Full wwPDB X-ray Structure Validation Report (i)

Jul 26, 2023 – 03:23 AM EDT

PDB ID	:	1BGG
Title	:	GLUCOSIDASE A FROM BACILLUS POLYMYXA COMPLEXED WITH GLUCONATE
Authors	:	Sanz-Aparicio, J.; Hermoso, J.; Martinez-Ripoll, M.; Polaina, J.
Deposited on	:	1997-05-12
Resolution	:	2.30 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*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

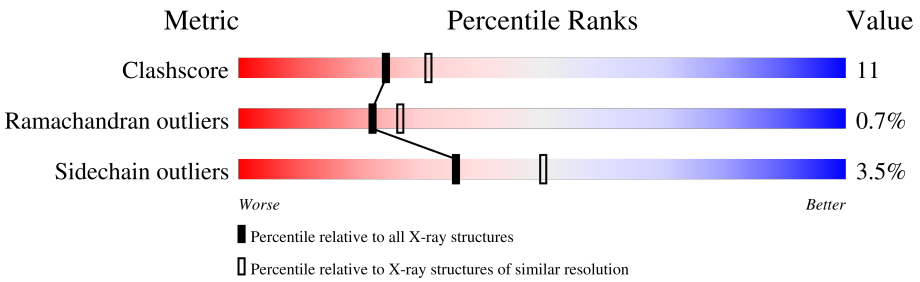
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.34

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.30 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	5643 (2.30-2.30)
Ramachandran outliers	138981	5575 (2.30-2.30)
Sidechain outliers	138945	5575 (2.30-2.30)

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

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	448	80% 17% •
1	B	448	79% 19% •
1	C	448	78% 19% •
1	D	448	79% 19% •

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	GCO	B	500	-	X	X	-
2	GCO	C	500	-	X	-	-
2	GCO	D	500	-	X	-	-

2 Entry composition (i)

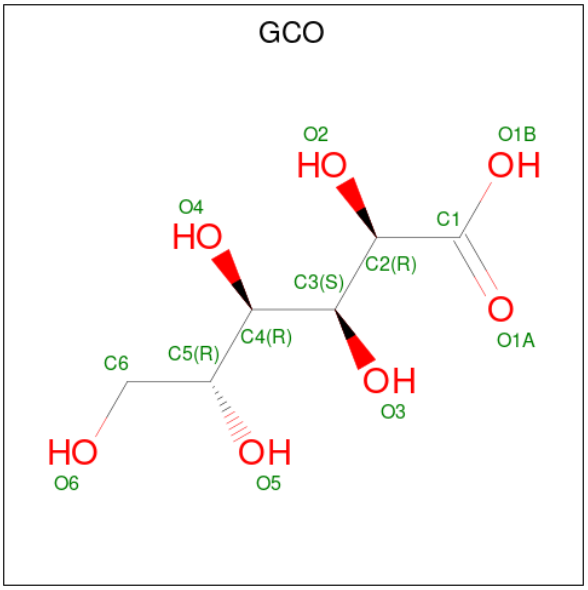
There are 3 unique types of molecules in this entry. The entry contains 16109 atoms, of which 0 are hydrogens and 0 are deuteriums.

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-GLUCOSIDASE A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	447	3644	2326	628	673	17	0	0	0
1	B	447	3644	2326	628	673	17	0	0	0
1	C	447	3644	2326	628	673	17	0	0	0
1	D	447	3644	2326	628	673	17	0	0	0

- Molecule 2 is D-gluconic acid (three-letter code: GCO) (formula: $C_6H_{12}O_7$).



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

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
2	D	1	13	6	7	0	0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
3	A	368	368	368	0	0
			Total	O		
3	B	393	393	393	0	0
			Total	O		
3	C	375	375	375	0	0
			Total	O		
3	D	358	358	358	0	0

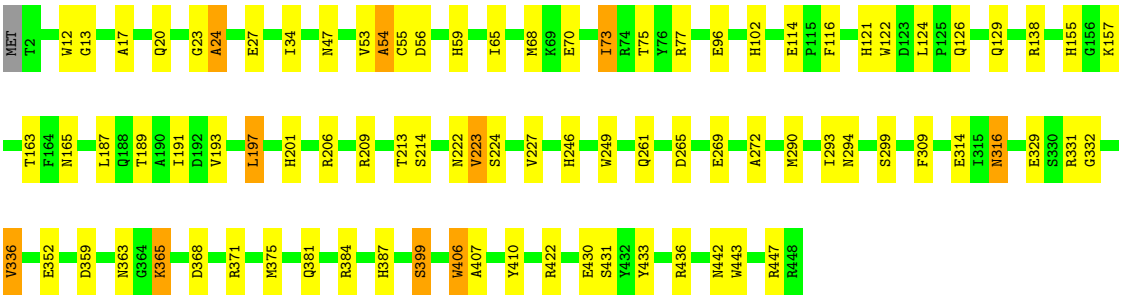
3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. 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. 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.

Note EDS was not executed.

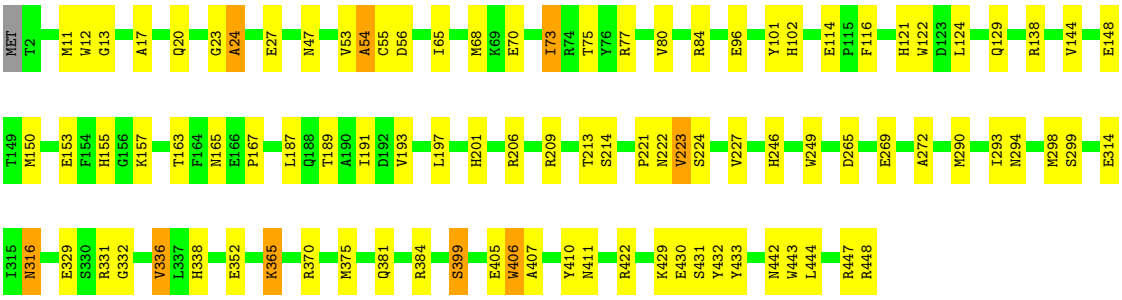
• Molecule 1: BETA-GLUCOSIDASE A

Chain A:



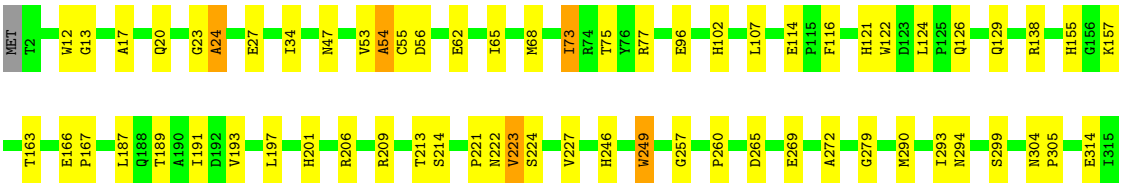
• Molecule 1: BETA-GLUCOSIDASE A

Chain B:



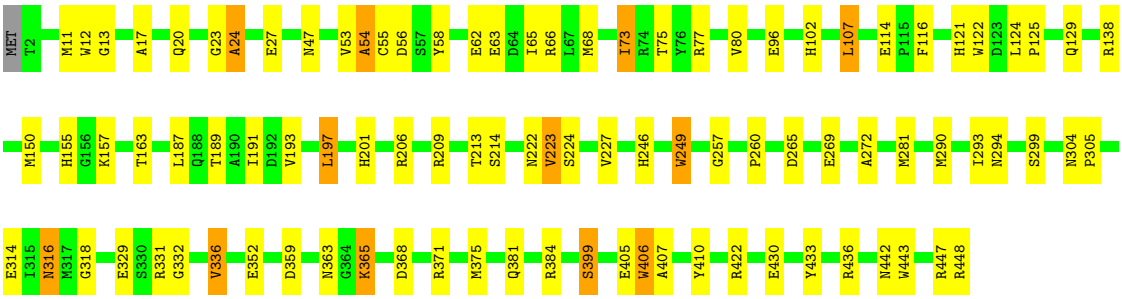
• Molecule 1: BETA-GLUCOSIDASE A

Chain C:



- Molecule 1: BETA-GLUCOSIDASE A

Chain D:



4 Data and refinement statistics (i)

Xtriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 42 21 2	Depositor
Cell constants a, b, c, α, β, γ	205.85Å 205.85Å 155.50Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	8.00 – 2.30	Depositor
% Data completeness (in resolution range)	75.6 (8.00-2.30)	Depositor
R_{merge}	0.09	Depositor
R_{sym}	0.09	Depositor
Refinement program	X-PLOR 3.843	Depositor
R, R_{free}	0.200 , 0.250	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	16109	wwPDB-VP
Average B, all atoms (Å^2)	15.0	wwPDB-VP

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: GCO

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	0.46	1/3754 (0.0%)	0.72	2/5107 (0.0%)
1	B	0.51	2/3754 (0.1%)	0.72	1/5107 (0.0%)
1	C	0.50	2/3754 (0.1%)	0.72	1/5107 (0.0%)
1	D	0.48	2/3754 (0.1%)	0.72	2/5107 (0.0%)
All	All	0.49	7/15016 (0.0%)	0.72	6/20428 (0.0%)

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	448	ARG	C-OXT	13.56	1.49	1.23
1	C	448	ARG	C-OXT	12.18	1.46	1.23
1	D	448	ARG	C-OXT	8.65	1.39	1.23
1	B	430	GLU	CD-OE2	7.13	1.33	1.25
1	A	430	GLU	CD-OE2	6.42	1.32	1.25
1	C	430	GLU	CD-OE2	6.36	1.32	1.25
1	D	430	GLU	CD-OE2	5.99	1.32	1.25

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	399	SER	N-CA-C	6.17	127.66	111.00
1	D	399	SER	N-CA-C	6.14	127.57	111.00
1	C	399	SER	N-CA-C	6.12	127.52	111.00
1	B	399	SER	N-CA-C	6.01	127.22	111.00
1	A	197	LEU	CA-CB-CG	5.07	126.96	115.30
1	D	197	LEU	CA-CB-CG	5.04	126.89	115.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3644	0	3419	75	0
1	B	3644	0	3419	84	0
1	C	3644	0	3419	83	0
1	D	3644	0	3419	81	0
2	B	13	0	11	8	0
2	C	13	0	10	5	0
2	D	13	0	10	4	0
3	A	368	0	0	16	0
3	B	393	0	0	15	0
3	C	375	0	0	17	0
3	D	358	0	0	15	0
All	All	16109	0	13707	312	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 11.

