



Full wwPDB X-ray Structure Validation Report ⓘ

May 15, 2020 – 02:48 pm BST

PDB ID : 6H4C
Title : A polyamorous repressor: deciphering the evolutionary strategy used by the phage-inducible chromosomal islands to spread in nature.
Authors : Ciges-Tomas, J.R.; Alite, C.; Bowring, J.Z.; Donderis, J.; Penades, J.R.; Marina, A.
Deposited on : 2018-07-20
Resolution : 2.52 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 following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.11
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) : 2.11

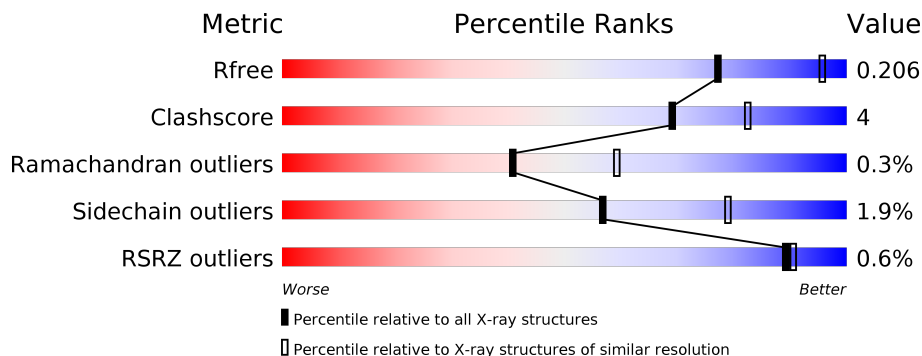
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.52 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	5743 (2.54-2.50)
Clashscore	141614	6463 (2.54-2.50)
Ramachandran outliers	138981	6335 (2.54-2.50)
Sidechain outliers	138945	6337 (2.54-2.50)
RSRZ outliers	127900	5630 (2.54-2.50)

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 on 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	191	73% 6% • 20%
1	C	191	73% 7% 20% %
1	E	191	74% 6% 19%
1	G	191	77% • • 19%
2	B	157	87% 6% • 6%
2	D	157	89% 5% • 6% %

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Mol	Chain	Length	Quality of chain
2	F	157	<p>%</p> <p>83% 9% 8%</p>
2	H	157	<p>3%</p> <p>78% 14% 8%</p>

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
5	PEG	C	201	-	-	X	-
5	PEG	E	201	-	-	X	-

2 Entry composition i

There are 6 unique types of molecules in this entry. The entry contains 9321 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 dUTPase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	153	1162	735	195	231	1	0	0	0
1	C	153	1161	735	196	229	1	0	0	0
1	E	154	1158	732	196	228	2	0	0	0
1	G	155	1171	741	197	232	1	0	0	0

There are 88 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-21	MET	-	initiating methionine	UNP Q8SDV3
A	-20	HIS	-	expression tag	UNP Q8SDV3
A	-19	HIS	-	expression tag	UNP Q8SDV3
A	-18	HIS	-	expression tag	UNP Q8SDV3
A	-17	HIS	-	expression tag	UNP Q8SDV3
A	-16	HIS	-	expression tag	UNP Q8SDV3
A	-15	HIS	-	expression tag	UNP Q8SDV3
A	-14	SER	-	expression tag	UNP Q8SDV3
A	-13	SER	-	expression tag	UNP Q8SDV3
A	-12	GLY	-	expression tag	UNP Q8SDV3
A	-11	VAL	-	expression tag	UNP Q8SDV3
A	-10	ASP	-	expression tag	UNP Q8SDV3
A	-9	LEU	-	expression tag	UNP Q8SDV3
A	-8	GLY	-	expression tag	UNP Q8SDV3
A	-7	THR	-	expression tag	UNP Q8SDV3
A	-6	GLU	-	expression tag	UNP Q8SDV3
A	-5	ASN	-	expression tag	UNP Q8SDV3
A	-4	LEU	-	expression tag	UNP Q8SDV3
A	-3	TYR	-	expression tag	UNP Q8SDV3
A	-2	PHE	-	expression tag	UNP Q8SDV3
A	-1	GLN	-	expression tag	UNP Q8SDV3

