



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 19, 2016 – 10:19 PM GMT

PDB ID : 5CSY  
Title : Disproportionating enzyme 1 from Arabidopsis - acarbose soak  
Authors : O'Neill, E.C.; Stevenson, C.E.M.; Tantanarat, K.; Latousakis, D.; Donaldson, M.I.; Rejzek, M.; Limpaseni, T.; Smith, A.M.; Field, R.A.; Lawson, D.M.  
Deposited on : 2015-07-23  
Resolution : 2.05 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.  
We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)  
A user guide is available at  
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>  
with specific help available everywhere you see the ⓘ symbol.

---

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

MolProbity : 4.02b-467  
Mogul : 1.7.1 (RC1), CSD as537be (2016)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20026982  
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)  
Refmac : 5.8.0135  
CCP4 : 6.5.0  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : rb-20026982

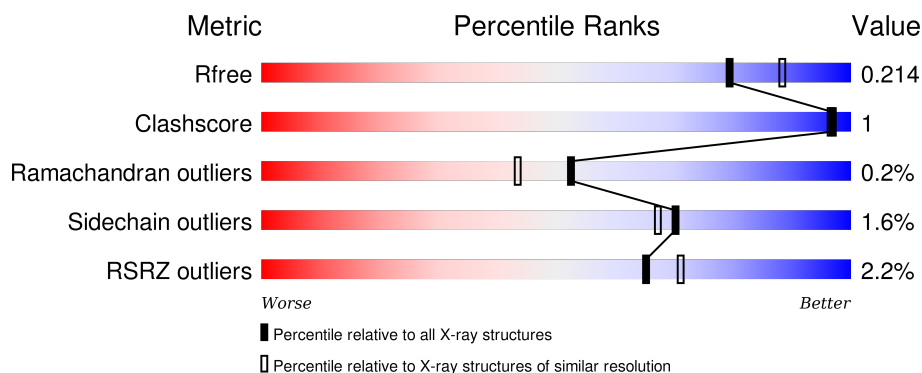
# 1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.05 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))
$R_{free}$	91344	1192 (2.04-2.04)
Clashscore	102246	1269 (2.04-2.04)
Ramachandran outliers	100387	1258 (2.04-2.04)
Sidechain outliers	100360	1258 (2.04-2.04)
RSRZ outliers	91569	1194 (2.04-2.04)

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

Mol	Chain	Length	Quality of chain
1	A	564	<div> <div>3%</div> <div>85%</div> <div>10%</div> </div>
1	B	564	<div> <div>%</div> <div>87%</div> <div>5%</div> <div>8%</div> </div>

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
4	EDO	A	609	-	-	-	X
4	EDO	A	610	-	-	-	X
4	EDO	A	612	-	-	-	X
4	EDO	A	613	-	-	-	X
4	EDO	B	607	-	-	-	X
4	EDO	B	608	-	-	-	X

## 2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 8614 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 4-alpha-glucanotransferase DPE1, chloroplastic/amyloplastic.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	506	Total	C	N	O	S	0	1	0
			3952	2528	670	743	11			
1	B	517	Total	C	N	O	S	0	1	0
			4059	2601	687	759	12			

There are 66 discrepancies between the modelled and reference sequences:

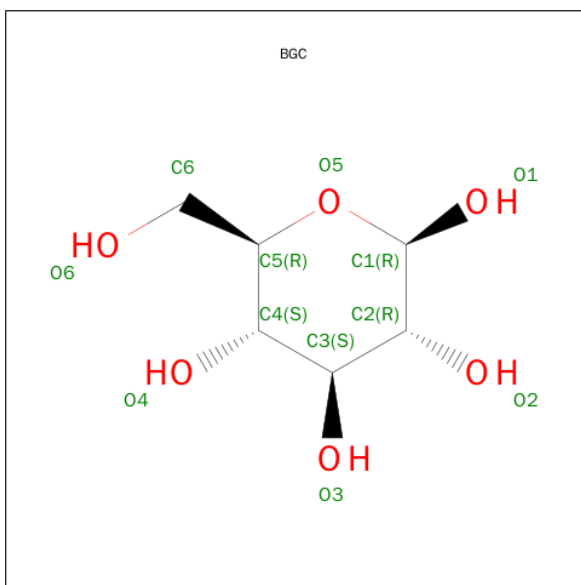
Chain	Residue	Modelled	Actual	Comment	Reference
A	13	MET	-	initiating methionine	UNP Q9LV91
A	14	HIS	-	expression tag	UNP Q9LV91
A	15	HIS	-	expression tag	UNP Q9LV91
A	16	HIS	-	expression tag	UNP Q9LV91
A	17	HIS	-	expression tag	UNP Q9LV91
A	18	HIS	-	expression tag	UNP Q9LV91
A	19	HIS	-	expression tag	UNP Q9LV91
A	20	GLY	-	expression tag	UNP Q9LV91
A	21	LYS	-	expression tag	UNP Q9LV91
A	22	PRO	-	expression tag	UNP Q9LV91
A	23	ILE	-	expression tag	UNP Q9LV91
A	24	PRO	-	expression tag	UNP Q9LV91
A	25	ASN	-	expression tag	UNP Q9LV91
A	26	PRO	-	expression tag	UNP Q9LV91
A	27	LEU	-	expression tag	UNP Q9LV91
A	28	LEU	-	expression tag	UNP Q9LV91
A	29	GLY	-	expression tag	UNP Q9LV91
A	30	LEU	-	expression tag	UNP Q9LV91
A	31	ASP	-	expression tag	UNP Q9LV91
A	32	SER	-	expression tag	UNP Q9LV91
A	33	THR	-	expression tag	UNP Q9LV91
A	34	GLU	-	expression tag	UNP Q9LV91
A	35	ASN	-	expression tag	UNP Q9LV91
A	36	LEU	-	expression tag	UNP Q9LV91
A	37	TYR	-	expression tag	UNP Q9LV91

*Continued on next page...*

*Continued from previous page...*

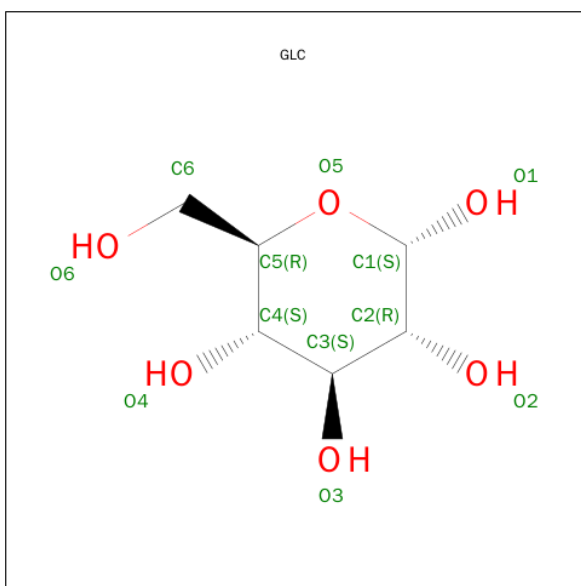
Chain	Residue	Modelled	Actual	Comment	Reference
A	38	PHE	-	expression tag	UNP Q9LV91
A	39	GLN	-	expression tag	UNP Q9LV91
A	40	GLY	-	expression tag	UNP Q9LV91
A	41	ILE	-	expression tag	UNP Q9LV91
A	42	ASP	-	expression tag	UNP Q9LV91
A	43	PRO	-	expression tag	UNP Q9LV91
A	44	PHE	-	expression tag	UNP Q9LV91
A	45	THR	-	expression tag	UNP Q9LV91
B	13	MET	-	initiating methionine	UNP Q9LV91
B	14	HIS	-	expression tag	UNP Q9LV91
B	15	HIS	-	expression tag	UNP Q9LV91
B	16	HIS	-	expression tag	UNP Q9LV91
B	17	HIS	-	expression tag	UNP Q9LV91
B	18	HIS	-	expression tag	UNP Q9LV91
B	19	HIS	-	expression tag	UNP Q9LV91
B	20	GLY	-	expression tag	UNP Q9LV91
B	21	LYS	-	expression tag	UNP Q9LV91
B	22	PRO	-	expression tag	UNP Q9LV91
B	23	ILE	-	expression tag	UNP Q9LV91
B	24	PRO	-	expression tag	UNP Q9LV91
B	25	ASN	-	expression tag	UNP Q9LV91
B	26	PRO	-	expression tag	UNP Q9LV91
B	27	LEU	-	expression tag	UNP Q9LV91
B	28	LEU	-	expression tag	UNP Q9LV91
B	29	GLY	-	expression tag	UNP Q9LV91
B	30	LEU	-	expression tag	UNP Q9LV91
B	31	ASP	-	expression tag	UNP Q9LV91
B	32	SER	-	expression tag	UNP Q9LV91
B	33	THR	-	expression tag	UNP Q9LV91
B	34	GLU	-	expression tag	UNP Q9LV91
B	35	ASN	-	expression tag	UNP Q9LV91
B	36	LEU	-	expression tag	UNP Q9LV91
B	37	TYR	-	expression tag	UNP Q9LV91
B	38	PHE	-	expression tag	UNP Q9LV91
B	39	GLN	-	expression tag	UNP Q9LV91
B	40	GLY	-	expression tag	UNP Q9LV91
B	41	ILE	-	expression tag	UNP Q9LV91
B	42	ASP	-	expression tag	UNP Q9LV91
B	43	PRO	-	expression tag	UNP Q9LV91
B	44	PHE	-	expression tag	UNP Q9LV91
B	45	THR	-	expression tag	UNP Q9LV91

