



# Full wwPDB X-ray Structure Validation Report ⓘ

Dec 6, 2022 – 03:13 pm GMT

PDB ID : 7R3G  
Title : PROSS optimized variant of RhlR (75 mutations) in complex with the synthetic antagonist mBTL  
Authors : Henke, S.; Blankenfeldt, W.  
Deposited on : 2022-02-07  
Resolution : 2.15 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](mailto: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>.

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

MolProbity : 4.02b-467  
Mogul : 1.8.4, CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.31.3  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0267  
CCP4 : 7.1.010 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.31.3

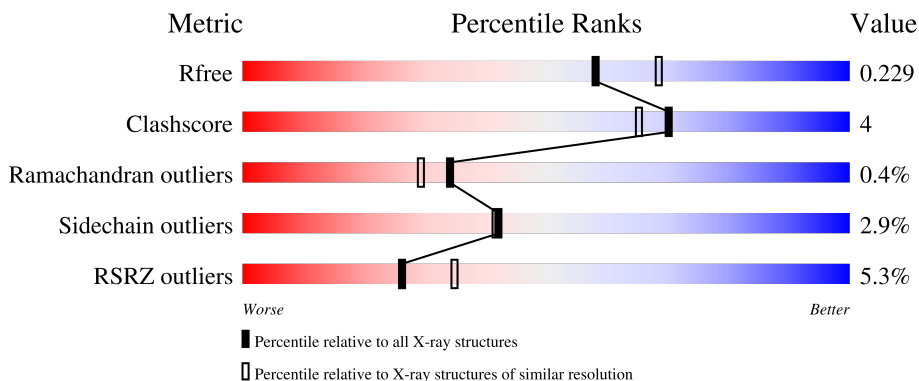
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

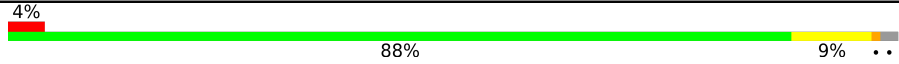

The reported resolution of this entry is 2.15 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	1479 (2.16-2.16)
Clashscore	141614	1585 (2.16-2.16)
Ramachandran outliers	138981	1560 (2.16-2.16)
Sidechain outliers	138945	1559 (2.16-2.16)
RSRZ outliers	127900	1456 (2.16-2.16)

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  $\geq 3$ , 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	241	 4% 88% 9% ..
1	B	241	 6% 87% 11% .

## 2 Entry composition i

There are 3 unique types of molecules in this entry. The entry contains 7605 atoms, of which 3649 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 Regulatory protein RhIR.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	H	N	O	S			
1	B	236	3681	1197	1799	337	337	11	0	3	0
1	A	236	3716	1207	1818	345	335	11	0	4	0

There are 150 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	9	ASP	LEU	engineered mutation	UNP P54292
B	12	GLU	ASP	engineered mutation	UNP P54292
B	13	ASP	GLY	engineered mutation	UNP P54292
B	20	SER	PRO	engineered mutation	UNP P54292
B	22	THR	HIS	engineered mutation	UNP P54292
B	26	GLU	GLY	engineered mutation	UNP P54292
B	46	CYS	GLY	engineered mutation	UNP P54292
B	50	PRO	THR	engineered mutation	UNP P54292
B	57	ARG	LYS	engineered mutation	UNP P54292
B	58	ILE	THR	engineered mutation	UNP P54292
B	59	PHE	GLU	engineered mutation	UNP P54292
B	60	MET	VAL	engineered mutation	UNP P54292
B	61	PHE	HIS	engineered mutation	UNP P54292
B	63	ASN	THR	engineered mutation	UNP P54292
B	66	PRO	LYS	engineered mutation	UNP P54292
B	69	GLN	LEU	engineered mutation	UNP P54292
B	71	HIS	ARG	engineered mutation	UNP P54292
B	74	ALA	MET	engineered mutation	UNP P54292
B	78	PHE	GLY	engineered mutation	UNP P54292
B	80	ILE	VAL	engineered mutation	UNP P54292
B	83	THR	ALA	engineered mutation	UNP P54292
B	85	ARG	LEU	engineered mutation	UNP P54292
B	86	HIS	ASN	engineered mutation	UNP P54292
B	87	CYS	GLY	engineered mutation	UNP P54292
B	91	GLY	SER	engineered mutation	UNP P54292

