



# Full wwPDB X-ray Structure Validation Report ⓘ

Aug 29, 2018 – 06:56 PM EDT

PDB ID : 4YB5  
Title : Adenosine triphosphate phosphoribosyltransferase from *Campylobacter jejuni*  
in complex with the allosteric inhibitor histidine  
Authors : Mittelstaedt, G.; Moggre, G.-J.; Parker, E.J.  
Deposited on : 2015-02-18  
Resolution : 2.24 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](mailto: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.

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

MolProbity : 4.02b-467  
Mogul : 1.7.3 (157068), CSD as539be (2018)  
Xtriage (Phenix) : 1.13  
EDS : rb-20031172  
Percentile statistics : 20171227.v01 (using entries in the PDB archive December 27th 2017)  
Refmac : 5.8.0158  
CCP4 : 7.0 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : rb-20031172

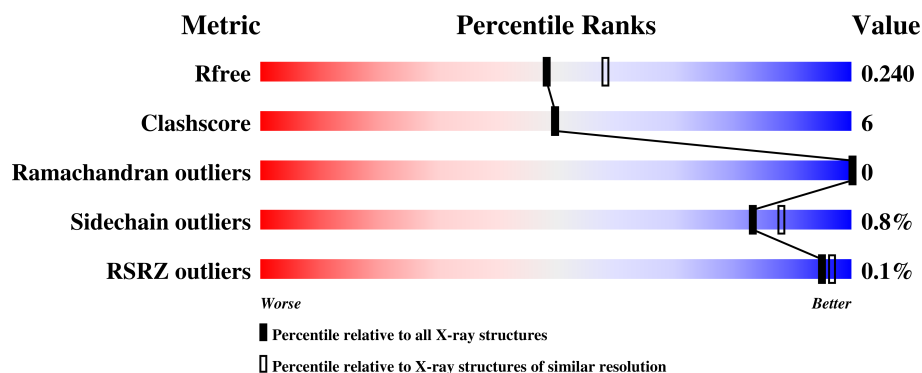
# 1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.24 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))
$R_{free}$	111664	2027 (2.26-2.22)
Clashscore	122126	2170 (2.26-2.22)
Ramachandran outliers	120053	2129 (2.26-2.22)
Sidechain outliers	120020	2130 (2.26-2.22)
RSRZ outliers	108989	1991 (2.26-2.22)

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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. 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	300	<div> <div>85%</div> <div>11%</div> <div>.</div> </div>
1	B	300	<div> <div>88%</div> <div>10%</div> <div>.</div> </div>
1	C	300	<div> <div>87%</div> <div>11%</div> <div>.</div> </div>
1	D	300	<div> <div>87%</div> <div>10%</div> <div>.</div> </div>
1	E	300	<div> <div>88%</div> <div>9%</div> <div>.</div> </div>

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Mol	Chain	Length	Quality of chain
1	F	300	 87% 9% . .

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
2	SCN	A	301	-	-	X	-
2	SCN	B	301	-	-	X	-
2	SCN	C	301	-	-	X	-
2	SCN	E	301	-	-	X	-
2	SCN	F	301	-	-	X	-
2	SCN	F	302	-	-	X	-
6	PEG	D	301	-	-	X	-

## 2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 13442 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.

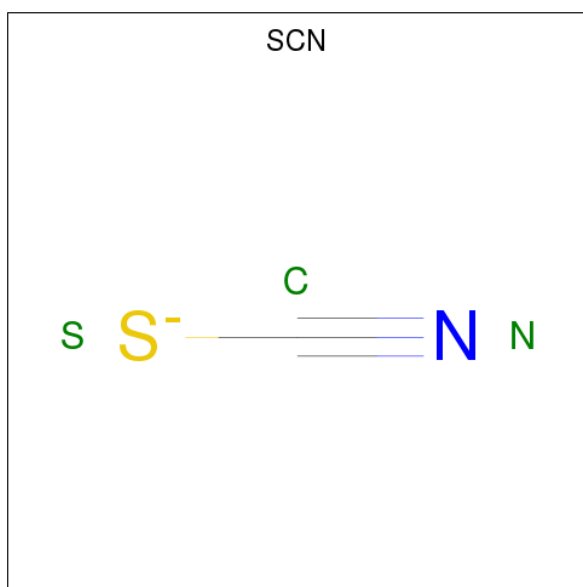
- Molecule 1 is a protein called ATP phosphoribosyltransferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	291	Total	C	N	O	S	0	0	0
			2187	1388	376	410	13			
1	B	295	Total	C	N	O	S	0	0	0
			2228	1416	387	412	13			
1	C	295	Total	C	N	O	S	0	0	0
			2207	1402	381	411	13			
1	D	292	Total	C	N	O	S	0	0	0
			2215	1406	381	415	13			
1	E	290	Total	C	N	O	S	0	0	0
			2171	1380	370	408	13			
1	F	290	Total	C	N	O	S	0	0	0
			2187	1389	375	410	13			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	0	GLY	-	expression tag	UNP Q5HSJ4
B	0	GLY	-	expression tag	UNP Q5HSJ4
C	0	GLY	-	expression tag	UNP Q5HSJ4
D	0	GLY	-	expression tag	UNP Q5HSJ4
E	0	GLY	-	expression tag	UNP Q5HSJ4
F	0	GLY	-	expression tag	UNP Q5HSJ4

- Molecule 2 is THIOCYANATE ION (three-letter code: SCN) (formula: CNS).

