



# Full wwPDB X-ray Structure Validation Report ⓘ

Oct 13, 2024 – 03:00 AM EDT

PDB ID : 2DKF  
Title : Crystal Structure of TTHA0252 from *Thermus thermophilus* HB8, a RNA Degradation Protein of the Metallo-beta-lactamase Superfamily  
Authors : Ishikawa, I.; Nakagawa, N.; Kuramitsu, S.; Yokoyama, S.; Masui, R.; RIKEN Structural Genomics/Proteomics Initiative (RSGI)  
Deposited on : 2006-04-10  
Resolution : 2.80 Å(reported)

This is a Full wwPDB X-ray Structure 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/XrayValidationReportHelp>

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:

MolProbity : 4.02b-467  
Mogul : 2022.3.0, CSD as543be (2022)  
Xtriage (Phenix) : 1.20.1  
EDS : 3.0  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
CCP4 : 9.0.003 (Gargrove)  
Density-Fitness : 1.0.11  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.39

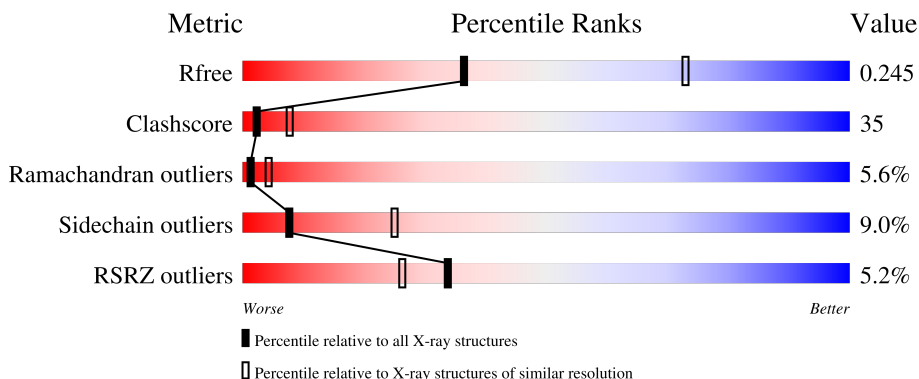
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.80 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) | Similar resolution<br>(#Entries, resolution range(Å)) |
|-----------------------|-----------------------------|---|
| $R_{free}$            | 164625                      | 3657 (2.80-2.80)                                      |
| Clashscore            | 180529                      | 4123 (2.80-2.80)                                      |
| Ramachandran outliers | 177936                      | 4071 (2.80-2.80)                                      |
| Sidechain outliers    | 177891                      | 4073 (2.80-2.80)                                      |
| RSRZ outliers         | 164620                      | 3659 (2.80-2.80)                                      |

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower 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 electron density. The numeric value is given above the bar.

| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 1   | A     | 431    |                  |
| 1   | B     | 431    |                  |
| 1   | C     | 431    |                  |
| 1   | D     | 431    |                  |

## 2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 13404 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, 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 metallo-beta-lactamase superfamily protein.

| Mol | Chain | Residues | Atoms |      |     |     |   |    | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|----|---------|---------|-------|
|     |       |          | Total | C    | N   | O   | S | Se |         |         |       |
| 1   | A     | 431      | 3326  | 2127 | 597 | 594 | 1 | 7  | 0       | 0       | 0     |
| 1   | B     | 431      | 3326  | 2127 | 597 | 594 | 1 | 7  | 0       | 0       | 0     |
| 1   | C     | 431      | 3326  | 2127 | 597 | 594 | 1 | 7  | 0       | 0       | 0     |
| 1   | D     | 431      | 3326  | 2127 | 597 | 594 | 1 | 7  | 0       | 0       | 0     |

There are 28 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment          | Reference   |
|-------|---------|----------|--------|------------------|-------------|
| A     | 1       | MSE      | MET    | modified residue | GB 55771634 |
| A     | 32      | MSE      | MET    | modified residue | GB 55771634 |
| A     | 90      | MSE      | MET    | modified residue | GB 55771634 |
| A     | 101     | MSE      | MET    | modified residue | GB 55771634 |
| A     | 253     | MSE      | MET    | modified residue | GB 55771634 |
| A     | 307     | MSE      | MET    | modified residue | GB 55771634 |
| A     | 315     | MSE      | MET    | modified residue | GB 55771634 |
| B     | 1       | MSE      | MET    | modified residue | GB 55771634 |
| B     | 32      | MSE      | MET    | modified residue | GB 55771634 |
| B     | 90      | MSE      | MET    | modified residue | GB 55771634 |
| B     | 101     | MSE      | MET    | modified residue | GB 55771634 |
| B     | 253     | MSE      | MET    | modified residue | GB 55771634 |
| B     | 307     | MSE      | MET    | modified residue | GB 55771634 |
| B     | 315     | MSE      | MET    | modified residue | GB 55771634 |
| C     | 1       | MSE      | MET    | modified residue | GB 55771634 |
| C     | 32      | MSE      | MET    | modified residue | GB 55771634 |
| C     | 90      | MSE      | MET    | modified residue | GB 55771634 |
| C     | 101     | MSE      | MET    | modified residue | GB 55771634 |
| C     | 253     | MSE      | MET    | modified residue | GB 55771634 |
| C     | 307     | MSE      | MET    | modified residue | GB 55771634 |
| C     | 315     | MSE      | MET    | modified residue | GB 55771634 |

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| Chain | Residue | Modelled | Actual | Comment          | Reference   |
|-------|---------|----------|--------|------------------|-------------|
| D     | 1       | MSE      | MET    | modified residue | GB 55771634 |
| D     | 32      | MSE      | MET    | modified residue | GB 55771634 |
| D     | 90      | MSE      | MET    | modified residue | GB 55771634 |
| D     | 101     | MSE      | MET    | modified residue | GB 55771634 |
| D     | 253     | MSE      | MET    | modified residue | GB 55771634 |
| D     | 307     | MSE      | MET    | modified residue | GB 55771634 |
| D     | 315     | MSE      | MET    | modified residue | GB 55771634 |

- Molecule 2 is ZINC ION (three-letter code: ZN) (formula: Zn).

| Mol | Chain | Residues | Atoms      |         | ZeroOcc | AltConf |
|-----|-------|----------|------------|---------|---------|---------|
| 2   | A     | 2        | Total<br>2 | Zn<br>2 | 0       | 0       |
| 2   | B     | 2        | Total<br>2 | Zn<br>2 | 0       | 0       |
| 2   | C     | 2        | Total<br>2 | Zn<br>2 | 0       | 0       |
| 2   | D     | 2        | Total<br>2 | Zn<br>2 | 0       | 0       |

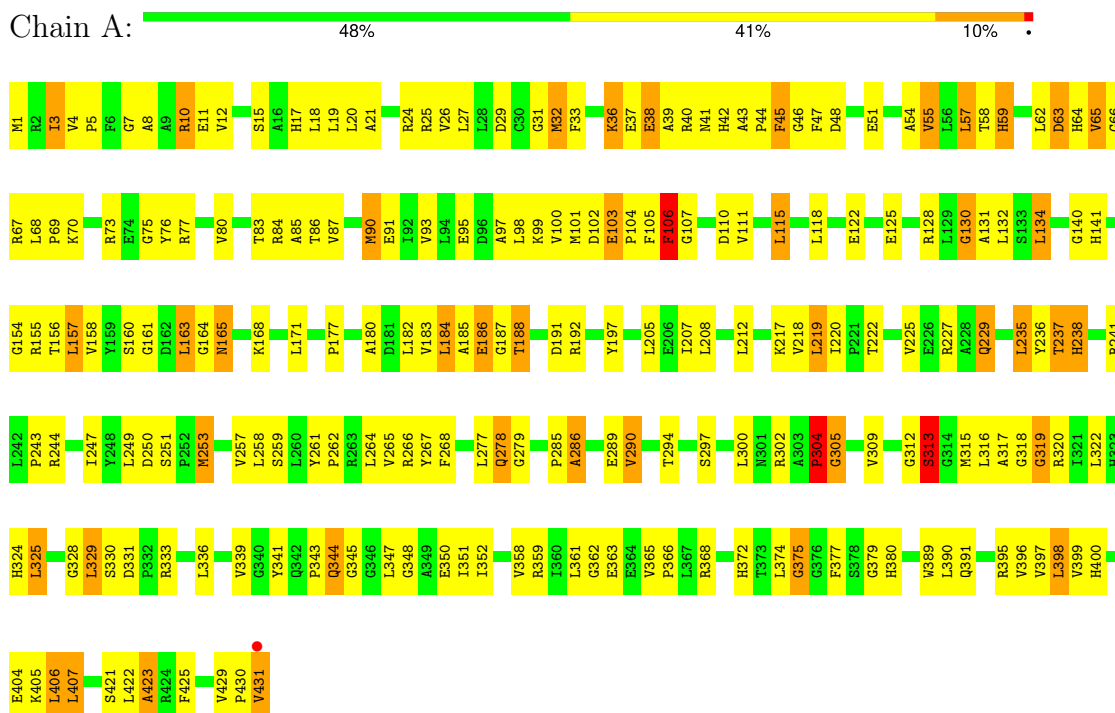
- Molecule 3 is water.

| Mol | Chain | Residues | Atoms       |         | ZeroOcc | AltConf |
|-----|-------|----------|-------------|---------|---------|---------|
| 3   | A     | 32       | Total<br>32 | O<br>32 | 0       | 0       |
| 3   | B     | 28       | Total<br>28 | O<br>28 | 0       | 0       |
| 3   | C     | 16       | Total<br>16 | O<br>16 | 0       | 0       |
| 3   | D     | 16       | Total<br>16 | O<br>16 | 0       | 0       |

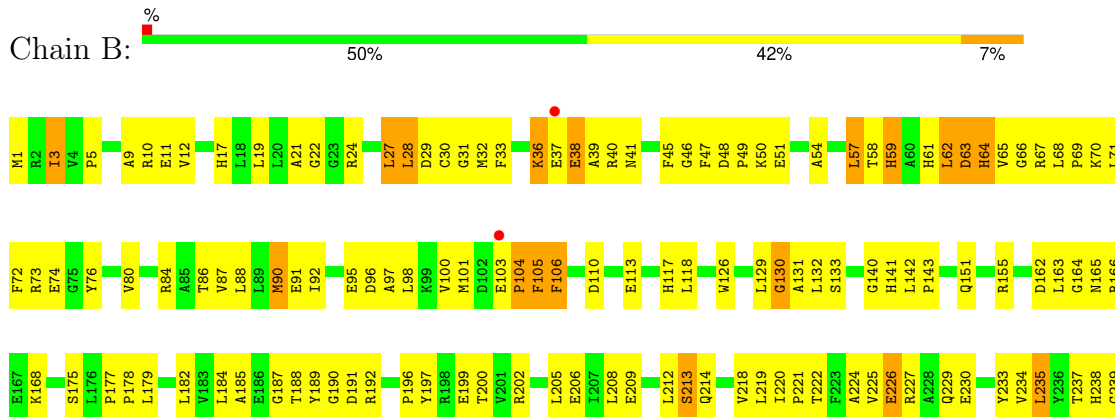
### 3 Residue-property plots [i](#)

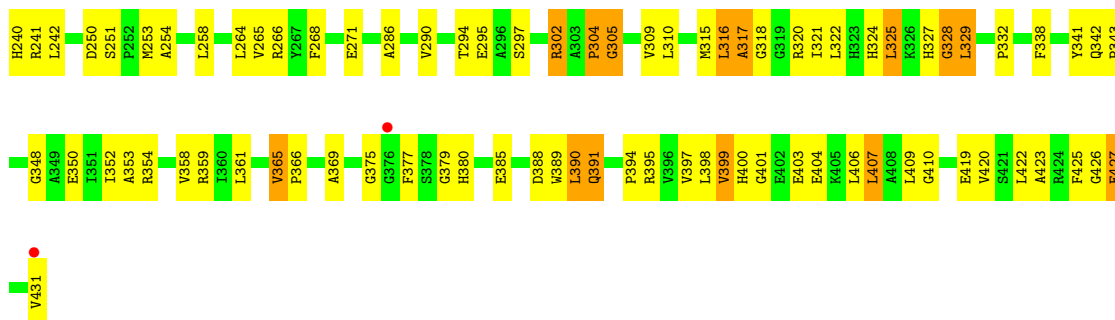
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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 dot above a residue indicates a poor fit to the electron density ( $RSRZ > 2$ ). 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: metallo-beta-lactamase superfamily protein

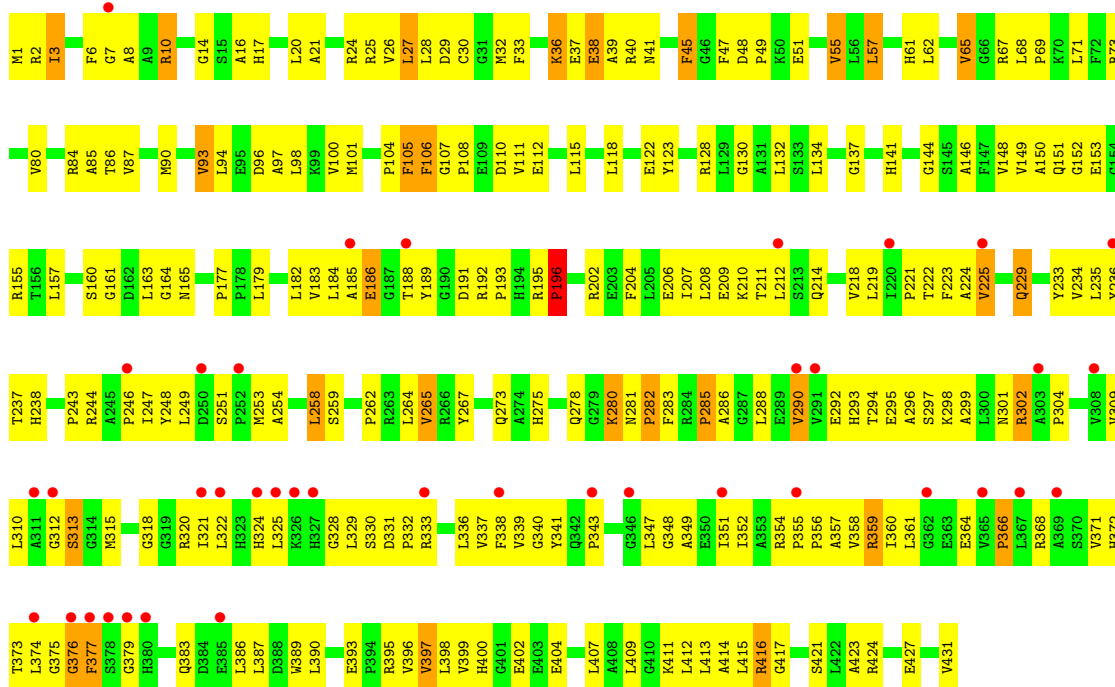


- Molecule 1: metallo-beta-lactamase superfamily protein

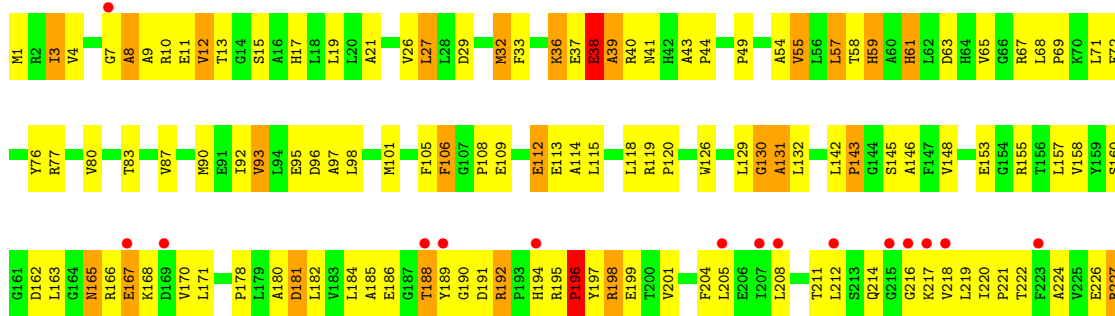


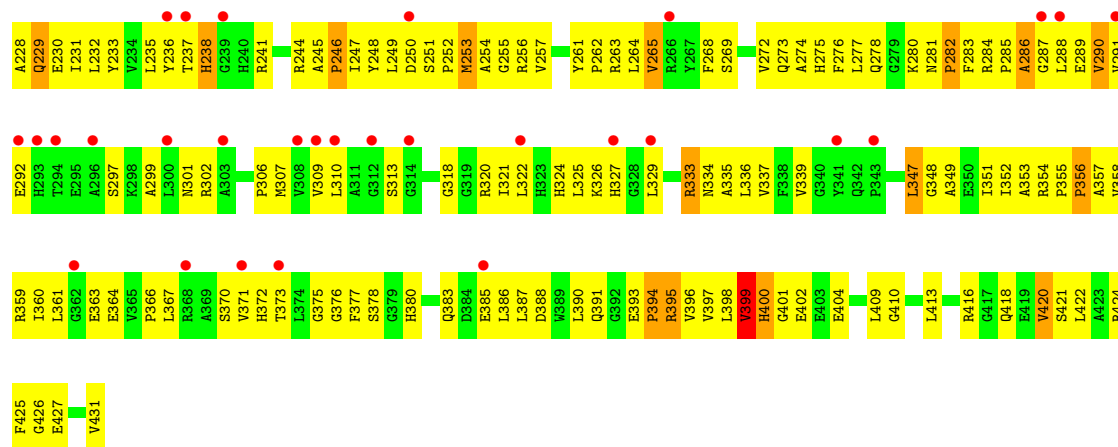


● Molecule 1: metallo-beta-lactamase superfamily protein



● Molecule 1: metallo-beta-lactamase superfamily protein





## 4 Data and refinement statistics

| Property  | Value   | Source           |
|---|---|------------------|
| Space group   | C 1 2 1   | Depositor        |
| Cell constants<br>a, b, c, $\alpha$ , $\beta$ , $\gamma$                | 143.22Å 147.10Å 121.23Å<br>90.00° 109.25° 90.00°            | Depositor        |
| Resolution (Å)  | 19.99 – 2.80<br>19.99 – 2.80                                | Depositor<br>EDS |
| % Data completeness<br>(in resolution range)                            | 96.0 (19.99-2.80)<br>95.8 (19.99-2.80)                      | Depositor<br>EDS |
| $R_{merge}$   | (Not available)   | Depositor        |
| $R_{sym}$   | (Not available)   | Depositor        |
| $\langle I/\sigma(I) \rangle$ <sup>1</sup>                              | 28.81 (at 2.79Å)  | Xtrriage         |
| Refinement program  | CNS 1.1   | Depositor        |
| R, $R_{free}$   | 0.242 , 0.285<br>0.246 , 0.245                              | Depositor<br>DCC |
| $R_{free}$ test set   | 2847 reflections (5.09%)                                    | wwPDB-VP         |
| Wilson B-factor (Å <sup>2</sup> )                                       | 59.7  | Xtrriage         |
| Anisotropy  | 0.048   | Xtrriage         |
| Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> ) | 0.30 , 55.4   | EDS              |
| L-test for twinning <sup>2</sup>  | $\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$ | Xtrriage         |
| Estimated twinning fraction   | No twinning to report.                                      | Xtrriage         |
| $F_o, F_c$ correlation  | 0.91  | EDS              |
| Total number of atoms   | 13404   | wwPDB-VP         |
| Average B, all atoms (Å <sup>2</sup> )                                  | 67.0  | wwPDB-VP         |

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.99% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.



