Full wwPDB X-ray Structure Validation Report (i)

Nov 21, 2023 – 05:12 PM JST

PDB ID	:	7W7Y
Title	:	The crystal structure of human abl1 kinase domain in complex with ABL2-A5
Authors	:	Zhu, C.; Zhang, Z.M.
Deposited on	:	2021-12-06
Resolution	:	2.20 Å(reported)

The following versions of software and data (see references (i)) were used in the production of this report:

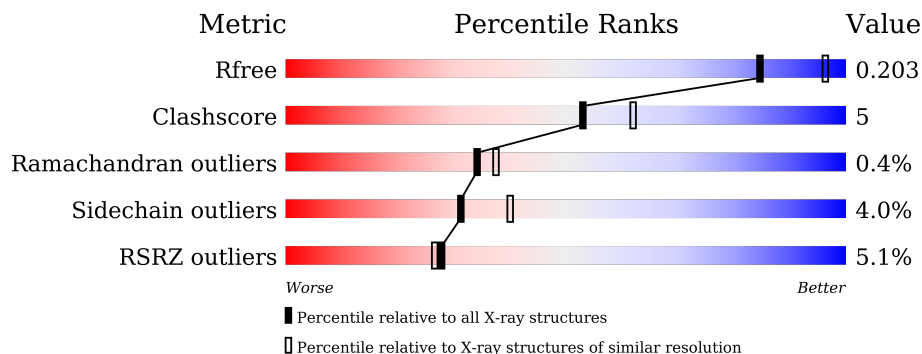|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
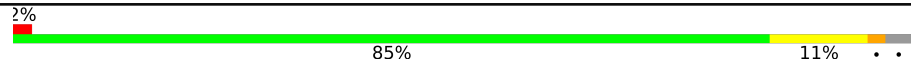*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.20 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	Percentile Ranks	Value
Rfree		0.203
Clashscore		5
Ramachandran outliers		0.4%
Sidechain outliers		4.0%
RSRZ outliers		5.1%

Worse   Better

▌ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R$_{free}$	130704	4898 (2.20-2.20)
Clashscore	141614	5594 (2.20-2.20)
Ramachandran outliers	138981	5503 (2.20-2.20)
Sidechain outliers	138945	5504 (2.20-2.20)
RSRZ outliers	127900	4800 (2.20-2.20)

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	276	2% 85% 11% · ·
1	B	276	8% 84% 11% · ·

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 4741 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 Tyrosine-protein kinase ABL1.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	269	Total	C	N	O	P	S	0	0	0
			2159	1390	351	400	1	17			
1	B	267	Total	C	N	O	P	S	0	0	0
			2138	1378	345	398	1	16			

- Molecule 2 is 5-[3-(5-methanoyl-2-methoxy-4-oxidanyl-phenyl)-1 {H}-pyrrolo[2,3-b]pyridin-5-yl]- {N}, {N}-dimethyl-pyridine-3-carboxamide (three-letter code: 8IW) (formula: $C_{23}H_{20}N_4O_4$) (labeled as "Ligand of Interest" by depositor).
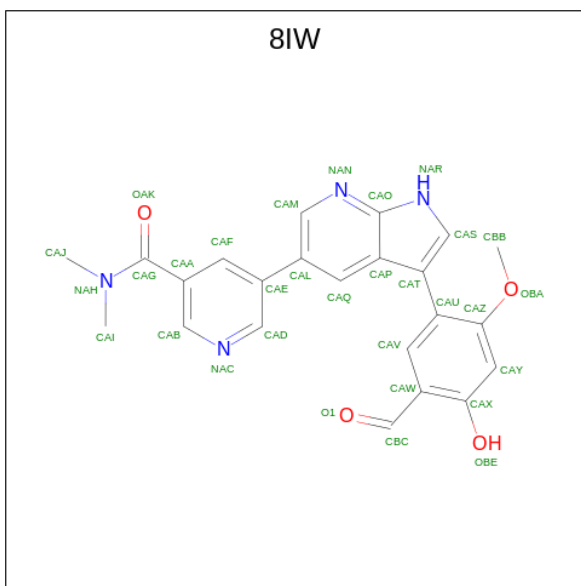
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			30	23	4	3		
2	B	1	Total	C	N	O	0	0
			30	23	4	3		

