



# Full wwPDB X-ray Structure Validation Report ⓘ

May 25, 2020 – 03:59 am BST

PDB ID : 5OPQ  
Title : A 3,6-anhydro-D-galactosidase produced by *Zobellia galactanivorans*. This is an exo-lytic enzyme that hydrolyzes terminal 3,6-anhydro-D-galactose from the non-reducing end of carrageenan oligosaccharides.  
Authors : Ficko-Blean, E.; Michel, G.; Czjzek, M.  
Deposited on : 2017-08-10  
Resolution : 1.70 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

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

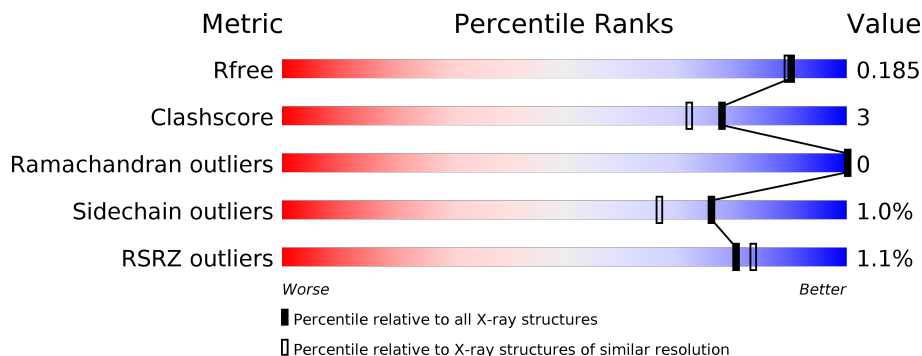
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*


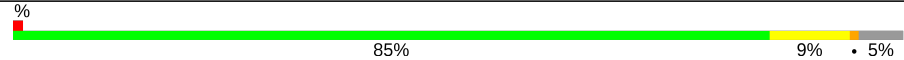
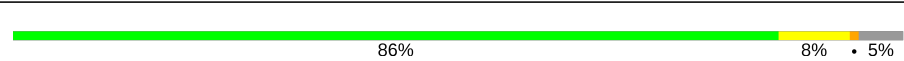

The reported resolution of this entry is 1.70 Å.

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	4298 (1.70-1.70)
Clashscore	141614	4695 (1.70-1.70)
Ramachandran outliers	138981	4610 (1.70-1.70)
Sidechain outliers	138945	4610 (1.70-1.70)
RSRZ outliers	127900	4222 (1.70-1.70)

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 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  $\leq 5\%$ . 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	693	 2% 86% 9% 5%
1	B	693	 2% 85% 9% 5%
1	C	693	 86% 8% 5%
1	D	693	 2% 88% 7% 5%

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 crite-

ria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	MPD	A	702	-	X	X	-
2	MPD	B	701	-	X	X	-
2	MPD	D	701	-	X	X	-
3	TRS	A	703[A]	-	X	-	-
3	TRS	A	703[B]	-	X	-	-
3	TRS	B	702[A]	-	X	-	-
3	TRS	C	702[A]	-	X	-	-
3	TRS	C	703	-	X	-	-
3	TRS	D	702[A]	-	X	-	-

## 2 Entry composition [i](#)

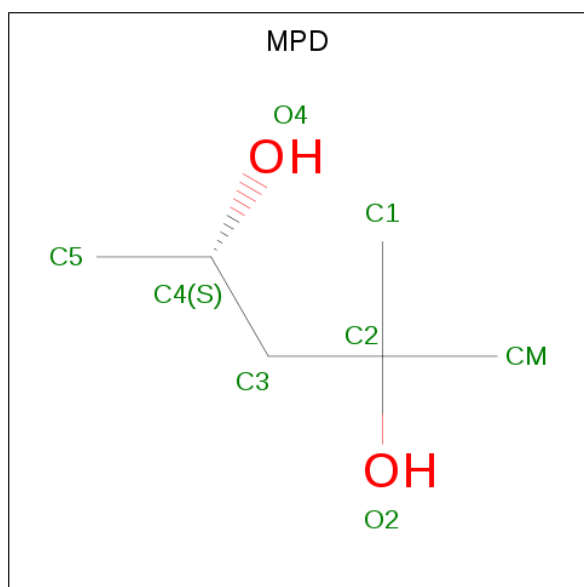
There are 5 unique types of molecules in this entry. The entry contains 23909 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 3,6-anhydro-D-galactosidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	659	Total 5244	C 3345	N 884	O 991	S 24	0	6	0
1	B	659	Total 5256	C 3356	N 892	O 984	S 24	0	4	0
1	C	659	Total 5224	C 3333	N 883	O 984	S 24	0	3	0
1	D	658	Total 5228	C 3337	N 884	O 983	S 24	0	3	0

- Molecule 2 is (4S)-2-METHYL-2,4-PENTANEDIOL (three-letter code: MPD) (formula: C<sub>6</sub>H<sub>14</sub>O<sub>2</sub>).



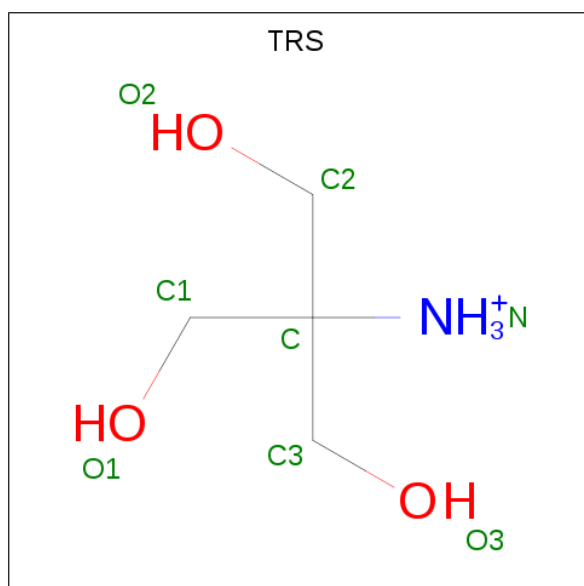
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	C O		
2	A	1	Total 8	C O 6 2	0	0
2	A	1	Total 8	C O 6 2	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	B	1	Total	C	O	0	0
			8	6	2		
2	C	1	Total	C	O	0	0
			8	6	2		
2	D	1	Total	C	O	0	0
			8	6	2		

- Molecule 3 is 2-AMINO-2-HYDROXYMETHYL-PROPANE-1,3-DIOL (three-letter code: TRS) (formula: C<sub>4</sub>H<sub>12</sub>NO<sub>3</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	1
			16	8	2	6		
3	B	1	Total	C	N	O	0	1
			16	8	2	6		
3	C	1	Total	C	N	O	0	1
			16	8	2	6		
3	C	1	Total	C	N	O	0	0
			8	4	1	3		
3	D	1	Total	C	N	O	0	1
			16	8	2	6		

