



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 9, 2023 – 03:05 AM EDT

PDB ID : 6XJU
Title : Crystal Structure of KPT-8602 bound to CRM1 (E582K, 537-DLTVK-541 to GLCEQ)
Authors : Baumhardt, J.M.; Chook, Y.M.
Deposited on : 2020-06-24
Resolution : 2.19 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtrriage (Phenix) : 1.13
EDS : 2.35.1
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.35.1

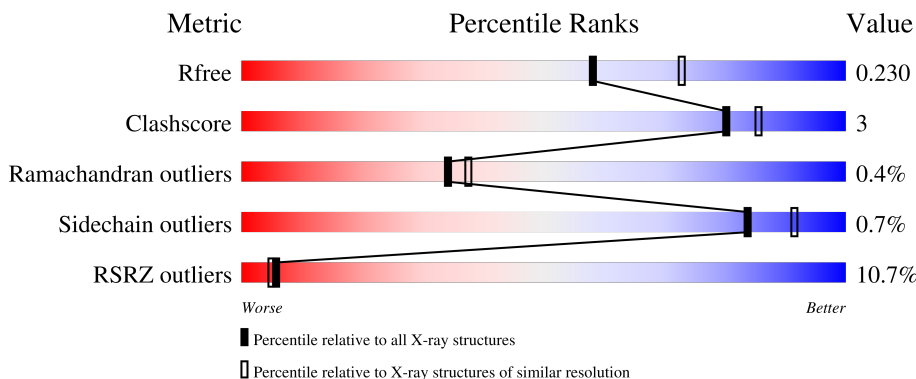
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.19 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	4898 (2.20-2.20)
Clashscore	141614	5594 (2.20-2.20)
Ramachandran outliers	138981	5503 (2.20-2.20)
Sidechain outliers	138945	5504 (2.20-2.20)
RSRZ outliers	127900	4800 (2.20-2.20)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	216	 12% 94% . .
2	B	140	 7% 82% 6% 12%
3	C	1024	 11% 93% 5% ..

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
6	6L8	C	1101	-	-	X	-

2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 22828 atoms, of which 11174 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 GTP-binding nuclear protein Ran.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	H	N	O	S			
1	A	208	3391	1093	1697	291	304	6	0	5	0

- Molecule 2 is a protein called Ran-specific GTPase-activating protein 1.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	H	N	O	S			
2	B	123	2060	652	1031	181	191	5	0	3	0

- Molecule 3 is a protein called Exportin-1.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	H	N	O	S			
3	C	1011	16732	5337	8422	1368	1560	45	0	42	0

There are 46 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	-2	GLY	-	expression tag	UNP P30822
C	-1	GLY	-	expression tag	UNP P30822
C	0	SER	-	expression tag	UNP P30822
C	?	-	VAL	deletion	UNP P30822
C	?	-	GLN	deletion	UNP P30822
C	?	-	ARG	deletion	UNP P30822
C	?	-	LEU	deletion	UNP P30822
C	?	-	PRO	deletion	UNP P30822
C	?	-	ALA	deletion	UNP P30822
C	?	-	THR	deletion	UNP P30822
C	?	-	GLU	deletion	UNP P30822
C	?	-	MET	deletion	UNP P30822
C	?	-	SER	deletion	UNP P30822
C	?	-	PRO	deletion	UNP P30822

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Chain	Residue	Modelled	Actual	Comment	Reference
C	?	-	LEU	deletion	UNP P30822
C	?	-	ILE	deletion	UNP P30822
C	?	-	GLN	deletion	UNP P30822
C	?	-	LEU	deletion	UNP P30822
C	?	-	SER	deletion	UNP P30822
C	?	-	VAL	deletion	UNP P30822
C	?	-	GLY	deletion	UNP P30822
C	?	-	SER	deletion	UNP P30822
C	?	-	GLN	deletion	UNP P30822
C	?	-	ALA	deletion	UNP P30822
C	?	-	ILE	deletion	UNP P30822
C	?	-	SER	deletion	UNP P30822
C	?	-	THR	deletion	UNP P30822
C	?	-	GLY	deletion	UNP P30822
C	?	-	SER	deletion	UNP P30822
C	?	-	GLY	deletion	UNP P30822
C	?	-	ALA	deletion	UNP P30822
C	?	-	LEU	deletion	UNP P30822
C	?	-	ASN	deletion	UNP P30822
C	?	-	PRO	deletion	UNP P30822
C	?	-	GLU	deletion	UNP P30822
C	?	-	TYR	deletion	UNP P30822
C	?	-	MET	deletion	UNP P30822
C	?	-	LYS	deletion	UNP P30822
C	?	-	ARG	deletion	UNP P30822
C	?	-	PHE	deletion	UNP P30822
C	537	GLY	ASP	engineered mutation	UNP P30822
C	539	CYS	THR	engineered mutation	UNP P30822
C	540	GLU	VAL	engineered mutation	UNP P30822
C	541	GLN	LYS	engineered mutation	UNP P30822
C	582	LYS	GLU	engineered mutation	UNP P30822
C	1022	CYS	TYR	conflict	UNP P30822

- Molecule 4 is PHOSPHOAMINOPHOSPHONIC ACID-GUANYLATE ESTER (three-letter code: GNP) (formula: C₁₀H₁₇N₆O₁₃P₃).

