WORLDWIDE PDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report ⓘ

Nov 14, 2022 – 03:32 pm GMT

PDB ID	:	7Z6B
Title	:	PET hydrolase PET6 from halophilic organsim Vibrio gazogenes
Authors	:	Weigert, S.; Hoecker, B.
Deposited on	:	2022-03-11
Resolution	:	1.40 Å(reported)

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

|		
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.31.2
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0267
CCP4	:	7.1.010 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.2

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 1.40 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.
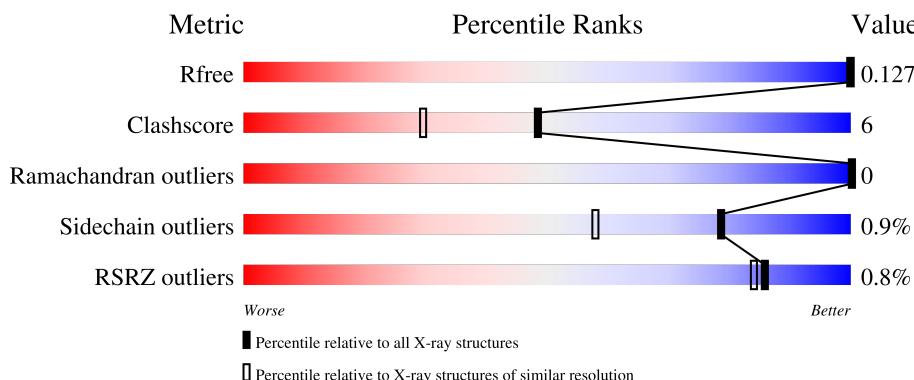
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1714 (1.40-1.40)
Clashscore	141614	1812 (1.40-1.40)
Ramachandran outliers	138981	1763 (1.40-1.40)
Sidechain outliers	138945	1762 (1.40-1.40)
RSRZ outliers	127900	1674 (1.40-1.40)

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	295	
1	B	295	
1	C	295	
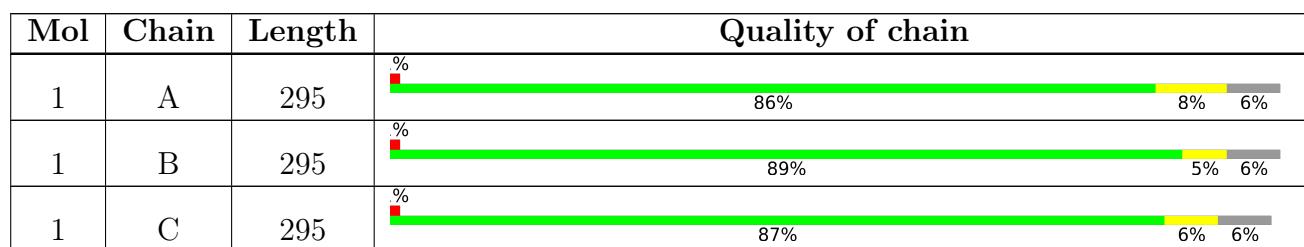
The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	PO4	C	304	-	-	-	X
5	MPD	B	310[A]	-	-	X	-

2 Entry composition ⓘ

There are 6 unique types of molecules in this entry. The entry contains 15206 atoms, of which 7161 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 Cutinase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	277	Total	C	H	N	O	S	0	24	0
			4537	1439	2262	401	423	12			
1	B	277	Total	C	H	N	O	S	0	24	0
			4544	1439	2269	403	421	12			
1	C	277	Total	C	H	N	O	S	0	22	0
			4517	1432	2252	401	420	12			

There are 66 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	3	MET	-	initiating methionine	UNP A0A1M5F0K3
A	4	GLY	-	expression tag	UNP A0A1M5F0K3
A	5	SER	-	expression tag	UNP A0A1M5F0K3
A	6	SER	-	expression tag	UNP A0A1M5F0K3
A	7	HIS	-	expression tag	UNP A0A1M5F0K3
A	8	HIS	-	expression tag	UNP A0A1M5F0K3
A	9	HIS	-	expression tag	UNP A0A1M5F0K3
A	10	HIS	-	expression tag	UNP A0A1M5F0K3
A	11	HIS	-	expression tag	UNP A0A1M5F0K3
A	12	HIS	-	expression tag	UNP A0A1M5F0K3
A	13	SER	-	expression tag	UNP A0A1M5F0K3
A	14	SER	-	expression tag	UNP A0A1M5F0K3
A	15	GLY	-	expression tag	UNP A0A1M5F0K3
A	16	LEU	-	expression tag	UNP A0A1M5F0K3
A	17	VAL	-	expression tag	UNP A0A1M5F0K3
A	18	PRO	-	expression tag	UNP A0A1M5F0K3
A	19	ARG	-	expression tag	UNP A0A1M5F0K3
A	20	GLY	-	expression tag	UNP A0A1M5F0K3
A	21	SER	-	expression tag	UNP A0A1M5F0K3
A	22	HIS	-	expression tag	UNP A0A1M5F0K3
A	23	MET	-	expression tag	UNP A0A1M5F0K3
A	24	MET	-	expression tag	UNP A0A1M5F0K3
B	3	MET	-	initiating methionine	UNP A0A1M5F0K3

