Full wwPDB X-ray Structure Validation Report (i)

Dec 4, 2023 – 04:53 pm GMT

PDB ID	:	2W66
Title	:	BtGH84 in complex with HQ602
Authors	:	He, Y.; Davies, G.J.
Deposited on	:	2008-12-17
Resolution	:	2.27 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:

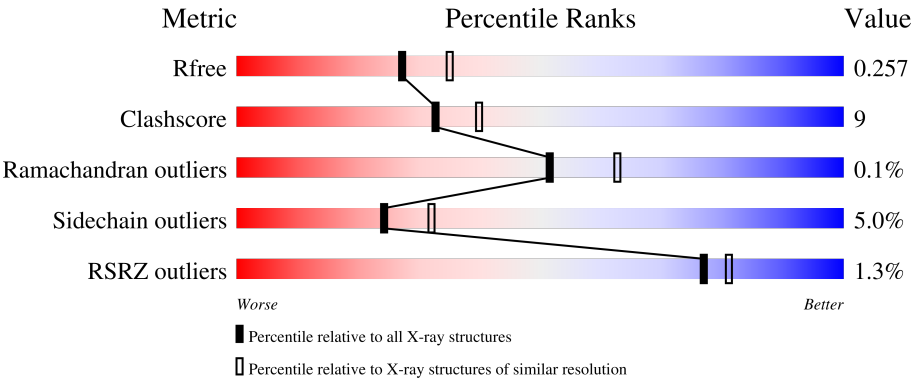
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 2.27 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	6980 (2.30-2.26)
Clashscore	141614	7711 (2.30-2.26)
Ramachandran outliers	138981	7597 (2.30-2.26)
Sidechain outliers	138945	7598 (2.30-2.26)
RSRZ outliers	127900	6849 (2.30-2.26)

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	716	2% 70% 18% • 10%
1	B	716	73% 16% • 9%

2 Entry composition

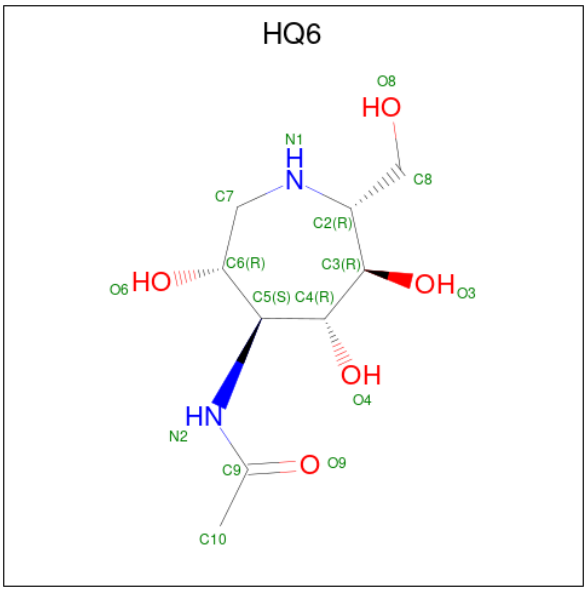
There are 5 unique types of molecules in this entry. The entry contains 11119 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 O-GLCNACASE BT_4395.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	647	Total	C	N	O	S	0	2	0
			5259	3374	886	981	18			
1	B	648	Total	C	N	O	S	0	1	0
			5264	3375	888	983	18			

- Molecule 2 is N-[(3R,4S,5R,6R,7R)-3,5,6-trihydroxy-7-(hydroxymethyl)azepan-4-yl]acetamide (three-letter code: HQ6) (formula: $C_9H_{18}N_2O_5$).

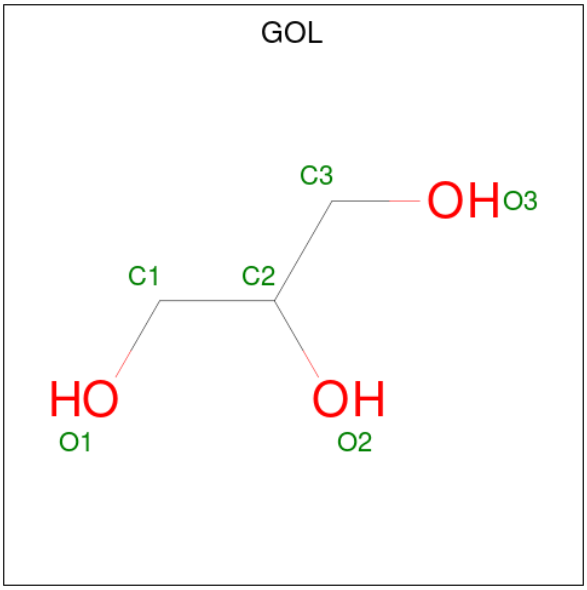


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			16	9	2	5		
2	B	1	Total	C	N	O	0	0
			16	9	2	5		

- Molecule 3 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total Ca 1 1	0	0
3	B	1	Total Ca 1 1	0	0

- Molecule 4 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



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

- Molecule 5 is water.

