Full wwPDB X-ray Structure Validation Report (i)

Nov 9, 2026 – 08:06 AM EST

PDB ID	:	36ZR / pdb_000036zr
Title	:	KRAS G12V Mutant in Complex with GMPPNP and Compound 1
Authors	:	DiDonato, M.; Spraggon, G.
Deposited on	:	2026-07-08
Resolution	:	2.44 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:

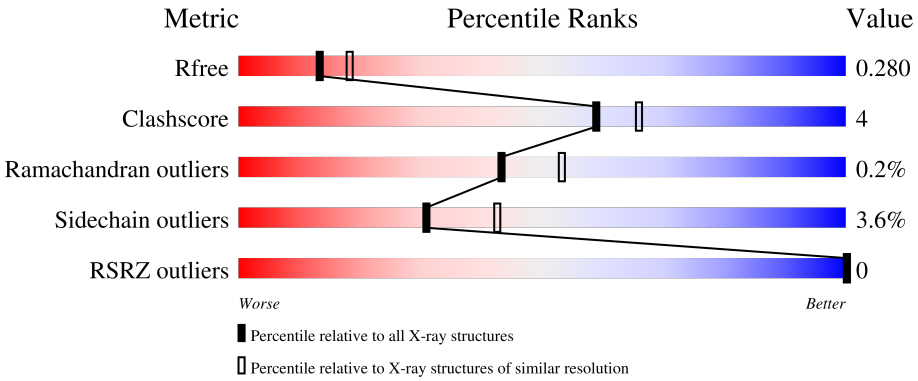
MolProbity	:	4-5-2 with Phenix2.2
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.2
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.015 (Gargrove)
Density-Fitness	:	1.0.12
Ideal 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 2.44 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.



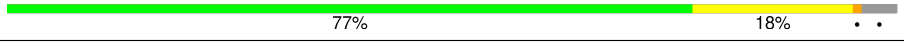
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	2340 (2.46-2.42)
Clashscore	190562	2400 (2.46-2.42)
Ramachandran outliers	187476	2379 (2.46-2.42)
Sidechain outliers	187428	2379 (2.46-2.42)
RSRZ outliers	180081	2340 (2.46-2.42)

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	88% 9% • •
1	B	171	87% 11% •
1	C	171	82% 13% • •
1	D	171	84% 11% • 5%
1	E	171	81% 16% • •

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Mol	Chain	Length	Quality of chain
1	F	171	

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 8586 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	0	0
			1346	845	230	267	4			
1	B	168	Total	C	N	O	S	0	0	0
			1346	845	230	267	4			
1	C	166	Total	C	N	O	S	0	0	0
			1331	835	228	264	4			
1	D	163	Total	C	N	O	S	0	0	0
			1303	818	225	256	4			
1	E	167	Total	C	N	O	S	0	0	0
			1339	841	229	265	4			
1	F	165	Total	C	N	O	S	0	0	0
			1327	833	227	263	4			

There are 36 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

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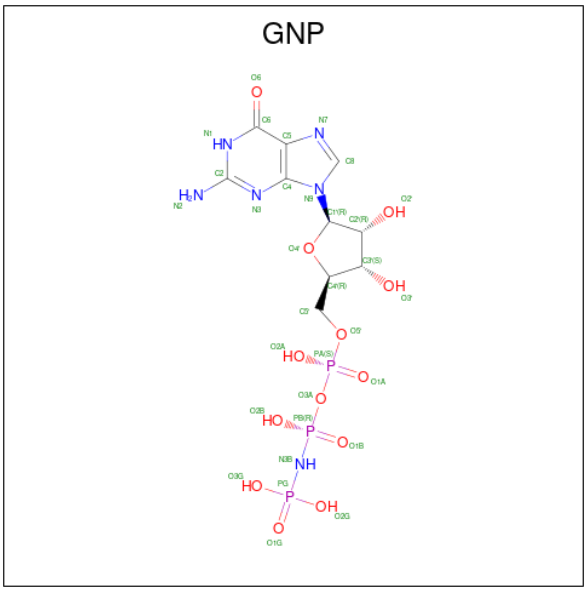
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Chain	Residue	Modelled	Actual	Comment	Reference
C	118	SER	CYS	engineered mutation	UNP P01116
D	-1	GLY	-	expression tag	UNP P01116
D	0	PRO	-	expression tag	UNP P01116
D	12	VAL	GLY	engineered mutation	UNP P01116
D	51	SER	CYS	engineered mutation	UNP P01116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

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

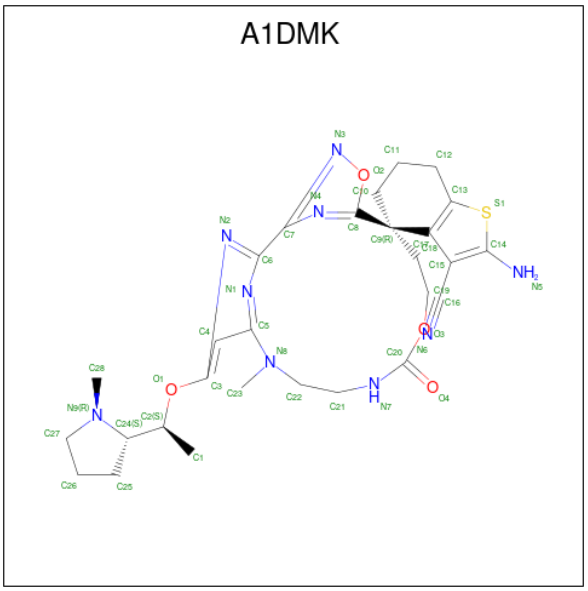
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total Mg 1 1	0	0
2	B	1	Total Mg 1 1	0	0
2	C	1	Total Mg 1 1	0	0
2	D	1	Total Mg 1 1	0	0
2	E	1	Total Mg 1 1	0	0
2	F	1	Total Mg 1 1	0	0

- 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	0	0
			32	10	6	13	3		
3	B	1	Total	C	N	O	P	0	0
			32	10	6	13	3		
3	C	1	Total	C	N	O	P	0	0
			32	10	6	13	3		
3	D	1	Total	C	N	O	P	0	0
			32	10	6	13	3		
3	E	1	Total	C	N	O	P	0	0
			32	10	6	13	3		
3	F	1	Total	C	N	O	P	0	0
			32	10	6	13	3		

- Molecule 4 is (4R)-2-amino-14'-methyl-17'-{(1S)-1-[(2S)-1-methylpyrrolidin-2-yl]ethoxy}-10'-oxo-6,7-dihydro-5H-spiro[[1]benzothiophene-4,6'-[4,9]dioxa[3,11,14,18,19,20]hexaazatricyclo[13.3.1.1 2,5]icosa[1(19),2,5(20),15,17]pentaene]-3-carbonitrile (CCD ID: A1DMK) (formula: $C_{28}H_{35}N_9O_4S$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C N O S 42 28 9 4 1	0	0
4	B	1	Total C N O S 42 28 9 4 1	0	0
4	C	1	Total C N O S 42 28 9 4 1	0	0
4	D	1	Total C N O S 42 28 9 4 1	0	0
4	E	1	Total C N O S 42 28 9 4 1	0	0
4	F	1	Total C N O S 42 28 9 4 1	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	34	Total O 34 34	0	0
5	B	39	Total O 39 39	0	0
5	C	24	Total O 24 24	0	0
5	D	21	Total O 21 21	0	0
5	E	13	Total O 13 13	0	0
5	F	13	Total O 13 13	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:

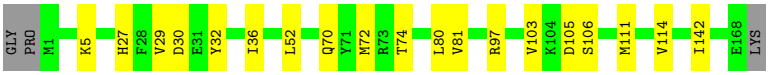




• Molecule 1: Isoform 2B of GTPase KRas

Chain B:

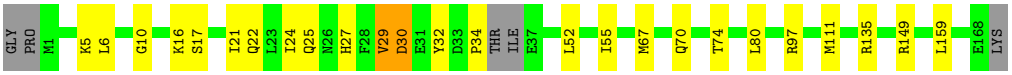




• Molecule 1: Isoform 2B of GTPase KRas

Chain C:

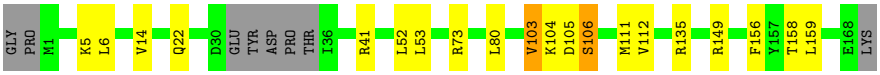




• Molecule 1: Isoform 2B of GTPase KRas

Chain D:

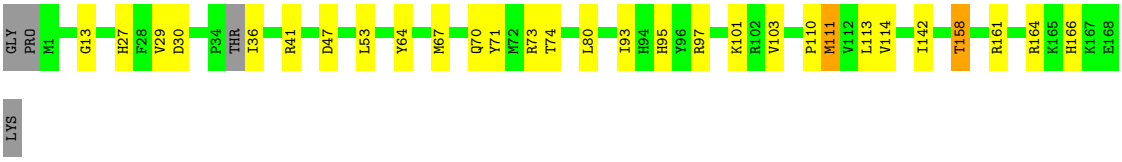




• Molecule 1: Isoform 2B of GTPase KRas

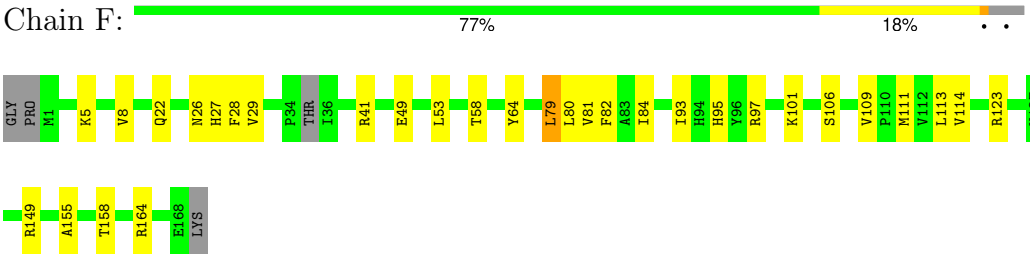
Chain E:





• Molecule 1: Isoform 2B of GTPase KRas

Chain F:


77%
18%
GLY
PRO
M1
K5
V8
Q22
N26
H27
F28
V29
P34
THR
I36
R41
E49
L53
T58
Y64
L79
L80
V81
F82
A83
I84
T93
H94
H95
Y96
R97
K101
S106
V109
P110
M111
V112
L113
V114
R123
Y137
GLY
ILE
P140
F141
R149
A155
T158
R164
E168
LYS

4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	134.86Å 181.96Å 64.41Å 90.00° 118.55° 90.00°	Depositor
Resolution (Å)	60.72 – 2.44 60.72 – 2.44	Depositor EDS
% Data completeness (in resolution range)	95.5 (60.72-2.44) 95.4 (60.72-2.44)	Depositor EDS
R_{merge}	0.18	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.55 (at 2.42Å)	Xtriage
Refinement program	PHENIX 2.1_6048	Depositor
R, R_{free}	0.260 , 0.286 0.257 , 0.280	Depositor DCC
R_{free} test set	2404 reflections (4.73%)	wwPDB-VP
Wilson B-factor (Å^2)	39.7	Xtriage
Anisotropy	0.240	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 28.3	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	0.449 for -h-2*l,-k,l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	8586	wwPDB-VP
Average B, all atoms (Å^2)	64.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.41% 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: MG, GNP, A1DMK

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	0.13	0/1367	0.36	0/1845
1	B	0.13	0/1367	0.32	0/1845
1	C	0.12	0/1351	0.31	0/1821
1	D	0.17	0/1321	0.35	0/1779
1	E	0.15	0/1359	0.38	0/1832
1	F	0.17	0/1346	0.42	0/1812
All	All	0.15	0/8111	0.36	0/10934