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

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

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

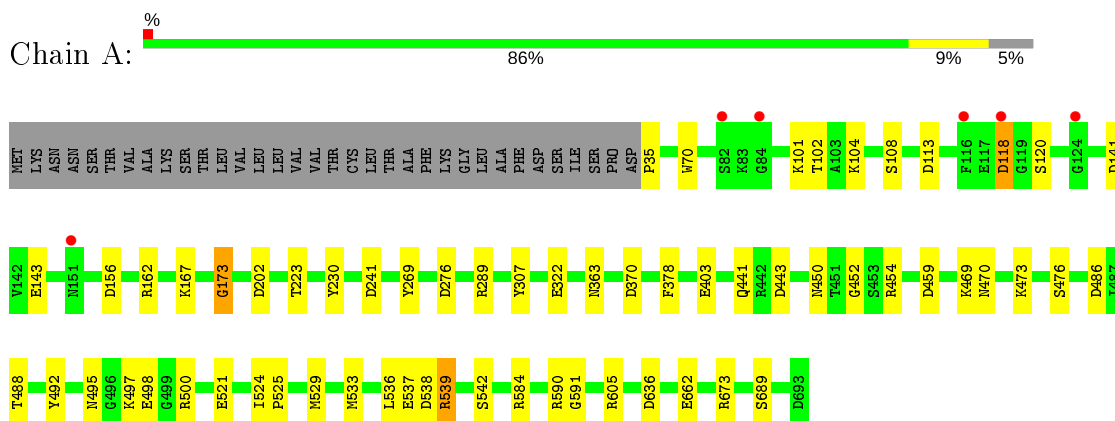
- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	706	Total O 718 718	0	12
5	B	686	Total O 695 695	0	9
5	C	733	Total O 745 745	0	11
5	D	669	Total O 683 683	0	14

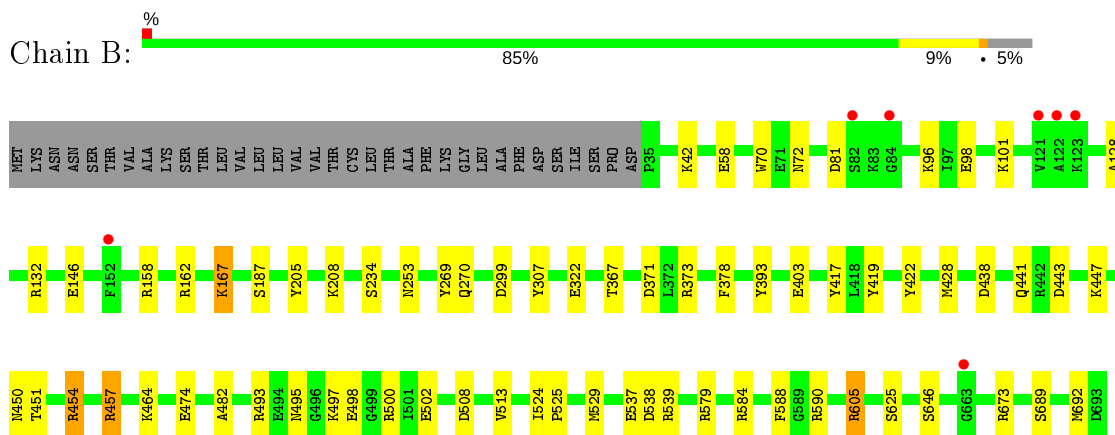
### 3 Residue-property plots i

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

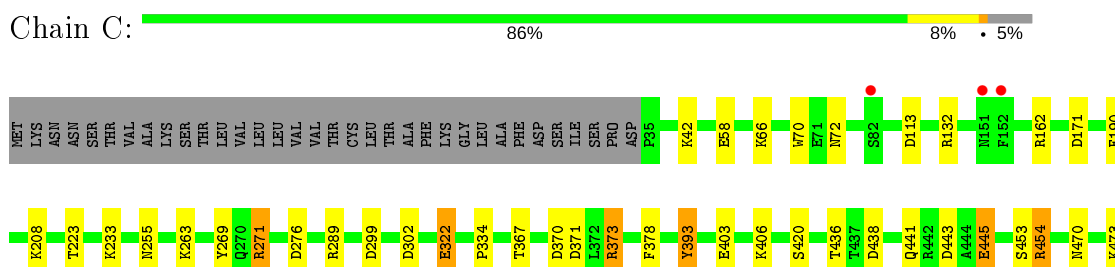
- Molecule 1: 3,6-anhydro-D-galactosidase



- Molecule 1: 3,6-anhydro-D-galactosidase

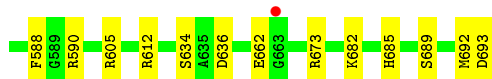
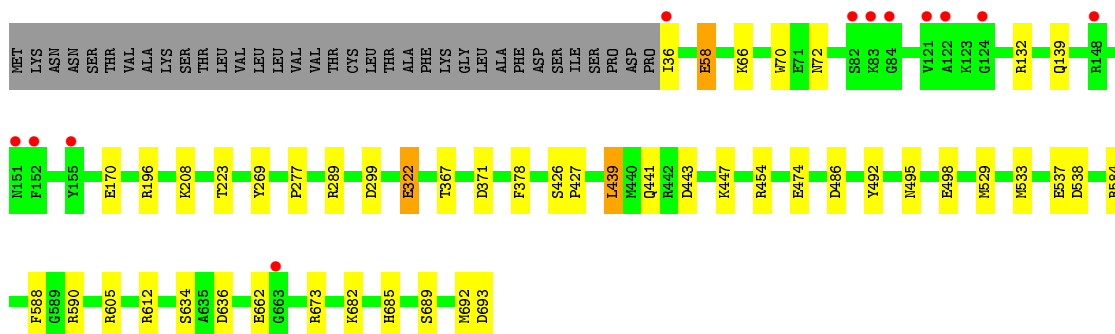
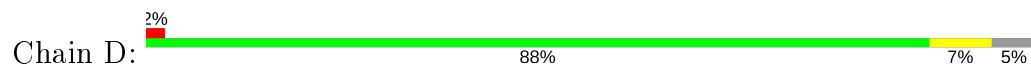


- Molecule 1: 3,6-anhydro-D-galactosidase





● Molecule 1: 3,6-anhydro-D-galactosidase





## 4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	222.00Å 107.50Å 165.80Å 90.00° 114.00° 90.00°	Depositor
Resolution (Å)	46.70 – 1.70 46.66 – 1.70	Depositor EDS
% Data completeness (in resolution range)	99.6 (46.70-1.70) 99.6 (46.66-1.70)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.27 (at 1.70Å)	Xtrriage
Refinement program	REFMAC 5.7.0032	Depositor
R, $R_{free}$	0.146 , 0.176 0.158 , 0.185	Depositor DCC
$R_{free}$ test set	19548 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	18.9	Xtrriage
Anisotropy	0.048	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.34 , 49.8	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.97	EDS
Total number of atoms	23909	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	21.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.94% of the height of the origin peak. No significant pseudotranslation is detected.*

