Full wwPDB X-ray Structure Validation Report ⓘ

Jun 25, 2024 – 08:22 AM EDT

PDB ID	:	5OHZ
Title	:	Crystal structure of Mycolicibacterium hassiacum glucosylglycerate hydrolase (MhGgH) - SeMet derivative
Authors	:	Cereija, T.B.; Macedo-Ribeiro, S.; Pereira, P.J.B.
Deposited on	:	2017-07-18
Resolution	:	2.04 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 ⓘ 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 ⓘ) were used in the production of this report:

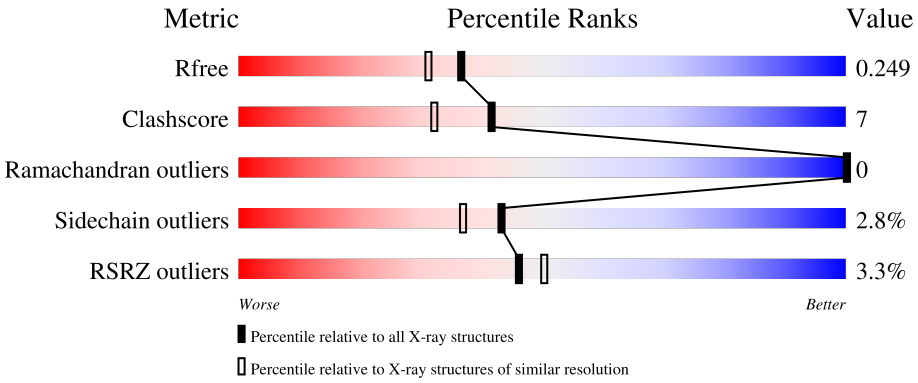
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.37.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry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

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.04 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	1692 (2.04-2.04)
Clashscore	141614	1773 (2.04-2.04)
Ramachandran outliers	138981	1752 (2.04-2.04)
Sidechain outliers	138945	1752 (2.04-2.04)
RSRZ outliers	127900	1672 (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 of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	448	86% 12%
1	B	448	83% 15%
1	C	448	3% 82% 17%
1	D	448	8% 80% 17%

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	GOL	A	504	-	-	X	-
2	GOL	D	502	-	-	X	-

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 15955 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.

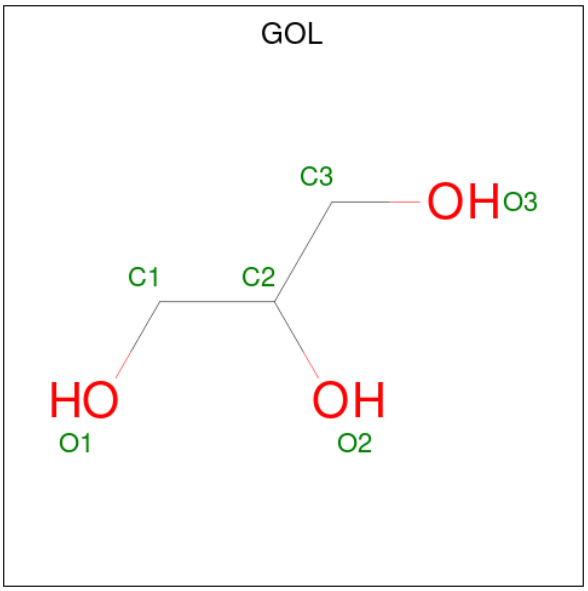
- Molecule 1 is a protein called Hydrolase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	443	Total	C	N	O	S	Se	0	11	0
			3671	2332	671	654	5	9			
1	B	442	Total	C	N	O	S	Se	0	10	0
			3654	2319	668	654	5	8			
1	C	444	Total	C	N	O	S	Se	0	4	0
			3606	2295	649	648	5	9			
1	D	442	Total	C	N	O	S	Se	0	6	0
			3611	2297	653	646	5	10			

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	expression tag	UNP K5BDL0
A	0	ALA	-	expression tag	UNP K5BDL0
B	-1	GLY	-	expression tag	UNP K5BDL0
B	0	ALA	-	expression tag	UNP K5BDL0
C	-1	GLY	-	expression tag	UNP K5BDL0
C	0	ALA	-	expression tag	UNP K5BDL0
D	-1	GLY	-	expression tag	UNP K5BDL0
D	0	ALA	-	expression tag	UNP K5BDL0

- Molecule 2 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



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

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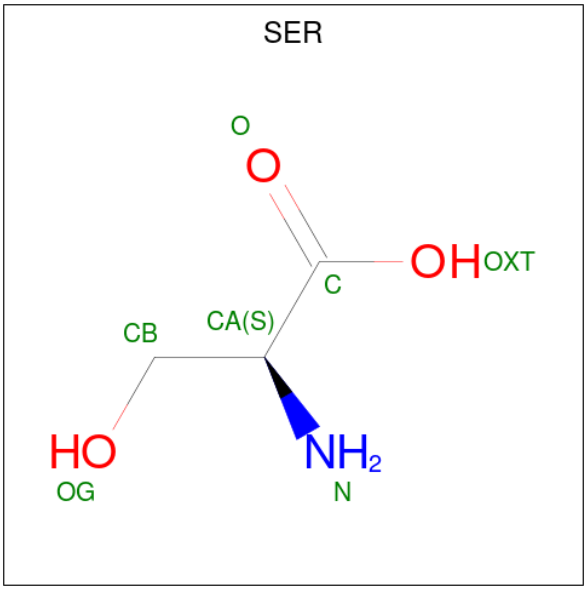
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	D	1	Total C O 6 3 3	0	0
2	D	1	Total C O 6 3 3	0	0