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	1346	0	1333	9	0
1	B	1346	0	1332	10	0
1	C	1331	0	1314	18	0
1	D	1303	0	1298	8	0
1	E	1339	0	1325	19	0
1	F	1327	0	1310	19	0
2	A	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	0	0
2	E	1	0	0	0	0
2	F	1	0	0	0	0
3	A	32	0	13	0	0
3	B	32	0	13	0	0
3	C	32	0	13	1	0
3	D	32	0	13	0	0
3	E	32	0	13	1	0
3	F	32	0	13	0	0
4	A	42	0	0	1	0
4	B	42	0	0	0	0
4	C	42	0	0	0	0
4	D	42	0	0	0	0
4	E	42	0	0	0	0
4	F	42	0	0	1	0
5	A	34	0	0	0	0
5	B	39	0	0	0	0
5	C	24	0	0	0	0
5	D	21	0	0	0	0
5	E	13	0	0	0	0
5	F	13	0	0	0	0
All	All	8586	0	7990	73	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 (73) 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:F:26:ASN:HA	1:F:149:ARG:HH12	1.50	0.76
1:B:97:ARG:HG3	1:B:111:MET:HE1	1.70	0.72
1:A:80:LEU:HD11	1:A:111:MET:HE2	1.80	0.63
1:D:80:LEU:HD11	1:D:111:MET:HE2	1.82	0.61
1:F:113:LEU:O	1:F:141:PHE:HA	2.03	0.59
1:C:80:LEU:HD11	1:C:111:MET:HE2	1.84	0.58
1:F:97:ARG:HG3	1:F:111:MET:HE1	1.88	0.56
1:E:73:ARG:HB2	1:E:103:VAL:HG12	1.89	0.54
1:F:8:VAL:HG22	1:F:79:LEU:HD13	1.89	0.54
1:F:93:ILE:HD13	1:F:113:LEU:HD11	1.89	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:158:THR:HA	1:E:161:ARG:HD2	1.88	0.53
1:E:97:ARG:CZ	1:E:101:LYS:HD2	2.38	0.53
1:F:97:ARG:CZ	1:F:101:LYS:HD2	2.38	0.53
1:E:110:PRO:HD3	1:E:166:HIS:CD2	2.44	0.53
1:F:82:PHE:HB3	1:F:93:ILE:HD11	1.91	0.52
1:A:29:VAL:HG11	1:D:135:ARG:NH1	2.23	0.52
1:C:97:ARG:HG3	1:C:111:MET:HE1	1.91	0.52
1:F:80:LEU:HD11	1:F:111:MET:HE2	1.91	0.51
1:D:73:ARG:HB2	1:D:103:VAL:HG13	1.93	0.51
1:B:80:LEU:HD11	1:B:111:MET:HE2	1.93	0.50
1:A:74:THR:HG21	1:B:70:GLN:HG2	1.94	0.50
1:C:22:GLN:HG3	1:C:149:ARG:HG3	1.92	0.50
1:C:67:MET:HG2	1:E:67:MET:HG2	1.92	0.50
1:C:29:VAL:HG21	1:C:32:TYR:HD2	1.77	0.50
1:C:27:HIS:NE2	1:C:29:VAL:HG13	2.28	0.49
1:C:6:LEU:HG	1:C:159:LEU:HD23	1.96	0.48
1:C:67:MET:HG3	1:E:71:TYR:HB2	1.96	0.48
1:E:64:TYR:HD2	1:F:95:HIS:CE1	2.32	0.47
1:C:74:THR:HG21	1:E:70:GLN:HG2	1.97	0.47
1:E:27:HIS:CE1	1:E:29:VAL:HG23	2.49	0.47
1:C:17:SER:HB3	1:C:34:PRO:HG2	1.97	0.47
1:B:114:VAL:HA	1:B:142:ILE:O	2.15	0.46
1:A:70:GLN:HG2	1:B:74:THR:HG21	1.98	0.46
1:B:29:VAL:HG11	1:C:135:ARG:NH1	2.30	0.46
1:E:111:MET:HE2	1:E:111:MET:HB2	1.82	0.46
1:F:27:HIS:CE1	1:F:29:VAL:HG23	2.51	0.45
1:A:126:ASP:HB2	1:A:129:GLN:HG3	1.97	0.45
1:E:95:HIS:CE1	1:F:64:TYR:HD2	2.34	0.45
1:E:13:GLY:HA2	3:E:201:GNP:H5'1	1.98	0.45
1:C:24:ILE:HG22	1:C:25:GLN:HG3	1.99	0.45
1:F:49:GLU:HB3	1:F:164:ARG:NH2	2.32	0.45
1:E:93:ILE:HD13	1:E:113:LEU:HD11	1.99	0.45
1:C:22:GLN:CG	1:C:149:ARG:HG3	2.47	0.45
1:D:41:ARG:HA	1:D:53:LEU:O	2.17	0.45
1:D:6:LEU:HD23	1:D:156:PHE:HD1	1.82	0.44
1:F:41:ARG:HA	1:F:53:LEU:O	2.18	0.44
1:B:81:VAL:HG13	1:B:114:VAL:HG23	1.97	0.44
1:C:30:ASP:HA	3:C:201:GNP:O2'	2.18	0.44
1:D:22:GLN:CG	1:D:149:ARG:HG3	2.47	0.44
1:A:22:GLN:HG3	1:A:149:ARG:HG3	2.00	0.44
1:D:104:LYS:O	1:D:106:SER:N	2.51	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:29:VAL:HG12	1:E:30:ASP:N	2.33	0.44
1:E:80:LEU:HD11	1:E:111:MET:HE3	2.00	0.43
1:F:140:PRO:O	1:F:141:PHE:HB3	2.17	0.43
1:A:5:LYS:HE3	1:A:54:ASP:O	2.19	0.43
1:C:24:ILE:HD11	1:C:55:ILE:HD12	2.01	0.43
1:F:81:VAL:HA	1:F:114:VAL:HG23	2.01	0.43
1:C:10:GLY:N	1:C:16:LYS:HD3	2.34	0.43
1:F:84:ILE:HD12	1:F:123:ARG:HG3	2.01	0.43
1:E:47:ASP:HB2	1:E:164:ARG:HH12	1.83	0.43
1:F:22:GLN:NE2	1:F:28:PHE:HB2	2.34	0.43
1:C:70:GLN:HG2	1:E:74:THR:HG21	2.01	0.43
1:E:41:ARG:HA	1:E:53:LEU:O	2.19	0.43
1:C:17:SER:O	1:C:21:ILE:HG22	2.19	0.42
1:A:41:ARG:HA	1:A:53:LEU:O	2.19	0.42
1:D:6:LEU:HG	1:D:159:LEU:HD23	2.01	0.42
1:B:29:VAL:HG13	1:B:32:TYR:HB2	2.02	0.41
1:F:58:THR:HB	4:F:202:A1DMK:O4	2.21	0.41
1:B:29:VAL:HG22	1:B:30:ASP:H	1.86	0.41
1:A:103:VAL:HG21	4:A:202:A1DMK:S1	2.61	0.41
1:B:97:ARG:CG	1:B:111:MET:HE1	2.48	0.40
1:E:114:VAL:HA	1:E:142:ILE:O	2.21	0.40
1:F:114:VAL:HG11	1:F:155:ALA:HB1	2.04	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	166/171 (97%)	163 (98%)	3 (2%)	0	100	100
1	B	166/171 (97%)	163 (98%)	3 (2%)	0	100	100
1	C	162/171 (95%)	158 (98%)	4 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	D	159/171 (93%)	155 (98%)	3 (2%)	1 (1%)	21 25
1	E	163/171 (95%)	160 (98%)	3 (2%)	0	100 100
1	F	159/171 (93%)	155 (98%)	3 (2%)	1 (1%)	21 25
All	All	975/1026 (95%)	954 (98%)	19 (2%)	2 (0%)	43 53

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	105	ASP
1	F	141	PHE

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	149/151 (99%)	144 (97%)	5 (3%)	32 45
1	B	149/151 (99%)	141 (95%)	8 (5%)	20 27
1	C	147/151 (97%)	143 (97%)	4 (3%)	39 52
1	D	144/151 (95%)	137 (95%)	7 (5%)	22 31
1	E	148/151 (98%)	145 (98%)	3 (2%)	48 62
1	F	147/151 (97%)	142 (97%)	5 (3%)	32 45
All	All	884/906 (98%)	852 (96%)	32 (4%)	31 42

All (32) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	5	LYS
1	A	29	VAL
1	A	36	ILE
1	A	52	LEU
1	A	106	SER
1	B	5	LYS

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Mol	Chain	Res	Type
1	B	27	HIS
1	B	36	ILE
1	B	52	LEU
1	B	72	MET
1	B	103	VAL
1	B	105	ASP
1	B	106	SER
1	C	5	LYS
1	C	29	VAL
1	C	30	ASP
1	C	52	LEU
1	D	5	LYS
1	D	14	VAL
1	D	52	LEU
1	D	103	VAL
1	D	106	SER
1	D	112	VAL
1	D	158	THR
1	E	36	ILE
1	E	111	MET
1	E	158	THR
1	F	5	LYS
1	F	79	LEU
1	F	106	SER
1	F	109	VAL
1	F	158	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	22	GLN
1	A	26	ASN
1	B	27	HIS
1	C	22	GLN
1	E	22	GLN
1	E	27	HIS

5.3.3 RNA

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 18 ligands modelled in this entry, 6 are monoatomic - leaving 12 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	$\#\|Z\| > 2$
3	GNP	C	201	2	34,34,34	2.24	6 (17%)	47,54,54	1.50	5 (10%)
3	GNP	F	201	2	34,34,34	2.31	6 (17%)	47,54,54	1.43	4 (8%)
3	GNP	D	201	2	34,34,34	2.24	6 (17%)	47,54,54	1.50	4 (8%)
3	GNP	B	201	2	34,34,34	2.30	6 (17%)	47,54,54	1.47	4 (8%)
4	A1DMK	F	202	-	44,47,47	1.13	3 (6%)	52,69,69	1.68	11 (21%)
4	A1DMK	A	202	-	44,47,47	1.20	4 (9%)	52,69,69	1.70	9 (17%)
3	GNP	A	201	2	34,34,34	2.27	6 (17%)	47,54,54	1.50	5 (10%)
4	A1DMK	D	202	-	44,47,47	1.22	5 (11%)	52,69,69	1.67	10 (19%)
4	A1DMK	E	202	-	44,47,47	1.13	3 (6%)	52,69,69	1.70	12 (23%)
4	A1DMK	B	202	-	44,47,47	1.21	5 (11%)	52,69,69	1.71	11 (21%)
3	GNP	E	201	2	34,34,34	2.29	6 (17%)	47,54,54	1.44	5 (10%)
4	A1DMK	C	202	-	44,47,47	1.22	4 (9%)	52,69,69	1.66	10 (19%)

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	C	201	2	-	5/18/38/38	0/3/3/3
3	GNP	F	201	2	-	6/18/38/38	0/3/3/3
3	GNP	D	201	2	-	5/18/38/38	0/3/3/3
3	GNP	B	201	2	-	4/18/38/38	0/3/3/3
4	A1DMK	F	202	-	-	11/33/60/60	0/5/6/6
4	A1DMK	A	202	-	-	12/33/60/60	0/5/6/6
3	GNP	A	201	2	-	5/18/38/38	0/3/3/3
4	A1DMK	D	202	-	-	10/33/60/60	0/5/6/6
4	A1DMK	E	202	-	-	13/33/60/60	0/5/6/6
4	A1DMK	B	202	-	-	12/33/60/60	0/5/6/6
3	GNP	E	201	2	-	4/18/38/38	0/3/3/3
4	A1DMK	C	202	-	-	12/33/60/60	0/5/6/6

All (60) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	F	201	GNP	PB-O3A	8.23	1.69	1.59
3	E	201	GNP	PB-O3A	8.10	1.69	1.59
3	B	201	GNP	PB-O3A	8.07	1.69	1.59
3	A	201	GNP	PB-O3A	7.91	1.68	1.59
3	D	201	GNP	PB-O3A	7.78	1.68	1.59
3	C	201	GNP	PB-O3A	7.77	1.68	1.59
3	B	201	GNP	PG-N3B	6.55	1.80	1.63
3	E	201	GNP	PG-N3B	6.53	1.80	1.63
3	F	201	GNP	PG-N3B	6.52	1.80	1.63
3	A	201	GNP	PG-N3B	6.47	1.80	1.63
3	C	201	GNP	PG-N3B	6.45	1.80	1.63
3	D	201	GNP	PG-N3B	6.42	1.80	1.63
3	A	201	GNP	PG-O1G	4.93	1.53	1.46
3	B	201	GNP	PG-O1G	4.91	1.53	1.46
3	D	201	GNP	PG-O1G	4.91	1.53	1.46
3	C	201	GNP	PG-O1G	4.90	1.53	1.46
3	F	201	GNP	PG-O1G	4.82	1.53	1.46
3	E	201	GNP	PG-O1G	4.82	1.53	1.46
4	D	202	A1DMK	C8-N4	3.83	1.32	1.28
4	C	202	A1DMK	C8-N4	3.82	1.32	1.28
4	A	202	A1DMK	C8-N4	3.77	1.32	1.28
4	B	202	A1DMK	C8-N4	3.64	1.32	1.28
4	E	202	A1DMK	C8-N4	3.49	1.32	1.28
4	F	202	A1DMK	C8-N4	3.45	1.32	1.28
3	F	201	GNP	PA-O3A	3.43	1.63	1.59

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	E	201	GNP	PA-O3A	3.37	1.63	1.59
3	B	201	GNP	PA-O3A	3.35	1.63	1.59
3	F	201	GNP	PB-O1B	3.26	1.51	1.46
3	A	201	GNP	PA-O3A	3.22	1.63	1.59
3	A	201	GNP	PB-O1B	3.21	1.51	1.46
3	E	201	GNP	PB-O1B	3.19	1.51	1.46
3	B	201	GNP	PB-O1B	3.16	1.51	1.46
3	D	201	GNP	PB-O1B	3.13	1.50	1.46
3	C	201	GNP	PB-O1B	3.13	1.50	1.46
3	D	201	GNP	PA-O3A	3.03	1.62	1.59
3	C	201	GNP	PA-O3A	2.95	1.62	1.59
4	C	202	A1DMK	C2-C24	2.74	1.56	1.52
4	B	202	A1DMK	C2-C24	2.74	1.56	1.52
4	C	202	A1DMK	O2-C8	2.63	1.36	1.33
4	D	202	A1DMK	C2-C24	2.61	1.56	1.52
4	D	202	A1DMK	O2-C8	2.59	1.36	1.33
4	E	202	A1DMK	O2-C8	2.52	1.36	1.33
4	A	202	A1DMK	C2-C24	2.52	1.56	1.52
4	F	202	A1DMK	O2-C8	2.51	1.36	1.33
4	A	202	A1DMK	O2-C8	2.46	1.36	1.33
4	B	202	A1DMK	O2-C8	2.43	1.36	1.33
4	C	202	A1DMK	C14-N5	2.33	1.39	1.35
3	A	201	GNP	PB-O2B	-2.30	1.50	1.56
3	D	201	GNP	PB-O2B	-2.29	1.50	1.56
3	E	201	GNP	PB-O2B	-2.27	1.50	1.56
3	C	201	GNP	PB-O2B	-2.26	1.50	1.56
3	F	201	GNP	PB-O2B	-2.25	1.50	1.56
3	B	201	GNP	PB-O2B	-2.25	1.50	1.56
4	F	202	A1DMK	C14-N5	2.21	1.38	1.35
4	E	202	A1DMK	C14-N5	2.16	1.38	1.35
4	D	202	A1DMK	C14-N5	2.15	1.38	1.35
4	B	202	A1DMK	C14-N5	2.10	1.38	1.35
4	A	202	A1DMK	C14-N5	2.08	1.38	1.35
4	D	202	A1DMK	C15-C14	-2.08	1.36	1.39
4	B	202	A1DMK	C15-C14	-2.03	1.36	1.39