## 5 Model quality i

### 5.1 Standard geometry i

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

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

| Mol | Chain | Bond lengths |                | Bond angles |                |
|-----|-------|--------------|----------------|-------------|----------------|
|     |       | RMSZ         | # Z  >5        | RMSZ        | # Z  >5        |
| 1   | A     | 0.59         | 4/3401 (0.1%)  | 0.84        | 5/4603 (0.1%)  |
| 1   | B     | 0.59         | 1/3401 (0.0%)  | 0.80        | 2/4603 (0.0%)  |
| 1   | C     | 0.47         | 0/3401         | 0.67        | 2/4603 (0.0%)  |
| 1   | D     | 0.45         | 1/3401 (0.0%)  | 0.65        | 0/4603         |
| All | All   | 0.53         | 6/13604 (0.0%) | 0.75        | 9/18412 (0.0%) |

All (6) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|-------|-------|-------------|----------|
| 1   | A     | 253 | MSE  | CG-SE | -6.77 | 1.72        | 1.95     |
| 1   | A     | 90  | MSE  | SE-CE | -6.12 | 1.59        | 1.95     |
| 1   | B     | 90  | MSE  | CG-SE | -6.07 | 1.74        | 1.95     |
| 1   | A     | 90  | MSE  | CG-SE | -5.91 | 1.75        | 1.95     |
| 1   | A     | 32  | MSE  | SE-CE | -5.21 | 1.64        | 1.95     |
| 1   | D     | 253 | MSE  | CG-SE | -5.16 | 1.77        | 1.95     |

All (9) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms    | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|----------|-------|-------------|----------|
| 1   | A     | 375 | GLY  | N-CA-C   | -8.06 | 92.94       | 113.10   |
| 1   | B     | 375 | GLY  | N-CA-C   | -6.94 | 95.75       | 113.10   |
| 1   | C     | 161 | GLY  | N-CA-C   | -5.78 | 98.66       | 113.10   |
| 1   | A     | 161 | GLY  | N-CA-C   | -5.76 | 98.69       | 113.10   |
| 1   | C     | 105 | PHE  | N-CA-C   | -5.18 | 97.00       | 111.00   |
| 1   | A     | 63  | ASP  | N-CA-C   | -5.12 | 97.19       | 111.00   |
| 1   | A     | 237 | THR  | N-CA-C   | -5.05 | 97.37       | 111.00   |
| 1   | A     | 319 | GLY  | N-CA-C   | 5.02  | 125.65      | 113.10   |
| 1   | B     | 390 | LEU  | CA-CB-CG | 5.01  | 126.83      | 115.30   |

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts

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

| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 1   | A     | 3326  | 0        | 3351     | 206     | 0            |
| 1   | B     | 3326  | 0        | 3351     | 224     | 0            |
| 1   | C     | 3326  | 0        | 3351     | 242     | 0            |
| 1   | D     | 3326  | 0        | 3351     | 272     | 0            |
| 2   | A     | 2     | 0        | 0        | 0       | 0            |
| 2   | B     | 2     | 0        | 0        | 0       | 0            |
| 2   | C     | 2     | 0        | 0        | 0       | 0            |
| 2   | D     | 2     | 0        | 0        | 0       | 0            |
| 3   | A     | 32    | 0        | 0        | 3       | 0            |
| 3   | B     | 28    | 0        | 0        | 0       | 0            |
| 3   | C     | 16    | 0        | 0        | 1       | 0            |
| 3   | D     | 16    | 0        | 0        | 0       | 0            |
| All | All   | 13404 | 0        | 13404    | 933     | 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 35.