All (312) 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:B:121:HIS:CE1	2:B:500:GCO:O2	2.06	1.09
1:B:121:HIS:HE1	2:B:500:GCO:O2	1.41	0.99
1:B:17:ALA:HB3	1:B:20:GLN:HE21	1.28	0.94
1:A:436:ARG:HD3	3:A:560:HOH:O	1.80	0.81
1:B:375:MET:SD	3:B:758:HOH:O	2.40	0.80
1:D:58:TYR:HB3	3:D:702:HOH:O	1.82	0.78
1:D:375:MET:SD	3:D:639:HOH:O	2.42	0.77
1:C:375:MET:SD	3:C:755:HOH:O	2.44	0.76
1:A:375:MET:SD	3:A:655:HOH:O	2.43	0.75
1:C:75:THR:HB	3:C:812:HOH:O	1.87	0.74
1:D:17:ALA:HB3	1:D:20:GLN:HE21	1.53	0.74
1:B:77:ARG:HH21	1:B:352:GLU:HG3	1.53	0.73
1:C:138:ARG:HG3	3:C:867:HOH:O	1.89	0.72
1:D:363:ASN:HB2	3:D:620:HOH:O	1.90	0.72
1:D:77:ARG:HH21	1:D:352:GLU:HG3	1.55	0.72
1:C:77:ARG:HH21	1:C:352:GLU:HG3	1.53	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:363:ASN:HB2	3:C:830:HOH:O	1.90	0.71
1:C:17:ALA:HB3	1:C:20:GLN:HE21	1.54	0.71
1:A:17:ALA:HB3	1:A:20:GLN:HE21	1.54	0.71
1:A:77:ARG:HH21	1:A:352:GLU:HG3	1.54	0.71
1:A:381:GLN:HE22	1:A:384:ARG:HH11	1.40	0.69
1:A:13:GLY:HA2	1:A:73:ILE:HG13	1.74	0.69
1:A:363:ASN:HB2	3:A:596:HOH:O	1.92	0.69
1:C:13:GLY:HA2	1:C:73:ILE:HG13	1.75	0.69
1:D:138:ARG:HG3	3:D:853:HOH:O	1.93	0.69
1:D:436:ARG:HD3	3:D:766:HOH:O	1.92	0.68
1:B:381:GLN:HE22	1:B:384:ARG:HH11	1.40	0.68
1:D:13:GLY:HA2	1:D:73:ILE:HG13	1.76	0.68
1:C:75:THR:HG23	1:C:114:GLU:O	1.93	0.68
1:A:12:TRP:HE1	1:A:442:ASN:HD22	1.43	0.67
1:B:12:TRP:HE1	1:B:442:ASN:HD22	1.42	0.67
1:D:381:GLN:HE22	1:D:384:ARG:HH11	1.42	0.67
1:C:12:TRP:HE1	1:C:442:ASN:HD22	1.42	0.66
1:B:13:GLY:HA2	1:B:73:ILE:HG13	1.77	0.65
1:B:422:ARG:HD3	1:C:433:TYR:CE2	2.31	0.65
1:C:381:GLN:HE22	1:C:384:ARG:HH11	1.42	0.65
1:B:101:TYR:HE2	3:B:768:HOH:O	1.80	0.65
1:B:75:THR:HG23	1:B:114:GLU:O	1.97	0.64
1:C:166:GLU:CD	2:C:500:GCO:O1A	2.36	0.64
1:D:12:TRP:HE1	1:D:442:ASN:HD22	1.44	0.64
1:A:75:THR:HG23	1:A:114:GLU:O	1.98	0.63
1:B:20:GLN:NE2	2:B:500:GCO:O3	2.31	0.63
1:B:73:ILE:HG21	3:B:757:HOH:O	1.98	0.63
1:D:163:THR:OG1	1:D:201:HIS:HD2	1.82	0.63
1:C:166:GLU:OE1	2:C:500:GCO:O1A	2.16	0.63
1:A:447:ARG:HH12	1:D:47:ASN:HD22	1.47	0.63
1:A:59:HIS:HE1	3:A:497:HOH:O	1.81	0.62
1:B:422:ARG:HD3	1:C:433:TYR:CD2	2.35	0.61
1:A:73:ILE:HG21	3:A:746:HOH:O	1.99	0.61
1:C:209:ARG:NH1	3:C:722:HOH:O	2.33	0.61
1:A:163:THR:OG1	1:A:201:HIS:HD2	1.84	0.61
1:C:422:ARG:HD3	1:D:433:TYR:CE2	2.35	0.61
1:C:422:ARG:HD3	1:D:433:TYR:CD2	2.36	0.61
1:D:75:THR:HG23	1:D:114:GLU:O	2.00	0.61
1:B:121:HIS:CE1	2:B:500:GCO:HO2	2.16	0.61
1:C:163:THR:OG1	1:C:201:HIS:HD2	1.82	0.61
1:B:163:THR:OG1	1:B:201:HIS:HD2	1.83	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:265:ASP:O	1:B:269:GLU:HG2	2.01	0.60
1:A:265:ASP:O	1:A:269:GLU:HG2	2.02	0.60
1:A:209:ARG:NH1	3:A:727:HOH:O	2.34	0.60
1:D:121:HIS:CE1	2:D:500:GCO:O2	2.54	0.59
1:C:265:ASP:O	1:C:269:GLU:HG2	2.02	0.59
1:A:222:ASN:HA	1:A:294:ASN:HB2	1.84	0.59
1:A:433:TYR:CD2	1:D:422:ARG:HD3	2.37	0.59
1:D:222:ASN:HA	1:D:294:ASN:HB2	1.85	0.59
1:D:265:ASP:O	1:D:269:GLU:HG2	2.02	0.59
1:C:222:ASN:HA	1:C:294:ASN:HB2	1.84	0.58
1:A:422:ARG:HD3	1:B:433:TYR:CD2	2.38	0.58
1:D:365:LYS:NZ	1:D:365:LYS:HB3	2.18	0.58
1:B:411:ASN:HB2	3:B:618:HOH:O	2.03	0.58
1:C:12:TRP:HE1	1:C:442:ASN:ND2	2.02	0.58
1:C:365:LYS:NZ	1:C:365:LYS:HB3	2.18	0.58
1:D:189:THR:HG21	3:D:847:HOH:O	2.04	0.58
1:B:12:TRP:HE1	1:B:442:ASN:ND2	2.02	0.57
1:C:155:HIS:O	1:C:214:SER:HB2	2.04	0.57
1:C:223:VAL:HG11	1:C:336:VAL:HG21	1.86	0.57
1:B:223:VAL:HG11	1:B:336:VAL:HG21	1.85	0.57
1:B:365:LYS:HB3	1:B:365:LYS:NZ	2.20	0.57
