# WORLDWIDE PDB

## PROTEIN DATA BANK

# wwPDB X-ray Structure Validation Summary Report (i)

May 13, 2020 – 01:40 am BST

| | | |
|---|---|---|
| PDB ID | : | 4DNQ |
| Title | : | Crystal Structure of DAD2 S96A mutant |
| Authors | : | Hamiaux, C. |
| Deposited on | : | 2012-02-08 |
| Resolution | : | 2.80 Å(reported) |

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The following versions of software and data (see references (1)) were used in the production of this report:

| | | |
|---|---|---|
| MolProbity | : | 4.02b-467 |
| Xtriage (Phenix) | : | 1.13 |
| EDS | : | 2.11 |
| Percentile statistics | : | 20191225.v01 (using entries in the PDB archive December 25th 2019) |
| Refmac | : | 5.8.0158 |
| CCP4 | : | 7.0.044 (Gargrove) |
| Ideal geometry (proteins) | : | Engh & Huber (2001) |
| Ideal geometry (DNA, RNA) | : | Parkinson et al. (1996) |
| Validation Pipeline (wwPDB-VP) | : | 2.11 |

# 1   Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.80 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.
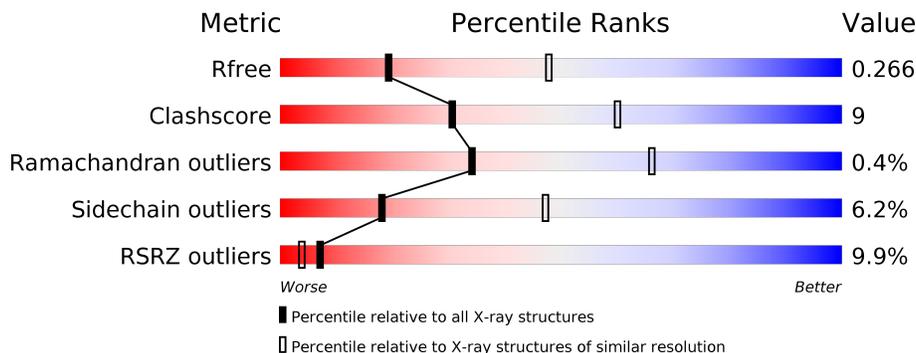


| Metric | Whole archive (#Entries) | Similar resolution (#Entries, resolution range(Å)) |
|---|---|---|
| R$_{free}$ | 130704 | 3140 (2.80-2.80) |
| Clashscore | 141614 | 3569 (2.80-2.80) |
| Ramachandran outliers | 138981 | 3498 (2.80-2.80) |
| Sidechain outliers | 138945 | 3500 (2.80-2.80) |
| RSRZ outliers | 127900 | 3078 (2.80-2.80) |

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for >=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 <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 1 | A | 269 | 4% / 78% / 17% / •  • |
| 1 | B | 269 | 4% / 78% / 17% / •  • |
| 1 | C | 269 | 6% / 78% / 19% / •  • |
| 1 | D | 269 | 5% / 79% / 18% / •  • |
| 1 | E | 269 | 9% / 80% / 16% / •  • |
| 1 | F | 269 | 5% / 81% / 14% / •  • |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 1 | G | 269 | 7%    80%    16% |
| 1 | H | 269 | 9%    78%    18% |
| 1 | I | 269 | 9%    79%    17% |
| 1 | J | 269 | 13%    80%    16% |
| 1 | K | 269 | 14%    79%    16% |
| 1 | L | 269 | 30%    78%    18% |

# 2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 25042 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, 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 DAD2.