- Molecule 2 is BETA-D-GLUCOSE (three-letter code: BGC) (formula: C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			12	6	6		
2	A	1	Total	C	O	0	0
			11	6	5		

- Molecule 3 is ALPHA-D-GLUCOSE (three-letter code: GLC) (formula:  $C_6H_{12}O_6$ ).



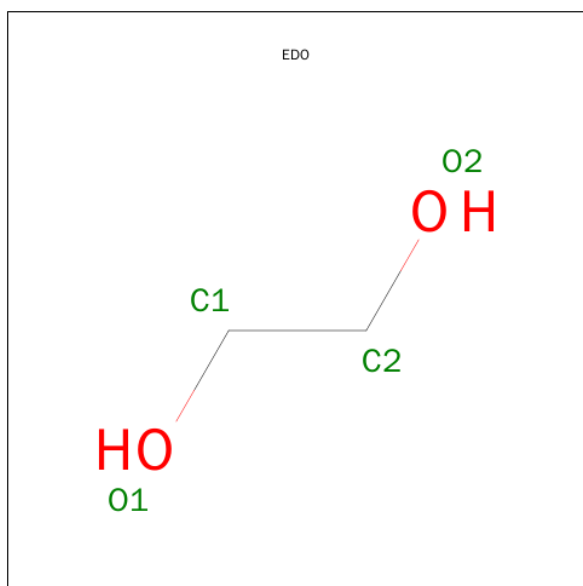
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			11	6	5		
3	A	1	Total	C	O	0	0
			11	6	5		

*Continued on next page...*

Continued from previous page...

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			11	6	5		
3	A	1	Total	C	O	0	0
			11	6	5		
3	A	1	Total	C	O	0	0
			11	6	5		
3	B	1	Total	C	O	0	0
			11	6	5		
3	B	1	Total	C	O	0	0
			11	6	5		
3	B	1	Total	C	O	0	0
			11	6	5		

- Molecule 4 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C<sub>2</sub>H<sub>6</sub>O<sub>2</sub>).



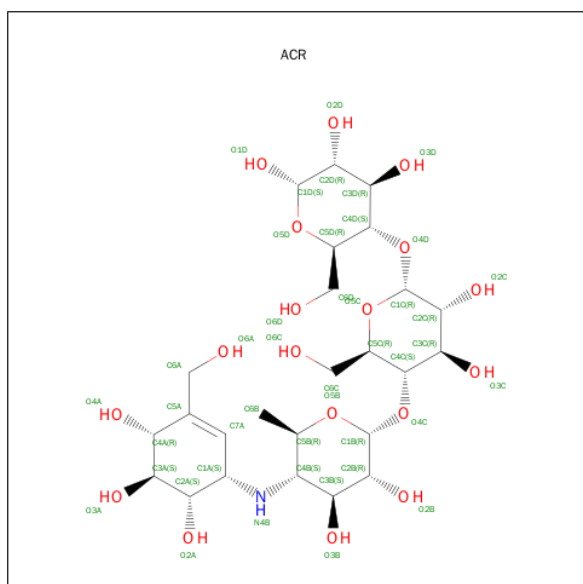
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			4	2	2		
4	A	1	Total	C	O	0	0
			4	2	2		
4	A	1	Total	C	O	0	0
			4	2	2		
4	A	1	Total	C	O	0	0
			4	2	2		
4	A	1	Total	C	O	0	0
			4	2	2		