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Chain	Residue	Modelled	Actual	Comment	Reference
A	0	SER	-	expression tag	UNP Q8SDV3
C	-21	MET	-	initiating methionine	UNP Q8SDV3
C	-20	HIS	-	expression tag	UNP Q8SDV3
C	-19	HIS	-	expression tag	UNP Q8SDV3
C	-18	HIS	-	expression tag	UNP Q8SDV3
C	-17	HIS	-	expression tag	UNP Q8SDV3
C	-16	HIS	-	expression tag	UNP Q8SDV3
C	-15	HIS	-	expression tag	UNP Q8SDV3
C	-14	SER	-	expression tag	UNP Q8SDV3
C	-13	SER	-	expression tag	UNP Q8SDV3
C	-12	GLY	-	expression tag	UNP Q8SDV3
C	-11	VAL	-	expression tag	UNP Q8SDV3
C	-10	ASP	-	expression tag	UNP Q8SDV3
C	-9	LEU	-	expression tag	UNP Q8SDV3
C	-8	GLY	-	expression tag	UNP Q8SDV3
C	-7	THR	-	expression tag	UNP Q8SDV3
C	-6	GLU	-	expression tag	UNP Q8SDV3
C	-5	ASN	-	expression tag	UNP Q8SDV3
C	-4	LEU	-	expression tag	UNP Q8SDV3
C	-3	TYR	-	expression tag	UNP Q8SDV3
C	-2	PHE	-	expression tag	UNP Q8SDV3
C	-1	GLN	-	expression tag	UNP Q8SDV3
C	0	SER	-	expression tag	UNP Q8SDV3
E	-21	MET	-	initiating methionine	UNP Q8SDV3
E	-20	HIS	-	expression tag	UNP Q8SDV3
E	-19	HIS	-	expression tag	UNP Q8SDV3
E	-18	HIS	-	expression tag	UNP Q8SDV3
E	-17	HIS	-	expression tag	UNP Q8SDV3
E	-16	HIS	-	expression tag	UNP Q8SDV3
E	-15	HIS	-	expression tag	UNP Q8SDV3
E	-14	SER	-	expression tag	UNP Q8SDV3
E	-13	SER	-	expression tag	UNP Q8SDV3
E	-12	GLY	-	expression tag	UNP Q8SDV3
E	-11	VAL	-	expression tag	UNP Q8SDV3
E	-10	ASP	-	expression tag	UNP Q8SDV3
E	-9	LEU	-	expression tag	UNP Q8SDV3
E	-8	GLY	-	expression tag	UNP Q8SDV3
E	-7	THR	-	expression tag	UNP Q8SDV3
E	-6	GLU	-	expression tag	UNP Q8SDV3
E	-5	ASN	-	expression tag	UNP Q8SDV3
E	-4	LEU	-	expression tag	UNP Q8SDV3
E	-3	TYR	-	expression tag	UNP Q8SDV3