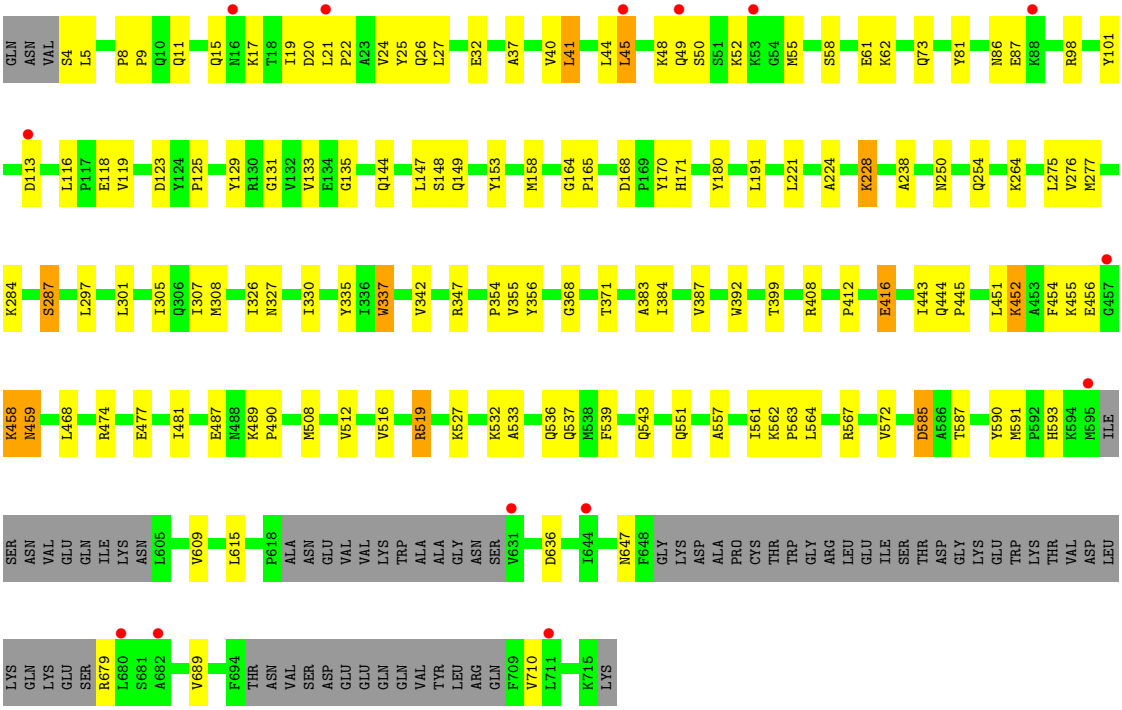
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	262	Total O 262 262	0	0
5	B	288	Total O 288 288	0	0

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.

