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

Jun 16, 2024 – 07:47 PM EDT

| | | |
|---|---|---|
| PDB ID | : | 3HB7 |
| Title | : | The Crystal Structure of an Isochorismatase-like Hydrolase from Alkaliphilus metalliredigens to 2.3A |
| Authors | : | Stein, A.J.; Xu, X.; Cui, H.; Ng, J.; Edwards, A.; Savchenko, A.; Joachimiak, A.; Midwest Center for Structural Genomics (MCSG) |
| Deposited on | : | 2009-05-04 |
| Resolution | : | 2.30 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 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 (i)) were used in the production of this report:

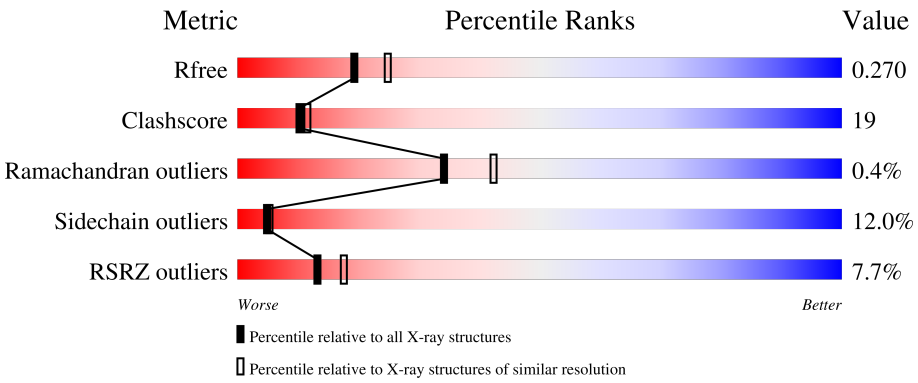
| | | |
|---|---|---|
| MolProbity | : | 4.02b-467 |
| Mogul | : | 2022.3.0, CSD as543be (2022) |
| Xtriage (Phenix) | : | 1.20.1 |
| EDS | : | 2.37.1 |
| Percentile statistics | : | 20191225.v01 (using entries in the PDB archive December 25th 2019) |
| Refmac | : | 5.8.0158 |
| CCP4 | : | 7.0.044 (Gargrove) |
| Ideal geometry (proteins) | : | Engh & Huber (2001) |
| Ideal geometry (DNA, RNA) | : | Parkinson et al. (1996) |
| Validation Pipeline (wwPDB-VP) | : | 2.37.1 |

# 1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.30 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 | 5042 (2.30-2.30) |
| Clashscore | 141614 | 5643 (2.30-2.30) |
| Ramachandran outliers | 138981 | 5575 (2.30-2.30) |
| Sidechain outliers | 138945 | 5575 (2.30-2.30) |
| RSRZ outliers | 127900 | 4938 (2.30-2.30) |

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 of 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 | 204 | 4% 67% 22% • 8% |
| 1 | B | 204 | 7% 66% 19% • 12% |
| 1 | C | 204 | 5% 54% 29% • 13% |
| 1 | D | 204 | 4% 59% 26% • 12% |
| 1 | E | 204 | 7% 64% 24% 5% 7% |

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| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 1 | F | 204 | 5% 64% 24% • 10% |
| 1 | G | 204 | 4% 60% 24% 5% 11% |
| 1 | H | 204 | 18% 39% 34% 11% 16% |

# 2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 11682 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 Isochorismatase hydrolase.

| Mol | Chain | Residues | Atoms | | | | | | ZeroOcc | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | S | Se | | | |
| 1 | A | 188 | 1478 | 945 | 254 | 274 | 2 | 3 | 0 | 2 | 0 |
| 1 | C | 178 | 1396 | 887 | 240 | 264 | 2 | 3 | 0 | 0 | 0 |
| 1 | B | 179 | 1419 | 908 | 239 | 267 | 2 | 3 | 0 | 1 | 0 |
| 1 | D | 179 | 1398 | 890 | 241 | 262 | 2 | 3 | 0 | 0 | 0 |
| 1 | E | 189 | 1474 | 935 | 253 | 281 | 2 | 3 | 0 | 0 | 0 |
| 1 | F | 183 | 1437 | 914 | 246 | 272 | 2 | 3 | 0 | 0 | 0 |
| 1 | G | 182 | 1423 | 907 | 242 | 269 | 2 | 3 | 0 | 0 | 0 |
| 1 | H | 171 | 1309 | 835 | 226 | 243 | 2 | 3 | 0 | 0 | 0 |

