



wwPDB X-ray Structure Validation Summary Report ⓘ

Aug 27, 2023 – 06:58 AM EDT

PDB ID : 3HAJ
Title : Crystal structure of human PACSIN2 F-BAR domain (p212121 lattice)
Authors : Wang, Q.; Navarro, M.V.A.S.; Peng, G.; Rajashankar, K.R.; Sondermann, H.
Deposited on : 2009-05-01
Resolution : 2.78 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 ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity : 4.02b-467
Xtriage (Phenix) : 1.13
EDS : 2.35
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) : 2.35

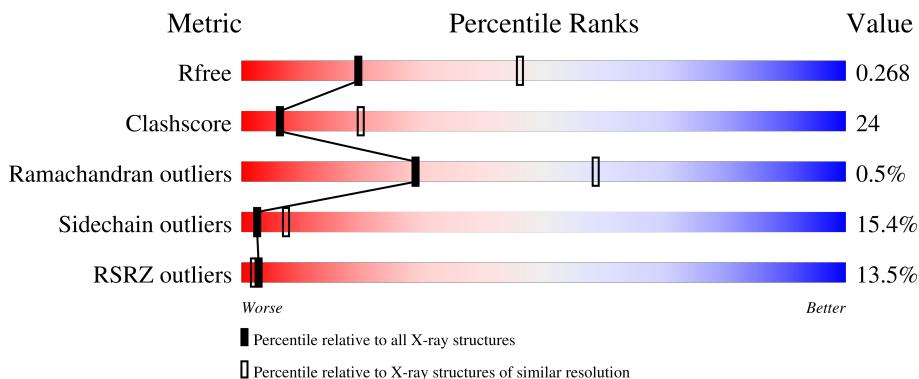
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.78 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	4107 (2.80-2.76)
Clashscore	141614	4575 (2.80-2.76)
Ramachandran outliers	138981	4487 (2.80-2.76)
Sidechain outliers	138945	4489 (2.80-2.76)
RSRZ outliers	127900	4027 (2.80-2.76)

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 $\leq 5\%$. 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	486	
1	B	486	

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 4753 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 human PACSIN2 F-BAR.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	286	2368	1489	427	437	15	0	0	0
1	B	284	2347	1475	424	433	15	0	0	0

- Molecule 2 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total 1	Ca 1	0	0
2	B	1	Total 1	Ca 1	0	0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	14	Total 14	O 14	0	0
3	B	22	Total 22	O 22	0	0

D257	ASN	LYS	GLY
L286	GLN	THR	ASP
S259	THR	GLN	GLU
N260	GLY	SER	LEU
V261	ASP	TYR	THR
A262	GLN	PRO	LYS
G263	SER	THR	MET
Y264	LEU	ASP	GLU
	PRO	TRP	ASP
I267	PRO	ASP	GLU
Y268	SER	SER	GLU
H269	LYS	ASP	ASP
D270	PRO	ASP	GLU
L271	SER	GLU	GLN
E272	SER	SER	GLY
Q273	THR	ASN	TRP
S274	LEU	ASN	CYS
I275	ASN	PRO	LYS
R276	VAL	PHE	GLY
A277	PRO	SER	ARG
A278	SER	SER	LEU
D279	ASN	THR	ASP
	PRO	ASP	ASN
	ALA	ALA	GLY
D283	GLN	ASN	GLN
R285	SER	GLY	VAL
W286	ALA	ASP	GLY
F287	GLN	SER	LEU
	GLN	PRO	TYR
P300	SER	ALA	ASN
	THR	TYR	VAL
GLN	PHE	ASP	GLU
PHE	GLU	ASP	ALA
GLU	GLU	ALA	GLU
GLU	TRP	THR	ALA
TRP	SER	GLU	ALA
SER	ALA	GLY	ILE
SER	ALA	THR	GLN
ASP	ASP	GLU	
LEU	LEU	GLU	
ASN	ASN	VAL	
ASN	ARG	ARG	
ARG	THR	VAL	
LEU	SER	ARG	
ARG	THR	ALA	
ARG	VAL	LEU	
GLU	VAL	TYR	
GLU	GLU	ASP	
LYS	LYS	TYR	
LYS	LYS	GLU	
LYS	LYS	GLY	
ALA	ALA	GLN	
THR	THR	GLU	
THR	LYS	HIS	
ASP	ALA	ASP	
GLY	LYS	LYS	
VAL	VAL	GLU	
THR	VAL	LEU	
LEU	SER	SER	
THR	SER	PHE	
GLY	TYR	LYS	
ILE	LYS	ALA	

