wwPDB X-ray Structure Validation Summary Report (i)

Jun 15, 2024 – 08:51 PM EDT

PDB ID	:	4NXK
Title	:	Crystal structure of Abp-D197A, a catalytic mutant of a GH27-b-L-arabinopyranosidase from Geobacillus stearothermophilus
Authors	:	Lansky, S.; Solomon, H.V.; Salama, R.; Belrhali, H.; Shoham, Y.; Shoham, G.
Deposited on	:	2013-12-09
Resolution	:	2.30 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 types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

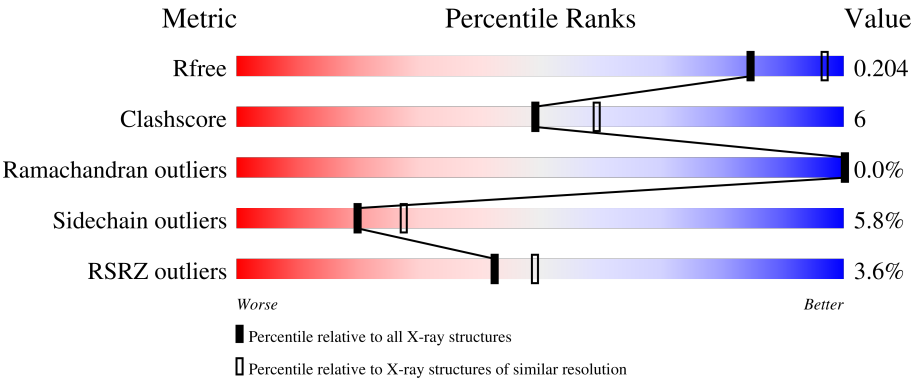
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.37.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.30 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	5042 (2.30-2.30)
Clashscore	141614	5643 (2.30-2.30)
Ramachandran outliers	138981	5575 (2.30-2.30)
Sidechain outliers	138945	5575 (2.30-2.30)
RSRZ outliers	127900	4938 (2.30-2.30)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	448	88% 8%
1	B	448	85% 9%
1	C	448	83% 10%
1	D	448	86% 10%
1	E	448	86% 9%

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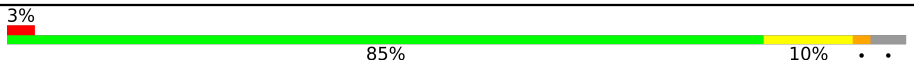
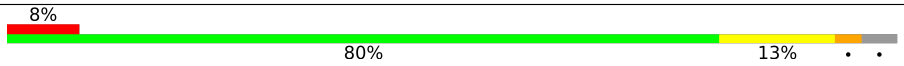
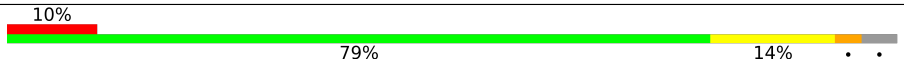
Mol	Chain	Length	Quality of chain
1	F	448	
1	G	448	
1	H	448	

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	SO4	H	502	-	-	X	-
3	GOL	B	509	-	-	-	X
3	GOL	C	510	-	X	-	-
3	GOL	C	513	-	X	-	-
3	GOL	C	514	-	-	X	-
3	GOL	E	510	-	X	-	-
3	GOL	H	509	-	-	X	-
4	CIT	A	513	-	X	X	-
4	CIT	B	514	-	X	X	-
4	CIT	C	515	-	-	X	-
4	CIT	D	516	-	-	X	-
4	CIT	E	514	-	-	X	-
4	CIT	G	509	-	X	-	-

2 Entry composition (i)

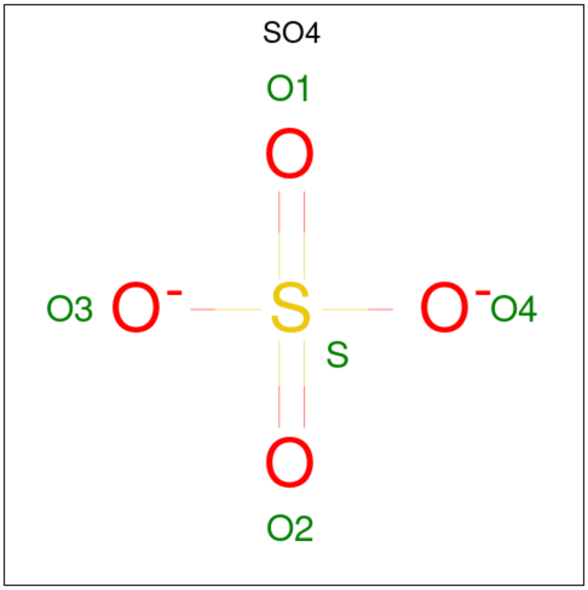
There are 5 unique types of molecules in this entry. The entry contains 31524 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Abp, a GH27 beta-L-arabinopyranosidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	431	Total	C	N	O	S	0	4	0
			3494	2235	599	635	25			
1	B	430	Total	C	N	O	S	0	2	0
			3482	2227	598	632	25			
1	C	430	Total	C	N	O	S	0	2	0
			3479	2226	597	631	25			
1	D	435	Total	C	N	O	S	0	2	0
			3509	2247	604	633	25			
1	E	431	Total	C	N	O	S	0	2	0
			3481	2227	598	631	25			
1	F	430	Total	C	N	O	S	0	0	0
			3467	2218	596	628	25			
1	G	430	Total	C	N	O	S	0	2	0
			3479	2226	597	631	25			
1	H	430	Total	C	N	O	S	0	3	0
			3483	2230	597	629	27			

