Full wwPDB X-ray Structure Validation Report (i)

Jun 15, 2026 – 10:42 am BST

PDB ID	:	9RJ4 / pdb_00009rj4
Title	:	Bub1 kinase domain in complex with inhibitor LEI221
Authors	:	Konijnenberg, M.J.; Ahmad, M.U.D.; Perrakis, A.
Deposited on	:	2025-06-12
Resolution	:	1.85 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:

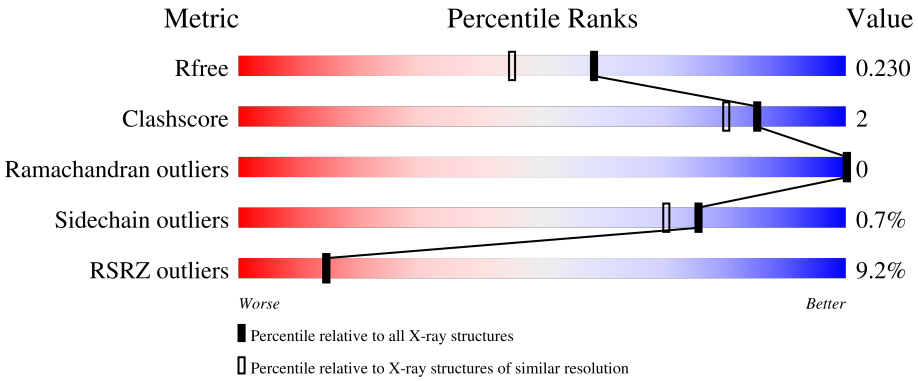
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 1.85 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	3428 (1.86-1.86)
Clashscore	190562	3579 (1.86-1.86)
Ramachandran outliers	187476	3553 (1.86-1.86)
Sidechain outliers	187428	3553 (1.86-1.86)
RSRZ outliers	180081	3429 (1.86-1.86)

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	364	8% 86% 6% 8%
1	B	364	9% 84% 7% 9%

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 5865 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.

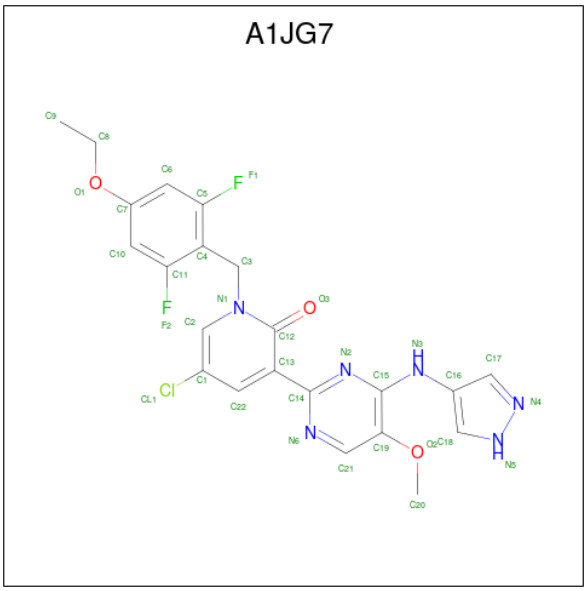
- Molecule 1 is a protein called Mitotic checkpoint serine/threonine-protein kinase BUB1.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	335	Total	C	N	O	P	S	0	5	0
			2748	1795	452	478	1	22			
1	B	332	Total	C	N	O	P	S	0	4	0
			2721	1777	447	473	1	23			

There are 6 discrepancies between the modelled and reference sequences:

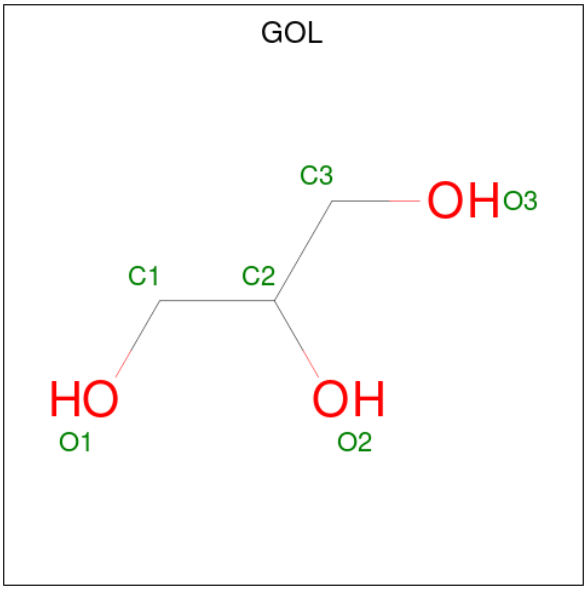
Chain	Residue	Modelled	Actual	Comment	Reference
A	722	GLY	-	expression tag	UNP O43683
A	723	PRO	-	expression tag	UNP O43683
A	724	GLY	-	expression tag	UNP O43683
B	722	GLY	-	expression tag	UNP O43683
B	723	PRO	-	expression tag	UNP O43683
B	724	GLY	-	expression tag	UNP O43683

- Molecule 2 is 5-chloranyl-1-[[4-ethoxy-2,6-bis(fluoranyl)phenyl]methyl]-3-[5-methoxy-4-(1H-pyrazol-4-ylamino)pyrimidin-2-yl]pyridin-2-one (CCD ID: A1JG7) (formula: $C_{22}H_{19}ClF_2N_6O_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
2	A	1	Total	C	Cl	F	N	O	0	0
			34	22	1	2	6	3		
2	B	1	Total	C	Cl	F	N	O	0	0
			34	22	1	2	6	3		

- Molecule 3 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



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

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

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

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total Ca 1 1	0	0
4	B	1	Total Ca 1 1	0	0

- Molecule 5 is water.

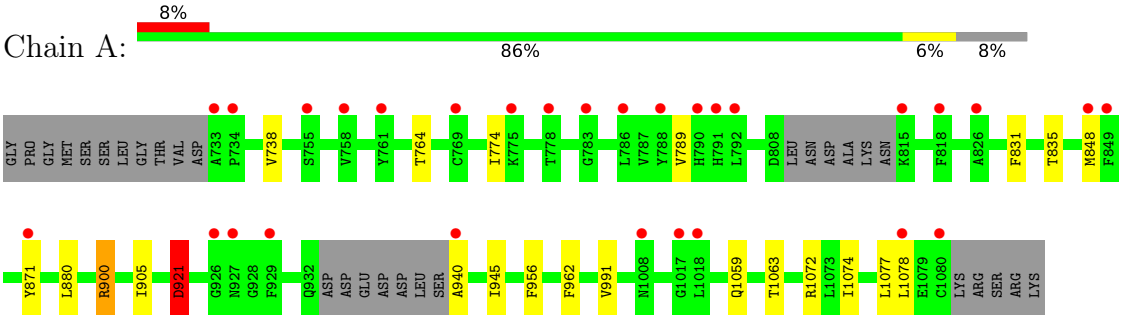
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	173	Total O 173 173	0	0
5	B	123	Total O 123 123	0	0

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.

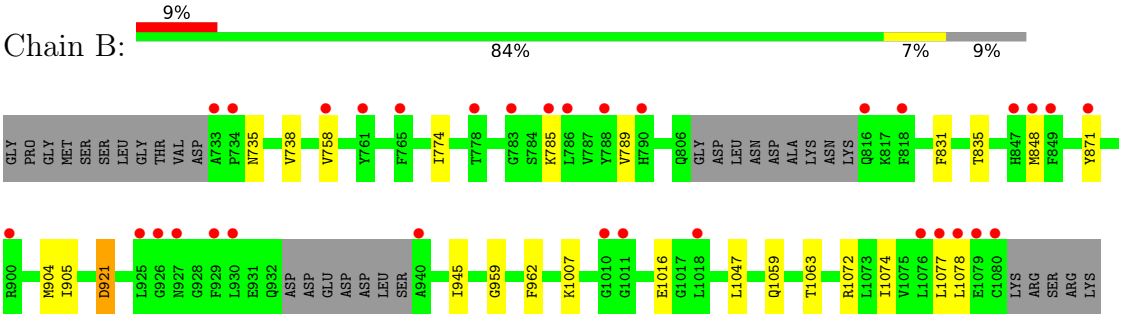
• Molecule 1: Mitotic checkpoint serine/threonine-protein kinase BUB1

