Full wwPDB X-ray Structure Validation Report ⓘ

Apr 29, 2025 – 09:10 AM EDT

PDB ID	:	2Q3E / pdb_00002q3e
Title	:	Structure of human UDP-glucose dehydrogenase complexed with NADH and UDP-glucose
Authors	:	Kavanagh, K.L.; Guo, K.; Bunkoczi, G.; Savitsky, P.; Pilka, E.; Bhatia, C.; Smee, C.; Berridge, G.; von Delft, F.; Wiegelt, J.; Arrowsmith, C.; Sundstrom, M.; Edwards, A.; Oppermann, U.; Structural Genomics Consortium (SGC)
Deposited on	:	2007-05-30
Resolution	:	2.00 Å(reported)

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

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

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

The following versions of software and data (see references (1)) were used in the production of this report:

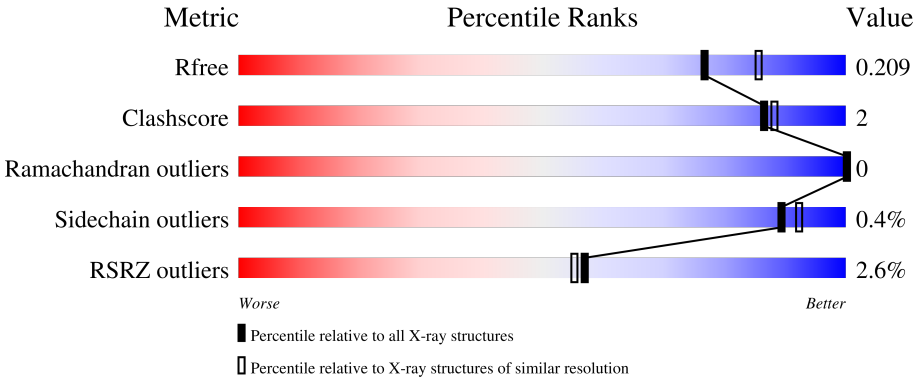
MolProbity	:	4-5-2 with Phenix2.0rc1
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.006 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.43.1

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 2.00 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	9409 (2.00-2.00)
Clashscore	180529	10737 (2.00-2.00)
Ramachandran outliers	177936	10628 (2.00-2.00)
Sidechain outliers	177891	10627 (2.00-2.00)
RSRZ outliers	164620	9409 (2.00-2.00)

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	467	94%
1	B	467	5% 95%
1	C	467	94%
1	D	467	2% 95%
1	E	467	95%

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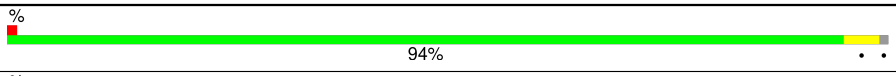
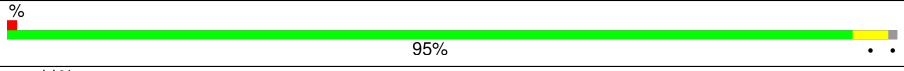
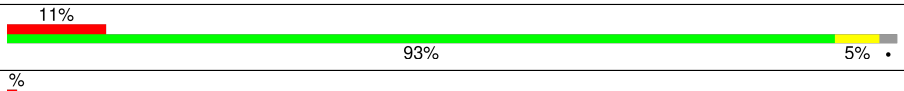
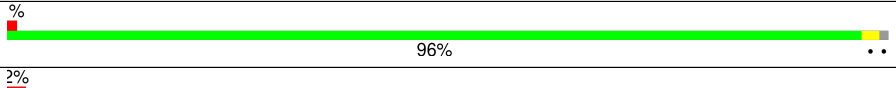
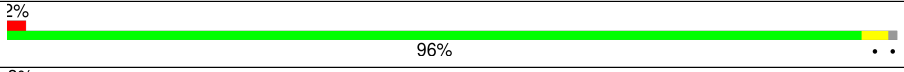
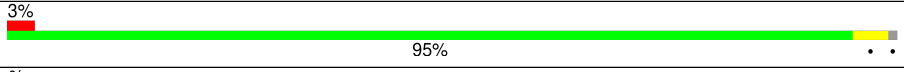
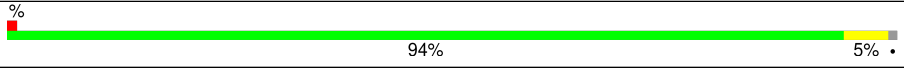
Mol	Chain	Length	Quality of chain
1	F	467	
1	G	467	
1	H	467	
1	I	467	
1	J	467	
1	K	467	
1	L	467	

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 46652 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 UDP-glucose 6-dehydrogenase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	460	Total	C	N	O	S	0	7	0
			3629	2299	624	685	21			
1	B	460	Total	C	N	O	S	0	1	0
			3556	2255	609	672	20			
1	C	460	Total	C	N	O	S	0	5	0
			3598	2278	618	682	20			
1	D	458	Total	C	N	O	S	0	3	0
			3569	2264	609	676	20			
1	E	459	Total	C	N	O	S	0	3	0
			3567	2264	612	671	20			
1	F	460	Total	C	N	O	S	0	2	0
			3573	2265	612	676	20			
1	G	460	Total	C	N	O	S	0	2	0
			3579	2268	610	681	20			
1	H	459	Total	C	N	O	S	0	3	0
			3548	2250	604	674	20			
1	I	460	Total	C	N	O	S	0	4	0
			3593	2275	618	679	21			
1	J	460	Total	C	N	O	S	0	3	0
			3575	2266	614	675	20			
1	K	460	Total	C	N	O	S	0	3	0
			3580	2268	615	677	20			
1	L	460	Total	C	N	O	S	0	2	0
			3568	2261	611	676	20			

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	0	SER	-	cloning artifact	UNP O60701
B	0	SER	-	cloning artifact	UNP O60701
C	0	SER	-	cloning artifact	UNP O60701
D	0	SER	-	cloning artifact	UNP O60701
E	0	SER	-	cloning artifact	UNP O60701

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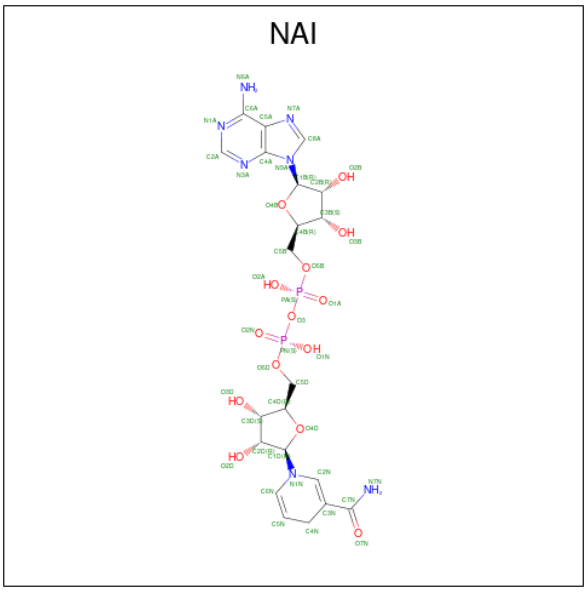
Chain	Residue	Modelled	Actual	Comment	Reference
F	0	SER	-	cloning artifact	UNP O60701
G	0	SER	-	cloning artifact	UNP O60701
H	0	SER	-	cloning artifact	UNP O60701
I	0	SER	-	cloning artifact	UNP O60701
J	0	SER	-	cloning artifact	UNP O60701
K	0	SER	-	cloning artifact	UNP O60701
L	0	SER	-	cloning artifact	UNP O60701

- Molecule 2 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

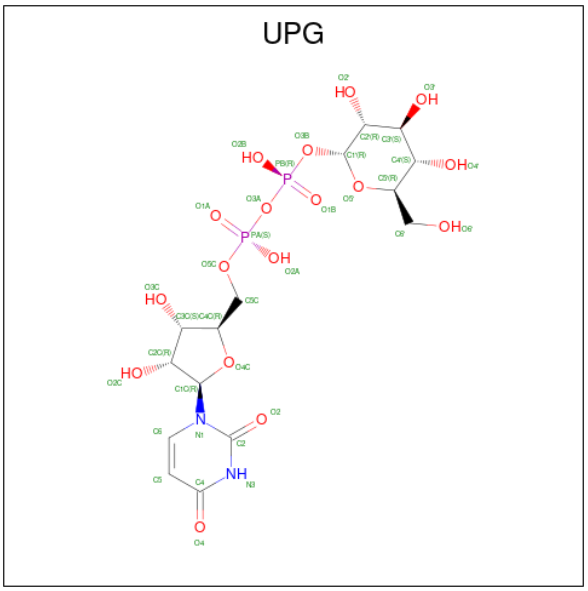
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total Cl 1 1	0	0
2	B	1	Total Cl 1 1	0	0
2	C	1	Total Cl 1 1	0	0
2	D	1	Total Cl 1 1	0	0
2	E	1	Total Cl 1 1	0	0
2	F	1	Total Cl 1 1	0	0
2	G	1	Total Cl 1 1	0	0
2	H	1	Total Cl 1 1	0	0
2	I	1	Total Cl 1 1	0	0
2	J	1	Total Cl 1 1	0	0
2	K	1	Total Cl 1 1	0	0
2	L	1	Total Cl 1 1	0	0

- Molecule 3 is 1,4-DIHYDRONICOTINAMIDE ADENINE DINUCLEOTIDE (CCD ID: NAI) (formula: $C_{21}H_{29}N_7O_{14}P_2$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
3	B	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
3	C	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
3	D	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
3	E	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
3	F	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
3	G	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
3	H	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
3	I	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
3	J	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
3	K	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
3	L	1	Total	C	N	O	P	0	0
			44	21	7	14	2		

- Molecule 4 is URIDINE-5'-DIPHOSPHATE-GLUCOSE (CCD ID: UPG) (formula: $C_{15}H_{24}N_2O_{17}P_2$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	N	O	P	0	0
			36	15	2	17	2		
4	B	1	Total	C	N	O	P	0	0
			36	15	2	17	2		
4	C	1	Total	C	N	O	P	0	0
			36	15	2	17	2		
4	D	1	Total	C	N	O	P	0	0
			36	15	2	17	2		
4	E	1	Total	C	N	O	P	0	0
			36	15	2	17	2		
4	F	1	Total	C	N	O	P	0	0
			36	15	2	17	2		
4	G	1	Total	C	N	O	P	0	0
			36	15	2	17	2		
4	H	1	Total	C	N	O	P	0	0
			36	15	2	17	2		
4	I	1	Total	C	N	O	P	0	0
			36	15	2	17	2		
4	J	1	Total	C	N	O	P	0	0
			36	15	2	17	2		
4	K	1	Total	C	N	O	P	0	0
			36	15	2	17	2		
4	L	1	Total	C	N	O	P	0	0
			36	15	2	17	2		

- Molecule 5 is water.

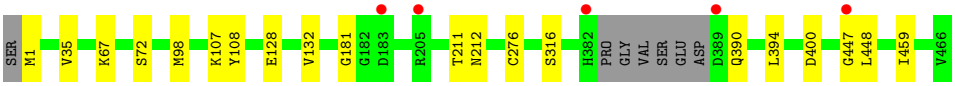
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	287	Total O 287 287	0	0
5	B	175	Total O 175 175	0	0
5	C	283	Total O 283 283	0	0
5	D	236	Total O 236 236	0	0
5	E	268	Total O 268 268	0	0
5	F	227	Total O 227 227	0	0
5	G	263	Total O 263 263	0	0
5	H	130	Total O 130 130	0	0
5	I	254	Total O 254 254	0	0
5	J	195	Total O 195 195	0	0
5	K	234	Total O 234 234	0	0
5	L	193	Total O 193 193	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.

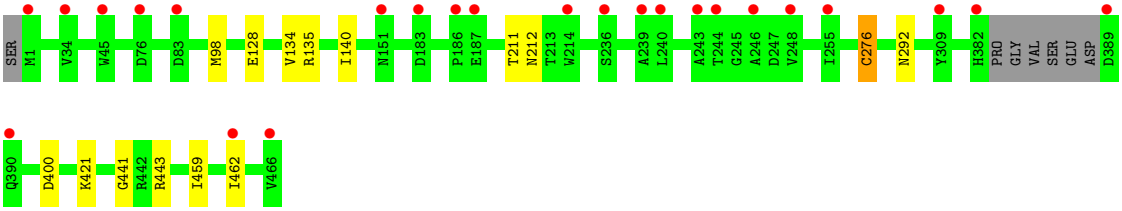
• Molecule 1: UDP-glucose 6-dehydrogenase

Chain A:



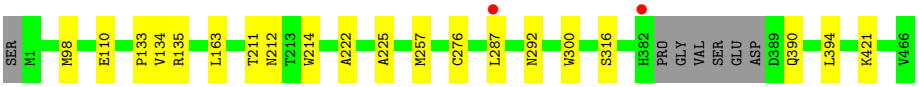
• Molecule 1: UDP-glucose 6-dehydrogenase

Chain B:



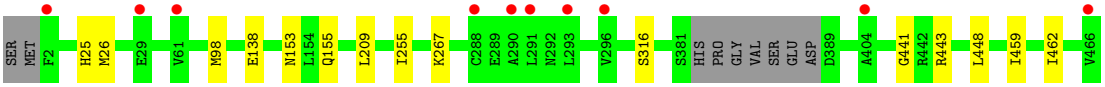
• Molecule 1: UDP-glucose 6-dehydrogenase

Chain C:



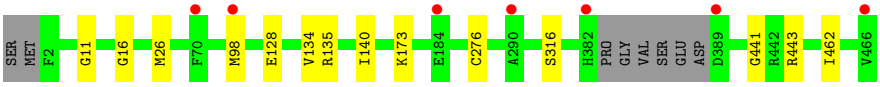
• Molecule 1: UDP-glucose 6-dehydrogenase

Chain D:



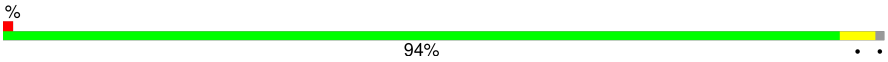
• Molecule 1: UDP-glucose 6-dehydrogenase

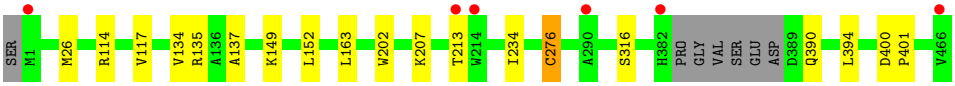
Chain E:



• Molecule 1: UDP-glucose 6-dehydrogenase

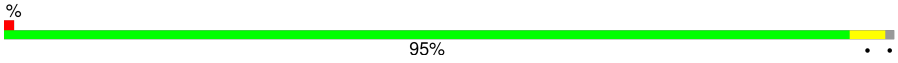
Chain F:

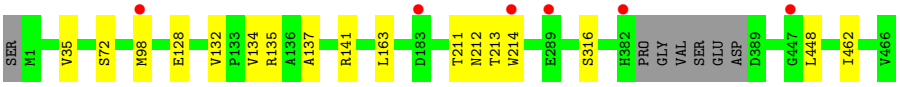




• Molecule 1: UDP-glucose 6-dehydrogenase

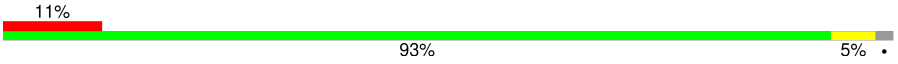
Chain G:

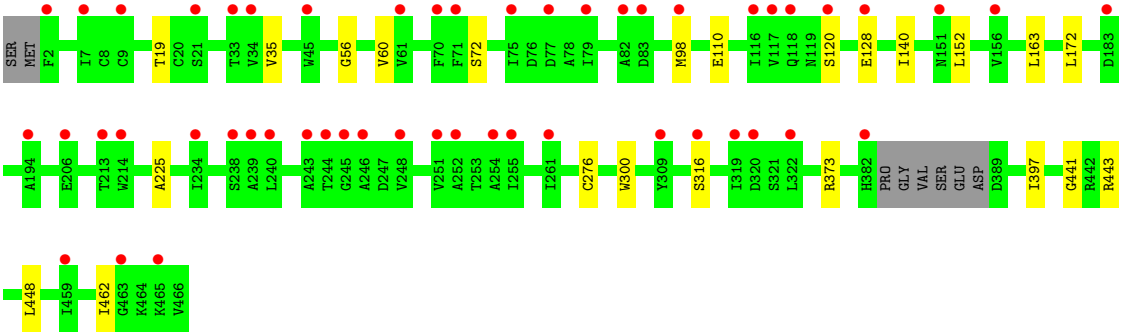




• Molecule 1: UDP-glucose 6-dehydrogenase

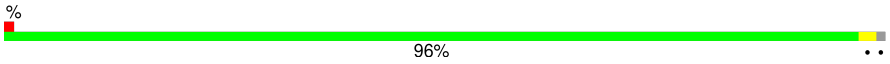
Chain H:

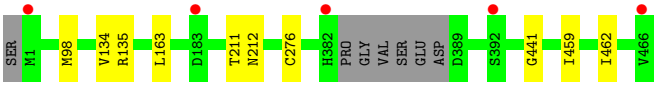




• Molecule 1: UDP-glucose 6-dehydrogenase

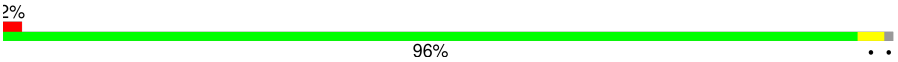
Chain I:

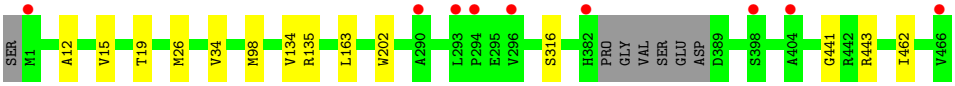




• Molecule 1: UDP-glucose 6-dehydrogenase

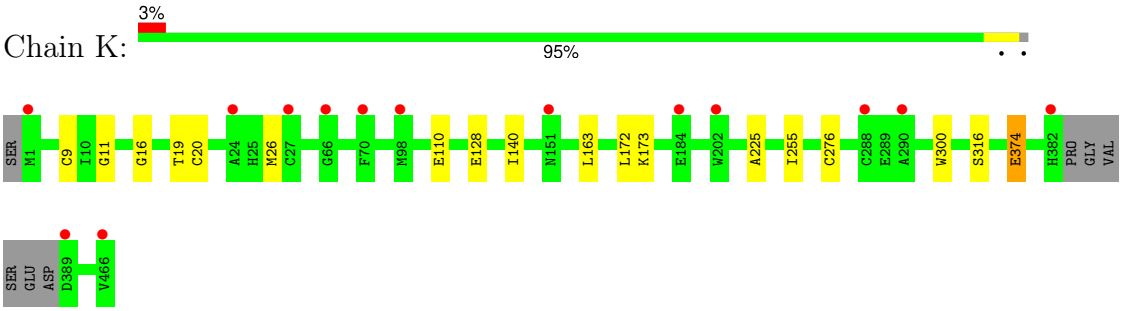
Chain J:





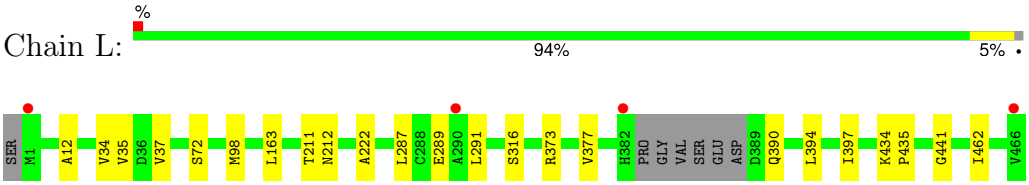
• Molecule 1: UDP-glucose 6-dehydrogenase

Chain K:



• Molecule 1: UDP-glucose 6-dehydrogenase

Chain L:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	115.99Å 184.13Å 170.94Å 90.00° 109.23° 90.00°	Depositor
Resolution (Å)	49.09 – 2.00 49.09 – 2.00	Depositor EDS
% Data completeness (in resolution range)	100.0 (49.09-2.00) 99.5 (49.09-2.00)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.99 (at 2.00Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.172 , 0.205 0.176 , 0.209	Depositor DCC
R_{free} test set	23473 reflections (5.18%)	wwPDB-VP
Wilson B-factor (Å^2)	29.0	Xtriage
Anisotropy	0.267	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 39.0	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	0.000 for h,-k,-h-l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	46652	wwPDB-VP
Average B, all atoms (Å^2)	33.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 44.77 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 1.4554e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

[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: UPG, NAI, CL

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\| > 5$	RMSZ	$\#\|Z\| > 5$
1	A	0.66	0/3717	0.79	1/5031 (0.0%)
1	B	0.61	0/3624	0.78	1/4911 (0.0%)
1	C	0.65	0/3679	0.78	1/4982 (0.0%)
1	D	0.59	0/3642	0.75	0/4934
1	E	0.63	0/3640	0.76	1/4931 (0.0%)
1	F	0.60	0/3644	0.77	1/4937 (0.0%)
1	G	0.63	0/3649	0.77	0/4942
1	H	0.58	0/3622	0.74	1/4911 (0.0%)
1	I	0.63	0/3669	0.77	1/4970 (0.0%)
1	J	0.58	0/3650	0.74	0/4945
1	K	0.62	0/3654	0.76	1/4952 (0.0%)
1	L	0.58	0/3638	0.76	0/4931
All	All	0.61	0/43828	0.76	8/59377 (0.0%)

There are no bond length outliers.

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	E	276	CYS	N-CA-C	6.49	121.73	113.55
1	A	276	CYS	N-CA-C	6.12	121.26	113.55
1	H	276	CYS	N-CA-C	5.91	121.00	113.55
1	B	276	CYS	N-CA-C	5.57	120.57	113.55
1	F	276	CYS	N-CA-C	5.38	120.33	113.55
1	K	276	CYS	N-CA-C	5.28	120.20	113.55
1	I	276	CYS	N-CA-C	5.18	120.07	113.55
1	C	276	CYS	N-CA-C	5.09	119.96	113.55

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3629	0	3624	15	0
1	B	3556	0	3526	10	0
1	C	3598	0	3588	19	0
1	D	3569	0	3560	17	0
1	E	3567	0	3560	13	0
1	F	3573	0	3556	20	0
1	G	3579	0	3561	11	0
1	H	3548	0	3506	24	0
1	I	3593	0	3581	6	0
1	J	3575	0	3557	20	0
1	K	3580	0	3562	11	0
1	L	3568	0	3545	28	0
2	A	1	0	0	0	0
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
2	G	1	0	0	0	0
2	H	1	0	0	0	0
2	I	1	0	0	0	0
2	J	1	0	0	0	0
2	K	1	0	0	0	0
2	L	1	0	0	0	0
3	A	44	0	27	2	0
3	B	44	0	27	3	0
3	C	44	0	27	2	0
3	D	44	0	27	2	0
3	E	44	0	27	4	0
3	F	44	0	27	2	0
3	G	44	0	27	2	0
3	H	44	0	26	2	0
3	I	44	0	27	2	0
3	J	44	0	27	3	0
3	K	44	0	27	4	0
3	L	44	0	27	3	0
4	A	36	0	22	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	B	36	0	22	4	0
4	C	36	0	22	2	0
4	D	36	0	22	2	0
4	E	36	0	22	4	0
4	F	36	0	22	4	0
4	G	36	0	22	2	0
4	H	36	0	22	2	0
4	I	36	0	22	2	0
4	J	36	0	22	3	0
4	K	36	0	22	4	0
4	L	36	0	22	2	0
5	A	287	0	0	1	1
5	B	175	0	0	0	0
5	C	283	0	0	0	1
5	D	236	0	0	0	0
5	E	268	0	0	0	0
5	F	227	0	0	1	0
5	G	263	0	0	0	0
5	H	130	0	0	0	0
5	I	254	0	0	0	0
5	J	195	0	0	0	0
5	K	234	0	0	0	0
5	L	193	0	0	0	0
All	All	46652	0	43313	177	1

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 2.

