

# Full wwPDB X-ray Structure Validation Report (i)

#### Dec 2, 2024 – 01:25 PM JST

PDB ID : 8ZM8

Title : Crystal Structure of the first bromodomain of human BRD4 BD1 in complex

with the inhibitor Y13221

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Υ.

Deposited on : 2024-05-22

Resolution : 3.00 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 : 1.8.5 (274361), CSD as541be (2020)

Xtriage (Phenix) : 1.21

EDS : 3.0

buster-report : 1.1.7 (2018)

Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)

CCP4 : 9.0.004 (Gargrove)

Density-Fitness : 1.0.11

Ideal geometry (proteins) : Engh & Huber (2001) Ideal geometry (DNA, RNA) : Parkinson et al. (1996)

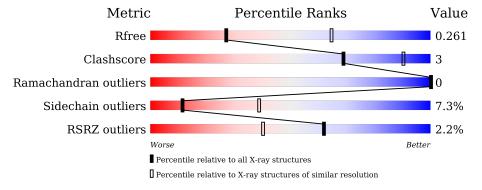
Validation Pipeline (wwPDB-VP) : 2.40

## 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 3.00 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 $(\# \mathrm{Entries})$	$\begin{array}{c} {\rm Similar\ resolution} \\ (\#{\rm Entries},{\rm resolution\ range}(\mathring{\rm A})) \end{array}$
$R_{free}$	164625	2511 (3.00-3.00)
Clashscore	180529	2866 (3.00-3.00)
Ramachandran outliers	177936	2778 (3.00-3.00)
Sidechain outliers	177891	2781 (3.00-3.00)
RSRZ outliers	164620	2523 (3.00-3.00)

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	141	67%	8% •	24%			
1	D	141	%	20/	220/			
1	В	141	68%	9%	23%			
1	С	141	60%	15% •	23%			



## 2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 2857 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 BRD4\_HUMAN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	Λ	107	Total	С	N	О	S	0	0	0
1	A	107	900	590	144	160	6	0	U	U
1	D	109	Total	С	N	О	S	0	0	0
1	Б	109	920	601	150	163	6	0	U	
1	С	108	Total	С	N	О	S	0	0	0
1		108	912	597	147	162	6	U	U	U

There are 48 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	28	MET	-	expression tag	UNP O60885
A	29	LYS	-	expression tag	UNP O60885
A	30	LYS	-	expression tag	UNP O60885
A	31	GLY	-	expression tag	UNP O60885
A	32	HIS	-	expression tag	UNP O60885
A	33	HIS	-	expression tag	UNP O60885
A	34	HIS	-	expression tag	UNP O60885
A	35	HIS	-	expression tag	UNP O60885
A	36	HIS	-	expression tag	UNP O60885
A	37	HIS	-	expression tag	UNP O60885
A	38	LEU	-	expression tag	UNP O60885
A	39	VAL	-	expression tag	UNP O60885
A	40	PRO	-	expression tag	UNP O60885
A	41	ARG	-	expression tag	UNP O60885
A	42	GLY	-	expression tag	UNP O60885
A	43	SER	-	expression tag	UNP O60885
В	28	MET	-	expression tag	UNP O60885
В	29	LYS	-	expression tag	UNP O60885
В	30	LYS	-	expression tag	UNP O60885
В	31	GLY	ı	expression tag	UNP O60885
В	32	HIS	-	expression tag	UNP O60885
В	33	HIS	-	expression tag	UNP O60885
В	34	HIS	-	expression tag	UNP O60885

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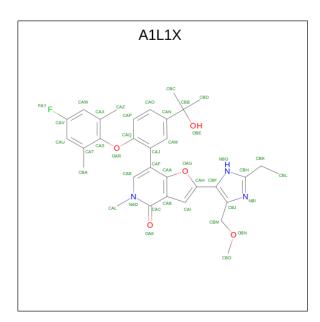


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Chain	Residue	Modelled	Actual	Comment	Reference
В	35	HIS	-	expression tag	UNP O60885
В	36	HIS	-	expression tag	UNP O60885
В	37	HIS	-	expression tag	UNP O60885
В	38	LEU	-	expression tag	UNP O60885
В	39	VAL	-	expression tag	UNP O60885
В	40	PRO	-	expression tag	UNP O60885
В	41	ARG	-	expression tag	UNP O60885
В	42	GLY	-	expression tag	UNP O60885
В	43	SER	-	expression tag	UNP O60885
С	28	MET	-	expression tag	UNP O60885
С	29	LYS	-	expression tag	UNP O60885
С	30	LYS	-	expression tag	UNP O60885
С	31	GLY	-	expression tag	UNP O60885
С	32	HIS	-	expression tag	UNP O60885
С	33	HIS	-	expression tag	UNP O60885
С	34	HIS	-	expression tag	UNP O60885
С	35	HIS	-	expression tag	UNP O60885
С	36	HIS	ı	expression tag	UNP O60885
С	37	HIS	-	expression tag	UNP O60885
С	38	LEU	-	expression tag	UNP O60885
С	39	VAL	=	expression tag	UNP O60885
С	40	PRO	-	expression tag	UNP O60885
С	41	ARG	-	expression tag	UNP O60885
С	42	GLY	-	expression tag	UNP O60885
С	43	SER	_	expression tag	UNP O60885

• Molecule 2 is 2-[2-ethyl-4-(methoxymethyl)-1 {H}-imidazol-5-yl]-7-[2-(4-fluoranyl-2,6-dimethyl-phenoxy)-5-(2-oxidanylpropan-2-yl)phenyl]-5-methyl-furo[3,2-c]pyridin-4-on e (three-letter code: A1L1X) (formula:  $C_{32}H_{34}FN_3O_5$ ) (labeled as "Ligand of Interest" by depositor).





