



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 9, 2026 – 10:50 AM UTC

PDB ID : 1JPN / pdb_00001jpn
Title : GMPPNP Complex of SRP GTPase NG Domain
Authors : Padmanabhan, S.; Freymann, D.M.
Deposited on : 2001-08-02
Resolution : 1.90 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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 : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

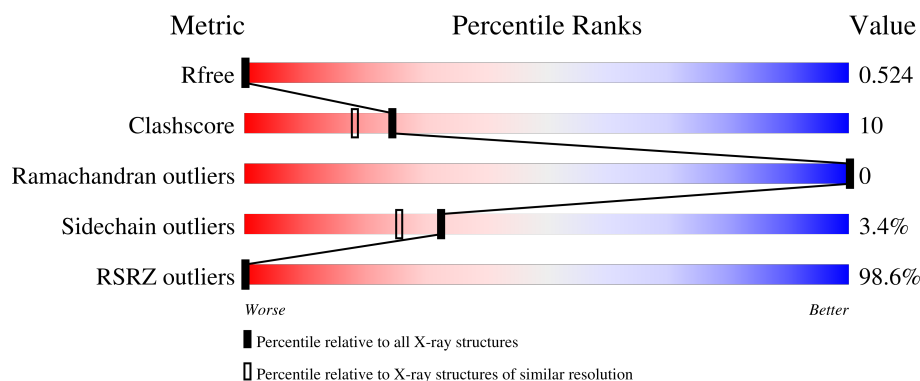
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.90 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	7789 (1.90-1.90)
Clashscore	190562	8410 (1.90-1.90)
Ramachandran outliers	187476	8333 (1.90-1.90)
Sidechain outliers	187428	8333 (1.90-1.90)
RSRZ outliers	180081	7790 (1.90-1.90)

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	296	98% 80%19%.
1	B	296	99% 77%22%.

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
4	ACY	A	952	-	-	X	-

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 5117 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.

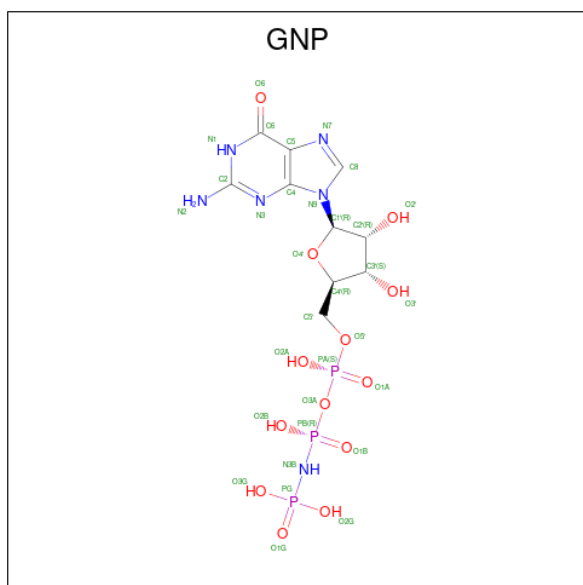
- Molecule 1 is a protein called SIGNAL RECOGNITION PARTICLE PROTEIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	B	295	Total	C	N	O	S	0	6	0
			2318	1454	423	434	7			
1	A	296	Total	C	N	O	S	0	1	0
			2286	1435	416	428	7			

- Molecule 2 is CALCIUM ION (CCD ID: CA) (formula: Ca).

