Full wwPDB X-ray Structure Validation Report (i)

Jun 23, 2024 – 04:43 AM EDT

PDB ID	:	6FT9
Title	:	Crystal structure of CLK1 in complex with inhibitor 16
Authors	:	Chaikuad, A.; Walter, A.; von Delft, F.; Bountra, C.; Arrowsmith, C.H.; Edwards, A.M.; Kunick, C.; Knapp, S.; Structural Genomics Consortium (SGC)
Deposited on	:	2018-02-20
Resolution	:	1.87 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:

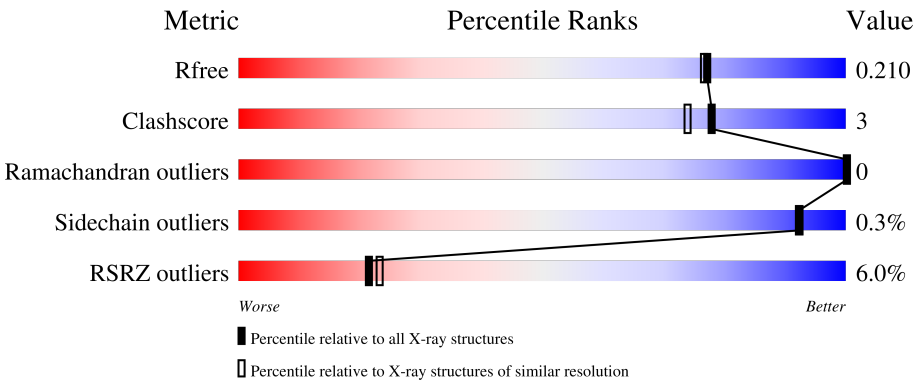
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	2.37.1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

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 1.87 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	9470 (1.90-1.86)
Clashscore	141614	10282 (1.90-1.86)
Ramachandran outliers	138981	10152 (1.90-1.86)
Sidechain outliers	138945	10152 (1.90-1.86)
RSRZ outliers	127900	9303 (1.90-1.86)

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	339	4% 91% 8% •
1	B	339	7% 93% 6% •
1	C	339	7% 92% 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	BR	C	502[B]	-	-	X	-

2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 9019 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.

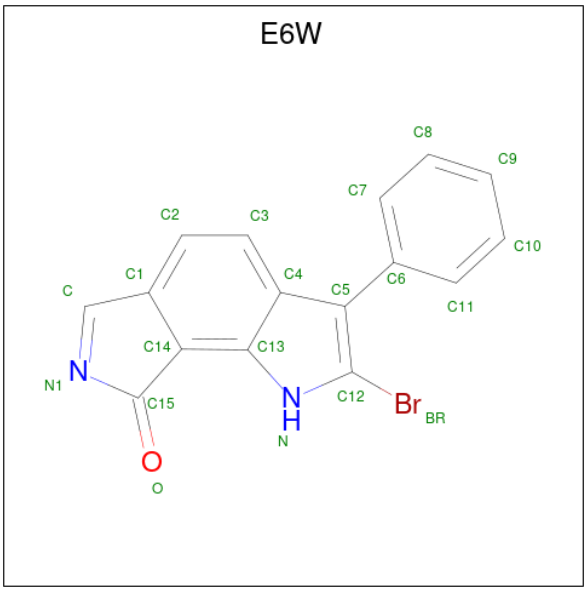
- Molecule 1 is a protein called Dual specificity protein kinase CLK1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	336	2768	1769	483	499	17	0	2	0
1	B	337	2775	1774	485	499	17	0	2	0
1	C	337	2754	1760	478	499	17	0	2	0

There are 9 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	SER	-	expression tag	UNP P49759
A	0	MET	-	expression tag	UNP P49759
A	432	ALA	ARG	variant	UNP P49759
B	-1	SER	-	expression tag	UNP P49759
B	0	MET	-	expression tag	UNP P49759
B	432	ALA	ARG	conflict	UNP P49759
C	-1	SER	-	expression tag	UNP P49759
C	0	MET	-	expression tag	UNP P49759
C	432	ALA	ARG	variant	UNP P49759

- Molecule 2 is 2-bromanyl-3-phenyl-1 {H}-pyrrolo[3,4-g]indol-8-one (three-letter code: E6W) (formula: $C_{16}H_9BrN_2O$).

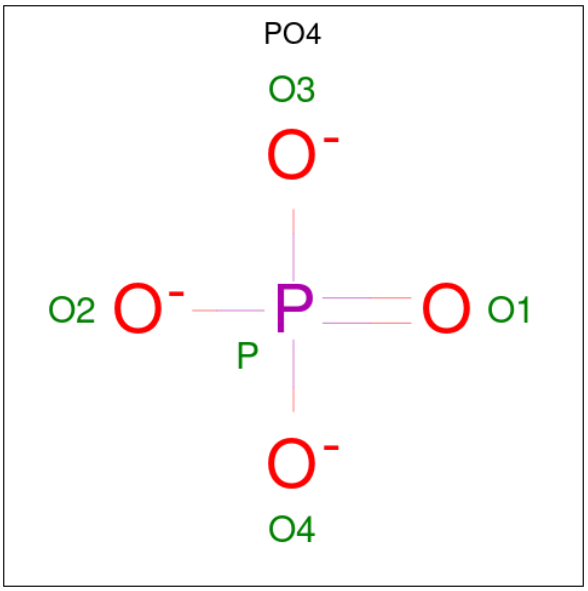


Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	Br	C	N	O		
2	A	1	39	1	32	4	2	0	1
			Total	Br	C	N	O		
2	B	1	39	1	32	4	2	0	1
			Total	Br	C	N	O		
2	C	1	39	1	32	4	2	0	1

- Molecule 3 is BROMIDE ION (three-letter code: BR) (formula: Br).

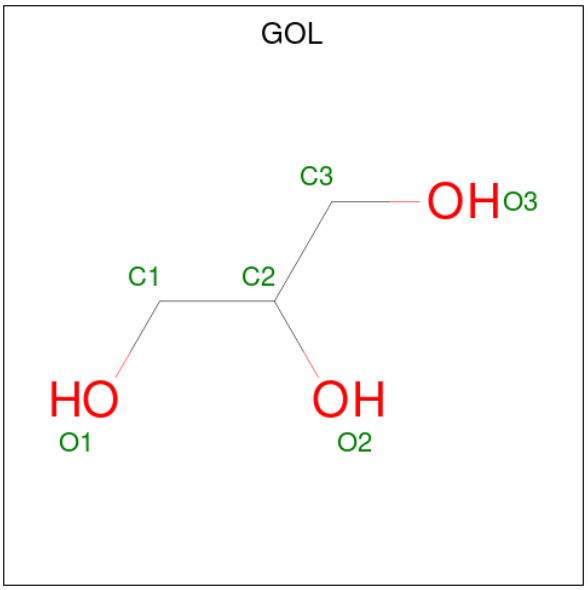
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Br		
3	A	1	1	1	0	1
			Total	Br		
3	B	1	1	1	0	1
			Total	Br		
3	C	1	1	1	0	1

- Molecule 4 is PHOSPHATE ION (three-letter code: PO4) (formula: O_4P).



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

- Molecule 5 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



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

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

- Molecule 6 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Na		
6	A	1	1	1	0	0
			Total	Na		
6	B	1	1	1	0	0
			Total	Na		
6	C	1	1	1	0	0

- Molecule 7 is water.

