Full wwPDB X-ray Structure Validation Report (i)

Nov 9, 2026 – 10:12 AM EST

PDB ID	:	36ZT / pdb_000036zt
Title	:	KRAS G12V Mutant in Complex with GMPPNP and Compound 11.
Authors	:	DiDonato, M.; Spraggon, G.
Deposited on	:	2026-07-08
Resolution	:	2.16 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

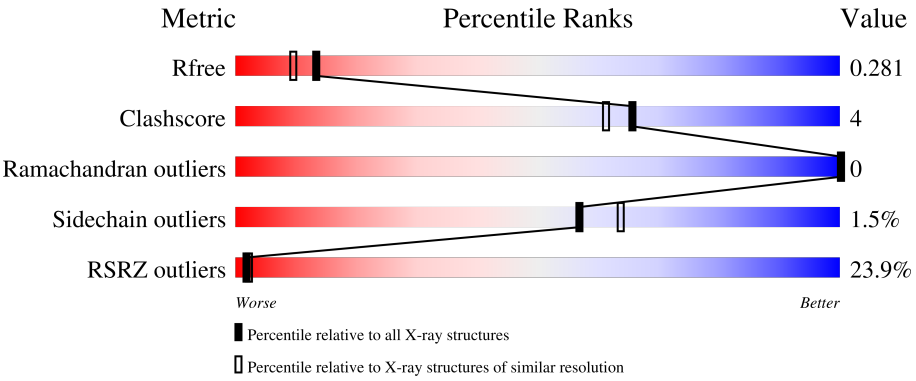
MolProbity	:	4-5-2 with Phenix2.2
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.2
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.015 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.51

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.16 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	2057 (2.16-2.16)
Clashscore	190562	2159 (2.16-2.16)
Ramachandran outliers	187476	2134 (2.16-2.16)
Sidechain outliers	187428	2133 (2.16-2.16)
RSRZ outliers	180081	2059 (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 >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	171	5% 92% 6% ·
1	B	171	3% 85% 10% · ·
1	C	171	57% 65% 12% 22%

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 4078 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 Isoform 2B of GTPase KRas.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	168	Total	C	N	O	S	0	3	0
			1377	862	239	272	4			
1	B	164	Total	C	N	O	S	0	3	0
			1337	838	232	263	4			
1	C	133	Total	C	N	O	S	0	0	0
			1063	663	185	212	3			

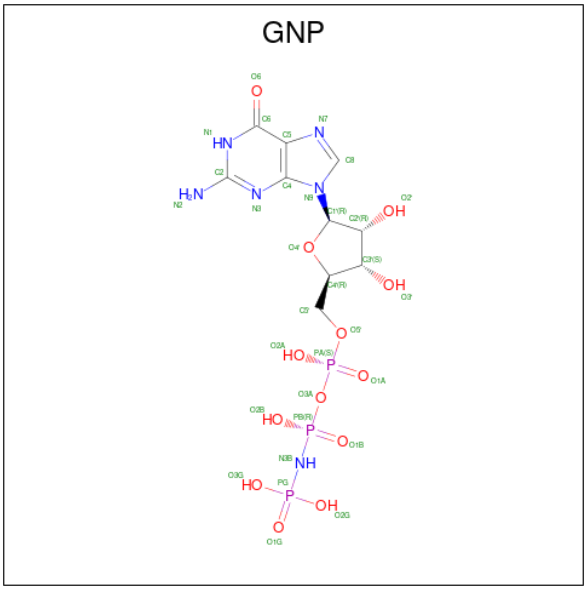
There are 18 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	expression tag	UNP P01116
A	0	PRO	-	expression tag	UNP P01116
A	12	VAL	GLY	engineered mutation	UNP P01116
A	51	SER	CYS	engineered mutation	UNP P01116
A	80	LEU	CYS	engineered mutation	UNP P01116
A	118	SER	CYS	engineered mutation	UNP P01116
B	-1	GLY	-	expression tag	UNP P01116
B	0	PRO	-	expression tag	UNP P01116
B	12	VAL	GLY	engineered mutation	UNP P01116
B	51	SER	CYS	engineered mutation	UNP P01116
B	80	LEU	CYS	engineered mutation	UNP P01116
B	118	SER	CYS	engineered mutation	UNP P01116
C	-1	GLY	-	expression tag	UNP P01116
C	0	PRO	-	expression tag	UNP P01116
C	12	VAL	GLY	engineered mutation	UNP P01116
C	51	SER	CYS	engineered mutation	UNP P01116
C	80	LEU	CYS	engineered mutation	UNP P01116
C	118	SER	CYS	engineered mutation	UNP P01116

- Molecule 2 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

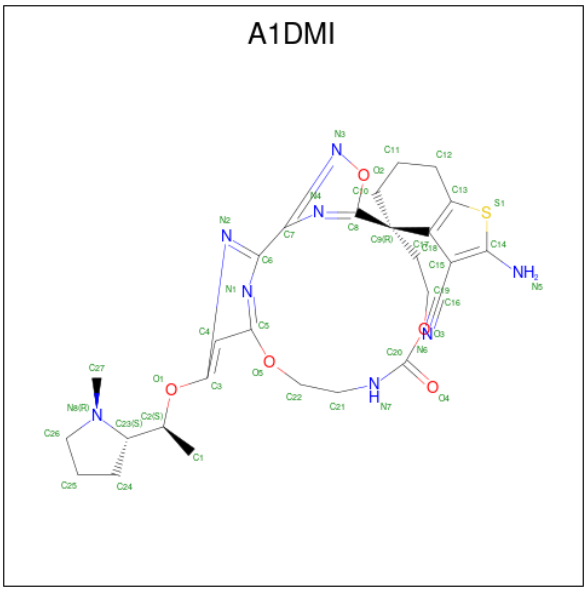
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total Mg 1 1	0	0
2	B	1	Total Mg 1 1	0	0
2	C	1	Total Mg 1 1	0	0

- Molecule 3 is PHOSPHOAMINOPHOSPHONIC ACID-GUANYLATE ESTER (CCD ID: GNP) (formula: $C_{10}H_{17}N_6O_{13}P_3$).



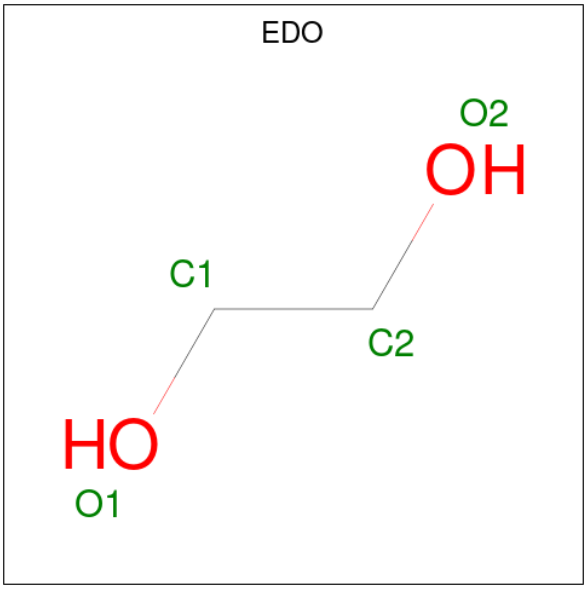
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C N O P 32 10 6 13 3	0	0
3	B	1	Total C N O P 32 10 6 13 3	0	0
3	C	1	Total C N O P 32 10 6 13 3	0	0

- Molecule 4 is (4R)-2-amino-17'-{(1S)-1-[(2S)-1-methylpyrrolidin-2-yl]ethoxy}-10'-oxo-6,7-dihydro-5H-spiro[[1]benzothiophene-4,6'-[4,9,14]trioxa[3,11,18,19,20]pentaazatricyclo[13.3.1.1 2,5]icosa[1(19),2,5(20),15,17]pentaene]-3-carbonitrile (CCD ID: A1DMI) (formula: $C_{27}H_{32}N_8O_5S$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	N	O	S	0	0
			41	27	8	5	1		
4	B	1	Total	C	N	O	S	0	0
			41	27	8	5	1		
4	C	1	Total	C	N	O	S	0	0
			41	27	8	5	1		

- Molecule 5 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: $C_2H_6O_2$).



