



## Full wwPDB EM Validation Report ⓘ

Sep 9, 2026 – 04:28 PM EDT

PDB ID : 9ZP9 / pdb\_00009zp9  
EMDB ID : EMD-74524  
Title : CryoEM structure of DNA-PK bound to N7 nucleosome, state 1  
Authors : Lu, W.; He, Y.  
Deposited on : 2025-12-16  
Resolution : 3.88 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:

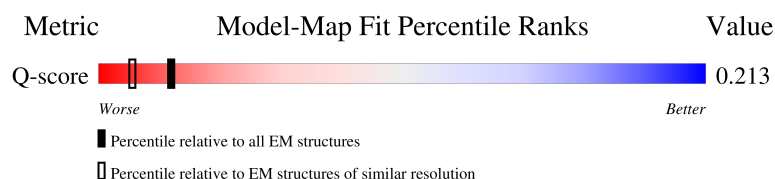
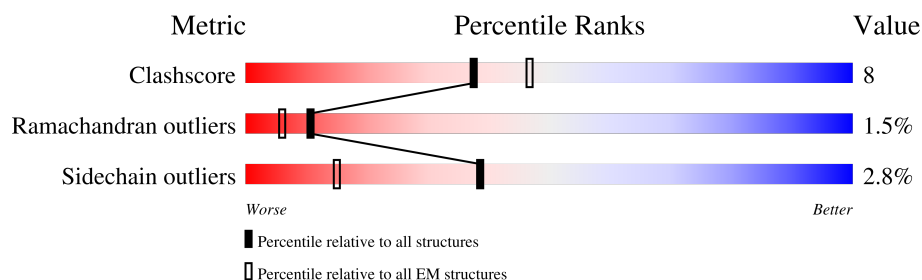
EMDB validation analysis : 0.0.1.dev133  
MolProbity : 4-5-2 with Phenix2.0  
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)  
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.50

# 1 Overall quality at a glance

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

The reported resolution of this entry is 3.88 Å.

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



| Metric                | Whole archive<br>(#Entries) | EM structures<br>(#Entries) | Similar EM resolution<br>(#Entries, resolution range(Å)) |
|-----------------------|-----------------------------|-----------------------------|----------------------------------------------------------|
| Clashscore            | 229148                      | 23984                       | -                                                        |
| Ramachandran outliers | 224038                      | 23583                       | -                                                        |
| Sidechain outliers    | 223484                      | 23102                       | -                                                        |
| Q-score               | -                           | 25397                       | 8773 ( 3.38 - 4.38 )                                     |

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     | 112    | <div> <div>11%</div> <div>54%</div> <div>38%</div> <div>6%</div> </div> |
| 1   | E     | 112    | <div> <div>9%</div> <div>56%</div> <div>24%</div> <div>20%</div> </div> |
| 2   | B     | 87     | <div> <div>14%</div> <div>52%</div> <div>43%</div> <div>5%</div> </div> |
| 2   | F     | 87     | <div> <div>7%</div> <div>68%</div> <div>31%</div> </div>                |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 3   | C     | 111    |                  |
| 3   | G     | 111    |                  |
| 4   | D     | 96     |                  |
| 4   | H     | 96     |                  |
| 5   | I     | 154    |                  |
| 6   | J     | 154    |                  |
| 7   | K     | 609    |                  |
| 8   | L     | 732    |                  |
| 9   | M     | 4128   |                  |
| 10  | N     | 20     |                  |

## 2 Entry composition

There are 10 unique types of molecules in this entry. The entry contains 98192 atoms, of which 48089 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 Histone H3.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 1   | A     | 112      | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1853  | 566 | 952 | 176 | 156 | 3 |         |       |
| 1   | E     | 90       | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1522  | 467 | 782 | 140 | 130 | 3 |         |       |

- Molecule 2 is a protein called Histone H4.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 2   | B     | 86       | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1453  | 440 | 755 | 141 | 116 | 1 |         |       |
| 2   | F     | 86       | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1438  | 436 | 744 | 140 | 117 | 1 |         |       |

- Molecule 3 is a protein called Histone H2A.

| Mol | Chain | Residues | Atoms |     |     |     |     |  | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|--|---------|-------|
| 3   | C     | 103      | Total | C   | H   | N   | O   |  | 0       | 0     |
|     |       |          | 1609  | 493 | 825 | 152 | 139 |  |         |       |
| 3   | G     | 111      | Total | C   | H   | N   | O   |  | 0       | 0     |
|     |       |          | 1783  | 539 | 925 | 169 | 150 |  |         |       |

There are 4 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment  | Reference      |
|-------|---------|----------|--------|----------|----------------|
| C     | 19      | SER      | THR    | conflict | UNP A0A974HJ06 |
| C     | 99      | ARG      | GLY    | conflict | UNP A0A974HJ06 |
| G     | 19      | SER      | THR    | conflict | UNP A0A974HJ06 |
| G     | 99      | ARG      | GLY    | conflict | UNP A0A974HJ06 |

- Molecule 4 is a protein called Histone H2B.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 4   | D     | 96       | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1547  | 475 | 789 | 140 | 141 | 2 |         |       |
| 4   | H     | 95       | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1521  | 469 | 774 | 136 | 140 | 2 |         |       |

- Molecule 5 is a DNA chain called DNA (154-MER).

| Mol | Chain | Residues | Atoms |      |      |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|-----|---------|-------|
| 5   | I     | 154      | Total | C    | H    | N   | O   | P   | 0       | 0     |
|     |       |          | 4904  | 1503 | 1730 | 591 | 926 | 154 |         |       |

- Molecule 6 is a DNA chain called DNA (154-MER).

| Mol | Chain | Residues | Atoms |      |      |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|-----|---------|-------|
| 6   | J     | 154      | Total | C    | H    | N   | O   | P   | 0       | 0     |
|     |       |          | 4866  | 1491 | 1729 | 573 | 920 | 153 |         |       |

- Molecule 7 is a protein called X-ray repair cross-complementing protein 6.

| Mol | Chain | Residues | Atoms |      |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|----|---------|-------|
| 7   | K     | 490      | Total | C    | H    | N   | O   | S  | 0       | 0     |
|     |       |          | 7999  | 2533 | 4045 | 671 | 733 | 17 |         |       |

- Molecule 8 is a protein called X-ray repair cross-complementing protein 5.

| Mol | Chain | Residues | Atoms |      |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|----|---------|-------|
| 8   | L     | 535      | Total | C    | H    | N   | O   | S  | 0       | 0     |
|     |       |          | 8580  | 2736 | 4307 | 713 | 800 | 24 |         |       |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment  | Reference  |
|-------|---------|----------|--------|----------|------------|
| L     | 663     | GLN      | ARG    | conflict | UNP G3R763 |

- Molecule 9 is a protein called DNA-dependent protein kinase catalytic subunit.

| Mol | Chain | Residues | Atoms |       |       |      |      |     | AltConf | Trace |
|-----|-------|----------|-------|-------|-------|------|------|-----|---------|-------|
| 9   | M     | 3662     | Total | C     | H     | N    | O    | S   | 0       | 0     |
|     |       |          | 58976 | 18776 | 29692 | 4946 | 5370 | 192 |         |       |

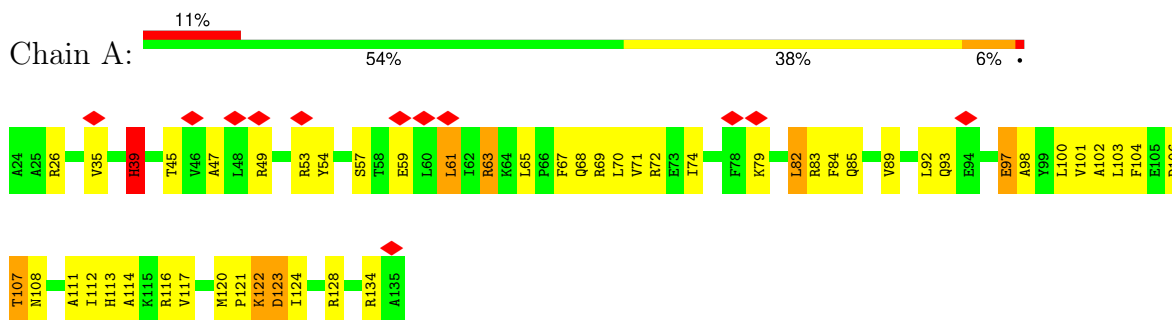
- Molecule 10 is a protein called Unknown peptide.

| Mol | Chain | Residues | Atoms |    |    |    |    | AltConf | Trace |
|-----|-------|----------|-------|----|----|----|----|---------|-------|
|     |       |          | Total | C  | H  | N  | O  |         |       |
| 10  | N     | 20       | 141   | 60 | 40 | 20 | 21 | 0       | 0     |

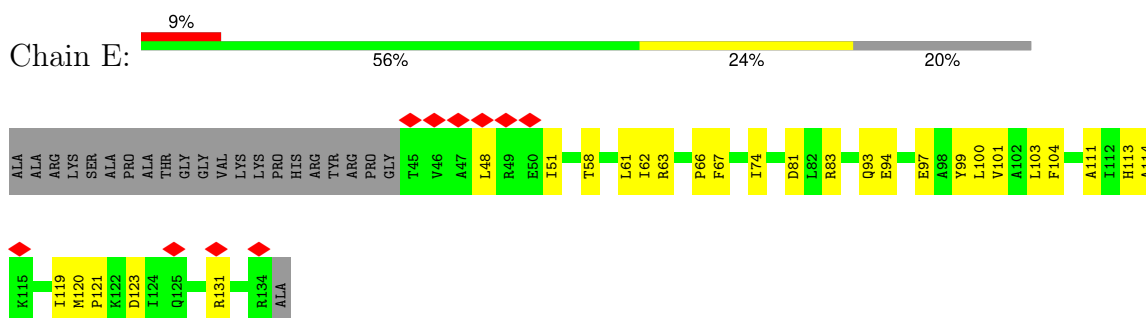
### 3 Residue-property plots

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.

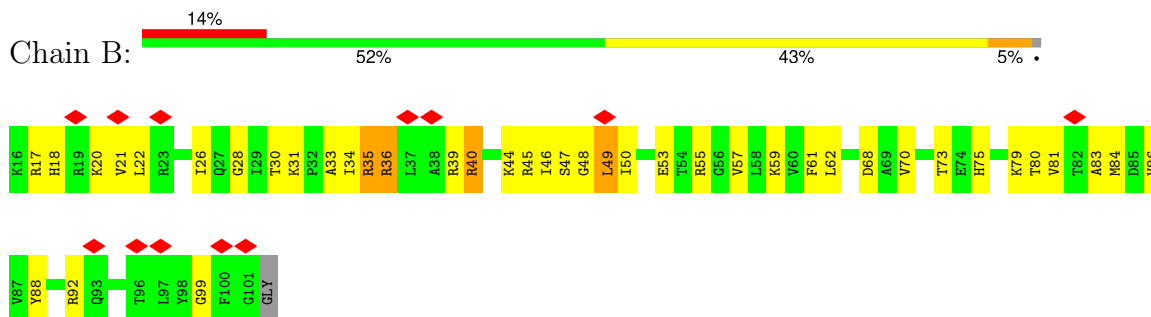
#### • Molecule 1: Histone H3



#### • Molecule 1: Histone H3



#### • Molecule 2: Histone H4

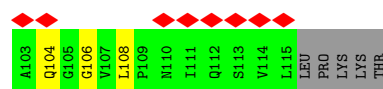
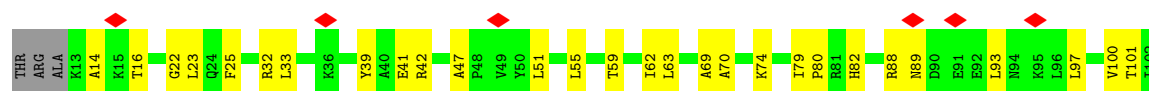


#### • Molecule 2: Histone H4

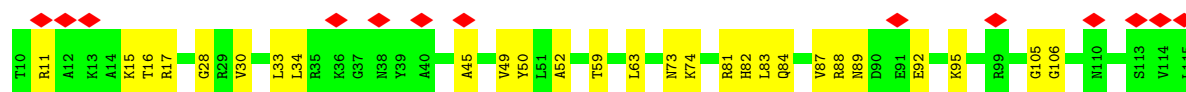
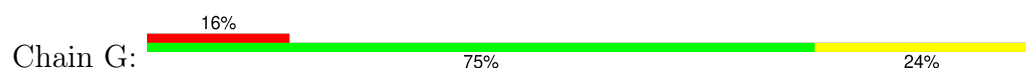




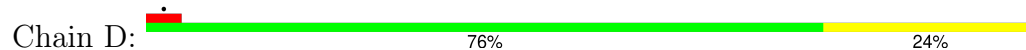
• Molecule 3: Histone H2A



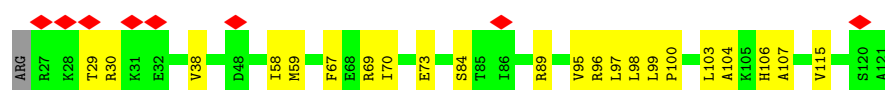
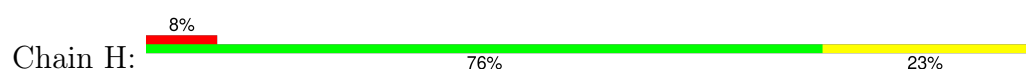
• Molecule 3: Histone H2A



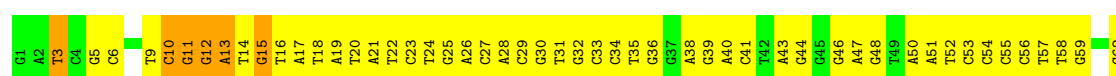
• Molecule 4: Histone H2B



• Molecule 4: Histone H2B

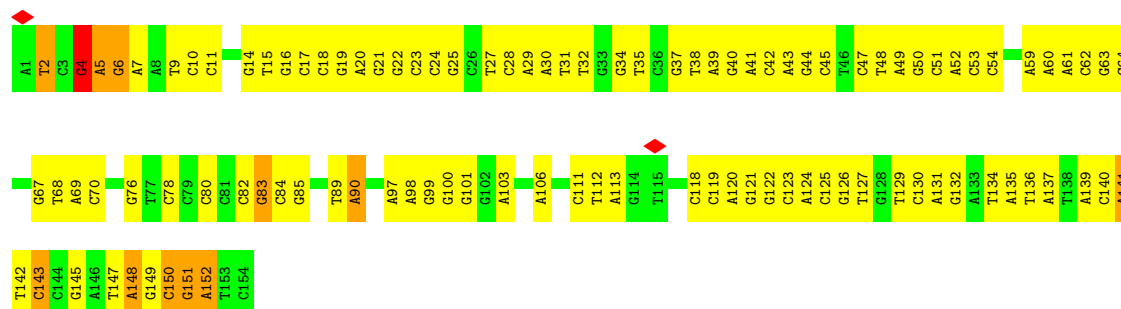


• Molecule 5: DNA (154-MER)

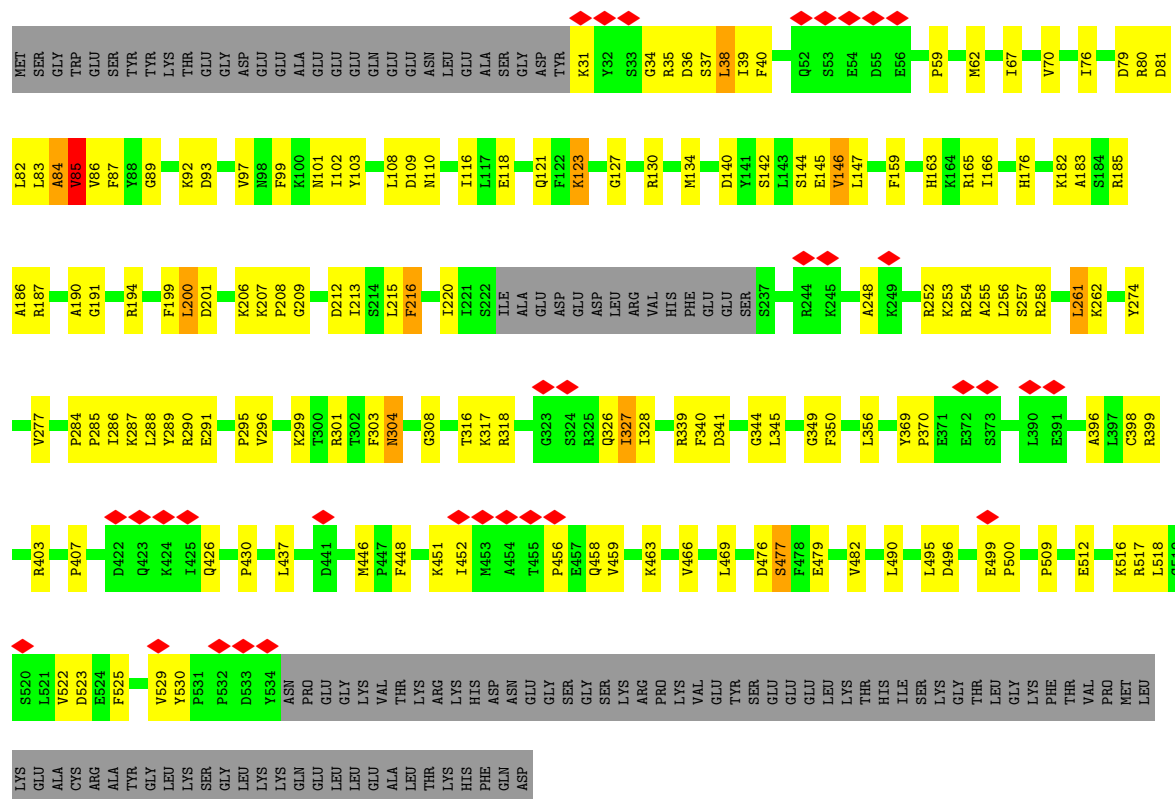




• Molecule 6: DNA (154-MER)

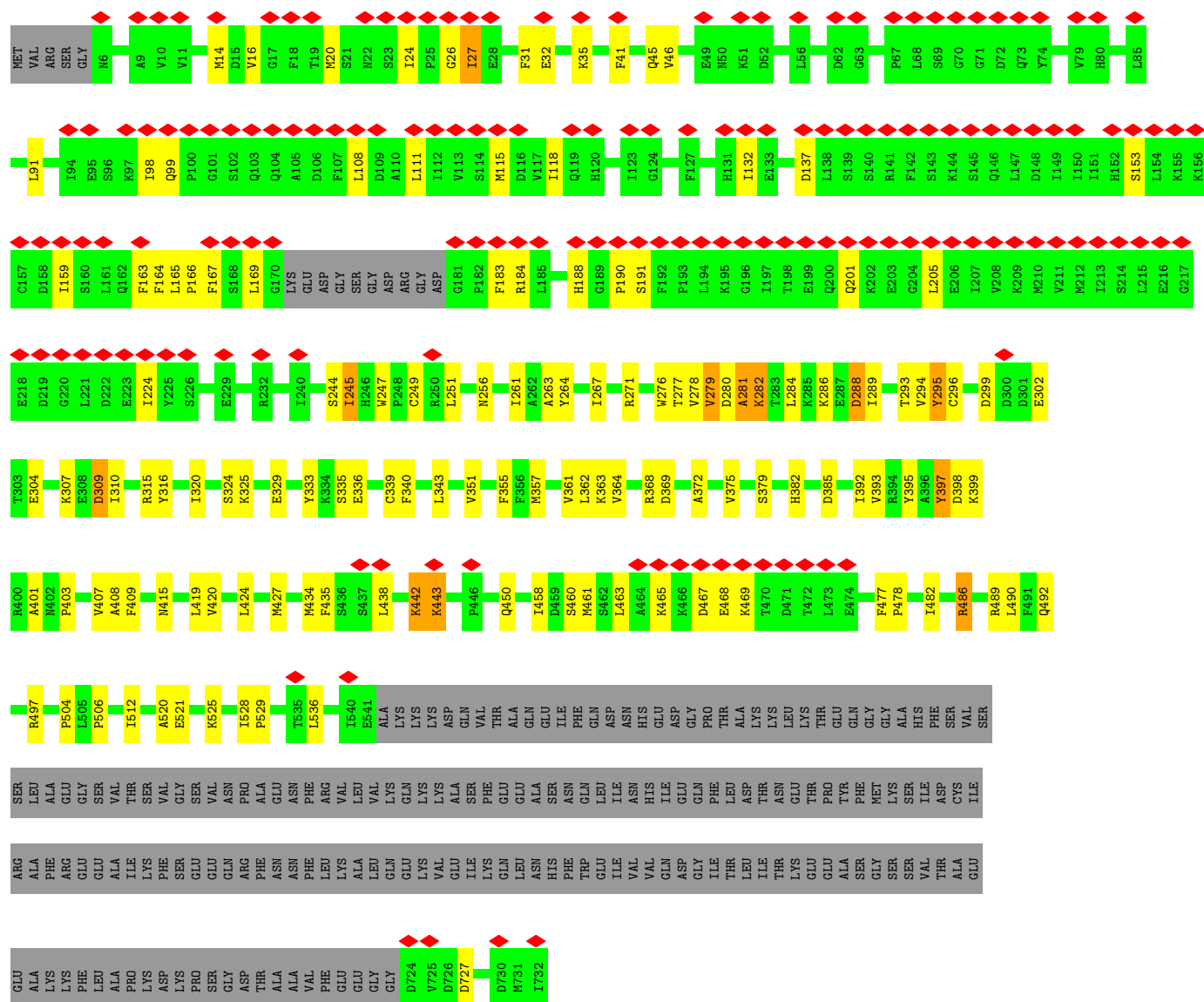


• Molecule 7: X-ray repair cross-complementing protein 6

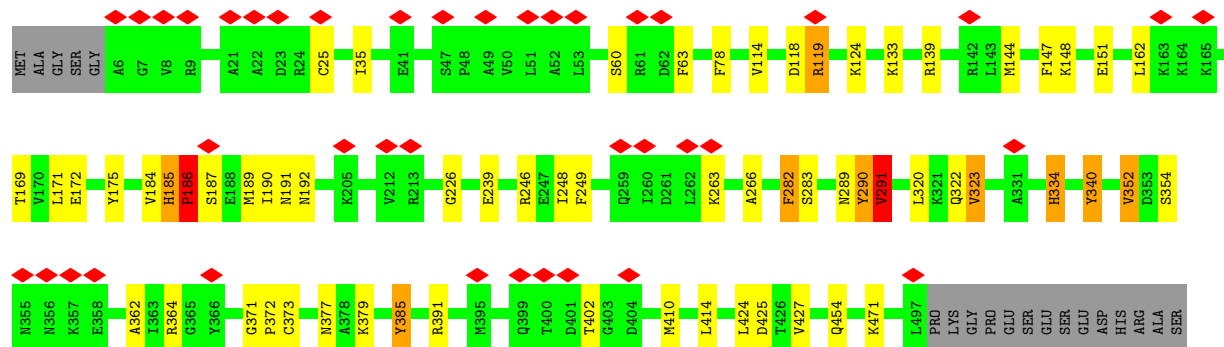
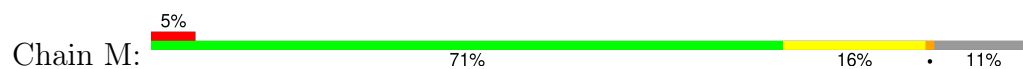


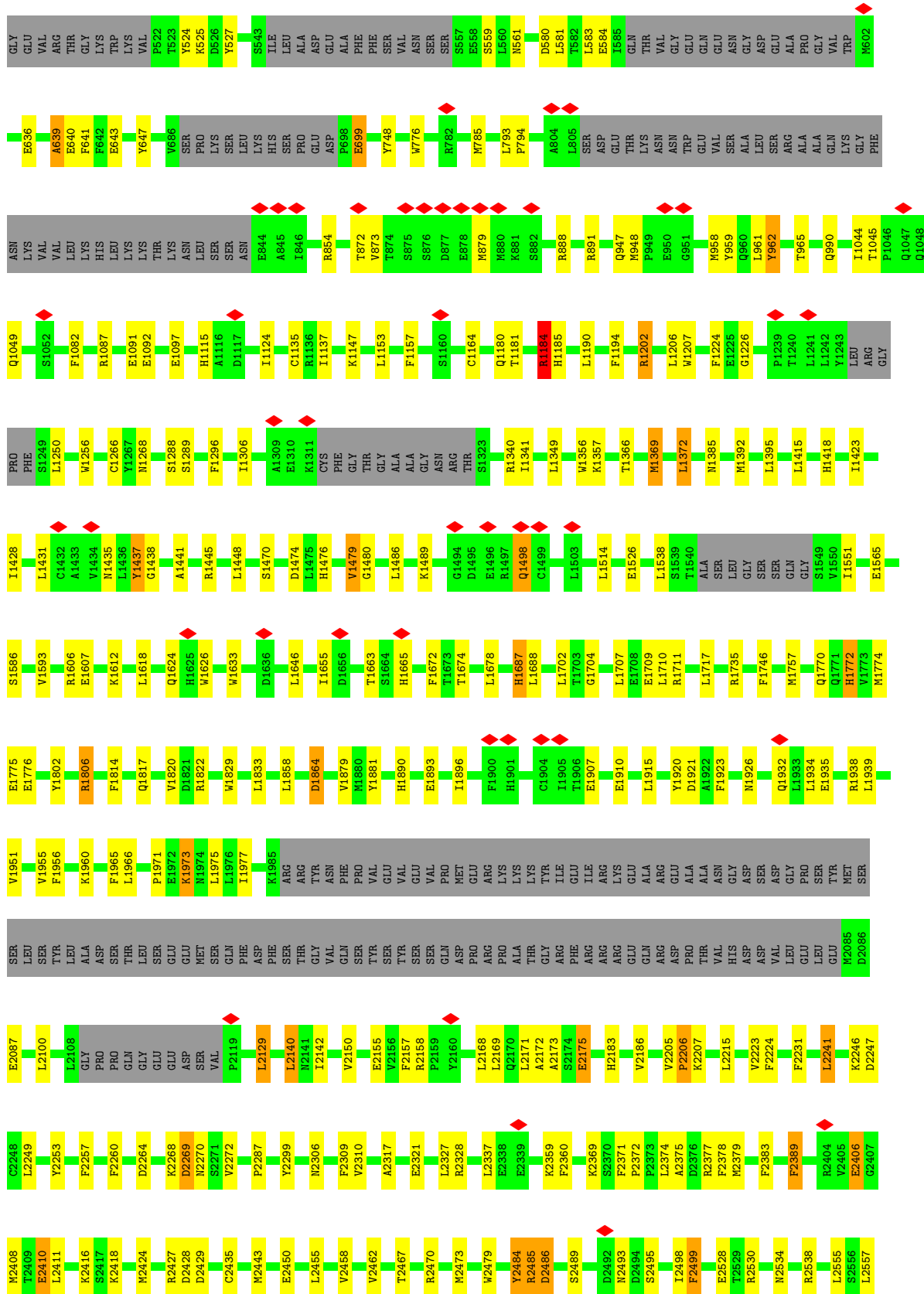
• Molecule 8: X-ray repair cross-complementing protein 5

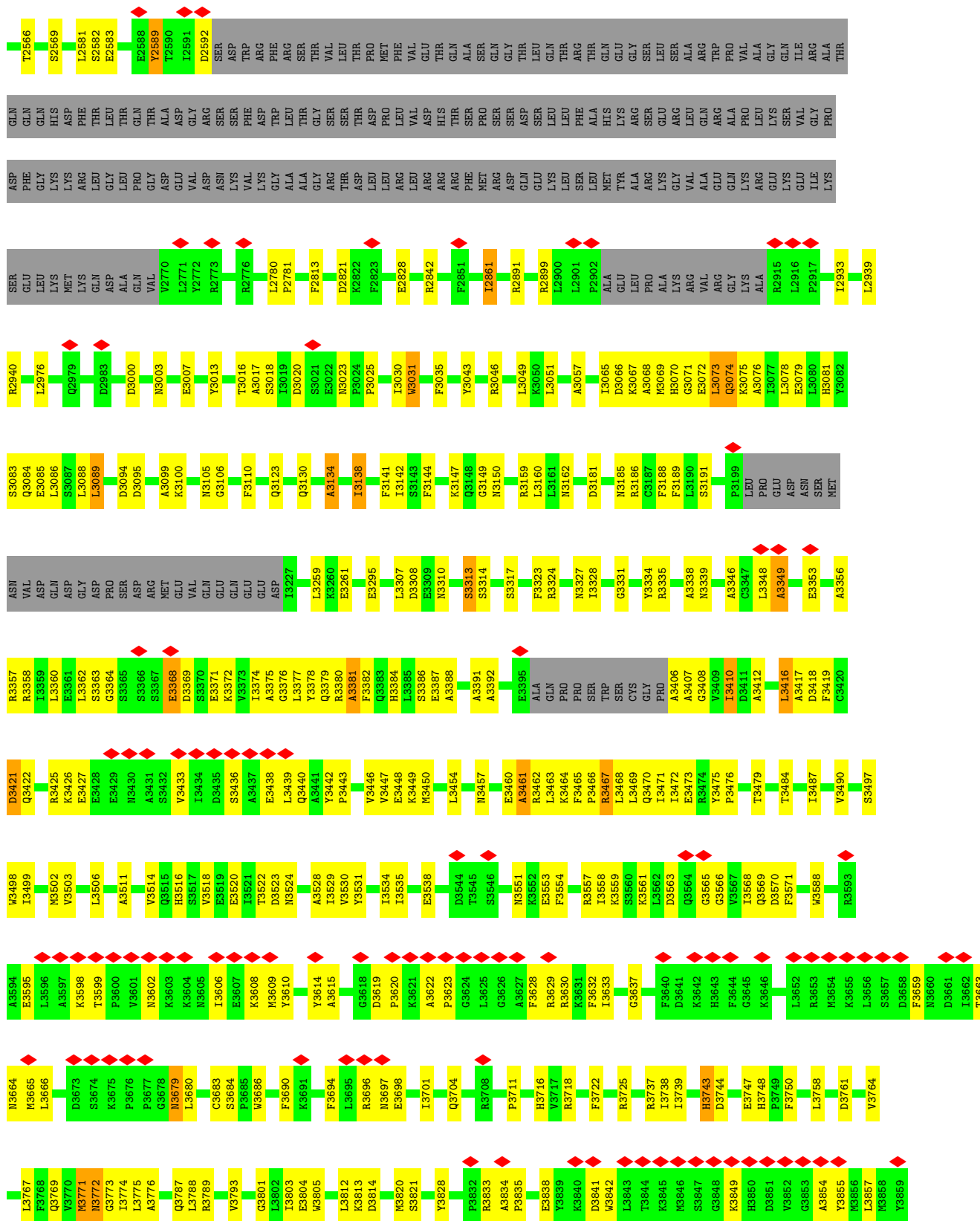


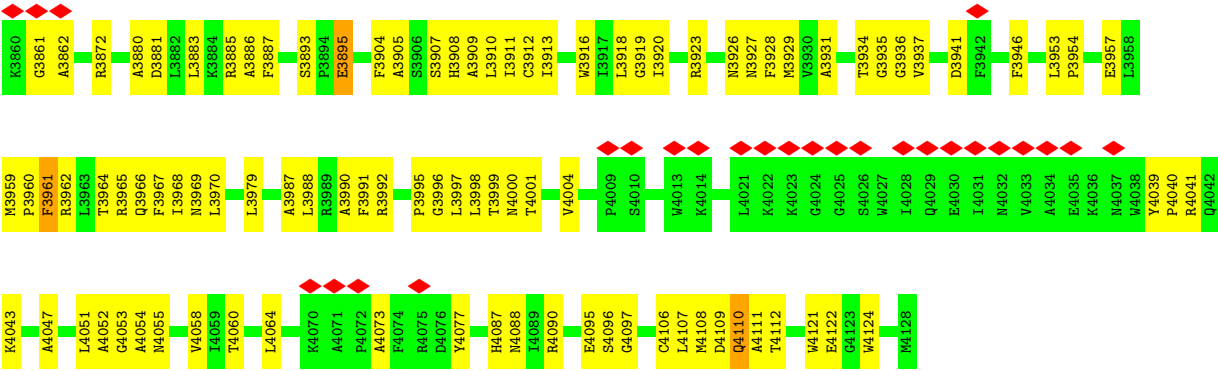


• Molecule 9: DNA-dependent protein kinase catalytic subunit









● Molecule 10: Unknown peptide



## 4 Experimental information

| Property                             | Value                   | Source    |
|--------------------------------------|-------------------------|-----------|
| EM reconstruction method             | SINGLE PARTICLE         | Depositor |
| Imposed symmetry                     | POINT, Not provided     |           |
| Number of particles used             | 220128                  | Depositor |
| Resolution determination method      | FSC 0.143 CUT-OFF       | Depositor |
| CTF correction method                | PHASE FLIPPING ONLY     | Depositor |
| Microscope                           | TFS KRIOS               | Depositor |
| Voltage (kV)                         | 300                     | Depositor |
| Electron dose ( $e^-/\text{\AA}^2$ ) | 60                      | Depositor |
| Minimum defocus (nm)                 | 2000                    | Depositor |
| Maximum defocus (nm)                 | 4000                    | Depositor |
| Magnification                        | Not provided            |           |
| Image detector                       | FEI FALCON IV (4k x 4k) | Depositor |
| Maximum map value                    | 0.788                   | Depositor |
| Minimum map value                    | -0.099                  | Depositor |
| Average map value                    | 0.003                   | Depositor |
| Map value standard deviation         | 0.029                   | Depositor |
| Recommended contour level            | 0.2                     | Depositor |
| Map size ( $\text{\AA}$ )            | 446.4, 446.4, 446.4     | wwPDB     |
| Map dimensions                       | 240, 240, 240           | wwPDB     |
| Map angles ( $^\circ$ )              | 90.0, 90.0, 90.0        | wwPDB     |
| Pixel spacing ( $\text{\AA}$ )       | 1.86, 1.86, 1.86        | Depositor |