There are 32 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| A | -3 | TYR | - | expression tag | UNP A6TWT6 |
| A | -2 | PHE | - | expression tag | UNP A6TWT6 |
| A | -1 | GLN | - | expression tag | UNP A6TWT6 |
| A | 0 | GLY | - | expression tag | UNP A6TWT6 |
| C | -3 | TYR | - | expression tag | UNP A6TWT6 |
| C | -2 | PHE | - | expression tag | UNP A6TWT6 |
| C | -1 | GLN | - | expression tag | UNP A6TWT6 |
| C | 0 | GLY | - | expression tag | UNP A6TWT6 |
| B | -3 | TYR | - | expression tag | UNP A6TWT6 |
| B | -2 | PHE | - | expression tag | UNP A6TWT6 |
| B | -1 | GLN | - | expression tag | UNP A6TWT6 |
| B | 0 | GLY | - | expression tag | UNP A6TWT6 |
| D | -3 | TYR | - | expression tag | UNP A6TWT6 |

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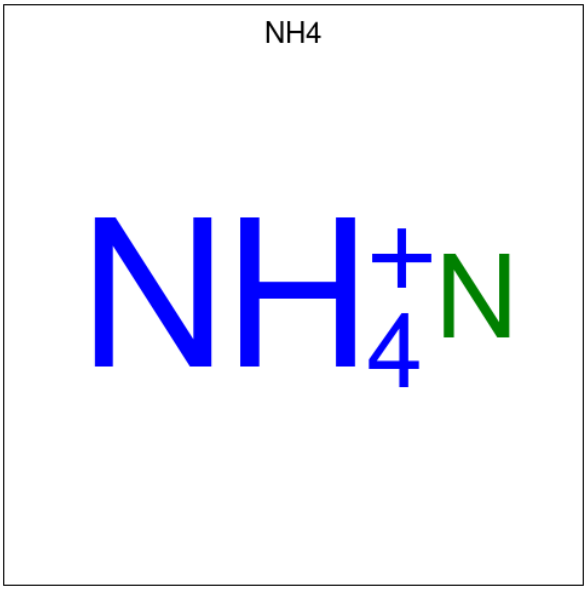
| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| D | -2 | PHE | - | expression tag | UNP A6TWT6 |
| D | -1 | GLN | - | expression tag | UNP A6TWT6 |
| D | 0 | GLY | - | expression tag | UNP A6TWT6 |
| E | -3 | TYR | - | expression tag | UNP A6TWT6 |
| E | -2 | PHE | - | expression tag | UNP A6TWT6 |
| E | -1 | GLN | - | expression tag | UNP A6TWT6 |
| E | 0 | GLY | - | expression tag | UNP A6TWT6 |
| F | -3 | TYR | - | expression tag | UNP A6TWT6 |
| F | -2 | PHE | - | expression tag | UNP A6TWT6 |
| F | -1 | GLN | - | expression tag | UNP A6TWT6 |
| F | 0 | GLY | - | expression tag | UNP A6TWT6 |
| G | -3 | TYR | - | expression tag | UNP A6TWT6 |
| G | -2 | PHE | - | expression tag | UNP A6TWT6 |
| G | -1 | GLN | - | expression tag | UNP A6TWT6 |
| G | 0 | GLY | - | expression tag | UNP A6TWT6 |
| H | -3 | TYR | - | expression tag | UNP A6TWT6 |
| H | -2 | PHE | - | expression tag | UNP A6TWT6 |
| H | -1 | GLN | - | expression tag | UNP A6TWT6 |
| H | 0 | GLY | - | expression tag | UNP A6TWT6 |

- Molecule 2 is AMMONIUM ION (three-letter code: NH4) (formula: $H_4N$).