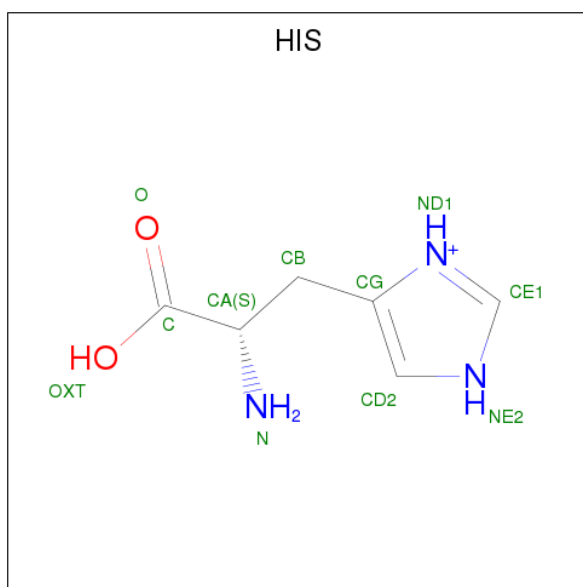


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	S	0	0
			3	1	1	1		
2	A	1	Total	C	N	S	0	0
			3	1	1	1		
2	B	1	Total	C	N	S	0	0
			3	1	1	1		
2	C	1	Total	C	N	S	0	0
			3	1	1	1		
2	E	1	Total	C	N	S	0	0
			3	1	1	1		
2	E	1	Total	C	N	S	0	0
			3	1	1	1		
2	F	1	Total	C	N	S	0	0
			3	1	1	1		
2	F	1	Total	C	N	S	0	0
			3	1	1	1		

- Molecule 3 is POTASSIUM ION (three-letter code: K) (formula: K).

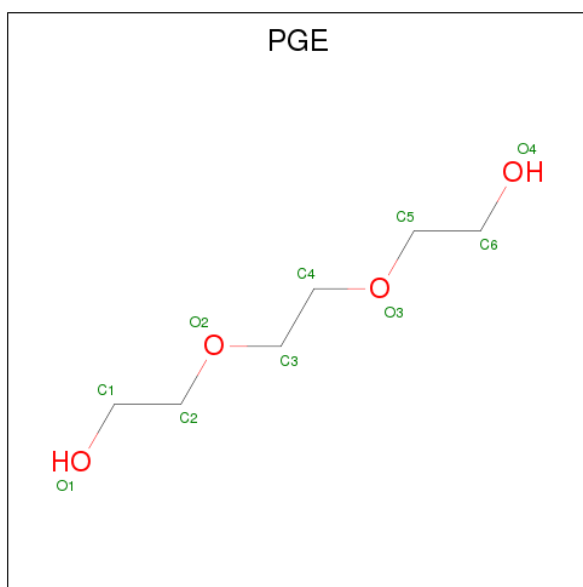
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	1	Total	K	0	0
			1	1		
3	A	2	Total	K	0	0
			2	2		
3	C	2	Total	K	0	0
			2	2		

- Molecule 4 is HISTIDINE (three-letter code: HIS) (formula: C<sub>6</sub>H<sub>10</sub>N<sub>3</sub>O<sub>2</sub>).



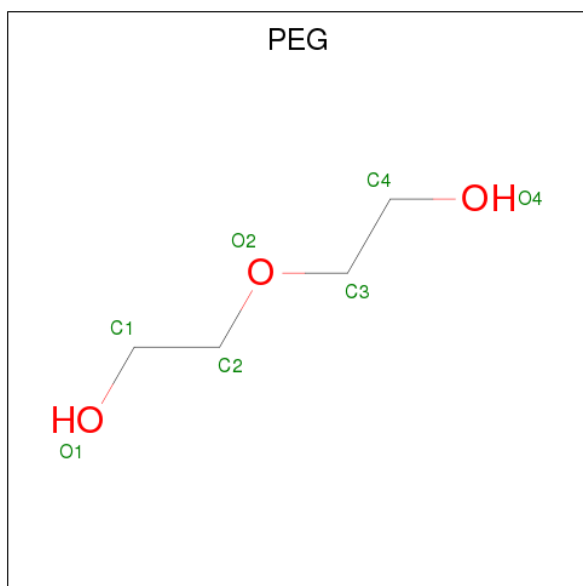
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	N	O	0	0
			11	6	3	2		
4	B	1	Total	C	N	O	0	0
			11	6	3	2		
4	C	1	Total	C	N	O	0	0
			11	6	3	2		
4	D	1	Total	C	N	O	0	0
			11	6	3	2		
4	E	1	Total	C	N	O	0	0
			11	6	3	2		
4	F	1	Total	C	N	O	0	0
			11	6	3	2		

- Molecule 5 is TRIETHYLENE GLYCOL (three-letter code: PGE) (formula: C<sub>6</sub>H<sub>14</sub>O<sub>4</sub>).



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

- Molecule 6 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula:  $C_4H_{10}O_3$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	D	1	Total	C	O	0	0
			7	4	3		
6	F	1	Total	C	O	0	0
			7	4	3		

- Molecule 7 is water.

