 489  | ILE  |
| 4   | E     | 793  | LEU  |
| 11  | L     | 405  | ILE  |
| 2   | C     | 1030 | THR  |
| 5   | F     | 553  | ILE  |
| 10  | K     | 87   | TYR  |

### 5.3.2 Protein sidechains ⓘ

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

The Analysed column shows the number of residues for which the sidechain conformation was

analysed, and the total number of residues.

| Mol | Chain | Analysed        | Rotameric  | Outliers | Percentiles |     |
|-----|-------|-----------------|------------|----------|-------------|-----|
| 1   | A     | 275/301 (91%)   | 271 (98%)  | 4 (2%)   | 60          | 80  |
| 1   | B     | 258/301 (86%)   | 255 (99%)  | 3 (1%)   | 67          | 84  |
| 2   | C     | 905/931 (97%)   | 890 (98%)  | 15 (2%)  | 56          | 77  |
| 3   | D     | 546/608 (90%)   | 539 (99%)  | 7 (1%)   | 65          | 83  |
| 4   | E     | 969/1230 (79%)  | 956 (99%)  | 13 (1%)  | 65          | 83  |
| 5   | F     | 565/782 (72%)   | 558 (99%)  | 7 (1%)   | 67          | 84  |
| 6   | G     | 642/740 (87%)   | 639 (100%) | 3 (0%)   | 86          | 95  |
| 7   | H     | 489/609 (80%)   | 485 (99%)  | 4 (1%)   | 79          | 91  |
| 8   | I     | 187/230 (81%)   | 185 (99%)  | 2 (1%)   | 70          | 86  |
| 9   | J     | 212/469 (45%)   | 211 (100%) | 1 (0%)   | 86          | 95  |
| 10  | K     | 338/401 (84%)   | 333 (98%)  | 5 (2%)   | 60          | 80  |
| 11  | L     | 369/431 (86%)   | 366 (99%)  | 3 (1%)   | 79          | 91  |
| 12  | M     | 205/299 (69%)   | 198 (97%)  | 7 (3%)   | 32          | 56  |
| 13  | N     | 192/259 (74%)   | 190 (99%)  | 2 (1%)   | 73          | 87  |
| 14  | O     | 103/169 (61%)   | 103 (100%) | 0        | 100         | 100 |
| 14  | P     | 97/169 (57%)    | 97 (100%)  | 0        | 100         | 100 |
| 15  | Q     | 458/661 (69%)   | 450 (98%)  | 8 (2%)   | 56          | 77  |
| 16  | R     | 114/144 (79%)   | 114 (100%) | 0        | 100         | 100 |
| 17  | S     | 336/532 (63%)   | 336 (100%) | 0        | 100         | 100 |
| 18  | T     | 93/126 (74%)    | 92 (99%)   | 1 (1%)   | 70          | 86  |
| 19  | U     | 91/160 (57%)    | 91 (100%)  | 0        | 100         | 100 |
| All | All   | 7444/9552 (78%) | 7359 (99%) | 85 (1%)  | 69          | 86  |

