



## Full wwPDB EM Validation Report ⓘ

Jan 9, 2024 – 03:00 PM JST

PDB ID : 8IFM  
EMDB ID : EMD-35421  
Title : Cryo-EM structure of tetrameric SPARTA gRNA-ssDNA target complex in state 2  
Authors : Zhang, J.T.; Jia, N.  
Deposited on : 2023-02-18  
Resolution : 2.92 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.dev70  
MolProbity : 4.02b-467  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.9  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.36

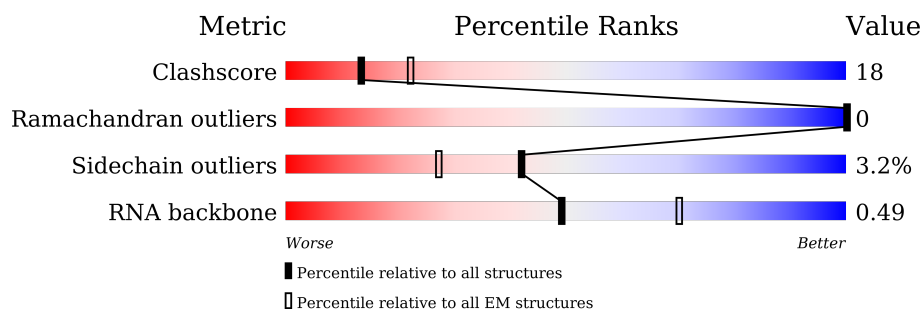
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 2.92 Å.

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



| Metric                | Whole archive<br>(#Entries) | EM structures<br>(#Entries) |
|-----------------------|-----------------------------|-----------------------------|
| Clashscore            | 158937                      | 4297                        |
| Ramachandran outliers | 154571                      | 4023                        |
| Sidechain outliers    | 154315                      | 3826                        |
| RNA backbone          | 4643                        | 859                         |

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

| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 1   | A     | 450    |                  |
| 1   | F     | 450    |                  |
| 1   | J     | 450    |                  |
| 1   | N     | 450    |                  |
| 2   | B     | 507    |                  |
| 2   | G     | 507    |                  |
| 2   | K     | 507    |                  |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 2   | O     | 507    |                  |
| 3   | C     | 21     |                  |
| 3   | H     | 21     |                  |
| 3   | L     | 21     |                  |
| 3   | P     | 21     |                  |
| 4   | D     | 25     |                  |
| 4   | I     | 25     |                  |
| 4   | M     | 25     |                  |
| 4   | Q     | 25     |                  |

## 2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 30994 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 TIR domain-containing protein.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 1   | A     | 415      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3475  | 2253 | 586 | 626 | 10 |         |       |
| 1   | F     | 412      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3450  | 2240 | 579 | 621 | 10 |         |       |
| 1   | J     | 415      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3475  | 2253 | 586 | 626 | 10 |         |       |
| 1   | N     | 412      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3450  | 2240 | 579 | 621 | 10 |         |       |

- Molecule 2 is a protein called Piwi domain-containing protein.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 2   | B     | 428      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3449  | 2245 | 568 | 625 | 11 |         |       |
| 2   | G     | 428      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3449  | 2245 | 568 | 625 | 11 |         |       |
| 2   | K     | 428      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3449  | 2245 | 568 | 625 | 11 |         |       |
| 2   | O     | 428      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3449  | 2245 | 568 | 625 | 11 |         |       |

- Molecule 3 is a RNA chain called guide RNA.

| Mol | Chain | Residues | Atoms |     |    |     |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|-----|----|---------|-------|
| 3   | C     | 20       | Total | C   | N  | O   | P  | 0       | 0     |
|     |       |          | 423   | 190 | 74 | 139 | 20 |         |       |
| 3   | H     | 20       | Total | C   | N  | O   | P  | 0       | 0     |
|     |       |          | 423   | 190 | 74 | 139 | 20 |         |       |
| 3   | L     | 20       | Total | C   | N  | O   | P  | 0       | 0     |
|     |       |          | 423   | 190 | 74 | 139 | 20 |         |       |
| 3   | P     | 20       | Total | C   | N  | O   | P  | 0       | 0     |
|     |       |          | 423   | 190 | 74 | 139 | 20 |         |       |

- Molecule 4 is a DNA chain called target ssDNA.

| Mol | Chain | Residues | Atoms        |          |         |          |         | AltConf | Trace |
|-----|-------|----------|--------------|----------|---------|----------|---------|---------|-------|
| 4   | D     | 20       | Total<br>413 | C<br>198 | N<br>75 | O<br>120 | P<br>20 | 0       | 0     |
| 4   | I     | 20       | Total<br>413 | C<br>198 | N<br>75 | O<br>120 | P<br>20 | 0       | 0     |
| 4   | M     | 20       | Total<br>413 | C<br>198 | N<br>75 | O<br>120 | P<br>20 | 0       | 0     |
| 4   | Q     | 20       | Total<br>413 | C<br>198 | N<br>75 | O<br>120 | P<br>20 | 0       | 0     |

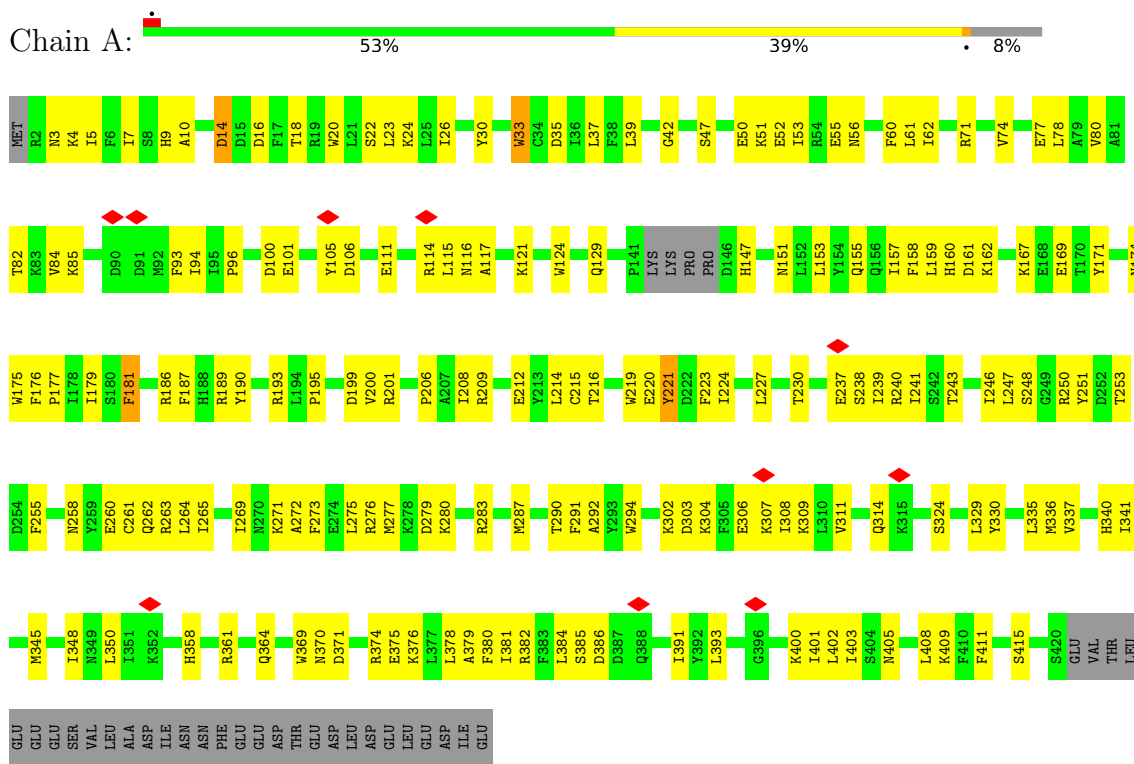
- Molecule 5 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

| Mol | Chain | Residues | Atoms      |         | AltConf |
|-----|-------|----------|------------|---------|---------|
| 5   | K     | 1        | Total<br>1 | Mg<br>1 | 0       |
| 5   | C     | 1        | Total<br>1 | Mg<br>1 | 0       |
| 5   | H     | 1        | Total<br>1 | Mg<br>1 | 0       |
| 5   | P     | 1        | Total<br>1 | Mg<br>1 | 0       |

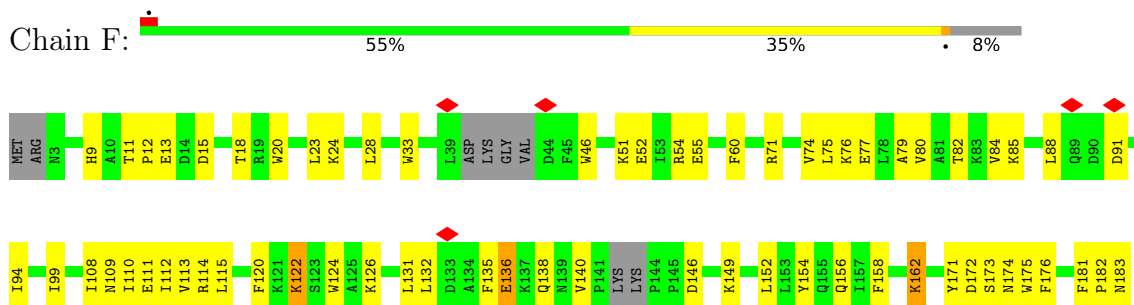
### 3 Residue-property plots

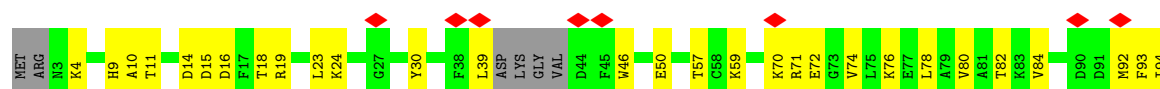
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

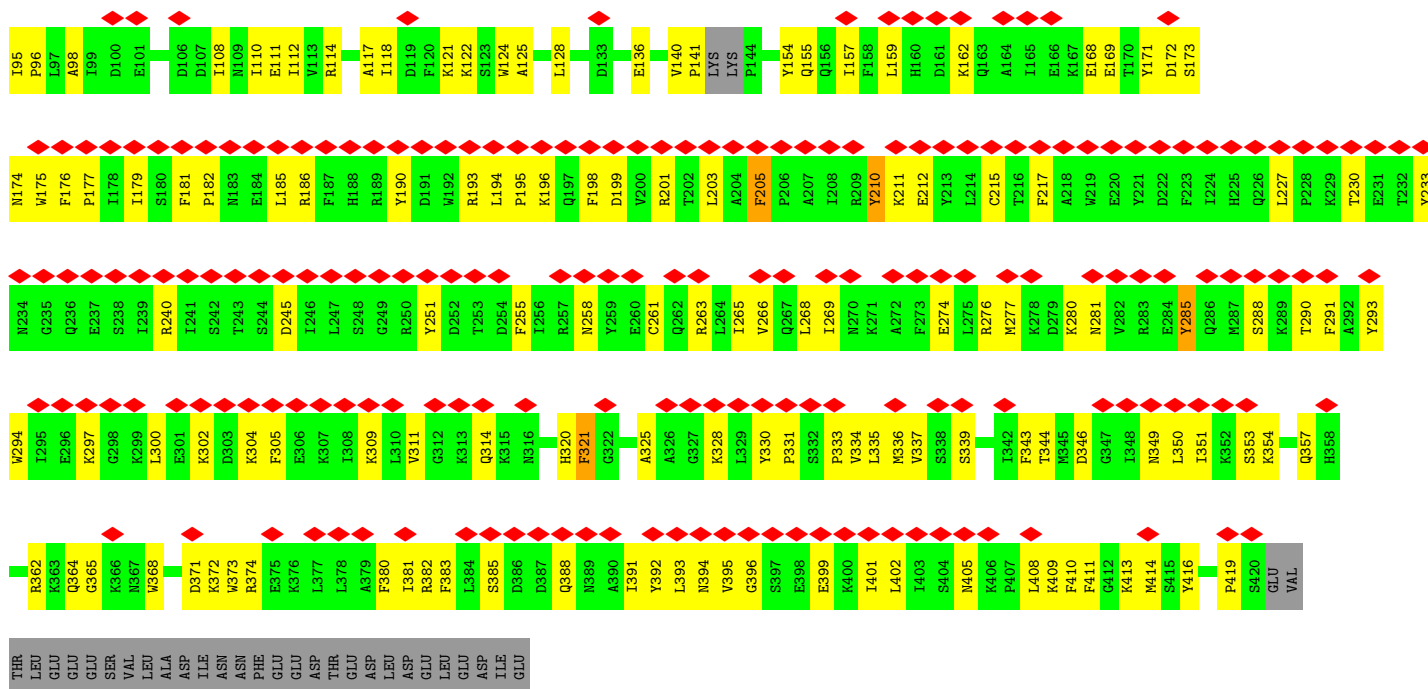
#### • Molecule 1: TIR domain-containing protein



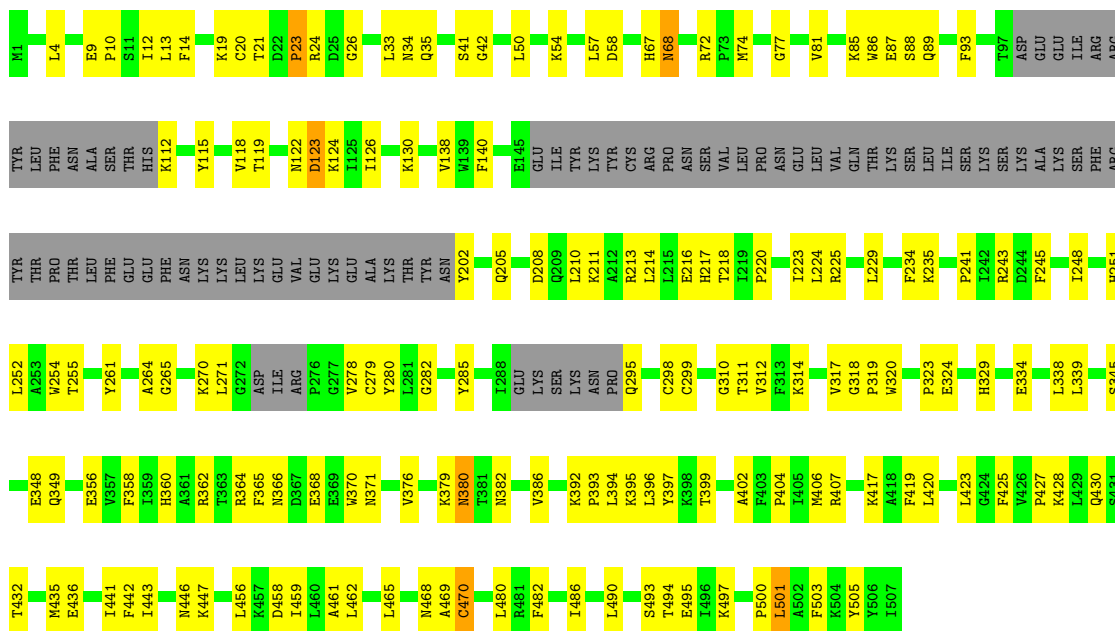
#### • Molecule 1: TIR domain-containing protein







• Molecule 2: Piwi domain-containing protein

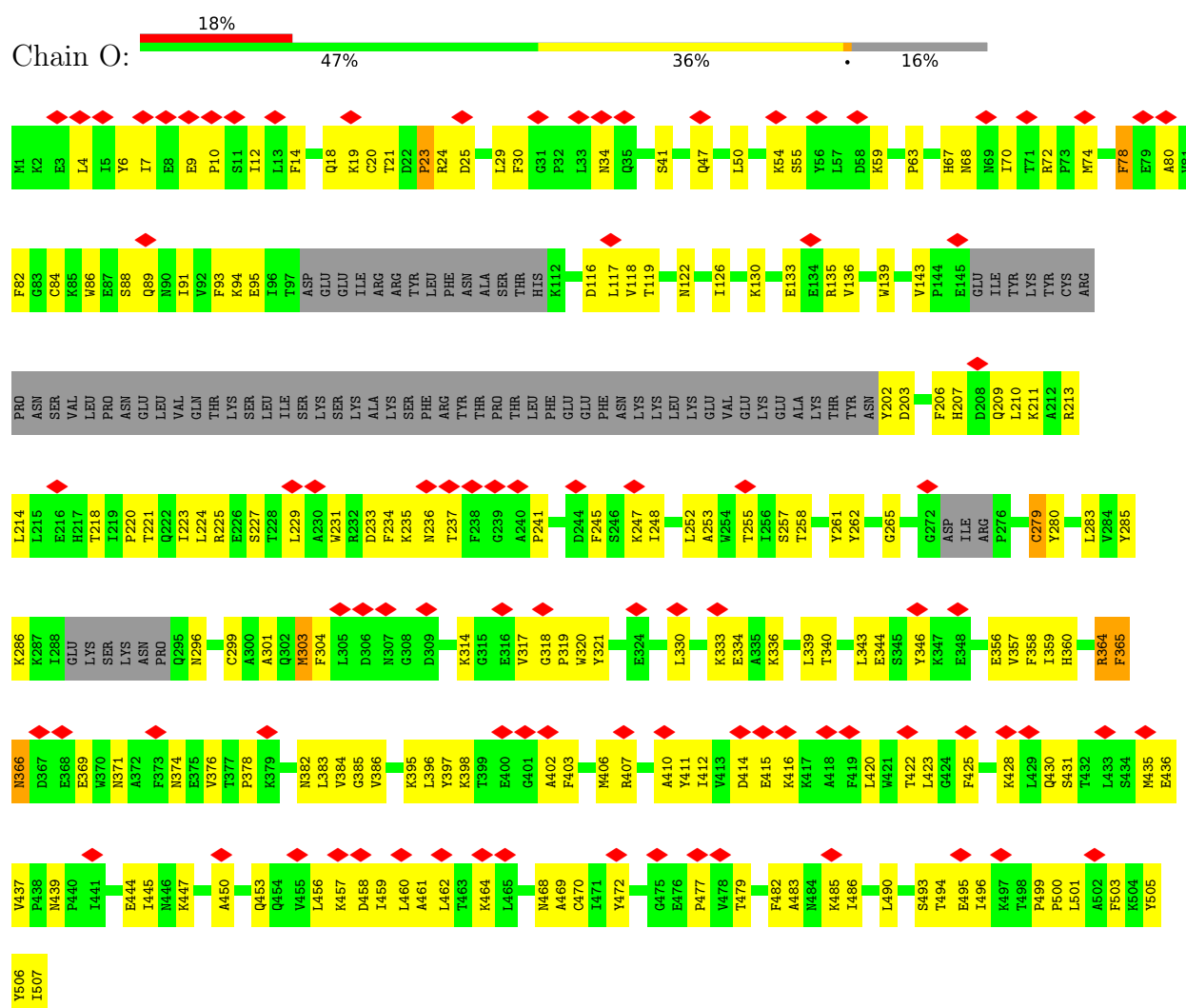


• Molecule 2: Piwi domain-containing protein









• Molecule 3: guide RNA

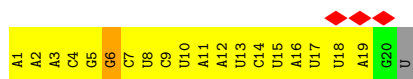


• Molecule 3: guide RNA



• Molecule 3: guide RNA

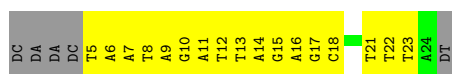




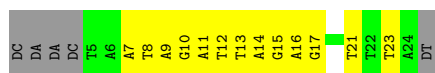
● Molecule 3: guide RNA



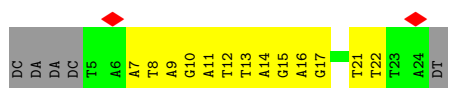
● Molecule 4: target ssDNA



● Molecule 4: target ssDNA



● Molecule 4: target ssDNA



● Molecule 4: target ssDNA



## 4 Experimental information

| Property                             | Value               | Source    |
|--------------------------------------|---------------------|-----------|
| EM reconstruction method             | SINGLE PARTICLE     | Depositor |
| Imposed symmetry                     | POINT, Not provided |           |
| Number of particles used             | 251736              | Depositor |
| Resolution determination method      | FSC 0.143 CUT-OFF   | Depositor |
| CTF correction method                | PHASE FLIPPING ONLY | Depositor |
| Microscope                           | FEI TITAN KRIOS     | Depositor |
| Voltage (kV)                         | 300                 | Depositor |
| Electron dose ( $e^-/\text{\AA}^2$ ) | 50                  | Depositor |
| Minimum defocus (nm)                 | 1500                | Depositor |
| Maximum defocus (nm)                 | 2500                | Depositor |
| Magnification                        | Not provided        |           |
| Image detector                       | GATAN K3 (6k x 4k)  | Depositor |
| Maximum map value                    | 4.038               | Depositor |
| Minimum map value                    | -2.410              | Depositor |
| Average map value                    | 0.000               | Depositor |
| Map value standard deviation         | 0.088               | Depositor |
| Recommended contour level            | 0.3                 | Depositor |
| Map size ( $\text{\AA}$ )            | 396.0, 396.0, 396.0 | wwPDB     |
| Map dimensions                       | 360, 360, 360       | wwPDB     |
| Map angles ( $^\circ$ )              | 90.0, 90.0, 90.0    | wwPDB     |
| Pixel spacing ( $\text{\AA}$ )       | 1.1, 1.1, 1.1       | Depositor |

## 5 Model quality

### 5.1 Standard geometry

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

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

| Mol | Chain | Bond lengths |         | Bond angles |                |
|-----|-------|--------------|---------|-------------|----------------|
|     |       | RMSZ         | # Z  >5 | RMSZ        | # Z  >5        |
| 1   | A     | 0.26         | 0/3561  | 0.54        | 2/4798 (0.0%)  |
| 1   | F     | 0.27         | 0/3537  | 0.52        | 0/4767         |
| 1   | J     | 0.26         | 0/3561  | 0.52        | 0/4798         |
| 1   | N     | 0.26         | 0/3537  | 0.50        | 0/4767         |
| 2   | B     | 0.28         | 0/3535  | 0.55        | 3/4783 (0.1%)  |
| 2   | G     | 0.27         | 0/3535  | 0.50        | 0/4783         |
| 2   | K     | 0.27         | 0/3535  | 0.52        | 1/4783 (0.0%)  |
| 2   | O     | 0.26         | 0/3535  | 0.50        | 0/4783         |
| 3   | C     | 0.20         | 0/472   | 0.71        | 0/732          |
| 3   | H     | 0.21         | 0/472   | 0.73        | 0/732          |
| 3   | L     | 0.18         | 0/472   | 0.72        | 0/732          |
| 3   | P     | 0.19         | 0/472   | 0.78        | 0/732          |
| 4   | D     | 0.49         | 0/463   | 0.93        | 0/713          |
| 4   | I     | 0.51         | 0/463   | 0.94        | 0/713          |
| 4   | M     | 0.49         | 0/463   | 0.94        | 0/713          |
| 4   | Q     | 0.49         | 0/463   | 0.94        | 0/713          |
| All | All   | 0.28         | 0/32076 | 0.57        | 6/44042 (0.0%) |

There are no bond length outliers.

All (6) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms     | Z      | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-----------|--------|-------------|----------|
| 2   | B     | 23  | PRO  | CA-N-CD   | -11.98 | 94.72       | 111.50   |
| 2   | B     | 501 | LEU  | CA-CB-CG  | 7.14   | 131.72      | 115.30   |
| 2   | B     | 23  | PRO  | N-CD-CG   | -6.63  | 93.26       | 103.20   |
| 1   | A     | 14  | ASP  | CB-CG-OD2 | 6.45   | 124.11      | 118.30   |
| 2   | K     | 501 | LEU  | CA-CB-CG  | 5.58   | 128.12      | 115.30   |
| 1   | A     | 37  | LEU  | CA-CB-CG  | 5.05   | 126.92      | 115.30   |

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts ⓘ

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

| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 1   | A     | 3475  | 0        | 3476     | 124     | 0            |
| 1   | F     | 3450  | 0        | 3448     | 133     | 0            |
| 1   | J     | 3475  | 0        | 3476     | 145     | 0            |
| 1   | N     | 3450  | 0        | 3448     | 136     | 0            |
| 2   | B     | 3449  | 0        | 3469     | 117     | 0            |
| 2   | G     | 3449  | 0        | 3468     | 131     | 0            |
| 2   | K     | 3449  | 0        | 3469     | 141     | 0            |
| 2   | O     | 3449  | 0        | 3468     | 151     | 0            |
| 3   | C     | 423   | 0        | 215      | 11      | 0            |
| 3   | H     | 423   | 0        | 215      | 16      | 0            |
| 3   | L     | 423   | 0        | 215      | 23      | 0            |
| 3   | P     | 423   | 0        | 215      | 19      | 0            |
| 4   | D     | 413   | 0        | 228      | 20      | 0            |
| 4   | I     | 413   | 0        | 228      | 20      | 0            |
| 4   | M     | 413   | 0        | 228      | 18      | 0            |
| 4   | Q     | 413   | 0        | 228      | 17      | 0            |
| 5   | C     | 1     | 0        | 0        | 0       | 0            |
| 5   | H     | 1     | 0        | 0        | 0       | 0            |
| 5   | K     | 1     | 0        | 0        | 0       | 0            |
| 5   | P     | 1     | 0        | 0        | 0       | 0            |
| All | All   | 30994 | 0        | 29494    | 1090    | 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 18.