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
			Total	C	F	H	N	O		
6	C	1	42	17	6	12	6	1	0	0

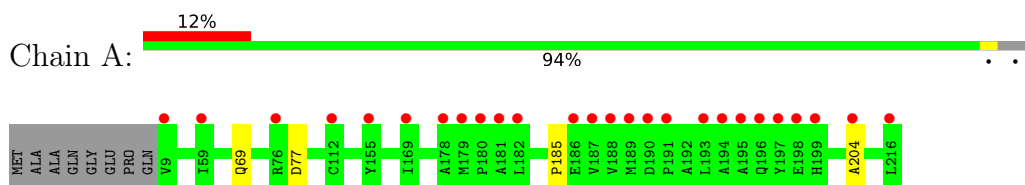
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	86	Total 86	O 86	0	0
7	B	26	Total 26	O 26	0	0
7	C	446	Total 446	O 446	0	0

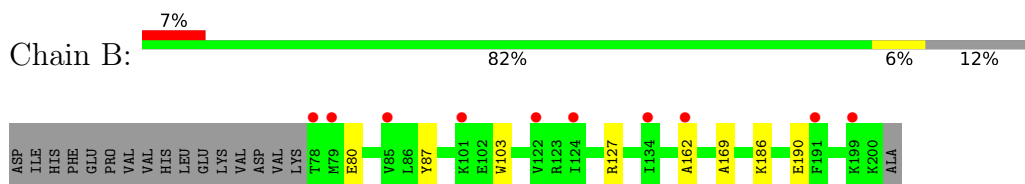
3 Residue-property plots [i](#)

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.

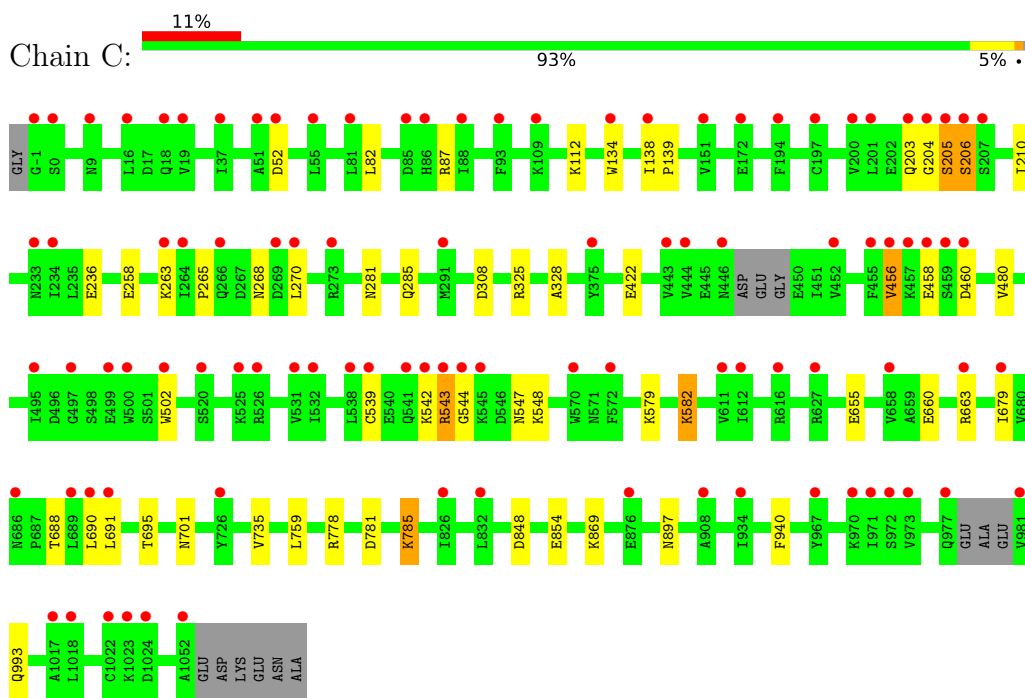
- Molecule 1: GTP-binding nuclear protein Ran



- Molecule 2: Ran-specific GTPase-activating protein 1



- Molecule 3: Exportin-1



4 Data and refinement statistics

Property	Value	Source
Space group	P 43 21 2	Depositor
Cell constants a, b, c, α , β , γ	105.97Å 105.97Å 305.40Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	38.17 – 2.19 50.06 – 2.50	Depositor EDS
% Data completeness (in resolution range)	79.7 (38.17-2.19) 93.7 (50.06-2.50)	Depositor EDS
R_{merge}	0.15	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.35 (at 2.51Å)	Xtrriage
Refinement program	PHENIX 1.11.1_2575	Depositor
R, R_{free}	0.199 , 0.225 0.229 , 0.230	Depositor DCC
R_{free} test set	2002 reflections (3.50%)	wwPDB-VP
Wilson B-factor (Å ²)	36.8	Xtrriage
Anisotropy	0.135	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.38 , 51.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	22828	wwPDB-VP
Average B, all atoms (Å ²)	46.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.99% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: GNP, 6L8, MG

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	0.33	0/1754	0.51	0/2379
2	B	0.31	0/1059	0.46	0/1413
3	C	0.34	0/8608	0.45	0/11658
All	All	0.34	0/11421	0.46	0/15450

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
3	C	0	1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	C	203	GLN	Peptide

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	1694	1697	1676	3	0
2	B	1029	1031	1021	5	0
3	C	8310	8422	8266	52	1
4	A	32	12	12	0	0
5	A	1	0	0	0	0
6	C	30	12	0	9	0
7	A	86	0	0	0	0
7	B	26	0	0	1	0
7	C	446	0	0	24	0
All	All	11654	11174	10975	59	1

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 3.