## 5 Model quality

### 5.1 Standard geometry

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     | 1.67         | 8/914 (0.9%)     | 1.86        | 36/1225 (2.9%)   |
| 1   | E     | 0.18         | 0/748            | 0.53        | 0/1003           |
| 2   | B     | 1.42         | 9/706 (1.3%)     | 1.45        | 19/943 (2.0%)    |
| 2   | F     | 0.22         | 0/702            | 0.60        | 0/937            |
| 3   | C     | 0.19         | 0/793            | 0.55        | 0/1072           |
| 3   | G     | 1.41         | 10/868 (1.2%)    | 1.32        | 19/1169 (1.6%)   |
| 4   | D     | 0.19         | 0/769            | 0.51        | 0/1032           |
| 4   | H     | 0.18         | 0/758            | 0.49        | 0/1018           |
| 5   | I     | 0.80         | 14/3563 (0.4%)   | 0.98        | 5/5502 (0.1%)    |
| 6   | J     | 0.78         | 14/3516 (0.4%)   | 0.94        | 3/5420 (0.1%)    |
| 7   | K     | 1.56         | 50/4031 (1.2%)   | 1.53        | 117/5429 (2.2%)  |
| 8   | L     | 0.90         | 15/4359 (0.3%)   | 0.97        | 38/5881 (0.6%)   |
| 9   | M     | 1.16         | 121/29884 (0.4%) | 1.49        | 375/40387 (0.9%) |
| All | All   | 1.11         | 241/51611 (0.5%) | 1.34        | 612/71018 (0.9%) |

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

| Mol | Chain | #Chirality outliers | #Planarity outliers |
|-----|-------|---------------------|---------------------|
| 1   | A     | 0                   | 1                   |
| 5   | I     | 0                   | 7                   |
| 6   | J     | 0                   | 8                   |
| 7   | K     | 0                   | 2                   |
| 8   | L     | 0                   | 1                   |
| 9   | M     | 0                   | 22                  |
| All | All   | 0                   | 41                  |

All (241) bond length outliers are listed below:

| Mol | Chain | Res  | Type | Atoms | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|-------|-------|-------------|----------|
| 9   | M     | 3349 | ALA  | CA-CB | -9.93 | 1.42        | 1.54     |

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| Mol | Chain | Res  | Type | Atoms   | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|---------|-------|-------------|----------|
| 3   | G     | 82   | HIS  | CE1-NE2 | -8.92 | 1.23        | 1.32     |
| 9   | M     | 3908 | HIS  | CE1-NE2 | -8.88 | 1.23        | 1.32     |
| 7   | K     | 163  | HIS  | ND1-CE1 | -8.81 | 1.23        | 1.32     |
| 9   | M     | 3384 | HIS  | CE1-NE2 | -8.78 | 1.23        | 1.32     |
| 7   | K     | 176  | HIS  | CE1-NE2 | -8.73 | 1.23        | 1.32     |
| 9   | M     | 3716 | HIS  | CE1-NE2 | -8.73 | 1.23        | 1.32     |
| 9   | M     | 3070 | HIS  | CE1-NE2 | -8.71 | 1.23        | 1.32     |
| 9   | M     | 3516 | HIS  | CE1-NE2 | -8.72 | 1.23        | 1.32     |
| 9   | M     | 3748 | HIS  | CE1-NE2 | -8.70 | 1.23        | 1.32     |
| 7   | K     | 258  | ARG  | CZ-NH2  | -8.68 | 1.22        | 1.33     |
| 9   | M     | 3081 | HIS  | CE1-NE2 | -8.64 | 1.24        | 1.32     |
| 1   | A     | 63   | ARG  | CZ-NH2  | -8.56 | 1.22        | 1.33     |
| 9   | M     | 3557 | ARG  | CZ-NH2  | -8.50 | 1.22        | 1.33     |
| 7   | K     | 254  | ARG  | CZ-NH2  | -8.46 | 1.22        | 1.33     |
| 9   | M     | 3718 | ARG  | CZ-NH2  | -8.45 | 1.22        | 1.33     |
| 7   | K     | 399  | ARG  | CZ-NH2  | -8.44 | 1.22        | 1.33     |
| 9   | M     | 3992 | ARG  | CZ-NH2  | -8.44 | 1.22        | 1.33     |
| 9   | M     | 3629 | ARG  | CZ-NH2  | -8.42 | 1.22        | 1.33     |
| 9   | M     | 3046 | ARG  | CZ-NH2  | -8.41 | 1.22        | 1.33     |
| 9   | M     | 3872 | ARG  | CZ-NH2  | -8.40 | 1.22        | 1.33     |
| 7   | K     | 35   | ARG  | CZ-NH2  | -8.40 | 1.22        | 1.33     |
| 8   | L     | 486  | ARG  | CZ-NH2  | -8.40 | 1.22        | 1.33     |
| 9   | M     | 3965 | ARG  | CZ-NH2  | -8.39 | 1.22        | 1.33     |
| 7   | K     | 194  | ARG  | CZ-NH2  | -8.37 | 1.22        | 1.33     |
| 9   | M     | 3725 | ARG  | CZ-NH2  | -8.36 | 1.22        | 1.33     |
| 3   | G     | 81   | ARG  | CZ-NH2  | -8.36 | 1.22        | 1.33     |
| 3   | G     | 88   | ARG  | CZ-NH2  | -8.36 | 1.22        | 1.33     |
| 9   | M     | 4090 | ARG  | CZ-NH2  | -8.36 | 1.22        | 1.33     |
| 9   | M     | 3885 | ARG  | CZ-NH2  | -8.34 | 1.22        | 1.33     |
| 9   | M     | 3159 | ARG  | CZ-NH2  | -8.33 | 1.22        | 1.33     |
| 8   | L     | 497  | ARG  | CZ-NH2  | -8.33 | 1.22        | 1.33     |
| 9   | M     | 3324 | ARG  | CZ-NH2  | -8.32 | 1.22        | 1.33     |
| 7   | K     | 318  | ARG  | CZ-NH2  | -8.32 | 1.22        | 1.33     |
| 9   | M     | 3630 | ARG  | CZ-NH2  | -8.32 | 1.22        | 1.33     |
| 7   | K     | 187  | ARG  | CZ-NH2  | -8.31 | 1.22        | 1.33     |
| 9   | M     | 3737 | ARG  | CZ-NH2  | -8.31 | 1.22        | 1.33     |
| 9   | M     | 3335 | ARG  | CZ-NH2  | -8.31 | 1.22        | 1.33     |
| 1   | A     | 116  | ARG  | CZ-NH2  | -8.30 | 1.22        | 1.33     |
| 9   | M     | 3467 | ARG  | CZ-NH2  | -8.31 | 1.22        | 1.33     |
| 2   | B     | 45   | ARG  | CZ-NH2  | -8.30 | 1.22        | 1.33     |
| 7   | K     | 185  | ARG  | CZ-NH2  | -8.30 | 1.22        | 1.33     |
| 9   | M     | 3357 | ARG  | CZ-NH2  | -8.29 | 1.22        | 1.33     |

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| Mol | Chain | Res  | Type | Atoms   | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|---------|-------|-------------|----------|
| 9   | M     | 3789 | ARG  | CZ-NH2  | -8.30 | 1.22        | 1.33     |
| 8   | L     | 489  | ARG  | CZ-NH2  | -8.29 | 1.22        | 1.33     |
| 7   | K     | 252  | ARG  | CZ-NH2  | -8.29 | 1.22        | 1.33     |
| 7   | K     | 80   | ARG  | CZ-NH2  | -8.28 | 1.22        | 1.33     |
| 7   | K     | 165  | ARG  | CZ-NH2  | -8.27 | 1.22        | 1.33     |
| 8   | L     | 315  | ARG  | CZ-NH2  | -8.27 | 1.22        | 1.33     |
| 7   | K     | 403  | ARG  | CZ-NH2  | -8.26 | 1.22        | 1.33     |
| 9   | M     | 3380 | ARG  | CZ-NH2  | -8.25 | 1.22        | 1.33     |
| 9   | M     | 3716 | HIS  | CD2-NE2 | -8.19 | 1.28        | 1.37     |
| 2   | B     | 35   | ARG  | CZ-NH2  | -8.18 | 1.22        | 1.33     |
| 3   | G     | 82   | HIS  | CD2-NE2 | -8.13 | 1.28        | 1.37     |
| 9   | M     | 3070 | HIS  | CD2-NE2 | -8.09 | 1.28        | 1.37     |
| 9   | M     | 3081 | HIS  | CD2-NE2 | -8.08 | 1.28        | 1.37     |
| 9   | M     | 3516 | HIS  | CD2-NE2 | -8.07 | 1.28        | 1.37     |
| 9   | M     | 3748 | HIS  | CD2-NE2 | -8.06 | 1.28        | 1.37     |
| 9   | M     | 3384 | HIS  | CD2-NE2 | -8.04 | 1.29        | 1.37     |
| 9   | M     | 3908 | HIS  | CD2-NE2 | -8.02 | 1.29        | 1.37     |
| 7   | K     | 176  | HIS  | CD2-NE2 | -7.96 | 1.29        | 1.37     |
| 9   | M     | 4111 | ALA  | CA-CB   | -7.29 | 1.42        | 1.53     |
| 7   | K     | 186  | ALA  | CA-CB   | -7.20 | 1.42        | 1.53     |
| 9   | M     | 3099 | ALA  | CA-CB   | -7.19 | 1.42        | 1.53     |
| 2   | B     | 35   | ARG  | CZ-NH1  | -7.17 | 1.22        | 1.32     |
| 9   | M     | 3909 | ALA  | CA-CB   | -7.17 | 1.42        | 1.53     |
| 9   | M     | 3381 | ALA  | CA-CB   | -7.15 | 1.42        | 1.53     |
| 9   | M     | 3905 | ALA  | CA-CB   | -7.15 | 1.42        | 1.53     |
| 9   | M     | 3068 | ALA  | CA-CB   | -7.14 | 1.42        | 1.53     |
| 9   | M     | 3886 | ALA  | CA-CB   | -7.14 | 1.42        | 1.53     |
| 9   | M     | 3990 | ALA  | CA-CB   | -7.12 | 1.42        | 1.53     |
| 7   | K     | 190  | ALA  | CA-CB   | -7.11 | 1.42        | 1.53     |
| 9   | M     | 3338 | ALA  | CA-CB   | -7.10 | 1.42        | 1.53     |
| 9   | M     | 3388 | ALA  | CA-CB   | -7.10 | 1.42        | 1.53     |
| 1   | A     | 102  | ALA  | CA-CB   | -7.10 | 1.42        | 1.53     |
| 9   | M     | 3987 | ALA  | CA-CB   | -7.09 | 1.42        | 1.53     |
| 1   | A     | 98   | ALA  | CA-CB   | -7.09 | 1.42        | 1.53     |
| 7   | K     | 183  | ALA  | CA-CB   | -7.08 | 1.42        | 1.53     |
| 9   | M     | 3773 | GLY  | N-CA    | -7.04 | 1.37        | 1.45     |
| 9   | M     | 3375 | ALA  | CA-CB   | -7.04 | 1.42        | 1.53     |
| 9   | M     | 3391 | ALA  | CA-CB   | -7.03 | 1.42        | 1.53     |
| 2   | B     | 33   | ALA  | CA-CB   | -7.03 | 1.42        | 1.53     |
| 9   | M     | 3017 | ALA  | CA-CB   | -7.02 | 1.42        | 1.53     |
| 1   | A     | 111  | ALA  | CA-CB   | -7.01 | 1.42        | 1.53     |
| 9   | M     | 3076 | ALA  | CA-CB   | -7.01 | 1.42        | 1.53     |

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| Mol | Chain | Res  | Type | Atoms  | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|--------|-------|-------------|----------|
| 9   | M     | 3134 | ALA  | CA-CB  | -7.00 | 1.42        | 1.53     |
| 9   | M     | 3392 | ALA  | CA-CB  | -6.97 | 1.42        | 1.53     |
| 9   | M     | 3931 | ALA  | CA-CB  | -6.97 | 1.41        | 1.53     |
| 9   | M     | 3356 | ALA  | CA-CB  | -6.96 | 1.42        | 1.53     |
| 9   | M     | 3412 | ALA  | CA-CB  | -6.93 | 1.42        | 1.53     |
| 9   | M     | 4090 | ARG  | CZ-NH1 | -6.92 | 1.23        | 1.32     |
| 9   | M     | 3880 | ALA  | CA-CB  | -6.92 | 1.42        | 1.53     |
| 7   | K     | 344  | GLY  | N-CA   | -6.91 | 1.38        | 1.45     |
| 7   | K     | 254  | ARG  | CZ-NH1 | -6.91 | 1.23        | 1.32     |
| 9   | M     | 3407 | ALA  | CA-CB  | -6.91 | 1.42        | 1.53     |
| 9   | M     | 3046 | ARG  | CZ-NH1 | -6.84 | 1.23        | 1.32     |
| 9   | M     | 3776 | ALA  | CA-CB  | -6.81 | 1.42        | 1.53     |
| 1   | A     | 63   | ARG  | CZ-NH1 | -6.81 | 1.23        | 1.32     |
| 9   | M     | 3965 | ARG  | CZ-NH1 | -6.81 | 1.23        | 1.32     |
| 9   | M     | 3737 | ARG  | CZ-NH1 | -6.80 | 1.23        | 1.32     |
| 8   | L     | 497  | ARG  | CZ-NH1 | -6.80 | 1.23        | 1.32     |
| 9   | M     | 3872 | ARG  | CZ-NH1 | -6.79 | 1.23        | 1.32     |
| 7   | K     | 258  | ARG  | CZ-NH1 | -6.78 | 1.23        | 1.32     |
| 7   | K     | 165  | ARG  | CZ-NH1 | -6.78 | 1.23        | 1.32     |
| 1   | A     | 116  | ARG  | CZ-NH1 | -6.77 | 1.23        | 1.32     |
| 9   | M     | 3629 | ARG  | CZ-NH1 | -6.77 | 1.23        | 1.32     |
| 7   | K     | 185  | ARG  | CZ-NH1 | -6.77 | 1.23        | 1.32     |
| 9   | M     | 3992 | ARG  | CZ-NH1 | -6.76 | 1.23        | 1.32     |
| 8   | L     | 489  | ARG  | CZ-NH1 | -6.76 | 1.23        | 1.32     |
| 7   | K     | 252  | ARG  | CZ-NH1 | -6.76 | 1.23        | 1.32     |
| 2   | B     | 45   | ARG  | CZ-NH1 | -6.76 | 1.23        | 1.32     |
| 9   | M     | 3324 | ARG  | CZ-NH1 | -6.75 | 1.23        | 1.32     |
| 9   | M     | 3630 | ARG  | CZ-NH1 | -6.75 | 1.23        | 1.32     |
| 7   | K     | 80   | ARG  | CZ-NH1 | -6.74 | 1.23        | 1.32     |
| 3   | G     | 81   | ARG  | CZ-NH1 | -6.74 | 1.23        | 1.32     |
| 3   | G     | 88   | ARG  | CZ-NH1 | -6.74 | 1.23        | 1.32     |
| 7   | K     | 187  | ARG  | CZ-NH1 | -6.74 | 1.23        | 1.32     |
| 9   | M     | 3357 | ARG  | CZ-NH1 | -6.74 | 1.23        | 1.32     |
| 8   | L     | 315  | ARG  | CZ-NH1 | -6.74 | 1.23        | 1.32     |
| 8   | L     | 486  | ARG  | CZ-NH1 | -6.74 | 1.23        | 1.32     |
| 9   | M     | 3885 | ARG  | CZ-NH1 | -6.73 | 1.23        | 1.32     |
| 9   | M     | 3159 | ARG  | CZ-NH1 | -6.73 | 1.23        | 1.32     |
| 7   | K     | 35   | ARG  | CZ-NH1 | -6.73 | 1.23        | 1.32     |
| 7   | K     | 403  | ARG  | CZ-NH1 | -6.72 | 1.23        | 1.32     |
| 9   | M     | 3718 | ARG  | CZ-NH1 | -6.72 | 1.23        | 1.32     |
| 9   | M     | 3789 | ARG  | CZ-NH1 | -6.71 | 1.23        | 1.32     |
| 7   | K     | 194  | ARG  | CZ-NH1 | -6.71 | 1.23        | 1.32     |

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| Mol | Chain | Res  | Type | Atoms  | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|--------|-------|-------------|----------|
| 9   | M     | 3467 | ARG  | CZ-NH1 | -6.71 | 1.23        | 1.32     |
| 9   | M     | 3557 | ARG  | CZ-NH1 | -6.71 | 1.23        | 1.32     |
| 9   | M     | 3057 | ALA  | CA-CB  | -6.70 | 1.42        | 1.53     |
| 9   | M     | 3725 | ARG  | CZ-NH1 | -6.70 | 1.23        | 1.32     |
| 7   | K     | 399  | ARG  | CZ-NH1 | -6.69 | 1.23        | 1.32     |
| 9   | M     | 3380 | ARG  | CZ-NH1 | -6.68 | 1.23        | 1.32     |
| 7   | K     | 318  | ARG  | CZ-NH1 | -6.68 | 1.23        | 1.32     |
| 7   | K     | 84   | ALA  | CA-CB  | -6.63 | 1.42        | 1.54     |
| 9   | M     | 4054 | ALA  | CA-CB  | -6.63 | 1.42        | 1.53     |
| 8   | L     | 281  | ALA  | CA-CB  | -6.59 | 1.42        | 1.53     |
| 9   | M     | 3335 | ARG  | CZ-NH1 | -6.59 | 1.23        | 1.32     |
| 3   | G     | 105  | GLY  | N-CA   | -6.53 | 1.37        | 1.45     |
| 7   | K     | 191  | GLY  | N-CA   | -6.46 | 1.37        | 1.45     |
| 9   | M     | 3331 | GLY  | N-CA   | -6.37 | 1.37        | 1.45     |
| 9   | M     | 3106 | GLY  | N-CA   | -6.36 | 1.37        | 1.45     |
| 9   | M     | 3408 | GLY  | N-CA   | -6.28 | 1.38        | 1.45     |
| 9   | M     | 4052 | ALA  | CA-CB  | -6.24 | 1.42        | 1.53     |
| 9   | M     | 3346 | ALA  | CA-CB  | -6.08 | 1.42        | 1.53     |
| 9   | M     | 3376 | GLY  | N-CA   | -5.98 | 1.38        | 1.45     |
| 9   | M     | 3031 | TRP  | CA-CB  | -5.94 | 1.47        | 1.54     |
| 2   | B     | 48   | GLY  | N-CA   | -5.90 | 1.37        | 1.45     |
| 9   | M     | 3684 | SER  | CA-CB  | -5.81 | 1.47        | 1.53     |
| 7   | K     | 34   | GLY  | N-CA   | -5.78 | 1.36        | 1.45     |
| 2   | B     | 35   | ARG  | CD-NE  | -5.70 | 1.38        | 1.46     |
| 9   | M     | 3965 | ARG  | CD-NE  | -5.62 | 1.38        | 1.46     |
| 9   | M     | 3046 | ARG  | CD-NE  | -5.61 | 1.38        | 1.46     |
| 9   | M     | 3748 | HIS  | CA-CB  | -5.61 | 1.47        | 1.53     |
| 8   | L     | 497  | ARG  | CD-NE  | -5.60 | 1.38        | 1.46     |
| 7   | K     | 165  | ARG  | CD-NE  | -5.58 | 1.38        | 1.46     |
| 8   | L     | 489  | ARG  | CD-NE  | -5.57 | 1.38        | 1.46     |
| 9   | M     | 3565 | GLY  | N-CA   | -5.57 | 1.38        | 1.45     |
| 9   | M     | 3748 | HIS  | N-CA   | -5.55 | 1.41        | 1.46     |
| 1   | A     | 116  | ARG  | CD-NE  | -5.55 | 1.38        | 1.46     |
| 7   | K     | 308  | GLY  | N-CA   | -5.54 | 1.37        | 1.45     |
| 5   | I     | 144  | DG   | C2-N2  | -5.54 | 1.23        | 1.34     |
| 9   | M     | 3467 | ARG  | CD-NE  | -5.53 | 1.38        | 1.46     |
| 9   | M     | 3789 | ARG  | CD-NE  | -5.53 | 1.38        | 1.46     |
| 7   | K     | 403  | ARG  | CD-NE  | -5.51 | 1.38        | 1.46     |
| 8   | L     | 506  | PRO  | CA-CB  | -5.50 | 1.46        | 1.54     |
| 7   | K     | 252  | ARG  | CD-NE  | -5.48 | 1.38        | 1.46     |
| 9   | M     | 3335 | ARG  | CD-NE  | -5.47 | 1.38        | 1.46     |
| 9   | M     | 3357 | ARG  | CD-NE  | -5.47 | 1.38        | 1.46     |

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| Mol | Chain | Res  | Type | Atoms | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|-------|-------|-------------|----------|
| 9   | M     | 3557 | ARG  | CD-NE | -5.47 | 1.38        | 1.46     |
| 9   | M     | 4090 | ARG  | CD-NE | -5.47 | 1.38        | 1.46     |
| 7   | K     | 399  | ARG  | CD-NE | -5.46 | 1.38        | 1.46     |
| 3   | G     | 106  | GLY  | N-CA  | -5.46 | 1.37        | 1.45     |
| 9   | M     | 3737 | ARG  | CD-NE | -5.46 | 1.38        | 1.46     |
| 9   | M     | 4097 | GLY  | N-CA  | -5.44 | 1.37        | 1.45     |
| 8   | L     | 295  | TYR  | CA-CB | -5.43 | 1.45        | 1.52     |
| 9   | M     | 3885 | ARG  | CD-NE | -5.43 | 1.38        | 1.46     |
| 9   | M     | 3629 | ARG  | CD-NE | -5.43 | 1.38        | 1.46     |
| 7   | K     | 194  | ARG  | CD-NE | -5.42 | 1.38        | 1.46     |
| 2   | B     | 28   | GLY  | N-CA  | -5.42 | 1.38        | 1.45     |
| 9   | M     | 3310 | ASN  | CA-CB | -5.41 | 1.46        | 1.53     |
| 9   | M     | 3380 | ARG  | CD-NE | -5.41 | 1.38        | 1.46     |
| 7   | K     | 318  | ARG  | CD-NE | -5.41 | 1.38        | 1.46     |
| 6   | J     | 85   | DG   | C2-N2 | -5.39 | 1.23        | 1.34     |
| 8   | L     | 315  | ARG  | CD-NE | -5.38 | 1.38        | 1.46     |
| 9   | M     | 3936 | GLY  | N-CA  | -5.36 | 1.38        | 1.45     |
| 7   | K     | 254  | ARG  | CD-NE | -5.35 | 1.38        | 1.46     |
| 7   | K     | 187  | ARG  | CD-NE | -5.34 | 1.38        | 1.46     |
| 7   | K     | 35   | ARG  | CD-NE | -5.34 | 1.38        | 1.46     |
| 9   | M     | 3159 | ARG  | CD-NE | -5.33 | 1.38        | 1.46     |
| 6   | J     | 151  | DG   | C2-N2 | -5.32 | 1.24        | 1.34     |
| 9   | M     | 3095 | ASP  | CA-CB | -5.32 | 1.46        | 1.52     |
| 9   | M     | 3071 | GLY  | N-CA  | -5.31 | 1.37        | 1.45     |
| 2   | B     | 45   | ARG  | CD-NE | -5.30 | 1.38        | 1.46     |
| 3   | G     | 81   | ARG  | CD-NE | -5.29 | 1.38        | 1.46     |
| 8   | L     | 486  | ARG  | CD-NE | -5.29 | 1.38        | 1.46     |
| 5   | I     | 12   | DG   | C2-N2 | -5.29 | 1.24        | 1.34     |
| 9   | M     | 3149 | GLY  | N-CA  | -5.28 | 1.38        | 1.45     |
| 7   | K     | 258  | ARG  | CD-NE | -5.27 | 1.38        | 1.46     |
| 7   | K     | 185  | ARG  | CD-NE | -5.26 | 1.38        | 1.46     |
| 9   | M     | 3324 | ARG  | CD-NE | -5.25 | 1.39        | 1.46     |
| 7   | K     | 285  | PRO  | CA-CB | -5.23 | 1.46        | 1.53     |
| 9   | M     | 4096 | SER  | CA-CB | -5.22 | 1.46        | 1.53     |
| 9   | M     | 3718 | ARG  | CD-NE | -5.22 | 1.39        | 1.46     |
| 5   | I     | 145  | DG   | C2-N2 | -5.20 | 1.24        | 1.34     |
| 5   | I     | 71   | DG   | C2-N2 | -5.20 | 1.24        | 1.34     |
| 9   | M     | 3872 | ARG  | CD-NE | -5.20 | 1.39        | 1.46     |
| 7   | K     | 80   | ARG  | CD-NE | -5.20 | 1.39        | 1.46     |
| 6   | J     | 149  | DG   | C2-N2 | -5.18 | 1.24        | 1.34     |
| 9   | M     | 3630 | ARG  | CD-NE | -5.18 | 1.39        | 1.46     |
| 9   | M     | 3992 | ARG  | CD-NE | -5.18 | 1.39        | 1.46     |

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| Mol | Chain | Res  | Type | Atoms  | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|--------|-------|-------------|----------|
| 3   | G     | 88   | ARG  | CD-NE  | -5.17 | 1.39        | 1.46     |
| 7   | K     | 407  | PRO  | CA-CB  | -5.16 | 1.47        | 1.54     |
| 5   | I     | 10   | DC   | C4-N4  | -5.15 | 1.23        | 1.34     |
| 6   | J     | 90   | DA   | C6-N6  | -5.15 | 1.23        | 1.34     |
| 6   | J     | 141  | DA   | C6-N6  | -5.15 | 1.23        | 1.34     |
| 6   | J     | 152  | DA   | C6-N6  | -5.15 | 1.23        | 1.34     |
| 6   | J     | 76   | DG   | C2-N2  | -5.14 | 1.24        | 1.34     |
| 6   | J     | 80   | DC   | C4-N4  | -5.14 | 1.23        | 1.34     |
| 9   | M     | 3725 | ARG  | CD-NE  | -5.14 | 1.39        | 1.46     |
| 5   | I     | 11   | DG   | C2-N2  | -5.11 | 1.24        | 1.34     |
| 5   | I     | 73   | DG   | C2-N2  | -5.09 | 1.24        | 1.34     |
| 9   | M     | 4110 | GLN  | CD-NE2 | -5.09 | 1.22        | 1.33     |
| 7   | K     | 284  | PRO  | CA-CB  | -5.09 | 1.47        | 1.54     |
| 5   | I     | 72   | DC   | C4-N4  | -5.09 | 1.24        | 1.34     |
| 6   | J     | 11   | DC   | C4-N4  | -5.08 | 1.24        | 1.34     |
| 5   | I     | 13   | DA   | C6-N6  | -5.08 | 1.24        | 1.34     |
| 9   | M     | 3969 | ASN  | CG-ND2 | -5.08 | 1.22        | 1.33     |
| 5   | I     | 15   | DG   | C2-N2  | -5.07 | 1.24        | 1.34     |
| 9   | M     | 3711 | PRO  | CA-CB  | -5.05 | 1.47        | 1.53     |
| 9   | M     | 3070 | HIS  | C-N    | -5.05 | 1.29        | 1.33     |
| 5   | I     | 78   | DA   | C6-N6  | -5.04 | 1.24        | 1.34     |
| 6   | J     | 84   | DC   | C4-N4  | -5.03 | 1.24        | 1.34     |
| 6   | J     | 148  | DA   | C6-N6  | -5.03 | 1.24        | 1.34     |
| 6   | J     | 150  | DC   | C4-N4  | -5.03 | 1.24        | 1.34     |
| 5   | I     | 146  | DA   | C6-N6  | -5.02 | 1.24        | 1.34     |
| 9   | M     | 4053 | GLY  | N-CA   | -5.02 | 1.38        | 1.45     |
| 5   | I     | 79   | DC   | C4-N4  | -5.01 | 1.24        | 1.34     |
| 6   | J     | 10   | DC   | C4-N4  | -5.01 | 1.24        | 1.34     |
| 6   | J     | 78   | DC   | C4-N4  | -5.01 | 1.24        | 1.34     |
| 5   | I     | 69   | DA   | C6-N6  | -5.00 | 1.24        | 1.34     |

All (612) bond angle outliers are listed below:

| Mol | Chain | Res  | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-----------|-------|-------------|----------|
| 1   | A     | 39   | HIS  | CA-CB-CG  | 9.61  | 123.41      | 113.80   |
| 9   | M     | 186  | PRO  | CA-N-CD   | -8.88 | 99.56       | 112.00   |
| 5   | I     | 102  | DG   | OP2-P-O3' | -8.77 | 81.69       | 108.00   |
| 8   | L     | 288  | ASP  | CA-CB-CG  | 8.07  | 120.67      | 112.60   |
| 9   | M     | 1864 | ASP  | CA-CB-CG  | 7.88  | 120.48      | 112.60   |
| 9   | M     | 3628 | PHE  | CA-CB-CG  | 7.71  | 121.51      | 113.80   |
| 9   | M     | 3382 | PHE  | CA-CB-CG  | 7.60  | 121.40      | 113.80   |
| 9   | M     | 3020 | ASP  | CA-CB-CG  | 7.59  | 120.19      | 112.60   |

