



## Full wwPDB EM Validation Report ⓘ

Oct 27, 2024 – 09:37 PM JST

PDB ID : 8GOC  
EMDB ID : EMD-34175  
Title : Structure of beta-arrestin2 in complex with a phosphopeptide corresponding to the human Vasopressin V2 receptor, V2R  
Authors : Maharana, J.; Sarma, P.; Yadav, M.K.; Banerjee, R.; Shukla, A.K.  
Deposited on : 2022-08-24  
Resolution : 4.18 Å(reported)  
Based on initial model : 5TV1

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

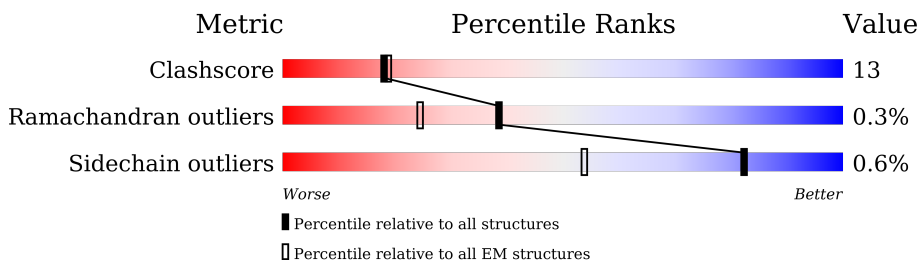
EMDB validation analysis : 0.0.1.dev113  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
MolProbity : 4.02b-467  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.39

# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:  
*ELECTRON MICROSCOPY*

The reported resolution of this entry is 4.18 Å.

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



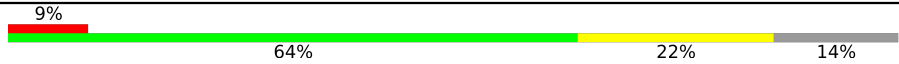



| Metric                | Whole archive (#Entries) | EM structures (#Entries) |
|-----------------------|--------------------------|--------------------------|
| Clashscore            | 210492                   | 15764                    |
| Ramachandran outliers | 207382                   | 16835  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

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     | 420    | 56% 25% 18%      |
| 1   | B     | 420    | 56% 25% 18%      |
| 1   | C     | 420    | 56% 25% 18%      |
| 2   | D     | 237    | 65% 20% 15%      |
| 2   | H     | 237    | 66% 19% 15%      |
| 2   | M     | 237    | 66% 19% 15%      |
| 3   | E     | 215    | 67% 19% 14%      |
| 3   | L     | 215    | 62% 24% 14%      |

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| Mol | Chain | Length | Quality of chain   |
|-----|-------|--------|--|
| 3   | N     | 215    |  |
| 4   | G     | 29     |  |
| 4   | U     | 29     |  |
| 4   | V     | 29     |  |

## 2 Entry composition i

There are 4 unique types of molecules in this entry. The entry contains 16942 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 Beta-arrestin-2.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
|     |       |          | Total | C    | N   | O   | S |         |       |
| 1   | A     | 344      | 2725  | 1743 | 480 | 499 | 3 | 0       | 0     |
| 1   | B     | 344      | 2725  | 1743 | 480 | 499 | 3 | 0       | 0     |
| 1   | C     | 344      | 2717  | 1738 | 479 | 497 | 3 | 0       | 0     |

There are 33 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment             | Reference  |
|-------|---------|----------|--------|---------------------|------------|
| A     | 17      | GLY      | CYS    | engineered mutation | UNP P32120 |
| A     | 60      | VAL      | CYS    | engineered mutation | UNP P32120 |
| A     | 69      | CYS      | LEU    | engineered mutation | UNP P32120 |
| A     | 126     | SER      | CYS    | engineered mutation | UNP P32120 |
| A     | 141     | LEU      | CYS    | engineered mutation | UNP P32120 |
| A     | 151     | VAL      | CYS    | engineered mutation | UNP P32120 |
| A     | 243     | VAL      | CYS    | engineered mutation | UNP P32120 |
| A     | 252     | VAL      | CYS    | engineered mutation | UNP P32120 |
| A     | 270     | SER      | CYS    | engineered mutation | UNP P32120 |
| A     | 278     | PHE      | LEU    | engineered mutation | UNP P32120 |
| A     | 280     | ALA      | SER    | engineered mutation | UNP P32120 |
| B     | 17      | GLY      | CYS    | engineered mutation | UNP P32120 |
| B     | 60      | VAL      | CYS    | engineered mutation | UNP P32120 |
| B     | 69      | CYS      | LEU    | engineered mutation | UNP P32120 |
| B     | 126     | SER      | CYS    | engineered mutation | UNP P32120 |
| B     | 141     | LEU      | CYS    | engineered mutation | UNP P32120 |
| B     | 151     | VAL      | CYS    | engineered mutation | UNP P32120 |
| B     | 243     | VAL      | CYS    | engineered mutation | UNP P32120 |
| B     | 252     | VAL      | CYS    | engineered mutation | UNP P32120 |
| B     | 270     | SER      | CYS    | engineered mutation | UNP P32120 |
| B     | 278     | PHE      | LEU    | engineered mutation | UNP P32120 |
| B     | 280     | ALA      | SER    | engineered mutation | UNP P32120 |
| C     | 17      | GLY      | CYS    | engineered mutation | UNP P32120 |
| C     | 60      | VAL      | CYS    | engineered mutation | UNP P32120 |

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| Chain | Residue | Modelled | Actual | Comment             | Reference  |
|-------|---------|----------|--------|---------------------|------------|
| C     | 69      | CYS      | LEU    | engineered mutation | UNP P32120 |
| C     | 126     | SER      | CYS    | engineered mutation | UNP P32120 |
| C     | 141     | LEU      | CYS    | engineered mutation | UNP P32120 |
| C     | 151     | VAL      | CYS    | engineered mutation | UNP P32120 |
| C     | 243     | VAL      | CYS    | engineered mutation | UNP P32120 |
| C     | 252     | VAL      | CYS    | engineered mutation | UNP P32120 |
| C     | 270     | SER      | CYS    | engineered mutation | UNP P32120 |
| C     | 278     | PHE      | LEU    | engineered mutation | UNP P32120 |
| C     | 280     | ALA      | SER    | engineered mutation | UNP P32120 |

- Molecule 2 is a protein called Fab30 Heavy Chain.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 2   | D     | 202      | 1479  | 938 | 247 | 289 | 5 | 0       | 0     |
| 2   | H     | 202      | 1479  | 938 | 247 | 289 | 5 | 0       | 0     |
| 2   | M     | 202      | 1479  | 938 | 247 | 289 | 5 | 0       | 0     |

- Molecule 3 is a protein called Fab30 Light Chain.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 3   | E     | 185      | 1359  | 856 | 225 | 274 | 4 | 0       | 0     |
| 3   | L     | 185      | 1359  | 856 | 225 | 274 | 4 | 0       | 0     |
| 3   | N     | 185      | 1359  | 856 | 225 | 274 | 4 | 0       | 0     |

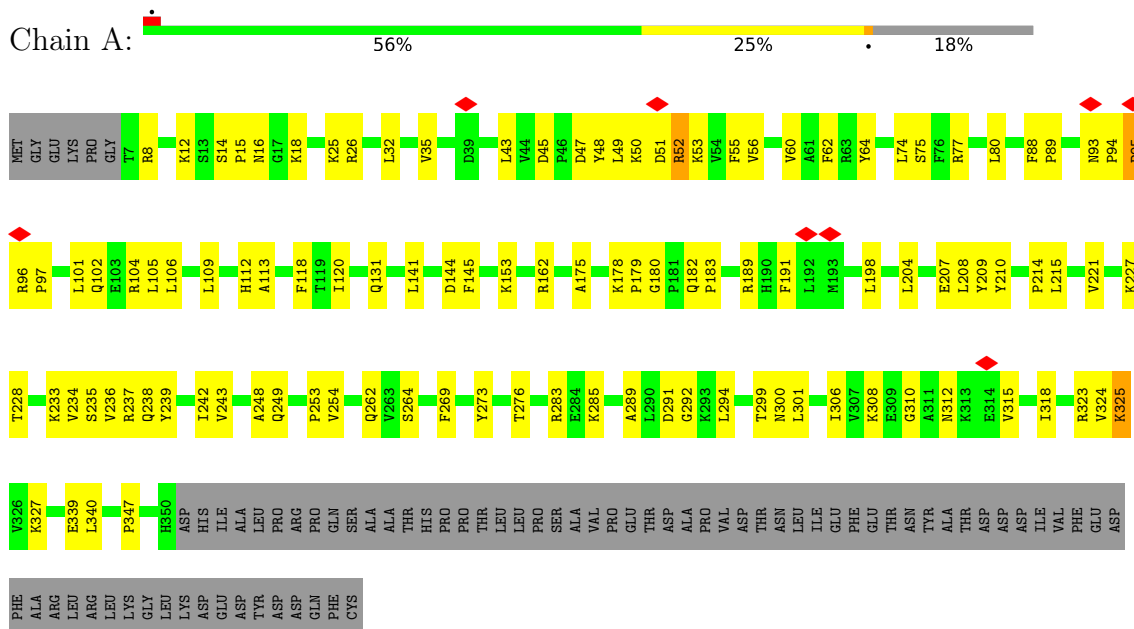
- Molecule 4 is a protein called Vasopressin V2 receptor.

| Mol | Chain | Residues | Atoms |    |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|----|----|----|---|---------|-------|
|     |       |          | Total | C  | N  | O  | P |         |       |
| 4   | G     | 10       | 87    | 39 | 11 | 32 | 5 | 0       | 0     |
| 4   | U     | 10       | 87    | 39 | 11 | 32 | 5 | 0       | 0     |
| 4   | V     | 10       | 87    | 39 | 11 | 32 | 5 | 0       | 0     |

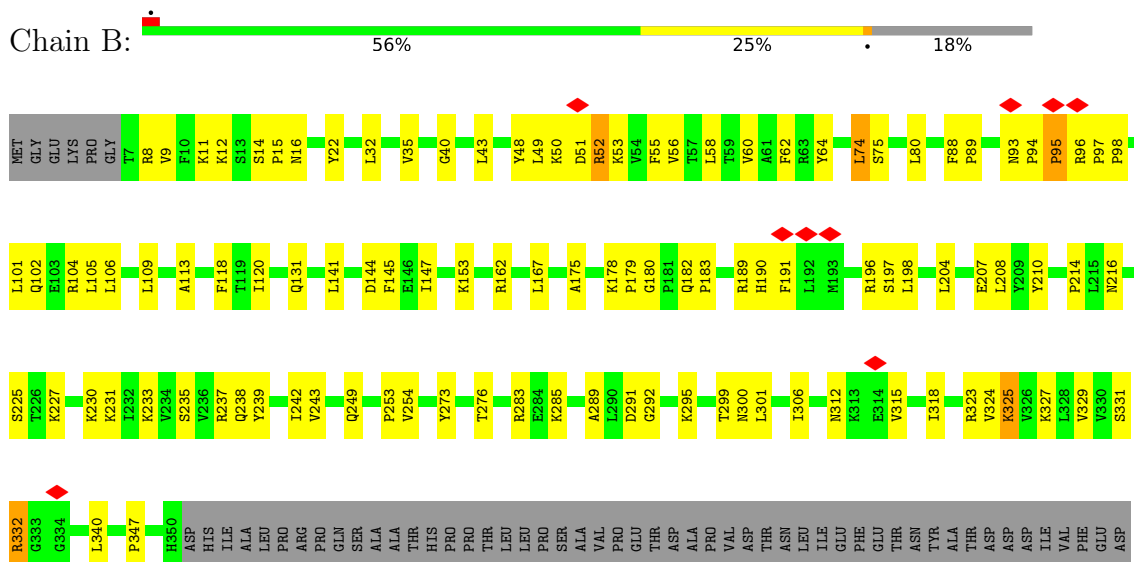
### 3 Residue-property plots i

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

- Molecule 1: Beta-arrestin-2



- Molecule 1: Beta-arrestin-2



PHE  
ALA  
ARG  
LEU  
LEU  
LEU  
LEU  
GLY  
PHE  
GLY  
CYS

● Molecule 1: Beta-arrestin-2



MET  
GLY  
GLU  
LYS  
PRO  
GLY  
T7  
R8  
V9  
F10  
K11  
K12  
S13  
S14  
P15  
N16  
Y22  
D27  
F28  
L32  
V35  
V38  
D39  
G40  
L43  
Y48  
L49  
K50  
D61  
R52  
K53  
F54  
F55  
V56  
V60  
A63  
F62  
R63  
Y64  
L74  
S75  
L80  
F88  
P89  
N93  
P94  
P95  
R96

P97  
P98  
Q102  
L106  
L109  
A113  
S235  
F118  
T119  
I120  
Q131  
L141  
D144  
F145  
I147  
K153  
E157  
R162  
L167  
R170  
A175  
K178  
P179  
G180  
P181  
Q182  
P183  
R189  
H190  
F191  
L192  
M193  
L198  
L204  
E207  
L208  
Y209  
Y210  
P214  
L215

V221  
K227  
K230  
K231  
E232  
K233  
V234  
S235  
V236  
R237  
Q238  
T242  
V243  
T247  
K251  
V252  
P253  
V254  
Q262  
F269  
Y273  
T276  
R283  
E284  
K285  
A289  
L290  
G292  
T299  
N300  
L301  
I306  
N312  
V315  
I318  
R323  
V324  
K325  
V326  
K327  
L328

V329  
V330  
R332  
G333  
G334  
L340  
P347  
H350  
ASP  
HIS  
ILE  
ALA  
LEU  
PRO  
ARG  
PRO  
GLN  
SER  
P253  
ALA  
ALA  
THR  
HIS  
PRO  
PRO  
THR  
LEU  
LEU  
PRO  
SER  
ALA  
VAL  
PRO  
GLU  
THR  
ASP  
ALA  
PRO  
VAL  
ASP  
THR  
ASN  
LEU  
ILE  
GLU  
PHE  
GLU  
THR  
ASN  
TYR  
ALA  
THR  
ASP  
ASP  
ASP  
ILE  
VAL

PHE  
GLU  
ASP  
S331  
PHE  
R332  
ALA  
G333  
LEU  
ARG  
LEU

● Molecule 2: Fab30 Heavy Chain



GLU  
ILE  
SER  
GLU  
V5  
E9  
Q16  
P17  
F30  
Y33  
W39  
R41  
L48  
E49  
W50  
A64  
V67  
S74  
Y83  
L84  
D83  
T94  
C99  
A100  
R101  
S102  
R103  
Q104  
F105  
W106  
L110  
D111  
Y112  
G116  
V121  
S122  
S130  
P136  
SER  
LYS  
SER

THR  
SER  
GLY  
GLU  
THR  
A146  
G149  
P157  
V160  
S163  
W164  
T170  
V173  
L180  
Y186  
S187  
L188  
V191  
V192  
P195  
S196  
S197  
SER  
LEU  
GLY  
THR  
GLN  
THR  
TYR  
ILE  
C206  
N207  
H210  
K211  
P212  
S213  
N214  
D218  
K219  
E222  
P223  
LYS  
SER  
CYS  
ASP  
LYS  
THR

HIS  
HIS  
HIS  
HIS  
HIS  
HIS  
HIS

● Molecule 2: Fab30 Heavy Chain

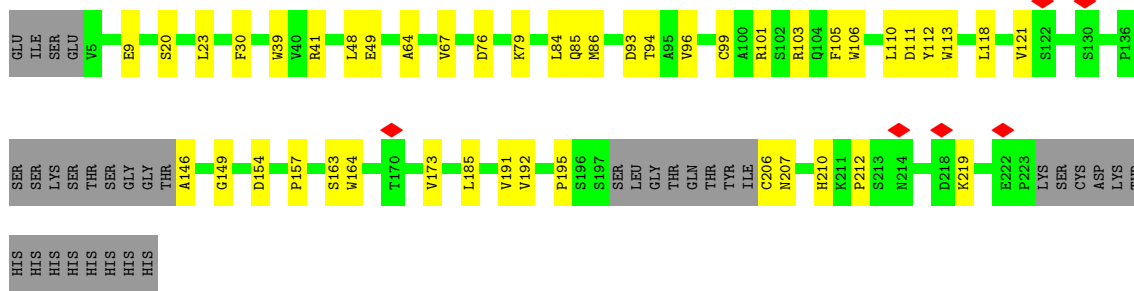


GLU  
ILE  
SER  
GLU  
V5  
E9  
Q16  
P17  
L23  
F30  
Y33  
N39  
V40  
R41  
W50  
A64  
V67  
T72  
D76  
K79  
L84  
Q85  
M86  
D83  
T94  
C99  
A100  
R101  
S102  
R103  
Q104  
F105  
W106  
L110  
D111  
Y112  
V121  
S122  
S130  
P136  
SER