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

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

- Molecule 6 is water.

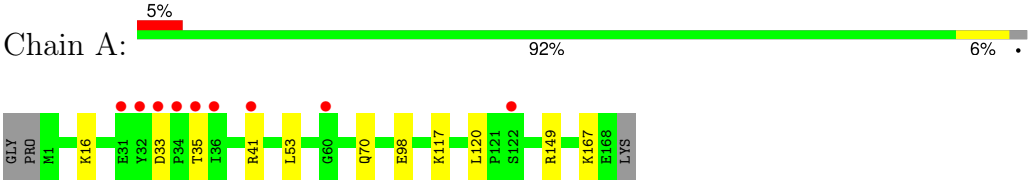
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	38	Total O 38 38	0	0
6	B	19	Total O 19 19	0	0
6	C	14	Total O 14 14	0	0

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.

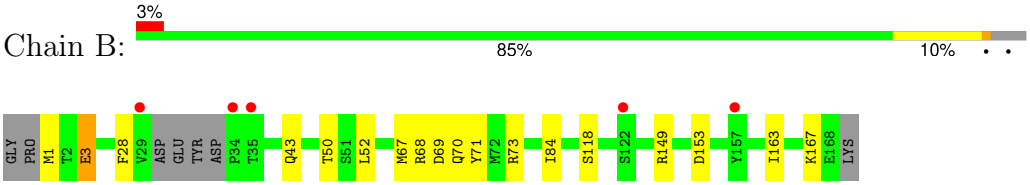
• Molecule 1: Isoform 2B of GTPase KRas

Chain A:



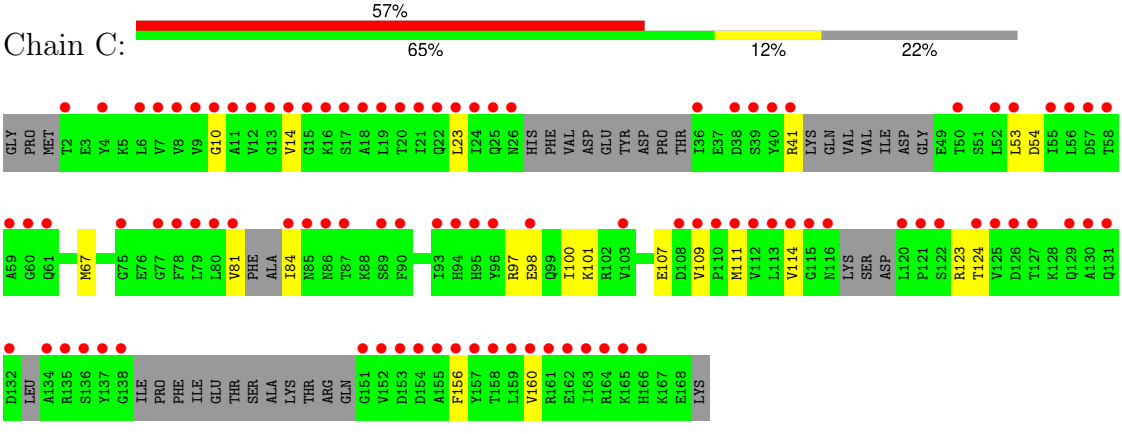
• Molecule 1: Isoform 2B of GTPase KRas

Chain B:



• Molecule 1: Isoform 2B of GTPase KRas

Chain C:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	I 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	64.23Å 118.59Å 183.82Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	42.39 – 2.16 42.39 – 2.16	Depositor EDS
% Data completeness (in resolution range)	54.7 (42.39-2.16) 54.7 (42.39-2.16)	Depositor EDS
R_{merge}	0.19	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	0.89 (at 2.16Å)	Xtriage
Refinement program	PHENIX 1.21.1_5286	Depositor
R, R_{free}	0.244 , 0.285 0.241 , 0.281	Depositor DCC
R_{free} test set	1038 reflections (2.73%)	wwPDB-VP
Wilson B-factor (Å^2)	40.5	Xtriage
Anisotropy	0.109	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 39.5	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.91	EDS
Total number of atoms	4078	wwPDB-VP
Average B, all atoms (Å^2)	55.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.83% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: GNP, MG, EDO, A1DMI

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	0.14	0/1398	0.33	0/1885
1	B	0.13	0/1356	0.30	0/1826
1	C	0.13	0/1071	0.27	0/1434
All	All	0.13	0/3825	0.31	0/5145

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

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	1377	0	1361	6	0
1	B	1337	0	1330	12	0
1	C	1063	0	1047	14	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
3	A	32	0	13	1	0
3	B	32	0	13	0	0
3	C	32	0	13	0	0
4	A	41	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	B	41	0	0	2	0
4	C	41	0	0	0	0
5	A	4	0	6	0	0
5	C	4	0	6	0	0
6	A	38	0	0	1	0
6	B	19	0	0	1	0
6	C	14	0	0	0	0
All	All	4078	0	3789	30	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 (30) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:84:ILE:O	1:C:124:THR:N	2.32	0.58
1:B:1:MET:HE3	1:B:50:THR:HG22	1.86	0.56
1:A:117:LYS:HB3	1:A:120:LEU:HD12	1.88	0.55
1:B:68[B]:ARG:NH2	4:B:202:A1DMI:O4	2.40	0.54
1:A:16:LYS:NZ	3:A:202:GNP:O1G	2.41	0.54
1:C:41:ARG:NH1	1:C:54:ASP:OD2	2.41	0.54
1:B:70:GLN:OE1	1:B:73:ARG:NH1	2.41	0.53
1:A:33:ASP:OD1	1:A:33:ASP:N	2.37	0.52
1:C:84:ILE:HD12	1:C:123:ARG:HD3	1.93	0.51
1:C:97:ARG:HG3	1:C:111:MET:HE1	1.93	0.50
1:C:100:ILE:HG22	1:C:109:VAL:HG11	1.93	0.49
1:B:149:ARG:HH12	1:B:153:ASP:CG	2.21	0.49
1:B:67:MET:HG2	1:C:67:MET:HE2	1.96	0.47
1:B:1:MET:HE1	1:B:43:GLN:HG3	1.96	0.47
1:C:98:GLU:HA	1:C:101:LYS:HE2	1.98	0.46
1:C:10:GLY:HA3	1:C:14:VAL:HG21	1.99	0.45
1:C:100:ILE:CG2	1:C:109:VAL:HG11	2.47	0.44
1:A:41[A]:ARG:HA	1:A:53:LEU:O	2.18	0.44
1:C:81:VAL:HG22	1:C:114:VAL:HB	2.00	0.43
1:C:23:LEU:HD22	1:C:156:PHE:CG	2.54	0.42
1:A:167:LYS:NZ	6:A:304:HOH:O	2.36	0.42
1:B:69:ASP:OD1	4:B:202:A1DMI:N5	2.53	0.41
1:C:156:PHE:O	1:C:160:VAL:HG23	2.20	0.41
1:A:41[B]:ARG:HA	1:A:53:LEU:O	2.20	0.41
1:B:28:PHE:HA	6:B:306:HOH:O	2.20	0.41
1:B:163:ILE:HG22	1:B:167:LYS:HD2	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:3:GLU:HG3	1:B:52:LEU:HB3	2.01	0.41
1:B:84:ILE:HD13	1:B:118:SER:HA	2.03	0.40
1:B:71:TYR:CD2	1:C:67:MET:HG2	2.56	0.40
1:C:41:ARG:HA	1:C:53:LEU: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	169/171 (99%)	163 (96%)	6 (4%)	0	100	100
1	B	163/171 (95%)	154 (94%)	9 (6%)	0	100	100
1	C	119/171 (70%)	115 (97%)	4 (3%)	0	100	100
All	All	451/513 (88%)	432 (96%)	19 (4%)	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	152/151 (101%)	147 (97%)	5 (3%)	33	34
1	B	148/151 (98%)	147 (99%)	1 (1%)	76	82
1	C	117/151 (78%)	116 (99%)	1 (1%)	70	77

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	417/453 (92%)	410 (98%)	7 (2%)	57 60

All (7) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	35	THR
1	A	70	GLN
1	A	98[A]	GLU
1	A	98[B]	GLU
1	A	149	ARG
1	B	3	GLU
1	C	107	GLU