- Molecule 2 is SULFATE ION (three-letter code: SO4) (formula: O_4S).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total O S 5 4 1	0	0
2	A	1	Total O S 5 4 1	0	0
2	A	1	Total O S 5 4 1	0	0
2	A	1	Total O S 5 4 1	0	0
2	A	1	Total O S 5 4 1	0	0
2	A	1	Total O S 5 4 1	0	0
2	A	1	Total O S 5 4 1	0	0
2	A	1	Total O S 5 4 1	0	0
2	A	1	Total O S 5 4 1	0	0
2	B	1	Total O S 5 4 1	0	0
2	B	1	Total O S 5 4 1	0	0
2	B	1	Total O S 5 4 1	0	0
2	B	1	Total O S 5 4 1	0	0
2	B	1	Total O S 5 4 1	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	B	1	Total O S 5 4 1	0	0
2	B	1	Total O S 5 4 1	0	0
2	B	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	D	1	Total O S 5 4 1	0	0
2	D	1	Total O S 5 4 1	0	0
2	D	1	Total O S 5 4 1	0	0
2	D	1	Total O S 5 4 1	0	0
2	D	1	Total O S 5 4 1	0	0
2	D	1	Total O S 5 4 1	0	0
2	D	1	Total O S 5 4 1	0	0
2	D	1	Total O S 5 4 1	0	0
2	D	1	Total O S 5 4 1	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	D	1	Total O S 5 4 1	0	0
2	D	1	Total O S 5 4 1	0	0
2	E	1	Total O S 5 4 1	0	0
2	E	1	Total O S 5 4 1	0	0
2	E	1	Total O S 5 4 1	0	0
2	E	1	Total O S 5 4 1	0	0
2	E	1	Total O S 5 4 1	0	0
2	E	1	Total O S 5 4 1	0	0
2	E	1	Total O S 5 4 1	0	0
2	E	1	Total O S 5 4 1	0	0
2	E	1	Total O S 5 4 1	0	0
2	F	1	Total O S 5 4 1	0	0
2	F	1	Total O S 5 4 1	0	0
2	F	1	Total O S 5 4 1	0	0
2	F	1	Total O S 5 4 1	0	0
2	F	1	Total O S 5 4 1	0	0
2	F	1	Total O S 5 4 1	0	0
2	F	1	Total O S 5 4 1	0	0
2	G	1	Total O S 5 4 1	0	0
2	G	1	Total O S 5 4 1	0	0
2	G	1	Total O S 5 4 1	0	0

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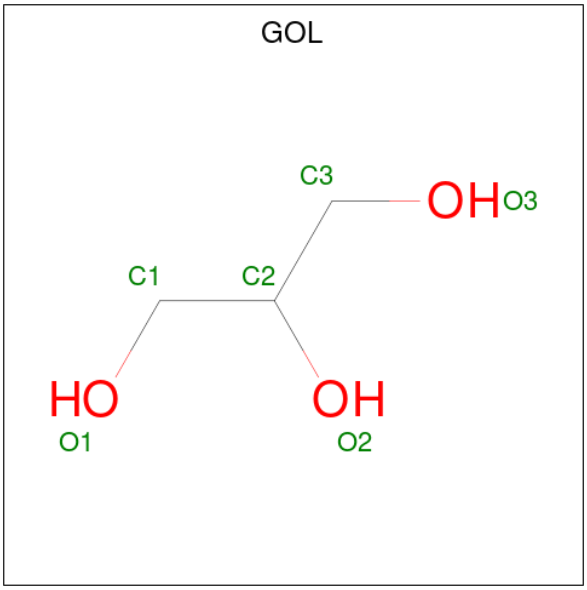
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	G	1	Total O S 5 4 1	0	0
2	G	1	Total O S 5 4 1	0	0
2	G	1	Total O S 5 4 1	0	0
2	H	1	Total O S 5 4 1	0	0
2	H	1	Total O S 5 4 1	0	0
2	H	1	Total O S 5 4 1	0	0
2	H	1	Total O S 5 4 1	0	0
2	H	1	Total O S 5 4 1	0	0
2	H	1	Total O S 5 4 1	0	0
2	H	1	Total O S 5 4 1	0	0

- Molecule 3 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



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

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

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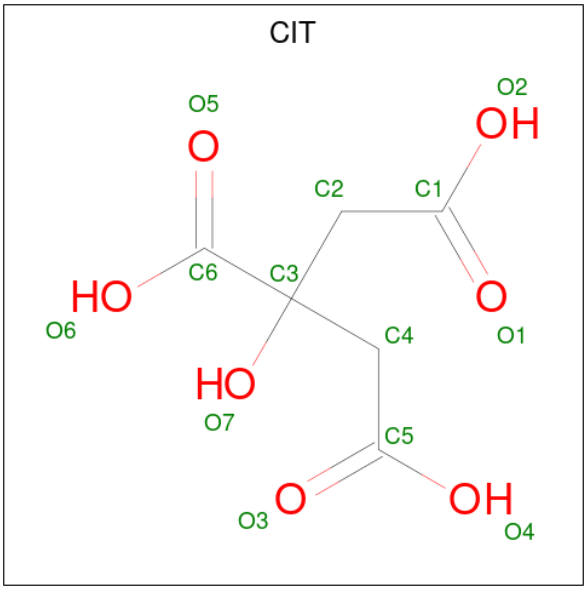
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	F	1	Total C O 6 3 3	0	0
3	F	1	Total C O 6 3 3	0	0
3	F	1	Total C O 6 3 3	0	0
3	G	1	Total C O 6 3 3	0	0
3	G	1	Total C O 6 3 3	0	0
3	H	1	Total C O 6 3 3	0	0
3	H	1	Total C O 6 3 3	0	0
3	H	1	Total C O 6 3 3	0	0

- Molecule 4 is CITRIC ACID (three-letter code: CIT) (formula: $C_6H_8O_7$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C O 13 6 7	0	0
4	B	1	Total C O 13 6 7	0	0
4	C	1	Total C O 13 6 7	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	D	1	Total C O 13 6 7	0	0
4	E	1	Total C O 13 6 7	0	0
4	G	1	Total C O 13 6 7	0	0

- Molecule 5 is water.

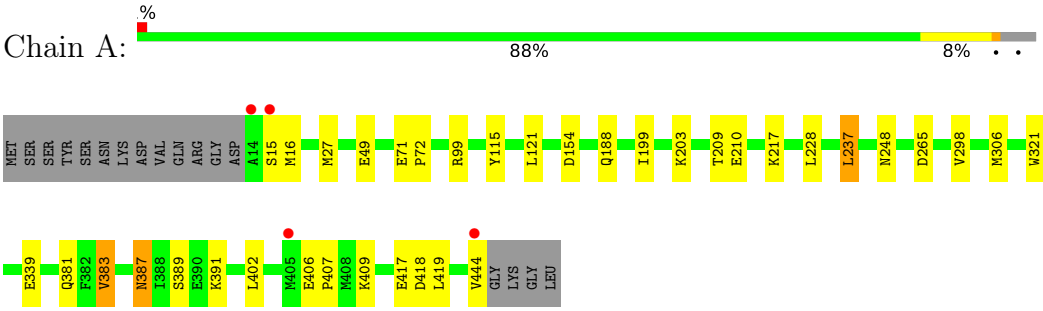
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	574	Total O 574 574	0	0
5	B	491	Total O 491 491	0	0
5	C	433	Total O 433 433	0	0
5	D	402	Total O 402 402	0	0
5	E	377	Total O 377 377	0	0
5	F	299	Total O 299 299	0	0
5	G	295	Total O 295 295	0	0
5	H	191	Total O 191 191	0	0