- Molecule 3 is SERINE (three-letter code: SER) (formula: $C_3H_7NO_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C N O 7 3 1 3	0	0
3	B	1	Total C N O 7 3 1 3	0	0
3	C	1	Total C N O 7 3 1 3	0	0
3	D	1	Total C N O 7 3 1 3	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	398	Total O 398 398	0	2
4	B	380	Total O 380 380	0	0
4	C	284	Total O 284 284	0	1

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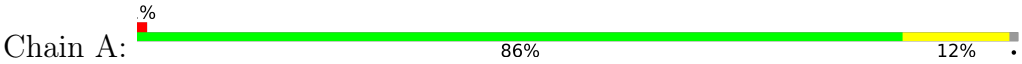
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	D	227	Total O 227 227	0	0

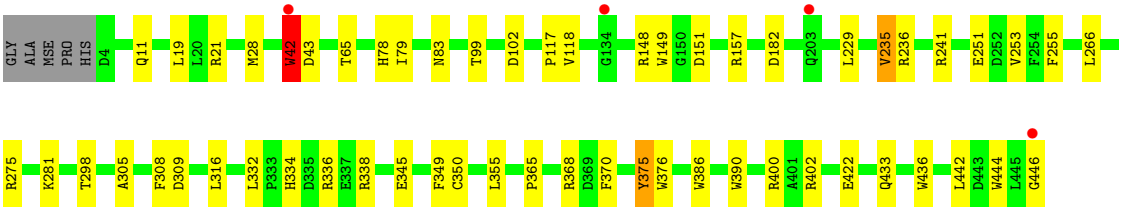
3 Residue-property plots (i)

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

• Molecule 1: Hydrolase

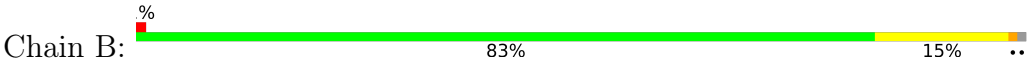
Chain A:

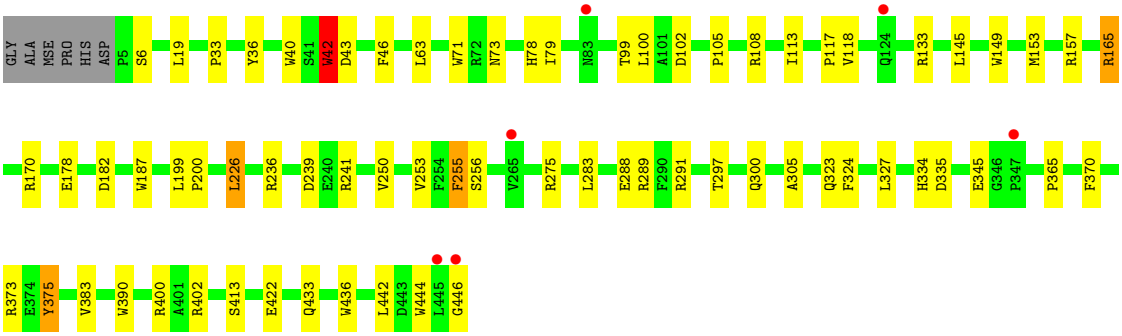




• Molecule 1: Hydrolase

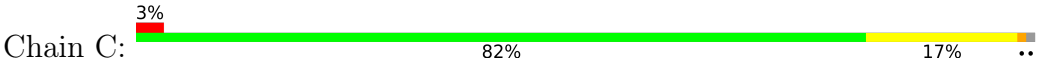
Chain B:

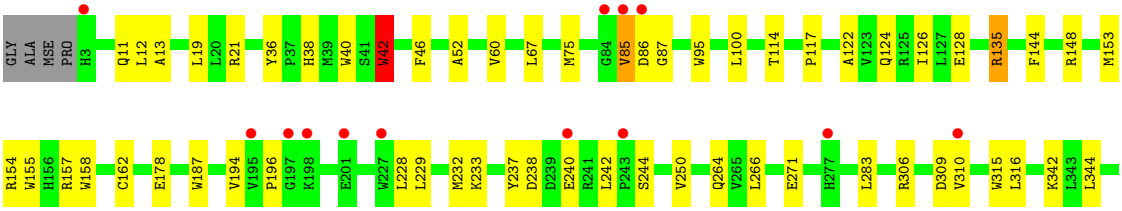




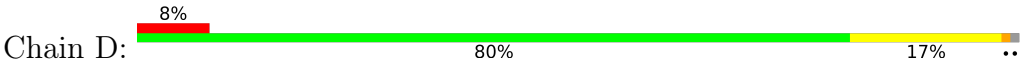
• Molecule 1: Hydrolase

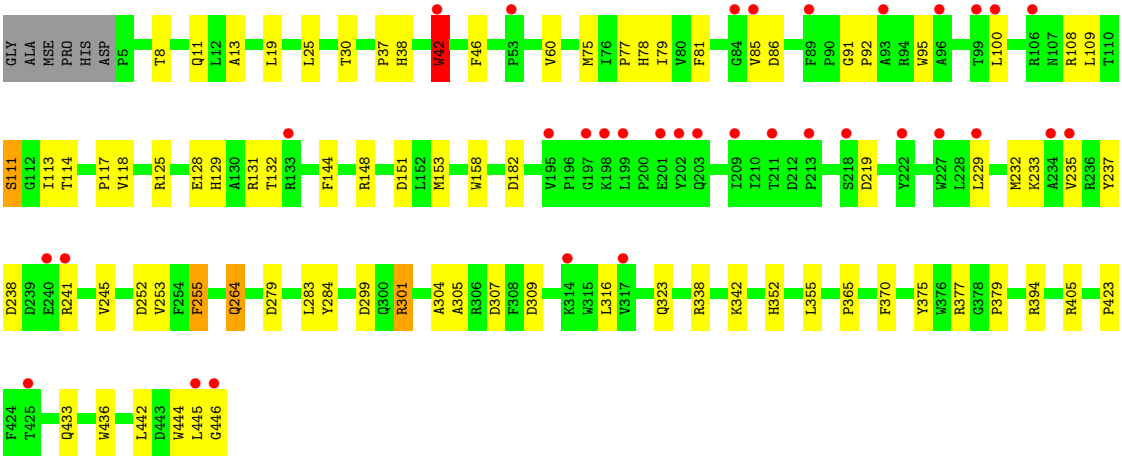
Chain C:





