



wwPDB X-ray Structure Validation Summary Report ⓘ

Nov 2, 2024 – 09:24 PM EDT

PDB ID : 3Q84
Title : Crystal structure of human PACSIN 1 F-BAR domain
Authors : Bai, X.
Deposited on : 2011-01-06
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 ⓘ 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
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 1.20.1
EDS : 3.0
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4 : 9.0.003 (Gargrove)
Density-Fitness : 1.0.11
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

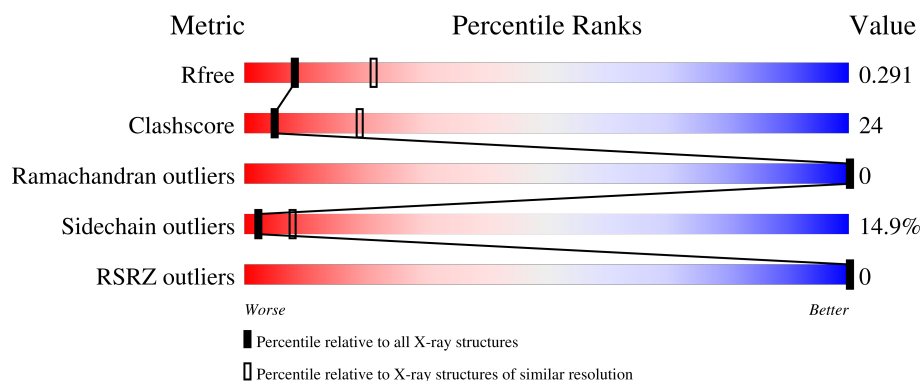
1 Overall quality at a glance ⓘ

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}	164625	3657 (2.80-2.80)
Clashscore	180529	4123 (2.80-2.80)
Ramachandran outliers	177936	4071 (2.80-2.80)
Sidechain outliers	177891	4073 (2.80-2.80)
RSRZ outliers	164620	3659 (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 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	295	 60% 30% 7% •
1	B	295	 64% 27% 5% •
1	G	295	 66% 23% 7% •
1	H	295	 61% 28% 8% ••
1	M	295	 51% 36% 5% 8%

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Mol	Chain	Length	Quality of chain
1	N	295	<div><div></div><div>56%</div><div>31%</div><div>6%</div><div>8%</div></div>

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 14091 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 Protein kinase C and casein kinase substrate in neurons protein 1.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	285	Total	C	N	O	S	Se	0	0	0
			2350	1478	415	442	5	10			
1	B	285	Total	C	N	O	S	Se	0	0	0
			2353	1475	418	445	5	10			
1	G	287	Total	C	N	O	S	Se	0	0	0
			2353	1475	419	444	5	10			
1	H	288	Total	C	N	O	S	Se	0	0	0
			2375	1492	421	447	5	10			
1	M	271	Total	C	N	O	S	Se	0	0	0
			2227	1401	395	418	5	8			
1	N	272	Total	C	N	O	S	Se	0	0	0
			2216	1390	395	418	5	8			

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

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	B	1	Total	Ca	0	0
			1	1		
2	G	1	Total	Ca	0	0
			1	1		
2	M	1	Total	Ca	0	0
			1	1		
2	N	1	Total	Ca	0	0
			1	1		

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	44	Total	O	0	0
			44	44		
3	B	44	Total	O	0	0
			44	44		

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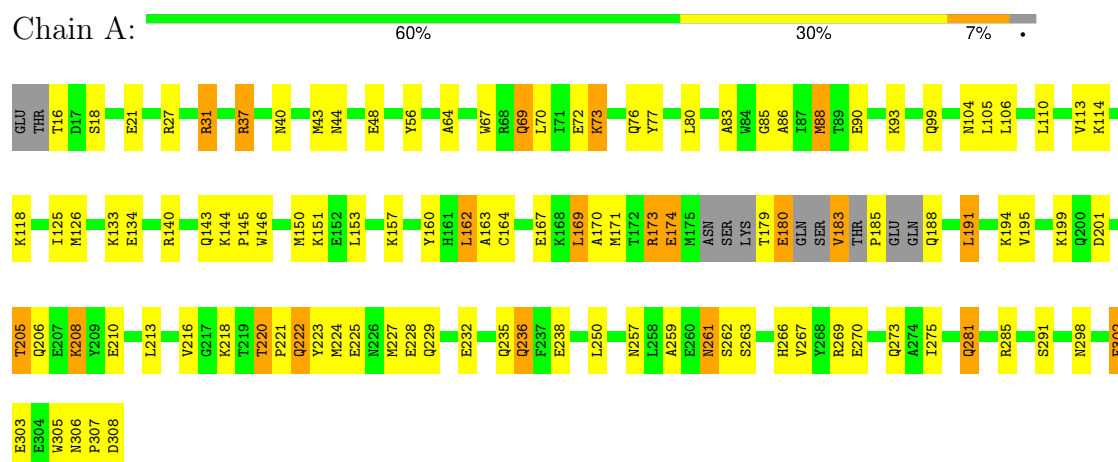
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	G	40	Total 40	O 40	0	0
3	H	32	Total 32	O 32	0	0
3	M	23	Total 23	O 23	0	0
3	N	30	Total 30	O 30	0	0

