



## Full wwPDB EM Validation Report ⓘ

Jun 17, 2025 – 04:14 AM JST

PDB ID : 8WUC / pdb\_00008wuc  
EMDB ID : EMD-37853  
Title : Cryo-EM structure of H. thermoluteolus GroEL-GroES2 football complex  
Authors : Liao, Z.; Gopalasingam, C.C.; Kameya, M.; Gerle, C.; Shigematsu, H.; Ishii, M.; Arakawa, T.; Fushinobu, S.  
Deposited on : 2023-10-20  
Resolution : 2.50 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.dev118  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
MolProbity : 4-5-2 with Phenix2.0rc1  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.44

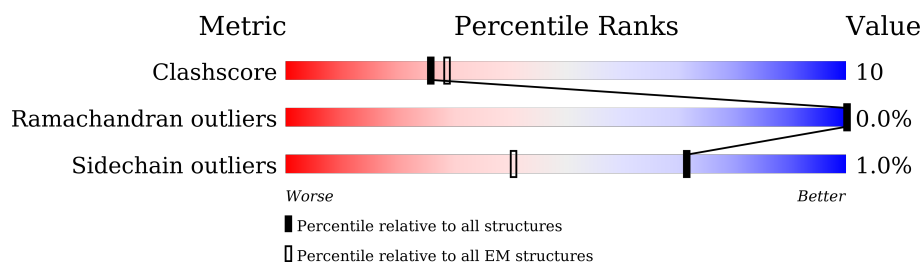
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 2.50 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.



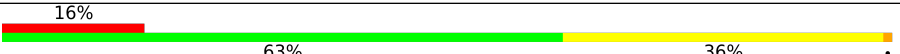
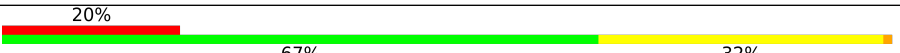
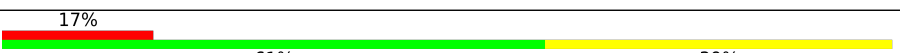
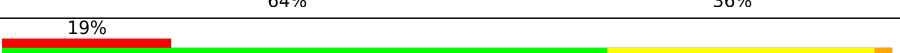
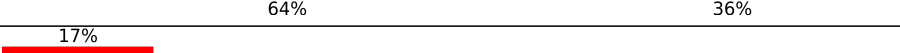
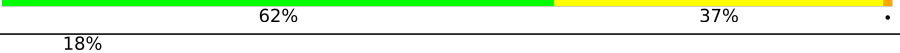
| Metric                | Whole archive<br>(#Entries) | EM structures<br>(#Entries) |
|-----------------------|-----------------------------|-----------------------------|
| Clashscore            | 210492                      | 15764                       |
| Ramachandran outliers | 207382                      | 16835                       |
| Sidechain outliers    | 206894                      | 16415                       |

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     | 528    |                  |
| 1   | B     | 528    |                  |
| 1   | C     | 528    |                  |
| 1   | D     | 528    |                  |
| 1   | E     | 528    |                  |
| 1   | F     | 528    |                  |
| 1   | G     | 528    |                  |
| 1   | H     | 528    |                  |

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| Mol | Chain | Length | Quality of chain                                                                     |
|-----|-------|--------|--------------------------------------------------------------------------------------|
| 1   | I     | 528    |    |
| 1   | J     | 528    |    |
| 1   | K     | 528    |    |
| 1   | L     | 528    |    |
| 1   | M     | 528    |    |
| 1   | N     | 528    |    |
| 2   | a     | 94     |    |
| 2   | b     | 94     |    |
| 2   | c     | 94     |    |
| 2   | d     | 94     |    |
| 2   | e     | 94     |    |
| 2   | f     | 94     |    |
| 2   | g     | 94     |  |
| 2   | h     | 94     |  |
| 2   | i     | 94     |  |
| 2   | j     | 94     |  |
| 2   | k     | 94     |  |
| 2   | l     | 94     |  |
| 2   | m     | 94     |  |
| 2   | n     | 94     |  |

## 2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 65338 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 Chaperonin GroEL.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 1   | A     | 528      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3923  | 2449 | 685 | 773 | 16 |         |       |
| 1   | B     | 528      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3923  | 2449 | 685 | 773 | 16 |         |       |
| 1   | C     | 528      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3923  | 2449 | 685 | 773 | 16 |         |       |
| 1   | D     | 528      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3923  | 2449 | 685 | 773 | 16 |         |       |
| 1   | E     | 528      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3923  | 2449 | 685 | 773 | 16 |         |       |
| 1   | F     | 528      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3923  | 2449 | 685 | 773 | 16 |         |       |
| 1   | G     | 528      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3923  | 2449 | 685 | 773 | 16 |         |       |
| 1   | H     | 528      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3923  | 2449 | 685 | 773 | 16 |         |       |
| 1   | I     | 528      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3923  | 2449 | 685 | 773 | 16 |         |       |
| 1   | J     | 528      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3923  | 2449 | 685 | 773 | 16 |         |       |
| 1   | K     | 528      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3923  | 2449 | 685 | 773 | 16 |         |       |
| 1   | L     | 528      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3923  | 2449 | 685 | 773 | 16 |         |       |
| 1   | M     | 528      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3923  | 2449 | 685 | 773 | 16 |         |       |
| 1   | N     | 528      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3923  | 2449 | 685 | 773 | 16 |         |       |

- Molecule 2 is a protein called Co-chaperonin GroES.

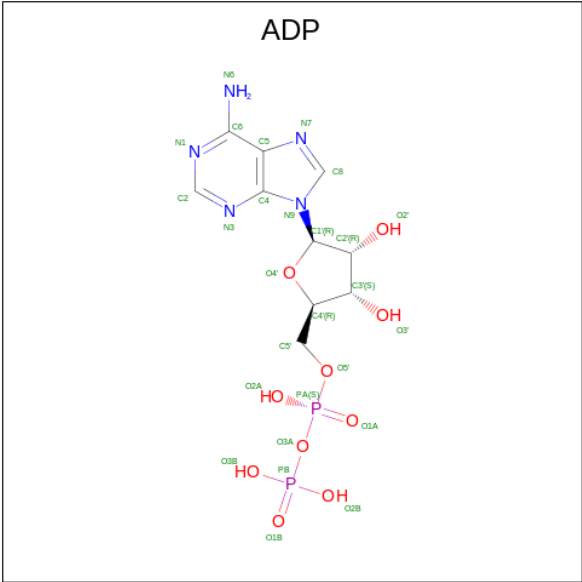
| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 2   | a     | 94       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 716   | 449 | 126 | 139 | 2 |         |       |

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| Mol | Chain | Residues | Atoms        |          |          |          |        | AltConf | Trace |
|-----|-------|----------|--------------|----------|----------|----------|--------|---------|-------|
| 2   | b     | 94       | Total<br>716 | C<br>449 | N<br>126 | O<br>139 | S<br>2 | 0       | 0     |
| 2   | c     | 94       | Total<br>716 | C<br>449 | N<br>126 | O<br>139 | S<br>2 | 0       | 0     |
| 2   | d     | 94       | Total<br>716 | C<br>449 | N<br>126 | O<br>139 | S<br>2 | 0       | 0     |
| 2   | e     | 94       | Total<br>716 | C<br>449 | N<br>126 | O<br>139 | S<br>2 | 0       | 0     |
| 2   | f     | 94       | Total<br>716 | C<br>449 | N<br>126 | O<br>139 | S<br>2 | 0       | 0     |
| 2   | g     | 94       | Total<br>716 | C<br>449 | N<br>126 | O<br>139 | S<br>2 | 0       | 0     |
| 2   | h     | 94       | Total<br>716 | C<br>449 | N<br>126 | O<br>139 | S<br>2 | 0       | 0     |
| 2   | i     | 94       | Total<br>716 | C<br>449 | N<br>126 | O<br>139 | S<br>2 | 0       | 0     |
| 2   | j     | 94       | Total<br>716 | C<br>449 | N<br>126 | O<br>139 | S<br>2 | 0       | 0     |
| 2   | k     | 94       | Total<br>716 | C<br>449 | N<br>126 | O<br>139 | S<br>2 | 0       | 0     |
| 2   | l     | 94       | Total<br>716 | C<br>449 | N<br>126 | O<br>139 | S<br>2 | 0       | 0     |
| 2   | m     | 94       | Total<br>716 | C<br>449 | N<br>126 | O<br>139 | S<br>2 | 0       | 0     |
| 2   | n     | 94       | Total<br>716 | C<br>449 | N<br>126 | O<br>139 | S<br>2 | 0       | 0     |

- Molecule 3 is ADENOSINE-5'-DIPHOSPHATE (CCD ID: ADP) (formula: C<sub>10</sub>H<sub>15</sub>N<sub>5</sub>O<sub>10</sub>P<sub>2</sub>) (labeled as "Ligand of Interest" by depositor).



| Mol | Chain | Residues | Atoms |    |   |    |   | AltConf |
|-----|-------|----------|-------|----|---|----|---|---------|
| 3   | A     | 1        | Total | C  | N | O  | P | 0       |
|     |       |          | 27    | 10 | 5 | 10 | 2 |         |
| 3   | B     | 1        | Total | C  | N | O  | P | 0       |
|     |       |          | 27    | 10 | 5 | 10 | 2 |         |
| 3   | C     | 1        | Total | C  | N | O  | P | 0       |
|     |       |          | 27    | 10 | 5 | 10 | 2 |         |
| 3   | D     | 1        | Total | C  | N | O  | P | 0       |
|     |       |          | 27    | 10 | 5 | 10 | 2 |         |
| 3   | E     | 1        | Total | C  | N | O  | P | 0       |
|     |       |          | 27    | 10 | 5 | 10 | 2 |         |
| 3   | F     | 1        | Total | C  | N | O  | P | 0       |
|     |       |          | 27    | 10 | 5 | 10 | 2 |         |
| 3   | G     | 1        | Total | C  | N | O  | P | 0       |
|     |       |          | 27    | 10 | 5 | 10 | 2 |         |
| 3   | H     | 1        | Total | C  | N | O  | P | 0       |
|     |       |          | 27    | 10 | 5 | 10 | 2 |         |
| 3   | I     | 1        | Total | C  | N | O  | P | 0       |
|     |       |          | 27    | 10 | 5 | 10 | 2 |         |
| 3   | J     | 1        | Total | C  | N | O  | P | 0       |
|     |       |          | 27    | 10 | 5 | 10 | 2 |         |
| 3   | K     | 1        | Total | C  | N | O  | P | 0       |
|     |       |          | 27    | 10 | 5 | 10 | 2 |         |
| 3   | L     | 1        | Total | C  | N | O  | P | 0       |
|     |       |          | 27    | 10 | 5 | 10 | 2 |         |
| 3   | M     | 1        | Total | C  | N | O  | P | 0       |
|     |       |          | 27    | 10 | 5 | 10 | 2 |         |
| 3   | N     | 1        | Total | C  | N | O  | P | 0       |
|     |       |          | 27    | 10 | 5 | 10 | 2 |         |

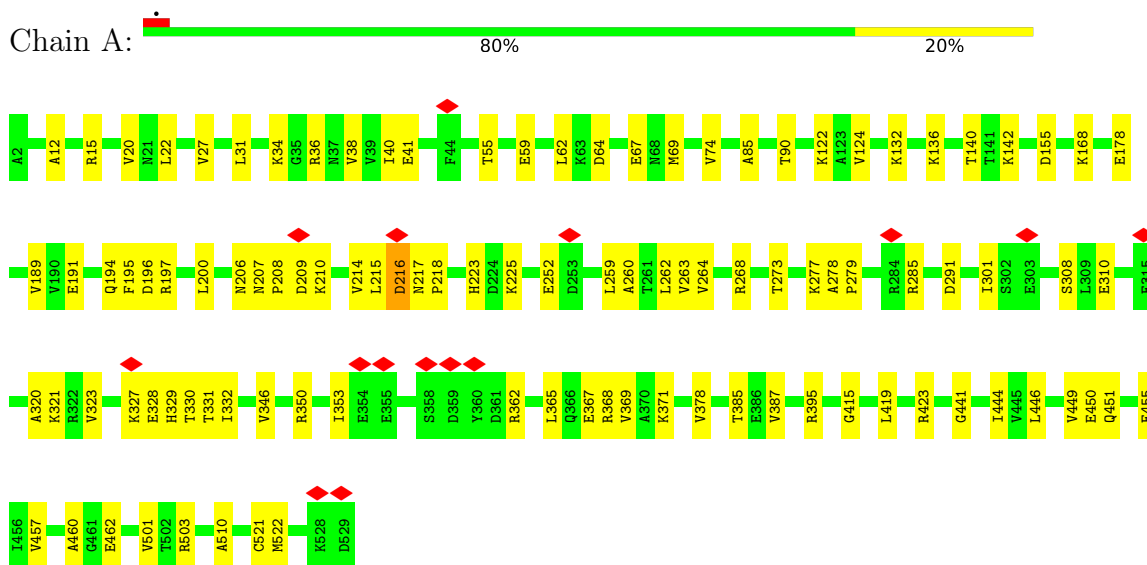
- Molecule 4 is MAGNESIUM ION (CCD ID: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

| Mol | Chain | Residues | Atoms      |         | AltConf |
|-----|-------|----------|------------|---------|---------|
| 4   | A     | 1        | Total<br>1 | Mg<br>1 | 0       |
| 4   | B     | 1        | Total<br>1 | Mg<br>1 | 0       |
| 4   | C     | 1        | Total<br>1 | Mg<br>1 | 0       |
| 4   | D     | 1        | Total<br>1 | Mg<br>1 | 0       |
| 4   | E     | 1        | Total<br>1 | Mg<br>1 | 0       |
| 4   | F     | 1        | Total<br>1 | Mg<br>1 | 0       |
| 4   | G     | 1        | Total<br>1 | Mg<br>1 | 0       |
| 4   | H     | 1        | Total<br>1 | Mg<br>1 | 0       |
| 4   | I     | 1        | Total<br>1 | Mg<br>1 | 0       |
| 4   | J     | 1        | Total<br>1 | Mg<br>1 | 0       |
| 4   | K     | 1        | Total<br>1 | Mg<br>1 | 0       |
| 4   | L     | 1        | Total<br>1 | Mg<br>1 | 0       |
| 4   | M     | 1        | Total<br>1 | Mg<br>1 | 0       |
| 4   | N     | 1        | Total<br>1 | Mg<br>1 | 0       |

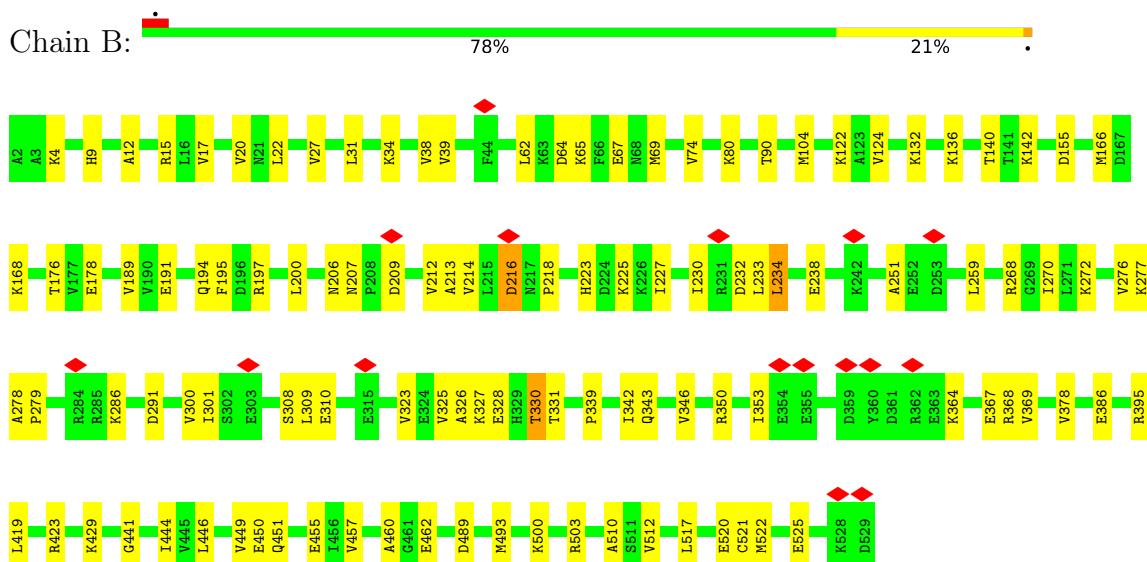
### 3 Residue-property plots

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: Chaperonin GroEL

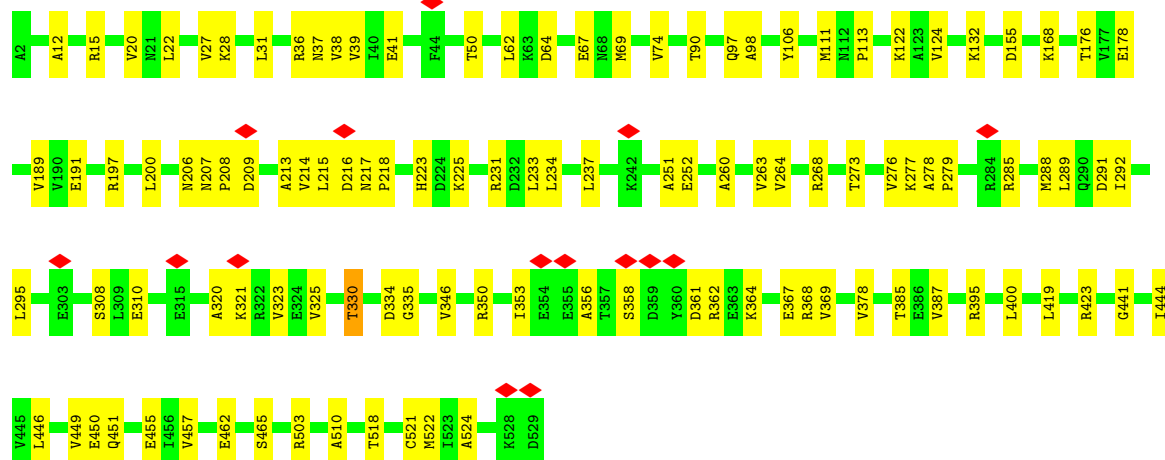


#### • Molecule 1: Chaperonin GroEL



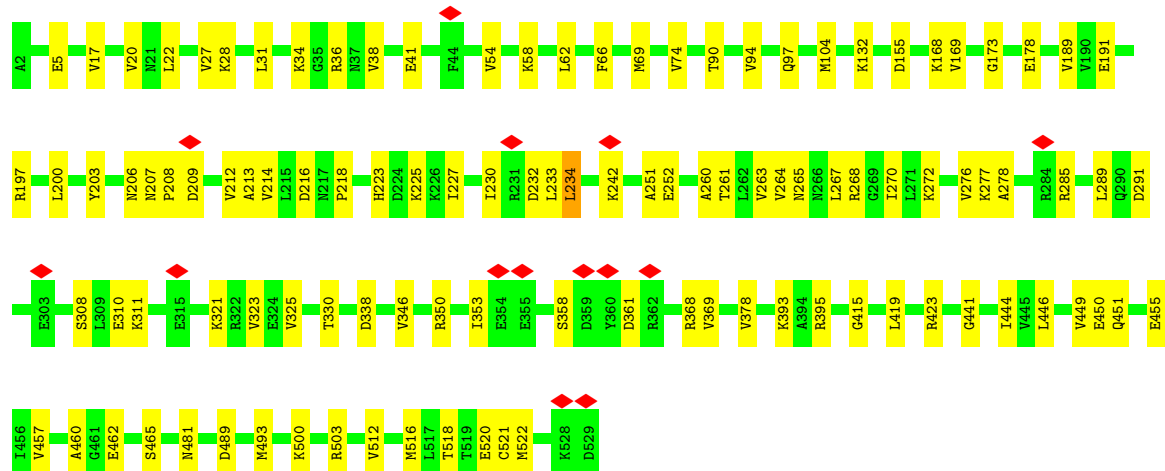
#### • Molecule 1: Chaperonin GroEL

Chain C:  79% 21%



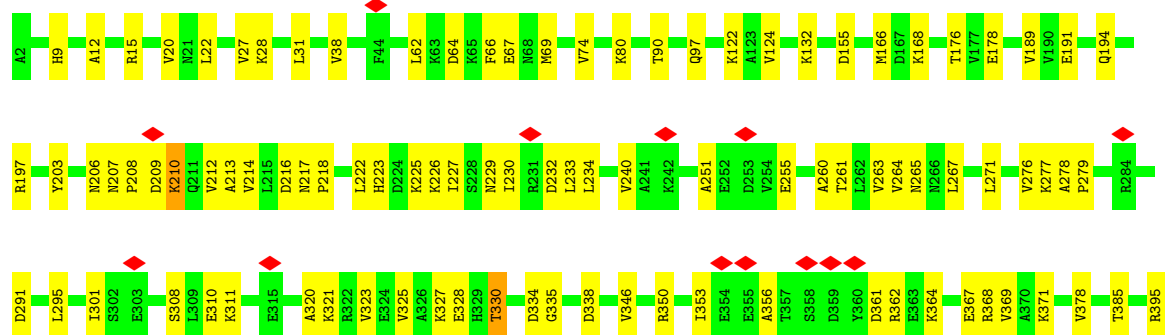
• Molecule 1: Chaperonin GroEL

Chain D:  79% 20%



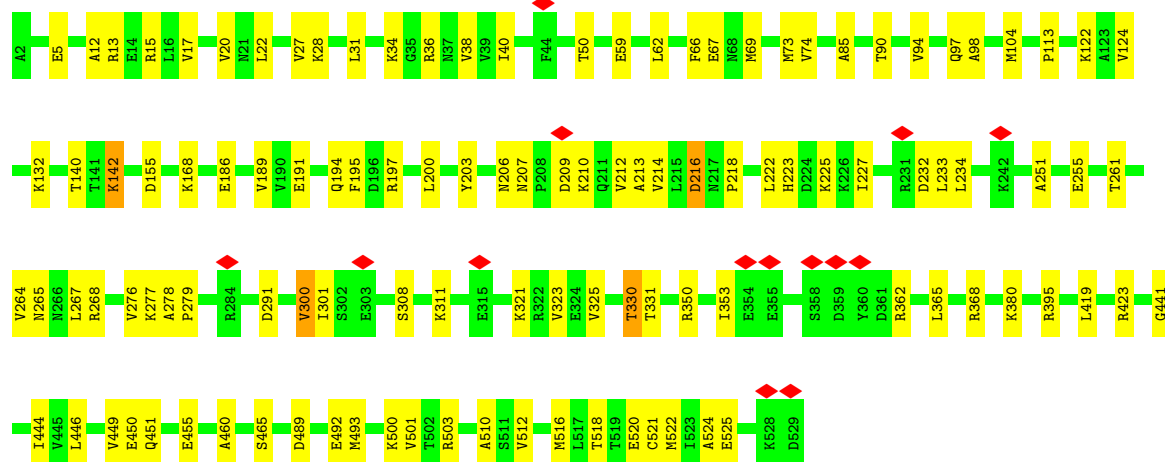
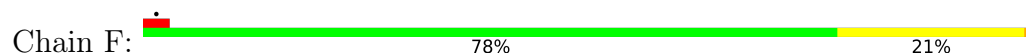
• Molecule 1: Chaperonin GroEL

Chain E:  78% 22%

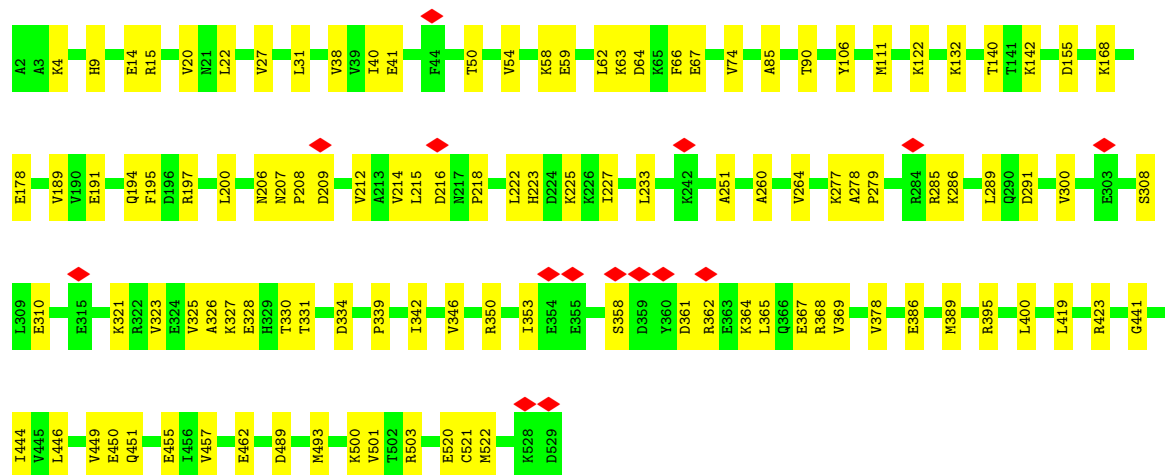
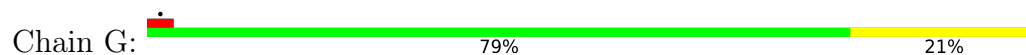




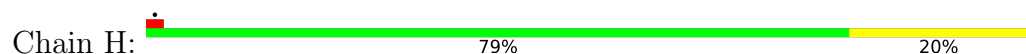
• Molecule 1: Chaperonin GroEL

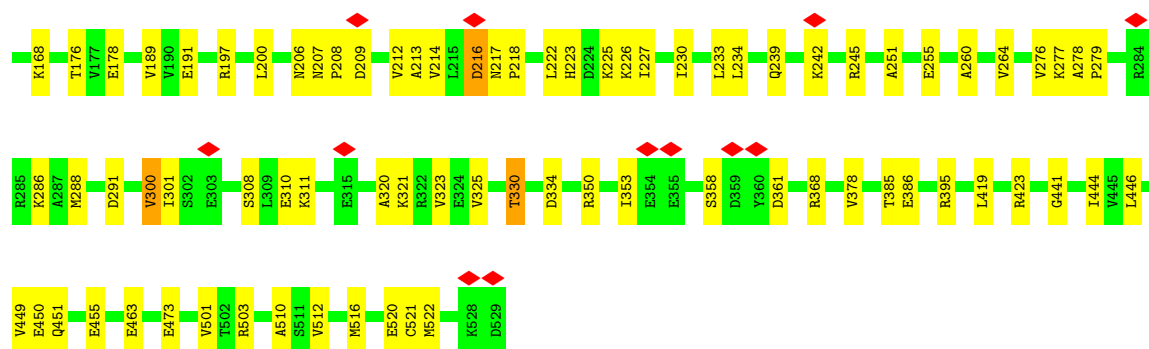


• Molecule 1: Chaperonin GroEL



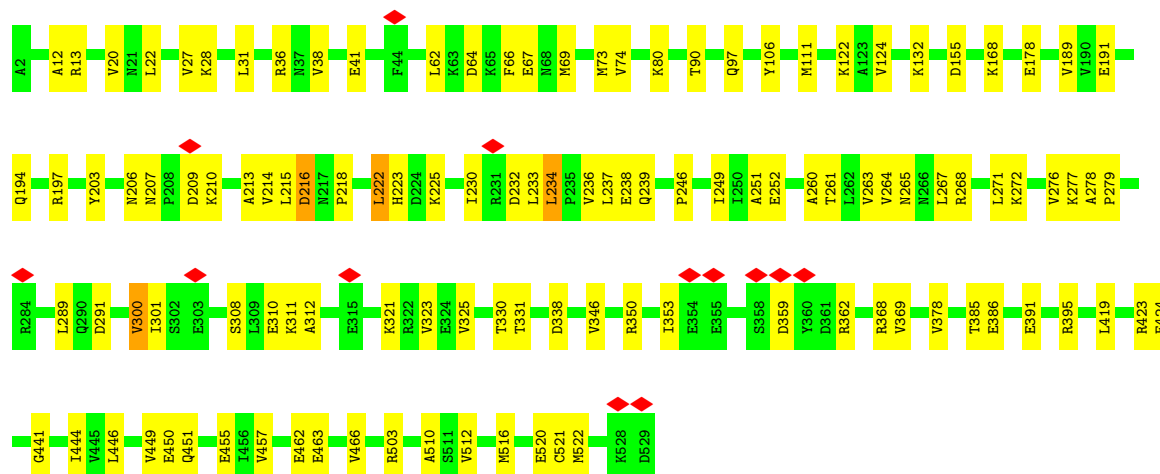
• Molecule 1: Chaperonin GroEL





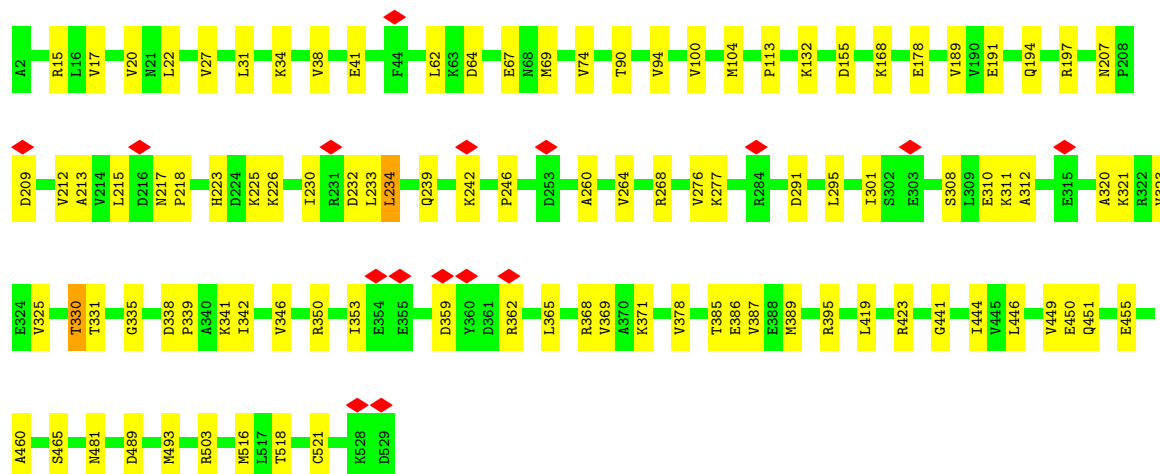
• Molecule 1: Chaperonin GroEL

Chain I: 78% 21%



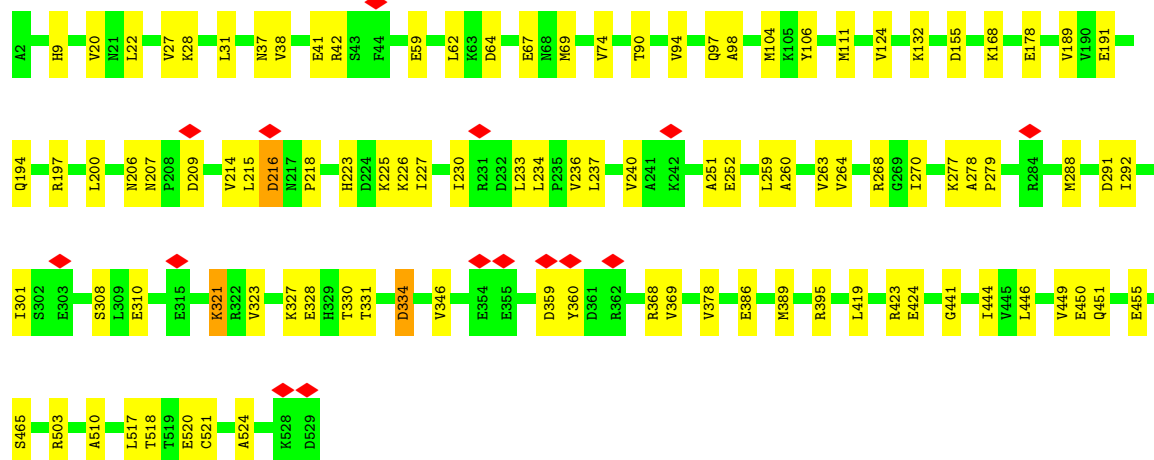
• Molecule 1: Chaperonin GroEL

Chain J: 81% 19%



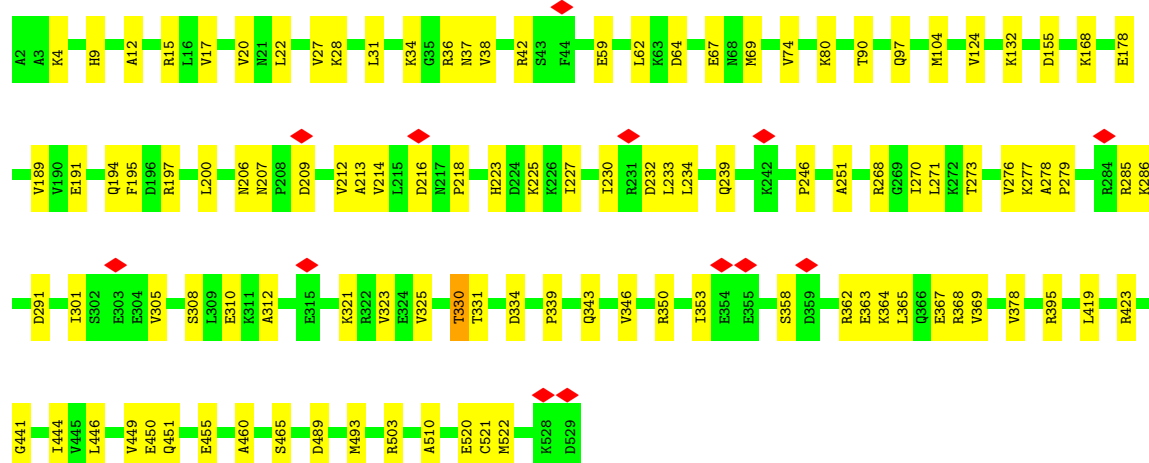
• Molecule 1: Chaperonin GroEL

Chain K:  81% 19%



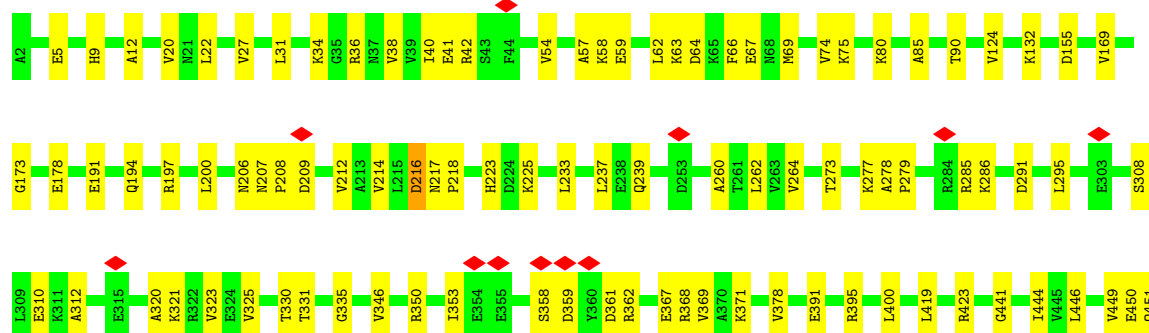
• Molecule 1: Chaperonin GroEL

Chain L:  79% 20%



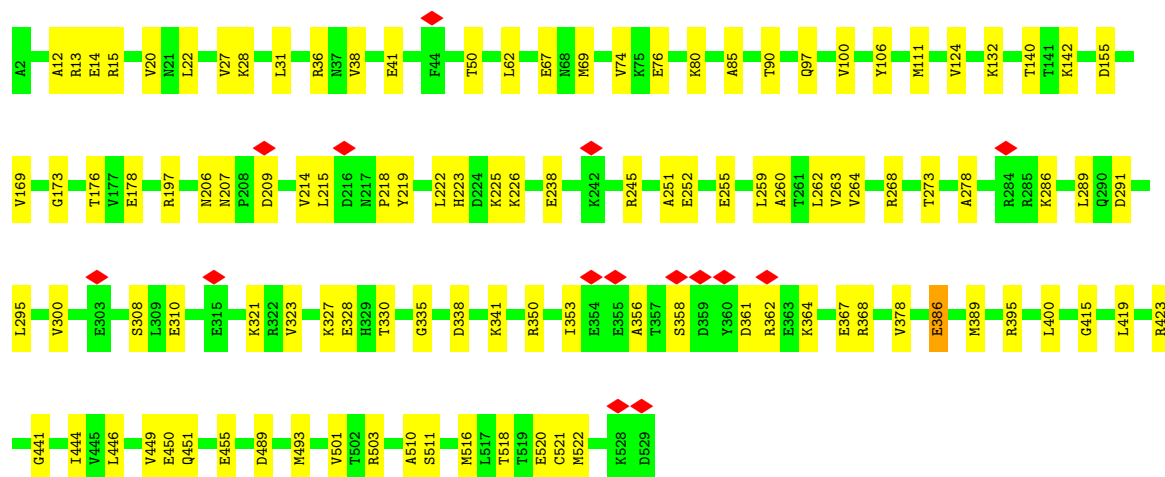
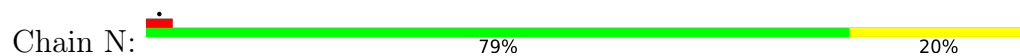
• Molecule 1: Chaperonin GroEL