| Mol | Chain | Residues | Atoms | ZeroOcc | AltConf |
|---|---|---|---|---|---|
| 2 | A | 1 | Total N<br>1 1 | 0 | 0 |
| 2 | C | 1 | Total N<br>1 1 | 0 | 0 |

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| Mol | Chain | Residues | Atoms | ZeroOcc | AltConf |
|---|---|---|---|---|---|
| 2 | B | 1 | Total N<br>1 1 | 0 | 0 |
| 2 | D | 1 | Total N<br>1 1 | 0 | 0 |
| 2 | E | 1 | Total N<br>1 1 | 0 | 0 |
| 2 | H | 1 | Total N<br>1 1 | 0 | 0 |

- Molecule 3 is SODIUM ION (three-letter code: NA) (formula: Na).

| Mol | Chain | Residues | Atoms | ZeroOcc | AltConf |
|---|---|---|---|---|---|
| 3 | A | 1 | Total Na<br>1 1 | 0 | 0 |
| 3 | B | 1 | Total Na<br>1 1 | 0 | 0 |
| 3 | E | 1 | Total Na<br>1 1 | 0 | 0 |
| 3 | F | 1 | Total Na<br>1 1 | 0 | 0 |
| 3 | G | 1 | Total Na<br>1 1 | 0 | 0 |

- Molecule 4 is water.

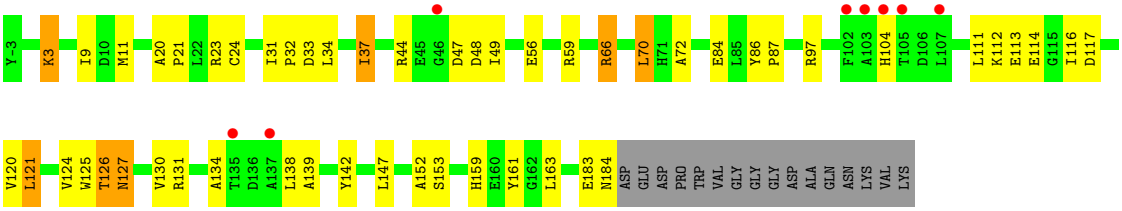
| Mol | Chain | Residues | Atoms | ZeroOcc | AltConf |
|---|---|---|---|---|---|
| 4 | A | 69 | Total O<br>69 69 | 0 | 0 |
| 4 | C | 52 | Total O<br>52 52 | 0 | 0 |
| 4 | B | 67 | Total O<br>67 67 | 0 | 0 |
| 4 | D | 38 | Total O<br>38 38 | 0 | 0 |
| 4 | E | 19 | Total O<br>19 19 | 0 | 0 |
| 4 | F | 44 | Total O<br>44 44 | 0 | 0 |
| 4 | G | 35 | Total O<br>35 35 | 0 | 0 |
| 4 | H | 13 | Total O<br>13 13 | 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 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.

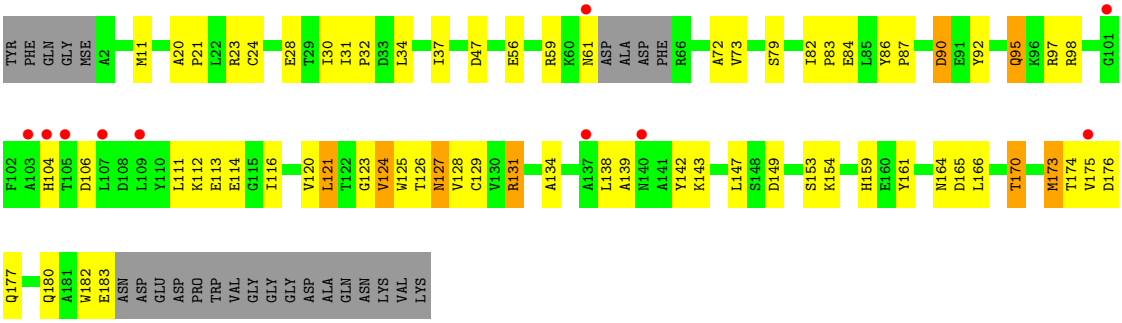
• Molecule 1: Isochorismatase hydrolase

Chain A:



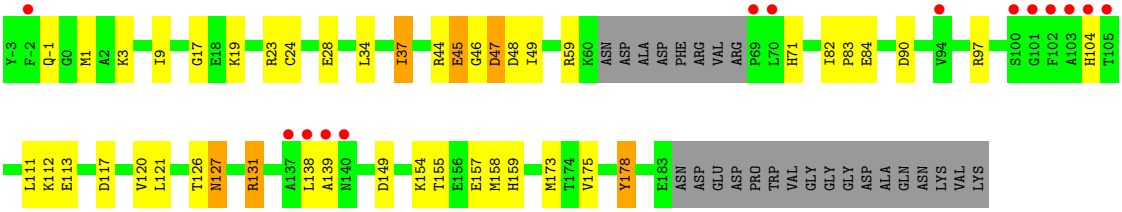

• Molecule 1: Isochorismatase hydrolase

Chain C:



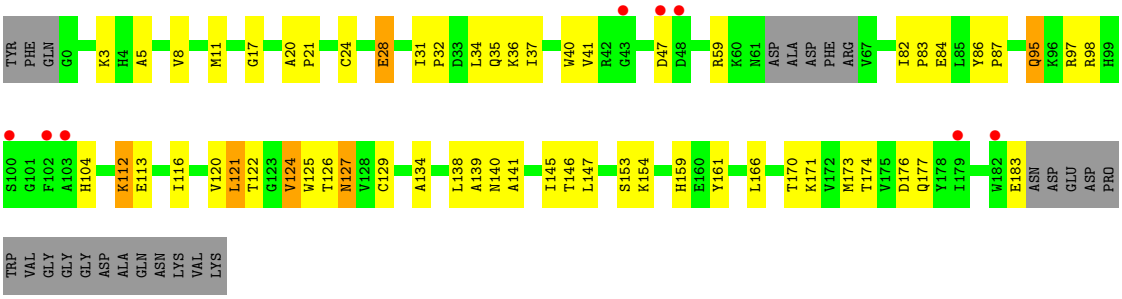

• Molecule 1: Isochorismatase hydrolase

Chain B:



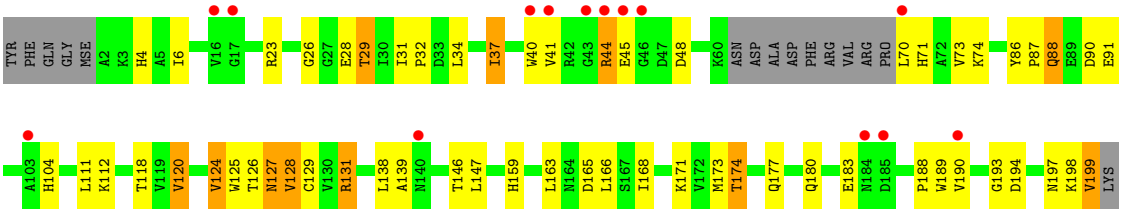

• Molecule 1: Isochorismatase hydrolase

Chain D:



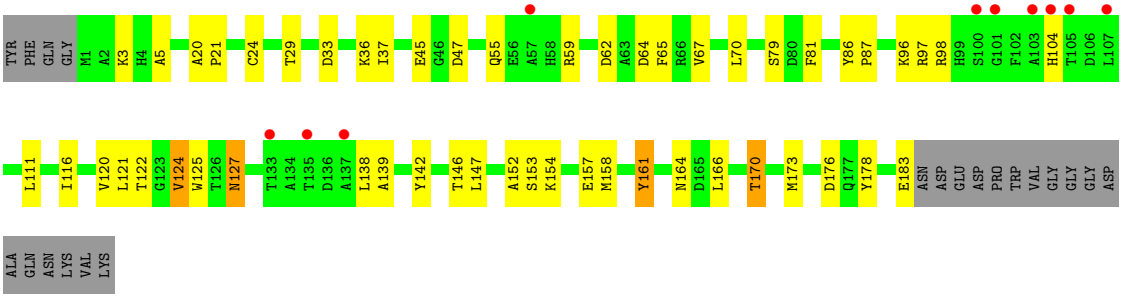

• Molecule 1: Isochorismatase hydrolase

Chain E:



