



## Full wwPDB EM Validation Report ⓘ

Jul 19, 2026 – 10:31 PM EDT

PDB ID : 9ZQR / pdb\_00009zqr  
EMDB ID : EMD-74576  
Title : Composite map of the bGDH di-hexamer in apo form  
Authors : Shan, Z.; Lyumkis, D.  
Deposited on : 2025-12-19  
Resolution : 2.90 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

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

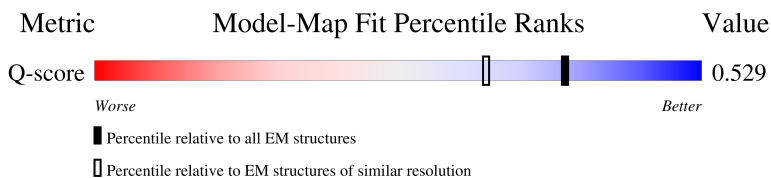
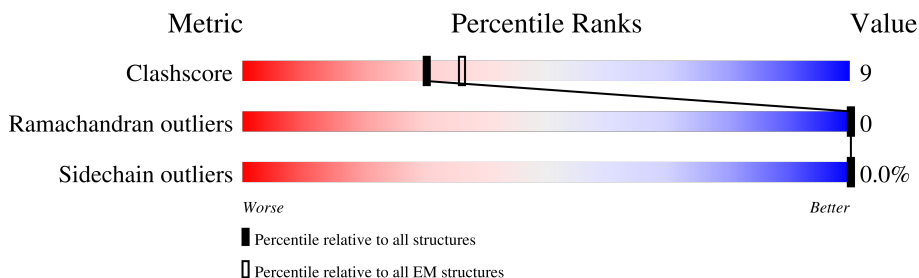
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 2.90 Å.

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



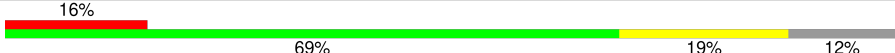
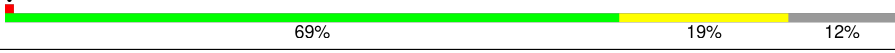
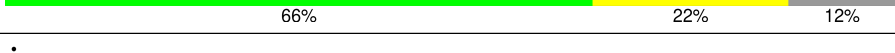
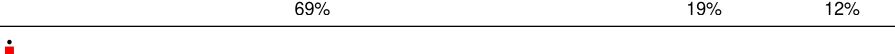
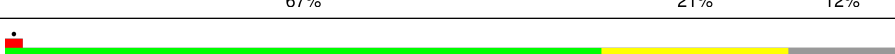
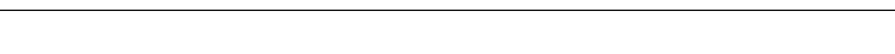
| Metric                | Whole archive<br>(#Entries) | EM structures<br>(#Entries) | Similar EM resolution<br>(#Entries, resolution range(Å)) |
|-----------------------|-----------------------------|-----------------------------|----------------------------------------------------------|
| Clashscore            | 229148                      | 23984                       | -                                                        |
| Ramachandran outliers | 224038                      | 23583                       | -                                                        |
| Sidechain outliers    | 223484                      | 23102                       | -                                                        |
| Q-score               | -                           | 25397                       | 13054 ( 2.40 - 3.40 )                                    |

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     | 558    | <div> <div>51%</div> <div>66%</div> <div>22%</div> <div>12%</div> </div> |
| 1   | B     | 558    | <div> <div>47%</div> <div>68%</div> <div>20%</div> <div>13%</div> </div> |
| 1   | C     | 558    | <div> <div>55%</div> <div>70%</div> <div>18%</div> <div>13%</div> </div> |
| 1   | D     | 558    | <div> <div>29%</div> <div>70%</div> <div>18%</div> <div>12%</div> </div> |

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| Mol | Chain | Length | Quality of chain                                                                   |
|-----|-------|--------|------------------------------------------------------------------------------------|
| 1   | E     | 558    |  |
| 1   | F     | 558    |  |
| 1   | G     | 558    |  |
| 1   | H     | 558    |  |
| 1   | I     | 558    |  |
| 1   | J     | 558    |  |
| 1   | K     | 558    |  |
| 1   | L     | 558    |  |

## 2 Entry composition

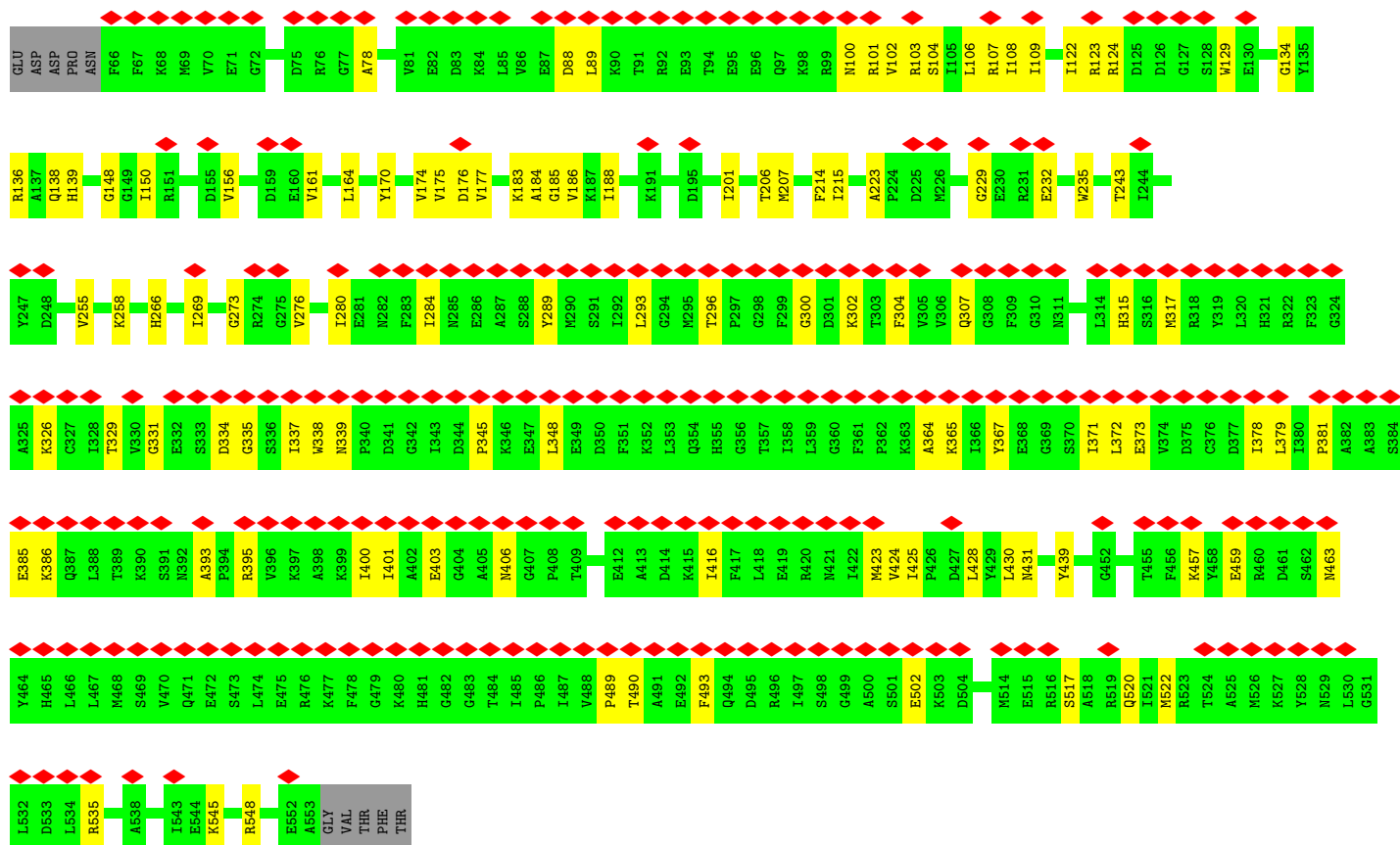
There is only 1 type of molecule in this entry. The entry contains 46047 atoms, of which 0 are hydrogens and 0 are deuteriums.

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.

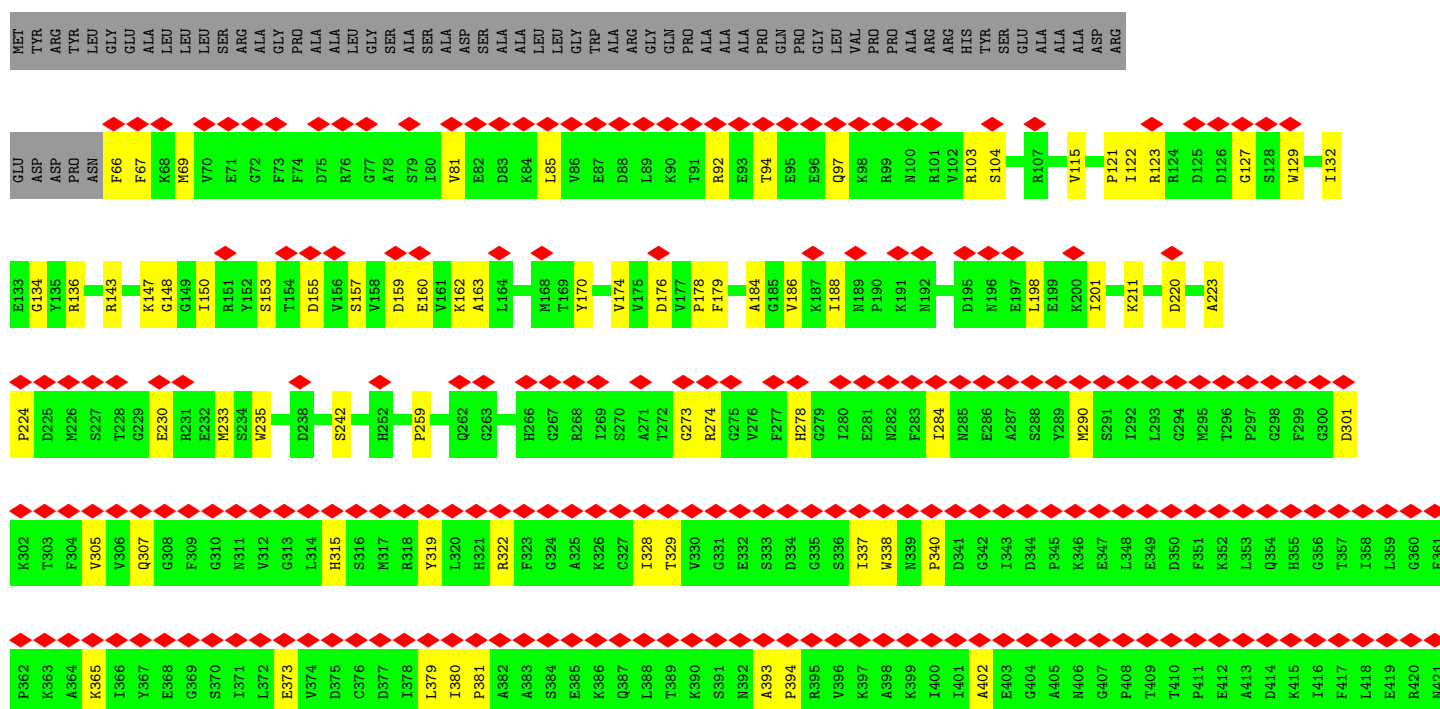
- Molecule 1 is a protein called Glutamate dehydrogenase 1, mitochondrial.

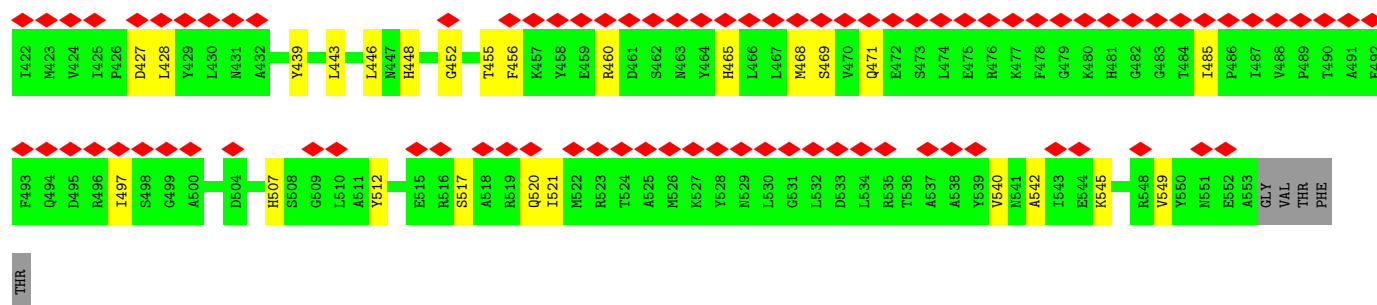
| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 1   | A     | 489      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3829  | 2421 | 672 | 717 | 19 |         |       |
| 1   | B     | 488      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3821  | 2417 | 670 | 715 | 19 |         |       |
| 1   | C     | 488      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3821  | 2417 | 670 | 715 | 19 |         |       |
| 1   | D     | 489      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3829  | 2421 | 672 | 717 | 19 |         |       |
| 1   | E     | 490      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3836  | 2426 | 673 | 718 | 19 |         |       |
| 1   | F     | 489      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3829  | 2421 | 672 | 717 | 19 |         |       |
| 1   | G     | 492      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3847  | 2433 | 675 | 720 | 19 |         |       |
| 1   | H     | 492      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3847  | 2433 | 675 | 720 | 19 |         |       |
| 1   | I     | 492      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3847  | 2433 | 675 | 720 | 19 |         |       |
| 1   | J     | 492      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3847  | 2433 | 675 | 720 | 19 |         |       |
| 1   | K     | 492      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3847  | 2433 | 675 | 720 | 19 |         |       |
| 1   | L     | 492      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3847  | 2433 | 675 | 720 | 19 |         |       |



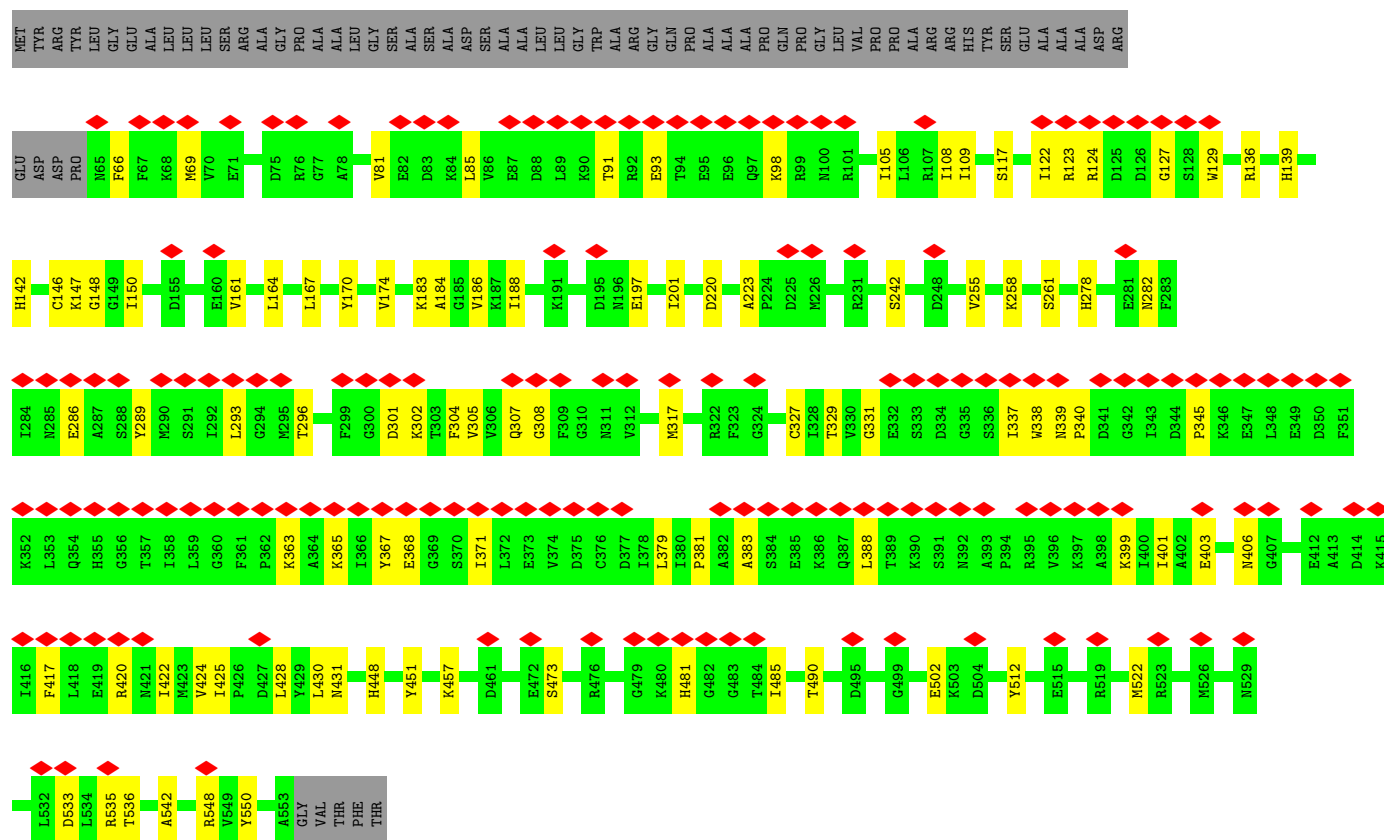


• Molecule 1: Glutamate dehydrogenase 1, mitochondrial

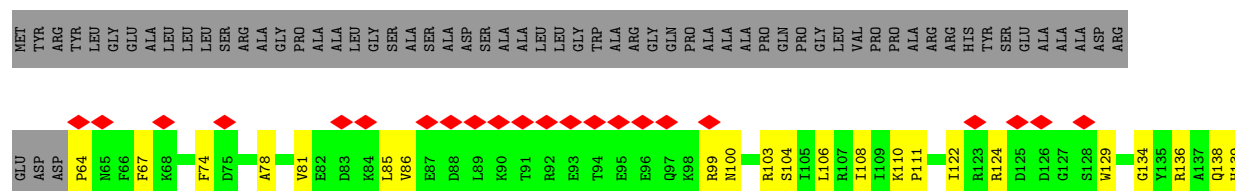




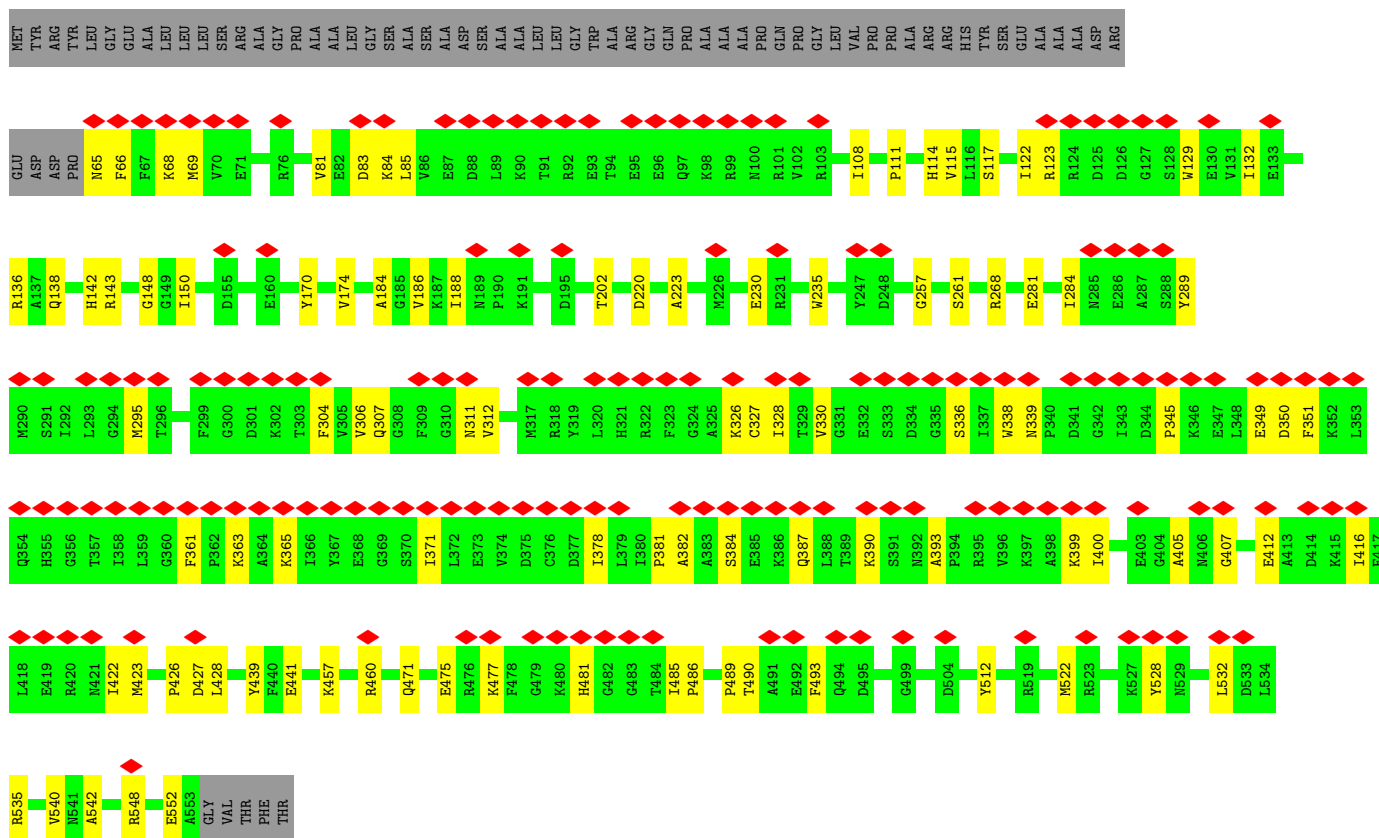
- Molecule 1: Glutamate dehydrogenase 1, mitochondrial



