



## Full wwPDB EM Validation Report ⓘ

Dec 31, 2024 – 01:20 AM EST

PDB ID : 8G9S  
EMDB ID : EMD-29877  
Title : Exploiting Activation and Inactivation Mechanisms in Type I-C CRISPR-Cas3  
for Genome Editing Applications  
Authors : Hu, C.; Nam, K.H.; Ke, A.  
Deposited on : 2023-02-22  
Resolution : 3.40 Å(reported)

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

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

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

EMDB validation analysis : 0.0.1.dev113  
MolProbity : 4.02b-467  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.40

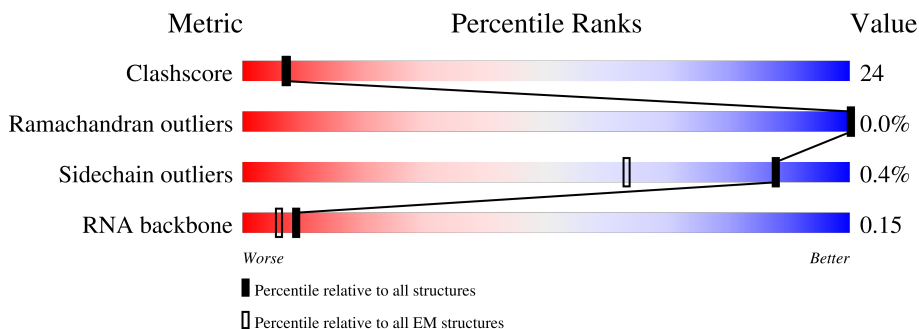
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.40 Å.

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




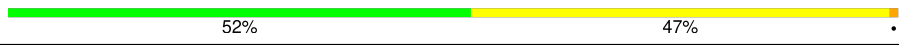
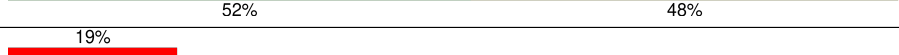


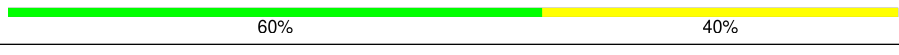


| Metric                | Whole archive (#Entries) | EM structures (#Entries) |
|-----------------------|--------------------------|--------------------------|
| Clashscore            | 210492                   | 15764                    |
| Ramachandran outliers | 207382                   | 16835                    |
| Sidechain outliers    | 206894                   | 16415                    |
| RNA backbone          | 6643                     | 2191                     |

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion  $< 40\%$ ). The numeric value is given above the bar.

| Mol | Chain | Length | Quality of chain  |
|-----|-------|--------|---|
| 1   | B     | 283    | 55% (green), 45% (yellow)                                   |
| 1   | C     | 283    | 58% (green), 42% (yellow), 0% (orange), 0% (red), 0% (grey) |
| 1   | D     | 283    | 60% (green), 40% (yellow)                                   |
| 1   | E     | 283    | 53% (green), 47% (yellow)                                   |
| 1   | F     | 283    | 46% (green), 47% (yellow), 6% (grey)                        |
| 1   | G     | 283    | 47% (green), 49% (yellow), 0% (orange), 0% (red), 0% (grey) |
| 1   | M     | 283    | 53% (green), 40% (yellow), 7% (grey)                        |

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| Mol | Chain | Length | Quality of chain  |
|-----|-------|--------|---|
| 2   | H     | 124    |  49% 50%        |
| 2   | I     | 124    |  52% 47%        |
| 2   | J     | 124    |  52% 48%        |
| 2   | L     | 124    |  19% 60% 31% 8% |
| 3   | N     | 205    |  49% 51%        |
| 4   | O     | 42     |  7% 40% 52%     |
| 5   | K     | 409    |  60% 40%        |
| 6   | A     | 70     |  50% 49%        |

## 2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 25758 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called Cas7.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
|     |       |          | Total | C    | N   | O   | S  |         |       |
| 1   | B     | 283      | 2261  | 1408 | 406 | 436 | 11 | 0       | 0     |
| 1   | C     | 283      | 2261  | 1408 | 406 | 436 | 11 | 0       | 0     |
| 1   | D     | 283      | 2261  | 1408 | 406 | 436 | 11 | 0       | 0     |
| 1   | E     | 283      | 2261  | 1408 | 406 | 436 | 11 | 0       | 0     |
| 1   | F     | 265      | 2124  | 1331 | 379 | 404 | 10 | 0       | 0     |
| 1   | G     | 271      | 2173  | 1360 | 391 | 411 | 11 | 0       | 0     |
| 1   | M     | 264      | 2110  | 1318 | 379 | 402 | 11 | 0       | 0     |

There are 7 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment        | Reference      |
|-------|---------|----------|--------|----------------|----------------|
| B     | 284     | GLY      | -      | expression tag | UNP A0A378VEU0 |
| C     | 284     | GLY      | -      | expression tag | UNP A0A378VEU0 |
| D     | 284     | GLY      | -      | expression tag | UNP A0A378VEU0 |
| E     | 284     | GLY      | -      | expression tag | UNP A0A378VEU0 |
| F     | 284     | GLY      | -      | expression tag | UNP A0A378VEU0 |
| G     | 284     | GLY      | -      | expression tag | UNP A0A378VEU0 |
| M     | 284     | GLY      | -      | expression tag | UNP A0A378VEU0 |

- Molecule 2 is a protein called Cas11.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 2   | H     | 124      | 1007  | 646 | 180 | 179 | 2 | 0       | 0     |
| 2   | I     | 124      | 1007  | 646 | 180 | 179 | 2 | 0       | 0     |

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| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 2   | J     | 124      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1007  | 646 | 180 | 179 | 2 |         |       |
| 2   | L     | 114      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 917   | 588 | 163 | 165 | 1 |         |       |

- Molecule 3 is a protein called Cas5.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 3   | N     | 205      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 1673  | 1067 | 289 | 305 | 12 |         |       |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment  | Reference  |
|-------|---------|----------|--------|----------|------------|
| N     | 32      | ALA      | SER    | conflict | UNP D0W8X4 |

- Molecule 4 is a RNA chain called RNA (42-MER).

| Mol | Chain | Residues | Atoms |     |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| 4   | O     | 42       | Total | C   | N   | O   | P  | 0       | 0     |
|     |       |          | 895   | 399 | 158 | 296 | 42 |         |       |

- Molecule 5 is a protein called Cas8.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 5   | K     | 409      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3223  | 2056 | 569 | 586 | 12 |         |       |

There are 19 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment               | Reference      |
|-------|---------|----------|--------|-----------------------|----------------|
| K     | 1       | MET      | -      | initiating methionine | UNP A0A378VF47 |
| K     | 2       | ILE      | -      | expression tag        | UNP A0A378VF47 |
| K     | 3       | LEU      | -      | expression tag        | UNP A0A378VF47 |
| K     | 4       | HIS      | -      | expression tag        | UNP A0A378VF47 |
| K     | 5       | ALA      | -      | expression tag        | UNP A0A378VF47 |
| K     | 6       | LEU      | VAL    | conflict              | UNP A0A378VF47 |
| K     | 7       | THR      | SER    | conflict              | UNP A0A378VF47 |
| K     | 9       | TYR      | ALA    | conflict              | UNP A0A378VF47 |
| K     | 10      | TYR      | ASN    | conflict              | UNP A0A378VF47 |
| K     | 12      | ARG      | THR    | conflict              | UNP A0A378VF47 |

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| Chain | Residue | Modelled | Actual | Comment  | Reference      |
|-------|---------|----------|--------|----------|----------------|
| K     | 13      | LYS      | GLN    | conflict | UNP A0A378VF47 |
| K     | 14      | ALA      | SER    | conflict | UNP A0A378VF47 |
| K     | 15      | GLU      | ASP    | conflict | UNP A0A378VF47 |
| K     | 16      | SER      | ASN    | conflict | UNP A0A378VF47 |
| K     | 190     | ALA      | VAL    | conflict | UNP A0A378VF47 |
| K     | 239     | ALA      | ILE    | conflict | UNP A0A378VF47 |
| K     | 242     | ILE      | VAL    | conflict | UNP A0A378VF47 |
| K     | 260     | GLY      | SER    | conflict | UNP A0A378VF47 |
| K     | 271     | THR      | ALA    | conflict | UNP A0A378VF47 |

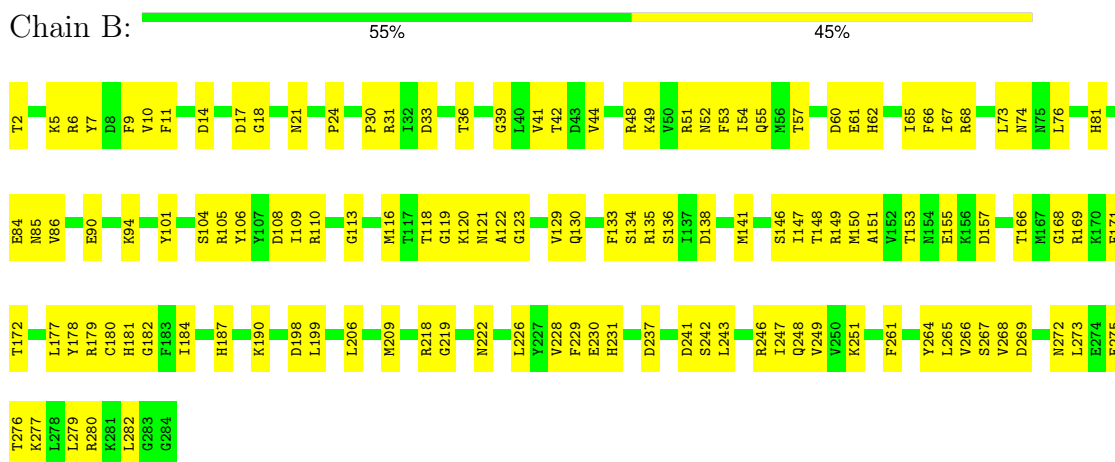
- Molecule 6 is a protein called AcrIC8.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 6   | A     | 70       | 578   | 367 | 102 | 108 | 1 | 0       | 0     |

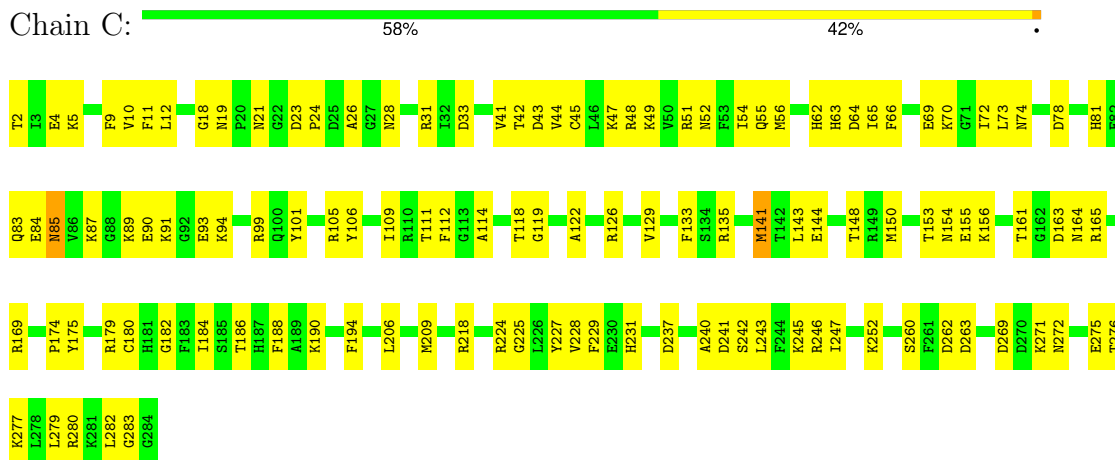
### 3 Residue-property plots [i](#)

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 atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

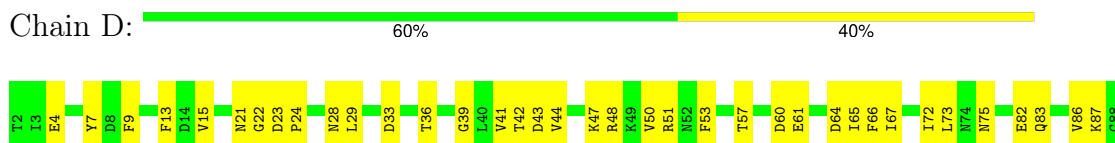
- Molecule 1: Cas7

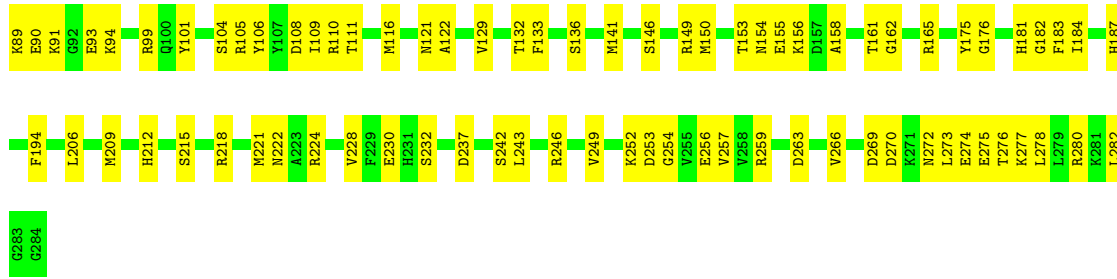


- Molecule 1: Cas7

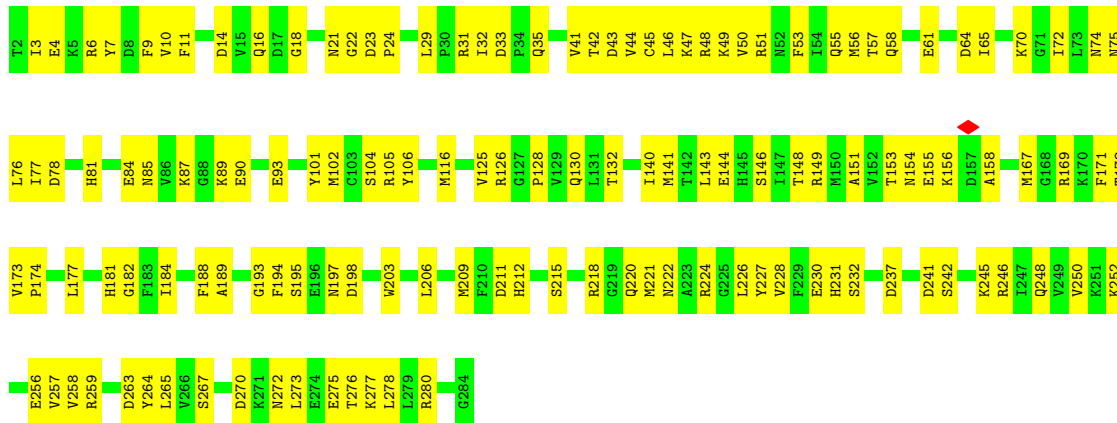


- Molecule 1: Cas7

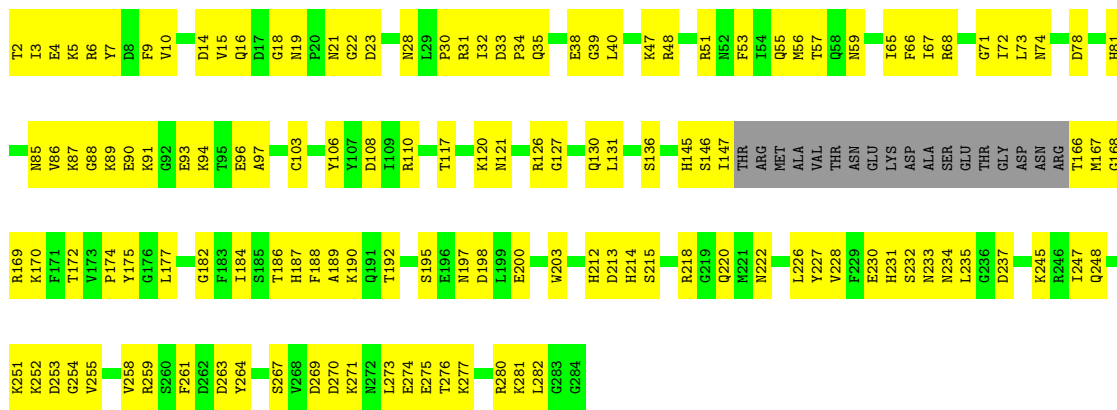




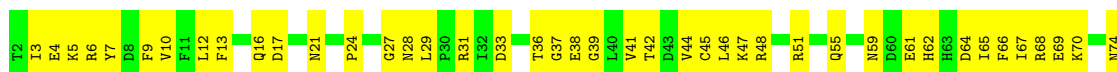
• Molecule 1: Cas7



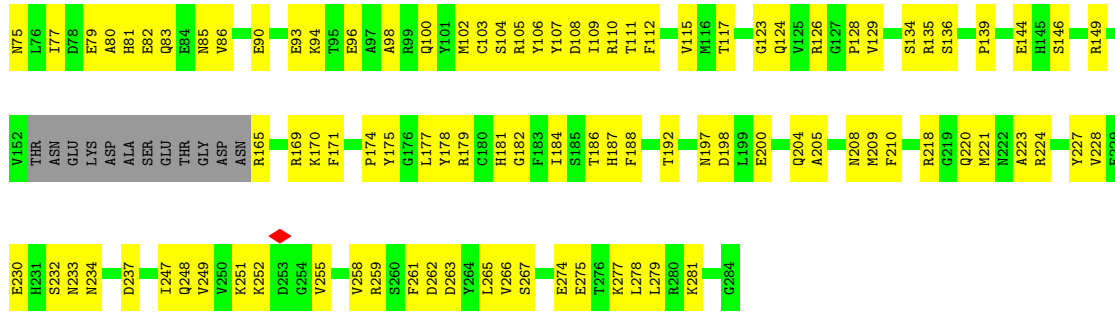
• Molecule 1: Cas7



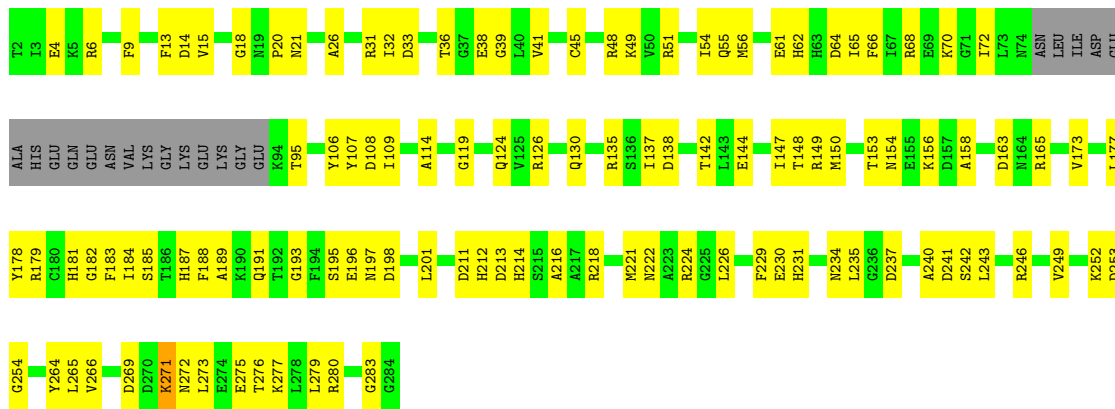
• Molecule 1: Cas7



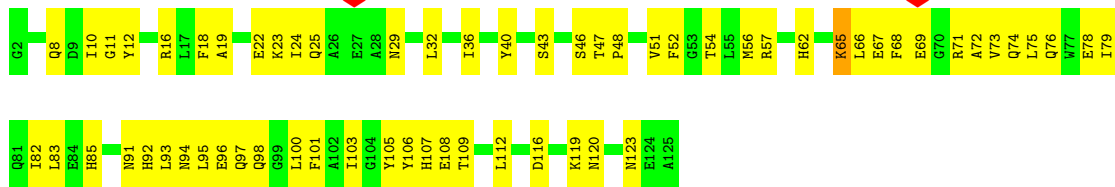




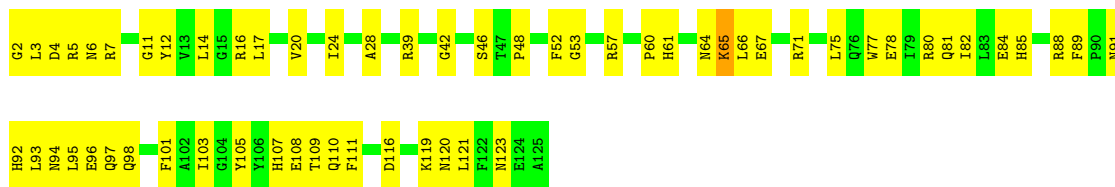
• Molecule 1: Cas7



• Molecule 2: Cas11

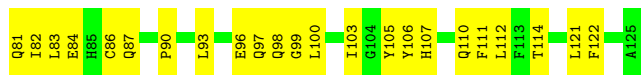
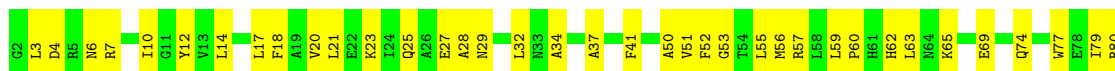


• Molecule 2: Cas11

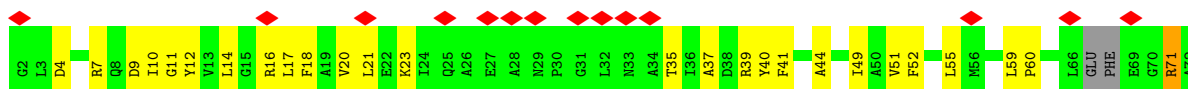


• Molecule 2: Cas11

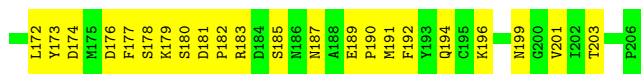
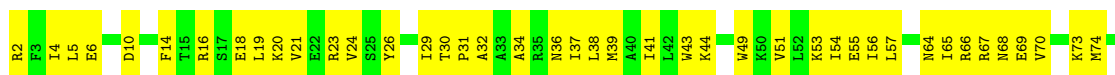




• Molecule 2: Cas11



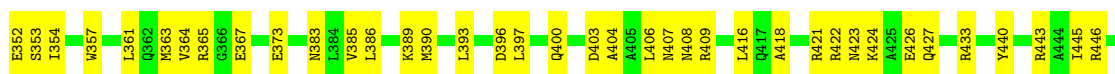
• Molecule 3: Cas5



• Molecule 4: RNA (42-MER)



• Molecule 5: Cas8





• Molecule 6: AcrIC8



## 4 Experimental information

| Property                             | Value                                   | Source    |
|--------------------------------------|---|-----------|
| EM reconstruction method             | SINGLE PARTICLE                         | Depositor |
| Imposed symmetry                     | POINT, Not provided                     |           |
| Number of particles used             | 200000                                  | Depositor |
| Resolution determination method      | FSC 0.143 CUT-OFF                       | Depositor |
| CTF correction method                | PHASE FLIPPING AND AMPLITUDE CORRECTION | Depositor |
| Microscope                           | FEI TALOS ARCTICA                       | Depositor |
| Voltage (kV)                         | 200                                     | Depositor |
| Electron dose ( $e^-/\text{\AA}^2$ ) | 50                                      | Depositor |
| Minimum defocus (nm)                 | 1500                                    | Depositor |
| Maximum defocus (nm)                 | 3000                                    | Depositor |
| Magnification                        | 67000                                   | Depositor |
| Image detector                       | GATAN K3 (6k x 4k)                      | Depositor |
| Maximum map value                    | 1.085                                   | Depositor |
| Minimum map value                    | -0.631                                  | Depositor |
| Average map value                    | -0.000                                  | Depositor |
| Map value standard deviation         | 0.034                                   | Depositor |
| Recommended contour level            | 0.118                                   | Depositor |
| Map size (Å)                         | 353.1, 353.1, 353.1                     | wwPDB     |
| Map dimensions                       | 250, 250, 250                           | wwPDB     |
| Map angles (°)                       | 90.0, 90.0, 90.0                        | wwPDB     |
| Pixel spacing (Å)                    | 1.4124, 1.4124, 1.4124                  | Depositor |

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

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   | B     | 0.49         | 0/2303  | 0.53        | 0/3101  |
| 1   | C     | 0.52         | 0/2303  | 0.54        | 0/3101  |
| 1   | D     | 0.48         | 0/2303  | 0.55        | 0/3101  |
| 1   | E     | 0.44         | 0/2303  | 0.52        | 0/3101  |
| 1   | F     | 0.36         | 0/2165  | 0.49        | 0/2914  |
| 1   | G     | 0.29         | 0/2214  | 0.48        | 0/2979  |
| 1   | M     | 0.43         | 0/2150  | 0.54        | 0/2896  |
| 2   | H     | 0.34         | 0/1030  | 0.52        | 0/1392  |
| 2   | I     | 0.37         | 0/1030  | 0.47        | 0/1392  |
| 2   | J     | 0.36         | 0/1030  | 0.50        | 0/1392  |
| 2   | L     | 0.29         | 0/934   | 0.46        | 0/1259  |
| 3   | N     | 0.39         | 0/1711  | 0.52        | 0/2306  |
| 4   | O     | 0.98         | 0/999   | 1.08        | 0/1555  |
| 5   | K     | 0.38         | 0/3290  | 0.51        | 0/4450  |
| 6   | A     | 0.35         | 0/591   | 0.52        | 0/792   |
| All | All   | 0.45         | 0/26356 | 0.55        | 0/35731 |

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

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

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

| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 1   | B     | 2261  | 0        | 2193     | 106     | 0            |

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| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 1   | C     | 2261  | 0        | 2193     | 103     | 0            |
| 1   | D     | 2261  | 0        | 2193     | 116     | 0            |
| 1   | E     | 2261  | 0        | 2193     | 122     | 0            |
| 1   | F     | 2124  | 0        | 2064     | 116     | 0            |
| 1   | G     | 2173  | 0        | 2120     | 131     | 0            |
| 1   | M     | 2110  | 0        | 2050     | 110     | 0            |
| 2   | H     | 1007  | 0        | 992      | 59      | 0            |
| 2   | I     | 1007  | 0        | 992      | 50      | 0            |
| 2   | J     | 1007  | 0        | 992      | 51      | 0            |
| 2   | L     | 917   | 0        | 909      | 35      | 0            |
| 3   | N     | 1673  | 0        | 1663     | 110     | 0            |
| 4   | O     | 895   | 0        | 453      | 76      | 0            |
| 5   | K     | 3223  | 0        | 3241     | 126     | 0            |
| 6   | A     | 578   | 0        | 557      | 36      | 0            |
| All | All   | 25758 | 0        | 24805    | 1189    | 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 24.

