



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 21, 2024 – 12:39 PM EDT

PDB ID : 8UQU
Title : Crystal Structure of N-terminal Domain of Fic Family Protein from *Bordetella bronchiseptica*
Authors : Minasov, G.; Shuvalova, L.; Brunzelle, J.S.; Kiryukhina, O.; Satchell, K.J.F.; Center for Structural Biology of Infectious Diseases (CSBID)
Deposited on : 2023-10-24
Resolution : 2.95 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 : 4.02b-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

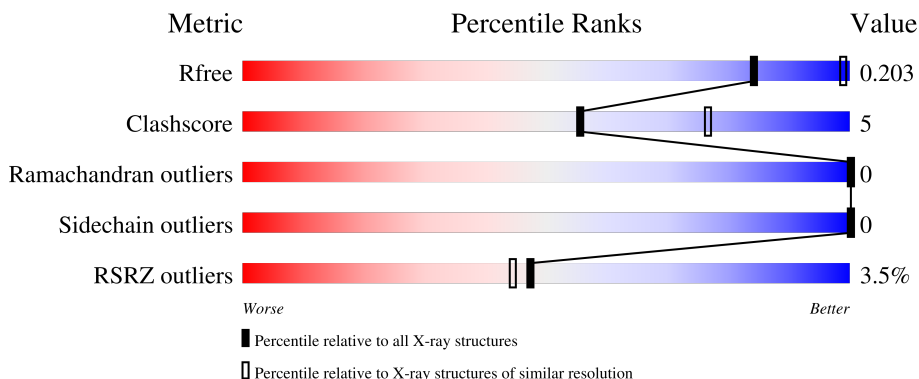
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.95 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	1044 (2.98-2.94)
Clashscore	180529	1097 (2.98-2.94)
Ramachandran outliers	177936	1049 (2.98-2.94)
Sidechain outliers	177891	1049 (2.98-2.94)
RSRZ outliers	164620	1044 (2.98-2.94)

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	366	 0% 60% 7% 33%
1	B	366	 2% 60% 8% 32%
1	C	366	 4% 60% 9% 31%

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
6	EDO	A	406	-	-	-	X

2 Entry composition i

There are 7 unique types of molecules in this entry. The entry contains 6252 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 Fido domain-containing protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	246	Total 1969	C 1258	N 340	O 363	S 8	0	0	0
1	B	250	Total 2004	C 1277	N 351	O 368	S 8	0	0	0
1	C	253	Total 2027	C 1293	N 355	O 371	S 8	0	0	0

There are 54 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-17	MET	-	expression tag	UNP A0A0H3LJJ5
A	-16	HIS	-	expression tag	UNP A0A0H3LJJ5
A	-15	HIS	-	expression tag	UNP A0A0H3LJJ5
A	-14	HIS	-	expression tag	UNP A0A0H3LJJ5
A	-13	HIS	-	expression tag	UNP A0A0H3LJJ5
A	-12	HIS	-	expression tag	UNP A0A0H3LJJ5
A	-11	HIS	-	expression tag	UNP A0A0H3LJJ5
A	-10	SER	-	expression tag	UNP A0A0H3LJJ5
A	-9	SER	-	expression tag	UNP A0A0H3LJJ5
A	-8	GLY	-	expression tag	UNP A0A0H3LJJ5
A	-7	ARG	-	expression tag	UNP A0A0H3LJJ5
A	-6	GLU	-	expression tag	UNP A0A0H3LJJ5
A	-5	ASN	-	expression tag	UNP A0A0H3LJJ5
A	-4	LEU	-	expression tag	UNP A0A0H3LJJ5
A	-3	TYR	-	expression tag	UNP A0A0H3LJJ5
A	-2	PHE	-	expression tag	UNP A0A0H3LJJ5
A	-1	GLN	-	expression tag	UNP A0A0H3LJJ5
A	0	GLY	-	expression tag	UNP A0A0H3LJJ5
B	-17	MET	-	expression tag	UNP A0A0H3LJJ5
B	-16	HIS	-	expression tag	UNP A0A0H3LJJ5
B	-15	HIS	-	expression tag	UNP A0A0H3LJJ5
B	-14	HIS	-	expression tag	UNP A0A0H3LJJ5
B	-13	HIS	-	expression tag	UNP A0A0H3LJJ5