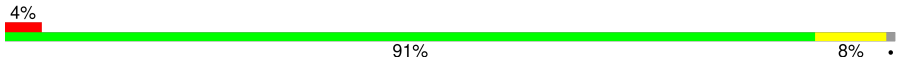
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
7	A	187	187	187	0	0
			Total	O		
7	B	174	174	174	0	0
			Total	O		
7	C	193	193	193	0	0

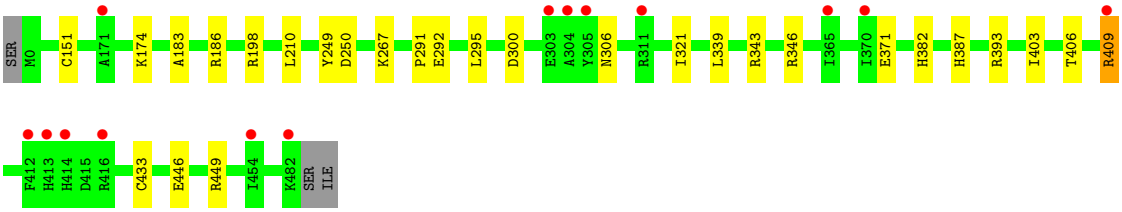
3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

• Molecule 1: Dual specificity protein kinase CLK1

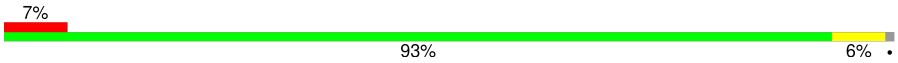
Chain A:

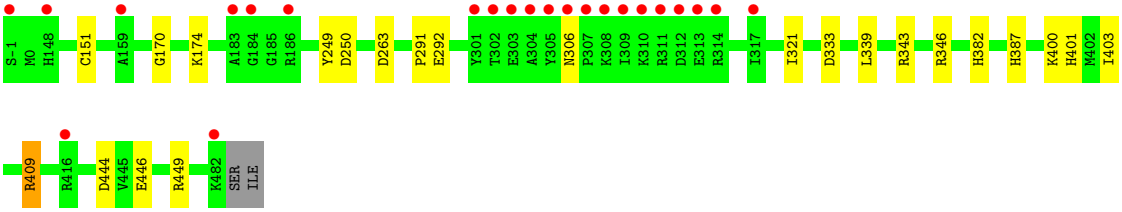




• Molecule 1: Dual specificity protein kinase CLK1

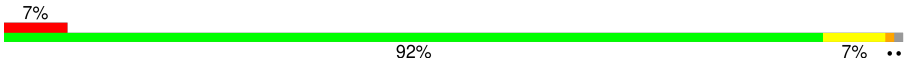
Chain B:

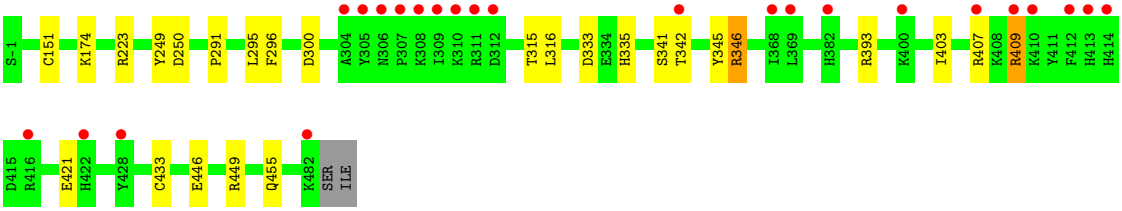




• Molecule 1: Dual specificity protein kinase CLK1

Chain C:





4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	56.40Å 116.30Å 91.33Å 90.00° 98.98° 90.00°	Depositor
Resolution (Å)	29.11 – 1.87 29.11 – 1.87	Depositor EDS
% Data completeness (in resolution range)	99.9 (29.11-1.87) 100.0 (29.11-1.87)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.85 (at 1.87Å)	Xtriage
Refinement program	REFMAC 5.8.0073	Depositor
R, R_{free}	0.166 , 0.202 0.176 , 0.210	Depositor DCC
R_{free} test set	4748 reflections (4.95%)	wwPDB-VP
Wilson B-factor (Å^2)	30.9	Xtriage
Anisotropy	0.142	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 45.5	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	0.97	EDS
Total number of atoms	9019	wwPDB-VP
Average B, all atoms (Å^2)	42.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.56% 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 (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: E6W, NA, BR, GOL, PO4

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	0.83	3/2845 (0.1%)	0.84	2/3845 (0.1%)
1	B	0.83	1/2852 (0.0%)	0.85	4/3854 (0.1%)
1	C	0.87	1/2831 (0.0%)	0.87	5/3830 (0.1%)
All	All	0.84	5/8528 (0.1%)	0.85	11/11529 (0.1%)

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	345	TYR	CE1-CZ	6.03	1.46	1.38
1	A	371	GLU	CD-OE2	5.54	1.31	1.25
1	A	292	GLU	CD-OE1	5.51	1.31	1.25
1	B	292	GLU	CD-OE1	5.20	1.31	1.25
1	A	371	GLU	CD-OE1	5.20	1.31	1.25

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	409	ARG	NE-CZ-NH2	12.61	126.60	120.30
1	A	409	ARG	NE-CZ-NH1	11.02	125.81	120.30
1	C	409	ARG	NE-CZ-NH1	10.86	125.73	120.30
1	C	409	ARG	NE-CZ-NH2	-10.69	114.95	120.30
1	B	409	ARG	NE-CZ-NH1	-10.61	115.00	120.30
1	A	409	ARG	NE-CZ-NH2	-10.13	115.23	120.30
1	C	223	ARG	NE-CZ-NH2	-6.41	117.09	120.30
1	B	444	ASP	CB-CG-OD2	6.09	123.78	118.30
1	C	333	ASP	CB-CG-OD1	5.97	123.67	118.30
1	C	346	ARG	NE-CZ-NH2	5.75	123.17	120.30
1	B	333	ASP	CB-CG-OD1	5.41	123.17	118.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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	2768	0	2730	17	0
1	B	2775	0	2738	14	0
1	C	2754	0	2688	18	0
2	A	39	0	0	1	0
2	B	39	0	0	0	0
2	C	39	0	0	1	0
3	A	1	0	0	1	0
3	B	1	0	0	1	0
3	C	1	0	0	2	0
4	A	5	0	0	0	0
4	B	5	0	0	0	0
4	C	5	0	0	0	0
5	A	18	0	24	0	0
5	B	6	0	8	0	0
5	C	6	0	8	0	0
6	A	1	0	0	0	0
6	B	1	0	0	0	0
6	C	1	0	0	0	0
7	A	187	0	0	2	1
7	B	174	0	0	4	1
7	C	193	0	0	9	0
All	All	9019	0	8196	49	1

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 3.

