Full wwPDB X-ray Structure Validation Report ⓘ

Aug 18, 2025 – 05:16 PM EDT

PDB ID	:	9C9F / pdb_00009c9f
Title	:	Crystal structures fluoroacetate dehalogenase D4B from Delftia acidovorans strain D4B
Authors	:	Caputo, A.T.; Hu, M.; Scott, C.
Deposited on	:	2024-06-13
Resolution	:	1.98 Å(reported)

This is a Full wwPDB X-ray Structure Validation 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:

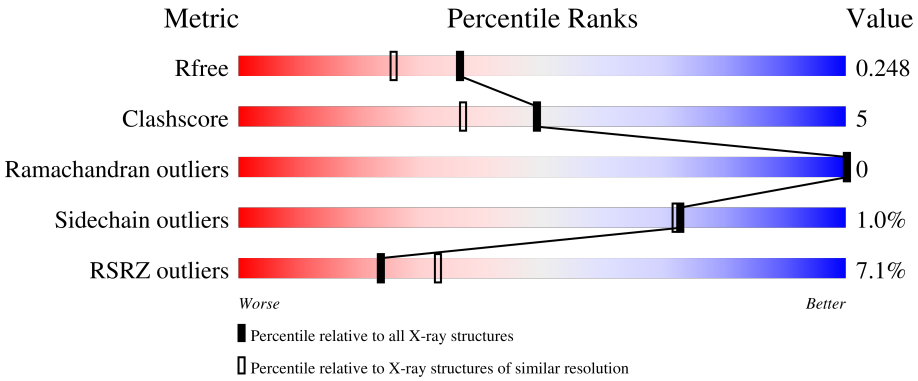
MolProbity	:	4-5-2 with Phenix2.0rc1
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.006 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.45.1

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 1.98 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	1356 (1.98-1.98)
Clashscore	180529	1437 (1.98-1.98)
Ramachandran outliers	177936	1426 (1.98-1.98)
Sidechain outliers	177891	1426 (1.98-1.98)
RSRZ outliers	164620	1356 (1.98-1.98)

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	320	4% 79% 13% 8%
1	B	320	4% 79% 14% • 6%
1	C	320	12% 82% 10% 8%
1	D	320	6% 82% 12% 6%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 19318 atoms, of which 9201 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 Fluoroacetate dehalogenase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	294	Total	C	H	N	O	S	2274	0	0
			4600	1470	2277	433	408	12			
1	B	300	Total	C	H	N	O	S	2218	1	0
			4712	1505	2330	446	418	13			
1	C	293	Total	C	H	N	O	S	2266	0	0
			4591	1467	2273	432	407	12			
1	D	301	Total	C	H	N	O	S	2270	0	0
			4699	1502	2321	444	419	13			

There are 80 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-19	MET	-	initiating methionine	UNP A9BLX5
A	-18	GLY	-	expression tag	UNP A9BLX5
A	-17	SER	-	expression tag	UNP A9BLX5
A	-16	SER	-	expression tag	UNP A9BLX5
A	-15	HIS	-	expression tag	UNP A9BLX5
A	-14	HIS	-	expression tag	UNP A9BLX5
A	-13	HIS	-	expression tag	UNP A9BLX5
A	-12	HIS	-	expression tag	UNP A9BLX5
A	-11	HIS	-	expression tag	UNP A9BLX5
A	-10	HIS	-	expression tag	UNP A9BLX5
A	-9	SER	-	expression tag	UNP A9BLX5
A	-8	SER	-	expression tag	UNP A9BLX5
A	-7	GLY	-	expression tag	UNP A9BLX5
A	-6	LEU	-	expression tag	UNP A9BLX5
A	-5	VAL	-	expression tag	UNP A9BLX5
A	-4	PRO	-	expression tag	UNP A9BLX5
A	-3	ARG	-	expression tag	UNP A9BLX5
A	-2	GLY	-	expression tag	UNP A9BLX5
A	-1	SER	-	expression tag	UNP A9BLX5
A	0	HIS	-	expression tag	UNP A9BLX5
B	-19	MET	-	initiating methionine	UNP A9BLX5