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
B	-12	HIS	-	expression tag	UNP A0A0H3LJJ5
B	-11	HIS	-	expression tag	UNP A0A0H3LJJ5
B	-10	SER	-	expression tag	UNP A0A0H3LJJ5
B	-9	SER	-	expression tag	UNP A0A0H3LJJ5
B	-8	GLY	-	expression tag	UNP A0A0H3LJJ5
B	-7	ARG	-	expression tag	UNP A0A0H3LJJ5
B	-6	GLU	-	expression tag	UNP A0A0H3LJJ5
B	-5	ASN	-	expression tag	UNP A0A0H3LJJ5
B	-4	LEU	-	expression tag	UNP A0A0H3LJJ5
B	-3	TYR	-	expression tag	UNP A0A0H3LJJ5
B	-2	PHE	-	expression tag	UNP A0A0H3LJJ5
B	-1	GLN	-	expression tag	UNP A0A0H3LJJ5
B	0	GLY	-	expression tag	UNP A0A0H3LJJ5
C	-17	MET	-	expression tag	UNP A0A0H3LJJ5
C	-16	HIS	-	expression tag	UNP A0A0H3LJJ5
C	-15	HIS	-	expression tag	UNP A0A0H3LJJ5
C	-14	HIS	-	expression tag	UNP A0A0H3LJJ5
C	-13	HIS	-	expression tag	UNP A0A0H3LJJ5
C	-12	HIS	-	expression tag	UNP A0A0H3LJJ5
C	-11	HIS	-	expression tag	UNP A0A0H3LJJ5
C	-10	SER	-	expression tag	UNP A0A0H3LJJ5
C	-9	SER	-	expression tag	UNP A0A0H3LJJ5
C	-8	GLY	-	expression tag	UNP A0A0H3LJJ5
C	-7	ARG	-	expression tag	UNP A0A0H3LJJ5
C	-6	GLU	-	expression tag	UNP A0A0H3LJJ5
C	-5	ASN	-	expression tag	UNP A0A0H3LJJ5
C	-4	LEU	-	expression tag	UNP A0A0H3LJJ5
C	-3	TYR	-	expression tag	UNP A0A0H3LJJ5
C	-2	PHE	-	expression tag	UNP A0A0H3LJJ5
C	-1	GLN	-	expression tag	UNP A0A0H3LJJ5
C	0	GLY	-	expression tag	UNP A0A0H3LJJ5

- Molecule 2 is SODIUM ION (three-letter code: NA) (formula: Na).

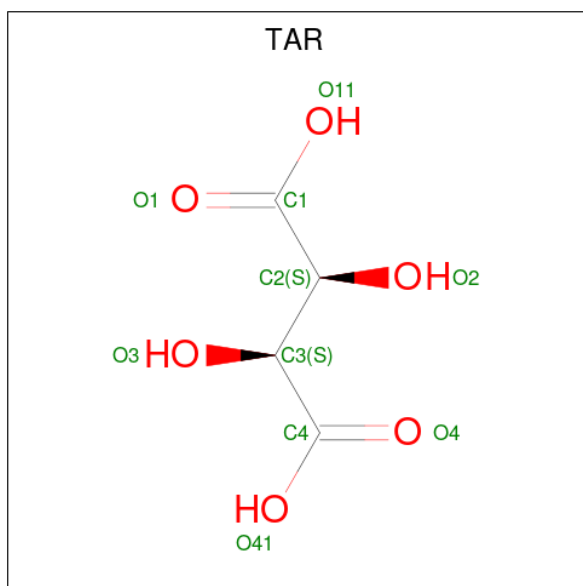
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total Na 1 1	0	0

- Molecule 3 is PENTAETHYLENE GLYCOL (three-letter code: 1PE) (formula: C₁₀H₂₂O₆).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			16	10	6		

- Molecule 4 is D(-)-TARTARIC ACID (three-letter code: TAR) (formula: C₄H₆O₆).