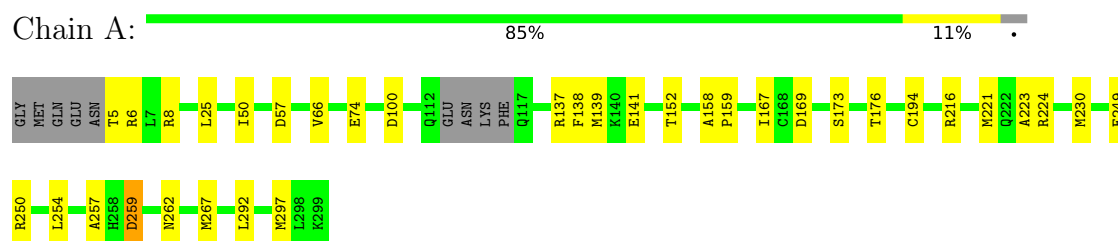
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	19	Total 19	O 19	0	0
7	B	21	Total 21	O 21	0	0
7	C	18	Total 18	O 18	0	0
7	D	27	Total 27	O 27	0	0
7	E	22	Total 22	O 22	0	0
7	F	21	Total 21	O 21	0	0



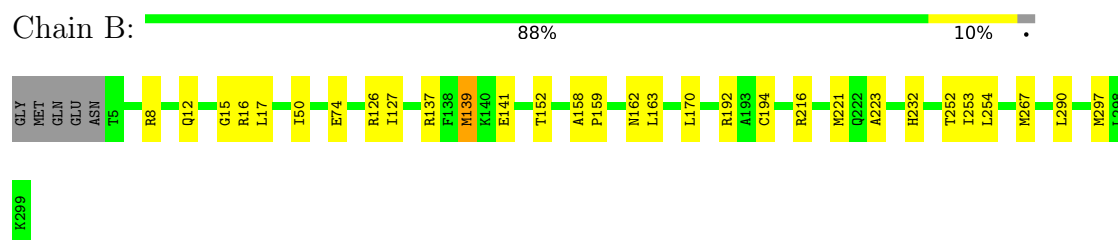
### 3 Residue-property plots

These plots are drawn for all protein, RNA and DNA 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.

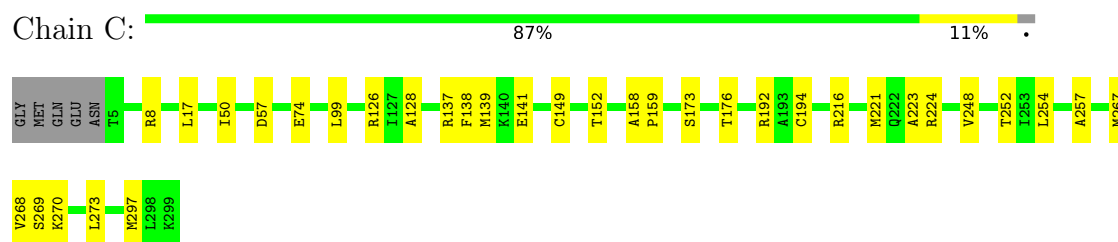
- Molecule 1: ATP phosphoribosyltransferase



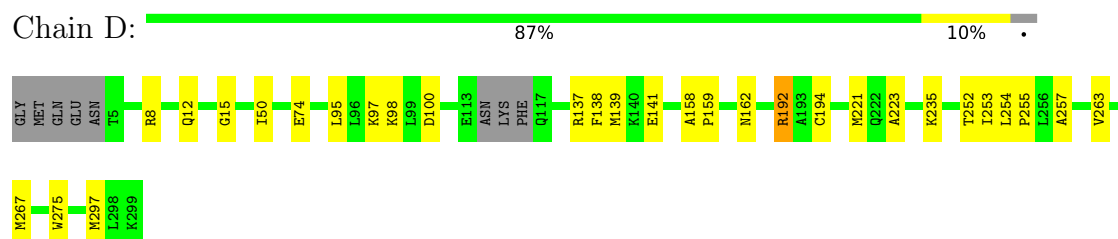
- Molecule 1: ATP phosphoribosyltransferase




- Molecule 1: ATP phosphoribosyltransferase

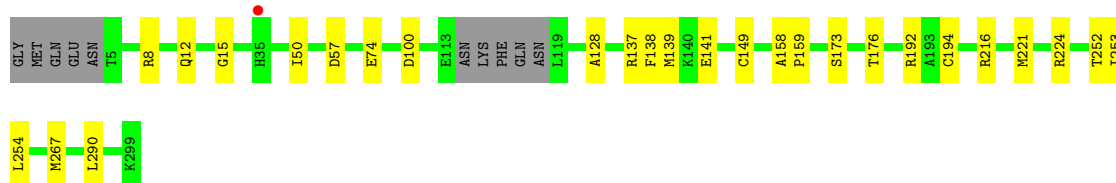


- Molecule 1: ATP phosphoribosyltransferase




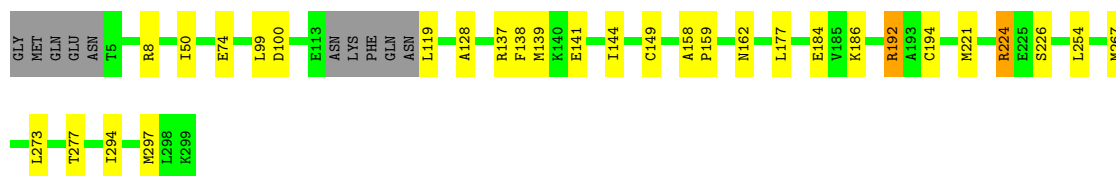
- Molecule 1: ATP phosphoribosyltransferase

Chain E:  88% 9% .