Chain M:  80% 20%

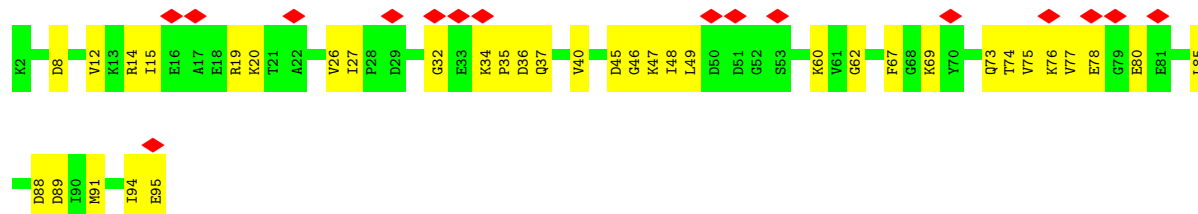




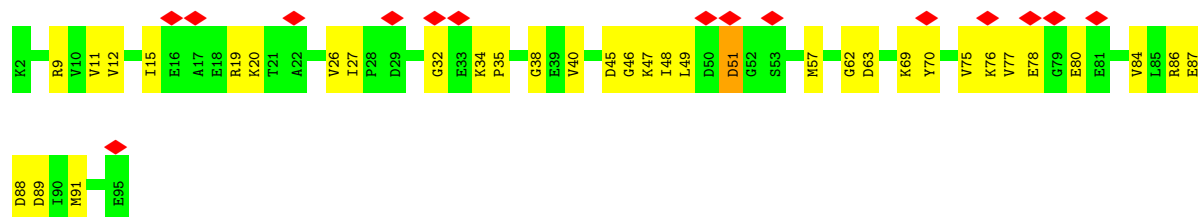
• Molecule 1: Chaperonin GroEL



• Molecule 2: Co-chaperonin GroES

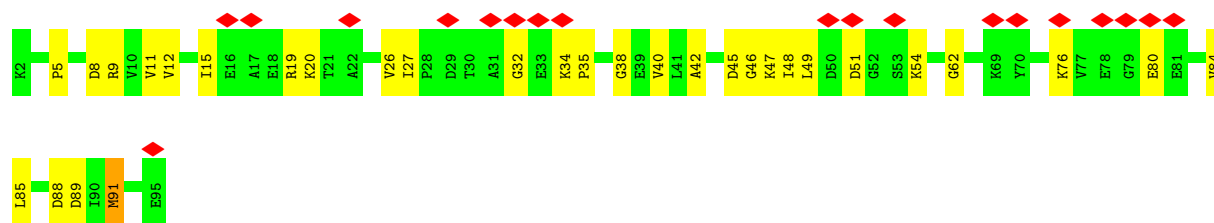


• Molecule 2: Co-chaperonin GroES

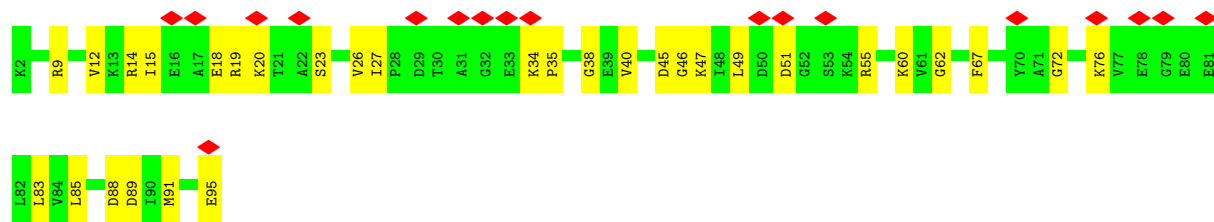


• Molecule 2: Co-chaperonin GroES

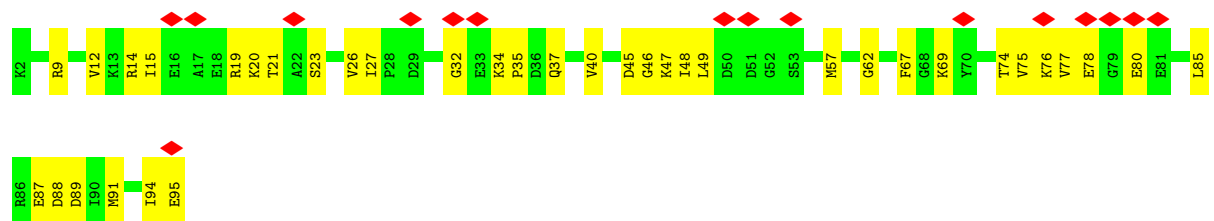




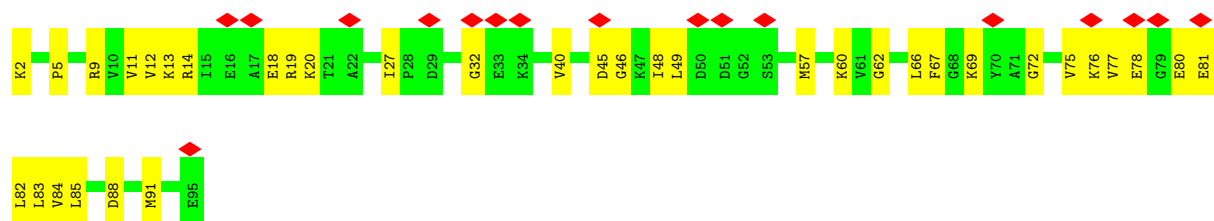
• Molecule 2: Co-chaperonin GroES



• Molecule 2: Co-chaperonin GroES



• Molecule 2: Co-chaperonin GroES

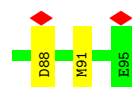
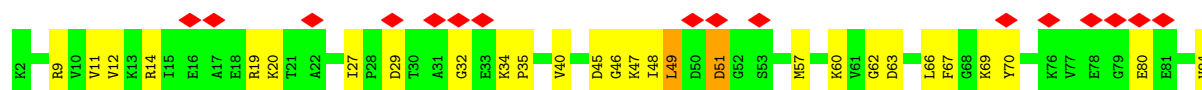


• Molecule 2: Co-chaperonin GroES

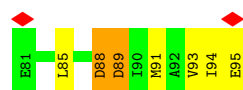
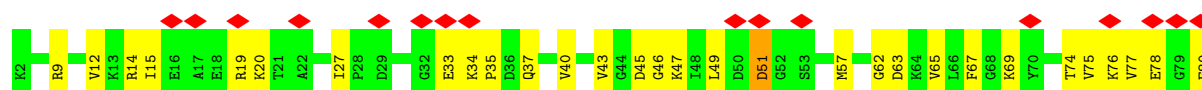




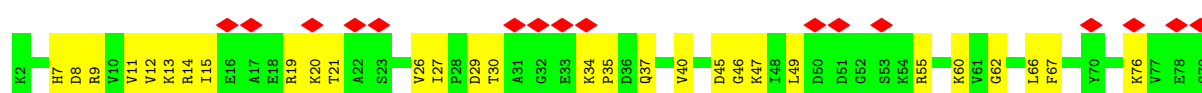
- Molecule 2: Co-chaperonin GroES



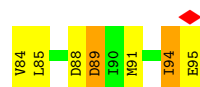
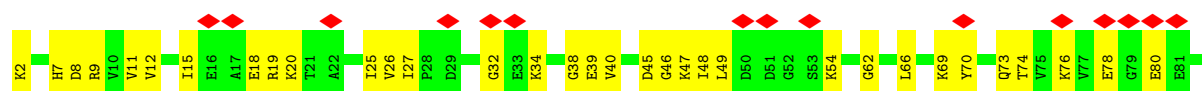
- Molecule 2: Co-chaperonin GroES



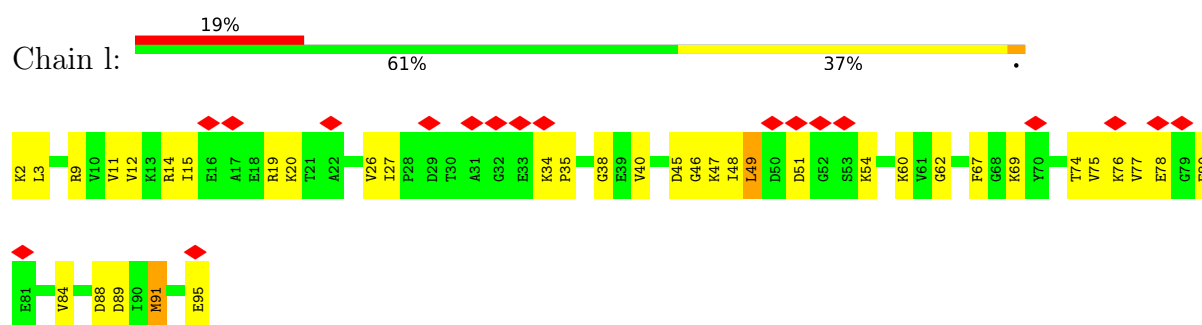
- Molecule 2: Co-chaperonin GroES



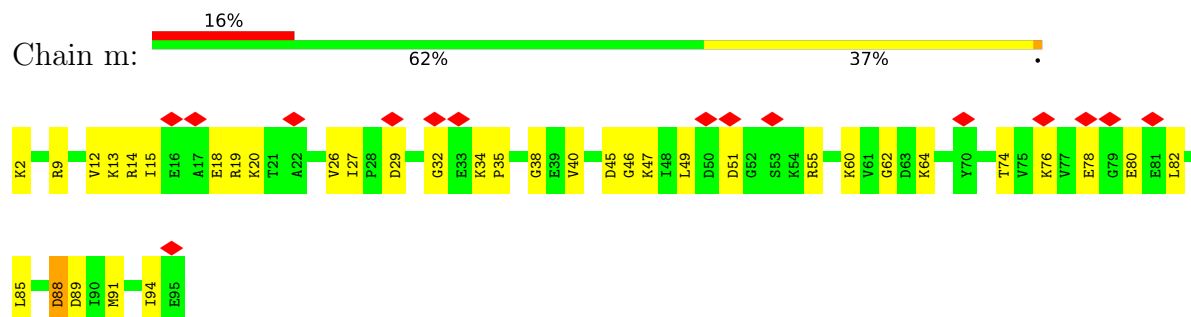
- Molecule 2: Co-chaperonin GroES



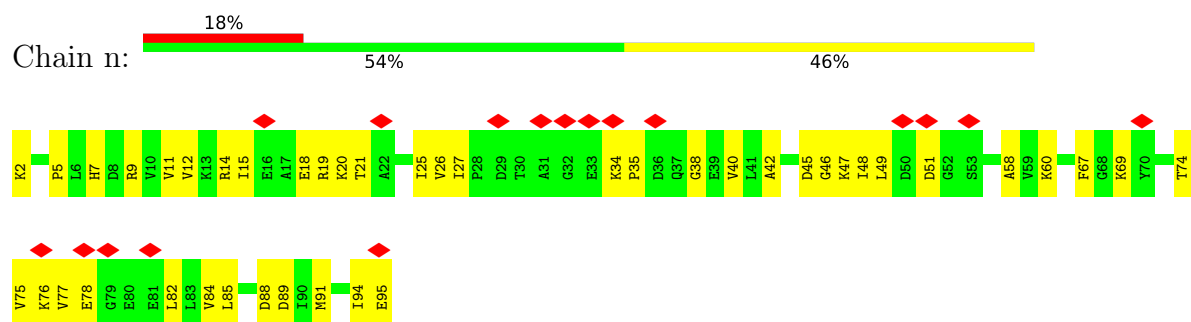
- Molecule 2: Co-chaperonin GroES



• Molecule 2: Co-chaperonin GroES



• Molecule 2: Co-chaperonin GroES



## 4 Experimental information

| Property                             | Value                                   | Source    |
|--------------------------------------|-----------------------------------------|-----------|
| EM reconstruction method             | SINGLE PARTICLE                         | Depositor |
| Imposed symmetry                     | POINT, D7                               | Depositor |
| Number of particles used             | 103957                                  | Depositor |
| Resolution determination method      | FSC 0.143 CUT-OFF                       | Depositor |
| CTF correction method                | PHASE FLIPPING AND AMPLITUDE CORRECTION | Depositor |
| Microscope                           | FEI TALOS ARCTICA                       | Depositor |
| Voltage (kV)                         | 200                                     | Depositor |
| Electron dose ( $e^-/\text{\AA}^2$ ) | 50                                      | Depositor |
| Minimum defocus (nm)                 | 1000                                    | Depositor |
| Maximum defocus (nm)                 | 2500                                    | Depositor |
| Magnification                        | 120000                                  | Depositor |
| Image detector                       | FEI FALCON IV (4k x 4k)                 | Depositor |
| Maximum map value                    | 0.678                                   | Depositor |
| Minimum map value                    | -0.187                                  | Depositor |
| Average map value                    | -0.000                                  | Depositor |
| Map value standard deviation         | 0.015                                   | Depositor |
| Recommended contour level            | 0.08                                    | Depositor |
| Map size (Å)                         | 420.0, 420.0, 420.0                     | wwPDB     |
| Map dimensions                       | 500, 500, 500                           | wwPDB     |
| Map angles (°)                       | 90.0, 90.0, 90.0                        | wwPDB     |
| Pixel spacing (Å)                    | 0.84, 0.84, 0.84                        | Depositor |

## 5 Model quality

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: ADP, 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     | 0.14         | 0/3957  | 0.27        | 0/5339         |
| 1   | B     | 0.14         | 0/3957  | 0.26        | 0/5339         |
| 1   | C     | 0.14         | 0/3957  | 0.29        | 0/5339         |
| 1   | D     | 0.14         | 0/3957  | 0.26        | 0/5339         |
| 1   | E     | 0.14         | 0/3957  | 0.29        | 1/5339 (0.0%)  |
| 1   | F     | 0.14         | 0/3957  | 0.28        | 0/5339         |
| 1   | G     | 0.14         | 0/3957  | 0.27        | 0/5339         |
| 1   | H     | 0.14         | 0/3957  | 0.28        | 0/5339         |
| 1   | I     | 0.14         | 0/3957  | 0.25        | 0/5339         |
| 1   | J     | 0.14         | 0/3957  | 0.28        | 0/5339         |
| 1   | K     | 0.14         | 0/3957  | 0.27        | 0/5339         |
| 1   | L     | 0.14         | 0/3957  | 0.27        | 0/5339         |
| 1   | M     | 0.14         | 0/3957  | 0.28        | 0/5339         |
| 1   | N     | 0.13         | 0/3957  | 0.27        | 0/5339         |
| 2   | a     | 0.17         | 0/722   | 0.49        | 0/968          |
| 2   | b     | 0.19         | 0/722   | 0.56        | 0/968          |
| 2   | c     | 0.18         | 0/722   | 0.50        | 0/968          |
| 2   | d     | 0.21         | 0/722   | 0.52        | 0/968          |
| 2   | e     | 0.19         | 0/722   | 0.55        | 0/968          |
| 2   | f     | 0.19         | 0/722   | 0.57        | 0/968          |
| 2   | g     | 0.18         | 0/722   | 0.51        | 0/968          |
| 2   | h     | 0.17         | 0/722   | 0.52        | 0/968          |
| 2   | i     | 0.20         | 0/722   | 0.55        | 0/968          |
| 2   | j     | 0.19         | 0/722   | 0.54        | 0/968          |
| 2   | k     | 0.22         | 0/722   | 0.61        | 0/968          |
| 2   | l     | 0.20         | 0/722   | 0.59        | 0/968          |
| 2   | m     | 0.18         | 0/722   | 0.52        | 0/968          |
| 2   | n     | 0.19         | 0/722   | 0.54        | 0/968          |
| All | All   | 0.15         | 0/65506 | 0.33        | 1/88298 (0.0%) |

There are no bond length outliers.

All (1) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms    | Z    | Observed(°) | Ideal(°) |
|-----|-------|-----|------|----------|------|-------------|----------|
| 1   | E     | 210 | LYS  | CA-CB-CG | 5.88 | 125.86      | 114.10   |

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     | 3923  | 0        | 4073     | 69      | 0            |
| 1   | B     | 3923  | 0        | 4073     | 75      | 0            |
| 1   | C     | 3923  | 0        | 4073     | 71      | 0            |
| 1   | D     | 3923  | 0        | 4073     | 78      | 0            |
| 1   | E     | 3923  | 0        | 4073     | 79      | 0            |
| 1   | F     | 3923  | 0        | 4073     | 76      | 0            |
| 1   | G     | 3923  | 0        | 4073     | 69      | 0            |
| 1   | H     | 3923  | 0        | 4073     | 75      | 0            |
| 1   | I     | 3923  | 0        | 4073     | 83      | 0            |
| 1   | J     | 3923  | 0        | 4073     | 64      | 0            |
| 1   | K     | 3923  | 0        | 4073     | 71      | 0            |
| 1   | L     | 3923  | 0        | 4073     | 78      | 0            |
| 1   | M     | 3923  | 0        | 4073     | 66      | 0            |
| 1   | N     | 3923  | 0        | 4073     | 68      | 0            |
| 2   | a     | 716   | 0        | 751      | 28      | 0            |
| 2   | b     | 716   | 0        | 751      | 28      | 0            |
| 2   | c     | 716   | 0        | 751      | 25      | 0            |
| 2   | d     | 716   | 0        | 751      | 30      | 0            |
| 2   | e     | 716   | 0        | 751      | 30      | 0            |
| 2   | f     | 716   | 0        | 751      | 29      | 0            |
| 2   | g     | 716   | 0        | 751      | 23      | 0            |
| 2   | h     | 716   | 0        | 751      | 22      | 0            |
| 2   | i     | 716   | 0        | 751      | 27      | 0            |
| 2   | j     | 716   | 0        | 751      | 29      | 0            |
| 2   | k     | 716   | 0        | 751      | 35      | 0            |
| 2   | l     | 716   | 0        | 751      | 30      | 0            |
| 2   | m     | 716   | 0        | 751      | 27      | 0            |

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| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 2   | n     | 716   | 0        | 751      | 35      | 0            |
| 3   | A     | 27    | 0        | 12       | 1       | 0            |
| 3   | B     | 27    | 0        | 12       | 0       | 0            |
| 3   | C     | 27    | 0        | 12       | 0       | 0            |
| 3   | D     | 27    | 0        | 12       | 1       | 0            |
| 3   | E     | 27    | 0        | 12       | 0       | 0            |
| 3   | F     | 27    | 0        | 12       | 0       | 0            |
| 3   | G     | 27    | 0        | 12       | 0       | 0            |
| 3   | H     | 27    | 0        | 12       | 0       | 0            |
| 3   | I     | 27    | 0        | 12       | 0       | 0            |
| 3   | J     | 27    | 0        | 12       | 0       | 0            |
| 3   | K     | 27    | 0        | 12       | 0       | 0            |
| 3   | L     | 27    | 0        | 12       | 0       | 0            |
| 3   | M     | 27    | 0        | 12       | 0       | 0            |
| 3   | N     | 27    | 0        | 12       | 1       | 0            |
| 4   | A     | 1     | 0        | 0        | 0       | 0            |
| 4   | B     | 1     | 0        | 0        | 0       | 0            |
| 4   | C     | 1     | 0        | 0        | 0       | 0            |
| 4   | D     | 1     | 0        | 0        | 0       | 0            |
| 4   | E     | 1     | 0        | 0        | 0       | 0            |
| 4   | F     | 1     | 0        | 0        | 0       | 0            |
| 4   | G     | 1     | 0        | 0        | 0       | 0            |
| 4   | H     | 1     | 0        | 0        | 0       | 0            |
| 4   | I     | 1     | 0        | 0        | 0       | 0            |
| 4   | J     | 1     | 0        | 0        | 0       | 0            |
| 4   | K     | 1     | 0        | 0        | 0       | 0            |
| 4   | L     | 1     | 0        | 0        | 0       | 0            |
| 4   | M     | 1     | 0        | 0        | 0       | 0            |
| 4   | N     | 1     | 0        | 0        | 0       | 0            |
| All | All   | 65338 | 0        | 67704    | 1331    | 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 10.

