



Full wwPDB X-ray Structure Validation Report ⓘ

Aug 24, 2026 – 12:54 PM JST

PDB ID : 9WGU / pdb_00009wgu
Title : Crystal structure of Cbl-b bound to compound
Authors : Fan, Y.; Ding, X.
Deposited on : 2025-08-25
Resolution : 1.95 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 : 1.8.5 (274361), CSD as541be (2020)
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 : 9.0.015 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.50

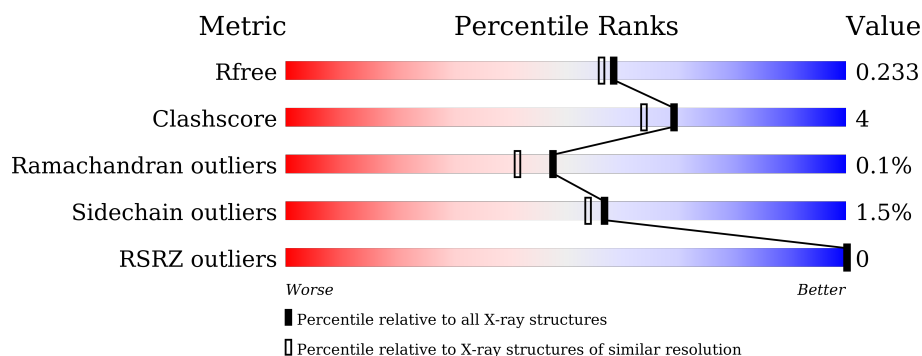
1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.95 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	3494 (1.96-1.96)
Clashscore	190562	3612 (1.96-1.96)
Ramachandran outliers	187476	3587 (1.96-1.96)
Sidechain outliers	187428	3587 (1.96-1.96)
RSRZ outliers	180081	3495 (1.96-1.96)

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	AAA	388	89% 9% .
1	BBB	388	89% 9% ..

2 Entry composition [i](#)

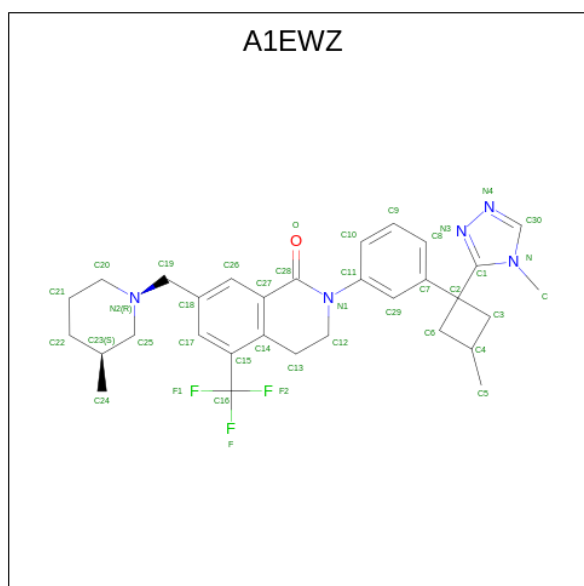
There are 6 unique types of molecules in this entry. The entry contains 7019 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 E3 ubiquitin-protein ligase CBL-B.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	AAA	382	Total	C	N	O	S	0	5	0
			3141	2017	530	571	23			
1	BBB	384	Total	C	N	O	S	0	3	0
			3146	2018	532	574	22			

- Molecule 2 is 2-[3-[3-methyl-1-(4-methyl-1,2,4-triazol-3-yl)cyclobutyl]phenyl]-7-[[3-(3-methylpiperidin-1-yl)methyl]-5-(trifluoromethyl)-3,4-dihydroisoquinolin-1-one (CCD ID: A1EWZ) (formula: C₃₁H₃₆F₃N₅O) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	AAA	1	Total	C	F	N	O	0	0
			40	31	3	5	1		
2	BBB	1	Total	C	F	N	O	0	0
			40	31	3	5	1		