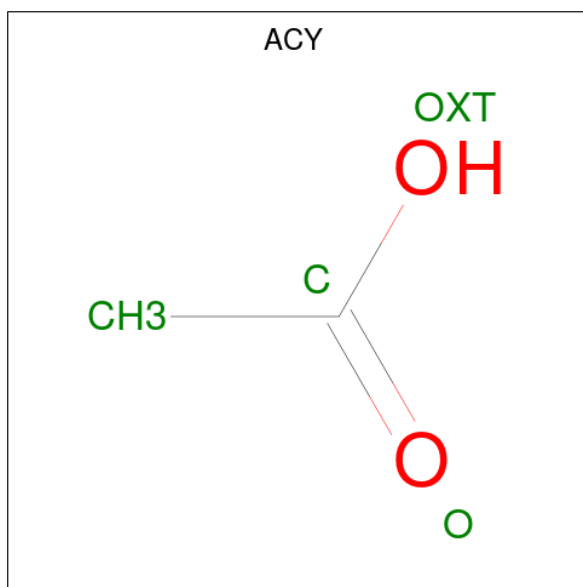
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	B	1	Total	Ca	0	0
			1	1		
2	A	1	Total	Ca	0	0
			1	1		

- Molecule 3 is PHOSPHOAMINOPHOSPHONIC ACID-GUANYLATE ESTER (CCD ID: GNP) (formula: C₁₀H₁₇N₆O₁₃P₃).



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

- Molecule 4 is ACETIC ACID (CCD ID: ACY) (formula: C₂H₄O₂).



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

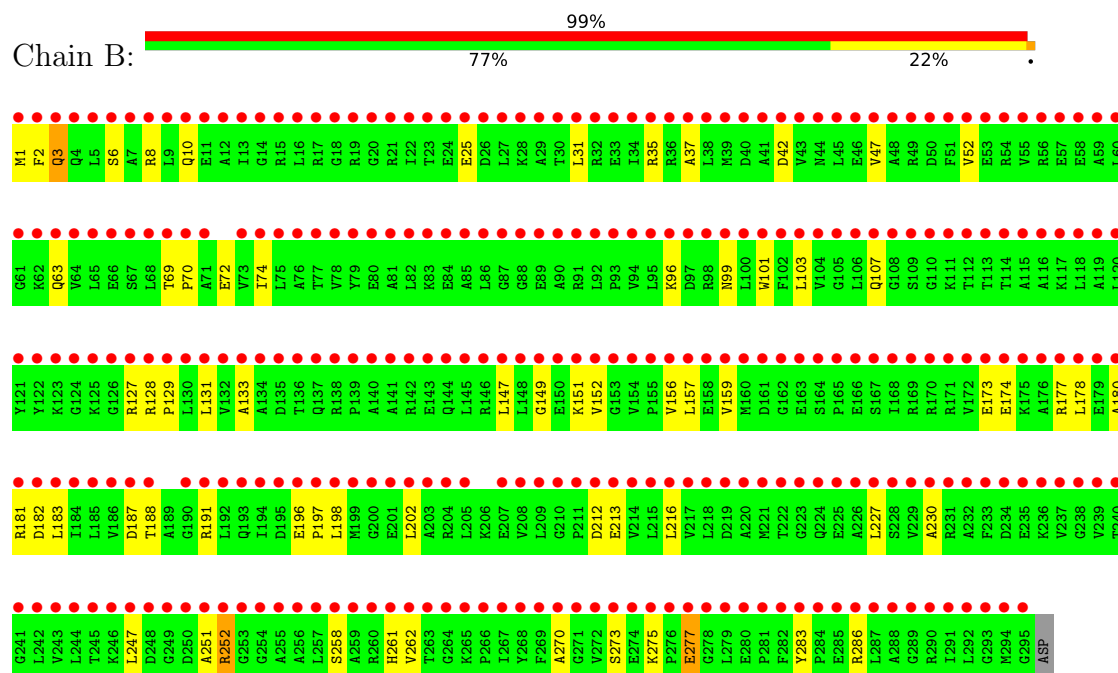
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	B	180	Total	O	0	0
			180	180		
5	A	251	Total	O	0	0
			251	251		