All (59) 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)
3:C:539:CYS:SG	6:C:1101:6L8:C3	2.17	1.32
3:C:690:LEU:O	7:C:1201:HOH:O	1.83	0.97
3:C:542:LYS:O	3:C:547:ASN:HB3	1.67	0.93
3:C:236:GLU:OE1	7:C:1202:HOH:O	1.87	0.92
3:C:539:CYS:SG	6:C:1101:6L8:C2	2.60	0.88
3:C:484:GLU:OE1	7:C:1203:HOH:O	1.94	0.84
3:C:539:CYS:CB	6:C:1101:6L8:C3	2.55	0.84
3:C:778:ARG:NH2	7:C:1213:HOH:O	2.16	0.77
3:C:848:ASP:OD2	7:C:1205:HOH:O	2.03	0.76
3:C:539:CYS:SG	6:C:1101:6L8:C2'	2.76	0.72
3:C:422:GLU:OE1	7:C:1208:HOH:O	2.07	0.72
3:C:993:GLN:NE2	7:C:1206:HOH:O	2.07	0.71
2:B:87:TYR:OH	7:B:301:HOH:O	2.09	0.69
3:C:236:GLU:OE2	7:C:1210:HOH:O	2.12	0.67
3:C:258:GLU:OE2	7:C:1211:HOH:O	2.13	0.65
3:C:458:GLU:N	7:C:1222:HOH:O	2.29	0.65
3:C:543:ARG:HB3	3:C:548:LYS:NZ	2.13	0.63
3:C:480[B]:VAL:HG12	7:C:1267:HOH:O	2.00	0.62
3:C:308:ASP:OD2	7:C:1212:HOH:O	2.16	0.61
3:C:215[B]:GLU:OE1	7:C:1214:HOH:O	2.17	0.58
3:C:548:LYS:HB3	6:C:1101:6L8:N1'	2.18	0.57
3:C:458:GLU:CG	7:C:1222:HOH:O	2.55	0.55
3:C:539:CYS:HB3	6:C:1101:6L8:C3	2.37	0.55
3:C:205[A]:SER:OG	3:C:206[A]:SER:N	2.40	0.54
6:C:1101:6L8:C4	6:C:1101:6L8:C1'	2.86	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:897:ASN:ND2	7:C:1234:HOH:O	2.42	0.53
3:C:204[B]:GLY:HA2	3:C:210:ILE:HD11	1.92	0.51
3:C:268:ASN:OD1	3:C:270:LEU:N	2.43	0.51
3:C:579:LYS:NZ	3:C:582:LYS:HD2	2.26	0.51
3:C:460:ASP:OD1	3:C:460:ASP:N	2.45	0.50
3:C:542:LYS:O	3:C:547:ASN:CB	2.52	0.49
3:C:328:ALA:HB3	7:C:1580:HOH:O	2.12	0.49
3:C:781:ASP:O	3:C:785:LYS:HE2	2.14	0.48
3:C:458:GLU:HG3	7:C:1222:HOH:O	2.14	0.47
3:C:655:GLU:HG2	3:C:660:GLU:HG3	1.98	0.46
3:C:112:LYS:NZ	7:C:1219:HOH:O	2.27	0.45
3:C:544:GLY:H	3:C:547:ASN:HD22	1.63	0.45
3:C:701:ASN:ND2	7:C:1229:HOH:O	2.38	0.45
3:C:869:LYS:HD3	7:C:1299:HOH:O	2.16	0.45
3:C:82:LEU:O	3:C:87:ARG:NH1	2.51	0.44
3:C:263:LYS:HE2	7:C:1461:HOH:O	2.17	0.43
3:C:548:LYS:HD2	6:C:1101:6L8:C2'	2.48	0.43
3:C:456:VAL:HA	7:C:1421:HOH:O	2.18	0.43
2:B:80:GLU:OE1	2:B:127:ARG:NH2	2.45	0.42
1:A:77:ASP:N	1:A:77:ASP:OD1	2.50	0.42
3:C:263:LYS:HD2	3:C:325:ARG:HD2	2.02	0.42
3:C:542:LYS:HB3	3:C:547:ASN:CG	2.39	0.42
3:C:281:ASN:O	3:C:285:GLN:HG2	2.20	0.42
3:C:138:ILE:HB	3:C:139:PRO:HD3	2.02	0.41
3:C:456:VAL:C	7:C:1222:HOH:O	2.58	0.41
3:C:679:ILE:HD11	3:C:695:THR:HG23	2.03	0.41
1:A:185:PRO:HG2	2:B:162:ALA:HB1	2.03	0.41
2:B:186:LYS:NZ	2:B:190:GLU:OE1	2.54	0.41
3:C:543:ARG:HB3	3:C:548:LYS:HZ1	1.86	0.41
3:C:688:THR:O	3:C:691:LEU:HG	2.20	0.41
1:A:204:ALA:HB1	2:B:103:TRP:CZ2	2.56	0.40
3:C:458:GLU:HG2	7:C:1222:HOH:O	2.17	0.40
3:C:735[B]:VAL:HG13	3:C:759:LEU:HB3	2.04	0.40
3:C:539:CYS:SG	6:C:1101:6L8:C1'	3.10	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:660:GLU:OE2	3:C:663:ARG:NH2[7_555]	2.13	0.07