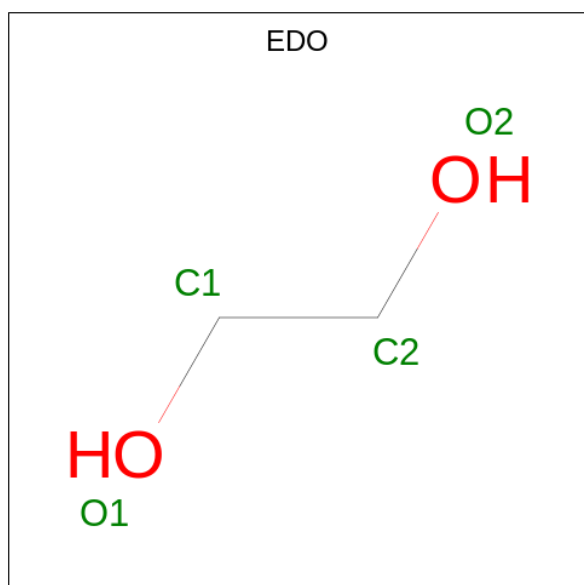
- Molecule 3 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	AAA	2	Total	Zn	0	0
			2	2		
3	BBB	2	Total	Zn	0	0
			2	2		

- Molecule 4 is CALCIUM ION (CCD ID: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	AAA	1	Total	Ca	0	0
			1	1		
4	BBB	1	Total	Ca	0	0
			1	1		

- Molecule 5 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: C₂H₆O₂).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	AAA	1	Total	C	O	0	0
			4	2	2		
5	AAA	1	Total	C	O	0	0
			4	2	2		
5	AAA	1	Total	C	O	0	0
			4	2	2		
5	AAA	1	Total	C	O	0	0
			4	2	2		
5	AAA	1	Total	C	O	0	0
			4	2	2		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	BBB	1	Total	C	O	0	0
			4	2	2		
5	BBB	1	Total	C	O	0	0
			4	2	2		
5	BBB	1	Total	C	O	0	0
			4	2	2		
5	BBB	1	Total	C	O	0	0
			4	2	2		
5	BBB	1	Total	C	O	0	0
			4	2	2		
5	BBB	1	Total	C	O	0	0
			4	2	2		

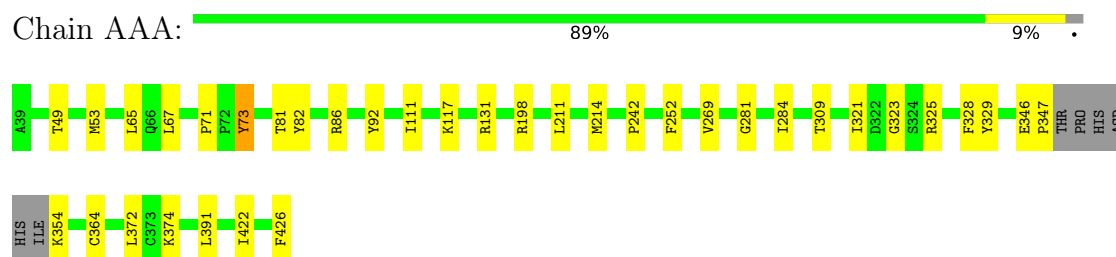
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	AAA	302	Total	O	0	0
			302	302		
6	BBB	292	Total	O	0	0
			292	292		

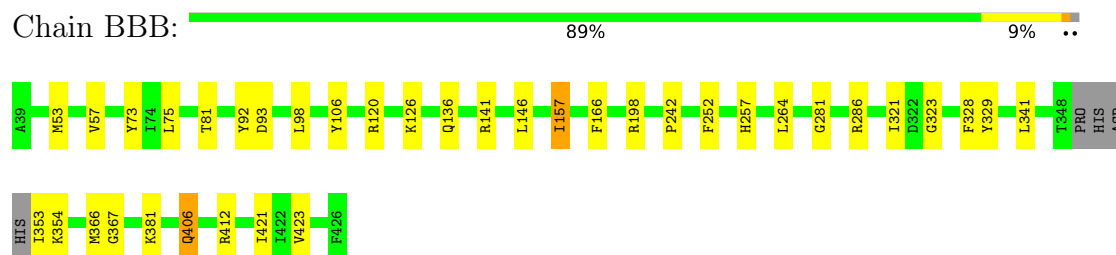
3 Residue-property plots [i](#)

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: E3 ubiquitin-protein ligase CBL-B