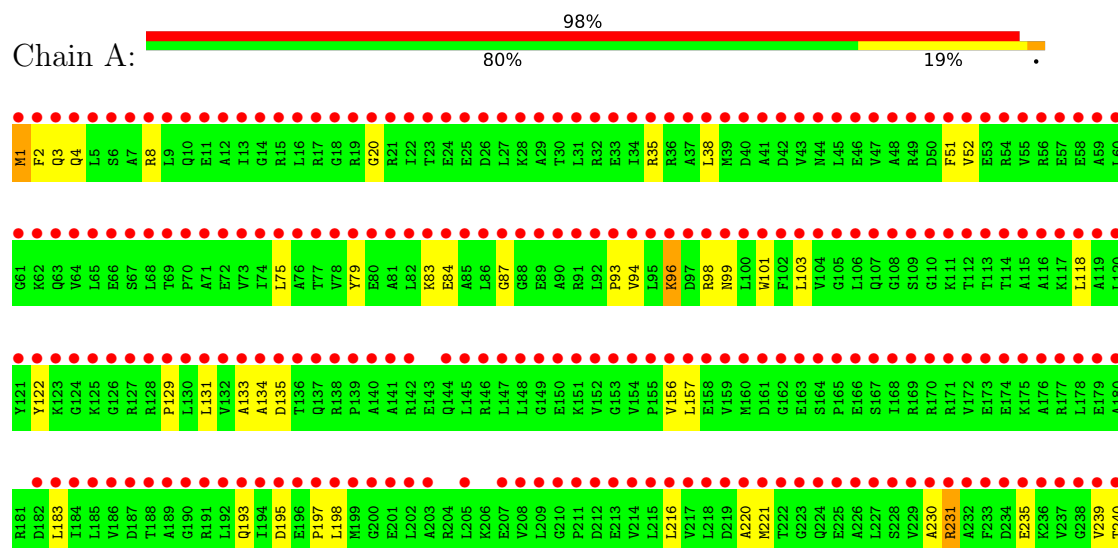
3 Residue-property plots

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: SIGNAL RECOGNITION PARTICLE PROTEIN



• Molecule 1: SIGNAL RECOGNITION PARTICLE PROTEIN



G241	L242	V243	L244	T245	K246	L247	E248	G249	D250	A251	R252	G253	G254	A255	A256	L257	S258	A259	R260	R261	V262	T263	G264	K265	P266	I267	Y268	F269	A270	G271	V272	S273	E274	K275	P276	F277	G278	L279	E280	P281	F282	Y283	P284	E285	R286	L287	A288	G289	R290	I291	L292	G293	M294	G295	D296
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4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	108.81Å 54.53Å 99.08Å 90.00° 97.42° 90.00°	Depositor
Resolution (Å)	15.00 – 1.90 15.00 – 1.90	Depositor EDS
% Data completeness (in resolution range)	(Not available) (15.00-1.90) 22.7 (15.00-1.90)	Depositor EDS
R_{merge}	0.05	Depositor
R_{sym}	0.05	Depositor
$\langle I/\sigma(I) \rangle$	-	Xtrriage
Refinement program	X-PLOR 3.851	Depositor
R, R_{free}	0.190 , 0.241 0.521 , 0.524	Depositor DCC
R_{free} test set	4875 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å ²)	(Not available)	Xtrriage
Anisotropy	(Not available)	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	1.35 , 736.0	EDS
L-test for twinning ¹	$\langle L \rangle =$ (Not available), $\langle L^2 \rangle =$ (Not available)	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.03	EDS
Total number of atoms	5117	wwPDB-VP
Average B, all atoms (Å ²)	23.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *(Not available)*

¹Theoretical 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: ACY, GNP, CA

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z > 5$	RMSZ	$\# Z > 5$
1	A	0.30	0/2311	0.75	2/3112 (0.1%)
1	B	0.29	0/2343	0.76	1/3155 (0.0%)
All	All	0.29	0/4654	0.75	3/6267 (0.0%)

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	262	VAL	N-CA-C	6.99	117.10	110.53
1	A	262	VAL	N-CA-C	6.14	116.78	110.82
1	A	134	ALA	N-CA-C	5.21	119.27	113.02

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	2286	0	2385	40	0
1	B	2318	0	2416	54	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
3	A	32	0	13	0	0
3	B	32	0	13	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	A	8	0	6	3	0
4	B	8	0	6	1	0
5	A	251	0	0	4	3
5	B	180	0	0	2	3
All	All	5117	0	4839	94	4

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 10.

