Full wwPDB X-ray Structure Validation Report ⓘ

Oct 3, 2023 – 04:00 PM EDT

PDB ID	:	6Q0D
Title	:	CRYSTAL STRUCTURE OF LDHA IN COMPLEX WITH COMPOUND NCGC00384414-01 AT 2.05 A RESOLUTION
Authors	:	Dranow, D.M.; Davies, D.R.
Deposited on	:	2019-08-01
Resolution	:	2.05 Å(reported)

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

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

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

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

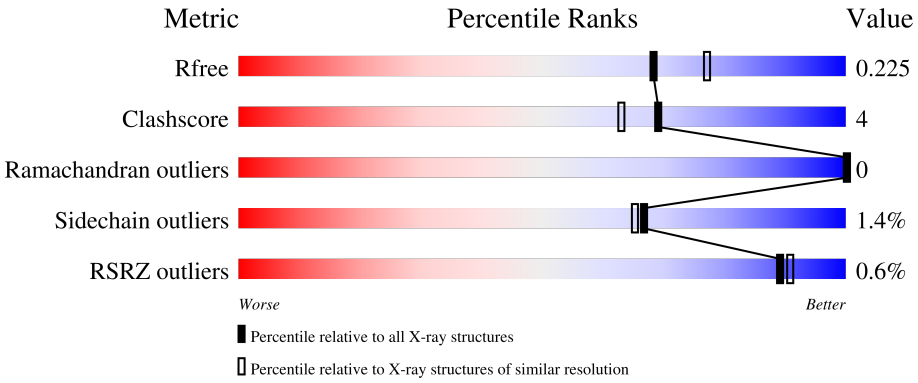
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35.1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35.1

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 2.05 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}	130704	1692 (2.04-2.04)
Clashscore	141614	1773 (2.04-2.04)
Ramachandran outliers	138981	1752 (2.04-2.04)
Sidechain outliers	138945	1752 (2.04-2.04)
RSRZ outliers	127900	1672 (2.04-2.04)

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	332	90% 9%
1	B	332	90% 10%
1	C	332	91% 8%
1	D	332	85% 14%
1	E	332	93% 6%

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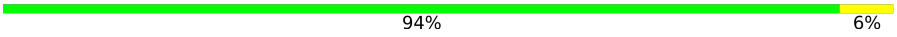
Mol	Chain	Length	Quality of chain
1	F	332	

2 Entry composition (i)

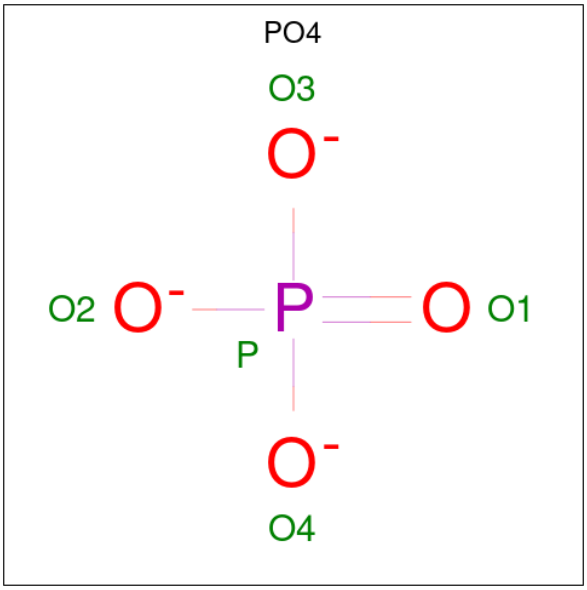
There are 6 unique types of molecules in this entry. The entry contains 16383 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 L-lactate dehydrogenase A chain.

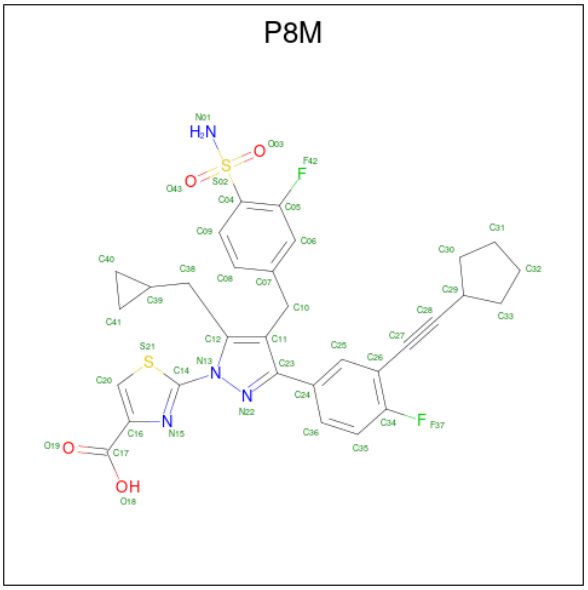
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	331	Total	C	N	O	S	0	0	0
			2488	1589	429	457	13			
1	B	331	Total	C	N	O	S	0	0	0
			2493	1589	425	466	13			
1	C	331	Total	C	N	O	S	0	1	0
			2504	1599	429	463	13			
1	D	331	Total	C	N	O	S	0	0	0
			2468	1577	420	458	13			
1	E	331	Total	C	N	O	S	0	2	0
			2538	1621	432	472	13			
1	F	331	Total	C	N	O	S	0	2	0
			2550	1628	437	472	13			

- Molecule 2 is PHOSPHATE ION (three-letter code: PO4) (formula: O_4P).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total O P 5 4 1	0	0
2	B	1	Total O P 5 4 1	0	0
2	C	1	Total O P 5 4 1	0	0
2	D	1	Total O P 5 4 1	0	0
2	E	1	Total O P 5 4 1	0	0
2	F	1	Total O P 5 4 1	0	0

- Molecule 3 is 2-{3-[3-(cyclopentylethynyl)-4-fluorophenyl]-5-(cyclopropylmethyl)-4-[(3-fluoro-4-sulfamoylphenyl)methyl]-1H-pyrazol-1-yl}-1,3-thiazole-4-carboxylic acid (three-letter code: P8M) (formula: $C_{31}H_{28}F_2N_4O_4S_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C F N O S 43 31 2 4 4 2	0	0
3	B	1	Total C F N O S 43 31 2 4 4 2	0	0
3	C	1	Total C F N O S 43 31 2 4 4 2	0	0
3	D	1	Total C F N O S 43 31 2 4 4 2	0	0
3	E	1	Total C F N O S 43 31 2 4 4 2	0	0

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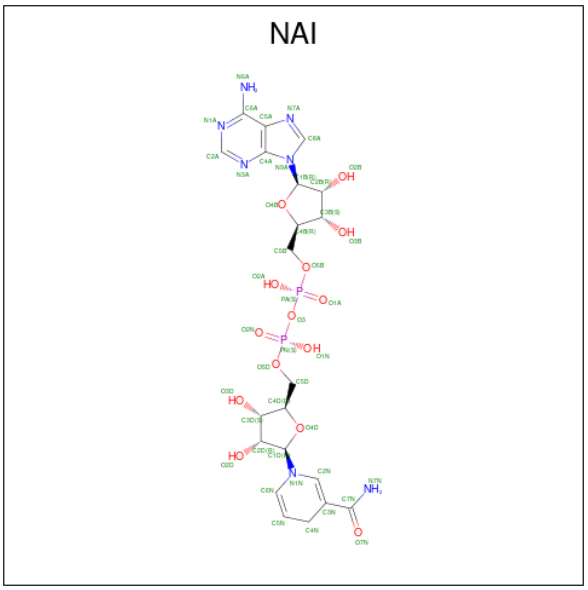
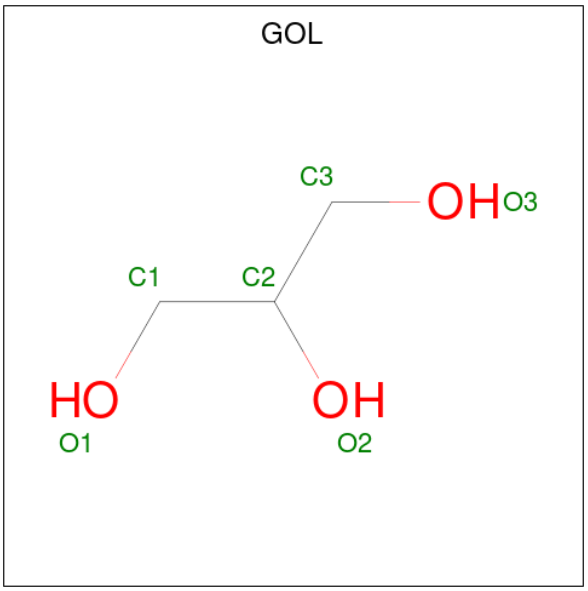
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
3	F	1	Total	C	F	N	O	S	0	0
			43	31	2	4	4	2		

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



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
4	B	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
4	C	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
4	D	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
4	E	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
4	F	1	Total	C	N	O	P	0	0
			44	21	7	14	2		

- Molecule 5 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	B	1	Total C O 6 3 3	0	0
5	C	1	Total C O 6 3 3	0	0
5	E	1	Total C O 6 3 3	0	0
5	E	1	Total C O 6 3 3	0	0
5	E	1	Total C O 6 3 3	0	0
5	F	1	Total C O 6 3 3	0	0

- Molecule 6 is water.

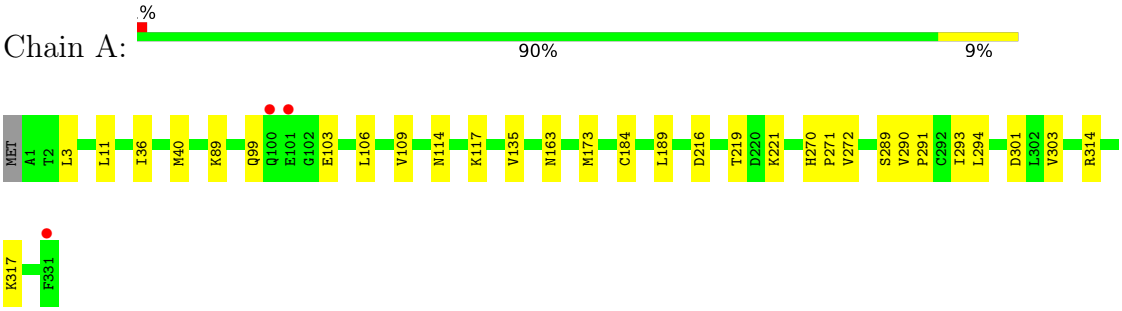
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	118	Total O 118 118	0	0
6	B	121	Total O 121 121	0	0
6	C	83	Total O 83 83	0	0
6	D	86	Total O 86 86	0	0
6	E	164	Total O 164 164	0	0
6	F	182	Total O 182 182	0	0

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.