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Chain	Residue	Modelled	Actual	Comment	Reference
E	-2	PHE	-	expression tag	UNP Q8SDV3
E	-1	GLN	-	expression tag	UNP Q8SDV3
E	0	SER	-	expression tag	UNP Q8SDV3
G	-21	MET	-	initiating methionine	UNP Q8SDV3
G	-20	HIS	-	expression tag	UNP Q8SDV3
G	-19	HIS	-	expression tag	UNP Q8SDV3
G	-18	HIS	-	expression tag	UNP Q8SDV3
G	-17	HIS	-	expression tag	UNP Q8SDV3
G	-16	HIS	-	expression tag	UNP Q8SDV3
G	-15	HIS	-	expression tag	UNP Q8SDV3
G	-14	SER	-	expression tag	UNP Q8SDV3
G	-13	SER	-	expression tag	UNP Q8SDV3
G	-12	GLY	-	expression tag	UNP Q8SDV3
G	-11	VAL	-	expression tag	UNP Q8SDV3
G	-10	ASP	-	expression tag	UNP Q8SDV3
G	-9	LEU	-	expression tag	UNP Q8SDV3
G	-8	GLY	-	expression tag	UNP Q8SDV3
G	-7	THR	-	expression tag	UNP Q8SDV3
G	-6	GLU	-	expression tag	UNP Q8SDV3
G	-5	ASN	-	expression tag	UNP Q8SDV3
G	-4	LEU	-	expression tag	UNP Q8SDV3
G	-3	TYR	-	expression tag	UNP Q8SDV3
G	-2	PHE	-	expression tag	UNP Q8SDV3
G	-1	GLN	-	expression tag	UNP Q8SDV3
G	0	SER	-	expression tag	UNP Q8SDV3

- Molecule 2 is a protein called Orf20.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	147	1116	716	175	223	2	0	0	0
2	D	148	1075	690	173	210	2	0	0	0
2	F	144	1129	728	177	222	2	0	0	0
2	H	145	1100	712	174	212	2	0	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	0	GLY	-	expression tag	UNP Q9F0J8

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Chain	Residue	Modelled	Actual	Comment	Reference
D	0	GLY	-	expression tag	UNP Q9F0J8
F	0	GLY	-	expression tag	UNP Q9F0J8
H	0	GLY	-	expression tag	UNP Q9F0J8

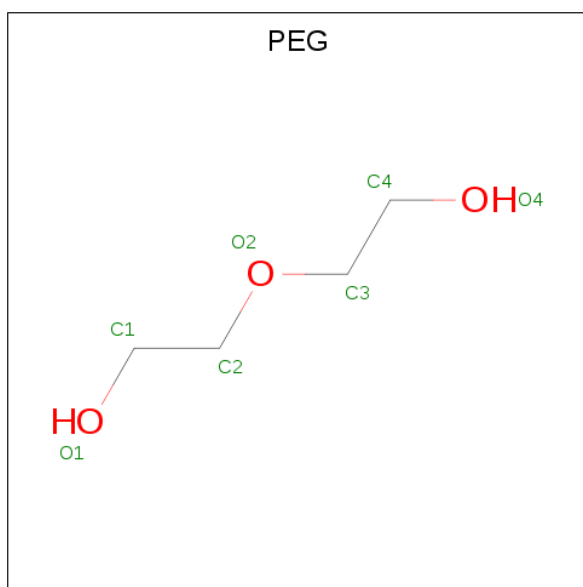
- Molecule 3 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	G	1	Total Mg 1 1	0	0
3	A	1	Total Mg 1 1	0	0

- Molecule 4 is NICKEL (II) ION (three-letter code: NI) (formula: Ni).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	H	1	Total Ni 1 1	0	0
4	B	1	Total Ni 1 1	0	0
4	A	1	Total Ni 1 1	0	0
4	C	1	Total Ni 1 1	0	0
4	E	1	Total Ni 1 1	0	0

- Molecule 5 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: C₄H₁₀O₃).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	C	1	Total C O 7 4 3	0	0
5	C	1	Total C O 7 4 3	0	0
5	C	1	Total C O 7 4 3	0	0
5	D	1	Total C O 7 4 3	0	0
5	E	1	Total C O 7 4 3	0	0
5	E	1	Total C O 7 4 3	0	0
5	H	1	Total C O 7 4 3	0	0

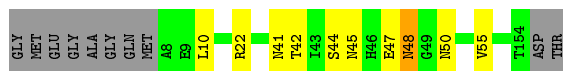
- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	46	Total O 46 46	0	0
6	B	18	Total O 18 18	0	0
6	C	40	Total O 40 40	0	0
6	D	12	Total O 12 12	0	0
6	E	28	Total O 28 28	0	0