All (1331) 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:m:91:MET:HB3  | 2:n:9:ARG:HG2   | 1.63                     | 0.80              |
| 1:A:12:ALA:HB1  | 1:A:522:MET:HG3 | 1.67                     | 0.77              |
| 2:j:40:VAL:HG23 | 2:j:62:GLY:H    | 1.50                     | 0.77              |
| 1:K:520:GLU:HG2 | 1:L:36:ARG:HD2  | 1.66                     | 0.77              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:j:88:ASP:O     | 2:k:9:ARG:NH2    | 2.19                     | 0.75              |
| 2:k:74:THR:O     | 2:k:76:LYS:NZ    | 2.20                     | 0.74              |
| 2:k:15:ILE:HG23  | 2:k:38:GLY:HA2   | 1.71                     | 0.73              |
| 1:N:15:ARG:NH1   | 1:N:67:GLU:OE2   | 2.23                     | 0.72              |
| 1:D:227:ILE:HG21 | 1:D:233:LEU:HD12 | 1.70                     | 0.72              |
| 2:a:19:ARG:HH22  | 2:a:32:GLY:HA3   | 1.55                     | 0.72              |
| 2:d:40:VAL:HG23  | 2:d:62:GLY:H     | 1.54                     | 0.72              |
| 1:H:227:ILE:HG21 | 1:H:233:LEU:HD12 | 1.72                     | 0.72              |
| 1:L:227:ILE:HG21 | 1:L:233:LEU:HD12 | 1.71                     | 0.72              |
| 1:K:69:MET:HE2   | 1:K:524:ALA:HB2  | 1.72                     | 0.72              |
| 2:m:74:THR:O     | 2:m:76:LYS:NZ    | 2.22                     | 0.71              |
| 2:d:47:LYS:HE2   | 2:d:47:LYS:HA    | 1.70                     | 0.71              |
| 1:B:12:ALA:HB1   | 1:B:522:MET:HG3  | 1.71                     | 0.71              |
| 1:G:15:ARG:NH1   | 1:G:67:GLU:OE2   | 2.24                     | 0.71              |
| 2:f:40:VAL:HG23  | 2:f:62:GLY:H     | 1.55                     | 0.70              |
| 1:M:12:ALA:HB1   | 1:M:522:MET:HG3  | 1.72                     | 0.70              |
| 2:a:91:MET:HB2   | 2:g:9:ARG:HG2    | 1.72                     | 0.70              |
| 1:D:358:SER:HB2  | 1:D:361:ASP:HB2  | 1.72                     | 0.70              |
| 1:J:15:ARG:NH1   | 1:J:67:GLU:OE2   | 2.25                     | 0.70              |
| 1:E:15:ARG:NH1   | 1:E:67:GLU:OE2   | 2.25                     | 0.69              |
| 2:m:19:ARG:NH1   | 2:m:27:ILE:O     | 2.25                     | 0.69              |
| 1:K:236:VAL:HG13 | 1:K:237:LEU:HD12 | 1.73                     | 0.69              |
| 1:J:268:ARG:HG3  | 1:J:268:ARG:HH11 | 1.56                     | 0.69              |
| 2:c:19:ARG:NH1   | 2:c:27:ILE:O     | 2.26                     | 0.69              |
| 1:B:227:ILE:HG21 | 1:B:233:LEU:HD12 | 1.74                     | 0.69              |
| 1:E:12:ALA:HB1   | 1:E:522:MET:HG3  | 1.75                     | 0.69              |
| 1:N:69:MET:HE3   | 1:N:522:MET:HE3  | 1.75                     | 0.68              |
| 1:A:194:GLN:HB2  | 1:A:331:THR:HG22 | 1.75                     | 0.68              |
| 1:L:191:GLU:OE2  | 1:L:191:GLU:N    | 2.22                     | 0.68              |
| 1:F:36:ARG:HD2   | 1:G:520:GLU:HG2  | 1.75                     | 0.68              |
| 2:k:66:LEU:O     | 2:k:91:MET:N     | 2.25                     | 0.68              |
| 1:H:12:ALA:HB1   | 1:H:522:MET:HG3  | 1.76                     | 0.68              |
| 2:i:75:VAL:HG22  | 2:i:77:VAL:HG13  | 1.73                     | 0.68              |
| 2:k:73:GLN:NE2   | 2:k:74:THR:O     | 2.27                     | 0.68              |
| 1:I:12:ALA:HB1   | 1:I:522:MET:HG3  | 1.74                     | 0.67              |
| 1:E:168:LYS:HD3  | 1:E:189:VAL:HG21 | 1.75                     | 0.67              |
| 1:F:12:ALA:HB1   | 1:F:522:MET:HG3  | 1.75                     | 0.67              |
| 1:B:191:GLU:OE2  | 1:B:191:GLU:N    | 2.22                     | 0.67              |
| 1:E:227:ILE:HG21 | 1:E:233:LEU:HD12 | 1.76                     | 0.67              |
| 1:F:191:GLU:OE2  | 1:F:191:GLU:N    | 2.22                     | 0.67              |
| 1:A:191:GLU:OE2  | 1:A:191:GLU:N    | 2.24                     | 0.66              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:d:19:ARG:NH1   | 2:d:27:ILE:O     | 2.28                     | 0.66              |
| 1:A:321:LYS:H    | 1:A:321:LYS:HE2  | 1.59                     | 0.66              |
| 2:b:19:ARG:NH1   | 2:b:27:ILE:O     | 2.28                     | 0.66              |
| 2:l:19:ARG:NH1   | 2:l:27:ILE:O     | 2.28                     | 0.66              |
| 2:m:19:ARG:HH22  | 2:m:32:GLY:HA3   | 1.61                     | 0.66              |
| 1:I:191:GLU:OE2  | 1:I:191:GLU:N    | 2.22                     | 0.66              |
| 2:e:40:VAL:HG23  | 2:e:62:GLY:H     | 1.61                     | 0.66              |
| 1:I:207:ASN:ND2  | 1:I:209:ASP:OD1  | 2.29                     | 0.66              |
| 2:m:47:LYS:HA    | 2:m:47:LYS:HE2   | 1.78                     | 0.66              |
| 2:i:88:ASP:O     | 2:j:9:ARG:NH2    | 2.28                     | 0.66              |
| 2:j:47:LYS:HA    | 2:j:47:LYS:HE2   | 1.77                     | 0.66              |
| 2:i:19:ARG:NH1   | 2:i:27:ILE:O     | 2.29                     | 0.65              |
| 1:C:200:LEU:HD11 | 1:C:277:LYS:HD3  | 1.78                     | 0.65              |
| 2:c:80:GLU:OE1   | 2:c:80:GLU:N     | 2.25                     | 0.65              |
| 1:G:191:GLU:OE2  | 1:G:191:GLU:N    | 2.22                     | 0.65              |
| 2:m:40:VAL:HG23  | 2:m:62:GLY:H     | 1.61                     | 0.65              |
| 2:e:19:ARG:NH1   | 2:e:27:ILE:O     | 2.28                     | 0.65              |
| 2:k:19:ARG:NH1   | 2:k:27:ILE:O     | 2.29                     | 0.65              |
| 1:E:260:ALA:O    | 1:E:264:VAL:HG23 | 1.96                     | 0.65              |
| 1:F:168:LYS:HD3  | 1:F:189:VAL:HG21 | 1.77                     | 0.65              |
| 1:B:38:VAL:HG22  | 1:C:521:CYS:HB3  | 1.77                     | 0.65              |
| 1:C:38:VAL:HG22  | 1:D:521:CYS:HB3  | 1.79                     | 0.65              |
| 1:M:520:GLU:HG2  | 1:N:36:ARG:HD2   | 1.78                     | 0.65              |
| 1:C:268:ARG:HG3  | 1:C:268:ARG:HH11 | 1.62                     | 0.65              |
| 1:H:260:ALA:O    | 1:H:264:VAL:HG23 | 1.97                     | 0.65              |
| 1:J:521:CYS:HB3  | 1:K:38:VAL:HG22  | 1.77                     | 0.65              |
| 1:M:391:GLU:OE2  | 1:M:395:ARG:NH1  | 2.31                     | 0.65              |
| 1:D:213:ALA:HB3  | 1:D:325:VAL:HB   | 1.79                     | 0.64              |
| 1:H:191:GLU:OE2  | 1:H:191:GLU:N    | 2.22                     | 0.64              |
| 1:L:362:ARG:H    | 1:L:362:ARG:HE   | 1.45                     | 0.64              |
| 1:A:168:LYS:HD3  | 1:A:189:VAL:HG21 | 1.78                     | 0.64              |
| 2:n:19:ARG:NH1   | 2:n:27:ILE:O     | 2.30                     | 0.64              |
| 1:E:191:GLU:OE2  | 1:E:191:GLU:N    | 2.25                     | 0.64              |
| 1:F:210:LYS:HD2  | 1:F:210:LYS:O    | 1.97                     | 0.64              |
| 1:L:521:CYS:HB3  | 1:M:38:VAL:HG22  | 1.78                     | 0.64              |
| 2:e:74:THR:O     | 2:e:76:LYS:NZ    | 2.26                     | 0.64              |
| 1:C:213:ALA:HB3  | 1:C:325:VAL:HB   | 1.80                     | 0.64              |
| 1:M:521:CYS:HB3  | 1:N:38:VAL:HG22  | 1.80                     | 0.64              |
| 1:I:168:LYS:HD3  | 1:I:189:VAL:HG21 | 1.80                     | 0.64              |
| 2:d:9:ARG:HG2    | 2:e:91:MET:HB2   | 1.79                     | 0.64              |
| 2:a:73:GLN:NE2   | 2:a:74:THR:O     | 2.31                     | 0.64              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:H:385:THR:OG1  | 1:N:511:SER:OG   | 2.15                     | 0.64              |
| 1:I:260:ALA:O    | 1:I:264:VAL:HG23 | 1.98                     | 0.64              |
| 1:D:22:LEU:HD12  | 1:D:62:LEU:HD21  | 1.80                     | 0.64              |
| 2:h:40:VAL:HG23  | 2:h:62:GLY:H     | 1.63                     | 0.63              |
| 1:A:38:VAL:HG22  | 1:B:521:CYS:HB3  | 1.80                     | 0.63              |
| 1:A:521:CYS:HB3  | 1:G:38:VAL:HG22  | 1.79                     | 0.63              |
| 2:j:21:THR:HG23  | 2:j:27:ILE:HD11  | 1.78                     | 0.63              |
| 1:L:321:LYS:HD3  | 1:L:321:LYS:N    | 2.14                     | 0.63              |
| 2:l:60:LYS:N     | 2:l:60:LYS:HE2   | 2.13                     | 0.63              |
| 1:N:20:VAL:HG13  | 1:N:74:VAL:HG21  | 1.80                     | 0.63              |
| 1:E:441:GLY:HA2  | 1:E:444:ILE:HD12 | 1.79                     | 0.63              |
| 2:f:19:ARG:NH1   | 2:f:27:ILE:O     | 2.32                     | 0.63              |
| 1:D:191:GLU:OE2  | 1:D:191:GLU:N    | 2.22                     | 0.63              |
| 1:H:15:ARG:NH1   | 1:H:67:GLU:OE2   | 2.32                     | 0.63              |
| 2:a:40:VAL:HG23  | 2:a:62:GLY:H     | 1.63                     | 0.63              |
| 2:f:9:ARG:HG2    | 2:g:91:MET:HB2   | 1.80                     | 0.63              |
| 2:g:19:ARG:NH1   | 2:g:27:ILE:O     | 2.32                     | 0.63              |
| 2:h:19:ARG:NH1   | 2:h:27:ILE:O     | 2.32                     | 0.63              |
| 2:h:80:GLU:OE1   | 2:h:80:GLU:N     | 2.22                     | 0.63              |
| 1:C:15:ARG:NH1   | 1:C:67:GLU:OE2   | 2.32                     | 0.62              |
| 2:k:12:VAL:HG12  | 2:k:40:VAL:HG12  | 1.81                     | 0.62              |
| 1:B:423:ARG:NH1  | 1:B:450:GLU:OE2  | 2.31                     | 0.62              |
| 1:I:521:CYS:HB3  | 1:J:38:VAL:HG22  | 1.80                     | 0.62              |
| 2:h:88:ASP:O     | 2:i:9:ARG:NH2    | 2.31                     | 0.62              |
| 2:k:47:LYS:HE2   | 2:k:47:LYS:HA    | 1.81                     | 0.62              |
| 1:J:22:LEU:HD12  | 1:J:62:LEU:HD21  | 1.80                     | 0.62              |
| 1:M:441:GLY:HA2  | 1:M:444:ILE:HD12 | 1.82                     | 0.62              |
| 1:B:9:HIS:ND1    | 1:B:520:GLU:OE1  | 2.32                     | 0.62              |
| 1:D:38:VAL:HG22  | 1:E:521:CYS:HB3  | 1.82                     | 0.62              |
| 1:E:207:ASN:ND2  | 1:E:209:ASP:OD1  | 2.32                     | 0.62              |
| 1:G:194:GLN:HB2  | 1:G:331:THR:HG22 | 1.82                     | 0.62              |
| 2:h:49:LEU:HD23  | 2:h:49:LEU:H     | 1.65                     | 0.62              |
| 1:C:276:VAL:HG11 | 1:C:330:THR:HG21 | 1.80                     | 0.62              |
| 1:F:20:VAL:HG13  | 1:F:74:VAL:HG21  | 1.82                     | 0.62              |
| 1:K:521:CYS:HB3  | 1:L:38:VAL:HG22  | 1.81                     | 0.62              |
| 1:M:191:GLU:OE2  | 1:M:191:GLU:N    | 2.24                     | 0.62              |
| 1:C:64:ASP:HB3   | 1:C:67:GLU:HB2   | 1.81                     | 0.61              |
| 1:B:207:ASN:ND2  | 1:B:209:ASP:OD1  | 2.33                     | 0.61              |
| 1:G:441:GLY:HA2  | 1:G:444:ILE:HD12 | 1.82                     | 0.61              |
| 2:l:75:VAL:HG22  | 2:l:77:VAL:HG13  | 1.81                     | 0.61              |
| 1:N:423:ARG:NH1  | 1:N:450:GLU:OE2  | 2.32                     | 0.61              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:G:168:LYS:HD3  | 1:G:189:VAL:HG21 | 1.82                     | 0.61              |
| 1:H:38:VAL:HG22  | 1:N:521:CYS:HB3  | 1.83                     | 0.61              |
| 1:I:213:ALA:HB3  | 1:I:325:VAL:HB   | 1.82                     | 0.61              |
| 1:A:210:LYS:O    | 1:A:210:LYS:NZ   | 2.21                     | 0.61              |
| 1:A:441:GLY:HA2  | 1:A:444:ILE:HD12 | 1.83                     | 0.61              |
| 1:E:276:VAL:HG11 | 1:E:330:THR:HG21 | 1.82                     | 0.61              |
| 2:g:19:ARG:HH22  | 2:g:32:GLY:HA3   | 1.65                     | 0.61              |
| 1:H:521:CYS:HB3  | 1:I:38:VAL:HG22  | 1.81                     | 0.61              |
| 2:d:15:ILE:HG23  | 2:d:38:GLY:HA2   | 1.82                     | 0.61              |
| 1:C:260:ALA:O    | 1:C:264:VAL:HG23 | 2.01                     | 0.61              |
| 1:A:268:ARG:HG3  | 1:A:268:ARG:HH11 | 1.66                     | 0.61              |
| 1:I:463:GLU:OE2  | 1:I:463:GLU:N    | 2.26                     | 0.61              |
| 1:N:441:GLY:HA2  | 1:N:444:ILE:HD12 | 1.82                     | 0.61              |
| 1:L:423:ARG:NH1  | 1:L:450:GLU:OE2  | 2.31                     | 0.61              |
| 1:B:386:GLU:OE1  | 1:B:386:GLU:N    | 2.27                     | 0.60              |
| 1:D:465:SER:OG   | 1:K:465:SER:OG   | 2.19                     | 0.60              |
| 1:E:423:ARG:NH1  | 1:E:450:GLU:OE2  | 2.33                     | 0.60              |
| 1:I:441:GLY:HA2  | 1:I:444:ILE:HD12 | 1.82                     | 0.60              |
| 2:n:74:THR:O     | 2:n:76:LYS:NZ    | 2.26                     | 0.60              |
| 1:D:423:ARG:NH1  | 1:D:450:GLU:OE2  | 2.33                     | 0.60              |
| 1:E:362:ARG:H    | 1:E:362:ARG:HE   | 1.47                     | 0.60              |
| 1:F:15:ARG:NH1   | 1:F:67:GLU:OE2   | 2.34                     | 0.60              |
| 1:M:200:LEU:HD21 | 1:M:277:LYS:HD3  | 1.83                     | 0.60              |
| 1:E:213:ALA:HB3  | 1:E:325:VAL:HB   | 1.83                     | 0.60              |
| 2:h:20:LYS:HE2   | 2:h:20:LYS:N     | 2.16                     | 0.60              |
| 1:J:276:VAL:HG11 | 1:J:330:THR:HG21 | 1.83                     | 0.60              |
| 2:m:88:ASP:OD2   | 2:m:88:ASP:N     | 2.34                     | 0.60              |
| 1:C:69:MET:HE2   | 1:C:524:ALA:HB2  | 1.83                     | 0.60              |
| 1:C:465:SER:OG   | 1:J:465:SER:OG   | 2.19                     | 0.60              |
| 1:E:465:SER:OG   | 1:L:465:SER:OG   | 2.20                     | 0.60              |
| 1:F:465:SER:OG   | 1:M:465:SER:OG   | 2.18                     | 0.60              |
| 2:k:80:GLU:OE2   | 2:k:80:GLU:N     | 2.33                     | 0.60              |
| 2:l:69:LYS:H     | 2:l:69:LYS:HD2   | 1.66                     | 0.60              |
| 2:a:19:ARG:NH1   | 2:a:27:ILE:O     | 2.34                     | 0.60              |
| 1:B:276:VAL:HG11 | 1:B:330:THR:HG21 | 1.84                     | 0.60              |
| 2:b:88:ASP:OD1   | 2:b:88:ASP:N     | 2.33                     | 0.60              |
| 1:K:359:ASP:OD2  | 1:K:360:TYR:N    | 2.35                     | 0.60              |
| 2:k:88:ASP:O     | 2:l:9:ARG:NH2    | 2.29                     | 0.60              |
| 1:D:207:ASN:ND2  | 1:D:209:ASP:OD1  | 2.34                     | 0.60              |
| 2:i:95:GLU:OE1   | 2:i:95:GLU:N     | 2.35                     | 0.60              |
| 1:K:237:LEU:HA   | 1:K:240:VAL:HG22 | 1.82                     | 0.60              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:M:155:ASP:OD2  | 1:M:395:ARG:NH2  | 2.35                     | 0.60              |
| 1:M:423:ARG:NH1  | 1:M:450:GLU:OE2  | 2.33                     | 0.60              |
| 1:C:206:ASN:ND2  | 1:C:214:VAL:O    | 2.34                     | 0.60              |
| 1:E:206:ASN:ND2  | 1:E:214:VAL:O    | 2.34                     | 0.60              |
| 1:H:230:ILE:HD11 | 1:H:234:LEU:HD23 | 1.83                     | 0.60              |
| 2:c:12:VAL:HG12  | 2:c:40:VAL:HG12  | 1.82                     | 0.60              |
| 2:j:66:LEU:O     | 2:j:91:MET:N     | 2.33                     | 0.60              |
| 2:m:2:LYS:NZ     | 2:m:78:GLU:OE1   | 2.33                     | 0.60              |
| 1:A:207:ASN:ND2  | 1:A:209:ASP:OD1  | 2.35                     | 0.60              |
| 1:H:73:MET:HB2   | 1:H:516:MET:HE3  | 1.83                     | 0.60              |
| 1:H:520:GLU:HG2  | 1:I:36:ARG:HD2   | 1.83                     | 0.60              |
| 1:L:268:ARG:HG3  | 1:L:268:ARG:HH11 | 1.65                     | 0.60              |
| 1:A:216:ASP:OD1  | 1:A:216:ASP:N    | 2.35                     | 0.60              |
| 1:J:191:GLU:OE2  | 1:J:191:GLU:N    | 2.23                     | 0.60              |
| 1:K:191:GLU:OE2  | 1:K:191:GLU:N    | 2.22                     | 0.60              |
| 1:A:206:ASN:ND2  | 1:A:214:VAL:O    | 2.35                     | 0.59              |
| 1:F:423:ARG:NH1  | 1:F:450:GLU:OE2  | 2.34                     | 0.59              |
| 2:j:8:ASP:HB3    | 2:j:47:LYS:HB2   | 1.84                     | 0.59              |
| 2:m:15:ILE:HG23  | 2:m:38:GLY:HA2   | 1.84                     | 0.59              |
| 1:N:132:LYS:HE3  | 1:N:503:ARG:HD3  | 1.83                     | 0.59              |
| 1:D:276:VAL:HG11 | 1:D:330:THR:HG21 | 1.84                     | 0.59              |
| 1:J:359:ASP:HA   | 1:J:362:ARG:HH22 | 1.66                     | 0.59              |
| 1:F:38:VAL:HG22  | 1:G:521:CYS:HB3  | 1.84                     | 0.59              |
| 1:J:132:LYS:HE3  | 1:J:503:ARG:HD3  | 1.85                     | 0.59              |
| 1:L:276:VAL:HG11 | 1:L:330:THR:HG21 | 1.84                     | 0.59              |
| 1:B:20:VAL:HG13  | 1:B:74:VAL:HG21  | 1.85                     | 0.59              |
| 1:H:22:LEU:HD12  | 1:H:62:LEU:HD21  | 1.85                     | 0.59              |
| 1:H:276:VAL:HG11 | 1:H:330:THR:HG21 | 1.84                     | 0.59              |
| 1:E:38:VAL:HG22  | 1:F:521:CYS:HB3  | 1.82                     | 0.59              |
| 2:f:88:ASP:OD2   | 2:f:88:ASP:N     | 2.35                     | 0.59              |
| 2:j:19:ARG:NH1   | 2:j:27:ILE:O     | 2.35                     | 0.59              |
| 1:L:15:ARG:NH1   | 1:L:67:GLU:OE2   | 2.36                     | 0.59              |
| 2:n:2:LYS:NZ     | 2:n:78:GLU:OE2   | 2.35                     | 0.59              |
| 2:e:75:VAL:HG22  | 2:e:77:VAL:HG13  | 1.85                     | 0.59              |
| 1:H:27:VAL:HG12  | 1:H:90:THR:HG23  | 1.85                     | 0.59              |
| 1:I:423:ARG:NH1  | 1:I:450:GLU:OE2  | 2.33                     | 0.59              |
| 1:A:27:VAL:HG12  | 1:A:90:THR:HG23  | 1.85                     | 0.59              |
| 1:M:206:ASN:ND2  | 1:M:214:VAL:O    | 2.35                     | 0.59              |
| 1:A:20:VAL:HG13  | 1:A:74:VAL:HG21  | 1.85                     | 0.59              |
| 1:E:255:GLU:OE2  | 1:E:255:GLU:N    | 2.35                     | 0.59              |
| 2:e:20:LYS:N     | 2:e:20:LYS:HE2   | 2.17                     | 0.59              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:F:132:LYS:HE3  | 1:F:503:ARG:HD3  | 1.85                     | 0.59              |
| 2:l:91:MET:HB2   | 2:m:9:ARG:HG2    | 1.84                     | 0.59              |
| 1:C:191:GLU:OE2  | 1:C:191:GLU:N    | 2.25                     | 0.58              |
| 1:B:441:GLY:HA2  | 1:B:444:ILE:HD12 | 1.85                     | 0.58              |
| 1:I:276:VAL:HG11 | 1:I:330:THR:HG21 | 1.84                     | 0.58              |
| 1:J:213:ALA:HB3  | 1:J:325:VAL:HB   | 1.85                     | 0.58              |
| 1:J:441:GLY:HA2  | 1:J:444:ILE:HD12 | 1.85                     | 0.58              |
| 2:b:9:ARG:HG2    | 2:c:91:MET:HB2   | 1.85                     | 0.58              |
| 1:C:20:VAL:HG13  | 1:C:74:VAL:HG21  | 1.85                     | 0.58              |
| 1:C:441:GLY:HA2  | 1:C:444:ILE:HD12 | 1.85                     | 0.58              |
| 2:g:60:LYS:HD3   | 2:g:60:LYS:N     | 2.16                     | 0.58              |
| 1:I:391:GLU:OE2  | 1:I:395:ARG:NH1  | 2.33                     | 0.58              |
| 1:K:441:GLY:HA2  | 1:K:444:ILE:HD12 | 1.84                     | 0.58              |
| 2:k:40:VAL:HG23  | 2:k:62:GLY:H     | 1.68                     | 0.58              |
| 1:M:54:VAL:HG22  | 1:M:58:LYS:HE3   | 1.84                     | 0.58              |
| 1:N:206:ASN:ND2  | 1:N:214:VAL:O    | 2.36                     | 0.58              |
| 1:H:69:MET:SD    | 1:I:41:GLU:HB2   | 2.43                     | 0.58              |
| 1:K:386:GLU:N    | 1:K:386:GLU:OE1  | 2.31                     | 0.58              |
| 1:E:27:VAL:HG12  | 1:E:90:THR:HG23  | 1.86                     | 0.58              |
| 1:H:20:VAL:HG13  | 1:H:74:VAL:HG21  | 1.85                     | 0.58              |
| 1:E:155:ASP:OD2  | 1:E:395:ARG:NH2  | 2.37                     | 0.58              |
| 1:I:27:VAL:HG12  | 1:I:90:THR:HG23  | 1.85                     | 0.58              |
| 1:K:206:ASN:ND2  | 1:K:214:VAL:O    | 2.36                     | 0.58              |
| 1:K:451:GLN:NE2  | 1:K:455:GLU:OE2  | 2.33                     | 0.58              |
| 2:n:49:LEU:H     | 2:n:49:LEU:HD23  | 1.68                     | 0.58              |
| 1:B:194:GLN:HB2  | 1:B:331:THR:HG22 | 1.85                     | 0.58              |
| 1:F:200:LEU:HD21 | 1:F:277:LYS:HG2  | 1.86                     | 0.58              |
| 1:F:276:VAL:HG11 | 1:F:330:THR:HG21 | 1.84                     | 0.58              |
| 2:j:45:ASP:OD2   | 2:j:46:GLY:N     | 2.36                     | 0.58              |
| 2:k:94:ILE:HG22  | 2:k:95:GLU:OE2   | 2.03                     | 0.58              |
| 1:C:423:ARG:NH1  | 1:C:450:GLU:OE2  | 2.33                     | 0.58              |
| 2:d:85:LEU:HD12  | 2:d:89:ASP:HB2   | 1.86                     | 0.58              |
| 1:D:206:ASN:ND2  | 1:D:214:VAL:O    | 2.36                     | 0.58              |
| 1:D:216:ASP:OD1  | 1:D:216:ASP:N    | 2.35                     | 0.58              |
| 2:e:57:MET:HE2   | 2:e:87:GLU:HG3   | 1.86                     | 0.58              |
| 1:H:132:LYS:HE3  | 1:H:503:ARG:HD3  | 1.85                     | 0.58              |
| 1:H:216:ASP:OD1  | 1:H:216:ASP:N    | 2.34                     | 0.58              |
| 1:I:451:GLN:NE2  | 1:I:455:GLU:OE2  | 2.37                     | 0.58              |
| 1:L:441:GLY:HA2  | 1:L:444:ILE:HD12 | 1.86                     | 0.58              |
| 1:M:194:GLN:HB2  | 1:M:331:THR:HG22 | 1.86                     | 0.58              |
| 1:N:14:GLU:OE1   | 1:N:15:ARG:NH2   | 2.30                     | 0.58              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:G:54:VAL:HG22  | 1:G:58:LYS:HE3   | 1.86                     | 0.58              |
| 1:G:218:PRO:HG3  | 1:G:323:VAL:HG12 | 1.84                     | 0.58              |
| 1:J:27:VAL:HG12  | 1:J:90:THR:HG23  | 1.86                     | 0.58              |
| 1:C:36:ARG:HD2   | 1:D:520:GLU:HG2  | 1.85                     | 0.57              |
| 1:F:69:MET:HE2   | 1:F:524:ALA:HB2  | 1.85                     | 0.57              |
| 1:K:42:ARG:NH2   | 1:K:59:GLU:OE2   | 2.29                     | 0.57              |
| 1:K:260:ALA:O    | 1:K:264:VAL:HG23 | 2.04                     | 0.57              |
| 1:D:36:ARG:HD2   | 1:E:520:GLU:HG2  | 1.86                     | 0.57              |
| 1:F:206:ASN:ND2  | 1:F:214:VAL:O    | 2.37                     | 0.57              |
| 1:H:200:LEU:HD21 | 1:H:277:LYS:HG2  | 1.86                     | 0.57              |
| 1:I:155:ASP:OD2  | 1:I:395:ARG:NH2  | 2.37                     | 0.57              |
| 1:L:520:GLU:HG2  | 1:M:36:ARG:HD2   | 1.85                     | 0.57              |
| 1:H:451:GLN:NE2  | 1:H:455:GLU:OE2  | 2.36                     | 0.57              |
| 1:J:155:ASP:OD2  | 1:J:395:ARG:NH2  | 2.38                     | 0.57              |
| 1:L:207:ASN:ND2  | 1:L:209:ASP:OD1  | 2.37                     | 0.57              |
| 1:A:22:LEU:HD12  | 1:A:62:LEU:HD21  | 1.86                     | 0.57              |
| 1:D:441:GLY:HA2  | 1:D:444:ILE:HD12 | 1.86                     | 0.57              |
| 1:E:9:HIS:ND1    | 1:E:520:GLU:OE1  | 2.29                     | 0.57              |
| 1:H:239:GLN:HA   | 1:H:242:LYS:HE3  | 1.87                     | 0.57              |
| 2:i:80:GLU:OE1   | 2:i:80:GLU:N     | 2.31                     | 0.57              |
| 2:j:60:LYS:HD2   | 2:j:60:LYS:C     | 2.29                     | 0.57              |
| 1:L:194:GLN:HB2  | 1:L:331:THR:HG22 | 1.87                     | 0.57              |
| 1:A:323:VAL:HG23 | 1:A:332:ILE:HA   | 1.86                     | 0.57              |
| 2:a:14:ARG:HG3   | 2:a:67:PHE:HZ    | 1.69                     | 0.57              |
| 1:F:451:GLN:NE2  | 1:F:455:GLU:OE2  | 2.37                     | 0.57              |
| 2:h:51:ASP:OD2   | 2:h:51:ASP:N     | 2.33                     | 0.57              |
| 2:a:48:ILE:HD12  | 2:a:48:ILE:O     | 2.04                     | 0.57              |
| 1:B:15:ARG:NH1   | 1:B:67:GLU:OE2   | 2.37                     | 0.57              |
| 2:f:48:ILE:HD12  | 2:f:48:ILE:O     | 2.04                     | 0.57              |
| 1:G:206:ASN:ND2  | 1:G:214:VAL:O    | 2.37                     | 0.57              |
| 1:J:386:GLU:OE2  | 1:J:386:GLU:N    | 2.22                     | 0.57              |
| 1:L:27:VAL:HG12  | 1:L:90:THR:HG23  | 1.87                     | 0.57              |
| 2:l:49:LEU:H     | 2:l:49:LEU:HD23  | 1.69                     | 0.57              |
| 1:M:27:VAL:HG12  | 1:M:90:THR:HG23  | 1.87                     | 0.57              |
| 2:c:9:ARG:NH2    | 2:d:88:ASP:O     | 2.20                     | 0.57              |
| 1:G:207:ASN:ND2  | 1:G:209:ASP:OD1  | 2.37                     | 0.57              |
| 2:b:51:ASP:OD2   | 2:b:51:ASP:N     | 2.36                     | 0.57              |
| 1:C:321:LYS:HE2  | 1:C:321:LYS:H    | 1.70                     | 0.57              |
| 1:D:27:VAL:HG12  | 1:D:90:THR:HG23  | 1.87                     | 0.57              |
| 2:l:51:ASP:OD2   | 2:l:51:ASP:N     | 2.35                     | 0.57              |
| 1:N:27:VAL:HG12  | 1:N:90:THR:HG23  | 1.87                     | 0.57              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:A:155:ASP:OD2  | 1:A:395:ARG:NH2  | 2.38                     | 0.57              |
| 1:B:27:VAL:HG12  | 1:B:90:THR:HG23  | 1.86                     | 0.57              |
| 1:F:27:VAL:HG12  | 1:F:90:THR:HG23  | 1.86                     | 0.57              |
| 1:H:441:GLY:HA2  | 1:H:444:ILE:HD12 | 1.87                     | 0.57              |
| 2:c:5:PRO:HD3    | 2:c:42:ALA:HB1   | 1.86                     | 0.57              |
| 1:F:155:ASP:OD2  | 1:F:395:ARG:NH2  | 2.38                     | 0.57              |
| 2:a:78:GLU:HG2   | 2:a:80:GLU:HG2   | 1.86                     | 0.56              |
| 1:G:27:VAL:HG12  | 1:G:90:THR:HG23  | 1.87                     | 0.56              |
| 1:A:64:ASP:HB3   | 1:A:67:GLU:HB2   | 1.87                     | 0.56              |
| 1:B:22:LEU:HD12  | 1:B:62:LEU:HD21  | 1.86                     | 0.56              |
| 1:C:451:GLN:NE2  | 1:C:455:GLU:OE2  | 2.33                     | 0.56              |
| 1:F:441:GLY:HA2  | 1:F:444:ILE:HD12 | 1.87                     | 0.56              |
| 2:j:88:ASP:OD2   | 2:j:88:ASP:N     | 2.35                     | 0.56              |
| 1:M:22:LEU:HD12  | 1:M:62:LEU:HD21  | 1.87                     | 0.56              |
| 1:M:132:LYS:HE3  | 1:M:503:ARG:HD3  | 1.87                     | 0.56              |
| 1:N:155:ASP:OD2  | 1:N:395:ARG:NH2  | 2.38                     | 0.56              |
| 1:E:64:ASP:HB3   | 1:E:67:GLU:HB2   | 1.87                     | 0.56              |
| 1:E:210:LYS:HD2  | 1:E:210:LYS:O    | 2.05                     | 0.56              |
| 1:F:207:ASN:ND2  | 1:F:209:ASP:OD1  | 2.37                     | 0.56              |
| 1:K:291:ASP:OD2  | 1:K:368:ARG:NH1  | 2.38                     | 0.56              |
| 1:L:155:ASP:OD2  | 1:L:395:ARG:NH2  | 2.39                     | 0.56              |
| 1:D:155:ASP:OD2  | 1:D:395:ARG:NH2  | 2.39                     | 0.56              |
| 2:f:13:LYS:HE3   | 2:f:82:LEU:HD23  | 1.86                     | 0.56              |
| 1:I:230:ILE:HD11 | 1:I:234:LEU:HD23 | 1.87                     | 0.56              |
| 1:J:321:LYS:HE2  | 1:J:321:LYS:H    | 1.70                     | 0.56              |
| 2:m:49:LEU:HD23  | 2:m:49:LEU:H     | 1.69                     | 0.56              |
| 1:G:155:ASP:OD2  | 1:G:395:ARG:NH2  | 2.39                     | 0.56              |
| 1:J:423:ARG:NH1  | 1:J:450:GLU:OE2  | 2.33                     | 0.56              |
| 1:K:27:VAL:HG12  | 1:K:90:THR:HG23  | 1.88                     | 0.56              |
| 1:K:423:ARG:NH1  | 1:K:450:GLU:OE2  | 2.33                     | 0.56              |
| 1:L:200:LEU:HD21 | 1:L:277:LYS:HG2  | 1.88                     | 0.56              |
| 1:M:451:GLN:NE2  | 1:M:455:GLU:OE2  | 2.36                     | 0.56              |
| 1:H:206:ASN:ND2  | 1:H:214:VAL:O    | 2.39                     | 0.56              |
| 2:i:49:LEU:H     | 2:i:49:LEU:HD23  | 1.70                     | 0.56              |
| 1:B:206:ASN:ND2  | 1:B:214:VAL:O    | 2.39                     | 0.56              |
| 2:f:49:LEU:HD23  | 2:f:49:LEU:H     | 1.69                     | 0.56              |
| 1:G:358:SER:HB2  | 1:G:361:ASP:HB2  | 1.86                     | 0.56              |
| 1:H:40:ILE:HG21  | 1:H:59:GLU:HG2   | 1.87                     | 0.56              |
| 1:I:218:PRO:HG3  | 1:I:323:VAL:HG12 | 1.87                     | 0.56              |
| 2:a:88:ASP:OD1   | 2:a:88:ASP:N     | 2.33                     | 0.56              |
| 1:D:451:GLN:NE2  | 1:D:455:GLU:OE2  | 2.35                     | 0.56              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:G:216:ASP:OD1  | 1:G:216:ASP:N    | 2.35                     | 0.56              |
| 2:n:18:GLU:N     | 2:n:18:GLU:OE2   | 2.38                     | 0.56              |
| 1:D:321:LYS:HD3  | 1:D:321:LYS:N    | 2.20                     | 0.56              |
| 2:e:14:ARG:HG3   | 2:e:67:PHE:HZ    | 1.70                     | 0.56              |
| 1:A:423:ARG:HG3  | 1:A:446:LEU:HD22 | 1.88                     | 0.56              |
| 1:H:358:SER:HB2  | 1:H:361:ASP:HB2  | 1.87                     | 0.56              |
| 1:M:207:ASN:ND2  | 1:M:209:ASP:OD1  | 2.39                     | 0.56              |
| 1:M:423:ARG:HG3  | 1:M:446:LEU:HD22 | 1.88                     | 0.56              |
| 2:m:12:VAL:HG12  | 2:m:40:VAL:HG12  | 1.87                     | 0.56              |
| 1:C:291:ASP:OD2  | 1:C:368:ARG:NH1  | 2.37                     | 0.55              |
| 1:G:22:LEU:HD12  | 1:G:62:LEU:HD21  | 1.88                     | 0.55              |
| 2:j:66:LEU:HG    | 2:j:91:MET:HB2   | 1.88                     | 0.55              |
| 1:K:155:ASP:OD2  | 1:K:395:ARG:NH2  | 2.38                     | 0.55              |
| 1:A:423:ARG:NH1  | 1:A:450:GLU:OE2  | 2.33                     | 0.55              |
| 1:J:291:ASP:OD2  | 1:J:368:ARG:NH1  | 2.39                     | 0.55              |
| 2:k:8:ASP:HB3    | 2:k:47:LYS:HB2   | 1.87                     | 0.55              |
| 2:b:19:ARG:HH22  | 2:b:32:GLY:HA3   | 1.71                     | 0.55              |
| 1:N:386:GLU:HA   | 1:N:389:MET:HB3  | 1.89                     | 0.55              |
| 2:n:21:THR:HG23  | 2:n:27:ILE:HD11  | 1.88                     | 0.55              |
| 2:c:45:ASP:OD2   | 2:c:46:GLY:N     | 2.40                     | 0.55              |
| 1:F:22:LEU:HD12  | 1:F:62:LEU:HD21  | 1.89                     | 0.55              |
| 1:K:22:LEU:HD12  | 1:K:62:LEU:HD21  | 1.89                     | 0.55              |
| 1:M:31:LEU:HD23  | 1:M:455:GLU:HB2  | 1.88                     | 0.55              |
| 1:J:359:ASP:HA   | 1:J:362:ARG:NH2  | 2.22                     | 0.55              |
| 2:k:85:LEU:HD12  | 2:k:89:ASP:HB2   | 1.89                     | 0.55              |
| 2:e:49:LEU:HD23  | 2:e:49:LEU:H     | 1.71                     | 0.55              |
| 1:G:321:LYS:NZ   | 1:G:334:ASP:O    | 2.40                     | 0.55              |
| 1:C:27:VAL:HG12  | 1:C:90:THR:HG23  | 1.88                     | 0.55              |
| 1:H:423:ARG:HG3  | 1:H:446:LEU:HD22 | 1.88                     | 0.55              |
| 2:i:85:LEU:HD12  | 2:i:89:ASP:HB2   | 1.89                     | 0.55              |
| 1:L:206:ASN:ND2  | 1:L:214:VAL:O    | 2.38                     | 0.55              |
| 1:C:155:ASP:OD2  | 1:C:395:ARG:NH2  | 2.40                     | 0.55              |
| 1:H:291:ASP:OD2  | 1:H:368:ARG:NH1  | 2.39                     | 0.55              |
| 2:h:12:VAL:HG12  | 2:h:40:VAL:HG12  | 1.89                     | 0.55              |
| 1:J:451:GLN:NE2  | 1:J:455:GLU:OE2  | 2.36                     | 0.55              |
| 1:M:260:ALA:O    | 1:M:264:VAL:HG23 | 2.07                     | 0.55              |
| 1:A:451:GLN:NE2  | 1:A:455:GLU:OE2  | 2.37                     | 0.54              |
| 1:B:268:ARG:HE   | 2:b:26:VAL:HG11  | 1.72                     | 0.54              |
| 1:C:22:LEU:HD12  | 1:C:62:LEU:HD21  | 1.88                     | 0.54              |
| 1:H:325:VAL:HG13 | 1:H:330:THR:HG22 | 1.90                     | 0.54              |
| 1:I:206:ASN:ND2  | 1:I:214:VAL:O    | 2.40                     | 0.54              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:L:350:ARG:HA   | 1:L:353:ILE:HD12 | 1.88                     | 0.54              |
| 2:l:14:ARG:HG3   | 2:l:67:PHE:HZ    | 1.72                     | 0.54              |
| 1:C:350:ARG:HA   | 1:C:353:ILE:HD12 | 1.89                     | 0.54              |
| 2:f:20:LYS:HE2   | 2:f:20:LYS:N     | 2.21                     | 0.54              |
| 2:g:49:LEU:H     | 2:g:49:LEU:HD23  | 1.72                     | 0.54              |
| 1:H:155:ASP:OD2  | 1:H:395:ARG:NH2  | 2.40                     | 0.54              |
| 1:H:386:GLU:OE2  | 1:H:386:GLU:N    | 2.38                     | 0.54              |
| 1:J:31:LEU:HD23  | 1:J:455:GLU:HB2  | 1.88                     | 0.54              |
| 1:M:9:HIS:ND1    | 1:M:520:GLU:OE1  | 2.40                     | 0.54              |
| 1:B:451:GLN:NE2  | 1:B:455:GLU:OE2  | 2.36                     | 0.54              |
| 1:D:423:ARG:HG3  | 1:D:446:LEU:HD22 | 1.89                     | 0.54              |
| 1:G:260:ALA:O    | 1:G:264:VAL:HG23 | 2.07                     | 0.54              |
| 1:G:423:ARG:NH1  | 1:G:450:GLU:OE2  | 2.33                     | 0.54              |
| 2:g:69:LYS:HG2   | 2:g:70:TYR:CD2   | 2.42                     | 0.54              |
| 1:J:423:ARG:HG3  | 1:J:446:LEU:HD22 | 1.89                     | 0.54              |
| 1:B:155:ASP:OD2  | 1:B:395:ARG:NH2  | 2.40                     | 0.54              |
| 1:C:216:ASP:OD1  | 1:C:216:ASP:N    | 2.35                     | 0.54              |
| 1:D:230:ILE:HD11 | 1:D:234:LEU:HD23 | 1.90                     | 0.54              |
| 1:I:216:ASP:OD2  | 1:I:216:ASP:N    | 2.35                     | 0.54              |
| 1:D:512:VAL:HG12 | 1:D:516:MET:HE2  | 1.89                     | 0.54              |
| 2:d:45:ASP:OD1   | 2:d:46:GLY:N     | 2.41                     | 0.54              |
| 1:F:423:ARG:HG3  | 1:F:446:LEU:HD22 | 1.89                     | 0.54              |
| 1:I:22:LEU:HD12  | 1:I:62:LEU:HD21  | 1.89                     | 0.54              |
| 1:K:327:LYS:HG3  | 1:K:328:GLU:HG2  | 1.88                     | 0.54              |
| 1:L:22:LEU:HD12  | 1:L:62:LEU:HD21  | 1.90                     | 0.54              |
| 1:E:451:GLN:NE2  | 1:E:455:GLU:OE2  | 2.36                     | 0.54              |
| 1:H:350:ARG:HA   | 1:H:353:ILE:HD12 | 1.89                     | 0.54              |
| 1:K:197:ARG:HH21 | 1:K:279:PRO:HA   | 1.73                     | 0.54              |
| 1:J:20:VAL:HG13  | 1:J:74:VAL:HG21  | 1.89                     | 0.54              |
| 1:K:423:ARG:HG3  | 1:K:446:LEU:HD22 | 1.90                     | 0.54              |
| 1:H:207:ASN:ND2  | 1:H:209:ASP:OD1  | 2.41                     | 0.54              |
| 2:k:45:ASP:OD2   | 2:k:46:GLY:N     | 2.40                     | 0.54              |
| 1:C:423:ARG:HG3  | 1:C:446:LEU:HD22 | 1.90                     | 0.54              |
| 2:c:48:ILE:HD13  | 2:c:54:LYS:HD3   | 1.90                     | 0.54              |
| 2:f:66:LEU:O     | 2:f:91:MET:N     | 2.40                     | 0.54              |
| 1:N:451:GLN:NE2  | 1:N:455:GLU:OE2  | 2.37                     | 0.54              |
| 1:D:132:LYS:HE3  | 1:D:503:ARG:HD3  | 1.89                     | 0.54              |
| 1:E:20:VAL:HG13  | 1:E:74:VAL:HG21  | 1.89                     | 0.54              |
| 1:L:362:ARG:H    | 1:L:362:ARG:NE   | 2.06                     | 0.54              |
| 1:B:218:PRO:HG3  | 1:B:323:VAL:HG12 | 1.90                     | 0.53              |
| 2:b:76:LYS:HD3   | 2:b:76:LYS:N     | 2.22                     | 0.53              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:c:51:ASP:OD1   | 2:c:51:ASP:N     | 2.35                     | 0.53              |
| 1:D:31:LEU:HD23  | 1:D:455:GLU:HB2  | 1.90                     | 0.53              |
| 1:K:207:ASN:ND2  | 1:K:209:ASP:OD1  | 2.41                     | 0.53              |
| 1:N:207:ASN:ND2  | 1:N:209:ASP:OD1  | 2.41                     | 0.53              |
| 2:n:69:LYS:H     | 2:n:69:LYS:HD2   | 1.73                     | 0.53              |
| 1:F:73:MET:HB3   | 1:F:516:MET:HE3  | 1.90                     | 0.53              |
| 2:f:75:VAL:HG23  | 2:f:77:VAL:HG22  | 1.90                     | 0.53              |
| 1:L:451:GLN:NE2  | 1:L:455:GLU:OE2  | 2.37                     | 0.53              |
| 1:A:200:LEU:HD21 | 1:A:277:LYS:HD3  | 1.89                     | 0.53              |
| 1:G:423:ARG:HG3  | 1:G:446:LEU:HD22 | 1.91                     | 0.53              |
| 1:L:489:ASP:O    | 1:L:493:MET:HG3  | 2.08                     | 0.53              |
| 1:N:215:LEU:HB2  | 1:N:323:VAL:HG12 | 1.90                     | 0.53              |
| 1:A:215:LEU:HB2  | 1:A:323:VAL:HG12 | 1.91                     | 0.53              |
| 1:A:415:GLY:N    | 3:A:601:ADP:O2'  | 2.29                     | 0.53              |
| 1:D:20:VAL:HG13  | 1:D:74:VAL:HG21  | 1.89                     | 0.53              |
| 1:G:291:ASP:OD2  | 1:G:368:ARG:NH1  | 2.41                     | 0.53              |
| 2:g:14:ARG:HG3   | 2:g:67:PHE:HZ    | 1.74                     | 0.53              |
| 1:B:31:LEU:HD23  | 1:B:455:GLU:HB2  | 1.89                     | 0.53              |
| 1:B:200:LEU:HD21 | 1:B:277:LYS:HG2  | 1.90                     | 0.53              |
| 2:b:57:MET:HE3   | 2:b:87:GLU:HG3   | 1.91                     | 0.53              |
| 2:b:78:GLU:HG2   | 2:b:80:GLU:HG2   | 1.91                     | 0.53              |
| 2:d:49:LEU:HD23  | 2:d:49:LEU:H     | 1.72                     | 0.53              |
| 1:L:423:ARG:HG3  | 1:L:446:LEU:HD22 | 1.90                     | 0.53              |
| 1:N:321:LYS:HE2  | 1:N:321:LYS:H    | 1.73                     | 0.53              |
| 1:A:31:LEU:HD23  | 1:A:455:GLU:HB2  | 1.89                     | 0.53              |
| 2:b:49:LEU:H     | 2:b:49:LEU:HD23  | 1.73                     | 0.53              |
| 1:G:386:GLU:HA   | 1:G:389:MET:HB3  | 1.90                     | 0.53              |
| 2:i:14:ARG:HG3   | 2:i:67:PHE:HZ    | 1.74                     | 0.53              |
| 2:i:65:VAL:HG12  | 2:i:93:VAL:HG22  | 1.91                     | 0.53              |