- Molecule 1: ATP phosphoribosyltransferase

Chain F:  87% 9% . .



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	91.14Å 123.22Å 95.70Å 90.00° 110.66° 90.00°	Depositor
Resolution (Å)	48.04 – 2.24 48.04 – 2.24	Depositor EDS
% Data completeness (in resolution range)	98.9 (48.04-2.24) 98.9 (48.04-2.24)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.42 (at 2.24Å)	Xtriage
Refinement program	REFMAC 5.8.0049	Depositor
R, $R_{free}$	0.209 , 0.239 0.209 , 0.240	Depositor DCC
$R_{free}$ test set	4730 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	43.8	Xtriage
Anisotropy	0.096	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.31 , 26.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	0.022 for l,-k,h	Xtriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	13442	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	49.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.88% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: SCN, K, PEG, PGE

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	0.60	0/2214	0.73	2/2998 (0.1%)
1	B	0.62	0/2258	0.76	6/3056 (0.2%)
1	C	0.60	0/2237	0.68	0/3034
1	D	0.62	0/2242	0.72	0/3032
1	E	0.61	0/2197	0.74	2/2975 (0.1%)
1	F	0.61	0/2214	0.71	1/2996 (0.0%)
All	All	0.61	0/13362	0.73	11/18091 (0.1%)

There are no bond length outliers.

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	259	ASP	CB-CG-OD2	7.80	125.32	118.30
1	B	126	ARG	NE-CZ-NH2	-6.79	116.90	120.30
1	B	192	ARG	NE-CZ-NH2	-6.55	117.02	120.30
1	B	192	ARG	NE-CZ-NH1	6.38	123.49	120.30
1	E	192	ARG	NE-CZ-NH2	-6.14	117.23	120.30
1	E	192	ARG	NE-CZ-NH1	6.09	123.34	120.30
1	B	126	ARG	NE-CZ-NH1	5.78	123.19	120.30
1	B	163	LEU	CB-CG-CD2	-5.62	101.44	111.00
1	B	139	MET	CG-SD-CE	5.60	109.16	100.20
1	A	216	ARG	NE-CZ-NH2	-5.07	117.76	120.30
1	F	224	ARG	NE-CZ-NH2	-5.04	117.78	120.30