| Mol | Chain | Residues | Atoms | | | | | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|---|---|---|---|---------|---------|-------|
| 1 | A | 262 | Total<br>2054 | C<br>1320 | N<br>359 | O<br>367 | S<br>8 | 0 | 0 | 0 |
| 1 | B | 262 | Total<br>2054 | C<br>1320 | N<br>359 | O<br>367 | S<br>8 | 0 | 0 | 0 |
| 1 | C | 263 | Total<br>2063 | C<br>1325 | N<br>361 | O<br>369 | S<br>8 | 0 | 0 | 0 |
| 1 | D | 263 | Total<br>2063 | C<br>1325 | N<br>361 | O<br>369 | S<br>8 | 0 | 0 | 0 |
| 1 | E | 262 | Total<br>2054 | C<br>1320 | N<br>359 | O<br>367 | S<br>8 | 0 | 0 | 0 |
| 1 | F | 263 | Total<br>2063 | C<br>1325 | N<br>361 | O<br>369 | S<br>8 | 0 | 0 | 0 |
| 1 | G | 263 | Total<br>2063 | C<br>1325 | N<br>361 | O<br>369 | S<br>8 | 0 | 0 | 0 |
| 1 | H | 262 | Total<br>2054 | C<br>1320 | N<br>359 | O<br>367 | S<br>8 | 0 | 0 | 0 |
| 1 | I | 264 | Total<br>2067 | C<br>1327 | N<br>362 | O<br>370 | S<br>8 | 0 | 0 | 0 |
| 1 | J | 263 | Total<br>2063 | C<br>1325 | N<br>361 | O<br>369 | S<br>8 | 0 | 0 | 0 |
| 1 | K | 262 | Total<br>2054 | C<br>1320 | N<br>359 | O<br>367 | S<br>8 | 0 | 0 | 0 |
| 1 | L | 264 | Total<br>2067 | C<br>1327 | N<br>362 | O<br>370 | S<br>8 | 0 | 0 | 0 |

- Molecule 2 is water.

| Mol | Chain | Residues | Atoms | | ZeroOcc | AltConf |
|-----|-------|----------|-------|---|---------|---------|
| 2 | A | 33 | Total<br>33 | O<br>33 | 0 | 0 |
| 2 | B | 27 | Total<br>27 | O<br>27 | 0 | 0 |

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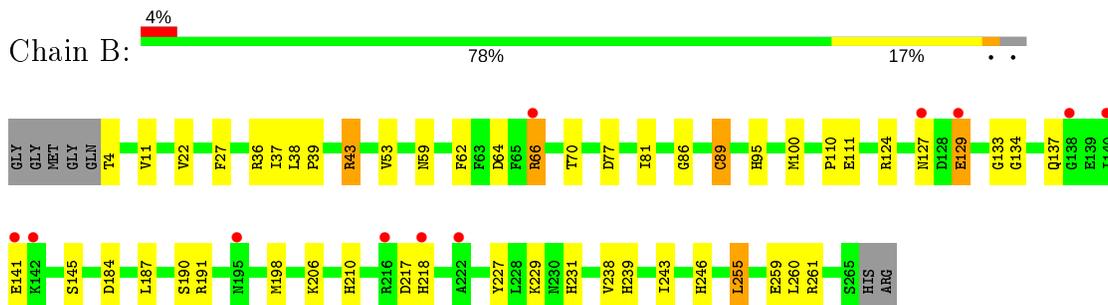| Mol | Chain | Residues | Atoms | | ZeroOcc | AltConf |
|-----|-------|----------|-------|---|---------|---------|
| 2 | C | 35 | Total<br>35 | O<br>35 | 0 | 0 |
| 2 | D | 32 | Total<br>32 | O<br>32 | 0 | 0 |
| 2 | E | 27 | Total<br>27 | O<br>27 | 0 | 0 |
| 2 | F | 27 | Total<br>27 | O<br>27 | 0 | 0 |
| 2 | G | 31 | Total<br>31 | O<br>31 | 0 | 0 |
| 2 | H | 24 | Total<br>24 | O<br>24 | 0 | 0 |
| 2 | I | 21 | Total<br>21 | O<br>21 | 0 | 0 |
| 2 | J | 12 | Total<br>12 | O<br>12 | 0 | 0 |
| 2 | K | 22 | Total<br>22 | O<br>22 | 0 | 0 |
| 2 | L | 32 | Total<br>32 | O<br>32 | 0 | 0 |

