



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 29, 2024 – 11:17 AM EDT

PDB ID : 4HAT
Title : Crystal structure of CRM1 inhibitor Leptomycin B in complex with CRM1-Ran-RanBP1
Authors : Sun, Q.; Chook, Y.M.
Deposited on : 2012-09-27
Resolution : 1.78 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 : 2022.3.0, CSD as543be (2022)
Xtrriage (Phenix) : 1.20.1
EDS : 3.0
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4 : 9.0.003 (Gargrove)
Density-Fitness : 1.0.11
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

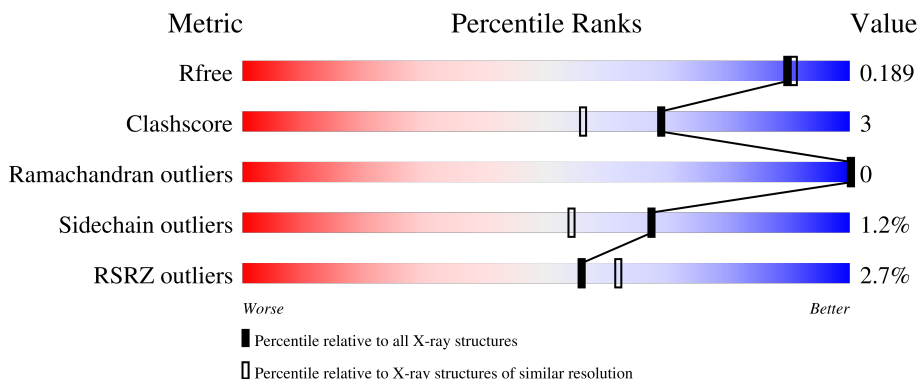
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION


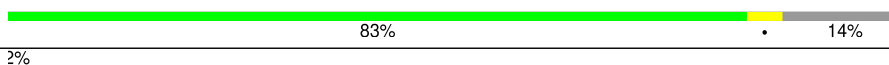
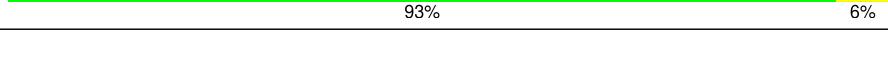
The reported resolution of this entry is 1.78 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	1191 (1.78-1.78)
Clashscore	180529	1282 (1.78-1.78)
Ramachandran outliers	177936	1270 (1.78-1.78)
Sidechain outliers	177891	1270 (1.78-1.78)
RSRZ outliers	164620	1191 (1.78-1.78)

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

Mol	Chain	Length	Quality of chain
1	A	216	
2	B	140	
3	C	1023	

2 Entry composition [i](#)

There are 10 unique types of molecules in this entry. The entry contains 12628 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 GTP-binding nuclear protein Ran.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	209	1723	1113	294	309	7	0	6	0

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	121	1005	636	176	189	4	0	1	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	98	LYS	ALA	conflict	UNP P41920

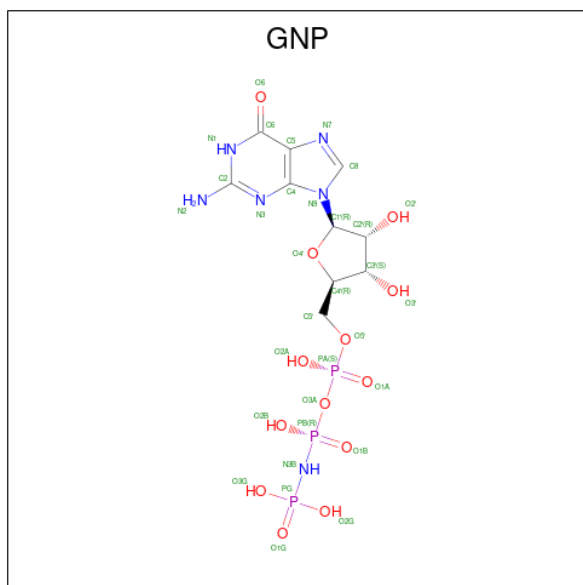
- Molecule 3 is a protein called Exportin-1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	1017	8344	5376	1359	1566	43	0	25	0

There are 5 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	-1	GLY	-	expression tag	UNP P30822
C	0	ALA	-	expression tag	UNP P30822
C	205	ALA	SER	conflict	UNP P30822
C	539	CYS	THR	engineered mutation	UNP P30822
C	1022	CYS	TYR	engineered mutation	UNP P30822