All (85) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | A     | 73  | ASP  |
| 1   | A     | 138 | THR  |
| 1   | A     | 143 | ILE  |
| 1   | A     | 301 | ASN  |
| 1   | B     | 100 | LEU  |
| 1   | B     | 159 | LEU  |
| 1   | B     | 275 | ASP  |
| 2   | C     | 56  | THR  |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | C     | 79   | GLU  |
| 2   | C     | 82   | VAL  |
| 2   | C     | 196  | GLU  |
| 2   | C     | 266  | ILE  |
| 2   | C     | 401  | LEU  |
| 2   | C     | 402  | THR  |
| 2   | C     | 469  | LEU  |
| 2   | C     | 510  | ILE  |
| 2   | C     | 659  | VAL  |
| 2   | C     | 722  | LEU  |
| 2   | C     | 923  | TYR  |
| 2   | C     | 943  | ILE  |
| 2   | C     | 944  | ILE  |
| 2   | C     | 1021 | VAL  |
| 3   | D     | 1    | MET  |
| 3   | D     | 14   | LEU  |
| 3   | D     | 15   | VAL  |
| 3   | D     | 68   | ILE  |
| 3   | D     | 216  | LEU  |
| 3   | D     | 236  | LYS  |
| 3   | D     | 535  | MET  |
| 4   | E     | 56   | SER  |
| 4   | E     | 368  | LEU  |
| 4   | E     | 463  | THR  |
| 4   | E     | 489  | ILE  |
| 4   | E     | 490  | LEU  |
| 4   | E     | 784  | THR  |
| 4   | E     | 793  | LEU  |
| 4   | E     | 795  | THR  |
| 4   | E     | 796  | LEU  |
| 4   | E     | 864  | THR  |
| 4   | E     | 945  | ASN  |
| 4   | E     | 990  | TYR  |
| 4   | E     | 997  | THR  |
| 5   | F     | 133  | LEU  |
| 5   | F     | 360  | ASN  |
| 5   | F     | 412  | LEU  |
| 5   | F     | 497  | GLU  |
| 5   | F     | 597  | LEU  |
| 5   | F     | 808  | VAL  |
| 5   | F     | 848  | LEU  |
| 6   | G     | 245  | ILE  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 6   | G     | 577 | ASP  |
| 6   | G     | 776 | ASP  |
| 7   | H     | 113 | ILE  |
| 7   | H     | 474 | LEU  |
| 7   | H     | 532 | SER  |
| 7   | H     | 535 | GLN  |
| 8   | I     | 148 | GLU  |
| 8   | I     | 203 | ASP  |
| 9   | J     | 335 | THR  |
| 10  | K     | 88  | ASP  |
| 10  | K     | 99  | VAL  |
| 10  | K     | 246 | MET  |
| 10  | K     | 383 | THR  |
| 10  | K     | 392 | SER  |
| 11  | L     | 218 | ARG  |
| 11  | L     | 246 | ASP  |
| 11  | L     | 303 | ILE  |
| 12  | M     | 120 | PHE  |
| 12  | M     | 131 | VAL  |
| 12  | M     | 181 | VAL  |
| 12  | M     | 261 | THR  |
| 12  | M     | 266 | LEU  |
| 12  | M     | 301 | ASP  |
| 12  | M     | 316 | GLU  |
| 13  | N     | 63  | HIS  |
| 13  | N     | 67  | GLU  |
| 15  | Q     | 266 | HIS  |
| 15  | Q     | 362 | LEU  |
| 15  | Q     | 373 | PHE  |
| 15  | Q     | 633 | THR  |
| 15  | Q     | 643 | THR  |
| 15  | Q     | 746 | TYR  |
| 15  | Q     | 757 | THR  |
| 15  | Q     | 763 | ARG  |
| 18  | T     | 119 | GLU  |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (128) such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | A     | 193 | ASN  |
| 1   | A     | 262 | GLN  |
| 1   | A     | 303 | GLN  |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | B     | 14   | GLN  |
| 1   | B     | 180  | GLN  |
| 1   | B     | 196  | GLN  |
| 1   | B     | 303  | GLN  |
| 2   | C     | 16   | ASN  |
| 2   | C     | 17   | GLN  |
| 2   | C     | 19   | GLN  |
| 2   | C     | 93   | ASN  |
| 2   | C     | 124  | ASN  |
| 2   | C     | 135  | GLN  |
| 2   | C     | 228  | GLN  |
| 2   | C     | 278  | ASN  |
| 2   | C     | 307  | ASN  |
| 2   | C     | 322  | GLN  |
| 2   | C     | 334  | ASN  |
| 2   | C     | 441  | HIS  |
| 2   | C     | 475  | GLN  |
| 2   | C     | 516  | HIS  |
| 2   | C     | 524  | GLN  |
| 2   | C     | 538  | HIS  |
| 2   | C     | 542  | ASN  |
| 2   | C     | 624  | GLN  |
| 2   | C     | 713  | HIS  |
| 2   | C     | 812  | GLN  |
| 2   | C     | 867  | GLN  |
| 2   | C     | 883  | HIS  |
| 2   | C     | 954  | HIS  |
| 2   | C     | 974  | GLN  |
| 2   | C     | 1014 | HIS  |
| 3   | D     | 19   | GLN  |
| 3   | D     | 128  | ASN  |
| 3   | D     | 258  | ASN  |
| 3   | D     | 324  | GLN  |
| 3   | D     | 446  | GLN  |
| 3   | D     | 453  | ASN  |
| 3   | D     | 464  | GLN  |
| 3   | D     | 467  | GLN  |
| 3   | D     | 494  | GLN  |
| 3   | D     | 607  | GLN  |
| 3   | D     | 610  | GLN  |
| 3   | D     | 629  | ASN  |
| 3   | D     | 636  | HIS  |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 3   | D     | 674  | GLN  |
| 4   | E     | 41   | GLN  |
| 4   | E     | 78   | GLN  |
| 4   | E     | 113  | GLN  |
| 4   | E     | 118  | ASN  |
| 4   | E     | 144  | HIS  |
| 4   | E     | 283  | GLN  |
| 4   | E     | 310  | HIS  |
| 4   | E     | 326  | GLN  |
| 4   | E     | 739  | HIS  |
| 4   | E     | 792  | ASN  |
| 4   | E     | 922  | HIS  |
| 4   | E     | 1053 | GLN  |
| 4   | E     | 1054 | ASN  |
| 4   | E     | 1206 | GLN  |
| 4   | E     | 1291 | GLN  |
| 4   | E     | 1315 | ASN  |
| 4   | E     | 1365 | HIS  |
| 5   | F     | 84   | ASN  |
| 5   | F     | 270  | ASN  |
| 5   | F     | 360  | ASN  |
| 5   | F     | 363  | ASN  |
| 5   | F     | 788  | GLN  |
| 5   | F     | 835  | GLN  |
| 6   | G     | 130  | GLN  |
| 6   | G     | 182  | ASN  |
| 6   | G     | 217  | ASN  |
| 6   | G     | 351  | ASN  |
| 6   | G     | 362  | GLN  |
| 6   | G     | 363  | ASN  |
| 6   | G     | 409  | HIS  |
| 6   | G     | 518  | ASN  |
| 6   | G     | 624  | ASN  |
| 6   | G     | 628  | ASN  |
| 6   | G     | 640  | ASN  |
| 7   | H     | 228  | GLN  |
| 7   | H     | 249  | GLN  |
| 7   | H     | 289  | GLN  |
| 7   | H     | 322  | HIS  |
| 7   | H     | 588  | HIS  |
| 8   | I     | 68   | GLN  |
| 8   | I     | 123  | GLN  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 8   | I     | 126 | ASN  |
| 8   | I     | 149 | GLN  |
| 8   | I     | 215 | HIS  |
| 9   | J     | 329 | GLN  |
| 9   | J     | 340 | ASN  |
| 9   | J     | 349 | HIS  |
| 9   | J     | 415 | ASN  |
| 10  | K     | 110 | HIS  |
| 10  | K     | 112 | ASN  |
| 10  | K     | 179 | GLN  |
| 10  | K     | 414 | GLN  |
| 11  | L     | 124 | HIS  |
| 11  | L     | 233 | HIS  |
| 11  | L     | 323 | ASN  |
| 11  | L     | 360 | ASN  |
| 12  | M     | 124 | GLN  |
| 12  | M     | 142 | HIS  |
| 12  | M     | 190 | GLN  |
| 13  | N     | 190 | ASN  |
| 14  | O     | 147 | GLN  |
| 15  | Q     | 440 | ASN  |
| 15  | Q     | 491 | ASN  |
| 15  | Q     | 509 | HIS  |
| 15  | Q     | 545 | ASN  |
| 15  | Q     | 676 | HIS  |
| 15  | Q     | 725 | GLN  |
| 16  | R     | 37  | GLN  |
| 16  | R     | 71  | GLN  |
| 17  | S     | 195 | HIS  |
| 17  | S     | 277 | GLN  |
| 17  | S     | 284 | ASN  |
| 17  | S     | 348 | HIS  |
| 17  | S     | 371 | ASN  |
| 17  | S     | 395 | GLN  |
| 17  | S     | 469 | ASN  |
| 17  | S     | 510 | ASN  |
| 17  | S     | 562 | ASN  |
| 18  | T     | 46  | ASN  |
| 18  | T     | 55  | GLN  |
| 19  | U     | 101 | HIS  |
| 19  | U     | 175 | HIS  |

### 5.3.3 RNA ⓘ

| Mol | Chain | Analysed    | Backbone Outliers | Pucker Outliers |
|-----|-------|-------------|-------------------|-----------------|
| 22  | Z     | 10/40 (25%) | 2 (20%)           | 1 (10%)         |

All (2) RNA backbone outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 22  | Z     | 32  | C    |
| 22  | Z     | 38  | G    |

All (1) RNA pucker outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 22  | Z     | 31  | C    |

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

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

## 5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry ⓘ

Of 5 ligands modelled in this entry, 4 are monoatomic - leaving 1 for Mogul analysis.