All (1189) 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) |
|-----------------|------------------|--------------------------|-------------------|
| 6:A:11:LYS:HB3  | 6:A:23:SER:O     | 1.42                     | 1.16              |
| 2:H:16:ARG:HG3  | 2:H:108:GLU:HG3  | 1.45                     | 0.96              |
| 2:H:95:LEU:HD21 | 2:I:53:GLY:HA3   | 1.50                     | 0.93              |
| 1:M:165:ARG:HD3 | 6:A:53:VAL:HG22  | 1.51                     | 0.92              |
| 1:M:56:MET:SD   | 1:M:212:HIS:ND1  | 2.45                     | 0.89              |
| 1:B:44:VAL:HG21 | 1:M:147:ILE:HD11 | 1.54                     | 0.89              |
| 3:N:167:ASP:HA  | 3:N:196:LYS:HB3  | 1.56                     | 0.88              |
| 1:D:141:MET:SD  | 1:E:35:GLN:NE2   | 2.48                     | 0.86              |
| 1:B:51:ARG:NH2  | 4:O:13:U:OP1     | 2.09                     | 0.86              |
| 1:M:45:CYS:SG   | 1:M:49:LYS:NZ    | 2.49                     | 0.85              |
| 1:E:51:ARG:NH2  | 4:O:31:C:OP1     | 2.09                     | 0.84              |
| 2:L:71:ARG:HA   | 2:L:74:GLN:HE21  | 1.42                     | 0.83              |
| 5:K:424:LYS:O   | 5:K:427:GLN:NE2  | 2.12                     | 0.83              |
| 1:E:56:MET:SD   | 1:E:212:HIS:ND1  | 2.52                     | 0.81              |
| 1:E:222:ASN:HB2 | 1:E:224:ARG:HH22 | 1.45                     | 0.81              |
| 1:F:55:GLN:HB2  | 1:F:65:ILE:HG13  | 1.64                     | 0.80              |
| 1:G:5:LYS:HG2   | 1:G:232:SER:HA   | 1.63                     | 0.80              |
| 1:D:22:GLY:HA3  | 4:O:27:G:H3'     | 1.61                     | 0.80              |
| 1:M:48:ARG:NH2  | 4:O:8:C:OP2      | 2.14                     | 0.79              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:11:PHE:HB3   | 1:C:180:CYS:HB3  | 1.63                     | 0.79              |
| 1:F:56:MET:SD    | 1:G:187:HIS:ND1  | 2.56                     | 0.79              |
| 1:G:48:ARG:HH21  | 1:G:69:GLU:HB3   | 1.46                     | 0.78              |
| 1:M:6:ARG:HH11   | 1:M:231:HIS:HE1  | 1.30                     | 0.78              |
| 2:H:80:ARG:NH2   | 2:L:106:TYR:HB3  | 1.99                     | 0.78              |
| 1:B:110:ARG:NH2  | 1:B:198:ASP:OD2  | 2.15                     | 0.78              |
| 1:M:230:GLU:HB2  | 1:M:280:ARG:HH12 | 1.45                     | 0.78              |
| 3:N:87:ARG:NH2   | 4:O:8:C:N3       | 2.30                     | 0.78              |
| 5:K:324:LYS:HA   | 5:K:346:THR:HA   | 1.64                     | 0.77              |
| 1:M:226:LEU:H    | 1:M:283:GLY:HA3  | 1.49                     | 0.77              |
| 1:D:161:THR:HA   | 1:E:70:LYS:HE2   | 1.66                     | 0.77              |
| 1:C:126:ARG:HG2  | 4:O:17:C:H4'     | 1.66                     | 0.76              |
| 1:M:195:SER:OG   | 1:M:197:ASN:OD1  | 2.04                     | 0.76              |
| 1:D:224:ARG:NH2  | 1:E:241:ASP:OD2  | 2.19                     | 0.76              |
| 1:D:259:ARG:NH1  | 1:E:33:ASP:OD2   | 2.18                     | 0.76              |
| 1:E:258:VAL:HG23 | 1:E:263:ASP:HB2  | 1.67                     | 0.76              |
| 1:E:89:LYS:HD3   | 1:E:90:GLU:H     | 1.49                     | 0.75              |
| 1:D:156:LYS:HG3  | 1:D:158:ALA:H    | 1.51                     | 0.75              |
| 1:C:275:GLU:HG2  | 1:C:276:THR:HG23 | 1.69                     | 0.75              |
| 5:K:288:MET:HA   | 5:K:292:GLY:HA3  | 1.66                     | 0.75              |
| 1:B:241:ASP:HB2  | 1:M:222:ASN:HD21 | 1.52                     | 0.75              |
| 1:F:227:TYR:HD2  | 1:F:247:ILE:HD13 | 1.49                     | 0.75              |
| 1:G:90:GLU:O     | 1:G:94:LYS:N     | 2.20                     | 0.75              |
| 1:M:246:ARG:HH12 | 1:M:273:LEU:H    | 1.35                     | 0.75              |
| 1:G:96:GLU:O     | 1:G:100:GLN:NE2  | 2.20                     | 0.75              |
| 1:E:75:ASN:OD1   | 1:E:76:LEU:N     | 2.21                     | 0.74              |
| 1:D:146:SER:O    | 1:E:31:ARG:NH2   | 2.19                     | 0.74              |
| 2:H:80:ARG:HH22  | 2:H:83:LEU:HD12  | 1.52                     | 0.74              |
| 2:I:2:GLY:N      | 2:J:84:GLU:OE2   | 2.20                     | 0.74              |
| 6:A:6:MET:HB3    | 6:A:35:LEU:HD22  | 1.68                     | 0.74              |
| 1:F:213:ASP:HB3  | 1:F:218:ARG:HH22 | 1.52                     | 0.74              |
| 1:M:6:ARG:HH11   | 1:M:231:HIS:CE1  | 2.05                     | 0.74              |
| 1:G:146:SER:HB2  | 1:G:169:ARG:HG3  | 1.69                     | 0.73              |
| 1:G:33:ASP:HB3   | 1:G:37:GLY:H     | 1.53                     | 0.73              |
| 1:M:213:ASP:HB3  | 1:M:218:ARG:HH12 | 1.51                     | 0.73              |
| 1:G:21:ASN:HA    | 1:G:218:ARG:HH21 | 1.53                     | 0.73              |
| 1:F:255:VAL:HG21 | 1:F:263:ASP:HB3  | 1.71                     | 0.73              |
| 1:M:163:ASP:OD1  | 1:M:165:ARG:NH2  | 2.22                     | 0.72              |
| 3:N:34:ALA:HA    | 3:N:37:ILE:HD12  | 1.71                     | 0.72              |
| 1:B:218:ARG:NH2  | 4:O:16:G:OP1     | 2.21                     | 0.72              |
| 1:M:230:GLU:HB3  | 1:M:280:ARG:HH22 | 1.54                     | 0.72              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:21:ASN:HB2   | 1:D:41:VAL:HG23  | 1.70                     | 0.72              |
| 5:K:263:ARG:HH21 | 5:K:265:ARG:HG3  | 1.54                     | 0.71              |
| 1:M:64:ASP:HB3   | 1:M:106:TYR:HD1  | 1.54                     | 0.71              |
| 1:D:21:ASN:OD1   | 1:D:22:GLY:N     | 2.23                     | 0.71              |
| 6:A:11:LYS:CB    | 6:A:23:SER:O     | 2.33                     | 0.71              |
| 1:F:89:LYS:HZ2   | 1:F:96:GLU:HB3   | 1.54                     | 0.71              |
| 2:H:29:ASN:HB3   | 2:H:32:LEU:HB2   | 1.71                     | 0.71              |
| 1:F:91:LYS:HA    | 1:F:94:LYS:HB3   | 1.72                     | 0.71              |
| 3:N:18:GLU:HA    | 5:K:240:PHE:HD1  | 1.54                     | 0.71              |
| 1:G:67:ILE:HD12  | 1:G:70:LYS:HB2   | 1.72                     | 0.71              |
| 1:C:45:CYS:SG    | 1:C:49:LYS:NZ    | 2.64                     | 0.70              |
| 1:E:189:ALA:O    | 1:E:193:GLY:N    | 2.24                     | 0.70              |
| 1:B:237:ASP:OD1  | 1:B:276:THR:OG1  | 2.09                     | 0.70              |
| 5:K:464:ARG:NH1  | 5:K:466:ASP:OD2  | 2.24                     | 0.70              |
| 3:N:149:PHE:O    | 3:N:150:ARG:NH2  | 2.22                     | 0.70              |
| 1:M:249:VAL:HG22 | 1:M:266:VAL:HG12 | 1.73                     | 0.70              |
| 3:N:139:TYR:CZ   | 3:N:143:ARG:HG2  | 2.26                     | 0.70              |
| 5:K:365:ARG:HH21 | 5:K:373:GLU:HB3  | 1.56                     | 0.70              |
| 1:D:242:SER:O    | 1:D:246:ARG:NH2  | 2.24                     | 0.70              |
| 1:F:146:SER:OG   | 1:F:169:ARG:NH2  | 2.24                     | 0.70              |
| 3:N:20:LYS:NZ    | 4:O:3:U:O2'      | 2.24                     | 0.70              |
| 2:J:32:LEU:HG    | 2:J:34:ALA:H     | 1.57                     | 0.70              |
| 2:H:80:ARG:HA    | 2:H:80:ARG:CZ    | 2.22                     | 0.70              |
| 3:N:36:ASN:ND2   | 4:O:2:U:OP2      | 2.23                     | 0.69              |
| 1:C:161:THR:OG1  | 1:C:163:ASP:OD1  | 2.10                     | 0.69              |
| 1:M:237:ASP:OD2  | 1:M:276:THR:OG1  | 2.10                     | 0.69              |
| 3:N:162:GLU:HG3  | 3:N:199:ASN:HD22 | 1.57                     | 0.69              |
| 3:N:173:TYR:HB2  | 3:N:192:PHE:HD1  | 1.57                     | 0.69              |
| 5:K:265:ARG:NH2  | 6:A:29:ALA:O     | 2.24                     | 0.69              |
| 2:H:94:ASN:H     | 2:H:97:GLN:NE2   | 1.90                     | 0.69              |
| 1:C:85:ASN:O     | 1:C:94:LYS:NZ    | 2.22                     | 0.69              |
| 2:J:110:GLN:HA   | 5:K:537:ARG:HH21 | 1.58                     | 0.69              |
| 2:I:12:TYR:OH    | 2:I:107:HIS:ND1  | 2.16                     | 0.69              |
| 1:M:4:GLU:O      | 1:M:234:ASN:ND2  | 2.26                     | 0.69              |
| 6:A:45:ARG:HD3   | 6:A:49:LEU:HD23  | 1.75                     | 0.69              |
| 1:G:36:THR:HG22  | 1:G:139:PRO:HG3  | 1.75                     | 0.69              |
| 3:N:5:LEU:HD11   | 3:N:149:PHE:HB2  | 1.75                     | 0.69              |
| 1:B:146:SER:O    | 1:C:31:ARG:NH2   | 2.26                     | 0.68              |
| 2:H:93:LEU:O     | 2:H:98:GLN:NE2   | 2.25                     | 0.68              |
| 1:F:51:ARG:NH2   | 4:O:37:C:OP1     | 2.22                     | 0.68              |
| 2:I:60:PRO:O     | 2:I:64:ASN:ND2   | 2.25                     | 0.68              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:280:ARG:HH11 | 1:D:282:LEU:HD21 | 1.59                     | 0.68              |
| 1:F:38:GLU:OE1   | 1:F:136:SER:OG   | 2.11                     | 0.68              |
| 1:G:128:PRO:HD3  | 1:G:192:THR:HG21 | 1.76                     | 0.68              |
| 1:G:108:ASP:O    | 1:G:112:PHE:N    | 2.20                     | 0.68              |
| 1:E:22:GLY:N     | 4:O:34:C:OP2     | 2.27                     | 0.67              |
| 5:K:206:ARG:NH1  | 5:K:236:GLN:OE1  | 2.27                     | 0.67              |
| 1:D:33:ASP:OD2   | 1:D:36:THR:N     | 2.21                     | 0.67              |
| 1:F:195:SER:OG   | 1:F:197:ASN:OD1  | 2.11                     | 0.67              |
| 1:B:246:ARG:HB3  | 1:B:269:ASP:HB3  | 1.76                     | 0.67              |
| 1:C:144:GLU:OE2  | 1:C:169:ARG:NH2  | 2.26                     | 0.67              |
| 5:K:445:ILE:HG22 | 5:K:450:LEU:HB3  | 1.77                     | 0.67              |
| 1:D:89:LYS:HE2   | 1:D:93:GLU:HB3   | 1.77                     | 0.67              |
| 1:D:90:GLU:H     | 1:D:93:GLU:HB2   | 1.60                     | 0.67              |
| 1:F:230:GLU:O    | 1:F:277:LYS:HA   | 1.93                     | 0.67              |
| 1:D:86:VAL:O     | 1:D:94:LYS:NZ    | 2.25                     | 0.67              |
| 3:N:124:MET:HA   | 3:N:127:ARG:HE   | 1.61                     | 0.66              |
| 1:C:74:ASN:ND2   | 1:C:118:THR:OG1  | 2.29                     | 0.66              |
| 1:F:220:GLN:NE2  | 1:F:222:ASN:OD1  | 2.27                     | 0.66              |
| 1:B:101:TYR:O    | 1:B:104:SER:OG   | 2.11                     | 0.66              |
| 1:B:149:ARG:HG2  | 1:B:151:ALA:H    | 1.61                     | 0.66              |
| 1:C:10:VAL:HG11  | 1:C:247:ILE:HD13 | 1.78                     | 0.66              |
| 1:F:147:ILE:HG21 | 1:G:42:THR:HG21  | 1.78                     | 0.66              |
| 5:K:486:ASN:ND2  | 5:K:488:GLY:O    | 2.29                     | 0.66              |
| 5:K:553:GLU:OE1  | 5:K:553:GLU:N    | 2.27                     | 0.66              |
| 1:B:48:ARG:HH21  | 1:M:150:MET:HG3  | 1.60                     | 0.66              |
| 1:B:84:GLU:OE2   | 1:B:84:GLU:N     | 2.28                     | 0.66              |
| 1:C:161:THR:H    | 1:C:164:ASN:HB2  | 1.61                     | 0.66              |
| 1:E:14:ASP:HB3   | 1:E:177:LEU:HD23 | 1.76                     | 0.66              |
| 6:A:72:ARG:NH1   | 6:A:73:GLY:O     | 2.29                     | 0.66              |
| 1:C:5:LYS:O      | 1:C:186:THR:OG1  | 2.13                     | 0.66              |
| 1:E:232:SER:H    | 1:E:277:LYS:HZ3  | 1.43                     | 0.66              |
| 1:E:89:LYS:HD3   | 1:E:90:GLU:N     | 2.10                     | 0.65              |
| 1:E:74:ASN:HA    | 1:E:77:ILE:HG12  | 1.79                     | 0.65              |
| 1:C:246:ARG:HH22 | 1:C:271:LYS:HG2  | 1.61                     | 0.65              |
| 1:F:89:LYS:HB3   | 1:F:93:GLU:HB2   | 1.77                     | 0.65              |
| 1:D:230:GLU:HG2  | 1:D:278:LEU:HB2  | 1.77                     | 0.65              |
| 1:B:33:ASP:OD1   | 1:B:36:THR:N     | 2.30                     | 0.65              |
| 1:C:62:HIS:O     | 1:C:63:HIS:ND1   | 2.30                     | 0.65              |
| 1:M:124:GLN:OE1  | 4:O:4:G:N2       | 2.30                     | 0.65              |
| 1:C:23:ASP:OD2   | 1:C:26:ALA:N     | 2.27                     | 0.65              |
| 1:G:252:LYS:HA   | 1:G:265:LEU:HD22 | 1.80                     | 0.65              |

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| Atom-1          | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-----------------|------------------|--------------------------|-------------------|
| 1:B:48:ARG:NH1  | 1:B:52:ASN:OD1   | 2.31                     | 0.64              |
| 1:G:82:GLU:HA   | 1:G:86:VAL:HG22  | 1.78                     | 0.64              |
| 2:I:93:LEU:HD12 | 2:I:97:GLN:HB3   | 1.79                     | 0.64              |
| 1:B:51:ARG:NE   | 1:B:108:ASP:OD1  | 2.30                     | 0.64              |
| 1:D:232:SER:HB3 | 1:D:276:THR:HB   | 1.79                     | 0.64              |
| 1:F:237:ASP:HB2 | 1:F:277:LYS:HZ3  | 1.62                     | 0.64              |
| 1:F:227:TYR:HE1 | 1:F:281:LYS:HE2  | 1.62                     | 0.64              |
| 6:A:6:MET:O     | 6:A:71:VAL:N     | 2.29                     | 0.64              |
| 1:F:89:LYS:NZ   | 1:F:96:GLU:OE1   | 2.30                     | 0.64              |
| 1:G:6:ARG:HG2   | 1:G:186:THR:H    | 1.62                     | 0.64              |
| 1:B:229:PHE:HE1 | 1:B:279:LEU:HD12 | 1.61                     | 0.64              |
| 5:K:390:MET:SD  | 5:K:390:MET:N    | 2.70                     | 0.64              |
| 1:M:51:ARG:NE   | 1:M:108:ASP:OD1  | 2.31                     | 0.63              |
| 5:K:302:ASP:OD1 | 5:K:305:LYS:NZ   | 2.30                     | 0.63              |
| 1:E:156:LYS:HG3 | 1:E:158:ALA:H    | 1.64                     | 0.63              |
| 1:M:106:TYR:HB2 | 1:M:109:ILE:HG22 | 1.81                     | 0.63              |
| 1:G:9:PHE:HB3   | 1:G:228:VAL:HG12 | 1.79                     | 0.63              |
| 3:N:20:LYS:HE2  | 5:K:231:SER:HB2  | 1.79                     | 0.63              |
| 1:D:106:TYR:O   | 1:D:110:ARG:NH2  | 2.32                     | 0.63              |
| 1:C:21:ASN:OD1  | 1:C:31:ARG:NH1   | 2.31                     | 0.63              |
| 1:D:60:ASP:OD1  | 1:D:61:GLU:N     | 2.32                     | 0.63              |
| 1:E:49:LYS:HB3  | 1:E:209:MET:HE2  | 1.80                     | 0.63              |
| 1:G:200:GLU:O   | 1:G:204:GLN:NE2  | 2.31                     | 0.63              |
| 3:N:68:ASN:HB3  | 3:N:87:ARG:HD2   | 1.81                     | 0.63              |
| 1:D:23:ASP:HB3  | 1:D:28:ASN:HA    | 1.81                     | 0.63              |
| 1:F:166:THR:HA  | 1:F:169:ARG:HH12 | 1.63                     | 0.63              |
| 1:G:102:MET:HB3 | 1:G:109:ILE:HG21 | 1.81                     | 0.63              |
| 5:K:325:PHE:N   | 5:K:345:THR:O    | 2.30                     | 0.63              |
| 1:E:230:GLU:HB3 | 1:E:278:LEU:HB2  | 1.80                     | 0.63              |
| 2:I:57:ARG:HA   | 2:I:57:ARG:CZ    | 2.28                     | 0.63              |
| 2:L:23:LYS:HZ2  | 2:L:112:LEU:HD13 | 1.64                     | 0.63              |
| 1:F:3:ILE:HG22  | 1:F:5:LYS:H      | 1.64                     | 0.62              |
| 1:C:165:ARG:NH2 | 4:O:26:G:N7      | 2.46                     | 0.62              |
| 2:J:56:MET:HA   | 2:J:59:LEU:HD23  | 1.81                     | 0.62              |
| 2:H:79:ILE:O    | 2:H:83:LEU:HG    | 1.99                     | 0.62              |
| 1:C:48:ARG:O    | 1:C:52:ASN:ND2   | 2.32                     | 0.62              |
| 2:I:7:ARG:HH12  | 2:J:87:GLN:HB3   | 1.64                     | 0.62              |
| 1:M:142:THR:OG1 | 5:K:421:ARG:NH2  | 2.32                     | 0.62              |
| 1:E:43:ASP:OD1  | 1:E:44:VAL:N     | 2.33                     | 0.62              |
| 3:N:162:GLU:HA  | 3:N:199:ASN:HB2  | 1.82                     | 0.62              |
| 5:K:310:SER:O   | 5:K:318:LYS:NZ   | 2.33                     | 0.62              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:G:85:ASN:O     | 1:G:94:LYS:NZ    | 2.33                     | 0.62              |
| 2:H:105:TYR:O    | 2:H:109:THR:HG23 | 1.98                     | 0.61              |
| 1:E:81:HIS:O     | 1:E:85:ASN:N     | 2.32                     | 0.61              |
| 3:N:177:PHE:CZ   | 4:O:1:A:H8       | 2.18                     | 0.61              |
| 5:K:517:PRO:HA   | 5:K:520:LEU:HD12 | 1.82                     | 0.61              |
| 1:D:162:GLY:O    | 1:D:165:ARG:NH2  | 2.33                     | 0.61              |
| 1:M:48:ARG:HH21  | 4:O:8:C:P        | 2.22                     | 0.61              |
| 1:G:4:GLU:HG2    | 1:G:5:LYS:HG3    | 1.81                     | 0.61              |
| 5:K:341:PHE:HB2  | 5:K:343:HIS:HE1  | 1.65                     | 0.61              |
| 1:F:32:ILE:HA    | 1:F:39:GLY:HA2   | 1.83                     | 0.61              |
| 1:F:33:ASP:N     | 1:F:38:GLU:O     | 2.27                     | 0.61              |
| 2:I:61:HIS:HA    | 2:I:64:ASN:HD21  | 1.65                     | 0.61              |
| 2:J:79:ILE:HA    | 2:J:82:ILE:HG22  | 1.83                     | 0.61              |
| 1:C:9:PHE:CZ     | 1:C:182:GLY:HA3  | 2.36                     | 0.60              |
| 1:G:55:GLN:HB2   | 1:G:65:ILE:HG21  | 1.84                     | 0.60              |
| 1:M:64:ASP:OD1   | 1:M:65:ILE:N     | 2.31                     | 0.60              |
| 2:L:74:GLN:HA    | 2:L:77:TRP:HE3   | 1.64                     | 0.60              |
| 1:M:154:ASN:HB2  | 1:M:156:LYS:HG2  | 1.82                     | 0.60              |
| 3:N:86:ASN:O     | 3:N:88:GLN:NE2   | 2.30                     | 0.60              |
| 5:K:273:CYS:HB2  | 5:K:325:PHE:HE2  | 1.64                     | 0.60              |
| 1:C:99:ARG:HG3   | 1:C:122:ALA:O    | 2.02                     | 0.60              |
| 1:D:259:ARG:N    | 1:D:263:ASP:OD2  | 2.22                     | 0.60              |
| 1:E:146:SER:O    | 1:F:31:ARG:NH2   | 2.35                     | 0.60              |
| 1:M:253:ASP:OD1  | 1:M:254:GLY:N    | 2.35                     | 0.60              |
| 1:D:43:ASP:OD1   | 1:D:44:VAL:N     | 2.34                     | 0.60              |
| 2:J:20:VAL:HG22  | 2:J:112:LEU:HD11 | 1.83                     | 0.60              |
| 1:F:231:HIS:CD2  | 1:F:277:LYS:HE3  | 2.37                     | 0.60              |
| 2:I:48:PRO:O     | 2:I:52:PHE:HB2   | 2.02                     | 0.60              |
| 1:M:51:ARG:NH1   | 4:O:7:A:OP1      | 2.30                     | 0.60              |
| 2:I:42:GLY:O     | 2:J:57:ARG:NH2   | 2.34                     | 0.60              |
| 5:K:224:VAL:HG13 | 5:K:229:PHE:HB2  | 1.83                     | 0.60              |
| 1:C:83:GLN:HG3   | 1:C:84:GLU:H     | 1.66                     | 0.59              |
| 1:C:154:ASN:HD22 | 1:C:156:LYS:HE2  | 1.66                     | 0.59              |
| 1:D:253:ASP:OD1  | 1:D:254:GLY:N    | 2.33                     | 0.59              |
| 4:O:14:C:H5      | 4:O:16:G:HO2'    | 1.49                     | 0.59              |
| 2:I:110:GLN:HA   | 2:J:80:ARG:NH2   | 2.16                     | 0.59              |
| 1:B:280:ARG:CZ   | 1:B:282:LEU:HD11 | 2.33                     | 0.59              |
| 1:F:5:LYS:O      | 1:F:186:THR:OG1  | 2.20                     | 0.59              |
| 1:F:245:LYS:O    | 1:F:248:GLN:NE2  | 2.35                     | 0.59              |
| 2:I:24:ILE:HG12  | 2:I:75:LEU:HD13  | 1.83                     | 0.59              |
| 1:M:130:GLN:NE2  | 3:N:143:ARG:O    | 2.36                     | 0.59              |