3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

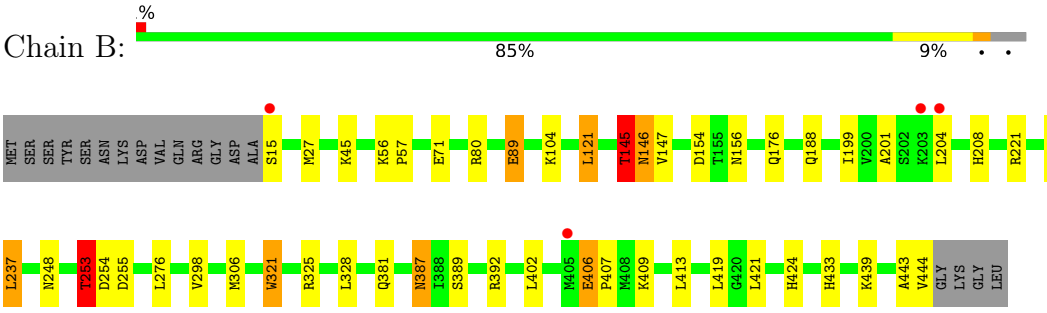
• Molecule 1: Abp, a GH27 beta-L-arabinopyranosidase

Chain A:



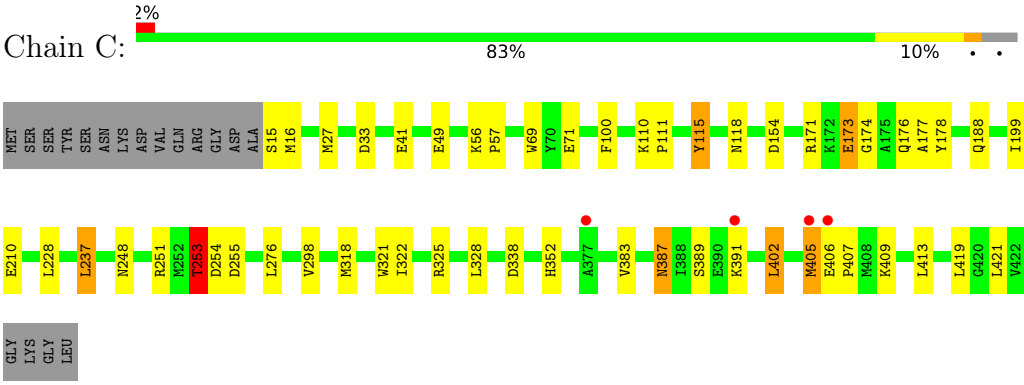
• Molecule 1: Abp, a GH27 beta-L-arabinopyranosidase

Chain B:



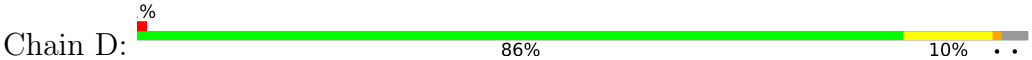
• Molecule 1: Abp, a GH27 beta-L-arabinopyranosidase

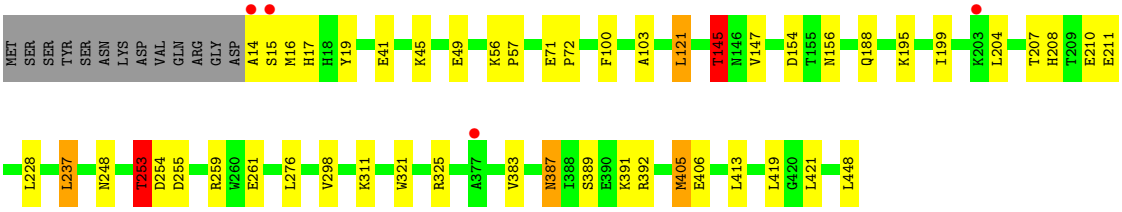
Chain C:



• Molecule 1: Abp, a GH27 beta-L-arabinopyranosidase

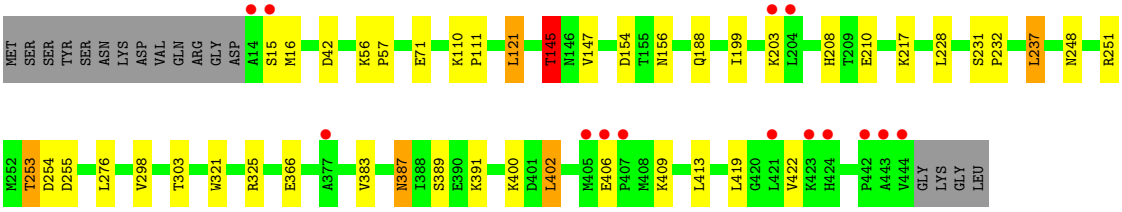
Chain D:





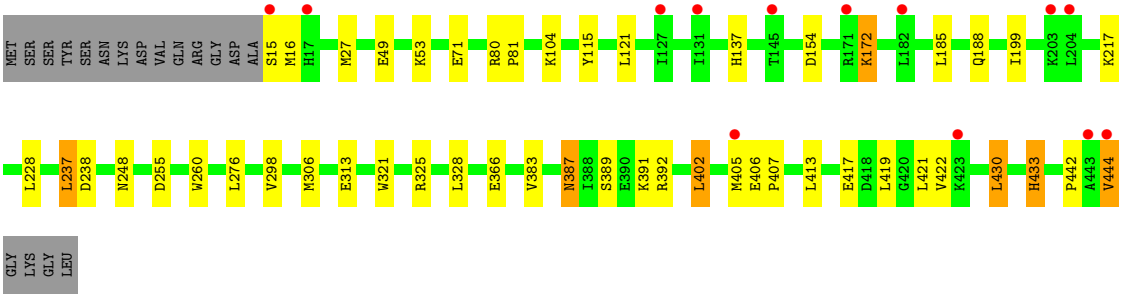
• Molecule 1: Abp, a GH27 beta-L-arabinopyranosidase

Chain E:



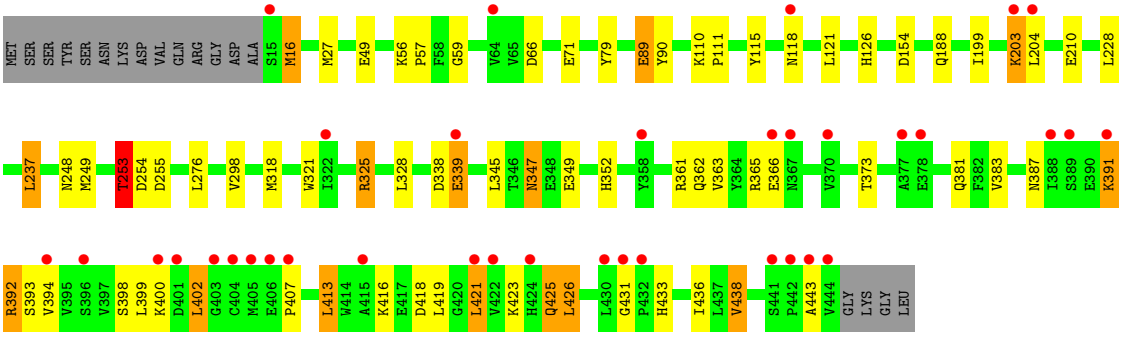
• Molecule 1: Abp, a GH27 beta-L-arabinopyranosidase

Chain F:



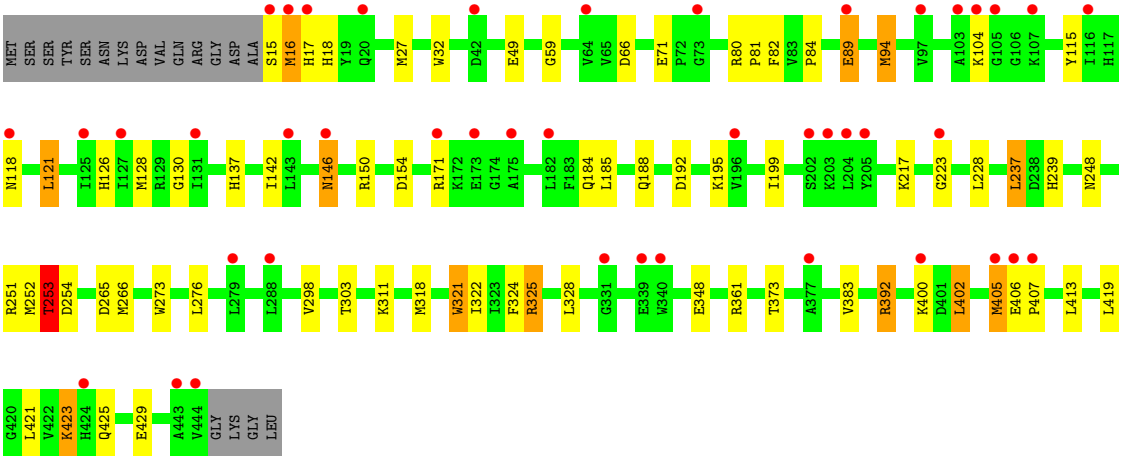
• Molecule 1: Abp, a GH27 beta-L-arabinopyranosidase

Chain G:



• Molecule 1: Abp, a GH27 beta-L-arabinopyranosidase

Chain H:


MET SER SER TYR SER ASN LYS ASP VAL GLN ARG GLY ASP ALA S15 M16 H17 H18 Y19 Q20 M27 W32 D42 E49 G59 V64 V65 D66 E71 P72 G73 R80 P81 F82 V83 P84 E89 M94 V97 A103 K104 G105 G106 K107 Y115 I116 H117
N118 L121 I125 H126 I127 M128 R129 G130 I131 H137 I142 L143 N146 R150 D154 R171 K172 E173 G174 A175 L182 F183 Q184 L185 Q188 D192 K195 V196 I199 S202 K203 L204 Y205 K217 G223 L228 L237 D238 H239 N248
R251 M252 T253 D254 D265 M266 W273 L276 L279 L288 V298 T303 K311 M318 W321 I322 I323 F324 R325 L328 G331 E339 W340 E348 R361 T373 A377 V383 R392 K400 D401 L402 M405 E406 P407 L413 L419
G420 L421 V422 K423 H424 Q425 E429 A443 V444 GLY LYS GLY LEU

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	107.70Å 203.53Å 286.95Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	24.86 – 2.30 24.84 – 2.30	Depositor EDS
% Data completeness (in resolution range)	96.3 (24.86-2.30) 96.4 (24.84-2.30)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.65 (at 2.31Å)	Xtriage
Refinement program	REFMAC 5.7.0029	Depositor
R, R_{free}	0.170 , 0.201 0.175 , 0.204	Depositor DCC
R_{free} test set	13611 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å^2)	26.7	Xtriage
Anisotropy	0.972	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 47.2	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	31524	wwPDB-VP
Average B, all atoms (Å^2)	36.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.19% 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: CIT, SO4, GOL

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	1.07	0/3608	0.92	7/4898 (0.1%)
1	B	1.03	1/3587 (0.0%)	0.91	9/4869 (0.2%)
1	C	0.99	4/3587 (0.1%)	0.89	8/4869 (0.2%)
1	D	0.95	1/3617 (0.0%)	0.90	9/4906 (0.2%)
1	E	0.88	0/3589	0.86	6/4873 (0.1%)
1	F	0.87	1/3569 (0.0%)	0.88	8/4845 (0.2%)
1	G	0.86	0/3587	0.90	6/4869 (0.1%)
1	H	0.81	0/3594	0.87	10/4877 (0.2%)
All	All	0.94	7/28738 (0.0%)	0.89	63/39006 (0.2%)

The worst 5 of 7 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	178	TYR	CG-CD1	-5.57	1.31	1.39
1	D	325	ARG	CZ-NH1	5.39	1.40	1.33
1	C	173	GLU	CD-OE1	5.30	1.31	1.25
1	C	115	TYR	CG-CD2	-5.23	1.32	1.39
1	B	321	TRP	CG-CD1	-5.20	1.29	1.36

The worst 5 of 63 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	325	ARG	NE-CZ-NH2	-9.75	115.43	120.30
1	C	154	ASP	CB-CG-OD2	-8.71	110.46	118.30
1	C	171	ARG	NE-CZ-NH1	8.58	124.59	120.30
1	E	154	ASP	CB-CG-OD2	-8.44	110.70	118.30
1	D	405	MET	CG-SD-CE	8.29	113.46	100.20

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	3494	0	3376	35	0
1	B	3482	0	3360	28	0
1	C	3479	0	3361	46	0
1	D	3509	0	3408	36	0
1	E	3481	0	3365	21	0
1	F	3467	0	3347	18	0
1	G	3479	0	3361	56	0
1	H	3483	0	3373	73	0
2	A	45	0	0	0	0
2	B	40	0	0	0	0
2	C	45	0	0	1	0
2	D	55	0	0	3	0
2	E	45	0	0	0	0
2	F	35	0	0	0	0
2	G	30	0	0	0	0
2	H	35	0	0	3	0
3	A	18	0	24	3	0
3	B	30	0	40	3	0
3	C	30	0	37	9	0
3	D	24	0	31	6	0
3	E	24	0	31	5	0
3	F	24	0	32	3	0
3	G	12	0	16	3	0
3	H	18	0	24	11	0
4	A	13	0	5	15	0
4	B	13	0	5	6	0
4	C	13	0	5	8	0
4	D	13	0	5	9	0
4	E	13	0	5	7	0
4	G	13	0	5	3	0
5	A	574	0	0	14	0
5	B	491	0	0	8	0
5	C	433	0	0	13	0
5	D	402	0	0	6	0
5	E	377	0	0	5	0
5	F	299	0	0	5	0
5	G	295	0	0	22	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	H	191	0	0	25	0
All	All	31524	0	27216	331	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.