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
B	4	GLY	-	expression tag	UNP A0A1M5F0K3
B	5	SER	-	expression tag	UNP A0A1M5F0K3
B	6	SER	-	expression tag	UNP A0A1M5F0K3
B	7	HIS	-	expression tag	UNP A0A1M5F0K3
B	8	HIS	-	expression tag	UNP A0A1M5F0K3
B	9	HIS	-	expression tag	UNP A0A1M5F0K3
B	10	HIS	-	expression tag	UNP A0A1M5F0K3
B	11	HIS	-	expression tag	UNP A0A1M5F0K3
B	12	HIS	-	expression tag	UNP A0A1M5F0K3
B	13	SER	-	expression tag	UNP A0A1M5F0K3
B	14	SER	-	expression tag	UNP A0A1M5F0K3
B	15	GLY	-	expression tag	UNP A0A1M5F0K3
B	16	LEU	-	expression tag	UNP A0A1M5F0K3
B	17	VAL	-	expression tag	UNP A0A1M5F0K3
B	18	PRO	-	expression tag	UNP A0A1M5F0K3
B	19	ARG	-	expression tag	UNP A0A1M5F0K3
B	20	GLY	-	expression tag	UNP A0A1M5F0K3
B	21	SER	-	expression tag	UNP A0A1M5F0K3
B	22	HIS	-	expression tag	UNP A0A1M5F0K3
B	23	MET	-	expression tag	UNP A0A1M5F0K3
B	24	MET	-	expression tag	UNP A0A1M5F0K3
C	3	MET	-	initiating methionine	UNP A0A1M5F0K3
C	4	GLY	-	expression tag	UNP A0A1M5F0K3
C	5	SER	-	expression tag	UNP A0A1M5F0K3
C	6	SER	-	expression tag	UNP A0A1M5F0K3
C	7	HIS	-	expression tag	UNP A0A1M5F0K3
C	8	HIS	-	expression tag	UNP A0A1M5F0K3
C	9	HIS	-	expression tag	UNP A0A1M5F0K3
C	10	HIS	-	expression tag	UNP A0A1M5F0K3
C	11	HIS	-	expression tag	UNP A0A1M5F0K3
C	12	HIS	-	expression tag	UNP A0A1M5F0K3
C	13	SER	-	expression tag	UNP A0A1M5F0K3
C	14	SER	-	expression tag	UNP A0A1M5F0K3
C	15	GLY	-	expression tag	UNP A0A1M5F0K3
C	16	LEU	-	expression tag	UNP A0A1M5F0K3
C	17	VAL	-	expression tag	UNP A0A1M5F0K3
C	18	PRO	-	expression tag	UNP A0A1M5F0K3
C	19	ARG	-	expression tag	UNP A0A1M5F0K3
C	20	GLY	-	expression tag	UNP A0A1M5F0K3
C	21	SER	-	expression tag	UNP A0A1M5F0K3
C	22	HIS	-	expression tag	UNP A0A1M5F0K3
C	23	MET	-	expression tag	UNP A0A1M5F0K3

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
C	24	MET	-	expression tag	UNP A0A1M5F0K3

- Molecule 2 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

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

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

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	2	Total 2	Na 2	0	0
3	B	2	Total 2	Na 2	0	0
3	C	2	Total 2	Na 2	0	0

- Molecule 4 is PHOSPHATE ION (three-letter code: PO4) (formula: O_4P).
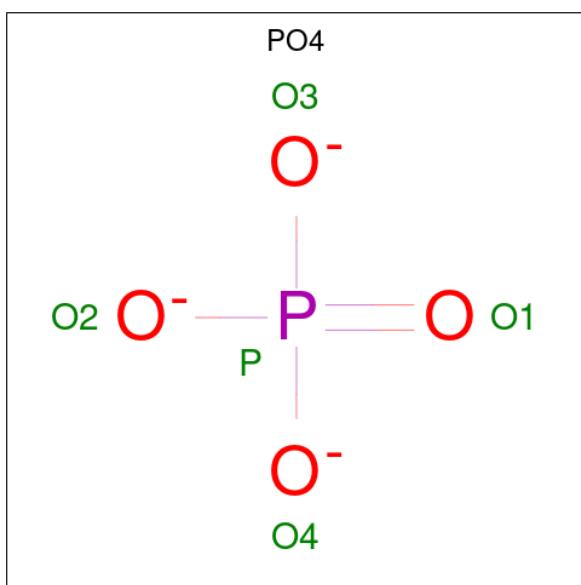
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total 5	O 4	P 1	0	0
4	A	1	Total 5	O 4	P 1	0	0
4	A	1	Total 5	O 4	P 1	0	0
4	A	1	Total 5	O 4	P 1	0	0
4	B	1	Total 5	O 4	P 1	0	0
4	B	1	Total 5	O 4	P 1	0	0
4	B	1	Total 5	O 4	P 1	0	0
4	C	1	Total 5	O 4	P 1	0	0
4	C	1	Total 5	O 4	P 1	0	0