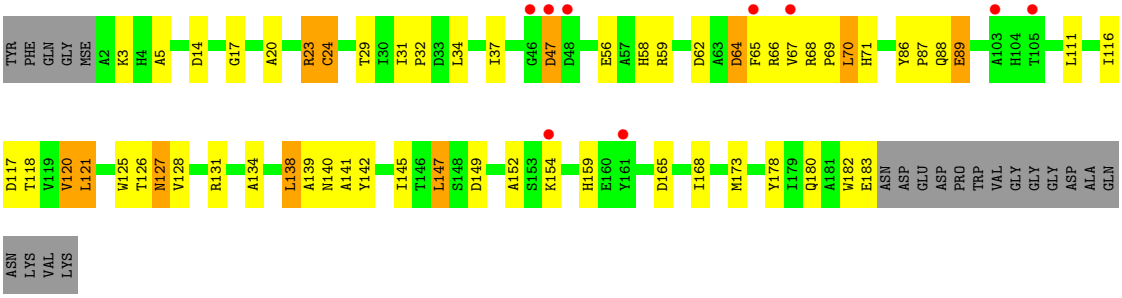

• Molecule 1: Isochorismatase hydrolase

Chain F:




• Molecule 1: Isochorismatase hydrolase

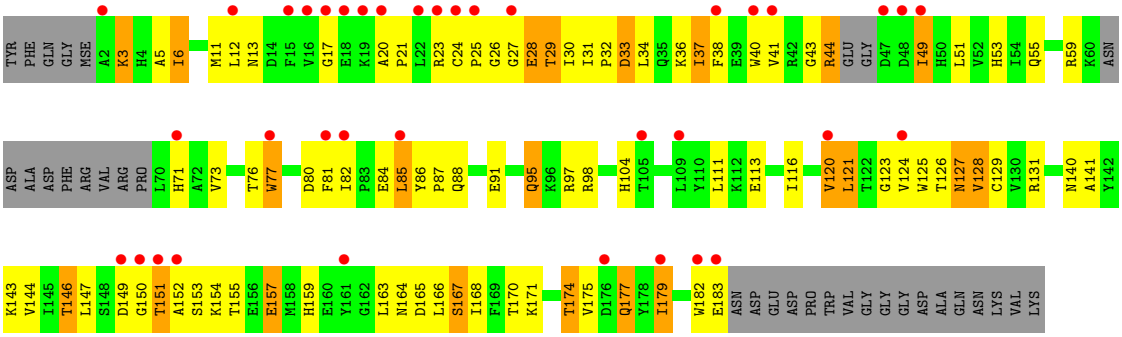
Chain G:




• Molecule 1: Isochorismatase hydrolase

Chain H:

18%
39%
34%
11%
16%


TYR PHE GLN GLY MSE A2 K3 H4 A5 I6 M11 L12 N13 D14 F15 V16 G17 E18 K19 A20 P21 L22 R23 C24 P25 G26 G27 E28 T29 I30 I31 P32 D33 L34 Q35 K36 I37 F38 E39 W40 V41 R42 G43 R44 GLU GLY D47 D48 I49 H50 L51 V52 H53 I54 Q55 R59 K60 ASN
ASP ALA ASP PHE ARG VAL ARG PRO L70 H71 A72 V73 T76 W77 D80 F81 I82 P83 E84 L85 Y86 P87 Q88 E91 Q95 K96 R97 R98 H104 T105 L109 Y110 L111 K112 E113 I116 V120 L121 T122 G123 V124 W125 T126 N127 V128 C129 V130 R131 N140 A141 Y142
K143 V144 I145 T146 L147 S148 D149 G150 T151 A152 S153 K154 T155 E156 E157 M158 H159 E160 Y161 G162 L163 N164 D165 L166 S167 I168 F169 T170 K171 T174 V175 D176 Q177 Y178 I179 W182 E183 ASN ASP GLU ASP PRO TRP VAL GLY GLY GLY ASP ALA GLN ASN LYS VAL LYS