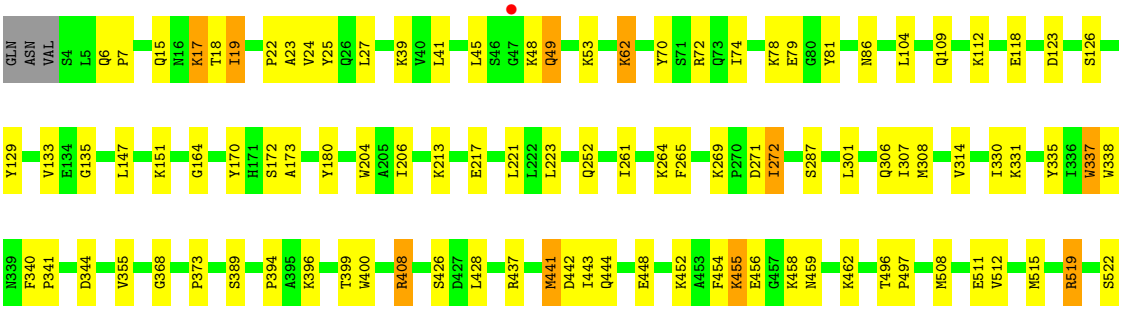
• Molecule 1: O-GLCNACASE BT_4395

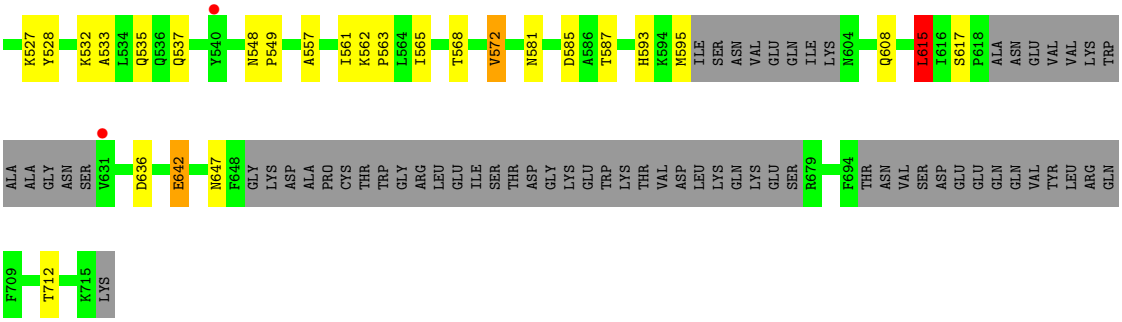
Chain A:



• Molecule 1: O-GLCNACASE BT_4395

Chain B:




K527 Y528 K532 A533 L534 Q535 Q536 Q537 Y540 N548 P549 A557 I561 K562 P563 L564 I565 T568 V572 N581 D585 A586 T587 H593 K594 M595 ILE SER ASN VAL GLU GLN ILE LYS N604 Q608 L615 I616 S617 P618 ALA ASN GLU VAL VAL LYS TRP
ALA ALA GLY ASN SER V631 D636 E642 N647 F648 GLY LYS ASP ALA PRO CYS THR TRP GLY ARG LEU GLU ILE SER THR ASP GLY LYS GLU TRP LYS THR VAL ASP LEU LYS GLN LYS GLU SER R679 F694 THR ASN VAL SER ASP GLU GLU GLN GLN VAL TYR LEU ARG GLN
F709 T712 K715 LYS

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	51.20Å 93.47Å 99.01Å 104.16° 94.01° 103.02°	Depositor
Resolution (Å)	95.35 – 2.27 95.16 – 2.27	Depositor EDS
% Data completeness (in resolution range)	95.9 (95.35-2.27) 95.9 (95.16-2.27)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.67 (at 2.27Å)	Xtriage
Refinement program	REFMAC 5.4.0077	Depositor
R, R_{free}	0.188 , 0.236 0.211 , 0.257	Depositor DCC
R_{free} test set	3781 reflections (4.96%)	wwPDB-VP
Wilson B-factor (Å^2)	28.4	Xtriage
Anisotropy	0.052	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.37 , 40.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	11119	wwPDB-VP
Average B, all atoms (Å^2)	10.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.25% 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: HQ6, GOL, CA

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	0.72	1/5397 (0.0%)	0.75	1/7312 (0.0%)
1	B	0.74	0/5396	0.78	1/7311 (0.0%)
All	All	0.73	1/10793 (0.0%)	0.77	2/14623 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	287	SER	CB-OG	-5.01	1.35	1.42

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	98	ARG	NE-CZ-NH1	-5.13	117.74	120.30
1	B	615	LEU	CA-CB-CG	5.01	126.82	115.30

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	5259	0	5179	105	0
1	B	5264	0	5176	77	0
2	A	16	0	18	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	16	0	18	4	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	B	12	0	16	1	0
5	A	262	0	0	8	0
5	B	288	0	0	5	0
All	All	11119	0	10407	183	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 9.

