



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 9, 2026 – 10:17 AM EDT

PDB ID : 10OU / pdb_000010ou
Title : FGFR2 mutant D650V with compound 12
Authors : Hoffman, I.D.; Nelson, K.J.; Bensen, D.C.; Rideout, M.; Hudkins, R.L.; Frye, C.; Bailey, J.B.
Deposited on : 2026-01-29
Resolution : 1.77 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)
Xtrriage (Phenix) : 2.0
EDS : 3.0
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
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) : 2.48.1

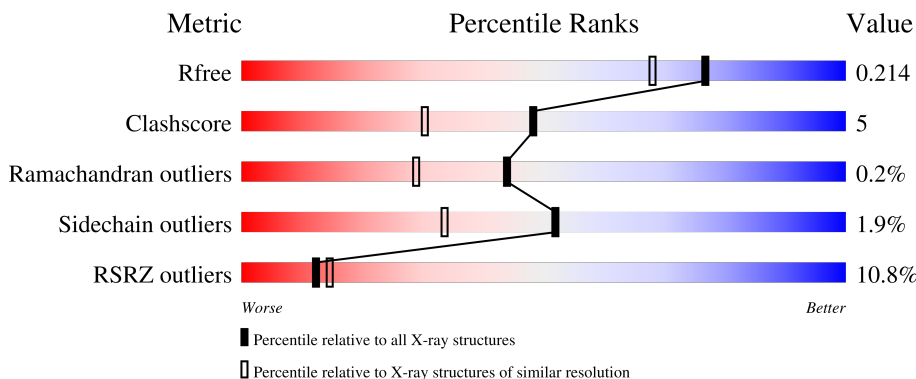
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.77 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}	164625	1191 (1.78-1.78)
Clashscore	180529	1282 (1.78-1.78)
Ramachandran outliers	177936	1270 (1.78-1.78)
Sidechain outliers	177891	1270 (1.78-1.78)
RSRZ outliers	164620	1191 (1.78-1.78)

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	324	
1	B	324	

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	EDO	A	815	-	-	X	-
3	EDO	B	820	-	-	X	-
3	EDO	B	823	-	-	X	-

2 Entry composition i

There are 6 unique types of molecules in this entry. The entry contains 5389 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 Fibroblast growth factor receptor 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	309	2474	1576	413	461	24	0	2	0
1	B	295	2365	1508	401	434	22	0	2	0

There are 28 discrepancies between the modelled and reference sequences:

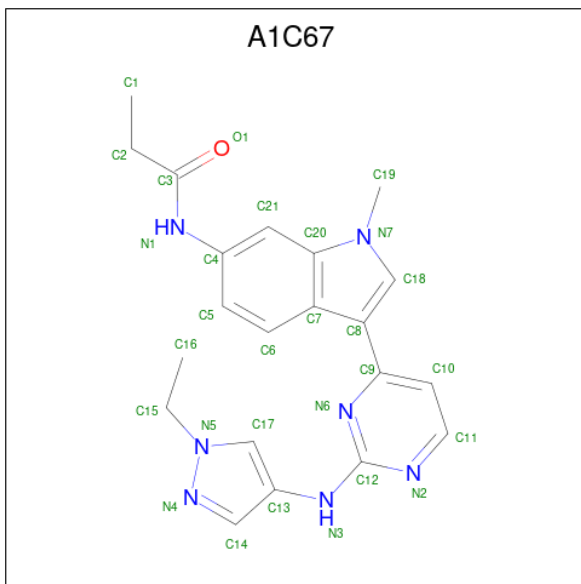
Chain	Residue	Modelled	Actual	Comment	Reference
A	445	MET	-	initiating methionine	UNP P21802
A	446	GLY	-	expression tag	UNP P21802
A	447	SER	-	expression tag	UNP P21802
A	448	SER	-	expression tag	UNP P21802
A	449	HIS	-	expression tag	UNP P21802
A	450	HIS	-	expression tag	UNP P21802
A	451	HIS	-	expression tag	UNP P21802
A	452	HIS	-	expression tag	UNP P21802
A	453	HIS	-	expression tag	UNP P21802
A	454	HIS	-	expression tag	UNP P21802
A	455	SER	-	expression tag	UNP P21802
A	456	GLN	-	expression tag	UNP P21802
A	457	ASP	-	expression tag	UNP P21802
A	650	VAL	ASP	engineered mutation	UNP P21802
B	445	MET	-	initiating methionine	UNP P21802
B	446	GLY	-	expression tag	UNP P21802
B	447	SER	-	expression tag	UNP P21802
B	448	SER	-	expression tag	UNP P21802
B	449	HIS	-	expression tag	UNP P21802
B	450	HIS	-	expression tag	UNP P21802
B	451	HIS	-	expression tag	UNP P21802
B	452	HIS	-	expression tag	UNP P21802
B	453	HIS	-	expression tag	UNP P21802
B	454	HIS	-	expression tag	UNP P21802
B	455	SER	-	expression tag	UNP P21802

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Chain	Residue	Modelled	Actual	Comment	Reference
B	456	GLN	-	expression tag	UNP P21802
B	457	ASP	-	expression tag	UNP P21802
B	650	VAL	ASP	engineered mutation	UNP P21802

- Molecule 2 is N-[(3M)-3-{2-[(1-ethyl-1H-pyrazol-4-yl)amino]pyrimidin-4-yl}-1-methyl-1H-indol-6-yl]propanamide (CCD ID: A1C67) (formula: C₂₁H₂₃N₇O) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
2	A	1	Total	C	N	O	0	0
			29	21	7	1		
2	B	1	Total	C	N	O	0	0
			29	21	7	1		

- Molecule 3 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: C₂H₆O₂).