- Molecule 5 is (4S)-2-METHYL-2,4-PENTANEDIOL (three-letter code: MPD) (formula: $C_6H_{14}O_2$).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total 44	C 12	H 28	O 4	0	1
5	A	1	Total 44	C 12	H 28	O 4	0	1

Continued from previous page...

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total 44	C 12	H 28	O 4	0	1
5	A	1	Total 44	C 12	H 28	O 4	0	1
5	A	1	Total 44	C 12	H 28	O 4	0	1
5	A	1	Total 44	C 12	H 28	O 4	0	1
5	A	1	Total 44	C 12	H 28	O 4	0	1
5	B	1	Total 22	C 6	H 14	O 2	0	0
5	B	1	Total 44	C 12	H 28	O 4	0	1
5	B	1	Total 44	C 12	H 28	O 4	0	1
5	B	1	Total 44	C 12	H 28	O 4	0	1
5	B	1	Total 22	C 6	H 14	O 2	0	0
5	B	1	Total 44	C 12	H 28	O 4	0	1
5	C	1	Total 22	C 6	H 14	O 2	0	0
5	C	1	Total 44	C 12	H 28	O 4	0	1

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	323	Total 323	O 323	0	0
6	B	319	Total 319	O 319	0	0
6	C	318	Total 318	O 318	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: Cutinase

Chain A:

- Molecule 1: Cutinase

Chain B:

- Molecule 1: Cutinase

Chain C:
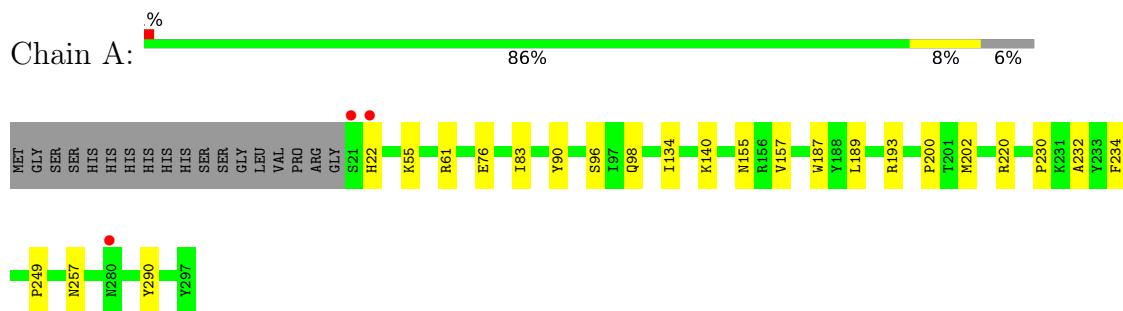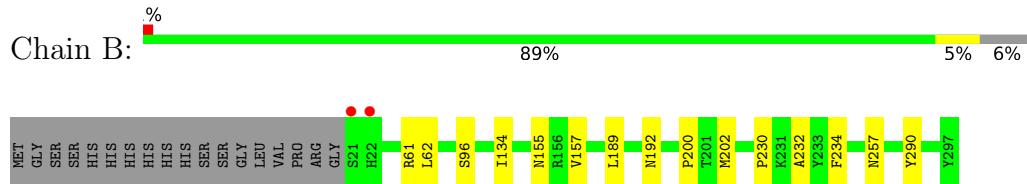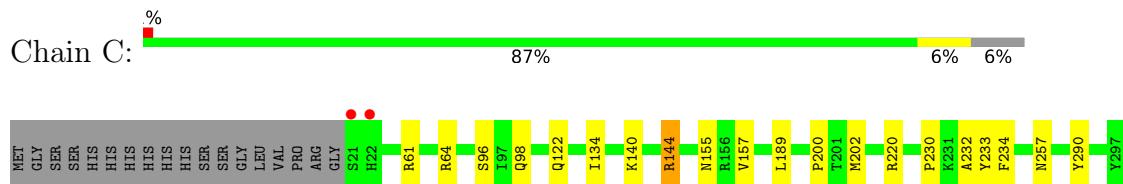
4   Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	44.82Å 72.61Å 72.76Å 119.78° 91.64° 91.82°	Depositor
Resolution (Å)	25.70 – 1.40 44.74 – 1.40	Depositor EDS
% Data completeness (in resolution range)	95.8 (25.70-1.40) 95.8 (44.74-1.40)	Depositor EDS
R_{merge}	0.05	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.69 (at 1.40Å)	Xtriage
Refinement program	PHENIX 1.19.2_4158	Depositor
R, R_{free}	0.100 , 0.126 0.100 , 0.127	Depositor DCC
R_{free} test set	7503 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	9.5	Xtriage
Anisotropy	0.431	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	(Not available) , (Not available)	EDS
L-test for twinning[2]	$< |L| > = 0.50$, $< L^2 > = 0.34$	Xtriage
Estimated twinning fraction	0.009 for -h,-l,-k	Xtriage
F_o,F_c correlation	0.98	EDS
Total number of atoms	15206	wwPDB-VP
Average B, all atoms (Å^2)	14.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.34% 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 ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: NA, MPD, PO4, CL