All (933) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:37:GLU:HB3   | 1:C:40:ARG:HH11  | 0.97                     | 1.13              |
| 1:C:37:GLU:HB3   | 1:C:40:ARG:NH1   | 1.76                     | 1.00              |
| 1:D:227:ARG:HB2  | 1:D:227:ARG:HH21 | 1.25                     | 0.99              |
| 1:C:73:ARG:HE    | 1:C:106:PHE:HA   | 1.24                     | 0.98              |
| 1:C:235:LEU:HD23 | 1:C:247:ILE:HD13 | 1.45                     | 0.97              |
| 1:C:36:LYS:H     | 1:C:36:LYS:HD3   | 1.29                     | 0.97              |
| 1:D:59:HIS:CD2   | 1:D:61:HIS:HB2   | 2.00                     | 0.96              |
| 1:A:36:LYS:H     | 1:A:36:LYS:HD3   | 1.31                     | 0.95              |
| 1:C:160:SER:HB2  | 1:C:163:LEU:HD11 | 1.51                     | 0.93              |
| 1:D:90:MSE:HE1   | 1:D:118:LEU:HD21 | 1.51                     | 0.92              |
| 1:C:61:HIS:O     | 1:C:65:VAL:HG12  | 1.70                     | 0.92              |
| 1:B:101:MSE:HB3  | 1:B:104:PRO:HB3  | 1.51                     | 0.92              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:B:33:PHE:H     | 1:B:41:ASN:HD21  | 0.92                     | 0.91              |
| 1:D:227:ARG:HH11 | 1:D:378:SER:HA   | 1.34                     | 0.91              |
| 1:D:360:ILE:HG22 | 1:D:361:LEU:HD23 | 1.51                     | 0.91              |
| 1:B:348:GLY:O    | 1:B:352:ILE:HG12 | 1.72                     | 0.90              |
| 1:A:184:LEU:HD23 | 1:A:397:VAL:HG13 | 1.55                     | 0.89              |
| 1:C:33:PHE:H     | 1:C:41:ASN:HD21  | 1.16                     | 0.89              |
| 1:C:98:LEU:HD21  | 1:C:108:PRO:HB3  | 1.54                     | 0.88              |
| 1:C:36:LYS:HD3   | 1:C:36:LYS:N     | 1.90                     | 0.86              |
| 1:D:33:PHE:H     | 1:D:41:ASN:HD21  | 1.18                     | 0.86              |
| 1:C:10:ARG:HH12  | 1:C:424:ARG:HG2  | 1.38                     | 0.85              |
| 1:D:235:LEU:HD23 | 1:D:247:ILE:HD13 | 1.57                     | 0.85              |
| 1:C:222:THR:HG22 | 1:C:339:VAL:HG21 | 1.57                     | 0.85              |
| 1:C:37:GLU:CB    | 1:C:40:ARG:HH11  | 1.86                     | 0.85              |
| 1:B:168:LYS:HG2  | 1:B:197:TYR:CD2  | 2.13                     | 0.84              |
| 1:A:31:GLY:HA3   | 1:A:64:HIS:N     | 1.91                     | 0.84              |
| 1:D:420:VAL:HG22 | 1:D:421:SER:H    | 1.43                     | 0.83              |
| 1:D:155:ARG:HH11 | 1:D:431:VAL:HG11 | 1.42                     | 0.83              |
| 1:A:155:ARG:HE   | 1:A:431:VAL:CG2  | 1.90                     | 0.82              |
| 1:C:359:ARG:H    | 1:C:359:ARG:HD2  | 1.43                     | 0.82              |
| 1:A:48:ASP:OD2   | 1:A:51:GLU:HG2   | 1.79                     | 0.82              |
| 1:B:141:HIS:HD2  | 1:B:379:GLY:O    | 1.62                     | 0.82              |
| 1:B:11:GLU:OE1   | 1:B:37:GLU:HG3   | 1.80                     | 0.81              |
| 1:C:163:LEU:HD21 | 1:C:389:TRP:CD2  | 2.15                     | 0.81              |
| 1:A:91:GLU:O     | 1:A:95:GLU:HG2   | 1.81                     | 0.81              |
| 1:B:155:ARG:HE   | 1:B:431:VAL:HG13 | 1.45                     | 0.81              |
| 1:C:278:GLN:HG3  | 1:C:280:LYS:HG2  | 1.64                     | 0.80              |
| 1:B:3:ILE:HD11   | 1:B:17:HIS:HB3   | 1.62                     | 0.80              |
| 1:B:33:PHE:H     | 1:B:41:ASN:ND2   | 1.77                     | 0.80              |
| 1:C:86:THR:HG22  | 1:C:90:MSE:HE2   | 1.65                     | 0.79              |
| 1:D:38:GLU:O     | 1:D:40:ARG:N     | 2.14                     | 0.79              |
| 1:A:348:GLY:O    | 1:A:352:ILE:HG12 | 1.82                     | 0.79              |
| 1:D:416:ARG:HD2  | 1:D:418:GLN:OE1  | 1.81                     | 0.79              |
| 1:C:338:PHE:HB2  | 1:C:373:THR:HA   | 1.63                     | 0.79              |
| 1:B:12:VAL:HG12  | 1:B:401:GLY:HA2  | 1.63                     | 0.79              |
| 1:C:182:LEU:HD11 | 1:C:397:VAL:HG12 | 1.63                     | 0.79              |
| 1:C:302:ARG:HH21 | 1:C:302:ARG:HB2  | 1.47                     | 0.79              |
| 1:B:37:GLU:O     | 1:B:40:ARG:HG3   | 1.82                     | 0.78              |
| 1:B:404:GLU:H    | 1:B:404:GLU:CD   | 1.82                     | 0.78              |
| 1:D:59:HIS:HD2   | 1:D:61:HIS:HB2   | 1.48                     | 0.78              |
| 1:B:33:PHE:N     | 1:B:41:ASN:HD21  | 1.77                     | 0.78              |
| 1:D:59:HIS:HB3   | 1:D:145:SER:CB   | 2.14                     | 0.78              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:B:63:ASP:O     | 1:B:65:VAL:N     | 2.17                     | 0.78              |
| 1:A:33:PHE:H     | 1:A:41:ASN:HD21  | 1.31                     | 0.77              |
| 1:B:61:HIS:O     | 1:B:65:VAL:HG12  | 1.84                     | 0.77              |
| 1:A:309:VAL:HG11 | 1:A:324:HIS:ND1  | 1.99                     | 0.76              |
| 1:D:170:VAL:HG21 | 1:D:230:GLU:HG3  | 1.66                     | 0.76              |
| 1:D:359:ARG:HA   | 1:D:363:GLU:O    | 1.85                     | 0.76              |
| 1:B:221:PRO:HB3  | 1:B:321:ILE:HG12 | 1.66                     | 0.76              |
| 1:B:1:MSE:CB     | 1:B:21:ALA:HB2   | 2.16                     | 0.76              |
| 1:C:132:LEU:HG   | 1:C:134:LEU:HD11 | 1.66                     | 0.76              |
| 1:A:57:LEU:HG    | 1:A:65:VAL:HG23  | 1.68                     | 0.75              |
| 1:B:394:PRO:O    | 1:B:395:ARG:HB2  | 1.87                     | 0.75              |
| 1:D:387:LEU:HB3  | 1:D:416:ARG:HH12 | 1.52                     | 0.75              |
| 1:B:208:LEU:HD21 | 1:B:218:VAL:HG11 | 1.69                     | 0.74              |
| 1:A:155:ARG:HE   | 1:A:431:VAL:HG22 | 1.50                     | 0.74              |
| 1:B:407:LEU:HD13 | 1:B:422:LEU:HD21 | 1.70                     | 0.74              |
| 1:B:63:ASP:OD1   | 1:B:63:ASP:N     | 2.19                     | 0.74              |
| 1:B:73:ARG:HE    | 1:B:106:PHE:HA   | 1.52                     | 0.74              |
| 1:C:409:LEU:O    | 1:C:413:LEU:HG   | 1.86                     | 0.74              |
| 1:C:123:TYR:HE1  | 1:C:146:ALA:HB2  | 1.52                     | 0.74              |
| 1:D:220:ILE:HG22 | 1:D:222:THR:HG23 | 1.69                     | 0.74              |
| 1:B:401:GLY:HA3  | 1:B:406:LEU:HD11 | 1.70                     | 0.73              |
| 1:C:20:LEU:HD23  | 1:C:25:ARG:HG2   | 1.70                     | 0.73              |
| 1:A:1:MSE:HG2    | 1:A:21:ALA:HB1   | 1.71                     | 0.73              |
| 1:C:294:THR:HG22 | 1:C:320:ARG:HH11 | 1.52                     | 0.73              |
| 1:B:132:LEU:HD12 | 1:B:133:SER:H    | 1.53                     | 0.73              |
| 1:C:10:ARG:NH1   | 1:C:424:ARG:HG2  | 2.04                     | 0.73              |
| 1:C:328:GLY:C    | 1:C:330:SER:H    | 1.89                     | 0.73              |
| 1:D:38:GLU:OE2   | 1:D:39:ALA:N     | 2.22                     | 0.73              |
| 1:D:227:ARG:NH1  | 1:D:378:SER:HA   | 2.04                     | 0.73              |
| 1:B:10:ARG:HG2   | 1:B:10:ARG:HH11  | 1.53                     | 0.72              |
| 1:B:32:MSE:HA    | 1:B:67:ARG:HG3   | 1.71                     | 0.72              |
| 1:D:27:LEU:HD13  | 1:D:29:ASP:O     | 1.88                     | 0.72              |
| 1:C:236:TYR:N    | 1:C:285:PRO:HB3  | 2.05                     | 0.72              |
| 1:A:1:MSE:HB3    | 1:A:21:ALA:HB2   | 1.71                     | 0.72              |
| 1:D:1:MSE:HG2    | 1:D:21:ALA:HB1   | 1.70                     | 0.72              |
| 1:D:227:ARG:HB2  | 1:D:227:ARG:NH2  | 2.04                     | 0.72              |
| 1:D:153:GLU:O    | 1:D:155:ARG:HG2  | 1.90                     | 0.72              |
| 1:A:103:GLU:O    | 1:A:103:GLU:HG2  | 1.89                     | 0.72              |
| 1:B:45:PHE:HB3   | 1:B:47:PHE:CE1   | 2.25                     | 0.71              |
| 1:B:36:LYS:H     | 1:B:36:LYS:HD3   | 1.55                     | 0.71              |
| 1:C:259:SER:O    | 1:C:262:PRO:HD2  | 1.90                     | 0.71              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:194:HIS:ND1  | 1:D:376:GLY:HA2  | 2.05                     | 0.71              |
| 1:A:63:ASP:O     | 1:A:64:HIS:HB2   | 1.90                     | 0.71              |
| 1:D:214:GLN:NE2  | 1:D:333:ARG:HA   | 2.05                     | 0.71              |
| 1:C:309:VAL:HG11 | 1:C:324:HIS:ND1  | 2.06                     | 0.70              |
| 1:D:59:HIS:HB3   | 1:D:145:SER:HB2  | 1.73                     | 0.70              |
| 1:B:220:ILE:HG22 | 1:B:222:THR:HG23 | 1.72                     | 0.70              |
| 1:A:313:SER:HB2  | 1:A:319:GLY:H    | 1.56                     | 0.70              |
| 1:D:309:VAL:HG11 | 1:D:324:HIS:ND1  | 2.05                     | 0.70              |
| 1:A:208:LEU:HD23 | 1:A:218:VAL:HG21 | 1.74                     | 0.70              |
| 1:B:155:ARG:HH11 | 1:B:431:VAL:HG11 | 1.55                     | 0.70              |
| 1:C:10:ARG:HG2   | 1:C:10:ARG:HH11  | 1.56                     | 0.70              |
| 1:A:155:ARG:HH11 | 1:A:431:VAL:HG21 | 1.57                     | 0.69              |
| 1:C:49:PRO:HB3   | 1:C:71:LEU:HD12  | 1.74                     | 0.69              |
| 1:D:37:GLU:O     | 1:D:38:GLU:O     | 2.11                     | 0.69              |
| 1:D:191:ASP:OD2  | 1:D:192:ARG:HG3  | 1.93                     | 0.69              |
| 1:D:420:VAL:HG22 | 1:D:421:SER:N    | 2.05                     | 0.69              |
| 1:A:134:LEU:N    | 1:A:134:LEU:HD12 | 2.07                     | 0.69              |
| 1:C:20:LEU:CD2   | 1:C:25:ARG:HG2   | 2.22                     | 0.69              |
| 1:A:3:ILE:HD11   | 1:A:17:HIS:HB3   | 1.73                     | 0.69              |
| 1:D:198:ARG:HG2  | 1:D:199:GLU:H    | 1.58                     | 0.69              |
| 1:B:240:HIS:CE1  | 1:B:241:ARG:HH11 | 2.10                     | 0.69              |
| 1:D:227:ARG:HH21 | 1:D:227:ARG:CB   | 2.05                     | 0.69              |
| 1:D:291:VAL:HG11 | 1:D:297:SER:HB2  | 1.73                     | 0.69              |
| 1:D:1:MSE:HG2    | 1:D:21:ALA:CB    | 2.23                     | 0.68              |
| 1:B:38:GLU:O     | 1:B:39:ALA:HB3   | 1.93                     | 0.68              |
| 1:B:68:LEU:N     | 1:B:69:PRO:HD2   | 2.09                     | 0.68              |
| 1:B:182:LEU:HD11 | 1:B:397:VAL:HG12 | 1.76                     | 0.68              |
| 1:C:262:PRO:O    | 1:C:265:VAL:HG12 | 1.93                     | 0.68              |
| 1:C:1:MSE:HG2    | 1:C:21:ALA:HB1   | 1.76                     | 0.68              |
| 1:C:10:ARG:HH22  | 1:C:424:ARG:HG2  | 1.58                     | 0.68              |
| 1:B:141:HIS:CD2  | 1:B:379:GLY:O    | 2.47                     | 0.67              |
| 1:D:8:ALA:O      | 1:D:399:VAL:HG22 | 1.93                     | 0.67              |
| 1:C:155:ARG:HB3  | 1:C:431:VAL:HG13 | 1.76                     | 0.67              |
| 1:D:49:PRO:HB3   | 1:D:71:LEU:HD12  | 1.76                     | 0.67              |
| 1:B:36:LYS:HD3   | 1:B:36:LYS:N     | 2.09                     | 0.67              |
| 1:B:250:ASP:OD1  | 1:B:324:HIS:HE1  | 1.77                     | 0.67              |
| 1:D:348:GLY:O    | 1:D:352:ILE:HG12 | 1.94                     | 0.67              |
| 1:D:36:LYS:H     | 1:D:36:LYS:HD3   | 1.58                     | 0.67              |
| 1:B:208:LEU:CD2  | 1:B:218:VAL:HG11 | 2.24                     | 0.67              |
| 1:C:85:ALA:HB2   | 1:C:267:TYR:CD2  | 2.29                     | 0.67              |
| 1:C:325:LEU:HG   | 1:C:329:LEU:HD22 | 1.77                     | 0.67              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:160:SER:HB2  | 1:C:163:LEU:CD1  | 2.24                     | 0.67              |
| 1:D:214:GLN:HE21 | 1:D:333:ARG:HA   | 1.60                     | 0.67              |
| 1:D:32:MSE:HA    | 1:D:67:ARG:HG3   | 1.75                     | 0.66              |
| 1:A:404:GLU:CD   | 1:A:404:GLU:H    | 1.97                     | 0.66              |
| 1:D:284:ARG:HA   | 1:D:288:LEU:HD22 | 1.77                     | 0.66              |
| 1:D:313:SER:OG   | 1:D:318:GLY:HA3  | 1.95                     | 0.66              |
| 1:B:97:ALA:O     | 1:B:101:MSE:HB2  | 1.95                     | 0.66              |
| 1:B:155:ARG:HE   | 1:B:431:VAL:CG1  | 2.08                     | 0.66              |
| 1:C:97:ALA:O     | 1:C:101:MSE:HB2  | 1.95                     | 0.66              |
| 1:D:90:MSE:HE1   | 1:D:118:LEU:CD2  | 2.26                     | 0.66              |
| 1:A:87:VAL:HG13  | 1:A:118:LEU:HD13 | 1.78                     | 0.66              |
| 1:C:32:MSE:HA    | 1:C:67:ARG:HG3   | 1.78                     | 0.66              |
| 1:D:196:PRO:HB2  | 1:D:199:GLU:OE2  | 1.96                     | 0.66              |
| 1:A:330:SER:HA   | 1:A:366:PRO:O    | 1.96                     | 0.65              |
| 1:A:191:ASP:OD2  | 1:A:192:ARG:HG2  | 1.96                     | 0.65              |
| 1:C:153:GLU:O    | 1:C:155:ARG:HG2  | 1.95                     | 0.65              |
| 1:D:198:ARG:HD2  | 1:D:198:ARG:N    | 2.11                     | 0.65              |
| 1:A:155:ARG:NH1  | 1:A:431:VAL:HG21 | 2.11                     | 0.65              |
| 1:D:182:LEU:HD11 | 1:D:397:VAL:HG12 | 1.79                     | 0.65              |
| 1:B:225:VAL:O    | 1:B:225:VAL:CG1  | 2.44                     | 0.65              |
| 1:B:398:LEU:CD2  | 1:B:420:VAL:HG23 | 2.27                     | 0.65              |
| 1:C:313:SER:HB2  | 1:C:318:GLY:HA3  | 1.78                     | 0.65              |
| 1:A:45:PHE:O     | 1:A:47:PHE:N     | 2.29                     | 0.65              |
| 1:A:266:ARG:NH2  | 1:C:273:GLN:HE22 | 1.94                     | 0.65              |
| 1:B:63:ASP:C     | 1:B:65:VAL:H     | 2.01                     | 0.65              |
| 1:B:1:MSE:HB2    | 1:B:21:ALA:HB2   | 1.77                     | 0.64              |
| 1:B:32:MSE:HE2   | 1:B:105:PHE:HZ   | 1.61                     | 0.64              |
| 1:D:54:ALA:HA    | 1:D:76:TYR:OH    | 1.97                     | 0.64              |
| 1:D:335:ALA:O    | 1:D:337:VAL:HG23 | 1.97                     | 0.64              |
| 1:D:402:GLU:HB3  | 1:D:404:GLU:OE2  | 1.96                     | 0.64              |
| 1:B:87:VAL:HA    | 1:B:90:MSE:HE3   | 1.80                     | 0.64              |
| 1:D:322:LEU:HB3  | 1:D:361:LEU:HD21 | 1.78                     | 0.64              |
| 1:D:394:PRO:O    | 1:D:395:ARG:HB2  | 1.98                     | 0.64              |
| 1:A:86:THR:HG22  | 1:A:90:MSE:HE3   | 1.80                     | 0.64              |
| 1:D:12:VAL:HB    | 1:D:401:GLY:N    | 2.11                     | 0.64              |
| 1:C:177:PRO:HD3  | 1:C:389:TRP:NE1  | 2.12                     | 0.64              |
| 1:B:130:GLY:O    | 1:B:131:ALA:HB3  | 1.98                     | 0.63              |
| 1:C:3:ILE:HD12   | 1:C:17:HIS:HB3   | 1.80                     | 0.63              |
| 1:A:302:ARG:HD3  | 1:A:302:ARG:N    | 2.13                     | 0.63              |
| 1:B:328:GLY:O    | 1:B:329:LEU:CB   | 2.46                     | 0.63              |
| 1:D:226:GLU:O    | 1:D:229:GLN:HG2  | 1.98                     | 0.63              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:A:163:LEU:HD21 | 1:A:389:TRP:CE2  | 2.32                     | 0.63              |
| 1:A:220:ILE:HG22 | 1:A:222:THR:HG23 | 1.79                     | 0.63              |
| 1:B:1:MSE:HB3    | 1:B:21:ALA:HB2   | 1.80                     | 0.63              |
| 1:C:375:GLY:O    | 1:C:377:PHE:N    | 2.32                     | 0.63              |
| 1:D:289:GLU:O    | 1:D:290:VAL:HB   | 1.98                     | 0.63              |
| 1:A:220:ILE:HG22 | 1:A:222:THR:CG2  | 2.28                     | 0.63              |
| 1:C:348:GLY:O    | 1:C:352:ILE:HG12 | 1.98                     | 0.63              |
| 1:B:191:ASP:OD2  | 1:B:192:ARG:HG2  | 1.98                     | 0.63              |
| 1:B:395:ARG:HH22 | 1:B:431:VAL:HB   | 1.64                     | 0.63              |
| 1:D:221:PRO:HD2  | 1:D:337:VAL:O    | 1.97                     | 0.63              |
| 1:A:155:ARG:HE   | 1:A:431:VAL:HG21 | 1.64                     | 0.62              |
| 1:C:73:ARG:NE    | 1:C:106:PHE:HA   | 2.05                     | 0.62              |
| 1:A:12:VAL:HG23  | 1:A:400:HIS:CE1  | 2.33                     | 0.62              |
| 1:C:96:ASP:O     | 1:C:100:VAL:HG22 | 2.00                     | 0.62              |
| 1:C:233:TYR:CD1  | 1:C:282:PRO:HB2  | 2.35                     | 0.62              |
| 1:C:202:ARG:O    | 1:C:206:GLU:HG3  | 1.99                     | 0.62              |
| 1:C:211:THR:HG21 | 1:C:218:VAL:HG22 | 1.82                     | 0.62              |
| 1:B:189:TYR:HE2  | 1:B:341:TYR:CD1  | 2.17                     | 0.62              |
| 1:A:83:THR:O     | 1:A:87:VAL:HG23  | 1.99                     | 0.62              |
| 1:D:217:LYS:HB2  | 1:D:334:ASN:OD1  | 2.00                     | 0.62              |
| 1:D:195:ARG:HB3  | 1:D:375:GLY:O    | 2.00                     | 0.62              |
| 1:A:38:GLU:O     | 1:A:40:ARG:N     | 2.30                     | 0.62              |
| 1:D:32:MSE:HE1   | 1:D:101:MSE:HE2  | 1.82                     | 0.62              |
| 1:A:398:LEU:HB3  | 1:A:406:LEU:HG   | 1.82                     | 0.61              |
| 1:D:155:ARG:HE   | 1:D:431:VAL:HG13 | 1.65                     | 0.61              |
| 1:A:177:PRO:HD3  | 1:A:389:TRP:CE2  | 2.34                     | 0.61              |
| 1:C:247:ILE:O    | 1:C:288:LEU:HA   | 2.00                     | 0.61              |
| 1:C:424:ARG:HD3  | 1:C:427:GLU:OE1  | 1.99                     | 0.61              |
| 1:D:12:VAL:HB    | 1:D:401:GLY:H    | 1.66                     | 0.61              |
| 1:A:98:LEU:HD13  | 1:A:106:PHE:CE2  | 2.36                     | 0.61              |
| 1:D:97:ALA:O     | 1:D:101:MSE:HB2  | 2.01                     | 0.61              |
| 1:B:238:HIS:HA   | 1:B:240:HIS:CE1  | 2.34                     | 0.61              |
| 1:A:107:GLY:N    | 1:A:110:ASP:OD2  | 2.30                     | 0.61              |
| 1:A:8:ALA:O      | 1:A:399:VAL:HG23 | 2.00                     | 0.61              |
| 1:B:225:VAL:O    | 1:B:225:VAL:HG12 | 2.01                     | 0.61              |
| 1:C:61:HIS:NE2   | 1:C:225:VAL:HG11 | 2.15                     | 0.61              |
| 1:B:48:ASP:OD2   | 1:B:51:GLU:HG2   | 2.00                     | 0.61              |
| 1:D:250:ASP:HA   | 1:D:291:VAL:HB   | 1.82                     | 0.61              |
| 1:B:70:LYS:HE3   | 1:B:74:GLU:OE1   | 2.01                     | 0.60              |
| 1:C:221:PRO:HD2  | 1:C:337:VAL:O    | 2.01                     | 0.60              |
| 1:C:358:VAL:HG12 | 1:C:359:ARG:N    | 2.15                     | 0.60              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:397:VAL:HA   | 1:C:421:SER:O    | 1.99                     | 0.60              |
| 1:D:224:ALA:CB   | 1:D:254:ALA:HB2  | 2.31                     | 0.60              |
| 1:C:8:ALA:HB1    | 1:C:400:HIS:HA   | 1.84                     | 0.60              |
| 1:A:328:GLY:O    | 1:A:329:LEU:CB   | 2.49                     | 0.60              |
| 1:B:265:VAL:HA   | 1:B:268:PHE:CD2  | 2.37                     | 0.60              |
| 1:C:164:GLY:HA2  | 1:C:379:GLY:O    | 2.01                     | 0.60              |
| 1:D:184:LEU:HD23 | 1:D:397:VAL:HG13 | 1.83                     | 0.60              |
| 1:D:347:LEU:HG   | 1:D:348:GLY:H    | 1.67                     | 0.60              |
| 1:C:298:LYS:HA   | 1:C:301:ASN:ND2  | 2.17                     | 0.60              |
| 1:D:347:LEU:HG   | 1:D:348:GLY:N    | 2.16                     | 0.60              |
| 1:A:253:MSE:O    | 1:A:257:VAL:HG23 | 2.02                     | 0.60              |
| 1:C:302:ARG:HD3  | 1:C:302:ARG:N    | 2.16                     | 0.60              |
| 1:B:37:GLU:OE2   | 1:B:40:ARG:HD2   | 2.02                     | 0.60              |
| 1:B:354:ARG:HG3  | 1:B:354:ARG:O    | 2.02                     | 0.60              |
| 1:D:190:GLY:O    | 1:D:409:LEU:HB2  | 2.01                     | 0.60              |
| 1:D:197:TYR:O    | 1:D:201:VAL:HG23 | 2.02                     | 0.60              |