All (183) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:22:PRO:HG3	1:A:55:MET:SD	2.07	0.93
1:A:593:HIS:HD2	1:A:636:ASP:H	1.16	0.92
1:A:19:ILE:HD12	1:A:20:ASP:O	1.70	0.92
1:A:19:ILE:HG13	1:A:19:ILE:O	1.82	0.80
1:B:337:TRP:CD2	2:B:1716:HQ6:H103	2.18	0.79
1:A:4:SER:HA	5:A:2001:HOH:O	1.84	0.78
1:B:337:TRP:CE2	2:B:1716:HQ6:H103	2.24	0.72
1:B:508:MET:O	1:B:512:VAL:HG23	1.90	0.72
1:A:593:HIS:CD2	1:A:636:ASP:H	2.06	0.72
1:B:408:ARG:HD2	5:B:2191:HOH:O	1.89	0.71
1:A:22:PRO:CG	1:A:55:MET:SD	2.79	0.71
1:A:508:MET:O	1:A:512:VAL:HG23	1.90	0.71
1:B:308:MET:HA	1:B:335:TYR:O	1.91	0.71
1:A:615:LEU:HB3	1:A:710:VAL:HG22	1.75	0.69
1:B:527:LYS:HA	1:B:527:LYS:HE2	1.75	0.68
1:B:23:ALA:HA	1:B:48:LYS:HD2	1.77	0.65
1:A:452:LYS:HB3	1:A:452:LYS:NZ	2.11	0.65
1:B:6:GLN:H	1:B:109:GLN:HE22	1.45	0.65
1:B:593:HIS:HD2	1:B:636:ASP:H	1.42	0.65
1:B:217:GLU:O	1:B:221:LEU:HD23	1.97	0.64
1:A:337:TRP:CD2	2:A:1716:HQ6:H103	2.33	0.64
1:B:585:ASP:OD1	1:B:587:THR:HG23	1.98	0.64
1:B:6:GLN:NE2	1:B:389:SER:OG	2.30	0.64
1:A:41:LEU:HD12	1:A:41:LEU:O	1.98	0.63
1:A:355:VAL:O	1:A:399:THR:HG23	1.98	0.63
1:B:355:VAL:O	1:B:399:THR:HG23	1.99	0.62
1:B:533:ALA:O	1:B:537:GLN:HG3	2.01	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:170:TYR:HB2	1:B:180:TYR:CE1	2.36	0.60
1:A:308:MET:HA	1:A:335:TYR:O	2.02	0.60
1:B:72:ARG:HB2	5:B:2028:HOH:O	2.02	0.59
1:B:78:LYS:O	1:B:79:GLU:HB2	2.02	0.59
1:A:354:PRO:HB2	1:A:399:THR:HG22	1.84	0.58
1:B:454:PHE:CZ	1:B:572:VAL:HG13	2.39	0.58
1:B:301:LEU:HD12	1:B:307:ILE:HD11	1.85	0.58
1:A:452:LYS:HB3	1:A:452:LYS:HZ2	1.67	0.56
1:A:165:PRO:HG2	1:A:168:ASP:HB2	1.87	0.56
1:A:148:SER:HB3	5:A:2162:HOH:O	2.05	0.56
1:A:562:LYS:HE3	5:A:2246:HOH:O	2.06	0.55
1:A:689:VAL:HG13	1:A:689:VAL:O	2.07	0.54
1:A:527:LYS:HE2	1:A:527:LYS:HA	1.90	0.54
1:A:4:SER:CA	5:A:2001:HOH:O	2.51	0.54
1:B:454:PHE:HZ	1:B:572:VAL:CG1	2.20	0.54
1:A:454:PHE:HZ	1:A:572:VAL:HG12	1.73	0.54
1:B:70:TYR:O	1:B:74:ILE:HG13	2.07	0.54
2:B:1716:HQ6:H71C	2:B:1716:HQ6:O9	2.06	0.54
1:A:557:ALA:HB1	1:A:561:ILE:HB	1.90	0.54
1:A:615:LEU:CB	1:A:710:VAL:HG22	2.38	0.54
1:A:26:GLN:OE1	1:A:52:LYS:HD2	2.08	0.53
1:A:585:ASP:OD1	1:A:587:THR:HG23	2.08	0.53
1:B:81:TYR:CE2	1:B:123:ASP:HB3	2.44	0.53
1:A:133:VAL:HG13	1:A:133:VAL:O	2.08	0.53
1:A:86:ASN:HB2	1:A:87:GLU:OE1	2.09	0.53
1:A:536:GLN:HG2	1:A:590:TYR:CD1	2.43	0.53
1:A:25:TYR:HE1	1:A:48:LYS:HB2	1.73	0.53
1:A:170:TYR:HB2	1:A:180:TYR:CE1	2.44	0.53
1:A:456:GLU:OE1	1:A:458:LYS:HD3	2.09	0.52
1:A:26:GLN:OE1	1:A:52:LYS:CD	2.58	0.52
1:A:477:GLU:O	1:A:481:ILE:HG13	2.09	0.51
1:B:454:PHE:HZ	1:B:572:VAL:HG13	1.72	0.51
1:A:444:GLN:HB3	1:A:445:PRO:HD3	1.92	0.51
1:A:543:GLN:OE1	1:A:609:VAL:HG12	2.10	0.51
1:B:17:LYS:HD2	1:B:118:GLU:OE1	2.11	0.51