Chain A:



• Molecule 1: Mitotic checkpoint serine/threonine-protein kinase BUB1

Chain B:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	67.58Å 50.10Å 114.02Å 90.00° 101.96° 90.00°	Depositor
Resolution (Å)	66.20 – 1.85 66.20 – 1.85	Depositor EDS
% Data completeness (in resolution range)	95.2 (66.20-1.85) 95.2 (66.20-1.85)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.19 (at 1.86Å)	Xtriage
Refinement program	REFMAC 5.8.0430 (refmacat 0.4.105), PDB-REDO	Depositor
R, R_{free}	0.186 , 0.224 0.196 , 0.230	Depositor DCC
R_{free} test set	3026 reflections (4.71%)	wwPDB-VP
Wilson B-factor (Å^2)	33.1	Xtriage
Anisotropy	0.121	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 48.8	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	5865	wwPDB-VP
Average B, all atoms (Å^2)	46.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 9.48% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: A1JG7, SEP, GOL, CA

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|$ >5	RMSZ	#$\|Z\|$ >5
1	A	0.55	0/2818	0.90	2/3802 (0.1%)
1	B	0.53	0/2785	0.87	0/3760
All	All	0.54	0/5603	0.89	2/7562 (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	2
1	B	0	1
All	All	0	3

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	848	MET	CG-SD-CE	-6.81	85.91	100.90
1	A	921	ASP	CA-CB-CG	5.91	118.51	112.60

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	1072	ARG	Sidechain
1	A	900	ARG	Sidechain
1	B	1072	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	2748	0	2765	12	0
1	B	2721	0	2733	13	0
2	A	34	0	0	0	0
2	B	34	0	0	0	0
3	A	12	0	16	1	0
3	B	18	0	24	1	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
5	A	173	0	0	0	0
5	B	123	0	0	0	0
All	All	5865	0	5538	24	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 2.

All (24) 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:B:848:MET:HG2	1:B:904:MET:HG2	1.59	0.84
1:B:758:VAL:HA	3:B:1104:GOL:H32	1.70	0.74
1:A:764:THR:O	1:B:785:LYS:NZ	2.31	0.52
1:A:1074:ILE:O	1:A:1078:LEU:HG	2.11	0.50
1:B:1059:GLN:HA	1:B:1063:THR:HG23	1.92	0.49
1:B:1074:ILE:O	1:B:1078:LEU:HG	2.12	0.48
1:A:774:ILE:HG23	1:A:789:VAL:HG21	1.96	0.48
1:A:871:TYR:HB3	1:A:1077:LEU:HD13	1.95	0.48
1:A:905[A]:ILE:HD13	1:A:991:VAL:HG21	1.96	0.46
1:B:871:TYR:HB3	1:B:1077:LEU:HD13	1.98	0.46
1:B:831:PHE:O	1:B:835:THR:HG23	2.17	0.45
1:A:831:PHE:O	1:A:835:THR:HG23	2.17	0.45
1:A:1059:GLN:HA	1:A:1063:THR:HG23	1.99	0.45
1:B:738:VAL:O	1:B:962:PHE:HA	2.19	0.42
1:A:880:LEU:HD12	1:A:1077:LEU:HD23	2.00	0.42
1:B:774:ILE:HG23	1:B:789:VAL:HG21	2.01	0.42
1:B:921:ASP:OD1	1:B:921:ASP:N	2.49	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:738:VAL:O	1:A:962:PHE:HA	2.20	0.41
1:B:735:ASN:HB3	1:B:959:GLY:O	2.20	0.41
1:A:921:ASP:OD1	1:A:921:ASP:N	2.50	0.41
1:B:905[B]:ILE:HG13	1:B:1047:LEU:HD13	2.01	0.41
1:A:900:ARG:HH11	1:A:940:ALA:HB3	1.86	0.41
1:B:1007:LYS:HD3	1:B:1016:GLU:HG2	2.03	0.40
1:A:956:PHE:O	3:A:1103:GOL:H12	2.22	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	333/364 (92%)	322 (97%)	11 (3%)	0	100	100
1	B	329/364 (90%)	320 (97%)	9 (3%)	0	100	100
All	All	662/728 (91%)	642 (97%)	20 (3%)	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	301/321 (94%)	299 (99%)	2 (1%)	76	70