| 1:A:163:LEU:HD21 | 1:A:389:TRP:CD2  | 2.37                     | 0.59              |
| 1:C:313:SER:HB3  | 1:C:321:ILE:HG21 | 1.83                     | 0.59              |
| 1:D:166:ARG:HG2  | 1:D:385:GLU:OE2  | 2.02                     | 0.59              |
| 1:D:424:ARG:HD3  | 1:D:427:GLU:OE2  | 2.01                     | 0.59              |
| 1:A:317:ALA:HA   | 1:A:322:LEU:HD11 | 1.85                     | 0.59              |
| 1:B:177:PRO:HD3  | 1:B:389:TRP:CE2  | 2.36                     | 0.59              |
| 1:C:85:ALA:HB3   | 1:C:144:GLY:HA3  | 1.85                     | 0.59              |
| 1:C:415:LEU:C    | 1:C:417:GLY:H    | 2.05                     | 0.59              |
| 1:D:163:LEU:N    | 1:D:163:LEU:HD12 | 2.16                     | 0.59              |
| 1:D:236:TYR:CA   | 1:D:285:PRO:HB3  | 2.31                     | 0.59              |
| 1:D:237:THR:O    | 1:D:238:HIS:HB2  | 2.02                     | 0.59              |
| 1:B:31:GLY:HA3   | 1:B:64:HIS:N     | 2.18                     | 0.59              |
| 1:B:187:GLY:O    | 1:B:188:THR:C    | 2.40                     | 0.59              |
| 1:C:328:GLY:O    | 1:C:329:LEU:HB3  | 2.01                     | 0.59              |
| 1:D:387:LEU:HB3  | 1:D:416:ARG:NH1  | 2.16                     | 0.59              |
| 1:B:224:ALA:HB3  | 1:B:253:MSE:HE2  | 1.85                     | 0.59              |
| 1:C:2:ARG:NH1    | 3:C:446:HOH:O    | 2.32                     | 0.59              |
| 1:A:155:ARG:NE   | 1:A:431:VAL:HG21 | 2.18                     | 0.59              |
| 1:C:359:ARG:HA   | 1:C:364:GLU:HA   | 1.83                     | 0.59              |
| 1:D:238:HIS:HA   | 1:D:241:ARG:NH1  | 2.18                     | 0.59              |
| 1:C:219:LEU:HD11 | 1:C:324:HIS:HB3  | 1.84                     | 0.59              |
| 1:B:37:GLU:O     | 1:B:38:GLU:O     | 2.21                     | 0.59              |
| 1:B:338:PHE:CD1  | 1:B:342:GLN:NE2  | 2.71                     | 0.59              |
| 1:D:235:LEU:CD2  | 1:D:247:ILE:HD13 | 2.32                     | 0.59              |
| 1:B:202:ARG:O    | 1:B:206:GLU:HG3  | 2.01                     | 0.59              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:235:LEU:CD2  | 1:C:247:ILE:HD13 | 2.28                     | 0.59              |
| 1:C:236:TYR:CA   | 1:C:285:PRO:HB3  | 2.33                     | 0.59              |
| 1:A:111:VAL:O    | 1:A:115:LEU:HB2  | 2.03                     | 0.59              |
| 1:C:36:LYS:H     | 1:C:36:LYS:CD    | 2.03                     | 0.58              |
| 1:D:10:ARG:HH22  | 1:D:424:ARG:NH2  | 2.00                     | 0.58              |
| 1:C:10:ARG:NH2   | 1:C:424:ARG:HG2  | 2.18                     | 0.58              |
| 1:A:374:LEU:C    | 1:A:375:GLY:O    | 2.37                     | 0.58              |
| 1:B:309:VAL:C    | 1:B:310:LEU:HD12 | 2.24                     | 0.58              |
| 1:C:355:PRO:HB2  | 1:C:356:PRO:HD2  | 1.85                     | 0.58              |
| 1:D:208:LEU:HD23 | 1:D:218:VAL:HG21 | 1.83                     | 0.58              |
| 1:D:388:ASP:O    | 1:D:391:GLN:HB3  | 2.03                     | 0.58              |
| 1:A:58:THR:O     | 1:A:59:HIS:O     | 2.20                     | 0.58              |
| 1:A:222:THR:HG22 | 1:A:339:VAL:CG2  | 2.32                     | 0.58              |
| 1:B:251:SER:HB3  | 1:B:254:ALA:HB3  | 1.85                     | 0.58              |
| 1:C:155:ARG:HE   | 1:C:431:VAL:CG1  | 2.15                     | 0.58              |
| 1:C:357:ALA:HB2  | 1:C:366:PRO:HA   | 1.86                     | 0.58              |
| 1:A:141:HIS:HD2  | 1:A:379:GLY:O    | 1.86                     | 0.58              |
| 1:D:98:LEU:HD21  | 1:D:108:PRO:HB3  | 1.85                     | 0.58              |
| 1:D:394:PRO:O    | 1:D:395:ARG:CB   | 2.51                     | 0.58              |
| 1:A:289:GLU:O    | 1:A:290:VAL:HB   | 2.04                     | 0.58              |
| 1:A:328:GLY:O    | 1:A:329:LEU:HB2  | 2.02                     | 0.58              |
| 1:B:265:VAL:HA   | 1:B:268:PHE:HD2  | 1.66                     | 0.58              |
| 1:D:246:PRO:HB2  | 1:D:248:TYR:CE1  | 2.37                     | 0.58              |
| 1:A:359:ARG:NH2  | 1:A:362:GLY:HA2  | 2.19                     | 0.58              |
| 1:B:45:PHE:C     | 1:B:47:PHE:H     | 2.06                     | 0.58              |
| 1:B:91:GLU:O     | 1:B:95:GLU:HG2   | 2.04                     | 0.57              |
| 1:B:317:ALA:HA   | 1:B:322:LEU:HD11 | 1.86                     | 0.57              |
| 1:A:86:THR:O     | 1:A:90:MSE:HB2   | 2.05                     | 0.57              |
| 1:C:251:SER:HB3  | 1:C:254:ALA:HB3  | 1.86                     | 0.57              |
| 1:B:10:ARG:CD    | 1:B:403:GLU:HG3  | 2.33                     | 0.57              |
| 1:A:86:THR:HG22  | 1:A:90:MSE:CE    | 2.34                     | 0.57              |
| 1:A:250:ASP:OD2  | 1:A:320:ARG:NH2  | 2.37                     | 0.57              |
| 1:C:87:VAL:HA    | 1:C:90:MSE:HE3   | 1.87                     | 0.57              |
| 1:D:275:HIS:HA   | 1:D:278:GLN:HG2  | 1.86                     | 0.57              |
| 1:C:296:ALA:HA   | 1:C:299:ALA:HB3  | 1.87                     | 0.57              |
| 1:D:274:ALA:O    | 1:D:277:LEU:HB3  | 2.05                     | 0.57              |
| 1:A:157:LEU:HG   | 1:A:158:VAL:N    | 2.15                     | 0.57              |
| 1:D:395:ARG:HH22 | 1:D:431:VAL:HB   | 1.69                     | 0.57              |
| 1:C:61:HIS:CD2   | 1:C:225:VAL:HG11 | 2.39                     | 0.57              |
| 1:C:387:LEU:HD22 | 1:C:416:ARG:NH1  | 2.19                     | 0.57              |
| 1:A:85:ALA:HB2   | 1:A:267:TYR:CD2  | 2.39                     | 0.57              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:B:32:MSE:HE2   | 1:B:105:PHE:CZ   | 2.39                     | 0.57              |
| 1:B:238:HIS:O    | 1:B:241:ARG:HG2  | 2.05                     | 0.57              |
| 1:A:186:GLU:OE1  | 1:A:380:HIS:HD2  | 1.88                     | 0.56              |
| 1:B:101:MSE:HE1  | 1:B:106:PHE:CE1  | 2.40                     | 0.56              |
| 1:D:33:PHE:H     | 1:D:41:ASN:ND2   | 1.96                     | 0.56              |
| 1:D:198:ARG:HG2  | 1:D:199:GLU:N    | 2.19                     | 0.56              |
| 1:B:404:GLU:OE2  | 1:B:404:GLU:N    | 2.31                     | 0.56              |
| 1:C:360:ILE:O    | 1:C:361:LEU:HB2  | 2.05                     | 0.56              |
| 1:D:12:VAL:HG22  | 1:D:12:VAL:O     | 2.06                     | 0.56              |
| 1:D:347:LEU:O    | 1:D:349:ALA:N    | 2.38                     | 0.56              |
| 1:C:57:LEU:HD22  | 1:C:80:VAL:HG12  | 1.88                     | 0.56              |
| 1:C:7:GLY:HA3    | 1:C:14:GLY:O     | 2.06                     | 0.56              |
| 1:C:233:TYR:CE1  | 1:C:282:PRO:HB2  | 2.40                     | 0.56              |
| 1:C:296:ALA:HA   | 1:C:299:ALA:CB   | 2.36                     | 0.56              |
| 1:B:103:GLU:N    | 1:B:104:PRO:HD3  | 2.21                     | 0.56              |
| 1:C:68:LEU:N     | 1:C:69:PRO:HD2   | 2.19                     | 0.56              |
| 1:C:204:PHE:HB2  | 1:C:374:LEU:HD13 | 1.88                     | 0.56              |
| 1:B:61:HIS:O     | 1:B:63:ASP:O     | 2.23                     | 0.56              |
| 1:C:10:ARG:HH22  | 1:C:424:ARG:HH21 | 1.54                     | 0.56              |
| 1:D:12:VAL:HG23  | 1:D:400:HIS:ND1  | 2.21                     | 0.56              |
| 1:A:333:ARG:HG2  | 1:A:333:ARG:HH21 | 1.71                     | 0.55              |
| 1:B:224:ALA:CB   | 1:B:253:MSE:HE2  | 2.36                     | 0.55              |
| 1:C:10:ARG:NH2   | 1:C:424:ARG:HH21 | 2.04                     | 0.55              |
| 1:C:148:VAL:HG12 | 1:C:149:VAL:N    | 2.21                     | 0.55              |
| 1:C:339:VAL:HG23 | 1:C:340:GLY:H    | 1.70                     | 0.55              |
| 1:D:236:TYR:HA   | 1:D:285:PRO:HB3  | 1.88                     | 0.55              |
| 1:B:1:MSE:HB3    | 1:B:21:ALA:CB    | 2.37                     | 0.55              |
| 1:B:187:GLY:O    | 1:B:190:GLY:N    | 2.39                     | 0.55              |
| 1:C:1:MSE:O      | 1:C:431:VAL:N    | 2.37                     | 0.55              |
| 1:A:222:THR:HG22 | 1:A:339:VAL:HG21 | 1.87                     | 0.55              |
| 1:B:38:GLU:O     | 1:B:39:ALA:CB    | 2.54                     | 0.55              |
| 1:B:401:GLY:CA   | 1:B:406:LEU:HD11 | 2.37                     | 0.55              |
| 1:D:347:LEU:CG   | 1:D:348:GLY:H    | 2.19                     | 0.55              |
| 1:A:97:ALA:HA    | 1:A:100:VAL:HG22 | 1.88                     | 0.55              |
| 1:C:85:ALA:HB2   | 1:C:267:TYR:CE2  | 2.41                     | 0.55              |
| 1:B:327:HIS:O    | 1:B:328:GLY:O    | 2.25                     | 0.55              |
| 1:B:395:ARG:HA   | 1:B:419:GLU:O    | 2.07                     | 0.55              |
| 1:D:248:TYR:O    | 1:D:310:LEU:HD12 | 2.07                     | 0.55              |
| 1:B:1:MSE:O      | 1:B:431:VAL:N    | 2.40                     | 0.55              |
| 1:C:302:ARG:HD3  | 1:C:302:ARG:H    | 1.72                     | 0.55              |
| 1:A:165:ASN:C    | 1:A:165:ASN:HD22 | 2.10                     | 0.55              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:B:220:ILE:HG22 | 1:B:222:THR:CG2  | 2.37                     | 0.55              |
| 1:B:304:PRO:O    | 1:B:305:GLY:O    | 2.25                     | 0.55              |
| 1:C:177:PRO:HD3  | 1:C:389:TRP:CE2  | 2.42                     | 0.55              |
| 1:D:55:VAL:CG2   | 1:D:80:VAL:HG13  | 2.36                     | 0.55              |
| 1:A:57:LEU:HD22  | 1:A:80:VAL:CG1   | 2.37                     | 0.55              |
| 1:D:354:ARG:HG3  | 1:D:354:ARG:O    | 2.07                     | 0.54              |
| 1:A:45:PHE:C     | 1:A:47:PHE:H     | 2.10                     | 0.54              |
| 1:B:225:VAL:O    | 1:B:226:GLU:HB2  | 2.07                     | 0.54              |
| 1:A:3:ILE:HD13   | 1:A:4:VAL:N      | 2.22                     | 0.54              |
| 1:A:65:VAL:HG13  | 1:A:65:VAL:O     | 2.07                     | 0.54              |
| 1:A:259:SER:O    | 1:A:262:PRO:HD2  | 2.08                     | 0.54              |
| 1:B:88:LEU:HD12  | 1:B:264:LEU:HD11 | 1.90                     | 0.54              |
| 1:D:49:PRO:CB    | 1:D:71:LEU:HD12  | 2.38                     | 0.54              |
| 1:D:204:PHE:CE1  | 1:D:208:LEU:HD11 | 2.42                     | 0.54              |
| 1:C:195:ARG:HH21 | 1:C:195:ARG:HG3  | 1.72                     | 0.54              |
| 1:C:237:THR:HG22 | 1:C:238:HIS:ND1  | 2.23                     | 0.54              |
| 1:D:353:ALA:HB3  | 1:D:355:PRO:HD3  | 1.90                     | 0.54              |
| 1:A:1:MSE:HG2    | 1:A:21:ALA:CB    | 2.38                     | 0.54              |
| 1:C:360:ILE:HG22 | 1:C:361:LEU:CD2  | 2.38                     | 0.54              |
| 1:D:12:VAL:HB    | 1:D:401:GLY:CA   | 2.38                     | 0.54              |
| 1:A:1:MSE:CB     | 1:A:21:ALA:HB2   | 2.37                     | 0.54              |
| 1:B:189:TYR:CE2  | 1:B:341:TYR:CD1  | 2.95                     | 0.54              |
| 1:C:332:PRO:HD3  | 1:C:368:ARG:HB3  | 1.90                     | 0.54              |
| 1:A:11:GLU:OE1   | 1:A:40:ARG:NH1   | 2.41                     | 0.54              |
| 1:D:237:THR:HG22 | 1:D:238:HIS:ND1  | 2.23                     | 0.54              |
| 1:D:257:VAL:HG12 | 1:D:261:TYR:CD2  | 2.42                     | 0.54              |
| 1:C:128:ARG:NH2  | 1:C:128:ARG:HG3  | 2.23                     | 0.53              |
| 1:D:244:ARG:HG3  | 1:D:244:ARG:HH11 | 1.74                     | 0.53              |
| 1:A:3:ILE:CD1    | 1:A:17:HIS:HB3   | 2.36                     | 0.53              |
| 1:B:399:VAL:HG22 | 1:B:400:HIS:H    | 1.71                     | 0.53              |
| 1:C:94:LEU:HD13  | 1:C:111:VAL:HG13 | 1.89                     | 0.53              |
| 1:A:54:ALA:HA    | 1:A:76:TYR:OH    | 2.08                     | 0.53              |
| 1:C:32:MSE:HE2   | 1:C:105:PHE:HZ   | 1.74                     | 0.53              |
| 1:D:396:VAL:HG12 | 1:D:398:LEU:HD22 | 1.90                     | 0.53              |
| 1:C:36:LYS:N     | 1:C:36:LYS:CD    | 2.66                     | 0.53              |
| 1:C:360:ILE:HG22 | 1:C:361:LEU:HD23 | 1.88                     | 0.53              |
| 1:D:248:TYR:CE1  | 1:D:307:MSE:HE2  | 2.43                     | 0.53              |
| 1:D:249:LEU:HB3  | 1:D:290:VAL:HA   | 1.89                     | 0.53              |
| 1:D:251:SER:HB3  | 1:D:254:ALA:HB3  | 1.90                     | 0.53              |
| 1:A:399:VAL:HG22 | 1:A:400:HIS:N    | 2.22                     | 0.53              |
| 1:C:10:ARG:HH11  | 1:C:10:ARG:CG    | 2.22                     | 0.53              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:90:MSE:C     | 1:D:92:ILE:H     | 2.11                     | 0.53              |
| 1:B:5:PRO:HA     | 1:B:17:HIS:HD2   | 1.73                     | 0.53              |
| 1:C:302:ARG:HH21 | 1:C:302:ARG:CB   | 2.19                     | 0.53              |
| 1:D:182:LEU:HD11 | 1:D:397:VAL:CG1  | 2.39                     | 0.53              |
| 1:D:278:GLN:O    | 1:D:280:LYS:HG2  | 2.09                     | 0.53              |
| 1:D:309:VAL:HG11 | 1:D:324:HIS:CE1  | 2.44                     | 0.53              |
| 1:A:156:THR:HG22 | 1:A:180:ALA:CB   | 2.39                     | 0.53              |
| 1:A:229:GLN:HG3  | 1:A:261:TYR:CZ   | 2.44                     | 0.53              |
| 1:B:28:LEU:O     | 1:B:29:ASP:HB2   | 2.09                     | 0.53              |
| 1:B:398:LEU:HD22 | 1:B:398:LEU:H    | 1.74                     | 0.53              |
| 1:C:204:PHE:O    | 1:C:208:LEU:HG   | 2.09                     | 0.53              |
| 1:C:209:GLU:C    | 1:C:211:THR:H    | 2.12                     | 0.53              |
| 1:D:420:VAL:CG2  | 1:D:421:SER:H    | 2.17                     | 0.53              |
| 1:B:316:LEU:O    | 1:B:317:ALA:C    | 2.47                     | 0.53              |
| 1:C:45:PHE:HB3   | 1:C:47:PHE:CE1   | 2.43                     | 0.53              |
| 1:A:207:ILE:HG12 | 1:A:372:HIS:CE1  | 2.44                     | 0.52              |
| 1:C:163:LEU:HD12 | 1:C:163:LEU:N    | 2.24                     | 0.52              |
| 1:D:65:VAL:HG21  | 1:D:90:MSE:SE    | 2.58                     | 0.52              |
| 1:D:142:LEU:HD12 | 1:D:226:GLU:HG3  | 1.91                     | 0.52              |
| 1:B:45:PHE:O     | 1:B:47:PHE:N     | 2.43                     | 0.52              |
| 1:B:250:ASP:OD1  | 1:B:324:HIS:CE1  | 2.61                     | 0.52              |
| 1:A:36:LYS:H     | 1:A:36:LYS:CD    | 2.08                     | 0.52              |
| 1:B:310:LEU:HD12 | 1:B:310:LEU:N    | 2.24                     | 0.52              |
| 1:B:105:PHE:O    | 1:B:106:PHE:O    | 2.27                     | 0.52              |
| 1:D:165:ASN:HB2  | 1:D:380:HIS:O    | 2.09                     | 0.52              |
| 1:D:269:SER:O    | 1:D:273:GLN:HG3  | 2.10                     | 0.52              |
| 1:A:315:MSE:HG2  | 1:A:343:PRO:HD3  | 1.91                     | 0.52              |
| 1:A:31:GLY:HA3   | 1:A:64:HIS:H     | 1.70                     | 0.52              |
| 1:B:350:GLU:O    | 1:B:353:ALA:HB3  | 2.10                     | 0.52              |
| 1:D:87:VAL:HG13  | 1:D:118:LEU:HD13 | 1.91                     | 0.52              |
| 1:D:324:HIS:O    | 1:D:325:LEU:HD12 | 2.10                     | 0.52              |
| 1:B:37:GLU:HB3   | 1:B:40:ARG:HD3   | 1.91                     | 0.52              |
| 1:B:140:GLY:O    | 1:B:164:GLY:HA3  | 2.10                     | 0.52              |
| 1:B:410:GLY:CA   | 1:B:420:VAL:HG21 | 2.40                     | 0.52              |
| 1:D:129:LEU:O    | 1:D:130:GLY:O    | 2.27                     | 0.52              |
| 1:D:216:GLY:HA3  | 1:D:333:ARG:O    | 2.09                     | 0.52              |
| 1:D:233:TYR:HD1  | 1:D:282:PRO:O    | 1.92                     | 0.52              |
| 1:D:347:LEU:CG   | 1:D:348:GLY:N    | 2.72                     | 0.52              |
| 1:C:424:ARG:HG2  | 1:C:424:ARG:HH21 | 1.76                     | 0.51              |
| 1:D:162:ASP:HA   | 1:D:186:GLU:OE1  | 2.10                     | 0.51              |
| 1:B:5:PRO:HG2    | 1:B:423:ALA:HB1  | 1.92                     | 0.51              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:352:ILE:HG22 | 1:D:352:ILE:O    | 2.10                     | 0.51              |
| 1:A:128:ARG:NH2  | 1:A:128:ARG:HG3  | 2.24                     | 0.51              |
| 1:A:266:ARG:NH2  | 1:C:273:GLN:NE2  | 2.56                     | 0.51              |
| 1:B:80:VAL:HB    | 1:B:118:LEU:HD23 | 1.92                     | 0.51              |
| 1:B:325:LEU:HG   | 1:B:329:LEU:HD22 | 1.92                     | 0.51              |
| 1:C:87:VAL:HG13  | 1:C:118:LEU:HD13 | 1.92                     | 0.51              |
| 1:C:249:LEU:HB3  | 1:C:290:VAL:HA   | 1.92                     | 0.51              |
| 1:D:163:LEU:N    | 1:D:163:LEU:CD1  | 2.73                     | 0.51              |
| 1:D:410:GLY:HA2  | 1:D:420:VAL:HG21 | 1.93                     | 0.51              |
| 1:C:209:GLU:OE1  | 1:C:209:GLU:HA   | 2.10                     | 0.51              |
| 1:D:233:TYR:CE1  | 1:D:282:PRO:HB2  | 2.45                     | 0.51              |
| 1:D:253:MSE:HA   | 1:D:256:ARG:CZ   | 2.41                     | 0.51              |
| 1:D:321:ILE:O    | 1:D:325:LEU:HD13 | 2.10                     | 0.51              |
| 1:A:430:PRO:O    | 1:A:431:VAL:HB   | 2.10                     | 0.51              |
| 1:B:36:LYS:N     | 1:B:36:LYS:CD    | 2.71                     | 0.51              |
| 1:C:223:PHE:HE2  | 1:C:315:MSE:HE2  | 1.76                     | 0.51              |
| 1:A:37:GLU:C     | 1:A:38:GLU:O     | 2.49                     | 0.51              |
| 1:A:130:GLY:O    | 1:A:131:ALA:HB3  | 2.09                     | 0.51              |
| 1:D:181:ASP:O    | 1:D:395:ARG:HB2  | 2.11                     | 0.51              |
| 1:B:31:GLY:HA3   | 1:B:64:HIS:H     | 1.76                     | 0.51              |
| 1:C:375:GLY:O    | 1:C:377:PHE:HB2  | 2.11                     | 0.51              |
| 1:A:73:ARG:HB2   | 1:A:110:ASP:OD1  | 2.09                     | 0.51              |
| 1:A:266:ARG:HH21 | 1:C:273:GLN:HE22 | 1.57                     | 0.51              |
| 1:B:126:TRP:CE3  | 1:D:178:PRO:HB3  | 2.45                     | 0.51              |
| 1:B:251:SER:HB3  | 1:B:254:ALA:CB   | 2.40                     | 0.50              |
| 1:A:155:ARG:CZ   | 1:A:431:VAL:HG21 | 2.40                     | 0.50              |
| 1:A:219:LEU:HD13 | 1:A:219:LEU:N    | 2.26                     | 0.50              |
| 1:C:177:PRO:HD3  | 1:C:389:TRP:CD1  | 2.47                     | 0.50              |
| 1:D:284:ARG:NH2  | 1:D:288:LEU:HD23 | 2.26                     | 0.50              |
| 1:D:301:ASN:HB3  | 1:D:327:HIS:HB3  | 1.93                     | 0.50              |
| 1:A:358:VAL:HG12 | 1:A:359:ARG:N    | 2.26                     | 0.50              |
| 1:C:155:ARG:HE   | 1:C:431:VAL:HG11 | 1.75                     | 0.50              |
| 1:C:204:PHE:CE1  | 1:C:208:LEU:HD11 | 2.46                     | 0.50              |
| 1:D:10:ARG:HE    | 1:D:422:LEU:HB3  | 1.76                     | 0.50              |
| 1:B:22:GLY:O     | 1:B:130:GLY:O    | 2.30                     | 0.50              |
| 1:D:92:ILE:O     | 1:D:95:GLU:N     | 2.45                     | 0.50              |
| 1:A:84:ARG:NH2   | 1:A:122:GLU:HG2  | 2.27                     | 0.50              |
| 1:B:62:LEU:O     | 1:B:66:GLY:N     | 2.44                     | 0.50              |
| 1:C:281:ASN:O    | 1:C:283:PHE:N    | 2.44                     | 0.50              |
| 1:C:411:LYS:O    | 1:C:414:ALA:HB3  | 2.12                     | 0.50              |
| 1:D:244:ARG:HG3  | 1:D:244:ARG:NH1  | 2.26                     | 0.50              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:38:GLU:C     | 1:C:40:ARG:H     | 2.14                     | 0.50              |
| 1:D:112:GLU:HG3  | 1:D:113:GLU:N    | 2.26                     | 0.50              |
| 1:C:354:ARG:NH1  | 1:C:371:VAL:HG23 | 2.27                     | 0.50              |