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



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
4	A	1	32	10	6	13	3	0	0

- Molecule 5 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

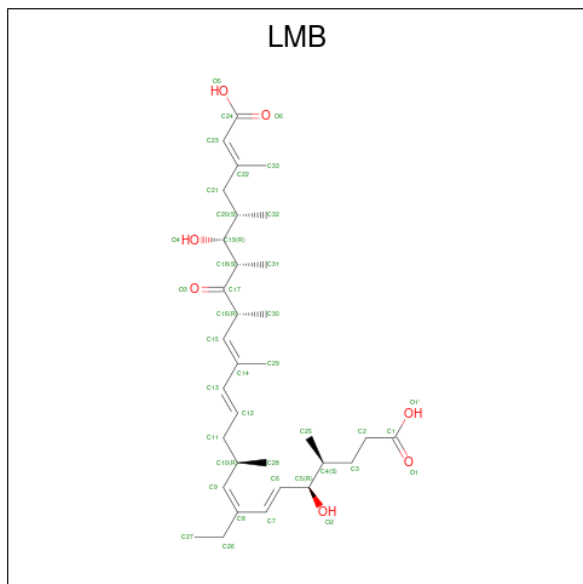
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Mg		
5	A	1	1	1	0	0

- Molecule 6 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C₂H₆O₂).



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

- Molecule 7 is Leptomycin B, bound form (three-letter code: LMB) (formula: C₃₃H₅₂O₇).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	C	1	Total	C	O	0	0
			40	33	7		

- Molecule 8 is GLYCEROL (three-letter code: GOL) (formula: C₃H₈O₃).



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

- Molecule 9 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	C	4	Total Cl 4 4	0	0

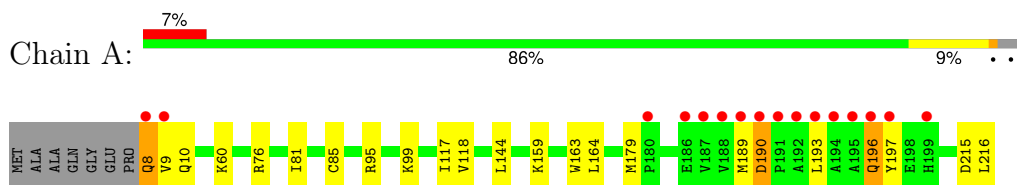
- Molecule 10 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
10	A	231	Total O 231 231	0	0
10	B	80	Total O 80 80	0	0
10	C	1144	Total O 1144 1144	0	0

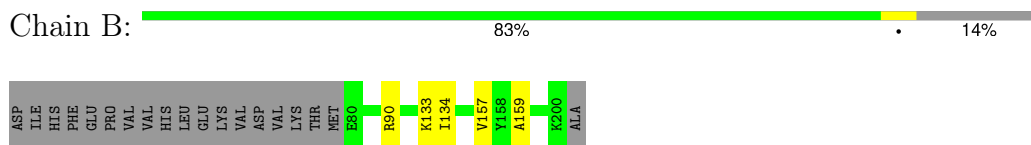
3 Residue-property plots [i](#)

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.

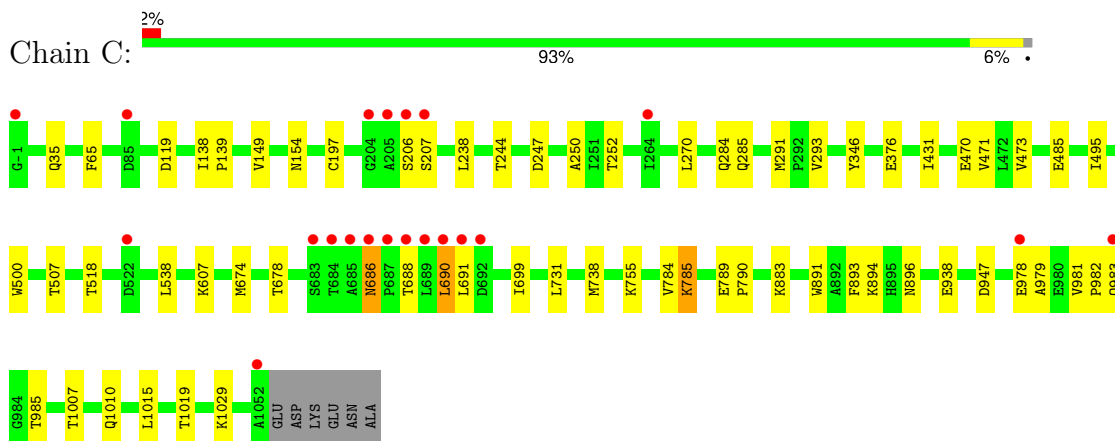
- Molecule 1: GTP-binding nuclear protein Ran



- 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	105.68Å 105.68Å 305.51Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 1.78 50.00 – 1.78	Depositor EDS
% Data completeness (in resolution range)	97.8 (50.00-1.78) 97.8 (50.00-1.78)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.21 (at 1.78Å)	Xtrriage
Refinement program	REFMAC 5.6.0117	Depositor
R, R_{free}	0.136 , 0.173 0.157 , 0.189	Depositor DCC
R_{free} test set	3272 reflections (2.02%)	wwPDB-VP
Wilson B-factor (Å ²)	25.7	Xtrriage
Anisotropy	0.355	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 50.9	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	0.97	EDS
Total number of atoms	12628	wwPDB-VP
Average B, all atoms (Å ²)	31.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.29% 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: EDO, GOL, GNP, MG, LMB, CL