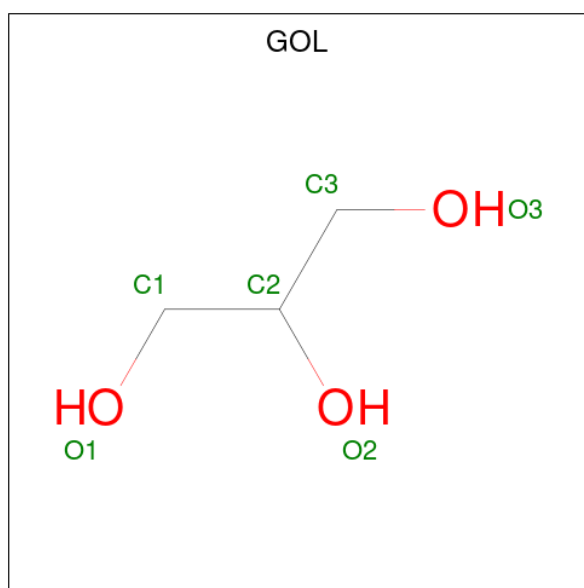
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			10	4	6		
4	A	1	Total	C	O	0	0
			10	4	6		
4	B	1	Total	C	O	0	0
			10	4	6		

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	B	1	Total C O 10 4 6	0	0
4	B	1	Total C O 10 4 6	0	0
4	C	1	Total C O 10 4 6	0	0
4	C	1	Total C O 10 4 6	0	0
4	C	1	Total C O 10 4 6	0	0

- Molecule 5 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C O 6 3 3	0	0
5	C	1	Total C O 6 3 3	0	0

- Molecule 6 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total C O 4 2 2	0	0
6	A	1	Total C O 4 2 2	0	0
6	B	1	Total C O 4 2 2	0	0
6	B	1	Total C O 4 2 2	0	0
6	B	1	Total C O 4 2 2	0	0
6	B	1	Total C O 4 2 2	0	0
6	B	1	Total C O 4 2 2	0	0

- Molecule 7 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	40	Total O 40 40	0	0
7	B	39	Total O 39 39	0	0
7	C	36	Total O 36 36	0	0

HIS	ARG	
SER	GLY	
ASP	SER	
GLY	LYS	
THR	GLY	
SER	ASP	
ARG	ARG	
LEU	VAL	
ARG	ARG	
PHE	ALA	
GLN	GLU	
PRO	ILE	
VAL	LEU	
ALA	GLY	
ALA	ARG	
HIS	SER	
LEU	GLN	
THR	PRO	
PRO	PHE	
MET	SER	
A162	ILE	
L166	SER	
L187	GLU	
Y215	ILE	
Y221	GLU	
G222	GLU	
R223	ALA	
Y224	CYS	
E228	PRO	
T234	GLY	
T241	VAL	
S245	SER	
Q251	ARG	
D255	ASP	
V256	MET	
Y262	VAL	
L268	ARG	
R269	LEU	
A270	VAL	
Y271	LEU	
R277	LEU	
T280	ARG	
L281	GLY	
E282	ALA	
R283	LYS	
GLY	TRP	
ILE		
LYS		
ARG		
ALA		

4 Data and refinement statistics

Property	Value	Source
Space group	P 65 2 2	Depositor
Cell constants a, b, c, α , β , γ	149.97Å 149.97Å 371.92Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	29.91 – 2.95 29.91 – 2.95	Depositor EDS
% Data completeness (in resolution range)	99.8 (29.91-2.95) 99.8 (29.91-2.95)	Depositor EDS
R_{merge}	0.20	Depositor
R_{sym}	0.20	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.21 (at 2.95Å)	Xtrriage
Refinement program	REFMAC 5.8.0267	Depositor
R, R_{free}	0.178 , 0.207 0.177 , 0.203	Depositor DCC
R_{free} test set	2701 reflections (5.11%)	wwPDB-VP
Wilson B-factor (Å ²)	78.7	Xtrriage
Anisotropy	0.107	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 44.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	6252	wwPDB-VP
Average B, all atoms (Å ²)	84.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.54% 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: GOL, TAR, 1PE, EDO, NA

