Full wwPDB X-ray Structure Validation Report (i)

Dec 3, 2023 – 07:38 am GMT

PDB ID	:	1W1P
Title	:	Crystal structure of S. marcescens chitinase B in complex with the cyclic dipeptide inhibitor cyclo-(Gly-L-Pro) at 2.1 A resolution
Authors	:	Houston, D.R.; Synstad, B.; Eijsink, V.G.H.; Eggleston, I.; Van Aalten, D.M.F.
Deposited on	:	2004-06-23
Resolution	:	2.10 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:

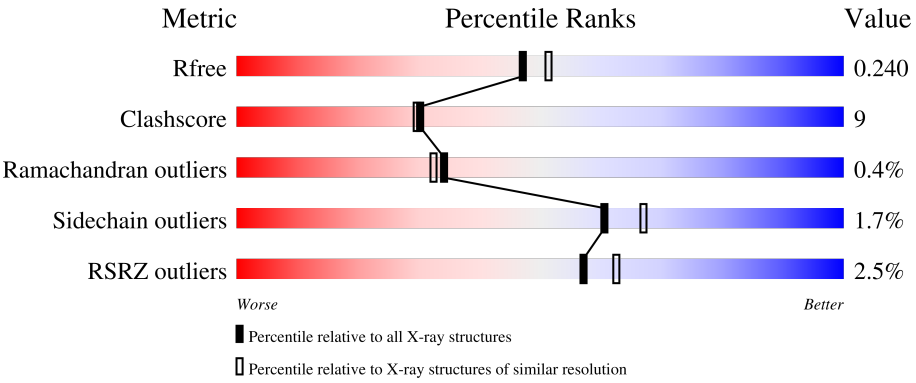
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	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 2.10 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	5197 (2.10-2.10)
Clashscore	141614	5710 (2.10-2.10)
Ramachandran outliers	138981	5647 (2.10-2.10)
Sidechain outliers	138945	5648 (2.10-2.10)
RSRZ outliers	127900	5083 (2.10-2.10)

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	499	3% 82% 18%
1	B	499	2% 84% 15%

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	1503	-	-	X	-
2	GOL	A	1505	-	-	X	-
2	GOL	A	1509	-	-	X	-
2	GOL	A	1511	-	-	X	X
2	GOL	A	1515	-	-	-	X

2 Entry composition (i)

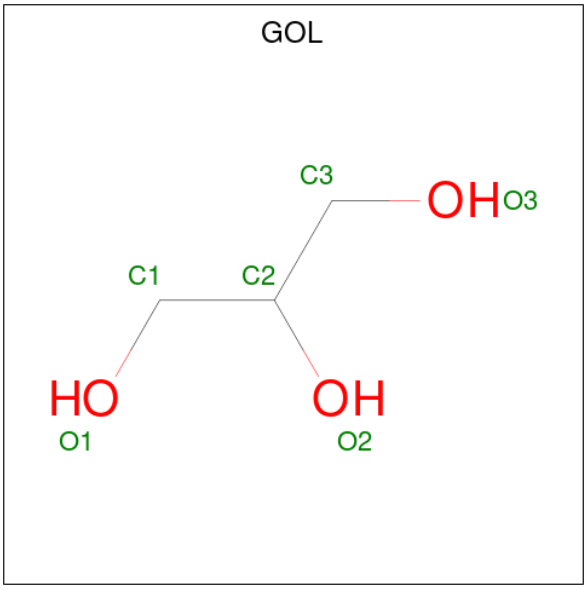
There are 5 unique types of molecules in this entry. The entry contains 8961 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 CHITINASE B.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	498	Total	C	N	O	S	0	3	1
			3919	2504	659	742	14			
1	B	498	Total	C	N	O	S	1	3	0
			3921	2505	660	742	14			