All (90) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	201	GNP	O1G-PG-N3B	-7.49	100.74	111.77
3	B	201	GNP	O1G-PG-N3B	-7.35	100.95	111.77
3	D	201	GNP	O1G-PG-N3B	-7.29	101.04	111.77

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	C	201	GNP	O1G-PG-N3B	-7.21	101.15	111.77
3	F	201	GNP	O1G-PG-N3B	-7.06	101.38	111.77
3	E	201	GNP	O1G-PG-N3B	-6.92	101.58	111.77
4	E	202	A1DMK	C6-C7-N4	-5.76	119.35	124.20
4	F	202	A1DMK	C6-C7-N4	-5.75	119.36	124.20
4	B	202	A1DMK	C6-C7-N4	-5.73	119.37	124.20
4	C	202	A1DMK	C6-C7-N4	-5.70	119.40	124.20
4	D	202	A1DMK	C6-C7-N4	-5.69	119.40	124.20
4	A	202	A1DMK	C6-C7-N4	-5.38	119.66	124.20
3	C	201	GNP	O2B-PB-O1B	4.71	119.96	109.87
3	D	201	GNP	O2B-PB-O1B	4.70	119.96	109.87
3	E	201	GNP	O2B-PB-O1B	4.67	119.89	109.87
4	B	202	A1DMK	C7-C6-N2	4.63	120.77	116.57
3	A	201	GNP	O2B-PB-O1B	4.60	119.73	109.87
3	B	201	GNP	O2B-PB-O1B	4.58	119.68	109.87
4	A	202	A1DMK	C7-C6-N2	4.55	120.69	116.57
3	F	201	GNP	O2B-PB-O1B	4.45	119.41	109.87
4	F	202	A1DMK	O1-C3-N2	-3.94	116.65	119.49
4	C	202	A1DMK	C7-C6-N2	3.82	120.03	116.57
4	D	202	A1DMK	O2-C8-N4	-3.73	112.85	115.25
4	A	202	A1DMK	O2-C8-N4	-3.62	112.92	115.25
4	D	202	A1DMK	C7-C6-N2	3.52	119.75	116.57
4	C	202	A1DMK	O2-C8-N4	-3.51	113.00	115.25
4	A	202	A1DMK	C5-N1-C6	3.47	119.16	116.00
4	D	202	A1DMK	C5-N1-C6	3.46	119.15	116.00
4	F	202	A1DMK	C5-N1-C6	3.43	119.12	116.00
4	B	202	A1DMK	O2-C8-N4	-3.42	113.05	115.25
4	B	202	A1DMK	C5-N1-C6	3.40	119.09	116.00
4	E	202	A1DMK	C19-O3-C20	3.39	123.59	115.76
4	C	202	A1DMK	C5-N1-C6	3.35	119.05	116.00
4	E	202	A1DMK	C5-N1-C6	3.28	118.98	116.00
4	E	202	A1DMK	O1-C3-N2	-3.21	117.18	119.49
4	A	202	A1DMK	C19-O3-C20	2.95	122.59	115.76
4	B	202	A1DMK	C19-O3-C20	2.93	122.53	115.76
4	F	202	A1DMK	O1-C3-C4	2.89	120.41	116.16
4	A	202	A1DMK	C8-O2-N3	2.87	106.53	105.34
3	C	201	GNP	O3A-PB-N3B	-2.79	98.84	106.59
4	B	202	A1DMK	C8-O2-N3	2.75	106.48	105.34
4	E	202	A1DMK	N4-C7-N3	2.66	116.41	114.47
4	D	202	A1DMK	C8-O2-N3	2.66	106.44	105.34
3	A	201	GNP	O3A-PB-N3B	-2.54	99.54	106.59
4	E	202	A1DMK	O1-C3-C4	2.54	119.90	116.16

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	E	202	A1DMK	C2-C24-N9	-2.54	106.05	112.82
4	F	202	A1DMK	N4-C7-N3	2.54	116.32	114.47
4	C	202	A1DMK	C19-O3-C20	2.46	121.46	115.76
4	D	202	A1DMK	C19-O3-C20	2.45	121.44	115.76
3	D	201	GNP	O3A-PB-N3B	-2.44	99.82	106.59
4	F	202	A1DMK	C19-O3-C20	2.43	121.37	115.76
4	F	202	A1DMK	C22-C21-N7	-2.42	106.88	111.56
3	C	201	GNP	O2G-PG-O3G	2.41	114.07	107.59
3	D	201	GNP	O2G-PG-O3G	2.41	114.06	107.59
4	B	202	A1DMK	C7-C6-N1	-2.40	114.39	116.57
4	C	202	A1DMK	C8-O2-N3	2.39	106.33	105.34
4	E	202	A1DMK	O2-C8-N4	-2.39	113.71	115.25
3	F	201	GNP	O2G-PG-O3G	2.35	113.91	107.59
3	E	201	GNP	O3A-PB-N3B	-2.33	100.13	106.59
4	C	202	A1DMK	C21-N7-C20	2.32	125.92	121.98
4	D	202	A1DMK	C21-N7-C20	2.32	125.91	121.98
3	E	201	GNP	O2G-PG-O3G	2.32	113.82	107.59
3	B	201	GNP	O2G-PG-O3G	2.29	113.75	107.59
3	A	201	GNP	O2G-PG-O3G	2.28	113.71	107.59
4	D	202	A1DMK	C22-C21-N7	-2.26	107.20	111.56
4	A	202	A1DMK	C7-C6-N1	-2.23	114.54	116.57
4	F	202	A1DMK	O2-C8-N4	-2.22	113.82	115.25
3	F	201	GNP	O3A-PB-N3B	-2.22	100.42	106.59
4	C	202	A1DMK	C4-C3-N2	-2.22	121.57	124.16
4	A	202	A1DMK	O1-C3-N2	2.20	121.08	119.49
4	A	202	A1DMK	O3-C20-N7	-2.20	106.99	110.62
4	F	202	A1DMK	C21-N7-C20	2.20	125.71	121.98
3	B	201	GNP	O3A-PB-N3B	-2.19	100.52	106.59
4	C	202	A1DMK	C6-N2-C3	2.17	117.10	115.61
4	C	202	A1DMK	O3-C20-N7	-2.14	107.08	110.62
4	E	202	A1DMK	C23-N8-C22	2.13	121.21	115.56
4	B	202	A1DMK	C4-C3-N2	-2.12	121.68	124.16
4	E	202	A1DMK	C21-N7-C20	2.09	125.53	121.98
4	F	202	A1DMK	C16-C15-C17	-2.09	121.84	127.00
4	D	202	A1DMK	C6-N2-C3	2.07	117.03	115.61
4	E	202	A1DMK	O3-C20-N7	-2.06	107.22	110.62
4	B	202	A1DMK	O3-C20-N7	-2.03	107.27	110.62
3	C	201	GNP	O2A-PA-O1A	2.03	121.88	112.44
3	A	201	GNP	O2A-PA-O1A	2.03	121.87	112.44
4	E	202	A1DMK	C25-C24-N9	2.02	107.92	104.61
3	E	201	GNP	O2A-PA-O1A	2.02	121.86	112.44
4	B	202	A1DMK	C21-N7-C20	2.02	125.40	121.98

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	B	202	A1DMK	C6-N2-C3	2.02	116.99	115.61
4	F	202	A1DMK	C6-N2-C3	2.01	116.99	115.61
4	D	202	A1DMK	C4-C3-N2	-2.01	121.81	124.16

There are no chirality outliers.

All (99) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	201	GNP	PB-N3B-PG-O1G
3	A	201	GNP	PG-N3B-PB-O1B
3	B	201	GNP	PB-N3B-PG-O1G
3	B	201	GNP	PG-N3B-PB-O1B
3	C	201	GNP	PB-N3B-PG-O1G
3	C	201	GNP	PG-N3B-PB-O1B
3	D	201	GNP	PB-N3B-PG-O1G
3	D	201	GNP	PG-N3B-PB-O1B
3	E	201	GNP	PB-N3B-PG-O1G
3	E	201	GNP	PG-N3B-PB-O1B
3	F	201	GNP	PB-N3B-PG-O1G
3	F	201	GNP	PG-N3B-PB-O1B
4	A	202	A1DMK	C19-C18-C9-C17
4	A	202	A1DMK	O3-C20-N7-C21
4	B	202	A1DMK	C19-C18-C9-C17
4	B	202	A1DMK	O3-C20-N7-C21
4	B	202	A1DMK	C4-C5-N8-C22
4	B	202	A1DMK	N1-C5-N8-C22
4	C	202	A1DMK	O3-C20-N7-C21
4	D	202	A1DMK	C19-C18-C9-C17
4	D	202	A1DMK	O3-C20-N7-C21
4	E	202	A1DMK	C19-C18-C9-C17
4	E	202	A1DMK	O3-C20-N7-C21
4	E	202	A1DMK	N1-C5-N8-C22
4	F	202	A1DMK	C19-C18-C9-C17
4	F	202	A1DMK	O3-C20-N7-C21
4	A	202	A1DMK	O4-C20-N7-C21
4	B	202	A1DMK	O4-C20-N7-C21
4	C	202	A1DMK	O4-C20-N7-C21
4	D	202	A1DMK	O4-C20-N7-C21
4	E	202	A1DMK	O4-C20-N7-C21
4	F	202	A1DMK	O4-C20-N7-C21
3	A	201	GNP	O4'-C4'-C5'-O5'
3	B	201	GNP	O4'-C4'-C5'-O5'

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Mol	Chain	Res	Type	Atoms
3	C	201	GNP	O4'-C4'-C5'-O5'
3	D	201	GNP	O4'-C4'-C5'-O5'
3	E	201	GNP	O4'-C4'-C5'-O5'
3	F	201	GNP	O4'-C4'-C5'-O5'
4	A	202	A1DMK	N7-C21-C22-N8
4	C	202	A1DMK	N7-C21-C22-N8
4	D	202	A1DMK	N7-C21-C22-N8
4	B	202	A1DMK	N7-C21-C22-N8
4	E	202	A1DMK	N7-C21-C22-N8
4	F	202	A1DMK	N7-C21-C22-N8
4	C	202	A1DMK	N7-C20-O3-C19
4	D	202	A1DMK	N7-C20-O3-C19
4	B	202	A1DMK	N1-C5-N8-C23
4	F	202	A1DMK	N7-C20-O3-C19
4	A	202	A1DMK	N7-C20-O3-C19
4	B	202	A1DMK	N7-C20-O3-C19
4	E	202	A1DMK	N7-C20-O3-C19
4	D	202	A1DMK	O4-C20-O3-C19
4	A	202	A1DMK	O4-C20-O3-C19
4	B	202	A1DMK	O4-C20-O3-C19
4	C	202	A1DMK	O4-C20-O3-C19
4	B	202	A1DMK	C4-C5-N8-C23
4	E	202	A1DMK	O4-C20-O3-C19
4	F	202	A1DMK	O4-C20-O3-C19
4	E	202	A1DMK	C4-C5-N8-C22
3	A	201	GNP	C3'-C4'-C5'-O5'
3	B	201	GNP	C3'-C4'-C5'-O5'
3	C	201	GNP	C3'-C4'-C5'-O5'
3	D	201	GNP	C3'-C4'-C5'-O5'
3	E	201	GNP	C3'-C4'-C5'-O5'
3	F	201	GNP	C3'-C4'-C5'-O5'
4	A	202	A1DMK	C19-C18-C9-C10
4	B	202	A1DMK	C19-C18-C9-C10
4	D	202	A1DMK	C19-C18-C9-C10
4	E	202	A1DMK	C19-C18-C9-C10
4	F	202	A1DMK	C19-C18-C9-C10
4	C	202	A1DMK	C19-C18-C9-C17
4	C	202	A1DMK	C19-C18-C9-C10
4	E	202	A1DMK	N1-C5-N8-C23
4	A	202	A1DMK	C22-C21-N7-C20
4	B	202	A1DMK	C22-C21-N7-C20
4	C	202	A1DMK	C22-C21-N7-C20

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Mol	Chain	Res	Type	Atoms
4	D	202	A1DMK	C22-C21-N7-C20
4	E	202	A1DMK	C22-C21-N7-C20
4	F	202	A1DMK	C22-C21-N7-C20
4	A	202	A1DMK	C4-C5-N8-C22
4	A	202	A1DMK	N1-C5-N8-C22
4	C	202	A1DMK	C4-C5-N8-C22
4	C	202	A1DMK	N1-C5-N8-C22
4	A	202	A1DMK	N1-C5-N8-C23
4	C	202	A1DMK	N1-C5-N8-C23
4	D	202	A1DMK	N1-C5-N8-C23
4	E	202	A1DMK	C1-C2-O1-C3
4	F	202	A1DMK	C1-C2-O1-C3
3	A	201	GNP	PB-O3A-PA-O2A
3	C	201	GNP	PB-O3A-PA-O2A
3	D	201	GNP	PB-O3A-PA-O2A
3	F	201	GNP	PB-O3A-PA-O2A
4	F	202	A1DMK	N1-C5-N8-C23
4	A	202	A1DMK	C4-C5-N8-C23
4	C	202	A1DMK	C4-C5-N8-C23
4	E	202	A1DMK	C4-C5-N8-C23
3	F	201	GNP	PG-N3B-PB-O3A
4	D	202	A1DMK	N1-C5-N8-C22
4	F	202	A1DMK	N1-C5-N8-C22

There are no ring outliers.