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

| Mol | Type | Chain | Res  | Link | Bond lengths |      |          | Bond angles |      |          |
|-----|------|-------|------|------|--------------|------|----------|-------------|------|----------|
|     |      |       |      |      | Counts       | RMSZ | # Z  > 2 | Counts      | RMSZ | # Z  > 2 |
| 26  | SAH  | L     | 8001 | -    | 24,28,28     | 1.21 | 3 (12%)  | 25,40,40    | 1.80 | 5 (20%)  |

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   |
|-----|------|-------|------|------|---------|------------|---------|
| 26  | SAH  | L     | 8001 | -    | -       | 3/11/31/31 | 0/3/3/3 |

All (3) bond length outliers are listed below:

| Mol | Chain | Res  | Type | Atoms | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|-------|-------|-------------|----------|
| 26  | L     | 8001 | SAH  | C2-N3 | 3.94  | 1.38        | 1.32     |
| 26  | L     | 8001 | SAH  | C2-N1 | 2.36  | 1.38        | 1.33     |
| 26  | L     | 8001 | SAH  | OXT-C | -2.19 | 1.23        | 1.30     |

All (5) bond angle outliers are listed below:

| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 26  | L     | 8001 | SAH  | N3-C2-N1    | -5.50 | 120.08      | 128.68   |
| 26  | L     | 8001 | SAH  | C5'-SD-CG   | -3.81 | 90.83       | 102.27   |
| 26  | L     | 8001 | SAH  | C3'-C2'-C1' | 3.29  | 105.94      | 100.98   |
| 26  | L     | 8001 | SAH  | OXT-C-O     | -2.73 | 117.89      | 124.09   |
| 26  | L     | 8001 | SAH  | OXT-C-CA    | 2.30  | 121.23      | 113.38   |

There are no chirality outliers.

All (3) torsion outliers are listed below:

| Mol | Chain | Res  | Type | Atoms          |
|-----|-------|------|------|----------------|
| 26  | L     | 8001 | SAH  | O4'-C4'-C5'-SD |
| 26  | L     | 8001 | SAH  | C3'-C4'-C5'-SD |
| 26  | L     | 8001 | SAH  | CB-CG-SD-C5'   |

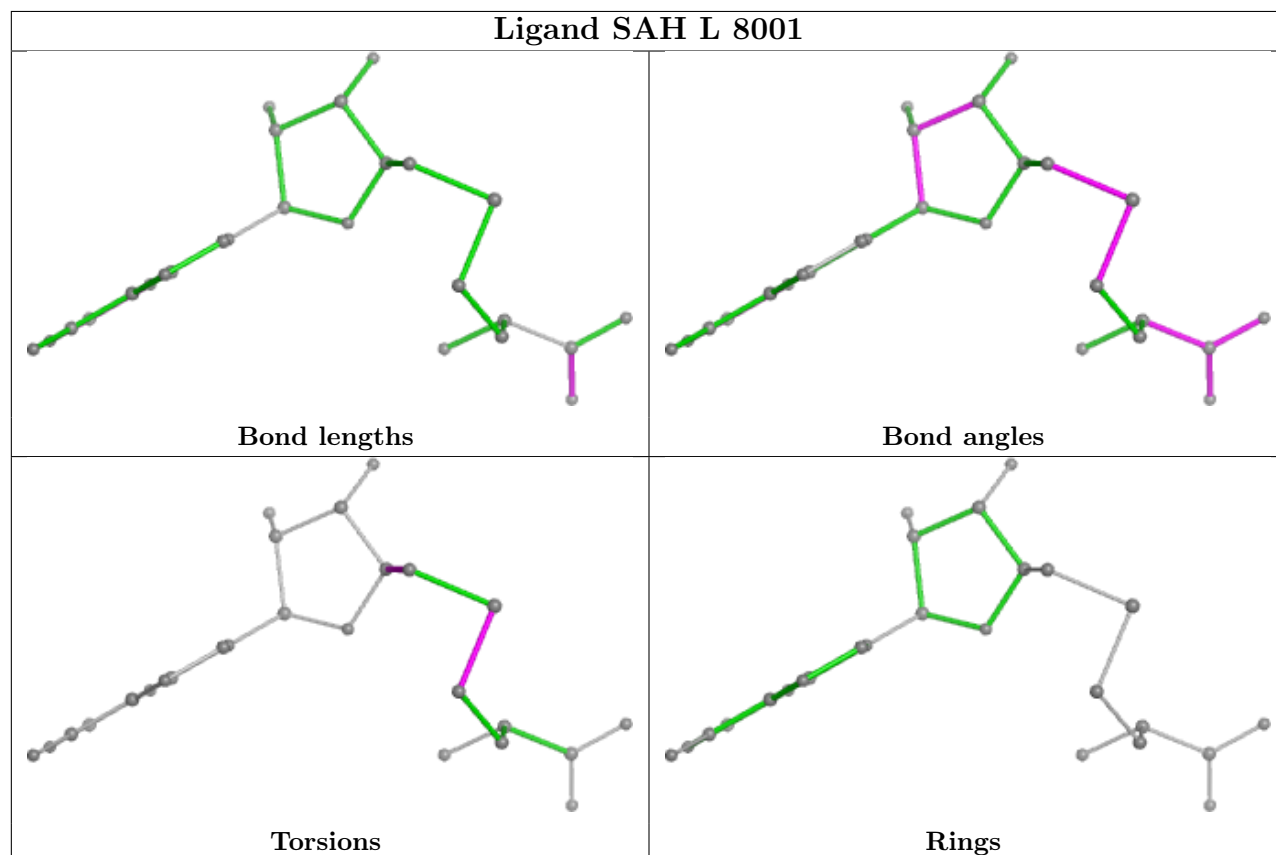
There are no ring outliers.

1 monomer is involved in 1 short contact:

| Mol | Chain | Res  | Type | Clashes | Symm-Clashes |
|-----|-------|------|------|---------|--------------|
| 26  | L     | 8001 | SAH  | 1       | 0            |

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring

in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



## 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

There are no chain breaks in this entry.

