Full wwPDB X-ray Structure Validation Report (i)

Oct 15, 2023 – 12:23 PM EDT

PDB ID	:	8EUT
Title	:	Co-crystal structure of Chaetomium glucosidase with compound 27
Authors	:	Karade, S.S.; Mariuzza, R.A.
Deposited on	:	2022-10-19
Resolution	:	2.80 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:

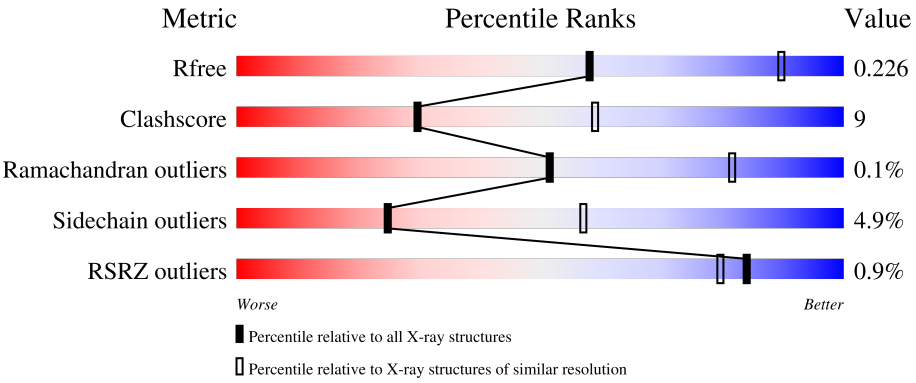
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (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 2.80 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	3140 (2.80-2.80)
Clashscore	141614	3569 (2.80-2.80)
Ramachandran outliers	138981	3498 (2.80-2.80)
Sidechain outliers	138945	3500 (2.80-2.80)
RSRZ outliers	127900	3078 (2.80-2.80)

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	819	2% 73% 19% 7%
1	B	819	74% 17% 7%

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
3	GOL	A	903	-	-	X	-
4	SO4	A	906	-	-	X	-

2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 12464 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 Chaetomium alpha glucosidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	763	Total	C	N	O	S	0	1	0
			6053	3890	1020	1130	13			
1	B	763	Total	C	N	O	S	0	0	0
			6070	3896	1020	1141	13			

There are 78 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	MET	-	initiating methionine	UNP G0SFD1
A	0	GLY	-	expression tag	UNP G0SFD1
A	1	ILE	-	expression tag	UNP G0SFD1
A	2	LEU	-	expression tag	UNP G0SFD1
A	3	PRO	-	expression tag	UNP G0SFD1
A	4	SER	-	expression tag	UNP G0SFD1
A	5	PRO	-	expression tag	UNP G0SFD1
A	6	GLY	-	expression tag	UNP G0SFD1
A	7	MET	-	expression tag	UNP G0SFD1
A	8	PRO	-	expression tag	UNP G0SFD1
A	9	ALA	-	expression tag	UNP G0SFD1
A	10	LEU	-	expression tag	UNP G0SFD1
A	11	LEU	-	expression tag	UNP G0SFD1
A	12	SER	-	expression tag	UNP G0SFD1
A	13	LEU	-	expression tag	UNP G0SFD1
A	14	VAL	-	expression tag	UNP G0SFD1
A	15	SER	-	expression tag	UNP G0SFD1
A	16	LEU	-	expression tag	UNP G0SFD1
A	17	LEU	-	expression tag	UNP G0SFD1
A	18	SER	-	expression tag	UNP G0SFD1
A	19	VAL	-	expression tag	UNP G0SFD1
A	20	LEU	-	expression tag	UNP G0SFD1
A	21	LEU	-	expression tag	UNP G0SFD1
A	22	MET	-	expression tag	UNP G0SFD1
A	23	GLY	-	expression tag	UNP G0SFD1

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Chain	Residue	Modelled	Actual	Comment	Reference
A	24	CYS	-	expression tag	UNP G0SFD1
A	25	VAL	-	expression tag	UNP G0SFD1
A	26	ALA	-	expression tag	UNP G0SFD1
A	27	GLU	-	expression tag	UNP G0SFD1
A	28	THR	-	expression tag	UNP G0SFD1
A	29	GLY	-	expression tag	UNP G0SFD1
A	810	SER	-	expression tag	UNP G0SFD1
A	811	GLY	-	expression tag	UNP G0SFD1
A	812	HIS	-	expression tag	UNP G0SFD1
A	813	HIS	-	expression tag	UNP G0SFD1
A	814	HIS	-	expression tag	UNP G0SFD1
A	815	HIS	-	expression tag	UNP G0SFD1
A	816	HIS	-	expression tag	UNP G0SFD1
A	817	HIS	-	expression tag	UNP G0SFD1
B	-1	MET	-	initiating methionine	UNP G0SFD1
B	0	GLY	-	expression tag	UNP G0SFD1
B	1	ILE	-	expression tag	UNP G0SFD1
B	2	LEU	-	expression tag	UNP G0SFD1
B	3	PRO	-	expression tag	UNP G0SFD1
B	4	SER	-	expression tag	UNP G0SFD1
B	5	PRO	-	expression tag	UNP G0SFD1
B	6	GLY	-	expression tag	UNP G0SFD1
B	7	MET	-	expression tag	UNP G0SFD1
B	8	PRO	-	expression tag	UNP G0SFD1
B	9	ALA	-	expression tag	UNP G0SFD1
B	10	LEU	-	expression tag	UNP G0SFD1
B	11	LEU	-	expression tag	UNP G0SFD1
B	12	SER	-	expression tag	UNP G0SFD1
B	13	LEU	-	expression tag	UNP G0SFD1
B	14	VAL	-	expression tag	UNP G0SFD1
B	15	SER	-	expression tag	UNP G0SFD1
B	16	LEU	-	expression tag	UNP G0SFD1
B	17	LEU	-	expression tag	UNP G0SFD1
B	18	SER	-	expression tag	UNP G0SFD1
B	19	VAL	-	expression tag	UNP G0SFD1
B	20	LEU	-	expression tag	UNP G0SFD1
B	21	LEU	-	expression tag	UNP G0SFD1
B	22	MET	-	expression tag	UNP G0SFD1
B	23	GLY	-	expression tag	UNP G0SFD1
B	24	CYS	-	expression tag	UNP G0SFD1
B	25	VAL	-	expression tag	UNP G0SFD1
B	26	ALA	-	expression tag	UNP G0SFD1

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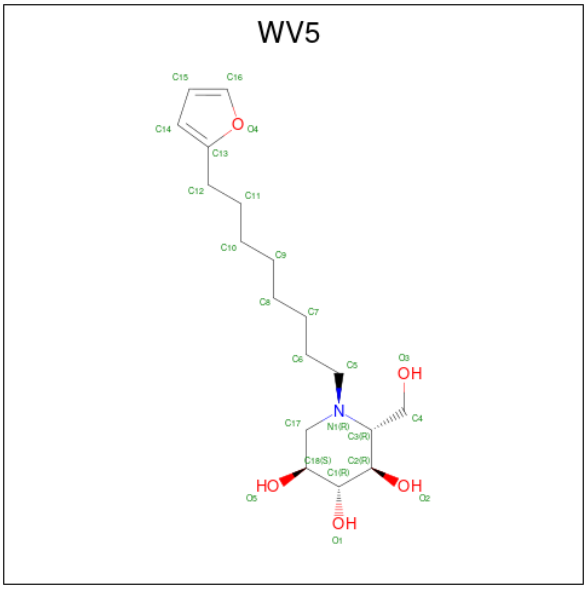
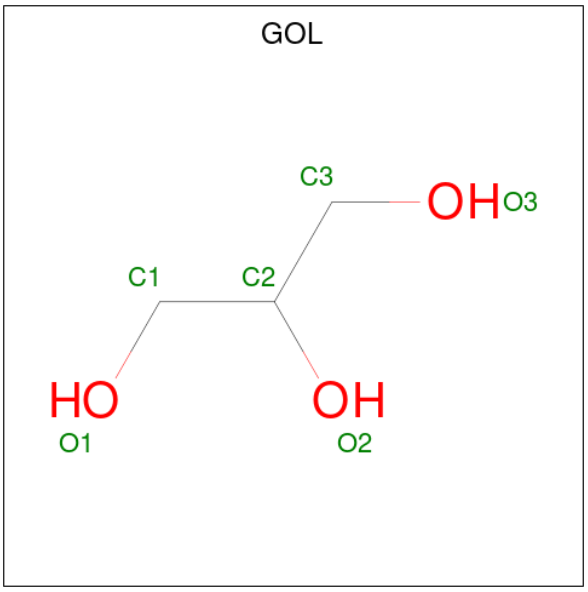
Chain	Residue	Modelled	Actual	Comment	Reference
B	27	GLU	-	expression tag	UNP G0SFD1
B	28	THR	-	expression tag	UNP G0SFD1
B	29	GLY	-	expression tag	UNP G0SFD1
B	810	SER	-	expression tag	UNP G0SFD1
B	811	GLY	-	expression tag	UNP G0SFD1
B	812	HIS	-	expression tag	UNP G0SFD1
B	813	HIS	-	expression tag	UNP G0SFD1
B	814	HIS	-	expression tag	UNP G0SFD1
B	815	HIS	-	expression tag	UNP G0SFD1
B	816	HIS	-	expression tag	UNP G0SFD1
B	817	HIS	-	expression tag	UNP G0SFD1