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	B	298/321 (93%)	296 (99%)	2 (1%)	76 70
All	All	599/642 (93%)	595 (99%)	4 (1%)	76 70

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

Mol	Chain	Res	Type
1	A	921	ASP
1	A	945	ILE
1	B	921	ASP
1	B	945	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	735	ASN
1	A	781	GLN
1	A	806	GLN
1	A	816	GLN
1	A	1060	GLN
1	A	1061	HIS
1	B	781	GLN
1	B	806	GLN
1	B	859	GLN
1	B	932	GLN
1	B	1043	HIS
1	B	1071	ASN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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	SEP	A	969	4,1	8,9,10	0.59	0	8,12,14	0.78	0
1	SEP	B	969	4,1	8,9,10	0.53	0	8,12,14	0.67	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	SEP	A	969	4,1	-	0/5/8/10	-
1	SEP	B	969	4,1	-	0/5/8/10	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 9 ligands modelled in this entry, 2 are monoatomic - leaving 7 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	$\#\|Z\| > 2$
3	GOL	B	1103	-	5,5,5	0.17	0	5,5,5	0.31	0
3	GOL	A	1102	-	5,5,5	0.12	0	5,5,5	0.37	0
3	GOL	B	1104	-	5,5,5	0.08	0	5,5,5	0.30	0
2	A1JG7	A	1101	-	36,37,37	0.95	4 (11%)	39,52,52	1.11	3 (7%)
2	A1JG7	B	1101	-	36,37,37	0.96	3 (8%)	39,52,52	1.22	4 (10%)
3	GOL	A	1103	-	5,5,5	0.15	0	5,5,5	0.35	0
3	GOL	B	1102	-	5,5,5	0.13	0	5,5,5	0.35	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
3	GOL	B	1103	-	-	2/4/4/4	-
3	GOL	A	1102	-	-	0/4/4/4	-
3	GOL	B	1104	-	-	4/4/4/4	-
2	A1JG7	A	1101	-	-	8/17/17/17	0/4/4/4
2	A1JG7	B	1101	-	-	8/17/17/17	0/4/4/4
3	GOL	A	1103	-	-	2/4/4/4	-
3	GOL	B	1102	-	-	0/4/4/4	-

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	1101	A1JG7	C2-C1	3.41	1.38	1.35
2	A	1101	A1JG7	C17-C16	-3.06	1.38	1.40
2	A	1101	A1JG7	C22-C1	-2.85	1.37	1.41
2	B	1101	A1JG7	C17-C16	-2.64	1.38	1.40
2	B	1101	A1JG7	C22-C1	-2.53	1.37	1.41
2	A	1101	A1JG7	C15-N3	-2.13	1.35	1.39
2	A	1101	A1JG7	C2-C1	2.10	1.37	1.35

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	1101	A1JG7	C17-N4-N5	3.50	112.28	105.70
2	A	1101	A1JG7	C17-N4-N5	3.41	112.11	105.70
2	B	1101	A1JG7	C18-N5-N4	-2.61	106.07	111.40
2	A	1101	A1JG7	C18-N5-N4	-2.53	106.23	111.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	1101	A1JG7	O3-C12-N1	-2.34	117.51	120.61
2	A	1101	A1JG7	O3-C12-N1	-2.32	117.53	120.61
2	B	1101	A1JG7	C1-C2-N1	-2.05	119.77	121.51

There are no chirality outliers.