Mol	Chain	Residues		Ato	ms			ZeroOcc	AltConf
9	Λ	1	Total	С	F	N	О	0	0
	Α	1	41	32	1	3	5	0	0
9	D	1	Total	С	F	N	О	0	0
	Ъ	1	41	32	1	3	5	0	0
2	C	1	Total	С	F	N	О	0	0
		1	41	32	1	3	5	U	

### • Molecule 3 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	С	2	Total O 2 2	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.



## 4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 61 2 2	Depositor
Cell constants	142.07Å 142.07Å 134.14Å	Donogitor
a, b, c, $\alpha$ , $\beta$ , $\gamma$	90.00° 90.00° 120.00°	Depositor
Resolution (Å)	123.03 - 3.00	Depositor
Resolution (A)	123.03 - 3.00	EDS
% Data completeness	99.9 (123.03-3.00)	Depositor
(in resolution range)	99.9 (123.03-3.00)	EDS
$R_{merge}$	0.17	Depositor
$R_{sym}$	(Not available)	Depositor
$< I/\sigma(I) > 1$	2.32 (at 3.01Å)	Xtriage
Refinement program	REFMAC 5.8.0258	Depositor
D D	0.207 , 0.265	Depositor
$R, R_{free}$	0.213 , 0.261	DCC
$R_{free}$ test set	864 reflections (5.22%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	85.5	Xtriage
Anisotropy	0.703	Xtriage
Bulk solvent $k_{sol}(e/Å^3)$ , $B_{sol}(Å^2)$	0.35, 91.0	EDS
L-test for twinning <sup>2</sup>	$ < L >=0.51, < L^2>=0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	2857	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	99.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: The largest off-origin peak in the Patterson function is 2.36% of the height of the origin peak. No significant pseudotranslation is detected.

<sup>&</sup>lt;sup>2</sup>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.



<sup>&</sup>lt;sup>1</sup>Intensities estimated from amplitudes.

## 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: A1L1X

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		
IVIOI		RMSZ	# Z  > 5	RMSZ	# Z  > 5	
1	A	0.62	0/924	0.73	0/1256	
1	В	0.62	0/944	0.71	0/1282	
1	С	0.65	0/936	0.74	0/1271	
All	All	0.63	0/2804	0.73	0/3809	

There are no bond length outliers.

There are no bond angle outliers.

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	900	0	896	4	0
1	В	920	0	917	4	0
1	С	912	0	913	11	0
2	A	41	0	0	0	0
2	В	41	0	0	1	0
2	С	41	0	0	0	0
3	С	2	0	0	0	0
All	All	2857	0	2726	19	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 3.



All (19) 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:C:94:LEU:HG	1:C:139:TYR:OH	2.05	0.56
1:A:71:LEU:HD21	1:A:111:LYS:HD3	1.89	0.53
1:C:61:ASN:OD1	1:C:62:GLN:N	2.43	0.51
1:C:157:PHE:CE1	1:C:161:ILE:HD13	2.46	0.51
1:B:81:TRP:CG	1:B:82:PRO:HD3	2.47	0.49
1:A:69:VAL:O	1:A:73:THR:OG1	2.31	0.48
1:C:81:TRP:CG	1:C:82:PRO:HD3	2.48	0.48
1:C:161:ILE:O	1:C:164:LEU:HB2	2.13	0.47
1:C:115:GLU:O	1:C:116:ASN:ND2	2.51	0.44
1:C:164:LEU:HD22	1:C:164:LEU:HA	1.89	0.43
1:C:61:ASN:HB3	1:C:64:GLN:HB2	1.99	0.43
1:A:81:TRP:N	1:A:82:PRO:CD	2.81	0.43
1:C:113:ARG:NH1	1:C:128:ASP:OD2	2.52	0.43
1:C:146:ILE:O	1:C:149:MET:HB2	2.19	0.42
1:B:146:ILE:HD13	2:B:201:A1L1X:CAC	2.50	0.42
1:A:77:HIS:HE1	1:A:79:PHE:CD2	2.38	0.41
1:C:103:THR:N	1:C:104:PRO:HD3	2.36	0.41
1:B:79:PHE:O	1:B:82:PRO:HD2	2.21	0.41
1:B:93:ASN:HD22	1:B:93:ASN:HA	1.81	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	Percer	ntiles
1	A	105/141~(74%)	98 (93%)	7 (7%)	0	100	100
1	В	107/141~(76%)	103 (96%)	4 (4%)	0	100	100
1	С	106/141 (75%)	97 (92%)	9 (8%)	0	100	100
All	All	318/423 (75%)	298 (94%)	20 (6%)	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	99/132 (75%)	94 (95%)	5 (5%)	20 53		
1	В	101/132 (76%)	93 (92%)	8 (8%)	10 35		
1	С	101/132 (76%)	92 (91%)	9 (9%)	8 31		
All	All	301/396 (76%)	279 (93%)	22 (7%)	11 39		