4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	31.30Å 88.39Å 357.72Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	44.72 – 2.78 44.72 – 2.78	Depositor EDS
% Data completeness (in resolution range)	95.4 (44.72-2.78) 95.4 (44.72-2.78)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.81 (at 2.77Å)	Xtrriage
Refinement program	PHENIX (phenix.refine)	Depositor
R, R_{free}	0.224 , 0.274 0.219 , 0.268	Depositor DCC
R_{free} test set	1259 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	46.6	Xtrriage
Anisotropy	0.271	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 77.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.43$, $\langle L^2 \rangle = 0.26$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	4753	wwPDB-VP
Average B, all atoms (Å ²)	78.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.85% of the height of the origin peak. No significant pseudotranslation is detected.*

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](#)

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

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	0.23	0/2417	0.37	0/3235
1	B	0.24	0/2395	0.41	0/3205
All	All	0.24	0/4812	0.39	0/6440

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	2368	0	2334	114	0
1	B	2347	0	2317	139	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
3	A	14	0	0	0	0
3	B	22	0	0	4	0
All	All	4753	0	4651	226	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 24.

The worst 5 of 226 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:192:GLN:HA	1:B:195:ILE:HD11	1.37	1.06
1:B:183:LEU:HB3	1:B:187:GLN:HG3	1.41	1.01
1:A:183:LEU:HB3	1:A:184:ASN:HB3	1.39	1.01
1:B:285:ARG:HG2	1:B:285:ARG:HH21	1.23	0.99
1:B:79:THR:HG21	1:B:279:ASP:H	1.27	0.97

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	284/486 (58%)	277 (98%)	7 (2%)	0	100	100
1	B	282/486 (58%)	268 (95%)	11 (4%)	3 (1%)	14	38
All	All	566/972 (58%)	545 (96%)	18 (3%)	3 (0%)	29	58

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	185	PRO
1	B	220	THR
1	B	184	ASN

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	247/424 (58%)	212 (86%)	35 (14%)	3	9
1	B	245/424 (58%)	204 (83%)	41 (17%)	2	6
All	All	492/848 (58%)	416 (85%)	76 (15%)	2	7

5 of 76 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	190	LYS
1	B	240	LYS
1	B	197	LYS
1	B	211	LYS
1	B	276	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 24 such sidechains are listed below:

Mol	Chain	Res	Type
1	A	298	ASN
1	B	58	GLN
1	B	44	ASN
1	B	69	GLN
1	A	192	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 2 ligands modelled in this entry, 2 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

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, 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	286/486 (58%)	0.94	45 (15%) 2 1	27, 69, 159, 174	0
1	B	284/486 (58%)	0.77	32 (11%) 5 3	23, 63, 161, 177	0
All	All	570/972 (58%)	0.86	77 (13%) 3 2	23, 66, 160, 177	0

The worst 5 of 77 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	188	LEU	7.1
1	A	163	ALA	7.0
1	B	178	LYS	6.7
1	A	182	SER	6.5
1	A	171	ILE	6.4

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, 95th 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(\AA^2)	Q<0.9
2	CA	B	488	1/1	0.94	0.10	68,68,68,68	0
2	CA	A	488	1/1	0.98	0.17	69,69,69,69	0

6.5 Other polymers [i](#)

There are no such residues in this entry.