All (24) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	1101	A1JG7	C22-C13-C14-N2
2	A	1101	A1JG7	C22-C13-C14-N6
2	A	1101	A1JG7	C12-C13-C14-N2
2	B	1101	A1JG7	C22-C13-C14-N2
2	B	1101	A1JG7	C22-C13-C14-N6
2	B	1101	A1JG7	C12-C13-C14-N2
3	A	1103	GOL	O1-C1-C2-O2
2	B	1101	A1JG7	C15-C19-O2-C20
3	B	1103	GOL	O1-C1-C2-O2
2	B	1101	A1JG7	C21-C19-O2-C20
3	A	1103	GOL	O1-C1-C2-C3
3	B	1103	GOL	O1-C1-C2-C3
3	B	1104	GOL	O1-C1-C2-C3
3	B	1104	GOL	C1-C2-C3-O3
2	A	1101	A1JG7	C21-C19-O2-C20
2	A	1101	A1JG7	C15-C19-O2-C20
3	B	1104	GOL	O1-C1-C2-O2
2	B	1101	A1JG7	C9-C8-O1-C7
3	B	1104	GOL	O2-C2-C3-O3
2	A	1101	A1JG7	C9-C8-O1-C7
2	A	1101	A1JG7	C4-C3-N1-C12
2	B	1101	A1JG7	C4-C3-N1-C12
2	A	1101	A1JG7	C4-C3-N1-C2
2	B	1101	A1JG7	C4-C3-N1-C2

There are no ring outliers.

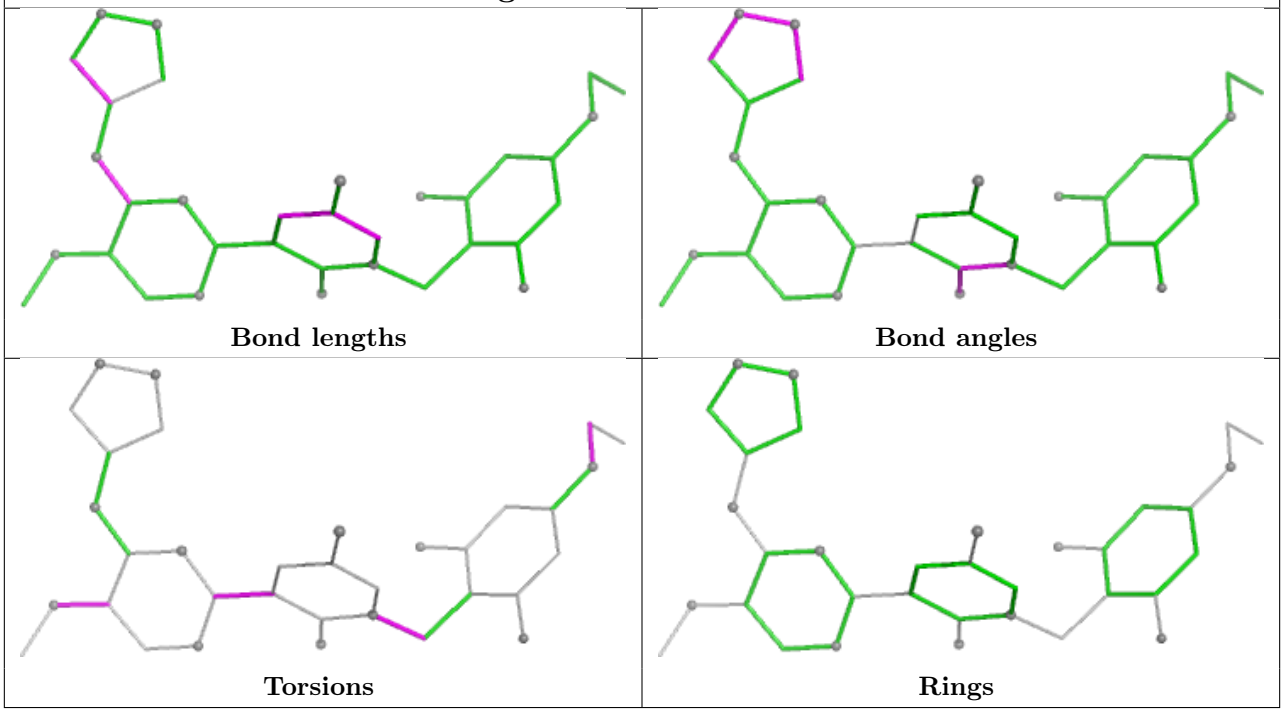
2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	1104	GOL	1	0
3	A	1103	GOL	1	0