All (22) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	78	GLN
1	A	90	VAL
1	A	103	THR
1	A	105	MET
1	A	111	LYS
1	В	78	GLN
1	В	92	LEU
1	В	94	LEU
1	В	105	MET
1	В	121	ASN
1	В	131	THR
1	В	145	ASP
1	В	166	THR
1	С	59	GLN
1	С	94	LEU
1	С	96	ASP
1	С	99	LYS
1	С	102	LYS
1	С	103	THR
1	C C C C	112	LYS
1	С	127	GLN
1	С	164	LEU



Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	116	ASN
1	A	127	GLN
1	В	78	GLN
1	В	93	ASN
1	В	116	ASN
1	В	121	ASN
1	В	162	ASN
1	С	59	GLN
1	С	116	ASN
1	С	159	GLN

#### 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)

3 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	В	Bond lengths			Bond angles		
MOI					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2	
2	A1L1X	A	201	-	35,45,45	4.04	11 (31%)	48,68,68	1.13	1 (2%)	
2	A1L1X	С	201	-	35,45,45	4.19	8 (22%)	48,68,68	1.24	5 (10%)	



	Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
						Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
	2	A1L1X	В	201	-	35,45,45	4.14	10 (28%)	48,68,68	1.09	4 (8%)

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	A1L1X	A	201	-	-	3/17/23/23	0/5/5/5
2	A1L1X	С	201	-	-	3/17/23/23	0/5/5/5
2	A1L1X	В	201	-	-	5/17/23/23	0/5/5/5

All (29) bond length outliers are listed below:

2         C         201         A1L1X         CBB-CAN         -19.60         1.40         1.53           2         B         201         A1L1X         CBB-CAN         -19.27         1.40         1.53           2         A         201         A1L1X         CBB-CAN         -17.34         1.41         1.53           2         A         201         A1L1X         CBF-CAH         -6.65         1.34         1.49           2         A         201         A1L1X         CAB-CAC         -6.42         1.34         1.47           2         B         201         A1L1X         CAB-CAC         -6.32         1.34         1.47           2         B         201         A1L1X         CBF-CAH         -6.26         1.35         1.49           2         C         201         A1L1X         CBF-CAH         -6.06         1.35         1.49           2         A         201         A1L1X         CBF-CAH         -6.06         1.35         1.49           2         C         201         A1L1X         CAB-CAC         -5.82         1.35         1.47           2         A         201         A1L1X         CAB-CAF<	Mol	Chain	Res	Type	Atoms	$\mathbf{Z}$	Observed(A)	Ideal(Å)
2         A         201         A1L1X         CBB-CAN         -17.34         1.41         1.53           2         A         201         A1L1X         CBF-CAH         -6.65         1.34         1.49           2         A         201         A1L1X         CAB-CAC         -6.42         1.34         1.47           2         B         201         A1L1X         CAB-CAC         -6.32         1.34         1.47           2         C         201         A1L1X         CBF-CAH         -6.26         1.35         1.49           2         A         201         A1L1X         CBF-CAH         -6.26         1.35         1.49           2         A         201         A1L1X         CBM-CBJ         6.23         1.57         1.50           2         B         201         A1L1X         CBF-CAH         -6.06         1.35         1.49           2         C         201         A1L1X         CBF-CAH         -6.06         1.35         1.49           2         C         201         A1L1X         CAB-CAC         -5.82         1.35         1.47           2         A         201         A1L1X         CAZ-CAX <td>2</td> <td>С</td> <td>201</td> <td>A1L1X</td> <td>CBB-CAN</td> <td>-19.60</td> <td>1.40</td> <td>1.53</td>	2	С	201	A1L1X	CBB-CAN	-19.60	1.40	1.53
2         A         201         A1L1X         CBF-CAH         -6.65         1.34         1.49           2         A         201         A1L1X         CAB-CAC         -6.42         1.34         1.47           2         B         201         A1L1X         CAB-CAC         -6.32         1.34         1.47           2         B         201         A1L1X         CBF-CAH         -6.26         1.35         1.49           2         A         201         A1L1X         CBM-CBJ         6.23         1.57         1.50           2         B         201         A1L1X         CBM-CBJ         6.23         1.57         1.50           2         B         201         A1L1X         CBF-CAH         -6.06         1.35         1.49           2         C         201         A1L1X         CAB-CAC         -5.82         1.35         1.49           2         C         201         A1L1X         CAB-CAC         -5.82         1.33         1.47           2         A         201         A1L1X         CAZ-CAX         -5.55         1.39         1.51           2         B         201         A1L1X         CAZ-CAX	2	В	201	A1L1X	CBB-CAN	-19.27	1.40	1.53
2         A         201         A1L1X         CAB-CAC         -6.42         1.34         1.47           2         B         201         A1L1X         CAB-CAC         -6.32         1.34         1.47           2         C         201         A1L1X         CBF-CAH         -6.26         1.35         1.49           2         A         201         A1L1X         CBM-CBJ         6.23         1.57         1.50           2         B         201         A1L1X         CBF-CAH         -6.06         1.35         1.49           2         C         201         A1L1X         CAB-CAC         -5.82         1.35         1.47           2         A         201         A1L1X         CAB-CAC         -5.82         1.35         1.47           2         A         201         A1L1X         CAA-CAF         -5.81         1.33         1.47           2         A         201         A1L1X         CAZ-CAX         -5.55         1.39         1.51           2         B         201         A1L1X         CAZ-CAX         -5.52         1.40         1.51           2         C         201         A1L1X         CAZ-CAX	2	A	201	A1L1X	CBB-CAN	-17.34	1.41	1.53
2         B         201         A1L1X         CAB-CAC         -6.32         1.34         1.47           2         C         201         A1L1X         CBF-CAH         -6.26         1.35         1.49           2         A         201         A1L1X         CBM-CBJ         6.23         1.57         1.50           2         B         201         A1L1X         CBF-CAH         -6.06         1.35         1.49           2         C         201         A1L1X         CAB-CAC         -5.82         1.35         1.47           2         A         201         A1L1X         CAA-CAF         -5.81         1.33         1.47           2         A         201         A1L1X         CAA-CAF         -5.81         1.33         1.47           2         A         201         A1L1X         CAZ-CAX         -5.55         1.39         1.51           2         B         201         A1L1X         CAZ-CAX         -5.52         1.40         1.51           2         C         201         A1L1X         CAZ-CAX         -5.49         1.40         1.51           2         C         201         A1L1X         CBM-CBJ	2	A	201	A1L1X	CBF-CAH	-6.65	1.34	1.49
2         C         201         A1L1X         CBF-CAH         -6.26         1.35         1.49           2         A         201         A1L1X         CBM-CBJ         6.23         1.57         1.50           2         B         201         A1L1X         CBF-CAH         -6.06         1.35         1.49           2         C         201         A1L1X         CAB-CAC         -5.82         1.35         1.47           2         A         201         A1L1X         CAA-CAF         -5.81         1.33         1.47           2         A         201         A1L1X         CAZ-CAX         -5.55         1.39         1.51           2         B         201         A1L1X         CAZ-CAX         -5.52         1.40         1.51           2         C         201         A1L1X         CAZ-CAX         -5.52         1.40         1.51           2         C         201         A1L1X         CAZ-CAX         -5.49         1.40         1.51           2         C         201         A1L1X         CAA-CAF         -5.46         1.34         1.47           2         C         201         A1L1X         CBA-CAT	2	A	201	A1L1X	CAB-CAC	-6.42	1.34	1.47