- Molecule 1: E3 ubiquitin-protein ligase CBL-B



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	56.66Å 102.78Å 74.65Å 90.00° 90.25° 90.00°	Depositor
Resolution (Å)	49.66 – 1.95 49.66 – 1.95	Depositor EDS
% Data completeness (in resolution range)	98.4 (49.66-1.95) 97.2 (49.66-1.95)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.10 (at 1.95Å)	Xtriage
Refinement program	REFMAC 5.8.0267	Depositor
R, R_{free}	0.174 , 0.226 0.183 , 0.233	Depositor DCC
R_{free} test set	2954 reflections (4.75%)	wwPDB-VP
Wilson B-factor (Å ²)	27.1	Xtriage
Anisotropy	0.005	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 34.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.206 for h,-k,-l	Xtriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	7019	wwPDB-VP
Average B, all atoms (Å ²)	34.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 15.34% 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 ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, EDO, A1EWZ, CA

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z > 5$	RMSZ	$\# Z > 5$
1	AAA	1.02	0/3232	1.30	2/4361 (0.0%)
1	BBB	1.03	1/3231 (0.0%)	1.34	3/4361 (0.1%)
All	All	1.02	1/6463 (0.0%)	1.32	5/8722 (0.1%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	BBB	367	GLY	C-O	5.10	1.28	1.23

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	BBB	242	PRO	CA-C-N	5.54	127.71	120.28
1	BBB	242	PRO	C-N-CA	5.54	127.71	120.28
1	BBB	93	ASP	CA-CB-CG	5.12	117.72	112.60
1	AAA	242	PRO	CA-C-N	5.08	127.33	120.38
1	AAA	242	PRO	C-N-CA	5.08	127.33	120.38

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	AAA	3141	0	3121	23	0
1	BBB	3146	0	3119	20	0
2	AAA	40	0	0	0	0
2	BBB	40	0	0	0	0
3	AAA	2	0	0	0	0
3	BBB	2	0	0	0	0
4	AAA	1	0	0	0	0
4	BBB	1	0	0	0	0
5	AAA	24	0	36	3	0
5	BBB	28	0	42	4	0
6	AAA	302	0	0	4	0
6	BBB	292	0	0	2	0
All	All	7019	0	6318	45	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 4.

All (45) 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:BBB:406:GLN:NE2	1:BBB:412:ARG:O	2.28	0.66
1:AAA:53:MET:HE1	1:AAA:81:THR:HB	1.79	0.64
1:BBB:53:MET:O	1:BBB:57:VAL:HG23	2.00	0.62
1:BBB:92:TYR:O	1:BBB:98:LEU:HD13	2.00	0.62
1:BBB:421:ILE:HG23	1:BBB:423:VAL:HG23	1.82	0.61
1:BBB:321:ILE:HA	5:BBB:505:EDO:H22	1.85	0.57
1:BBB:353:ILE:HG12	1:BBB:354:LYS:H	1.69	0.57
1:AAA:214[A]:MET:HG3	1:AAA:372:LEU:HD23	1.86	0.57
5:BBB:510:EDO:H11	6:BBB:636:HOH:O	2.04	0.57
1:BBB:252:PHE:CE1	1:BBB:341:LEU:HD23	2.40	0.56
6:AAA:626:HOH:O	5:BBB:507:EDO:H12	2.07	0.55
1:AAA:65:LEU:HB3	1:AAA:67:LEU:HG	1.89	0.54
1:BBB:73:TYR:OH	1:BBB:75:LEU:HD12	2.07	0.54
1:BBB:381:LYS:NZ	6:BBB:603:HOH:O	2.33	0.53
1:BBB:53:MET:HE1	1:BBB:81:THR:HB	1.90	0.52
1:BBB:421:ILE:CG2	1:BBB:423:VAL:HG23	2.38	0.52
1:BBB:106:TYR:HE2	1:BBB:157:ILE:HD12	1.75	0.52
1:AAA:422:ILE:HG23	6:AAA:891:HOH:O	2.11	0.50
1:AAA:309:THR:HG23	6:AAA:834:HOH:O	2.13	0.48
1:AAA:325:ARG:NH2	6:AAA:610:HOH:O	2.46	0.47
1:AAA:391:LEU:HD12	5:AAA:506:EDO:O2	2.14	0.47
1:AAA:214[B]:MET:HG2	1:AAA:364:CYS:SG	2.55	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:AAA:321:ILE:HA	5:AAA:505:EDO:H12	1.97	0.46
1:BBB:136:GLN:O	1:BBB:141:ARG:NH1	2.49	0.46
1:BBB:166:PHE:CB	5:BBB:511:EDO:H11	2.45	0.45
1:BBB:73:TYR:CZ	1:BBB:75:LEU:HD12	2.51	0.45
1:AAA:82:TYR:CZ	1:AAA:86:ARG:HG3	2.51	0.45
1:AAA:92:TYR:HH	5:AAA:507:EDO:HO2	1.65	0.45
1:BBB:252:PHE:O	1:BBB:257:HIS:HB2	2.18	0.44
1:AAA:281:GLY:HA2	1:AAA:328:PHE:O	2.18	0.44
1:BBB:264:LEU:HB2	1:BBB:286:ARG:HD3	1.99	0.44
1:AAA:71:PRO:HG3	1:AAA:73:TYR:OH	2.18	0.44
1:BBB:323:GLY:HA3	1:BBB:329:TYR:CD2	2.52	0.44
1:AAA:71:PRO:HG3	1:AAA:73:TYR:CZ	2.54	0.42
1:AAA:211:LEU:HD23	1:AAA:211:LEU:HA	1.95	0.42
1:AAA:269:VAL:HG13	1:AAA:284[B]:ILE:HD11	2.01	0.42
1:BBB:281:GLY:HA2	1:BBB:328:PHE:O	2.20	0.42
1:AAA:214[B]:MET:HE1	1:AAA:374:LYS:HA	2.01	0.42
1:AAA:117:LYS:HE3	1:AAA:426:PHE:CE2	2.54	0.41
1:AAA:49:THR:HG21	1:AAA:111:ILE:HG23	2.01	0.41
1:AAA:346:GLU:HB3	1:AAA:347:PRO:CD	2.51	0.41
1:BBB:146:LEU:HD23	1:BBB:146:LEU:HA	1.90	0.41
1:AAA:323:GLY:HA3	1:AAA:329:TYR:CD2	2.55	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	AAA	383/388 (99%)	370 (97%)	12 (3%)	1 (0%)	36	28
1	BBB	383/388 (99%)	376 (98%)	7 (2%)	0	100	100
All	All	766/776 (99%)	746 (97%)	19 (2%)	1 (0%)	48	41