# 3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA and DNA 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 electron 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 dot above a residue indicates a poor fit to the electron density (RSRZ > 2). 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.
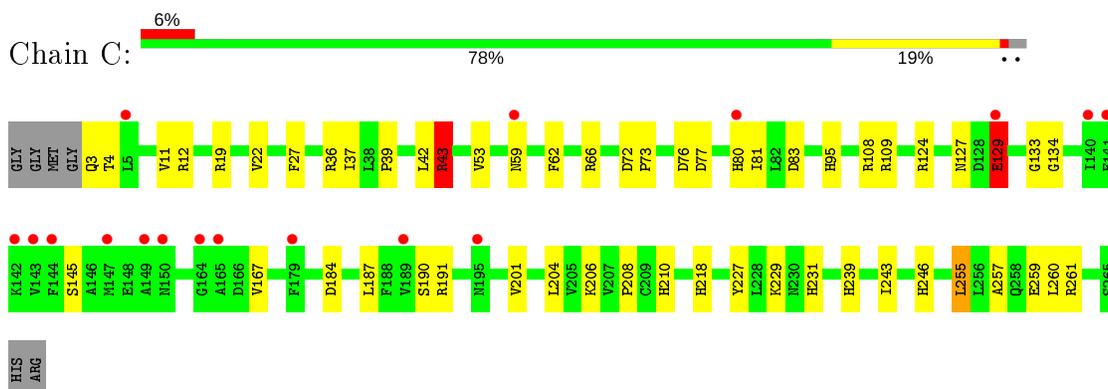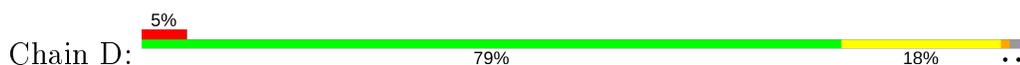
• Molecule 1: DAD2

Chain A:



• Molecule 1: DAD2

Chain B:



• Molecule 1: DAD2

Chain C:



• Molecule 1: DAD2

Chain D:

GLY GLY MET GLY | Q3 T4 | V11 | V22 | F27 | I37 L38 P39 | R43 | V53 | N59 P60 | R66 | D72 P73 | D77 | I81 | D88 C89 | H95 | M100 | P110 E111 L112 | R124 | N127 D128 E129 D130 | G133 G134 | I140 E141 K142 V143 | A149

A162 | E173 | D184 | L187 F188 V189 S190 R191 T192 | N195 S196 D197 M198 | K206 | H210 | T214 | H218 | A225 | K229 | V238 H239 | I243 | H246 | L255 L256 A257 Q258 E259 L260 R261 | S265 HIS ARG

• **Molecule 1: DAD2**

9%

Chain E:
80%          16%

GLY GLY MET GLY GLN | T4 | L9 | N10 V11 | R19 | V22 | H25 G26 F27 | R36 | P39 | L42 | R43 | D51 L52 V53 | N59 P60 D61 F62 | R66 | Y74 | D77 | H80 I81 | A84 | H95 | S98 | S114 | R124 | N127 D128 | E129 | G133 G134

F135 E136 | E139 I140 E141 K142 V143 F144 | M147 E148 A149 N150 Y151 E152 | L161 | G164 A165 D166 V167 P168 | R172 | F179 | R182 P183 D184 | L187 | S190 R191 T192 V193 F194 | P208 C209 H210 | Q213 T214 | H218 | Y227 | H231 | H239 | I243 | H246

L255 | L260 R261 | S265 HIS ARG

• **Molecule 1: DAD2**

5%

Chain F:
81%          14%

GLY GLY MET GLY | Q3 T4 | L9 | N10 V11 | V22 | H25 G26 F27 | I37 L38 P39 | R43 | D51 L52 V53 | D64 F65 R66 Y68 | D77 | I81 | G86 I87 D88 C89 | P110 E111 | R124 | N127 D128 E129 | G133 G134 | F135 E136 | I140 | V143 F144

S145 | N150 | L161 | E173 | D184 I185 T186 L187 | S190 R191 T192 V193 F194 N195 S196 | C209 H210 | H218 | Y227 | H231 | H239 | I243 | H249 | L255 L256 A257 | L260 R261 | S265 HIS ARG

• **Molecule 1: DAD2**

7%

Chain G:
80%          16%

GLY GLY MET GLY | Q3 T4 L5 | V11 | E18 | V22 | H25 G26 F27 | I37 | R43 | D51 L52 V53 | R66 R67 Y68 T69 | D76 D77 | I81 | C89 | H95 | R108 | S114 K115 | R124 | N127 D128 E129 | G133 G134 | Q137 G138 E139 I140 E141 K142

V143 F144 S145 A146 M147 E148 A149 | L178 | D184 | L187 | S190 R191 | N195 S196 | V201 | L204 V205 K206 V207 P208 C209 H210 | D217 H218 | Y227 K228 K229 N230 H231 | H239 | I243 | H246 | L255 L256 A257 Q258 E259 L260 R261 | S265 HIS ARG