The worst 5 of 94 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:96:LYS:H	1:B:99:ASN:HD21	1.06	0.93
1:A:96:LYS:H	1:A:99:ASN:HD21	1.13	0.92
1:B:35:ARG:HB2	1:B:52[A]:VAL:HG21	1.68	0.76
1:B:69:THR:HB	1:B:72:GLU:HG3	1.69	0.73
1:A:1:MET:HA	1:A:3:GLN:HE22	1.51	0.73

All (4) 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)
5:B:1121:HOH:O	5:B:1407:HOH:O[2_656]	1.93	0.27
5:B:1299:HOH:O	5:A:1385:HOH:O[3_445]	2.02	0.18
5:A:1180:HOH:O	5:A:1321:HOH:O[2_655]	2.04	0.16
5:B:1158:HOH:O	5:A:1050:HOH:O[4_546]	2.11	0.09

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	295/296 (100%)	289 (98%)	6 (2%)	0	100	100
1	B	299/296 (101%)	295 (99%)	4 (1%)	0	100	100
All	All	594/592 (100%)	584 (98%)	10 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

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	235/234 (100%)	226 (96%)	9 (4%)	29	21
1	B	239/234 (102%)	232 (97%)	7 (3%)	37	31
All	All	474/468 (101%)	458 (97%)	16 (3%)	32	25

5 of 16 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	273	SER
1	A	231	ARG
1	A	4	GLN
1	A	103	LEU
1	A	1	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 11 such sidechains are listed below:

Mol	Chain	Res	Type
1	A	99	ASN
1	A	107	GLN
1	A	261	HIS
1	A	224	GLN
1	B	261	HIS

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 8 ligands modelled in this entry, 2 are monoatomic - leaving 6 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$
4	ACY	A	952	-	3,3,3	1.32	0	3,3,3	1.32	0
3	GNP	B	910	-	34,34,34	1.48	8 (23%)	47,54,54	1.06	4 (8%)
4	ACY	B	951	-	3,3,3	1.45	0	3,3,3	1.26	0
3	GNP	A	911	-	34,34,34	1.49	7 (20%)	47,54,54	1.03	3 (6%)
4	ACY	B	950	-	3,3,3	1.46	0	3,3,3	1.25	0
4	ACY	A	953	-	3,3,3	1.42	0	3,3,3	1.25	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	GNP	A	911	-	-	1/18/38/38	0/3/3/3
3	GNP	B	910	-	-	2/18/38/38	0/3/3/3

The worst 5 of 15 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	911	GNP	PB-N3B	3.19	1.71	1.63
3	A	911	GNP	PG-N3B	3.12	1.71	1.63
3	B	910	GNP	PB-N3B	2.96	1.71	1.63
3	B	910	GNP	PG-N3B	2.94	1.71	1.63
3	B	910	GNP	PB-O1B	2.88	1.50	1.46

The worst 5 of 7 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	911	GNP	O2B-PB-O1B	4.19	118.85	109.87
3	B	910	GNP	O2B-PB-O1B	4.18	118.83	109.87
3	B	910	GNP	O1G-PG-N3B	-2.25	108.46	111.77
3	A	911	GNP	O3A-PB-N3B	-2.15	100.64	106.59
3	A	911	GNP	O1B-PB-N3B	-2.14	108.62	111.77

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	B	910	GNP	PB-N3B-PG-O1G
3	A	911	GNP	PG-N3B-PB-O1B
3	B	910	GNP	PB-O3A-PA-O1A