- 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		

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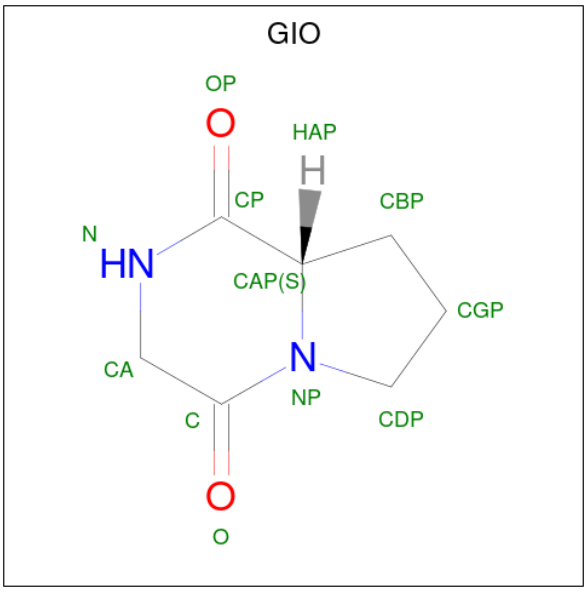
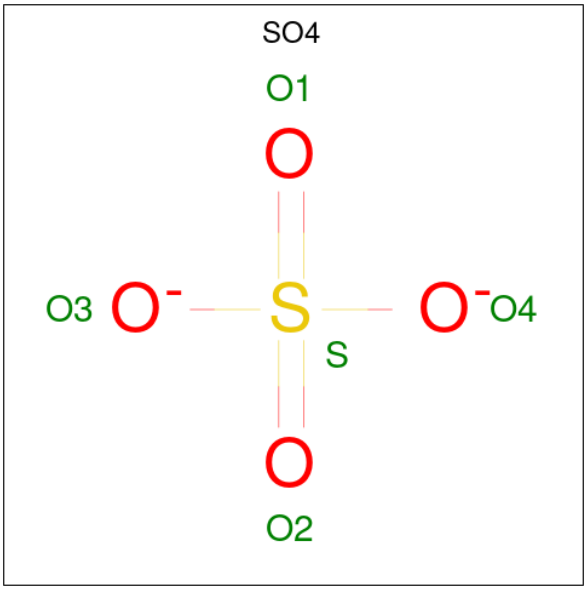
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C O 6 3 3	0	0
2	A	1	Total C O 6 3 3	0	0
2	A	1	Total C O 6 3 3	0	0
2	A	1	Total C O 6 3 3	0	0
2	A	1	Total C O 6 3 3	0	0
2	A	1	Total C O 6 3 3	0	0
2	A	1	Total C O 6 3 3	0	0
2	A	1	Total C O 6 3 3	0	0
2	A	1	Total C O 6 3 3	0	0
2	A	1	Total C O 6 3 3	0	0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

- Molecule 3 is CYCLO-(GLYCINE-L-PROLINE) INHIBITOR (three-letter code: GIO) (formula: $C_7H_{10}N_2O_2$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C N O 11 7 2 2	0	0
3	B	1	Total C N O 11 7 2 2	0	0

- Molecule 4 is SULFATE ION (three-letter code: SO4) (formula: O_4S).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total O S 5 4 1	0	0
4	A	1	Total O S 5 4 1	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	B	1	Total O S 5 4 1	0	0
4	B	1	Total O S 5 4 1	0	0
4	B	1	Total O S 5 4 1	0	0
4	B	1	Total O S 5 4 1	0	0

- Molecule 5 is water.

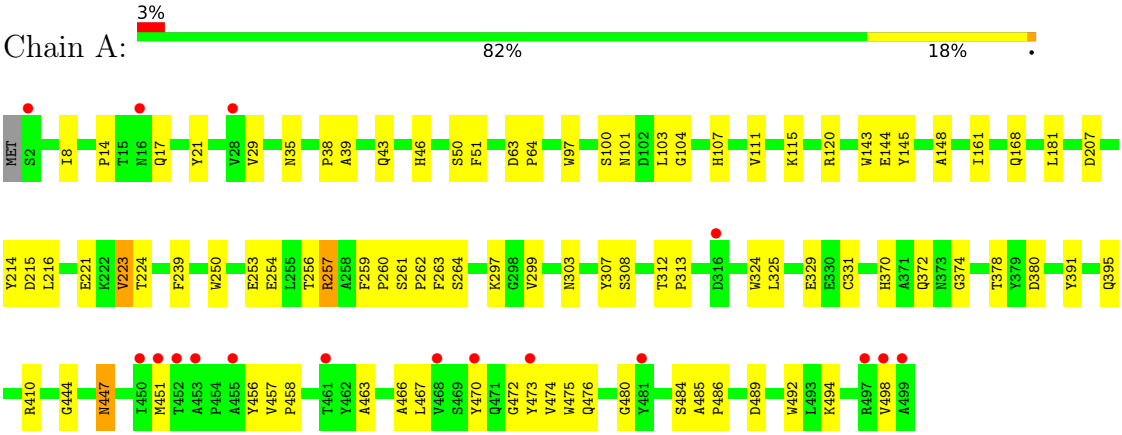
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	422	Total O 422 422	0	0
5	B	527	Total O 527 527	0	0

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.