• **Molecule 1: DAD2**

9%

Chain H:
78%          18%

GLY GLY MET GLY GLN | T4 | D7 | V11 | V22 | H25 G26 F27 | I37 | R43 | R46 | D51 L52 V53 C54 | N59 | F62 F63 D64 F65 R66 | D72 | D77 | I81 | G86 | C89 | H95 | M100 | P110 E111 | R124 | F125 L126 N127 D128 E129 D130
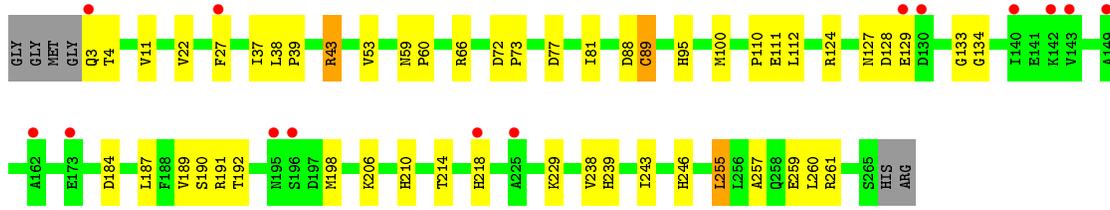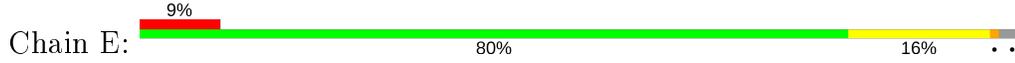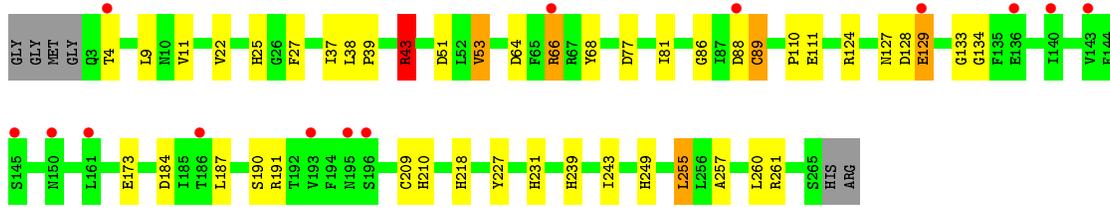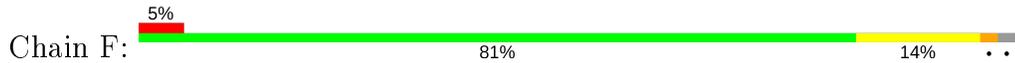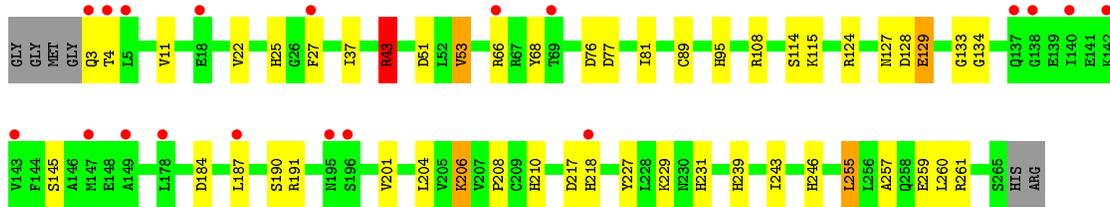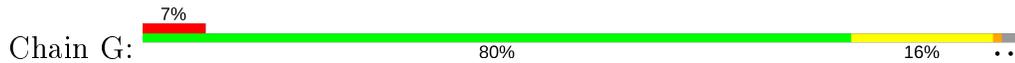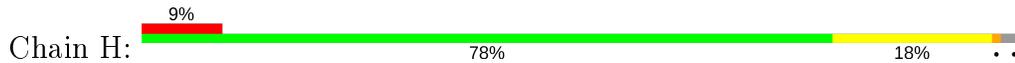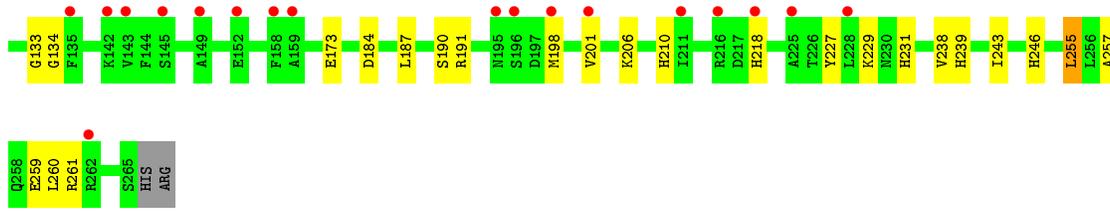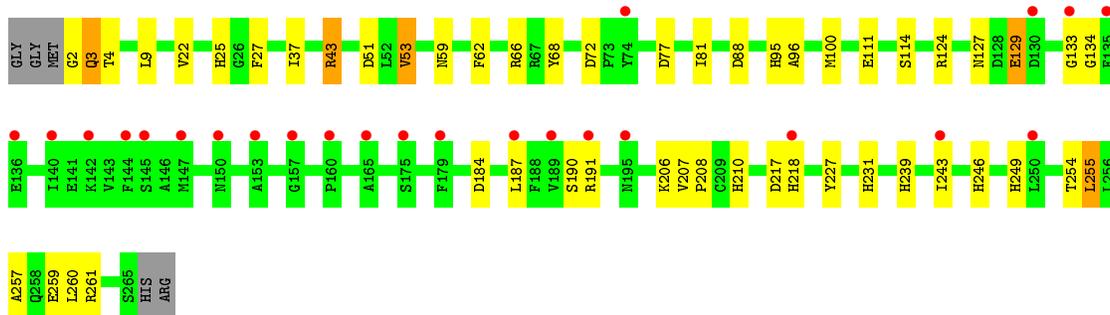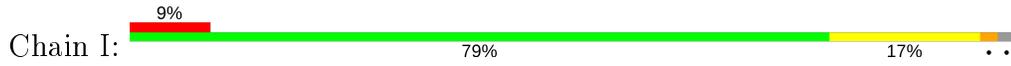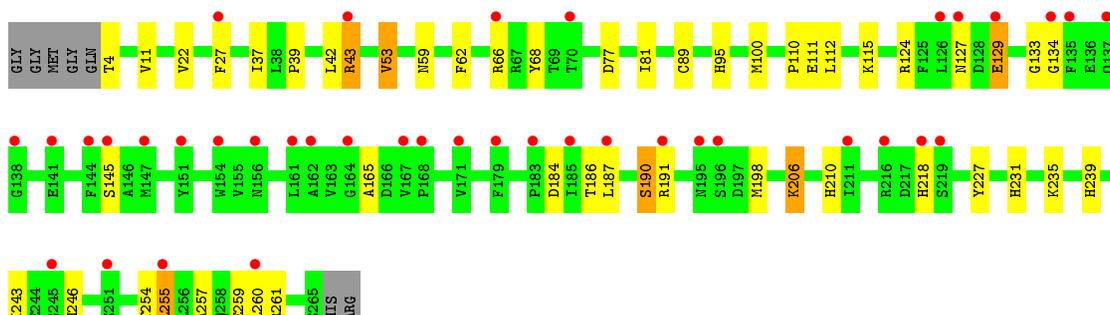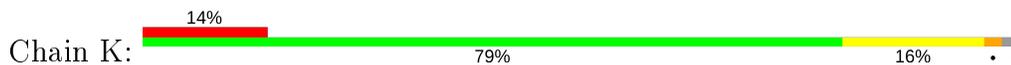
● Molecule 1: DAD2



