wwPDB X-ray Structure Validation Summary Report (i)

May 16, 2020 – 10:45 pm BST

PDB ID	:	6GRJ
Title	:	Structure of the AhlB pore of the tripartite alpha-pore forming toxin, AHL, from Aeromonas hydrophila.
Authors	:	Churchill-Angus, A.M.; Wilson, J.S.; Baker, P.J.
Deposited on	:	2018-06-11
Resolution	:	2.94 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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 (i) symbol.

The following versions of software and data (see references (1)) were used in the production of this report:

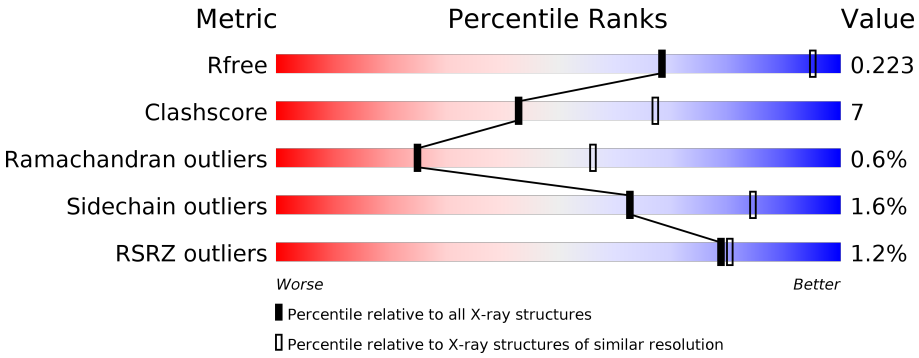
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.11
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.11

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.94 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	2969 (2.98-2.90)
Clashscore	141614	3218 (2.98-2.90)
Ramachandran outliers	138981	3122 (2.98-2.90)
Sidechain outliers	138945	3124 (2.98-2.90)
RSRZ outliers	127900	2902 (2.98-2.90)

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 <=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	367	2% 78% 13% • 8%
1	B	367	% 74% 13% • 12%
1	C	367	% 78% 14% • 8%
1	D	367	% 77% 10% • 13%
1	E	367	79% 12% • 8%
1	F	367	% 74% 12% • 14%

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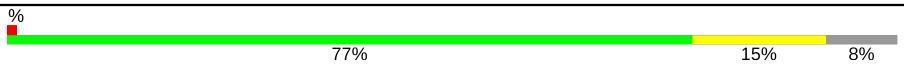
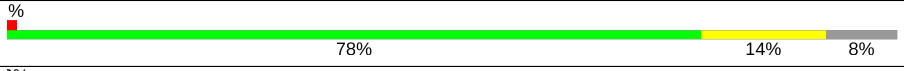
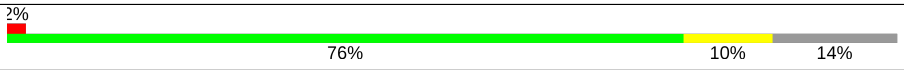
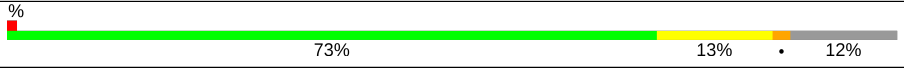
Mol	Chain	Length	Quality of chain
1	G	367	
1	H	367	
1	I	367	
1	J	367	

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
3	PO4	G	404	-	-	-	X
5	NA	C	409	-	-	-	X

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 24385 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 AhlB.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	G	338	Total	C	N	O	S	Se	0	0	0
			2489	1550	431	501	1	6			
1	J	322	Total	C	N	O	S	Se	0	0	0
			2375	1483	412	475	1	4			
1	A	338	Total	C	N	O	S	Se	0	0	0
			2489	1550	431	501	1	6			
1	B	322	Total	C	N	O	S	Se	0	0	0
			2375	1483	412	475	1	4			
1	C	338	Total	C	N	O	S	Se	0	0	0
			2488	1549	431	501	1	6			
1	D	320	Total	C	N	O	S	Se	0	0	0
			2367	1478	411	473	1	4			
1	E	338	Total	C	N	O	S	Se	0	1	0
			2492	1552	432	501	1	6			
1	F	317	Total	C	N	O	S	Se	0	0	0
			2343	1464	406	468	1	4			
1	H	337	Total	C	N	O	S	Se	0	0	0
			2482	1546	430	499	1	6			
1	I	315	Total	C	N	O	S	Se	0	0	0
			2326	1452	405	464	1	4			

There are 90 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	336	ILE	MET	engineered mutation	UNP A0A081US78
G	360	LEU	-	expression tag	UNP A0A081US78
G	361	GLU	-	expression tag	UNP A0A081US78
G	362	HIS	-	expression tag	UNP A0A081US78
G	363	HIS	-	expression tag	UNP A0A081US78
G	364	HIS	-	expression tag	UNP A0A081US78
G	365	HIS	-	expression tag	UNP A0A081US78
G	366	HIS	-	expression tag	UNP A0A081US78
G	367	HIS	-	expression tag	UNP A0A081US78