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	0.69	0/2408	0.84	0/3265
1	B	0.69	0/2412	0.84	0/3269
1	C	0.70	0/2388	0.83	0/3238
All	All	0.69	0/7208	0.84	0/9772

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 ⓘ

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	2275	2262	2228	22	0
1	B	2275	2269	2240	15	0
1	C	2265	2252	2224	26	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
3	A	2	0	0	0	0
3	B	2	0	0	0	0
3	C	2	0	0	0	0
4	A	20	0	0	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	B	15	0	0	0	0
4	C	10	0	0	0	0
5	A	112	196	196	15	0
5	B	80	140	140	13	0
5	C	24	42	42	4	0
6	A	323	0	0	11	0
6	B	319	0	0	4	0
6	C	318	0	0	10	0
All	All	8045	7161	7070	86	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 6.

All (86) 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:220[B]:ARG:HD3	6:A:471:HOH:O	1.58	1.03
1:C:220[B]:ARG:HD3	6:C:447:HOH:O	1.63	0.99
5:B:310[A]:MPD:H53	5:B:310[A]:MPD:CM	1.94	0.97
1:B:155[B]:ASN:ND2	6:B:401:HOH:O	2.01	0.92
5:A:311[B]:MPD:HM1	5:A:311[B]:MPD:H52	1.54	0.87
5:B:310[A]:MPD:H53	5:B:310[A]:MPD:HM3	1.59	0.85
1:C:134:ILE:HD13	1:C:157[B]:VAL:HG11	1.60	0.84
5:B:310[B]:MPD:H12	6:B:461:HOH:O	1.77	0.84
1:B:134:ILE:HD13	1:B:157[B]:VAL:HG11	1.58	0.83
5:B:310[A]:MPD:H11	5:B:310[A]:MPD:O4	1.79	0.82
1:A:134:ILE:HD13	1:A:157[B]:VAL:HG11	1.64	0.79
5:A:309[A]:MPD:O4	5:A:309[A]:MPD:H13	1.83	0.78
1:B:62:LEU:HD21	1:C:144[A]:ARG:CD	2.13	0.78
5:B:310[A]:MPD:H53	5:B:310[A]:MPD:HM1	1.65	0.76
5:A:312[B]:MPD:O2	5:A:312[B]:MPD:C5	2.37	0.72
5:C:306:MPD:H52	5:C:306:MPD:H11	1.72	0.71
1:A:155[B]:ASN:ND2	6:A:404:HOH:O	2.24	0.71
5:B:308[A]:MPD:H13	5:B:308[A]:MPD:H53	1.73	0.71
1:B:96[B]:SER:OG	6:B:402:HOH:O	2.07	0.71
1:C:96[B]:SER:OG	6:C:401:HOH:O	2.09	0.71
1:C:61[B]:ARG:NH1	6:C:403:HOH:O	2.23	0.70
1:B:61[B]:ARG:NH1	6:B:405:HOH:O	2.27	0.68
1:A:189[B]:LEU:HB3	5:A:314[B]:MPD:H31	1.76	0.68
1:A:22:HIS:HD2	6:A:590:HOH:O	1.75	0.67
1:A:96[B]:SER:OG	6:A:401:HOH:O	2.06	0.65