● Molecule 1: DAD2



● Molecule 1: DAD2



● Molecule 1: DAD2

Chain L:

# 4   Data and refinement statistics (i)

| Property | Value | Source |
|---|---|---|
| Space group | P 31 | Depositor |
| Cell constants<br>a, b, c, $\alpha$, $\beta$, $\gamma$ | 176.66Å    176.66Å    107.67Å<br>90.00°    90.00°    120.00° | Depositor |
| Resolution (Å) | 62.36   –   2.80<br>62.36   –   2.80 | Depositor<br>EDS |
| % Data completeness<br>(in resolution range) | 100.0 (62.36-2.80)<br>100.0 (62.36-2.80) | Depositor<br>EDS |
| $R_{merge}$ | 0.18 | Depositor |
| $R_{sym}$ | 0.18 | Depositor |
| $< I/\sigma(I) >$ [1] | 3.86 (at 2.81Å) | Xtriage |
| Refinement program | REFMAC | Depositor |
| R, $R_{free}$ | 0.242   ,   0.272<br>0.240   ,   0.266 | Depositor<br>DCC |
| $R_{free}$ test set | 4632 reflections (5.01%) | wwPDB-VP |
| Wilson B-factor (Å$^2$) | 45.9 | Xtriage |
| Anisotropy | 0.074 | Xtriage |
| Bulk solvent $k_{sol}$(e/Å$^3$), $B_{sol}$(Å$^2$) | 0.34 , 46.2 | EDS |
| L-test for twinning[2] | $< |L| > = 0.46, < L^2 > = 0.28$ | Xtriage |
| Estimated twinning fraction | 0.015 for -h,-k,l<br>0.046 for h,-h-k,-l<br>0.017 for -k,-h,-l | Xtriage |
| $F_o,F_c$ correlation | 0.89 | EDS |
| Total number of atoms | 25042 | wwPDB-VP |
| Average B, all atoms (Å$^2$) | 52.0 | wwPDB-VP |