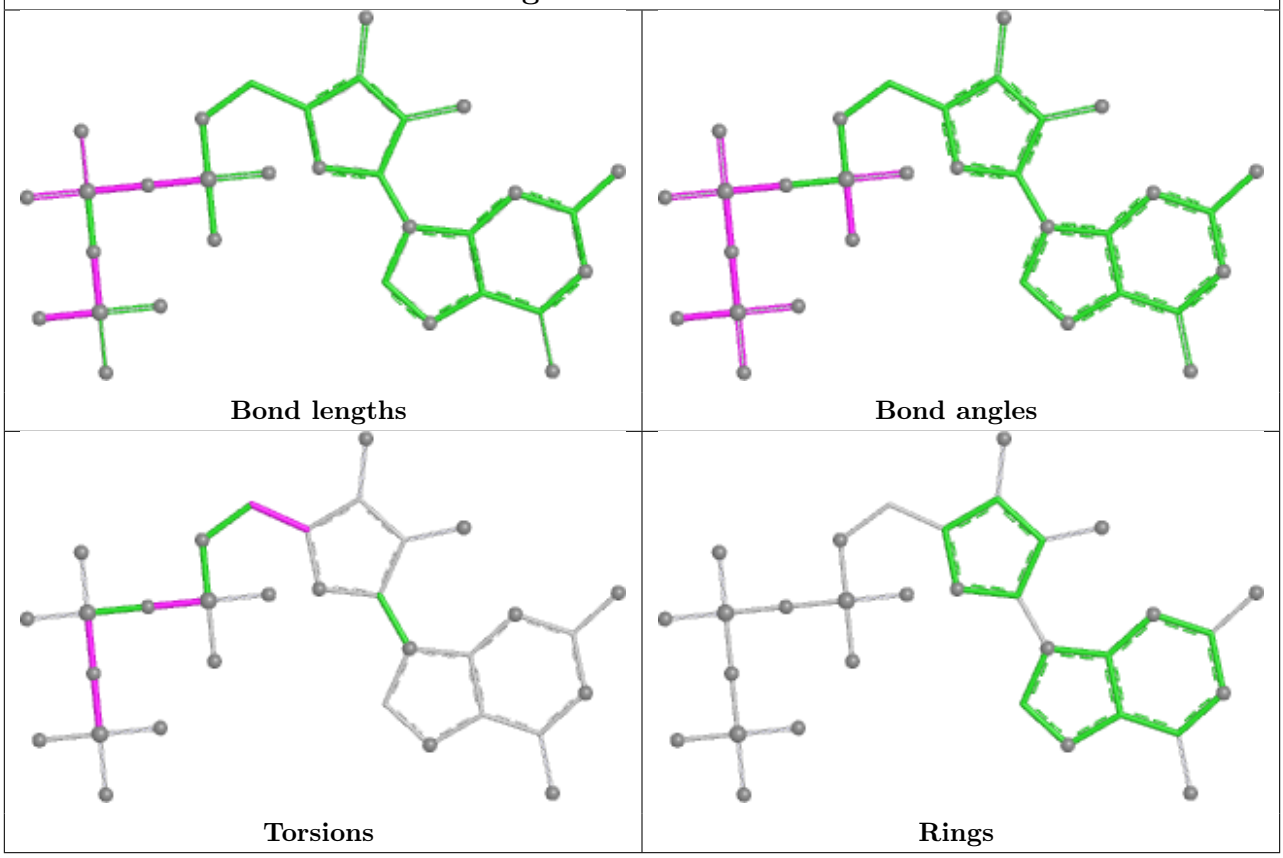
4 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	201	GNP	1	0
4	F	202	A1DMK	1	0
4	A	202	A1DMK	1	0
3	E	201	GNP	1	0

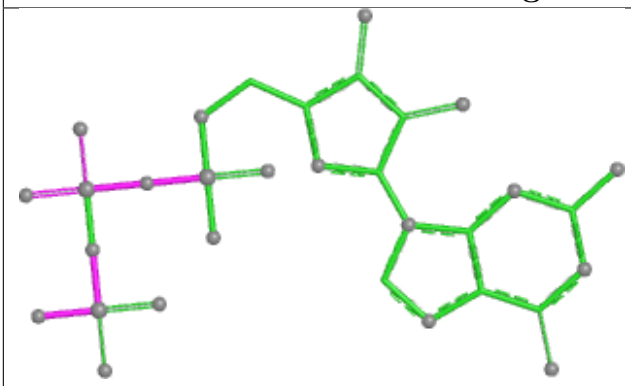
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.