| 1:G:451:GLN:NE2  | 1:G:455:GLU:OE2  | 2.37                     | 0.53              |
| 1:H:423:ARG:NH1  | 1:H:450:GLU:OE2  | 2.33                     | 0.53              |
| 1:L:31:LEU:HD23  | 1:L:455:GLU:HB2  | 1.90                     | 0.53              |
| 1:L:69:MET:SD    | 1:M:41:GLU:HB2   | 2.49                     | 0.53              |
| 1:N:423:ARG:HG3  | 1:N:446:LEU:HD22 | 1.91                     | 0.53              |
| 1:D:291:ASP:OD2  | 1:D:368:ARG:NH1  | 2.40                     | 0.53              |
| 2:k:95:GLU:OE2   | 2:k:95:GLU:N     | 2.42                     | 0.53              |
| 2:m:78:GLU:HG2   | 2:m:80:GLU:OE1   | 2.09                     | 0.53              |
| 1:C:36:ARG:HD2   | 1:D:520:GLU:CG   | 2.39                     | 0.53              |
| 1:F:350:ARG:HA   | 1:F:353:ILE:HD12 | 1.90                     | 0.53              |
| 1:G:9:HIS:ND1    | 1:G:520:GLU:OE2  | 2.35                     | 0.53              |
| 2:k:2:LYS:NZ     | 2:k:78:GLU:OE1   | 2.38                     | 0.53              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:a:20:LYS:HE2   | 2:a:20:LYS:N     | 2.24                     | 0.52              |
| 1:K:268:ARG:HG3  | 1:K:268:ARG:HH11 | 1.73                     | 0.52              |
| 1:L:200:LEU:HD11 | 1:L:277:LYS:HD3  | 1.91                     | 0.52              |
| 1:M:197:ARG:HH21 | 1:M:279:PRO:HA   | 1.72                     | 0.52              |
| 1:C:207:ASN:ND2  | 1:C:209:ASP:OD1  | 2.42                     | 0.52              |
| 1:I:350:ARG:HA   | 1:I:353:ILE:HD12 | 1.90                     | 0.52              |
| 2:l:48:ILE:HG12  | 2:l:54:LYS:HE3   | 1.91                     | 0.52              |
| 1:B:232:ASP:OD1  | 1:B:233:LEU:N    | 2.43                     | 0.52              |
| 1:C:218:PRO:HG3  | 1:C:323:VAL:HG12 | 1.92                     | 0.52              |
| 1:F:36:ARG:HD2   | 1:G:520:GLU:CG   | 2.40                     | 0.52              |
| 1:C:251:ALA:O    | 1:C:278:ALA:N    | 2.42                     | 0.52              |
| 1:I:463:GLU:HG2  | 1:I:466:VAL:HB   | 1.90                     | 0.52              |
| 2:i:45:ASP:OD2   | 2:i:46:GLY:N     | 2.42                     | 0.52              |
| 1:C:31:LEU:HD23  | 1:C:455:GLU:HB2  | 1.91                     | 0.52              |
| 2:c:84:VAL:HG11  | 2:d:91:MET:HB3   | 1.91                     | 0.52              |
| 1:D:268:ARG:HE   | 2:d:26:VAL:HG11  | 1.73                     | 0.52              |
| 1:I:423:ARG:HG3  | 1:I:446:LEU:HD22 | 1.92                     | 0.52              |
| 2:i:47:LYS:HE2   | 2:i:47:LYS:HA    | 1.92                     | 0.52              |
| 2:l:74:THR:O     | 2:l:76:LYS:NZ    | 2.31                     | 0.52              |
| 1:M:350:ARG:HA   | 1:M:353:ILE:HD12 | 1.91                     | 0.52              |
| 2:n:47:LYS:HE2   | 2:n:47:LYS:HA    | 1.91                     | 0.52              |
| 1:A:350:ARG:HA   | 1:A:353:ILE:HD12 | 1.92                     | 0.52              |
| 1:E:218:PRO:HG3  | 1:E:323:VAL:HG12 | 1.91                     | 0.52              |
| 1:F:218:PRO:HG3  | 1:F:323:VAL:HG12 | 1.89                     | 0.52              |
| 1:K:9:HIS:ND1    | 1:K:520:GLU:OE1  | 2.38                     | 0.52              |
| 1:L:9:HIS:ND1    | 1:L:520:GLU:OE1  | 2.43                     | 0.52              |
| 1:N:31:LEU:HD23  | 1:N:455:GLU:HB2  | 1.90                     | 0.52              |
| 1:N:260:ALA:O    | 1:N:264:VAL:HG23 | 2.09                     | 0.52              |
| 1:B:291:ASP:OD2  | 1:B:368:ARG:NH1  | 2.41                     | 0.52              |
| 1:G:31:LEU:HD23  | 1:G:455:GLU:HB2  | 1.90                     | 0.52              |
| 1:K:20:VAL:HG13  | 1:K:74:VAL:HG21  | 1.91                     | 0.52              |
| 1:L:218:PRO:HG3  | 1:L:323:VAL:HG12 | 1.92                     | 0.52              |
| 1:F:216:ASP:OD1  | 1:F:216:ASP:N    | 2.33                     | 0.52              |
| 1:F:291:ASP:OD2  | 1:F:368:ARG:NH1  | 2.41                     | 0.52              |
| 1:K:230:ILE:HD11 | 1:K:234:LEU:HD23 | 1.92                     | 0.52              |
| 2:m:14:ARG:HD3   | 2:m:34:LYS:HD2   | 1.91                     | 0.52              |
| 1:G:227:ILE:HG21 | 1:G:233:LEU:HD12 | 1.92                     | 0.51              |
| 2:g:69:LYS:H     | 2:g:69:LYS:HD2   | 1.74                     | 0.51              |
| 1:H:321:LYS:HE2  | 1:H:321:LYS:H    | 1.75                     | 0.51              |
| 2:m:60:LYS:C     | 2:m:60:LYS:HD2   | 2.34                     | 0.51              |
| 2:d:60:LYS:HD2   | 2:d:60:LYS:C     | 2.34                     | 0.51              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:E:362:ARG:H    | 1:E:362:ARG:NE   | 2.08                     | 0.51              |
| 1:F:227:ILE:HG21 | 1:F:233:LEU:HD12 | 1.92                     | 0.51              |
| 1:G:197:ARG:HH21 | 1:G:279:PRO:HA   | 1.76                     | 0.51              |
| 2:a:34:LYS:HD3   | 2:a:35:PRO:HD2   | 1.92                     | 0.51              |
| 1:B:178:GLU:HG3  | 1:B:378:VAL:HG13 | 1.91                     | 0.51              |
| 1:D:218:PRO:HG3  | 1:D:323:VAL:HG12 | 1.91                     | 0.51              |
| 2:e:9:ARG:NH2    | 2:f:88:ASP:O     | 2.26                     | 0.51              |
| 2:i:74:THR:O     | 2:i:76:LYS:NZ    | 2.40                     | 0.51              |
| 1:B:64:ASP:HB3   | 1:B:67:GLU:HB2   | 1.92                     | 0.51              |
| 1:I:308:SER:HB3  | 1:I:311:LYS:HG3  | 1.92                     | 0.51              |
| 2:j:14:ARG:HD3   | 2:j:34:LYS:HD2   | 1.92                     | 0.51              |
| 1:M:20:VAL:HG13  | 1:M:74:VAL:HG21  | 1.91                     | 0.51              |
| 1:M:358:SER:HB2  | 1:M:361:ASP:HB2  | 1.93                     | 0.51              |
| 2:m:20:LYS:HE2   | 2:m:20:LYS:N     | 2.25                     | 0.51              |
| 1:A:223:HIS:HD2  | 1:A:301:ILE:HG22 | 1.76                     | 0.51              |
| 2:c:34:LYS:HD3   | 2:c:35:PRO:HD2   | 1.93                     | 0.51              |
| 2:k:69:LYS:HE3   | 2:k:70:TYR:HD1   | 1.76                     | 0.51              |
| 1:N:22:LEU:HD12  | 1:N:62:LEU:HD21  | 1.93                     | 0.51              |
| 1:B:489:ASP:O    | 1:B:493:MET:HG3  | 2.10                     | 0.51              |
| 1:E:31:LEU:HD23  | 1:E:455:GLU:HB2  | 1.93                     | 0.51              |
| 1:E:223:HIS:HD2  | 1:E:301:ILE:HG22 | 1.76                     | 0.51              |
| 1:G:140:THR:HG22 | 1:G:142:LYS:H    | 1.76                     | 0.51              |
| 1:J:268:ARG:HG3  | 1:J:268:ARG:NH1  | 2.24                     | 0.51              |
| 1:K:31:LEU:HD23  | 1:K:455:GLU:HB2  | 1.91                     | 0.51              |
| 1:L:346:VAL:HG13 | 1:L:369:VAL:HG13 | 1.93                     | 0.51              |
| 1:L:362:ARG:HA   | 1:L:365:LEU:HD12 | 1.92                     | 0.51              |
| 1:N:489:ASP:O    | 1:N:493:MET:HG3  | 2.10                     | 0.51              |
| 1:C:325:VAL:HG13 | 1:C:330:THR:HG22 | 1.92                     | 0.51              |
| 2:j:12:VAL:HG12  | 2:j:40:VAL:HG12  | 1.92                     | 0.51              |
| 2:n:58:ALA:O     | 2:n:60:LYS:NZ    | 2.39                     | 0.51              |
| 2:b:15:ILE:HG23  | 2:b:38:GLY:HA2   | 1.93                     | 0.51              |
| 1:J:178:GLU:HG3  | 1:J:378:VAL:HG13 | 1.93                     | 0.51              |
| 2:b:69:LYS:HE3   | 2:b:70:TYR:HD2   | 1.76                     | 0.51              |
| 1:E:178:GLU:HG3  | 1:E:378:VAL:HG13 | 1.92                     | 0.51              |
| 1:M:218:PRO:HG3  | 1:M:323:VAL:HG12 | 1.92                     | 0.51              |
| 1:F:194:GLN:HB2  | 1:F:331:THR:HG22 | 1.93                     | 0.50              |
| 1:G:178:GLU:HG3  | 1:G:378:VAL:HG13 | 1.92                     | 0.50              |
| 1:K:308:SER:OG   | 1:K:310:GLU:OE1  | 2.27                     | 0.50              |
| 1:L:268:ARG:HG3  | 1:L:268:ARG:NH1  | 2.26                     | 0.50              |
| 1:E:197:ARG:HG2  | 1:E:277:LYS:HB2  | 1.92                     | 0.50              |
| 1:H:31:LEU:HD23  | 1:H:455:GLU:HB2  | 1.92                     | 0.50              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:i:12:VAL:HG12  | 2:i:40:VAL:HG12  | 1.92                     | 0.50              |
| 2:i:51:ASP:OD1   | 2:i:51:ASP:N     | 2.34                     | 0.50              |
| 2:a:85:LEU:HD12  | 2:a:89:ASP:HB2   | 1.93                     | 0.50              |
| 2:b:75:VAL:HG22  | 2:b:77:VAL:HG13  | 1.92                     | 0.50              |
| 1:I:31:LEU:HD23  | 1:I:455:GLU:HB2  | 1.91                     | 0.50              |
| 1:J:194:GLN:HB2  | 1:J:331:THR:HG22 | 1.93                     | 0.50              |
| 1:K:200:LEU:HD11 | 1:K:277:LYS:NZ   | 2.27                     | 0.50              |
| 1:M:178:GLU:HG3  | 1:M:378:VAL:HG13 | 1.91                     | 0.50              |
| 1:E:295:LEU:HG   | 1:E:335:GLY:HA3  | 1.92                     | 0.50              |
| 2:j:15:ILE:HD11  | 2:j:37:GLN:HB2   | 1.92                     | 0.50              |
| 2:n:20:LYS:N     | 2:n:20:LYS:HE2   | 2.25                     | 0.50              |
| 1:E:423:ARG:HG3  | 1:E:446:LEU:HD22 | 1.94                     | 0.50              |
| 1:F:74:VAL:HG23  | 1:F:516:MET:HE1  | 1.93                     | 0.50              |
| 1:G:350:ARG:HA   | 1:G:353:ILE:HD12 | 1.93                     | 0.50              |
| 2:j:76:LYS:HD3   | 2:j:76:LYS:N     | 2.27                     | 0.50              |
| 2:l:95:GLU:N     | 2:l:95:GLU:OE2   | 2.44                     | 0.50              |
| 2:d:76:LYS:HD3   | 2:d:76:LYS:N     | 2.27                     | 0.50              |
| 1:E:429:LYS:HB2  | 1:E:429:LYS:NZ   | 2.27                     | 0.50              |
| 1:G:222:LEU:HB2  | 1:G:300:VAL:HA   | 1.92                     | 0.50              |
| 1:I:386:GLU:OE2  | 1:I:386:GLU:N    | 2.42                     | 0.50              |
| 1:J:325:VAL:HG13 | 1:J:330:THR:HG22 | 1.94                     | 0.50              |
| 1:M:346:VAL:HG13 | 1:M:369:VAL:HG13 | 1.94                     | 0.50              |
| 1:B:200:LEU:HD11 | 1:B:277:LYS:HD3  | 1.92                     | 0.50              |
| 1:C:295:LEU:HG   | 1:C:335:GLY:HA3  | 1.94                     | 0.50              |
| 2:h:19:ARG:HH22  | 2:h:32:GLY:HA3   | 1.77                     | 0.50              |
| 1:L:230:ILE:HD11 | 1:L:234:LEU:HD23 | 1.93                     | 0.50              |
| 2:c:76:LYS:HD3   | 2:c:76:LYS:N     | 2.26                     | 0.50              |
| 1:D:350:ARG:HA   | 1:D:353:ILE:HD12 | 1.94                     | 0.50              |
| 2:d:95:GLU:N     | 2:d:95:GLU:OE2   | 2.45                     | 0.50              |
| 2:h:60:LYS:NZ    | 2:h:63:ASP:HB3   | 2.27                     | 0.50              |
| 1:L:216:ASP:OD2  | 1:L:216:ASP:N    | 2.35                     | 0.50              |
| 1:L:308:SER:OG   | 1:L:310:GLU:OE1  | 2.30                     | 0.50              |
| 2:n:60:LYS:HE2   | 2:n:60:LYS:H     | 1.77                     | 0.50              |
| 1:F:31:LEU:HD23  | 1:F:455:GLU:HB2  | 1.93                     | 0.49              |
| 1:G:14:GLU:OE1   | 1:G:15:ARG:NH2   | 2.36                     | 0.49              |
| 1:I:325:VAL:HG13 | 1:I:330:THR:HG22 | 1.94                     | 0.49              |
| 2:j:91:MET:HE3   | 2:j:91:MET:HA    | 1.94                     | 0.49              |
| 1:A:362:ARG:H    | 1:A:362:ARG:HE   | 1.58                     | 0.49              |
| 1:H:512:VAL:HG22 | 1:I:385:THR:HG21 | 1.94                     | 0.49              |
| 1:H:520:GLU:CG   | 1:I:36:ARG:HD2   | 2.41                     | 0.49              |
| 1:E:74:VAL:HG22  | 1:E:516:MET:HE1  | 1.94                     | 0.49              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:F:66:PHE:HD1   | 1:F:522:MET:HE3  | 1.76                     | 0.49              |
| 1:D:41:GLU:HB2   | 1:E:69:MET:SD    | 2.53                     | 0.49              |
| 1:K:227:ILE:HG21 | 1:K:233:LEU:HD23 | 1.93                     | 0.49              |
| 2:k:11:VAL:HG13  | 2:k:84:VAL:HG22  | 1.94                     | 0.49              |
| 2:l:77:VAL:HG23  | 2:l:78:GLU:OE1   | 2.11                     | 0.49              |
| 2:n:95:GLU:N     | 2:n:95:GLU:OE2   | 2.45                     | 0.49              |
| 1:D:260:ALA:O    | 1:D:264:VAL:HG23 | 2.12                     | 0.49              |
| 1:E:232:ASP:OD1  | 1:E:233:LEU:N    | 2.46                     | 0.49              |
| 1:E:325:VAL:HG13 | 1:E:330:THR:HG22 | 1.93                     | 0.49              |
| 2:j:34:LYS:HD3   | 2:j:35:PRO:HD2   | 1.94                     | 0.49              |
| 1:D:36:ARG:HD2   | 1:E:520:GLU:CG   | 2.41                     | 0.49              |
| 1:D:325:VAL:HG13 | 1:D:330:THR:HG22 | 1.93                     | 0.49              |
| 1:F:5:GLU:HG2    | 1:F:66:PHE:CZ    | 2.47                     | 0.49              |
| 1:H:9:HIS:ND1    | 1:H:520:GLU:OE1  | 2.43                     | 0.49              |
| 2:e:34:LYS:HD3   | 2:e:35:PRO:HD2   | 1.95                     | 0.49              |
| 1:N:338:ASP:HB3  | 1:N:341:LYS:HG3  | 1.95                     | 0.49              |
| 1:A:291:ASP:OD2  | 1:A:368:ARG:NH1  | 2.46                     | 0.49              |
| 1:B:325:VAL:HG13 | 1:B:330:THR:HG22 | 1.95                     | 0.49              |
| 2:c:48:ILE:HG21  | 2:d:55:ARG:HD2   | 1.94                     | 0.49              |
| 1:D:308:SER:OG   | 1:D:310:GLU:OE1  | 2.31                     | 0.49              |
| 1:G:362:ARG:HA   | 1:G:365:LEU:HD12 | 1.95                     | 0.49              |
| 2:g:15:ILE:HD11  | 2:g:37:GLN:HB2   | 1.95                     | 0.49              |
| 1:H:178:GLU:HG3  | 1:H:378:VAL:HG13 | 1.93                     | 0.49              |
| 1:J:218:PRO:HG3  | 1:J:323:VAL:HG12 | 1.94                     | 0.49              |
| 1:K:215:LEU:HB2  | 1:K:323:VAL:HG12 | 1.95                     | 0.49              |
| 2:c:85:LEU:HD12  | 2:c:89:ASP:HB2   | 1.94                     | 0.49              |
| 2:l:34:LYS:HD3   | 2:l:35:PRO:HD2   | 1.94                     | 0.49              |
| 2:h:9:ARG:HG2    | 2:n:91:MET:HB2   | 1.94                     | 0.48              |
| 2:h:69:LYS:HE3   | 2:h:70:TYR:HD2   | 1.78                     | 0.48              |
| 1:A:346:VAL:HG13 | 1:A:369:VAL:HG13 | 1.95                     | 0.48              |
| 1:D:34:LYS:HD2   | 1:D:460:ALA:HA   | 1.95                     | 0.48              |
| 1:H:197:ARG:HH21 | 1:H:279:PRO:HA   | 1.78                     | 0.48              |
| 1:I:223:HIS:HD2  | 1:I:301:ILE:HG22 | 1.77                     | 0.48              |
| 1:J:489:ASP:O    | 1:J:493:MET:HG3  | 2.13                     | 0.48              |
| 2:a:49:LEU:HD23  | 2:a:49:LEU:H     | 1.78                     | 0.48              |
| 2:h:88:ASP:OD2   | 2:h:88:ASP:N     | 2.44                     | 0.48              |
| 1:I:232:ASP:OD1  | 1:I:233:LEU:N    | 2.47                     | 0.48              |
| 2:i:88:ASP:OD2   | 2:i:88:ASP:N     | 2.35                     | 0.48              |
| 2:k:49:LEU:HD23  | 2:k:49:LEU:H     | 1.78                     | 0.48              |
| 1:M:216:ASP:OD2  | 1:M:216:ASP:N    | 2.35                     | 0.48              |
| 1:D:489:ASP:O    | 1:D:493:MET:HG3  | 2.14                     | 0.48              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:e:77:VAL:HG23  | 2:e:78:GLU:OE2   | 2.13                     | 0.48              |
| 1:G:489:ASP:O    | 1:G:493:MET:HG3  | 2.13                     | 0.48              |
| 1:I:268:ARG:HG3  | 1:I:268:ARG:HH11 | 1.77                     | 0.48              |
| 1:J:34:LYS:HD2   | 1:J:460:ALA:HA   | 1.94                     | 0.48              |
| 2:k:19:ARG:HH22  | 2:k:32:GLY:HA3   | 1.79                     | 0.48              |
| 1:L:64:ASP:HB3   | 1:L:67:GLU:HB2   | 1.95                     | 0.48              |
| 1:L:178:GLU:HG3  | 1:L:378:VAL:HG13 | 1.95                     | 0.48              |
| 1:L:291:ASP:OD2  | 1:L:368:ARG:NH1  | 2.45                     | 0.48              |
| 1:L:321:LYS:NZ   | 1:L:334:ASP:OD2  | 2.44                     | 0.48              |
| 2:m:20:LYS:HD3   | 2:m:26:VAL:HG22  | 1.95                     | 0.48              |
| 1:N:238:GLU:HG2  | 2:n:25:ILE:HD13  | 1.94                     | 0.48              |
| 1:N:350:ARG:HA   | 1:N:353:ILE:HD12 | 1.96                     | 0.48              |
| 1:A:178:GLU:HG3  | 1:A:378:VAL:HG13 | 1.95                     | 0.48              |
| 1:E:321:LYS:NZ   | 1:E:334:ASP:O    | 2.43                     | 0.48              |
| 1:F:251:ALA:O    | 1:F:278:ALA:N    | 2.47                     | 0.48              |
| 1:I:178:GLU:HG3  | 1:I:378:VAL:HG13 | 1.95                     | 0.48              |
| 1:I:272:LYS:H    | 1:I:272:LYS:HD3  | 1.78                     | 0.48              |
| 2:i:20:LYS:N     | 2:i:20:LYS:HE2   | 2.29                     | 0.48              |
| 1:L:520:GLU:CG   | 1:M:36:ARG:HD2   | 2.42                     | 0.48              |
| 2:h:66:LEU:O     | 2:h:91:MET:N     | 2.46                     | 0.48              |
| 1:I:263:VAL:O    | 1:I:267:LEU:HG   | 2.13                     | 0.48              |
| 1:J:295:LEU:HG   | 1:J:335:GLY:HA3  | 1.95                     | 0.48              |
| 1:M:295:LEU:HG   | 1:M:335:GLY:HA3  | 1.95                     | 0.48              |
| 2:n:51:ASP:OD1   | 2:n:51:ASP:N     | 2.35                     | 0.48              |
| 1:A:69:MET:SD    | 1:G:41:GLU:HB2   | 2.54                     | 0.48              |
| 1:B:168:LYS:HD3  | 1:B:189:VAL:HG21 | 1.94                     | 0.48              |
| 1:B:346:VAL:HG13 | 1:B:369:VAL:HG13 | 1.95                     | 0.48              |
| 2:c:40:VAL:HG23  | 2:c:62:GLY:H     | 1.77                     | 0.48              |
| 1:E:22:LEU:HD12  | 1:E:62:LEU:HD21  | 1.95                     | 0.48              |
| 1:E:291:ASP:OD2  | 1:E:368:ARG:NH1  | 2.44                     | 0.48              |
| 2:e:20:LYS:HD3   | 2:e:26:VAL:HG22  | 1.96                     | 0.48              |
| 2:e:85:LEU:HD12  | 2:e:89:ASP:HB2   | 1.96                     | 0.48              |
| 1:H:168:LYS:HD3  | 1:H:189:VAL:HG21 | 1.94                     | 0.48              |
| 1:J:64:ASP:HB3   | 1:J:67:GLU:HB2   | 1.95                     | 0.48              |
| 1:J:232:ASP:OD1  | 1:J:233:LEU:N    | 2.47                     | 0.48              |
| 2:j:29:ASP:OD2   | 2:j:30:THR:N     | 2.47                     | 0.48              |
| 1:B:429:LYS:HB2  | 1:B:429:LYS:NZ   | 2.29                     | 0.48              |
| 2:c:11:VAL:HB    | 2:c:42:ALA:HB3   | 1.95                     | 0.48              |
| 1:E:226:LYS:NZ   | 1:E:255:GLU:OE1  | 2.45                     | 0.48              |
| 2:e:80:GLU:OE1   | 2:e:80:GLU:N     | 2.33                     | 0.48              |
| 1:G:325:VAL:HG13 | 1:G:330:THR:HB   | 1.95                     | 0.48              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:I:251:ALA:O    | 1:I:278:ALA:N    | 2.47                     | 0.48              |
| 1:I:268:ARG:HG3  | 1:I:268:ARG:NH1  | 2.29                     | 0.48              |
| 2:i:34:LYS:HD3   | 2:i:35:PRO:HD2   | 1.95                     | 0.48              |
| 1:J:230:ILE:HD11 | 1:J:234:LEU:HD23 | 1.95                     | 0.48              |
| 1:K:268:ARG:HG3  | 1:K:268:ARG:NH1  | 2.29                     | 0.48              |
| 1:L:168:LYS:HD3  | 1:L:189:VAL:HG21 | 1.95                     | 0.48              |
| 1:N:12:ALA:HB1   | 1:N:522:MET:HB2  | 1.95                     | 0.48              |
| 1:A:34:LYS:HD2   | 1:A:460:ALA:HA   | 1.95                     | 0.48              |
| 2:a:75:VAL:HG22  | 2:a:77:VAL:H     | 1.79                     | 0.48              |
| 2:a:94:ILE:HD12  | 2:a:94:ILE:H     | 1.78                     | 0.48              |
| 1:B:104:MET:HE2  | 1:B:517:LEU:HD23 | 1.95                     | 0.48              |
| 1:B:423:ARG:HG3  | 1:B:446:LEU:HD22 | 1.96                     | 0.48              |
| 2:b:34:LYS:HD3   | 2:b:35:PRO:HD2   | 1.96                     | 0.48              |
| 1:C:215:LEU:HB3  | 1:C:218:PRO:HB3  | 1.95                     | 0.48              |
| 1:G:251:ALA:O    | 1:G:278:ALA:N    | 2.47                     | 0.48              |
| 1:H:223:HIS:HD2  | 1:H:301:ILE:HG22 | 1.78                     | 0.48              |
| 1:I:512:VAL:HG12 | 1:I:516:MET:HE2  | 1.96                     | 0.48              |
| 1:D:74:VAL:HG22  | 1:D:516:MET:HE1  | 1.96                     | 0.48              |
| 2:g:85:LEU:HD12  | 2:g:89:ASP:HB2   | 1.95                     | 0.48              |
| 2:i:43:VAL:HG22  | 2:i:57:MET:HE3   | 1.96                     | 0.48              |
| 2:n:14:ARG:HG2   | 2:n:34:LYS:HD2   | 1.95                     | 0.48              |
| 1:A:132:LYS:HE3  | 1:A:503:ARG:HD3  | 1.95                     | 0.47              |
| 1:B:308:SER:OG   | 1:B:310:GLU:OE1  | 2.29                     | 0.47              |
| 2:b:20:LYS:N     | 2:b:20:LYS:HE2   | 2.29                     | 0.47              |
| 2:c:47:LYS:HD3   | 2:c:48:ILE:N     | 2.29                     | 0.47              |
| 1:H:66:PHE:HD1   | 1:H:522:MET:HE3  | 1.79                     | 0.47              |
| 2:h:14:ARG:HG3   | 2:h:67:PHE:HZ    | 1.79                     | 0.47              |
| 1:M:34:LYS:HD2   | 1:M:460:ALA:HA   | 1.95                     | 0.47              |
| 1:B:457:VAL:HG13 | 1:B:462:GLU:HB2  | 1.96                     | 0.47              |
| 2:b:45:ASP:OD2   | 2:b:46:GLY:N     | 2.47                     | 0.47              |
| 1:C:457:VAL:HG13 | 1:C:462:GLU:HB2  | 1.96                     | 0.47              |
| 1:E:457:VAL:HG13 | 1:E:462:GLU:HB2  | 1.95                     | 0.47              |
| 1:J:207:ASN:ND2  | 1:J:209:ASP:OD1  | 2.47                     | 0.47              |
| 2:j:14:ARG:HG3   | 2:j:67:PHE:HZ    | 1.79                     | 0.47              |
| 1:M:520:GLU:CG   | 1:N:36:ARG:HD2   | 2.43                     | 0.47              |
| 1:E:350:ARG:HA   | 1:E:353:ILE:HD12 | 1.95                     | 0.47              |
| 1:I:237:LEU:HD21 | 1:I:271:LEU:HD21 | 1.95                     | 0.47              |
| 1:J:226:LYS:HE2  | 1:J:226:LYS:HB2  | 1.61                     | 0.47              |
| 1:N:178:GLU:HG3  | 1:N:378:VAL:HG13 | 1.95                     | 0.47              |
| 1:A:259:LEU:O    | 1:A:263:VAL:HG23 | 2.14                     | 0.47              |
| 1:D:311:LYS:HE2  | 1:D:311:LYS:HB2  | 1.73                     | 0.47              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:e:19:ARG:HH22  | 2:e:32:GLY:HA3   | 1.79                     | 0.47              |
| 2:f:18:GLU:N     | 2:f:18:GLU:OE2   | 2.47                     | 0.47              |
| 1:G:308:SER:OG   | 1:G:310:GLU:OE1  | 2.31                     | 0.47              |
| 1:H:255:GLU:N    | 1:H:255:GLU:OE2  | 2.47                     | 0.47              |
| 1:H:419:LEU:HB3  | 1:H:449:VAL:HB   | 1.97                     | 0.47              |
| 1:K:200:LEU:HD11 | 1:K:277:LYS:HZ3  | 1.78                     | 0.47              |
| 1:K:520:GLU:CG   | 1:L:36:ARG:HD2   | 2.41                     | 0.47              |
| 1:M:64:ASP:HB3   | 1:M:67:GLU:HB2   | 1.96                     | 0.47              |
| 2:m:34:LYS:HD3   | 2:m:35:PRO:HD2   | 1.95                     | 0.47              |
| 1:B:272:LYS:H    | 1:B:272:LYS:HD3  | 1.80                     | 0.47              |
| 1:D:5:GLU:HG2    | 1:D:66:PHE:CZ    | 2.49                     | 0.47              |
| 2:e:15:ILE:HD11  | 2:e:37:GLN:HB2   | 1.97                     | 0.47              |
| 1:G:200:LEU:HD11 | 1:G:277:LYS:HG2  | 1.95                     | 0.47              |
| 1:A:40:ILE:HG21  | 1:A:59:GLU:HG3   | 1.94                     | 0.47              |
| 1:C:168:LYS:HD3  | 1:C:189:VAL:HG21 | 1.96                     | 0.47              |
| 1:L:325:VAL:HG13 | 1:L:330:THR:HG22 | 1.96                     | 0.47              |
| 2:b:69:LYS:HD2   | 2:b:69:LYS:O     | 2.14                     | 0.47              |
| 1:C:41:GLU:HB2   | 1:D:69:MET:SD    | 2.54                     | 0.47              |
| 2:c:49:LEU:HD23  | 2:c:49:LEU:H     | 1.80                     | 0.47              |
| 1:D:251:ALA:O    | 1:D:278:ALA:N    | 2.47                     | 0.47              |
| 1:D:272:LYS:H    | 1:D:272:LYS:HD3  | 1.80                     | 0.47              |
| 1:E:132:LYS:HE3  | 1:E:503:ARG:HD3  | 1.95                     | 0.47              |
| 2:e:45:ASP:OD1   | 2:e:46:GLY:N     | 2.48                     | 0.47              |
| 1:F:200:LEU:HD11 | 1:F:277:LYS:HD3  | 1.95                     | 0.47              |
| 1:F:362:ARG:HA   | 1:F:365:LEU:HB2  | 1.96                     | 0.47              |
| 2:f:14:ARG:HG3   | 2:f:67:PHE:HZ    | 1.79                     | 0.47              |
| 1:I:291:ASP:OD2  | 1:I:368:ARG:NH1  | 2.44                     | 0.47              |
| 1:K:215:LEU:HB3  | 1:K:218:PRO:HB3  | 1.97                     | 0.47              |
| 2:k:20:LYS:HE2   | 2:k:20:LYS:N     | 2.29                     | 0.47              |
| 2:a:15:ILE:HD11  | 2:a:37:GLN:HB2   | 1.96                     | 0.47              |
| 1:F:489:ASP:HB3  | 1:F:492:GLU:HB2  | 1.97                     | 0.47              |
| 1:I:197:ARG:O    | 1:I:330:THR:HG23 | 2.15                     | 0.47              |
| 1:K:178:GLU:HG3  | 1:K:378:VAL:HG13 | 1.96                     | 0.47              |
| 1:L:251:ALA:O    | 1:L:278:ALA:N    | 2.47                     | 0.47              |
| 1:N:215:LEU:HB3  | 1:N:218:PRO:HB3  | 1.96                     | 0.47              |
| 1:D:232:ASP:OD1  | 1:D:233:LEU:N    | 2.48                     | 0.47              |
| 2:h:45:ASP:OD2   | 2:h:46:GLY:N     | 2.48                     | 0.47              |
| 2:a:20:LYS:HD3   | 2:a:26:VAL:HG22  | 1.97                     | 0.47              |
| 1:C:132:LYS:HE3  | 1:C:503:ARG:HD3  | 1.96                     | 0.46              |
| 2:e:21:THR:HG23  | 2:e:27:ILE:HD11  | 1.97                     | 0.46              |
| 1:F:5:GLU:HG2    | 1:F:66:PHE:CE2   | 2.50                     | 0.46              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:f:19:ARG:HH22  | 2:f:32:GLY:HA3   | 1.79                     | 0.46              |
| 1:G:20:VAL:HG13  | 1:G:74:VAL:HG21  | 1.97                     | 0.46              |
| 1:K:223:HIS:HD2  | 1:K:301:ILE:HG22 | 1.80                     | 0.46              |
| 1:A:215:LEU:HB3  | 1:A:218:PRO:HB3  | 1.97                     | 0.46              |
| 1:A:419:LEU:HB3  | 1:A:449:VAL:HB   | 1.97                     | 0.46              |
| 1:F:325:VAL:HG13 | 1:F:330:THR:HG22 | 1.97                     | 0.46              |
| 2:h:34:LYS:HD3   | 2:h:35:PRO:HD2   | 1.97                     | 0.46              |
| 1:I:132:LYS:HE3  | 1:I:503:ARG:HD3  | 1.97                     | 0.46              |
| 1:M:69:MET:SD    | 1:N:41:GLU:HB2   | 2.55                     | 0.46              |
| 1:N:251:ALA:O    | 1:N:278:ALA:N    | 2.48                     | 0.46              |
| 1:B:339:PRO:HA   | 1:B:342:ILE:HD12 | 1.97                     | 0.46              |
| 2:c:19:ARG:HH22  | 2:c:32:GLY:HA3   | 1.79                     | 0.46              |
| 1:D:178:GLU:HG3  | 1:D:378:VAL:HG13 | 1.97                     | 0.46              |
| 1:H:222:LEU:HB2  | 1:H:300:VAL:HA   | 1.97                     | 0.46              |
| 2:i:33:GLU:OE1   | 2:i:34:LYS:N     | 2.46                     | 0.46              |
| 1:K:168:LYS:HD3  | 1:K:189:VAL:HG21 | 1.96                     | 0.46              |
| 1:L:197:ARG:HG2  | 1:L:277:LYS:HB2  | 1.98                     | 0.46              |
| 1:L:364:LYS:HA   | 1:L:367:GLU:HG2  | 1.98                     | 0.46              |
| 2:e:47:LYS:HD3   | 2:e:48:ILE:H     | 1.81                     | 0.46              |
| 2:e:69:LYS:HD2   | 2:e:69:LYS:O     | 2.14                     | 0.46              |
| 2:e:80:GLU:H     | 2:e:80:GLU:CD    | 2.19                     | 0.46              |
| 1:G:346:VAL:HG13 | 1:G:369:VAL:HG13 | 1.98                     | 0.46              |
| 1:H:213:ALA:HB3  | 1:H:325:VAL:HB   | 1.96                     | 0.46              |
| 1:H:308:SER:OG   | 1:H:310:GLU:OE1  | 2.31                     | 0.46              |
| 1:I:194:GLN:HB2  | 1:I:331:THR:HG22 | 1.97                     | 0.46              |
| 1:L:239:GLN:NE2  | 1:L:312:ALA:O    | 2.48                     | 0.46              |
| 2:l:2:LYS:NZ     | 2:l:78:GLU:OE2   | 2.41                     | 0.46              |
| 1:B:39:VAL:HB    | 1:C:522:MET:HG3  | 1.98                     | 0.46              |
| 1:C:37:ASN:ND2   | 1:D:518:THR:OG1  | 2.47                     | 0.46              |
| 1:C:234:LEU:HA   | 1:C:234:LEU:HD23 | 1.80                     | 0.46              |
| 1:I:457:VAL:HG13 | 1:I:462:GLU:HB2  | 1.97                     | 0.46              |
| 1:B:233:LEU:O    | 1:B:233:LEU:HD23 | 2.16                     | 0.46              |
| 1:D:200:LEU:HD11 | 1:D:277:LYS:HG2  | 1.98                     | 0.46              |
| 1:D:457:VAL:HG13 | 1:D:462:GLU:HB2  | 1.97                     | 0.46              |
| 2:d:14:ARG:HG3   | 2:d:67:PHE:HZ    | 1.79                     | 0.46              |
| 2:d:72:GLY:HA3   | 2:d:83:LEU:HD21  | 1.96                     | 0.46              |
| 1:G:419:LEU:HB3  | 1:G:449:VAL:HB   | 1.97                     | 0.46              |
| 1:K:386:GLU:HA   | 1:K:389:MET:HB3  | 1.97                     | 0.46              |
| 1:N:362:ARG:H    | 1:N:362:ARG:CD   | 2.28                     | 0.46              |
| 2:n:34:LYS:HD3   | 2:n:35:PRO:HD2   | 1.98                     | 0.46              |
| 1:A:197:ARG:HH21 | 1:A:279:PRO:HA   | 1.79                     | 0.46              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:260:ALA:O    | 1:C:263:VAL:HG22 | 2.16                     | 0.46              |
| 1:D:197:ARG:O    | 1:D:330:THR:HG23 | 2.16                     | 0.46              |
| 2:d:9:ARG:NH1    | 2:e:88:ASP:O     | 2.46                     | 0.46              |
| 1:E:251:ALA:O    | 1:E:278:ALA:N    | 2.48                     | 0.46              |
| 1:E:338:ASP:OD1  | 1:E:338:ASP:N    | 2.49                     | 0.46              |
| 1:J:350:ARG:HA   | 1:J:353:ILE:HD12 | 1.98                     | 0.46              |
| 2:l:47:LYS:HD3   | 2:l:48:ILE:N     | 2.30                     | 0.46              |
| 1:N:223:HIS:CE1  | 1:N:225:LYS:HB2  | 2.50                     | 0.46              |
| 1:B:386:GLU:H    | 1:B:386:GLU:CD   | 2.17                     | 0.46              |
| 1:E:261:THR:O    | 1:E:265:ASN:ND2  | 2.34                     | 0.46              |
| 1:F:255:GLU:N    | 1:F:255:GLU:OE1  | 2.49                     | 0.46              |
| 2:l:45:ASP:OD2   | 2:l:46:GLY:N     | 2.49                     | 0.46              |
| 1:N:100:VAL:HG21 | 1:N:516:MET:HE3  | 1.98                     | 0.46              |
| 1:A:278:ALA:HB3  | 1:A:285:ARG:HD2  | 1.97                     | 0.46              |
| 1:C:385:THR:HG21 | 1:D:512:VAL:HG22 | 1.97                     | 0.46              |
| 1:F:13:ARG:NH1   | 1:F:520:GLU:OE1  | 2.40                     | 0.46              |
| 1:F:197:ARG:HH21 | 1:F:279:PRO:HA   | 1.80                     | 0.46              |
| 2:i:69:LYS:HD2   | 2:i:69:LYS:O     | 2.15                     | 0.46              |
| 1:N:419:LEU:HB3  | 1:N:449:VAL:HB   | 1.98                     | 0.46              |
| 1:G:457:VAL:HG13 | 1:G:462:GLU:HB2  | 1.98                     | 0.46              |
| 1:I:13:ARG:NH1   | 1:I:520:GLU:OE1  | 2.42                     | 0.46              |
| 1:I:69:MET:SD    | 1:J:41:GLU:HB2   | 2.56                     | 0.46              |
| 1:M:419:LEU:HB3  | 1:M:449:VAL:HB   | 1.97                     | 0.46              |
| 2:g:20:LYS:N     | 2:g:20:LYS:HE2   | 2.31                     | 0.45              |
| 1:K:233:LEU:HD13 | 1:K:237:LEU:HD13 | 1.97                     | 0.45              |
| 2:k:7:HIS:HB3    | 2:k:47:LYS:HE2   | 1.97                     | 0.45              |
| 2:m:64:LYS:HB2   | 2:m:94:ILE:HB    | 1.96                     | 0.45              |
| 1:B:197:ARG:HG2  | 1:B:277:LYS:HB2  | 1.98                     | 0.45              |
| 1:B:230:ILE:HD11 | 1:B:234:LEU:HD23 | 1.97                     | 0.45              |
| 1:F:308:SER:HB3  | 1:F:311:LYS:HE2  | 1.97                     | 0.45              |
| 2:g:12:VAL:HG12  | 2:g:40:VAL:HG12  | 1.97                     | 0.45              |
| 1:I:74:VAL:HG22  | 1:I:516:MET:HE1  | 1.99                     | 0.45              |
| 1:K:419:LEU:HB3  | 1:K:449:VAL:HB   | 1.97                     | 0.45              |
| 1:N:140:THR:HG22 | 1:N:142:LYS:H    | 1.81                     | 0.45              |
| 1:N:308:SER:OG   | 1:N:310:GLU:OE1  | 2.34                     | 0.45              |
| 2:n:5:PRO:HD3    | 2:n:42:ALA:HB1   | 1.98                     | 0.45              |
| 1:D:54:VAL:HG22  | 1:D:58:LYS:HE3   | 1.97                     | 0.45              |
| 2:e:47:LYS:HD3   | 2:e:48:ILE:N     | 2.30                     | 0.45              |
| 1:F:213:ALA:HB3  | 1:F:325:VAL:HB   | 1.99                     | 0.45              |
| 1:I:419:LEU:HB3  | 1:I:449:VAL:HB   | 1.99                     | 0.45              |
| 1:J:518:THR:OG1  | 1:K:37:ASN:ND2   | 2.47                     | 0.45              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:a:77:VAL:HG13  | 2:a:78:GLU:OE1   | 2.16                     | 0.45              |
| 1:C:178:GLU:HG3  | 1:C:378:VAL:HG13 | 1.98                     | 0.45              |
| 2:c:20:LYS:N     | 2:c:20:LYS:HE2   | 2.32                     | 0.45              |
| 1:F:321:LYS:H    | 1:F:321:LYS:HE2  | 1.81                     | 0.45              |
| 2:f:60:LYS:C     | 2:f:60:LYS:HD2   | 2.41                     | 0.45              |
| 2:f:78:GLU:HG2   | 2:f:80:GLU:HG2   | 1.98                     | 0.45              |
| 2:g:5:PRO:HD3    | 2:g:42:ALA:HB1   | 1.98                     | 0.45              |
| 2:k:39:GLU:OE2   | 2:k:39:GLU:N     | 2.46                     | 0.45              |
| 1:A:385:THR:HG22 | 1:A:387:VAL:H    | 1.82                     | 0.45              |
| 1:D:168:LYS:HD3  | 1:D:189:VAL:HG21 | 1.97                     | 0.45              |
| 1:D:203:TYR:HB3  | 1:D:267:LEU:HD11 | 1.98                     | 0.45              |
| 1:E:197:ARG:HH21 | 1:E:279:PRO:HA   | 1.81                     | 0.45              |
| 1:E:216:ASP:OD1  | 1:E:216:ASP:N    | 2.35                     | 0.45              |
| 1:F:222:LEU:HB2  | 1:F:300:VAL:HA   | 1.98                     | 0.45              |
| 1:F:419:LEU:HB3  | 1:F:449:VAL:HB   | 1.98                     | 0.45              |
| 2:f:57:MET:HA    | 2:f:57:MET:HE2   | 1.99                     | 0.45              |
| 1:G:64:ASP:HB3   | 1:G:67:GLU:HB2   | 1.97                     | 0.45              |
| 2:g:45:ASP:OD2   | 2:g:46:GLY:N     | 2.49                     | 0.45              |
| 1:I:338:ASP:OD1  | 1:I:338:ASP:N    | 2.49                     | 0.45              |
| 1:A:308:SER:OG   | 1:A:310:GLU:OE1  | 2.35                     | 0.45              |
| 1:B:364:LYS:O    | 1:B:367:GLU:HG2  | 2.17                     | 0.45              |
| 2:f:69:LYS:HD2   | 2:f:69:LYS:O     | 2.16                     | 0.45              |
| 2:f:81:GLU:CD    | 2:f:81:GLU:O     | 2.60                     | 0.45              |
| 2:i:15:ILE:HD11  | 2:i:37:GLN:HB2   | 1.98                     | 0.45              |
| 1:J:311:LYS:HE2  | 1:J:311:LYS:HB2  | 1.79                     | 0.45              |
| 1:L:223:HIS:CE1  | 1:L:225:LYS:HB2  | 2.52                     | 0.45              |
| 1:N:415:GLY:N    | 3:N:601:ADP:O2'  | 2.30                     | 0.45              |
| 1:A:223:HIS:CE1  | 1:A:225:LYS:HB2  | 2.51                     | 0.45              |
| 1:A:362:ARG:HA   | 1:A:365:LEU:HB2  | 1.99                     | 0.45              |
| 1:D:263:VAL:O    | 1:D:267:LEU:HD13 | 2.17                     | 0.45              |
| 2:d:88:ASP:OD2   | 2:d:88:ASP:C     | 2.60                     | 0.45              |
| 2:d:91:MET:HE2   | 2:d:91:MET:HB2   | 1.67                     | 0.45              |
| 1:F:69:MET:CE    | 1:F:524:ALA:HB2  | 2.47                     | 0.45              |
| 1:E:364:LYS:O    | 1:E:367:GLU:HG2  | 2.17                     | 0.45              |
| 1:E:512:VAL:HG12 | 1:E:516:MET:HE2  | 1.99                     | 0.45              |
| 2:e:78:GLU:HG2   | 2:e:80:GLU:OE1   | 2.17                     | 0.45              |
| 1:G:223:HIS:CE1  | 1:G:225:LYS:HB2  | 2.52                     | 0.45              |
| 1:N:291:ASP:OD2  | 1:N:368:ARG:NH1  | 2.41                     | 0.45              |
| 1:F:113:PRO:HB2  | 1:F:518:THR:HA   | 1.99                     | 0.45              |
| 2:f:76:LYS:N     | 2:f:76:LYS:HD3   | 2.31                     | 0.45              |
| 1:G:364:LYS:O    | 1:G:367:GLU:HG2  | 2.16                     | 0.45              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:J:419:LEU:HB3  | 1:J:449:VAL:HB   | 1.99                     | 0.45              |
| 1:A:262:LEU:HD22 | 1:A:273:THR:HG21 | 1.98                     | 0.45              |
| 1:A:327:LYS:HG3  | 1:A:328:GLU:HG2  | 1.98                     | 0.45              |
| 2:a:76:LYS:N     | 2:a:76:LYS:HD3   | 2.32                     | 0.45              |
| 1:C:419:LEU:HB3  | 1:C:449:VAL:HB   | 1.98                     | 0.45              |
| 1:D:197:ARG:HG2  | 1:D:277:LYS:HB2  | 1.99                     | 0.45              |
| 2:f:91:MET:HE3   | 2:f:91:MET:HA    | 1.97                     | 0.45              |
| 1:G:197:ARG:O    | 1:G:330:THR:HG22 | 2.17                     | 0.45              |
| 1:H:40:ILE:CG2   | 1:H:59:GLU:HG2   | 2.46                     | 0.45              |
| 1:H:251:ALA:O    | 1:H:278:ALA:N    | 2.49                     | 0.45              |
| 1:J:100:VAL:HG21 | 1:J:516:MET:HE3  | 1.98                     | 0.45              |
| 1:J:223:HIS:CE1  | 1:J:225:LYS:HB2  | 2.52                     | 0.45              |
| 1:M:291:ASP:OD2  | 1:M:368:ARG:NH1  | 2.45                     | 0.45              |
| 2:n:47:LYS:HD3   | 2:n:48:ILE:N     | 2.32                     | 0.45              |
| 1:A:197:ARG:O    | 1:A:330:THR:HG22 | 2.17                     | 0.44              |
| 2:a:45:ASP:OD1   | 2:a:46:GLY:N     | 2.50                     | 0.44              |
| 1:E:240:VAL:HG23 | 1:E:271:LEU:HD11 | 1.99                     | 0.44              |
| 2:e:12:VAL:HG12  | 2:e:40:VAL:HG12  | 1.99                     | 0.44              |
| 1:I:20:VAL:HG13  | 1:I:74:VAL:HG21  | 1.99                     | 0.44              |
| 1:J:215:LEU:HD23 | 1:J:246:PRO:HB2  | 1.98                     | 0.44              |
| 1:K:218:PRO:HG3  | 1:K:323:VAL:HG12 | 1.99                     | 0.44              |
| 1:L:34:LYS:HD2   | 1:L:460:ALA:HA   | 1.98                     | 0.44              |