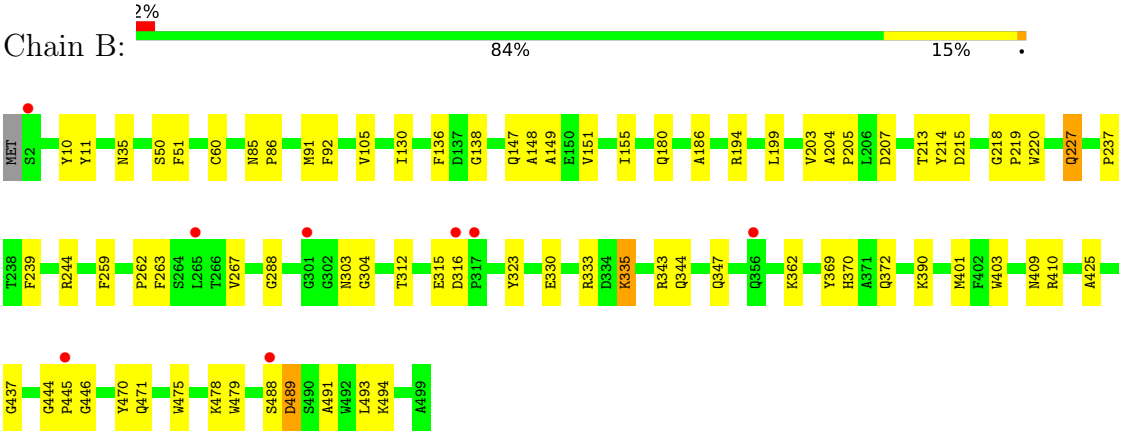
• Molecule 1: CHITINASE B

Chain A:



• Molecule 1: CHITINASE B

Chain B:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	56.07Å 103.91Å 186.44Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	24.91 – 2.10 24.91 – 2.10	Depositor EDS
% Data completeness (in resolution range)	48.1 (24.91-2.10) 89.4 (24.91-2.10)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	4.52 (at 2.10Å)	Xtriage
Refinement program	CNS 1.0	Depositor
R, R_{free}	0.199 , 0.249 0.194 , 0.240	Depositor DCC
R_{free} test set	581 reflections (1.00%)	wwPDB-VP
Wilson B-factor (Å^2)	24.7	Xtriage
Anisotropy	0.019	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 62.2	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	8961	wwPDB-VP
Average B, all atoms (Å^2)	29.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.38% 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: GOL, SO4, GIO

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	0.48	0/4042	0.67	1/5512 (0.0%)
1	B	0.50	0/4044	0.70	0/5512
All	All	0.49	0/8086	0.69	1/11024 (0.0%)

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

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

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	100	SER	N-CA-C	5.03	124.57	111.00