All (1090) 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) |
|------------------|-----------------|--------------------------|-------------------|
| 2:K:255:THR:HG22 | 2:K:470:CYS:H   | 1.35                     | 0.91              |
| 1:J:51:LYS:O     | 1:J:55:GLU:HB2  | 1.71                     | 0.89              |
| 2:G:426:VAL:HG11 | 2:G:472:TYR:HE2 | 1.39                     | 0.86              |
| 1:F:391:ILE:HG22 | 1:F:403:ILE:HB  | 1.56                     | 0.85              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:A:324:SER:HG   | 1:A:340:HIS:HE2  | 1.21                     | 0.85              |
| 1:F:370:ASN:HD22 | 2:G:404:PRO:HA   | 1.42                     | 0.84              |
| 2:O:41:SER:HB3   | 2:O:86:TRP:HE1   | 1.42                     | 0.84              |
| 2:O:360:HIS:HE2  | 2:O:479:THR:HG1  | 1.24                     | 0.82              |
| 1:A:308:ILE:HG12 | 1:A:375:GLU:HB3  | 1.60                     | 0.80              |
| 2:O:321:TYR:OH   | 2:O:495:GLU:OE1  | 2.00                     | 0.80              |
| 1:A:391:ILE:HG22 | 1:A:403:ILE:HB   | 1.63                     | 0.80              |
| 2:G:301:ALA:HA   | 2:G:315:GLY:HA2  | 1.62                     | 0.79              |
| 1:J:187:PHE:HB3  | 1:J:213:TYR:HB3  | 1.65                     | 0.79              |
| 1:N:300:LEU:HD21 | 1:N:383:PHE:HE2  | 1.49                     | 0.77              |
| 1:A:85:LYS:HG3   | 1:A:93:PHE:HB3   | 1.68                     | 0.75              |
| 2:O:459:ILE:HD11 | 2:O:477:PRO:HB3  | 1.69                     | 0.75              |
| 2:K:33:LEU:HD22  | 2:K:270:LYS:HD3  | 1.67                     | 0.75              |
| 2:O:255:THR:HG23 | 2:O:469:ALA:HA   | 1.70                     | 0.74              |
| 1:A:246:ILE:HD11 | 1:A:265:ILE:HD12 | 1.70                     | 0.74              |
| 1:J:314:GLN:NE2  | 1:J:364:GLN:OE1  | 2.21                     | 0.74              |
| 1:J:231:GLU:HG2  | 1:J:232:THR:HG23 | 1.71                     | 0.73              |
| 2:G:245:PHE:HD2  | 2:G:252:LEU:HD22 | 1.54                     | 0.73              |
| 4:I:10:DG:H2"    | 4:I:11:DA:H5"    | 1.69                     | 0.73              |
| 1:F:110:ILE:HG12 | 1:J:80:VAL:HG21  | 1.71                     | 0.73              |
| 2:K:9:GLU:OE1    | 2:K:407:ARG:NH1  | 2.22                     | 0.73              |
| 1:N:217:PHE:HB2  | 1:N:395:VAL:HG22 | 1.72                     | 0.72              |
| 2:K:317:VAL:HG12 | 2:K:318:GLY:H    | 1.52                     | 0.72              |
| 2:O:317:VAL:HG12 | 2:O:318:GLY:H    | 1.53                     | 0.72              |
| 2:B:364:ARG:HH21 | 4:D:12:DT:H4'    | 1.54                     | 0.72              |
| 1:J:12:PRO:HD2   | 1:J:71:ARG:HH12  | 1.55                     | 0.71              |
| 2:O:395:LYS:HE3  | 2:O:437:VAL:HB   | 1.72                     | 0.71              |
| 1:A:174:ASN:ND2  | 1:A:337:VAL:O    | 2.23                     | 0.71              |
| 1:A:306:GLU:OE1  | 1:A:382:ARG:NH1  | 2.23                     | 0.71              |
| 2:K:235:LYS:HA   | 2:K:241:PRO:HA   | 1.73                     | 0.71              |
| 2:G:236:ASN:ND2  | 2:G:240:ALA:O    | 2.23                     | 0.71              |
| 2:K:40:LYS:NZ    | 2:K:135:ARG:O    | 2.21                     | 0.71              |
| 2:O:224:LEU:HD13 | 2:O:229:LEU:HD21 | 1.72                     | 0.71              |
| 2:B:271:LEU:H    | 2:B:311:THR:HG21 | 1.56                     | 0.70              |
| 2:G:317:VAL:HG12 | 2:G:318:GLY:H    | 1.55                     | 0.70              |
| 1:A:80:VAL:HG21  | 1:J:110:ILE:HG22 | 1.73                     | 0.70              |
| 2:K:423:LEU:HD21 | 2:K:434:SER:HB3  | 1.72                     | 0.70              |
| 1:A:186:ARG:HG2  | 1:A:240:ARG:HD2  | 1.74                     | 0.70              |
| 2:K:414:ASP:OD1  | 2:K:415:GLU:N    | 2.25                     | 0.70              |
| 2:K:406:MET:HA   | 2:K:425:PHE:HB3  | 1.74                     | 0.70              |
| 1:F:79:ALA:HB2   | 1:N:114:ARG:HH11 | 1.55                     | 0.69              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:J:174:ASN:ND2  | 1:J:337:VAL:O    | 2.26                     | 0.69              |
| 1:A:50:GLU:HG2   | 1:J:110:ILE:HG23 | 1.73                     | 0.69              |
| 2:G:278:VAL:HG22 | 2:G:356:GLU:HB3  | 1.74                     | 0.69              |
| 1:A:393:LEU:HB2  | 1:A:401:ILE:HB   | 1.73                     | 0.69              |
| 2:O:248:ILE:HD12 | 3:P:2:A:H61      | 1.57                     | 0.69              |
| 1:F:283:ARG:HG3  | 1:F:296:GLU:HG3  | 1.74                     | 0.69              |
| 1:F:351:ILE:HB   | 1:F:357:GLN:HE21 | 1.58                     | 0.69              |
| 2:B:317:VAL:HG12 | 2:B:318:GLY:H    | 1.56                     | 0.69              |
| 1:N:174:ASN:ND2  | 1:N:337:VAL:O    | 2.26                     | 0.69              |
| 2:O:203:ASP:O    | 3:P:1:A:N6       | 2.24                     | 0.69              |
| 1:N:96:PRO:HG2   | 1:N:117:ALA:HA   | 1.75                     | 0.69              |
| 1:J:246:ILE:HG22 | 1:J:262:GLN:HE21 | 1.58                     | 0.69              |
| 2:B:87:GLU:OE1   | 2:B:89:GLN:NE2   | 2.26                     | 0.68              |
| 1:N:276:ARG:HG3  | 1:N:393:LEU:HA   | 1.73                     | 0.68              |
| 2:B:395:LYS:HB3  | 2:B:397:TYR:HE1  | 1.59                     | 0.68              |
| 1:F:385:SER:HA   | 1:F:391:ILE:HG13 | 1.74                     | 0.68              |
| 2:K:14:PHE:HZ    | 2:K:23:PRO:HA    | 1.59                     | 0.68              |
| 2:K:249:GLU:O    | 2:K:252:LEU:HB3  | 1.94                     | 0.68              |
| 1:N:419:PRO:HG2  | 2:O:430:GLN:HG2  | 1.76                     | 0.68              |
| 2:K:301:ALA:HA   | 2:K:315:GLY:HA2  | 1.75                     | 0.68              |
| 1:J:370:ASN:HD21 | 2:K:397:TYR:HA   | 1.59                     | 0.67              |
| 2:G:14:PHE:HZ    | 2:G:23:PRO:HA    | 1.60                     | 0.67              |
| 2:K:271:LEU:HD21 | 2:K:461:ALA:HB1  | 1.76                     | 0.67              |
| 2:O:119:THR:HG22 | 2:O:213:ARG:HH22 | 1.58                     | 0.67              |
| 1:F:110:ILE:HG22 | 1:J:76:LYS:HB3   | 1.77                     | 0.67              |
| 4:I:11:DA:H2''   | 4:I:12:DT:H5''   | 1.77                     | 0.67              |
| 1:A:5:ILE:HD13   | 1:A:30:TYR:HB3   | 1.75                     | 0.66              |
| 1:J:373:TRP:NE1  | 2:K:436:GLU:OE2  | 2.28                     | 0.66              |
| 1:F:263:ARG:NH1  | 4:I:9:DA:N3      | 2.44                     | 0.66              |
| 2:G:271:LEU:HD22 | 2:G:465:LEU:HD21 | 1.77                     | 0.66              |
| 2:O:20:CYS:SG    | 2:O:21:THR:N     | 2.68                     | 0.66              |
| 2:K:72:ARG:NH2   | 2:K:247:LYS:O    | 2.29                     | 0.66              |
| 2:O:431:SER:OG   | 4:Q:23:DT:OP2    | 2.13                     | 0.66              |
| 2:O:469:ALA:HB2  | 3:P:3:A:H4'      | 1.78                     | 0.66              |
| 2:G:114:THR:HG21 | 2:G:205:GLN:HG2  | 1.76                     | 0.66              |
| 1:J:198:PHE:O    | 1:J:209:ARG:NH2  | 2.28                     | 0.66              |
| 2:G:74:MET:O     | 2:G:254:TRP:NE1  | 2.29                     | 0.65              |
| 2:G:232:ARG:NH2  | 2:G:249:GLU:OE2  | 2.30                     | 0.65              |
| 2:B:20:CYS:SG    | 2:B:21:THR:N     | 2.70                     | 0.65              |
| 2:O:118:VAL:HG13 | 2:O:210:LEU:HD23 | 1.79                     | 0.65              |
| 1:J:167:LYS:NZ   | 1:J:168:GLU:O    | 2.30                     | 0.65              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:B:123:ASP:OD1  | 2:B:124:LYS:N    | 2.30                     | 0.65              |
| 4:M:13:DT:H2'    | 4:M:14:DA:H8     | 1.61                     | 0.65              |
| 1:J:36:ILE:HG13  | 1:J:37:LEU:HD12  | 1.79                     | 0.65              |
| 1:N:304:LYS:HD2  | 1:N:309:LYS:HB3  | 1.79                     | 0.65              |
| 4:Q:11:DA:H2''   | 4:Q:12:DT:H5''   | 1.78                     | 0.64              |
| 1:A:371:ASP:HB3  | 2:B:402:ALA:HA   | 1.78                     | 0.64              |
| 1:F:311:VAL:HG23 | 1:F:320:HIS:HD1  | 1.60                     | 0.64              |
| 1:J:196:LYS:HE3  | 3:L:19:A:H5'     | 1.79                     | 0.64              |
| 2:K:425:PHE:HA   | 2:K:432:THR:HA   | 1.79                     | 0.64              |
| 2:G:122:ASN:O    | 2:G:126:ILE:HG13 | 1.97                     | 0.64              |
| 2:O:357:VAL:HB   | 2:O:383:LEU:HB3  | 1.79                     | 0.64              |
| 1:A:9:HIS:NE2    | 1:A:35:ASP:OD1   | 2.27                     | 0.64              |
| 1:F:154:TYR:HA   | 1:F:158:PHE:HD2  | 1.63                     | 0.64              |
| 1:F:304:LYS:HE3  | 1:F:309:LYS:HG2  | 1.80                     | 0.64              |
| 2:K:236:ASN:ND2  | 2:K:240:ALA:O    | 2.31                     | 0.64              |
| 2:O:435:MET:HG3  | 2:O:436:GLU:HG3  | 1.80                     | 0.64              |
| 1:A:10:ALA:HB1   | 1:A:71:ARG:HH21  | 1.62                     | 0.64              |
| 1:J:391:ILE:HG12 | 1:J:403:ILE:HB   | 1.80                     | 0.64              |
| 2:K:119:THR:OG1  | 2:K:213:ARG:NH2  | 2.30                     | 0.64              |
| 1:A:208:ILE:HD11 | 1:A:264:LEU:HB3  | 1.79                     | 0.63              |
| 2:K:362:ARG:HG2  | 2:K:480:LEU:HD13 | 1.80                     | 0.63              |
| 1:N:186:ARG:HG2  | 1:N:240:ARG:HG2  | 1.80                     | 0.63              |
| 1:F:51:LYS:O     | 1:F:55:GLU:HB2   | 1.98                     | 0.63              |
| 1:F:284:GLU:OE1  | 1:F:284:GLU:N    | 2.30                     | 0.63              |
| 2:G:119:THR:OG1  | 2:G:213:ARG:NH2  | 2.32                     | 0.63              |
| 1:F:152:LEU:O    | 1:F:156:GLN:HG3  | 1.98                     | 0.63              |
| 1:F:186:ARG:HG2  | 1:F:240:ARG:HD2  | 1.81                     | 0.63              |
| 1:A:153:LEU:O    | 1:A:157:ILE:HG12 | 1.99                     | 0.63              |
| 2:B:271:LEU:HD13 | 2:B:465:LEU:HD21 | 1.79                     | 0.63              |
| 1:N:195:PRO:HB2  | 1:N:198:PHE:HB2  | 1.81                     | 0.63              |
| 2:B:365:PHE:HB2  | 2:B:447:LYS:HG3  | 1.80                     | 0.63              |
| 2:K:420:LEU:HB2  | 2:K:456:LEU:HD22 | 1.81                     | 0.63              |
| 2:B:270:LYS:HD3  | 2:B:310:GLY:HA2  | 1.80                     | 0.62              |
| 1:A:147:HIS:O    | 1:A:151:ASN:ND2  | 2.32                     | 0.62              |
| 1:A:271:LYS:HD2  | 1:A:275:LEU:HD23 | 1.80                     | 0.62              |
| 2:K:41:SER:HB3   | 2:K:86:TRP:HE1   | 1.63                     | 0.62              |
| 2:O:320:TRP:HB3  | 2:O:334:GLU:HB3  | 1.80                     | 0.62              |
| 2:B:126:ILE:HG22 | 2:B:130:LYS:HE2  | 1.81                     | 0.62              |
| 2:G:22:ASP:HB2   | 2:G:428:LYS:HE3  | 1.80                     | 0.62              |
| 1:A:60:PHE:HD2   | 1:A:94:ILE:HG23  | 1.65                     | 0.62              |
| 1:A:280:LYS:NZ   | 1:A:386:ASP:OD1  | 2.31                     | 0.62              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:F:175:TRP:CD1  | 1:F:336:MET:HB3  | 2.35                     | 0.62              |
| 2:K:469:ALA:HB2  | 3:L:3:A:H4'      | 1.82                     | 0.62              |
| 1:N:343:PHE:O    | 1:N:357:GLN:NE2  | 2.33                     | 0.62              |
| 4:I:13:DT:H2'    | 4:I:14:DA:H8     | 1.65                     | 0.62              |
| 2:B:420:LEU:HB2  | 2:B:456:LEU:HD22 | 1.81                     | 0.62              |
| 2:O:503:PHE:HA   | 2:O:506:TYR:HD2  | 1.65                     | 0.61              |
| 1:N:159:LEU:HD21 | 2:O:428:LYS:HG3  | 1.82                     | 0.61              |
| 3:P:11:A:H2'     | 3:P:12:A:C8      | 2.35                     | 0.61              |
| 1:A:187:PHE:O    | 1:A:238:SER:HA   | 2.00                     | 0.61              |
| 1:J:85:LYS:HG3   | 1:J:93:PHE:HB3   | 1.80                     | 0.61              |
| 1:J:263:ARG:NH1  | 4:M:9:DA:N3      | 2.48                     | 0.61              |
| 2:B:320:TRP:HB3  | 2:B:334:GLU:HB3  | 1.82                     | 0.61              |
| 2:K:271:LEU:HB2  | 2:K:465:LEU:HD21 | 1.82                     | 0.61              |
| 1:A:50:GLU:OE1   | 1:J:70:LYS:NZ    | 2.33                     | 0.61              |
| 2:B:12:ILE:HD11  | 2:B:23:PRO:HD3   | 1.81                     | 0.61              |
| 2:B:365:PHE:O    | 2:B:447:LYS:NZ   | 2.33                     | 0.61              |
| 2:K:34:ASN:O     | 2:K:261:TYR:OH   | 2.19                     | 0.61              |
| 2:K:468:ASN:HB2  | 2:K:507:ILE:HD12 | 1.83                     | 0.61              |
| 1:J:277:MET:HA   | 1:J:280:LYS:HB2  | 1.83                     | 0.61              |
| 1:F:135:PHE:HA   | 1:F:138:GLN:HB2  | 1.83                     | 0.61              |
| 1:J:308:ILE:HG12 | 1:J:375:GLU:HB2  | 1.83                     | 0.60              |
| 4:Q:10:DG:H2''   | 4:Q:11:DA:H5''   | 1.81                     | 0.60              |
| 1:N:265:ILE:HA   | 1:N:268:LEU:HD12 | 1.83                     | 0.60              |
| 1:A:294:TRP:HZ2  | 1:A:350:LEU:HD11 | 1.66                     | 0.60              |
| 2:K:423:LEU:HG   | 2:K:433:LEU:HB2  | 1.83                     | 0.60              |
| 1:N:393:LEU:HB2  | 1:N:401:ILE:HB   | 1.83                     | 0.60              |
| 2:O:422:THR:HG22 | 2:O:460:LEU:HD12 | 1.83                     | 0.60              |
| 4:I:9:DA:H2'     | 4:I:10:DG:C8     | 2.36                     | 0.60              |
| 1:F:309:LYS:O    | 1:F:376:LYS:NZ   | 2.25                     | 0.60              |
| 1:F:112:ILE:HA   | 1:F:115:LEU:HD23 | 1.83                     | 0.60              |
| 1:A:385:SER:HA   | 1:A:391:ILE:HG13 | 1.83                     | 0.60              |
| 1:F:361:ARG:NH1  | 2:G:436:GLU:OE2  | 2.35                     | 0.60              |
| 1:F:393:LEU:HB2  | 1:F:401:ILE:HB   | 1.84                     | 0.60              |
| 2:G:54:LYS:HG2   | 2:G:88:SER:HB2   | 1.84                     | 0.60              |
| 1:N:173:SER:HA   | 2:O:396:LEU:HA   | 1.84                     | 0.60              |
| 2:O:235:LYS:HA   | 2:O:241:PRO:HA   | 1.83                     | 0.60              |
| 4:Q:8:DT:H2'     | 4:Q:9:DA:H8      | 1.67                     | 0.60              |
| 2:O:495:GLU:OE2  | 2:O:496:ILE:N    | 2.35                     | 0.60              |
| 2:G:384:VAL:HG21 | 2:G:450:ALA:HB2  | 1.84                     | 0.59              |
| 2:K:466:ASN:HA   | 2:K:478:VAL:HG21 | 1.84                     | 0.59              |
| 2:O:365:PHE:O    | 2:O:447:LYS:NZ   | 2.30                     | 0.59              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:N:78:LEU:O     | 1:N:82:THR:HG23  | 2.02                     | 0.59              |
| 1:A:341:ILE:HD12 | 1:A:361:ARG:HD2  | 1.83                     | 0.59              |
| 1:F:77:GLU:HA    | 1:N:110:ILE:HD11 | 1.83                     | 0.59              |
| 2:G:319:PRO:HD3  | 2:G:490:LEU:HD13 | 1.84                     | 0.59              |
| 2:O:439:ASN:ND2  | 3:P:7:C:OP2      | 2.29                     | 0.59              |
| 2:B:13:LEU:HA    | 2:B:19:LYS:HA    | 1.84                     | 0.59              |
| 1:F:124:TRP:CE2  | 2:G:63:PRO:HG3   | 2.37                     | 0.59              |
| 1:F:175:TRP:HB3  | 1:F:334:VAL:HG21 | 1.85                     | 0.59              |
| 4:I:14:DA:H2'    | 4:I:15:DG:H8     | 1.65                     | 0.59              |
| 1:F:195:PRO:O    | 1:F:209:ARG:NH2  | 2.35                     | 0.59              |
| 4:M:13:DT:H2'    | 4:M:14:DA:C8     | 2.37                     | 0.59              |
| 1:F:173:SER:HA   | 2:G:396:LEU:HA   | 1.83                     | 0.59              |
| 1:A:162:LYS:HB3  | 2:B:428:LYS:HA   | 1.85                     | 0.59              |
| 1:A:309:LYS:O    | 1:A:376:LYS:NZ   | 2.27                     | 0.59              |
| 2:G:317:VAL:HG13 | 2:G:490:LEU:HD11 | 1.83                     | 0.59              |
| 2:G:425:PHE:HA   | 2:G:432:THR:HA   | 1.85                     | 0.59              |
| 2:K:280:TYR:HA   | 2:K:358:PHE:HB3  | 1.84                     | 0.59              |
| 2:K:365:PHE:O    | 2:K:447:LYS:NZ   | 2.34                     | 0.59              |
| 2:G:64:ILE:HG23  | 2:G:250:GLY:HA2  | 1.85                     | 0.59              |
| 2:G:439:ASN:ND2  | 3:H:7:C:OP2      | 2.30                     | 0.58              |
| 2:B:469:ALA:HB2  | 3:C:3:A:H4'      | 1.85                     | 0.58              |
| 1:N:59:LYS:NZ    | 1:N:92:MET:O     | 2.29                     | 0.58              |
| 2:O:485:LYS:HD3  | 2:O:507:ILE:HG22 | 1.85                     | 0.58              |
| 4:Q:7:DA:H2''    | 4:Q:8:DT:H5'     | 1.85                     | 0.58              |
| 1:N:15:ASP:O     | 1:N:19:ARG:HG2   | 2.04                     | 0.58              |
| 2:O:285:TYR:HB3  | 2:O:296:ASN:HD21 | 1.68                     | 0.58              |
| 4:Q:13:DT:H2'    | 4:Q:14:DA:H8     | 1.67                     | 0.58              |
| 1:A:189:ARG:HB3  | 1:A:237:GLU:HB3  | 1.85                     | 0.58              |
| 1:F:82:THR:HG21  | 1:F:111:GLU:OE1  | 2.02                     | 0.58              |
| 1:A:78:LEU:O     | 1:A:82:THR:HG23  | 2.03                     | 0.58              |
| 2:B:119:THR:OG1  | 2:B:213:ARG:NH2  | 2.32                     | 0.58              |
| 2:K:317:VAL:HG22 | 2:K:486:ILE:HD12 | 1.86                     | 0.58              |
| 1:N:381:ILE:HG23 | 1:N:391:ILE:HD11 | 1.86                     | 0.58              |
| 2:G:365:PHE:O    | 2:G:447:LYS:NZ   | 2.36                     | 0.58              |
| 1:A:276:ARG:NH1  | 1:A:279:ASP:OD2  | 2.35                     | 0.58              |
| 2:B:427:PRO:O    | 2:B:430:GLN:NE2  | 2.36                     | 0.58              |
| 1:J:324:SER:OG   | 1:J:338:SER:OG   | 2.22                     | 0.58              |
| 2:O:339:LEU:O    | 2:O:343:LEU:HG   | 2.04                     | 0.58              |
| 2:B:122:ASN:O    | 2:B:126:ILE:HD12 | 2.03                     | 0.58              |
| 1:J:200:VAL:HG11 | 1:J:209:ARG:HB2  | 1.86                     | 0.58              |
| 1:J:92:MET:HB3   | 1:J:138:GLN:HE22 | 1.69                     | 0.57              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:N:371:ASP:HA   | 1:N:374:ARG:HH12 | 1.69                     | 0.57              |
| 2:O:493:SER:OG   | 2:O:494:THR:N    | 2.37                     | 0.57              |
| 1:N:277:MET:HG2  | 1:N:293:TYR:CD2  | 2.38                     | 0.57              |
| 3:P:11:A:H2'     | 3:P:12:A:H8      | 1.69                     | 0.57              |
| 4:I:7:DA:H2''    | 4:I:8:DT:H5'     | 1.87                     | 0.57              |
| 4:M:8:DT:H2'     | 4:M:9:DA:H8      | 1.70                     | 0.57              |
| 2:B:317:VAL:HG13 | 2:B:490:LEU:HD11 | 1.86                     | 0.57              |
| 4:D:14:DA:H2'    | 4:D:15:DG:C8     | 2.39                     | 0.57              |
| 2:B:245:PHE:HD1  | 2:B:252:LEU:HD22 | 1.69                     | 0.57              |
| 2:G:41:SER:HB3   | 2:G:86:TRP:HE1   | 1.69                     | 0.57              |
| 4:D:7:DA:H2''    | 4:D:8:DT:H5'     | 1.85                     | 0.57              |
| 2:B:33:LEU:HD21  | 2:B:270:LYS:HE2  | 1.86                     | 0.57              |
| 2:B:314:LYS:HD2  | 2:G:131:ASN:HB3  | 1.86                     | 0.57              |
| 1:F:217:PHE:HB2  | 1:F:395:VAL:HG22 | 1.85                     | 0.57              |
| 2:G:57:LEU:HB3   | 2:G:88:SER:HB3   | 1.86                     | 0.57              |
| 2:G:449:GLU:N    | 2:G:449:GLU:OE2  | 2.37                     | 0.57              |
| 4:M:10:DG:H2''   | 4:M:11:DA:H5''   | 1.87                     | 0.57              |
| 1:J:265:ILE:HA   | 1:J:268:LEU:HD12 | 1.85                     | 0.57              |
| 2:O:47:GLN:NE2   | 2:O:95:GLU:OE2   | 2.36                     | 0.57              |
| 1:F:362:ARG:NH1  | 3:H:6:G:O2'      | 2.37                     | 0.57              |
| 1:A:167:LYS:HG2  | 1:A:415:SER:HB3  | 1.85                     | 0.57              |
| 1:A:253:THR:HG22 | 1:A:255:PHE:H    | 1.70                     | 0.57              |
| 1:N:385:SER:OG   | 1:N:405:ASN:OD1  | 2.22                     | 0.57              |
| 1:A:10:ALA:HB3   | 1:A:14:ASP:HB3   | 1.87                     | 0.57              |
| 1:N:9:HIS:CD2    | 1:N:18:THR:HG21  | 2.40                     | 0.57              |
| 2:B:4:LEU:HD11   | 2:B:396:LEU:HD21 | 1.85                     | 0.56              |
| 1:N:411:PHE:HE2  | 1:N:413:LYS:HE3  | 1.69                     | 0.56              |
| 2:O:203:ASP:HB2  | 2:O:206:PHE:HB2  | 1.87                     | 0.56              |
| 1:F:80:VAL:O     | 1:F:84:VAL:HG23  | 2.04                     | 0.56              |
| 4:M:7:DA:H2''    | 4:M:8:DT:H5'     | 1.87                     | 0.56              |
| 1:F:60:PHE:HD2   | 1:F:94:ILE:HG23  | 1.70                     | 0.56              |
| 1:J:173:SER:HA   | 2:K:396:LEU:HA   | 1.88                     | 0.56              |
| 2:K:215:LEU:HD12 | 2:K:496:ILE:HD13 | 1.87                     | 0.56              |
| 4:D:14:DA:H2'    | 4:D:15:DG:H8     | 1.69                     | 0.56              |
| 4:D:9:DA:H2'     | 4:D:10:DG:C8     | 2.40                     | 0.56              |
| 1:A:9:HIS:CD2    | 1:A:18:THR:HG21  | 2.41                     | 0.56              |
| 2:K:407:ARG:NE   | 2:K:422:THR:O    | 2.38                     | 0.56              |
| 3:L:11:A:H2'     | 3:L:12:A:C8      | 2.40                     | 0.56              |
| 2:B:264:ALA:O    | 2:G:135:ARG:NE   | 2.33                     | 0.56              |
| 1:F:219:TRP:NE1  | 1:F:220:GLU:OE2  | 2.38                     | 0.56              |
| 1:F:286:GLN:OE1  | 1:F:286:GLN:N    | 2.39                     | 0.56              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:O:453:GLN:OE1  | 2:O:453:GLN:N    | 2.37                     | 0.56              |
| 2:K:113:ARG:NH1  | 2:K:116:ASP:OD1  | 2.39                     | 0.56              |
| 1:J:193:ARG:HA   | 1:J:229:LYS:HE3  | 1.87                     | 0.56              |
| 1:F:370:ASN:HD21 | 2:G:398:LYS:N    | 2.04                     | 0.56              |
| 1:N:125:ALA:HB2  | 2:O:80:ALA:HA    | 1.87                     | 0.56              |
| 4:Q:13:DT:H2'    | 4:Q:14:DA:C8     | 2.41                     | 0.56              |
| 1:A:7:ILE:HG12   | 1:A:61:LEU:HD12  | 1.87                     | 0.56              |
| 1:F:189:ARG:HB3  | 1:F:237:GLU:HB3  | 1.88                     | 0.56              |
| 2:K:500:PRO:HA   | 2:O:130:LYS:HG2  | 1.87                     | 0.56              |
| 4:D:15:DG:H2'    | 4:D:16:DA:C8     | 2.41                     | 0.56              |
| 1:F:23:LEU:HD13  | 2:G:29:LEU:HD11  | 1.87                     | 0.55              |
| 1:J:16:ASP:OD1   | 1:J:16:ASP:N     | 2.38                     | 0.55              |
| 1:J:175:TRP:HB3  | 1:J:334:VAL:HG21 | 1.86                     | 0.55              |
| 1:N:344:THR:HG22 | 1:N:350:LEU:HA   | 1.87                     | 0.55              |
| 2:K:46:THR:HG22  | 2:K:48:LYS:H     | 1.71                     | 0.55              |
| 1:A:371:ASP:O    | 1:A:375:GLU:HG3  | 2.07                     | 0.55              |
| 2:G:482:PHE:O    | 2:G:486:ILE:HG23 | 2.06                     | 0.55              |
| 1:J:96:PRO:HG2   | 1:J:117:ALA:HA   | 1.88                     | 0.55              |
| 2:G:210:LEU:HD22 | 2:G:223:ILE:HD11 | 1.89                     | 0.55              |
| 2:G:255:THR:HG23 | 2:G:469:ALA:HA   | 1.89                     | 0.55              |
| 1:J:4:LYS:O      | 1:J:58:CYS:N     | 2.31                     | 0.55              |
| 1:J:64:SER:HB2   | 1:J:98:ALA:HA    | 1.89                     | 0.55              |