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Chain	Residue	Modelled	Actual	Comment	Reference
B	92	ASN	GLU	engineered mutation	UNP P54292
B	93	HIS	MET	engineered mutation	UNP P54292
B	94	ILE	VAL	engineered mutation	UNP P54292
B	99	ASP	SER	engineered mutation	UNP P54292
B	102	ALA	ASP	engineered mutation	UNP P54292
B	103	ASP	GLN	engineered mutation	UNP P54292
B	104	ALA	SER	engineered mutation	UNP P54292
B	105	GLN	ARG	engineered mutation	UNP P54292
B	106	GLU	MET	engineered mutation	UNP P54292
B	109	ASP	ASN	engineered mutation	UNP P54292
B	110	ASP	GLU	engineered mutation	UNP P54292
B	114	TYR	TRP	engineered mutation	UNP P54292
B	117	ARG	CYS	engineered mutation	UNP P54292
B	118	HIS	VAL	engineered mutation	UNP P54292
B	122	HIS	LEU	engineered mutation	UNP P54292
B	123	SER	PRO	engineered mutation	UNP P54292
B	124	CYS	ILE	engineered mutation	UNP P54292
B	125	MET	ARG	engineered mutation	UNP P54292
B	129	GLY	ASN	engineered mutation	UNP P54292
B	130	VAL	LEU	engineered mutation	UNP P54292
B	131	MET	LEU	engineered mutation	UNP P54292
B	132	GLY	SER	engineered mutation	UNP P54292
B	133	PHE	VAL	engineered mutation	UNP P54292
B	139	SER	ASP	engineered mutation	UNP P54292
B	140	SER	GLN	engineered mutation	UNP P54292
B	141	PRO	GLN	engineered mutation	UNP P54292
B	142	ALA	ASN	engineered mutation	UNP P54292
B	145	PRO	SER	engineered mutation	UNP P54292
B	146	HIS	PHE	engineered mutation	UNP P54292
B	151	LEU	ILE	engineered mutation	UNP P54292
B	155	MET	LEU	engineered mutation	UNP P54292
B	158	LEU	MET	engineered mutation	UNP P54292
B	163	HIS	THR	engineered mutation	UNP P54292
B	165	THR	LYS	engineered mutation	UNP P54292
B	168	GLU	ASP	engineered mutation	UNP P54292
B	170	ASN	GLU	engineered mutation	UNP P54292
B	173	SER	MET	engineered mutation	UNP P54292
B	175	GLN	MET	engineered mutation	UNP P54292
B	176	PRO	SER	engineered mutation	UNP P54292
B	177	GLN	ASN	engineered mutation	UNP P54292
B	179	ILE	VAL	engineered mutation	UNP P54292
B	183	LYS	HIS	engineered mutation	UNP P54292

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Chain	Residue	Modelled	Actual	Comment	Reference
B	190	ARG	GLN	engineered mutation	UNP P54292
B	197	THR	SER	engineered mutation	UNP P54292
B	199	ALA	GLY	engineered mutation	UNP P54292
B	203	LYS	ILE	engineered mutation	UNP P54292
B	206	GLY	SER	engineered mutation	UNP P54292
B	216	LEU	HIS	engineered mutation	UNP P54292
B	224	ASN	ASP	engineered mutation	UNP P54292
B	230	GLN	LEU	engineered mutation	UNP P54292
A	9	ASP	LEU	engineered mutation	UNP P54292
A	12	GLU	ASP	engineered mutation	UNP P54292
A	13	ASP	GLY	engineered mutation	UNP P54292
A	20	SER	PRO	engineered mutation	UNP P54292
A	22	THR	HIS	engineered mutation	UNP P54292
A	26	GLU	GLY	engineered mutation	UNP P54292
A	46	CYS	GLY	engineered mutation	UNP P54292
A	50	PRO	THR	engineered mutation	UNP P54292
A	57	ARG	LYS	engineered mutation	UNP P54292
A	58	ILE	THR	engineered mutation	UNP P54292
A	59	PHE	GLU	engineered mutation	UNP P54292
A	60	MET	VAL	engineered mutation	UNP P54292
A	61	PHE	HIS	engineered mutation	UNP P54292
A	63	ASN	THR	engineered mutation	UNP P54292
A	66	PRO	LYS	engineered mutation	UNP P54292
A	69	GLN	LEU	engineered mutation	UNP P54292
A	71	HIS	ARG	engineered mutation	UNP P54292
A	74	ALA	MET	engineered mutation	UNP P54292
A	78	PHE	GLY	engineered mutation	UNP P54292
A	80	ILE	VAL	engineered mutation	UNP P54292
A	83	THR	ALA	engineered mutation	UNP P54292
A	85	ARG	LEU	engineered mutation	UNP P54292
A	86	HIS	ASN	engineered mutation	UNP P54292
A	87	CYS	GLY	engineered mutation	UNP P54292
A	91	GLY	SER	engineered mutation	UNP P54292
A	92	ASN	GLU	engineered mutation	UNP P54292
A	93	HIS	MET	engineered mutation	UNP P54292
A	94	ILE	VAL	engineered mutation	UNP P54292
A	99	ASP	SER	engineered mutation	UNP P54292
A	102	ALA	ASP	engineered mutation	UNP P54292
A	103	ASP	GLN	engineered mutation	UNP P54292
A	104	ALA	SER	engineered mutation	UNP P54292
A	105	GLN	ARG	engineered mutation	UNP P54292
A	106	GLU	MET	engineered mutation	UNP P54292