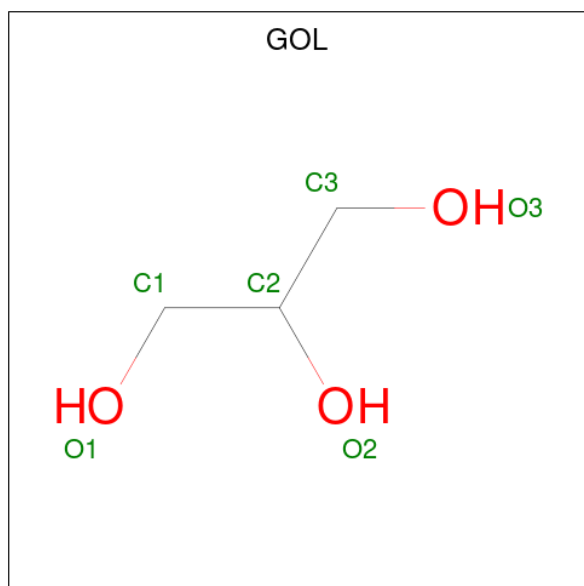
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O 4 2 2	0	0
3	A	1	Total C O 4 2 2	0	0
3	A	1	Total C O 4 2 2	0	0
3	A	1	Total C O 4 2 2	0	0
3	A	1	Total C O 4 2 2	0	0
3	A	1	Total C O 4 2 2	0	0
3	A	1	Total C O 4 2 2	0	0
3	A	1	Total C O 4 2 2	0	0
3	A	1	Total C O 4 2 2	0	0
3	A	1	Total C O 4 2 2	0	0
3	A	1	Total C O 4 2 2	0	0
3	B	1	Total C O 4 2 2	0	0
3	B	1	Total C O 4 2 2	0	0
3	B	1	Total C O 4 2 2	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	B	1	Total C O 4 2 2	0	0
3	B	1	Total C O 4 2 2	0	0
3	B	1	Total C O 4 2 2	0	0
3	B	1	Total C O 4 2 2	0	0
3	B	1	Total C O 4 2 2	0	0
3	B	1	Total C O 4 2 2	0	0
3	B	1	Total C O 4 2 2	0	0
3	B	1	Total C O 4 2 2	0	0

- Molecule 4 is GLYCEROL (CCD ID: GOL) (formula: C₃H₈O₃).



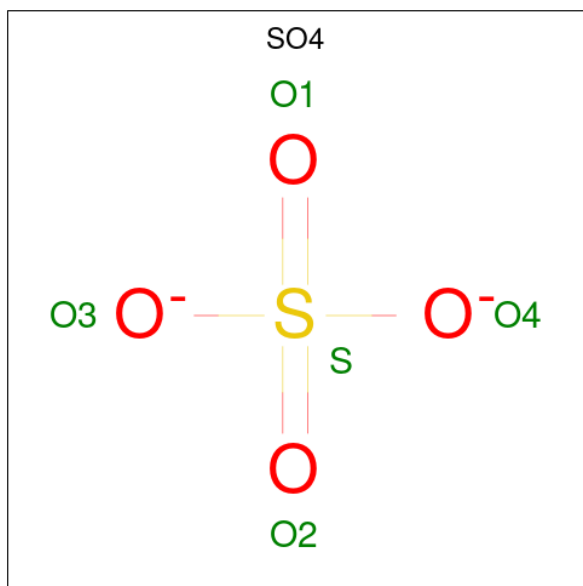
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C O 6 3 3	0	0
4	A	1	Total C O 6 3 3	0	0
4	A	1	Total C O 6 3 3	0	0

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

- Molecule 5 is SULFATE ION (CCD ID: SO4) (formula: O₄S).



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

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

- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	155	Total O 155 155	0	0
6	B	132	Total O 132 132	0	0

4 Data and refinement statistics

Property	Value	Source
Space group	P 31 2 1	Depositor
Cell constants a, b, c, α , β , γ	96.91Å 96.91Å 145.90Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	55.06 – 1.77 55.06 – 1.77	Depositor EDS
% Data completeness (in resolution range)	99.9 (55.06-1.77) 99.9 (55.06-1.77)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.96 (at 1.77Å)	Xtrriage
Refinement program	REFMAC 5.8.0430	Depositor
R, R_{free}	0.172 , 0.213 0.180 , 0.214	Depositor DCC
R_{free} test set	3894 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å ²)	28.5	Xtrriage
Anisotropy	0.024	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 47.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	0.023 for -h,-k,l	Xtrriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	5389	wwPDB-VP
Average B, all atoms (Å ²)	45.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.21% 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: GOL, EDO, SO4, A1C67

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	0.81	0/2534	1.26	12/3427 (0.4%)
1	B	0.79	1/2421 (0.0%)	1.21	10/3270 (0.3%)
All	All	0.80	1/4955 (0.0%)	1.24	22/6697 (0.3%)

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	2
1	B	0	6
All	All	0	8

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	462	GLY	C-O	11.50	1.38	1.24