The worst 5 of 331 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)
3:E:510:GOL:O3	3:E:510:GOL:C3	1.65	1.45
1:G:352:HIS:HB2	5:G:864:HOH:O	1.32	1.26
1:H:16:MET:CE	1:H:16:MET:HA	1.67	1.24
4:D:516:CIT:O2	4:D:516:CIT:C6	1.85	1.15
1:H:16:MET:HA	1:H:16:MET:HE3	1.12	1.09

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	433/448 (97%)	419 (97%)	14 (3%)	0	100	100
1	B	430/448 (96%)	414 (96%)	16 (4%)	0	100	100
1	C	430/448 (96%)	419 (97%)	11 (3%)	0	100	100
1	D	435/448 (97%)	422 (97%)	13 (3%)	0	100	100
1	E	431/448 (96%)	419 (97%)	12 (3%)	0	100	100
1	F	428/448 (96%)	416 (97%)	12 (3%)	0	100	100
1	G	430/448 (96%)	416 (97%)	14 (3%)	0	100	100
1	H	431/448 (96%)	418 (97%)	12 (3%)	1 (0%)	47	58
All	All	3448/3584 (96%)	3343 (97%)	104 (3%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	H	325	ARG

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	372/382 (97%)	359 (96%)	13 (4%)	36	50
1	B	370/382 (97%)	348 (94%)	22 (6%)	19	27
1	C	370/382 (97%)	351 (95%)	19 (5%)	24	33
1	D	372/382 (97%)	354 (95%)	18 (5%)	25	36
1	E	370/382 (97%)	348 (94%)	22 (6%)	19	27
1	F	368/382 (96%)	344 (94%)	24 (6%)	17	23
1	G	370/382 (97%)	339 (92%)	31 (8%)	11	13
1	H	371/382 (97%)	348 (94%)	23 (6%)	18	25
All	All	2963/3056 (97%)	2791 (94%)	172 (6%)	20	27

5 of 172 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	F	430	LEU
1	G	418	ASP
1	G	71	GLU
1	G	339	GLU
1	H	16	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 48 such sidechains are listed below:

Mol	Chain	Res	Type
1	E	356	ASN
1	F	356	ASN
1	E	387	ASN
1	F	75	ASN

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Mol	Chain	Res	Type
1	F	433	HIS

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 monosaccharides in this entry.

5.6 Ligand geometry

102 ligands are modelled in this entry.