| 1:L:305:VAL:O    | 1:M:264:VAL:HG22 | 2.17                     | 0.44              |
| 2:m:85:LEU:HD12  | 2:m:89:ASP:HB2   | 1.99                     | 0.44              |
| 2:c:15:ILE:HG23  | 2:c:38:GLY:HA2   | 1.99                     | 0.44              |
| 1:D:346:VAL:HG13 | 1:D:369:VAL:HG13 | 1.99                     | 0.44              |
| 2:f:45:ASP:OD2   | 2:f:46:GLY:N     | 2.49                     | 0.44              |
| 2:g:59:VAL:C     | 2:g:60:LYS:HD3   | 2.42                     | 0.44              |
| 2:g:76:LYS:HD3   | 2:g:76:LYS:N     | 2.32                     | 0.44              |
| 2:h:11:VAL:HG22  | 2:h:84:VAL:HG22  | 1.98                     | 0.44              |
| 2:j:49:LEU:HD23  | 2:j:49:LEU:H     | 1.81                     | 0.44              |
| 2:l:12:VAL:HG12  | 2:l:40:VAL:HG12  | 1.98                     | 0.44              |
| 1:M:239:GLN:NE2  | 1:M:312:ALA:O    | 2.44                     | 0.44              |
| 1:B:213:ALA:HB3  | 1:B:325:VAL:HB   | 1.99                     | 0.44              |
| 1:D:289:LEU:HD12 | 1:D:289:LEU:HA   | 1.86                     | 0.44              |
| 1:D:419:LEU:HB3  | 1:D:449:VAL:HB   | 1.98                     | 0.44              |
| 1:K:216:ASP:OD1  | 1:K:216:ASP:N    | 2.35                     | 0.44              |
| 1:K:251:ALA:O    | 1:K:278:ALA:N    | 2.48                     | 0.44              |
| 1:N:252:GLU:N    | 1:N:252:GLU:OE1  | 2.51                     | 0.44              |
| 2:n:45:ASP:OD2   | 2:n:46:GLY:N     | 2.51                     | 0.44              |
| 1:B:223:HIS:CE1  | 1:B:225:LYS:HB2  | 2.52                     | 0.44              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:e:94:ILE:HD12  | 2:e:94:ILE:H     | 1.82                     | 0.44              |
| 1:H:41:GLU:HB2   | 1:N:69:MET:SD    | 2.58                     | 0.44              |
| 1:I:28:LYS:HE3   | 1:I:97:GLN:OE1   | 2.18                     | 0.44              |
| 2:k:48:ILE:HD13  | 2:k:54:LYS:HD3   | 1.99                     | 0.44              |
| 1:M:223:HIS:CE1  | 1:M:225:LYS:HB2  | 2.52                     | 0.44              |
| 1:M:308:SER:OG   | 1:M:310:GLU:OE1  | 2.35                     | 0.44              |
| 1:A:195:PHE:HB2  | 1:A:279:PRO:HB3  | 1.99                     | 0.44              |
| 1:B:216:ASP:OD1  | 1:B:216:ASP:N    | 2.34                     | 0.44              |
| 1:C:113:PRO:HB2  | 1:C:518:THR:HA   | 1.98                     | 0.44              |
| 1:F:223:HIS:CE1  | 1:F:225:LYS:HB2  | 2.52                     | 0.44              |
| 1:F:223:HIS:HD2  | 1:F:301:ILE:HG22 | 1.82                     | 0.44              |
| 1:F:234:LEU:HD23 | 1:F:234:LEU:HA   | 1.81                     | 0.44              |
| 1:I:234:LEU:HD13 | 1:I:238:GLU:HG3  | 1.99                     | 0.44              |
| 1:K:64:ASP:HB3   | 1:K:67:GLU:HG3   | 1.98                     | 0.44              |
| 1:L:12:ALA:HB1   | 1:L:522:MET:HB2  | 1.98                     | 0.44              |
| 1:L:232:ASP:OD1  | 1:L:233:LEU:N    | 2.51                     | 0.44              |
| 2:n:12:VAL:HG12  | 2:n:40:VAL:HG12  | 1.99                     | 0.44              |
| 1:B:17:VAL:HG21  | 1:B:104:MET:HG3  | 2.00                     | 0.44              |
| 2:e:88:ASP:C     | 2:e:88:ASP:OD2   | 2.61                     | 0.44              |
| 1:G:106:TYR:O    | 1:G:111:MET:HG3  | 2.18                     | 0.44              |
| 2:g:88:ASP:OD1   | 2:g:88:ASP:C     | 2.61                     | 0.44              |
| 1:H:311:LYS:HB2  | 1:H:311:LYS:HE2  | 1.79                     | 0.44              |
| 1:I:308:SER:OG   | 1:I:310:GLU:OE1  | 2.35                     | 0.44              |
| 1:I:346:VAL:HG13 | 1:I:369:VAL:HG13 | 2.00                     | 0.44              |
| 1:J:217:ASN:HA   | 1:J:320:ALA:O    | 2.18                     | 0.44              |
| 1:K:346:VAL:HG13 | 1:K:369:VAL:HG13 | 2.00                     | 0.44              |
| 2:m:45:ASP:OD2   | 2:m:46:GLY:N     | 2.51                     | 0.44              |
| 2:m:51:ASP:OD1   | 2:m:51:ASP:N     | 2.35                     | 0.44              |
| 2:n:88:ASP:OD1   | 2:n:88:ASP:C     | 2.60                     | 0.44              |
| 1:A:15:ARG:NH2   | 1:A:67:GLU:OE2   | 2.41                     | 0.44              |
| 2:a:34:LYS:HD3   | 2:a:35:PRO:CD    | 2.47                     | 0.44              |
| 2:d:12:VAL:HG23  | 2:d:83:LEU:HB3   | 2.00                     | 0.44              |
| 1:G:66:PHE:HD1   | 1:G:522:MET:HE2  | 1.82                     | 0.44              |
| 1:H:218:PRO:HG3  | 1:H:323:VAL:HG12 | 2.00                     | 0.44              |
| 1:J:339:PRO:HA   | 1:J:342:ILE:HD12 | 1.98                     | 0.44              |
| 2:j:13:LYS:HE3   | 2:j:82:LEU:HD23  | 2.00                     | 0.44              |
| 1:N:295:LEU:HG   | 1:N:335:GLY:HA3  | 2.00                     | 0.44              |
| 1:C:252:GLU:N    | 1:C:252:GLU:OE1  | 2.50                     | 0.44              |
| 1:C:346:VAL:HG13 | 1:C:369:VAL:HG13 | 2.00                     | 0.44              |
| 1:E:419:LEU:HB3  | 1:E:449:VAL:HB   | 1.99                     | 0.44              |
| 1:K:194:GLN:HB2  | 1:K:331:THR:HG22 | 1.99                     | 0.44              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:K:197:ARG:O    | 1:K:330:THR:HG22 | 2.18                     | 0.44              |
| 2:k:88:ASP:OD2   | 2:k:88:ASP:C     | 2.60                     | 0.44              |
| 1:L:218:PRO:HB3  | 1:L:246:PRO:HB2  | 1.98                     | 0.44              |
| 1:L:339:PRO:O    | 1:L:343:GLN:HG2  | 2.17                     | 0.44              |
| 1:B:195:PHE:HB2  | 1:B:279:PRO:HB3  | 2.00                     | 0.44              |
| 1:C:308:SER:OG   | 1:C:310:GLU:OE1  | 2.36                     | 0.44              |
| 2:c:88:ASP:OD2   | 2:c:88:ASP:C     | 2.60                     | 0.44              |
| 1:D:338:ASP:OD1  | 1:D:338:ASP:N    | 2.51                     | 0.44              |
| 1:E:230:ILE:HD11 | 1:E:234:LEU:HD13 | 2.00                     | 0.44              |
| 1:G:289:LEU:HD23 | 1:G:289:LEU:HA   | 1.85                     | 0.44              |
| 1:I:64:ASP:HB3   | 1:I:67:GLU:HB2   | 2.00                     | 0.44              |
| 1:I:272:LYS:H    | 1:I:272:LYS:CD   | 2.31                     | 0.44              |
| 1:J:338:ASP:HB3  | 1:J:341:LYS:HE2  | 1.99                     | 0.44              |
| 1:K:223:HIS:CE1  | 1:K:225:LYS:HB2  | 2.53                     | 0.44              |
| 2:l:11:VAL:HG13  | 2:l:84:VAL:HG22  | 1.99                     | 0.44              |
| 1:M:5:GLU:HG2    | 1:M:66:PHE:CZ    | 2.53                     | 0.44              |
| 1:N:13:ARG:NH1   | 1:N:520:GLU:OE1  | 2.41                     | 0.44              |
| 1:A:252:GLU:OE1  | 1:A:252:GLU:N    | 2.51                     | 0.43              |
| 1:A:522:MET:HE3  | 1:A:522:MET:HB3  | 1.88                     | 0.43              |
| 1:B:251:ALA:O    | 1:B:278:ALA:N    | 2.51                     | 0.43              |
| 1:B:350:ARG:HA   | 1:B:353:ILE:HD12 | 2.00                     | 0.43              |
| 1:B:419:LEU:HB3  | 1:B:449:VAL:HB   | 2.00                     | 0.43              |
| 1:D:278:ALA:HB3  | 1:D:285:ARG:HD2  | 2.00                     | 0.43              |
| 2:e:95:GLU:OE2   | 2:e:95:GLU:N     | 2.52                     | 0.43              |
| 1:K:259:LEU:O    | 1:K:263:VAL:HG23 | 2.18                     | 0.43              |
| 2:m:55:ARG:HD2   | 2:n:48:ILE:HG21  | 1.99                     | 0.43              |
| 1:A:55:THR:O     | 1:A:59:GLU:HG2   | 2.18                     | 0.43              |
| 2:b:9:ARG:NH1    | 2:c:88:ASP:O     | 2.44                     | 0.43              |
| 1:D:500:LYS:HG3  | 1:D:503:ARG:HH21 | 1.83                     | 0.43              |
| 1:E:327:LYS:HG3  | 1:E:328:GLU:HG2  | 2.00                     | 0.43              |
| 1:I:233:LEU:HD11 | 1:I:249:ILE:HD13 | 1.99                     | 0.43              |
| 1:K:321:LYS:NZ   | 1:K:334:ASP:HB3  | 2.34                     | 0.43              |
| 1:A:264:VAL:HG13 | 1:A:268:ARG:NH1  | 2.34                     | 0.43              |
| 1:C:223:HIS:CE1  | 1:C:225:LYS:HB2  | 2.52                     | 0.43              |
| 1:E:321:LYS:HE2  | 1:E:321:LYS:H    | 1.83                     | 0.43              |
| 2:f:11:VAL:HG22  | 2:f:84:VAL:HG22  | 1.99                     | 0.43              |
| 2:g:34:LYS:HD3   | 2:g:35:PRO:HD2   | 2.00                     | 0.43              |
| 2:j:55:ARG:HD2   | 2:k:48:ILE:HG21  | 2.01                     | 0.43              |
| 1:M:217:ASN:HA   | 1:M:320:ALA:O    | 2.19                     | 0.43              |
| 2:m:88:ASP:O     | 2:n:9:ARG:NH2    | 2.49                     | 0.43              |
| 1:E:356:ALA:HB1  | 1:E:361:ASP:HB3  | 2.01                     | 0.43              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:F:59:GLU:O     | 1:G:4:LYS:HG3    | 2.19                     | 0.43              |
| 1:H:17:VAL:HG21  | 1:H:104:MET:HG3  | 2.00                     | 0.43              |
| 1:H:200:LEU:HD11 | 1:H:277:LYS:HD3  | 1.99                     | 0.43              |
| 2:h:47:LYS:HD3   | 2:h:48:ILE:N     | 2.33                     | 0.43              |
| 2:m:13:LYS:HE3   | 2:m:82:LEU:HD23  | 1.99                     | 0.43              |
| 1:F:197:ARG:HG2  | 1:F:277:LYS:HB2  | 2.01                     | 0.43              |
| 2:f:72:GLY:HA3   | 2:f:83:LEU:HD21  | 1.99                     | 0.43              |
| 1:G:215:LEU:HB3  | 1:G:218:PRO:HB3  | 1.99                     | 0.43              |
| 1:G:327:LYS:HG3  | 1:G:328:GLU:HG2  | 2.00                     | 0.43              |
| 1:K:518:THR:OG1  | 1:L:37:ASN:ND2   | 2.48                     | 0.43              |
| 1:M:321:LYS:N    | 1:M:321:LYS:HD3  | 2.33                     | 0.43              |
| 1:N:358:SER:O    | 1:N:362:ARG:NE   | 2.51                     | 0.43              |
| 1:D:261:THR:O    | 1:D:265:ASN:ND2  | 2.44                     | 0.43              |
| 2:g:47:LYS:HD3   | 2:g:48:ILE:N     | 2.33                     | 0.43              |
| 1:H:5:GLU:HG2    | 1:H:66:PHE:CZ    | 2.53                     | 0.43              |
| 1:H:223:HIS:CE1  | 1:H:225:LYS:HB2  | 2.52                     | 0.43              |
| 1:I:203:TYR:HB3  | 1:I:267:LEU:HD21 | 2.00                     | 0.43              |
| 1:I:261:THR:O    | 1:I:265:ASN:ND2  | 2.39                     | 0.43              |
| 1:J:346:VAL:HG13 | 1:J:369:VAL:HG13 | 2.00                     | 0.43              |
| 1:J:385:THR:HG22 | 1:J:387:VAL:HG12 | 2.01                     | 0.43              |
| 2:d:20:LYS:HE2   | 2:d:20:LYS:N     | 2.34                     | 0.43              |
| 1:F:525:GLU:CD   | 1:F:525:GLU:H    | 2.27                     | 0.43              |
| 1:J:308:SER:OG   | 1:J:310:GLU:OE1  | 2.35                     | 0.43              |
| 2:l:15:ILE:HG23  | 2:l:38:GLY:HA2   | 2.00                     | 0.43              |
| 2:l:89:ASP:N     | 2:l:89:ASP:OD1   | 2.50                     | 0.43              |
| 2:m:29:ASP:OD1   | 2:m:29:ASP:N     | 2.52                     | 0.43              |
| 2:n:20:LYS:HD3   | 2:n:26:VAL:HG22  | 2.00                     | 0.43              |
| 2:n:77:VAL:HG23  | 2:n:78:GLU:OE1   | 2.18                     | 0.43              |
| 1:A:457:VAL:HG13 | 1:A:462:GLU:HB2  | 2.01                     | 0.43              |
| 1:B:65:LYS:HE2   | 1:B:525:GLU:HB3  | 1.99                     | 0.43              |
| 1:D:17:VAL:HG21  | 1:D:104:MET:HG3  | 2.01                     | 0.43              |
| 2:d:51:ASP:C     | 2:d:51:ASP:OD1   | 2.61                     | 0.43              |
| 1:G:500:LYS:HG3  | 1:G:503:ARG:HH21 | 1.82                     | 0.43              |
| 2:h:57:MET:HA    | 2:h:57:MET:HE2   | 2.01                     | 0.43              |
| 1:I:386:GLU:H    | 1:I:386:GLU:CD   | 2.22                     | 0.43              |
| 1:B:234:LEU:HD13 | 1:B:238:GLU:HG3  | 2.01                     | 0.43              |
| 1:C:364:LYS:O    | 1:C:367:GLU:HG2  | 2.18                     | 0.43              |
| 1:D:270:ILE:HG13 | 2:d:26:VAL:HG23  | 2.01                     | 0.43              |
| 1:E:28:LYS:HE3   | 1:E:97:GLN:OE1   | 2.18                     | 0.43              |
| 1:E:223:HIS:CE1  | 1:E:225:LYS:HB2  | 2.54                     | 0.43              |
| 1:F:124:VAL:HG21 | 1:F:510:ALA:HB2  | 2.01                     | 0.43              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:g:33:GLU:OE2   | 2:g:34:LYS:N     | 2.50                     | 0.43              |
| 1:I:73:MET:HB3   | 1:I:73:MET:HE2   | 1.81                     | 0.43              |
| 1:I:197:ARG:HG2  | 1:I:277:LYS:HB3  | 2.01                     | 0.43              |
| 2:i:80:GLU:H     | 2:i:80:GLU:CD    | 2.26                     | 0.43              |
| 1:J:386:GLU:HA   | 1:J:389:MET:HB3  | 2.01                     | 0.43              |
| 1:L:20:VAL:HG13  | 1:L:74:VAL:HG21  | 2.01                     | 0.43              |
| 2:l:80:GLU:OE2   | 2:l:80:GLU:N     | 2.47                     | 0.43              |
| 2:l:88:ASP:OD1   | 2:l:88:ASP:C     | 2.61                     | 0.43              |
| 1:C:217:ASN:HA   | 1:C:321:LYS:HA   | 2.00                     | 0.43              |
| 1:C:285:ARG:O    | 1:C:289:LEU:HB2  | 2.19                     | 0.43              |
| 1:G:278:ALA:HB3  | 1:G:285:ARG:HD2  | 2.00                     | 0.43              |
| 2:j:20:LYS:N     | 2:j:20:LYS:HE2   | 2.33                     | 0.43              |
| 1:K:124:VAL:HG21 | 1:K:510:ALA:HB2  | 2.01                     | 0.43              |
| 2:a:95:GLU:OE2   | 2:a:95:GLU:N     | 2.52                     | 0.42              |
| 2:f:72:GLY:HA2   | 2:f:85:LEU:HB3   | 2.00                     | 0.42              |
| 2:j:20:LYS:HD3   | 2:j:26:VAL:HG22  | 2.01                     | 0.42              |
| 2:k:94:ILE:HG13  | 2:l:3:LEU:HD12   | 2.01                     | 0.42              |
| 1:L:270:ILE:HG13 | 2:l:26:VAL:HG23  | 2.00                     | 0.42              |
| 1:L:419:LEU:HB3  | 1:L:449:VAL:HB   | 2.00                     | 0.42              |
| 2:l:20:LYS:N     | 2:l:20:LYS:HE2   | 2.34                     | 0.42              |
| 1:N:197:ARG:O    | 1:N:330:THR:HG22 | 2.18                     | 0.42              |
| 1:N:327:LYS:HG3  | 1:N:328:GLU:HG2  | 2.00                     | 0.42              |
| 2:n:75:VAL:HG22  | 2:n:82:LEU:HB2   | 2.01                     | 0.42              |
| 1:F:186:GLU:HG3  | 1:F:380:LYS:HB2  | 2.01                     | 0.42              |
| 1:F:195:PHE:HB2  | 1:F:279:PRO:HB3  | 2.01                     | 0.42              |
| 1:G:286:LYS:HD2  | 1:G:286:LYS:C    | 2.44                     | 0.42              |
| 1:H:217:ASN:HA   | 1:H:320:ALA:O    | 2.17                     | 0.42              |
| 1:I:66:PHE:HD1   | 1:I:522:MET:HE3  | 1.84                     | 0.42              |
| 1:I:210:LYS:HA   | 1:I:210:LYS:HD2  | 1.92                     | 0.42              |
| 1:J:197:ARG:HG2  | 1:J:277:LYS:HB3  | 2.01                     | 0.42              |
| 1:J:223:HIS:HD2  | 1:J:301:ILE:HG22 | 1.84                     | 0.42              |
| 1:J:223:HIS:ND1  | 1:J:225:LYS:O    | 2.46                     | 0.42              |
| 1:J:260:ALA:O    | 1:J:264:VAL:HG23 | 2.20                     | 0.42              |
| 1:J:365:LEU:O    | 1:J:369:VAL:HG23 | 2.19                     | 0.42              |
| 2:a:12:VAL:HG12  | 2:a:40:VAL:HG12  | 2.00                     | 0.42              |
| 1:C:207:ASN:HA   | 1:C:208:PRO:HD3  | 1.90                     | 0.42              |
| 1:D:223:HIS:CE1  | 1:D:225:LYS:HB2  | 2.54                     | 0.42              |
| 1:E:346:VAL:HG13 | 1:E:369:VAL:HG13 | 2.00                     | 0.42              |
| 1:J:239:GLN:NE2  | 1:J:312:ALA:O    | 2.48                     | 0.42              |
| 1:L:195:PHE:HB2  | 1:L:279:PRO:HB3  | 2.01                     | 0.42              |
| 2:l:40:VAL:HG23  | 2:l:62:GLY:H     | 1.84                     | 0.42              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:m:60:LYS:HD2   | 2:m:60:LYS:O     | 2.19                     | 0.42              |
| 1:A:136:LYS:HD3  | 1:A:136:LYS:HA   | 1.72                     | 0.42              |
| 2:a:74:THR:O     | 2:a:76:LYS:NZ    | 2.49                     | 0.42              |
| 1:B:34:LYS:HD2   | 1:B:460:ALA:HA   | 2.00                     | 0.42              |
| 1:B:223:HIS:HD2  | 1:B:301:ILE:HG22 | 1.83                     | 0.42              |
| 1:E:308:SER:OG   | 1:E:310:GLU:OE1  | 2.36                     | 0.42              |
| 1:F:264:VAL:HG13 | 1:F:268:ARG:NH1  | 2.34                     | 0.42              |
| 1:K:230:ILE:O    | 1:K:234:LEU:N    | 2.50                     | 0.42              |
| 1:N:169:VAL:HB   | 1:N:173:GLY:HA3  | 2.02                     | 0.42              |
| 1:N:262:LEU:HD22 | 1:N:273:THR:HG21 | 2.00                     | 0.42              |
| 1:B:136:LYS:HD3  | 1:B:136:LYS:HA   | 1.74                     | 0.42              |
| 1:F:98:ALA:HB2   | 1:F:451:GLN:HG2  | 2.01                     | 0.42              |
| 2:h:60:LYS:HZ2   | 2:h:63:ASP:HB3   | 1.85                     | 0.42              |
| 1:J:31:LEU:HD22  | 1:J:94:VAL:HG21  | 2.01                     | 0.42              |
| 1:J:168:LYS:HD3  | 1:J:189:VAL:HG21 | 2.01                     | 0.42              |
| 2:l:47:LYS:HD3   | 2:l:48:ILE:H     | 1.84                     | 0.42              |
| 1:M:278:ALA:HB3  | 1:M:285:ARG:HD2  | 2.01                     | 0.42              |
| 1:C:334:ASP:OD1  | 1:C:334:ASP:C    | 2.62                     | 0.42              |
| 2:d:60:LYS:HD2   | 2:d:60:LYS:O     | 2.20                     | 0.42              |
| 1:I:215:LEU:HD23 | 1:I:246:PRO:HB2  | 2.02                     | 0.42              |
| 1:I:222:LEU:HB2  | 1:I:300:VAL:HA   | 2.00                     | 0.42              |
| 1:I:223:HIS:CE1  | 1:I:225:LYS:HB2  | 2.54                     | 0.42              |
| 1:J:481:ASN:HB2  | 1:J:493:MET:CE   | 2.50                     | 0.42              |
| 2:k:94:ILE:HD12  | 2:k:94:ILE:H     | 1.85                     | 0.42              |
| 1:L:223:HIS:HD2  | 1:L:301:ILE:HG22 | 1.85                     | 0.42              |
| 1:N:356:ALA:HB1  | 1:N:361:ASP:HB3  | 2.02                     | 0.42              |
| 1:A:367:GLU:OE1  | 1:A:371:LYS:NZ   | 2.43                     | 0.42              |
| 1:C:385:THR:HG22 | 1:C:387:VAL:H    | 1.85                     | 0.42              |
| 1:G:195:PHE:HB2  | 1:G:279:PRO:HB3  | 2.02                     | 0.42              |
| 1:G:207:ASN:HA   | 1:G:208:PRO:HD3  | 1.93                     | 0.42              |
| 2:g:78:GLU:HG2   | 2:g:80:GLU:OE2   | 2.20                     | 0.42              |
| 1:K:104:MET:HE2  | 1:K:517:LEU:HD23 | 2.02                     | 0.42              |
| 1:K:132:LYS:HE3  | 1:K:503:ARG:HD3  | 2.01                     | 0.42              |
| 1:B:132:LYS:HE3  | 1:B:503:ARG:HD3  | 2.01                     | 0.42              |
| 1:E:207:ASN:HA   | 1:E:208:PRO:HD3  | 1.91                     | 0.42              |
| 1:E:385:THR:HG21 | 1:F:512:VAL:HG22 | 2.02                     | 0.42              |
| 1:G:85:ALA:HB1   | 1:G:501:VAL:HG22 | 2.02                     | 0.42              |
| 1:L:17:VAL:HG21  | 1:L:104:MET:HG3  | 2.02                     | 0.42              |
| 1:N:28:LYS:HE3   | 1:N:97:GLN:OE1   | 2.20                     | 0.42              |
| 1:N:76:GLU:C     | 1:N:76:GLU:OE1   | 2.62                     | 0.42              |
| 1:N:226:LYS:NZ   | 1:N:255:GLU:OE2  | 2.45                     | 0.42              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:B:232:ASP:HA   | 1:B:310:GLU:HG3  | 2.02                     | 0.42              |
| 1:C:358:SER:HB2  | 1:C:361:ASP:HB2  | 2.01                     | 0.42              |
| 1:D:272:LYS:H    | 1:D:272:LYS:CD   | 2.33                     | 0.42              |
| 1:E:203:TYR:HB3  | 1:E:267:LEU:HD21 | 2.02                     | 0.42              |
| 2:f:12:VAL:HG12  | 2:f:40:VAL:HG12  | 2.02                     | 0.42              |
| 1:G:40:ILE:HG21  | 1:G:59:GLU:HG3   | 2.02                     | 0.42              |
| 1:H:207:ASN:HA   | 1:H:208:PRO:HD3  | 1.92                     | 0.42              |
| 2:k:25:ILE:N     | 2:k:25:ILE:HD12  | 2.35                     | 0.42              |
| 2:k:34:LYS:HA    | 2:k:34:LYS:HD3   | 1.73                     | 0.42              |
| 1:M:262:LEU:HD22 | 1:M:273:THR:HG21 | 2.01                     | 0.42              |
| 1:N:289:LEU:HD23 | 1:N:289:LEU:HA   | 1.86                     | 0.42              |
| 2:n:14:ARG:HD3   | 2:n:67:PHE:CZ    | 2.55                     | 0.42              |
| 2:d:67:PHE:C     | 2:d:91:MET:HE1   | 2.45                     | 0.42              |
| 1:F:232:ASP:OD1  | 1:F:233:LEU:N    | 2.53                     | 0.42              |
| 1:G:63:LYS:HB2   | 1:G:63:LYS:HE2   | 1.83                     | 0.42              |
| 1:H:206:ASN:HD21 | 1:H:214:VAL:HG12 | 1.84                     | 0.42              |
| 1:H:226:LYS:HE2  | 1:H:226:LYS:HB2  | 1.90                     | 0.42              |
| 1:I:122:LYS:HB2  | 1:I:122:LYS:HE2  | 1.85                     | 0.42              |
| 1:I:277:LYS:HE2  | 1:I:277:LYS:HB2  | 1.97                     | 0.42              |
| 2:j:7:HIS:HB3    | 2:j:47:LYS:HE2   | 2.01                     | 0.42              |
| 1:K:209:ASP:OD1  | 1:K:209:ASP:N    | 2.53                     | 0.42              |
| 1:L:365:LEU:O    | 1:L:369:VAL:HG23 | 2.19                     | 0.42              |
| 1:M:85:ALA:HB1   | 1:M:501:VAL:HG22 | 2.02                     | 0.42              |
| 2:b:40:VAL:HG23  | 2:b:62:GLY:H     | 1.85                     | 0.41              |
| 2:b:77:VAL:HG23  | 2:b:78:GLU:OE1   | 2.19                     | 0.41              |
| 2:b:89:ASP:N     | 2:b:89:ASP:OD1   | 2.51                     | 0.41              |
| 1:D:252:GLU:OE1  | 1:D:252:GLU:N    | 2.53                     | 0.41              |
| 1:G:386:GLU:N    | 1:G:386:GLU:OE1  | 2.53                     | 0.41              |
| 1:J:113:PRO:HB2  | 1:J:518:THR:HA   | 2.02                     | 0.41              |
| 1:A:140:THR:HG22 | 1:A:142:LYS:H    | 1.85                     | 0.41              |
| 1:A:260:ALA:O    | 1:A:264:VAL:HG23 | 2.20                     | 0.41              |
| 1:B:124:VAL:HG21 | 1:B:510:ALA:CB   | 2.50                     | 0.41              |
| 1:B:339:PRO:O    | 1:B:343:GLN:HG2  | 2.20                     | 0.41              |
| 2:b:47:LYS:HD3   | 2:b:48:ILE:N     | 2.34                     | 0.41              |
| 1:C:197:ARG:HH21 | 1:C:279:PRO:HA   | 1.84                     | 0.41              |
| 1:H:28:LYS:HE3   | 1:H:97:GLN:OE1   | 2.20                     | 0.41              |
| 1:I:359:ASP:HA   | 1:I:362:ARG:HH12 | 1.85                     | 0.41              |
| 1:L:358:SER:O    | 1:L:362:ARG:NE   | 2.53                     | 0.41              |
| 1:N:222:LEU:HB2  | 1:N:300:VAL:HA   | 2.02                     | 0.41              |
| 1:N:286:LYS:HD2  | 1:N:286:LYS:C    | 2.45                     | 0.41              |
| 1:C:124:VAL:HG21 | 1:C:510:ALA:CB   | 2.50                     | 0.41              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:481:ASN:HB2  | 1:D:493:MET:CE   | 2.50                     | 0.41              |
| 1:E:311:LYS:HE2  | 1:E:311:LYS:HB2  | 1.78                     | 0.41              |
| 1:G:400:LEU:HD23 | 1:G:400:LEU:HA   | 1.92                     | 0.41              |
| 1:I:106:TYR:O    | 1:I:111:MET:HG3  | 2.20                     | 0.41              |
| 1:K:252:GLU:O    | 1:K:277:LYS:HG3  | 2.19                     | 0.41              |
| 1:L:4:LYS:HG3    | 1:M:59:GLU:O     | 2.20                     | 0.41              |
| 1:M:367:GLU:OE1  | 1:M:371:LYS:NZ   | 2.46                     | 0.41              |
| 1:A:85:ALA:HB1   | 1:A:501:VAL:HG22 | 2.02                     | 0.41              |
| 2:b:12:VAL:HG12  | 2:b:40:VAL:HG12  | 2.02                     | 0.41              |
| 1:D:242:LYS:NZ   | 2:d:23:SER:HB3   | 2.35                     | 0.41              |
| 1:G:339:PRO:HA   | 1:G:342:ILE:HD12 | 2.03                     | 0.41              |
| 1:K:28:LYS:HE3   | 1:K:97:GLN:OE1   | 2.20                     | 0.41              |
| 1:K:106:TYR:O    | 1:K:111:MET:HG3  | 2.20                     | 0.41              |
| 1:K:288:MET:O    | 1:K:292:ILE:HG13 | 2.20                     | 0.41              |
| 1:L:213:ALA:HB3  | 1:L:325:VAL:HB   | 2.03                     | 0.41              |
| 1:L:286:LYS:HD2  | 1:L:286:LYS:C    | 2.46                     | 0.41              |
| 1:N:85:ALA:HB1   | 1:N:501:VAL:HG22 | 2.02                     | 0.41              |
| 1:N:124:VAL:HG21 | 1:N:510:ALA:CB   | 2.51                     | 0.41              |
| 1:E:122:LYS:HB2  | 1:E:122:LYS:HE2  | 1.81                     | 0.41              |
| 1:E:217:ASN:HA   | 1:E:320:ALA:O    | 2.21                     | 0.41              |
| 1:E:263:VAL:O    | 1:E:267:LEU:HG   | 2.20                     | 0.41              |
| 1:F:203:TYR:HB3  | 1:F:267:LEU:HD21 | 2.03                     | 0.41              |
| 1:G:212:VAL:HG22 | 1:G:326:ALA:HA   | 2.03                     | 0.41              |
| 2:i:94:ILE:HG22  | 2:i:95:GLU:OE1   | 2.20                     | 0.41              |
| 1:L:28:LYS:HE3   | 1:L:97:GLN:OE1   | 2.20                     | 0.41              |
| 1:L:69:MET:HE1   | 1:L:522:MET:HG2  | 2.02                     | 0.41              |
| 1:L:124:VAL:HG21 | 1:L:510:ALA:CB   | 2.51                     | 0.41              |
| 1:N:364:LYS:O    | 1:N:367:GLU:HG2  | 2.21                     | 0.41              |
| 1:A:36:ARG:HD2   | 1:B:520:GLU:CG   | 2.51                     | 0.41              |
| 1:B:270:ILE:HG13 | 2:b:26:VAL:HG23  | 2.03                     | 0.41              |
| 2:b:77:VAL:HG23  | 2:b:78:GLU:CD    | 2.46                     | 0.41              |
| 1:C:400:LEU:HD23 | 1:C:400:LEU:HA   | 1.94                     | 0.41              |
| 1:D:415:GLY:N    | 3:D:601:ADP:O2'  | 2.30                     | 0.41              |
| 1:G:132:LYS:HE3  | 1:G:503:ARG:HD3  | 2.02                     | 0.41              |
| 1:H:85:ALA:HB1   | 1:H:501:VAL:HG22 | 2.02                     | 0.41              |
| 1:H:321:LYS:HZ3  | 1:H:334:ASP:C    | 2.26                     | 0.41              |
| 1:I:252:GLU:OE1  | 1:I:252:GLU:N    | 2.54                     | 0.41              |
| 2:i:40:VAL:HG23  | 2:i:62:GLY:H     | 1.85                     | 0.41              |
| 1:K:270:ILE:HG13 | 2:k:26:VAL:HG23  | 2.03                     | 0.41              |
| 1:L:197:ARG:HH21 | 1:L:279:PRO:HA   | 1.85                     | 0.41              |
| 1:M:63:LYS:HE2   | 1:M:63:LYS:HB2   | 1.71                     | 0.41              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:N:259:LEU:O    | 1:N:263:VAL:HG23 | 2.20                     | 0.41              |
| 1:A:207:ASN:HA   | 1:A:208:PRO:HD3  | 1.90                     | 0.41              |
| 2:a:77:VAL:HG22  | 2:a:78:GLU:OE2   | 2.20                     | 0.41              |
| 1:B:212:VAL:HG22 | 1:B:326:ALA:HA   | 2.01                     | 0.41              |
| 1:D:285:ARG:O    | 1:D:289:LEU:HB2  | 2.21                     | 0.41              |
| 1:E:124:VAL:HG21 | 1:E:510:ALA:CB   | 2.51                     | 0.41              |
| 1:E:166:MET:HE3  | 1:E:166:MET:HB3  | 1.83                     | 0.41              |
| 1:F:85:ALA:HB1   | 1:F:501:VAL:HG22 | 2.03                     | 0.41              |
| 2:f:5:PRO:HA     | 2:g:92:ALA:HA    | 2.03                     | 0.41              |
| 1:H:37:ASN:ND2   | 1:N:518:THR:OG1  | 2.52                     | 0.41              |
| 1:H:98:ALA:HB2   | 1:H:451:GLN:HG2  | 2.02                     | 0.41              |
| 1:I:239:GLN:NE2  | 1:I:312:ALA:O    | 2.52                     | 0.41              |
| 1:I:321:LYS:HB2  | 1:I:321:LYS:HE2  | 1.87                     | 0.41              |
| 1:J:17:VAL:HG21  | 1:J:104:MET:HG3  | 2.02                     | 0.41              |
| 1:K:124:VAL:HG21 | 1:K:510:ALA:CB   | 2.51                     | 0.41              |
| 2:n:11:VAL:HG22  | 2:n:84:VAL:HG22  | 2.02                     | 0.41              |
| 2:n:15:ILE:HG23  | 2:n:38:GLY:HA2   | 2.02                     | 0.41              |
| 1:C:233:LEU:HD21 | 1:C:237:LEU:HD13 | 2.02                     | 0.41              |
| 1:E:66:PHE:HD1   | 1:E:522:MET:HE3  | 1.86                     | 0.41              |
| 1:E:80:LYS:HD2   | 1:E:80:LYS:HA    | 1.86                     | 0.41              |
| 1:F:140:THR:HG22 | 1:F:142:LYS:H    | 1.86                     | 0.41              |
| 1:K:424:GLU:OE2  | 1:K:424:GLU:HA   | 2.20                     | 0.41              |
| 2:l:19:ARG:HB3   | 2:l:20:LYS:HE2   | 2.03                     | 0.41              |
| 1:M:169:VAL:HB   | 1:M:173:GLY:HA3  | 2.03                     | 0.41              |
| 1:N:80:LYS:HA    | 1:N:80:LYS:HD2   | 1.91                     | 0.41              |
| 1:A:41:GLU:HB2   | 1:B:69:MET:SD    | 2.61                     | 0.41              |
| 1:A:122:LYS:HE2  | 1:A:122:LYS:HB2  | 1.86                     | 0.41              |
| 1:B:80:LYS:HA    | 1:B:80:LYS:HD2   | 1.91                     | 0.41              |
| 1:B:122:LYS:HE2  | 1:B:122:LYS:HB2  | 1.84                     | 0.41              |
| 1:B:140:THR:HG22 | 1:B:142:LYS:H    | 1.86                     | 0.41              |
| 1:B:327:LYS:HG3  | 1:B:328:GLU:HG2  | 2.02                     | 0.41              |
| 1:C:231:ARG:HB3  | 1:C:231:ARG:NH1  | 2.36                     | 0.41              |
| 2:c:8:ASP:HB3    | 2:c:47:LYS:HB2   | 2.02                     | 0.41              |
| 2:c:20:LYS:HD3   | 2:c:26:VAL:HG22  | 2.03                     | 0.41              |
| 1:D:31:LEU:HD22  | 1:D:94:VAL:HG21  | 2.01                     | 0.41              |
| 1:D:169:VAL:HB   | 1:D:173:GLY:HA3  | 2.03                     | 0.41              |
| 1:E:194:GLN:O    | 1:E:371:LYS:HE3  | 2.21                     | 0.41              |
| 1:E:400:LEU:HD23 | 1:E:400:LEU:HA   | 1.92                     | 0.41              |
| 1:E:500:LYS:HG3  | 1:E:503:ARG:HH21 | 1.86                     | 0.41              |
| 2:e:34:LYS:HD3   | 2:e:35:PRO:CD    | 2.51                     | 0.41              |
| 2:f:2:LYS:NZ     | 2:f:78:GLU:OE2   | 2.39                     | 0.41              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:f:75:VAL:HG22  | 2:f:82:LEU:HB2   | 2.03                     | 0.41              |
| 1:G:122:LYS:HE2  | 1:G:122:LYS:HB2  | 1.85                     | 0.41              |
| 1:H:217:ASN:O    | 1:H:245:ARG:NE   | 2.48                     | 0.41              |
| 1:H:463:GLU:H    | 1:H:463:GLU:CD   | 2.27                     | 0.41              |
| 1:I:80:LYS:HA    | 1:I:80:LYS:HD2   | 1.89                     | 0.41              |
| 1:I:223:HIS:ND1  | 1:I:225:LYS:O    | 2.51                     | 0.41              |
| 1:I:424:GLU:OE2  | 1:I:424:GLU:HA   | 2.20                     | 0.41              |
| 2:i:91:MET:O     | 2:j:9:ARG:HG2    | 2.20                     | 0.41              |
| 1:J:194:GLN:O    | 1:J:371:LYS:HE3  | 2.21                     | 0.41              |
| 2:j:89:ASP:OD2   | 2:j:89:ASP:N     | 2.54                     | 0.41              |
| 1:L:271:LEU:HD13 | 1:L:273:THR:HG23 | 2.03                     | 0.41              |
| 1:M:40:ILE:HG21  | 1:M:59:GLU:HG3   | 2.02                     | 0.41              |
| 1:M:207:ASN:HA   | 1:M:208:PRO:HD3  | 1.91                     | 0.41              |
| 1:M:359:ASP:HA   | 1:M:362:ARG:NH1  | 2.35                     | 0.41              |
| 1:N:264:VAL:O    | 1:N:268:ARG:HG3  | 2.21                     | 0.41              |
| 1:N:362:ARG:H    | 1:N:362:ARG:HD2  | 1.86                     | 0.41              |
| 1:B:500:LYS:HG3  | 1:B:503:ARG:HH21 | 1.85                     | 0.41              |
| 2:d:34:LYS:HD3   | 2:d:35:PRO:HD2   | 2.03                     | 0.41              |
| 1:F:31:LEU:HD22  | 1:F:94:VAL:HG21  | 2.02                     | 0.41              |
| 1:H:124:VAL:HG21 | 1:H:510:ALA:CB   | 2.51                     | 0.41              |
| 2:j:11:VAL:HG13  | 2:j:84:VAL:HG22  | 2.03                     | 0.41              |
| 1:L:278:ALA:HB3  | 1:L:285:ARG:HD2  | 2.03                     | 0.41              |
| 1:M:42:ARG:HH22  | 1:M:59:GLU:CD    | 2.29                     | 0.41              |
| 1:M:57:ALA:O     | 1:M:75:LYS:HE2   | 2.20                     | 0.41              |
| 1:M:233:LEU:HD21 | 1:M:237:LEU:HD13 | 2.03                     | 0.41              |
| 2:n:7:HIS:HB3    | 2:n:47:LYS:HE2   | 2.03                     | 0.41              |
| 2:n:94:ILE:H     | 2:n:94:ILE:HD12  | 1.86                     | 0.41              |
| 1:A:196:ASP:HA   | 1:A:329:HIS:HB2  | 2.03                     | 0.40              |
| 1:A:385:THR:HG21 | 1:B:512:VAL:HG22 | 2.03                     | 0.40              |
| 2:a:36:ASP:OD1   | 2:a:69:LYS:HB3   | 2.21                     | 0.40              |
| 1:B:166:MET:HE3  | 1:B:166:MET:HB3  | 1.83                     | 0.40              |
| 1:B:286:LYS:HE3  | 1:B:286:LYS:HB3  | 1.86                     | 0.40              |
| 1:C:356:ALA:C    | 1:C:362:ARG:HH21 | 2.29                     | 0.40              |
| 1:H:286:LYS:HD2  | 1:H:286:LYS:C    | 2.46                     | 0.40              |
| 1:K:226:LYS:HE2  | 1:K:226:LYS:HB2  | 1.66                     | 0.40              |
| 2:k:48:ILE:HD13  | 2:k:48:ILE:HA    | 1.95                     | 0.40              |
| 1:L:132:LYS:HE3  | 1:L:503:ARG:HD3  | 2.03                     | 0.40              |
| 1:A:217:ASN:HA   | 1:A:320:ALA:O    | 2.20                     | 0.40              |
| 2:b:86:ARG:HB2   | 2:b:88:ASP:OD1   | 2.22                     | 0.40              |
| 1:C:28:LYS:HE3   | 1:C:97:GLN:OE1   | 2.21                     | 0.40              |
| 1:C:39:VAL:HB    | 1:D:522:MET:HG2  | 2.02                     | 0.40              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:288:MET:O    | 1:C:292:ILE:HG13 | 2.21                     | 0.40              |
| 1:D:28:LYS:HE3   | 1:D:97:GLN:OE1   | 2.20                     | 0.40              |
| 1:D:207:ASN:HA   | 1:D:208:PRO:HD3  | 1.90                     | 0.40              |
| 1:F:17:VAL:HG21  | 1:F:104:MET:HG3  | 2.03                     | 0.40              |
| 1:F:261:THR:O    | 1:F:265:ASN:ND2  | 2.43                     | 0.40              |
| 1:H:31:LEU:HD22  | 1:H:94:VAL:HG21  | 2.03                     | 0.40              |
| 1:I:197:ARG:HH21 | 1:I:279:PRO:HA   | 1.87                     | 0.40              |
| 1:K:31:LEU:HD22  | 1:K:94:VAL:HG21  | 2.04                     | 0.40              |
| 1:L:363:GLU:OE2  | 1:L:364:LYS:HD3  | 2.21                     | 0.40              |
| 1:M:286:LYS:C    | 1:M:286:LYS:HD2  | 2.45                     | 0.40              |
| 1:N:106:TYR:O    | 1:N:111:MET:HG3  | 2.20                     | 0.40              |
| 2:n:85:LEU:HD12  | 2:n:89:ASP:HB2   | 2.03                     | 0.40              |
| 2:b:11:VAL:HG22  | 2:b:84:VAL:HG22  | 2.04                     | 0.40              |
| 1:D:393:LYS:HE2  | 1:D:393:LYS:HB3  | 1.90                     | 0.40              |
| 1:E:229:ASN:OD1  | 1:E:229:ASN:C    | 2.64                     | 0.40              |
| 1:F:28:LYS:HE3   | 1:F:97:GLN:OE1   | 2.21                     | 0.40              |
| 1:F:34:LYS:HD2   | 1:F:460:ALA:HA   | 2.03                     | 0.40              |
| 1:F:124:VAL:HG21 | 1:F:510:ALA:CB   | 2.51                     | 0.40              |
| 2:k:18:GLU:OE1   | 2:k:18:GLU:C     | 2.64                     | 0.40              |
| 1:L:42:ARG:HH22  | 1:L:59:GLU:CD    | 2.30                     | 0.40              |
| 2:l:78:GLU:HG2   | 2:l:80:GLU:OE2   | 2.21                     | 0.40              |
| 1:M:80:LYS:HA    | 1:M:80:LYS:HD2   | 1.90                     | 0.40              |
| 1:M:400:LEU:HD23 | 1:M:400:LEU:HA   | 1.91                     | 0.40              |
| 1:N:400:LEU:HD23 | 1:N:400:LEU:HA   | 1.92                     | 0.40              |
| 2:n:60:LYS:HE2   | 2:n:60:LYS:N     | 2.35                     | 0.40              |
| 1:A:59:GLU:O     | 1:B:4:LYS:HG3    | 2.21                     | 0.40              |
| 1:C:12:ALA:HB1   | 1:C:522:MET:HB2  | 2.04                     | 0.40              |
| 1:E:233:LEU:O    | 1:E:233:LEU:HD23 | 2.21                     | 0.40              |
| 1:H:19:GLY:HA3   | 1:H:67:GLU:O     | 2.22                     | 0.40              |
| 1:H:122:LYS:HE2  | 1:H:122:LYS:HB2  | 1.85                     | 0.40              |
| 1:H:124:VAL:HG21 | 1:H:510:ALA:HB2  | 2.04                     | 0.40              |
| 1:I:124:VAL:HG21 | 1:I:510:ALA:CB   | 2.51                     | 0.40              |
| 1:I:289:LEU:HD12 | 1:I:289:LEU:HA   | 1.87                     | 0.40              |
| 1:K:98:ALA:HB2   | 1:K:451:GLN:HG2  | 2.02                     | 0.40              |
| 1:L:80:LYS:HA    | 1:L:80:LYS:HD2   | 1.86                     | 0.40              |
| 1:N:219:TYR:HE1  | 1:N:245:ARG:HG3  | 1.84                     | 0.40              |
| 1:A:124:VAL:HG21 | 1:A:510:ALA:CB   | 2.51                     | 0.40              |
| 2:a:8:ASP:HB3    | 2:a:47:LYS:HB2   | 2.03                     | 0.40              |
| 2:a:60:LYS:HE3   | 2:a:60:LYS:HB3   | 1.89                     | 0.40              |
| 2:b:63:ASP:OD1   | 2:b:63:ASP:N     | 2.54                     | 0.40              |
| 1:C:98:ALA:HB2   | 1:C:451:GLN:HG2  | 2.02                     | 0.40              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:106:TYR:O    | 1:C:111:MET:HG3  | 2.21                     | 0.40              |
| 1:C:122:LYS:HE2  | 1:C:122:LYS:HB2  | 1.85                     | 0.40              |
| 1:C:217:ASN:HA   | 1:C:320:ALA:O    | 2.21                     | 0.40              |
| 2:d:14:ARG:HD3   | 2:d:34:LYS:HG3   | 2.04                     | 0.40              |
| 2:d:18:GLU:OE1   | 2:d:18:GLU:C     | 2.65                     | 0.40              |
| 1:F:40:ILE:HD13  | 1:F:59:GLU:HG3   | 2.03                     | 0.40              |
| 1:F:122:LYS:HE2  | 1:F:122:LYS:HB2  | 1.85                     | 0.40              |
| 1:F:500:LYS:HG3  | 1:F:503:ARG:HH21 | 1.86                     | 0.40              |
| 1:H:288:MET:HE2  | 1:H:288:MET:HB3  | 1.75                     | 0.40              |
| 2:h:29:ASP:OD2   | 2:h:29:ASP:N     | 2.52                     | 0.40              |
| 2:i:63:ASP:OD1   | 2:i:63:ASP:N     | 2.54                     | 0.40              |
| 1:J:69:MET:SD    | 1:K:41:GLU:HB2   | 2.62                     | 0.40              |
| 2:k:25:ILE:HD12  | 2:k:25:ILE:H     | 1.87                     | 0.40              |
| 1:M:124:VAL:HG21 | 1:M:510:ALA:CB   | 2.52                     | 0.40              |
| 1:M:325:VAL:HG13 | 1:M:330:THR:HB   | 2.04                     | 0.40              |