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	0.46	0/1777	0.59	0/2406
2	B	0.42	0/1022	0.59	0/1363
3	C	0.46	1/8570 (0.0%)	0.54	1/11613 (0.0%)
All	All	0.46	1/11369 (0.0%)	0.55	1/15382 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	376	GLU	C-N	13.00	1.58	1.34

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	893	PHE	CB-CA-C	-5.89	98.62	110.40

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	1723	0	1733	27	0
2	B	1005	0	1005	8	0
3	C	8344	0	8478	48	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	A	32	0	13	0	0
5	A	1	0	0	0	0
6	A	4	0	6	0	0
6	C	8	0	12	0	0
7	C	40	0	49	3	0
8	C	12	0	16	1	0
9	C	4	0	0	0	0
10	A	231	0	0	4	0
10	B	80	0	0	1	0
10	C	1144	0	0	13	0
All	All	12628	0	11312	77	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 (77) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:179:MET:HE2	2:B:134:ILE:N	1.57	1.16
1:A:179:MET:CE	2:B:134:ILE:H	1.73	1.00
1:A:179:MET:HE2	2:B:134:ILE:H	0.84	0.98
1:A:179:MET:CE	2:B:134:ILE:N	2.40	0.77
1:A:196:GLN:HA	1:A:196:GLN:HE21	1.50	0.77
1:A:95:ARG:O	1:A:99[B]:LYS:HE2	1.92	0.69
3:C:197[A]:CYS:SG	10:C:2337:HOH:O	2.50	0.69
3:C:293[B]:VAL:HG12	3:C:346:TYR:CE2	2.33	0.64
3:C:981:VAL:HG11	3:C:985:THR:HG21	1.80	0.63
3:C:981:VAL:HG13	3:C:982:PRO:HD2	1.81	0.62
3:C:686:ASN:HB3	3:C:688:THR:HG22	1.82	0.62
3:C:1007:THR:H	3:C:1010:GLN:HE21	1.50	0.59
1:A:179:MET:HE3	10:B:376:HOH:O	2.02	0.59
3:C:250:ALA:HB3	10:C:1805:HOH:O	2.02	0.58
3:C:690:LEU:HB3	3:C:738:MET:HE1	1.86	0.57
3:C:507[B]:THR:HG23	10:C:2278:HOH:O	2.04	0.57
1:A:99[B]:LYS:NZ	10:A:480:HOH:O	2.37	0.56
3:C:688:THR:HA	3:C:691:LEU:HD23	1.87	0.56
3:C:149:VAL:HG12	10:C:2329:HOH:O	2.06	0.56
3:C:894:LYS:NZ	3:C:938:GLU:OE1	2.36	0.54
3:C:690:LEU:HD13	3:C:690:LEU:O	2.08	0.54
3:C:1029:LYS:HE3	10:C:1376:HOH:O	2.08	0.54
3:C:270:LEU:HD12	10:C:2295:HOH:O	2.07	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:189:MET:SD	1:A:197[A]:TYR:CD1	3.02	0.53
3:C:690:LEU:HD21	3:C:699:ILE:CD1	2.39	0.53
3:C:284[B]:GLN:HG3	10:C:2178:HOH:O	2.08	0.53
3:C:495:ILE:HD12	3:C:538:LEU:HD23	1.90	0.53
3:C:691:LEU:O	3:C:755:LYS:NZ	2.40	0.52
3:C:978:GLU:O	3:C:979:ALA:HB3	2.10	0.52
3:C:247:ASP:HB3	10:C:2317:HOH:O	2.11	0.50
3:C:674:MET:O	3:C:678:THR:HG23	2.13	0.49
3:C:784:VAL:HG12	3:C:785[B]:LYS:HD3	1.94	0.49
3:C:293[B]:VAL:HG12	3:C:346:TYR:CZ	2.47	0.48
1:A:76[B]:ARG:NH1	10:A:614:HOH:O	2.42	0.48
1:A:8:GLN:CG	1:A:9:VAL:H	2.25	0.48
3:C:891:TRP:CE3	8:C:1103:GOL:H12	2.48	0.48
3:C:473:VAL:HG13	3:C:518:THR:HG22	1.96	0.47
7:C:1101:LMB:O6	7:C:1101:LMB:C33	2.63	0.47
3:C:238:LEU:O	3:C:252:THR:HG21	2.15	0.47
3:C:485:GLU:HG3	10:C:1612:HOH:O	2.13	0.47
3:C:691:LEU:HD13	3:C:755:LYS:HZ3	1.80	0.47
1:A:197[B]:TYR:HE1	2:B:159:ALA:HB3	1.81	0.46
3:C:896:ASN:ND2	3:C:947:ASP:O	2.30	0.46
3:C:244:THR:HG22	3:C:285:GLN:OE1	2.14	0.46
3:C:206:SER:OG	3:C:247:ASP:OD2	2.33	0.46
1:A:81:ILE:HD11	3:C:65:PHE:CG	2.51	0.45
1:A:76[B]:ARG:CZ	10:A:605:HOH:O	2.65	0.45
1:A:215:ASP:C	1:A:216:LEU:HD12	2.37	0.45
1:A:95:ARG:O	1:A:99[B]:LYS:CE	2.63	0.45
3:C:431[B]:ILE:HD11	3:C:471:VAL:HG11	1.98	0.45
3:C:691:LEU:CD1	3:C:755:LYS:HZ3	2.31	0.44
3:C:470[B]:GLU:HG3	10:C:1774:HOH:O	2.18	0.43
3:C:699:ILE:HG21	3:C:731:LEU:HD21	2.00	0.43
3:C:981:VAL:CG1	3:C:985:THR:OG1	2.66	0.43
3:C:789[B]:GLU:HB2	3:C:790:PRO:HD3	2.00	0.43
3:C:1007:THR:H	3:C:1010:GLN:NE2	2.13	0.43
1:A:190:ASP:OD2	1:A:193:LEU:HD23	2.19	0.43
1:A:10:GLN:HA	1:A:60:LYS:O	2.18	0.42
1:A:99[B]:LYS:HA	1:A:99[B]:LYS:HD3	1.72	0.42
1:A:179:MET:HE1	2:B:133:LYS:HB3	2.01	0.42
1:A:8:GLN:HE21	1:A:8:GLN:HB3	1.74	0.42
3:C:1015:LEU:O	3:C:1019:THR:HG23	2.19	0.42
1:A:85:CYS:HB2	1:A:164:LEU:HD22	2.02	0.42
3:C:293[A]:VAL:HG23	10:C:1324:HOH:O	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:789[A]:GLU:HB3	3:C:790:PRO:HD3	2.02	0.42
1:A:159:LYS:NZ	10:A:629:HOH:O	2.53	0.42
7:C:1101:LMB:H4	10:C:1892:HOH:O	2.19	0.42
3:C:500:TRP:CZ3	3:C:538:LEU:HD11	2.55	0.41
3:C:691:LEU:C	3:C:755:LYS:HZ1	2.23	0.41
7:C:1101:LMB:H27	7:C:1101:LMB:H23	1.92	0.41
1:A:118:VAL:HG22	1:A:163:TRP:CE3	2.56	0.41
3:C:138:ILE:HB	3:C:139:PRO:HD3	2.03	0.41
3:C:119:ASP:OD2	3:C:154:ASN:ND2	2.50	0.41
1:A:179:MET:HE2	2:B:133:LYS:HA	2.03	0.41
1:A:179:MET:HE2	2:B:133:LYS:CA	2.51	0.40
1:A:117:ILE:HB	1:A:144:LEU:HD22	2.03	0.40
3:C:250:ALA:HA	10:C:1824:HOH:O	2.21	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	213/216 (99%)	206 (97%)	7 (3%)	0	100	100
2	B	120/140 (86%)	113 (94%)	7 (6%)	0	100	100
3	C	1040/1023 (102%)	1029 (99%)	11 (1%)	0	100	100
All	All	1373/1379 (100%)	1348 (98%)	25 (2%)	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	187/185 (101%)	184 (98%)	3 (2%)	58	41
2	B	105/122 (86%)	103 (98%)	2 (2%)	52	33
3	C	952/932 (102%)	942 (99%)	10 (1%)	70	57
All	All	1244/1239 (100%)	1229 (99%)	15 (1%)	67	54