All (22) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	652	ASN	CA-C-N	-11.66	99.26	121.54
1	A	652	ASN	C-N-CA	-11.66	99.26	121.54
1	B	537	MET	CG-SD-CE	-9.17	80.72	100.90
1	B	736	MET	CG-SD-CE	-9.12	80.84	100.90
1	B	573	ARG	CD-NE-CZ	8.86	136.81	124.40
1	B	713	PHE	CA-CB-CG	8.67	122.47	113.80
1	B	736	MET	CB-CA-C	-6.98	99.21	110.79
1	A	710	GLU	CB-CG-CD	6.94	124.40	112.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	538	MET	CG-SD-CE	6.74	115.73	100.90
1	A	652	ASN	N-CA-CB	6.64	122.30	111.27
1	A	710	GLU	CB-CA-C	6.37	121.36	110.79
1	B	573	ARG	NE-CZ-NH2	-6.34	113.49	119.20
1	A	518	MET	CG-SD-CE	-5.86	88.01	100.90
1	A	736	MET	CG-SD-CE	-5.80	88.14	100.90
1	B	525	GLU	CG-CD-OE1	-5.64	105.43	118.40
1	A	652	ASN	O-C-N	-5.57	115.18	122.20
1	A	758	ASP	CA-CB-CG	5.38	117.98	112.60
1	B	682	HIS	CA-CB-CG	-5.34	108.46	113.80
1	A	713	PHE	CA-CB-CG	5.18	118.98	113.80
1	B	456	GLN	CB-CA-C	5.10	118.38	109.65
1	A	589	ASP	CA-CB-CG	5.09	117.69	112.60
1	A	658	LYS	CB-CA-C	-5.07	101.39	109.75

There are no chirality outliers.

All (8) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	612	ARG	Sidechain
1	A	649	ARG	Sidechain
1	B	467	GLU	Mainchain
1	B	573	ARG	Sidechain
1	B	612[A]	ARG	Sidechain
1	B	612[B]	ARG	Sidechain
1	B	664	ARG	Sidechain
1	B	678	ARG	Sidechain

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	2474	0	2470	28	0
1	B	2365	0	2386	20	0
2	A	29	0	0	0	0
2	B	29	0	0	0	0
3	A	44	0	64	16	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	44	0	66	15	0
4	A	24	0	32	3	0
4	B	48	0	64	2	0
5	A	25	0	0	1	0
5	B	20	0	0	2	0
6	A	155	0	0	4	0
6	B	132	0	0	4	0
All	All	5389	0	5082	55	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 5.

All (55) 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:474:TRP:HE1	3:A:815:EDO:H12	1.19	1.06
1:A:664:ARG:HA	3:A:802:EDO:H21	1.40	1.03
1:B:682:HIS:HE1	3:B:823:EDO:H22	1.31	0.95
1:A:474:TRP:NE1	3:A:815:EDO:H12	1.95	0.79
1:A:681:THR:HB	3:A:821:EDO:H21	1.65	0.77
1:A:664:ARG:HG3	3:A:802:EDO:H22	1.69	0.74
1:A:664:ARG:HA	3:A:802:EDO:C2	2.16	0.72
1:A:586:TYR:OH	1:A:592:ARG:O	2.08	0.71
1:B:681:THR:HG21	3:B:820:EDO:H12	1.72	0.70
1:A:637:ASN:HD22	3:A:806:EDO:H22	1.57	0.69
1:B:682:HIS:HE1	3:B:823:EDO:C2	2.06	0.67
1:A:630:ARG:NH2	5:A:810:SO4:O4	2.28	0.67
4:B:806:GOL:H12	6:B:954:HOH:O	1.96	0.66
6:A:965:HOH:O	3:B:823:EDO:H11	1.97	0.65
1:B:682:HIS:CE1	3:B:823:EDO:H22	2.22	0.64
1:B:682:HIS:HD2	6:B:939:HOH:O	1.80	0.64
1:A:709:VAL:CG1	1:A:713:PHE:CZ	2.82	0.62
1:A:651:ILE:HD11	1:A:654:ILE:HD11	1.81	0.61
1:A:709:VAL:HG12	1:A:713:PHE:CZ	2.36	0.60
1:B:683[B]:GLN:OE1	3:B:817:EDO:H22	2.05	0.57
1:B:673:GLU:OE2	3:B:820:EDO:H21	2.04	0.56
1:A:499:GLU:HG3	1:A:511:ALA:HB1	1.88	0.54
1:A:483:LEU:HD13	1:A:518:MET:HE1	1.90	0.54
1:A:706:GLY:H	4:A:808:GOL:H2	1.74	0.53
1:B:683[B]:GLN:HB2	3:B:820:EDO:H22	1.91	0.52
6:A:965:HOH:O	3:B:823:EDO:C1	2.55	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:489:GLU:OE2	1:B:494:GLN:NE2	2.43	0.52
1:A:681:THR:HB	3:A:821:EDO:C2	2.38	0.50
4:A:809:GOL:H12	6:B:989:HOH:O	2.11	0.49
1:A:633:LEU:HD21	4:A:803:GOL:H11	1.95	0.49
3:A:815:EDO:O2	6:A:901:HOH:O	2.20	0.47
1:A:489:GLU:OE1	1:A:494:GLN:NE2	2.49	0.46
1:A:738[B]:ASP:OD1	3:A:817:EDO:O2	2.33	0.46
1:B:683[A]:GLN:NE2	6:B:907:HOH:O	2.49	0.45
3:A:815:EDO:C2	3:B:823:EDO:H12	2.46	0.45
3:A:815:EDO:H22	3:B:823:EDO:H12	1.99	0.45
1:B:683[B]:GLN:OE1	3:B:817:EDO:C2	2.65	0.45
1:A:539:LYS:HB3	3:A:815:EDO:H11	2.00	0.44
1:B:673:GLU:OE2	3:B:820:EDO:C2	2.64	0.44
1:A:593:VAL:HA	1:A:594:PRO:HD3	1.88	0.44
1:A:738[B]:ASP:CG	3:A:817:EDO:HO2	2.25	0.44
1:B:749:THR:HB	4:B:806:GOL:H32	1.99	0.44
1:B:534:GLU:HG2	1:B:538:MET:HE2	2.00	0.44
1:B:630:ARG:HD2	5:B:813:SO4:O2	2.17	0.44
1:A:678:ARG:NH2	6:A:914:HOH:O	2.51	0.43
1:B:621:LYS:HG2	3:B:823:EDO:H21	2.00	0.43
1:A:474:TRP:HE1	3:A:815:EDO:C1	2.07	0.43
1:A:699:LEU:HD12	1:A:699:LEU:N	2.34	0.42
1:A:496:VAL:HG22	1:A:518:MET:HE3	2.02	0.42
1:A:586:TYR:OH	1:A:592:ARG:C	2.63	0.41
1:B:664:ARG:HG3	5:B:812:SO4:O3	2.20	0.41
1:B:687:TRP:CD1	1:B:687:TRP:C	2.99	0.41
1:A:748:PRO:HB3	3:A:817:EDO:H12	2.03	0.41
1:B:681:THR:OG1	3:B:820:EDO:C2	2.69	0.40
1:B:687:TRP:CE3	1:B:740:TRP:HA	2.56	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	309/324 (95%)	300 (97%)	8 (3%)	1 (0%)	37	23
1	B	293/324 (90%)	290 (99%)	3 (1%)	0	100	100
All	All	602/648 (93%)	590 (98%)	11 (2%)	1 (0%)	44	29