- Molecule 2 is (2R,3R,4R,5S)-1-[8-(furan-2-yl)octyl]-2-(hydroxymethyl)piperidine-3,4,5-triol (three-letter code: WV5) (formula: $C_{18}H_{31}NO_5$) (labeled as "Ligand of Interest" by depositor).



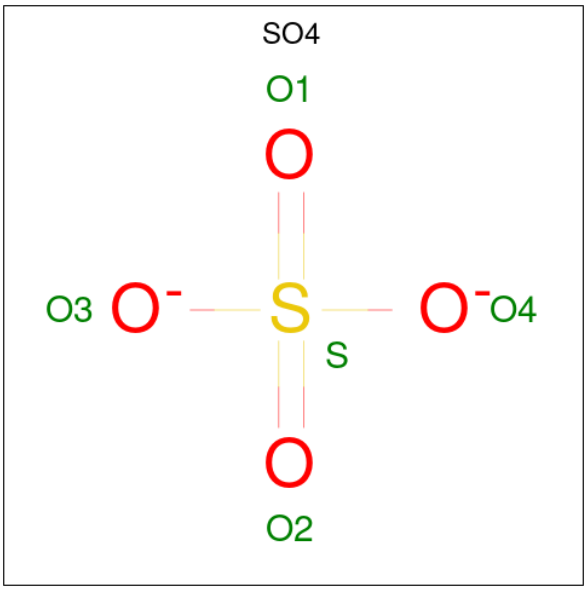
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			24	18	1	5		
2	B	1	Total	C	N	O	0	0
			24	18	1	5		

- Molecule 3 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



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

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



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

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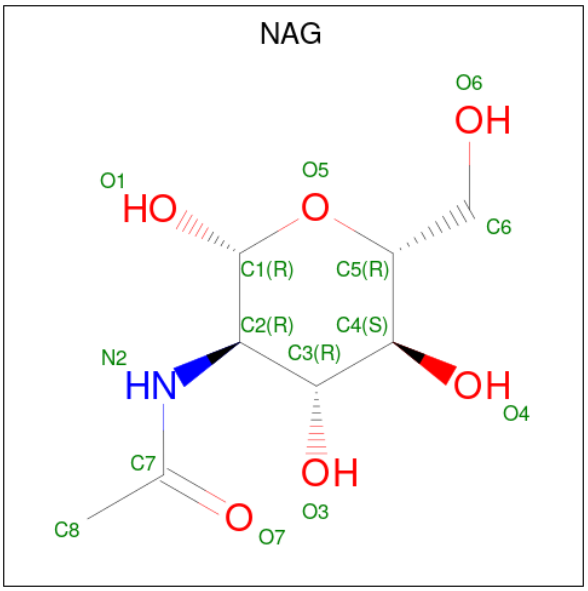
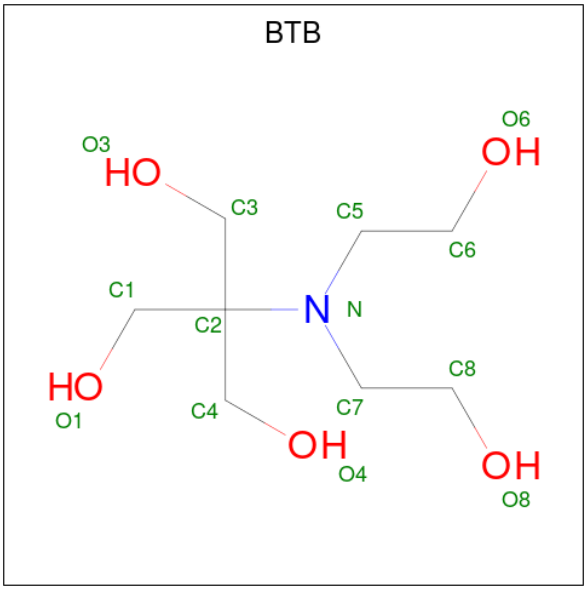
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total O S 5 4 1	0	0
4	A	1	Total O S 5 4 1	0	0
4	A	1	Total O S 5 4 1	0	0
4	A	1	Total O S 5 4 1	0	0
4	A	1	Total O S 5 4 1	0	0
4	A	1	Total O S 5 4 1	0	0
4	B	1	Total O S 5 4 1	0	0
4	B	1	Total O S 5 4 1	0	0
4	B	1	Total O S 5 4 1	0	0
4	B	1	Total O S 5 4 1	0	0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

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	B	1	Total	C	N	O	0	0
			14	8	1	5		

- Molecule 6 is 2-[BIS-(2-HYDROXY-ETHYL)-AMINO]-2-HYDROXYMETHYL-PROPANE-1,3-DIOL (three-letter code: BTB) (formula: $C_8H_{19}NO_5$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	B	1	Total	C	N	O	0	0
			14	8	1	5		

- Molecule 7 is water.

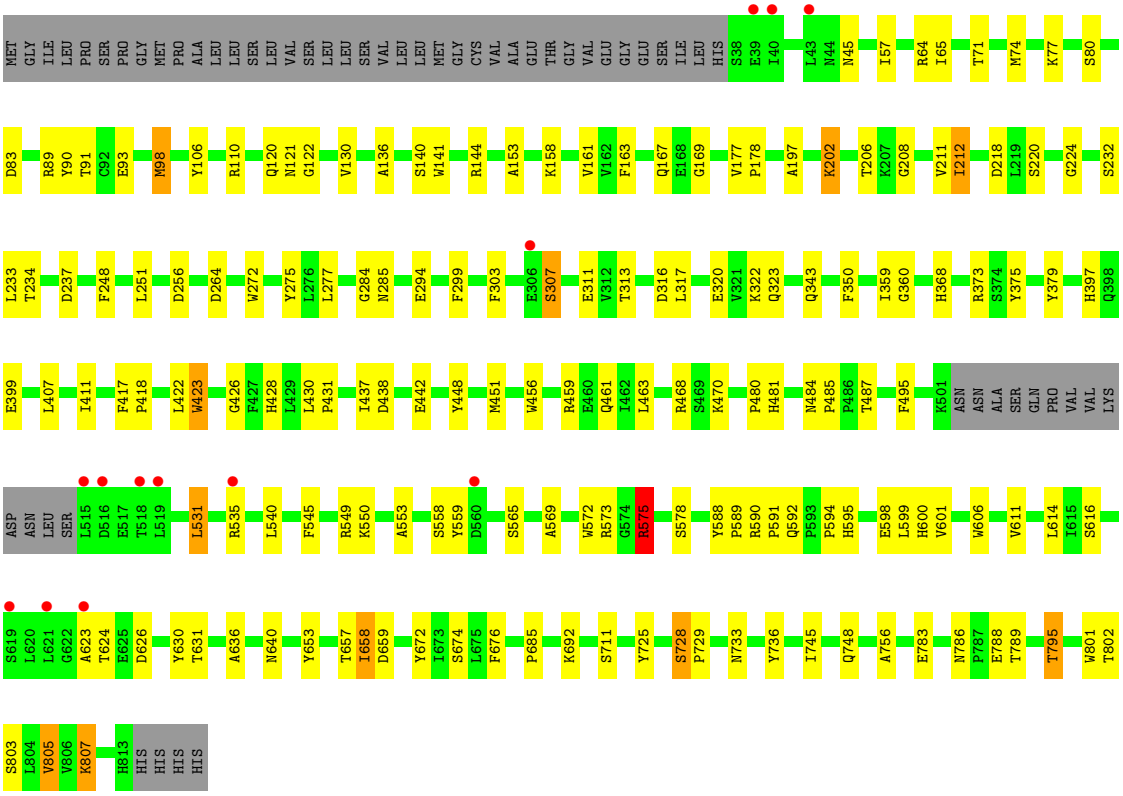
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	79	Total	O	0	0
			79	79		
7	B	108	Total	O	0	0
			108	108		

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.