All (15) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	8	GLN
1	A	190	ASP
1	A	196	GLN
2	B	90	ARG
2	B	157	VAL
3	C	35	GLN
3	C	207	SER
3	C	291	MET
3	C	607	LYS
3	C	686	ASN
3	C	690	LEU
3	C	785[A]	LYS
3	C	785[B]	LYS
3	C	883	LYS
3	C	983	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	8	GLN
1	A	62	ASN
1	A	196	GLN
3	C	203	GLN
3	C	434	ASN
3	C	983	GLN
3	C	1010	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](#)

Of 12 ligands modelled in this entry, 5 are monoatomic - leaving 7 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
7	LMB	C	1101	3	37,39,39	0.90	3 (8%)	43,51,51	1.44	6 (13%)
8	GOL	C	1102	-	5,5,5	0.41	0	5,5,5	0.25	0
6	EDO	C	1105	-	3,3,3	0.50	0	2,2,2	0.36	0
4	GNP	A	301	5	29,34,34	1.51	6 (20%)	33,54,54	1.95	7 (21%)
6	EDO	C	1104	-	3,3,3	0.52	0	2,2,2	0.02	0
6	EDO	A	303	-	3,3,3	0.46	0	2,2,2	0.30	0
8	GOL	C	1103	-	5,5,5	0.24	0	5,5,5	0.40	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
7	LMB	C	1101	3	-	3/54/54/54	-
8	GOL	C	1102	-	-	2/4/4/4	-
6	EDO	C	1105	-	-	0/1/1/1	-
4	GNP	A	301	5	-	4/14/38/38	0/3/3/3
6	EDO	C	1104	-	-	1/1/1/1	-
6	EDO	A	303	-	-	0/1/1/1	-
8	GOL	C	1103	-	-	2/4/4/4	-