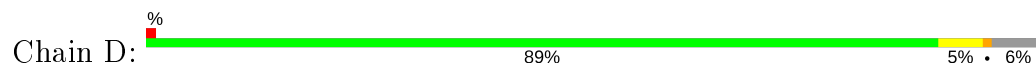
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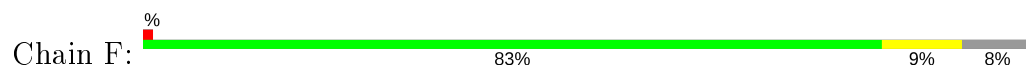
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	F	13	Total 13	O 13	0	0
6	G	29	Total 29	O 29	0	0
6	H	7	Total 7	O 7	0	0



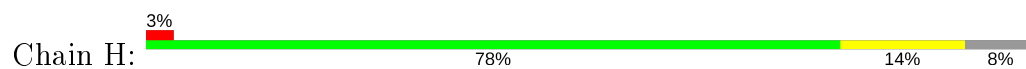
- Molecule 2: Orf20



- Molecule 2: Orf20



- Molecule 2: Orf20



4 Data and refinement statistics

Property	Value	Source
Space group	P 3 2 1	Depositor
Cell constants a, b, c, α , β , γ	144.49Å 144.49Å 149.42Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	95.93 – 2.52 95.93 – 2.52	Depositor EDS
% Data completeness (in resolution range)	100.0 (95.93-2.52) 100.0 (95.93-2.52)	Depositor EDS
R_{merge}	0.16	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.53 (at 2.51Å)	Xtrriage
Refinement program	PHENIX 1.9_1692	Depositor
R, R_{free}	0.197 , 0.242 0.208 , 0.206	Depositor DCC
R_{free} test set	3122 reflections (5.10%)	wwPDB-VP
Wilson B-factor (Å ²)	54.6	Xtrriage
Anisotropy	0.188	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 52.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	0.016 for -h,-k,l	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	9321	wwPDB-VP
Average B, all atoms (Å ²)	61.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.31% 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: NI, MG, PEG

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	0.49	0/1181	0.63	0/1607
1	C	0.50	0/1180	0.66	0/1605
1	E	0.49	0/1177	0.65	0/1602
1	G	0.55	0/1190	0.66	0/1619
2	B	0.45	0/1140	0.58	0/1557
2	D	0.40	0/1098	0.57	0/1501
2	F	0.43	0/1154	0.56	0/1568
2	H	0.38	0/1125	0.52	0/1534
All	All	0.47	0/9245	0.61	0/12593

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	1162	0	1142	13	0
1	C	1161	0	1147	14	0
1	E	1158	0	1135	10	0
1	G	1171	0	1149	3	0
2	B	1116	0	994	8	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	D	1075	0	910	6	0
2	F	1129	0	1037	8	0
2	H	1100	0	980	13	0
3	A	1	0	0	0	0
3	G	1	0	0	0	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	E	1	0	0	0	0
4	H	1	0	0	0	0
5	C	21	0	27	9	0
5	D	7	0	10	0	0
5	E	14	0	19	4	0
5	H	7	0	10	0	0
6	A	46	0	0	0	0
6	B	18	0	0	0	0
6	C	40	0	0	0	0
6	D	12	0	0	0	0
6	E	28	0	0	0	0
6	F	13	0	0	0	0
6	G	29	0	0	0	0
6	H	7	0	0	0	0
All	All	9321	0	8560	65	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 4.