- Molecule 3 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	225	Total O 225 225	0	0
3	B	159	Total O 159 159	0	0

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 o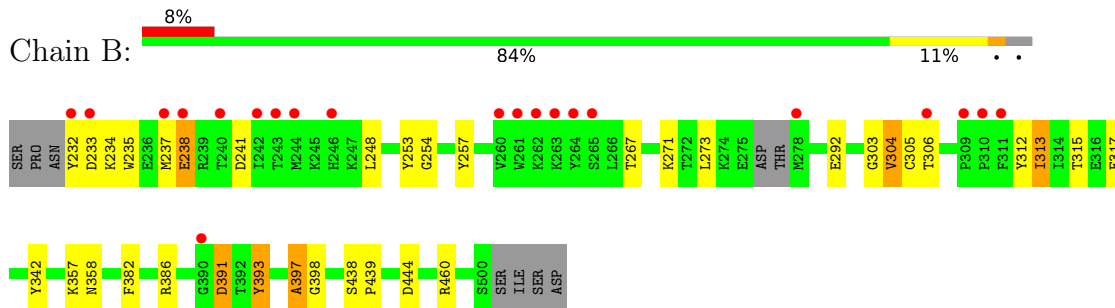r more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

• Molecule 1: Tyrosine-protein kinase ABL1

Chain A:

• Molecule 1: Tyrosine-protein kinase ABL1

Chain B:
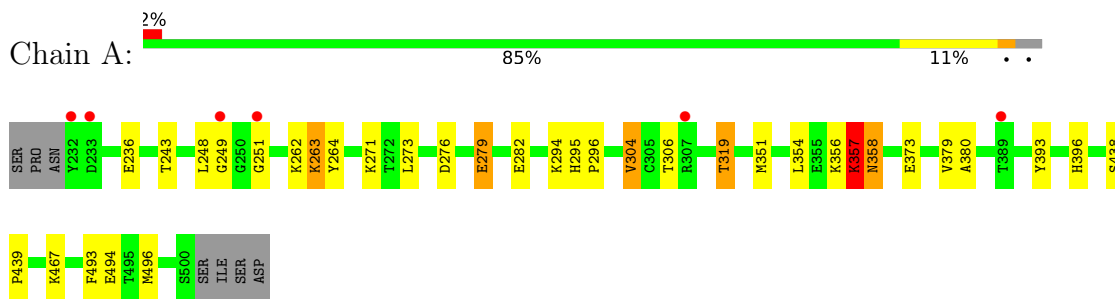
4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 2 21 21	Depositor
Cell constants a, b, c, α, β, γ	56.52Å 105.35Å 132.28Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	42.97 – 2.20 42.97 – 2.20	Depositor EDS
% Data completeness (in resolution range)	100.0 (42.97-2.20) 100.0 (42.97-2.20)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	5.31 (at 2.20Å)	Xtriage
Refinement program	PHENIX 1.9_1692+SVN	Depositor
R, R_{free}	0.175 , 0.201 0.177 , 0.203	Depositor DCC
R_{free} test set	2052 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å^2)	28.8	Xtriage
Anisotropy	0.562	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 49.1	EDS
L-test for twinning[2]	$< |L| > = 0.49, < L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	4741	wwPDB-VP
Average B, all atoms (Å^2)	37.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.44% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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: 8IW, PTR

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	0.40	0/2197	0.56	1/2977 (0.0%)
1	B	0.37	0/2174	0.53	0/2945
All	All	0.39	0/4371	0.55	1/5922 (0.0%)

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

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

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	357	LYS	N-CA-C	5.60	126.12	111.00

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	380	ALA	Peptide

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	2159	0	2075	22	0
1	B	2138	0	2056	25	0
2	A	30	0	0	1	0
2	B	30	0	0	0	0
3	A	225	0	0	6	2
3	B	159	0	0	7	0
All	All	4741	0	4131	46	2

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 5.