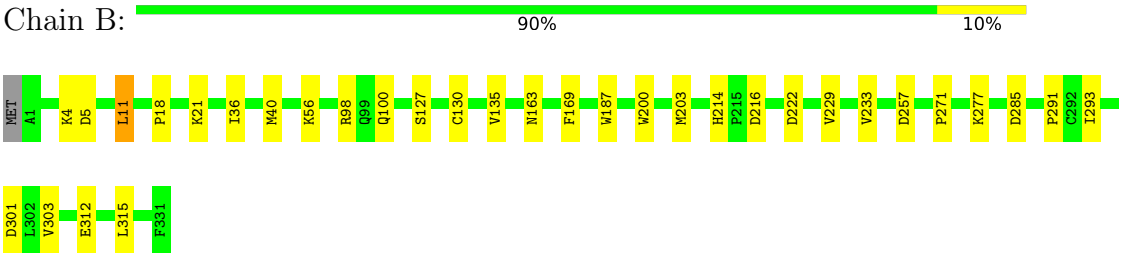
• Molecule 1: L-lactate dehydrogenase A chain

Chain A:



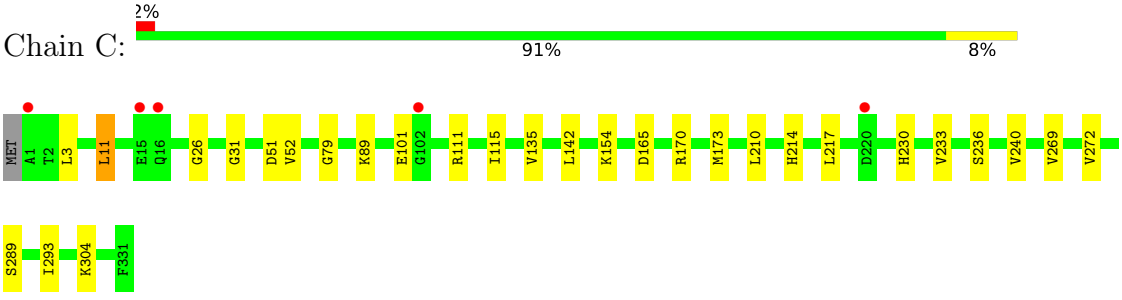
• Molecule 1: L-lactate dehydrogenase A chain

Chain B:



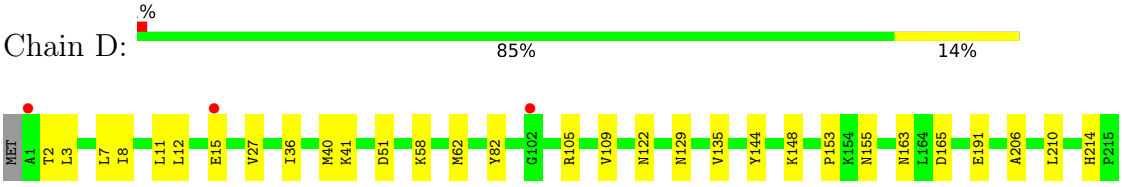
• Molecule 1: L-lactate dehydrogenase A chain

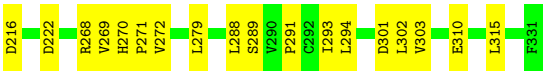
Chain C:



• Molecule 1: L-lactate dehydrogenase A chain

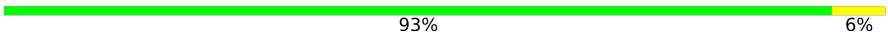
Chain D:





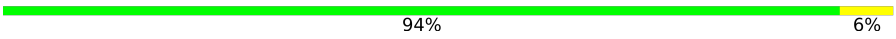
• Molecule 1: L-lactate dehydrogenase A chain

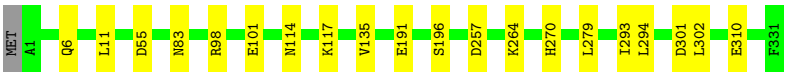
Chain E:



• Molecule 1: L-lactate dehydrogenase A chain

Chain F:





4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	212.04Å 128.07Å 104.14Å 90.00° 119.35° 90.00°	Depositor
Resolution (Å)	46.68 – 2.05 46.68 – 2.05	Depositor EDS
% Data completeness (in resolution range)	99.3 (46.68-2.05) 99.0 (46.68-2.05)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.26 (at 2.05Å)	Xtriage
Refinement program	PHENIX 1.10.1_2155	Depositor
R, R_{free}	0.184 , 0.225 0.184 , 0.225	Depositor DCC
R_{free} test set	2014 reflections (1.34%)	wwPDB-VP
Wilson B-factor (Å^2)	30.6	Xtriage
Anisotropy	0.025	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 33.4	EDS
L-test for twinning[2]	$< \|L\| > = 0.42$, $< L^2 > = 0.24$	Xtriage
Estimated twinning fraction	0.215 for -h-2*l,-k,l	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	16383	wwPDB-VP
Average B, all atoms (Å^2)	38.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.02% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

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

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: P8M, NAI, PO4, GOL

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	0.35	0/2532	0.53	0/3439
1	B	0.35	0/2537	0.52	0/3447
1	C	0.31	0/2548	0.51	1/3460 (0.0%)
1	D	0.33	0/2512	0.52	0/3419
1	E	0.39	0/2588	0.57	1/3510 (0.0%)
1	F	0.40	0/2600	0.55	0/3522
All	All	0.36	0/15317	0.53	2/20797 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	E	11	LEU	CA-CB-CG	6.19	129.53	115.30
1	C	11	LEU	CA-CB-CG	5.39	127.71	115.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2488	0	2506	18	0
1	B	2493	0	2489	22	0
1	C	2504	0	2522	16	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	2468	0	2452	26	0
1	E	2538	0	2587	17	0
1	F	2550	0	2613	12	0
2	A	5	0	0	0	0
2	B	5	0	0	0	0
2	C	5	0	0	1	0
2	D	5	0	0	0	0
2	E	5	0	0	0	0
2	F	5	0	0	0	0
3	A	43	0	0	1	0
3	B	43	0	0	2	0
3	C	43	0	0	1	0
3	D	43	0	0	3	0
3	E	43	0	0	1	0
3	F	43	0	0	2	0
4	A	44	0	26	2	0
4	B	44	0	26	4	0
4	C	44	0	27	4	0
4	D	44	0	27	3	0
4	E	44	0	27	2	0
4	F	44	0	27	3	0
5	B	6	0	8	0	0
5	C	6	0	8	1	0
5	E	18	0	24	4	0
5	F	6	0	8	0	0
6	A	118	0	0	2	0
6	B	121	0	0	4	0
6	C	83	0	0	2	0
6	D	86	0	0	2	0
6	E	164	0	0	3	0
6	F	182	0	0	4	0
All	All	16383	0	15377	114	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 4.

All (114) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:79:GLY:HA2	5:C:500:GOL:H2	1.60	0.83
1:F:293:ILE:HD12	1:F:301:ASP:HB2	1.61	0.82

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:200:TRP:CD1	5:E:401:GOL:H32	2.18	0.78
1:E:293:ILE:HD12	1:E:301:ASP:HB2	1.69	0.74
1:B:5:ASP:O	1:C:304:LYS:NZ	2.22	0.73
1:B:293:ILE:HD13	1:B:301:ASP:HB2	1.72	0.71
1:E:99:GLN:NE2	1:E:103:GLU:O	2.23	0.71
3:F:502:P8M:C17	4:F:503:NAI:H42N	2.21	0.70
1:D:41:LYS:NZ	6:D:602:HOH:O	2.25	0.68
1:F:257:ASP:OD2	6:F:601:HOH:O	2.15	0.64
3:A:502:P8M:C17	4:A:503:NAI:H42N	2.29	0.63
3:B:502:P8M:C17	4:B:503:NAI:H42N	2.29	0.62
3:D:502:P8M:C17	4:D:503:NAI:H42N	2.29	0.62
1:A:314:ARG:NH1	6:A:601:HOH:O	2.33	0.61
1:F:55[B]:ASP:OD2	6:F:602:HOH:O	2.16	0.61
1:E:148:LYS:NZ	6:E:502:HOH:O	2.28	0.60
1:D:58:LYS:NZ	1:D:62:MET:SD	2.75	0.59
1:B:291:PRO:HB2	1:B:303:VAL:HB	1.85	0.59
1:C:3:LEU:HD13	1:D:214:HIS:HB2	1.84	0.58
1:F:114:ASN:HA	1:F:117:LYS:HD3	1.86	0.58
1:A:291:PRO:HB2	1:A:303:VAL:HB	1.87	0.57
4:C:503:NAI:O2A	6:C:601:HOH:O	2.18	0.56
1:F:279:LEU:HD13	1:F:302:LEU:HD11	1.86	0.56
1:F:83:ASN:ND2	6:F:610:HOH:O	2.40	0.56
1:B:163:ASN:HA	1:B:271:PRO:HG2	1.89	0.55
1:A:216:ASP:O	1:A:219:THR:HG22	2.06	0.55
1:C:115:ILE:HD12	4:C:503:NAI:N7A	2.22	0.54
1:D:216:ASP:HB3	1:D:222:ASP:HA	1.89	0.54
1:D:269:VAL:HG22	1:D:293:ILE:HG13	1.90	0.53
1:E:41:LYS:NZ	5:E:402:GOL:O3	2.33	0.53
1:B:56:LYS:NZ	6:B:609:HOH:O	2.41	0.52
1:E:114:ASN:HA	1:E:117:LYS:HD3	1.91	0.52
1:A:135:VAL:O	4:A:503:NAI:H2N	2.09	0.52
1:B:98:ARG:O	1:B:100:GLN:NE2	2.43	0.52
3:C:502:P8M:C17	4:C:503:NAI:H42N	2.40	0.52
4:B:503:NAI:H6N	6:B:692:HOH:O	2.10	0.52
1:F:270:HIS:CD2	1:F:294:LEU:HD12	2.44	0.51
1:A:189:LEU:HD22	1:A:290:VAL:HA	1.93	0.51
1:D:272:VAL:O	1:D:289:SER:HA	2.09	0.51
3:F:502:P8M:C16	4:F:503:NAI:H42N	2.40	0.51
1:D:288:LEU:HD13	1:D:315:LEU:HD22	1.91	0.51
1:A:99:GLN:NE2	1:A:103:GLU:O	2.44	0.51
1:F:135:VAL:O	4:F:503:NAI:H2N	2.12	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:18:PRO:HG3	1:E:46:GLU:OE1	2.11	0.50
1:B:257:ASP:OD2	6:B:601:HOH:O	2.19	0.50
1:C:51:ASP:OD1	1:C:52:VAL:N	2.45	0.49
1:A:106:LEU:O	1:A:109:VAL:HG12	2.11	0.49
3:D:502:P8M:C16	4:D:503:NAI:H42N	2.42	0.49
1:C:111:ARG:O	1:C:115:ILE:HG12	2.13	0.49
2:C:501:PO4:O2	6:C:602:HOH:O	2.19	0.49
1:A:114:ASN:HA	1:A:117:LYS:HD3	1.95	0.48
1:E:56:LYS:NZ	6:E:510:HOH:O	2.45	0.48
3:E:405:P8M:C17	4:E:406:NAI:H42N	2.43	0.48
1:E:200:TRP:HD1	5:E:401:GOL:H32	1.73	0.48
1:C:236:SER:O	1:C:240:VAL:HG23	2.13	0.48
1:A:270:HIS:CD2	1:A:294:LEU:HD12	2.48	0.48
1:B:18:PRO:HB2	1:B:21:LYS:HB2	1.96	0.47
1:C:135:VAL:O	4:C:503:NAI:H2N	2.15	0.47
3:B:502:P8M:C16	4:B:503:NAI:H42N	2.45	0.47
1:C:214:HIS:HB2	1:D:3:LEU:HD13	1.96	0.47
1:D:105:ARG:O	1:D:109:VAL:HG23	2.14	0.46
1:B:127:SER:HB3	1:B:130:CYS:HB3	1.97	0.46
1:B:169:PHE:HD1	1:B:233:VAL:HG21	1.80	0.46
1:E:200:TRP:NE1	5:E:401:GOL:H32	2.29	0.46
1:D:270:HIS:CD2	1:D:294:LEU:HD12	2.51	0.46
1:C:26:GLY:O	1:C:31:GLY:HA3	2.14	0.46
1:D:27:VAL:HG22	1:D:51:ASP:HB2	1.98	0.45
1:A:3:LEU:HD13	1:B:214:HIS:HB2	1.98	0.45
1:A:173:MET:SD	1:A:184:CYS:HB3	2.57	0.45
1:D:7:LEU:HG	1:D:8:ILE:HG13	2.00	0.44
1:D:291:PRO:HB2	1:D:303:VAL:HB	2.00	0.44
1:B:135:VAL:O	4:B:503:NAI:H2N	2.17	0.44
1:B:36:ILE:O	1:B:40:MET:HG3	2.17	0.44
1:E:310:GLU:H	1:E:310:GLU:CD	2.20	0.44
1:A:272:VAL:O	1:A:289:SER:HA	2.18	0.43
1:E:304:LYS:HE3	1:F:6:GLN:O	2.18	0.43
1:A:219:THR:HG23	1:A:221:LYS:N	2.33	0.43
1:A:293:ILE:HD13	1:A:301:ASP:HB2	2.00	0.43
1:D:163:ASN:HA	1:D:271:PRO:HG2	2.01	0.43
1:E:72:ARG:NH1	6:E:517:HOH:O	2.50	0.43
1:D:144:TYR:CZ	1:D:148:LYS:HG3	2.54	0.43
1:D:191:GLU:OE1	3:D:502:P8M:N01	2.52	0.43
1:A:36:ILE:O	1:A:40:MET:HG3	2.19	0.43
1:D:293:ILE:HD13	1:D:301:ASP:HB2	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:101:GLU:H	1:F:101:GLU:CD	2.22	0.42
1:B:216:ASP:O	1:B:222:ASP:HB2	2.18	0.42
1:D:135:VAL:O	4:D:503:NAI:H2N	2.19	0.42
1:F:264:LYS:HB3	6:F:663:HOH:O	2.18	0.42
1:A:163:ASN:HA	1:A:271:PRO:HG2	2.00	0.42
1:C:269:VAL:HG22	1:C:293:ILE:HG13	2.00	0.42
1:B:200:TRP:CE3	1:B:203:MET:SD	3.12	0.42
1:E:55[B]:ASP:OD1	1:E:56:LYS:N	2.53	0.42
1:B:277:LYS:HD2	1:B:285:ASP:OD1	2.20	0.42
1:D:153:PRO:HB2	1:D:155:ASN:OD1	2.20	0.42
1:D:279:LEU:HD13	1:D:302:LEU:HD11	2.02	0.42
1:F:191:GLU:O	1:F:196:SER:HB3	2.20	0.42
1:B:187:TRP:CE2	1:D:206:ALA:HA	2.55	0.41
1:B:11:LEU:HD13	1:C:154:LYS:HD2	2.02	0.41
1:D:129:ASN:OD1	6:D:601:HOH:O	2.21	0.41
1:E:30:VAL:HG21	4:E:406:NAI:H6N	2.03	0.41
1:B:315:LEU:HD23	1:B:315:LEU:HA	1.89	0.41
1:C:142:LEU:HD23	1:C:142:LEU:HA	1.89	0.41
1:C:230:HIS:O	1:C:233:VAL:HB	2.21	0.41
1:D:82:TYR:CG	1:D:122:ASN:HB3	2.56	0.41
1:B:187:TRP:CZ2	1:D:206:ALA:HA	2.56	0.41
1:D:36:ILE:O	1:D:40:MET:HG3	2.21	0.41
1:B:4:LYS:NZ	6:B:610:HOH:O	2.43	0.41
1:D:15:GLU:CB	1:E:125:LYS:HG3	2.51	0.41
1:C:170:ARG:HA	1:C:173:MET:HE3	2.03	0.40
1:A:89:LYS:HD3	6:A:688:HOH:O	2.21	0.40
1:B:229:VAL:O	1:B:233:VAL:HG23	2.21	0.40
1:E:200:TRP:CE3	1:E:203:MET:SD	3.15	0.40
1:A:317:LYS:HD2	1:A:317:LYS:HA	1.82	0.40
1:C:272:VAL:O	1:C:289:SER:HA	2.21	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	329/332 (99%)	324 (98%)	5 (2%)	0	100	100
1	B	329/332 (99%)	323 (98%)	6 (2%)	0	100	100
1	C	330/332 (99%)	320 (97%)	10 (3%)	0	100	100
1	D	329/332 (99%)	320 (97%)	9 (3%)	0	100	100
1	E	331/332 (100%)	324 (98%)	7 (2%)	0	100	100
1	F	331/332 (100%)	324 (98%)	7 (2%)	0	100	100
All	All	1979/1992 (99%)	1935 (98%)	44 (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	266/288 (92%)	265 (100%)	1 (0%)	91	91
1	B	267/288 (93%)	265 (99%)	2 (1%)	84	84
1	C	269/288 (93%)	263 (98%)	6 (2%)	52	46
1	D	261/288 (91%)	254 (97%)	7 (3%)	44	38
1	E	279/288 (97%)	276 (99%)	3 (1%)	73	73
1	F	281/288 (98%)	278 (99%)	3 (1%)	73	73
All	All	1623/1728 (94%)	1601 (99%)	22 (1%)	67	65