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 39.05 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 3.3633e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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[1]Intensities estimated from amplitudes.

[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

# 5 Model quality (i)

## 5.1 Standard geometry (i)

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

| Mol | Chain | Bond lengths | | Bond angles | |
|-----|-------|------|------|------|------|
| | | RMSZ | #$|Z|$>5 | RMSZ | #$|Z|$>5 |
| 1 | A | 0.82 | 2/2105 (0.1%) | 0.77 | 1/2865 (0.0%) |
| 1 | B | 0.69 | 0/2105 | 0.75 | 1/2865 (0.0%) |
| 1 | C | 0.70 | 0/2114 | 0.75 | 2/2877 (0.1%) |
| 1 | D | 0.75 | 1/2114 (0.0%) | 0.77 | 1/2877 (0.0%) |
| 1 | E | 0.74 | 0/2105 | 0.71 | 1/2865 (0.0%) |
| 1 | F | 0.76 | 2/2114 (0.1%) | 0.75 | 2/2877 (0.1%) |
| 1 | G | 0.72 | 1/2114 (0.0%) | 0.74 | 1/2877 (0.0%) |
| 1 | H | 0.75 | 2/2105 (0.1%) | 0.75 | 1/2865 (0.0%) |
| 1 | I | 0.70 | 0/2118 | 0.73 | 0/2882 |
| 1 | J | 0.64 | 0/2114 | 0.70 | 1/2877 (0.0%) |
| 1 | K | 0.70 | 1/2105 (0.0%) | 0.74 | 2/2865 (0.1%) |
| 1 | L | 0.68 | 0/2118 | 0.70 | 1/2882 (0.0%) |
| All | All | 0.72 | 9/25331 (0.0%) | 0.74 | 14/34474 (0.0%) |

The worst 5 of 9 bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|-------|-----|-------------|----------|
| 1 | K | 89 | CYS | CB-SG | -12.59 | 1.60 | 1.82 |
| 1 | A | 89 | CYS | CB-SG | -11.16 | 1.63 | 1.82 |
| 1 | A | 54 | CYS | CB-SG | -7.76 | 1.69 | 1.82 |
| 1 | G | 89 | CYS | CB-SG | -6.99 | 1.70 | 1.82 |
| 1 | H | 89 | CYS | CB-SG | -6.10 | 1.71 | 1.82 |

The worst 5 of 14 bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|-----|-------|-----|------|-------|-----|----------------|-------------|
| 1 | K | 89 | CYS | CA-CB-SG | 12.01 | 135.62 | 114.00 |
| 1 | B | 89 | CYS | CA-CB-SG | 10.46 | 132.83 | 114.00 |
| 1 | D | 89 | CYS | CA-CB-SG | 8.35 | 129.03 | 114.00 |
| 1 | K | 89 | CYS | CB-CA-C | -8.08 | 94.23 | 110.40 |
| 1 | H | 89 | CYS | CA-CB-SG | 7.47 | 127.45 | 114.00 |

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts (i)