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

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 11 ligands modelled in this entry, 3 are monoatomic - leaving 8 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	$\#\|Z\|>2$
5	EDO	A	204	-	3,3,3	0.25	0	2,2,2	0.32	0
3	GNP	C	202	2	34,34,34	2.38	7 (20%)	47,54,54	1.44	4 (8%)
3	GNP	B	201	2	34,34,34	2.22	6 (17%)	47,54,54	1.51	4 (8%)
5	EDO	C	204	-	3,3,3	0.25	0	2,2,2	0.33	0
4	A1DMI	A	203	-	43,46,46	1.14	4 (9%)	51,67,67	1.94	12 (23%)
4	A1DMI	B	202	-	43,46,46	1.16	4 (9%)	51,67,67	2.05	12 (23%)
4	A1DMI	C	203	-	43,46,46	1.19	3 (6%)	51,67,67	1.95	12 (23%)
3	GNP	A	202	2	34,34,34	2.36	7 (20%)	47,54,54	1.45	4 (8%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	EDO	A	204	-	-	0/1/1/1	-
3	GNP	C	202	2	-	2/18/38/38	0/3/3/3
3	GNP	B	201	2	-	3/18/38/38	0/3/3/3
5	EDO	C	204	-	-	1/1/1/1	-
4	A1DMI	A	203	-	-	3/30/57/57	0/5/6/6
4	A1DMI	B	202	-	-	5/30/57/57	0/5/6/6
4	A1DMI	C	203	-	-	1/30/57/57	0/5/6/6
3	GNP	A	202	2	-	3/18/38/38	0/3/3/3

All (31) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	202	GNP	PB-O3A	8.56	1.69	1.59
3	A	202	GNP	PB-O3A	8.21	1.69	1.59
3	B	201	GNP	PB-O3A	7.68	1.68	1.59
3	C	202	GNP	PG-N3B	6.74	1.81	1.63
3	A	202	GNP	PG-N3B	6.73	1.80	1.63
3	B	201	GNP	PG-N3B	6.35	1.80	1.63
3	B	201	GNP	PG-O1G	5.00	1.53	1.46
3	A	202	GNP	PG-O1G	4.90	1.53	1.46
3	C	202	GNP	PG-O1G	4.85	1.53	1.46
3	A	202	GNP	PA-O3A	3.89	1.63	1.59
3	C	202	GNP	PA-O3A	3.80	1.63	1.59
4	C	203	A1DMI	C8-N4	3.52	1.32	1.28
4	A	203	A1DMI	C8-N4	3.42	1.32	1.28

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	202	A1DMI	C8-N4	3.38	1.32	1.28
3	A	202	GNP	PB-O1B	3.38	1.51	1.46
3	C	202	GNP	PB-O1B	3.34	1.51	1.46
3	B	201	GNP	PB-O1B	3.29	1.51	1.46
3	B	201	GNP	PA-O3A	3.01	1.62	1.59
4	C	203	A1DMI	O2-C8	2.61	1.36	1.33
4	B	202	A1DMI	O2-C8	2.51	1.36	1.33
4	C	203	A1DMI	C14-N5	2.50	1.39	1.35
4	B	202	A1DMI	C14-N5	2.45	1.39	1.35
4	A	203	A1DMI	C14-N5	2.41	1.39	1.35
4	B	202	A1DMI	C2-C23	2.23	1.55	1.52
4	A	203	A1DMI	C2-C23	2.23	1.55	1.52
3	C	202	GNP	PB-O2B	-2.20	1.51	1.56
3	C	202	GNP	PB-N3B	2.19	1.69	1.63
4	A	203	A1DMI	O2-C8	2.17	1.36	1.33
3	A	202	GNP	PB-O2B	-2.16	1.51	1.56
3	B	201	GNP	PB-O2B	-2.13	1.51	1.56
3	A	202	GNP	PB-N3B	2.07	1.68	1.63

All (48) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	B	202	A1DMI	C6-C7-N4	-7.79	117.63	124.20
3	B	201	GNP	O1G-PG-N3B	-7.23	101.13	111.77
4	A	203	A1DMI	C6-C7-N4	-7.18	118.15	124.20
4	C	203	A1DMI	C6-C7-N4	-7.15	118.18	124.20
3	C	202	GNP	O1G-PG-N3B	-7.14	101.25	111.77
3	A	202	GNP	O1G-PG-N3B	-7.01	101.45	111.77
4	A	203	A1DMI	C7-C6-N2	5.07	121.16	116.57
4	B	202	A1DMI	C7-C6-N2	4.89	121.00	116.57
3	B	201	GNP	O2B-PB-O1B	4.89	120.35	109.87
3	A	202	GNP	O2B-PB-O1B	4.74	120.04	109.87
4	C	203	A1DMI	C6-N1-C5	4.69	118.83	115.61
4	A	203	A1DMI	C6-N1-C5	4.48	118.68	115.61
4	B	202	A1DMI	C6-N1-C5	4.38	118.61	115.61
3	C	202	GNP	O2B-PB-O1B	4.08	118.63	109.87
4	C	203	A1DMI	C7-C6-N2	3.54	119.78	116.57
4	A	203	A1DMI	C7-C6-N1	-3.22	113.65	116.57
4	C	203	A1DMI	O5-C22-C21	3.19	115.04	107.90
4	B	202	A1DMI	O5-C22-C21	3.08	114.78	107.90
4	C	203	A1DMI	C4-C5-N1	-2.97	120.69	124.16
4	A	203	A1DMI	C4-C5-N1	-2.96	120.70	124.16

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	B	202	A1DMI	C7-C6-N1	-2.96	113.89	116.57
4	B	202	A1DMI	O2-C8-N4	-2.94	113.36	115.25
4	A	203	A1DMI	C19-O3-C20	2.92	122.53	115.76
4	B	202	A1DMI	C4-C5-N1	-2.87	120.81	124.16
4	C	203	A1DMI	O1-C3-C4	2.84	120.34	116.16
4	C	203	A1DMI	C6-N2-C3	2.83	117.55	115.61
4	C	203	A1DMI	C19-O3-C20	2.83	122.32	115.76
4	B	202	A1DMI	C19-O3-C20	2.69	121.98	115.76
4	B	202	A1DMI	N4-C7-N3	2.65	116.40	114.47
3	B	201	GNP	O2G-PG-O3G	2.63	114.66	107.59
4	C	203	A1DMI	O1-C3-N2	-2.58	117.63	119.49
4	B	202	A1DMI	C6-C7-N3	2.55	125.96	123.10
4	C	203	A1DMI	O2-C8-N4	-2.55	113.61	115.25
4	A	203	A1DMI	N4-C7-N3	2.53	116.31	114.47
3	C	202	GNP	O3A-PB-N3B	-2.45	99.79	106.59
4	A	203	A1DMI	O5-C22-C21	2.44	113.36	107.90
4	C	203	A1DMI	C6-C7-N3	2.43	125.83	123.10
4	B	202	A1DMI	C8-O2-N3	2.43	106.35	105.34
3	B	201	GNP	O3A-PB-N3B	-2.42	99.89	106.59
3	A	202	GNP	O2G-PG-O3G	2.33	113.84	107.59
3	C	202	GNP	O2G-PG-O3G	2.28	113.70	107.59
4	A	203	A1DMI	O2-C8-N4	-2.20	113.84	115.25
4	A	203	A1DMI	C6-C7-N3	2.17	125.54	123.10
4	B	202	A1DMI	O5-C5-C4	2.17	121.18	116.67
4	A	203	A1DMI	O5-C5-C4	2.10	121.03	116.67
4	C	203	A1DMI	N4-C7-N3	2.09	115.99	114.47
3	A	202	GNP	O2A-PA-O1A	2.02	121.86	112.44
4	A	203	A1DMI	O3-C20-N7	-2.00	107.31	110.62

There are no chirality outliers.