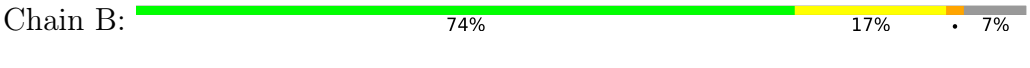
• Molecule 1: Chaetomium alpha glucosidase

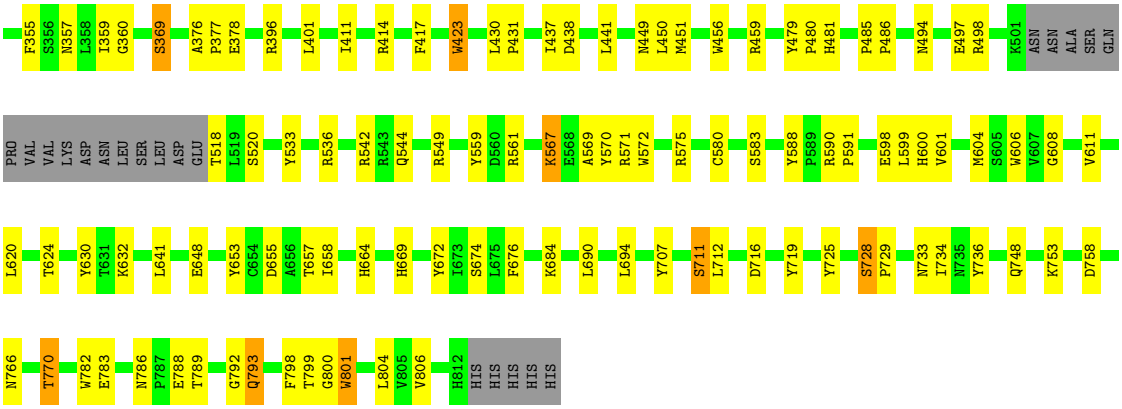
Chain A:



• Molecule 1: Chaetomium alpha glucosidase

Chain B:




F355 S356 N357 L358 I359 G360 S369 A376 P377 E378 R396 L401 I411 R414 F417 W423 L430 P431 I437 D438 L441 M449 L450 M451 W456 R459 Y479 P480 H481 P485 P486 N494 E497 R498 K501 ASN ASN ALA SER GLN
PRO VAL VAL LYS ASP ASN LEU SER LEU ASP GLU T518 L519 S520 Y533 R536 R542 R543 Q544 R549 Y559 D560 R561 K567 E568 A569 Y570 R571 W572 R575 C580 S583 Y588 P589 R590 P591 E598 L599 H600 V601 M604 S605 W606 V607 G608 V611
L620 T624 Y630 T631 K632 L641 E648 Y653 C654 D655 A656 T657 I658 H664 H669 Y672 I673 S674 L675 F676 K684 L690 L694 Y707 S711 L712 D716 Y719 Y725 S728 P729 N733 I734 N735 Y736 Q748 K753 D758
N766 T770 W782 E783 N786 P787 E788 T789 G792 Q793 F798 T799 G800 W801 L804 V805 V806 H812 HIS HIS HIS HIS HIS

4 Data and refinement statistics (i)

Property	Value	Source
Space group	I 2 2 2	Depositor
Cell constants a, b, c, α, β, γ	135.54Å 178.70Å 179.45Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	46.71 – 2.80 46.67 – 2.80	Depositor EDS
% Data completeness (in resolution range)	99.5 (46.71-2.80) 99.5 (46.67-2.80)	Depositor EDS
R_{merge}	0.16	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.20 (at 2.81Å)	Xtriage
Refinement program	REFMAC 5.8.0258	Depositor
R, R_{free}	0.170 , 0.225 0.171 , 0.226	Depositor DCC
R_{free} test set	2708 reflections (5.08%)	wwPDB-VP
Wilson B-factor (Å^2)	39.6	Xtriage
Anisotropy	0.533	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 35.5	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	0.010 for -h,-l,-k	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	12464	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 3.22% 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: SO4, GOL, NAG, BTB, WV5

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	0.47	0/6231	0.87	6/8483 (0.1%)
1	B	0.51	0/6246	0.88	7/8501 (0.1%)
All	All	0.49	0/12477	0.88	13/16984 (0.1%)

There are no bond length outliers.

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	659	ASP	CB-CA-C	-8.23	93.93	110.40
1	B	45	ASN	CB-CA-C	7.55	125.49	110.40
1	B	684	LYS	CB-CA-C	7.38	125.17	110.40
1	A	624	THR	CA-CB-OG1	-6.66	95.02	109.00
1	B	567	LYS	CB-CA-C	6.55	123.50	110.40
1	A	575	ARG	CB-CA-C	6.50	123.41	110.40
1	B	536	ARG	CG-CD-NE	-6.50	98.15	111.80
1	A	248	PHE	CB-CA-C	6.10	122.60	110.40
1	B	793	GLN	CB-CA-C	-6.08	98.24	110.40
1	B	126	THR	CA-CB-OG1	-6.01	96.37	109.00
1	A	802	THR	CA-CB-OG1	-6.00	96.40	109.00
1	B	624	THR	CA-CB-OG1	-5.82	96.78	109.00
1	A	448	TYR	CB-CA-C	5.08	120.55	110.40