All (46) 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:351:MET:SD	3:A:884:HOH:O	2.18	1.00
1:B:393:PTR:O1P	3:B:701:HOH:O	1.99	0.80
1:A:249:GLY:O	3:A:701:HOH:O	2.00	0.78
1:A:357:LYS:O	3:A:702:HOH:O	2.01	0.78
1:B:397:ALA:HB3	1:B:398:GLY:HA3	1.71	0.72
1:B:386:ARG:NH1	3:B:703:HOH:O	2.23	0.71
1:B:397:ALA:CB	1:B:398:GLY:HA3	2.23	0.68
1:A:396:HIS:ND1	3:A:707:HOH:O	2.26	0.68
1:A:373:GLU:OE2	3:A:703:HOH:O	2.15	0.60
1:B:237:MET:HE3	1:B:303:GLY:HA3	1.84	0.59
1:B:257:TYR:OH	3:B:702:HOH:O	2.17	0.59
1:A:279:GLU:HG2	1:B:342:TYR:OH	2.02	0.59
1:A:304:VAL:HG13	1:A:306:THR:HG23	1.85	0.57
1:A:351:MET:HE3	1:A:379:VAL:HG21	1.86	0.57
1:B:253:TYR:H	1:B:254:GLY:HA2	1.71	0.55
1:B:253:TYR:N	1:B:254:GLY:HA2	2.21	0.55
1:B:254:GLY:HA2	3:B:754:HOH:O	2.06	0.55
1:B:304:VAL:HG13	1:B:306:THR:HG23	1.89	0.53
1:B:292:GLU:CD	1:B:386:ARG:HH22	2.15	0.49
1:A:236:GLU:OE1	1:A:306:THR:N	2.37	0.48
1:A:243:THR:OG1	1:A:262:LYS:HD2	2.14	0.48
1:A:319:THR:HG21	1:A:373:GLU:OE2	2.13	0.48
1:B:305:CYS:HB2	1:B:312:TYR:HB2	1.95	0.47
1:A:493:PHE:HA	1:A:496:MET:HE3	1.96	0.47
1:B:358:ASN:HA	3:B:762:HOH:O	2.15	0.47
1:A:249:GLY:HA3	1:A:251:GLY:N	2.30	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:271:LYS:NZ	2:A:601:8IW:OBE	2.50	0.45
1:A:249:GLY:HA3	1:A:251:GLY:H	1.82	0.45
1:B:460:ARG:NH2	3:B:707:HOH:O	2.32	0.44
1:A:282:GLU:CD	3:A:711:HOH:O	2.55	0.44
1:A:356:LYS:HB2	1:A:356:LYS:HE2	1.74	0.44
1:B:271:LYS:HB3	1:B:313:ILE:CG2	2.48	0.43
1:B:248:LEU:HD12	1:B:248:LEU:HA	1.79	0.43
1:A:295:HIS:CG	1:A:296:PRO:HD2	2.54	0.43
1:A:358:ASN:OD1	1:A:358:ASN:N	2.52	0.43
1:B:248:LEU:HD11	1:B:317:PHE:HE1	1.83	0.43
1:A:354:LEU:O	1:A:358:ASN:HA	2.19	0.42
1:A:438:SER:HA	1:A:439:PRO:HD3	1.83	0.42
1:B:357:LYS:HB3	1:B:357:LYS:HE3	1.88	0.42
1:A:263:LYS:HD2	1:A:264:TYR:CE2	2.54	0.42
1:B:233:ASP:OD1	1:B:234:LYS:N	2.51	0.41
1:B:315:THR:HG21	1:B:382:PHE:HE1	1.85	0.41
1:B:391:ASP:HB2	3:B:722:HOH:O	2.21	0.41
1:B:232:TYR:HA	1:B:235:TRP:HB2	2.02	0.41
1:B:238:GLU:O	1:B:241:ASP:HB2	2.21	0.41
1:B:438:SER:HA	1:B:439:PRO:HD3	1.95	0.40