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	SO4	H	505	-	4,4,4	0.50	0	6,6,6	0.48	0
3	GOL	D	514	-	5,5,5	0.27	0	5,5,5	0.29	0
2	SO4	B	507	-	4,4,4	0.62	0	6,6,6	0.59	0
2	SO4	A	505	-	4,4,4	0.48	0	6,6,6	0.57	0
3	GOL	B	511	-	5,5,5	0.47	0	5,5,5	1.67	1 (20%)
2	SO4	H	506	-	4,4,4	0.60	0	6,6,6	0.35	0
2	SO4	B	505	-	4,4,4	0.79	0	6,6,6	1.29	0
4	CIT	B	514	-	12,12,12	1.84	2 (16%)	17,17,17	2.59	7 (41%)
2	SO4	H	501	-	4,4,4	0.79	0	6,6,6	0.66	0
2	SO4	G	506	-	4,4,4	0.56	0	6,6,6	0.48	0
2	SO4	B	501	-	4,4,4	0.96	0	6,6,6	1.21	1 (16%)
2	SO4	D	509	-	4,4,4	0.58	0	6,6,6	0.41	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
2	SO4	G	504	-	4,4,4	0.50	0	6,6,6	0.53	0
2	SO4	G	503	-	4,4,4	0.72	0	6,6,6	0.90	0
2	SO4	H	507	-	4,4,4	0.55	0	6,6,6	0.64	0
2	SO4	B	506	-	4,4,4	1.11	0	6,6,6	0.91	0
3	GOL	C	513	-	5,5,5	1.22	1 (20%)	5,5,5	1.91	2 (40%)
2	SO4	A	501	-	4,4,4	0.75	0	6,6,6	0.47	0
2	SO4	A	506	-	4,4,4	0.60	0	6,6,6	1.11	1 (16%)
2	SO4	D	502	-	4,4,4	0.72	0	6,6,6	0.82	0
3	GOL	F	511	-	5,5,5	0.67	0	5,5,5	0.49	0
2	SO4	D	508	-	4,4,4	0.79	0	6,6,6	0.59	0
2	SO4	C	503	-	4,4,4	0.71	0	6,6,6	0.94	0
2	SO4	C	505	-	4,4,4	0.74	0	6,6,6	0.59	0
2	SO4	F	505	-	4,4,4	0.59	0	6,6,6	0.38	0
2	SO4	E	507	-	4,4,4	0.55	0	6,6,6	0.95	0
3	GOL	B	509	-	5,5,5	0.79	0	5,5,5	0.61	0
2	SO4	F	502	-	4,4,4	0.65	0	6,6,6	0.24	0
2	SO4	E	501	-	4,4,4	0.78	0	6,6,6	1.11	0
4	CIT	C	515	-	12,12,12	2.53	5 (41%)	17,17,17	2.81	5 (29%)
3	GOL	F	509	-	5,5,5	0.40	0	5,5,5	0.32	0
2	SO4	C	509	-	4,4,4	0.96	0	6,6,6	0.71	0
2	SO4	E	502	-	4,4,4	0.40	0	6,6,6	0.33	0
2	SO4	E	508	-	4,4,4	0.81	0	6,6,6	0.68	0
2	SO4	D	506	-	4,4,4	0.60	0	6,6,6	0.58	0
4	CIT	E	514	-	12,12,12	1.32	1 (8%)	17,17,17	2.08	6 (35%)
2	SO4	E	504	-	4,4,4	0.68	0	6,6,6	0.74	0
2	SO4	F	507	-	4,4,4	0.57	0	6,6,6	0.45	0
2	SO4	C	508	-	4,4,4	0.46	0	6,6,6	0.46	0
2	SO4	A	502	-	4,4,4	0.53	0	6,6,6	0.68	0
2	SO4	G	505	-	4,4,4	0.67	0	6,6,6	0.72	0
2	SO4	D	503	-	4,4,4	0.51	0	6,6,6	0.60	0
3	GOL	D	515	-	5,5,5	0.53	0	5,5,5	0.92	0
2	SO4	H	503	-	4,4,4	0.47	0	6,6,6	0.36	0
2	SO4	G	502	-	4,4,4	0.48	0	6,6,6	0.50	0
2	SO4	D	510	-	4,4,4	0.65	0	6,6,6	0.68	0
3	GOL	C	512	-	5,5,5	0.32	0	5,5,5	1.92	1 (20%)
2	SO4	E	506	-	4,4,4	0.73	0	6,6,6	0.42	0
2	SO4	D	511	-	4,4,4	0.56	0	6,6,6	0.18	0
3	GOL	C	511	-	5,5,5	0.56	0	5,5,5	1.23	0
3	GOL	G	507	-	5,5,5	1.08	0	5,5,5	0.99	0
2	SO4	B	503	-	4,4,4	0.59	0	6,6,6	0.39	0
4	CIT	D	516	-	12,12,12	2.11	4 (33%)	17,17,17	2.09	7 (41%)
3	GOL	H	508	-	5,5,5	0.50	0	5,5,5	0.65	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
2	SO4	A	503	-	4,4,4	0.53	0	6,6,6	0.55	0
2	SO4	C	507	-	4,4,4	0.79	0	6,6,6	1.68	2 (33%)
2	SO4	A	507	-	4,4,4	1.01	0	6,6,6	1.12	0
2	SO4	A	509	-	4,4,4	0.45	0	6,6,6	0.57	0
3	GOL	A	510	-	5,5,5	0.74	0	5,5,5	0.98	0
2	SO4	H	502	-	4,4,4	0.62	0	6,6,6	0.43	0
2	SO4	C	501	-	4,4,4	0.69	0	6,6,6	0.50	0
3	GOL	E	512	-	5,5,5	0.63	0	5,5,5	0.86	0
2	SO4	C	502	-	4,4,4	0.80	0	6,6,6	0.64	0
2	SO4	F	503	-	4,4,4	0.46	0	6,6,6	0.78	0
2	SO4	D	504	-	4,4,4	0.35	0	6,6,6	0.59	0
3	GOL	F	510	-	5,5,5	0.43	0	5,5,5	0.47	0
4	CIT	A	513	-	12,12,12	3.35	4 (33%)	17,17,17	1.63	2 (11%)
3	GOL	E	513	-	5,5,5	0.73	0	5,5,5	1.40	1 (20%)
2	SO4	G	501	-	4,4,4	0.64	0	6,6,6	0.86	0
2	SO4	E	509	-	4,4,4	0.63	0	6,6,6	0.93	0
2	SO4	A	508	-	4,4,4	0.78	0	6,6,6	1.13	0
2	SO4	C	504	-	4,4,4	0.52	0	6,6,6	0.95	0
3	GOL	E	510	-	5,5,5	2.79	2 (40%)	5,5,5	2.91	3 (60%)
2	SO4	A	504	-	4,4,4	0.93	0	6,6,6	1.77	1 (16%)
3	GOL	G	508	-	5,5,5	0.64	0	5,5,5	1.22	1 (20%)
2	SO4	B	504	-	4,4,4	0.45	0	6,6,6	0.63	0
3	GOL	A	512	-	5,5,5	0.61	0	5,5,5	0.55	0
3	GOL	A	511	-	5,5,5	0.39	0	5,5,5	0.49	0
3	GOL	C	514	-	5,5,5	1.18	1 (20%)	5,5,5	0.91	0
2	SO4	D	507	-	4,4,4	0.63	0	6,6,6	1.39	2 (33%)
2	SO4	D	505	-	4,4,4	0.48	0	6,6,6	0.55	0
3	GOL	B	512	-	5,5,5	0.26	0	5,5,5	1.29	1 (20%)
3	GOL	D	512	-	5,5,5	1.04	1 (20%)	5,5,5	1.12	0
3	GOL	H	510	-	5,5,5	0.26	0	5,5,5	0.36	0
2	SO4	C	506	-	4,4,4	0.80	0	6,6,6	0.43	0
3	GOL	B	510	-	5,5,5	0.73	0	5,5,5	0.65	0
3	GOL	H	509	-	5,5,5	0.60	0	5,5,5	0.91	0
3	GOL	C	510	-	5,5,5	1.24	0	5,5,5	2.52	2 (40%)
3	GOL	D	513	-	5,5,5	0.68	0	5,5,5	1.44	1 (20%)
3	GOL	B	513	-	5,5,5	0.61	0	5,5,5	1.17	1 (20%)
3	GOL	E	511	-	5,5,5	0.39	0	5,5,5	0.49	0
2	SO4	B	508	-	4,4,4	0.63	0	6,6,6	0.74	0
2	SO4	E	503	-	4,4,4	0.51	0	6,6,6	0.96	0
2	SO4	E	505	-	4,4,4	0.57	0	6,6,6	0.35	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
4	CIT	G	509	-	12,12,12	2.40	4 (33%)	17,17,17	3.23	8 (47%)
2	SO4	F	506	-	4,4,4	0.61	0	6,6,6	0.67	0
2	SO4	F	504	-	4,4,4	0.59	0	6,6,6	0.30	0
3	GOL	F	508	-	5,5,5	0.33	0	5,5,5	1.35	1 (20%)
2	SO4	H	504	-	4,4,4	0.80	0	6,6,6	0.38	0
2	SO4	D	501	-	4,4,4	0.54	0	6,6,6	0.43	0
2	SO4	B	502	-	4,4,4	0.64	0	6,6,6	0.90	0
2	SO4	F	501	-	4,4,4	0.46	0	6,6,6	0.35	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
3	GOL	E	510	-	-	3/4/4/4	-
3	GOL	C	512	-	-	2/4/4/4	-
3	GOL	D	514	-	-	4/4/4/4	-
3	GOL	G	508	-	-	4/4/4/4	-
3	GOL	A	512	-	-	3/4/4/4	-
3	GOL	G	507	-	-	4/4/4/4	-
3	GOL	C	511	-	-	0/4/4/4	-
3	GOL	B	509	-	-	2/4/4/4	-
3	GOL	A	511	-	-	0/4/4/4	-
3	GOL	C	514	-	-	2/4/4/4	-
4	CIT	C	515	-	-	7/16/16/16	-
3	GOL	B	511	-	-	2/4/4/4	-
3	GOL	F	509	-	-	2/4/4/4	-
3	GOL	B	512	-	-	0/4/4/4	-
3	GOL	D	512	-	-	3/4/4/4	-
4	CIT	D	516	-	-	5/16/16/16	-
3	GOL	H	508	-	-	4/4/4/4	-
3	GOL	H	510	-	-	4/4/4/4	-
4	CIT	B	514	-	-	10/16/16/16	-
3	GOL	B	510	-	-	2/4/4/4	-
3	GOL	H	509	-	-	4/4/4/4	-
3	GOL	C	510	-	-	4/4/4/4	-
3	GOL	D	513	-	-	3/4/4/4	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	GOL	B	513	-	-	2/4/4/4	-
3	GOL	A	510	-	-	0/4/4/4	-
4	CIT	E	514	-	-	7/16/16/16	-
3	GOL	E	511	-	-	2/4/4/4	-
3	GOL	E	512	-	-	2/4/4/4	-
4	CIT	G	509	-	-	10/16/16/16	-
3	GOL	C	513	-	-	4/4/4/4	-
3	GOL	F	508	-	-	2/4/4/4	-
3	GOL	F	510	-	-	4/4/4/4	-
4	CIT	A	513	-	-	12/16/16/16	-
3	GOL	D	515	-	-	0/4/4/4	-
3	GOL	E	513	-	-	2/4/4/4	-
3	GOL	F	511	-	-	4/4/4/4	-