All (18) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	202	GNP	PB-N3B-PG-O1G
3	A	202	GNP	PG-N3B-PB-O1B
3	B	201	GNP	PB-N3B-PG-O1G
3	B	201	GNP	PG-N3B-PB-O1B
3	C	202	GNP	PB-N3B-PG-O1G
3	C	202	GNP	PG-N3B-PB-O1B
4	A	203	A1DMI	C19-C18-C9-C17
4	B	202	A1DMI	C19-C18-C9-C17
4	B	202	A1DMI	C19-C18-C9-C8

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Mol	Chain	Res	Type	Atoms
4	A	203	A1DMI	C19-C18-C9-C10
4	B	202	A1DMI	C19-C18-C9-C10
4	A	203	A1DMI	C19-C18-C9-C8
3	B	201	GNP	PG-N3B-PB-O3A
5	C	204	EDO	O1-C1-C2-O2
4	B	202	A1DMI	C21-C22-O5-C5
4	B	202	A1DMI	C18-C19-O3-C20
3	A	202	GNP	PG-N3B-PB-O3A
4	C	203	A1DMI	C19-C18-C9-C10

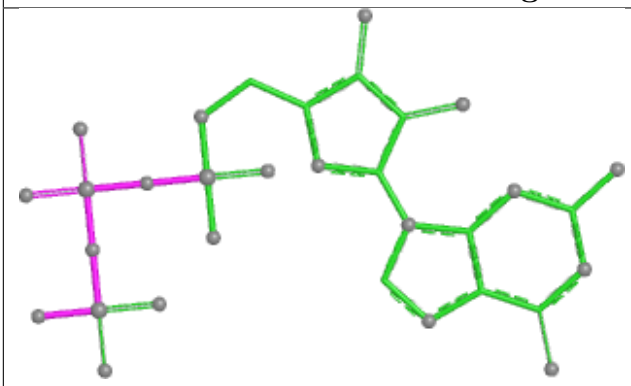
There are no ring outliers.

2 monomers are involved in 3 short contacts:

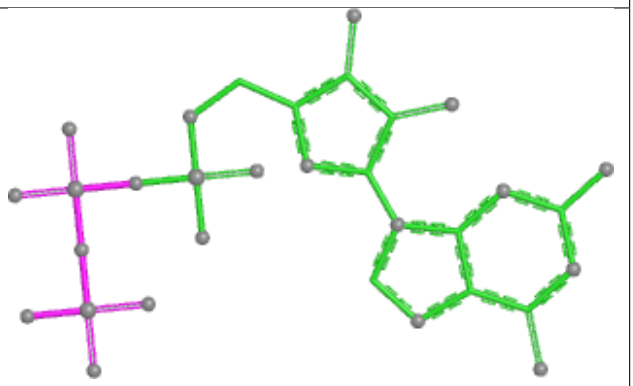
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	202	A1DMI	2	0
3	A	202	GNP	1	0