All (2) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:822:HOH:O	3:A:822:HOH:O[2_565]	1.51	0.69
3:A:794:HOH:O	3:A:847:HOH:O[2_565]	2.08	0.12

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	A	266/276 (96%)	256 (96%)	9 (3%)	1 (0%)	34	37
1	B	262/276 (95%)	253 (97%)	8 (3%)	1 (0%)	34	37
All	All	528/552 (96%)	509 (96%)	17 (3%)	2 (0%)	34	37

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	397	ALA
1	A	276	ASP

5.3.2 Protein sidechains ⓘ

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	224/241 (93%)	213 (95%)	11 (5%)	25	31
1	B	222/241 (92%)	215 (97%)	7 (3%)	39	50
All	All	446/482 (92%)	428 (96%)	18 (4%)	31	40

All (18) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	248	LEU
1	A	263	LYS
1	A	273	LEU
1	A	279	GLU
1	A	294	LYS
1	A	304	VAL
1	A	319	THR
1	A	357	LYS
1	A	358	ASN
1	A	467	LYS
1	A	494	GLU
1	B	238	GLU
1	B	267	THR
1	B	273	LEU

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Mol	Chain	Res	Type
1	B	304	VAL
1	B	313	ILE
1	B	391	ASP
1	B	444	ASP

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

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

2 non-standard protein/DNA/RNA residues 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	$\#|Z| > 2$
1	PTR	B	393	1	15,16,17	1.32	1 (6%)	19,22,24	0.80	0
1	PTR	A	393	1	15,16,17	1.20	1 (6%)	19,22,24	0.64	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
1	PTR	B	393	1	-	0/10/11/13	0/1/1/1
1	PTR	A	393	1	-	0/10/11/13	0/1/1/1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	393	PTR	OH-CZ	-4.10	1.31	1.40
1	B	393	PTR	OH-CZ	-4.04	1.31	1.40

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	B	393	PTR	1	0

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

2 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#$|Z| > 2$	Counts	RMSZ	#$|Z| > 2$
2	8IW	A	601	-	32,33,34	2.35	13 (40%)	39,48,49	2.08	12 (30%)
2	8IW	B	601	-	32,33,34	2.39	15 (46%)	39,48,49	2.07	12 (30%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	8IW	A	601	-	-	1/18/18/20	0/4/4/4

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	8IW	B	601	-	-	1/18/18/20	0/4/4/4

All (28) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	601	8IW	CAG-NAH	6.67	1.43	1.34
2	A	601	8IW	CAG-NAH	6.54	1.43	1.34
2	A	601	8IW	OBA-CAZ	4.90	1.45	1.37
2	B	601	8IW	OBA-CAZ	4.59	1.44	1.37
2	B	601	8IW	CAA-CAG	4.04	1.56	1.50
2	A	601	8IW	CAA-CAG	3.79	1.56	1.50
2	A	601	8IW	CAO-NAR	3.43	1.41	1.34
2	A	601	8IW	CAM-NAN	3.20	1.36	1.31
2	B	601	8IW	CAO-NAR	3.17	1.40	1.34
2	B	601	8IW	CAQ-CAP	3.06	1.48	1.42
2	A	601	8IW	CAQ-CAP	2.93	1.48	1.42
2	B	601	8IW	OBE-CAX	2.88	1.42	1.36
2	B	601	8IW	CAS-NAR	-2.86	1.30	1.36
2	B	601	8IW	CAM-NAN	2.81	1.36	1.31
2	A	601	8IW	OAK-CAG	2.78	1.28	1.22
2	B	601	8IW	CAX-CAW	2.72	1.43	1.40
2	B	601	8IW	OAK-CAG	2.70	1.27	1.22
2	A	601	8IW	CAS-NAR	-2.62	1.31	1.36
2	B	601	8IW	CAP-CAO	-2.39	1.36	1.43
2	A	601	8IW	CAP-CAO	-2.35	1.36	1.43
2	A	601	8IW	OBE-CAX	2.30	1.41	1.36
2	B	601	8IW	CAQ-CAL	2.29	1.44	1.38
2	A	601	8IW	CAL-CAE	2.27	1.54	1.49
2	A	601	8IW	CAX-CAW	2.23	1.43	1.40
2	B	601	8IW	CAU-CAZ	2.21	1.45	1.40
2	B	601	8IW	CBC-CAW	2.18	1.55	1.51
2	B	601	8IW	CAL-CAE	2.16	1.54	1.49
2	A	601	8IW	CAU-CAZ	2.10	1.44	1.40