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	211/216 (98%)	205 (97%)	6 (3%)	0	100	100
2	B	124/140 (89%)	118 (95%)	5 (4%)	1 (1%)	19	19
3	C	1047/1024 (102%)	1018 (97%)	23 (2%)	6 (1%)	25	26
All	All	1382/1380 (100%)	1341 (97%)	34 (2%)	7 (0%)	34	31

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	C	205[A]	SER
3	C	205[B]	SER
3	C	206[A]	SER
3	C	206[B]	SER
2	B	169	ALA
3	C	134	TRP
3	C	265	PRO

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	185/185 (100%)	183 (99%)	2 (1%)	73	85
2	B	108/121 (89%)	108 (100%)	0	100	100
3	C	960/933 (103%)	952 (99%)	8 (1%)	81	90
All	All	1253/1239 (101%)	1243 (99%)	10 (1%)	84	90

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

Mol	Chain	Res	Type
1	A	69[A]	GLN
1	A	69[B]	GLN
3	C	52	ASP
3	C	456	VAL
3	C	502	TRP
3	C	543	ARG
3	C	582	LYS
3	C	785	LYS
3	C	854	GLU
3	C	940	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
3	C	541	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 monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 3 ligands modelled in this entry, 1 is monoatomic - leaving 2 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
6	6L8	C	1101	-	31,32,32	2.50	8 (25%)	39,48,48	2.85	15 (38%)
4	GNP	A	301	5	29,34,34	5.05	15 (51%)	33,54,54	1.80	7 (21%)

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
6	6L8	C	1101	-	-	4/28/28/28	0/3/3/3
4	GNP	A	301	5	-	7/14/38/38	0/3/3/3

All (23) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	301	GNP	O4'-C1'	14.80	1.61	1.41
4	A	301	GNP	C2'-C1'	-14.68	1.31	1.53
4	A	301	GNP	C2-N2	10.45	1.54	1.33
6	C	1101	6L8	C4-N2	-9.08	1.24	1.33
4	A	301	GNP	PB-O3A	6.92	1.67	1.59
4	A	301	GNP	PB-O1B	5.57	1.55	1.46
4	A	301	GNP	O4'-C4'	-5.31	1.33	1.45
6	C	1101	6L8	C5-N3	-4.69	1.28	1.35
6	C	1101	6L8	C1-N1	4.52	1.44	1.32
4	A	301	GNP	O2'-C2'	4.20	1.52	1.43
4	A	301	GNP	PG-O1G	3.90	1.52	1.46
6	C	1101	6L8	C4-N3	-3.71	1.28	1.35
6	C	1101	6L8	C5-N4	-3.67	1.26	1.34
4	A	301	GNP	O3'-C3'	-3.06	1.35	1.43
4	A	301	GNP	C5-C4	-2.78	1.33	1.40
4	A	301	GNP	PB-N3B	2.72	1.70	1.63
6	C	1101	6L8	C2-C1	-2.64	1.50	1.53
4	A	301	GNP	PA-O5'	2.44	1.69	1.59
4	A	301	GNP	PG-N3B	2.41	1.69	1.63
4	A	301	GNP	O6-C6	-2.33	1.18	1.24
4	A	301	GNP	C5-C6	-2.28	1.37	1.41
6	C	1101	6L8	O1-C1	-2.26	1.19	1.23
6	C	1101	6L8	C2'-C1'	2.14	1.42	1.39

All (22) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	C	1101	6L8	N4-C5-N3	-8.65	107.55	114.72
6	C	1101	6L8	C4'-N2'-C3'	6.47	124.08	115.80
6	C	1101	6L8	C2'-N1'-C3'	5.39	122.70	115.80
4	A	301	GNP	N3-C2-N1	-5.32	120.12	127.22
6	C	1101	6L8	N1'-C3'-N2'	-4.81	117.20	126.61
6	C	1101	6L8	C2-C1-N1	-4.32	112.09	116.80
6	C	1101	6L8	N3-C4-N2	-4.13	106.31	112.21
4	A	301	GNP	C2-N3-C4	4.07	120.01	115.36
6	C	1101	6L8	F1-C13-C10	3.96	121.63	112.93
6	C	1101	6L8	C6-C5-N4	3.59	130.71	123.78
6	C	1101	6L8	F2-C13-C10	-3.29	105.69	112.93
4	A	301	GNP	C1'-N9-C4	-3.25	120.93	126.64
6	C	1101	6L8	C1'-C2-C1	3.12	116.06	109.84
6	C	1101	6L8	F3-C13-F2	3.11	117.13	105.72
6	C	1101	6L8	F3-C13-C10	-2.81	106.76	112.93
4	A	301	GNP	N2-C2-N3	2.71	122.21	117.79
6	C	1101	6L8	C1'-C4'-N2'	-2.64	120.00	124.14
4	A	301	GNP	PB-O3A-PA	-2.63	123.34	132.62
4	A	301	GNP	C2-N1-C6	2.58	120.03	115.93
4	A	301	GNP	C5-C6-N1	-2.58	119.90	123.43
6	C	1101	6L8	O1-C1-C2	2.53	124.37	120.95
6	C	1101	6L8	F3-C13-F1	-2.26	97.41	105.72