1:B:568:THR:O	1:B:572:VAL:HG22	2.11	0.50
1:B:41:LEU:HB2	1:B:104:LEU:HD11	1.93	0.50
1:B:269:LYS:HB2	1:B:272:ILE:HG13	1.94	0.50
1:A:459:ASN:OD1	1:A:459:ASN:N	2.38	0.50
1:B:45:LEU:O	1:B:48:LYS:HB2	2.12	0.50
1:A:19:ILE:CD1	1:A:20:ASP:O	2.53	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:133:VAL:O	1:B:133:VAL:HG13	2.13	0.48
1:A:468:LEU:HD13	1:A:564:LEU:HD21	1.95	0.48
1:A:17:LYS:HD3	1:A:118:GLU:OE1	2.13	0.48
1:B:172:SER:OG	1:B:173:ALA:N	2.45	0.48
1:B:223:LEU:HD11	1:B:265:PHE:HB2	1.95	0.48
1:A:444:GLN:N	1:A:445:PRO:CD	2.77	0.47
1:B:22:PRO:HB2	1:B:25:TYR:HB3	1.96	0.47
1:B:147:LEU:O	1:B:151:LYS:HE3	2.14	0.47
1:A:532:LYS:HA	1:A:532:LYS:HD2	1.62	0.47
1:B:496:THR:O	1:B:497:PRO:C	2.52	0.47
1:A:516:VAL:HG22	1:A:572:VAL:HG11	1.94	0.47
1:B:338:TRP:CH2	1:B:355:VAL:HG13	2.49	0.47
1:B:39:LYS:HD2	5:B:2030:HOH:O	2.14	0.47
1:B:25:TYR:CD2	1:B:25:TYR:C	2.87	0.47
1:A:354:PRO:HB2	1:A:399:THR:CG2	2.44	0.47
1:A:297:LEU:O	1:A:301:LEU:HB2	2.15	0.47
1:B:24:VAL:HG22	1:B:49:GLN:HB2	1.96	0.47
1:B:261:ILE:O	1:B:265:PHE:HB3	2.15	0.46
1:B:562:LYS:HB3	1:B:563:PRO:HD3	1.97	0.46
1:A:144:GLN:HG2	5:A:2048:HOH:O	2.15	0.46
1:A:228:LYS:HB3	1:A:228:LYS:HE2	1.72	0.46
1:A:25:TYR:CE2	1:A:50:SER:HB3	2.50	0.46
1:A:131:GLY:HA2	1:A:158:MET:HG2	1.98	0.46
1:B:511:GLU:O	1:B:515:MET:HG3	2.16	0.46
1:B:519:ARG:H	1:B:519:ARG:HG2	1.41	0.46
1:A:168:ASP:HB3	1:A:171:HIS:HB3	1.96	0.46
1:A:277:MET:HG2	1:A:301:LEU:HD11	1.98	0.46
1:A:536:GLN:HG2	1:A:590:TYR:CG	2.50	0.46
1:A:15:GLN:OE1	1:A:15:GLN:HA	2.16	0.45
1:A:125:PRO:HB3	1:A:392:TRP:CE3	2.51	0.45
1:B:548:ASN:HB2	1:B:549:PRO:HD2	1.96	0.45
1:A:238:ALA:HA	1:A:276:VAL:O	2.16	0.45
1:A:412:PRO:HD2	1:A:487:GLU:OE1	2.17	0.45
1:B:204:TRP:CZ3	1:B:206:ILE:HB	2.51	0.45
1:B:557:ALA:HB1	1:B:561:ILE:HB	1.98	0.45
1:A:41:LEU:HD11	1:A:45:LEU:HD21	1.97	0.45
1:A:41:LEU:HD11	1:A:45:LEU:CD2	2.46	0.45
1:A:451:LEU:HD21	1:A:567:ARG:HD3	1.99	0.45
1:B:562:LYS:HB3	5:B:2265:HOH:O	2.17	0.45
1:A:326:ILE:HG23	1:A:327:ASN:H	1.80	0.45
1:A:519:ARG:H	1:A:519:ARG:HG2	1.26	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:135:GLY:HA2	1:B:164:GLY:O	2.16	0.45
1:B:86:ASN:HA	1:B:118:GLU:HG3	1.98	0.45
1:B:341:PRO:HD2	1:B:373:PRO:HA	1.98	0.45
1:B:426[B]:SER:O	1:B:437:ARG:HB2	2.17	0.45
1:A:149:GLN:HE22	1:A:384:ILE:HD13	1.82	0.45
1:A:41:LEU:CD1	1:A:45:LEU:HD22	2.46	0.45
1:A:539:PHE:O	1:A:543:GLN:HG2	2.17	0.44
1:A:562:LYS:HB3	1:A:563:PRO:HD3	2.00	0.44
1:B:62:LYS:HG3	1:B:62:LYS:O	2.16	0.44
1:A:135:GLY:HA2	1:A:164:GLY:O	2.18	0.44
1:A:489:LYS:N	1:A:490:PRO:CD	2.80	0.44
1:B:428:LEU:HD12	1:B:428:LEU:N	2.33	0.44
1:B:452:LYS:O	1:B:455:LYS:HG3	2.18	0.44
1:A:250:ASN:O	1:A:254:GLN:HG3	2.17	0.44
1:A:416:GLU:HB3	1:A:474:ARG:HH21	1.82	0.44