• Molecule 1: Hydrolase





4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	90.75Å 86.10Å 159.72Å 90.00° 93.03° 90.00°	Depositor
Resolution (Å)	57.42 – 2.04 57.42 – 2.04	Depositor EDS
% Data completeness (in resolution range)	82.5 (57.42-2.04) 96.3 (57.42-2.04)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.21 (at 2.03Å)	Xtriage
Refinement program	PHENIX (1.11.1_2575: ???)	Depositor
R, R_{free}	0.199 , 0.245 0.204 , 0.249	Depositor DCC
R_{free} test set	7494 reflections (4.95%)	wwPDB-VP
Wilson B-factor (Å^2)	27.8	Xtriage
Anisotropy	0.236	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 58.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	15955	wwPDB-VP
Average B, all atoms (Å^2)	36.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.79% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 2CO, GOL

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\| > 5$	RMSZ	$\#\|Z\| > 5$
1	A	0.55	0/3761	0.70	2/5103 (0.0%)
1	B	0.53	0/3744	0.67	2/5080 (0.0%)
1	C	0.45	0/3697	0.62	1/5022 (0.0%)
1	D	0.46	0/3701	0.62	2/5023 (0.0%)
All	All	0.50	0/14903	0.65	7/20228 (0.0%)

There are no bond length outliers.

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	42	TRP	CA-CB-CG	7.33	127.62	113.70
1	B	42	TRP	CA-CB-CG	7.16	127.31	113.70
1	C	42	TRP	CA-CB-CG	6.11	125.31	113.70
1	D	42	TRP	CA-CB-CG	6.10	125.30	113.70
1	B	226	LEU	CA-CB-CG	-5.98	101.55	115.30
1	D	252	ASP	CB-CG-OD1	5.19	122.97	118.30
1	A	21	ARG	NE-CZ-NH1	5.10	122.85	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	3671	0	3555	42	0
1	B	3654	0	3530	47	0
1	C	3606	0	3478	55	0
1	D	3611	0	3492	59	0
2	A	24	0	32	6	0
2	B	36	0	48	6	0
2	C	24	0	32	6	0
2	D	12	0	16	5	0
3	A	7	0	4	2	0
3	B	7	0	4	2	0
3	C	7	0	4	1	0
3	D	7	0	4	2	0
4	A	398	0	0	5	0
4	B	380	0	0	9	1
4	C	284	0	0	9	0
4	D	227	0	0	7	1
All	All	15955	0	14199	203	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 7.