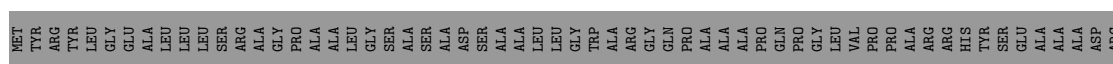
- Molecule 1: Glutamate dehydrogenase 1, mitochondrial



- Molecule 1: Glutamate dehydrogenase 1, mitochondrial

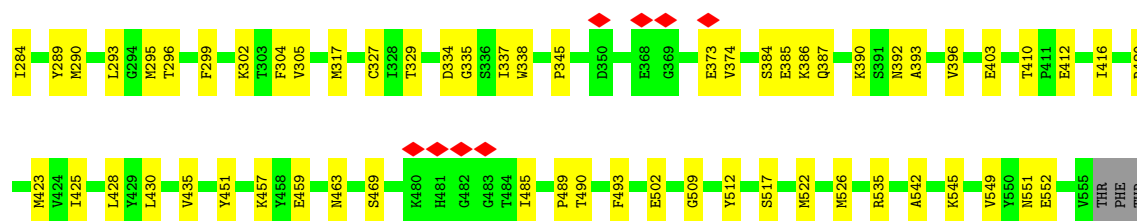


- Molecule 1: Glutamate dehydrogenase 1, mitochondrial



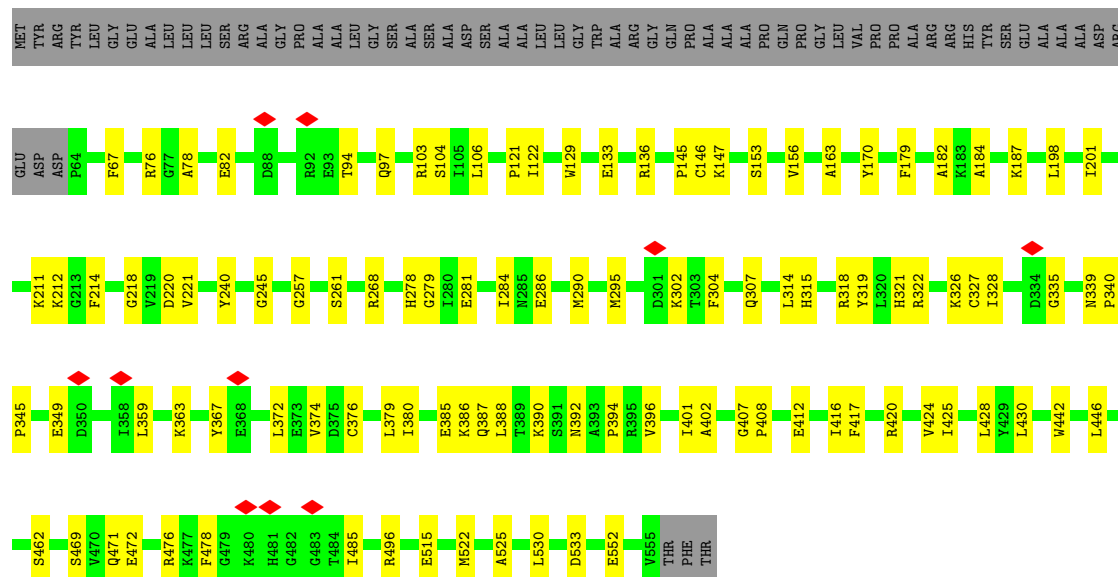






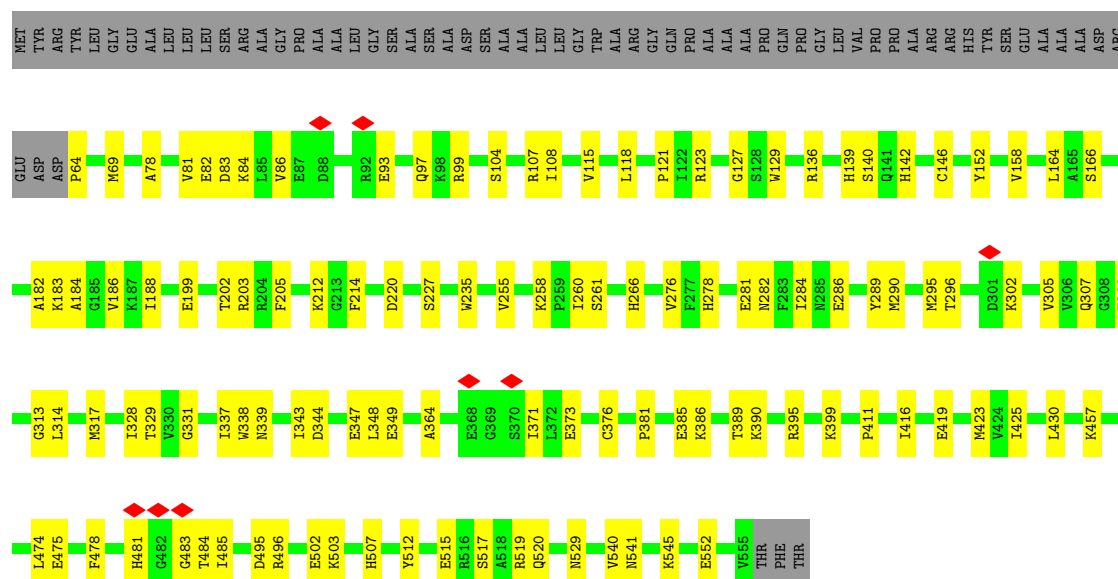
- Molecule 1: Glutamate dehydrogenase 1, mitochondrial

Chain J: 69% 19% 12%

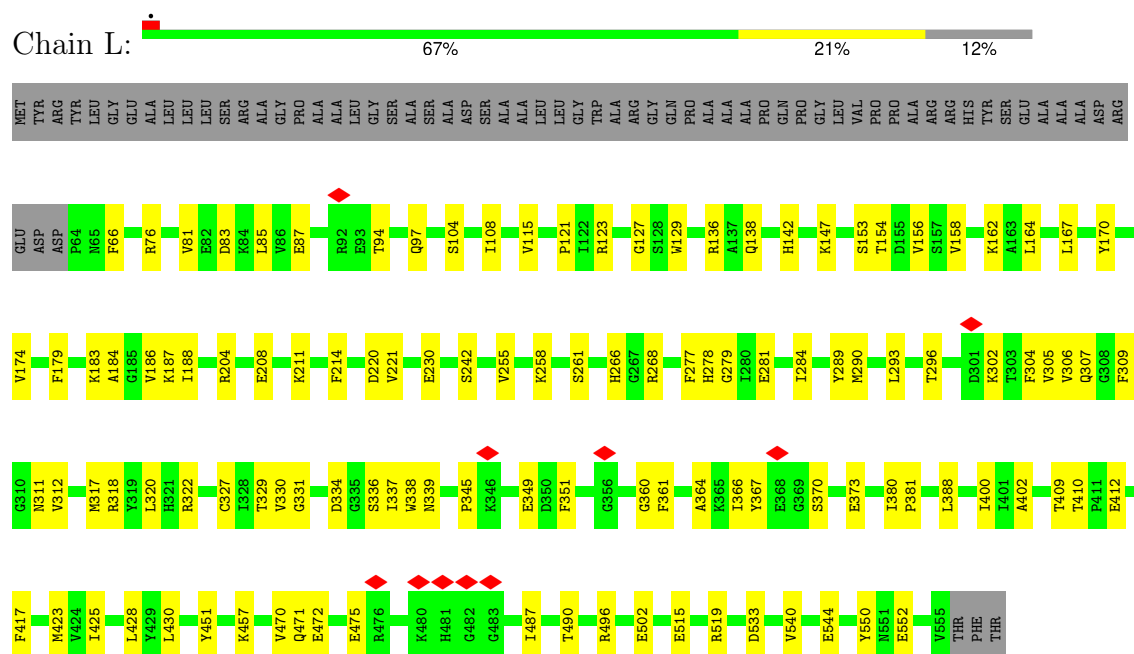


- Molecule 1: Glutamate dehydrogenase 1, mitochondrial

Chain K: 67% 21% 12%



- Molecule 1: Glutamate dehydrogenase 1, mitochondrial



## 4 Experimental information

| Property                             | Value                                   | Source    |
|--------------------------------------|-----------------------------------------|-----------|
| EM reconstruction method             | SINGLE PARTICLE                         | Depositor |
| Imposed symmetry                     | POINT, Not provided                     |           |
| Number of particles used             | 149135                                  | Depositor |
| Resolution determination method      | OTHER                                   | Depositor |
| CTF correction method                | PHASE FLIPPING AND AMPLITUDE CORRECTION | Depositor |
| Microscope                           | TFS KRIOS                               | Depositor |
| Voltage (kV)                         | 300                                     | Depositor |
| Electron dose ( $e^-/\text{\AA}^2$ ) | 40.4                                    | Depositor |
| Minimum defocus (nm)                 | 1000                                    | Depositor |
| Maximum defocus (nm)                 | 3000                                    | Depositor |
| Magnification                        | Not provided                            |           |
| Image detector                       | GATAN K3 (6k x 4k)                      | Depositor |
| Maximum map value                    | 3.328                                   | Depositor |
| Minimum map value                    | -0.564                                  | Depositor |
| Average map value                    | 0.023                                   | Depositor |
| Map value standard deviation         | 0.071                                   | Depositor |
| Recommended contour level            | 0.4                                     | Depositor |
| Map size (Å)                         | 419.8272, 419.8272, 419.8272            | wwPDB     |
| Map dimensions                       | 384, 384, 384                           | wwPDB     |
| Map angles (°)                       | 90.0, 90.0, 90.0                        | wwPDB     |
| Pixel spacing (Å)                    | 1.0933, 1.0933, 1.0933                  | Depositor |

## 5 Model quality [i](#)

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

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

| Mol | Chain | Bond lengths |         | Bond angles |         |
|-----|-------|--------------|---------|-------------|---------|
|     |       | RMSZ         | # Z  >5 | RMSZ        | # Z  >5 |
| 1   | A     | 0.11         | 0/3910  | 0.26        | 0/5277  |
| 1   | B     | 0.10         | 0/3902  | 0.23        | 0/5266  |
| 1   | C     | 0.09         | 0/3902  | 0.23        | 0/5266  |
| 1   | D     | 0.11         | 0/3910  | 0.23        | 0/5277  |
| 1   | E     | 0.11         | 0/3918  | 0.23        | 0/5288  |
| 1   | F     | 0.11         | 0/3910  | 0.24        | 0/5277  |
| 1   | G     | 0.20         | 0/3929  | 0.28        | 0/5303  |
| 1   | H     | 0.20         | 0/3929  | 0.27        | 0/5303  |
| 1   | I     | 0.20         | 0/3929  | 0.27        | 0/5303  |
| 1   | J     | 0.19         | 0/3929  | 0.27        | 0/5303  |
| 1   | K     | 0.20         | 0/3929  | 0.29        | 0/5303  |
| 1   | L     | 0.20         | 0/3929  | 0.27        | 0/5303  |
| All | All   | 0.16         | 0/47026 | 0.26        | 0/63469 |

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

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

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

| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 1   | A     | 3829  | 0        | 3802     | 87      | 0            |
| 1   | B     | 3821  | 0        | 3796     | 75      | 0            |
| 1   | C     | 3821  | 0        | 3796     | 69      | 0            |
| 1   | D     | 3829  | 0        | 3802     | 68      | 0            |

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| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 1   | E     | 3836  | 0        | 3810     | 77      | 0            |
| 1   | F     | 3829  | 0        | 3802     | 68      | 0            |
| 1   | G     | 3847  | 0        | 3822     | 69      | 0            |
| 1   | H     | 3847  | 0        | 3822     | 79      | 0            |
| 1   | I     | 3847  | 0        | 3822     | 81      | 0            |
| 1   | J     | 3847  | 0        | 3822     | 69      | 0            |
| 1   | K     | 3847  | 0        | 3822     | 87      | 0            |
| 1   | L     | 3847  | 0        | 3822     | 82      | 0            |
| All | All   | 46047 | 0        | 45740    | 830     | 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 9.