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| Atom-1          | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-----------------|------------------|--------------------------|-------------------|
| 3:N:176:ASP:O   | 3:N:187:ASN:ND2  | 2.24                     | 0.59              |
| 1:C:85:ASN:C    | 1:C:85:ASN:HD22  | 2.04                     | 0.59              |
| 2:I:77:TRP:O    | 2:I:81:GLN:HG2   | 2.03                     | 0.59              |
| 1:M:33:ASP:OD2  | 1:M:135:ARG:NH1  | 2.35                     | 0.59              |
| 4:O:36:C:O2'    | 4:O:37:C:O5'     | 2.19                     | 0.59              |
| 1:G:16:GLN:NE2  | 1:G:174:PRO:O    | 2.35                     | 0.59              |
| 1:M:183:PHE:HE2 | 3:N:137:GLN:HG2  | 1.67                     | 0.59              |
| 1:B:147:ILE:N   | 1:B:168:GLY:O    | 2.28                     | 0.58              |
| 1:F:55:GLN:OE1  | 1:F:68:ARG:NH1   | 2.36                     | 0.58              |
| 2:H:23:LYS:HD2  | 2:H:112:LEU:HB3  | 1.85                     | 0.58              |
| 3:N:68:ASN:HB3  | 3:N:87:ARG:HH11  | 1.68                     | 0.58              |
| 1:D:154:ASN:OD1 | 1:D:155:GLU:N    | 2.37                     | 0.58              |
| 1:E:155:GLU:HB3 | 1:F:72:ILE:HG21  | 1.86                     | 0.58              |
| 1:G:252:LYS:HD3 | 1:G:255:VAL:HG23 | 1.85                     | 0.58              |
| 2:H:10:ILE:HD12 | 2:H:10:ILE:H     | 1.67                     | 0.58              |
| 1:M:55:GLN:HB2  | 1:M:65:ILE:HG13  | 1.84                     | 0.58              |
| 1:E:3:ILE:HD11  | 1:E:194:PHE:HD2  | 1.69                     | 0.58              |
| 1:E:148:THR:N   | 4:O:39:U:OP2     | 2.35                     | 0.58              |
| 3:N:18:GLU:HA   | 5:K:240:PHE:CD1  | 2.35                     | 0.58              |
| 1:C:64:ASP:OD1  | 1:C:65:ILE:N     | 2.37                     | 0.58              |
| 1:G:107:TYR:HE1 | 1:G:198:ASP:HB3  | 1.69                     | 0.58              |
| 1:G:275:GLU:N   | 1:G:275:GLU:OE1  | 2.36                     | 0.58              |
| 1:B:229:PHE:CE1 | 1:B:279:LEU:HD12 | 2.39                     | 0.58              |
| 1:C:260:SER:OG  | 1:C:262:ASP:OD1  | 2.15                     | 0.58              |
| 1:D:237:ASP:HB2 | 1:D:277:LYS:HD2  | 1.85                     | 0.58              |
| 1:E:9:PHE:CZ    | 1:E:182:GLY:HA3  | 2.38                     | 0.58              |
| 1:G:41:VAL:HB   | 1:G:134:SER:HB3  | 1.85                     | 0.58              |
| 5:K:483:ALA:HA  | 5:K:489:LEU:HD11 | 1.86                     | 0.58              |
| 1:D:90:GLU:O    | 1:D:94:LYS:N     | 2.26                     | 0.58              |
| 3:N:20:LYS:O    | 3:N:90:ARG:NH2   | 2.37                     | 0.58              |
| 1:G:174:PRO:HB2 | 1:G:259:ARG:HH22 | 1.68                     | 0.58              |
| 1:G:4:GLU:OE2   | 1:G:5:LYS:NZ     | 2.35                     | 0.58              |
| 3:N:16:ARG:HG2  | 3:N:26:TYR:CE1   | 2.39                     | 0.58              |
| 2:L:9:ASP:HB2   | 2:L:12:TYR:HB2   | 1.85                     | 0.58              |
| 2:J:14:LEU:HD22 | 2:J:52:PHE:HE1   | 1.69                     | 0.58              |
| 2:J:86:CYS:SG   | 2:J:87:GLN:N     | 2.76                     | 0.57              |
| 5:K:423:ASN:N   | 5:K:433:ARG:HH12 | 2.02                     | 0.57              |
| 5:K:518:HIS:HA  | 5:K:521:ASN:ND2  | 2.19                     | 0.57              |
| 1:G:39:GLY:N    | 1:G:136:SER:OG   | 2.30                     | 0.57              |
| 1:G:230:GLU:O   | 1:G:277:LYS:HA   | 2.04                     | 0.57              |
| 2:I:95:LEU:HD21 | 2:J:50:ALA:HA    | 1.86                     | 0.57              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:E:246:ARG:HH11 | 1:E:270:ASP:HA   | 1.67                     | 0.57              |
| 1:M:163:ASP:HB3  | 6:A:63:ARG:HH12  | 1.69                     | 0.57              |
| 5:K:422:ARG:NH2  | 5:K:426:GLU:OE2  | 2.37                     | 0.57              |
| 1:F:280:ARG:NH1  | 1:F:282:LEU:HD21 | 2.20                     | 0.57              |
| 1:G:47:LYS:HE3   | 1:G:112:PHE:CG   | 2.39                     | 0.57              |
| 5:K:195:CYS:SG   | 5:K:243:GLY:N    | 2.77                     | 0.57              |
| 1:E:32:ILE:HD12  | 1:E:140:ILE:HD11 | 1.85                     | 0.57              |
| 1:E:246:ARG:HH21 | 1:E:273:LEU:HD12 | 1.69                     | 0.57              |
| 4:O:24:U:O2'     | 4:O:25:A:O5'     | 2.18                     | 0.57              |
| 5:K:226:LEU:HG   | 5:K:227:SER:H    | 1.69                     | 0.57              |
| 1:F:81:HIS:CE1   | 1:F:120:LYS:HB2  | 2.40                     | 0.57              |
| 1:D:82:GLU:HA    | 1:D:87:LYS:NZ    | 2.20                     | 0.57              |
| 1:M:252:LYS:HZ2  | 1:M:265:LEU:HB2  | 1.70                     | 0.57              |
| 1:B:86:VAL:O     | 1:B:94:LYS:NZ    | 2.37                     | 0.57              |
| 1:G:48:ARG:NH2   | 1:G:69:GLU:OE1   | 2.38                     | 0.57              |
| 1:M:26:ALA:HB1   | 5:K:393:LEU:HB3  | 1.87                     | 0.57              |
| 5:K:212:LYS:HG3  | 5:K:218:PRO:HG3  | 1.87                     | 0.57              |
| 1:B:129:VAL:HG22 | 1:B:184:ILE:HG12 | 1.86                     | 0.57              |
| 1:D:7:TYR:HB2    | 1:D:184:ILE:HB   | 1.87                     | 0.57              |
| 1:D:206:LEU:HA   | 1:D:209:MET:HE3  | 1.86                     | 0.57              |
| 1:C:150:MET:SD   | 1:D:48:ARG:NH2   | 2.77                     | 0.56              |
| 5:K:10:TYR:CG    | 5:K:249:GLU:HB2  | 2.40                     | 0.56              |
| 5:K:418:ALA:HA   | 5:K:421:ARG:HD2  | 1.86                     | 0.56              |
| 1:E:55:GLN:HB2   | 1:E:65:ILE:HG13  | 1.86                     | 0.56              |
| 1:G:228:VAL:O    | 1:G:279:LEU:HA   | 2.05                     | 0.56              |
| 1:B:2:THR:HG21   | 1:B:190:LYS:HA   | 1.87                     | 0.56              |
| 1:D:13:PHE:HZ    | 1:D:41:VAL:HG11  | 1.69                     | 0.56              |
| 1:E:48:ARG:HB2   | 4:O:32:A:OP2     | 2.05                     | 0.56              |
| 5:K:307:LEU:O    | 5:K:310:SER:OG   | 2.17                     | 0.56              |
| 2:L:12:TYR:O     | 2:L:16:ARG:HG3   | 2.05                     | 0.56              |
| 6:A:7:TYR:HA     | 6:A:70:TRP:HA    | 1.88                     | 0.56              |
| 1:D:9:PHE:CZ     | 1:D:182:GLY:HA3  | 2.40                     | 0.56              |
| 1:G:205:ALA:O    | 1:G:209:MET:HG3  | 2.05                     | 0.56              |
| 1:B:135:ARG:O    | 1:B:178:TYR:HA   | 2.05                     | 0.56              |
| 1:E:53:PHE:HB2   | 1:E:209:MET:SD   | 2.46                     | 0.56              |
| 1:F:127:GLY:O    | 1:F:130:GLN:NE2  | 2.35                     | 0.56              |
| 1:G:10:VAL:HG22  | 1:G:181:HIS:CD2  | 2.40                     | 0.56              |
| 1:G:230:GLU:HB2  | 1:G:278:LEU:HB2  | 1.87                     | 0.56              |
| 3:N:31:PRO:HG2   | 3:N:192:PHE:CE1  | 2.41                     | 0.56              |
| 1:D:89:LYS:HB3   | 1:D:93:GLU:HB2   | 1.88                     | 0.56              |
| 2:H:107:HIS:CD2  | 2:I:84:GLU:HA    | 2.40                     | 0.56              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 5:K:341:PHE:HB2  | 5:K:343:HIS:CE1  | 2.40                     | 0.56              |
| 1:B:150:MET:SD   | 1:C:48:ARG:NH2   | 2.75                     | 0.56              |
| 1:F:166:THR:OG1  | 1:F:167:MET:N    | 2.38                     | 0.56              |
| 2:J:100:LEU:HD23 | 2:J:103:ILE:HD13 | 1.88                     | 0.56              |
| 5:K:407:ASN:O    | 5:K:409:ARG:NH2  | 2.38                     | 0.56              |
| 1:C:4:GLU:N      | 1:C:4:GLU:OE1    | 2.39                     | 0.56              |
| 1:E:89:LYS:HD2   | 1:E:93:GLU:HG2   | 1.88                     | 0.56              |
| 1:G:175:TYR:H    | 1:G:259:ARG:HH12 | 1.52                     | 0.56              |
| 1:G:197:ASN:OD1  | 1:G:198:ASP:N    | 2.39                     | 0.56              |
| 1:B:138:ASP:OD2  | 1:B:264:TYR:OH   | 2.16                     | 0.56              |
| 1:D:228:VAL:HB   | 1:D:280:ARG:HG3  | 1.88                     | 0.56              |
| 1:F:280:ARG:HH22 | 1:F:282:LEU:HD11 | 1.70                     | 0.56              |
| 2:H:16:ARG:HH21  | 2:H:82:ILE:HG23  | 1.71                     | 0.56              |
| 2:J:12:TYR:OH    | 2:J:107:HIS:ND1  | 2.29                     | 0.56              |
| 5:K:469:TYR:HH   | 5:K:564:HIS:HD1  | 1.50                     | 0.56              |
| 1:D:22:GLY:HA3   | 4:O:27:G:C3'     | 2.36                     | 0.55              |
| 1:G:12:LEU:HD22  | 1:G:249:VAL:HG11 | 1.88                     | 0.55              |
| 1:C:18:GLY:HA3   | 1:C:218:ARG:O    | 2.06                     | 0.55              |
| 1:C:93:GLU:N     | 1:C:93:GLU:OE1   | 2.39                     | 0.55              |
| 1:M:9:PHE:CZ     | 1:M:182:GLY:HA3  | 2.42                     | 0.55              |
| 1:C:271:LYS:HG3  | 1:C:272:ASN:N    | 2.21                     | 0.55              |
| 1:F:14:ASP:OD1   | 1:F:15:VAL:N     | 2.39                     | 0.55              |
| 3:N:53:LYS:HE2   | 3:N:103:HIS:CG   | 2.42                     | 0.55              |
| 5:K:389:LYS:NZ   | 6:A:29:ALA:HB2   | 2.21                     | 0.55              |
| 1:F:55:GLN:O     | 1:F:59:ASN:ND2   | 2.39                     | 0.55              |
| 1:F:7:TYR:HB2    | 1:F:184:ILE:HG13 | 1.87                     | 0.55              |
| 1:M:64:ASP:HB3   | 1:M:106:TYR:CD1  | 2.39                     | 0.55              |
| 1:B:39:GLY:N     | 1:B:136:SER:OG   | 2.35                     | 0.55              |
| 1:E:177:LEU:HD12 | 1:E:264:TYR:HD2  | 1.71                     | 0.55              |
| 1:F:197:ASN:OD1  | 1:F:198:ASP:N    | 2.39                     | 0.55              |
| 1:F:258:VAL:HG21 | 1:F:264:TYR:HE1  | 1.71                     | 0.55              |
| 2:L:18:PHE:CZ    | 2:L:44:ALA:HB1   | 2.42                     | 0.55              |
| 1:C:237:ASP:HB3  | 1:C:277:LYS:HD3  | 1.87                     | 0.55              |
| 1:D:15:VAL:HA    | 1:D:221:MET:HG2  | 1.88                     | 0.55              |
| 1:F:35:GLN:OE1   | 2:H:91:ASN:ND2   | 2.40                     | 0.55              |
| 1:F:81:HIS:CE1   | 1:F:120:LYS:HE2  | 2.41                     | 0.55              |
| 2:J:28:ALA:O     | 2:J:65:LYS:NZ    | 2.39                     | 0.55              |
| 1:M:15:VAL:HG12  | 1:M:221:MET:HG3  | 1.87                     | 0.55              |
| 4:O:15:A:C8      | 4:O:16:G:C4      | 2.95                     | 0.55              |
| 5:K:264:PHE:HE2  | 5:K:266:ILE:HD11 | 1.72                     | 0.55              |
| 1:C:4:GLU:CD     | 1:C:4:GLU:H      | 2.10                     | 0.55              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:E:275:GLU:HG2  | 1:E:276:THR:HG23 | 1.88                     | 0.55              |
| 2:I:4:ASP:OD1    | 2:I:5:ARG:N      | 2.40                     | 0.55              |
| 2:L:10:ILE:O     | 2:L:14:LEU:HG    | 2.07                     | 0.55              |
| 1:B:11:PHE:HB3   | 1:B:180:CYS:SG   | 2.47                     | 0.55              |
| 1:C:129:VAL:HG22 | 1:C:184:ILE:HG12 | 1.89                     | 0.55              |
| 1:F:215:SER:OG   | 4:O:41:G:OP2     | 2.25                     | 0.55              |
| 3:N:128:ARG:HG2  | 3:N:133:GLN:OE1  | 2.07                     | 0.55              |
| 5:K:313:ASN:O    | 5:K:315:GLN:N    | 2.40                     | 0.55              |
| 5:K:357:TRP:CE2  | 5:K:361:LEU:HD11 | 2.43                     | 0.54              |
| 1:E:237:ASP:OD2  | 1:E:277:LYS:NZ   | 2.33                     | 0.54              |
| 2:H:78:GLU:O     | 2:H:82:ILE:HD12  | 2.07                     | 0.54              |
| 1:C:55:GLN:HG3   | 1:C:65:ILE:HD12  | 1.88                     | 0.54              |
| 1:E:144:GLU:HG2  | 1:E:171:PHE:CE1  | 2.42                     | 0.54              |
| 1:M:184:ILE:HG22 | 1:M:185:SER:H    | 1.72                     | 0.54              |
| 1:C:126:ARG:HD3  | 1:C:188:PHE:CE1  | 2.43                     | 0.54              |
| 3:N:80:SER:OG    | 3:N:81:LEU:N     | 2.40                     | 0.54              |
| 1:F:103:CYS:O    | 1:F:110:ARG:NE   | 2.40                     | 0.54              |
| 1:G:31:ARG:NH2   | 1:G:42:THR:OG1   | 2.40                     | 0.54              |
| 1:B:130:GLN:HG3  | 1:M:214:HIS:O    | 2.08                     | 0.54              |
| 1:C:19:ASN:ND2   | 1:C:28:ASN:O     | 2.41                     | 0.54              |
| 1:C:51:ARG:NH2   | 4:O:19:U:OP1     | 2.41                     | 0.54              |
| 1:C:148:THR:HB   | 4:O:26:G:O2'     | 2.07                     | 0.54              |
| 1:F:258:VAL:HG21 | 1:F:264:TYR:CE1  | 2.42                     | 0.54              |
| 5:K:9:TYR:HA     | 5:K:12:ARG:HG2   | 1.88                     | 0.54              |
| 5:K:367:GLU:OE2  | 5:K:570:PHE:HB3  | 2.08                     | 0.54              |
| 3:N:43:TRP:H     | 3:N:135:PHE:HE2  | 1.54                     | 0.54              |
| 5:K:303:ALA:O    | 5:K:306:THR:OG1  | 2.19                     | 0.54              |
| 1:B:218:ARG:NH2  | 4:O:16:G:H5'     | 2.22                     | 0.54              |
| 1:E:215:SER:OG   | 4:O:36:C:OP2     | 2.24                     | 0.54              |
| 5:K:316:TYR:CZ   | 5:K:318:LYS:HB2  | 2.42                     | 0.54              |
| 6:A:6:MET:HG2    | 6:A:73:GLY:HA2   | 1.89                     | 0.54              |
| 1:D:21:ASN:ND2   | 1:D:42:THR:H     | 2.06                     | 0.54              |
| 1:F:212:HIS:CE1  | 1:G:187:HIS:HD1  | 2.25                     | 0.54              |
| 1:M:149:ARG:NH2  | 1:M:153:THR:OG1  | 2.41                     | 0.53              |
| 1:F:4:GLU:N      | 1:F:4:GLU:OE1    | 2.37                     | 0.53              |
| 2:H:16:ARG:HG3   | 2:H:108:GLU:CG   | 2.31                     | 0.53              |
| 2:H:24:ILE:HG12  | 2:H:75:LEU:HD13  | 1.90                     | 0.53              |
| 2:J:17:LEU:O     | 2:J:21:LEU:HG    | 2.08                     | 0.53              |
| 1:M:271:LYS:HD2  | 1:M:272:ASN:HB2  | 1.91                     | 0.53              |
| 3:N:54:ILE:HB    | 3:N:201:VAL:CG2  | 2.39                     | 0.53              |
| 5:K:213:GLY:HA3  | 5:K:258:LEU:HD22 | 1.90                     | 0.53              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:101:TYR:O    | 1:D:104:SER:OG   | 2.16                     | 0.53              |
| 2:H:29:ASN:HB2   | 2:H:65:LYS:NZ    | 2.23                     | 0.53              |
| 1:C:246:ARG:HB3  | 1:C:269:ASP:HB3  | 1.91                     | 0.53              |
| 1:G:51:ARG:HH22  | 1:G:68:ARG:HA    | 1.74                     | 0.53              |
| 1:G:64:ASP:OD2   | 1:G:105:ARG:NH1  | 2.37                     | 0.53              |
| 2:J:51:VAL:HG13  | 2:J:52:PHE:HD2   | 1.73                     | 0.53              |
| 1:D:129:VAL:HG22 | 1:D:184:ILE:HD12 | 1.89                     | 0.53              |
| 1:E:177:LEU:HD12 | 1:E:264:TYR:CD2  | 2.44                     | 0.53              |
| 2:J:99:GLY:O     | 2:J:103:ILE:HD12 | 2.08                     | 0.53              |
| 1:D:47:LYS:NZ    | 4:O:24:U:O3'     | 2.37                     | 0.53              |
| 1:E:61:GLU:OE1   | 1:E:105:ARG:NH2  | 2.42                     | 0.53              |
| 5:K:7:THR:HG22   | 5:K:11:GLN:HE22  | 1.74                     | 0.53              |
| 1:B:246:ARG:NH1  | 1:B:272:ASN:OD1  | 2.41                     | 0.53              |
| 1:G:129:VAL:HG13 | 1:G:184:ILE:HG12 | 1.91                     | 0.53              |
| 5:K:543:CYS:SG   | 5:K:544:GLN:N    | 2.82                     | 0.53              |
| 1:B:55:GLN:HG2   | 1:B:65:ILE:HD13  | 1.90                     | 0.53              |
| 1:E:230:GLU:HG2  | 1:E:278:LEU:HD13 | 1.91                     | 0.53              |
| 1:G:107:TYR:HA   | 1:G:110:ARG:CZ   | 2.39                     | 0.53              |
| 1:G:149:ARG:O    | 1:G:165:ARG:HD2  | 2.09                     | 0.53              |
| 1:G:210:PHE:HB3  | 1:G:221:MET:HG3  | 1.89                     | 0.53              |
| 1:G:252:LYS:HD2  | 1:G:262:ASP:O    | 2.09                     | 0.53              |
| 2:I:6:ASN:OD1    | 2:I:85:HIS:NE2   | 2.42                     | 0.53              |
| 1:F:19:ASN:ND2   | 1:F:28:ASN:O     | 2.42                     | 0.53              |
| 1:G:274:GLU:HA   | 1:G:277:LYS:O    | 2.09                     | 0.53              |
| 1:M:21:ASN:ND2   | 1:M:41:VAL:HG13  | 2.23                     | 0.53              |
| 1:D:218:ARG:HH12 | 4:O:28:U:P       | 2.32                     | 0.53              |
| 1:B:14:ASP:HB3   | 1:B:177:LEU:HD23 | 1.91                     | 0.52              |
| 1:F:21:ASN:HA    | 4:O:40:C:OP1     | 2.09                     | 0.52              |
| 2:H:116:ASP:HA   | 2:H:119:LYS:NZ   | 2.24                     | 0.52              |
| 1:M:156:LYS:C    | 1:M:158:ALA:H    | 2.12                     | 0.52              |
| 1:G:24:PRO:HG2   | 1:G:28:ASN:HA    | 1.90                     | 0.52              |
| 1:B:249:VAL:HG12 | 1:B:266:VAL:HG22 | 1.90                     | 0.52              |
| 1:C:85:ASN:O     | 1:C:85:ASN:ND2   | 2.33                     | 0.52              |
| 1:D:87:LYS:O     | 1:D:94:LYS:NZ    | 2.41                     | 0.52              |
| 1:G:170:LYS:HD3  | 1:G:171:PHE:H    | 1.74                     | 0.52              |
| 1:B:248:GLN:OE1  | 1:B:248:GLN:N    | 2.42                     | 0.52              |
| 2:I:28:ALA:HA    | 2:I:66:LEU:HD13  | 1.92                     | 0.52              |
| 2:J:25:GLN:HG2   | 2:J:62:HIS:CE1   | 2.44                     | 0.52              |
| 2:L:20:VAL:HG21  | 2:L:79:ILE:HG12  | 1.91                     | 0.52              |
| 1:E:231:HIS:HA   | 1:E:277:LYS:HZ3  | 1.74                     | 0.52              |
| 1:F:200:GLU:HA   | 1:F:203:TRP:HD1  | 1.74                     | 0.52              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 3:N:55:GLU:HB2   | 3:N:101:ARG:HB3  | 1.92                     | 0.52              |
| 5:K:465:GLN:OE1  | 5:K:542:HIS:ND1  | 2.43                     | 0.52              |
| 2:L:23:LYS:HD2   | 2:L:112:LEU:HD22 | 1.91                     | 0.52              |
| 1:C:154:ASN:ND2  | 1:C:156:LYS:HB2  | 2.24                     | 0.52              |
| 1:F:89:LYS:HE2   | 1:F:97:ALA:HB2   | 1.92                     | 0.52              |
| 2:I:57:ARG:HA    | 2:I:57:ARG:NE    | 2.25                     | 0.52              |
| 1:B:226:LEU:HD23 | 1:B:282:LEU:HB2  | 1.91                     | 0.52              |
| 1:D:64:ASP:OD1   | 1:D:65:ILE:N     | 2.38                     | 0.52              |
| 2:H:57:ARG:HA    | 2:L:41:PHE:HE2   | 1.75                     | 0.52              |
| 3:N:160:PRO:HB2  | 3:N:199:ASN:HD21 | 1.74                     | 0.52              |
| 3:N:122:ALA:O    | 3:N:126:LYS:HG2  | 2.09                     | 0.52              |
| 2:L:95:LEU:HD12  | 2:L:96:GLU:N     | 2.24                     | 0.52              |
| 1:G:129:VAL:HG22 | 1:G:184:ILE:HG23 | 1.92                     | 0.52              |
| 2:H:8:GLN:OE1    | 2:H:85:HIS:ND1   | 2.43                     | 0.52              |
| 5:K:210:ALA:HA   | 5:K:220:PRO:HA   | 1.91                     | 0.52              |
| 1:C:150:MET:SD   | 1:D:48:ARG:NE    | 2.78                     | 0.52              |
| 2:H:47:THR:OG1   | 2:H:91:ASN:O     | 2.20                     | 0.52              |
| 2:J:93:LEU:O     | 2:J:98:GLN:NE2   | 2.41                     | 0.52              |
| 1:F:18:GLY:H     | 1:F:172:THR:HG23 | 1.75                     | 0.51              |
| 1:F:175:TYR:OH   | 1:F:261:PHE:HA   | 2.09                     | 0.51              |
| 1:D:61:GLU:OE2   | 1:D:105:ARG:HB2  | 2.10                     | 0.51              |
| 1:G:51:ARG:NH1   | 1:G:66:PHE:O     | 2.43                     | 0.51              |
| 1:M:14:ASP:HB3   | 1:M:177:LEU:HD12 | 1.93                     | 0.51              |
| 6:A:32:ARG:HH22  | 6:A:35:LEU:HD12  | 1.75                     | 0.51              |
| 1:D:156:LYS:HG3  | 1:D:158:ALA:N    | 2.22                     | 0.51              |
| 1:E:195:SER:OG   | 1:E:197:ASN:OD1  | 2.18                     | 0.51              |
| 1:C:12:LEU:HD21  | 1:C:179:ARG:HG3  | 1.93                     | 0.51              |
| 1:E:11:PHE:CD1   | 1:E:226:LEU:HD12 | 2.46                     | 0.51              |
| 1:B:169:ARG:HH11 | 1:B:171:PHE:HZ   | 1.58                     | 0.51              |
| 1:C:109:ILE:HG23 | 1:C:114:ALA:HB3  | 1.91                     | 0.51              |
| 1:D:212:HIS:CD2  | 1:E:6:ARG:HH12   | 2.29                     | 0.51              |
| 1:D:222:ASN:HD21 | 1:D:224:ARG:NH1  | 2.08                     | 0.51              |
| 1:E:18:GLY:HA3   | 1:E:218:ARG:O    | 2.10                     | 0.51              |
| 1:F:56:MET:SD    | 1:F:212:HIS:CE1  | 3.04                     | 0.51              |
| 1:G:117:THR:OG1  | 1:G:123:GLY:N    | 2.43                     | 0.51              |
| 5:K:285:LEU:HD12 | 5:K:288:MET:HB2  | 1.91                     | 0.51              |
| 2:L:16:ARG:HA    | 2:L:108:GLU:HG3  | 1.92                     | 0.51              |
| 1:C:229:PHE:CE1  | 1:C:279:LEU:HD13 | 2.45                     | 0.51              |
| 1:F:258:VAL:HG13 | 1:F:263:ASP:HB2  | 1.92                     | 0.51              |
| 1:M:241:ASP:HB2  | 3:N:150:ARG:NH1  | 2.26                     | 0.51              |
| 1:M:240:ALA:HA   | 1:M:243:LEU:HD13 | 1.93                     | 0.51              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:B:184:ILE:HD13 | 1:B:199:LEU:HD11 | 1.93                     | 0.51              |
| 1:D:4:GLU:OE1    | 1:D:4:GLU:N      | 2.44                     | 0.51              |
| 1:M:49:LYS:HE3   | 1:M:218:ARG:HH11 | 1.76                     | 0.51              |
| 1:M:144:GLU:OE2  | 5:K:421:ARG:HD3  | 2.11                     | 0.51              |
| 1:D:272:ASN:O    | 1:D:274:GLU:N    | 2.44                     | 0.51              |
| 1:M:229:PHE:CE1  | 1:M:279:LEU:HD13 | 2.46                     | 0.51              |
| 1:M:235:LEU:HB3  | 3:N:133:GLN:HB3  | 1.93                     | 0.51              |
| 5:K:246:ALA:O    | 5:K:249:GLU:HG3  | 2.10                     | 0.51              |
| 1:E:23:ASP:HB2   | 1:E:31:ARG:HG2   | 1.93                     | 0.51              |
| 2:J:25:GLN:HG2   | 2:J:62:HIS:HE1   | 1.76                     | 0.51              |
| 1:C:42:THR:HG22  | 1:C:133:PHE:CE2  | 2.45                     | 0.50              |
| 1:C:242:SER:O    | 1:C:246:ARG:NE   | 2.44                     | 0.50              |
| 1:D:24:PRO:HD3   | 1:D:29:LEU:O     | 2.11                     | 0.50              |
| 1:M:33:ASP:HB3   | 1:M:36:THR:HG22  | 1.93                     | 0.50              |
| 1:B:179:ARG:HH11 | 1:B:181:HIS:HE1  | 1.60                     | 0.50              |
| 1:F:117:THR:HA   | 1:F:121:ASN:HB2  | 1.94                     | 0.50              |
| 1:D:270:ASP:HA   | 1:D:273:LEU:HD23 | 1.93                     | 0.50              |
| 1:E:84:GLU:OE2   | 1:E:87:LYS:HB2   | 2.11                     | 0.50              |
| 2:H:11:GLY:O     | 2:H:101:PHE:HA   | 2.11                     | 0.50              |
| 3:N:4:ILE:HD12   | 3:N:153:GLU:O    | 2.11                     | 0.50              |
| 3:N:66:ARG:NH2   | 3:N:89:GLN:OE1   | 2.44                     | 0.50              |
| 3:N:117:ASN:HB3  | 3:N:120:LYS:HG2  | 1.94                     | 0.50              |
| 5:K:500:SER:O    | 5:K:503:SER:OG   | 2.22                     | 0.50              |
| 1:B:68:ARG:HH11  | 1:B:76:LEU:HD11  | 1.76                     | 0.50              |
| 1:G:233:ASN:HB3  | 1:G:237:ASP:OD2  | 2.12                     | 0.50              |
| 1:D:53:PHE:O     | 1:D:57:THR:OG1   | 2.20                     | 0.50              |
| 1:F:10:VAL:HG21  | 1:F:247:ILE:HD12 | 1.94                     | 0.50              |
| 1:F:174:PRO:HB2  | 1:F:259:ARG:NE   | 2.26                     | 0.50              |
| 1:G:27:GLY:HA3   | 2:L:40:TYR:HE1   | 1.77                     | 0.50              |
| 3:N:87:ARG:NH1   | 4:O:8:C:O2       | 2.44                     | 0.50              |
| 1:B:237:ASP:HB3  | 1:B:277:LYS:NZ   | 2.27                     | 0.50              |
| 1:D:218:ARG:HH22 | 4:O:28:U:P       | 2.35                     | 0.50              |
| 1:E:248:GLN:HB2  | 1:E:267:SER:OG   | 2.11                     | 0.50              |
| 2:H:43:SER:O     | 2:H:46:SER:OG    | 2.24                     | 0.50              |
| 5:K:578:LEU:HD13 | 5:K:581:GLU:OE1  | 2.11                     | 0.50              |
| 1:F:200:GLU:HA   | 1:F:203:TRP:CD1  | 2.46                     | 0.50              |
| 1:M:18:GLY:HA3   | 1:M:218:ARG:O    | 2.11                     | 0.50              |
| 5:K:321:GLY:HA2  | 5:K:347:VAL:HB   | 1.93                     | 0.50              |
| 1:B:9:PHE:CZ     | 1:B:182:GLY:HA3  | 2.47                     | 0.50              |
| 1:B:187:HIS:HE1  | 1:M:72:ILE:HG23  | 1.76                     | 0.50              |
| 1:F:9:PHE:CZ     | 1:F:182:GLY:HA3  | 2.46                     | 0.50              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:F:233:ASN:OD1  | 1:F:234:ASN:N    | 2.44                     | 0.50              |
| 1:G:227:TYR:HD2  | 1:G:247:ILE:HG23 | 1.76                     | 0.50              |
| 2:L:37:ALA:O     | 2:L:41:PHE:HD1   | 1.95                     | 0.50              |
| 1:E:21:ASN:HD22  | 1:E:42:THR:H     | 1.60                     | 0.50              |
| 1:F:251:LYS:HA   | 1:F:264:TYR:CD1  | 2.47                     | 0.50              |
| 1:G:124:GLN:NE2  | 4:O:41:G:N3      | 2.59                     | 0.50              |
| 1:G:252:LYS:N    | 1:G:263:ASP:O    | 2.30                     | 0.50              |
| 6:A:9:ILE:HD11   | 6:A:42:ALA:HB1   | 1.93                     | 0.50              |
| 1:E:45:CYS:SG    | 1:E:49:LYS:HE2   | 2.52                     | 0.49              |
| 1:F:145:HIS:O    | 1:F:170:LYS:N    | 2.45                     | 0.49              |
| 1:C:262:ASP:OD1  | 1:C:262:ASP:N    | 2.42                     | 0.49              |
| 1:F:252:LYS:HB3  | 1:F:255:VAL:HG22 | 1.94                     | 0.49              |
| 3:N:5:LEU:HD12   | 3:N:6:GLU:H      | 1.77                     | 0.49              |
| 1:B:116:MET:HG3  | 1:B:122:ALA:HB3  | 1.95                     | 0.49              |
| 1:C:56:MET:SD    | 1:D:187:HIS:ND1  | 2.80                     | 0.49              |
| 1:F:48:ARG:HD3   | 4:O:38:C:OP2     | 2.11                     | 0.49              |
| 1:G:44:VAL:HG12  | 1:G:48:ARG:HD2   | 1.93                     | 0.49              |
| 1:G:224:ARG:HG3  | 1:G:261:PHE:CE1  | 2.48                     | 0.49              |
| 1:M:4:GLU:N      | 1:M:4:GLU:OE1    | 2.45                     | 0.49              |
| 6:A:42:ALA:O     | 6:A:46:ILE:HG12  | 2.11                     | 0.49              |
| 1:D:155:GLU:HB3  | 1:E:72:ILE:HD12  | 1.93                     | 0.49              |
| 1:D:276:THR:C    | 1:D:277:LYS:HD3  | 2.32                     | 0.49              |
| 5:K:363:MET:HG2  | 5:K:364:VAL:H    | 1.77                     | 0.49              |
| 1:C:33:ASP:OD2   | 1:C:135:ARG:NH1  | 2.46                     | 0.49              |
| 1:F:232:SER:N    | 1:F:276:THR:O    | 2.45                     | 0.49              |
| 1:D:155:GLU:CD   | 1:E:72:ILE:HD12  | 2.33                     | 0.49              |
| 1:E:7:TYR:HB2    | 1:E:184:ILE:HB   | 1.93                     | 0.49              |
| 1:F:168:GLY:O    | 1:F:169:ARG:NH2  | 2.35                     | 0.49              |
| 2:H:54:THR:HA    | 2:H:57:ARG:NH1   | 2.28                     | 0.49              |
| 2:I:12:TYR:O     | 2:I:16:ARG:HG3   | 2.12                     | 0.49              |
| 5:K:296:LYS:CG   | 5:K:297:PRO:HD3  | 2.43                     | 0.49              |
| 2:L:73:VAL:HG22  | 2:L:77:TRP:CZ3   | 2.48                     | 0.49              |
| 1:E:42:THR:HG22  | 1:E:44:VAL:HG12  | 1.94                     | 0.49              |
| 1:G:174:PRO:HG2  | 1:G:259:ARG:NH1  | 2.27                     | 0.49              |
| 1:M:31:ARG:NH2   | 3:N:66:ARG:O     | 2.43                     | 0.49              |
| 1:M:187:HIS:CE1  | 3:N:135:PHE:HA   | 2.47                     | 0.49              |
| 1:B:49:LYS:HB3   | 1:B:209:MET:SD   | 2.53                     | 0.49              |
| 1:E:197:ASN:OD1  | 1:E:198:ASP:N    | 2.44                     | 0.49              |
| 3:N:120:LYS:HE3  | 3:N:121:PHE:CE2  | 2.48                     | 0.49              |
| 4:O:17:C:H2'     | 4:O:18:U:H5''    | 1.95                     | 0.49              |
| 5:K:214:VAL:HG12 | 5:K:332:PRO:HB3  | 1.95                     | 0.49              |