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	6053	0	5727	117	0
1	B	6070	0	5733	109	0
2	A	24	0	0	0	0
2	B	24	0	0	0	0
3	A	18	0	24	6	0
4	A	35	0	0	3	0
4	B	25	0	0	1	0
5	B	14	0	13	0	0
6	B	14	0	19	1	0
7	A	79	0	0	1	0
7	B	108	0	0	1	0
All	All	12464	0	11516	224	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 (224) 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:559:TYR:CE1	1:A:658:ILE:HD13	1.93	1.03
1:B:561:ARG:HE	1:B:664:HIS:HD2	1.02	1.01
1:A:598:GLU:OE2	1:A:600:HIS:HE1	1.47	0.97
1:B:572:TRP:H	1:B:600:HIS:HD2	1.16	0.94
1:A:578:SER:HB2	4:A:906:SO4:O1	1.67	0.93
1:A:559:TYR:CD1	1:A:658:ILE:HD13	2.06	0.91
1:B:561:ARG:HE	1:B:664:HIS:CD2	1.90	0.89
1:B:572:TRP:H	1:B:600:HIS:CD2	1.93	0.87
1:B:786:ASN:HB2	1:B:793:GLN:NE2	1.92	0.84
1:A:468:ARG:HH11	3:A:902:GOL:H12	1.44	0.83
1:A:685:PRO:HG3	1:A:748:GLN:HE22	1.45	0.82
1:A:795:THR:HG23	7:A:1001:HOH:O	1.80	0.81
1:B:217:HIS:HD2	1:B:219:LEU:H	1.29	0.79
1:A:202:LYS:HE3	1:A:311:GLU:OE1	1.82	0.78
1:A:598:GLU:OE2	1:A:600:HIS:CE1	2.37	0.77
1:B:181:ASN:HD22	1:B:186:GLU:HG2	1.49	0.77
1:A:559:TYR:CE1	1:A:658:ILE:CD1	2.69	0.76
1:B:786:ASN:HD22	1:B:789:THR:H	1.33	0.75
1:B:561:ARG:NE	1:B:664:HIS:HD2	1.80	0.75
1:A:559:TYR:CD1	1:A:658:ILE:CD1	2.69	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:251:LEU:HD23	1:A:277:LEU:HD21	1.68	0.74
1:B:65:ILE:HD13	1:B:197:ALA:HB1	1.71	0.73
1:A:553:ALA:O	1:A:573:ARG:NH2	2.22	0.72
1:B:217:HIS:HE1	1:B:267:ASP:O	1.76	0.68
1:B:451:MET:CE	1:B:544:GLN:HB2	2.23	0.68
1:B:728:SER:N	1:B:729:PRO:HD3	2.09	0.67
1:B:114:GLN:NE2	1:B:414:ARG:HH12	1.93	0.67
1:A:614:LEU:HB3	1:A:630:TYR:CE2	2.30	0.66
1:B:181:ASN:ND2	1:B:186:GLU:CG	2.59	0.66
1:B:451:MET:HE1	1:B:544:GLN:HB2	1.77	0.66
1:B:766:ASN:O	1:B:770:THR:HG23	1.96	0.65
1:B:181:ASN:ND2	1:B:186:GLU:HG3	2.13	0.64
1:B:217:HIS:CD2	1:B:219:LEU:H	2.15	0.64
1:A:232:SER:O	1:A:233:LEU:HD23	1.96	0.64
1:B:181:ASN:HD22	1:B:186:GLU:CG	2.10	0.64
1:A:256:ASP:OD2	1:B:262:LYS:HE3	1.97	0.64
1:A:545:PHE:CZ	1:A:549:ARG:HD2	2.34	0.62
1:B:236:PRO:HD2	1:B:239:VAL:HG22	1.82	0.61
1:A:397:HIS:HD2	1:A:399:GLU:OE2	1.84	0.60
1:A:786:ASN:HD22	1:A:789:THR:H	1.49	0.60
1:A:733:ASN:HB3	1:A:801:TRP:CG	2.37	0.60
1:B:707:TYR:HA	1:B:770:THR:HG21	1.83	0.60
1:A:423:TRP:H	1:A:484:ASN:ND2	2.00	0.59
1:B:89:ARG:CZ	1:B:98:MET:HE1	2.32	0.59
1:B:140:SER:HB3	1:B:303:PHE:O	2.01	0.59
1:A:451:MET:CE	1:A:540:LEU:HB3	2.33	0.59
1:B:786:ASN:ND2	1:B:788:GLU:H	2.00	0.59
1:A:575:ARG:HH22	1:A:592:GLN:HE22	1.51	0.58
1:A:423:TRP:CE3	1:A:485:PRO:HG2	2.38	0.58
1:A:572:TRP:H	1:A:600:HIS:HD2	1.49	0.58
1:A:745:ILE:HG22	1:A:756:ALA:CB	2.33	0.58
1:B:128:SER:O	1:B:143:ALA:HA	2.02	0.58
1:B:450:LEU:HB3	4:B:904:SO4:O4	2.03	0.58
1:A:783:GLU:HB2	1:A:795:THR:HG22	1.85	0.58
1:A:251:LEU:HD23	1:A:277:LEU:CD2	2.33	0.58
1:A:422:LEU:HB3	1:A:484:ASN:HD22	1.68	0.58
1:A:64:ARG:NH2	1:A:442:GLU:OE2	2.32	0.57
1:A:426:GLY:HA3	1:A:487:THR:OG1	2.03	0.57
1:A:578:SER:CB	4:A:906:SO4:O1	2.48	0.57
1:B:600:HIS:HA	1:B:655:ASP:OD1	2.05	0.57
1:A:208:GLY:H	3:A:903:GOL:C1	2.17	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:106:TYR:CD2	1:B:360:GLY:HA2	2.40	0.57
1:B:559:TYR:CE2	1:B:658:ILE:HG13	2.41	0.56
1:B:569:ALA:HB1	1:B:599:LEU:HD22	1.87	0.56
1:A:313:THR:O	1:A:316:ASP:HB2	2.06	0.56
1:B:145:ILE:HD13	1:B:301:ILE:CD1	2.35	0.56
1:B:591:PRO:HG2	1:B:598:GLU:HG2	1.86	0.55
1:A:575:ARG:HH22	1:A:592:GLN:NE2	2.05	0.55
1:B:799:THR:N	1:B:800:GLY:HA3	2.21	0.55
1:B:481:HIS:H	1:B:481:HIS:CD2	2.23	0.55
1:B:378:GLU:CD	1:B:396:ARG:HH22	2.10	0.55
1:B:728:SER:N	1:B:729:PRO:CD	2.69	0.55
1:A:212:ILE:HG13	1:A:212:ILE:O	2.07	0.54
1:A:89:ARG:NH2	1:A:120:GLN:HE21	2.06	0.54
1:A:234[A]:THR:CG2	1:A:284:GLY:HA2	2.37	0.54
1:B:103:TRP:H	1:B:357:ASN:ND2	2.06	0.54
1:A:161:VAL:HG11	1:A:299:PHE:HE2	1.73	0.54
1:B:430:LEU:HB2	1:B:431:PRO:HD3	1.90	0.53
1:B:766:ASN:O	1:B:770:THR:CG2	2.55	0.53
1:A:565:SER:HB2	1:A:636:ALA:HB1	1.89	0.53
1:B:106:TYR:CE2	1:B:360:GLY:HA2	2.43	0.53
1:B:355:PHE:HB2	1:B:806:VAL:HG21	1.90	0.53
1:A:158:LYS:HD3	1:A:272:TRP:CD1	2.44	0.53
1:A:594:PRO:HA	1:A:598:GLU:OE1	2.09	0.53
1:B:591:PRO:HD2	1:B:598:GLU:OE2	2.08	0.53
1:A:672:TYR:CZ	1:A:711:SER:HA	2.44	0.53
1:B:786:ASN:ND2	1:B:789:THR:H	2.05	0.52
1:B:485:PRO:HB3	1:B:606:TRP:CE2	2.44	0.52
1:A:451:MET:HE1	1:A:540:LEU:HB3	1.91	0.52
1:B:728:SER:H	1:B:729:PRO:CD	2.22	0.52
1:A:234[A]:THR:HG22	1:A:285:ASN:H	1.75	0.52
1:A:685:PRO:CG	1:A:748:GLN:HE22	2.19	0.52
1:A:130:VAL:HG21	1:A:320:GLU:HB3	1.91	0.52
1:A:77:LYS:HD3	1:A:121:ASN:HA	1.91	0.51
1:A:569:ALA:HB1	1:A:599:LEU:HD22	1.91	0.51
1:A:461:GLN:HE21	1:A:463:LEU:HD21	1.75	0.51
1:B:179:SER:HB3	1:B:185:TYR:CD2	2.45	0.51
1:A:74:MET:HG2	1:A:90:TYR:HB2	1.93	0.51
1:A:456:TRP:CD2	1:A:480:PRO:HA	2.46	0.51
1:A:456:TRP:CE2	1:A:480:PRO:HA	2.46	0.50
1:A:588:TYR:CG	1:A:589:PRO:HD2	2.47	0.50
1:A:161:VAL:HG11	1:A:299:PHE:CE2	2.46	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:456:TRP:CE2	1:B:480:PRO:HA	2.46	0.50
1:A:130:VAL:HG21	1:A:320:GLU:CB	2.41	0.50
1:B:423:TRP:CE3	1:B:485:PRO:HG2	2.46	0.50
1:B:572:TRP:N	1:B:600:HIS:HD2	1.96	0.50
1:A:144:ARG:HB2	1:A:317:LEU:HD21	1.93	0.50
1:A:407:LEU:HD22	1:A:461:GLN:HG3	1.92	0.50
1:B:67:LYS:HG2	1:B:168:GLU:HG2	1.94	0.49