There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone

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

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

| Mol | Chain | Analysed       | Favoured  | Allowed | Outliers | Percentiles |     |
|-----|-------|----------------|-----------|---------|----------|-------------|-----|
| 1   | A     | 526/528 (100%) | 522 (99%) | 4 (1%)  | 0        | 100         | 100 |
| 1   | B     | 526/528 (100%) | 521 (99%) | 5 (1%)  | 0        | 100         | 100 |
| 1   | C     | 526/528 (100%) | 522 (99%) | 4 (1%)  | 0        | 100         | 100 |
| 1   | D     | 526/528 (100%) | 521 (99%) | 5 (1%)  | 0        | 100         | 100 |
| 1   | E     | 526/528 (100%) | 521 (99%) | 5 (1%)  | 0        | 100         | 100 |
| 1   | F     | 526/528 (100%) | 522 (99%) | 4 (1%)  | 0        | 100         | 100 |
| 1   | G     | 526/528 (100%) | 520 (99%) | 6 (1%)  | 0        | 100         | 100 |
| 1   | H     | 526/528 (100%) | 521 (99%) | 5 (1%)  | 0        | 100         | 100 |

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| Mol | Chain | Analysed        | Favoured   | Allowed  | Outliers | Percentiles |     |
|-----|-------|-----------------|------------|----------|----------|-------------|-----|
| 1   | I     | 526/528 (100%)  | 520 (99%)  | 6 (1%)   | 0        | 100         | 100 |
| 1   | J     | 526/528 (100%)  | 523 (99%)  | 3 (1%)   | 0        | 100         | 100 |
| 1   | K     | 526/528 (100%)  | 522 (99%)  | 4 (1%)   | 0        | 100         | 100 |
| 1   | L     | 526/528 (100%)  | 523 (99%)  | 3 (1%)   | 0        | 100         | 100 |
| 1   | M     | 526/528 (100%)  | 524 (100%) | 2 (0%)   | 0        | 100         | 100 |
| 1   | N     | 526/528 (100%)  | 522 (99%)  | 4 (1%)   | 0        | 100         | 100 |
| 2   | a     | 92/94 (98%)     | 89 (97%)   | 3 (3%)   | 0        | 100         | 100 |
| 2   | b     | 92/94 (98%)     | 87 (95%)   | 5 (5%)   | 0        | 100         | 100 |
| 2   | c     | 92/94 (98%)     | 84 (91%)   | 8 (9%)   | 0        | 100         | 100 |
| 2   | d     | 92/94 (98%)     | 89 (97%)   | 3 (3%)   | 0        | 100         | 100 |
| 2   | e     | 92/94 (98%)     | 88 (96%)   | 4 (4%)   | 0        | 100         | 100 |
| 2   | f     | 92/94 (98%)     | 88 (96%)   | 4 (4%)   | 0        | 100         | 100 |
| 2   | g     | 92/94 (98%)     | 87 (95%)   | 5 (5%)   | 0        | 100         | 100 |
| 2   | h     | 92/94 (98%)     | 86 (94%)   | 6 (6%)   | 0        | 100         | 100 |
| 2   | i     | 92/94 (98%)     | 86 (94%)   | 5 (5%)   | 1 (1%)   | 12          | 23  |
| 2   | j     | 92/94 (98%)     | 88 (96%)   | 4 (4%)   | 0        | 100         | 100 |
| 2   | k     | 92/94 (98%)     | 85 (92%)   | 7 (8%)   | 0        | 100         | 100 |
| 2   | l     | 92/94 (98%)     | 87 (95%)   | 5 (5%)   | 0        | 100         | 100 |
| 2   | m     | 92/94 (98%)     | 87 (95%)   | 5 (5%)   | 0        | 100         | 100 |
| 2   | n     | 92/94 (98%)     | 87 (95%)   | 5 (5%)   | 0        | 100         | 100 |
| All | All   | 8652/8708 (99%) | 8522 (98%) | 129 (2%) | 1 (0%)   | 100         | 100 |

All (1) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2   | i     | 78  | GLU  |

### 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     | 411/411 (100%)   | 410 (100%) | 1 (0%)   | 92          | 97  |
| 1   | B     | 411/411 (100%)   | 404 (98%)  | 7 (2%)   | 56          | 79  |
| 1   | C     | 411/411 (100%)   | 407 (99%)  | 4 (1%)   | 73          | 88  |
| 1   | D     | 411/411 (100%)   | 409 (100%) | 2 (0%)   | 86          | 95  |
| 1   | E     | 411/411 (100%)   | 407 (99%)  | 4 (1%)   | 73          | 88  |
| 1   | F     | 411/411 (100%)   | 404 (98%)  | 7 (2%)   | 56          | 79  |
| 1   | G     | 411/411 (100%)   | 410 (100%) | 1 (0%)   | 92          | 97  |
| 1   | H     | 411/411 (100%)   | 405 (98%)  | 6 (2%)   | 60          | 82  |
| 1   | I     | 411/411 (100%)   | 406 (99%)  | 5 (1%)   | 67          | 86  |
| 1   | J     | 411/411 (100%)   | 407 (99%)  | 4 (1%)   | 73          | 88  |
| 1   | K     | 411/411 (100%)   | 408 (99%)  | 3 (1%)   | 81          | 93  |
| 1   | L     | 411/411 (100%)   | 409 (100%) | 2 (0%)   | 86          | 95  |
| 1   | M     | 411/411 (100%)   | 408 (99%)  | 3 (1%)   | 81          | 93  |
| 1   | N     | 411/411 (100%)   | 408 (99%)  | 3 (1%)   | 81          | 93  |
| 2   | a     | 77/77 (100%)     | 77 (100%)  | 0        | 100         | 100 |
| 2   | b     | 77/77 (100%)     | 75 (97%)   | 2 (3%)   | 41          | 68  |
| 2   | c     | 77/77 (100%)     | 76 (99%)   | 1 (1%)   | 65          | 85  |
| 2   | d     | 77/77 (100%)     | 77 (100%)  | 0        | 100         | 100 |
| 2   | e     | 77/77 (100%)     | 76 (99%)   | 1 (1%)   | 65          | 85  |
| 2   | f     | 77/77 (100%)     | 77 (100%)  | 0        | 100         | 100 |
| 2   | g     | 77/77 (100%)     | 76 (99%)   | 1 (1%)   | 65          | 85  |
| 2   | h     | 77/77 (100%)     | 75 (97%)   | 2 (3%)   | 41          | 68  |
| 2   | i     | 77/77 (100%)     | 74 (96%)   | 3 (4%)   | 27          | 52  |
| 2   | j     | 77/77 (100%)     | 77 (100%)  | 0        | 100         | 100 |
| 2   | k     | 77/77 (100%)     | 75 (97%)   | 2 (3%)   | 41          | 68  |
| 2   | l     | 77/77 (100%)     | 75 (97%)   | 2 (3%)   | 41          | 68  |
| 2   | m     | 77/77 (100%)     | 75 (97%)   | 2 (3%)   | 41          | 68  |
| 2   | n     | 77/77 (100%)     | 77 (100%)  | 0        | 100         | 100 |
| All | All   | 6832/6832 (100%) | 6764 (99%) | 68 (1%)  | 71          | 88  |

All (68) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | A     | 216 | ASP  |
| 1   | B     | 176 | THR  |
| 1   | B     | 216 | ASP  |
| 1   | B     | 234 | LEU  |
| 1   | B     | 259 | LEU  |
| 1   | B     | 300 | VAL  |
| 1   | B     | 309 | LEU  |
| 1   | B     | 330 | THR  |
| 2   | b     | 51  | ASP  |
| 2   | b     | 91  | MET  |
| 1   | C     | 50  | THR  |
| 1   | C     | 176 | THR  |
| 1   | C     | 273 | THR  |
| 1   | C     | 330 | THR  |
| 2   | c     | 91  | MET  |
| 1   | D     | 212 | VAL  |
| 1   | D     | 234 | LEU  |
| 1   | E     | 176 | THR  |
| 1   | E     | 212 | VAL  |
| 1   | E     | 222 | LEU  |
| 1   | E     | 330 | THR  |
| 2   | e     | 23  | SER  |
| 1   | F     | 50  | THR  |
| 1   | F     | 142 | LYS  |
| 1   | F     | 212 | VAL  |
| 1   | F     | 216 | ASP  |
| 1   | F     | 300 | VAL  |
| 1   | F     | 330 | THR  |
| 1   | F     | 493 | MET  |
| 1   | G     | 50  | THR  |
| 2   | g     | 57  | MET  |
| 1   | H     | 176 | THR  |
| 1   | H     | 212 | VAL  |
| 1   | H     | 216 | ASP  |
| 1   | H     | 300 | VAL  |
| 1   | H     | 330 | THR  |
| 1   | H     | 473 | GLU  |
| 2   | h     | 49  | LEU  |
| 2   | h     | 51  | ASP  |
| 1   | I     | 216 | ASP  |
| 1   | I     | 222 | LEU  |
| 1   | I     | 234 | LEU  |
| 1   | I     | 236 | VAL  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | I     | 300 | VAL  |
| 2   | i     | 51  | ASP  |
| 2   | i     | 88  | ASP  |
| 2   | i     | 89  | ASP  |
| 1   | J     | 212 | VAL  |
| 1   | J     | 234 | LEU  |
| 1   | J     | 242 | LYS  |
| 1   | J     | 330 | THR  |
| 1   | K     | 216 | ASP  |
| 1   | K     | 321 | LYS  |
| 1   | K     | 334 | ASP  |
| 2   | k     | 89  | ASP  |
| 2   | k     | 94  | ILE  |
| 1   | L     | 212 | VAL  |
| 1   | L     | 330 | THR  |
| 2   | l     | 49  | LEU  |
| 2   | l     | 91  | MET  |
| 1   | M     | 212 | VAL  |
| 1   | M     | 216 | ASP  |
| 1   | M     | 490 | MET  |
| 2   | m     | 18  | GLU  |
| 2   | m     | 88  | ASP  |
| 1   | N     | 50  | THR  |
| 1   | N     | 176 | THR  |
| 1   | N     | 386 | GLU  |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (24) such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | A     | 9   | HIS  |
| 1   | A     | 37  | ASN  |
| 2   | b     | 37  | GLN  |
| 1   | C     | 37  | ASN  |
| 1   | C     | 211 | GLN  |
| 2   | c     | 37  | GLN  |
| 1   | D     | 37  | ASN  |
| 1   | E     | 37  | ASN  |
| 1   | F     | 37  | ASN  |
| 1   | F     | 477 | ASN  |
| 2   | f     | 37  | GLN  |
| 2   | g     | 37  | GLN  |
| 1   | H     | 352 | GLN  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | I     | 207 | ASN  |
| 2   | i     | 37  | GLN  |
| 1   | J     | 217 | ASN  |
| 1   | K     | 37  | ASN  |
| 1   | K     | 211 | GLN  |
| 1   | L     | 37  | ASN  |
| 2   | l     | 37  | GLN  |
| 1   | M     | 37  | ASN  |
| 1   | M     | 217 | ASN  |
| 2   | m     | 37  | GLN  |
| 1   | N     | 217 | ASN  |

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 28 ligands modelled in this entry, 14 are monoatomic - leaving 14 for Mogul analysis.

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

| Mol | Type | Chain | Res | Link | Bond lengths |      |             | Bond angles |      |             |
|-----|------|-------|-----|------|--------------|------|-------------|-------------|------|-------------|
|     |      |       |     |      | Counts       | RMSZ | $\# Z  > 2$ | Counts      | RMSZ | $\# Z  > 2$ |
| 3   | ADP  | I     | 601 | 4    | 24,29,29     | 0.92 | 1 (4%)      | 29,45,45    | 1.48 | 4 (13%)     |
| 3   | ADP  | G     | 601 | 4    | 24,29,29     | 0.91 | 1 (4%)      | 29,45,45    | 1.50 | 4 (13%)     |

| Mol | Type | Chain | Res | Link | Bond lengths |      |          | Bond angles |      |          |
|-----|------|-------|-----|------|--------------|------|----------|-------------|------|----------|
|     |      |       |     |      | Counts       | RMSZ | # Z  > 2 | Counts      | RMSZ | # Z  > 2 |
| 3   | ADP  | H     | 601 | 4    | 24,29,29     | 0.92 | 1 (4%)   | 29,45,45    | 1.48 | 4 (13%)  |
| 3   | ADP  | K     | 601 | 4    | 24,29,29     | 0.92 | 1 (4%)   | 29,45,45    | 1.48 | 4 (13%)  |
| 3   | ADP  | M     | 601 | 4    | 24,29,29     | 0.92 | 1 (4%)   | 29,45,45    | 1.48 | 4 (13%)  |
| 3   | ADP  | N     | 601 | 4    | 24,29,29     | 0.92 | 1 (4%)   | 29,45,45    | 1.49 | 4 (13%)  |
| 3   | ADP  | L     | 601 | 4    | 24,29,29     | 0.91 | 1 (4%)   | 29,45,45    | 1.48 | 4 (13%)  |
| 3   | ADP  | A     | 601 | 4    | 24,29,29     | 0.91 | 1 (4%)   | 29,45,45    | 1.48 | 4 (13%)  |
| 3   | ADP  | F     | 601 | 4    | 24,29,29     | 0.92 | 1 (4%)   | 29,45,45    | 1.43 | 4 (13%)  |
| 3   | ADP  | E     | 601 | 4    | 24,29,29     | 0.91 | 1 (4%)   | 29,45,45    | 1.50 | 4 (13%)  |
| 3   | ADP  | B     | 601 | 4    | 24,29,29     | 0.91 | 1 (4%)   | 29,45,45    | 1.49 | 4 (13%)  |
| 3   | ADP  | J     | 601 | 4    | 24,29,29     | 0.92 | 1 (4%)   | 29,45,45    | 1.49 | 4 (13%)  |
| 3   | ADP  | D     | 601 | 4    | 24,29,29     | 0.91 | 1 (4%)   | 29,45,45    | 1.49 | 4 (13%)  |
| 3   | ADP  | C     | 601 | 4    | 24,29,29     | 0.91 | 1 (4%)   | 29,45,45    | 1.49 | 4 (13%)  |

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

| Mol | Type | Chain | Res | Link | Chirals | Torsions   | Rings   |
|-----|------|-------|-----|------|---------|------------|---------|
| 3   | ADP  | I     | 601 | 4    | -       | 5/12/32/32 | 0/3/3/3 |
| 3   | ADP  | G     | 601 | 4    | -       | 2/12/32/32 | 0/3/3/3 |
| 3   | ADP  | H     | 601 | 4    | -       | 3/12/32/32 | 0/3/3/3 |
| 3   | ADP  | K     | 601 | 4    | -       | 3/12/32/32 | 0/3/3/3 |
| 3   | ADP  | M     | 601 | 4    | -       | 1/12/32/32 | 0/3/3/3 |
| 3   | ADP  | N     | 601 | 4    | -       | 1/12/32/32 | 0/3/3/3 |
| 3   | ADP  | L     | 601 | 4    | -       | 3/12/32/32 | 0/3/3/3 |
| 3   | ADP  | A     | 601 | 4    | -       | 2/12/32/32 | 0/3/3/3 |
| 3   | ADP  | F     | 601 | 4    | -       | 5/12/32/32 | 0/3/3/3 |
| 3   | ADP  | E     | 601 | 4    | -       | 3/12/32/32 | 0/3/3/3 |
| 3   | ADP  | B     | 601 | 4    | -       | 5/12/32/32 | 0/3/3/3 |
| 3   | ADP  | J     | 601 | 4    | -       | 5/12/32/32 | 0/3/3/3 |
| 3   | ADP  | D     | 601 | 4    | -       | 6/12/32/32 | 0/3/3/3 |
| 3   | ADP  | C     | 601 | 4    | -       | 4/12/32/32 | 0/3/3/3 |

All (14) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z    | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|-------|------|-------------|----------|
| 3   | K     | 601 | ADP  | C5-C4 | 2.34 | 1.47        | 1.40     |
| 3   | G     | 601 | ADP  | C5-C4 | 2.32 | 1.47        | 1.40     |
| 3   | E     | 601 | ADP  | C5-C4 | 2.32 | 1.47        | 1.40     |
| 3   | C     | 601 | ADP  | C5-C4 | 2.32 | 1.47        | 1.40     |
| 3   | B     | 601 | ADP  | C5-C4 | 2.31 | 1.47        | 1.40     |
| 3   | N     | 601 | ADP  | C5-C4 | 2.31 | 1.47        | 1.40     |
| 3   | H     | 601 | ADP  | C5-C4 | 2.31 | 1.47        | 1.40     |
| 3   | M     | 601 | ADP  | C5-C4 | 2.31 | 1.47        | 1.40     |
| 3   | F     | 601 | ADP  | C5-C4 | 2.30 | 1.47        | 1.40     |
| 3   | I     | 601 | ADP  | C5-C4 | 2.30 | 1.47        | 1.40     |
| 3   | A     | 601 | ADP  | C5-C4 | 2.30 | 1.47        | 1.40     |
| 3   | D     | 601 | ADP  | C5-C4 | 2.29 | 1.47        | 1.40     |
| 3   | J     | 601 | ADP  | C5-C4 | 2.29 | 1.47        | 1.40     |
| 3   | L     | 601 | ADP  | C5-C4 | 2.28 | 1.47        | 1.40     |

All (56) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-----------|-------|-------------|----------|
| 3   | E     | 601 | ADP  | PA-O3A-PB | -3.33 | 121.40      | 132.83   |
| 3   | G     | 601 | ADP  | PA-O3A-PB | -3.29 | 121.54      | 132.83   |
| 3   | C     | 601 | ADP  | PA-O3A-PB | -3.29 | 121.54      | 132.83   |
| 3   | I     | 601 | ADP  | N3-C2-N1  | -3.28 | 123.54      | 128.68   |
| 3   | B     | 601 | ADP  | N3-C2-N1  | -3.28 | 123.55      | 128.68   |
| 3   | J     | 601 | ADP  | PA-O3A-PB | -3.28 | 121.58      | 132.83   |
| 3   | L     | 601 | ADP  | N3-C2-N1  | -3.27 | 123.56      | 128.68   |
| 3   | E     | 601 | ADP  | N3-C2-N1  | -3.27 | 123.57      | 128.68   |
| 3   | J     | 601 | ADP  | N3-C2-N1  | -3.27 | 123.57      | 128.68   |
| 3   | H     | 601 | ADP  | N3-C2-N1  | -3.26 | 123.58      | 128.68   |
| 3   | N     | 601 | ADP  | PA-O3A-PB | -3.26 | 121.63      | 132.83   |
| 3   | N     | 601 | ADP  | N3-C2-N1  | -3.26 | 123.58      | 128.68   |
| 3   | D     | 601 | ADP  | N3-C2-N1  | -3.26 | 123.58      | 128.68   |
| 3   | D     | 601 | ADP  | PA-O3A-PB | -3.25 | 121.67      | 132.83   |
| 3   | F     | 601 | ADP  | N3-C2-N1  | -3.25 | 123.60      | 128.68   |
| 3   | K     | 601 | ADP  | N3-C2-N1  | -3.25 | 123.60      | 128.68   |
| 3   | G     | 601 | ADP  | N3-C2-N1  | -3.25 | 123.61      | 128.68   |
| 3   | C     | 601 | ADP  | N3-C2-N1  | -3.24 | 123.61      | 128.68   |
| 3   | M     | 601 | ADP  | N3-C2-N1  | -3.23 | 123.62      | 128.68   |
| 3   | A     | 601 | ADP  | N3-C2-N1  | -3.23 | 123.63      | 128.68   |
| 3   | A     | 601 | ADP  | PA-O3A-PB | -3.22 | 121.77      | 132.83   |
| 3   | M     | 601 | ADP  | PA-O3A-PB | -3.22 | 121.78      | 132.83   |
| 3   | L     | 601 | ADP  | PA-O3A-PB | -3.21 | 121.80      | 132.83   |
| 3   | K     | 601 | ADP  | PA-O3A-PB | -3.21 | 121.81      | 132.83   |
| 3   | B     | 601 | ADP  | PA-O3A-PB | -3.20 | 121.84      | 132.83   |

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| Mol | Chain | Res | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-------------|-------|-------------|----------|
| 3   | H     | 601 | ADP  | PA-O3A-PB   | -3.16 | 122.00      | 132.83   |
| 3   | F     | 601 | ADP  | PA-O3A-PB   | -3.05 | 122.36      | 132.83   |
| 3   | I     | 601 | ADP  | PA-O3A-PB   | -3.05 | 122.36      | 132.83   |
| 3   | N     | 601 | ADP  | C3'-C2'-C1' | 2.81  | 105.20      | 100.98   |
| 3   | G     | 601 | ADP  | C3'-C2'-C1' | 2.79  | 105.18      | 100.98   |
| 3   | M     | 601 | ADP  | C3'-C2'-C1' | 2.79  | 105.18      | 100.98   |
| 3   | J     | 601 | ADP  | C3'-C2'-C1' | 2.79  | 105.17      | 100.98   |
| 3   | A     | 601 | ADP  | C3'-C2'-C1' | 2.78  | 105.17      | 100.98   |
| 3   | E     | 601 | ADP  | C3'-C2'-C1' | 2.78  | 105.16      | 100.98   |
| 3   | D     | 601 | ADP  | C3'-C2'-C1' | 2.78  | 105.16      | 100.98   |
| 3   | B     | 601 | ADP  | C3'-C2'-C1' | 2.76  | 105.13      | 100.98   |
| 3   | I     | 601 | ADP  | C3'-C2'-C1' | 2.75  | 105.12      | 100.98   |
| 3   | H     | 601 | ADP  | C3'-C2'-C1' | 2.75  | 105.12      | 100.98   |
| 3   | F     | 601 | ADP  | C3'-C2'-C1' | 2.75  | 105.11      | 100.98   |
| 3   | L     | 601 | ADP  | C3'-C2'-C1' | 2.74  | 105.11      | 100.98   |
| 3   | K     | 601 | ADP  | C3'-C2'-C1' | 2.73  | 105.09      | 100.98   |
| 3   | C     | 601 | ADP  | C3'-C2'-C1' | 2.72  | 105.07      | 100.98   |
| 3   | C     | 601 | ADP  | C4-C5-N7    | -2.68 | 106.61      | 109.40   |
| 3   | G     | 601 | ADP  | C4-C5-N7    | -2.68 | 106.61      | 109.40   |
| 3   | I     | 601 | ADP  | C4-C5-N7    | -2.66 | 106.63      | 109.40   |
| 3   | L     | 601 | ADP  | C4-C5-N7    | -2.65 | 106.63      | 109.40   |
| 3   | B     | 601 | ADP  | C4-C5-N7    | -2.65 | 106.63      | 109.40   |
| 3   | K     | 601 | ADP  | C4-C5-N7    | -2.65 | 106.64      | 109.40   |
| 3   | D     | 601 | ADP  | C4-C5-N7    | -2.64 | 106.65      | 109.40   |
| 3   | J     | 601 | ADP  | C4-C5-N7    | -2.63 | 106.66      | 109.40   |
| 3   | N     | 601 | ADP  | C4-C5-N7    | -2.63 | 106.66      | 109.40   |
| 3   | E     | 601 | ADP  | C4-C5-N7    | -2.63 | 106.66      | 109.40   |
| 3   | F     | 601 | ADP  | C4-C5-N7    | -2.60 | 106.69      | 109.40   |
| 3   | H     | 601 | ADP  | C4-C5-N7    | -2.59 | 106.70      | 109.40   |
| 3   | M     | 601 | ADP  | C4-C5-N7    | -2.59 | 106.70      | 109.40   |
| 3   | A     | 601 | ADP  | C4-C5-N7    | -2.57 | 106.72      | 109.40   |

There are no chirality outliers.

All (48) torsion outliers are listed below:

| Mol | Chain | Res | Type | Atoms          |
|-----|-------|-----|------|----------------|
| 3   | B     | 601 | ADP  | C5'-O5'-PA-O2A |
| 3   | C     | 601 | ADP  | C5'-O5'-PA-O2A |
| 3   | D     | 601 | ADP  | C5'-O5'-PA-O2A |
| 3   | E     | 601 | ADP  | C5'-O5'-PA-O2A |
| 3   | F     | 601 | ADP  | C5'-O5'-PA-O1A |
| 3   | F     | 601 | ADP  | C5'-O5'-PA-O2A |

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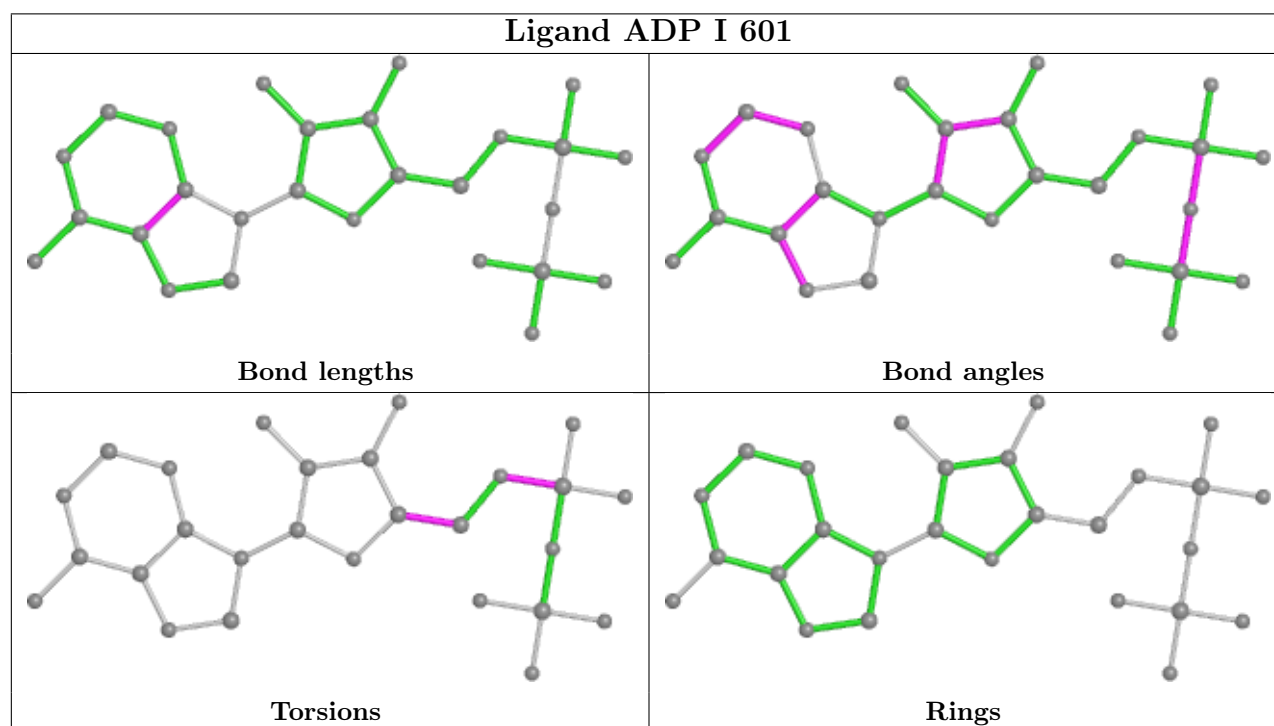
| Mol | Chain | Res | Type | Atoms           |
|-----|-------|-----|------|-----------------|
| 3   | F     | 601 | ADP  | C3'-C4'-C5'-O5' |
| 3   | I     | 601 | ADP  | C5'-O5'-PA-O1A  |
| 3   | J     | 601 | ADP  | C5'-O5'-PA-O1A  |
| 3   | K     | 601 | ADP  | C5'-O5'-PA-O1A  |
| 3   | L     | 601 | ADP  | C5'-O5'-PA-O1A  |
| 3   | F     | 601 | ADP  | O4'-C4'-C5'-O5' |
| 3   | D     | 601 | ADP  | C3'-C4'-C5'-O5' |
| 3   | I     | 601 | ADP  | C3'-C4'-C5'-O5' |
| 3   | J     | 601 | ADP  | C3'-C4'-C5'-O5' |
| 3   | K     | 601 | ADP  | C3'-C4'-C5'-O5' |
| 3   | D     | 601 | ADP  | C5'-O5'-PA-O3A  |
| 3   | F     | 601 | ADP  | C5'-O5'-PA-O3A  |
| 3   | I     | 601 | ADP  | C5'-O5'-PA-O3A  |
| 3   | J     | 601 | ADP  | C5'-O5'-PA-O3A  |
| 3   | L     | 601 | ADP  | C3'-C4'-C5'-O5' |
| 3   | H     | 601 | ADP  | C5'-O5'-PA-O1A  |
| 3   | I     | 601 | ADP  | C5'-O5'-PA-O2A  |
| 3   | B     | 601 | ADP  | C3'-C4'-C5'-O5' |
| 3   | C     | 601 | ADP  | C3'-C4'-C5'-O5' |
| 3   | A     | 601 | ADP  | C3'-C4'-C5'-O5' |
| 3   | M     | 601 | ADP  | C3'-C4'-C5'-O5' |
| 3   | E     | 601 | ADP  | C3'-C4'-C5'-O5' |
| 3   | H     | 601 | ADP  | C3'-C4'-C5'-O5' |
| 3   | D     | 601 | ADP  | O4'-C4'-C5'-O5' |
| 3   | I     | 601 | ADP  | O4'-C4'-C5'-O5' |
| 3   | J     | 601 | ADP  | O4'-C4'-C5'-O5' |
| 3   | B     | 601 | ADP  | C5'-O5'-PA-O3A  |
| 3   | C     | 601 | ADP  | C5'-O5'-PA-O3A  |
| 3   | K     | 601 | ADP  | C5'-O5'-PA-O3A  |
| 3   | L     | 601 | ADP  | C5'-O5'-PA-O3A  |
| 3   | G     | 601 | ADP  | C3'-C4'-C5'-O5' |
| 3   | N     | 601 | ADP  | C3'-C4'-C5'-O5' |
| 3   | A     | 601 | ADP  | PB-O3A-PA-O1A   |
| 3   | B     | 601 | ADP  | PB-O3A-PA-O1A   |
| 3   | B     | 601 | ADP  | PB-O3A-PA-O2A   |
| 3   | C     | 601 | ADP  | PB-O3A-PA-O1A   |
| 3   | D     | 601 | ADP  | PB-O3A-PA-O1A   |
| 3   | E     | 601 | ADP  | PB-O3A-PA-O2A   |
| 3   | G     | 601 | ADP  | PB-O3A-PA-O1A   |
| 3   | H     | 601 | ADP  | PB-O3A-PA-O2A   |
| 3   | D     | 601 | ADP  | C5'-O5'-PA-O1A  |
| 3   | J     | 601 | ADP  | C5'-O5'-PA-O2A  |

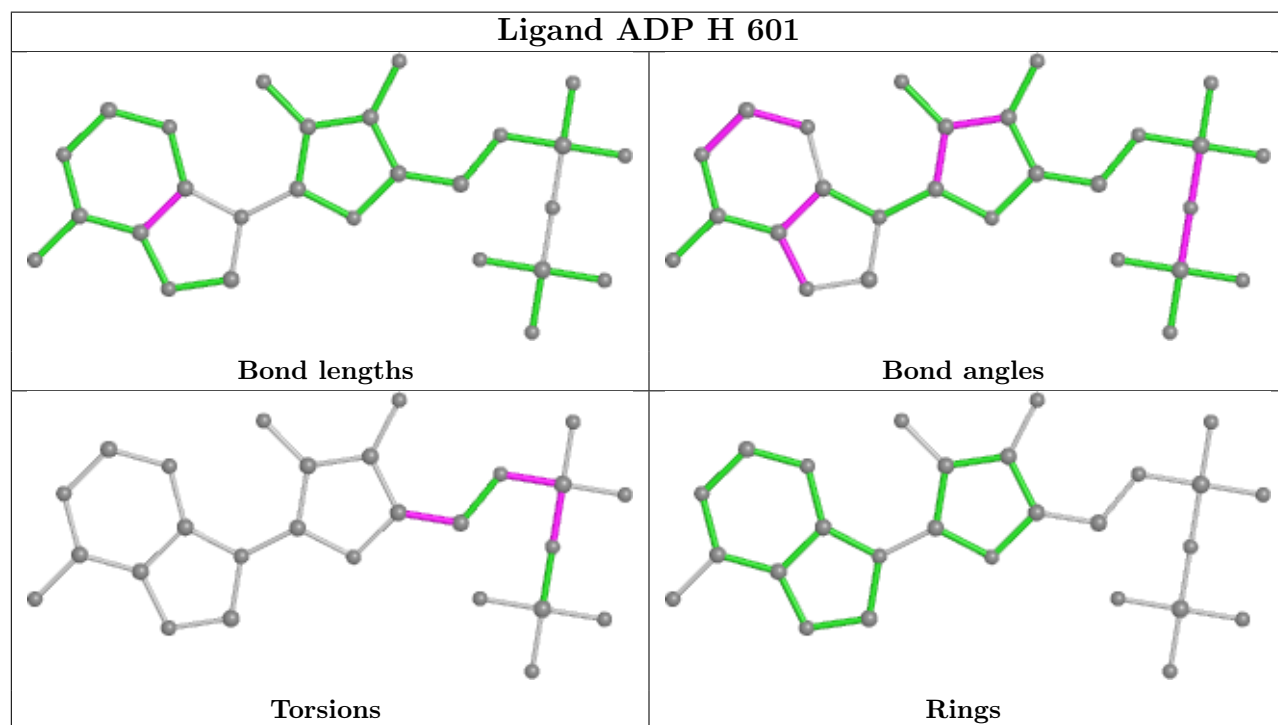
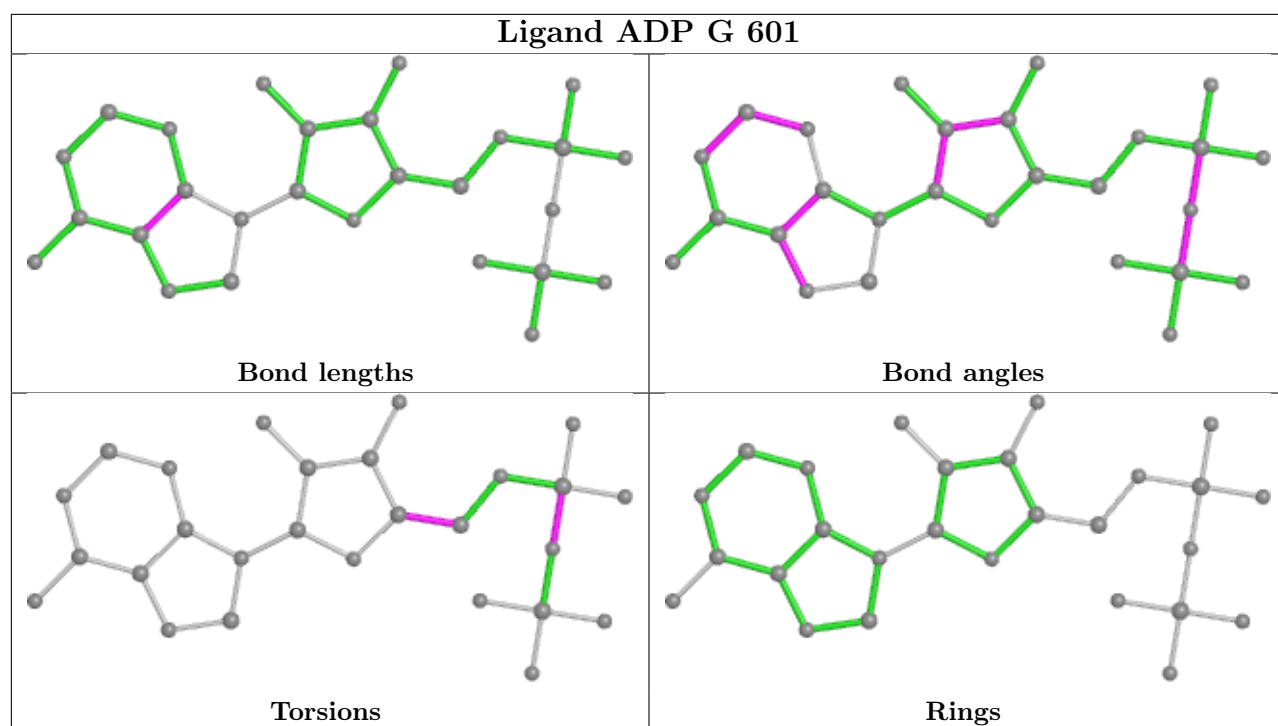
There are no ring outliers.