| 1:D:130:GLY:O    | 1:D:132:LEU:N    | 2.45                     | 0.50              |
| 1:C:207:ILE:HD13 | 1:C:372:HIS:CG   | 2.46                     | 0.50              |
| 1:A:186:GLU:OE2  | 1:A:188:THR:OG1  | 2.21                     | 0.50              |
| 1:B:9:ALA:O      | 1:B:11:GLU:HG2   | 2.12                     | 0.50              |
| 1:C:62:LEU:HD22  | 1:C:93:VAL:HG13  | 1.94                     | 0.50              |
| 1:C:258:LEU:HD21 | 1:C:283:PHE:HB3  | 1.93                     | 0.50              |
| 1:C:357:ALA:CB   | 1:C:366:PRO:HA   | 2.41                     | 0.50              |
| 1:C:415:LEU:C    | 1:C:417:GLY:N    | 2.66                     | 0.50              |
| 1:C:339:VAL:HG23 | 1:C:340:GLY:N    | 2.26                     | 0.49              |
| 1:C:105:PHE:O    | 1:C:106:PHE:O    | 2.30                     | 0.49              |
| 1:C:123:TYR:CE1  | 1:C:146:ALA:HB2  | 2.39                     | 0.49              |
| 1:C:186:GLU:HA   | 1:C:399:VAL:O    | 2.13                     | 0.49              |
| 1:D:233:TYR:HE1  | 1:D:282:PRO:HB2  | 1.76                     | 0.49              |
| 1:A:205:LEU:HD11 | 1:A:238:HIS:CD2  | 2.47                     | 0.49              |
| 1:A:244:ARG:HB3  | 1:B:295:GLU:OE1  | 2.12                     | 0.49              |
| 1:B:132:LEU:HD12 | 1:B:133:SER:N    | 2.24                     | 0.49              |
| 1:C:1:MSE:HG2    | 1:C:21:ALA:CB    | 2.40                     | 0.49              |
| 1:C:396:VAL:HG12 | 1:C:398:LEU:HD22 | 1.93                     | 0.49              |
| 1:D:32:MSE:HE1   | 1:D:101:MSE:CE   | 2.42                     | 0.49              |
| 1:C:10:ARG:HH12  | 1:C:424:ARG:CG   | 2.18                     | 0.49              |
| 1:C:27:LEU:HD13  | 1:C:29:ASP:O     | 2.12                     | 0.49              |
| 1:C:55:VAL:HG22  | 1:C:80:VAL:HG13  | 1.95                     | 0.49              |
| 1:C:237:THR:HG22 | 1:C:238:HIS:N    | 2.28                     | 0.49              |
| 1:D:237:THR:O    | 1:D:238:HIS:CB   | 2.60                     | 0.49              |
| 1:B:250:ASP:OD2  | 1:B:320:ARG:NH2  | 2.42                     | 0.49              |
| 1:A:290:VAL:HG12 | 1:A:290:VAL:O    | 2.13                     | 0.49              |
| 1:B:12:VAL:HG12  | 1:B:401:GLY:CA   | 2.38                     | 0.49              |
| 1:B:324:HIS:O    | 1:B:327:HIS:O    | 2.31                     | 0.49              |
| 1:C:193:PRO:HD3  | 1:C:383:GLN:HE21 | 1.78                     | 0.49              |
| 1:C:246:PRO:HB2  | 1:C:248:TYR:CZ   | 2.47                     | 0.49              |
| 1:D:38:GLU:C     | 1:D:40:ARG:H     | 2.11                     | 0.49              |
| 1:D:77:ARG:NE    | 1:D:113:GLU:OE1  | 2.44                     | 0.49              |
| 1:D:269:SER:OG   | 1:D:272:VAL:HG23 | 2.13                     | 0.49              |
| 1:A:8:ALA:HB3    | 1:A:399:VAL:HG22 | 1.95                     | 0.49              |
| 1:A:105:PHE:O    | 1:A:106:PHE:O    | 2.30                     | 0.49              |
| 1:B:105:PHE:CD1  | 1:B:106:PHE:HD1  | 2.31                     | 0.49              |
| 1:A:63:ASP:O     | 1:A:64:HIS:CB    | 2.57                     | 0.49              |
| 1:C:359:ARG:HH21 | 1:C:359:ARG:HG3  | 1.78                     | 0.49              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:59:HIS:NE2   | 1:D:61:HIS:HB2   | 2.26                     | 0.49              |
| 1:D:228:ALA:O    | 1:D:232:LEU:HG   | 2.13                     | 0.49              |
| 1:D:337:VAL:HG13 | 1:D:372:HIS:O    | 2.12                     | 0.49              |
| 1:A:37:GLU:O     | 1:A:38:GLU:O     | 2.31                     | 0.49              |
| 1:B:19:LEU:CD2   | 1:B:132:LEU:HD21 | 2.42                     | 0.49              |
| 1:C:37:GLU:O     | 1:C:38:GLU:O     | 2.31                     | 0.49              |
| 1:C:94:LEU:HD12  | 1:C:115:LEU:HD11 | 1.94                     | 0.49              |
| 1:C:163:LEU:HD21 | 1:C:389:TRP:CE2  | 2.48                     | 0.49              |
| 1:C:246:PRO:HB2  | 1:C:248:TYR:CE1  | 2.48                     | 0.49              |
| 1:B:22:GLY:CA    | 1:B:131:ALA:HB3  | 2.43                     | 0.49              |
| 1:B:103:GLU:N    | 1:B:104:PRO:CD   | 2.76                     | 0.49              |
| 1:B:209:GLU:O    | 1:B:213:SER:HB2  | 2.13                     | 0.49              |
| 1:D:198:ARG:HD2  | 1:D:198:ARG:H    | 1.78                     | 0.49              |
| 1:A:8:ALA:O      | 1:A:399:VAL:CG2  | 2.61                     | 0.48              |
| 1:A:10:ARG:NH1   | 1:A:10:ARG:HG2   | 2.28                     | 0.48              |
| 1:A:396:VAL:HG12 | 1:A:398:LEU:HD13 | 1.94                     | 0.48              |
| 1:A:398:LEU:HD23 | 1:A:406:LEU:O    | 2.12                     | 0.48              |
| 1:B:188:THR:HG22 | 1:B:189:TYR:CD1  | 2.48                     | 0.48              |
| 1:C:366:PRO:HB3  | 1:C:368:ARG:HH12 | 1.78                     | 0.48              |
| 1:D:3:ILE:CD1    | 1:D:17:HIS:HB3   | 2.43                     | 0.48              |
| 1:B:422:LEU:HD12 | 1:B:422:LEU:N    | 2.28                     | 0.48              |
| 1:C:111:VAL:O    | 1:C:115:LEU:HD13 | 2.13                     | 0.48              |
| 1:A:191:ASP:CG   | 1:A:405:LYS:HD3  | 2.33                     | 0.48              |
| 1:C:27:LEU:O     | 1:C:55:VAL:HA    | 2.13                     | 0.48              |
| 1:C:38:GLU:O     | 1:C:40:ARG:N     | 2.41                     | 0.48              |
| 1:C:348:GLY:H    | 1:C:351:ILE:HG13 | 1.78                     | 0.48              |
| 1:D:130:GLY:C    | 1:D:132:LEU:H    | 2.16                     | 0.48              |
| 1:B:230:GLU:O    | 1:B:234:VAL:HG23 | 2.14                     | 0.48              |
| 1:C:84:ARG:HD2   | 1:C:122:GLU:OE2  | 2.12                     | 0.48              |
| 1:C:137:GLY:O    | 1:C:146:ALA:HB1  | 2.13                     | 0.48              |
| 1:B:394:PRO:O    | 1:B:395:ARG:CB   | 2.57                     | 0.48              |
| 1:C:243:PRO:O    | 1:C:244:ARG:C    | 2.52                     | 0.48              |
| 1:D:7:GLY:O      | 1:D:9:ALA:N      | 2.45                     | 0.48              |
| 1:C:10:ARG:HH22  | 1:C:424:ARG:CG   | 2.26                     | 0.48              |
| 1:A:250:ASP:OD1  | 1:A:297:SER:OG   | 2.29                     | 0.48              |
| 1:D:363:GLU:HG3  | 1:D:364:GLU:N    | 2.29                     | 0.48              |
| 1:A:68:LEU:N     | 1:A:69:PRO:HD2   | 2.28                     | 0.48              |
| 1:A:103:GLU:N    | 1:A:104:PRO:CD   | 2.77                     | 0.48              |
| 1:A:155:ARG:NE   | 1:A:431:VAL:CG2  | 2.66                     | 0.48              |
| 1:A:237:THR:HG22 | 1:A:238:HIS:ND1  | 2.29                     | 0.48              |
| 1:D:219:LEU:N    | 1:D:219:LEU:HD22 | 2.28                     | 0.48              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:248:TYR:CE2  | 1:D:289:GLU:HG2  | 2.48                     | 0.48              |
| 1:D:422:LEU:HD12 | 1:D:422:LEU:N    | 2.28                     | 0.48              |
| 1:A:75:GLY:O     | 1:A:77:ARG:HG2   | 2.13                     | 0.47              |
| 1:C:10:ARG:NH1   | 1:C:423:ALA:O    | 2.47                     | 0.47              |
| 1:C:61:HIS:HE2   | 1:C:225:VAL:HG11 | 1.78                     | 0.47              |
| 1:D:160:SER:HB2  | 1:D:163:LEU:HD11 | 1.95                     | 0.47              |
| 1:D:195:ARG:O    | 1:D:196:PRO:C    | 2.53                     | 0.47              |
| 1:D:409:LEU:O    | 1:D:413:LEU:HG   | 2.14                     | 0.47              |
| 1:C:237:THR:HG22 | 1:C:238:HIS:H    | 1.79                     | 0.47              |
| 1:D:1:MSE:HE1    | 1:D:157:LEU:CB   | 2.44                     | 0.47              |
| 1:B:32:MSE:HE1   | 1:B:101:MSE:HE2  | 1.95                     | 0.47              |
| 1:B:358:VAL:CG1  | 1:B:359:ARG:N    | 2.76                     | 0.47              |
| 1:C:8:ALA:O      | 1:C:399:VAL:CG2  | 2.62                     | 0.47              |
| 1:D:19:LEU:HD13  | 1:D:157:LEU:CD2  | 2.44                     | 0.47              |
| 1:C:8:ALA:O      | 1:C:399:VAL:HG22 | 2.15                     | 0.47              |
| 1:C:375:GLY:O    | 1:C:376:GLY:C    | 2.53                     | 0.47              |
| 1:D:148:VAL:O    | 1:D:158:VAL:HA   | 2.14                     | 0.47              |
| 1:D:212:LEU:HD22 | 1:D:306:PRO:HB2  | 1.97                     | 0.47              |
| 1:D:222:THR:HG22 | 1:D:339:VAL:HG21 | 1.95                     | 0.47              |
| 1:A:97:ALA:O     | 1:A:101:MSE:HB2  | 2.13                     | 0.47              |
| 1:A:122:GLU:O    | 1:A:125:GLU:HB2  | 2.13                     | 0.47              |
| 1:A:236:TYR:C    | 1:A:237:THR:O    | 2.46                     | 0.47              |
| 1:A:344:GLN:OE1  | 1:A:345:GLY:N    | 2.48                     | 0.47              |
| 1:A:422:LEU:O    | 1:A:423:ALA:C    | 2.52                     | 0.47              |
| 1:B:68:LEU:N     | 1:B:69:PRO:CD    | 2.76                     | 0.47              |
| 1:C:10:ARG:CZ    | 1:C:424:ARG:HG2  | 2.43                     | 0.47              |
| 1:C:219:LEU:HD22 | 1:C:219:LEU:N    | 2.29                     | 0.47              |
| 1:C:341:TYR:HD1  | 1:C:341:TYR:H    | 1.61                     | 0.47              |
| 1:D:265:VAL:HA   | 1:D:268:PHE:HD2  | 1.78                     | 0.47              |
| 1:D:278:GLN:HG3  | 1:D:280:LYS:HG2  | 1.95                     | 0.47              |
| 1:B:24:ARG:HG3   | 1:B:24:ARG:HH11  | 1.80                     | 0.47              |
| 1:B:86:THR:HG22  | 1:B:90:MSE:HE2   | 1.96                     | 0.47              |
| 1:B:166:ARG:HG2  | 1:B:385:GLU:OE2  | 2.14                     | 0.47              |
| 1:C:258:LEU:HD11 | 1:C:283:PHE:O    | 2.14                     | 0.47              |
| 1:C:358:VAL:CG1  | 1:C:359:ARG:N    | 2.77                     | 0.47              |
| 1:B:101:MSE:CB   | 1:B:104:PRO:HB3  | 2.36                     | 0.47              |
| 1:B:233:TYR:OH   | 1:B:271:GLU:OE1  | 2.29                     | 0.47              |
| 1:C:328:GLY:C    | 1:C:330:SER:N    | 2.59                     | 0.47              |
| 1:B:36:LYS:H     | 1:B:36:LYS:CD    | 2.19                     | 0.47              |
| 1:C:224:ALA:HB3  | 1:C:253:MSE:HE2  | 1.95                     | 0.47              |
| 1:D:9:ALA:C      | 1:D:11:GLU:H     | 2.17                     | 0.47              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:59:HIS:HD2   | 1:D:61:HIS:H     | 1.62                     | 0.47              |
| 1:D:59:HIS:HB3   | 1:D:145:SER:HB3  | 1.96                     | 0.47              |
| 1:B:208:LEU:CD2  | 1:B:218:VAL:HG21 | 2.45                     | 0.47              |
| 1:B:328:GLY:O    | 1:B:329:LEU:HB2  | 2.14                     | 0.47              |
| 1:D:399:VAL:O    | 1:D:400:HIS:O    | 2.33                     | 0.47              |
| 1:B:188:THR:HG22 | 1:B:189:TYR:CE1  | 2.50                     | 0.46              |
| 1:B:317:ALA:H    | 1:B:322:LEU:HD21 | 1.80                     | 0.46              |
| 1:A:62:LEU:HD13  | 1:A:93:VAL:HG12  | 1.96                     | 0.46              |
| 1:A:366:PRO:HB3  | 1:A:368:ARG:HH12 | 1.81                     | 0.46              |
| 1:A:397:VAL:HG13 | 1:A:397:VAL:O    | 2.15                     | 0.46              |
| 1:B:400:HIS:O    | 1:B:400:HIS:ND1  | 2.48                     | 0.46              |
| 1:C:313:SER:HB3  | 1:C:321:ILE:CG2  | 2.45                     | 0.46              |
| 1:D:1:MSE:HE1    | 1:D:157:LEU:HB2  | 1.97                     | 0.46              |
| 1:D:248:TYR:CD2  | 1:D:289:GLU:HG2  | 2.50                     | 0.46              |
| 1:C:222:THR:HG22 | 1:C:339:VAL:CG2  | 2.36                     | 0.46              |
| 1:B:21:ALA:HB3   | 1:B:132:LEU:HD22 | 1.97                     | 0.46              |
| 1:C:84:ARG:HB2   | 1:C:267:TYR:OH   | 2.15                     | 0.46              |
| 1:C:359:ARG:HG3  | 1:C:359:ARG:NH2  | 2.31                     | 0.46              |
| 1:D:57:LEU:HD23  | 1:D:90:MSE:SE    | 2.64                     | 0.46              |
| 1:B:45:PHE:C     | 1:B:47:PHE:N     | 2.69                     | 0.46              |
| 1:B:63:ASP:C     | 1:B:65:VAL:N     | 2.62                     | 0.46              |
| 1:B:182:LEU:HD11 | 1:B:397:VAL:CG1  | 2.44                     | 0.46              |
| 1:B:235:LEU:HD12 | 1:B:242:LEU:HD11 | 1.96                     | 0.46              |
| 1:C:57:LEU:HD22  | 1:C:80:VAL:CG1   | 2.46                     | 0.46              |
| 1:C:233:TYR:HA   | 1:C:282:PRO:O    | 2.15                     | 0.46              |
| 1:D:357:ALA:HA   | 1:D:366:PRO:HA   | 1.96                     | 0.46              |
| 1:B:96:ASP:O     | 1:B:100:VAL:HG22 | 2.16                     | 0.46              |
| 1:B:110:ASP:O    | 1:B:113:GLU:N    | 2.48                     | 0.46              |
| 1:B:329:LEU:HA   | 1:B:369:ALA:CB   | 2.46                     | 0.46              |
| 1:C:132:LEU:HG   | 1:C:134:LEU:CD1  | 2.40                     | 0.46              |
| 1:A:333:ARG:HG2  | 1:A:333:ARG:NH2  | 2.31                     | 0.46              |
| 1:B:353:ALA:O    | 1:B:354:ARG:HB3  | 2.16                     | 0.46              |
| 1:A:5:PRO:HG2    | 1:A:423:ALA:HB1  | 1.97                     | 0.46              |
| 1:D:347:LEU:CD1  | 1:D:348:GLY:H    | 2.28                     | 0.46              |
| 1:D:355:PRO:HB2  | 1:D:356:PRO:HD2  | 1.97                     | 0.46              |
| 1:B:84:ARG:HE    | 1:B:266:ARG:HH12 | 1.63                     | 0.46              |
| 1:B:327:HIS:C    | 1:B:328:GLY:O    | 2.54                     | 0.46              |
| 1:B:388:ASP:O    | 1:B:391:GLN:HB3  | 2.16                     | 0.46              |
| 1:C:258:LEU:HD21 | 1:C:283:PHE:CB   | 2.46                     | 0.46              |
| 1:D:188:THR:C    | 1:D:190:GLY:N    | 2.68                     | 0.46              |
| 1:D:354:ARG:N    | 1:D:355:PRO:CD   | 2.79                     | 0.46              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:360:ILE:O    | 1:D:363:GLU:HB3  | 2.16                     | 0.46              |
| 1:B:295:GLU:OE2  | 1:B:295:GLU:HA   | 2.14                     | 0.46              |
| 1:A:26:VAL:HA    | 1:A:54:ALA:O     | 2.16                     | 0.45              |
| 1:A:29:ASP:HA    | 1:A:57:LEU:HD12  | 1.98                     | 0.45              |
| 1:A:65:VAL:HG21  | 1:A:90:MSE:HE2   | 1.96                     | 0.45              |
| 1:A:177:PRO:HD3  | 1:A:389:TRP:NE1  | 2.31                     | 0.45              |
| 1:D:33:PHE:CD2   | 1:D:40:ARG:HB2   | 2.51                     | 0.45              |
| 1:D:336:LEU:O    | 1:D:371:VAL:HA   | 2.16                     | 0.45              |
| 1:B:68:LEU:O     | 1:B:71:LEU:HB3   | 2.16                     | 0.45              |
| 1:C:141:HIS:CG   | 1:C:141:HIS:O    | 2.69                     | 0.45              |
| 1:D:198:ARG:N    | 1:D:198:ARG:CD   | 2.78                     | 0.45              |
| 1:A:55:VAL:HG22  | 1:A:80:VAL:HG13  | 1.98                     | 0.45              |
| 1:B:59:HIS:CE1   | 1:B:64:HIS:CD2   | 3.05                     | 0.45              |
| 1:B:237:THR:C    | 1:B:239:GLY:H    | 2.19                     | 0.45              |
| 1:A:160:SER:OG   | 1:A:185:ALA:HA   | 2.16                     | 0.45              |
| 1:A:235:LEU:HD23 | 1:A:247:ILE:HD13 | 1.98                     | 0.45              |
| 1:B:365:VAL:HA   | 1:B:366:PRO:HD3  | 1.71                     | 0.45              |
| 1:B:422:LEU:N    | 1:B:422:LEU:CD1  | 2.79                     | 0.45              |
| 1:B:425:PHE:O    | 1:B:427:GLU:N    | 2.50                     | 0.45              |
| 1:C:128:ARG:HG3  | 1:C:128:ARG:HH21 | 1.81                     | 0.45              |
| 1:C:357:ALA:O    | 1:C:358:VAL:HG23 | 2.17                     | 0.45              |
| 1:D:55:VAL:HG22  | 1:D:80:VAL:HG13  | 1.99                     | 0.45              |
| 1:D:68:LEU:HB3   | 1:D:69:PRO:CD    | 2.47                     | 0.45              |
| 1:A:128:ARG:HG3  | 1:A:128:ARG:HH21 | 1.82                     | 0.45              |
| 1:B:162:ASP:OD1  | 1:B:380:HIS:NE2  | 2.47                     | 0.45              |
| 1:C:48:ASP:O     | 1:C:51:GLU:HB2   | 2.16                     | 0.45              |
| 1:C:210:LYS:O    | 1:C:210:LYS:HG2  | 2.16                     | 0.45              |
| 1:C:333:ARG:HG2  | 1:C:333:ARG:HH11 | 1.81                     | 0.45              |
| 1:D:142:LEU:HG   | 1:D:143:PRO:HD2  | 1.98                     | 0.45              |
| 1:A:309:VAL:HG11 | 1:A:324:HIS:CE1  | 2.49                     | 0.45              |
| 1:B:10:ARG:HD2   | 1:B:403:GLU:HG3  | 1.97                     | 0.45              |
| 1:C:101:MSE:SE   | 1:C:104:PRO:HB3  | 2.66                     | 0.45              |
| 1:D:238:HIS:HA   | 1:D:241:ARG:HH12 | 1.81                     | 0.45              |
| 1:D:253:MSE:HB2  | 1:D:256:ARG:NH1  | 2.32                     | 0.45              |
| 1:B:31:GLY:CA    | 1:B:64:HIS:N     | 2.79                     | 0.45              |
| 1:B:95:GLU:O     | 1:B:98:LEU:HB3   | 2.17                     | 0.45              |
| 1:B:113:GLU:O    | 1:B:117:HIS:HD2  | 1.99                     | 0.45              |
| 1:B:200:THR:HG22 | 1:B:377:PHE:CE1  | 2.51                     | 0.45              |
| 1:C:105:PHE:CD1  | 1:C:106:PHE:HD1  | 2.34                     | 0.45              |
| 1:C:309:VAL:C    | 1:C:310:LEU:HD12 | 2.38                     | 0.45              |
| 1:D:43:ALA:HB1   | 1:D:44:PRO:HD2   | 1.99                     | 0.45              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:198:ARG:O    | 1:D:201:VAL:N    | 2.49                     | 0.45              |
| 1:D:287:GLY:O    | 1:D:288:LEU:C    | 2.55                     | 0.45              |
| 1:D:302:ARG:HD3  | 1:D:302:ARG:N    | 2.31                     | 0.45              |
| 1:D:425:PHE:O    | 1:D:427:GLU:N    | 2.49                     | 0.45              |
| 1:A:341:TYR:CZ   | 1:A:375:GLY:HA3  | 2.52                     | 0.45              |
| 1:A:347:LEU:HA   | 1:A:350:GLU:HB3  | 1.99                     | 0.45              |
| 1:C:10:ARG:NH1   | 1:C:10:ARG:CG    | 2.80                     | 0.45              |
| 1:C:107:GLY:O    | 1:C:110:ASP:HB2  | 2.17                     | 0.45              |
| 1:C:219:LEU:HD13 | 1:C:309:VAL:HB   | 1.99                     | 0.45              |
| 1:D:421:SER:C    | 1:D:422:LEU:HD12 | 2.37                     | 0.45              |
| 1:A:99:LYS:HG2   | 1:A:100:VAL:N    | 2.32                     | 0.45              |
| 1:A:422:LEU:O    | 1:A:423:ALA:O    | 2.35                     | 0.45              |
| 1:B:410:GLY:HA3  | 1:B:420:VAL:HG21 | 1.99                     | 0.45              |
| 1:C:195:ARG:O    | 1:C:196:PRO:C    | 2.55                     | 0.45              |
| 1:A:45:PHE:HB3   | 1:A:47:PHE:CE1   | 2.52                     | 0.44              |
| 1:C:163:LEU:HD21 | 1:C:389:TRP:CE3  | 2.51                     | 0.44              |
| 1:D:90:MSE:C     | 1:D:92:ILE:N     | 2.69                     | 0.44              |
| 1:D:188:THR:O    | 1:D:189:TYR:C    | 2.54                     | 0.44              |
| 1:A:168:LYS:HA   | 1:A:197:TYR:CD1  | 2.52                     | 0.44              |
| 1:A:277:LEU:C    | 1:A:279:GLY:H    | 2.20                     | 0.44              |
| 1:A:372:HIS:CD2  | 1:A:372:HIS:N    | 2.84                     | 0.44              |
| 1:A:407:LEU:HD13 | 1:A:422:LEU:HD21 | 1.99                     | 0.44              |
| 1:D:252:PRO:HB2  | 1:D:256:ARG:HH22 | 1.82                     | 0.44              |
| 1:D:425:PHE:C    | 1:D:427:GLU:H    | 2.20                     | 0.44              |
| 1:B:410:GLY:HA2  | 1:B:420:VAL:HG21 | 1.99                     | 0.44              |
| 1:A:244:ARG:NH2  | 3:A:447:HOH:O    | 2.33                     | 0.44              |
| 1:A:359:ARG:HH21 | 1:A:362:GLY:HA2  | 1.82                     | 0.44              |
| 1:B:10:ARG:HG2   | 1:B:10:ARG:NH1   | 2.27                     | 0.44              |
| 1:B:19:LEU:HD21  | 1:B:132:LEU:HD21 | 1.98                     | 0.44              |
| 1:B:101:MSE:HE1  | 1:B:106:PHE:HE1  | 1.82                     | 0.44              |
| 1:B:205:LEU:HD11 | 1:B:238:HIS:CD2  | 2.53                     | 0.44              |
| 1:C:3:ILE:CD1    | 1:C:17:HIS:HB3   | 2.47                     | 0.44              |
