



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 04:15 PM UTC

PDB ID : 8EUT / pdb_00008eut
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 ⓘ 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 : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

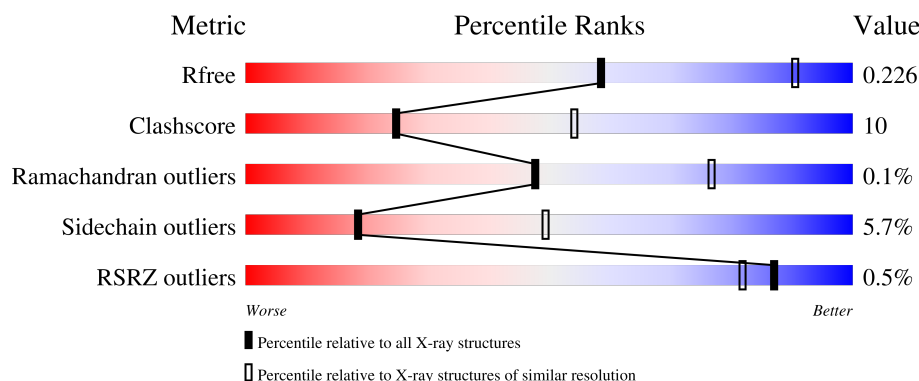
1 Overall quality at a glance

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}	180053	3866 (2.80-2.80)
Clashscore	190562	4276 (2.80-2.80)
Ramachandran outliers	187476	4196 (2.80-2.80)
Sidechain outliers	187428	4198 (2.80-2.80)
RSRZ outliers	180081	3869 (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 $\leq 5\%$. 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	71% 20% • 7%
1	B	819	72% 19% • 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

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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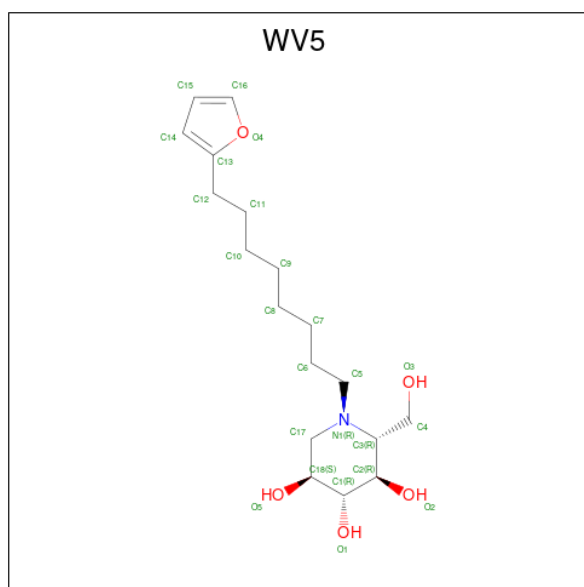
Chain	Residue	Modelled	Actual	Comment	Reference
A	24	CYS	-	expression tag	UNP G0SFD1
A	25	VAL	-	expression tag	UNP G0SFD1
A	26	ALA	-	expression tag	UNP G0SFD1
A	27	GLU	-	expression tag	UNP G0SFD1
A	28	THR	-	expression tag	UNP G0SFD1
A	29	GLY	-	expression tag	UNP G0SFD1
A	810	SER	-	expression tag	UNP 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 (CCD ID: WV5) (formula: C₁₈H₃₁NO₅) (labeled as "Ligand of Interest" by depositor).



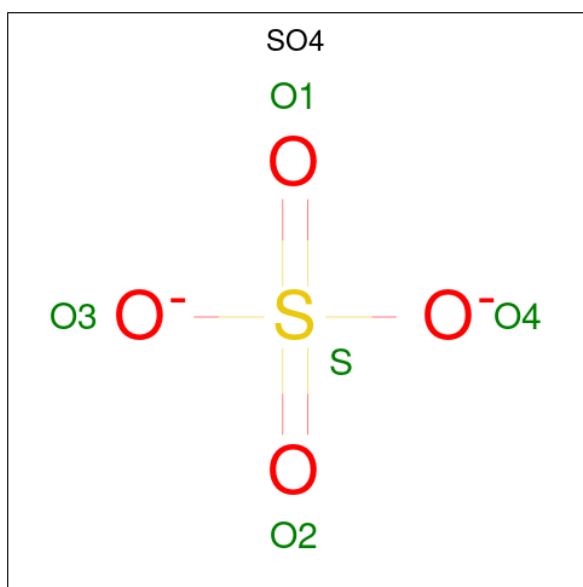
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			24	18	1	5		
2	B	1	Total	C	N	O	0	0
			24	18	1	5		

- Molecule 3 is GLYCEROL (CCD ID: GOL) (formula: C₃H₈O₃).



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 (CCD ID: SO4) (formula: O₄S).