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

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality i

### 5.1 Standard geometry i

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

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	A	1.22	11/5381 (0.2%)	1.21	29/7285 (0.4%)
1	B	1.22	9/5393 (0.2%)	1.20	29/7292 (0.4%)
1	C	1.23	9/5361 (0.2%)	1.18	33/7258 (0.5%)
1	D	1.21	10/5361 (0.2%)	1.17	26/7254 (0.4%)
All	All	1.22	39/21496 (0.2%)	1.19	117/29089 (0.4%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	B	0	1

All (39) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	322	GLU	CD-OE2	12.32	1.39	1.25
1	D	322	GLU	CD-OE1	11.02	1.37	1.25
1	C	322	GLU	CD-OE1	10.04	1.36	1.25
1	B	403	GLU	CD-OE1	8.92	1.35	1.25
1	C	403	GLU	CD-OE1	8.25	1.34	1.25
1	A	289	ARG	CD-NE	-7.82	1.33	1.46
1	D	289	ARG	CD-NE	-7.61	1.33	1.46
1	C	453	SER	CB-OG	-7.42	1.32	1.42
1	B	689	SER	CB-OG	-7.25	1.32	1.42
1	C	542	SER	CB-OG	-7.18	1.32	1.42
1	A	689	SER	CB-OG	-7.17	1.32	1.42
1	B	689	SER	CA-CB	6.89	1.63	1.52
1	B	322	GLU	CG-CD	6.88	1.62	1.51
1	A	498	GLU	CD-OE1	6.64	1.32	1.25

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	689	SER	CB-OG	-6.61	1.33	1.42
1	A	542	SER	CB-OG	-6.46	1.33	1.42
1	D	498	GLU	CD-OE1	6.31	1.32	1.25
1	D	58	GLU	CD-OE2	-6.05	1.19	1.25
1	A	521	GLU	CD-OE2	6.02	1.32	1.25
1	B	498	GLU	CD-OE1	5.88	1.32	1.25
1	A	476	SER	CB-OG	-5.80	1.34	1.42
1	A	452	GLY	N-CA	5.79	1.54	1.46
1	A	403	GLU	CD-OE1	5.75	1.31	1.25
1	A	591	GLY	N-CA	-5.63	1.37	1.46
1	C	393	TYR	CB-CG	5.61	1.60	1.51
1	D	693	ASP	CA-CB	-5.58	1.41	1.53
1	C	420	SER	CB-OG	5.51	1.49	1.42
1	B	393	TYR	CG-CD1	5.43	1.46	1.39
1	C	693	ASP	CA-CB	-5.37	1.42	1.53
1	A	307	TYR	CE2-CZ	5.28	1.45	1.38
1	D	492	TYR	CE2-CZ	-5.27	1.31	1.38
1	D	693	ASP	N-CA	5.26	1.56	1.46
1	C	445	GLU	CG-CD	-5.23	1.44	1.51
1	D	474	GLU	CG-CD	5.21	1.59	1.51
1	B	422	TYR	CE1-CZ	5.20	1.45	1.38
1	B	307	TYR	CE1-CZ	5.09	1.45	1.38
1	C	436	THR	CB-CG2	-5.09	1.35	1.52
1	D	322	GLU	CG-CD	5.06	1.59	1.51
1	A	173	GLY	N-CA	-5.05	1.38	1.46