# 4 Data and refinement statistics (i)

| Property | Value | Source |
|---|---|---|
| Space group | P 1 21 1 | Depositor |
| Cell constants<br>a, b, c, $\alpha$, $\beta$, $\gamma$ | 85.65Å 105.42Å 106.27Å<br>90.00° 103.90° 90.00° | Depositor |
| Resolution (Å) | 46.32 – 2.30<br>46.33 – 2.30 | Depositor<br>EDS |
| % Data completeness<br>(in resolution range) | 99.5 (46.32-2.30)<br>99.5 (46.33-2.30) | Depositor<br>EDS |
| $R_{merge}$ | 0.07 | Depositor |
| $R_{sym}$ | (Not available) | Depositor |
| $< I/\sigma(I) >$ [1] | 4.01 (at 2.29Å) | Xtriage |
| Refinement program | REFMAC refmac_5.5.0054 | Depositor |
| R, $R_{free}$ | 0.196 , 0.238<br>0.230 , 0.270 | Depositor<br>DCC |
| $R_{free}$ test set | 4054 reflections (5.01%) | wwPDB-VP |
| Wilson B-factor (Å$^2$) | 43.1 | Xtriage |
| Anisotropy | 0.033 | Xtriage |
| Bulk solvent $k_{sol}$(e/Å$^3$), $B_{sol}$(Å$^2$) | 0.33 , 43.1 | EDS |
| L-test for twinning[2] | $< \|L\| > = 0.49$, $< L^2 > = 0.32$ | Xtriage |
| Estimated twinning fraction | No twinning to report. | Xtriage |
| $F_o$,$F_c$ correlation | 0.94 | EDS |
| Total number of atoms | 11682 | wwPDB-VP |
| Average B, all atoms (Å$^2$) | 25.0 | wwPDB-VP |

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.41% of the height of the origin peak. No significant pseudotranslation is detected.*

[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)

Bond lengths and bond angles in the following residue types are not validated in this section: NA, NH4

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 | 1.56 | 4/1515 (0.3%) | 0.78 | 0/2057 |
| 1 | B | 1.58 | 3/1451 (0.2%) | 0.81 | 2/1965 (0.1%) |
| 1 | C | 1.45 | 3/1424 (0.2%) | 0.73 | 0/1934 |
| 1 | D | 1.45 | 2/1425 (0.1%) | 0.70 | 0/1932 |
| 1 | E | 1.33 | 0/1504 | 0.70 | 0/2042 |
| 1 | F | 1.49 | 2/1467 (0.1%) | 0.72 | 0/1992 |
| 1 | G | 1.44 | 2/1453 (0.1%) | 0.72 | 0/1974 |
| 1 | H | 1.23 | 1/1334 (0.1%) | 0.75 | 0/1813 |
| All | All | 1.45 | 17/11573 (0.1%) | 0.74 | 2/15709 (0.0%) |

The worst 5 of 17 bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|---|---|---|---|---|---|---|---|
| 1 | B | 9[A] | ILE | N-CA | -12.13 | 1.22 | 1.46 |
| 1 | B | 9[B] | ILE | N-CA | -12.13 | 1.22 | 1.46 |
| 1 | A | 9[A] | ILE | N-CA | -10.13 | 1.26 | 1.46 |
| 1 | A | 9[B] | ILE | N-CA | -10.13 | 1.26 | 1.46 |
| 1 | C | 24 | CYS | CB-SG | -7.41 | 1.69 | 1.82 |

All (2) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|---|---|---|---|---|---|---|---|
| 1 | B | 9[A] | ILE | CA-C-O | 5.75 | 132.18 | 120.10 |
| 1 | B | 9[B] | ILE | CA-C-O | 5.75 | 132.18 | 120.10 |