There are no chirality outliers.

All (11) torsion outliers are listed below:

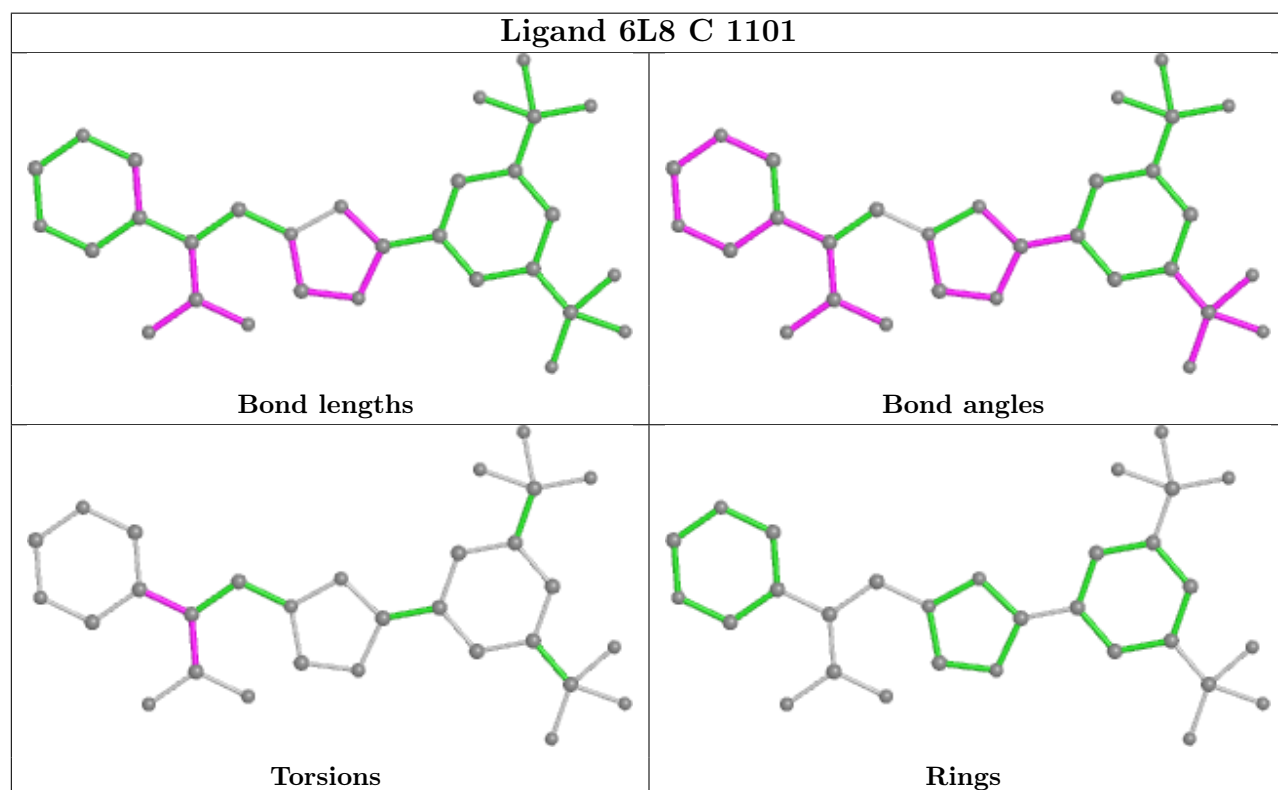
Mol	Chain	Res	Type	Atoms
4	A	301	GNP	PG-N3B-PB-O1B
4	A	301	GNP	PG-N3B-PB-O3A
4	A	301	GNP	C5'-O5'-PA-O3A
6	C	1101	6L8	C4'-C1'-C2-C1
6	C	1101	6L8	C2'-C1'-C2-C1
4	A	301	GNP	O4'-C4'-C5'-O5'
6	C	1101	6L8	O1-C1-C2-C1'
6	C	1101	6L8	N1-C1-C2-C1'
4	A	301	GNP	C3'-C4'-C5'-O5'
4	A	301	GNP	C5'-O5'-PA-O1A
4	A	301	GNP	C5'-O5'-PA-O2A