All (24) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	601	8IW	CAL-CAM-NAN	-5.24	120.70	125.55
2	B	601	8IW	CAM-NAN-CAO	4.99	121.71	116.69
2	A	601	8IW	CAM-NAN-CAO	4.83	121.54	116.69
2	A	601	8IW	CAL-CAM-NAN	-4.51	121.37	125.55
2	A	601	8IW	CAV-CAW-CAX	4.41	121.08	117.56

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	601	8IW	CBB-OBA-CAZ	-3.66	112.00	117.53
2	A	601	8IW	CAA-CAG-NAH	3.55	122.96	119.00
2	B	601	8IW	CAD-NAC-CAB	3.51	122.27	117.48
2	B	601	8IW	CAA-CAG-NAH	3.47	122.88	119.00
2	B	601	8IW	CAV-CAW-CAX	3.25	120.16	117.56
2	A	601	8IW	CAE-CAF-CAA	-3.21	117.62	121.09
2	B	601	8IW	CAQ-CAL-CAM	3.16	120.66	116.24
2	A	601	8IW	CAD-NAC-CAB	3.06	121.65	117.48
2	B	601	8IW	CAE-CAF-CAA	-3.01	117.82	121.09
2	A	601	8IW	CAL-CAQ-CAP	-2.95	115.83	122.30
2	B	601	8IW	CAL-CAQ-CAP	-2.87	116.01	122.30
2	B	601	8IW	OBA-CAZ-CAY	-2.80	119.30	124.12
2	A	601	8IW	CAQ-CAL-CAM	2.78	120.12	116.24
2	B	601	8IW	OBA-CAZ-CAU	2.70	120.28	116.26
2	B	601	8IW	CAY-CAX-CAW	-2.37	119.49	121.45
2	A	601	8IW	OBA-CAZ-CAY	-2.34	120.10	124.12
2	A	601	8IW	OBA-CAZ-CAU	2.27	119.64	116.26
2	A	601	8IW	CAY-CAX-CAW	-2.17	119.66	121.45
2	B	601	8IW	CAA-CAB-NAC	-2.12	120.36	123.49

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	601	8IW	CAP-CAT-CAU-CAZ
2	B	601	8IW	CAP-CAT-CAU-CAZ

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	601	8IW	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 8IW A 601