Continued on next page...

Continued from previous page...

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

- Molecule 5 is ALPHA-ACARBOSE (three-letter code: ACR) (formula:  $C_{25}H_{43}NO_{18}$ ).

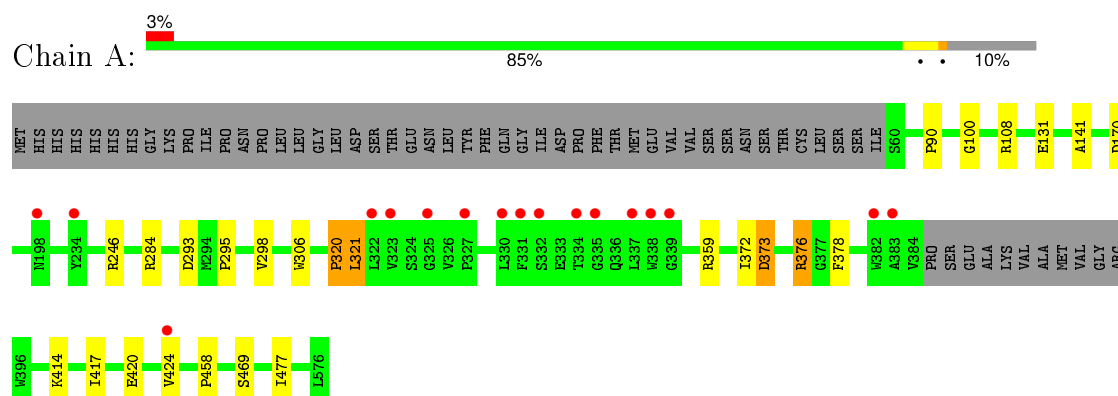




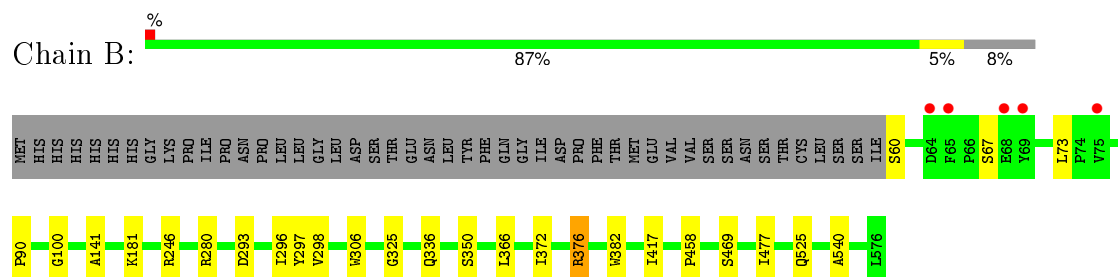
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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 ( $\text{RSRZ} > 2$ ). 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: 4-alpha-glucanotransferase DPE1, chloroplastic/amyloplastic



- Molecule 1: 4-alpha-glucanotransferase DPE1, chloroplastic/amyloplastic



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	69.79Å 73.69Å 79.35Å 64.59° 69.99° 66.78°	Depositor
Resolution (Å)	63.67 – 2.05 63.67 – 2.05	Depositor EDS
% Data completeness (in resolution range)	89.7 (63.67-2.05) 79.3 (63.67-2.05)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.34 (at 2.05Å)	Xtriage
Refinement program	REFMAC	Depositor
R, $R_{free}$	0.187 , 0.210 0.193 , 0.214	Depositor DCC
$R_{free}$ test set	3689 reflections (5.38%)	DCC
Wilson B-factor (Å <sup>2</sup> )	34.0	Xtriage
Anisotropy	0.663	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.33 , 35.2	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Outliers	0 of 72208 reflections	Xtriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	8614	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	44.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.01% of the height of the origin peak. No significant pseudotranslation is detected.*