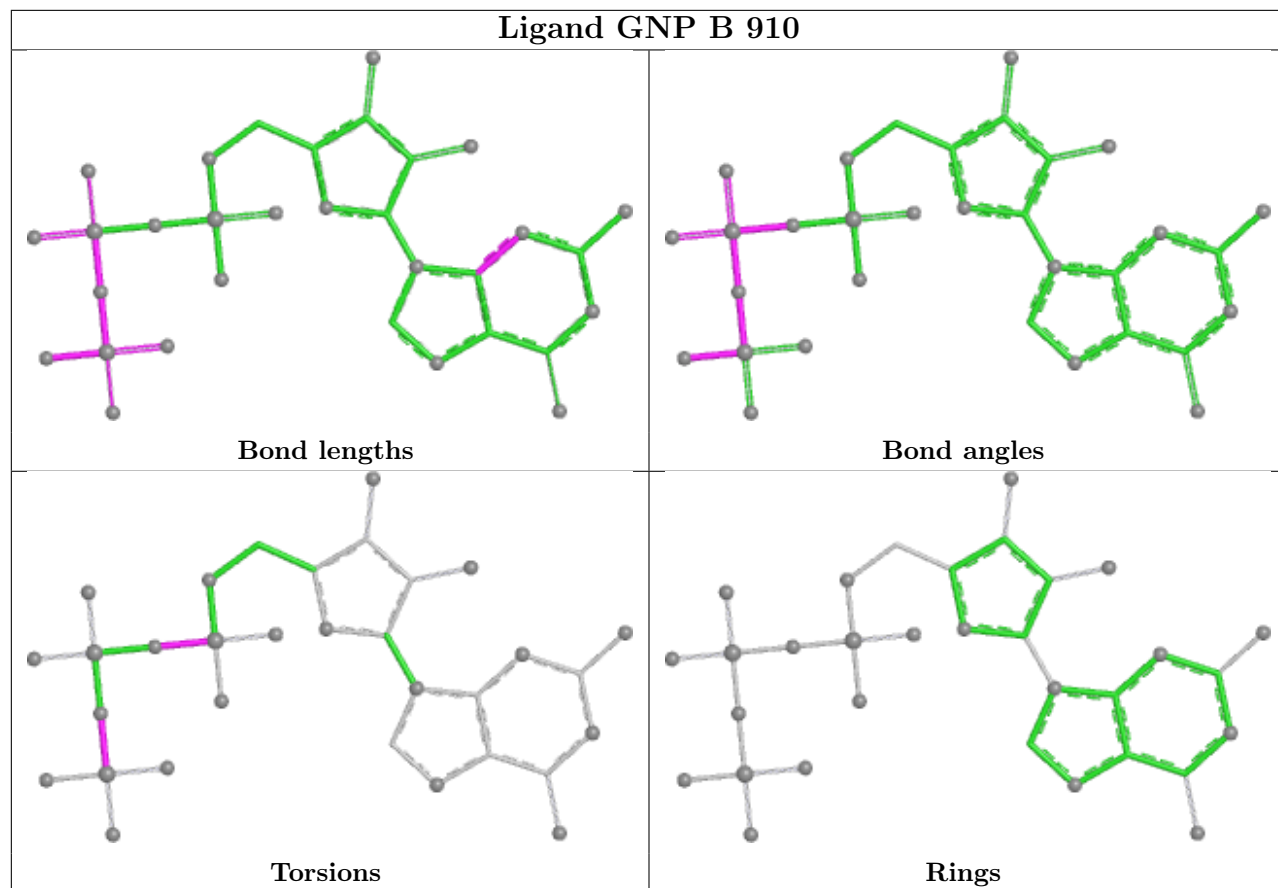
There are no ring outliers.