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:62:LEU:HD21	1:C:144[A]:ARG:NE	2.10	0.65
1:A:98[B]:GLN:NE2	6:A:405:HOH:O	2.31	0.64
1:A:155[B]:ASN:OD1	6:A:403:HOH:O	2.16	0.62
1:C:64[B]:ARG:NH2	6:C:404:HOH:O	2.32	0.62
5:B:310[A]:MPD:HM3	5:B:310[A]:MPD:C5	2.22	0.61
1:A:61[B]:ARG:NE	6:A:402:HOH:O	2.10	0.61
5:B:310[A]:MPD:HM3	5:B:310[A]:MPD:O4	2.00	0.61
5:A:310[A]:MPD:O4	5:A:310[A]:MPD:H13	2.01	0.61
5:B:310[A]:MPD:CM	5:B:310[A]:MPD:C5	2.65	0.60
5:A:312[B]:MPD:O2	5:A:312[B]:MPD:H52	2.02	0.60
1:C:134:ILE:HD13	1:C:157[B]:VAL:CG1	2.30	0.60
1:C:202[B]:MET:CE	1:C:257:ASN:HD22	2.17	0.58
5:A:314[A]:MPD:H52	5:A:314[A]:MPD:CM	2.35	0.57
1:B:134:ILE:HD13	1:B:157[B]:VAL:CG1	2.33	0.57
1:C:155[B]:ASN:OD1	6:C:402:HOH:O	2.18	0.57
1:C:155[B]:ASN:ND2	6:C:406:HOH:O	2.38	0.56
5:A:309[A]:MPD:O4	5:A:309[A]:MPD:C1	2.52	0.55
1:B:202[B]:MET:CE	1:B:257:ASN:HD22	2.20	0.55
1:A:134:ILE:HD13	1:A:157[B]:VAL:CG1	2.35	0.54
1:B:202[B]:MET:HE1	1:B:257:ASN:HD22	1.73	0.53
1:C:61[B]:ARG:CZ	6:C:403:HOH:O	2.55	0.53
1:B:62:LEU:CD2	1:C:144[A]:ARG:CD	2.87	0.53
1:A:76:GLU:HG3	1:C:98[B]:GLN:NE2	2.24	0.53
5:A:310[A]:MPD:O4	5:A:310[A]:MPD:C1	2.57	0.52
5:A:314[B]:MPD:H13	5:A:314[B]:MPD:H52	1.91	0.52
1:C:202[B]:MET:HG3	1:C:232:ALA:HB3	1.91	0.52
5:A:311[B]:MPD:HM1	5:A:311[B]:MPD:C5	2.34	0.51
1:A:220[B]:ARG:HG3	6:A:591:HOH:O	2.09	0.51
1:C:189[A]:LEU:HB3	5:C:307[A]:MPD:H32	1.94	0.50
1:B:202[B]:MET:HG3	1:B:232:ALA:HB3	1.94	0.50
5:A:314[A]:MPD:H52	5:A:314[A]:MPD:HM3	1.93	0.49
1:A:140:LYS:HE2	6:A:409:HOH:O	2.13	0.48
1:A:202[B]:MET:CE	1:A:257:ASN:HD22	2.27	0.47
1:A:187:TRP:CZ2	1:A:189[B]:LEU:HD12	2.50	0.47
1:A:83:ILE:HB	1:A:157[B]:VAL:HG22	1.97	0.46
1:C:202[B]:MET:HE1	1:C:257:ASN:HD22	1.79	0.46
1:A:202[B]:MET:HG3	1:A:232:ALA:HB3	1.98	0.46
1:C:122:GLN:OE1	5:C:307[A]:MPD:H51	2.17	0.45
1:A:90:TYR:HB3	5:A:309[A]:MPD:H12	1.98	0.45
1:B:62:LEU:CD2	1:C:144[A]:ARG:HD3	2.47	0.45
1:C:220[B]:ARG:HG3	6:C:586:HOH:O	2.17	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:A:312[B]:MPD:O2	5:A:312[B]:MPD:H53	2.13	0.44
1:C:202[B]:MET:HE3	1:C:257:ASN:HD22	1.82	0.44
1:A:55[B]:LYS:NZ	6:C:405:HOH:O	2.50	0.44
5:C:306:MPD:H53	6:C:438:HOH:O	2.17	0.44
5:B:308[A]:MPD:O4	5:B:308[A]:MPD:O2	2.31	0.43
1:A:202[B]:MET:CE	1:A:290:TYR:OH	2.66	0.43
1:B:202[B]:MET:CE	1:B:290:TYR:OH	2.67	0.43
1:C:189[B]:LEU:HA	1:C:189[B]:LEU:HD23	1.72	0.42
5:A:313[A]:MPD:H53	6:A:420:HOH:O	2.19	0.42
1:C:200:PRO:HA	1:C:230:PRO:O	2.19	0.42
5:B:310[A]:MPD:O4	5:B:310[A]:MPD:C1	2.48	0.42
1:C:140[B]:LYS:HD3	1:C:140[B]:LYS:HA	1.85	0.42
1:C:202[B]:MET:CE	1:C:290:TYR:OH	2.68	0.41
1:A:200:PRO:HA	1:A:230:PRO:O	2.20	0.41
1:C:233:TYR:O	1:C:290:TYR:HA	2.21	0.41
1:A:193[A]:ARG:NH1	6:A:418:HOH:O	2.54	0.41
1:B:200:PRO:HA	1:B:230:PRO:O	2.21	0.40
5:B:310[B]:MPD:H13	5:B:310[B]:MPD:O4	2.21	0.40
1:B:189[B]:LEU:HD23	1:B:189[B]:LEU:HA	1.85	0.40
5:B:310[B]:MPD:O4	5:B:310[B]:MPD:C1	2.70	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	299/295 (101%)	294 (98%)	5 (2%)	0	100	100
1	B	299/295 (101%)	294 (98%)	5 (2%)	0	100	100
1	C	297/295 (101%)	292 (98%)	5 (2%)	0	100	100
All	All	895/885 (101%)	880 (98%)	15 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2   Protein sidechains   ⓘ