All (117) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	289	ARG	NE-CZ-NH2	-19.88	110.36	120.30
1	A	289	ARG	NE-CZ-NH1	18.23	129.41	120.30
1	D	289	ARG	NE-CZ-NH2	-18.02	111.29	120.30
1	D	289	ARG	NE-CZ-NH1	13.57	127.08	120.30
1	B	457[A]	ARG	NE-CZ-NH1	-12.65	113.97	120.30
1	B	457[B]	ARG	NE-CZ-NH1	-12.65	113.97	120.30
1	A	584	ARG	NE-CZ-NH2	-11.53	114.54	120.30
1	B	162	ARG	NE-CZ-NH2	11.34	125.97	120.30
1	D	584	ARG	NE-CZ-NH1	10.97	125.79	120.30
1	B	162	ARG	NE-CZ-NH1	-10.88	114.86	120.30
1	A	605	ARG	NE-CZ-NH2	-10.71	114.95	120.30
1	C	584	ARG	NE-CZ-NH1	9.77	125.18	120.30
1	A	454	ARG	NE-CZ-NH2	-9.40	115.60	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	373	ARG	NE-CZ-NH2	-9.37	115.61	120.30
1	A	673	ARG	NE-CZ-NH1	9.08	124.84	120.30
1	B	584	ARG	NE-CZ-NH1	8.77	124.68	120.30
1	B	417	TYR	CB-CG-CD2	-8.36	115.99	121.00
1	C	605	ARG	NE-CZ-NH2	-8.24	116.18	120.30
1	C	590	ARG	NE-CZ-NH1	8.03	124.32	120.30
1	C	443	ASP	CB-CG-OD1	8.03	125.53	118.30
1	D	692	MET	C-N-CA	8.02	141.75	121.70
1	B	590	ARG	NE-CZ-NH1	7.96	124.28	120.30
1	D	693	ASP	CB-CG-OD2	-7.86	111.22	118.30
1	A	584	ARG	NE-CZ-NH1	7.84	124.22	120.30
1	C	162	ARG	NE-CZ-NH1	7.59	124.09	120.30
1	C	171	ASP	CB-CG-OD2	7.43	124.99	118.30
1	B	508	ASP	CB-CG-OD1	7.37	124.94	118.30
1	B	417	TYR	CB-CG-CD1	7.36	125.41	121.00
1	D	584	ARG	NE-CZ-NH2	-7.33	116.64	120.30
1	A	162	ARG	NE-CZ-NH1	7.03	123.81	120.30
1	C	113	ASP	CB-CG-OD1	6.94	124.55	118.30
1	A	590	ARG	NE-CZ-NH1	6.93	123.76	120.30
1	A	276	ASP	CB-CG-OD2	-6.78	112.19	118.30
1	B	605	ARG	NE-CZ-NH2	-6.76	116.92	120.30
1	C	289	ARG	NE-CZ-NH2	6.75	123.68	120.30
1	D	693	ASP	CB-CG-OD1	6.71	124.33	118.30
1	B	588	PHE	CB-CG-CD1	6.70	125.49	120.80
1	C	539	ARG	NE-CZ-NH2	-6.64	116.98	120.30
1	A	113	ASP	CB-CG-OD1	6.61	124.25	118.30
1	B	579	ARG	NE-CZ-NH2	-6.46	117.07	120.30
1	A	167	LYS	CD-CE-NZ	-6.44	96.89	111.70
1	A	118	ASP	CB-CG-OD1	6.41	124.06	118.30
1	B	158	ARG	NE-CZ-NH2	-6.40	117.10	120.30
1	A	289	ARG	CB-CG-CD	-6.39	94.98	111.60
1	B	457[A]	ARG	NE-CZ-NH2	6.36	123.48	120.30
1	B	457[B]	ARG	NE-CZ-NH2	6.36	123.48	120.30
1	C	271	ARG	NE-CZ-NH2	6.34	123.47	120.30
1	D	590	ARG	NE-CZ-NH1	6.30	123.45	120.30
1	B	584	ARG	NE-CZ-NH2	-6.30	117.15	120.30
1	A	241	ASP	CB-CG-OD2	-6.28	112.65	118.30
1	C	693	ASP	CB-CG-OD2	-6.28	112.65	118.30
1	B	373	ARG	NE-CZ-NH2	-6.23	117.18	120.30
1	B	443	ASP	CB-CG-OD1	6.22	123.89	118.30
1	A	276	ASP	CB-CG-OD1	6.20	123.88	118.30
1	C	584	ARG	NE-CZ-NH2	-6.15	117.22	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	605	ARG	NE-CZ-NH1	6.04	123.32	120.30
1	B	132	ARG	NE-CZ-NH1	6.01	123.31	120.30
1	C	692	MET	C-N-CA	5.96	136.59	121.70
1	B	299	ASP	CB-CG-OD1	5.95	123.66	118.30
1	D	693	ASP	CA-C-O	5.93	132.55	120.10
1	D	132	ARG	NE-CZ-NH2	-5.89	117.35	120.30
1	C	373	ARG	NE-CZ-NH1	5.89	123.25	120.30
1	A	486	ASP	CB-CG-OD1	-5.85	113.03	118.30
1	C	276	ASP	CB-CG-OD2	-5.85	113.03	118.30
1	C	612	ARG	NE-CZ-NH2	-5.84	117.38	120.30
1	A	636	ASP	CB-CG-OD2	-5.79	113.09	118.30
1	C	693	ASP	CB-CG-OD1	5.79	123.51	118.30
1	D	673	ARG	NE-CZ-NH1	5.79	123.19	120.30
1	A	605	ARG	NE-CZ-NH1	5.79	123.19	120.30
1	D	605	ARG	NE-CZ-NH1	5.78	123.19	120.30
1	B	132	ARG	NE-CZ-NH2	-5.76	117.42	120.30
1	B	500	ARG	NE-CZ-NH1	5.74	123.17	120.30
1	A	454	ARG	NE-CZ-NH1	5.70	123.15	120.30
1	B	438	ASP	CB-CG-OD2	-5.66	113.20	118.30
1	C	302	ASP	CB-CG-OD2	5.62	123.36	118.30
1	B	539	ARG	NE-CZ-NH1	5.60	123.10	120.30
1	C	590	ARG	NE-CZ-NH2	-5.56	117.52	120.30
1	B	447	LYS	CD-CE-NZ	5.55	124.46	111.70
1	D	299	ASP	CB-CG-OD1	5.52	123.27	118.30
1	C	636	ASP	CB-CG-OD1	5.51	123.26	118.30
1	C	370	ASP	CB-CG-OD2	-5.47	113.37	118.30
1	D	612	ARG	NE-CZ-NH1	5.47	123.03	120.30
1	D	605	ARG	NE-CZ-NH2	-5.44	117.58	120.30
1	C	445	GLU	OE1-CD-OE2	5.43	129.82	123.30
1	D	486	ASP	CB-CG-OD2	-5.43	113.41	118.30
1	D	590	ARG	NE-CZ-NH2	-5.43	117.59	120.30
1	A	443	ASP	CB-CG-OD1	5.42	123.17	118.30
1	A	539	ARG	NE-CZ-NH2	-5.40	117.60	120.30
1	C	539	ARG	NE-CZ-NH1	5.37	122.98	120.30
1	D	588	PHE	CB-CG-CD1	5.32	124.53	120.80
1	C	436	THR	OG1-CB-CG2	-5.32	97.77	110.00
1	C	438	ASP	CB-CG-OD2	-5.32	113.51	118.30
1	C	454	ARG	NE-CZ-NH2	-5.29	117.66	120.30
1	A	289	ARG	CD-NE-CZ	5.28	130.99	123.60
1	C	508	ASP	CB-CG-OD1	5.27	123.05	118.30
1	D	196	ARG	NE-CZ-NH2	-5.27	117.66	120.30
1	D	692	MET	O-C-N	5.27	131.13	122.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	459	ASP	CB-CG-OD1	5.26	123.03	118.30
1	C	132	ARG	NE-CZ-NH2	-5.25	117.68	120.30
1	A	141	ASP	CB-CG-OD2	-5.24	113.58	118.30
1	D	636	ASP	CB-CG-OD2	-5.23	113.60	118.30
1	D	196	ARG	NE-CZ-NH1	5.22	122.91	120.30
1	A	141	ASP	CB-CG-OD1	5.19	122.97	118.30
1	C	113	ASP	CB-CG-OD2	-5.17	113.65	118.30
1	A	673	ARG	NE-CZ-NH2	-5.17	117.72	120.30
1	B	493	ARG	NE-CZ-NH2	-5.17	117.72	120.30
1	D	66	LYS	CD-CE-NZ	5.14	123.52	111.70
1	D	443	ASP	CB-CG-OD1	5.12	122.91	118.30
1	D	634	SER	N-CA-CB	5.12	118.17	110.50
1	B	81	ASP	CB-CG-OD1	5.09	122.88	118.30
1	D	289	ARG	CB-CG-CD	-5.09	98.36	111.60
1	A	370	ASP	CB-CG-OD1	5.08	122.87	118.30
1	B	500	ARG	NE-CZ-NH2	-5.07	117.77	120.30
1	C	190	PHE	CB-CG-CD1	-5.07	117.25	120.80
1	C	299	ASP	CB-CG-OD1	5.07	122.86	118.30
1	A	156	ASP	CB-CG-OD2	-5.03	113.78	118.30
1	B	474	GLU	OE1-CD-OE2	5.01	129.31	123.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	205	TYR	Mainchain

## 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	5244	0	5064	28	0
1	B	5256	0	5129	34	0
1	C	5224	0	5055	29	0
1	D	5228	0	5070	20	0
2	A	16	0	27	7	0
2	B	8	0	12	7	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	C	8	0	14	0	0
2	D	8	0	12	8	0
3	A	16	0	23	0	0
3	B	16	0	24	3	0
3	C	24	0	36	2	0
3	D	16	0	24	0	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	718	0	0	13	1
5	B	695	0	0	9	0
5	C	745	0	0	17	1
5	D	683	0	0	6	0
All	All	23909	0	20490	121	1

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 3.