All (177) 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:H:98[B]:MET:HE1	1:J:316[B]:SER:HB3	1.20	1.18
1:J:98[A]:MET:CE	1:L:316[A]:SER:HB2	1.76	1.14
1:H:316[B]:SER:OG	1:L:98[B]:MET:HE3	1.50	1.09
1:H:98[B]:MET:HE3	1:J:316[B]:SER:OG	1.53	1.06
1:H:316[B]:SER:HB3	1:L:98[B]:MET:HE1	1.38	1.05
3:E:500:NAI:H4N	4:E:501:UPG:H6'1	1.34	1.05
1:H:98[B]:MET:CE	1:J:316[B]:SER:HB3	1.89	1.02
3:K:500:NAI:H4N	4:K:501:UPG:H6'1	1.44	0.98
1:J:98[A]:MET:HE1	1:L:316[A]:SER:HB2	1.45	0.97
1:H:98[B]:MET:CE	1:J:316[B]:SER:CB	2.44	0.95

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:500:NAI:H4N	4:B:501:UPG:H6'1	1.49	0.94
1:A:98[A]:MET:CE	1:E:316[A]:SER:HB2	1.98	0.93
1:H:316[B]:SER:HB3	1:L:98[B]:MET:CE	1.99	0.92
1:H:98[B]:MET:HE1	1:J:316[B]:SER:CB	2.00	0.91
1:J:98[A]:MET:HE3	1:L:316[A]:SER:HB2	1.51	0.90
3:C:500:NAI:H4N	4:C:501:UPG:H6'1	1.54	0.90
1:D:98[A]:MET:CE	1:F:316[A]:SER:HB2	2.03	0.89
1:F:137:ALA:HB3	1:F:213:THR:HG21	1.56	0.87
1:H:316[B]:SER:CB	1:L:98[B]:MET:CE	2.53	0.86
3:E:500:NAI:C4N	4:E:501:UPG:H6'1	2.06	0.84
1:B:98[A]:MET:CE	1:D:316[A]:SER:HB2	2.07	0.83
3:A:500:NAI:H4N	4:A:501:UPG:H6'1	1.61	0.83
3:J:500:NAI:H4N	4:J:501:UPG:H6'1	1.61	0.82
3:I:500:NAI:H4N	4:I:501:UPG:H6'1	1.60	0.81
1:H:316[B]:SER:CB	1:L:98[B]:MET:HE3	2.09	0.80
3:D:500:NAI:H4N	4:D:501:UPG:H6'1	1.62	0.80
3:L:500:NAI:H4N	4:L:501:UPG:H6'1	1.63	0.79
1:J:98[A]:MET:HE3	1:L:316[A]:SER:CB	2.12	0.79
3:K:500:NAI:C4N	4:K:501:UPG:H6'1	2.12	0.78
1:H:98[B]:MET:HE3	1:J:316[B]:SER:CB	2.09	0.78
1:F:137:ALA:CB	1:F:213:THR:HG21	2.15	0.77
1:J:98[A]:MET:CE	1:L:316[A]:SER:CB	2.63	0.76
3:H:500:NAI:H4N	4:H:501:UPG:H6'1	1.68	0.75
1:B:98[A]:MET:HE3	1:D:316[A]:SER:HB2	1.68	0.73
1:D:98[A]:MET:HE1	1:F:316[A]:SER:HB2	1.71	0.71
1:A:98[A]:MET:HE3	1:E:316[A]:SER:HB2	1.71	0.69
3:C:500:NAI:C4N	4:C:501:UPG:H6'1	2.23	0.69
1:A:316[A]:SER:HB2	1:C:98[A]:MET:CE	2.23	0.68
3:G:500:NAI:H4N	4:G:501:UPG:H6'1	1.76	0.67
3:B:500:NAI:C4N	4:B:501:UPG:H6'1	2.23	0.66
3:I:500:NAI:C4N	4:I:501:UPG:H6'1	2.25	0.66
3:D:500:NAI:C4N	4:D:501:UPG:H6'1	2.27	0.65
3:J:500:NAI:C4N	4:J:501:UPG:H6'1	2.26	0.65
1:D:98[A]:MET:HE3	1:F:316[A]:SER:HB2	1.78	0.65
1:B:128:GLU:OE2	1:B:140:ILE:HD11	1.98	0.64
1:D:98[A]:MET:HE3	1:F:316[A]:SER:CB	2.27	0.64
3:A:500:NAI:C4N	4:A:501:UPG:H6'1	2.25	0.64
1:H:316[B]:SER:OG	1:L:98[B]:MET:CE	2.36	0.64
1:D:98[A]:MET:CE	1:F:316[A]:SER:CB	2.76	0.63
3:F:500:NAI:H4N	4:F:501:UPG:H6'1	1.82	0.61
1:A:390:GLN:HG2	1:A:394:LEU:HD12	1.84	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:L:500:NAI:C4N	4:L:501:UPG:H6'1	2.29	0.60
1:B:98[A]:MET:HE1	1:D:316[A]:SER:HB2	1.84	0.59
1:A:98[A]:MET:HE1	1:E:316[A]:SER:HB2	1.85	0.59
1:C:222:ALA:CB	1:D:255:ILE:HD11	2.34	0.57
1:C:316[B]:SER:HB3	1:E:98[B]:MET:CE	2.36	0.56
1:L:441:GLY:HA2	1:L:462:ILE:HD12	1.87	0.56
1:B:441:GLY:HA2	1:B:462:ILE:HD12	1.89	0.55
1:F:26:MET:HE2	1:F:202:TRP:HB2	1.88	0.55
1:D:443:ARG:HD3	1:D:462:ILE:O	2.07	0.55
1:L:163:LEU:C	1:L:163:LEU:HD12	2.32	0.55
1:H:128:GLU:OE2	1:H:140:ILE:HD11	2.06	0.54
1:C:133:PRO:HB3	1:C:287:LEU:HD21	1.90	0.53
1:F:26:MET:HE2	1:F:202:TRP:CB	2.38	0.53
3:G:500:NAI:C4N	4:G:501:UPG:H6'1	2.39	0.53
1:C:316[B]:SER:HB3	1:E:98[B]:MET:HE1	1.91	0.52
1:J:12:ALA:HB2	1:J:34:VAL:HG12	1.91	0.52
1:C:222:ALA:HB1	1:D:255:ILE:HD11	1.91	0.52
3:E:500:NAI:H4N	4:E:501:UPG:C6'	2.24	0.52
1:H:316[B]:SER:CB	1:L:98[B]:MET:HE1	2.18	0.51
1:H:441:GLY:HA2	1:H:462:ILE:HD12	1.92	0.51
1:A:316[A]:SER:HB2	1:C:98[A]:MET:HE3	1.92	0.51
3:K:500:NAI:C5N	4:K:501:UPG:H6'1	2.40	0.51
1:A:316[A]:SER:HB2	1:C:98[A]:MET:HE1	1.92	0.50
3:H:500:NAI:C4N	4:H:501:UPG:H6'1	2.37	0.50
1:K:128:GLU:OE2	1:K:140:ILE:HD11	2.11	0.50
1:L:390:GLN:HG2	1:L:394:LEU:HD12	1.94	0.50
1:F:163:LEU:HD12	1:F:163:LEU:C	2.37	0.49
1:K:26:MET:HE2	1:K:173:LYS:HG2	1.93	0.49
1:E:26:MET:HE2	1:E:173:LYS:HE2	1.95	0.49
1:J:441:GLY:HA2	1:J:462:ILE:HD12	1.94	0.49
1:J:163:LEU:HD12	1:J:163:LEU:C	2.38	0.49
1:B:134:VAL:HG12	1:B:135:ARG:HG2	1.94	0.49
1:F:149:LYS:HE3	1:F:152:LEU:HD22	1.95	0.48
1:H:443:ARG:HD3	1:H:462:ILE:O	2.13	0.48
1:C:390:GLN:HG2	1:C:394:LEU:HD12	1.96	0.48
1:D:25:HIS:ND1	1:D:26:MET:CE	2.77	0.47
1:E:443:ARG:HD3	1:E:462:ILE:O	2.15	0.47
1:F:276:CYS:HB2	4:F:501:UPG:H6'2	1.95	0.47
1:I:211:THR:OG1	1:I:212:ASN:N	2.45	0.47
1:B:443:ARG:HD3	1:B:462:ILE:O	2.14	0.47
1:G:98[B]:MET:CE	1:K:316[B]:SER:HB3	2.44	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:35:VAL:HA	1:G:72:SER:O	2.15	0.47
1:G:135:ARG:HA	1:G:214:TRP:CZ3	2.50	0.47
1:H:35:VAL:HA	1:H:72:SER:O	2.14	0.47
1:F:207:LYS:NZ	5:F:3123:HOH:O	2.48	0.47
1:L:287:LEU:HD11	1:L:291:LEU:HD11	1.96	0.47
1:G:211:THR:OG1	1:G:212:ASN:N	2.48	0.46
1:A:447:GLY:C	1:A:448:LEU:HD12	2.41	0.46
1:J:443:ARG:HD3	1:J:462:ILE:O	2.16	0.46
1:D:441:GLY:HA2	1:D:462:ILE:HD12	1.97	0.46
1:G:137:ALA:O	1:G:141:ARG:HG3	2.16	0.46
1:E:441:GLY:HA2	1:E:462:ILE:HD12	1.98	0.46
1:K:163:LEU:C	1:K:163:LEU:HD12	2.41	0.45
1:K:19:THR:HG22	1:K:172:LEU:HD21	1.97	0.45
1:A:67:LYS:HE2	5:A:3267:HOH:O	2.16	0.45
1:C:316[B]:SER:OG	1:E:98[B]:MET:HE3	2.16	0.45
1:H:56:GLY:O	1:H:60:VAL:HG23	2.16	0.45
1:J:134:VAL:HG12	1:J:135:ARG:HG2	1.99	0.45
1:L:373:ARG:O	1:L:377:VAL:HG23	2.17	0.45
1:C:135:ARG:HA	1:C:214:TRP:CZ3	2.51	0.44
1:C:257:MET:SD	1:D:209:LEU:HD11	2.57	0.44
1:L:211:THR:OG1	1:L:212:ASN:N	2.51	0.44
1:H:448:LEU:HD12	1:H:448:LEU:N	2.33	0.44
1:C:211:THR:OG1	1:C:212:ASN:N	2.50	0.44
3:F:500:NAI:C4N	4:F:501:UPG:H6'1	2.45	0.44
1:K:255:ILE:HD11	1:L:222:ALA:HB1	1.99	0.44
3:K:500:NAI:H4N	4:K:501:UPG:C6'	2.32	0.44
1:G:128:GLU:CD	1:G:132:VAL:HG21	2.43	0.44
1:H:19:THR:HG22	1:H:172:LEU:HD21	2.00	0.44
3:J:500:NAI:C5N	4:J:501:UPG:H6'1	2.48	0.44
1:L:12:ALA:HB2	1:L:34:VAL:HG12	1.99	0.43
1:J:26:MET:HE3	1:J:202:TRP:CB	2.48	0.43
1:J:26:MET:HE3	1:J:202:TRP:HB3	2.00	0.43
1:A:98[A]:MET:SD	1:E:316[A]:SER:HB2	2.57	0.43
1:C:211:THR:HG23	1:C:212:ASN:O	2.18	0.43
1:I:211:THR:HG23	1:I:212:ASN:O	2.19	0.43
1:B:211:THR:OG1	1:B:212:ASN:N	2.51	0.43
1:B:276:CYS:HB2	4:B:501:UPG:H6'2	2.00	0.43
1:B:292:ASN:ND2	1:C:292:ASN:HB2	2.34	0.43
1:D:153:ASN:OD1	1:D:155:GLN:NE2	2.49	0.43
1:J:15:VAL:O	1:J:19:THR:HG23	2.19	0.43
1:K:374:GLU:H	1:K:374:GLU:CD	2.26	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:222:ALA:HB3	1:D:255:ILE:HD11	1.99	0.43
1:F:134:VAL:HG12	1:F:135:ARG:HG2	2.00	0.43
1:H:163:LEU:C	1:H:163:LEU:HD12	2.44	0.43
1:K:11:GLY:O	1:K:16:GLY:HA3	2.18	0.43
1:D:98[A]:MET:HE3	1:F:316[A]:SER:HB3	1.98	0.43
1:E:11:GLY:O	1:E:16:GLY:HA3	2.19	0.42
1:G:163:LEU:C	1:G:163:LEU:HD12	2.44	0.42
1:I:134:VAL:O	1:I:135:ARG:HB2	2.19	0.42
1:C:163:LEU:C	1:C:163:LEU:HD12	2.44	0.42
1:C:134:VAL:O	1:C:135:ARG:HB2	2.19	0.42
1:K:255:ILE:HD11	1:L:222:ALA:CB	2.49	0.42
1:A:211:THR:OG1	1:A:212:ASN:N	2.52	0.42
1:K:225:ALA:HB1	1:K:300:TRP:CZ3	2.55	0.42
1:L:289:GLU:HA	1:L:289:GLU:OE1	2.19	0.42
1:A:35:VAL:HA	1:A:72:SER:O	2.20	0.42
1:G:134:VAL:O	1:G:135:ARG:HB2	2.20	0.42
1:F:276:CYS:CB	4:F:501:UPG:H6'2	2.50	0.42
1:F:390:GLN:HG2	1:F:394:LEU:HD12	2.01	0.42
1:A:128:GLU:CD	1:A:132:VAL:HG21	2.44	0.41
1:G:448:LEU:N	1:G:448:LEU:HD12	2.35	0.41
1:H:373:ARG:CB	1:H:397:ILE:HG21	2.49	0.41
1:E:128:GLU:OE2	1:E:140:ILE:HD11	2.20	0.41
1:F:400:ASP:HB2	1:F:401:PRO:HD2	2.03	0.41
1:K:9:CYS:HB2	1:K:20:CYS:SG	2.61	0.41
1:L:37:VAL:HG13	3:L:500:NAI:C2A	2.50	0.41
1:L:390:GLN:CG	1:L:394:LEU:HD12	2.51	0.41
1:I:163:LEU:C	1:I:163:LEU:HD12	2.45	0.41
1:I:441:GLY:HA2	1:I:462:ILE:HD12	2.03	0.41
1:E:134:VAL:HG12	1:E:135:ARG:HG2	2.03	0.41
1:L:35:VAL:HA	1:L:72:SER:O	2.20	0.41
1:F:234:ILE:HD12	1:F:234:ILE:HA	1.98	0.41
3:E:500:NAI:C5N	4:E:501:UPG:H6'1	2.50	0.41
1:F:114:ARG:O	1:F:117:VAL:HG12	2.21	0.41
1:A:181:GLY:HA2	1:A:211:THR:O	2.21	0.41
1:G:316[B]:SER:HB3	1:I:98[B]:MET:CE	2.51	0.41
1:L:434:LYS:HA	1:L:435:PRO:C	2.46	0.41
1:H:225:ALA:HB1	1:H:300:TRP:CZ3	2.56	0.40
1:C:225:ALA:HB1	1:C:300:TRP:CZ3	2.57	0.40
1:H:120:SER:O	1:H:152:LEU:HD13	2.21	0.40
1:A:107:LYS:HE3	1:A:108:TYR:CZ	2.56	0.40
1:L:373:ARG:CB	1:L:397:ILE:HG21	2.51	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:500:NAI:H4N	4:B:501:UPG:C6'	2.36	0.40
1:G:134:VAL:HG12	1:G:135:ARG:HG2	2.02	0.40
1:J:98[A]:MET:HE3	1:L:316[A]:SER:HB3	1.97	0.40

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

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:A:3222:HOH:O	5:C:3187:HOH:O[2_444]	2.16	0.04

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	463/467 (99%)	452 (98%)	11 (2%)	0	100	100
1	B	457/467 (98%)	447 (98%)	10 (2%)	0	100	100
1	C	461/467 (99%)	454 (98%)	7 (2%)	0	100	100
1	D	457/467 (98%)	448 (98%)	9 (2%)	0	100	100
1	E	458/467 (98%)	449 (98%)	9 (2%)	0	100	100
1	F	458/467 (98%)	450 (98%)	8 (2%)	0	100	100
1	G	458/467 (98%)	451 (98%)	7 (2%)	0	100	100
1	H	458/467 (98%)	450 (98%)	8 (2%)	0	100	100
1	I	460/467 (98%)	450 (98%)	10 (2%)	0	100	100
1	J	459/467 (98%)	451 (98%)	8 (2%)	0	100	100
1	K	459/467 (98%)	449 (98%)	10 (2%)	0	100	100
1	L	458/467 (98%)	450 (98%)	8 (2%)	0	100	100
All	All	5506/5604 (98%)	5401 (98%)	105 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	395/401 (98%)	392 (99%)	3 (1%)	79 84
1	B	380/401 (95%)	377 (99%)	3 (1%)	79 84
1	C	390/401 (97%)	388 (100%)	2 (0%)	86 90
1	D	386/401 (96%)	382 (99%)	4 (1%)	73 78
1	E	384/401 (96%)	384 (100%)	0	100 100
1	F	385/401 (96%)	385 (100%)	0	100 100
1	G	386/401 (96%)	384 (100%)	2 (0%)	86 90
1	H	380/401 (95%)	379 (100%)	1 (0%)	91 94
1	I	388/401 (97%)	387 (100%)	1 (0%)	91 94
1	J	385/401 (96%)	385 (100%)	0	100 100
1	K	386/401 (96%)	384 (100%)	2 (0%)	86 90
1	L	384/401 (96%)	384 (100%)	0	100 100
All	All	4629/4812 (96%)	4611 (100%)	18 (0%)	89 92

All (18) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1	MET
1	A	400	ASP
1	A	459	ILE
1	B	400	ASP
1	B	421	LYS
1	B	459	ILE
1	C	110	GLU
1	C	421	LYS
1	D	138	GLU
1	D	267	LYS
1	D	448	LEU

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Mol	Chain	Res	Type
1	D	459	ILE
1	G	213	THR
1	G	462	ILE
1	H	110	GLU
1	I	459	ILE
1	K	110	GLU
1	K	374	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (56) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	147	ASN
1	A	155	GLN
1	A	159	ASN
1	A	259	GLN
1	A	302	GLN
1	A	429	HIS
1	B	25	HIS
1	B	155	GLN
1	B	292	ASN
1	B	302	GLN
1	B	324	ASN
1	B	429	HIS
1	C	118	GLN
1	C	155	GLN
1	C	159	ASN
1	C	229	GLN
1	C	292	ASN
1	C	302	GLN
1	C	429	HIS
1	D	159	ASN
1	D	390	GLN
1	D	429	HIS
1	E	155	GLN
1	E	159	ASN
1	E	259	GLN
1	E	302	GLN
1	E	324	ASN
1	F	155	GLN
1	F	159	ASN
1	F	259	GLN
1	G	155	GLN

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Mol	Chain	Res	Type
1	G	159	ASN
1	G	259	GLN
1	G	302	GLN
1	G	390	GLN
1	G	429	HIS
1	H	159	ASN
1	H	259	GLN
1	H	302	GLN
1	H	365	HIS
1	H	429	HIS
1	H	450	ASN
1	I	121	ASN
1	I	159	ASN
1	I	302	GLN
1	I	324	ASN
1	I	365	HIS
1	J	119	ASN
1	J	121	ASN
1	J	302	GLN
1	K	159	ASN
1	K	302	GLN
1	K	365	HIS
1	K	429	HIS
1	L	155	GLN
1	L	159	ASN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 36 ligands modelled in this entry, 12 are monoatomic - leaving 24 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
4	UPG	I	501	-	37,38,38	1.46	3 (8%)	55,58,58	1.22	6 (10%)
3	NAI	F	500	-	43,48,48	1.81	6 (13%)	50,73,73	1.46	5 (10%)
3	NAI	D	500	-	43,48,48	1.89	8 (18%)	50,73,73	1.36	5 (10%)
4	UPG	B	501	-	37,38,38	1.27	2 (5%)	55,58,58	1.16	4 (7%)
3	NAI	G	500	-	43,48,48	1.72	5 (11%)	50,73,73	1.43	8 (16%)
3	NAI	I	500	-	43,48,48	1.75	8 (18%)	50,73,73	1.38	7 (14%)
4	UPG	A	501	-	37,38,38	1.04	1 (2%)	55,58,58	1.24	9 (16%)
4	UPG	J	501	-	37,38,38	0.96	3 (8%)	55,58,58	1.10	5 (9%)
3	NAI	E	500	-	43,48,48	1.86	6 (13%)	50,73,73	1.46	6 (12%)
4	UPG	C	501	-	37,38,38	1.20	1 (2%)	55,58,58	1.39	6 (10%)
3	NAI	A	500	-	43,48,48	1.81	7 (16%)	50,73,73	1.51	11 (22%)
3	NAI	K	500	-	43,48,48	1.80	5 (11%)	50,73,73	1.64	7 (14%)
3	NAI	L	500	-	43,48,48	1.82	6 (13%)	50,73,73	1.72	10 (20%)
4	UPG	F	501	-	37,38,38	0.99	2 (5%)	55,58,58	1.34	6 (10%)
4	UPG	L	501	-	37,38,38	1.05	2 (5%)	55,58,58	1.32	7 (12%)
3	NAI	B	500	-	43,48,48	1.83	5 (11%)	50,73,73	1.49	5 (10%)
4	UPG	H	501	-	37,38,38	1.39	4 (10%)	55,58,58	1.20	5 (9%)
4	UPG	K	501	-	37,38,38	1.18	2 (5%)	55,58,58	1.21	4 (7%)
4	UPG	G	501	-	37,38,38	0.86	0	55,58,58	1.28	6 (10%)
3	NAI	J	500	-	43,48,48	1.80	6 (13%)	50,73,73	1.71	9 (18%)
3	NAI	C	500	-	43,48,48	1.82	6 (13%)	50,73,73	1.61	6 (12%)
4	UPG	D	501	-	37,38,38	0.93	2 (5%)	55,58,58	1.16	4 (7%)
4	UPG	E	501	-	37,38,38	1.08	4 (10%)	55,58,58	1.22	4 (7%)
3	NAI	H	500	-	43,48,48	1.93	8 (18%)	50,73,73	1.80	7 (14%)

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
4	UPG	I	501	-	-	2/23/59/59	0/3/3/3
3	NAI	F	500	-	-	4/25/72/72	0/5/5/5
3	NAI	D	500	-	-	2/25/72/72	0/5/5/5
4	UPG	B	501	-	-	5/23/59/59	0/3/3/3
3	NAI	G	500	-	-	2/25/72/72	0/5/5/5
3	NAI	I	500	-	-	4/25/72/72	0/5/5/5
4	UPG	A	501	-	-	3/23/59/59	0/3/3/3
4	UPG	J	501	-	-	2/23/59/59	0/3/3/3
3	NAI	E	500	-	-	3/25/72/72	0/5/5/5
4	UPG	C	501	-	-	3/23/59/59	0/3/3/3
3	NAI	A	500	-	-	4/25/72/72	0/5/5/5
3	NAI	K	500	-	-	3/25/72/72	0/5/5/5
3	NAI	L	500	-	-	3/25/72/72	0/5/5/5
4	UPG	F	501	-	-	5/23/59/59	0/3/3/3
4	UPG	L	501	-	-	6/23/59/59	0/3/3/3
3	NAI	B	500	-	-	3/25/72/72	0/5/5/5
4	UPG	H	501	-	-	5/23/59/59	0/3/3/3
4	UPG	K	501	-	-	4/23/59/59	0/3/3/3
4	UPG	G	501	-	-	4/23/59/59	0/3/3/3
3	NAI	J	500	-	-	3/25/72/72	0/5/5/5
3	NAI	C	500	-	-	2/25/72/72	0/5/5/5
4	UPG	D	501	-	-	2/23/59/59	0/3/3/3
4	UPG	E	501	-	-	4/23/59/59	0/3/3/3
3	NAI	H	500	-	-	7/25/72/72	0/5/5/5

All (102) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	500	NAI	O7N-C7N	7.02	1.40	1.24
4	I	501	UPG	PA-O3A	7.01	1.67	1.59
3	H	500	NAI	O7N-C7N	6.90	1.40	1.24
3	J	500	NAI	O7N-C7N	6.81	1.40	1.24
3	K	500	NAI	O7N-C7N	6.78	1.40	1.24
3	L	500	NAI	O7N-C7N	6.74	1.40	1.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	500	NAI	O7N-C7N	6.74	1.40	1.24
3	A	500	NAI	O7N-C7N	6.62	1.40	1.24
3	E	500	NAI	O7N-C7N	6.55	1.39	1.24
3	F	500	NAI	O7N-C7N	6.54	1.39	1.24
3	G	500	NAI	O7N-C7N	6.47	1.39	1.24
3	C	500	NAI	O7N-C7N	6.07	1.38	1.24
3	I	500	NAI	O7N-C7N	5.88	1.38	1.24
4	B	501	UPG	PA-O3A	5.86	1.65	1.59
3	H	500	NAI	C4N-C3N	-5.60	1.39	1.50
3	L	500	NAI	C4N-C3N	-5.38	1.39	1.50
3	F	500	NAI	C4N-C3N	-5.37	1.39	1.50
4	H	501	UPG	PA-O3A	5.36	1.65	1.59
3	J	500	NAI	C4N-C3N	-5.24	1.40	1.50
3	C	500	NAI	C4N-C3N	-5.24	1.40	1.50
3	I	500	NAI	C4N-C3N	-5.10	1.40	1.50
3	B	500	NAI	C4N-C3N	-5.08	1.40	1.50
3	D	500	NAI	C4N-C3N	-5.06	1.40	1.50
3	E	500	NAI	C4N-C3N	-5.06	1.40	1.50
3	K	500	NAI	C4N-C3N	-4.96	1.40	1.50
3	G	500	NAI	C4N-C3N	-4.94	1.40	1.50
4	C	501	UPG	PA-O3A	4.67	1.64	1.59
3	A	500	NAI	C4N-C3N	-4.36	1.41	1.50
3	E	500	NAI	C2A-N3A	4.34	1.38	1.32
3	D	500	NAI	C2A-N3A	4.17	1.38	1.32
3	C	500	NAI	C2A-N3A	4.13	1.38	1.32
3	A	500	NAI	C2A-N3A	4.13	1.38	1.32
3	F	500	NAI	C2A-N3A	4.07	1.38	1.32
3	L	500	NAI	C2A-N3A	4.03	1.38	1.32
3	K	500	NAI	C2A-N3A	4.01	1.38	1.32
3	B	500	NAI	C2A-N3A	3.99	1.38	1.32
3	H	500	NAI	C4N-C5N	-3.98	1.38	1.49
3	J	500	NAI	C2A-N3A	3.97	1.38	1.32
3	I	500	NAI	C4N-C5N	-3.82	1.39	1.49
3	H	500	NAI	C2A-N3A	3.79	1.38	1.32
4	H	501	UPG	PB-O3A	-3.76	1.55	1.59
3	F	500	NAI	C4N-C5N	-3.75	1.39	1.49
3	A	500	NAI	C4N-C5N	-3.71	1.39	1.49
3	E	500	NAI	C4N-C5N	-3.68	1.39	1.49
3	G	500	NAI	C4N-C5N	-3.59	1.39	1.49
3	C	500	NAI	C4N-C5N	-3.55	1.39	1.49
3	L	500	NAI	C4N-C5N	-3.51	1.39	1.49
3	K	500	NAI	C4N-C5N	-3.50	1.39	1.49