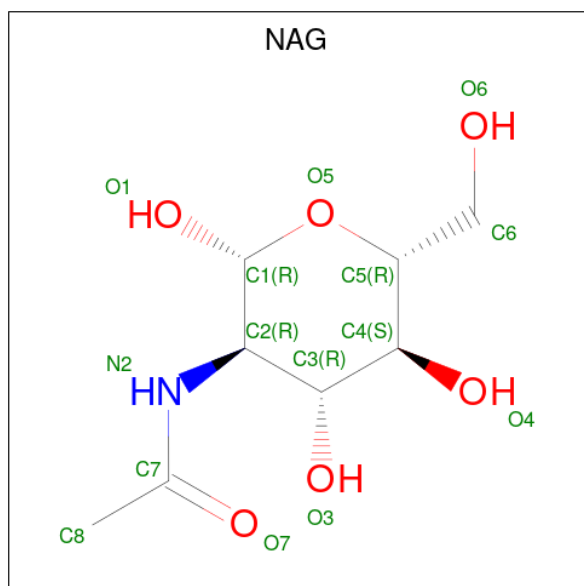
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	O	S	0	0
			5	4	1		

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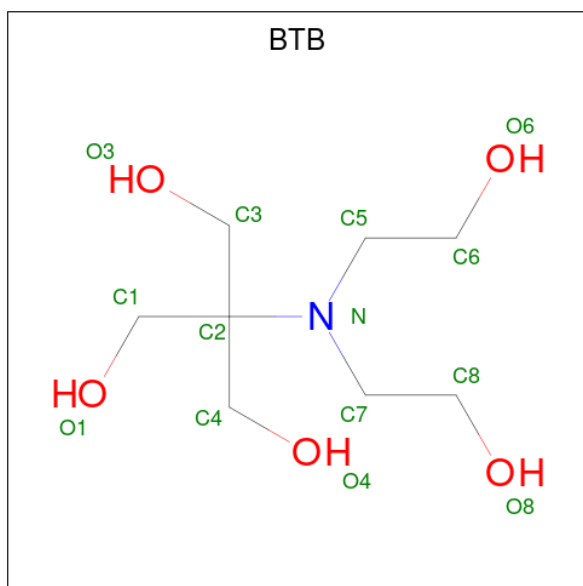
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	O	S	0	0
			5	4	1		
4	A	1	Total	O	S	0	0
			5	4	1		
4	A	1	Total	O	S	0	0
			5	4	1		
4	A	1	Total	O	S	0	0
			5	4	1		
4	A	1	Total	O	S	0	0
			5	4	1		
4	B	1	Total	O	S	0	0
			5	4	1		
4	B	1	Total	O	S	0	0
			5	4	1		
4	B	1	Total	O	S	0	0
			5	4	1		
4	B	1	Total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

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: 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-PROPAN E-1,3-DIOL (CCD ID: BTB) (formula: C₈H₁₉NO₅).



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

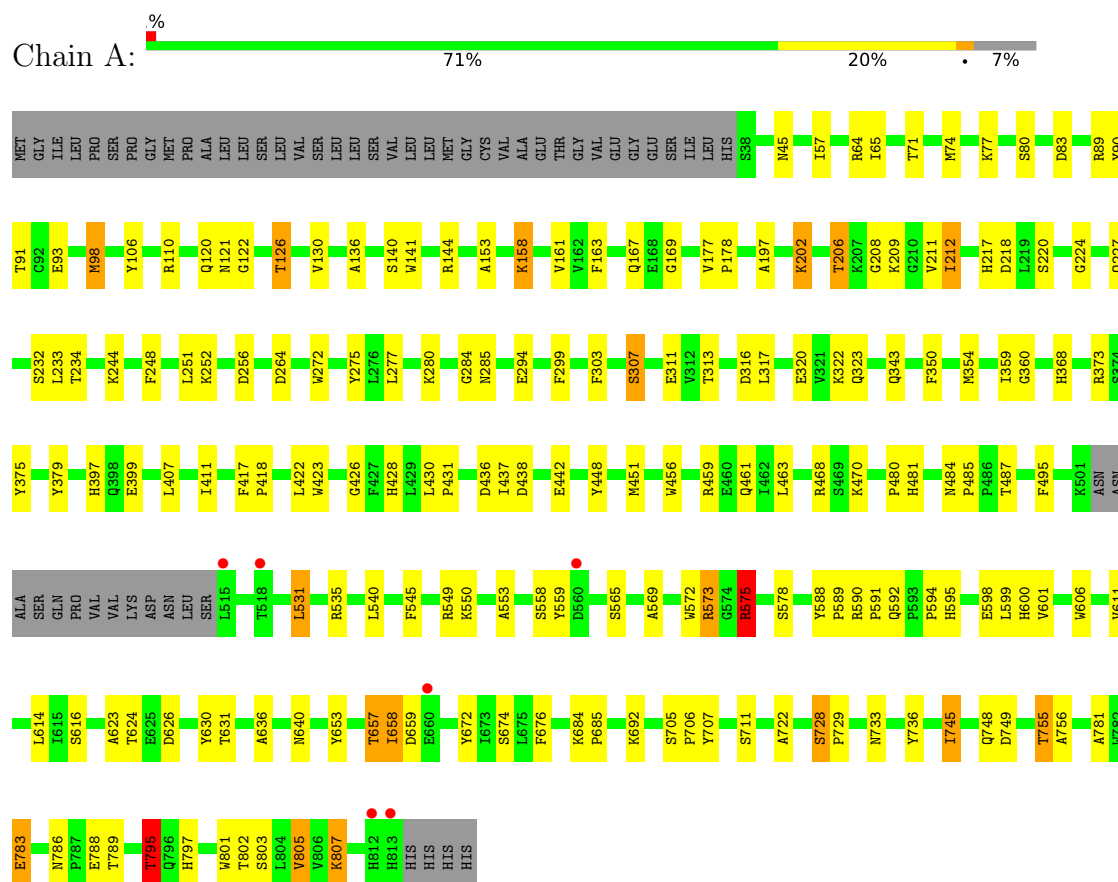
- Molecule 7 is water.