1:A:81:TYR:CE2	1:A:123:ASP:HB3	2.53	0.44
1:A:81:TYR:CZ	1:A:123:ASP:HB3	2.52	0.43
1:A:679:ARG:N	5:A:2259:HOH:O	2.51	0.43
1:B:515:MET:HG2	1:B:527:LYS:HB2	2.00	0.43
1:A:37:ALA:HB2	1:A:101:TYR:HA	1.99	0.43
1:A:40:VAL:O	1:A:44:LEU:HG	2.18	0.43
1:A:533:ALA:O	1:A:537:GLN:HG3	2.18	0.43
1:A:8:PRO:HA	1:A:9:PRO:HD3	1.89	0.43
1:A:224:ALA:O	1:A:228:LYS:HG2	2.18	0.43
1:A:527:LYS:HE2	1:A:527:LYS:CA	2.47	0.43
1:A:149:GLN:HB3	1:A:153:TYR:CZ	2.53	0.43
1:A:326:ILE:HG23	1:A:327:ASN:N	2.34	0.43
1:A:21:LEU:HD23	1:A:48:LYS:HE3	2.00	0.43
1:A:456:GLU:C	1:A:458:LYS:H	2.21	0.43
1:B:454:PHE:C	1:B:456:GLU:H	2.23	0.43
1:A:591:MET:HG3	1:A:593:HIS:O	2.18	0.42
1:B:330:ILE:O	1:B:331:LYS:HB2	2.19	0.42
1:A:21:LEU:HD12	1:A:22:PRO:HD2	2.02	0.42
1:A:519:ARG:NE	5:A:2222:HOH:O	2.48	0.42
1:B:443:ILE:C	1:B:443:ILE:HD12	2.39	0.42
1:B:512:VAL:HG21	1:B:565:ILE:HG23	2.01	0.42
1:A:15:GLN:C	1:A:17:LYS:H	2.21	0.42
1:A:147:LEU:HD23	1:A:191:LEU:HD23	2.01	0.42
1:A:562:LYS:CE	5:A:2246:HOH:O	2.67	0.42
1:B:126:SER:HB2	1:B:394:PRO:HD2	2.02	0.42
1:A:21:LEU:HD23	1:A:48:LYS:CE	2.50	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:527:LYS:HE2	1:B:527:LYS:CA	2.46	0.42
1:A:61:GLU:O	1:A:62:LYS:C	2.57	0.42
1:B:340:PHE:CG	1:B:341:PRO:HA	2.55	0.42
1:B:396:LYS:HD3	1:B:396:LYS:HA	1.81	0.42
1:B:400:TRP:CH2	1:B:441:MET:HE1	2.55	0.42
1:A:45:LEU:O	1:A:48:LYS:HG2	2.20	0.42
1:A:347:ARG:HG3	1:A:551:GLN:OE1	2.20	0.42
1:A:356:TYR:HB3	1:A:399:THR:HG21	2.02	0.42
1:B:271:ASP:N	1:B:271:ASP:OD1	2.52	0.42
1:A:15:GLN:O	1:A:17:LYS:N	2.46	0.41
1:A:147:LEU:CD2	1:A:191:LEU:HD23	2.50	0.41
1:A:383:ALA:O	1:A:387:VAL:HG23	2.20	0.41
1:B:86:ASN:HB2	5:B:2036:HOH:O	2.19	0.41
1:B:129:TYR:O	1:B:368:GLY:HA2	2.19	0.41
1:B:528:TYR:O	1:B:532:LYS:HG2	2.20	0.41
1:B:19:ILE:O	1:B:19:ILE:HG13	2.16	0.41
1:A:275:LEU:HD23	1:A:305:ILE:HG12	2.02	0.41
1:B:459:ASN:HD22	1:B:459:ASN:HA	1.71	0.41
1:B:462:LYS:HE2	1:B:462:LYS:HB3	1.73	0.41
1:B:642:GLU:HB2	1:B:712:THR:O	2.19	0.41
1:A:19:ILE:HD11	1:A:116:LEU:HD12	2.01	0.41
1:B:6:GLN:HA	1:B:7:PRO:HA	1.91	0.41
1:A:129:TYR:O	1:A:368:GLY:HA2	2.20	0.41
1:A:307:ILE:HD12	1:A:330:ILE:HB	2.03	0.41
1:B:314:VAL:HG13	2:B:1716:HQ6:H72C	2.01	0.41
1:A:443:ILE:C	1:A:443:ILE:HD12	2.41	0.41
1:B:608:GLN:HB2	1:B:615:LEU:HD22	2.01	0.41
1:B:508:MET:HE1	1:B:535:GLN:HG2	2.02	0.41
1:B:344:ASP:O	4:B:1718:GOL:H32	2.21	0.41
1:A:444:GLN:N	1:A:445:PRO:HD2	2.37	0.40
1:A:474:ARG:HH11	1:A:474:ARG:HD2	1.74	0.40
1:B:264:LYS:HA	1:B:264:LYS:HD3	1.88	0.40
1:A:284:LYS:O	1:A:287:SER:HB2	2.21	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	639/716 (89%)	605 (95%)	33 (5%)	1 (0%)	47 57
1	B	639/716 (89%)	607 (95%)	32 (5%)	0	100 100
All	All	1278/1432 (89%)	1212 (95%)	65 (5%)	1 (0%)	51 63