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-18	GLY	-	expression tag	UNP A9BLX5
B	-17	SER	-	expression tag	UNP A9BLX5
B	-16	SER	-	expression tag	UNP A9BLX5
B	-15	HIS	-	expression tag	UNP A9BLX5
B	-14	HIS	-	expression tag	UNP A9BLX5
B	-13	HIS	-	expression tag	UNP A9BLX5
B	-12	HIS	-	expression tag	UNP A9BLX5
B	-11	HIS	-	expression tag	UNP A9BLX5
B	-10	HIS	-	expression tag	UNP A9BLX5
B	-9	SER	-	expression tag	UNP A9BLX5
B	-8	SER	-	expression tag	UNP A9BLX5
B	-7	GLY	-	expression tag	UNP A9BLX5
B	-6	LEU	-	expression tag	UNP A9BLX5
B	-5	VAL	-	expression tag	UNP A9BLX5
B	-4	PRO	-	expression tag	UNP A9BLX5
B	-3	ARG	-	expression tag	UNP A9BLX5
B	-2	GLY	-	expression tag	UNP A9BLX5
B	-1	SER	-	expression tag	UNP A9BLX5
B	0	HIS	-	expression tag	UNP A9BLX5
C	-19	MET	-	initiating methionine	UNP A9BLX5
C	-18	GLY	-	expression tag	UNP A9BLX5
C	-17	SER	-	expression tag	UNP A9BLX5
C	-16	SER	-	expression tag	UNP A9BLX5
C	-15	HIS	-	expression tag	UNP A9BLX5
C	-14	HIS	-	expression tag	UNP A9BLX5
C	-13	HIS	-	expression tag	UNP A9BLX5
C	-12	HIS	-	expression tag	UNP A9BLX5
C	-11	HIS	-	expression tag	UNP A9BLX5
C	-10	HIS	-	expression tag	UNP A9BLX5
C	-9	SER	-	expression tag	UNP A9BLX5
C	-8	SER	-	expression tag	UNP A9BLX5
C	-7	GLY	-	expression tag	UNP A9BLX5
C	-6	LEU	-	expression tag	UNP A9BLX5
C	-5	VAL	-	expression tag	UNP A9BLX5
C	-4	PRO	-	expression tag	UNP A9BLX5
C	-3	ARG	-	expression tag	UNP A9BLX5
C	-2	GLY	-	expression tag	UNP A9BLX5
C	-1	SER	-	expression tag	UNP A9BLX5
C	0	HIS	-	expression tag	UNP A9BLX5
D	-19	MET	-	initiating methionine	UNP A9BLX5
D	-18	GLY	-	expression tag	UNP A9BLX5
D	-17	SER	-	expression tag	UNP A9BLX5

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-16	SER	-	expression tag	UNP A9BLX5
D	-15	HIS	-	expression tag	UNP A9BLX5
D	-14	HIS	-	expression tag	UNP A9BLX5
D	-13	HIS	-	expression tag	UNP A9BLX5
D	-12	HIS	-	expression tag	UNP A9BLX5
D	-11	HIS	-	expression tag	UNP A9BLX5
D	-10	HIS	-	expression tag	UNP A9BLX5
D	-9	SER	-	expression tag	UNP A9BLX5
D	-8	SER	-	expression tag	UNP A9BLX5
D	-7	GLY	-	expression tag	UNP A9BLX5
D	-6	LEU	-	expression tag	UNP A9BLX5
D	-5	VAL	-	expression tag	UNP A9BLX5
D	-4	PRO	-	expression tag	UNP A9BLX5
D	-3	ARG	-	expression tag	UNP A9BLX5
D	-2	GLY	-	expression tag	UNP A9BLX5
D	-1	SER	-	expression tag	UNP A9BLX5
D	0	HIS	-	expression tag	UNP A9BLX5

- Molecule 2 is water.