| 3:H:3:A:H2'      | 3:H:4:C:C6       | 2.42                     | 0.55              |
| 2:B:54:LYS:HG2   | 2:B:88:SER:HB2   | 1.88                     | 0.55              |
| 2:G:322:ASN:ND2  | 2:G:329:HIS:O    | 2.39                     | 0.55              |
| 1:J:287:MET:SD   | 1:J:287:MET:N    | 2.80                     | 0.55              |
| 2:O:340:THR:O    | 2:O:344:GLU:HG2  | 2.07                     | 0.55              |
| 2:O:384:VAL:HG11 | 2:O:450:ALA:HB2  | 1.89                     | 0.55              |
| 3:P:12:A:H2'     | 3:P:13:U:H6      | 1.71                     | 0.55              |
| 1:A:62:ILE:HD11  | 1:A:78:LEU:HD13  | 1.89                     | 0.55              |
| 2:G:484:ASN:O    | 2:G:488:GLU:HG3  | 2.07                     | 0.55              |
| 1:J:62:ILE:HD12  | 1:J:112:ILE:HD11 | 1.89                     | 0.55              |
| 1:J:78:LEU:HD21  | 1:J:111:GLU:HB3  | 1.89                     | 0.55              |
| 1:J:319:TRP:HB3  | 1:J:343:PHE:CE1  | 2.42                     | 0.55              |
| 1:N:302:LYS:HE2  | 1:N:304:LYS:HG3  | 1.87                     | 0.55              |
| 3:H:15:U:O4      | 3:H:16:A:N6      | 2.39                     | 0.55              |
| 1:N:80:VAL:O     | 1:N:84:VAL:HG12  | 2.07                     | 0.55              |
| 1:A:227:LEU:O    | 1:A:230:THR:OG1  | 2.25                     | 0.55              |
| 1:F:112:ILE:HD12 | 1:F:115:LEU:HD23 | 1.89                     | 0.55              |
| 2:K:322:ASN:ND2  | 2:K:329:HIS:O    | 2.40                     | 0.55              |
| 1:N:290:THR:OG1  | 1:N:291:PHE:N    | 2.40                     | 0.55              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 4:I:12:DT:H2''   | 4:I:13:DT:H5''   | 1.89                     | 0.55              |
| 1:J:268:LEU:HA   | 1:J:271:LYS:HZ3  | 1.71                     | 0.54              |
| 1:J:314:GLN:O    | 1:J:314:GLN:HG2  | 2.07                     | 0.54              |
| 2:K:271:LEU:H    | 2:K:311:THR:HG21 | 1.72                     | 0.54              |
| 2:O:118:VAL:HG22 | 2:O:210:LEU:HG   | 1.88                     | 0.54              |
| 4:D:13:DT:H2'    | 4:D:14:DA:H8     | 1.70                     | 0.54              |
| 4:I:13:DT:H2'    | 4:I:14:DA:C8     | 2.42                     | 0.54              |
| 1:F:162:LYS:HD2  | 1:F:162:LYS:O    | 2.06                     | 0.54              |
| 2:G:215:LEU:HD22 | 2:G:500:PRO:HG2  | 1.89                     | 0.54              |
| 1:J:294:TRP:CD1  | 1:J:342:ILE:HD13 | 2.42                     | 0.54              |
| 4:I:15:DG:H2'    | 4:I:16:DA:C8     | 2.42                     | 0.54              |
| 2:K:123:ASP:OD1  | 2:K:124:LYS:N    | 2.41                     | 0.54              |
| 1:F:327:GLY:HA2  | 1:F:335:LEU:HA   | 1.89                     | 0.54              |
| 1:N:321:PHE:HE1  | 1:N:339:SER:HB3  | 1.72                     | 0.54              |
| 2:O:317:VAL:HG12 | 2:O:499:PRO:HG2  | 1.89                     | 0.54              |
| 1:J:175:TRP:CE2  | 2:K:394:LEU:HD13 | 2.43                     | 0.54              |
| 1:N:9:HIS:CE1    | 1:N:11:THR:HA    | 2.43                     | 0.54              |
| 2:O:23:PRO:HD2   | 2:O:472:TYR:HA   | 1.90                     | 0.54              |
| 1:A:53:ILE:HD11  | 1:A:77:GLU:HG2   | 1.90                     | 0.54              |
| 2:B:130:LYS:HG2  | 2:G:218:THR:HG21 | 1.90                     | 0.54              |
| 1:F:173:SER:OG   | 1:F:408:LEU:O    | 2.24                     | 0.54              |
| 2:G:317:VAL:HG21 | 2:G:501:LEU:HA   | 1.90                     | 0.54              |
| 2:K:317:VAL:HG13 | 2:K:490:LEU:HD11 | 1.89                     | 0.54              |
| 1:A:290:THR:OG1  | 1:A:291:PHE:N    | 2.41                     | 0.54              |
| 2:G:325:LYS:HE3  | 3:H:12:A:H4'     | 1.90                     | 0.54              |
| 1:J:73:GLY:O     | 1:J:77:GLU:HG3   | 2.08                     | 0.54              |
| 3:C:15:U:O4      | 3:C:16:A:N6      | 2.41                     | 0.54              |
| 4:I:14:DA:H2'    | 4:I:15:DG:C8     | 2.43                     | 0.54              |
| 2:G:416:LYS:HD2  | 2:G:445:ILE:HB   | 1.90                     | 0.53              |
| 2:K:484:ASN:O    | 2:K:488:GLU:HG3  | 2.08                     | 0.53              |
| 2:O:420:LEU:HB2  | 2:O:456:LEU:HD22 | 1.90                     | 0.53              |
| 1:A:22:SER:O     | 1:A:26:ILE:HD12  | 2.08                     | 0.53              |
| 1:A:187:PHE:CD2  | 1:A:215:CYS:HB3  | 2.44                     | 0.53              |
| 1:N:276:ARG:HH12 | 1:N:280:LYS:HE3  | 1.73                     | 0.53              |
| 2:B:224:LEU:HD13 | 2:B:229:LEU:HD11 | 1.91                     | 0.53              |
| 1:J:7:ILE:HG12   | 1:J:61:LEU:HD12  | 1.90                     | 0.53              |
| 1:N:364:GLN:HG3  | 1:N:368:TRP:NE1  | 2.24                     | 0.53              |
| 1:A:314:GLN:NE2  | 1:A:364:GLN:OE1  | 2.41                     | 0.53              |
| 2:K:13:LEU:HD12  | 2:K:19:LYS:HG2   | 1.90                     | 0.53              |
| 1:N:339:SER:HB2  | 1:N:373:TRP:CZ3  | 2.43                     | 0.53              |
| 1:A:115:LEU:HD12 | 1:A:116:ASN:H    | 1.73                     | 0.53              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:A:330:TYR:OH   | 2:B:417:LYS:HD3  | 2.08                     | 0.53              |
| 2:B:317:VAL:HG22 | 2:B:486:ILE:HD12 | 1.90                     | 0.53              |
| 1:J:172:ASP:O    | 2:K:397:TYR:N    | 2.38                     | 0.53              |
| 1:N:198:PHE:HE2  | 1:N:203:LEU:HD13 | 1.74                     | 0.53              |
| 2:O:258:THR:O    | 2:O:262:TYR:N    | 2.42                     | 0.53              |
| 2:O:482:PHE:HB3  | 2:O:503:PHE:CE1  | 2.44                     | 0.53              |
| 1:A:160:HIS:HA   | 2:B:428:LYS:HE2  | 1.89                     | 0.53              |
| 1:F:187:PHE:O    | 1:F:238:SER:HA   | 2.09                     | 0.53              |
| 2:G:34:ASN:O     | 2:G:261:TYR:OH   | 2.26                     | 0.53              |
| 1:J:176:PHE:CE2  | 1:J:407:PRO:HD3  | 2.43                     | 0.53              |
| 1:J:330:TYR:HB3  | 1:J:331:PRO:HD3  | 1.89                     | 0.53              |
| 2:K:72:ARG:NH2   | 4:M:22:DT:OP2    | 2.42                     | 0.53              |
| 1:N:263:ARG:NH1  | 4:Q:9:DA:N3      | 2.57                     | 0.53              |
| 1:N:362:ARG:NH2  | 2:O:435:MET:SD   | 2.81                     | 0.53              |
| 2:B:493:SER:OG   | 2:B:494:THR:N    | 2.40                     | 0.53              |
| 1:F:416:TYR:CD1  | 2:G:406:MET:HB2  | 2.42                     | 0.53              |
| 1:N:339:SER:HB2  | 1:N:373:TRP:HZ3  | 1.73                     | 0.53              |
| 2:O:406:MET:HA   | 2:O:425:PHE:HB3  | 1.90                     | 0.53              |
| 2:B:482:PHE:O    | 2:B:486:ILE:HG23 | 2.09                     | 0.53              |
| 1:F:183:ASN:OD1  | 1:F:183:ASN:N    | 2.41                     | 0.53              |
| 2:G:243:ARG:HB3  | 2:G:245:PHE:CE1  | 2.44                     | 0.53              |
| 2:K:248:ILE:HG23 | 4:M:21:DT:H2''   | 1.90                     | 0.53              |
| 1:N:177:PRO:HD3  | 1:N:408:LEU:HD12 | 1.91                     | 0.53              |
| 2:B:370:TRP:CE2  | 2:B:447:LYS:HB3  | 2.45                     | 0.53              |
| 1:N:321:PHE:HE2  | 1:N:380:PHE:HB2  | 1.74                     | 0.53              |
| 4:M:11:DA:H2''   | 4:M:12:DT:H5''   | 1.91                     | 0.53              |
| 4:M:16:DA:H2'    | 4:M:17:DG:C8     | 2.44                     | 0.53              |
| 4:Q:9:DA:H2'     | 4:Q:10:DG:C8     | 2.44                     | 0.52              |
| 1:A:385:SER:OG   | 1:A:405:ASN:ND2  | 2.23                     | 0.52              |
| 2:B:57:LEU:HB3   | 2:B:88:SER:HB3   | 1.90                     | 0.52              |
| 1:F:271:LYS:O    | 1:F:275:LEU:HD12 | 2.09                     | 0.52              |
| 2:G:77:GLY:O     | 2:G:81:VAL:HG23  | 2.09                     | 0.52              |
| 3:P:3:A:H2'      | 3:P:4:C:C6       | 2.43                     | 0.52              |
| 2:O:410:ALA:HB2  | 2:O:420:LEU:HD13 | 1.91                     | 0.52              |
| 2:B:220:PRO:HD3  | 2:B:505:TYR:HE1  | 1.74                     | 0.52              |
| 2:B:248:ILE:HG12 | 2:B:251:HIS:HB3  | 1.91                     | 0.52              |
| 1:F:79:ALA:O     | 1:F:82:THR:HG22  | 2.09                     | 0.52              |
| 1:F:290:THR:HG22 | 1:F:291:PHE:H    | 1.75                     | 0.52              |
| 2:K:320:TRP:HB3  | 2:K:334:GLU:HB3  | 1.90                     | 0.52              |
| 2:K:434:SER:HB2  | 3:L:5:G:O2'      | 2.09                     | 0.52              |
| 1:N:72:GLU:O     | 1:N:76:LYS:HG3   | 2.08                     | 0.52              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:F:196:LYS:HE3  | 3:H:19:A:H5'     | 1.90                     | 0.52              |
| 2:B:458:ASP:O    | 2:B:462:LEU:HG   | 2.10                     | 0.52              |
| 2:G:469:ALA:HB2  | 3:H:3:A:H4'      | 1.92                     | 0.52              |
| 2:O:317:VAL:HG22 | 2:O:486:ILE:HD12 | 1.92                     | 0.52              |
| 4:M:9:DA:H2'     | 4:M:10:DG:C8     | 2.43                     | 0.52              |
| 1:N:344:THR:HA   | 1:N:351:ILE:HG13 | 1.91                     | 0.52              |
| 1:F:323:ILE:HG12 | 1:F:380:PHE:CE1  | 2.45                     | 0.52              |
| 1:J:101:GLU:HA   | 1:J:121:LYS:HE3  | 1.92                     | 0.52              |
| 2:K:455:VAL:O    | 2:K:459:ILE:HG12 | 2.10                     | 0.52              |
| 1:N:9:HIS:HE1    | 1:N:11:THR:HA    | 1.75                     | 0.52              |
| 2:O:55:SER:O     | 2:O:59:LYS:HG2   | 2.10                     | 0.52              |
| 4:I:16:DA:H2'    | 4:I:17:DG:C8     | 2.44                     | 0.52              |
| 1:J:22:SER:O     | 1:J:26:ILE:HD12  | 2.10                     | 0.51              |
| 1:J:207:ALA:H    | 1:J:271:LYS:HE2  | 1.73                     | 0.51              |
| 1:N:416:TYR:CD1  | 2:O:406:MET:HB3  | 2.45                     | 0.51              |
| 2:K:203:ASP:O    | 3:L:1:A:N6       | 2.31                     | 0.51              |
| 2:O:336:LYS:HG2  | 2:O:376:VAL:HB   | 1.93                     | 0.51              |
| 1:A:33:TRP:CE2   | 1:A:52:GLU:HG3   | 2.44                     | 0.51              |
| 1:A:303:ASP:HB3  | 1:A:311:VAL:HG22 | 1.93                     | 0.51              |
| 2:B:34:ASN:O     | 2:B:261:TYR:OH   | 2.29                     | 0.51              |
| 1:J:206:PRO:HG3  | 1:J:272:ALA:HB2  | 1.90                     | 0.51              |
| 2:B:404:PRO:HD3  | 4:D:23:DT:O4     | 2.11                     | 0.51              |
| 1:F:341:ILE:HB   | 1:F:361:ARG:HG2  | 1.91                     | 0.51              |
| 1:F:343:PHE:O    | 1:F:357:GLN:NE2  | 2.40                     | 0.51              |
| 2:G:360:HIS:NE2  | 2:G:479:THR:OG1  | 2.30                     | 0.51              |
| 2:G:493:SER:OG   | 2:G:494:THR:N    | 2.42                     | 0.51              |
| 2:K:130:LYS:HD2  | 2:O:500:PRO:HA   | 1.92                     | 0.51              |
| 1:N:351:ILE:HB   | 1:N:357:GLN:HE21 | 1.75                     | 0.51              |
| 1:A:195:PRO:O    | 1:A:209:ARG:NH2  | 2.43                     | 0.51              |
| 2:B:205:GLN:N    | 2:B:205:GLN:OE1  | 2.44                     | 0.51              |
| 1:N:266:VAL:HA   | 1:N:269:ILE:HD12 | 1.92                     | 0.51              |
| 2:O:397:TYR:HE1  | 2:O:437:VAL:HG21 | 1.75                     | 0.51              |
| 2:B:285:TYR:CE1  | 2:B:298:CYS:HB2  | 2.46                     | 0.51              |
| 1:F:132:LEU:O    | 1:F:136:GLU:HB2  | 2.11                     | 0.51              |
| 1:J:9:HIS:ND1    | 1:J:18:THR:HG21  | 2.24                     | 0.51              |
| 2:K:77:GLY:O     | 2:K:81:VAL:HG23  | 2.09                     | 0.51              |
| 1:F:84:VAL:O     | 1:F:88:LEU:HD12  | 2.09                     | 0.51              |
| 2:G:66:ASN:ND2   | 2:G:73:PRO:O     | 2.44                     | 0.51              |
| 2:O:364:ARG:NH2  | 2:O:444:GLU:OE1  | 2.43                     | 0.51              |
| 2:O:122:ASN:HD21 | 2:O:214:LEU:HG   | 1.76                     | 0.51              |
| 2:B:235:LYS:HA   | 2:B:241:PRO:HA   | 1.93                     | 0.51              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:F:46:TRP:HE3   | 1:N:110:ILE:HG21 | 1.76                     | 0.51              |
| 2:K:324:GLU:HB2  | 2:K:327:GLU:HB3  | 1.93                     | 0.51              |
| 3:L:3:A:H2'      | 3:L:4:C:C6       | 2.46                     | 0.51              |
| 1:A:358:HIS:NE2  | 4:D:18:DC:O2     | 2.29                     | 0.51              |
| 1:F:371:ASP:HB3  | 2:G:402:ALA:HA   | 1.92                     | 0.51              |
| 2:B:406:MET:HA   | 2:B:425:PHE:HB3  | 1.93                     | 0.50              |
| 2:G:485:LYS:HD3  | 2:G:507:ILE:HG22 | 1.92                     | 0.50              |
| 2:K:11:SER:HB3   | 2:K:19:LYS:HB3   | 1.92                     | 0.50              |
| 2:K:282:GLY:HA2  | 2:K:360:HIS:O    | 2.10                     | 0.50              |
| 2:O:496:ILE:HG13 | 2:O:496:ILE:O    | 2.11                     | 0.50              |
| 3:L:8:U:H2'      | 3:L:9:C:C6       | 2.45                     | 0.50              |
| 2:B:74:MET:O     | 2:B:254:TRP:NE1  | 2.41                     | 0.50              |
| 2:B:362:ARG:HG2  | 2:B:480:LEU:HD13 | 1.94                     | 0.50              |
| 2:G:324:GLU:HB2  | 2:G:327:GLU:HB3  | 1.93                     | 0.50              |
| 2:K:370:TRP:CD1  | 2:K:447:LYS:HD2  | 2.46                     | 0.50              |
| 2:K:493:SER:OG   | 2:K:494:THR:N    | 2.44                     | 0.50              |
| 1:F:172:ASP:O    | 2:G:397:TYR:N    | 2.36                     | 0.50              |
| 1:F:206:PRO:HB2  | 1:F:268:LEU:HD23 | 1.94                     | 0.50              |
| 2:G:343:LEU:HB3  | 2:G:353:TYR:HE1  | 1.76                     | 0.50              |
| 1:J:309:LYS:O    | 1:J:376:LYS:HE3  | 2.11                     | 0.50              |
| 1:J:311:VAL:HG23 | 1:J:320:HIS:HD2  | 1.76                     | 0.50              |
| 1:J:344:THR:HG22 | 1:J:350:LEU:HA   | 1.93                     | 0.50              |
| 3:L:2:A:H2'      | 3:L:3:A:O4'      | 2.12                     | 0.50              |
| 3:L:15:U:O4      | 3:L:16:A:N6      | 2.44                     | 0.50              |
| 1:F:131:LEU:HG   | 1:F:135:PHE:CZ   | 2.46                     | 0.50              |
| 2:G:271:LEU:HD13 | 2:G:465:LEU:HD11 | 1.93                     | 0.50              |
| 2:G:466:ASN:HA   | 2:G:478:VAL:HG21 | 1.93                     | 0.50              |
| 1:J:273:PHE:O    | 1:J:277:MET:HG2  | 2.12                     | 0.50              |
| 3:C:4:C:H2'      | 3:C:5:G:O4'      | 2.11                     | 0.50              |
| 1:A:71:ARG:HG3   | 1:A:71:ARG:HH11  | 1.77                     | 0.50              |
| 1:A:181:PHE:HE1  | 1:A:401:ILE:HD13 | 1.76                     | 0.50              |
| 2:O:143:VAL:HG23 | 2:O:225:ARG:HA   | 1.94                     | 0.50              |
| 1:F:371:ASP:OD1  | 1:F:372:LYS:N    | 2.45                     | 0.50              |
| 2:G:11:SER:HB2   | 2:G:19:LYS:HB2   | 1.93                     | 0.50              |
| 1:J:217:PHE:HE1  | 1:J:243:THR:HG21 | 1.77                     | 0.50              |
| 2:B:251:HIS:O    | 2:B:254:TRP:HB2  | 2.12                     | 0.50              |
| 2:K:283:LEU:HD23 | 2:K:283:LEU:H    | 1.77                     | 0.50              |
| 1:A:47:SER:O     | 1:A:50:GLU:HB2   | 2.11                     | 0.50              |
| 1:N:382:ARG:NH1  | 1:N:405:ASN:HB3  | 2.27                     | 0.50              |
| 1:N:388:GLN:O    | 1:N:405:ASN:ND2  | 2.42                     | 0.50              |
| 1:A:283:ARG:NH1  | 1:A:348:ILE:O    | 2.44                     | 0.50              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:B:255:THR:HG22 | 2:B:470:CYS:H    | 1.76                     | 0.50              |
| 2:K:224:LEU:HD23 | 2:K:229:LEU:HD21 | 1.93                     | 0.50              |
| 2:K:404:PRO:HD2  | 2:K:432:THR:HG21 | 1.93                     | 0.50              |
| 1:N:343:PHE:HZ   | 1:N:364:GLN:HB2  | 1.75                     | 0.50              |
| 2:O:50:LEU:HD13  | 2:O:93:PHE:CD1   | 2.47                     | 0.50              |
| 2:O:414:ASP:OD1  | 2:O:415:GLU:N    | 2.41                     | 0.50              |
| 1:F:308:ILE:HG12 | 1:F:375:GLU:HB2  | 1.94                     | 0.49              |
| 1:N:76:LYS:O     | 1:N:80:VAL:HG12  | 2.11                     | 0.49              |
| 2:O:245:PHE:HD2  | 2:O:252:LEU:HD22 | 1.77                     | 0.49              |
| 2:O:339:LEU:HD21 | 2:O:383:LEU:HD22 | 1.94                     | 0.49              |
| 1:A:260:GLU:O    | 1:A:264:LEU:HG   | 2.13                     | 0.49              |
| 1:J:179:ILE:HD11 | 1:J:404:SER:HA   | 1.93                     | 0.49              |
| 4:Q:12:DT:H2''   | 4:Q:13:DT:H5''   | 1.93                     | 0.49              |
| 4:Q:16:DA:H2'    | 4:Q:17:DG:H8     | 1.77                     | 0.49              |
| 1:J:203:LEU:HD22 | 1:J:207:ALA:HB3  | 1.94                     | 0.49              |
| 2:G:211:LYS:HZ3  | 2:G:223:ILE:HD12 | 1.77                     | 0.49              |
| 2:O:118:VAL:HG21 | 2:O:209:GLN:HG3  | 1.94                     | 0.49              |
| 1:A:42:GLY:O     | 1:F:115:LEU:HD12 | 2.12                     | 0.49              |
| 2:G:220:PRO:HD3  | 2:G:505:TYR:HE1  | 1.77                     | 0.49              |
| 1:N:176:PHE:CZ   | 1:N:381:ILE:HG13 | 2.47                     | 0.49              |
| 1:N:382:ARG:CZ   | 1:N:405:ASN:HB3  | 2.43                     | 0.49              |
| 2:O:430:GLN:O    | 2:O:430:GLN:NE2  | 2.45                     | 0.49              |
| 1:F:108:ILE:HG23 | 1:F:113:VAL:HG23 | 1.94                     | 0.49              |
| 1:J:78:LEU:HD11  | 1:J:111:GLU:HG2  | 1.95                     | 0.49              |
| 1:J:81:ALA:HB1   | 1:J:94:ILE:HD11  | 1.94                     | 0.49              |
| 2:K:24:ARG:NE    | 2:K:73:PRO:HD2   | 2.27                     | 0.49              |
| 3:P:6:G:OP2      | 3:P:6:G:H8       | 1.96                     | 0.49              |
| 1:A:175:TRP:CD1  | 1:A:336:MET:HG2  | 2.47                     | 0.49              |
| 2:B:295:GLN:HG3  | 2:B:323:PRO:HA   | 1.94                     | 0.49              |
| 1:F:325:ALA:HB1  | 1:F:335:LEU:HD12 | 1.95                     | 0.49              |
| 2:G:24:ARG:HD2   | 2:G:73:PRO:HD2   | 1.94                     | 0.49              |
| 1:J:151:ASN:N    | 1:J:151:ASN:OD1  | 2.46                     | 0.49              |
| 1:N:364:GLN:HE21 | 1:N:368:TRP:HZ2  | 1.61                     | 0.49              |
| 2:B:225:ARG:NH1  | 3:C:1:A:O2'      | 2.46                     | 0.49              |
| 2:B:417:LYS:HB3  | 2:B:442:PHE:CE1  | 2.47                     | 0.49              |
| 2:B:441:ILE:HD12 | 2:B:443:ILE:HD11 | 1.95                     | 0.49              |
| 2:G:85:LYS:HB3   | 2:G:87:GLU:OE2   | 2.13                     | 0.49              |
| 2:G:228:THR:OG1  | 2:G:243:ARG:NH2  | 2.39                     | 0.49              |
| 1:J:270:ASN:ND2  | 4:M:10:DG:OP1    | 2.46                     | 0.49              |
| 4:I:15:DG:H2'    | 4:I:16:DA:H8     | 1.78                     | 0.49              |
| 1:J:41:LYS:HD2   | 1:N:118:ILE:HG12 | 1.94                     | 0.49              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:J:134:ALA:HA   | 1:J:137:LYS:HD2  | 1.95                     | 0.49              |
| 2:O:317:VAL:HG13 | 2:O:490:LEU:HD11 | 1.95                     | 0.49              |
| 1:A:265:ILE:O    | 1:A:269:ILE:HG13 | 2.12                     | 0.49              |
| 4:I:8:DT:H2'     | 4:I:9:DA:H8      | 1.77                     | 0.49              |
| 1:A:80:VAL:O     | 1:A:84:VAL:HG23  | 2.13                     | 0.48              |
| 2:B:9:GLU:OE1    | 2:B:407:ARG:NH1  | 2.46                     | 0.48              |
| 1:J:155:GLN:O    | 1:J:159:LEU:HB2  | 2.12                     | 0.48              |
| 2:B:486:ILE:O    | 2:B:490:LEU:HG   | 2.13                     | 0.48              |
| 1:F:24:LYS:O     | 1:F:28:LEU:HD22  | 2.13                     | 0.48              |
| 1:J:296:GLU:OE1  | 1:J:296:GLU:N    | 2.44                     | 0.48              |
| 1:J:336:MET:SD   | 2:K:393:PRO:HG2  | 2.52                     | 0.48              |
| 1:J:393:LEU:O    | 1:J:400:LYS:NZ   | 2.46                     | 0.48              |
| 2:K:444:GLU:N    | 2:K:444:GLU:OE1  | 2.46                     | 0.48              |
| 2:B:312:VAL:HG21 | 2:B:349:GLN:HG2  | 1.94                     | 0.48              |
| 1:F:211:LYS:HG2  | 3:H:17:U:H5''    | 1.94                     | 0.48              |
| 1:F:344:THR:HG22 | 1:F:350:LEU:HD23 | 1.95                     | 0.48              |
| 2:G:404:PRO:HB3  | 2:G:438:PRO:HD3  | 1.95                     | 0.48              |
| 1:N:169:GLU:HG3  | 1:N:171:TYR:CE1  | 2.48                     | 0.48              |
| 3:P:10:U:H2'     | 3:P:11:A:C8      | 2.49                     | 0.48              |
| 1:A:187:PHE:HB2  | 1:A:239:ILE:HG22 | 1.96                     | 0.48              |
| 1:A:263:ARG:NH1  | 4:D:9:DA:N3      | 2.61                     | 0.48              |
| 2:K:135:ARG:HB3  | 2:O:265:GLY:HA3  | 1.96                     | 0.48              |
| 1:N:414:MET:HG3  | 2:O:6:TYR:CD2    | 2.48                     | 0.48              |
| 2:B:218:THR:OG1  | 2:G:129:ASN:OD1  | 2.23                     | 0.48              |
| 1:F:211:LYS:H    | 3:H:17:U:H4'     | 1.77                     | 0.48              |
| 1:J:81:ALA:HA    | 1:J:84:VAL:HG12  | 1.94                     | 0.48              |
| 1:J:287:MET:HB3  | 3:L:9:C:OP2      | 2.12                     | 0.48              |
| 2:K:252:LEU:O    | 2:K:255:THR:OG1  | 2.32                     | 0.48              |
| 4:D:13:DT:H2'    | 4:D:14:DA:C8     | 2.48                     | 0.48              |
| 1:F:91:ASP:OD1   | 1:F:91:ASP:N     | 2.45                     | 0.48              |
| 1:F:374:ARG:HG3  | 1:F:375:GLU:N    | 2.28                     | 0.48              |
| 2:K:53:PHE:HZ    | 2:K:86:TRP:HZ2   | 1.61                     | 0.48              |
| 1:N:124:TRP:CE2  | 2:O:63:PRO:HG3   | 2.48                     | 0.48              |
| 2:O:10:PRO:HG3   | 2:O:461:ALA:HA   | 1.96                     | 0.48              |
| 3:H:4:C:H2'      | 3:H:5:G:O4'      | 2.14                     | 0.48              |
| 1:A:71:ARG:HB3   | 1:A:74:VAL:HG12  | 1.94                     | 0.48              |
| 2:B:265:GLY:HA3  | 2:G:135:ARG:HB3  | 1.94                     | 0.48              |
| 1:F:380:PHE:CE1  | 1:F:384:LEU:HD21 | 2.48                     | 0.48              |
| 2:G:211:LYS:HB2  | 2:G:489:ILE:HD12 | 1.96                     | 0.48              |
| 2:K:96:ILE:HG13  | 2:K:124:LYS:HE3  | 1.95                     | 0.48              |
| 2:O:233:ASP:OD1  | 2:O:234:PHE:N    | 2.46                     | 0.48              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:K:130:LYS:HG2  | 2:O:218:THR:HG21 | 1.96                     | 0.48              |
| 4:M:21:DT:H5''   | 4:M:22:DT:H5'    | 1.96                     | 0.48              |
| 1:A:277:MET:SD   | 1:A:280:LYS:HG3  | 2.54                     | 0.48              |
| 1:F:314:GLN:HG2  | 1:F:364:GLN:OE1  | 2.14                     | 0.48              |
| 2:G:303:MET:HB2  | 2:G:313:PHE:CD1  | 2.49                     | 0.48              |
| 2:O:317:VAL:HG21 | 2:O:501:LEU:HA   | 1.95                     | 0.48              |
| 1:F:162:LYS:HG2  | 2:G:430:GLN:HG2  | 1.96                     | 0.48              |
| 2:G:404:PRO:HD3  | 4:I:23:DT:O4     | 2.14                     | 0.48              |
| 1:J:28:LEU:HA    | 1:J:150:SER:OG   | 2.14                     | 0.48              |