All (830) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:I:129:TRP:HB2  | 1:J:104:SER:HB3  | 1.57                     | 0.84              |
| 1:I:104:SER:HB3  | 1:J:129:TRP:HB2  | 1.59                     | 0.83              |
| 1:H:129:TRP:HB2  | 1:K:104:SER:HB3  | 1.61                     | 0.81              |
| 1:G:317:MET:HE2  | 1:G:345:PRO:HG3  | 1.64                     | 0.79              |
| 1:G:129:TRP:HB2  | 1:L:104:SER:HB3  | 1.64                     | 0.78              |
| 1:I:296:THR:O    | 1:I:302:LYS:NZ   | 2.17                     | 0.77              |
| 1:B:78:ALA:HB1   | 1:B:106:LEU:HD21 | 1.67                     | 0.76              |
| 1:F:136:ARG:HH21 | 1:F:220:ASP:HB3  | 1.53                     | 0.74              |
| 1:J:425:ILE:HG21 | 1:J:430:LEU:HD13 | 1.70                     | 0.74              |
| 1:L:329:THR:OG1  | 1:L:337:ILE:O    | 2.07                     | 0.73              |
| 1:C:329:THR:OG1  | 1:C:337:ILE:O    | 2.07                     | 0.73              |
| 1:L:296:THR:O    | 1:L:302:LYS:NZ   | 2.19                     | 0.73              |
| 1:H:329:THR:OG1  | 1:H:337:ILE:O    | 2.06                     | 0.72              |
| 1:K:289:TYR:HB3  | 1:K:423:MET:HE1  | 1.71                     | 0.72              |
| 1:H:211:LYS:NZ   | 1:L:242:SER:O    | 2.23                     | 0.72              |
| 1:J:339:ASN:ND2  | 1:J:363:LYS:O    | 2.19                     | 0.72              |
| 1:H:104:SER:HB3  | 1:K:129:TRP:HB2  | 1.72                     | 0.72              |
| 1:D:307:GLN:HB3  | 1:D:381:PRO:HA   | 1.72                     | 0.71              |
| 1:E:329:THR:OG1  | 1:E:337:ILE:O    | 2.07                     | 0.71              |
| 1:A:124:ARG:HG3  | 1:A:129:TRP:HA   | 1.70                     | 0.71              |
| 1:K:281:GLU:HA   | 1:K:284:ILE:HG22 | 1.72                     | 0.71              |
| 1:G:344:ASP:HB3  | 1:G:347:GLU:HG2  | 1.73                     | 0.71              |
| 1:L:318:ARG:NH2  | 1:L:349:GLU:OE1  | 2.23                     | 0.71              |
| 1:E:86:VAL:HG11  | 1:E:99:ARG:HD2   | 1.72                     | 0.71              |
| 1:A:403:GLU:OE2  | 1:A:535:ARG:NH2  | 2.24                     | 0.70              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:H:329:THR:HB   | 1:H:338:TRP:HD1  | 1.56                     | 0.70              |
| 1:K:83:ASP:OD2   | 1:K:84:LYS:N     | 2.24                     | 0.70              |
| 1:H:357:THR:HG22 | 1:H:359:LEU:H    | 1.57                     | 0.70              |
| 1:B:273:GLY:HA3  | 1:B:315:HIS:HB2  | 1.75                     | 0.69              |
| 1:G:278:HIS:O    | 1:G:282:ASN:ND2  | 2.25                     | 0.69              |
| 1:B:109:ILE:O    | 1:B:139:HIS:NE2  | 2.25                     | 0.69              |
| 1:B:296:THR:O    | 1:B:302:LYS:NZ   | 2.25                     | 0.69              |
| 1:G:519:ARG:NH2  | 1:G:522:MET:SD   | 2.66                     | 0.69              |
| 1:C:380:ILE:HG12 | 1:C:402:ALA:HB3  | 1.74                     | 0.69              |
| 1:F:399:LYS:HA   | 1:F:422:ILE:HD11 | 1.74                     | 0.68              |
| 1:J:462:SER:OG   | 1:L:496:ARG:NH1  | 2.26                     | 0.68              |
| 1:K:69:MET:HE2   | 1:K:411:PRO:HD3  | 1.75                     | 0.68              |
| 1:J:290:MET:HE1  | 1:J:295:MET:HE2  | 1.75                     | 0.68              |
| 1:K:307:GLN:HB3  | 1:K:381:PRO:HA   | 1.74                     | 0.68              |
| 1:E:423:MET:HE2  | 1:E:534:LEU:HD11 | 1.75                     | 0.68              |
| 1:H:278:HIS:O    | 1:H:282:ASN:ND2  | 2.27                     | 0.68              |
| 1:J:315:HIS:HD2  | 1:J:318:ARG:HH21 | 1.40                     | 0.68              |
| 1:A:136:ARG:NH2  | 1:A:220:ASP:OD1  | 2.26                     | 0.67              |
| 1:E:124:ARG:HG3  | 1:E:129:TRP:HA   | 1.75                     | 0.67              |
| 1:K:136:ARG:NH2  | 1:K:220:ASP:OD1  | 2.24                     | 0.67              |
| 1:E:122:ILE:HG21 | 1:E:201:ILE:HG12 | 1.76                     | 0.67              |
| 1:K:136:ARG:HD2  | 1:K:184:ALA:HB2  | 1.76                     | 0.67              |
| 1:L:471:GLN:OE1  | 1:L:487:ILE:N    | 2.26                     | 0.67              |
| 1:E:290:MET:HE3  | 1:E:295:MET:HB2  | 1.77                     | 0.67              |
| 1:B:136:ARG:HD3  | 1:B:184:ALA:HB2  | 1.77                     | 0.66              |
| 1:C:211:LYS:NZ   | 1:E:242:SER:O    | 2.26                     | 0.66              |
| 1:B:329:THR:HB   | 1:B:338:TRP:HD1  | 1.59                     | 0.66              |
| 1:G:195:ASP:OD2  | 1:I:92:ARG:NH2   | 2.29                     | 0.66              |
| 1:H:66:PHE:HD1   | 1:H:69:MET:HE3   | 1.61                     | 0.65              |
| 1:D:317:MET:HG2  | 1:D:345:PRO:HG3  | 1.77                     | 0.65              |
| 1:H:338:TRP:HB2  | 1:H:367:TYR:HB2  | 1.76                     | 0.65              |
| 1:C:136:ARG:HD3  | 1:C:184:ALA:HB2  | 1.79                     | 0.65              |
| 1:B:379:LEU:HG   | 1:B:381:PRO:HD3  | 1.79                     | 0.65              |
| 1:A:273:GLY:HA3  | 1:A:315:HIS:HB2  | 1.78                     | 0.65              |
| 1:J:281:GLU:HA   | 1:J:284:ILE:HG22 | 1.79                     | 0.65              |
| 1:K:296:THR:O    | 1:K:302:LYS:NZ   | 2.30                     | 0.65              |
| 1:C:176:ASP:OD1  | 1:C:545:LYS:NZ   | 2.30                     | 0.64              |
| 1:E:308:GLY:HA3  | 1:E:383:ALA:HB2  | 1.79                     | 0.64              |
| 1:G:373:GLU:OE2  | 1:G:395:ARG:NH1  | 2.30                     | 0.64              |
| 1:J:496:ARG:NH1  | 1:K:462:SER:OG   | 2.30                     | 0.64              |
| 1:G:151:ARG:NH1  | 1:G:160:GLU:OE2  | 2.30                     | 0.64              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:H:391:SER:O    | 1:H:395:ARG:NH2  | 2.31                     | 0.64              |
| 1:L:255:VAL:O    | 1:L:258:LYS:NZ   | 2.28                     | 0.64              |
| 1:E:136:ARG:HD3  | 1:E:184:ALA:HB2  | 1.80                     | 0.64              |
| 1:J:261:SER:OG   | 1:L:552:GLU:OE1  | 2.14                     | 0.64              |
| 1:L:290:MET:HE1  | 1:L:400:ILE:HD11 | 1.80                     | 0.64              |
| 1:H:230:GLU:OE1  | 1:H:268:ARG:NH2  | 2.31                     | 0.64              |
| 1:D:136:ARG:HD3  | 1:D:184:ALA:HB2  | 1.80                     | 0.64              |
| 1:H:281:GLU:HA   | 1:H:284:ILE:HG22 | 1.79                     | 0.63              |
| 1:J:295:MET:HE3  | 1:J:302:LYS:HE3  | 1.81                     | 0.63              |
| 1:J:394:PRO:O    | 1:J:420:ARG:NH1  | 2.32                     | 0.63              |
| 1:F:123:ARG:HA   | 1:F:129:TRP:HB3  | 1.79                     | 0.63              |
| 1:C:104:SER:OG   | 1:D:129:TRP:O    | 2.16                     | 0.63              |
| 1:D:123:ARG:HH21 | 1:D:127:GLY:HA2  | 1.63                     | 0.63              |
| 1:B:329:THR:OG1  | 1:B:337:ILE:O    | 2.14                     | 0.63              |
| 1:L:154:THR:O    | 1:L:187:LYS:NZ   | 2.32                     | 0.63              |
| 1:D:91:THR:OG1   | 1:D:98:LYS:NZ    | 2.27                     | 0.62              |
| 1:B:385:GLU:HG3  | 1:B:386:LYS:HG2  | 1.81                     | 0.62              |
| 1:L:329:THR:HB   | 1:L:338:TRP:HD1  | 1.64                     | 0.62              |
| 1:A:307:GLN:HB3  | 1:A:381:PRO:HA   | 1.82                     | 0.62              |
| 1:B:174:VAL:HG13 | 1:B:175:VAL:HG13 | 1.82                     | 0.62              |
| 1:A:377:ASP:OD1  | 1:A:399:LYS:NZ   | 2.27                     | 0.62              |
| 1:B:490:THR:HG21 | 1:C:468:MET:HE1  | 1.79                     | 0.62              |
| 1:G:423:MET:HE3  | 1:G:425:ILE:HD11 | 1.82                     | 0.62              |
| 1:B:373:GLU:OE2  | 1:B:395:ARG:NH1  | 2.32                     | 0.62              |
| 1:J:515:GLU:OE1  | 1:K:457:LYS:NZ   | 2.27                     | 0.62              |
| 1:A:512:TYR:HB2  | 1:B:457:LYS:HB2  | 1.81                     | 0.62              |
| 1:D:136:ARG:NH2  | 1:D:220:ASP:OD2  | 2.32                     | 0.62              |
| 1:A:427:ASP:OD1  | 1:A:535:ARG:NH1  | 2.33                     | 0.62              |
| 1:K:202:THR:HG21 | 1:K:235:TRP:HE3  | 1.63                     | 0.62              |
| 1:L:123:ARG:NH1  | 1:L:127:GLY:O    | 2.32                     | 0.62              |
| 1:H:403:GLU:OE2  | 1:H:535:ARG:NH2  | 2.33                     | 0.61              |
| 1:I:385:GLU:HG2  | 1:I:386:LYS:HG2  | 1.82                     | 0.61              |
| 1:C:122:ILE:HG21 | 1:C:201:ILE:HG12 | 1.82                     | 0.61              |
| 1:B:207:MET:HE2  | 1:B:243:THR:HG21 | 1.81                     | 0.61              |
| 1:H:451:TYR:HB2  | 1:H:502:GLU:HG3  | 1.81                     | 0.61              |
| 1:C:230:GLU:HB3  | 1:C:259:PRO:HG3  | 1.83                     | 0.61              |
| 1:F:471:GLN:NE2  | 1:F:485:ILE:O    | 2.34                     | 0.61              |
| 1:I:290:MET:HE1  | 1:I:295:MET:HE3  | 1.83                     | 0.61              |
| 1:B:156:VAL:HG21 | 1:B:185:GLY:HA3  | 1.83                     | 0.61              |
| 1:H:136:ARG:NH2  | 1:H:220:ASP:OD1  | 2.32                     | 0.61              |
| 1:A:457:LYS:HB2  | 1:C:512:TYR:HB2  | 1.82                     | 0.61              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:E:170:TYR:HB2  | 1:E:428:LEU:HD11 | 1.83                     | 0.61              |
| 1:J:326:LYS:NZ   | 1:J:340:PRO:O    | 2.31                     | 0.61              |
| 1:D:261:SER:HB3  | 1:F:548:ARG:HE   | 1.64                     | 0.61              |
| 1:D:286:GLU:HG3  | 1:D:522:MET:HE3  | 1.81                     | 0.61              |
| 1:H:207:MET:HE1  | 1:H:243:THR:HG21 | 1.82                     | 0.61              |
| 1:J:472:GLU:OE2  | 1:J:476:ARG:NH2  | 2.34                     | 0.60              |
| 1:K:512:TYR:HB2  | 1:L:457:LYS:HB2  | 1.83                     | 0.60              |
| 1:L:351:PHE:HD1  | 1:L:361:PHE:HD1  | 1.49                     | 0.60              |
| 1:F:378:ILE:HD13 | 1:F:400:ILE:HB   | 1.84                     | 0.60              |
| 1:B:104:SER:OG   | 1:E:129:TRP:O    | 2.19                     | 0.60              |
| 1:B:489:PRO:HB3  | 1:B:493:PHE:HD2  | 1.65                     | 0.60              |
| 1:G:305:VAL:HG13 | 1:G:329:THR:HG23 | 1.83                     | 0.60              |
| 1:B:317:MET:HE1  | 1:B:348:LEU:HD23 | 1.84                     | 0.60              |
| 1:D:186:VAL:HG23 | 1:D:188:ILE:HG12 | 1.84                     | 0.60              |
| 1:A:258:LYS:NZ   | 1:A:441:GLU:OE2  | 2.34                     | 0.60              |
| 1:A:275:GLY:HA2  | 1:A:510:LEU:HD21 | 1.83                     | 0.60              |
| 1:G:309:PHE:HE2  | 1:G:330:VAL:HB   | 1.65                     | 0.60              |
| 1:H:296:THR:O    | 1:H:302:LYS:NZ   | 2.27                     | 0.60              |
| 1:G:329:THR:HB   | 1:G:338:TRP:HD1  | 1.66                     | 0.60              |
| 1:G:339:ASN:ND2  | 1:G:363:LYS:O    | 2.34                     | 0.60              |
| 1:D:278:HIS:O    | 1:D:282:ASN:ND2  | 2.35                     | 0.60              |
| 1:B:229:GLY:N    | 1:B:232:GLU:OE2  | 2.35                     | 0.59              |
| 1:D:296:THR:O    | 1:D:302:LYS:NZ   | 2.31                     | 0.59              |
| 1:B:307:GLN:HB3  | 1:B:381:PRO:HA   | 1.84                     | 0.59              |
| 1:G:186:VAL:HG23 | 1:G:188:ILE:HG12 | 1.84                     | 0.59              |
| 1:L:136:ARG:NH2  | 1:L:220:ASP:OD1  | 2.31                     | 0.59              |
| 1:A:363:LYS:HD2  | 1:A:363:LYS:O    | 2.02                     | 0.59              |
| 1:B:161:VAL:HG13 | 1:B:183:LYS:HB3  | 1.85                     | 0.59              |
| 1:C:115:VAL:HB   | 1:D:117:SER:HB2  | 1.85                     | 0.59              |
| 1:H:154:THR:O    | 1:H:187:LYS:NZ   | 2.35                     | 0.59              |
| 1:L:164:LEU:HD13 | 1:L:183:LYS:HE3  | 1.85                     | 0.59              |
| 1:H:242:SER:O    | 1:L:211:LYS:NZ   | 2.34                     | 0.59              |
| 1:H:108:ILE:HG12 | 1:K:121:PRO:HB3  | 1.85                     | 0.58              |
| 1:E:124:ARG:H    | 1:E:129:TRP:HB3  | 1.67                     | 0.58              |
| 1:F:150:ILE:HG12 | 1:F:184:ALA:HB3  | 1.85                     | 0.58              |
| 1:J:94:THR:HG23  | 1:J:97:GLN:H     | 1.67                     | 0.58              |
| 1:A:81:VAL:HB    | 1:A:540:VAL:HG13 | 1.85                     | 0.58              |
| 1:D:66:PHE:HA    | 1:D:69:MET:HE2   | 1.85                     | 0.58              |
| 1:A:361:PHE:HB3  | 1:A:364:ALA:HB3  | 1.85                     | 0.58              |
| 1:A:389:THR:OG1  | 1:A:392:ASN:OD1  | 2.21                     | 0.58              |
| 1:F:382:ALA:HA   | 1:F:405:ALA:HB2  | 1.84                     | 0.58              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:F:307:GLN:HB3  | 1:F:381:PRO:HA   | 1.86                     | 0.58              |
| 1:B:379:LEU:HD23 | 1:B:401:ILE:HG23 | 1.86                     | 0.58              |
| 1:D:261:SER:OG   | 1:F:552:GLU:OE1  | 2.20                     | 0.58              |
| 1:F:136:ARG:HD3  | 1:F:184:ALA:HB2  | 1.86                     | 0.58              |
| 1:G:261:SER:OG   | 1:I:552:GLU:OE1  | 2.18                     | 0.58              |
| 1:K:186:VAL:HG23 | 1:K:188:ILE:HG12 | 1.86                     | 0.58              |
| 1:L:186:VAL:HG23 | 1:L:188:ILE:HG12 | 1.86                     | 0.58              |
| 1:B:176:ASP:OD1  | 1:B:545:LYS:NZ   | 2.36                     | 0.58              |
| 1:E:78:ALA:HB1   | 1:E:106:LEU:HD13 | 1.85                     | 0.58              |
| 1:L:311:ASN:OD1  | 1:L:312:VAL:N    | 2.36                     | 0.58              |
| 1:H:317:MET:HE3  | 1:H:345:PRO:HA   | 1.84                     | 0.58              |
| 1:A:293:LEU:HG   | 1:A:423:MET:HE3  | 1.86                     | 0.57              |
| 1:E:284:ILE:HD11 | 1:E:302:LYS:HD2  | 1.85                     | 0.57              |
| 1:E:329:THR:HG21 | 1:E:374:VAL:HG11 | 1.85                     | 0.57              |
| 1:L:317:MET:HE2  | 1:L:345:PRO:HG3  | 1.84                     | 0.57              |
| 1:A:93:GLU:HB3   | 1:A:98:LYS:HD3   | 1.86                     | 0.57              |
| 1:A:104:SER:OG   | 1:F:129:TRP:O    | 2.22                     | 0.57              |
| 1:D:293:LEU:HD13 | 1:D:399:LYS:HG2  | 1.87                     | 0.57              |
| 1:I:403:GLU:OE2  | 1:I:535:ARG:NH2  | 2.37                     | 0.57              |
| 1:E:100:ASN:OD1  | 1:E:103:ARG:NH2  | 2.37                     | 0.57              |
| 1:I:281:GLU:HA   | 1:I:284:ILE:HG22 | 1.86                     | 0.57              |
| 1:A:81:VAL:HG22  | 1:A:85:LEU:HG    | 1.86                     | 0.57              |
| 1:E:512:TYR:HB2  | 1:F:457:LYS:HB2  | 1.86                     | 0.57              |
| 1:F:423:MET:HB2  | 1:F:532:LEU:HD13 | 1.85                     | 0.57              |
| 1:G:202:THR:HG21 | 1:G:235:TRP:HE3  | 1.68                     | 0.57              |
| 1:I:230:GLU:HG3  | 1:I:259:PRO:HG3  | 1.86                     | 0.57              |
| 1:A:186:VAL:HG23 | 1:A:188:ILE:HG12 | 1.87                     | 0.57              |
| 1:C:143:ARG:HD3  | 1:C:178:PRO:HA   | 1.87                     | 0.57              |
| 1:A:147:LYS:NZ   | 1:A:438:SER:OG   | 2.37                     | 0.57              |
| 1:D:473:SER:OG   | 1:F:486:PRO:O    | 2.23                     | 0.57              |
| 1:A:136:ARG:HD3  | 1:A:184:ALA:HB2  | 1.87                     | 0.57              |
| 1:G:104:SER:OG   | 1:L:129:TRP:HB2  | 2.05                     | 0.57              |
| 1:H:202:THR:HG21 | 1:H:235:TRP:HE3  | 1.70                     | 0.57              |
| 1:I:95:GLU:OE2   | 1:I:99:ARG:NH1   | 2.38                     | 0.57              |
| 1:H:170:TYR:HB2  | 1:H:428:LEU:HD11 | 1.87                     | 0.56              |
| 1:A:122:ILE:HG21 | 1:A:201:ILE:HD13 | 1.88                     | 0.56              |
| 1:A:293:LEU:HB3  | 1:A:295:MET:HE1  | 1.86                     | 0.56              |
| 1:I:136:ARG:HD3  | 1:I:184:ALA:HB2  | 1.87                     | 0.56              |
| 1:J:136:ARG:HH21 | 1:J:220:ASP:CG   | 2.13                     | 0.56              |
| 1:J:335:GLY:HA3  | 1:J:359:LEU:HD21 | 1.86                     | 0.56              |
| 1:G:307:GLN:HG3  | 1:G:371:ILE:HG21 | 1.86                     | 0.56              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:H:373:GLU:OE2  | 1:H:395:ARG:NH1  | 2.39                     | 0.56              |
| 1:B:88:ASP:OD2   | 1:B:548:ARG:NH2  | 2.39                     | 0.56              |
| 1:F:138:GLN:NE2  | 1:F:220:ASP:OD2  | 2.38                     | 0.56              |
| 1:F:384:SER:OG   | 1:F:387:GLN:OE1  | 2.23                     | 0.56              |
| 1:I:305:VAL:HG22 | 1:I:329:THR:HG22 | 1.88                     | 0.56              |
| 1:K:313:GLY:O    | 1:K:317:MET:HG2  | 2.05                     | 0.56              |
| 1:K:337:ILE:HD11 | 1:K:348:LEU:HD11 | 1.88                     | 0.56              |
| 1:L:138:GLN:NE2  | 1:L:220:ASP:OD2  | 2.35                     | 0.56              |
| 1:L:170:TYR:HB2  | 1:L:428:LEU:HD11 | 1.86                     | 0.56              |
| 1:C:307:GLN:HB3  | 1:C:381:PRO:HA   | 1.86                     | 0.56              |
| 1:C:174:VAL:HG13 | 1:C:521:ILE:HD11 | 1.88                     | 0.56              |
| 1:E:373:GLU:OE2  | 1:E:395:ARG:NH1  | 2.38                     | 0.56              |
| 1:K:344:ASP:HB3  | 1:K:347:GLU:HG2  | 1.88                     | 0.56              |
| 1:H:307:GLN:HB3  | 1:H:381:PRO:HA   | 1.87                     | 0.56              |
| 1:B:338:TRP:HB2  | 1:B:367:TYR:HB2  | 1.88                     | 0.56              |
| 1:B:459:GLU:OE1  | 1:B:463:ASN:ND2  | 2.39                     | 0.56              |
| 1:F:528:TYR:HE2  | 1:F:540:VAL:HG11 | 1.71                     | 0.56              |
| 1:G:71:GLU:OE1   | 1:G:110:LYS:HE2  | 2.05                     | 0.56              |