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Chain	Residue	Modelled	Actual	Comment	Reference
J	336	ILE	MET	engineered mutation	UNP A0A081US78
J	360	LEU	-	expression tag	UNP A0A081US78
J	361	GLU	-	expression tag	UNP A0A081US78
J	362	HIS	-	expression tag	UNP A0A081US78
J	363	HIS	-	expression tag	UNP A0A081US78
J	364	HIS	-	expression tag	UNP A0A081US78
J	365	HIS	-	expression tag	UNP A0A081US78
J	366	HIS	-	expression tag	UNP A0A081US78
J	367	HIS	-	expression tag	UNP A0A081US78
A	336	ILE	MET	engineered mutation	UNP A0A081US78
A	360	LEU	-	expression tag	UNP A0A081US78
A	361	GLU	-	expression tag	UNP A0A081US78
A	362	HIS	-	expression tag	UNP A0A081US78
A	363	HIS	-	expression tag	UNP A0A081US78
A	364	HIS	-	expression tag	UNP A0A081US78
A	365	HIS	-	expression tag	UNP A0A081US78
A	366	HIS	-	expression tag	UNP A0A081US78
A	367	HIS	-	expression tag	UNP A0A081US78
B	336	ILE	MET	engineered mutation	UNP A0A081US78
B	360	LEU	-	expression tag	UNP A0A081US78
B	361	GLU	-	expression tag	UNP A0A081US78
B	362	HIS	-	expression tag	UNP A0A081US78
B	363	HIS	-	expression tag	UNP A0A081US78
B	364	HIS	-	expression tag	UNP A0A081US78
B	365	HIS	-	expression tag	UNP A0A081US78
B	366	HIS	-	expression tag	UNP A0A081US78
B	367	HIS	-	expression tag	UNP A0A081US78
C	336	ILE	MET	engineered mutation	UNP A0A081US78
C	360	LEU	-	expression tag	UNP A0A081US78
C	361	GLU	-	expression tag	UNP A0A081US78
C	362	HIS	-	expression tag	UNP A0A081US78
C	363	HIS	-	expression tag	UNP A0A081US78
C	364	HIS	-	expression tag	UNP A0A081US78
C	365	HIS	-	expression tag	UNP A0A081US78
C	366	HIS	-	expression tag	UNP A0A081US78
C	367	HIS	-	expression tag	UNP A0A081US78
D	336	ILE	MET	engineered mutation	UNP A0A081US78
D	360	LEU	-	expression tag	UNP A0A081US78
D	361	GLU	-	expression tag	UNP A0A081US78
D	362	HIS	-	expression tag	UNP A0A081US78
D	363	HIS	-	expression tag	UNP A0A081US78
D	364	HIS	-	expression tag	UNP A0A081US78

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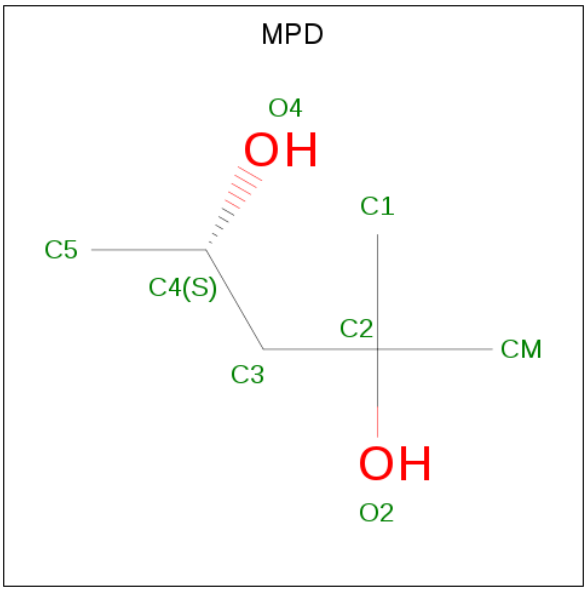
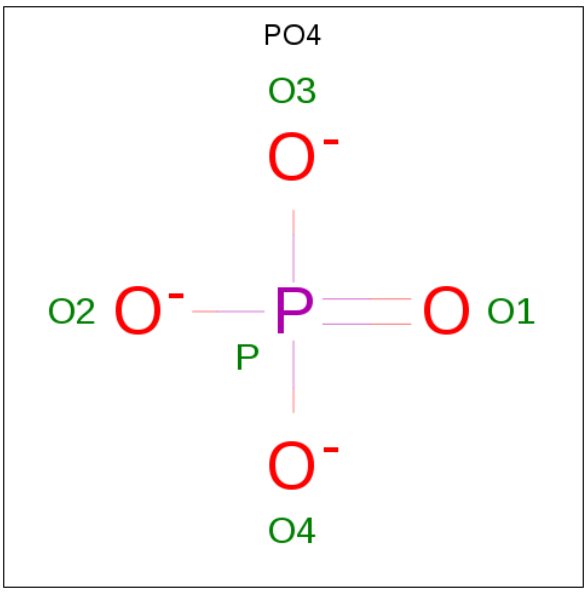
Chain	Residue	Modelled	Actual	Comment	Reference
D	365	HIS	-	expression tag	UNP A0A081US78
D	366	HIS	-	expression tag	UNP A0A081US78
D	367	HIS	-	expression tag	UNP A0A081US78
E	336	ILE	MET	engineered mutation	UNP A0A081US78
E	360	LEU	-	expression tag	UNP A0A081US78
E	361	GLU	-	expression tag	UNP A0A081US78
E	362	HIS	-	expression tag	UNP A0A081US78
E	363	HIS	-	expression tag	UNP A0A081US78
E	364	HIS	-	expression tag	UNP A0A081US78
E	365	HIS	-	expression tag	UNP A0A081US78
E	366	HIS	-	expression tag	UNP A0A081US78
E	367	HIS	-	expression tag	UNP A0A081US78
F	336	ILE	MET	engineered mutation	UNP A0A081US78
F	360	LEU	-	expression tag	UNP A0A081US78
F	361	GLU	-	expression tag	UNP A0A081US78
F	362	HIS	-	expression tag	UNP A0A081US78
F	363	HIS	-	expression tag	UNP A0A081US78
F	364	HIS	-	expression tag	UNP A0A081US78
F	365	HIS	-	expression tag	UNP A0A081US78
F	366	HIS	-	expression tag	UNP A0A081US78
F	367	HIS	-	expression tag	UNP A0A081US78
H	336	ILE	MET	engineered mutation	UNP A0A081US78
H	360	LEU	-	expression tag	UNP A0A081US78
H	361	GLU	-	expression tag	UNP A0A081US78
H	362	HIS	-	expression tag	UNP A0A081US78
H	363	HIS	-	expression tag	UNP A0A081US78
H	364	HIS	-	expression tag	UNP A0A081US78
H	365	HIS	-	expression tag	UNP A0A081US78
H	366	HIS	-	expression tag	UNP A0A081US78
H	367	HIS	-	expression tag	UNP A0A081US78
I	336	ILE	MET	engineered mutation	UNP A0A081US78
I	360	LEU	-	expression tag	UNP A0A081US78
I	361	GLU	-	expression tag	UNP A0A081US78
I	362	HIS	-	expression tag	UNP A0A081US78
I	363	HIS	-	expression tag	UNP A0A081US78
I	364	HIS	-	expression tag	UNP A0A081US78
I	365	HIS	-	expression tag	UNP A0A081US78
I	366	HIS	-	expression tag	UNP A0A081US78
I	367	HIS	-	expression tag	UNP A0A081US78