All (22) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	11	LEU
1	B	11	LEU
1	B	312	GLU
1	C	11	LEU

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Mol	Chain	Res	Type
1	C	89	LYS
1	C	101	GLU
1	C	165	ASP
1	C	210	LEU
1	C	217	LEU
1	D	2	THR
1	D	11	LEU
1	D	12	LEU
1	D	165	ASP
1	D	210	LEU
1	D	268	ARG
1	D	310	GLU
1	E	11	LEU
1	E	210	LEU
1	E	315	LEU
1	F	11	LEU
1	F	98	ARG
1	F	310	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	326	GLN
1	C	232	GLN
1	E	296	GLN
1	F	100	GLN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

24 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
5	GOL	B	500	-	5,5,5	0.35	0	5,5,5	0.29	0
4	NAI	F	503	-	42,48,48	4.77	22 (52%)	47,73,73	3.24	8 (17%)
5	GOL	E	402	-	5,5,5	0.37	0	5,5,5	0.23	0
2	PO4	D	501	-	4,4,4	0.76	0	6,6,6	0.66	0
5	GOL	E	401	-	5,5,5	0.34	0	5,5,5	0.80	0
2	PO4	E	404	-	4,4,4	1.00	0	6,6,6	0.48	0
4	NAI	C	503	-	42,48,48	4.97	22 (52%)	47,73,73	3.36	10 (21%)
4	NAI	D	503	-	42,48,48	4.96	23 (54%)	47,73,73	3.32	10 (21%)
5	GOL	C	500	-	5,5,5	0.31	0	5,5,5	0.34	0
4	NAI	E	406	-	42,48,48	4.85	21 (50%)	47,73,73	3.14	6 (12%)
2	PO4	F	501	-	4,4,4	0.88	0	6,6,6	0.49	0
3	P8M	F	502	-	42,48,48	2.41	6 (14%)	51,71,71	1.24	6 (11%)
4	NAI	B	503	-	42,48,48	4.94	22 (52%)	47,73,73	3.25	6 (12%)
2	PO4	C	501	-	4,4,4	0.90	0	6,6,6	0.44	0
2	PO4	B	501	-	4,4,4	0.81	0	6,6,6	0.87	0
3	P8M	E	405	-	42,48,48	2.34	7 (16%)	51,71,71	1.26	5 (9%)
2	PO4	A	501	-	4,4,4	0.81	0	6,6,6	0.53	0
5	GOL	F	500	-	5,5,5	0.38	0	5,5,5	0.16	0
3	P8M	C	502	-	42,48,48	2.39	7 (16%)	51,71,71	1.39	6 (11%)
4	NAI	A	503	-	42,48,48	4.87	24 (57%)	47,73,73	3.24	7 (14%)
5	GOL	E	403	-	5,5,5	0.43	0	5,5,5	0.38	0
3	P8M	D	502	-	42,48,48	2.44	7 (16%)	51,71,71	1.43	6 (11%)
3	P8M	B	502	-	42,48,48	2.43	6 (14%)	51,71,71	1.39	6 (11%)
3	P8M	A	502	-	42,48,48	2.34	6 (14%)	51,71,71	1.43	7 (13%)

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	NAI	A	503	-	-	9/25/72/72	0/5/5/5
4	NAI	F	503	-	-	5/25/72/72	0/5/5/5
5	GOL	E	401	-	-	2/4/4/4	-
4	NAI	C	503	-	-	6/25/72/72	0/5/5/5
3	P8M	E	405	-	-	4/22/40/40	0/6/6/6
5	GOL	E	403	-	-	4/4/4/4	-
4	NAI	D	503	-	-	4/25/72/72	0/5/5/5
5	GOL	C	500	-	-	4/4/4/4	-
4	NAI	E	406	-	-	4/25/72/72	0/5/5/5
5	GOL	B	500	-	-	2/4/4/4	-
5	GOL	F	500	-	-	2/4/4/4	-
3	P8M	D	502	-	-	5/22/40/40	0/6/6/6
3	P8M	B	502	-	-	2/22/40/40	0/6/6/6
3	P8M	C	502	-	-	5/22/40/40	0/6/6/6
3	P8M	A	502	-	-	3/22/40/40	0/6/6/6
3	P8M	F	502	-	-	3/22/40/40	0/6/6/6
5	GOL	E	402	-	-	3/4/4/4	-
4	NAI	B	503	-	-	6/25/72/72	0/5/5/5