2       A       201       A1L1X       CBM-CBJ       6.23       1.57       1.50         2       B       201       A1L1X       CBF-CAH       -6.06       1.35       1.49         2       C       201       A1L1X       CAB-CAC       -5.82       1.35       1.47         2       A       201       A1L1X       CAA-CAF       -5.81       1.33       1.47         2       A       201       A1L1X       CAZ-CAX       -5.55       1.39       1.51         2       B       201       A1L1X       CAZ-CAX       -5.52       1.40       1.51         2       C       201       A1L1X       CAZ-CAX       -5.52       1.40       1.51         2       C       201       A1L1X       CAZ-CAX       -5.49       1.40       1.51         2       C       201       A1L1X       CAZ-CAX       -5.49       1.40       1.51         2       C       201       A1L1X       CBM-CBJ       5.19       1.56       1.50         2       B       201       A1L1X       CBA-CAT       -5.17       1.40       1.51         2       B       201       A1L1X	2	В	201	A1L1X	CAB-CAC	-6.32	1.34	1.47
2         B         201         A1L1X         CBF-CAH         -6.06         1.35         1.49           2         C         201         A1L1X         CAB-CAC         -5.82         1.35         1.47           2         A         201         A1L1X         CAA-CAF         -5.81         1.33         1.47           2         A         201         A1L1X         CAZ-CAX         -5.55         1.39         1.51           2         B         201         A1L1X         CAZ-CAX         -5.52         1.40         1.51           2         C         201         A1L1X         CAZ-CAX         -5.52         1.40         1.51           2         C         201         A1L1X         CAZ-CAX         -5.49         1.40         1.51           2         C         201         A1L1X         CAZ-CAX         -5.49         1.40         1.51           2         C         201         A1L1X         CBA-CAF         -5.46         1.34         1.47           2         C         201         A1L1X         CBM-CBJ         5.19         1.56         1.50           2         B         201         A1L1X         CBA-CAT	2	С	201	A1L1X	CBF-CAH	-6.26	1.35	1.49
2         C         201         A1L1X         CAB-CAC         -5.82         1.35         1.47           2         A         201         A1L1X         CAA-CAF         -5.81         1.33         1.47           2         A         201         A1L1X         CAZ-CAX         -5.55         1.39         1.51           2         B         201         A1L1X         CAZ-CAX         -5.52         1.40         1.51           2         C         201         A1L1X         CAZ-CAX         -5.49         1.40         1.51           2         C         201         A1L1X         CBM-CBJ         5.19         1.56         1.50           2         B         201         A1L1X         CBA-CAT         -5.17         1.40         1.51           2         B         201         A1L1X         CBA-CAT	2	A	201	A1L1X	CBM-CBJ	6.23	1.57	1.50
2       A       201       A1L1X       CAA-CAF       -5.81       1.33       1.47         2       A       201       A1L1X       CAZ-CAX       -5.55       1.39       1.51         2       B       201       A1L1X       CAZ-CAX       -5.52       1.40       1.51         2       C       201       A1L1X       CAZ-CAX       -5.49       1.40       1.51         2       C       201       A1L1X       CBA-CAF       -5.46       1.34       1.47         2       C       201       A1L1X       CBA-CAT       -5.17       1.40       1.51         2       B       201       A1L1X       CBA-CAT       -5.10       1.35       1.47         2       C       201       A1L1X       CBA-CAT       -4.56       1.41       1.51         2       B       201       A1L1X	2	В	201	A1L1X	CBF-CAH	-6.06	1.35	1.49
2       A       201       A1L1X       CAZ-CAX       -5.55       1.39       1.51         2       B       201       A1L1X       CAZ-CAX       -5.52       1.40       1.51         2       C       201       A1L1X       CAZ-CAX       -5.49       1.40       1.51         2       C       201       A1L1X       CAZ-CAX       -5.49       1.40       1.51         2       C       201       A1L1X       CAZ-CAF       -5.46       1.34       1.47         2       C       201       A1L1X       CBM-CBJ       5.19       1.56       1.50         2       B       201       A1L1X       CBA-CAT       -5.17       1.40       1.51         2       B       201       A1L1X       CBA-CAF       -5.10       1.35       1.47         2       C       201       A1L1X       CBA-CAT       -5.01       1.41       1.51         2       A       201       A1L1X       CBA-CAT       -4.56       1.41       1.51         2       B       201       A1L1X       CBM-CBJ       4.52       1.55       1.50         2       C       201       A1L1X	2	С	201	A1L1X	CAB-CAC	-5.82	1.35	1.47
2       B       201       A1L1X       CAZ-CAX       -5.52       1.40       1.51         2       C       201       A1L1X       CAZ-CAX       -5.49       1.40       1.51         2       C       201       A1L1X       CAA-CAF       -5.46       1.34       1.47         2       C       201       A1L1X       CBM-CBJ       5.19       1.56       1.50         2       B       201       A1L1X       CBA-CAT       -5.17       1.40       1.51         2       B       201       A1L1X       CBA-CAT       -5.10       1.35       1.47         2       C       201       A1L1X       CBA-CAT       -5.01       1.41       1.51         2       A       201       A1L1X       CBA-CAT       -4.56       1.41       1.51         2       B       201       A1L1X       CBM-CBJ       4.52       1.55       1.50         2       C       201       A1L1X       CAJ-CAF       -4.17       1.42       1.49         2       A       201       A1L1X       CAJ-CAF       -4.05       1.42       1.49         2       B       201       A1L1X	2	A	201	A1L1X	CAA-CAF	-5.81	1.33	1.47
2         C         201         A1L1X         CAZ-CAX         -5.49         1.40         1.51           2         C         201         A1L1X         CAA-CAF         -5.46         1.34         1.47           2         C         201         A1L1X         CBM-CBJ         5.19         1.56         1.50           2         B         201         A1L1X         CBA-CAT         -5.17         1.40         1.51           2         B         201         A1L1X         CBA-CAT         -5.10         1.35         1.47           2         C         201         A1L1X         CBA-CAT         -5.01         1.41         1.51           2         A         201         A1L1X         CBA-CAT         -4.56         1.41         1.51           2         B         201         A1L1X         CBM-CBJ         4.52         1.55         1.50           2         C         201         A1L1X         CAJ-CAF         -4.17         1.42         1.49           2         A         201         A1L1X         CAJ-CAF         -4.05         1.42         1.49           2         B         201         A1L1X         CAJ-CAF	2	A	201	A1L1X	CAZ-CAX	-5.55	1.39	1.51