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	AAA	73	TYR

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	AAA	347/348 (100%)	343 (99%)	4 (1%)	63	61
1	BBB	347/348 (100%)	341 (98%)	6 (2%)	53	49
All	All	694/696 (100%)	684 (99%)	10 (1%)	57	56

All (10) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	AAA	131	ARG
1	AAA	198	ARG
1	AAA	252	PHE
1	AAA	354	LYS
1	BBB	120	ARG
1	BBB	126	LYS
1	BBB	157	ILE
1	BBB	198	ARG
1	BBB	366	MET
1	BBB	406	GLN

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

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 21 ligands modelled in this entry, 6 are monoatomic - leaving 15 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
5	EDO	AAA	505	-	3,3,3	0.21	0	2,2,2	0.26	0
5	EDO	BBB	508	-	3,3,3	0.22	0	2,2,2	0.21	0
5	EDO	AAA	510	-	3,3,3	0.18	0	2,2,2	0.25	0
2	A1EWZ	AAA	501	-	44,45,45	1.72	7 (15%)	57,69,69	1.63	13 (22%)
5	EDO	BBB	511	-	3,3,3	0.09	0	2,2,2	0.25	0
5	EDO	AAA	509	-	3,3,3	0.09	0	2,2,2	0.21	0
5	EDO	BBB	506	-	3,3,3	0.12	0	2,2,2	0.10	0
5	EDO	BBB	507	-	3,3,3	0.10	0	2,2,2	0.31	0
5	EDO	BBB	510	-	3,3,3	0.14	0	2,2,2	0.33	0
5	EDO	AAA	508	-	3,3,3	0.22	0	2,2,2	0.21	0
2	A1EWZ	BBB	501	-	44,45,45	1.58	5 (11%)	57,69,69	1.67	12 (21%)
5	EDO	AAA	507	-	3,3,3	0.10	0	2,2,2	0.14	0
5	EDO	AAA	506	-	3,3,3	0.15	0	2,2,2	0.12	0
5	EDO	BBB	505	-	3,3,3	0.20	0	2,2,2	0.28	0
5	EDO	BBB	509	-	3,3,3	0.31	0	2,2,2	0.37	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
5	EDO	AAA	505	-	-	0/1/1/1	-
5	EDO	BBB	508	-	-	0/1/1/1	-
5	EDO	AAA	510	-	-	1/1/1/1	-
2	A1EWZ	AAA	501	-	-	4/20/59/59	0/6/6/6
5	EDO	BBB	511	-	-	0/1/1/1	-
5	EDO	AAA	509	-	-	0/1/1/1	-
5	EDO	BBB	506	-	-	0/1/1/1	-
5	EDO	BBB	507	-	-	1/1/1/1	-
5	EDO	BBB	510	-	-	0/1/1/1	-
5	EDO	AAA	508	-	-	0/1/1/1	-
2	A1EWZ	BBB	501	-	-	7/20/59/59	0/6/6/6
5	EDO	AAA	507	-	-	0/1/1/1	-
5	EDO	AAA	506	-	-	1/1/1/1	-
5	EDO	BBB	505	-	-	1/1/1/1	-
5	EDO	BBB	509	-	-	0/1/1/1	-