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	301	GNP	PB-N3B	3.76	1.73	1.63
4	A	301	GNP	PG-N3B	3.66	1.72	1.63
4	A	301	GNP	C5-C6	3.62	1.47	1.41
7	C	1101	LMB	C16-C17	-3.01	1.50	1.53
4	A	301	GNP	PG-O1G	2.38	1.49	1.46
7	C	1101	LMB	O5-C24	-2.12	1.25	1.30
4	A	301	GNP	PB-O1B	2.07	1.49	1.46
7	C	1101	LMB	C7-C8	2.06	1.49	1.45
4	A	301	GNP	O4'-C1'	2.02	1.43	1.40

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	301	GNP	C2-N1-C6	4.84	122.69	115.96
4	A	301	GNP	O1G-PG-N3B	-4.41	105.28	111.77
4	A	301	GNP	C5-C6-N1	-4.00	118.07	123.42
4	A	301	GNP	C2-N3-C4	3.65	119.42	115.48
4	A	301	GNP	N3-C2-N1	-3.47	122.80	127.21
7	C	1101	LMB	C5-C6-C7	-3.46	119.54	125.39
7	C	1101	LMB	C11-C12-C13	-3.43	118.51	125.93
7	C	1101	LMB	C30-C16-C15	-3.42	107.46	110.73
4	A	301	GNP	C4-C5-C6	-3.18	116.37	121.23
7	C	1101	LMB	C22-C23-C24	-2.46	122.61	126.94
7	C	1101	LMB	O2-C5-C6	-2.44	104.56	110.88
4	A	301	GNP	O3A-PB-N3B	-2.30	100.21	106.59
7	C	1101	LMB	C10-C11-C12	-2.29	110.21	113.51

There are no chirality outliers.

All (12) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	301	GNP	PG-N3B-PB-O1B
4	A	301	GNP	PA-O3A-PB-O1B
4	A	301	GNP	PA-O3A-PB-O2B
8	C	1102	GOL	C1-C2-C3-O3
8	C	1103	GOL	C1-C2-C3-O3
8	C	1103	GOL	O2-C2-C3-O3
8	C	1102	GOL	O2-C2-C3-O3
7	C	1101	LMB	C2-C3-C4-C5
7	C	1101	LMB	C2-C3-C4-C25
7	C	1101	LMB	C27-C26-C8-C9

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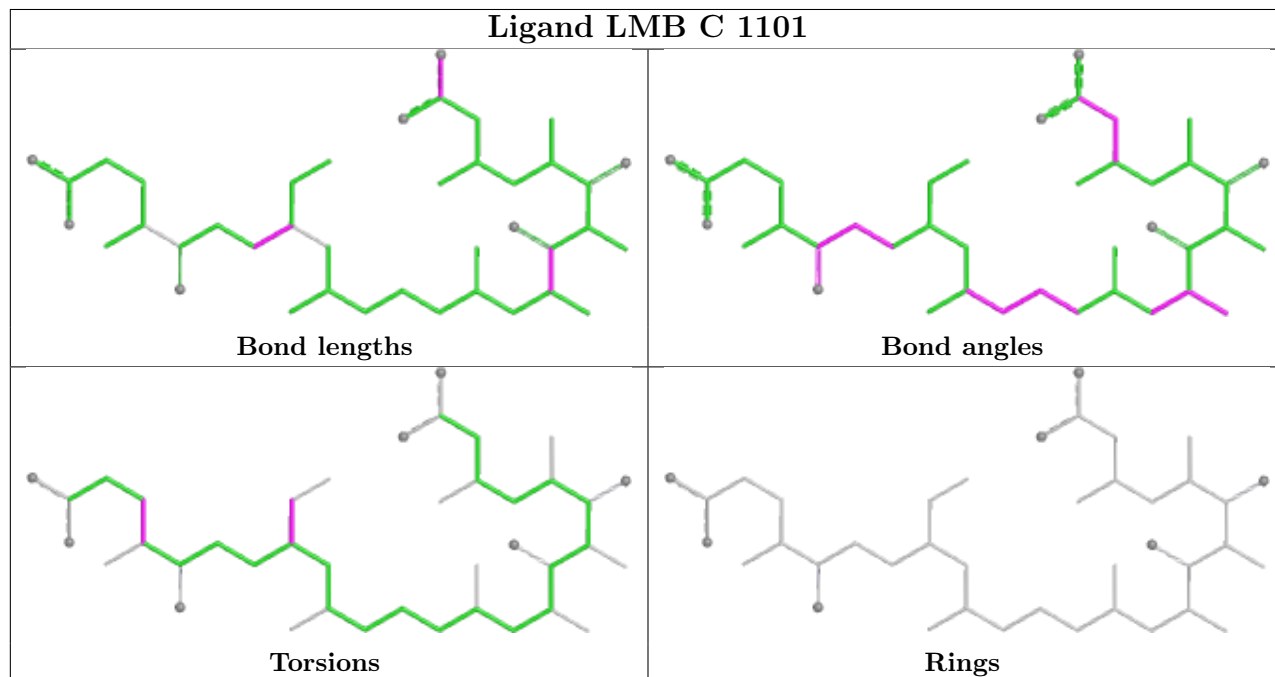
Mol	Chain	Res	Type	Atoms
6	C	1104	EDO	O1-C1-C2-O2
4	A	301	GNP	PG-N3B-PB-O3A