2         C         201         A1L1X         CAA-CAF         -5.46         1.34         1.47           2         C         201         A1L1X         CBM-CBJ         5.19         1.56         1.50           2         B         201         A1L1X         CBA-CAT         -5.17         1.40         1.51           2         B         201         A1L1X         CBA-CAF         -5.10         1.35         1.47           2         C         201         A1L1X         CBA-CAT         -5.01         1.41         1.51           2         A         201         A1L1X         CBA-CAT         -4.56         1.41         1.51           2         B         201         A1L1X         CBM-CBJ         4.52         1.55         1.50           2         C         201         A1L1X         CAJ-CAF         -4.17         1.42         1.49           2         A         201         A1L1X         CAJ-CAF         -4.05         1.42         1.49           2         B         201         A1L1X         CAJ-CAF         -4.00         1.42         1.49           2         B         201         A1L1X         CAI-CAB	2	В	201	A1L1X	CAZ-CAX	-5.52	1.40	1.51
2       C       201       A1L1X       CBM-CBJ       5.19       1.56       1.50         2       B       201       A1L1X       CBA-CAT       -5.17       1.40       1.51         2       B       201       A1L1X       CBA-CAF       -5.10       1.35       1.47         2       C       201       A1L1X       CBA-CAT       -5.01       1.41       1.51         2       A       201       A1L1X       CBA-CAT       -4.56       1.41       1.51         2       B       201       A1L1X       CBM-CBJ       4.52       1.55       1.50         2       C       201       A1L1X       CAJ-CAF       -4.17       1.42       1.49         2       A       201       A1L1X       CAJ-CAF       -4.05       1.42       1.49         2       B       201       A1L1X       CAJ-CAF       -4.00       1.42       1.49         2       B       201       A1L1X       CAJ-CAF       -2.88       1.34       1.40	2	С	201	A1L1X	CAZ-CAX	-5.49	1.40	1.51
2       B       201       A1L1X       CBA-CAT       -5.17       1.40       1.51         2       B       201       A1L1X       CAA-CAF       -5.10       1.35       1.47         2       C       201       A1L1X       CBA-CAT       -5.01       1.41       1.51         2       A       201       A1L1X       CBA-CAT       -4.56       1.41       1.51         2       B       201       A1L1X       CBM-CBJ       4.52       1.55       1.50         2       C       201       A1L1X       CAJ-CAF       -4.17       1.42       1.49         2       A       201       A1L1X       CAJ-CAF       -4.05       1.42       1.49         2       B       201       A1L1X       CAJ-CAF       -4.00       1.42       1.49         2       B       201       A1L1X       CAJ-CAF       -2.88       1.34       1.40	2	С	201	A1L1X	CAA-CAF	-5.46	1.34	1.47
2       B       201       A1L1X       CAA-CAF       -5.10       1.35       1.47         2       C       201       A1L1X       CBA-CAT       -5.01       1.41       1.51         2       A       201       A1L1X       CBA-CAT       -4.56       1.41       1.51         2       B       201       A1L1X       CBM-CBJ       4.52       1.55       1.50         2       C       201       A1L1X       CAJ-CAF       -4.17       1.42       1.49         2       A       201       A1L1X       CAJ-CAF       -4.05       1.42       1.49         2       B       201       A1L1X       CAJ-CAF       -4.00       1.42       1.49         2       B       201       A1L1X       CAJ-CAF       -2.88       1.34       1.40	2	С	201	A1L1X	CBM-CBJ	5.19	1.56	1.50
2       C       201       A1L1X       CBA-CAT       -5.01       1.41       1.51         2       A       201       A1L1X       CBA-CAT       -4.56       1.41       1.51         2       B       201       A1L1X       CBM-CBJ       4.52       1.55       1.50         2       C       201       A1L1X       CAJ-CAF       -4.17       1.42       1.49         2       A       201       A1L1X       CAJ-CAF       -4.05       1.42       1.49         2       B       201       A1L1X       CAJ-CAF       -4.00       1.42       1.49         2       B       201       A1L1X       CAJ-CAF       -2.88       1.34       1.40	2	В	201	A1L1X	CBA-CAT	-5.17	1.40	1.51
2       A       201       A1L1X       CBA-CAT       -4.56       1.41       1.51         2       B       201       A1L1X       CBM-CBJ       4.52       1.55       1.50         2       C       201       A1L1X       CAJ-CAF       -4.17       1.42       1.49         2       A       201       A1L1X       CAJ-CAF       -4.05       1.42       1.49         2       B       201       A1L1X       CAJ-CAF       -4.00       1.42       1.49         2       B       201       A1L1X       CAI-CAB       -2.88       1.34       1.40	2	В	201	A1L1X	CAA-CAF	-5.10	1.35	1.47
2     B     201     A1L1X     CBM-CBJ     4.52     1.55     1.50       2     C     201     A1L1X     CAJ-CAF     -4.17     1.42     1.49       2     A     201     A1L1X     CAJ-CAF     -4.05     1.42     1.49       2     B     201     A1L1X     CAJ-CAF     -4.00     1.42     1.49       2     B     201     A1L1X     CAI-CAB     -2.88     1.34     1.40	2	С	201	A1L1X	CBA-CAT	-5.01	1.41	1.51
2       C       201       A1L1X       CAJ-CAF       -4.17       1.42       1.49         2       A       201       A1L1X       CAJ-CAF       -4.05       1.42       1.49         2       B       201       A1L1X       CAJ-CAF       -4.00       1.42       1.49         2       B       201       A1L1X       CAI-CAB       -2.88       1.34       1.40	2	A	201	A1L1X	CBA-CAT	-4.56	1.41	1.51
2       A       201       A1L1X       CAJ-CAF       -4.05       1.42       1.49         2       B       201       A1L1X       CAJ-CAF       -4.00       1.42       1.49         2       B       201       A1L1X       CAI-CAB       -2.88       1.34       1.40	2	В	201	A1L1X	CBM-CBJ	4.52	1.55	1.50
2         B         201         A1L1X         CAJ-CAF         -4.00         1.42         1.49           2         B         201         A1L1X         CAI-CAB         -2.88         1.34         1.40	2	С	201	A1L1X	CAJ-CAF	-4.17	1.42	1.49
2 B 201 A1L1X CAI-CAB -2.88 1.34 1.40	2	A	201	A1L1X	CAJ-CAF	-4.05	1.42	1.49
	2	В	201	A1L1X	CAJ-CAF	-4.00	1.42	1.49
2 A 201 A1L1X CAI-CAB -2.76 1.34 1.40	2	В	201	A1L1X	CAI-CAB	-2.88	1.34	1.40
	2	A	201	A1L1X	CAI-CAB	-2.76	1.34	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(A)	$Ideal(\AA)$
2	A	201	A1L1X	FAY-CAV	-2.30	1.30	1.36
2	A	201	A1L1X	OBN-CBM	2.12	1.50	1.41
2	В	201	A1L1X	OAR-CAQ	-2.05	1.34	1.39