| 1:A:417:PHE:HD1  | 1:A:422:ILE:HG21 | 1.70                     | 0.56              |
| 1:G:153:SER:HB3  | 1:G:156:VAL:HG13 | 1.87                     | 0.56              |
| 1:F:281:GLU:HA   | 1:F:284:ILE:HG22 | 1.89                     | 0.55              |
| 1:K:329:THR:HB   | 1:K:338:TRP:HD1  | 1.71                     | 0.55              |
| 1:A:174:VAL:HG11 | 1:A:429:TYR:HB2  | 1.88                     | 0.55              |
| 1:E:385:GLU:HG3  | 1:E:386:LYS:HG2  | 1.87                     | 0.55              |
| 1:H:129:TRP:O    | 1:K:107:ARG:NH1  | 2.38                     | 0.55              |
| 1:L:158:VAL:HG12 | 1:L:162:LYS:HD3  | 1.88                     | 0.55              |
| 1:E:150:ILE:HG12 | 1:E:184:ALA:HB3  | 1.89                     | 0.55              |
| 1:A:405:ALA:HB3  | 1:A:408:PRO:HG3  | 1.89                     | 0.55              |
| 1:G:229:GLY:O    | 1:G:233:MET:HG2  | 2.06                     | 0.55              |
| 1:L:281:GLU:HA   | 1:L:284:ILE:HG22 | 1.86                     | 0.55              |
| 1:B:108:ILE:HD11 | 1:E:129:TRP:HZ3  | 1.71                     | 0.55              |
| 1:G:403:GLU:OE1  | 1:G:535:ARG:NH2  | 2.28                     | 0.55              |
| 1:J:207:MET:O    | 1:J:211:LYS:HG2  | 2.06                     | 0.55              |
| 1:B:406:ASN:OD1  | 1:B:431:ASN:ND2  | 2.39                     | 0.55              |
| 1:D:512:TYR:HB2  | 1:E:457:LYS:HB2  | 1.87                     | 0.55              |
| 1:G:136:ARG:HH21 | 1:G:220:ASP:CG   | 2.14                     | 0.55              |
| 1:I:136:ARG:HH21 | 1:I:220:ASP:CG   | 2.15                     | 0.55              |
| 1:I:289:TYR:HB3  | 1:I:423:MET:HE1  | 1.88                     | 0.55              |
| 1:D:403:GLU:OE2  | 1:D:535:ARG:NH2  | 2.39                     | 0.55              |
| 1:B:317:MET:HE3  | 1:B:345:PRO:HB3  | 1.89                     | 0.55              |
| 1:F:390:LYS:HB2  | 1:F:412:GLU:HG3  | 1.89                     | 0.55              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:I:393:ALA:O    | 1:I:420:ARG:NH1  | 2.40                     | 0.55              |
| 1:F:471:GLN:O    | 1:F:475:GLU:HG2  | 2.07                     | 0.55              |
| 1:B:425:ILE:HG21 | 1:B:430:LEU:HD13 | 1.88                     | 0.54              |
| 1:H:138:GLN:NE2  | 1:H:220:ASP:OD2  | 2.31                     | 0.54              |
| 1:A:91:THR:OG1   | 1:A:98:LYS:NZ    | 2.39                     | 0.54              |
| 1:A:393:ALA:HB3  | 1:A:416:ILE:HD11 | 1.89                     | 0.54              |
| 1:A:461:ASP:O    | 1:A:465:HIS:ND1  | 2.41                     | 0.54              |
| 1:D:339:ASN:ND2  | 1:D:363:LYS:O    | 2.40                     | 0.54              |
| 1:G:286:GLU:HG2  | 1:G:289:TYR:HD2  | 1.72                     | 0.54              |
| 1:H:136:ARG:HH21 | 1:H:220:ASP:CG   | 2.15                     | 0.54              |
| 1:I:202:THR:HG21 | 1:I:235:TRP:HE3  | 1.72                     | 0.54              |
| 1:F:186:VAL:HG23 | 1:F:188:ILE:HG12 | 1.89                     | 0.54              |
| 1:I:255:VAL:O    | 1:I:258:LYS:NZ   | 2.41                     | 0.54              |
| 1:A:211:LYS:NZ   | 1:D:242:SER:O    | 2.40                     | 0.54              |
| 1:C:328:ILE:HG13 | 1:C:340:PRO:HA   | 1.90                     | 0.54              |
| 1:H:314:LEU:HD11 | 1:H:349:GLU:HG3  | 1.89                     | 0.54              |
| 1:J:78:ALA:HB1   | 1:J:106:LEU:HD13 | 1.90                     | 0.54              |
| 1:H:121:PRO:HB3  | 1:K:108:ILE:HG12 | 1.90                     | 0.54              |
| 1:I:425:ILE:HG21 | 1:I:430:LEU:HD13 | 1.89                     | 0.54              |
| 1:B:150:ILE:HG12 | 1:B:184:ALA:HB3  | 1.90                     | 0.54              |
| 1:E:138:GLN:OE1  | 1:E:141:GLN:NE2  | 2.41                     | 0.54              |
| 1:I:130:GLU:OE2  | 1:I:193:TYR:OH   | 2.19                     | 0.54              |
| 1:K:123:ARG:HH21 | 1:K:127:GLY:HA2  | 1.73                     | 0.54              |
| 1:E:288:SER:HB3  | 1:K:483:GLY:HA3  | 1.90                     | 0.54              |
| 1:G:457:LYS:HB2  | 1:I:512:TYR:HB2  | 1.89                     | 0.54              |
| 1:A:138:GLN:OE1  | 1:A:141:GLN:NE2  | 2.41                     | 0.54              |
| 1:A:306:VAL:HG22 | 1:A:380:ILE:HD12 | 1.90                     | 0.54              |
| 1:B:100:ASN:OD1  | 1:B:103:ARG:NH2  | 2.40                     | 0.54              |
| 1:C:136:ARG:NH2  | 1:C:220:ASP:OD2  | 2.30                     | 0.54              |
| 1:J:396:VAL:O    | 1:J:420:ARG:NH2  | 2.40                     | 0.54              |
| 1:A:124:ARG:H    | 1:A:129:TRP:HB3  | 1.73                     | 0.53              |
| 1:B:108:ILE:HD11 | 1:E:129:TRP:CZ3  | 2.42                     | 0.53              |
| 1:E:230:GLU:HB3  | 1:E:259:PRO:HG3  | 1.89                     | 0.53              |
| 1:E:266:HIS:ND1  | 1:E:502:GLU:OE2  | 2.37                     | 0.53              |
| 1:J:147:LYS:HD2  | 1:J:221:VAL:HB   | 1.89                     | 0.53              |
| 1:B:170:TYR:HB2  | 1:B:428:LEU:HD11 | 1.91                     | 0.53              |
| 1:H:393:ALA:O    | 1:H:420:ARG:NH1  | 2.41                     | 0.53              |
| 1:D:329:THR:HB   | 1:D:338:TRP:HD1  | 1.73                     | 0.53              |
| 1:D:457:LYS:HB2  | 1:F:512:TYR:HB2  | 1.91                     | 0.53              |
| 1:F:338:TRP:HB3  | 1:F:365:LYS:HE3  | 1.90                     | 0.53              |
| 1:A:339:ASN:HB2  | 1:A:364:ALA:HA   | 1.90                     | 0.53              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:L:307:GLN:HB3  | 1:L:381:PRO:HA   | 1.91                     | 0.53              |
| 1:L:470:VAL:HG12 | 1:L:487:ILE:HG13 | 1.91                     | 0.53              |
| 1:B:232:GLU:HA   | 1:B:235:TRP:CE3  | 2.44                     | 0.53              |
| 1:E:552:GLU:OE1  | 1:F:261:SER:OG   | 2.24                     | 0.53              |
| 1:G:230:GLU:HB3  | 1:G:259:PRO:HG3  | 1.90                     | 0.53              |
| 1:B:284:ILE:HD11 | 1:B:302:LYS:HG2  | 1.91                     | 0.53              |
| 1:E:468:MET:HE3  | 1:E:472:GLU:HB2  | 1.91                     | 0.53              |
| 1:F:174:VAL:HG23 | 1:F:542:ALA:HB2  | 1.90                     | 0.53              |
| 1:L:204:ARG:O    | 1:L:208:GLU:HG2  | 2.09                     | 0.53              |
| 1:E:307:GLN:HB3  | 1:E:381:PRO:HA   | 1.89                     | 0.52              |
| 1:G:496:ARG:NH1  | 1:H:462:SER:OG   | 2.36                     | 0.52              |
| 1:K:93:GLU:HB3   | 1:K:97:GLN:HB2   | 1.89                     | 0.52              |
| 1:L:410:THR:HG22 | 1:L:412:GLU:H    | 1.74                     | 0.52              |
| 1:G:384:SER:OG   | 1:G:387:GLN:OE1  | 2.27                     | 0.52              |
| 1:D:255:VAL:O    | 1:D:258:LYS:NZ   | 2.37                     | 0.52              |
| 1:J:552:GLU:OE1  | 1:K:261:SER:OG   | 2.19                     | 0.52              |
| 1:K:123:ARG:HD3  | 1:K:129:TRP:CZ2  | 2.45                     | 0.52              |
| 1:A:282:ASN:HD22 | 1:A:518:ALA:HB3  | 1.74                     | 0.52              |
| 1:E:290:MET:HE1  | 1:E:295:MET:HE3  | 1.91                     | 0.52              |
| 1:A:86:VAL:HG21  | 1:A:99:ARG:HD2   | 1.91                     | 0.52              |
| 1:I:230:GLU:OE1  | 1:I:268:ARG:NH2  | 2.43                     | 0.52              |
| 1:K:425:ILE:HG21 | 1:K:430:LEU:HD13 | 1.92                     | 0.52              |
| 1:E:230:GLU:OE2  | 1:E:268:ARG:NH2  | 2.42                     | 0.52              |
| 1:H:105:ILE:HA   | 1:H:108:ILE:HD12 | 1.91                     | 0.52              |
| 1:I:396:VAL:O    | 1:I:420:ARG:NH2  | 2.41                     | 0.52              |
| 1:L:284:ILE:HD11 | 1:L:302:LYS:HG2  | 1.91                     | 0.52              |
| 1:E:361:PHE:HB3  | 1:E:364:ALA:HB3  | 1.92                     | 0.52              |
| 1:J:82:GLU:OE2   | 1:J:103:ARG:NE   | 2.43                     | 0.52              |
| 1:J:136:ARG:NH2  | 1:J:220:ASP:OD1  | 2.36                     | 0.52              |
| 1:K:290:MET:HE1  | 1:K:295:MET:HE3  | 1.91                     | 0.52              |
| 1:B:186:VAL:HG23 | 1:B:188:ILE:HG12 | 1.92                     | 0.52              |
| 1:I:384:SER:OG   | 1:I:387:GLN:OE1  | 2.24                     | 0.52              |
| 1:A:379:LEU:HD23 | 1:A:401:ILE:HG23 | 1.92                     | 0.51              |
| 1:C:273:GLY:HA3  | 1:C:315:HIS:HB3  | 1.93                     | 0.51              |
| 1:H:146:CYS:HB3  | 1:H:182:ALA:HB2  | 1.92                     | 0.51              |
| 1:J:471:GLN:HG3  | 1:J:485:ILE:O    | 2.11                     | 0.51              |
| 1:E:290:MET:CE   | 1:E:295:MET:HB2  | 2.39                     | 0.51              |
| 1:G:334:ASP:OD1  | 1:G:335:GLY:N    | 2.44                     | 0.51              |
| 1:J:314:LEU:HD11 | 1:J:349:GLU:HG2  | 1.92                     | 0.51              |
| 1:C:174:VAL:HG23 | 1:C:542:ALA:HB2  | 1.92                     | 0.51              |
| 1:F:148:GLY:O    | 1:F:223:ALA:N    | 2.43                     | 0.51              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:F:490:THR:HG23 | 1:F:493:PHE:H    | 1.75                     | 0.51              |
| 1:A:159:ASP:OD1  | 1:A:160:GLU:N    | 2.43                     | 0.51              |
| 1:H:81:VAL:HG22  | 1:H:85:LEU:HG    | 1.91                     | 0.51              |
| 1:B:300:GLY:O    | 1:B:326:LYS:NZ   | 2.44                     | 0.51              |
| 1:C:170:TYR:HB2  | 1:C:428:LEU:HD11 | 1.91                     | 0.51              |
| 1:D:451:TYR:HB2  | 1:D:502:GLU:HG3  | 1.92                     | 0.51              |
| 1:E:471:GLN:HG3  | 1:E:485:ILE:O    | 2.09                     | 0.51              |
| 1:K:389:THR:HG22 | 1:K:390:LYS:H    | 1.75                     | 0.51              |
| 1:H:339:ASN:ND2  | 1:H:363:LYS:O    | 2.40                     | 0.51              |
| 1:I:151:ARG:NH1  | 1:I:160:GLU:OE2  | 2.44                     | 0.51              |
| 1:D:142:HIS:HB3  | 1:D:550:TYR:CE1  | 2.46                     | 0.51              |
| 1:L:329:THR:HB   | 1:L:338:TRP:CD1  | 2.45                     | 0.51              |
| 1:H:305:VAL:HG22 | 1:H:329:THR:HG22 | 1.93                     | 0.51              |
| 1:G:104:SER:HA   | 1:G:107:ARG:HG2  | 1.93                     | 0.51              |
| 1:G:290:MET:HE3  | 1:G:295:MET:HG3  | 1.93                     | 0.51              |
| 1:G:454:LEU:HD23 | 1:I:509:GLY:HA3  | 1.93                     | 0.51              |
| 1:K:64:PRO:O     | 1:K:386:LYS:HE3  | 2.11                     | 0.51              |
| 1:F:457:LYS:HD2  | 1:F:460:ARG:HD2  | 1.92                     | 0.50              |
| 1:I:124:ARG:NH2  | 1:I:197:GLU:OE1  | 2.43                     | 0.50              |
| 1:I:522:MET:HB3  | 1:I:526:MET:HE1  | 1.93                     | 0.50              |
| 1:A:321:HIS:ND1  | 1:A:345:PRO:HD3  | 2.27                     | 0.50              |
| 1:A:437:VAL:HG23 | 1:A:510:LEU:HD12 | 1.92                     | 0.50              |
| 1:H:371:ILE:HG23 | 1:H:372:LEU:HD22 | 1.92                     | 0.50              |
| 1:J:304:PHE:CZ   | 1:J:327:CYS:HB2  | 2.47                     | 0.50              |
| 1:D:425:ILE:HG21 | 1:D:430:LEU:HD13 | 1.92                     | 0.50              |
| 1:J:390:LYS:HG3  | 1:J:416:ILE:HD11 | 1.94                     | 0.50              |
| 1:D:338:TRP:HE3  | 1:D:365:LYS:HD3  | 1.76                     | 0.50              |
| 1:A:477:LYS:HE3  | 1:C:485:ILE:HG13 | 1.94                     | 0.50              |
| 1:B:401:ILE:HB   | 1:B:424:VAL:HG13 | 1.92                     | 0.50              |
| 1:C:134:GLY:HA2  | 1:C:186:VAL:HA   | 1.92                     | 0.50              |
| 1:D:109:ILE:O    | 1:D:139:HIS:NE2  | 2.44                     | 0.50              |
| 1:F:336:SER:HB2  | 1:F:371:ILE:HD13 | 1.94                     | 0.50              |
| 1:F:426:PRO:HB3  | 1:F:535:ARG:HA   | 1.94                     | 0.50              |
| 1:K:140:SER:OG   | 1:K:142:HIS:ND1  | 2.35                     | 0.50              |
| 1:B:439:TYR:OH   | 1:C:448:HIS:O    | 2.28                     | 0.50              |
| 1:C:81:VAL:HB    | 1:C:540:VAL:HG23 | 1.92                     | 0.50              |
| 1:E:305:VAL:HG23 | 1:E:329:THR:HG23 | 1.93                     | 0.50              |
| 1:F:311:ASN:OD1  | 1:F:312:VAL:N    | 2.45                     | 0.50              |
| 1:F:345:PRO:O    | 1:F:349:GLU:N    | 2.44                     | 0.50              |
| 1:J:367:TYR:CZ   | 1:J:374:VAL:HG12 | 2.47                     | 0.50              |
| 1:A:74:PHE:HD2   | 1:A:110:LYS:HZ1  | 1.60                     | 0.50              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:81:VAL:HG22  | 1:C:85:LEU:HG    | 1.93                     | 0.50              |
| 1:E:164:LEU:HD13 | 1:E:183:LYS:HE3  | 1.93                     | 0.50              |
| 1:H:153:SER:HB3  | 1:H:156:VAL:HG13 | 1.93                     | 0.50              |
| 1:I:170:TYR:HB2  | 1:I:428:LEU:HD11 | 1.93                     | 0.50              |
| 1:J:469:SER:HA   | 1:L:490:THR:HG23 | 1.93                     | 0.50              |
| 1:A:150:ILE:HG12 | 1:A:184:ALA:HB3  | 1.93                     | 0.50              |
| 1:A:426:PRO:HB3  | 1:A:535:ARG:HA   | 1.93                     | 0.50              |
| 1:C:242:SER:O    | 1:E:211:LYS:NZ   | 2.43                     | 0.50              |
| 1:G:138:GLN:OE1  | 1:G:141:GLN:NE2  | 2.43                     | 0.50              |
| 1:H:512:TYR:HB2  | 1:I:457:LYS:HB2  | 1.94                     | 0.50              |
| 1:I:207:MET:HE3  | 1:I:211:LYS:HZ1  | 1.76                     | 0.50              |
| 1:D:490:THR:HG23 | 1:E:469:SER:HA   | 1.94                     | 0.49              |
| 1:I:101:ARG:NH1  | 1:I:551:ASN:OD1  | 2.28                     | 0.49              |
| 1:L:331:GLY:HA2  | 1:L:336:SER:HB3  | 1.94                     | 0.49              |
| 1:D:170:TYR:HB2  | 1:D:428:LEU:HD11 | 1.94                     | 0.49              |
| 1:H:284:ILE:HD11 | 1:H:302:LYS:HE2  | 1.93                     | 0.49              |
| 1:H:471:GLN:O    | 1:H:475:GLU:HG3  | 2.13                     | 0.49              |
| 1:A:158:VAL:HG12 | 1:A:162:LYS:HE2  | 1.93                     | 0.49              |
| 1:A:256:THR:HG21 | 1:A:438:SER:HB2  | 1.94                     | 0.49              |
| 1:A:259:PRO:HD2  | 1:A:262:GLN:HB2  | 1.94                     | 0.49              |
| 1:A:379:LEU:HG   | 1:A:381:PRO:HD3  | 1.94                     | 0.49              |
| 1:C:147:LYS:HZ3  | 1:C:223:ALA:HB2  | 1.77                     | 0.49              |
| 1:J:307:GLN:HE22 | 1:J:387:GLN:NE2  | 2.09                     | 0.49              |
| 1:E:142:HIS:CD2  | 1:E:143:ARG:HG2  | 2.47                     | 0.49              |
| 1:F:81:VAL:HG22  | 1:F:85:LEU:HG    | 1.93                     | 0.49              |
| 1:H:130:GLU:OE2  | 1:H:193:TYR:OH   | 2.24                     | 0.49              |
| 1:I:410:THR:HG22 | 1:I:412:GLU:H    | 1.76                     | 0.49              |
| 1:J:286:GLU:HG3  | 1:J:522:MET:SD   | 2.53                     | 0.49              |
| 1:B:304:PHE:HB2  | 1:B:378:ILE:HB   | 1.95                     | 0.49              |
| 1:K:83:ASP:OD2   | 1:K:84:LYS:HG3   | 2.13                     | 0.49              |
| 1:B:148:GLY:O    | 1:B:223:ALA:N    | 2.46                     | 0.49              |
| 1:C:153:SER:OG   | 1:C:155:ASP:OD1  | 2.22                     | 0.49              |
| 1:E:204:ARG:NE   | 1:E:208:GLU:OE2  | 2.35                     | 0.49              |
| 1:H:115:VAL:HG21 | 1:H:162:LYS:HD3  | 1.95                     | 0.49              |
| 1:A:388:LEU:HB2  | 1:A:409:THR:HA   | 1.94                     | 0.49              |
| 1:E:122:ILE:O    | 1:E:129:TRP:HB2  | 2.13                     | 0.49              |
| 1:H:552:GLU:OE1  | 1:I:261:SER:OG   | 2.26                     | 0.49              |
| 1:L:306:VAL:HG13 | 1:L:330:VAL:HG13 | 1.95                     | 0.49              |
| 1:A:306:VAL:HG21 | 1:A:317:MET:HB3  | 1.94                     | 0.49              |
| 1:I:390:LYS:HD3  | 1:I:412:GLU:HG2  | 1.95                     | 0.49              |
| 1:E:277:PHE:HD1  | 1:E:320:LEU:HD23 | 1.77                     | 0.49              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:J:278:HIS:ND1  | 1:J:281:GLU:OE2  | 2.42                     | 0.49              |
| 1:B:331:GLY:HA3  | 1:B:371:ILE:HG12 | 1.95                     | 0.48              |
| 1:C:150:ILE:HA   | 1:C:184:ALA:HB3  | 1.94                     | 0.48              |
| 1:C:235:TRP:CD1  | 1:C:235:TRP:N    | 2.81                     | 0.48              |
| 1:D:81:VAL:HG22  | 1:D:85:LEU:HG    | 1.93                     | 0.48              |
| 1:I:146:CYS:HB3  | 1:I:182:ALA:HB2  | 1.94                     | 0.48              |
| 1:G:477:LYS:HG2  | 1:I:485:ILE:HG23 | 1.94                     | 0.48              |
| 1:A:230:GLU:OE1  | 1:A:259:PRO:HG3  | 2.13                     | 0.48              |
| 1:B:124:ARG:H    | 1:B:129:TRP:HB3  | 1.78                     | 0.48              |
| 1:C:471:GLN:NE2  | 1:C:485:ILE:O    | 2.44                     | 0.48              |
| 1:F:122:ILE:HG13 | 1:F:132:ILE:HD12 | 1.94                     | 0.48              |
| 1:G:210:ALA:HA   | 1:G:215:ILE:HG22 | 1.96                     | 0.48              |
| 1:I:207:MET:HE3  | 1:I:211:LYS:NZ   | 2.28                     | 0.48              |
| 1:C:274:ARG:NH1  | 1:C:507:HIS:HB3  | 2.28                     | 0.48              |
| 1:K:385:GLU:HG3  | 1:K:386:LYS:HG2  | 1.93                     | 0.48              |
| 1:L:136:ARG:HD2  | 1:L:184:ALA:HB2  | 1.95                     | 0.48              |
| 1:D:338:TRP:HB2  | 1:D:367:TYR:HB2  | 1.95                     | 0.48              |
| 1:H:78:ALA:O     | 1:H:82:GLU:HG3   | 2.14                     | 0.48              |
| 1:C:157:SER:OG   | 1:C:159:ASP:OD1  | 2.29                     | 0.48              |
| 1:D:388:LEU:HD12 | 1:D:417:PHE:HZ   | 1.79                     | 0.48              |
| 1:H:304:PHE:CZ   | 1:H:327:CYS:HB2  | 2.49                     | 0.48              |