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| Mol | Chain | Res  | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-----------|-------|-------------|----------|
| 9   | M     | 282  | PHE  | CA-CB-CG  | 7.51  | 121.31      | 113.80   |
| 9   | M     | 427  | VAL  | N-CA-C    | 7.46  | 116.48      | 107.61   |
| 7   | K     | 341  | ASP  | CA-CB-CG  | 7.42  | 120.02      | 112.60   |
| 9   | M     | 3961 | PHE  | CA-CB-CG  | 7.39  | 121.19      | 113.80   |
| 7   | K     | 109  | ASP  | CA-CB-CG  | 7.38  | 119.98      | 112.60   |
| 9   | M     | 3181 | ASP  | CA-CB-CG  | 7.34  | 119.94      | 112.60   |
| 7   | K     | 303  | PHE  | CA-CB-CG  | 7.33  | 121.13      | 113.80   |
| 9   | M     | 3632 | PHE  | CA-CB-CG  | 7.32  | 121.12      | 113.80   |
| 9   | M     | 3928 | PHE  | CA-CB-CG  | 7.32  | 121.12      | 113.80   |
| 9   | M     | 3697 | ASN  | CA-CB-CG  | 7.31  | 119.91      | 112.60   |
| 9   | M     | 4088 | ASN  | CA-CB-CG  | 7.29  | 119.89      | 112.60   |
| 7   | K     | 304  | ASN  | CA-CB-CG  | 7.27  | 119.87      | 112.60   |
| 9   | M     | 3716 | HIS  | CA-CB-CG  | 7.26  | 121.06      | 113.80   |
| 9   | M     | 3189 | PHE  | CA-CB-CG  | 7.22  | 121.02      | 113.80   |
| 9   | M     | 3384 | HIS  | CA-CB-CG  | 7.21  | 121.01      | 113.80   |
| 9   | M     | 3095 | ASP  | CA-CB-CG  | 7.21  | 119.81      | 112.60   |
| 3   | G     | 89   | ASN  | CA-CB-CG  | 7.19  | 119.79      | 112.60   |
| 9   | M     | 3750 | PHE  | CA-CB-CG  | 7.18  | 120.98      | 113.80   |
| 5   | I     | 102  | DG   | OP1-P-O3' | -7.17 | 86.50       | 108.00   |
| 7   | K     | 285  | PRO  | CA-C-N    | 7.13  | 131.15      | 120.95   |
| 7   | K     | 285  | PRO  | C-N-CA    | 7.13  | 131.15      | 120.95   |
| 9   | M     | 3571 | PHE  | CA-CB-CG  | 7.13  | 120.93      | 113.80   |
| 1   | A     | 104  | PHE  | CA-CB-CG  | 7.12  | 120.92      | 113.80   |
| 1   | A     | 106  | ASP  | CA-CB-CG  | 7.12  | 119.72      | 112.60   |
| 8   | L     | 304  | GLU  | CA-C-N    | 7.11  | 130.52      | 122.48   |
| 8   | L     | 304  | GLU  | C-N-CA    | 7.11  | 130.52      | 122.48   |
| 9   | M     | 3893 | SER  | N-CA-C    | 7.10  | 114.52      | 108.13   |
| 3   | G     | 73   | ASN  | CA-CB-CG  | 7.09  | 119.69      | 112.60   |
| 7   | K     | 398  | CYS  | CA-C-N    | 7.08  | 132.97      | 122.99   |
| 7   | K     | 398  | CYS  | C-N-CA    | 7.08  | 132.97      | 122.99   |
| 9   | M     | 3887 | PHE  | CA-CB-CG  | 7.04  | 120.84      | 113.80   |
| 1   | A     | 108  | ASN  | CA-CB-CG  | 7.02  | 119.62      | 112.60   |
| 9   | M     | 3185 | ASN  | CA-CB-CG  | 7.01  | 119.61      | 112.60   |
| 9   | M     | 3926 | ASN  | CA-CB-CG  | 6.99  | 119.59      | 112.60   |
| 9   | M     | 4000 | ASN  | CA-CB-CG  | 6.99  | 119.59      | 112.60   |
| 7   | K     | 340  | PHE  | CA-CB-CG  | 6.91  | 120.71      | 113.80   |
| 9   | M     | 3772 | ASN  | CA-CB-CG  | 6.88  | 119.48      | 112.60   |
| 9   | M     | 3991 | PHE  | CA-CB-CG  | 6.88  | 120.68      | 113.80   |
| 9   | M     | 3679 | ASN  | CA-CB-CG  | 6.88  | 119.47      | 112.60   |
| 1   | A     | 123  | ASP  | CA-CB-CG  | 6.87  | 119.47      | 112.60   |
| 9   | M     | 3524 | ASN  | CA-CB-CG  | 6.84  | 119.44      | 112.60   |
| 9   | M     | 3814 | ASP  | CA-CB-CG  | 6.84  | 119.44      | 112.60   |

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| Mol | Chain | Res  | Type | Atoms     | Z    | Observed(°) | Ideal(°) |
|-----|-------|------|------|-----------|------|-------------|----------|
| 7   | K     | 87   | PHE  | CA-CB-CG  | 6.82 | 120.62      | 113.80   |
| 8   | L     | 280  | ASP  | CA-CB-CG  | 6.81 | 119.41      | 112.60   |
| 9   | M     | 3051 | LEU  | CA-C-N    | 6.80 | 129.40      | 120.28   |
| 9   | M     | 3051 | LEU  | C-N-CA    | 6.80 | 129.40      | 120.28   |
| 9   | M     | 1385 | ASN  | CA-C-N    | 6.79 | 130.85      | 120.13   |
| 9   | M     | 1385 | ASN  | C-N-CA    | 6.79 | 130.85      | 120.13   |
| 9   | M     | 3969 | ASN  | CA-CB-CG  | 6.78 | 119.38      | 112.60   |
| 9   | M     | 3339 | ASN  | CA-CB-CG  | 6.78 | 119.38      | 112.60   |
| 7   | K     | 163  | HIS  | CA-CB-CG  | 6.77 | 120.57      | 113.80   |
| 9   | M     | 4055 | ASN  | CA-CB-CG  | 6.75 | 119.35      | 112.60   |
| 7   | K     | 176  | HIS  | CA-CB-CG  | 6.73 | 120.53      | 113.80   |
| 7   | K     | 40   | PHE  | CA-CB-CG  | 6.72 | 120.52      | 113.80   |
| 8   | L     | 276  | TRP  | CA-C-N    | 6.69 | 130.21      | 120.71   |
| 8   | L     | 276  | TRP  | C-N-CA    | 6.69 | 130.21      | 120.71   |
| 9   | M     | 3967 | PHE  | CA-CB-CG  | 6.68 | 120.48      | 113.80   |
| 9   | M     | 3317 | SER  | CA-C-N    | 6.66 | 130.11      | 120.38   |
| 9   | M     | 3317 | SER  | C-N-CA    | 6.66 | 130.11      | 120.38   |
| 7   | K     | 110  | ASN  | CA-CB-CG  | 6.64 | 119.24      | 112.60   |
| 9   | M     | 3563 | ASP  | CA-CB-CG  | 6.64 | 119.24      | 112.60   |
| 9   | M     | 3690 | PHE  | CA-CB-CG  | 6.63 | 120.43      | 113.80   |
| 9   | M     | 4109 | ASP  | CA-CB-CG  | 6.63 | 119.23      | 112.60   |
| 7   | K     | 199  | PHE  | CA-CB-CG  | 6.62 | 120.42      | 113.80   |
| 9   | M     | 3904 | PHE  | CA-CB-CG  | 6.61 | 120.41      | 113.80   |
| 9   | M     | 3105 | ASN  | CA-CB-CG  | 6.58 | 119.18      | 112.60   |
| 9   | M     | 3162 | ASN  | CA-CB-CG  | 6.58 | 119.18      | 112.60   |
| 2   | B     | 45   | ARG  | CA-C-N    | 6.58 | 131.32      | 122.90   |
| 2   | B     | 45   | ARG  | C-N-CA    | 6.58 | 131.32      | 122.90   |
| 7   | K     | 288  | LEU  | CA-C-N    | 6.54 | 130.11      | 120.95   |
| 7   | K     | 288  | LEU  | C-N-CA    | 6.54 | 130.11      | 120.95   |
| 9   | M     | 3081 | HIS  | CA-CB-CG  | 6.51 | 120.31      | 113.80   |
| 9   | M     | 3323 | PHE  | CA-CB-CG  | 6.51 | 120.31      | 113.80   |
| 9   | M     | 3066 | ASP  | CA-CB-CG  | 6.50 | 119.10      | 112.60   |
| 9   | M     | 3776 | ALA  | CA-C-N    | 6.49 | 128.88      | 120.44   |
| 9   | M     | 3776 | ALA  | C-N-CA    | 6.49 | 128.88      | 120.44   |
| 7   | K     | 201  | ASP  | CA-CB-CG  | 6.49 | 119.09      | 112.60   |
| 9   | M     | 2486 | ASP  | CA-CB-CG  | 6.48 | 119.08      | 112.60   |
| 9   | M     | 3418 | ASP  | CA-CB-CG  | 6.48 | 119.08      | 112.60   |
| 9   | M     | 3694 | PHE  | CA-CB-CG  | 6.47 | 120.27      | 113.80   |
| 9   | M     | 3683 | CYS  | CA-C-N    | 6.46 | 131.68      | 123.34   |
| 9   | M     | 3683 | CYS  | C-N-CA    | 6.46 | 131.68      | 123.34   |
| 9   | M     | 891  | ARG  | NE-CZ-NH2 | 6.45 | 125.01      | 119.20   |
| 8   | L     | 727  | ASP  | CA-CB-CG  | 6.43 | 119.03      | 112.60   |

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| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 8   | L     | 288  | ASP  | CA-C-N      | 6.42  | 130.15      | 120.77   |
| 8   | L     | 288  | ASP  | C-N-CA      | 6.42  | 130.15      | 120.77   |
| 9   | M     | 334  | HIS  | CB-CG-CD2   | -6.42 | 122.86      | 131.20   |
| 8   | L     | 309  | ASP  | CA-C-N      | 6.42  | 129.27      | 120.35   |
| 8   | L     | 309  | ASP  | C-N-CA      | 6.42  | 129.27      | 120.35   |
| 9   | M     | 1921 | ASP  | CA-CB-CG    | 6.41  | 119.01      | 112.60   |
| 8   | L     | 277  | THR  | CA-C-N      | 6.40  | 130.10      | 120.95   |
| 8   | L     | 277  | THR  | C-N-CA      | 6.40  | 130.10      | 120.95   |
| 9   | M     | 3310 | ASN  | CA-CB-CG    | 6.40  | 119.00      | 112.60   |
| 7   | K     | 36   | ASP  | CA-CB-CG    | 6.39  | 118.99      | 112.60   |
| 9   | M     | 1687 | HIS  | CB-CG-CD2   | -6.38 | 122.91      | 131.20   |
| 9   | M     | 3327 | ASN  | CA-CB-CG    | 6.37  | 118.97      | 112.60   |
| 9   | M     | 3881 | ASP  | CA-CB-CG    | 6.37  | 118.97      | 112.60   |
| 7   | K     | 103  | TYR  | CA-C-N      | 6.36  | 130.95      | 122.93   |
| 7   | K     | 103  | TYR  | C-N-CA      | 6.36  | 130.95      | 122.93   |
| 2   | B     | 39   | ARG  | NE-CZ-NH2   | 6.36  | 124.92      | 119.20   |
| 7   | K     | 81   | ASP  | CA-CB-CG    | 6.33  | 118.93      | 112.60   |
| 9   | M     | 3150 | ASN  | CA-CB-CG    | 6.33  | 118.93      | 112.60   |
| 6   | J     | 7    | DA   | C2'-C3'-O3' | 6.33  | 120.99      | 111.50   |
| 9   | M     | 3554 | PHE  | CA-CB-CG    | 6.33  | 120.13      | 113.80   |
| 9   | M     | 3937 | VAL  | CA-C-N      | 6.30  | 131.92      | 122.98   |
| 9   | M     | 3937 | VAL  | C-N-CA      | 6.30  | 131.92      | 122.98   |
| 9   | M     | 3369 | ASP  | CA-CB-CG    | 6.30  | 118.90      | 112.60   |
| 7   | K     | 159  | PHE  | CA-CB-CG    | 6.29  | 120.09      | 113.80   |
| 9   | M     | 3771 | MET  | CA-C-N      | 6.29  | 128.62      | 120.44   |
| 9   | M     | 3771 | MET  | C-N-CA      | 6.29  | 128.62      | 120.44   |
| 7   | K     | 258  | ARG  | CD-NE-CZ    | 6.28  | 133.19      | 124.40   |
| 9   | M     | 334  | HIS  | CA-C-N      | 6.28  | 131.18      | 121.19   |
| 9   | M     | 334  | HIS  | C-N-CA      | 6.28  | 131.18      | 121.19   |
| 9   | M     | 3516 | HIS  | CA-CB-CG    | 6.27  | 120.07      | 113.80   |
| 9   | M     | 1822 | ARG  | NE-CZ-NH2   | 6.27  | 124.84      | 119.20   |
| 9   | M     | 3159 | ARG  | CD-NE-CZ    | 6.27  | 133.17      | 124.40   |
| 9   | M     | 3872 | ARG  | CD-NE-CZ    | 6.26  | 133.17      | 124.40   |
| 9   | M     | 3747 | GLU  | CA-C-N      | 6.26  | 129.78      | 122.52   |
| 9   | M     | 3747 | GLU  | C-N-CA      | 6.26  | 129.78      | 122.52   |
| 9   | M     | 3722 | PHE  | CA-CB-CG    | 6.26  | 120.06      | 113.80   |
| 9   | M     | 3701 | ILE  | N-CA-CB     | 6.24  | 117.10      | 110.17   |
| 1   | A     | 63   | ARG  | CD-NE-CZ    | 6.22  | 133.11      | 124.40   |
| 9   | M     | 3094 | ASP  | CA-CB-CG    | 6.22  | 118.82      | 112.60   |
| 1   | A     | 107  | THR  | CA-C-N      | 6.21  | 128.60      | 120.28   |
| 1   | A     | 107  | THR  | C-N-CA      | 6.21  | 128.60      | 120.28   |
| 9   | M     | 3362 | LEU  | CA-C-N      | 6.20  | 128.50      | 120.44   |

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| Mol | Chain | Res  | Type | Atoms    | Z    | Observed(°) | Ideal(°) |
|-----|-------|------|------|----------|------|-------------|----------|
| 9   | M     | 3362 | LEU  | C-N-CA   | 6.20 | 128.50      | 120.44   |
| 7   | K     | 38   | LEU  | CA-C-N   | 6.20 | 130.74      | 122.93   |
| 7   | K     | 38   | LEU  | C-N-CA   | 6.20 | 130.74      | 122.93   |
| 7   | K     | 80   | ARG  | CD-NE-CZ | 6.20 | 133.07      | 124.40   |
| 9   | M     | 3141 | PHE  | CA-CB-CG | 6.18 | 119.98      | 113.80   |
| 9   | M     | 3885 | ARG  | CD-NE-CZ | 6.17 | 133.04      | 124.40   |
| 3   | G     | 88   | ARG  | CD-NE-CZ | 6.16 | 133.02      | 124.40   |
| 9   | M     | 3718 | ARG  | CD-NE-CZ | 6.14 | 132.99      | 124.40   |
| 9   | M     | 948  | MET  | CA-C-N   | 6.12 | 125.82      | 119.82   |
| 9   | M     | 948  | MET  | C-N-CA   | 6.12 | 125.82      | 119.82   |
| 7   | K     | 185  | ARG  | CD-NE-CZ | 6.12 | 132.97      | 124.40   |
| 9   | M     | 3144 | PHE  | CA-CB-CG | 6.11 | 119.91      | 113.80   |
| 9   | M     | 3725 | ARG  | CD-NE-CZ | 6.09 | 132.92      | 124.40   |
| 9   | M     | 3738 | ILE  | CA-C-N   | 6.05 | 130.86      | 122.93   |
| 9   | M     | 3738 | ILE  | C-N-CA   | 6.05 | 130.86      | 122.93   |
| 7   | K     | 93   | ASP  | CA-C-N   | 6.05 | 131.03      | 121.72   |
| 7   | K     | 93   | ASP  | C-N-CA   | 6.05 | 131.03      | 121.72   |
| 7   | K     | 327  | ILE  | CA-C-N   | 6.05 | 130.98      | 123.12   |
| 7   | K     | 327  | ILE  | C-N-CA   | 6.05 | 130.98      | 123.12   |
| 9   | M     | 3381 | ALA  | CA-C-N   | 6.04 | 128.69      | 120.54   |
| 9   | M     | 3381 | ALA  | C-N-CA   | 6.04 | 128.69      | 120.54   |
| 9   | M     | 3935 | GLY  | CA-C-N   | 6.04 | 127.42      | 121.62   |
| 9   | M     | 3935 | GLY  | C-N-CA   | 6.04 | 127.42      | 121.62   |
| 9   | M     | 4109 | ASP  | CA-C-N   | 6.03 | 128.83      | 120.63   |
| 9   | M     | 4109 | ASP  | C-N-CA   | 6.03 | 128.83      | 120.63   |
| 9   | M     | 3324 | ARG  | CG-CD-NE | 6.01 | 125.22      | 112.00   |
| 9   | M     | 3748 | HIS  | CA-CB-CG | 6.01 | 119.81      | 113.80   |
| 8   | L     | 293  | THR  | CA-C-N   | 6.00 | 131.50      | 122.98   |
| 8   | L     | 293  | THR  | C-N-CA   | 6.00 | 131.50      | 122.98   |
| 9   | M     | 3630 | ARG  | CD-NE-CZ | 5.99 | 132.78      | 124.40   |
| 7   | K     | 79   | ASP  | CA-C-N   | 5.97 | 128.77      | 120.29   |
| 7   | K     | 79   | ASP  | C-N-CA   | 5.97 | 128.77      | 120.29   |
| 9   | M     | 3419 | PHE  | N-CA-CB  | 5.96 | 118.66      | 110.01   |
| 9   | M     | 3070 | HIS  | CA-CB-CG | 5.96 | 119.76      | 113.80   |
| 7   | K     | 101  | ASN  | CA-C-N   | 5.95 | 131.21      | 123.11   |
| 7   | K     | 101  | ASN  | C-N-CA   | 5.95 | 131.21      | 123.11   |
| 7   | K     | 86   | VAL  | CA-C-N   | 5.95 | 132.15      | 122.81   |
| 7   | K     | 86   | VAL  | C-N-CA   | 5.95 | 132.15      | 122.81   |
| 1   | A     | 47   | ALA  | N-CA-C   | 5.94 | 117.43      | 111.07   |
| 9   | M     | 3911 | ILE  | CA-C-N   | 5.93 | 128.48      | 120.65   |
| 9   | M     | 3911 | ILE  | C-N-CA   | 5.93 | 128.48      | 120.65   |
| 9   | M     | 3191 | SER  | CA-C-N   | 5.93 | 128.50      | 120.44   |

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| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 9   | M     | 3191 | SER  | C-N-CA      | 5.93  | 128.50      | 120.44   |
| 2   | B     | 40   | ARG  | NE-CZ-NH2   | 5.92  | 124.53      | 119.20   |
| 9   | M     | 3378 | TYR  | CA-C-N      | 5.92  | 128.14      | 120.44   |
| 9   | M     | 3378 | TYR  | C-N-CA      | 5.92  | 128.14      | 120.44   |
| 7   | K     | 326  | GLN  | CA-C-N      | 5.92  | 130.73      | 123.10   |
| 7   | K     | 326  | GLN  | C-N-CA      | 5.92  | 130.73      | 123.10   |
| 2   | B     | 44   | LYS  | CA-C-N      | 5.91  | 131.10      | 122.41   |
| 2   | B     | 44   | LYS  | C-N-CA      | 5.91  | 131.10      | 122.41   |
| 9   | M     | 3020 | ASP  | CA-C-N      | 5.91  | 128.48      | 120.44   |
| 9   | M     | 3020 | ASP  | C-N-CA      | 5.91  | 128.48      | 120.44   |
| 7   | K     | 254  | ARG  | CD-NE-CZ    | 5.91  | 132.67      | 124.40   |
| 3   | G     | 81   | ARG  | CD-NE-CZ    | 5.90  | 132.66      | 124.40   |
| 8   | L     | 289  | ILE  | CA-C-N      | 5.90  | 131.09      | 122.77   |
| 8   | L     | 289  | ILE  | C-N-CA      | 5.90  | 131.09      | 122.77   |
| 3   | G     | 82   | HIS  | CA-CB-CG    | 5.88  | 119.68      | 113.80   |
| 2   | B     | 53   | GLU  | CA-C-N      | 5.88  | 128.08      | 120.44   |
| 2   | B     | 53   | GLU  | C-N-CA      | 5.88  | 128.08      | 120.44   |
| 5   | I     | 77   | DG   | C4'-C3'-O3' | 5.87  | 118.80      | 110.00   |
| 9   | M     | 2470 | ARG  | NE-CZ-NH2   | 5.87  | 124.48      | 119.20   |
| 9   | M     | 2183 | HIS  | CB-CG-CD2   | -5.86 | 123.58      | 131.20   |
| 9   | M     | 3105 | ASN  | CA-C-N      | 5.86  | 126.48      | 119.98   |
| 9   | M     | 3105 | ASN  | C-N-CA      | 5.86  | 126.48      | 119.98   |
| 9   | M     | 3686 | TRP  | N-CA-CB     | 5.86  | 118.67      | 109.94   |
| 1   | A     | 117  | VAL  | CA-C-N      | 5.85  | 130.21      | 121.72   |
| 1   | A     | 117  | VAL  | C-N-CA      | 5.85  | 130.21      | 121.72   |
| 9   | M     | 190  | ILE  | CA-C-N      | 5.85  | 132.71      | 121.54   |
| 9   | M     | 190  | ILE  | C-N-CA      | 5.85  | 132.71      | 121.54   |
| 9   | M     | 1082 | PHE  | CA-CB-CG    | -5.84 | 107.96      | 113.80   |
| 9   | M     | 3739 | ILE  | CA-C-N      | 5.83  | 130.42      | 123.19   |
| 9   | M     | 3739 | ILE  | C-N-CA      | 5.83  | 130.42      | 123.19   |
| 9   | M     | 3928 | PHE  | CA-C-N      | 5.83  | 131.20      | 122.99   |
| 9   | M     | 3928 | PHE  | C-N-CA      | 5.83  | 131.20      | 122.99   |
| 7   | K     | 252  | ARG  | CB-CG-CD    | 5.82  | 124.69      | 111.30   |
| 9   | M     | 3528 | ALA  | CA-C-N      | 5.82  | 129.81      | 121.02   |
| 9   | M     | 3528 | ALA  | C-N-CA      | 5.82  | 129.81      | 121.02   |
| 7   | K     | 85   | VAL  | CA-C-N      | 5.82  | 130.13      | 122.51   |
| 7   | K     | 85   | VAL  | C-N-CA      | 5.82  | 130.13      | 122.51   |
| 9   | M     | 3992 | ARG  | CD-NE-CZ    | 5.81  | 132.53      | 124.40   |
| 9   | M     | 3138 | ILE  | N-CA-CB     | 5.81  | 116.95      | 110.51   |
| 9   | M     | 4106 | CYS  | CA-C-N      | 5.80  | 128.06      | 120.28   |
| 9   | M     | 4106 | CYS  | C-N-CA      | 5.80  | 128.06      | 120.28   |
| 9   | M     | 185  | HIS  | CA-C-N      | 5.79  | 127.08      | 119.84   |

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| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 9   | M     | 185  | HIS  | C-N-CA      | 5.79  | 127.08      | 119.84   |
| 9   | M     | 2427 | ARG  | N-CA-CB     | -5.79 | 102.54      | 111.46   |
| 7   | K     | 89   | GLY  | CA-C-N      | 5.77  | 128.96      | 120.82   |
| 7   | K     | 89   | GLY  | C-N-CA      | 5.77  | 128.96      | 120.82   |
| 7   | K     | 40   | PHE  | CA-C-N      | 5.77  | 131.12      | 122.99   |
| 7   | K     | 40   | PHE  | C-N-CA      | 5.77  | 131.12      | 122.99   |
| 7   | K     | 344  | GLY  | N-CA-C      | 5.77  | 120.01      | 110.55   |
| 7   | K     | 39   | ILE  | CA-C-N      | 5.76  | 130.68      | 122.72   |
| 7   | K     | 39   | ILE  | C-N-CA      | 5.76  | 130.68      | 122.72   |
| 6   | J     | 4    | DG   | C2'-C3'-O3' | 5.76  | 120.14      | 111.50   |
| 7   | K     | 99   | PHE  | CA-C-N      | 5.75  | 129.53      | 121.02   |
| 7   | K     | 99   | PHE  | C-N-CA      | 5.75  | 129.53      | 121.02   |
| 9   | M     | 1202 | ARG  | NE-CZ-NH2   | 5.75  | 124.38      | 119.20   |
| 1   | A     | 49   | ARG  | NE-CZ-NH2   | 5.74  | 124.37      | 119.20   |
| 9   | M     | 3557 | ARG  | N-CA-CB     | 5.73  | 118.32      | 110.01   |
| 9   | M     | 1045 | THR  | CB-CA-C     | 5.73  | 116.23      | 109.47   |
| 1   | A     | 116  | ARG  | CA-C-N      | 5.72  | 128.30      | 120.46   |
| 1   | A     | 116  | ARG  | C-N-CA      | 5.72  | 128.30      | 120.46   |
| 9   | M     | 1184 | ARG  | NE-CZ-NH2   | 5.72  | 124.35      | 119.20   |
| 7   | K     | 101  | ASN  | CA-CB-CG    | 5.69  | 118.29      | 112.60   |
| 7   | K     | 102  | ILE  | CA-C-N      | 5.69  | 131.03      | 123.00   |
| 7   | K     | 102  | ILE  | C-N-CA      | 5.69  | 131.03      | 123.00   |
| 9   | M     | 3188 | PHE  | CA-CB-CG    | 5.69  | 119.49      | 113.80   |
| 9   | M     | 3324 | ARG  | CD-NE-CZ    | 5.69  | 132.37      | 124.40   |
| 7   | K     | 399  | ARG  | CA-CB-CG    | 5.68  | 125.47      | 114.10   |
| 9   | M     | 3382 | PHE  | CA-C-N      | 5.68  | 127.83      | 120.44   |
| 9   | M     | 3382 | PHE  | C-N-CA      | 5.68  | 127.83      | 120.44   |
| 9   | M     | 3772 | ASN  | CA-C-N      | 5.68  | 126.25      | 119.94   |
| 9   | M     | 3772 | ASN  | C-N-CA      | 5.68  | 126.25      | 119.94   |
| 8   | L     | 489  | ARG  | CA-C-N      | 5.67  | 128.16      | 120.44   |
| 8   | L     | 489  | ARG  | C-N-CA      | 5.67  | 128.16      | 120.44   |
| 8   | L     | 282  | LYS  | CA-CB-CG    | 5.66  | 125.42      | 114.10   |
| 9   | M     | 3068 | ALA  | CA-C-N      | 5.66  | 128.18      | 120.54   |
| 9   | M     | 3068 | ALA  | C-N-CA      | 5.66  | 128.18      | 120.54   |
| 9   | M     | 3804 | GLU  | N-CA-CB     | 5.66  | 118.35      | 109.69   |
| 9   | M     | 3908 | HIS  | N-CA-CB     | 5.64  | 118.42      | 110.12   |
| 9   | M     | 2899 | ARG  | CA-C-N      | 5.63  | 128.86      | 120.87   |
| 9   | M     | 2899 | ARG  | C-N-CA      | 5.63  | 128.86      | 120.87   |
| 9   | M     | 3353 | GLU  | CA-C-N      | 5.63  | 128.28      | 120.29   |
| 9   | M     | 3353 | GLU  | C-N-CA      | 5.63  | 128.28      | 120.29   |
| 8   | L     | 294  | VAL  | CA-C-N      | 5.61  | 130.35      | 122.05   |
| 8   | L     | 294  | VAL  | C-N-CA      | 5.61  | 130.35      | 122.05   |

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| Mol | Chain | Res  | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-----------|-------|-------------|----------|
| 1   | A     | 111  | ALA  | CA-C-N    | 5.59  | 127.82      | 120.60   |
| 1   | A     | 111  | ALA  | C-N-CA    | 5.59  | 127.82      | 120.60   |
| 9   | M     | 1890 | HIS  | CB-CG-CD2 | -5.59 | 123.93      | 131.20   |
| 7   | K     | 291  | GLU  | CA-C-N    | 5.58  | 130.62      | 122.08   |
| 7   | K     | 291  | GLU  | C-N-CA    | 5.58  | 130.62      | 122.08   |
| 9   | M     | 3324 | ARG  | CA-CB-CG  | 5.58  | 125.27      | 114.10   |
| 9   | M     | 854  | ARG  | NE-CZ-NH2 | 5.58  | 124.22      | 119.20   |
| 9   | M     | 1476 | HIS  | CA-C-N    | 5.57  | 130.18      | 121.76   |
| 9   | M     | 1476 | HIS  | C-N-CA    | 5.57  | 130.18      | 121.76   |
| 9   | M     | 3520 | GLU  | CA-C-N    | 5.57  | 128.09      | 120.46   |
| 9   | M     | 3520 | GLU  | C-N-CA    | 5.57  | 128.09      | 120.46   |
| 9   | M     | 3743 | HIS  | CB-CG-CD2 | -5.57 | 123.96      | 131.20   |
| 1   | A     | 100  | LEU  | CA-C-N    | 5.57  | 127.58      | 120.56   |
| 1   | A     | 100  | LEU  | C-N-CA    | 5.57  | 127.58      | 120.56   |
| 9   | M     | 3368 | GLU  | CA-C-N    | 5.56  | 131.01      | 123.11   |
| 9   | M     | 3368 | GLU  | C-N-CA    | 5.56  | 131.01      | 123.11   |
| 9   | M     | 2337 | LEU  | CA-C-N    | 5.56  | 129.58      | 120.63   |
| 9   | M     | 2337 | LEU  | C-N-CA    | 5.56  | 129.58      | 120.63   |
| 9   | M     | 3570 | ASP  | CA-C-N    | 5.56  | 127.66      | 120.44   |
| 9   | M     | 3570 | ASP  | C-N-CA    | 5.56  | 127.66      | 120.44   |
| 9   | M     | 3391 | ALA  | CA-C-N    | 5.55  | 127.98      | 120.38   |
| 9   | M     | 3391 | ALA  | C-N-CA    | 5.55  | 127.98      | 120.38   |
| 8   | L     | 280  | ASP  | N-CA-CB   | 5.54  | 118.61      | 110.35   |
| 9   | M     | 3338 | ALA  | CA-C-N    | 5.54  | 127.71      | 120.28   |
| 9   | M     | 3338 | ALA  | C-N-CA    | 5.54  | 127.71      | 120.28   |
| 9   | M     | 3568 | ILE  | N-CA-CB   | 5.54  | 116.66      | 110.51   |
| 9   | M     | 4107 | LEU  | CA-C-N    | 5.53  | 127.95      | 120.65   |
| 9   | M     | 4107 | LEU  | C-N-CA    | 5.53  | 127.95      | 120.65   |
| 9   | M     | 3913 | ILE  | N-CA-CB   | 5.53  | 117.02      | 110.55   |
| 7   | K     | 328  | ILE  | CA-C-N    | 5.52  | 131.25      | 122.59   |
| 7   | K     | 328  | ILE  | C-N-CA    | 5.52  | 131.25      | 122.59   |
| 9   | M     | 3142 | ILE  | N-CA-CB   | 5.52  | 117.01      | 110.55   |
| 9   | M     | 2205 | VAL  | CA-C-N    | 5.51  | 126.72      | 119.84   |
| 9   | M     | 2205 | VAL  | C-N-CA    | 5.51  | 126.72      | 119.84   |
| 9   | M     | 3069 | MET  | CA-C-N    | 5.51  | 127.66      | 120.28   |
| 9   | M     | 3069 | MET  | C-N-CA    | 5.51  | 127.66      | 120.28   |
| 9   | M     | 3083 | SER  | CA-C-N    | 5.49  | 127.58      | 120.44   |
| 9   | M     | 3083 | SER  | C-N-CA    | 5.49  | 127.58      | 120.44   |
| 8   | L     | 289  | ILE  | N-CA-CB   | 5.49  | 116.80      | 110.49   |
| 1   | A     | 93   | GLN  | N-CA-CB   | 5.48  | 118.15      | 109.82   |
| 9   | M     | 3328 | ILE  | N-CA-CB   | 5.48  | 116.59      | 110.51   |
| 7   | K     | 286  | ILE  | CA-C-N    | 5.48  | 129.91      | 122.19   |