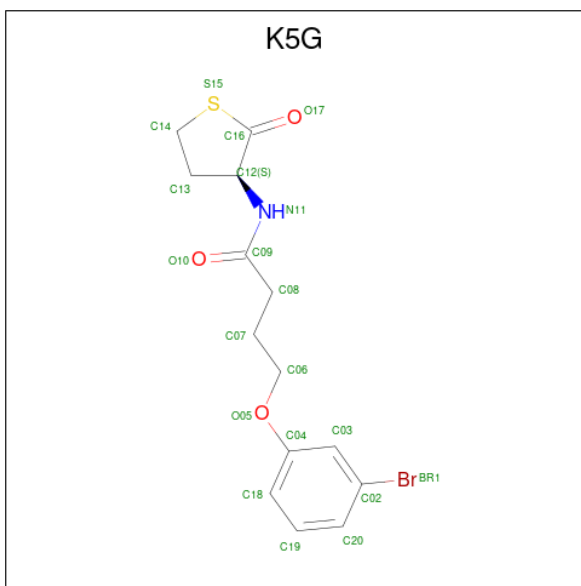
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Chain	Residue	Modelled	Actual	Comment	Reference
A	109	ASP	ASN	engineered mutation	UNP P54292
A	110	ASP	GLU	engineered mutation	UNP P54292
A	114	TYR	TRP	engineered mutation	UNP P54292
A	117	ARG	CYS	engineered mutation	UNP P54292
A	118	HIS	VAL	engineered mutation	UNP P54292
A	122	HIS	LEU	engineered mutation	UNP P54292
A	123	SER	PRO	engineered mutation	UNP P54292
A	124	CYS	ILE	engineered mutation	UNP P54292
A	125	MET	ARG	engineered mutation	UNP P54292
A	129	GLY	ASN	engineered mutation	UNP P54292
A	130	VAL	LEU	engineered mutation	UNP P54292
A	131	MET	LEU	engineered mutation	UNP P54292
A	132	GLY	SER	engineered mutation	UNP P54292
A	133	PHE	VAL	engineered mutation	UNP P54292
A	139	SER	ASP	engineered mutation	UNP P54292
A	140	SER	GLN	engineered mutation	UNP P54292
A	141	PRO	GLN	engineered mutation	UNP P54292
A	142	ALA	ASN	engineered mutation	UNP P54292
A	145	PRO	SER	engineered mutation	UNP P54292
A	146	HIS	PHE	engineered mutation	UNP P54292
A	151	LEU	ILE	engineered mutation	UNP P54292
A	155	MET	LEU	engineered mutation	UNP P54292
A	158	LEU	MET	engineered mutation	UNP P54292
A	163	HIS	THR	engineered mutation	UNP P54292
A	165	THR	LYS	engineered mutation	UNP P54292
A	168	GLU	ASP	engineered mutation	UNP P54292
A	170	ASN	GLU	engineered mutation	UNP P54292
A	173	SER	MET	engineered mutation	UNP P54292
A	175	GLN	MET	engineered mutation	UNP P54292
A	176	PRO	SER	engineered mutation	UNP P54292
A	177	GLN	ASN	engineered mutation	UNP P54292
A	179	ILE	VAL	engineered mutation	UNP P54292
A	183	LYS	HIS	engineered mutation	UNP P54292
A	190	ARG	GLN	engineered mutation	UNP P54292
A	197	THR	SER	engineered mutation	UNP P54292
A	199	ALA	GLY	engineered mutation	UNP P54292
A	203	LYS	ILE	engineered mutation	UNP P54292
A	206	GLY	SER	engineered mutation	UNP P54292
A	216	LEU	HIS	engineered mutation	UNP P54292
A	224	ASN	ASP	engineered mutation	UNP P54292
A	230	GLN	LEU	engineered mutation	UNP P54292