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	342	VAL

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	570/630 (90%)	544 (95%)	26 (5%)	27 35
1	B	570/630 (90%)	539 (95%)	31 (5%)	22 28
All	All	1140/1260 (90%)	1083 (95%)	57 (5%)	24 32

All (57) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	5	LEU
1	A	11	GLN
1	A	24	VAL
1	A	27	LEU
1	A	32	GLU

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Mol	Chain	Res	Type
1	A	41	LEU
1	A	45	LEU
1	A	49	GLN
1	A	58	SER
1	A	73	GLN
1	A	113	ASP
1	A	119	VAL
1	A	221	LEU
1	A	228	LYS
1	A	264	LYS
1	A	337	TRP
1	A	371	THR
1	A	408	ARG
1	A	416	GLU
1	A	452	LYS
1	A	455	LYS
1	A	458	LYS
1	A	459	ASN
1	A	519	ARG
1	A	585	ASP
1	A	647	ASN
1	B	15	GLN
1	B	17	LYS
1	B	18	THR
1	B	19	ILE
1	B	27	LEU
1	B	49	GLN
1	B	53	LYS
1	B	62	LYS
1	B	112	LYS
1	B	213	LYS
1	B	252	GLN
1	B	272	ILE
1	B	287	SER
1	B	306	GLN
1	B	337	TRP
1	B	408	ARG
1	B	441	MET
1	B	442	ASP
1	B	444	GLN
1	B	448	GLU
1	B	455	LYS