All (203) 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)
2:A:501:GOL:HO2	3:A:505:SER:N	1.63	0.96
2:D:501:GOL:HO2	3:D:503:SER:N	1.69	0.91
1:B:345:GLU:OE2	1:B:400:ARG:NH1	2.08	0.87
1:D:442:LEU:O	1:D:446[B]:GLY:N	2.19	0.76
1:D:125:ARG:HH22	2:D:502:GOL:H31	1.51	0.75
1:B:323:GLN:NE2	4:B:601:HOH:O	2.19	0.74
2:B:501:GOL:HO2	3:B:507:SER:N	1.87	0.72
1:C:75:MSE:HE2	1:C:114:THR:HB	1.73	0.70
1:D:394:ARG:NH2	4:D:604:HOH:O	2.26	0.68
2:C:502:GOL:HO2	3:C:505:SER:N	1.92	0.67
1:B:241[A]:ARG:NH2	4:B:604:HOH:O	2.25	0.66
1:A:446[A]:GLY:HA3	4:C:797:HOH:O	1.95	0.66
1:C:244:SER:N	4:C:606:HOH:O	2.30	0.65
1:A:28[A]:MSE:HB3	1:A:65:THR:HG21	1.79	0.64
1:D:95:TRP:CZ3	1:D:229:LEU:HD11	2.31	0.64
1:B:165:ARG:NH1	4:B:607:HOH:O	2.30	0.64
1:D:235:VAL:HG21	1:D:245:VAL:HG11	1.80	0.64
1:C:442:LEU:O	1:C:446[B]:GLY:N	2.30	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:19:LEU:HD11	1:B:433:GLN:HA	1.82	0.62
1:B:6:SER:HB2	1:B:413:SER:HB3	1.82	0.61
1:D:42:TRP:O	1:D:46:PHE:HD1	1.83	0.61
1:C:19:LEU:HD11	1:C:433:GLN:HA	1.81	0.61
1:D:129:HIS:CE1	2:D:502:GOL:H2	2.35	0.60
1:B:149:TRP:HD1	2:B:504:GOL:H11	1.65	0.60
1:D:264:GLN:HG2	1:D:394:ARG:HH12	1.66	0.60
1:A:386:TRP:NE1	2:A:504:GOL:H32	2.16	0.60
1:D:323:GLN:NE2	4:D:603:HOH:O	2.34	0.60
1:A:102:ASP:OD1	1:A:236:ARG:NH2	2.34	0.60
1:D:309:ASP:HB2	1:D:316:LEU:HD21	1.81	0.60
1:A:345:GLU:OE2	1:A:400:ARG:NH1	2.25	0.59
1:D:405:ARG:HG3	1:D:444:TRP:CD1	2.38	0.58
1:D:75:MSE:HE3	1:D:158:TRP:CH2	2.39	0.58
1:C:122:ALA:O	1:C:126:ILE:HG12	2.04	0.57
1:A:19[A]:LEU:HD23	1:A:433:GLN:OE1	2.04	0.57
1:D:75:MSE:HE3	1:D:158:TRP:HH2	1.69	0.57
1:D:131:ARG:NH2	4:D:609:HOH:O	2.30	0.57
1:C:11:GLN:HG3	1:D:446[A]:GLY:O	2.05	0.57
1:D:352:HIS:HB3	1:D:355:LEU:HG	1.86	0.57
1:C:405:ARG:HG3	1:C:444:TRP:CD1	2.40	0.56
1:B:78:HIS:CE1	1:B:79:ILE:HG13	2.41	0.56
1:A:148:ARG:NH1	1:A:151:ASP:OD2	2.34	0.56
1:D:30:THR:N	4:D:621:HOH:O	2.39	0.56
1:D:148:ARG:NH1	1:D:151:ASP:OD2	2.38	0.55
1:C:75:MSE:HE3	1:C:158:TRP:HH2	1.70	0.55
1:A:444:TRP:CD1	2:A:504:GOL:H31	2.41	0.55
1:B:334:HIS:CD2	2:B:503:GOL:H32	2.42	0.55
1:A:309:ASP:HB2	1:A:316:LEU:HD21	1.88	0.54
1:C:75:MSE:HE3	1:C:158:TRP:CH2	2.42	0.54
1:D:379:PRO:HA	1:D:423:PRO:HG3	1.89	0.54
1:D:91:GLY:O	1:D:95:TRP:HD1	1.90	0.54
1:D:377:ARG:NH2	4:D:623:HOH:O	2.41	0.54
1:A:235:VAL:HG22	1:A:241[B]:ARG:NE	2.22	0.54
1:B:133[B]:ARG:HH11	1:B:133[B]:ARG:HG3	1.72	0.54
1:D:25:LEU:HG	4:D:621:HOH:O	2.06	0.54
1:D:38:HIS:CE1	1:D:85:VAL:HB	2.43	0.53
1:B:288:GLU:OE2	1:B:291:ARG:NH1	2.41	0.53
1:C:60:VAL:HG13	1:C:144:PHE:CD2	2.43	0.53
1:D:95:TRP:CE3	1:D:229:LEU:HD11	2.44	0.52
1:A:365:PRO:HA	1:A:370:PHE:CG	2.45	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:299:ASP:OD1	1:D:301[B]:ARG:HG2	2.10	0.52
1:D:13:ALA:HB2	1:D:445[A]:LEU:HD13	1.90	0.52
1:C:114:THR:HG22	1:C:178:GLU:OE1	2.10	0.52
1:C:394:ARG:NH2	4:C:615:HOH:O	2.42	0.52
1:D:79:ILE:N	1:D:111:SER:OG	2.40	0.52
1:B:149:TRP:CD2	1:B:275:ARG:HG3	2.46	0.51
1:D:30:THR:HG23	4:D:621:HOH:O	2.10	0.51
1:B:390:TRP:HB2	2:B:506:GOL:H11	1.92	0.51
1:C:13:ALA:HB2	1:C:445[A]:LEU:HD13	1.92	0.51
1:D:264:GLN:HG2	1:D:394:ARG:NH1	2.26	0.51
1:A:19[A]:LEU:HD21	1:A:433:GLN:HB3	1.92	0.51
1:A:11:GLN:HG2	4:B:804:HOH:O	2.11	0.51
1:C:194:VAL:O	1:C:196:PRO:HD3	2.12	0.50
1:D:100:LEU:HD12	1:D:233:LYS:HG2	1.93	0.50
1:C:154:ARG:HD2	4:C:716:HOH:O	2.12	0.50
1:C:52:ALA:HB2	1:C:126:ILE:HD13	1.93	0.50
1:D:75:MSE:HE2	1:D:114:THR:HB	1.94	0.50
1:D:37:PRO:HB2	1:D:85:VAL:HG11	1.94	0.50
1:D:75:MSE:HE2	1:D:114:THR:N	2.27	0.50
1:A:149:TRP:CE3	1:A:275:ARG:HG3	2.47	0.49
1:B:113:ILE:HB	1:B:178:GLU:CG	2.42	0.49
1:C:153:MSE:SE	1:C:283:LEU:HD11	2.62	0.49
1:B:73:ASN:ND2	1:B:239:ASP:OD2	2.45	0.49
1:B:400:ARG:NH2	4:B:629:HOH:O	2.46	0.49
1:B:402:ARG:NH2	2:D:502:GOL:H12	2.27	0.49
1:C:67:LEU:HD13	1:C:148:ARG:HD2	1.95	0.49
1:C:238:ASP:O	1:C:242:LEU:HG	2.13	0.48
1:C:117:PRO:HB3	1:C:155:TRP:CZ2	2.48	0.48
2:B:503:GOL:H11	1:D:284:TYR:CE1	2.49	0.48
1:C:86:ASP:OD1	1:C:87:GLY:N	2.42	0.48
1:A:334:HIS:NE2	1:A:338:ARG:HD2	2.28	0.48
1:A:402:ARG:NH2	2:C:503:GOL:H32	2.28	0.48
1:A:444:TRP:NE1	2:A:504:GOL:H31	2.28	0.48
1:A:83:ASN:ND2	4:A:601:HOH:O	2.19	0.47
1:A:182:ASP:OD2	3:A:505:SER:HA	2.13	0.47
1:B:117:PRO:HD3	1:B:255:PHE:CE1	2.49	0.47
1:A:253:VAL:HG21	1:A:305:ALA:HB1	1.96	0.47
1:A:251:GLU:HB2	1:A:308:PHE:HB3	1.95	0.47
1:C:135:ARG:HA	1:C:135:ARG:HD2	1.67	0.47
1:D:108:ARG:O	1:D:109:LEU:HB2	2.15	0.47
1:D:125:ARG:HH22	2:D:502:GOL:C3	2.25	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:133[B]:ARG:HG3	1:B:133[B]:ARG:NH1	2.29	0.47
1:C:264:GLN:HG2	1:C:394:ARG:HH12	1.79	0.47