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	0.65	0/2015	0.76	0/2732
1	B	0.66	0/2050	0.75	0/2777
1	C	0.65	0/2075	0.76	0/2812
All	All	0.65	0/6140	0.76	0/8321

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	1969	0	1944	17	0
1	B	2004	0	1981	19	0
1	C	2027	0	1999	22	0
2	A	1	0	0	0	0
3	A	16	0	22	0	0
4	A	20	0	8	0	0
4	B	30	0	12	0	0
4	C	30	0	12	0	0
5	A	6	0	8	0	0
5	C	6	0	8	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	A	8	0	12	0	0
6	B	20	0	30	0	0
7	A	40	0	0	1	0
7	B	39	0	0	0	0
7	C	36	0	0	0	0
All	All	6252	0	6036	56	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 5.

All (56) 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:C:1:MET:HG2	1:C:166:LEU:HA	1.79	0.65
1:B:58:SER:HB2	1:B:228:GLU:HG2	1.80	0.64
1:C:58:SER:HB2	1:C:228:GLU:HG2	1.81	0.62
1:A:58:SER:HB2	1:A:228:GLU:HG2	1.81	0.61
1:B:29:GLN:HB2	1:B:219:TYR:CE1	2.36	0.60
1:C:34:LEU:C	1:C:34:LEU:HD23	2.25	0.57
1:C:215:TYR:OH	1:C:223:ARG:HB2	2.06	0.55
1:B:83:ASN:O	1:B:87:GLN:HG3	2.07	0.54
1:A:23:ARG:NH2	1:A:27:GLU:OE1	2.38	0.54
1:A:277:ARG:HB2	7:A:521:HOH:O	2.09	0.52
1:C:43:LEU:HB3	1:C:224:TYR:CE1	2.45	0.51
1:C:34:LEU:HD21	1:C:38:GLN:NE2	2.26	0.51
1:A:83:ASN:O	1:A:87:GLN:HG3	2.11	0.51
1:B:165:ASP:O	1:B:166:LEU:C	2.50	0.50
1:B:56:GLU:HB2	1:B:71:LEU:HD21	1.95	0.49
1:C:29:GLN:O	1:C:29:GLN:HG2	2.13	0.49
1:B:234:THR:HG21	1:B:269:ARG:NH2	2.27	0.49
1:C:187:LEU:HD22	1:C:256:VAL:HG11	1.94	0.48
1:A:21:THR:HG23	1:A:268:LEU:HD11	1.95	0.48
1:B:187:LEU:HD22	1:B:256:VAL:HG11	1.96	0.48
1:A:121:TYR:HD1	1:A:124:MET:HG3	1.78	0.48
1:A:36:ALA:O	1:A:40:PRO:HD3	2.14	0.48
1:A:277:ARG:O	1:A:277:ARG:HG3	2.13	0.47
1:B:108:PHE:HB2	1:B:213:LEU:HD21	1.96	0.47
1:C:241:THR:HG21	1:C:262:TYR:HB2	1.96	0.47
1:C:23:ARG:NH2	1:C:27:GLU:OE1	2.49	0.46
1:C:28:TYR:HB3	1:C:271:TYR:CD1	2.51	0.46
1:B:1:MET:HE3	1:B:166:LEU:H	1.81	0.45