| 1:D:188:THR:O    | 1:D:190:GLY:N    | 2.50                     | 0.44              |
| 1:D:272:VAL:HG12 | 1:D:272:VAL:O    | 2.18                     | 0.44              |
| 1:A:8:ALA:HB1    | 1:A:400:HIS:HA   | 1.98                     | 0.44              |
| 1:C:313:SER:CB   | 1:C:318:GLY:HA3  | 2.45                     | 0.44              |
| 1:B:84:ARG:HE    | 1:B:266:ARG:NH1  | 2.15                     | 0.44              |
| 1:C:152:GLY:O    | 1:C:153:GLU:HB2  | 2.18                     | 0.44              |
| 1:C:155:ARG:HE   | 1:C:431:VAL:HG13 | 1.82                     | 0.44              |
| 1:C:275:HIS:O    | 1:C:278:GLN:HG2  | 2.18                     | 0.44              |
| 1:D:205:LEU:HD11 | 1:D:238:HIS:CD2  | 2.53                     | 0.44              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:A:98:LEU:HD22  | 1:A:111:VAL:HG21 | 1.98                     | 0.44              |
| 1:A:302:ARG:HD3  | 1:A:302:ARG:H    | 1.82                     | 0.44              |
| 1:B:179:LEU:CD2  | 1:D:131:ALA:HA   | 2.48                     | 0.44              |
| 1:C:343:PRO:O    | 1:C:349:ALA:HB2  | 2.18                     | 0.44              |
| 1:C:359:ARG:O    | 1:C:359:ARG:HG2  | 2.17                     | 0.44              |
| 1:A:244:ARG:NH1  | 3:A:447:HOH:O    | 2.30                     | 0.43              |
| 1:C:32:MSE:CA    | 1:C:67:ARG:HG3   | 2.46                     | 0.43              |
| 1:C:357:ALA:O    | 1:C:358:VAL:CG2  | 2.66                     | 0.43              |
| 1:D:227:ARG:O    | 1:D:231:ILE:HG12 | 2.18                     | 0.43              |
| 1:A:165:ASN:C    | 1:A:165:ASN:ND2  | 2.71                     | 0.43              |
| 1:A:212:LEU:HB2  | 1:A:243:PRO:CG   | 2.48                     | 0.43              |
| 1:A:429:VAL:HG12 | 1:A:430:PRO:N    | 2.32                     | 0.43              |
| 1:C:182:LEU:HD12 | 1:C:183:VAL:H    | 1.83                     | 0.43              |
| 1:C:212:LEU:C    | 1:C:214:GLN:H    | 2.20                     | 0.43              |
| 1:C:415:LEU:O    | 1:C:417:GLY:N    | 2.51                     | 0.43              |
| 1:D:11:GLU:O     | 1:D:401:GLY:N    | 2.51                     | 0.43              |
| 1:A:62:LEU:C     | 1:A:63:ASP:O     | 2.55                     | 0.43              |
| 1:C:332:PRO:HA   | 1:C:368:ARG:O    | 2.18                     | 0.43              |
| 1:D:263:ARG:C    | 1:D:265:VAL:H    | 2.22                     | 0.43              |
| 1:D:383:GLN:O    | 1:D:387:LEU:HG   | 2.17                     | 0.43              |
| 1:A:95:GLU:OE1   | 1:A:95:GLU:HA    | 2.18                     | 0.43              |
| 1:A:102:ASP:O    | 1:A:103:GLU:C    | 2.57                     | 0.43              |
| 1:A:208:LEU:HD21 | 1:A:218:VAL:HG11 | 2.00                     | 0.43              |
| 1:B:315:MSE:O    | 1:B:316:LEU:O    | 2.36                     | 0.43              |
| 1:B:328:GLY:O    | 1:B:329:LEU:HB3  | 2.19                     | 0.43              |
| 1:D:351:ILE:C    | 1:D:353:ALA:H    | 2.21                     | 0.43              |
| 1:A:182:LEU:HG   | 1:A:183:VAL:N    | 2.32                     | 0.43              |
| 1:A:325:LEU:HD12 | 1:A:325:LEU:HA   | 1.77                     | 0.43              |
| 1:A:429:VAL:HG13 | 1:A:430:PRO:HD2  | 2.00                     | 0.43              |
| 1:C:183:VAL:HG12 | 1:C:185:ALA:HB2  | 2.00                     | 0.43              |
| 1:C:233:TYR:HD1  | 1:C:282:PRO:HB2  | 1.82                     | 0.43              |
| 1:C:321:ILE:HG23 | 1:C:322:LEU:N    | 2.33                     | 0.43              |
| 1:D:17:HIS:ND1   | 1:D:17:HIS:N     | 2.65                     | 0.43              |
| 1:D:233:TYR:C    | 1:D:235:LEU:H    | 2.21                     | 0.43              |
| 1:A:18:LEU:HD12  | 1:A:19:LEU:N     | 2.33                     | 0.43              |
| 1:A:36:LYS:HD3   | 1:A:36:LYS:N     | 2.15                     | 0.43              |
| 1:A:100:VAL:HG23 | 1:A:101:MSE:N    | 2.33                     | 0.43              |
| 1:A:134:LEU:N    | 1:A:134:LEU:CD1  | 2.80                     | 0.43              |
| 1:C:298:LYS:HA   | 1:C:301:ASN:HD21 | 1.84                     | 0.43              |
| 1:D:19:LEU:HD13  | 1:D:157:LEU:HD23 | 2.00                     | 0.43              |
| 1:D:186:GLU:OE2  | 1:D:380:HIS:HD2  | 2.02                     | 0.43              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:397:VAL:HG13 | 1:D:397:VAL:O    | 2.18                     | 0.43              |
| 1:A:131:ALA:HA   | 1:C:179:LEU:HD22 | 2.01                     | 0.43              |
| 1:B:129:LEU:O    | 1:B:130:GLY:O    | 2.37                     | 0.43              |
| 1:C:234:VAL:O    | 1:C:237:THR:O    | 2.37                     | 0.43              |
| 1:D:83:THR:O     | 1:D:87:VAL:HG23  | 2.19                     | 0.43              |
| 1:D:181:ASP:N    | 1:D:181:ASP:OD1  | 2.52                     | 0.43              |
| 1:D:245:ALA:O    | 1:D:246:PRO:C    | 2.57                     | 0.43              |
| 1:A:33:PHE:H     | 1:A:41:ASN:ND2   | 2.09                     | 0.43              |
| 1:A:67:ARG:C     | 1:A:69:PRO:HD2   | 2.39                     | 0.43              |
| 1:A:186:GLU:HA   | 1:A:399:VAL:O    | 2.19                     | 0.43              |
| 1:C:404:GLU:O    | 1:C:407:LEU:N    | 2.51                     | 0.43              |
| 1:D:26:VAL:HA    | 1:D:54:ALA:O     | 2.19                     | 0.43              |
| 1:D:262:PRO:HA   | 1:D:276:PHE:CZ   | 2.54                     | 0.43              |
| 1:A:187:GLY:HA3  | 1:A:406:LEU:HD12 | 2.01                     | 0.43              |
| 1:A:265:VAL:HA   | 1:A:268:PHE:HD2  | 1.83                     | 0.43              |
| 1:A:421:SER:C    | 1:A:422:LEU:HD12 | 2.39                     | 0.43              |
| 1:B:110:ASP:O    | 1:B:113:GLU:HB3  | 2.19                     | 0.43              |
| 1:D:170:VAL:HB   | 1:D:171:LEU:HD22 | 2.01                     | 0.43              |
| 1:D:219:LEU:HD12 | 1:D:324:HIS:HB3  | 1.99                     | 0.43              |
| 1:B:37:GLU:HB3   | 1:B:40:ARG:CD    | 2.49                     | 0.43              |
| 1:B:105:PHE:CD2  | 1:B:105:PHE:N    | 2.86                     | 0.43              |
| 1:D:358:VAL:HG12 | 1:D:359:ARG:N    | 2.34                     | 0.43              |
| 1:A:305:GLY:HA3  | 1:B:302:ARG:HH22 | 1.83                     | 0.42              |
| 1:B:142:LEU:O    | 1:B:143:PRO:C    | 2.53                     | 0.42              |
| 1:B:398:LEU:HD21 | 1:B:420:VAL:HG23 | 1.99                     | 0.42              |
| 1:D:157:LEU:HD12 | 1:D:158:VAL:H    | 1.84                     | 0.42              |
| 1:D:281:ASN:O    | 1:D:283:PHE:N    | 2.52                     | 0.42              |
| 1:D:335:ALA:HA   | 1:D:370:SER:O    | 2.19                     | 0.42              |
| 1:B:130:GLY:O    | 1:B:131:ALA:CB   | 2.63                     | 0.42              |
| 1:B:310:LEU:N    | 1:B:310:LEU:CD1  | 2.82                     | 0.42              |
| 1:D:290:VAL:O    | 1:D:292:GLU:OE2  | 2.37                     | 0.42              |
| 1:D:325:LEU:HD21 | 1:D:336:LEU:HD11 | 2.00                     | 0.42              |
| 1:A:39:ALA:O     | 1:A:42:HIS:HB2   | 2.19                     | 0.42              |
| 1:A:217:LYS:NZ   | 1:A:300:LEU:O    | 2.52                     | 0.42              |
| 1:B:9:ALA:C      | 1:B:11:GLU:H     | 2.23                     | 0.42              |
| 1:B:189:TYR:CE2  | 1:B:341:TYR:CE1  | 3.07                     | 0.42              |
| 1:C:223:PHE:CE2  | 1:C:315:MSE:HE2  | 2.53                     | 0.42              |
| 1:C:224:ALA:HB3  | 1:C:253:MSE:CE   | 2.49                     | 0.42              |
| 1:D:326:LYS:HD2  | 1:D:361:LEU:HB2  | 2.00                     | 0.42              |
| 1:A:24:ARG:NH1   | 3:A:436:HOH:O    | 2.52                     | 0.42              |
| 1:B:10:ARG:HH11  | 1:B:10:ARG:CG    | 2.24                     | 0.42              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:294:THR:CG2  | 1:C:320:ARG:HH11 | 2.25                     | 0.42              |
| 1:D:226:GLU:HG2  | 1:D:261:TYR:OH   | 2.20                     | 0.42              |
| 1:B:212:LEU:O    | 1:B:214:GLN:N    | 2.53                     | 0.42              |
| 1:C:32:MSE:HB2   | 1:C:41:ASN:OD1   | 2.19                     | 0.42              |
| 1:C:101:MSE:SE   | 1:C:104:PRO:CB   | 3.18                     | 0.42              |
| 1:C:294:THR:O    | 1:C:297:SER:HB3  | 2.20                     | 0.42              |
| 1:D:72:PHE:CE1   | 1:D:114:ALA:HA   | 2.55                     | 0.42              |
| 1:D:383:GLN:HA   | 1:D:386:LEU:HD12 | 2.01                     | 0.42              |
| 1:D:388:ASP:O    | 1:D:391:GLN:CB   | 2.67                     | 0.42              |
| 1:A:358:VAL:O    | 1:A:365:VAL:HG12 | 2.19                     | 0.42              |
| 1:D:105:PHE:CD2  | 1:D:105:PHE:N    | 2.81                     | 0.42              |
| 1:D:166:ARG:C    | 1:D:168:LYS:H    | 2.23                     | 0.42              |
| 1:A:131:ALA:HA   | 1:C:179:LEU:CD2  | 2.50                     | 0.42              |
| 1:A:404:GLU:OE2  | 1:A:404:GLU:N    | 2.44                     | 0.42              |
| 1:B:155:ARG:NH1  | 1:B:431:VAL:HG11 | 2.28                     | 0.42              |
| 1:C:229:GLN:HE21 | 1:C:229:GLN:HB3  | 1.59                     | 0.42              |
| 1:C:387:LEU:HD11 | 1:C:412:LEU:HD13 | 2.01                     | 0.42              |
| 1:D:165:ASN:HA   | 1:D:385:GLU:OE1  | 2.19                     | 0.42              |
| 1:D:325:LEU:HD11 | 1:D:336:LEU:HD12 | 2.02                     | 0.42              |
| 1:A:20:LEU:CD2   | 1:A:25:ARG:HE    | 2.33                     | 0.42              |
| 1:A:304:PRO:O    | 1:A:305:GLY:O    | 2.38                     | 0.42              |
| 1:C:6:PHE:HB2    | 1:C:16:ALA:O     | 2.19                     | 0.42              |
| 1:D:257:VAL:HG12 | 1:D:261:TYR:CE2  | 2.54                     | 0.42              |
| 1:D:347:LEU:HD12 | 1:D:348:GLY:H    | 1.84                     | 0.42              |
| 1:A:10:ARG:CG    | 1:A:10:ARG:HH11  | 2.33                     | 0.42              |
| 1:A:85:ALA:HB2   | 1:A:267:TYR:CE2  | 2.54                     | 0.42              |
| 1:A:425:PHE:CD2  | 1:A:425:PHE:C    | 2.92                     | 0.42              |
| 1:B:48:ASP:C     | 1:B:50:LYS:H     | 2.23                     | 0.42              |
| 1:D:373:THR:O    | 1:D:373:THR:HG22 | 2.20                     | 0.42              |
| 1:A:250:ASP:OD1  | 1:A:324:HIS:CE1  | 2.73                     | 0.42              |
| 1:B:62:LEU:O     | 1:B:66:GLY:HA3   | 2.20                     | 0.42              |
| 1:B:315:MSE:SE   | 1:B:343:PRO:HD3  | 2.70                     | 0.42              |
| 1:C:163:LEU:CD1  | 1:C:163:LEU:N    | 2.82                     | 0.42              |
| 1:D:157:LEU:HD12 | 1:D:158:VAL:N    | 2.34                     | 0.42              |
| 1:D:198:ARG:CG   | 1:D:199:GLU:H    | 2.29                     | 0.42              |
| 1:D:299:ALA:HA   | 1:D:302:ARG:HH21 | 1.85                     | 0.42              |
| 1:B:225:VAL:HG23 | 1:B:253:MSE:HE1  | 2.02                     | 0.41              |
| 1:B:398:LEU:CD1  | 1:B:409:LEU:HD23 | 2.50                     | 0.41              |
| 1:C:21:ALA:O     | 1:C:24:ARG:N     | 2.46                     | 0.41              |
| 1:C:49:PRO:HB3   | 1:C:71:LEU:CD1   | 2.48                     | 0.41              |
| 1:B:48:ASP:O     | 1:B:50:LYS:N     | 2.52                     | 0.41              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:160:SER:HB3  | 1:D:185:ALA:HA   | 2.02                     | 0.41              |
| 1:A:32:MSE:HE3   | 1:A:62:LEU:HG    | 2.02                     | 0.41              |
| 1:A:55:VAL:HG13  | 1:A:80:VAL:HG22  | 2.02                     | 0.41              |
| 1:A:348:GLY:O    | 1:A:351:ILE:N    | 2.52                     | 0.41              |
| 1:B:297:SER:OG   | 1:B:320:ARG:HD3  | 2.21                     | 0.41              |
| 1:D:167:GLU:O    | 1:D:197:TYR:CG   | 2.73                     | 0.41              |
| 1:D:253:MSE:C    | 1:D:255:GLY:N    | 2.73                     | 0.41              |
| 1:A:57:LEU:HG    | 1:A:65:VAL:CG2   | 2.43                     | 0.41              |
| 1:A:331:ASP:OD2  | 1:A:331:ASP:C    | 2.59                     | 0.41              |
| 1:B:185:ALA:O    | 1:B:399:VAL:HG12 | 2.21                     | 0.41              |
| 1:B:196:PRO:HG2  | 1:B:199:GLU:OE2  | 2.21                     | 0.41              |
| 1:D:247:ILE:HD12 | 1:D:286:ALA:HB3  | 2.02                     | 0.41              |
| 1:D:399:VAL:HG13 | 1:D:400:HIS:N    | 2.34                     | 0.41              |
| 1:A:37:GLU:OE2   | 1:A:37:GLU:HA    | 2.19                     | 0.41              |
| 1:A:163:LEU:HA   | 1:A:163:LEU:HD12 | 1.57                     | 0.41              |
| 1:B:113:GLU:OE2  | 1:B:113:GLU:HA   | 2.21                     | 0.41              |
| 1:B:188:THR:OG1  | 1:B:400:HIS:CE1  | 2.73                     | 0.41              |
| 1:C:68:LEU:O     | 1:C:71:LEU:HB3   | 2.21                     | 0.41              |
| 1:D:90:MSE:O     | 1:D:92:ILE:N     | 2.54                     | 0.41              |
| 1:D:92:ILE:O     | 1:D:93:VAL:C     | 2.57                     | 0.41              |
| 1:A:4:VAL:HA     | 1:A:5:PRO:HD3    | 1.92                     | 0.41              |
| 1:A:26:VAL:O     | 1:A:26:VAL:HG23  | 2.19                     | 0.41              |
| 1:A:45:PHE:C     | 1:A:47:PHE:N     | 2.72                     | 0.41              |
| 1:A:97:ALA:O     | 1:A:101:MSE:CB   | 2.68                     | 0.41              |
| 1:B:17:HIS:O     | 1:B:27:LEU:HD23  | 2.21                     | 0.41              |
| 1:B:91:GLU:HG3   | 1:B:92:ILE:N     | 2.35                     | 0.41              |
| 1:C:188:THR:HG22 | 1:C:189:TYR:CD1  | 2.56                     | 0.41              |
| 1:D:3:ILE:HD13   | 1:D:4:VAL:H      | 1.86                     | 0.41              |
| 1:D:36:LYS:HG2   | 1:D:37:GLU:N     | 2.36                     | 0.41              |
| 1:D:318:GLY:H    | 1:D:322:LEU:HD11 | 1.85                     | 0.41              |
| 1:A:115:LEU:HD12 | 1:A:115:LEU:HA   | 1.88                     | 0.41              |
| 1:A:329:LEU:HD11 | 1:A:336:LEU:HD12 | 2.02                     | 0.41              |
| 1:A:358:VAL:CG1  | 1:A:359:ARG:N    | 2.83                     | 0.41              |
| 1:B:208:LEU:HD23 | 1:B:218:VAL:HG21 | 2.03                     | 0.41              |
| 1:B:332:PRO:HA   | 1:B:369:ALA:HA   | 2.03                     | 0.41              |
| 1:B:425:PHE:C    | 1:B:427:GLU:H    | 2.23                     | 0.41              |
| 1:C:235:LEU:HD23 | 1:C:247:ILE:HG21 | 2.02                     | 0.41              |
| 1:C:258:LEU:HD21 | 1:C:283:PHE:O    | 2.21                     | 0.41              |
| 1:D:17:HIS:N     | 1:D:17:HIS:HD1   | 2.19                     | 0.41              |
| 1:D:90:MSE:CE    | 1:D:118:LEU:HD11 | 2.51                     | 0.41              |
| 1:D:196:PRO:HB3  | 1:D:198:ARG:HD3  | 2.02                     | 0.41              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:227:ARG:HA   | 1:D:227:ARG:HD3  | 1.96                     | 0.41              |
| 1:D:336:LEU:C    | 1:D:336:LEU:HD23 | 2.40                     | 0.41              |
| 1:A:155:ARG:HH11 | 1:A:431:VAL:HG11 | 1.85                     | 0.41              |
| 1:B:37:GLU:O     | 1:B:38:GLU:C     | 2.58                     | 0.41              |
| 1:B:57:LEU:HD22  | 1:B:80:VAL:CG1   | 2.51                     | 0.41              |
| 1:B:58:THR:O     | 1:B:59:HIS:O     | 2.39                     | 0.41              |
| 1:B:126:TRP:CD2  | 1:D:178:PRO:HB3  | 2.56                     | 0.41              |
| 1:C:321:ILE:HG23 | 1:C:322:LEU:HG   | 2.02                     | 0.41              |
| 1:D:58:THR:HB    | 1:D:146:ALA:O    | 2.20                     | 0.41              |
| 1:D:158:VAL:HG23 | 1:D:180:ALA:HB2  | 2.02                     | 0.41              |
| 1:D:221:PRO:O    | 1:D:339:VAL:HG22 | 2.20                     | 0.41              |
| 1:D:281:ASN:C    | 1:D:283:PHE:H    | 2.23                     | 0.41              |
| 1:A:41:ASN:O     | 1:A:70:LYS:NZ    | 2.47                     | 0.41              |
| 1:A:103:GLU:N    | 1:A:104:PRO:HD3  | 2.35                     | 0.41              |
| 1:B:57:LEU:HD12  | 1:B:57:LEU:HA    | 1.92                     | 0.41              |
| 1:B:178:PRO:HB3  | 1:D:126:TRP:CD2  | 2.56                     | 0.41              |
| 1:B:431:VAL:O    | 1:B:431:VAL:HG12 | 2.20                     | 0.41              |
| 1:C:105:PHE:O    | 1:C:106:PHE:CD1  | 2.74                     | 0.41              |
| 1:C:150:ALA:HB3  | 1:C:157:LEU:HB3  | 2.03                     | 0.41              |
| 1:D:219:LEU:CD1  | 1:D:324:HIS:HB3  | 2.51                     | 0.41              |
| 1:D:285:PRO:O    | 1:D:286:ALA:C    | 2.59                     | 0.41              |
| 1:D:390:LEU:O    | 1:D:418:GLN:NE2  | 2.53                     | 0.41              |
| 1:A:19:LEU:HB3   | 1:A:26:VAL:HG22  | 2.03                     | 0.41              |
| 1:A:285:PRO:O    | 1:A:286:ALA:C    | 2.59                     | 0.41              |
| 1:B:5:PRO:HA     | 1:B:17:HIS:CD2   | 2.54                     | 0.41              |
| 1:B:155:ARG:HD2  | 1:B:155:ARG:HA   | 1.82                     | 0.41              |
| 1:A:59:HIS:HE1   | 1:A:64:HIS:CE1   | 2.38                     | 0.40              |
| 1:A:75:GLY:O     | 1:A:76:TYR:C     | 2.58                     | 0.40              |
| 1:B:54:ALA:HA    | 1:B:76:TYR:OH    | 2.21                     | 0.40              |
| 1:B:325:LEU:HA   | 1:B:325:LEU:HD12 | 1.84                     | 0.40              |
| 1:C:38:GLU:O     | 1:C:39:ALA:HB3   | 2.21                     | 0.40              |
| 1:C:386:LEU:O    | 1:C:390:LEU:HD23 | 2.21                     | 0.40              |
| 1:D:113:GLU:HA   | 1:D:113:GLU:OE2  | 2.21                     | 0.40              |
| 1:D:119:ARG:HA   | 1:D:120:PRO:HD3  | 1.85                     | 0.40              |
| 1:D:211:THR:HG21 | 1:D:218:VAL:HG22 | 2.03                     | 0.40              |
| 1:A:62:LEU:O     | 1:A:66:GLY:N     | 2.53                     | 0.40              |
| 1:A:312:GLY:O    | 1:A:313:SER:HB2  | 2.21                     | 0.40              |
| 1:B:72:PHE:CD2   | 1:B:113:GLU:HG3  | 2.56                     | 0.40              |
| 1:D:8:ALA:H      | 1:D:15:SER:HA    | 1.86                     | 0.40              |
| 1:D:68:LEU:O     | 1:D:71:LEU:HB3   | 2.21                     | 0.40              |
| 1:D:109:GLU:HA   | 1:D:112:GLU:HG2  | 2.02                     | 0.40              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:141:HIS:HB2  | 1:C:164:GLY:N    | 2.36                     | 0.40              |
| 1:C:163:LEU:CD2  | 1:C:389:TRP:CD2  | 2.98                     | 0.40              |
| 1:C:387:LEU:O    | 1:C:416:ARG:NH2  | 2.55                     | 0.40              |
| 1:C:390:LEU:O    | 1:C:393:GLU:HB2  | 2.20                     | 0.40              |
| 1:D:10:ARG:HH22  | 1:D:424:ARG:HH21 | 1.66                     | 0.40              |
| 1:D:184:LEU:HA   | 1:D:397:VAL:HG13 | 2.02                     | 0.40              |
| 1:A:18:LEU:HD12  | 1:A:19:LEU:H     | 1.86                     | 0.40              |
| 1:A:140:GLY:O    | 1:A:164:GLY:HA3  | 2.20                     | 0.40              |
| 1:A:249:LEU:O    | 1:A:290:VAL:HA   | 2.21                     | 0.40              |
| 1:B:3:ILE:HG23   | 1:B:3:ILE:O      | 2.21                     | 0.40              |
| 1:B:39:ALA:C     | 1:B:41:ASN:N     | 2.74                     | 0.40              |
| 1:B:427:GLU:HA   | 1:B:427:GLU:OE1  | 2.21                     | 0.40              |
| 1:C:191:ASP:OD2  | 1:C:192:ARG:N    | 2.53                     | 0.40              |
| 1:C:333:ARG:HG2  | 1:C:333:ARG:NH1  | 2.36                     | 0.40              |
| 1:A:105:PHE:HD2  | 1:A:105:PHE:H    | 1.66                     | 0.40              |
| 1:B:3:ILE:HD11   | 1:B:17:HIS:CB    | 2.43                     | 0.40              |
| 1:D:194:HIS:CG   | 1:D:376:GLY:HA2  | 2.56                     | 0.40              |
| 1:D:351:ILE:HG23 | 1:D:367:LEU:HD22 | 2.04                     | 0.40              |
| 1:D:393:GLU:O    | 1:D:418:GLN:HG2  | 2.21                     | 0.40              |