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	501	UPG	PA-O3A	3.49	1.63	1.59
3	I	500	NAI	C2A-N3A	3.46	1.37	1.32
3	B	500	NAI	C4N-C5N	-3.45	1.40	1.49
3	G	500	NAI	C2A-N3A	3.42	1.37	1.32
3	D	500	NAI	PA-O3	3.37	1.63	1.59
3	J	500	NAI	C4N-C5N	-3.36	1.40	1.49
4	K	501	UPG	PB-O3A	3.32	1.63	1.59
3	D	500	NAI	C4N-C5N	-3.27	1.40	1.49
4	K	501	UPG	PA-O3A	3.27	1.63	1.59
3	C	500	NAI	PA-O3	3.16	1.62	1.59
3	E	500	NAI	PA-O3	3.13	1.62	1.59
3	A	500	NAI	PN-O3	2.90	1.62	1.59
4	F	501	UPG	C2-N1	2.83	1.42	1.38
3	A	500	NAI	C2A-N1A	2.82	1.38	1.33
3	B	500	NAI	C2A-N1A	2.80	1.38	1.33
4	E	501	UPG	O4C-C1C	2.75	1.48	1.42
3	E	500	NAI	C2A-N1A	2.75	1.38	1.33
3	F	500	NAI	C2A-N1A	2.71	1.38	1.33
3	L	500	NAI	C2A-N1A	2.65	1.38	1.33
3	I	500	NAI	C2A-N1A	2.64	1.38	1.33
3	D	500	NAI	C2A-N1A	2.64	1.38	1.33
3	H	500	NAI	C2A-N1A	2.63	1.38	1.33
3	K	500	NAI	C2A-N1A	2.63	1.38	1.33
4	F	501	UPG	O4C-C1C	2.61	1.48	1.42
3	C	500	NAI	C2A-N1A	2.52	1.38	1.33
3	I	500	NAI	PA-O3	2.51	1.62	1.59
3	J	500	NAI	C2A-N1A	2.43	1.38	1.33
4	E	501	UPG	C6-C5	2.39	1.40	1.35
3	H	500	NAI	PN-O3	2.33	1.62	1.59
4	B	501	UPG	C5-C4	-2.32	1.38	1.43
3	H	500	NAI	PA-O3	2.32	1.62	1.59
3	I	500	NAI	O4B-C4B	-2.30	1.39	1.45
4	H	501	UPG	C6-C5	2.27	1.40	1.35
3	D	500	NAI	PN-O3	2.26	1.61	1.59
4	L	501	UPG	O4C-C1C	2.25	1.47	1.42
4	E	501	UPG	C6-N1	2.21	1.43	1.38
4	J	501	UPG	O4C-C1C	2.19	1.47	1.42
3	F	500	NAI	C6N-C5N	2.17	1.39	1.33
4	I	501	UPG	C6-C5	2.17	1.40	1.35
4	L	501	UPG	C6-C5	2.16	1.40	1.35
3	J	500	NAI	C6N-C5N	2.16	1.39	1.33
4	E	501	UPG	PA-O3A	2.15	1.61	1.59

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	500	NAI	C6N-C5N	2.14	1.39	1.33
3	D	500	NAI	C6N-C5N	2.09	1.39	1.33
3	L	500	NAI	C6N-C5N	2.09	1.39	1.33
4	D	501	UPG	C6-C5	2.08	1.39	1.35
3	H	500	NAI	O4B-C1B	2.07	1.43	1.40
4	I	501	UPG	C6-N1	2.06	1.43	1.38
3	I	500	NAI	C6N-C5N	2.06	1.39	1.33
3	G	500	NAI	C2A-N1A	2.06	1.37	1.33
4	D	501	UPG	PA-O3A	2.04	1.61	1.59
4	J	501	UPG	C2-N1	2.03	1.41	1.38
4	H	501	UPG	C5-C4	-2.02	1.39	1.43
4	J	501	UPG	C6-C5	2.00	1.39	1.35

All (152) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	H	500	NAI	N3A-C2A-N1A	-6.86	119.36	128.67
3	K	500	NAI	N3A-C2A-N1A	-6.54	119.80	128.67
3	J	500	NAI	N3A-C2A-N1A	-6.53	119.81	128.67
3	B	500	NAI	N3A-C2A-N1A	-6.45	119.92	128.67
3	C	500	NAI	N3A-C2A-N1A	-6.41	119.97	128.67
3	L	500	NAI	N3A-C2A-N1A	-6.29	120.13	128.67
3	E	500	NAI	N3A-C2A-N1A	-6.19	120.26	128.67
3	G	500	NAI	N3A-C2A-N1A	-6.10	120.39	128.67
3	F	500	NAI	N3A-C2A-N1A	-5.85	120.73	128.67
3	A	500	NAI	N3A-C2A-N1A	-5.80	120.80	128.67
3	I	500	NAI	N3A-C2A-N1A	-5.72	120.91	128.67
3	D	500	NAI	N3A-C2A-N1A	-5.30	121.48	128.67
3	C	500	NAI	C4B-O4B-C1B	-4.90	105.43	109.92
3	H	500	NAI	C2B-C3B-C4B	4.87	112.01	102.61
3	L	500	NAI	O3B-C3B-C4B	4.79	124.85	111.08
3	H	500	NAI	O3B-C3B-C4B	4.63	124.37	111.08
3	J	500	NAI	O3B-C3B-C4B	4.56	124.18	111.08
4	F	501	UPG	C4-N3-C2	-4.49	121.04	126.61
3	K	500	NAI	O3B-C3B-C4B	4.39	123.68	111.08
4	H	501	UPG	C4-N3-C2	-4.31	121.27	126.61
4	C	501	UPG	C4-N3-C2	-4.31	121.27	126.61
4	L	501	UPG	C4-N3-C2	-4.21	121.39	126.61
4	K	501	UPG	C4-N3-C2	-4.16	121.45	126.61
4	K	501	UPG	C5-C4-N3	4.13	120.58	114.80
4	G	501	UPG	C5-C4-N3	3.99	120.39	114.80
4	L	501	UPG	C5-C4-N3	3.95	120.33	114.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	E	501	UPG	C4-N3-C2	-3.90	121.77	126.61
4	D	501	UPG	C5-C4-N3	3.88	120.23	114.80
4	H	501	UPG	C5-C4-N3	3.84	120.18	114.80
3	H	500	NAI	C1B-N9A-C4A	-3.77	120.02	126.64
4	A	501	UPG	C4-N3-C2	-3.73	121.99	126.61
4	G	501	UPG	C4-N3-C2	-3.64	122.10	126.61
4	C	501	UPG	O5'-C1'-O3B	-3.63	106.62	111.36
4	E	501	UPG	N3-C2-N1	3.58	119.55	114.89
4	D	501	UPG	C4-N3-C2	-3.55	122.20	126.61
4	J	501	UPG	C4-N3-C2	-3.50	122.27	126.61
3	L	500	NAI	C2B-C3B-C4B	3.49	109.34	102.61
4	B	501	UPG	C4-N3-C2	-3.48	122.30	126.61
3	A	500	NAI	C4B-O4B-C1B	-3.47	106.75	109.92
4	I	501	UPG	C4-N3-C2	-3.47	122.31	126.61
3	C	500	NAI	C1B-N9A-C4A	-3.45	120.58	126.64
3	D	500	NAI	C4B-O4B-C1B	-3.45	106.77	109.92
4	F	501	UPG	N3-C2-N1	3.44	119.37	114.89
3	K	500	NAI	C1B-N9A-C4A	-3.40	120.66	126.64
4	A	501	UPG	C5-C4-N3	3.38	119.53	114.80
3	B	500	NAI	C4B-O4B-C1B	-3.33	106.88	109.92
3	F	500	NAI	C4B-O4B-C1B	-3.30	106.90	109.92
3	J	500	NAI	O7N-C7N-C3N	-3.29	114.70	120.90
4	C	501	UPG	O4-C4-C5	-3.29	119.49	125.16
3	K	500	NAI	C2B-C3B-C4B	3.27	108.93	102.61
4	B	501	UPG	N3-C2-N1	3.23	119.09	114.89
4	F	501	UPG	C5-C4-N3	3.13	119.18	114.80
4	C	501	UPG	C5-C4-N3	3.11	119.16	114.80
4	I	501	UPG	N3-C2-N1	3.10	118.93	114.89
3	J	500	NAI	C2B-C3B-C4B	3.05	108.49	102.61
4	B	501	UPG	C5-C4-N3	3.05	119.06	114.80
4	F	501	UPG	O4-C4-C5	-3.03	119.93	125.16
3	E	500	NAI	O2A-PA-O3	3.02	115.45	107.27
4	H	501	UPG	N3-C2-N1	3.02	118.83	114.89
3	G	500	NAI	C2D-C1D-N1N	3.00	120.68	113.31
4	E	501	UPG	C5-C4-N3	2.99	118.99	114.80
3	A	500	NAI	C2D-C1D-N1N	2.98	120.64	113.31
3	E	500	NAI	C1B-N9A-C4A	-2.98	121.41	126.64
3	J	500	NAI	O3B-C3B-C2B	2.97	121.34	111.82
4	L	501	UPG	N3-C2-N1	2.97	118.76	114.89
4	J	501	UPG	C5-C4-N3	2.94	118.91	114.80
4	F	501	UPG	C1C-N1-C2	2.90	122.80	117.59
3	I	500	NAI	C1B-N9A-C4A	-2.89	121.56	126.64

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	H	500	NAI	O3B-C3B-C2B	2.89	121.08	111.82
3	B	500	NAI	C1B-N9A-C4A	-2.88	121.57	126.64
3	E	500	NAI	C4B-O4B-C1B	-2.87	107.30	109.92
3	L	500	NAI	O3B-C3B-C2B	2.85	120.96	111.82
4	G	501	UPG	O4-C4-C5	-2.84	120.27	125.16
4	I	501	UPG	O2B-PB-O3A	-2.84	99.60	107.27
4	G	501	UPG	O2A-PA-O3A	2.84	114.94	107.27
4	D	501	UPG	N3-C2-N1	2.81	118.55	114.89
4	K	501	UPG	N3-C2-N1	2.79	118.52	114.89
4	J	501	UPG	N3-C2-N1	2.78	118.52	114.89
3	D	500	NAI	O7N-C7N-C3N	-2.77	115.67	120.90
4	I	501	UPG	C5-C4-N3	2.76	118.67	114.80
4	L	501	UPG	O5'-C1'-O3B	-2.76	107.76	111.36
3	A	500	NAI	O7N-C7N-C3N	-2.75	115.72	120.90
4	C	501	UPG	N3-C2-N1	2.73	118.45	114.89
3	B	500	NAI	O2A-PA-O3	2.71	114.61	107.27
3	F	500	NAI	C3N-C2N-N1N	-2.71	119.22	123.20
3	K	500	NAI	O3B-C3B-C2B	2.71	120.51	111.82
3	I	500	NAI	O7N-C7N-C3N	-2.67	115.86	120.90
4	K	501	UPG	O4-C4-C5	-2.66	120.58	125.16
3	F	500	NAI	O7N-C7N-C3N	-2.65	115.91	120.90
4	I	501	UPG	O2A-PA-O3A	2.64	114.41	107.27
4	J	501	UPG	O4-C4-C5	-2.62	120.64	125.16
3	G	500	NAI	C4B-O4B-C1B	-2.60	107.54	109.92
4	A	501	UPG	N3-C2-N1	2.56	118.23	114.89
4	D	501	UPG	C5C-C4C-C3C	-2.53	106.10	115.21
3	A	500	NAI	O2A-PA-O3	2.50	114.03	107.27
3	L	500	NAI	C2D-C1D-N1N	2.50	119.45	113.31
3	J	500	NAI	C1B-N9A-C4A	-2.48	122.28	126.64
3	C	500	NAI	C3N-C7N-N7N	2.46	122.05	117.67
3	I	500	NAI	C3N-C7N-N7N	2.46	122.03	117.67
4	L	501	UPG	O4-C4-C5	-2.45	120.94	125.16
3	L	500	NAI	C1B-N9A-C4A	-2.44	122.35	126.64
4	G	501	UPG	O2B-PB-O3A	-2.42	100.73	107.27
3	I	500	NAI	O2A-PA-O3	2.41	113.80	107.27
4	A	501	UPG	O4-C4-C5	-2.39	121.04	125.16
3	J	500	NAI	C3N-C7N-N7N	2.38	121.89	117.67
3	L	500	NAI	O7N-C7N-C3N	-2.34	116.48	120.90
3	L	500	NAI	C3N-C2N-N1N	-2.34	119.77	123.20
3	B	500	NAI	C3N-C2N-N1N	-2.33	119.79	123.20
3	J	500	NAI	C2D-C1D-N1N	2.32	119.02	113.31
4	C	501	UPG	O2B-PB-O3A	-2.32	101.00	107.27

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	A	501	UPG	O2A-PA-O3A	2.32	113.54	107.27
3	D	500	NAI	O1N-PN-O3	2.32	113.53	107.27
3	G	500	NAI	O2A-PA-O3	2.31	113.50	107.27
3	F	500	NAI	C2D-C1D-N1N	2.30	118.96	113.31
4	H	501	UPG	O4-C4-C5	-2.28	121.22	125.16
3	I	500	NAI	O1N-PN-O3	2.26	113.39	107.27
3	D	500	NAI	C2D-C1D-N1N	2.25	118.85	113.31
3	E	500	NAI	C2D-C1D-N1N	2.25	118.84	113.31
4	B	501	UPG	C6-N1-C2	-2.24	118.27	121.00
3	C	500	NAI	C2D-C1D-N1N	2.24	118.81	113.31
4	A	501	UPG	O2B-PB-O3A	-2.24	101.22	107.27
3	I	500	NAI	C2D-C1D-N1N	2.22	118.77	113.31
3	G	500	NAI	C2D-C3D-C4D	2.22	106.89	102.61
3	J	500	NAI	O4D-C1D-N1N	-2.20	103.89	108.08
3	C	500	NAI	C3N-C2N-N1N	-2.20	119.97	123.20
3	A	500	NAI	C1B-N9A-C4A	-2.20	122.78	126.64
3	A	500	NAI	O3-PA-O1A	-2.20	104.10	110.70
3	L	500	NAI	C6N-N1N-C2N	2.18	121.66	119.32
3	G	500	NAI	O7N-C7N-C3N	-2.18	116.79	120.90
4	J	501	UPG	O5'-C5'-C6'	2.17	111.82	106.44
4	A	501	UPG	O3A-PA-O1A	-2.17	104.19	110.70
3	G	500	NAI	O4D-C1D-N1N	-2.15	103.99	108.08
3	E	500	NAI	C3N-C2N-N1N	-2.14	120.06	123.20
4	E	501	UPG	O2B-PB-O3A	-2.13	101.51	107.27
4	H	501	UPG	O5'-C1'-O3B	2.13	114.15	111.36
4	L	501	UPG	C6'-C5'-C4'	2.13	118.25	113.02
4	G	501	UPG	N3-C2-N1	2.11	117.64	114.89
3	K	500	NAI	O7N-C7N-C3N	-2.11	116.92	120.90
4	F	501	UPG	C6'-C5'-C4'	2.10	118.18	113.02
3	A	500	NAI	C3N-C2N-N1N	-2.10	120.12	123.20
3	H	500	NAI	C3N-C2N-N1N	-2.10	120.12	123.20
3	K	500	NAI	C3N-C2N-N1N	-2.08	120.15	123.20
4	L	501	UPG	O5'-C1'-C2'	2.08	114.65	110.37
3	A	500	NAI	O4D-C1D-N1N	-2.08	104.13	108.08
3	L	500	NAI	C3N-C7N-N7N	2.07	121.34	117.67
4	A	501	UPG	C4'-C3'-C2'	-2.03	107.26	110.83
3	A	500	NAI	O1N-PN-O2N	2.03	121.90	112.44
4	I	501	UPG	O4-C4-C5	-2.02	121.67	125.16
4	A	501	UPG	O3B-C1'-C2'	-2.02	104.67	108.38
3	A	500	NAI	C3N-C7N-N7N	2.02	121.25	117.67
3	H	500	NAI	C4B-O4B-C1B	-2.00	108.09	109.92
3	G	500	NAI	C1B-N9A-C4A	-2.00	123.12	126.64

There are no chirality outliers.

All (85) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	501	UPG	C1'-O3B-PB-O3A
4	B	501	UPG	C1'-O3B-PB-O3A
4	C	501	UPG	C1'-O3B-PB-O3A
4	D	501	UPG	C1'-O3B-PB-O3A
4	E	501	UPG	C1'-O3B-PB-O3A
4	G	501	UPG	C1'-O3B-PB-O3A
4	I	501	UPG	C1'-O3B-PB-O3A
4	J	501	UPG	C1'-O3B-PB-O3A
4	K	501	UPG	C1'-O3B-PB-O3A
4	L	501	UPG	C1'-O3B-PB-O3A
4	F	501	UPG	C4'-C5'-C6'-O6'
4	B	501	UPG	O5'-C5'-C6'-O6'
4	B	501	UPG	C4'-C5'-C6'-O6'
4	F	501	UPG	O5'-C5'-C6'-O6'
3	F	500	NAI	C2D-C1D-N1N-C6N
3	H	500	NAI	C2D-C1D-N1N-C6N
4	C	501	UPG	PB-O3A-PA-O1A
4	E	501	UPG	PB-O3A-PA-O1A
4	F	501	UPG	PB-O3A-PA-O1A
4	H	501	UPG	PB-O3A-PA-O1A
4	L	501	UPG	O5'-C5'-C6'-O6'
4	G	501	UPG	C4'-C5'-C6'-O6'
4	A	501	UPG	PA-O3A-PB-O3B
4	B	501	UPG	PA-O3A-PB-O3B
4	E	501	UPG	PA-O3A-PB-O3B
4	F	501	UPG	PA-O3A-PB-O3B
4	H	501	UPG	PA-O3A-PB-O3B
4	I	501	UPG	PA-O3A-PB-O3B
4	K	501	UPG	PA-O3A-PB-O3B
4	L	501	UPG	C4'-C5'-C6'-O6'
4	G	501	UPG	O5'-C5'-C6'-O6'
3	I	500	NAI	C2D-C1D-N1N-C6N
4	H	501	UPG	C4'-C5'-C6'-O6'
3	F	500	NAI	O4D-C1D-N1N-C6N
3	A	500	NAI	C2D-C1D-N1N-C6N
3	C	500	NAI	C2D-C1D-N1N-C6N
3	G	500	NAI	C2D-C1D-N1N-C6N
3	L	500	NAI	C2D-C1D-N1N-C6N
3	H	500	NAI	C5B-O5B-PA-O1A
3	H	500	NAI	O4D-C1D-N1N-C6N

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Mol	Chain	Res	Type	Atoms
3	D	500	NAI	C2D-C1D-N1N-C6N
3	E	500	NAI	C2D-C1D-N1N-C6N
3	J	500	NAI	C2D-C1D-N1N-C6N
3	A	500	NAI	O4D-C1D-N1N-C6N
3	L	500	NAI	O4D-C1D-N1N-C6N
3	B	500	NAI	C2D-C1D-N1N-C6N
3	K	500	NAI	C2D-C1D-N1N-C6N
4	A	501	UPG	PB-O3A-PA-O1A
4	G	501	UPG	PB-O3A-PA-O1A
4	K	501	UPG	PB-O3A-PA-O1A
4	L	501	UPG	PB-O3A-PA-O1A
3	B	500	NAI	O4D-C1D-N1N-C6N
3	C	500	NAI	O4D-C1D-N1N-C6N
3	E	500	NAI	O4D-C1D-N1N-C6N
3	G	500	NAI	O4D-C1D-N1N-C6N
3	I	500	NAI	O4D-C1D-N1N-C6N
3	H	500	NAI	C2D-C1D-N1N-C2N
3	D	500	NAI	O4D-C1D-N1N-C6N
3	J	500	NAI	O4D-C1D-N1N-C6N
3	K	500	NAI	O4D-C1D-N1N-C6N
3	F	500	NAI	C2D-C1D-N1N-C2N
3	H	500	NAI	O4D-C1D-N1N-C2N
3	H	500	NAI	PN-O3-PA-O1A
4	B	501	UPG	PB-O3A-PA-O1A
4	D	501	UPG	PB-O3A-PA-O1A
4	F	501	UPG	PB-O3A-PA-O2A
4	J	501	UPG	PB-O3A-PA-O1A
4	K	501	UPG	PB-O3A-PA-O2A
4	L	501	UPG	PB-O3A-PA-O2A
4	L	501	UPG	PA-O3A-PB-O3B
3	F	500	NAI	O4D-C1D-N1N-C2N
4	H	501	UPG	O5'-C5'-C6'-O6'
4	C	501	UPG	PB-O3A-PA-O2A
4	E	501	UPG	PB-O3A-PA-O2A
4	H	501	UPG	PB-O3A-PA-O2A
3	A	500	NAI	C2D-C1D-N1N-C2N
3	I	500	NAI	C2D-C1D-N1N-C2N
3	K	500	NAI	O4B-C4B-C5B-O5B
3	A	500	NAI	O4D-C1D-N1N-C2N
3	J	500	NAI	O4B-C4B-C5B-O5B
3	E	500	NAI	O4D-C1D-N1N-C2N
3	I	500	NAI	O4D-C1D-N1N-C2N

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Mol	Chain	Res	Type	Atoms
3	L	500	NAI	O4D-C1D-N1N-C2N
3	H	500	NAI	C2N-C3N-C7N-O7N
3	B	500	NAI	O4D-C1D-N1N-C2N

There are no ring outliers.

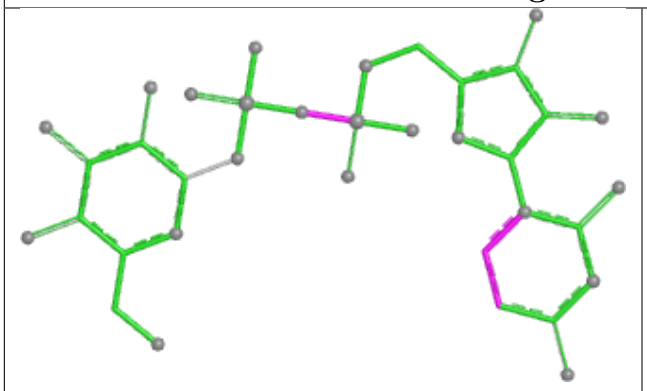
24 monomers are involved in 34 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	I	501	UPG	2	0
3	F	500	NAI	2	0
3	D	500	NAI	2	0
4	B	501	UPG	4	0
3	G	500	NAI	2	0
3	I	500	NAI	2	0
4	A	501	UPG	2	0
4	J	501	UPG	3	0
3	E	500	NAI	4	0
4	C	501	UPG	2	0
3	A	500	NAI	2	0
3	K	500	NAI	4	0
3	L	500	NAI	3	0
4	F	501	UPG	4	0
4	L	501	UPG	2	0
3	B	500	NAI	3	0
4	H	501	UPG	2	0
4	K	501	UPG	4	0
4	G	501	UPG	2	0
3	J	500	NAI	3	0
3	C	500	NAI	2	0
4	D	501	UPG	2	0
4	E	501	UPG	4	0
3	H	500	NAI	2	0

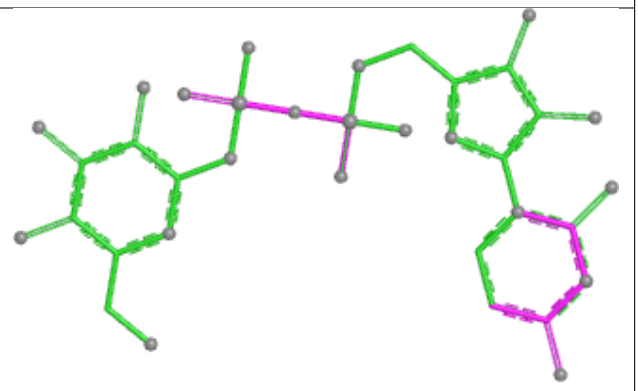
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

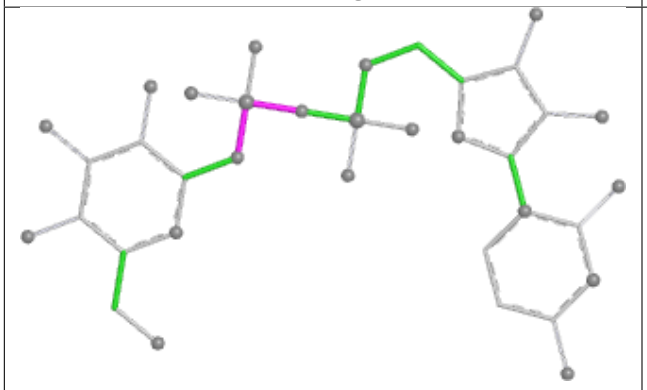
Ligand UPG I 501



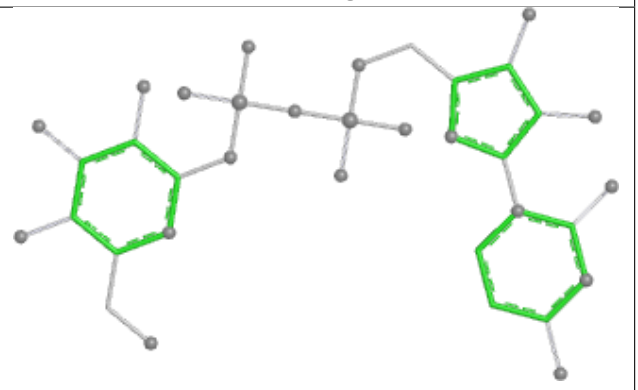
Bond lengths



Bond angles

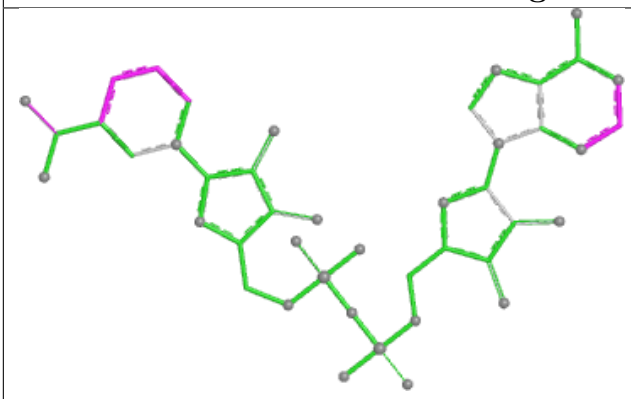


Torsions

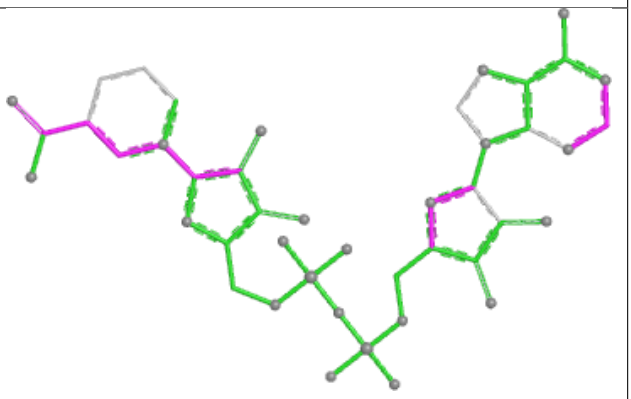


Rings

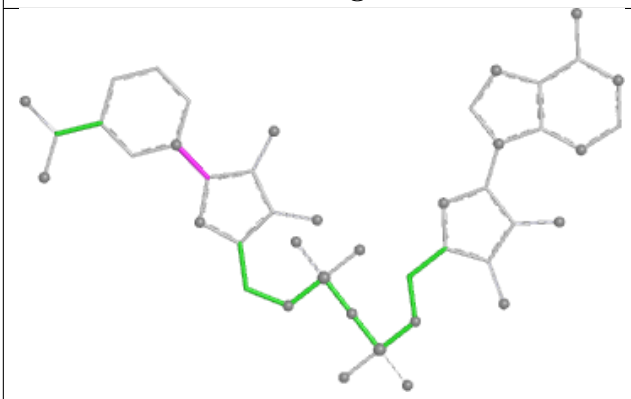
Ligand NAI F 500



Bond lengths



Bond angles



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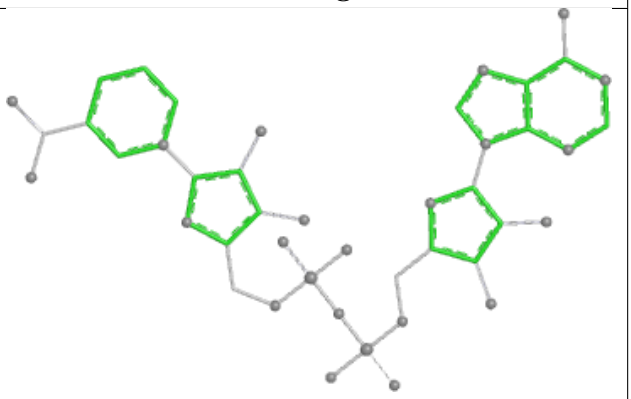
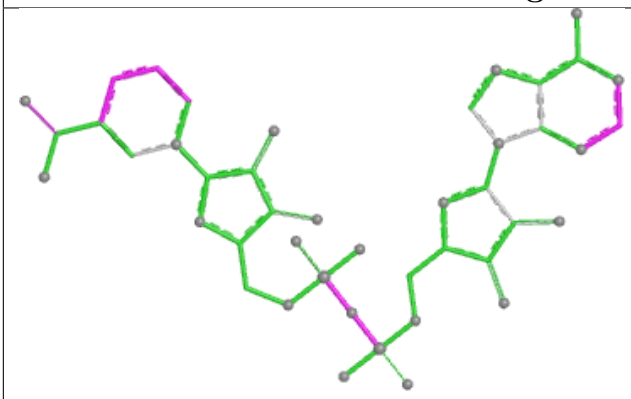
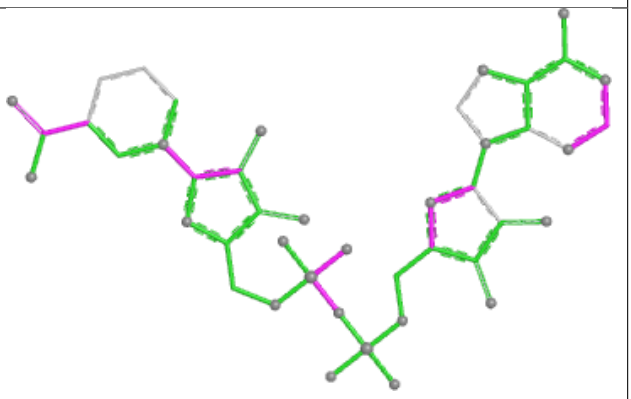