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

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.375 respectively for untwinned datasets, and 0.333, 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: GLC, ACR, BGC, EDO

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	0.62	0/4066	0.78	7/5537 (0.1%)
1	B	0.63	0/4176	0.76	3/5684 (0.1%)
All	All	0.63	0/8242	0.77	10/11221 (0.1%)

There are no bond length outliers.

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	376	ARG	NE-CZ-NH1	7.59	124.09	120.30
1	B	376	ARG	NE-CZ-NH2	-7.42	116.59	120.30
1	A	376	ARG	NE-CZ-NH2	-6.99	116.81	120.30
1	B	376	ARG	NE-CZ-NH1	6.62	123.61	120.30
1	A	284	ARG	NE-CZ-NH1	5.98	123.29	120.30
1	A	373	ASP	CB-CG-OD1	5.91	123.62	118.30
1	A	293	ASP	CB-CG-OD1	5.69	123.42	118.30
1	B	293	ASP	CB-CG-OD1	5.17	122.95	118.30
1	A	131	GLU	OE1-CD-OE2	-5.10	117.19	123.30
1	A	108	ARG	NE-CZ-NH1	5.04	122.82	120.30

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3952	0	3728	9	0
1	B	4059	0	3887	12	0
2	A	23	0	20	0	0
3	A	55	0	47	1	0
3	B	33	0	28	0	0
4	A	24	0	36	0	0
4	B	20	0	30	1	0
5	B	44	0	42	0	0
6	A	192	0	0	0	0
6	B	212	0	0	0	0
All	All	8614	0	7818	21	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 1.

All (21) 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:A:320:PRO:O	1:A:321:LEU:CB	2.35	0.73
1:B:525:GLN:HE22	4:B:607:EDO:H22	1.66	0.60
1:B:141:ALA:HB2	1:B:298:VAL:HG11	1.87	0.56
1:B:325:GLY:O	1:B:382:TRP:HB3	2.09	0.53
1:A:372:ILE:HD11	1:A:417:ILE:HD12	1.92	0.52
1:A:295:PRO:HA	1:A:373:ASP:HB3	1.94	0.49
1:B:372:ILE:HD11	1:B:417:ILE:HD12	1.94	0.49
1:B:336:GLN:HG2	1:B:540:ALA:HB2	1.93	0.49
1:B:246:ARG:HG2	1:B:306:TRP:CZ2	2.48	0.48
1:B:469:SER:HB2	1:B:477:ILE:HD11	1.95	0.48
1:A:469:SER:HB2	1:A:477:ILE:HD11	1.95	0.47
1:B:372:ILE:HG12	1:B:417:ILE:HG23	1.96	0.47
1:A:372:ILE:HG21	1:A:378:PHE:HE2	1.80	0.46
1:A:246:ARG:HG2	1:A:306:TRP:CZ2	2.52	0.45
1:B:372:ILE:CG1	1:B:417:ILE:HG23	2.48	0.44
1:A:420:GLU:OE1	3:A:603:GLC:O3	2.27	0.44
1:A:141:ALA:HB2	1:A:298:VAL:HG11	2.00	0.44
1:B:280:ARG:HD2	1:B:366:LEU:O	2.19	0.43
1:B:90:PRO:O	1:B:100:GLY:HA3	2.19	0.42
1:A:90:PRO:O	1:A:100:GLY:HA3	2.21	0.41
1:B:296:ILE:HG23	1:B:297:TYR:CD2	2.56	0.41

There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone

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	503/564 (89%)	492 (98%)	9 (2%)	2 (0%)	39	28
1	B	516/564 (92%)	508 (98%)	8 (2%)	0	100	100
All	All	1019/1128 (90%)	1000 (98%)	17 (2%)	2 (0%)	52	43