All (173) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	503	NAI	C2B-C1B	-17.22	1.27	1.53
4	C	503	NAI	C2B-C1B	-17.12	1.27	1.53
4	D	503	NAI	C2B-C1B	-17.02	1.27	1.53
4	E	406	NAI	C2B-C1B	-16.96	1.28	1.53
4	A	503	NAI	C2B-C1B	-16.48	1.28	1.53
4	F	503	NAI	C2B-C1B	-15.83	1.29	1.53
4	B	503	NAI	C6N-C5N	12.13	1.55	1.33
4	C	503	NAI	C6N-C5N	11.99	1.54	1.33
4	D	503	NAI	C6N-C5N	11.89	1.54	1.33
4	F	503	NAI	C6N-C5N	11.85	1.54	1.33
4	A	503	NAI	C6N-C5N	11.76	1.54	1.33
4	E	406	NAI	C6N-C5N	11.71	1.54	1.33
4	D	503	NAI	C3B-C4B	-10.23	1.26	1.53
4	C	503	NAI	C3B-C4B	-10.20	1.26	1.53
4	A	503	NAI	C3B-C4B	-10.07	1.27	1.53
4	E	406	NAI	C3B-C4B	-10.04	1.27	1.53
4	C	503	NAI	O4B-C1B	9.92	1.54	1.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	503	NAI	O4B-C1B	9.77	1.54	1.41
4	B	503	NAI	C3B-C4B	-9.76	1.28	1.53
4	D	503	NAI	O4B-C1B	9.75	1.54	1.41
4	F	503	NAI	C3B-C4B	-9.72	1.28	1.53
4	A	503	NAI	O4B-C1B	9.03	1.53	1.41
4	E	406	NAI	O4B-C1B	8.95	1.53	1.41
4	F	503	NAI	O4B-C1B	8.66	1.53	1.41
3	D	502	P8M	O43-S02	8.24	1.59	1.43
3	B	502	P8M	O43-S02	8.18	1.58	1.43
3	B	502	P8M	O03-S02	8.03	1.58	1.43
3	F	502	P8M	O43-S02	7.87	1.58	1.43
3	E	405	P8M	O03-S02	7.84	1.58	1.43
3	F	502	P8M	O03-S02	7.72	1.58	1.43
3	C	502	P8M	O03-S02	7.64	1.57	1.43
3	B	502	P8M	C20-S21	7.60	1.82	1.70
3	A	502	P8M	O43-S02	7.54	1.57	1.43
3	C	502	P8M	O43-S02	7.49	1.57	1.43
4	C	503	NAI	C2D-C1D	-7.43	1.29	1.53
3	F	502	P8M	C20-S21	7.42	1.82	1.70
3	E	405	P8M	C20-S21	7.36	1.82	1.70
4	F	503	NAI	C2D-C1D	-7.35	1.30	1.53
4	A	503	NAI	C2D-C1D	-7.32	1.30	1.53
4	A	503	NAI	O4D-C1D	7.29	1.59	1.42
3	D	502	P8M	C20-S21	7.28	1.82	1.70
3	C	502	P8M	C20-S21	7.26	1.82	1.70
4	D	503	NAI	O4D-C1D	7.22	1.59	1.42
3	D	502	P8M	O03-S02	7.22	1.57	1.43
3	A	502	P8M	O03-S02	7.11	1.56	1.43
3	E	405	P8M	O43-S02	7.10	1.56	1.43
4	B	503	NAI	C2D-C1D	-7.09	1.30	1.53
4	D	503	NAI	C2D-C1D	-7.09	1.30	1.53
4	E	406	NAI	C2D-C1D	-7.05	1.30	1.53
4	B	503	NAI	C2N-C3N	7.03	1.54	1.34
4	F	503	NAI	C2N-C3N	7.01	1.54	1.34
4	D	503	NAI	C2N-C3N	6.95	1.54	1.34
4	B	503	NAI	O4D-C1D	6.94	1.58	1.42
4	A	503	NAI	C2N-C3N	6.91	1.54	1.34
4	E	406	NAI	O4D-C1D	6.91	1.58	1.42
4	C	503	NAI	C2N-C3N	6.89	1.54	1.34
4	F	503	NAI	O4D-C1D	6.87	1.58	1.42
4	C	503	NAI	O4D-C1D	6.71	1.57	1.42
4	E	406	NAI	C2N-C3N	6.61	1.53	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	502	P8M	C20-S21	6.59	1.81	1.70
4	F	503	NAI	C7N-N7N	6.18	1.49	1.33
4	C	503	NAI	O4D-C4D	-6.02	1.31	1.45
4	D	503	NAI	C7N-N7N	5.83	1.48	1.33
4	A	503	NAI	O4D-C4D	-5.81	1.32	1.45
4	E	406	NAI	O4D-C4D	-5.77	1.32	1.45
4	C	503	NAI	C7N-N7N	5.77	1.48	1.33
4	A	503	NAI	C7N-N7N	5.74	1.48	1.33
4	D	503	NAI	O4D-C4D	-5.71	1.32	1.45
4	F	503	NAI	O4D-C4D	-5.70	1.32	1.45
4	B	503	NAI	C7N-N7N	5.67	1.48	1.33
4	E	406	NAI	C7N-N7N	5.67	1.48	1.33
4	B	503	NAI	O4D-C4D	-5.51	1.32	1.45
4	B	503	NAI	C2B-C3B	5.46	1.68	1.53
4	C	503	NAI	C2B-C3B	5.44	1.68	1.53
4	C	503	NAI	O4B-C4B	5.42	1.57	1.45
3	C	502	P8M	C23-N22	-5.35	1.31	1.35
4	F	503	NAI	C2B-C3B	5.34	1.67	1.53
4	D	503	NAI	O4B-C4B	5.33	1.56	1.45
4	D	503	NAI	C2B-C3B	5.31	1.67	1.53
3	F	502	P8M	C23-N22	-5.31	1.31	1.35
4	E	406	NAI	O4B-C4B	5.24	1.56	1.45
4	E	406	NAI	C2B-C3B	5.21	1.67	1.53
4	A	503	NAI	C2B-C3B	5.20	1.67	1.53
3	D	502	P8M	C23-N22	-5.19	1.31	1.35
4	B	503	NAI	O4B-C4B	5.16	1.56	1.45
4	F	503	NAI	O4B-C4B	5.07	1.56	1.45
4	A	503	NAI	O4B-C4B	5.06	1.56	1.45
3	B	502	P8M	C23-N22	-5.00	1.31	1.35
3	E	405	P8M	C23-N22	-4.88	1.31	1.35
3	A	502	P8M	C23-N22	-4.72	1.31	1.35
4	E	406	NAI	C6A-N6A	4.71	1.51	1.34
4	C	503	NAI	C6A-N6A	4.69	1.51	1.34
3	A	502	P8M	C05-C04	-4.66	1.36	1.39
4	A	503	NAI	C6A-N6A	4.65	1.51	1.34
4	B	503	NAI	C6A-N6A	4.58	1.50	1.34
4	F	503	NAI	C6A-N6A	4.56	1.50	1.34
4	D	503	NAI	C6A-N6A	4.53	1.50	1.34
3	D	502	P8M	S02-N01	4.44	1.69	1.60
3	A	502	P8M	S02-N01	4.40	1.69	1.60
3	F	502	P8M	S02-N01	4.03	1.68	1.60
3	C	502	P8M	S02-N01	4.00	1.68	1.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	E	405	P8M	S02-N01	3.96	1.68	1.60
4	A	503	NAI	C2A-N3A	3.83	1.38	1.32
4	C	503	NAI	C6N-N1N	3.78	1.46	1.37
4	D	503	NAI	C6N-N1N	3.67	1.46	1.37
4	B	503	NAI	C6N-N1N	3.63	1.46	1.37
4	D	503	NAI	C2A-N3A	3.61	1.37	1.32
4	F	503	NAI	C2A-N3A	3.59	1.37	1.32
4	A	503	NAI	C6N-N1N	3.58	1.46	1.37
4	E	406	NAI	C2A-N3A	3.58	1.37	1.32
4	B	503	NAI	C2A-N3A	3.52	1.37	1.32
4	F	503	NAI	C6N-N1N	3.47	1.46	1.37
4	C	503	NAI	C2A-N3A	3.44	1.37	1.32
3	B	502	P8M	S02-N01	3.43	1.67	1.60
3	D	502	P8M	C05-C04	-3.42	1.36	1.39
4	E	406	NAI	C6N-N1N	3.28	1.45	1.37
4	D	503	NAI	C7N-C3N	3.15	1.55	1.48
4	D	503	NAI	C4N-C5N	3.09	1.57	1.48
4	F	503	NAI	C4N-C5N	3.08	1.56	1.48
4	A	503	NAI	C4N-C5N	3.00	1.56	1.48
4	E	406	NAI	C4N-C5N	2.98	1.56	1.48
4	B	503	NAI	C4N-C5N	2.93	1.56	1.48
4	F	503	NAI	O2D-C2D	2.88	1.49	1.43
4	C	503	NAI	O7N-C7N	-2.85	1.17	1.24
4	B	503	NAI	O2D-C2D	2.82	1.49	1.43
4	A	503	NAI	C7N-C3N	2.76	1.54	1.48
4	D	503	NAI	O2D-C2D	2.70	1.49	1.43
4	C	503	NAI	C4N-C5N	2.65	1.55	1.48
4	E	406	NAI	C5A-C4A	-2.64	1.33	1.40
4	D	503	NAI	C5A-C4A	-2.62	1.34	1.40
4	A	503	NAI	C5A-C4A	-2.60	1.34	1.40
4	D	503	NAI	O7N-C7N	-2.57	1.18	1.24
4	A	503	NAI	O2D-C2D	2.55	1.49	1.43
4	E	406	NAI	C7N-C3N	2.55	1.54	1.48
4	C	503	NAI	O2D-C2D	2.54	1.49	1.43
4	B	503	NAI	C5A-C4A	-2.53	1.34	1.40
4	E	406	NAI	O2D-C2D	2.53	1.48	1.43
4	C	503	NAI	C5A-C4A	-2.52	1.34	1.40
4	F	503	NAI	C7N-C3N	2.51	1.54	1.48
3	C	502	P8M	C16-C17	2.49	1.54	1.50
4	A	503	NAI	C4N-C3N	2.48	1.54	1.49
4	B	503	NAI	O3B-C3B	2.47	1.48	1.43
4	E	406	NAI	O7N-C7N	-2.45	1.18	1.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	F	503	NAI	C5A-C4A	-2.43	1.34	1.40
4	B	503	NAI	O7N-C7N	-2.41	1.18	1.24
4	C	503	NAI	C7N-C3N	2.38	1.53	1.48
4	C	503	NAI	O3D-C3D	-2.37	1.37	1.43
4	B	503	NAI	C7N-C3N	2.36	1.53	1.48
4	E	406	NAI	C4N-C3N	2.35	1.54	1.49
4	B	503	NAI	C5B-C4B	2.34	1.58	1.51
4	D	503	NAI	C5B-C4B	2.31	1.58	1.51
3	F	502	P8M	C16-C17	2.30	1.54	1.50
4	D	503	NAI	O3D-C3D	-2.30	1.37	1.43
3	B	502	P8M	C16-C17	2.29	1.54	1.50
4	A	503	NAI	O7N-C7N	-2.28	1.19	1.24
4	D	503	NAI	PN-O5D	2.28	1.68	1.59
4	A	503	NAI	C5B-C4B	2.25	1.58	1.51
4	A	503	NAI	O3B-C3B	2.23	1.48	1.43
4	C	503	NAI	C5B-C4B	2.21	1.58	1.51
4	A	503	NAI	PN-O5D	2.21	1.68	1.59
4	F	503	NAI	O3D-C3D	-2.16	1.37	1.43
3	E	405	P8M	O18-C17	-2.13	1.24	1.30
4	F	503	NAI	C4N-C3N	2.12	1.54	1.49
4	A	503	NAI	O3D-C3D	-2.12	1.38	1.43
4	C	503	NAI	O3B-C3B	2.11	1.48	1.43
4	F	503	NAI	C5B-C4B	2.11	1.58	1.51
3	C	502	P8M	C05-C04	-2.10	1.37	1.39
3	D	502	P8M	C16-C17	2.10	1.53	1.50
3	E	405	P8M	C16-C17	2.06	1.53	1.50
4	D	503	NAI	C4N-C3N	2.05	1.54	1.49
4	B	503	NAI	O3D-C3D	-2.03	1.38	1.43
4	E	406	NAI	O3D-C3D	-2.02	1.38	1.43
4	F	503	NAI	PN-O5D	2.01	1.67	1.59

All (83) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	C	503	NAI	C5A-C6A-N6A	15.53	143.95	120.35
4	B	503	NAI	C5A-C6A-N6A	15.35	143.68	120.35
4	D	503	NAI	C5A-C6A-N6A	15.20	143.44	120.35
4	F	503	NAI	C5A-C6A-N6A	14.85	142.92	120.35
4	A	503	NAI	C5A-C6A-N6A	14.82	142.87	120.35
4	E	406	NAI	C5A-C6A-N6A	14.58	142.51	120.35
4	D	503	NAI	N6A-C6A-N1A	-10.81	96.14	118.57
4	C	503	NAI	N6A-C6A-N1A	-10.79	96.18	118.57

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	B	503	NAI	N6A-C6A-N1A	-10.73	96.30	118.57
4	F	503	NAI	N6A-C6A-N1A	-10.60	96.56	118.57
4	A	503	NAI	N6A-C6A-N1A	-10.50	96.77	118.57
4	E	406	NAI	N6A-C6A-N1A	-9.93	97.97	118.57
4	D	503	NAI	C1B-N9A-C4A	-9.01	110.80	126.64
4	C	503	NAI	C1B-N9A-C4A	-8.98	110.86	126.64
4	B	503	NAI	C1B-N9A-C4A	-8.54	111.64	126.64
4	E	406	NAI	C1B-N9A-C4A	-8.38	111.92	126.64
4	A	503	NAI	C1B-N9A-C4A	-7.95	112.67	126.64
4	F	503	NAI	C1B-N9A-C4A	-7.14	114.10	126.64
4	F	503	NAI	N3A-C2A-N1A	-5.97	119.35	128.68
4	D	503	NAI	N3A-C2A-N1A	-5.76	119.68	128.68
4	A	503	NAI	N3A-C2A-N1A	-5.69	119.79	128.68
4	C	503	NAI	N3A-C2A-N1A	-5.41	120.22	128.68
4	E	406	NAI	N3A-C2A-N1A	-5.34	120.34	128.68
4	B	503	NAI	N3A-C2A-N1A	-5.29	120.41	128.68
4	F	503	NAI	O4B-C1B-C2B	-4.90	99.77	106.93
3	D	502	P8M	O19-C17-C16	-4.51	112.10	121.24
4	A	503	NAI	O4B-C1B-C2B	-3.97	101.13	106.93
3	A	502	P8M	O18-C17-O19	3.82	131.83	123.35
3	B	502	P8M	O19-C17-C16	-3.82	113.50	121.24
3	C	502	P8M	O43-S02-C04	3.76	112.81	107.29
3	A	502	P8M	O19-C17-C16	-3.74	113.66	121.24
3	D	502	P8M	O18-C17-O19	3.73	131.63	123.35
3	B	502	P8M	O18-C17-O19	3.72	131.60	123.35
3	E	405	P8M	C09-C04-C05	3.66	120.86	118.43
3	D	502	P8M	C06-C05-C04	-3.65	120.98	123.10
3	A	502	P8M	C09-C04-C05	3.63	120.84	118.43
3	D	502	P8M	C09-C04-C05	3.62	120.83	118.43
3	C	502	P8M	C06-C05-C04	-3.59	121.02	123.10
3	A	502	P8M	O43-S02-C04	3.54	112.47	107.29
3	B	502	P8M	C06-C05-C04	-3.54	121.05	123.10
3	F	502	P8M	O19-C17-C16	-3.49	114.16	121.24
3	B	502	P8M	O03-S02-C04	-3.45	102.23	107.29
3	E	405	P8M	O18-C17-O19	3.44	130.97	123.35
3	E	405	P8M	O19-C17-C16	-3.42	114.31	121.24
3	C	502	P8M	O18-C17-O19	3.36	130.81	123.35
3	F	502	P8M	O18-C17-O19	3.36	130.81	123.35
3	C	502	P8M	O19-C17-C16	-3.36	114.42	121.24
3	F	502	P8M	C06-C05-C04	-3.33	121.17	123.10
3	C	502	P8M	C09-C04-C05	3.26	120.60	118.43
3	D	502	P8M	O43-S02-C04	3.22	112.01	107.29