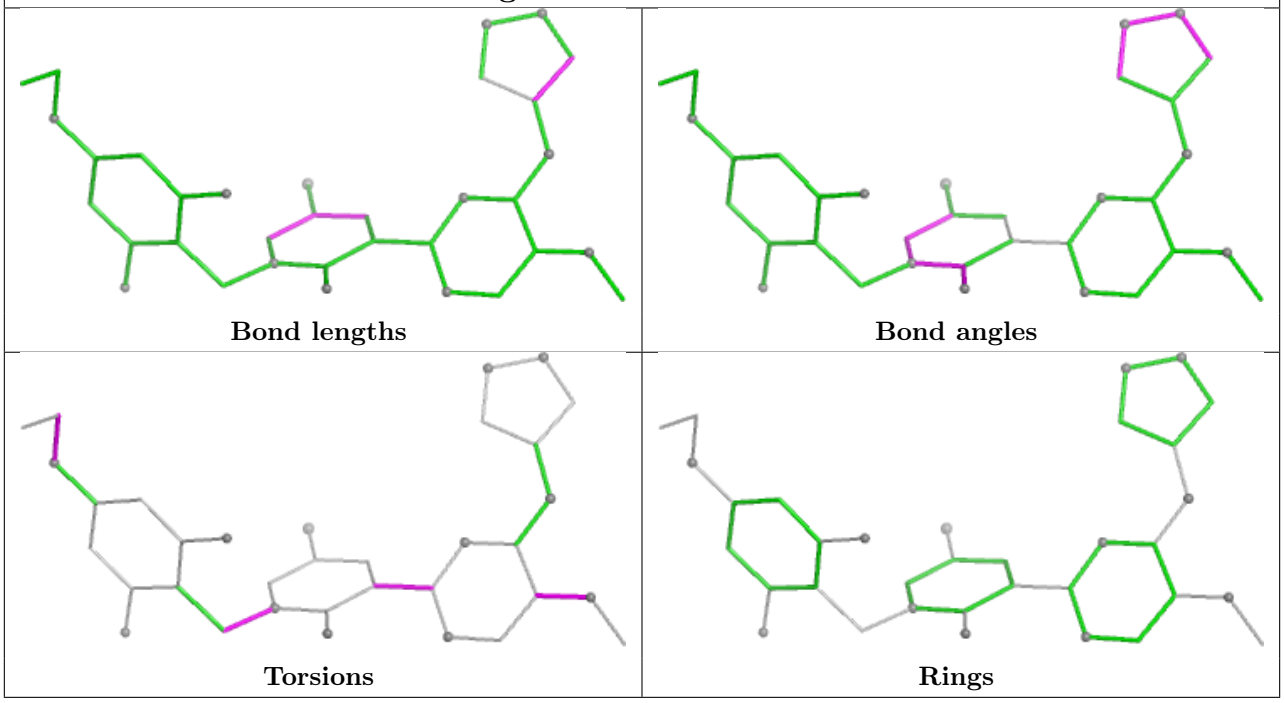
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths,