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| Atom-1           | Atom-2          | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-----------------|--------------------------|-------------------|
| 1:D:246:ARG:HG3  | 1:D:269:ASP:HB2 | 1.95                     | 0.49              |
| 2:H:62:HIS:HA    | 2:H:65:LYS:HE3  | 1.94                     | 0.48              |
| 2:I:11:GLY:O     | 2:I:101:PHE:HA  | 2.13                     | 0.48              |
| 2:J:4:ASP:OD1    | 2:J:6:ASN:N     | 2.45                     | 0.48              |
| 1:D:47:LYS:O     | 1:D:50:VAL:HG12 | 2.13                     | 0.48              |
| 1:E:14:ASP:OD2   | 1:E:224:ARG:NH1 | 2.46                     | 0.48              |
| 1:E:252:LYS:NZ   | 1:E:264:TYR:O   | 2.40                     | 0.48              |
| 1:F:66:PHE:HB2   | 1:F:106:TYR:CD1 | 2.48                     | 0.48              |
| 1:G:258:VAL:O    | 1:G:259:ARG:NE  | 2.46                     | 0.48              |
| 2:J:77:TRP:O     | 2:J:81:GLN:HG2  | 2.13                     | 0.48              |
| 1:M:66:PHE:HZ    | 3:N:74:MET:HB2  | 1.78                     | 0.48              |
| 6:A:47:GLU:O     | 6:A:51:GLU:HG3  | 2.12                     | 0.48              |
| 6:A:48:ASP:HA    | 6:A:51:GLU:HG3  | 1.95                     | 0.48              |
| 1:B:141:MET:N    | 1:B:141:MET:SD  | 2.86                     | 0.48              |
| 1:F:248:GLN:HB2  | 1:F:267:SER:OG  | 2.13                     | 0.48              |
| 1:G:134:SER:OG   | 1:G:178:TYR:HB3 | 2.13                     | 0.48              |
| 3:N:18:GLU:OE1   | 3:N:18:GLU:N    | 2.30                     | 0.48              |
| 1:D:150:MET:HG2  | 1:E:48:ARG:NH2  | 2.28                     | 0.48              |
| 1:E:21:ASN:ND2   | 1:E:41:VAL:HG13 | 2.29                     | 0.48              |
| 1:E:101:TYR:O    | 1:E:104:SER:OG  | 2.24                     | 0.48              |
| 1:G:48:ARG:HB3   | 1:G:68:ARG:HG3  | 1.96                     | 0.48              |
| 1:G:237:ASP:HB2  | 1:G:277:LYS:HD2 | 1.96                     | 0.48              |
| 1:M:106:TYR:HB2  | 1:M:109:ILE:CG2 | 2.43                     | 0.48              |
| 4:O:39:U:O2'     | 4:O:40:C:O5'    | 2.31                     | 0.48              |
| 1:G:5:LYS:HD2    | 1:G:230:GLU:HB3 | 1.95                     | 0.48              |
| 1:G:39:GLY:O     | 1:G:135:ARG:HA  | 2.13                     | 0.48              |
| 1:G:65:ILE:HD12  | 1:G:108:ASP:HB3 | 1.96                     | 0.48              |
| 1:G:136:SER:HB3  | 1:G:178:TYR:CE1 | 2.48                     | 0.48              |
| 1:M:197:ASN:OD1  | 1:M:198:ASP:N   | 2.46                     | 0.48              |
| 5:K:403:ASP:OD1  | 5:K:407:ASN:ND2 | 2.45                     | 0.48              |
| 1:B:81:HIS:ND1   | 1:B:120:LYS:HD2 | 2.27                     | 0.48              |
| 1:C:153:THR:HA   | 1:D:73:LEU:HB2  | 1.96                     | 0.48              |
| 1:C:206:LEU:HD23 | 1:C:206:LEU:HA  | 1.70                     | 0.48              |
| 1:C:252:LYS:HB2  | 1:C:263:ASP:O   | 2.13                     | 0.48              |
| 1:D:39:GLY:N     | 1:D:136:SER:OG  | 2.27                     | 0.48              |
| 1:G:62:HIS:O     | 1:G:62:HIS:ND1  | 2.47                     | 0.48              |
| 1:G:77:ILE:HG22  | 1:G:81:HIS:CE1  | 2.48                     | 0.48              |
| 1:G:144:GLU:HG2  | 1:G:171:PHE:HB3 | 1.95                     | 0.48              |
| 2:I:77:TRP:HD1   | 2:I:80:ARG:NH2  | 2.11                     | 0.48              |
| 6:A:20:ASP:OD1   | 6:A:20:ASP:N    | 2.47                     | 0.48              |
| 1:C:2:THR:HG21   | 1:C:190:LYS:HA  | 1.94                     | 0.48              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:E:7:TYR:HE1    | 1:E:230:GLU:HB2  | 1.79                     | 0.48              |
| 1:E:258:VAL:HG21 | 1:E:264:TYR:CZ   | 2.48                     | 0.48              |
| 2:H:100:LEU:HD23 | 2:H:103:ILE:HD12 | 1.96                     | 0.48              |
| 3:N:172:LEU:HA   | 3:N:191:MET:SD   | 2.54                     | 0.48              |
| 4:O:4:G:C5       | 4:O:5:A:C2       | 3.02                     | 0.48              |
| 2:I:120:ASN:O    | 2:I:123:ASN:N    | 2.46                     | 0.48              |
| 2:J:32:LEU:HD21  | 2:J:34:ALA:HB3   | 1.95                     | 0.48              |
| 3:N:194:GLN:HE22 | 3:N:196:LYS:HA   | 1.79                     | 0.48              |
| 5:K:224:VAL:HG23 | 5:K:240:PHE:CZ   | 2.49                     | 0.48              |
| 1:B:41:VAL:HB    | 1:B:134:SER:OG   | 2.13                     | 0.48              |
| 1:B:54:ILE:HG22  | 1:B:65:ILE:HD11  | 1.95                     | 0.48              |
| 1:B:116:MET:HG2  | 1:B:123:GLY:O    | 2.13                     | 0.48              |
| 1:C:24:PRO:HA    | 4:O:21:C:C6      | 2.49                     | 0.48              |
| 1:D:51:ARG:NH1   | 4:O:25:A:OP2     | 2.42                     | 0.48              |
| 1:E:206:LEU:HD23 | 1:E:206:LEU:HA   | 1.75                     | 0.48              |
| 5:K:247:MET:HA   | 5:K:250:TYR:CE1  | 2.47                     | 0.48              |
| 5:K:478:LEU:HD21 | 5:K:512:LEU:HB3  | 1.96                     | 0.48              |
| 5:K:534:TRP:HH2  | 5:K:578:LEU:HB3  | 1.79                     | 0.48              |
| 1:B:60:ASP:OD1   | 1:B:61:GLU:N     | 2.46                     | 0.48              |
| 1:B:66:PHE:HB2   | 1:B:109:ILE:HD11 | 1.95                     | 0.48              |
| 1:D:21:ASN:HD22  | 1:D:41:VAL:HG23  | 1.79                     | 0.48              |
| 1:G:16:GLN:CG    | 1:G:220:GLN:HB3  | 2.44                     | 0.48              |
| 2:J:7:ARG:HH12   | 5:K:544:GLN:HB3  | 1.78                     | 0.48              |
| 1:M:184:ILE:HG22 | 1:M:185:SER:N    | 2.29                     | 0.48              |
| 3:N:16:ARG:HG2   | 3:N:26:TYR:CD1   | 2.49                     | 0.48              |
| 4:O:24:U:HO2'    | 4:O:25:A:P       | 2.37                     | 0.48              |
| 1:C:126:ARG:HA   | 4:O:17:C:O3'     | 2.14                     | 0.47              |
| 1:D:149:ARG:NH1  | 1:D:153:THR:OG1  | 2.47                     | 0.47              |
| 1:D:252:LYS:HB2  | 1:D:263:ASP:O    | 2.12                     | 0.47              |
| 1:F:214:HIS:C    | 1:G:126:ARG:HH21 | 2.17                     | 0.47              |
| 2:J:60:PRO:HA    | 2:J:63:LEU:HD12  | 1.95                     | 0.47              |
| 1:M:235:LEU:HD12 | 3:N:133:GLN:HB3  | 1.96                     | 0.47              |
| 3:N:67:ARG:HG3   | 3:N:69:GLU:OE2   | 2.14                     | 0.47              |
| 5:K:296:LYS:HG3  | 5:K:297:PRO:HD3  | 1.96                     | 0.47              |
| 5:K:383:ASN:HB3  | 5:K:433:ARG:HG2  | 1.95                     | 0.47              |
| 5:K:545:ARG:HH21 | 5:K:547:PRO:HA   | 1.79                     | 0.47              |
| 1:G:106:TYR:HB2  | 1:G:109:ILE:HG12 | 1.96                     | 0.47              |
| 3:N:16:ARG:HG3   | 3:N:24:VAL:O     | 2.14                     | 0.47              |
| 1:B:106:TYR:HB2  | 1:B:109:ILE:HD12 | 1.94                     | 0.47              |
| 1:D:212:HIS:O    | 1:D:212:HIS:ND1  | 2.47                     | 0.47              |
| 1:D:256:GLU:HG2  | 1:D:257:VAL:HG22 | 1.95                     | 0.47              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 5:K:551:ASN:OD1  | 5:K:554:GLN:HG2  | 2.14                     | 0.47              |
| 1:B:55:GLN:NE2   | 1:B:68:ARG:HG2   | 2.30                     | 0.47              |
| 1:B:81:HIS:CD2   | 1:B:120:LYS:HB3  | 2.49                     | 0.47              |
| 1:C:21:ASN:ND2   | 1:C:41:VAL:HA    | 2.29                     | 0.47              |
| 1:G:210:PHE:CE2  | 1:G:223:ALA:HB2  | 2.49                     | 0.47              |
| 3:N:43:TRP:HB3   | 3:N:135:PHE:CE2  | 2.49                     | 0.47              |
| 5:K:285:LEU:O    | 5:K:288:MET:N    | 2.46                     | 0.47              |
| 5:K:534:TRP:CH2  | 5:K:578:LEU:HB3  | 2.50                     | 0.47              |
| 5:K:577:ASN:O    | 5:K:581:GLU:HG3  | 2.15                     | 0.47              |
| 1:B:65:ILE:HG22  | 1:B:67:ILE:H     | 1.79                     | 0.47              |
| 1:G:3:ILE:HD12   | 1:G:7:TYR:CE2    | 2.50                     | 0.47              |
| 1:G:9:PHE:CE2    | 1:G:182:GLY:HA3  | 2.48                     | 0.47              |
| 2:H:74:GLN:HE22  | 2:H:119:LYS:HA   | 1.79                     | 0.47              |
| 6:A:32:ARG:HH12  | 6:A:35:LEU:HG    | 1.80                     | 0.47              |
| 1:B:121:ASN:OD1  | 1:B:122:ALA:N    | 2.48                     | 0.47              |
| 1:D:232:SER:HB3  | 1:D:276:THR:O    | 2.15                     | 0.47              |
| 1:D:280:ARG:NH1  | 1:D:282:LEU:HD11 | 2.29                     | 0.47              |
| 1:F:48:ARG:HB2   | 4:O:38:C:H5'     | 1.96                     | 0.47              |
| 1:M:49:LYS:HE3   | 1:M:218:ARG:NH1  | 2.29                     | 0.47              |
| 1:B:7:TYR:HE1    | 1:B:230:GLU:HG3  | 1.78                     | 0.47              |
| 1:B:247:ILE:HG22 | 1:B:268:VAL:HG23 | 1.96                     | 0.47              |
| 1:F:269:ASP:OD2  | 1:F:271:LYS:NZ   | 2.46                     | 0.47              |
| 2:J:23:LYS:HG3   | 2:J:27:GLU:OE1   | 2.15                     | 0.47              |
| 1:M:38:GLU:OE2   | 1:M:135:ARG:NE   | 2.42                     | 0.47              |
| 3:N:6:GLU:O      | 3:N:149:PHE:HA   | 2.15                     | 0.47              |
| 3:N:30:THR:HG22  | 3:N:32:ALA:H     | 1.79                     | 0.47              |
| 1:D:9:PHE:CE1    | 1:D:182:GLY:HA3  | 2.50                     | 0.47              |
| 1:E:218:ARG:NH2  | 4:O:34:C:O5'     | 2.48                     | 0.47              |
| 3:N:54:ILE:HB    | 3:N:201:VAL:HG23 | 1.97                     | 0.47              |
| 3:N:84:GLU:OE2   | 3:N:84:GLU:N     | 2.45                     | 0.47              |
| 5:K:404:ALA:HA   | 5:K:409:ARG:HB2  | 1.96                     | 0.47              |
| 6:A:7:TYR:CE2    | 6:A:70:TRP:HB3   | 2.50                     | 0.47              |
| 1:F:93:GLU:O     | 1:F:96:GLU:N     | 2.42                     | 0.47              |
| 1:M:32:ILE:HA    | 1:M:39:GLY:HA2   | 1.97                     | 0.47              |
| 3:N:163:ASP:OD1  | 3:N:163:ASP:N    | 2.48                     | 0.47              |
| 5:K:393:LEU:HB2  | 5:K:397:LEU:HD23 | 1.97                     | 0.47              |
| 1:D:132:THR:HG22 | 1:D:181:HIS:O    | 2.15                     | 0.47              |
| 1:E:228:VAL:HB   | 1:E:280:ARG:HG2  | 1.97                     | 0.47              |
| 1:F:89:LYS:O     | 1:F:90:GLU:HG3   | 2.14                     | 0.47              |
| 3:N:178:SER:OG   | 3:N:179:LYS:N    | 2.47                     | 0.47              |
| 5:K:285:LEU:HG   | 5:K:289:ILE:CG1  | 2.45                     | 0.47              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:B:246:ARG:HH22 | 1:B:273:LEU:HA   | 1.79                     | 0.46              |
| 1:C:87:LYS:NZ    | 1:C:90:GLU:HA    | 2.30                     | 0.46              |
| 1:D:121:ASN:OD1  | 1:D:122:ALA:N    | 2.48                     | 0.46              |
| 1:G:251:LYS:HZ3  | 1:G:258:VAL:HA   | 1.80                     | 0.46              |
| 1:M:179:ARG:HH11 | 1:M:181:HIS:CE1  | 2.33                     | 0.46              |
| 1:M:196:GLU:OE1  | 1:M:196:GLU:N    | 2.36                     | 0.46              |
| 1:M:230:GLU:O    | 1:M:277:LYS:HA   | 2.15                     | 0.46              |
| 3:N:124:MET:HB2  | 3:N:127:ARG:HH21 | 1.80                     | 0.46              |
| 4:O:2:U:OP1      | 4:O:4:G:N2       | 2.38                     | 0.46              |
| 2:L:118:LEU:HD12 | 2:L:121:LEU:HD11 | 1.95                     | 0.46              |
| 1:B:113:GLY:HA3  | 4:O:12:G:H5'     | 1.97                     | 0.46              |
| 1:E:4:GLU:N      | 1:E:4:GLU:OE1    | 2.47                     | 0.46              |
| 1:E:144:GLU:OE2  | 1:E:169:ARG:HG2  | 2.15                     | 0.46              |
| 1:E:172:THR:OG1  | 1:E:173:VAL:N    | 2.47                     | 0.46              |
| 2:J:74:GLN:HA    | 2:J:122:PHE:CD1  | 2.50                     | 0.46              |
| 3:N:16:ARG:HH22  | 5:K:1:MET:N      | 2.12                     | 0.46              |
| 3:N:21:VAL:C     | 3:N:90:ARG:HH21  | 2.17                     | 0.46              |
| 4:O:4:G:C6       | 5:K:232:TYR:CZ   | 3.03                     | 0.46              |
| 6:A:16:TYR:HB2   | 6:A:59:ASN:OD1   | 2.15                     | 0.46              |
| 1:B:10:VAL:HG22  | 1:B:181:HIS:ND1  | 2.30                     | 0.46              |
| 1:D:149:ARG:HG3  | 4:O:31:C:O2'     | 2.14                     | 0.46              |
| 1:F:273:LEU:HD23 | 1:F:273:LEU:H    | 1.79                     | 0.46              |
| 2:H:36:ILE:HD12  | 2:H:36:ILE:H     | 1.81                     | 0.46              |
| 1:M:188:PHE:HZ   | 3:N:136:HIS:HD2  | 1.62                     | 0.46              |
| 3:N:14:PHE:CE2   | 3:N:29:ILE:HA    | 2.51                     | 0.46              |
| 3:N:23:ARG:HD2   | 3:N:92:SER:OG    | 2.15                     | 0.46              |
| 5:K:261:GLU:OE1  | 5:K:261:GLU:N    | 2.43                     | 0.46              |
| 1:B:81:HIS:CE1   | 1:B:120:LYS:HD2  | 2.51                     | 0.46              |
| 1:D:66:PHE:CD2   | 1:D:109:ILE:HD11 | 2.50                     | 0.46              |
| 1:E:203:TRP:CD2  | 1:E:280:ARG:NH1  | 2.83                     | 0.46              |
| 1:G:175:TYR:HB3  | 1:G:259:ARG:CZ   | 2.46                     | 0.46              |
| 2:H:12:TYR:HE2   | 2:H:103:ILE:HG22 | 1.80                     | 0.46              |
| 2:J:21:LEU:HD22  | 2:J:59:LEU:HD21  | 1.96                     | 0.46              |
| 1:M:13:PHE:O     | 1:M:178:TYR:HB2  | 2.16                     | 0.46              |
| 5:K:282:GLU:HB3  | 5:K:286:ALA:HB2  | 1.98                     | 0.46              |
| 1:G:45:CYS:SG    | 1:G:218:ARG:NH2  | 2.89                     | 0.46              |
| 3:N:39:MET:HG2   | 3:N:49:TRP:CD1   | 2.50                     | 0.46              |
| 3:N:44:LYS:HG3   | 3:N:121:PHE:HE1  | 1.78                     | 0.46              |
| 4:O:38:C:H2'     | 4:O:39:U:H4'     | 1.98                     | 0.46              |
| 2:L:11:GLY:O     | 2:L:101:PHE:HA   | 2.16                     | 0.46              |
| 2:H:71:ARG:HA    | 2:H:71:ARG:NE    | 2.30                     | 0.46              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:I:46:SER:HB3   | 2:J:57:ARG:NH2   | 2.31                     | 0.46              |
| 1:B:150:MET:SD   | 1:C:48:ARG:NE    | 2.85                     | 0.46              |
| 1:C:154:ASN:ND2  | 1:C:156:LYS:HE2  | 2.29                     | 0.46              |
| 1:D:132:THR:OG1  | 1:D:133:PHE:N    | 2.49                     | 0.46              |
| 1:D:243:LEU:HA   | 1:D:246:ARG:HH21 | 1.80                     | 0.46              |
| 1:E:252:LYS:HZ2  | 1:E:265:LEU:HB2  | 1.80                     | 0.46              |
| 2:J:29:ASN:ND2   | 2:J:32:LEU:HD22  | 2.30                     | 0.46              |
| 1:B:187:HIS:ND1  | 1:M:56:MET:HG3   | 2.31                     | 0.46              |
| 1:D:44:VAL:HG11  | 4:O:25:A:O2'     | 2.15                     | 0.46              |
| 1:D:72:ILE:O     | 1:D:75:ASN:ND2   | 2.48                     | 0.46              |
| 1:D:175:TYR:CG   | 1:D:176:GLY:N    | 2.84                     | 0.46              |
| 1:G:3:ILE:HD12   | 1:G:7:TYR:HE2    | 1.80                     | 0.46              |
| 2:I:16:ARG:HA    | 2:I:108:GLU:HG3  | 1.97                     | 0.46              |
| 1:M:137:ILE:HG22 | 1:M:138:ASP:OD1  | 2.15                     | 0.46              |
| 1:M:183:PHE:CE2  | 3:N:137:GLN:HG2  | 2.50                     | 0.46              |
| 5:K:265:ARG:HG2  | 5:K:270:THR:HG22 | 1.97                     | 0.46              |
| 1:C:271:LYS:HG3  | 1:C:272:ASN:H    | 1.80                     | 0.46              |
| 1:F:30:PRO:O     | 1:F:32:ILE:HG23  | 2.16                     | 0.46              |
| 1:G:62:HIS:HA    | 1:G:104:SER:O    | 2.16                     | 0.46              |
| 1:G:103:CYS:O    | 1:G:110:ARG:NH2  | 2.39                     | 0.46              |
| 2:H:18:PHE:HZ    | 2:H:40:TYR:HB2   | 1.81                     | 0.46              |
| 2:H:19:ALA:HB2   | 2:H:105:TYR:CD1  | 2.51                     | 0.46              |
| 2:H:91:ASN:OD1   | 2:H:92:HIS:N     | 2.45                     | 0.46              |
| 1:D:153:THR:HB   | 1:D:156:LYS:NZ   | 2.31                     | 0.46              |
| 1:E:10:VAL:HG12  | 1:E:227:TYR:HB2  | 1.97                     | 0.46              |
| 1:F:233:ASN:CG   | 1:F:235:LEU:H    | 2.19                     | 0.46              |
| 1:F:274:GLU:HA   | 1:F:277:LYS:O    | 2.16                     | 0.46              |
| 1:G:111:THR:HG22 | 1:G:112:PHE:HD1  | 1.80                     | 0.46              |
| 2:J:110:GLN:HA   | 5:K:537:ARG:NH2  | 2.27                     | 0.46              |
| 1:M:188:PHE:HA   | 1:M:191:GLN:NE2  | 2.31                     | 0.46              |
| 2:L:7:ARG:HG3    | 2:L:12:TYR:CE2   | 2.51                     | 0.46              |
| 1:E:171:PHE:N    | 1:E:171:PHE:CD1  | 2.84                     | 0.45              |
| 1:E:222:ASN:HB2  | 1:E:224:ARG:NH2  | 2.22                     | 0.45              |
| 2:I:77:TRP:HH2   | 2:I:121:LEU:HB3  | 1.81                     | 0.45              |
| 2:J:10:ILE:HG21  | 2:J:90:PRO:HG3   | 1.98                     | 0.45              |
| 1:M:226:LEU:N    | 1:M:283:GLY:HA3  | 2.25                     | 0.45              |
| 1:M:241:ASP:HB2  | 3:N:150:ARG:HH11 | 1.79                     | 0.45              |
| 3:N:68:ASN:CB    | 3:N:87:ARG:HH11  | 2.27                     | 0.45              |
| 5:K:294:LYS:NZ   | 6:A:31:GLY:HA2   | 2.31                     | 0.45              |
| 1:D:141:MET:CE   | 1:E:35:GLN:HE22  | 2.29                     | 0.45              |
| 1:G:4:GLU:OE1    | 1:G:4:GLU:N      | 2.42                     | 0.45              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:G:175:TYR:N    | 1:G:259:ARG:HH12 | 2.15                     | 0.45              |
| 2:I:67:GLU:H     | 2:I:67:GLU:CD    | 2.19                     | 0.45              |
| 2:J:53:GLY:O     | 2:J:57:ARG:HG3   | 2.17                     | 0.45              |
| 1:M:26:ALA:HB1   | 5:K:393:LEU:HD22 | 1.98                     | 0.45              |
| 1:M:70:LYS:N     | 3:N:84:GLU:OE1   | 2.42                     | 0.45              |
| 3:N:41:ILE:HD13  | 3:N:134:TYR:HB3  | 1.98                     | 0.45              |