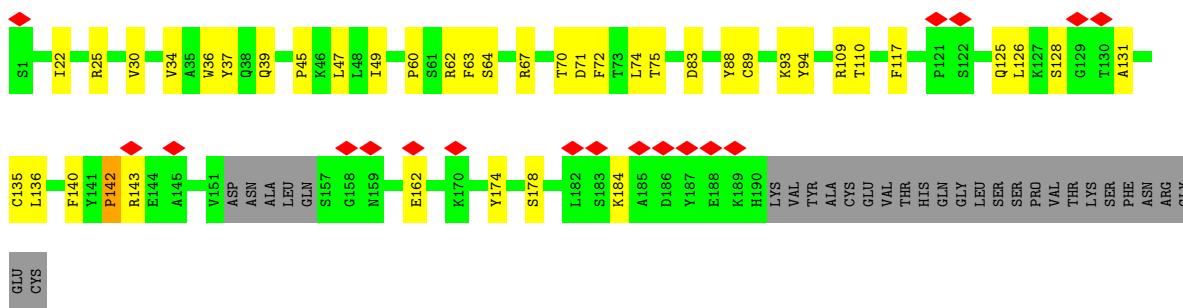
SER  
LYS  
SER  
THR  
SER  
GLY  
GLY  
THR  
A146  
G149  
P157  
V160  
S163  
W164  
T170  
L180  
Y186  
S187  
L188  
V191  
P195  
S196  
S197  
SER  
GLY  
THR  
GLN  
THR  
TYR  
ILE  
C206  
N207  
H210  
K211  
P212  
S213  
N214  
D218  
K219  
E222  
P223  
LYS  
SER  
CYS  
ASP  
LYS  
THR

HIS  
HIS  
HIS  
HIS  
HIS  
HIS  
HIS

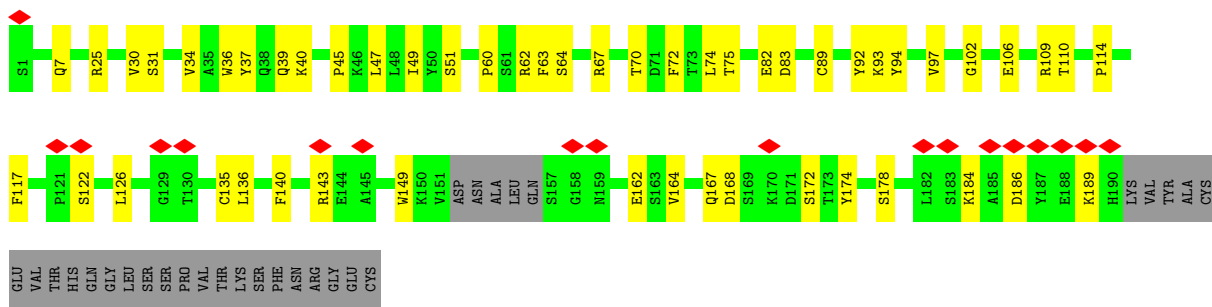
• Molecule 2: Fab30 Heavy Chain



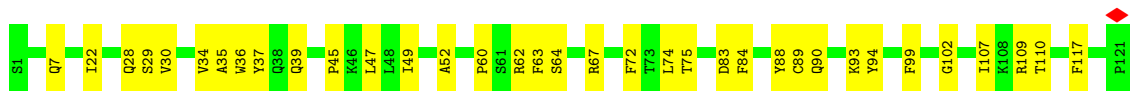
• Molecule 3: Fab30 Light Chain



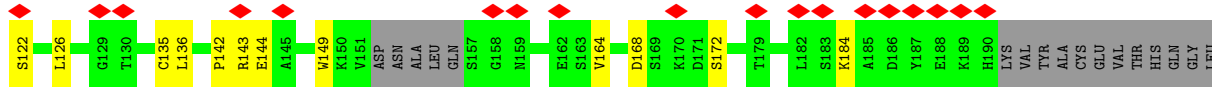
• Molecule 3: Fab30 Light Chain



• Molecule 3: Fab30 Light Chain







SER  
SER  
PRO  
VAL  
THR  
LYS  
SER  
PHE  
ASN  
ARG  
GLY  
GLU  
CYS

● Molecule 4: Vasopressin V2 receptor



ALA  
ARG  
GLY  
TPO  
PRO  
PRO  
SEP  
LEU  
GLY  
PRO  
GLN  
ASP  
GLU  
SEP  
CYS  
T359  
T360  
A361  
S362  
S363  
S364  
L365  
A366  
K367  
D368  
TPO  
SEP  
SEP

● Molecule 4: Vasopressin V2 receptor



ALA  
ARG  
GLY  
TPO  
PRO  
PRO  
SEP  
LEU  
GLY  
PRO  
GLN  
ASP  
GLU  
SEP  
CYS  
T359  
T360  
A361  
S362  
S363  
S364  
L365  
A366  
K367  
D368  
TPO  
SEP  
SEP

● Molecule 4: Vasopressin V2 receptor



ALA  
ARG  
GLY  
TPO  
PRO  
PRO  
SEP  
LEU  
GLY  
PRO  
GLN  
ASP  
GLU  
SEP  
CYS  
T359  
T360  
A361  
S362  
S363  
S364  
L365  
A366  
K367  
D368  
TPO  
SEP  
SEP

## 4 Experimental information

| Property                             | Value                     | Source    |
|--------------------------------------|---------------------------|-----------|
| EM reconstruction method             | SINGLE PARTICLE           | Depositor |
| Imposed symmetry                     | POINT, C3                 | Depositor |
| Number of particles used             | 18492                     | Depositor |
| Resolution determination method      | FSC 0.143 CUT-OFF         | Depositor |
| CTF correction method                | NONE                      | Depositor |
| Microscope                           | FEI TITAN KRIOS           | Depositor |
| Voltage (kV)                         | 300                       | Depositor |
| Electron dose ( $e^-/\text{\AA}^2$ ) | 48.7                      | Depositor |
| Minimum defocus (nm)                 | 500                       | Depositor |
| Maximum defocus (nm)                 | 2500                      | Depositor |
| Magnification                        | 165000                    | Depositor |
| Image detector                       | GATAN K2 SUMMIT (4k x 4k) | Depositor |
| Maximum map value                    | 0.495                     | Depositor |
| Minimum map value                    | -0.319                    | Depositor |
| Average map value                    | 0.000                     | Depositor |
| Map value standard deviation         | 0.010                     | Depositor |
| Recommended contour level            | 0.08                      | Depositor |
| Map size ( $\text{\AA}$ )            | 419.84, 419.84, 419.84    | wwPDB     |
| Map dimensions                       | 512, 512, 512             | wwPDB     |
| Map angles ( $^\circ$ )              | 90.0, 90.0, 90.0          | wwPDB     |
| Pixel spacing ( $\text{\AA}$ )       | 0.82, 0.82, 0.82          | Depositor |

## 5 Model quality [i](#)

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

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

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

| Mol | Chain | Bond lengths |         | Bond angles |                |
|-----|-------|--------------|---------|-------------|----------------|
|     |       | RMSZ         | # Z  >5 | RMSZ        | # Z  >5        |
| 1   | A     | 0.26         | 0/2789  | 0.54        | 0/3785         |
| 1   | B     | 0.26         | 0/2789  | 0.55        | 1/3785 (0.0%)  |
| 1   | C     | 0.26         | 0/2781  | 0.55        | 1/3776 (0.0%)  |
| 2   | D     | 0.26         | 0/1519  | 0.49        | 0/2080         |
| 2   | H     | 0.26         | 0/1519  | 0.50        | 0/2080         |
| 2   | M     | 0.26         | 0/1519  | 0.49        | 0/2080         |
| 3   | E     | 0.28         | 0/1388  | 0.55        | 0/1893         |
| 3   | L     | 0.26         | 0/1388  | 0.52        | 0/1893         |
| 3   | N     | 0.26         | 0/1388  | 0.53        | 0/1893         |
| 4   | G     | 0.24         | 0/33    | 0.52        | 0/41           |
| 4   | U     | 0.23         | 0/33    | 0.34        | 0/41           |
| 4   | V     | 0.24         | 0/33    | 0.56        | 0/41           |
| All | All   | 0.26         | 0/17179 | 0.53        | 2/23388 (0.0%) |

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

| Mol | Chain | #Chirality outliers | #Planarity outliers |
|-----|-------|---------------------|---------------------|
| 1   | A     | 0                   | 1                   |
| 1   | B     | 0                   | 1                   |
| 1   | C     | 0                   | 1                   |
| All | All   | 0                   | 3                   |

There are no bond length outliers.

All (2) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms    | Z    | Observed(°) | Ideal(°) |
|-----|-------|-----|------|----------|------|-------------|----------|
| 1   | B     | 74  | LEU  | CA-CB-CG | 5.60 | 128.18      | 115.30   |

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| Mol | Chain | Res | Type | Atoms    | Z    | Observed( $^{\circ}$ ) | Ideal( $^{\circ}$ ) |
|-----|-------|-----|------|----------|------|------------------------|---------------------|
| 1   | C     | 74  | LEU  | CA-CB-CG | 5.08 | 126.97                 | 115.30              |

There are no chirality outliers.

All (3) planarity outliers are listed below:

| Mol | Chain | Res | Type | Group   |
|-----|-------|-----|------|---------|
| 1   | A     | 95  | PRO  | Peptide |
| 1   | B     | 95  | PRO  | Peptide |
| 1   | C     | 95  | PRO  | Peptide |

## 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     | 2725  | 0        | 2774     | 78      | 0            |
| 1   | B     | 2725  | 0        | 2774     | 80      | 0            |
| 1   | C     | 2717  | 0        | 2759     | 75      | 0            |
| 2   | D     | 1479  | 0        | 1353     | 33      | 0            |
| 2   | H     | 1479  | 0        | 1353     | 34      | 0            |
| 2   | M     | 1479  | 0        | 1353     | 37      | 0            |
| 3   | E     | 1359  | 0        | 1268     | 32      | 0            |
| 3   | L     | 1359  | 0        | 1268     | 38      | 0            |
| 3   | N     | 1359  | 0        | 1268     | 32      | 0            |
| 4   | G     | 87    | 0        | 60       | 5       | 0            |
| 4   | U     | 87    | 0        | 60       | 5       | 0            |
| 4   | V     | 87    | 0        | 60       | 4       | 0            |
| All | All   | 16942 | 0        | 16350    | 431     | 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 13.

