WORLDWIDE PDB

PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Jun 18, 2024 – 12:50 PM EDT

PDB ID	:	3WF3
Title	:	Crystal structure of human beta-galactosidase mutant I51T in complex with Galactose
Authors	:	Suzuki, H.; Ohto, U.; Shimizu, T.
Deposited on	:	2013-07-16
Resolution	:	2.15 Å(reported)

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

|		
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	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
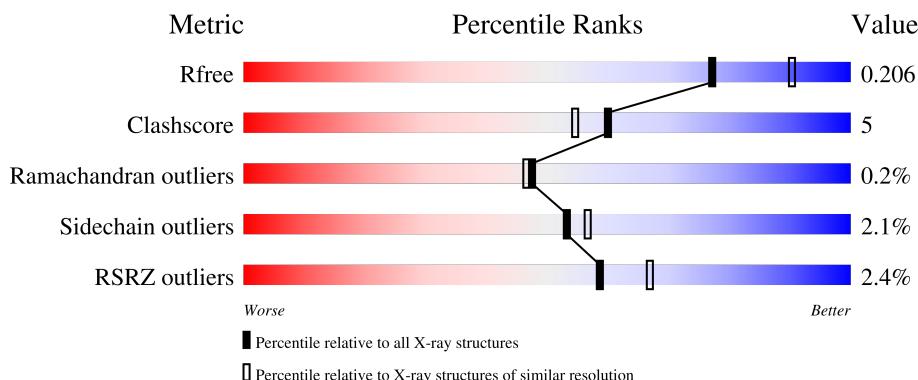
1   Overall quality at a glance   ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION
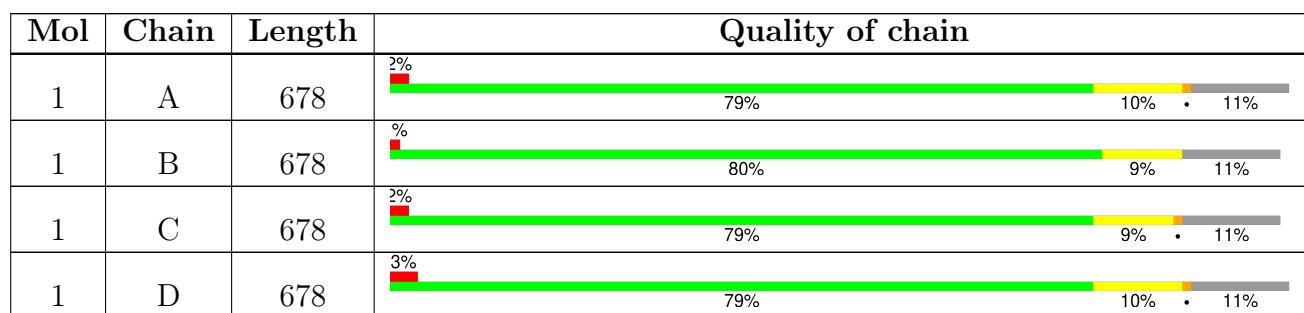
The reported resolution of this entry is 2.15 Å.

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	Percentile Ranks	Value
Rfree		0.206
Clashscore		5
Ramachandran outliers		0.2%
Sidechain outliers		2.1%
RSRZ outliers		2.4%

Worse   *Better*

▮ Percentile relative to all X-ray structures
▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1479 (2.16-2.16)
Clashscore	141614	1585 (2.16-2.16)
Ramachandran outliers	138981	1560 (2.16-2.16)
Sidechain outliers	138945	1559 (2.16-2.16)
RSRZ outliers	127900	1456 (2.16-2.16)

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	678	2% ... 79% ... 10% · 11%
1	B	678	% ... 80% ... 9% 11%
1	C	678	2% ... 79% ... 9% · 11%
1	D	678	3% ... 79% ... 10% · 11%

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	NAG	C	701	-	-	-	X
2	NAG	D	701	-	-	-	X
2	NAG	D	703	-	-	X	-
5	SO4	D	708	-	-	X	-

2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 21055 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 Beta-galactosidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	605	Total	C	N	O	S	0	6	0
			4841	3140	801	882	18			
1	B	605	Total	C	N	O	S	0	4	0
			4825	3131	796	881	17			
1	C	603	Total	C	N	O	S	0	6	0
			4808	3120	789	882	17			
1	D	603	Total	C	N	O	S	0	5	0
			4805	3115	790	883	17			

There are 100 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	0	GLU	-	expression tag	UNP P16278
A	1	ALA	-	expression tag	UNP P16278
A	2	GLU	-	expression tag	UNP P16278
A	3	ALA	-	expression tag	UNP P16278
A	4	TYR	-	expression tag	UNP P16278
A	5	VAL	-	expression tag	UNP P16278
A	6	GLU	-	expression tag	UNP P16278
A	7	PHE	-	expression tag	UNP P16278
A	8	HIS	-	expression tag	UNP P16278
A	9	HIS	-	expression tag	UNP P16278
A	10	HIS	-	expression tag	UNP P16278
A	11	HIS	-	expression tag	UNP P16278
A	12	HIS	-	expression tag	UNP P16278
A	13	HIS	-	expression tag	UNP P16278
A	14	ASP	-	expression tag	UNP P16278
A	15	TYR	-	expression tag	UNP P16278
A	16	LYS	-	expression tag	UNP P16278
A	17	ASP	-	expression tag	UNP P16278
A	18	ASP	-	expression tag	UNP P16278
A	19	ASP	-	expression tag	UNP P16278
A	20	ASP	-	expression tag	UNP P16278

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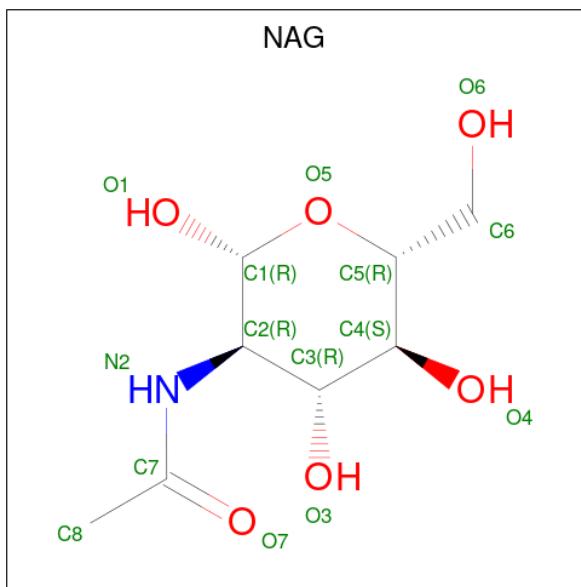
Chain	Residue	Modelled	Actual	Comment	Reference
A	21	LYS	-	expression tag	UNP P16278
A	22	THR	-	expression tag	UNP P16278
A	23	SER	-	expression tag	UNP P16278
A	51	THR	ILE	engineered mutation	UNP P16278
B	0	GLU	-	expression tag	UNP P16278
B	1	ALA	-	expression tag	UNP P16278
B	2	GLU	-	expression tag	UNP P16278
B	3	ALA	-	expression tag	UNP P16278
B	4	TYR	-	expression tag	UNP P16278
B	5	VAL	-	expression tag	UNP P16278
B	6	GLU	-	expression tag	UNP P16278
B	7	PHE	-	expression tag	UNP P16278
B	8	HIS	-	expression tag	UNP P16278
B	9	HIS	-	expression tag	UNP P16278
B	10	HIS	-	expression tag	UNP P16278
B	11	HIS	-	expression tag	UNP P16278
B	12	HIS	-	expression tag	UNP P16278
B	13	HIS	-	expression tag	UNP P16278
B	14	ASP	-	expression tag	UNP P16278
B	15	TYR	-	expression tag	UNP P16278
B	16	LYS	-	expression tag	UNP P16278
B	17	ASP	-	expression tag	UNP P16278
B	18	ASP	-	expression tag	UNP P16278
B	19	ASP	-	expression tag	UNP P16278
B	20	ASP	-	expression tag	UNP P16278
B	21	LYS	-	expression tag	UNP P16278
B	22	THR	-	expression tag	UNP P16278
B	23	SER	-	expression tag	UNP P16278
B	51	THR	ILE	engineered mutation	UNP P16278
C	0	GLU	-	expression tag	UNP P16278
C	1	ALA	-	expression tag	UNP P16278
C	2	GLU	-	expression tag	UNP P16278
C	3	ALA	-	expression tag	UNP P16278
C	4	TYR	-	expression tag	UNP P16278
C	5	VAL	-	expression tag	UNP P16278
C	6	GLU	-	expression tag	UNP P16278
C	7	PHE	-	expression tag	UNP P16278
C	8	HIS	-	expression tag	UNP P16278
C	9	HIS	-	expression tag	UNP P16278
C	10	HIS	-	expression tag	UNP P16278
C	11	HIS	-	expression tag	UNP P16278
C	12	HIS	-	expression tag	UNP P16278