| 2:K:255:THR:OG1  | 3:L:2:A:N3       | 2.45                     | 0.48              |
| 1:N:46:TRP:O     | 1:N:50:GLU:HG2   | 2.13                     | 0.48              |
| 3:C:10:U:H2'     | 3:C:11:A:C8      | 2.49                     | 0.48              |
| 2:G:32:PRO:HG3   | 2:G:82:PHE:HD1   | 1.78                     | 0.47              |
| 2:O:9:GLU:OE1    | 2:O:407:ARG:NH1  | 2.46                     | 0.47              |
| 3:L:11:A:H2'     | 3:L:12:A:H8      | 1.78                     | 0.47              |
| 1:A:50:GLU:HG2   | 1:J:110:ILE:CG2  | 2.41                     | 0.47              |
| 1:F:176:PHE:C    | 1:F:334:VAL:HG23 | 2.35                     | 0.47              |
| 2:O:29:LEU:HD23  | 2:O:30:PHE:CE1   | 2.49                     | 0.47              |
| 4:D:12:DT:H2''   | 4:D:13:DT:O4'    | 2.15                     | 0.47              |
| 2:B:42:GLY:O     | 2:B:140:PHE:N    | 2.33                     | 0.47              |
| 1:F:46:TRP:CH2   | 1:F:76:LYS:HE3   | 2.49                     | 0.47              |
| 2:G:57:LEU:O     | 2:G:61:GLN:NE2   | 2.37                     | 0.47              |
| 2:G:64:ILE:HG13  | 2:G:65:TYR:N     | 2.28                     | 0.47              |
| 2:G:460:LEU:O    | 2:G:463:THR:OG1  | 2.29                     | 0.47              |
| 1:J:304:LYS:HA   | 1:J:309:LYS:HA   | 1.95                     | 0.47              |
| 2:K:203:ASP:HB2  | 2:K:206:PHE:HB2  | 1.96                     | 0.47              |
| 2:K:315:GLY:O    | 2:K:501:LEU:HG   | 2.14                     | 0.47              |
| 2:O:280:TYR:HB2  | 2:O:303:MET:HG3  | 1.96                     | 0.47              |
| 2:O:407:ARG:NE   | 2:O:422:THR:O    | 2.47                     | 0.47              |
| 2:B:126:ILE:HG12 | 2:B:217:HIS:NE2  | 2.29                     | 0.47              |
| 2:B:435:MET:HE2  | 2:B:436:GLU:HG3  | 1.96                     | 0.47              |
| 1:F:189:ARG:HB2  | 1:F:213:TYR:HE1  | 1.79                     | 0.47              |
| 2:K:206:PHE:CE1  | 2:K:210:LEU:HD12 | 2.50                     | 0.47              |
| 1:N:30:TYR:OH    | 1:N:136:GLU:OE2  | 2.30                     | 0.47              |
| 2:O:18:GLN:N     | 2:O:18:GLN:OE1   | 2.46                     | 0.47              |
| 3:L:12:A:H2'     | 3:L:13:U:C6      | 2.49                     | 0.47              |
| 2:K:423:LEU:HD21 | 2:K:434:SER:CB   | 2.44                     | 0.47              |
| 1:N:297:LYS:HA   | 1:N:311:VAL:HG11 | 1.96                     | 0.47              |
| 2:O:34:ASN:O     | 2:O:261:TYR:OH   | 2.32                     | 0.47              |
| 4:D:5:DT:H2'     | 4:D:6:DA:H8      | 1.78                     | 0.47              |
| 1:F:211:LYS:C    | 1:F:213:TYR:H    | 2.18                     | 0.47              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:J:364:GLN:HE21 | 1:J:368:TRP:HE1  | 1.63                     | 0.47              |
| 1:J:373:TRP:HB3  | 2:K:397:TYR:HE2  | 1.80                     | 0.47              |
| 1:N:19:ARG:HH22  | 1:N:154:TYR:HE1  | 1.63                     | 0.47              |
| 1:N:277:MET:HG2  | 1:N:293:TYR:CG   | 2.49                     | 0.47              |
| 1:A:380:PHE:HE1  | 1:A:384:LEU:HD11 | 1.80                     | 0.47              |
| 1:J:2:ARG:HA     | 1:J:56:ASN:HA    | 1.97                     | 0.47              |
| 1:J:95:ILE:HD12  | 1:J:135:PHE:HE1  | 1.80                     | 0.47              |
| 1:J:159:LEU:HD22 | 2:K:428:LYS:O    | 2.14                     | 0.47              |
| 1:J:207:ALA:N    | 1:J:271:LYS:HE2  | 2.30                     | 0.47              |
| 2:K:320:TRP:CE3  | 2:K:338:LEU:HD12 | 2.50                     | 0.47              |
| 2:K:457:LYS:HE2  | 2:K:457:LYS:HB2  | 1.67                     | 0.47              |
| 2:K:482:PHE:O    | 2:K:486:ILE:HG23 | 2.14                     | 0.47              |
| 1:N:23:LEU:HD13  | 2:O:29:LEU:HD11  | 1.97                     | 0.47              |
| 2:O:416:LYS:HD2  | 2:O:445:ILE:HB   | 1.97                     | 0.47              |
| 3:C:3:A:H2'      | 3:C:4:C:C6       | 2.49                     | 0.47              |
| 4:Q:8:DT:H2'     | 4:Q:9:DA:C8      | 2.49                     | 0.47              |
| 2:G:458:ASP:O    | 2:G:462:LEU:HG   | 2.15                     | 0.47              |
| 2:G:482:PHE:HB3  | 2:G:503:PHE:CE1  | 2.50                     | 0.47              |
| 1:J:4:LYS:N      | 1:J:58:CYS:SG    | 2.86                     | 0.47              |
| 1:J:285:TYR:HD1  | 1:J:286:GLN:N    | 2.12                     | 0.47              |
| 2:K:235:LYS:NZ   | 2:K:239:GLY:O    | 2.35                     | 0.47              |
| 2:O:317:VAL:HG12 | 2:O:318:GLY:N    | 2.27                     | 0.47              |
| 1:A:177:PRO:HD3  | 1:A:408:LEU:HD12 | 1.97                     | 0.47              |
| 1:A:243:THR:O    | 1:A:247:LEU:HG   | 2.15                     | 0.47              |
| 1:N:314:GLN:HG3  | 1:N:364:GLN:OE1  | 2.14                     | 0.47              |
| 2:O:468:ASN:OD1  | 3:P:3:A:H5''     | 2.15                     | 0.47              |
| 4:D:5:DT:H2'     | 4:D:6:DA:C8      | 2.50                     | 0.47              |
| 2:B:278:VAL:HG22 | 2:B:356:GLU:HB3  | 1.96                     | 0.47              |
| 1:F:146:ASP:HB3  | 1:F:149:LYS:HG3  | 1.96                     | 0.47              |
| 1:J:152:LEU:HD13 | 1:J:152:LEU:HA   | 1.80                     | 0.47              |
| 3:P:2:A:H2'      | 3:P:3:A:O4'      | 2.15                     | 0.47              |
| 1:F:217:PHE:HB2  | 1:F:395:VAL:CG2  | 2.44                     | 0.46              |
| 2:K:135:ARG:NH1  | 2:K:137:ASP:OD1  | 2.48                     | 0.46              |
| 2:O:136:VAL:HG21 | 2:O:139:TRP:CZ2  | 2.49                     | 0.46              |
| 3:L:7:C:H2'      | 3:L:8:U:C6       | 2.50                     | 0.46              |
| 1:A:33:TRP:HH2   | 1:A:39:LEU:HD13  | 1.81                     | 0.46              |
| 2:B:280:TYR:HE2  | 2:B:458:ASP:HB3  | 1.81                     | 0.46              |
| 1:F:176:PHE:CZ   | 1:F:381:ILE:HG13 | 2.50                     | 0.46              |
| 2:O:12:ILE:HG13  | 2:O:14:PHE:CE1   | 2.50                     | 0.46              |
| 2:O:118:VAL:HG21 | 2:O:209:GLN:CG   | 2.46                     | 0.46              |
| 1:A:111:GLU:C    | 1:A:114:ARG:HH12 | 2.19                     | 0.46              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:A:304:LYS:HE3  | 1:A:307:LYS:H    | 1.81                     | 0.46              |
| 2:B:317:VAL:HG12 | 2:B:318:GLY:N    | 2.28                     | 0.46              |
| 2:K:144:PRO:HA   | 2:K:226:GLU:OE2  | 2.15                     | 0.46              |
| 2:K:325:LYS:HE3  | 3:L:12:A:H4'     | 1.96                     | 0.46              |
| 1:N:285:TYR:HB2  | 1:N:294:TRP:HE1  | 1.81                     | 0.46              |
| 2:O:116:ASP:OD1  | 2:O:117:LEU:N    | 2.49                     | 0.46              |
| 2:O:366:ASN:N    | 2:O:369:GLU:OE2  | 2.43                     | 0.46              |
| 1:J:314:GLN:O    | 1:J:317:LYS:HB2  | 2.15                     | 0.46              |
| 2:K:137:ASP:OD2  | 2:O:135:ARG:NH1  | 2.49                     | 0.46              |
| 1:N:96:PRO:HB3   | 1:N:112:ILE:HG12 | 1.97                     | 0.46              |
| 2:O:236:ASN:O    | 2:O:237:THR:OG1  | 2.31                     | 0.46              |
| 4:Q:14:DA:H2'    | 4:Q:15:DG:C8     | 2.49                     | 0.46              |
| 2:B:41:SER:HB3   | 2:B:86:TRP:HE1   | 1.80                     | 0.46              |
| 2:B:50:LEU:HD22  | 2:B:93:PHE:CD2   | 2.50                     | 0.46              |
| 2:B:112:LYS:HD3  | 2:B:115:TYR:HB3  | 1.98                     | 0.46              |
| 1:F:182:PRO:HB3  | 1:F:399:GLU:HB3  | 1.96                     | 0.46              |
| 2:G:407:ARG:NE   | 2:G:422:THR:O    | 2.48                     | 0.46              |
| 1:N:205:PHE:HE1  | 1:N:396:GLY:CA   | 2.29                     | 0.46              |
| 1:N:346:ASP:OD1  | 1:N:346:ASP:N    | 2.46                     | 0.46              |
| 1:A:115:LEU:HD12 | 1:A:116:ASN:N    | 2.31                     | 0.46              |
| 2:B:138:VAL:HG13 | 2:B:140:PHE:CE1  | 2.51                     | 0.46              |
| 2:B:299:CYS:SG   | 2:B:319:PRO:HB3  | 2.56                     | 0.46              |
| 1:F:243:THR:HA   | 1:F:246:ILE:HD12 | 1.97                     | 0.46              |
| 2:G:358:PHE:CZ   | 2:G:386:VAL:HG21 | 2.50                     | 0.46              |
| 1:J:3:ASN:HA     | 1:J:58:CYS:SG    | 2.56                     | 0.46              |
| 2:O:279:CYS:HB2  | 2:O:346:TYR:CD2  | 2.50                     | 0.46              |
| 2:O:371:ASN:HA   | 2:O:374:ASN:ND2  | 2.31                     | 0.46              |
| 1:J:189:ARG:HB2  | 1:J:213:TYR:CE2  | 2.51                     | 0.46              |
| 4:D:8:DT:H2'     | 4:D:9:DA:H8      | 1.80                     | 0.46              |
| 1:A:96:PRO:HG2   | 1:A:117:ALA:HA   | 1.98                     | 0.46              |
| 1:F:187:PHE:HB3  | 1:F:213:TYR:HB3  | 1.97                     | 0.46              |
| 2:G:315:GLY:O    | 2:G:501:LEU:HG   | 2.16                     | 0.46              |
| 2:G:320:TRP:HB3  | 2:G:334:GLU:HB3  | 1.98                     | 0.46              |
| 1:J:194:LEU:HD22 | 1:J:214:LEU:HD21 | 1.97                     | 0.46              |
| 1:J:268:LEU:HA   | 1:J:271:LYS:NZ   | 2.30                     | 0.46              |
| 2:K:32:PRO:HG3   | 2:K:82:PHE:HD1   | 1.80                     | 0.46              |
| 2:K:416:LYS:HD2  | 2:K:445:ILE:HB   | 1.96                     | 0.46              |
| 1:N:175:TRP:HZ3  | 2:O:411:TYR:HE2  | 1.64                     | 0.46              |
| 1:N:300:LEU:HD13 | 1:N:305:PHE:HB2  | 1.98                     | 0.46              |
| 1:A:241:ILE:HD13 | 1:A:251:TYR:CZ   | 2.51                     | 0.46              |
| 1:A:246:ILE:HD13 | 1:A:261:CYS:SG   | 2.55                     | 0.46              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:F:262:GLN:O    | 1:F:266:VAL:HG23 | 2.15                     | 0.46              |
| 1:F:416:TYR:HD1  | 2:G:406:MET:HB2  | 1.80                     | 0.46              |
| 1:N:210:TYR:CE1  | 1:N:211:LYS:HB2  | 2.51                     | 0.46              |
| 2:O:458:ASP:O    | 2:O:462:LEU:HG   | 2.16                     | 0.46              |
| 1:A:179:ILE:HD12 | 1:A:402:LEU:HB3  | 1.97                     | 0.46              |
| 2:B:122:ASN:C    | 2:B:126:ILE:HD12 | 2.36                     | 0.46              |
| 1:F:11:THR:O     | 1:F:15:ASP:HB2   | 2.15                     | 0.46              |
| 2:G:300:ALA:HB3  | 2:G:316:GLU:HB2  | 1.98                     | 0.46              |
| 1:J:35:ASP:O     | 1:J:39:LEU:HB3   | 2.16                     | 0.46              |
| 2:K:370:TRP:CE2  | 2:K:447:LYS:HB3  | 2.51                     | 0.46              |
| 2:K:395:LYS:HE3  | 2:K:395:LYS:HB2  | 1.63                     | 0.46              |
| 2:K:504:LYS:HE2  | 2:O:133:GLU:HA   | 1.98                     | 0.46              |
| 4:D:16:DA:H2'    | 4:D:17:DG:H8     | 1.80                     | 0.46              |
| 3:L:10:U:H2'     | 3:L:11:A:C8      | 2.51                     | 0.46              |
| 1:A:20:TRP:CZ3   | 1:A:124:TRP:HB3  | 2.51                     | 0.45              |
| 1:F:114:ARG:HH11 | 1:J:79:ALA:HB2   | 1.80                     | 0.45              |
| 1:F:189:ARG:HG3  | 1:F:189:ARG:O    | 2.17                     | 0.45              |
| 1:J:215:CYS:SG   | 1:J:264:LEU:HD13 | 2.56                     | 0.45              |
| 2:K:286:LYS:HE3  | 2:K:286:LYS:HB3  | 1.75                     | 0.45              |
| 2:K:460:LEU:O    | 2:K:463:THR:OG1  | 2.33                     | 0.45              |
| 1:N:39:LEU:HG    | 1:N:157:ILE:HG23 | 1.98                     | 0.45              |
| 1:A:174:ASN:HB2  | 2:B:395:LYS:O    | 2.16                     | 0.45              |
| 1:F:317:LYS:HE2  | 1:F:317:LYS:HB2  | 1.71                     | 0.45              |
| 2:G:280:TYR:HE2  | 2:G:458:ASP:HB3  | 1.81                     | 0.45              |
| 2:K:224:LEU:HD23 | 2:K:229:LEU:HD11 | 1.99                     | 0.45              |
| 1:N:410:PHE:HB3  | 2:O:4:LEU:HD13   | 1.99                     | 0.45              |
| 2:O:10:PRO:HD3   | 2:O:460:LEU:HD23 | 1.98                     | 0.45              |
| 2:O:423:LEU:HD11 | 3:P:6:G:OP1      | 2.16                     | 0.45              |
| 2:B:500:PRO:O    | 2:B:501:LEU:HB3  | 2.16                     | 0.45              |
| 2:G:13:LEU:HB2   | 2:G:270:LYS:HB2  | 1.98                     | 0.45              |
| 1:J:176:PHE:CZ   | 1:J:381:ILE:HG13 | 2.51                     | 0.45              |
| 1:J:180:SER:OG   | 1:J:402:LEU:HB3  | 2.17                     | 0.45              |
| 2:K:211:LYS:HZ3  | 2:K:223:ILE:HD12 | 1.81                     | 0.45              |
| 2:K:357:VAL:HB   | 2:K:383:LEU:HB2  | 1.99                     | 0.45              |
| 1:A:18:THR:O     | 1:A:22:SER:OG    | 2.23                     | 0.45              |
| 1:A:190:TYR:OH   | 1:A:220:GLU:O    | 2.34                     | 0.45              |
| 2:B:279:CYS:O    | 2:B:358:PHE:N    | 2.49                     | 0.45              |
| 1:F:99:ILE:HG22  | 1:F:120:PHE:HB2  | 1.99                     | 0.45              |
| 1:F:135:PHE:HB2  | 1:F:140:VAL:HB   | 1.99                     | 0.45              |
| 1:J:389:ASN:C    | 1:J:405:ASN:HB2  | 2.36                     | 0.45              |
| 1:J:193:ARG:HD3  | 1:J:230:THR:HA   | 1.98                     | 0.45              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:J:389:ASN:O    | 1:J:405:ASN:HB2  | 2.17                     | 0.45              |
| 2:K:279:CYS:O    | 2:K:358:PHE:N    | 2.40                     | 0.45              |
| 2:O:94:LYS:HB3   | 2:O:94:LYS:HE3   | 1.68                     | 0.45              |
| 2:O:330:LEU:HD23 | 2:O:330:LEU:HA   | 1.82                     | 0.45              |
| 1:A:370:ASN:HD21 | 2:B:397:TYR:HA   | 1.82                     | 0.45              |
| 1:J:164:ALA:HB2  | 2:K:406:MET:HE3  | 1.99                     | 0.45              |
| 2:K:211:LYS:HB2  | 2:K:489:ILE:HD12 | 1.98                     | 0.45              |
| 1:N:321:PHE:CE2  | 1:N:380:PHE:HB2  | 2.51                     | 0.45              |
| 2:O:358:PHE:CZ   | 2:O:386:VAL:HG21 | 2.52                     | 0.45              |
| 2:O:359:ILE:O    | 2:O:385:GLY:HA2  | 2.17                     | 0.45              |
| 2:B:255:THR:HA   | 2:B:470:CYS:HB2  | 1.98                     | 0.45              |
| 1:F:332:SER:O    | 1:F:334:VAL:HG12 | 2.16                     | 0.45              |
| 1:J:206:PRO:O    | 1:J:216:THR:OG1  | 2.22                     | 0.45              |
| 1:J:406:LYS:HE2  | 1:J:406:LYS:HB2  | 1.83                     | 0.45              |
| 1:N:15:ASP:OD2   | 1:N:16:ASP:N     | 2.50                     | 0.45              |
| 1:N:196:LYS:HD2  | 3:P:19:A:H5'     | 1.99                     | 0.45              |
| 1:N:325:ALA:HB1  | 1:N:335:LEU:HD11 | 1.99                     | 0.45              |
| 1:N:371:ASP:HB3  | 2:O:402:ALA:HA   | 1.98                     | 0.45              |
| 1:A:248:SER:OG   | 1:A:250:ARG:NH1  | 2.50                     | 0.45              |
| 1:F:176:PHE:O    | 1:F:335:LEU:HD23 | 2.17                     | 0.45              |
| 1:J:17:PHE:CE2   | 1:J:99:ILE:HG21  | 2.51                     | 0.45              |
| 1:J:273:PHE:HA   | 1:J:393:LEU:HD22 | 1.99                     | 0.45              |
| 2:K:5:ILE:HG12   | 2:K:410:ALA:HB3  | 1.99                     | 0.45              |
| 1:N:354:LYS:HB3  | 1:N:354:LYS:HE3  | 1.63                     | 0.45              |
| 1:F:406:LYS:HB2  | 1:F:406:LYS:HE2  | 1.78                     | 0.45              |
| 2:G:245:PHE:CD2  | 2:G:252:LEU:HD22 | 2.43                     | 0.45              |
| 1:J:162:LYS:HE2  | 2:K:427:PRO:O    | 2.17                     | 0.45              |
| 1:J:203:LEU:HD23 | 1:J:223:PHE:CD1  | 2.52                     | 0.45              |
| 1:J:210:TYR:CZ   | 1:J:211:LYS:HG3  | 2.51                     | 0.45              |
| 1:N:174:ASN:OD1  | 1:N:337:VAL:HB   | 2.17                     | 0.45              |
| 1:N:190:TYR:HB3  | 1:N:194:LEU:HB2  | 1.98                     | 0.45              |
| 1:N:245:ASP:HB3  | 1:N:251:TYR:HB2  | 1.98                     | 0.45              |
| 2:O:283:LEU:HD21 | 2:O:365:PHE:HZ   | 1.81                     | 0.45              |
| 4:M:8:DT:H2'     | 4:M:9:DA:C8      | 2.51                     | 0.45              |
| 2:B:365:PHE:H    | 2:B:446:ASN:HD21 | 1.65                     | 0.44              |
| 1:J:378:LEU:HB3  | 1:J:382:ARG:HH21 | 1.82                     | 0.44              |
| 2:K:71:THR:HA    | 2:K:429:LEU:O    | 2.17                     | 0.44              |
| 2:K:346:TYR:CG   | 2:K:354:PRO:HG3  | 2.52                     | 0.44              |
| 4:Q:16:DA:H2'    | 4:Q:17:DG:C8     | 2.52                     | 0.44              |
| 2:G:22:ASP:OD2   | 2:G:24:ARG:NH1   | 2.50                     | 0.44              |
| 2:G:465:LEU:HB2  | 2:G:478:VAL:HG11 | 1.99                     | 0.44              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:N:10:ALA:HB1   | 1:N:71:ARG:HH21  | 1.82                     | 0.44              |
| 1:N:201:ARG:HE   | 1:N:201:ARG:HB2  | 1.53                     | 0.44              |
| 1:N:210:TYR:OH   | 1:N:255:PHE:O    | 2.36                     | 0.44              |
| 2:B:482:PHE:HB3  | 2:B:503:PHE:CE1  | 2.52                     | 0.44              |
| 1:F:276:ARG:HA   | 1:F:276:ARG:HH11 | 1.83                     | 0.44              |
| 2:G:7:ILE:HG23   | 2:G:457:LYS:HG3  | 1.99                     | 0.44              |
| 2:O:220:PRO:HD3  | 2:O:505:TYR:CE1  | 2.52                     | 0.44              |
| 2:O:248:ILE:HG23 | 4:Q:21:DT:H2''   | 1.99                     | 0.44              |
| 1:A:24:LYS:HD3   | 1:A:24:LYS:HA    | 1.79                     | 0.44              |
| 1:A:308:ILE:HD13 | 1:A:379:ALA:HB2  | 2.00                     | 0.44              |
| 1:F:71:ARG:HB2   | 1:F:74:VAL:HG12  | 1.99                     | 0.44              |
| 1:F:110:ILE:HG13 | 1:J:50:GLU:OE1   | 2.17                     | 0.44              |
| 1:J:85:LYS:HE2   | 1:J:94:ILE:HG12  | 1.99                     | 0.44              |
| 1:J:101:GLU:HG3  | 1:J:121:LYS:HB3  | 1.98                     | 0.44              |
| 1:J:152:LEU:O    | 1:J:155:GLN:HG3  | 2.18                     | 0.44              |
| 1:J:182:PRO:HB3  | 1:J:399:GLU:HB3  | 2.00                     | 0.44              |
| 2:K:74:MET:O     | 2:K:254:TRP:NE1  | 2.47                     | 0.44              |
| 2:K:300:ALA:HB3  | 2:K:316:GLU:HB2  | 1.98                     | 0.44              |
| 1:N:59:LYS:HE3   | 1:N:140:VAL:HG22 | 1.98                     | 0.44              |
| 2:O:78:PHE:CD2   | 2:O:86:TRP:HE3   | 2.35                     | 0.44              |
| 1:A:262:GLN:HB3  | 1:A:329:LEU:HD12 | 2.00                     | 0.44              |
| 1:F:216:THR:HA   | 1:F:268:LEU:HD21 | 1.99                     | 0.44              |
| 2:G:40:LYS:NZ    | 2:G:135:ARG:O    | 2.43                     | 0.44              |
| 2:G:373:PHE:HB3  | 2:G:383:LEU:HD11 | 1.98                     | 0.44              |
| 1:N:276:ARG:HD3  | 1:N:394:ASN:ND2  | 2.32                     | 0.44              |
| 2:O:54:LYS:HE2   | 2:O:88:SER:O     | 2.18                     | 0.44              |
| 4:D:11:DA:H2''   | 4:D:12:DT:H5''   | 2.00                     | 0.44              |
| 1:F:54:ARG:NH2   | 1:N:108:ILE:O    | 2.49                     | 0.44              |
| 1:F:188:HIS:HB3  | 1:F:190:TYR:CE1  | 2.53                     | 0.44              |
| 2:K:395:LYS:HD3  | 2:K:437:VAL:HG21 | 2.00                     | 0.44              |
| 2:O:253:ALA:O    | 2:O:257:SER:OG   | 2.25                     | 0.44              |
| 2:O:482:PHE:O    | 2:O:486:ILE:HG23 | 2.18                     | 0.44              |
| 1:A:23:LEU:HA    | 1:A:26:ILE:HD12  | 1.99                     | 0.44              |
| 1:A:216:THR:HG21 | 1:A:223:PHE:HZ   | 1.83                     | 0.44              |
| 1:A:378:LEU:HB3  | 1:A:382:ARG:NH2  | 2.32                     | 0.44              |
| 2:B:468:ASN:ND2  | 3:C:3:A:H5''     | 2.32                     | 0.44              |
| 1:F:344:THR:HG22 | 1:F:350:LEU:HA   | 1.99                     | 0.44              |
| 1:J:187:PHE:O    | 1:J:238:SER:HA   | 2.18                     | 0.44              |
| 1:J:245:ASP:O    | 1:J:250:ARG:N    | 2.51                     | 0.44              |
| 2:O:280:TYR:HE1  | 2:O:458:ASP:HB3  | 1.82                     | 0.44              |
| 2:O:314:LYS:HD3  | 2:O:501:LEU:HD21 | 1.99                     | 0.44              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:A:3:ASN:OD1    | 1:A:3:ASN:N      | 2.46                     | 0.44              |
| 1:F:410:PHE:CD2  | 2:G:2:LYS:HB2    | 2.52                     | 0.44              |
| 2:G:235:LYS:HA   | 2:G:241:PRO:HA   | 1.99                     | 0.44              |
| 2:K:280:TYR:HB3  | 2:K:462:LEU:HD21 | 1.99                     | 0.44              |
| 1:N:288:SER:HB2  | 3:P:9:C:O5'      | 2.18                     | 0.44              |
| 2:O:50:LEU:HD13  | 2:O:93:PHE:CG    | 2.53                     | 0.44              |
| 2:O:397:TYR:CE1  | 2:O:437:VAL:HG21 | 2.53                     | 0.44              |
| 2:B:118:VAL:O    | 2:B:122:ASN:HB2  | 2.18                     | 0.44              |
| 1:F:336:MET:SD   | 2:G:393:PRO:HG2  | 2.58                     | 0.44              |
| 1:J:261:CYS:O    | 1:J:265:ILE:HG13 | 2.18                     | 0.44              |
| 2:K:129:ASN:O    | 2:O:505:TYR:OH   | 2.32                     | 0.44              |
| 1:N:168:GLU:OE1  | 1:N:168:GLU:N    | 2.48                     | 0.44              |
| 2:O:122:ASN:ND2  | 2:O:214:LEU:HG   | 2.32                     | 0.44              |
| 2:O:286:LYS:HD3  | 2:O:286:LYS:HA   | 1.82                     | 0.44              |
| 1:A:176:PHE:CE2  | 1:A:381:ILE:HG21 | 2.53                     | 0.43              |
| 2:B:366:ASN:OD1  | 2:B:368:GLU:N    | 2.50                     | 0.43              |
| 1:F:199:ASP:OD1  | 1:F:202:THR:HG22 | 2.18                     | 0.43              |
| 1:J:118:ILE:HG13 | 1:J:131:LEU:HD13 | 1.99                     | 0.43              |
| 2:K:485:LYS:O    | 2:K:489:ILE:HG12 | 2.18                     | 0.43              |
| 1:N:190:TYR:HD2  | 1:N:194:LEU:HB2  | 1.82                     | 0.43              |
| 1:N:365:GLY:HA2  | 1:N:368:TRP:CD1  | 2.52                     | 0.43              |
| 2:O:319:PRO:HD3  | 2:O:490:LEU:HD13 | 1.99                     | 0.43              |
| 3:C:11:A:H2'     | 3:C:12:A:C8      | 2.53                     | 0.43              |
| 2:G:358:PHE:HE2  | 2:G:455:VAL:HG22 | 1.83                     | 0.43              |
| 1:J:60:PHE:CE2   | 1:J:62:ILE:HG12  | 2.53                     | 0.43              |
| 2:O:19:LYS:HB3   | 2:O:19:LYS:HE2   | 1.82                     | 0.43              |
| 2:O:299:CYS:SG   | 2:O:319:PRO:HB3  | 2.58                     | 0.43              |
| 2:B:425:PHE:HA   | 2:B:432:THR:HA   | 1.99                     | 0.43              |
| 1:J:176:PHE:CE2  | 1:J:381:ILE:HG21 | 2.53                     | 0.43              |
| 1:J:276:ARG:HG2  | 1:J:392:TYR:O    | 2.18                     | 0.43              |
| 2:K:245:PHE:CD1  | 2:K:248:ILE:HD11 | 2.52                     | 0.43              |
| 2:O:70:ILE:H     | 2:O:70:ILE:HG13  | 1.69                     | 0.43              |
| 2:O:371:ASN:HA   | 2:O:374:ASN:HD21 | 1.82                     | 0.43              |
| 2:O:483:ALA:HA   | 2:O:486:ILE:HG12 | 2.00                     | 0.43              |
| 2:O:503:PHE:O    | 2:O:507:ILE:HG12 | 2.18                     | 0.43              |
| 1:A:221:TYR:HD1  | 1:A:224:ILE:HD11 | 1.83                     | 0.43              |
| 2:B:443:ILE:HD12 | 2:B:459:ILE:HG13 | 2.00                     | 0.43              |