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:110:GLU:OE2	1:B:164:ALA:HA	2.16	0.45
1:A:23:ARG:HD3	1:B:180:ASP:OD2	2.16	0.45
1:A:221:VAL:HB	1:A:271:TYR:CE1	2.52	0.45
1:C:21:THR:HG23	1:C:268:LEU:HD11	1.99	0.45
1:B:14:PHE:HA	1:B:18:GLN:OE1	2.17	0.45
1:A:28:TYR:CD1	1:A:271:TYR:HB3	2.52	0.44
1:C:223:ARG:HD2	1:C:224:TYR:CZ	2.53	0.44
1:C:234:THR:HG21	1:C:269:ARG:NH2	2.32	0.44
1:A:185:VAL:HG22	1:A:213:LEU:HB3	1.99	0.44
1:B:2:HIS:HB3	1:B:252:GLY:HA2	1.99	0.43
1:C:277:ARG:O	1:C:281:ILE:HG13	2.19	0.43
1:C:221:VAL:HB	1:C:271:TYR:CE1	2.54	0.42
1:B:189:MET:HA	1:B:189:MET:CE	2.49	0.42
1:C:1:MET:SD	1:C:1:MET:N	2.76	0.42
1:C:36:ALA:HA	1:C:43:LEU:HD11	2.01	0.42
1:A:51:VAL:HG12	1:A:75:VAL:CG1	2.49	0.42
1:A:183:VAL:O	1:A:187:LEU:HG	2.20	0.41
1:C:245:SER:HA	1:C:255:ASP:O	2.20	0.41
1:B:53:GLU:OE2	1:B:229:ARG:NE	2.52	0.41
1:A:26:GLY:O	1:B:27:GLU:HA	2.20	0.41
1:B:61:LEU:HD21	1:B:232:GLU:HA	2.02	0.41
1:A:189:MET:HA	1:A:189:MET:CE	2.51	0.41
1:B:1:MET:HE3	1:B:162:ALA:O	2.21	0.41
1:B:189:MET:HA	1:B:189:MET:HE2	2.02	0.41
1:C:34:LEU:HD23	1:C:35:TYR:N	2.36	0.41
1:A:268:LEU:O	1:A:272:ARG:HD3	2.22	0.40
1:C:90:ALA:O	1:C:93:ARG:HB3	2.22	0.40
1:C:251:GLN:OE1	1:C:251:GLN:N	2.52	0.40

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	242/366 (66%)	235 (97%)	7 (3%)	0	100	100
1	B	246/366 (67%)	230 (94%)	16 (6%)	0	100	100
1	C	249/366 (68%)	241 (97%)	8 (3%)	0	100	100
All	All	737/1098 (67%)	706 (96%)	31 (4%)	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	206/303 (68%)	206 (100%)	0	100	100
1	B	209/303 (69%)	209 (100%)	0	100	100
1	C	210/303 (69%)	210 (100%)	0	100	100
All	All	625/909 (69%)	625 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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 19 ligands modelled in this entry, 1 is monoatomic - leaving 18 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
6	EDO	B	407	-	3,3,3	0.07	0	2,2,2	0.12	0
6	EDO	B	405	-	3,3,3	0.10	0	2,2,2	0.15	0
6	EDO	B	406	-	3,3,3	0.09	0	2,2,2	0.13	0
4	TAR	C	401	-	9,9,9	1.04	0	12,12,12	0.93	0
4	TAR	A	404	-	9,9,9	1.05	0	12,12,12	0.89	0
4	TAR	B	402	-	9,9,9	1.07	0	12,12,12	0.90	0
4	TAR	C	402	-	9,9,9	1.00	0	12,12,12	0.95	0
4	TAR	B	403	-	9,9,9	0.99	0	12,12,12	0.94	0
3	1PE	A	402	2	15,15,15	0.22	0	14,14,14	0.10	0
4	TAR	A	403	-	9,9,9	1.06	0	12,12,12	0.91	0
6	EDO	B	404	-	3,3,3	0.22	0	2,2,2	0.25	0
5	GOL	C	404	-	5,5,5	0.09	0	5,5,5	0.28	0
4	TAR	B	401	-	9,9,9	1.05	0	12,12,12	0.95	0
5	GOL	A	405	-	5,5,5	0.10	0	5,5,5	0.26	0
6	EDO	A	406	-	3,3,3	0.06	0	2,2,2	0.06	0
6	EDO	B	408	-	3,3,3	0.16	0	2,2,2	0.40	0
6	EDO	A	407	-	3,3,3	0.08	0	2,2,2	0.07	0
4	TAR	C	403	-	9,9,9	1.01	0	12,12,12	0.94	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
6	EDO	B	407	-	-	0/1/1/1	-
6	EDO	B	405	-	-	0/1/1/1	-
6	EDO	B	406	-	-	0/1/1/1	-
4	TAR	C	401	-	-	4/12/12/12	-
4	TAR	A	404	-	-	8/12/12/12	-
4	TAR	B	402	-	-	6/12/12/12	-