- Molecule 2 is 4-(3-bromophenoxy)-N-[(3S)-2-oxothiolan-3-yl]butanamide (three-letter code:

K5G) (formula: C<sub>14</sub>H<sub>16</sub>BrNO<sub>3</sub>S) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms							ZeroOcc	AltConf
			Total	Br	C	H	N	O	S		
2	B	1	36	1	14	16	1	3	1	0	0
2	A	1	36	1	14	16	1	3	1	0	0

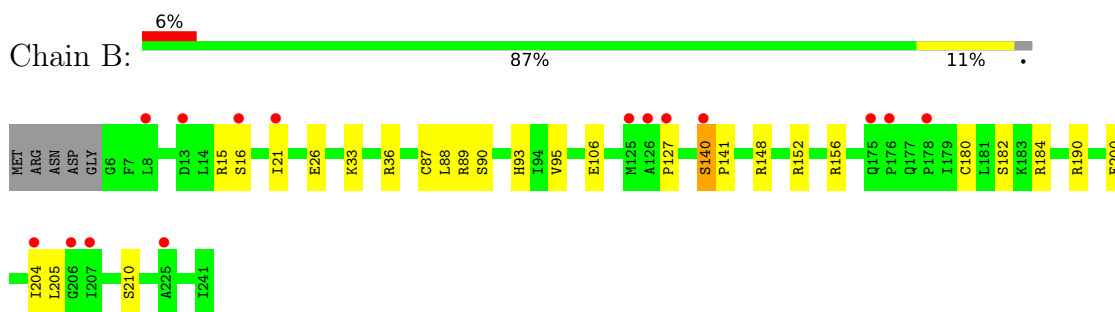
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
3	B	55	55	55	0	0
3	A	81	81	81	0	0

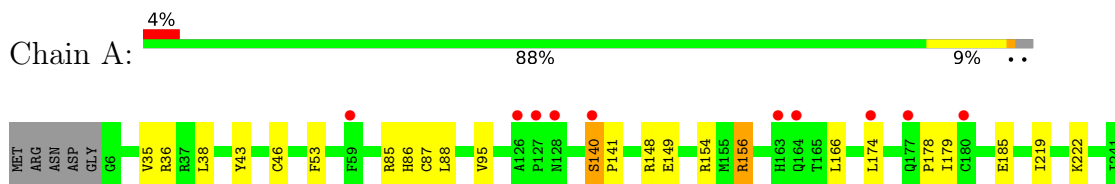
### 3 Residue-property plots [i](#)

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: Regulatory protein RhIR



- Molecule 1: Regulatory protein RhIR





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 61	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	164.78Å 164.78Å 40.31Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	47.57 – 2.15 47.57 – 2.15	Depositor EDS
% Data completeness (in resolution range)	100.0 (47.57-2.15) 100.0 (47.57-2.15)	Depositor EDS
$R_{merge}$	0.23	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.74 (at 2.16Å)	Xtrriage
Refinement program	PHENIX 1.19.2	Depositor
R, $R_{free}$	0.199 , 0.230 0.197 , 0.229	Depositor DCC
$R_{free}$ test set	1739 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	35.0	Xtrriage
Anisotropy	0.376	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	(Not available) , (Not available)	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.51$ , $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	0.018 for h,-h-k,-l	Xtrriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	7605	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	51.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.77% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: K5G

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	0.28	0/1963	0.52	0/2668
1	B	0.27	0/1942	0.51	0/2640
All	All	0.27	0/3905	0.52	0/5308

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	1898	1818	1821	15	0
1	B	1882	1799	1801	16	0
2	A	20	16	0	1	0
2	B	20	16	0	0	0
3	A	81	0	0	1	0
3	B	55	0	0	3	0
All	All	3956	3649	3622	27	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 4.