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	321	LEU
1	A	320	PRO

### 5.3.2 Protein sidechains

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	405/480 (84%)	399 (98%)	6 (2%)	72	70
1	B	422/480 (88%)	415 (98%)	7 (2%)	68	65
All	All	827/960 (86%)	814 (98%)	13 (2%)	70	67

All (13) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	170	ASP
1	A	359	ARG
1	A	376	ARG
1	A	414	LYS

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
1	A	424	VAL
1	A	458	PRO
1	B	60	SER
1	B	67	SER
1	B	73	LEU
1	B	181	LYS
1	B	350	SER
1	B	376	ARG
1	B	458	PRO

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	198	ASN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

## 5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

## 5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

22 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	BGC	A	601	3	12,12,12	0.23	0	17,17,17	0.63	0
3	GLC	A	602	3,2	11,11,12	0.37	0	15,15,17	0.74	0
3	GLC	A	603	3	11,11,12	0.26	0	15,15,17	0.75	0
2	BGC	A	604	1,3	11,11,12	0.25	0	15,15,17	1.55	2 (13%)
3	GLC	A	605	3,2	11,11,12	0.32	0	15,15,17	0.77	0
3	GLC	A	606	3	11,11,12	0.38	0	15,15,17	0.79	1 (6%)
3	GLC	A	607	3	11,11,12	0.42	0	15,15,17	0.97	1 (6%)
4	EDO	A	608	-	3,3,3	0.60	0	2,2,2	0.29	0
4	EDO	A	609	-	3,3,3	0.71	0	2,2,2	0.08	0
4	EDO	A	610	-	3,3,3	0.59	0	2,2,2	0.35	0
4	EDO	A	611	-	3,3,3	0.54	0	2,2,2	0.35	0
4	EDO	A	612	-	3,3,3	0.71	0	2,2,2	0.13	0
4	EDO	A	613	-	3,3,3	0.52	0	2,2,2	0.32	0
5	ACR	B	601	3	46,47,47	1.01	2 (4%)	60,70,70	0.66	1 (1%)
3	GLC	B	602	3,5	11,11,12	0.21	0	15,15,17	0.79	0
3	GLC	B	603	3	11,11,12	0.25	0	15,15,17	0.69	0
3	GLC	B	604	3	11,11,12	0.25	0	15,15,17	0.57	0
4	EDO	B	605	-	3,3,3	0.60	0	2,2,2	0.36	0
4	EDO	B	606	-	3,3,3	0.66	0	2,2,2	0.20	0
4	EDO	B	607	-	3,3,3	0.24	0	2,2,2	0.75	0
4	EDO	B	608	-	3,3,3	0.51	0	2,2,2	0.12	0
4	EDO	B	609	-	3,3,3	0.42	0	2,2,2	0.59	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	BGC	A	601	3	-	0/2/22/22	0/1/1/1
3	GLC	A	602	3,2	-	0/2/19/22	0/1/1/1
3	GLC	A	603	3	-	0/2/19/22	0/1/1/1
2	BGC	A	604	1,3	-	0/2/19/22	0/1/1/1
3	GLC	A	605	3,2	-	0/2/19/22	0/1/1/1
3	GLC	A	606	3	-	0/2/19/22	0/1/1/1
3	GLC	A	607	3	-	0/2/19/22	0/1/1/1
4	EDO	A	608	-	-	0/1/1/1	0/0/0/0
4	EDO	A	609	-	-	0/1/1/1	0/0/0/0
4	EDO	A	610	-	-	0/1/1/1	0/0/0/0
4	EDO	A	611	-	-	0/1/1/1	0/0/0/0
4	EDO	A	612	-	-	0/1/1/1	0/0/0/0
4	EDO	A	613	-	-	0/1/1/1	0/0/0/0

*Continued on next page...*

*Continued from previous page...*

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	ACR	B	601	3	-	1/18/98/98	0/4/4/4
3	GLC	B	602	3,5	-	0/2/19/22	0/1/1/1
3	GLC	B	603	3	-	0/2/19/22	0/1/1/1
3	GLC	B	604	3	-	0/2/19/22	0/1/1/1
4	EDO	B	605	-	-	0/1/1/1	0/0/0/0
4	EDO	B	606	-	-	0/1/1/1	0/0/0/0
4	EDO	B	607	-	-	0/1/1/1	0/0/0/0
4	EDO	B	608	-	-	0/1/1/1	0/0/0/0
4	EDO	B	609	-	-	0/1/1/1	0/0/0/0