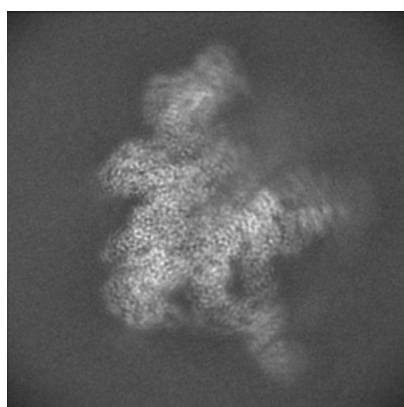
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-19023. These allow visual inspection of the internal detail of the map and identification of artifacts.

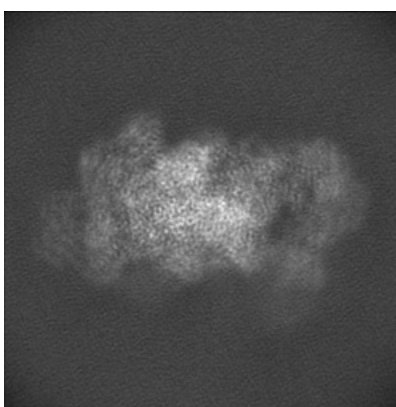
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

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

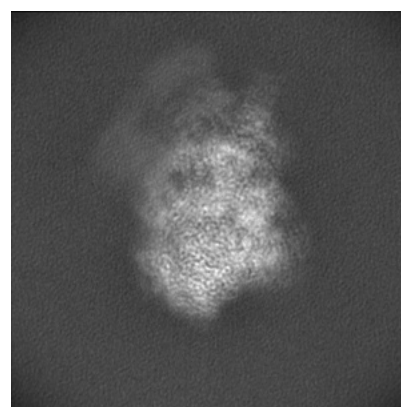
#### 6.1.1 Primary map



X



Y

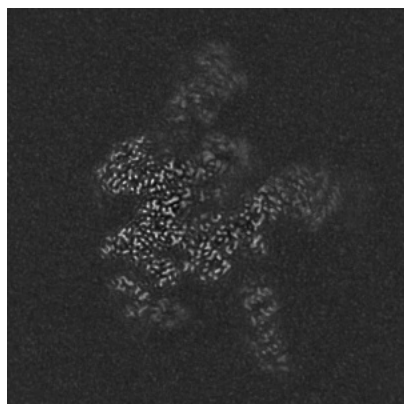


Z

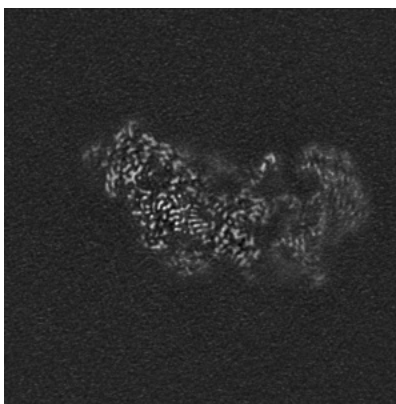
The images above show the map projected in three orthogonal directions.

### 6.2 Central slices [i](#)

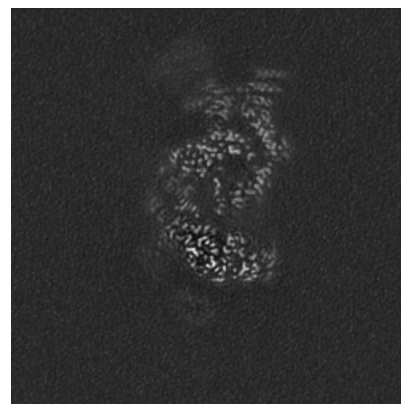
#### 6.2.1 Primary map



X Index: 300



Y Index: 300

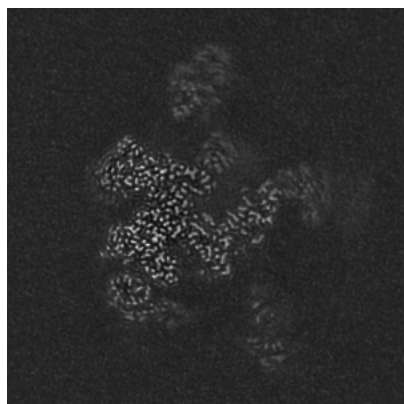


Z Index: 300

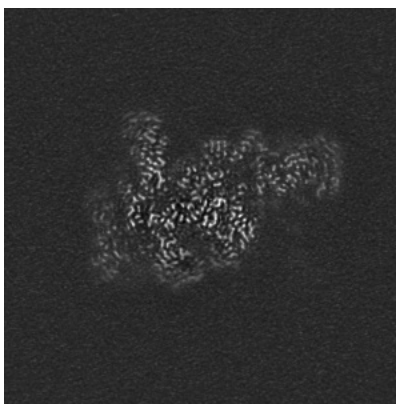
The images above show central slices of the map in three orthogonal directions.

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

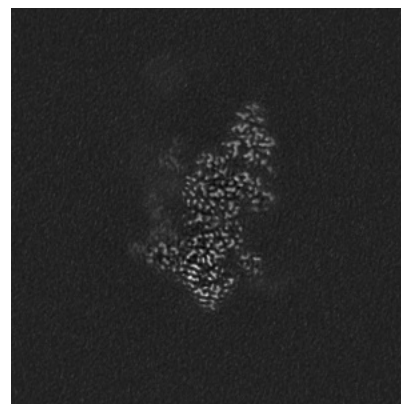
### 6.3.1 Primary map



X Index: 288



Y Index: 233

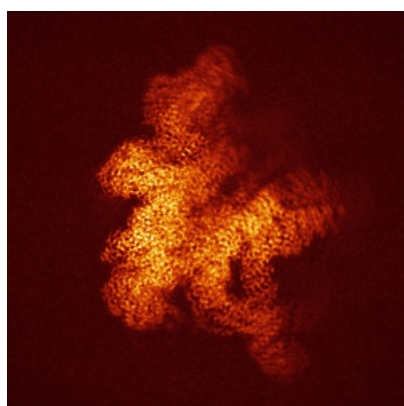


Z Index: 253

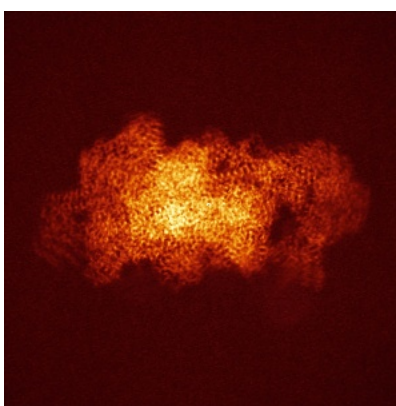
The images above show the largest variance slices of the map in three orthogonal directions.