| 1:I:293:LEU:HD21 | 1:I:423:MET:HB2  | 1.95                     | 0.48              |
| 1:K:474:LEU:HB3  | 1:K:485:ILE:HD12 | 1.95                     | 0.48              |
| 1:K:503:LYS:HE2  | 1:K:507:HIS:NE2  | 2.28                     | 0.48              |
| 1:C:67:PHE:HA    | 1:C:163:ALA:HB2  | 1.96                     | 0.48              |
| 1:D:105:ILE:HA   | 1:D:108:ILE:HD12 | 1.95                     | 0.48              |
| 1:D:148:GLY:O    | 1:D:223:ALA:N    | 2.47                     | 0.48              |
| 1:F:339:ASN:ND2  | 1:F:363:LYS:O    | 2.47                     | 0.48              |
| 1:K:146:CYS:HB3  | 1:K:182:ALA:HB2  | 1.95                     | 0.48              |
| 1:K:202:THR:HG21 | 1:K:235:TRP:CE3  | 2.46                     | 0.48              |
| 1:H:76:ARG:NH2   | 1:H:533:ASP:OD2  | 2.47                     | 0.48              |
| 1:I:284:ILE:HD11 | 1:I:302:LYS:HG2  | 1.96                     | 0.48              |
| 1:K:278:HIS:O    | 1:K:282:ASN:ND2  | 2.44                     | 0.48              |
| 1:L:360:GLY:H    | 1:L:366:ILE:HD11 | 1.79                     | 0.48              |
| 1:C:338:TRP:O    | 1:C:365:LYS:N    | 2.41                     | 0.48              |
| 1:H:552:GLU:HB2  | 1:I:262:GLN:HE21 | 1.79                     | 0.48              |
| 1:I:451:TYR:HB2  | 1:I:502:GLU:HB2  | 1.96                     | 0.48              |
| 1:E:388:LEU:HB2  | 1:E:409:THR:HA   | 1.95                     | 0.48              |
| 1:J:380:ILE:HG12 | 1:J:402:ALA:HB3  | 1.95                     | 0.48              |
| 1:C:452:GLY:HA2  | 1:C:455:THR:HG22 | 1.95                     | 0.47              |
| 1:C:517:SER:O    | 1:C:520:GLN:HG2  | 2.14                     | 0.47              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:G:469:SER:HA   | 1:I:490:THR:HG23 | 1.96                     | 0.47              |
| 1:I:118:LEU:HD12 | 1:I:205:PHE:CE1  | 2.48                     | 0.47              |
| 1:J:146:CYS:HB3  | 1:J:182:ALA:HB2  | 1.96                     | 0.47              |
| 1:L:147:LYS:HD3  | 1:L:179:PHE:CE2  | 2.49                     | 0.47              |
| 1:C:460:ARG:HG2  | 1:C:497:ILE:HG23 | 1.97                     | 0.47              |
| 1:K:305:VAL:HG13 | 1:K:329:THR:HG23 | 1.96                     | 0.47              |
| 1:K:328:ILE:HD11 | 1:K:376:CYS:HB3  | 1.95                     | 0.47              |
| 1:A:290:MET:HE1  | 1:A:297:PRO:HA   | 1.95                     | 0.47              |
| 1:C:465:HIS:O    | 1:C:469:SER:N    | 2.45                     | 0.47              |
| 1:I:204:ARG:O    | 1:I:208:GLU:HG2  | 2.14                     | 0.47              |
| 1:J:372:LEU:HD11 | 1:J:387:GLN:HB3  | 1.97                     | 0.47              |
| 1:G:148:GLY:O    | 1:G:223:ALA:N    | 2.48                     | 0.47              |
| 1:K:416:ILE:O    | 1:K:419:GLU:HG2  | 2.14                     | 0.47              |
| 1:K:552:GLU:OE1  | 1:L:261:SER:OG   | 2.20                     | 0.47              |
| 1:L:136:ARG:HH21 | 1:L:220:ASP:CG   | 2.19                     | 0.47              |
| 1:B:517:SER:HA   | 1:B:520:GLN:HG2  | 1.97                     | 0.47              |
| 1:E:293:LEU:HD21 | 1:E:423:MET:HB2  | 1.96                     | 0.47              |
| 1:F:230:GLU:OE2  | 1:F:268:ARG:NH1  | 2.47                     | 0.47              |
| 1:B:206:THR:HG23 | 1:B:215:ILE:HD13 | 1.97                     | 0.47              |
| 1:C:373:GLU:O    | 1:C:373:GLU:HG2  | 2.14                     | 0.47              |
| 1:E:518:ALA:O    | 1:E:522:MET:HG3  | 2.13                     | 0.47              |
| 1:K:123:ARG:HD3  | 1:K:129:TRP:CE2  | 2.49                     | 0.47              |
| 1:L:85:LEU:HD21  | 1:L:544:GLU:HG3  | 1.95                     | 0.47              |
| 1:A:329:THR:HB   | 1:A:338:TRP:HD1  | 1.79                     | 0.47              |
| 1:B:371:ILE:HG23 | 1:B:372:LEU:HD22 | 1.97                     | 0.47              |
| 1:B:393:ALA:HB3  | 1:B:416:ILE:HD12 | 1.97                     | 0.47              |
| 1:F:481:HIS:NE2  | 1:L:322:ARG:O    | 2.46                     | 0.47              |
| 1:K:541:ASN:O    | 1:K:545:LYS:HG3  | 2.14                     | 0.47              |
| 1:E:139:HIS:ND1  | 1:E:169:THR:HG21 | 2.30                     | 0.47              |
| 1:H:148:GLY:HA3  | 1:H:182:ALA:O    | 2.15                     | 0.47              |
| 1:A:164:LEU:HD13 | 1:A:183:LYS:HE3  | 1.97                     | 0.47              |
| 1:A:489:PRO:HB3  | 1:A:493:PHE:HD2  | 1.80                     | 0.47              |
| 1:C:159:ASP:OD1  | 1:C:160:GLU:N    | 2.48                     | 0.47              |
| 1:E:67:PHE:HA    | 1:E:163:ALA:HB2  | 1.96                     | 0.47              |
| 1:I:210:ALA:HB1  | 1:I:244:ILE:HG21 | 1.97                     | 0.47              |
| 1:I:212:LYS:HD2  | 1:J:214:PHE:CE1  | 2.50                     | 0.47              |
| 1:L:284:ILE:HA   | 1:L:290:MET:HE3  | 1.97                     | 0.47              |
| 1:L:339:ASN:HB2  | 1:L:364:ALA:HA   | 1.97                     | 0.47              |
| 1:E:202:THR:HG21 | 1:E:235:TRP:HE3  | 1.80                     | 0.46              |
| 1:F:393:ALA:HB3  | 1:F:416:ILE:HD11 | 1.96                     | 0.46              |
| 1:B:338:TRP:N    | 1:B:365:LYS:O    | 2.45                     | 0.46              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:164:LEU:HD13 | 1:D:183:LYS:HE3  | 1.97                     | 0.46              |
| 1:I:203:ARG:HH12 | 1:I:238:ASP:HB3  | 1.81                     | 0.46              |
| 1:J:328:ILE:HD11 | 1:J:376:CYS:HB3  | 1.97                     | 0.46              |
| 1:L:94:THR:HG23  | 1:L:97:GLN:H     | 1.81                     | 0.46              |
| 1:C:66:PHE:HA    | 1:C:69:MET:HG2   | 1.96                     | 0.46              |
| 1:D:150:ILE:HG12 | 1:D:184:ALA:HB3  | 1.97                     | 0.46              |
| 1:I:276:VAL:HG13 | 1:I:430:LEU:HD21 | 1.97                     | 0.46              |
| 1:L:142:HIS:HB3  | 1:L:550:TYR:CE1  | 2.50                     | 0.46              |
| 1:C:174:VAL:O    | 1:C:520:GLN:NE2  | 2.48                     | 0.46              |
| 1:E:186:VAL:HG23 | 1:E:188:ILE:HG12 | 1.96                     | 0.46              |
| 1:G:67:PHE:HA    | 1:G:163:ALA:HB2  | 1.98                     | 0.46              |
| 1:I:78:ALA:HB1   | 1:I:106:LEU:HD13 | 1.97                     | 0.46              |
| 1:K:286:GLU:HG2  | 1:K:289:TYR:HD1  | 1.80                     | 0.46              |
| 1:K:339:ASN:HB2  | 1:K:364:ALA:HA   | 1.96                     | 0.46              |
| 1:D:66:PHE:HZ    | 1:D:167:LEU:HD22 | 1.80                     | 0.46              |
| 1:K:86:VAL:HG21  | 1:K:99:ARG:HD3   | 1.97                     | 0.46              |
| 1:A:394:PRO:HG3  | 1:A:416:ILE:HD12 | 1.98                     | 0.46              |
| 1:D:293:LEU:HB3  | 1:D:399:LYS:HD3  | 1.98                     | 0.46              |
| 1:K:331:GLY:HA3  | 1:K:371:ILE:HG12 | 1.98                     | 0.46              |
| 1:L:351:PHE:CE1  | 1:L:361:PHE:HA   | 2.51                     | 0.46              |
| 1:E:158:VAL:O    | 1:E:162:LYS:HG3  | 2.16                     | 0.46              |
| 1:B:122:ILE:HG21 | 1:B:201:ILE:HG12 | 1.98                     | 0.46              |
| 1:D:379:LEU:HD23 | 1:D:381:PRO:HD3  | 1.98                     | 0.46              |
| 1:F:83:ASP:HB3   | 1:F:84:LYS:HZ2   | 1.81                     | 0.46              |
| 1:G:65:ASN:OD1   | 1:G:68:LYS:NZ    | 2.34                     | 0.46              |
| 1:H:351:PHE:HA   | 1:H:354:GLN:NE2  | 2.31                     | 0.46              |
| 1:K:276:VAL:HG13 | 1:K:430:LEU:HD21 | 1.97                     | 0.46              |
| 1:B:403:GLU:OE2  | 1:B:535:ARG:NH2  | 2.34                     | 0.46              |
| 1:G:188:ILE:HD13 | 1:G:201:ILE:HD13 | 1.98                     | 0.46              |
| 1:C:94:THR:HG23  | 1:C:97:GLN:H     | 1.80                     | 0.46              |
| 1:E:519:ARG:HG2  | 1:K:481:HIS:CE1  | 2.51                     | 0.46              |
| 1:G:108:ILE:HG12 | 1:L:121:PRO:HB3  | 1.96                     | 0.46              |
| 1:H:329:THR:HG21 | 1:H:374:VAL:HG21 | 1.97                     | 0.46              |
| 1:J:407:GLY:N    | 1:J:408:PRO:HD3  | 2.31                     | 0.46              |
| 1:C:148:GLY:O    | 1:C:223:ALA:N    | 2.48                     | 0.45              |
| 1:D:481:HIS:CE1  | 1:L:519:ARG:HG2  | 2.51                     | 0.45              |
| 1:I:304:PHE:CZ   | 1:I:327:CYS:HB2  | 2.51                     | 0.45              |
| 1:A:68:LYS:HA    | 1:A:68:LYS:HE2   | 1.98                     | 0.45              |
| 1:B:123:ARG:HA   | 1:B:129:TRP:HB2  | 1.98                     | 0.45              |
| 1:B:164:LEU:HD13 | 1:B:183:LYS:HE3  | 1.97                     | 0.45              |
| 1:D:286:GLU:OE1  | 1:D:289:TYR:N    | 2.28                     | 0.45              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:F:304:PHE:CZ   | 1:F:327:CYS:HB2  | 2.51                     | 0.45              |
| 1:C:186:VAL:HG23 | 1:C:188:ILE:HG12 | 1.98                     | 0.45              |
| 1:D:329:THR:OG1  | 1:D:337:ILE:O    | 2.21                     | 0.45              |
| 1:J:478:PHE:CD2  | 1:K:478:PHE:HE1  | 2.34                     | 0.45              |
| 1:L:289:TYR:HB3  | 1:L:423:MET:HE1  | 1.98                     | 0.45              |
| 1:E:74:PHE:CD1   | 1:E:110:LYS:HD3  | 2.52                     | 0.45              |
| 1:G:512:TYR:HB2  | 1:H:457:LYS:HB2  | 1.99                     | 0.45              |
| 1:I:108:ILE:HG12 | 1:J:121:PRO:HB3  | 1.97                     | 0.45              |
| 1:J:385:GLU:HG3  | 1:J:386:LYS:HG2  | 1.98                     | 0.45              |
| 1:J:454:LEU:HD22 | 1:L:451:TYR:CE1  | 2.51                     | 0.45              |
| 1:F:295:MET:HE3  | 1:F:399:LYS:HB3  | 1.99                     | 0.45              |
| 1:F:338:TRP:HD1  | 1:F:339:ASN:N    | 2.15                     | 0.45              |
| 1:G:195:ASP:OD1  | 1:G:231:ARG:NH1  | 2.50                     | 0.45              |
| 1:H:423:MET:HE2  | 1:H:534:LEU:HD11 | 1.97                     | 0.45              |
| 1:J:76:ARG:NH2   | 1:J:533:ASP:OD2  | 2.50                     | 0.45              |
| 1:K:86:VAL:HG21  | 1:K:99:ARG:HH11  | 1.81                     | 0.45              |
| 1:L:425:ILE:HG21 | 1:L:430:LEU:HD13 | 1.99                     | 0.45              |
| 1:D:161:VAL:HG13 | 1:D:183:LYS:HB3  | 1.99                     | 0.45              |
| 1:F:289:TYR:CE1  | 1:F:522:MET:HG2  | 2.52                     | 0.45              |
| 1:I:334:ASP:OD1  | 1:I:335:GLY:N    | 2.49                     | 0.45              |
| 1:J:379:LEU:HB3  | 1:J:401:ILE:HD13 | 1.97                     | 0.45              |
| 1:K:136:ARG:HH11 | 1:K:184:ALA:HB2  | 1.81                     | 0.45              |
| 1:D:93:GLU:HB2   | 1:D:98:LYS:HE3   | 1.99                     | 0.45              |
| 1:E:480:LYS:HG2  | 1:E:484:THR:HG22 | 1.99                     | 0.45              |
| 1:K:475:GLU:OE2  | 1:K:484:THR:HB   | 2.17                     | 0.45              |
| 1:B:122:ILE:O    | 1:B:129:TRP:HB2  | 2.17                     | 0.45              |
| 1:J:147:LYS:HD3  | 1:J:179:PHE:CE2  | 2.52                     | 0.45              |
| 1:K:309:PHE:HE1  | 1:K:317:MET:SD   | 2.40                     | 0.45              |
| 1:I:317:MET:HE3  | 1:I:345:PRO:HA   | 2.00                     | 0.45              |
| 1:I:489:PRO:HB3  | 1:I:493:PHE:CD2  | 2.52                     | 0.45              |
| 1:K:118:LEU:HD12 | 1:K:205:PHE:CE1  | 2.52                     | 0.45              |
| 1:E:81:VAL:HG22  | 1:E:85:LEU:HG    | 1.99                     | 0.44              |
| 1:H:150:ILE:HG12 | 1:H:184:ALA:HB3  | 2.00                     | 0.44              |
| 1:J:257:GLY:HA2  | 1:J:268:ARG:HD3  | 1.99                     | 0.44              |
| 1:L:451:TYR:HB2  | 1:L:502:GLU:HB2  | 1.98                     | 0.44              |
| 1:A:402:ALA:HA   | 1:A:425:ILE:HG22 | 1.98                     | 0.44              |
| 1:G:372:LEU:HD13 | 1:G:388:LEU:HD22 | 1.98                     | 0.44              |
| 1:I:100:ASN:O    | 1:I:104:SER:OG   | 2.31                     | 0.44              |
| 1:E:281:GLU:HA   | 1:E:284:ILE:HG22 | 1.98                     | 0.44              |
| 1:I:278:HIS:O    | 1:I:282:ASN:ND2  | 2.46                     | 0.44              |
| 1:J:412:GLU:OE1  | 1:J:412:GLU:N    | 2.48                     | 0.44              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:L:293:LEU:HD11 | 1:L:423:MET:HB2  | 1.99                     | 0.44              |
| 1:A:425:ILE:HG13 | 1:A:426:PRO:HD2  | 1.98                     | 0.44              |
| 1:B:378:ILE:HD13 | 1:B:400:ILE:HB   | 1.99                     | 0.44              |
| 1:E:134:GLY:HA2  | 1:E:186:VAL:HA   | 2.00                     | 0.44              |
| 1:E:266:HIS:HB2  | 1:E:502:GLU:HG3  | 1.99                     | 0.44              |
| 1:G:233:MET:HE3  | 1:G:255:VAL:CG2  | 2.48                     | 0.44              |
| 1:K:314:LEU:HD11 | 1:K:349:GLU:HB2  | 1.99                     | 0.44              |
| 1:A:93:GLU:HG2   | 1:A:97:GLN:OE1   | 2.16                     | 0.44              |
| 1:D:301:ASP:OD1  | 1:D:301:ASP:N    | 2.50                     | 0.44              |
| 1:H:204:ARG:HA   | 1:H:204:ARG:HD2  | 1.81                     | 0.44              |
| 1:K:136:ARG:HG2  | 1:K:214:PHE:HD2  | 1.82                     | 0.44              |
| 1:D:485:ILE:HD13 | 1:E:477:LYS:HE2  | 1.98                     | 0.44              |
| 1:E:108:ILE:O    | 1:E:111:PRO:HD2  | 2.18                     | 0.44              |
| 1:E:489:PRO:HB3  | 1:E:493:PHE:CD2  | 2.53                     | 0.44              |
| 1:F:326:LYS:HE3  | 1:F:328:ILE:HG22 | 1.99                     | 0.44              |
| 1:G:269:ILE:HD12 | 1:G:269:ILE:H    | 1.83                     | 0.44              |
| 1:G:314:LEU:HD11 | 1:G:349:GLU:HG3  | 2.00                     | 0.44              |
| 1:H:78:ALA:HB1   | 1:H:106:LEU:HD13 | 2.00                     | 0.44              |
| 1:K:339:ASN:HB3  | 1:K:343:ILE:HG12 | 2.00                     | 0.44              |
| 1:K:373:GLU:OE2  | 1:K:395:ARG:NH1  | 2.50                     | 0.44              |
| 1:A:86:VAL:HG11  | 1:A:99:ARG:HD2   | 2.00                     | 0.44              |
| 1:A:282:ASN:ND2  | 1:A:515:GLU:HA   | 2.32                     | 0.44              |
| 1:C:284:ILE:HG23 | 1:C:290:MET:HE1  | 2.00                     | 0.44              |
| 1:C:443:LEU:HD23 | 1:C:446:LEU:HD12 | 1.98                     | 0.44              |
| 1:E:539:TYR:O    | 1:E:543:ILE:HG12 | 2.18                     | 0.44              |
| 1:K:255:VAL:O    | 1:K:258:LYS:NZ   | 2.42                     | 0.44              |
| 1:L:136:ARG:HH11 | 1:L:184:ALA:HB2  | 1.82                     | 0.44              |
| 1:B:334:ASP:OD1  | 1:B:335:GLY:N    | 2.50                     | 0.44              |
| 1:C:319:TYR:O    | 1:C:322:ARG:HG2  | 2.18                     | 0.44              |
| 1:I:189:ASN:OD1  | 1:I:191:LYS:HE2  | 2.17                     | 0.44              |
| 1:J:170:TYR:HB2  | 1:J:428:LEU:HD11 | 2.00                     | 0.44              |
| 1:L:153:SER:HB3  | 1:L:156:VAL:HG13 | 1.99                     | 0.44              |
| 1:L:370:SER:HB3  | 1:L:373:GLU:OE1  | 2.17                     | 0.44              |
| 1:A:122:ILE:HD13 | 1:A:201:ILE:HD11 | 2.00                     | 0.44              |
| 1:L:279:GLY:HA3  | 1:L:430:LEU:HD12 | 2.00                     | 0.44              |
| 1:B:89:LEU:HD11  | 1:B:102:VAL:HG23 | 1.99                     | 0.43              |
| 1:I:373:GLU:OE2  | 1:I:392:ASN:HB2  | 2.18                     | 0.43              |
| 1:J:388:LEU:HD13 | 1:J:392:ASN:HD21 | 1.83                     | 0.43              |
| 1:L:388:LEU:HB2  | 1:L:409:THR:HA   | 1.99                     | 0.43              |
| 1:D:261:SER:O    | 1:F:143:ARG:NH2  | 2.51                     | 0.43              |
| 1:D:368:GLU:CD   | 1:D:368:GLU:H    | 2.27                     | 0.43              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:F:170:TYR:HB2  | 1:F:428:LEU:HD11 | 2.00                     | 0.43              |
| 1:G:121:PRO:HB3  | 1:L:108:ILE:HG12 | 1.99                     | 0.43              |
| 1:I:202:THR:HG21 | 1:I:235:TRP:CE3  | 2.53                     | 0.43              |
| 1:J:321:HIS:ND1  | 1:J:345:PRO:HD3  | 2.32                     | 0.43              |
| 1:L:170:TYR:O    | 1:L:174:VAL:HG23 | 2.18                     | 0.43              |
| 1:C:301:ASP:OD1  | 1:C:301:ASP:N    | 2.51                     | 0.43              |
| 1:E:206:THR:HG23 | 1:E:215:ILE:HD13 | 2.01                     | 0.43              |
| 1:I:545:LYS:O    | 1:I:549:VAL:HG23 | 2.19                     | 0.43              |
| 1:L:115:VAL:HG11 | 1:L:158:VAL:HG13 | 1.99                     | 0.43              |
| 1:E:526:MET:HE2  | 1:E:526:MET:HB3  | 1.89                     | 0.43              |
| 1:F:350:ASP:OD1  | 1:F:351:PHE:N    | 2.51                     | 0.43              |
| 1:G:212:LYS:HD3  | 1:G:212:LYS:HA   | 1.82                     | 0.43              |
| 1:H:388:LEU:HB2  | 1:H:409:THR:HA   | 2.01                     | 0.43              |
| 1:L:147:LYS:HD2  | 1:L:221:VAL:HB   | 2.00                     | 0.43              |
| 1:L:334:ASP:N    | 1:L:334:ASP:OD1  | 2.51                     | 0.43              |
| 1:L:338:TRP:HB2  | 1:L:367:TYR:HB2  | 2.01                     | 0.43              |
| 1:A:74:PHE:CE2   | 1:A:110:LYS:HB2  | 2.53                     | 0.43              |
| 1:A:284:ILE:HG21 | 1:A:299:PHE:CE2  | 2.54                     | 0.43              |
| 1:C:121:PRO:HB2  | 1:C:129:TRP:HZ3  | 1.83                     | 0.43              |
| 1:C:427:ASP:OD1  | 1:C:427:ASP:N    | 2.51                     | 0.43              |
| 1:E:485:ILE:HG13 | 1:F:477:LYS:HZ3  | 1.84                     | 0.43              |
| 1:G:118:LEU:HD12 | 1:G:205:PHE:CE1  | 2.53                     | 0.43              |
| 1:H:490:THR:HG23 | 1:I:469:SER:HA   | 2.00                     | 0.43              |