All (49) 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:250:ASP:OD2	3:A:502[B]:BR:BR	2.64	0.71
1:C:250:ASP:OD2	3:C:502[B]:BR:BR	2.65	0.70
1:B:170:GLY:O	7:B:601:HOH:O	2.10	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:382:HIS:HE1	7:A:606:HOH:O	1.78	0.67
1:A:198:ARG:NH1	1:C:407:ARG:HG2	2.12	0.65
1:C:341:SER:HB3	7:C:742:HOH:O	1.98	0.63
1:C:315:THR:OG1	7:C:601:HOH:O	2.16	0.63
1:C:296:PHE:CZ	1:C:316:LEU:HD11	2.33	0.63
1:C:403:ILE:O	1:C:409:ARG:NH2	2.34	0.59
3:C:502[B]:BR:BR	7:C:650:HOH:O	2.73	0.56
1:A:151:CYS:SG	1:A:174:LYS:NZ	2.67	0.56
1:A:403:ILE:O	1:A:409:ARG:NH2	2.36	0.56
1:B:263:ASP:HB3	7:B:719:HOH:O	2.06	0.55
1:C:446[A]:GLU:OE2	1:C:449:ARG:NH1	2.36	0.54
1:C:151:CYS:SG	1:C:174:LYS:NZ	2.70	0.53
1:B:401:HIS:HE1	7:B:706:HOH:O	1.93	0.51
1:B:400:LYS:HG3	7:B:636:HOH:O	2.11	0.51
1:C:421:GLU:O	7:C:602:HOH:O	2.20	0.50
1:A:339:LEU:HD11	1:A:346:ARG:CZ	2.41	0.50
1:C:393:ARG:HG2	1:C:433:CYS:HB2	1.94	0.50
1:B:446:GLU:OE2	1:B:449:ARG:NH1	2.38	0.50
1:B:250:ASP:OD2	3:B:502[B]:BR:BR	2.85	0.49
1:B:403:ILE:O	1:B:409:ARG:NH2	2.42	0.49
1:B:151:CYS:SG	1:B:174:LYS:NZ	2.68	0.48
1:C:455:GLN:NE2	7:C:604:HOH:O	2.31	0.48
1:C:300:ASP:HB2	7:C:744:HOH:O	2.15	0.47
1:C:407:ARG:HB2	7:C:608:HOH:O	2.14	0.47
1:A:446:GLU:OE2	1:A:449:ARG:NH1	2.43	0.47
1:B:339:LEU:HD11	1:B:346:ARG:CZ	2.45	0.47
1:A:249:TYR:HB2	1:A:291:PRO:HB2	1.98	0.45
1:A:343:ARG:HD2	1:A:382:HIS:HA	1.98	0.45
1:A:393:ARG:HG2	1:A:433:CYS:HB2	1.99	0.44
1:C:341:SER:CB	7:C:742:HOH:O	2.63	0.44
1:B:343:ARG:HD2	1:B:382:HIS:HA	2.00	0.44
1:B:321:ILE:C	1:B:321:ILE:HD12	2.39	0.43
1:C:342:THR:HG23	1:C:346:ARG:NH2	2.33	0.43
1:B:249:TYR:HB2	1:B:291:PRO:HB2	2.00	0.43
1:B:306:ASN:OD1	1:B:306:ASN:C	2.58	0.42
1:A:183:ALA:HB1	1:A:186:ARG:HD2	2.02	0.41
1:A:306:ASN:OD1	1:A:306:ASN:C	2.59	0.41
1:A:403:ILE:O	1:A:406:THR:HG22	2.20	0.41
1:A:295:LEU:HD21	2:A:501[B]:E6W:C13	2.51	0.41
1:A:267:LYS:NZ	7:A:612:HOH:O	2.54	0.41
1:C:249:TYR:HB2	1:C:291:PRO:HB2	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:321:ILE:HD12	1:A:321:ILE:C	2.41	0.41
1:C:295:LEU:HD21	2:C:501[B]:E6W:C13	2.51	0.41
1:A:210:LEU:HD23	1:A:210:LEU:HA	1.91	0.40
1:B:343:ARG:CD	1:B:382:HIS:HA	2.52	0.40
1:C:335:HIS:HD2	7:C:782:HOH:O	2.05	0.40

All (1) 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)
7:A:727:HOH:O	7:B:693:HOH:O[2_757]	2.16	0.04

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	336/339 (99%)	330 (98%)	6 (2%)	0	100	100
1	B	337/339 (99%)	330 (98%)	7 (2%)	0	100	100
1	C	337/339 (99%)	329 (98%)	8 (2%)	0	100	100
All	All	1010/1017 (99%)	989 (98%)	21 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	306/308 (99%)	303 (99%)	3 (1%)	76	73
1	B	306/308 (99%)	305 (100%)	1 (0%)	92	92
1	C	301/308 (98%)	301 (100%)	0	100	100
All	All	913/924 (99%)	909 (100%)	4 (0%)	92	90

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	300[A]	ASP
1	A	300[B]	ASP
1	A	387	HIS
1	B	387	HIS

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 monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 20 ligands modelled in this entry, 6 are monoatomic - leaving 14 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	$\#\|Z\| > 2$
2	E6W	C	501[A]	-	19,23,23	2.05	3 (15%)	21,34,34	1.85	6 (28%)
4	PO4	A	503	-	4,4,4	0.67	0	6,6,6	0.85	0
5	GOL	B	504	-	5,5,5	0.44	0	5,5,5	0.33	0
2	E6W	B	501[B]	-	20,22,23	2.00	3 (15%)	21,32,34	1.89	6 (28%)
5	GOL	C	504	-	5,5,5	0.36	0	5,5,5	0.55	0
2	E6W	C	501[B]	-	20,22,23	1.96	2 (10%)	21,32,34	1.83	5 (23%)
5	GOL	A	504	-	5,5,5	0.35	0	5,5,5	0.82	0
5	GOL	A	507	-	5,5,5	0.80	0	5,5,5	0.83	0
4	PO4	B	503	-	4,4,4	0.86	0	6,6,6	0.75	0
2	E6W	A	501[A]	-	19,23,23	2.08	3 (15%)	21,34,34	1.84	5 (23%)
4	PO4	C	503	-	4,4,4	0.92	0	6,6,6	1.02	0
5	GOL	A	505	-	5,5,5	0.37	0	5,5,5	0.62	0
2	E6W	A	501[B]	-	20,22,23	1.92	2 (10%)	21,32,34	1.86	6 (28%)
2	E6W	B	501[A]	-	19,23,23	2.14	4 (21%)	21,34,34	1.85	6 (28%)

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	E6W	C	501[A]	-	-	3/4/13/13	0/4/4/4
5	GOL	B	504	-	-	2/4/4/4	-
2	E6W	B	501[B]	-	-	0/4/13/13	0/4/4/4
5	GOL	C	504	-	-	2/4/4/4	-
2	E6W	C	501[B]	-	-	3/4/13/13	0/4/4/4
5	GOL	A	504	-	-	2/4/4/4	-
5	GOL	A	507	-	-	4/4/4/4	-
2	E6W	A	501[A]	-	-	2/4/13/13	0/4/4/4
5	GOL	A	505	-	-	0/4/4/4	-
2	E6W	A	501[B]	-	-	0/4/13/13	0/4/4/4
2	E6W	B	501[A]	-	-	0/4/13/13	0/4/4/4