1:A:42:TRP:HB2	1:A:118:VAL:HG21	1.97	0.47
1:B:253:VAL:HG21	1:B:305:ALA:HB1	1.96	0.47
1:B:36:TYR:HB3	1:B:40:TRP:CZ3	2.50	0.47
1:C:402:ARG:NH2	2:C:501:GOL:H2	2.29	0.47
1:A:117:PRO:HD3	1:A:255:PHE:CE1	2.49	0.47
1:B:300[A]:GLN:HG2	4:B:788:HOH:O	2.15	0.46
1:C:38:HIS:CE1	1:C:85:VAL:HG22	2.50	0.46
1:A:350:CYS:HB3	4:A:870:HOH:O	2.15	0.46
1:D:238:ASP:HB3	1:D:241:ARG:HD3	1.98	0.46
1:B:236:ARG:HD2	4:B:824:HOH:O	2.14	0.46
1:C:405:ARG:HG3	1:C:444:TRP:CG	2.51	0.46
1:B:170:ARG:HD3	1:B:297:THR:CG2	2.46	0.45
1:D:229:LEU:HD12	1:D:232[B]:MSE:HE3	1.98	0.45
1:B:108:ARG:NH1	4:B:612:HOH:O	2.35	0.45
1:B:187:TRP:HZ3	1:B:250:VAL:HG11	1.81	0.45
1:B:444:TRP:O	1:B:446[A]:GLY:N	2.49	0.45
1:A:149:TRP:CD2	1:A:275:ARG:HG3	2.51	0.45
1:B:100:LEU:O	1:B:236:ARG:HB3	2.17	0.45
1:D:81:PHE:CD1	1:D:92:PRO:HD3	2.51	0.45
1:D:301[A]:ARG:HE	1:D:301[A]:ARG:HB2	1.58	0.45
1:C:309:ASP:HB2	1:C:316:LEU:HD21	1.98	0.45
1:C:446[A]:GLY:OXT	1:D:11:GLN:HG3	2.16	0.45
1:C:42:TRP:O	1:C:46:PHE:HD1	1.99	0.45
1:C:100:LEU:CD1	1:C:233:LYS:HG2	2.46	0.45
1:D:77:PRO:HA	1:D:113:ILE:O	2.16	0.45
1:A:236:ARG:HD2	4:A:904:HOH:O	2.17	0.45
1:C:135:ARG:NH1	4:C:616:HOH:O	2.50	0.45
1:A:157[A]:ARG:HD2	4:A:847:HOH:O	2.16	0.44
1:A:442:LEU:O	1:A:446[B]:GLY:N	2.49	0.44
1:B:46:PHE:CE2	1:B:383:VAL:HG23	2.52	0.44
1:B:289:ARG:HH21	1:B:289:ARG:HG3	1.83	0.44
1:C:12:LEU:HG	1:C:441:VAL:HG11	2.00	0.44
1:C:266:LEU:HA	1:C:266:LEU:HD12	1.78	0.44
1:C:162:2CO:OE	4:C:601:HOH:O	2.21	0.44
1:A:19[B]:LEU:HD21	1:A:433:GLN:HA	2.00	0.44
1:B:365:PRO:HA	1:B:370:PHE:CG	2.53	0.44
1:C:95:TRP:CH2	1:C:229:LEU:HD11	2.52	0.44
1:A:334:HIS:HE2	1:C:271:GLU:CD	2.21	0.44
1:C:157:ARG:HD3	4:C:664:HOH:O	2.16	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:306:ARG:NH2	4:C:620:HOH:O	2.49	0.44
1:D:229:LEU:HD12	1:D:229:LEU:HA	1.56	0.44
1:D:338:ARG:O	1:D:342:LYS:HG3	2.17	0.44
1:A:298:THR:OG1	1:A:336[A]:ARG:NH2	2.43	0.44
1:A:334:HIS:O	1:A:338:ARG:HG3	2.18	0.44
1:C:389:SER:HB3	4:C:745:HOH:O	2.18	0.43
1:A:349:PHE:O	1:A:355:LEU:HD11	2.17	0.43
1:C:232[B]:MSE:HG3	1:C:237:TYR:CE2	2.53	0.43
1:D:117:PRO:HD3	1:D:255:PHE:CE1	2.53	0.43
1:C:349:PHE:CZ	1:C:364:SER:HB2	2.54	0.43
1:A:402:ARG:CZ	2:C:503:GOL:H12	2.48	0.43
1:B:149:TRP:CD1	2:B:504:GOL:H11	2.48	0.43
1:A:78:HIS:CE1	1:A:79:ILE:HG13	2.54	0.43
1:A:241[A]:ARG:HA	1:A:241[A]:ARG:HD2	1.86	0.43
1:A:266:LEU:HD12	1:A:266:LEU:HA	1.89	0.43
1:C:36:TYR:HB3	1:C:40:TRP:CZ3	2.54	0.43
1:C:375:TYR:HB3	1:C:376:TRP:H	1.65	0.43
1:B:153:MSE:SE	1:B:283:LEU:HD11	2.69	0.43
1:C:100:LEU:HD12	1:C:233:LYS:HG2	2.00	0.43
1:D:182:ASP:OD2	3:D:503:SER:HA	2.19	0.43
1:B:149:TRP:CE3	1:B:275:ARG:HG3	2.54	0.43
1:D:304:ALA:HB1	1:D:323:GLN:HG2	2.01	0.43
1:B:63:LEU:HD23	1:B:63:LEU:HA	1.79	0.42
1:C:124:GLN:O	1:C:128:GLU:HG3	2.19	0.42
1:C:344:LEU:HD11	1:C:360:ILE:HG12	2.00	0.42
1:B:42:TRP:HB2	1:B:118:VAL:HG21	2.01	0.42
1:C:75:MSE:CE	1:C:114:THR:HB	2.46	0.42
1:D:19:LEU:HD11	1:D:433:GLN:HA	2.02	0.42
1:D:38:HIS:HE1	1:D:85:VAL:HB	1.85	0.42
1:A:298:THR:HG21	1:A:332:LEU:HD21	2.01	0.42
1:A:368[A]:ARG:HG3	4:A:748:HOH:O	2.20	0.42
1:B:182:ASP:OD2	3:B:507:SER:HA	2.19	0.42
1:B:373:ARG:NH1	4:B:615:HOH:O	2.37	0.42
1:C:315:TRP:CG	2:C:504:GOL:H31	2.54	0.42
1:D:60:VAL:HG13	1:D:144:PHE:CD1	2.55	0.42
1:B:33:PRO:HD3	1:B:433:GLN:O	2.20	0.42
1:B:102:ASP:OD1	1:B:236:ARG:NH2	2.50	0.41
1:C:21:ARG:HA	1:C:21:ARG:HD2	1.88	0.41
1:C:187:TRP:CZ3	1:C:250:VAL:HG11	2.54	0.41
1:B:324:PHE:HB3	1:B:327:LEU:HD12	2.02	0.41
1:C:228:LEU:O	1:C:232[A]:MSE:HG2	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:128:GLU:O	1:D:132:THR:HG23	2.21	0.41
1:D:365:PRO:HA	1:D:370:PHE:CD1	2.55	0.41
1:B:71:TRP:CD1	1:B:105:PRO:HD3	2.56	0.41
1:C:233:LYS:HG3	1:C:237:TYR:OH	2.20	0.41
1:C:348:ARG:HG2	1:C:366[B]:VAL:HG21	2.02	0.41
1:D:42:TRP:HB2	1:D:118:VAL:HG21	2.02	0.41
1:D:153:MSE:SE	1:D:283:LEU:HD11	2.71	0.41
1:D:253:VAL:HG12	1:D:307:ASP:OD1	2.20	0.41
1:D:253:VAL:HG21	1:D:305:ALA:HB1	2.03	0.41
1:B:145:LEU:HD23	1:B:145:LEU:HA	1.85	0.41
1:B:187:TRP:CZ3	1:B:250:VAL:HG11	2.56	0.41
1:D:153:MSE:SE	1:D:279:ASP:HB3	2.71	0.41
1:C:402:ARG:CZ	2:C:501:GOL:H2	2.51	0.40
1:A:390:TRP:HD1	2:A:504:GOL:H2	1.86	0.40
1:A:444:TRP:HE1	2:A:504:GOL:H31	1.87	0.40
1:A:375:TYR:HB3	1:A:376:TRP:H	1.72	0.40
1:B:375:TYR:HD1	1:B:375:TYR:HA	1.76	0.40
1:B:199:LEU:HD12	1:B:200:PRO:HD2	2.04	0.40
1:C:446[A]:GLY:O	1:D:8:THR:HG21	2.21	0.40
1:B:442:LEU:O	1:B:446[B]:GLY:N	2.46	0.40
1:D:232[A]:MSE:HE2	1:D:237:TYR:CD1	2.57	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)
4:B:914:HOH:O	4:D:765:HOH:O[2_646]	2.10	0.10