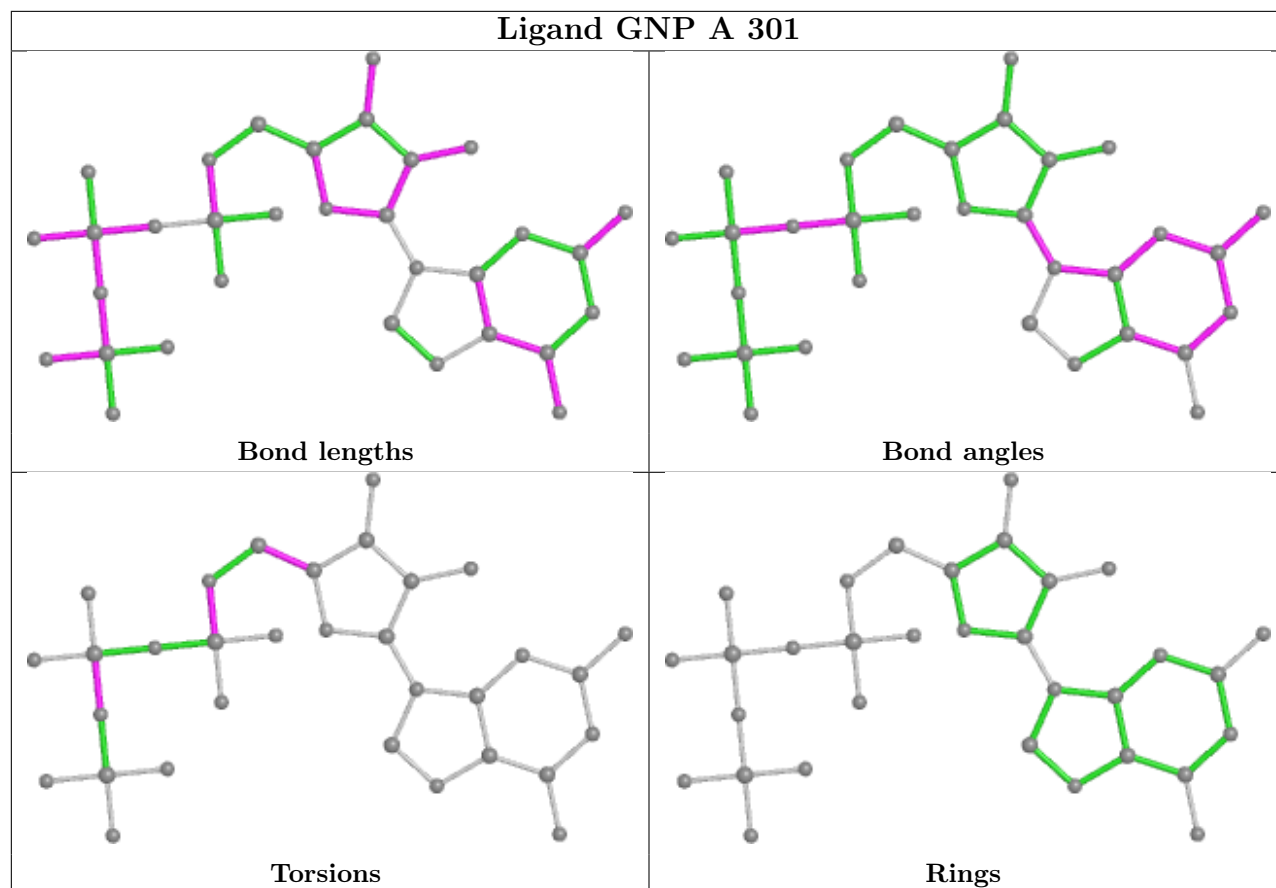
There are no ring outliers.

1 monomer is involved in 9 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	C	1101	6L8	9	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





5.7 Other polymers [\(i\)](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [\(i\)](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	208/216 (96%)	0.99	26 (12%) 3 3	20, 35, 94, 142	0
2	B	123/140 (87%)	0.87	10 (8%) 12 10	34, 48, 85, 110	0
3	C	1011/1024 (98%)	0.99	108 (10%) 6 5	17, 37, 76, 126	0
All	All	1342/1380 (97%)	0.98	144 (10%) 6 5	17, 38, 80, 142	0

All (144) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	195	ALA	9.9
3	C	-1	GLY	8.6
3	C	205[A]	SER	7.8
3	C	541	GLN	6.6
3	C	206[A]	SER	6.6
2	B	79	MET	6.4
3	C	543	ARG	5.8
3	C	457	LYS	5.7
3	C	967	TYR	5.4
3	C	270	LEU	5.4
3	C	455	PHE	5.2
1	A	179	MET	4.8
3	C	264	ILE	4.8
3	C	495	ILE	4.7
1	A	188	VAL	4.7
3	C	459	SER	4.6
1	A	197	TYR	4.4
3	C	983	GLN	4.4
3	C	982	PRO	4.3
3	C	229	ILE	4.2
3	C	456	VAL	4.2
3	C	0	SER	4.2
3	C	658	VAL	4.2