1:B:103:TRP:H	1:B:357:ASN:HD21	1.59	0.49
1:B:451:MET:HE2	1:B:544:GLN:HB2	1.93	0.49
1:A:136:ALA:H	1:A:307:SER:HG	1.59	0.49
1:A:206:THR:OG1	3:A:903:GOL:C3	2.61	0.49
1:B:204:VAL:HB	1:B:302:LEU:HB2	1.95	0.49
1:A:736:TYR:OH	1:A:807:LYS:HE3	2.13	0.49
6:B:903:BTB:H11	6:B:903:BTB:H82	1.95	0.49
1:B:571:ARG:HA	1:B:600:HIS:CD2	2.48	0.48
1:A:411:ILE:HD12	1:A:418:PRO:HA	1.95	0.48
1:B:580:CYS:SG	1:B:583:SER:HB3	2.53	0.48
1:B:672:TYR:CZ	1:B:711:SER:HA	2.48	0.48
1:B:236:PRO:HD2	1:B:239:VAL:CG2	2.43	0.48
1:A:484:ASN:O	1:A:485:PRO:C	2.51	0.48
1:B:588:TYR:O	1:B:590:ARG:HG2	2.14	0.48
1:B:411:ILE:HG13	1:B:411:ILE:O	2.14	0.48
1:B:559:TYR:CD2	1:B:658:ILE:HG13	2.48	0.48
1:A:206:THR:OG1	3:A:903:GOL:H32	2.14	0.48
1:A:234[B]:THR:HA	1:A:285:ASN:OD1	2.14	0.47
1:A:251:LEU:HD13	1:A:275:TYR:HD2	1.79	0.47
1:A:786:ASN:ND2	1:A:788:GLU:H	2.12	0.47
1:B:145:ILE:HD13	1:B:301:ILE:HD12	1.94	0.47
1:B:486:PRO:CD	1:B:606:TRP:HB3	2.44	0.47
1:A:379:TYR:HB3	1:A:481:HIS:CE1	2.49	0.47
1:B:249:GLN:HG2	7:B:1099:HOH:O	2.14	0.47
1:B:181:ASN:HD21	1:B:186:GLU:HG3	1.78	0.47
1:A:685:PRO:HG3	1:A:748:GLN:NE2	2.23	0.47
1:B:89:ARG:CZ	1:B:98:MET:CE	2.92	0.47
1:B:549:ARG:HG2	1:B:570:TYR:OH	2.15	0.47
1:A:110:ARG:HH21	1:A:323:GLN:HG3	1.79	0.47
1:A:485:PRO:HB3	1:A:606:TRP:CE2	2.49	0.47
1:A:601:VAL:HG21	1:A:653:TYR:HB3	1.97	0.47
1:B:486:PRO:HD2	1:B:606:TRP:HB3	1.97	0.47
1:A:233:LEU:HD22	1:B:265:VAL:HG23	1.96	0.46
1:A:672:TYR:CE1	1:A:711:SER:HA	2.50	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:782:TRP:CG	1:B:792:GLY:HA3	2.51	0.46
1:A:423:TRP:H	1:A:484:ASN:HD22	1.62	0.46
1:A:623:ALA:O	1:A:626:ASP:HB2	2.16	0.46
1:B:262:LYS:HB2	1:B:262:LYS:HE2	1.74	0.46
1:B:601:VAL:HG21	1:B:653:TYR:HB3	1.96	0.46
1:A:65:ILE:HD13	1:A:197:ALA:HB1	1.97	0.46
1:A:803:SER:C	1:A:805:VAL:H	2.18	0.46
1:A:728:SER:N	1:A:729:PRO:CD	2.79	0.46
1:A:140:SER:HB3	1:A:303:PHE:O	2.16	0.46
1:B:226:GLY:H	1:B:227:GLN:HE22	1.63	0.45
1:B:798:PHE:C	1:B:800:GLY:HA3	2.36	0.45
1:A:208:GLY:H	3:A:903:GOL:H11	1.81	0.45
1:A:728:SER:OG	1:A:729:PRO:HD3	2.17	0.45
1:A:786:ASN:HD22	1:A:788:GLU:H	1.65	0.45
1:B:672:TYR:CE1	1:B:711:SER:HA	2.51	0.45
1:A:350:PHE:CZ	1:A:805:VAL:HG11	2.51	0.45
1:A:368:HIS:HD2	4:A:905:SO4:O4	2.00	0.45
1:A:428:HIS:O	1:A:431:PRO:HD2	2.17	0.45
1:B:203:LEU:HD11	1:B:301:ILE:HG23	1.99	0.45
1:A:80:SER:OG	1:A:83:ASP:HB3	2.17	0.44
1:A:569:ALA:HB1	1:A:599:LEU:CD2	2.46	0.44
1:B:68:SER:OG	1:B:69:LEU:N	2.49	0.44
1:A:373:ARG:O	1:A:375:TYR:HD2	2.00	0.44
1:A:57:ILE:HG22	1:A:91:THR:HA	2.00	0.44
1:B:620:LEU:HD12	1:B:620:LEU:HA	1.86	0.44
1:A:636:ALA:O	1:A:640:ASN:HB2	2.17	0.44
1:A:89:ARG:CZ	1:A:98:MET:CE	2.96	0.44
1:A:211:VAL:HG12	1:A:294:GLU:HB3	1.99	0.43
1:B:672:TYR:CG	1:B:734:ILE:HG21	2.53	0.43
1:A:745:ILE:HG22	1:A:756:ALA:HB2	2.00	0.43
1:B:712:LEU:HD23	1:B:719:TYR:HA	2.00	0.43
1:B:748:GLN:O	1:B:753:LYS:HD2	2.18	0.43
1:A:565:SER:CB	1:A:636:ALA:HB1	2.49	0.43
1:B:542:ARG:HD3	1:B:630:TYR:OH	2.18	0.43
1:B:49:LEU:O	1:B:63:PRO:HA	2.19	0.43
1:B:437:ILE:HB	1:B:498:ARG:NH2	2.33	0.43
1:A:167:GLN:O	1:A:285:ASN:HB2	2.19	0.43
1:B:441:LEU:HD22	1:B:533:TYR:CE1	2.54	0.43
1:B:707:TYR:CA	1:B:770:THR:HG21	2.49	0.43
1:A:71:THR:HB	1:A:163:PHE:CZ	2.54	0.42
1:A:430:LEU:HB2	1:A:431:PRO:HD3	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:669:HIS:ND1	1:B:716:ASP:OD1	2.35	0.42
1:B:783:GLU:HA	1:B:798:PHE:CD2	2.55	0.42
1:B:786:ASN:CB	1:B:793:GLN:NE2	2.74	0.42
1:A:130:VAL:O	1:A:141:TRP:HA	2.20	0.42
1:A:531:LEU:HD23	1:A:535:ARG:HH22	1.85	0.42
1:A:590:ARG:O	1:A:591:PRO:C	2.58	0.42
1:B:608:GLY:O	1:B:611:VAL:HG12	2.20	0.42
1:B:733:ASN:HB3	1:B:801:TRP:CG	2.54	0.42
1:A:531:LEU:HD23	1:A:535:ARG:NH2	2.35	0.42
1:B:114:GLN:HE22	1:B:414:ARG:HH22	1.68	0.42
1:A:169:GLY:HA3	3:A:904:GOL:H12	2.01	0.41
1:A:106:TYR:CD2	1:A:360:GLY:HA2	2.55	0.41
1:A:545:PHE:CE2	1:A:549:ARG:CD	3.03	0.41
1:B:572:TRP:N	1:B:600:HIS:CD2	2.74	0.41
1:A:437:ILE:HD11	1:A:495:PHE:HB2	2.01	0.41
1:A:803:SER:C	1:A:805:VAL:N	2.74	0.41
1:B:179:SER:HB3	1:B:185:TYR:CE2	2.55	0.41
1:B:181:ASN:ND2	1:B:186:GLU:HG2	2.20	0.41
1:B:369:SER:O	1:B:401:LEU:HA	2.20	0.41
1:B:479:TYR:HA	1:B:480:PRO:HD3	1.82	0.41
1:A:234[A]:THR:HA	1:A:285:ASN:OD1	2.19	0.41
1:B:648:GLU:OE2	1:B:648:GLU:HA	2.20	0.41
1:B:604:MET:HE3	1:B:641:LEU:N	2.36	0.41
1:A:122:GLY:HA3	1:A:153:ALA:HB2	2.03	0.41
1:B:106:TYR:HD2	1:B:359:ILE:HG23	1.85	0.41
1:A:110:ARG:HA	1:A:110:ARG:HD2	1.92	0.41
1:A:451:MET:HE3	1:A:540:LEU:HD22	2.03	0.41
1:A:89:ARG:NE	1:A:98:MET:HE1	2.36	0.41
1:A:177:VAL:HA	1:A:178:PRO:HD3	1.97	0.41
1:B:485:PRO:HA	1:B:486:PRO:HD3	1.96	0.40
1:A:595:HIS:CE1	1:A:658:ILE:HG12	2.57	0.40
1:B:376:ALA:HA	1:B:377:PRO:HD2	1.90	0.40
1:B:736:TYR:HB3	1:B:804:LEU:HD13	2.03	0.40
1:B:194:ARG:CG	1:B:194:ARG:HH11	2.34	0.40
1:B:95:ASN:HD22	1:B:97:GLY:H	1.68	0.40
1:B:494:ASN:O	1:B:497:GLU:HB3	2.21	0.40
1:B:690:LEU:O	1:B:694:LEU:HG	2.21	0.40
1:A:106:TYR:HD2	1:A:359:ILE:HG23	1.85	0.40
1:A:220:SER:HA	1:A:224:GLY:O	2.22	0.40
1:A:234[B]:THR:HG21	1:B:268:PRO:HG3	2.03	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	760/819 (93%)	729 (96%)	30 (4%)	1 (0%)	51 81
1	B	759/819 (93%)	736 (97%)	22 (3%)	1 (0%)	51 81
All	All	1519/1638 (93%)	1465 (96%)	52 (3%)	2 (0%)	51 81