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	11	TYR	Sidechain

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	3919	0	3734	76	0
1	B	3921	0	3740	56	0
2	A	114	0	152	35	0
2	B	6	0	8	3	0
3	A	11	0	10	0	0
3	B	11	0	10	2	0
4	A	10	0	0	0	0
4	B	20	0	0	0	0
5	A	422	0	0	16	0
5	B	527	0	0	13	0
All	All	8961	0	7654	146	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 (146) 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:260:PRO:HA	2:A:1503:GOL:H12	1.35	1.07
1:A:444:GLY:H	1:A:447:ASN:HD21	1.03	0.95
1:A:484:SER:HB3	1:A:489:ASP:HB2	1.51	0.90
1:A:444:GLY:H	1:A:447:ASN:ND2	1.70	0.89
1:B:478:LYS:HE3	1:B:493:LEU:HB2	1.56	0.86
2:A:1510:GOL:H32	2:A:1514:GOL:H11	1.63	0.80
2:A:1509:GOL:H12	5:B:2211:HOH:O	1.81	0.79
2:A:1502:GOL:H31	1:B:263:PHE:HB2	1.65	0.79
1:A:263:PHE:HB2	2:A:1501:GOL:H31	1.65	0.77
1:A:253:GLU:O	1:A:257:ARG:HG2	1.85	0.77
1:A:104:GLY:HA2	5:A:2111:HOH:O	1.83	0.76
1:A:221:GLU:OE2	2:B:1500:GOL:H11	1.86	0.76
1:B:147:GLN:HB3	1:B:194:ARG:HD3	1.69	0.75
1:A:256:THR:HG23	2:A:1503:GOL:H31	1.70	0.73
2:A:1509:GOL:H32	5:B:2211:HOH:O	1.87	0.73
1:B:444:GLY:C	1:B:446:GLY:H	1.93	0.72
2:A:1507:GOL:H32	1:B:479:TRP:HE1	1.55	0.71
1:A:410:ARG:HD2	5:A:2328:HOH:O	1.89	0.70
1:A:444:GLY:N	1:A:447:ASN:HD21	1.86	0.69
1:A:168:GLN:HE22	2:A:1505:GOL:H11	1.58	0.68
1:A:257:ARG:HD3	5:A:2370:HOH:O	1.95	0.66
2:A:1510:GOL:H32	2:A:1514:GOL:C1	2.25	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:444:GLY:O	1:B:446:GLY:N	2.29	0.65
1:B:333:ARG:HB2	5:B:2176:HOH:O	1.97	0.65
1:A:120:ARG:HH22	2:A:1515:GOL:H2	1.62	0.65
1:A:223:VAL:HG13	5:A:2196:HOH:O	1.98	0.63
1:B:488:SER:O	1:B:489:ASP:HB3	1.99	0.63
1:A:466:ALA:O	1:A:476:GLN:HA	1.99	0.63
2:A:1516:GOL:H2	5:A:2415:HOH:O	1.98	0.62
1:A:38:PRO:HD2	5:A:2052:HOH:O	1.99	0.61
2:A:1499:GOL:H11	5:A:2394:HOH:O	2.00	0.61
1:A:297:LYS:HD3	1:A:324:TRP:CE2	2.37	0.60
1:A:263:PHE:HB2	2:A:1501:GOL:C3	2.30	0.59
1:A:144:GLU:HA	1:A:145:TYR:CG	2.38	0.59
1:A:447:ASN:H	1:A:447:ASN:HD22	1.49	0.58
1:B:330:GLU:H	1:B:344:GLN:HE21	1.48	0.58
1:B:444:GLY:C	1:B:446:GLY:N	2.54	0.58
2:A:1511:GOL:H12	2:B:1500:GOL:H32	1.84	0.58
1:A:484:SER:HB3	1:A:489:ASP:CB	2.31	0.56
1:A:480:GLY:O	2:A:1508:GOL:H11	2.06	0.56
1:B:215:ASP:H	1:B:227:GLN:HE21	1.54	0.56
1:A:143:TRP:O	1:A:145:TYR:HA	2.05	0.56
1:A:168:GLN:NE2	2:A:1505:GOL:H11	2.20	0.56