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

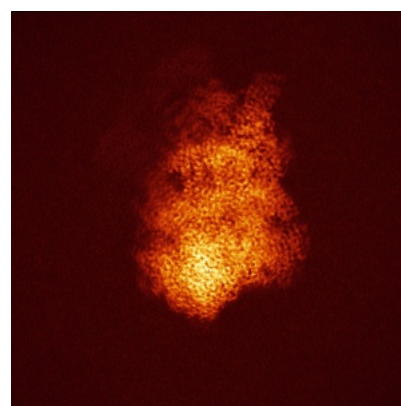
### 6.4.1 Primary map



X



Y

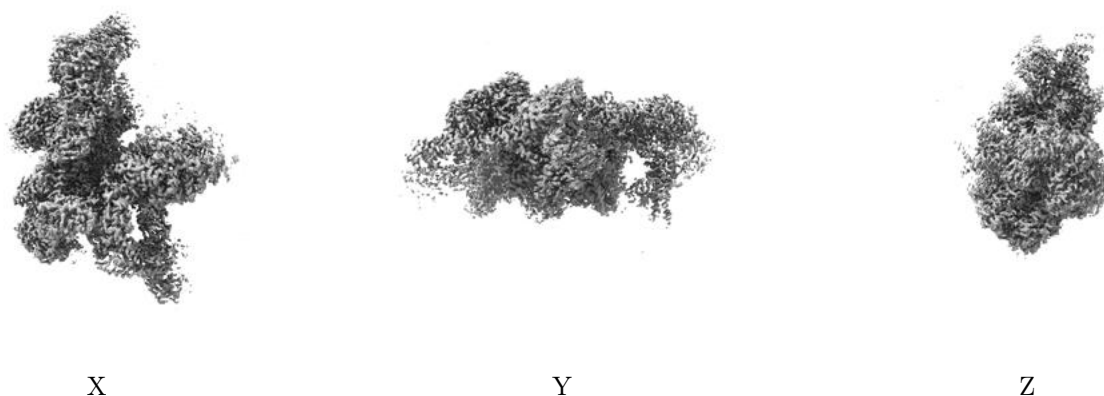


Z

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 0.8. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

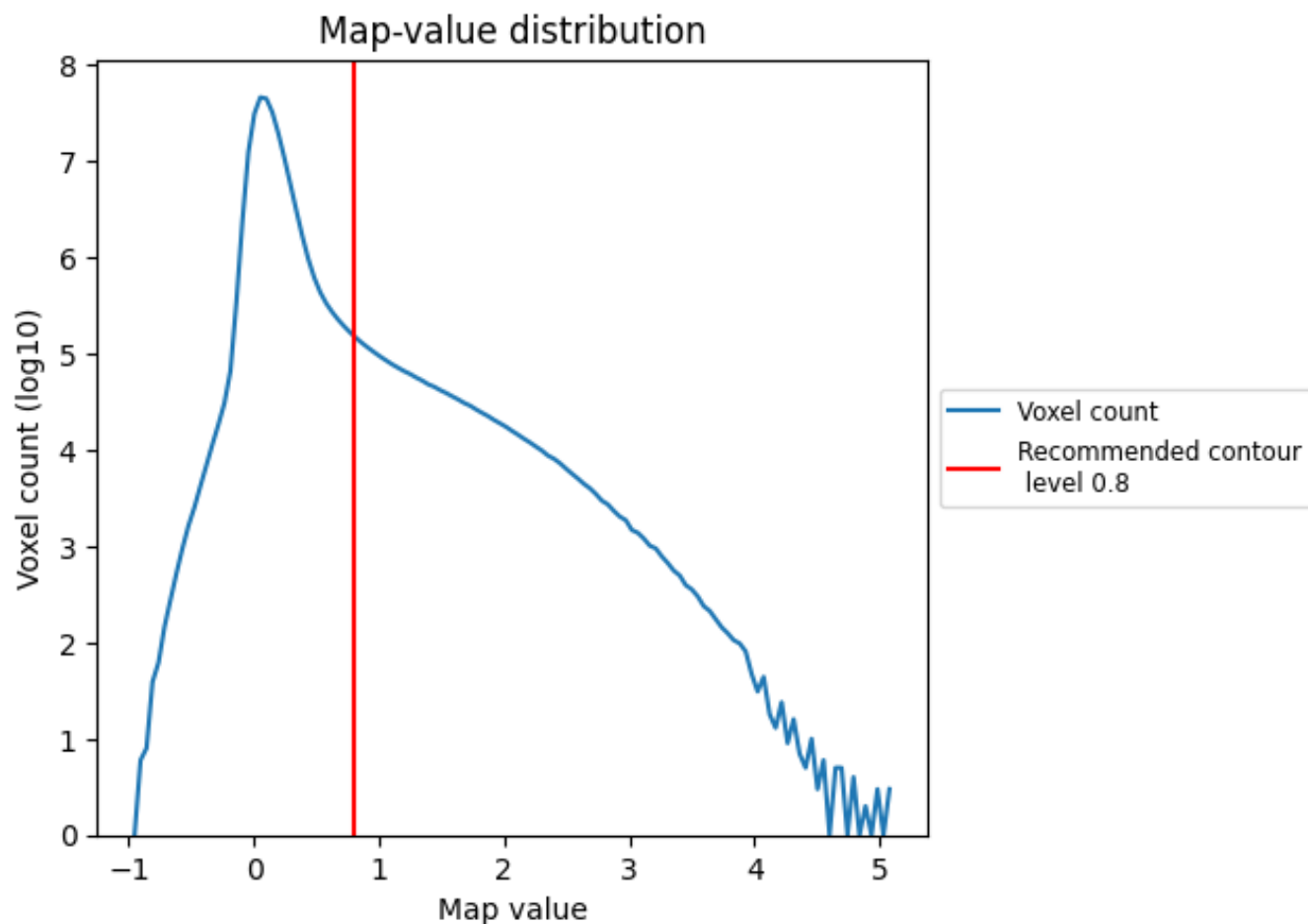
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