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 | 1478 | 0 | 1424 | 41 | 0 |
| 1 | B | 1419 | 0 | 1377 | 38 | 0 |
| 1 | C | 1396 | 0 | 1341 | 58 | 0 |
| 1 | D | 1398 | 0 | 1352 | 57 | 0 |
| 1 | E | 1474 | 0 | 1409 | 61 | 0 |
| 1 | F | 1437 | 0 | 1385 | 32 | 1 |
| 1 | G | 1423 | 0 | 1367 | 46 | 0 |
| 1 | H | 1309 | 0 | 1242 | 115 | 1 |
| 2 | A | 1 | 0 | 0 | 0 | 0 |
| 2 | B | 1 | 0 | 0 | 0 | 0 |
| 2 | C | 1 | 0 | 0 | 0 | 0 |
| 2 | D | 1 | 0 | 0 | 0 | 0 |
| 2 | E | 1 | 0 | 0 | 0 | 0 |
| 2 | H | 1 | 0 | 0 | 0 | 0 |
| 3 | A | 1 | 0 | 0 | 0 | 0 |
| 3 | B | 1 | 0 | 0 | 0 | 0 |
| 3 | E | 1 | 0 | 0 | 0 | 0 |
| 3 | F | 1 | 0 | 0 | 0 | 0 |
| 3 | G | 1 | 0 | 0 | 0 | 0 |
| 4 | A | 69 | 0 | 0 | 0 | 0 |
| 4 | B | 67 | 0 | 0 | 1 | 0 |
| 4 | C | 52 | 0 | 0 | 3 | 0 |
| 4 | D | 38 | 0 | 0 | 2 | 0 |
| 4 | E | 19 | 0 | 0 | 0 | 0 |
| 4 | F | 44 | 0 | 0 | 2 | 0 |
| 4 | G | 35 | 0 | 0 | 0 | 0 |
| 4 | H | 13 | 0 | 0 | 2 | 0 |
| All | All | 11682 | 0 | 10897 | 417 | 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 19.

The worst 5 of 417 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:H:13:ASN:ND2 | 1:H:77:TRP:CE3 | 1.68 | 1.55 |
| 1:E:174:THR:CG2 | 1:E:177:GLN:HG3 | 1.34 | 1.53 |
| 1:H:82:ILE:HD11 | 1:H:85:LEU:CD1 | 1.53 | 1.35 |
| 1:H:146:THR:OG1 | 1:H:170:THR:HG21 | 1.26 | 1.32 |
| 1:H:13:ASN:ND2 | 1:H:77:TRP:CZ3 | 1.95 | 1.31 |

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:F:97:ARG:NH2 | 1:H:113:GLU:OE1[1_655] | 2.15 | 0.05 |

## 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 | 188/204 (92%) | 185 (98%) | 3 (2%) | 0 | 100 | 100 |
| 1 | B | 176/204 (86%) | 172 (98%) | 4 (2%) | 0 | 100 | 100 |
| 1 | C | 174/204 (85%) | 170 (98%) | 3 (2%) | 1 (1%) | 25 | 31 |
| 1 | D | 175/204 (86%) | 171 (98%) | 4 (2%) | 0 | 100 | 100 |
| 1 | E | 185/204 (91%) | 179 (97%) | 5 (3%) | 1 (0%) | 29 | 35 |
| 1 | F | 181/204 (89%) | 178 (98%) | 3 (2%) | 0 | 100 | 100 |
| 1 | G | 180/204 (88%) | 176 (98%) | 2 (1%) | 2 (1%) | 14 | 15 |
| 1 | H | 165/204 (81%) | 160 (97%) | 4 (2%) | 1 (1%) | 25 | 31 |
| All | All | 1424/1632 (87%) | 1391 (98%) | 28 (2%) | 5 (0%) | 34 | 42 |

All (5) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | G | 89 | GLU |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | E | 128 | VAL |
| 1 | H | 128 | VAL |
| 1 | C | 128 | VAL |
| 1 | G | 128 | VAL |

### 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 | 153/170 (90%) | 136 (89%) | 17 (11%) | 6 7 |
| 1 | B | 150/170 (88%) | 135 (90%) | 15 (10%) | 7 9 |
| 1 | C | 147/170 (86%) | 130 (88%) | 17 (12%) | 5 6 |
| 1 | D | 146/170 (86%) | 135 (92%) | 11 (8%) | 13 17 |
| 1 | E | 154/170 (91%) | 134 (87%) | 20 (13%) | 4 4 |
| 1 | F | 151/170 (89%) | 133 (88%) | 18 (12%) | 5 5 |
| 1 | G | 149/170 (88%) | 135 (91%) | 14 (9%) | 8 10 |
| 1 | H | 133/170 (78%) | 103 (77%) | 30 (23%) | 1 0 |
| All | All | 1183/1360 (87%) | 1041 (88%) | 142 (12%) | 5 5 |