| 2:G:303:MET:HE3  | 2:G:465:LEU:HD23 | 2.00                     | 0.43              |
| 2:K:268:PRO:HB2  | 2:K:269:TRP:CE3  | 2.54                     | 0.43              |
| 2:K:489:ILE:HG13 | 2:K:506:TYR:HB3  | 2.00                     | 0.43              |
| 1:N:71:ARG:HB3   | 1:N:74:VAL:HG12  | 2.00                     | 0.43              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:N:179:ILE:HB   | 1:N:402:LEU:HB2  | 2.00                     | 0.43              |
| 1:N:371:ASP:HA   | 1:N:374:ARG:NH1  | 2.33                     | 0.43              |
| 2:O:67:HIS:HB3   | 2:O:247:LYS:HA   | 2.00                     | 0.43              |
| 1:A:71:ARG:HG3   | 1:A:71:ARG:NH1   | 2.33                     | 0.43              |
| 1:A:200:VAL:HG21 | 1:A:209:ARG:HG3  | 2.00                     | 0.43              |
| 1:F:60:PHE:CD2   | 1:F:94:ILE:HG23  | 2.52                     | 0.43              |
| 1:J:250:ARG:HA   | 1:J:250:ARG:HD2  | 1.70                     | 0.43              |
| 2:K:94:LYS:HD3   | 2:K:128:ALA:HB2  | 2.01                     | 0.43              |
| 2:O:25:ASP:OD2   | 2:O:428:LYS:NZ   | 2.41                     | 0.43              |
| 3:P:9:C:H2'      | 3:P:10:U:C6      | 2.53                     | 0.43              |
| 1:A:169:GLU:O    | 1:A:411:PHE:HA   | 2.19                     | 0.43              |
| 2:B:211:LYS:HZ1  | 2:B:223:ILE:HG13 | 1.84                     | 0.43              |
| 1:F:162:LYS:HD3  | 2:G:428:LYS:HA   | 2.00                     | 0.43              |
| 2:G:2:LYS:HD3    | 2:G:2:LYS:N      | 2.32                     | 0.43              |
| 2:K:205:GLN:OE1  | 2:K:205:GLN:N    | 2.52                     | 0.43              |
| 1:N:227:LEU:HD13 | 1:N:230:THR:HG21 | 2.00                     | 0.43              |
| 2:O:207:HIS:ND1  | 2:O:223:ILE:HD12 | 2.33                     | 0.43              |
| 1:A:80:VAL:HG21  | 1:J:110:ILE:CG2  | 2.46                     | 0.43              |
| 1:A:206:PRO:HG3  | 1:A:272:ALA:HB2  | 2.00                     | 0.43              |
| 1:A:381:ILE:HG22 | 1:A:405:ASN:HD22 | 1.83                     | 0.43              |
| 2:B:14:PHE:CE2   | 2:B:26:GLY:HA3   | 2.54                     | 0.43              |
| 2:B:210:LEU:HD23 | 2:B:214:LEU:HD12 | 2.00                     | 0.43              |
| 2:B:495:GLU:HG2  | 2:B:497:LYS:NZ   | 2.33                     | 0.43              |
| 1:F:254:ASP:HA   | 1:F:257:ARG:HH21 | 1.84                     | 0.43              |
| 1:N:193:ARG:HB3  | 1:N:230:THR:HA   | 2.01                     | 0.43              |
| 2:O:211:LYS:HE3  | 2:O:221:THR:HG23 | 2.01                     | 0.43              |
| 1:A:181:PHE:CD2  | 1:A:247:LEU:HD11 | 2.54                     | 0.43              |
| 2:B:35:GLN:O     | 2:B:35:GLN:HG2   | 2.19                     | 0.43              |
| 2:B:358:PHE:CZ   | 2:B:386:VAL:HG21 | 2.54                     | 0.43              |
| 1:F:393:LEU:HB3  | 1:F:401:ILE:HD12 | 2.01                     | 0.43              |
| 1:J:252:ASP:OD2  | 1:J:258:ASN:ND2  | 2.52                     | 0.43              |
| 1:J:378:LEU:HB3  | 1:J:382:ARG:NH2  | 2.33                     | 0.43              |
| 1:N:140:VAL:HA   | 1:N:141:PRO:HD3  | 1.88                     | 0.43              |
| 2:O:126:ILE:O    | 2:O:130:LYS:HB2  | 2.19                     | 0.43              |
| 1:A:129:GLN:HB2  | 1:A:157:ILE:HG22 | 2.01                     | 0.43              |
| 1:A:246:ILE:HD11 | 1:A:265:ILE:CD1  | 2.44                     | 0.43              |
| 2:B:282:GLY:HA2  | 2:B:360:HIS:O    | 2.18                     | 0.43              |
| 2:G:285:TYR:OH   | 2:G:330:LEU:HG   | 2.19                     | 0.43              |
| 1:J:328:LYS:HG2  | 1:J:330:TYR:H    | 1.83                     | 0.43              |
| 1:J:393:LEU:H    | 1:J:400:LYS:HZ1  | 1.66                     | 0.43              |
| 2:K:481:ARG:O    | 2:K:485:LYS:HG3  | 2.18                     | 0.43              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:N:121:LYS:HB3  | 1:N:122:LYS:HZ3  | 1.84                     | 0.43              |
| 2:O:285:TYR:HB3  | 2:O:296:ASN:ND2  | 2.34                     | 0.43              |
| 2:O:412:ILE:O    | 2:O:412:ILE:HG13 | 2.19                     | 0.43              |
| 3:C:7:C:H2'      | 3:C:8:U:C6       | 2.54                     | 0.43              |
| 4:D:7:DA:H2'     | 4:D:8:DT:C6      | 2.54                     | 0.43              |
| 1:F:276:ARG:HH12 | 1:F:279:ASP:HB2  | 1.84                     | 0.43              |
| 2:K:335:ALA:HB1  | 2:K:373:PHE:CE1  | 2.54                     | 0.43              |
| 1:N:193:ARG:HB3  | 1:N:230:THR:HG22 | 2.01                     | 0.43              |
| 3:H:5:G:H2'      | 3:H:6:G:C8       | 2.53                     | 0.43              |
| 3:P:12:A:H2'     | 3:P:13:U:C6      | 2.51                     | 0.43              |
| 2:B:77:GLY:O     | 2:B:81:VAL:HG23  | 2.19                     | 0.42              |
| 2:B:345:SER:O    | 2:B:348:GLU:HG3  | 2.19                     | 0.42              |
| 2:G:236:ASN:OD1  | 2:G:239:GLY:N    | 2.52                     | 0.42              |
| 1:N:78:LEU:HD21  | 1:N:111:GLU:HB3  | 2.00                     | 0.42              |
| 1:N:181:PHE:HE2  | 1:N:333:PRO:HB3  | 1.84                     | 0.42              |
| 2:O:262:TYR:OH   | 2:O:503:PHE:HB2  | 2.18                     | 0.42              |
| 2:B:379:LYS:HG2  | 2:B:380:ASN:H    | 1.84                     | 0.42              |
| 1:F:9:HIS:CD2    | 1:F:18:THR:HG21  | 2.54                     | 0.42              |
| 2:G:271:LEU:H    | 2:G:311:THR:HG21 | 1.84                     | 0.42              |
| 2:G:395:LYS:HZ3  | 3:H:7:C:P        | 2.42                     | 0.42              |
| 2:G:426:VAL:HG11 | 2:G:472:TYR:CE2  | 2.32                     | 0.42              |
| 2:K:336:LYS:HE2  | 2:K:336:LYS:HB2  | 1.87                     | 0.42              |
| 3:P:17:U:H2'     | 3:P:18:U:C6      | 2.54                     | 0.42              |
| 1:A:361:ARG:HH21 | 3:C:7:C:H5'      | 1.85                     | 0.42              |
| 1:F:297:LYS:C    | 1:F:297:LYS:HD2  | 2.40                     | 0.42              |
| 2:G:343:LEU:HB3  | 2:G:353:TYR:CE1  | 2.53                     | 0.42              |
| 1:N:98:ALA:HB1   | 1:N:121:LYS:NZ   | 2.34                     | 0.42              |
| 1:N:330:TYR:HB2  | 1:N:331:PRO:HD3  | 2.01                     | 0.42              |
| 1:N:362:ARG:NH1  | 3:P:6:G:O2'      | 2.50                     | 0.42              |
| 3:H:11:A:H2'     | 3:H:12:A:C8      | 2.54                     | 0.42              |
| 4:M:12:DT:H2''   | 4:M:13:DT:O4'    | 2.18                     | 0.42              |
| 4:M:14:DA:H2'    | 4:M:15:DG:C8     | 2.54                     | 0.42              |
| 1:A:176:PHE:CZ   | 1:A:381:ILE:HG13 | 2.55                     | 0.42              |
| 1:F:181:PHE:HE2  | 1:F:333:PRO:HB3  | 1.84                     | 0.42              |
| 1:F:275:LEU:HA   | 1:F:278:LYS:HB2  | 2.00                     | 0.42              |
| 1:F:373:TRP:NE1  | 2:G:436:GLU:OE1  | 2.46                     | 0.42              |
| 1:J:267:GLN:HA   | 1:J:270:ASN:OD1  | 2.19                     | 0.42              |
| 2:K:336:LYS:NZ   | 2:K:376:VAL:HB   | 2.34                     | 0.42              |
| 1:N:364:GLN:O    | 1:N:368:TRP:CD1  | 2.73                     | 0.42              |
| 2:G:128:ALA:O    | 2:G:132:ASP:HB2  | 2.20                     | 0.42              |
| 2:G:268:PRO:HB2  | 2:G:269:TRP:CE3  | 2.54                     | 0.42              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:K:10:PRO:HG2   | 2:K:461:ALA:HA   | 2.01                     | 0.42              |
| 2:K:395:LYS:HG2  | 2:K:397:TYR:CZ   | 2.54                     | 0.42              |
| 2:O:356:GLU:HA   | 2:O:382:ASN:O    | 2.19                     | 0.42              |
| 1:A:374:ARG:HD2  | 2:B:399:THR:HA   | 2.00                     | 0.42              |
| 1:F:85:LYS:HD3   | 1:F:94:ILE:HG13  | 2.00                     | 0.42              |
| 1:F:416:TYR:HB3  | 2:G:427:PRO:HG3  | 2.01                     | 0.42              |
| 2:G:423:LEU:HD12 | 2:G:434:SER:HB3  | 2.02                     | 0.42              |
| 1:J:45:PHE:O     | 1:J:49:ILE:HG13  | 2.19                     | 0.42              |
| 1:J:160:HIS:HA   | 2:K:428:LYS:HE2  | 2.01                     | 0.42              |
| 2:K:302:GLN:H    | 2:K:315:GLY:HA2  | 1.85                     | 0.42              |
| 1:N:199:ASP:OD2  | 1:N:201:ARG:NH2  | 2.52                     | 0.42              |
| 2:O:7:ILE:HG21   | 2:O:457:LYS:HA   | 2.02                     | 0.42              |
| 2:O:333:LYS:HG3  | 2:O:334:GLU:N    | 2.34                     | 0.42              |
| 4:I:7:DA:H2'     | 4:I:8:DT:C6      | 2.55                     | 0.42              |
| 4:I:8:DT:H2'     | 4:I:9:DA:C8      | 2.54                     | 0.42              |
| 4:M:7:DA:H2'     | 4:M:8:DT:C6      | 2.54                     | 0.42              |
| 2:B:72:ARG:NH1   | 2:B:248:ILE:HG13 | 2.35                     | 0.42              |
| 2:B:243:ARG:HB3  | 2:B:245:PHE:CE2  | 2.55                     | 0.42              |
| 1:J:285:TYR:HD2  | 1:J:342:ILE:HG23 | 1.83                     | 0.42              |
| 2:K:417:LYS:HD2  | 2:K:444:GLU:HG3  | 2.01                     | 0.42              |
| 1:N:185:LEU:HB2  | 1:N:217:PHE:CE1  | 2.55                     | 0.42              |
| 2:O:343:LEU:HD13 | 2:O:378:PRO:HD3  | 2.00                     | 0.42              |
| 3:L:4:C:H2'      | 3:L:5:G:O4'      | 2.20                     | 0.42              |
| 2:B:420:LEU:HD22 | 2:B:456:LEU:HD22 | 2.02                     | 0.42              |
| 1:F:210:TYR:O    | 1:F:213:TYR:HB2  | 2.19                     | 0.42              |
| 1:J:12:PRO:HD2   | 1:J:71:ARG:NH1   | 2.30                     | 0.42              |
| 1:J:343:PHE:HE2  | 1:J:361:ARG:HA   | 1.84                     | 0.42              |
| 2:O:360:HIS:HB3  | 2:O:386:VAL:HB   | 2.02                     | 0.42              |
| 3:L:12:A:H2'     | 3:L:13:U:H6      | 1.84                     | 0.42              |
| 4:M:11:DA:H2''   | 4:M:12:DT:O4'    | 2.20                     | 0.42              |
| 1:A:219:TRP:CD1  | 1:A:220:GLU:N    | 2.88                     | 0.42              |
| 2:B:397:TYR:N    | 2:B:397:TYR:CD1  | 2.88                     | 0.42              |
| 2:G:50:LEU:HD22  | 2:G:93:PHE:CD2   | 2.55                     | 0.42              |
| 2:G:90:ASN:OD1   | 2:G:90:ASN:O     | 2.38                     | 0.42              |
| 1:J:276:ARG:HB3  | 1:J:277:MET:CE   | 2.50                     | 0.42              |
| 3:L:5:G:H2'      | 3:L:6:G:C8       | 2.55                     | 0.42              |
| 1:A:258:ASN:O    | 1:A:262:GLN:HG3  | 2.20                     | 0.42              |
| 1:A:381:ILE:HD13 | 1:A:381:ILE:HA   | 1.94                     | 0.42              |
| 1:A:400:LYS:HE3  | 1:A:400:LYS:HB2  | 1.64                     | 0.42              |
| 2:B:10:PRO:HG3   | 2:B:461:ALA:HA   | 2.02                     | 0.42              |
| 1:F:33:TRP:CD1   | 1:F:52:GLU:HG2   | 2.55                     | 0.42              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:F:258:ASN:OD1  | 1:F:258:ASN:N    | 2.52                     | 0.42              |
| 2:G:255:THR:HA   | 2:G:470:CYS:HB2  | 2.01                     | 0.42              |
| 2:G:410:ALA:HB2  | 2:G:420:LEU:HD13 | 2.02                     | 0.42              |
| 1:N:374:ARG:NH1  | 2:O:398:LYS:O    | 2.53                     | 0.42              |
| 2:O:459:ILE:HD12 | 2:O:459:ILE:HA   | 1.77                     | 0.42              |
| 2:B:58:ASP:OD1   | 2:B:88:SER:OG    | 2.23                     | 0.41              |
| 1:F:384:LEU:HB2  | 1:F:391:ILE:HD11 | 2.02                     | 0.41              |
| 2:G:9:GLU:OE2    | 2:G:407:ARG:NH1  | 2.53                     | 0.41              |
| 1:J:194:LEU:HD12 | 1:J:195:PRO:HD2  | 2.02                     | 0.41              |
| 2:K:12:ILE:HG13  | 2:K:14:PHE:CE2   | 2.55                     | 0.41              |
| 1:N:93:PHE:HD2   | 1:N:94:ILE:HG13  | 1.85                     | 0.41              |
| 1:N:154:TYR:OH   | 2:O:25:ASP:OD2   | 2.36                     | 0.41              |
| 1:N:395:VAL:HG11 | 1:N:401:ILE:HG13 | 2.02                     | 0.41              |
| 1:N:419:PRO:HD2  | 2:O:403:PHE:CE2  | 2.55                     | 0.41              |
| 1:A:4:LYS:HB3    | 1:A:56:ASN:O     | 2.20                     | 0.41              |
| 1:N:24:LYS:HG2   | 1:N:128:LEU:HD21 | 2.02                     | 0.41              |
| 1:N:155:GLN:N    | 1:N:155:GLN:OE1  | 2.53                     | 0.41              |
| 1:N:276:ARG:HH21 | 1:N:392:TYR:HB2  | 1.85                     | 0.41              |
| 2:O:231:TRP:CE2  | 2:O:245:PHE:HB2  | 2.55                     | 0.41              |
| 1:A:171:TYR:HB3  | 2:B:397:TYR:O    | 2.20                     | 0.41              |
| 1:F:201:ARG:HE   | 1:F:201:ARG:HB2  | 1.57                     | 0.41              |
| 1:F:330:TYR:HB3  | 1:F:331:PRO:HD3  | 2.02                     | 0.41              |
| 1:F:372:LYS:HA   | 1:F:375:GLU:HG2  | 2.02                     | 0.41              |
| 2:K:78:PHE:CE2   | 2:K:86:TRP:HE3   | 2.38                     | 0.41              |
| 2:K:90:ASN:O     | 2:K:90:ASN:OD1   | 2.39                     | 0.41              |
| 2:K:94:LYS:HE3   | 2:K:94:LYS:HB3   | 1.80                     | 0.41              |
| 2:K:422:THR:OG1  | 2:K:475:GLY:O    | 2.26                     | 0.41              |
| 1:N:175:TRP:HB3  | 1:N:408:LEU:HD13 | 2.02                     | 0.41              |
| 1:N:185:LEU:HD11 | 1:N:215:CYS:SG   | 2.60                     | 0.41              |
| 1:N:300:LEU:HD23 | 1:N:300:LEU:HA   | 1.76                     | 0.41              |
| 1:A:287:MET:HE3  | 1:A:292:ALA:HB2  | 2.03                     | 0.41              |
| 1:F:12:PRO:HG2   | 1:F:13:GLU:OE1   | 2.20                     | 0.41              |
| 1:F:174:ASN:ND2  | 2:G:395:LYS:HB2  | 2.35                     | 0.41              |
| 2:G:64:ILE:HG13  | 2:G:65:TYR:H     | 1.84                     | 0.41              |
| 1:J:297:LYS:HD3  | 1:J:347:GLY:HA3  | 2.02                     | 0.41              |
| 1:N:162:LYS:HE2  | 2:O:428:LYS:O    | 2.21                     | 0.41              |
| 1:N:328:LYS:HZ2  | 1:N:334:VAL:HB   | 1.86                     | 0.41              |
| 2:B:67:HIS:ND1   | 2:B:68:ASN:OD1   | 2.51                     | 0.41              |
| 2:G:138:VAL:HG13 | 2:G:140:PHE:CE2  | 2.54                     | 0.41              |
| 2:K:208:ASP:HB3  | 2:K:492:ALA:HB2  | 2.03                     | 0.41              |
| 2:K:251:HIS:O    | 2:K:254:TRP:HB2  | 2.20                     | 0.41              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:K:327:GLU:HG3  | 2:K:329:HIS:ND1  | 2.36                     | 0.41              |
| 1:N:175:TRP:CZ3  | 2:O:411:TYR:HE2  | 2.39                     | 0.41              |
| 1:N:311:VAL:HG13 | 1:N:320:HIS:ND1  | 2.36                     | 0.41              |
| 1:N:372:LYS:HE3  | 1:N:372:LYS:HB2  | 1.88                     | 0.41              |
| 3:H:17:U:H2'     | 3:H:18:U:C6      | 2.55                     | 0.41              |
| 1:A:219:TRP:HD1  | 1:A:220:GLU:H    | 1.68                     | 0.41              |
| 2:B:19:LYS:HE2   | 2:B:19:LYS:HB3   | 1.69                     | 0.41              |
| 2:B:395:LYS:HB3  | 2:B:397:TYR:CE1  | 2.48                     | 0.41              |
| 1:F:408:LEU:HD22 | 2:G:2:LYS:NZ     | 2.36                     | 0.41              |
| 2:G:5:ILE:HG12   | 2:G:410:ALA:HB3  | 2.02                     | 0.41              |
| 2:G:204:ALA:O    | 3:H:1:A:N6       | 2.50                     | 0.41              |
| 1:N:82:THR:HG21  | 1:N:111:GLU:OE2  | 2.21                     | 0.41              |
| 3:L:17:U:H2'     | 3:L:18:U:C6      | 2.55                     | 0.41              |
| 1:A:101:GLU:HG2  | 1:A:121:LYS:HB3  | 2.02                     | 0.41              |
| 1:F:20:TRP:O     | 1:F:24:LYS:HG2   | 2.21                     | 0.41              |
| 2:G:118:VAL:O    | 2:G:122:ASN:HB2  | 2.21                     | 0.41              |
| 2:G:235:LYS:N    | 2:G:235:LYS:HD2  | 2.36                     | 0.41              |
| 1:J:283:ARG:O    | 1:J:293:TYR:HA   | 2.20                     | 0.41              |
| 2:K:295:GLN:HG3  | 2:K:323:PRO:HA   | 2.03                     | 0.41              |
| 2:O:78:PHE:HE1   | 2:O:84:CYS:HG    | 1.68                     | 0.41              |
| 4:Q:15:DG:H2'    | 4:Q:16:DA:C8     | 2.56                     | 0.41              |
| 2:G:78:PHE:CD2   | 2:G:257:SER:HB3  | 2.55                     | 0.41              |
| 1:J:289:LYS:HD2  | 1:J:289:LYS:HA   | 1.92                     | 0.41              |
| 2:K:128:ALA:O    | 2:K:132:ASP:HB2  | 2.20                     | 0.41              |
| 2:K:319:PRO:HD3  | 2:K:490:LEU:HD13 | 2.02                     | 0.41              |
| 2:K:421:TRP:CD2  | 2:K:440:PRO:HB3  | 2.56                     | 0.41              |
| 2:O:41:SER:OG    | 2:O:91:ILE:HG12  | 2.21                     | 0.41              |
| 1:A:60:PHE:HE2   | 1:A:62:ILE:HG12  | 1.86                     | 0.41              |
| 1:A:155:GLN:O    | 1:A:159:LEU:HB2  | 2.21                     | 0.41              |
| 1:A:169:GLU:HB2  | 1:A:415:SER:HB2  | 2.03                     | 0.41              |
| 1:A:189:ARG:HG3  | 1:A:189:ARG:O    | 2.21                     | 0.41              |
| 1:A:273:PHE:CE1  | 1:A:335:LEU:HD11 | 2.56                     | 0.41              |
| 2:B:314:LYS:HE2  | 2:B:314:LYS:HB2  | 1.81                     | 0.41              |
| 2:B:339:LEU:HD23 | 2:B:376:VAL:HG13 | 2.03                     | 0.41              |
| 1:F:171:TYR:CD1  | 2:G:398:LYS:HG3  | 2.56                     | 0.41              |
| 1:F:227:LEU:HD23 | 1:F:230:THR:HG21 | 2.03                     | 0.41              |
| 1:F:358:HIS:O    | 1:F:362:ARG:HG2  | 2.20                     | 0.41              |
| 2:K:206:PHE:CD1  | 2:K:206:PHE:C    | 2.94                     | 0.41              |
| 2:K:339:LEU:O    | 2:K:339:LEU:HD12 | 2.21                     | 0.41              |
| 1:N:4:LYS:HB2    | 1:N:57:THR:HA    | 2.03                     | 0.41              |
| 2:O:262:TYR:CE2  | 2:O:507:ILE:HD11 | 2.56                     | 0.41              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 4:I:9:DA:H2'     | 4:I:10:DG:H8     | 1.84                     | 0.41              |
| 3:L:16:A:H2'     | 3:L:17:U:C6      | 2.56                     | 0.41              |
| 1:A:51:LYS:HE3   | 1:A:55:GLU:HG2   | 2.03                     | 0.41              |
| 2:B:356:GLU:HG3  | 2:B:382:ASN:O    | 2.21                     | 0.41              |
| 2:G:345:SER:O    | 2:G:348:GLU:HG3  | 2.21                     | 0.41              |
| 2:K:50:LEU:HD22  | 2:K:93:PHE:CD2   | 2.56                     | 0.41              |
| 2:O:10:PRO:HG2   | 2:O:464:LYS:HD2  | 2.02                     | 0.41              |
| 2:O:227:SER:HA   | 2:O:234:PHE:CD2  | 2.56                     | 0.41              |
| 2:B:394:LEU:HD23 | 2:B:419:PHE:CG   | 2.56                     | 0.40              |
| 2:B:501:LEU:HD23 | 2:G:131:ASN:CG   | 2.41                     | 0.40              |
| 2:G:388:ILE:HD13 | 2:G:477:PRO:HG3  | 2.03                     | 0.40              |
| 1:J:262:GLN:HE22 | 1:J:329:LEU:HD23 | 1.85                     | 0.40              |
| 1:J:266:VAL:HA   | 1:J:269:ILE:HD12 | 2.03                     | 0.40              |
| 2:O:72:ARG:NH1   | 2:O:248:ILE:HG22 | 2.36                     | 0.40              |
| 2:O:333:LYS:HE2  | 2:O:333:LYS:HB2  | 1.86                     | 0.40              |
| 1:A:200:VAL:HG11 | 1:A:214:LEU:HD11 | 2.02                     | 0.40              |
| 1:A:201:ARG:HE   | 1:A:201:ARG:HB2  | 1.55                     | 0.40              |
| 2:B:216:GLU:HG3  | 2:B:217:HIS:ND1  | 2.37                     | 0.40              |
| 2:B:251:HIS:O    | 2:B:255:THR:HG23 | 2.20                     | 0.40              |
| 2:B:446:ASN:OD1  | 2:B:447:LYS:N    | 2.54                     | 0.40              |
| 1:F:75:LEU:HD23  | 1:F:75:LEU:HA    | 1.87                     | 0.40              |
| 1:F:109:ASN:HA   | 1:J:50:GLU:OE2   | 2.21                     | 0.40              |
| 1:J:42:GLY:HA3   | 1:N:95:ILE:HG12  | 2.03                     | 0.40              |
| 2:K:343:LEU:HD22 | 2:K:353:TYR:HD2  | 1.85                     | 0.40              |
| 2:K:503:PHE:O    | 2:K:507:ILE:HG12 | 2.21                     | 0.40              |
| 1:N:155:GLN:HA   | 1:N:159:LEU:HB2  | 2.04                     | 0.40              |
| 1:N:304:LYS:HE2  | 1:N:304:LYS:HB3  | 1.78                     | 0.40              |
| 1:N:344:THR:HB   | 1:N:349:ASN:O    | 2.21                     | 0.40              |
| 2:O:82:PHE:HB3   | 2:O:261:TYR:CE2  | 2.56                     | 0.40              |
| 2:B:72:ARG:NH2   | 4:D:21:DT:O3'    | 2.55                     | 0.40              |
| 1:F:266:VAL:HG21 | 4:I:11:DA:OP1    | 2.21                     | 0.40              |
| 2:G:123:ASP:OD1  | 2:G:124:LYS:N    | 2.55                     | 0.40              |
| 1:J:178:ILE:HG12 | 1:J:403:ILE:HD12 | 2.03                     | 0.40              |
| 2:K:22:ASP:HB2   | 2:K:428:LYS:HE3  | 2.04                     | 0.40              |
| 1:N:70:LYS:HB2   | 1:N:70:LYS:HE3   | 1.83                     | 0.40              |
| 1:N:182:PRO:HB3  | 1:N:399:GLU:HB3  | 2.03                     | 0.40              |
| 2:O:301:ALA:HB1  | 2:O:503:PHE:HZ   | 1.85                     | 0.40              |
| 3:C:17:U:H2'     | 3:C:18:U:C6      | 2.57                     | 0.40              |
| 3:L:13:U:H2'     | 3:L:14:C:C6      | 2.56                     | 0.40              |
| 4:Q:7:DA:H2'     | 4:Q:8:DT:C6      | 2.56                     | 0.40              |
| 2:B:320:TRP:CZ3  | 2:B:338:LEU:HD12 | 2.56                     | 0.40              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:B:392:LYS:HG3  | 2:B:393:PRO:HD2  | 2.02                     | 0.40              |
| 2:G:485:LYS:O    | 2:G:489:ILE:HG12 | 2.21                     | 0.40              |
| 1:J:385:SER:OG   | 1:J:391:ILE:HG22 | 2.21                     | 0.40              |
| 2:K:248:ILE:HD12 | 3:L:2:A:H61      | 1.86                     | 0.40              |
| 2:K:389:THR:HG22 | 2:K:392:LYS:HG2  | 2.04                     | 0.40              |
| 1:N:172:ASP:OD1  | 1:N:409:LYS:HE3  | 2.21                     | 0.40              |
| 1:N:173:SER:OG   | 1:N:408:LEU:O    | 2.26                     | 0.40              |
| 1:A:160:HIS:CE1  | 1:A:161:ASP:HB2  | 2.56                     | 0.40              |
| 1:A:253:THR:HG22 | 1:A:255:PHE:N    | 2.36                     | 0.40              |
| 1:A:369:TRP:CH2  | 4:D:22:DT:H2''   | 2.56                     | 0.40              |
| 2:B:329:HIS:CD2  | 2:B:366:ASN:HB3  | 2.56                     | 0.40              |
| 1:F:122:LYS:O    | 1:F:126:LYS:HE2  | 2.21                     | 0.40              |
| 2:G:71:THR:HA    | 2:G:429:LEU:O    | 2.21                     | 0.40              |
| 2:G:248:ILE:HG23 | 4:I:21:DT:H2''   | 2.02                     | 0.40              |
| 1:J:71:ARG:HA    | 1:J:71:ARG:HD3   | 1.91                     | 0.40              |
| 1:J:71:ARG:HH11  | 1:J:71:ARG:HG2   | 1.85                     | 0.40              |
| 1:J:241:ILE:HD13 | 1:J:251:TYR:CE2  | 2.56                     | 0.40              |
| 1:J:247:LEU:HD23 | 1:J:262:GLN:HE22 | 1.86                     | 0.40              |
| 1:J:343:PHE:O    | 1:J:357:GLN:NE2  | 2.54                     | 0.40              |
| 3:H:6:G:H8       | 3:H:6:G:OP2      | 2.03                     | 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   | A     | 411/450 (91%) | 391 (95%) | 20 (5%) | 0        | 100         | 100 |
| 1   | F     | 406/450 (90%) | 385 (95%) | 21 (5%) | 0        | 100         | 100 |
| 1   | J     | 411/450 (91%) | 394 (96%) | 17 (4%) | 0        | 100         | 100 |
| 1   | N     | 406/450 (90%) | 383 (94%) | 23 (6%) | 0        | 100         | 100 |