| 3:N:167:ASP:CB   | 3:N:196:LYS:HD2  | 2.46                     | 0.45              |
| 2:L:14:LEU:HD22  | 2:L:52:PHE:CZ    | 2.51                     | 0.45              |
| 1:B:24:PRO:HA    | 4:O:15:A:C2      | 2.52                     | 0.45              |
| 1:C:228:VAL:HB   | 1:C:280:ARG:HG3  | 1.97                     | 0.45              |
| 1:E:126:ARG:HG2  | 1:E:188:PHE:CE1  | 2.52                     | 0.45              |
| 1:E:256:GLU:HG2  | 1:E:257:VAL:HG13 | 1.98                     | 0.45              |
| 2:H:96:GLU:O     | 2:H:100:LEU:HG   | 2.17                     | 0.45              |
| 2:J:14:LEU:HD22  | 2:J:52:PHE:CE1   | 2.49                     | 0.45              |
| 1:B:42:THR:HG22  | 1:B:133:PHE:CE1  | 2.52                     | 0.45              |
| 1:D:149:ARG:NE   | 4:O:31:C:O2      | 2.49                     | 0.45              |
| 1:E:102:MET:HG3  | 1:E:116:MET:SD   | 2.56                     | 0.45              |
| 1:E:242:SER:O    | 1:E:246:ARG:HG3  | 2.17                     | 0.45              |
| 1:M:109:ILE:HG13 | 1:M:114:ALA:HB2  | 1.97                     | 0.45              |
| 3:N:73:LYS:HG3   | 5:K:228:ALA:HA   | 1.98                     | 0.45              |
| 5:K:354:ILE:HD11 | 5:K:406:LEU:HD23 | 1.97                     | 0.45              |
| 1:B:17:ASP:O     | 1:B:219:GLY:HA3  | 2.16                     | 0.45              |
| 1:C:106:TYR:HB2  | 1:C:109:ILE:HD12 | 1.99                     | 0.45              |
| 1:C:47:LYS:HD3   | 1:C:112:PHE:CG   | 2.52                     | 0.45              |
| 1:C:243:LEU:HD21 | 1:C:277:LYS:HE2  | 1.98                     | 0.45              |
| 1:G:51:ARG:HG2   | 1:G:65:ILE:HD11  | 1.99                     | 0.45              |
| 1:G:98:ALA:O     | 1:G:102:MET:HG2  | 2.17                     | 0.45              |
| 1:M:163:ASP:HB3  | 6:A:63:ARG:NH1   | 2.30                     | 0.45              |
| 1:M:187:HIS:ND1  | 3:N:135:PHE:HA   | 2.31                     | 0.45              |
| 3:N:53:LYS:HE2   | 3:N:103:HIS:CD2  | 2.52                     | 0.45              |
| 1:B:54:ILE:HD13  | 1:B:54:ILE:HA    | 1.84                     | 0.45              |
| 1:D:90:GLU:HG3   | 1:D:91:LYS:H     | 1.81                     | 0.45              |
| 2:H:71:ARG:O     | 2:H:75:LEU:HG    | 2.17                     | 0.45              |
| 1:B:74:ASN:HB2   | 1:M:154:ASN:OD1  | 2.16                     | 0.45              |
| 1:C:280:ARG:NH1  | 1:C:282:LEU:HD11 | 2.31                     | 0.45              |
| 1:E:24:PRO:O     | 2:I:39:ARG:NH2   | 2.46                     | 0.45              |
| 1:F:252:LYS:HB2  | 1:F:263:ASP:O    | 2.17                     | 0.45              |
| 1:G:13:PHE:O     | 1:G:177:LEU:HD12 | 2.17                     | 0.45              |
| 1:G:16:GLN:HB2   | 1:G:220:GLN:HB3  | 1.97                     | 0.45              |
| 1:G:29:LEU:HA    | 1:G:171:PHE:HE2  | 1.82                     | 0.45              |
| 1:G:90:GLU:OE1   | 1:G:93:GLU:N     | 2.44                     | 0.45              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:I:7:ARG:NH2    | 2:J:87:GLN:O     | 2.48                     | 0.45              |
| 1:D:23:ASP:HA    | 1:D:29:LEU:O     | 2.17                     | 0.45              |
| 1:F:189:ALA:HA   | 1:F:192:THR:HG22 | 1.98                     | 0.45              |
| 1:G:80:ALA:HA    | 1:G:83:GLN:HG2   | 1.99                     | 0.45              |
| 1:G:81:HIS:O     | 1:G:86:VAL:HA    | 2.16                     | 0.45              |
| 2:J:7:ARG:NH1    | 5:K:544:GLN:HB3  | 2.32                     | 0.45              |
| 3:N:43:TRP:O     | 3:N:44:LYS:HE2   | 2.17                     | 0.45              |
| 2:L:103:ILE:HG12 | 2:L:107:HIS:CD2  | 2.52                     | 0.45              |
| 1:B:130:GLN:OE1  | 1:M:216:ALA:N    | 2.49                     | 0.45              |
| 1:D:51:ARG:NE    | 1:D:67:ILE:HD11  | 2.32                     | 0.45              |
| 1:E:228:VAL:HB   | 1:E:280:ARG:CG   | 2.47                     | 0.45              |
| 1:G:115:VAL:HG23 | 4:O:42:U:C2      | 2.52                     | 0.45              |
| 2:L:59:LEU:HB3   | 2:L:60:PRO:HD3   | 1.99                     | 0.45              |
| 1:B:273:LEU:O    | 1:B:275:GLU:N    | 2.50                     | 0.44              |
| 1:C:21:ASN:HD21  | 1:C:41:VAL:HA    | 1.82                     | 0.44              |
| 1:C:141:MET:SD   | 1:C:141:MET:N    | 2.90                     | 0.44              |
| 1:D:89:LYS:HB2   | 1:D:94:LYS:HE2   | 1.99                     | 0.44              |
| 3:N:98:VAL:HB    | 3:N:100:TYR:HE2  | 1.82                     | 0.44              |
| 5:K:257:LEU:HD23 | 5:K:257:LEU:HA   | 1.79                     | 0.44              |
| 1:B:222:ASN:ND2  | 1:C:241:ASP:OD2  | 2.50                     | 0.44              |
| 1:D:87:LYS:HE2   | 1:D:87:LYS:HA    | 1.98                     | 0.44              |
| 1:F:275:GLU:OE1  | 1:F:275:GLU:N    | 2.45                     | 0.44              |
| 1:G:210:PHE:HE2  | 1:G:223:ALA:HB2  | 1.82                     | 0.44              |
| 1:G:224:ARG:HA   | 1:G:224:ARG:HD3  | 1.82                     | 0.44              |
| 2:I:17:LEU:HD23  | 2:I:52:PHE:HE2   | 1.82                     | 0.44              |
| 2:I:88:ARG:HD2   | 2:I:89:PHE:O     | 2.17                     | 0.44              |
| 3:N:180:SER:HB2  | 3:N:185:SER:N    | 2.33                     | 0.44              |
| 6:A:9:ILE:HD12   | 6:A:46:ILE:HD11  | 1.99                     | 0.44              |
| 6:A:10:ARG:HH21  | 6:A:24:TYR:N     | 2.15                     | 0.44              |
| 1:C:245:LYS:HD2  | 1:C:245:LYS:N    | 2.32                     | 0.44              |
| 1:F:167:MET:CE   | 1:G:69:GLU:HB2   | 2.47                     | 0.44              |
| 2:H:22:GLU:O     | 2:H:25:GLN:HG2   | 2.18                     | 0.44              |
| 2:H:66:LEU:HD12  | 2:H:67:GLU:H     | 1.82                     | 0.44              |
| 1:M:213:ASP:HB3  | 1:M:218:ARG:NH1  | 2.25                     | 0.44              |
| 1:M:224:ARG:HD3  | 1:M:224:ARG:HA   | 1.63                     | 0.44              |
| 3:N:160:PRO:HG2  | 3:N:162:GLU:OE2  | 2.17                     | 0.44              |
| 5:K:333:ASN:HB2  | 5:K:338:VAL:HG23 | 1.98                     | 0.44              |
| 1:C:101:TYR:OH   | 1:C:105:ARG:NH1  | 2.50                     | 0.44              |
| 1:E:242:SER:HA   | 1:E:245:LYS:HE3  | 2.00                     | 0.44              |
| 1:F:86:VAL:O     | 1:F:87:LYS:HE2   | 2.17                     | 0.44              |
| 1:G:74:ASN:OD1   | 1:G:75:ASN:N     | 2.50                     | 0.44              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:G:227:TYR:CD1  | 1:G:281:LYS:HG3  | 2.52                     | 0.44              |
| 2:J:51:VAL:O     | 2:J:55:LEU:HG    | 2.18                     | 0.44              |
| 1:M:106:TYR:O    | 1:M:109:ILE:HG22 | 2.18                     | 0.44              |
| 5:K:212:LYS:HA   | 5:K:218:PRO:HA   | 1.99                     | 0.44              |
| 1:C:206:LEU:HD23 | 1:C:209:MET:HE3  | 1.99                     | 0.44              |
| 1:M:20:PRO:HB3   | 1:M:221:MET:HE2  | 1.99                     | 0.44              |
| 1:M:149:ARG:HD3  | 4:O:13:U:O2      | 2.18                     | 0.44              |
| 1:M:249:VAL:HA   | 1:M:265:LEU:O    | 2.18                     | 0.44              |
| 3:N:174:ASP:O    | 3:N:190:PRO:HD2  | 2.18                     | 0.44              |
| 2:L:17:LEU:O     | 2:L:20:VAL:HG22  | 2.17                     | 0.44              |
| 1:B:118:THR:OG1  | 1:B:119:GLY:N    | 2.51                     | 0.44              |
| 1:C:66:PHE:CZ    | 1:C:73:LEU:HD12  | 2.52                     | 0.44              |
| 1:D:282:LEU:HD23 | 1:D:282:LEU:HA   | 1.77                     | 0.44              |
| 1:F:237:ASP:CB   | 1:F:277:LYS:HZ3  | 2.30                     | 0.44              |
| 2:H:66:LEU:HD23  | 2:H:72:ALA:HB2   | 2.00                     | 0.44              |
| 5:K:508:VAL:O    | 5:K:511:THR:OG1  | 2.29                     | 0.44              |
| 2:L:51:VAL:HG12  | 2:L:55:LEU:HG    | 2.00                     | 0.44              |
| 6:A:10:ARG:CB    | 6:A:67:LYS:HE3   | 2.47                     | 0.44              |
| 1:B:61:GLU:O     | 1:B:62:HIS:HB2   | 2.17                     | 0.44              |
| 1:B:148:THR:HA   | 1:B:166:THR:O    | 2.17                     | 0.44              |
| 1:C:70:LYS:HD2   | 1:C:70:LYS:HA    | 1.72                     | 0.44              |
| 1:C:90:GLU:O     | 1:C:91:LYS:HG2   | 2.18                     | 0.44              |
| 1:C:218:ARG:NH1  | 4:O:23:G:OP1     | 2.51                     | 0.44              |
| 1:F:51:ARG:NE    | 1:F:67:ILE:HD13  | 2.33                     | 0.44              |
| 1:D:116:MET:HB3  | 1:D:122:ALA:HB3  | 2.00                     | 0.44              |
| 1:D:230:GLU:CG   | 1:D:278:LEU:HB2  | 2.44                     | 0.44              |
| 1:E:47:LYS:O     | 1:E:51:ARG:HG3   | 2.18                     | 0.44              |
| 1:E:250:VAL:HG23 | 1:E:265:LEU:HB3  | 1.98                     | 0.44              |
| 1:G:7:TYR:HB2    | 1:G:184:ILE:HD12 | 1.99                     | 0.44              |
| 2:I:12:TYR:HE1   | 2:I:103:ILE:HG22 | 1.82                     | 0.44              |
| 2:J:111:PHE:O    | 2:J:114:THR:OG1  | 2.20                     | 0.44              |
| 5:K:533:GLN:O    | 5:K:536:ILE:HG22 | 2.18                     | 0.44              |
| 1:C:179:ARG:NH1  | 1:C:247:ILE:O    | 2.50                     | 0.44              |
| 1:D:246:ARG:HG2  | 1:D:273:LEU:HD21 | 2.00                     | 0.44              |
| 1:E:212:HIS:CD2  | 1:F:6:ARG:HH22   | 2.36                     | 0.44              |
| 1:F:275:GLU:HG2  | 1:F:276:THR:HG23 | 1.99                     | 0.44              |
| 2:H:18:PHE:O     | 2:H:22:GLU:HG3   | 2.17                     | 0.44              |
| 2:I:71:ARG:HA    | 2:I:71:ARG:NE    | 2.33                     | 0.44              |
| 1:M:107:TYR:CE2  | 1:M:201:LEU:HD23 | 2.53                     | 0.44              |
| 3:N:51:VAL:O     | 3:N:203:THR:OG1  | 2.26                     | 0.44              |
| 5:K:316:TYR:CE2  | 5:K:318:LYS:HB2  | 2.53                     | 0.44              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 5:K:524:GLU:HG2  | 5:K:525:PHE:N    | 2.33                     | 0.44              |
| 2:L:10:ILE:H     | 2:L:10:ILE:HD12  | 1.83                     | 0.44              |
| 6:A:15:PHE:HD1   | 6:A:60:GLU:HA    | 1.83                     | 0.44              |
| 1:E:14:ASP:HB3   | 1:E:177:LEU:CD2  | 2.45                     | 0.43              |
| 1:F:85:ASN:O     | 1:F:94:LYS:NZ    | 2.33                     | 0.43              |
| 3:N:167:ASP:HB2  | 3:N:196:LYS:HD2  | 2.00                     | 0.43              |
| 1:B:81:HIS:CE1   | 1:B:94:LYS:HD3   | 2.53                     | 0.43              |
| 1:B:90:GLU:O     | 1:B:94:LYS:HB2   | 2.17                     | 0.43              |
| 1:B:206:LEU:HD23 | 1:B:206:LEU:HA   | 1.82                     | 0.43              |
| 1:C:118:THR:OG1  | 1:C:119:GLY:N    | 2.51                     | 0.43              |
| 1:F:14:ASP:OD2   | 1:F:16:GLN:NE2   | 2.51                     | 0.43              |
| 1:G:55:GLN:O     | 1:G:59:ASN:HB3   | 2.19                     | 0.43              |
| 1:G:249:VAL:HG13 | 1:G:266:VAL:HG22 | 2.00                     | 0.43              |
| 2:J:110:GLN:O    | 2:J:114:THR:HG23 | 2.17                     | 0.43              |
| 1:M:124:GLN:HG3  | 4:O:5:A:O2'      | 2.18                     | 0.43              |
| 4:O:10:G:C6      | 4:O:11:G:N1      | 2.86                     | 0.43              |
| 5:K:209:ASN:HB3  | 5:K:251:THR:HG21 | 2.00                     | 0.43              |
| 2:L:23:LYS:NZ    | 2:L:112:LEU:HB2  | 2.33                     | 0.43              |
| 1:E:141:MET:O    | 1:E:174:PRO:HD2  | 2.17                     | 0.43              |
| 1:E:149:ARG:HG3  | 4:O:37:C:O2      | 2.18                     | 0.43              |
| 1:E:151:ALA:HB1  | 1:F:71:GLY:O     | 2.18                     | 0.43              |
| 2:I:110:GLN:NE2  | 2:I:110:GLN:O    | 2.51                     | 0.43              |
| 1:M:124:GLN:NE2  | 1:M:126:ARG:HH11 | 2.16                     | 0.43              |
| 3:N:177:PHE:CZ   | 4:O:1:A:C8       | 3.02                     | 0.43              |
| 4:O:4:G:C6       | 4:O:5:A:H2       | 2.35                     | 0.43              |
| 4:O:14:C:H5      | 4:O:16:G:O2'     | 2.01                     | 0.43              |
| 6:A:7:TYR:CZ     | 6:A:70:TRP:HB3   | 2.53                     | 0.43              |
| 1:B:21:ASN:O     | 1:B:30:PRO:HA    | 2.18                     | 0.43              |
| 1:B:157:ASP:OD1  | 1:B:157:ASP:N    | 2.52                     | 0.43              |
| 1:E:212:HIS:HE1  | 1:F:187:HIS:NE2  | 2.17                     | 0.43              |
| 1:F:66:PHE:CZ    | 1:F:73:LEU:HD22  | 2.53                     | 0.43              |
| 1:G:17:ASP:CG    | 1:G:174:PRO:HA   | 2.38                     | 0.43              |
| 1:G:249:VAL:HG22 | 1:G:266:VAL:HG13 | 2.00                     | 0.43              |
| 2:H:73:VAL:HA    | 2:H:76:GLN:OE1   | 2.17                     | 0.43              |
| 6:A:12:ILE:HG22  | 6:A:65:ASP:O     | 2.17                     | 0.43              |
| 1:B:66:PHE:CZ    | 1:B:73:LEU:HD22  | 2.53                     | 0.43              |
| 1:B:148:THR:O    | 4:O:19:U:O2'     | 2.36                     | 0.43              |
| 1:D:243:LEU:O    | 1:D:246:ARG:HB2  | 2.19                     | 0.43              |
| 1:E:246:ARG:NH2  | 1:E:273:LEU:HD12 | 2.34                     | 0.43              |
| 1:F:81:HIS:O     | 1:F:94:LYS:NZ    | 2.50                     | 0.43              |
| 2:H:48:PRO:HA    | 2:H:51:VAL:HG22  | 2.00                     | 0.43              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:H:95:LEU:HA    | 2:H:98:GLN:OE1   | 2.18                     | 0.43              |
| 2:H:116:ASP:HA   | 2:H:119:LYS:HZ1  | 1.83                     | 0.43              |
| 1:M:54:ILE:HG22  | 1:M:65:ILE:HD11  | 1.99                     | 0.43              |
| 3:N:6:GLU:HG2    | 3:N:101:ARG:HA   | 2.01                     | 0.43              |
| 5:K:481:ILE:HD13 | 5:K:516:LEU:HD11 | 2.00                     | 0.43              |
| 1:D:256:GLU:OE1  | 1:D:256:GLU:N    | 2.48                     | 0.43              |
| 1:E:258:VAL:O    | 1:E:259:ARG:NE   | 2.52                     | 0.43              |
| 1:F:253:ASP:OD1  | 1:F:254:GLY:N    | 2.51                     | 0.43              |
| 1:G:21:ASN:HD21  | 1:G:48:ARG:HH12  | 1.65                     | 0.43              |
| 3:N:34:ALA:HB3   | 3:N:51:VAL:HG21  | 1.99                     | 0.43              |
| 4:O:22:C:N4      | 4:O:23:G:O6      | 2.52                     | 0.43              |
| 5:K:9:TYR:CZ     | 5:K:257:LEU:HD21 | 2.53                     | 0.43              |
| 5:K:279:THR:O    | 5:K:279:THR:HG23 | 2.19                     | 0.43              |
| 1:B:6:ARG:NH2    | 1:M:211:ASP:O    | 2.48                     | 0.43              |
| 1:E:3:ILE:HG22   | 1:E:4:GLU:H      | 1.83                     | 0.43              |
| 1:F:226:LEU:HD21 | 1:F:228:VAL:HG23 | 2.00                     | 0.43              |
| 1:F:231:HIS:HA   | 1:F:277:LYS:HD2  | 2.00                     | 0.43              |
| 1:G:36:THR:HB    | 1:G:38:GLU:OE1   | 2.18                     | 0.43              |
| 1:G:248:GLN:HB3  | 1:G:267:SER:OG   | 2.19                     | 0.43              |
| 2:H:94:ASN:HB2   | 2:H:97:GLN:HE22  | 1.83                     | 0.43              |
| 3:N:181:ASP:HB2  | 3:N:182:PRO:HD2  | 1.99                     | 0.43              |
| 5:K:353:SER:OG   | 5:K:408:ASN:N    | 2.52                     | 0.43              |
| 1:C:175:TYR:CZ   | 1:C:260:SER:HA   | 2.54                     | 0.43              |
| 1:C:231:HIS:CG   | 1:C:277:LYS:NZ   | 2.87                     | 0.43              |
| 1:D:149:ARG:HA   | 4:O:31:C:O2'     | 2.19                     | 0.43              |
| 1:D:155:GLU:OE1  | 1:E:74:ASN:HB2   | 2.19                     | 0.43              |
| 1:E:246:ARG:HD2  | 1:E:273:LEU:HD12 | 2.00                     | 0.43              |
| 1:E:252:LYS:HZ3  | 1:E:264:TYR:C    | 2.17                     | 0.43              |
| 1:F:53:PHE:CE1   | 1:F:57:THR:HG21  | 2.53                     | 0.43              |
| 2:H:80:ARG:HA    | 2:H:80:ARG:NE    | 2.34                     | 0.43              |
| 1:M:246:ARG:HE   | 1:M:269:ASP:HB2  | 1.84                     | 0.43              |
| 2:L:35:THR:O     | 2:L:39:ARG:HG2   | 2.18                     | 0.43              |
| 6:A:24:TYR:HB2   | 6:A:27:GLU:OE2   | 2.17                     | 0.43              |
| 1:B:21:ASN:ND2   | 1:B:31:ARG:HE    | 2.17                     | 0.43              |
| 1:B:228:VAL:HB   | 1:B:280:ARG:HG3  | 2.01                     | 0.43              |
| 1:B:242:SER:O    | 1:B:246:ARG:HG3  | 2.19                     | 0.43              |
| 1:F:23:ASP:N     | 1:F:23:ASP:OD1   | 2.51                     | 0.43              |
| 2:H:54:THR:HG22  | 2:H:57:ARG:HH12  | 1.84                     | 0.43              |
| 2:I:77:TRP:CH2   | 2:I:121:LEU:HB3  | 2.54                     | 0.43              |
| 5:K:443:ARG:HG2  | 5:K:446:ARG:HH22 | 1.84                     | 0.43              |
| 5:K:569:LEU:HD23 | 5:K:569:LEU:HA   | 1.79                     | 0.43              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:B:18:GLY:HA2   | 1:B:172:THR:HA   | 2.00                     | 0.43              |
| 1:C:85:ASN:HB2   | 1:C:89:LYS:HD3   | 2.00                     | 0.43              |
| 1:E:64:ASP:HB3   | 1:E:106:TYR:HD1  | 1.84                     | 0.43              |
| 1:G:126:ARG:HD3  | 1:G:188:PHE:CE1  | 2.53                     | 0.43              |
| 1:G:175:TYR:HB3  | 1:G:259:ARG:NH1  | 2.33                     | 0.43              |
| 2:I:103:ILE:HD13 | 2:J:83:LEU:HD21  | 2.01                     | 0.43              |
| 2:I:110:GLN:HA   | 2:J:80:ARG:HH21  | 1.84                     | 0.43              |
| 1:M:275:GLU:HG3  | 1:M:276:THR:H    | 1.84                     | 0.43              |
| 3:N:34:ALA:O     | 3:N:38:LEU:HD23  | 2.19                     | 0.43              |
| 5:K:496:ARG:HB2  | 5:K:497:TYR:HD1  | 1.84                     | 0.43              |
| 1:D:111:THR:OG1  | 1:D:194:PHE:HE1  | 2.01                     | 0.42              |
| 1:G:79:GLU:O     | 1:G:83:GLN:HG2   | 2.18                     | 0.42              |
| 4:O:14:C:H2'     | 4:O:15:A:H4'     | 1.99                     | 0.42              |
| 1:B:222:ASN:OD1  | 1:B:222:ASN:N    | 2.52                     | 0.42              |