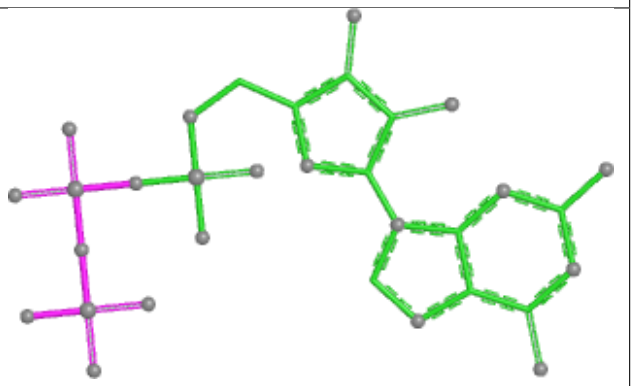
Ligand GNP C 201



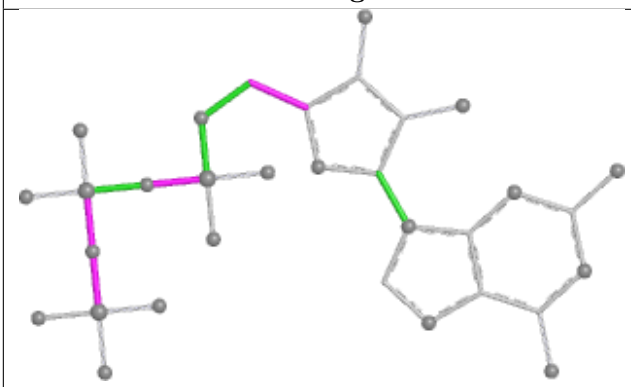
Ligand GNP F 201



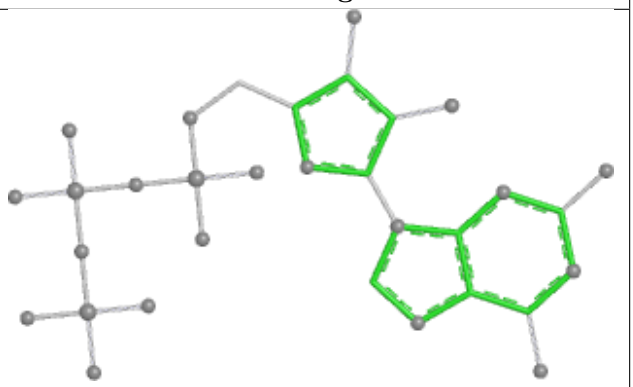
Bond lengths



Bond angles

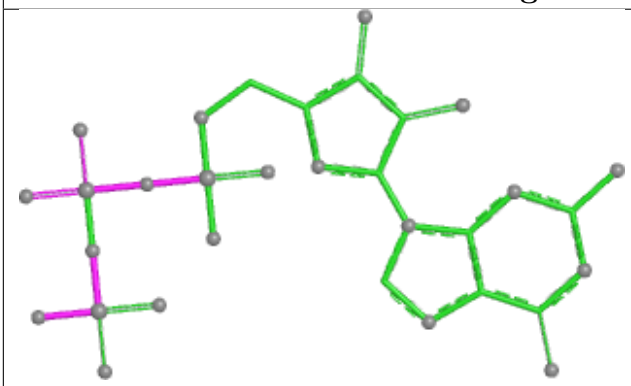


Torsions

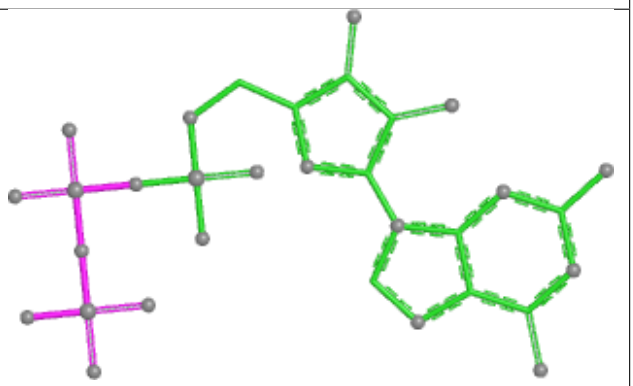


Rings

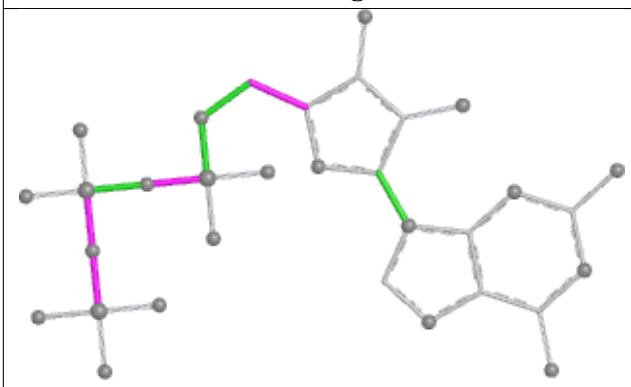
Ligand GNP D 201



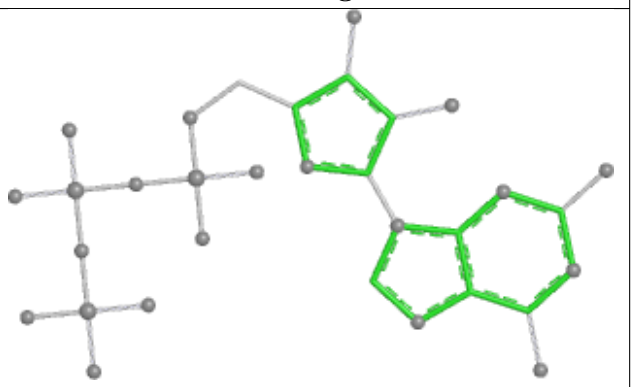
Bond lengths



Bond angles

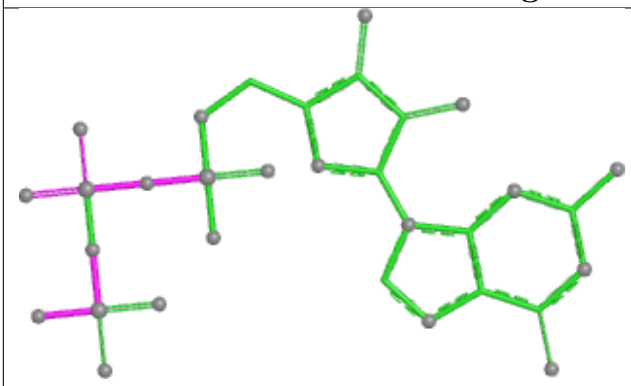


Torsions

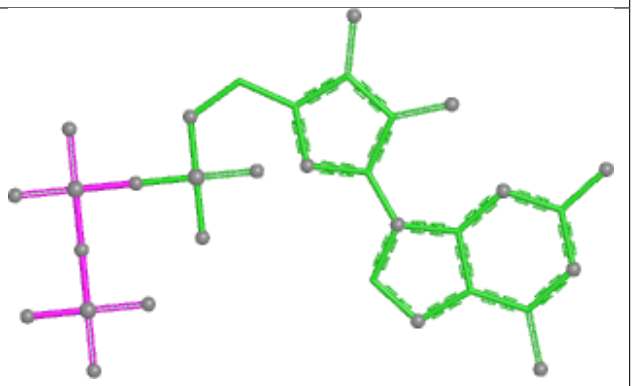


Rings

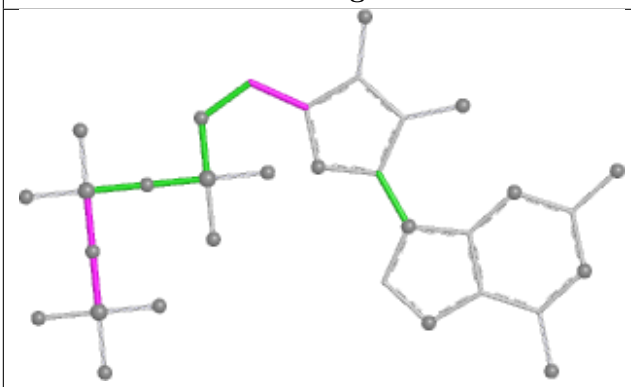
Ligand GNP B 201



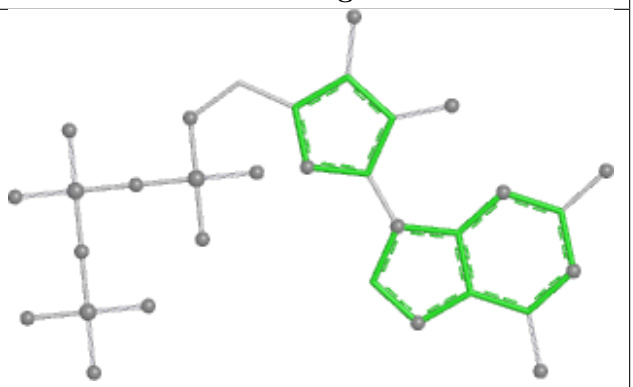
Bond lengths



Bond angles



Torsions

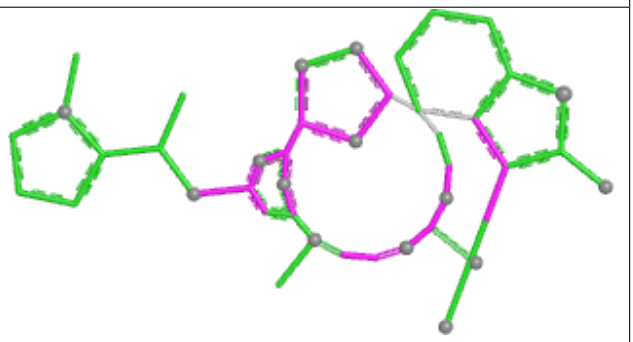


Rings

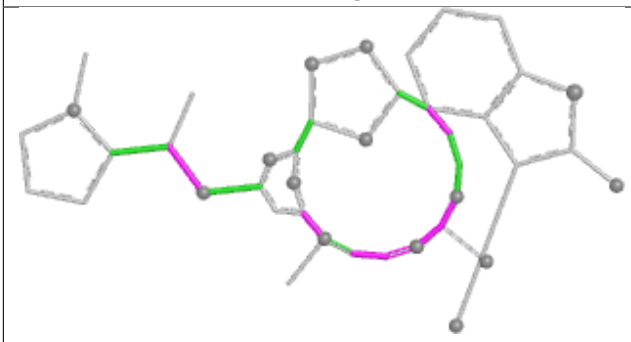
Ligand A1DMK F 202



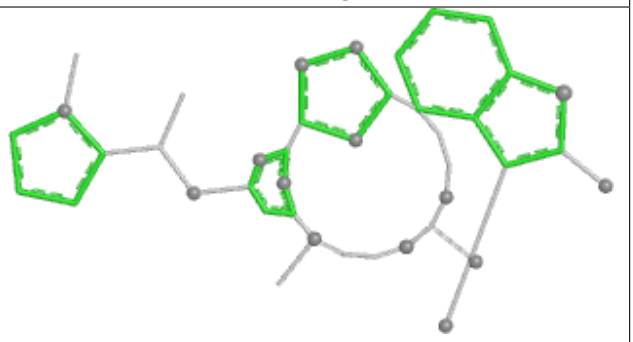
Bond lengths



Bond angles

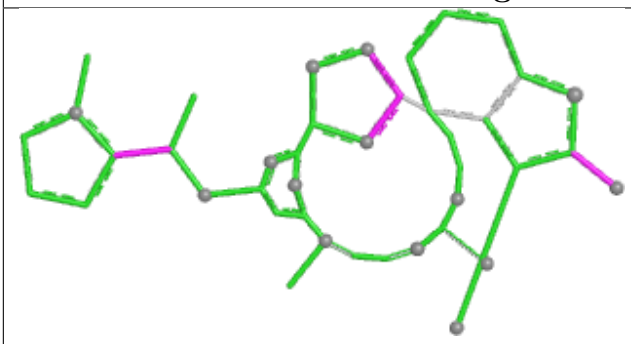


Torsions

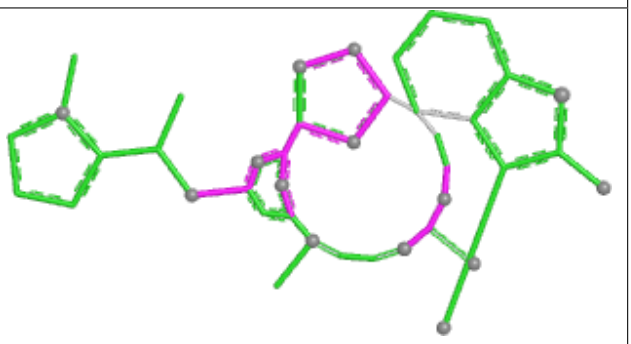


Rings

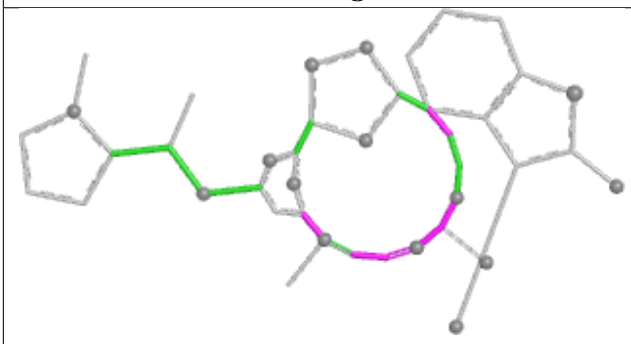
Ligand A1DMK A 202



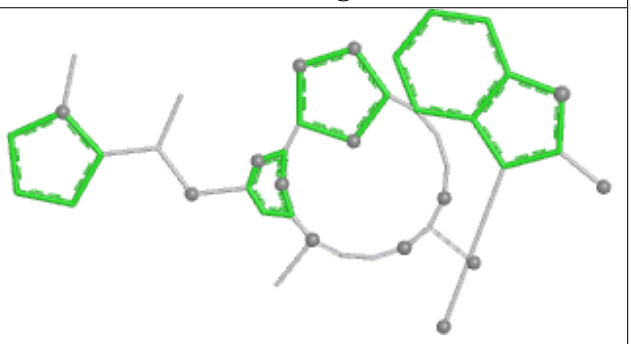
Bond lengths



Bond angles

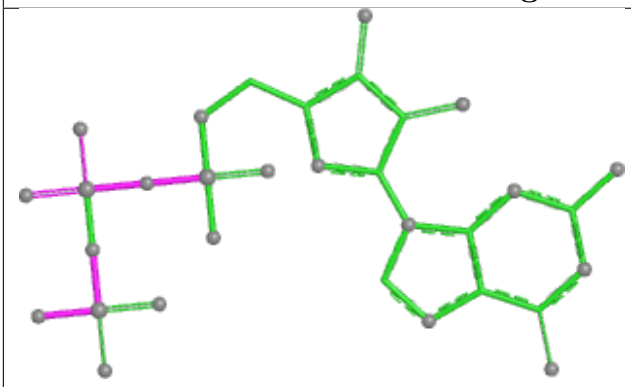


Torsions

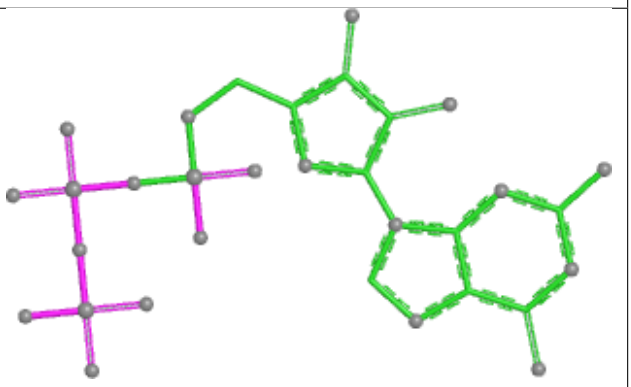


Rings

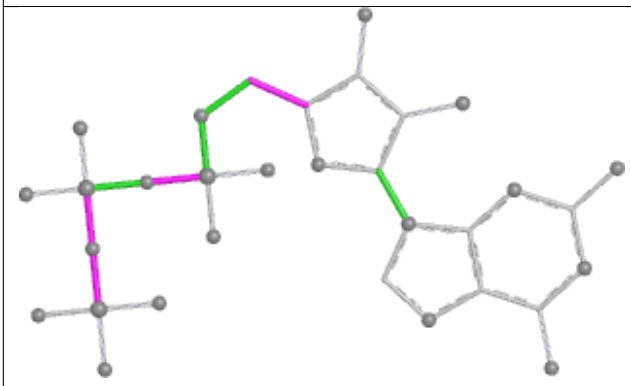
Ligand GNP A 201



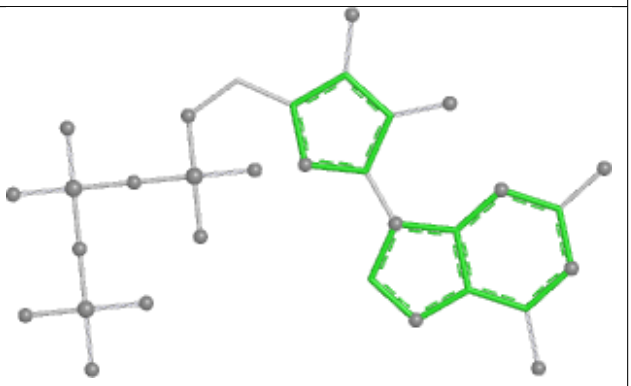
Bond lengths



Bond angles

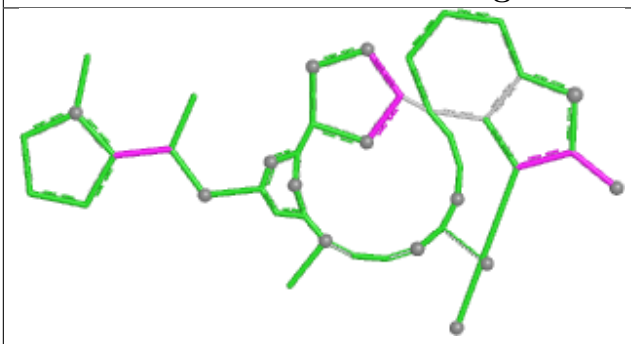


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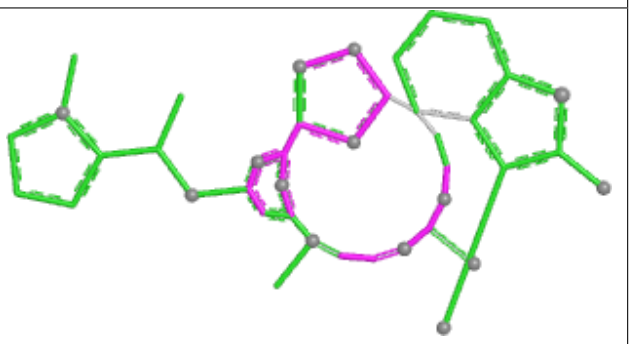


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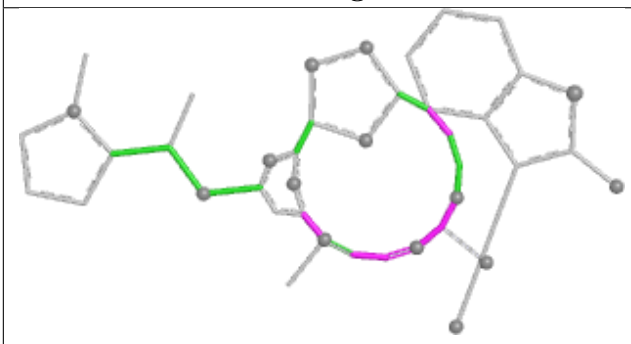
Ligand A1DMK D 202



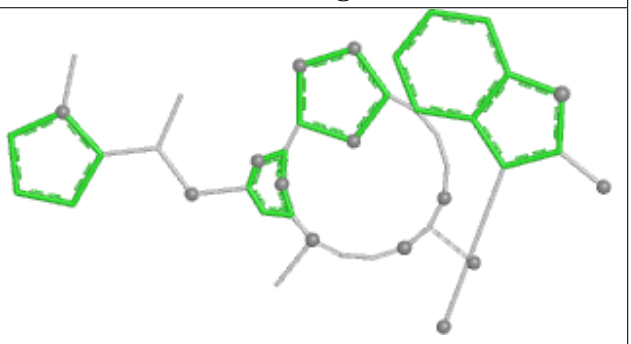
Bond lengths



Bond angles

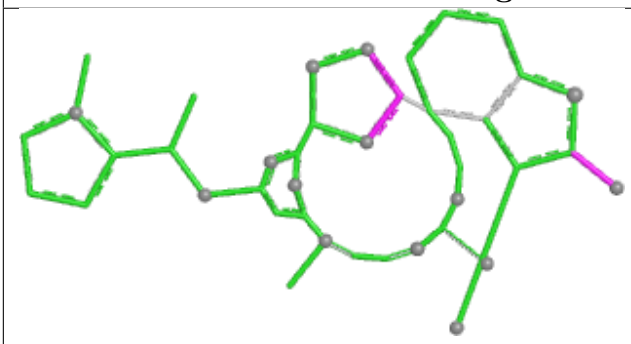


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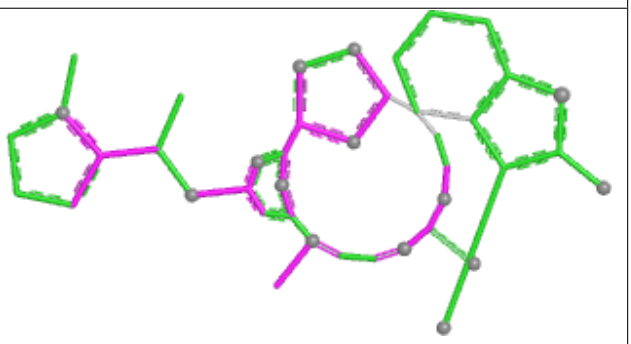


Rings

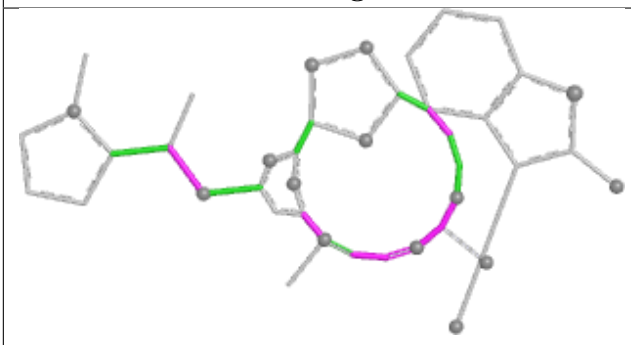
Ligand A1DMK E 202



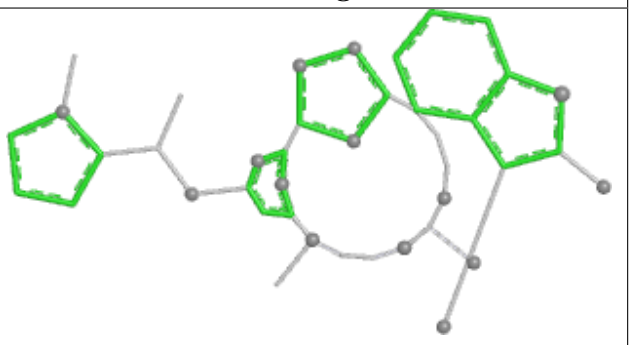
Bond lengths



Bond angles

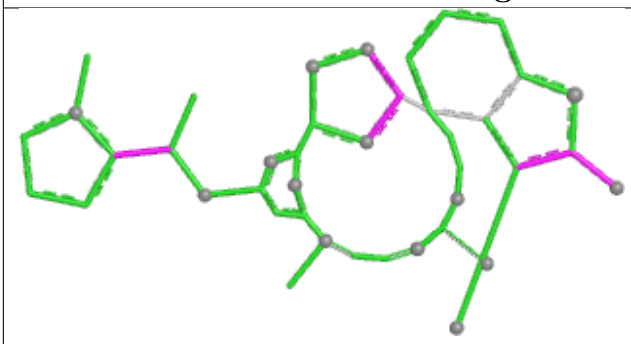


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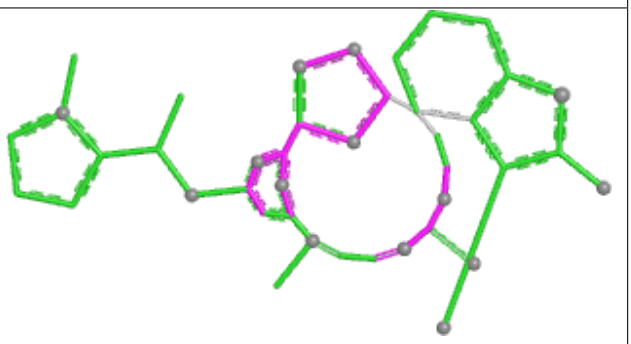