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 A1JG7 A 1101



Ligand A1JG7 B 1101



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, 95^{th} 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	334/364 (91%)	0.49	29 (8%)	16	16	15, 39, 81, 136	5 (1%)
1	B	331/364 (90%)	0.62	32 (9%)	13	13	17, 44, 85, 113	4 (1%)
All	All	665/728 (91%)	0.56	61 (9%)	14	14	15, 42, 83, 136	9 (1%)

All (61) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	940	ALA	7.7
1	A	761	TYR	6.0
1	A	940	ALA	5.1
1	B	848	MET	4.3
1	A	848	MET	4.3
1	B	761	TYR	4.3
1	B	849	PHE	4.1
1	B	733	ALA	4.0
1	A	733	ALA	3.9
1	B	930	LEU	3.8
1	A	1018	LEU	3.6
1	B	1018	LEU	3.6
1	B	818	PHE	3.4
1	B	926	GLY	3.4
1	B	1080	CYS	3.2
1	B	1010	GLY	3.0
1	A	871	TYR	3.0
1	B	927	ASN	2.9
1	A	791	HIS	2.8
1	B	1078	LEU	2.8
1	A	775	LYS	2.7
1	A	792	LEU	2.7
1	A	1078	LEU	2.7
1	B	1077	LEU	2.7

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Mol	Chain	Res	Type	RSRZ
1	B	929	PHE	2.7
1	B	788	TYR	2.7
1	A	755	SER	2.6
1	B	925	LEU	2.6
1	A	818	PHE	2.6
1	B	758	VAL	2.5
1	B	765	PHE	2.5
1	B	785	LYS	2.5
1	A	788	TYR	2.4
1	A	769	CYS	2.4
1	A	826	ALA	2.4
1	A	926	GLY	2.4
1	B	790	HIS	2.4
1	B	778	THR	2.4
1	B	1011	GLY	2.3
1	A	1080	CYS	2.3
1	A	778	THR	2.3
1	A	734	PRO	2.3
1	A	786	LEU	2.3
1	A	790	HIS	2.3
1	A	849	PHE	2.2
1	A	1017	GLY	2.2
1	B	847	HIS	2.2
1	B	783	GLY	2.2
1	B	734	PRO	2.2
1	B	871	TYR	2.2
1	B	786	LEU	2.2
1	A	1008	ASN	2.1
1	A	783	GLY	2.1
1	A	815	LYS	2.1
1	B	900	ARG	2.1
1	B	1076	LEU	2.1
1	B	816	GLN	2.1
1	A	927	ASN	2.1
1	A	758	VAL	2.1
1	B	1079	GLU	2.0
1	A	929	PHE	2.0

6.2 Non-standard residues in protein, DNA, RNA chains (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, 95^{th} 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	SEP	B	969	10/11	0.96	0.09	35,39,42,44	0
1	SEP	A	969	10/11	0.97	0.07	30,35,36,37	0

6.3 Carbohydrates (i)

There are no oligosaccharides in this entry.

6.4 Ligands (i)

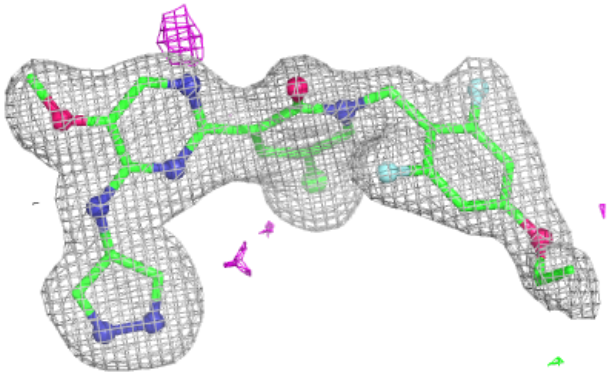
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