All (65) 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:68:SER:HB2	5:C:201:PEG:H42	1.62	0.80
2:H:36:THR:HG23	2:H:38:PHE:H	1.50	0.76
2:D:45:ASN:HB2	2:D:50:ASN:HB2	1.67	0.75
2:H:20:THR:HG21	2:H:88:LEU:HD21	1.69	0.72
1:C:74:VAL:HG22	5:C:201:PEG:H31	1.75	0.69
2:H:16:THR:O	2:H:20:THR:HG22	1.94	0.67
2:B:44:SER:O	2:B:48:ASN:HB3	1.95	0.67
1:E:74:VAL:HG22	5:E:201:PEG:H32	1.77	0.66
5:C:201:PEG:H41	1:E:76:GLU:CD	2.18	0.63
2:D:45:ASN:HB2	2:D:50:ASN:CB	2.29	0.61
2:B:41:ASN:O	2:B:45:ASN:ND2	2.34	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:33:SER:HA	2:H:36:THR:HG22	1.84	0.59
2:D:10:LEU:HD11	2:D:55:VAL:HA	1.85	0.58
5:C:201:PEG:H12	1:E:42:LYS:NZ	2.17	0.58
2:H:41:ASN:O	2:H:45:ASN:ND2	2.36	0.57
1:A:149:GLN:OE1	2:F:55:VAL:HG11	2.04	0.57
1:A:93:LYS:HD2	5:E:201:PEG:H12	1.87	0.56
1:A:97:ILE:HG12	1:E:97:ILE:HD11	1.87	0.55
2:B:48:ASN:HD21	2:B:50:ASN:ND2	2.06	0.54
2:F:68:PRO:HB2	2:F:71:ILE:HD12	1.90	0.54
1:C:117:SER:OG	1:C:118:ASP:N	2.41	0.53
2:B:22:ARG:NH2	2:B:47:GLU:OE2	2.43	0.52
1:A:19:ARG:NH1	1:C:144:THR:HB	2.24	0.52
1:C:68:SER:CB	5:C:201:PEG:H42	2.35	0.52
2:F:10:LEU:HD11	2:F:55:VAL:HA	1.91	0.52
2:B:48:ASN:ND2	2:B:50:ASN:H	2.07	0.51
1:A:19:ARG:HH12	1:C:144:THR:HB	1.75	0.51
1:A:23:THR:HG22	1:C:55:GLU:HG3	1.92	0.51
1:E:99:SER:O	1:E:101:GLY:N	2.43	0.51
2:H:14:TYR:O	2:H:18:ILE:HG13	2.11	0.51
2:D:14:TYR:O	2:D:18:ILE:HG13	2.14	0.47
2:H:35:ARG:NH1	2:H:64:GLY:O	2.47	0.47
1:C:46:LYS:HD2	1:C:48:ASP:OD1	2.15	0.47
1:A:154:GLU:OE1	1:A:154:GLU:HA	2.14	0.47
1:G:64:ARG:NH2	1:G:133:LYS:HE2	2.30	0.47
2:H:32:LEU:O	2:H:36:THR:HG22	2.15	0.47
2:F:22:ARG:HG3	2:F:32:LEU:HD22	1.97	0.46
1:A:6:GLN:HG2	1:C:150:VAL:HG21	1.96	0.46
2:H:22:ARG:NH2	2:H:47:GLU:OE2	2.48	0.46
5:C:201:PEG:H12	1:E:42:LYS:HZ2	1.81	0.45
2:F:22:ARG:NH2	2:F:47:GLU:OE2	2.50	0.44
1:E:68:SER:HB2	5:E:201:PEG:O4	2.17	0.44
2:H:46:HIS:HD2	2:H:61:TYR:OH	1.99	0.44
2:B:48:ASN:HD21	2:B:50:ASN:CG	2.20	0.44
1:A:28:ASP:OD2	1:A:133:LYS:HE3	2.19	0.43
1:A:69:SER:HB3	1:C:91:ASN:HD22	1.84	0.43
2:H:45:ASN:OD1	2:H:50:ASN:ND2	2.47	0.43
2:B:10:LEU:HD11	2:B:55:VAL:HA	2.01	0.43
2:B:22:ARG:NH2	2:B:47:GLU:OE1	2.52	0.42
2:D:21:LEU:HA	2:D:21:LEU:HD13	1.81	0.42
1:C:74:VAL:HA	5:C:201:PEG:H31	2.01	0.42
1:A:69:SER:HB3	1:C:91:ASN:ND2	2.34	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:93:LYS:CD	5:E:201:PEG:H12	2.49	0.42
2:H:103:LYS:HD3	2:H:141:TYR:CE1	2.55	0.42
2:F:79:PHE:CE1	2:F:84:TYR:HA	2.55	0.42
2:F:58:ILE:HA	2:F:58:ILE:HD13	1.94	0.42
1:A:144:THR:HB	1:E:19:ARG:NH1	2.36	0.41
5:C:201:PEG:H12	1:E:42:LYS:HZ3	1.84	0.41
1:G:64:ARG:HG2	1:G:136:GLN:HG2	2.03	0.41
2:D:48:ASN:CB	2:D:50:ASN:HD22	2.33	0.41
2:F:14:TYR:HA	2:F:17:ILE:HD12	2.02	0.41
1:C:19:ARG:NH1	1:E:144:THR:HB	2.36	0.41
1:C:21:HIS:CE1	5:C:203:PEG:H42	2.57	0.40
2:H:33:SER:HA	2:H:36:THR:CG2	2.52	0.40
1:G:64:ARG:CZ	1:G:133:LYS:HE2	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	151/191 (79%)	148 (98%)	2 (1%)	1 (1%)	22	37
1	C	151/191 (79%)	149 (99%)	2 (1%)	0	100	100
1	E	152/191 (80%)	149 (98%)	2 (1%)	1 (1%)	22	37
1	G	153/191 (80%)	149 (97%)	2 (1%)	2 (1%)	12	20
2	B	145/157 (92%)	145 (100%)	0	0	100	100
2	D	146/157 (93%)	143 (98%)	3 (2%)	0	100	100
2	F	142/157 (90%)	139 (98%)	3 (2%)	0	100	100
2	H	143/157 (91%)	140 (98%)	3 (2%)	0	100	100
All	All	1183/1392 (85%)	1162 (98%)	17 (1%)	4 (0%)	41	59