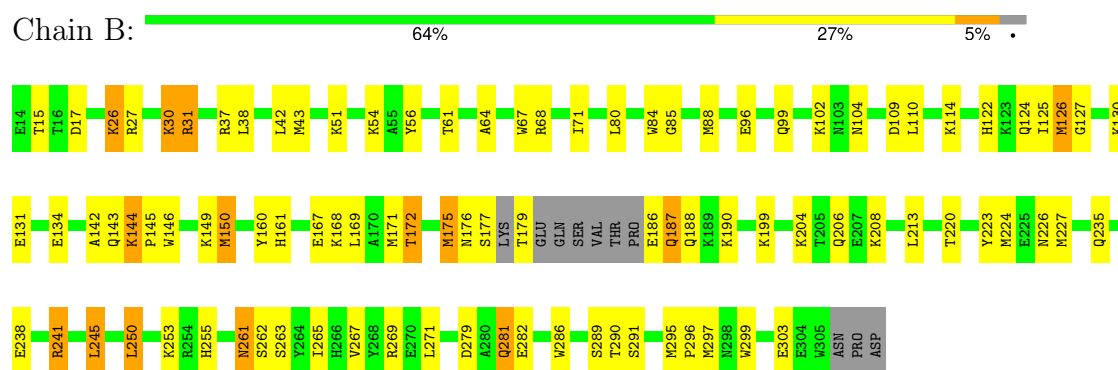
3 Residue-property plots

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.

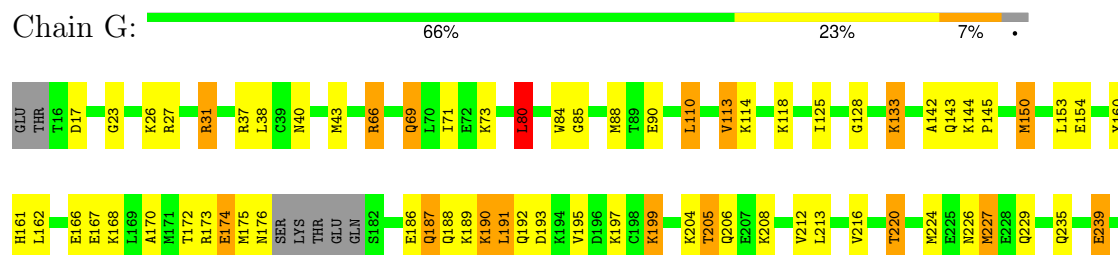
- Molecule 1: Protein kinase C and casein kinase substrate in neurons protein 1



- Molecule 1: Protein kinase C and casein kinase substrate in neurons protein 1



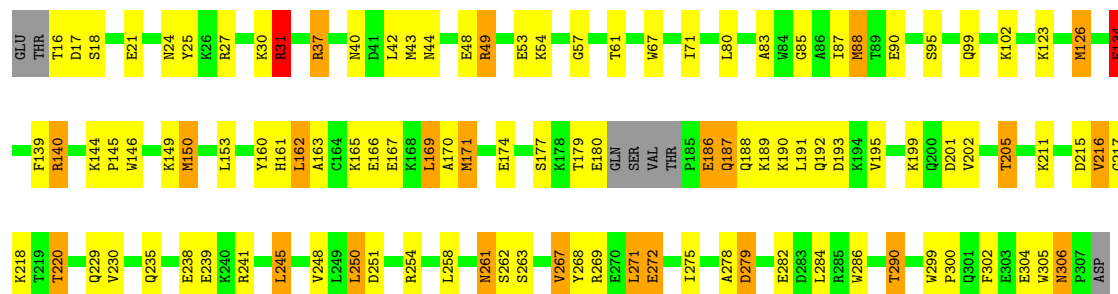
- Molecule 1: Protein kinase C and casein kinase substrate in neurons protein 1