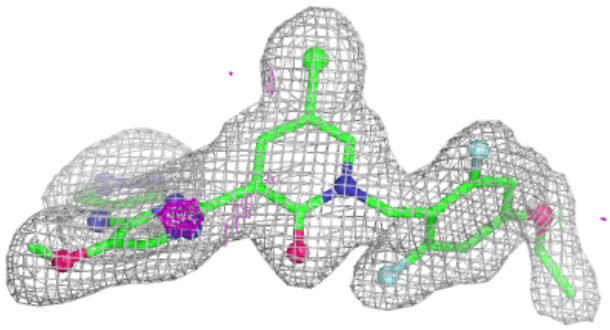
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	GOL	B	1104	6/6	0.82	0.15	58,68,89,112	0
3	GOL	B	1103	6/6	0.86	0.11	40,61,66,70	0
3	GOL	A	1103	6/6	0.87	0.13	34,52,66,80	0
3	GOL	B	1102	6/6	0.89	0.15	38,45,64,70	0
3	GOL	A	1102	6/6	0.95	0.09	33,40,54,63	0
2	A1JG7	B	1101	34/34	0.96	0.07	25,33,53,59	0
2	A1JG7	A	1101	34/34	0.97	0.07	20,29,54,82	0
4	CA	B	1105	1/1	0.98	0.04	33,33,33,33	0
4	CA	A	1104	1/1	0.99	0.04	29,29,29,29	0

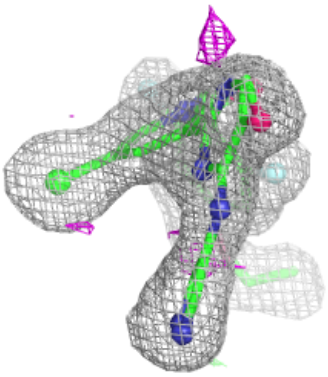
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around A1JG7 B 1101:

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

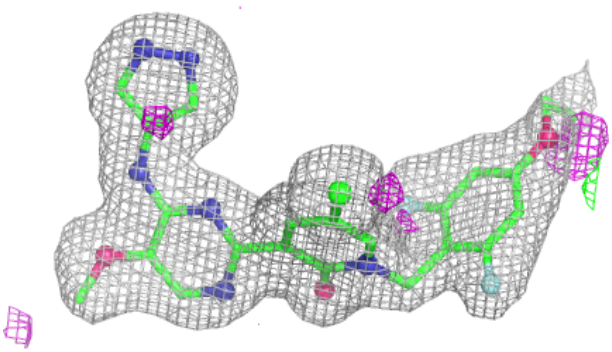


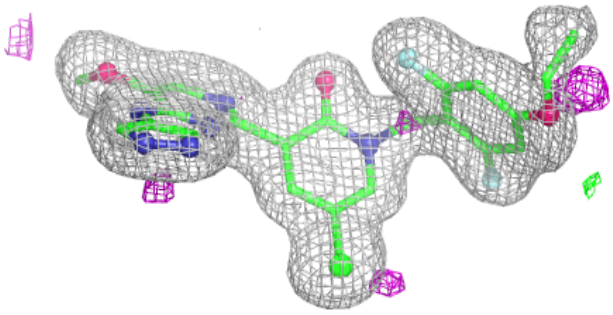


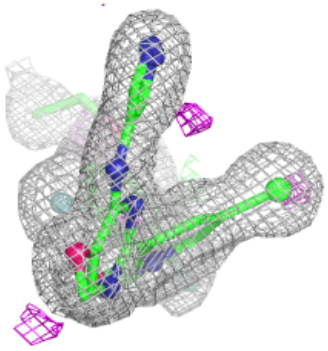


Electron density around A1JG7 A 1101:

$2mF_o$-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.