All (431) 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:B:94:PRO:HA | 1:B:96:ARG:HA | 1.65                     | 0.78              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:74:LEU:HD23  | 1:C:75:SER:H     | 1.50                     | 0.77              |
| 1:B:52:ARG:HG3   | 1:B:153:LYS:HG3  | 1.66                     | 0.75              |
| 1:C:52:ARG:HG3   | 1:C:153:LYS:HG3  | 1.69                     | 0.75              |
| 1:A:52:ARG:HG3   | 1:A:153:LYS:HG3  | 1.66                     | 0.75              |
| 1:C:35:VAL:HG11  | 1:C:120:ILE:HB   | 1.69                     | 0.74              |
| 1:A:74:LEU:HG    | 1:A:75:SER:H     | 1.53                     | 0.73              |
| 1:B:64:TYR:HB3   | 1:B:75:SER:HA    | 1.73                     | 0.71              |
| 2:M:101:ARG:HH22 | 2:M:103:ARG:HG3  | 1.54                     | 0.71              |
| 1:C:64:TYR:HB3   | 1:C:75:SER:HA    | 1.72                     | 0.70              |
| 1:A:49:LEU:HA    | 1:A:52:ARG:HH21  | 1.56                     | 0.70              |
| 1:B:49:LEU:HA    | 1:B:52:ARG:HH21  | 1.58                     | 0.69              |
| 1:C:96:ARG:HB3   | 1:C:97:PRO:HD3   | 1.74                     | 0.69              |
| 2:M:206:CYS:N    | 2:M:219:LYS:O    | 2.25                     | 0.69              |
| 2:H:206:CYS:N    | 2:H:219:LYS:O    | 2.25                     | 0.69              |
| 1:A:64:TYR:HB3   | 1:A:75:SER:HA    | 1.74                     | 0.68              |
| 1:C:235:SER:HB2  | 1:C:325:LYS:HE3  | 1.75                     | 0.68              |
| 1:A:96:ARG:HB3   | 1:A:97:PRO:HD3   | 1.75                     | 0.67              |
| 2:D:111:ASP:HA   | 3:E:47:LEU:HD22  | 1.77                     | 0.67              |
| 2:D:206:CYS:N    | 2:D:219:LYS:O    | 2.26                     | 0.67              |
| 1:A:235:SER:HB2  | 1:A:325:LYS:HE3  | 1.77                     | 0.67              |
| 1:C:49:LEU:HB2   | 1:C:52:ARG:HB2   | 1.78                     | 0.66              |
| 2:M:76:ASP:OD2   | 2:M:79:LYS:NZ    | 2.28                     | 0.66              |
| 1:B:74:LEU:HD23  | 1:B:75:SER:H     | 1.60                     | 0.65              |
| 1:B:235:SER:HB2  | 1:B:325:LYS:HE3  | 1.76                     | 0.65              |
| 2:H:157:PRO:O    | 2:H:210:HIS:NE2  | 2.30                     | 0.65              |
| 1:B:12:LYS:NZ    | 4:U:360:TPO:O3P  | 2.25                     | 0.65              |
| 2:M:157:PRO:O    | 2:M:210:HIS:NE2  | 2.29                     | 0.65              |
| 1:A:35:VAL:HG11  | 1:A:120:ILE:HB   | 1.79                     | 0.65              |
| 2:D:157:PRO:O    | 2:D:210:HIS:NE2  | 2.29                     | 0.65              |
| 1:B:35:VAL:HG11  | 1:B:120:ILE:HB   | 1.79                     | 0.65              |
| 1:B:60:VAL:HG23  | 1:B:80:LEU:HB2   | 1.78                     | 0.65              |
| 1:C:94:PRO:HA    | 1:C:96:ARG:HA    | 1.79                     | 0.64              |
| 3:L:36:TRP:HB2   | 3:L:49:ILE:HB    | 1.79                     | 0.64              |
| 1:A:253:PRO:O    | 1:A:285:LYS:NZ   | 2.29                     | 0.64              |
| 2:D:16:GLN:OE1   | 2:D:17:PRO:HD2   | 1.98                     | 0.64              |
| 2:D:103:ARG:NH2  | 2:D:105:PHE:O    | 2.30                     | 0.64              |
| 2:M:41:ARG:O     | 2:M:49:GLU:N     | 2.30                     | 0.64              |
| 1:B:96:ARG:HG3   | 1:B:97:PRO:HD3   | 1.79                     | 0.63              |
| 3:E:142:PRO:HA   | 3:E:174:TYR:CE2  | 2.34                     | 0.63              |
| 1:A:254:VAL:HG21 | 1:A:301:LEU:HD21 | 1.80                     | 0.63              |
| 1:B:254:VAL:HG21 | 1:B:301:LEU:HD21 | 1.81                     | 0.62              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:49:LEU:HA    | 1:C:52:ARG:HH21  | 1.63                     | 0.62              |
| 1:C:254:VAL:HG21 | 1:C:301:LEU:HD21 | 1.80                     | 0.62              |
| 1:C:40:GLY:O     | 1:C:102:GLN:NE2  | 2.33                     | 0.62              |
| 1:C:253:PRO:O    | 1:C:285:LYS:NZ   | 2.29                     | 0.62              |
| 3:E:36:TRP:HB2   | 3:E:49:ILE:HB    | 1.82                     | 0.62              |
| 1:A:48:TYR:OH    | 1:A:162:ARG:NH1  | 2.32                     | 0.62              |
| 1:A:94:PRO:HA    | 1:A:96:ARG:HA    | 1.82                     | 0.61              |
| 1:A:43:LEU:HD12  | 1:A:109:LEU:HD13 | 1.82                     | 0.61              |
| 3:E:143:ARG:HH11 | 3:E:174:TYR:HD1  | 1.46                     | 0.61              |
| 3:L:117:PHE:HB2  | 3:L:136:LEU:HB3  | 1.82                     | 0.61              |
| 2:M:103:ARG:NH2  | 2:M:105:PHE:O    | 2.30                     | 0.61              |
| 3:N:117:PHE:HB2  | 3:N:136:LEU:HB3  | 1.83                     | 0.61              |
| 1:C:131:GLN:NE2  | 1:C:283:ARG:O    | 2.34                     | 0.60              |
| 1:C:12:LYS:NZ    | 4:V:360:TPO:O3P  | 2.26                     | 0.60              |
| 1:B:253:PRO:O    | 1:B:285:LYS:NZ   | 2.29                     | 0.59              |
| 3:L:93:LYS:HG3   | 3:L:94:TYR:HD2   | 1.67                     | 0.59              |
| 2:D:163:SER:O    | 2:D:207:ASN:N    | 2.36                     | 0.59              |
| 1:A:182:GLN:NE2  | 1:A:204:LEU:O    | 2.35                     | 0.59              |
| 1:C:48:TYR:OH    | 1:C:162:ARG:NH1  | 2.35                     | 0.59              |
| 1:C:233:LYS:HB2  | 1:C:327:LYS:HB3  | 1.85                     | 0.59              |
| 1:B:48:TYR:OH    | 1:B:162:ARG:NH1  | 2.36                     | 0.58              |
| 1:B:62:PHE:HE1   | 1:B:318:ILE:HD11 | 1.67                     | 0.58              |
| 2:H:103:ARG:NH2  | 2:H:105:PHE:O    | 2.30                     | 0.58              |
| 1:C:182:GLN:NE2  | 1:C:204:LEU:O    | 2.36                     | 0.58              |
| 1:B:182:GLN:NE2  | 1:B:204:LEU:O    | 2.35                     | 0.58              |
| 1:C:27:ASP:OD2   | 1:C:170:ARG:NH2  | 2.36                     | 0.58              |
| 1:A:12:LYS:NZ    | 4:G:360:TPO:O3P  | 2.25                     | 0.58              |
| 2:H:76:ASP:OD2   | 2:H:79:LYS:NZ    | 2.31                     | 0.58              |
| 1:A:53:LYS:HE3   | 1:A:55:PHE:HZ    | 1.69                     | 0.57              |
| 2:H:40:VAL:HG12  | 2:H:50:TRP:HA    | 1.85                     | 0.57              |
| 2:H:163:SER:O    | 2:H:207:ASN:N    | 2.37                     | 0.57              |
| 1:A:62:PHE:HE1   | 1:A:318:ILE:HD11 | 1.69                     | 0.57              |
| 1:A:131:GLN:NE2  | 1:A:283:ARG:O    | 2.37                     | 0.57              |
| 1:B:53:LYS:HE3   | 1:B:55:PHE:HZ    | 1.69                     | 0.57              |
| 2:H:101:ARG:HH12 | 2:H:103:ARG:HG3  | 1.69                     | 0.57              |
| 2:H:111:ASP:HA   | 3:L:47:LEU:HD22  | 1.86                     | 0.57              |
| 1:B:8:ARG:NH2    | 4:U:363:SEP:O    | 2.37                     | 0.57              |
| 1:B:32:LEU:HD21  | 1:B:306:ILE:HD11 | 1.87                     | 0.57              |
| 3:L:34:VAL:HG21  | 3:L:72:PHE:CZ    | 2.39                     | 0.57              |
| 1:B:131:GLN:NE2  | 1:B:283:ARG:O    | 2.37                     | 0.56              |
| 3:E:25:ARG:NH1   | 3:E:71:ASP:OD1   | 2.37                     | 0.56              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:62:PHE:HE1   | 1:C:318:ILE:HD11 | 1.69                     | 0.56              |
| 2:H:111:ASP:OD1  | 2:H:112:TYR:N    | 2.38                     | 0.56              |
| 3:L:25:ARG:NH1   | 3:L:70:THR:OG1   | 2.37                     | 0.56              |
| 1:A:64:TYR:HA    | 1:A:141:LEU:HA   | 1.88                     | 0.56              |
| 2:H:85:GLN:NE2   | 2:H:86:MET:O     | 2.39                     | 0.56              |
| 1:A:32:LEU:HD21  | 1:A:306:ILE:HD11 | 1.88                     | 0.56              |
| 1:B:49:LEU:HB2   | 1:B:52:ARG:HB2   | 1.88                     | 0.56              |
| 2:H:16:GLN:OE1   | 2:H:17:PRO:HD2   | 2.05                     | 0.56              |
| 3:L:31:SER:O     | 3:L:67:ARG:NH1   | 2.39                     | 0.56              |
| 1:A:262:GLN:HE22 | 1:A:264:SER:HA   | 1.71                     | 0.56              |
| 3:E:34:VAL:HG21  | 3:E:72:PHE:CZ    | 2.41                     | 0.56              |
| 3:E:39:GLN:HG3   | 3:E:45:PRO:HG3   | 1.88                     | 0.56              |
| 2:M:111:ASP:OD1  | 2:M:112:TYR:N    | 2.39                     | 0.55              |
| 1:A:276:THR:HG1  | 2:D:33:TYR:HE2   | 1.54                     | 0.55              |
| 1:C:43:LEU:HD12  | 1:C:109:LEU:HD13 | 1.89                     | 0.55              |
| 1:A:233:LYS:HB2  | 1:A:327:LYS:HB3  | 1.88                     | 0.55              |
| 1:C:74:LEU:HD23  | 1:C:75:SER:N     | 2.20                     | 0.55              |
| 2:D:101:ARG:NH2  | 2:D:111:ASP:OD2  | 2.39                     | 0.55              |
| 1:B:74:LEU:HD23  | 1:B:75:SER:N     | 2.21                     | 0.55              |
| 1:C:53:LYS:HE3   | 1:C:55:PHE:HZ    | 1.72                     | 0.55              |
| 2:M:85:GLN:NE2   | 2:M:86:MET:O     | 2.39                     | 0.55              |
| 2:M:163:SER:O    | 2:M:207:ASN:N    | 2.36                     | 0.55              |
| 1:B:233:LYS:HB2  | 1:B:327:LYS:HB3  | 1.89                     | 0.55              |
| 2:D:41:ARG:NH1   | 2:D:93:ASP:OD1   | 2.40                     | 0.55              |
| 3:E:109:ARG:NH2  | 3:E:110:THR:OG1  | 2.36                     | 0.55              |
| 2:M:41:ARG:NH1   | 2:M:93:ASP:OD1   | 2.40                     | 0.54              |
| 3:N:36:TRP:HB2   | 3:N:49:ILE:HB    | 1.88                     | 0.54              |
| 1:B:64:TYR:HA    | 1:B:141:LEU:HA   | 1.90                     | 0.54              |
| 1:B:183:PRO:HG2  | 1:B:204:LEU:HB2  | 1.89                     | 0.54              |
| 2:M:39:TRP:CZ3   | 2:M:99:CYS:HB3   | 2.43                     | 0.54              |
| 3:N:39:GLN:HG3   | 3:N:45:PRO:HG3   | 1.90                     | 0.54              |
| 1:A:74:LEU:HD22  | 1:C:251:LYS:HE2  | 1.90                     | 0.54              |
| 3:L:39:GLN:HG3   | 3:L:45:PRO:HG3   | 1.90                     | 0.54              |
| 2:D:9:GLU:OE2    | 2:D:116:GLY:N    | 2.31                     | 0.54              |
| 3:E:25:ARG:NH1   | 3:E:70:THR:OG1   | 2.41                     | 0.54              |
| 2:M:110:LEU:HB2  | 2:M:113:TRP:HE1  | 1.73                     | 0.53              |
| 1:B:49:LEU:HD12  | 1:B:50:LYS:N     | 2.23                     | 0.53              |
| 2:H:39:TRP:CH2   | 2:H:84:LEU:HD21  | 2.43                     | 0.53              |
| 1:A:238:GLN:HE22 | 1:A:289:ALA:HB3  | 1.73                     | 0.53              |
| 1:C:32:LEU:HD21  | 1:C:306:ILE:HD11 | 1.90                     | 0.53              |
| 3:L:39:GLN:NE2   | 3:L:40:LYS:O     | 2.41                     | 0.53              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:M:48:LEU:HD22  | 3:N:88:TYR:CD1   | 2.44                     | 0.53              |
| 1:C:64:TYR:HA    | 1:C:141:LEU:HA   | 1.91                     | 0.53              |
| 1:C:233:LYS:HD2  | 1:C:327:LYS:HE3  | 1.91                     | 0.53              |
| 1:C:234:VAL:HG21 | 1:C:273:TYR:HD2  | 1.73                     | 0.53              |
| 1:C:243:VAL:HG21 | 1:C:315:VAL:HB   | 1.91                     | 0.53              |
| 1:B:189:ARG:O    | 1:B:198:LEU:N    | 2.42                     | 0.53              |
| 2:M:164:TRP:HA   | 2:M:206:CYS:HA   | 1.91                     | 0.53              |
| 3:E:36:TRP:CD2   | 3:E:74:LEU:HD22  | 2.44                     | 0.53              |
| 2:M:149:GLY:HA2  | 2:M:191:VAL:HA   | 1.91                     | 0.53              |
| 3:N:37:TYR:HB2   | 3:N:88:TYR:HB2   | 1.90                     | 0.52              |
| 1:B:196:ARG:HB3  | 1:B:225:SER:HA   | 1.91                     | 0.52              |
| 3:N:36:TRP:CD2   | 3:N:74:LEU:HD22  | 2.45                     | 0.52              |
| 1:A:233:LYS:HD2  | 1:A:327:LYS:HE3  | 1.92                     | 0.52              |
| 1:B:214:PRO:HA   | 1:B:276:THR:HG22 | 1.91                     | 0.52              |
| 1:C:49:LEU:HD12  | 1:C:50:LYS:N     | 2.24                     | 0.52              |
| 3:N:122:SER:O    | 3:N:126:LEU:N    | 2.42                     | 0.52              |
| 1:A:236:VAL:HG23 | 1:A:324:VAL:HG22 | 1.92                     | 0.52              |
| 2:D:164:TRP:HA   | 2:D:206:CYS:HA   | 1.91                     | 0.52              |
| 1:B:180:GLY:N    | 1:B:207:GLU:OE2  | 2.42                     | 0.52              |
| 1:C:16:ASN:ND2   | 1:C:162:ARG:O    | 2.42                     | 0.52              |
| 2:D:149:GLY:HA2  | 2:D:191:VAL:HA   | 1.91                     | 0.52              |
| 1:A:18:LYS:NZ    | 1:A:47:ASP:OD1   | 2.43                     | 0.52              |
| 1:A:180:GLY:N    | 1:A:207:GLU:OE2  | 2.42                     | 0.52              |
| 1:A:234:VAL:HG21 | 1:A:273:TYR:HD2  | 1.73                     | 0.52              |
| 1:C:28:PHE:CE2   | 1:C:38:VAL:HG22  | 2.45                     | 0.52              |
| 1:C:180:GLY:N    | 1:C:207:GLU:OE2  | 2.42                     | 0.52              |
| 1:C:183:PRO:HG2  | 1:C:204:LEU:HB2  | 1.91                     | 0.51              |
| 2:H:149:GLY:HA2  | 2:H:191:VAL:HA   | 1.92                     | 0.51              |
| 2:M:41:ARG:HG2   | 2:M:49:GLU:HB3   | 1.92                     | 0.51              |
| 2:M:149:GLY:HA3  | 2:M:191:VAL:HG22 | 1.93                     | 0.51              |
| 1:C:60:VAL:HG23  | 1:C:80:LEU:HB2   | 1.93                     | 0.51              |
| 3:L:143:ARG:HH21 | 3:L:164:VAL:HG13 | 1.75                     | 0.51              |
| 1:A:183:PRO:HG2  | 1:A:204:LEU:HB2  | 1.92                     | 0.51              |
| 3:L:36:TRP:CD2   | 3:L:74:LEU:HD22  | 2.45                     | 0.51              |
| 3:L:67:ARG:HG3   | 3:L:72:PHE:CE1   | 2.45                     | 0.51              |
| 3:N:60:PRO:HB2   | 3:N:62:ARG:HG2   | 1.93                     | 0.51              |
| 1:B:276:THR:HG1  | 2:H:33:TYR:HE2   | 1.58                     | 0.51              |
| 1:C:236:VAL:HG23 | 1:C:324:VAL:HG22 | 1.93                     | 0.51              |
| 3:L:109:ARG:NH2  | 3:L:110:THR:OG1  | 2.37                     | 0.51              |
| 3:N:143:ARG:HH21 | 3:N:164:VAL:HG13 | 1.76                     | 0.51              |
| 2:D:30:PHE:CE2   | 2:D:101:ARG:HG3  | 2.46                     | 0.51              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 3:L:7:GLN:HE22   | 3:L:102:GLY:N    | 2.09                     | 0.51              |
| 3:N:34:VAL:HB    | 3:N:52:ALA:HB2   | 1.93                     | 0.51              |
| 1:B:15:PRO:HG2   | 1:B:162:ARG:HA   | 1.93                     | 0.51              |
| 2:H:164:TRP:HA   | 2:H:206:CYS:HA   | 1.92                     | 0.51              |
| 3:N:30:VAL:HA    | 3:N:93:LYS:HD3   | 1.93                     | 0.51              |
| 1:C:51:ASP:OD1   | 1:C:52:ARG:HD3   | 2.11                     | 0.50              |
| 3:E:62:ARG:NH1   | 3:E:83:ASP:OD2   | 2.30                     | 0.50              |
| 2:H:94:THR:HB    | 2:H:121:VAL:HG12 | 1.93                     | 0.50              |
| 1:B:233:LYS:HD2  | 1:B:327:LYS:HE3  | 1.92                     | 0.50              |
| 2:M:39:TRP:CD1   | 2:M:84:LEU:HD13  | 2.45                     | 0.50              |
| 1:B:16:ASN:ND2   | 1:B:162:ARG:O    | 2.44                     | 0.50              |
| 2:M:39:TRP:CH2   | 2:M:99:CYS:HB3   | 2.46                     | 0.50              |
| 1:A:238:GLN:NE2  | 1:A:289:ALA:HB3  | 2.27                     | 0.50              |
| 1:C:106:LEU:HD13 | 1:C:113:ALA:HB3  | 1.93                     | 0.50              |
| 3:N:93:LYS:HZ3   | 3:N:94:TYR:HE1   | 1.60                     | 0.50              |
| 3:L:62:ARG:NH1   | 3:L:83:ASP:OD2   | 2.29                     | 0.50              |
| 1:A:64:TYR:HD1   | 1:A:141:LEU:HB3  | 1.77                     | 0.50              |
| 1:A:16:ASN:ND2   | 1:A:162:ARG:O    | 2.44                     | 0.50              |
| 1:A:178:LYS:HD2  | 1:A:179:PRO:HD2  | 1.94                     | 0.50              |
| 1:C:178:LYS:HD2  | 1:C:179:PRO:HD2  | 1.94                     | 0.50              |
| 1:B:147:ILE:HG23 | 1:B:167:LEU:HB3  | 1.94                     | 0.49              |
| 1:B:178:LYS:HD2  | 1:B:179:PRO:HD2  | 1.94                     | 0.49              |
| 3:N:37:TYR:CE2   | 3:N:47:LEU:HB3   | 2.47                     | 0.49              |
| 1:B:14:SER:OG    | 1:B:162:ARG:O    | 2.30                     | 0.49              |
| 1:C:14:SER:OG    | 1:C:162:ARG:O    | 2.30                     | 0.49              |
| 1:C:15:PRO:HG2   | 1:C:162:ARG:HA   | 1.94                     | 0.49              |
| 3:N:62:ARG:NH1   | 3:N:83:ASP:OD2   | 2.26                     | 0.49              |
| 1:C:238:GLN:NE2  | 1:C:289:ALA:HB3  | 2.27                     | 0.49              |
| 1:A:237:ARG:N    | 1:A:323:ARG:O    | 2.42                     | 0.49              |
| 1:B:93:ASN:N     | 1:B:94:PRO:HD2   | 2.28                     | 0.49              |
| 1:A:60:VAL:HG23  | 1:A:80:LEU:HB2   | 1.95                     | 0.49              |
| 2:H:41:ARG:NH1   | 2:H:93:ASP:OD1   | 2.46                     | 0.49              |
| 1:B:106:LEU:HD13 | 1:B:113:ALA:HB3  | 1.95                     | 0.49              |
| 1:B:237:ARG:N    | 1:B:323:ARG:O    | 2.41                     | 0.49              |
| 2:H:149:GLY:HA3  | 2:H:191:VAL:HG22 | 1.94                     | 0.49              |
| 3:N:7:GLN:HE22   | 3:N:102:GLY:N    | 2.10                     | 0.49              |
| 3:E:126:LEU:HA   | 3:E:184:LYS:NZ   | 2.28                     | 0.49              |
| 1:B:9:VAL:HG23   | 4:U:365:LEU:HD22 | 1.95                     | 0.49              |
| 3:L:122:SER:O    | 3:L:126:LEU:N    | 2.43                     | 0.48              |
| 1:B:144:ASP:OD2  | 1:B:145:PHE:N    | 2.46                     | 0.48              |
| 3:N:35:ALA:HB3   | 3:N:90:GLN:HB2   | 1.94                     | 0.48              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:B:238:GLN:NE2  | 1:B:289:ALA:HB3  | 2.29                     | 0.48              |
| 1:C:93:ASN:N     | 1:C:94:PRO:HD2   | 2.29                     | 0.48              |
| 1:C:214:PRO:HA   | 1:C:276:THR:HG22 | 1.95                     | 0.48              |
| 1:A:77:ARG:HB2   | 1:C:247:THR:HB   | 1.95                     | 0.48              |
| 1:A:15:PRO:HG2   | 1:A:162:ARG:HA   | 1.95                     | 0.48              |
| 2:D:149:GLY:HA3  | 2:D:191:VAL:HG22 | 1.96                     | 0.48              |
| 2:D:210:HIS:HD2  | 2:D:212:PRO:HD2  | 1.79                     | 0.48              |
| 2:M:20:SER:HB3   | 2:M:85:GLN:HE22  | 1.79                     | 0.48              |
| 1:B:238:GLN:HE22 | 1:B:289:ALA:HB3  | 1.79                     | 0.48              |
| 3:E:131:ALA:HB2  | 3:E:184:LYS:HZ3  | 1.79                     | 0.48              |
| 3:E:162:GLU:N    | 3:E:162:GLU:OE1  | 2.47                     | 0.48              |
| 3:L:60:PRO:HB2   | 3:L:62:ARG:HG2   | 1.96                     | 0.48              |
| 1:A:104:ARG:HD3  | 4:G:366:ALA:O    | 2.14                     | 0.48              |
| 2:D:40:VAL:HG12  | 2:D:50:TRP:HA    | 1.96                     | 0.48              |
| 3:E:60:PRO:HG2   | 3:E:63:PHE:HE1   | 1.78                     | 0.48              |
| 2:M:39:TRP:CE2   | 2:M:84:LEU:HD22  | 2.49                     | 0.48              |
| 2:M:210:HIS:HD2  | 2:M:212:PRO:HD2  | 1.79                     | 0.48              |
| 1:A:8:ARG:NH2    | 4:G:362:SEP:OG   | 2.47                     | 0.47              |
| 1:C:238:GLN:HE22 | 1:C:289:ALA:HB3  | 1.79                     | 0.47              |
| 2:D:180:LEU:HB2  | 2:D:186:TYR:CE1  | 2.49                     | 0.47              |
| 1:A:228:THR:HG23 | 1:A:262:GLN:HE21 | 1.79                     | 0.47              |
| 1:C:74:LEU:CD2   | 1:C:75:SER:H     | 2.25                     | 0.47              |
| 1:C:189:ARG:O    | 1:C:198:LEU:N    | 2.46                     | 0.47              |
| 3:N:60:PRO:HG2   | 3:N:63:PHE:HE1   | 1.78                     | 0.47              |
| 1:A:189:ARG:O    | 1:A:198:LEU:N    | 2.47                     | 0.47              |
| 2:D:111:ASP:OD1  | 2:D:112:TYR:N    | 2.47                     | 0.47              |
| 1:A:45:ASP:OD2   | 1:A:112:HIS:ND1  | 2.45                     | 0.47              |
| 3:L:93:LYS:HG3   | 3:L:94:TYR:CD2   | 2.49                     | 0.47              |
| 1:A:214:PRO:HA   | 1:A:276:THR:HG22 | 1.96                     | 0.47              |
| 3:E:143:ARG:NH1  | 3:E:174:TYR:CD1  | 2.82                     | 0.47              |
| 1:A:243:VAL:HG21 | 1:A:315:VAL:HB   | 1.95                     | 0.47              |
| 1:B:43:LEU:HD12  | 1:B:109:LEU:HD13 | 1.95                     | 0.47              |
| 2:H:180:LEU:HB2  | 2:H:186:TYR:CE1  | 2.49                     | 0.47              |
| 1:A:144:ASP:OD2  | 1:A:145:PHE:N    | 2.47                     | 0.47              |
| 1:B:243:VAL:HG21 | 1:B:315:VAL:HB   | 1.96                     | 0.47              |
| 1:C:9:VAL:HG23   | 4:V:365:LEU:HD12 | 1.96                     | 0.47              |
| 2:H:72:THR:O     | 2:H:84:LEU:HB2   | 2.15                     | 0.47              |
| 3:L:60:PRO:HG2   | 3:L:63:PHE:HE1   | 1.79                     | 0.47              |
| 3:E:60:PRO:HB2   | 3:E:62:ARG:HG2   | 1.96                     | 0.47              |
| 3:E:140:PHE:O    | 3:E:174:TYR:HD2  | 1.96                     | 0.47              |
| 2:D:157:PRO:HD2  | 2:D:212:PRO:HB2  | 1.97                     | 0.47              |