Rings

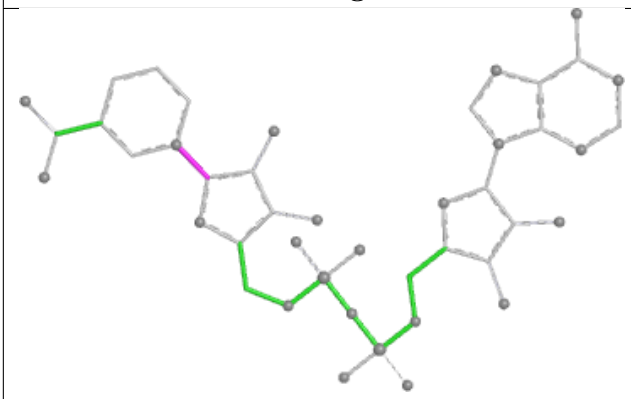
Ligand NAI D 500



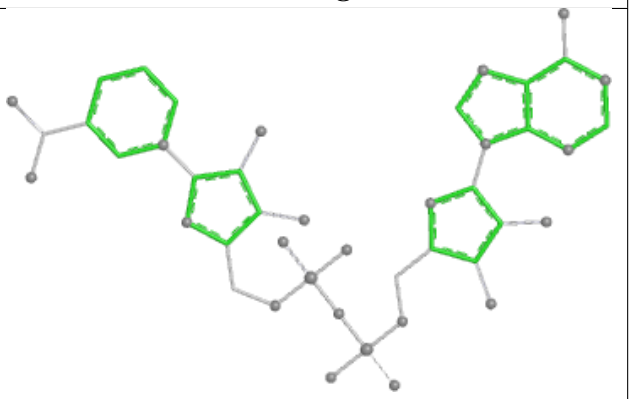
Bond lengths



Bond angles

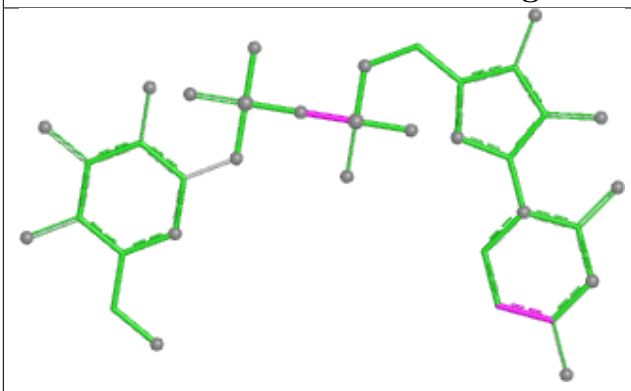


Torsions



Rings

Ligand UPG B 501



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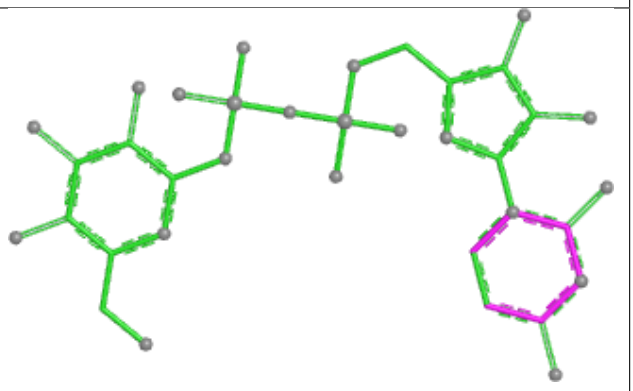

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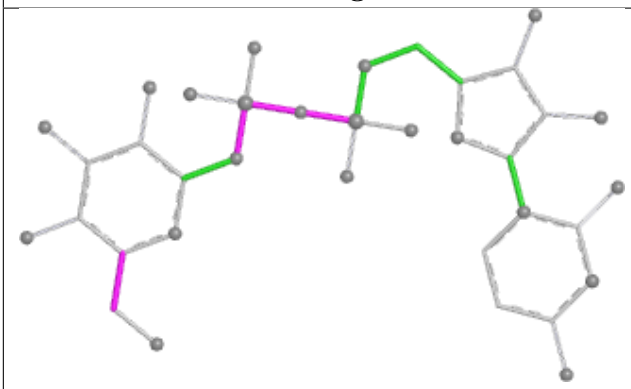

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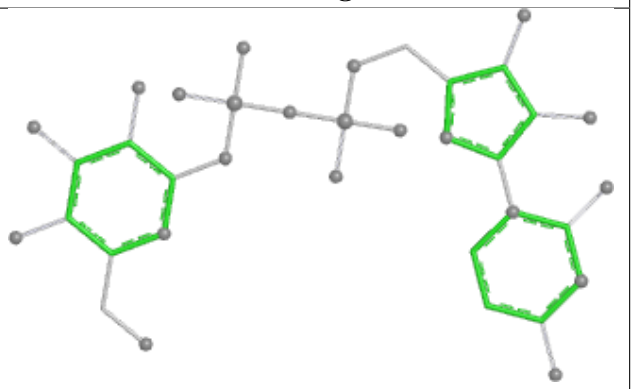
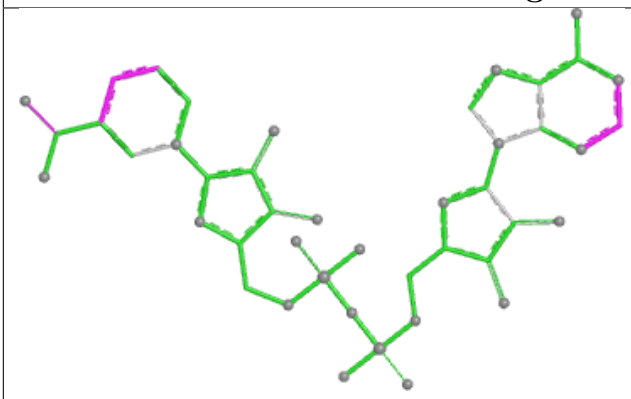


Rings

Ligand NAI G 500



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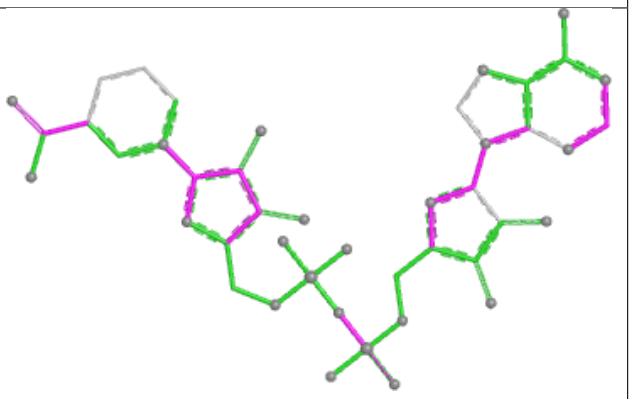

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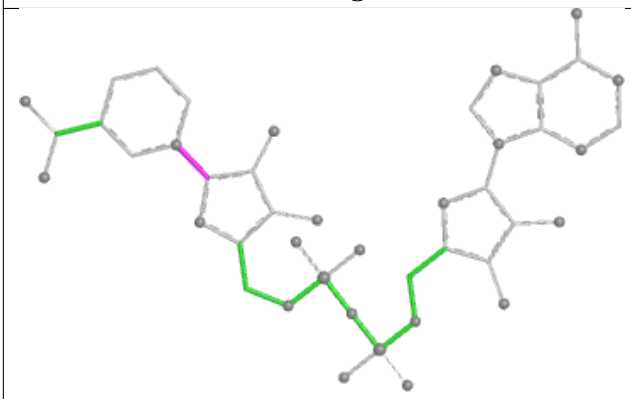

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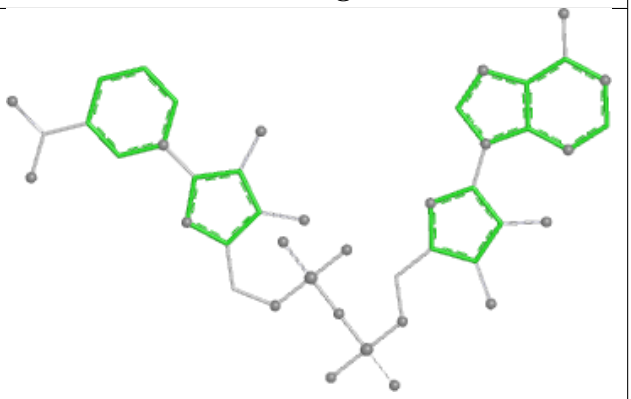
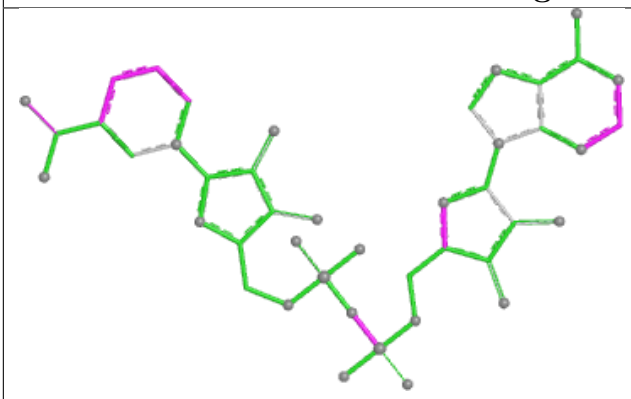


Rings

Ligand NAI I 500



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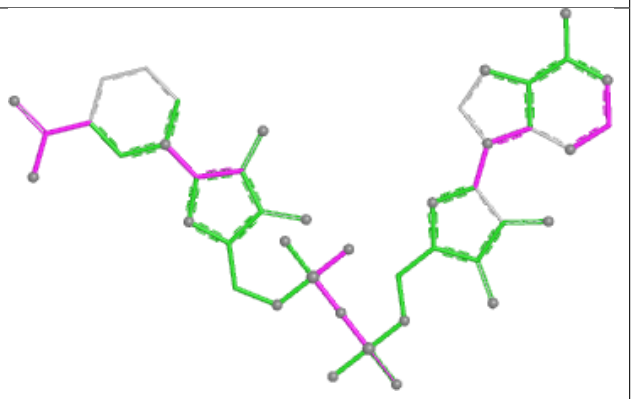

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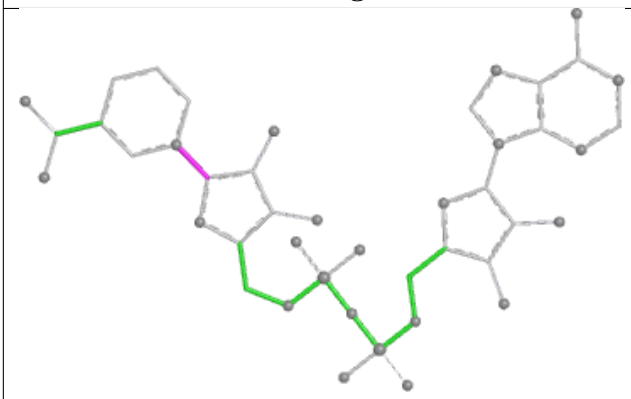

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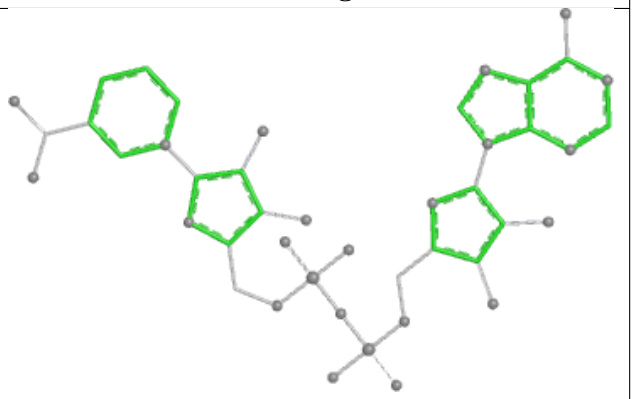
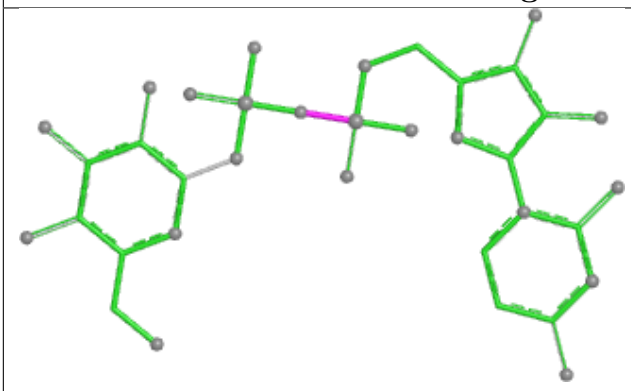


Rings

Ligand UPG A 501



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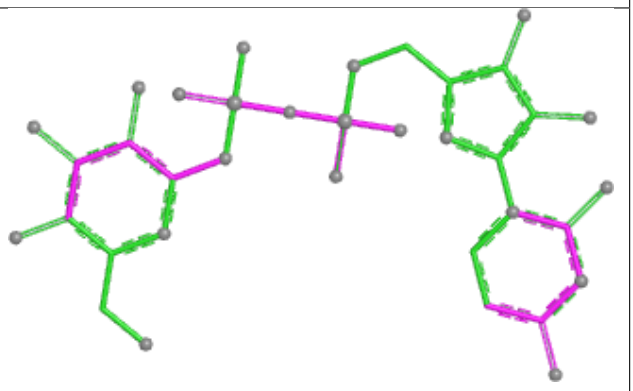

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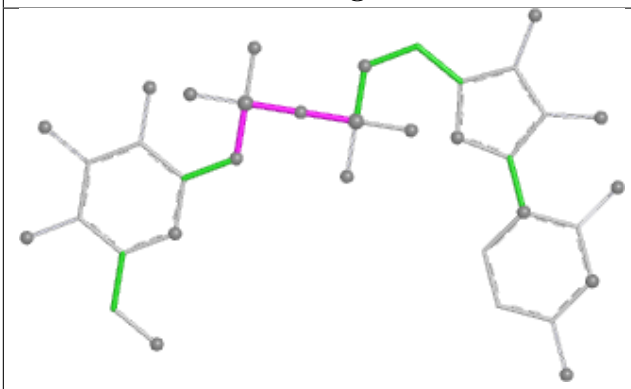

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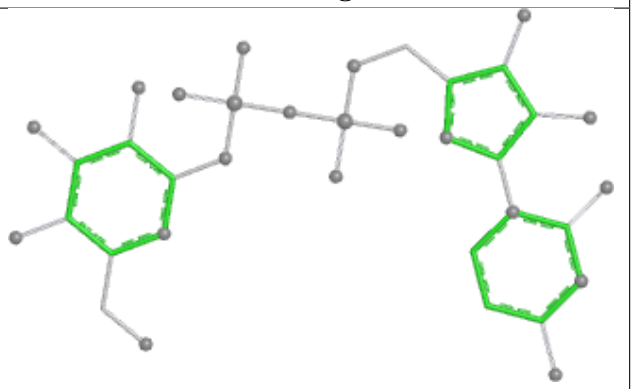
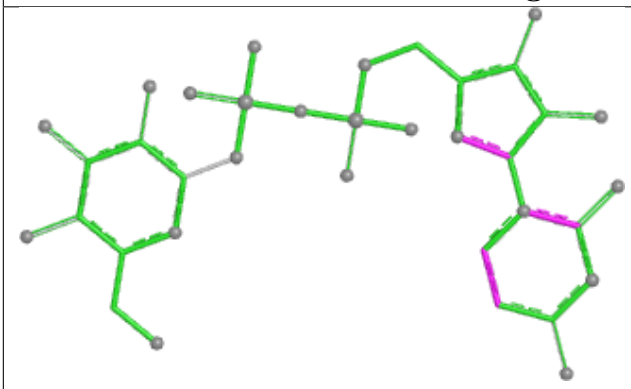


Rings

Ligand UPG J 501



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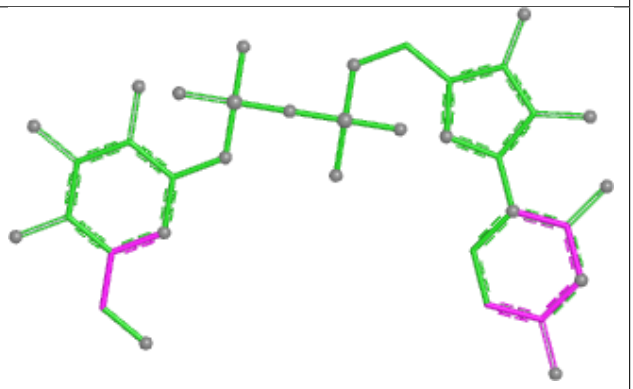

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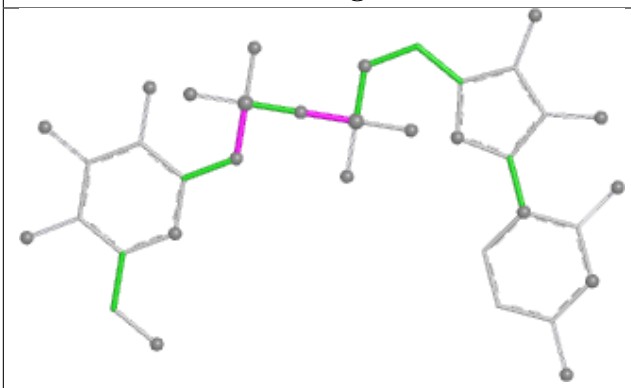

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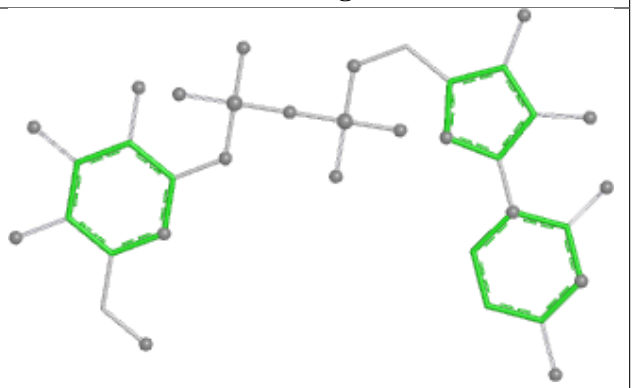
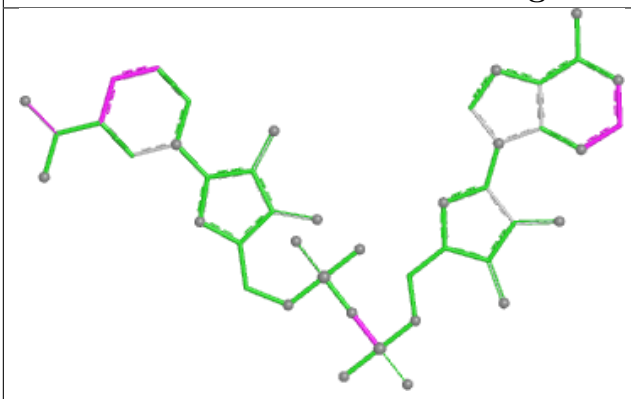


Rings

Ligand NAI E 500



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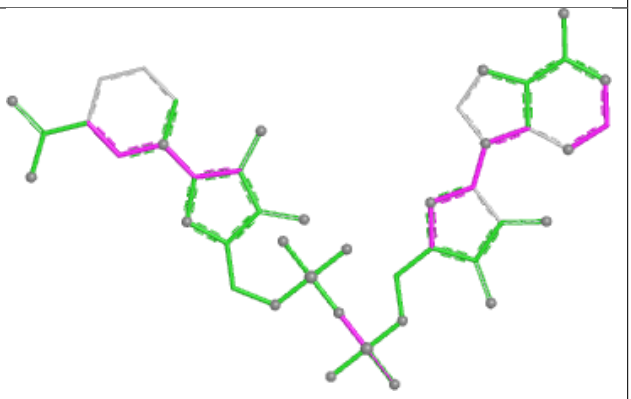

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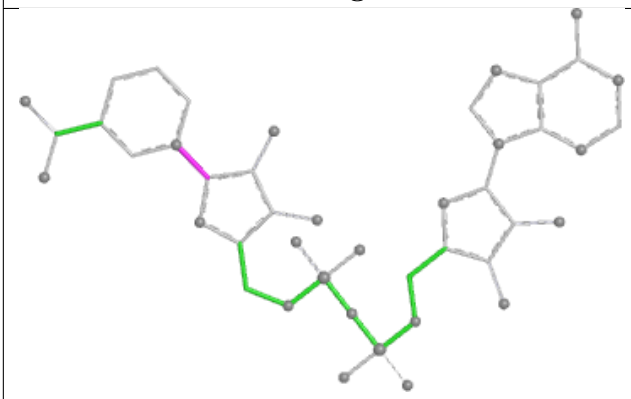

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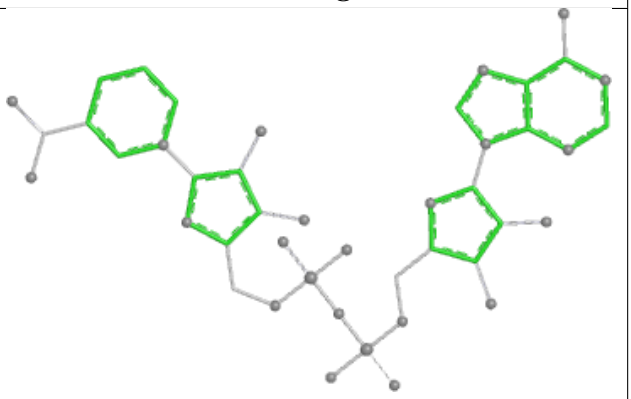
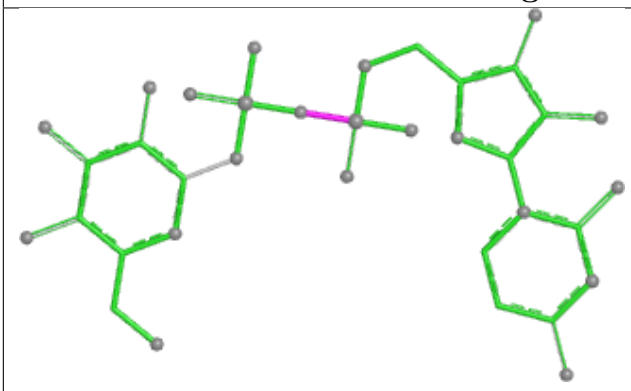


Rings

Ligand UPG C 501



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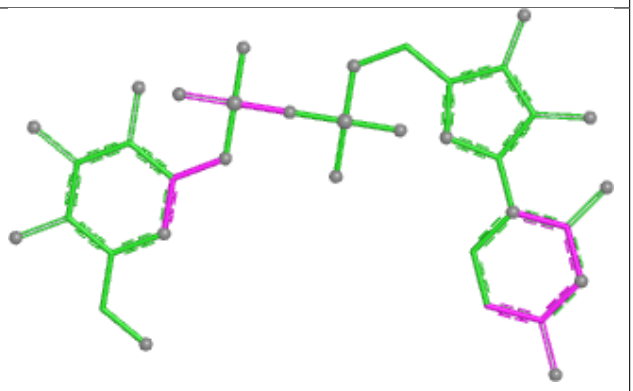