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	728	SER
1	B	728	SER

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	626/707 (88%)	594 (95%)	32 (5%)	24 55
1	B	631/707 (89%)	601 (95%)	30 (5%)	25 58
All	All	1257/1414 (89%)	1195 (95%)	62 (5%)	25 57

All (62) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	45	ASN
1	A	93	GLU
1	A	98	MET
1	A	202	LYS

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Mol	Chain	Res	Type
1	A	212	ILE
1	A	218	ASP
1	A	237	ASP
1	A	264	ASP
1	A	307	SER
1	A	322	LYS
1	A	343	GLN
1	A	417	PHE
1	A	423	TRP
1	A	438	ASP
1	A	459	ARG
1	A	470	LYS
1	A	531	LEU
1	A	550	LYS
1	A	558	SER
1	A	575	ARG
1	A	611	VAL
1	A	616	SER
1	A	631	THR
1	A	657	THR
1	A	658	ILE
1	A	674	SER
1	A	676	PHE
1	A	692	LYS
1	A	725	TYR
1	A	795	THR
1	A	805	VAL
1	A	807	LYS
1	B	95	ASN
1	B	99	LYS
1	B	105	GLU
1	B	126	THR
1	B	194	ARG
1	B	227	GLN
1	B	244	LYS
1	B	262	LYS
1	B	283	SER
1	B	304	SER
1	B	323	GLN
1	B	369	SER
1	B	417	PHE
1	B	423	TRP

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Mol	Chain	Res	Type
1	B	438	ASP
1	B	449	ASN
1	B	459	ARG
1	B	518	THR
1	B	520	SER
1	B	567	LYS
1	B	575	ARG
1	B	632	LYS
1	B	657	THR
1	B	674	SER
1	B	676	PHE
1	B	711	SER
1	B	725	TYR
1	B	758	ASP
1	B	770	THR
1	B	801	TRP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (40) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	120	GLN
1	A	157	GLN
1	A	167	GLN
1	A	231	GLN
1	A	242	GLN
1	A	249	GLN
1	A	250	GLN
1	A	323	GLN
1	A	368	HIS
1	A	397	HIS
1	A	398	GLN
1	A	461	GLN
1	A	484	ASN
1	A	592	GLN
1	A	600	HIS
1	A	639	HIS
1	A	748	GLN
1	A	786	ASN
1	A	793	GLN
1	B	95	ASN
1	B	114	GLN
1	B	120	GLN

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Mol	Chain	Res	Type
1	B	137	HIS
1	B	167	GLN
1	B	181	ASN
1	B	217	HIS
1	B	227	GLN
1	B	249	GLN
1	B	323	GLN
1	B	357	ASN
1	B	368	HIS
1	B	461	GLN
1	B	481	HIS
1	B	484	ASN
1	B	600	HIS
1	B	639	HIS
1	B	664	HIS
1	B	748	GLN
1	B	786	ASN
1	B	793	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates

There are no monosaccharides in this entry.

5.6 Ligand geometry

19 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	$\#\|Z\| > 2$
3	GOL	A	904	-	5,5,5	0.14	0	5,5,5	0.37	0
2	WV5	A	901	-	21,25,25	3.55	5 (23%)	26,32,32	1.65	6 (23%)
4	SO4	B	907	-	4,4,4	0.29	0	6,6,6	0.22	0
4	SO4	A	908	-	4,4,4	0.31	0	6,6,6	0.23	0
4	SO4	B	906	-	4,4,4	0.31	0	6,6,6	0.28	0
4	SO4	A	910	-	4,4,4	0.32	0	6,6,6	0.08	0
4	SO4	B	905	-	4,4,4	0.51	0	6,6,6	0.35	0
4	SO4	A	906	-	4,4,4	0.39	0	6,6,6	0.23	0
6	BTB	B	903	-	13,13,13	0.42	0	7,16,16	0.31	0
4	SO4	B	904	-	4,4,4	0.38	0	6,6,6	0.31	0
4	SO4	A	909	-	4,4,4	0.33	0	6,6,6	0.09	0
4	SO4	A	907	-	4,4,4	0.34	0	6,6,6	0.09	0
4	SO4	A	911	-	4,4,4	0.29	0	6,6,6	0.12	0
3	GOL	A	903	-	5,5,5	0.13	0	5,5,5	0.30	0
2	WV5	B	901	-	21,25,25	3.06	4 (19%)	26,32,32	1.86	6 (23%)
4	SO4	A	905	-	4,4,4	0.40	0	6,6,6	0.25	0
3	GOL	A	902	-	5,5,5	0.21	0	5,5,5	0.34	0
5	NAG	B	902	1	14,14,15	0.95	0	17,19,21	1.47	3 (17%)
4	SO4	B	908	-	4,4,4	0.34	0	6,6,6	0.13	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
3	GOL	A	904	-	-	2/4/4/4	-
2	WV5	A	901	-	-	5/12/33/33	0/2/2/2
5	NAG	B	902	1	-	2/6/23/26	0/1/1/1
3	GOL	A	903	-	-	2/4/4/4	-
2	WV5	B	901	-	-	8/12/33/33	0/2/2/2
3	GOL	A	902	-	-	2/4/4/4	-
6	BTB	B	903	-	-	8/21/21/21	-

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	901	WV5	C5-N1	-14.39	1.21	1.47
2	B	901	WV5	C5-N1	-12.29	1.25	1.47
2	A	901	WV5	C18-C1	-5.17	1.44	1.52
2	B	901	WV5	C18-C1	-3.20	1.47	1.52
2	A	901	WV5	O1-C1	3.03	1.50	1.43
2	B	901	WV5	O1-C1	2.75	1.49	1.43
2	A	901	WV5	C17-C18	2.47	1.55	1.52
2	A	901	WV5	C2-C1	-2.45	1.46	1.52
2	B	901	WV5	C4-C3	2.21	1.56	1.52

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	901	WV5	C4-C3-C2	-4.88	105.42	112.90
2	B	901	WV5	C4-C3-C2	-4.34	106.25	112.90
2	B	901	WV5	O1-C1-C2	-3.77	101.64	110.35
5	B	902	NAG	C2-N2-C7	3.47	127.84	122.90
2	B	901	WV5	C11-C12-C13	3.22	123.17	113.10
2	B	901	WV5	C6-C5-N1	3.18	122.58	113.88
2	A	901	WV5	C18-C17-N1	-3.03	105.14	110.54
2	B	901	WV5	C1-C2-C3	2.78	116.06	111.37
2	B	901	WV5	O5-C18-C1	2.76	115.67	110.14
2	A	901	WV5	C17-C18-C1	2.57	113.17	110.24
2	A	901	WV5	O2-C2-C1	-2.28	105.08	110.35
5	B	902	NAG	C1-O5-C5	2.26	115.26	112.19
2	A	901	WV5	C14-C15-C16	-2.13	105.33	112.92
2	A	901	WV5	O3-C4-C3	-2.07	106.98	111.42
5	B	902	NAG	C3-C4-C5	-2.03	106.61	110.24

There are no chirality outliers.