| 1:C:24:PRO:HA    | 4:O:21:C:C5      | 2.54                     | 0.42              |
| 1:D:28:ASN:C     | 1:D:29:LEU:HD12  | 2.40                     | 0.42              |
| 1:D:215:SER:HA   | 1:E:130:GLN:HE21 | 1.84                     | 0.42              |
| 1:E:153:THR:HG23 | 1:E:156:LYS:HZ1  | 1.85                     | 0.42              |
| 1:E:211:ASP:O    | 1:F:6:ARG:NH1    | 2.52                     | 0.42              |
| 2:H:52:PHE:O     | 2:H:56:MET:HG2   | 2.19                     | 0.42              |
| 2:I:78:GLU:O     | 2:I:82:ILE:HG12  | 2.19                     | 0.42              |
| 3:N:39:MET:HG2   | 3:N:49:TRP:HD1   | 1.84                     | 0.42              |
| 5:K:389:LYS:HZ3  | 6:A:29:ALA:HB2   | 1.84                     | 0.42              |
| 6:A:10:ARG:HH21  | 6:A:23:SER:C     | 2.22                     | 0.42              |
| 1:B:155:GLU:HG2  | 1:C:72:ILE:HG13  | 2.01                     | 0.42              |
| 1:B:177:LEU:HD23 | 1:B:177:LEU:HA   | 1.85                     | 0.42              |
| 1:C:247:ILE:O    | 1:C:247:ILE:HG23 | 2.20                     | 0.42              |
| 1:D:66:PHE:O     | 1:D:66:PHE:CG    | 2.72                     | 0.42              |
| 1:D:83:GLN:O     | 1:D:87:LYS:HG2   | 2.19                     | 0.42              |
| 1:D:154:ASN:HB3  | 1:D:156:LYS:NZ   | 2.34                     | 0.42              |
| 1:G:46:LEU:HD23  | 1:G:46:LEU:HA    | 1.87                     | 0.42              |
| 1:G:51:ARG:HH12  | 1:G:67:ILE:C     | 2.23                     | 0.42              |
| 1:M:61:GLU:CD    | 1:M:62:HIS:H     | 2.22                     | 0.42              |
| 1:M:130:GLN:HE21 | 3:N:143:ARG:HB3  | 1.84                     | 0.42              |
| 1:M:242:SER:O    | 1:M:246:ARG:HG2  | 2.19                     | 0.42              |
| 1:C:155:GLU:OE1  | 1:D:72:ILE:HG13  | 2.19                     | 0.42              |
| 1:E:72:ILE:O     | 1:E:72:ILE:HG13  | 2.18                     | 0.42              |
| 1:F:22:GLY:O     | 4:O:39:U:H3'     | 2.19                     | 0.42              |
| 1:G:5:LYS:HB2    | 1:G:7:TYR:CZ     | 2.54                     | 0.42              |
| 1:G:38:GLU:OE1   | 1:G:38:GLU:N     | 2.53                     | 0.42              |
| 1:G:61:GLU:HG2   | 1:G:105:ARG:NH1  | 2.34                     | 0.42              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:G:210:PHE:HB3  | 1:G:221:MET:O    | 2.20                     | 0.42              |
| 2:H:57:ARG:HA    | 2:L:41:PHE:CE2   | 2.53                     | 0.42              |
| 2:I:14:LEU:HD23  | 2:I:14:LEU:HA    | 1.81                     | 0.42              |
| 2:I:91:ASN:OD1   | 2:I:92:HIS:N     | 2.53                     | 0.42              |
| 5:K:416:LEU:HD22 | 5:K:440:TYR:HE2  | 1.84                     | 0.42              |
| 1:C:69:GLU:OE1   | 1:C:69:GLU:N     | 2.39                     | 0.42              |
| 1:D:99:ARG:HG3   | 1:D:122:ALA:O    | 2.20                     | 0.42              |
| 2:I:16:ARG:NH2   | 2:I:108:GLU:OE2  | 2.52                     | 0.42              |
| 3:N:4:ILE:HD13   | 3:N:103:HIS:CE1  | 2.54                     | 0.42              |
| 3:N:182:PRO:HB3  | 3:N:183:ARG:NH1  | 2.35                     | 0.42              |
| 5:K:325:PHE:HD2  | 5:K:327:LEU:HD22 | 1.84                     | 0.42              |
| 5:K:350:LEU:O    | 5:K:354:ILE:HG12 | 2.19                     | 0.42              |
| 6:A:16:TYR:CZ    | 6:A:61:SER:HA    | 2.55                     | 0.42              |
| 1:C:240:ALA:O    | 1:C:243:LEU:HB2  | 2.19                     | 0.42              |
| 1:C:252:LYS:HB2  | 1:C:252:LYS:HE3  | 1.82                     | 0.42              |
| 1:E:77:ILE:HG13  | 1:E:78:ASP:N     | 2.34                     | 0.42              |
| 1:E:257:VAL:HB   | 1:E:259:ARG:NH2  | 2.35                     | 0.42              |
| 1:F:280:ARG:NH2  | 1:F:282:LEU:HD11 | 2.35                     | 0.42              |
| 1:M:54:ILE:HD13  | 1:M:54:ILE:HA    | 1.82                     | 0.42              |
| 1:M:142:THR:HG22 | 1:M:173:VAL:HG12 | 2.00                     | 0.42              |
| 3:N:56:ILE:C     | 3:N:57:LEU:HD22  | 2.40                     | 0.42              |
| 5:K:363:MET:HG2  | 5:K:364:VAL:N    | 2.34                     | 0.42              |
| 5:K:385:VAL:HG22 | 5:K:386:LEU:H    | 1.84                     | 0.42              |
| 5:K:408:ASN:HA   | 5:K:443:ARG:HH22 | 1.85                     | 0.42              |
| 1:B:53:PHE:CZ    | 1:B:57:THR:HG21  | 2.55                     | 0.42              |
| 1:E:57:THR:OG1   | 1:E:58:GLN:OE1   | 2.20                     | 0.42              |
| 1:F:3:ILE:HD12   | 1:F:3:ILE:H      | 1.85                     | 0.42              |
| 1:F:51:ARG:NE    | 1:F:108:ASP:OD1  | 2.52                     | 0.42              |
| 1:G:7:TYR:CE1    | 1:G:230:GLU:HG2  | 2.55                     | 0.42              |
| 1:G:103:CYS:O    | 1:G:110:ARG:HD3  | 2.19                     | 0.42              |
| 5:K:348:ALA:O    | 5:K:352:GLU:HG2  | 2.18                     | 0.42              |
| 5:K:464:ARG:HH21 | 5:K:464:ARG:HG3  | 1.83                     | 0.42              |
| 2:L:71:ARG:HA    | 2:L:74:GLN:NE2   | 2.21                     | 0.42              |
| 1:F:212:HIS:O    | 1:F:212:HIS:ND1  | 2.51                     | 0.42              |
| 1:M:72:ILE:H     | 1:M:72:ILE:HD12  | 1.85                     | 0.42              |
| 5:K:545:ARG:NH2  | 5:K:547:PRO:HA   | 2.35                     | 0.42              |
| 1:B:243:LEU:HD21 | 1:B:277:LYS:HE2  | 2.01                     | 0.42              |
| 1:D:51:ARG:HE    | 1:D:108:ASP:CG   | 2.23                     | 0.42              |
| 1:F:66:PHE:O     | 1:F:66:PHE:CG    | 2.72                     | 0.42              |
| 1:F:270:ASP:OD2  | 1:F:270:ASP:N    | 2.51                     | 0.42              |
| 2:I:28:ALA:HB1   | 2:I:65:LYS:HE3   | 2.02                     | 0.42              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:J:69:GLU:OE1   | 2:J:69:GLU:N     | 2.46                     | 0.42              |
| 2:J:105:TYR:HD2  | 2:J:106:TYR:CD1  | 2.37                     | 0.42              |
| 3:N:10:ASP:O     | 3:N:97:ASP:N     | 2.37                     | 0.42              |
| 3:N:144:GLU:O    | 3:N:146:PRO:HD3  | 2.20                     | 0.42              |
| 5:K:433:ARG:HE   | 5:K:433:ARG:HB3  | 1.69                     | 0.42              |
| 1:B:105:ARG:NH2  | 1:B:106:TYR:OH   | 2.53                     | 0.42              |
| 1:B:280:ARG:NH2  | 1:B:282:LEU:HD11 | 2.34                     | 0.42              |
| 1:C:229:PHE:HE1  | 1:C:279:LEU:HD22 | 1.85                     | 0.42              |
| 1:D:44:VAL:HG12  | 4:O:26:G:H5''    | 2.00                     | 0.42              |
| 1:E:272:ASN:OD1  | 1:E:273:LEU:N    | 2.53                     | 0.42              |
| 1:F:32:ILE:O     | 1:F:34:PRO:HD3   | 2.20                     | 0.42              |
| 5:K:524:GLU:OE1  | 5:K:524:GLU:N    | 2.51                     | 0.42              |
| 1:B:51:ARG:HE    | 1:B:108:ASP:CG   | 2.24                     | 0.41              |
| 1:D:277:LYS:HD3  | 1:D:277:LYS:N    | 2.35                     | 0.41              |
| 1:E:132:THR:HG22 | 1:E:181:HIS:O    | 2.20                     | 0.41              |
| 1:G:251:LYS:NZ   | 1:G:258:VAL:HA   | 2.34                     | 0.41              |
| 2:I:116:ASP:HA   | 2:I:119:LYS:HE2  | 2.01                     | 0.41              |
| 1:M:246:ARG:NH1  | 1:M:272:ASN:H    | 2.19                     | 0.41              |
| 3:N:69:GLU:O     | 3:N:87:ARG:HA    | 2.20                     | 0.41              |
| 1:B:48:ARG:HD3   | 4:O:14:C:P       | 2.60                     | 0.41              |
| 1:C:78:ASP:O     | 1:C:81:HIS:N     | 2.52                     | 0.41              |
| 1:E:29:LEU:HA    | 1:E:171:PHE:CD2  | 2.55                     | 0.41              |
| 1:E:143:LEU:HD13 | 1:E:174:PRO:HD3  | 2.01                     | 0.41              |
| 2:J:74:GLN:HA    | 2:J:122:PHE:CE1  | 2.56                     | 0.41              |
| 3:N:70:VAL:HG23  | 3:N:86:ASN:HB3   | 2.02                     | 0.41              |
| 5:K:10:TYR:O     | 5:K:13:LYS:HG3   | 2.20                     | 0.41              |
| 5:K:535:GLU:OE2  | 5:K:539:ILE:HG12 | 2.20                     | 0.41              |
| 1:B:121:ASN:HB2  | 6:A:18:PRO:HG3   | 2.02                     | 0.41              |
| 1:D:249:VAL:HG12 | 1:D:266:VAL:HG22 | 2.02                     | 0.41              |
| 1:D:275:GLU:HB2  | 1:D:277:LYS:HZ1  | 1.84                     | 0.41              |
| 1:E:16:GLN:HG3   | 1:E:220:GLN:OE1  | 2.21                     | 0.41              |
| 1:E:125:VAL:HG12 | 1:E:126:ARG:H    | 1.85                     | 0.41              |
| 3:N:2:ARG:HH11   | 3:N:103:HIS:HB3  | 1.84                     | 0.41              |
| 3:N:163:ASP:O    | 3:N:165:THR:HG23 | 2.20                     | 0.41              |
| 1:E:154:ASN:OD1  | 1:E:155:GLU:N    | 2.52                     | 0.41              |
| 1:E:232:SER:N    | 1:E:277:LYS:HZ3  | 2.12                     | 0.41              |
| 2:H:75:LEU:O     | 2:H:79:ILE:HG13  | 2.19                     | 0.41              |
| 2:I:16:ARG:CB    | 2:I:108:GLU:HG3  | 2.50                     | 0.41              |
| 2:I:105:TYR:O    | 2:I:109:THR:HG23 | 2.21                     | 0.41              |
| 2:J:51:VAL:HG13  | 2:J:52:PHE:CD2   | 2.52                     | 0.41              |
| 1:M:95:THR:HG21  | 1:M:119:GLY:HA2  | 2.01                     | 0.41              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:M:148:THR:OG1  | 1:M:149:ARG:N    | 2.53                     | 0.41              |
| 5:K:506:ILE:HG23 | 5:K:547:PRO:O    | 2.20                     | 0.41              |
| 1:C:43:ASP:OD1   | 1:C:44:VAL:N     | 2.53                     | 0.41              |
| 1:C:111:THR:OG1  | 1:C:194:PHE:HE2  | 2.03                     | 0.41              |
| 1:D:48:ARG:HB2   | 4:O:26:G:H5'     | 2.02                     | 0.41              |
| 1:F:269:ASP:N    | 1:F:269:ASP:OD1  | 2.53                     | 0.41              |
| 2:H:57:ARG:CA    | 2:L:41:PHE:HE2   | 2.33                     | 0.41              |
| 2:J:96:GLU:HG2   | 2:J:97:GLN:N     | 2.35                     | 0.41              |
| 3:N:64:ASN:OD1   | 3:N:93:MET:HG2   | 2.20                     | 0.41              |
| 2:L:21:LEU:HD13  | 2:L:55:LEU:HD13  | 2.03                     | 0.41              |
| 1:B:251:LYS:H    | 1:B:251:LYS:HG3  | 1.71                     | 0.41              |
| 1:C:224:ARG:HD3  | 1:C:224:ARG:HA   | 1.77                     | 0.41              |
| 1:F:147:ILE:HD13 | 1:G:31:ARG:HH12  | 1.86                     | 0.41              |
| 1:G:252:LYS:HG3  | 1:G:255:VAL:H    | 1.85                     | 0.41              |
| 2:I:3:LEU:HD22   | 2:I:111:PHE:HB2  | 2.03                     | 0.41              |
| 1:M:138:ASP:OD2  | 1:M:264:TYR:OH   | 2.18                     | 0.41              |
| 3:N:18:GLU:O     | 3:N:19:LEU:HD22  | 2.21                     | 0.41              |
| 4:O:39:U:O2'     | 4:O:40:C:O4'     | 2.39                     | 0.41              |
| 5:K:396:ASP:OD1  | 5:K:400:GLN:HG3  | 2.21                     | 0.41              |
| 1:B:177:LEU:HD11 | 1:B:261:PHE:HE1  | 1.84                     | 0.41              |
| 1:D:48:ARG:HD3   | 4:O:26:G:H5'     | 2.02                     | 0.41              |
| 1:D:218:ARG:HD2  | 1:D:221:MET:HE1  | 2.02                     | 0.41              |
| 1:E:6:ARG:HD3    | 1:E:184:ILE:O    | 2.21                     | 0.41              |
| 1:E:128:PRO:O    | 1:E:184:ILE:HA   | 2.21                     | 0.41              |
| 2:H:93:LEU:HD12  | 2:H:93:LEU:HA    | 1.93                     | 0.41              |
| 2:H:120:ASN:HA   | 2:H:123:ASN:OD1  | 2.21                     | 0.41              |
| 3:N:57:LEU:HB2   | 3:N:99:ALA:O     | 2.21                     | 0.41              |
| 5:K:213:GLY:HA3  | 5:K:258:LEU:CD2  | 2.49                     | 0.41              |
| 5:K:246:ALA:HA   | 5:K:249:GLU:HG3  | 2.02                     | 0.41              |
| 1:C:143:LEU:HD13 | 1:C:174:PRO:HD3  | 2.01                     | 0.41              |
| 1:E:246:ARG:HH11 | 1:E:270:ASP:CA   | 2.32                     | 0.41              |
| 1:F:78:ASP:O     | 1:F:81:HIS:N     | 2.54                     | 0.41              |
| 2:L:4:ASP:O      | 2:L:7:ARG:HG2    | 2.21                     | 0.41              |
| 1:B:81:HIS:CG    | 1:B:120:LYS:HD2  | 2.56                     | 0.41              |
| 1:B:153:THR:O    | 1:C:73:LEU:HB2   | 2.20                     | 0.41              |
| 1:B:248:GLN:NE2  | 1:B:267:SER:HB3  | 2.36                     | 0.41              |
| 1:D:183:PHE:O    | 1:D:184:ILE:HD13 | 2.20                     | 0.41              |
| 1:E:21:ASN:ND2   | 1:E:42:THR:H     | 2.17                     | 0.41              |
| 1:E:29:LEU:HA    | 1:E:171:PHE:HD2  | 1.86                     | 0.41              |
| 1:F:47:LYS:HZ3   | 1:F:131:LEU:HB2  | 1.86                     | 0.41              |
| 1:F:169:ARG:HD3  | 1:F:169:ARG:HA   | 1.79                     | 0.41              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:G:33:ASP:OD2   | 1:G:36:THR:N     | 2.37                     | 0.41              |
| 2:H:68:PHE:HB3   | 2:H:71:ARG:HG2   | 2.03                     | 0.41              |
| 2:I:7:ARG:HD2    | 2:I:12:TYR:CG    | 2.56                     | 0.41              |
| 2:J:3:LEU:HD12   | 2:J:107:HIS:HB3  | 2.03                     | 0.41              |
| 2:J:37:ALA:HB1   | 2:J:41:PHE:HE2   | 1.86                     | 0.41              |
| 4:O:4:G:C6       | 4:O:5:A:C2       | 3.09                     | 0.41              |
| 5:K:294:LYS:HZ3  | 6:A:31:GLY:HA2   | 1.86                     | 0.41              |
| 2:L:4:ASP:HB2    | 2:L:7:ARG:HD3    | 2.02                     | 0.41              |
| 1:B:84:GLU:HG2   | 1:B:85:ASN:N     | 2.36                     | 0.41              |
| 1:B:249:VAL:HA   | 1:B:265:LEU:O    | 2.21                     | 0.41              |
| 1:E:46:LEU:O     | 1:E:50:VAL:HG23  | 2.21                     | 0.41              |
| 1:G:135:ARG:O    | 1:G:179:ARG:N    | 2.50                     | 0.41              |
| 1:G:205:ALA:HA   | 1:G:208:ASN:OD1  | 2.21                     | 0.41              |
| 1:G:233:ASN:OD1  | 1:G:234:ASN:N    | 2.55                     | 0.41              |
| 2:H:106:TYR:O    | 2:H:109:THR:OG1  | 2.30                     | 0.41              |
| 1:M:68:ARG:NH1   | 3:N:80:SER:HB2   | 2.36                     | 0.41              |
| 3:N:180:SER:HB2  | 3:N:185:SER:H    | 1.86                     | 0.41              |
| 3:N:189:GLU:O    | 5:K:194:ILE:HD11 | 2.20                     | 0.41              |
| 1:C:87:LYS:HZ3   | 1:C:90:GLU:HA    | 1.85                     | 0.40              |
| 1:E:146:SER:HB2  | 1:E:167:MET:HB3  | 2.04                     | 0.40              |
| 1:F:40:LEU:HD23  | 1:F:40:LEU:HA    | 1.91                     | 0.40              |
| 2:J:77:TRP:CH2   | 2:J:121:LEU:HB3  | 2.56                     | 0.40              |
| 3:N:29:ILE:HB    | 3:N:100:TYR:CE1  | 2.56                     | 0.40              |
| 3:N:65:ILE:HG22  | 3:N:92:SER:HB2   | 2.03                     | 0.40              |
| 5:K:264:PHE:CE2  | 5:K:266:ILE:HD11 | 2.52                     | 0.40              |
| 5:K:523:LEU:HD23 | 5:K:529:ALA:HB2  | 2.03                     | 0.40              |
| 2:L:49:ILE:HD12  | 2:L:49:ILE:H     | 1.86                     | 0.40              |
| 1:C:54:ILE:HA    | 1:C:54:ILE:HD13  | 1.86                     | 0.40              |
| 1:C:56:MET:HB3   | 1:D:187:HIS:HD1  | 1.85                     | 0.40              |
| 1:E:218:ARG:HG2  | 1:E:221:MET:CE   | 2.51                     | 0.40              |
| 1:F:89:LYS:HB2   | 1:F:94:LYS:N     | 2.36                     | 0.40              |
| 1:F:177:LEU:HD12 | 1:F:177:LEU:HA   | 1.86                     | 0.40              |
| 1:G:126:ARG:HD3  | 1:G:188:PHE:CZ   | 2.56                     | 0.40              |
| 2:H:69:GLU:OE1   | 2:H:69:GLU:N     | 2.54                     | 0.40              |
| 2:J:18:PHE:HA    | 2:J:21:LEU:HD12  | 2.03                     | 0.40              |
| 1:M:213:ASP:HB3  | 1:M:218:ARG:HH22 | 1.86                     | 0.40              |
| 3:N:31:PRO:HG2   | 3:N:192:PHE:CZ   | 2.56                     | 0.40              |
| 1:C:10:VAL:HG12  | 1:C:227:TYR:HB2  | 2.04                     | 0.40              |
| 1:F:2:THR:HG21   | 1:F:190:LYS:HG3  | 2.02                     | 0.40              |
| 1:F:85:ASN:HB3   | 1:F:88:GLY:HA3   | 2.03                     | 0.40              |
| 1:G:9:PHE:HE1    | 1:G:184:ILE:HG13 | 1.86                     | 0.40              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:I:94:ASN:O     | 2:I:98:GLN:HG3   | 2.21                     | 0.40              |
| 2:I:96:GLU:HG2   | 2:I:97:GLN:N     | 2.36                     | 0.40              |
| 1:M:189:ALA:O    | 1:M:193:GLY:N    | 2.55                     | 0.40              |
| 3:N:21:VAL:O     | 3:N:90:ARG:NH2   | 2.47                     | 0.40              |
| 4:O:27:G:H1'     | 4:O:28:U:C6      | 2.56                     | 0.40              |
| 4:O:39:U:H1'     | 4:O:40:C:N3      | 2.37                     | 0.40              |
| 5:K:12:ARG:HH22  | 5:K:278:ARG:HD3  | 1.86                     | 0.40              |
| 2:L:21:LEU:HD21  | 2:L:59:LEU:HD12  | 2.02                     | 0.40              |
| 6:A:47:GLU:OE1   | 6:A:47:GLU:HA    | 2.22                     | 0.40              |
| 1:B:136:SER:HB3  | 1:B:178:TYR:CE1  | 2.56                     | 0.40              |
| 1:C:48:ARG:HD3   | 4:O:20:G:OP2     | 2.22                     | 0.40              |
| 1:C:225:GLY:HA2  | 1:C:283:GLY:HA3  | 2.03                     | 0.40              |
| 1:E:232:SER:H    | 1:E:277:LYS:NZ   | 2.14                     | 0.40              |
| 1:F:126:ARG:HD3  | 1:F:188:PHE:CZ   | 2.57                     | 0.40              |
| 2:H:25:GLN:HE22  | 2:H:36:ILE:HG21  | 1.86                     | 0.40              |
| 2:H:100:LEU:HA   | 2:H:103:ILE:HD12 | 2.04                     | 0.40              |
| 2:I:20:VAL:O     | 2:I:24:ILE:HG13  | 2.22                     | 0.40              |
| 1:B:5:LYS:HE2    | 1:B:231:HIS:O    | 2.21                     | 0.40              |
| 1:C:280:ARG:HH12 | 1:C:282:LEU:HD11 | 1.87                     | 0.40              |
| 3:N:30:THR:HG22  | 3:N:32:ALA:N     | 2.37                     | 0.40              |
| 3:N:124:MET:HA   | 3:N:127:ARG:NE   | 2.32                     | 0.40              |
| 5:K:351:SER:OG   | 5:K:352:GLU:OE2  | 2.27                     | 0.40              |