All (12) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	AAA	501	A1EWZ	C27-C14	6.65	1.48	1.40
2	BBB	501	A1EWZ	C27-C14	6.22	1.48	1.40
2	BBB	501	A1EWZ	C14-C15	5.44	1.49	1.40
2	AAA	501	A1EWZ	C14-C15	4.64	1.47	1.40
2	AAA	501	A1EWZ	C6-C4	-3.70	1.50	1.55
2	AAA	501	A1EWZ	C1-N	-2.51	1.34	1.36
2	BBB	501	A1EWZ	C1-N	-2.32	1.34	1.36
2	AAA	501	A1EWZ	C27-C28	2.12	1.51	1.47
2	AAA	501	A1EWZ	C25-N2	2.10	1.50	1.46
2	AAA	501	A1EWZ	C30-N4	2.10	1.35	1.31
2	BBB	501	A1EWZ	C3-C4	-2.06	1.52	1.55
2	BBB	501	A1EWZ	C6-C2	-2.02	1.51	1.56

All (25) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	BBB	501	A1EWZ	N-C30-N4	-4.67	107.13	111.39
2	AAA	501	A1EWZ	O-C28-N1	4.34	124.80	120.89
2	BBB	501	A1EWZ	C14-C27-C28	-3.93	117.16	120.21
2	BBB	501	A1EWZ	C27-C28-N1	3.36	118.73	115.97
2	AAA	501	A1EWZ	F1-C16-C15	-3.29	106.97	112.70
2	AAA	501	A1EWZ	C29-C11-N1	3.13	124.33	119.85
2	AAA	501	A1EWZ	C27-C28-N1	3.06	118.48	115.97
2	BBB	501	A1EWZ	C1-N3-N4	-2.95	103.92	107.29

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	AAA	501	A1EWZ	C22-C21-C20	2.81	114.79	110.85
2	BBB	501	A1EWZ	C29-C11-N1	2.81	123.87	119.85
2	AAA	501	A1EWZ	C14-C27-C28	-2.64	118.15	120.21
2	BBB	501	A1EWZ	C26-C27-C28	2.61	123.41	118.37
2	BBB	501	A1EWZ	F-C16-C15	-2.57	108.22	112.70
2	BBB	501	A1EWZ	O-C28-N1	2.55	123.19	120.89
2	AAA	501	A1EWZ	C17-C15-C16	2.52	122.68	116.50
2	BBB	501	A1EWZ	C6-C4-C3	2.47	89.81	87.50
2	AAA	501	A1EWZ	C26-C27-C28	2.46	123.13	118.37
2	AAA	501	A1EWZ	O-C28-C27	-2.38	116.65	122.99
2	BBB	501	A1EWZ	C19-N2-C25	2.34	115.15	111.36
2	BBB	501	A1EWZ	C23-C25-N2	-2.32	109.58	112.71
2	AAA	501	A1EWZ	C21-C20-N2	-2.24	107.72	111.33
2	AAA	501	A1EWZ	C-N-C1	-2.20	127.15	129.06
2	BBB	501	A1EWZ	C17-C15-C16	2.14	121.76	116.50
2	AAA	501	A1EWZ	C19-N2-C25	2.12	114.80	111.36
2	AAA	501	A1EWZ	C20-N2-C25	-2.10	106.31	109.52

There are no chirality outliers.