1:B:222:ASN:HA	1:B:294:ASN:HB2	1.86	0.57
1:A:223:VAL:HG11	1:A:336:VAL:HG21	1.86	0.57
1:A:422:ARG:HD3	1:B:433:TYR:CE2	2.40	0.57
1:D:12:TRP:HE1	1:D:442:ASN:ND2	2.03	0.56
1:A:365:LYS:NZ	1:A:365:LYS:HB3	2.19	0.56
1:B:155:HIS:O	1:B:214:SER:HB2	2.05	0.56
1:D:23:GLY:HA3	1:D:56:ASP:HA	1.88	0.56
1:D:223:VAL:HG11	1:D:336:VAL:HG21	1.85	0.56
1:A:12:TRP:HE1	1:A:442:ASN:ND2	2.02	0.56
1:C:443:TRP:HZ3	3:C:523:HOH:O	1.88	0.56
1:A:309:PHE:HD2	3:A:634:HOH:O	1.89	0.56
1:D:102:HIS:HD2	1:D:157:LYS:NZ	2.04	0.56
1:A:155:HIS:O	1:A:214:SER:HB2	2.05	0.55
1:A:47:ASN:HD22	1:B:447:ARG:HH12	1.55	0.55
1:C:121:HIS:CE1	2:C:500:GCO:O2	2.60	0.55
1:B:201:HIS:HE1	3:B:562:HOH:O	1.88	0.55
1:C:102:HIS:HD2	1:C:157:LYS:NZ	2.05	0.55
1:B:54:ALA:HB2	1:B:410:TYR:OH	2.06	0.55
1:A:102:HIS:HD2	1:A:157:LYS:NZ	2.05	0.55
1:C:54:ALA:HB2	1:C:410:TYR:OH	2.06	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:102:HIS:HD2	1:B:157:LYS:NZ	2.06	0.54
1:C:436:ARG:HD2	3:C:758:HOH:O	2.07	0.54
1:C:23:GLY:HA3	1:C:56:ASP:HA	1.90	0.54
1:A:201:HIS:HE1	3:A:675:HOH:O	1.89	0.54
1:A:209:ARG:HG3	1:A:209:ARG:HH11	1.73	0.54
1:B:405:GLU:O	1:B:405:GLU:HG3	2.08	0.54
1:C:338:HIS:HD2	3:C:696:HOH:O	1.90	0.53
1:D:155:HIS:O	1:D:214:SER:HB2	2.08	0.53
1:B:443:TRP:HZ3	3:B:694:HOH:O	1.89	0.53
1:C:381:GLN:HE21	1:C:381:GLN:HA	1.74	0.53
1:A:329:GLU:HG2	1:A:331:ARG:HG2	1.91	0.53
1:B:329:GLU:HG2	1:B:331:ARG:HG2	1.91	0.53
1:A:23:GLY:HA3	1:A:56:ASP:HA	1.90	0.53
1:D:54:ALA:HB2	1:D:410:TYR:OH	2.08	0.52
1:D:329:GLU:HG2	1:D:331:ARG:HG2	1.91	0.52
1:B:444:LEU:HB2	3:B:760:HOH:O	2.08	0.52
1:D:436:ARG:HD2	3:D:623:HOH:O	2.08	0.52
1:D:209:ARG:HG3	1:D:209:ARG:HH11	1.74	0.52
1:B:23:GLY:HA3	1:B:56:ASP:HA	1.90	0.52
1:B:209:ARG:HH11	1:B:209:ARG:HG3	1.75	0.52
1:C:47:ASN:HD22	1:D:447:ARG:HH12	1.58	0.52
1:D:249:TRP:CH2	3:D:713:HOH:O	2.62	0.52
1:A:54:ALA:HB2	1:A:410:TYR:OH	2.10	0.52
1:C:54:ALA:O	1:C:55:CYS:HB2	2.09	0.52
1:A:433:TYR:CE2	1:D:422:ARG:HD3	2.45	0.52
1:C:329:GLU:HG2	1:C:331:ARG:HG2	1.91	0.52
1:B:381:GLN:HE21	1:B:381:GLN:HA	1.75	0.51
1:C:20:GLN:NE2	2:C:500:GCO:O3	2.43	0.51
1:C:209:ARG:HG3	1:C:209:ARG:HH11	1.74	0.51
1:D:121:HIS:HD2	3:D:742:HOH:O	1.94	0.51
1:B:70:GLU:HG3	3:B:864:HOH:O	2.09	0.51
1:B:84:ARG:HB2	3:B:768:HOH:O	2.09	0.51
1:D:54:ALA:O	1:D:55:CYS:HB2	2.11	0.51
1:C:23:GLY:HA3	1:C:53:VAL:O	2.11	0.51
1:C:405:GLU:HG3	1:C:405:GLU:O	2.11	0.51
1:A:332:GLY:O	1:A:336:VAL:HG22	2.11	0.50
1:A:381:GLN:HE21	1:A:381:GLN:HA	1.76	0.50
1:B:138:ARG:HD2	3:B:523:HOH:O	2.11	0.50
1:D:102:HIS:HD2	1:D:157:LYS:HZ3	1.58	0.50
1:D:381:GLN:HA	1:D:381:GLN:HE21	1.75	0.50
1:C:77:ARG:NH2	1:C:352:GLU:HG3	2.26	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:54:ALA:O	1:B:55:CYS:HB2	2.11	0.50
1:A:443:TRP:HZ3	3:A:563:HOH:O	1.95	0.49
1:D:332:GLY:O	1:D:336:VAL:HG22	2.12	0.49
1:B:155:HIS:CD2	1:B:213:THR:HA	2.48	0.49
1:D:23:GLY:HA3	1:D:53:VAL:O	2.11	0.49
1:C:332:GLY:O	1:C:336:VAL:HG22	2.12	0.49
1:A:54:ALA:O	1:A:55:CYS:HB2	2.12	0.49
1:A:299:SER:HB2	1:A:314:GLU:HG3	1.94	0.49
1:C:13:GLY:HA2	1:C:73:ILE:CG1	2.43	0.49
1:A:102:HIS:HD2	1:A:157:LYS:HZ3	1.60	0.49
1:B:332:GLY:O	1:B:336:VAL:HG22	2.13	0.49
1:C:411:ASN:HB3	3:C:784:HOH:O	2.13	0.48
1:B:23:GLY:HA3	1:B:53:VAL:O	2.14	0.48
1:D:77:ARG:NH2	1:D:352:GLU:HG3	2.27	0.48
1:D:224:SER:HB2	1:D:246:HIS:CG	2.48	0.48
1:A:201:HIS:CE1	3:A:675:HOH:O	2.65	0.48
1:B:224:SER:HB2	1:B:246:HIS:CG	2.48	0.48
1:D:223:VAL:HG13	1:D:336:VAL:HG11	1.95	0.48
1:B:299:SER:HB2	1:B:314:GLU:HG3	1.94	0.48
1:B:406:TRP:HE1	2:B:500:GCO:HO3	1.59	0.48