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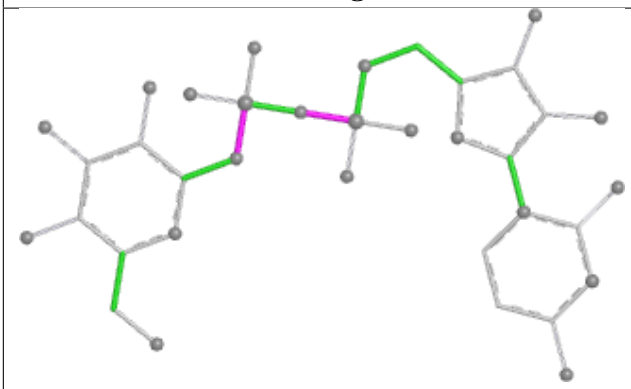

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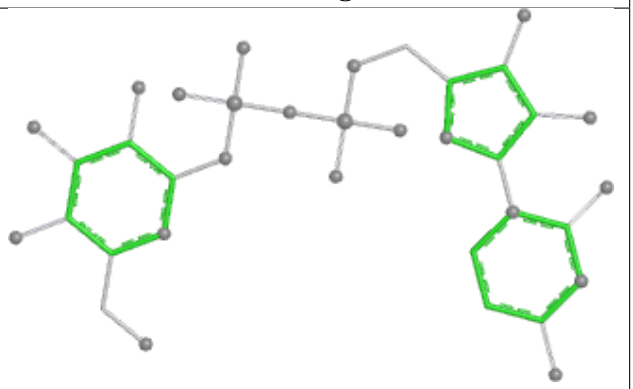
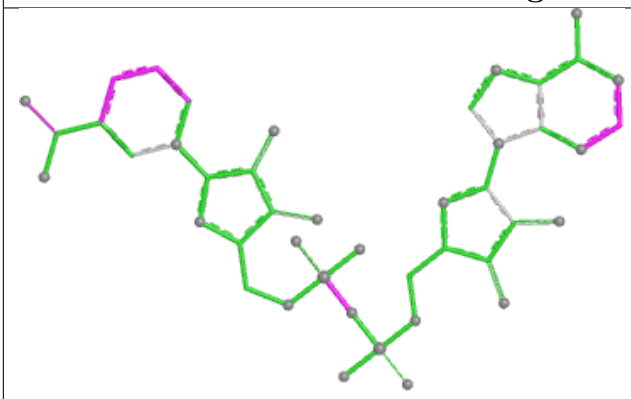


Rings

Ligand NAI A 500



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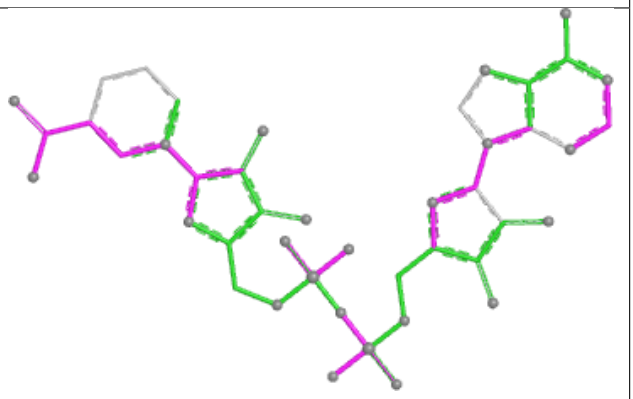

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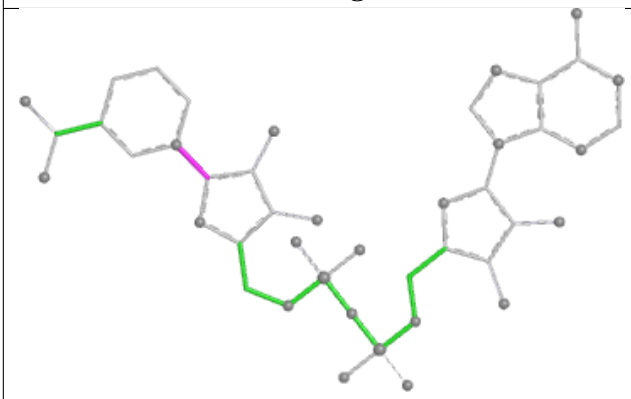

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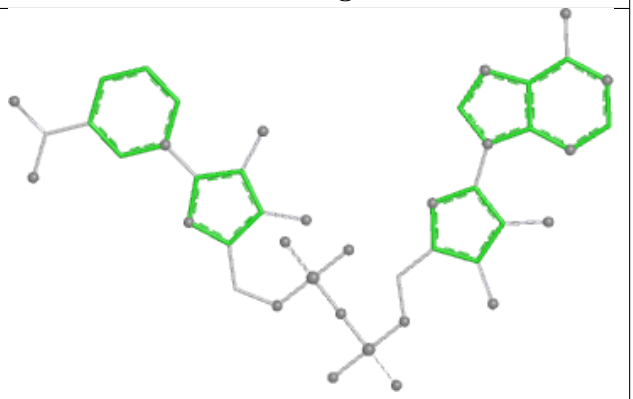
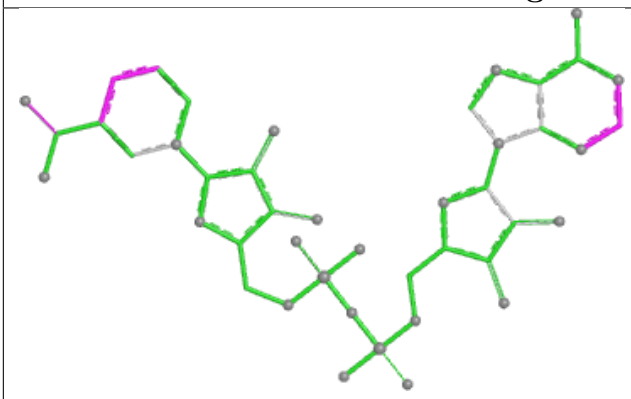


Rings

Ligand NAI K 500



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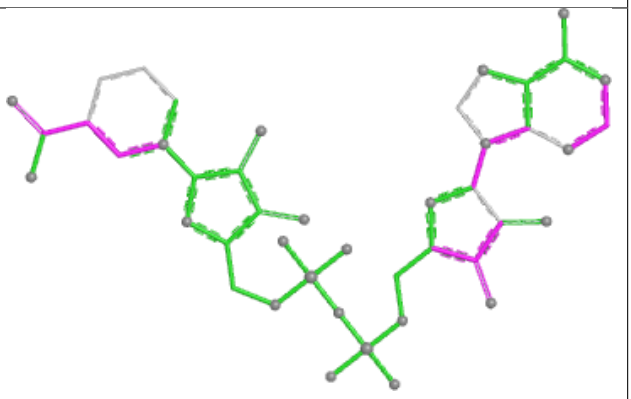

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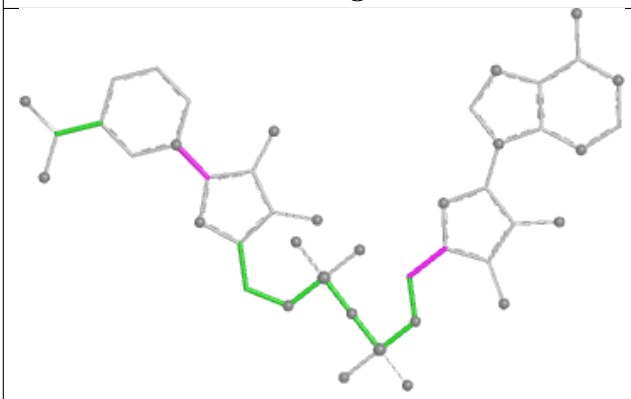

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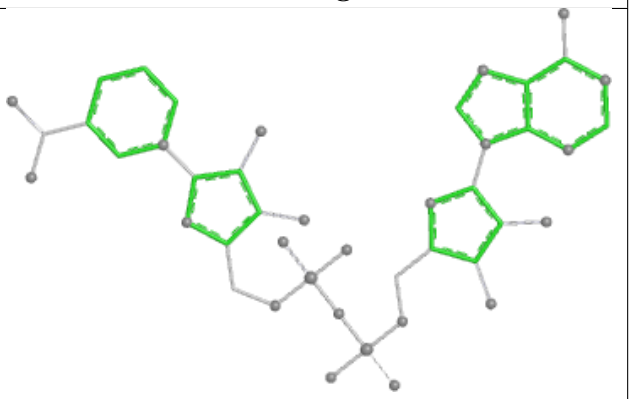
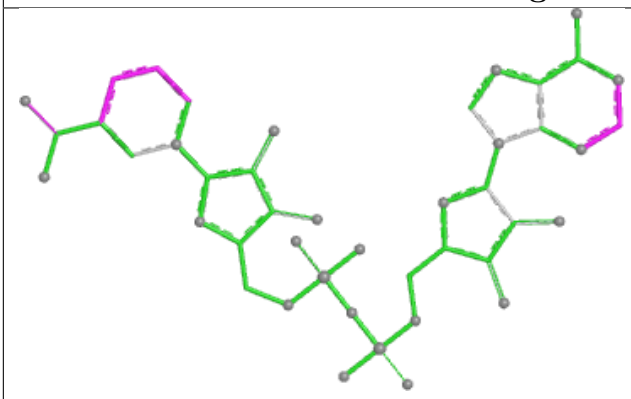


Rings

Ligand NAI L 500



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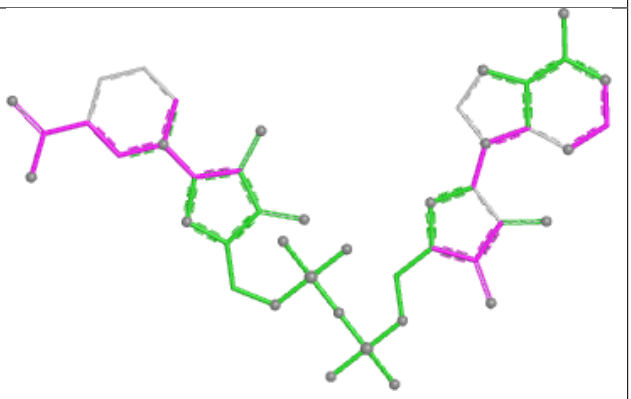

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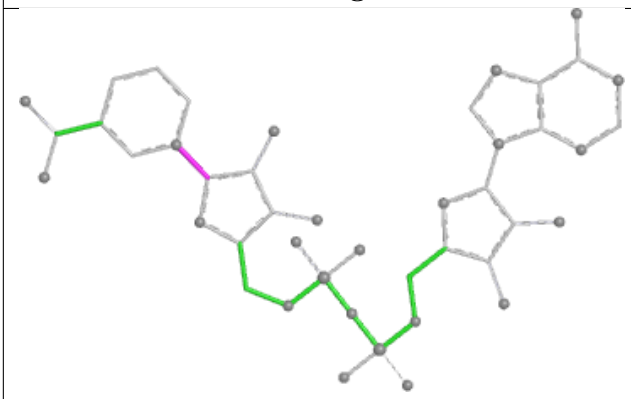

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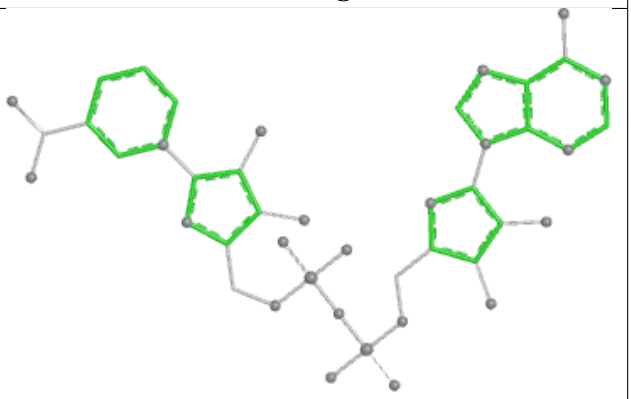
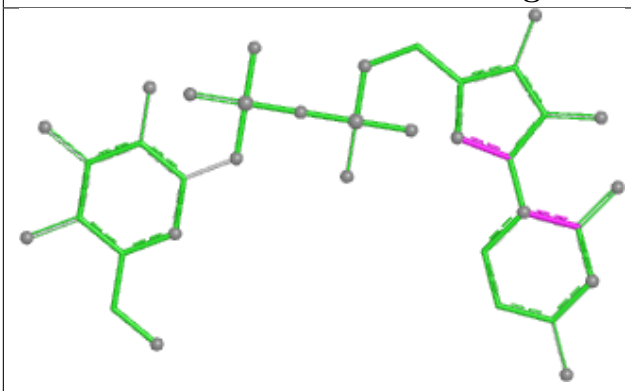


Rings

Ligand UPG F 501



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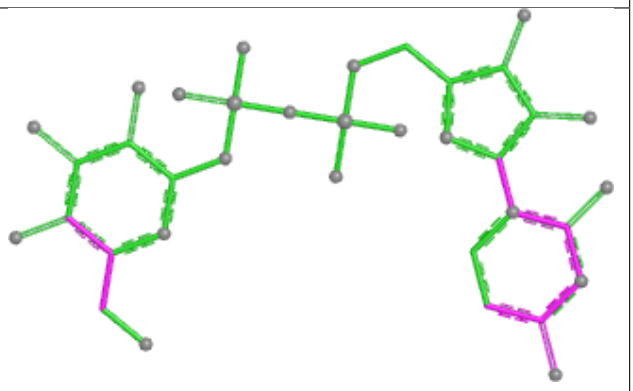

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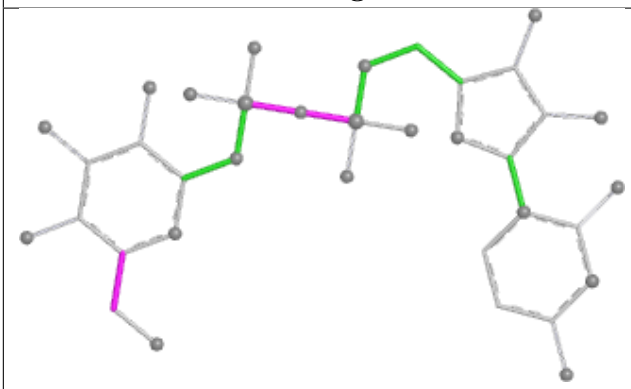

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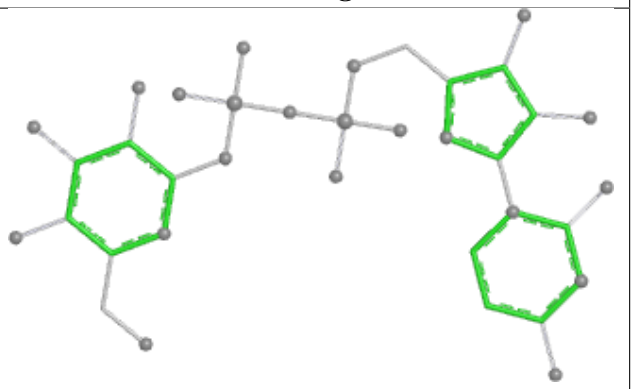
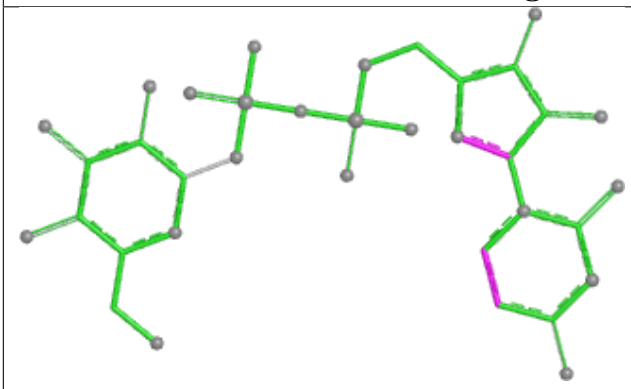


Rings

Ligand UPG L 501



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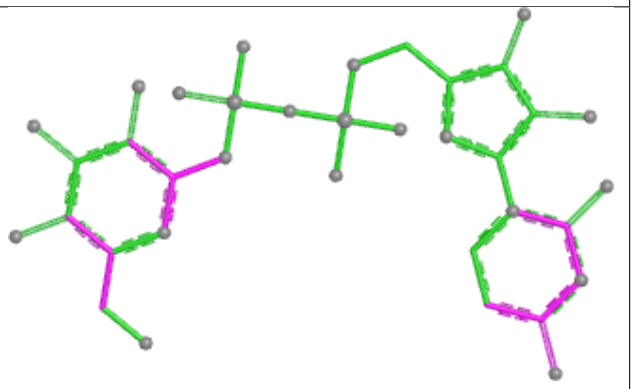

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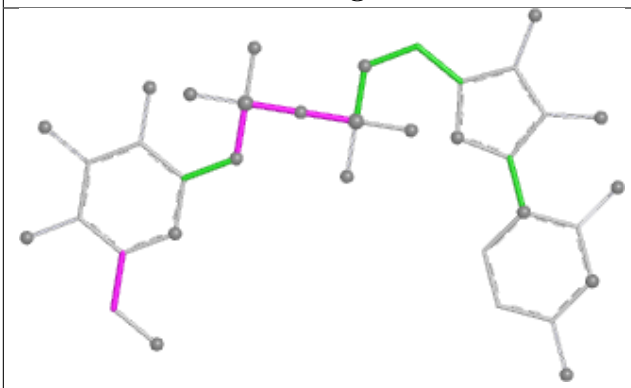

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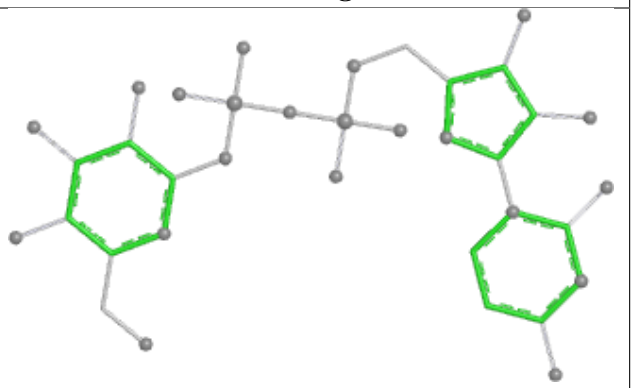
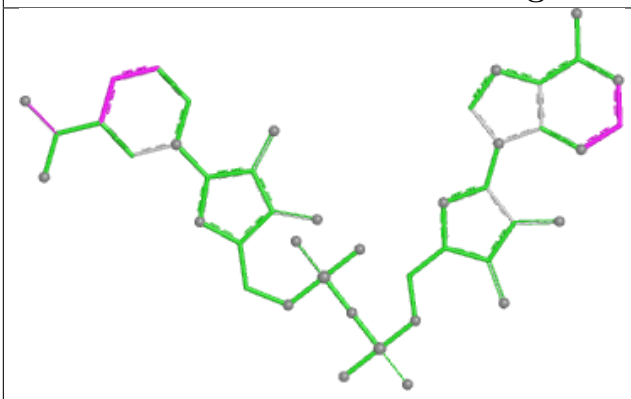


Rings

Ligand NAI B 500



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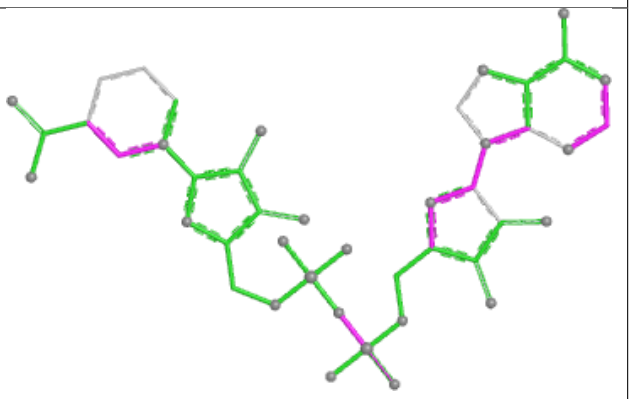
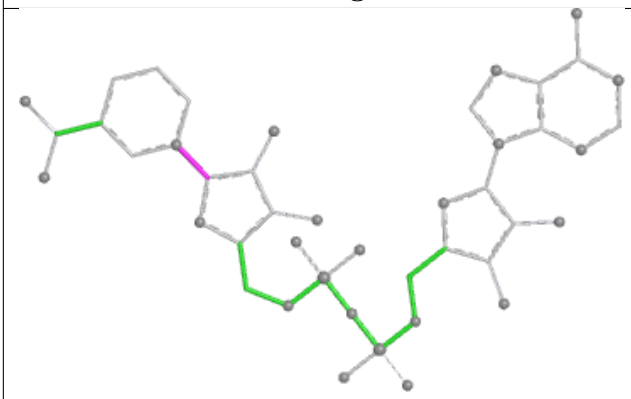


Bond angles



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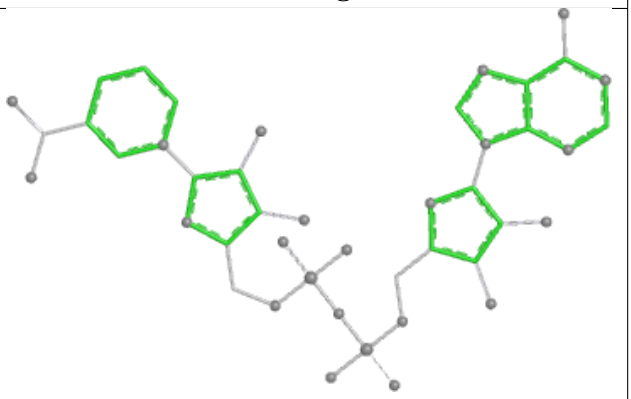
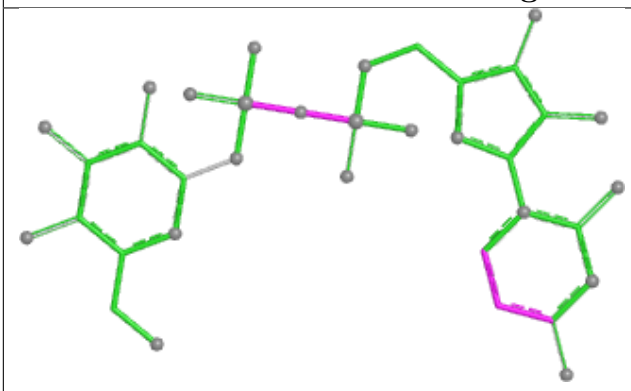


Rings

Ligand UPG H 501



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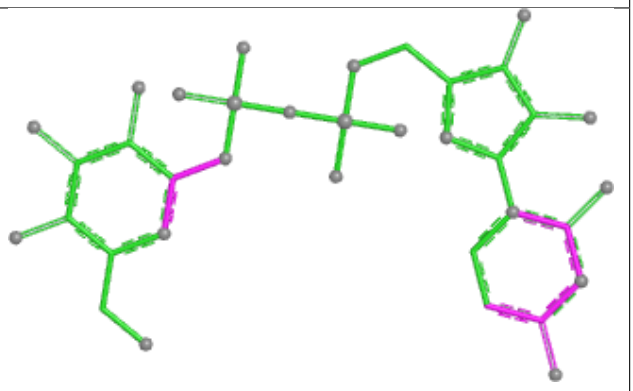
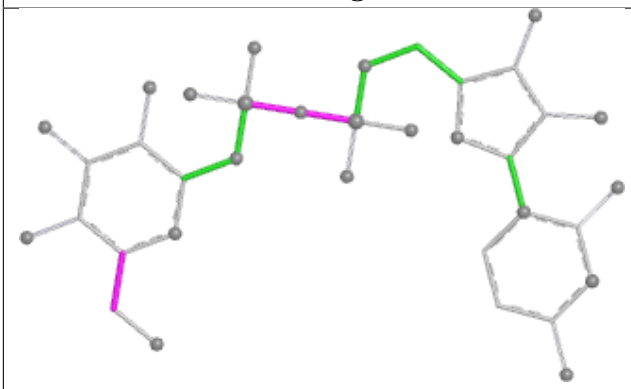
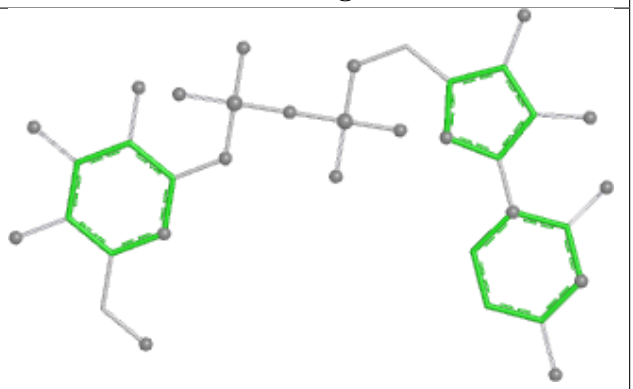