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	D	503	NAI	C3B-C2B-C1B	3.17	105.75	100.98
3	B	502	P8M	O43-S02-C04	3.16	111.92	107.29
3	A	502	P8M	C06-C05-C04	-3.15	121.27	123.10
4	C	503	NAI	O4B-C1B-C2B	-3.12	102.37	106.93
4	A	503	NAI	C3B-C2B-C1B	3.12	105.67	100.98
4	E	406	NAI	O4B-C1B-C2B	-3.07	102.45	106.93
4	B	503	NAI	O4B-C1B-C2B	-2.85	102.76	106.93
3	B	502	P8M	C09-C04-C05	2.82	120.31	118.43
3	E	405	P8M	C06-C05-C04	-2.74	121.51	123.10
3	D	502	P8M	C04-S02-N01	-2.74	103.23	108.28
3	F	502	P8M	C09-C04-C05	2.69	120.22	118.43
4	E	406	NAI	O4D-C1D-C2D	-2.66	100.83	106.64
4	F	503	NAI	C3B-C2B-C1B	2.65	104.96	100.98
3	F	502	P8M	O43-S02-C04	2.55	111.03	107.29
4	C	503	NAI	C3B-C2B-C1B	2.55	104.81	100.98
4	D	503	NAI	PN-O3-PA	-2.54	124.10	132.83
3	C	502	P8M	O03-S02-C04	-2.52	103.58	107.29
4	D	503	NAI	O4B-C1B-C2B	-2.45	103.34	106.93
3	A	502	P8M	O03-S02-C04	-2.35	103.84	107.29
4	B	503	NAI	C3B-C2B-C1B	2.35	104.51	100.98
3	E	405	P8M	O43-S02-C04	2.31	110.67	107.29
4	F	503	NAI	PN-O3-PA	-2.26	125.08	132.83
3	F	502	P8M	O03-S02-C04	-2.18	104.09	107.29
4	C	503	NAI	C4D-O4D-C1D	-2.17	104.68	109.47
4	C	503	NAI	O4D-C1D-N1N	2.15	112.27	108.06
4	A	503	NAI	C1D-N1N-C2N	-2.15	117.53	121.11
4	C	503	NAI	PN-O3-PA	-2.10	125.60	132.83
4	D	503	NAI	C2B-C3B-C4B	2.10	106.71	102.64
4	C	503	NAI	C3N-C2N-N1N	-2.09	120.11	123.10
4	D	503	NAI	C1D-N1N-C2N	-2.08	117.65	121.11
4	D	503	NAI	C4D-O4D-C1D	-2.07	104.91	109.47
4	F	503	NAI	C4D-O4D-C1D	-2.04	104.98	109.47
3	A	502	P8M	O03-S02-N01	2.03	110.37	107.36

There are no chirality outliers.

All (73) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	502	P8M	C26-C27-C28-C29
5	B	500	GOL	O1-C1-C2-O2
5	B	500	GOL	O1-C1-C2-C3
5	C	500	GOL	C1-C2-C3-O3

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Mol	Chain	Res	Type	Atoms
5	E	403	GOL	O1-C1-C2-C3
5	E	403	GOL	C1-C2-C3-O3
5	F	500	GOL	O1-C1-C2-C3
3	A	502	P8M	C11-C23-C24-C36
3	A	502	P8M	C11-C23-C24-C25
3	B	502	P8M	C11-C23-C24-C36
3	B	502	P8M	C11-C23-C24-C25
3	D	502	P8M	C11-C23-C24-C36
3	D	502	P8M	C11-C23-C24-C25
3	E	405	P8M	C11-C23-C24-C36
3	F	502	P8M	C11-C23-C24-C36
3	F	502	P8M	C11-C23-C24-C25
3	C	502	P8M	C34-C26-C27-C28
5	C	500	GOL	O1-C1-C2-O2
5	E	402	GOL	O1-C1-C2-O2
3	C	502	P8M	C26-C27-C28-C29
3	F	502	P8M	C26-C27-C28-C29
3	E	405	P8M	C11-C23-C24-C25
5	C	500	GOL	O1-C1-C2-C3
5	E	401	GOL	O1-C1-C2-C3
5	E	402	GOL	O1-C1-C2-C3
5	E	403	GOL	O2-C2-C3-O3
3	C	502	P8M	C25-C26-C27-C28
3	D	502	P8M	C26-C27-C28-C29
4	A	503	NAI	C2D-C1D-N1N-C2N
3	E	405	P8M	C34-C26-C27-C28
5	E	403	GOL	O1-C1-C2-O2
5	F	500	GOL	O1-C1-C2-O2
4	A	503	NAI	C2D-C1D-N1N-C6N
3	E	405	P8M	C25-C26-C27-C28
4	B	503	NAI	C2D-C1D-N1N-C2N
4	F	503	NAI	C2D-C1D-N1N-C2N
3	C	502	P8M	C11-C23-C24-C25
4	A	503	NAI	O4D-C1D-N1N-C2N
4	A	503	NAI	C5B-O5B-PA-O2A
3	C	502	P8M	C11-C23-C24-C36
4	A	503	NAI	O4D-C1D-N1N-C6N
4	B	503	NAI	O4D-C1D-N1N-C2N
4	C	503	NAI	C2D-C1D-N1N-C2N
4	D	503	NAI	C2D-C1D-N1N-C2N
4	D	503	NAI	O4D-C1D-N1N-C2N
4	F	503	NAI	O4D-C1D-N1N-C2N

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Mol	Chain	Res	Type	Atoms
4	C	503	NAI	O4D-C1D-N1N-C2N
4	A	503	NAI	O4B-C4B-C5B-O5B
4	E	406	NAI	O4D-C1D-N1N-C2N
4	E	406	NAI	C2D-C1D-N1N-C2N
4	B	503	NAI	C2D-C1D-N1N-C6N
4	C	503	NAI	C2D-C1D-N1N-C6N
4	F	503	NAI	C2D-C1D-N1N-C6N
4	D	503	NAI	O4B-C4B-C5B-O5B
4	A	503	NAI	PA-O3-PN-O1N
5	C	500	GOL	O2-C2-C3-O3
5	E	401	GOL	O1-C1-C2-O2
4	A	503	NAI	C3B-C4B-C5B-O5B
4	F	503	NAI	O4D-C1D-N1N-C6N
3	D	502	P8M	C25-C26-C27-C28
4	E	406	NAI	O4B-C4B-C5B-O5B
4	B	503	NAI	O4D-C1D-N1N-C6N
4	D	503	NAI	C2D-C1D-N1N-C6N
4	B	503	NAI	O4B-C4B-C5B-O5B
4	C	503	NAI	O4B-C4B-C5B-O5B
4	F	503	NAI	O4B-C4B-C5B-O5B
5	E	402	GOL	C1-C2-C3-O3
4	C	503	NAI	O4D-C1D-N1N-C6N
4	A	503	NAI	C2N-C3N-C7N-N7N
4	B	503	NAI	C2N-C3N-C7N-N7N
4	C	503	NAI	C2N-C3N-C7N-N7N
3	D	502	P8M	C12-C38-C39-C40
4	E	406	NAI	C2D-C1D-N1N-C6N

There are no ring outliers.

16 monomers are involved in 25 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	F	503	NAI	3	0
5	E	402	GOL	1	0
5	E	401	GOL	3	0
4	C	503	NAI	4	0
4	D	503	NAI	3	0
5	C	500	GOL	1	0
4	E	406	NAI	2	0
3	F	502	P8M	2	0
4	B	503	NAI	4	0
2	C	501	PO4	1	0

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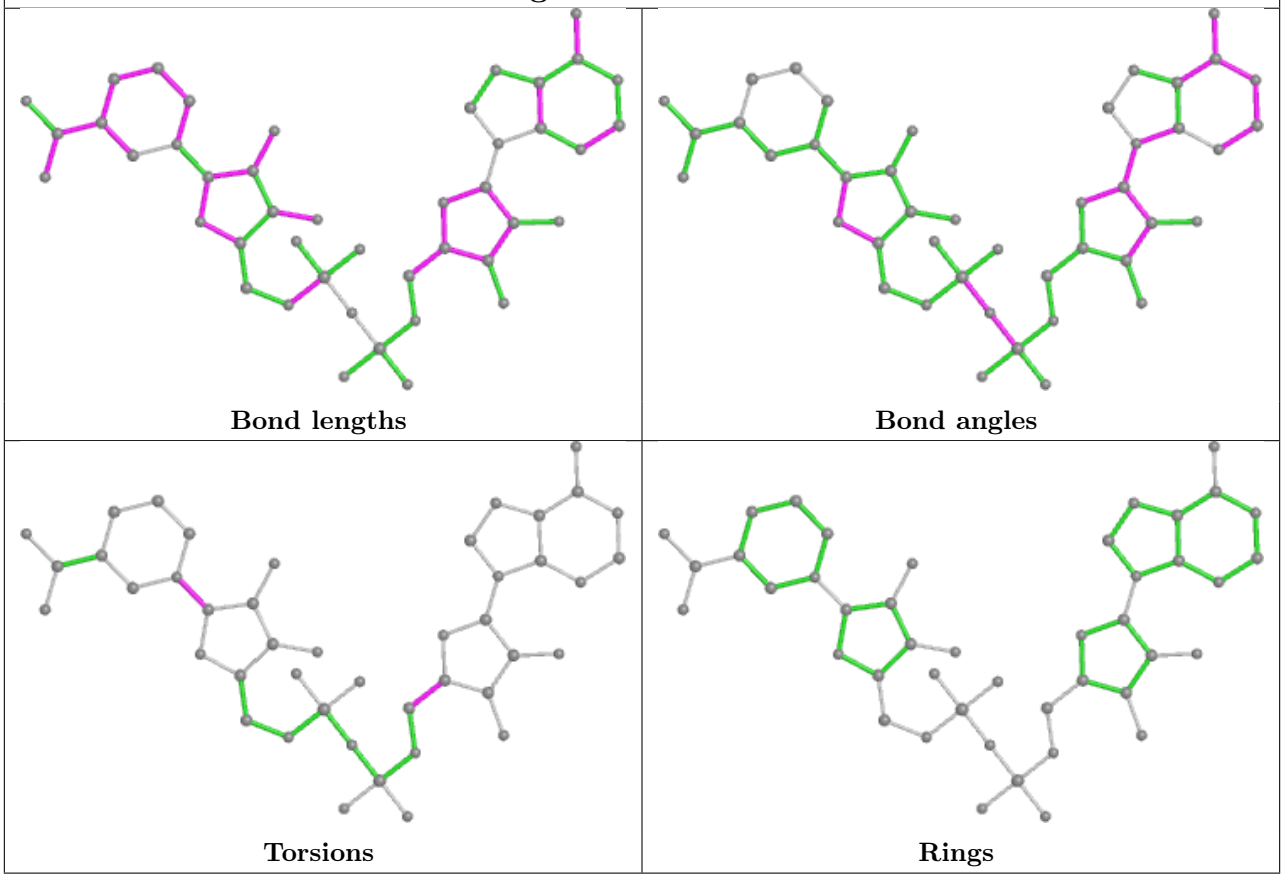
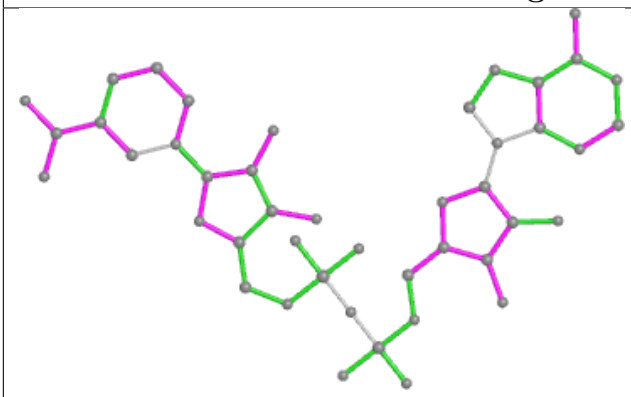
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	E	405	P8M	1	0
3	C	502	P8M	1	0
4	A	503	NAI	2	0
3	D	502	P8M	3	0
3	B	502	P8M	2	0
3	A	502	P8M	1	0