1:B:347:GLN:NE2	5:B:2366:HOH:O	2.39	0.55
1:B:50:SER:HB2	1:B:51:PHE:CG	2.41	0.55
1:B:186:ALA:HA	5:B:2211:HOH:O	2.07	0.54
1:B:315:GLU:H	1:B:315:GLU:CD	2.11	0.54
1:A:97:TRP:CG	2:A:1514:GOL:H31	2.42	0.54
1:A:14:PRO:HG3	1:A:17:GLN:NE2	2.22	0.54
1:A:63:ASP:OD1	1:A:64:PRO:HD2	2.07	0.54
1:A:223:VAL:HG23	1:A:307:TYR:HA	1.89	0.53
1:A:260:PRO:CA	2:A:1503:GOL:H12	2.23	0.53
1:A:467:LEU:HA	1:A:475:TRP:O	2.08	0.53
1:A:470:TYR:CD2	1:A:486:PRO:HB2	2.43	0.52
1:A:115:LYS:HE3	5:A:2114:HOH:O	2.09	0.52
1:B:330:GLU:H	1:B:344:GLN:NE2	2.07	0.52
1:A:254:GLU:O	1:A:257:ARG:HG3	2.09	0.52
1:A:475:TRP:CD2	1:A:486:PRO:HB3	2.44	0.52
1:A:221:GLU:OE2	2:A:1511:GOL:O1	2.26	0.52
1:B:244:ARG:HG2	1:B:259:PHE:HB2	1.93	0.51
1:A:50:SER:HB2	1:A:51:PHE:CG	2.46	0.51
1:A:447:ASN:HD22	1:A:447:ASN:N	2.08	0.51
1:B:213:THR:HB	1:B:267:VAL:HG22	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:456:TYR:CE2	1:A:485:ALA:HB2	2.45	0.51
1:B:390:LYS:HE3	5:B:2446:HOH:O	2.09	0.51
1:A:216:LEU:HA	2:A:1511:GOL:O3	2.10	0.50
1:B:214:TYR:O	1:B:215:ASP:HB2	2.11	0.50
1:A:259:PHE:O	2:A:1503:GOL:H32	2.11	0.50
1:B:330:GLU:HB2	1:B:344:GLN:HE21	1.77	0.50
1:B:470:TYR:CD2	1:B:471:GLN:HG3	2.47	0.50
1:A:14:PRO:CG	1:A:17:GLN:NE2	2.75	0.49
1:B:239:PHE:O	1:B:262:PRO:HA	2.12	0.49
1:B:50:SER:HB2	1:B:51:PHE:CD1	2.47	0.49
1:B:333:ARG:HD3	5:B:2176:HOH:O	2.12	0.48
2:A:1516:GOL:C2	5:A:2415:HOH:O	2.57	0.48
1:A:484:SER:HB2	1:B:147:GLN:HE22	1.78	0.48
1:A:451:MET:HB2	1:A:474:VAL:HG21	1.95	0.48
2:A:1509:GOL:C1	5:B:2211:HOH:O	2.53	0.48
1:B:323:TYR:OH	1:B:335:LYS:HG3	2.14	0.48
2:A:1499:GOL:O1	5:A:2398:HOH:O	2.20	0.48
1:B:478:LYS:HD2	1:B:491:ALA:O	2.14	0.48
1:A:161:ILE:HG21	1:A:181:LEU:HD13	1.96	0.48
1:B:362:LYS:HD2	1:B:437:GLY:HA2	1.95	0.48
1:B:475:TRP:CZ3	1:B:494:LYS:HG3	2.49	0.47
1:A:370:HIS:CE1	1:A:372:GLN:HB3	2.49	0.47
1:A:472:GLY:HA2	5:A:2397:HOH:O	2.15	0.47
1:B:91:MET:SD	1:B:138:GLY:HA3	2.54	0.47
1:A:261:SER:HA	1:A:262:PRO:C	2.35	0.47
1:A:101:ASN:HA	1:A:144:GLU:O	2.15	0.46
2:A:1505:GOL:H2	5:A:2403:HOH:O	2.15	0.46
1:B:218:GLY:HA3	1:B:220:TRP:CH2	2.50	0.46
1:A:250:TRP:HB3	1:A:254:GLU:HB2	1.98	0.46
1:A:261:SER:H	2:A:1503:GOL:H2	1.81	0.46
1:B:343:ARG:HB2	1:B:409:ASN:HA	1.97	0.45
1:A:214:TYR:O	1:A:215:ASP:HB2	2.16	0.45
1:B:204:ALA:N	1:B:205:PRO:HD2	2.32	0.45
1:A:224:THR:HG23	1:A:308:SER:O	2.17	0.45
1:A:307:TYR:CD1	1:A:307:TYR:N	2.84	0.45