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	100	ASN
1	E	100	ASN
1	G	102	TYR
1	G	101	GLY

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	124/162 (76%)	122 (98%)	2 (2%)	62	82
1	C	124/162 (76%)	122 (98%)	2 (2%)	62	82
1	E	122/162 (75%)	120 (98%)	2 (2%)	62	82
1	G	124/162 (76%)	121 (98%)	3 (2%)	49	73
2	B	110/141 (78%)	108 (98%)	2 (2%)	59	80
2	D	94/141 (67%)	92 (98%)	2 (2%)	53	76
2	F	115/141 (82%)	113 (98%)	2 (2%)	60	81
2	H	105/141 (74%)	103 (98%)	2 (2%)	57	79
All	All	918/1212 (76%)	901 (98%)	17 (2%)	57	79

All (17) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	6	GLN
1	A	46	LYS
2	B	42	THR
2	B	48	ASN
1	C	6	GLN
1	C	10	LEU
2	D	21	LEU
2	D	46	HIS
1	E	6	GLN
1	E	10	LEU

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Mol	Chain	Res	Type
2	F	46	HIS
2	F	123	ILE
1	G	21	HIS
1	G	99	SER
1	G	136	GLN
2	H	69	SER
2	H	123	ILE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	3	ASN
2	B	48	ASN
1	C	13	ASN
1	C	21	HIS
1	C	91	ASN
1	C	136	GLN
2	D	50	ASN
1	E	21	HIS
2	H	46	HIS

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 carbohydrates in this entry.