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

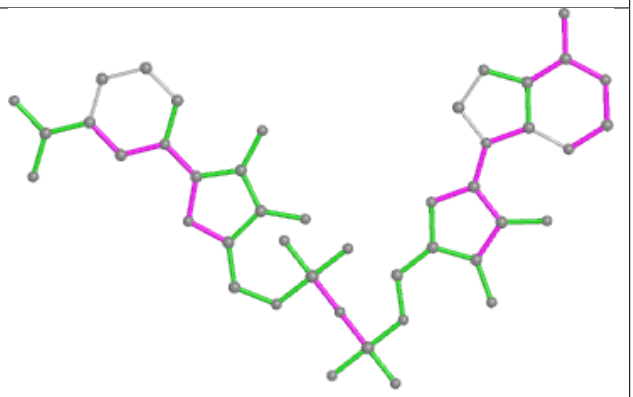
Ligand NAI F 503



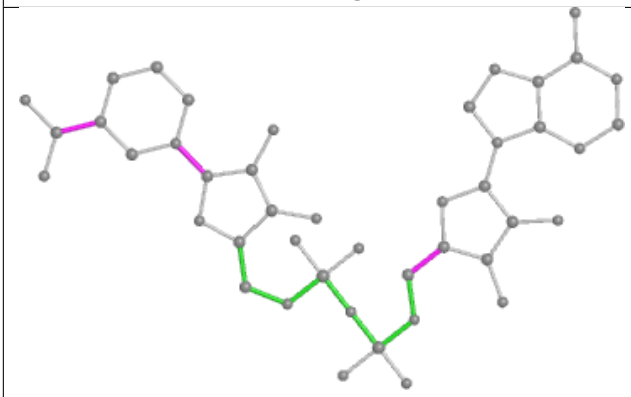
Ligand NAI C 503



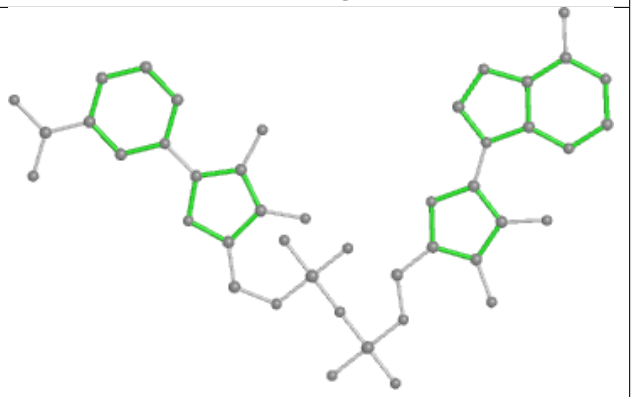
Bond lengths



Bond angles

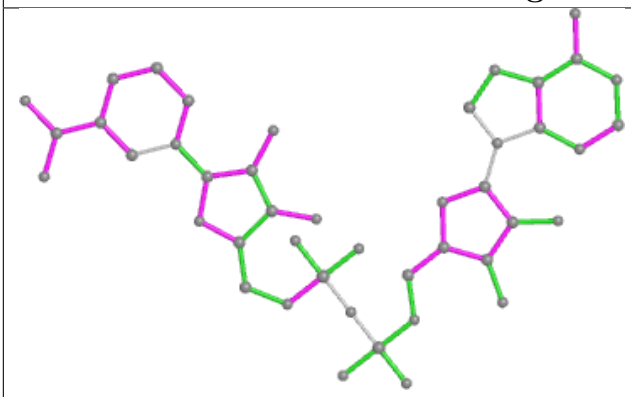


Torsions

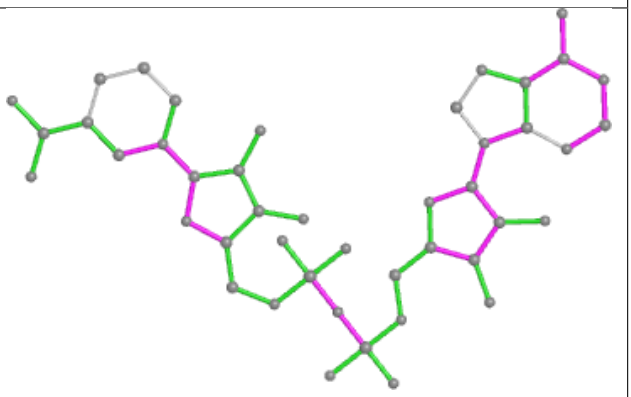


Rings

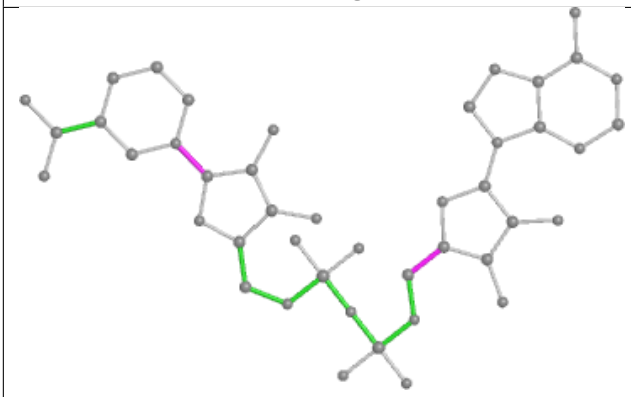
Ligand NAI D 503



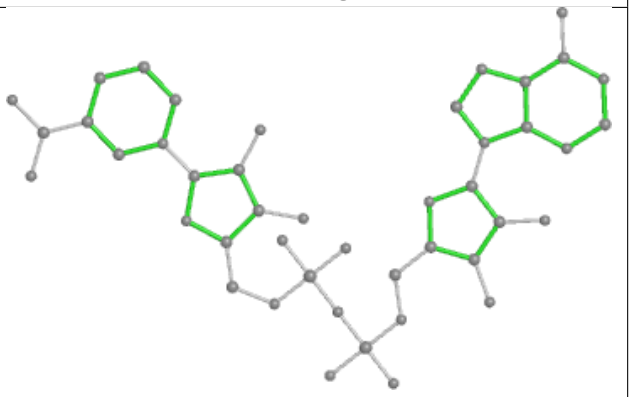
Bond lengths



Bond angles

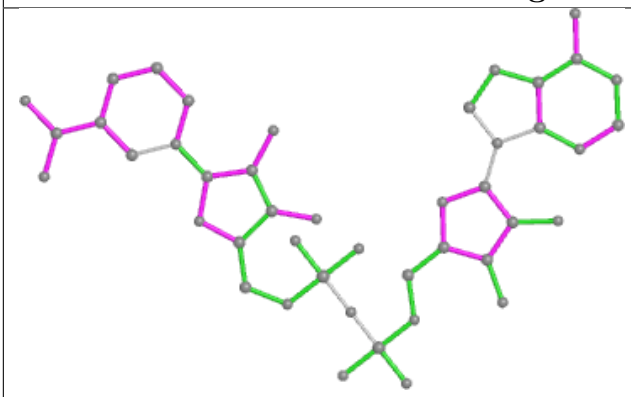


Torsions

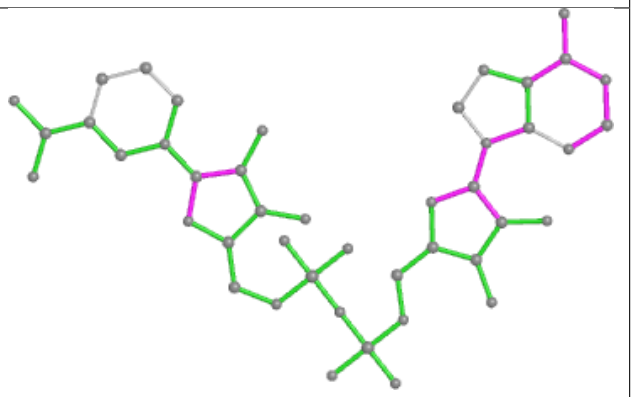


Rings

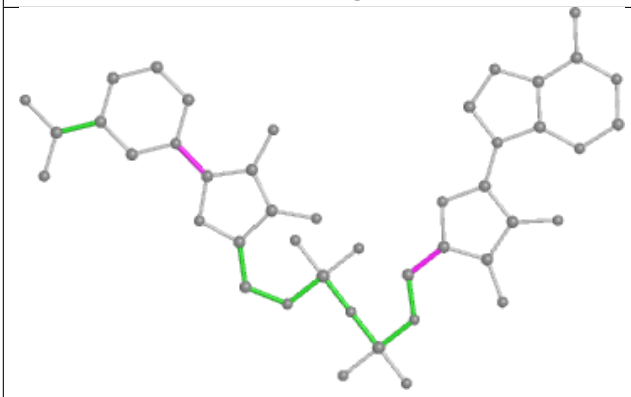
Ligand NAI E 406



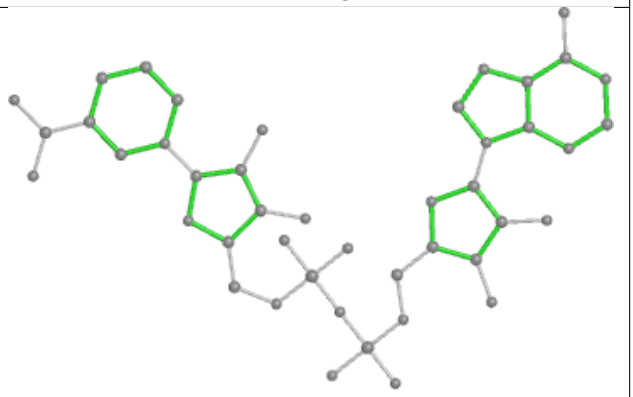
Bond lengths



Bond angles

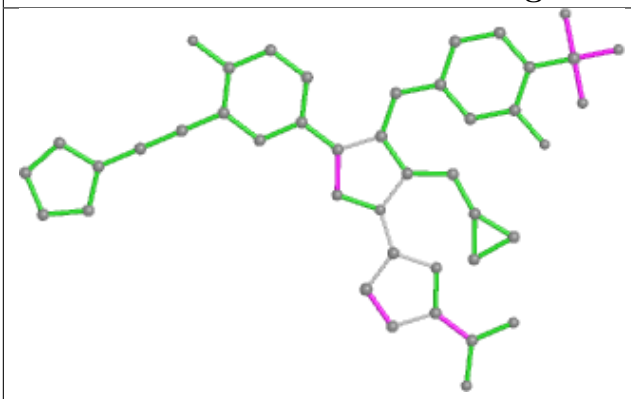


Torsions



Rings

Ligand P8M F 502



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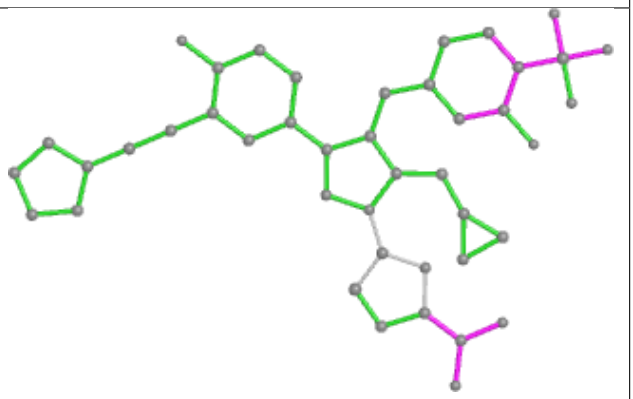
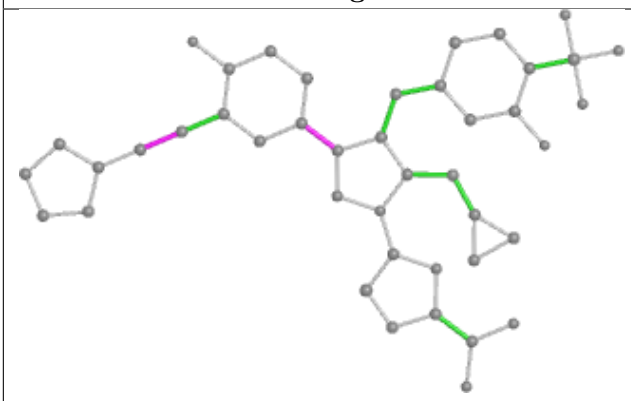


Bond angles



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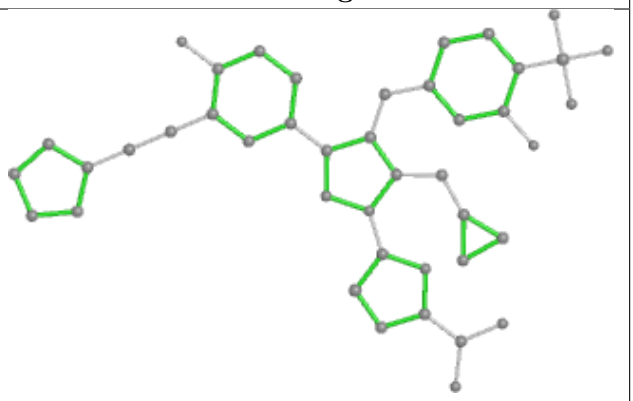
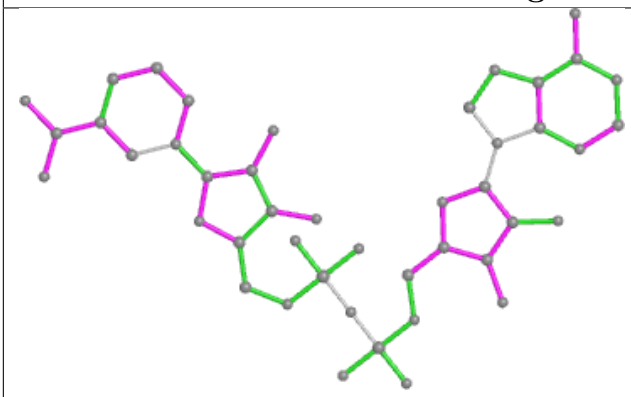