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Mol	Chain	Res	Type	RSRZ
3	C	500	TRP	4.2
3	C	93	PHE	4.1
3	C	204[A]	GLY	4.0
3	C	684	THR	3.9
1	A	191	PRO	3.9
1	A	193	LEU	3.9
3	C	542	LYS	3.8
3	C	679	ILE	3.7
2	B	78	THR	3.7
3	C	981	VAL	3.7
3	C	532	ILE	3.7
3	C	570	TRP	3.7
3	C	497	GLY	3.7
1	A	198	GLU	3.6
1	A	199	HIS	3.6
3	C	539	CYS	3.6
1	A	182	LEU	3.5
3	C	443	VAL	3.5
3	C	1022	CYS	3.4
3	C	1024	ASP	3.4
1	A	196	GLN	3.4
3	C	663	ARG	3.4
3	C	18	GLN	3.4
3	C	544	GLY	3.3
3	C	1052	ALA	3.3
3	C	81	LEU	3.2
3	C	689	LEU	3.2
3	C	16	LEU	3.1
3	C	201	LEU	3.1
2	B	134	ILE	3.1
3	C	197[A]	CYS	3.1
3	C	616	ARG	3.1
3	C	726	TYR	3.1
3	C	233	ASN	3.0
3	C	973	VAL	3.0
3	C	977	GLN	3.0
1	A	180	PRO	3.0
3	C	690	LEU	3.0
3	C	502	TRP	2.9
3	C	681	GLU	2.9
3	C	273	ARG	2.9
3	C	151	VAL	2.8

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Mol	Chain	Res	Type	RSRZ
2	B	199	LYS	2.8
3	C	263	LYS	2.8
1	A	186	GLU	2.8
3	C	19	VAL	2.7
3	C	291[A]	MET	2.7
2	B	101	LYS	2.7
1	A	181	ALA	2.7
3	C	985	THR	2.7
3	C	234	ILE	2.7
1	A	187	VAL	2.7
3	C	207[A]	SER	2.7
3	C	971	ILE	2.7
3	C	266	GLN	2.7
3	C	203	GLN	2.6
1	A	178	ALA	2.6
2	B	191	PHE	2.6
2	B	122	VAL	2.6
3	C	109	LYS	2.6
3	C	832	LEU	2.6
3	C	230	TYR	2.6
3	C	826	ILE	2.6
2	B	162	ALA	2.6
3	C	686	ASN	2.6
3	C	452	VAL	2.5
3	C	269	ASP	2.5
3	C	55	LEU	2.5
3	C	526	ARG	2.5
1	A	194	ALA	2.4
1	A	190	ASP	2.4
3	C	682	GLN	2.4
3	C	572	PHE	2.4
3	C	499	GLU	2.4
3	C	88	ILE	2.4
2	B	85	VAL	2.4
3	C	934	ILE	2.4
3	C	134	TRP	2.4
3	C	460	ASP	2.4
1	A	9	VAL	2.3
3	C	444	VAL	2.3
3	C	1023	LYS	2.3
3	C	538	LEU	2.3
3	C	1018	LEU	2.3

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Mol	Chain	Res	Type	RSRZ
1	A	76	ARG	2.3
3	C	52	ASP	2.3
3	C	86	HIS	2.3
3	C	138	ILE	2.3
3	C	172	GLU	2.3
1	A	216	LEU	2.2
3	C	375	TYR	2.2
3	C	1017	ALA	2.2
3	C	200	VAL	2.2
2	B	124	ILE	2.2
3	C	488	ILE	2.2
3	C	612	ILE	2.2
1	A	189	MET	2.2
3	C	194	PHE	2.2
3	C	51	ALA	2.2
3	C	446	ASN	2.2
3	C	545	LYS	2.2
3	C	908	ALA	2.1
3	C	627	ARG	2.1
1	A	204	ALA	2.1
3	C	525	LYS	2.1
1	A	59	ILE	2.1
3	C	691	LEU	2.1
3	C	531	VAL	2.1
3	C	876	GLU	2.1
3	C	492	ALA	2.1
1	A	155	TYR	2.1
3	C	970	LYS	2.1
3	C	458	GLU	2.0
3	C	972	SER	2.0
3	C	9	ASN	2.0
3	C	37	ILE	2.0
3	C	85	ASP	2.0
3	C	520	SER	2.0
1	A	112	CYS	2.0
1	A	169	ILE	2.0
3	C	611	VAL	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

There are no monosaccharides in this entry.