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



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	G	1	Total	C	O	0	0
			8	6	2		
2	G	1	Total	C	O	0	0
			8	6	2		
2	G	1	Total	C	O	0	0
			8	6	2		
2	J	1	Total	C	O	0	0
			8	6	2		
2	J	1	Total	C	O	0	0
			8	6	2		
2	A	1	Total	C	O	0	0
			8	6	2		
2	C	1	Total	C	O	0	0
			8	6	2		
2	C	1	Total	C	O	0	0
			8	6	2		
2	E	1	Total	C	O	0	0
			8	6	2		
2	E	1	Total	C	O	0	0
			8	6	2		
2	F	1	Total	C	O	0	0
			8	6	2		
2	H	1	Total	C	O	0	0
			8	6	2		
2	H	1	Total	C	O	0	0
			8	6	2		
2	I	1	Total	C	O	0	0
			8	6	2		

- Molecule 3 is PHOSPHATE ION (three-letter code: PO4) (formula: O_4P).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	G	1	Total O P 5 4 1	0	0
3	E	1	Total O P 5 4 1	0	0

- Molecule 4 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	G	3	Total Cl 3 3	0	0
4	J	1	Total Cl 1 1	0	0
4	D	2	Total Cl 2 2	0	0
4	E	2	Total Cl 2 2	0	0
4	H	3	Total Cl 3 3	0	0
4	B	2	Total Cl 2 2	0	0
4	I	4	Total Cl 4 4	0	0
4	C	5	Total Cl 5 5	0	0
4	A	1	Total Cl 1 1	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	F	4	Total Cl 4 4	0	0

- Molecule 5 is SODIUM ION (three-letter code: NA) (formula: Na).

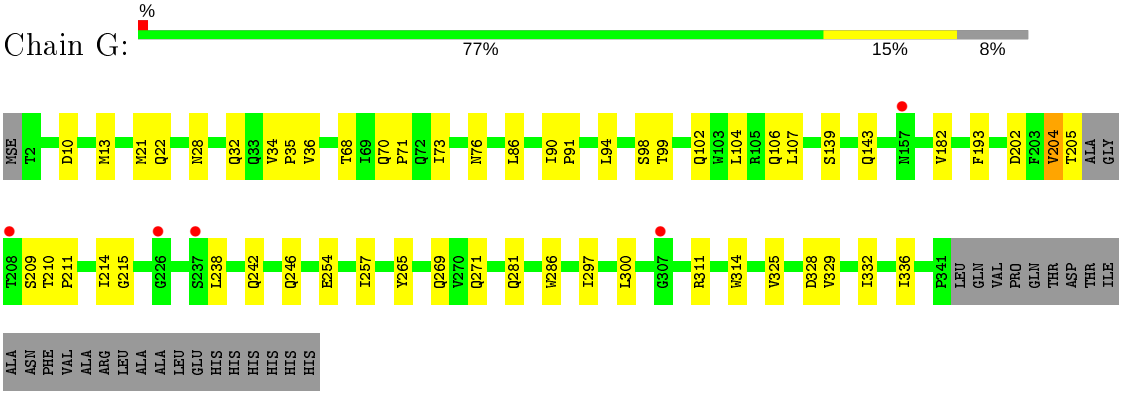
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	J	1	Total Na 1 1	0	0
5	D	1	Total Na 1 1	0	0
5	E	2	Total Na 2 2	0	0
5	H	1	Total Na 1 1	0	0
5	B	1	Total Na 1 1	0	0
5	C	3	Total Na 3 3	0	0
5	F	1	Total Na 1 1	0	0

3 Residue-property plots (i)

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.