1:C:124:LEU:HD23	1:C:129:GLN:HE21	1.79	0.48
1:C:381:GLN:HA	1:C:381:GLN:NE2	2.28	0.48
1:D:201:HIS:HE1	3:D:726:HOH:O	1.96	0.48
1:D:443:TRP:HZ3	3:D:564:HOH:O	1.97	0.48
2:D:500:GCO:H4	2:D:500:GCO:O1B	2.14	0.48
1:A:124:LEU:HD23	1:A:129:GLN:HE21	1.79	0.47
1:A:155:HIS:CD2	1:A:213:THR:HA	2.48	0.47
1:A:375:MET:HE2	1:A:431:SER:HB2	1.95	0.47
1:B:122:TRP:CD1	1:B:122:TRP:N	2.81	0.47
1:C:299:SER:HB2	1:C:314:GLU:HG3	1.96	0.47
1:A:223:VAL:HG13	1:A:336:VAL:HG11	1.95	0.47
1:B:17:ALA:CB	1:B:20:GLN:HE21	2.12	0.47
1:B:223:VAL:HG13	1:B:336:VAL:HG11	1.95	0.47
1:A:436:ARG:HD2	3:A:597:HOH:O	2.13	0.47
1:B:27:GLU:HB2	3:B:575:HOH:O	2.15	0.47
1:C:122:TRP:N	1:C:122:TRP:CD1	2.81	0.47
1:D:73:ILE:HG21	3:D:751:HOH:O	2.14	0.47
1:A:23:GLY:HA3	1:A:53:VAL:O	2.14	0.47
1:B:102:HIS:HD2	1:B:157:LYS:HZ3	1.62	0.47
1:D:75:THR:HG21	1:D:116:PHE:HD2	1.79	0.47
1:D:299:SER:HB2	1:D:314:GLU:HG3	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:405:GLU:OE2	2:D:500:GCO:O4	2.33	0.47
1:A:122:TRP:CD1	1:A:122:TRP:N	2.82	0.47
1:B:381:GLN:HA	1:B:381:GLN:NE2	2.30	0.47
1:A:381:GLN:HA	1:A:381:GLN:NE2	2.30	0.47
1:C:201:HIS:HE1	3:C:552:HOH:O	1.98	0.47
1:C:316:ASN:C	1:C:316:ASN:HD22	2.18	0.47
1:D:155:HIS:CD2	1:D:213:THR:HA	2.49	0.47
1:C:155:HIS:CD2	1:C:213:THR:HA	2.49	0.47
1:A:13:GLY:HA2	1:A:73:ILE:CG1	2.43	0.46
1:D:381:GLN:HA	1:D:381:GLN:NE2	2.30	0.46
1:B:121:HIS:HD2	3:B:609:HOH:O	1.97	0.46
1:C:371:ARG:HD3	3:C:762:HOH:O	2.14	0.46
1:C:224:SER:HB2	1:C:246:HIS:CG	2.50	0.46
1:D:365:LYS:HB3	1:D:365:LYS:HZ2	1.80	0.46
1:C:75:THR:HG21	1:C:116:PHE:HD2	1.80	0.46
1:C:365:LYS:HB3	1:C:365:LYS:HZ2	1.80	0.46
1:D:329:GLU:OE2	1:D:331:ARG:HD3	2.16	0.46
1:C:223:VAL:HG13	1:C:336:VAL:HG11	1.96	0.46
1:B:124:LEU:HD23	1:B:129:GLN:HE21	1.80	0.46
1:D:316:ASN:C	1:D:316:ASN:HD22	2.19	0.46
1:A:155:HIS:HD2	1:A:213:THR:HA	1.80	0.46
1:C:155:HIS:HD2	1:C:213:THR:HA	1.81	0.46
1:D:122:TRP:N	1:D:122:TRP:CD1	2.82	0.46
1:A:224:SER:HB2	1:A:246:HIS:CG	2.51	0.46
1:A:293:ILE:HD13	1:A:293:ILE:HA	1.77	0.46
1:B:155:HIS:HD2	1:B:213:THR:HA	1.80	0.46
1:D:13:GLY:HA2	1:D:73:ILE:CG1	2.44	0.46
1:D:124:LEU:HD23	1:D:129:GLN:HE21	1.81	0.45
1:A:329:GLU:OE2	1:A:331:ARG:HD3	2.17	0.45
1:D:281:MET:HE3	3:D:826:HOH:O	2.15	0.45
1:B:189:THR:O	1:B:193:VAL:HG23	2.16	0.45
1:B:121:HIS:NE2	2:B:500:GCO:O2	2.45	0.45
1:A:316:ASN:C	1:A:316:ASN:HD22	2.20	0.45
1:B:77:ARG:NH2	1:B:352:GLU:HG3	2.25	0.45
1:B:293:ILE:HD13	1:B:293:ILE:HA	1.79	0.45
1:A:365:LYS:HB3	1:A:365:LYS:HZ2	1.81	0.44
1:A:77:ARG:NH2	1:A:352:GLU:HG3	2.26	0.44
1:A:189:THR:O	1:A:193:VAL:HG23	2.17	0.44
1:B:17:ALA:HB3	1:B:20:GLN:NE2	2.12	0.44
1:B:47:ASN:HD22	1:C:447:ARG:HH12	1.66	0.44
1:B:375:MET:HE2	1:B:431:SER:HB2	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:65:ILE:HA	1:D:68:MET:HG2	1.99	0.44
1:D:406:TRP:O	1:D:407:ALA:HB3	2.17	0.44
1:C:138:ARG:NE	3:C:867:HOH:O	2.49	0.44
1:C:279:GLY:HA2	3:C:561:HOH:O	2.18	0.44
1:B:191:ILE:HD12	1:B:272:ALA:HB1	1.99	0.44
1:C:406:TRP:O	1:C:407:ALA:HB3	2.17	0.44
1:D:24:ALA:HB1	1:D:27:GLU:CB	2.48	0.44
1:A:191:ILE:HD12	1:A:272:ALA:HB1	2.00	0.44
1:B:65:ILE:HA	1:B:68:MET:HG2	2.00	0.44
1:B:316:ASN:C	1:B:316:ASN:HD22	2.20	0.44
1:C:375:MET:HE2	1:C:431:SER:HB2	1.99	0.44
1:D:138:ARG:O	1:D:138:ARG:HG2	2.17	0.44
1:C:24:ALA:HB1	1:C:27:GLU:CB	2.48	0.43
1:C:189:THR:O	1:C:193:VAL:HG23	2.18	0.43
1:A:65:ILE:HA	1:A:68:MET:HG2	2.00	0.43
1:C:24:ALA:HB1	1:C:27:GLU:HB3	2.01	0.43
1:C:293:ILE:HD13	1:C:293:ILE:HA	1.79	0.43
1:B:75:THR:HG21	1:B:116:PHE:HD2	1.83	0.43