5 of 142 residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | H | 28 | GLU |
| 1 | H | 37 | ILE |
| 1 | H | 120 | VAL |
| 1 | B | 138 | LEU |
| 1 | B | 131 | ARG |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 33 such sidechains are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | H | 53 | HIS |

*Continued on next page...*

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | H | 55 | GLN |
| 1 | H | 159 | HIS |
| 1 | D | 55 | GLN |
| 1 | B | 159 | HIS |

### 5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry (i)

Of 11 ligands modelled in this entry, 6 are modelled with single atom and 5 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 5.7 Other polymers (i)

There are no such residues in this entry.

## 5.8 Polymer linkage issues (i)

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 | 184/204 (90%) | 0.22 | 8 (4%) | 35 | 42 | 13, 21, 30, 56 | 0 |
| 1 | B | 175/204 (85%) | 0.45 | 14 (8%) | 12 | 16 | 8, 23, 32, 64 | 0 |
| 1 | C | 175/204 (85%) | 0.29 | 10 (5%) | 23 | 30 | 14, 24, 30, 36 | 0 |
| 1 | D | 175/204 (85%) | 0.45 | 8 (4%) | 32 | 39 | 15, 24, 31, 55 | 0 |
| 1 | E | 186/204 (91%) | 0.56 | 14 (7%) | 14 | 19 | 19, 28, 49, 66 | 0 |
| 1 | F | 179/204 (87%) | 0.29 | 10 (5%) | 24 | 30 | 14, 23, 29, 38 | 0 |
| 1 | G | 179/204 (87%) | 0.24 | 9 (5%) | 28 | 35 | 11, 24, 39, 62 | 0 |
| 1 | H | 168/204 (82%) | 1.09 | 37 (22%) | 0 | 1 | 17, 30, 38, 40 | 0 |
| All | All | 1421/1632 (87%) | 0.44 | 110 (7%) | 13 | 17 | 8, 24, 36, 66 | 0 |

The worst 5 of 110 RSRZ outliers are listed below:

| Mol | Chain | Res | Type | RSRZ |
|---|---|---|---|---|
| 1 | H | 182 | TRP | 5.2 |
| 1 | H | 77 | TRP | 4.4 |
| 1 | H | 22 | LEU | 4.3 |
| 1 | H | 16 | VAL | 4.3 |
| 1 | H | 17 | GLY | 4.3 |

## 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 monosaccharides in this entry.

## 6.4 Ligands (i)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, $95^{th}$ percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

| Mol | Type | Chain | Res | Atoms | RSCC | RSR | B-factors(Å$^2$) | Q<0.9 |
|---|---|---|---|---|---|---|---|---|
| 2 | NH4 | B | 201 | 1/1 | 0.82 | 0.72 | 26,26,26,26 | 0 |
| 2 | NH4 | H | 201 | 1/1 | 0.83 | 0.45 | 27,27,27,27 | 0 |
| 2 | NH4 | E | 201 | 1/1 | 0.86 | 0.53 | 30,30,30,30 | 0 |
| 2 | NH4 | C | 201 | 1/1 | 0.86 | 0.74 | 28,28,28,28 | 0 |
| 3 | NA | G | 201 | 1/1 | 0.88 | 0.44 | 49,49,49,49 | 0 |
| 2 | NH4 | D | 201 | 1/1 | 0.96 | 0.88 | 25,25,25,25 | 0 |
| 3 | NA | E | 202 | 1/1 | 0.96 | 0.60 | 41,41,41,41 | 0 |
| 3 | NA | F | 201 | 1/1 | 0.96 | 0.35 | 29,29,29,29 | 0 |
| 2 | NH4 | A | 201 | 1/1 | 0.96 | 0.50 | 20,20,20,20 | 0 |
| 3 | NA | B | 202 | 1/1 | 0.98 | 0.52 | 31,31,31,31 | 0 |
| 3 | NA | A | 202 | 1/1 | 0.98 | 0.41 | 27,27,27,27 | 0 |

## 6.5 Other polymers (i)

There are no such residues in this entry.