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Chain	Residue	Modelled	Actual	Comment	Reference
C	13	HIS	-	expression tag	UNP P16278
C	14	ASP	-	expression tag	UNP P16278
C	15	TYR	-	expression tag	UNP P16278
C	16	LYS	-	expression tag	UNP P16278
C	17	ASP	-	expression tag	UNP P16278
C	18	ASP	-	expression tag	UNP P16278
C	19	ASP	-	expression tag	UNP P16278
C	20	ASP	-	expression tag	UNP P16278
C	21	LYS	-	expression tag	UNP P16278
C	22	THR	-	expression tag	UNP P16278
C	23	SER	-	expression tag	UNP P16278
C	51	THR	ILE	engineered mutation	UNP P16278
D	0	GLU	-	expression tag	UNP P16278
D	1	ALA	-	expression tag	UNP P16278
D	2	GLU	-	expression tag	UNP P16278
D	3	ALA	-	expression tag	UNP P16278
D	4	TYR	-	expression tag	UNP P16278
D	5	VAL	-	expression tag	UNP P16278
D	6	GLU	-	expression tag	UNP P16278
D	7	PHE	-	expression tag	UNP P16278
D	8	HIS	-	expression tag	UNP P16278
D	9	HIS	-	expression tag	UNP P16278
D	10	HIS	-	expression tag	UNP P16278
D	11	HIS	-	expression tag	UNP P16278
D	12	HIS	-	expression tag	UNP P16278
D	13	HIS	-	expression tag	UNP P16278
D	14	ASP	-	expression tag	UNP P16278
D	15	TYR	-	expression tag	UNP P16278
D	16	LYS	-	expression tag	UNP P16278
D	17	ASP	-	expression tag	UNP P16278
D	18	ASP	-	expression tag	UNP P16278
D	19	ASP	-	expression tag	UNP P16278
D	20	ASP	-	expression tag	UNP P16278
D	21	LYS	-	expression tag	UNP P16278
D	22	THR	-	expression tag	UNP P16278
D	23	SER	-	expression tag	UNP P16278
D	51	THR	ILE	engineered mutation	UNP P16278

- Molecule 2 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).
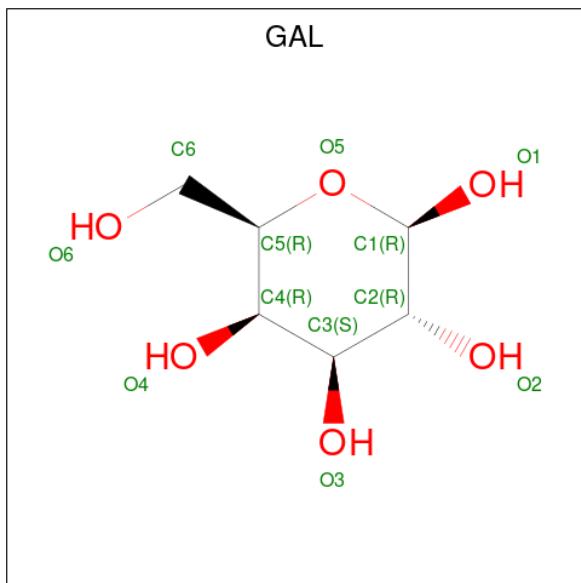
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total 14	C 8	N 1	O 5	0	0
2	A	1	Total 14	C 8	N 1	O 5	0	0
2	A	1	Total 14	C 8	N 1	O 5	0	0
2	A	1	Total 14	C 8	N 1	O 5	0	0
2	B	1	Total 14	C 8	N 1	O 5	0	0
2	B	1	Total 14	C 8	N 1	O 5	0	0
2	B	1	Total 14	C 8	N 1	O 5	0	0
2	B	1	Total 14	C 8	N 1	O 5	0	0
2	C	1	Total 14	C 8	N 1	O 5	0	0
2	C	1	Total 14	C 8	N 1	O 5	0	0
2	C	1	Total 14	C 8	N 1	O 5	0	0
2	C	1	Total 14	C 8	N 1	O 5	0	0
2	D	1	Total 14	C 8	N 1	O 5	0	0
2	D	1	Total 14	C 8	N 1	O 5	0	0

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	D	1	Total 14	C 8	N 1	O 5	0	0
2	D	1	Total 14	C 8	N 1	O 5	0	0

- Molecule 3 is beta-D-galactopyranose (three-letter code: GAL) (formula: $C_6H_{12}O_6$).

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total 12	C 6	O 6	0	0
3	B	1	Total 12	C 6	O 6	0	0
3	C	1	Total 12	C 6	O 6	0	0
3	D	1	Total 12	C 6	O 6	0	0

- Molecule 4 is CHLORIDE ION (three-letter code: CL) (formula: Cl).
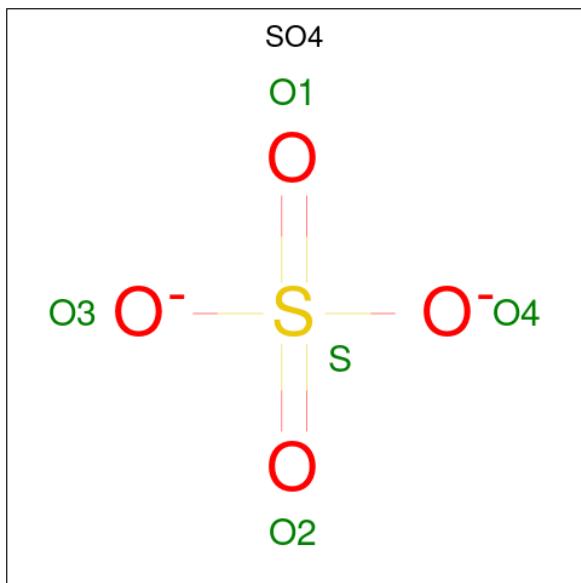
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total 1	Cl 1	0	0
4	B	1	Total 1	Cl 1	0	0
4	C	1	Total 1	Cl 1	0	0

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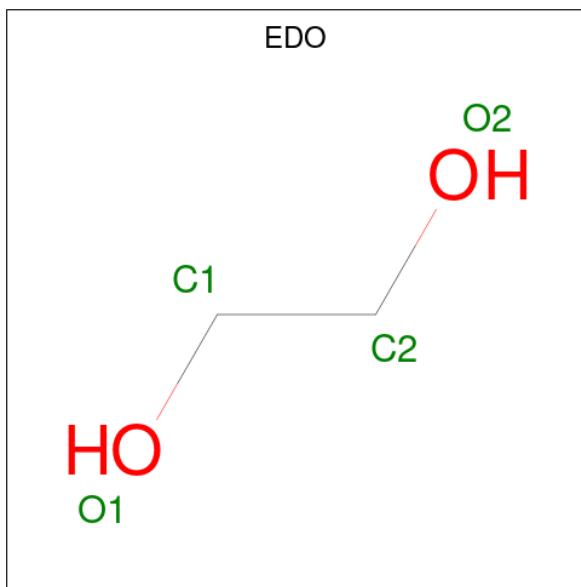
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	D	1	Total Cl		0	0
			1 1			

- Molecule 5 is SULFATE ION (three-letter code: SO4) (formula: O_4S).