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	450/448 (100%)	434 (96%)	16 (4%)	0	100	100
1	B	448/448 (100%)	431 (96%)	17 (4%)	0	100	100
1	C	444/448 (99%)	422 (95%)	22 (5%)	0	100	100
1	D	444/448 (99%)	422 (95%)	22 (5%)	0	100	100
All	All	1786/1792 (100%)	1709 (96%)	77 (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	372/356 (104%)	363 (98%)	9 (2%)	49	42
1	B	370/356 (104%)	357 (96%)	13 (4%)	36	29
1	C	366/356 (103%)	357 (98%)	9 (2%)	47	40
1	D	366/356 (103%)	355 (97%)	11 (3%)	41	34
All	All	1474/1424 (104%)	1432 (97%)	42 (3%)	43	37

All (42) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	42	TRP
1	A	43	ASP
1	A	99	THR
1	A	229	LEU
1	A	235	VAL
1	A	281	LYS
1	A	375	TYR
1	A	422	GLU
1	A	436	TRP
1	B	42	TRP
1	B	43	ASP
1	B	99	THR
1	B	157	ARG

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Mol	Chain	Res	Type
1	B	165	ARG
1	B	226	LEU
1	B	255	PHE
1	B	256	SER
1	B	335[A]	ASP
1	B	335[B]	ASP
1	B	375	TYR
1	B	422	GLU
1	B	436	TRP
1	C	42	TRP
1	C	85	VAL
1	C	135	ARG
1	C	240	GLU
1	C	310	VAL
1	C	342	LYS
1	C	375	TYR
1	C	422	GLU
1	C	436	TRP
1	D	42	TRP
1	D	78	HIS
1	D	86	ASP
1	D	111	SER
1	D	219	ASP
1	D	255	PHE
1	D	264	GLN
1	D	301[A]	ARG
1	D	301[B]	ARG
1	D	375	TYR
1	D	436	TRP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