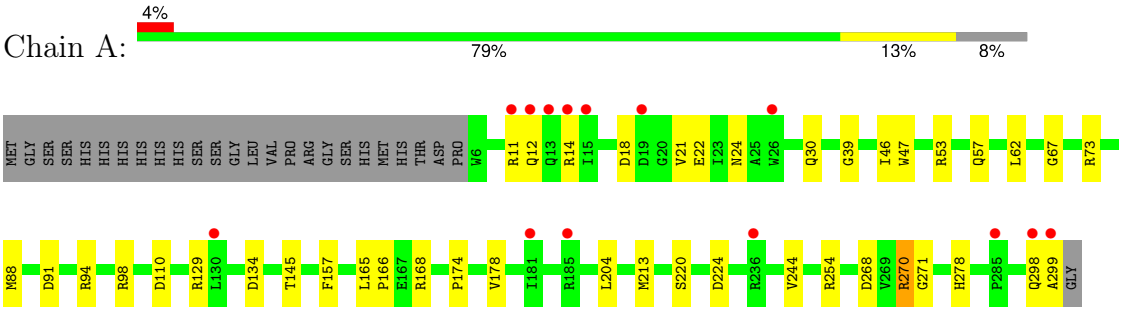
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	177	Total O 177 177	0	0
2	B	197	Total O 197 197	0	0
2	C	154	Total O 154 154	0	0
2	D	188	Total O 188 188	0	0

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.

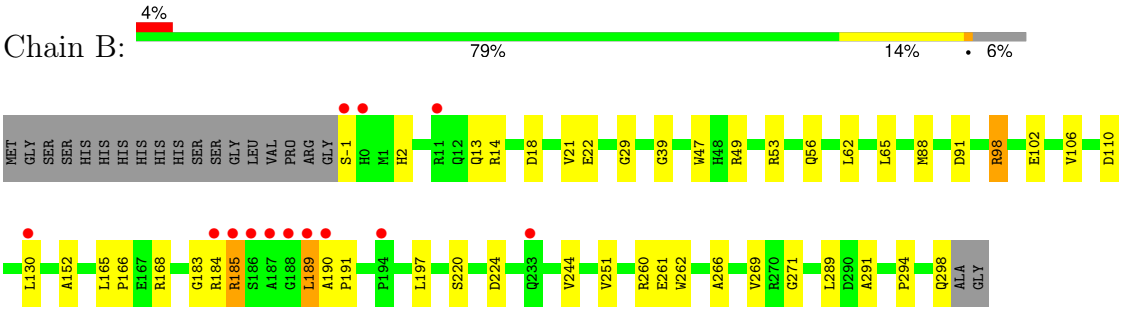
• Molecule 1: Fluoroacetate dehalogenase

Chain A:



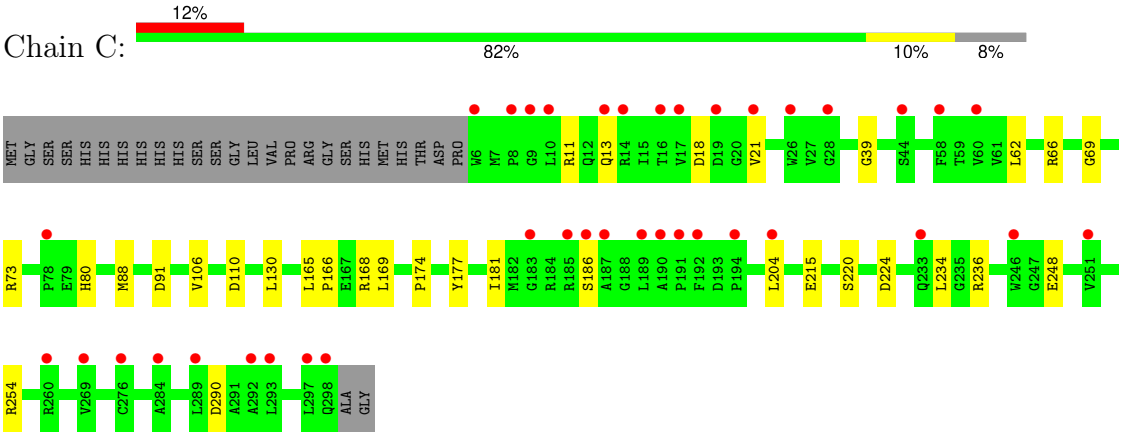
• Molecule 1: Fluoroacetate dehalogenase

Chain B:



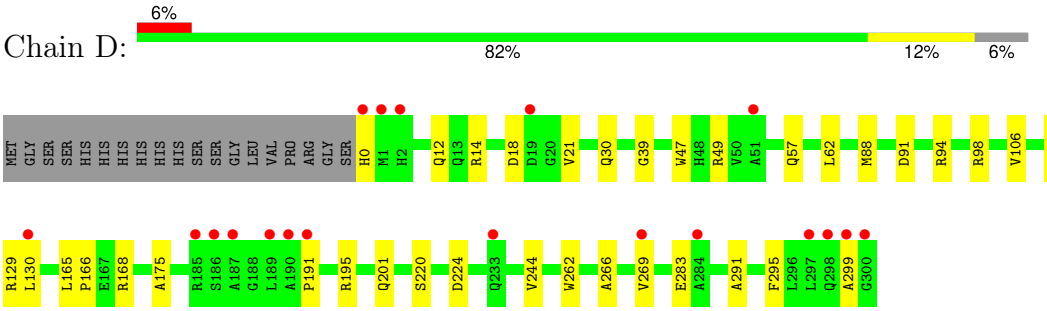
• Molecule 1: Fluoroacetate dehalogenase

Chain C:



• Molecule 1: Fluoroacetate dehalogenase

Chain D:


6%
82%
12%
6%
MET GLY SER SER HIS HIS HIS HIS HIS HIS SER SER GLY LEU VAL PRO ARG GLY SER H0 M1 H2 Q12 Q13 R14 D18 D19 G20 V21 Q30 G39 W47 H48 R49 V50 A51 Q57 L62 M88 D91 R94 R98 V106 D110 V127 Q128
R129 L130 L165 P166 E167 R168 A175 R185 S186 A187 G188 L189 A190 P191 R195 Q201 S220 D224 Q233 V244 W262 A266 V269 E283 A284 A291 F295 L296 L297 Q298 A299 G300

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	42.94Å 83.78Å 84.92Å 101.60° 96.03° 94.67°	Depositor
Resolution (Å)	39.41 – 1.98 39.41 – 1.98	Depositor EDS
% Data completeness (in resolution range)	97.0 (39.41-1.98) 85.4 (39.41-1.98)	Depositor EDS
R_{merge}	0.18	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	0.58 (at 1.98Å)	Xtriage
Refinement program	PHENIX 1.21_5207	Depositor
R, R_{free}	0.221 , 0.248 0.222 , 0.248	Depositor DCC
R_{free} test set	3777 reflections (4.75%)	wwPDB-VP
Wilson B-factor (Å^2)	18.9	Xtriage
Anisotropy	0.218	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 37.0	EDS
L-test for twinning[2]	$< \|L\| > = 0.51$, $< L^2 > = 0.34$	Xtriage
Estimated twinning fraction	0.000 for -h,-l,-k	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	19318	wwPDB-VP
Average B, all atoms (Å^2)	32.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 17.51% 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

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	0/2386	0.46	0/3247
1	B	0.26	0/2451	0.46	0/3335
1	C	0.23	0/2381	0.43	0/3240
1	D	0.25	0/2444	0.44	0/3325
All	All	0.24	0/9662	0.45	0/13147

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	3
1	B	0	1
1	C	0	1
1	D	0	1
All	All	0	6

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (6) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	11	ARG	Sidechain
1	A	168	ARG	Sidechain
1	A	270	ARG	Sidechain
1	B	168	ARG	Sidechain
1	C	168	ARG	Sidechain
1	D	168	ARG	Sidechain

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	2323	2277	2276	27	1
1	B	2382	2330	2333	32	1
1	C	2318	2273	2271	19	1
1	D	2378	2321	2323	22	1
2	A	177	0	0	2	0
2	B	197	0	0	4	1
2	C	154	0	0	3	0
2	D	188	0	0	1	1
All	All	10117	9201	9203	98	3

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 5.