2:A:1511:GOL:C1	2:B:1500:GOL:H32	2.46	0.45
1:B:105:VAL:HG21	5:B:2014:HOH:O	2.16	0.45
1:B:425:ALA:HB2	5:B:2435:HOH:O	2.15	0.45
1:A:391:TYR:CE2	1:A:395:GLN:HG3	2.51	0.44
2:A:1517:GOL:H31	1:B:237:PRO:HB3	2.00	0.44
1:B:35:ASN:ND2	5:B:2067:HOH:O	2.50	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:470:TYR:CE2	1:A:486:PRO:O	2.70	0.44
1:A:107:HIS:O	1:A:111:VAL:HG23	2.17	0.44
1:A:14:PRO:HG3	1:A:17:GLN:HE21	1.83	0.44
1:A:312:THR:HA	1:A:313:PRO:HD3	1.90	0.44
2:A:1509:GOL:C3	5:B:2211:HOH:O	2.57	0.44
1:B:218:GLY:HA3	1:B:220:TRP:CZ2	2.53	0.44
1:A:50:SER:HA	1:A:51:PHE:HA	1.83	0.43
2:A:1499:GOL:H32	5:A:2394:HOH:O	2.18	0.43
1:A:325:LEU:HD23	1:A:331:CYS:SG	2.59	0.43
1:B:403:TRP:CE2	3:B:1501:GIO:HAC1	2.54	0.43
1:A:463:ALA:HB1	5:A:2382:HOH:O	2.19	0.43
1:A:467:LEU:HD23	1:A:476:GLN:HB2	2.00	0.42
1:A:498:VAL:HG12	5:A:2373:HOH:O	2.19	0.42
1:B:10:TYR:CZ	3:B:1501:GIO:HGP1	2.54	0.42
1:A:299:VAL:HG22	1:A:374:GLY:O	2.20	0.42
1:A:21:TYR:HA	1:A:29:VAL:HG21	2.02	0.42
1:B:370:HIS:CE1	1:B:372:GLN:HB3	2.54	0.42
1:A:8:ILE:HG12	1:A:46:HIS:HB2	2.00	0.42
1:A:207:ASP:OD1	2:A:1504:GOL:H32	2.20	0.42
1:B:92:PHE:HB3	1:B:136:PHE:CD1	2.55	0.42
1:B:199:LEU:O	1:B:203:VAL:HG23	2.20	0.42
1:A:457:VAL:HA	1:A:458:PRO:HD2	1.93	0.41
2:A:1505:GOL:H12	5:A:2405:HOH:O	2.20	0.41
1:A:120:ARG:HH22	2:A:1515:GOL:C2	2.31	0.41
1:A:264:SER:HB2	2:A:1501:GOL:O3	2.21	0.41
1:B:92:PHE:HB3	1:B:136:PHE:CE1	2.55	0.41
1:B:304:GLY:O	1:B:369:TYR:HB2	2.20	0.41
1:A:473:TYR:CD1	1:A:494:LYS:HD3	2.55	0.41
1:A:486:PRO:HG3	1:A:492:TRP:CD2	2.55	0.41
1:B:288:GLY:HA2	1:B:401:MET:O	2.20	0.41
1:B:50:SER:HA	1:B:51:PHE:HA	1.73	0.41
1:B:204:ALA:HB3	1:B:205:PRO:HD3	2.02	0.41
1:B:330:GLU:CB	1:B:344:GLN:HE21	2.33	0.41
1:A:297:LYS:HD3	1:A:324:TRP:NE1	2.35	0.41
1:B:219:PRO:HB3	1:B:312:THR:HG22	2.02	0.41
1:B:149:ALA:O	5:B:2217:HOH:O	2.22	0.40
1:A:39:ALA:O	1:A:43:GLN:HG3	2.21	0.40
1:A:239:PHE:O	1:A:262:PRO:HA	2.22	0.40
1:B:180:GLN:HG2	1:B:207:ASP:OD2	2.22	0.40
1:B:60:CYS:SG	1:B:130:ILE:HG13	2.62	0.40
1:B:85:ASN:HA	1:B:86:PRO:HD2	1.82	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:151:VAL:HG12	1:B:155:ILE:CD1	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	499/499 (100%)	484 (97%)	14 (3%)	1 (0%)	47 49
1	B	499/499 (100%)	483 (97%)	13 (3%)	3 (1%)	25 21
All	All	998/998 (100%)	967 (97%)	27 (3%)	4 (0%)	34 32