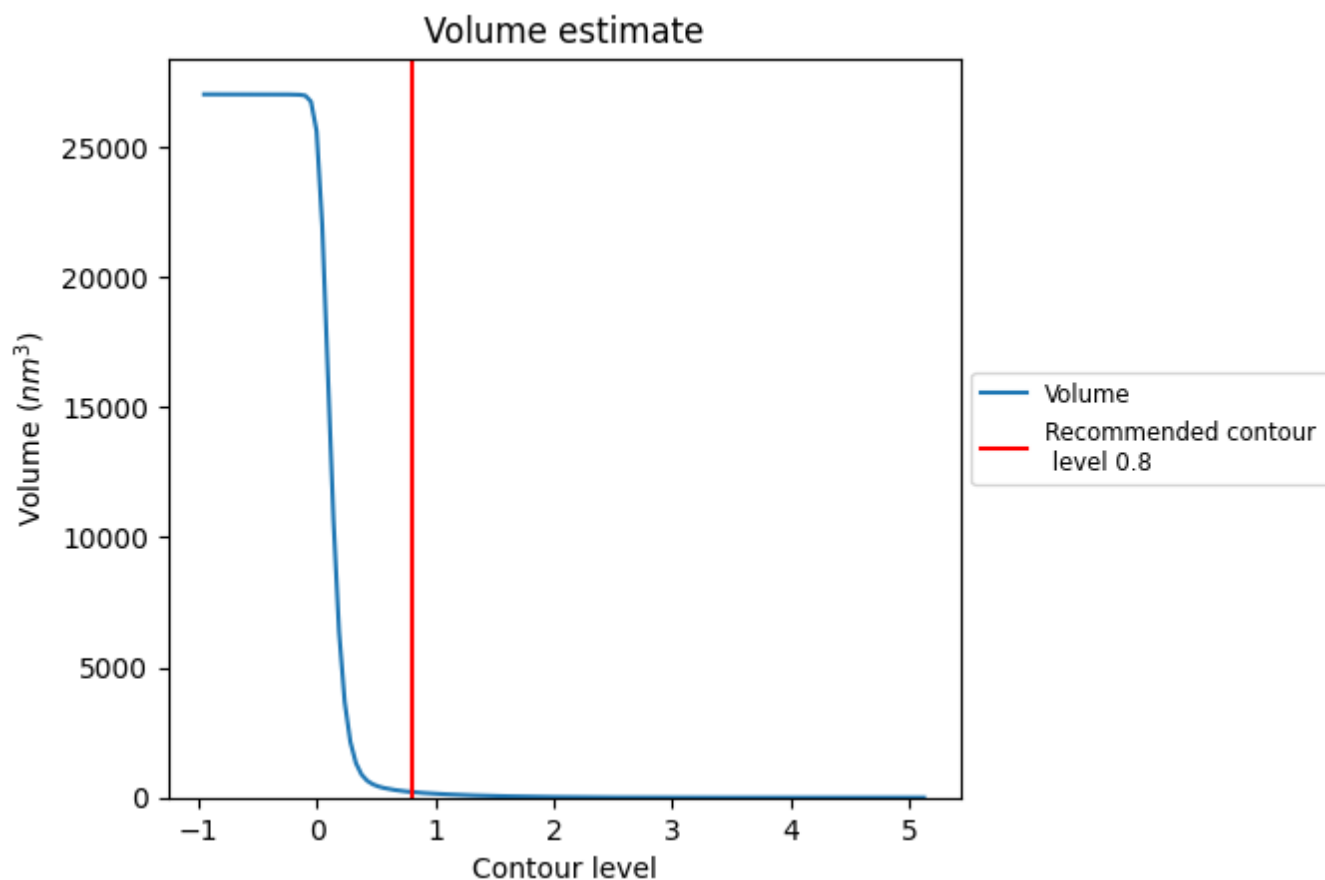
This section contains the results of statistical analysis of the map.

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



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

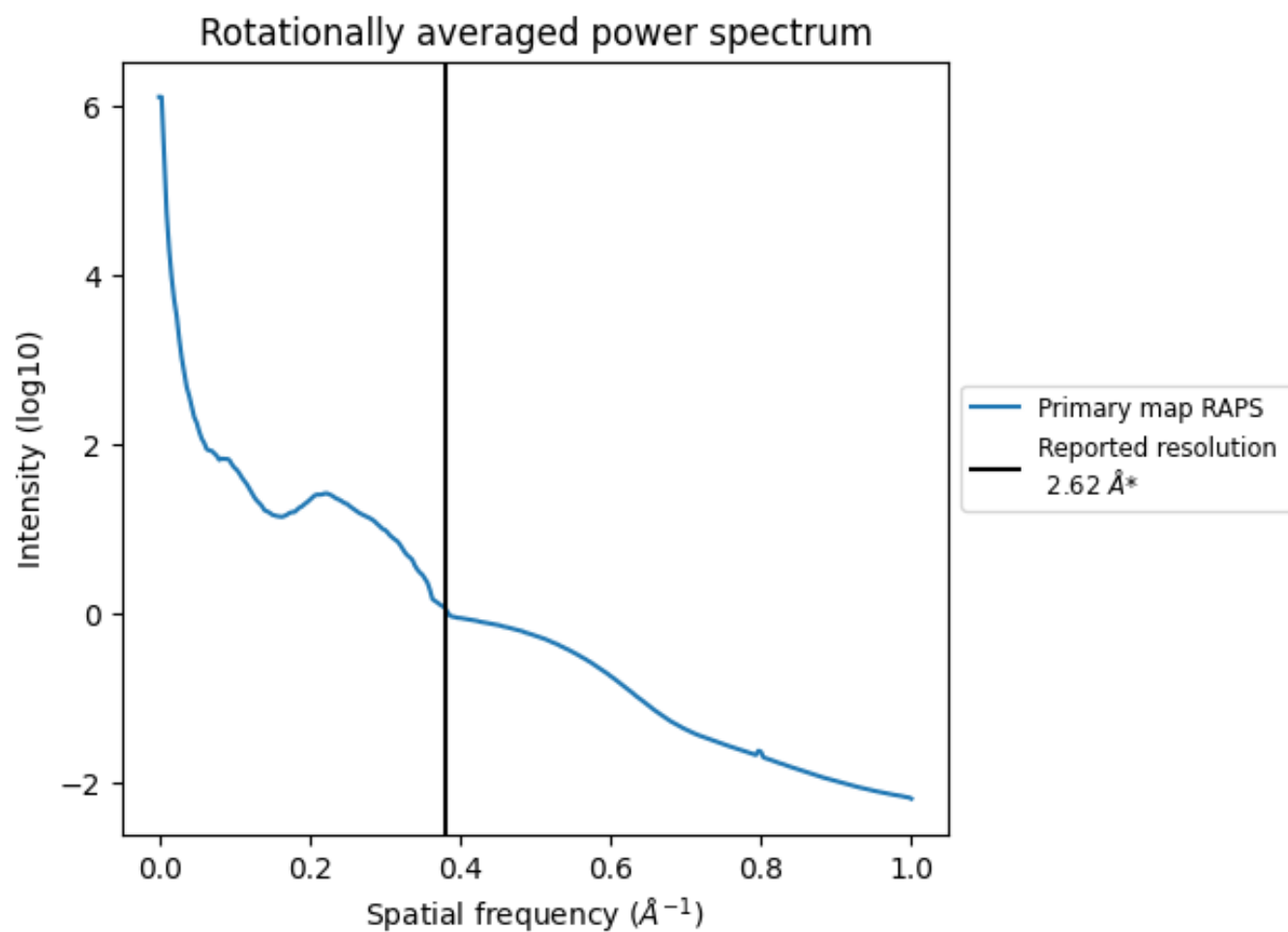
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 214 nm<sup>3</sup>; this corresponds to an approximate mass of 193 kDa.