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| Mol | Chain | Res  | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-----------|-------|-------------|----------|
| 7   | K     | 286  | ILE  | C-N-CA    | 5.48  | 129.91      | 122.19   |
| 9   | M     | 3911 | ILE  | N-CA-CB   | 5.47  | 116.59      | 110.51   |
| 7   | K     | 166  | ILE  | CA-C-N    | 5.47  | 131.06      | 123.07   |
| 7   | K     | 166  | ILE  | C-N-CA    | 5.47  | 131.06      | 123.07   |
| 9   | M     | 3771 | MET  | CA-CB-CG  | 5.47  | 125.04      | 114.10   |
| 3   | G     | 84   | GLN  | N-CA-CB   | 5.47  | 117.89      | 109.91   |
| 7   | K     | 109  | ASP  | CA-C-N    | 5.47  | 128.96      | 120.60   |
| 7   | K     | 109  | ASP  | C-N-CA    | 5.47  | 128.96      | 120.60   |
| 7   | K     | 295  | PRO  | CA-C-N    | 5.46  | 127.44      | 120.56   |
| 7   | K     | 295  | PRO  | C-N-CA    | 5.46  | 127.44      | 120.56   |
| 7   | K     | 317  | LYS  | CA-C-N    | 5.46  | 130.45      | 121.39   |
| 7   | K     | 317  | LYS  | C-N-CA    | 5.46  | 130.45      | 121.39   |
| 9   | M     | 2940 | ARG  | NE-CZ-NH2 | 5.45  | 124.11      | 119.20   |
| 9   | M     | 3908 | HIS  | CA-CB-CG  | 5.43  | 119.23      | 113.80   |
| 2   | B     | 34   | ILE  | CA-C-N    | 5.42  | 127.49      | 120.44   |
| 2   | B     | 34   | ILE  | C-N-CA    | 5.42  | 127.49      | 120.44   |
| 9   | M     | 2378 | PHE  | CA-CB-CG  | -5.42 | 108.38      | 113.80   |
| 9   | M     | 3566 | GLY  | CA-C-N    | 5.42  | 127.88      | 120.46   |
| 9   | M     | 3566 | GLY  | C-N-CA    | 5.42  | 127.88      | 120.46   |
| 9   | M     | 3929 | MET  | CA-C-N    | 5.42  | 130.30      | 123.10   |
| 9   | M     | 3929 | MET  | C-N-CA    | 5.42  | 130.30      | 123.10   |
| 9   | M     | 372  | PRO  | CA-C-N    | 5.41  | 131.88      | 121.54   |
| 9   | M     | 372  | PRO  | C-N-CA    | 5.41  | 131.88      | 121.54   |
| 9   | M     | 4097 | GLY  | CA-C-N    | 5.41  | 128.55      | 120.87   |
| 9   | M     | 4097 | GLY  | C-N-CA    | 5.41  | 128.55      | 120.87   |
| 7   | K     | 344  | GLY  | CA-C-N    | 5.41  | 131.41      | 122.33   |
| 7   | K     | 344  | GLY  | C-N-CA    | 5.41  | 131.41      | 122.33   |
| 7   | K     | 301  | ARG  | NE-CZ-NH2 | 5.40  | 124.06      | 119.20   |
| 8   | L     | 278  | VAL  | CA-C-N    | 5.40  | 130.57      | 122.58   |
| 8   | L     | 278  | VAL  | C-N-CA    | 5.40  | 130.57      | 122.58   |
| 1   | A     | 122  | LYS  | CA-C-N    | 5.39  | 129.80      | 120.58   |
| 1   | A     | 122  | LYS  | C-N-CA    | 5.39  | 129.80      | 120.58   |
| 2   | B     | 47   | SER  | N-CA-CB   | 5.39  | 117.84      | 109.48   |
| 7   | K     | 200  | LEU  | CA-C-N    | 5.39  | 130.94      | 122.21   |
| 7   | K     | 200  | LEU  | C-N-CA    | 5.39  | 130.94      | 122.21   |
| 7   | K     | 316  | THR  | CA-C-N    | 5.38  | 130.74      | 122.93   |
| 7   | K     | 316  | THR  | C-N-CA    | 5.38  | 130.74      | 122.93   |
| 9   | M     | 3558 | ILE  | CA-C-N    | 5.38  | 127.81      | 120.54   |
| 9   | M     | 3558 | ILE  | C-N-CA    | 5.38  | 127.81      | 120.54   |
| 9   | M     | 4108 | MET  | CA-CB-CG  | 5.37  | 124.83      | 114.10   |
| 1   | A     | 103  | LEU  | CA-C-N    | 5.36  | 127.73      | 120.38   |
| 1   | A     | 103  | LEU  | C-N-CA    | 5.36  | 127.73      | 120.38   |

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| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 1   | A     | 97   | GLU  | CA-C-N      | 5.36  | 127.41      | 120.44   |
| 1   | A     | 97   | GLU  | C-N-CA      | 5.36  | 127.41      | 120.44   |
| 9   | M     | 3076 | ALA  | CA-C-N      | 5.36  | 127.31      | 120.56   |
| 9   | M     | 3076 | ALA  | C-N-CA      | 5.36  | 127.31      | 120.56   |
| 9   | M     | 3697 | ASN  | CA-C-N      | 5.35  | 130.97      | 122.94   |
| 9   | M     | 3697 | ASN  | C-N-CA      | 5.35  | 130.97      | 122.94   |
| 7   | K     | 92   | LYS  | CA-CB-CG    | 5.35  | 124.80      | 114.10   |
| 9   | M     | 3018 | SER  | CA-C-N      | 5.35  | 127.41      | 120.56   |
| 9   | M     | 3018 | SER  | C-N-CA      | 5.35  | 127.41      | 120.56   |
| 7   | K     | 163  | HIS  | CE1-NE2-CD2 | -5.35 | 103.65      | 109.00   |
| 7   | K     | 257  | SER  | CA-C-N      | 5.35  | 130.01      | 122.09   |
| 7   | K     | 257  | SER  | C-N-CA      | 5.35  | 130.01      | 122.09   |
| 9   | M     | 147  | PHE  | CA-C-N      | 5.35  | 130.42      | 122.82   |
| 9   | M     | 147  | PHE  | C-N-CA      | 5.35  | 130.42      | 122.82   |
| 9   | M     | 3079 | GLU  | CA-C-N      | 5.35  | 127.71      | 120.44   |
| 9   | M     | 3079 | GLU  | C-N-CA      | 5.35  | 127.71      | 120.44   |
| 9   | M     | 3725 | ARG  | CA-C-N      | 5.35  | 130.89      | 122.33   |
| 9   | M     | 3725 | ARG  | C-N-CA      | 5.35  | 130.89      | 122.33   |
| 9   | M     | 1340 | ARG  | NE-CZ-NH2   | 5.34  | 124.01      | 119.20   |
| 9   | M     | 3805 | TRP  | N-CA-CB     | 5.34  | 117.81      | 109.85   |
| 9   | M     | 454  | GLN  | OE1-CD-NE2  | -5.34 | 117.26      | 122.60   |
| 9   | M     | 3358 | ARG  | NE-CZ-NH2   | 5.34  | 124.00      | 119.20   |
| 9   | M     | 2264 | ASP  | CA-C-N      | 5.33  | 125.05      | 119.82   |
| 9   | M     | 2264 | ASP  | C-N-CA      | 5.33  | 125.05      | 119.82   |
| 9   | M     | 3553 | GLU  | CA-C-N      | 5.33  | 127.37      | 120.44   |
| 9   | M     | 3553 | GLU  | C-N-CA      | 5.33  | 127.37      | 120.44   |
| 9   | M     | 3379 | GLN  | CA-CB-CG    | 5.33  | 124.76      | 114.10   |
| 8   | L     | 279  | VAL  | CA-C-N      | 5.33  | 130.24      | 122.41   |
| 8   | L     | 279  | VAL  | C-N-CA      | 5.33  | 130.24      | 122.41   |
| 9   | M     | 3788 | LEU  | CA-C-N      | 5.32  | 128.43      | 120.87   |
| 9   | M     | 3788 | LEU  | C-N-CA      | 5.32  | 128.43      | 120.87   |
| 9   | M     | 3997 | LEU  | CA-C-N      | 5.32  | 127.36      | 120.44   |
| 9   | M     | 3997 | LEU  | C-N-CA      | 5.32  | 127.36      | 120.44   |
| 9   | M     | 1153 | LEU  | N-CA-CB     | -5.32 | 104.17      | 111.77   |
| 9   | M     | 3149 | GLY  | CA-C-N      | 5.31  | 127.35      | 120.44   |
| 9   | M     | 3149 | GLY  | C-N-CA      | 5.31  | 127.35      | 120.44   |
| 7   | K     | 142  | SER  | CA-C-N      | 5.31  | 131.67      | 121.54   |
| 7   | K     | 142  | SER  | C-N-CA      | 5.31  | 131.67      | 121.54   |
| 9   | M     | 1806 | ARG  | NE-CZ-NH2   | 5.30  | 123.97      | 119.20   |
| 9   | M     | 1772 | HIS  | CB-CG-CD2   | -5.30 | 124.31      | 131.20   |
| 7   | K     | 163  | HIS  | ND1-CG-CD2  | -5.30 | 100.80      | 106.10   |
| 9   | M     | 3417 | ALA  | CA-C-N      | 5.30  | 127.33      | 120.44   |

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| Mol | Chain | Res  | Type | Atoms      | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|------------|-------|-------------|----------|
| 9   | M     | 3417 | ALA  | C-N-CA     | 5.30  | 127.33      | 120.44   |
| 9   | M     | 3821 | SER  | N-CA-CB    | 5.30  | 117.83      | 110.04   |
| 9   | M     | 3968 | ILE  | CA-C-N     | 5.30  | 127.91      | 120.28   |
| 9   | M     | 3968 | ILE  | C-N-CA     | 5.30  | 127.91      | 120.28   |
| 7   | K     | 146  | VAL  | N-CA-CB    | 5.29  | 116.39      | 110.62   |
| 9   | M     | 3630 | ARG  | CB-CG-CD   | 5.29  | 123.47      | 111.30   |
| 3   | G     | 106  | GLY  | CA-C-N     | 5.29  | 130.33      | 122.71   |
| 3   | G     | 106  | GLY  | C-N-CA     | 5.29  | 130.33      | 122.71   |
| 1   | A     | 53   | ARG  | NE-CZ-NH2  | 5.29  | 123.96      | 119.20   |
| 8   | L     | 497  | ARG  | N-CA-CB    | 5.29  | 117.89      | 110.12   |
| 7   | K     | 252  | ARG  | CA-C-N     | 5.28  | 131.38      | 122.87   |
| 7   | K     | 252  | ARG  | C-N-CA     | 5.28  | 131.38      | 122.87   |
| 9   | M     | 3680 | LEU  | N-CA-CB    | 5.28  | 118.99      | 110.85   |
| 9   | M     | 3966 | GLN  | CA-C-N     | 5.28  | 127.31      | 120.44   |
| 9   | M     | 3966 | GLN  | C-N-CA     | 5.28  | 127.31      | 120.44   |
| 7   | K     | 183  | ALA  | CA-C-N     | 5.28  | 127.31      | 120.44   |
| 7   | K     | 183  | ALA  | C-N-CA     | 5.28  | 127.31      | 120.44   |
| 9   | M     | 3828 | TYR  | CA-C-N     | 5.28  | 127.30      | 120.44   |
| 9   | M     | 3828 | TYR  | C-N-CA     | 5.28  | 127.30      | 120.44   |
| 8   | L     | 512  | ILE  | N-CA-CB    | 5.27  | 116.16      | 110.62   |
| 9   | M     | 3372 | LYS  | CA-C-N     | 5.27  | 127.20      | 120.56   |
| 9   | M     | 3372 | LYS  | C-N-CA     | 5.27  | 127.20      | 120.56   |
| 9   | M     | 3013 | TYR  | N-CA-CB    | 5.27  | 117.65      | 110.01   |
| 2   | B     | 49   | LEU  | CA-C-N     | 5.27  | 127.96      | 120.53   |
| 2   | B     | 49   | LEU  | C-N-CA     | 5.27  | 127.96      | 120.53   |
| 9   | M     | 3387 | GLU  | CA-C-N     | 5.26  | 127.28      | 120.44   |
| 9   | M     | 3387 | GLU  | C-N-CA     | 5.26  | 127.28      | 120.44   |
| 9   | M     | 3188 | PHE  | N-CA-CB    | 5.25  | 117.63      | 110.01   |
| 2   | B     | 50   | ILE  | N-CA-CB    | 5.25  | 117.03      | 110.47   |
| 9   | M     | 1185 | HIS  | CB-CG-CD2  | -5.25 | 124.38      | 131.20   |
| 7   | K     | 165  | ARG  | CA-C-N     | 5.24  | 131.48      | 122.67   |
| 7   | K     | 165  | ARG  | C-N-CA     | 5.24  | 131.48      | 122.67   |
| 9   | M     | 3016 | THR  | CA-C-N     | 5.24  | 127.56      | 120.38   |
| 9   | M     | 3016 | THR  | C-N-CA     | 5.24  | 127.56      | 120.38   |
| 9   | M     | 3377 | LEU  | CA-C-N     | 5.24  | 127.62      | 120.54   |
| 9   | M     | 3377 | LEU  | C-N-CA     | 5.24  | 127.62      | 120.54   |
| 7   | K     | 253  | LYS  | CA-CB-CG   | 5.24  | 124.58      | 114.10   |
| 9   | M     | 1049 | GLN  | OE1-CD-NE2 | -5.24 | 117.36      | 122.60   |
| 9   | M     | 3406 | ALA  | CA-C-N     | 5.24  | 127.30      | 120.28   |
| 9   | M     | 3406 | ALA  | C-N-CA     | 5.24  | 127.30      | 120.28   |
| 9   | M     | 3805 | TRP  | CA-C-N     | 5.24  | 129.96      | 122.21   |
| 9   | M     | 3805 | TRP  | C-N-CA     | 5.24  | 129.96      | 122.21   |

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| Mol | Chain | Res  | Type | Atoms       | Z    | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|------|-------------|----------|
| 6   | J     | 80   | DC   | O5'-C5'-C4' | 5.23 | 118.65      | 110.80   |
| 7   | K     | 182  | LYS  | CA-C-N      | 5.23 | 127.24      | 120.44   |
| 7   | K     | 182  | LYS  | C-N-CA      | 5.23 | 127.24      | 120.44   |
| 8   | L     | 443  | LYS  | CA-CB-CG    | 5.23 | 124.56      | 114.10   |
| 9   | M     | 3886 | ALA  | CA-C-N      | 5.23 | 127.23      | 120.44   |
| 9   | M     | 3886 | ALA  | C-N-CA      | 5.23 | 127.23      | 120.44   |
| 3   | G     | 81   | ARG  | CG-CD-NE    | 5.22 | 123.49      | 112.00   |
| 9   | M     | 3371 | GLU  | CA-C-N      | 5.21 | 127.22      | 120.44   |
| 9   | M     | 3371 | GLU  | C-N-CA      | 5.21 | 127.22      | 120.44   |
| 9   | M     | 4110 | GLN  | CA-C-N      | 5.21 | 127.22      | 120.44   |
| 9   | M     | 4110 | GLN  | C-N-CA      | 5.21 | 127.22      | 120.44   |
| 1   | A     | 61   | LEU  | CA-C-N      | 5.21 | 127.59      | 120.35   |
| 1   | A     | 61   | LEU  | C-N-CA      | 5.21 | 127.59      | 120.35   |
| 9   | M     | 3426 | LYS  | N-CA-CB     | 5.21 | 117.70      | 109.94   |
| 9   | M     | 3910 | LEU  | N-CA-CB     | 5.21 | 117.56      | 110.01   |
| 7   | K     | 163  | HIS  | CG-CD2-NE2  | 5.20 | 112.40      | 107.20   |
| 9   | M     | 3408 | GLY  | CA-C-N      | 5.20 | 127.86      | 120.53   |
| 9   | M     | 3408 | GLY  | C-N-CA      | 5.20 | 127.86      | 120.53   |
| 9   | M     | 3821 | SER  | CA-C-N      | 5.20 | 127.50      | 120.38   |
| 9   | M     | 3821 | SER  | C-N-CA      | 5.20 | 127.50      | 120.38   |
| 9   | M     | 3910 | LEU  | CA-C-N      | 5.19 | 127.30      | 120.60   |
| 9   | M     | 3910 | LEU  | C-N-CA      | 5.19 | 127.30      | 120.60   |
| 9   | M     | 3775 | LEU  | CA-C-N      | 5.19 | 127.76      | 120.28   |
| 9   | M     | 3775 | LEU  | C-N-CA      | 5.19 | 127.76      | 120.28   |
| 7   | K     | 261  | LEU  | CA-C-N      | 5.19 | 130.57      | 122.17   |
| 7   | K     | 261  | LEU  | C-N-CA      | 5.19 | 130.57      | 122.17   |
| 9   | M     | 3696 | ARG  | NE-CZ-NH2   | 5.19 | 123.87      | 119.20   |
| 9   | M     | 3073 | LEU  | CA-C-N      | 5.18 | 127.18      | 120.44   |
| 9   | M     | 3073 | LEU  | C-N-CA      | 5.18 | 127.18      | 120.44   |
| 7   | K     | 35   | ARG  | CD-NE-CZ    | 5.18 | 131.65      | 124.40   |
| 9   | M     | 3067 | LYS  | N-CA-CB     | 5.18 | 117.65      | 109.94   |
| 9   | M     | 3049 | LEU  | N-CA-CB     | 5.17 | 117.51      | 110.01   |
| 9   | M     | 3374 | ILE  | CA-C-N      | 5.17 | 127.16      | 120.44   |
| 9   | M     | 3374 | ILE  | C-N-CA      | 5.17 | 127.16      | 120.44   |
| 7   | K     | 185  | ARG  | CA-C-N      | 5.17 | 127.51      | 120.54   |
| 7   | K     | 185  | ARG  | C-N-CA      | 5.17 | 127.51      | 120.54   |
| 3   | G     | 118  | LYS  | CA-C-N      | 5.16 | 128.44      | 121.05   |
| 3   | G     | 118  | LYS  | C-N-CA      | 5.16 | 128.44      | 121.05   |
| 9   | M     | 3099 | ALA  | CA-C-N      | 5.16 | 127.15      | 120.44   |
| 9   | M     | 3099 | ALA  | C-N-CA      | 5.16 | 127.15      | 120.44   |
| 1   | A     | 112  | ILE  | N-CA-CB     | 5.16 | 116.24      | 110.51   |
| 8   | L     | 486  | ARG  | CA-CB-CG    | 5.16 | 124.42      | 114.10   |

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| Mol | Chain | Res  | Type | Atoms     | Z    | Observed(°) | Ideal(°) |
|-----|-------|------|------|-----------|------|-------------|----------|
| 3   | G     | 87   | VAL  | CA-C-N    | 5.16 | 127.71      | 120.28   |
| 3   | G     | 87   | VAL  | C-N-CA    | 5.16 | 127.71      | 120.28   |
| 9   | M     | 3774 | ILE  | CA-C-N    | 5.16 | 127.15      | 120.44   |
| 9   | M     | 3774 | ILE  | C-N-CA    | 5.16 | 127.15      | 120.44   |
| 7   | K     | 82   | LEU  | CA-C-N    | 5.16 | 130.98      | 121.85   |
| 7   | K     | 82   | LEU  | C-N-CA    | 5.16 | 130.98      | 121.85   |
| 9   | M     | 3368 | GLU  | CA-CB-CG  | 5.16 | 124.41      | 114.10   |
| 1   | A     | 57   | SER  | CA-C-N    | 5.16 | 129.64      | 121.44   |
| 1   | A     | 57   | SER  | C-N-CA    | 5.16 | 129.64      | 121.44   |
| 7   | K     | 287  | LYS  | CA-C-N    | 5.15 | 130.68      | 122.74   |
| 7   | K     | 287  | LYS  | C-N-CA    | 5.15 | 130.68      | 122.74   |
| 1   | A     | 59   | GLU  | CA-C-N    | 5.15 | 129.03      | 120.94   |
| 1   | A     | 59   | GLU  | C-N-CA    | 5.15 | 129.03      | 120.94   |
| 3   | G     | 81   | ARG  | CA-C-N    | 5.15 | 127.49      | 120.54   |
| 3   | G     | 81   | ARG  | C-N-CA    | 5.15 | 127.49      | 120.54   |
| 8   | L     | 302  | GLU  | CA-C-N    | 5.15 | 129.27      | 122.42   |
| 8   | L     | 302  | GLU  | C-N-CA    | 5.15 | 129.27      | 122.42   |
| 9   | M     | 3554 | PHE  | N-CA-CB   | 5.15 | 117.48      | 110.01   |
| 9   | M     | 3557 | ARG  | CA-C-N    | 5.15 | 127.05      | 120.56   |
| 9   | M     | 3557 | ARG  | C-N-CA    | 5.15 | 127.05      | 120.56   |
| 9   | M     | 3813 | LYS  | N-CA-CB   | 5.15 | 117.69      | 110.12   |
| 9   | M     | 3100 | LYS  | N-CA-CB   | 5.15 | 117.47      | 110.01   |
| 9   | M     | 3363 | SER  | N-CA-CB   | 5.15 | 117.47      | 110.01   |
| 9   | M     | 3421 | ASP  | CA-C-N    | 5.15 | 127.13      | 120.44   |
| 9   | M     | 3421 | ASP  | C-N-CA    | 5.15 | 127.13      | 120.44   |
| 2   | B     | 35   | ARG  | CD-NE-CZ  | 5.14 | 131.60      | 124.40   |
| 9   | M     | 78   | PHE  | CA-C-N    | 5.14 | 128.53      | 120.82   |
| 9   | M     | 78   | PHE  | C-N-CA    | 5.14 | 128.53      | 120.82   |
| 9   | M     | 3514 | VAL  | CA-C-N    | 5.14 | 127.43      | 120.38   |
| 9   | M     | 3514 | VAL  | C-N-CA    | 5.14 | 127.43      | 120.38   |
| 9   | M     | 3698 | GLU  | CA-C-N    | 5.14 | 129.61      | 122.77   |
| 9   | M     | 3698 | GLU  | C-N-CA    | 5.14 | 129.61      | 122.77   |
| 9   | M     | 3072 | GLU  | CA-C-N    | 5.14 | 127.17      | 120.28   |
| 9   | M     | 3072 | GLU  | C-N-CA    | 5.14 | 127.17      | 120.28   |
| 9   | M     | 1735 | ARG  | NE-CZ-NH2 | 5.14 | 123.82      | 119.20   |
| 7   | K     | 262  | LYS  | CA-CB-CG  | 5.13 | 124.36      | 114.10   |
| 9   | M     | 3308 | ASP  | CA-C-N    | 5.13 | 130.87      | 122.81   |
| 9   | M     | 3308 | ASP  | C-N-CA    | 5.13 | 130.87      | 122.81   |
| 7   | K     | 142  | SER  | N-CA-CB   | 5.13 | 117.69      | 110.36   |
| 9   | M     | 3999 | THR  | CA-C-N    | 5.13 | 127.10      | 120.44   |
| 9   | M     | 3999 | THR  | C-N-CA    | 5.13 | 127.10      | 120.44   |
| 9   | M     | 139  | ARG  | NE-CZ-NH2 | 5.12 | 123.81      | 119.20   |

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| Mol | Chain | Res  | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-----------|-------|-------------|----------|
| 9   | M     | 3142 | ILE  | CA-C-N    | 5.12  | 127.10      | 120.44   |
| 9   | M     | 3142 | ILE  | C-N-CA    | 5.12  | 127.10      | 120.44   |
| 9   | M     | 3074 | GLN  | CB-CG-CD  | 5.12  | 121.30      | 112.60   |
| 9   | M     | 3769 | GLN  | CA-C-N    | 5.12  | 127.10      | 120.70   |
| 9   | M     | 3769 | GLN  | C-N-CA    | 5.12  | 127.10      | 120.70   |
| 9   | M     | 3386 | SER  | CA-C-N    | 5.12  | 127.45      | 120.54   |
| 9   | M     | 3386 | SER  | C-N-CA    | 5.12  | 127.45      | 120.54   |
| 9   | M     | 3144 | PHE  | N-CA-CB   | 5.12  | 117.38      | 109.91   |
| 3   | G     | 83   | LEU  | CA-C-N    | 5.11  | 127.39      | 120.65   |
| 3   | G     | 83   | LEU  | C-N-CA    | 5.11  | 127.39      | 120.65   |
| 7   | K     | 289  | TYR  | N-CA-CB   | 5.11  | 117.46      | 109.85   |
| 9   | M     | 3907 | SER  | N-CA-CB   | 5.11  | 117.42      | 110.01   |
| 8   | L     | 492  | GLN  | CA-C-N    | 5.11  | 127.08      | 120.44   |
| 8   | L     | 492  | GLN  | C-N-CA    | 5.11  | 127.08      | 120.44   |
| 9   | M     | 1476 | HIS  | CA-CB-CG  | 5.11  | 118.91      | 113.80   |
| 7   | K     | 253  | LYS  | CG-CD-CE  | 5.10  | 123.04      | 111.30   |
| 9   | M     | 3313 | SER  | CA-C-N    | 5.10  | 127.83      | 120.38   |
| 9   | M     | 3313 | SER  | C-N-CA    | 5.10  | 127.83      | 120.38   |
| 9   | M     | 3141 | PHE  | N-CA-CB   | 5.10  | 117.40      | 110.01   |
| 9   | M     | 3988 | LEU  | N-CA-CB   | 5.10  | 117.40      | 110.01   |
| 1   | A     | 103  | LEU  | N-CA-CB   | 5.10  | 117.57      | 109.82   |
| 9   | M     | 3147 | LYS  | N-CA-CB   | 5.09  | 118.02      | 110.49   |
| 9   | M     | 3904 | PHE  | CA-C-N    | 5.09  | 127.06      | 120.44   |
| 9   | M     | 3904 | PHE  | C-N-CA    | 5.09  | 127.06      | 120.44   |
| 9   | M     | 3416 | LEU  | N-CA-CB   | 5.09  | 117.39      | 110.01   |
| 9   | M     | 2158 | ARG  | NE-CZ-NH2 | 5.08  | 123.77      | 119.20   |
| 9   | M     | 2538 | ARG  | NE-CZ-NH2 | 5.08  | 123.77      | 119.20   |
| 9   | M     | 1418 | HIS  | CB-CG-CD2 | -5.08 | 124.60      | 131.20   |
| 9   | M     | 3376 | GLY  | CA-C-N    | 5.08  | 127.04      | 120.44   |
| 9   | M     | 3376 | GLY  | C-N-CA    | 5.08  | 127.04      | 120.44   |
| 9   | M     | 3559 | LYS  | CA-C-N    | 5.08  | 127.35      | 120.65   |
| 9   | M     | 3559 | LYS  | C-N-CA    | 5.08  | 127.35      | 120.65   |
| 9   | M     | 3812 | LEU  | N-CA-CB   | 5.08  | 117.53      | 109.82   |
| 9   | M     | 3323 | PHE  | N-CA-CB   | 5.07  | 117.36      | 110.01   |
| 7   | K     | 256  | LEU  | N-CA-CB   | 5.07  | 117.49      | 109.94   |
| 9   | M     | 3927 | ASN  | CA-C-N    | 5.07  | 129.72      | 122.72   |
| 9   | M     | 3927 | ASN  | C-N-CA    | 5.07  | 129.72      | 122.72   |
| 3   | G     | 74   | LYS  | CB-CG-CD  | 5.07  | 122.96      | 111.30   |
| 9   | M     | 639  | ALA  | N-CA-C    | 5.07  | 117.58      | 110.23   |
| 9   | M     | 3075 | LYS  | CA-C-N    | 5.07  | 127.83      | 120.79   |
| 9   | M     | 3075 | LYS  | C-N-CA    | 5.07  | 127.83      | 120.79   |
| 9   | M     | 3159 | ARG  | CA-C-N    | 5.07  | 127.38      | 120.54   |

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| Mol | Chain | Res  | Type | Atoms      | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|------------|-------|-------------|----------|
| 9   | M     | 3159 | ARG  | C-N-CA     | 5.07  | 127.38      | 120.54   |
| 7   | K     | 182  | LYS  | CA-CB-CG   | 5.07  | 124.23      | 114.10   |
| 1   | A     | 116  | ARG  | CA-CB-CG   | 5.06  | 124.22      | 114.10   |
| 7   | K     | 254  | ARG  | CA-CB-CG   | 5.06  | 124.22      | 114.10   |
| 7   | K     | 339  | ARG  | NE-CZ-NH2  | 5.06  | 123.75      | 119.20   |
| 9   | M     | 2592 | ASP  | CA-CB-CG   | 5.06  | 117.66      | 112.60   |
| 9   | M     | 3046 | ARG  | N-CA-CB    | 5.05  | 117.34      | 110.01   |
| 9   | M     | 3364 | GLY  | CA-C-N     | 5.05  | 127.88      | 120.71   |
| 9   | M     | 3364 | GLY  | C-N-CA     | 5.05  | 127.88      | 120.71   |
| 5   | I     | 148  | DT   | N1-C1'-C2' | 5.05  | 121.07      | 113.50   |
| 9   | M     | 3085 | GLU  | CA-C-N     | 5.05  | 127.00      | 120.44   |
| 9   | M     | 3085 | GLU  | C-N-CA     | 5.05  | 127.00      | 120.44   |
| 9   | M     | 3998 | LEU  | CA-C-N     | 5.05  | 127.36      | 120.54   |
| 9   | M     | 3998 | LEU  | C-N-CA     | 5.05  | 127.36      | 120.54   |
| 9   | M     | 3569 | GLN  | N-CA-CB    | 5.05  | 117.54      | 110.12   |
| 2   | B     | 36   | ARG  | CA-C-N     | 5.04  | 127.04      | 120.28   |
| 2   | B     | 36   | ARG  | C-N-CA     | 5.04  | 127.04      | 120.28   |
| 9   | M     | 3327 | ASN  | CA-C-N     | 5.04  | 127.11      | 120.60   |
| 9   | M     | 3327 | ASN  | C-N-CA     | 5.04  | 127.11      | 120.60   |
| 9   | M     | 3820 | MET  | CA-C-N     | 5.04  | 128.37      | 120.75   |
| 9   | M     | 3820 | MET  | C-N-CA     | 5.04  | 128.37      | 120.75   |
| 1   | A     | 93   | GLN  | CB-CG-CD   | 5.04  | 121.17      | 112.60   |
| 3   | G     | 81   | ARG  | N-CA-CB    | 5.04  | 117.31      | 110.01   |
| 9   | M     | 2534 | ASN  | CA-CB-CG   | -5.04 | 107.56      | 112.60   |
| 9   | M     | 3410 | ILE  | CA-C-N     | 5.04  | 127.03      | 120.28   |
| 9   | M     | 3410 | ILE  | C-N-CA     | 5.04  | 127.03      | 120.28   |
| 9   | M     | 1746 | PHE  | CA-CB-CG   | 5.03  | 118.83      | 113.80   |
| 9   | M     | 3089 | LEU  | CA-C-N     | 5.03  | 127.02      | 120.28   |
| 9   | M     | 3089 | LEU  | C-N-CA     | 5.03  | 127.02      | 120.28   |
| 7   | K     | 140  | ASP  | CA-C-N     | 5.03  | 129.01      | 121.72   |
| 7   | K     | 140  | ASP  | C-N-CA     | 5.03  | 129.01      | 121.72   |
| 9   | M     | 4087 | HIS  | CA-C-N     | 5.03  | 130.58      | 123.14   |
| 9   | M     | 4087 | HIS  | C-N-CA     | 5.03  | 130.58      | 123.14   |
| 9   | M     | 3186 | ARG  | NE-CZ-NH2  | 5.03  | 123.72      | 119.20   |
| 9   | M     | 3086 | LEU  | CA-C-N     | 5.02  | 126.96      | 120.44   |
| 9   | M     | 3086 | LEU  | C-N-CA     | 5.02  | 126.96      | 120.44   |
| 9   | M     | 3130 | GLN  | CA-C-N     | 5.02  | 127.50      | 120.28   |
| 9   | M     | 3130 | GLN  | C-N-CA     | 5.02  | 127.50      | 120.28   |
| 9   | M     | 3804 | GLU  | CA-C-N     | 5.01  | 127.97      | 120.95   |
| 9   | M     | 3804 | GLU  | C-N-CA     | 5.01  | 127.97      | 120.95   |
| 9   | M     | 2428 | ASP  | CA-C-N     | 5.01  | 131.12      | 121.54   |
| 9   | M     | 2428 | ASP  | C-N-CA     | 5.01  | 131.12      | 121.54   |

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| Mol | Chain | Res  | Type | Atoms      | Z    | Observed(°) | Ideal(°) |
|-----|-------|------|------|------------|------|-------------|----------|
| 2   | B     | 33   | ALA  | CA-C-N     | 5.01 | 127.33      | 120.46   |
| 2   | B     | 33   | ALA  | C-N-CA     | 5.01 | 127.33      | 120.46   |
| 9   | M     | 3704 | GLN  | CA-C-N     | 5.01 | 127.83      | 120.71   |
| 9   | M     | 3704 | GLN  | C-N-CA     | 5.01 | 127.83      | 120.71   |
| 5   | I     | 149  | DC   | N1-C1'-C2' | 5.01 | 121.02      | 113.50   |
| 9   | M     | 3422 | GLN  | N-CA-CB    | 5.01 | 117.28      | 110.01   |
| 9   | M     | 3314 | SER  | CA-C-N     | 5.01 | 127.24      | 120.38   |
| 9   | M     | 3314 | SER  | C-N-CA     | 5.01 | 127.24      | 120.38   |
| 9   | M     | 3813 | LYS  | CB-CG-CD   | 5.00 | 122.81      | 111.30   |
| 8   | L     | 504  | PRO  | CA-C-N     | 5.00 | 128.26      | 120.60   |
| 8   | L     | 504  | PRO  | C-N-CA     | 5.00 | 128.26      | 120.60   |
| 7   | K     | 31   | LYS  | CA-C-N     | 5.00 | 126.94      | 120.44   |
| 7   | K     | 31   | LYS  | C-N-CA     | 5.00 | 126.94      | 120.44   |
| 9   | M     | 1087 | ARG  | NE-CZ-NH2  | 5.00 | 123.70      | 119.20   |
| 9   | M     | 3049 | LEU  | CA-C-N     | 5.00 | 127.29      | 120.54   |
| 9   | M     | 3049 | LEU  | C-N-CA     | 5.00 | 127.29      | 120.54   |

There are no chirality outliers.