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	148	ALA
1	B	445	PRO
1	B	148	ALA
1	B	489	ASP

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	406/405 (100%)	397 (98%)	9 (2%)	52 57

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	B	406/405 (100%)	401 (99%)	5 (1%)	71 77
All	All	812/810 (100%)	798 (98%)	14 (2%)	60 67

All (14) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	35	ASN
1	A	103	LEU
1	A	223	VAL
1	A	257	ARG
1	A	303	ASN
1	A	329	GLU
1	A	378	THR
1	A	380	ASP
1	A	447	ASN
1	B	227	GLN
1	B	303	ASN
1	B	316	ASP
1	B	335	LYS
1	B	410	ARG

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	17	GLN
1	A	57	ASN
1	A	168	GLN
1	A	347	GLN
1	A	447	ASN
1	A	464	GLN
1	B	35	ASN
1	B	57	ASN
1	B	112	ASN
1	B	147	GLN
1	B	167	GLN
1	B	180	GLN
1	B	227	GLN
1	B	273	GLN
1	B	303	ASN
1	B	306	GLN
1	B	344	GLN

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Mol	Chain	Res	Type
1	B	372	GLN
1	B	394	GLN
1	B	431	GLN

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)

28 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	A	1508	-	5,5,5	0.35	0	5,5,5	0.16	0
2	GOL	A	1516	-	5,5,5	0.39	0	5,5,5	0.13	0
2	GOL	A	1509	-	5,5,5	0.44	0	5,5,5	0.26	0
4	SO4	A	1519	-	4,4,4	0.29	0	6,6,6	0.12	0
2	GOL	A	1510	-	5,5,5	0.48	0	5,5,5	0.18	0
3	GIO	A	1518	-	12,12,12	1.69	2 (16%)	15,17,17	1.62	3 (20%)
2	GOL	A	1511	-	5,5,5	0.21	0	5,5,5	0.39	0
4	SO4	B	1505	-	4,4,4	0.25	0	6,6,6	0.14	0
4	SO4	A	1520	-	4,4,4	0.24	0	6,6,6	0.11	0
2	GOL	A	1515	-	5,5,5	0.45	0	5,5,5	0.39	0
4	SO4	B	1504	-	4,4,4	0.26	0	6,6,6	0.08	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
2	GOL	A	1500	-	5,5,5	0.33	0	5,5,5	0.35	0
2	GOL	A	1514	-	5,5,5	0.28	0	5,5,5	0.25	0
2	GOL	A	1504	-	5,5,5	0.25	0	5,5,5	0.39	0
2	GOL	B	1500	-	5,5,5	0.29	0	5,5,5	0.21	0
4	SO4	B	1503	-	4,4,4	0.24	0	6,6,6	0.10	0
2	GOL	A	1501	-	5,5,5	0.43	0	5,5,5	0.31	0
4	SO4	B	1502	-	4,4,4	0.31	0	6,6,6	0.19	0
2	GOL	A	1502	-	5,5,5	0.40	0	5,5,5	0.40	0
3	GIO	B	1501	-	12,12,12	1.69	3 (25%)	15,17,17	1.54	2 (13%)
2	GOL	A	1517	-	5,5,5	0.42	0	5,5,5	0.20	0
2	GOL	A	1512	-	5,5,5	0.27	0	5,5,5	0.29	0
2	GOL	A	1513	-	5,5,5	0.41	0	5,5,5	0.09	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	A	1511	-	-	0/4/4/4	-
2	GOL	A	1514	-	-	0/4/4/4	-
2	GOL	A	1508	-	-	0/4/4/4	-
2	GOL	A	1504	-	-	0/4/4/4	-
2	GOL	A	1502	-	-	0/4/4/4	-
2	GOL	A	1509	-	-	0/4/4/4	-
2	GOL	A	1516	-	-	0/4/4/4	-
3	GIO	B	1501	-	-	-	0/2/2/2
2	GOL	B	1500	-	-	0/4/4/4	-
2	GOL	A	1515	-	-	0/4/4/4	-
2	GOL	A	1517	-	-	0/4/4/4	-
2	GOL	A	1501	-	-	0/4/4/4	-
2	GOL	A	1512	-	-	0/4/4/4	-
2	GOL	A	1510	-	-	0/4/4/4	-
2	GOL	A	1500	-	-	0/4/4/4	-
3	GIO	A	1518	-	-	-	0/2/2/2
2	GOL	A	1513	-	-	0/4/4/4	-

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	1501	GIO	CP-N	3.91	1.40	1.33
3	A	1518	GIO	CP-N	3.88	1.40	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	1501	GIO	C-NP	3.43	1.40	1.35
3	A	1518	GIO	C-NP	3.39	1.40	1.35
3	B	1501	GIO	CA-N	2.02	1.48	1.45

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	B	1501	GIO	CDP-NP-C	3.14	129.41	123.47
3	A	1518	GIO	CDP-NP-C	2.94	129.03	123.47
3	A	1518	GIO	CBP-CAP-CP	-2.54	110.99	116.23
3	B	1501	GIO	CBP-CAP-CP	-2.38	111.33	116.23
3	A	1518	GIO	CGP-CBP-CAP	-2.19	99.59	104.18