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| Atom-1          | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-----------------|------------------|--------------------------|-------------------|
| 2:H:23:LEU:HB3  | 2:H:39:TRP:HH2   | 1.80                     | 0.47              |
| 2:H:64:ALA:HB3  | 2:H:67:VAL:HG22  | 1.96                     | 0.47              |
| 3:N:36:TRP:CZ3  | 3:N:89:CYS:HB2   | 2.50                     | 0.47              |
| 2:D:210:HIS:CD2 | 2:D:212:PRO:HD2  | 2.50                     | 0.46              |
| 3:E:135:CYS:SG  | 3:E:178:SER:HB3  | 2.56                     | 0.46              |
| 3:N:64:SER:OG   | 3:N:75:THR:OG1   | 2.33                     | 0.46              |
| 1:A:64:TYR:O    | 1:A:75:SER:HB2   | 2.15                     | 0.46              |
| 3:N:135:CYS:HB2 | 3:N:149:TRP:CH2  | 2.50                     | 0.46              |
| 1:A:93:ASN:N    | 1:A:94:PRO:HD2   | 2.30                     | 0.46              |
| 3:L:36:TRP:CZ3  | 3:L:89:CYS:HB2   | 2.50                     | 0.46              |
| 3:L:64:SER:OG   | 3:L:75:THR:OG1   | 2.33                     | 0.46              |
| 1:A:191:PHE:CE1 | 1:A:227:LYS:HD2  | 2.50                     | 0.46              |
| 3:E:117:PHE:HB2 | 3:E:136:LEU:HB3  | 1.97                     | 0.46              |
| 3:L:162:GLU:HA  | 3:L:178:SER:HA   | 1.96                     | 0.46              |
| 1:B:231:LYS:H   | 1:B:329:VAL:HB   | 1.80                     | 0.46              |
| 3:E:36:TRP:CZ3  | 3:E:89:CYS:HB2   | 2.51                     | 0.46              |
| 2:M:210:HIS:CD2 | 2:M:212:PRO:HD2  | 2.51                     | 0.46              |
| 3:E:64:SER:OG   | 3:E:75:THR:OG1   | 2.32                     | 0.46              |
| 2:H:210:HIS:HD2 | 2:H:212:PRO:HD2  | 1.79                     | 0.46              |
| 3:L:30:VAL:HA   | 3:L:93:LYS:HZ1   | 1.81                     | 0.46              |
| 2:M:157:PRO:HD2 | 2:M:212:PRO:HB2  | 1.98                     | 0.46              |
| 2:H:39:TRP:CZ3  | 2:H:84:LEU:HD21  | 2.50                     | 0.46              |
| 2:H:105:PHE:HA  | 2:H:106:TRP:HA   | 1.71                     | 0.46              |
| 1:B:239:TYR:HD1 | 1:B:249:GLN:HE21 | 1.63                     | 0.46              |
| 2:D:105:PHE:HA  | 2:D:106:TRP:HA   | 1.73                     | 0.46              |
| 3:N:84:PHE:CZ   | 3:N:107:ILE:HG13 | 2.51                     | 0.46              |
| 3:N:109:ARG:NH2 | 3:N:110:THR:OG1  | 2.42                     | 0.46              |
| 1:A:308:LYS:NZ  | 1:A:310:GLY:O    | 2.38                     | 0.46              |
| 1:C:8:ARG:NH2   | 4:V:362:SEP:OG   | 2.48                     | 0.46              |
| 2:D:64:ALA:HB3  | 2:D:67:VAL:HG22  | 1.96                     | 0.46              |
| 1:C:191:PHE:HE1 | 1:C:227:LYS:HD2  | 1.80                     | 0.45              |
| 2:H:157:PRO:HD2 | 2:H:212:PRO:HB2  | 1.97                     | 0.45              |
| 1:A:49:LEU:HD12 | 1:A:50:LYS:N     | 2.31                     | 0.45              |
| 1:B:56:VAL:HG23 | 1:B:118:PHE:HE2  | 1.81                     | 0.45              |
| 1:B:230:LYS:HE3 | 1:B:331:SER:HA   | 1.97                     | 0.45              |
| 3:L:168:ASP:O   | 3:L:172:SER:N    | 2.48                     | 0.45              |
| 1:A:56:VAL:HG23 | 1:A:118:PHE:HE2  | 1.81                     | 0.45              |
| 1:C:53:LYS:HG2  | 1:C:89:PRO:HD3   | 1.98                     | 0.45              |
| 2:H:210:HIS:CD2 | 2:H:212:PRO:HD2  | 2.51                     | 0.45              |
| 2:M:146:ALA:HB3 | 2:M:195:PRO:HA   | 1.98                     | 0.45              |
| 1:B:64:TYR:H    | 1:B:75:SER:CB    | 2.30                     | 0.45              |

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| Atom-1          | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-----------------|------------------|--------------------------|-------------------|
| 2:H:146:ALA:HB3 | 2:H:195:PRO:HA   | 1.97                     | 0.45              |
| 3:L:135:CYS:HB2 | 3:L:149:TRP:CH2  | 2.52                     | 0.45              |
| 1:B:191:PHE:CZ  | 1:B:225:SER:HB2  | 2.51                     | 0.45              |
| 1:A:324:VAL:HB  | 1:A:340:LEU:HD11 | 1.98                     | 0.45              |
| 1:A:102:GLN:O   | 1:A:106:LEU:HD23 | 2.17                     | 0.45              |
| 2:H:110:LEU:N   | 3:L:37:TYR:OH    | 2.37                     | 0.45              |
| 2:M:64:ALA:HB3  | 2:M:67:VAL:HG22  | 1.98                     | 0.44              |
| 1:A:49:LEU:HB2  | 1:A:52:ARG:HB2   | 1.97                     | 0.44              |
| 1:B:64:TYR:HD1  | 1:B:141:LEU:HB3  | 1.82                     | 0.44              |
| 1:B:210:TYR:CE1 | 1:B:347:PRO:HB3  | 2.53                     | 0.44              |
| 1:C:49:LEU:HD11 | 1:C:88:PHE:HE2   | 1.82                     | 0.44              |
| 2:D:160:VAL:HB  | 2:D:188:LEU:HD21 | 1.99                     | 0.44              |
| 3:E:30:VAL:HA   | 3:E:93:LYS:HD3   | 1.99                     | 0.44              |
| 2:M:154:ASP:HA  | 2:M:185:LEU:HB3  | 1.98                     | 0.44              |
| 3:N:142:PRO:HG2 | 3:N:144:GLU:HG3  | 1.99                     | 0.44              |
| 1:A:49:LEU:HD11 | 1:A:88:PHE:HE2   | 1.83                     | 0.44              |
| 1:B:102:GLN:O   | 1:B:106:LEU:HD23 | 2.16                     | 0.44              |
| 1:A:210:TYR:CE1 | 1:A:347:PRO:HB3  | 2.52                     | 0.44              |
| 1:C:64:TYR:HD1  | 1:C:141:LEU:HB3  | 1.82                     | 0.44              |
| 3:E:67:ARG:HG3  | 3:E:72:PHE:CE1   | 2.52                     | 0.44              |
| 3:N:168:ASP:O   | 3:N:172:SER:N    | 2.50                     | 0.44              |
| 1:A:74:LEU:CG   | 1:A:75:SER:H     | 2.28                     | 0.44              |
| 2:D:9:GLU:OE1   | 2:D:9:GLU:N      | 2.51                     | 0.44              |
| 3:N:126:LEU:HA  | 3:N:184:LYS:NZ   | 2.33                     | 0.44              |
| 1:B:49:LEU:C    | 1:B:51:ASP:H     | 2.21                     | 0.44              |
| 1:C:231:LYS:H   | 1:C:329:VAL:HB   | 1.83                     | 0.44              |
| 3:N:28:GLN:CD   | 3:N:29:SER:H     | 2.21                     | 0.44              |
| 3:N:67:ARG:HG3  | 3:N:72:PHE:HE2   | 1.82                     | 0.44              |
| 1:C:102:GLN:O   | 1:C:106:LEU:HD23 | 2.17                     | 0.44              |
| 1:A:221:VAL:N   | 1:A:269:PHE:O    | 2.46                     | 0.43              |
| 1:B:190:HIS:HA  | 1:B:197:SER:HA   | 2.00                     | 0.43              |
| 2:H:160:VAL:HB  | 2:H:188:LEU:HD21 | 1.99                     | 0.43              |
| 3:L:92:TYR:HA   | 3:L:97:VAL:HG12  | 2.00                     | 0.43              |
| 3:N:67:ARG:HG3  | 3:N:72:PHE:CE2   | 2.53                     | 0.43              |
| 3:N:93:LYS:NZ   | 3:N:94:TYR:HE1   | 2.16                     | 0.43              |
| 1:B:175:ALA:HB1 | 1:B:208:LEU:HD11 | 2.00                     | 0.43              |
| 1:B:191:PHE:CE2 | 1:B:225:SER:HB2  | 2.53                     | 0.43              |
| 2:D:39:TRP:CE2  | 2:D:84:LEU:HD22  | 2.53                     | 0.43              |
| 2:D:101:ARG:HD2 | 2:D:102:SER:N    | 2.33                     | 0.43              |
| 2:M:49:GLU:HA   | 3:N:99:PHE:CE1   | 2.53                     | 0.43              |
| 1:C:56:VAL:HG23 | 1:C:118:PHE:HE2  | 1.82                     | 0.43              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:291:ASP:OD1  | 1:C:292:GLY:N    | 2.51                     | 0.43              |
| 1:C:175:ALA:HB1  | 1:C:208:LEU:HD11 | 2.00                     | 0.43              |
| 3:L:167:GLN:NE2  | 3:L:174:TYR:OH   | 2.30                     | 0.43              |
| 2:M:191:VAL:HG21 | 3:N:136:LEU:HD12 | 2.01                     | 0.43              |
| 2:D:146:ALA:HB3  | 2:D:195:PRO:HA   | 2.00                     | 0.43              |
| 1:B:64:TYR:H     | 1:B:75:SER:HB2   | 1.83                     | 0.43              |
| 3:L:126:LEU:HA   | 3:L:184:LYS:NZ   | 2.33                     | 0.43              |
| 1:C:144:ASP:OD2  | 1:C:145:PHE:N    | 2.52                     | 0.43              |
| 1:C:242:ILE:HG12 | 1:C:318:ILE:HD12 | 2.01                     | 0.43              |
| 3:E:93:LYS:HG3   | 3:E:94:TYR:CD2   | 2.54                     | 0.43              |
| 2:H:30:PHE:CE2   | 2:H:101:ARG:HG3  | 2.53                     | 0.43              |
| 1:A:14:SER:OG    | 1:A:162:ARG:O    | 2.34                     | 0.43              |
| 1:A:299:THR:OG1  | 1:A:300:ASN:N    | 2.52                     | 0.43              |
| 2:D:74:SER:N     | 2:D:83:TYR:O     | 2.42                     | 0.43              |
| 1:B:58:LEU:HD23  | 1:B:118:PHE:CE2  | 2.54                     | 0.43              |
| 1:C:64:TYR:H     | 1:C:75:SER:CB    | 2.32                     | 0.43              |
| 1:B:40:GLY:O     | 1:B:102:GLN:NE2  | 2.43                     | 0.43              |
| 3:L:109:ARG:HH21 | 3:L:110:THR:HG1  | 1.63                     | 0.43              |
| 1:B:96:ARG:CG    | 1:B:97:PRO:HD3   | 2.48                     | 0.42              |
| 2:M:173:VAL:HG12 | 2:M:192:VAL:HB   | 2.00                     | 0.42              |
| 1:C:210:TYR:CE1  | 1:C:347:PRO:HB3  | 2.54                     | 0.42              |
| 2:H:9:GLU:OE2    | 2:H:99:CYS:N     | 2.52                     | 0.42              |
| 3:L:51:SER:O     | 3:L:51:SER:OG    | 2.35                     | 0.42              |
| 1:B:49:LEU:HD11  | 1:B:88:PHE:HE2   | 1.83                     | 0.42              |
| 3:E:67:ARG:HG3   | 3:E:72:PHE:HE1   | 1.83                     | 0.42              |
| 3:L:106:GLU:HG3  | 3:L:167:GLN:NE2  | 2.34                     | 0.42              |
| 1:B:101:LEU:O    | 1:B:105:LEU:HD23 | 2.20                     | 0.42              |
| 2:D:173:VAL:HG12 | 2:D:192:VAL:HB   | 2.02                     | 0.42              |
| 2:M:94:THR:HB    | 2:M:121:VAL:HG12 | 2.02                     | 0.42              |
| 4:U:360:TPO:P    | 4:U:360:TPO:H    | 2.43                     | 0.42              |
| 1:A:141:LEU:HD23 | 1:A:141:LEU:H    | 1.85                     | 0.42              |
| 1:A:291:ASP:OD1  | 1:A:292:GLY:N    | 2.53                     | 0.42              |
| 1:A:323:ARG:NE   | 1:A:339:GLU:OE2  | 2.47                     | 0.42              |
| 1:B:227:LYS:HG2  | 1:B:332:ARG:CZ   | 2.49                     | 0.42              |
| 1:B:299:THR:OG1  | 1:B:300:ASN:N    | 2.52                     | 0.42              |
| 1:C:95:PRO:HA    | 1:C:96:ARG:HA    | 1.71                     | 0.42              |
| 2:D:48:LEU:HD22  | 3:E:88:TYR:CE2   | 2.55                     | 0.42              |
| 1:A:26:ARG:HH21  | 1:A:294:LEU:HD12 | 1.85                     | 0.42              |
| 1:A:49:LEU:O     | 1:A:50:LYS:HG2   | 2.20                     | 0.42              |
| 1:A:234:VAL:HG21 | 1:A:273:TYR:CD2  | 2.54                     | 0.42              |
| 3:E:22:ILE:HG23  | 3:E:74:LEU:HB3   | 2.02                     | 0.42              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:H:191:VAL:HG21 | 3:L:136:LEU:HD12 | 2.01                     | 0.42              |
| 1:B:93:ASN:OD1   | 1:B:98:PRO:HD3   | 2.20                     | 0.41              |
| 1:B:242:ILE:HG12 | 1:B:318:ILE:HD12 | 2.01                     | 0.41              |
| 1:C:221:VAL:N    | 1:C:269:PHE:O    | 2.47                     | 0.41              |
| 1:B:331:SER:C    | 1:B:332:ARG:HD3  | 2.41                     | 0.41              |
| 3:E:47:LEU:HD23  | 3:E:47:LEU:H     | 1.85                     | 0.41              |
| 2:M:105:PHE:HA   | 2:M:106:TRP:HA   | 1.75                     | 0.41              |
| 1:C:153:LYS:NZ   | 1:C:157:GLU:OE2  | 2.49                     | 0.41              |
| 2:D:94:THR:HB    | 2:D:121:VAL:HG12 | 2.02                     | 0.41              |
| 4:G:360:TPO:H    | 4:G:360:TPO:P    | 2.43                     | 0.41              |
| 2:H:39:TRP:CD1   | 2:H:99:CYS:HA    | 2.56                     | 0.41              |
| 1:A:101:LEU:O    | 1:A:105:LEU:HD23 | 2.20                     | 0.41              |
| 1:B:62:PHE:HB2   | 1:B:80:LEU:HD11  | 2.02                     | 0.41              |
| 1:B:95:PRO:HA    | 1:B:96:ARG:HA    | 1.71                     | 0.41              |
| 1:B:104:ARG:HD3  | 4:U:366:ALA:O    | 2.21                     | 0.41              |
| 1:C:230:LYS:HE3  | 1:C:331:SER:HA   | 2.01                     | 0.41              |
| 1:C:237:ARG:N    | 1:C:323:ARG:O    | 2.44                     | 0.41              |
| 2:M:96:VAL:HA    | 2:M:118:LEU:HA   | 2.02                     | 0.41              |
| 1:A:175:ALA:HB1  | 1:A:208:LEU:HD11 | 2.03                     | 0.41              |
| 1:B:324:VAL:HB   | 1:B:340:LEU:HD11 | 2.02                     | 0.41              |
| 1:C:191:PHE:CE1  | 1:C:227:LYS:HD2  | 2.55                     | 0.41              |
| 2:M:23:LEU:HB2   | 2:M:84:LEU:HD21  | 2.02                     | 0.41              |
| 1:A:49:LEU:C     | 1:A:51:ASP:H     | 2.24                     | 0.41              |
| 2:D:100:ALA:HB3  | 2:D:110:LEU:HD23 | 2.03                     | 0.41              |
| 3:E:37:TYR:O     | 3:E:88:TYR:N     | 2.51                     | 0.41              |
| 4:V:360:TPO:P    | 4:V:360:TPO:H    | 2.43                     | 0.41              |
| 1:A:239:TYR:HD1  | 1:A:249:GLN:HE21 | 1.69                     | 0.41              |
| 1:B:53:LYS:HG2   | 1:B:89:PRO:HD3   | 2.01                     | 0.41              |
| 1:B:196:ARG:HD2  | 1:B:196:ARG:HA   | 1.90                     | 0.41              |
| 1:C:299:THR:OG1  | 1:C:300:ASN:N    | 2.52                     | 0.41              |
| 1:C:331:SER:C    | 1:C:332:ARG:HD3  | 2.40                     | 0.41              |
| 3:E:62:ARG:HG2   | 3:E:62:ARG:H     | 1.67                     | 0.41              |
| 4:G:367:LYS:HE3  | 4:G:367:LYS:HB3  | 1.86                     | 0.41              |
| 3:L:186:ASP:O    | 3:L:189:LYS:HG2  | 2.21                     | 0.41              |
| 3:N:22:ILE:HG23  | 3:N:74:LEU:HB3   | 2.02                     | 0.41              |
| 2:M:30:PHE:CE2   | 2:M:101:ARG:HG3  | 2.56                     | 0.41              |
| 1:A:242:ILE:HG23 | 1:A:248:ALA:HB3  | 2.02                     | 0.41              |
| 1:B:216:ASN:HA   | 1:B:273:TYR:O    | 2.21                     | 0.41              |
| 1:C:93:ASN:OD1   | 1:C:98:PRO:HD3   | 2.21                     | 0.41              |
| 1:C:147:ILE:HG23 | 1:C:167:LEU:HB3  | 2.02                     | 0.41              |
| 2:M:39:TRP:NE1   | 2:M:84:LEU:HD22  | 2.36                     | 0.41              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:A:64:TYR:H     | 1:A:75:SER:CB    | 2.34                     | 0.41              |
| 3:E:125:GLN:HA   | 3:E:128:SER:HB2  | 2.03                     | 0.41              |
| 1:B:74:LEU:CD2   | 1:B:75:SER:H     | 2.31                     | 0.40              |
| 3:L:47:LEU:HD23  | 3:L:47:LEU:H     | 1.86                     | 0.40              |
| 1:A:25:LYS:HB2   | 1:A:25:LYS:HE3   | 1.84                     | 0.40              |
| 1:A:53:LYS:HG2   | 1:A:89:PRO:HD3   | 2.02                     | 0.40              |
| 1:A:95:PRO:HA    | 1:A:96:ARG:HA    | 1.71                     | 0.40              |
| 1:A:209:TYR:CG   | 1:A:215:LEU:HD11 | 2.57                     | 0.40              |
| 1:B:141:LEU:HD23 | 1:B:141:LEU:H    | 1.85                     | 0.40              |
| 1:B:291:ASP:OD1  | 1:B:292:GLY:N    | 2.55                     | 0.40              |
| 3:L:82:GLU:N     | 3:L:82:GLU:OE2   | 2.54                     | 0.40              |
| 2:M:9:GLU:OE2    | 2:M:99:CYS:N     | 2.54                     | 0.40              |
| 1:C:324:VAL:HB   | 1:C:340:LEU:HD11 | 2.03                     | 0.40              |
| 2:D:39:TRP:CZ3   | 2:D:99:CYS:HB3   | 2.55                     | 0.40              |
| 3:L:114:PRO:HB3  | 3:L:140:PHE:HB3  | 2.02                     | 0.40              |
| 1:A:106:LEU:HD13 | 1:A:113:ALA:HB3  | 2.02                     | 0.40              |
| 1:B:11:LYS:HE3   | 1:B:22:TYR:CE1   | 2.56                     | 0.40              |
| 1:C:209:TYR:CG   | 1:C:215:LEU:HD11 | 2.56                     | 0.40              |
| 1:C:11:LYS:HE3   | 1:C:22:TYR:CE1   | 2.56                     | 0.40              |
| 3:L:135:CYS:HB3  | 3:L:178:SER:HB3  | 2.03                     | 0.40              |