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

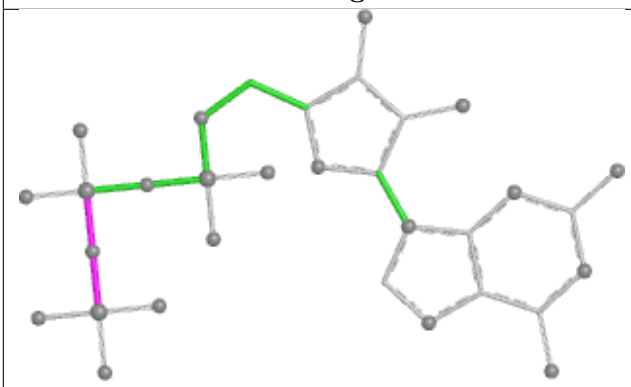
Ligand GNP C 202



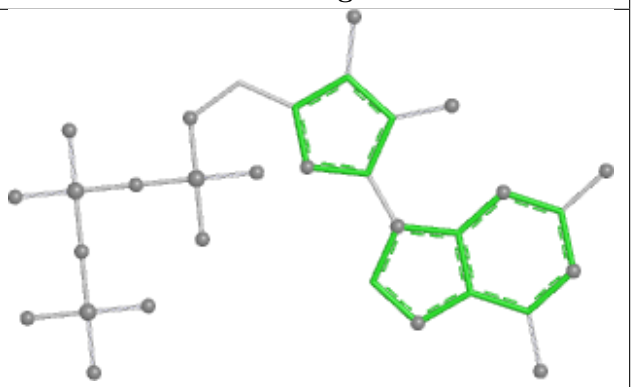
Bond lengths



Bond angles

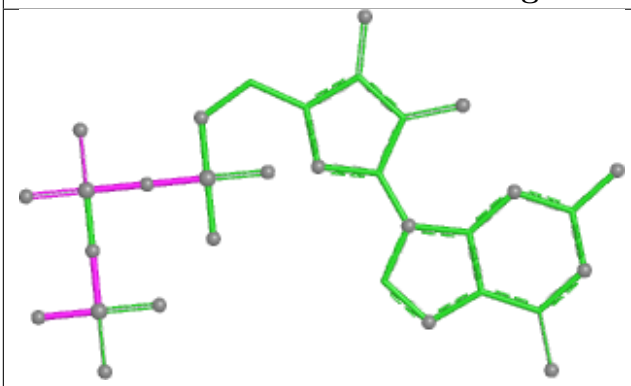


Torsions

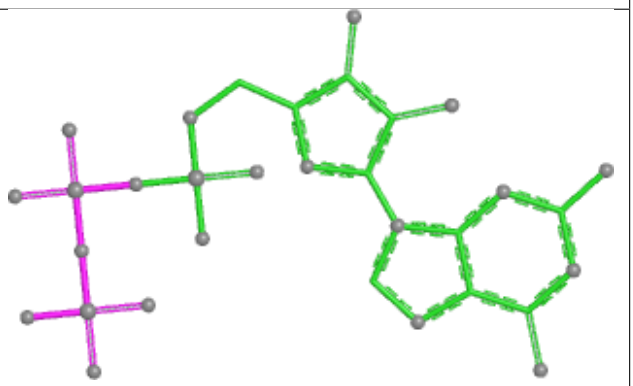


Rings

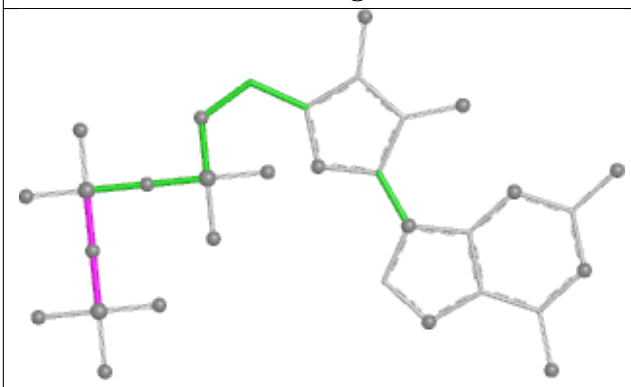
Ligand GNP B 201



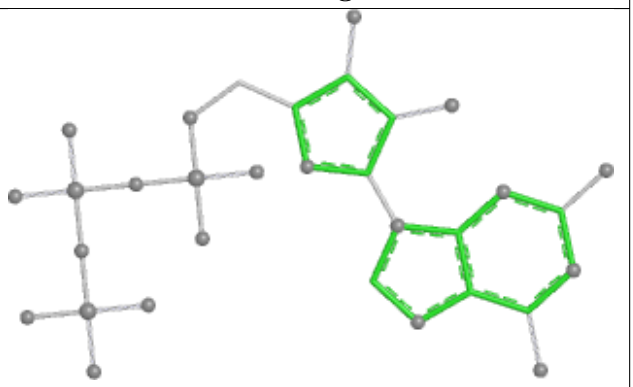
Bond lengths



Bond angles

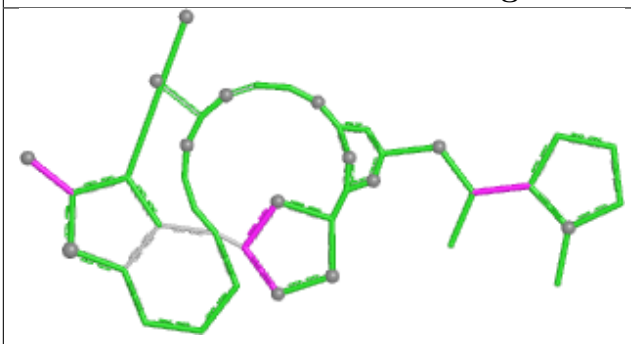


Torsions

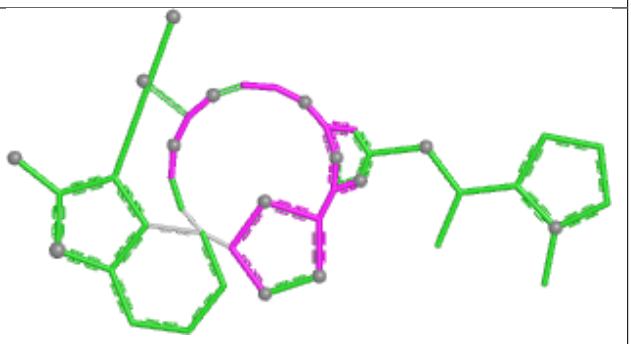


Rings

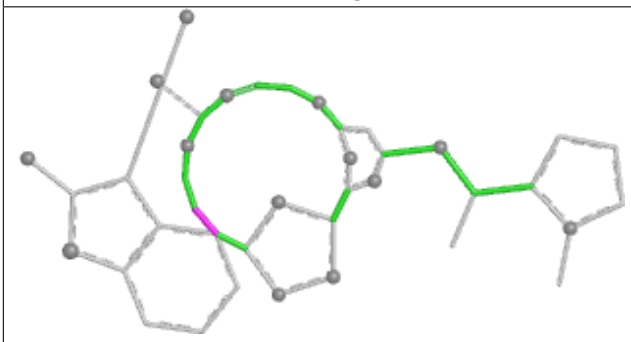
Ligand A1DMI A 203



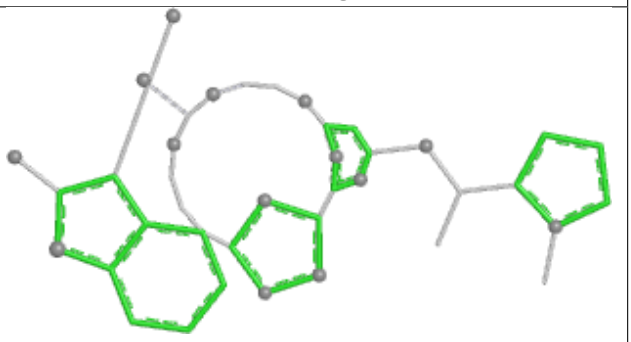
Bond lengths



Bond angles

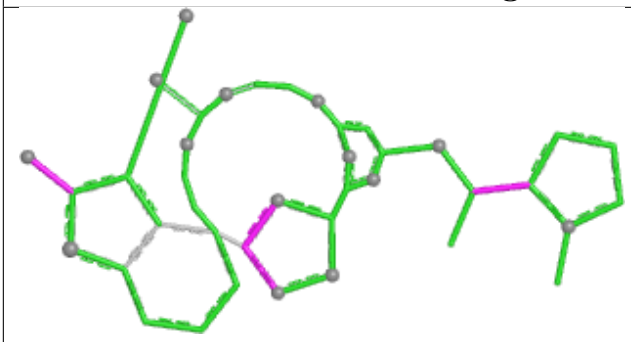


Torsions

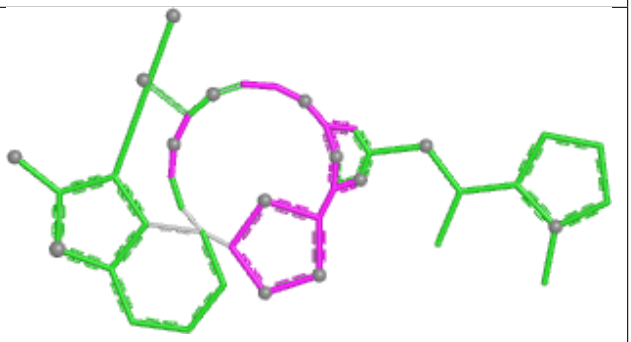


Rings

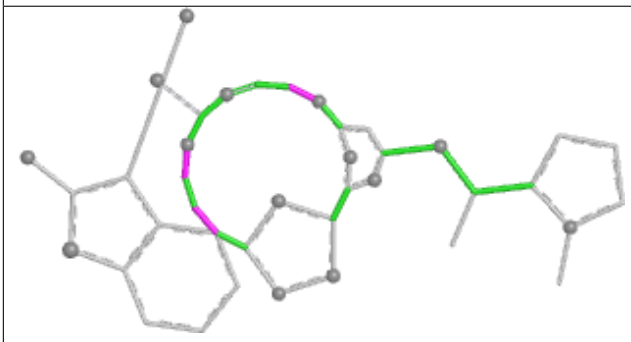
Ligand A1DMI B 202



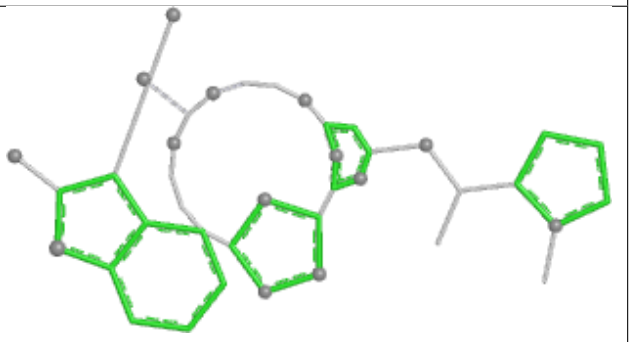
Bond lengths



Bond angles

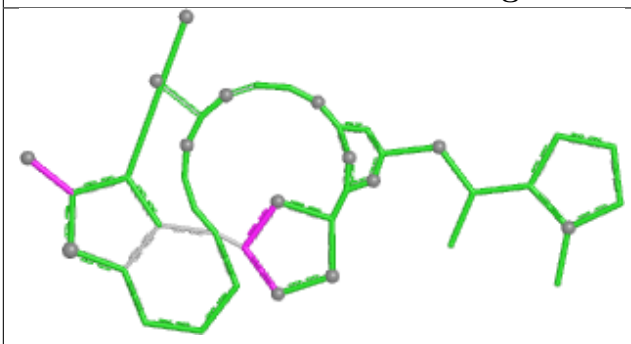


Torsions

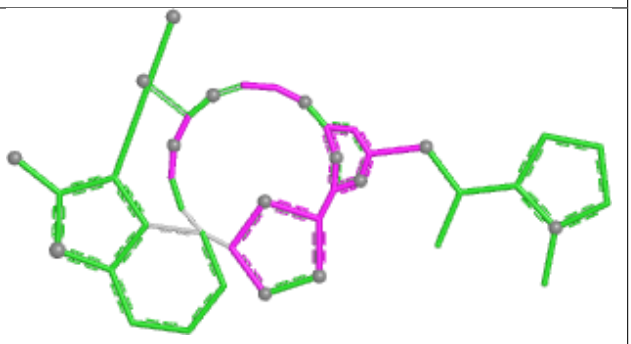


Rings

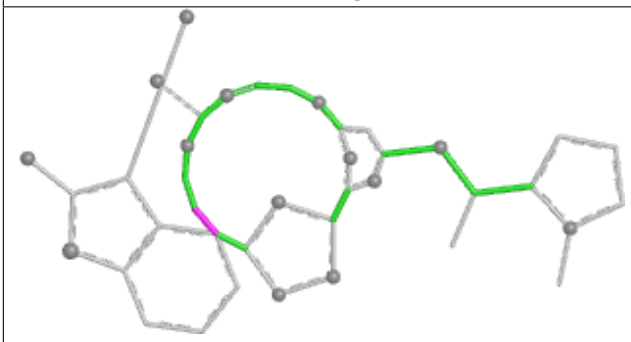
Ligand A1DMI C 203



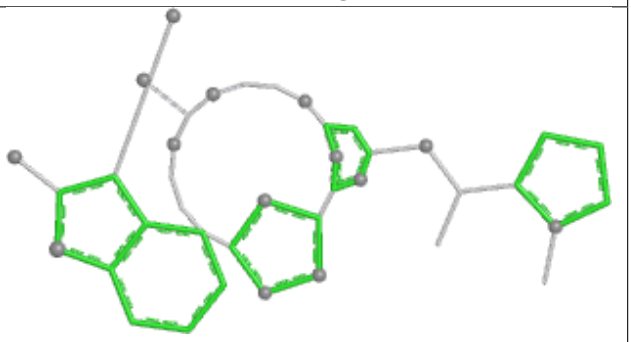
Bond lengths



Bond angles

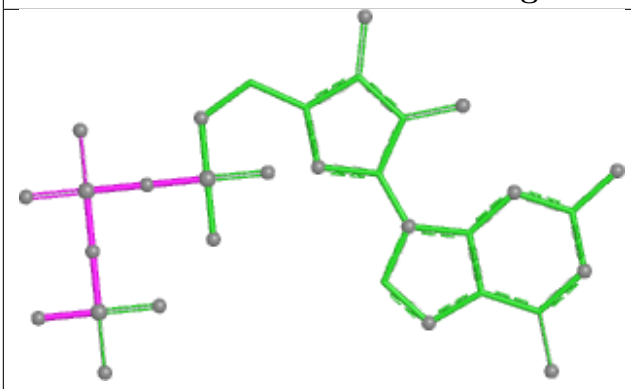


Torsions

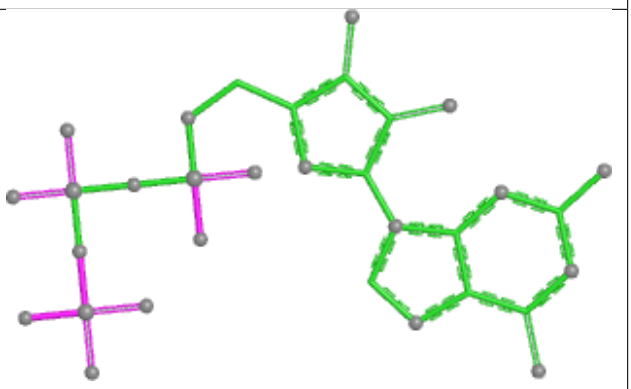


Rings

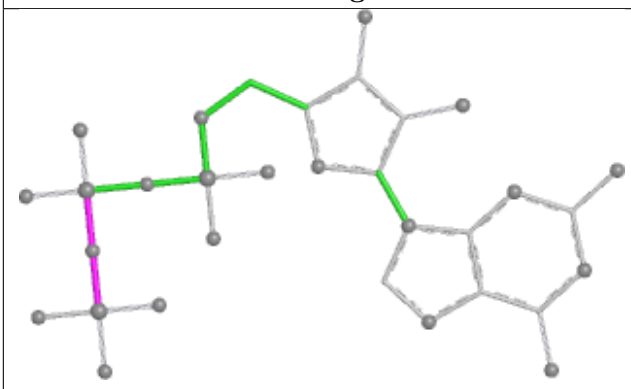
Ligand GNP A 202



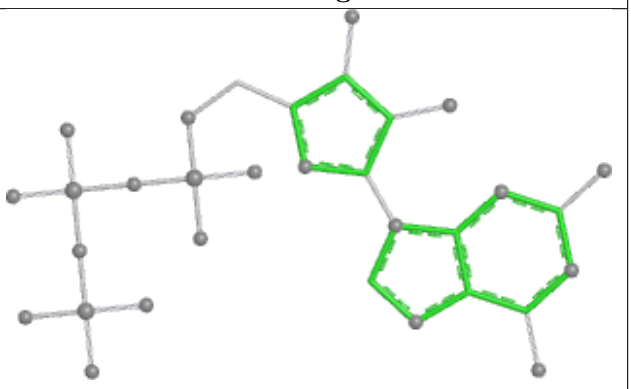
Bond lengths



Bond angles



Torsions



Rings

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^{th} percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å^2)	Q<0.9
1	A	168/171 (98%)	0.07	9 (5%) 31 35	15, 34, 57, 124	3 (1%)
1	B	164/171 (95%)	0.32	5 (3%) 52 56	16, 42, 64, 93	3 (1%)
1	C	133/171 (77%)	3.38	97 (72%) 0 0	40, 95, 126, 183	0
All	All	465/513 (90%)	1.10	111 (23%) 2 2	15, 44, 114, 183	6 (1%)

All (111) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	53	LEU	10.0
1	C	55	ILE	9.6
1	C	134	ALA	9.0
1	C	155	ALA	8.5
1	C	20	THR	7.8
1	C	6	LEU	7.4
1	C	130	ALA	7.4