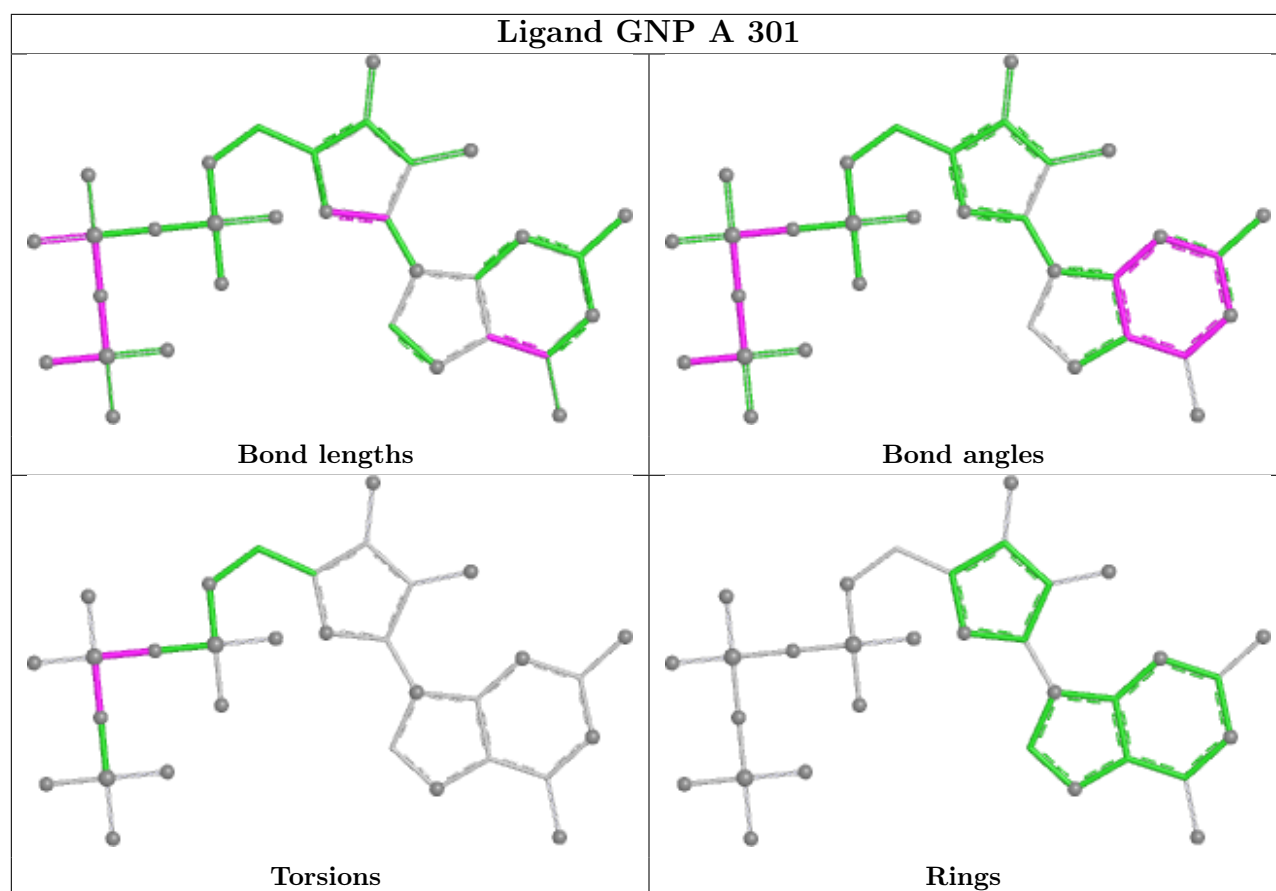
There are no ring outliers.