All (17) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	501[B]	E6W	C1-C	6.87	1.50	1.42
2	B	501[B]	E6W	C1-C	6.85	1.50	1.42
2	C	501[B]	E6W	C1-C	6.85	1.50	1.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	501[A]	E6W	C1-C	6.83	1.50	1.42
2	B	501[A]	E6W	C1-C	6.80	1.50	1.42
2	C	501[A]	E6W	C1-C	6.77	1.50	1.42
2	A	501[A]	E6W	C-N1	4.01	1.45	1.33
2	C	501[B]	E6W	C-N1	4.00	1.45	1.33
2	C	501[A]	E6W	C-N1	3.97	1.45	1.33
2	A	501[B]	E6W	C-N1	3.97	1.45	1.33
2	B	501[A]	E6W	C-N1	3.94	1.45	1.33
2	B	501[B]	E6W	C-N1	3.91	1.45	1.33
2	B	501[A]	E6W	C14-C13	-3.31	1.37	1.43
2	A	501[A]	E6W	BR-C12	-2.95	1.85	1.90
2	B	501[B]	E6W	C14-C13	-2.78	1.38	1.43
2	B	501[A]	E6W	BR-C12	-2.68	1.85	1.90
2	C	501[A]	E6W	BR-C12	-2.27	1.86	1.90

All (34) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	501[A]	E6W	C1-C-N1	-5.94	101.47	112.12
2	A	501[B]	E6W	C1-C-N1	-5.94	101.47	112.12
2	C	501[B]	E6W	C1-C-N1	-5.88	101.58	112.12
2	C	501[A]	E6W	C1-C-N1	-5.87	101.59	112.12
2	B	501[B]	E6W	C1-C-N1	-5.87	101.60	112.12
2	B	501[A]	E6W	C1-C-N1	-5.85	101.63	112.12
2	A	501[B]	E6W	C-N1-C15	3.59	114.66	107.59
2	A	501[A]	E6W	C-N1-C15	3.56	114.59	107.59
2	C	501[A]	E6W	C-N1-C15	3.43	114.35	107.59
2	C	501[B]	E6W	C-N1-C15	3.42	114.33	107.59
2	B	501[B]	E6W	C-N1-C15	3.41	114.30	107.59
2	B	501[A]	E6W	C-N1-C15	3.36	114.20	107.59
2	B	501[B]	E6W	C5-C12-N	2.67	114.07	108.91
2	B	501[B]	E6W	C2-C1-C	-2.61	129.79	135.71
2	C	501[B]	E6W	C2-C1-C	-2.56	129.88	135.71
2	B	501[A]	E6W	C2-C1-C	-2.54	129.94	135.71
2	C	501[A]	E6W	C2-C1-C	-2.54	129.94	135.71
2	A	501[B]	E6W	C2-C1-C	-2.54	129.94	135.71
2	C	501[A]	E6W	C6-C5-C12	2.48	133.16	127.54
2	A	501[A]	E6W	C3-C4-C5	-2.48	132.93	135.95
2	A	501[A]	E6W	C2-C1-C	-2.48	130.08	135.71
2	C	501[A]	E6W	C3-C4-C5	-2.47	132.95	135.95
2	B	501[A]	E6W	C6-C5-C12	2.44	133.06	127.54
2	B	501[A]	E6W	C3-C4-C5	-2.40	133.03	135.95

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	501[A]	E6W	C14-C15-N1	-2.30	106.06	109.96
2	A	501[A]	E6W	C14-C15-N1	-2.28	106.09	109.96
2	B	501[B]	E6W	C14-C15-N1	-2.28	106.09	109.96
2	C	501[A]	E6W	C14-C15-N1	-2.28	106.10	109.96
2	A	501[B]	E6W	C14-C15-N1	-2.26	106.13	109.96
2	C	501[B]	E6W	C14-C15-N1	-2.25	106.15	109.96
2	A	501[B]	E6W	C5-C12-N	2.19	113.15	108.91
2	C	501[B]	E6W	C5-C12-N	2.11	112.98	108.91
2	A	501[B]	E6W	C3-C4-C5	-2.10	132.63	135.63
2	B	501[B]	E6W	C3-C4-C5	-2.03	132.73	135.63

There are no chirality outliers.

All (18) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	501[A]	E6W	C4-C5-C6-C11
2	C	501[A]	E6W	C4-C5-C6-C7
2	C	501[A]	E6W	C4-C5-C6-C11
2	C	501[B]	E6W	C4-C5-C6-C11
5	C	504	GOL	O1-C1-C2-C3
5	A	504	GOL	C1-C2-C3-O3
5	A	507	GOL	O1-C1-C2-C3
5	A	507	GOL	C1-C2-C3-O3
5	B	504	GOL	C1-C2-C3-O3
5	A	507	GOL	O2-C2-C3-O3
5	B	504	GOL	O2-C2-C3-O3
5	C	504	GOL	O1-C1-C2-O2
5	A	504	GOL	O2-C2-C3-O3
2	A	501[A]	E6W	C4-C5-C6-C7
2	C	501[B]	E6W	C4-C5-C6-C7
2	C	501[A]	E6W	C12-C5-C6-C7
2	C	501[B]	E6W	C12-C5-C6-C11
5	A	507	GOL	O1-C1-C2-O2

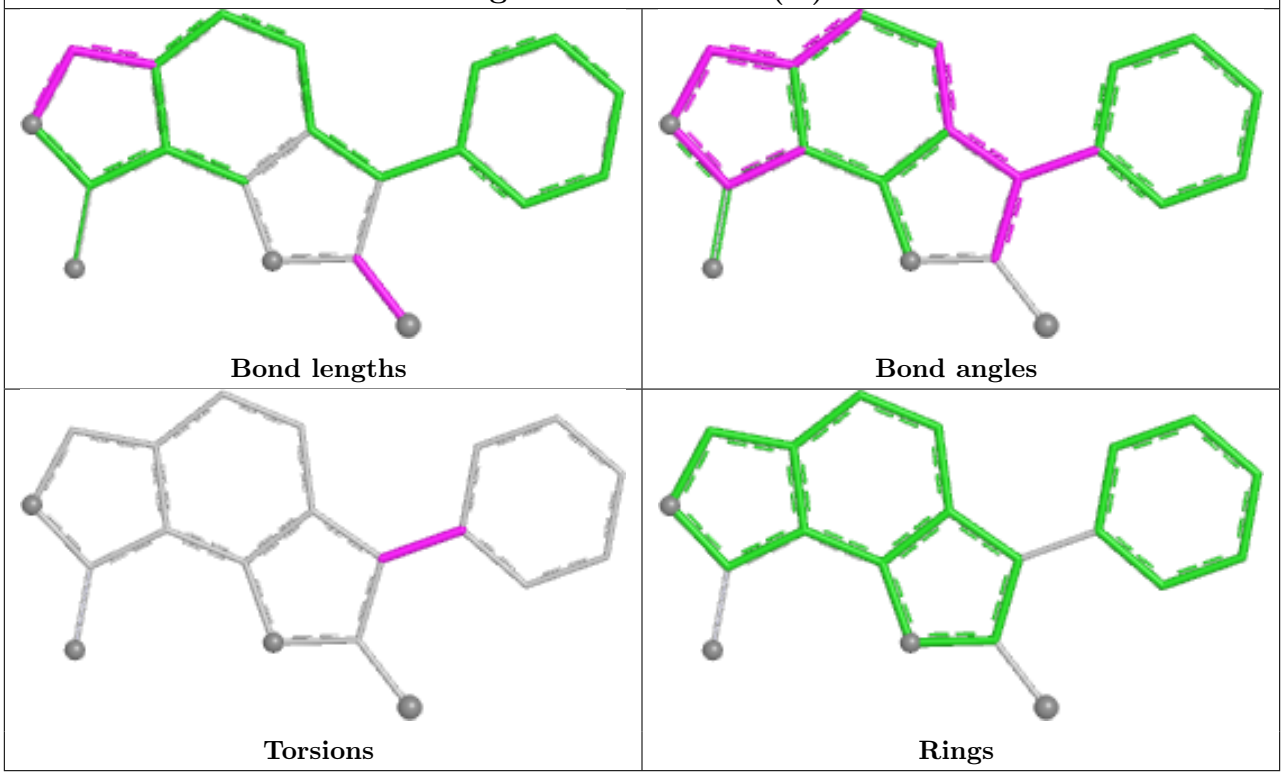
There are no ring outliers.