| 1:K:284:ILE:HD11 | 1:K:302:LYS:HE2  | 2.00                     | 0.43              |
| 1:B:339:ASN:HD22 | 1:B:364:ALA:HA   | 1.82                     | 0.43              |
| 1:C:439:TYR:CZ   | 1:C:443:LEU:HD11 | 2.54                     | 0.43              |
| 1:F:306:VAL:HG23 | 1:F:330:VAL:HG13 | 2.00                     | 0.43              |
| 1:G:552:GLU:HB2  | 1:H:262:GLN:HE21 | 1.83                     | 0.43              |
| 1:L:81:VAL:HB    | 1:L:540:VAL:HG13 | 2.00                     | 0.43              |
| 1:L:83:ASP:O     | 1:L:87:GLU:HG2   | 2.18                     | 0.43              |
| 1:A:423:MET:HA   | 1:A:532:LEU:HD11 | 2.00                     | 0.43              |
| 1:B:266:HIS:HB2  | 1:B:502:GLU:HG3  | 2.00                     | 0.43              |
| 1:C:224:PRO:HB3  | 1:C:233:MET:HE1  | 1.99                     | 0.43              |
| 1:D:305:VAL:HG23 | 1:D:329:THR:HG23 | 2.01                     | 0.43              |
| 1:D:331:GLY:HA3  | 1:D:371:ILE:HG12 | 2.00                     | 0.43              |
| 1:F:471:GLN:NE2  | 1:F:486:PRO:HA   | 2.33                     | 0.43              |
| 1:J:496:ARG:HH12 | 1:K:462:SER:HG   | 1.66                     | 0.43              |
| 1:J:525:ALA:HA   | 1:J:530:LEU:HD12 | 2.01                     | 0.43              |
| 1:B:175:VAL:HG23 | 1:B:177:VAL:HG23 | 2.01                     | 0.43              |
| 1:B:255:VAL:O    | 1:B:258:LYS:NZ   | 2.34                     | 0.43              |
| 1:C:123:ARG:NH2  | 1:C:127:GLY:HA2  | 2.33                     | 0.43              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:F:66:PHE:HA    | 1:F:69:MET:HG2   | 2.01                     | 0.43              |
| 1:I:174:VAL:HG23 | 1:I:542:ALA:HB2  | 2.01                     | 0.43              |
| 1:J:133:GLU:HG2  | 1:J:187:LYS:HB2  | 2.01                     | 0.43              |
| 1:J:279:GLY:HA3  | 1:J:430:LEU:HD12 | 2.01                     | 0.43              |
| 1:J:318:ARG:NH2  | 1:J:319:TYR:OH   | 2.51                     | 0.43              |
| 1:C:104:SER:HG   | 1:D:129:TRP:CD1  | 2.36                     | 0.43              |
| 1:D:401:ILE:HB   | 1:D:424:VAL:HG22 | 1.99                     | 0.43              |
| 1:H:351:PHE:HA   | 1:H:354:GLN:HE21 | 1.82                     | 0.43              |
| 1:A:117:SER:HB2  | 1:F:115:VAL:HB   | 2.01                     | 0.43              |
| 1:A:260:ILE:H    | 1:A:260:ILE:HD12 | 1.84                     | 0.43              |
| 1:C:198:LEU:HD23 | 1:C:201:ILE:HD12 | 1.99                     | 0.43              |
| 1:G:474:LEU:HD23 | 1:G:474:LEU:HA   | 1.92                     | 0.43              |
| 1:A:138:GLN:NE2  | 1:A:220:ASP:OD2  | 2.52                     | 0.42              |
| 1:C:115:VAL:HG21 | 1:C:162:LYS:HD3  | 2.00                     | 0.42              |
| 1:C:122:ILE:O    | 1:C:129:TRP:HB2  | 2.19                     | 0.42              |
| 1:E:371:ILE:HD12 | 1:E:374:VAL:HG21 | 2.01                     | 0.42              |
| 1:K:305:VAL:HG22 | 1:K:329:THR:HG22 | 2.00                     | 0.42              |
| 1:K:515:GLU:O    | 1:K:519:ARG:HG2  | 2.18                     | 0.42              |
| 1:A:147:LYS:HD2  | 1:A:221:VAL:O    | 2.19                     | 0.42              |
| 1:D:420:ARG:HB3  | 1:D:422:ILE:HG12 | 2.00                     | 0.42              |
| 1:E:519:ARG:HG2  | 1:K:481:HIS:NE2  | 2.33                     | 0.42              |
| 1:F:123:ARG:HG3  | 1:F:129:TRP:CE3  | 2.53                     | 0.42              |
| 1:G:68:LYS:HA    | 1:G:71:GLU:HB2   | 2.00                     | 0.42              |
| 1:H:308:GLY:HA3  | 1:H:383:ALA:HB2  | 2.00                     | 0.42              |
| 1:F:114:HIS:HB2  | 1:F:138:GLN:HB2  | 2.00                     | 0.42              |
| 1:G:518:ALA:O    | 1:G:522:MET:HG3  | 2.18                     | 0.42              |
| 1:I:269:ILE:HD12 | 1:I:269:ILE:H    | 1.84                     | 0.42              |
| 1:I:279:GLY:HA3  | 1:I:430:LEU:HD12 | 2.02                     | 0.42              |
| 1:L:66:PHE:HZ    | 1:L:167:LEU:HD22 | 1.84                     | 0.42              |
| 1:D:124:ARG:HE   | 1:D:197:GLU:CD   | 2.28                     | 0.42              |
| 1:E:140:SER:OG   | 1:E:142:HIS:ND1  | 2.36                     | 0.42              |
| 1:F:114:HIS:O    | 1:F:138:GLN:N    | 2.52                     | 0.42              |
| 1:G:170:TYR:HB2  | 1:G:428:LEU:HD11 | 2.01                     | 0.42              |
| 1:G:175:VAL:HG23 | 1:G:177:VAL:HG23 | 2.01                     | 0.42              |
| 1:G:425:ILE:HG21 | 1:G:430:LEU:HD13 | 2.00                     | 0.42              |
| 1:H:118:LEU:HD12 | 1:H:205:PHE:CE1  | 2.54                     | 0.42              |
| 1:H:305:VAL:HG13 | 1:H:329:THR:HG23 | 2.00                     | 0.42              |
| 1:I:329:THR:OG1  | 1:I:337:ILE:O    | 2.21                     | 0.42              |
| 1:C:104:SER:HG   | 1:D:129:TRP:CG   | 2.37                     | 0.42              |
| 1:G:136:ARG:HD3  | 1:G:184:ALA:HB2  | 2.02                     | 0.42              |
| 1:G:305:VAL:HB   | 1:G:379:LEU:HD12 | 2.00                     | 0.42              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:K:260:ILE:HD13 | 1:K:260:ILE:HA   | 1.92                     | 0.42              |
| 1:L:76:ARG:NH2   | 1:L:533:ASP:OD2  | 2.52                     | 0.42              |
| 1:A:171:LYS:O    | 1:A:175:VAL:HG22 | 2.20                     | 0.42              |
| 1:C:132:ILE:HD12 | 1:C:188:ILE:HG22 | 2.02                     | 0.42              |
| 1:D:308:GLY:HA3  | 1:D:383:ALA:HB2  | 2.02                     | 0.42              |
| 1:G:149:GLY:HA2  | 1:G:223:ALA:O    | 2.20                     | 0.42              |
| 1:K:284:ILE:HD11 | 1:K:302:LYS:HG2  | 2.01                     | 0.42              |
| 1:A:195:ASP:OD2  | 1:C:92:ARG:NE    | 2.52                     | 0.42              |
| 1:B:134:GLY:HA2  | 1:B:186:VAL:HA   | 2.01                     | 0.42              |
| 1:B:266:HIS:ND1  | 1:B:502:GLU:OE2  | 2.52                     | 0.42              |
| 1:B:293:LEU:HD11 | 1:B:423:MET:SD   | 2.60                     | 0.42              |
| 1:C:274:ARG:CZ   | 1:C:278:HIS:HE1  | 2.33                     | 0.42              |
| 1:D:406:ASN:OD1  | 1:D:431:ASN:ND2  | 2.44                     | 0.42              |
| 1:H:67:PHE:HA    | 1:H:163:ALA:HB2  | 2.02                     | 0.42              |
| 1:H:170:TYR:O    | 1:H:174:VAL:HG23 | 2.20                     | 0.42              |
| 1:I:164:LEU:HD13 | 1:I:183:LYS:HE3  | 2.01                     | 0.42              |
| 1:I:329:THR:HB   | 1:I:338:TRP:CD1  | 2.54                     | 0.42              |
| 1:A:94:THR:O     | 1:A:98:LYS:HG2   | 2.19                     | 0.42              |
| 1:C:305:VAL:HG23 | 1:C:329:THR:O    | 2.20                     | 0.42              |
| 1:D:146:CYS:HB2  | 1:D:220:ASP:OD1  | 2.19                     | 0.42              |
| 1:E:136:ARG:HH21 | 1:E:220:ASP:CG   | 2.28                     | 0.42              |
| 1:F:257:GLY:N    | 1:F:441:GLU:OE2  | 2.53                     | 0.42              |
| 1:G:198:LEU:HD23 | 1:G:198:LEU:HA   | 1.84                     | 0.42              |
| 1:H:81:VAL:HG21  | 1:H:544:GLU:HG3  | 2.01                     | 0.42              |
| 1:H:204:ARG:O    | 1:H:208:GLU:HG2  | 2.19                     | 0.42              |
| 1:I:115:VAL:HG21 | 1:I:162:LYS:HD3  | 2.02                     | 0.42              |
| 1:I:459:GLU:OE2  | 1:I:463:ASN:ND2  | 2.44                     | 0.42              |
| 1:L:277:PHE:HD1  | 1:L:320:LEU:HD23 | 1.83                     | 0.42              |
| 1:B:269:ILE:HD12 | 1:B:269:ILE:H    | 1.84                     | 0.42              |
| 1:E:64:PRO:HG2   | 1:E:386:LYS:HE3  | 2.02                     | 0.42              |
| 1:H:337:ILE:HB   | 1:H:364:ALA:HB1  | 2.00                     | 0.42              |
| 1:K:139:HIS:CG   | 1:K:166:SER:HA   | 2.55                     | 0.42              |
| 1:L:311:ASN:OD1  | 1:L:312:VAL:HG23 | 2.20                     | 0.42              |
| 1:B:276:VAL:HG13 | 1:B:430:LEU:HD21 | 2.02                     | 0.42              |
| 1:C:147:LYS:HB2  | 1:C:179:PHE:HB3  | 2.01                     | 0.42              |
| 1:F:142:HIS:CD2  | 1:F:143:ARG:HG2  | 2.54                     | 0.42              |
| 1:F:471:GLN:HE22 | 1:F:486:PRO:HA   | 1.85                     | 0.42              |
| 1:J:153:SER:HB3  | 1:J:156:VAL:HG13 | 2.02                     | 0.42              |
| 1:J:401:ILE:HB   | 1:J:424:VAL:HG13 | 2.02                     | 0.42              |
| 1:A:277:PHE:HD1  | 1:A:320:LEU:HD23 | 1.85                     | 0.41              |
| 1:D:174:VAL:HG23 | 1:D:542:ALA:HB2  | 2.01                     | 0.41              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:H:84:LYS:HD2   | 1:H:527:LYS:HZ2  | 1.84                     | 0.41              |
| 1:K:115:VAL:HG11 | 1:K:158:VAL:HG13 | 2.02                     | 0.41              |
| 1:K:399:LYS:HA   | 1:K:399:LYS:HD2  | 1.84                     | 0.41              |
| 1:E:110:LYS:HB3  | 1:E:111:PRO:HD3  | 2.02                     | 0.41              |
| 1:K:212:LYS:HA   | 1:K:212:LYS:HD3  | 1.87                     | 0.41              |
| 1:L:305:VAL:HG22 | 1:L:329:THR:HG22 | 2.02                     | 0.41              |
| 1:A:125:ASP:OD1  | 1:A:196:ASN:ND2  | 2.48                     | 0.41              |
| 1:F:407:GLY:N    | 1:F:427:ASP:OD2  | 2.46                     | 0.41              |
| 1:F:427:ASP:C    | 1:F:427:ASP:OD1  | 2.63                     | 0.41              |
| 1:L:266:HIS:HB2  | 1:L:502:GLU:HG3  | 2.02                     | 0.41              |
| 1:A:262:GLN:NE2  | 1:C:549:VAL:O    | 2.52                     | 0.41              |
| 1:B:280:ILE:HG13 | 1:B:430:LEU:HD11 | 2.03                     | 0.41              |
| 1:I:75:ASP:OD2   | 1:I:110:LYS:NZ   | 2.52                     | 0.41              |
| 1:J:240:TYR:CE2  | 1:J:245:GLY:HA3  | 2.55                     | 0.41              |
| 1:K:175:VAL:HA   | 1:K:517:SER:OG   | 2.20                     | 0.41              |
| 1:L:472:GLU:HA   | 1:L:475:GLU:HB2  | 2.01                     | 0.41              |
| 1:B:138:GLN:HG3  | 1:B:214:PHE:CE2  | 2.54                     | 0.41              |
| 1:B:289:TYR:CE2  | 1:B:522:MET:HG2  | 2.55                     | 0.41              |
| 1:D:338:TRP:CZ2  | 1:D:340:PRO:HG3  | 2.55                     | 0.41              |
| 1:D:448:HIS:O    | 1:F:439:TYR:OH   | 2.30                     | 0.41              |
| 1:F:65:ASN:O     | 1:F:68:LYS:HG2   | 2.20                     | 0.41              |
| 1:F:108:ILE:O    | 1:F:111:PRO:HD2  | 2.21                     | 0.41              |
| 1:G:212:LYS:HD2  | 1:L:214:PHE:CE1  | 2.55                     | 0.41              |
| 1:I:329:THR:HG21 | 1:I:374:VAL:HG21 | 2.02                     | 0.41              |
| 1:K:309:PHE:CZ   | 1:K:348:LEU:HD22 | 2.55                     | 0.41              |
| 1:K:389:THR:HG22 | 1:K:390:LYS:N    | 2.34                     | 0.41              |
| 1:A:137:ALA:HB3  | 1:A:161:VAL:HG12 | 2.03                     | 0.41              |
| 1:B:326:LYS:HE2  | 1:B:326:LYS:HB2  | 1.93                     | 0.41              |
| 1:C:452:GLY:HA3  | 1:C:456:PHE:CE1  | 2.56                     | 0.41              |
| 1:D:304:PHE:CZ   | 1:D:327:CYS:HB2  | 2.55                     | 0.41              |
| 1:D:533:ASP:OD2  | 1:D:536:THR:OG1  | 2.31                     | 0.41              |
| 1:G:66:PHE:HZ    | 1:G:167:LEU:HD22 | 1.85                     | 0.41              |
| 1:H:352:LYS:HD3  | 1:H:358:ILE:HG23 | 2.01                     | 0.41              |
| 1:J:122:ILE:HG21 | 1:J:201:ILE:HG12 | 2.02                     | 0.41              |
| 1:K:152:TYR:O    | 1:K:227:SER:OG   | 2.32                     | 0.41              |
| 1:C:103:ARG:HE   | 1:C:103:ARG:HB3  | 1.63                     | 0.41              |
| 1:E:317:MET:SD   | 1:E:345:PRO:HB3  | 2.61                     | 0.41              |
| 1:I:240:TYR:CE2  | 1:I:245:GLY:HA3  | 2.56                     | 0.41              |
| 1:K:152:TYR:CD1  | 1:K:186:VAL:HG22 | 2.56                     | 0.41              |
| 1:L:304:PHE:CZ   | 1:L:327:CYS:HB2  | 2.56                     | 0.41              |
| 1:L:309:PHE:HE2  | 1:L:317:MET:SD   | 2.44                     | 0.41              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:B:89:LEU:HD13  | 1:B:101:ARG:HH12 | 1.85                     | 0.41              |
| 1:C:379:LEU:HD23 | 1:C:381:PRO:HD3  | 2.03                     | 0.41              |
| 1:C:393:ALA:HB3  | 1:C:394:PRO:HD3  | 2.03                     | 0.41              |
| 1:D:147:LYS:HZ2  | 1:D:223:ALA:HB2  | 1.84                     | 0.41              |
| 1:E:334:ASP:OD1  | 1:E:334:ASP:N    | 2.54                     | 0.41              |
| 1:H:354:GLN:HG3  | 1:H:355:HIS:ND1  | 2.36                     | 0.41              |
| 1:J:388:LEU:HD12 | 1:J:417:PHE:HZ   | 1.85                     | 0.41              |
| 1:K:199:GLU:O    | 1:K:203:ARG:HG3  | 2.21                     | 0.41              |
| 1:K:266:HIS:HB2  | 1:K:502:GLU:HG3  | 2.01                     | 0.41              |
| 1:A:334:ASP:OD1  | 1:A:334:ASP:N    | 2.54                     | 0.41              |
| 1:A:373:GLU:OE2  | 1:A:395:ARG:HB2  | 2.21                     | 0.41              |
| 1:A:466:LEU:HD23 | 1:A:466:LEU:HA   | 1.92                     | 0.41              |
| 1:D:122:ILE:HG21 | 1:D:201:ILE:HG12 | 2.03                     | 0.41              |
| 1:E:198:LEU:HD23 | 1:E:198:LEU:HA   | 1.88                     | 0.41              |
| 1:E:288:SER:CB   | 1:K:483:GLY:HA3  | 2.51                     | 0.41              |
| 1:F:361:PHE:CE2  | 1:F:363:LYS:HB2  | 2.56                     | 0.41              |
| 1:G:78:ALA:HB1   | 1:G:106:LEU:HD13 | 2.03                     | 0.41              |
| 1:G:475:GLU:OE1  | 1:G:484:THR:HB   | 2.21                     | 0.41              |
| 1:H:202:THR:HG21 | 1:H:235:TRP:CE3  | 2.52                     | 0.41              |
| 1:H:289:TYR:OH   | 1:H:526:MET:HE3  | 2.21                     | 0.41              |
| 1:H:292:ILE:H    | 1:H:292:ILE:HD12 | 1.85                     | 0.41              |
| 1:H:336:SER:OG   | 1:H:367:TYR:O    | 2.39                     | 0.41              |
| 1:I:94:THR:HG23  | 1:I:97:GLN:H     | 1.85                     | 0.41              |
| 1:I:115:VAL:HG11 | 1:I:158:VAL:HG13 | 2.03                     | 0.41              |
| 1:I:172:CYS:SG   | 1:I:435:VAL:HG21 | 2.60                     | 0.41              |
| 1:I:214:PHE:CE1  | 1:J:212:LYS:HD2  | 2.56                     | 0.41              |
| 1:I:393:ALA:HB3  | 1:I:416:ILE:HD12 | 2.03                     | 0.41              |
| 1:J:145:PRO:HB3  | 1:J:218:GLY:C    | 2.46                     | 0.41              |
| 1:K:164:LEU:HB2  | 1:K:183:LYS:HG2  | 2.03                     | 0.41              |
| 1:K:164:LEU:HD13 | 1:K:183:LYS:HE3  | 2.02                     | 0.41              |
| 1:K:495:ASP:OD1  | 1:K:496:ARG:N    | 2.54                     | 0.41              |
| 1:L:278:HIS:HA   | 1:L:281:GLU:HG2  | 2.02                     | 0.41              |
| 1:L:380:ILE:HG12 | 1:L:402:ALA:HB3  | 2.03                     | 0.41              |
| 1:A:306:VAL:HA   | 1:A:380:ILE:HB   | 2.01                     | 0.41              |
| 1:A:331:GLY:HA3  | 1:A:371:ILE:HG12 | 2.03                     | 0.41              |
| 1:B:129:TRP:O    | 1:E:104:SER:OG   | 2.30                     | 0.41              |
| 1:G:309:PHE:CE2  | 1:G:330:VAL:HB   | 2.51                     | 0.41              |
| 1:I:299:PHE:HA   | 1:I:302:LYS:HB2  | 2.02                     | 0.41              |
| 1:B:365:LYS:HE2  | 1:B:365:LYS:HB3  | 1.96                     | 0.40              |
| 1:K:81:VAL:CG1   | 1:K:540:VAL:HG13 | 2.51                     | 0.40              |
| 1:L:388:LEU:HD12 | 1:L:417:PHE:HZ   | 1.86                     | 0.40              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:A:200:LYS:HA   | 1:A:200:LYS:HD3  | 1.89                     | 0.40              |
| 1:A:489:PRO:HB3  | 1:A:493:PHE:CD2  | 2.56                     | 0.40              |
| 1:G:436:THR:O    | 1:G:439:TYR:HB3  | 2.21                     | 0.40              |
| 1:J:198:LEU:HD23 | 1:J:198:LEU:HA   | 1.92                     | 0.40              |
| 1:L:515:GLU:O    | 1:L:519:ARG:HG3  | 2.21                     | 0.40              |
| 1:A:115:VAL:HB   | 1:F:117:SER:HB2  | 2.03                     | 0.40              |
| 1:B:258:LYS:HE2  | 1:B:258:LYS:HB2  | 1.94                     | 0.40              |
| 1:H:119:SER:OG   | 1:H:133:GLU:OE2  | 2.34                     | 0.40              |
| 1:H:183:LYS:HD2  | 1:H:183:LYS:HA   | 1.93                     | 0.40              |
| 1:I:175:VAL:HA   | 1:I:517:SER:OG   | 2.22                     | 0.40              |
| 1:J:67:PHE:HA    | 1:J:163:ALA:HB2  | 2.03                     | 0.40              |
| 1:L:230:GLU:OE2  | 1:L:268:ARG:NH2  | 2.46                     | 0.40              |
| 1:A:178:PRO:HD2  | 1:A:439:TYR:CE1  | 2.56                     | 0.40              |
| 1:B:104:SER:O    | 1:B:107:ARG:HG2  | 2.21                     | 0.40              |
| 1:D:548:ARG:HG2  | 1:E:261:SER:HB3  | 2.03                     | 0.40              |
| 1:F:202:THR:HG21 | 1:F:235:TRP:HE3  | 1.86                     | 0.40              |
| 1:F:489:PRO:HB3  | 1:F:493:PHE:CD2  | 2.56                     | 0.40              |
| 1:G:152:TYR:H    | 1:G:227:SER:HB3  | 1.86                     | 0.40              |
| 1:G:275:GLY:O    | 1:G:514:MET:HE2  | 2.21                     | 0.40              |
| 1:H:136:ARG:HD3  | 1:H:184:ALA:HB2  | 2.04                     | 0.40              |
| 1:I:168:MET:HE3  | 1:I:172:CYS:SG   | 2.61                     | 0.40              |
| 1:J:136:ARG:HH11 | 1:J:184:ALA:HB2  | 1.87                     | 0.40              |
| 1:J:322:ARG:HE   | 1:J:322:ARG:HB2  | 1.69                     | 0.40              |
| 1:J:442:TRP:O    | 1:J:446:LEU:HG   | 2.21                     | 0.40              |
| 1:K:78:ALA:O     | 1:K:82:GLU:HG2   | 2.21                     | 0.40              |
| 1:K:520:GLN:HB3  | 1:K:541:ASN:HD21 | 1.86                     | 0.40              |