All (98) 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:14:ARG:NH1	1:B:22:GLU:OE1	1.93	1.02
1:A:254:ARG:NH1	2:A:401:HOH:O	2.18	0.77
1:B:29:GLY:O	2:B:401:HOH:O	2.02	0.76
1:C:248:GLU:OE2	2:C:401:HOH:O	2.02	0.76
1:C:186:SER:O	2:C:402:HOH:O	2.05	0.75
1:A:129:ARG:HD2	1:A:299:ALA:HB2	1.72	0.69
1:B:106:VAL:HB	1:B:130:LEU:HD12	1.75	0.68
1:B:185:ARG:HH11	1:B:185:ARG:HB3	1.60	0.67
1:A:178:VAL:HG23	1:A:204:LEU:HD22	1.78	0.65
1:D:129:ARG:CZ	1:D:299:ALA:HB2	2.31	0.61
1:B:-1:SER:HB2	1:B:49:ARG:HH22	1.65	0.61
1:B:184:ARG:O	1:B:185:ARG:HG3	2.01	0.61
1:B:294:PRO:O	1:B:298:GLN:HG2	2.01	0.61
1:A:12:GLN:CG	1:A:24:ASN:HD21	2.15	0.60
1:D:127:VAL:HG11	1:D:130:LEU:HD13	1.83	0.60
1:A:39:GLY:HA3	1:A:110:ASP:HB3	1.84	0.59
1:A:204:LEU:CD1	1:A:213:MET:HE1	2.33	0.58
1:A:67:GLY:HA2	1:A:73:ARG:HD2	1.86	0.57
1:C:18:ASP:HB3	1:C:21:VAL:HB	1.87	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:106:VAL:HB	1:D:130:LEU:HD12	1.87	0.56
1:A:94:ARG:O	1:A:98:ARG:HD3	2.06	0.56
1:B:13:GLN:NE2	2:B:404:HOH:O	2.32	0.56
1:C:106:VAL:HB	1:C:130:LEU:HD12	1.88	0.56
1:B:189:LEU:HG	1:B:197:LEU:HD11	1.88	0.56
1:D:94:ARG:O	1:D:98:ARG:HD3	2.05	0.56
1:C:39:GLY:HA3	1:C:110:ASP:HB3	1.88	0.56
1:B:189:LEU:CG	1:B:197:LEU:HD11	2.38	0.54
1:A:18:ASP:HB3	1:A:21:VAL:HB	1.89	0.54
1:C:290:ASP:OD2	2:C:403:HOH:O	2.19	0.53
1:B:62:LEU:HD12	1:B:62:LEU:N	2.24	0.52
1:C:174:PRO:HB3	1:C:204:LEU:CD2	2.40	0.52
1:C:234:LEU:HB2	1:C:236:ARG:HD3	1.92	0.51
1:D:18:ASP:HB3	1:D:21:VAL:HB	1.92	0.51
1:C:169:LEU:HD21	1:D:165:LEU:HD11	1.93	0.51
1:B:39:GLY:HA3	1:B:110:ASP:HB3	1.93	0.50
1:B:260:ARG:NH1	1:B:261:GLU:OE2	2.45	0.50
1:B:266:ALA:HB3	1:B:269:VAL:CG2	2.42	0.50
1:A:220:SER:HA	1:A:224:ASP:HB2	1.94	0.50
1:B:291:ALA:O	2:B:402:HOH:O	2.19	0.50
1:A:165:LEU:HB3	1:A:166:PRO:CD	2.42	0.48
1:B:220:SER:HA	1:B:224:ASP:HB2	1.95	0.48
1:D:291:ALA:O	2:D:401:HOH:O	2.20	0.48
1:A:298:GLN:NE2	2:A:406:HOH:O	2.43	0.48
1:C:165:LEU:HB3	1:C:166:PRO:CD	2.44	0.48
1:B:244:VAL:HG23	1:B:271:GLY:HA3	1.96	0.48
1:D:129:ARG:NH1	1:D:295:PHE:O	2.47	0.47
1:B:18:ASP:HB3	1:B:21:VAL:HB	1.97	0.47
1:B:102:GLU:N	2:B:409:HOH:O	2.39	0.47