2 monomers are involved in 2 short contacts:

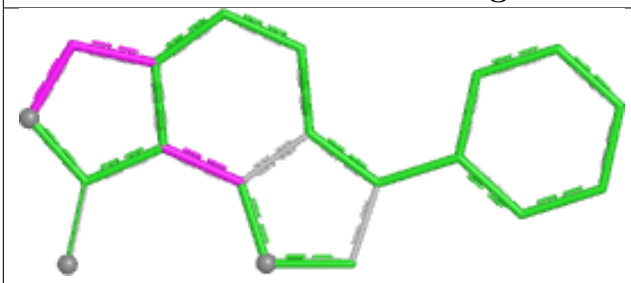
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	501[B]	E6W	1	0
2	A	501[B]	E6W	1	0

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 E6W C 501 (A)

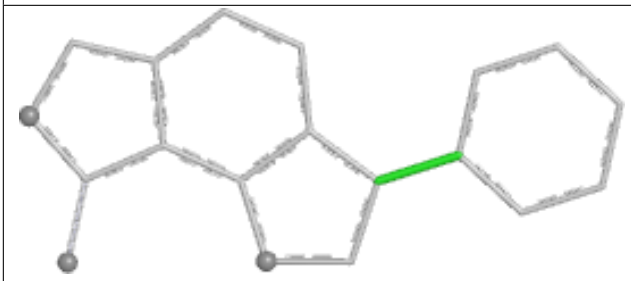


Ligand E6W B 501 (B)

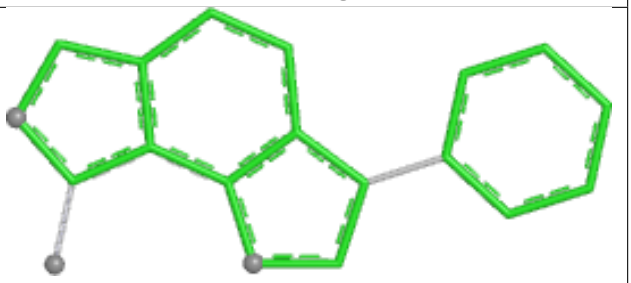


Bond lengths

Bond angles

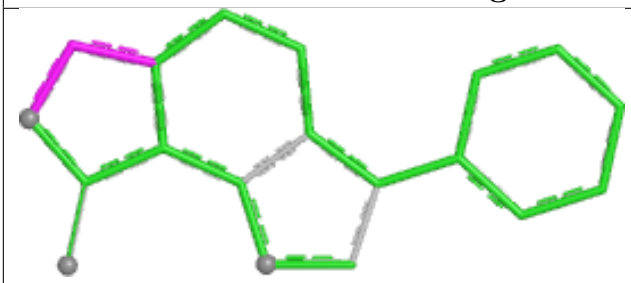


Torsions

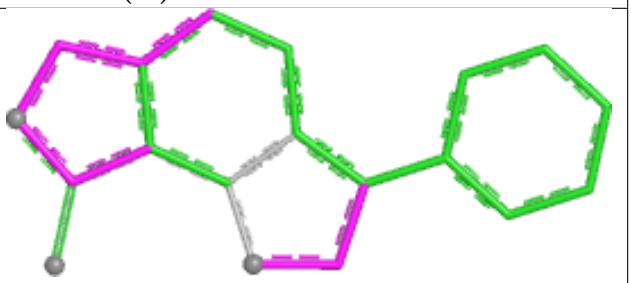


Rings

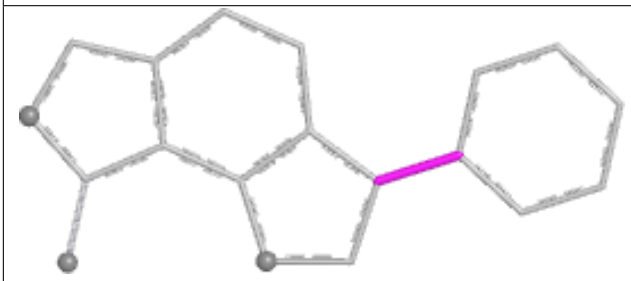
Ligand E6W C 501 (B)



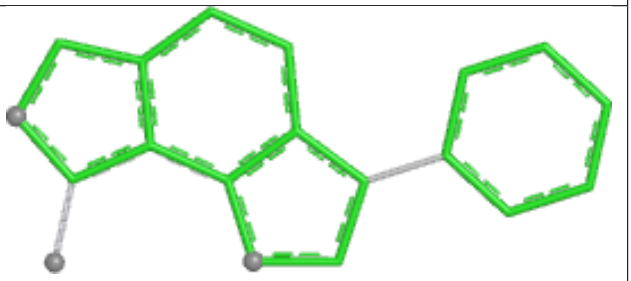
Bond lengths



Bond angles

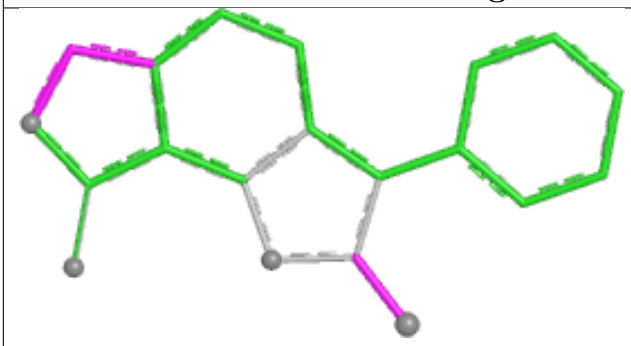


Torsions

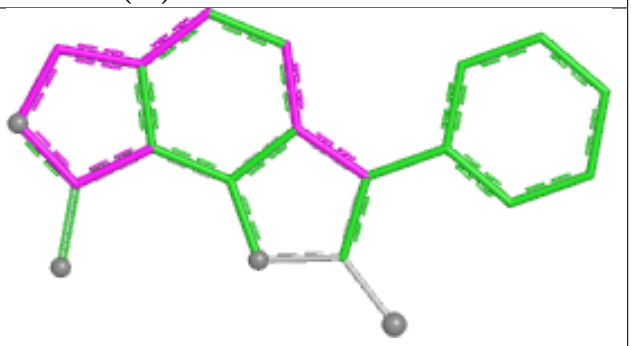


Rings

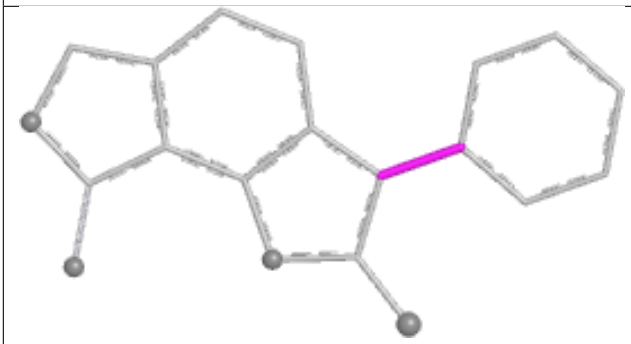
Ligand E6W A 501 (A)