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Mol	Chain	Res	Type
1	B	458	LYS
1	B	519	ARG
1	B	522	SER
1	B	572	VAL
1	B	581	ASN
1	B	595	MET
1	B	615	LEU
1	B	617	SER
1	B	642	GLU
1	B	647	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (20) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	10	GLN
1	A	49	GLN
1	A	149	GLN
1	A	349	HIS
1	A	593	HIS
1	A	608	GLN
1	B	6	GLN
1	B	26	GLN
1	B	49	GLN
1	B	109	GLN
1	B	189	GLN
1	B	254	GLN
1	B	306	GLN
1	B	444	GLN
1	B	459	ASN
1	B	469	GLN
1	B	547	GLN
1	B	578	GLN
1	B	593	HIS
1	B	647	ASN

5.3.3 RNA

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)

Of 6 ligands modelled in this entry, 2 are monoatomic - leaving 4 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	HQ6	A	1716	-	13,16,16	1.32	1 (7%)	13,22,22	1.38	3 (23%)
4	GOL	B	1718	-	5,5,5	0.43	0	5,5,5	0.69	0
4	GOL	B	1717	-	5,5,5	0.42	0	5,5,5	0.50	0
2	HQ6	B	1716	-	13,16,16	1.86	5 (38%)	13,22,22	2.16	3 (23%)

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	HQ6	A	1716	-	-	0/5/27/27	0/1/1/1
4	GOL	B	1718	-	-	2/4/4/4	-
4	GOL	B	1717	-	-	4/4/4/4	-
2	HQ6	B	1716	-	-	0/5/27/27	0/1/1/1

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	1716	HQ6	C9-N2	3.29	1.45	1.34
2	A	1716	HQ6	C9-N2	3.15	1.45	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	1716	HQ6	C3-C2	3.08	1.58	1.53
2	B	1716	HQ6	C4-C5	2.91	1.57	1.53
2	B	1716	HQ6	C3-C4	2.54	1.57	1.53
2	B	1716	HQ6	C10-C9	2.29	1.55	1.50

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	1716	HQ6	C3-C4-C5	5.56	122.90	114.67
2	A	1716	HQ6	C3-C4-C5	2.98	119.08	114.67
2	B	1716	HQ6	C10-C9-N2	2.53	120.38	116.10
2	B	1716	HQ6	O9-C9-N2	-2.48	117.39	121.95
2	A	1716	HQ6	C4-C5-C6	2.30	119.25	115.38
2	A	1716	HQ6	O3-C3-C2	2.18	112.97	107.57

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	B	1717	GOL	C1-C2-C3-O3
4	B	1718	GOL	C1-C2-C3-O3
4	B	1717	GOL	O1-C1-C2-C3
4	B	1717	GOL	O2-C2-C3-O3
4	B	1718	GOL	O2-C2-C3-O3
4	B	1717	GOL	O1-C1-C2-O2

There are no ring outliers.

3 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	1716	HQ6	1	0
4	B	1718	GOL	1	0
2	B	1716	HQ6	4	0

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{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	647/716 (90%)	0.05	14 (2%) 62 68	2, 6, 33, 42	0
1	B	648/716 (90%)	-0.08	3 (0%) 91 93	2, 6, 32, 42	0
All	All	1295/1432 (90%)	-0.02	17 (1%) 77 81	2, 6, 33, 42	0

All (17) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	680	LEU	3.5
1	A	49	GLN	3.4
1	A	682	ALA	3.2
1	B	631	VAL	2.8
1	A	45	LEU	2.7
1	A	16	ASN	2.6
1	A	21	LEU	2.5
1	A	53	LYS	2.4
1	A	113	ASP	2.3
1	B	47	GLY	2.3
1	A	88	LYS	2.3
1	A	631	VAL	2.2
1	A	595	MET	2.2
1	B	540	TYR	2.1
1	A	457	GLY	2.1
1	A	644	ILE	2.1
1	A	711	LEU	2.0

6.2 Non-standard residues in protein, DNA, RNA chains

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

6.3 Carbohydrates (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
4	GOL	B	1717	6/6	0.94	0.13	31,33,33,34	0
4	GOL	B	1718	6/6	0.94	0.14	11,16,16,19	0
3	CA	A	1717	1/1	0.95	0.11	26,26,26,26	0
2	HQ6	B	1716	16/16	0.96	0.14	2,5,8,9	0
2	HQ6	A	1716	16/16	0.96	0.12	2,4,6,8	0
3	CA	B	1719	1/1	0.97	0.12	25,25,25,25	0

6.5 Other polymers (i)

There are no such residues in this entry.