Bond angles

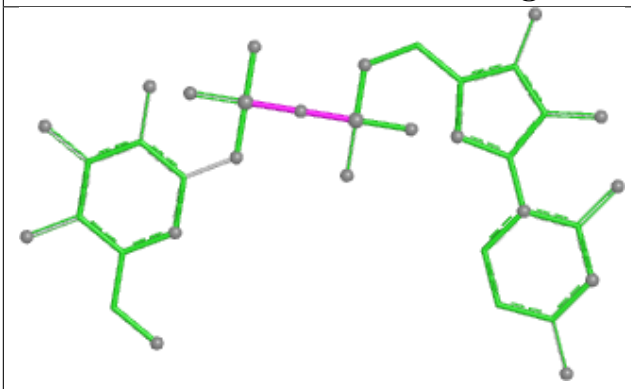


Torsions

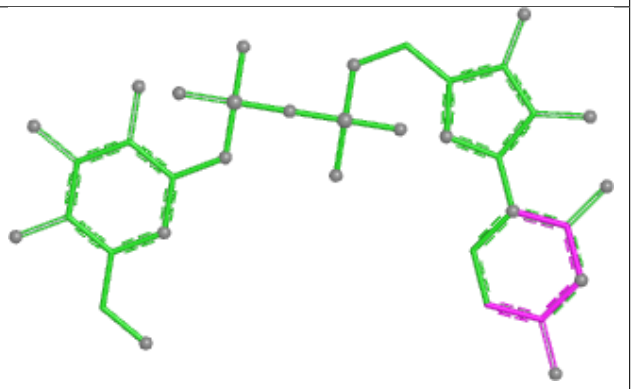


Rings

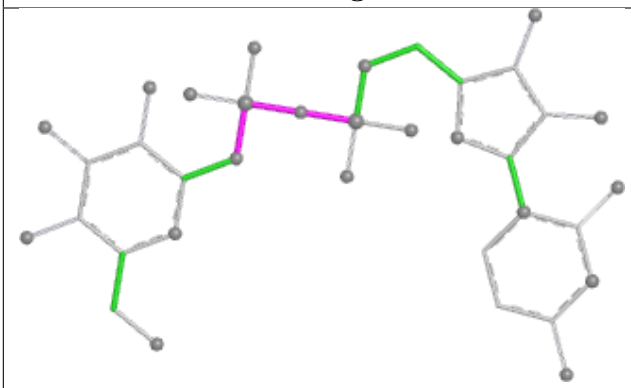
Ligand UPG K 501



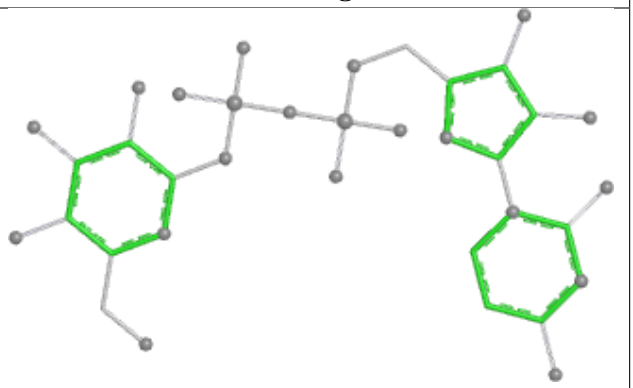
Bond lengths



Bond angles

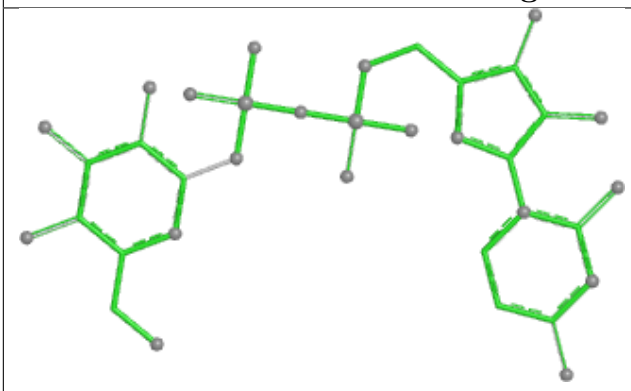


Torsions

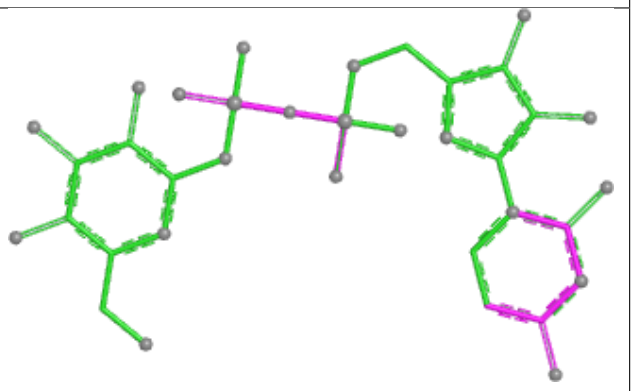


Rings

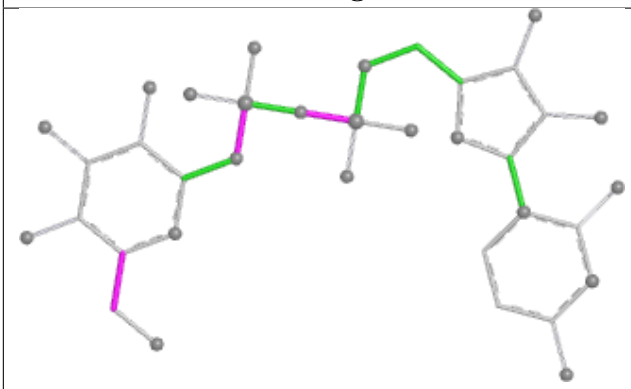
Ligand UPG G 501



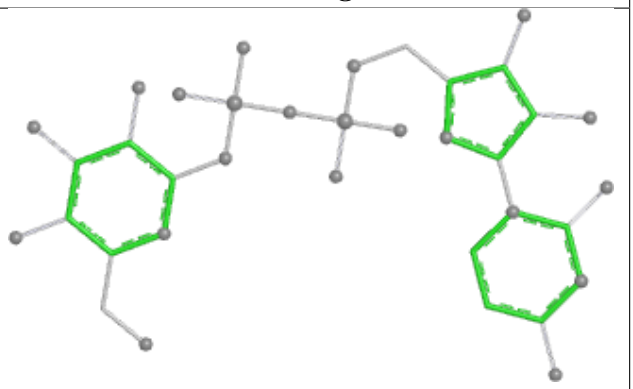
Bond lengths



Bond angles

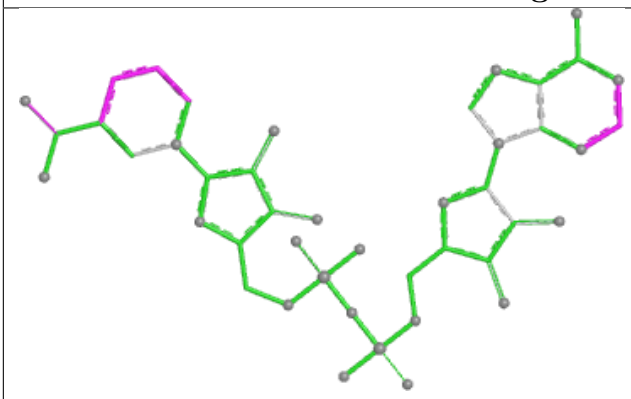


Torsions

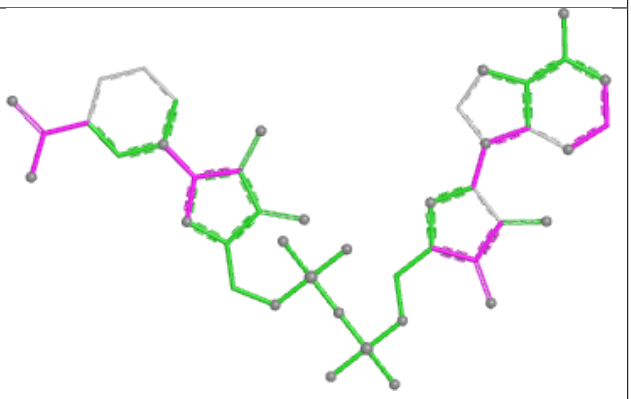


Rings

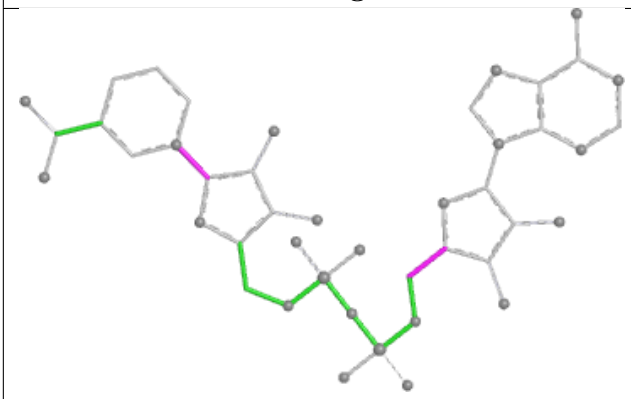
Ligand NAI J 500



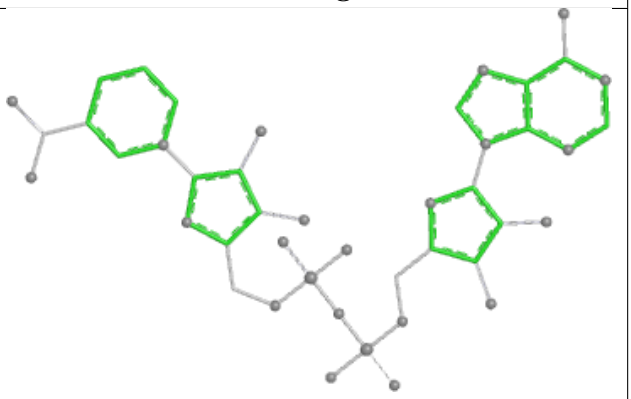
Bond lengths



Bond angles

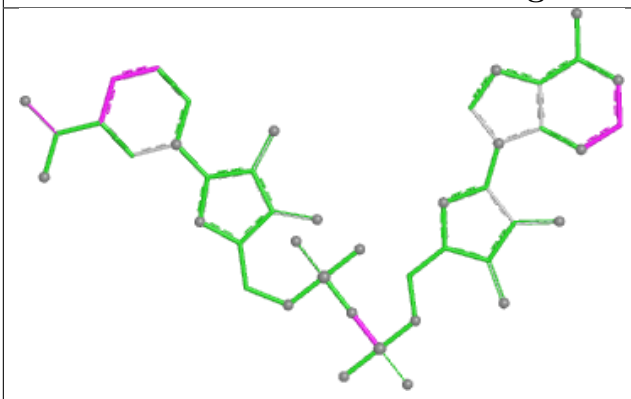


Torsions

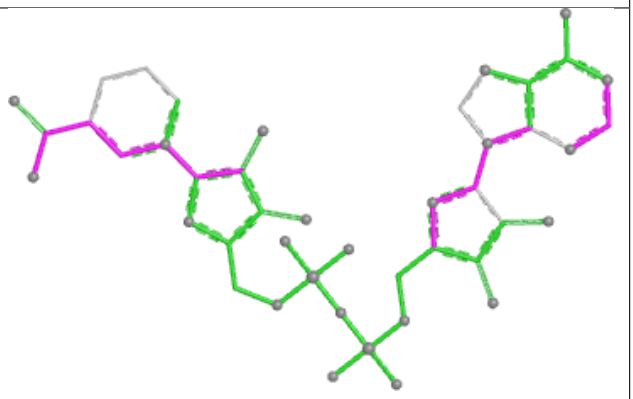


Rings

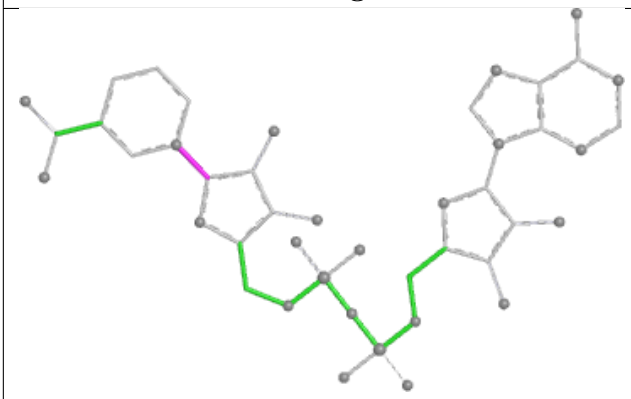
Ligand NAI C 500



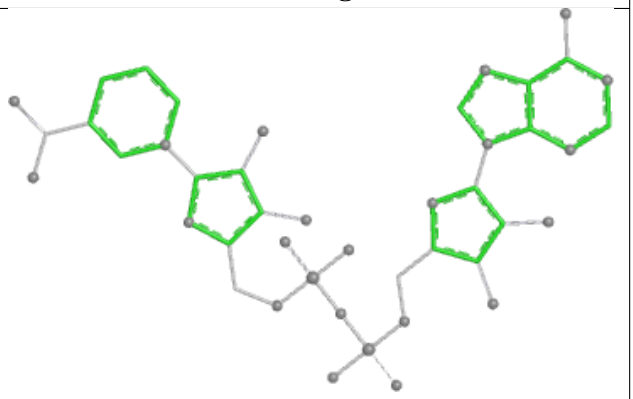
Bond lengths



Bond angles

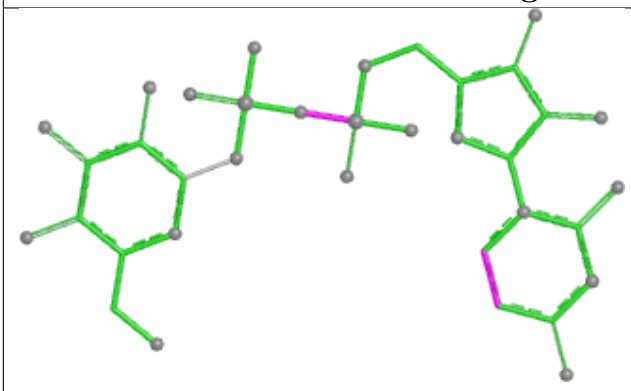


Torsions

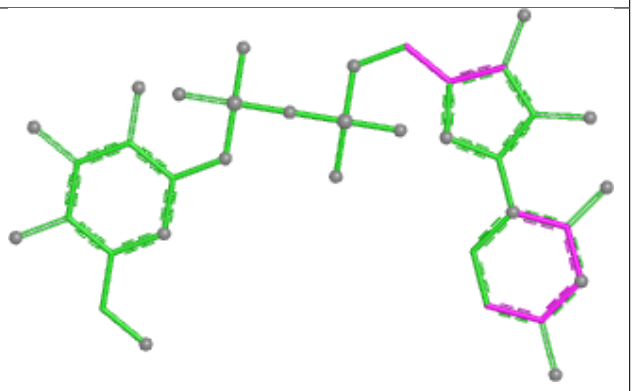


Rings

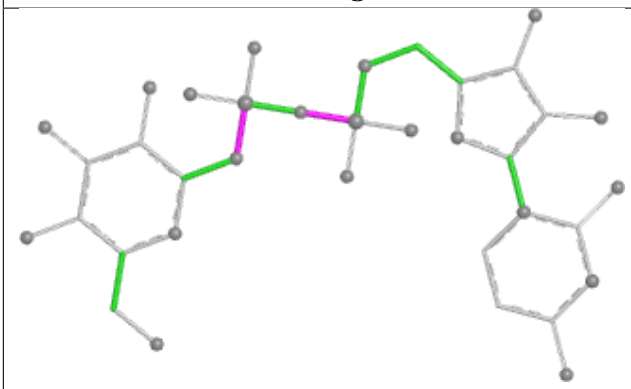
Ligand UPG D 501



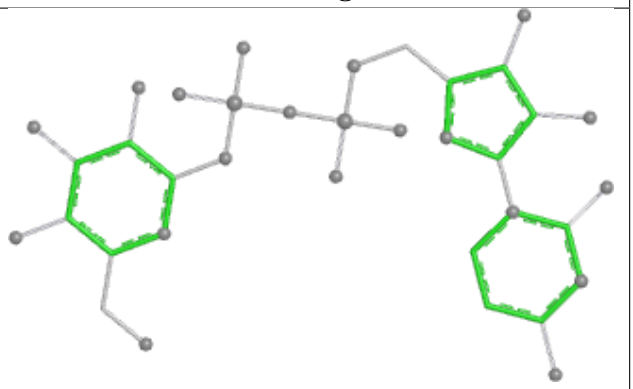
Bond lengths



Bond angles

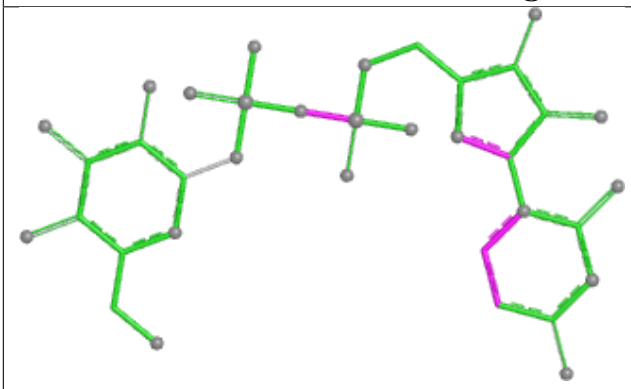


Torsions

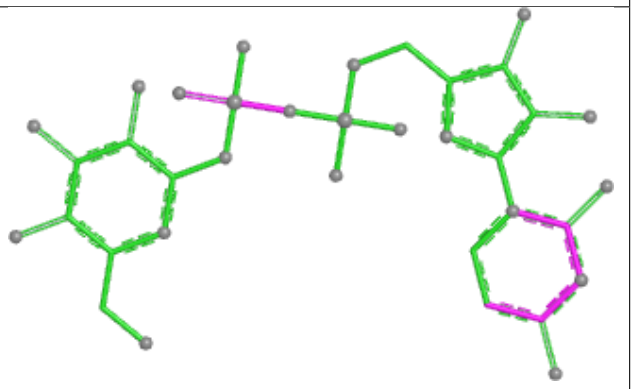


Rings

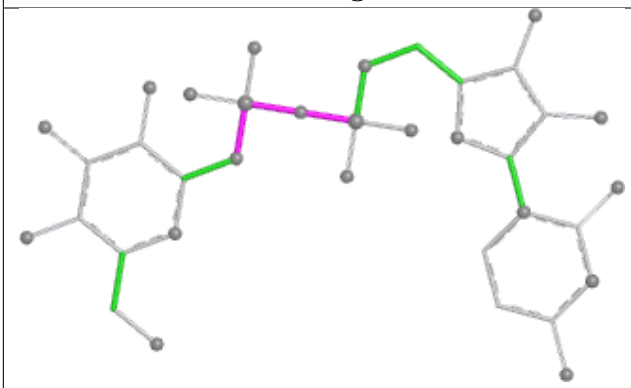
Ligand UPG E 501



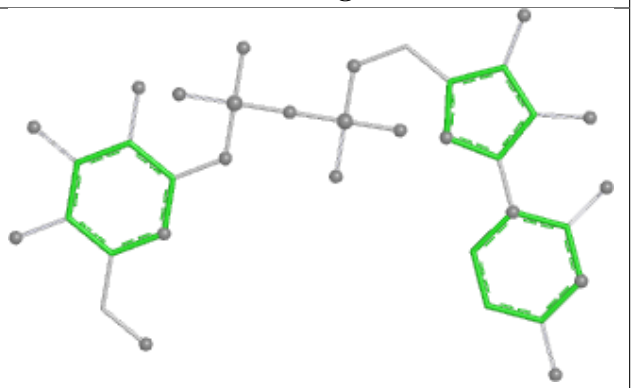
Bond lengths



Bond angles

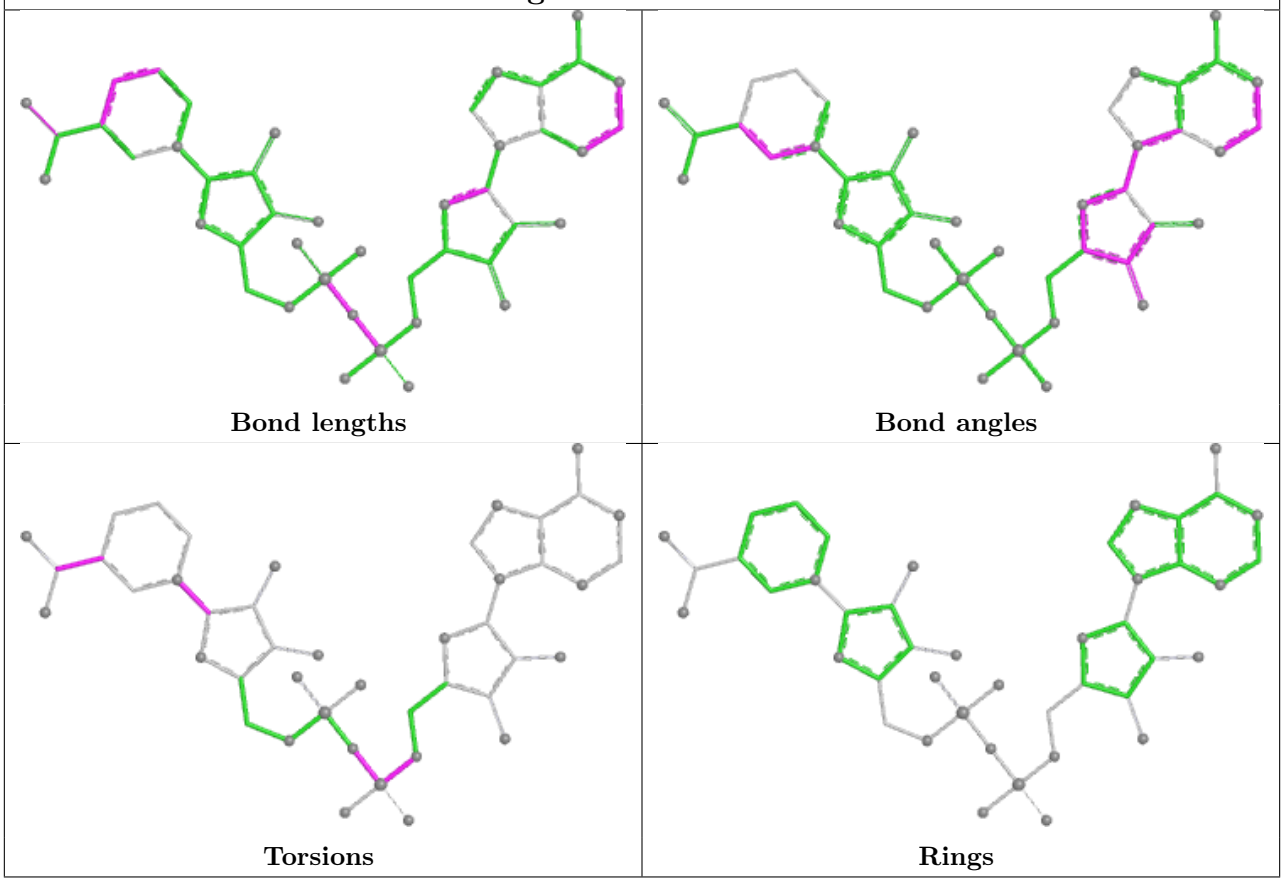


Torsions



Rings

Ligand NAI H 500



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	460/467 (98%)	-0.15	5 (1%) 77 76	17, 31, 45, 62	7 (1%)
1	B	460/467 (98%)	0.63	24 (5%) 34 32	24, 31, 45, 62	1 (0%)
1	C	460/467 (98%)	-0.18	2 (0%) 89 88	21, 31, 44, 59	5 (1%)
1	D	458/467 (98%)	0.31	10 (2%) 62 60	20, 31, 44, 57	3 (0%)
1	E	459/467 (98%)	0.28	7 (1%) 71 70	19, 31, 44, 64	3 (0%)
1	F	460/467 (98%)	0.10	6 (1%) 74 73	20, 31, 44, 60	2 (0%)
1	G	460/467 (98%)	-0.14	6 (1%) 74 73	20, 31, 44, 60	2 (0%)
1	H	459/467 (98%)	0.91	51 (11%) 12 10	20, 31, 44, 60	3 (0%)
1	I	460/467 (98%)	-0.16	5 (1%) 77 76	20, 31, 44, 60	4 (0%)
1	J	460/467 (98%)	0.40	9 (1%) 64 63	21, 31, 44, 59	3 (0%)
1	K	460/467 (98%)	0.43	14 (3%) 52 51	19, 31, 45, 62	3 (0%)
1	L	460/467 (98%)	0.20	4 (0%) 81 80	20, 31, 45, 63	2 (0%)
All	All	5516/5604 (98%)	0.22	143 (2%) 57 55	17, 31, 45, 64	38 (0%)

All (143) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	K	382	HIS	4.8
1	B	382	HIS	4.6
1	H	183	ASP	4.6
1	E	382	HIS	3.8
1	H	151	ASN	3.6
1	J	382	HIS	3.6
1	D	466	VAL	3.6
1	B	243	ALA	3.4
1	H	243	ALA	3.4
1	H	45	TRP	3.3
1	K	1	MET	3.3

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Mol	Chain	Res	Type	RSRZ
1	B	214	TRP	3.3
1	E	466	VAL	3.3
1	F	466	VAL	3.3
1	I	183	ASP	3.2
1	E	389	ASP	3.1
1	K	98[A]	MET	3.1
1	B	151	ASN	3.0
1	H	309	TYR	3.0
1	H	117	VAL	3.0
1	J	466	VAL	3.0
1	E	290	ALA	3.0
1	B	183	ASP	2.9
1	H	234	ILE	2.9
1	A	382	HIS	2.9
1	K	66	GLY	2.9
1	I	382	HIS	2.9
1	D	293	LEU	2.8
1	H	382	HIS	2.8
1	L	382	HIS	2.8
1	H	118	GLN	2.8
1	H	465	LYS	2.8
1	E	98[A]	MET	2.8
1	K	389	ASP	2.8
1	G	214	TRP	2.8
1	H	98[A]	MET	2.7
1	H	83	ASP	2.7
1	H	246	ALA	2.7
1	J	404	ALA	2.7
1	B	1	MET	2.7
1	B	240	LEU	2.7
1	D	296	VAL	2.7
1	B	83	ASP	2.7
1	G	98[A]	MET	2.7
1	J	1	MET	2.7
1	B	246	ALA	2.7
1	G	382	HIS	2.7
1	G	183	ASP	2.7
1	H	239	ALA	2.6
1	H	459	ILE	2.6
1	J	294	PRO	2.6
1	H	261	ILE	2.6
1	H	316[A]	SER	2.6

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Mol	Chain	Res	Type	RSRZ
1	H	156	VAL	2.5
1	B	187	GLU	2.5
1	B	236	SER	2.5
1	H	2	PHE	2.5
1	H	71	PHE	2.5
1	C	382	HIS	2.5
1	H	120	SER	2.5
1	I	392	SER	2.5
1	F	1	MET	2.5
1	B	466	VAL	2.5
1	H	34	VAL	2.5
1	H	79	ILE	2.4
1	J	296	VAL	2.4
1	B	186	PRO	2.4
1	H	238	SER	2.4
1	K	70	PHE	2.4
1	B	255	ILE	2.4
1	H	75	ILE	2.4
1	D	404	ALA	2.4
1	H	254	ALA	2.4
1	K	24	ALA	2.4
1	F	213	THR	2.4
1	H	214	TRP	2.4
1	B	34	VAL	2.4
1	H	240	LEU	2.4
1	H	82	ALA	2.4
1	G	447	GLY	2.4
1	H	251	VAL	2.3
1	B	45	TRP	2.3
1	H	320	ASP	2.3
1	F	382	HIS	2.3
1	J	290	ALA	2.3
1	H	9	CYS	2.3
1	L	1	MET	2.3
1	B	248	VAL	2.3
1	K	466	VAL	2.3
1	H	245	GLY	2.3
1	D	290	ALA	2.3
1	K	290	ALA	2.3
1	A	183	ASP	2.2
1	L	466	VAL	2.2
1	D	2	PHE	2.2

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Mol	Chain	Res	Type	RSRZ
1	K	202	TRP	2.2
1	H	244	THR	2.2
1	K	288	CYS	2.2
1	H	248	VAL	2.2
1	K	151	ASN	2.2
1	F	214	TRP	2.2
1	H	116	ILE	2.2
1	C	287	LEU	2.2
1	H	33	THR	2.2
1	F	290	ALA	2.2
1	H	463	GLY	2.2
1	E	184	GLU	2.2
1	H	255	ILE	2.2
1	B	239	ALA	2.2
1	A	389	ASP	2.2
1	H	77	ASP	2.2
1	A	205[A]	ARG	2.2
1	H	206	GLU	2.1
1	J	293	LEU	2.1
1	G	289	GLU	2.1
1	K	184	GLU	2.1
1	B	389	ASP	2.1
1	B	462	ILE	2.1
1	H	7	ILE	2.1
1	H	322	LEU	2.1
1	L	290	ALA	2.1
1	K	27	CYS	2.1
1	D	291	LEU	2.1
1	B	244	THR	2.1
1	H	70	PHE	2.1
1	I	1	MET	2.1
1	A	447	GLY	2.0
1	H	194	ALA	2.0
1	D	29	GLU	2.0
1	H	128	GLU	2.0
1	H	61	VAL	2.0
1	I	466	VAL	2.0
1	H	21	SER	2.0
1	J	398	SER	2.0
1	B	390	GLN	2.0
1	H	213	THR	2.0
1	E	70	PHE	2.0

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Mol	Chain	Res	Type	RSRZ
1	H	319	ILE	2.0
1	H	252	ALA	2.0
1	B	309	TYR	2.0
1	D	61	VAL	2.0
1	D	288	CYS	2.0
1	B	76	ASP	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 monosaccharides in this entry.