Rings

Ligand NAI B 503



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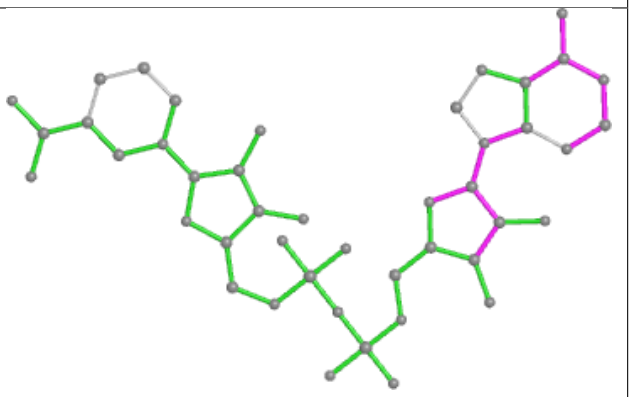
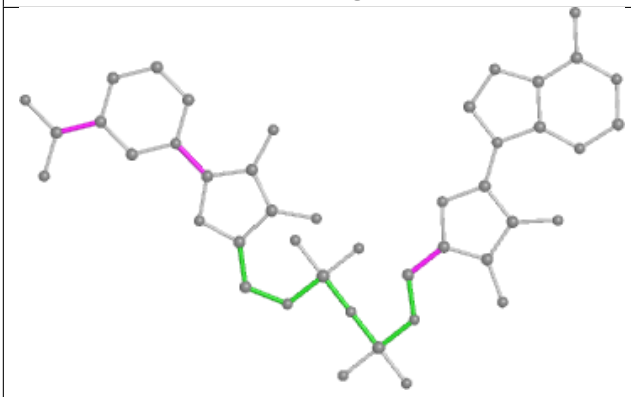
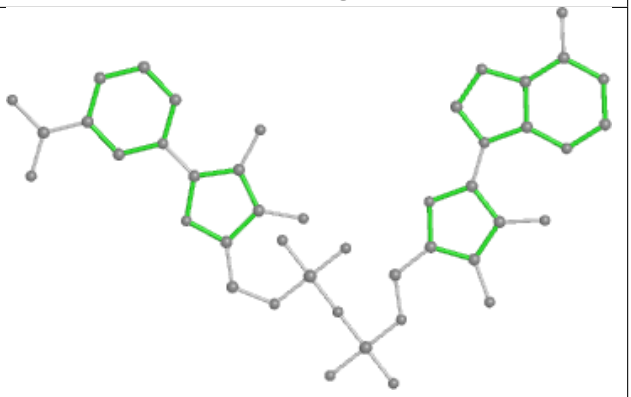


Bond angles

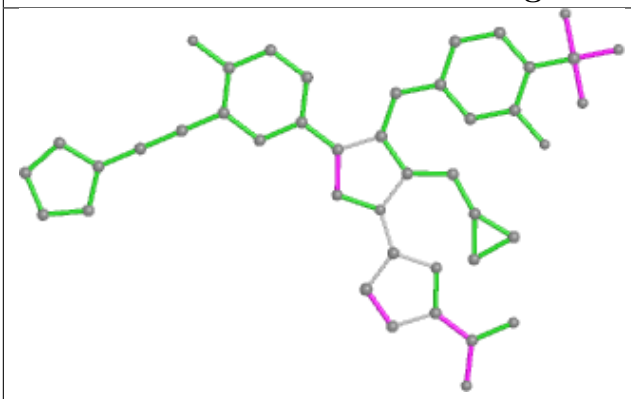


Torsions

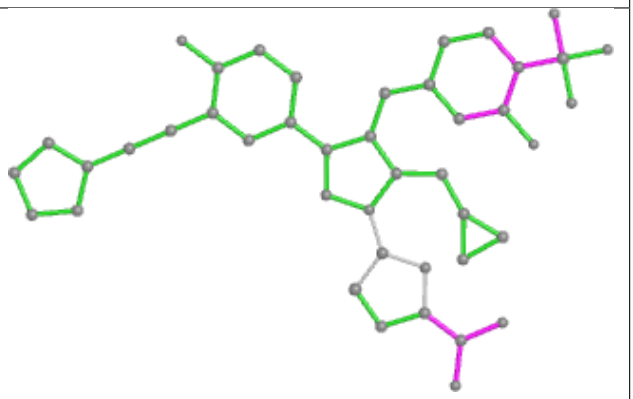


Rings

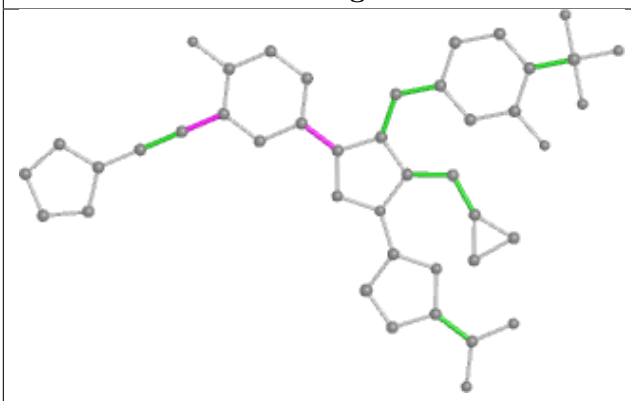
Ligand P8M E 405



Bond lengths



Bond angles



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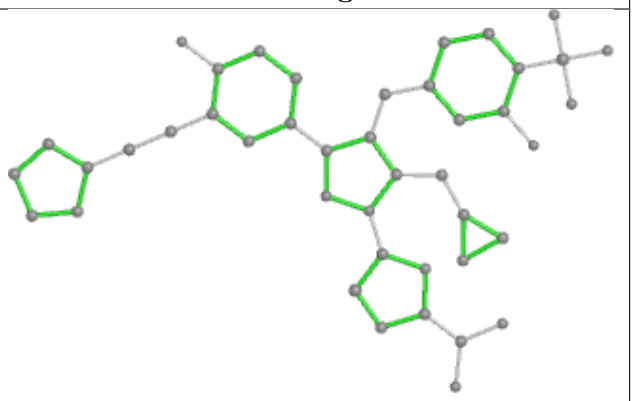
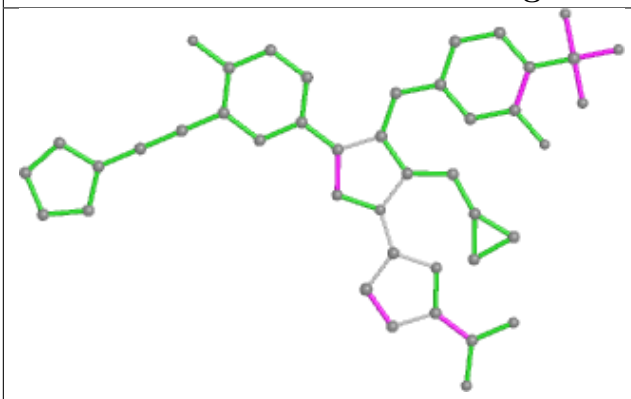


Rings

Ligand P8M C 502



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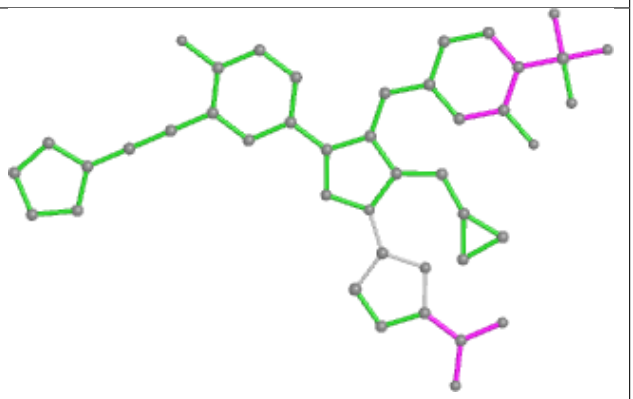
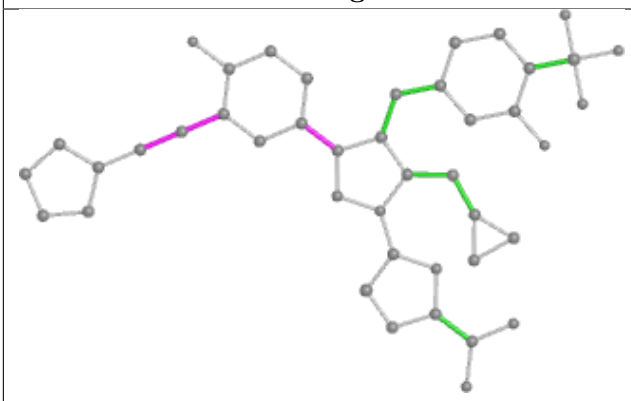


Bond angles



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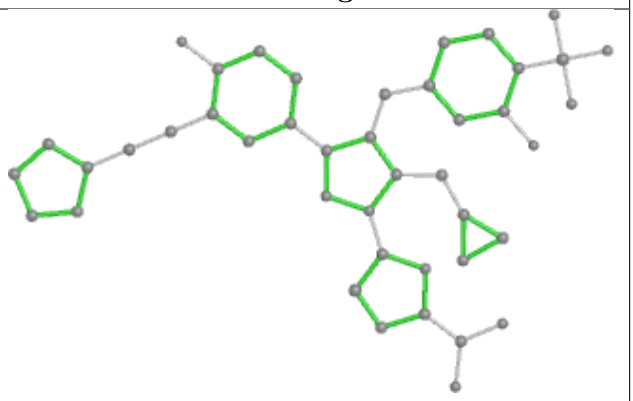
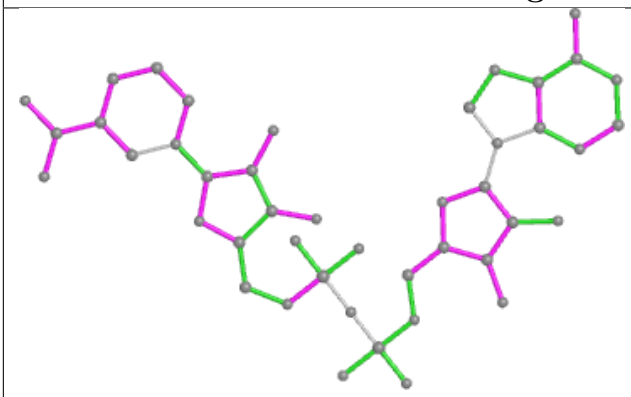
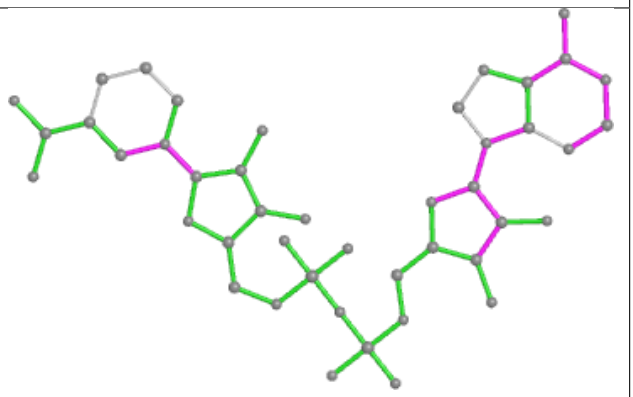