All (41) planarity outliers are listed below:

| Mol | Chain | Res  | Type | Group     |
|-----|-------|------|------|-----------|
| 1   | A     | 82   | LEU  | Peptide   |
| 5   | I     | 150  | DT   | Sidechain |
| 5   | I     | 152  | DG   | Sidechain |
| 5   | I     | 3    | DT   | Sidechain |
| 5   | I     | 5    | DG   | Sidechain |
| 5   | I     | 6    | DC   | Sidechain |
| 5   | I     | 74   | DG   | Sidechain |
| 5   | I     | 77   | DG   | Sidechain |
| 6   | J     | 143  | DC   | Sidechain |
| 6   | J     | 145  | DG   | Sidechain |
| 6   | J     | 2    | DT   | Sidechain |
| 6   | J     | 4    | DG   | Sidechain |
| 6   | J     | 5    | DA   | Sidechain |
| 6   | J     | 6    | DG   | Sidechain |
| 6   | J     | 83   | DG   | Sidechain |
| 6   | J     | 9    | DT   | Sidechain |
| 7   | K     | 123  | LYS  | Peptide   |
| 7   | K     | 206  | LYS  | Peptide   |
| 8   | L     | 397  | TYR  | Peptide   |
| 9   | M     | 1184 | ARG  | Sidechain |
| 9   | M     | 119  | ARG  | Sidechain |

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| Mol | Chain | Res  | Type | Group     |
|-----|-------|------|------|-----------|
| 9   | M     | 1437 | TYR  | Sidechain |
| 9   | M     | 1606 | ARG  | Sidechain |
| 9   | M     | 1687 | HIS  | Sidechain |
| 9   | M     | 2484 | TYR  | Sidechain |
| 9   | M     | 2589 | TYR  | Sidechain |
| 9   | M     | 2891 | ARG  | Sidechain |
| 9   | M     | 290  | TYR  | Sidechain |
| 9   | M     | 3043 | TYR  | Sidechain |
| 9   | M     | 3313 | SER  | Peptide   |
| 9   | M     | 334  | HIS  | Sidechain |
| 9   | M     | 340  | TYR  | Sidechain |
| 9   | M     | 364  | ARG  | Sidechain |
| 9   | M     | 3679 | ASN  | Peptide   |
| 9   | M     | 385  | TYR  | Sidechain |
| 9   | M     | 391  | ARG  | Sidechain |
| 9   | M     | 527  | TYR  | Sidechain |
| 9   | M     | 647  | TYR  | Sidechain |
| 9   | M     | 888  | ARG  | Sidechain |
| 9   | M     | 959  | TYR  | Sidechain |
| 9   | M     | 962  | TYR  | Sidechain |

## 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     | 901   | 952      | 951      | 33      | 0            |
| 1   | E     | 740   | 782      | 781      | 32      | 0            |
| 2   | B     | 698   | 755      | 752      | 41      | 0            |
| 2   | F     | 694   | 744      | 742      | 42      | 0            |
| 3   | C     | 784   | 825      | 824      | 31      | 0            |
| 3   | G     | 858   | 925      | 922      | 18      | 0            |
| 4   | D     | 758   | 789      | 786      | 32      | 0            |
| 4   | H     | 747   | 774      | 773      | 25      | 0            |
| 5   | I     | 3174  | 1730     | 1683     | 133     | 0            |
| 6   | J     | 3137  | 1729     | 1687     | 102     | 0            |
| 7   | K     | 3954  | 4045     | 4042     | 61      | 0            |
| 8   | L     | 4273  | 4307     | 4303     | 106     | 0            |
| 9   | M     | 29284 | 29692    | 29680    | 219     | 0            |

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| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 10  | N     | 101   | 40       | 23       | 0       | 0            |
| All | All   | 50103 | 48089    | 47949    | 729     | 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 8.