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	$Observed(^o)$	$Ideal(^{o})$
2	С	201	A1L1X	CAU-CAV-CAW	-2.95	119.80	123.52
2	С	201	A1L1X	CAQ-OAR-CAS	2.64	123.65	117.79
2	С	201	A1L1X	CAF-CAE-NAD	-2.55	119.70	122.96
2	A	201	A1L1X	CBD-CBB-CAN	-2.40	106.62	110.91
2	В	201	A1L1X	CAO-CAN-CBB	-2.22	118.72	121.55
2	В	201	A1L1X	CAF-CAE-NAD	-2.17	120.18	122.96
2	В	201	A1L1X	CAQ-OAR-CAS	2.15	122.57	117.79
2	С	201	A1L1X	CAT-CAU-CAV	2.11	120.78	119.26
2	С	201	A1L1X	CAQ-CAJ-CAF	2.05	124.08	121.57
2	В	201	A1L1X	CAU-CAV-CAW	-2.03	120.95	123.52

There are no chirality outliers.

All (11) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	201	A1L1X	CBJ-CBM-OBN-CBO
2	С	201	A1L1X	CBJ-CBM-OBN-CBO
2	В	201	A1L1X	CAA-CAF-CAJ-CAM
2	В	201	A1L1X	CBJ-CBM-OBN-CBO
2	С	201	A1L1X	CAA-CAF-CAJ-CAM
2	В	201	A1L1X	NBI-CBH-CBK-CBL
2	A	201	A1L1X	CAA-CAF-CAJ-CAM
2	В	201	A1L1X	CAA-CAF-CAJ-CAQ
2	С	201	A1L1X	CAA-CAF-CAJ-CAQ
2	A	201	A1L1X	NBG-CBH-CBK-CBL
2	В	201	A1L1X	NBG-CBH-CBK-CBL

There are no ring outliers.

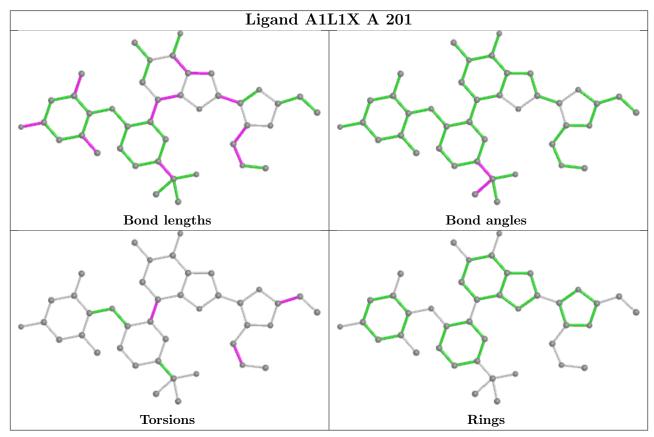
1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	В	201	A1L1X	1	0

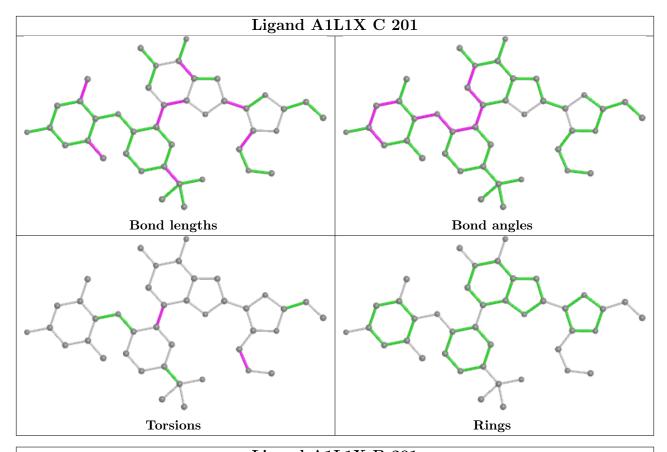
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths,

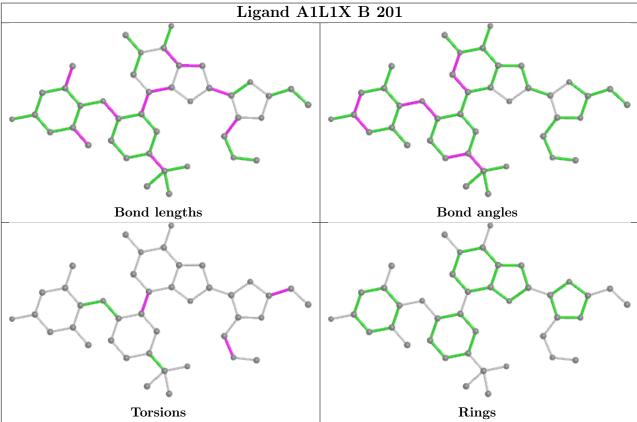


bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 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.