Bond lengths

Bond angles

Torsions

Rings

Ligand 8IW B 601

Bond lengths

Bond angles

Torsions

Rings
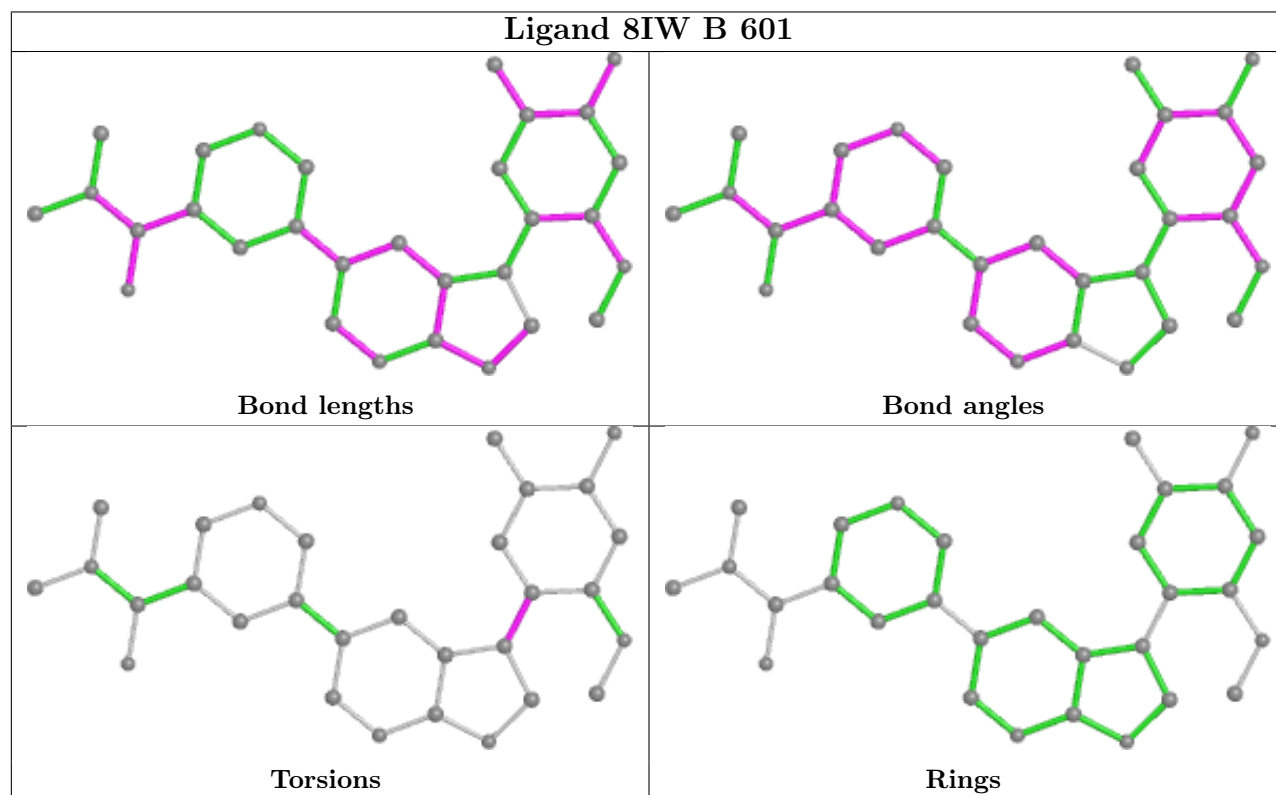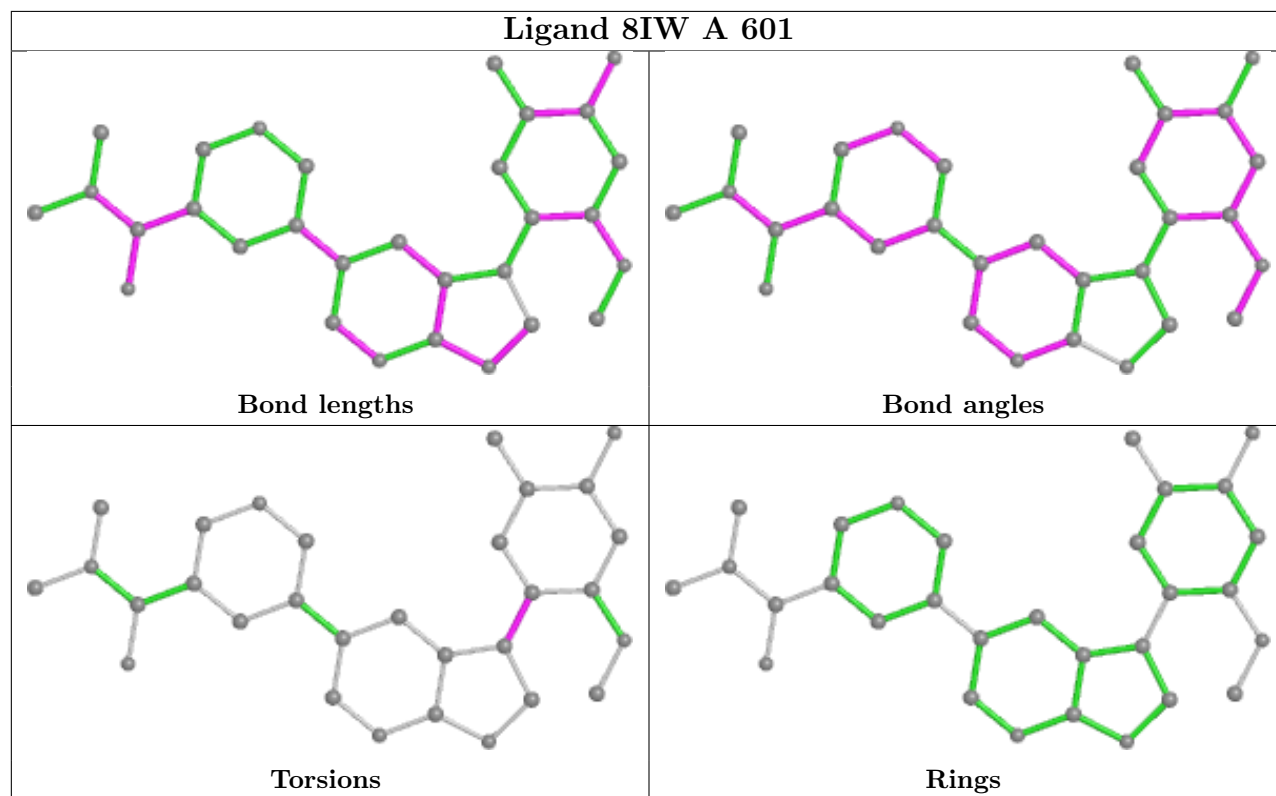
5.7 Other polymers ⓘ