All (729) 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) |
|-------------------|-------------------|--------------------------|-------------------|
| 8:L:118:ILE:HG21  | 8:L:159:ILE:HD11  | 1.54                     | 0.88              |
| 8:L:486:ARG:O     | 8:L:490:LEU:HD23  | 1.81                     | 0.81              |
| 3:G:50:TYR:CD1    | 4:H:115:VAL:HG21  | 2.18                     | 0.79              |
| 4:D:38:VAL:HG11   | 4:D:59:MET:HG2    | 1.65                     | 0.78              |
| 1:A:82:LEU:HD22   | 2:B:81:VAL:HG13   | 1.65                     | 0.77              |
| 9:M:3468:LEU:O    | 9:M:3472:ILE:HD12 | 1.85                     | 0.76              |
| 1:E:121:PRO:CG    | 2:F:49:LEU:HD22   | 2.17                     | 0.75              |
| 9:M:3588:TRP:CD1  | 9:M:3610:TYR:HH   | 2.05                     | 0.74              |
| 4:H:99:LEU:O      | 4:H:104:ALA:HB2   | 1.87                     | 0.73              |
| 7:K:456:PRO:O     | 7:K:459:VAL:HG22  | 1.90                     | 0.71              |
| 5:I:87:DA:N1      | 6:J:67:DG:C6      | 2.58                     | 0.71              |
| 2:F:57:VAL:HG12   | 2:F:61:PHE:CE2    | 2.27                     | 0.70              |
| 9:M:3522:THR:HG22 | 9:M:3529:ILE:HG21 | 1.72                     | 0.69              |
| 3:C:22:GLY:O      | 3:C:23:LEU:HD22   | 1.91                     | 0.69              |
| 4:D:95:VAL:HG13   | 4:D:99:LEU:HD12   | 1.75                     | 0.68              |
| 9:M:2379:MET:HE2  | 9:M:2408:MET:HE1  | 1.74                     | 0.68              |
| 1:E:121:PRO:HG2   | 2:F:49:LEU:HD22   | 1.74                     | 0.68              |
| 9:M:3633:ILE:HG23 | 9:M:3637:GLY:HA3  | 1.76                     | 0.68              |
| 1:A:84:PHE:CE2    | 1:A:89:VAL:HG21   | 2.29                     | 0.67              |
| 8:L:115:MET:HE1   | 8:L:159:ILE:HD12  | 1.77                     | 0.66              |
| 5:I:146:DA:H2''   | 5:I:147:DT:H71    | 1.76                     | 0.66              |
| 7:K:116:ILE:HD12  | 7:K:495:LEU:HD21  | 1.78                     | 0.65              |
| 9:M:2372:PRO:HA   | 9:M:2375:ALA:HB3  | 1.77                     | 0.65              |
| 3:G:17:ARG:HH21   | 6:J:30:DA:H3'     | 1.60                     | 0.65              |
| 9:M:3518:VAL:O    | 9:M:3522:THR:HG23 | 1.97                     | 0.64              |
| 8:L:46:VAL:HG21   | 8:L:91:LEU:HD23   | 1.79                     | 0.64              |
| 5:I:97:DA:H2'     | 5:I:98:DA:C8      | 2.33                     | 0.64              |
| 9:M:3834:ALA:HB3  | 9:M:3835:PRO:HD3  | 1.79                     | 0.64              |
| 3:C:16:THR:HG21   | 5:I:40:DA:H5'     | 1.79                     | 0.63              |
| 9:M:3460:GLU:O    | 9:M:3462:ARG:HD3  | 1.98                     | 0.63              |
| 1:A:67:PHE:O      | 1:A:71:VAL:HG23   | 1.98                     | 0.62              |
| 1:A:74:ILE:HD12   | 2:B:62:LEU:HD22   | 1.82                     | 0.62              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:A:79:LYS:HG2    | 2:B:70:VAL:HG21   | 1.81                     | 0.62              |
| 8:L:16:VAL:HG12   | 8:L:16:VAL:O      | 1.99                     | 0.62              |
| 8:L:249:CYS:HB3   | 8:L:261:ILE:HG23  | 1.82                     | 0.62              |
| 9:M:3883:LEU:HB3  | 9:M:3970:LEU:HD21 | 1.80                     | 0.62              |
| 5:I:87:DA:C6      | 6:J:67:DG:C6      | 2.88                     | 0.61              |
| 8:L:339:CYS:CB    | 8:L:340:PHE:HA    | 2.29                     | 0.61              |
| 1:A:82:LEU:HD23   | 2:B:79:LYS:O      | 2.01                     | 0.61              |
| 3:C:39:TYR:CZ     | 4:D:71:ALA:HB1    | 2.35                     | 0.61              |
| 3:G:95:LYS:HZ1    | 4:H:100:PRO:CB    | 2.12                     | 0.61              |
| 5:I:63:DG:H2''    | 5:I:64:DT:H72     | 1.82                     | 0.61              |
| 1:E:94:GLU:OE1    | 2:F:97:LEU:HD22   | 2.00                     | 0.61              |
| 2:F:18:HIS:NE2    | 5:I:98:DA:C8      | 2.69                     | 0.61              |
| 9:M:3531:TYR:O    | 9:M:3535:ILE:HD12 | 2.01                     | 0.61              |
| 2:B:18:HIS:CE1    | 5:I:64:DT:H71     | 2.35                     | 0.60              |
| 2:B:73:THR:OG1    | 2:B:81:VAL:HG12   | 2.01                     | 0.60              |
| 4:H:100:PRO:HD2   | 4:H:103:LEU:HD12  | 1.81                     | 0.60              |
| 6:J:100:DG:H1'    | 6:J:101:DG:C8     | 2.36                     | 0.60              |
| 9:M:3469:LEU:O    | 9:M:3473:GLU:OE1  | 2.19                     | 0.60              |
| 9:M:1710:LEU:HD21 | 9:M:1757:MET:HE2  | 1.82                     | 0.60              |
| 3:G:59:THR:O      | 3:G:63:LEU:HD13   | 2.01                     | 0.60              |
| 4:H:73:GLU:HG3    | 4:H:98:LEU:HD11   | 1.82                     | 0.60              |
| 6:J:111:DC:H2'    | 6:J:112:DT:H71    | 1.82                     | 0.60              |
| 6:J:31:DT:C6      | 6:J:32:DT:H72     | 2.37                     | 0.59              |
| 7:K:452:ILE:HG23  | 8:L:375:VAL:HG12  | 1.84                     | 0.59              |
| 2:B:26:ILE:HD13   | 2:B:59:LYS:HG3    | 1.83                     | 0.59              |
| 8:L:339:CYS:HB3   | 8:L:340:PHE:HA    | 1.83                     | 0.59              |
| 8:L:16:VAL:HG13   | 8:L:31:PHE:CE1    | 2.38                     | 0.59              |
| 4:H:70:ILE:HD12   | 4:H:98:LEU:HD12   | 1.84                     | 0.58              |
| 4:H:38:VAL:HG21   | 4:H:59:MET:SD     | 2.43                     | 0.58              |
| 1:E:61:LEU:HD11   | 2:F:37:LEU:HD23   | 1.85                     | 0.58              |
| 1:A:79:LYS:CG     | 2:B:70:VAL:HG21   | 2.33                     | 0.58              |
| 9:M:962:TYR:HA    | 9:M:965:THR:HG22  | 1.85                     | 0.58              |
| 6:J:51:DC:C2      | 6:J:52:DA:C8      | 2.92                     | 0.58              |
| 5:I:27:DC:H2'     | 5:I:28:DA:C8      | 2.39                     | 0.58              |
| 2:B:18:HIS:HB3    | 6:J:89:DT:H73     | 1.86                     | 0.57              |
| 3:C:55:LEU:HD11   | 4:D:63:VAL:HG13   | 1.85                     | 0.57              |
| 7:K:446:MET:HE1   | 8:L:264:TYR:HB2   | 1.86                     | 0.57              |
| 2:B:99:GLY:N      | 4:H:58:ILE:HD13   | 2.19                     | 0.57              |
| 8:L:14:MET:SD     | 8:L:98:ILE:HD11   | 2.44                     | 0.57              |
| 9:M:2462:VAL:HG23 | 9:M:2473:MET:HE1  | 1.87                     | 0.57              |
| 9:M:3334:TYR:HB2  | 9:M:3381:ALA:HB2  | 1.85                     | 0.57              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 9:M:3442:TYR:O    | 9:M:3446:VAL:HG22 | 2.05                     | 0.57              |
| 7:K:84:ALA:O      | 7:K:85:VAL:HG12   | 2.04                     | 0.56              |
| 1:E:63:ARG:HD3    | 5:I:99:DG:H4'     | 1.88                     | 0.56              |
| 2:F:71:THR:HG21   | 4:H:97:LEU:HG     | 1.88                     | 0.56              |
| 9:M:3442:TYR:O    | 9:M:3446:VAL:HG13 | 2.05                     | 0.56              |
| 9:M:3470:GLN:HG3  | 9:M:4004:VAL:HG21 | 1.87                     | 0.56              |
| 4:D:99:LEU:HD13   | 4:D:103:LEU:HD22  | 1.85                     | 0.56              |
| 6:J:39:DA:H1'     | 6:J:40:DG:C8      | 2.40                     | 0.56              |
| 2:B:26:ILE:HD13   | 2:B:59:LYS:CG     | 2.36                     | 0.56              |
| 3:C:32:ARG:NH2    | 3:C:33:LEU:HD23   | 2.19                     | 0.56              |
| 5:I:66:DA:H1'     | 5:I:67:DA:C8      | 2.40                     | 0.56              |
| 8:L:340:PHE:CD1   | 8:L:393:VAL:HG11  | 2.40                     | 0.56              |
| 9:M:4060:THR:O    | 9:M:4064:LEU:HD23 | 2.05                     | 0.56              |
| 7:K:479:GLU:HG3   | 8:L:427:MET:HE2   | 1.86                     | 0.56              |
| 7:K:525:PHE:O     | 7:K:529:VAL:HG22  | 2.05                     | 0.56              |
| 8:L:461:MET:O     | 8:L:461:MET:SD    | 2.64                     | 0.56              |
| 9:M:1586:SER:HB2  | 9:M:1593:VAL:HG21 | 1.88                     | 0.56              |
| 6:J:122:DG:H2'    | 6:J:123:DC:C6     | 2.41                     | 0.56              |
| 2:B:99:GLY:CA     | 4:H:58:ILE:HD13   | 2.36                     | 0.55              |
| 9:M:2150:VAL:HA   | 9:M:2157:PHE:CE1  | 2.42                     | 0.55              |
| 3:C:100:VAL:HG11  | 2:F:98:TYR:CE2    | 2.41                     | 0.55              |
| 8:L:164:PHE:C     | 8:L:165:LEU:HD12  | 2.31                     | 0.55              |
| 3:G:30:VAL:HG21   | 3:G:52:ALA:HB2    | 1.88                     | 0.55              |
| 3:C:23:LEU:HD23   | 4:D:118:TYR:HB2   | 1.89                     | 0.55              |
| 3:G:92:GLU:HA     | 3:G:95:LYS:HZ2    | 1.72                     | 0.55              |
| 9:M:1688:LEU:HD12 | 9:M:1688:LEU:H    | 1.70                     | 0.55              |
| 3:C:59:THR:HG22   | 3:C:63:LEU:HD12   | 1.89                     | 0.55              |
| 6:J:60:DA:C4      | 6:J:61:DA:C8      | 2.95                     | 0.55              |
| 9:M:3503:VAL:HG11 | 9:M:3529:ILE:HD11 | 1.87                     | 0.55              |
| 5:I:89:DG:H2''    | 5:I:90:DT:C6      | 2.41                     | 0.55              |
| 5:I:13:DA:H2'     | 8:L:271:ARG:NH1   | 2.22                     | 0.54              |
| 5:I:97:DA:C2      | 6:J:59:DA:C2      | 2.95                     | 0.54              |
| 5:I:103:DT:C2     | 5:I:104:DG:N7     | 2.76                     | 0.54              |
| 9:M:3633:ILE:HG23 | 9:M:3637:GLY:CA   | 2.38                     | 0.54              |
| 2:B:30:THR:HG21   | 5:I:69:DA:H3'     | 1.89                     | 0.54              |
| 7:K:130:ARG:HB3   | 7:K:134:MET:HE3   | 1.88                     | 0.54              |
| 7:K:476:ASP:O     | 7:K:477:SER:OG    | 2.25                     | 0.54              |
| 7:K:529:VAL:HG23  | 7:K:530:TYR:N     | 2.21                     | 0.54              |
| 4:D:59:MET:HA     | 4:D:62:PHE:HD2    | 1.73                     | 0.54              |
| 3:G:30:VAL:O      | 3:G:34:LEU:HD23   | 2.08                     | 0.54              |
| 9:M:1710:LEU:HD23 | 9:M:1711:ARG:N    | 2.23                     | 0.54              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 8:L:528:ILE:HB    | 8:L:529:PRO:HD3   | 1.89                     | 0.54              |
| 9:M:4047:ALA:O    | 9:M:4051:LEU:HD23 | 2.08                     | 0.54              |
| 3:G:15:LYS:O      | 6:J:30:DA:H5''    | 2.07                     | 0.54              |
| 5:I:128:DA:H1'    | 5:I:129:DG:C6     | 2.43                     | 0.54              |
| 9:M:3475:TYR:N    | 9:M:3476:PRO:HD2  | 2.23                     | 0.54              |
| 9:M:1633:TRP:CE2  | 9:M:1674:THR:HG21 | 2.43                     | 0.53              |
| 9:M:2443:MET:HE1  | 9:M:2479:TRP:CG   | 2.43                     | 0.53              |
| 7:K:458:GLN:HG2   | 7:K:529:VAL:HG12  | 1.90                     | 0.53              |
| 9:M:2555:LEU:HD22 | 9:M:2555:LEU:H    | 1.73                     | 0.53              |
| 5:I:87:DA:C2      | 6:J:67:DG:N1      | 2.77                     | 0.53              |
| 9:M:2142:ILE:HD12 | 9:M:2142:ILE:H    | 1.73                     | 0.53              |
| 1:A:82:LEU:CD2    | 2:B:81:VAL:HG13   | 2.37                     | 0.53              |
| 5:I:135:DT:H2''   | 5:I:136:DC:C5     | 2.44                     | 0.53              |
| 9:M:246:ARG:HA    | 9:M:249:PHE:CZ    | 2.43                     | 0.53              |
| 3:C:106:GLY:HA3   | 1:E:58:THR:HG22   | 1.91                     | 0.53              |
| 1:A:92:LEU:HD21   | 2:B:86:VAL:CG2    | 2.40                     | 0.52              |
| 3:C:25:PHE:CE2    | 3:C:55:LEU:HD22   | 2.44                     | 0.52              |
| 6:J:134:DT:O2     | 6:J:134:DT:H2'    | 2.10                     | 0.52              |
| 8:L:108:LEU:HD23  | 8:L:111:LEU:HD12  | 1.91                     | 0.52              |
| 2:F:49:LEU:HD23   | 2:F:49:LEU:O      | 2.09                     | 0.52              |
| 4:H:95:VAL:HA     | 4:H:99:LEU:HD23   | 1.90                     | 0.52              |
| 9:M:3619:ASP:HB2  | 9:M:3620:PRO:HD2  | 1.91                     | 0.52              |
| 1:A:85:GLN:O      | 1:A:89:VAL:HG23   | 2.10                     | 0.52              |
| 4:D:91:ILE:O      | 4:D:95:VAL:HG23   | 2.10                     | 0.52              |
| 9:M:3912:CYS:SG   | 9:M:3961:PHE:CD1  | 3.02                     | 0.52              |
| 5:I:95:DT:C2'     | 5:I:96:DT:H72     | 2.39                     | 0.52              |
| 8:L:16:VAL:HG11   | 8:L:99:GLN:O      | 2.09                     | 0.52              |
| 5:I:95:DT:H2'     | 5:I:96:DT:H72     | 1.92                     | 0.52              |
| 5:I:143:DG:H2''   | 5:I:144:DG:N7     | 2.25                     | 0.52              |
| 6:J:121:DG:H1'    | 6:J:122:DG:C8     | 2.44                     | 0.52              |
| 1:E:74:ILE:HG21   | 2:F:66:ILE:HD12   | 1.92                     | 0.52              |
| 9:M:352:VAL:HB    | 9:M:362:ALA:HB2   | 1.92                     | 0.52              |
| 9:M:3074:GLN:O    | 9:M:3078:LEU:HD23 | 2.10                     | 0.52              |
| 2:F:78:ARG:HD2    | 5:I:110:DG:H3'    | 1.93                     | 0.52              |
| 9:M:3446:VAL:O    | 9:M:3450:MET:HG3  | 2.10                     | 0.51              |
| 4:D:62:PHE:O      | 4:D:66:VAL:HG22   | 2.10                     | 0.51              |
| 4:H:38:VAL:HG21   | 4:H:59:MET:CE     | 2.40                     | 0.51              |
| 9:M:2410:GLU:CD   | 9:M:2410:GLU:H    | 2.18                     | 0.51              |
| 2:F:71:THR:HB     | 4:H:97:LEU:HD21   | 1.93                     | 0.51              |
| 6:J:52:DA:C4      | 6:J:53:DC:C5      | 2.98                     | 0.51              |
| 9:M:879:MET:HE2   | 9:M:879:MET:HA    | 1.93                     | 0.51              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 9:M:1135:CYS:SG   | 9:M:1190:LEU:HD13 | 2.51                     | 0.51              |
| 9:M:1190:LEU:HD11 | 9:M:1194:PHE:CE2  | 2.45                     | 0.51              |
| 4:D:99:LEU:HD13   | 4:D:103:LEU:CD2   | 2.40                     | 0.51              |
| 5:I:126:DT:C2     | 6:J:30:DA:C2      | 2.99                     | 0.51              |
| 6:J:53:DC:C2      | 6:J:54:DC:C5      | 2.98                     | 0.51              |
| 6:J:99:DG:H1'     | 6:J:100:DG:O4'    | 2.11                     | 0.51              |
| 8:L:261:ILE:HD11  | 8:L:364:VAL:HG11  | 1.93                     | 0.51              |
| 5:I:54:DC:O2      | 5:I:55:DC:C2      | 2.64                     | 0.51              |
| 8:L:467:ASP:O     | 8:L:468:GLU:HG2   | 2.10                     | 0.51              |
| 9:M:3838:GLU:O    | 9:M:3838:GLU:HG2  | 2.10                     | 0.51              |
| 1:E:61:LEU:HD11   | 2:F:37:LEU:CD2    | 2.41                     | 0.51              |
| 7:K:349:GLY:HA2   | 8:L:461:MET:SD    | 2.50                     | 0.51              |
| 8:L:281:ALA:O     | 8:L:282:LYS:HG2   | 2.11                     | 0.51              |
| 8:L:251:LEU:HB2   | 8:L:261:ILE:HG22  | 1.92                     | 0.51              |
| 3:C:62:ILE:HD13   | 3:C:93:LEU:HD13   | 1.92                     | 0.51              |
| 9:M:1915:LEU:HD11 | 9:M:1951:VAL:HG21 | 1.93                     | 0.51              |
| 2:F:46:ILE:HG21   | 2:F:51:TYR:CE1    | 2.45                     | 0.51              |
| 7:K:213:ILE:O     | 7:K:213:ILE:HG22  | 2.10                     | 0.51              |
| 2:F:17:ARG:HA     | 6:J:54:DC:C5      | 2.45                     | 0.50              |
| 6:J:44:DG:H2''    | 6:J:45:DC:OP2     | 2.11                     | 0.50              |
| 8:L:372:ALA:O     | 8:L:375:VAL:HG22  | 2.11                     | 0.50              |
| 8:L:201:GLN:O     | 8:L:205:LEU:HD23  | 2.11                     | 0.50              |
| 1:E:61:LEU:HD13   | 2:F:36:ARG:HB2    | 1.92                     | 0.50              |
| 7:K:356:LEU:HD22  | 7:K:437:LEU:HD21  | 1.93                     | 0.50              |
| 7:K:446:MET:HB2   | 7:K:448:PHE:CE1   | 2.46                     | 0.50              |
| 9:M:3447:VAL:HG21 | 9:M:3479:THR:HG21 | 1.91                     | 0.50              |
| 9:M:3442:TYR:CD2  | 9:M:3443:PRO:HD3  | 2.46                     | 0.50              |
| 3:C:39:TYR:CE2    | 4:D:71:ALA:HB1    | 2.46                     | 0.50              |
| 5:I:50:DA:C2'     | 5:I:51:DA:C8      | 2.94                     | 0.50              |
| 9:M:3334:TYR:CB   | 9:M:3381:ALA:HB2  | 2.41                     | 0.50              |
| 2:F:35:ARG:O      | 2:F:39:ARG:HG2    | 2.11                     | 0.50              |
| 5:I:50:DA:H2'     | 5:I:51:DA:C8      | 2.47                     | 0.50              |
| 9:M:1190:LEU:HD11 | 9:M:1194:PHE:CZ   | 2.47                     | 0.50              |
| 9:M:3883:LEU:CB   | 9:M:3970:LEU:HD21 | 2.41                     | 0.50              |
| 1:A:63:ARG:HG2    | 6:J:90:DA:H5''    | 1.94                     | 0.50              |
| 7:K:207:LYS:O     | 7:K:208:PRO:C     | 2.54                     | 0.50              |
| 7:K:495:LEU:O     | 7:K:496:ASP:OD1   | 2.30                     | 0.50              |
| 7:K:499:GLU:HB2   | 7:K:500:PRO:HD2   | 1.94                     | 0.50              |
| 8:L:450:GLN:HA    | 8:L:536:LEU:HD21  | 1.94                     | 0.50              |
| 2:B:83:ALA:O      | 2:B:86:VAL:HG12   | 2.12                     | 0.49              |
| 5:I:97:DA:H2''    | 5:I:98:DA:C5'     | 2.42                     | 0.49              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 6:J:52:DA:H2''    | 6:J:53:DC:OP2     | 2.11                     | 0.49              |
| 9:M:114:VAL:HG13  | 9:M:124:LYS:HE3   | 1.92                     | 0.49              |
| 9:M:4058:VAL:HG21 | 9:M:4095:GLU:OE1  | 2.12                     | 0.49              |
| 2:F:38:ALA:HB3    | 2:F:46:ILE:HD11   | 1.94                     | 0.49              |
| 9:M:3442:TYR:CG   | 9:M:3443:PRO:HD3  | 2.46                     | 0.49              |
| 2:F:18:HIS:CE1    | 5:I:98:DA:C8      | 3.00                     | 0.49              |
| 2:F:71:THR:HG23   | 4:H:96:ARG:NH1    | 2.28                     | 0.49              |
| 5:I:97:DA:C2      | 6:J:59:DA:N3      | 2.80                     | 0.49              |
| 9:M:385:TYR:C     | 9:M:385:TYR:CD2   | 2.90                     | 0.49              |
| 9:M:1224:PHE:CZ   | 9:M:1266:CYS:HB3  | 2.47                     | 0.49              |
| 9:M:1372:LEU:C    | 9:M:1372:LEU:HD23 | 2.38                     | 0.49              |
| 9:M:1479:VAL:HG23 | 9:M:1480:GLY:H    | 1.77                     | 0.49              |
| 9:M:3953:LEU:O    | 9:M:3954:PRO:C    | 2.56                     | 0.49              |
| 8:L:458:ILE:HA    | 8:L:461:MET:HE3   | 1.94                     | 0.49              |
| 5:I:11:DG:C2      | 5:I:12:DG:C5      | 3.00                     | 0.49              |
| 5:I:146:DA:C2'    | 5:I:147:DT:H71    | 2.43                     | 0.49              |
| 9:M:776:TRP:HB3   | 9:M:785:MET:HE1   | 1.94                     | 0.49              |
| 1:E:97:GLU:O      | 1:E:101:VAL:HG23  | 2.12                     | 0.49              |
| 5:I:26:DA:H1'     | 5:I:27:DC:C4      | 2.47                     | 0.49              |
| 9:M:1115:HIS:CG   | 9:M:1180:GLN:HA   | 2.48                     | 0.49              |
| 9:M:3793:VAL:HG13 | 9:M:3803:ILE:HD13 | 1.93                     | 0.49              |
| 1:E:51:ILE:HG12   | 2:F:39:ARG:O      | 2.12                     | 0.49              |
| 9:M:425:ASP:HA    | 9:M:471:LYS:CE    | 2.43                     | 0.49              |
| 9:M:3134:ALA:O    | 9:M:3138:ILE:HG12 | 2.12                     | 0.49              |
| 5:I:89:DG:N2      | 6:J:67:DG:N2      | 2.61                     | 0.49              |
| 8:L:267:ILE:HD11  | 8:L:361:VAL:HG23  | 1.95                     | 0.49              |
| 9:M:2458:VAL:O    | 9:M:2473:MET:HE3  | 2.13                     | 0.49              |
| 2:B:75:HIS:CD2    | 4:D:81:ASN:HD22   | 2.31                     | 0.48              |
| 8:L:263:ALA:HB2   | 8:L:364:VAL:HG12  | 1.94                     | 0.48              |
| 9:M:2309:PHE:CD1  | 9:M:2317:ALA:HA   | 2.47                     | 0.48              |
| 5:I:51:DA:H2''    | 5:I:52:DT:OP2     | 2.13                     | 0.48              |
| 6:J:20:DA:H2''    | 6:J:21:DG:OP2     | 2.13                     | 0.48              |
| 6:J:47:DC:H2''    | 6:J:48:DT:C6      | 2.48                     | 0.48              |
| 9:M:171:LEU:HD11  | 9:M:175:TYR:CE1   | 2.48                     | 0.48              |
| 9:M:3772:ASN:OD1  | 9:M:3787:GLN:OE1  | 2.31                     | 0.48              |
| 5:I:16:DT:H2''    | 5:I:17:DA:C8      | 2.48                     | 0.48              |
| 9:M:3088:LEU:HD12 | 9:M:3089:LEU:N    | 2.28                     | 0.48              |
| 5:I:13:DA:H2''    | 5:I:14:DT:O4'     | 2.13                     | 0.48              |
| 9:M:3758:LEU:O    | 9:M:3758:LEU:HD12 | 2.13                     | 0.48              |
| 2:F:57:VAL:HG12   | 2:F:61:PHE:HE2    | 1.79                     | 0.48              |
| 5:I:13:DA:C2      | 5:I:14:DT:O2      | 2.66                     | 0.48              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 3:G:33:LEU:HB3    | 4:H:67:PHE:CZ     | 2.49                     | 0.48              |
| 8:L:115:MET:HE2   | 8:L:153:SER:C     | 2.39                     | 0.48              |
| 9:M:1956:PHE:CE1  | 9:M:1960:LYS:HE3  | 2.49                     | 0.48              |
| 2:B:83:ALA:HA     | 2:B:86:VAL:HG12   | 1.96                     | 0.48              |
| 4:D:62:PHE:CD1    | 2:F:98:TYR:CE2    | 3.01                     | 0.48              |
| 5:I:124:DA:H2'    | 5:I:125:DT:H72    | 1.95                     | 0.48              |
| 5:I:141:DC:N3     | 6:J:14:DG:N2      | 2.60                     | 0.48              |
| 2:B:57:VAL:HG12   | 2:B:61:PHE:HE2    | 1.79                     | 0.48              |
| 6:J:18:DC:H2''    | 6:J:19:DG:OP2     | 2.13                     | 0.48              |
| 3:G:95:LYS:HZ1    | 4:H:100:PRO:HB3   | 1.79                     | 0.48              |
| 6:J:82:DC:H1'     | 6:J:83:DG:N7      | 2.29                     | 0.48              |
| 4:D:35:ALA:HB2    | 4:D:56:MET:SD     | 2.54                     | 0.47              |
| 4:H:73:GLU:CG     | 4:H:98:LEU:HD11   | 2.43                     | 0.47              |
| 7:K:299:LYS:HE2   | 8:L:296:CYS:SG    | 2.54                     | 0.47              |
| 9:M:3023:ASN:O    | 9:M:3025:PRO:HD3  | 2.14                     | 0.47              |
| 9:M:3490:VAL:HG23 | 9:M:3490:VAL:O    | 2.14                     | 0.47              |
| 4:D:52:SER:HA     | 5:I:28:DA:H5''    | 1.96                     | 0.47              |
| 3:G:28:GLY:HA3    | 6:J:30:DA:OP2     | 2.14                     | 0.47              |
| 5:I:139:DC:H1'    | 5:I:140:DA:O4'    | 2.14                     | 0.47              |
| 8:L:279:VAL:HG22  | 8:L:286:LYS:HG2   | 1.95                     | 0.47              |
| 9:M:3614:TYR:O    | 9:M:3615:ALA:HB3  | 2.14                     | 0.47              |
| 9:M:3918:LEU:H    | 9:M:3918:LEU:HD23 | 1.79                     | 0.47              |
| 1:A:113:HIS:CD2   | 1:E:114:ALA:HB2   | 2.49                     | 0.47              |
| 1:E:100:LEU:O     | 1:E:104:PHE:CD2   | 2.67                     | 0.47              |
| 9:M:3470:GLN:HA   | 9:M:3473:GLU:OE1  | 2.14                     | 0.47              |
| 4:H:29:THR:HG22   | 4:H:30:ARG:N      | 2.29                     | 0.47              |
| 8:L:247:TRP:CZ3   | 8:L:397:TYR:HA    | 2.49                     | 0.47              |
| 9:M:3484:THR:O    | 9:M:3487:ILE:HG22 | 2.14                     | 0.47              |
| 9:M:3523:ASP:OD1  | 9:M:3561:LYS:HE2  | 2.15                     | 0.47              |
| 5:I:18:DT:O2      | 5:I:19:DA:C5      | 2.67                     | 0.47              |
| 9:M:1833:LEU:HD12 | 9:M:1833:LEU:H    | 1.80                     | 0.47              |
| 8:L:325:LYS:HA    | 8:L:329:GLU:OE1   | 2.14                     | 0.47              |
| 8:L:363:LYS:HG2   | 8:L:420:VAL:HG12  | 1.96                     | 0.47              |
| 9:M:2241:LEU:HD23 | 9:M:2241:LEU:C    | 2.40                     | 0.47              |
| 9:M:3461:ALA:C    | 9:M:3462:ARG:HD3  | 2.39                     | 0.47              |
| 5:I:103:DT:H2''   | 5:I:104:DG:OP2    | 2.14                     | 0.47              |
| 5:I:110:DG:H2''   | 5:I:111:DC:C6     | 2.50                     | 0.47              |
| 5:I:119:DG:C2     | 6:J:37:DG:N2      | 2.83                     | 0.47              |
| 6:J:129:DT:H2''   | 6:J:130:DC:C5     | 2.49                     | 0.47              |
| 8:L:247:TRP:CH2   | 8:L:397:TYR:HA    | 2.49                     | 0.47              |
| 1:A:72:ARG:HD2    | 2:B:22:LEU:HD23   | 1.97                     | 0.47              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 3:C:42:ARG:HB2    | 6:J:111:DC:H4'    | 1.97                     | 0.47              |
| 5:I:35:DT:O3'     | 5:I:36:DG:C8      | 2.68                     | 0.47              |
| 5:I:67:DA:C2      | 5:I:68:DA:C5      | 3.02                     | 0.47              |
| 5:I:87:DA:H2''    | 5:I:88:DC:C5      | 2.50                     | 0.47              |
| 9:M:3410:ILE:HD11 | 9:M:3462:ARG:HH11 | 1.80                     | 0.47              |
| 1:A:71:VAL:HG21   | 1:A:89:VAL:HG13   | 1.96                     | 0.47              |
| 8:L:118:ILE:HG13  | 8:L:132:ILE:HD11  | 1.97                     | 0.47              |
| 1:A:114:ALA:HB2   | 1:E:113:HIS:CD2   | 2.50                     | 0.46              |
| 9:M:1428:ILE:HA   | 9:M:1431:LEU:HD13 | 1.98                     | 0.46              |
| 1:A:113:HIS:NE2   | 1:E:114:ALA:HB2   | 2.30                     | 0.46              |
| 3:G:11:ARG:HD3    | 5:I:126:DT:H5''   | 1.97                     | 0.46              |
| 6:J:89:DT:H4'     | 6:J:90:DA:H5'     | 1.97                     | 0.46              |
| 7:K:304:ASN:O     | 8:L:288:ASP:O     | 2.34                     | 0.46              |
| 7:K:84:ALA:O      | 7:K:85:VAL:O      | 2.34                     | 0.46              |
| 7:K:430:PRO:HG2   | 8:L:438:LEU:HD23  | 1.96                     | 0.46              |
| 8:L:408:ALA:HB1   | 8:L:419:LEU:HD11  | 1.96                     | 0.46              |
| 9:M:1858:LEU:H    | 9:M:1858:LEU:HD22 | 1.80                     | 0.46              |
| 9:M:2416:LYS:HA   | 9:M:2418:LYS:HE2  | 1.97                     | 0.46              |
| 9:M:3499:ILE:CG1  | 9:M:3529:ILE:HD13 | 2.46                     | 0.46              |
| 1:A:70:LEU:HD13   | 2:B:26:ILE:HA     | 1.97                     | 0.46              |
| 7:K:463:LYS:HA    | 7:K:466:VAL:HG22  | 1.98                     | 0.46              |
| 9:M:3764:VAL:HG21 | 9:M:3941:ASP:OD2  | 2.16                     | 0.46              |
| 9:M:1441:ALA:HB3  | 9:M:1445:ARG:NH1  | 2.31                     | 0.46              |
| 9:M:1646:LEU:C    | 9:M:1646:LEU:HD23 | 2.40                     | 0.46              |
| 9:M:1704:GLY:O    | 9:M:1710:LEU:HD22 | 2.14                     | 0.46              |
| 9:M:1707:LEU:H    | 9:M:1709:GLU:CD   | 2.24                     | 0.46              |
| 9:M:2129:LEU:HD23 | 9:M:2129:LEU:C    | 2.41                     | 0.46              |
| 9:M:3447:VAL:HG23 | 9:M:3448:GLU:N    | 2.31                     | 0.46              |
| 4:H:84:SER:OG     | 6:J:38:DT:H3'     | 2.16                     | 0.46              |
| 5:I:87:DA:C6      | 6:J:67:DG:O6      | 2.68                     | 0.46              |
| 7:K:59:PRO:HA     | 7:K:62:MET:HE3    | 1.97                     | 0.46              |
| 7:K:451:LYS:HD3   | 8:L:415:ASN:O     | 2.16                     | 0.46              |
| 6:J:48:DT:H1'     | 6:J:49:DA:C8      | 2.51                     | 0.46              |
| 9:M:3912:CYS:SG   | 9:M:3961:PHE:CG   | 3.09                     | 0.46              |
| 1:A:71:VAL:HG12   | 1:A:84:PHE:HZ     | 1.81                     | 0.46              |
| 2:B:57:VAL:HG12   | 2:B:61:PHE:CE2    | 2.51                     | 0.46              |
| 3:C:79:ILE:HB     | 3:C:80:PRO:HD2    | 1.97                     | 0.46              |
| 9:M:4112:THR:HG22 | 9:M:4112:THR:O    | 2.15                     | 0.46              |
| 1:A:128:ARG:HB3   | 1:A:134:ARG:HB2   | 1.98                     | 0.46              |
| 7:K:350:PHE:CG    | 8:L:461:MET:HE1   | 2.51                     | 0.46              |
| 8:L:407:VAL:HG12  | 8:L:408:ALA:N     | 2.30                     | 0.46              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 9:M:3895:GLU:CD   | 9:M:3895:GLU:H    | 2.24                     | 0.46              |
| 1:E:67:PHE:CD2    | 1:E:93:GLN:HG2    | 2.50                     | 0.45              |
| 1:E:99:TYR:HE2    | 2:F:61:PHE:CE2    | 2.34                     | 0.45              |
| 1:E:120:MET:C     | 2:F:50:ILE:HD11   | 2.40                     | 0.45              |
| 2:F:83:ALA:O      | 2:F:87:VAL:HG23   | 2.17                     | 0.45              |
| 8:L:247:TRP:HB3   | 8:L:263:ALA:O     | 2.16                     | 0.45              |
| 8:L:397:TYR:O     | 8:L:398:ASP:C     | 2.59                     | 0.45              |
| 7:K:512:GLU:O     | 7:K:516:LYS:HG2   | 2.16                     | 0.45              |
| 8:L:335:SER:O     | 8:L:336:GLU:HG2   | 2.15                     | 0.45              |
| 9:M:2499:PHE:CD1  | 9:M:2499:PHE:C    | 2.94                     | 0.45              |
| 9:M:3416:LEU:HD11 | 9:M:3449:LYS:HZ1  | 1.82                     | 0.45              |
| 1:A:74:ILE:CD1    | 2:B:62:LEU:HD22   | 2.45                     | 0.45              |
| 3:C:104:GLN:O     | 3:C:104:GLN:HG2   | 2.16                     | 0.45              |
| 9:M:1770:GLN:HA   | 9:M:1814:PHE:CZ   | 2.51                     | 0.45              |
| 5:I:21:DA:C8      | 5:I:22:DT:H72     | 2.51                     | 0.45              |
| 6:J:15:DT:C2      | 6:J:16:DG:C6      | 3.04                     | 0.45              |
| 8:L:184:ARG:CD    | 8:L:520:ALA:HB2   | 2.47                     | 0.45              |
| 9:M:3793:VAL:HG13 | 9:M:3803:ILE:CD1  | 2.47                     | 0.45              |
| 9:M:3959:MET:HE3  | 9:M:4124:TRP:CE2  | 2.51                     | 0.45              |
| 1:A:65:LEU:HD23   | 1:A:69:ARG:HH11   | 1.82                     | 0.45              |
| 9:M:424:LEU:C     | 9:M:424:LEU:HD23  | 2.42                     | 0.45              |
| 9:M:3065:ILE:HD13 | 9:M:3089:LEU:HD23 | 1.98                     | 0.45              |
| 9:M:3460:GLU:O    | 9:M:3461:ALA:O    | 2.35                     | 0.45              |
| 9:M:3923:ARG:HA   | 9:M:3923:ARG:CZ   | 2.47                     | 0.45              |
| 1:A:69:ARG:HG2    | 2:B:22:LEU:HA     | 1.99                     | 0.45              |
| 5:I:50:DA:H2''    | 5:I:51:DA:C8      | 2.51                     | 0.45              |
| 7:K:215:LEU:O     | 7:K:216:PHE:C     | 2.59                     | 0.45              |
| 7:K:469:LEU:HD23  | 7:K:517:ARG:HD2   | 1.99                     | 0.45              |
| 8:L:467:ASP:C     | 8:L:469:LYS:H     | 2.24                     | 0.45              |
| 2:B:17:ARG:NH1    | 2:B:21:VAL:HG22   | 2.32                     | 0.45              |
| 3:C:51:LEU:HD21   | 4:D:67:PHE:CE1    | 2.52                     | 0.45              |
| 5:I:25:DG:H1'     | 5:I:26:DA:O4'     | 2.16                     | 0.45              |
| 5:I:46:DG:O3'     | 5:I:47:DA:C8      | 2.69                     | 0.45              |
| 9:M:1717:LEU:C    | 9:M:1717:LEU:HD23 | 2.41                     | 0.45              |
| 9:M:1955:VAL:HG23 | 9:M:1956:PHE:CD2  | 2.52                     | 0.45              |
| 1:A:97:GLU:O      | 1:A:101:VAL:HG23  | 2.17                     | 0.45              |
| 1:E:99:TYR:CE2    | 2:F:61:PHE:CE2    | 3.05                     | 0.45              |
| 6:J:89:DT:H1'     | 6:J:90:DA:C8      | 2.51                     | 0.45              |
| 8:L:32:GLU:HA     | 8:L:35:LYS:HG2    | 1.98                     | 0.45              |
| 9:M:4040:PRO:O    | 9:M:4043:LYS:HG2  | 2.17                     | 0.45              |
| 2:B:80:THR:HG22   | 2:B:81:VAL:O      | 2.17                     | 0.45              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 5:I:136:DC:H2''  | 5:I:137:DG:OP2   | 2.17                     | 0.45              |
| 6:J:111:DC:H2'   | 6:J:112:DT:C7    | 2.47                     | 0.45              |
| 6:J:148:DA:H4'   | 7:K:255:ALA:O    | 2.17                     | 0.45              |
| 8:L:392:ILE:HD12 | 8:L:424:LEU:HD11 | 1.99                     | 0.45              |
| 9:M:639:ALA:C    | 9:M:641:PHE:H    | 2.25                     | 0.45              |
| 9:M:2406:GLU:CD  | 9:M:2406:GLU:H   | 2.25                     | 0.45              |
| 9:M:3833:ARG:HG2 | 9:M:3838:GLU:HB3 | 1.99                     | 0.45              |
| 5:I:51:DA:N6     | 6:J:103:DA:N1    | 2.65                     | 0.45              |
| 5:I:53:DC:C2     | 5:I:54:DC:C5     | 3.05                     | 0.45              |
| 6:J:139:DA:H1'   | 6:J:140:DC:O5'   | 2.17                     | 0.45              |
| 8:L:339:CYS:HB3  | 8:L:340:PHE:CA   | 2.47                     | 0.45              |
| 9:M:3470:GLN:N   | 9:M:3470:GLN:CD  | 2.74                     | 0.45              |
| 9:M:3473:GLU:C   | 9:M:3476:PRO:HD2 | 2.42                     | 0.45              |
| 7:K:349:GLY:HA3  | 8:L:463:LEU:CB   | 2.46                     | 0.44              |
| 8:L:295:TYR:CZ   | 8:L:307:LYS:HB3  | 2.52                     | 0.44              |
| 9:M:1202:ARG:HG2 | 9:M:1207:TRP:HB2 | 1.99                     | 0.44              |
| 1:A:101:VAL:HG22 | 2:B:40:ARG:HB2   | 1.98                     | 0.44              |
| 4:H:30:ARG:CZ    | 6:J:25:DG:H21    | 2.30                     | 0.44              |
| 5:I:93:DG:C8     | 5:I:94:DT:H72    | 2.52                     | 0.44              |
| 5:I:98:DA:H2''   | 5:I:99:DG:C8     | 2.52                     | 0.44              |
| 5:I:130:DC:H2''  | 5:I:131:DG:N7    | 2.32                     | 0.44              |
| 6:J:118:DC:H4'   | 6:J:119:DC:OP1   | 2.17                     | 0.44              |
| 8:L:343:LEU:HG   | 8:L:343:LEU:O    | 2.16                     | 0.44              |
| 3:C:89:ASN:CG    | 3:C:108:LEU:HD11 | 2.42                     | 0.44              |
| 3:G:45:ALA:O     | 3:G:49:VAL:HG23  | 2.18                     | 0.44              |
| 5:I:23:DC:H1'    | 6:J:132:DG:O6    | 2.17                     | 0.44              |
| 9:M:185:HIS:N    | 9:M:186:PRO:HD2  | 2.31                     | 0.44              |
| 9:M:1184:ARG:C   | 9:M:1184:ARG:HD3 | 2.42                     | 0.44              |
| 1:E:104:PHE:HB2  | 2:F:41:GLY:HA3   | 1.98                     | 0.44              |
| 5:I:65:DT:H4'    | 5:I:66:DA:OP1    | 2.18                     | 0.44              |
| 5:I:101:DG:C6    | 5:I:102:DG:C6    | 3.05                     | 0.44              |
| 5:I:111:DC:C2'   | 5:I:112:DT:H71   | 2.48                     | 0.44              |
| 8:L:244:SER:O    | 8:L:245:ILE:O    | 2.35                     | 0.44              |
| 8:L:351:VAL:HG23 | 8:L:355:PHE:CD2  | 2.52                     | 0.44              |
| 9:M:1435:ASN:HB3 | 9:M:1441:ALA:HB2 | 2.00                     | 0.44              |
| 1:A:69:ARG:NH1   | 2:B:20:LYS:HB2   | 2.32                     | 0.44              |
| 2:F:18:HIS:CG    | 2:F:19:ARG:N     | 2.85                     | 0.44              |
| 5:I:102:DG:C4'   | 5:I:103:DT:OP1   | 2.65                     | 0.44              |
| 6:J:38:DT:H1'    | 6:J:39:DA:O4'    | 2.18                     | 0.44              |
| 8:L:267:ILE:HG12 | 8:L:361:VAL:HB   | 1.99                     | 0.44              |
| 8:L:407:VAL:HG23 | 8:L:424:LEU:HD21 | 1.99                     | 0.44              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 9:M:3438:GLU:HG2  | 9:M:3439:LEU:N    | 2.33                     | 0.44              |
| 9:M:3469:LEU:HD12 | 9:M:3502:MET:HE1  | 2.00                     | 0.44              |
| 1:A:121:PRO:HG2   | 2:B:49:LEU:CD2    | 2.48                     | 0.44              |
| 4:D:51:ILE:O      | 5:I:28:DA:H5''    | 2.17                     | 0.44              |
| 1:E:103:LEU:HA    | 1:E:131:ARG:HH12  | 1.83                     | 0.44              |
| 5:I:56:DC:C2      | 6:J:98:DA:N1      | 2.85                     | 0.44              |
| 5:I:57:DT:C2      | 5:I:58:DT:N3      | 2.86                     | 0.44              |
| 6:J:119:DC:H1'    | 6:J:120:DA:C5     | 2.53                     | 0.44              |
| 6:J:136:DT:H2''   | 6:J:137:DA:H8     | 1.82                     | 0.44              |
| 7:K:146:VAL:HG13  | 7:K:147:LEU:N     | 2.33                     | 0.44              |
| 9:M:1633:TRP:CZ2  | 9:M:1674:THR:HG21 | 2.53                     | 0.44              |
| 9:M:1829:TRP:CE3  | 9:M:1879:VAL:HG13 | 2.52                     | 0.44              |
| 9:M:2328:ARG:HA   | 9:M:2371:PHE:CE1  | 2.52                     | 0.44              |
| 9:M:3598:LYS:HG3  | 9:M:3599:THR:HG23 | 1.99                     | 0.44              |
| 1:A:120:MET:HB2   | 1:A:122:LYS:HB3   | 1.99                     | 0.44              |
| 3:C:100:VAL:HG12  | 3:C:101:THR:H     | 1.83                     | 0.44              |
| 6:J:131:DA:C2     | 6:J:132:DG:N7     | 2.85                     | 0.44              |
| 7:K:277:VAL:HG11  | 8:L:357:MET:SD    | 2.57                     | 0.44              |
| 8:L:525:LYS:O     | 8:L:529:PRO:HD2   | 2.18                     | 0.44              |
| 9:M:2269:ASP:CG   | 9:M:2270:ASN:H    | 2.26                     | 0.44              |
| 9:M:3497:SER:HG   | 9:M:3498:TRP:CD1  | 2.36                     | 0.44              |
| 5:I:23:DC:C4      | 6:J:131:DA:N6     | 2.86                     | 0.44              |
| 6:J:27:DT:H1'     | 6:J:28:DC:C5      | 2.52                     | 0.44              |
| 7:K:469:LEU:HD11  | 7:K:518:LEU:HD11  | 1.99                     | 0.44              |
| 8:L:137:ASP:O     | 8:L:166:PRO:HG3   | 2.18                     | 0.44              |
| 9:M:3348:LEU:O    | 9:M:3349:ALA:HB3  | 2.17                     | 0.44              |
| 9:M:3595:GLU:OE1  | 9:M:3606:ILE:HD11 | 2.18                     | 0.44              |
| 2:B:26:ILE:CG1    | 2:B:55:ARG:HB3    | 2.47                     | 0.44              |
| 4:D:58:ILE:HG22   | 4:D:62:PHE:CE2    | 2.52                     | 0.44              |
| 4:D:58:ILE:CG1    | 2:F:99:GLY:HA2    | 2.48                     | 0.44              |
| 4:H:89:ARG:HD2    | 4:H:89:ARG:O      | 2.18                     | 0.44              |
| 5:I:58:DT:H1'     | 5:I:59:DG:O5'     | 2.18                     | 0.44              |
| 5:I:90:DT:C2      | 5:I:91:DG:C5      | 3.06                     | 0.44              |
| 5:I:104:DG:H2''   | 5:I:105:DC:OP2    | 2.18                     | 0.44              |
| 4:D:89:ARG:O      | 4:D:92:GLN:HG3    | 2.17                     | 0.43              |
| 5:I:9:DT:C2       | 5:I:10:DC:C6      | 3.06                     | 0.43              |
| 5:I:55:DC:C2      | 5:I:56:DC:C4      | 3.05                     | 0.43              |
| 6:J:5:DA:C5       | 6:J:6:DG:C6       | 3.06                     | 0.43              |
| 6:J:120:DA:H1'    | 6:J:121:DG:O4'    | 2.18                     | 0.43              |
| 8:L:263:ALA:HA    | 8:L:364:VAL:HA    | 2.00                     | 0.43              |
| 9:M:3918:LEU:HG   | 9:M:3920:ILE:HD11 | 2.00                     | 0.43              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 3:C:97:LEU:HD13   | 4:D:62:PHE:HE1    | 1.83                     | 0.43              |
| 4:D:58:ILE:HG12   | 2:F:99:GLY:HA2    | 2.01                     | 0.43              |
| 1:E:61:LEU:HD12   | 1:E:61:LEU:C      | 2.43                     | 0.43              |
| 5:I:55:DC:H1'     | 5:I:56:DC:C6      | 2.53                     | 0.43              |
| 5:I:148:DT:H2''   | 5:I:149:DC:C5     | 2.54                     | 0.43              |
| 6:J:28:DC:C4      | 6:J:29:DA:C6      | 3.07                     | 0.43              |
| 7:K:482:VAL:HG12  | 8:L:333:TYR:HB3   | 2.00                     | 0.43              |
| 7:K:509:PRO:HA    | 8:L:343:LEU:HD13  | 1.99                     | 0.43              |
| 8:L:409:PHE:O     | 8:L:420:VAL:HG22  | 2.18                     | 0.43              |
| 9:M:1956:PHE:CD1  | 9:M:1960:LYS:HE2  | 2.53                     | 0.43              |
| 3:C:70:ALA:HA     | 3:C:82:HIS:CE1    | 2.54                     | 0.43              |
| 1:E:111:ALA:HB2   | 1:E:123:ASP:OD2   | 2.18                     | 0.43              |
| 2:F:38:ALA:HB1    | 2:F:43:VAL:HB     | 2.00                     | 0.43              |
| 5:I:24:DT:C2      | 5:I:25:DG:N7      | 2.86                     | 0.43              |
| 5:I:102:DG:H4'    | 5:I:103:DT:OP1    | 2.18                     | 0.43              |
| 9:M:1975:LEU:C    | 9:M:1975:LEU:HD23 | 2.42                     | 0.43              |
| 9:M:3465:PHE:N    | 9:M:3466:PRO:CD   | 2.81                     | 0.43              |
| 9:M:3919:GLY:O    | 9:M:3946:PHE:N    | 2.51                     | 0.43              |
| 2:B:26:ILE:HG12   | 2:B:55:ARG:HB3    | 1.99                     | 0.43              |
| 4:H:69:ARG:HG2    | 4:H:98:LEU:HD13   | 2.01                     | 0.43              |
| 5:I:62:DG:H2''    | 5:I:63:DG:C8      | 2.54                     | 0.43              |
| 8:L:395:TYR:O     | 8:L:403:PRO:HA    | 2.18                     | 0.43              |
| 9:M:3073:LEU:HD12 | 9:M:3074:GLN:N    | 2.33                     | 0.43              |
| 9:M:3918:LEU:O    | 9:M:3920:ILE:HD12 | 2.18                     | 0.43              |
| 5:I:58:DT:C2      | 5:I:59:DG:C5      | 3.07                     | 0.43              |
| 5:I:136:DC:H1'    | 5:I:137:DG:O5'    | 2.18                     | 0.43              |
| 7:K:76:ILE:HG21   | 7:K:248:ALA:CB    | 2.48                     | 0.43              |
| 9:M:2484:TYR:CE1  | 9:M:2499:PHE:HB2  | 2.53                     | 0.43              |
| 9:M:3427:GLU:O    | 9:M:3436:SER:HA   | 2.18                     | 0.43              |
| 9:M:3841:ASP:OD1  | 9:M:3842:TRP:N    | 2.52                     | 0.43              |
| 2:B:18:HIS:CD2    | 5:I:64:DT:O4      | 2.71                     | 0.43              |
| 2:B:31:LYS:O      | 2:B:35:ARG:HG3    | 2.19                     | 0.43              |
| 5:I:64:DT:C2'     | 5:I:65:DT:C6      | 3.02                     | 0.43              |
| 7:K:261:LEU:HD13  | 7:K:345:LEU:HB3   | 2.01                     | 0.43              |
| 9:M:1612:LYS:HE2  | 9:M:1612:LYS:HA   | 2.00                     | 0.43              |
| 9:M:2140:LEU:HD12 | 9:M:2140:LEU:H    | 1.82                     | 0.43              |
| 9:M:3462:ARG:O    | 9:M:3462:ARG:HG2  | 2.18                     | 0.43              |
| 3:C:14:ALA:HB3    | 5:I:39:DG:C2      | 2.54                     | 0.43              |
| 4:H:38:VAL:HG21   | 4:H:59:MET:HE2    | 2.01                     | 0.43              |
| 5:I:91:DG:H2''    | 5:I:92:DC:C6      | 2.53                     | 0.43              |
| 9:M:3659:PHE:O    | 9:M:3663:THR:HG23 | 2.18                     | 0.43              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:E:48:LEU:HA     | 1:E:51:ILE:HD12   | 2.01                     | 0.43              |
| 1:E:61:LEU:HD13   | 2:F:36:ARG:CB     | 2.49                     | 0.43              |
| 7:K:59:PRO:HA     | 7:K:62:MET:HG2    | 1.99                     | 0.43              |
| 9:M:3440:GLN:HB2  | 9:M:3443:PRO:HD2  | 2.00                     | 0.43              |
| 9:M:3462:ARG:O    | 9:M:3463:LEU:HB2  | 2.19                     | 0.43              |
| 1:A:39:HIS:CG     | 5:I:152:DG:H1'    | 2.54                     | 0.43              |
| 4:D:84:SER:N      | 5:I:48:DG:OP1     | 2.52                     | 0.43              |
| 8:L:41:PHE:O      | 8:L:45:GLN:HG2    | 2.18                     | 0.43              |
| 8:L:183:PHE:HB2   | 8:L:190:PRO:O     | 2.19                     | 0.43              |
| 8:L:408:ALA:C     | 8:L:419:LEU:HD11  | 2.44                     | 0.43              |
| 9:M:1356:TRP:CH2  | 9:M:1357:LYS:HE3  | 2.54                     | 0.43              |
| 9:M:3960:PRO:HD2  | 9:M:4110:GLN:OE1  | 2.18                     | 0.43              |
| 1:A:61:LEU:HD13   | 2:B:36:ARG:HB3    | 2.00                     | 0.43              |
| 5:I:33:DC:H2''    | 5:I:34:DC:C5      | 2.54                     | 0.43              |
| 5:I:130:DC:H1'    | 5:I:131:DG:N7     | 2.33                     | 0.43              |
| 6:J:21:DG:H2''    | 6:J:22:DG:H8      | 1.84                     | 0.43              |
| 8:L:247:TRP:HE1   | 8:L:249:CYS:CB    | 2.32                     | 0.43              |
| 9:M:1710:LEU:HD23 | 9:M:1711:ARG:H    | 1.83                     | 0.43              |
| 4:D:89:ARG:HA     | 4:D:92:GLN:HG3    | 2.00                     | 0.42              |
| 5:I:38:DA:C2      | 5:I:39:DG:N1      | 2.87                     | 0.42              |
| 6:J:52:DA:C4      | 6:J:53:DC:C6      | 3.07                     | 0.42              |
| 7:K:296:VAL:HG21  | 8:L:310:ILE:HD12  | 2.01                     | 0.42              |
| 7:K:426:GLN:O     | 8:L:434:MET:SD    | 2.77                     | 0.42              |
| 8:L:249:CYS:CB    | 8:L:261:ILE:HG23  | 2.49                     | 0.42              |
| 8:L:324:SER:O     | 8:L:325:LYS:HB3   | 2.19                     | 0.42              |
| 9:M:3608:LYS:O    | 9:M:3609:MET:C    | 2.61                     | 0.42              |
| 2:F:73:THR:HG22   | 2:F:78:ARG:O      | 2.18                     | 0.42              |
| 7:K:37:SER:OG     | 7:K:108:LEU:HD22  | 2.19                     | 0.42              |
| 7:K:38:LEU:O      | 7:K:83:LEU:HD23   | 2.19                     | 0.42              |
| 7:K:146:VAL:HG13  | 7:K:147:LEU:H     | 1.84                     | 0.42              |
| 9:M:3767:LEU:HD12 | 9:M:3771:MET:HE2  | 2.00                     | 0.42              |
| 3:C:100:VAL:HG12  | 3:C:101:THR:N     | 2.34                     | 0.42              |
| 4:H:106:HIS:O     | 4:H:107:ALA:C     | 2.60                     | 0.42              |
| 5:I:57:DT:O2      | 6:J:98:DA:C2      | 2.72                     | 0.42              |
| 5:I:92:DC:H2''    | 5:I:93:DG:H8      | 1.84                     | 0.42              |
| 5:I:97:DA:H2''    | 5:I:98:DA:O4'     | 2.20                     | 0.42              |
| 5:I:152:DG:N2     | 6:J:2:DT:H3       | 2.17                     | 0.42              |
| 6:J:20:DA:C2'     | 6:J:21:DG:OP2     | 2.68                     | 0.42              |
| 7:K:490:LEU:HB3   | 8:L:316:TYR:CD1   | 2.54                     | 0.42              |
| 8:L:264:TYR:O     | 8:L:362:LEU:HD12  | 2.18                     | 0.42              |
| 9:M:2327:LEU:HD12 | 9:M:2374:LEU:HD22 | 2.02                     | 0.42              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 9:M:2383:PHE:CZ   | 9:M:2408:MET:HE2  | 2.54                     | 0.42              |
| 5:I:15:DG:C6      | 6:J:141:DA:N1     | 2.87                     | 0.42              |
| 5:I:40:DA:H2''    | 5:I:41:DC:C6      | 2.53                     | 0.42              |
| 5:I:102:DG:H2''   | 5:I:103:DT:H71    | 2.00                     | 0.42              |
| 6:J:40:DG:C6      | 6:J:41:DA:C6      | 3.07                     | 0.42              |
| 6:J:97:DA:H1'     | 6:J:98:DA:H5'     | 2.02                     | 0.42              |
| 9:M:3454:LEU:HD11 | 9:M:3471:ILE:HG21 | 2.01                     | 0.42              |
| 9:M:3595:GLU:O    | 9:M:3602:ASN:HB3  | 2.19                     | 0.42              |
| 3:G:16:THR:HA     | 6:J:30:DA:OP1     | 2.18                     | 0.42              |
| 5:I:48:DG:O6      | 6:J:106:DA:N6     | 2.53                     | 0.42              |
| 7:K:349:GLY:HA3   | 8:L:463:LEU:HB2   | 2.02                     | 0.42              |
| 7:K:499:GLU:CB    | 7:K:500:PRO:HD2   | 2.50                     | 0.42              |
| 9:M:3461:ALA:O    | 9:M:3464:LYS:HE2  | 2.19                     | 0.42              |
| 2:B:84:MET:HE2    | 2:B:88:TYR:OH     | 2.19                     | 0.42              |
| 3:G:118:LYS:HD2   | 3:G:118:LYS:O     | 2.19                     | 0.42              |
| 5:I:32:DG:H2''    | 5:I:33:DC:C6      | 2.55                     | 0.42              |
| 5:I:131:DG:O6     | 6:J:23:DC:N4      | 2.53                     | 0.42              |
| 7:K:76:ILE:HG21   | 7:K:248:ALA:HB2   | 2.00                     | 0.42              |
| 7:K:118:GLU:O     | 7:K:121:GLN:HG2   | 2.19                     | 0.42              |
| 7:K:209:GLY:HA3   | 7:K:212:ASP:HB3   | 2.02                     | 0.42              |
| 1:A:107:THR:HG23  | 1:A:123:ASP:HB2   | 2.01                     | 0.42              |
| 5:I:21:DA:N3      | 6:J:134:DT:O4     | 2.52                     | 0.42              |
| 8:L:245:ILE:O     | 8:L:245:ILE:HG23  | 2.19                     | 0.42              |
| 8:L:442:LYS:HG3   | 8:L:443:LYS:H     | 1.84                     | 0.42              |
| 8:L:460:SER:HB2   | 8:L:525:LYS:HB3   | 2.00                     | 0.42              |
| 8:L:465:LYS:HD2   | 8:L:521:GLU:OE2   | 2.19                     | 0.42              |
| 9:M:793:LEU:N     | 9:M:794:PRO:HD2   | 2.34                     | 0.42              |
| 9:M:1672:PHE:CZ   | 9:M:1704:GLY:HA2  | 2.55                     | 0.42              |
| 9:M:2171:LEU:C    | 9:M:2173:ALA:H    | 2.28                     | 0.42              |
| 9:M:3619:ASP:OD1  | 9:M:3622:ALA:HB2  | 2.20                     | 0.42              |
| 9:M:3959:MET:HA   | 9:M:4110:GLN:NE2  | 2.35                     | 0.42              |
| 9:M:4001:THR:O    | 9:M:4004:VAL:HG12 | 2.20                     | 0.42              |
| 5:I:97:DA:C2'     | 5:I:98:DA:O4'     | 2.68                     | 0.42              |
| 5:I:102:DG:C4     | 5:I:103:DT:C5     | 3.08                     | 0.42              |
| 5:I:141:DC:C4     | 5:I:142:DC:C4     | 3.08                     | 0.42              |
| 9:M:1202:ARG:CG   | 9:M:1207:TRP:HB2  | 2.50                     | 0.42              |
| 2:B:68:ASP:HA     | 4:D:97:LEU:HD23   | 2.01                     | 0.42              |
| 1:E:119:ILE:HD13  | 2:F:43:VAL:CG2    | 2.50                     | 0.42              |
| 2:F:46:ILE:HG22   | 2:F:47:SER:O      | 2.20                     | 0.42              |
| 6:J:24:DC:C2      | 6:J:25:DG:C6      | 3.08                     | 0.42              |
| 9:M:524:TYR:CG    | 9:M:525:LYS:N     | 2.88                     | 0.42              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 9:M:3622:ALA:N    | 9:M:3623:PRO:HD2  | 2.34                     | 0.42              |
| 9:M:3855:TYR:C    | 9:M:3857:LEU:N    | 2.77                     | 0.42              |
| 9:M:4039:TYR:CE2  | 9:M:4041:ARG:HB2  | 2.55                     | 0.42              |
| 1:A:83:ARG:HB2    | 2:B:80:THR:OG1    | 2.20                     | 0.42              |
| 3:C:59:THR:HG23   | 4:D:59:MET:HE2    | 2.01                     | 0.42              |
| 5:I:43:DA:H2''    | 5:I:44:DG:C8      | 2.55                     | 0.42              |
| 5:I:130:DC:H1'    | 5:I:131:DG:C8     | 2.55                     | 0.42              |
| 6:J:4:DG:H1'      | 6:J:5:DA:C8       | 2.55                     | 0.42              |
| 6:J:60:DA:C2      | 6:J:61:DA:C4      | 3.08                     | 0.42              |
| 7:K:274:TYR:CZ    | 8:L:435:PHE:HZ    | 2.38                     | 0.42              |
| 8:L:478:PRO:O     | 8:L:482:ILE:HG12  | 2.20                     | 0.42              |
| 3:C:47:ALA:HA     | 4:D:91:ILE:HD12   | 2.01                     | 0.41              |
| 5:I:19:DA:OP1     | 8:L:399:LYS:HD2   | 2.19                     | 0.41              |
| 5:I:26:DA:H1'     | 5:I:27:DC:C5      | 2.54                     | 0.41              |
| 5:I:58:DT:H2''    | 5:I:59:DG:C8      | 2.55                     | 0.41              |
| 6:J:69:DA:H2''    | 6:J:70:DC:O5'     | 2.20                     | 0.41              |
| 9:M:290:TYR:CD2   | 9:M:291:VAL:N     | 2.88                     | 0.41              |
| 9:M:3160:LEU:C    | 9:M:3160:LEU:HD23 | 2.45                     | 0.41              |
| 9:M:3665:MET:HG3  | 9:M:3666:LEU:N    | 2.36                     | 0.41              |
| 1:A:68:GLN:HA     | 1:A:89:VAL:HG11   | 2.01                     | 0.41              |
| 1:E:66:PRO:HG3    | 5:I:99:DG:OP1     | 2.19                     | 0.41              |
| 1:E:83:ARG:CD     | 2:F:79:LYS:HZ3    | 2.33                     | 0.41              |
| 5:I:14:DT:H1'     | 5:I:15:DG:N1      | 2.35                     | 0.41              |
| 5:I:59:DG:N2      | 6:J:97:DA:C4      | 2.88                     | 0.41              |
| 6:J:27:DT:H1'     | 6:J:28:DC:C4      | 2.54                     | 0.41              |
| 6:J:123:DC:C2     | 6:J:124:DA:C5     | 3.08                     | 0.41              |
| 7:K:522:VAL:HG13  | 7:K:523:ASP:N     | 2.34                     | 0.41              |
| 8:L:165:LEU:HD22  | 8:L:169:LEU:CD1   | 2.50                     | 0.41              |
| 9:M:1147:LYS:HE2  | 9:M:1164:CYS:HB2  | 2.02                     | 0.41              |
| 9:M:1802:TYR:CZ   | 9:M:1806:ARG:HD2  | 2.56                     | 0.41              |
| 9:M:3467:ARG:HG3  | 9:M:3471:ILE:HD12 | 2.02                     | 0.41              |
| 9:M:3758:LEU:HD12 | 9:M:3758:LEU:C    | 2.45                     | 0.41              |
| 9:M:3758:LEU:HD21 | 9:M:3801:GLY:HA3  | 2.02                     | 0.41              |
| 9:M:3761:ASP:HA   | 9:M:3764:VAL:HG12 | 2.01                     | 0.41              |
| 5:I:29:DC:H2''    | 5:I:30:DG:OP2     | 2.21                     | 0.41              |
| 6:J:52:DA:N3      | 6:J:53:DC:C6      | 2.88                     | 0.41              |
| 6:J:59:DA:C2      | 6:J:60:DA:C4      | 3.08                     | 0.41              |
| 6:J:68:DT:H2''    | 6:J:69:DA:C8      | 2.55                     | 0.41              |
| 6:J:119:DC:H4'    | 6:J:120:DA:OP1    | 2.19                     | 0.41              |
| 9:M:699:GLU:CD    | 9:M:699:GLU:H     | 2.28                     | 0.41              |
| 7:K:123:LYS:O     | 7:K:127:GLY:HA3   | 2.19                     | 0.41              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 9:M:246:ARG:HA    | 9:M:249:PHE:CE1   | 2.55                     | 0.41              |
| 9:M:643:GLU:CD    | 9:M:643:GLU:H     | 2.28                     | 0.41              |
| 5:I:21:DA:H1'     | 6:J:135:DA:C2     | 2.56                     | 0.41              |
| 7:K:200:LEU:HD21  | 7:K:220:ILE:O     | 2.21                     | 0.41              |
| 8:L:279:VAL:HG11  | 8:L:284:LEU:HD13  | 2.03                     | 0.41              |
| 8:L:368:ARG:HD3   | 8:L:369:ASP:H     | 1.86                     | 0.41              |
| 8:L:467:ASP:O     | 8:L:468:GLU:CG    | 2.68                     | 0.41              |
| 9:M:1956:PHE:CD1  | 9:M:1960:LYS:CE   | 3.04                     | 0.41              |
| 9:M:3030:ILE:O    | 9:M:3031:TRP:HB2  | 2.21                     | 0.41              |
| 2:B:84:MET:O      | 2:B:88:TYR:CD1    | 2.74                     | 0.41              |
| 3:C:41:GLU:OE1    | 4:D:84:SER:HB2    | 2.20                     | 0.41              |
| 6:J:147:DT:H4'    | 6:J:148:DA:OP1    | 2.20                     | 0.41              |
| 7:K:350:PHE:CD1   | 7:K:396:ALA:HA    | 2.55                     | 0.41              |
| 9:M:290:TYR:CG    | 9:M:291:VAL:N     | 2.89                     | 0.41              |
| 9:M:1772:HIS:HD1  | 9:M:1774:MET:H    | 1.67                     | 0.41              |
| 9:M:3551:ASN:OD1  | 9:M:3551:ASN:C    | 2.64                     | 0.41              |
| 9:M:3957:GLU:OE1  | 9:M:3959:MET:O    | 2.38                     | 0.41              |
| 3:C:79:ILE:HG12   | 3:C:82:HIS:CE1    | 2.56                     | 0.41              |
| 3:C:80:PRO:HB3    | 4:D:58:ILE:CD1    | 2.50                     | 0.41              |
| 5:I:11:DG:C4      | 5:I:12:DG:N7      | 2.89                     | 0.41              |
| 5:I:103:DT:C2     | 5:I:104:DG:C8     | 3.09                     | 0.41              |
| 6:J:16:DG:H1'     | 6:J:17:DC:C2      | 2.55                     | 0.41              |
| 6:J:126:DG:H2''   | 6:J:127:DT:OP2    | 2.21                     | 0.41              |
| 8:L:247:TRP:CD1   | 8:L:249:CYS:HB2   | 2.55                     | 0.41              |
| 8:L:325:LYS:HG2   | 8:L:329:GLU:OE1   | 2.21                     | 0.41              |
| 8:L:382:HIS:HA    | 8:L:385:ASP:OD1   | 2.21                     | 0.41              |
| 9:M:320:LEU:HA    | 9:M:323:VAL:HG12  | 2.02                     | 0.41              |
| 9:M:1181:THR:HA   | 9:M:1184:ARG:HB3  | 2.03                     | 0.41              |
| 9:M:1624:GLN:HA   | 9:M:1626:TRP:CD1  | 2.55                     | 0.41              |
| 9:M:2257:PHE:HA   | 9:M:2260:PHE:CD2  | 2.55                     | 0.41              |
| 9:M:3457:ASN:HB3  | 9:M:3464:LYS:HG2  | 2.03                     | 0.41              |
| 9:M:3623:PRO:HB3  | 9:M:3633:ILE:CD1  | 2.51                     | 0.41              |
| 9:M:4121:TRP:CD2  | 9:M:4122:GLU:O    | 2.74                     | 0.41              |
| 7:K:67:ILE:O      | 7:K:70:VAL:HG12   | 2.21                     | 0.41              |
| 7:K:290:ARG:HB2   | 8:L:309:ASP:O     | 2.21                     | 0.41              |
| 8:L:339:CYS:CB    | 8:L:340:PHE:CA    | 2.97                     | 0.41              |
| 9:M:1633:TRP:CD2  | 9:M:1674:THR:HG21 | 2.55                     | 0.41              |
| 9:M:3110:PHE:CD1  | 9:M:3110:PHE:C    | 2.99                     | 0.41              |
| 9:M:3962:ARG:HH11 | 9:M:3964:THR:HG21 | 1.85                     | 0.41              |
| 1:A:121:PRO:HA    | 1:A:124:ILE:HB    | 2.02                     | 0.41              |
| 2:B:80:THR:OG1    | 6:J:101:DG:H5'    | 2.21                     | 0.41              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 3:C:69:ALA:HB3    | 3:C:82:HIS:HB3    | 2.02                     | 0.41              |
| 1:E:62:ILE:HG22   | 1:E:63:ARG:N      | 2.36                     | 0.41              |
| 1:E:121:PRO:HG3   | 2:F:49:LEU:HD22   | 2.02                     | 0.41              |
| 5:I:27:DC:H2''    | 5:I:28:DA:H5'     | 2.02                     | 0.41              |
| 5:I:28:DA:H4'     | 5:I:29:DC:OP1     | 2.21                     | 0.41              |
| 5:I:30:DG:H2''    | 5:I:31:DT:OP2     | 2.20                     | 0.41              |
| 5:I:57:DT:N3      | 6:J:98:DA:C6      | 2.88                     | 0.41              |
| 5:I:64:DT:H2''    | 5:I:65:DT:O5'     | 2.21                     | 0.41              |
| 6:J:112:DT:C2     | 6:J:113:DA:N7     | 2.89                     | 0.41              |
| 6:J:142:DT:H2'    | 6:J:143:DC:C6     | 2.56                     | 0.41              |
| 8:L:26:GLY:O      | 8:L:27:ILE:HB     | 2.20                     | 0.41              |
| 9:M:2813:PHE:CE2  | 9:M:2861:ILE:HG23 | 2.56                     | 0.41              |
| 9:M:3065:ILE:HD13 | 9:M:3089:LEU:CD2  | 2.51                     | 0.41              |
| 9:M:3084:GLN:NE2  | 9:M:3088:LEU:HD23 | 2.35                     | 0.41              |
| 9:M:3421:ASP:O    | 9:M:3425:ARG:HG2  | 2.20                     | 0.41              |
| 9:M:3460:GLU:O    | 9:M:3462:ARG:NH2  | 2.54                     | 0.41              |
| 9:M:3506:LEU:HA   | 9:M:3511:ALA:HB1  | 2.03                     | 0.41              |
| 9:M:3663:THR:O    | 9:M:3664:ASN:C    | 2.63                     | 0.41              |
| 9:M:3758:LEU:HD13 | 9:M:3793:VAL:CG1  | 2.50                     | 0.41              |
| 9:M:3916:TRP:HB2  | 9:M:3961:PHE:HE1  | 1.85                     | 0.41              |
| 5:I:19:DA:C5      | 5:I:20:DT:C4      | 3.09                     | 0.41              |
| 7:K:369:TYR:CG    | 7:K:370:PRO:HD2   | 2.56                     | 0.41              |
| 7:K:459:VAL:HG12  | 8:L:379:SER:O     | 2.21                     | 0.41              |
| 9:M:3743:HIS:CG   | 9:M:3744:ASP:N    | 2.88                     | 0.41              |
| 2:B:30:THR:HG21   | 5:I:69:DA:C3'     | 2.50                     | 0.40              |
| 2:B:92:ARG:NH2    | 4:D:80:TYR:OH     | 2.54                     | 0.40              |
| 5:I:98:DA:H2''    | 5:I:99:DG:N7      | 2.36                     | 0.40              |
| 6:J:34:DG:H2''    | 6:J:35:DT:H71     | 2.03                     | 0.40              |
| 6:J:42:DC:H2''    | 6:J:43:DA:OP2     | 2.21                     | 0.40              |
| 6:J:124:DA:H2''   | 6:J:125:DC:C6     | 2.56                     | 0.40              |
| 6:J:150:DC:H2''   | 6:J:151:DG:O5'    | 2.21                     | 0.40              |
| 7:K:529:VAL:HG23  | 7:K:530:TYR:H     | 1.86                     | 0.40              |
| 8:L:167:PHE:CE2   | 8:L:191:SER:O     | 2.75                     | 0.40              |
| 8:L:357:MET:HG2   | 8:L:357:MET:O     | 2.21                     | 0.40              |
| 9:M:580:ASP:C     | 9:M:581:LEU:HD22  | 2.46                     | 0.40              |
| 9:M:1663:THR:HG22 | 9:M:1665:HIS:CE1  | 2.56                     | 0.40              |
| 9:M:1920:TYR:HA   | 9:M:1923:PHE:CE1  | 2.57                     | 0.40              |
| 9:M:2224:PHE:HA   | 9:M:2231:PHE:CE1  | 2.56                     | 0.40              |
| 9:M:3534:ILE:O    | 9:M:3538:GLU:HG3  | 2.21                     | 0.40              |
| 9:M:3995:PRO:O    | 9:M:3996:GLY:C    | 2.63                     | 0.40              |
| 1:E:104:PHE:CB    | 2:F:41:GLY:HA3    | 2.51                     | 0.40              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 3:G:11:ARG:HD2    | 5:I:126:DT:H4'    | 2.03                     | 0.40              |
| 3:G:17:ARG:NH2    | 6:J:30:DA:H3'     | 2.33                     | 0.40              |
| 3:G:92:GLU:OE1    | 4:H:103:LEU:HG    | 2.22                     | 0.40              |
| 5:I:127:DG:H2''   | 5:I:128:DA:C8     | 2.57                     | 0.40              |
| 6:J:50:DG:C4      | 6:J:51:DC:C5      | 3.10                     | 0.40              |
| 6:J:63:DG:H2''    | 6:J:64:DC:OP2     | 2.21                     | 0.40              |
| 8:L:163:PHE:H     | 8:L:224:ILE:HG22  | 1.85                     | 0.40              |
| 5:I:53:DC:H2''    | 5:I:54:DC:C6      | 2.56                     | 0.40              |
| 5:I:87:DA:C2      | 6:J:69:DA:C2      | 3.10                     | 0.40              |
| 6:J:139:DA:H4'    | 8:L:401:ALA:HB2   | 2.02                     | 0.40              |
| 6:J:150:DC:H4'    | 6:J:151:DG:OP1    | 2.21                     | 0.40              |
| 8:L:24:ILE:HG13   | 8:L:24:ILE:O      | 2.20                     | 0.40              |
| 8:L:188:HIS:HD1   | 8:L:477:PHE:HD1   | 1.66                     | 0.40              |
| 8:L:249:CYS:SG    | 8:L:261:ILE:CG2   | 3.10                     | 0.40              |
| 9:M:1366:THR:HA   | 9:M:1369:MET:HG2  | 2.03                     | 0.40              |
| 9:M:1965:PHE:HA   | 9:M:1971:PRO:HG2  | 2.02                     | 0.40              |
| 9:M:2424:MET:HE3  | 9:M:2435:CYS:SG   | 2.62                     | 0.40              |
| 3:C:55:LEU:HD11   | 4:D:63:VAL:CG1    | 2.50                     | 0.40              |
| 3:C:74:LYS:HD3    | 3:C:74:LYS:O      | 2.22                     | 0.40              |
| 3:C:88:ARG:HB2    | 3:C:108:LEU:HD12  | 2.02                     | 0.40              |
| 4:D:62:PHE:CE1    | 2:F:98:TYR:CE2    | 3.09                     | 0.40              |
| 5:I:25:DG:O5'     | 5:I:25:DG:C8      | 2.74                     | 0.40              |
| 6:J:21:DG:C6      | 6:J:22:DG:C6      | 3.09                     | 0.40              |
| 7:K:452:ILE:CG2   | 8:L:375:VAL:HG12  | 2.51                     | 0.40              |
| 9:M:175:TYR:HB3   | 9:M:226:GLY:CA    | 2.51                     | 0.40              |
| 9:M:1206:LEU:HD22 | 9:M:1206:LEU:N    | 2.36                     | 0.40              |
| 9:M:3427:GLU:OE1  | 9:M:3433:VAL:HG23 | 2.21                     | 0.40              |
| 9:M:3849:LYS:HG3  | 9:M:3854:ALA:HB2  | 2.02                     | 0.40              |
| 1:E:81:ASP:O      | 2:F:79:LYS:HD3    | 2.21                     | 0.40              |
| 2:F:18:HIS:CG     | 2:F:19:ARG:H      | 2.39                     | 0.40              |
| 5:I:3:DT:H1'      | 6:J:152:DA:C2     | 2.57                     | 0.40              |
| 5:I:110:DG:H2''   | 5:I:111:DC:H6     | 1.86                     | 0.40              |
| 5:I:148:DT:H2'    | 5:I:148:DT:O5'    | 2.22                     | 0.40              |
| 6:J:62:DC:N3      | 6:J:63:DG:C6      | 2.89                     | 0.40              |
| 8:L:20:MET:HG3    | 8:L:31:PHE:HB2    | 2.03                     | 0.40              |
| 9:M:1256:TRP:CH2  | 9:M:1296:PHE:CE2  | 3.10                     | 0.40              |
| 9:M:1702:LEU:C    | 9:M:1702:LEU:HD23 | 2.46                     | 0.40              |
| 9:M:1973:LYS:O    | 9:M:1973:LYS:HE2  | 2.22                     | 0.40              |
| 9:M:3360:LEU:HD21 | 9:M:3368:GLU:HG2  | 2.03                     | 0.40              |
| 9:M:3861:GLY:O    | 9:M:3862:ALA:HB3  | 2.22                     | 0.40              |
| 9:M:4073:ALA:O    | 9:M:4077:TYR:CE2  | 2.75                     | 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     | 110/112 (98%)   | 102 (93%)  | 6 (6%)    | 2 (2%)   | 6           | 34  |
| 1   | E     | 88/112 (79%)    | 85 (97%)   | 3 (3%)    | 0        | 100         | 100 |
| 2   | B     | 84/87 (97%)     | 79 (94%)   | 5 (6%)    | 0        | 100         | 100 |
| 2   | F     | 84/87 (97%)     | 77 (92%)   | 7 (8%)    | 0        | 100         | 100 |
| 3   | C     | 101/111 (91%)   | 91 (90%)   | 10 (10%)  | 0        | 100         | 100 |
| 3   | G     | 109/111 (98%)   | 103 (94%)  | 6 (6%)    | 0        | 100         | 100 |
| 4   | D     | 94/96 (98%)     | 90 (96%)   | 4 (4%)    | 0        | 100         | 100 |
| 4   | H     | 93/96 (97%)     | 88 (95%)   | 5 (5%)    | 0        | 100         | 100 |
| 7   | K     | 486/609 (80%)   | 423 (87%)  | 58 (12%)  | 5 (1%)   | 12          | 45  |
| 8   | L     | 529/732 (72%)   | 455 (86%)  | 68 (13%)  | 6 (1%)   | 11          | 43  |
| 9   | M     | 3632/4128 (88%) | 3138 (86%) | 427 (12%) | 67 (2%)  | 6           | 34  |
| All | All   | 5410/6281 (86%) | 4731 (87%) | 599 (11%) | 80 (2%)  | 11          | 37  |