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

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

EDO

O2

OH

C1

C2

HO

O1

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total 4	C 2	O 2	0	0
6	A	1	Total 4	C 2	O 2	0	0
6	B	1	Total 4	C 2	O 2	0	0
6	B	1	Total 4	C 2	O 2	0	0
6	C	1	Total 4	C 2	O 2	0	0
6	C	1	Total 4	C 2	O 2	0	0
6	D	1	Total 4	C 2	O 2	0	0
6	D	1	Total 4	C 2	O 2	0	0
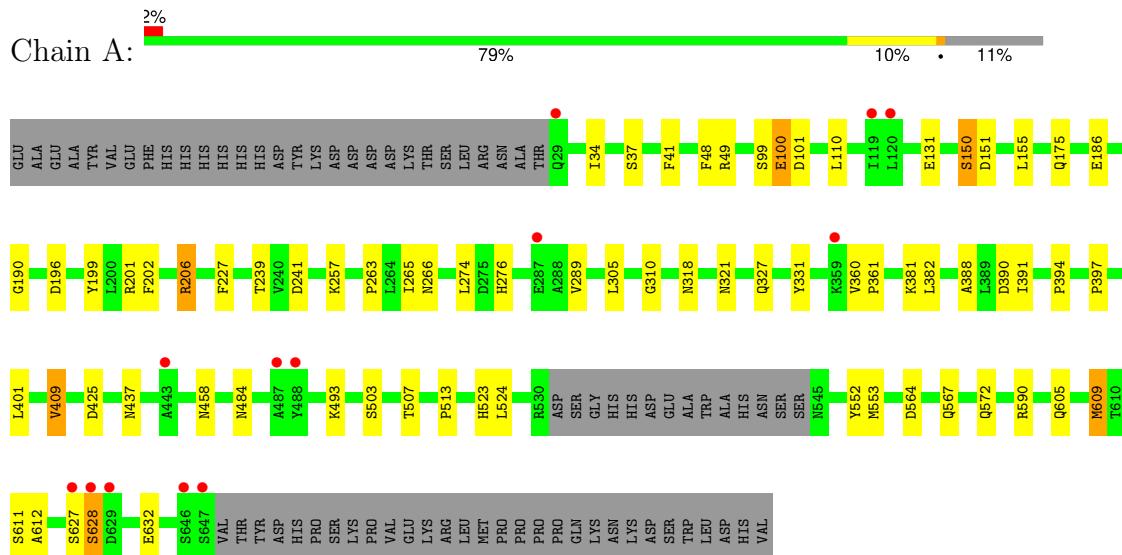
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	365	Total 365	O 365	0	0
7	B	369	Total 369	O 369	0	0
7	C	349	Total 349	O 349	0	0
7	D	345	Total 345	O 345	0	0

W O R L D W I D E
wwPDB
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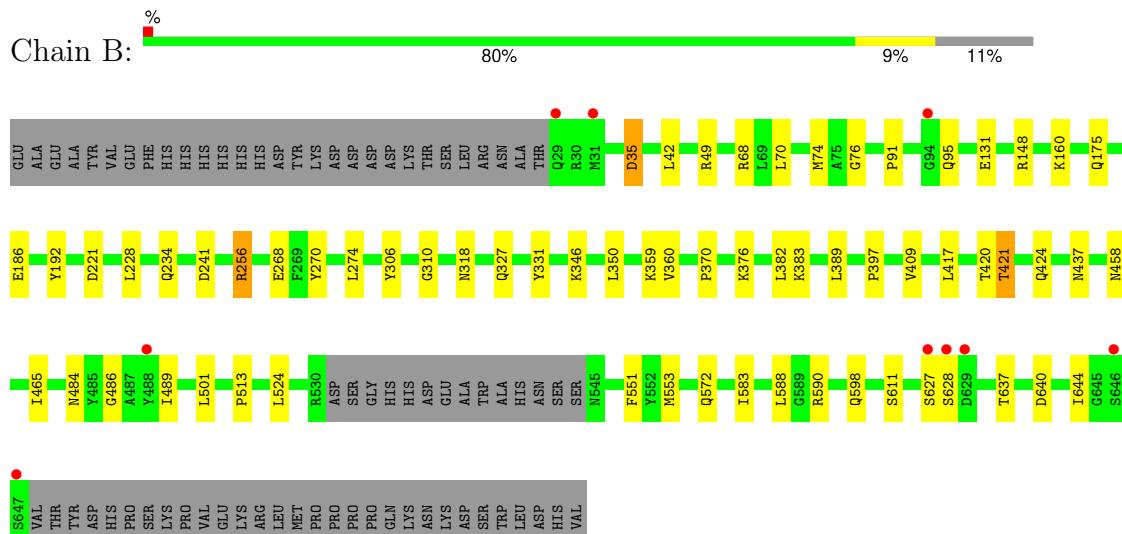
3 Residue-property plots ⓘ

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: Beta-galactosidase
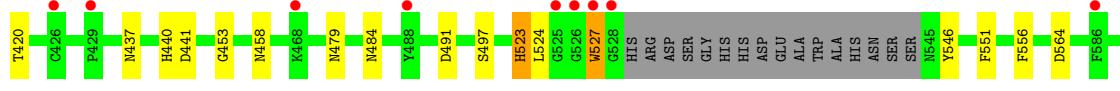
Chain A:

- Molecule 1: Beta-galactosidase
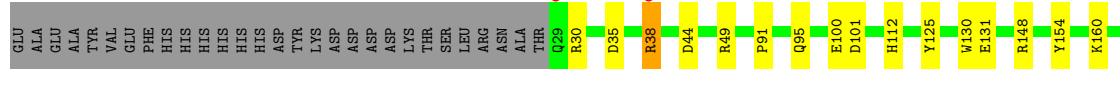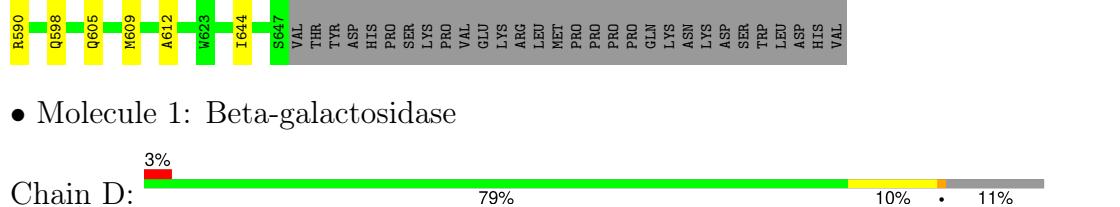
Chain B:

- Molecule 1: Beta-galactosidase

Chain C:

• Molecule 1: Beta-galactosidase

Chain D:

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	94.96Å 115.89Å 140.28Å 90.00° 92.23° 90.00°	Depositor
Resolution (Å)	27.30 – 2.15 27.30 – 2.15	Depositor EDS
% Data completeness (in resolution range)	96.4 (27.30-2.15) 96.4 (27.30-2.15)	Depositor EDS
R_{merge}	0.15	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.73 (at 2.15Å)	Xtriage
Refinement program	REFMAC 5.7.0029	Depositor
R, R_{free}	0.196 , 0.242 0.205 , 0.206	Depositor DCC
R_{free} test set	7959 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å^2)	27.0	Xtriage
Anisotropy	0.088	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 44.0	EDS
L-test for twinning[2]	$< |L| > = 0.48, < L^2 > = 0.31$	Xtriage
Estimated twinning fraction	0.049 for h,-k,-l	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	21055	wwPDB-VP
Average B, all atoms (Å^2)	29.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.17% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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: EDO, SO4, CL, NAG, GAL

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	0.74	0/5020	0.82	6/6846 (0.1%)
1	B	0.77	0/4998	0.83	5/6818 (0.1%)
1	C	0.73	0/4990	0.81	1/6808 (0.0%)
1	D	0.72	0/4979	0.81	3/6795 (0.0%)
All	All	0.74	0/19987	0.82	15/27267 (0.1%)

There are no bond length outliers.