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

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

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

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

| Mol | Chain | Analysed      | Favoured  | Allowed | Outliers | Percentiles |
|-----|-------|---------------|-----------|---------|----------|-------------|
| 1   | A     | 342/420 (81%) | 320 (94%) | 21 (6%) | 1 (0%)   | 37 72       |
| 1   | B     | 342/420 (81%) | 318 (93%) | 23 (7%) | 1 (0%)   | 37 72       |
| 1   | C     | 342/420 (81%) | 322 (94%) | 19 (6%) | 1 (0%)   | 37 72       |
| 2   | D     | 196/237 (83%) | 192 (98%) | 4 (2%)  | 0        | 100 100     |

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| Mol | Chain | Analysed        | Favoured   | Allowed  | Outliers | Percentiles |     |
|-----|-------|-----------------|------------|----------|----------|-------------|-----|
| 2   | H     | 196/237 (83%)   | 192 (98%)  | 4 (2%)   | 0        | 100         | 100 |
| 2   | M     | 196/237 (83%)   | 192 (98%)  | 4 (2%)   | 0        | 100         | 100 |
| 3   | E     | 181/215 (84%)   | 171 (94%)  | 9 (5%)   | 1 (1%)   | 22          | 59  |
| 3   | L     | 181/215 (84%)   | 172 (95%)  | 9 (5%)   | 0        | 100         | 100 |
| 3   | N     | 181/215 (84%)   | 171 (94%)  | 10 (6%)  | 0        | 100         | 100 |
| 4   | G     | 4/29 (14%)      | 3 (75%)    | 0        | 1 (25%)  | 0           | 1   |
| 4   | U     | 4/29 (14%)      | 3 (75%)    | 0        | 1 (25%)  | 0           | 1   |
| 4   | V     | 4/29 (14%)      | 3 (75%)    | 0        | 1 (25%)  | 0           | 1   |
| All | All   | 2169/2703 (80%) | 2059 (95%) | 103 (5%) | 7 (0%)   | 38          | 72  |

All (7) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | A     | 312 | ASN  |
| 1   | B     | 312 | ASN  |
| 1   | C     | 312 | ASN  |
| 4   | V     | 365 | LEU  |
| 4   | G     | 365 | LEU  |
| 4   | U     | 365 | LEU  |
| 3   | E     | 142 | PRO  |

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

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

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

| Mol | Chain | Analysed      | Rotameric  | Outliers | Percentiles |     |
|-----|-------|---------------|------------|----------|-------------|-----|
| 1   | A     | 308/376 (82%) | 306 (99%)  | 2 (1%)   | 84          | 88  |
| 1   | B     | 308/376 (82%) | 304 (99%)  | 4 (1%)   | 65          | 76  |
| 1   | C     | 306/376 (81%) | 302 (99%)  | 4 (1%)   | 65          | 76  |
| 2   | D     | 152/200 (76%) | 152 (100%) | 0        | 100         | 100 |
| 2   | H     | 152/200 (76%) | 151 (99%)  | 1 (1%)   | 81          | 87  |
| 2   | M     | 152/200 (76%) | 152 (100%) | 0        | 100         | 100 |

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| Mol | Chain | Analysed        | Rotameric  | Outliers | Percentiles |     |
|-----|-------|-----------------|------------|----------|-------------|-----|
| 3   | E     | 144/190 (76%)   | 144 (100%) | 0        | 100         | 100 |
| 3   | L     | 144/190 (76%)   | 144 (100%) | 0        | 100         | 100 |
| 3   | N     | 144/190 (76%)   | 144 (100%) | 0        | 100         | 100 |
| 4   | G     | 3/13 (23%)      | 3 (100%)   | 0        | 100         | 100 |
| 4   | U     | 3/13 (23%)      | 3 (100%)   | 0        | 100         | 100 |
| 4   | V     | 3/13 (23%)      | 3 (100%)   | 0        | 100         | 100 |
| All | All   | 1819/2337 (78%) | 1808 (99%) | 11 (1%)  | 82          | 88  |

All (11) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | A     | 52  | ARG  |
| 1   | A     | 325 | LYS  |
| 1   | B     | 52  | ARG  |
| 1   | B     | 295 | LYS  |
| 1   | B     | 325 | LYS  |
| 1   | B     | 332 | ARG  |
| 1   | C     | 52  | ARG  |
| 1   | C     | 262 | GLN  |
| 1   | C     | 325 | LYS  |
| 1   | C     | 332 | ARG  |
| 2   | H     | 101 | ARG  |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | A     | 86  | GLN  |
| 1   | A     | 262 | GLN  |
| 3   | L     | 7   | GLN  |
| 3   | L     | 167 | GLN  |
| 2   | M     | 85  | GLN  |
| 3   | N     | 7   | 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](#)

15 non-standard protein/DNA/RNA residues are modelled in this entry.

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

| Mol | Type | Chain | Res | Link | Bond lengths |      |          | Bond angles |      |          |
|-----|------|-------|-----|------|--------------|------|----------|-------------|------|----------|
|     |      |       |     |      | Counts       | RMSZ | # Z  > 2 | Counts      | RMSZ | # Z  > 2 |
| 4   | SEP  | V     | 364 | 4    | 8,9,10       | 1.56 | 1 (12%)  | 8,12,14     | 1.72 | 2 (25%)  |
| 4   | SEP  | G     | 363 | 4    | 8,9,10       | 1.55 | 1 (12%)  | 8,12,14     | 1.59 | 2 (25%)  |
| 4   | SEP  | G     | 362 | 4    | 8,9,10       | 1.54 | 1 (12%)  | 8,12,14     | 1.63 | 2 (25%)  |
| 4   | SEP  | U     | 364 | 4    | 8,9,10       | 1.56 | 1 (12%)  | 8,12,14     | 1.70 | 2 (25%)  |
| 4   | SEP  | V     | 363 | 4    | 8,9,10       | 0.62 | 0        | 8,12,14     | 0.60 | 0        |
| 4   | TPO  | V     | 360 | 4    | 8,10,11      | 1.17 | 0        | 10,14,16    | 1.26 | 1 (10%)  |
| 4   | TPO  | U     | 360 | 4    | 8,10,11      | 1.18 | 0        | 10,14,16    | 1.26 | 1 (10%)  |
| 4   | SEP  | U     | 362 | 4    | 8,9,10       | 1.54 | 1 (12%)  | 8,12,14     | 1.54 | 2 (25%)  |
| 4   | TPO  | G     | 359 | 4    | 8,10,11      | 1.59 | 1 (12%)  | 10,14,16    | 1.92 | 1 (10%)  |
| 4   | SEP  | V     | 362 | 4    | 8,9,10       | 1.54 | 1 (12%)  | 8,12,14     | 1.60 | 2 (25%)  |
| 4   | SEP  | U     | 363 | 4    | 8,9,10       | 1.55 | 1 (12%)  | 8,12,14     | 1.58 | 2 (25%)  |
| 4   | TPO  | G     | 360 | 4    | 8,10,11      | 1.16 | 0        | 10,14,16    | 1.29 | 1 (10%)  |
| 4   | SEP  | G     | 364 | 4    | 8,9,10       | 1.57 | 1 (12%)  | 8,12,14     | 1.74 | 2 (25%)  |
| 4   | TPO  | V     | 359 | 4    | 8,10,11      | 1.58 | 1 (12%)  | 10,14,16    | 1.93 | 1 (10%)  |
| 4   | TPO  | U     | 359 | 4    | 8,10,11      | 1.59 | 1 (12%)  | 10,14,16    | 1.92 | 1 (10%)  |

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

| Mol | Type | Chain | Res | Link | Chirals | Torsions | Rings |
|-----|------|-------|-----|------|---------|----------|-------|
| 4   | SEP  | V     | 364 | 4    | -       | 2/5/8/10 | -     |
| 4   | SEP  | G     | 363 | 4    | -       | 5/5/8/10 | -     |
| 4   | SEP  | G     | 362 | 4    | -       | 1/5/8/10 | -     |
| 4   | SEP  | U     | 364 | 4    | -       | 2/5/8/10 | -     |
| 4   | SEP  | V     | 363 | 4    | -       | 5/5/8/10 | -     |

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| Mol | Type | Chain | Res | Link | Chirals | Torsions  | Rings |
|-----|------|-------|-----|------|---------|-----------|-------|
| 4   | TPO  | V     | 360 | 4    | -       | 5/9/11/13 | -     |
| 4   | TPO  | U     | 360 | 4    | -       | 5/9/11/13 | -     |
| 4   | SEP  | U     | 362 | 4    | -       | 1/5/8/10  | -     |
| 4   | TPO  | G     | 359 | 4    | -       | 3/9/11/13 | -     |
| 4   | SEP  | V     | 362 | 4    | -       | 1/5/8/10  | -     |
| 4   | SEP  | U     | 363 | 4    | -       | 5/5/8/10  | -     |
| 4   | TPO  | G     | 360 | 4    | -       | 5/9/11/13 | -     |
| 4   | SEP  | G     | 364 | 4    | -       | 2/5/8/10  | -     |
| 4   | TPO  | V     | 359 | 4    | -       | 2/9/11/13 | -     |
| 4   | TPO  | U     | 359 | 4    | -       | 3/9/11/13 | -     |