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 ⓘ

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, 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(Å²)	Q<0.9
1	A	268/276 (97%)	-0.35	6 (2%)	62	59	16, 29, 62, 84	0
1	B	266/276 (96%)	0.08	21 (7%)	12	11	20, 35, 82, 99	0
All	All	534/552 (96%)	-0.14	27 (5%)	28	26	16, 32, 75, 99	0

All (27) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	232	TYR	5.6
1	B	240	THR	5.0
1	B	233	ASP	4.7
1	B	261	TRP	4.4
1	B	238	GLU	4.2
1	B	243	THR	4.0
1	B	237	MET	4.0
1	B	278	MET	3.9
1	B	263	LYS	3.9
1	A	232	TYR	3.6
1	B	309	PRO	3.4
1	B	311	PHE	3.3
1	B	264	TYR	3.2
1	A	249	GLY	3.2
1	B	262	LYS	3.1
1	B	265	SER	3.0
1	A	307	ARG	2.9
1	B	260	VAL	2.9
1	B	244	MET	2.6
1	B	246	HIS	2.5
1	B	306	THR	2.4
1	B	390	GLY	2.3
1	A	233	ASP	2.3
1	B	310	PRO	2.2

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Mol	Chain	Res	Type	RSRZ
1	B	242	ILE	2.2
1	A	389	THR	2.1
1	A	251	GLY	2.0

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

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
1	PTR	B	393	16/17	0.95	0.10	30,32,66,68	0
1	PTR	A	393	16/17	0.97	0.12	25,32,56,57	0