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	256/247 (104%)	254 (99%)	2 (1%)	81	62
1	B	256/247 (104%)	254 (99%)	2 (1%)	81	62
1	C	254/247 (103%)	251 (99%)	3 (1%)	71	47
All	All	766/741 (103%)	759 (99%)	7 (1%)	78	58

All (7) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	234	PHE
1	A	249	PRO
1	B	192	ASN
1	B	234	PHE
1	C	144[A]	ARG
1	C	144[B]	ARG
1	C	234	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	192	ASN
1	B	224	GLN
1	B	257	ASN
1	C	257	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 monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 45 ligands modelled in this entry, 9 are monoatomic - leaving 36 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#|Z| > 2$	Counts	RMSZ	$\#|Z| > 2$
4	PO4	A	305	-	4,4,4	0.87	0	6,6,6	0.57	0
4	PO4	C	304	-	4,4,4	0.57	0	6,6,6	0.45	0
5	MPD	A	308[A]	-	7,7,7	0.45	0	9,10,10	0.25	0
5	MPD	A	311[A]	-	7,7,7	0.35	0	9,10,10	0.55	0
5	MPD	B	309[B]	-	7,7,7	0.24	0	9,10,10	0.39	0
5	MPD	B	312[B]	-	7,7,7	0.16	0	9,10,10	0.28	0
5	MPD	A	314[B]	-	7,7,7	0.17	0	9,10,10	0.27	0
5	MPD	B	308[B]	-	7,7,7	0.35	0	9,10,10	0.59	0
5	MPD	B	310[A]	-	7,7,7	0.17	0	9,10,10	0.45	0
4	PO4	B	306	-	4,4,4	0.78	0	6,6,6	0.39	0
5	MPD	A	313[A]	-	7,7,7	0.17	0	9,10,10	0.32	0
4	PO4	A	306	-	4,4,4	0.68	0	6,6,6	0.42	0
5	MPD	A	310[A]	-	7,7,7	0.25	0	9,10,10	0.28	0
5	MPD	A	312[A]	-	7,7,7	0.44	0	9,10,10	0.73	0
4	PO4	A	304	-	4,4,4	0.78	0	6,6,6	0.40	0
5	MPD	A	309[B]	-	7,7,7	0.23	0	9,10,10	0.46	0
5	MPD	C	307[B]	-	7,7,7	0.12	0	9,10,10	0.43	0
5	MPD	C	306	-	7,7,7	0.19	0	9,10,10	0.65	0
5	MPD	B	309[A]	-	7,7,7	0.20	0	9,10,10	0.47	0
5	MPD	A	314[A]	-	7,7,7	0.18	0	9,10,10	0.48	0
5	MPD	B	312[A]	-	7,7,7	0.13	0	9,10,10	0.34	0
5	MPD	B	308[A]	-	7,7,7	0.40	0	9,10,10	0.71	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
5	MPD	B	311	-	7,7,7	0.24	0	9,10,10	0.31	0
5	MPD	A	311[B]	-	7,7,7	0.27	0	9,10,10	0.25	0
4	PO4	A	307	-	4,4,4	0.62	0	6,6,6	0.45	0
5	MPD	A	308[B]	-	7,7,7	0.17	0	9,10,10	0.57	0
4	PO4	B	305	-	4,4,4	0.75	0	6,6,6	0.41	0
5	MPD	B	310[B]	-	7,7,7	0.36	0	9,10,10	0.48	0
4	PO4	C	305	-	4,4,4	0.79	0	6,6,6	0.38	0
5	MPD	A	313[B]	-	7,7,7	0.14	0	9,10,10	0.47	0
5	MPD	A	309[A]	-	7,7,7	0.17	0	9,10,10	0.46	0
5	MPD	B	307	-	7,7,7	0.42	0	9,10,10	0.59	0
5	MPD	C	307[A]	-	7,7,7	0.17	0	9,10,10	0.51	0
4	PO4	B	304	-	4,4,4	0.62	0	6,6,6	0.45	0
5	MPD	A	312[B]	-	7,7,7	0.20	0	9,10,10	0.39	0
5	MPD	A	310[B]	-	7,7,7	0.26	0	9,10,10	0.74	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	MPD	B	309[B]	-	-	0/5/5/5	-
5	MPD	A	308[A]	-	-	3/5/5/5	-
5	MPD	A	311[A]	-	-	1/5/5/5	-
5	MPD	B	312[B]	-	-	3/5/5/5	-
5	MPD	A	314[B]	-	-	4/5/5/5	-
5	MPD	B	308[B]	-	-	1/5/5/5	-
5	MPD	B	310[A]	-	-	1/5/5/5	-
5	MPD	A	313[A]	-	-	1/5/5/5	-
5	MPD	A	310[B]	-	-	3/5/5/5	-
5	MPD	A	310[A]	-	-	0/5/5/5	-
5	MPD	A	312[A]	-	-	3/5/5/5	-
5	MPD	A	309[B]	-	-	0/5/5/5	-
5	MPD	C	307[B]	-	-	4/5/5/5	-
5	MPD	C	306	-	-	2/5/5/5	-
5	MPD	B	309[A]	-	-	3/5/5/5	-
5	MPD	A	314[A]	-	-	2/5/5/5	-
5	MPD	B	312[A]	-	-	4/5/5/5	-
5	MPD	B	308[A]	-	-	0/5/5/5	-
5	MPD	B	311	-	-	0/5/5/5	-