1:C:174:PRO:CB	1:C:204:LEU:CD2	2.93	0.47
1:A:47:TRP:HB2	1:A:62:LEU:HD23	1.97	0.47
1:D:39:GLY:HA3	1:D:110:ASP:HB3	1.97	0.46
1:D:62:LEU:N	1:D:62:LEU:HD12	2.30	0.46
1:D:191:PRO:HG3	1:D:283:GLU:HG2	1.97	0.46
1:B:47:TRP:HB2	1:B:62:LEU:HD23	1.96	0.46
1:A:174:PRO:CB	1:A:204:LEU:HD23	2.46	0.46
1:A:62:LEU:HD12	1:A:62:LEU:N	2.31	0.46
1:A:244:VAL:HG23	1:A:271:GLY:HA3	1.97	0.45
1:C:220:SER:HA	1:C:224:ASP:HB2	1.97	0.45
1:D:0:HIS:HB3	1:D:49:ARG:NH2	2.31	0.45
1:D:88:MET:O	1:D:91:ASP:HB2	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:14:ARG:HD3	1:A:22:GLU:OE1	2.16	0.45
1:D:220:SER:HA	1:D:224:ASP:HB2	1.97	0.45
1:B:2:HIS:HB3	1:D:195:ARG:HD2	1.99	0.45
1:A:129:ARG:CD	1:A:299:ALA:HB2	2.45	0.45
1:C:69:GLY:O	1:C:73:ARG:NH2	2.47	0.45
1:C:62:LEU:HD12	1:C:62:LEU:N	2.32	0.45
1:B:266:ALA:HB3	1:B:269:VAL:HG21	1.99	0.44
1:B:98:ARG:HA	1:B:98:ARG:HD3	1.82	0.44
1:A:268:ASP:OD1	1:A:270:ARG:NH2	2.50	0.44
1:D:129:ARG:NE	1:D:299:ALA:CB	2.80	0.44
1:A:145:THR:HG21	1:A:157:PHE:CZ	2.53	0.44
1:D:266:ALA:HB3	1:D:269:VAL:CG2	2.48	0.44
1:A:165:LEU:HB3	1:A:166:PRO:HD3	1.99	0.44
1:C:88:MET:O	1:C:91:ASP:HB2	2.18	0.44
1:A:88:MET:O	1:A:91:ASP:HB2	2.17	0.44
1:A:204:LEU:HD11	1:A:213:MET:HE1	2.00	0.44
1:B:190:ALA:N	1:B:191:PRO:CD	2.81	0.44
1:D:165:LEU:HB3	1:D:166:PRO:CD	2.48	0.43
1:B:183:GLY:HA3	1:B:189:LEU:HD13	2.00	0.42
1:D:47:TRP:HB2	1:D:62:LEU:HD23	2.02	0.42
1:D:129:ARG:NE	1:D:299:ALA:HB2	2.34	0.42
1:B:88:MET:O	1:B:91:ASP:HB2	2.20	0.42
1:B:244:VAL:HG11	1:B:262:TRP:CD1	2.55	0.42
1:D:244:VAL:HG11	1:D:262:TRP:CD1	2.54	0.42
1:A:46:ILE:HD11	1:A:47:TRP:CZ2	2.55	0.42
1:B:165:LEU:HB3	1:B:166:PRO:CD	2.50	0.42
1:A:134:ASP:OD2	1:A:278:HIS:ND1	2.42	0.41
1:C:66:ARG:NE	1:C:91:ASP:OD2	2.37	0.41
1:B:65:LEU:HD22	1:B:88:MET:HE2	2.01	0.41
1:B:152:ALA:HB1	1:B:251:VAL:HG21	2.02	0.41
1:B:53[B]:ARG:HD2	1:B:289:LEU:CD1	2.51	0.41
1:B:189:LEU:HD23	1:B:197:LEU:HD11	2.02	0.41
1:D:175:ALA:HA	1:D:201:GLN:OE1	2.21	0.41
1:C:80:HIS:HD2	1:C:215:GLU:OE1	2.04	0.40
1:A:53:ARG:HH12	1:A:57:GLN:HE21	1.68	0.40
1:C:177:TYR:CZ	1:C:181:ILE:HG13	2.57	0.40
1:A:67:GLY:HA2	1:A:73:ARG:CD	2.49	0.40
1:C:165:LEU:HB3	1:C:166:PRO:HD3	2.02	0.40