1:C:65:ILE:HA	1:C:68:MET:HG2	1.99	0.43
1:C:121:HIS:HD2	3:C:666:HOH:O	2.01	0.43
1:D:155:HIS:HD2	1:D:213:THR:HA	1.83	0.43
1:D:80:VAL:HG21	1:D:150:MET:HE2	2.01	0.43
1:B:405:GLU:OE1	2:B:500:GCO:O4	2.36	0.43
1:C:138:ARG:HG2	1:C:138:ARG:O	2.18	0.43
1:B:201:HIS:CE1	3:B:562:HOH:O	2.69	0.42
1:A:365:LYS:NZ	1:D:422:ARG:HH12	2.17	0.42
1:A:102:HIS:CD2	1:A:157:LYS:NZ	2.87	0.42
1:B:13:GLY:HA2	1:B:73:ILE:CG1	2.44	0.42
1:B:80:VAL:HG21	1:B:150:MET:HE2	2.01	0.42
1:D:316:ASN:ND2	1:D:318:GLY:H	2.17	0.42
1:A:138:ARG:O	1:A:138:ARG:HG2	2.18	0.42
1:D:257:GLY:HA2	3:D:826:HOH:O	2.19	0.42
1:B:329:GLU:OE2	1:B:331:ARG:HD3	2.19	0.42
1:D:11:MET:HE2	1:D:11:MET:HB2	1.91	0.42
1:A:75:THR:HG21	1:A:116:PHE:HD2	1.84	0.42
1:B:167:PRO:HD2	1:B:221:PRO:HA	2.01	0.42
1:B:338:HIS:HD2	3:B:725:HOH:O	2.03	0.42
1:B:406:TRP:NE1	2:B:500:GCO:O3	2.46	0.42
1:C:73:ILE:HG21	3:C:545:HOH:O	2.19	0.42
1:C:75:THR:CG2	1:C:116:PHE:HB2	2.50	0.42
1:D:189:THR:O	1:D:193:VAL:HG23	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:406:TRP:O	1:A:407:ALA:HB3	2.20	0.42
1:B:165:ASN:HD21	1:B:294:ASN:HD21	1.67	0.42
1:C:329:GLU:OE2	1:C:331:ARG:HD3	2.19	0.42
1:D:371:ARG:HG2	1:D:375:MET:HE2	2.01	0.42
1:A:121:HIS:HE1	3:A:808:HOH:O	2.02	0.41
1:B:24:ALA:HB1	1:B:27:GLU:CB	2.50	0.41
1:A:371:ARG:O	1:A:375:MET:HG3	2.19	0.41
1:D:249:TRP:CD1	1:D:260:PRO:HD2	2.55	0.41
1:D:304:ASN:HA	1:D:305:PRO:HD2	1.92	0.41
1:C:191:ILE:HD12	1:C:272:ALA:HB1	2.01	0.41
1:A:371:ARG:HD3	3:A:653:HOH:O	2.20	0.41
1:B:75:THR:CG2	1:B:116:PHE:HB2	2.51	0.41
1:C:102:HIS:CD2	1:C:157:LYS:HZ2	2.37	0.41
1:D:191:ILE:HD12	1:D:272:ALA:HB1	2.01	0.41
2:C:500:GCO:C4	2:C:500:GCO:O1B	2.67	0.41
1:A:34:ILE:HA	1:A:126:GLN:NE2	2.36	0.41
1:A:387:HIS:CD2	3:A:768:HOH:O	2.74	0.41
1:D:20:GLN:NE2	2:D:500:GCO:O3	2.50	0.41
1:D:316:ASN:HD22	1:D:318:GLY:H	1.69	0.41
1:B:11:MET:HE2	1:B:11:MET:HB2	1.95	0.41
1:B:370:ARG:HD3	3:B:623:HOH:O	2.21	0.41
1:D:359:ASP:OD2	1:D:368:ASP:HA	2.21	0.41
1:A:70:GLU:HB3	3:A:561:HOH:O	2.20	0.41
1:A:165:ASN:HD21	1:A:294:ASN:HD21	1.67	0.41
1:A:24:ALA:HB1	1:A:27:GLU:CB	2.51	0.41
1:A:75:THR:CG2	1:A:116:PHE:HB2	2.51	0.41
1:B:406:TRP:O	1:B:407:ALA:HB3	2.21	0.41
1:C:359:ASP:OD2	1:C:368:ASP:HA	2.21	0.41
1:D:125:PRO:HB3	3:D:736:HOH:O	2.20	0.41
1:D:293:ILE:HD13	1:D:293:ILE:HA	1.81	0.41
1:A:24:ALA:HB1	1:A:27:GLU:HB3	2.04	0.41
1:C:362:VAL:O	1:C:363:ASN:HB3	2.20	0.41
1:D:24:ALA:HB1	1:D:27:GLU:HB3	2.03	0.41
1:B:144:VAL:O	1:B:148:GLU:HG3	2.21	0.40
1:B:429:LYS:O	1:B:432:TYR:HB3	2.21	0.40
1:C:167:PRO:HD2	1:C:221:PRO:HA	2.03	0.40
1:C:257:GLY:HA2	3:C:821:HOH:O	2.19	0.40
1:C:304:ASN:HA	1:C:305:PRO:HD2	1.91	0.40
1:A:261:GLN:NE2	3:A:540:HOH:O	2.52	0.40
1:A:359:ASP:OD2	1:A:368:ASP:HA	2.21	0.40
1:C:34:ILE:HA	1:C:126:GLN:NE2	2.37	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:62:GLU:HG2	1:C:107:LEU:HD21	2.04	0.40
1:C:77:ARG:NH2	1:C:352:GLU:OE2	2.55	0.40
1:C:249:TRP:CD1	1:C:260:PRO:HD2	2.57	0.40
1:D:63:GLU:HG3	1:D:66:ARG:NH2	2.35	0.40
1:B:24:ALA:HB1	1:B:27:GLU:HB3	2.04	0.40
1:B:102:HIS:HE1	1:B:153:GLU:OE1	2.05	0.40
1:C:370:ARG:HD3	3:C:668:HOH:O	2.21	0.40
1:D:62:GLU:HG2	1:D:107:LEU:HD21	2.04	0.40
1:D:75:THR:CG2	1:D:116:PHE:HB2	2.51	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	445/448 (99%)	422 (95%)	20 (4%)	3 (1%)	22	26
1	B	445/448 (99%)	424 (95%)	18 (4%)	3 (1%)	22	26
1	C	445/448 (99%)	424 (95%)	18 (4%)	3 (1%)	22	26
1	D	445/448 (99%)	421 (95%)	21 (5%)	3 (1%)	22	26
All	All	1780/1792 (99%)	1691 (95%)	77 (4%)	12 (1%)	22	26