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

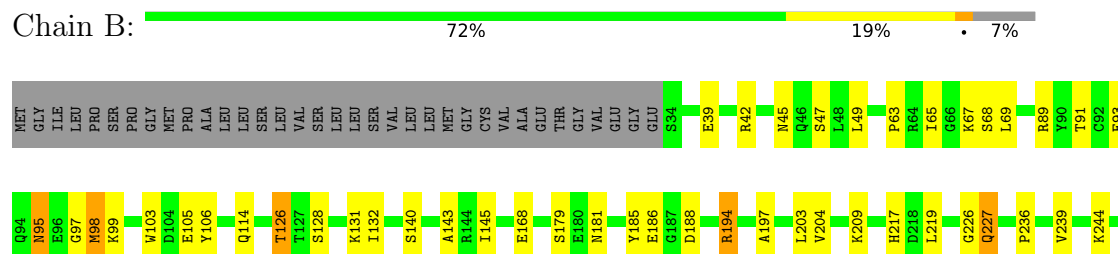
3 Residue-property plots

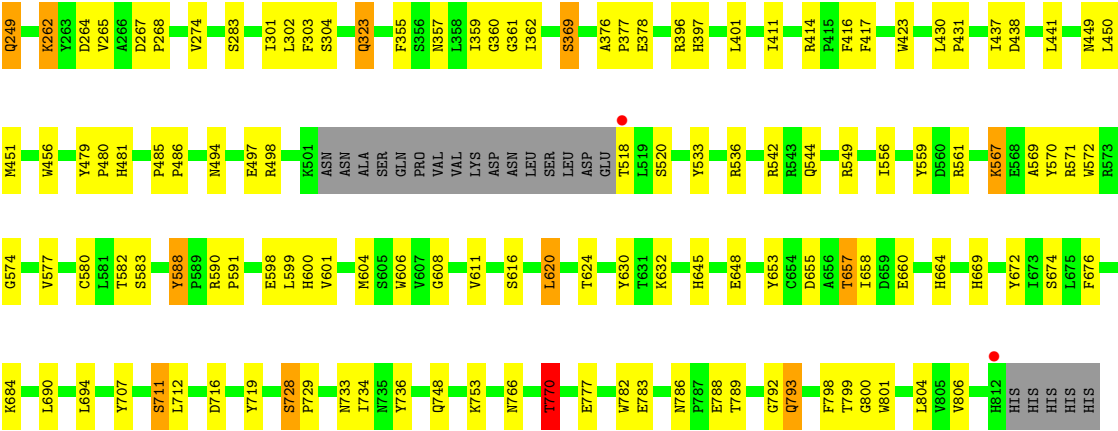
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density.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



• Molecule 1: Chaetomium alpha glucosidase





4 Data and refinement statistics

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 46.71 – 2.81	Depositor EDS
% Data completeness (in resolution range)	99.5 (46.71-2.80) 99.5 (46.71-2.81)	Depositor EDS
R_{merge}	0.16	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ 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 (5.05%)	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)	0.35 , 36.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.010 for -h,-l,-k	Xtriage
F_o, F_c correlation	0.95	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.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: WV5, GOL, NAG, SO4, BTB

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	0.65	1/6231 (0.0%)	1.25	21/8483 (0.2%)
1	B	0.69	1/6246 (0.0%)	1.25	23/8501 (0.3%)
All	All	0.67	2/12477 (0.0%)	1.25	44/16984 (0.3%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	397	HIS	CE1-NE2	5.76	1.38	1.32
1	A	797	HIS	CE1-NE2	5.16	1.37	1.32