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	601	ACR	C1A-C7A	4.64	1.56	1.50
5	B	601	ACR	C1A-N4B	4.72	1.54	1.47

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	B	601	ACR	C3B-C4B-N4B	2.10	117.59	111.38
2	A	604	BGC	C1-C2-C3	2.15	112.15	109.55
3	A	606	GLC	C1-C2-C3	2.20	112.22	109.55
3	A	607	GLC	C1-C2-C3	3.13	113.34	109.55
2	A	604	BGC	C1-O5-C5	5.04	119.55	112.14

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	B	601	ACR	C7A-C1A-N4B-C4B

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	603	GLC	1	0
4	B	607	EDO	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<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	506/564 (89%)	-0.08	17 (3%) 49 55	25, 44, 82, 104	0
1	B	517/564 (91%)	-0.20	5 (0%) 84 87	25, 40, 67, 89	0
All	All	1023/1128 (90%)	-0.14	22 (2%) 65 71	25, 42, 74, 104	0

All (22) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	65	PHE	6.1
1	A	331	PHE	6.0
1	A	337	LEU	5.6
1	A	335	GLY	4.7
1	A	332	SER	4.4
1	A	330	LEU	4.3
1	A	325	GLY	4.1
1	A	338	TRP	4.0
1	B	68	GLU	3.6
1	A	322	LEU	3.4
1	A	382	TRP	3.3
1	B	64	ASP	2.9
1	A	334	THR	2.7
1	A	327	PRO	2.7
1	B	75	VAL	2.7
1	A	383	ALA	2.6
1	B	69	TYR	2.5
1	A	339	GLY	2.3
1	A	198	ASN	2.2
1	A	323	VAL	2.1
1	A	424	VAL	2.0
1	A	234	TYR	2.0

## 6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

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

## 6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(Å <sup>2</sup> )	Q<0.9
4	EDO	A	612	4/4	0.91	0.30	21.58	56,56,58,59	0
4	EDO	A	609	4/4	0.79	0.31	16.47	69,74,78,85	0
4	EDO	A	613	4/4	0.96	0.25	14.78	40,46,46,47	0
4	EDO	B	608	4/4	0.94	0.24	11.94	37,43,46,47	0
4	EDO	B	607	4/4	0.74	0.27	11.67	56,57,59,64	0
4	EDO	A	610	4/4	0.90	0.24	10.19	63,64,65,66	0
4	EDO	A	611	4/4	0.94	0.17	1.44	55,56,57,58	0
3	GLC	A	603	11/12	0.88	0.26	0.87	64,68,71,72	0
2	BGC	A	601	12/12	0.89	0.20	0.77	57,63,65,67	0
4	EDO	B	609	4/4	0.94	0.12	0.53	58,59,59,62	0
3	GLC	A	606	11/12	0.90	0.26	0.52	69,77,86,88	0
3	GLC	A	602	11/12	0.89	0.24	0.49	60,63,64,65	0
5	ACR	B	601	44/44	0.93	0.10	-0.02	33,40,47,52	0
4	EDO	B	606	4/4	0.94	0.11	-0.05	50,50,50,51	0
2	BGC	A	604	11/12	0.95	0.13	-0.11	38,43,49,53	0
3	GLC	A	605	11/12	0.93	0.13	-0.32	47,51,55,62	0
3	GLC	B	603	11/12	0.96	0.10	-0.49	43,46,49,53	0
3	GLC	B	602	11/12	0.97	0.09	-0.51	37,40,41,43	0
3	GLC	B	604	11/12	0.93	0.15	-	54,58,65,69	0
4	EDO	A	608	4/4	0.96	0.13	-	44,45,45,45	0
3	GLC	A	607	11/12	0.75	0.40	-	89,91,95,99	0
4	EDO	B	605	4/4	0.96	0.09	-	37,38,38,39	0

## 6.5 Other polymers ⓘ

There are no such residues in this entry.