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

| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 1 | A | 2054 | 0 | 2034 | 44 | 0 |
| 1 | B | 2054 | 0 | 2034 | 43 | 0 |
| 1 | C | 2063 | 0 | 2042 | 61 | 0 |
| 1 | D | 2063 | 0 | 2042 | 35 | 0 |
| 1 | E | 2054 | 0 | 2034 | 54 | 0 |
| 1 | F | 2063 | 0 | 2042 | 40 | 0 |
| 1 | G | 2063 | 0 | 2042 | 43 | 0 |
| 1 | H | 2054 | 0 | 2034 | 44 | 0 |
| 1 | I | 2067 | 0 | 2045 | 36 | 1 |
| 1 | J | 2063 | 0 | 2042 | 36 | 0 |
| 1 | K | 2054 | 0 | 2034 | 44 | 0 |
| 1 | L | 2067 | 0 | 2045 | 49 | 0 |
| 2 | A | 33 | 0 | 0 | 3 | 0 |
| 2 | B | 27 | 0 | 0 | 2 | 0 |
| 2 | C | 35 | 0 | 0 | 1 | 0 |
| 2 | D | 32 | 0 | 0 | 2 | 0 |
| 2 | E | 27 | 0 | 0 | 5 | 0 |
| 2 | F | 27 | 0 | 0 | 1 | 0 |
| 2 | G | 31 | 0 | 0 | 0 | 0 |
| 2 | H | 24 | 0 | 0 | 4 | 0 |
| 2 | I | 21 | 0 | 0 | 3 | 0 |
| 2 | J | 12 | 0 | 0 | 1 | 0 |
| 2 | K | 22 | 0 | 0 | 2 | 0 |
| 2 | L | 32 | 0 | 0 | 4 | 0 |
| All | All | 25042 | 0 | 24470 | 451 | 1 |

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 9.

The worst 5 of 451 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:F:88:ASP:OD2 | 1:L:19:ARG:HD3 | 1.42 | 1.16 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:E:36:ARG:HG3 | 2:E:306:HOH:O | 1.50 | 1.09 |
| 1:C:36:ARG:HD3 | 1:G:108:ARG:HD2 | 1.34 | 1.09 |
| 1:A:70:THR:HG21 | 1:K:254:THR:HG21 | 1.10 | 1.05 |
| 1:F:88:ASP:OD2 | 1:L:19:ARG:CD | 2.06 | 1.03 |

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:I:72:ASP:OD2 | 1:I:254:THR:OG1[2_545] | 1.83 | 0.37 |

## 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 X-ray entries followed by that with respect to entries of similar resolution.

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 | 260/269 (97%) | 251 (96%) | 8 (3%) | 1 (0%) | 34 | 66 |
| 1 | B | 260/269 (97%) | 247 (95%) | 12 (5%) | 1 (0%) | 34 | 66 |
| 1 | C | 261/269 (97%) | 252 (97%) | 7 (3%) | 2 (1%) | 19 | 49 |
| 1 | D | 261/269 (97%) | 250 (96%) | 10 (4%) | 1 (0%) | 34 | 66 |
| 1 | E | 260/269 (97%) | 249 (96%) | 10 (4%) | 1 (0%) | 34 | 66 |
| 1 | F | 261/269 (97%) | 251 (96%) | 9 (3%) | 1 (0%) | 34 | 66 |
| 1 | G | 261/269 (97%) | 251 (96%) | 9 (3%) | 1 (0%) | 34 | 66 |
| 1 | H | 260/269 (97%) | 252 (97%) | 7 (3%) | 1 (0%) | 34 | 66 |
| 1 | I | 262/269 (97%) | 252 (96%) | 8 (3%) | 2 (1%) | 19 | 49 |
| 1 | J | 261/269 (97%) | 253 (97%) | 7 (3%) | 1 (0%) | 34 | 66 |
| 1 | K | 260/269 (97%) | 250 (96%) | 9 (4%) | 1 (0%) | 34 | 66 |
| 1 | L | 262/269 (97%) | 250 (95%) | 11 (4%) | 1 (0%) | 34 | 66 |
| All | All | 3129/3228 (97%) | 3008 (96%) | 107 (3%) | 14 (0%) | 34 | 66 |

5 of 14 Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | I | 3 | GLN |
| 1 | I | 184 | ASP |
| 1 | A | 184 | ASP |
| 1 | B | 184 | ASP |
| 1 | C | 184 | ASP |

### 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 X-ray entries followed by that with respect to entries of similar resolution.