2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	C	1101	LMB	3	0
8	C	1103	GOL	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less 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	209/216 (96%)	0.01	16 (7%) 21 25	9, 23, 49, 86	6 (2%)
2	B	121/140 (86%)	0.03	0 100 100	24, 32, 54, 64	1 (0%)
3	C	1017/1023 (99%)	-0.13	21 (2%) 63 70	9, 26, 48, 98	25 (2%)
All	All	1347/1379 (97%)	-0.09	37 (2%) 56 62	9, 26, 49, 98	32 (2%)

All (37) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	191	PRO	6.5
3	C	691	LEU	5.9
3	C	690	LEU	5.8
3	C	688	THR	5.5
1	A	190	ASP	5.5
1	A	196	GLN	5.3
1	A	189	MET	5.1
1	A	192	ALA	5.1
3	C	205	ALA	5.1
1	A	197[A]	TYR	5.0
3	C	687	PRO	5.0
3	C	689	LEU	4.8
1	A	193	LEU	4.8
1	A	194	ALA	4.4
1	A	195	ALA	4.4
1	A	187	VAL	4.3
3	C	206	SER	4.2
3	C	204	GLY	4.0
3	C	1052	ALA	3.8
1	A	188	VAL	3.7
1	A	9	VAL	3.1
1	A	199	HIS	3.0
3	C	685	ALA	3.0

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Mol	Chain	Res	Type	RSRZ
3	C	983	GLN	2.9
3	C	264	ILE	2.8
1	A	180	PRO	2.8
3	C	978	GLU	2.7
3	C	686	ASN	2.7
1	A	8	GLN	2.7
3	C	684	THR	2.5
3	C	522	ASP	2.4
3	C	207	SER	2.2
3	C	683	SER	2.2
3	C	692	ASP	2.1
3	C	85	ASP	2.1
1	A	186	GLU	2.1
3	C	-1	GLY	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, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q<0.9' lists the number of atoms with occupancy less than 0.9.

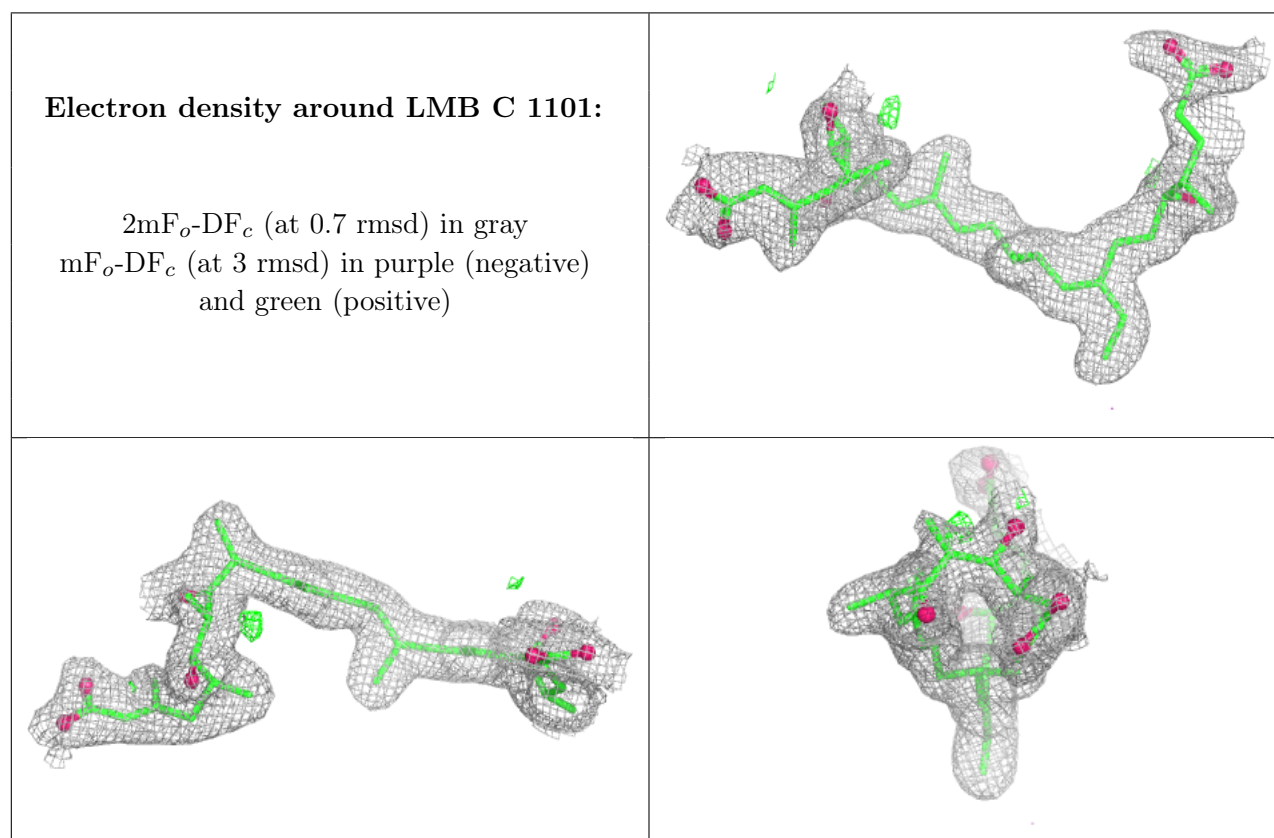
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
6	EDO	A	303	4/4	0.87	0.14	44,47,49,52	0
6	EDO	C	1105	4/4	0.87	0.12	47,48,56,56	0
6	EDO	C	1104	4/4	0.88	0.13	48,51,53,57	0
8	GOL	C	1102	6/6	0.90	0.10	53,62,65,71	0
8	GOL	C	1103	6/6	0.91	0.10	36,38,46,47	0
9	CL	C	1109	1/1	0.91	0.18	75,75,75,75	0
7	LMB	C	1101	40/40	0.93	0.09	29,41,60,65	0
9	CL	C	1106	1/1	0.94	0.11	68,68,68,68	0
9	CL	C	1107	1/1	0.97	0.08	54,54,54,54	0