All (29) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	901	WV5	C6-C5-N1-C3
2	B	901	WV5	C10-C11-C12-C13
3	A	902	GOL	O1-C1-C2-C3
3	A	903	GOL	O1-C1-C2-O2
3	A	903	GOL	O1-C1-C2-C3
3	A	904	GOL	C1-C2-C3-O3
6	B	903	BTB	O1-C1-C2-C3
6	B	903	BTB	O1-C1-C2-C4
6	B	903	BTB	C1-C2-C3-O3

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Mol	Chain	Res	Type	Atoms
6	B	903	BTB	C4-C2-C3-O3
6	B	903	BTB	N-C2-C3-O3
2	B	901	WV5	N1-C5-C6-C7
3	A	902	GOL	O1-C1-C2-O2
2	A	901	WV5	C10-C11-C12-C13
5	B	902	NAG	C8-C7-N2-C2
2	A	901	WV5	C9-C10-C11-C12
2	A	901	WV5	C7-C8-C9-C10
2	B	901	WV5	C9-C10-C11-C12
3	A	904	GOL	O2-C2-C3-O3
6	B	903	BTB	N-C5-C6-O6
5	B	902	NAG	O7-C7-N2-C2
2	A	901	WV5	C6-C7-C8-C9
2	B	901	WV5	C11-C10-C9-C8
6	B	903	BTB	N-C7-C8-O8
2	B	901	WV5	C6-C7-C8-C9
2	B	901	WV5	C6-C5-N1-C17
6	B	903	BTB	O1-C1-C2-N
2	B	901	WV5	C5-C6-C7-C8
2	A	901	WV5	C11-C10-C9-C8

There are no ring outliers.

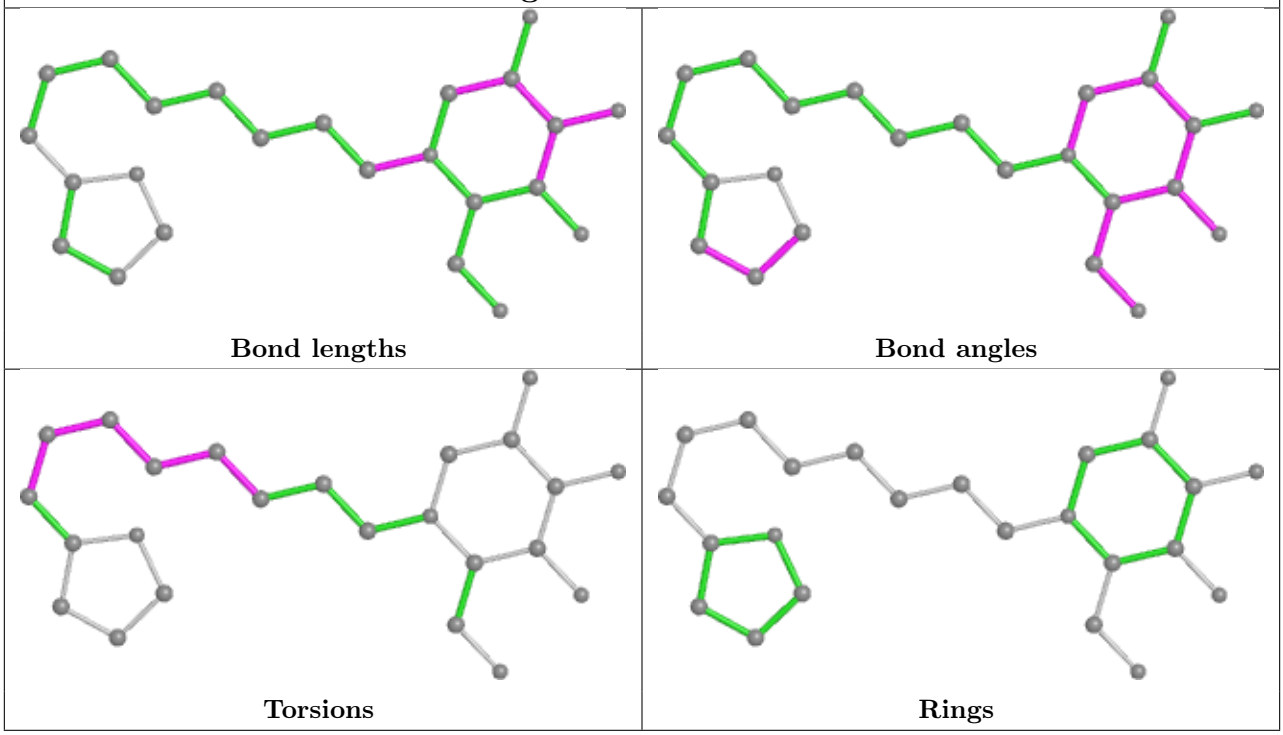
7 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	904	GOL	1	0
4	A	906	SO4	2	0
6	B	903	BTB	1	0
4	B	904	SO4	1	0
3	A	903	GOL	4	0
4	A	905	SO4	1	0
3	A	902	GOL	1	0

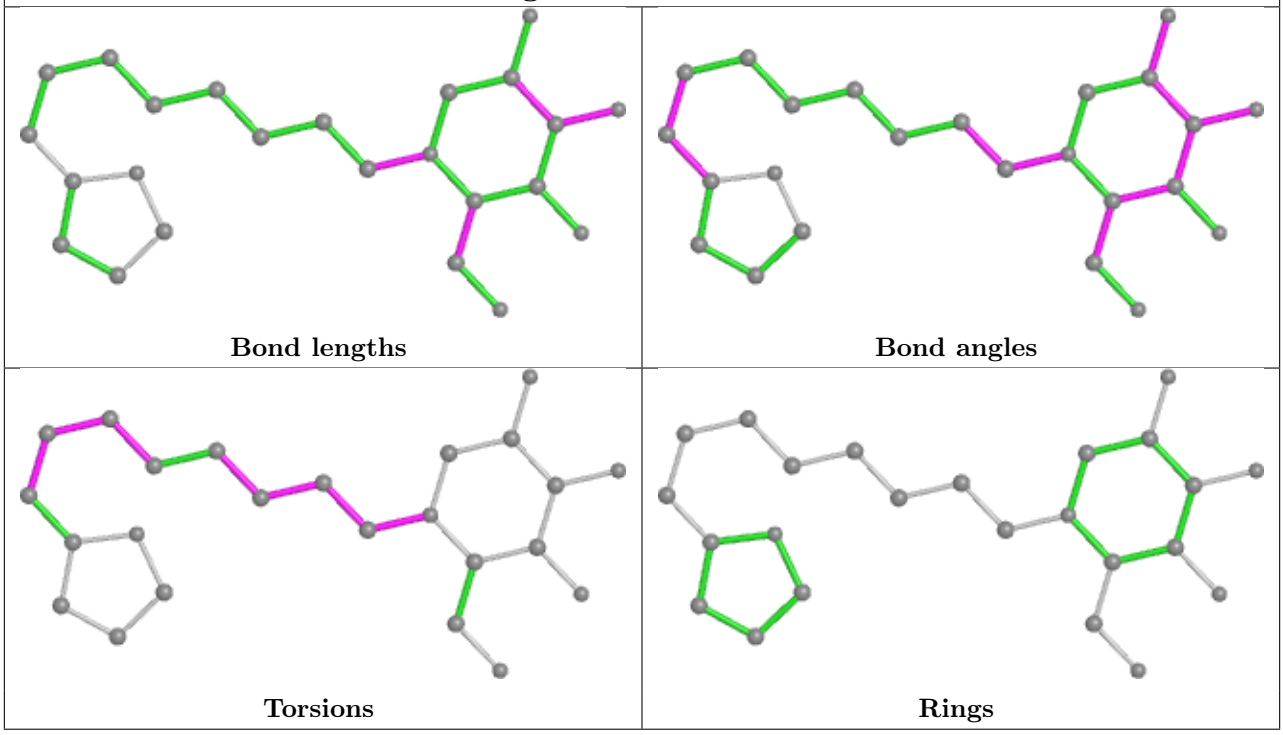
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and

any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand WV5 A 901



Ligand WV5 B 901



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	763/819 (93%)	-0.44	13 (1%) 70 63	19, 34, 62, 104	0
1	B	763/819 (93%)	-0.53	0 100 100	17, 32, 52, 81	0
All	All	1526/1638 (93%)	-0.49	13 (0%) 84 80	17, 34, 57, 104	0

All (13) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	518	THR	3.2
1	A	43	LEU	3.0
1	A	515	LEU	3.0
1	A	40	ILE	2.8
1	A	516	ASP	2.8
1	A	39	GLU	2.7
1	A	621	LEU	2.7
1	A	619	SER	2.5
1	A	306	GLU	2.3
1	A	560	ASP	2.2
1	A	535	ARG	2.2
1	A	519	LEU	2.1
1	A	623	ALA	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

There are no monosaccharides in this entry.