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	594	PRO

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	272/285 (95%)	267 (98%)	5 (2%)	54	36
1	B	260/285 (91%)	255 (98%)	5 (2%)	52	33
All	All	532/570 (93%)	522 (98%)	10 (2%)	52	33

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

Mol	Chain	Res	Type
1	A	457	ASP
1	A	585	GLU
1	A	630	ARG
1	A	649	ARG
1	A	653	ASN
1	B	455	SER
1	B	468	LEU
1	B	491	CYS
1	B	710	GLU
1	B	756	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	597	GLN
1	A	637	ASN
1	B	556	GLN
1	B	682	HIS
1	B	741	HIS

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](#)

45 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	GOL	B	806	-	5,5,5	0.30	0	5,5,5	1.04	0
3	EDO	B	818	-	3,3,3	0.11	0	2,2,2	0.24	0
3	EDO	B	819	-	3,3,3	0.20	0	2,2,2	0.21	0
3	EDO	A	821	-	3,3,3	0.27	0	2,2,2	0.65	0
3	EDO	A	817	-	3,3,3	0.17	0	2,2,2	0.59	0
3	EDO	A	804	-	3,3,3	0.32	0	2,2,2	0.15	0
5	SO4	A	813	-	4,4,4	0.31	0	6,6,6	0.11	0
3	EDO	B	820	-	3,3,3	0.57	0	2,2,2	0.77	0
5	SO4	B	814	-	4,4,4	0.29	0	6,6,6	0.10	0
3	EDO	A	818	-	3,3,3	0.22	0	2,2,2	0.31	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	EDO	B	816	-	3,3,3	0.45	0	2,2,2	0.29	0
4	GOL	B	805	-	5,5,5	0.11	0	5,5,5	0.42	0
2	A1C67	A	801	1	29,32,32	2.23	9 (31%)	35,45,45	2.53	14 (40%)
3	EDO	B	801	-	3,3,3	0.38	0	2,2,2	0.39	0
4	GOL	B	803	-	5,5,5	0.25	0	5,5,5	0.53	0
5	SO4	B	815	-	4,4,4	0.35	0	6,6,6	0.09	0
3	EDO	B	821	-	3,3,3	0.14	0	2,2,2	0.21	0
3	EDO	A	806	-	3,3,3	0.15	0	2,2,2	0.22	0
4	GOL	A	807	-	5,5,5	0.19	0	5,5,5	0.37	0
4	GOL	B	808	-	5,5,5	0.14	0	5,5,5	0.36	0
5	SO4	A	811	-	4,4,4	0.26	0	6,6,6	0.11	0
5	SO4	B	812	-	4,4,4	0.37	0	6,6,6	0.13	0
3	EDO	A	816	-	3,3,3	0.40	0	2,2,2	0.29	0
3	EDO	A	815	-	3,3,3	0.87	0	2,2,2	1.41	0
3	EDO	A	820	-	3,3,3	0.36	0	2,2,2	0.69	0
5	SO4	A	814	-	4,4,4	0.34	0	6,6,6	0.10	0
4	GOL	B	810	-	5,5,5	0.10	0	5,5,5	0.23	0
4	GOL	B	811	-	5,5,5	0.12	0	5,5,5	0.25	0
4	GOL	A	809	-	5,5,5	0.20	0	5,5,5	0.35	0
3	EDO	B	823	-	3,3,3	0.46	0	2,2,2	1.05	0
3	EDO	B	804	-	3,3,3	0.42	0	2,2,2	0.58	0
4	GOL	B	809	-	5,5,5	0.24	0	5,5,5	0.55	0
4	GOL	B	807	-	5,5,5	0.16	0	5,5,5	0.35	0
4	GOL	A	808	-	5,5,5	0.10	0	5,5,5	0.35	0
4	GOL	A	803	-	5,5,5	0.17	0	5,5,5	0.61	0
3	EDO	A	819	-	3,3,3	0.14	0	2,2,2	0.21	0
5	SO4	A	812	-	4,4,4	0.29	0	6,6,6	0.33	0
3	EDO	B	822	-	3,3,3	0.27	0	2,2,2	0.35	0
3	EDO	A	805	-	3,3,3	0.29	0	2,2,2	0.26	0
5	SO4	A	810	-	4,4,4	0.29	0	6,6,6	0.35	0
5	SO4	B	813	-	4,4,4	0.29	0	6,6,6	0.13	0
3	EDO	A	802	-	3,3,3	1.15	0	2,2,2	1.47	0
3	EDO	B	824	-	3,3,3	0.65	0	2,2,2	0.36	0
3	EDO	B	817	-	3,3,3	0.39	0	2,2,2	0.41	0
2	A1C67	B	802	1	29,32,32	2.31	10 (34%)	35,45,45	3.30	19 (54%)