5.6 Ligand geometry [i](#)

Of 14 ligands modelled in this entry, 7 are monoatomic - leaving 7 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
5	PEG	C	203	-	6,6,6	0.82	0	5,5,5	0.55	0
5	PEG	C	202	-	6,6,6	0.90	0	5,5,5	0.67	0
5	PEG	E	202	-	6,6,6	0.75	0	5,5,5	0.65	0
5	PEG	E	201	-	6,6,6	1.24	0	5,5,5	0.24	0
5	PEG	C	201	-	6,6,6	1.21	0	5,5,5	0.53	0
5	PEG	H	201	-	6,6,6	0.81	0	5,5,5	0.47	0
5	PEG	D	201	-	6,6,6	0.81	0	5,5,5	0.54	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	PEG	C	203	-	-	4/4/4/4	-
5	PEG	C	202	-	-	2/4/4/4	-
5	PEG	E	202	-	-	2/4/4/4	-
5	PEG	E	201	-	-	1/4/4/4	-
5	PEG	C	201	-	-	3/4/4/4	-
5	PEG	H	201	-	-	2/4/4/4	-
5	PEG	D	201	-	-	2/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (16) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	C	203	PEG	O1-C1-C2-O2
5	D	201	PEG	O2-C3-C4-O4
5	D	201	PEG	O1-C1-C2-O2
5	E	201	PEG	O1-C1-C2-O2
5	C	201	PEG	C1-C2-O2-C3
5	C	203	PEG	O2-C3-C4-O4

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Mol	Chain	Res	Type	Atoms
5	C	201	PEG	O2-C3-C4-O4
5	C	202	PEG	C1-C2-O2-C3
5	E	202	PEG	C4-C3-O2-C2
5	E	202	PEG	C1-C2-O2-C3
5	H	201	PEG	C1-C2-O2-C3
5	C	202	PEG	C4-C3-O2-C2
5	H	201	PEG	C4-C3-O2-C2
5	C	203	PEG	C1-C2-O2-C3
5	C	201	PEG	O1-C1-C2-O2
5	C	203	PEG	C4-C3-O2-C2

There are no ring outliers.

3 monomers are involved in 13 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	C	203	PEG	1	0
5	E	201	PEG	4	0
5	C	201	PEG	8	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 [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	153/191 (80%)	-0.30	0 100 100	38, 47, 72, 118	0
1	C	153/191 (80%)	-0.28	1 (0%) 87 89	38, 48, 73, 87	0
1	E	154/191 (80%)	-0.32	0 100 100	39, 50, 78, 132	0
1	G	155/191 (81%)	-0.27	0 100 100	37, 49, 76, 127	0
2	B	147/157 (93%)	-0.11	0 100 100	39, 64, 91, 102	0
2	D	148/157 (94%)	-0.09	1 (0%) 87 89	43, 78, 113, 120	0
2	F	144/157 (91%)	-0.14	1 (0%) 87 89	39, 68, 110, 131	0
2	H	145/157 (92%)	-0.16	4 (2%) 53 57	42, 74, 109, 140	0
All	All	1199/1392 (86%)	-0.21	7 (0%) 89 90	37, 58, 103, 140	0

All (7) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	H	139	ILE	3.4
2	F	12	THR	3.3
2	H	136	VAL	3.0
1	C	102	TYR	2.6
2	D	49	GLY	2.3
2	H	38	PHE	2.2
2	H	10	LEU	2.2

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 carbohydrates 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
5	PEG	C	203	7/7	0.75	0.19	81,89,93,98	0
5	PEG	E	201	7/7	0.78	0.33	49,55,66,66	0
5	PEG	C	201	7/7	0.81	0.29	41,53,58,63	0
5	PEG	C	202	7/7	0.83	0.13	69,77,89,92	0
5	PEG	H	201	7/7	0.84	0.14	64,75,80,82	0
3	MG	A	201	1/1	0.85	0.33	43,43,43,43	0
5	PEG	D	201	7/7	0.85	0.12	75,82,96,97	0
4	NI	A	202	1/1	0.86	0.08	120,120,120,120	0
4	NI	C	204	1/1	0.86	0.15	114,114,114,114	0
4	NI	B	201	1/1	0.87	0.10	112,112,112,112	0
4	NI	E	203	1/1	0.90	0.14	133,133,133,133	0
5	PEG	E	202	7/7	0.92	0.11	81,83,85,86	0
4	NI	H	202	1/1	0.97	0.07	110,110,110,110	0
3	MG	G	201	1/1	0.98	0.21	31,31,31,31	1

6.5 Other polymers [i](#)

There are no such residues in this entry.