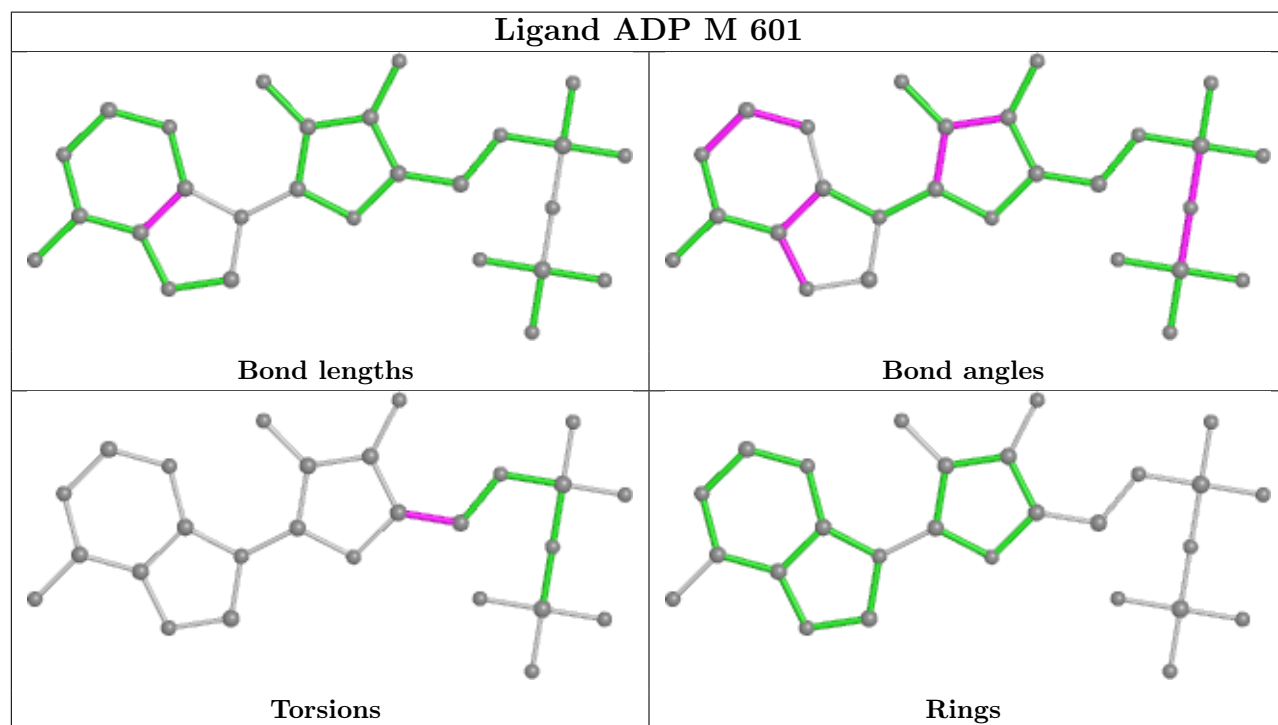
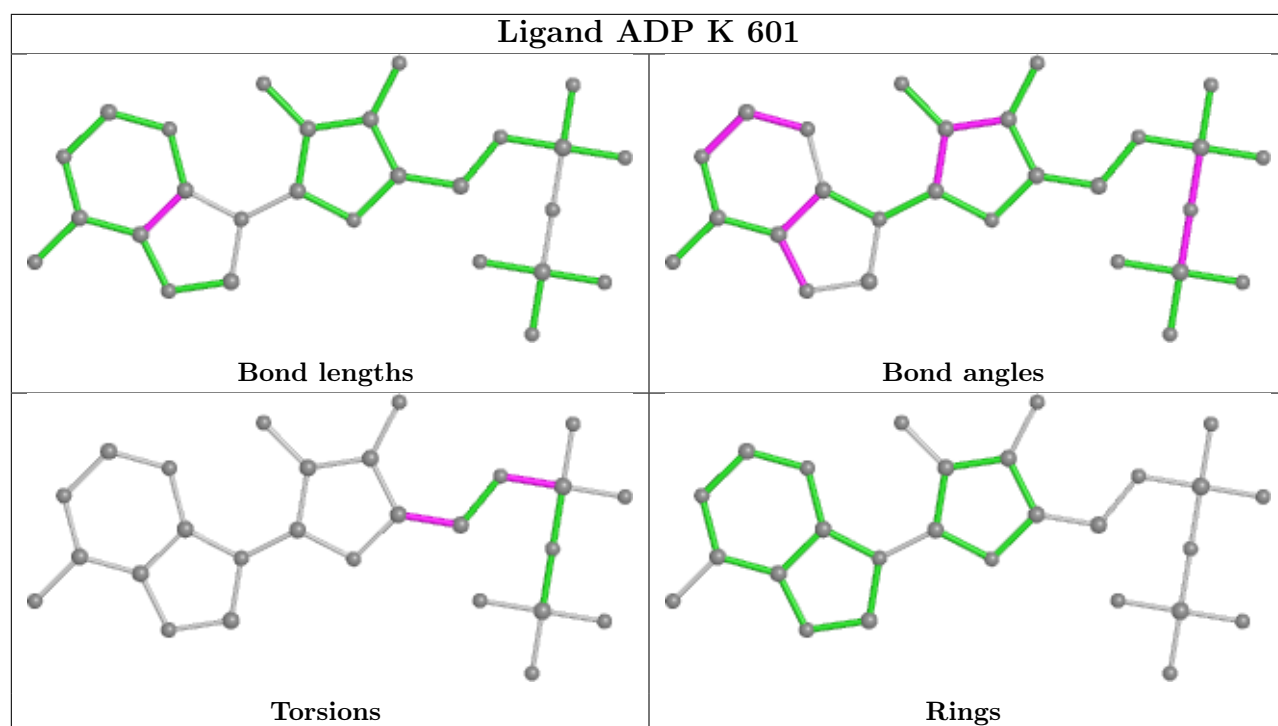
3 monomers are involved in 3 short contacts:

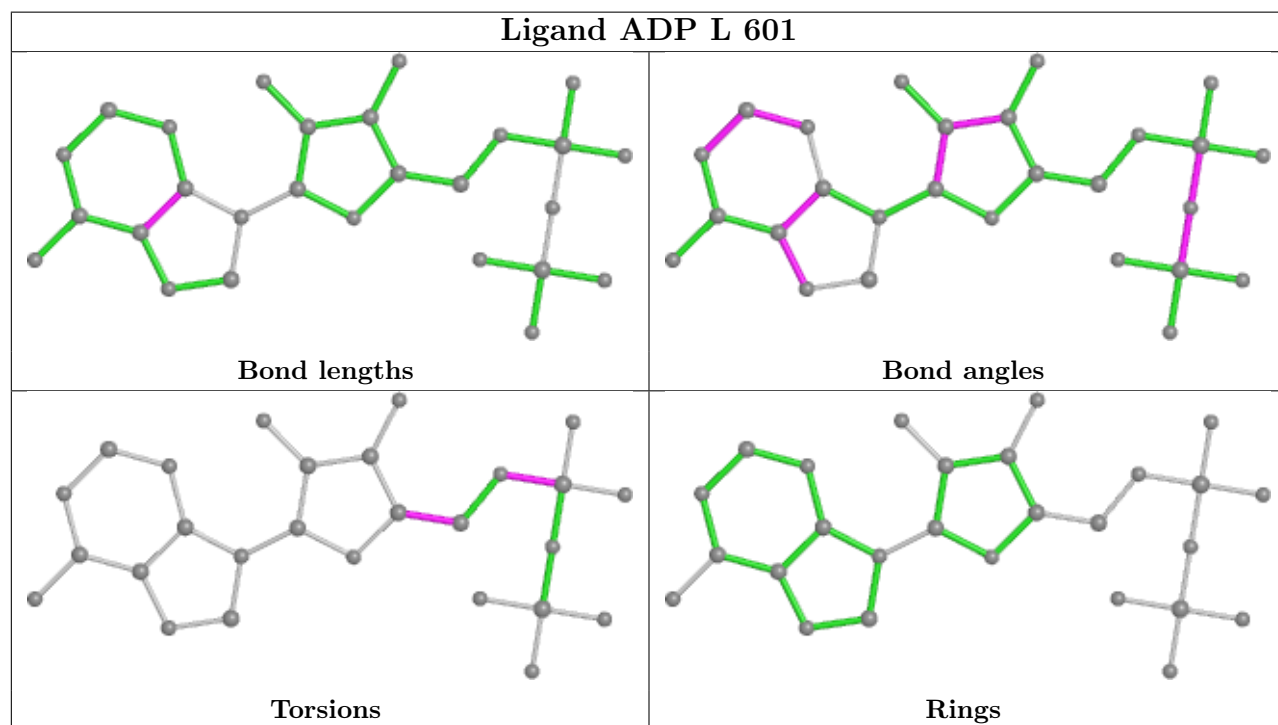
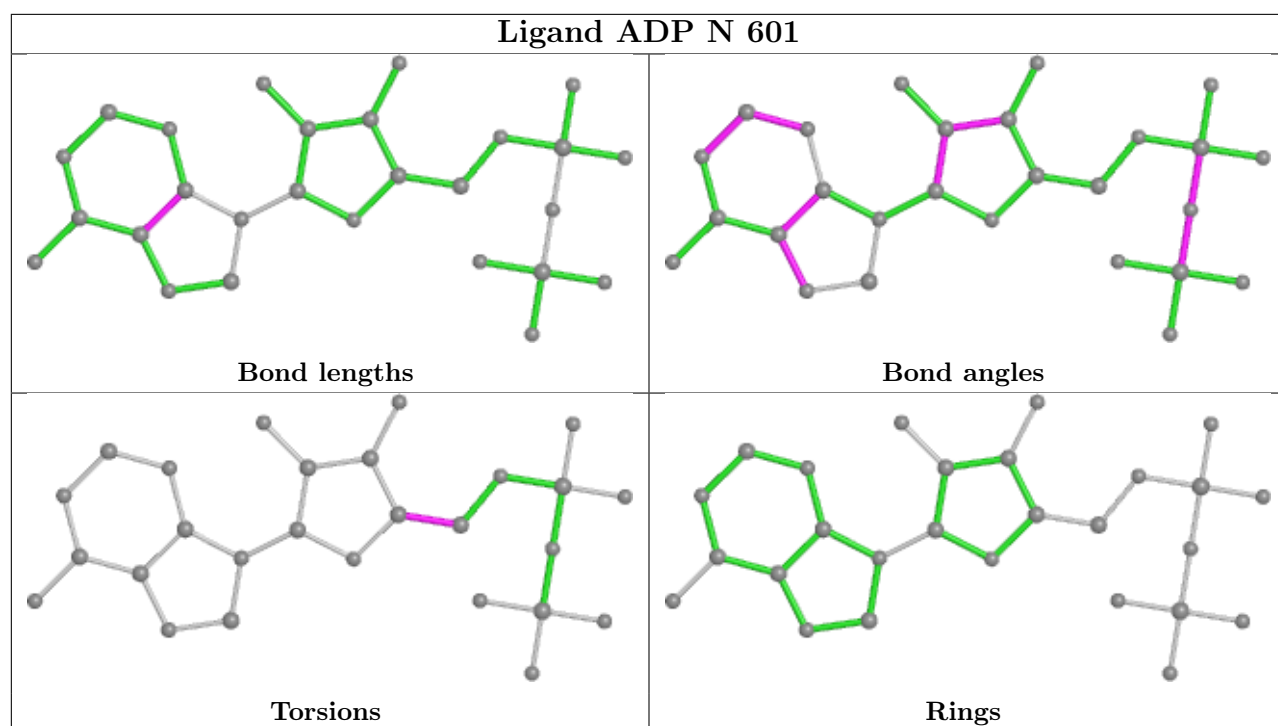
| Mol | Chain | Res | Type | Clashes | Symm-Clashes |
|-----|-------|-----|------|---------|--------------|
| 3   | N     | 601 | ADP  | 1       | 0            |
| 3   | A     | 601 | ADP  | 1       | 0            |
| 3   | D     | 601 | ADP  | 1       | 0            |

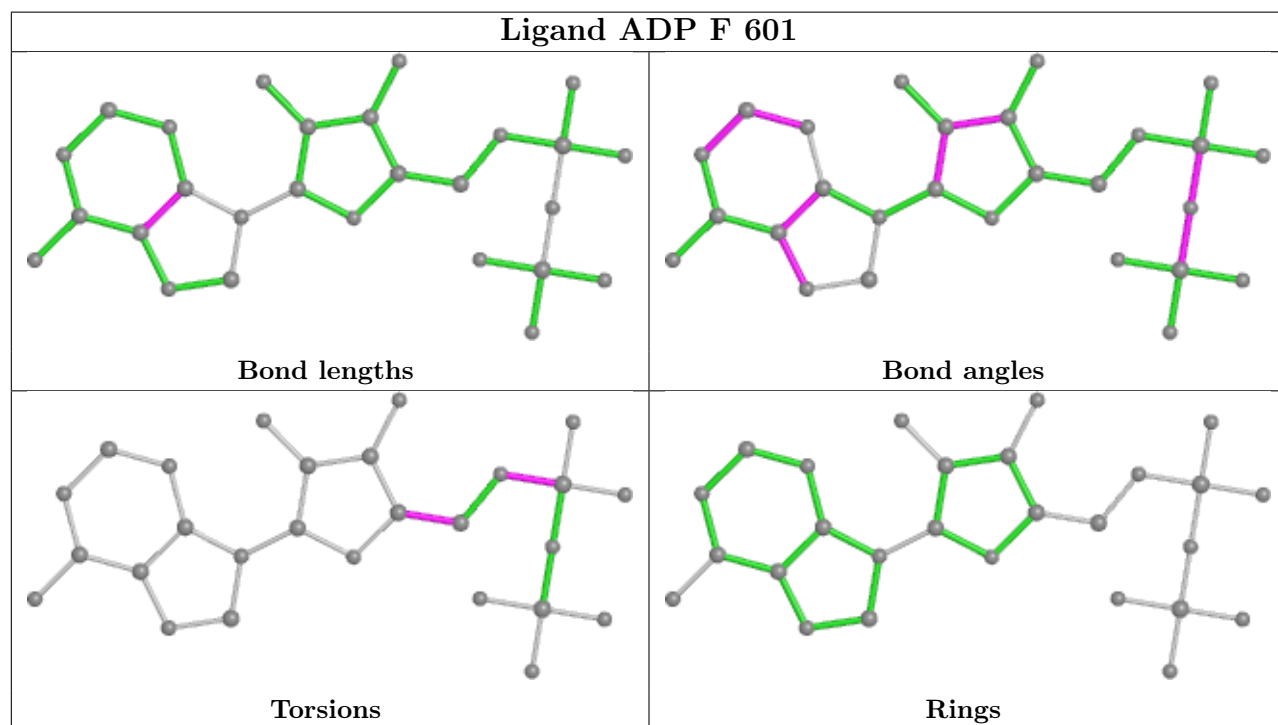
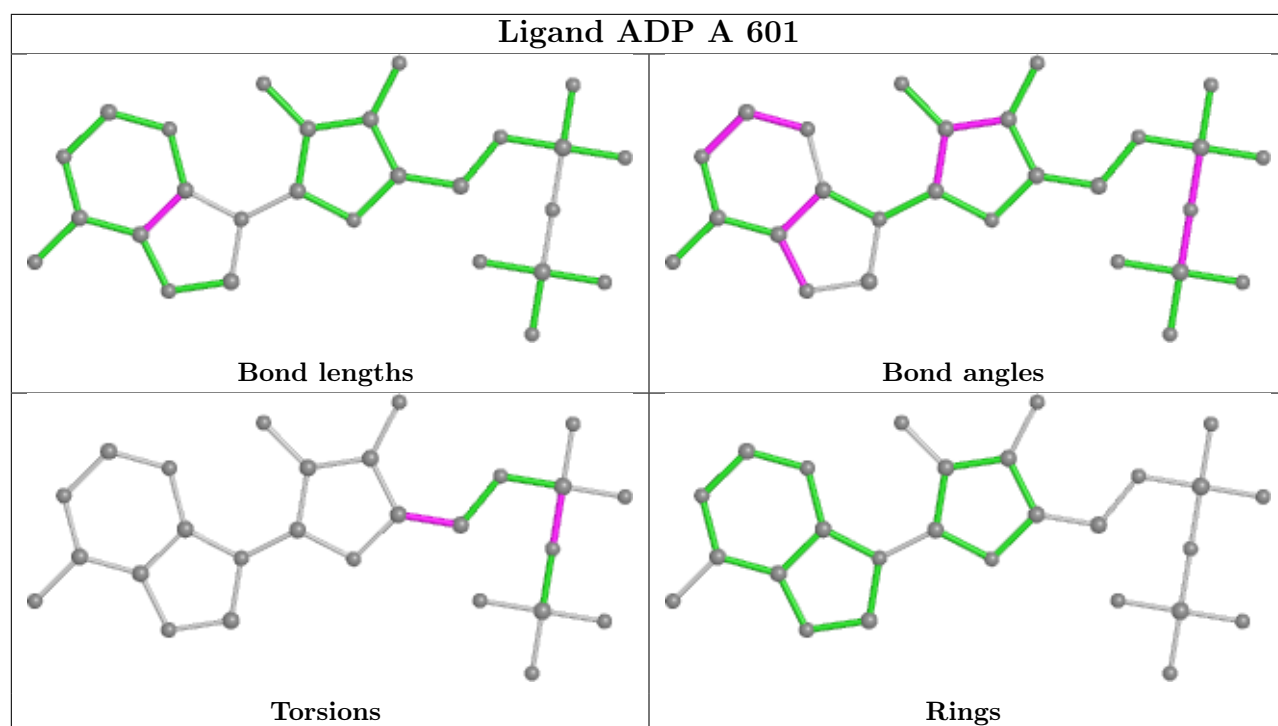
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

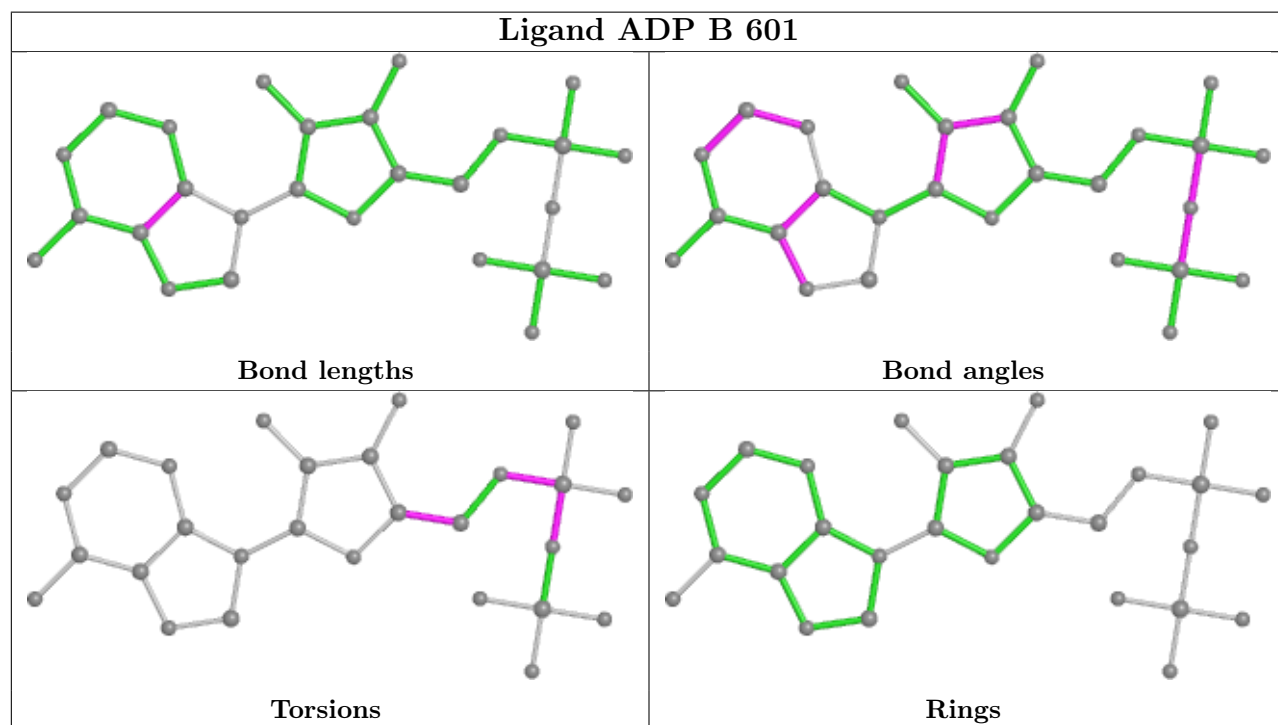
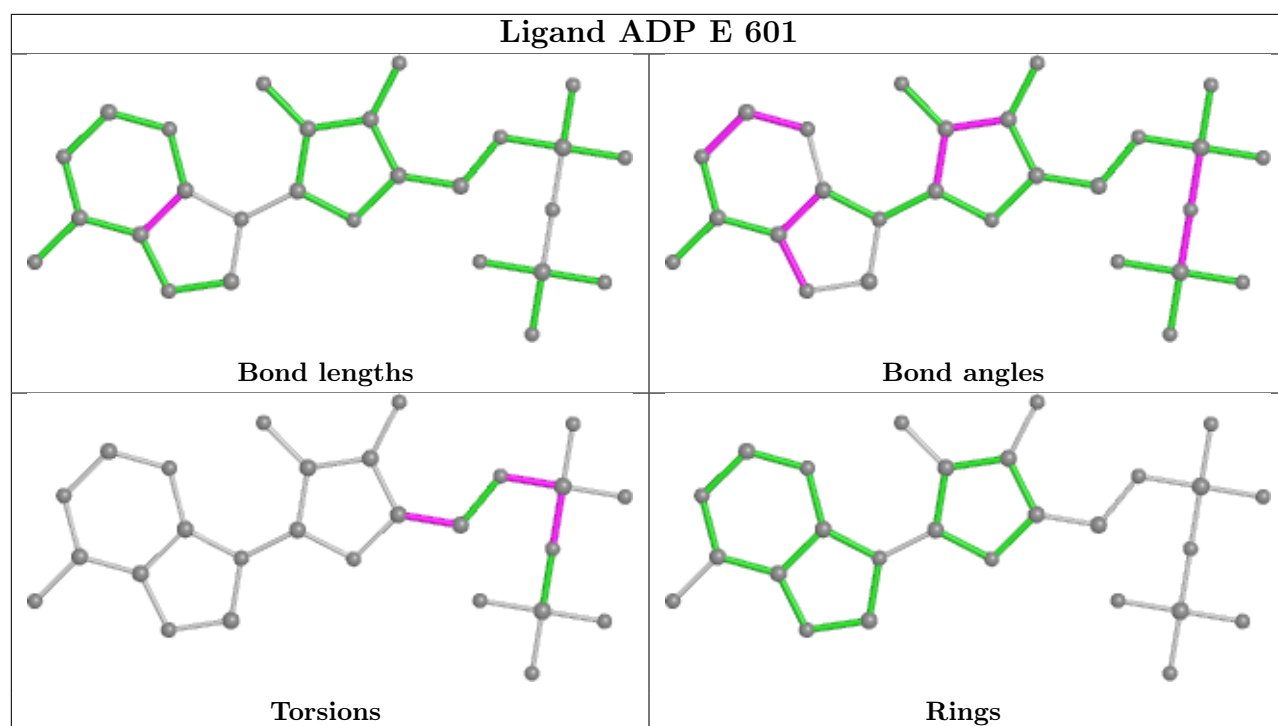




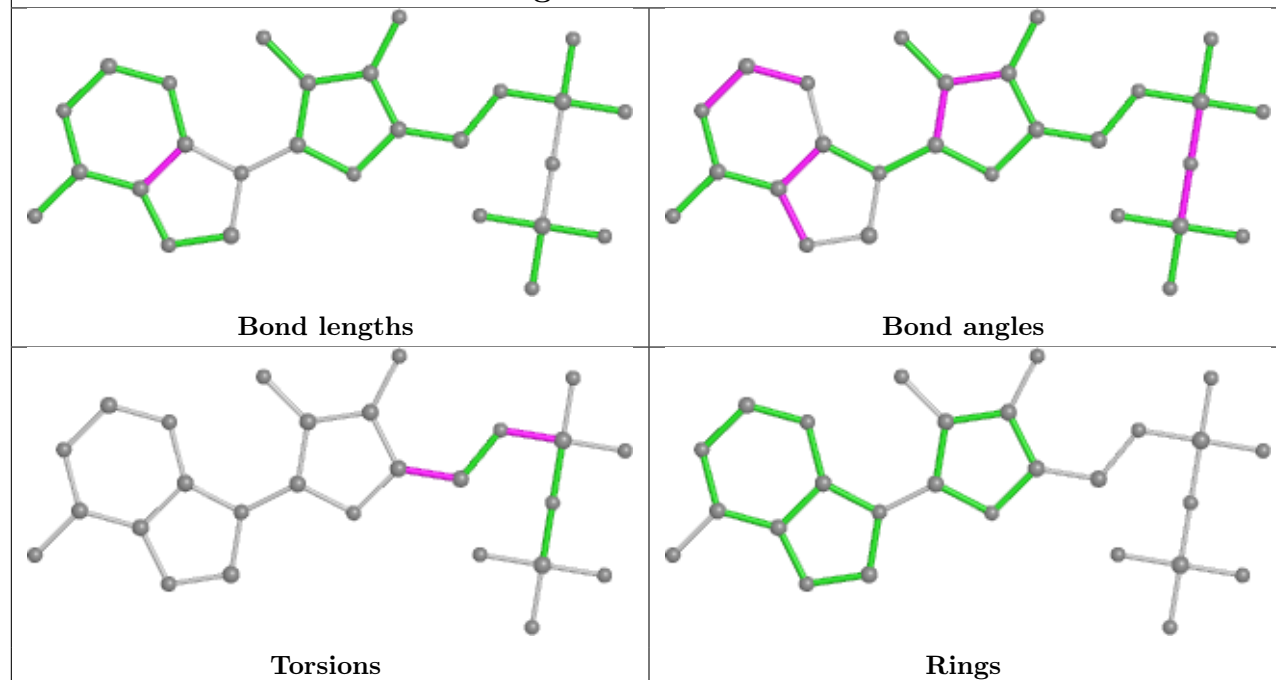




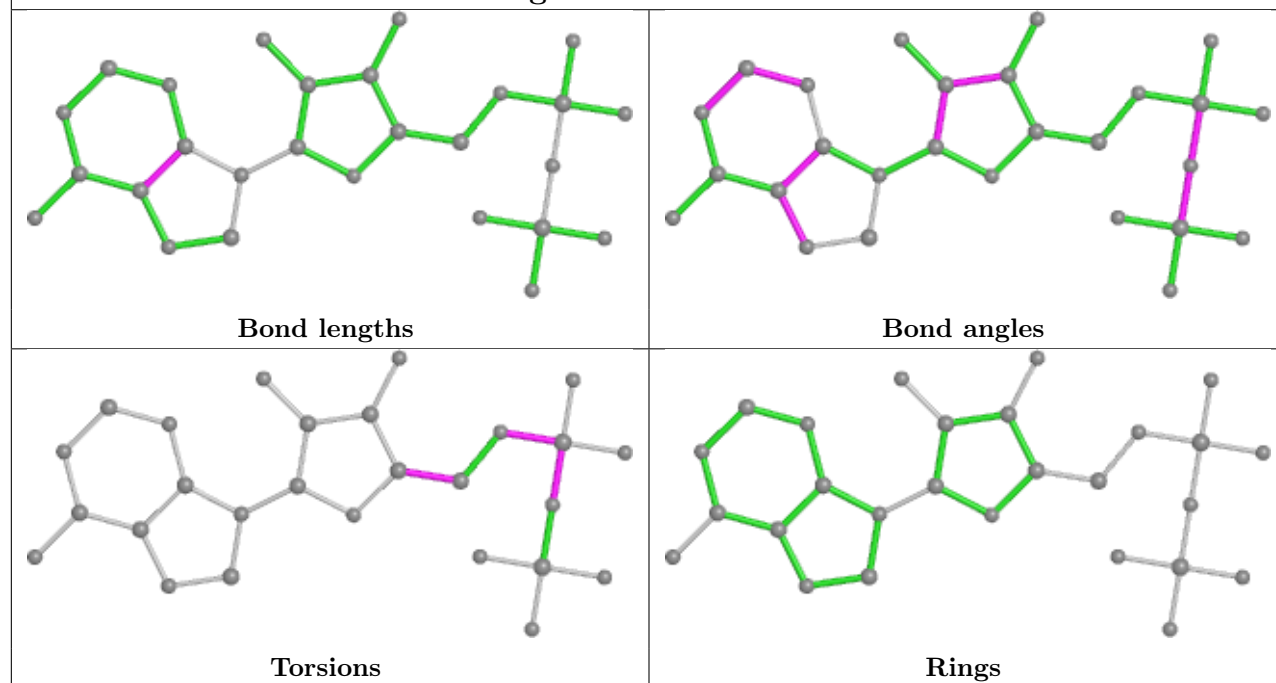


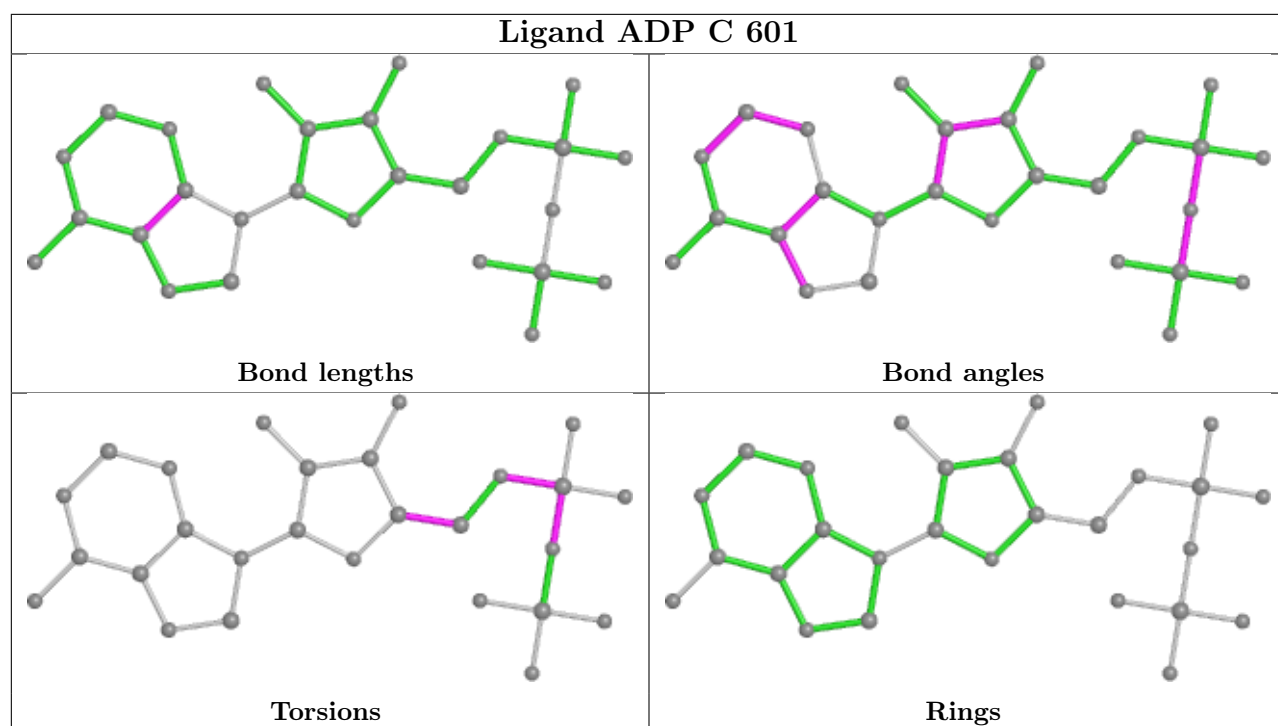


## Ligand ADP J 601



## Ligand ADP D 601





## 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

There are no chain breaks in this entry.

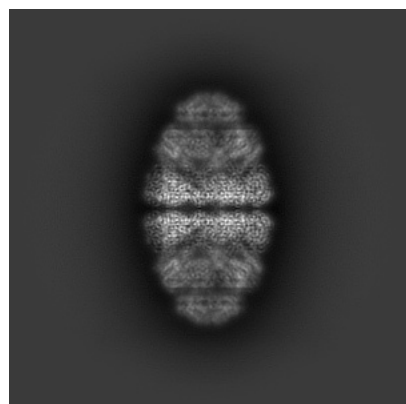
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-37853. These allow visual inspection of the internal detail of the map and identification of artifacts.