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
4	GOL	B	806	-	-	0/4/4/4	-
3	EDO	B	818	-	-	1/1/1/1	-
3	EDO	B	819	-	-	0/1/1/1	-
3	EDO	A	821	-	-	1/1/1/1	-
3	EDO	A	817	-	-	0/1/1/1	-
3	EDO	A	804	-	-	1/1/1/1	-
3	EDO	B	820	-	-	0/1/1/1	-
3	EDO	A	818	-	-	1/1/1/1	-
3	EDO	B	816	-	-	1/1/1/1	-
4	GOL	B	805	-	-	1/4/4/4	-
2	A1C67	A	801	1	-	0/10/16/16	0/4/4/4
3	EDO	B	801	-	-	1/1/1/1	-
4	GOL	B	803	-	-	2/4/4/4	-
3	EDO	B	821	-	-	0/1/1/1	-
3	EDO	A	806	-	-	1/1/1/1	-
4	GOL	A	807	-	-	3/4/4/4	-
4	GOL	B	808	-	-	4/4/4/4	-
3	EDO	A	816	-	-	1/1/1/1	-
3	EDO	A	815	-	-	1/1/1/1	-
3	EDO	A	820	-	-	0/1/1/1	-
4	GOL	B	810	-	-	2/4/4/4	-
4	GOL	B	811	-	-	2/4/4/4	-
4	GOL	A	809	-	-	2/4/4/4	-
3	EDO	B	823	-	-	1/1/1/1	-
3	EDO	B	804	-	-	1/1/1/1	-
4	GOL	B	809	-	-	3/4/4/4	-
4	GOL	B	807	-	-	2/4/4/4	-
4	GOL	A	808	-	-	2/4/4/4	-
4	GOL	A	803	-	-	1/4/4/4	-
3	EDO	A	819	-	-	1/1/1/1	-
3	EDO	B	822	-	-	1/1/1/1	-
3	EDO	A	805	-	-	1/1/1/1	-
3	EDO	A	802	-	-	0/1/1/1	-
3	EDO	B	824	-	-	0/1/1/1	-
3	EDO	B	817	-	-	1/1/1/1	-
2	A1C67	B	802	1	-	0/10/16/16	0/4/4/4

All (19) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	801	A1C67	C8-C9	-7.44	1.39	1.49

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	802	A1C67	C8-C9	-7.18	1.39	1.49
2	A	801	A1C67	C18-N7	-3.95	1.32	1.38
2	B	802	A1C67	C18-N7	-3.77	1.32	1.38
2	B	802	A1C67	C14-C13	3.68	1.42	1.38
2	B	802	A1C67	O1-C3	3.66	1.30	1.23
2	B	802	A1C67	C18-C8	3.27	1.43	1.38
2	A	801	A1C67	C18-C8	3.07	1.42	1.38
2	B	802	A1C67	C21-C4	3.02	1.43	1.37
2	A	801	A1C67	C17-C13	2.82	1.41	1.38
2	A	801	A1C67	C14-C13	2.76	1.41	1.38
2	B	802	A1C67	C12-N3	2.74	1.42	1.36
2	B	802	A1C67	C12-N2	2.70	1.38	1.34
2	A	801	A1C67	O1-C3	2.67	1.28	1.23
2	A	801	A1C67	C12-N2	2.66	1.38	1.34
2	B	802	A1C67	C1-C2	2.55	1.62	1.51
2	A	801	A1C67	C5-C4	2.55	1.43	1.39
2	A	801	A1C67	N4-N5	2.38	1.38	1.35
2	B	802	A1C67	C10-C11	-2.17	1.34	1.38

All (33) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	802	A1C67	C11-C10-C9	9.98	126.84	117.20
2	B	802	A1C67	C10-C9-N6	-8.21	111.15	121.97
2	B	802	A1C67	C9-N6-C12	6.87	122.10	116.81
2	A	801	A1C67	C9-N6-C12	6.55	121.85	116.81
2	B	802	A1C67	C8-C9-N6	5.50	123.11	116.23
2	A	801	A1C67	N2-C12-N6	-5.19	121.40	126.42
2	A	801	A1C67	C8-C9-N6	4.67	122.08	116.23
2	B	802	A1C67	C9-C8-C7	4.28	132.27	123.90
2	A	801	A1C67	C14-N4-N5	4.23	108.64	104.23
2	B	802	A1C67	O1-C3-N1	-4.04	116.39	123.64
2	A	801	A1C67	C9-C8-C7	3.66	131.06	123.90
2	A	801	A1C67	O1-C3-N1	-3.65	117.10	123.64
2	A	801	A1C67	C17-N5-N4	-3.29	108.69	111.56
2	B	802	A1C67	C10-C9-C8	3.05	125.06	121.07
2	B	802	A1C67	C2-C3-N1	3.02	122.44	114.65
2	B	802	A1C67	C5-C4-C21	-2.93	115.25	119.37
2	A	801	A1C67	C2-C3-N1	2.87	122.07	114.65
2	B	802	A1C67	C6-C5-C4	2.86	125.73	120.90
2	B	802	A1C67	C16-C15-N5	-2.84	107.67	112.14
2	A	801	A1C67	C5-C6-C7	-2.71	117.36	121.15