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts ⓘ

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2187	0	2204	32	0
1	B	2228	0	2254	28	0
1	C	2207	0	2203	32	0
1	D	2215	0	2253	44	0
1	E	2171	0	2187	27	0
1	F	2187	0	2213	36	0
2	A	6	0	0	2	0
2	B	3	0	0	2	0
2	C	3	0	0	2	0
2	E	6	0	0	2	0
2	F	6	0	0	4	0
3	A	2	0	0	0	0
3	B	1	0	0	0	0
3	C	2	0	0	0	0
4	A	11	0	6	0	0
4	B	11	0	6	1	0
4	C	11	0	6	1	0
4	D	11	0	6	1	0
4	E	11	0	6	1	0
4	F	11	0	6	1	0
5	C	10	0	14	5	0
6	D	7	0	10	6	0
6	F	7	0	10	2	0
7	A	19	0	0	0	0
7	B	21	0	0	1	0
7	C	18	0	0	1	0
7	D	27	0	0	0	0
7	E	22	0	0	0	0
7	F	21	0	0	0	0
All	All	13442	0	13384	167	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 (167) 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:F:177:LEU:HD12	1:F:184:GLU:HG3	1.31	1.11
1:B:216:ARG:HD2	7:B:419:HOH:O	1.54	1.05
1:F:119:LEU:CD2	1:F:144:ILE:CD1	2.36	1.04
1:D:97:LYS:HD2	1:D:221:MET:HE1	1.38	1.03
1:F:119:LEU:CD2	1:F:144:ILE:HD11	1.90	1.02
1:C:216:ARG:HD2	7:C:412:HOH:O	1.65	0.96
1:D:74:GLU:OE2	1:D:98:LYS:NZ	2.03	0.92
1:F:177:LEU:CD1	1:F:184:GLU:HG3	2.00	0.91
1:D:74:GLU:OE1	1:D:192:ARG:NH2	2.05	0.89
1:B:16:ARG:HG3	1:B:17:LEU:H	1.38	0.87
1:F:294:ILE:O	6:F:303:PEG:H41	1.75	0.87
1:D:97:LYS:CD	1:D:221:MET:HE1	2.06	0.86
1:F:119:LEU:HD21	1:F:144:ILE:HD12	1.60	0.83
1:D:97:LYS:HD2	1:D:221:MET:CE	2.11	0.79
1:F:119:LEU:HD23	1:F:144:ILE:CD1	2.12	0.78
1:A:254:LEU:HD22	1:D:254:LEU:HD22	1.66	0.78
1:F:119:LEU:HD21	1:F:144:ILE:CD1	2.11	0.76
1:F:100:ASP:OD2	1:F:224:ARG:NE	2.19	0.76
1:F:119:LEU:HD23	1:F:119:LEU:O	1.86	0.75
1:B:16:ARG:HG3	1:B:17:LEU:N	2.02	0.74
1:B:254:LEU:HD23	1:C:254:LEU:HD23	1.72	0.72
1:F:119:LEU:HD22	1:F:144:ILE:HD11	1.68	0.71
1:D:97:LYS:NZ	1:D:221:MET:HE1	2.05	0.71
1:C:248:VAL:HG23	1:C:268:VAL:HB	1.74	0.70
1:F:186:LYS:HE2	2:F:302:SCN:N	2.07	0.69
1:B:254:LEU:CD2	1:C:254:LEU:HD23	2.23	0.68
1:D:257:ALA:HA	1:E:253:ILE:CD1	2.24	0.68
1:C:173:SER:O	1:C:176:THR:HG22	1.95	0.67
1:F:119:LEU:CD2	1:F:144:ILE:HD12	2.18	0.67
1:A:254:LEU:HD22	1:E:254:LEU:HD22	1.75	0.67
1:F:177:LEU:CD1	1:F:184:GLU:CG	2.73	0.67
1:A:173:SER:O	1:A:176:THR:HG22	1.95	0.67
1:C:74:GLU:HG3	1:C:194:CYS:SG	2.35	0.67
1:C:273:LEU:HD12	5:C:302:PGE:H32	1.77	0.67
1:E:173:SER:O	1:E:176:THR:HG22	1.95	0.67
1:A:57:ASP:OD1	1:C:152:THR:HG23	1.95	0.65
1:A:254:LEU:CD2	1:E:254:LEU:HD22	2.27	0.64
1:D:97:LYS:CE	1:D:221:MET:HE1	2.27	0.64
1:F:99:LEU:O	1:F:192:ARG:HD2	1.98	0.64
1:E:100:ASP:O	1:E:224:ARG:NH2	2.30	0.64
1:F:226:SER:O	6:F:303:PEG:H42	1.98	0.64
1:D:263:VAL:CG1	6:D:301:PEG:H21	2.28	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:257:ALA:HA	1:E:253:ILE:HD11	1.81	0.62
1:B:221:MET:HG2	2:B:301:SCN:S	2.40	0.61
1:D:263:VAL:HG12	6:D:301:PEG:H42	1.81	0.61
1:A:254:LEU:HD22	1:D:254:LEU:CD2	2.29	0.61
1:C:99:LEU:O	1:C:192:ARG:HD2	2.01	0.61
1:F:221:MET:HG2	2:F:301:SCN:S	2.43	0.59
1:B:253:ILE:HD11	1:C:257:ALA:HA	1.83	0.58
1:D:255:PRO:HB3	6:D:301:PEG:H31	1.85	0.58
1:B:253:ILE:CD1	1:C:257:ALA:HA	2.34	0.58
1:B:162:ASN:O	1:E:8:ARG:NH2	2.37	0.57
1:A:221:MET:HG2	2:A:301:SCN:S	2.44	0.57
1:B:221:MET:CG	2:B:301:SCN:S	2.93	0.57
1:E:221:MET:HG2	2:E:301:SCN:S	2.45	0.57
1:D:97:LYS:NZ	1:D:221:MET:CE	2.68	0.56
1:E:138:PHE:CD2	1:E:139:MET:HE3	2.40	0.56
1:C:223:ALA:HA	1:C:297:MET:HE3	1.86	0.56
1:F:138:PHE:CD2	1:F:139:MET:HE3	2.41	0.55
1:E:138:PHE:HD2	1:E:139:MET:HE3	1.72	0.55
1:F:119:LEU:C	1:F:119:LEU:HD23	2.28	0.55
1:D:263:VAL:HG12	6:D:301:PEG:H21	1.88	0.54
1:C:269:SER:OG	5:C:302:PGE:H2	2.08	0.54
1:A:257:ALA:HA	1:D:253:ILE:HD11	1.89	0.54
1:D:252:THR:HG1	4:D:302:HIS:N	2.06	0.54
1:D:8:ARG:NH2	1:F:162:ASN:O	2.40	0.54
1:F:138:PHE:HD2	1:F:139:MET:HE3	1.73	0.53
1:A:138:PHE:CD2	1:A:139:MET:HE3	2.44	0.53
1:A:5:THR:HG22	1:A:6:ARG:N	2.24	0.53
1:A:137:ARG:O	1:A:141:GLU:HG3	2.09	0.53
1:B:252:THR:HG1	4:B:303:HIS:N	2.07	0.53
1:A:152:THR:HG23	1:C:57:ASP:OD1	2.08	0.53
1:B:152:THR:HG23	1:E:57:ASP:OD1	2.08	0.53
1:B:8:ARG:HG2	1:B:8:ARG:HH11	1.75	0.52
1:B:50:ILE:HD12	1:B:50:ILE:N	2.24	0.52
1:D:254:LEU:HD22	1:E:254:LEU:HD22	1.91	0.52
1:C:138:PHE:CD2	1:C:139:MET:HE3	2.43	0.52
1:C:138:PHE:HD2	1:C:139:MET:HE3	1.75	0.52
1:C:270:LYS:H	5:C:302:PGE:H3	1.75	0.52
1:C:269:SER:HA	5:C:302:PGE:H3	1.91	0.51
1:A:221:MET:CG	2:A:301:SCN:S	2.98	0.51