6.4 Ligands

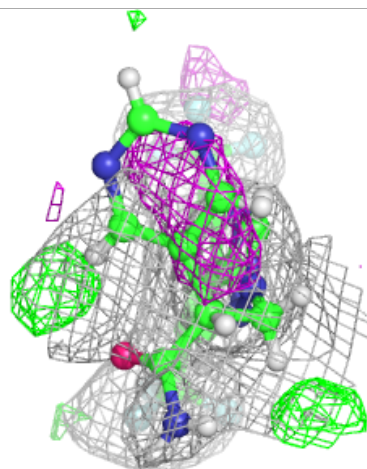
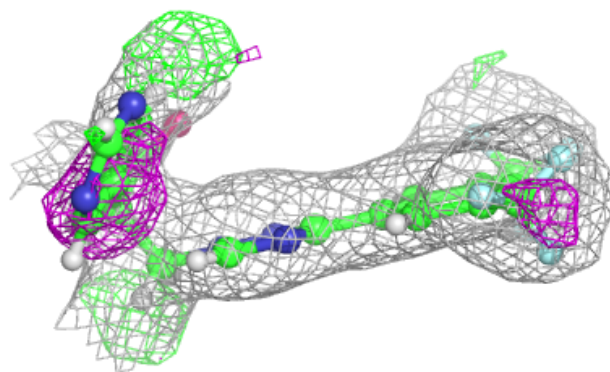
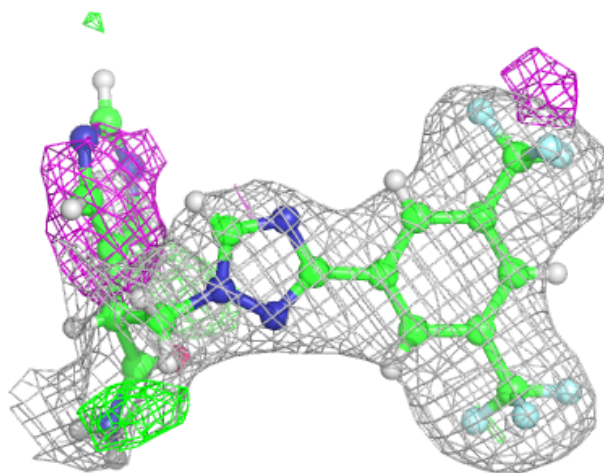
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

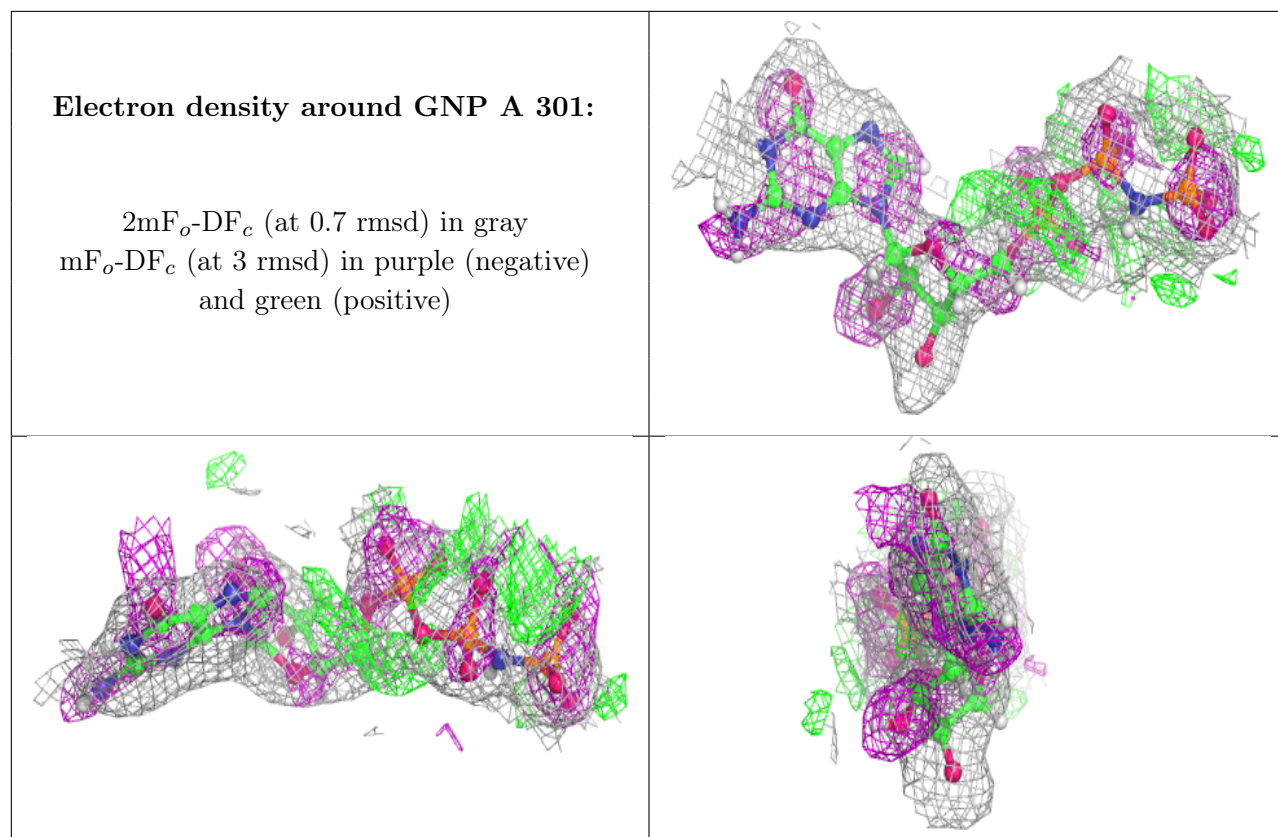
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
5	MG	A	302	1/1	0.79	0.12	6,6,6,6	0
6	6L8	C	1101	30/30	0.81	0.31	43,52,74,76	0
4	GNP	A	301	32/32	0.93	0.15	6,6,7,7	0

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 6L8 C 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.