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	206	ARG	NE-CZ-NH2	-6.39	117.10	120.30
1	A	101	ASP	CB-CG-OD1	6.05	123.75	118.30
1	B	35	ASP	CB-CG-OD2	-5.71	113.16	118.30
1	B	256	ARG	NE-CZ-NH2	5.66	123.13	120.30
1	A	609[A]	MET	CA-CB-CG	5.60	122.82	113.30
1	A	609[B]	MET	CA-CB-CG	5.60	122.82	113.30
1	B	256	ARG	NE-CZ-NH1	-5.46	117.57	120.30
1	A	201	ARG	NE-CZ-NH1	5.37	122.98	120.30
1	B	640	ASP	CB-CG-OD1	5.35	123.11	118.30
1	B	68	ARG	NE-CZ-NH1	5.31	122.96	120.30
1	D	101	ASP	CB-CG-OD1	5.26	123.03	118.30
1	C	491	ASP	CB-CG-OD1	5.23	123.00	118.30
1	D	38	ARG	NE-CZ-NH2	-5.22	117.69	120.30
1	A	390	ASP	CB-CG-OD1	5.13	122.92	118.30
1	D	215	VAL	CB-CA-C	-5.01	101.88	111.40

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	4841	0	4714	44	0
1	B	4825	0	4686	39	0
1	C	4808	0	4667	44	0
1	D	4805	0	4669	56	0
2	A	56	0	52	0	0
2	B	56	0	52	0	0
2	C	56	0	52	2	0
2	D	56	0	52	7	0
3	A	12	0	12	0	0
3	B	12	0	12	1	0
3	C	12	0	12	1	0
3	D	12	0	12	2	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
5	A	10	0	0	0	0
5	B	10	0	0	0	0
5	C	10	0	0	0	0
5	D	10	0	0	2	0
6	A	8	0	12	0	0
6	B	8	0	12	0	0
6	C	8	0	12	1	0
6	D	8	0	12	1	0
7	A	365	0	0	8	0
7	B	369	0	0	9	0
7	C	349	0	0	5	0
7	D	345	0	0	8	0
All	All	21055	0	19040	179	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 5.