All (15) torsion outliers are listed below:

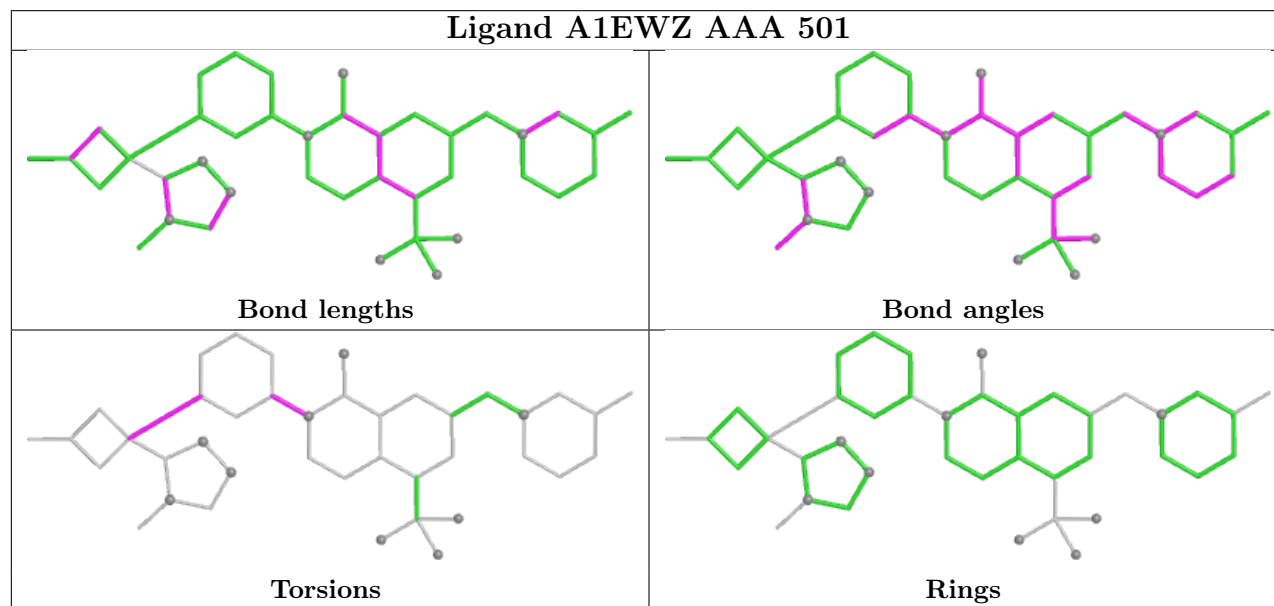
Mol	Chain	Res	Type	Atoms
2	BBB	501	A1EWZ	C10-C11-N1-C28
2	BBB	501	A1EWZ	C29-C11-N1-C28
5	AAA	506	EDO	O1-C1-C2-O2
5	BBB	507	EDO	O1-C1-C2-O2
2	AAA	501	A1EWZ	C3-C2-C7-C8
2	BBB	501	A1EWZ	C3-C2-C7-C29
5	BBB	505	EDO	O1-C1-C2-O2
2	BBB	501	A1EWZ	C3-C2-C7-C8
2	BBB	501	A1EWZ	C10-C11-N1-C12
2	AAA	501	A1EWZ	C1-C2-C7-C8
2	AAA	501	A1EWZ	C1-C2-C7-C29
2	BBB	501	A1EWZ	C1-C2-C7-C8
2	BBB	501	A1EWZ	C1-C2-C7-C29
5	AAA	510	EDO	O1-C1-C2-O2
2	AAA	501	A1EWZ	C29-C11-N1-C28