The worst 5 of 25 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	513	CIT	C3-C6	-8.74	1.44	1.53
4	A	513	CIT	C4-C3	-6.34	1.45	1.53
4	G	509	CIT	C3-C6	-5.42	1.47	1.53
3	E	510	GOL	O3-C3	5.35	1.65	1.42
4	C	515	CIT	C3-C6	-4.69	1.48	1.53

The worst 5 of 57 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	C	515	CIT	C3-C2-C1	-7.15	96.50	113.81
4	G	509	CIT	C3-C2-C1	6.77	130.20	113.81
4	G	509	CIT	O6-C6-C3	6.13	123.69	113.05
4	B	514	CIT	O7-C3-C6	5.33	116.34	108.86
4	C	515	CIT	O5-C6-C3	-4.90	115.32	122.25

There are no chirality outliers.

5 of 125 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	B	509	GOL	O1-C1-C2-C3
3	B	511	GOL	O1-C1-C2-C3
3	B	513	GOL	O1-C1-C2-O2

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Mol	Chain	Res	Type	Atoms
3	B	513	GOL	O1-C1-C2-C3
3	C	510	GOL	C1-C2-C3-O3

There are no ring outliers.

28 monomers are involved in 98 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	H	506	SO4	1	0
4	B	514	CIT	6	0
2	C	505	SO4	1	0
4	C	515	CIT	8	0
3	F	509	GOL	2	0
4	E	514	CIT	7	0
2	D	510	SO4	1	0
3	C	511	GOL	2	0
3	G	507	GOL	1	0
4	D	516	CIT	9	0
2	H	502	SO4	2	0
3	E	512	GOL	1	0
2	D	504	SO4	1	0
3	F	510	GOL	1	0
4	A	513	CIT	15	0
3	E	510	GOL	2	0
3	G	508	GOL	2	0
3	A	512	GOL	3	0
3	C	514	GOL	4	0
3	B	512	GOL	1	0
3	D	512	GOL	3	0
3	H	509	GOL	11	0
3	C	510	GOL	3	0
3	D	513	GOL	3	0
3	B	513	GOL	2	0
3	E	511	GOL	2	0
4	G	509	CIT	3	0
2	D	501	SO4	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

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	431/448 (96%)	-0.65	4 (0%)	84	88	11, 17, 38, 100	0
1	B	430/448 (95%)	-0.61	4 (0%)	84	88	13, 23, 44, 96	0
1	C	430/448 (95%)	-0.48	7 (1%)	72	77	12, 24, 58, 108	0
1	D	435/448 (97%)	-0.46	4 (0%)	84	88	20, 28, 52, 109	0
1	E	431/448 (96%)	-0.31	14 (3%)	47	54	18, 29, 68, 123	0
1	F	430/448 (95%)	-0.10	13 (3%)	50	57	22, 37, 68, 113	0
1	G	430/448 (95%)	0.36	36 (8%)	11	15	20, 45, 79, 130	1 (0%)
1	H	430/448 (95%)	0.68	43 (10%)	7	10	29, 54, 82, 124	0
All	All	3447/3584 (96%)	-0.20	125 (3%)	42	49	11, 31, 70, 130	1 (0%)

The worst 5 of 125 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	H	444	VAL	10.7
1	C	444	VAL	8.5
1	G	405	MET	8.1
1	F	444	VAL	8.0
1	E	444	VAL	7.5