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	801	A1C67	C10-C9-N6	-2.69	118.42	121.97
2	B	802	A1C67	C6-C7-C8	-2.53	132.02	135.63
2	A	801	A1C67	C19-N7-C18	2.52	129.62	124.90
2	B	802	A1C67	C14-N4-N5	2.51	106.84	104.23
2	A	801	A1C67	C8-C18-N7	2.44	113.25	108.53
2	A	801	A1C67	C17-C13-C14	2.38	107.12	106.02
2	A	801	A1C67	C4-N1-C3	2.37	131.72	127.52
2	B	802	A1C67	C5-C6-C7	-2.36	117.84	121.15
2	B	802	A1C67	C10-C11-N2	-2.29	121.17	123.97
2	B	802	A1C67	C15-N5-C17	-2.25	124.52	129.82
2	B	802	A1C67	C11-N2-C12	-2.16	113.62	115.42
2	B	802	A1C67	C17-C13-C14	2.14	107.01	106.02
2	B	802	A1C67	C13-N3-C12	-2.05	123.86	129.38

There are no chirality outliers.

All (39) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	807	GOL	C1-C2-C3-O3
4	B	808	GOL	O1-C1-C2-C3
4	B	808	GOL	C1-C2-C3-O3
4	B	809	GOL	O1-C1-C2-C3
4	B	810	GOL	C1-C2-C3-O3
4	B	811	GOL	O1-C1-C2-C3
4	A	807	GOL	O1-C1-C2-C3
4	A	808	GOL	O1-C1-C2-C3
4	B	805	GOL	O1-C1-C2-C3
4	B	807	GOL	C1-C2-C3-O3
4	A	807	GOL	O2-C2-C3-O3
4	B	807	GOL	O2-C2-C3-O3
4	B	808	GOL	O1-C1-C2-O2
4	B	808	GOL	O2-C2-C3-O3
4	B	810	GOL	O2-C2-C3-O3
3	A	821	EDO	O1-C1-C2-O2
3	B	801	EDO	O1-C1-C2-O2
3	B	804	EDO	O1-C1-C2-O2
3	B	818	EDO	O1-C1-C2-O2
4	A	808	GOL	O1-C1-C2-O2
3	A	804	EDO	O1-C1-C2-O2
3	A	815	EDO	O1-C1-C2-O2
3	A	819	EDO	O1-C1-C2-O2
4	B	811	GOL	O1-C1-C2-O2

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Mol	Chain	Res	Type	Atoms
3	A	818	EDO	O1-C1-C2-O2
3	B	816	EDO	O1-C1-C2-O2
3	B	822	EDO	O1-C1-C2-O2
4	A	803	GOL	O1-C1-C2-O2
4	A	809	GOL	O1-C1-C2-O2
4	B	809	GOL	O1-C1-C2-O2
3	A	806	EDO	O1-C1-C2-O2
4	B	803	GOL	C1-C2-C3-O3
4	B	809	GOL	C1-C2-C3-O3
3	A	816	EDO	O1-C1-C2-O2
3	A	805	EDO	O1-C1-C2-O2
3	B	817	EDO	O1-C1-C2-O2
4	A	809	GOL	O1-C1-C2-C3
4	B	803	GOL	O2-C2-C3-O3
3	B	823	EDO	O1-C1-C2-O2

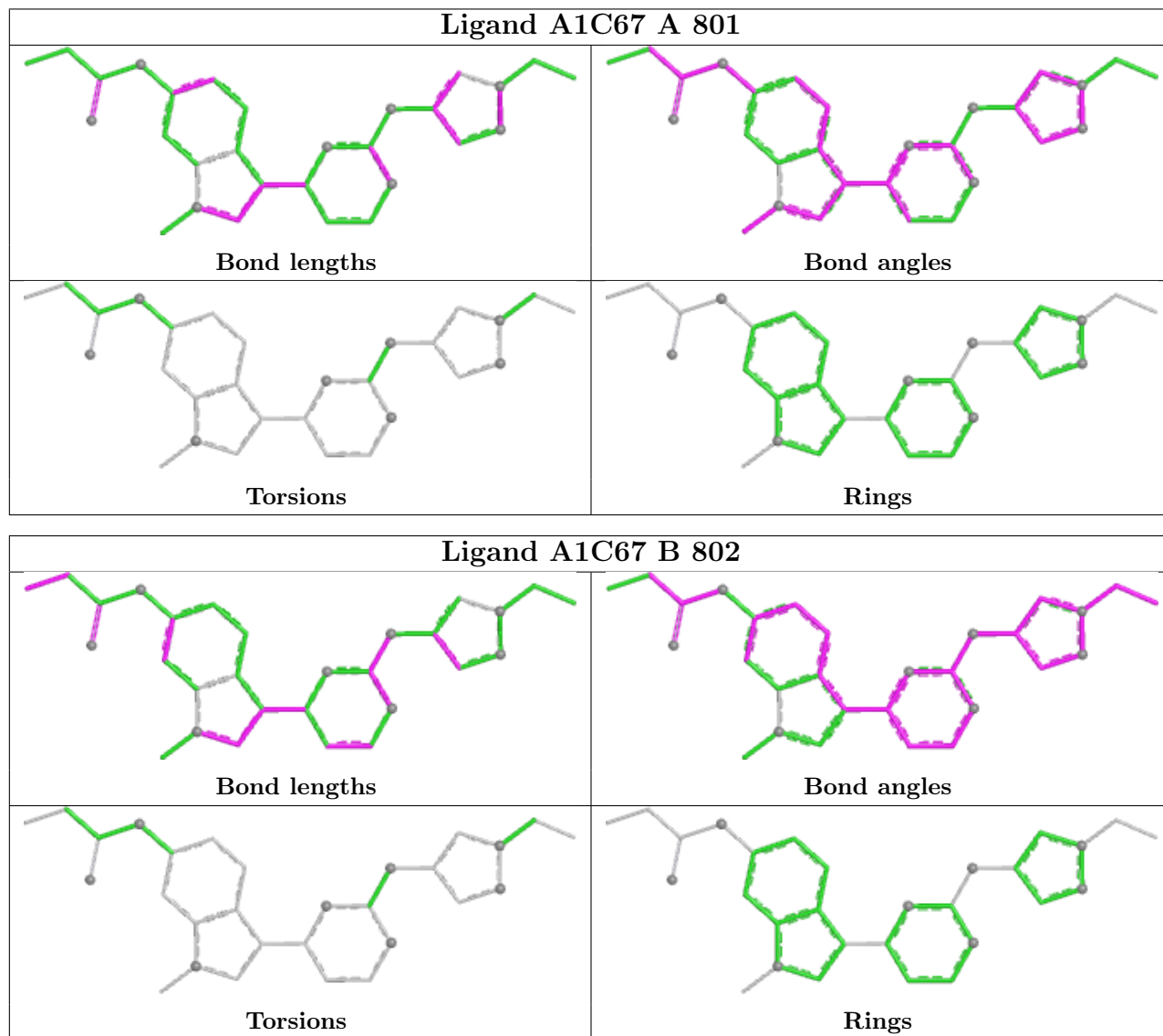
There are no ring outliers.