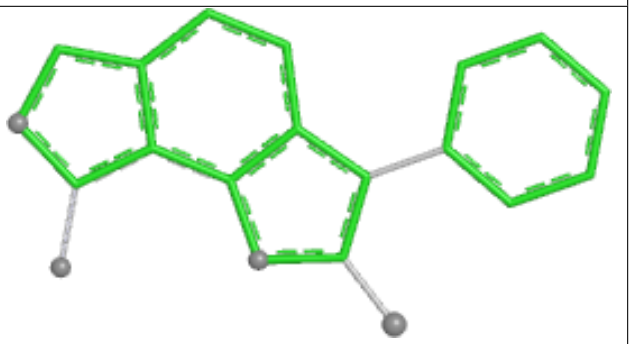
Bond lengths



Bond angles

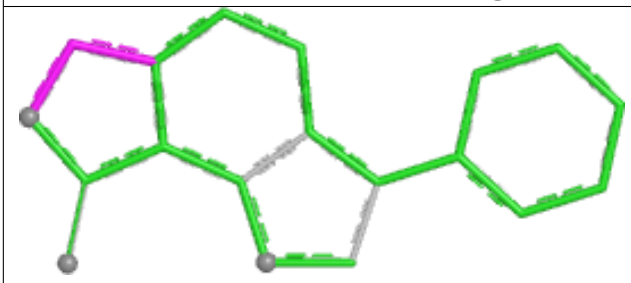


Torsions



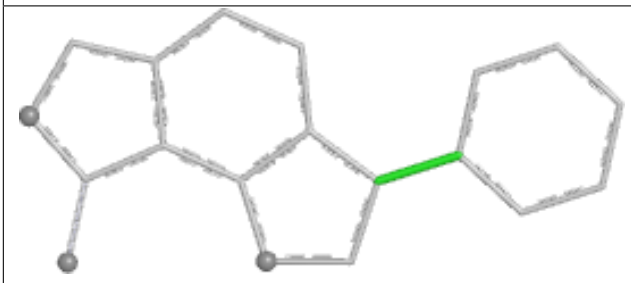
Rings

Ligand E6W A 501 (B)

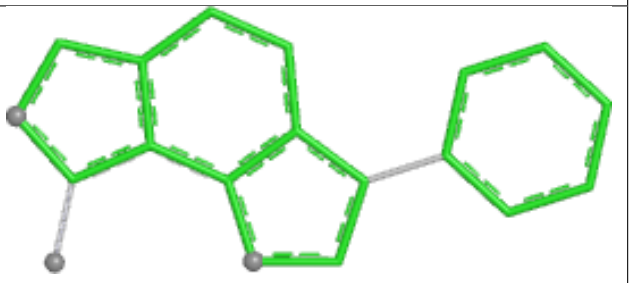


Bond lengths

Bond angles

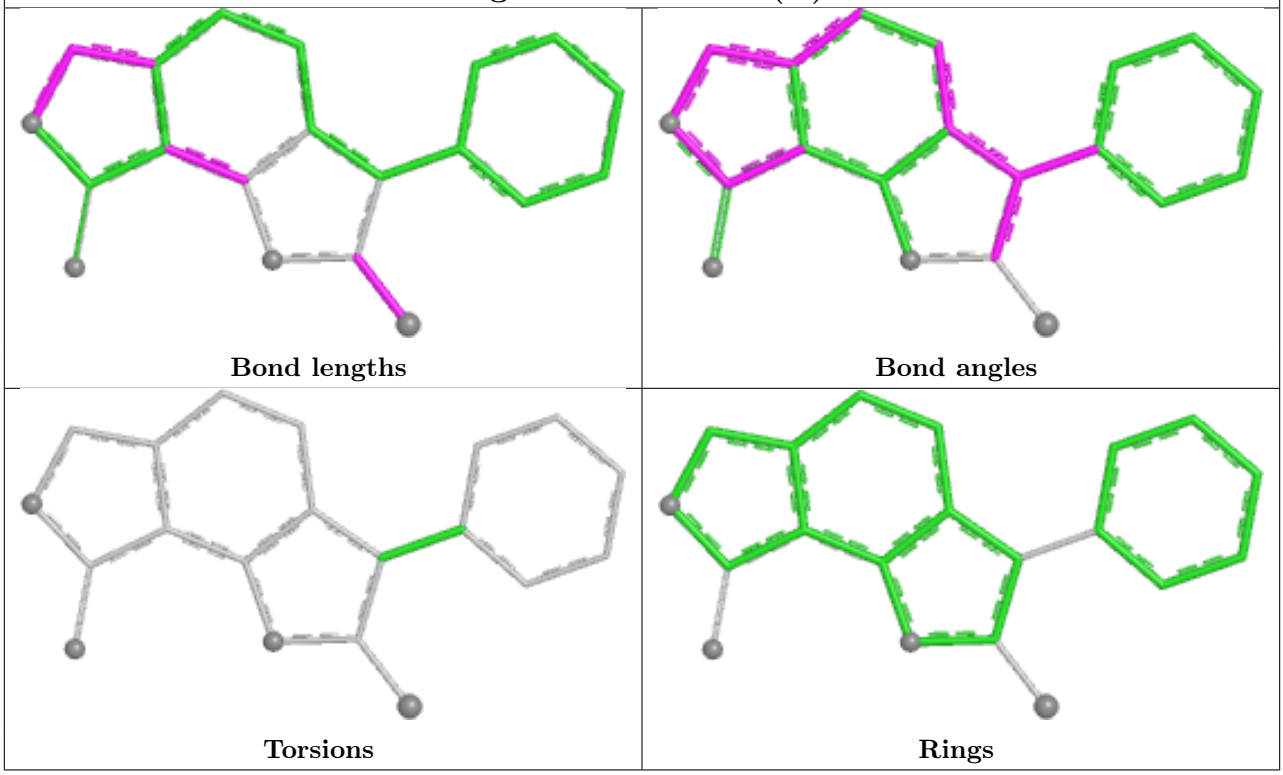


Torsions



Rings

Ligand E6W B 501 (A)



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	A	336/339 (99%)	0.06	14 (4%)	36	37	21, 37, 67, 87	0
1	B	337/339 (99%)	0.11	23 (6%)	17	18	23, 39, 71, 115	0
1	C	337/339 (99%)	0.16	24 (7%)	16	17	20, 36, 81, 112	0
All	All	1010/1017 (99%)	0.11	61 (6%)	21	23	20, 38, 74, 115	0