All (27) 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:200:GLU:O	1:B:204:ILE:HD12	1.92	0.69
1:B:184:ARG:NH1	3:B:402:HOH:O	2.24	0.69
1:B:87:CYS:SG	1:B:89:ARG:NH2	2.77	0.58
1:A:185:GLU:OE2	1:A:222:LYS:NZ	2.36	0.58
1:B:36:ARG:NH1	3:B:405:HOH:O	2.39	0.56
1:A:140:SER:HB3	1:A:141:PRO:HD3	1.86	0.56
1:A:36:ARG:NH1	3:A:401:HOH:O	2.43	0.52
1:B:204:ILE:HG22	1:B:205:LEU:HD23	1.93	0.51
1:B:15:ARG:CZ	1:A:149:GLU:HG2	2.41	0.49
1:B:190:ARG:HG3	1:A:53:PHE:HB3	1.94	0.49
1:A:178:PRO:C	1:A:179:ILE:HD13	2.34	0.48
1:A:35:VAL:HG21	1:A:43:TYR:HB3	1.96	0.47
1:B:140:SER:HB2	1:B:141:PRO:HD3	1.97	0.46
1:B:21:ILE:HG23	1:B:26:GLU:HB2	1.96	0.46
1:A:166:LEU:HB2	1:A:174:LEU:HD11	1.98	0.46
1:B:156:ARG:HD2	1:A:156:ARG:NH1	2.31	0.46
1:A:185:GLU:HB2	1:A:219:ILE:HD11	1.96	0.46
1:A:38:LEU:HD21	1:A:154:ARG:HD2	1.98	0.46
1:B:93:HIS:HB3	1:B:152:ARG:HD2	1.97	0.45
1:A:95:VAL:HG11	1:A:148:ARG:NH2	2.33	0.44
1:B:95:VAL:HG11	1:B:148[A]:ARG:NH2	2.33	0.44
1:B:127:PRO:HG2	1:A:88:LEU:HA	2.00	0.43
1:A:46[B]:CYS:SG	2:A:301:K5G:C06	3.06	0.43
1:A:166:LEU:CB	1:A:174:LEU:HD11	2.48	0.43
1:B:88:LEU:O	3:B:401:HOH:O	2.22	0.42
1:B:205:LEU:HD23	1:B:205:LEU:N	2.35	0.41
1:B:140:SER:CB	1:B:141:PRO:HD3	2.51	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	238/241 (99%)	232 (98%)	5 (2%)	1 (0%)	34	29
1	B	237/241 (98%)	232 (98%)	4 (2%)	1 (0%)	34	29
All	All	475/482 (98%)	464 (98%)	9 (2%)	2 (0%)	34	29

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	140	SER
1	A	140	SER

### 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	195/207 (94%)	191 (98%)	4 (2%)	53	57
1	B	193/207 (93%)	186 (96%)	7 (4%)	35	33
All	All	388/414 (94%)	377 (97%)	11 (3%)	42	44

All (11) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	16	SER
1	B	33	LYS
1	B	90	SER
1	B	106	GLU
1	B	180	CYS
1	B	182	SER
1	B	210	SER
1	A	85	ARG
1	A	86	HIS
1	A	87	CYS
1	A	156	ARG

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

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

2 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	K5G	B	301	-	19,21,21	0.19	0	19,27,27	0.51	0
2	K5G	A	301	-	19,21,21	0.17	0	19,27,27	0.36	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
2	K5G	B	301	-	-	0/11/21/21	0/2/2/2
2	K5G	A	301	-	-	6/11/21/21	0/2/2/2

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (6) torsion outliers are listed below:

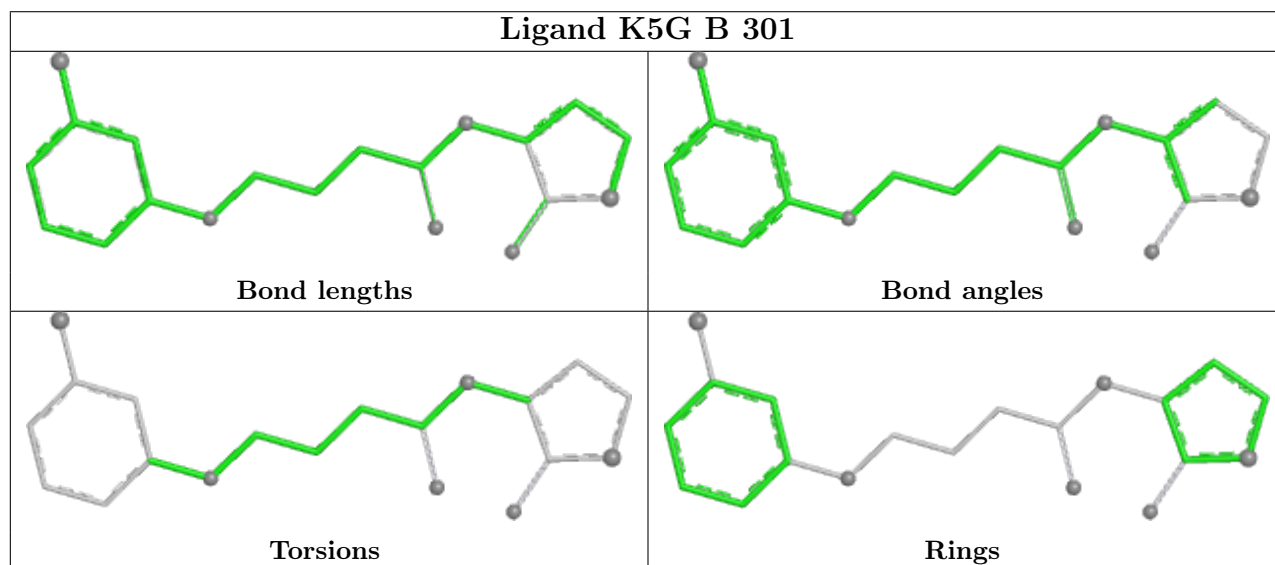
Mol	Chain	Res	Type	Atoms
2	A	301	K5G	C03-C04-O05-C06
2	A	301	K5G	C18-C04-O05-C06
2	A	301	K5G	O05-C06-C07-C08
2	A	301	K5G	C07-C06-O05-C04
2	A	301	K5G	C07-C08-C09-O10
2	A	301	K5G	C07-C08-C09-N11

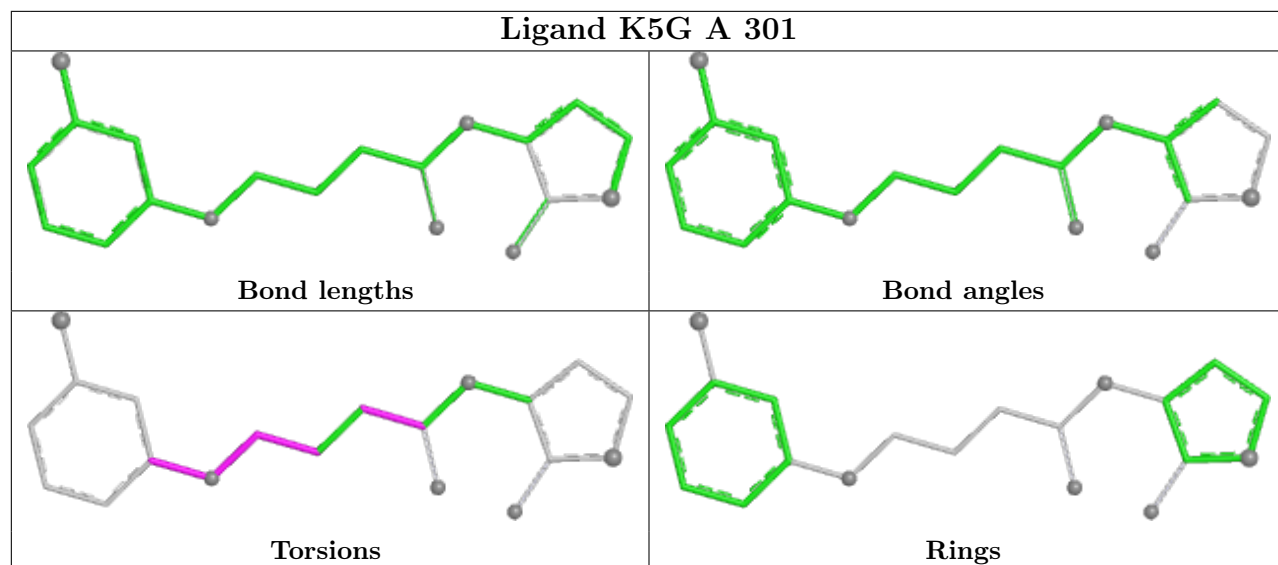
There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	301	K5G	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 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	236/241 (97%)	0.51	10 (4%) 36 45	25, 42, 73, 99	0
1	B	236/241 (97%)	0.54	15 (6%) 19 26	25, 45, 74, 107	0
All	All	472/482 (97%)	0.52	25 (5%) 26 35	25, 43, 74, 107	0