All (179) 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:D:555:ASN:HB2	2:D:703:NAG:O5	1.43	1.12
1:D:555:ASN:CB	2:D:703:NAG:O5	2.09	1.00
2:D:703:NAG:H3	7:D:1117:HOH:O	1.67	0.91
1:A:276:HIS:HE1	1:A:321:ASN:HD22	1.14	0.91
1:B:437:ASN:HD21	1:B:458:ASN:H	1.17	0.88
1:B:382:LEU:HD23	1:B:524:LEU:HD12	1.53	0.88
1:A:409:VAL:HG13	1:A:513:PRO:HG3	1.59	0.85
1:D:35:ASP:OD2	1:D:38:ARG:HG3	1.79	0.83
1:C:609[B]:MET:CE	1:C:612:ALA:HB3	2.09	0.81
1:D:327:GLN:HE22	1:D:484:ASN:HD21	1.30	0.78
1:D:35:ASP:OD2	1:D:38:ARG:CG	2.33	0.76
1:D:318:ASN:HD21	1:D:590:ARG:HH21	1.33	0.75
1:A:437:ASN:HD21	1:A:458:ASN:H	1.33	0.74
1:C:318:ASN:HD21	1:C:590:ARG:HH21	1.36	0.74
1:A:276:HIS:HE1	1:A:321:ASN:ND2	1.88	0.72
1:C:437:ASN:HD21	1:C:458:ASN:H	1.37	0.72
1:A:523:HIS:CD2	1:A:553:MET:SD	2.83	0.72
1:A:327:GLN:HE22	1:A:484:ASN:HD21	1.37	0.69
1:C:357:PHE:C	1:C:358:GLU:HG3	2.16	0.65
1:D:324:TYR:N	5:D:708:SO4:O2	2.29	0.65
1:D:91:PRO:HD2	1:D:95:GLN:O	1.97	0.65
1:D:323:PRO:HA	5:D:708:SO4:O2	1.97	0.64
1:A:397:PRO:HD2	1:C:527:TRP:CE3	2.33	0.64
1:B:376:LYS:HD3	7:B:1136:HOH:O	1.97	0.64
1:C:327:GLN:HE22	1:C:484:ASN:HD21	1.46	0.62
1:D:211:LEU:HB3	1:D:215:VAL:HG21	1.81	0.61
1:C:43:LYS:HE3	7:C:1090:HOH:O	2.01	0.61
1:D:409:VAL:HG13	1:D:513:PRO:HG3	1.82	0.61
1:C:43:LYS:CE	7:C:1090:HOH:O	2.50	0.59
1:B:327:GLN:HE22	1:B:484:ASN:HD21	1.49	0.58
2:D:703:NAG:H62	7:D:989:HOH:O	2.03	0.58
1:B:95:GLN:HB2	7:B:1088:HOH:O	2.05	0.57
1:B:437:ASN:ND2	1:B:458:ASN:H	1.97	0.56
1:A:394:PRO:HB2	1:C:609[B]:MET:CE	2.36	0.55
1:B:583:ILE:HD12	1:B:588:LEU:HD11	1.87	0.55
1:C:398:ILE:HD11	1:C:404:LEU:CD1	2.36	0.55
1:C:268:GLU:OE1	3:C:706:GAL:H1	2.07	0.55
1:D:320:ALA:H	1:D:484:ASN:HD22	1.53	0.55
1:C:91:PRO:HD2	1:C:95:GLN:O	2.07	0.54
1:D:112:HIS:HD2	7:D:1113:HOH:O	1.89	0.54
1:D:290:ALA:HB1	1:D:353:ILE:HD11	1.90	0.54
1:D:112:HIS:CD2	7:D:1113:HOH:O	2.61	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:268:GLU:OE1	3:B:710:GAL:H1	2.08	0.53
1:C:35:ASP:OD2	1:C:38:ARG:HB2	2.09	0.53
1:A:110:LEU:CD1	7:A:1138:HOH:O	2.57	0.53
1:C:609[B]:MET:HE2	1:C:612:ALA:HB3	1.89	0.53
1:C:524:LEU:HD11	1:C:551:PHE:CD2	2.44	0.52
1:B:572[A]:GLN:HG3	1:B:637:THR:HB	1.90	0.52
1:A:437:ASN:ND2	1:A:458:ASN:H	2.05	0.52
1:D:318:ASN:HD21	1:D:590:ARG:NH2	2.06	0.52
1:A:155:LEU:HD22	1:A:202:PHE:CD2	2.45	0.52
1:A:196:ASP:O	1:A:199:TYR:HB3	2.10	0.51
1:B:359:LYS:HB2	7:B:1142:HOH:O	2.10	0.51
1:C:108:LEU:HD22	1:C:118:VAL:HG11	1.92	0.51
1:D:190:GLY:HA3	1:D:227:PHE:O	2.10	0.51
1:A:202:PHE:O	1:A:206:ARG:HG2	2.12	0.50
1:B:70:LEU:O	1:B:74:MET:HG2	2.12	0.50
1:B:241:ASP:HB2	1:B:268:GLU:HB2	1.93	0.50
1:A:239:THR:HG22	1:A:265:ILE:HD12	1.94	0.50
1:C:150[A]:SER:HB2	1:C:196:ASP:OD2	2.11	0.50
1:D:246:SER:OG	6:D:709:EDO:H11	2.12	0.50
1:A:175:GLN:NE2	7:A:957:HOH:O	2.45	0.50
1:B:175:GLN:HB3	7:B:801:HOH:O	2.12	0.49
1:B:598:GLN:HA	1:B:644:ILE:HA	1.94	0.49
1:A:110:LEU:HG	7:A:1138:HOH:O	2.13	0.49
1:D:125:TYR:CE2	1:D:148:ARG:CZ	2.96	0.49
1:D:437:ASN:HD21	1:D:458:ASN:H	1.59	0.49
1:A:150:SER:O	1:A:151:ASP:C	2.48	0.49
1:C:99:SER:HB2	7:C:1110:HOH:O	2.12	0.49
1:D:437:ASN:ND2	1:D:458:ASN:H	2.11	0.49
1:A:310:GLY:HA3	1:A:331:TYR:O	2.13	0.48
1:A:110:LEU:HD12	7:A:1138:HOH:O	2.12	0.48
1:A:150:SER:OG	1:A:196:ASP:OD2	2.31	0.48
1:D:30:ARG:HB3	1:D:174:TYR:CE2	2.48	0.48
1:B:35:ASP:HB2	1:B:42:LEU:HG	1.93	0.48
1:B:486:GLY:HA3	7:B:1084:HOH:O	2.14	0.48
1:A:276:HIS:CE1	1:A:321:ASN:HD22	2.07	0.48
1:A:397:PRO:HD2	1:C:527:TRP:CD2	2.48	0.48
1:A:360:VAL:HG12	7:A:912:HOH:O	2.14	0.48
1:A:564:ASP:O	1:A:567:GLN:HG3	2.14	0.48
1:B:397:PRO:HD2	1:D:527:TRP:CD1	2.49	0.48
1:B:409:VAL:HG13	1:B:513:PRO:HG3	1.95	0.47
1:D:268:GLU:OE1	3:D:706:GAL:H1	2.14	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:389:LEU:HD21	1:B:417:LEU:HD23	1.95	0.47
1:C:54:SER:HA	1:C:81:GLN:O	2.14	0.47
1:A:318:ASN:HD21	1:A:590:ARG:HH21	1.62	0.47
1:D:590:ARG:HB3	7:D:1031:HOH:O	2.14	0.47
1:A:41:PHE:HB2	1:A:48:PHE:O	2.15	0.47
1:D:188:GLU:OE2	3:D:706:GAL:O1	2.32	0.47
1:C:598:GLN:HA	1:C:644:ILE:HA	1.97	0.47
1:B:346:LYS:O	1:B:350:LEU:HG	2.15	0.47
1:A:34:ILE:HG23	1:A:263:PRO:HD3	1.97	0.46
1:A:523:HIS:NE2	1:A:553:MET:SD	2.88	0.46
1:D:398:ILE:HD13	1:D:409:VAL:HG22	1.96	0.46
1:A:327:GLN:HE22	1:A:484:ASN:ND2	2.10	0.46
1:B:148:ARG:HB2	1:B:192:TYR:CE2	2.51	0.46
1:D:555:ASN:HB2	2:D:703:NAG:C5	2.42	0.46
1:D:555:ASN:HB2	2:D:703:NAG:H61	1.97	0.46
1:D:170:LYS:NZ	7:D:1029:HOH:O	2.48	0.46
1:D:453:GLY:HA2	1:D:546:TYR:CE2	2.50	0.46
1:D:545:ASN:N	7:D:1057:HOH:O	2.48	0.46
1:C:453:GLY:HA2	1:C:546:TYR:CE1	2.51	0.46
1:A:190:GLY:HA3	1:A:227:PHE:O	2.15	0.46
2:D:703:NAG:C6	7:D:989:HOH:O	2.62	0.46
1:C:125:TYR:CD2	1:C:148:ARG:CZ	2.99	0.46
1:C:245:GLY:H	6:C:709:EDO:H22	1.81	0.46
1:C:184:GLN:HB2	1:C:218:PHE:CZ	2.51	0.45
1:D:35:ASP:OD2	1:D:38:ARG:CB	2.63	0.45
1:D:516:THR:O	1:D:520:VAL:HG23	2.16	0.45
1:D:318:ASN:ND2	1:D:590:ARG:HH21	2.06	0.45
1:D:241:ASP:HB2	1:D:268:GLU:HB2	1.97	0.45
1:B:310:GLY:HA3	1:B:331:TYR:O	2.17	0.45
1:C:122:PRO:HD2	1:C:184:GLN:O	2.17	0.45
1:B:360:VAL:CG1	7:B:971:HOH:O	2.64	0.45
1:C:318:ASN:HD21	1:C:590:ARG:NH2	2.11	0.45
1:A:388:ALA:O	1:A:391:ILE:HG22	2.17	0.44
1:A:175:GLN:HG2	7:A:811:HOH:O	2.17	0.44
1:B:76:GLY:HA3	1:B:360:VAL:HG22	2.00	0.44
1:A:401:LEU:HD12	1:A:507:THR:HB	2.00	0.44
1:B:551:PHE:HB3	1:B:553:MET:HE1	1.98	0.44
1:A:382:LEU:HD23	1:A:524:LEU:HD12	2.00	0.44
1:D:551:PHE:HA	1:D:618:VAL:O	2.18	0.44
1:B:465:ILE:HD11	1:B:501:LEU:HD13	1.98	0.44
1:D:402:TYR:HB3	1:D:403:PRO:CD	2.48	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:383:LYS:NZ	1:D:100:GLU:OE2	2.50	0.43
1:D:174:TYR:HA	1:D:178:GLY:O	2.17	0.43
1:C:398:ILE:HD11	1:C:404:LEU:HD11	2.00	0.43
1:C:352[A]:ASN:OD1	1:C:355:GLN:NE2	2.51	0.43
1:A:289:VAL:HB	7:A:1135:HOH:O	2.17	0.43
1:D:35:ASP:OD2	1:D:38:ARG:HB2	2.17	0.43
1:D:383:LYS:HD3	1:D:388:ALA:HB2	2.00	0.43
1:C:523:HIS:CD2	1:C:527:TRP:CZ2	3.07	0.43
1:D:125:TYR:CD2	1:D:148:ARG:CZ	3.02	0.43
1:A:305:LEU:HD12	1:A:305:LEU:N	2.33	0.43
1:D:320:ALA:H	1:D:484:ASN:ND2	2.14	0.43
1:B:221:ASP:HB2	1:B:228:LEU:HD23	2.01	0.43
1:B:270:TYR:HA	1:B:306:TYR:O	2.19	0.43
1:C:62:ARG:HA	1:C:65:TRP:CD2	2.53	0.43
1:D:349:ALA:O	1:D:353:ILE:HD13	2.18	0.43
1:B:359:LYS:HA	7:B:1023:HOH:O	2.18	0.43
1:A:627:SER:O	1:A:628:SER:O	2.37	0.42
1:D:44:ASP:OD2	1:D:174:TYR:OH	2.25	0.42
1:D:256:ARG:NE	1:D:264:LEU:HD21	2.35	0.42
1:A:381:LYS:HB2	1:A:552:TYR:CE2	2.55	0.42
1:B:383:LYS:HE3	1:D:100:GLU:OE1	2.19	0.42
1:D:241:ASP:CB	1:D:268:GLU:HB2	2.49	0.42
1:B:370:PRO:HD2	1:C:564[A]:ASP:CG	2.39	0.42
2:C:703:NAG:H61	7:C:1040:HOH:O	2.20	0.42
1:A:99:SER:HB3	1:A:100:GLU:OE1	2.20	0.42
1:B:382:LEU:CD2	1:B:524:LEU:HD12	2.38	0.42
1:C:234:GLN:OE1	1:C:235:GLY:N	2.52	0.42
1:A:360:VAL:HG13	1:A:361:PRO:HD2	2.01	0.41
1:B:420:THR:OG1	1:B:421:THR:N	2.53	0.41
1:C:479:ASN:C	1:C:479:ASN:OD1	2.57	0.41
1:C:66:LYS:HE3	1:C:114:LEU:HD21	2.01	0.41
1:C:62:ARG:HA	1:C:65:TRP:CG	2.54	0.41
1:C:256:ARG:HA	1:C:259:GLU:O	2.20	0.41
1:B:318:ASN:HD21	1:B:590:ARG:HE	1.69	0.41
1:A:609[A]:MET:HG3	1:A:612:ALA:HB3	2.02	0.41
1:C:199:TYR:O	1:C:202:PHE:HB3	2.21	0.41
1:D:130:TRP:O	1:D:131:GLU:C	2.58	0.41
1:A:394:PRO:HB2	1:C:609[B]:MET:HE1	2.01	0.41
1:A:572:GLN:HG3	7:A:1088:HOH:O	2.21	0.41
1:B:91:PRO:HD2	1:B:95:GLN:O	2.21	0.41
1:B:241:ASP:CB	1:B:268:GLU:HB2	2.51	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:272:GLY:HA3	1:C:333:TYR:O	2.21	0.41
1:C:320:ALA:H	1:C:484:ASN:HD22	1.68	0.41
1:C:497:SER:HA	2:C:702:NAG:H81	2.02	0.41
1:D:276:HIS:O	1:D:277:TRP:C	2.58	0.41
1:D:440:HIS:HA	1:D:441:ASP:HA	1.84	0.41
1:A:241:ASP:HA	1:A:266:ASN:OD1	2.20	0.41
1:D:35:ASP:OD2	1:D:38:ARG:CD	2.69	0.41
1:D:154:TYR:HE2	1:D:199:TYR:CE1	2.38	0.41
1:B:160:LYS:HE2	7:B:897:HOH:O	2.21	0.40
1:B:489:ILE:HD13	7:B:1060:HOH:O	2.20	0.40
1:D:510:THR:HG22	1:D:512:PHE:CE1	2.56	0.40
1:C:556:PHE:HA	7:C:1052:HOH:O	2.22	0.40
1:D:272:GLY:HA3	1:D:333:TYR:O	2.21	0.40
1:C:440:HIS:HA	1:C:441:ASP:HA	1.81	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	607/678 (90%)	576 (95%)	28 (5%)	3 (0%)	29	22
1	B	605/678 (89%)	579 (96%)	26 (4%)	0	100	100
1	C	605/678 (89%)	578 (96%)	27 (4%)	0	100	100
1	D	604/678 (89%)	576 (95%)	27 (4%)	1 (0%)	47	46
All	All	2421/2712 (89%)	2309 (95%)	108 (4%)	4 (0%)	47	46