## 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,  $95^{th}$  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 $>$	$\#\mathrm{RSRZ}{>}2$		>2	$\mathbf{OWAB}(\mathrm{\AA}^2)$	Q < 0.9
1	A	107/141~(75%)	-0.29	3 (2%)	55	33	59, 82, 121, 164	0
1	В	109/141 (77%)	-0.29	2 (1%)	67	45	70, 88, 126, 144	0
1	С	108/141 (76%)	0.17	2 (1%)	66	44	76, 116, 159, 174	0
All	All	324/423 (76%)	-0.13	7 (2%)	62	40	59, 94, 146, 174	0

All (7) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ	
1	С	92	LEU	2.8	
1	В	166	THR	2.8	
1	A	117	ASN	2.3	
1	С	72	LYS	2.2	
1	A	166	THR	2.2	
1	В	92	LEU	2.2	
1	A	60	THR	2.1	

### 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)

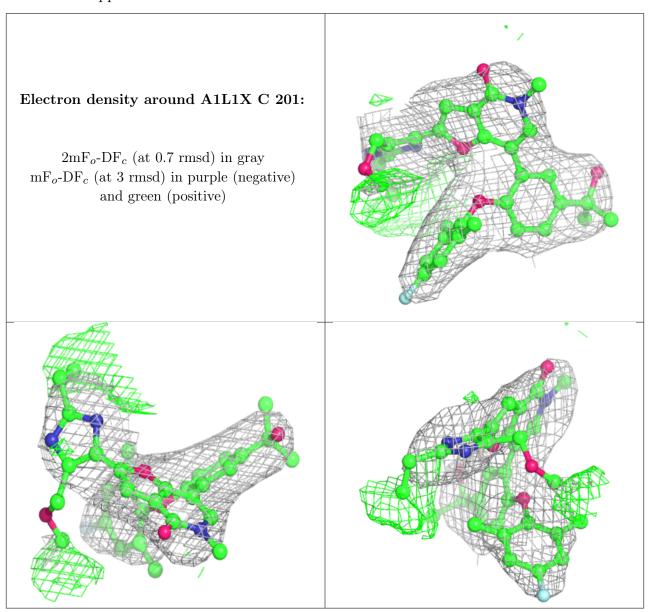
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum,



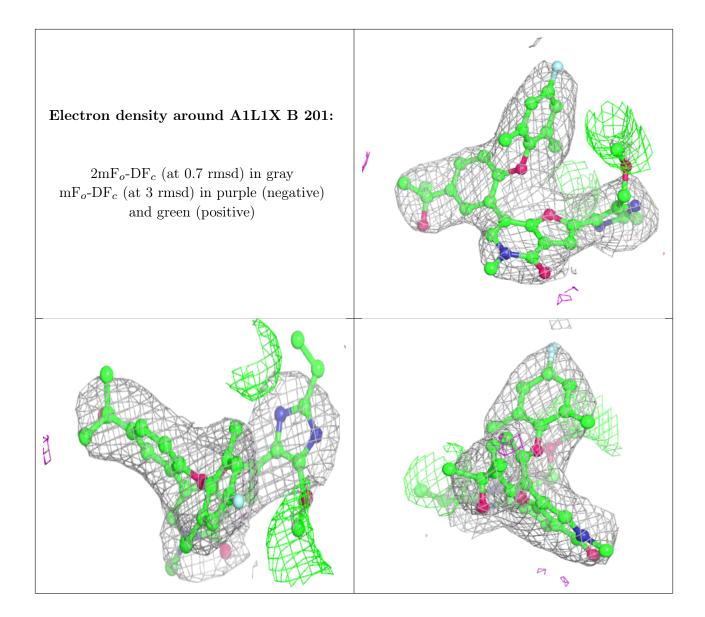
median,  $95^{th}$  percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	$\mathbf{B} ext{-}\mathbf{factors}(\mathbf{\mathring{A}}^2)$	Q<0.9
2	A1L1X	С	201	41/41	0.89	0.18	110,130,162,169	0
2	A1L1X	В	201	41/41	0.92	0.15	79,102,132,144	0
2	A1L1X	A	201	41/41	0.92	0.15	67,85,122,127	0

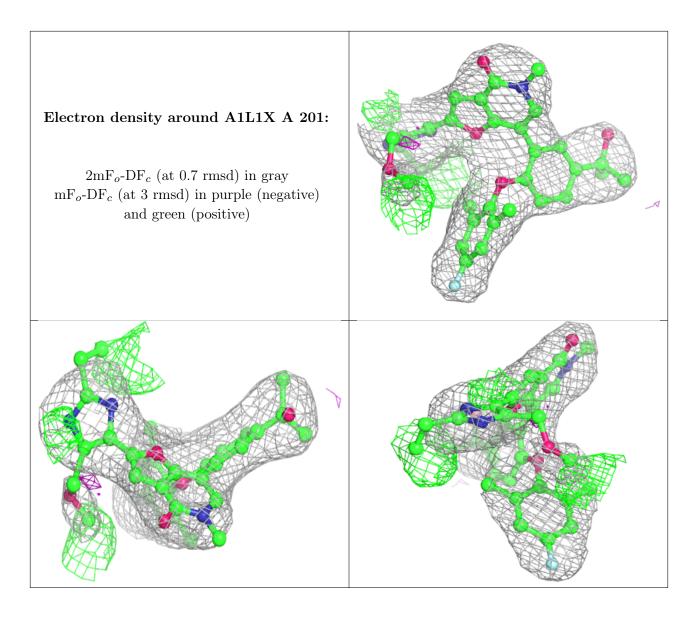
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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











## 6.5 Other polymers (i)

There are no such residues in this entry.