All (61) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	301	TYR	6.0
1	C	309	ILE	5.8
1	C	305	TYR	5.3
1	B	309	ILE	5.2
1	B	304	ALA	5.0
1	C	414	HIS	4.6
1	A	305	TYR	4.5
1	B	311	ARG	4.0
1	B	305	TYR	3.9
1	C	413	HIS	3.9
1	B	307	PRO	3.9
1	B	312	ASP	3.8
1	C	307	PRO	3.8
1	B	310	LYS	3.7
1	C	416	ARG	3.6
1	C	409	ARG	3.5
1	C	482	LYS	3.4
1	B	313	GLU	3.3
1	C	311	ARG	3.2
1	C	382	HIS	3.2
1	A	409	ARG	3.2
1	C	304	ALA	3.1
1	C	310	LYS	3.1

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Mol	Chain	Res	Type	RSRZ
1	C	412	PHE	3.1
1	A	311	ARG	3.0
1	B	159	ALA	3.0
1	C	312	ASP	2.9
1	C	400	LYS	2.9
1	B	303	GLU	2.8
1	B	308	LYS	2.8
1	B	314	ARG	2.8
1	C	308	LYS	2.8
1	A	304	ALA	2.8
1	A	416	ARG	2.7
1	C	428	TYR	2.7
1	A	482	LYS	2.7
1	B	482	LYS	2.7
1	B	306	ASN	2.6
1	A	171	ALA	2.6
1	C	342	THR	2.6
1	C	410	LYS	2.4
1	C	369	LEU	2.4
1	B	148	HIS	2.4
1	A	413	HIS	2.3
1	B	302	THR	2.3
1	C	306	ASN	2.3
1	C	368	ILE	2.3
1	B	183	ALA	2.3
1	B	-1	SER	2.2
1	B	416	ARG	2.2
1	B	184	GLY	2.2
1	A	414	HIS	2.1
1	B	317	ILE	2.1
1	C	422	HIS	2.1
1	A	412	PHE	2.1
1	B	186	ARG	2.1
1	A	454	ILE	2.1
1	A	365	ILE	2.1
1	A	303	GLU	2.0
1	A	370	ILE	2.0
1	C	407	ARG	2.0

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

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

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

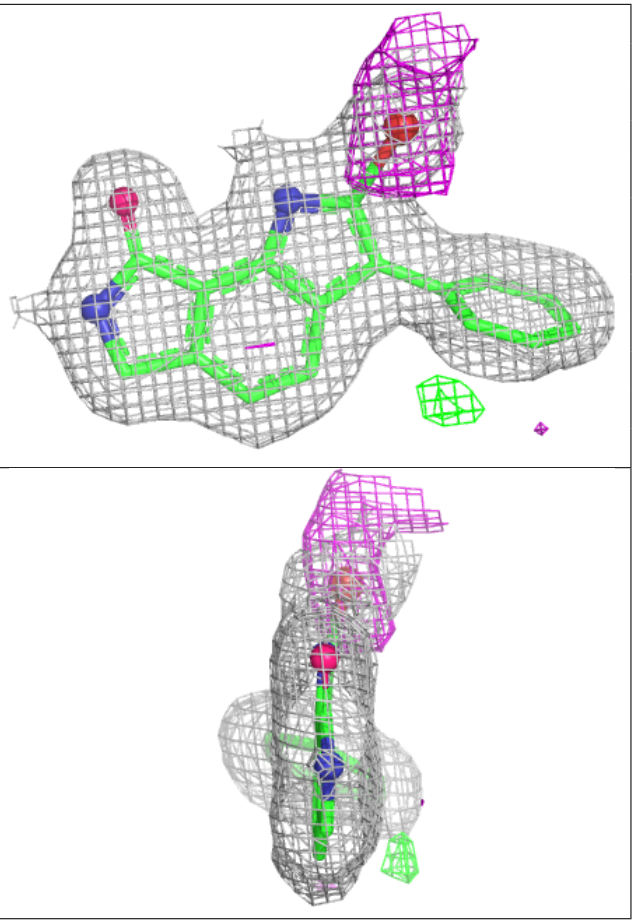
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

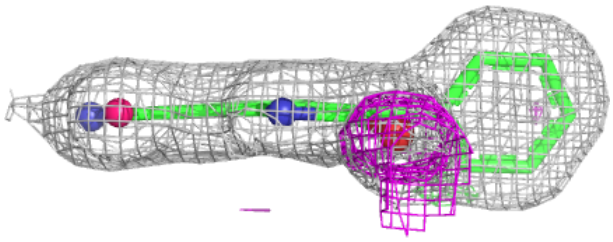
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
5	GOL	A	504	6/6	0.81	0.24	59,64,66,68	0
4	PO4	B	503	5/5	0.88	0.21	61,67,84,87	0
5	GOL	C	504	6/6	0.88	0.21	52,62,64,68	0
4	PO4	A	503	5/5	0.90	0.27	80,84,88,88	0
5	GOL	A	505	6/6	0.91	0.12	51,65,67,76	0
5	GOL	B	504	6/6	0.92	0.18	59,62,66,73	0
5	GOL	A	507	6/6	0.93	0.14	36,53,55,60	0
2	E6W	C	501[A]	20/20	0.93	0.14	20,26,35,43	20
2	E6W	C	501[B]	19/20	0.93	0.14	19,22,30,32	19
2	E6W	B	501[B]	19/20	0.94	0.11	23,25,35,37	19
2	E6W	B	501[A]	20/20	0.94	0.11	25,30,41,55	20
2	E6W	A	501[B]	19/20	0.95	0.10	22,23,32,34	19
2	E6W	A	501[A]	20/20	0.95	0.10	23,27,37,49	20
3	BR	A	502[B]	1/1	0.96	0.05	38,38,38,38	1
3	BR	B	502[B]	1/1	0.97	0.10	50,50,50,50	1
6	NA	C	505	1/1	0.97	0.17	38,38,38,38	0
3	BR	C	502[B]	1/1	0.99	0.04	36,36,36,36	1
6	NA	A	506	1/1	0.99	0.04	34,34,34,34	0
6	NA	B	505	1/1	0.99	0.09	35,35,35,35	0
4	PO4	C	503	5/5	0.99	0.11	48,48,50,53	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 E6W C 501 (A):

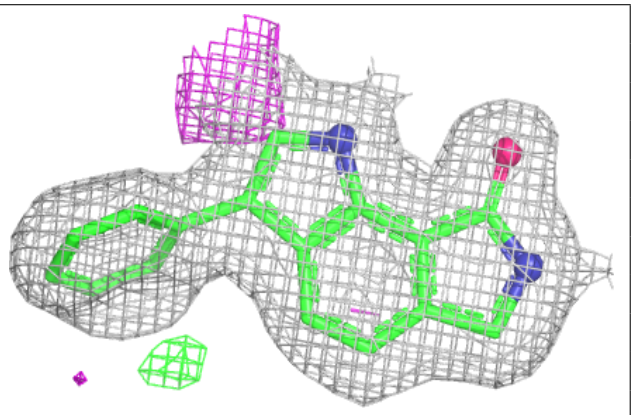
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

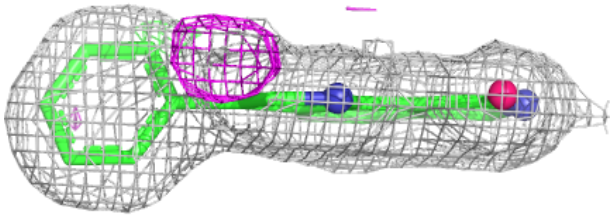


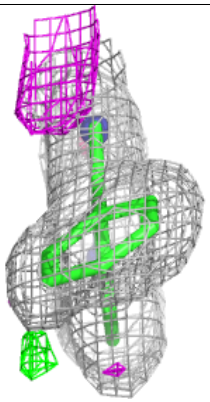


Electron density around E6W C 501 (B):