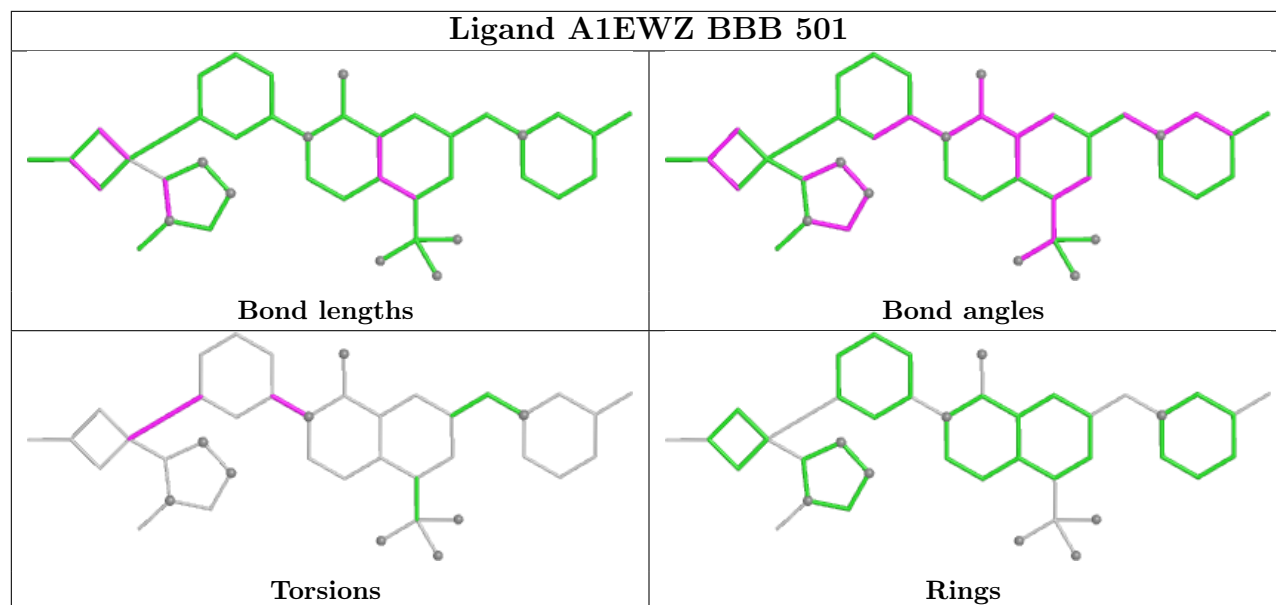
There are no ring outliers.

7 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	AAA	505	EDO	1	0
5	BBB	511	EDO	1	0
5	BBB	507	EDO	1	0
5	BBB	510	EDO	1	0
5	AAA	507	EDO	1	0
5	AAA	506	EDO	1	0
5	BBB	505	EDO	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 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 [i](#)

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	AAA	382/388 (98%)	-1.31	0 100 100	11, 29, 61, 81	5 (1%)
1	BBB	384/388 (98%)	-1.25	0 100 100	13, 31, 62, 101	3 (0%)
All	All	766/776 (98%)	-1.28	0 100 100	11, 30, 62, 101	8 (1%)

There are no RSRZ outliers to report.

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	EDO	BBB	506	4/4	0.97	0.05	49,56,57,60	0
5	EDO	BBB	507	4/4	0.97	0.05	51,52,53,54	0
5	EDO	AAA	507	4/4	0.98	0.05	47,50,52,54	0
5	EDO	AAA	510	4/4	0.98	0.08	42,46,46,49	0
5	EDO	BBB	505	4/4	0.98	0.06	51,54,54,57	0
5	EDO	AAA	505	4/4	0.98	0.06	41,44,50,50	0
5	EDO	AAA	506	4/4	0.98	0.05	35,45,50,56	0