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 | 219/223 (98%) | 206 (94%) | 13 (6%) | 19 | 49 |
| 1 | B | 219/223 (98%) | 204 (93%) | 15 (7%) | 16 | 42 |
| 1 | C | 220/223 (99%) | 206 (94%) | 14 (6%) | 17 | 45 |
| 1 | D | 220/223 (99%) | 206 (94%) | 14 (6%) | 17 | 45 |
| 1 | E | 219/223 (98%) | 206 (94%) | 13 (6%) | 19 | 49 |
| 1 | F | 220/223 (99%) | 206 (94%) | 14 (6%) | 17 | 45 |
| 1 | G | 220/223 (99%) | 203 (92%) | 17 (8%) | 13 | 35 |
| 1 | H | 219/223 (98%) | 207 (94%) | 12 (6%) | 21 | 52 |
| 1 | I | 220/223 (99%) | 205 (93%) | 15 (7%) | 16 | 42 |
| 1 | J | 220/223 (99%) | 208 (94%) | 12 (6%) | 21 | 52 |
| 1 | K | 219/223 (98%) | 205 (94%) | 14 (6%) | 17 | 45 |
| 1 | L | 220/223 (99%) | 209 (95%) | 11 (5%) | 24 | 56 |
| All | All | 2635/2676 (98%) | 2471 (94%) | 164 (6%) | 18 | 47 |

5 of 164 residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | F | 66 | ARG |
| 1 | G | 129 | GLU |
| 1 | K | 255 | LEU |
| 1 | F | 124 | ARG |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | G | 3 | GLN |

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 90 such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | F | 95 | HIS |
| 1 | G | 210 | HIS |
| 1 | L | 95 | HIS |
| 1 | F | 127 | ASN |
| 1 | F | 236 | ASN |

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

## 5.6 Ligand geometry ⓘ

There are no ligands in this entry.

## 5.7 Other polymers ⓘ

There are no such residues in this entry.

## 5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

# 6 Fit of model and data (i)

## 6.1 Protein, DNA and RNA chains (i)

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, $95^{th}$ percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

| Mol | Chain | Analysed | <RSRZ> | #RSRZ>2 | | | OWAB(Å$^2$) | Q<0.9 |
|-----|-------|----------|--------|---------|----|----|-------------|-------|
| 1 | A | 262/269 (97%) | 0.04 | 10 (3%) | 40 | 30 | 21, 38, 63, 76 | 0 |
| 1 | B | 262/269 (97%) | 0.19 | 11 (4%) | 36 | 26 | 29, 47, 72, 89 | 0 |
| 1 | C | 263/269 (97%) | 0.24 | 17 (6%) | 18 | 11 | 24, 45, 75, 93 | 0 |
| 1 | D | 263/269 (97%) | 0.19 | 14 (5%) | 26 | 17 | 25, 43, 70, 85 | 0 |
| 1 | E | 262/269 (97%) | 0.38 | 24 (9%) | 9 | 5 | 27, 47, 80, 105 | 0 |
| 1 | F | 263/269 (97%) | 0.32 | 14 (5%) | 26 | 17 | 29, 43, 68, 80 | 0 |
| 1 | G | 263/269 (97%) | 0.32 | 19 (7%) | 15 | 8 | 27, 45, 69, 87 | 0 |
| 1 | H | 262/269 (97%) | 0.43 | 25 (9%) | 8 | 4 | 27, 46, 72, 97 | 0 |
| 1 | I | 264/269 (98%) | 0.42 | 24 (9%) | 9 | 5 | 26, 53, 119, 145 | 0 |
| 1 | J | 263/269 (97%) | 0.62 | 34 (12%) | 3 | 2 | 32, 60, 132, 168 | 0 |
| 1 | K | 262/269 (97%) | 0.74 | 39 (14%) | 2 | 1 | 35, 59, 102, 124 | 0 |
| 1 | L | 264/269 (98%) | 1.40 | 80 (30%) | 0 | 0 | 42, 58, 86, 100 | 0 |
| All | All | 3153/3228 (97%) | 0.44 | 311 (9%) | 7 | 4 | 21, 49, 90, 168 | 0 |

The worst 5 of 311 RSRZ outliers are listed below:

| Mol | Chain | Res | Type | RSRZ |
|-----|-------|-----|------|------|
| 1 | K | 138 | GLY | 11.5 |
| 1 | J | 147 | MET | 9.0 |
| 1 | L | 189 | VAL | 7.7 |
| 1 | L | 80 | HIS | 7.7 |
| 1 | J | 179 | PHE | 7.3 |

## 6.2 Non-standard residues in protein, DNA, RNA chains (i)

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

## 6.3 Carbohydrates (i)

There are no carbohydrates in this entry.

## 6.4 Ligands (i)

There are no ligands in this entry.

## 6.5 Other polymers (i)

There are no such residues in this entry.