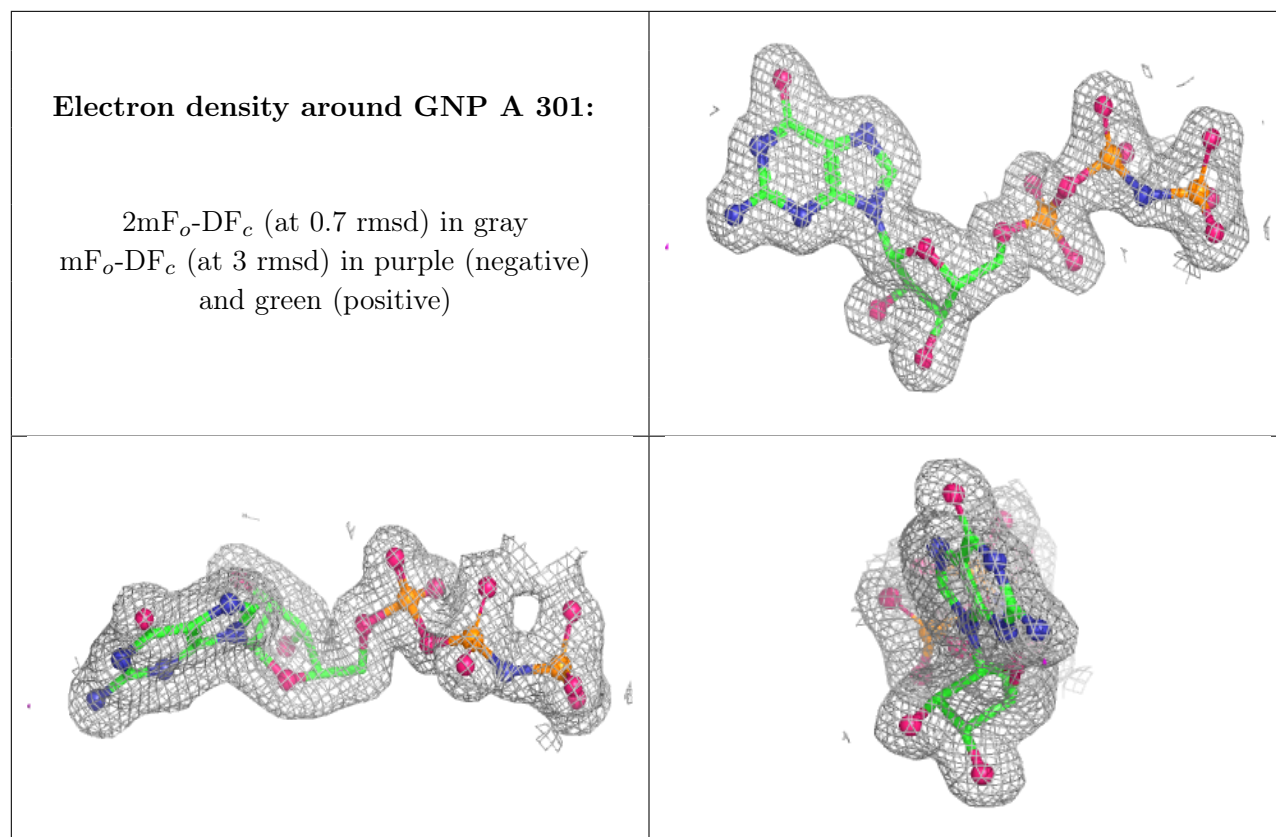
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
9	CL	C	1108	1/1	0.98	0.08	63,63,63,63	0
4	GNP	A	301	32/32	0.99	0.04	17,19,21,23	0
5	MG	A	302	1/1	0.99	0.03	20,20,20,20	0

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.