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

### 7.3 Rotationally averaged power spectrum ⓘ



\*Reported resolution corresponds to spatial frequency of 0.382 Å<sup>-1</sup>

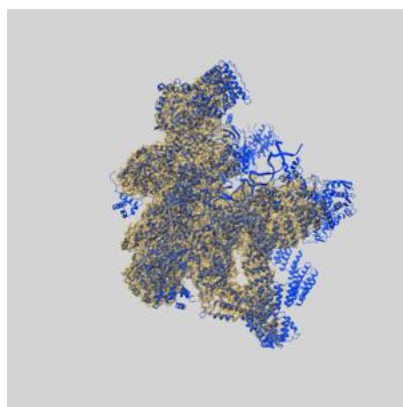
## 8 Fourier-Shell correlation

This section was not generated. No FSC curve or half-maps provided.

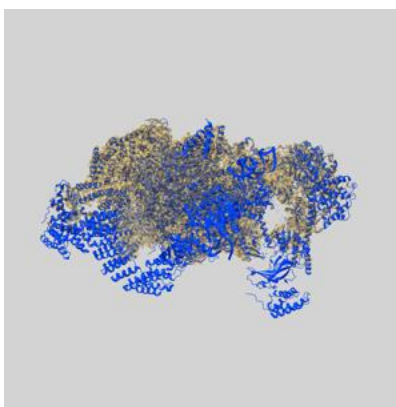
## 9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-19023 and PDB model 8RDJ. Per-residue inclusion information can be found in section [3](#) on page [10](#).

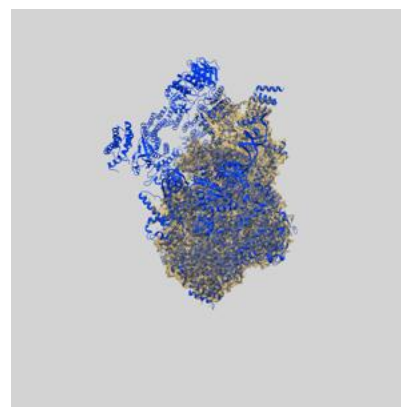
### 9.1 Map-model overlay [i](#)