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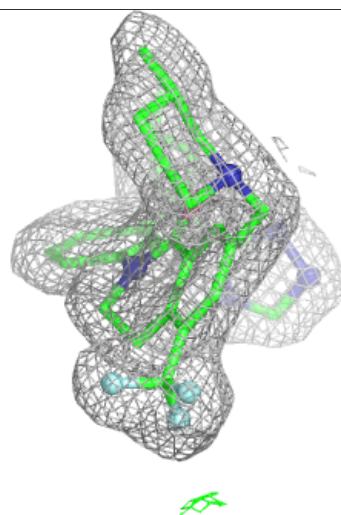
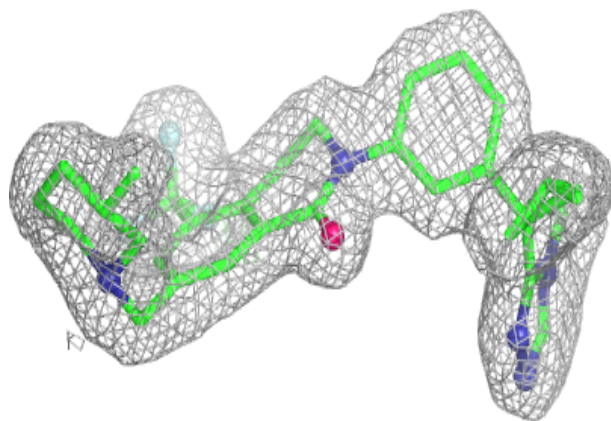
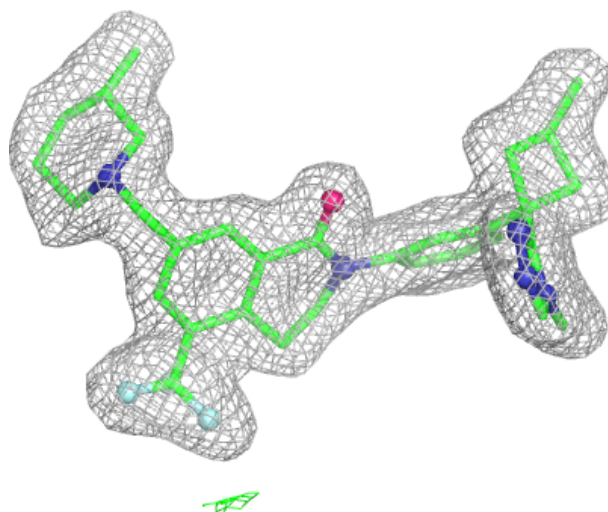
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
5	EDO	BBB	511	4/4	0.98	0.05	47,47,49,57	0
2	A1EWZ	AAA	501	40/40	0.99	0.03	19,22,30,33	0
5	EDO	AAA	508	4/4	0.99	0.05	52,54,60,63	0
5	EDO	AAA	509	4/4	0.99	0.05	51,51,52,58	0
5	EDO	BBB	508	4/4	0.99	0.03	31,36,36,37	0
5	EDO	BBB	509	4/4	0.99	0.04	32,41,41,42	0
5	EDO	BBB	510	4/4	0.99	0.05	43,46,47,48	0
2	A1EWZ	BBB	501	40/40	0.99	0.03	17,20,28,30	0
3	ZN	AAA	503	1/1	1.00	0.01	27,27,27,27	0
3	ZN	BBB	502	1/1	1.00	0.01	25,25,25,25	0
3	ZN	BBB	503	1/1	1.00	0.02	31,31,31,31	0
4	CA	AAA	504	1/1	1.00	0.11	33,33,33,33	0
4	CA	BBB	504	1/1	1.00	0.13	34,34,34,34	0
3	ZN	AAA	502	1/1	1.00	0.01	25,25,25,25	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.

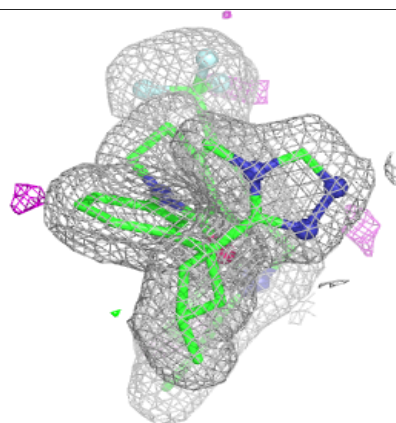
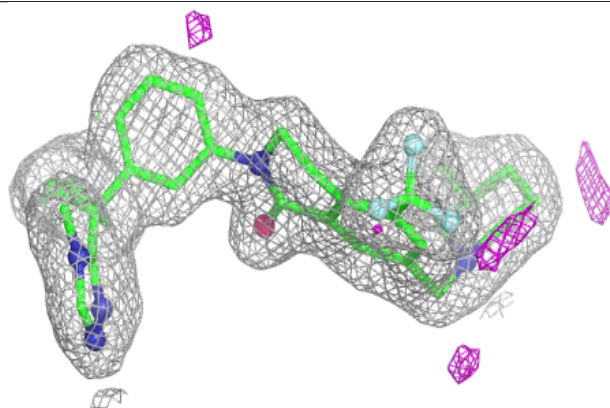
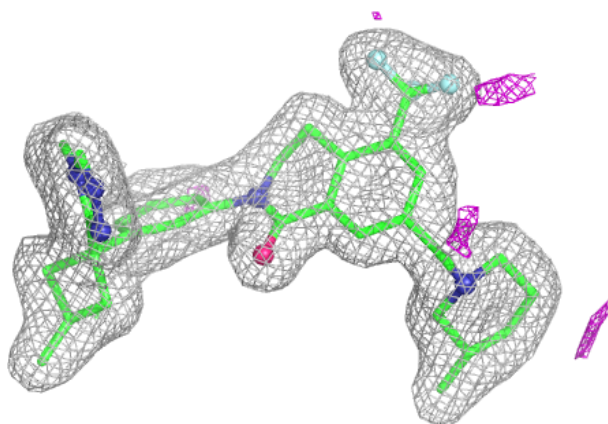
Electron density around A1EWZ AAA 501:

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



Electron density around A1EWZ BBB 501:

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



6.5 Other polymers ⓘ

There are no such residues in this entry.