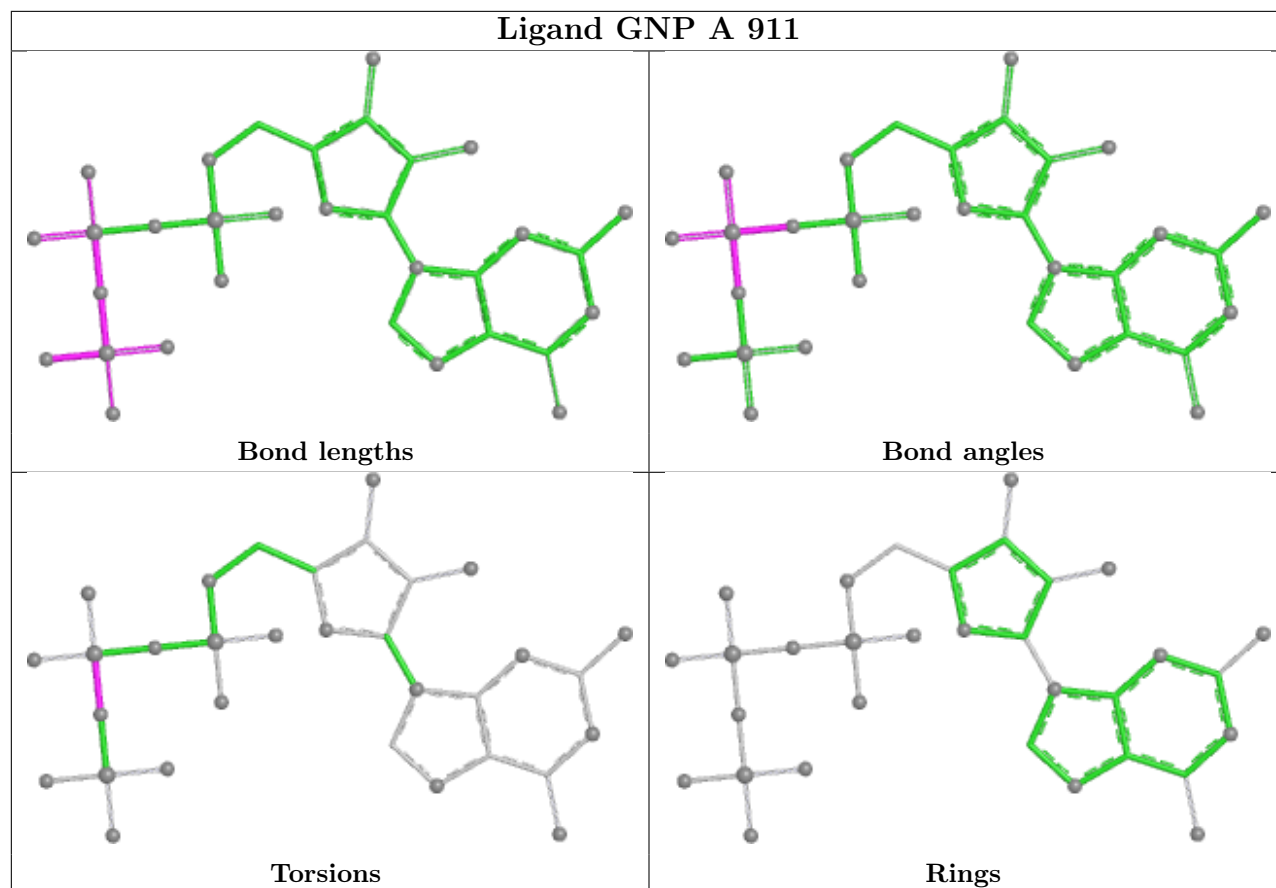
3 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	952	ACY	3	0
3	B	910	GNP	1	0
4	B	950	ACY	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 [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, 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	296/296 (100%)	4.73	291 (98%) 0 0	8, 17, 37, 63	1 (0%)
1	B	295/296 (99%)	4.78	292 (98%) 0 0	8, 20, 43, 65	6 (2%)
All	All	591/592 (99%)	4.75	583 (98%) 0 0	8, 18, 42, 65	7 (1%)