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	TAR	C	402	-	-	2/12/12/12	-
4	TAR	B	403	-	-	10/12/12/12	-
3	1PE	A	402	2	-	2/13/13/13	-
4	TAR	A	403	-	-	10/12/12/12	-
6	EDO	B	404	-	-	1/1/1/1	-
5	GOL	C	404	-	-	0/4/4/4	-
4	TAR	B	401	-	-	6/12/12/12	-
5	GOL	A	405	-	-	2/4/4/4	-
6	EDO	A	406	-	-	1/1/1/1	-
6	EDO	B	408	-	-	1/1/1/1	-
6	EDO	A	407	-	-	1/1/1/1	-
4	TAR	C	403	-	-	7/12/12/12	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (61) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	403	TAR	C1-C2-C3-O3
4	A	403	TAR	O2-C2-C3-O3
4	A	403	TAR	O2-C2-C3-C4
4	B	401	TAR	C1-C2-C3-O3
4	B	401	TAR	C1-C2-C3-C4
4	B	401	TAR	O2-C2-C3-O3
4	B	401	TAR	O2-C2-C3-C4
4	B	402	TAR	C1-C2-C3-O3
4	B	402	TAR	O2-C2-C3-O3
4	B	402	TAR	O2-C2-C3-C4
4	A	403	TAR	C1-C2-C3-C4
4	B	402	TAR	C1-C2-C3-C4
4	A	404	TAR	O3-C3-C4-O4
4	A	404	TAR	O3-C3-C4-O41
4	B	402	TAR	O3-C3-C4-O4
4	B	402	TAR	O3-C3-C4-O41
4	B	403	TAR	O1-C1-C2-O2
4	B	403	TAR	O11-C1-C2-O2
4	B	403	TAR	O3-C3-C4-O4
4	B	403	TAR	O3-C3-C4-O41

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
4	C	402	TAR	O1-C1-C2-O2
4	C	402	TAR	O11-C1-C2-O2
4	A	403	TAR	C2-C3-C4-O4
4	A	403	TAR	C2-C3-C4-O41
4	A	404	TAR	O1-C1-C2-C3
4	A	404	TAR	O11-C1-C2-C3
4	A	403	TAR	O3-C3-C4-O4
4	A	403	TAR	O3-C3-C4-O41
4	B	401	TAR	O1-C1-C2-O2
4	B	401	TAR	O11-C1-C2-O2
4	C	403	TAR	O3-C3-C4-O4
4	C	403	TAR	O3-C3-C4-O41
4	A	403	TAR	O1-C1-C2-O2
4	A	403	TAR	O11-C1-C2-O2
4	A	404	TAR	O1-C1-C2-O2
4	A	404	TAR	O11-C1-C2-O2
4	C	401	TAR	O1-C1-C2-C3
4	C	401	TAR	O11-C1-C2-C3
5	A	405	GOL	O1-C1-C2-C3
4	B	403	TAR	O1-C1-C2-C3
5	A	405	GOL	O1-C1-C2-O2
4	B	403	TAR	C1-C2-C3-O3
4	B	403	TAR	O2-C2-C3-C4
4	B	403	TAR	O11-C1-C2-C3
4	C	403	TAR	O2-C2-C3-O3
4	C	403	TAR	C1-C2-C3-O3
4	C	403	TAR	O2-C2-C3-C4
4	A	404	TAR	C2-C3-C4-O4
6	B	408	EDO	O1-C1-C2-O2
4	A	404	TAR	C2-C3-C4-O41
4	C	403	TAR	C1-C2-C3-C4
4	B	403	TAR	C1-C2-C3-C4
4	C	401	TAR	O1-C1-C2-O2
4	B	403	TAR	O2-C2-C3-O3
3	A	402	1PE	C14-C24-OH4-C13
6	A	406	EDO	O1-C1-C2-O2
6	A	407	EDO	O1-C1-C2-O2
6	B	404	EDO	O1-C1-C2-O2
3	A	402	1PE	OH2-C12-C22-OH3
4	C	401	TAR	O11-C1-C2-O2
4	C	403	TAR	O11-C1-C2-C3