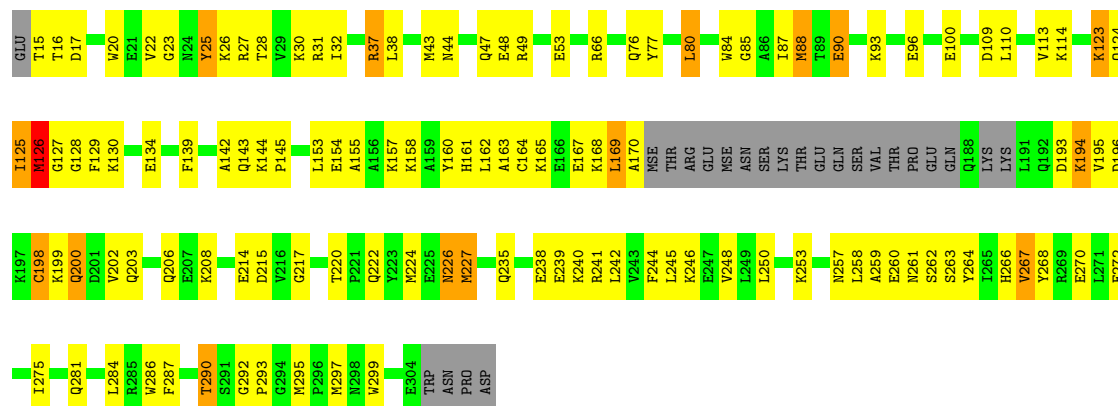
- Molecule 1: Protein kinase C and casein kinase substrate in neurons protein 1

Chain H: 61% 28% 8% ..



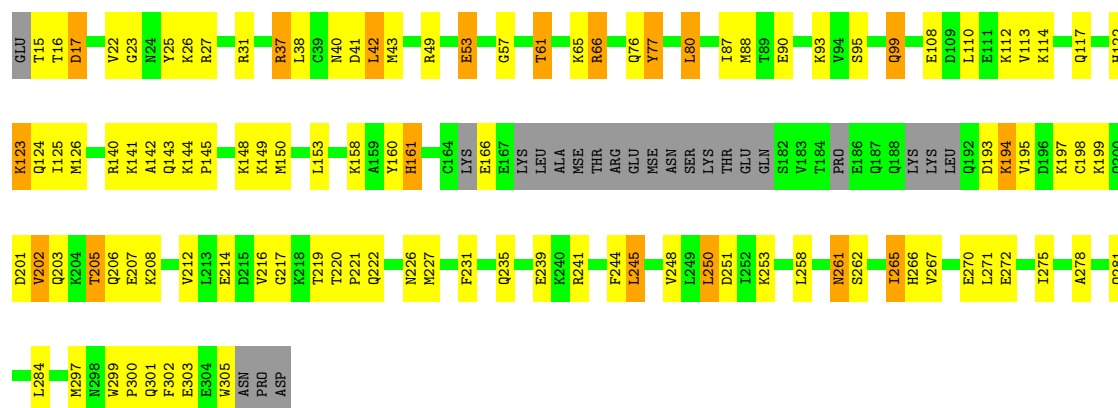
- Molecule 1: Protein kinase C and casein kinase substrate in neurons protein 1

Chain M: 51% 36% 5% 8%



- Molecule 1: Protein kinase C and casein kinase substrate in neurons protein 1

Chain N: 56% 31% 6% 8%



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	86.35Å 154.29Å 215.45Å 90.00° 90.34° 90.00°	Depositor
Resolution (Å)	29.06 – 2.80 29.06 – 2.80	Depositor EDS
% Data completeness (in resolution range)	96.2 (29.06-2.80) 94.6 (29.06-2.80)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	5.33 (at 2.80Å)	Xtriage
Refinement program	REFMAC 5.5.0110	Depositor
R, R_{free}	0.221 , 0.294 0.234 , 0.291	Depositor DCC
R_{free} test set	3358 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å ²)	53.5	Xtriage
Anisotropy	0.140	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 37.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.008 for -1/2*h-1/2*k,-3/2*h+1/2*k,-l 0.012 for -1/2*h+1/2*k,3/2*h+1/2*k,-l 0.003 for 1/2*h-1/2*k,-3/2*h-1/2*k,-l 0.005 for 1/2*h+1/2*k,3/2*h-1/2*k,-l 0.447 for h,-k,-l	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	14091	wwPDB-VP
Average B, all atoms (Å ²)	54.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.13% 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	1.17	1/2384 (0.0%)	0.91	1/3178 (0.0%)
1	B	1.02	0/2387	0.87	0/3184
1	G	1.05	0/2386	0.86	4/3180 (0.1%)
1	H	1.09	1/2411 (0.0%)	0.89	2/3215 (0.1%)
1	M	1.06	1/2261 (0.0%)	0.86	1/3019 (0.0%)
1	N	0.84	0/2247	0.80	0/2998
All	All	1.05	3/14076 (0.0%)	0.87	8/18774 (0.0%)