All (44) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	684	LYS	CB-CA-C	10.71	125.17	109.11
1	A	624	THR	CA-CB-OG1	-9.72	95.02	109.60
1	B	45	ASN	CB-CA-C	9.44	125.49	110.96
1	B	126	THR	CA-CB-OG1	-8.82	96.37	109.60
1	A	802	THR	CA-CB-OG1	-8.80	96.40	109.60
1	B	624	THR	CA-CB-OG1	-8.54	96.78	109.60
1	B	567	LYS	CB-CA-C	8.45	123.50	109.56
1	A	575	ARG	CB-CA-C	8.41	123.41	109.53
1	A	659	ASP	CB-CA-C	-7.79	93.93	111.30
1	B	770	THR	CB-CA-C	7.37	122.45	110.88
1	A	126	THR	CA-CB-OG1	-6.81	99.38	109.60
1	A	657	THR	CB-CA-C	-6.49	98.27	114.11
1	A	248	PHE	CB-CA-C	6.47	122.60	110.63
1	B	536	ARG	CG-CD-NE	-6.29	98.15	112.00
1	A	749	ASP	CB-CA-C	6.26	119.66	109.90
1	A	217	HIS	CA-C-N	5.95	128.85	120.28
1	A	217	HIS	C-N-CA	5.95	128.85	120.28

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	39	GLU	CB-CA-C	5.85	120.14	110.90
1	A	706	PRO	N-CA-C	-5.83	106.47	113.98
1	B	416	PHE	CA-C-N	-5.75	116.65	122.74
1	B	416	PHE	C-N-CA	-5.75	116.65	122.74
1	A	436	ASP	CA-CB-CG	5.69	118.29	112.60
1	B	574	GLY	CA-C-N	-5.68	110.61	122.03
1	B	574	GLY	C-N-CA	-5.68	110.61	122.03
1	B	588	TYR	CB-CA-C	5.62	118.45	109.62
1	A	795	THR	CB-CA-C	5.58	118.74	109.53
1	B	793	GLN	CB-CA-C	-5.58	98.24	110.67
1	B	556	ILE	CA-C-N	5.54	127.71	120.28
1	B	556	ILE	C-N-CA	5.54	127.71	120.28
1	B	264	ASP	CA-CB-CG	5.47	118.08	112.60
1	A	684	LYS	CB-CA-C	5.45	117.97	109.42
1	B	582	THR	CA-CB-OG1	-5.40	101.49	109.60
1	B	188	ASP	CA-CB-CG	5.40	118.00	112.60
1	B	209	LYS	CB-CA-C	5.37	119.62	109.37
1	A	209	LYS	CB-CA-C	5.36	118.49	109.48
1	B	657	THR	CB-CA-C	-5.31	99.86	110.42
1	A	722	ALA	CB-CA-C	-5.27	110.51	116.63
1	A	755	THR	CB-CA-C	-5.24	102.65	110.88
1	B	323	GLN	CB-CA-C	5.21	119.12	110.90
1	A	158	LYS	CB-CA-C	5.20	118.90	110.22
1	A	448	TYR	CB-CA-C	5.15	120.55	110.67
1	A	783	GLU	CB-CG-CD	5.10	121.27	112.60
1	B	91	THR	CB-CA-C	5.09	118.21	109.51
1	A	206	THR	CA-CB-OG1	-5.08	101.97	109.60

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	123	0
1	B	6070	0	5733	113	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
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	234	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 10.