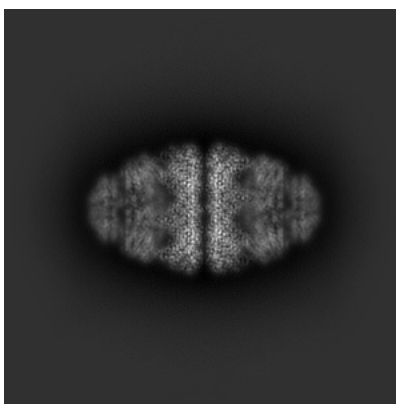
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

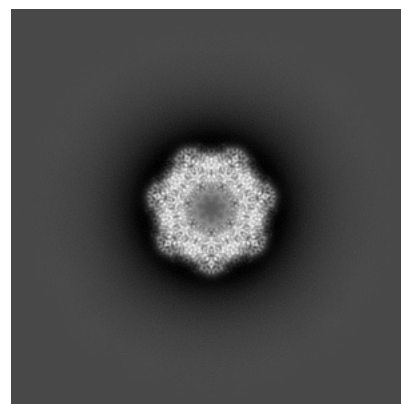
#### 6.1.1 Primary map



X

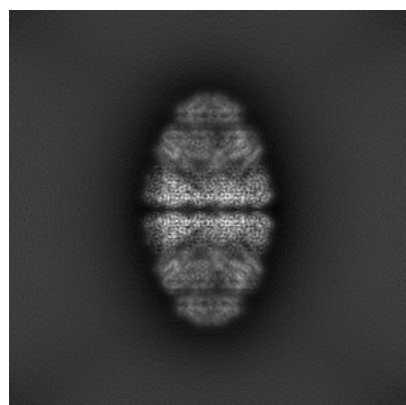


Y

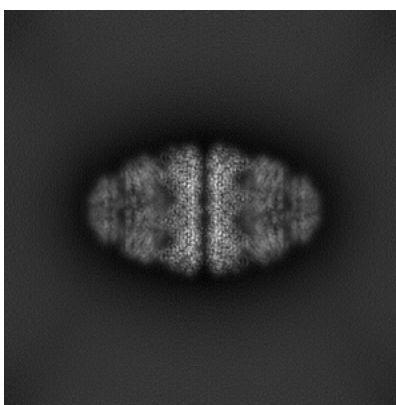


Z

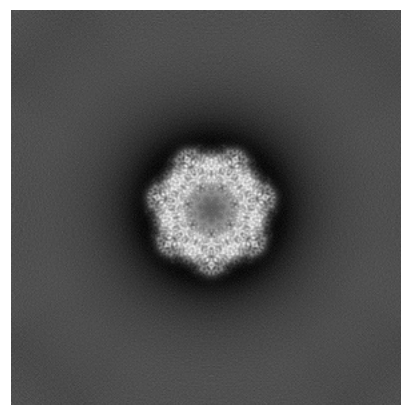
#### 6.1.2 Raw map



X



Y

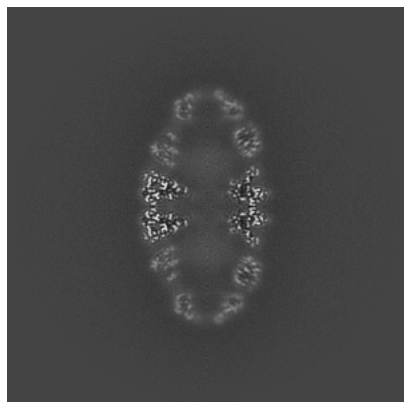


Z

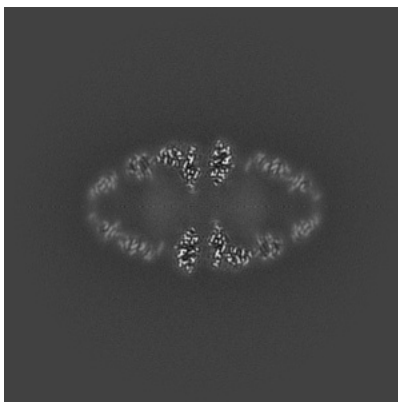
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

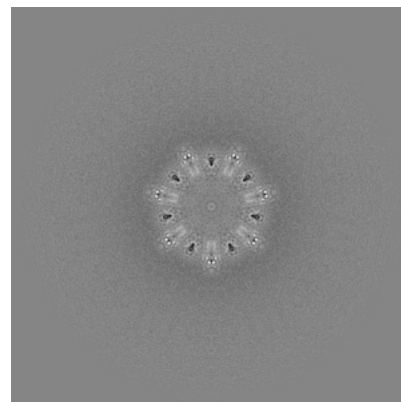
### 6.2.1 Primary map



X Index: 250

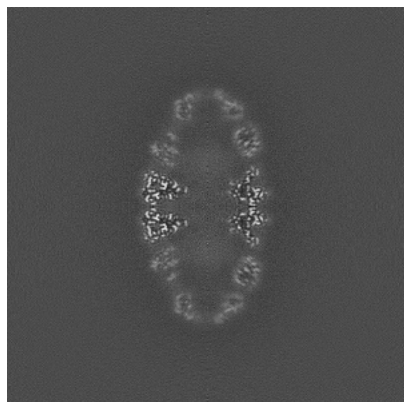


Y Index: 250

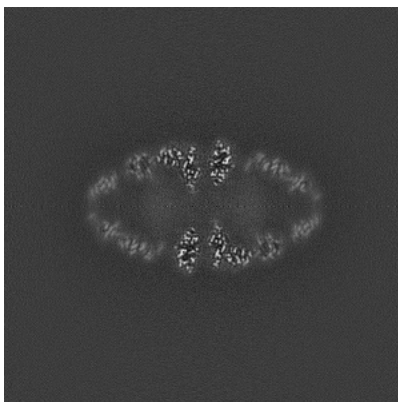


Z Index: 250

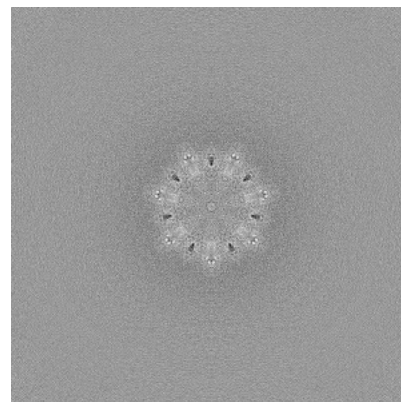
### 6.2.2 Raw map



X Index: 250



Y Index: 250



Z Index: 250

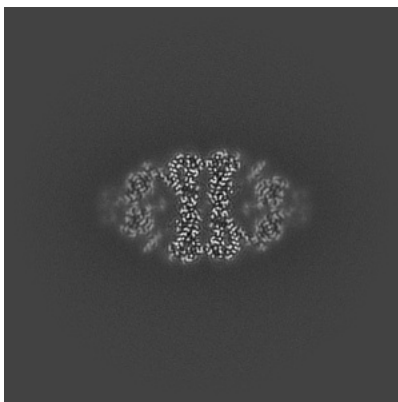
The images above show central slices of the map in three orthogonal directions.

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

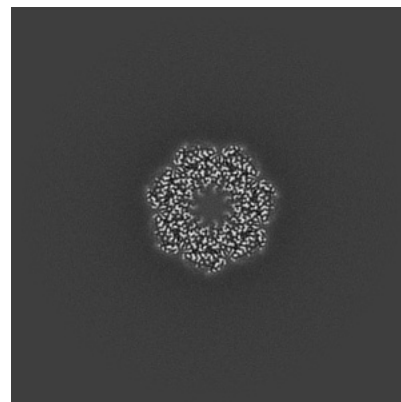
### 6.3.1 Primary map



X Index: 210

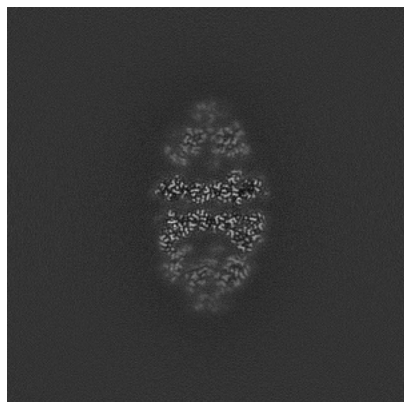


Y Index: 207

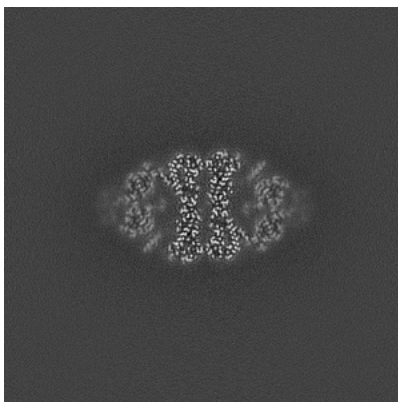


Z Index: 265

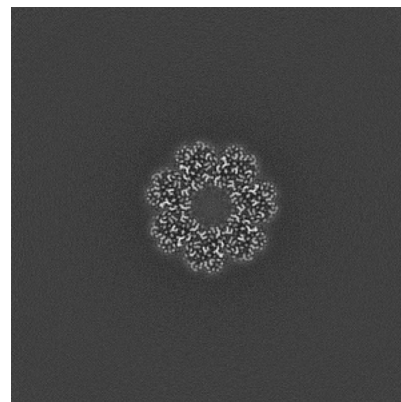
### 6.3.2 Raw map



X Index: 290



Y Index: 207

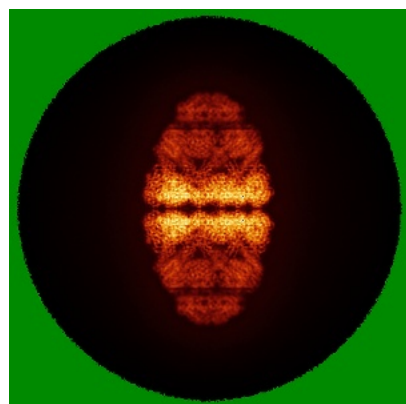


Z Index: 269

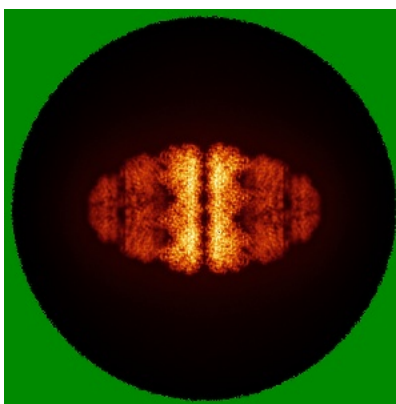
The images above show the largest variance slices of the map in three orthogonal directions.

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

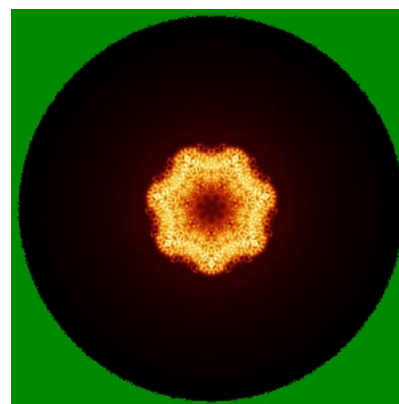
### 6.4.1 Primary map



X

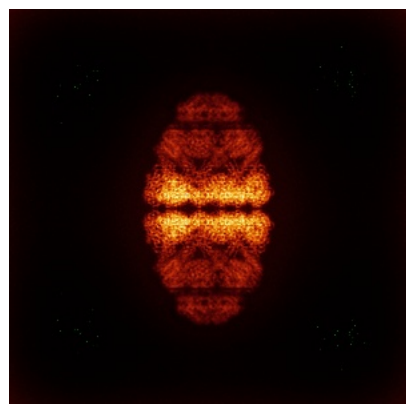


Y

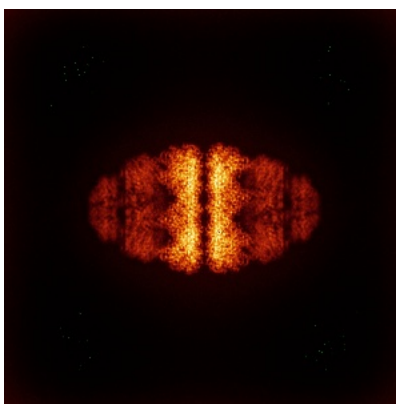


Z

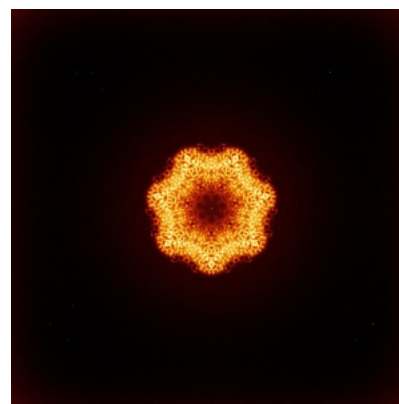
### 6.4.2 Raw map



X



Y

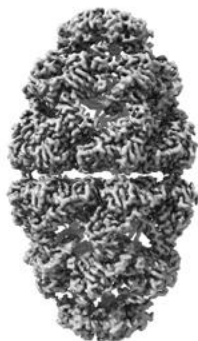


Z

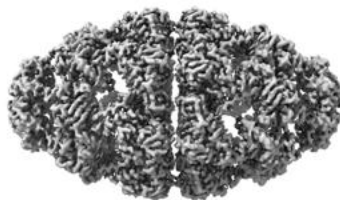
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

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

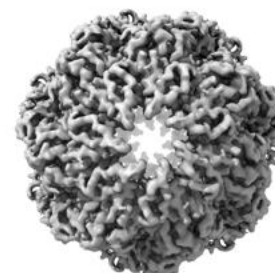
### 6.5.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.08. 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.

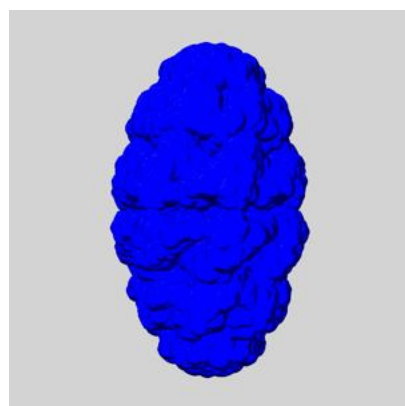
## 6.6 Mask visualisation [i](#)

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

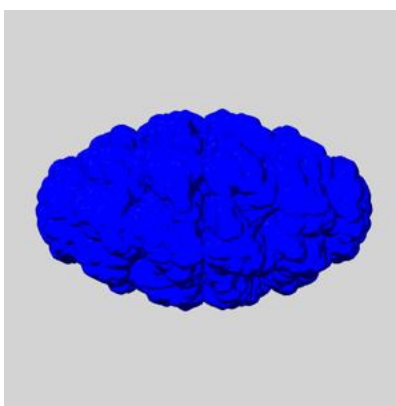
A mask typically either:

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

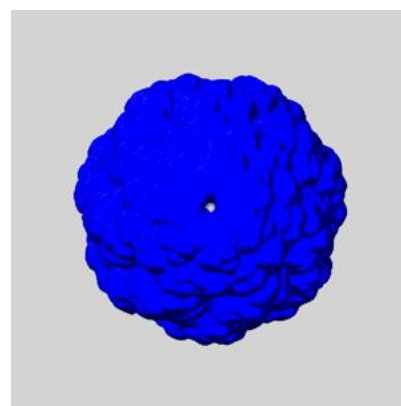
### 6.6.1 emd\_37853\_msk\_1.map [i](#)



X



Y

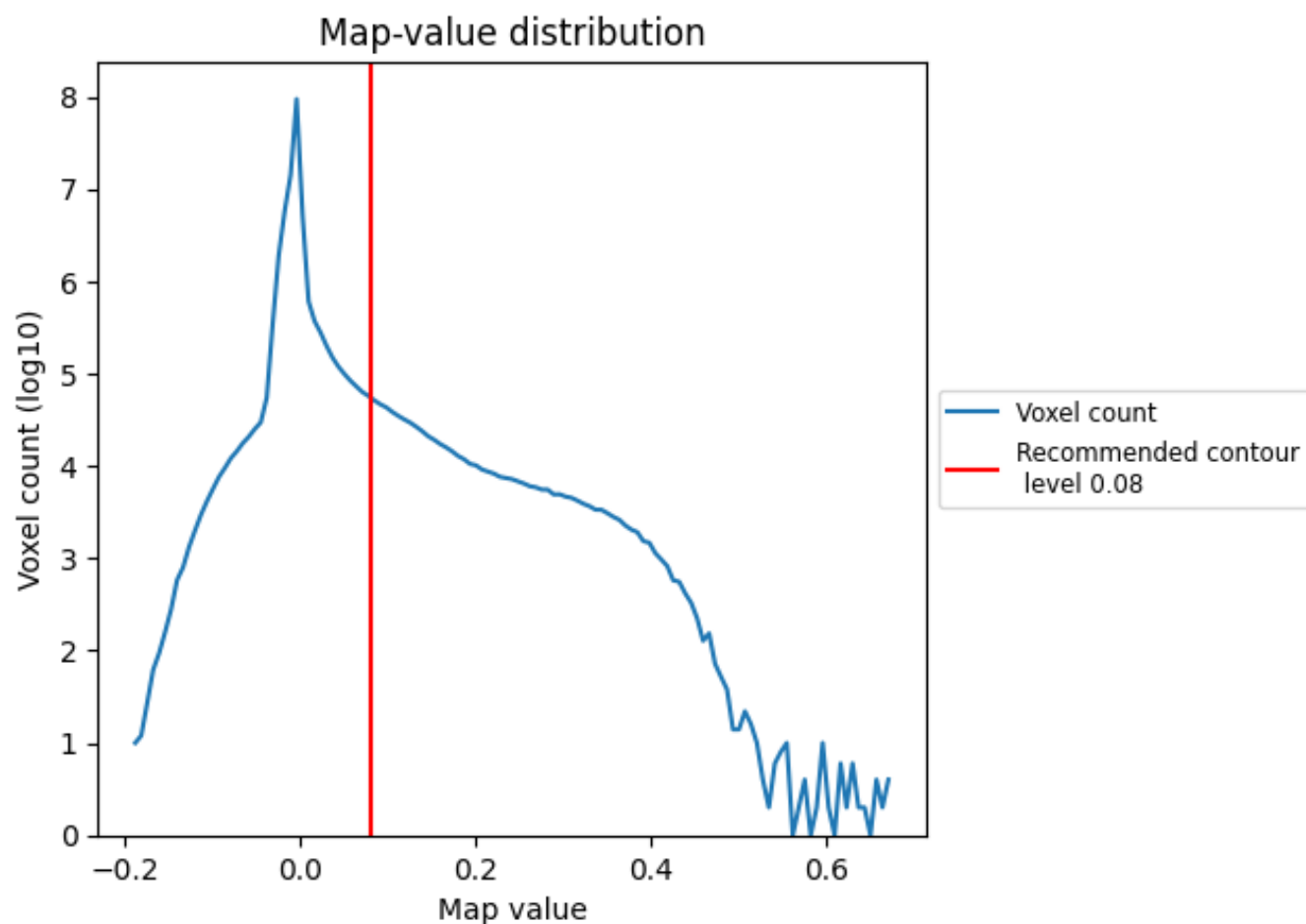


Z

## 7 Map analysis [i](#)

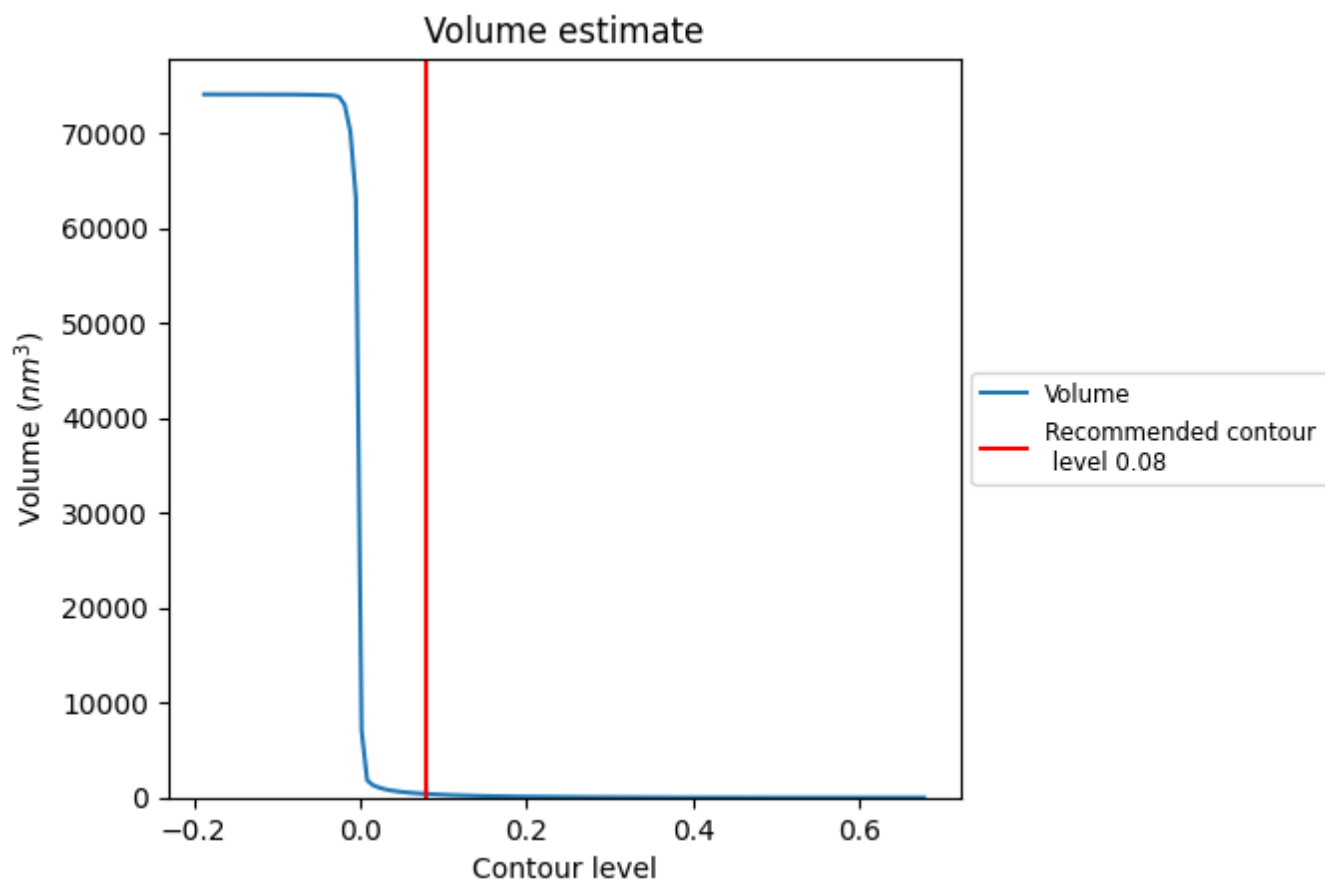
This section contains the results of statistical analysis of the map.

### 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.

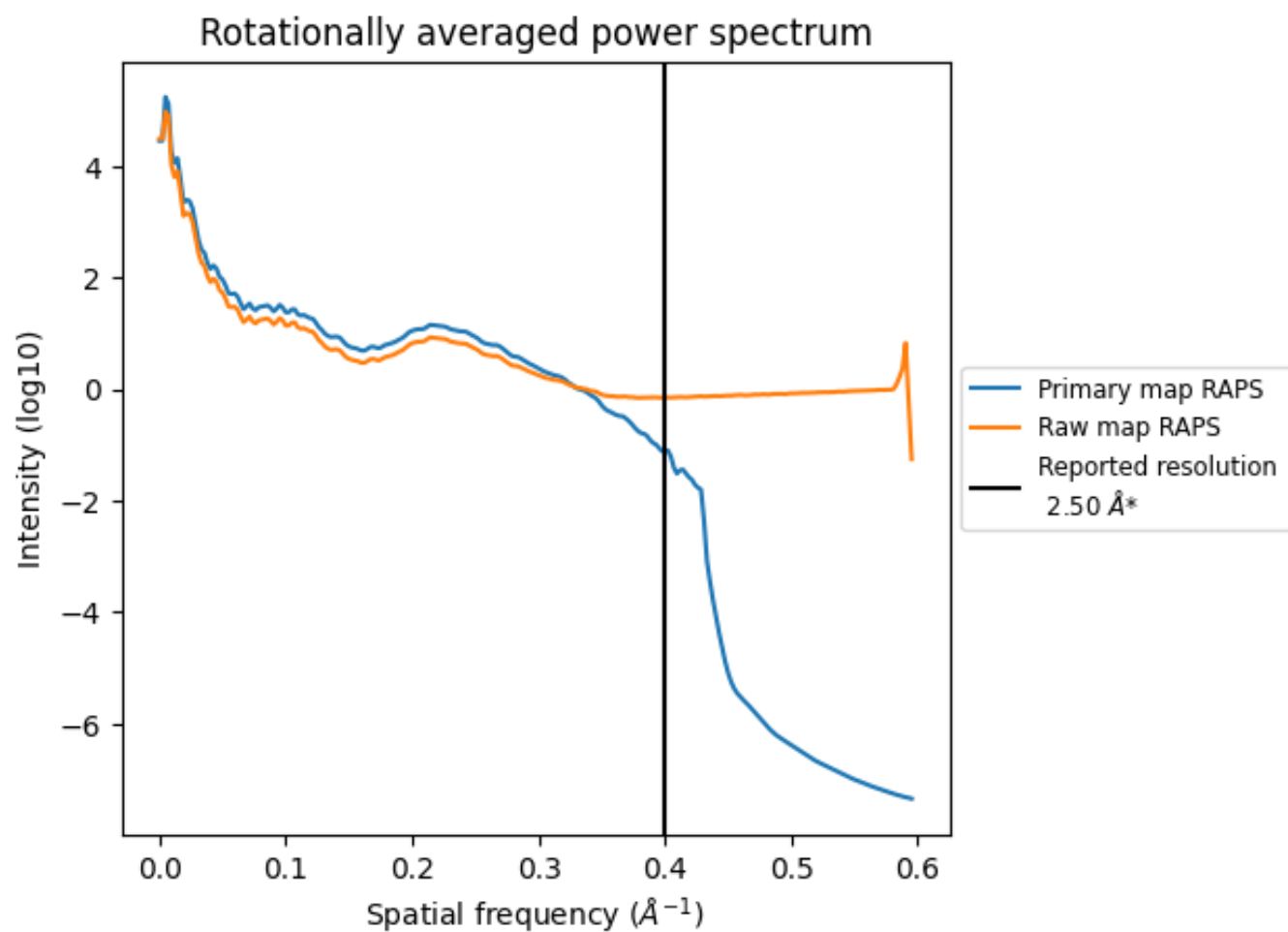
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 385  $\text{nm}^3$ ; this corresponds to an approximate mass of 348 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 ⓘ

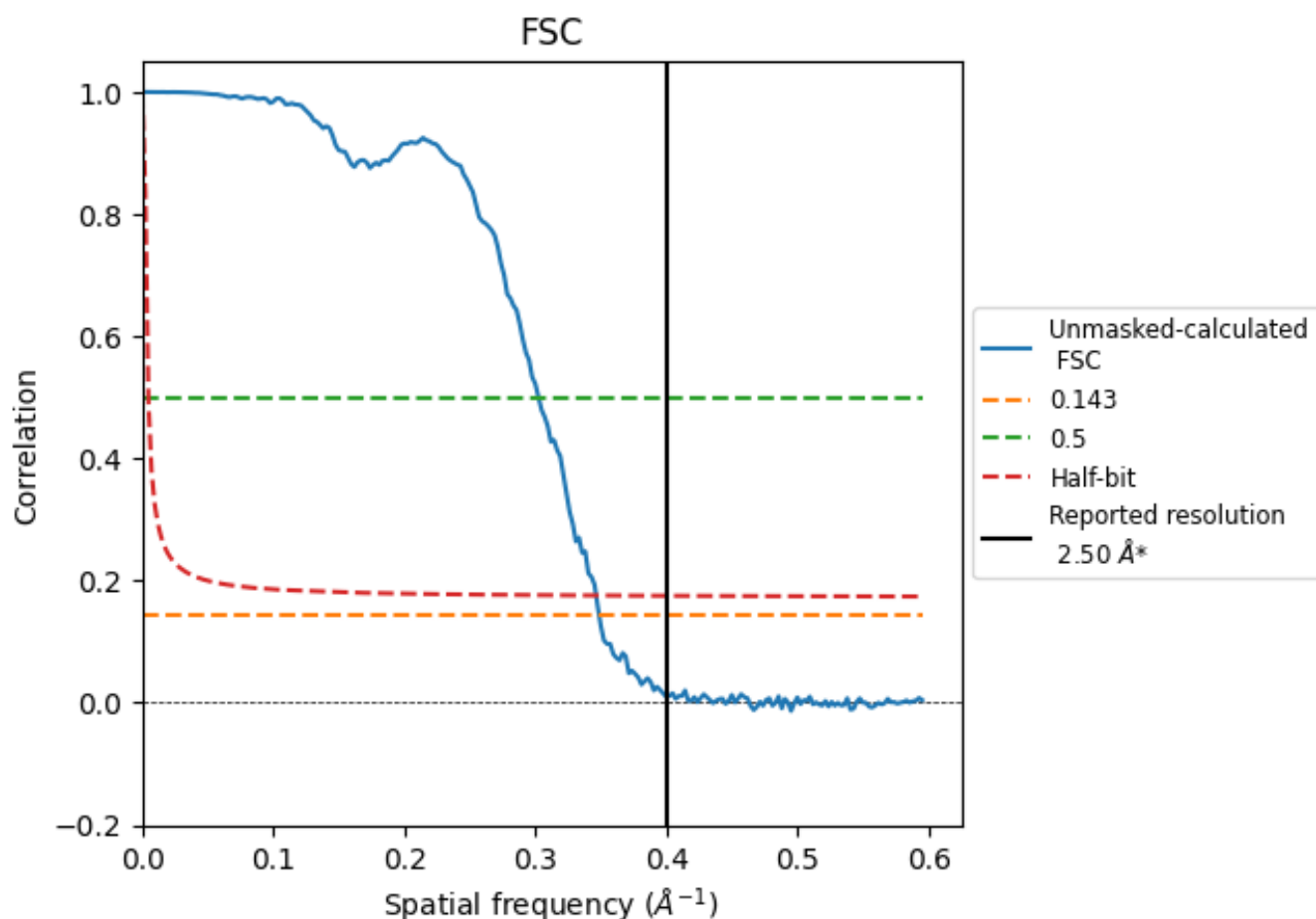


\*Reported resolution corresponds to spatial frequency of 0.400 Å<sup>-1</sup>

## 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  $0.400 \text{ \AA}^{-1}$

## 8.2 Resolution estimates [i](#)

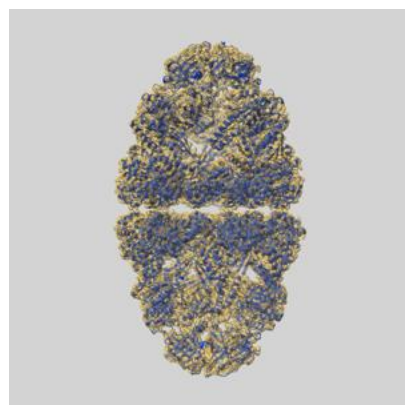
| Resolution estimate (Å)   | Estimation criterion (FSC cut-off) |      |          |
|---------------------------|------------------------------------|------|----------|
|                           | 0.143                              | 0.5  | Half-bit |
| Reported by author        | 2.50                               | -    | -        |
| Author-provided FSC curve | -                                  | -    | -        |
| Unmasked-calculated*      | 2.87                               | 3.31 | 2.89     |

\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 2.87 differs from the reported value 2.5 by more than 10 %

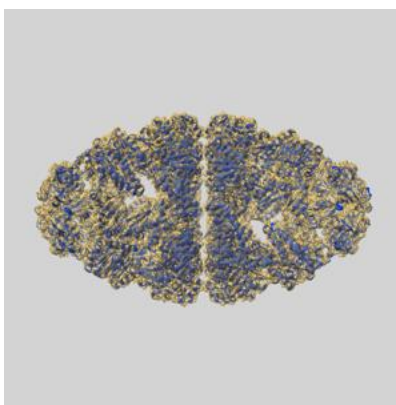
## 9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-37853 and PDB model 8WUC. Per-residue inclusion information can be found in section [3](#) on page [8](#).

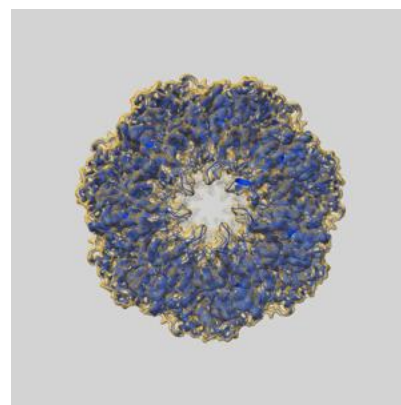
### 9.1 Map-model overlay [i](#)



X



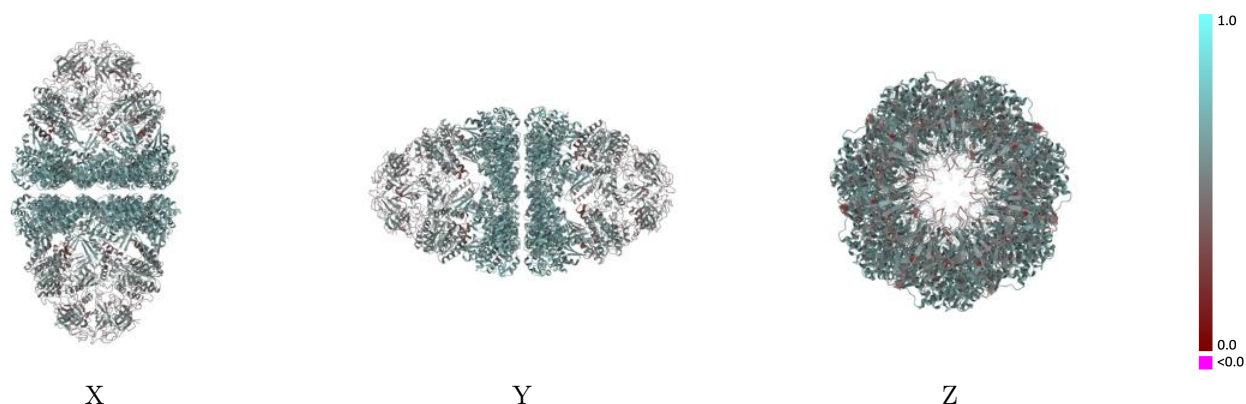
Y



Z

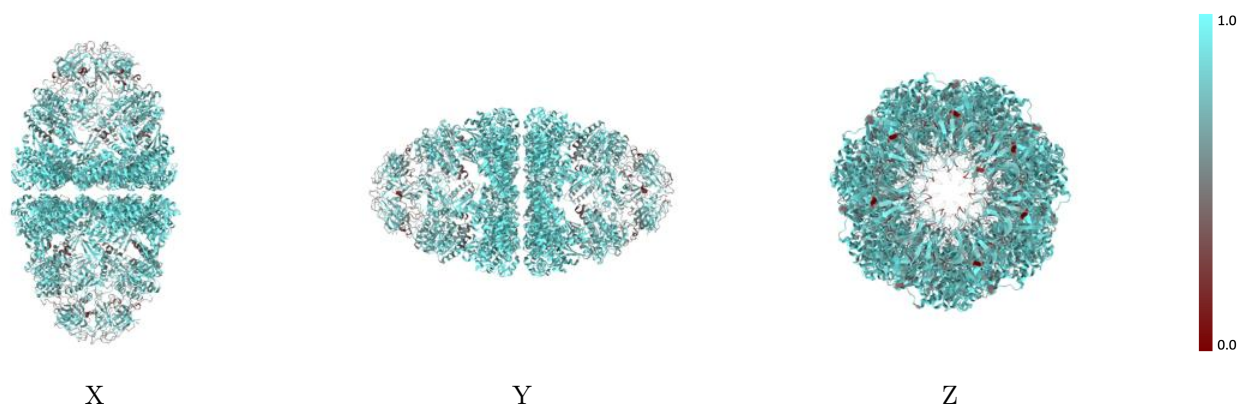
The images above show the 3D surface view of the map at the recommended contour level 0.08 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



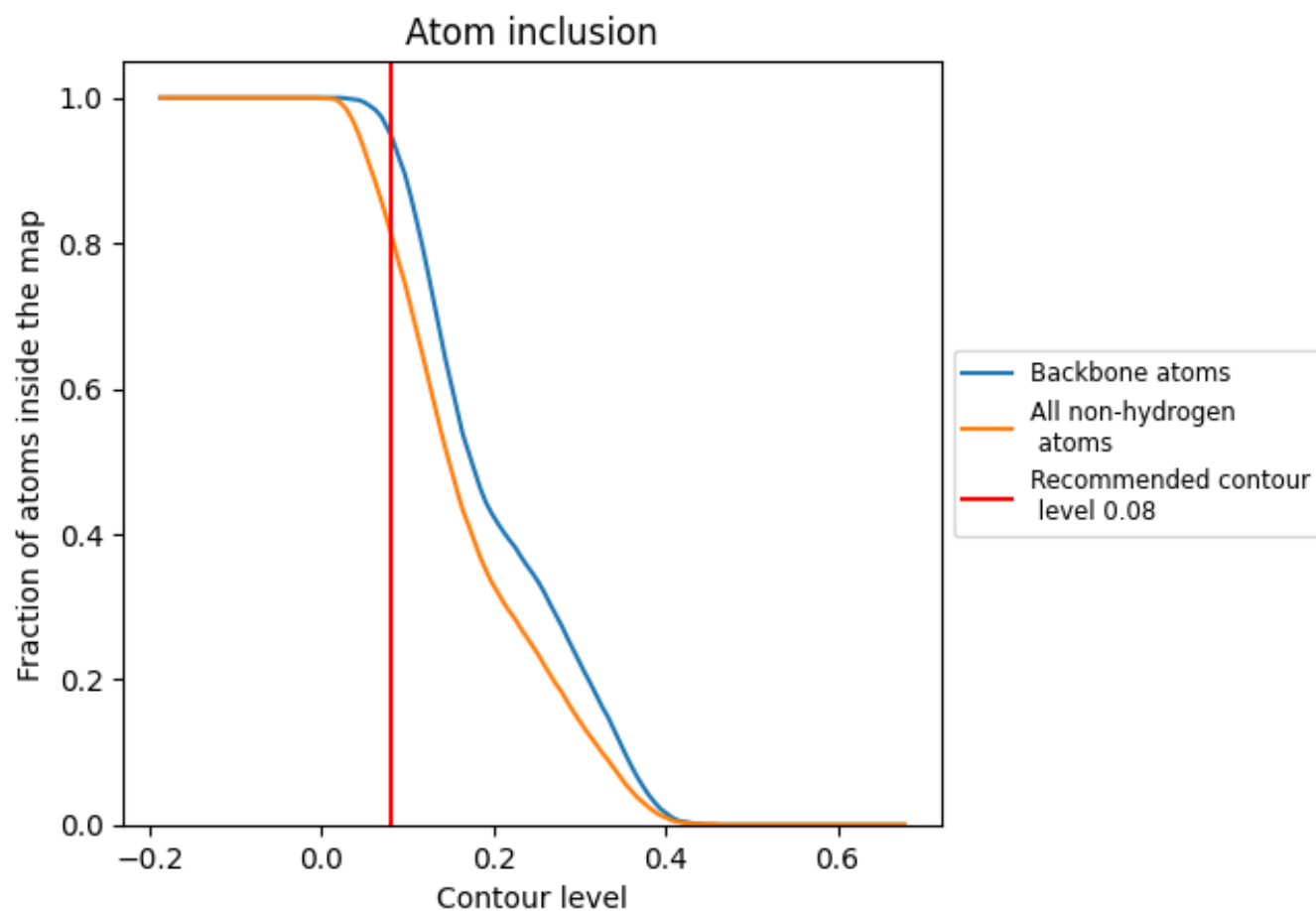
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.08).

## 9.4 Atom inclusion [i](#)



At the recommended contour level, 95% of all backbone atoms, 82% 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 (0.08) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion                                                                             | Q-score                                                                                    |
|-------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| All   |  0.8160   |  0.5540   |
| A     |  0.8550   |  0.5730   |
| B     |  0.8520   |  0.5730   |
| C     |  0.8540   |  0.5720   |
| D     |  0.8550   |  0.5730   |
| E     |  0.8520   |  0.5700   |
| F     |  0.8530   |  0.5730   |
| G     |  0.8530   |  0.5720   |
| H     |  0.8480   |  0.5710   |
| I     |  0.8470   |  0.5720   |
| J     |  0.8540   |  0.5710   |
| K     |  0.8530   |  0.5720   |
| L     |  0.8520   |  0.5740   |
| M     |  0.8520   |  0.5720   |
| N     |  0.8530  |  0.5710  |
| a     |  0.6070 |  0.4500 |
| b     |  0.6290 |  0.4490 |
| c     |  0.6170 |  0.4540 |
| d     |  0.6030 |  0.4530 |
| e     |  0.6190 |  0.4500 |
| f     |  0.6130 |  0.4570 |
| g     |  0.6170 |  0.4530 |
| h     |  0.6230 |  0.4560 |
| i     |  0.6160 |  0.4490 |
| j     |  0.6060 |  0.4430 |
| k     |  0.6200 |  0.4490 |
| l     |  0.6200 |  0.4510 |
| m     |  0.6160 |  0.4470 |
| n     |  0.6130 |  0.4540 |