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

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

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

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

| Mol | Chain | Analysed      | Favoured  | Allowed  | Outliers | Percentiles |     |
|-----|-------|---------------|-----------|----------|----------|-------------|-----|
| 1   | B     | 281/283 (99%) | 256 (91%) | 25 (9%)  | 0        | 100         | 100 |
| 1   | C     | 281/283 (99%) | 254 (90%) | 27 (10%) | 0        | 100         | 100 |
| 1   | D     | 281/283 (99%) | 250 (89%) | 31 (11%) | 0        | 100         | 100 |

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| Mol | Chain | Analysed        | Favoured   | Allowed  | Outliers | Percentiles |     |
|-----|-------|-----------------|------------|----------|----------|-------------|-----|
| 1   | E     | 281/283 (99%)   | 264 (94%)  | 17 (6%)  | 0        | 100         | 100 |
| 1   | F     | 261/283 (92%)   | 248 (95%)  | 13 (5%)  | 0        | 100         | 100 |
| 1   | G     | 267/283 (94%)   | 245 (92%)  | 22 (8%)  | 0        | 100         | 100 |
| 1   | M     | 260/283 (92%)   | 227 (87%)  | 33 (13%) | 0        | 100         | 100 |
| 2   | H     | 122/124 (98%)   | 114 (93%)  | 8 (7%)   | 0        | 100         | 100 |
| 2   | I     | 122/124 (98%)   | 119 (98%)  | 3 (2%)   | 0        | 100         | 100 |
| 2   | J     | 122/124 (98%)   | 115 (94%)  | 7 (6%)   | 0        | 100         | 100 |
| 2   | L     | 108/124 (87%)   | 106 (98%)  | 2 (2%)   | 0        | 100         | 100 |
| 3   | N     | 203/205 (99%)   | 172 (85%)  | 31 (15%) | 0        | 100         | 100 |
| 5   | K     | 405/409 (99%)   | 368 (91%)  | 36 (9%)  | 1 (0%)   | 44          | 72  |
| 6   | A     | 68/70 (97%)     | 62 (91%)   | 6 (9%)   | 0        | 100         | 100 |
| All | All   | 3062/3161 (97%) | 2800 (91%) | 261 (8%) | 1 (0%)   | 100         | 100 |

All (1) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 5   | K     | 314 | GLY  |

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

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

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

| Mol | Chain | Analysed       | Rotameric  | Outliers | Percentiles |     |
|-----|-------|----------------|------------|----------|-------------|-----|
| 1   | B     | 245/245 (100%) | 245 (100%) | 0        | 100         | 100 |
| 1   | C     | 245/245 (100%) | 243 (99%)  | 2 (1%)   | 79          | 87  |
| 1   | D     | 245/245 (100%) | 245 (100%) | 0        | 100         | 100 |
| 1   | E     | 245/245 (100%) | 245 (100%) | 0        | 100         | 100 |
| 1   | F     | 230/245 (94%)  | 229 (100%) | 1 (0%)   | 89          | 93  |
| 1   | G     | 235/245 (96%)  | 235 (100%) | 0        | 100         | 100 |
| 1   | M     | 229/245 (94%)  | 228 (100%) | 1 (0%)   | 89          | 93  |

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| Mol | Chain | Analysed        | Rotameric   | Outliers | Percentiles |     |
|-----|-------|-----------------|-------------|----------|-------------|-----|
| 2   | H     | 104/104 (100%)  | 103 (99%)   | 1 (1%)   | 73          | 83  |
| 2   | I     | 104/104 (100%)  | 103 (99%)   | 1 (1%)   | 73          | 83  |
| 2   | J     | 104/104 (100%)  | 104 (100%)  | 0        | 100         | 100 |
| 2   | L     | 94/104 (90%)    | 93 (99%)    | 1 (1%)   | 70          | 81  |
| 3   | N     | 181/181 (100%)  | 180 (99%)   | 1 (1%)   | 84          | 90  |
| 5   | K     | 334/336 (99%)   | 333 (100%)  | 1 (0%)   | 91          | 95  |
| 6   | A     | 57/57 (100%)    | 56 (98%)    | 1 (2%)   | 54          | 73  |
| All | All   | 2652/2705 (98%) | 2642 (100%) | 10 (0%)  | 88          | 93  |

All (10) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | C     | 85  | ASN  |
| 1   | C     | 141 | MET  |
| 1   | F     | 74  | ASN  |
| 2   | H     | 65  | LYS  |
| 2   | I     | 65  | LYS  |
| 1   | M     | 271 | LYS  |
| 3   | N     | 120 | LYS  |
| 5   | K     | 13  | LYS  |
| 2   | L     | 71  | ARG  |
| 6   | A     | 67  | LYS  |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | B     | 81  | HIS  |
| 1   | B     | 187 | HIS  |
| 1   | C     | 52  | ASN  |
| 1   | C     | 74  | ASN  |
| 1   | D     | 75  | ASN  |
| 1   | E     | 21  | ASN  |
| 1   | G     | 100 | GLN  |
| 1   | G     | 204 | GLN  |
| 1   | G     | 222 | ASN  |
| 2   | I     | 64  | ASN  |
| 1   | M     | 21  | ASN  |
| 1   | M     | 130 | GLN  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | M     | 231 | HIS  |
| 1   | M     | 234 | ASN  |
| 3   | N     | 199 | ASN  |

### 5.3.3 RNA [i](#)

| Mol | Chain | Analysed    | Backbone Outliers | Pucker Outliers |
|-----|-------|-------------|-------------------|-----------------|
| 4   | O     | 41/42 (97%) | 25 (60%)          | 2 (4%)          |

All (25) RNA backbone outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 4   | O     | 3   | U    |
| 4   | O     | 4   | G    |
| 4   | O     | 6   | A    |
| 4   | O     | 9   | A    |
| 4   | O     | 13  | U    |
| 4   | O     | 15  | A    |
| 4   | O     | 16  | G    |
| 4   | O     | 19  | U    |
| 4   | O     | 20  | G    |
| 4   | O     | 21  | C    |
| 4   | O     | 22  | C    |
| 4   | O     | 23  | G    |
| 4   | O     | 24  | U    |
| 4   | O     | 25  | A    |
| 4   | O     | 27  | G    |
| 4   | O     | 31  | C    |
| 4   | O     | 32  | A    |
| 4   | O     | 33  | U    |
| 4   | O     | 34  | C    |
| 4   | O     | 36  | C    |
| 4   | O     | 37  | C    |
| 4   | O     | 38  | C    |
| 4   | O     | 39  | U    |
| 4   | O     | 40  | C    |
| 4   | O     | 41  | G    |

All (2) RNA pucker outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 4   | O     | 24  | U    |
| 4   | O     | 39  | U    |

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

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

#### 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

#### 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

#### 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

The following chains have linkage breaks:

| Mol | Chain | Number of breaks |
|-----|-------|------------------|
| 5   | K     | 1                |

All chain breaks are listed below:

| Model | Chain | Residue-1 | Atom-1 | Residue-2 | Atom-2 | Distance (Å) |
|-------|-------|-----------|--------|-----------|--------|--------------|
| 1     | K     | 16:SER    | C      | 190:ALA   | N      | 30.88        |

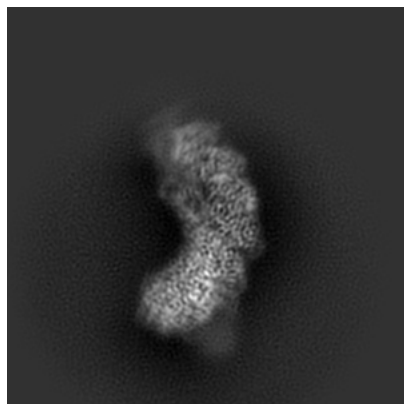
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-29877. These allow visual inspection of the internal detail of the map and identification of artifacts.

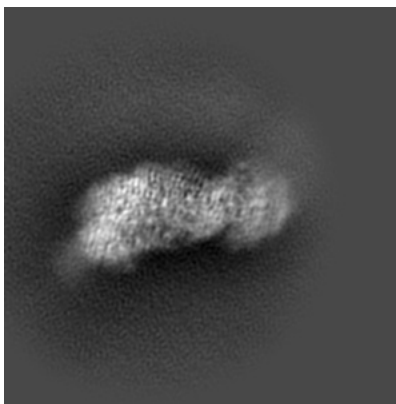
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

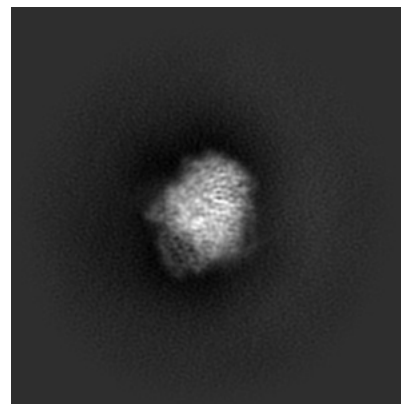
#### 6.1.1 Primary map



X

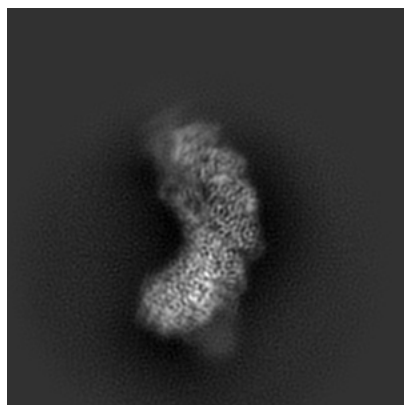


Y

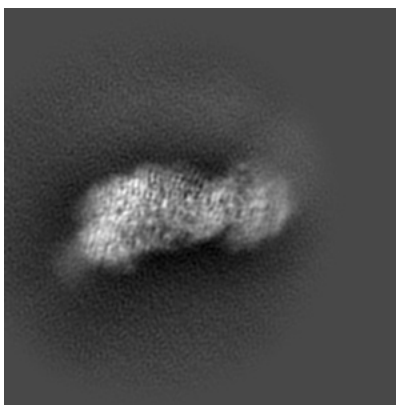


Z

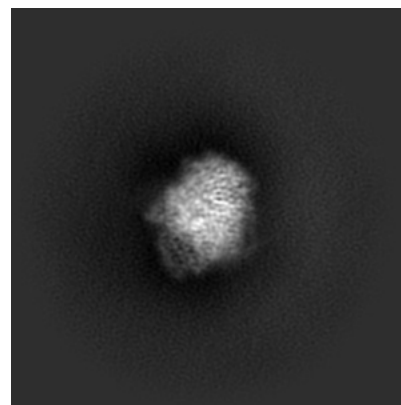
#### 6.1.2 Raw map



X



Y



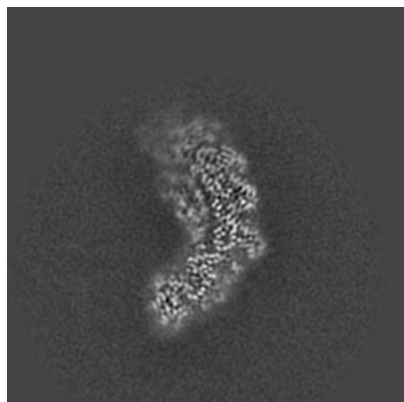
Z

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

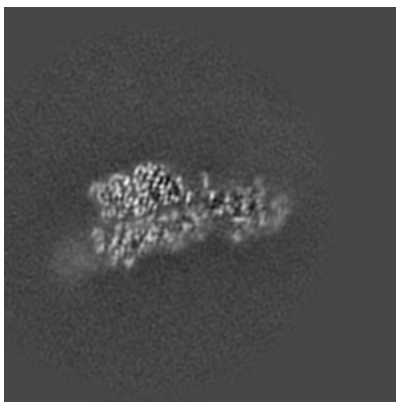


## 6.2 Central slices [i](#)

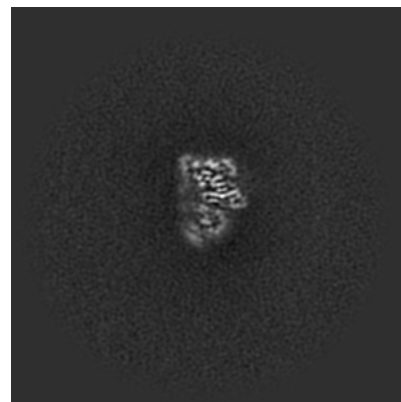
### 6.2.1 Primary map



X Index: 125

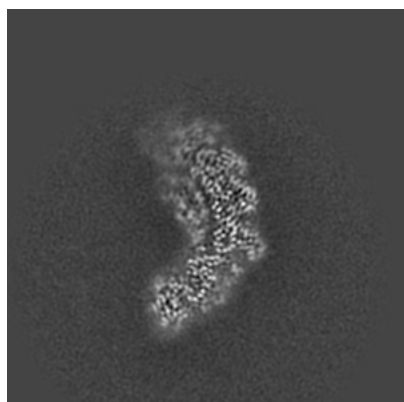


Y Index: 125

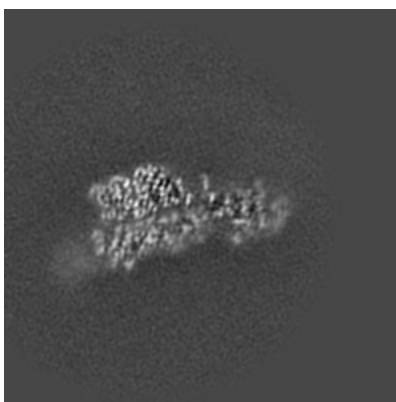


Z Index: 125

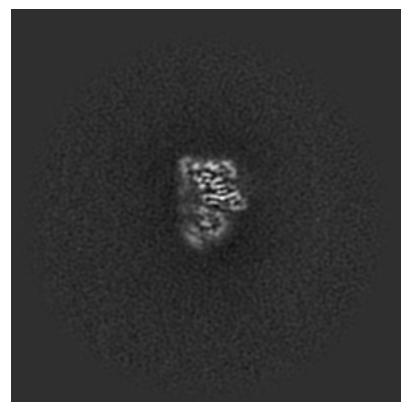
### 6.2.2 Raw map



X Index: 125



Y Index: 125

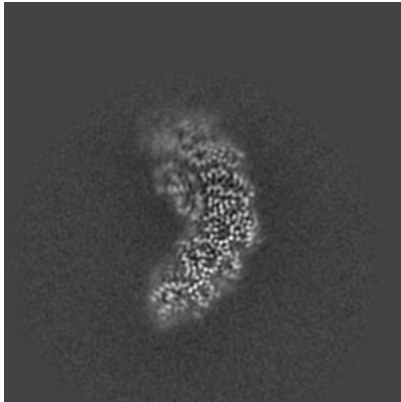


Z Index: 125

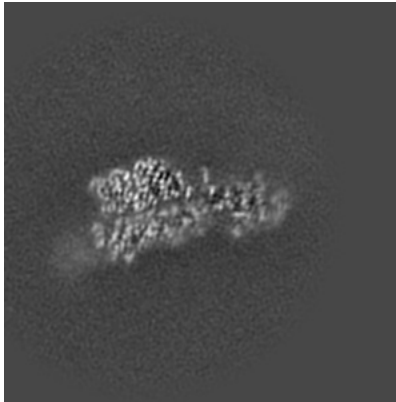
The images above show central slices of the map in three orthogonal directions.

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

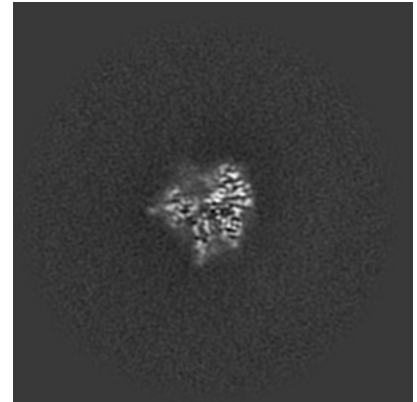
### 6.3.1 Primary map



X Index: 128

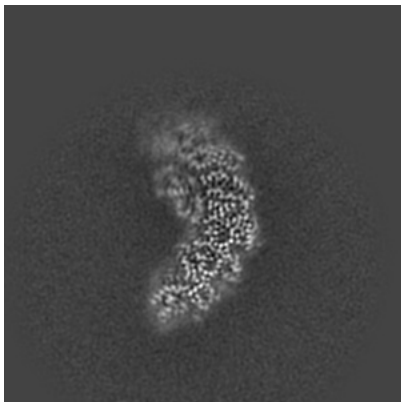


Y Index: 125

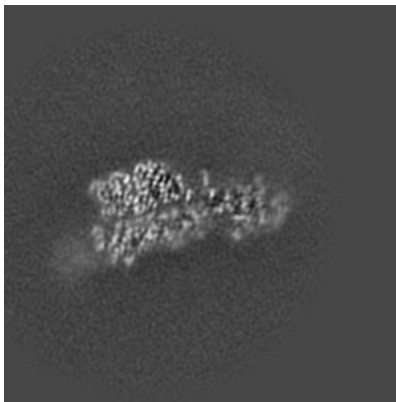


Z Index: 82

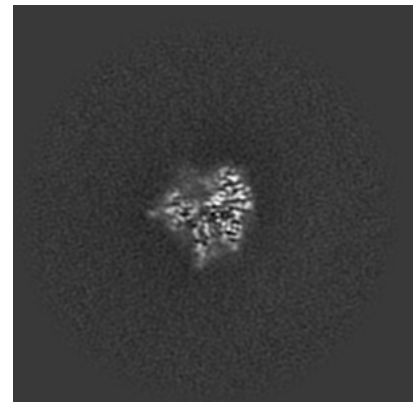
### 6.3.2 Raw map



X Index: 128



Y Index: 125

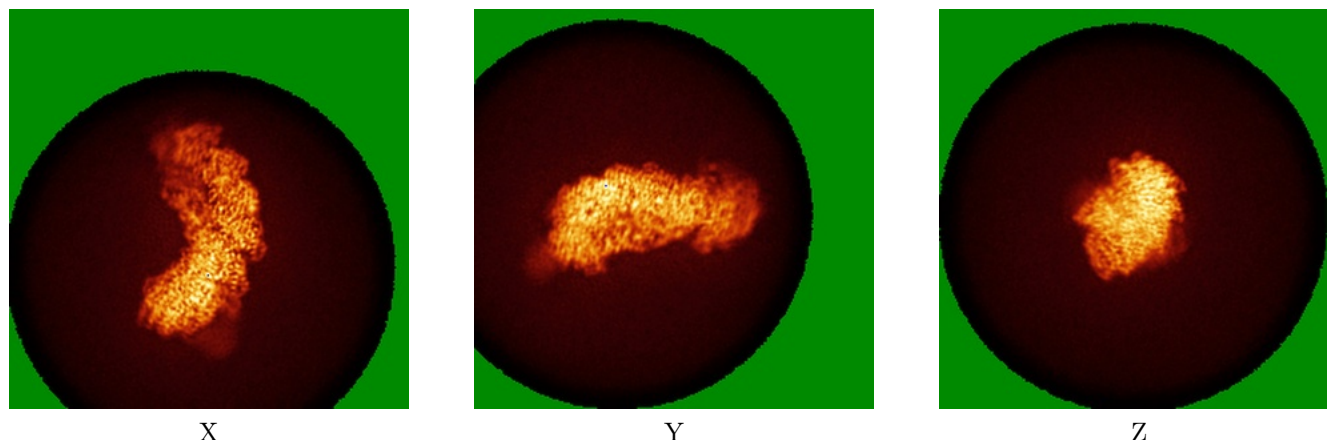


Z Index: 82

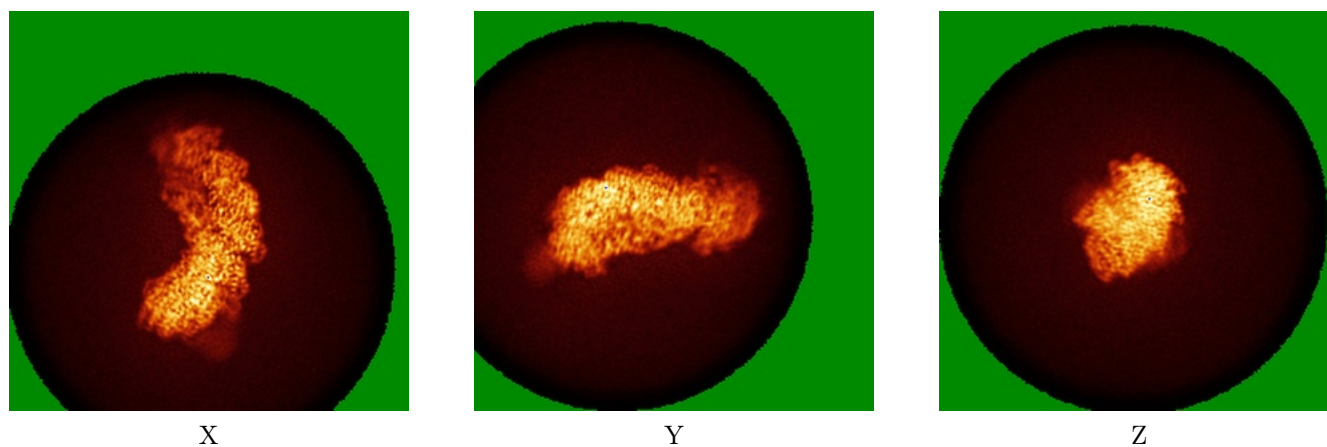
The images above show the largest variance slices of the map in three orthogonal directions.