1:A:25:LEU:HD13	1:A:50:ILE:HD12	1.92	0.51
1:D:257:ALA:HA	1:E:253:ILE:HD12	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:100:ASP:OD2	1:A:224:ARG:HD3	2.11	0.51
1:F:273:LEU:O	1:F:277:THR:HG22	2.11	0.50
1:E:221:MET:CG	2:E:301:SCN:S	2.99	0.50
1:D:74:GLU:HG3	1:D:194:CYS:SG	2.51	0.50
1:B:254:LEU:CD2	1:C:254:LEU:CD2	2.90	0.49
1:A:249:GLU:C	1:A:250:ARG:HG3	2.32	0.49
1:E:50:ILE:N	1:E:50:ILE:HD12	2.28	0.49
1:A:230:MET:CE	1:A:292:LEU:HD13	2.43	0.49
1:D:162:ASN:O	1:F:8:ARG:NH2	2.45	0.49
1:D:223:ALA:HA	1:D:297:MET:HE3	1.94	0.49
1:C:50:ILE:N	1:C:50:ILE:HD12	2.27	0.49
1:B:12:GLN:NE2	1:B:15:GLY:HA3	2.28	0.48
1:A:138:PHE:HD2	1:A:139:MET:HE3	1.77	0.48
1:D:138:PHE:CD2	1:D:139:MET:HE3	2.47	0.48
1:F:99:LEU:O	1:F:192:ARG:CD	2.60	0.48
1:A:257:ALA:HA	1:D:253:ILE:CD1	2.44	0.48
1:B:12:GLN:HE21	1:B:15:GLY:HA3	1.77	0.48
1:D:263:VAL:CG1	6:D:301:PEG:H42	2.43	0.48
1:D:50:ILE:N	1:D:50:ILE:HD12	2.29	0.48
1:F:186:LYS:HE2	2:F:302:SCN:C	2.44	0.48
1:B:254:LEU:HD21	1:C:254:LEU:CD2	2.44	0.48
1:C:126:ARG:HG3	1:C:126:ARG:HH11	1.79	0.48
1:E:12:GLN:OE1	1:E:15:GLY:HA3	2.14	0.48
1:D:257:ALA:CA	1:E:253:ILE:HD11	2.43	0.47
1:F:221:MET:CG	2:F:301:SCN:S	3.02	0.47
1:B:232:HIS:HE2	4:F:304:HIS:N	2.12	0.47
1:A:138:PHE:CD2	1:A:139:MET:CE	2.97	0.47
1:C:221:MET:HG2	2:C:301:SCN:S	2.55	0.47
1:D:12:GLN:HE21	1:D:15:GLY:HA3	1.78	0.47
1:F:50:ILE:HD12	1:F:50:ILE:N	2.29	0.47
1:A:74:GLU:HG3	1:A:194:CYS:SG	2.55	0.47
1:B:223:ALA:HA	1:B:297:MET:HE3	1.97	0.47
1:A:230:MET:HE2	1:A:292:LEU:HD13	1.96	0.46
1:C:126:ARG:HG3	1:C:126:ARG:NH1	2.31	0.46
1:B:290:LEU:CD2	1:F:297:MET:HG3	2.45	0.46
1:F:138:PHE:CD2	1:F:139:MET:CE	2.98	0.46
1:C:224:ARG:NE	2:C:301:SCN:N	2.63	0.46
1:D:138:PHE:CD2	1:D:139:MET:CE	2.99	0.46
1:A:8:ARG:NH2	1:A:66:VAL:O	2.45	0.46
1:D:12:GLN:NE2	1:D:15:GLY:HA3	2.31	0.46
1:C:138:PHE:CD2	1:C:139:MET:CE	2.99	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:74:GLU:HG3	1:F:194:CYS:SG	2.57	0.45
1:A:5:THR:CG2	1:A:6:ARG:N	2.79	0.45
1:F:158:ALA:HB3	1:F:159:PRO:HD3	1.99	0.45
1:C:252:THR:HG1	4:C:304:HIS:N	2.14	0.45
1:D:297:MET:HB2	1:D:297:MET:HE2	1.78	0.45
1:B:253:ILE:HD11	1:C:257:ALA:CA	2.47	0.44
1:E:138:PHE:CD2	1:E:139:MET:CE	3.00	0.44
1:E:74:GLU:HG3	1:E:194:CYS:SG	2.57	0.44
1:D:100:ASP:OD1	1:D:100:ASP:N	2.50	0.44
1:B:74:GLU:HG3	1:B:194:CYS:SG	2.57	0.44
1:D:138:PHE:HD2	1:D:139:MET:HE3	1.81	0.44
1:A:223:ALA:HA	1:A:297:MET:HE3	2.01	0.43
1:D:158:ALA:HB3	1:D:159:PRO:HD3	2.00	0.43
1:D:235:LYS:HE2	6:D:301:PEG:O1	2.18	0.43
1:A:259:ASP:OD2	1:A:262:ASN:HB2	2.18	0.43
1:B:254:LEU:HD23	1:F:254:LEU:HD21	2.00	0.42
1:B:254:LEU:HD23	1:F:254:LEU:CD2	2.49	0.42
1:D:254:LEU:HD22	1:E:254:LEU:CD2	2.49	0.42
1:D:275:TRP:CE2	1:E:216:ARG:HG2	2.55	0.42
1:E:158:ALA:HB3	1:E:159:PRO:HD3	2.01	0.42
1:C:158:ALA:HB3	1:C:159:PRO:HD3	2.01	0.42
1:E:137:ARG:O	1:E:141:GLU:HG3	2.20	0.42
1:A:138:PHE:CE2	1:A:139:MET:CE	3.03	0.42
1:B:158:ALA:HB3	1:B:159:PRO:HD3	2.02	0.42
1:B:127:ILE:CD1	1:B:139:MET:CE	2.97	0.41
1:C:128:ALA:HA	1:C:149:CYS:O	2.20	0.41
1:B:137:ARG:O	1:B:141:GLU:HG3	2.19	0.41
1:D:137:ARG:O	1:D:141:GLU:HG3	2.20	0.41
1:C:137:ARG:O	1:C:141:GLU:HG3	2.20	0.41
1:A:254:LEU:HB3	1:D:254:LEU:HD21	2.02	0.41
1:A:297:MET:HG3	1:E:290:LEU:CD2	2.50	0.41
1:F:128:ALA:HA	1:F:149:CYS:O	2.20	0.41
1:A:167:ILE:HD12	1:A:169:ASP:HB2	2.02	0.41
1:D:257:ALA:CB	1:E:253:ILE:HD11	2.50	0.41
1:A:158:ALA:HB3	1:A:159:PRO:HD3	2.03	0.41
1:F:138:PHE:CE2	1:F:139:MET:CE	3.04	0.41
1:D:98:LYS:HD2	1:D:192:ARG:HD3	2.02	0.41
1:E:128:ALA:HA	1:E:149:CYS:O	2.21	0.41
1:F:137:ARG:O	1:F:141:GLU:HG3	2.20	0.41
1:C:273:LEU:HD12	5:C:302:PGE:C3	2.49	0.40
1:E:252:THR:HG1	4:E:303:HIS:N	2.19	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:249:GLU:O	1:A:250:ARG:HG3	2.22	0.40
1:D:95:LEU:HD21	1:D:98:LYS:HE2	2.02	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	287/300 (96%)	285 (99%)	2 (1%)	0	100	100
1	B	293/300 (98%)	288 (98%)	5 (2%)	0	100	100
1	C	293/300 (98%)	291 (99%)	2 (1%)	0	100	100
1	D	288/300 (96%)	286 (99%)	2 (1%)	0	100	100
1	E	286/300 (95%)	285 (100%)	1 (0%)	0	100	100
1	F	286/300 (95%)	284 (99%)	2 (1%)	0	100	100
All	All	1733/1800 (96%)	1719 (99%)	14 (1%)	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	231/263 (88%)	230 (100%)	1 (0%)	92	94