All (12) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	406	TRP
1	B	406	TRP
1	C	406	TRP
1	D	406	TRP
1	A	24	ALA
1	A	54	ALA

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Mol	Chain	Res	Type
1	B	24	ALA
1	B	54	ALA
1	C	24	ALA
1	C	54	ALA
1	D	24	ALA
1	D	54	ALA

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	383/384 (100%)	370 (97%)	13 (3%)	37	51
1	B	383/384 (100%)	369 (96%)	14 (4%)	34	48
1	C	383/384 (100%)	370 (97%)	13 (3%)	37	51
1	D	383/384 (100%)	369 (96%)	14 (4%)	34	48
All	All	1532/1536 (100%)	1478 (96%)	54 (4%)	36	50

All (54) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	73	ILE
1	A	96	GLU
1	A	187	LEU
1	A	197	LEU
1	A	206	ARG
1	A	223	VAL
1	A	227	VAL
1	A	249	TRP
1	A	290	MET
1	A	316	ASN
1	A	336	VAL
1	A	365	LYS
1	A	399	SER
1	B	73	ILE
1	B	96	GLU

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Mol	Chain	Res	Type
1	B	187	LEU
1	B	197	LEU
1	B	206	ARG
1	B	223	VAL
1	B	227	VAL
1	B	249	TRP
1	B	290	MET
1	B	298	MET
1	B	316	ASN
1	B	336	VAL
1	B	365	LYS
1	B	399	SER
1	C	73	ILE
1	C	96	GLU
1	C	187	LEU
1	C	197	LEU
1	C	206	ARG
1	C	223	VAL
1	C	227	VAL
1	C	249	TRP
1	C	290	MET
1	C	316	ASN
1	C	336	VAL
1	C	365	LYS
1	C	399	SER
1	D	73	ILE
1	D	96	GLU
1	D	107	LEU
1	D	187	LEU
1	D	197	LEU
1	D	206	ARG
1	D	223	VAL
1	D	227	VAL
1	D	249	TRP
1	D	290	MET
1	D	316	ASN
1	D	336	VAL
1	D	365	LYS
1	D	399	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (80) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	20	GLN
1	A	40	HIS
1	A	47	ASN
1	A	102	HIS
1	A	126	GLN
1	A	129	GLN
1	A	155	HIS
1	A	165	ASN
1	A	201	HIS
1	A	216	GLN
1	A	261	GLN
1	A	311	GLN
1	A	316	ASN
1	A	338	HIS
1	A	367	GLN
1	A	381	GLN
1	A	387	HIS
1	A	391	HIS
1	A	403	ASN
1	A	442	ASN
1	B	20	GLN
1	B	40	HIS
1	B	47	ASN
1	B	52	ASN
1	B	102	HIS
1	B	121	HIS
1	B	126	GLN
1	B	129	GLN
1	B	155	HIS
1	B	165	ASN
1	B	201	HIS
1	B	216	GLN
1	B	261	GLN
1	B	311	GLN
1	B	316	ASN
1	B	338	HIS
1	B	367	GLN
1	B	381	GLN
1	B	403	ASN
1	B	442	ASN
1	C	8	GLN
1	C	20	GLN
1	C	40	HIS

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Mol	Chain	Res	Type
1	C	47	ASN
1	C	102	HIS
1	C	121	HIS
1	C	126	GLN
1	C	129	GLN
1	C	155	HIS
1	C	165	ASN
1	C	201	HIS
1	C	216	GLN
1	C	261	GLN
1	C	311	GLN
1	C	316	ASN
1	C	338	HIS
1	C	367	GLN
1	C	381	GLN
1	C	387	HIS
1	C	403	ASN
1	C	442	ASN
1	D	20	GLN
1	D	40	HIS
1	D	47	ASN
1	D	102	HIS
1	D	121	HIS
1	D	126	GLN
1	D	129	GLN
1	D	155	HIS
1	D	165	ASN
1	D	201	HIS
1	D	216	GLN
1	D	261	GLN
1	D	311	GLN
1	D	316	ASN
1	D	338	HIS
1	D	367	GLN
1	D	381	GLN
1	D	403	ASN
1	D	442	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 monosaccharides in this entry.