15 monomers are involved in 37 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	806	GOL	2	0
3	A	821	EDO	2	0
3	A	817	EDO	3	0
3	B	820	EDO	5	0
3	A	806	EDO	1	0
5	B	812	SO4	1	0
3	A	815	EDO	7	0
4	A	809	GOL	1	0
3	B	823	EDO	8	0
4	A	808	GOL	1	0
4	A	803	GOL	1	0
5	A	810	SO4	1	0
5	B	813	SO4	1	0
3	A	802	EDO	3	0
3	B	817	EDO	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 [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	309/324 (95%)	0.57	34 (11%) 12 14	21, 37, 78, 117	2 (0%)
1	B	295/324 (91%)	0.61	31 (10%) 13 15	21, 39, 86, 124	2 (0%)
All	All	604/648 (93%)	0.59	65 (10%) 12 14	21, 38, 85, 124	4 (0%)

All (65) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	588	TYR	7.1
1	A	590	ILE	6.9
1	B	713	PHE	6.2
1	A	461	ALA	5.4
1	A	463	VAL	5.3
1	B	676	PHE	4.9
1	A	586	TYR	4.8
1	A	594	PRO	4.7
1	B	582	PRO	4.6
1	B	657	TYR	4.6
1	B	663	GLY	4.6
1	A	717	LYS	4.5
1	A	764	THR	4.4
1	A	589	ASP	4.4
1	B	654	ILE	4.3
1	A	648	ALA	4.3
1	B	764	THR	4.2
1	A	464	SER	4.0
1	B	651	ILE	4.0
1	A	458	PRO	4.0
1	A	592	ARG	3.8
1	B	715	LEU	3.6
1	A	593	VAL	3.6
1	B	707	ILE	3.6

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Mol	Chain	Res	Type	RSRZ
1	B	650	VAL	3.5
1	A	462	GLY	3.4
1	B	763	LEU	3.4
1	A	591	ASN	3.4
1	A	653	ASN	3.4
1	B	649	ARG	3.4
1	B	661	THR	3.4
1	A	649	ARG	3.3
1	B	720	HIS	3.2
1	A	587	SER	3.1
1	A	713	PHE	3.1
1	B	709	VAL	3.0
1	B	706	GLY	2.9
1	A	661	THR	2.8
1	A	715	LEU	2.7
1	A	727	ASN	2.6
1	B	656	TYR	2.6
1	B	726	ALA	2.5
1	A	479	ASP	2.5
1	B	705	PRO	2.4
1	B	717	LYS	2.4
1	B	455	SER	2.3
1	A	654	ILE	2.3
1	A	485	LYS	2.3
1	A	675	LEU	2.3
1	A	763	LEU	2.3
1	B	708	PRO	2.2
1	A	465	GLU	2.2
1	B	507	LYS	2.2
1	A	662	ASN	2.2
1	A	457	ASP	2.1
1	A	522	ASP	2.1
1	B	662	ASN	2.1
1	B	660	THR	2.1
1	B	463	VAL	2.1
1	B	491	CYS	2.1
1	B	759	ARG	2.0
1	A	459	MET	2.0
1	A	710	GLU	2.0
1	B	648	ALA	2.0
1	B	581	PRO	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 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	SO4	B	813	5/5	0.66	0.16	106,112,120,125	0
5	SO4	A	810	5/5	0.68	0.16	59,62,81,84	0
4	GOL	B	810	6/6	0.71	0.19	65,67,77,80	0
3	EDO	A	818	4/4	0.74	0.22	57,58,65,66	0
5	SO4	A	814	5/5	0.76	0.09	93,97,103,108	0
3	EDO	B	822	4/4	0.76	0.23	59,63,70,81	0
3	EDO	B	804	4/4	0.77	0.23	51,58,63,66	0
5	SO4	B	814	5/5	0.77	0.10	81,98,113,114	0
5	SO4	A	813	5/5	0.78	0.11	100,105,123,124	0
5	SO4	A	812	5/5	0.78	0.10	62,66,86,98	0
3	EDO	B	824	4/4	0.79	0.25	49,53,58,60	0
3	EDO	A	816	4/4	0.79	0.18	61,67,72,79	0
4	GOL	A	807	6/6	0.80	0.20	48,64,80,84	0
3	EDO	B	819	4/4	0.80	0.20	54,68,70,77	0
3	EDO	A	819	4/4	0.80	0.15	62,63,66,72	0
3	EDO	B	816	4/4	0.80	0.18	53,59,63,65	0
5	SO4	A	811	5/5	0.81	0.13	58,72,90,97	0
3	EDO	A	817	4/4	0.81	0.18	54,58,58,70	0
4	GOL	B	808	6/6	0.81	0.17	72,79,88,98	0
4	GOL	B	807	6/6	0.82	0.18	59,67,71,77	0
3	EDO	A	804	4/4	0.82	0.20	41,65,70,89	0
3	EDO	B	818	4/4	0.83	0.19	69,71,71,74	0
4	GOL	B	805	6/6	0.83	0.17	62,69,75,77	0
3	EDO	A	806	4/4	0.83	0.21	51,59,59,72	0
3	EDO	B	823	4/4	0.84	0.18	38,60,62,63	0
4	GOL	B	806	6/6	0.84	0.19	41,66,69,79	0
4	GOL	A	809	6/6	0.84	0.16	40,62,67,70	0