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	164	CYS	CB-SG	-5.70	1.72	1.81
1	H	134	GLU	CG-CD	5.68	1.60	1.51
1	M	268	TYR	CE2-CZ	-5.00	1.32	1.38

The worst 5 of 8 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	G	80	LEU	CA-CB-CG	-5.73	102.12	115.30
1	G	66	ARG	NE-CZ-NH1	-5.53	117.54	120.30
1	M	126	MSE	N-CA-C	-5.35	96.55	111.00
1	G	305	TRP	N-CA-C	-5.34	96.59	111.00
1	H	31	ARG	NE-CZ-NH2	-5.32	117.64	120.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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	2350	0	2286	125	1
1	B	2353	0	2288	104	1
1	G	2353	0	2285	145	1
1	H	2375	0	2313	101	1
1	M	2227	0	2171	147	0
1	N	2216	0	2134	110	0
2	B	1	0	0	0	0
2	G	1	0	0	0	0
2	M	1	0	0	0	0
2	N	1	0	0	0	0
3	A	44	0	0	0	0
3	B	44	0	0	1	0
3	G	40	0	0	2	0
3	H	32	0	0	1	0
3	M	23	0	0	0	0
3	N	30	0	0	2	0
All	All	14091	0	13477	669	2

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 669 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:177:SER:CB	1:H:191:LEU:HD13	1.51	1.40
1:N:43:MSE:HE1	1:N:114:LYS:CB	1.53	1.38
1:A:169:LEU:HD13	1:A:170:ALA:N	1.41	1.33
1:M:160:TYR:HE1	1:M:206:GLN:NE2	1.28	1.29
1:G:191:LEU:HD12	1:G:192:GLN:N	1.45	1.28

All (2) 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:G:125:ILE:O	1:H:134:GLU:OE1[3_445]	1.89	0.31
1:A:210:GLU:OE2	1:B:265:ILE:CD1[4_546]	2.01	0.19

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	277/295 (94%)	272 (98%)	5 (2%)	0	100	100
1	B	280/295 (95%)	274 (98%)	6 (2%)	0	100	100
1	G	283/295 (96%)	279 (99%)	4 (1%)	0	100	100
1	H	284/295 (96%)	281 (99%)	3 (1%)	0	100	100
1	M	266/295 (90%)	260 (98%)	6 (2%)	0	100	100
1	N	262/295 (89%)	249 (95%)	13 (5%)	0	100	100
All	All	1652/1770 (93%)	1615 (98%)	37 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	246/253 (97%)	208 (85%)	38 (15%)	2	7
1	B	247/253 (98%)	215 (87%)	32 (13%)	3	11
1	G	244/253 (96%)	210 (86%)	34 (14%)	3	9

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	H	248/253 (98%)	203 (82%)	45 (18%)	1	4
1	M	232/253 (92%)	201 (87%)	31 (13%)	3	10
1	N	228/253 (90%)	193 (85%)	35 (15%)	2	7
All	All	1445/1518 (95%)	1230 (85%)	215 (15%)	2	8

5 of 215 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	H	123	LYS
1	H	267	VAL
1	N	166	GLU
1	H	149	LYS
1	H	193	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 80 such sidechains are listed below:

Mol	Chain	Res	Type
1	M	226	ASN
1	N	200	GLN
1	M	257	ASN
1	N	76	GLN
1	N	235	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 oligosaccharides in this entry.

5.6 Ligand geometry

Of 4 ligands modelled in this entry, 4 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	275/295 (93%)	-1.64	0 100 100	25, 44, 101, 123	0
1	B	275/295 (93%)	-1.65	0 100 100	25, 45, 95, 115	0
1	G	277/295 (93%)	-1.65	0 100 100	25, 43, 106, 114	0
1	H	278/295 (94%)	-1.62	0 100 100	23, 44, 111, 132	0
1	M	263/295 (89%)	-1.51	0 100 100	34, 58, 115, 121	0
1	N	264/295 (89%)	-1.56	0 100 100	36, 58, 105, 125	0
All	All	1632/1770 (92%)	-1.61	0 100 100	23, 48, 106, 132	0

There are no RSRZ outliers to report.

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(Å ²)	Q<0.9
2	CA	N	400	1/1	0.97	0.07	92,92,92,92	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	CA	G	400	1/1	0.98	0.09	91,91,91,91	0
2	CA	M	400	1/1	0.98	0.03	85,85,85,85	0
2	CA	B	400	1/1	0.98	0.05	87,87,87,87	0

6.5 Other polymers [i](#)

There are no such residues in this entry.