6.4 Ligands (i)

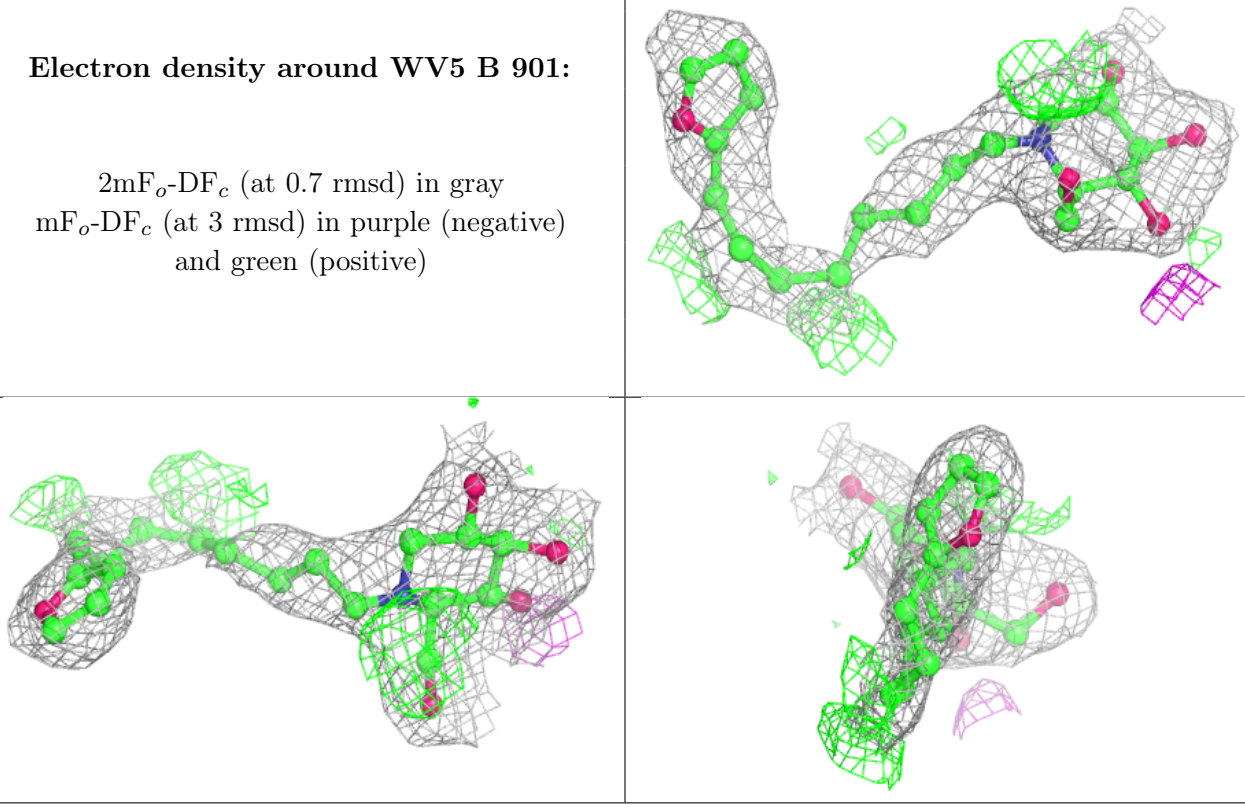
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' 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
6	BTB	B	903	14/14	0.87	0.24	50,62,64,68	0
4	SO4	A	910	5/5	0.89	0.26	96,105,112,113	0
5	NAG	B	902	14/15	0.89	0.23	49,66,70,80	0
3	GOL	A	902	6/6	0.89	0.33	41,54,60,60	0
3	GOL	A	904	6/6	0.90	0.28	54,74,75,79	0
4	SO4	A	911	5/5	0.92	0.21	74,76,81,84	0
3	GOL	A	903	6/6	0.93	0.25	49,53,63,74	0
4	SO4	A	909	5/5	0.93	0.48	97,97,101,105	0
4	SO4	A	908	5/5	0.94	0.16	74,80,94,95	0
4	SO4	B	904	5/5	0.94	0.16	57,65,72,84	0
2	WV5	B	901	24/24	0.96	0.18	19,34,68,73	0
4	SO4	B	908	5/5	0.97	0.19	64,64,70,73	0
4	SO4	A	906	5/5	0.97	0.11	59,66,71,73	0
4	SO4	B	907	5/5	0.97	0.11	57,63,69,70	0
4	SO4	A	905	5/5	0.98	0.18	34,35,39,39	0
4	SO4	B	906	5/5	0.98	0.14	51,59,67,67	0
2	WV5	A	901	24/24	0.98	0.19	19,22,78,82	0
4	SO4	B	905	5/5	0.99	0.12	33,35,42,46	0
4	SO4	A	907	5/5	0.99	0.13	48,56,63,63	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

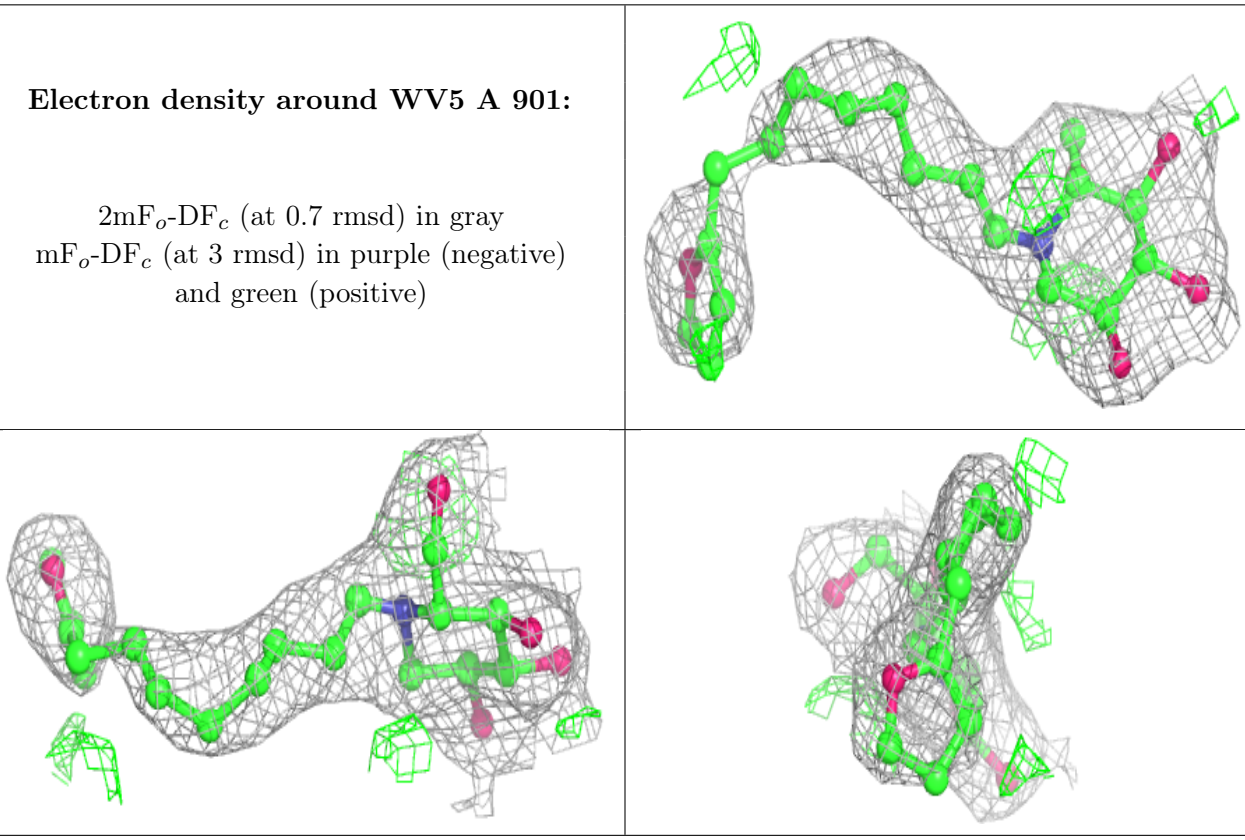
Electron density around WV5 B 901:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



Electron density around WV5 A 901:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



6.5 Other polymers (i)

There are no such residues in this entry.