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| Mol | Chain | Analysed        | Favoured   | Allowed  | Outliers | Percentiles |     |
|-----|-------|-----------------|------------|----------|----------|-------------|-----|
| 2   | B     | 418/507 (82%)   | 391 (94%)  | 27 (6%)  | 0        | 100         | 100 |
| 2   | G     | 418/507 (82%)   | 397 (95%)  | 21 (5%)  | 0        | 100         | 100 |
| 2   | K     | 418/507 (82%)   | 397 (95%)  | 21 (5%)  | 0        | 100         | 100 |
| 2   | O     | 418/507 (82%)   | 396 (95%)  | 22 (5%)  | 0        | 100         | 100 |
| All | All   | 3306/3828 (86%) | 3134 (95%) | 172 (5%) | 0        | 100         | 100 |

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains ⓘ

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

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

| Mol | Chain | Analysed        | Rotameric  | Outliers | Percentiles |    |
|-----|-------|-----------------|------------|----------|-------------|----|
| 1   | A     | 381/415 (92%)   | 367 (96%)  | 14 (4%)  | 34          | 66 |
| 1   | F     | 379/415 (91%)   | 367 (97%)  | 12 (3%)  | 39          | 71 |
| 1   | J     | 381/415 (92%)   | 366 (96%)  | 15 (4%)  | 32          | 64 |
| 1   | N     | 379/415 (91%)   | 366 (97%)  | 13 (3%)  | 37          | 69 |
| 2   | B     | 370/446 (83%)   | 358 (97%)  | 12 (3%)  | 39          | 71 |
| 2   | G     | 370/446 (83%)   | 363 (98%)  | 7 (2%)   | 57          | 83 |
| 2   | K     | 370/446 (83%)   | 361 (98%)  | 9 (2%)   | 49          | 78 |
| 2   | O     | 370/446 (83%)   | 356 (96%)  | 14 (4%)  | 33          | 65 |
| All | All   | 3000/3444 (87%) | 2904 (97%) | 96 (3%)  | 42          | 71 |