The worst 5 of 583 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	271	GLY	12.0
1	B	172	VAL	10.9
1	A	245	THR	10.3
1	B	267	ILE	9.8
1	B	69	THR	9.4

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](#)

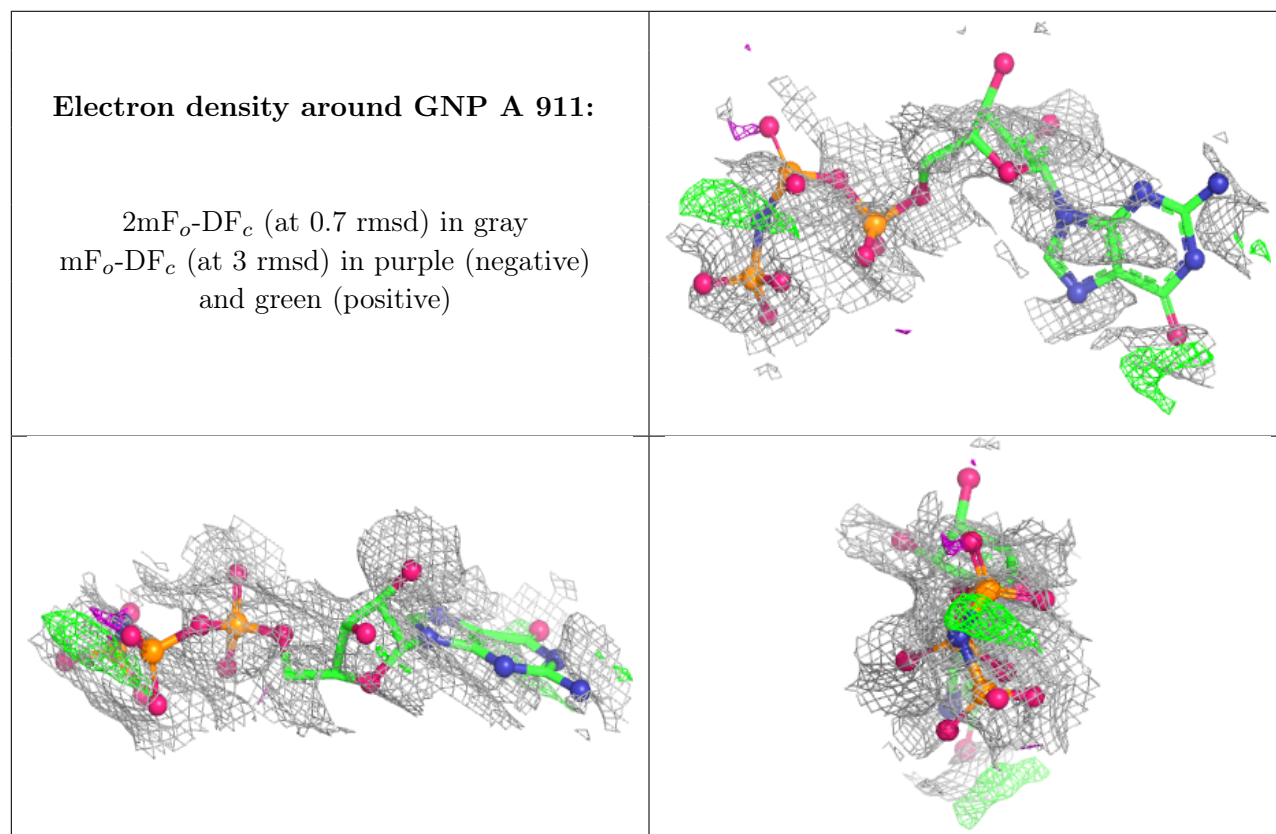
There are no oligosaccharides in this entry.