All (234) 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
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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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: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:B:451:MET:HE1	1:B:544:GLN:HB2	1.78	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:354:MET:HE1	1:A:781:ALA:HB2	1.83	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:B:378:GLU:CD	1:B:396:ARG:HH22	2.10	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
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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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: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:484:ASN:O	1:A:485:PRO:C	2.51	0.53
1:A:672:TYR:CZ	1:A:711:SER:HA	2.44	0.53
1:A:451:MET:HE1	1:A:540:LEU:HB3	1.90	0.52
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: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:B:451:MET:HE2	1:B:544:GLN:HB2	1.92	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
1:B:456:TRP:CE2	1:B:480:PRO:HA	2.46	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:130:VAL:HG21	1:A:320:GLU:CB	2.41	0.50
1:A:803:SER:C	1:A:805:VAL:H	2.18	0.50
1:B:423:TRP:CE3	1:B:485:PRO:HG2	2.46	0.50
1:A:354:MET:HE1	1:A:781:ALA:CB	2.41	0.50
1:B:798:PHE:C	1:B:800:GLY:HA3	2.36	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: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:B:588:TYR:O	1:B:590:ARG:HG2	2.14	0.48
1:B:411:ILE:O	1:B:411:ILE:HG13	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:590:ARG:O	1:A:591:PRO:C	2.58	0.47
1:A:233:LEU:HD22	1:B:265:VAL:HG23	1.96	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:672:TYR:CE1	1:A:711:SER:HA	2.50	0.46
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:N	2.74	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:47:SER:O	1:B:131:LYS:NZ	2.40	0.45
1:B:226:GLY:H	1:B:227:GLN:HE22	1.63	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:B:604:MET:HE2	1:B:645:HIS:CD2	2.53	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:705:SER:C	1:A:707:TYR:H	2.27	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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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
1:B:67:LYS:HG2	1:B:168:GLU:CD	2.44	0.42
1:B:361:GLY:O	1:B:362:ILE:C	2.62	0.42
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: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:232:SER:C	1:A:233:LEU:HD23	2.46	0.41
1:A:437:ILE:HD11	1:A:495:PHE:HB2	2.01	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: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:B:98:MET:HE3	1:B:98:MET:HB2	1.74	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:98:MET:HE3	1:A:98:MET:HB2	1.87	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:A:227:GLN:N	1:A:227:GLN:CD	2.79	0.40
1:A:451:MET:HE3	1:A:540:LEU:HD22	2.03	0.40
1:B:95:ASN:HD22	1:B:97:GLY:H	1.68	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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%)	48	77
1	B	759/819 (93%)	736 (97%)	22 (3%)	1 (0%)	48	77
All	All	1519/1638 (93%)	1465 (96%)	52 (3%)	2 (0%)	48	77

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%)	590 (94%)	36 (6%)	18	49
1	B	631/707 (89%)	596 (94%)	35 (6%)	19	51
All	All	1257/1414 (89%)	1186 (94%)	71 (6%)	18	50

All (71) 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	126	THR
1	A	202	LYS
1	A	212	ILE
1	A	218	ASP
1	A	244	LYS
1	A	252	LYS
1	A	264	ASP
1	A	280	LYS
1	A	307	SER
1	A	322	LYS
1	A	343	GLN
1	A	417	PHE
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	573	ARG
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	745	ILE
1	A	755	THR
1	A	795	THR
1	A	805	VAL

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Mol	Chain	Res	Type
1	A	807	LYS
1	B	42	ARG
1	B	93	GLU
1	B	95	ASN
1	B	98	MET
1	B	99	LYS
1	B	105	GLU
1	B	126	THR
1	B	132	ILE
1	B	194	ARG
1	B	227	GLN
1	B	244	LYS
1	B	249	GLN
1	B	262	LYS
1	B	274	VAL
1	B	283	SER
1	B	304	SER
1	B	323	GLN
1	B	369	SER
1	B	417	PHE
1	B	438	ASP
1	B	449	ASN
1	B	518	THR
1	B	520	SER
1	B	567	LYS
1	B	577	VAL
1	B	616	SER
1	B	620	LEU
1	B	632	LYS
1	B	657	THR
1	B	660	GLU
1	B	674	SER
1	B	676	PHE
1	B	711	SER
1	B	770	THR
1	B	777	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (44) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	85	GLN
1	A	120	GLN

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Mol	Chain	Res	Type
1	A	157	GLN
1	A	167	GLN
1	A	242	GLN
1	A	249	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	85	GLN
1	B	95	ASN
1	B	114	GLN
1	B	137	HIS
1	B	167	GLN
1	B	181	ASN
1	B	214	GLN
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	397	HIS
1	B	398	GLN
1	B	461	GLN
1	B	476	GLN
1	B	481	HIS
1	B	484	ASN
1	B	544	GLN
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 oligosaccharides 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$
4	SO4	B	908	-	4,4,4	0.29	0	6,6,6	0.13	0
3	GOL	A	904	-	5,5,5	0.15	0	5,5,5	0.37	0
5	NAG	B	902	1	14,14,15	0.95	0	17,19,21	1.49	2 (11%)
4	SO4	B	904	-	4,4,4	0.40	0	6,6,6	0.35	0
2	WV5	B	901	-	25,25,25	2.97	6 (24%)	31,32,32	2.24	10 (32%)
4	SO4	A	908	-	4,4,4	0.27	0	6,6,6	0.25	0
4	SO4	A	905	-	4,4,4	0.31	0	6,6,6	0.24	0
3	GOL	A	903	-	5,5,5	0.14	0	5,5,5	0.30	0
4	SO4	A	907	-	4,4,4	0.31	0	6,6,6	0.11	0
4	SO4	B	905	-	4,4,4	0.40	0	6,6,6	0.34	0
6	BTB	B	903	-	13,13,13	0.45	0	7,16,16	0.36	0
2	WV5	A	901	-	25,25,25	3.41	9 (36%)	31,32,32	1.62	7 (22%)
4	SO4	B	906	-	4,4,4	0.30	0	6,6,6	0.22	0
4	SO4	B	907	-	4,4,4	0.31	0	6,6,6	0.18	0
3	GOL	A	902	-	5,5,5	0.22	0	5,5,5	0.35	0
4	SO4	A	909	-	4,4,4	0.30	0	6,6,6	0.08	0
4	SO4	A	910	-	4,4,4	0.30	0	6,6,6	0.09	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	SO4	A	906	-	4,4,4	0.30	0	6,6,6	0.24	0
4	SO4	A	911	-	4,4,4	0.32	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
6	BTB	B	903	-	-	8/21/21/21	-
2	WV5	A	901	-	-	6/13/33/33	0/2/2/2
3	GOL	A	902	-	-	2/4/4/4	-
3	GOL	A	904	-	-	2/4/4/4	-
5	NAG	B	902	1	-	2/6/23/26	0/1/1/1
2	WV5	B	901	-	-	8/13/33/33	0/2/2/2
3	GOL	A	903	-	-	2/4/4/4	-