All (80) Ramachandran outliers are listed below:

| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | A     | 35   | VAL  |
| 1   | A     | 39   | HIS  |
| 7   | K     | 85   | VAL  |
| 7   | K     | 216  | PHE  |
| 8   | L     | 320  | ILE  |
| 9   | M     | 186  | PRO  |
| 9   | M     | 266  | ALA  |
| 9   | M     | 1479 | VAL  |
| 9   | M     | 1551 | ILE  |
| 9   | M     | 2169 | LEU  |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 9   | M     | 2272 | VAL  |
| 9   | M     | 2429 | ASP  |
| 9   | M     | 2485 | ARG  |
| 9   | M     | 2495 | SER  |
| 9   | M     | 2781 | PRO  |
| 7   | K     | 477  | SER  |
| 8   | L     | 27   | ILE  |
| 8   | L     | 245  | ILE  |
| 8   | L     | 442  | LYS  |
| 9   | M     | 119  | ARG  |
| 9   | M     | 189  | MET  |
| 9   | M     | 263  | LYS  |
| 9   | M     | 640  | GLU  |
| 9   | M     | 947  | GLN  |
| 9   | M     | 1306 | ILE  |
| 9   | M     | 1423 | ILE  |
| 9   | M     | 1438 | GLY  |
| 9   | M     | 2175 | GLU  |
| 9   | M     | 2359 | LYS  |
| 9   | M     | 2360 | PHE  |
| 9   | M     | 2411 | LEU  |
| 9   | M     | 2583 | GLU  |
| 9   | M     | 2821 | ASP  |
| 9   | M     | 3461 | ALA  |
| 7   | K     | 144  | SER  |
| 8   | L     | 256  | ASN  |
| 8   | L     | 299  | ASP  |
| 9   | M     | 25   | CYS  |
| 9   | M     | 192  | ASN  |
| 9   | M     | 354  | SER  |
| 9   | M     | 373  | CYS  |
| 9   | M     | 873  | VAL  |
| 9   | M     | 1157 | PHE  |
| 9   | M     | 1288 | SER  |
| 9   | M     | 1474 | ASP  |
| 9   | M     | 1775 | GLU  |
| 9   | M     | 1907 | GLU  |
| 9   | M     | 2087 | GLU  |
| 9   | M     | 2172 | ALA  |
| 9   | M     | 2287 | PRO  |
| 9   | M     | 2369 | LYS  |
| 9   | M     | 2467 | THR  |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 9   | M     | 872  | THR  |
| 9   | M     | 958  | MET  |
| 9   | M     | 1470 | SER  |
| 9   | M     | 1934 | LEU  |
| 9   | M     | 2155 | GLU  |
| 9   | M     | 2247 | ASP  |
| 9   | M     | 2310 | VAL  |
| 9   | M     | 2321 | GLU  |
| 9   | M     | 2389 | PHE  |
| 9   | M     | 2493 | ASN  |
| 9   | M     | 2528 | GLU  |
| 9   | M     | 3979 | LEU  |
| 7   | K     | 145  | GLU  |
| 9   | M     | 283  | SER  |
| 9   | M     | 291  | VAL  |
| 9   | M     | 559  | SER  |
| 9   | M     | 1655 | ILE  |
| 9   | M     | 2269 | ASP  |
| 9   | M     | 2489 | SER  |
| 9   | M     | 2780 | LEU  |
| 9   | M     | 187  | SER  |
| 9   | M     | 1289 | SER  |
| 9   | M     | 1498 | GLN  |
| 9   | M     | 2206 | PRO  |
| 9   | M     | 2530 | ARG  |
| 9   | M     | 1226 | GLY  |
| 9   | M     | 371  | GLY  |
| 9   | M     | 3530 | VAL  |

### 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     | 93/93 (100%) | 89 (96%)  | 4 (4%)   | 26          | 49  |
| 1   | E     | 79/93 (85%)  | 79 (100%) | 0        | 100         | 100 |
| 2   | B     | 72/72 (100%) | 71 (99%)  | 1 (1%)   | 59          | 70  |

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| Mol | Chain | Analysed        | Rotameric  | Outliers | Percentiles |     |
|-----|-------|-----------------|------------|----------|-------------|-----|
| 2   | F     | 71/72 (99%)     | 71 (100%)  | 0        | 100         | 100 |
| 3   | C     | 79/88 (90%)     | 79 (100%)  | 0        | 100         | 100 |
| 3   | G     | 88/88 (100%)    | 88 (100%)  | 0        | 100         | 100 |
| 4   | D     | 82/82 (100%)    | 82 (100%)  | 0        | 100         | 100 |
| 4   | H     | 81/82 (99%)     | 81 (100%)  | 0        | 100         | 100 |
| 7   | K     | 444/548 (81%)   | 442 (100%) | 2 (0%)   | 81          | 81  |
| 8   | L     | 481/649 (74%)   | 481 (100%) | 0        | 100         | 100 |
| 9   | M     | 3266/3671 (89%) | 3137 (96%) | 129 (4%) | 28          | 52  |
| All | All   | 4836/5538 (87%) | 4700 (97%) | 136 (3%) | 38          | 59  |

All (136) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | A     | 26  | ARG  |
| 1   | A     | 39  | HIS  |
| 1   | A     | 45  | THR  |
| 1   | A     | 54  | TYR  |
| 2   | B     | 46  | ILE  |
| 7   | K     | 97  | VAL  |
| 7   | K     | 327 | ILE  |
| 9   | M     | 35  | ILE  |
| 9   | M     | 60  | SER  |
| 9   | M     | 63  | PHE  |
| 9   | M     | 118 | ASP  |
| 9   | M     | 133 | LYS  |
| 9   | M     | 144 | MET  |
| 9   | M     | 148 | LYS  |
| 9   | M     | 151 | GLU  |
| 9   | M     | 162 | LEU  |
| 9   | M     | 169 | THR  |
| 9   | M     | 172 | GLU  |
| 9   | M     | 184 | VAL  |
| 9   | M     | 191 | ASN  |
| 9   | M     | 239 | GLU  |
| 9   | M     | 248 | ILE  |
| 9   | M     | 282 | PHE  |
| 9   | M     | 289 | ASN  |
| 9   | M     | 291 | VAL  |
| 9   | M     | 322 | GLN  |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 9   | M     | 323  | VAL  |
| 9   | M     | 340  | TYR  |
| 9   | M     | 352  | VAL  |
| 9   | M     | 377  | ASN  |
| 9   | M     | 379  | LYS  |
| 9   | M     | 402  | THR  |
| 9   | M     | 410  | MET  |
| 9   | M     | 414  | LEU  |
| 9   | M     | 561  | ASN  |
| 9   | M     | 583  | LEU  |
| 9   | M     | 584  | GLU  |
| 9   | M     | 636  | GLU  |
| 9   | M     | 699  | GLU  |
| 9   | M     | 748  | TYR  |
| 9   | M     | 961  | LEU  |
| 9   | M     | 990  | GLN  |
| 9   | M     | 1044 | ILE  |
| 9   | M     | 1091 | GLU  |
| 9   | M     | 1092 | GLU  |
| 9   | M     | 1097 | GLU  |
| 9   | M     | 1124 | ILE  |
| 9   | M     | 1137 | ILE  |
| 9   | M     | 1184 | ARG  |
| 9   | M     | 1250 | LEU  |
| 9   | M     | 1268 | ASN  |
| 9   | M     | 1341 | ILE  |
| 9   | M     | 1349 | LEU  |
| 9   | M     | 1369 | MET  |
| 9   | M     | 1372 | LEU  |
| 9   | M     | 1392 | MET  |
| 9   | M     | 1395 | LEU  |
| 9   | M     | 1415 | LEU  |
| 9   | M     | 1437 | TYR  |
| 9   | M     | 1448 | LEU  |
| 9   | M     | 1486 | LEU  |
| 9   | M     | 1489 | LYS  |
| 9   | M     | 1498 | GLN  |
| 9   | M     | 1514 | LEU  |
| 9   | M     | 1526 | GLU  |
| 9   | M     | 1538 | LEU  |
| 9   | M     | 1565 | GLU  |
| 9   | M     | 1607 | GLU  |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 9   | M     | 1618 | LEU  |
| 9   | M     | 1678 | LEU  |
| 9   | M     | 1776 | GLU  |
| 9   | M     | 1817 | GLN  |
| 9   | M     | 1820 | VAL  |
| 9   | M     | 1864 | ASP  |
| 9   | M     | 1881 | TYR  |
| 9   | M     | 1893 | GLU  |
| 9   | M     | 1896 | ILE  |
| 9   | M     | 1910 | GLU  |
| 9   | M     | 1926 | ASN  |
| 9   | M     | 1932 | GLN  |
| 9   | M     | 1935 | GLU  |
| 9   | M     | 1938 | ARG  |
| 9   | M     | 1939 | LEU  |
| 9   | M     | 1966 | LEU  |
| 9   | M     | 1973 | LYS  |
| 9   | M     | 1977 | ILE  |
| 9   | M     | 2100 | LEU  |
| 9   | M     | 2129 | LEU  |
| 9   | M     | 2140 | LEU  |
| 9   | M     | 2168 | LEU  |
| 9   | M     | 2175 | GLU  |
| 9   | M     | 2186 | VAL  |
| 9   | M     | 2206 | PRO  |
| 9   | M     | 2207 | LYS  |
| 9   | M     | 2215 | LEU  |
| 9   | M     | 2223 | VAL  |
| 9   | M     | 2241 | LEU  |
| 9   | M     | 2246 | LYS  |
| 9   | M     | 2249 | LEU  |
| 9   | M     | 2253 | TYR  |
| 9   | M     | 2268 | LYS  |
| 9   | M     | 2299 | TYR  |
| 9   | M     | 2306 | ASN  |
| 9   | M     | 2377 | ARG  |
| 9   | M     | 2389 | PHE  |
| 9   | M     | 2406 | GLU  |
| 9   | M     | 2410 | GLU  |
| 9   | M     | 2450 | GLU  |
| 9   | M     | 2455 | LEU  |
| 9   | M     | 2485 | ARG  |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 9   | M     | 2486 | ASP  |
| 9   | M     | 2498 | ILE  |
| 9   | M     | 2499 | PHE  |
| 9   | M     | 2557 | LEU  |
| 9   | M     | 2566 | THR  |
| 9   | M     | 2569 | SER  |
| 9   | M     | 2581 | LEU  |
| 9   | M     | 2582 | SER  |
| 9   | M     | 2589 | TYR  |
| 9   | M     | 2828 | GLU  |
| 9   | M     | 2842 | ARG  |
| 9   | M     | 2861 | ILE  |
| 9   | M     | 2933 | ILE  |
| 9   | M     | 2939 | LEU  |
| 9   | M     | 2976 | LEU  |
| 9   | M     | 3000 | ASP  |
| 9   | M     | 3003 | ASN  |
| 9   | M     | 3007 | GLU  |
| 9   | M     | 3035 | PHE  |
| 9   | M     | 3123 | GLN  |
| 9   | M     | 3259 | LEU  |
| 9   | M     | 3261 | GLU  |
| 9   | M     | 3295 | GLU  |
| 9   | M     | 3307 | LEU  |
| 9   | M     | 3895 | GLU  |
| 9   | M     | 3934 | THR  |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (39) such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 3   | C     | 112 | GLN  |
| 4   | D     | 64  | ASN  |
| 4   | D     | 81  | ASN  |
| 1   | E     | 76  | GLN  |
| 1   | E     | 108 | ASN  |
| 4   | H     | 81  | ASN  |
| 7   | K     | 52  | GLN  |
| 7   | K     | 486 | HIS  |
| 8   | L     | 75  | GLN  |
| 8   | L     | 152 | HIS  |
| 8   | L     | 496 | HIS  |
| 9   | M     | 442 | GLN  |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 9   | M     | 485  | GLN  |
| 9   | M     | 738  | HIS  |
| 9   | M     | 869  | ASN  |
| 9   | M     | 1098 | GLN  |
| 9   | M     | 1115 | HIS  |
| 9   | M     | 1268 | ASN  |
| 9   | M     | 1390 | GLN  |
| 9   | M     | 1435 | ASN  |
| 9   | M     | 1665 | HIS  |
| 9   | M     | 1866 | GLN  |
| 9   | M     | 2091 | HIS  |
| 9   | M     | 2103 | HIS  |
| 9   | M     | 2365 | ASN  |
| 9   | M     | 2426 | HIS  |
| 9   | M     | 2579 | HIS  |
| 9   | M     | 3093 | GLN  |
| 9   | M     | 3185 | ASN  |
| 9   | M     | 3327 | ASN  |
| 9   | M     | 3384 | HIS  |
| 9   | M     | 3671 | ASN  |
| 9   | M     | 3748 | HIS  |
| 9   | M     | 3772 | ASN  |
| 9   | M     | 3777 | GLN  |
| 9   | M     | 3808 | ASN  |
| 9   | M     | 3944 | HIS  |
| 9   | M     | 3969 | ASN  |
| 9   | M     | 4110 | GLN  |

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

### 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

There are no ligands in this entry.