All (96) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | A     | 16  | ASP  |
| 1   | A     | 33  | TRP  |
| 1   | A     | 100 | ASP  |
| 1   | A     | 105 | TYR  |
| 1   | A     | 106 | ASP  |
| 1   | A     | 158 | PHE  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | A     | 181 | PHE  |
| 1   | A     | 193 | ARG  |
| 1   | A     | 199 | ASP  |
| 1   | A     | 212 | GLU  |
| 1   | A     | 221 | TYR  |
| 1   | A     | 302 | LYS  |
| 1   | A     | 345 | MET  |
| 1   | A     | 409 | LYS  |
| 2   | B     | 24  | ARG  |
| 2   | B     | 68  | ASN  |
| 2   | B     | 85  | LYS  |
| 2   | B     | 123 | ASP  |
| 2   | B     | 202 | TYR  |
| 2   | B     | 208 | ASP  |
| 2   | B     | 234 | PHE  |
| 2   | B     | 324 | GLU  |
| 2   | B     | 371 | ASN  |
| 2   | B     | 380 | ASN  |
| 2   | B     | 423 | LEU  |
| 2   | B     | 470 | CYS  |
| 1   | F     | 122 | LYS  |
| 1   | F     | 136 | GLU  |
| 1   | F     | 162 | LYS  |
| 1   | F     | 226 | GLN  |
| 1   | F     | 233 | TYR  |
| 1   | F     | 252 | ASP  |
| 1   | F     | 273 | PHE  |
| 1   | F     | 297 | LYS  |
| 1   | F     | 299 | LYS  |
| 1   | F     | 336 | MET  |
| 1   | F     | 345 | MET  |
| 1   | F     | 385 | SER  |
| 2   | G     | 19  | LYS  |
| 2   | G     | 74  | MET  |
| 2   | G     | 285 | TYR  |
| 2   | G     | 309 | ASP  |
| 2   | G     | 367 | ASP  |
| 2   | G     | 398 | LYS  |
| 2   | G     | 470 | CYS  |
| 1   | J     | 15  | ASP  |
| 1   | J     | 54  | ARG  |
| 1   | J     | 69  | ASN  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | J     | 116 | ASN  |
| 1   | J     | 133 | ASP  |
| 1   | J     | 149 | LYS  |
| 1   | J     | 158 | PHE  |
| 1   | J     | 183 | ASN  |
| 1   | J     | 226 | GLN  |
| 1   | J     | 285 | TYR  |
| 1   | J     | 299 | LYS  |
| 1   | J     | 320 | HIS  |
| 1   | J     | 328 | LYS  |
| 1   | J     | 411 | PHE  |
| 1   | J     | 420 | SER  |
| 2   | K     | 78  | PHE  |
| 2   | K     | 206 | PHE  |
| 2   | K     | 209 | GLN  |
| 2   | K     | 270 | LYS  |
| 2   | K     | 367 | ASP  |
| 2   | K     | 383 | LEU  |
| 2   | K     | 430 | GLN  |
| 2   | K     | 442 | PHE  |
| 2   | K     | 470 | CYS  |
| 1   | N     | 14  | ASP  |
| 1   | N     | 205 | PHE  |
| 1   | N     | 210 | TYR  |
| 1   | N     | 212 | GLU  |
| 1   | N     | 233 | TYR  |
| 1   | N     | 258 | ASN  |
| 1   | N     | 261 | CYS  |
| 1   | N     | 274 | GLU  |
| 1   | N     | 281 | ASN  |
| 1   | N     | 285 | TYR  |
| 1   | N     | 321 | PHE  |
| 1   | N     | 336 | MET  |
| 1   | N     | 353 | SER  |
| 2   | O     | 23  | PRO  |
| 2   | O     | 24  | ARG  |
| 2   | O     | 68  | ASN  |
| 2   | O     | 74  | MET  |
| 2   | O     | 78  | PHE  |
| 2   | O     | 89  | GLN  |
| 2   | O     | 202 | TYR  |
| 2   | O     | 279 | CYS  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2   | O     | 303 | MET  |
| 2   | O     | 304 | PHE  |
| 2   | O     | 364 | ARG  |
| 2   | O     | 365 | PHE  |
| 2   | O     | 366 | ASN  |
| 2   | O     | 470 | CYS  |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | A     | 314 | GLN  |
| 1   | F     | 340 | HIS  |
| 1   | F     | 370 | ASN  |
| 1   | J     | 9   | HIS  |
| 1   | J     | 262 | GLN  |
| 1   | J     | 320 | HIS  |
| 2   | K     | 446 | ASN  |
| 2   | K     | 468 | ASN  |
| 1   | N     | 357 | GLN  |
| 2   | O     | 122 | ASN  |
| 2   | O     | 296 | ASN  |

### 5.3.3 RNA ⓘ

| Mol | Chain | Analysed    | Backbone Outliers | Pucker Outliers |
|-----|-------|-------------|-------------------|-----------------|
| 3   | C     | 19/21 (90%) | 3 (15%)           | 0               |
| 3   | H     | 19/21 (90%) | 2 (10%)           | 0               |
| 3   | L     | 19/21 (90%) | 1 (5%)            | 0               |
| 3   | P     | 19/21 (90%) | 3 (15%)           | 0               |
| All | All   | 76/84 (90%) | 9 (11%)           | 0               |

All (9) RNA backbone outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 3   | C     | 6   | G    |
| 3   | C     | 16  | A    |
| 3   | C     | 20  | G    |
| 3   | H     | 6   | G    |
| 3   | H     | 7   | C    |
| 3   | L     | 6   | G    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 3   | P     | 6   | G    |
| 3   | P     | 7   | C    |
| 3   | P     | 20  | G    |

There are no RNA pucker outliers to report.

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

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

## 5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

## 5.6 Ligand geometry ⓘ

Of 4 ligands modelled in this entry, 4 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 5.7 Other polymers ⓘ

There are no such residues in this entry.

## 5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

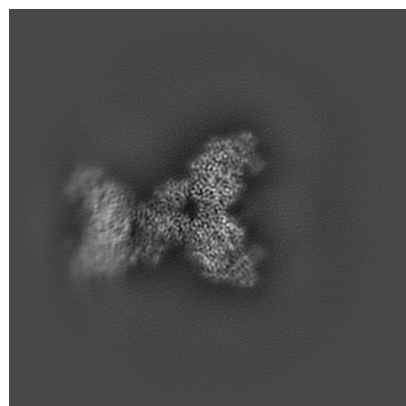
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-35421. These allow visual inspection of the internal detail of the map and identification of artifacts.

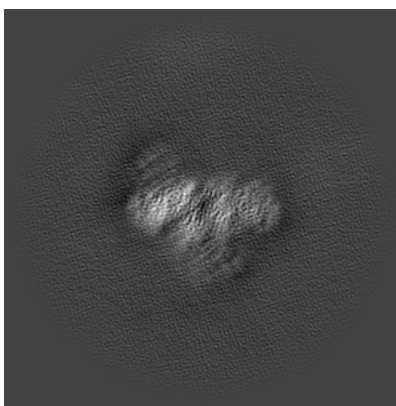
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

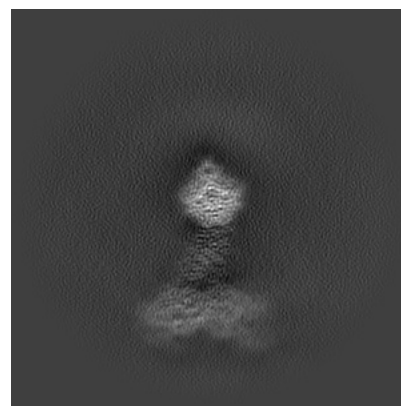
#### 6.1.1 Primary map



X

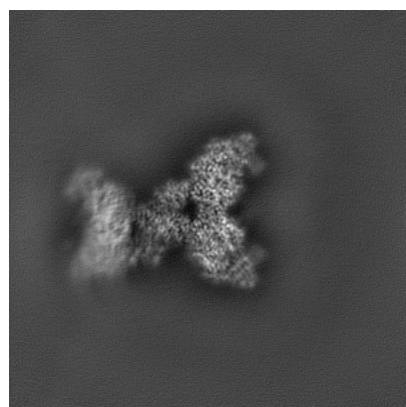


Y

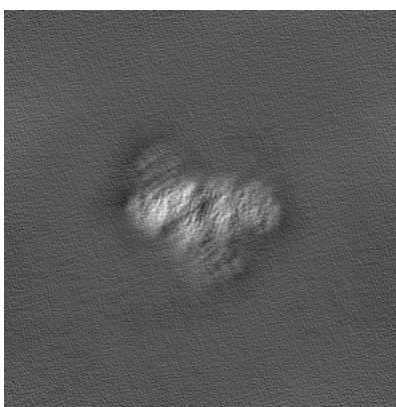


Z

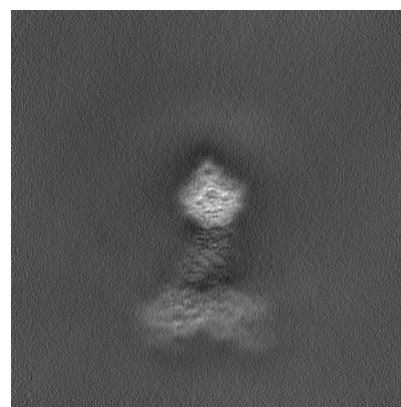
#### 6.1.2 Raw map



X



Y

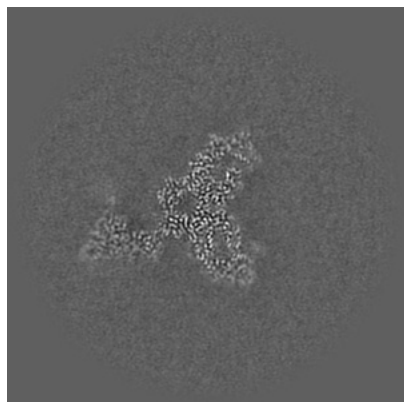


Z

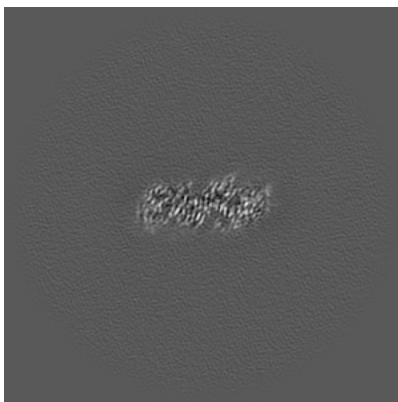
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

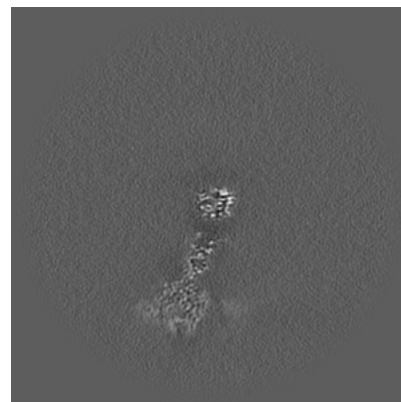
### 6.2.1 Primary map



X Index: 180

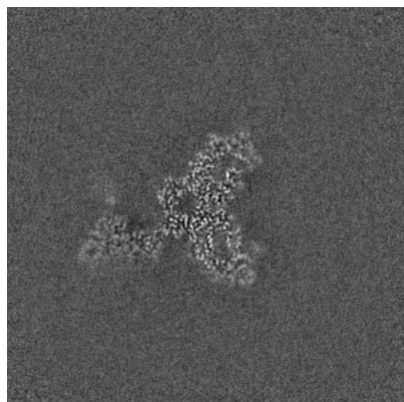


Y Index: 180

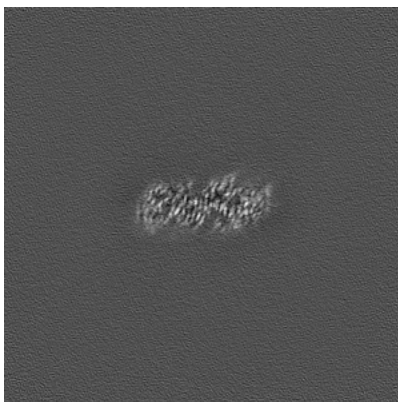


Z Index: 180

### 6.2.2 Raw map



X Index: 180



Y Index: 180



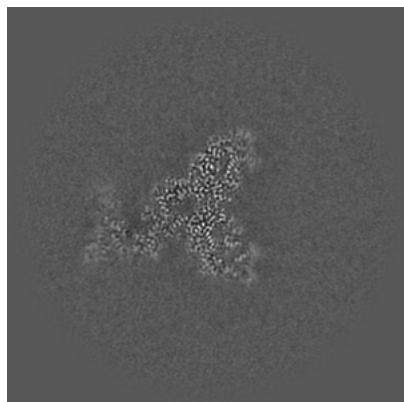
Z Index: 180

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

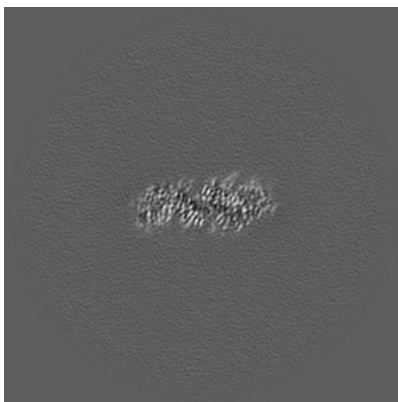


## 6.3 Largest variance slices [i](#)

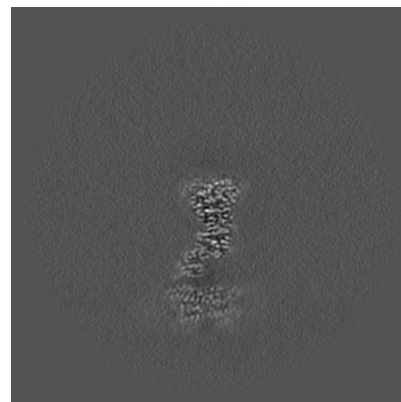
### 6.3.1 Primary map



X Index: 176

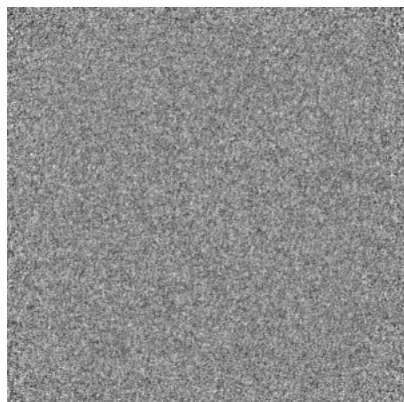


Y Index: 183

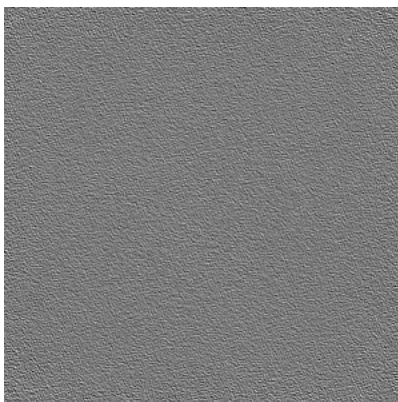


Z Index: 164

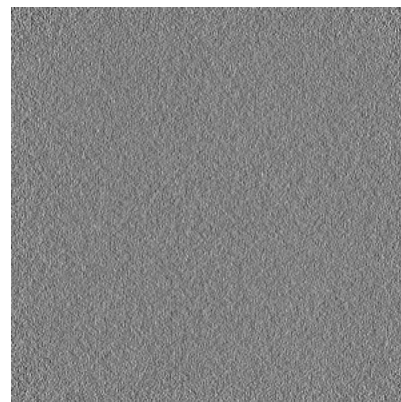
### 6.3.2 Raw map



X Index: 0



Y Index: 0

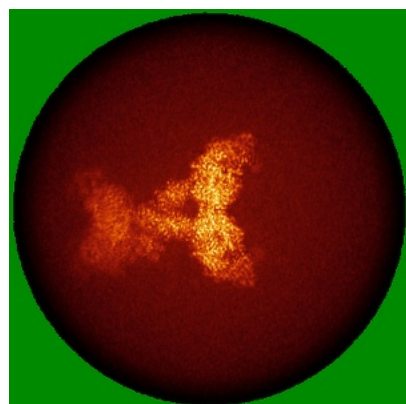


Z Index: 359

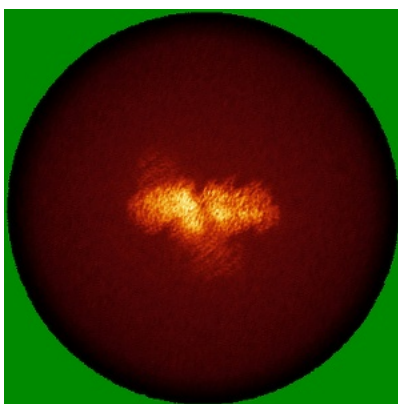
The images above show the largest variance slices of the map in three orthogonal directions.

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

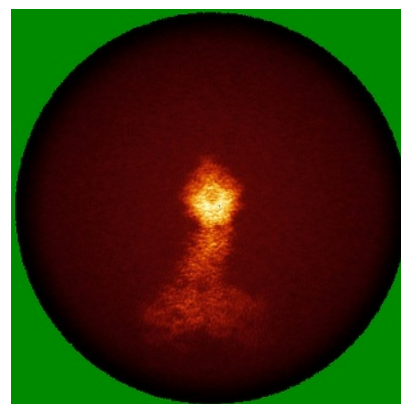
### 6.4.1 Primary map



X

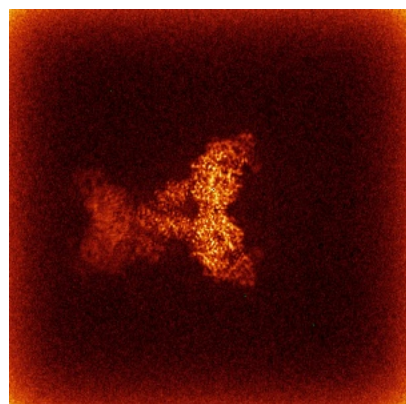


Y

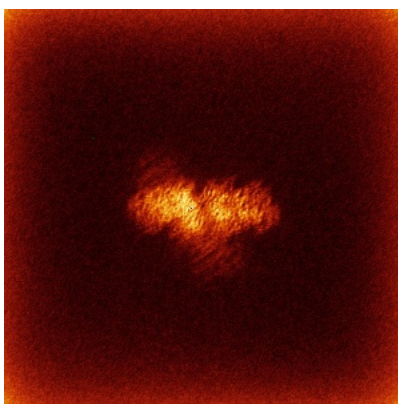


Z

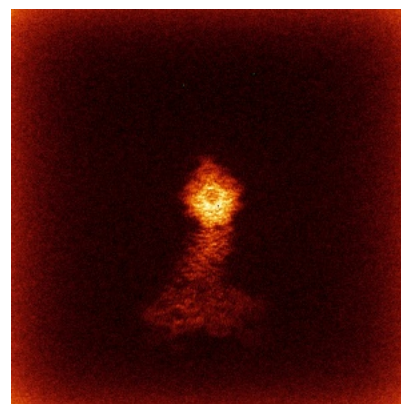
### 6.4.2 Raw map



X



Y

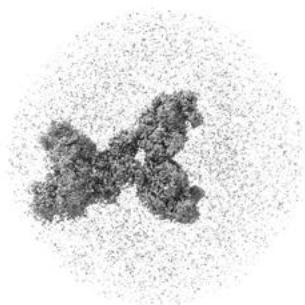


Z

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

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

### 6.5.1 Primary map



X



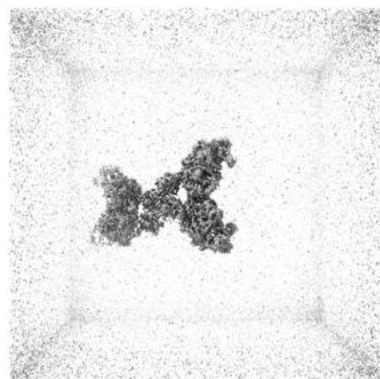
Y



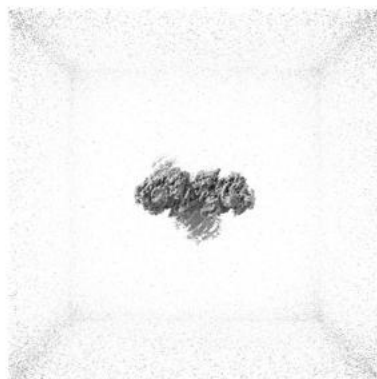
Z

The images above show the 3D surface view of the map at the recommended contour level 0.3. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

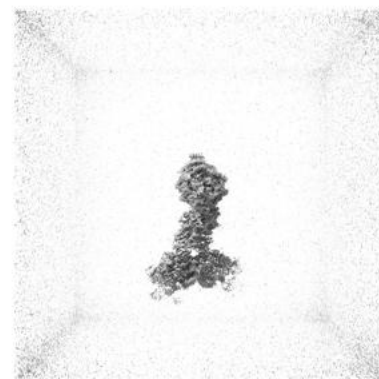
### 6.5.2 Raw map



X



Y



Z

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

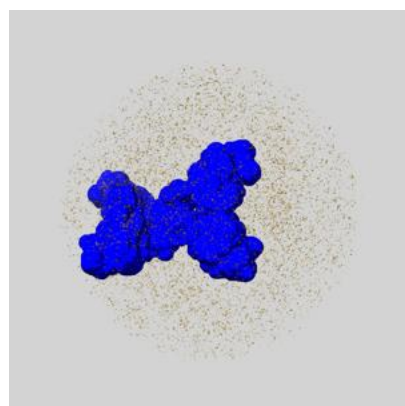
## 6.6 Mask visualisation [i](#)

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

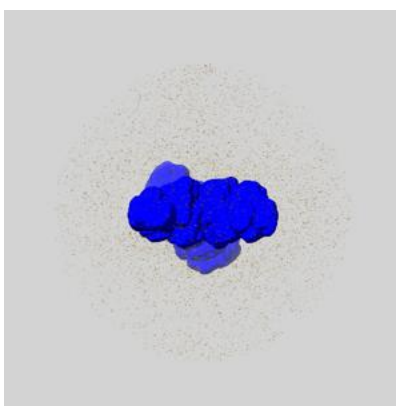
A mask typically either:

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

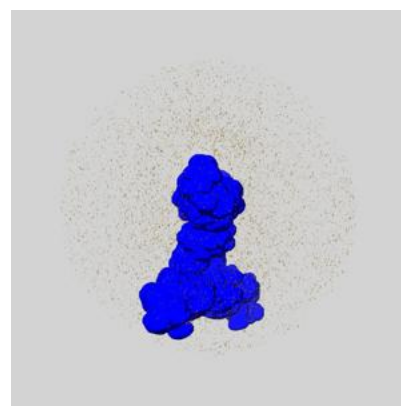
### 6.6.1 emd\_35421\_msk\_1.map [i](#)