All (121) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:406:LYS:HE2	5:C:1079:HOH:O	1.37	1.24
2:B:701:MPD:H51	5:B:1334:HOH:O	1.49	1.13
2:D:701:MPD:H52	2:D:701:MPD:H12	1.21	1.10
1:C:498:GLU:OE1	5:C:801:HOH:O	1.71	1.09
1:C:233:LYS:HE2	5:C:1349:HOH:O	1.51	1.08
1:D:538:ASP:H	2:D:701:MPD:H51	1.13	1.08
1:C:393:TYR:CD2	1:C:470[B]:ASN:ND2	2.23	1.07
1:A:537:GLU:H	2:A:702:MPD:H51	0.94	1.06
1:A:537:GLU:N	2:A:702:MPD:H51	1.72	1.04
2:A:702:MPD:H52	5:A:1089:HOH:O	1.63	0.98
1:A:35:PRO:N	5:A:801:HOH:O	1.95	0.98
1:A:537:GLU:H	2:A:702:MPD:C5	1.83	0.91
3:C:703:TRS:H12	5:C:986:HOH:O	1.69	0.91
2:D:701:MPD:C5	2:D:701:MPD:H12	1.84	0.88
1:C:322:GLU:HG2	5:C:1414:HOH:O	1.75	0.86
2:B:701:MPD:H11	5:B:990:HOH:O	1.80	0.81
1:B:441:GLN:HE22	1:B:495:ASN:HD21	1.31	0.78
1:C:486:ASP:OD2	3:C:702[A]:TRS:O2	2.02	0.77
1:A:102:THR:HG21	1:A:108[B]:SER:OG	1.85	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:457[A]:ARG:HH11	1:B:457[A]:ARG:HG2	1.51	0.76
1:C:538:ASP:OD1	1:D:538:ASP:OD1	2.05	0.75
1:A:202:ASP:OD2	3:B:702[B]:TRS:O2	2.04	0.75
1:B:367:THR:HG21	1:B:605:ARG:HH22	1.51	0.75
1:D:538:ASP:N	2:D:701:MPD:H51	1.96	0.75
1:D:322:GLU:HG2	5:D:1342:HOH:O	1.85	0.74
2:B:701:MPD:H52	5:B:1393:HOH:O	1.85	0.74
1:D:441:GLN:HE22	1:D:495:ASN:HD21	1.35	0.73
1:C:393:TYR:CE2	1:C:470[B]:ASN:ND2	2.56	0.73
1:B:96:LYS:HE3	1:B:98:GLU:OE2	1.90	0.72
1:B:537:GLU:H	2:B:701:MPD:C1	2.07	0.68
3:B:702[B]:TRS:O3	3:B:702[B]:TRS:O1	1.95	0.68
1:A:538:ASP:OD1	1:B:538:ASP:OD1	2.11	0.68
1:B:208:LYS:HE2	5:B:1084:HOH:O	1.94	0.67
1:A:143:GLU:OE2	5:A:802:HOH:O	2.13	0.66
1:C:512:LEU:O	5:C:802:HOH:O	2.14	0.65
5:C:1187[B]:HOH:O	1:D:685:HIS:HD2	1.79	0.64
2:A:702:MPD:O4	2:A:702:MPD:H12	1.68	0.64
1:A:539:ARG:NH1	5:A:805:HOH:O	2.30	0.64
1:B:454:ARG:HA	1:B:457[A]:ARG:NE	2.12	0.64
5:C:1364:HOH:O	2:D:701:MPD:C1	2.47	0.63
1:B:167:LYS:HZ1	1:B:270:GLN:HG3	1.65	0.61
1:A:363[B]:ASN:ND2	5:A:806:HOH:O	2.34	0.61
1:A:322:GLU:HG3	5:A:1343:HOH:O	1.99	0.61
1:D:170[B]:GLU:HG3	5:D:1176:HOH:O	2.01	0.60
1:D:537:GLU:HB2	2:D:701:MPD:H53	1.84	0.60
1:C:441:GLN:HE22	1:C:495:ASN:HD21	1.50	0.60
1:B:428:MET:O	1:B:457[A]:ARG:HD2	2.01	0.59
1:B:537:GLU:H	2:B:701:MPD:H13	1.68	0.59
1:D:439:LEU:HB2	5:D:819:HOH:O	2.04	0.57
1:C:673:ARG:HG2	1:C:683:THR:HG22	1.87	0.56
5:C:1364:HOH:O	2:D:701:MPD:H11	2.05	0.56
1:A:441:GLN:HE22	1:A:495:ASN:HD21	1.52	0.56
1:B:451:THR:HA	1:B:457[A]:ARG:HH12	1.71	0.56
1:B:208:LYS:CE	5:B:1084:HOH:O	2.53	0.56
1:D:36:ILE:N	5:D:812:HOH:O	2.41	0.54
1:C:42:LYS:NZ	5:C:807:HOH:O	2.40	0.53
1:A:492:TYR:OH	1:A:497:LYS:HD3	2.09	0.53
1:B:457[A]:ARG:NH1	1:B:457[A]:ARG:HG2	2.23	0.52
1:C:66:LYS:HE2	5:C:820:HOH:O	2.08	0.52
1:A:469:LYS:HD2	5:A:1185:HOH:O	2.09	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:675:GLN:HG2	5:C:1354:HOH:O	2.10	0.52
1:D:367:THR:HG23	1:D:371:ASP:OD2	2.10	0.52
1:B:367:THR:HG23	1:B:371:ASP:OD2	2.10	0.50
1:A:101:LYS:CE	5:A:1392:HOH:O	2.59	0.50
1:A:223:THR:HG21	1:A:533:MET:SD	2.52	0.50
1:B:101:LYS:HB3	1:B:101:LYS:NZ	2.26	0.49
1:D:223:THR:HG21	1:D:533:MET:SD	2.53	0.49
1:C:470[A]:ASN:OD1	1:C:473:LYS:HD2	2.13	0.48
1:B:625[A]:SER:OG	1:B:646:SER:HB3	2.14	0.48
1:C:367:THR:HG23	1:C:371:ASP:OD2	2.14	0.48
1:B:537:GLU:HB2	2:B:701:MPD:H13	1.95	0.48
1:A:101:LYS:HE2	5:A:1392:HOH:O	2.14	0.48
1:A:104:LYS:NZ	5:A:803:HOH:O	2.17	0.48
1:A:470:ASN:OD1	1:A:473:LYS:HD2	2.14	0.47
1:A:450:ASN:ND2	5:A:810:HOH:O	2.46	0.47
1:B:367:THR:HG21	1:B:605:ARG:NH2	2.25	0.47
1:A:173:GLY:HA3	1:A:230:TYR:O	2.15	0.47
1:A:488:THR:O	1:A:500:ARG:HD3	2.15	0.46
1:D:426:SER:N	1:D:427:PRO:HD3	2.29	0.46
1:B:464:LYS:HD2	1:B:502:GLU:HG2	1.98	0.45
1:B:482:ALA:HA	1:B:513:VAL:O	2.15	0.45
1:B:497:LYS:HE2	5:B:806:HOH:O	2.16	0.45
1:D:70:TRP:CD1	1:D:269:TYR:HB3	2.51	0.45
1:C:536:LEU:O	1:C:539:ARG:NH1	2.47	0.45
1:B:70:TRP:CD1	1:B:269:TYR:HB3	2.52	0.45
1:C:70:TRP:CD1	1:C:269:TYR:HB3	2.52	0.45
1:C:675:GLN:CG	5:C:1354:HOH:O	2.65	0.45
5:A:1066:HOH:O	1:B:692:MET:HE3	2.17	0.44
1:D:426:SER:H	1:D:427:PRO:HD3	1.82	0.44
1:B:450:ASN:O	1:B:457[A]:ARG:NH1	2.51	0.44
1:C:223:THR:HG21	1:C:533:MET:SD	2.57	0.44
2:A:702:MPD:H12	2:A:702:MPD:H4	1.10	0.44
1:A:202:ASP:CG	3:B:702[B]:TRS:HO2	2.14	0.44
1:C:66:LYS:CE	5:C:820:HOH:O	2.64	0.44
1:B:58:GLU:OE2	1:B:234:SER:HB3	2.18	0.43
1:D:426:SER:N	1:D:427:PRO:CD	2.82	0.43
1:A:70:TRP:CD1	1:A:269:TYR:HB3	2.54	0.43
1:B:187:SER:HA	1:B:253:ASN:HD21	1.83	0.43
1:A:118:ASP:OD1	1:A:120:SER:OG	2.18	0.43
1:C:334:PRO:HG3	1:C:623:PHE:CD2	2.54	0.43
1:C:233:LYS:CD	5:C:1349:HOH:O	2.65	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:42:LYS:HD3	5:B:1455:HOH:O	2.19	0.43
1:D:208[B]:LYS:NZ	5:D:821:HOH:O	2.52	0.43
1:C:393:TYR:CG	1:C:470[B]:ASN:ND2	2.85	0.42
1:A:536:LEU:HD22	2:A:702:MPD:H53	2.01	0.42
1:C:263:LYS:O	1:D:447:LYS:HD2	2.20	0.42
1:B:428:MET:O	1:B:457[A]:ARG:CD	2.68	0.42
1:B:673:ARG:HD3	5:B:810:HOH:O	2.19	0.42
1:B:524:ILE:N	1:B:525:PRO:CD	2.83	0.42
1:C:208:LYS:HE2	5:C:1364:HOH:O	2.20	0.42
1:D:682:LYS:HE3	5:D:916:HOH:O	2.17	0.42
1:D:537:GLU:HB2	2:D:701:MPD:C5	2.50	0.42
1:A:363[B]:ASN:CG	5:A:806:HOH:O	2.58	0.41
1:B:419:TYR:CD1	1:B:419:TYR:C	2.93	0.41
1:A:524:ILE:N	1:A:525:PRO:CD	2.84	0.41
1:C:373:ARG:HD2	5:C:1009:HOH:O	2.19	0.41
1:C:633:LEU:HD11	1:C:641:ARG:HB2	2.01	0.41
1:C:255:ASN:HB3	1:C:271:ARG:HG3	2.03	0.41
1:B:128:ALA:HB3	1:B:146:GLU:CG	2.51	0.40
2:B:701:MPD:HM2	5:B:844:HOH:O	2.21	0.40
1:B:457[A]:ARG:CG	1:B:457[A]:ARG:NH1	2.77	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:A:1240:HOH:O	5:C:806:HOH:O[2_556]	2.02	0.18