All (11) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z    | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|-------|------|-------------|----------|
| 4   | G     | 359 | TPO  | P-O1P | 3.40 | 1.61        | 1.50     |
| 4   | G     | 364 | SEP  | P-O1P | 3.40 | 1.61        | 1.50     |
| 4   | G     | 363 | SEP  | P-O1P | 3.39 | 1.61        | 1.50     |
| 4   | U     | 359 | TPO  | P-O1P | 3.39 | 1.61        | 1.50     |
| 4   | U     | 364 | SEP  | P-O1P | 3.39 | 1.61        | 1.50     |
| 4   | V     | 364 | SEP  | P-O1P | 3.39 | 1.61        | 1.50     |
| 4   | U     | 363 | SEP  | P-O1P | 3.38 | 1.61        | 1.50     |
| 4   | V     | 359 | TPO  | P-O1P | 3.37 | 1.61        | 1.50     |
| 4   | G     | 362 | SEP  | P-O1P | 3.37 | 1.61        | 1.50     |
| 4   | V     | 362 | SEP  | P-O1P | 3.35 | 1.61        | 1.50     |
| 4   | U     | 362 | SEP  | P-O1P | 3.35 | 1.61        | 1.50     |

All (22) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms    | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|----------|-------|-------------|----------|
| 4   | V     | 359 | TPO  | P-OG1-CB | -5.58 | 106.35      | 123.21   |
| 4   | U     | 359 | TPO  | P-OG1-CB | -5.58 | 106.36      | 123.21   |
| 4   | G     | 359 | TPO  | P-OG1-CB | -5.57 | 106.37      | 123.21   |
| 4   | G     | 364 | SEP  | P-OG-CB  | -3.39 | 108.97      | 118.30   |
| 4   | U     | 364 | SEP  | P-OG-CB  | -3.37 | 109.01      | 118.30   |
| 4   | V     | 364 | SEP  | P-OG-CB  | -3.32 | 109.16      | 118.30   |
| 4   | G     | 363 | SEP  | OG-CB-CA | 3.26  | 111.31      | 108.14   |
| 4   | U     | 363 | SEP  | OG-CB-CA | 3.19  | 111.25      | 108.14   |
| 4   | G     | 362 | SEP  | P-OG-CB  | -3.05 | 109.90      | 118.30   |
| 4   | V     | 362 | SEP  | P-OG-CB  | -3.03 | 109.94      | 118.30   |
| 4   | G     | 364 | SEP  | OG-CB-CA | 2.99  | 111.05      | 108.14   |

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| Mol | Chain | Res | Type | Atoms    | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|----------|-------|-------------|----------|
| 4   | V     | 364 | SEP  | OG-CB-CA | 2.97  | 111.03      | 108.14   |
| 4   | U     | 362 | SEP  | P-OG-CB  | -2.89 | 110.33      | 118.30   |
| 4   | G     | 362 | SEP  | OG-CB-CA | 2.88  | 110.94      | 108.14   |
| 4   | U     | 364 | SEP  | OG-CB-CA | 2.88  | 110.94      | 108.14   |
| 4   | V     | 362 | SEP  | OG-CB-CA | 2.78  | 110.85      | 108.14   |
| 4   | U     | 362 | SEP  | OG-CB-CA | 2.67  | 110.75      | 108.14   |
| 4   | U     | 360 | TPO  | P-OG1-CB | -2.51 | 115.64      | 123.21   |
| 4   | G     | 360 | TPO  | P-OG1-CB | -2.49 | 115.68      | 123.21   |
| 4   | V     | 360 | TPO  | P-OG1-CB | -2.49 | 115.68      | 123.21   |
| 4   | U     | 363 | SEP  | P-OG-CB  | -2.29 | 111.97      | 118.30   |
| 4   | G     | 363 | SEP  | P-OG-CB  | -2.25 | 112.09      | 118.30   |

There are no chirality outliers.

All (47) torsion outliers are listed below:

| Mol | Chain | Res | Type | Atoms        |
|-----|-------|-----|------|--------------|
| 4   | G     | 359 | TPO  | N-CA-CB-OG1  |
| 4   | G     | 360 | TPO  | N-CA-CB-CG2  |
| 4   | G     | 360 | TPO  | C-CA-CB-CG2  |
| 4   | G     | 360 | TPO  | CG2-CB-OG1-P |
| 4   | G     | 360 | TPO  | CB-OG1-P-O2P |
| 4   | G     | 363 | SEP  | CB-OG-P-O2P  |
| 4   | G     | 363 | SEP  | CB-OG-P-O3P  |
| 4   | U     | 359 | TPO  | N-CA-CB-OG1  |
| 4   | U     | 360 | TPO  | N-CA-CB-CG2  |
| 4   | U     | 360 | TPO  | C-CA-CB-CG2  |
| 4   | U     | 360 | TPO  | CG2-CB-OG1-P |
| 4   | U     | 363 | SEP  | CB-OG-P-O2P  |
| 4   | U     | 363 | SEP  | CB-OG-P-O3P  |
| 4   | V     | 359 | TPO  | N-CA-CB-OG1  |
| 4   | V     | 360 | TPO  | N-CA-CB-CG2  |
| 4   | V     | 360 | TPO  | C-CA-CB-CG2  |
| 4   | V     | 360 | TPO  | CG2-CB-OG1-P |
| 4   | V     | 363 | SEP  | CB-OG-P-O1P  |
| 4   | V     | 363 | SEP  | CB-OG-P-O2P  |
| 4   | V     | 363 | SEP  | CB-OG-P-O3P  |
| 4   | U     | 363 | SEP  | CB-OG-P-O1P  |
| 4   | V     | 362 | SEP  | CB-OG-P-O1P  |
| 4   | G     | 360 | TPO  | CB-OG1-P-O1P |
| 4   | U     | 360 | TPO  | CB-OG1-P-O1P |
| 4   | V     | 360 | TPO  | CB-OG1-P-O1P |
| 4   | G     | 364 | SEP  | CA-CB-OG-P   |

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| Mol | Chain | Res | Type | Atoms        |
|-----|-------|-----|------|--------------|
| 4   | U     | 360 | TPO  | CB-OG1-P-O2P |
| 4   | U     | 364 | SEP  | CA-CB-OG-P   |
| 4   | V     | 360 | TPO  | CB-OG1-P-O2P |
| 4   | V     | 364 | SEP  | CA-CB-OG-P   |
| 4   | G     | 359 | TPO  | C-CA-CB-CG2  |
| 4   | U     | 359 | TPO  | C-CA-CB-CG2  |
| 4   | G     | 363 | SEP  | N-CA-CB-OG   |
| 4   | G     | 364 | SEP  | N-CA-CB-OG   |
| 4   | U     | 363 | SEP  | N-CA-CB-OG   |
| 4   | U     | 364 | SEP  | N-CA-CB-OG   |
| 4   | V     | 363 | SEP  | N-CA-CB-OG   |
| 4   | V     | 364 | SEP  | N-CA-CB-OG   |
| 4   | G     | 362 | SEP  | CB-OG-P-O1P  |
| 4   | U     | 362 | SEP  | CB-OG-P-O1P  |
| 4   | G     | 363 | SEP  | CB-OG-P-O1P  |
| 4   | G     | 363 | SEP  | CA-CB-OG-P   |
| 4   | U     | 363 | SEP  | CA-CB-OG-P   |
| 4   | V     | 363 | SEP  | CA-CB-OG-P   |
| 4   | G     | 359 | TPO  | O-C-CA-CB    |
| 4   | U     | 359 | TPO  | O-C-CA-CB    |
| 4   | V     | 359 | TPO  | O-C-CA-CB    |

There are no ring outliers.

6 monomers are involved in 9 short contacts:

| Mol | Chain | Res | Type | Clashes | Symm-Clashes |
|-----|-------|-----|------|---------|--------------|
| 4   | G     | 362 | SEP  | 1       | 0            |
| 4   | V     | 360 | TPO  | 2       | 0            |
| 4   | U     | 360 | TPO  | 2       | 0            |
| 4   | V     | 362 | SEP  | 1       | 0            |
| 4   | U     | 363 | SEP  | 1       | 0            |
| 4   | G     | 360 | TPO  | 2       | 0            |

## 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.

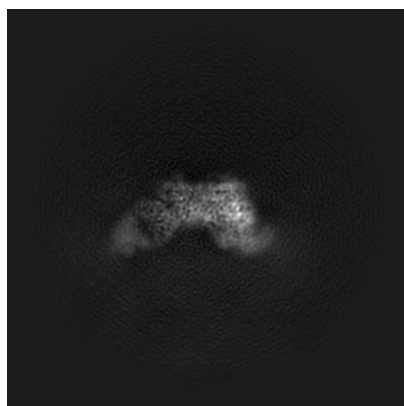
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-34175. These allow visual inspection of the internal detail of the map and identification of artifacts.

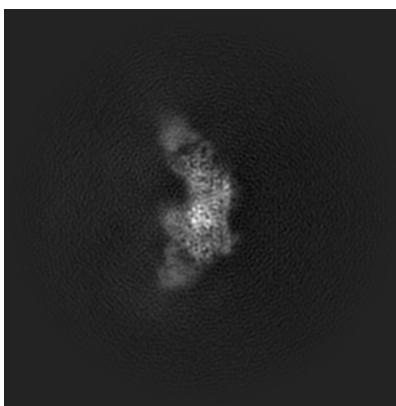
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

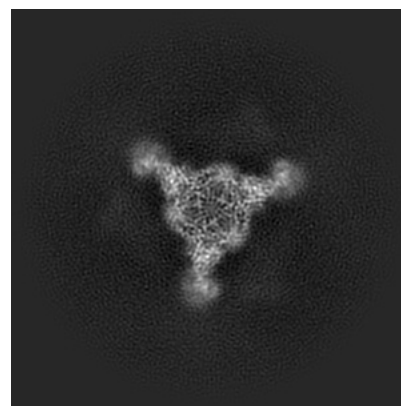
#### 6.1.1 Primary map



X

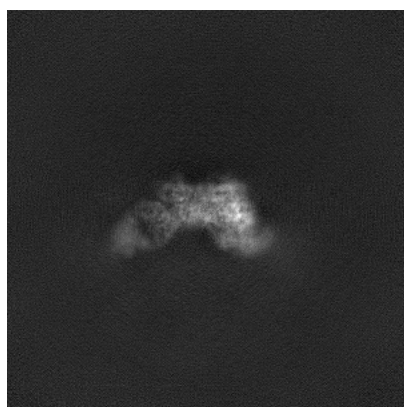


Y

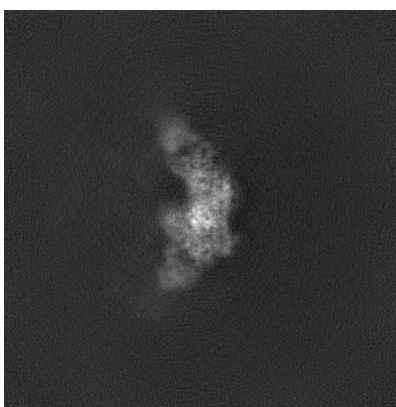


Z

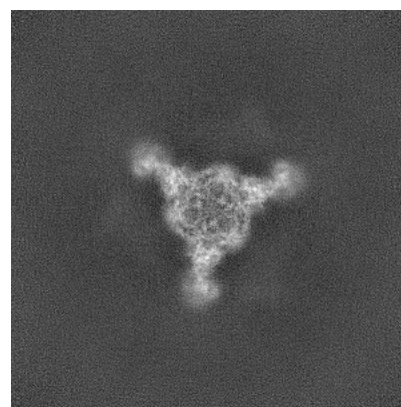
#### 6.1.2 Raw map



X



Y



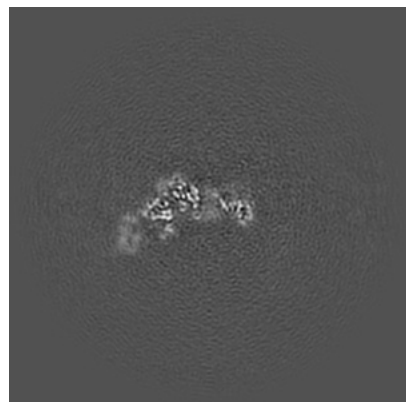
Z

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

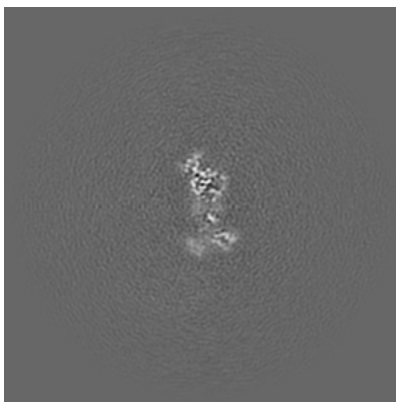


## 6.2 Central slices [i](#)

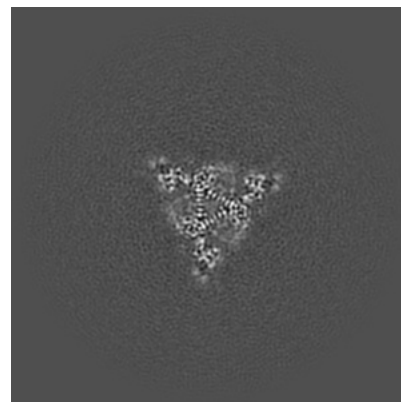
### 6.2.1 Primary map



X Index: 256

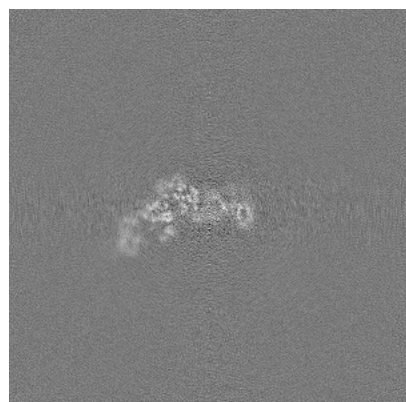


Y Index: 256



Z Index: 256

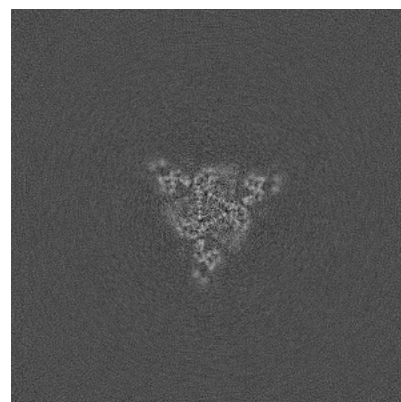
### 6.2.2 Raw map



X Index: 256



Y Index: 256



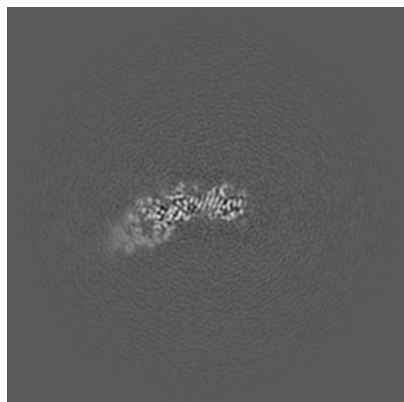
Z Index: 256

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

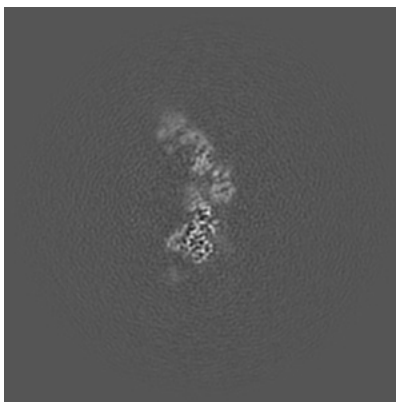


## 6.3 Largest variance slices [i](#)

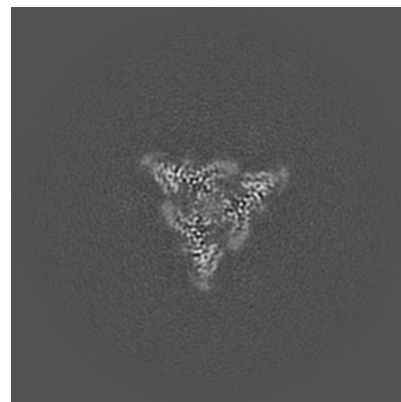
### 6.3.1 Primary map



X Index: 240

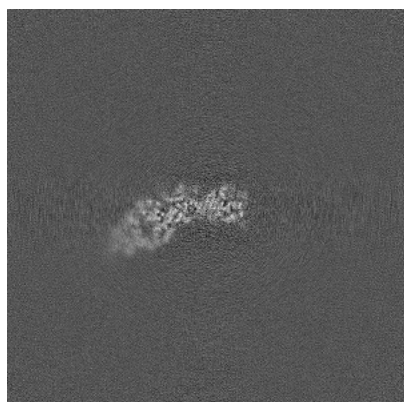


Y Index: 294

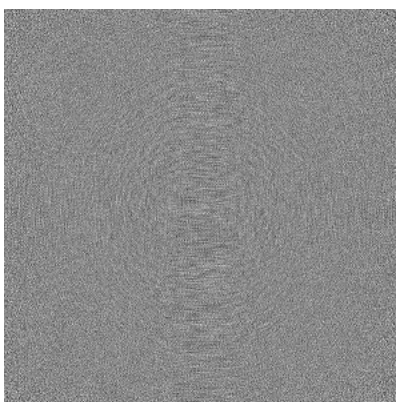


Z Index: 249

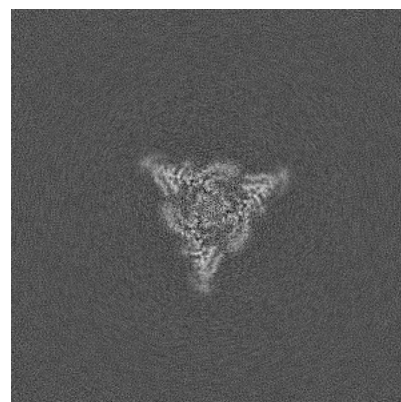
### 6.3.2 Raw map



X Index: 240



Y Index: 0

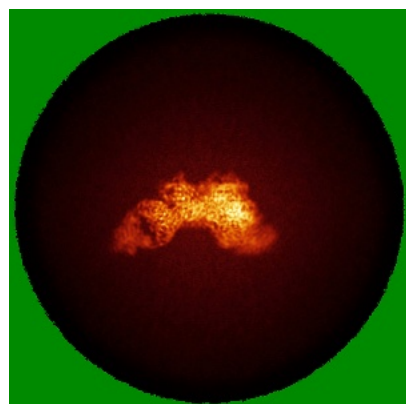


Z Index: 249

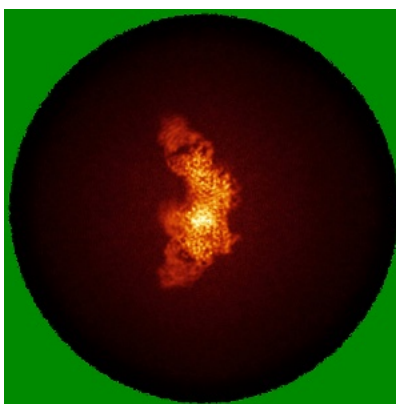
The images above show the largest variance slices of the map in three orthogonal directions.