All (25) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	140	SER	4.9
1	B	21	ILE	4.4
1	B	176	PRO	4.3
1	A	177	GLN	4.1
1	B	175	GLN	4.1
1	B	140	SER	4.1
1	B	204	ILE	3.6
1	B	127	PRO	3.5
1	B	206	GLY	3.3
1	A	163	HIS	3.2
1	B	8	LEU	3.1
1	A	59	PHE	3.1
1	A	180	CYS	3.0
1	A	127	PRO	3.0
1	B	178	PRO	2.7
1	B	207	ILE	2.6
1	B	225	ALA	2.5
1	B	13	ASP	2.4
1	B	16	SER	2.3
1	B	126	ALA	2.1
1	A	128	ASN	2.1
1	A	164	GLN	2.1
1	A	174	LEU	2.0
1	A	126	ALA	2.0

*Continued on next page...*



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Mol	Chain	Res	Type	RSRZ
1	B	125	MET	2.0

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

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

## 6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 6.4 Ligands [i](#)

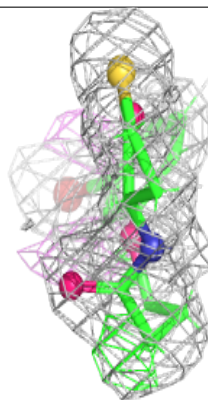
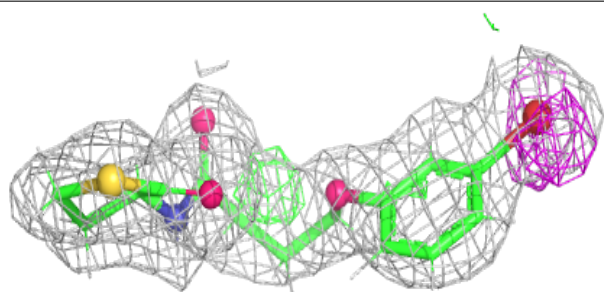
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
2	K5G	A	301	20/20	0.80	0.21	22,32,44,84	36
2	K5G	B	301	20/20	0.91	0.14	23,33,42,82	0

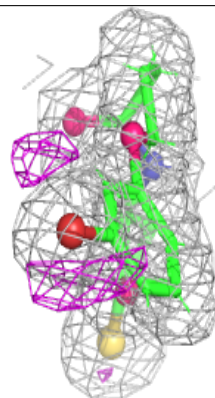
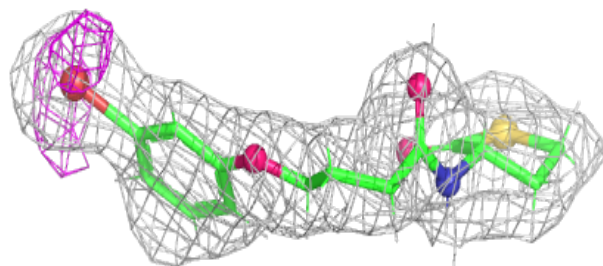
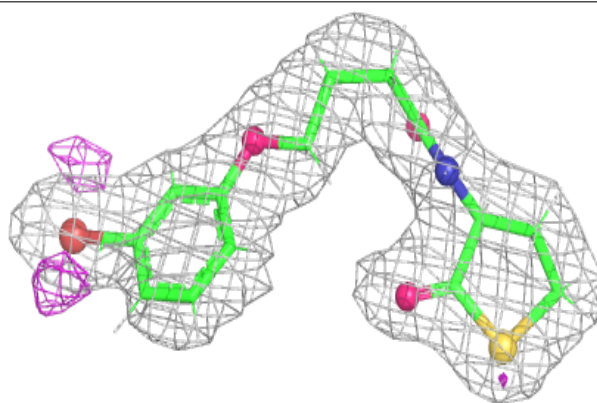
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

**Electron density around K5G A 301:**

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

**Electron density around K5G B 301:**

$2mF_o-DF_c$  (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.