## 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	663/693 (96%)	637 (96%)	26 (4%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	661/693 (95%)	637 (96%)	24 (4%)	0	100	100
1	C	660/693 (95%)	639 (97%)	21 (3%)	0	100	100
1	D	659/693 (95%)	631 (96%)	28 (4%)	0	100	100
All	All	2643/2772 (95%)	2544 (96%)	99 (4%)	0	100	100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	558/592 (94%)	555 (100%)	3 (0%)	88	83
1	B	562/592 (95%)	557 (99%)	5 (1%)	78	70
1	C	556/592 (94%)	550 (99%)	6 (1%)	73	63
1	D	556/592 (94%)	547 (98%)	9 (2%)	62	48
All	All	2232/2368 (94%)	2209 (99%)	23 (1%)	76	67

All (23) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	378	PHE
1	A	529	MET
1	A	662	GLU
1	B	72	ASN
1	B	167	LYS
1	B	378	PHE
1	B	454	ARG
1	B	529	MET
1	C	58	GLU
1	C	72	ASN
1	C	378	PHE
1	C	445	GLU
1	C	454	ARG

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Mol	Chain	Res	Type
1	C	529	MET
1	D	58	GLU
1	D	72	ASN
1	D	139	GLN
1	D	277	PRO
1	D	378	PHE
1	D	439	LEU
1	D	454	ARG
1	D	529	MET
1	D	662	GLU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (30) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	105	ASN
1	A	151	ASN
1	A	270	GLN
1	A	283	GLN
1	A	308	GLN
1	A	387	ASN
1	A	441	GLN
1	A	450	ASN
1	A	463	GLN
1	A	675	GLN
1	B	46	ASN
1	B	253	ASN
1	B	270	GLN
1	B	387	ASN
1	B	495	ASN
1	C	87	GLN
1	C	151	ASN
1	C	283	GLN
1	C	308	GLN
1	C	387	ASN
1	C	441	GLN
1	C	463	GLN
1	C	659	GLN
1	D	151	ASN
1	D	270	GLN
1	D	283	GLN
1	D	308	GLN
1	D	387	ASN

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Mol	Chain	Res	Type
1	D	463	GLN
1	D	495	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](#)