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

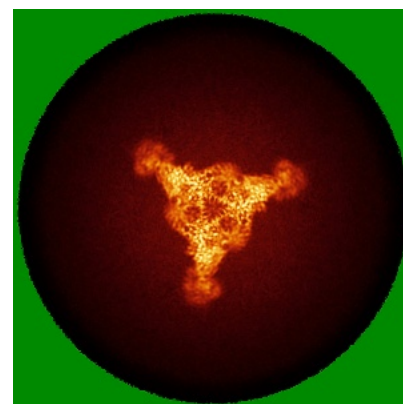
### 6.4.1 Primary map



X

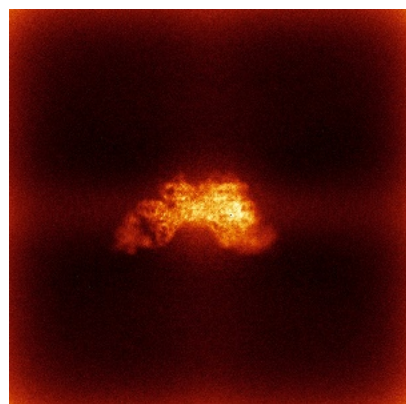


Y

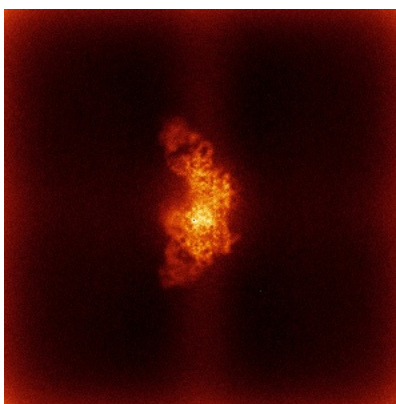


Z

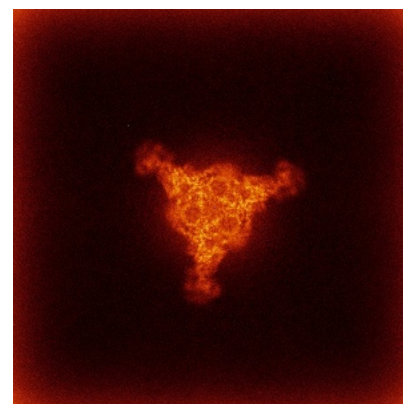
### 6.4.2 Raw map



X



Y

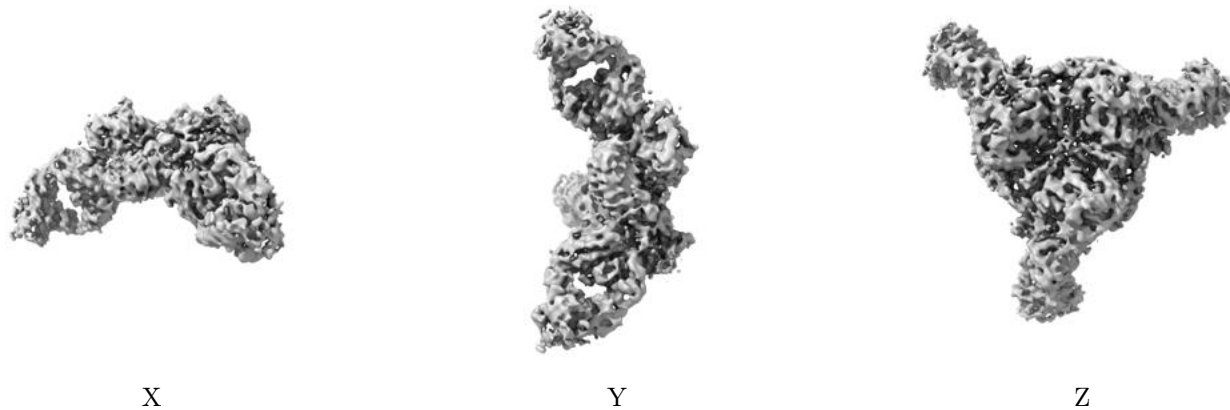


Z

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

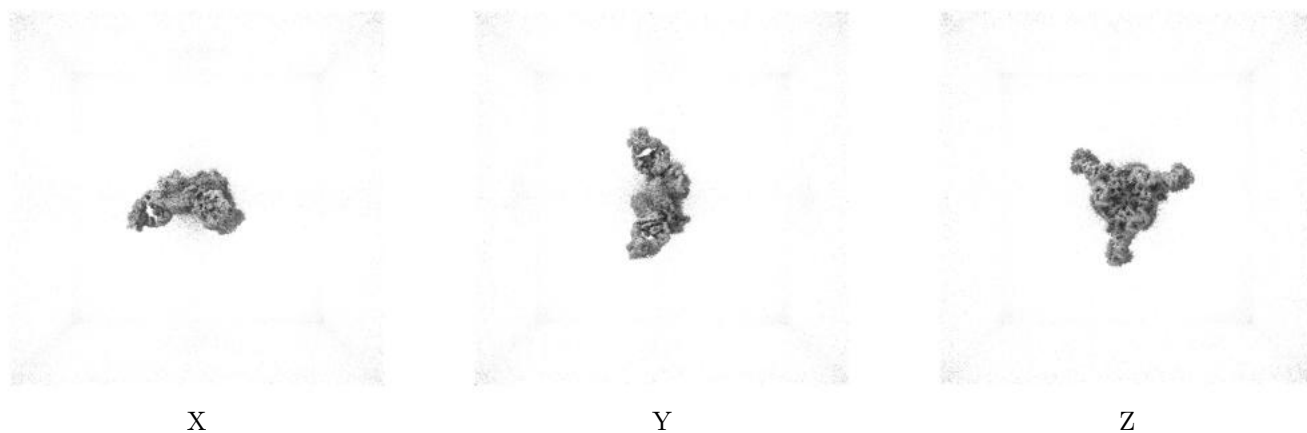
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.08. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

### 6.5.2 Raw map



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

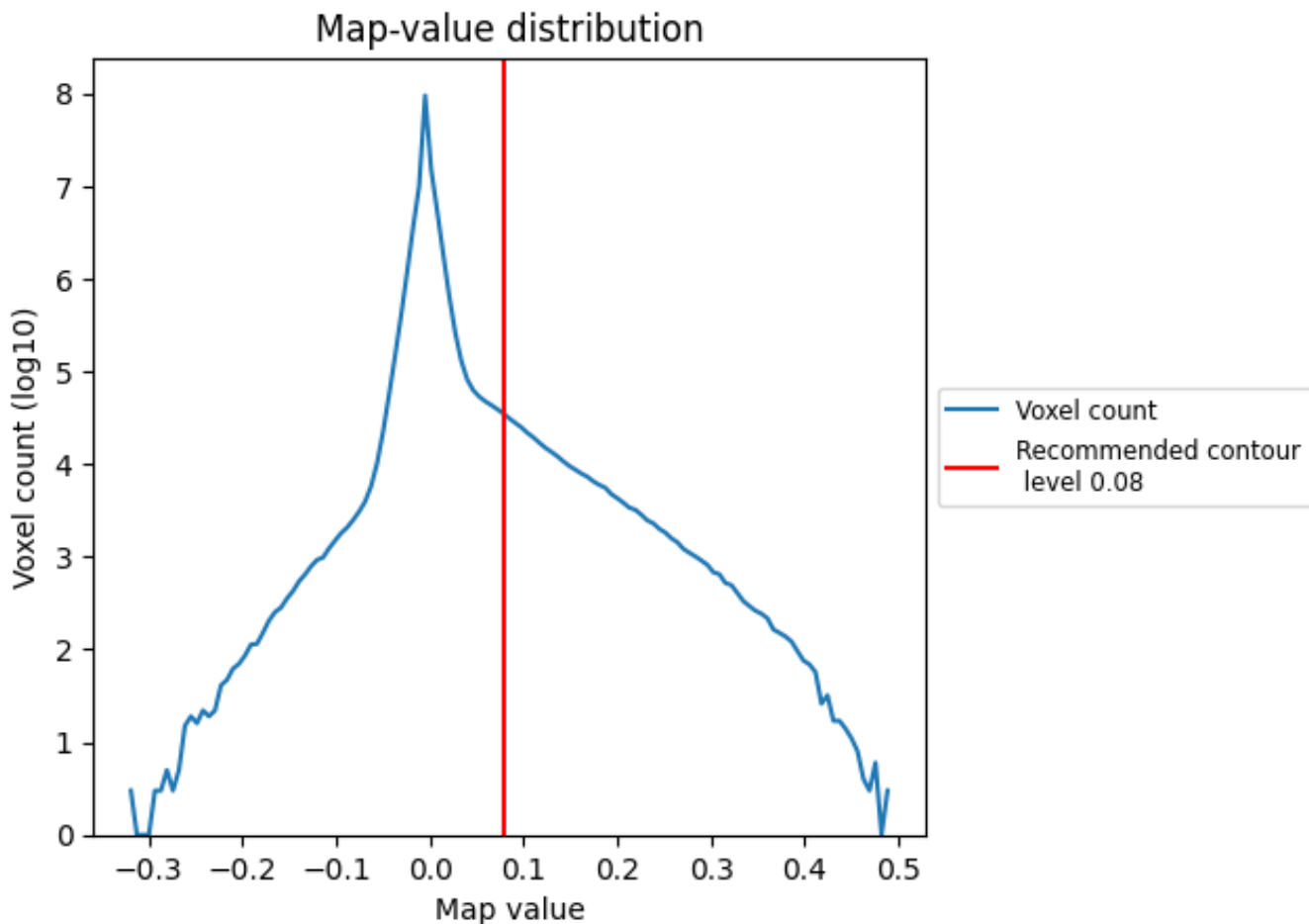
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

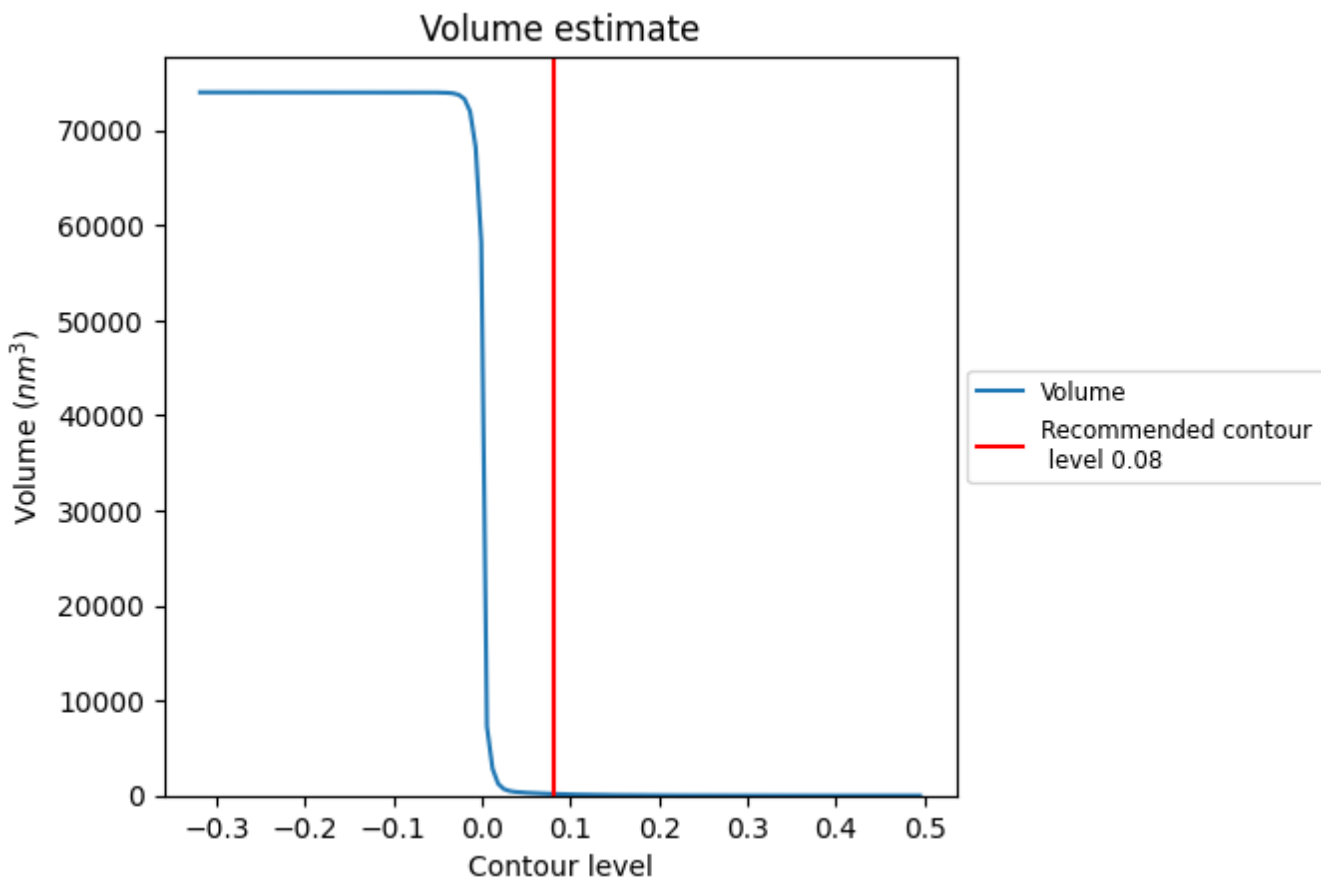
This section contains the results of statistical analysis of the map.