There are no ring outliers.

No monomer is involved in short contacts.

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	246/366 (67%)	-0.54	5 (2%) 64 63	60, 75, 113, 162	0
1	B	250/366 (68%)	-0.43	8 (3%) 50 47	58, 82, 125, 166	0
1	C	253/366 (69%)	-0.39	13 (5%) 34 31	57, 76, 142, 173	0
All	All	749/1098 (68%)	-0.45	26 (3%) 47 44	57, 77, 128, 173	0

All (26) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	131	TRP	6.8
1	C	127	ALA	6.4
1	C	128	GLY	4.6
1	C	162	ALA	4.6
1	B	162	ALA	4.0
1	A	281	ILE	3.7
1	A	279	GLY	3.4
1	C	35	TYR	2.9
1	C	280	THR	2.9
1	B	283	ARG	2.8
1	A	162	ALA	2.7
1	C	37	ALA	2.7
1	C	1	MET	2.6
1	C	130	ARG	2.6
1	C	30	GLY	2.5
1	B	281	ILE	2.5
1	B	44	LYS	2.5
1	C	36	ALA	2.5
1	B	285	ARG	2.4
1	B	282	GLU	2.4
1	A	125	PRO	2.3
1	C	72	LYS	2.2
1	C	129	GLY	2.2

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	A	165	ASP	2.1
1	B	32	GLN	2.1
1	B	1	MET	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 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
4	TAR	B	403	10/10	0.67	0.13	123,136,153,158	0
4	TAR	A	403	10/10	0.69	0.21	113,134,144,145	0
6	EDO	B	408	4/4	0.70	0.33	109,112,112,119	0
4	TAR	C	402	10/10	0.71	0.15	109,143,156,163	0
4	TAR	B	402	10/10	0.77	0.14	103,133,155,159	0
6	EDO	A	406	4/4	0.79	0.41	97,100,100,102	0
6	EDO	A	407	4/4	0.83	0.28	109,114,116,119	0
5	GOL	C	404	6/6	0.83	0.20	125,131,138,142	0
6	EDO	B	406	4/4	0.84	0.27	100,106,110,112	0
4	TAR	C	401	10/10	0.84	0.12	95,111,121,140	0
6	EDO	B	407	4/4	0.85	0.20	105,112,115,116	0
6	EDO	B	405	4/4	0.86	0.36	88,95,98,100	0
6	EDO	B	404	4/4	0.88	0.21	71,78,82,85	0
4	TAR	B	401	10/10	0.89	0.13	94,121,139,147	0
4	TAR	A	404	10/10	0.91	0.19	108,130,151,160	0
4	TAR	C	403	10/10	0.94	0.10	92,112,125,133	0
5	GOL	A	405	6/6	0.94	0.17	107,113,117,118	0
3	1PE	A	402	16/16	0.96	0.11	83,92,103,107	0
2	NA	A	401	1/1	0.98	0.03	58,58,58,58	0

6.5 Other polymers [i](#)

There are no such residues in this entry.