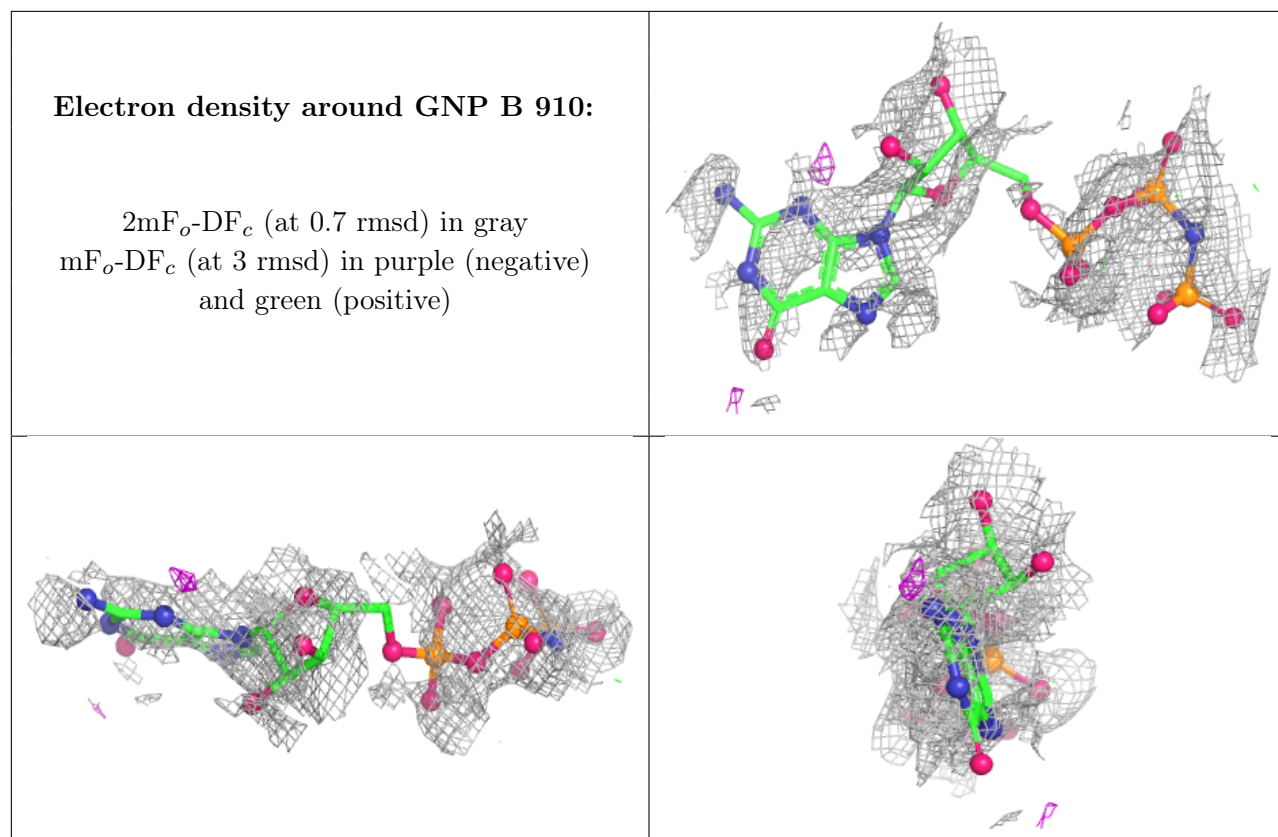
6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 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($\text{\AA}^2$)	Q<0.9
4	ACY	B	951	4/4	-0.04	0.36	44,45,46,47	0
4	ACY	A	953	4/4	0.07	0.30	62,64,64,65	0
2	CA	A	901	1/1	0.16	0.35	37,37,37,37	0
4	ACY	A	952	4/4	0.18	0.40	90,90,91,92	0
3	GNP	A	911	32/32	0.35	0.30	20,31,48,50	0
4	ACY	B	950	4/4	0.45	0.29	41,42,43,44	0
3	GNP	B	910	32/32	0.53	0.29	23,51,71,71	0
2	CA	B	900	1/1	0.69	0.17	16,16,16,16	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.