X



Y

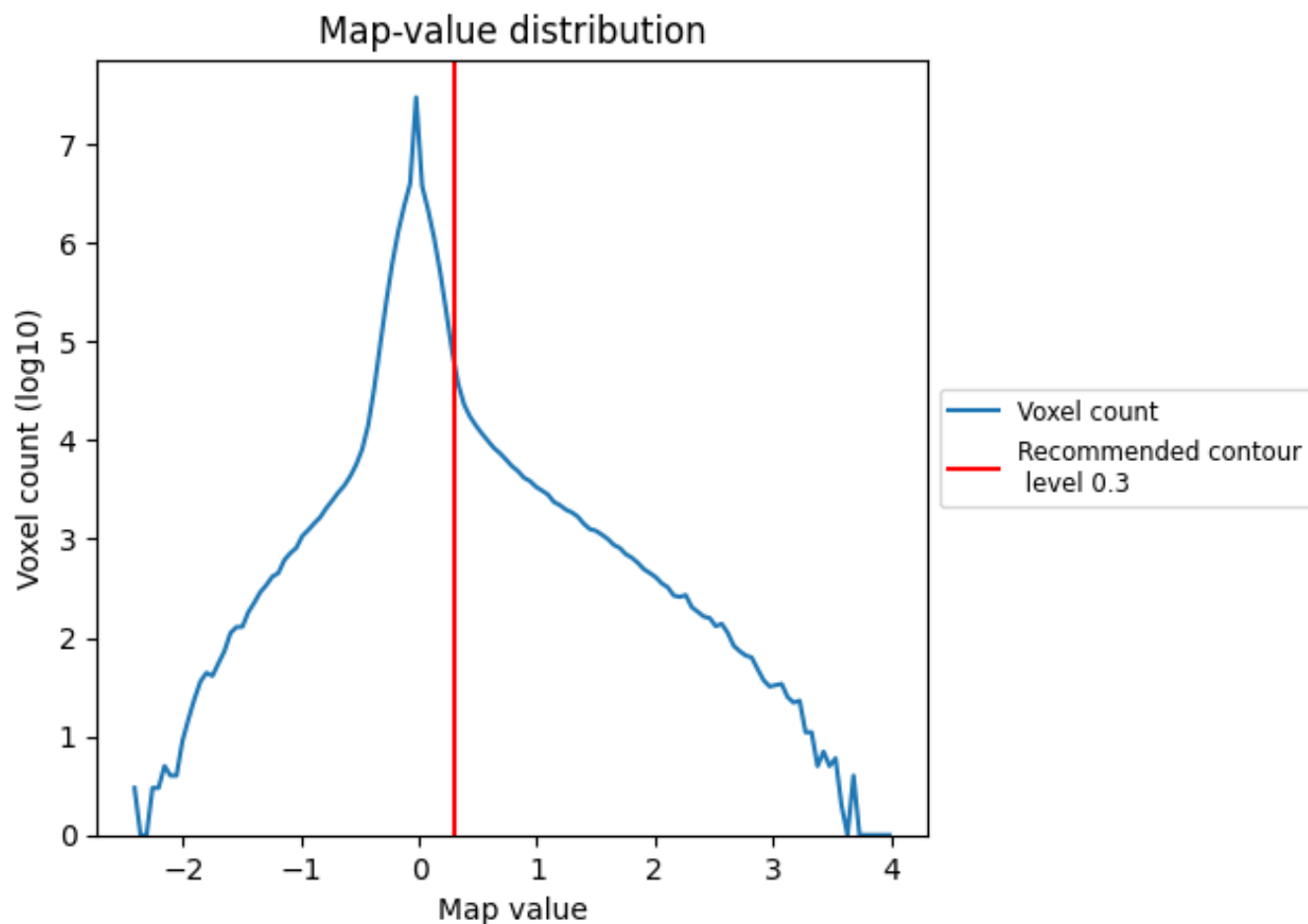


Z

## 7 Map analysis [i](#)

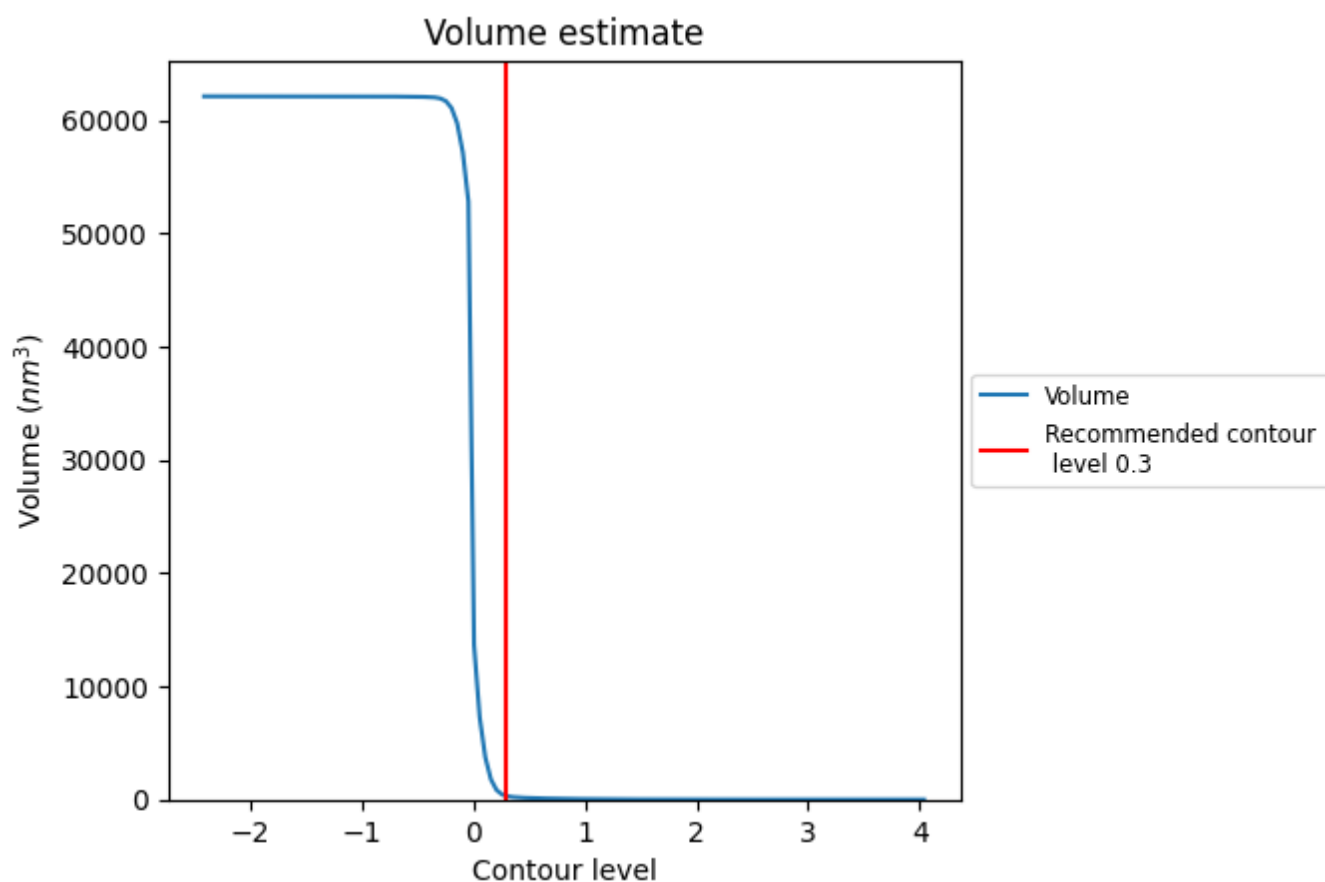
This section contains the results of statistical analysis of the map.

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



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

## 7.2 Volume estimate [i](#)

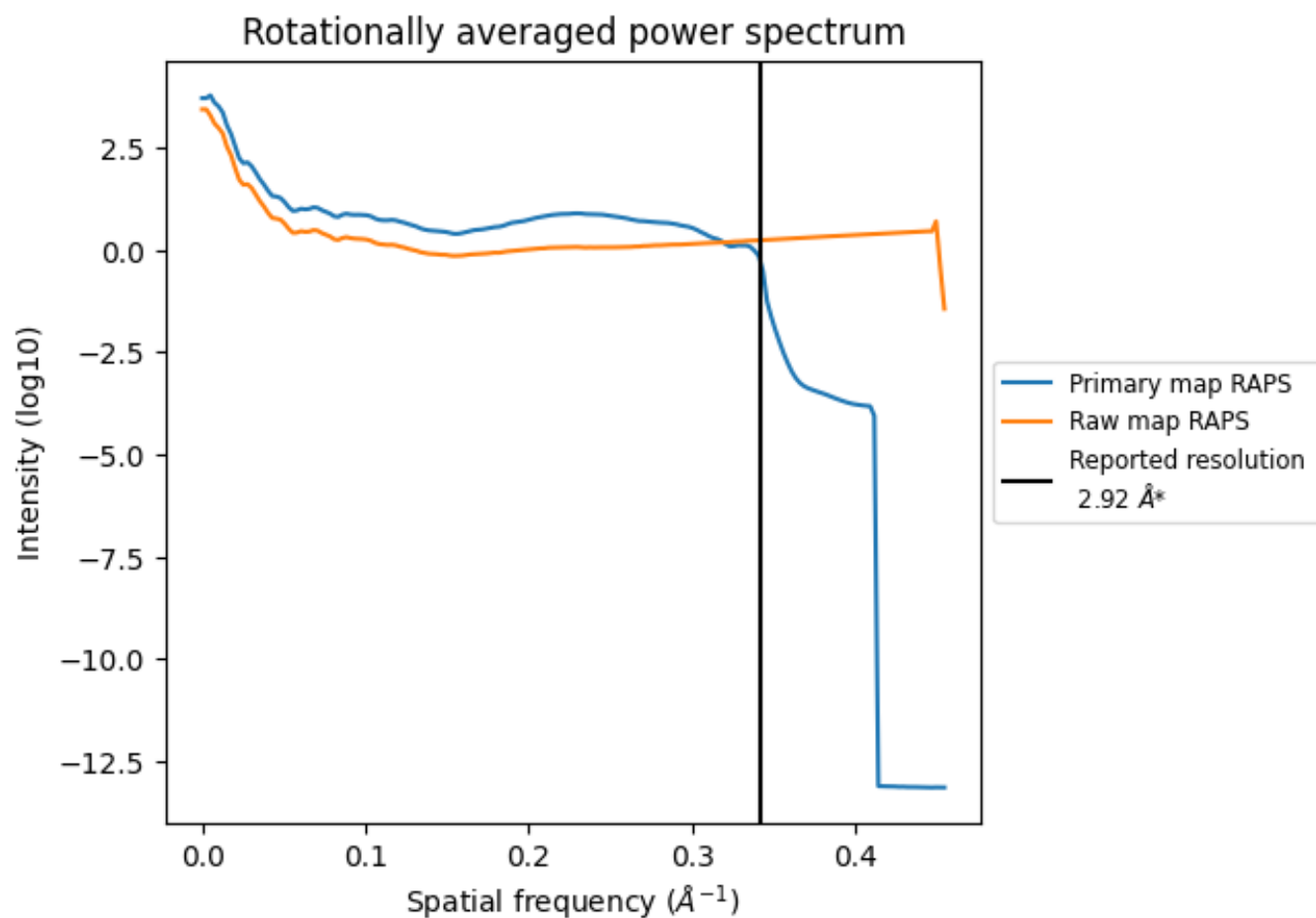


The volume at the recommended contour level is 315 nm<sup>3</sup>; this corresponds to an approximate mass of 284 kDa.

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



### 7.3 Rotationally averaged power spectrum ⓘ

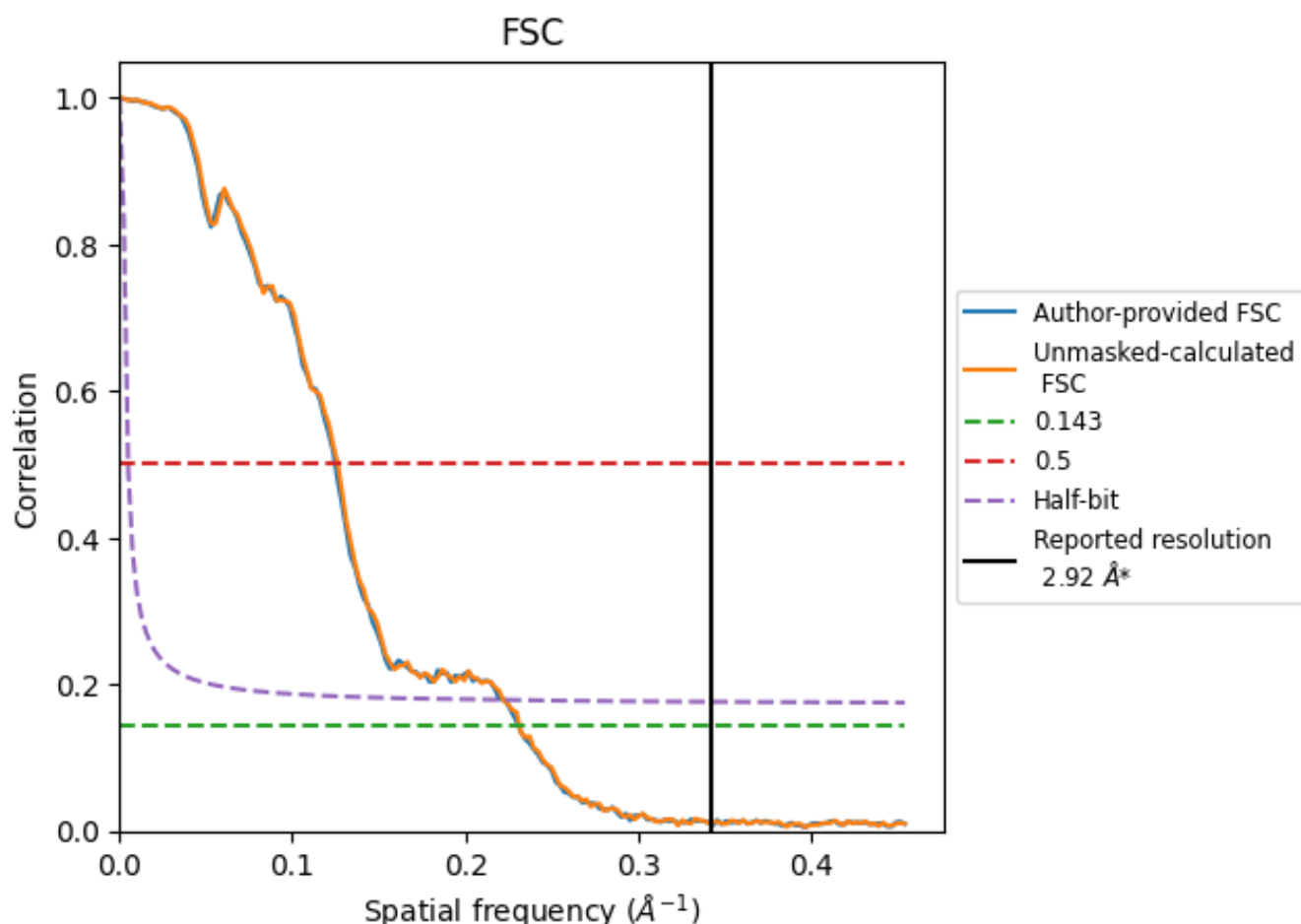


\*Reported resolution corresponds to spatial frequency of 0.342 Å<sup>-1</sup>

## 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 0.342 Å<sup>-1</sup>



## 8.2 Resolution estimates

| Resolution estimate (Å)   | Estimation criterion (FSC cut-off) |      |          |
|---------------------------|------------------------------------|------|----------|
|                           | 0.143                              | 0.5  | Half-bit |
| Reported by author        | 2.92                               | -    | -        |
| Author-provided FSC curve | 4.33                               | 8.01 | 4.49     |
| Unmasked-calculated*      | 4.32                               | 7.92 | 4.50     |

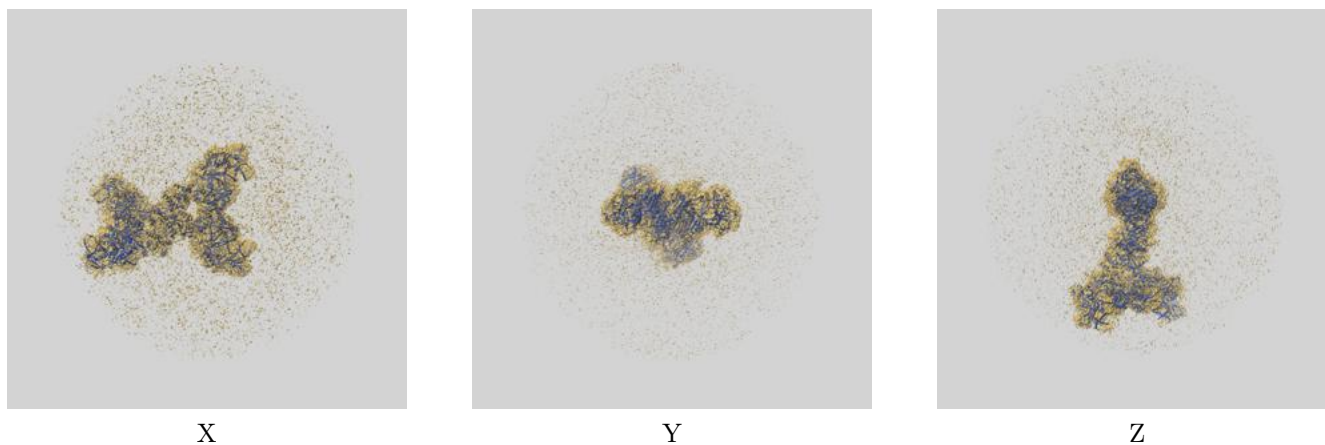
\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from author-provided FSC intersecting FSC 0.143 CUT-OFF 4.33 differs from the reported value 2.92 by more than 10 %

The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.32 differs from the reported value 2.92 by more than 10 %

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

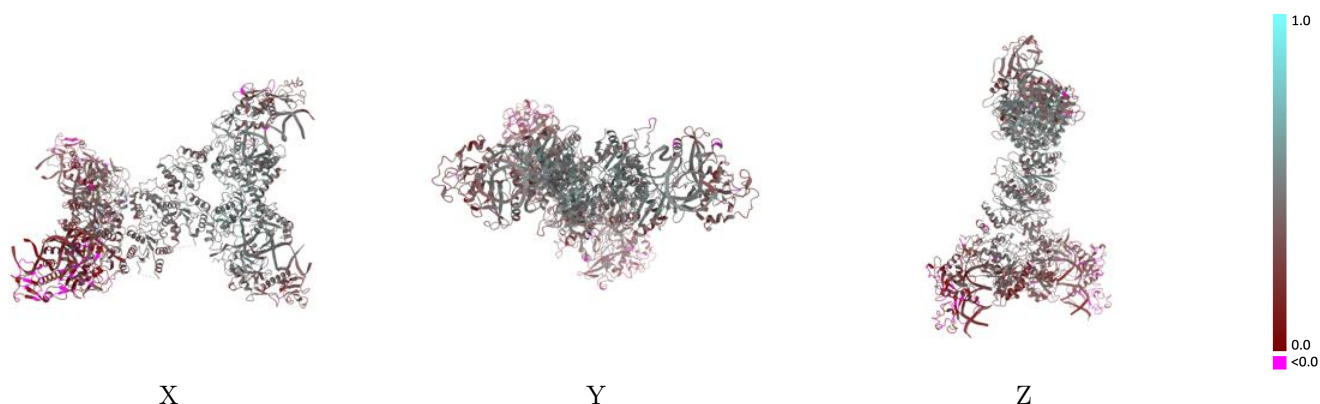
This section contains information regarding the fit between EMDB map EMD-35421 and PDB model 8IFM. Per-residue inclusion information can be found in section [3](#) on page [6](#).

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



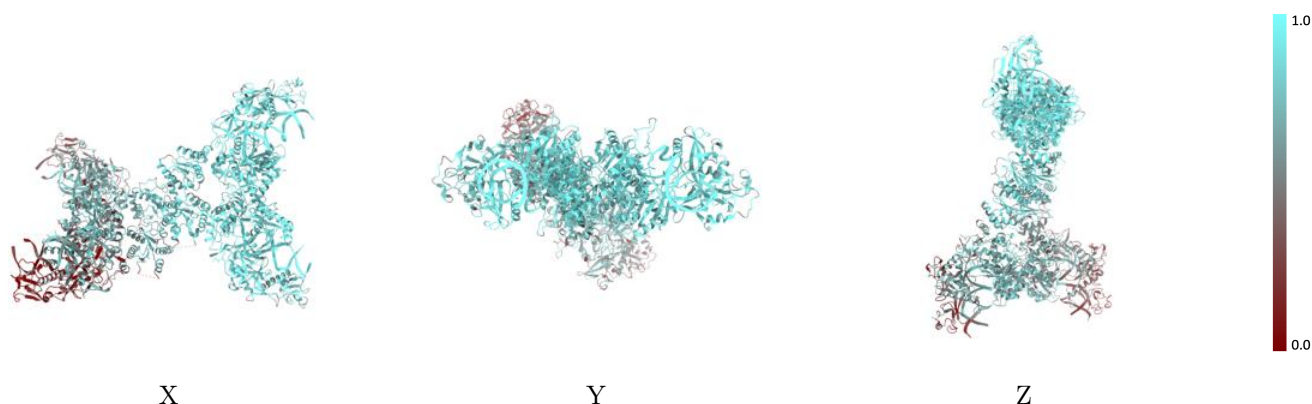
The images above show the 3D surface view of the map at the recommended contour level 0.3 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



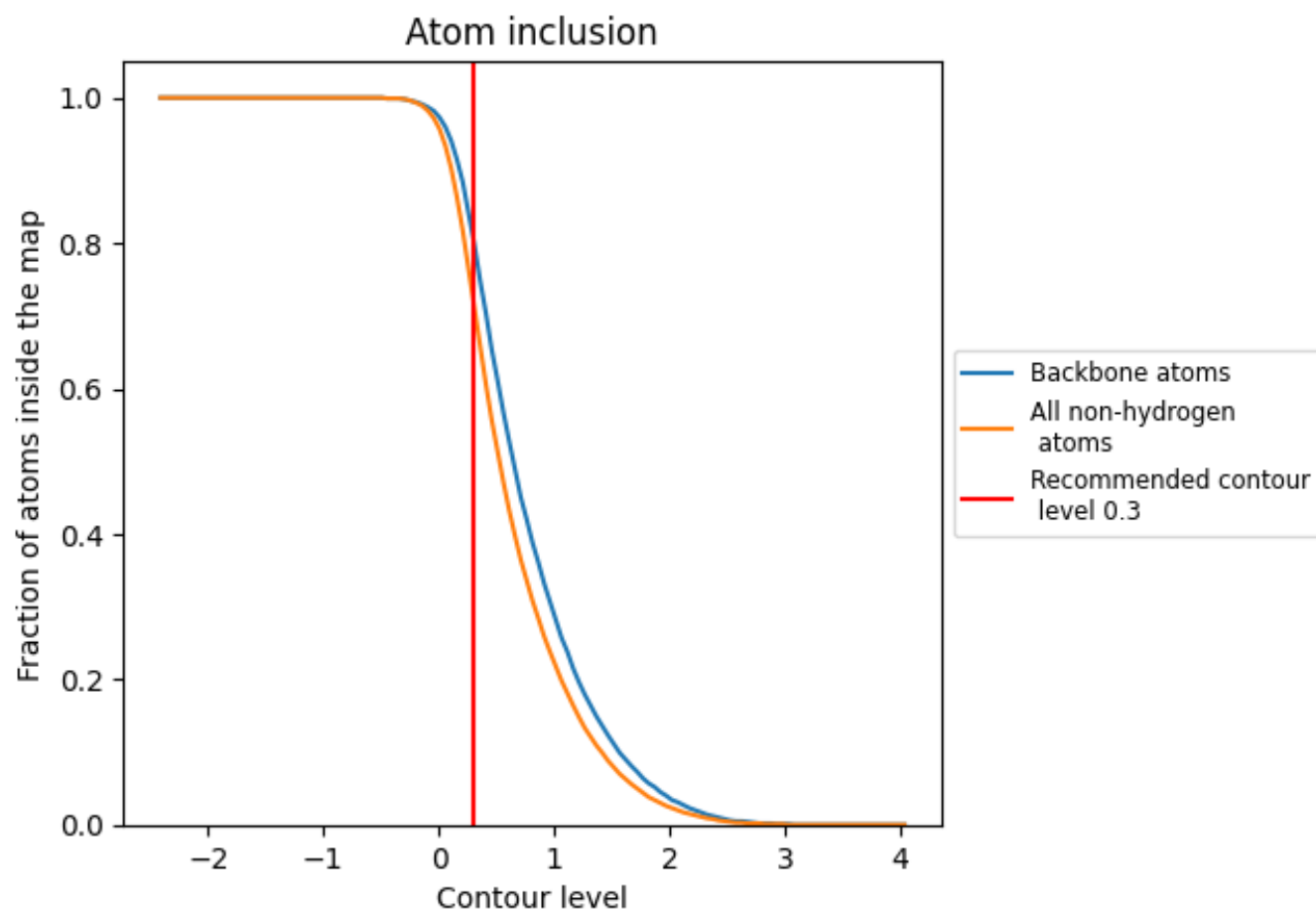
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.3).

## 9.4 Atom inclusion [i](#)



At the recommended contour level, 81% of all backbone atoms, 72% 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 (0.3) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion                                                                             | Q-score                                                                                    |
|-------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| All   |  0.7210   |  0.3590   |
| A     |  0.8440   |  0.4030   |
| B     |  0.8980   |  0.4780   |
| C     |  0.9320   |  0.4690   |
| D     |  0.9300   |  0.4730   |
| F     |  0.8220   |  0.4060   |
| G     |  0.8970   |  0.4870   |
| H     |  0.9270   |  0.4560   |
| I     |  0.9350   |  0.4640   |
| J     |  0.5810   |  0.2730   |
| K     |  0.6820   |  0.3400   |
| L     |  0.6740   |  0.2910   |
| M     |  0.6460   |  0.2570   |
| N     |  0.4170   |  0.2130   |
| O     |  0.5990  |  0.2810  |
| P     |  0.5260 |  0.2290 |
| Q     |  0.4160 |  0.1740 |