Of 18 ligands modelled in this entry, 4 are monoatomic - leaving 14 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	MPD	A	701	-	7,7,7	0.93	0	9,10,10	0.90	0
3	TRS	D	702[A]	-	7,7,7	1.01	1 (14%)	9,9,9	1.83	3 (33%)
3	TRS	B	702[A]	-	7,7,7	1.11	0	9,9,9	2.69	5 (55%)
2	MPD	C	701	-	7,7,7	0.81	0	9,10,10	1.07	0
3	TRS	A	703[A]	-	7,7,7	0.71	0	9,9,9	2.36	4 (44%)
3	TRS	C	703	-	7,7,7	2.29	2 (28%)	9,9,9	5.28	7 (77%)
3	TRS	A	703[B]	-	7,7,7	2.41	3 (42%)	9,9,9	4.13	6 (66%)
2	MPD	D	701	-	7,7,7	2.22	5 (71%)	9,10,10	3.07	5 (55%)
2	MPD	B	701	-	7,7,7	2.51	2 (28%)	9,10,10	7.79	6 (66%)
3	TRS	C	702[A]	-	7,7,7	1.86	3 (42%)	9,9,9	2.45	5 (55%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
3	TRS	D	702[B]	-	7,7,7	0.85	0	9,9,9	1.52	2 (22%)
2	MPD	A	702	-	7,7,7	3.27	5 (71%)	9,10,10	3.80	7 (77%)
3	TRS	C	702[B]	-	7,7,7	0.88	0	9,9,9	3.08	4 (44%)
3	TRS	B	702[B]	-	7,7,7	0.96	0	9,9,9	1.60	3 (33%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	MPD	A	701	-	-	0/5/5/5	-
3	TRS	D	702[A]	-	-	6/9/9/9	-
3	TRS	B	702[A]	-	-	8/9/9/9	-
2	MPD	C	701	-	-	0/5/5/5	-
3	TRS	A	703[A]	-	-	6/9/9/9	-
3	TRS	C	703	-	-	4/9/9/9	-
3	TRS	A	703[B]	-	-	7/9/9/9	-
2	MPD	D	701	-	-	3/5/5/5	-
2	MPD	B	701	-	-	3/5/5/5	-
3	TRS	C	702[A]	-	-	5/9/9/9	-
3	TRS	D	702[B]	-	-	0/9/9/9	-
2	MPD	A	702	-	-	2/5/5/5	-
3	TRS	C	702[B]	-	-	5/9/9/9	-
3	TRS	B	702[B]	-	-	3/9/9/9	-

All (21) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	702	MPD	C3-C2	-5.91	1.37	1.53
2	B	701	MPD	O2-C2	5.39	1.58	1.44
3	C	703	TRS	C3-C	4.86	1.68	1.53
3	A	703[B]	TRS	O2-C2	4.10	1.55	1.42
2	A	702	MPD	C5-C4	-3.64	1.35	1.51
3	A	703[B]	TRS	C2-C	3.19	1.63	1.53
2	B	701	MPD	C1-C2	3.18	1.62	1.52
2	A	702	MPD	C1-C2	3.18	1.62	1.52
3	C	703	TRS	O2-C2	3.08	1.52	1.42
2	D	701	MPD	C5-C4	-2.95	1.38	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	702[A]	TRS	C-N	2.95	1.59	1.49
2	A	702	MPD	CM-C2	2.93	1.61	1.52
2	D	701	MPD	C3-C2	-2.86	1.45	1.53
3	C	702[A]	TRS	C2-C	-2.78	1.44	1.53
2	D	701	MPD	CM-C2	2.62	1.60	1.52
3	A	703[B]	TRS	C1-C	-2.25	1.46	1.53
2	D	701	MPD	C1-C2	2.23	1.59	1.52
2	A	702	MPD	O2-C2	2.22	1.50	1.44
3	C	702[A]	TRS	O3-C3	2.10	1.49	1.42
2	D	701	MPD	O4-C4	-2.03	1.34	1.43
3	D	702[A]	TRS	O1-C1	2.02	1.49	1.42

All (57) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	701	MPD	CM-C2-C1	16.76	145.50	110.57
2	B	701	MPD	O2-C2-C1	-14.13	62.73	108.08
3	C	703	TRS	C2-C-C1	-8.92	83.14	110.81
3	C	703	TRS	C1-C-N	-8.44	82.78	107.98
3	A	703[B]	TRS	C3-C-C1	-8.29	85.12	110.81
2	A	702	MPD	O4-C4-C3	7.62	142.14	111.36
3	C	702[B]	TRS	C2-C-N	6.79	128.24	107.98
3	C	703	TRS	O3-C3-C	-6.73	89.66	111.00
2	D	701	MPD	C1-C2-C3	-6.34	80.43	109.96
3	A	703[B]	TRS	O1-C1-C	-6.31	90.99	111.00
2	B	701	MPD	O2-C2-CM	-5.94	89.03	108.08
2	A	702	MPD	C5-C4-C3	-4.67	89.69	111.69
2	A	702	MPD	O2-C2-CM	4.49	122.49	108.08
3	B	702[A]	TRS	C3-C-C2	-4.44	97.06	110.81
3	B	702[A]	TRS	C3-C-C1	4.35	124.30	110.81
3	C	702[A]	TRS	C1-C-N	4.33	120.90	107.98
3	C	702[B]	TRS	C3-C-C2	-4.29	97.50	110.81
3	A	703[A]	TRS	C2-C-N	-4.18	95.50	107.98
3	A	703[B]	TRS	O2-C2-C	4.11	124.01	111.00
3	C	703	TRS	C2-C-N	3.91	119.64	107.98
3	C	703	TRS	C3-C-C2	3.83	122.70	110.81
2	B	701	MPD	C5-C4-C3	3.80	129.60	111.69
2	D	701	MPD	CM-C2-C1	3.75	118.39	110.57
3	C	703	TRS	O2-C2-C	3.74	122.84	111.00
2	D	701	MPD	O4-C4-C3	-3.63	96.69	111.36
3	C	702[B]	TRS	O3-C3-C	-3.45	100.05	111.00
3	D	702[A]	TRS	C2-C-C1	3.44	121.46	110.81

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	702[A]	TRS	C2-C-C1	-3.42	100.21	110.81
3	A	703[A]	TRS	C3-C-C2	-3.39	100.29	110.81
3	C	702[A]	TRS	C3-C-C1	-3.34	100.46	110.81
3	A	703[B]	TRS	C3-C-N	3.25	117.69	107.98
2	A	702	MPD	C1-C2-C3	-3.18	95.14	109.96
3	C	703	TRS	C3-C-N	2.99	116.92	107.98
3	C	702[A]	TRS	C2-C-C1	-2.96	101.62	110.81
2	A	702	MPD	O2-C2-C3	-2.93	98.78	109.80
3	D	702[B]	TRS	O2-C2-C	-2.87	101.90	111.00
3	B	702[B]	TRS	O1-C1-C	-2.87	101.91	111.00
3	C	702[B]	TRS	C3-C-N	-2.79	99.64	107.98
3	D	702[A]	TRS	C3-C-C1	-2.77	102.23	110.81
2	D	701	MPD	O4-C4-C5	2.74	121.26	109.38
3	A	703[B]	TRS	C2-C-N	2.73	116.11	107.98
2	B	701	MPD	O2-C2-C3	2.60	119.55	109.80
3	A	703[B]	TRS	C2-C-C1	2.56	118.74	110.81
3	D	702[A]	TRS	C3-C-N	2.44	115.26	107.98
3	A	703[A]	TRS	O1-C1-C	2.37	118.52	111.00
2	B	701	MPD	CM-C2-C3	-2.27	99.39	109.96
3	B	702[A]	TRS	O2-C2-C	-2.19	104.04	111.00
2	D	701	MPD	O2-C2-CM	2.17	115.04	108.08
2	A	702	MPD	O2-C2-C1	2.16	115.01	108.08
3	D	702[B]	TRS	C2-C-N	-2.15	101.56	107.98
3	A	703[A]	TRS	C3-C-N	2.15	114.39	107.98
3	B	702[B]	TRS	O2-C2-C	-2.12	104.28	111.00
2	A	702	MPD	CM-C2-C1	2.11	114.96	110.57
3	C	702[A]	TRS	O3-C3-C	2.10	117.64	111.00
3	B	702[A]	TRS	C3-C-N	2.06	114.13	107.98
3	C	702[A]	TRS	C3-C-N	2.05	114.10	107.98
3	B	702[B]	TRS	C3-C-N	2.03	114.04	107.98

There are no chirality outliers.