Rings

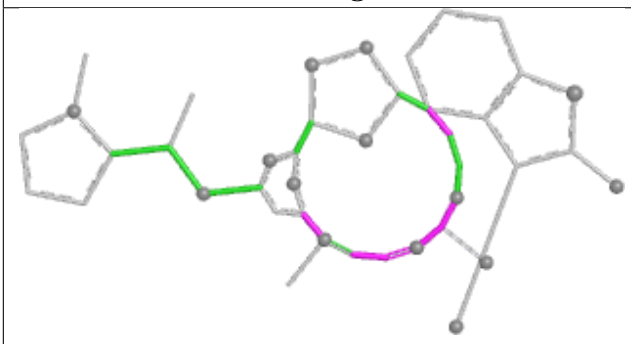
Ligand A1DMK B 202



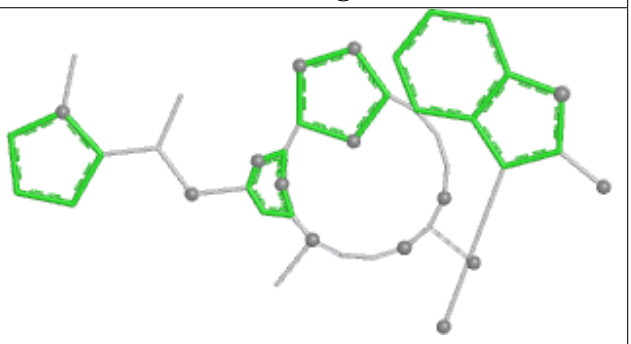
Bond lengths



Bond angles

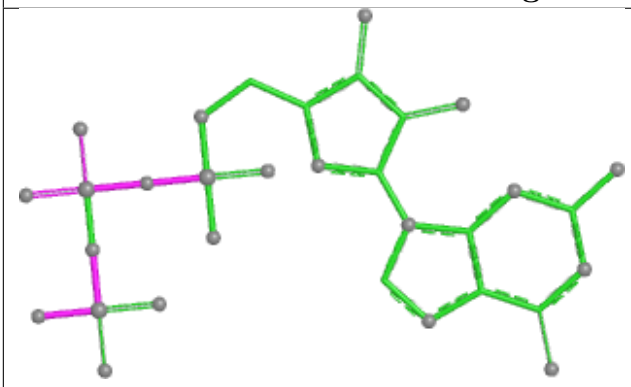


Torsions

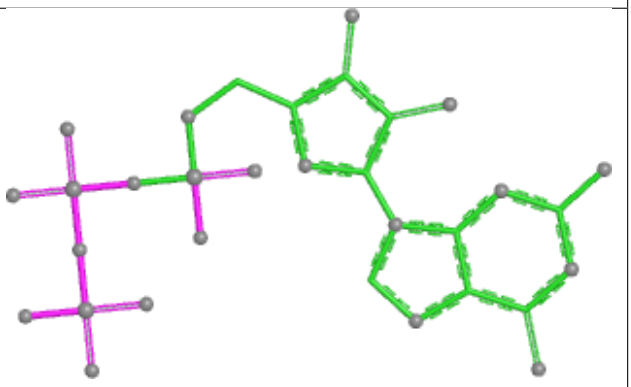


Rings

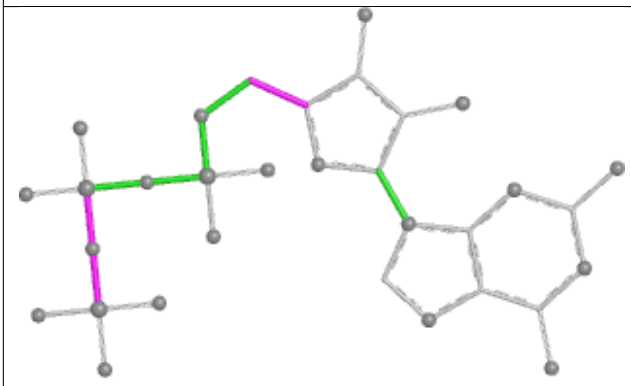
Ligand GNP E 201



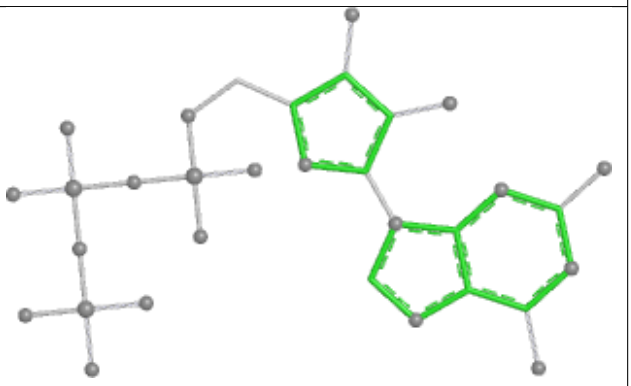
Bond lengths



Bond angles

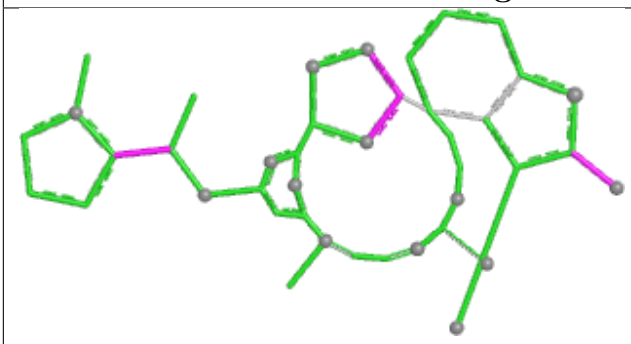


Torsions

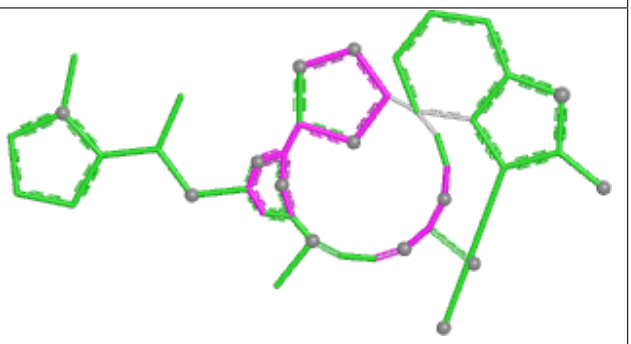


Rings

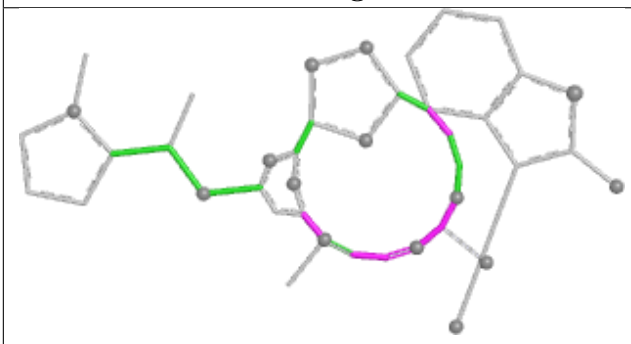
Ligand A1DMK C 202



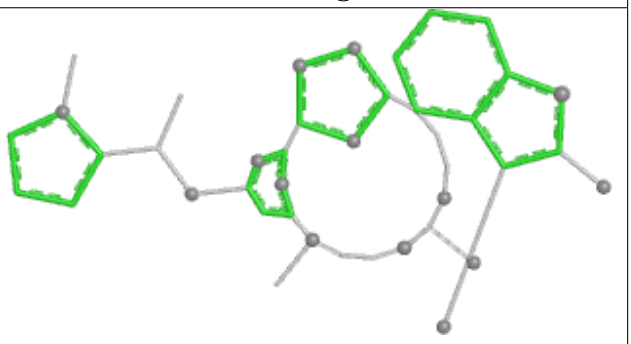
Bond lengths



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%)	-1.53	0	100	100	25, 39, 71, 99	0
1	B	168/171 (98%)	-1.52	0	100	100	27, 40, 74, 98	0
1	C	166/171 (97%)	-1.46	0	100	100	29, 46, 82, 134	0
1	D	163/171 (95%)	-1.45	0	100	100	31, 46, 75, 112	1 (0%)
1	E	167/171 (97%)	-0.55	0	100	100	53, 104, 139, 176	2 (1%)
1	F	165/171 (96%)	-0.68	0	100	100	56, 100, 129, 174	0
All	All	997/1026 (97%)	-1.20	0	100	100	25, 53, 123, 176	3 (0%)

There are no RSRZ outliers to report.

6.2 Non-standard residues in protein, DNA, RNA chains

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

6.3 Carbohydrates

There are no oligosaccharides 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, 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
2	MG	E	200	1/1	0.99	0.05	88,88,88,88	0

Continued on next page...

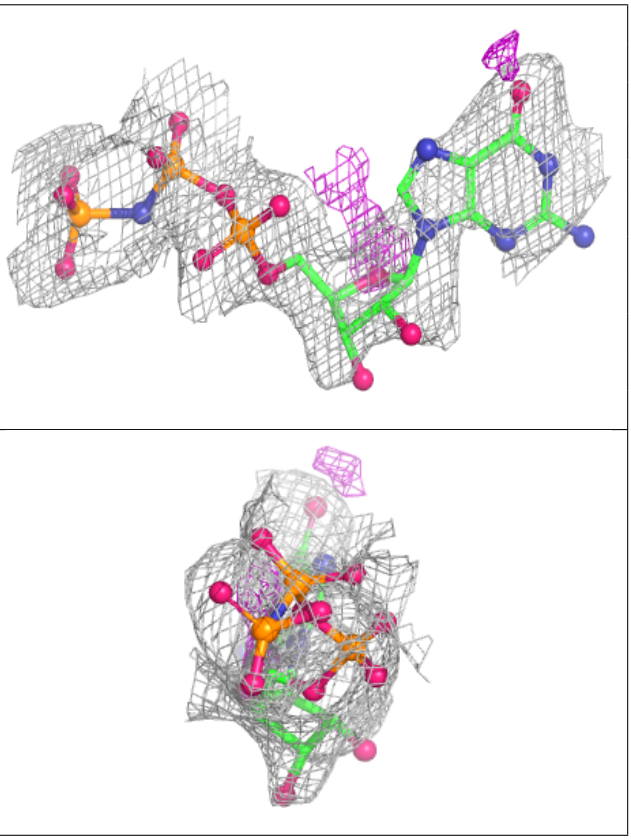
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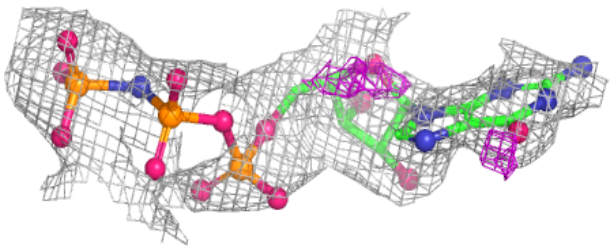
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	MG	F	200	1/1	0.99	0.02	82,82,82,82	0
3	GNP	E	201	32/32	0.99	0.05	86,107,110,113	0
3	GNP	F	201	32/32	0.99	0.04	78,100,105,108	0
4	A1DMK	C	202	42/42	0.99	0.03	26,34,42,51	0
4	A1DMK	E	202	42/42	0.99	0.05	50,92,101,108	0
4	A1DMK	F	202	42/42	0.99	0.05	48,89,98,100	0
3	GNP	B	201	32/32	1.00	0.02	31,42,49,51	0
3	GNP	C	201	32/32	1.00	0.02	36,54,64,73	0
3	GNP	D	201	32/32	1.00	0.02	38,52,64,67	0
2	MG	C	200	1/1	1.00	0.02	44,44,44,44	0
2	MG	D	200	1/1	1.00	0.02	40,40,40,40	0
4	A1DMK	A	202	42/42	1.00	0.02	21,31,35,43	0
4	A1DMK	B	202	42/42	1.00	0.02	23,30,38,59	0
2	MG	A	200	1/1	1.00	0.03	34,34,34,34	0
4	A1DMK	D	202	42/42	1.00	0.03	24,35,41,44	0
2	MG	B	200	1/1	1.00	0.03	41,41,41,41	0
3	GNP	A	201	32/32	1.00	0.02	29,39,44,46	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 E 201:

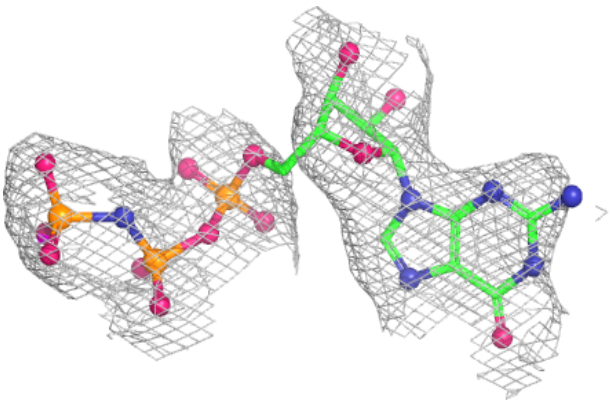
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

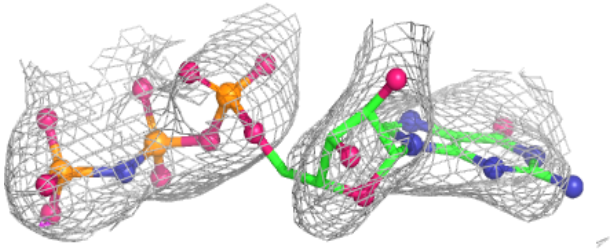




Electron density around GNP F 201:

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

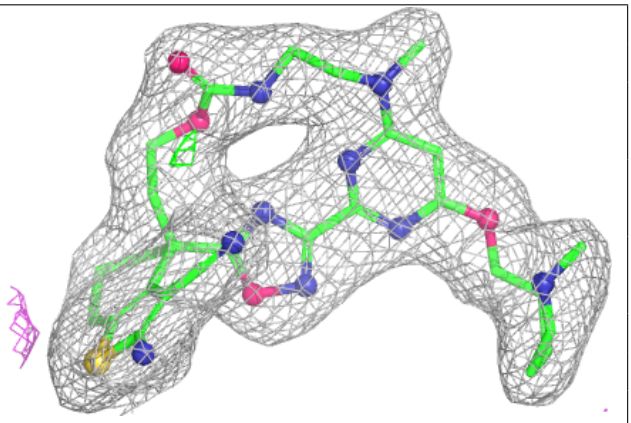


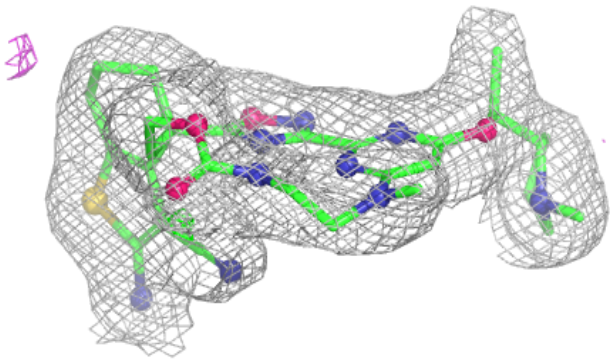


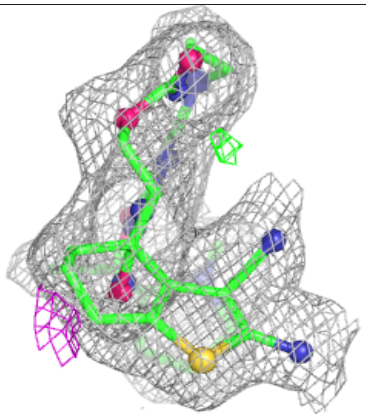


Electron density around A1DMK C 202:

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

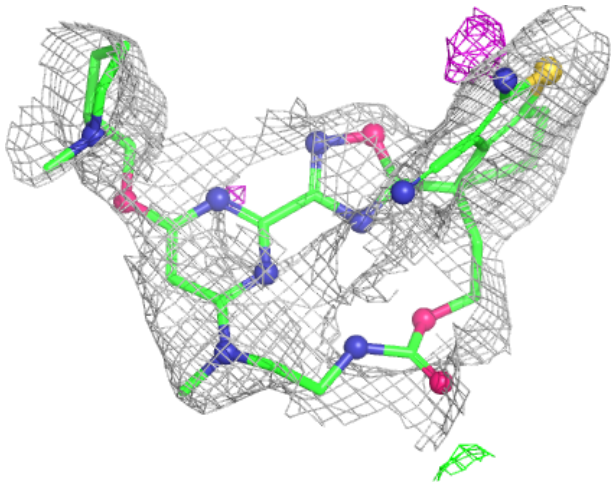


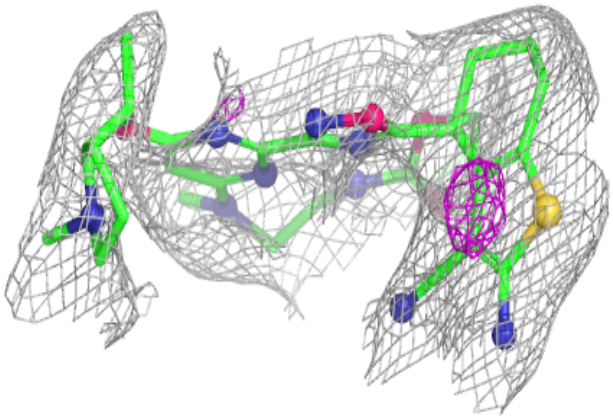


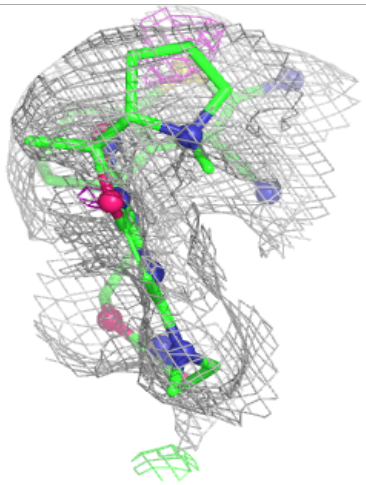


Electron density around A1DMK E 202:

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

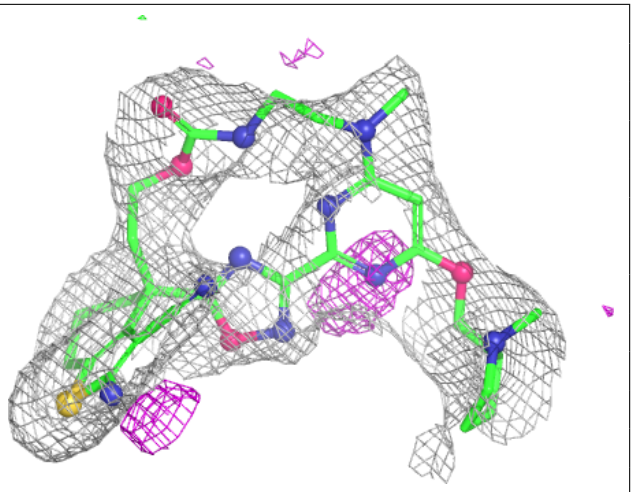


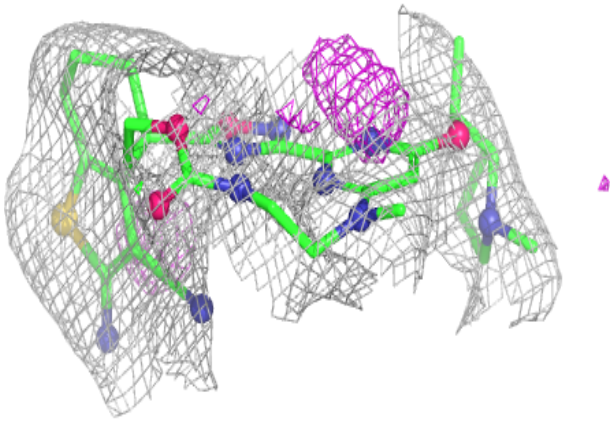


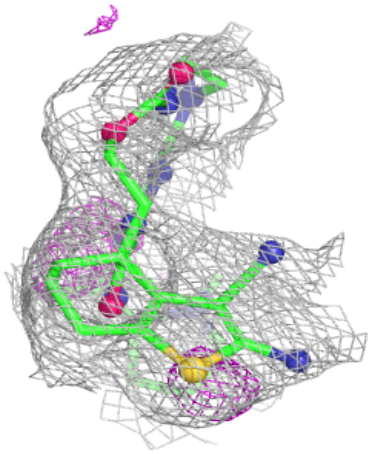


Electron density around A1DMK F 202:

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

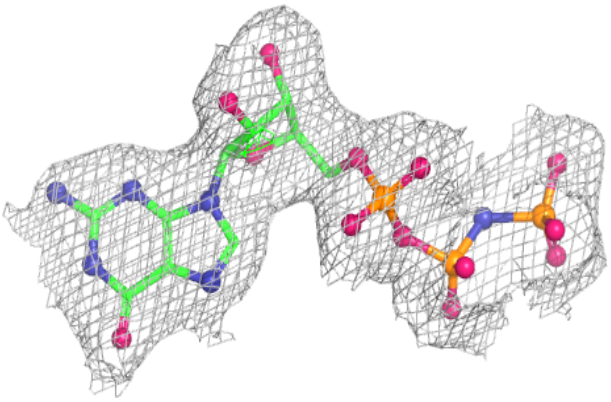


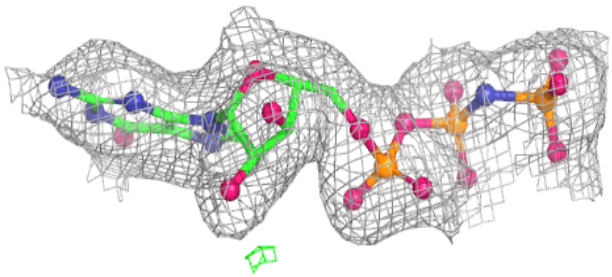


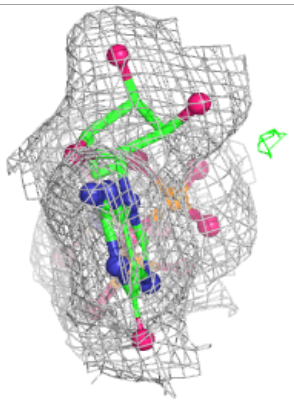


Electron density around GNP B 201:

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

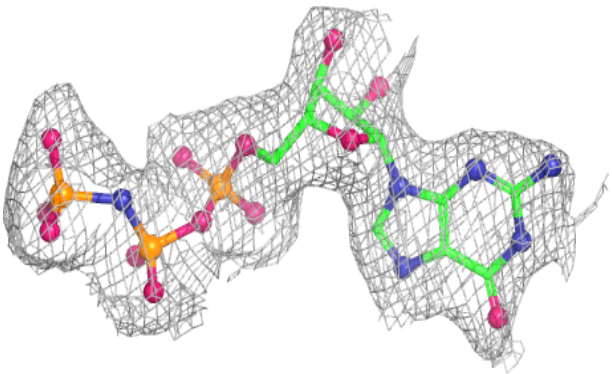


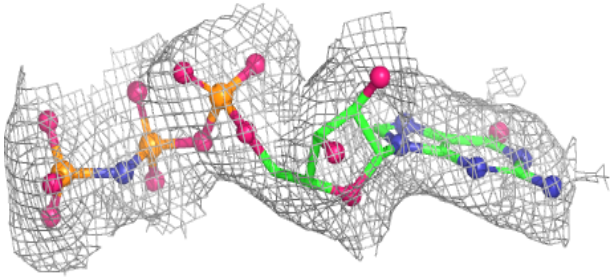


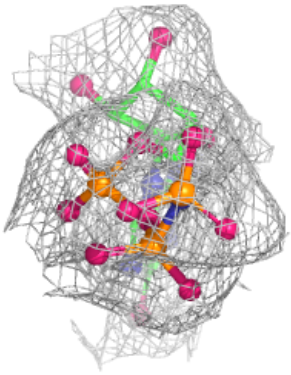


Electron density around GNP C 201:

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

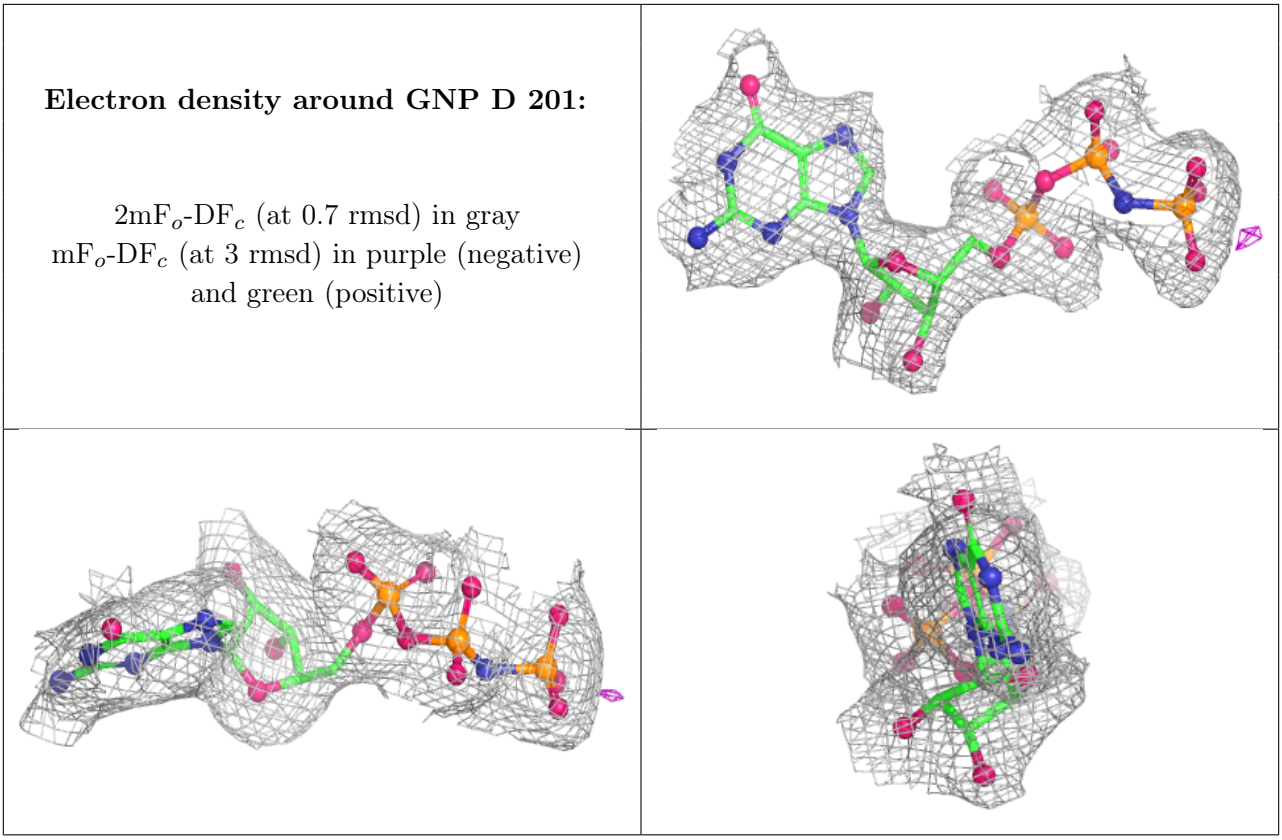






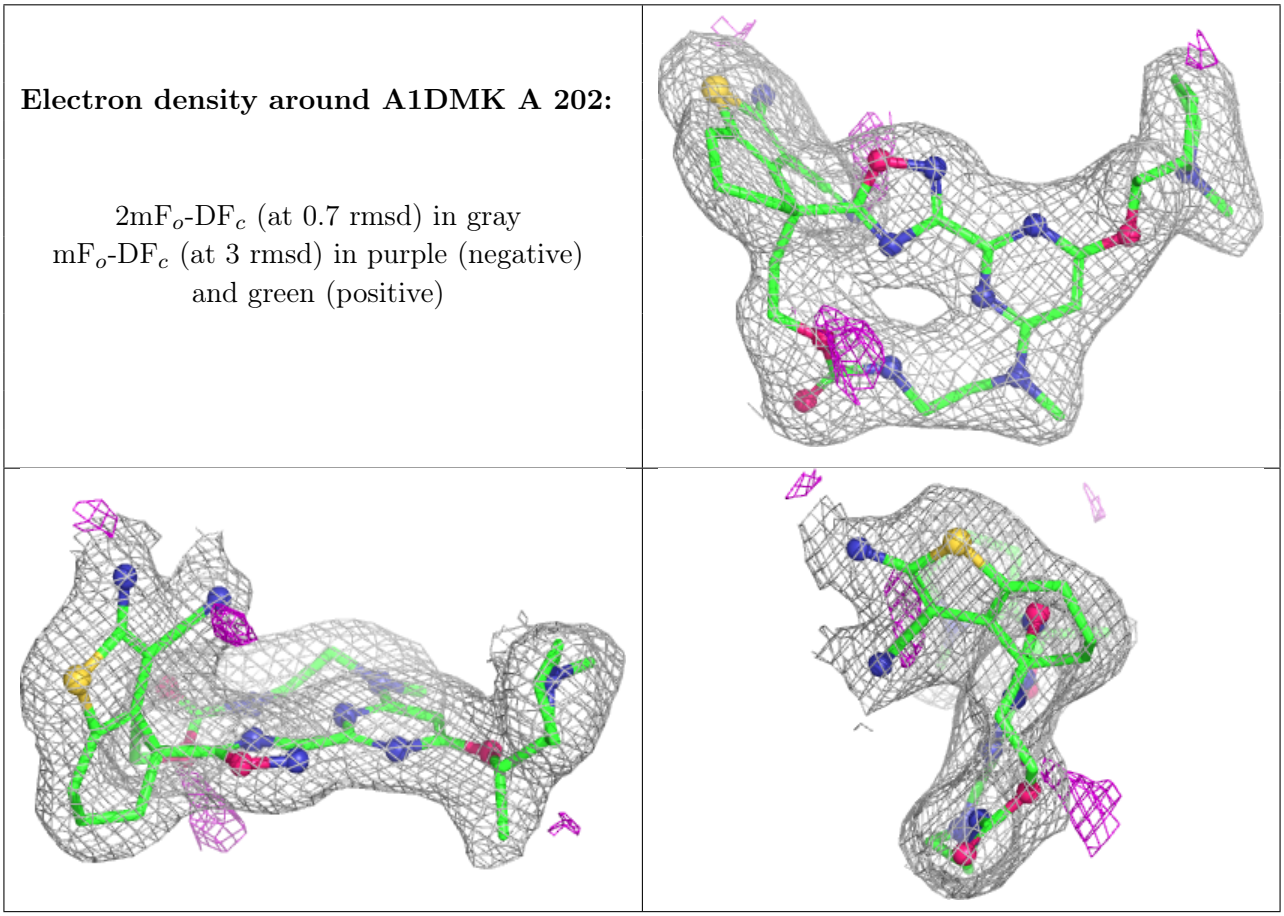
Electron density around GNP D 201:

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



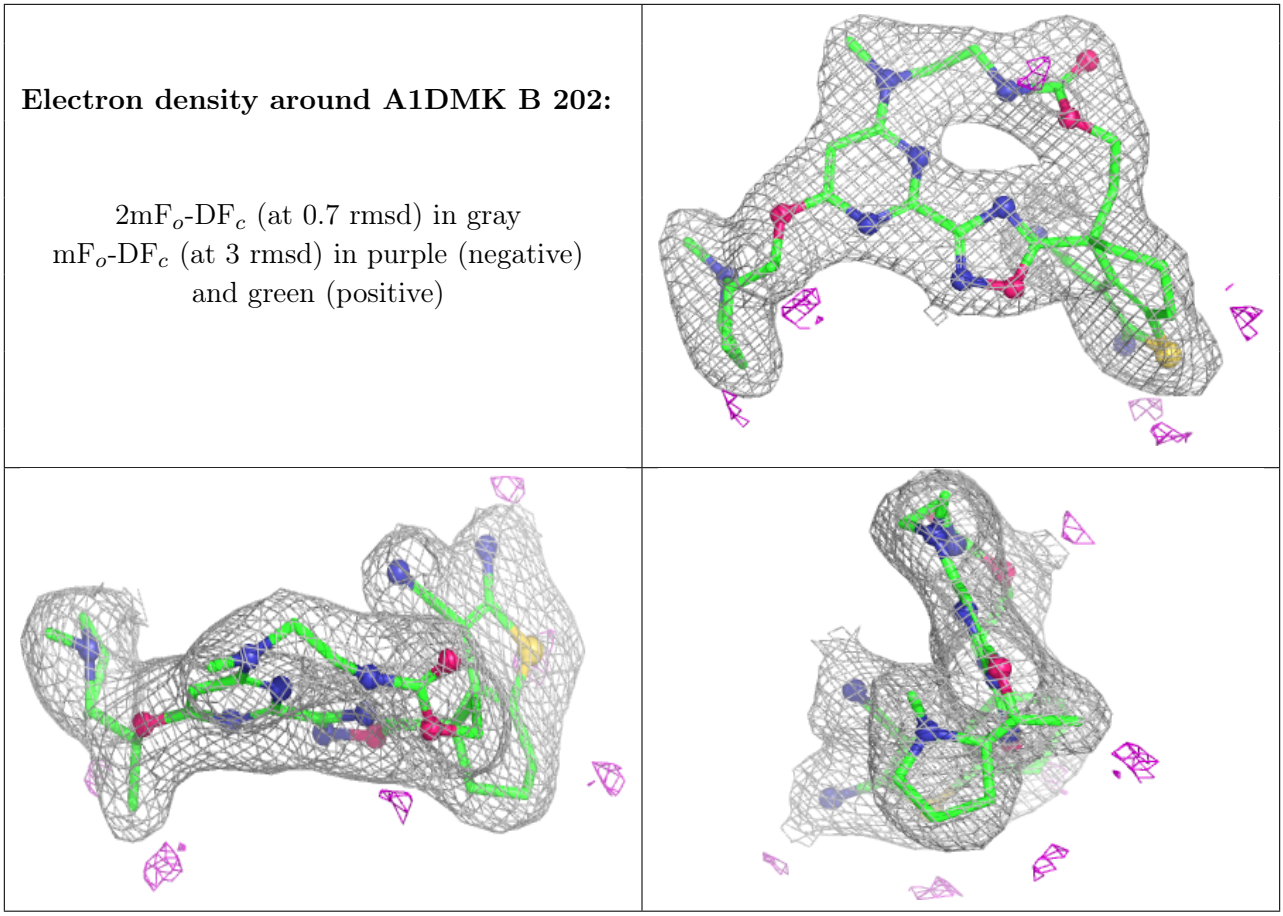
Electron density around A1DMK A 202:

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



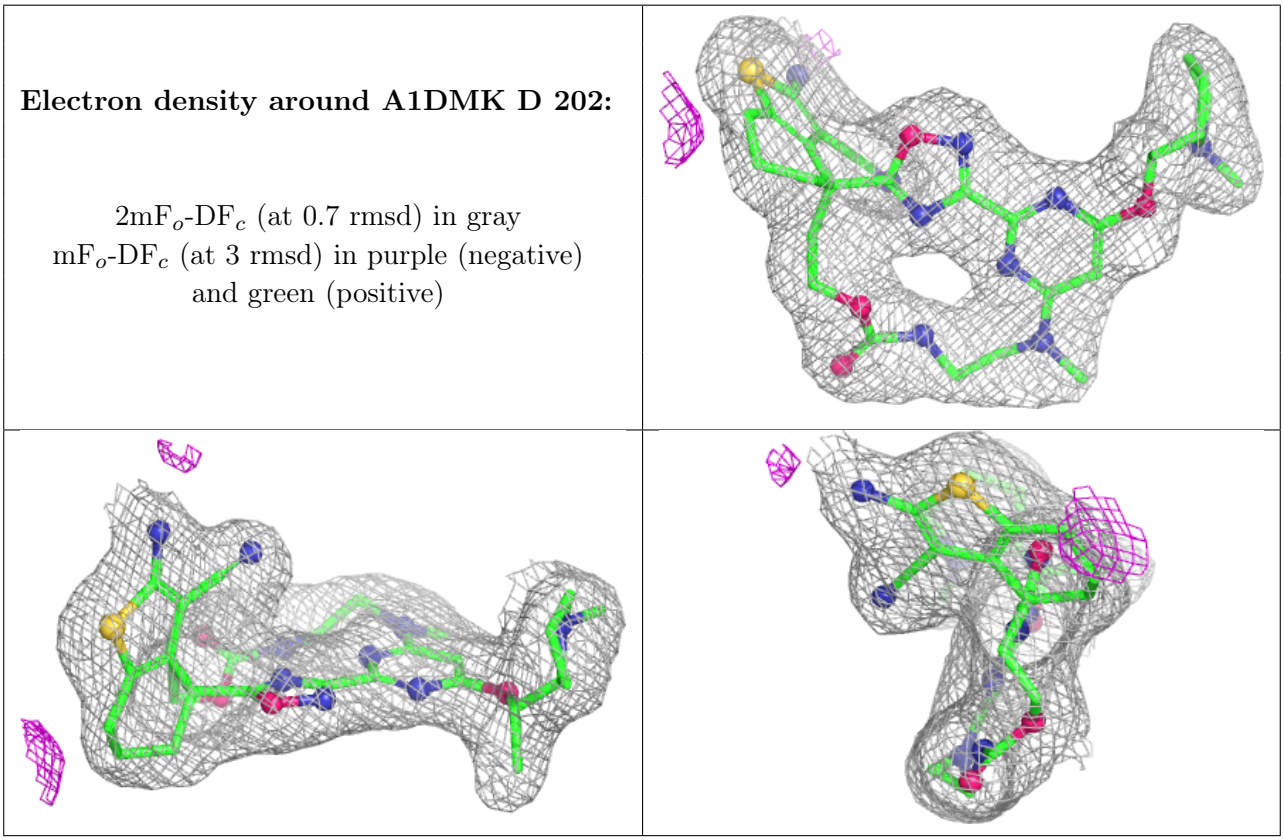
Electron density around A1DMK B 202:

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



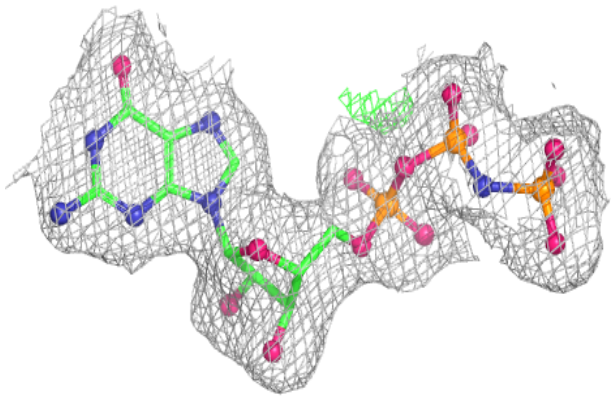
Electron density around A1DMK D 202:

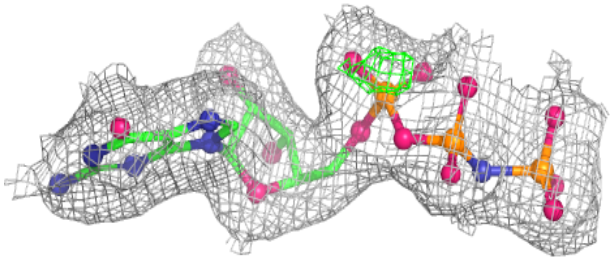
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

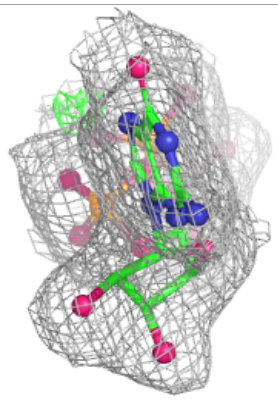


Electron density around GNP A 201:

$2mF_o$-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.