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	MPD	A	311[B]	-	-	1/5/5/5	-
5	MPD	A	308[B]	-	-	0/5/5/5	-
5	MPD	B	310[B]	-	-	0/5/5/5	-
5	MPD	A	313[B]	-	-	1/5/5/5	-
5	MPD	A	309[A]	-	-	0/5/5/5	-
5	MPD	C	307[A]	-	-	0/5/5/5	-
5	MPD	A	312[B]	-	-	2/5/5/5	-
5	MPD	B	307	-	-	0/5/5/5	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (39) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	310[B]	MPD	C2-C3-C4-O4
5	A	312[A]	MPD	C2-C3-C4-O4
5	A	312[B]	MPD	C2-C3-C4-C5
5	A	314[A]	MPD	C2-C3-C4-O4
5	A	314[B]	MPD	C1-C2-C3-C4
5	A	314[B]	MPD	O2-C2-C3-C4
5	A	314[B]	MPD	C2-C3-C4-O4
5	C	306	MPD	C2-C3-C4-O4
5	C	307[B]	MPD	C2-C3-C4-O4
5	A	308[A]	MPD	O2-C2-C3-C4
5	B	308[B]	MPD	O2-C2-C3-C4
5	B	309[A]	MPD	O2-C2-C3-C4
5	C	307[B]	MPD	O2-C2-C3-C4
5	A	313[A]	MPD	C2-C3-C4-C5
5	B	312[B]	MPD	C2-C3-C4-O4
5	A	308[A]	MPD	C1-C2-C3-C4
5	A	313[B]	MPD	CM-C2-C3-C4
5	A	314[A]	MPD	CM-C2-C3-C4
5	A	314[B]	MPD	CM-C2-C3-C4
5	B	309[A]	MPD	C1-C2-C3-C4
5	B	309[A]	MPD	CM-C2-C3-C4
5	B	312[A]	MPD	CM-C2-C3-C4
5	C	307[B]	MPD	C1-C2-C3-C4
5	C	307[B]	MPD	CM-C2-C3-C4
5	A	310[B]	MPD	O2-C2-C3-C4
5	A	312[A]	MPD	O2-C2-C3-C4

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
5	B	312[A]	MPD	O2-C2-C3-C4
5	B	312[B]	MPD	O2-C2-C3-C4
5	A	310[B]	MPD	C2-C3-C4-C5
5	A	311[B]	MPD	C2-C3-C4-C5
5	A	312[A]	MPD	C2-C3-C4-C5
5	B	312[A]	MPD	C2-C3-C4-C5
5	B	312[B]	MPD	C2-C3-C4-C5
5	C	306	MPD	C2-C3-C4-C5
5	A	308[A]	MPD	C2-C3-C4-O4
5	A	311[A]	MPD	C2-C3-C4-O4
5	A	312[B]	MPD	C2-C3-C4-O4
5	B	310[A]	MPD	C2-C3-C4-O4
5	B	312[A]	MPD	C2-C3-C4-O4

There are no ring outliers.