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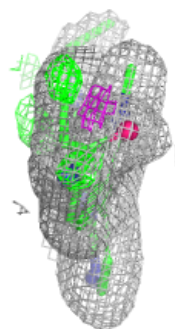
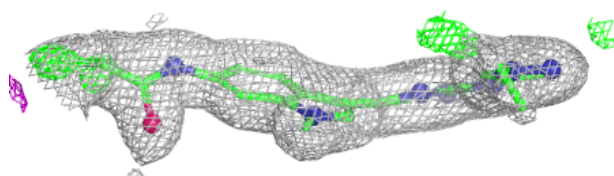
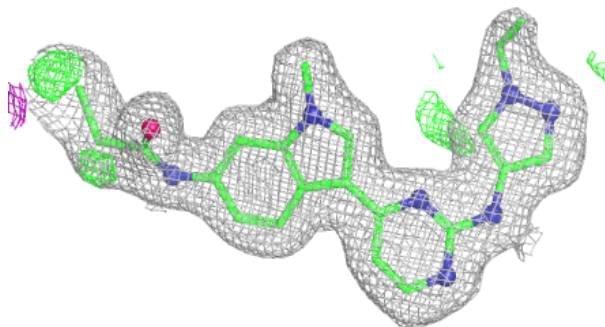
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
4	GOL	B	803	6/6	0.84	0.21	61,67,75,78	0
5	SO4	B	815	5/5	0.84	0.10	97,99,126,126	0
3	EDO	B	820	4/4	0.85	0.16	43,51,52,56	0
3	EDO	B	817	4/4	0.85	0.17	46,55,63,66	0
4	GOL	A	808	6/6	0.86	0.15	68,78,85,85	0
3	EDO	A	820	4/4	0.86	0.16	42,52,55,60	0
4	GOL	A	803	6/6	0.86	0.20	62,70,77,77	0
3	EDO	B	821	4/4	0.86	0.18	47,70,70,71	0
5	SO4	B	812	5/5	0.87	0.12	64,74,80,110	0
3	EDO	A	805	4/4	0.87	0.15	49,62,67,71	0
4	GOL	B	811	6/6	0.88	0.14	46,62,69,72	0
3	EDO	A	802	4/4	0.88	0.15	38,39,39,48	0
3	EDO	A	821	4/4	0.89	0.14	44,52,58,62	0
3	EDO	B	801	4/4	0.89	0.12	40,46,51,61	0
4	GOL	B	809	6/6	0.90	0.15	43,56,64,71	0
3	EDO	A	815	4/4	0.92	0.12	42,43,52,57	0
2	A1C67	B	802	29/29	0.96	0.07	29,33,44,56	0
2	A1C67	A	801	29/29	0.97	0.07	28,31,44,57	0

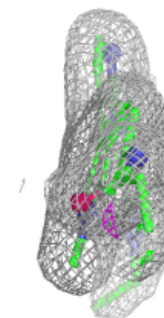
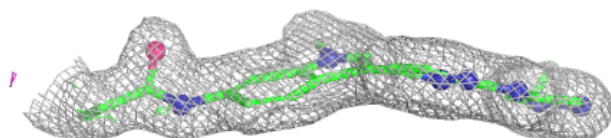
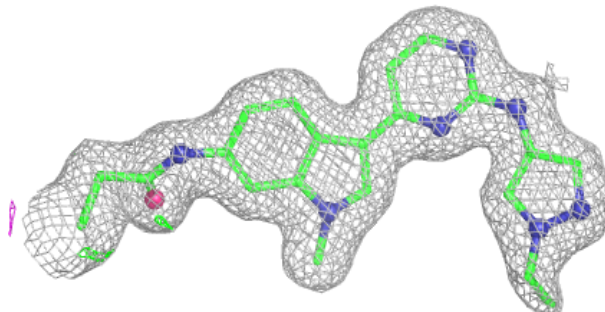
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around A1C67 B 802:

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

**Electron density around A1C67 A 801:**

$2mF_o-DF_c$ (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.