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

13 monomers are involved in 25 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	1508	GOL	1	0
2	A	1516	GOL	2	0
2	A	1509	GOL	4	0
2	A	1510	GOL	2	0
2	A	1511	GOL	4	0
2	A	1515	GOL	2	0
2	A	1514	GOL	3	0
2	A	1504	GOL	1	0
2	B	1500	GOL	3	0
2	A	1501	GOL	3	0
2	A	1502	GOL	1	0
3	B	1501	GIO	2	0
2	A	1517	GOL	1	0

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{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	498/499 (99%)	-0.01	17 (3%) 45 51	14, 28, 48, 67	0
1	B	498/499 (99%)	-0.12	8 (1%) 72 75	14, 24, 40, 51	1 (0%)
All	All	996/998 (99%)	-0.06	25 (2%) 57 62	14, 26, 46, 67	1 (0%)

All (25) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	499	ALA	5.5
1	A	450	ILE	4.0
1	A	498	VAL	4.0
1	B	317	PRO	3.8
1	B	2	SER	3.5
1	A	470	TYR	3.2
1	A	452	THR	3.2
1	B	316	ASP	3.2
1	B	488	SER	3.2
1	A	455	ALA	3.2
1	A	16	ASN	3.0
1	B	301	GLY	2.7
1	A	497	ARG	2.7
1	A	473	TYR	2.7
1	A	453	ALA	2.6
1	A	2	SER	2.6
1	A	461	THR	2.5
1	A	481	TYR	2.3
1	A	451	MET	2.2
1	B	265	LEU	2.1
1	A	316[A]	ASP	2.1
1	B	356	GLN	2.1
1	A	468	VAL	2.1
1	A	28	VAL	2.1

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Mol	Chain	Res	Type	RSRZ
1	B	445	PRO	2.0

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

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

6.3 Carbohydrates (i)

There are no 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	A	1511	6/6	0.61	0.45	85,85,86,89	0
2	GOL	A	1515	6/6	0.71	0.45	69,70,70,70	0
2	GOL	A	1517	6/6	0.75	0.35	62,63,63,63	0
2	GOL	A	1512	6/6	0.76	0.16	60,61,62,62	0
2	GOL	A	1503	6/6	0.77	0.33	41,44,47,51	0
2	GOL	A	1507	6/6	0.78	0.34	67,68,69,70	0
2	GOL	A	1516	6/6	0.79	0.39	65,66,67,67	0
2	GOL	A	1502	6/6	0.80	0.22	38,40,44,45	0
4	SO4	A	1520	5/5	0.80	0.24	92,92,94,94	0
2	GOL	A	1513	6/6	0.82	0.17	59,60,60,60	0
2	GOL	A	1514	6/6	0.82	0.24	63,63,64,66	0
2	GOL	A	1509	6/6	0.83	0.28	42,45,47,47	0
2	GOL	A	1499	6/6	0.85	0.26	50,54,56,58	0
2	GOL	A	1506	6/6	0.86	0.19	46,50,51,54	0
2	GOL	A	1510	6/6	0.86	0.15	33,38,40,42	0
2	GOL	A	1504	6/6	0.87	0.19	55,58,59,60	0
2	GOL	A	1501	6/6	0.88	0.16	33,39,40,40	0
4	SO4	B	1503	5/5	0.89	0.18	104,104,104,104	0
2	GOL	A	1508	6/6	0.91	0.13	38,41,42,43	0
2	GOL	A	1505	6/6	0.92	0.28	56,56,57,60	0
2	GOL	B	1500	6/6	0.92	0.15	44,48,49,50	0
3	GIO	A	1518	11/11	0.93	0.11	28,29,31,34	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	GIO	B	1501	11/11	0.94	0.11	24,26,27,28	0
4	SO4	B	1505	5/5	0.94	0.14	74,75,75,75	0
2	GOL	A	1500	6/6	0.95	0.12	35,36,37,39	0
4	SO4	B	1502	5/5	0.95	0.19	50,51,51,52	0
4	SO4	B	1504	5/5	0.96	0.32	76,77,77,78	0
4	SO4	A	1519	5/5	0.98	0.08	46,47,49,50	0

6.5 Other polymers (i)

There are no such residues in this entry.