All (15) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	901	WV5	C5-N1	-14.67	1.21	1.47
2	B	901	WV5	C5-N1	-12.52	1.25	1.47
2	A	901	WV5	C18-C1	-4.96	1.44	1.52
2	B	901	WV5	C12-C13	3.34	1.58	1.49
2	B	901	WV5	C18-C1	-3.05	1.47	1.52
2	A	901	WV5	O1-C1	2.89	1.50	1.43
2	A	901	WV5	C14-C13	2.71	1.42	1.34
2	B	901	WV5	O1-C1	2.62	1.49	1.43
2	A	901	WV5	C17-C18	2.59	1.55	1.52
2	A	901	WV5	C15-C16	2.50	1.41	1.32
2	B	901	WV5	C14-C13	2.42	1.41	1.34
2	A	901	WV5	C2-C1	-2.41	1.46	1.52
2	B	901	WV5	C4-C3	2.17	1.56	1.52
2	A	901	WV5	O4-C16	-2.14	1.30	1.37
2	A	901	WV5	C12-C13	2.05	1.55	1.49

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	901	WV5	C16-O4-C13	5.22	116.62	106.22

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	901	WV5	C4-C3-C2	-4.99	105.42	112.93
2	B	901	WV5	C11-C12-C13	4.72	123.17	113.49
2	B	901	WV5	C4-C3-C2	-4.44	106.25	112.93
2	B	901	WV5	O1-C1-C2	-3.70	101.64	110.38
5	B	902	NAG	C2-N2-C7	3.69	127.84	122.90
2	B	901	WV5	C6-C5-N1	3.20	122.58	113.88
2	B	901	WV5	O4-C13-C14	-3.16	103.83	109.61
2	A	901	WV5	C18-C17-N1	-3.00	105.14	110.72
2	B	901	WV5	O4-C13-C12	2.97	128.97	115.17
2	B	901	WV5	C1-C2-C3	2.78	116.06	111.37
2	B	901	WV5	O5-C18-C1	2.67	115.67	110.15
2	B	901	WV5	O4-C16-C15	-2.62	105.77	110.44
2	A	901	WV5	C12-C13-C14	-2.61	124.58	134.45
2	A	901	WV5	C17-C18-C1	2.53	113.17	110.17
5	B	902	NAG	C1-O5-C5	2.29	115.26	112.19
2	A	901	WV5	O2-C2-C1	-2.25	105.08	110.38
2	A	901	WV5	O3-C4-C3	-2.07	106.98	111.55
2	A	901	WV5	O4-C13-C12	2.06	124.77	115.17

There are no chirality outliers.

All (30) torsion outliers are listed below:

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

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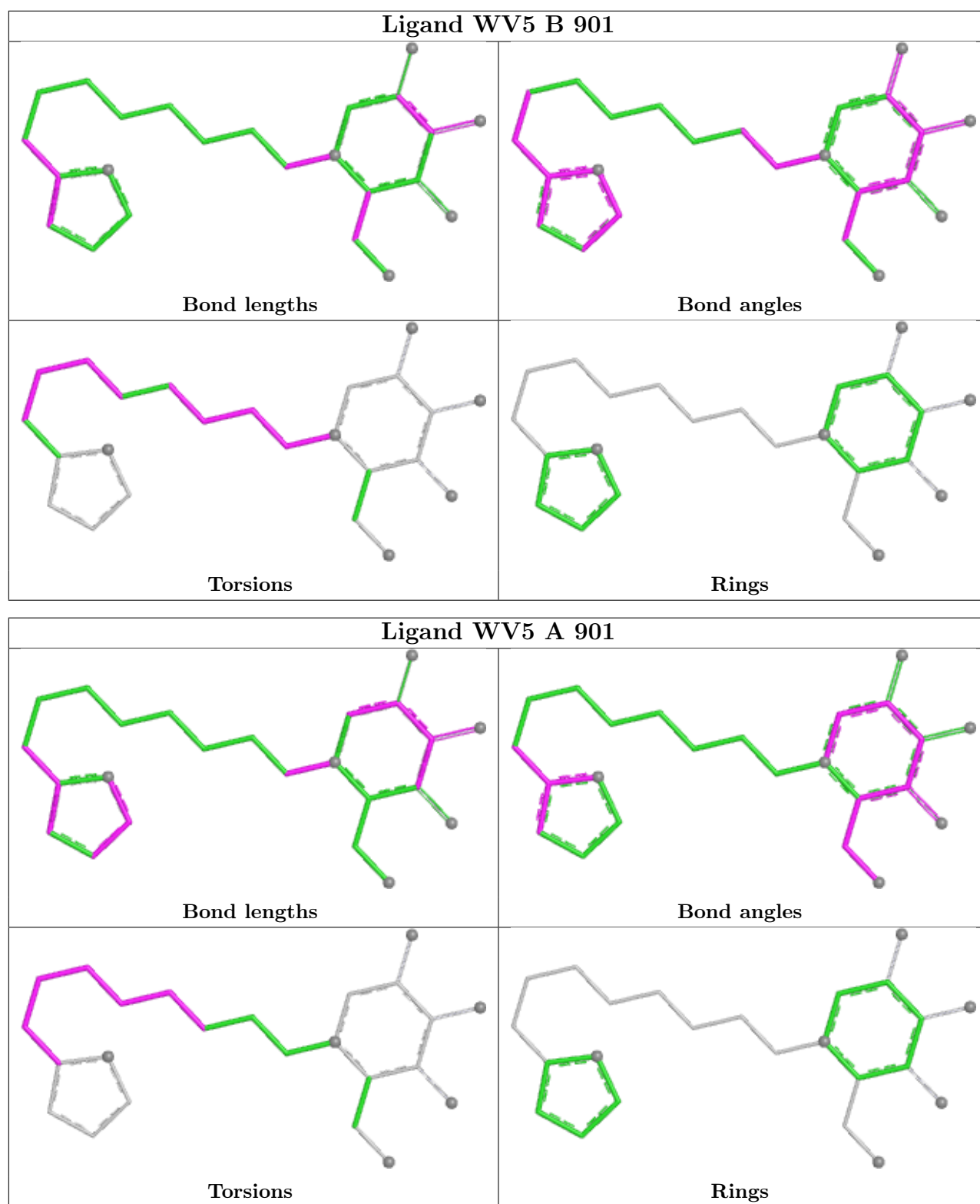
Mol	Chain	Res	Type	Atoms
2	A	901	WV5	C9-C10-C11-C12
6	B	903	BTB	N-C5-C6-O6
2	A	901	WV5	C6-C7-C8-C9
2	B	901	WV5	C11-C10-C9-C8
6	B	903	BTB	N-C7-C8-O8
2	B	901	WV5	C6-C5-N1-C17
2	B	901	WV5	C6-C7-C8-C9
2	A	901	WV5	C11-C10-C9-C8
2	B	901	WV5	C5-C6-C7-C8
2	A	901	WV5	C10-C11-C12-C13
2	A	901	WV5	C11-C12-C13-O4

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	B	904	SO4	1	0
4	A	905	SO4	1	0
3	A	903	GOL	4	0
6	B	903	BTB	1	0
3	A	902	GOL	1	0
4	A	906	SO4	2	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 than 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.



5.7 Other polymers [i](#)

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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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, 95th 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%)	-0.66	6 (0%)	82 75	19, 34, 62, 104	1 (0%)
1	B	763/819 (93%)	-0.75	2 (0%)	90 86	17, 32, 52, 81	0
All	All	1526/1638 (93%)	-0.70	8 (0%)	87 82	17, 34, 57, 104	1 (0%)

All (8) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	812	HIS	3.7
1	B	812	HIS	3.2
1	A	515	LEU	2.9
1	A	560	ASP	2.8
1	B	518	THR	2.7
1	A	518	THR	2.6
1	A	813	HIS	2.4
1	A	660	GLU	2.3

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 oligosaccharides 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,