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

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

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

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

| Mol | Chain | Analysed        | Favoured   | Allowed | Outliers | Percentiles |     |
|-----|-------|-----------------|------------|---------|----------|-------------|-----|
| 1   | A     | 487/558 (87%)   | 476 (98%)  | 11 (2%) | 0        | 100         | 100 |
| 1   | B     | 486/558 (87%)   | 478 (98%)  | 8 (2%)  | 0        | 100         | 100 |
| 1   | C     | 486/558 (87%)   | 476 (98%)  | 10 (2%) | 0        | 100         | 100 |
| 1   | D     | 487/558 (87%)   | 484 (99%)  | 3 (1%)  | 0        | 100         | 100 |
| 1   | E     | 488/558 (88%)   | 480 (98%)  | 8 (2%)  | 0        | 100         | 100 |
| 1   | F     | 487/558 (87%)   | 482 (99%)  | 5 (1%)  | 0        | 100         | 100 |
| 1   | G     | 490/558 (88%)   | 484 (99%)  | 6 (1%)  | 0        | 100         | 100 |
| 1   | H     | 490/558 (88%)   | 482 (98%)  | 8 (2%)  | 0        | 100         | 100 |
| 1   | I     | 490/558 (88%)   | 480 (98%)  | 10 (2%) | 0        | 100         | 100 |
| 1   | J     | 490/558 (88%)   | 480 (98%)  | 10 (2%) | 0        | 100         | 100 |
| 1   | K     | 490/558 (88%)   | 480 (98%)  | 10 (2%) | 0        | 100         | 100 |
| 1   | L     | 490/558 (88%)   | 480 (98%)  | 10 (2%) | 0        | 100         | 100 |
| All | All   | 5861/6696 (88%) | 5762 (98%) | 99 (2%) | 0        | 100         | 100 |

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains ⓘ

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

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

| Mol | Chain | Analysed      | Rotameric  | Outliers | Percentiles |     |
|-----|-------|---------------|------------|----------|-------------|-----|
| 1   | A     | 410/456 (90%) | 410 (100%) | 0        | 100         | 100 |
| 1   | B     | 409/456 (90%) | 409 (100%) | 0        | 100         | 100 |
| 1   | C     | 409/456 (90%) | 409 (100%) | 0        | 100         | 100 |
| 1   | D     | 410/456 (90%) | 410 (100%) | 0        | 100         | 100 |
| 1   | E     | 411/456 (90%) | 411 (100%) | 0        | 100         | 100 |
| 1   | F     | 410/456 (90%) | 410 (100%) | 0        | 100         | 100 |
| 1   | G     | 412/456 (90%) | 412 (100%) | 0        | 100         | 100 |
| 1   | H     | 412/456 (90%) | 412 (100%) | 0        | 100         | 100 |
| 1   | I     | 412/456 (90%) | 412 (100%) | 0        | 100         | 100 |

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| Mol | Chain | Analysed        | Rotameric   | Outliers | Percentiles |     |
|-----|-------|-----------------|-------------|----------|-------------|-----|
| 1   | J     | 412/456 (90%)   | 412 (100%)  | 0        | 100         | 100 |
| 1   | K     | 412/456 (90%)   | 411 (100%)  | 1 (0%)   | 87          | 96  |
| 1   | L     | 412/456 (90%)   | 412 (100%)  | 0        | 100         | 100 |
| All | All   | 4931/5472 (90%) | 4930 (100%) | 1 (0%)   | 100         | 100 |

All (1) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | K     | 529 | ASN  |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (38) such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | A     | 250 | ASN  |
| 1   | A     | 252 | HIS  |
| 1   | A     | 282 | ASN  |
| 1   | A     | 444 | ASN  |
| 1   | A     | 507 | HIS  |
| 1   | B     | 387 | GLN  |
| 1   | C     | 100 | ASN  |
| 1   | C     | 250 | ASN  |
| 1   | C     | 387 | GLN  |
| 1   | C     | 465 | HIS  |
| 1   | D     | 100 | ASN  |
| 1   | D     | 138 | GLN  |
| 1   | D     | 250 | ASN  |
| 1   | D     | 311 | ASN  |
| 1   | D     | 494 | GLN  |
| 1   | E     | 189 | ASN  |
| 1   | E     | 252 | HIS  |
| 1   | E     | 421 | ASN  |
| 1   | E     | 494 | GLN  |
| 1   | F     | 196 | ASN  |
| 1   | F     | 339 | ASN  |
| 1   | F     | 421 | ASN  |
| 1   | F     | 465 | HIS  |
| 1   | F     | 471 | GLN  |
| 1   | G     | 250 | ASN  |
| 1   | G     | 307 | GLN  |
| 1   | H     | 100 | ASN  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | H     | 431 | ASN  |
| 1   | I     | 250 | ASN  |
| 1   | J     | 250 | ASN  |
| 1   | J     | 307 | GLN  |
| 1   | J     | 448 | HIS  |
| 1   | J     | 465 | HIS  |
| 1   | J     | 471 | GLN  |
| 1   | K     | 192 | ASN  |
| 1   | K     | 250 | ASN  |
| 1   | K     | 481 | HIS  |
| 1   | L     | 494 | GLN  |

### 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](#)

There are no ligands in this entry.

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

There are no such residues in this entry.

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

There are no chain breaks in this entry.

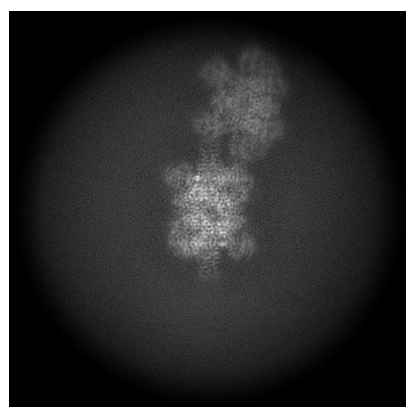
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-74576. These allow visual inspection of the internal detail of the map and identification of artifacts.

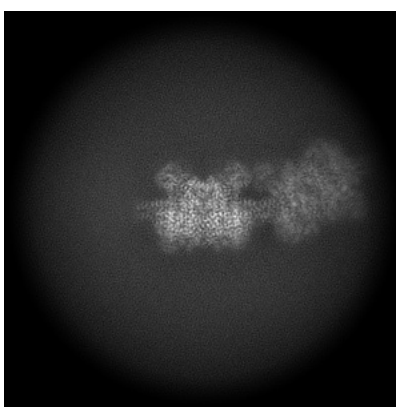
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

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

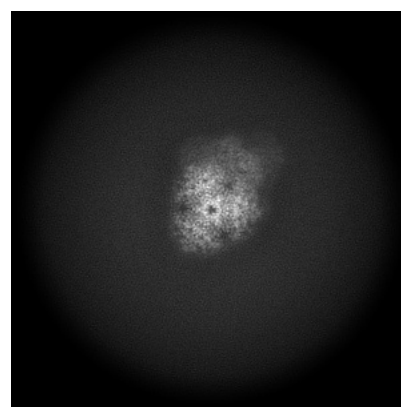
#### 6.1.1 Primary map



X



Y

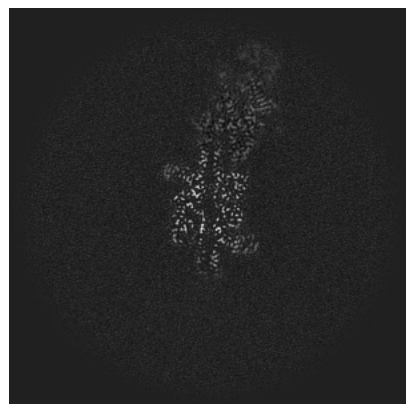


Z

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

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

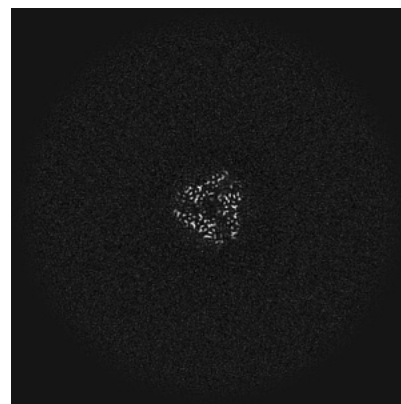
#### 6.2.1 Primary map



X Index: 192



Y Index: 192

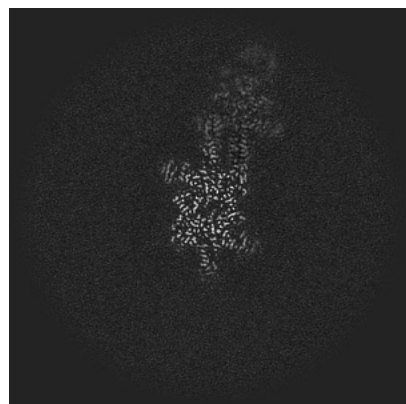


Z Index: 192

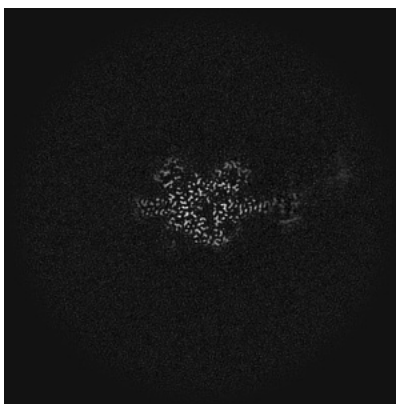
The images above show central slices of the map in three orthogonal directions.

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

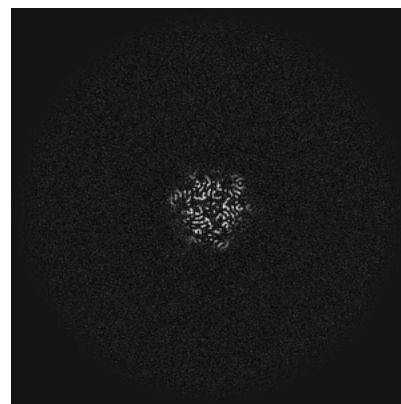
### 6.3.1 Primary map



X Index: 186



Y Index: 185

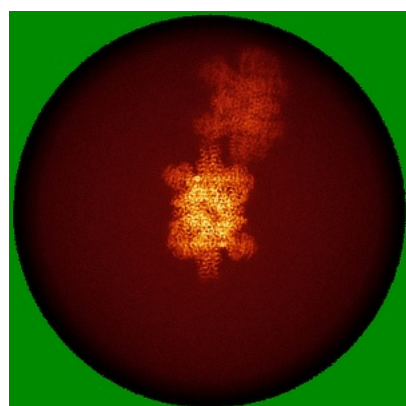


Z Index: 178

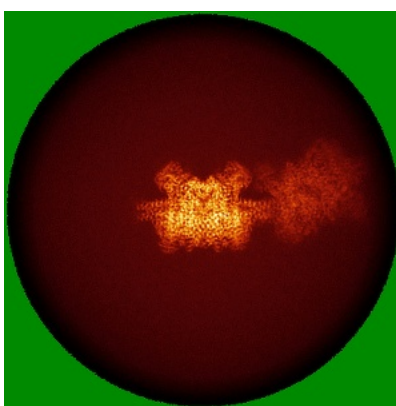
The images above show the largest variance slices of the map in three orthogonal directions.

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

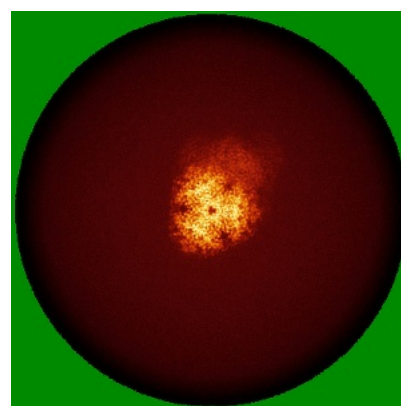
### 6.4.1 Primary map



X



Y



Z

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

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

### 6.5.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.4. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

## 6.6 Mask visualisation [i](#)

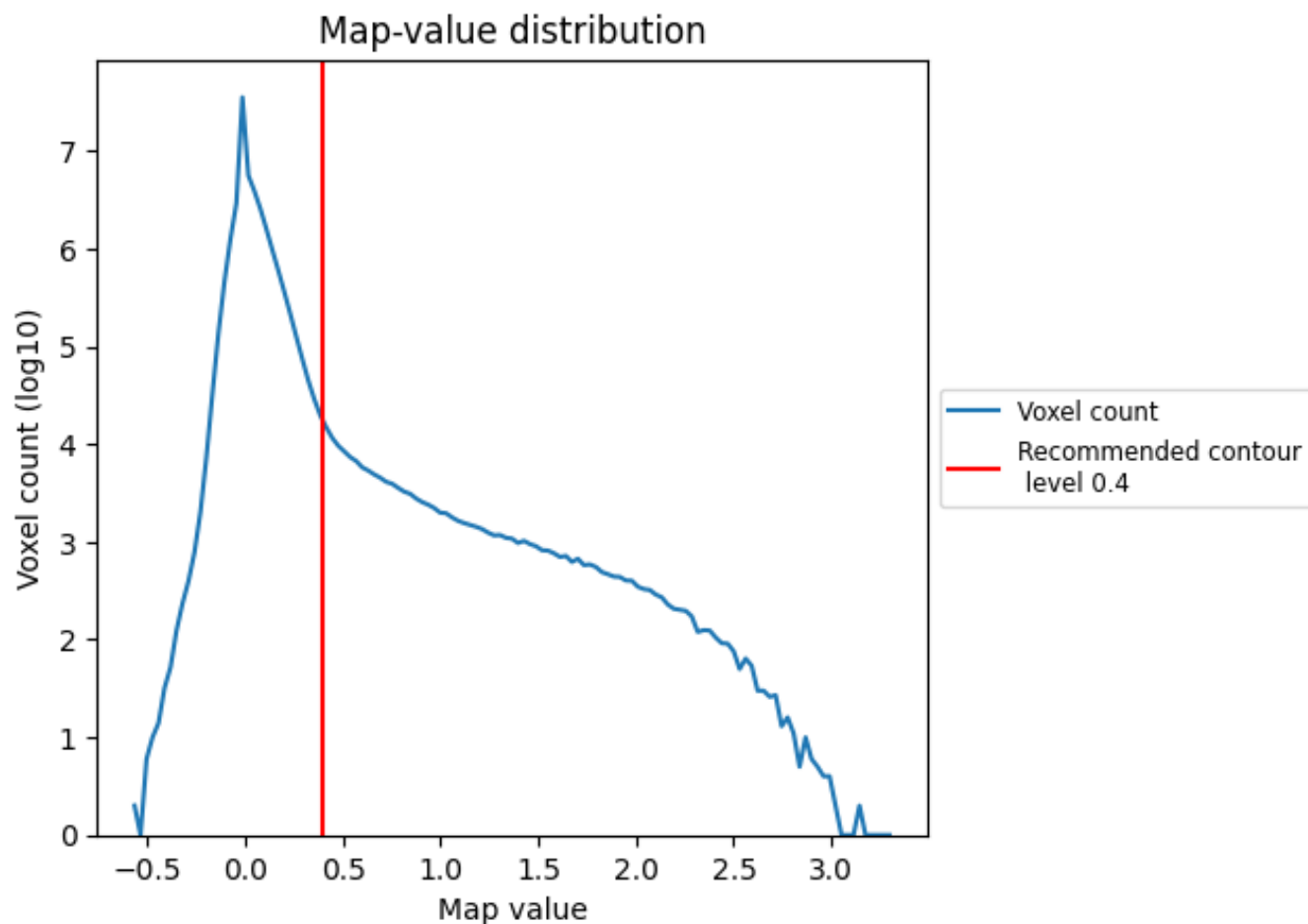
This section was not generated. No masks/segmentation were deposited.