1	C	84	ILE	7.3
1	C	81	VAL	7.0
1	C	19	LEU	6.7
1	C	24	ILE	6.4
1	C	9	VAL	6.4
1	C	152	VAL	6.4
1	C	79	LEU	6.4
1	C	112	VAL	6.3
1	C	8	VAL	6.3
1	C	80	LEU	6.3
1	C	156	PHE	6.3
1	C	159	LEU	6.1
1	C	78	PHE	5.9
1	C	158	THR	5.8
1	C	23	LEU	5.8
1	C	4	TYR	5.8

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Mol	Chain	Res	Type	RSRZ
1	C	113	LEU	5.5
1	C	137	TYR	5.2
1	C	36	ILE	5.0
1	C	94	HIS	4.9
1	C	21	ILE	4.9
1	C	77	GLY	4.7
1	C	109	VAL	4.6
1	C	22	GLN	4.6
1	C	115	GLY	4.5
1	C	120	LEU	4.5
1	C	15	GLY	4.5
1	C	153	ASP	4.4
1	C	75	GLY	4.3
1	C	154	ASP	4.1
1	C	40	TYR	4.1
1	C	114	VAL	4.0
1	C	127	THR	4.0
1	A	32	TYR	4.0
1	C	125	VAL	3.9
1	C	124	THR	3.9
1	C	157	TYR	3.8
1	C	7	VAL	3.8
1	C	52	LEU	3.7
1	C	110	PRO	3.7
1	C	59	ALA	3.7
1	C	96	TYR	3.7
1	B	29	VAL	3.6
1	C	18	ALA	3.6
1	C	60	GLY	3.6
1	C	90	PHE	3.5
1	C	56	LEU	3.5
1	C	111	MET	3.4
1	C	160	VAL	3.4
1	C	87	THR	3.3
1	C	57	ASP	3.3
1	C	14	VAL	3.2
1	C	162	GLU	3.2
1	C	108	ASP	3.2
1	A	34	PRO	3.2
1	A	35	THR	3.2
1	C	12	VAL	3.1
1	C	126	ASP	3.1

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Mol	Chain	Res	Type	RSRZ
1	C	41	ARG	3.1
1	C	61	GLN	3.1
1	C	116	ASN	3.0
1	C	26	ASN	3.0
1	C	151	GLY	3.0
1	C	38	ASP	3.0
1	C	132	ASP	3.0
1	C	135	ARG	3.0
1	C	89	SER	3.0
1	C	93	ILE	2.9
1	C	85	ASN	2.9
1	C	50	THR	2.8
1	C	163	ILE	2.8
1	C	121	PRO	2.8
1	B	35	THR	2.8
1	C	2	THR	2.8
1	A	122	SER	2.8
1	C	138	GLY	2.8
1	C	10	GLY	2.7
1	C	58	THR	2.7
1	C	136	SER	2.7
1	A	60	GLY	2.7
1	A	41[A]	ARG	2.6
1	B	122	SER	2.6
1	C	166	HIS	2.5
1	B	34	PRO	2.5
1	C	11	ALA	2.5
1	C	164	ARG	2.5
1	C	129	GLN	2.4
1	C	161	ARG	2.4
1	C	13	GLY	2.4
1	A	31	GLU	2.4
1	C	98	GLU	2.3
1	A	33	ASP	2.2
1	C	25	GLN	2.2
1	C	16	LYS	2.2
1	C	122	SER	2.2
1	C	165	LYS	2.2
1	B	157	TYR	2.1
1	C	17	SER	2.1
1	A	36	ILE	2.1
1	C	103	VAL	2.1

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Mol	Chain	Res	Type	RSRZ
1	C	39	SER	2.1
1	C	86	ASN	2.0
1	C	131	GLN	2.0
1	C	95	HIS	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 oligosaccharides in this entry.