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

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, 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
3	GOL	B	509	6/6	0.71	0.54	58,68,77,80	0
2	SO4	E	501	5/5	0.77	0.22	67,77,81,109	0
3	GOL	F	511	6/6	0.77	0.20	60,71,75,82	0
2	SO4	F	502	5/5	0.78	0.21	77,81,98,115	0
2	SO4	E	502	5/5	0.79	0.34	87,116,121,127	0
3	GOL	F	510	6/6	0.79	0.32	69,76,87,91	0
2	SO4	H	504	5/5	0.79	0.37	61,88,101,103	0
4	CIT	B	514	13/13	0.79	0.28	41,70,87,88	0
2	SO4	F	504	5/5	0.81	0.32	73,79,109,111	0
2	SO4	F	503	5/5	0.81	0.34	72,77,104,107	0
2	SO4	G	506	5/5	0.82	0.27	76,103,107,111	0
3	GOL	H	510	6/6	0.83	0.27	73,83,87,104	0
2	SO4	H	506	5/5	0.83	0.44	98,99,112,117	0
3	GOL	E	512	6/6	0.84	0.31	60,66,69,73	0
2	SO4	D	507	5/5	0.84	0.24	61,65,78,83	0
2	SO4	G	502	5/5	0.84	0.34	66,88,106,106	0
3	GOL	B	512	6/6	0.84	0.17	55,64,67,72	0
3	GOL	D	515	6/6	0.84	0.13	48,58,67,71	0
2	SO4	C	507	5/5	0.85	0.23	39,40,70,80	5
2	SO4	C	509	5/5	0.85	0.27	66,67,83,102	0
4	CIT	A	513	13/13	0.85	0.23	34,51,69,69	0
2	SO4	D	501	5/5	0.85	0.35	96,99,111,124	0
4	CIT	G	509	13/13	0.85	0.22	49,64,81,91	0
3	GOL	A	512	6/6	0.86	0.21	61,65,69,72	0
2	SO4	G	504	5/5	0.86	0.35	73,84,103,105	0
2	SO4	A	505	5/5	0.86	0.25	71,72,98,101	0
2	SO4	F	505	5/5	0.86	0.35	105,112,128,128	0
3	GOL	E	510	6/6	0.86	0.24	28,29,34,35	0
4	CIT	E	514	13/13	0.86	0.25	51,79,91,96	0
2	SO4	C	503	5/5	0.86	0.29	76,89,97,100	0
2	SO4	H	503	5/5	0.87	0.34	96,103,112,116	0
2	SO4	F	507	5/5	0.87	0.34	68,80,81,99	0
3	GOL	H	508	6/6	0.87	0.22	54,60,76,80	0
2	SO4	E	505	5/5	0.87	0.32	80,89,103,103	0
2	SO4	H	507	5/5	0.87	0.44	84,88,103,114	0
2	SO4	H	502	5/5	0.87	0.37	81,87,105,106	0
4	CIT	C	515	13/13	0.87	0.30	42,60,81,81	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	CIT	D	516	13/13	0.87	0.29	54,71,79,84	0
3	GOL	E	513	6/6	0.87	0.26	47,51,57,59	0
3	GOL	F	509	6/6	0.87	0.23	45,58,75,79	0
2	SO4	D	509	5/5	0.88	0.33	71,93,95,105	0
2	SO4	D	502	5/5	0.88	0.28	61,64,83,85	0
3	GOL	C	514	6/6	0.88	0.26	27,35,47,54	0
3	GOL	H	509	6/6	0.89	0.19	48,55,68,71	0
2	SO4	D	511	5/5	0.89	0.27	71,96,107,107	0
2	SO4	D	503	5/5	0.89	0.22	60,83,94,104	0
2	SO4	B	501	5/5	0.89	0.25	54,65,82,90	0
3	GOL	C	512	6/6	0.89	0.17	45,52,69,72	0
2	SO4	A	504	5/5	0.89	0.24	57,72,75,83	0
3	GOL	D	513	6/6	0.89	0.20	35,44,47,48	0
2	SO4	H	501	5/5	0.89	0.16	63,66,76,97	0
2	SO4	E	504	5/5	0.90	0.30	65,82,90,91	0
2	SO4	C	501	5/5	0.90	0.29	65,83,86,90	0
2	SO4	E	508	5/5	0.90	0.19	74,79,114,125	0
2	SO4	E	509	5/5	0.90	0.33	73,74,89,98	0
2	SO4	A	501	5/5	0.90	0.39	59,75,87,105	0
2	SO4	G	505	5/5	0.90	0.36	69,70,91,107	0
2	SO4	B	503	5/5	0.90	0.37	80,90,94,100	0
2	SO4	F	501	5/5	0.91	0.30	81,92,101,104	0
2	SO4	C	502	5/5	0.91	0.24	64,90,94,99	0
3	GOL	D	514	6/6	0.91	0.25	60,74,80,81	0
2	SO4	D	504	5/5	0.91	0.28	72,91,106,117	0
3	GOL	G	508	6/6	0.91	0.10	34,41,46,52	0
2	SO4	D	505	5/5	0.91	0.27	69,94,98,107	0
2	SO4	B	507	5/5	0.91	0.33	66,91,99,113	0
2	SO4	H	505	5/5	0.92	0.33	80,95,101,106	0
2	SO4	E	506	5/5	0.92	0.29	46,73,80,81	0
2	SO4	C	506	5/5	0.92	0.28	60,66,76,86	0
2	SO4	G	503	5/5	0.92	0.21	67,75,77,82	0
2	SO4	B	502	5/5	0.92	0.29	52,84,94,99	0
2	SO4	B	505	5/5	0.92	0.27	50,75,78,80	0
3	GOL	C	511	6/6	0.92	0.16	31,44,47,47	0
2	SO4	C	508	5/5	0.93	0.33	82,83,86,94	0
2	SO4	F	506	5/5	0.93	0.28	63,72,80,93	0
2	SO4	D	510	5/5	0.93	0.25	79,82,92,95	0
2	SO4	C	505	5/5	0.93	0.28	65,81,89,90	0
2	SO4	B	508	5/5	0.93	0.33	57,68,75,92	0
2	SO4	D	506	5/5	0.93	0.28	66,80,90,95	0
2	SO4	B	506	5/5	0.93	0.21	34,44,50,60	5

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	SO4	D	508	5/5	0.93	0.29	47,60,76,84	0
2	SO4	A	509	5/5	0.94	0.34	74,74,92,98	0
3	GOL	A	511	6/6	0.94	0.13	26,31,41,48	0
3	GOL	E	511	6/6	0.94	0.14	36,42,48,58	0
2	SO4	E	503	5/5	0.95	0.26	66,66,80,81	0
3	GOL	F	508	6/6	0.95	0.16	34,37,41,44	0
3	GOL	B	513	6/6	0.95	0.20	35,40,51,59	0
2	SO4	A	508	5/5	0.95	0.21	50,57,67,68	0
2	SO4	A	506	5/5	0.95	0.21	60,66,69,78	0
3	GOL	G	507	6/6	0.95	0.13	29,34,37,45	0
3	GOL	C	513	6/6	0.95	0.14	33,43,47,47	0
2	SO4	A	507	5/5	0.95	0.21	36,40,45,59	0
3	GOL	B	510	6/6	0.96	0.09	28,36,38,43	0
3	GOL	D	512	6/6	0.96	0.13	25,28,32,35	0
3	GOL	B	511	6/6	0.96	0.17	24,28,34,35	0
3	GOL	C	510	6/6	0.96	0.14	22,25,27,27	0
3	GOL	A	510	6/6	0.97	0.10	16,17,22,23	0
2	SO4	A	503	5/5	0.97	0.13	39,54,55,58	0
2	SO4	B	504	5/5	0.97	0.28	68,78,86,89	0
2	SO4	E	507	5/5	0.98	0.13	51,52,54,61	0
2	SO4	C	504	5/5	0.98	0.15	50,51,61,65	0
2	SO4	A	502	5/5	0.99	0.09	27,28,30,38	0
2	SO4	G	501	5/5	0.99	0.09	29,29,34,36	0

6.5 Other polymers (i)

There are no such residues in this entry.