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



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

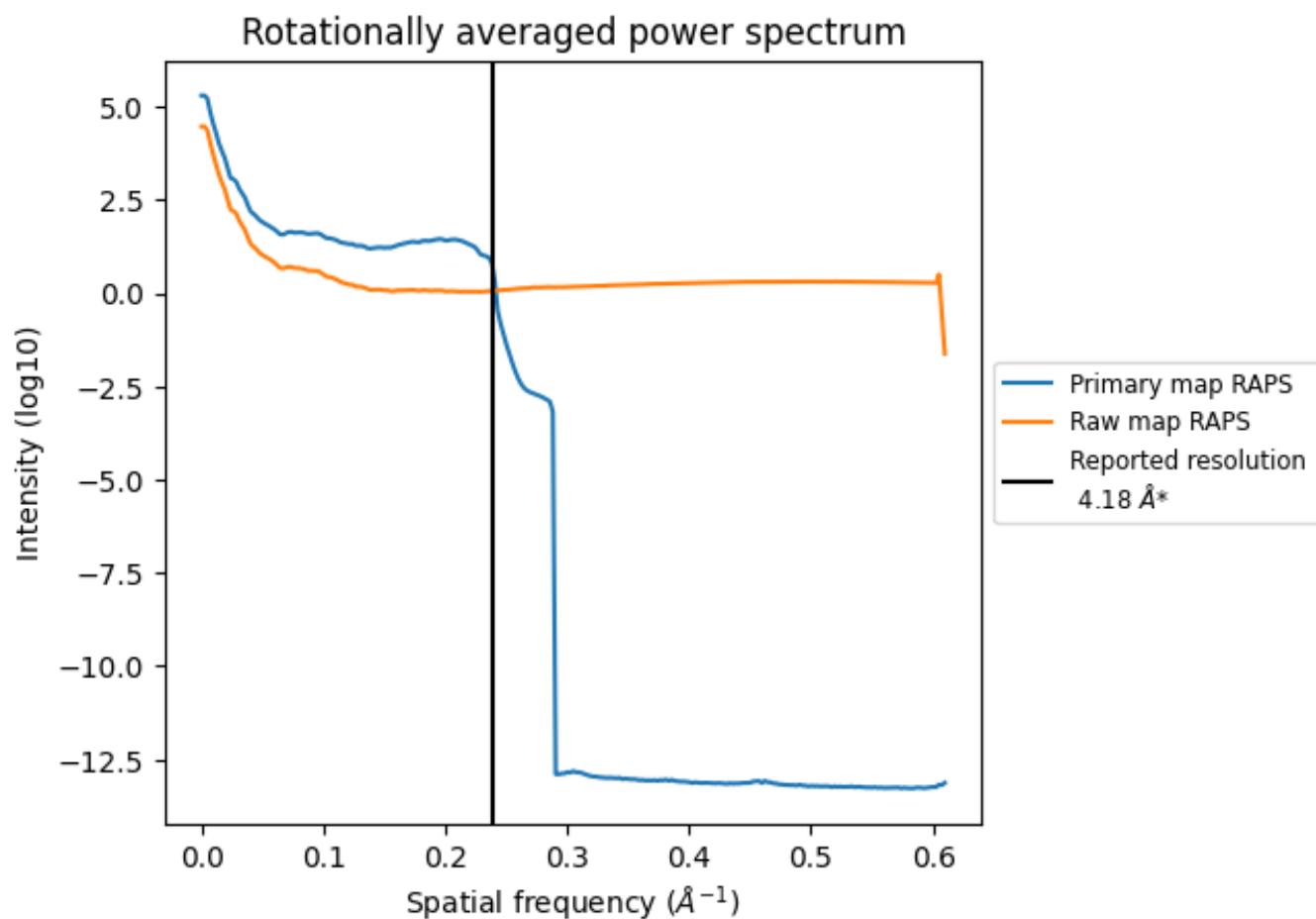
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 174 nm<sup>3</sup>; this corresponds to an approximate mass of 157 kDa.

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

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

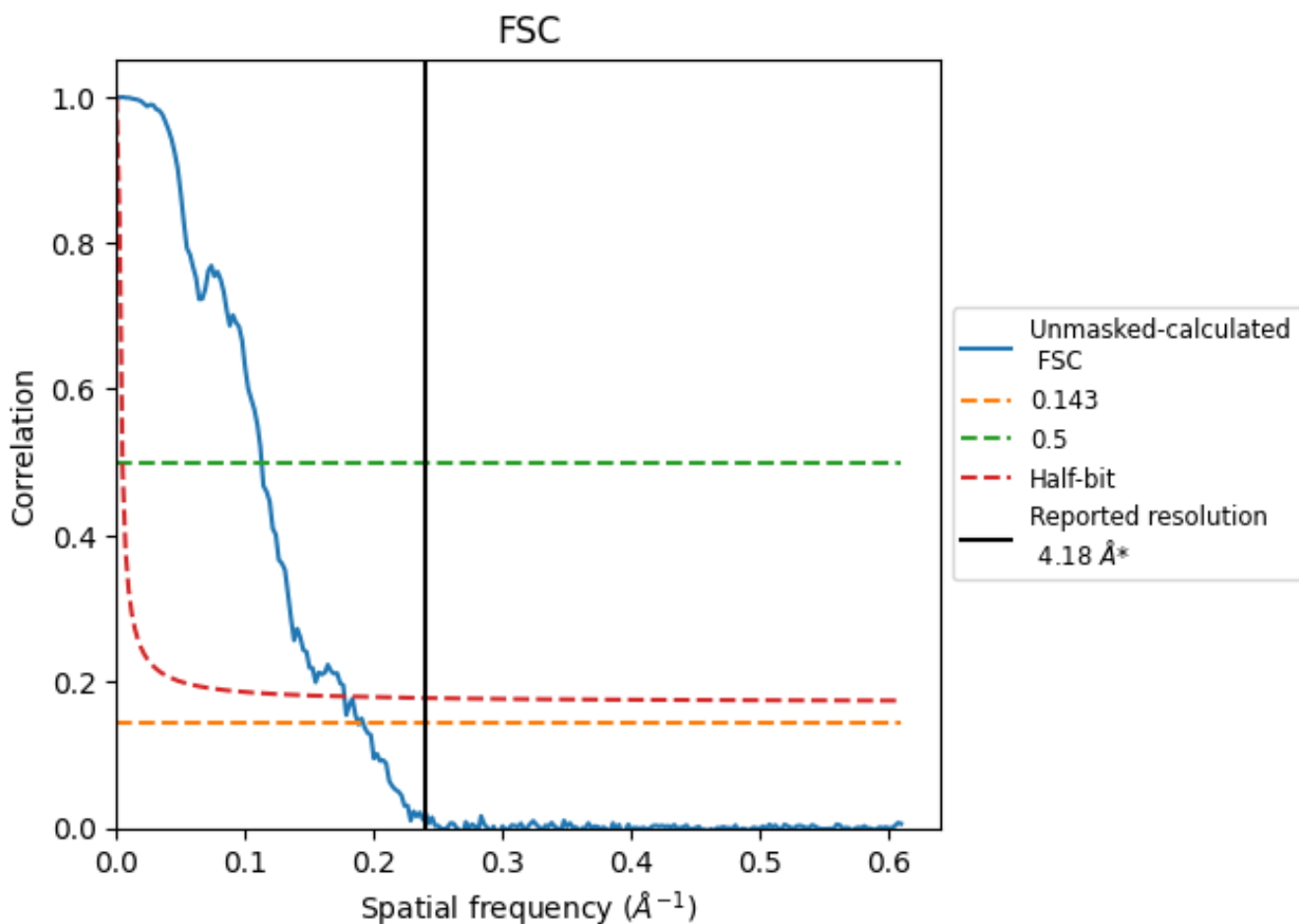


\*Reported resolution corresponds to spatial frequency of 0.239 Å<sup>-1</sup>

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

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

### 8.1 FSC [i](#)



\*Reported resolution corresponds to spatial frequency of 0.239 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

| Resolution estimate (Å)   | Estimation criterion (FSC cut-off) |      |          |
|---------------------------|------------------------------------|------|----------|
|                           | 0.143                              | 0.5  | Half-bit |
| Reported by author        | 4.18                               | -    | -        |
| Author-provided FSC curve | -                                  | -    | -        |
| Unmasked-calculated*      | 5.32                               | 8.86 | 5.64     |

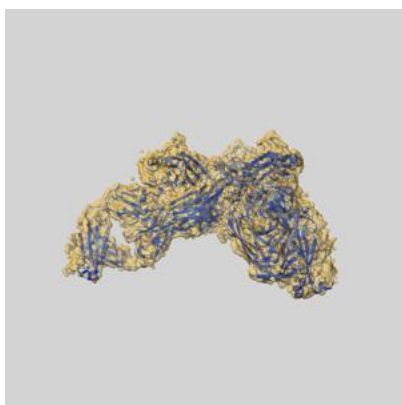
\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 5.32 differs from the reported value 4.18 by more than 10 %



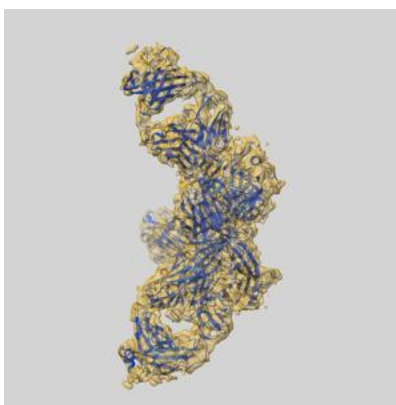
## 9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-34175 and PDB model 8GOC. Per-residue inclusion information can be found in section [3](#) on page [6](#).

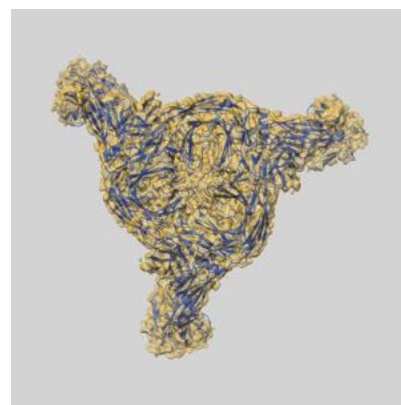
### 9.1 Map-model overlay [i](#)



X



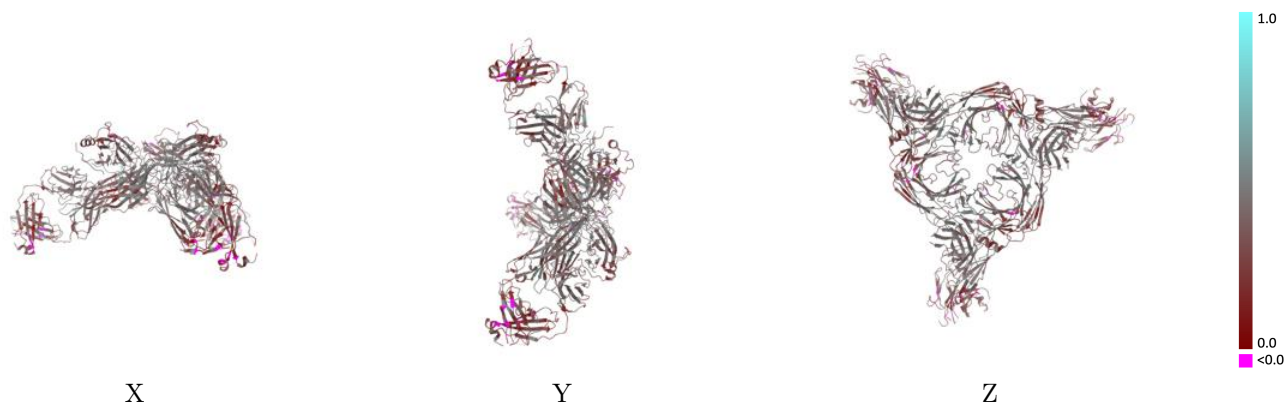
Y



Z

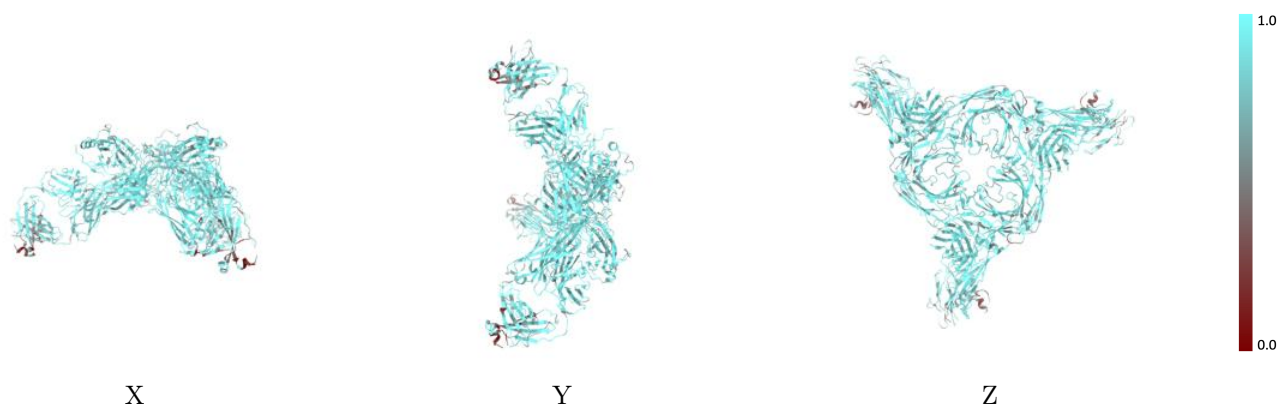
The images above show the 3D surface view of the map at the recommended contour level 0.08 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



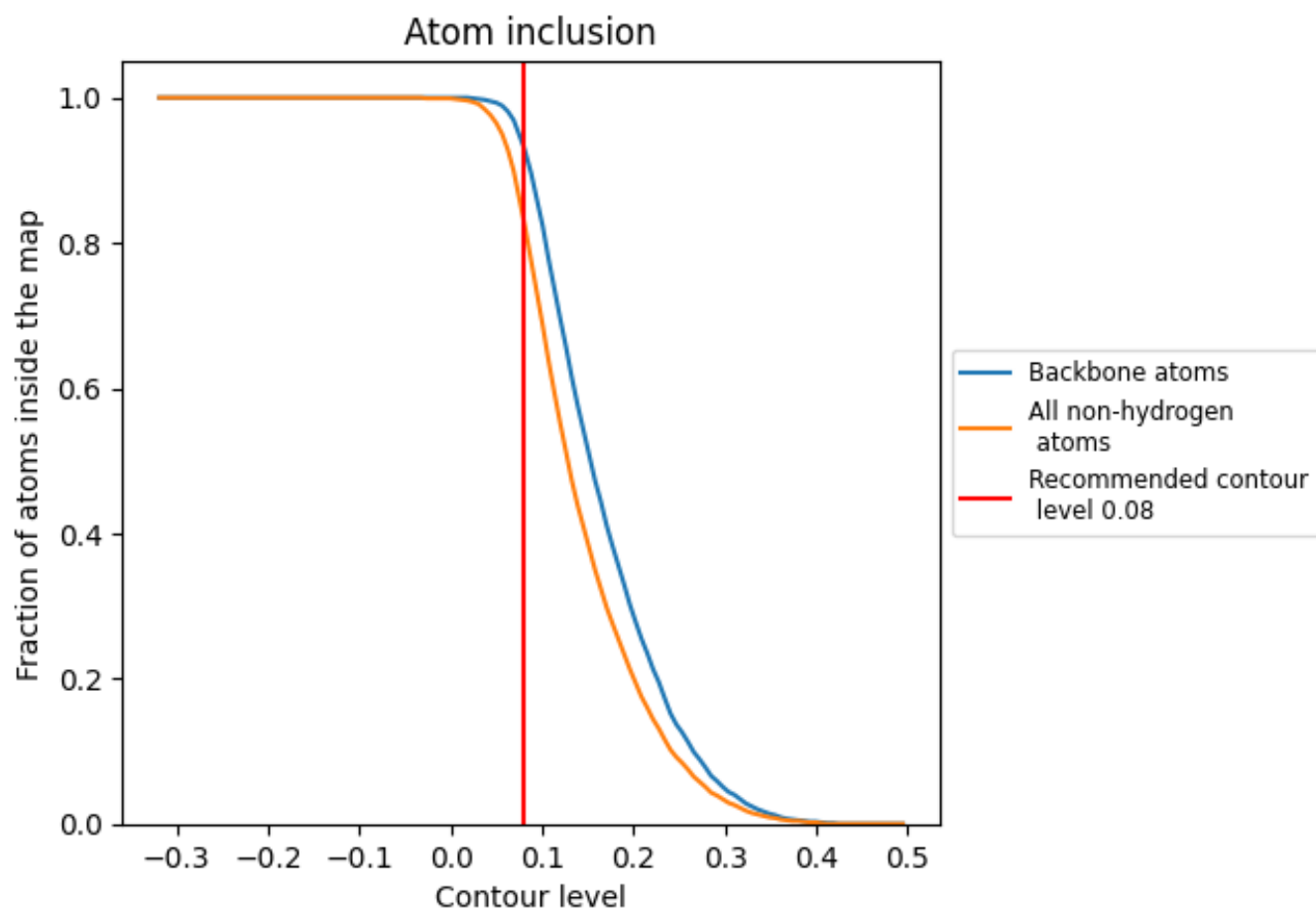
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.08).



























## 9.4 Atom inclusion [i](#)



At the recommended contour level, 93% of all backbone atoms, 83% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.08) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion   | Q-score  |
|-------|--|--|
| All   |  0.8320 |  0.3670 |
| A     |  0.8360 |  0.3850 |
| B     |  0.8360 |  0.3840 |
| C     |  0.8390 |  0.3820 |
| D     |  0.8520 |  0.3570 |
| E     |  0.7940 |  0.3430 |
| G     |  0.9080 |  0.3910 |
| H     |  0.8510 |  0.3570 |
| L     |  0.7990 |  0.3450 |
| M     |  0.8520 |  0.3560 |
| N     |  0.7980 |  0.3410 |
| U     |  0.8970 |  0.3930 |
| V     |  0.8970 |  0.3920 |