6.4 Ligands (i)

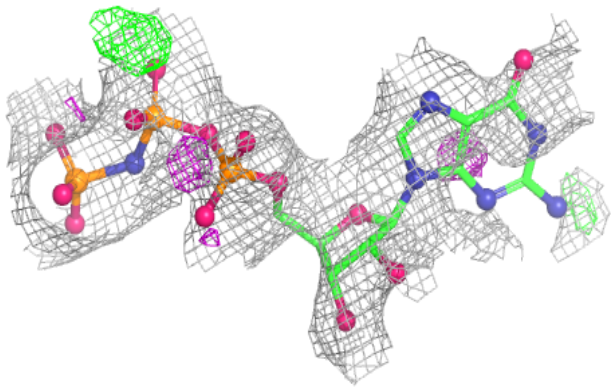
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

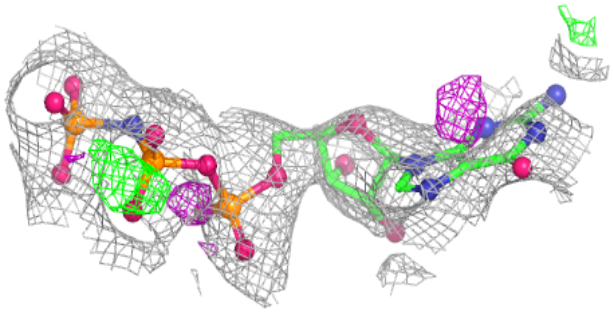
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
5	EDO	C	204	4/4	0.70	0.13	55,56,66,67	0
3	GNP	C	202	32/32	0.72	0.16	71,106,124,125	0
2	MG	C	201	1/1	0.88	0.12	78,78,78,78	0
4	A1DMI	C	203	41/41	0.89	0.14	30,63,84,101	0
5	EDO	A	204	4/4	0.91	0.13	37,38,40,50	0
2	MG	A	201	1/1	0.94	0.16	39,39,39,39	0
4	A1DMI	B	202	41/41	0.95	0.07	19,28,39,44	0
4	A1DMI	A	203	41/41	0.95	0.08	17,29,36,44	0
3	GNP	B	201	32/32	0.96	0.07	33,46,52,57	0
3	GNP	A	202	32/32	0.98	0.05	21,37,44,52	0
2	MG	B	200	1/1	0.99	0.08	40,40,40,40	0

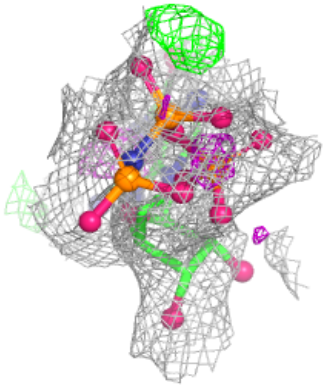
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around GNP C 202:

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

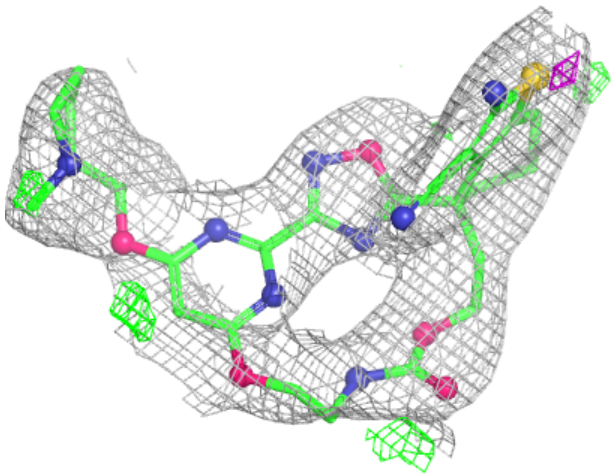


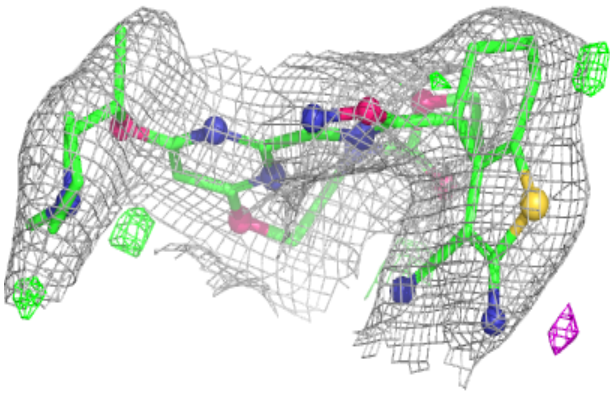


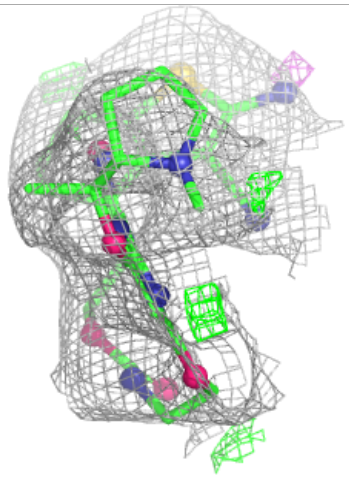


Electron density around A1DMI C 203:

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

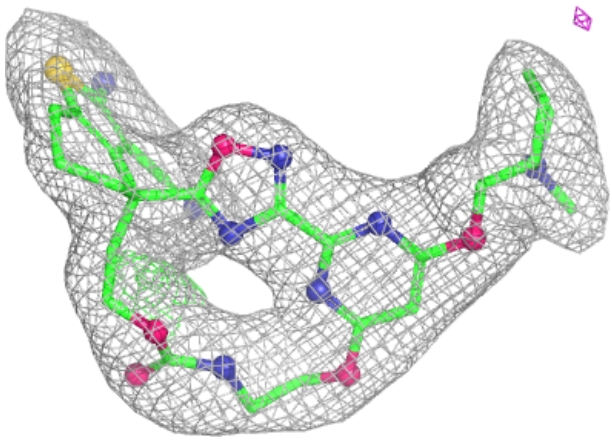


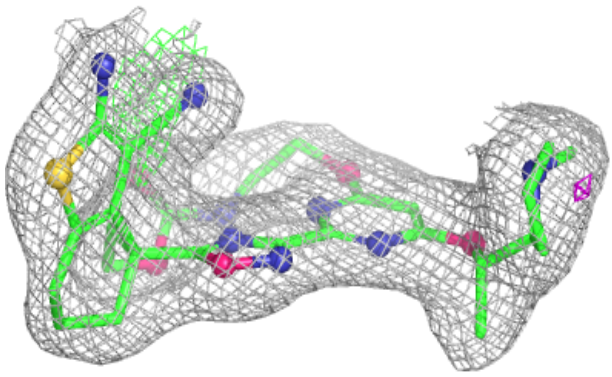


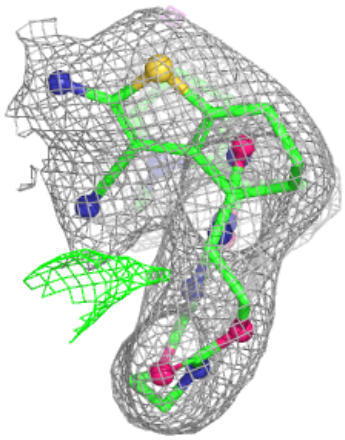


Electron density around A1DMI B 202:

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

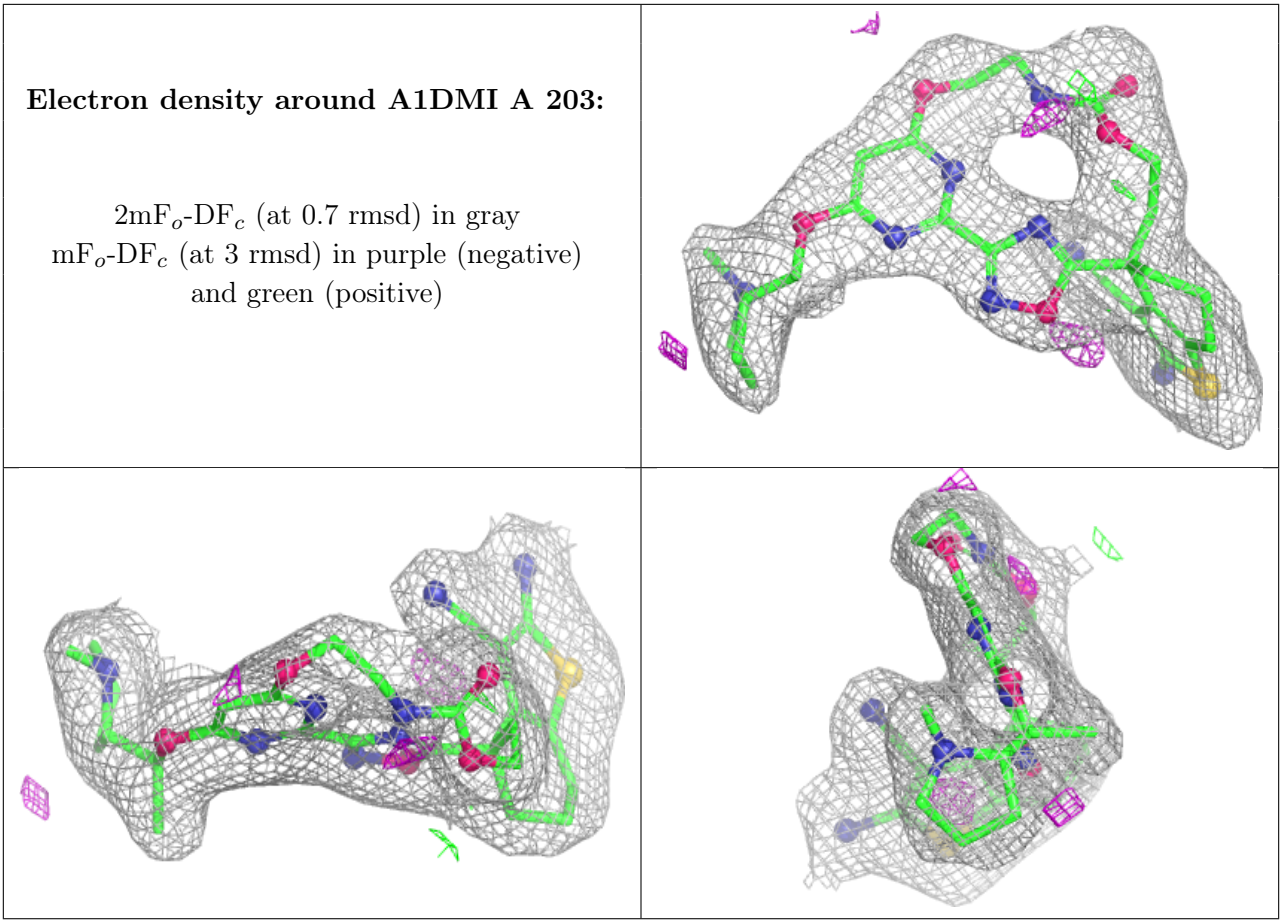






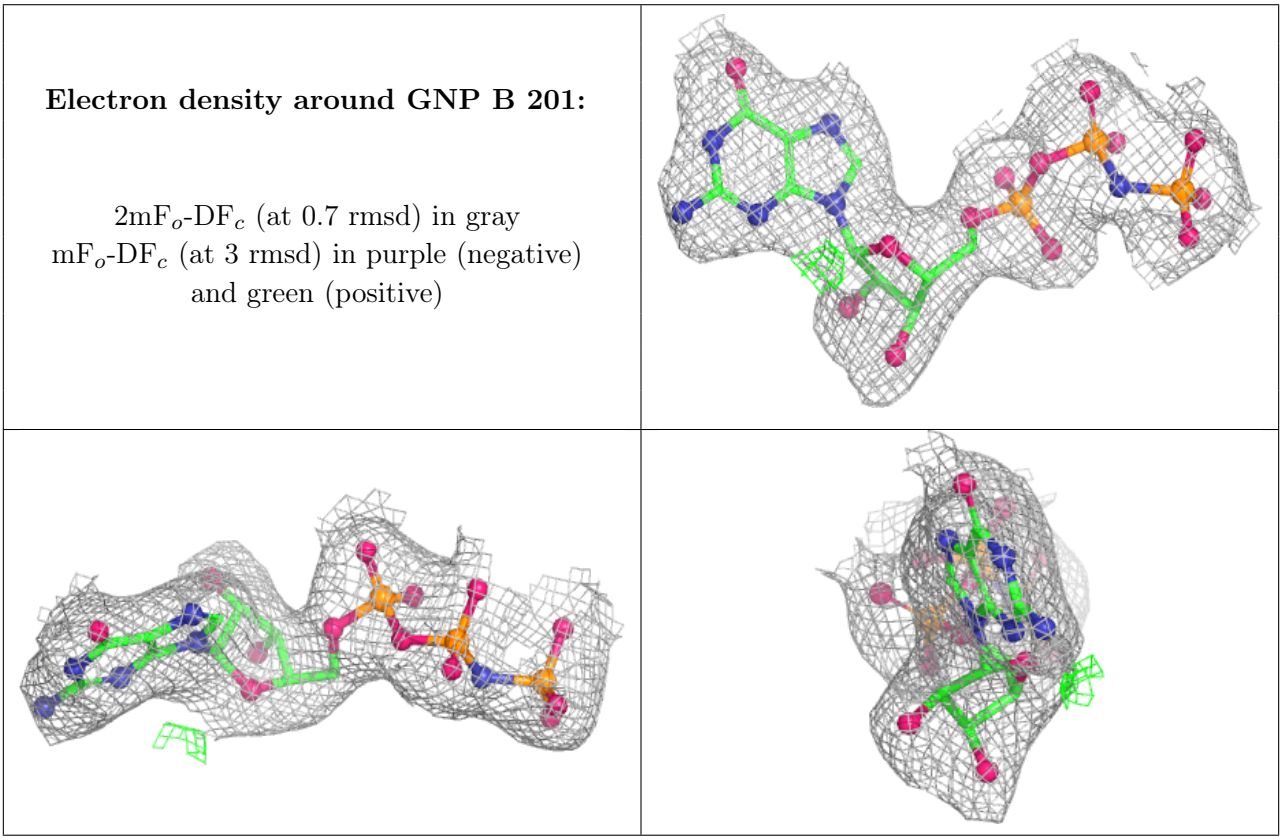
Electron density around A1DMI A 203:

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



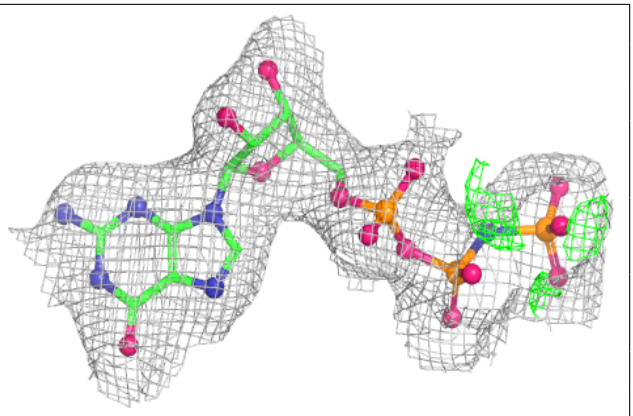
Electron density around GNP B 201:

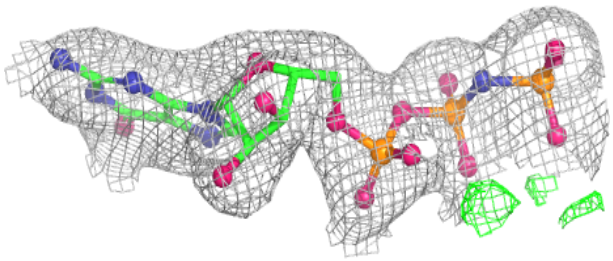
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

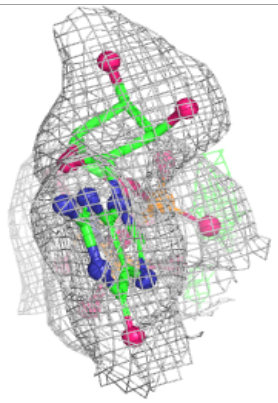


Electron density around GNP A 202:

$2mF_o$-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.