4 non-standard protein/DNA/RNA residues 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	$\#\|Z\| > 2$
1	2CO	D	162	1	3,7,8	0.72	0	1,7,9	0.70	0
1	2CO	A	162	1	3,7,8	0.86	0	1,7,9	0.81	0
1	2CO	C	162	1	3,7,8	0.85	0	1,7,9	0.06	0
1	2CO	B	162	1	3,7,8	0.67	0	1,7,9	0.79	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
1	2CO	D	162	1	-	0/1/6/8	-
1	2CO	A	162	1	-	0/1/6/8	-
1	2CO	C	162	1	-	0/1/6/8	-
1	2CO	B	162	1	-	0/1/6/8	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	C	162	2CO	1	0

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

20 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	GOL	B	503	-	5,5,5	0.36	0	5,5,5	0.27	0
2	GOL	B	504	-	5,5,5	0.45	0	5,5,5	0.33	0
2	GOL	D	501	-	5,5,5	0.46	0	5,5,5	0.41	0
2	GOL	A	501	-	5,5,5	0.57	0	5,5,5	0.91	0
3	SER	D	503	-	5,6,6	0.97	1 (20%)	5,7,7	1.33	2 (40%)
2	GOL	B	502	-	5,5,5	0.36	0	5,5,5	0.55	0
2	GOL	C	501	-	5,5,5	0.47	0	5,5,5	1.16	0
2	GOL	B	505	-	5,5,5	0.35	0	5,5,5	0.44	0
3	SER	A	505	-	5,6,6	1.11	1 (20%)	5,7,7	1.16	0
2	GOL	C	504	-	5,5,5	0.35	0	5,5,5	0.29	0
2	GOL	D	502	-	5,5,5	0.32	0	5,5,5	0.61	0
2	GOL	C	503	-	5,5,5	0.52	0	5,5,5	0.57	0
2	GOL	A	502	-	5,5,5	0.44	0	5,5,5	0.37	0
2	GOL	A	503	-	5,5,5	0.31	0	5,5,5	0.40	0
3	SER	C	505	-	5,6,6	1.03	1 (20%)	5,7,7	1.66	2 (40%)
2	GOL	A	504	-	5,5,5	0.64	0	5,5,5	0.51	0
2	GOL	B	506	-	5,5,5	0.31	0	5,5,5	1.04	0
2	GOL	C	502	-	5,5,5	0.47	0	5,5,5	0.65	0
3	SER	B	507	-	5,6,6	1.11	1 (20%)	5,7,7	1.70	2 (40%)
2	GOL	B	501	-	5,5,5	0.60	0	5,5,5	0.44	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	GOL	B	503	-	-	0/4/4/4	-
2	GOL	B	504	-	-	2/4/4/4	-
2	GOL	D	501	-	-	0/4/4/4	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	GOL	A	501	-	-	2/4/4/4	-
3	SER	D	503	-	-	3/6/6/6	-
2	GOL	B	502	-	-	1/4/4/4	-
2	GOL	C	501	-	-	0/4/4/4	-
2	GOL	B	505	-	-	2/4/4/4	-
3	SER	A	505	-	-	4/6/6/6	-
2	GOL	C	504	-	-	4/4/4/4	-
2	GOL	D	502	-	-	4/4/4/4	-
2	GOL	C	503	-	-	3/4/4/4	-
2	GOL	A	502	-	-	2/4/4/4	-
2	GOL	A	503	-	-	1/4/4/4	-
3	SER	C	505	-	-	3/6/6/6	-
2	GOL	A	504	-	-	2/4/4/4	-
2	GOL	B	506	-	-	4/4/4/4	-
2	GOL	C	502	-	-	0/4/4/4	-
3	SER	B	507	-	-	4/6/6/6	-
2	GOL	B	501	-	-	0/4/4/4	-

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	507	SER	OXT-C	-2.38	1.22	1.30
3	A	505	SER	OXT-C	-2.27	1.23	1.30
3	C	505	SER	OXT-C	-2.16	1.23	1.30
3	D	503	SER	OXT-C	-2.06	1.23	1.30

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	C	505	SER	OXT-C-O	-2.87	117.57	124.09
3	B	507	SER	OXT-C-CA	2.67	122.47	113.38
3	B	507	SER	OXT-C-O	-2.44	118.55	124.09
3	C	505	SER	OXT-C-CA	2.30	121.21	113.38
3	D	503	SER	OXT-C-O	-2.10	119.32	124.09
3	D	503	SER	OXT-C-CA	2.03	120.29	113.38

There are no chirality outliers.

All (41) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	502	GOL	O1-C1-C2-C3
2	A	504	GOL	O1-C1-C2-O2
2	A	504	GOL	O1-C1-C2-C3
2	B	504	GOL	O1-C1-C2-C3
2	B	505	GOL	C1-C2-C3-O3
2	B	506	GOL	O1-C1-C2-C3
2	C	504	GOL	O1-C1-C2-O2
2	C	504	GOL	O1-C1-C2-C3
2	C	504	GOL	C1-C2-C3-O3
2	D	502	GOL	O1-C1-C2-C3
2	D	502	GOL	C1-C2-C3-O3
3	A	505	SER	O-C-CA-CB
3	A	505	SER	OXT-C-CA-CB
3	B	507	SER	O-C-CA-CB
3	B	507	SER	OXT-C-CA-CB
3	D	503	SER	O-C-CA-CB
3	D	503	SER	OXT-C-CA-CB
2	A	501	GOL	O1-C1-C2-C3
2	A	503	GOL	C1-C2-C3-O3
2	B	506	GOL	C1-C2-C3-O3
2	B	505	GOL	O2-C2-C3-O3
2	D	502	GOL	O1-C1-C2-O2
3	A	505	SER	OXT-C-CA-N
3	B	507	SER	OXT-C-CA-N
2	A	502	GOL	O1-C1-C2-O2
2	B	504	GOL	O1-C1-C2-O2
2	B	506	GOL	O1-C1-C2-O2
2	C	503	GOL	O2-C2-C3-O3
2	C	504	GOL	O2-C2-C3-O3
2	A	501	GOL	C1-C2-C3-O3
3	C	505	SER	C-CA-CB-OG
3	D	503	SER	C-CA-CB-OG
2	C	503	GOL	O1-C1-C2-O2
2	D	502	GOL	O2-C2-C3-O3
3	A	505	SER	O-C-CA-N
3	B	507	SER	O-C-CA-N
3	C	505	SER	O-C-CA-CB
3	C	505	SER	OXT-C-CA-CB
2	C	503	GOL	C1-C2-C3-O3
2	B	502	GOL	C1-C2-C3-O3
2	B	506	GOL	O2-C2-C3-O3

There are no ring outliers.