6.4 Ligands (i)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 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
3	NAI	H	500	44/44	0.93	0.10	23,35,48,50	0
2	CL	H	3010	1/1	0.94	0.07	36,36,36,36	0
3	NAI	B	500	44/44	0.95	0.08	21,31,42,43	0
3	NAI	L	500	44/44	0.95	0.09	21,33,45,51	0
2	CL	K	3008	1/1	0.96	0.09	25,25,25,25	0
3	NAI	J	500	44/44	0.96	0.07	17,28,39,40	0
3	NAI	F	500	44/44	0.96	0.08	18,27,38,45	0
4	UPG	B	501	36/36	0.96	0.07	17,22,27,30	0
4	UPG	E	501	36/36	0.96	0.07	19,23,26,28	0
4	UPG	K	501	36/36	0.96	0.07	17,25,29,30	0
4	UPG	L	501	36/36	0.96	0.07	23,28,31,33	0
3	NAI	I	500	44/44	0.97	0.07	17,25,30,33	0
3	NAI	C	500	44/44	0.97	0.06	13,22,25,29	0
3	NAI	K	500	44/44	0.97	0.07	19,27,35,37	0
3	NAI	D	500	44/44	0.97	0.07	20,26,33,34	0
3	NAI	E	500	44/44	0.97	0.07	19,26,30,31	0
4	UPG	D	501	36/36	0.97	0.06	18,23,27,36	0

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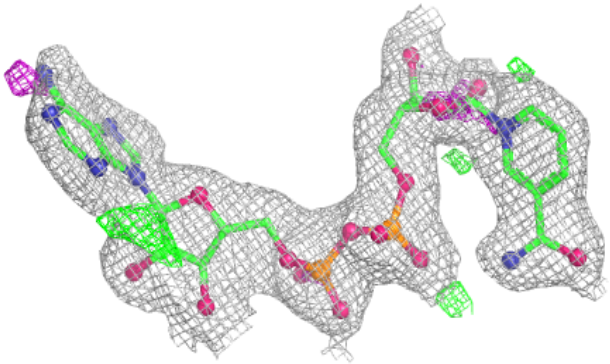
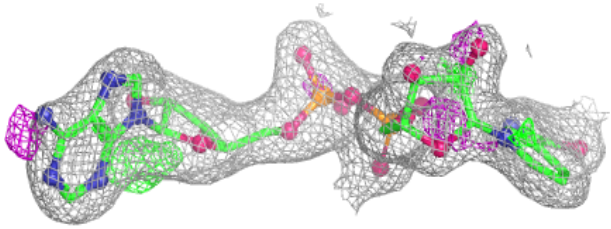
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	CL	D	3006	1/1	0.97	0.05	30,30,30,30	0
4	UPG	F	501	36/36	0.97	0.07	19,25,29,30	0
4	UPG	G	501	36/36	0.97	0.06	16,21,26,26	0
4	UPG	H	501	36/36	0.97	0.07	22,28,34,39	0
4	UPG	I	501	36/36	0.97	0.06	17,24,26,28	0
4	UPG	J	501	36/36	0.97	0.06	20,25,28,30	0
3	NAI	G	500	44/44	0.97	0.06	16,22,27,32	0
2	CL	C	3005	1/1	0.97	0.05	25,25,25,25	0
2	CL	L	3007	1/1	0.98	0.05	30,30,30,30	0
3	NAI	A	500	44/44	0.98	0.06	13,18,23,26	0
2	CL	G	3002	1/1	0.98	0.05	26,26,26,26	0
2	CL	B	3009	1/1	0.98	0.05	29,29,29,29	0
2	CL	I	3003	1/1	0.98	0.05	29,29,29,29	0
2	CL	J	3012	1/1	0.98	0.06	30,30,30,30	0
4	UPG	A	501	36/36	0.98	0.05	14,20,24,26	0
2	CL	E	3011	1/1	0.98	0.06	29,29,29,29	0
4	UPG	C	501	36/36	0.98	0.06	18,22,25,29	0
2	CL	A	3001	1/1	0.99	0.04	21,21,21,21	0
2	CL	F	3004	1/1	0.99	0.05	26,26,26,26	0

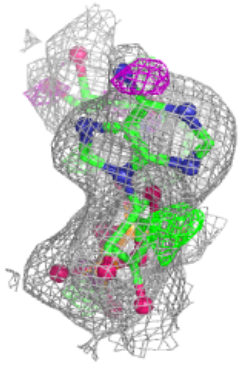
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around NAI H 500:

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

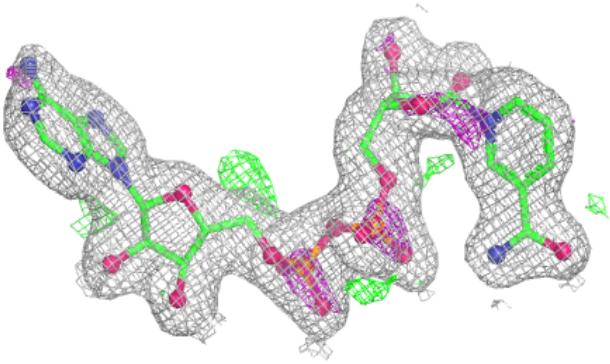


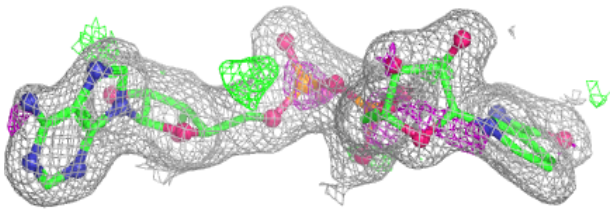


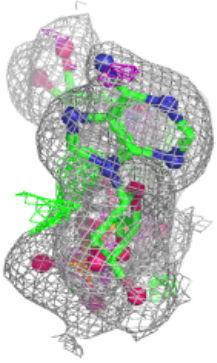


Electron density around NAI B 500:

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

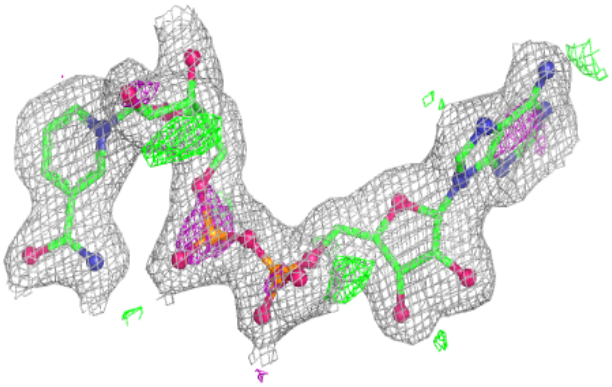


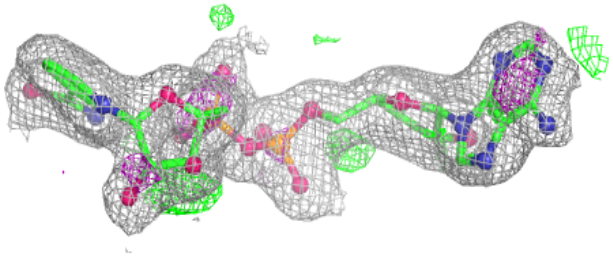


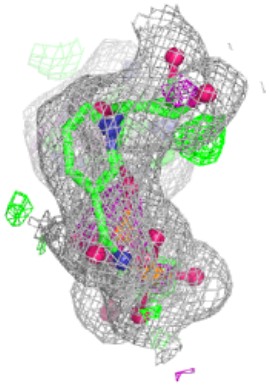


Electron density around NAI L 500:

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

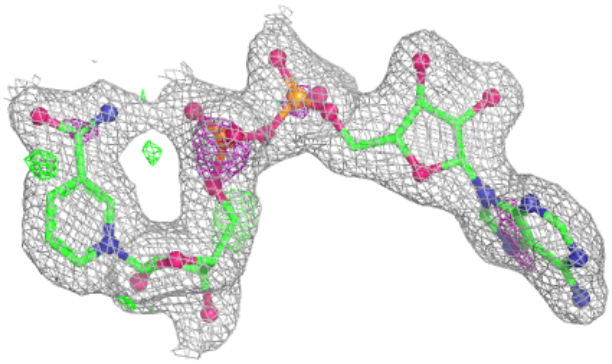


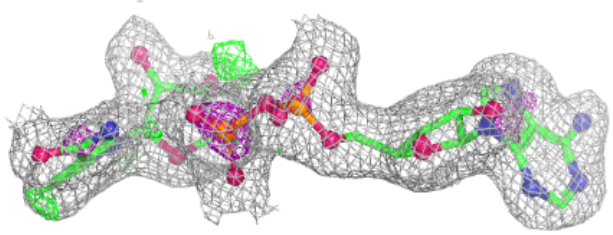


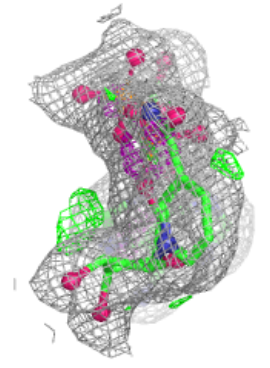


Electron density around NAI J 500:

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

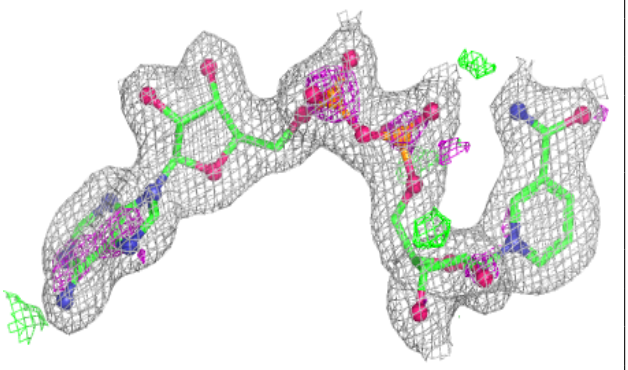


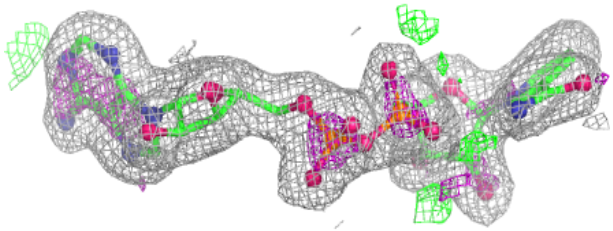


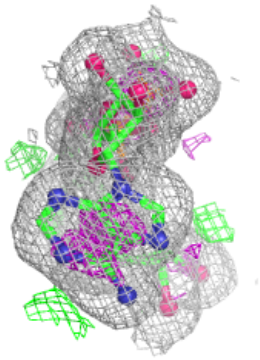


Electron density around NAI F 500:

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

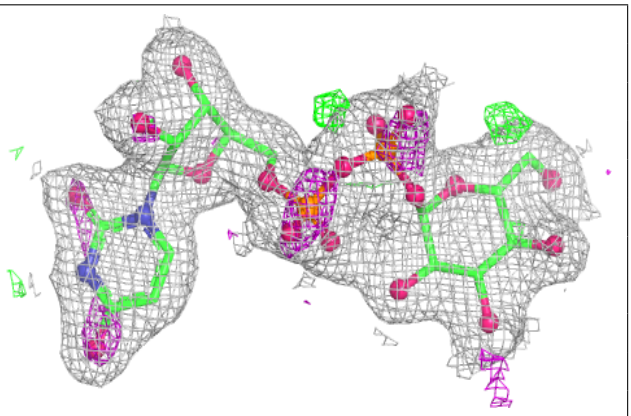


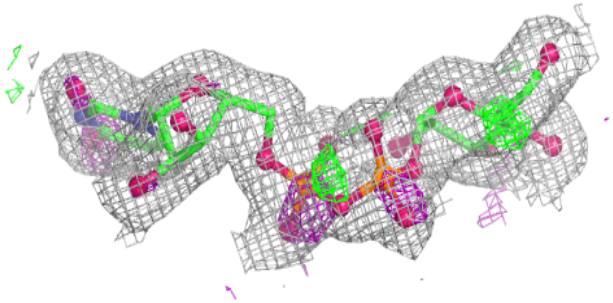


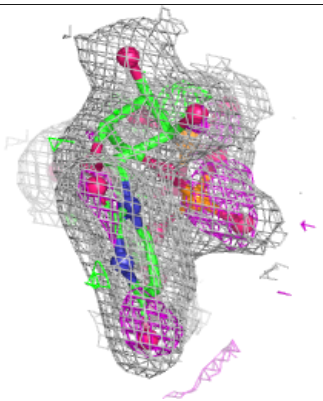


Electron density around UPG B 501:

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

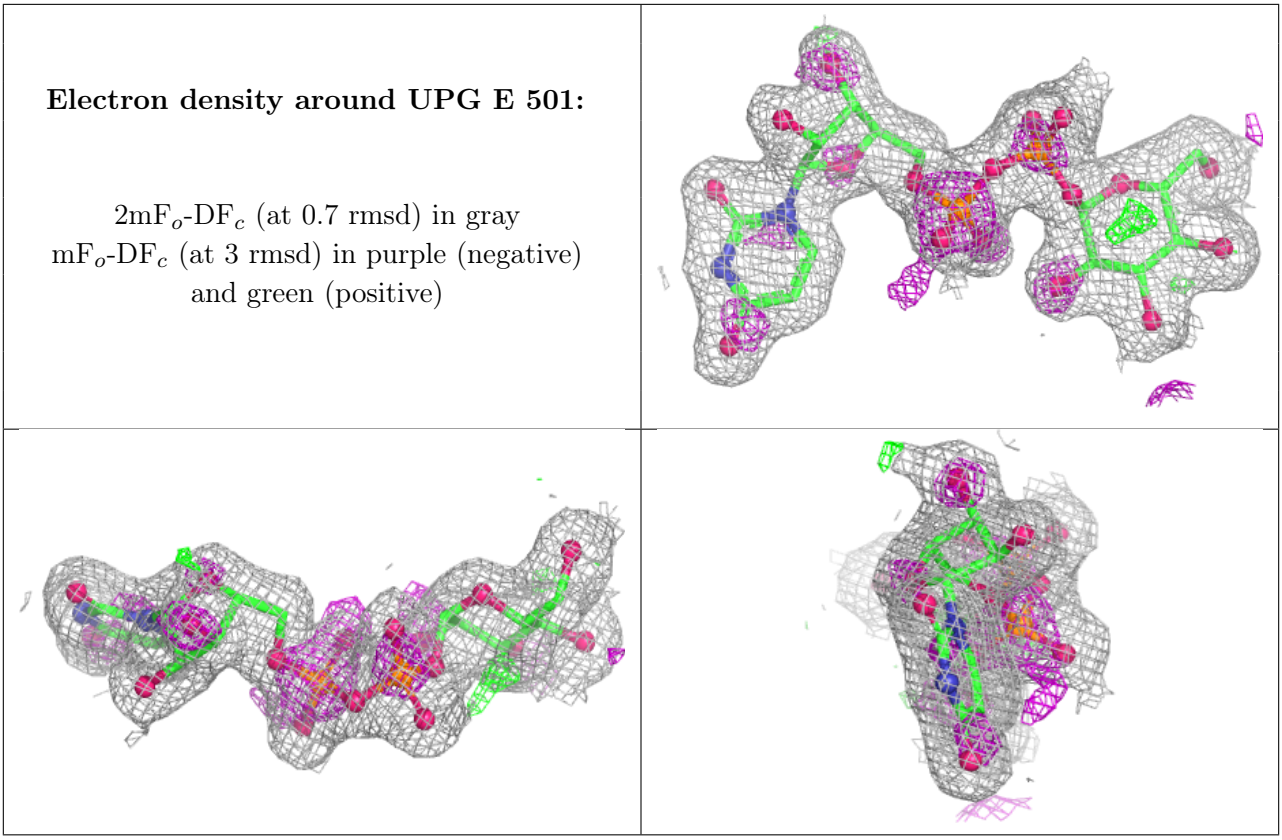






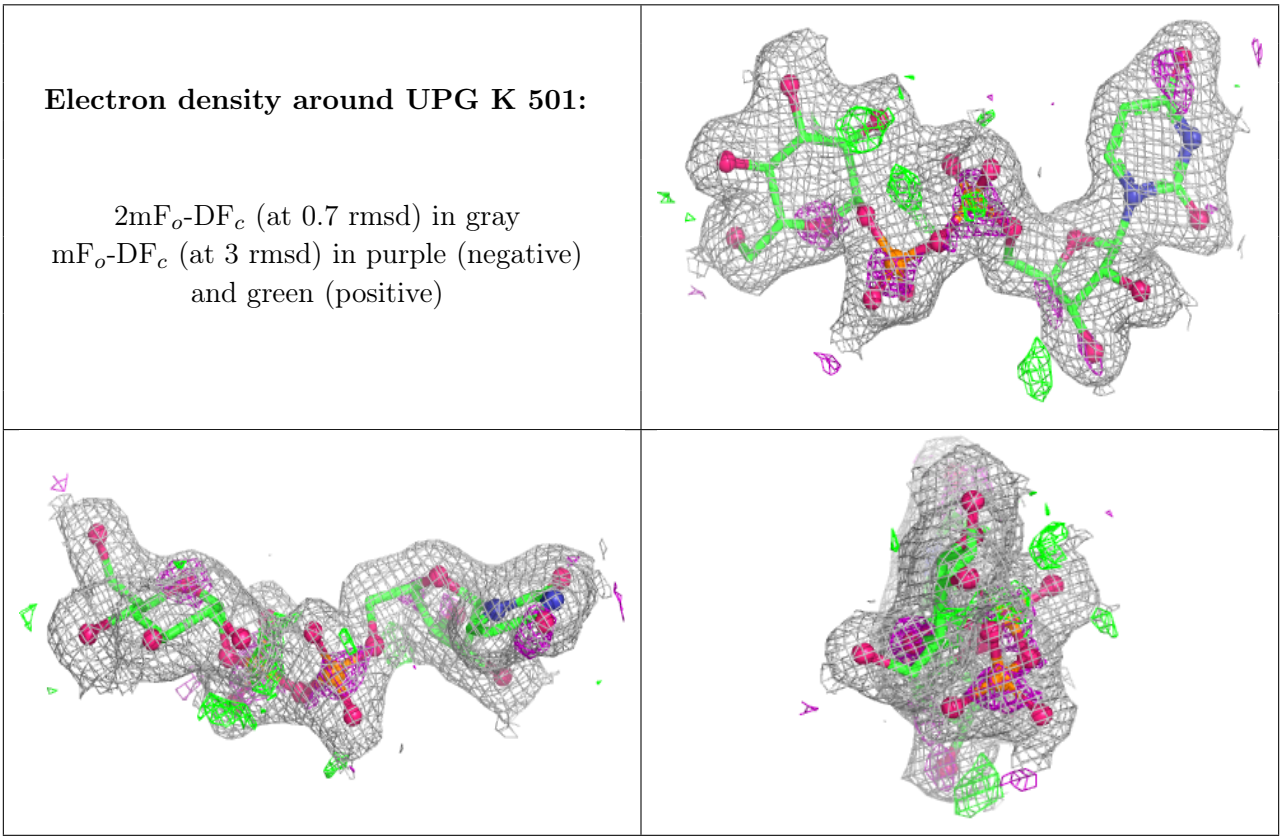
Electron density around UPG E 501:

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



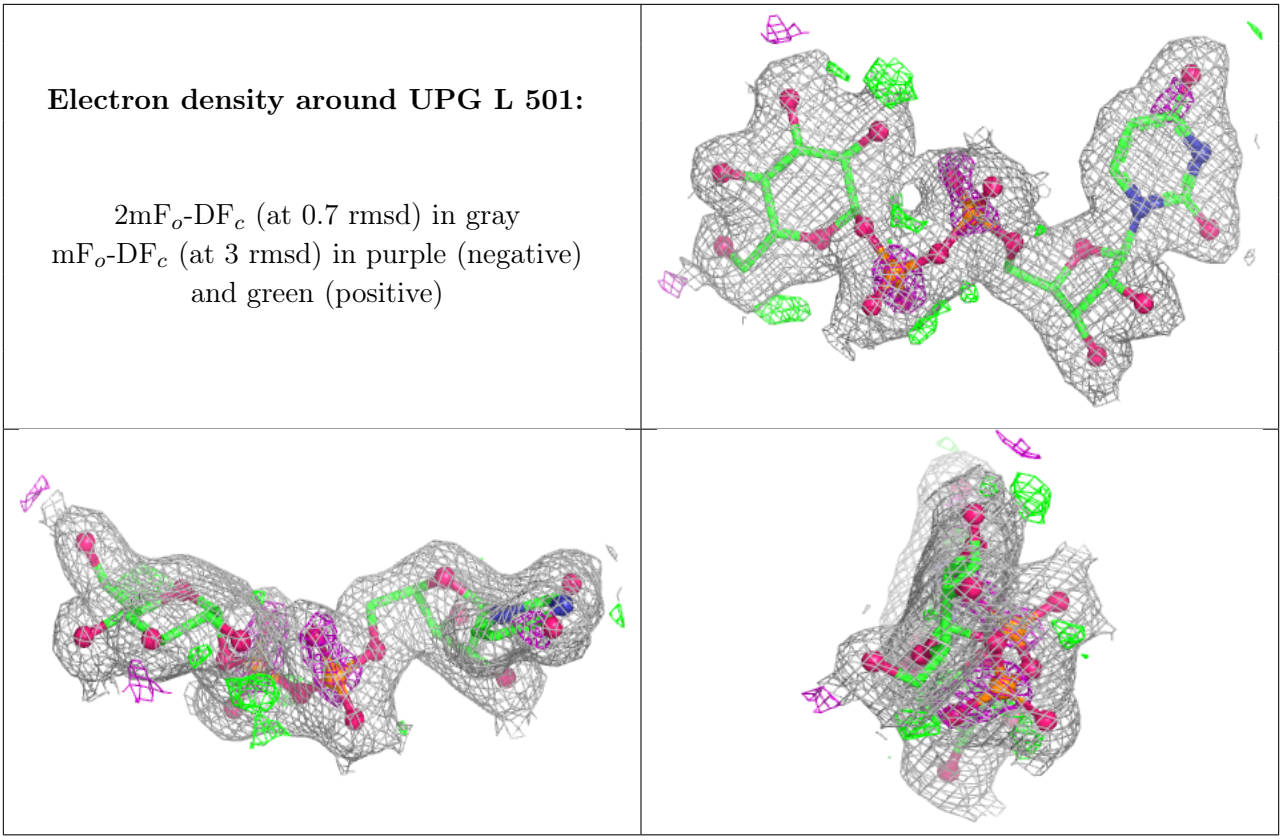
Electron density around UPG K 501:

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



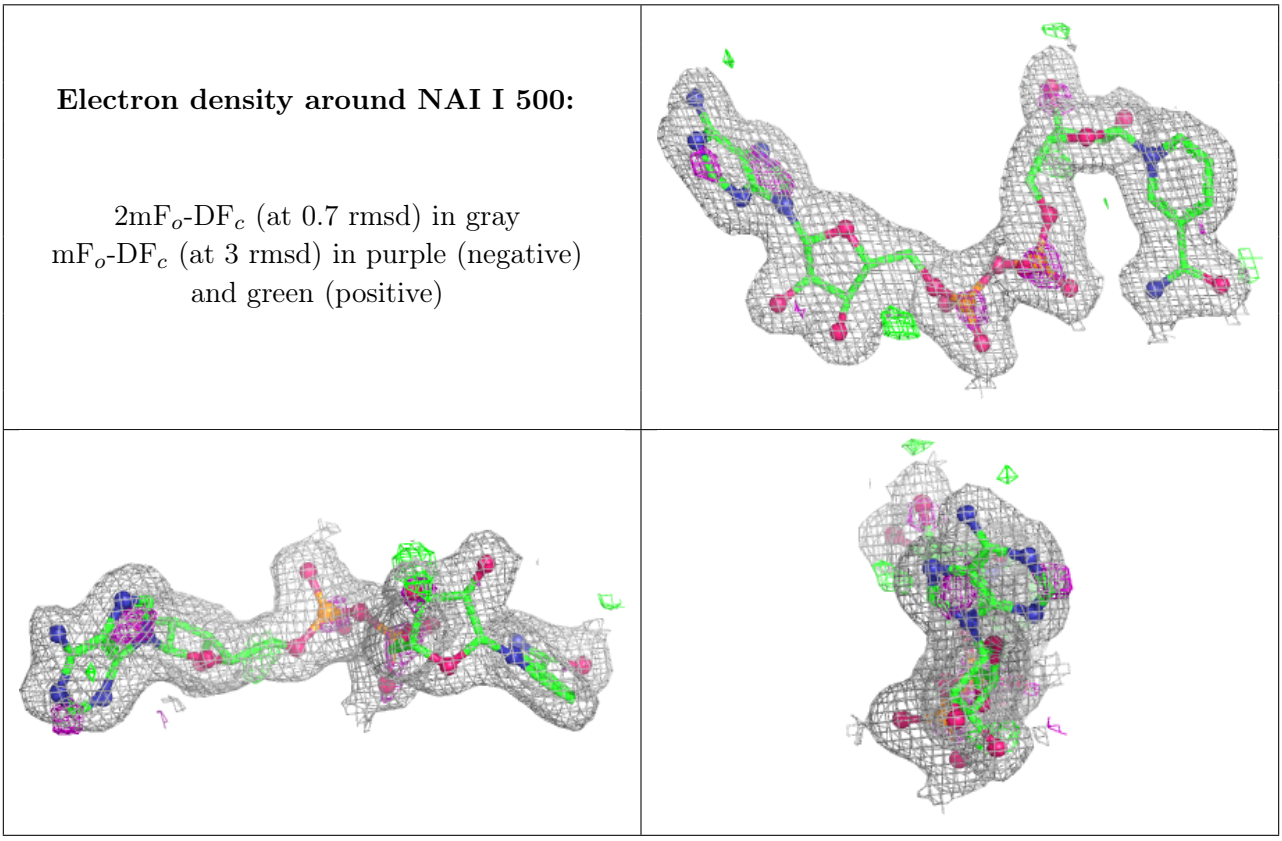
Electron density around UPG L 501:

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



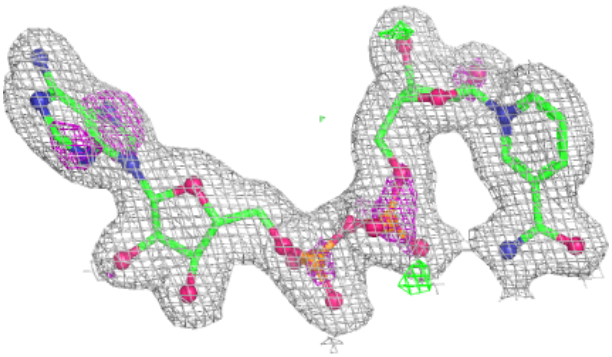
Electron density around NAI I 500:

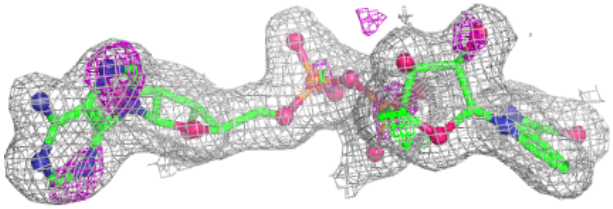
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

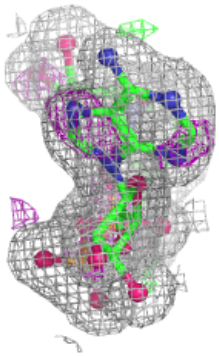


Electron density around NAI C 500:

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

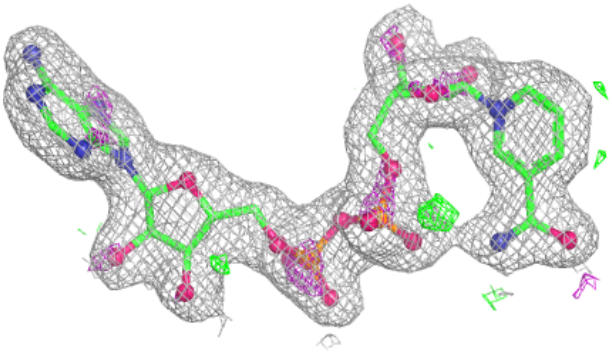


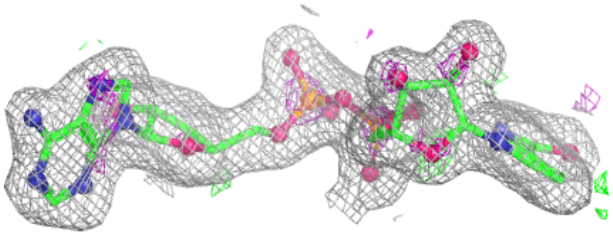


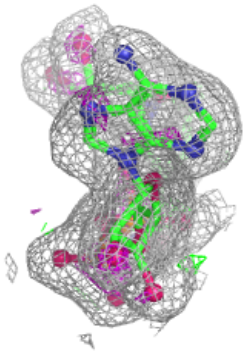


Electron density around NAI K 500:

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

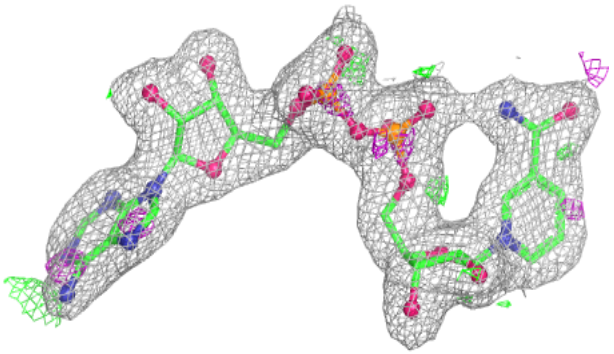


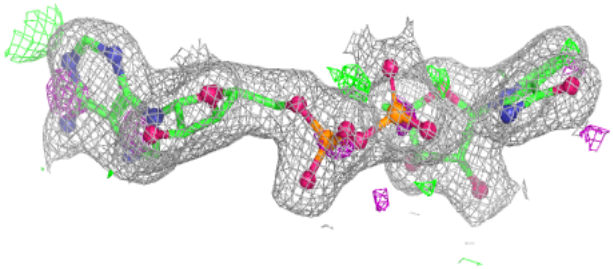


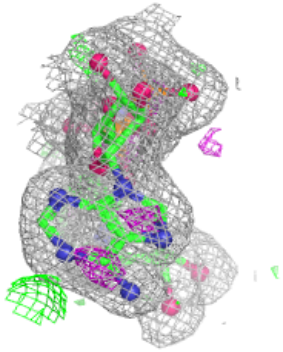


Electron density around NAI D 500:

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

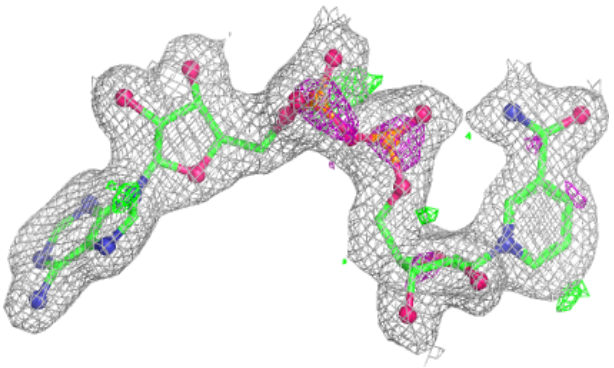


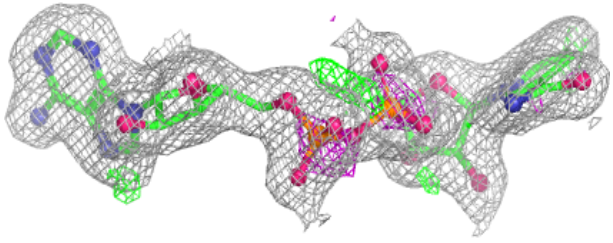


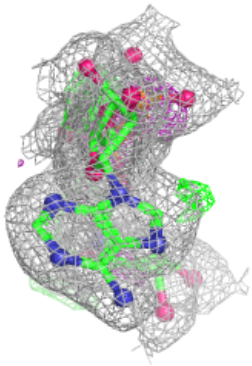


Electron density around NAI E 500:

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

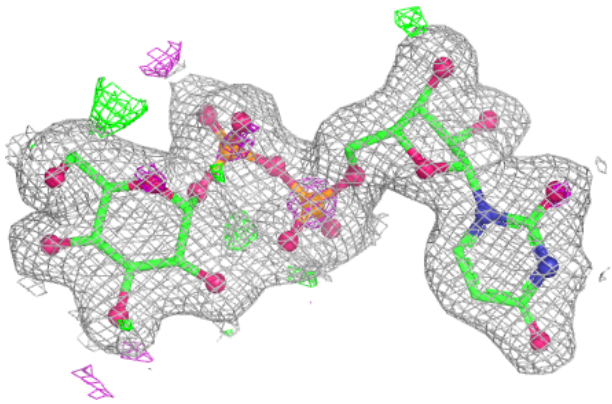


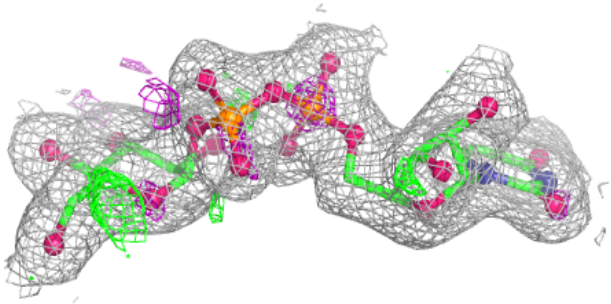


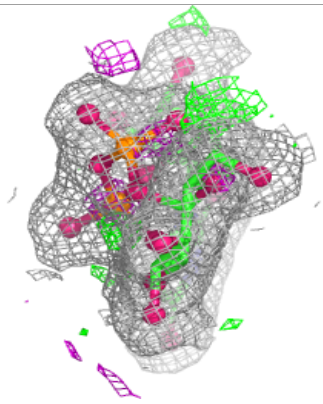


Electron density around UPG D 501:

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

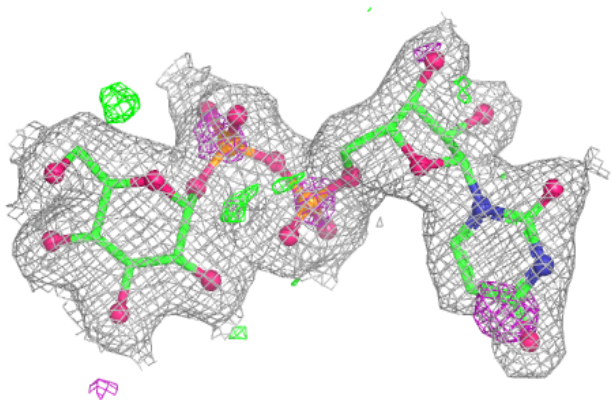


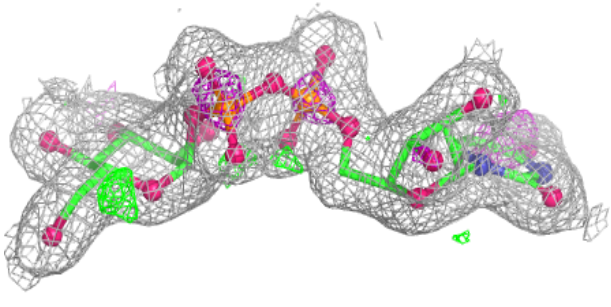


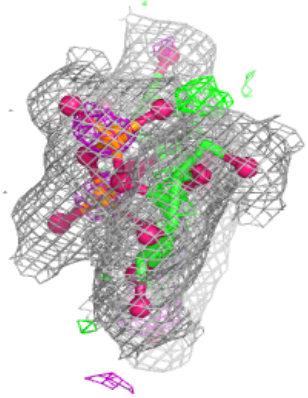


Electron density around UPG F 501:

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

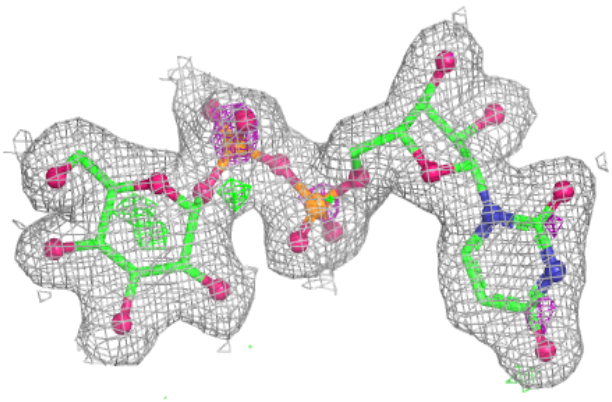


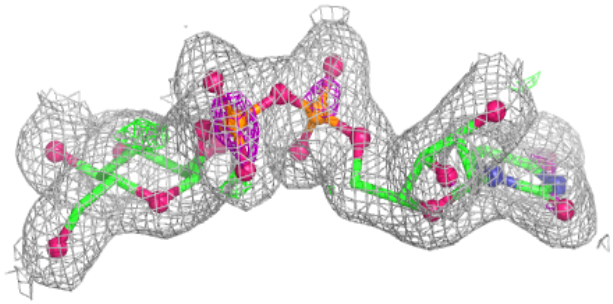


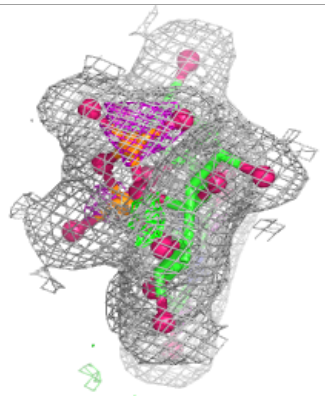


Electron density around UPG G 501:

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

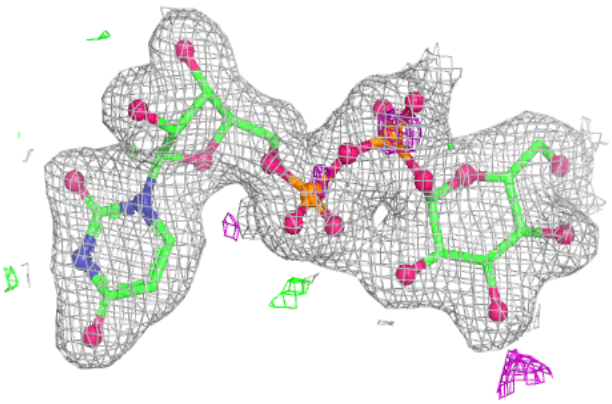


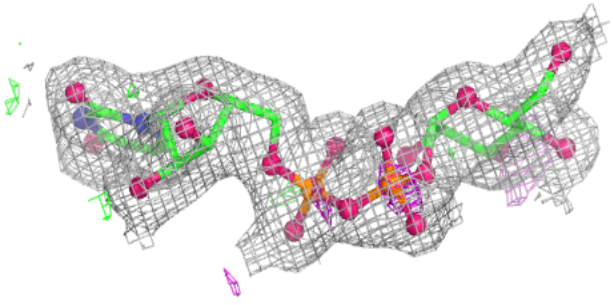


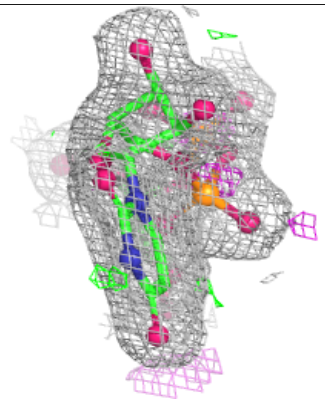


Electron density around UPG H 501:

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

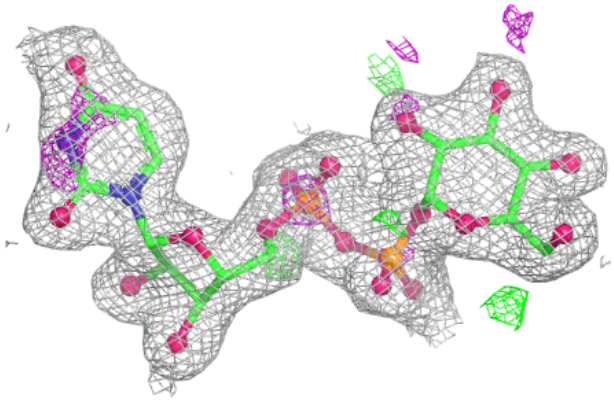


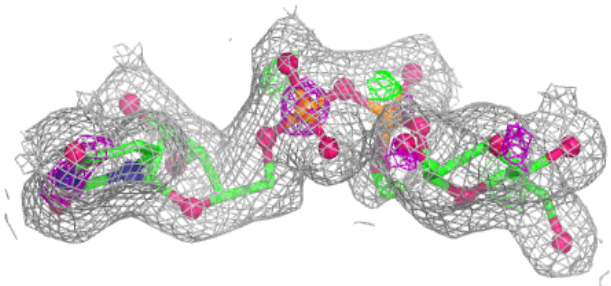


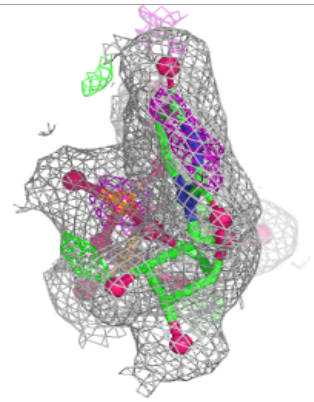


Electron density around UPG I 501:

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

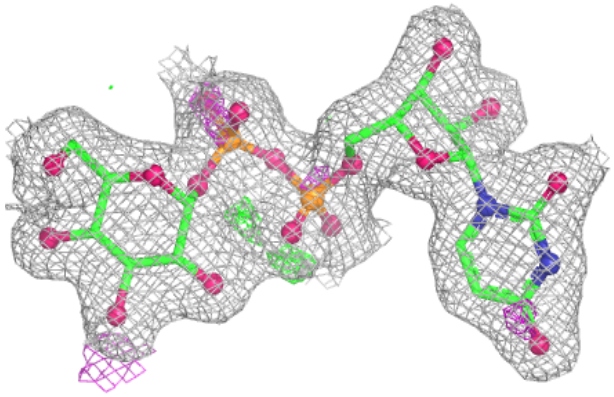


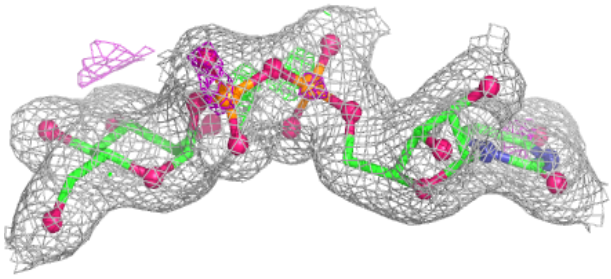


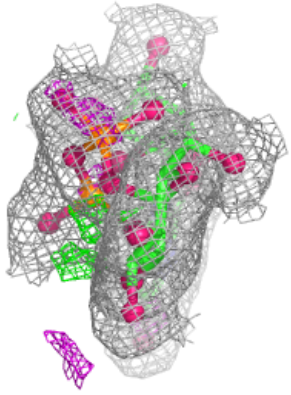


Electron density around UPG J 501:

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

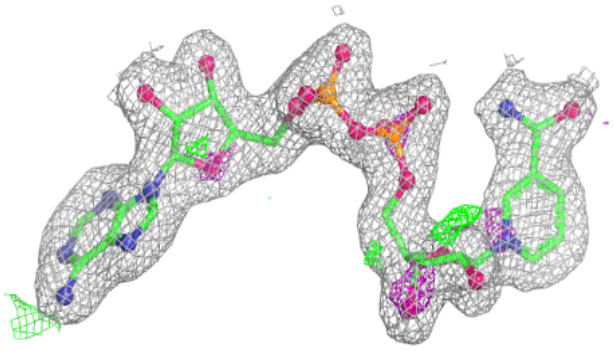


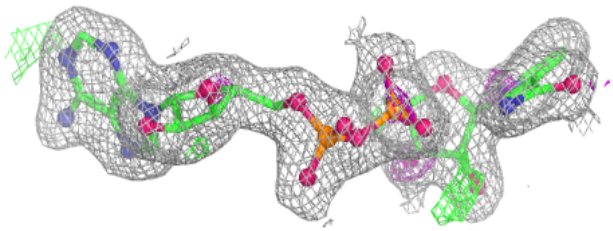


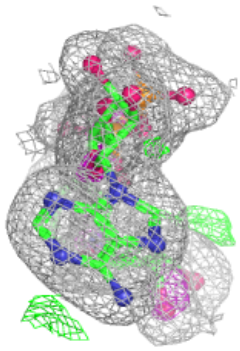


Electron density around NAI G 500:

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

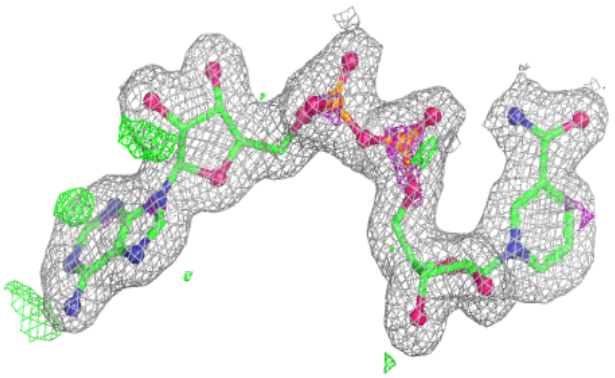


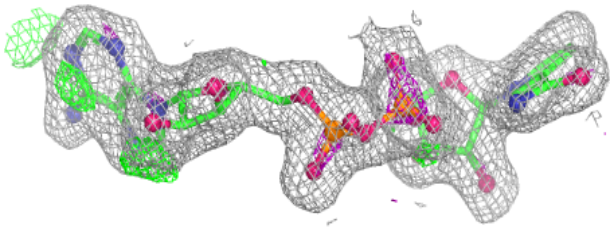


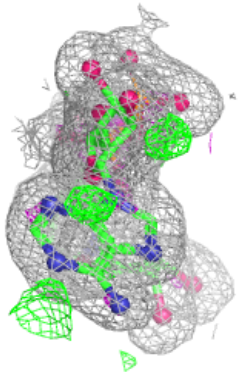


Electron density around NAI A 500:

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

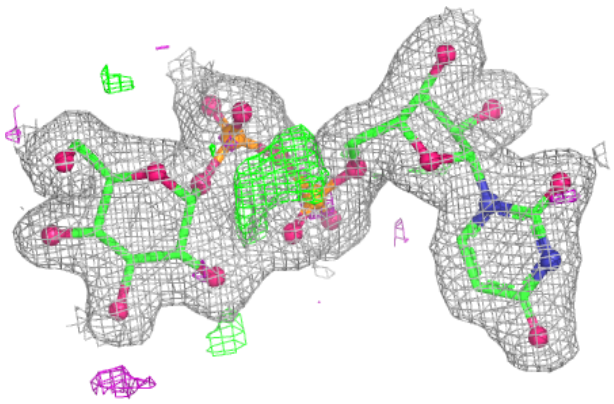


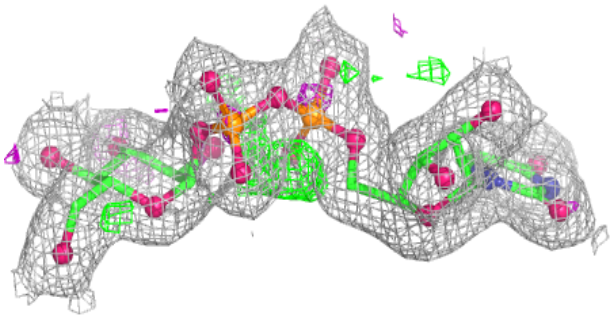




Electron density around UPG A 501:

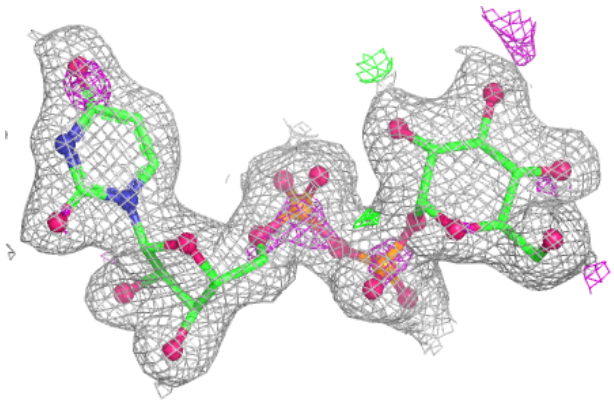
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

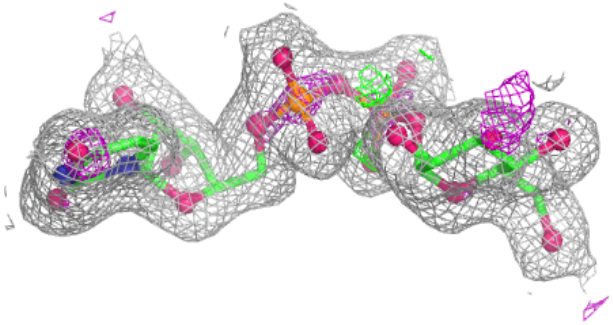


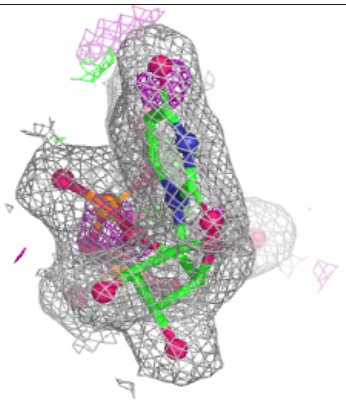


Electron density around UPG C 501:

$2mF_o$-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.