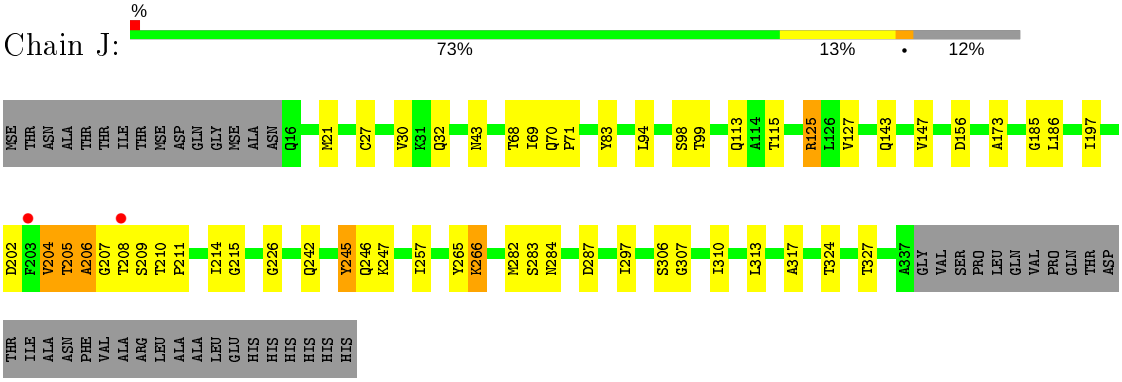
- Molecule 1: AhlB

Chain G:



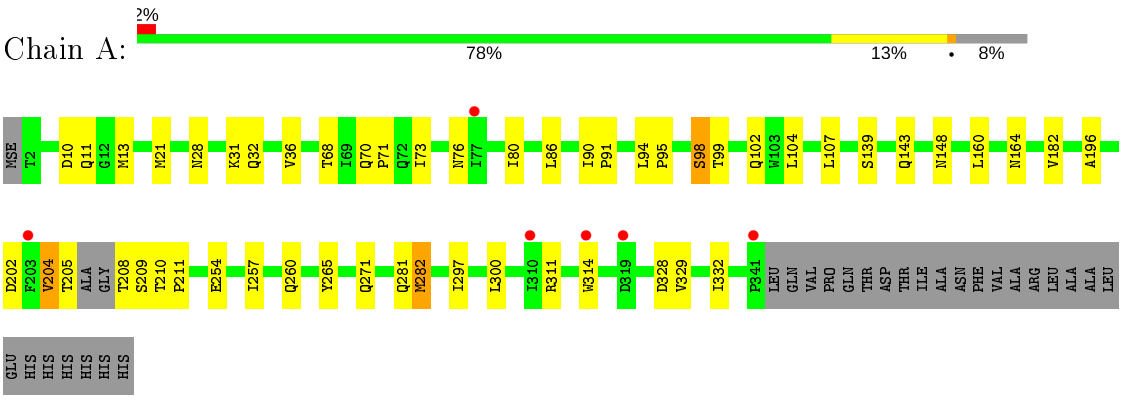
- Molecule 1: AhlB

Chain J:



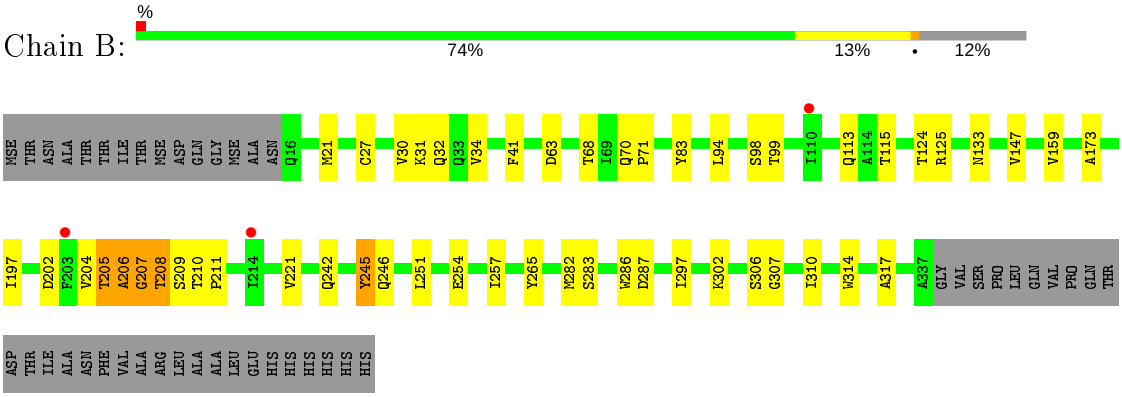
- Molecule 1: AhlB

Chain A:



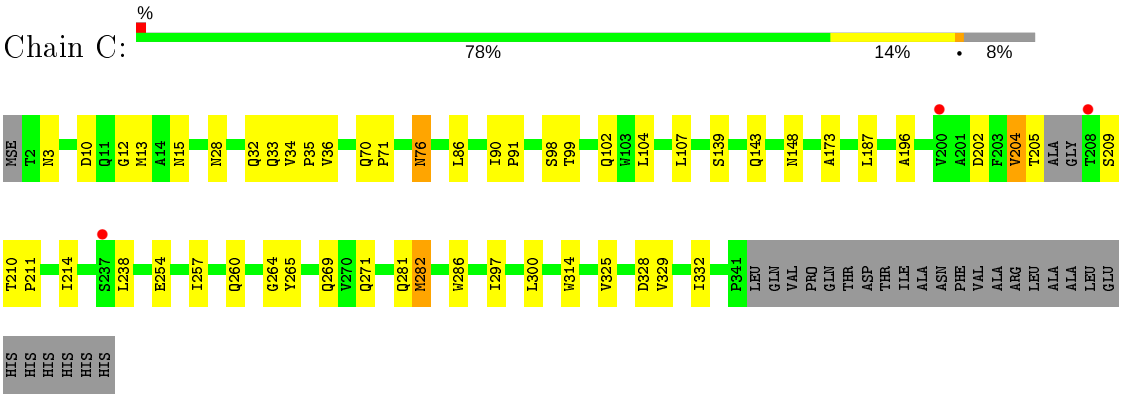
- Molecule 1: AhlB

Chain B:



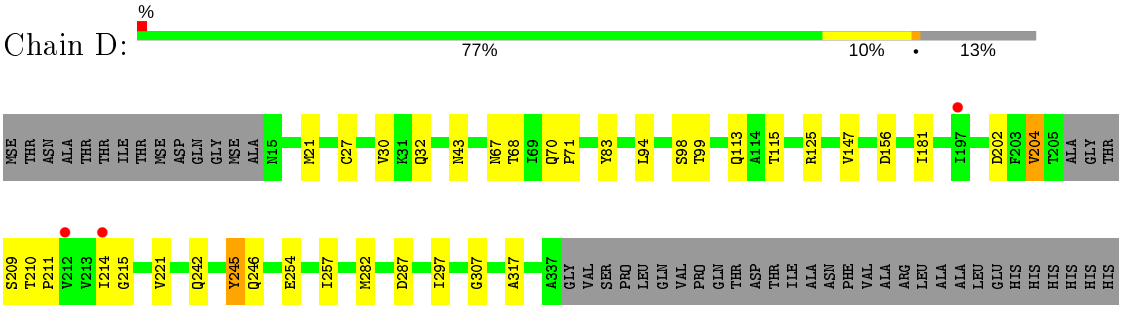
- Molecule 1: AhlB

Chain C:



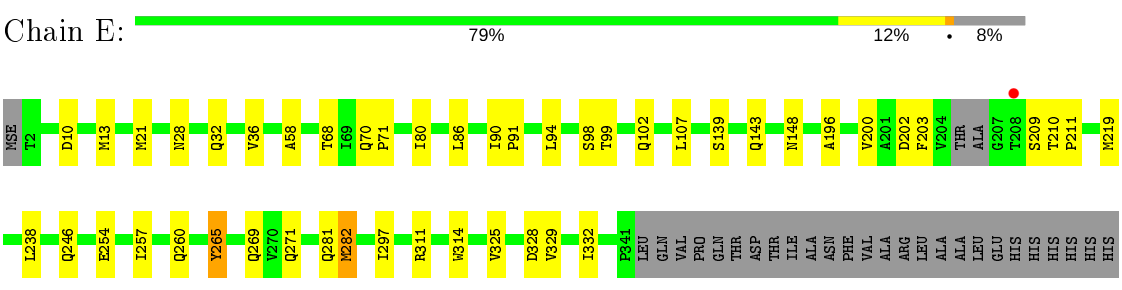
- Molecule 1: AhlB

Chain D:



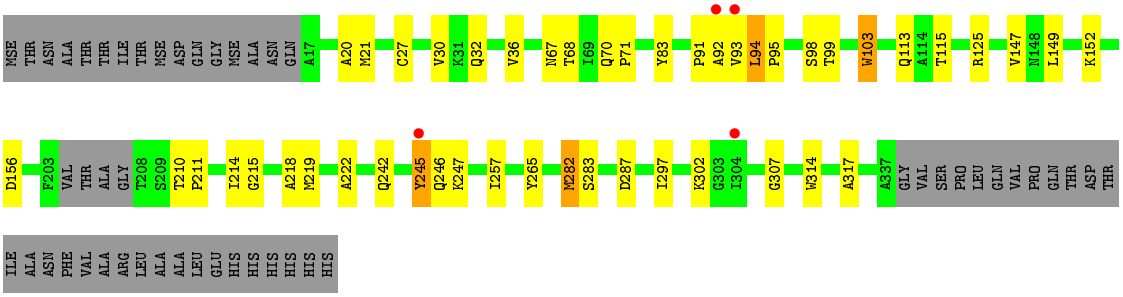
- Molecule 1: AhlB

Chain E:



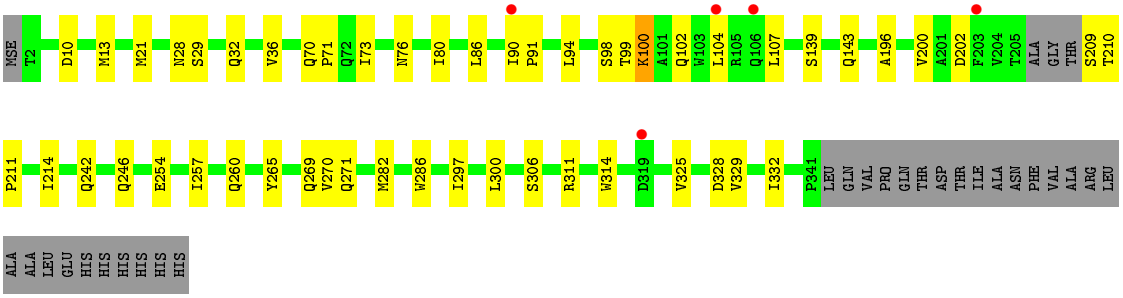
- Molecule 1: AhlB

Chain F:



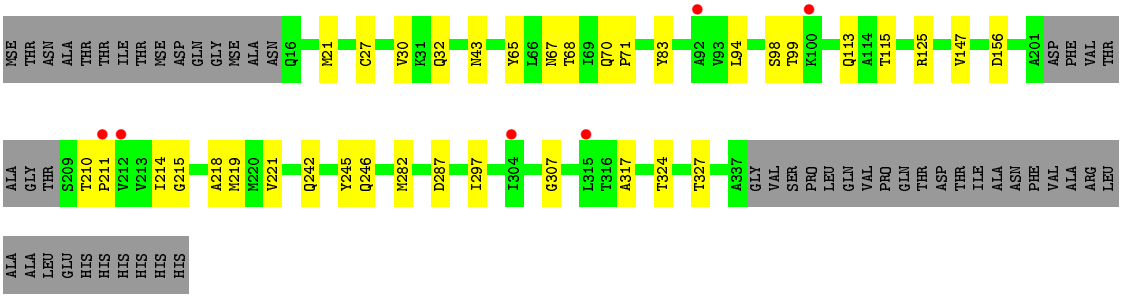
- Molecule 1: AhlB

Chain H:



- Molecule 1: AhlB

Chain I:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	363.64Å 116.53Å 217.41Å 90.00° 118.01° 90.00°	Depositor
Resolution (Å)	102.67 – 2.94 102.46 – 2.94	Depositor EDS
% Data completeness (in resolution range)	98.9 (102.67-2.94) 98.7 (102.46-2.94)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.54 (at 2.96Å)	Xtriage
Refinement program	REFMAC 5.8.0222	Depositor
R, R_{free}	0.222 , 0.239 0.230 , 0.223	Depositor DCC
R_{free} test set	8457 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å^2)	58.0	Xtriage
Anisotropy	0.074	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 50.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	24385	wwPDB-VP
Average B, all atoms (Å^2)	70.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.40% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

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

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|$ >5	RMSZ	#$\|Z\|$ >5
1	A	0.58	1/2509 (0.0%)	0.77	1/3410 (0.0%)
1	B	0.60	0/2397	0.78	3/3261 (0.1%)
1	C	0.60	1/2508 (0.0%)	0.77	0/3408
1	D	0.62	0/2388	0.78	2/3247 (0.1%)
1	E	0.58	0/2515	0.77	2/3417 (0.1%)
1	F	0.63	0/2364	0.80	4/3214 (0.1%)
1	G	0.60	0/2509	0.78	2/3410 (0.1%)
1	H	0.57	0/2502	0.75	2/3400 (0.1%)
1	I	0.61	0/2346	0.77	3/3189 (0.1%)
1	J	0.62	0/2397	0.79	3/3261 (0.1%)
All	All	0.60	2/24435 (0.0%)	0.78	22/33217 (0.1%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	260	GLN	C-O	-5.16	1.13	1.23
1	C	260	GLN	C-O	-5.03	1.13	1.23

The worst 5 of 22 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	J	282	MSE	CG-SE-CE	-8.68	79.81	98.90
1	I	282	MSE	CG-SE-CE	-7.52	82.36	98.90
1	E	21	MSE	CG-SE-CE	7.51	115.43	98.90
1	A	21	MSE	CG-SE-CE	7.03	114.38	98.90
1	G	21	MSE	CG-SE-CE	7.01	114.32	98.90

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	2489	0	2515	39	0
1	B	2375	0	2405	37	0
1	C	2488	0	2511	50	0
1	D	2367	0	2396	25	0
1	E	2492	0	2519	40	0
1	F	2343	0	2372	45	0
1	G	2489	0	2515	42	0
1	H	2482	0	2508	41	0
1	I	2326	0	2361	24	0
1	J	2375	0	2406	42	0
2	A	8	0	14	0	0
2	C	16	0	28	3	0
2	E	16	0	28	4	0
2	F	8	0	14	3	0
2	G	24	0	42	0	0
2	H	16	0	28	3	0
2	I	8	0	14	0	0
2	J	16	0	28	1	0
3	E	5	0	0	0	0
3	G	5	0	0	0	0
4	A	1	0	0	0	0
4	B	2	0	0	0	0
4	C	5	0	0	3	0
4	D	2	0	0	0	0
4	E	2	0	0	0	0
4	F	4	0	0	1	0
4	G	3	0	0	0	0
4	H	3	0	0	0	0
4	I	4	0	0	0	0
4	J	1	0	0	0	0
5	B	1	0	0	0	0
5	C	3	0	0	0	0
5	D	1	0	0	0	0
5	E	2	0	0	0	0
5	F	1	0	0	0	0
5	H	1	0	0	0	0
5	J	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	24385	0	24704	334	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 7.

The worst 5 of 334 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:13:MSE:HA	1:C:282:MSE:CE	1.89	1.03
1:C:13:MSE:N	1:C:282:MSE:HE2	1.79	0.97
1:E:260:GLN:HG3	2:E:401:MPD:H52	1.42	0.96
1:C:13:MSE:HA	1:C:282:MSE:HE3	1.46	0.96
1:C:13:MSE:CA	1:C:282:MSE:CE	2.44	0.95

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	334/367 (91%)	323 (97%)	10 (3%)	1 (0%)	41 69
1	B	320/367 (87%)	307 (96%)	8 (2%)	5 (2%)	9 30
1	C	334/367 (91%)	323 (97%)	10 (3%)	1 (0%)	41 69
1	D	316/367 (86%)	307 (97%)	7 (2%)	2 (1%)	25 56
1	E	335/367 (91%)	325 (97%)	10 (3%)	0	100 100
1	F	313/367 (85%)	305 (97%)	6 (2%)	2 (1%)	25 56
1	G	334/367 (91%)	324 (97%)	9 (3%)	1 (0%)	41 69
1	H	333/367 (91%)	322 (97%)	11 (3%)	0	100 100
1	I	311/367 (85%)	303 (97%)	7 (2%)	1 (0%)	41 69