X



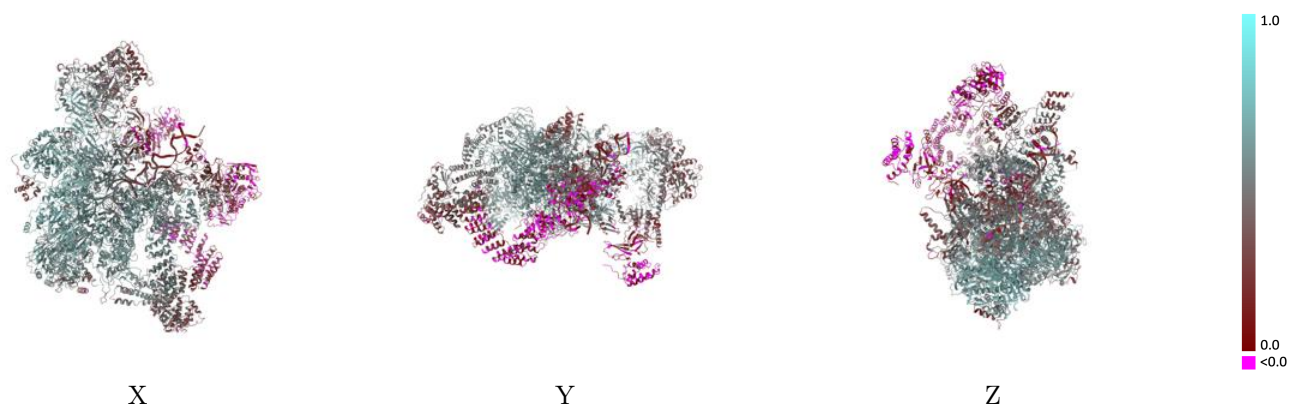
Y



Z

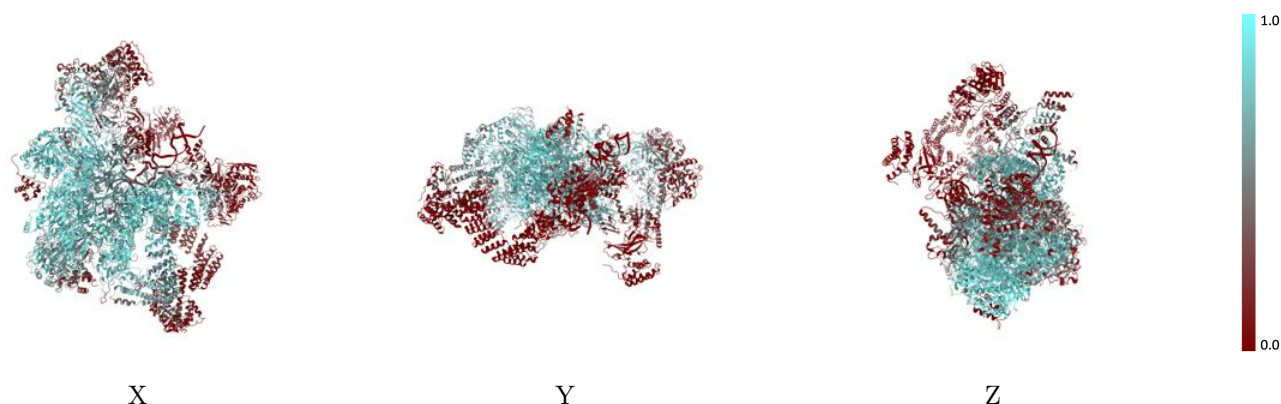
The images above show the 3D surface view of the map at the recommended contour level 0.8 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



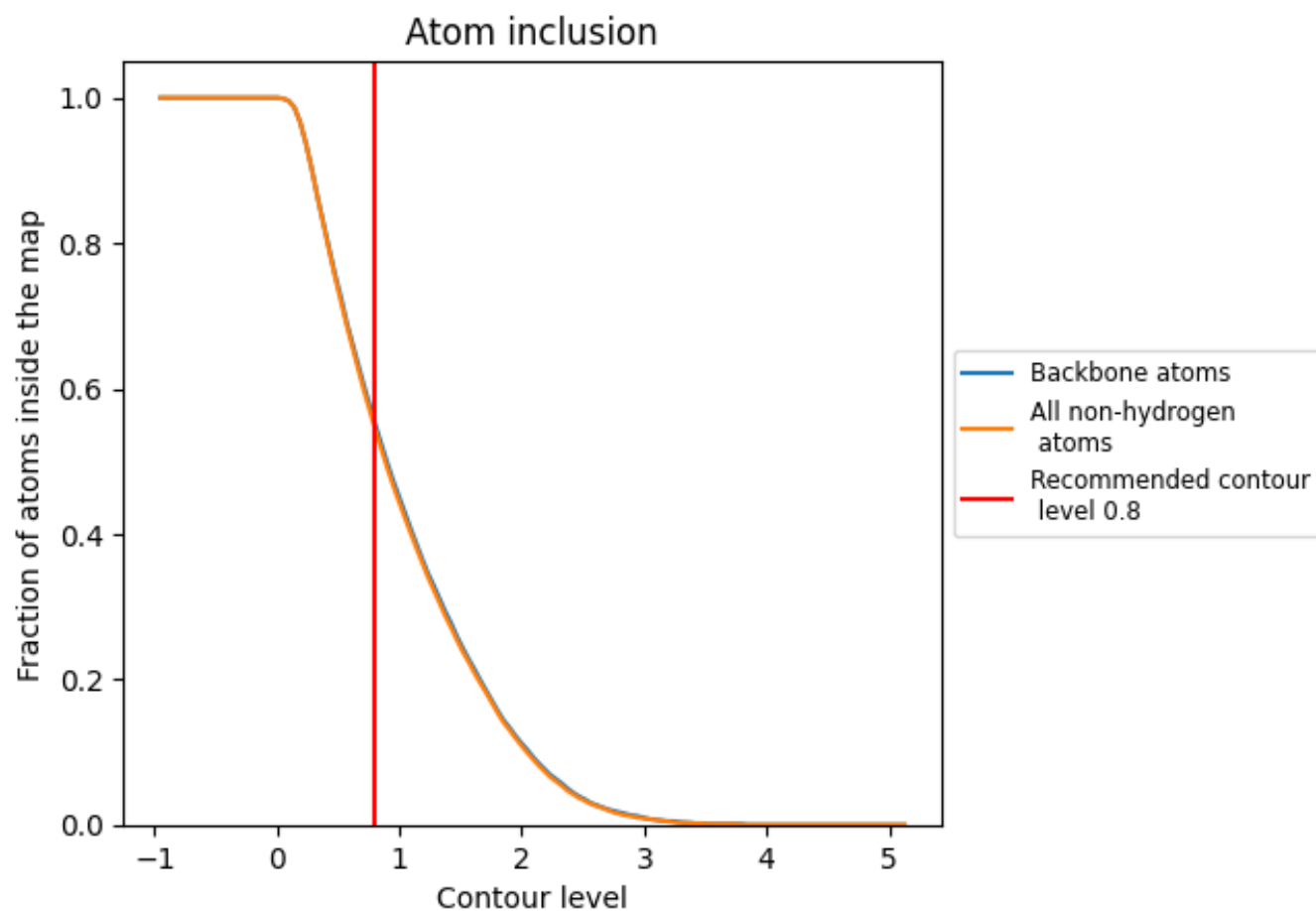
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.8).

## 9.4 Atom inclusion ⓘ



At the recommended contour level, 55% of all backbone atoms, 55% 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 (0.8) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion                                                                             | Q-score                                                                                     |
|-------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| All   |  0.5450   |  0.4680    |
| A     |  0.6670   |  0.5700    |
| B     |  0.5780   |  0.5310    |
| C     |  0.6660   |  0.5220    |
| D     |  0.7640   |  0.5570    |
| E     |  0.6020   |  0.4940    |
| F     |  0.6710   |  0.4890    |
| G     |  0.0740   |  0.2470    |
| H     |  0.4830   |  0.4760    |
| I     |  0.4460   |  0.4440    |
| J     |  0.8670   |  0.6370    |
| K     |  0.8720   |  0.6330    |
| L     |  0.7370   |  0.5480    |
| M     |  0.6850   |  0.5660    |
| N     |  0.1470  |  0.3720   |
| O     |  0.8620 |  0.6180  |
| P     |  0.5520 |  0.5450  |
| Q     |  0.0710 |  0.1330  |
| R     |  0.7050 |  0.5630  |
| S     |  0.7540 |  0.5930  |
| T     |  0.4670 |  0.4500  |
| U     |  0.0000 |  -0.0200 |
| X     |  0.1470 |  0.1820  |
| Y     |  0.3530 |  0.3440  |
| Z     |  0.4650 |  0.3220  |