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	B	235/263 (89%)	233 (99%)	2 (1%)	81	86
1	C	230/263 (88%)	227 (99%)	3 (1%)	71	79
1	D	237/263 (90%)	235 (99%)	2 (1%)	83	88
1	E	228/263 (87%)	227 (100%)	1 (0%)	92	94
1	F	232/263 (88%)	230 (99%)	2 (1%)	81	86
All	All	1393/1578 (88%)	1382 (99%)	11 (1%)	83	88

All (11) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	267	MET
1	B	170	LEU
1	B	267	MET
1	C	8	ARG
1	C	17	LEU
1	C	267	MET
1	D	192	ARG
1	D	267	MET
1	E	267	MET
1	F	192	ARG
1	F	267	MET

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	D	12	GLN
1	D	117	GLN

### 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 [i](#)

There are no carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

Of 22 ligands modelled in this entry, 5 are monoatomic - leaving 17 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	$\# Z  > 2$
2	SCN	A	301	-	1,2,2	0.20	0	0,1,1	0.00	-
2	SCN	A	302	-	1,2,2	0.17	0	0,1,1	0.00	-
4	HIS	A	304	-	3,11,11	0.52	0	3,14,14	1.35	1 (33%)
2	SCN	B	301	-	1,2,2	0.11	0	0,1,1	0.00	-
4	HIS	B	303	-	3,11,11	0.60	0	3,14,14	1.30	0
2	SCN	C	301	-	1,2,2	0.20	0	0,1,1	0.00	-
5	PGE	C	302	-	9,9,9	0.93	0	8,8,8	1.10	1 (12%)
4	HIS	C	304	-	3,11,11	0.59	0	3,14,14	1.26	0
6	PEG	D	301	-	6,6,6	0.77	0	5,5,5	1.11	0
4	HIS	D	302	-	3,11,11	0.43	0	3,14,14	1.37	1 (33%)
2	SCN	E	301	-	1,2,2	0.13	0	0,1,1	0.00	-
2	SCN	E	302	-	1,2,2	0.15	0	0,1,1	0.00	-
4	HIS	E	303	-	3,11,11	0.45	0	3,14,14	1.31	0
2	SCN	F	301	-	1,2,2	0.14	0	0,1,1	0.00	-
2	SCN	F	302	-	1,2,2	0.22	0	0,1,1	0.00	-
6	PEG	F	303	-	6,6,6	0.66	0	5,5,5	0.88	0
4	HIS	F	304	-	3,11,11	0.47	0	3,14,14	1.30	1 (33%)