5.6 Ligand geometry (i)

3 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	GCO	C	500	-	12,12,12	4.16	4 (33%)	16,16,16	5.41	8 (50%)
2	GCO	D	500	-	12,12,12	4.39	5 (41%)	16,16,16	5.30	9 (56%)
2	GCO	B	500	-	12,12,12	3.93	4 (33%)	16,16,16	5.40	10 (62%)

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	GCO	C	500	-	-	8/18/18/18	-
2	GCO	D	500	-	-	10/18/18/18	-
2	GCO	B	500	-	-	8/18/18/18	-

All (13) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	500	GCO	C2-C1	-12.95	1.35	1.52
2	C	500	GCO	C2-C1	-12.16	1.36	1.52
2	B	500	GCO	C2-C1	-11.78	1.36	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	500	GCO	O1A-C1	5.11	1.37	1.22
2	C	500	GCO	O1A-C1	4.80	1.36	1.22
2	D	500	GCO	C3-C2	-4.65	1.43	1.53
2	B	500	GCO	O1A-C1	4.56	1.36	1.22
2	C	500	GCO	C3-C2	-4.28	1.43	1.53
2	B	500	GCO	C3-C2	-3.29	1.46	1.53
2	C	500	GCO	C5-C4	-2.66	1.48	1.53
2	D	500	GCO	O2-C2	-2.36	1.37	1.42
2	D	500	GCO	C5-C4	-2.13	1.49	1.53
2	B	500	GCO	C5-C4	-2.03	1.49	1.53

All (27) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	500	GCO	O1B-C1-O1A	-12.47	95.77	124.09
2	C	500	GCO	O1B-C1-O1A	-12.34	96.08	124.09
2	D	500	GCO	O1B-C1-O1A	-11.88	97.11	124.09
2	C	500	GCO	C3-C2-C1	11.71	124.03	109.32
2	D	500	GCO	C3-C2-C1	11.61	123.91	109.32
2	B	500	GCO	C3-C2-C1	11.18	123.37	109.32
2	B	500	GCO	O2-C2-C1	-9.03	91.73	110.66
2	C	500	GCO	O2-C2-C1	-8.36	93.14	110.66
2	D	500	GCO	O2-C2-C1	-7.90	94.11	110.66
2	D	500	GCO	O1A-C1-C2	-7.03	103.14	121.63
2	B	500	GCO	O1A-C1-C2	-6.89	103.50	121.63
2	C	500	GCO	O1A-C1-C2	-6.73	103.94	121.63
2	C	500	GCO	C5-C4-C3	-4.22	105.86	112.47
2	D	500	GCO	O1B-C1-C2	-3.97	102.54	113.27
2	D	500	GCO	O3-C3-C2	-3.89	102.12	109.21
2	C	500	GCO	O1B-C1-C2	-3.78	103.06	113.27
2	B	500	GCO	O3-C3-C2	-3.77	102.34	109.21
2	B	500	GCO	O1B-C1-C2	-3.64	103.44	113.27
2	C	500	GCO	O3-C3-C2	-3.47	102.89	109.21
2	D	500	GCO	C5-C4-C3	-2.92	107.89	112.47
2	C	500	GCO	O3-C3-C4	2.68	115.72	109.47
2	B	500	GCO	O5-C5-C6	-2.68	102.85	109.14
2	B	500	GCO	O2-C2-C3	-2.51	105.13	110.45
2	D	500	GCO	O3-C3-C4	2.37	114.99	109.47
2	B	500	GCO	O3-C3-C4	2.34	114.91	109.47
2	B	500	GCO	O4-C4-C5	-2.14	103.65	108.81
2	D	500	GCO	O5-C5-C4	-2.01	104.20	109.10

There are no chirality outliers.

All (26) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	500	GCO	O1A-C1-C2-C3
2	B	500	GCO	C1-C2-C3-O3
2	B	500	GCO	C2-C3-C4-C5
2	B	500	GCO	C2-C3-C4-O4
2	B	500	GCO	O3-C3-C4-C5
2	C	500	GCO	O1A-C1-C2-O2
2	C	500	GCO	C2-C3-C4-C5
2	C	500	GCO	C2-C3-C4-O4
2	C	500	GCO	O3-C3-C4-C5
2	D	500	GCO	O1A-C1-C2-C3
2	D	500	GCO	O1A-C1-C2-O2
2	D	500	GCO	C2-C3-C4-C5
2	D	500	GCO	C2-C3-C4-O4
2	D	500	GCO	O3-C3-C4-C5
2	D	500	GCO	O3-C3-C4-O4
2	B	500	GCO	O1A-C1-C2-O2
2	C	500	GCO	O3-C3-C4-O4
2	D	500	GCO	C4-C5-C6-O6
2	B	500	GCO	O3-C3-C4-O4
2	C	500	GCO	O1A-C1-C2-C3
2	B	500	GCO	C1-C2-C3-C4
2	D	500	GCO	C3-C4-C5-O5
2	D	500	GCO	O4-C4-C5-O5
2	C	500	GCO	O5-C5-C6-O6
2	C	500	GCO	C1-C2-C3-O3
2	D	500	GCO	O5-C5-C6-O6

There are no ring outliers.

3 monomers are involved in 17 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	500	GCO	5	0
2	D	500	GCO	4	0
2	B	500	GCO	8	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)

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates (i)

EDS was not executed - this section is therefore empty.

6.4 Ligands (i)

EDS was not executed - this section is therefore empty.

6.5 Other polymers (i)

EDS was not executed - this section is therefore empty.