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	J	320/367 (87%)	307 (96%)	8 (2%)	5 (2%)	9 30
All	All	3250/3670 (89%)	3146 (97%)	86 (3%)	18 (1%)	25 56

5 of 18 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	J	205	THR
1	B	205	THR
1	B	207	GLY
1	B	208	THR
1	F	94	LEU

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	272/288 (94%)	267 (98%)	5 (2%)	59 82
1	B	258/288 (90%)	255 (99%)	3 (1%)	71 89
1	C	272/288 (94%)	265 (97%)	7 (3%)	46 75
1	D	258/288 (90%)	255 (99%)	3 (1%)	71 89
1	E	272/288 (94%)	266 (98%)	6 (2%)	52 78
1	F	255/288 (88%)	251 (98%)	4 (2%)	62 84
1	G	272/288 (94%)	269 (99%)	3 (1%)	73 90
1	H	271/288 (94%)	267 (98%)	4 (2%)	65 85
1	I	253/288 (88%)	251 (99%)	2 (1%)	81 93
1	J	258/288 (90%)	253 (98%)	5 (2%)	57 81
All	All	2641/2880 (92%)	2599 (98%)	42 (2%)	62 84

5 of 42 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	99	THR

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Mol	Chain	Res	Type
1	D	21	MSE
1	H	265	TYR
1	C	148	ASN
1	C	269	GLN

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 13 such sidechains are listed below:

Mol	Chain	Res	Type
1	E	15	ASN
1	E	260	GLN
1	I	43	ASN
1	C	242	GLN
1	H	15	ASN

5.3.3 RNA

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains

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

5.5 Carbohydrates

There are no carbohydrates in this entry.

5.6 Ligand geometry

Of 53 ligands modelled in this entry, 37 are monoatomic - leaving 16 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	MPD	G	402	-	7,7,7	0.51	0	9,10,10	0.68	0
2	MPD	H	402	-	7,7,7	0.47	0	9,10,10	0.60	0
2	MPD	F	401	-	7,7,7	0.68	0	9,10,10	0.78	0
2	MPD	G	403	-	7,7,7	0.61	0	9,10,10	0.65	0
2	MPD	J	401	-	7,7,7	0.46	0	9,10,10	1.07	0
2	MPD	H	401	-	7,7,7	0.34	0	9,10,10	0.61	0
2	MPD	A	401	-	7,7,7	0.48	0	9,10,10	1.03	1 (11%)
2	MPD	C	401	-	7,7,7	0.49	0	9,10,10	1.01	1 (11%)
2	MPD	E	401	-	7,7,7	0.53	0	9,10,10	1.10	0
2	MPD	G	401	-	7,7,7	0.49	0	9,10,10	1.38	2 (22%)
2	MPD	I	401	-	7,7,7	0.83	0	9,10,10	1.19	1 (11%)
2	MPD	E	402	-	7,7,7	0.62	0	9,10,10	1.83	1 (11%)
2	MPD	C	402	-	7,7,7	0.64	0	9,10,10	0.63	0
3	PO4	E	403	-	4,4,4	0.94	0	6,6,6	0.59	0
3	PO4	G	404	-	4,4,4	0.89	0	6,6,6	0.83	0
2	MPD	J	402	-	7,7,7	0.41	0	9,10,10	0.72	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
2	MPD	G	402	-	-	3/5/5/5	-
2	MPD	H	402	-	-	0/5/5/5	-
2	MPD	F	401	-	-	2/5/5/5	-
2	MPD	G	403	-	-	2/5/5/5	-
2	MPD	J	401	-	-	1/5/5/5	-
2	MPD	H	401	-	-	0/5/5/5	-
2	MPD	A	401	-	-	0/5/5/5	-
2	MPD	C	401	-	-	0/5/5/5	-
2	MPD	E	401	-	-	1/5/5/5	-
2	MPD	G	401	-	-	0/5/5/5	-
2	MPD	I	401	-	-	0/5/5/5	-
2	MPD	E	402	-	-	1/5/5/5	-
2	MPD	C	402	-	-	0/5/5/5	-
2	MPD	J	402	-	-	1/5/5/5	-

There are no bond length outliers.

The worst 5 of 6 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	E	402	MPD	CM-C2-C1	-3.44	103.40	110.57
2	G	401	MPD	CM-C2-C1	2.87	116.55	110.57
2	A	401	MPD	O2-C2-C3	-2.36	100.94	109.80
2	I	401	MPD	O2-C2-CM	-2.07	101.44	108.08
2	G	401	MPD	O2-C2-C1	-2.04	101.55	108.08

There are no chirality outliers.

5 of 11 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	G	402	MPD	C1-C2-C3-C4
2	G	402	MPD	O2-C2-C3-C4
2	E	402	MPD	C2-C3-C4-C5
2	F	401	MPD	C2-C3-C4-O4
2	F	401	MPD	C2-C3-C4-C5

There are no ring outliers.