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	628	SER

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Mol	Chain	Res	Type
1	A	611	SER
1	A	493	LYS
1	D	423	PRO

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	524/585 (90%)	510 (97%)	14 (3%)	44	46
1	B	522/585 (89%)	511 (98%)	11 (2%)	53	57
1	C	522/585 (89%)	509 (98%)	13 (2%)	47	49
1	D	521/585 (89%)	514 (99%)	7 (1%)	69	74
All	All	2089/2340 (89%)	2044 (98%)	45 (2%)	53	55

All (45) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	37	SER
1	A	49	ARG
1	A	100	GLU
1	A	131	GLU
1	A	150	SER
1	A	186	GLU
1	A	257	LYS
1	A	274	LEU
1	A	409	VAL
1	A	425	ASP
1	A	503	SER
1	A	605	GLN
1	A	632[A]	GLU
1	A	632[B]	GLU
1	B	49	ARG
1	B	131	GLU
1	B	186	GLU
1	B	234	GLN

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Mol	Chain	Res	Type
1	B	256	ARG
1	B	274	LEU
1	B	421	THR
1	B	424	GLN
1	B	611	SER
1	B	627	SER
1	B	628	SER
1	C	35	ASP
1	C	49	ARG
1	C	131	GLU
1	C	150[A]	SER
1	C	150[B]	SER
1	C	186	GLU
1	C	274	LEU
1	C	398	ILE
1	C	410	LYS
1	C	420	THR
1	C	523	HIS
1	C	527	TRP
1	C	605	GLN
1	D	49	ARG
1	D	160	LYS
1	D	274	LEU
1	D	409	VAL
1	D	424	GLN
1	D	524	LEU
1	D	527	TRP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (32) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	81	GLN
1	A	102	HIS
1	A	175	GLN
1	A	276	HIS
1	A	279	GLN
1	A	318	ASN
1	A	321	ASN
1	A	355	GLN
1	A	424	GLN
1	A	437	ASN
1	A	484	ASN

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Mol	Chain	Res	Type
1	A	523	HIS
1	B	204	GLN
1	B	279	GLN
1	B	318	ASN
1	B	321	ASN
1	B	355	GLN
1	B	424	GLN
1	B	437	ASN
1	B	484	ASN
1	C	318	ASN
1	C	321	ASN
1	C	412	HIS
1	C	437	ASN
1	C	484	ASN
1	D	102	HIS
1	D	318	ASN
1	D	321	ASN
1	D	355	GLN
1	D	428	ASN
1	D	437	ASN
1	D	484	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 monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 40 ligands modelled in this entry, 4 are monoatomic - leaving 36 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The

Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#$|Z| > 2$	Counts	RMSZ	#$|Z| > 2$
5	SO4	D	708	-	4,4,4	0.46	0	6,6,6	0.69	0
3	GAL	B	710	-	12,12,12	0.88	0	17,17,17	1.23	1 (5%)
3	GAL	C	706	-	12,12,12	0.83	0	17,17,17	1.02	1 (5%)
6	EDO	B	709	-	3,3,3	0.38	0	2,2,2	0.57	0
2	NAG	A	703	1	14,14,15	0.74	0	17,19,21	2.64	6 (35%)
2	NAG	C	702	1	14,14,15	0.63	0	17,19,21	1.29	1 (5%)
2	NAG	B	703	1	14,14,15	0.65	0	17,19,21	1.68	2 (11%)
2	NAG	A	702	1	14,14,15	0.68	0	17,19,21	2.87	7 (41%)
2	NAG	A	701	1	14,14,15	0.82	0	17,19,21	1.11	1 (5%)
2	NAG	C	703	1	14,14,15	0.66	0	17,19,21	1.68	4 (23%)
2	NAG	D	701	1	14,14,15	0.88	1 (7%)	17,19,21	1.30	2 (11%)
5	SO4	D	707	-	4,4,4	0.48	0	6,6,6	0.34	0
6	EDO	A	710	-	3,3,3	0.51	0	2,2,2	0.65	0
2	NAG	C	701	1	14,14,15	0.61	0	17,19,21	1.43	2 (11%)
2	NAG	C	704	1	14,14,15	0.66	0	17,19,21	1.33	1 (5%)
2	NAG	B	704	1	14,14,15	0.56	0	17,19,21	0.76	0
2	NAG	D	703	1	14,14,15	0.30	0	17,19,21	0.56	0
2	NAG	D	702	1	14,14,15	0.64	0	17,19,21	3.30	6 (35%)
6	EDO	B	708	-	3,3,3	0.52	0	2,2,2	0.12	0
3	GAL	D	706	-	12,12,12	0.69	0	17,17,17	0.97	0
2	NAG	B	701	1	14,14,15	1.04	0	17,19,21	1.84	4 (23%)
3	GAL	A	705	-	12,12,12	0.74	0	17,17,17	1.12	2 (11%)
5	SO4	A	708	-	4,4,4	0.53	0	6,6,6	0.66	0
6	EDO	C	710	-	3,3,3	0.46	0	2,2,2	0.14	0
2	NAG	B	702	1	14,14,15	0.86	0	17,19,21	2.72	6 (35%)
5	SO4	C	708	-	4,4,4	0.53	0	6,6,6	0.43	0
6	EDO	D	709	-	3,3,3	0.20	0	2,2,2	0.57	0
6	EDO	D	710	-	3,3,3	0.56	0	2,2,2	0.60	0
5	SO4	B	707	-	4,4,4	0.44	0	6,6,6	0.72	0
5	SO4	A	707	-	4,4,4	0.51	0	6,6,6	0.42	0
2	NAG	D	704	1	14,14,15	0.61	0	17,19,21	1.25	2 (11%)
5	SO4	C	707	-	4,4,4	0.60	0	6,6,6	0.39	0
2	NAG	A	704	1	14,14,15	0.54	0	17,19,21	1.48	3 (17%)
6	EDO	C	709	-	3,3,3	0.21	0	2,2,2	0.81	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#$\|Z\|>2$	Counts	RMSZ	#$\|Z\|>2$
6	EDO	A	709	-	3,3,3	0.42	0	2,2,2	0.45	0
5	SO4	B	706	-	4,4,4	0.50	0	6,6,6	0.23	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	GAL	B	710	-	-	1/2/22/22	0/1/1/1
3	GAL	C	706	-	-	1/2/22/22	0/1/1/1
6	EDO	B	709	-	-	0/1/1/1	-
2	NAG	A	703	1	-	0/6/23/26	0/1/1/1
2	NAG	C	702	1	-	0/6/23/26	0/1/1/1
2	NAG	B	703	1	-	0/6/23/26	0/1/1/1
2	NAG	A	702	1	-	2/6/23/26	0/1/1/1
2	NAG	A	701	1	-	1/6/23/26	0/1/1/1
2	NAG	C	703	1	-	0/6/23/26	0/1/1/1
2	NAG	D	701	1	-	2/6/23/26	0/1/1/1
6	EDO	A	710	-	-	1/1/1/1	-
2	NAG	C	701	1	-	3/6/23/26	0/1/1/1
2	NAG	C	704	1	-	0/6/23/26	0/1/1/1
2	NAG	B	704	1	-	0/6/23/26	0/1/1/1
2	NAG	D	703	1	-	2/6/23/26	0/1/1/1
2	NAG	D	702	1	-	0/6/23/26	0/1/1/1
6	EDO	B	708	-	-	1/1/1/1	-
3	GAL	D	706	-	-	1/2/22/22	0/1/1/1
2	NAG	B	701	1	-	2/6/23/26	0/1/1/1
3	GAL	A	705	-	-	1/2/22/22	0/1/1/1
6	EDO	C	710	-	-	1/1/1/1	-
6	EDO	D	709	-	-	1/1/1/1	-
2	NAG	B	702	1	-	2/6/23/26	0/1/1/1
6	EDO	D	710	-	-	1/1/1/1	-
2	NAG	D	704	1	-	0/6/23/26	0/1/1/1
2	NAG	A	704	1	-	0/6/23/26	0/1/1/1
6	EDO	C	709	-	-	1/1/1/1	-
6	EDO	A	709	-	-	0/1/1/1	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	701	NAG	C1-C2	2.68	1.56	1.52

All (51) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	D	702	NAG	C1-O5-C5	10.50	126.26	112.19
2	A	702	NAG	C1-O5-C5	8.29	123.30	112.19
2	B	702	NAG	C1-O5-C5	7.07	121.67	112.19
2	A	703	NAG	C1-O5-C5	6.86	121.38	112.19
2	B	703	NAG	C1-O5-C5	4.98	118.86	112.19
2	B	702	NAG	C1-C2-N2	-4.70	103.02	110.43
2	D	702	NAG	C4-C3-C2	4.60	117.76	111.02
2	B	701	NAG	C1-O5-C5	4.59	118.34	112.19
2	A	702	NAG	C6-C5-C4	-4.51	101.94	113.02
2	C	701	NAG	C1-O5-C5	3.91	117.42	112.19
2	C	702	NAG	C1-O5-C5	3.87	117.37	112.19
2	B	702	NAG	C6-C5-C4	-3.83	103.61	113.02
2	A	703	NAG	C4-C3-C2	-3.57	105.78	111.02
2	D	702	NAG	C3-C4-C5	3.57	116.71	110.23
2	A	704	NAG	C1-C2-N2	-3.50	104.92	110.43
2	C	703	NAG	O5-C1-C2	-3.41	106.02	111.29
2	A	703	NAG	O7-C7-C8	-3.40	116.00	122.05
2	B	702	NAG	O5-C5-C4	3.40	119.09	110.83
2	A	703	NAG	O5-C1-C2	-3.38	106.07	111.29
2	A	701	NAG	C1-C2-N2	-3.37	105.12	110.43
2	A	703	NAG	C8-C7-N2	3.35	121.68	116.12
2	A	702	NAG	C1-C2-N2	-3.33	105.18	110.43
2	C	704	NAG	O4-C4-C3	-3.33	102.54	110.38
2	D	702	NAG	O5-C5-C4	3.21	118.63	110.83
2	B	702	NAG	O5-C1-C2	3.16	116.19	111.29
2	D	702	NAG	C6-C5-C4	-3.13	105.32	113.02
2	A	703	NAG	O3-C3-C2	3.12	115.88	109.40
2	A	702	NAG	O4-C4-C5	-3.06	101.79	109.32
2	C	701	NAG	O5-C1-C2	3.04	116.00	111.29
2	C	703	NAG	C1-O5-C5	2.96	116.15	112.19
2	B	701	NAG	C1-C2-N2	-2.95	105.78	110.43
2	B	703	NAG	C1-C2-N2	-2.79	106.04	110.43
2	D	702	NAG	O3-C3-C4	-2.71	103.98	110.38
2	A	702	NAG	O5-C5-C4	2.70	117.39	110.83
2	B	702	NAG	O6-C6-C5	-2.62	102.40	111.33
2	D	704	NAG	C1-O5-C5	2.48	115.51	112.19
2	D	701	NAG	O5-C1-C2	2.44	115.06	111.29
2	A	702	NAG	O5-C5-C6	2.43	112.39	107.66

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	701	NAG	O6-C6-C5	-2.38	103.22	111.33
3	A	705	GAL	C4-C3-C2	-2.37	106.66	110.83
3	B	710	GAL	O1-C1-O5	-2.29	103.62	110.41
3	C	706	GAL	C1-C2-C3	-2.27	105.72	110.36
2	A	704	NAG	O5-C5-C6	2.26	112.06	107.66
2	A	704	NAG	C1-O5-C5	2.20	115.14	112.19
2	D	701	NAG	O5-C5-C4	-2.16	105.57	110.83
2	C	703	NAG	O3-C3-C2	-2.13	104.97	109.40
2	C	703	NAG	C8-C7-N2	2.11	119.61	116.12
2	B	701	NAG	O5-C1-C2	-2.09	108.06	111.29
3	A	705	GAL	O5-C5-C4	-2.03	106.04	109.70
2	D	704	NAG	O3-C3-C2	-2.02	105.20	109.40
2	A	702	NAG	O6-C6-C5	-2.02	104.45	111.33

There are no chirality outliers.

