



wwPDB X-ray Structure Validation Summary Report ⓘ

Feb 13, 2017 – 10:21 pm GMT

PDB ID : 4LZP
Title : Structure of the TIR domain of the immunosuppressor BtpA from Brucella
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Deposited on : 2013-08-01
Resolution : 3.15 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

<http://wwpdb.org/validation/2016/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.9-1692
EDS	:	trunk28620
Percentile statistics	:	20161228.v01 (using entries in the PDB archive December 28th 2016)
Refmac	:	5.8.0135
CCP4	:	6.5.0
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	recalc28949

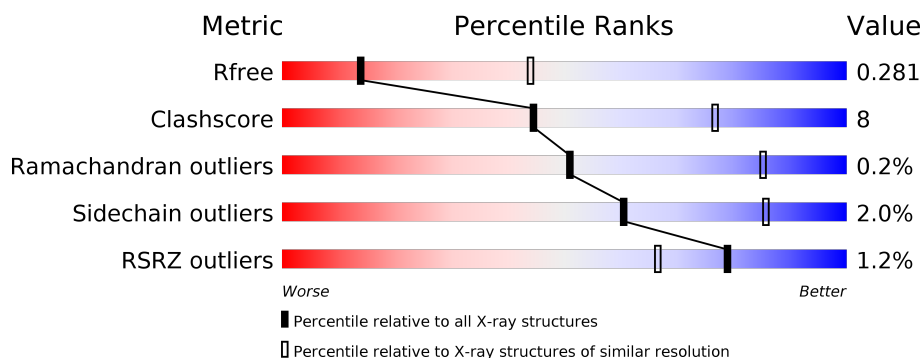
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.15 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}	100719	1259 (3.20-3.12)
Clashscore	112137	1397 (3.20-3.12)
Ramachandran outliers	110173	1368 (3.20-3.12)
Sidechain outliers	110143	1367 (3.20-3.12)
RSRZ outliers	101464	1264 (3.20-3.12)

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. 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 electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	176	<div> <div>%</div> <div> <div></div> <div>79%</div> <div>13%</div> <div>8%</div> </div> </div>
1	B	176	<div> <div>%</div> <div> <div></div> <div>61%</div> <div>13%</div> <div>27%</div> </div> </div>
1	C	176	<div> <div>%</div> <div> <div></div> <div>77%</div> <div>15%</div> <div>7%</div> </div> </div>
1	D	176	<div> <div>%</div> <div> <div></div> <div>63%</div> <div>11%</div> <div>26%</div> </div> </div>

2 Entry composition

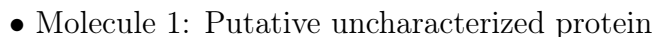
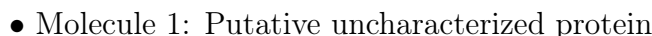
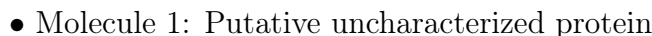
There is only 1 type of molecule in this entry. The entry contains 4669 atoms, of which 0 are hydrogens and 0 are deuteriums.

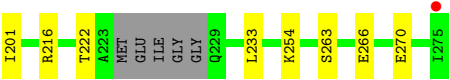
In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Putative uncharacterized protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	B	129	Total	C	N	O		0	0	0
			1033	665	176	192				
1	C	163	Total	C	N	O	S	0	0	0
			1307	832	227	247	1			
1	A	162	Total	C	N	O	S	0	0	0
			1286	820	222	243	1			
1	D	130	Total	C	N	O		0	0	0
			1043	671	176	196				

- Molecule 1: Putative uncharacterized protein





4 Data and refinement statistics

Property	Value	Source
Space group	P 2 21 21	Depositor
Cell constants a, b, c, α , β , γ	68.14Å 73.93Å 137.65Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.40 – 3.15 48.42 – 3.15	Depositor EDS
% Data completeness (in resolution range)	97.9 (48.40-3.15) 97.4 (48.42-3.15)	Depositor EDS
R_{merge}	0.17	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.75 (at 3.12Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.8.2_1309)	Depositor
R, R_{free}	0.222 , 0.279 0.222 , 0.281	Depositor DCC
R_{free} test set	591 reflections (4.84%)	DCC
Wilson B-factor (Å ²)	50.8	Xtriage
Anisotropy	0.474	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.27 , 48.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.45$, $\langle L^2 \rangle = 0.28$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	4669	wwPDB-VP
Average B, all atoms (Å ²)	82.0	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 39.85 % 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 2.9854e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ 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	0.43	0/1308	0.54	0/1761
1	B	0.46	0/1054	0.53	0/1420
1	C	0.48	0/1329	0.56	0/1787
1	D	0.47	0/1064	0.52	0/1434
All	All	0.46	0/4755	0.54	0/6402

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1286	0	1272	29	0
1	B	1033	0	1030	12	0
1	C	1307	0	1299	17	0
1	D	1043	0	1033	14	0
All	All	4669	0	4634	70	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 8.

The worst 5 of 70 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:A:182:VAL:CG1	1:A:211:LYS:HG3	1.72	1.17
1:A:182:VAL:CB	1:A:211:LYS:HG3	1.76	1.14
1:A:182:VAL:HB	1:A:211:LYS:HG3	1.28	1.13
1:A:182:VAL:O	1:A:182:VAL:HG23	1.66	0.94
1:A:182:VAL:HB	1:A:211:LYS:CG	2.05	0.86

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 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	156/176 (89%)	152 (97%)	3 (2%)	1 (1%)	28	70
1	B	125/176 (71%)	122 (98%)	3 (2%)	0	100	100
1	C	157/176 (89%)	153 (98%)	4 (2%)	0	100	100
1	D	126/176 (72%)	124 (98%)	2 (2%)	0	100	100
All	All	564/704 (80%)	551 (98%)	12 (2%)	1 (0%)	51	85

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	182	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	137/151 (91%)	135 (98%)	2 (2%)	70	90
1	B	110/151 (73%)	106 (96%)	4 (4%)	40	75
1	C	140/151 (93%)	137 (98%)	3 (2%)	59	85
1	D	111/151 (74%)	110 (99%)	1 (1%)	82	94
All	All	498/604 (82%)	488 (98%)	10 (2%)	60	86

5 of 10 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	181	LYS
1	C	192	GLN
1	A	132	THR
1	B	275	ILE
1	C	275	ILE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	192	GLN
1	C	196	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no carbohydrates 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 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, 95th 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	162/176 (92%)	-0.09	2 (1%) 79 66	43, 84, 125, 154	0
1	B	129/176 (73%)	-0.25	2 (1%) 72 58	43, 76, 112, 130	0
1	C	163/176 (92%)	-0.16	1 (0%) 89 83	37, 79, 121, 154	0
1	D	130/176 (73%)	-0.25	2 (1%) 74 60	45, 78, 120, 159	0
All	All	584/704 (82%)	-0.18	7 (1%) 79 66	37, 80, 121, 159	0

The worst 5 of 7 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	175	TYR	4.0
1	C	175	TYR	3.0
1	B	229	GLN	2.8
1	B	275	ILE	2.5
1	D	141	GLU	2.5

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.