7 monomers are involved in 14 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	F	401	MPD	3	0
2	H	401	MPD	3	0
2	C	401	MPD	2	0
2	E	401	MPD	2	0
2	E	402	MPD	2	0
2	C	402	MPD	1	0
2	J	402	MPD	1	0

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

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	332/367 (90%)	0.35	6 (1%)	68	69	47, 70, 120, 139	0
1	B	318/367 (86%)	0.24	3 (0%)	84	85	44, 67, 119, 160	0
1	C	332/367 (90%)	0.27	3 (0%)	84	85	31, 61, 111, 141	0
1	D	316/367 (86%)	0.26	3 (0%)	84	85	38, 56, 113, 158	0
1	E	332/367 (90%)	0.27	1 (0%)	94	94	34, 66, 122, 156	0
1	F	313/367 (85%)	0.36	4 (1%)	77	78	39, 67, 117, 142	0
1	G	332/367 (90%)	0.38	5 (1%)	73	75	35, 62, 108, 156	0
1	H	331/367 (90%)	0.23	5 (1%)	73	75	46, 74, 126, 150	0
1	I	311/367 (84%)	0.34	6 (1%)	66	67	42, 66, 119, 151	0
1	J	318/367 (86%)	0.28	2 (0%)	89	90	35, 54, 101, 149	0
All	All	3235/3670 (88%)	0.30	38 (1%)	79	80	31, 65, 119, 160	0

The worst 5 of 38 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	I	211	PRO	3.9
1	A	203	PHE	3.8
1	J	203	PHE	3.7
1	D	212	VAL	3.3
1	A	319	ASP	3.2

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

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

6.3 Carbohydrates (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^{th} 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	NA	C	409	1/1	0.30	1.31	83,83,83,83	0
3	PO4	G	404	5/5	0.70	0.95	134,155,173,200	0
4	CL	E	405	1/1	0.75	0.19	78,78,78,78	0
4	CL	F	404	1/1	0.77	0.13	72,72,72,72	0
4	CL	C	405	1/1	0.79	0.14	83,83,83,83	0
4	CL	A	402	1/1	0.80	0.25	107,107,107,107	0
4	CL	G	405	1/1	0.81	0.23	87,87,87,87	0
4	CL	H	403	1/1	0.82	0.19	98,98,98,98	0
4	CL	D	402	1/1	0.83	0.16	62,62,62,62	0
4	CL	B	401	1/1	0.84	0.19	69,69,69,69	0
5	NA	B	403	1/1	0.84	0.77	92,92,92,92	0
3	PO4	E	403	5/5	0.84	0.28	113,127,132,139	0
4	CL	H	405	1/1	0.84	0.16	75,75,75,75	0
4	CL	E	404	1/1	0.87	0.11	82,82,82,82	0
4	CL	F	403	1/1	0.87	0.23	76,76,76,76	0
4	CL	C	406	1/1	0.88	0.14	62,62,62,62	0
5	NA	C	410	1/1	0.88	0.86	60,60,60,60	0
4	CL	I	403	1/1	0.89	0.14	63,63,63,63	0
4	CL	H	404	1/1	0.89	0.16	68,68,68,68	0
4	CL	C	404	1/1	0.89	0.41	118,118,118,118	0
5	NA	E	407	1/1	0.89	0.22	45,45,45,45	0
4	CL	F	405	1/1	0.90	0.16	72,72,72,72	0
4	CL	I	404	1/1	0.90	0.18	83,83,83,83	0
4	CL	G	407	1/1	0.90	0.26	64,64,64,64	0
4	CL	G	406	1/1	0.91	0.15	61,61,61,61	0
2	MPD	I	401	8/8	0.91	0.37	62,76,85,89	0
2	MPD	G	401	8/8	0.91	0.34	68,74,77,77	0
2	MPD	F	401	8/8	0.92	0.29	62,76,84,84	0
2	MPD	H	402	8/8	0.92	0.46	85,96,99,100	0
2	MPD	E	402	8/8	0.92	0.37	70,77,86,92	0
2	MPD	G	403	8/8	0.93	0.34	79,82,98,100	0
4	CL	C	403	1/1	0.93	0.11	68,68,68,68	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	CL	I	405	1/1	0.93	0.19	76,76,76,76	0
5	NA	E	406	1/1	0.94	0.75	65,65,65,65	0
2	MPD	G	402	8/8	0.94	0.34	76,80,84,85	0
2	MPD	H	401	8/8	0.94	0.39	67,80,82,90	0
4	CL	B	402	1/1	0.94	0.91	102,102,102,102	0
4	CL	F	402	1/1	0.95	0.72	92,92,92,92	0
2	MPD	A	401	8/8	0.95	0.34	74,82,91,92	0
4	CL	C	407	1/1	0.95	0.43	84,84,84,84	0
2	MPD	C	401	8/8	0.95	0.39	64,71,73,76	0
4	CL	I	402	1/1	0.95	0.42	82,82,82,82	0
5	NA	H	406	1/1	0.96	0.46	63,63,63,63	0
2	MPD	C	402	8/8	0.96	0.38	50,63,66,70	0
4	CL	D	401	1/1	0.96	0.70	94,94,94,94	0
5	NA	J	404	1/1	0.96	0.63	62,62,62,62	0
2	MPD	E	401	8/8	0.96	0.34	63,72,78,78	0
2	MPD	J	401	8/8	0.96	0.33	66,75,77,79	0
2	MPD	J	402	8/8	0.96	0.44	87,92,103,104	0
4	CL	J	403	1/1	0.97	0.99	90,90,90,90	0
5	NA	D	403	1/1	0.97	1.00	60,60,60,60	0
5	NA	C	408	1/1	0.97	0.21	39,39,39,39	0
5	NA	F	406	1/1	0.98	0.60	60,60,60,60	0

6.5 Other polymers (i)

There are no such residues in this entry.