All (52) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	D	702[A]	TRS	C1-C-C2-O2
3	D	702[A]	TRS	C3-C-C2-O2
3	D	702[A]	TRS	N-C-C2-O2
3	B	702[A]	TRS	C2-C-C1-O1
3	B	702[A]	TRS	C3-C-C1-O1
3	B	702[A]	TRS	N-C-C1-O1
3	B	702[A]	TRS	C1-C-C2-O2

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Mol	Chain	Res	Type	Atoms
3	B	702[A]	TRS	C3-C-C2-O2
3	B	702[A]	TRS	N-C-C2-O2
3	A	703[A]	TRS	C1-C-C2-O2
3	A	703[A]	TRS	C3-C-C2-O2
3	A	703[A]	TRS	N-C-C2-O2
3	C	703	TRS	C1-C-C2-O2
3	C	703	TRS	C3-C-C2-O2
3	A	703[B]	TRS	C2-C-C1-O1
3	A	703[B]	TRS	C3-C-C1-O1
3	A	703[B]	TRS	N-C-C1-O1
2	B	701	MPD	C2-C3-C4-C5
3	C	702[A]	TRS	C2-C-C1-O1
3	C	702[A]	TRS	C3-C-C1-O1
3	C	702[A]	TRS	N-C-C1-O1
3	C	702[B]	TRS	C1-C-C2-O2
3	C	702[B]	TRS	C3-C-C2-O2
3	C	702[B]	TRS	N-C-C2-O2
3	C	702[B]	TRS	N-C-C3-O3
3	B	702[B]	TRS	N-C-C1-O1
3	D	702[A]	TRS	C2-C-C3-O3
3	A	703[A]	TRS	C3-C-C1-O1
3	A	703[B]	TRS	C1-C-C2-O2
3	C	702[A]	TRS	C2-C-C3-O3
3	D	702[A]	TRS	C1-C-C3-O3
3	D	702[A]	TRS	N-C-C3-O3
3	A	703[A]	TRS	C2-C-C1-O1
3	C	703	TRS	N-C-C2-O2
3	C	703	TRS	C2-C-C3-O3
3	A	703[B]	TRS	N-C-C2-O2
3	C	702[A]	TRS	N-C-C3-O3
3	B	702[B]	TRS	C3-C-C1-O1
3	B	702[B]	TRS	N-C-C2-O2
2	D	701	MPD	C2-C3-C4-C5
2	B	701	MPD	C1-C2-C3-C4
2	A	702	MPD	CM-C2-C3-C4
3	B	702[A]	TRS	C2-C-C3-O3
3	A	703[B]	TRS	C1-C-C3-O3
3	A	703[B]	TRS	C2-C-C3-O3
2	D	701	MPD	O2-C2-C3-C4
3	B	702[A]	TRS	N-C-C3-O3
3	A	703[A]	TRS	N-C-C1-O1
3	C	702[B]	TRS	C2-C-C1-O1

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Mol	Chain	Res	Type	Atoms
2	D	701	MPD	C2-C3-C4-O4
2	B	701	MPD	C2-C3-C4-O4
2	A	702	MPD	C2-C3-C4-O4

There are no ring outliers.

6 monomers are involved in 27 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	703	TRS	1	0
2	D	701	MPD	8	0
2	B	701	MPD	7	0
3	C	702[A]	TRS	1	0
2	A	702	MPD	7	0
3	B	702[B]	TRS	3	0

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	659/693 (95%)	-0.36	6 (0%) 84 87	11, 17, 36, 60	0
1	B	659/693 (95%)	-0.44	7 (1%) 80 83	11, 18, 37, 57	0
1	C	659/693 (95%)	-0.41	3 (0%) 91 92	12, 18, 36, 56	0
1	D	658/693 (94%)	-0.37	12 (1%) 68 72	11, 19, 37, 57	0
All	All	2635/2772 (95%)	-0.40	28 (1%) 80 83	11, 18, 37, 60	0

All (28) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	82	SER	4.0
1	C	82	SER	3.4
1	B	82	SER	3.1
1	A	84	GLY	3.1
1	B	663	GLY	2.8
1	A	151	ASN	2.8
1	D	151	ASN	2.6
1	A	116	PHE	2.6
1	D	663	GLY	2.6
1	D	152	PHE	2.5
1	D	148	ARG	2.4
1	D	83	LYS	2.4
1	D	122	ALA	2.4
1	B	84	GLY	2.4
1	C	151	ASN	2.3
1	A	82	SER	2.2
1	D	155	TYR	2.2
1	A	118	ASP	2.2
1	D	36	ILE	2.2
1	D	124	GLY	2.1
1	B	123	LYS	2.1

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Mol	Chain	Res	Type	RSRZ
1	D	121	VAL	2.1
1	B	152	PHE	2.1
1	C	152	PHE	2.1
1	B	121	VAL	2.1
1	B	122	ALA	2.1
1	A	124	GLY	2.0
1	D	84	GLY	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. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
3	TRS	C	703	8/8	0.77	0.19	21,28,30,40	0
2	MPD	D	701	8/8	0.81	0.21	21,25,31,32	0
2	MPD	A	702	8/8	0.81	0.19	14,24,31,31	0
2	MPD	B	701	8/8	0.83	0.19	14,21,30,34	0
3	TRS	C	702[A]	8/8	0.86	0.20	9,17,19,24	8
3	TRS	C	702[B]	8/8	0.86	0.20	16,22,23,28	8
3	TRS	D	702[B]	8/8	0.88	0.20	13,16,19,28	8
2	MPD	A	701	8/8	0.88	0.13	30,35,38,38	0
3	TRS	D	702[A]	8/8	0.88	0.20	15,25,27,30	8
3	TRS	B	702[A]	8/8	0.92	0.17	10,17,18,20	8
3	TRS	B	702[B]	8/8	0.92	0.17	13,24,31,35	8
2	MPD	C	701	8/8	0.93	0.11	29,35,39,40	0
3	TRS	A	703[B]	8/8	0.93	0.14	12,15,18,19	8
3	TRS	A	703[A]	8/8	0.93	0.14	19,21,23,25	8
4	CL	D	703	1/1	0.98	0.06	24,24,24,24	0
4	CL	B	703	1/1	0.99	0.07	23,23,23,23	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
4	CL	C	704	1/1	0.99	0.07	24,24,24,24	0
4	CL	A	704	1/1	0.99	0.05	21,21,21,21	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.