6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

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
2	8IW	B	601	30/31	0.93	0.12	26,35,73,76	0
2	8IW	A	601	30/31	0.95	0.12	18,26,74,86	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 8IW B 601:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
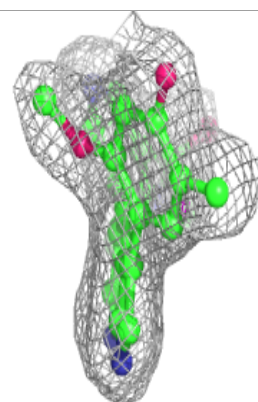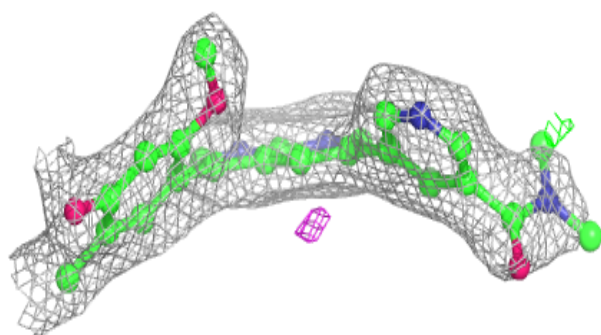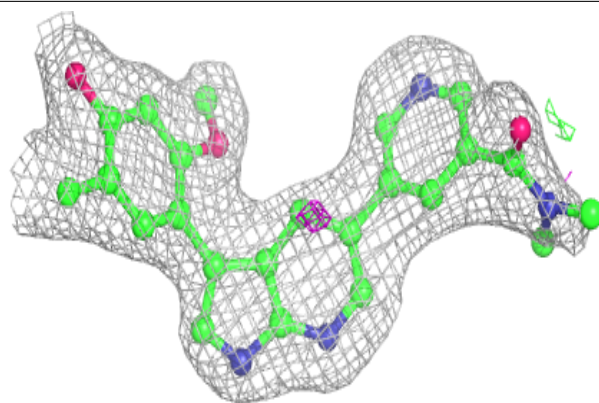
Electron density around 8IW A 601:

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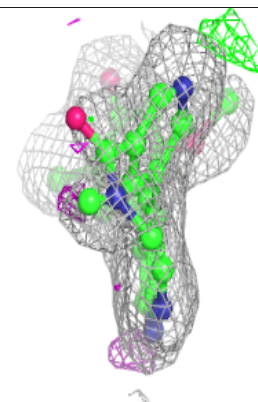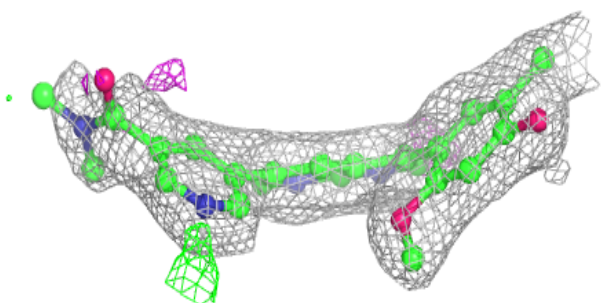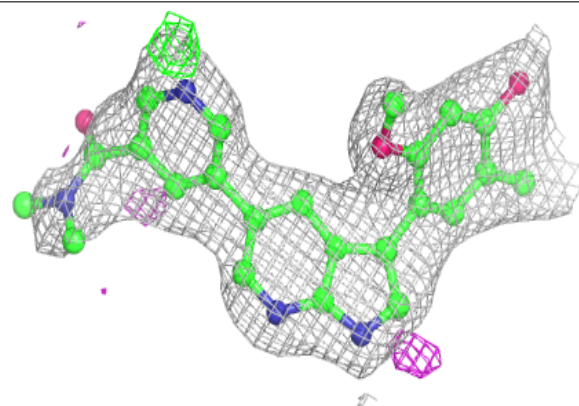
6.5 Other polymers (i)

There are no such residues in this entry.