All (3) 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:A:298:GLN:NE2	1:B:56:GLN:OE1[1_556]	2.13	0.07
2:B:586:HOH:O	2:D:516:HOH:O[1_455]	2.17	0.03
1:C:11:ARG:HH22	1:D:57:GLN:O[1_556]	1.59	0.01

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	292/320 (91%)	286 (98%)	6 (2%)	0	100	100
1	B	299/320 (93%)	293 (98%)	6 (2%)	0	100	100
1	C	291/320 (91%)	284 (98%)	7 (2%)	0	100	100
1	D	299/320 (93%)	288 (96%)	11 (4%)	0	100	100
All	All	1181/1280 (92%)	1151 (98%)	30 (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	233/255 (91%)	232 (100%)	1 (0%)	89	89
1	B	241/255 (94%)	238 (99%)	3 (1%)	67	65
1	C	233/255 (91%)	231 (99%)	2 (1%)	75	75
1	D	239/255 (94%)	236 (99%)	3 (1%)	65	62
All	All	946/1020 (93%)	937 (99%)	9 (1%)	73	72

All (9) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	30	GLN
1	B	98	ARG
1	B	185	ARG
1	B	189	LEU
1	C	13	GLN
1	C	254	ARG
1	D	12	GLN
1	D	14	ARG
1	D	30	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	12	GLN
1	A	13	GLN
1	A	24	ASN
1	A	57	GLN
1	A	201	GLN
1	B	263	GLN
1	C	80	HIS
1	C	263	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 (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

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, 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	294/320 (91%)	0.71	14 (4%)	36	47	8, 15, 23, 38	0
1	B	300/320 (93%)	0.69	13 (4%)	40	51	9, 14, 24, 87	1 (0%)
1	C	293/320 (91%)	1.07	38 (12%)	9	13	10, 16, 27, 46	0
1	D	301/320 (94%)	0.82	19 (6%)	27	37	9, 14, 23, 72	0
All	All	1188/1280 (92%)	0.82	84 (7%)	23	33	8, 14, 25, 87	1 (0%)

All (84) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	299	ALA	4.8
1	C	6	TRP	4.6
1	D	191	PRO	4.6
1	B	-1	SER	4.2
1	D	300	GLY	4.2
1	C	191	PRO	3.5
1	D	190	ALA	3.5
1	D	0	HIS	3.5
1	A	299	ALA	3.5
1	D	185	ARG	3.4
1	A	11	ARG	3.3
1	C	298	GLN	3.3
1	C	190	ALA	3.3
1	C	187	ALA	3.3
1	C	297	LEU	3.2
1	C	204	LEU	3.2
1	D	297	LEU	3.1
1	B	189	LEU	3.1
1	B	185	ARG	3.0
1	B	0	HIS	3.0
1	D	187	ALA	2.9

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Mol	Chain	Res	Type	RSRZ
1	C	26	TRP	2.9
1	A	298	GLN	2.8
1	C	186	SER	2.8
1	B	130	LEU	2.8
1	D	130	LEU	2.8
1	C	292	ALA	2.7
1	B	186	SER	2.7
1	D	269	VAL	2.7
1	C	269	VAL	2.6
1	A	285	PRO	2.6
1	C	8	PRO	2.6
1	C	10	LEU	2.6
1	B	190	ALA	2.6
1	C	260	ARG	2.6
1	B	187	ALA	2.6
1	D	186	SER	2.5
1	A	12	GLN	2.5
1	A	236	ARG	2.4
1	C	19	ASP	2.4
1	B	194	PRO	2.4
1	D	19	ASP	2.4
1	C	246	TRP	2.4
1	C	58	PHE	2.4
1	B	188	GLY	2.4
1	C	185	ARG	2.4
1	A	14	ARG	2.3
1	D	51	ALA	2.3
1	B	233	GLN	2.3
1	C	9	GLY	2.3
1	C	189	LEU	2.3
1	A	13	GLN	2.3
1	A	26	TRP	2.3
1	D	298	GLN	2.3
1	C	78	PRO	2.2
1	C	17	VAL	2.2
1	C	28	GLY	2.2
1	D	233	GLN	2.2
1	A	185	ARG	2.2
1	C	194	PRO	2.2
1	B	184	ARG	2.2
1	C	44	SER	2.2
1	C	192	PHE	2.2

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Mol	Chain	Res	Type	RSRZ
1	C	284	ALA	2.2
1	D	189	LEU	2.2
1	A	15	ILE	2.2
1	A	181	ILE	2.2
1	C	16	THR	2.1
1	C	251	VAL	2.1
1	C	293	LEU	2.1
1	B	11	ARG	2.1
1	C	21	VAL	2.1
1	C	60	VAL	2.1
1	D	2	HIS	2.1
1	C	14	ARG	2.1
1	D	284	ALA	2.1
1	C	276	CYS	2.1
1	C	13	GLN	2.1
1	C	183	GLY	2.1
1	A	19	ASP	2.0
1	D	1	MET	2.0
1	C	233	GLN	2.0
1	A	130	LEU	2.0
1	C	289	LEU	2.0

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 oligosaccharides 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.