## 7 Map analysis [i](#)

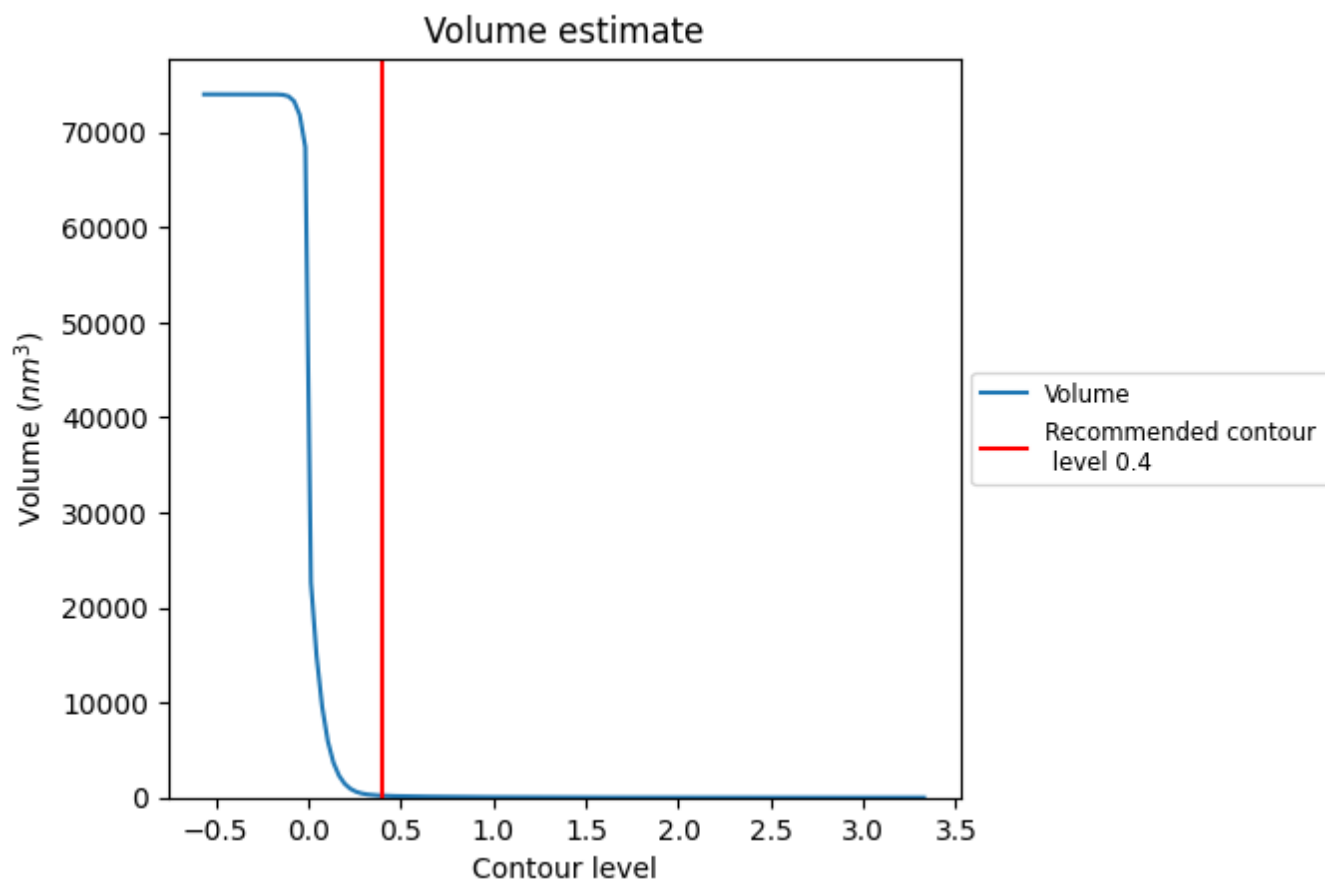
This section contains the results of statistical analysis of the map.

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



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

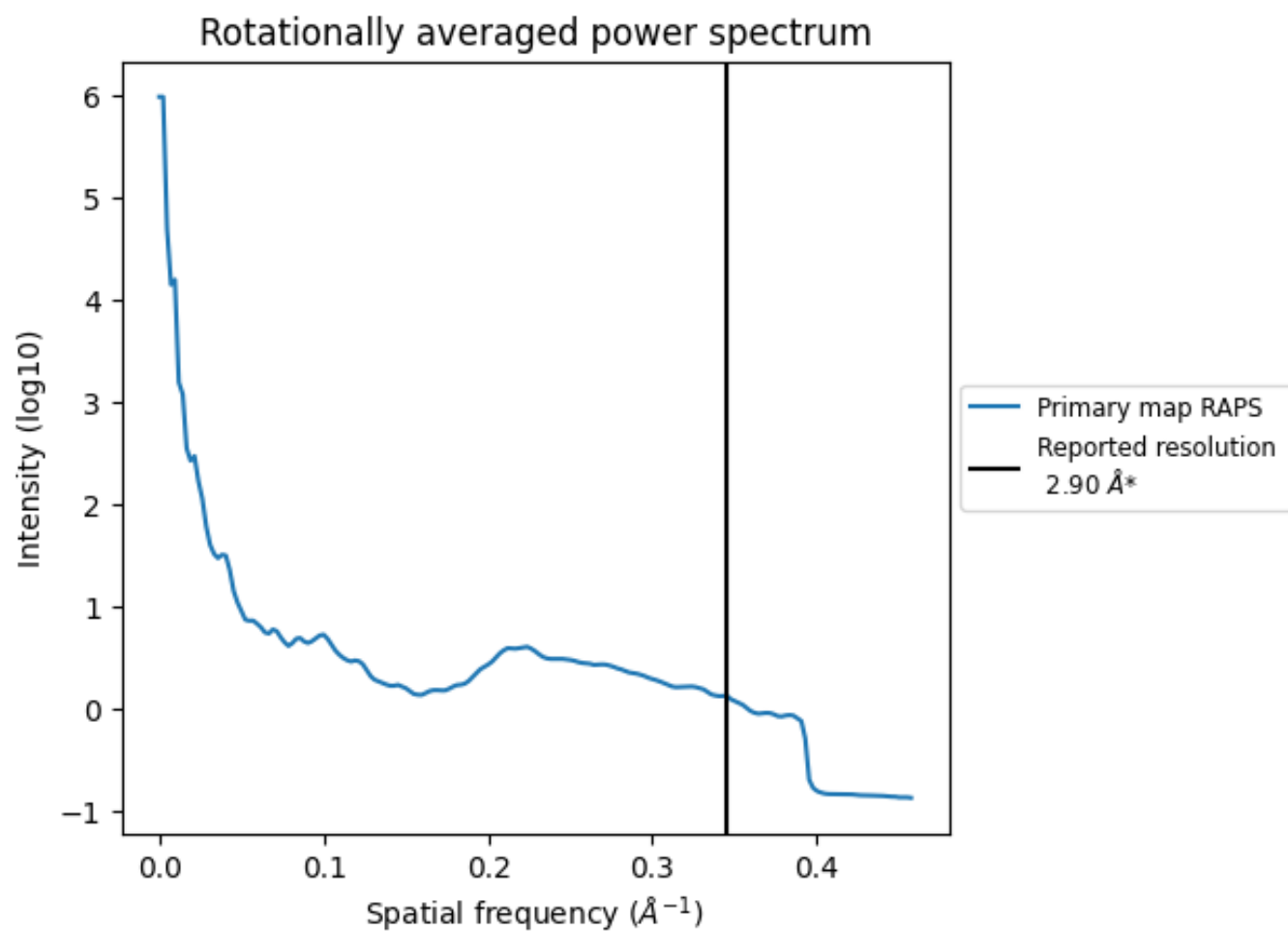
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 201 nm<sup>3</sup>; this corresponds to an approximate mass of 181 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 0.345 Å<sup>-1</sup>

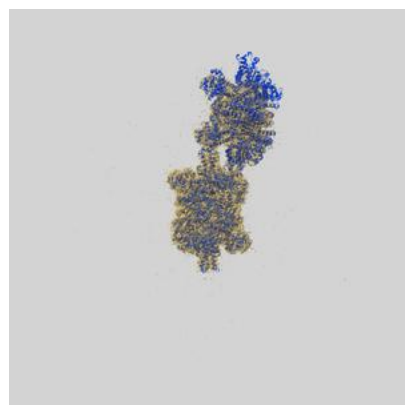
## 8 Fourier-Shell correlation ⓘ

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

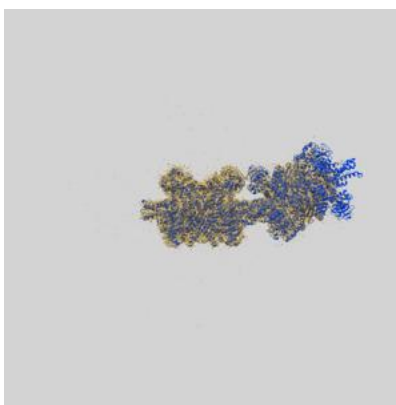
## 9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-74576 and PDB model 9ZQR. Per-residue inclusion information can be found in section [3](#) on page [5](#).

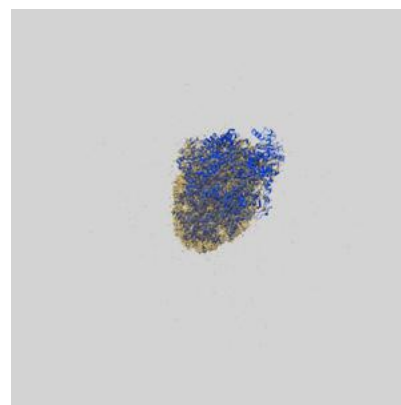
### 9.1 Map-model overlay [i](#)



X



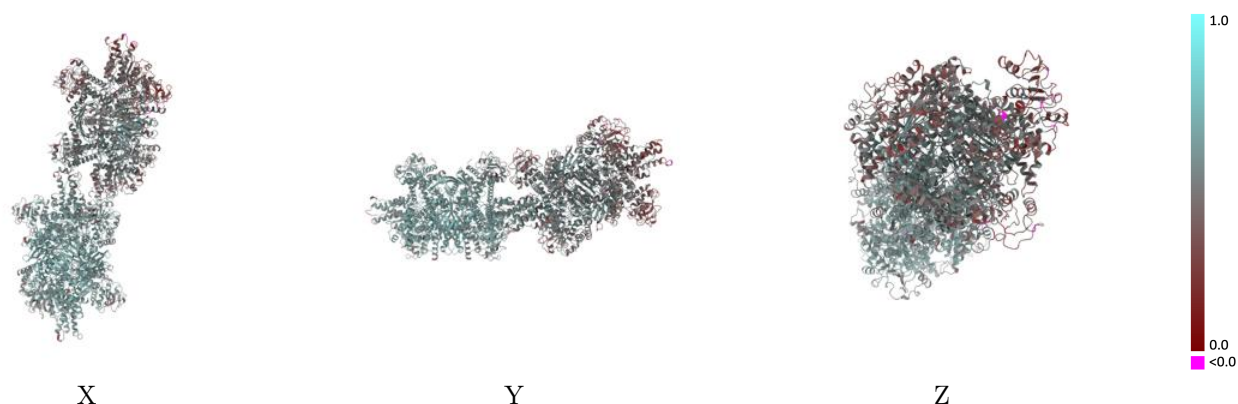
Y



Z

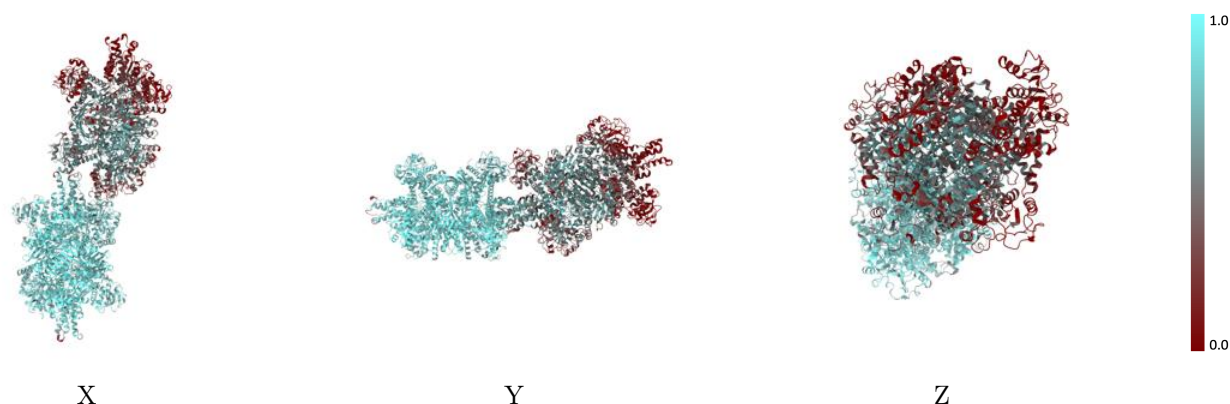
The images above show the 3D surface view of the map at the recommended contour level 0.4 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



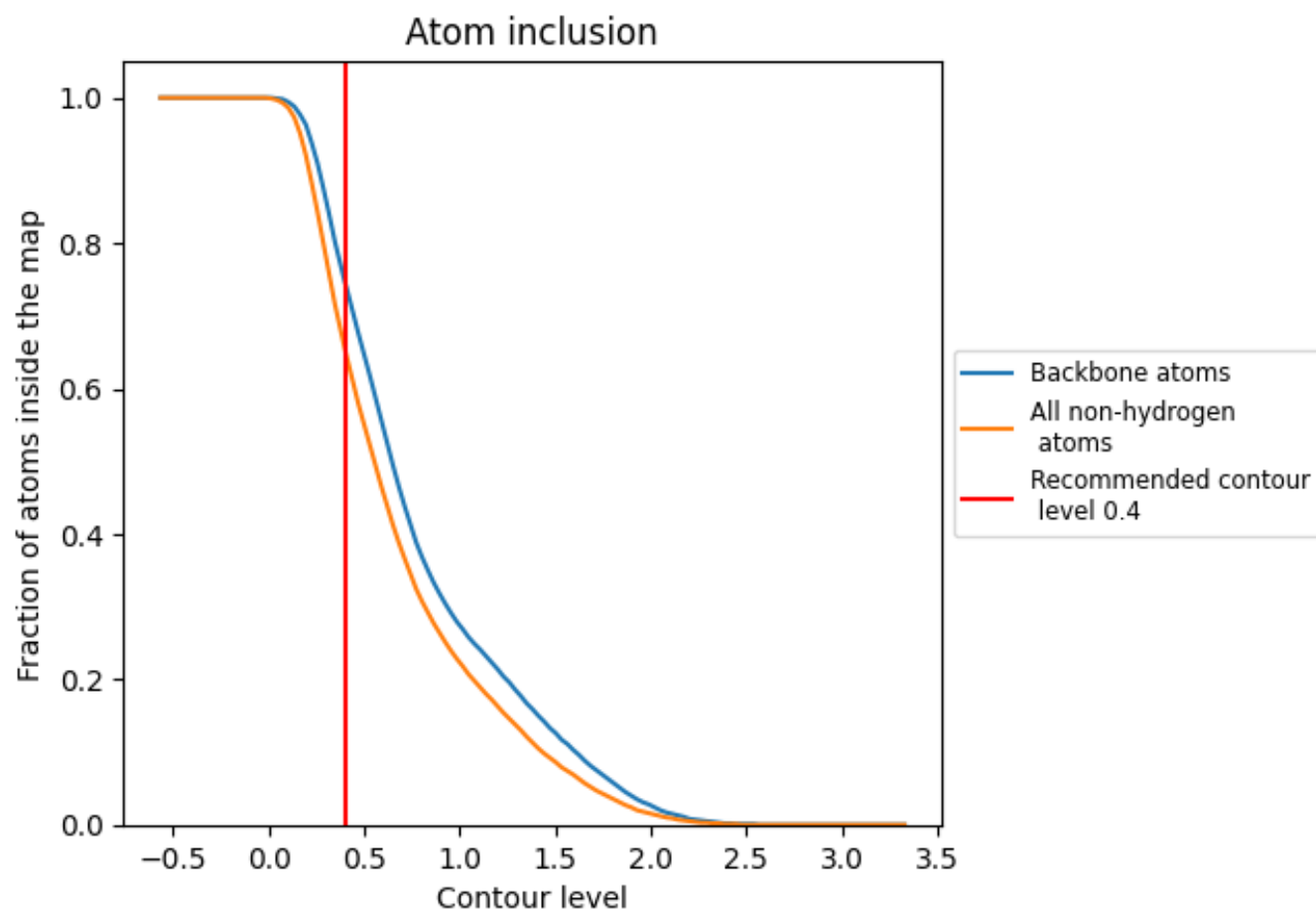
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.4).

## 9.4 Atom inclusion [i](#)



At the recommended contour level, 75% of all backbone atoms, 65% 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 (0.4) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion     | Q-score            |
|-------|--------------------|--------------------|
| All   | <div></div> 0.6540 | <div></div> 0.5290 |
| A     | <div></div> 0.3310 | <div></div> 0.4300 |
| B     | <div></div> 0.3660 | <div></div> 0.4460 |
| C     | <div></div> 0.2960 | <div></div> 0.4260 |
| D     | <div></div> 0.5040 | <div></div> 0.4900 |
| E     | <div></div> 0.5900 | <div></div> 0.5210 |
| F     | <div></div> 0.5020 | <div></div> 0.4840 |
| G     | <div></div> 0.8790 | <div></div> 0.5930 |
| H     | <div></div> 0.8670 | <div></div> 0.5900 |
| I     | <div></div> 0.8760 | <div></div> 0.5910 |
| J     | <div></div> 0.8660 | <div></div> 0.5860 |
| K     | <div></div> 0.8820 | <div></div> 0.5950 |
| L     | <div></div> 0.8820 | <div></div> 0.5940 |