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
2	SCN	A	301	-	-	0/0/0/0	0/0/0/0
2	SCN	A	302	-	-	0/0/0/0	0/0/0/0

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	HIS	A	304	-	-	0/4/8/8	0/1/1/1
2	SCN	B	301	-	-	0/0/0/0	0/0/0/0
4	HIS	B	303	-	-	0/4/8/8	0/1/1/1
2	SCN	C	301	-	-	0/0/0/0	0/0/0/0
5	PGE	C	302	-	-	0/7/7/7	0/0/0/0
4	HIS	C	304	-	-	0/4/8/8	0/1/1/1
6	PEG	D	301	-	-	0/4/4/4	0/0/0/0
4	HIS	D	302	-	-	0/4/8/8	0/1/1/1
2	SCN	E	301	-	-	0/0/0/0	0/0/0/0
2	SCN	E	302	-	-	0/0/0/0	0/0/0/0
4	HIS	E	303	-	-	0/4/8/8	0/1/1/1
2	SCN	F	301	-	-	0/0/0/0	0/0/0/0
2	SCN	F	302	-	-	0/0/0/0	0/0/0/0
6	PEG	F	303	-	-	0/4/4/4	0/0/0/0
4	HIS	F	304	-	-	0/4/8/8	0/1/1/1

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	C	302	PGE	O2-C3-C4	2.02	119.70	110.37
4	F	304	HIS	CD2-NE2-CE1	2.05	108.98	105.78
4	D	302	HIS	CD2-NE2-CE1	2.09	109.04	105.78
4	A	304	HIS	CD2-NE2-CE1	2.14	109.11	105.78

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

14 monomers are involved in 30 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	301	SCN	2	0
2	B	301	SCN	2	0
4	B	303	HIS	1	0
2	C	301	SCN	2	0
5	C	302	PGE	5	0
4	C	304	HIS	1	0
6	D	301	PEG	6	0
4	D	302	HIS	1	0
2	E	301	SCN	2	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	E	303	HIS	1	0
2	F	301	SCN	2	0
2	F	302	SCN	2	0
6	F	303	PEG	2	0
4	F	304	HIS	1	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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	291/300 (97%)	-0.34	0	100   100	29, 46, 70, 104	0
1	B	295/300 (98%)	-0.33	0	100   100	31, 49, 74, 97	0
1	C	295/300 (98%)	-0.30	0	100   100	31, 48, 69, 105	0
1	D	292/300 (97%)	-0.29	0	100   100	29, 48, 76, 106	0
1	E	290/300 (96%)	-0.25	1 (0%)	93   94	31, 49, 72, 105	0
1	F	290/300 (96%)	-0.28	0	100   100	31, 48, 71, 100	0
All	All	1753/1800 (97%)	-0.30	1 (0%)	95   97	29, 48, 73, 106	0

All (1) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	35	HIS	3.3

### 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, 95<sup>th</sup> 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( $\text{\AA}^2$ )	Q<0.9
5	PGE	C	302	10/10	0.76	0.31	54,65,75,79	0
6	PEG	D	301	7/7	0.81	0.30	46,59,63,66	0
2	SCN	A	302	3/3	0.86	0.29	56,56,69,73	0
6	PEG	F	303	7/7	0.87	0.19	45,52,62,65	0
3	K	A	303	1/1	0.93	0.09	77,77,77,77	0
3	K	B	302	1/1	0.94	0.11	80,80,80,80	0
2	SCN	F	302	3/3	0.94	0.16	57,57,59,63	0
4	HIS	A	304	11/11	0.95	0.13	31,33,36,38	0
2	SCN	F	301	3/3	0.96	0.12	67,67,67,71	0
2	SCN	C	301	3/3	0.96	0.14	52,52,60,61	0
4	HIS	F	304	11/11	0.96	0.12	31,33,35,39	0
3	K	A	305	1/1	0.97	0.07	70,70,70,70	0
3	K	C	305	1/1	0.97	0.10	75,75,75,75	0
2	SCN	A	301	3/3	0.97	0.14	51,51,57,64	0
2	SCN	E	302	3/3	0.97	0.18	60,60,66,68	0
4	HIS	B	303	11/11	0.97	0.15	35,37,39,40	0
4	HIS	E	303	11/11	0.97	0.12	29,31,33,33	0
2	SCN	E	301	3/3	0.97	0.15	59,59,61,62	0
4	HIS	C	304	11/11	0.97	0.09	34,35,40,41	0
2	SCN	B	301	3/3	0.98	0.15	51,51,52,53	0
4	HIS	D	302	11/11	0.98	0.11	28,31,34,35	0
3	K	C	303	1/1	0.99	0.02	63,63,63,63	0

## 6.5 Other polymers ⓘ

There are no such residues in this entry.