All (24) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	D	701	NAG	C4-C5-C6-O6
2	B	702	NAG	O5-C5-C6-O6
2	B	702	NAG	C4-C5-C6-O6
2	D	701	NAG	O5-C5-C6-O6
2	D	703	NAG	O5-C5-C6-O6
2	D	703	NAG	C4-C5-C6-O6
2	C	701	NAG	C4-C5-C6-O6
2	A	702	NAG	C4-C5-C6-O6
2	B	701	NAG	C4-C5-C6-O6
2	B	701	NAG	O5-C5-C6-O6
6	A	710	EDO	O1-C1-C2-O2
2	C	701	NAG	O5-C5-C6-O6
3	C	706	GAL	O5-C5-C6-O6
3	B	710	GAL	O5-C5-C6-O6
3	D	706	GAL	O5-C5-C6-O6
6	B	708	EDO	O1-C1-C2-O2
6	D	709	EDO	O1-C1-C2-O2
3	A	705	GAL	O5-C5-C6-O6
2	A	702	NAG	O5-C5-C6-O6
6	D	710	EDO	O1-C1-C2-O2
6	C	709	EDO	O1-C1-C2-O2
2	C	701	NAG	C1-C2-N2-C7
6	C	710	EDO	O1-C1-C2-O2
2	A	701	NAG	C4-C5-C6-O6

There are no ring outliers.

9 monomers are involved in 17 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	D	708	SO4	2	0
3	B	710	GAL	1	0
3	C	706	GAL	1	0
2	C	702	NAG	1	0
2	C	703	NAG	1	0
2	D	703	NAG	7	0
3	D	706	GAL	2	0
6	D	709	EDO	1	0
6	C	709	EDO	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, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	605/678 (89%)	0.00	13 (2%)	63	71	16, 26, 41, 85	0
1	B	605/678 (89%)	-0.04	9 (1%)	73	79	16, 25, 40, 83	0
1	C	603/678 (88%)	0.05	14 (2%)	60	68	17, 26, 49, 81	0
1	D	603/678 (88%)	0.09	23 (3%)	40	49	16, 28, 50, 83	0
All	All	2416/2712 (89%)	0.03	59 (2%)	59	67	16, 26, 46, 85	0

All (59) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	647	SER	8.6
1	C	527	TRP	7.0
1	D	527	TRP	6.5
1	A	647	SER	6.1
1	D	526	GLY	5.9
1	A	629	ASP	5.8
1	B	628	SER	5.2
1	A	646	SER	5.2
1	C	29	GLN	4.9
1	D	29	GLN	4.6
1	D	629	ASP	4.5
1	B	646	SER	4.4
1	B	29	GLN	4.3
1	D	528	GLY	4.1
1	A	628	SER	4.1
1	D	647	SER	3.9
1	C	647	SER	3.6
1	B	627	SER	3.5
1	C	525	GLY	3.5
1	A	488	TYR	3.5
1	A	29	GLN	3.4

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Mol	Chain	Res	Type	RSRZ
1	C	429	PRO	3.4
1	D	488	TYR	3.2
1	D	628	SER	3.2
1	D	632	GLU	3.2
1	C	586[A]	PHE	3.0
1	D	427	SER	2.9
1	C	526	GLY	2.8
1	C	35	ASP	2.7
1	A	359	LYS	2.7
1	B	488	TYR	2.7
1	B	629	ASP	2.7
1	C	488	TYR	2.6
1	D	631	PRO	2.6
1	D	359	LYS	2.6
1	A	627	SER	2.5
1	D	426	CYS	2.5
1	D	38	ARG	2.5
1	D	468	LYS	2.5
1	D	646	SER	2.5
1	A	443	ALA	2.5
1	A	487	ALA	2.5
1	A	120	LEU	2.3
1	C	528	GLY	2.3
1	D	469	ALA	2.3
1	D	425	ASP	2.2
1	D	428	ASN	2.2
1	A	119	ILE	2.2
1	D	627	SER	2.2
1	D	401	LEU	2.2
1	C	426	CYS	2.2
1	A	287	GLU	2.1
1	C	468	LYS	2.1
1	C	623	TRP	2.1
1	B	31	MET	2.1
1	B	94	GLY	2.1
1	D	477	VAL	2.1
1	D	623	TRP	2.0
1	C	391	ILE	2.0

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 ⓘ

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	NAG	D	703	14/15	0.64	0.32	72,93,100,101	0
2	NAG	D	701	14/15	0.70	0.42	81,88,93,93	0
2	NAG	C	701	14/15	0.73	0.43	79,88,98,103	0
2	NAG	D	702	14/15	0.74	0.20	35,46,49,51	0
6	EDO	B	708	4/4	0.76	0.14	45,47,47,49	0
6	EDO	A	709	4/4	0.81	0.20	45,49,52,53	0
2	NAG	B	703	14/15	0.83	0.23	45,53,61,68	0
2	NAG	A	703	14/15	0.84	0.14	40,45,50,61	0
6	EDO	D	710	4/4	0.84	0.18	28,30,33,33	0
2	NAG	A	704	14/15	0.85	0.39	54,60,64,65	0
2	NAG	C	702	14/15	0.85	0.23	43,51,56,56	0
6	EDO	A	710	4/4	0.86	0.22	25,29,30,35	0
2	NAG	B	701	14/15	0.88	0.14	28,31,34,43	0
5	SO4	D	707	5/5	0.88	0.26	64,69,73,80	0
6	EDO	D	709	4/4	0.88	0.14	35,38,39,45	0
2	NAG	C	703	14/15	0.88	0.21	36,41,44,44	0
2	NAG	A	702	14/15	0.89	0.12	28,33,36,42	0
2	NAG	B	704	14/15	0.89	0.24	46,51,59,63	0
5	SO4	C	707	5/5	0.89	0.24	55,55,59,63	0
2	NAG	B	702	14/15	0.91	0.12	25,30,34,35	0
6	EDO	C	710	4/4	0.91	0.14	36,41,41,45	0
2	NAG	D	704	14/15	0.92	0.12	27,30,32,36	0
5	SO4	A	707	5/5	0.92	0.24	69,72,73,78	0
6	EDO	C	709	4/4	0.93	0.17	41,44,46,54	0
5	SO4	D	708	5/5	0.94	0.13	49,50,52,56	0
5	SO4	A	708	5/5	0.94	0.17	45,48,54,56	0
3	GAL	B	710	12/12	0.94	0.11	19,21,23,30	0
2	NAG	A	701	14/15	0.94	0.08	24,30,33,41	0
3	GAL	D	706	12/12	0.95	0.08	21,25,27,31	0
3	GAL	A	705	12/12	0.95	0.11	16,20,24,29	0
2	NAG	C	704	14/15	0.95	0.13	24,26,29,35	0
5	SO4	B	706	5/5	0.95	0.28	56,63,64,67	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
5	SO4	B	707	5/5	0.95	0.16	47,47,54,55	0
6	EDO	B	709	4/4	0.96	0.10	33,33,33,37	0
3	GAL	C	706	12/12	0.97	0.11	18,22,25,32	0
5	SO4	C	708	5/5	0.97	0.15	40,43,47,48	0
4	CL	A	706	1/1	0.99	0.09	21,21,21,21	0
4	CL	B	705	1/1	0.99	0.06	20,20,20,20	0
4	CL	C	705	1/1	0.99	0.09	21,21,21,21	0
4	CL	D	705	1/1	0.99	0.09	20,20,20,20	0

6.5 Other polymers ⓘ

There are no such residues in this entry.