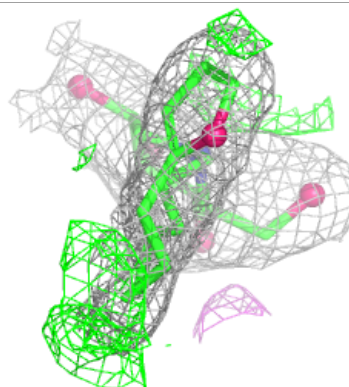
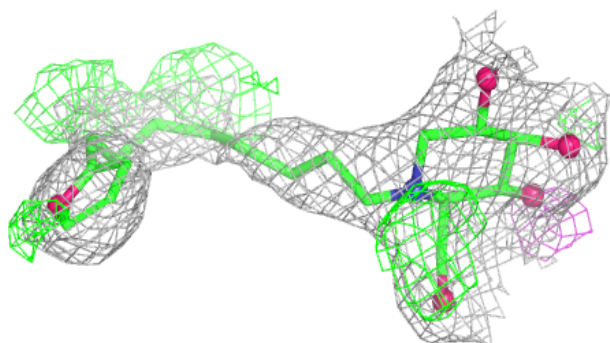
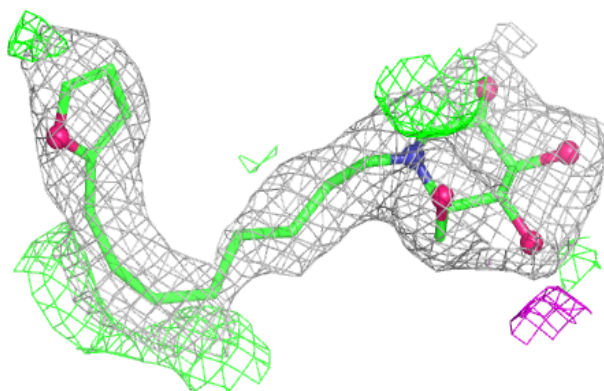
median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
5	NAG	B	902	14/15	0.76	0.15	49,66,70,80	0
3	GOL	A	902	6/6	0.81	0.18	41,54,60,60	0
3	GOL	A	904	6/6	0.84	0.16	54,74,75,79	0
4	SO4	A	909	5/5	0.86	0.21	97,97,101,105	0
4	SO4	A	911	5/5	0.88	0.12	74,76,81,84	0
6	BTB	B	903	14/14	0.90	0.11	50,62,64,68	0
4	SO4	A	908	5/5	0.91	0.12	74,80,94,95	0
4	SO4	B	904	5/5	0.92	0.13	57,65,72,84	0
4	SO4	A	910	5/5	0.92	0.10	96,105,112,113	0
3	GOL	A	903	6/6	0.92	0.10	49,53,63,74	0
4	SO4	B	907	5/5	0.93	0.09	57,63,69,70	0
4	SO4	A	906	5/5	0.93	0.10	59,66,71,73	0
2	WV5	B	901	24/24	0.93	0.12	19,34,68,73	0
4	SO4	B	906	5/5	0.95	0.08	51,59,67,67	0
4	SO4	B	908	5/5	0.96	0.11	64,64,70,73	0
2	WV5	A	901	24/24	0.97	0.09	19,22,78,82	0
4	SO4	A	907	5/5	0.97	0.17	48,56,63,63	0
4	SO4	B	905	5/5	0.98	0.06	33,35,42,46	0
4	SO4	A	905	5/5	0.98	0.04	34,35,39,39	0

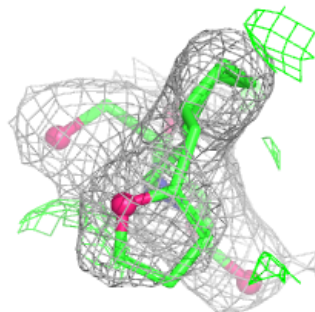
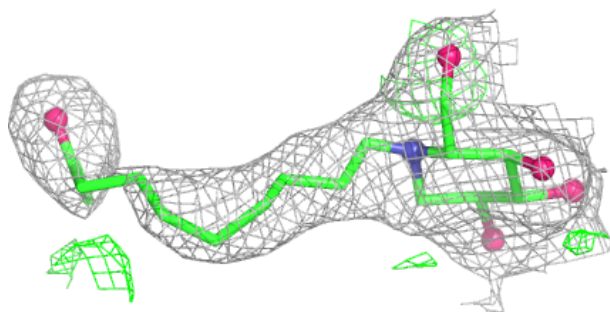
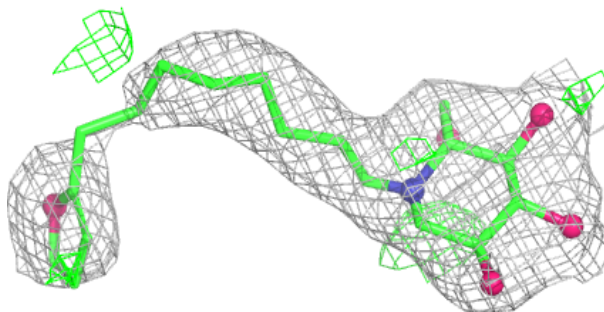
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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