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

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

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

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     | 429/431 (100%)   | 361 (84%)  | 45 (10%)  | 23 (5%)  | 1           | 5 |
| 1   | B     | 429/431 (100%)   | 364 (85%)  | 45 (10%)  | 20 (5%)  | 2           | 6 |
| 1   | C     | 429/431 (100%)   | 340 (79%)  | 64 (15%)  | 25 (6%)  | 1           | 4 |
| 1   | D     | 429/431 (100%)   | 333 (78%)  | 68 (16%)  | 28 (6%)  | 1           | 3 |
| All | All   | 1716/1724 (100%) | 1398 (82%) | 222 (13%) | 96 (6%)  | 1           | 4 |

All (96) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | A     | 38  | GLU  |
| 1   | A     | 59  | HIS  |
| 1   | A     | 106 | PHE  |
| 1   | A     | 286 | ALA  |
| 1   | A     | 304 | PRO  |
| 1   | A     | 423 | ALA  |
| 1   | B     | 38  | GLU  |
| 1   | B     | 59  | HIS  |
| 1   | B     | 106 | PHE  |
| 1   | B     | 213 | SER  |
| 1   | B     | 290 | VAL  |
| 1   | B     | 304 | PRO  |
| 1   | B     | 305 | GLY  |
| 1   | B     | 316 | LEU  |
| 1   | C     | 38  | GLU  |
| 1   | C     | 106 | PHE  |
| 1   | C     | 286 | ALA  |
| 1   | C     | 366 | PRO  |
| 1   | D     | 38  | GLU  |
| 1   | D     | 39  | ALA  |
| 1   | D     | 59  | HIS  |
| 1   | D     | 106 | PHE  |
| 1   | D     | 130 | GLY  |
| 1   | D     | 286 | ALA  |
| 1   | D     | 395 | ARG  |
| 1   | A     | 46  | GLY  |
| 1   | A     | 130 | GLY  |
| 1   | A     | 305 | GLY  |
| 1   | A     | 313 | SER  |
| 1   | A     | 329 | LEU  |
| 1   | A     | 395 | ARG  |
| 1   | B     | 130 | GLY  |
| 1   | B     | 226 | GLU  |
| 1   | B     | 286 | ALA  |
| 1   | B     | 329 | LEU  |
| 1   | B     | 426 | GLY  |
| 1   | C     | 130 | GLY  |
| 1   | C     | 196 | PRO  |
| 1   | C     | 280 | LYS  |
| 1   | C     | 282 | PRO  |
| 1   | C     | 312 | GLY  |
| 1   | C     | 376 | GLY  |