## 5.7 Other polymers

There are no such residues in this entry.

## 5.8 Polymer linkage issues

There are no chain breaks in this entry.

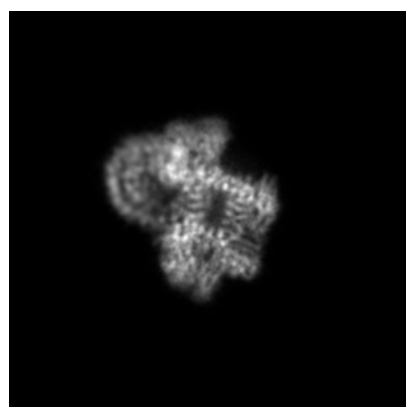
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-74524. These allow visual inspection of the internal detail of the map and identification of artifacts.

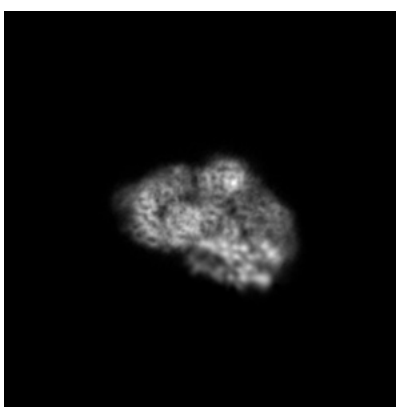
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

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

#### 6.1.1 Primary map



X



Y

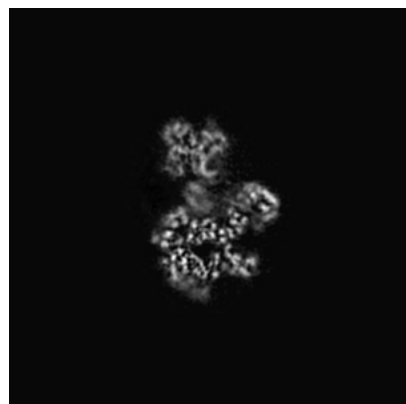


Z

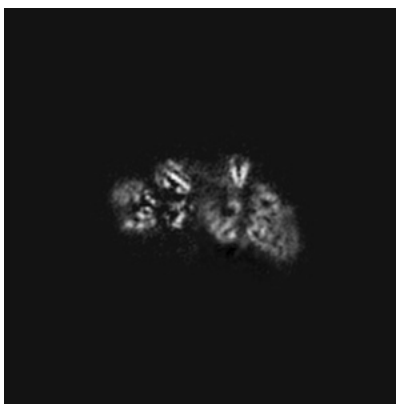
The images above show the map projected in three orthogonal directions.

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

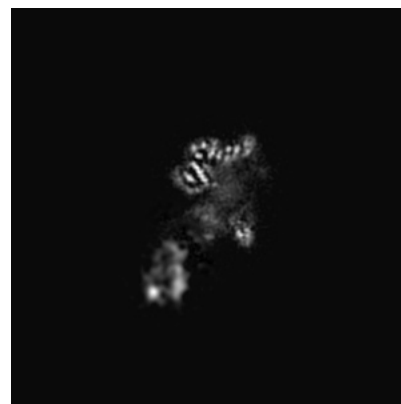
#### 6.2.1 Primary map



X Index: 120



Y Index: 120

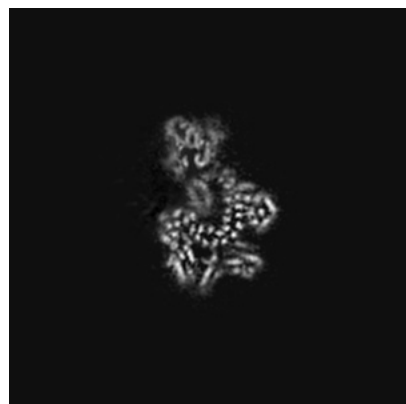


Z Index: 120

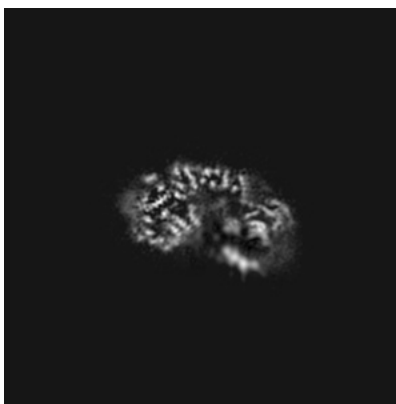
The images above show central slices of the map in three orthogonal directions.

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

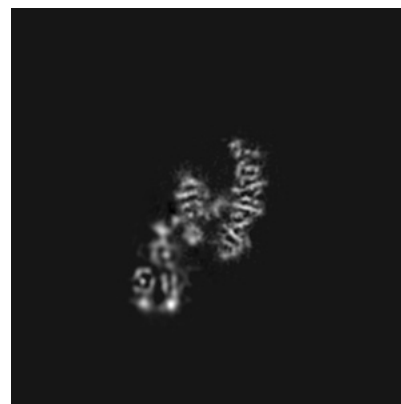
### 6.3.1 Primary map



X Index: 115



Y Index: 106

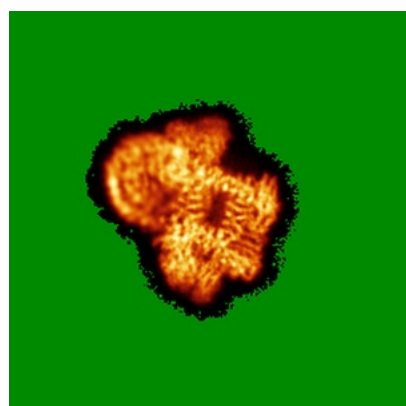


Z Index: 138

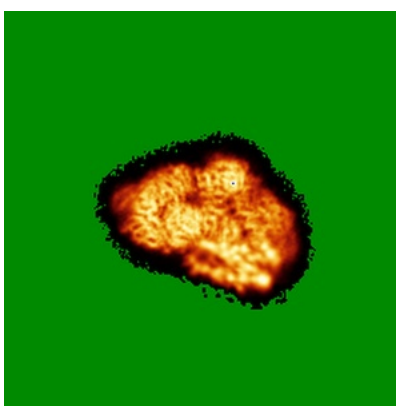
The images above show the largest variance slices of the map in three orthogonal directions.

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

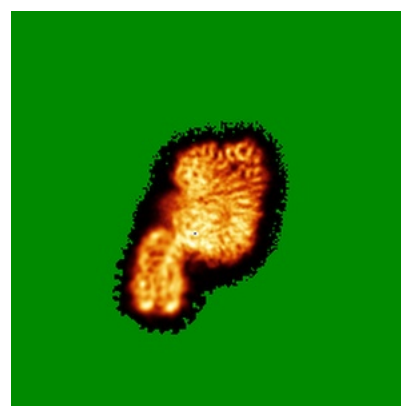
### 6.4.1 Primary map



X



Y

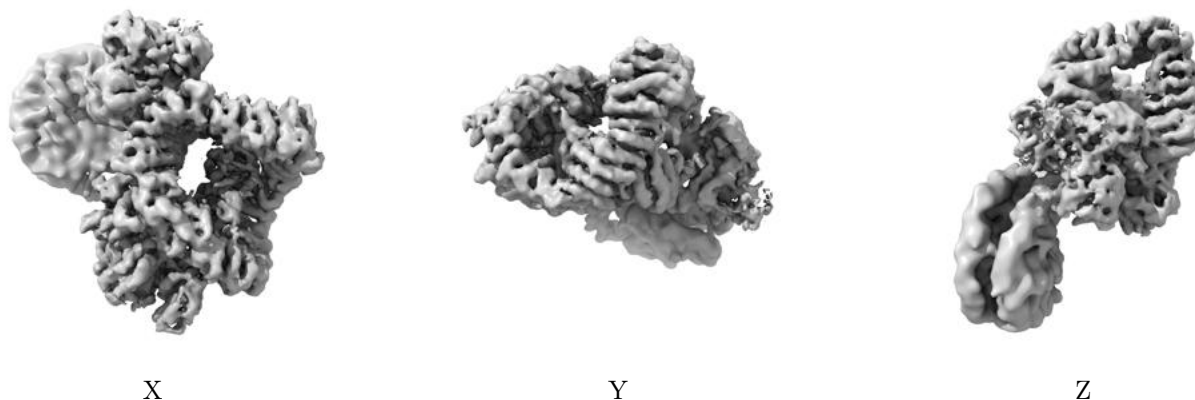


Z

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

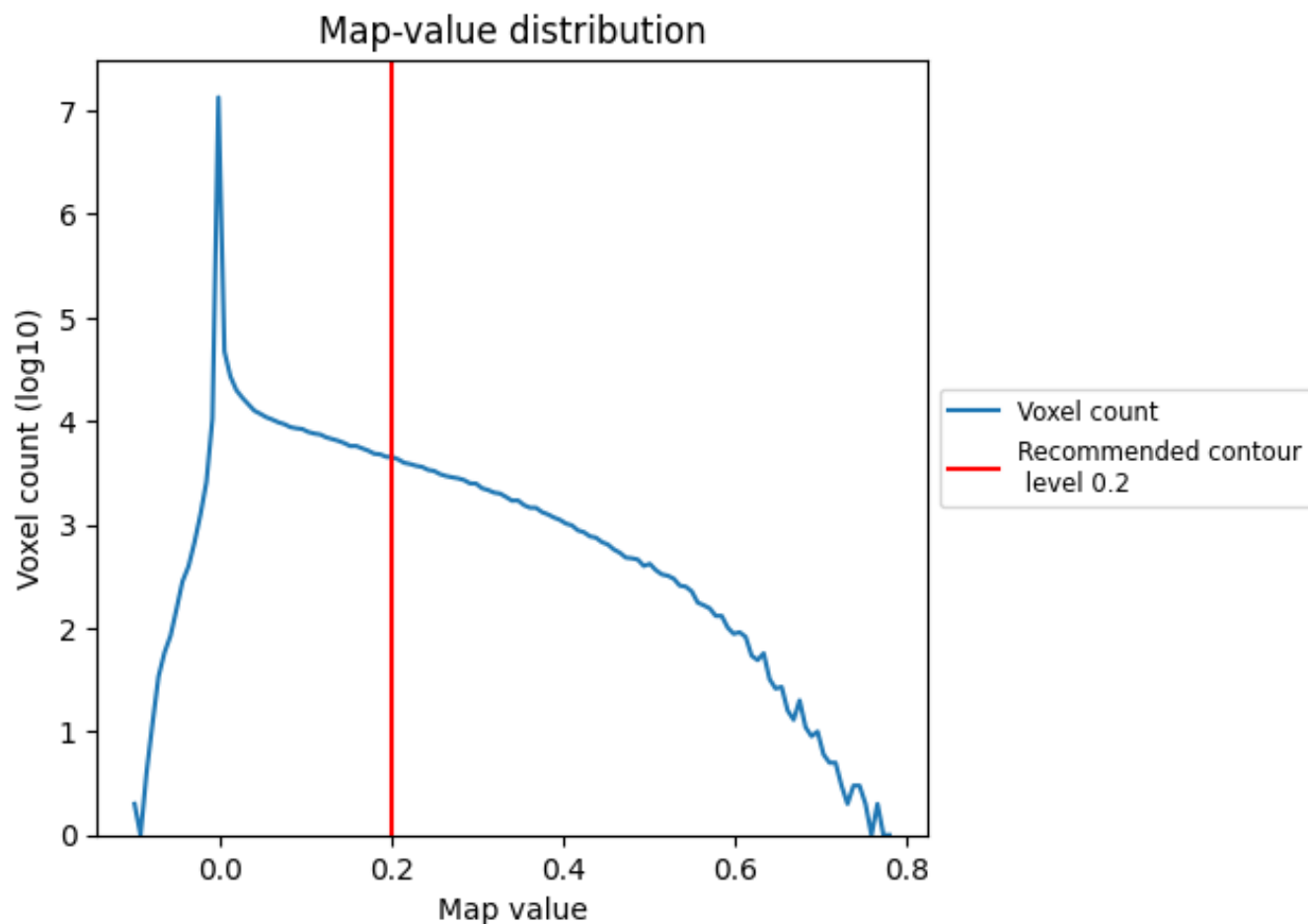
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

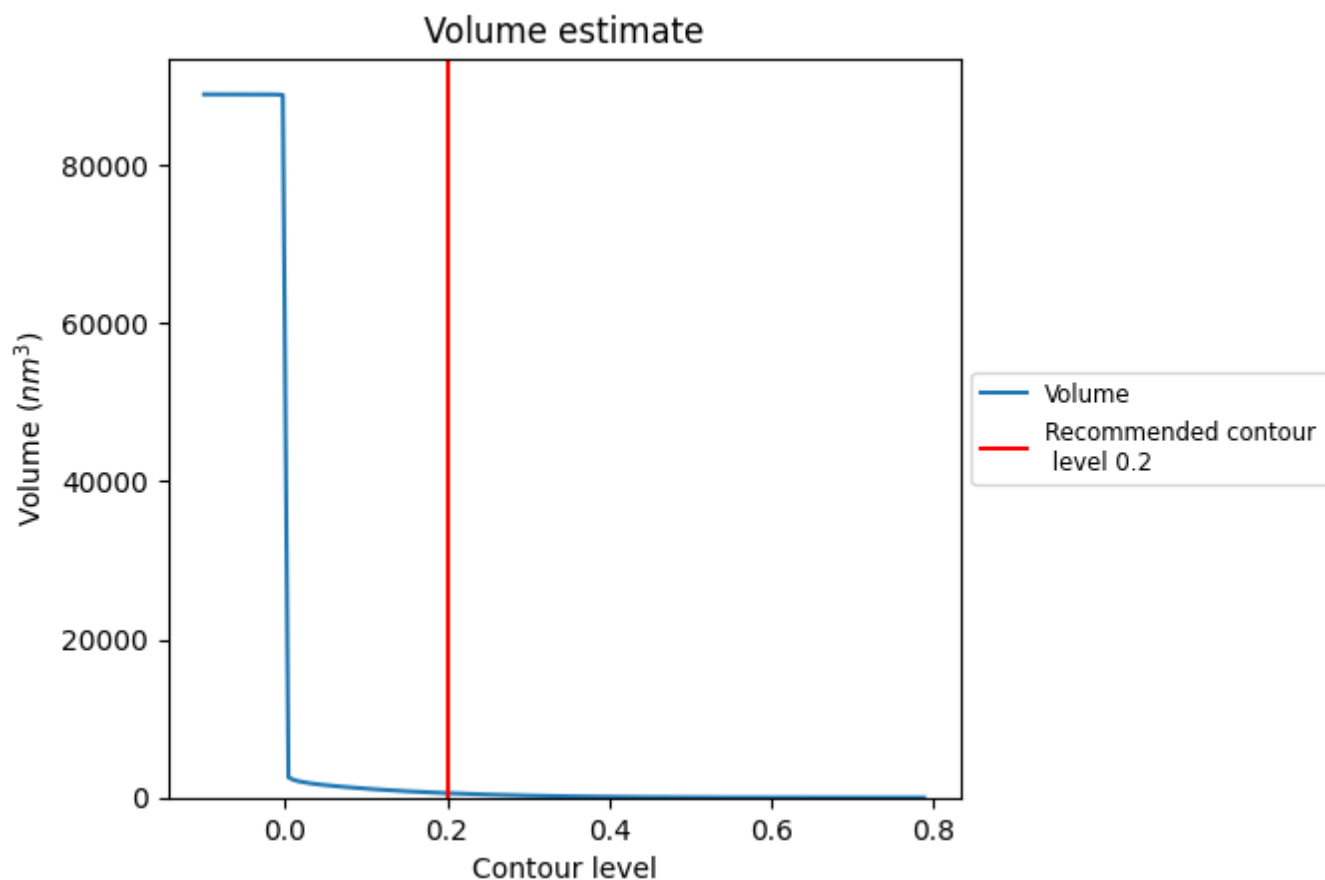
This section contains the results of statistical analysis of the map.

### 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.

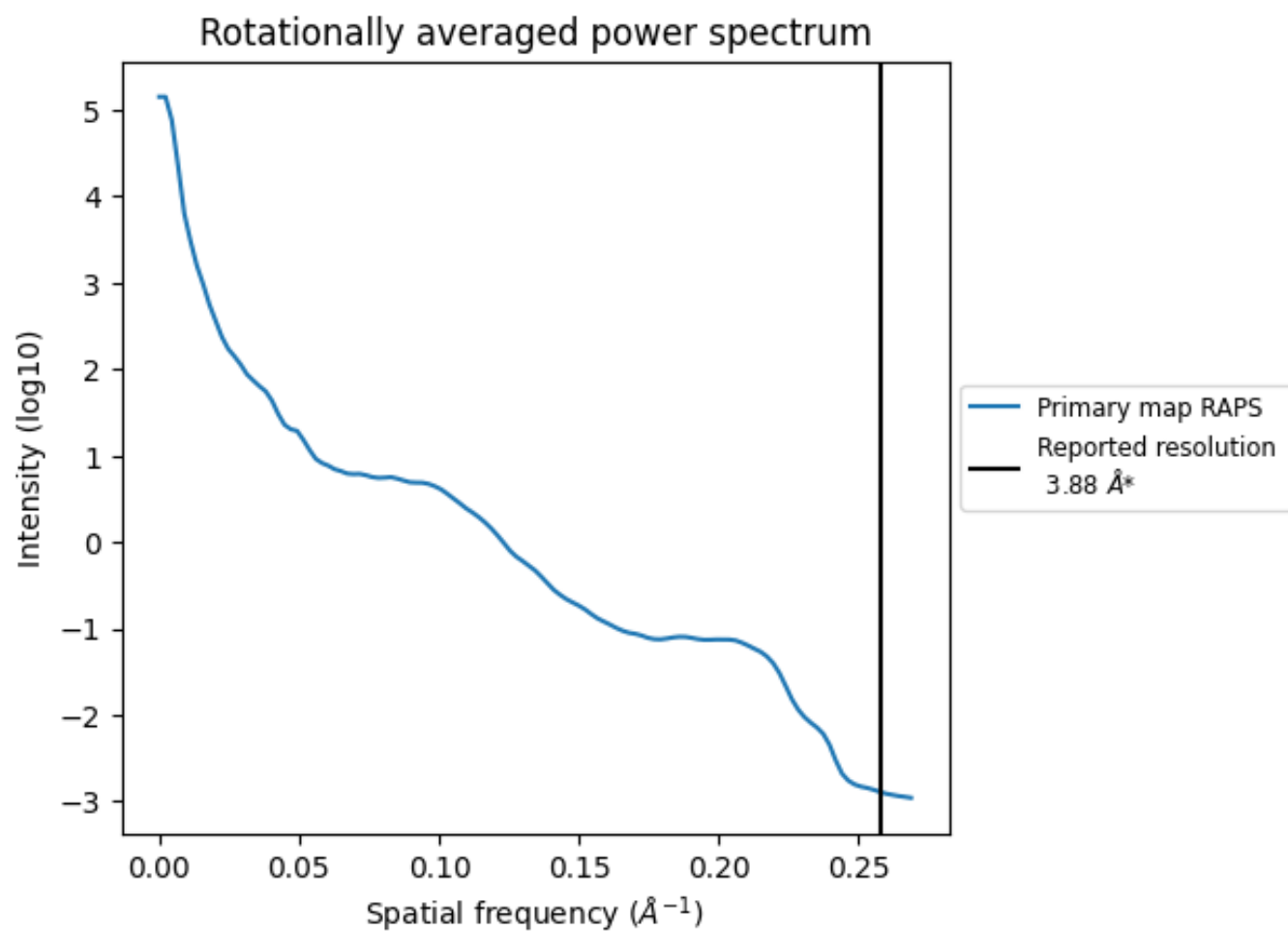
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 559 nm<sup>3</sup>; this corresponds to an approximate mass of 505 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 0.258 Å<sup>-1</sup>

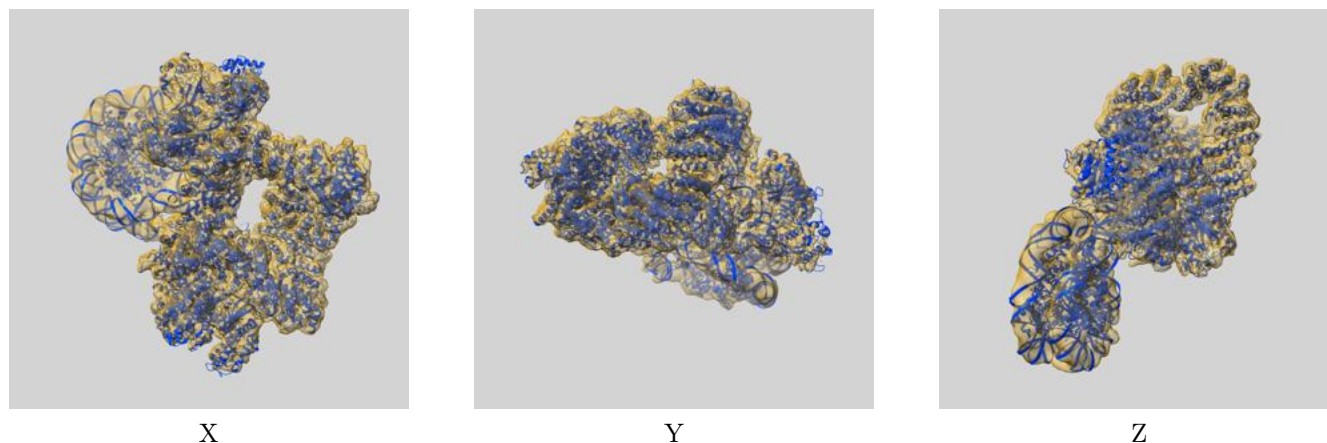
## 8 Fourier-Shell correlation ⓘ

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

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

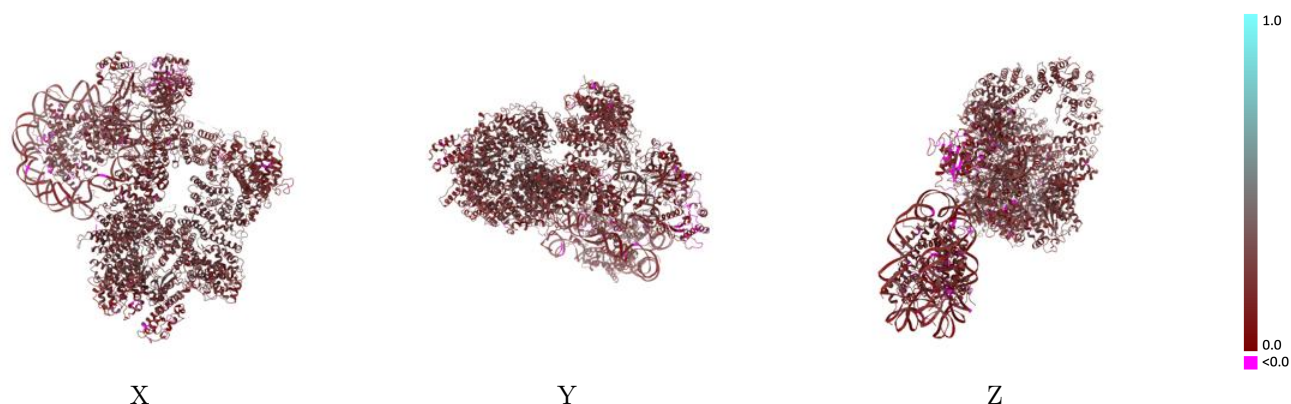
This section contains information regarding the fit between EMDB map EMD-74524 and PDB model 9ZP9. Per-residue inclusion information can be found in section [3](#) on page [7](#).

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



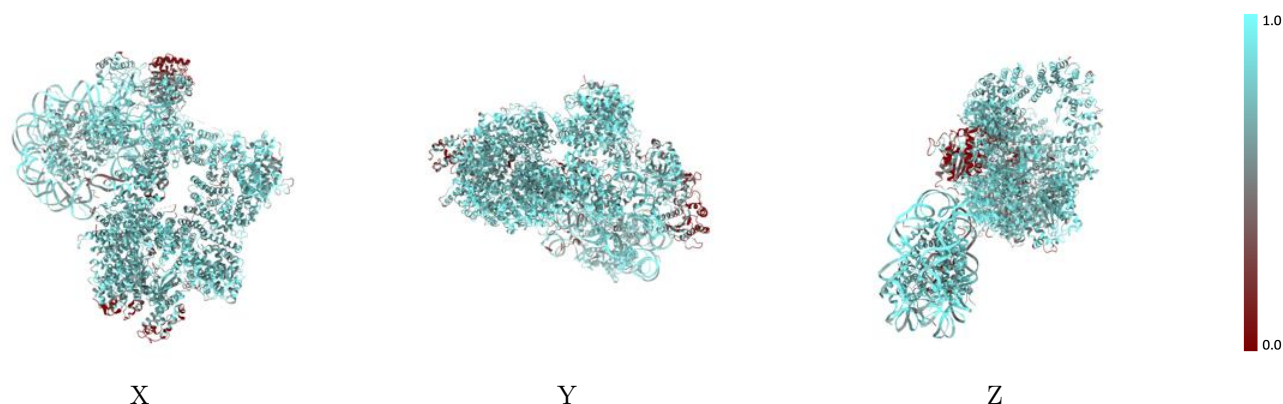
The images above show the 3D surface view of the map at the recommended contour level 0.2 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



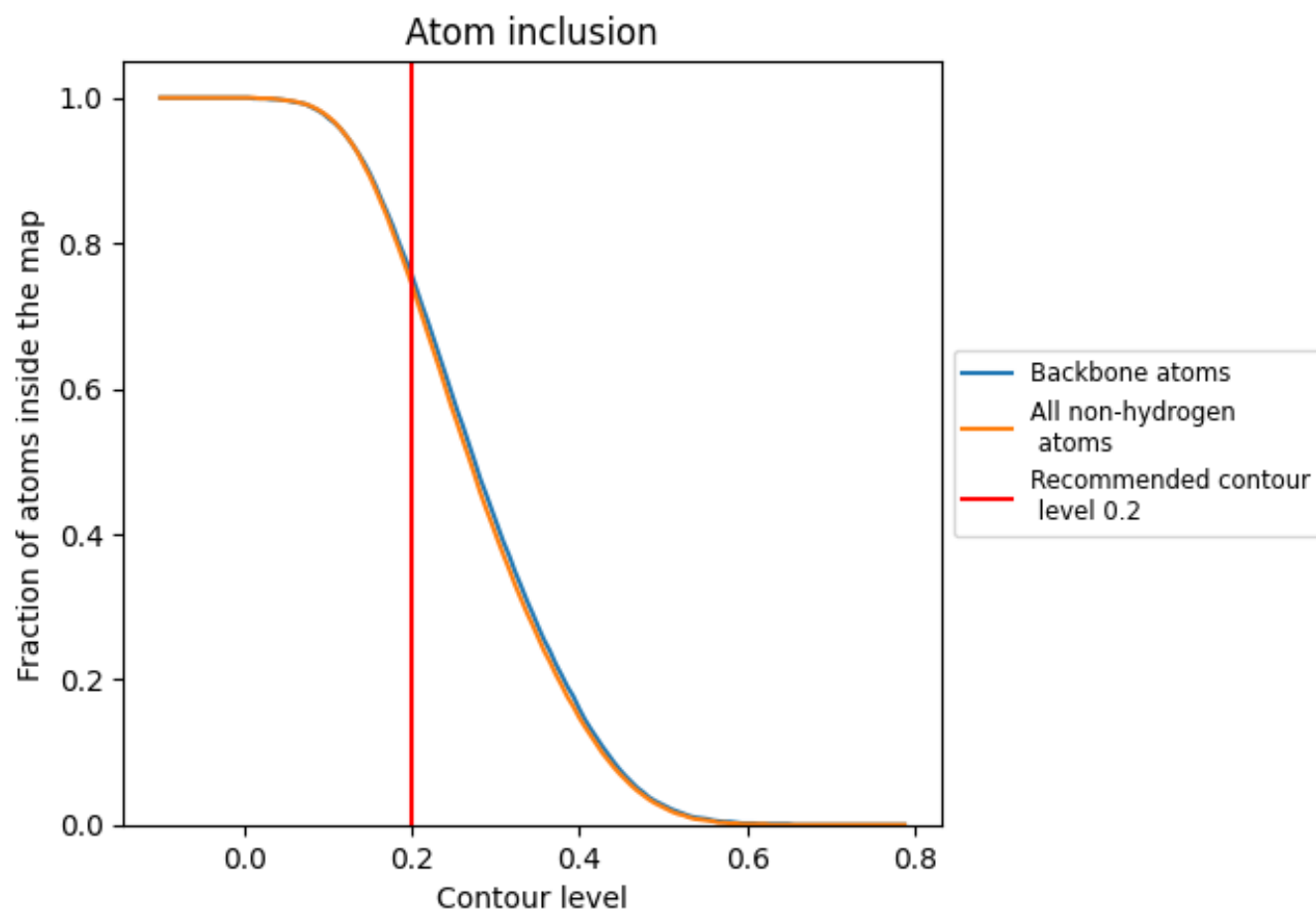
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

## 9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.2).

## 9.4 Atom inclusion ⓘ



At the recommended contour level, 76% of all backbone atoms, 74% 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 (0.2) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion                                                                            | Q-score                                                                                   |
|-------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| All   |  0.7440  |  0.2130  |
| A     |  0.8010  |  0.1600  |
| B     |  0.7830  |  0.1260  |
| C     |  0.7540  |  0.1470  |
| D     |  0.7900  |  0.1680  |
| E     |  0.7620  |  0.1460  |
| F     |  0.8060  |  0.1490  |
| G     |  0.7000  |  0.1550  |
| H     |  0.7580  |  0.1610  |
| I     |  0.8200  |  0.1680  |
| J     |  0.8330  |  0.1760  |
| K     |  0.7450  |  0.2290  |
| L     |  0.5690  |  0.1820  |
| M     |  0.7560  |  0.2360  |
| N     |  0.8710 |  0.3340 |