16 monomers are involved in 26 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	503	GOL	2	0
2	B	504	GOL	2	0
2	D	501	GOL	1	0
2	A	501	GOL	1	0
3	D	503	SER	2	0
2	C	501	GOL	2	0
3	A	505	SER	2	0
2	C	504	GOL	1	0
2	D	502	GOL	4	0
2	C	503	GOL	2	0
3	C	505	SER	1	0
2	A	504	GOL	5	0
2	B	506	GOL	1	0
2	C	502	GOL	1	0
3	B	507	SER	2	0
2	B	501	GOL	1	0

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	434/448 (96%)	0.04	4 (0%)	84	86	17, 28, 47, 78	0
1	B	433/448 (96%)	0.14	6 (1%)	75	78	17, 29, 46, 77	0
1	C	435/448 (97%)	0.22	14 (3%)	47	52	19, 35, 54, 94	0
1	D	433/448 (96%)	0.55	34 (7%)	12	13	22, 41, 68, 93	0
All	All	1735/1792 (96%)	0.24	58 (3%)	46	50	17, 32, 59, 94	0

All (58) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	199	LEU	6.0
1	A	446[A]	GLY	5.4
1	B	446[A]	GLY	5.2
1	D	93	ALA	4.4
1	D	85	VAL	4.3
1	C	198	LYS	3.9
1	C	446[A]	GLY	3.6
1	D	446[A]	GLY	3.6
1	D	222	TYR	3.6
1	B	347	PRO	3.3
1	D	218	SER	3.2
1	D	100	LEU	3.2
1	D	195	VAL	3.2
1	D	198	LYS	3.2
1	C	197	GLY	3.1
1	D	211	THR	3.1
1	B	83	ASN	3.1
1	D	197	GLY	3.0
1	C	85	VAL	2.8
1	D	209	ILE	2.8
1	C	201	GLU	2.7

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Mol	Chain	Res	Type	RSRZ
1	D	227	TRP	2.7
1	D	240	GLU	2.7
1	D	203	GLN	2.7
1	C	195	VAL	2.7
1	C	84	GLY	2.7
1	D	425	THR	2.6
1	D	229	LEU	2.6
1	D	235	VAL	2.6
1	D	99	THR	2.6
1	C	277	HIS	2.6
1	B	445[A]	LEU	2.6
1	D	445[A]	LEU	2.5
1	B	124[A]	GLN	2.4
1	D	201	GLU	2.4
1	B	265	VAL	2.4
1	D	84	GLY	2.4
1	D	89	PHE	2.4
1	D	133[A]	ARG	2.3
1	D	241	ARG	2.2
1	C	227	TRP	2.2
1	D	96	ALA	2.2
1	C	86	ASP	2.2
1	A	42	TRP	2.2
1	D	314	LYS	2.2
1	C	310	VAL	2.1
1	D	106	ARG	2.1
1	A	134	GLY	2.1
1	D	42	TRP	2.1
1	D	53	PRO	2.1
1	C	243	PRO	2.1
1	C	3	HIS	2.1
1	D	202	TYR	2.1
1	D	213	PRO	2.0
1	D	317	VAL	2.0
1	A	203	GLN	2.0
1	C	240	GLU	2.0
1	D	234	ALA	2.0

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

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum,

median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
1	2CO	D	162	8/9	0.91	0.10	44,49,64,66	0
1	2CO	C	162	8/9	0.92	0.14	30,39,51,55	0
1	2CO	B	162	8/9	0.94	0.10	21,28,53,55	0
1	2CO	A	162	8/9	0.96	0.09	23,29,43,52	0

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	GOL	B	506	6/6	0.65	0.28	35,39,42,49	0
2	GOL	C	504	6/6	0.74	0.23	66,70,72,74	0
2	GOL	B	504	6/6	0.77	0.18	43,45,52,52	0
2	GOL	B	503	6/6	0.78	0.19	63,67,71,73	0
2	GOL	B	505	6/6	0.78	0.22	50,68,76,82	0
2	GOL	A	503	6/6	0.79	0.25	60,68,73,74	0
2	GOL	C	503	6/6	0.80	0.21	32,49,54,58	0
2	GOL	D	502	6/6	0.83	0.24	28,44,48,54	0
2	GOL	D	501	6/6	0.85	0.16	36,40,45,49	0
2	GOL	A	501	6/6	0.85	0.17	19,21,27,27	0
3	SER	B	507	7/7	0.85	0.17	31,37,42,44	0
2	GOL	B	502	6/6	0.86	0.23	35,40,43,44	0
2	GOL	A	504	6/6	0.86	0.20	35,40,46,49	0
3	SER	C	505	7/7	0.88	0.18	33,42,48,52	0
2	GOL	C	501	6/6	0.90	0.16	30,34,36,36	0
3	SER	D	503	7/7	0.92	0.17	43,46,51,52	0
2	GOL	B	501	6/6	0.93	0.12	13,21,25,27	0
2	GOL	C	502	6/6	0.93	0.12	26,28,34,39	0
3	SER	A	505	7/7	0.93	0.17	24,31,39,40	0
2	GOL	A	502	6/6	0.94	0.16	45,49,53,56	0

6.5 Other polymers (i)

There are no such residues in this entry.