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| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 1          | D            | 8          | ALA         |
| 1          | D            | 329        | LEU         |
| 1          | D            | 347        | LEU         |
| 1          | D            | 400        | HIS         |
| 1          | D            | 420        | VAL         |
| 1          | A            | 7          | GLY         |
| 1          | A            | 44         | PRO         |
| 1          | C            | 30         | CYS         |
| 1          | C            | 225        | VAL         |
| 1          | C            | 292        | GLU         |
| 1          | C            | 295        | GLU         |
| 1          | C            | 304        | PRO         |
| 1          | C            | 395        | ARG         |
| 1          | D            | 93         | VAL         |
| 1          | D            | 131        | ALA         |
| 1          | D            | 196        | PRO         |
| 1          | D            | 282        | PRO         |
| 1          | D            | 356        | PRO         |
| 1          | D            | 426        | GLY         |
| 1          | A            | 391        | GLN         |
| 1          | B            | 46         | GLY         |
| 1          | B            | 317        | ALA         |
| 1          | B            | 328        | GLY         |
| 1          | B            | 399        | VAL         |
| 1          | C            | 285        | PRO         |
| 1          | C            | 313        | SER         |
| 1          | C            | 416        | ARG         |
| 1          | D            | 167        | GLU         |
| 1          | D            | 238        | HIS         |
| 1          | A            | 154        | GLY         |
| 1          | A            | 225        | VAL         |
| 1          | A            | 238        | HIS         |
| 1          | A            | 278        | GLN         |
| 1          | B            | 49         | PRO         |
| 1          | B            | 318        | GLY         |
| 1          | C            | 347        | LEU         |
| 1          | D            | 12         | VAL         |
| 1          | D            | 290        | VAL         |
| 1          | D            | 320        | ARG         |
| 1          | A            | 290        | VAL         |
| 1          | A            | 316        | LEU         |
| 1          | B            | 64         | HIS         |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | C     | 45  | PHE  |
| 1   | C     | 290 | VAL  |
| 1   | D     | 399 | VAL  |
| 1   | A     | 43  | ALA  |
| 1   | C     | 65  | VAL  |
| 1   | D     | 246 | PRO  |
| 1   | D     | 394 | PRO  |
| 1   | C     | 331 | ASP  |
| 1   | C     | 93  | VAL  |
| 1   | D     | 143 | PRO  |
| 1   | A     | 318 | GLY  |
| 1   | D     | 265 | VAL  |

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

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

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     | 342/335 (102%)   | 299 (87%)  | 43 (13%) | 3           | 12 |
| 1   | B     | 342/335 (102%)   | 313 (92%)  | 29 (8%)  | 8           | 27 |
| 1   | C     | 342/335 (102%)   | 317 (93%)  | 25 (7%)  | 11          | 34 |
| 1   | D     | 342/335 (102%)   | 316 (92%)  | 26 (8%)  | 11          | 32 |
| All | All   | 1368/1340 (102%) | 1245 (91%) | 123 (9%) | 8           | 25 |

All (123) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | A     | 3   | ILE  |
| 1   | A     | 10  | ARG  |
| 1   | A     | 15  | SER  |
| 1   | A     | 27  | LEU  |
| 1   | A     | 36  | LYS  |
| 1   | A     | 45  | PHE  |
| 1   | A     | 55  | VAL  |
| 1   | A     | 57  | LEU  |
| 1   | A     | 65  | VAL  |

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| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 1          | A            | 103        | GLU         |
| 1          | A            | 106        | PHE         |
| 1          | A            | 115        | LEU         |
| 1          | A            | 132        | LEU         |
| 1          | A            | 134        | LEU         |
| 1          | A            | 157        | LEU         |
| 1          | A            | 163        | LEU         |
| 1          | A            | 165        | ASN         |
| 1          | A            | 171        | LEU         |
| 1          | A            | 184        | LEU         |
| 1          | A            | 186        | GLU         |
| 1          | A            | 188        | THR         |
| 1          | A            | 219        | LEU         |
| 1          | A            | 227        | ARG         |
| 1          | A            | 229        | GLN         |
| 1          | A            | 235        | LEU         |
| 1          | A            | 241        | ARG         |
| 1          | A            | 251        | SER         |
| 1          | A            | 258        | LEU         |
| 1          | A            | 264        | LEU         |
| 1          | A            | 278        | GLN         |
| 1          | A            | 294        | THR         |
| 1          | A            | 304        | PRO         |
| 1          | A            | 313        | SER         |
| 1          | A            | 325        | LEU         |
| 1          | A            | 344        | GLN         |
| 1          | A            | 361        | LEU         |
| 1          | A            | 363        | GLU         |
| 1          | A            | 377        | PHE         |
| 1          | A            | 390        | LEU         |
| 1          | A            | 398        | LEU         |
| 1          | A            | 406        | LEU         |
| 1          | A            | 407        | LEU         |
| 1          | A            | 431        | VAL         |
| 1          | B            | 3          | ILE         |
| 1          | B            | 27         | LEU         |
| 1          | B            | 28         | LEU         |
| 1          | B            | 30         | CYS         |
| 1          | B            | 36         | LYS         |
| 1          | B            | 57         | LEU         |
| 1          | B            | 62         | LEU         |
| 1          | B            | 63         | ASP         |

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| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 1          | B            | 104        | PRO         |
| 1          | B            | 105        | PHE         |
| 1          | B            | 151        | GLN         |
| 1          | B            | 163        | LEU         |
| 1          | B            | 165        | ASN         |
| 1          | B            | 175        | SER         |
| 1          | B            | 184        | LEU         |
| 1          | B            | 219        | LEU         |
| 1          | B            | 227        | ARG         |
| 1          | B            | 229        | GLN         |
| 1          | B            | 235        | LEU         |
| 1          | B            | 258        | LEU         |
| 1          | B            | 294        | THR         |
| 1          | B            | 302        | ARG         |
| 1          | B            | 325        | LEU         |
| 1          | B            | 361        | LEU         |
| 1          | B            | 365        | VAL         |
| 1          | B            | 390        | LEU         |
| 1          | B            | 391        | GLN         |
| 1          | B            | 407        | LEU         |
| 1          | B            | 427        | GLU         |
| 1          | C            | 3          | ILE         |
| 1          | C            | 10         | ARG         |
| 1          | C            | 26         | VAL         |
| 1          | C            | 27         | LEU         |
| 1          | C            | 28         | LEU         |
| 1          | C            | 36         | LYS         |
| 1          | C            | 55         | VAL         |
| 1          | C            | 57         | LEU         |
| 1          | C            | 112        | GLU         |
| 1          | C            | 151        | GLN         |
| 1          | C            | 165        | ASN         |
| 1          | C            | 184        | LEU         |
| 1          | C            | 186        | GLU         |
| 1          | C            | 196        | PRO         |
| 1          | C            | 229        | GLN         |
| 1          | C            | 258        | LEU         |
| 1          | C            | 264        | LEU         |
| 1          | C            | 265        | VAL         |
| 1          | C            | 293        | HIS         |
| 1          | C            | 302        | ARG         |
| 1          | C            | 336        | LEU         |

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| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 1          | C            | 359        | ARG         |
| 1          | C            | 377        | PHE         |
| 1          | C            | 397        | VAL         |
| 1          | C            | 402        | GLU         |
| 1          | D            | 3          | ILE         |
| 1          | D            | 13         | THR         |
| 1          | D            | 27         | LEU         |
| 1          | D            | 32         | MSE         |
| 1          | D            | 36         | LYS         |
| 1          | D            | 38         | GLU         |
| 1          | D            | 55         | VAL         |
| 1          | D            | 57         | LEU         |
| 1          | D            | 61         | HIS         |
| 1          | D            | 63         | ASP         |
| 1          | D            | 96         | ASP         |
| 1          | D            | 106        | PHE         |
| 1          | D            | 112        | GLU         |
| 1          | D            | 115        | LEU         |
| 1          | D            | 165        | ASN         |
| 1          | D            | 181        | ASP         |
| 1          | D            | 188        | THR         |
| 1          | D            | 192        | ARG         |
| 1          | D            | 196        | PRO         |
| 1          | D            | 198        | ARG         |
| 1          | D            | 227        | ARG         |
| 1          | D            | 229        | GLN         |
| 1          | D            | 264        | LEU         |
| 1          | D            | 333        | ARG         |
| 1          | D            | 377        | PHE         |
| 1          | D            | 399        | VAL         |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (35) such sidechains are listed below:

| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 1          | A            | 41         | ASN         |
| 1          | A            | 117        | HIS         |
| 1          | A            | 141        | HIS         |
| 1          | A            | 165        | ASN         |
| 1          | A            | 229        | GLN         |
| 1          | A            | 380        | HIS         |
| 1          | B            | 17         | HIS         |
| 1          | B            | 34         | GLN         |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | B     | 41  | ASN  |
| 1   | B     | 117 | HIS  |
| 1   | B     | 141 | HIS  |
| 1   | B     | 165 | ASN  |
| 1   | B     | 229 | GLN  |
| 1   | B     | 240 | HIS  |
| 1   | B     | 323 | HIS  |
| 1   | B     | 324 | HIS  |
| 1   | B     | 383 | GLN  |
| 1   | C     | 41  | ASN  |
| 1   | C     | 59  | HIS  |
| 1   | C     | 117 | HIS  |
| 1   | C     | 165 | ASN  |
| 1   | C     | 229 | GLN  |
| 1   | C     | 273 | GLN  |
| 1   | C     | 383 | GLN  |
| 1   | D     | 41  | ASN  |
| 1   | D     | 59  | HIS  |
| 1   | D     | 64  | HIS  |
| 1   | D     | 165 | ASN  |
| 1   | D     | 194 | HIS  |
| 1   | D     | 214 | GLN  |
| 1   | D     | 229 | GLN  |
| 1   | D     | 240 | HIS  |
| 1   | D     | 278 | GLN  |
| 1   | D     | 372 | HIS  |
| 1   | D     | 380 | HIS  |

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

### 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.



## 5.6 Ligand geometry

Of 8 ligands modelled in this entry, 8 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 5.7 Other polymers

There are no such residues in this entry.

## 5.8 Polymer linkage issues

There are no chain breaks in this entry.

## 6 Fit of model and data

### 6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

| Mol | Chain | Analysed        | <RSRZ> | #RSRZ>2        | OWAB(Å <sup>2</sup> ) | Q<0.9 |
|-----|-------|-----------------|--------|----------------|-----------------------|-------|
| 1   | A     | 424/431 (98%)   | -0.26  | 1 (0%) 92 89   | 21, 44, 66, 81        | 0     |
| 1   | B     | 424/431 (98%)   | -0.10  | 4 (0%) 81 75   | 22, 45, 77, 93        | 0     |
| 1   | C     | 424/431 (98%)   | 0.55   | 39 (9%) 16 12  | 33, 78, 134, 141      | 0     |
| 1   | D     | 424/431 (98%)   | 0.72   | 44 (10%) 13 10 | 36, 90, 146, 160      | 0     |
| All | All   | 1696/1724 (98%) | 0.23   | 88 (5%) 34 26  | 21, 56, 136, 160      | 0     |

All (88) RSRZ outliers are listed below:

| Mol | Chain | Res | Type | RSRZ |
|-----|-------|-----|------|------|
| 1   | C     | 311 | ALA  | 6.0  |
| 1   | D     | 216 | GLY  | 4.5  |
| 1   | D     | 303 | ALA  | 4.3  |
| 1   | D     | 188 | THR  | 3.7  |
| 1   | D     | 371 | VAL  | 3.6  |
| 1   | D     | 169 | ASP  | 3.6  |
| 1   | D     | 250 | ASP  | 3.5  |
| 1   | A     | 431 | VAL  | 3.4  |
| 1   | D     | 308 | VAL  | 3.4  |
| 1   | C     | 312 | GLY  | 3.4  |
| 1   | C     | 376 | GLY  | 3.3  |
| 1   | B     | 37  | GLU  | 3.3  |
| 1   | D     | 167 | GLU  | 3.3  |
| 1   | D     | 205 | LEU  | 3.1  |
| 1   | C     | 212 | LEU  | 3.0  |
| 1   | D     | 236 | TYR  | 2.9  |
| 1   | D     | 218 | VAL  | 2.8  |
| 1   | C     | 185 | ALA  | 2.8  |
| 1   | C     | 290 | VAL  | 2.8  |
| 1   | D     | 189 | TYR  | 2.8  |
| 1   | D     | 309 | VAL  | 2.7  |

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| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> | <b>RSRZ</b> |
|------------|--------------|------------|-------------|-------------|
| 1          | D            | 207        | ILE         | 2.7         |
| 1          | C            | 291        | VAL         | 2.7         |
| 1          | C            | 250        | ASP         | 2.7         |
| 1          | C            | 188        | THR         | 2.7         |
| 1          | D            | 327        | HIS         | 2.7         |
| 1          | B            | 431        | VAL         | 2.6         |
| 1          | D            | 288        | LEU         | 2.6         |
| 1          | C            | 385        | GLU         | 2.6         |
| 1          | D            | 194        | HIS         | 2.6         |
| 1          | C            | 308        | VAL         | 2.6         |
| 1          | D            | 314        | GLY         | 2.5         |
| 1          | C            | 325        | LEU         | 2.5         |
| 1          | D            | 312        | GLY         | 2.5         |
| 1          | C            | 362        | GLY         | 2.5         |
| 1          | D            | 223        | PHE         | 2.5         |
| 1          | C            | 333        | ARG         | 2.5         |
| 1          | D            | 296        | ALA         | 2.5         |
| 1          | C            | 324        | HIS         | 2.4         |
| 1          | D            | 292        | GLU         | 2.4         |
| 1          | D            | 300        | LEU         | 2.4         |
| 1          | C            | 377        | PHE         | 2.4         |
| 1          | D            | 215        | GLY         | 2.4         |
| 1          | D            | 293        | HIS         | 2.4         |
| 1          | D            | 291        | VAL         | 2.4         |
| 1          | C            | 326        | LYS         | 2.4         |
| 1          | C            | 343        | PRO         | 2.3         |
| 1          | D            | 266        | ARG         | 2.3         |
| 1          | D            | 368        | ARG         | 2.3         |
| 1          | D            | 294        | THR         | 2.3         |
| 1          | C            | 236        | TYR         | 2.3         |
| 1          | C            | 378        | SER         | 2.3         |
| 1          | D            | 287        | GLY         | 2.3         |
| 1          | C            | 369        | ALA         | 2.3         |
| 1          | D            | 343        | PRO         | 2.3         |
| 1          | D            | 341        | TYR         | 2.3         |
| 1          | C            | 327        | HIS         | 2.3         |
| 1          | D            | 385        | GLU         | 2.3         |
| 1          | C            | 380        | HIS         | 2.2         |
| 1          | D            | 373        | THR         | 2.2         |
| 1          | D            | 362        | GLY         | 2.2         |
| 1          | C            | 321        | ILE         | 2.2         |
| 1          | C            | 303        | ALA         | 2.2         |

*Continued on next page...*

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| Mol | Chain | Res | Type | RSRZ |
|-----|-------|-----|------|------|
| 1   | C     | 355 | PRO  | 2.2  |
| 1   | C     | 379 | GLY  | 2.2  |
| 1   | C     | 246 | PRO  | 2.2  |
| 1   | C     | 374 | LEU  | 2.1  |
| 1   | C     | 252 | PRO  | 2.1  |
| 1   | C     | 7   | GLY  | 2.1  |
| 1   | D     | 237 | THR  | 2.1  |
| 1   | C     | 338 | PHE  | 2.1  |
| 1   | D     | 208 | LEU  | 2.1  |
| 1   | D     | 217 | LYS  | 2.1  |
| 1   | C     | 220 | ILE  | 2.1  |
| 1   | C     | 351 | ILE  | 2.1  |
| 1   | D     | 7   | GLY  | 2.1  |
| 1   | D     | 239 | GLY  | 2.1  |
| 1   | D     | 322 | LEU  | 2.1  |
| 1   | B     | 103 | GLU  | 2.1  |
| 1   | C     | 365 | VAL  | 2.1  |
| 1   | C     | 367 | LEU  | 2.0  |
| 1   | D     | 310 | LEU  | 2.0  |
| 1   | C     | 225 | VAL  | 2.0  |
| 1   | C     | 322 | LEU  | 2.0  |
| 1   | D     | 212 | LEU  | 2.0  |
| 1   | B     | 376 | GLY  | 2.0  |
| 1   | C     | 346 | GLY  | 2.0  |
| 1   | D     | 329 | LEU  | 2.0  |

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

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

## 6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q < 0.9' lists the number of atoms with occupancy less than 0.9.

| Mol | Type | Chain | Res | Atoms | RSCC | RSR  | B-factors( $\text{\AA}^2$ ) | Q<0.9 |
|-----|------|-------|-----|-------|------|------|-----------------------------|-------|
| 2   | ZN   | A     | 433 | 1/1   | 0.83 | 0.13 | 37,37,37,37                 | 1     |
| 2   | ZN   | B     | 432 | 1/1   | 0.86 | 0.19 | 28,28,28,28                 | 1     |
| 2   | ZN   | B     | 433 | 1/1   | 0.86 | 0.16 | 42,42,42,42                 | 1     |
| 2   | ZN   | D     | 432 | 1/1   | 0.89 | 0.20 | 59,59,59,59                 | 1     |
| 2   | ZN   | D     | 433 | 1/1   | 0.89 | 0.19 | 73,73,73,73                 | 1     |
| 2   | ZN   | C     | 432 | 1/1   | 0.95 | 0.14 | 48,48,48,48                 | 1     |
| 2   | ZN   | C     | 433 | 1/1   | 0.95 | 0.12 | 44,44,44,44                 | 1     |
| 2   | ZN   | A     | 432 | 1/1   | 0.97 | 0.10 | 19,19,19,19                 | 1     |

## 6.5 Other polymers [i](#)

There are no such residues in this entry.