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

### 6.4.1 Primary map



### 6.4.2 Raw map



The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

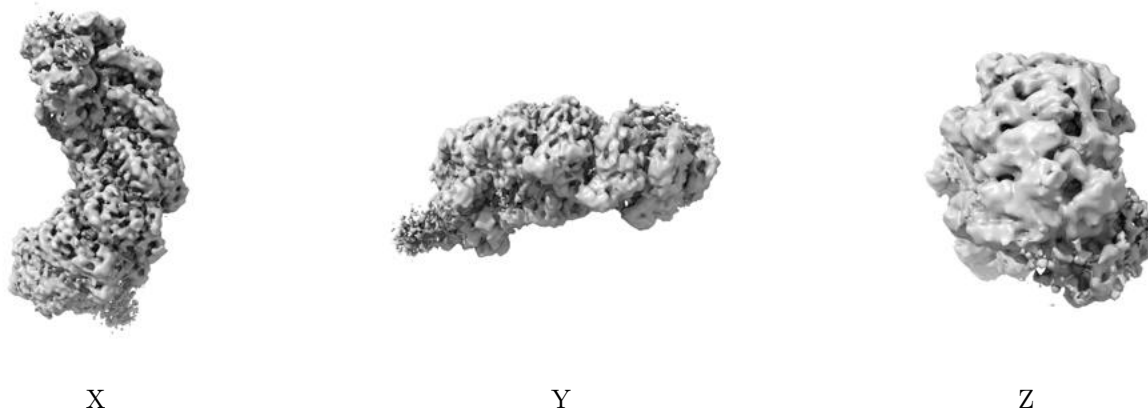
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.118. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

### 6.5.2 Raw map



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

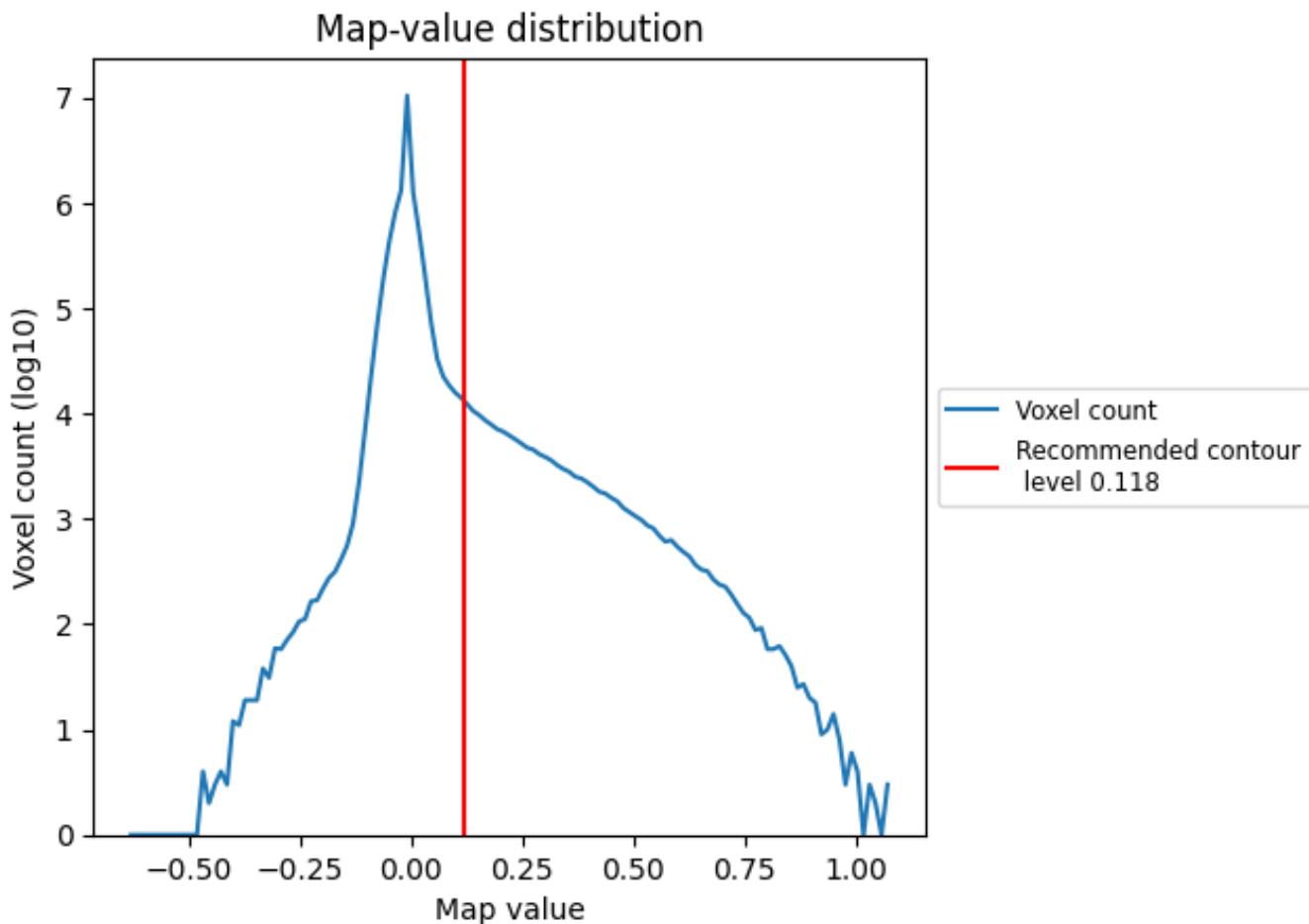
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

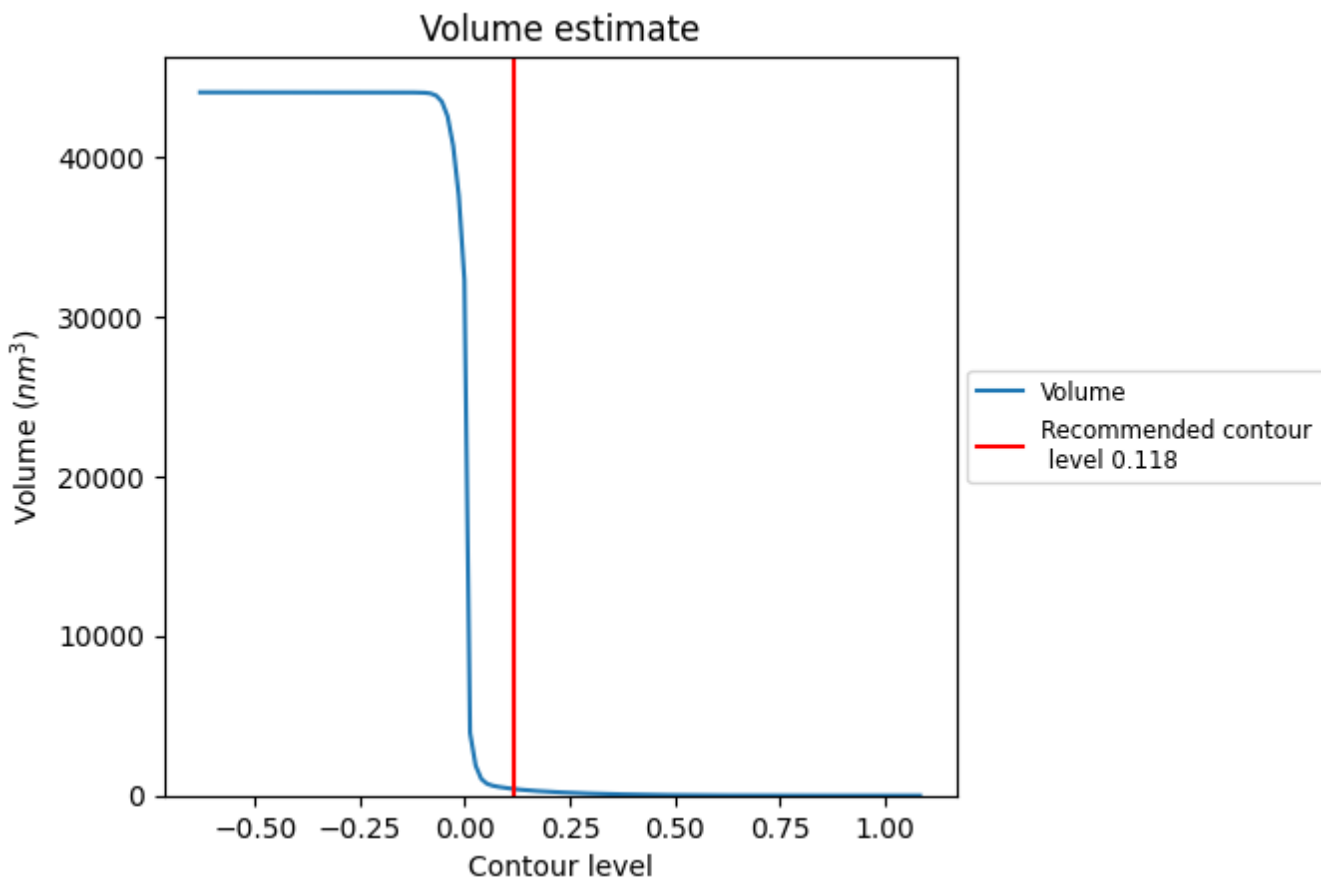
This section contains the results of statistical analysis of the map.

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



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

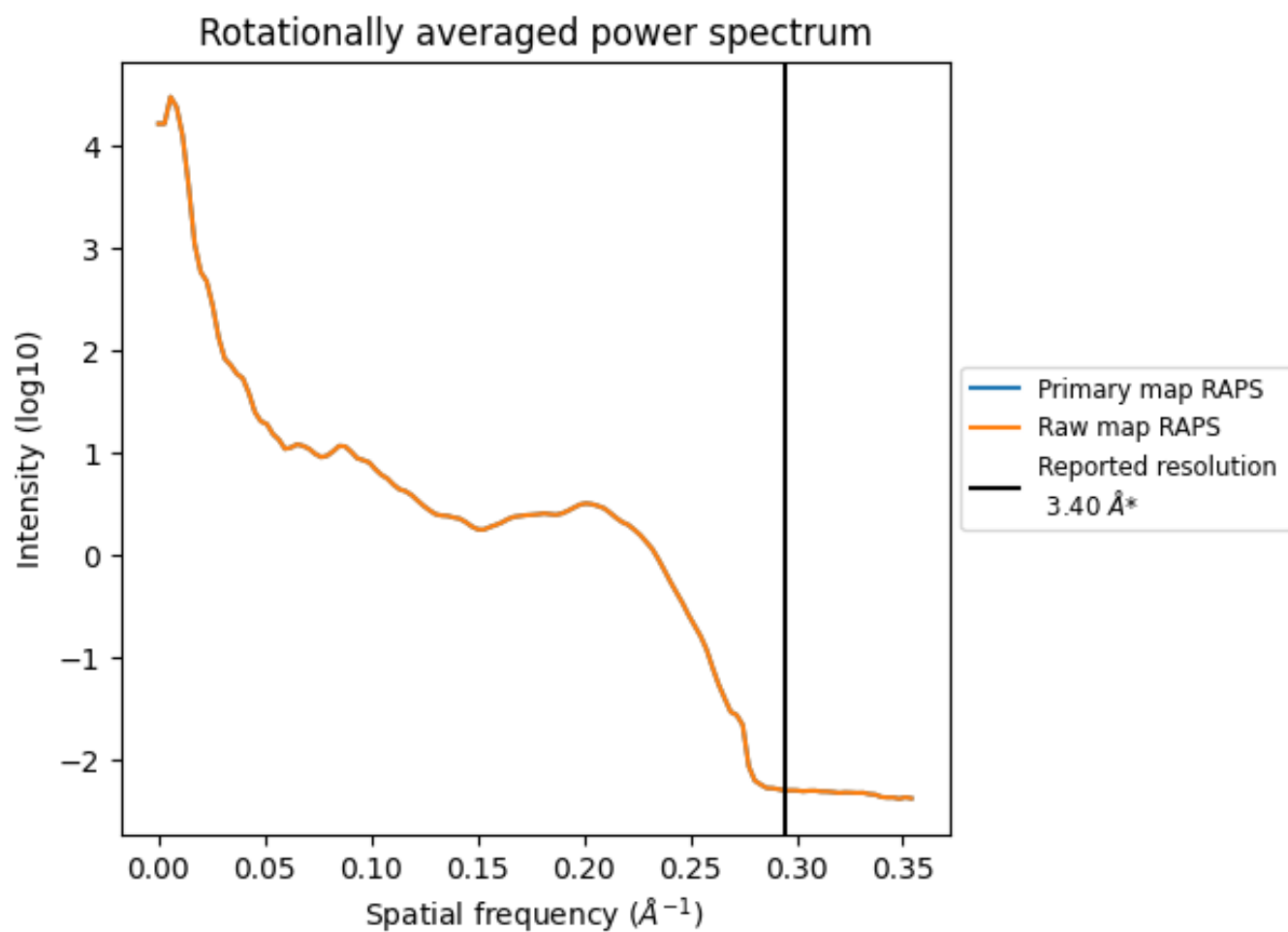
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 412  $\text{nm}^3$ ; this corresponds to an approximate mass of 372 kDa.

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

### 7.3 Rotationally averaged power spectrum [i](#)

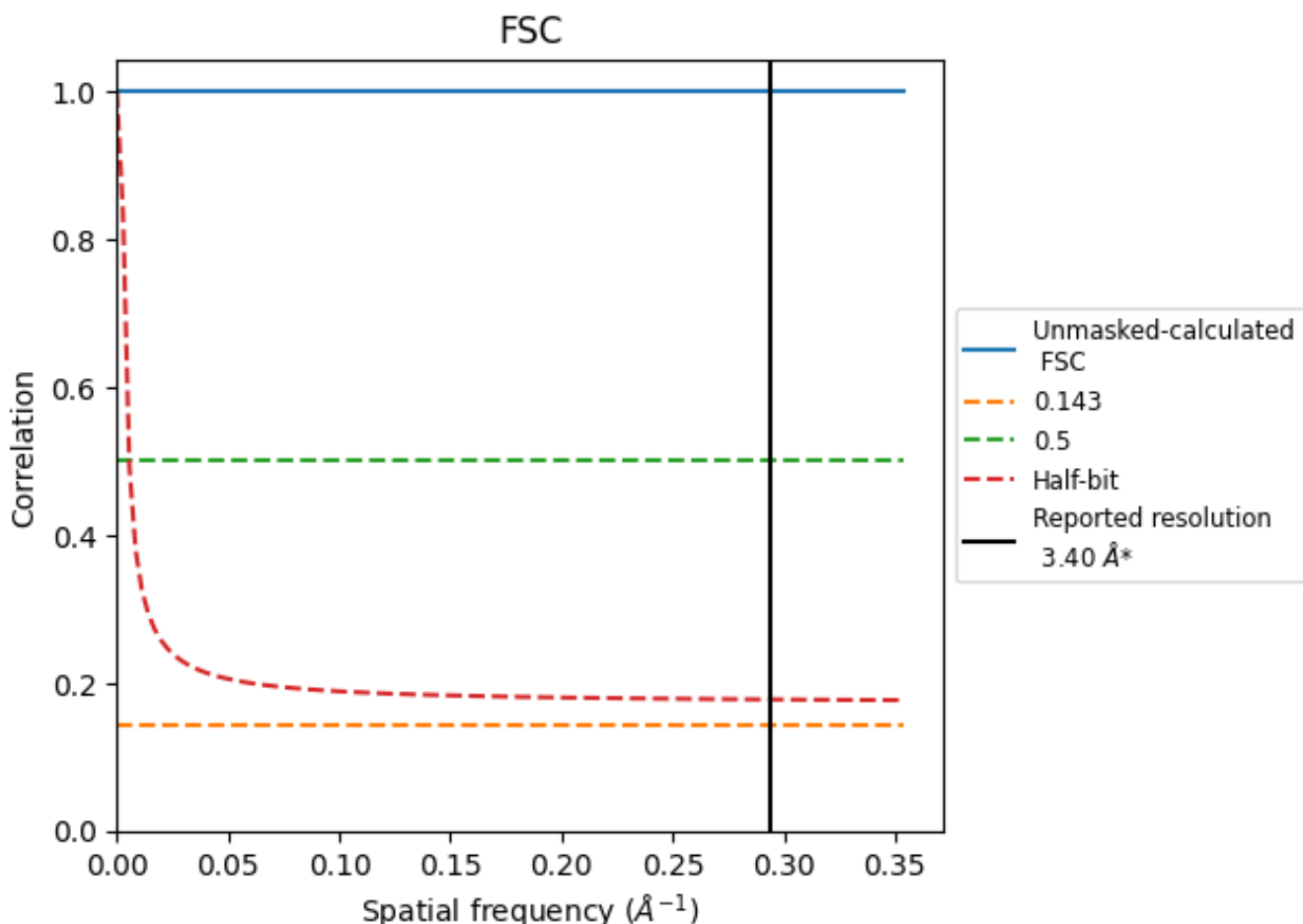


\*Reported resolution corresponds to spatial frequency of 0.294 Å<sup>-1</sup>

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

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

### 8.1 FSC [i](#)



\*Reported resolution corresponds to spatial frequency of 0.294 Å<sup>-1</sup>



## 8.2 Resolution estimates [i](#)

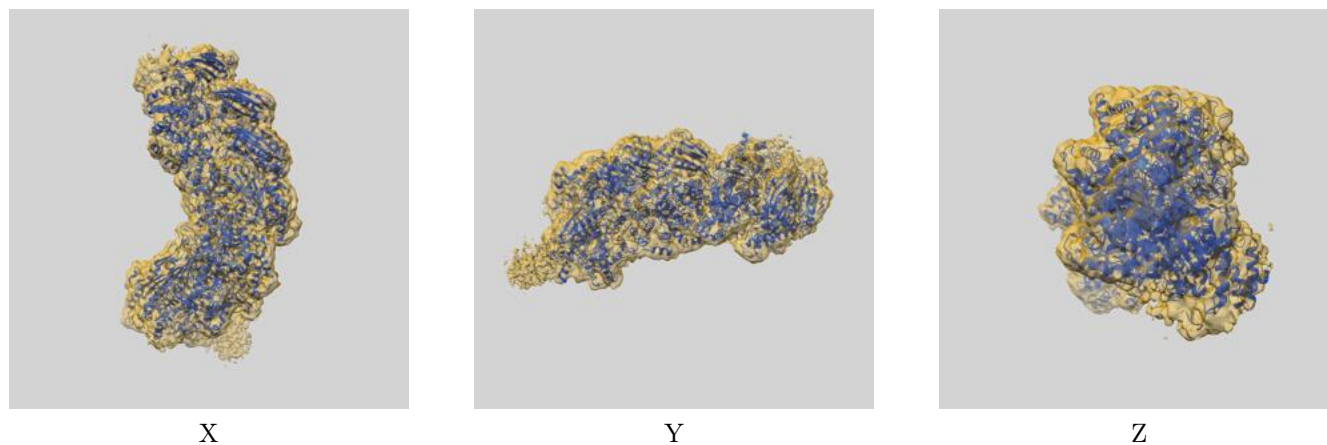
| Resolution estimate (Å)   | Estimation criterion (FSC cut-off) |     |          |
|---------------------------|------------------------------------|-----|----------|
|                           | 0.143                              | 0.5 | Half-bit |
| Reported by author        | 3.40                               | -   | -        |
| Author-provided FSC curve | -                                  | -   | -        |
| Unmasked-calculated*      | -                                  | -   | -        |

\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

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

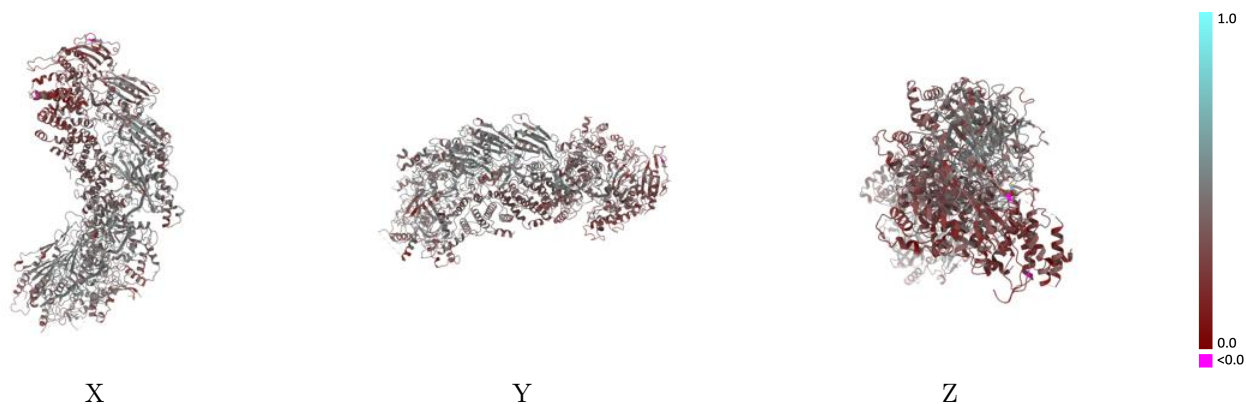
This section contains information regarding the fit between EMDB map EMD-29877 and PDB model 8G9S. Per-residue inclusion information can be found in section 3 on page 7.

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



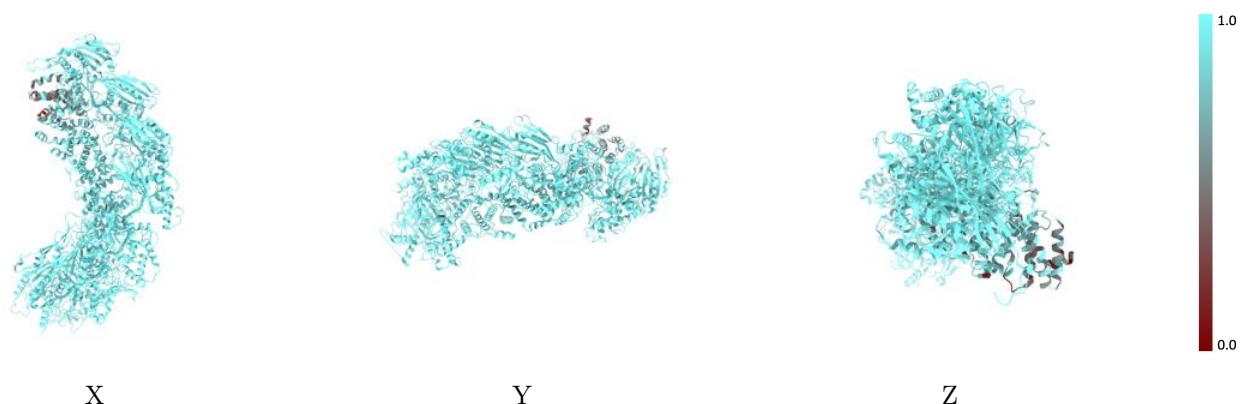
The images above show the 3D surface view of the map at the recommended contour level 0.118 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



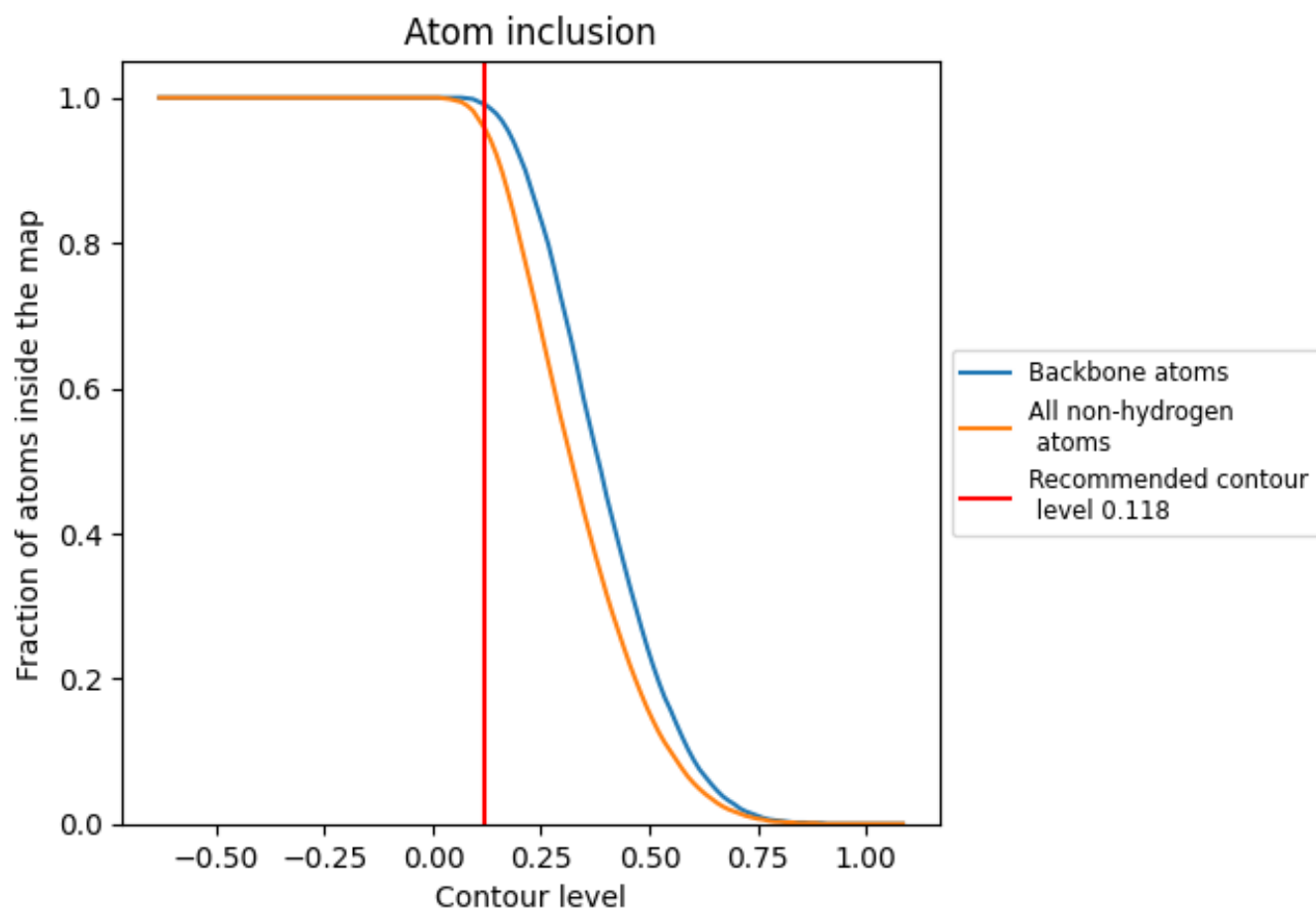
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.118).

































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 99% of all backbone atoms, 96% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.118) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion   | Q-score  |
|-------|--|--|
| All   |  0.9590   |  0.4010   |
| A     |  0.9790   |  0.3730   |
| B     |  0.9930   |  0.4580   |
| C     |  0.9840   |  0.4570   |
| D     |  0.9790   |  0.4550   |
| E     |  0.9630   |  0.4190   |
| F     |  0.9660   |  0.3680   |
| G     |  0.9400   |  0.2840   |
| H     |  0.8500   |  0.3180   |
| I     |  0.9480   |  0.3630   |
| J     |  0.9860   |  0.3680   |
| K     |  0.9850   |  0.4050   |
| L     |  0.6140   |  0.2610   |
| M     |  0.9950   |  0.4460   |
| N     |  0.9880  |  0.4170  |
| O     |  0.9970 |  0.4780 |