12 monomers are involved in 32 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	314[B]	MPD	2	0
5	B	310[A]	MPD	8	0
5	A	313[A]	MPD	1	0
5	A	310[A]	MPD	2	0
5	C	306	MPD	2	0
5	A	314[A]	MPD	2	0
5	B	308[A]	MPD	2	0
5	A	311[B]	MPD	2	0
5	B	310[B]	MPD	3	0
5	A	309[A]	MPD	3	0
5	C	307[A]	MPD	2	0
5	A	312[B]	MPD	3	0

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 ⓘ

6.1   Protein, DNA and RNA chains ⓘ

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	277/295 (93%)	-0.53	3 (1%)	80	79	8, 11, 22, 68	0
1	B	277/295 (93%)	-0.51	2 (0%)	87	86	8, 11, 24, 71	0
1	C	277/295 (93%)	-0.57	2 (0%)	87	86	8, 11, 20, 66	0
All	All	831/885 (93%)	-0.54	7 (0%)	86	84	8, 11, 21, 71	0

All (7) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	21	SER	5.0
1	A	21	SER	4.4
1	C	21	SER	3.4
1	A	22	HIS	2.7
1	C	22	HIS	2.6
1	B	22	HIS	2.5
1	A	280	ASN	2.1

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

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

6.3   Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4   Ligands ⓘ

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
4	PO4	A	305	5/5	0.64	0.33	78,100,111,116	0
4	PO4	B	306	5/5	0.65	0.28	95,103,107,111	0
4	PO4	A	307	5/5	0.70	0.25	78,84,92,94	0
5	MPD	A	314[A]	8/8	0.74	0.27	40,49,56,60	22
5	MPD	A	314[B]	8/8	0.74	0.27	24,25,26,26	22
5	MPD	B	312[A]	8/8	0.75	0.28	30,34,35,36	22
5	MPD	B	312[B]	8/8	0.75	0.28	31,36,45,59	22
4	PO4	C	304	5/5	0.78	0.41	75,89,104,105	0
4	PO4	A	306	5/5	0.80	0.26	76,79,99,101	0
5	MPD	B	311	8/8	0.80	0.19	33,47,54,54	0
5	MPD	C	306	8/8	0.81	0.15	30,42,47,47	0
4	PO4	C	305	5/5	0.82	0.20	64,77,81,84	0
5	MPD	A	313[A]	8/8	0.82	0.24	35,39,42,42	22
5	MPD	A	313[B]	8/8	0.82	0.24	30,37,39,40	22
4	PO4	B	305	5/5	0.85	0.33	80,92,105,107	0
5	MPD	C	307[A]	8/8	0.85	0.20	21,22,23,23	22
5	MPD	C	307[B]	8/8	0.85	0.20	55,61,66,66	22
4	PO4	B	304	5/5	0.86	0.24	72,73,83,84	0
4	PO4	A	304	5/5	0.87	0.21	72,78,85,86	0
5	MPD	A	312[A]	8/8	0.94	0.17	14,19,22,22	22
5	MPD	A	312[B]	8/8	0.94	0.17	16,18,18,21	22
5	MPD	A	308[A]	8/8	0.94	0.12	11,12,13,13	22
5	MPD	A	308[B]	8/8	0.94	0.12	18,20,23,25	22
5	MPD	B	308[A]	8/8	0.95	0.13	9,10,11,11	22
5	MPD	B	308[B]	8/8	0.95	0.13	11,18,24,24	22
5	MPD	A	311[A]	8/8	0.96	0.13	14,21,25,25	22
5	MPD	A	311[B]	8/8	0.96	0.13	14,15,16,17	22
5	MPD	A	310[A]	8/8	0.97	0.11	26,27,28,35	22
5	MPD	A	310[B]	8/8	0.97	0.11	13,16,19,19	22
5	MPD	B	309[A]	8/8	0.97	0.12	16,20,22,22	22
5	MPD	B	309[B]	8/8	0.97	0.12	10,13,15,16	22
5	MPD	B	310[A]	8/8	0.97	0.12	18,21,22,22	22
5	MPD	B	310[B]	8/8	0.97	0.12	11,12,15,20	22
5	MPD	A	309[A]	8/8	0.98	0.09	11,11,11,13	22
5	MPD	A	309[B]	8/8	0.98	0.09	11,14,17,17	22
3	NA	C	303	1/1	0.99	0.15	28,28,28,28	0
3	NA	A	302	1/1	0.99	0.05	19,19,19,19	0
3	NA	B	302	1/1	0.99	0.05	23,23,23,23	0
5	MPD	B	307	8/8	0.99	0.06	12,16,18,18	0
2	CL	A	301	1/1	1.00	0.05	12,12,12,12	0
3	NA	A	303	1/1	1.00	0.06	17,17,17,17	0

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	CL	B	301	1/1	1.00	0.05	12,12,12,12	0
3	NA	B	303	1/1	1.00	0.10	16,16,16,16	0
3	NA	C	302	1/1	1.00	0.08	16,16,16,16	0
2	CL	C	301	1/1	1.00	0.06	13,13,13,13	0

6.5   Other polymers ⓘ

There are no such residues in this entry.