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

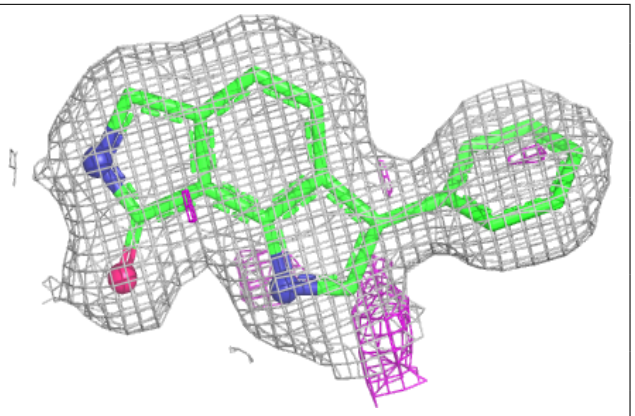


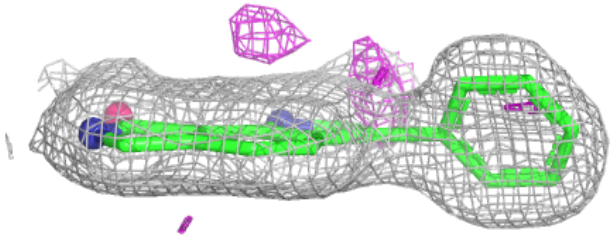


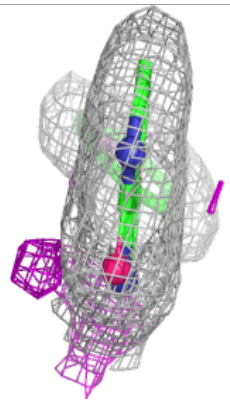


Electron density around E6W B 501 (B):

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

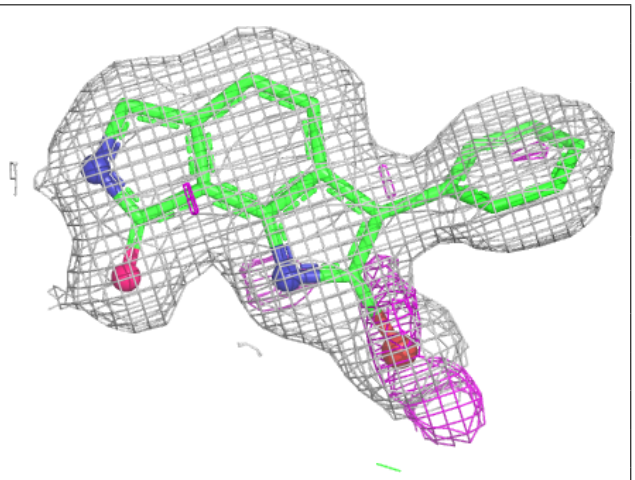


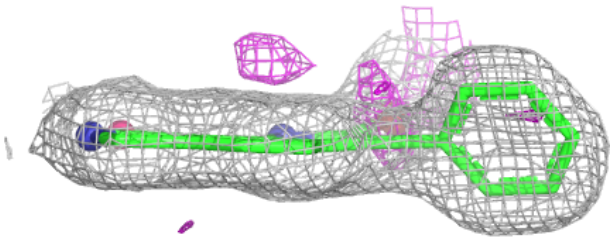


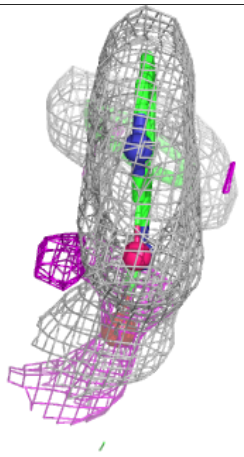


Electron density around E6W B 501 (A):

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

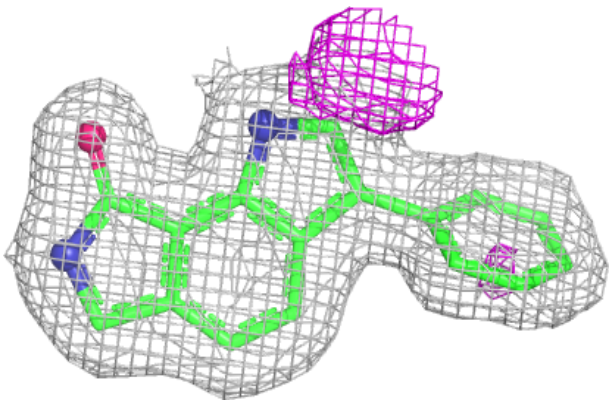


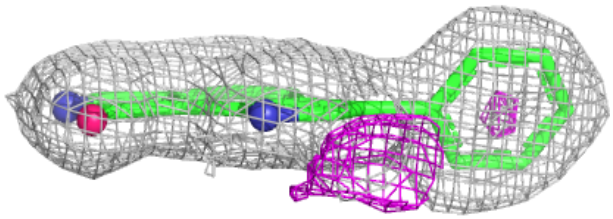


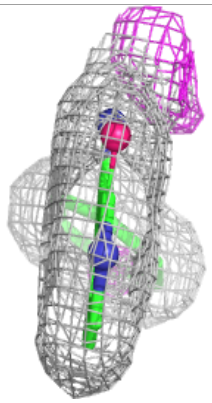


Electron density around E6W A 501 (B):

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

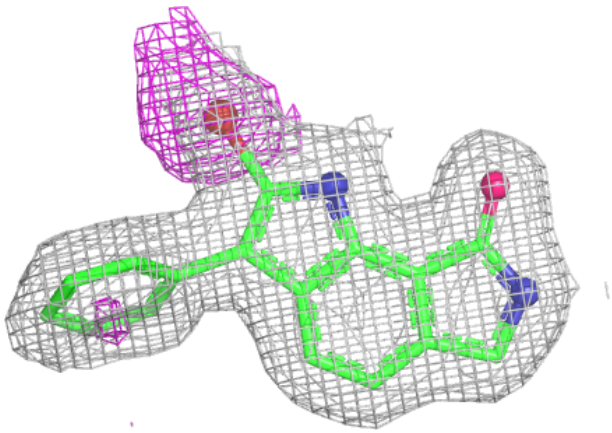


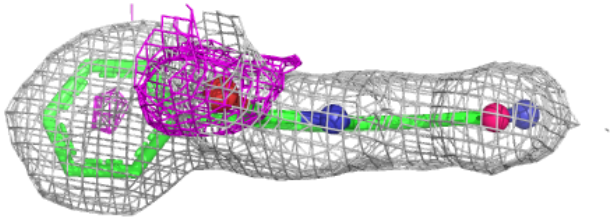


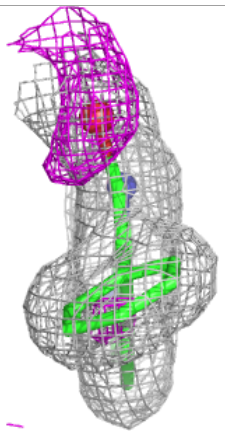


Electron density around E6W A 501 (A):

$2mF_o$-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.