Rings

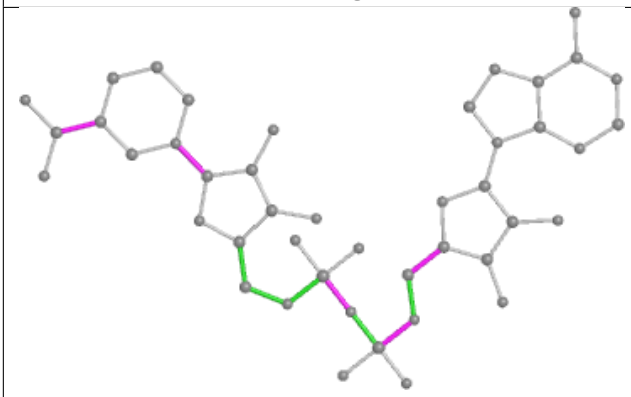
Ligand NAI A 503



Bond lengths



Bond angles



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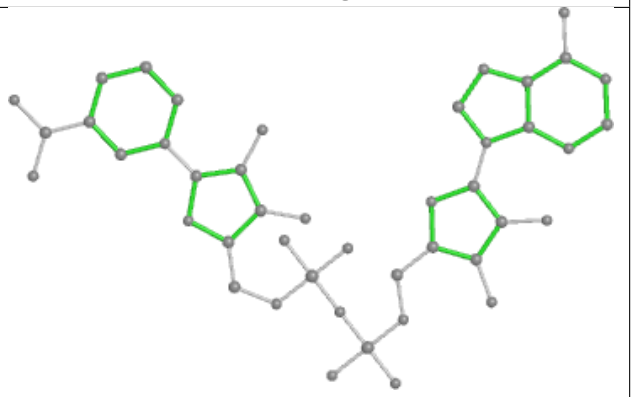
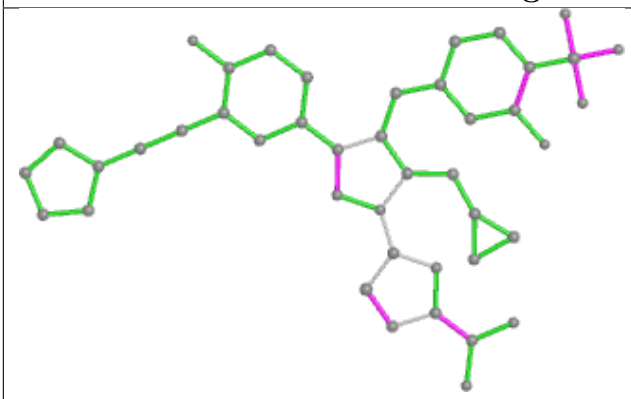


Rings

Ligand P8M D 502



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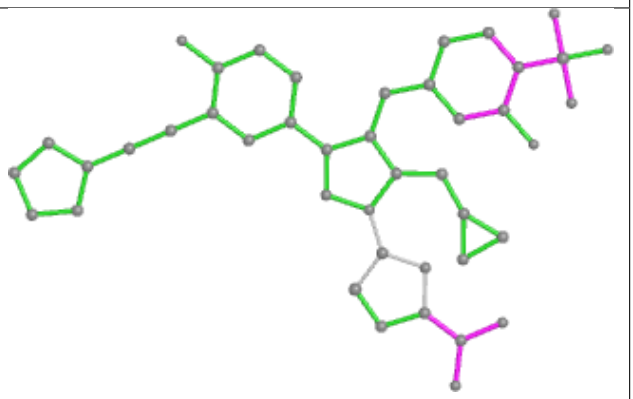
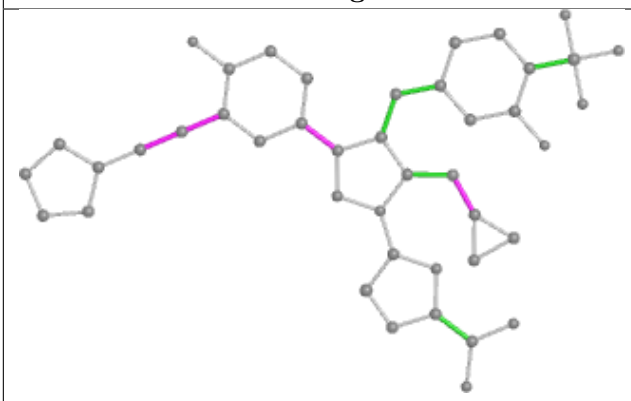


Bond angles



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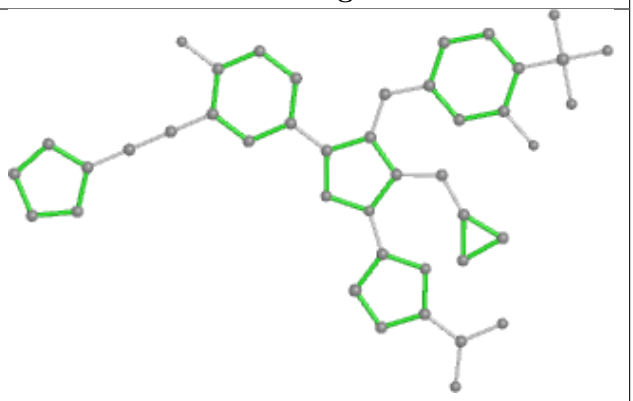
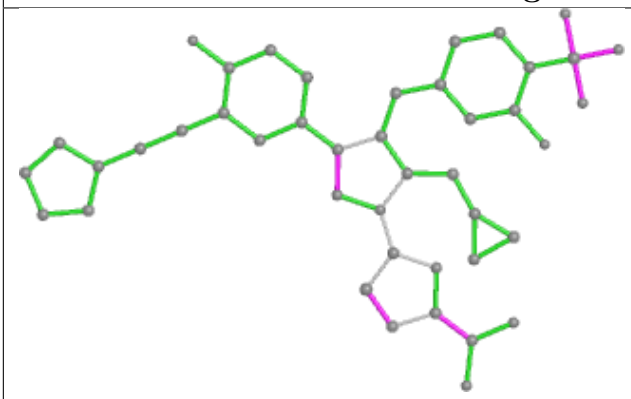
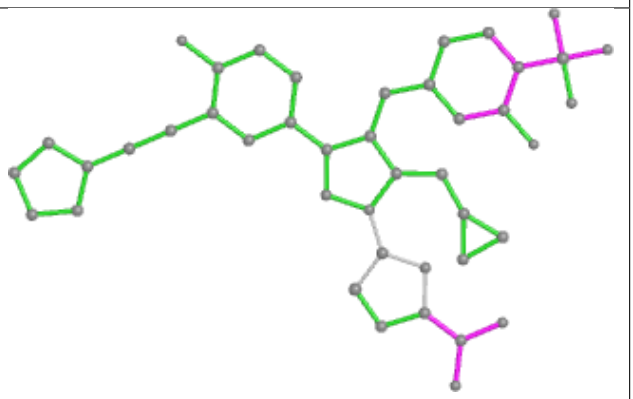


Rings

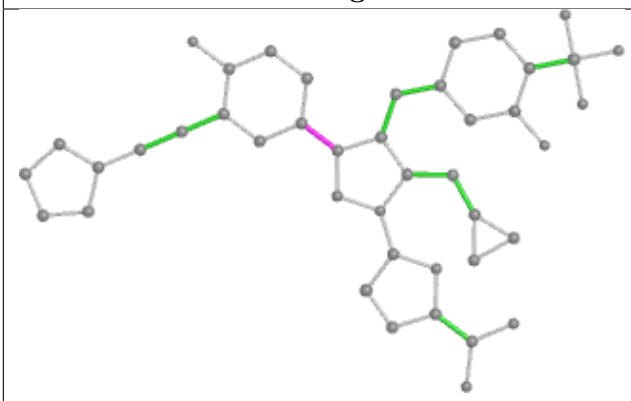
Ligand P8M B 502



Bond lengths



Bond angles



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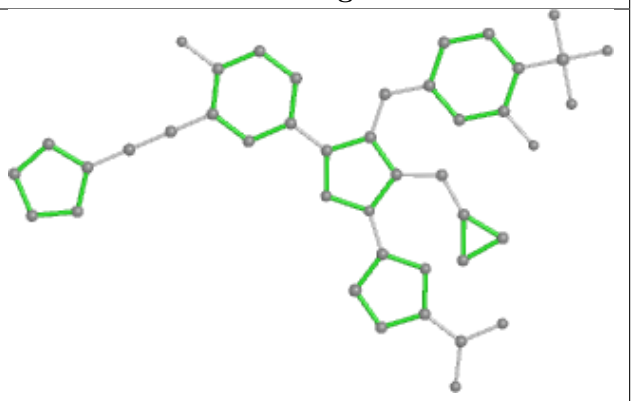
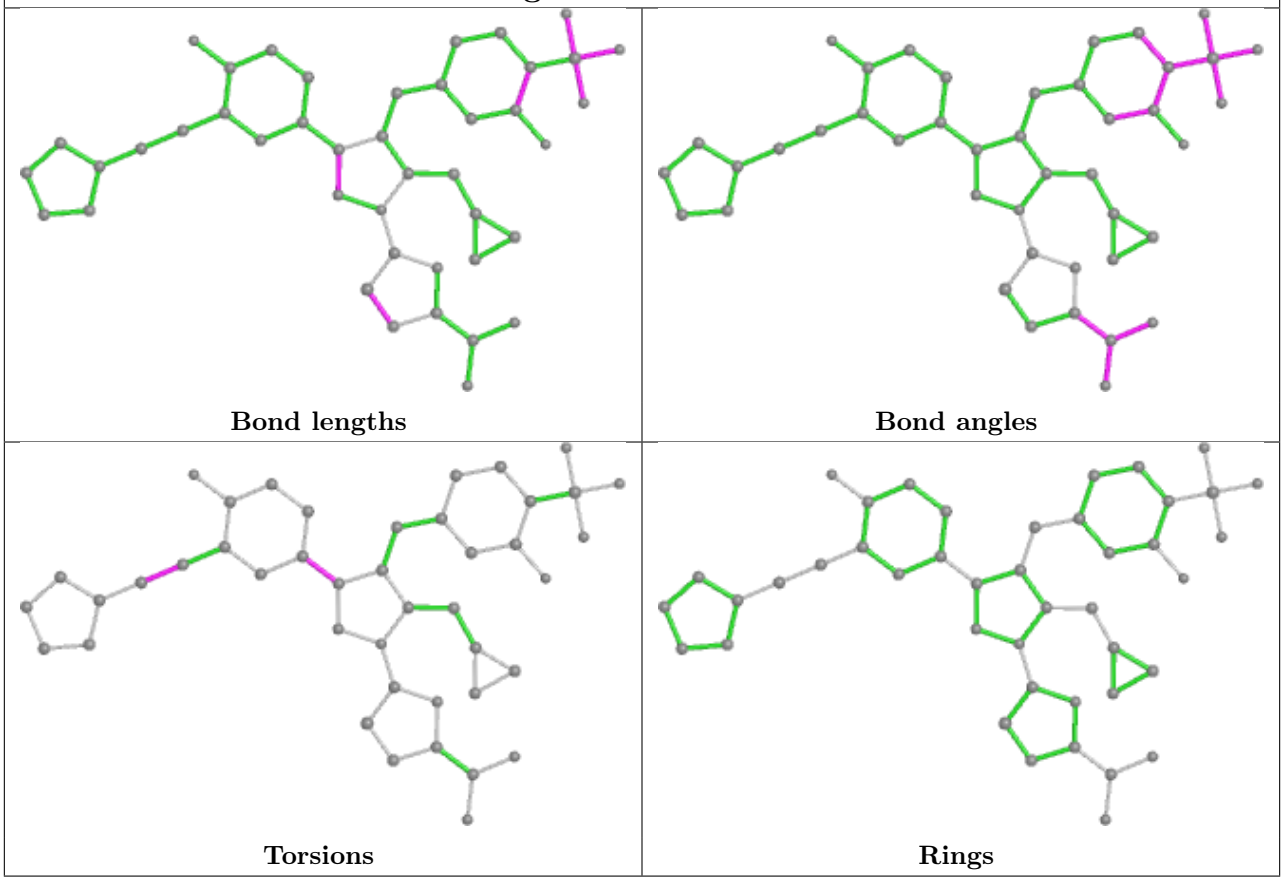


Rings

Ligand P8M A 502



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	331/332 (99%)	-0.52	3 (0%) 84 86	22, 35, 61, 87	0
1	B	331/332 (99%)	-0.51	0 100 100	24, 36, 62, 107	0
1	C	331/332 (99%)	-0.38	5 (1%) 73 76	30, 43, 65, 104	0
1	D	331/332 (99%)	-0.46	3 (0%) 84 86	25, 38, 69, 115	0
1	E	331/332 (99%)	-0.55	1 (0%) 94 94	19, 28, 55, 90	0
1	F	331/332 (99%)	-0.59	0 100 100	19, 28, 52, 73	0
All	All	1986/1992 (99%)	-0.50	12 (0%) 89 91	19, 36, 63, 115	0

All (12) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	102	GLY	5.7
1	C	1	ALA	4.0
1	D	15	GLU	2.9
1	C	16	GLN	2.7
1	E	16	GLN	2.5
1	D	1	ALA	2.4
1	C	102	GLY	2.4
1	A	331	PHE	2.3
1	A	101	GLU	2.1
1	C	15	GLU	2.1
1	C	220	ASP	2.1
1	A	100	GLN	2.1

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

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

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

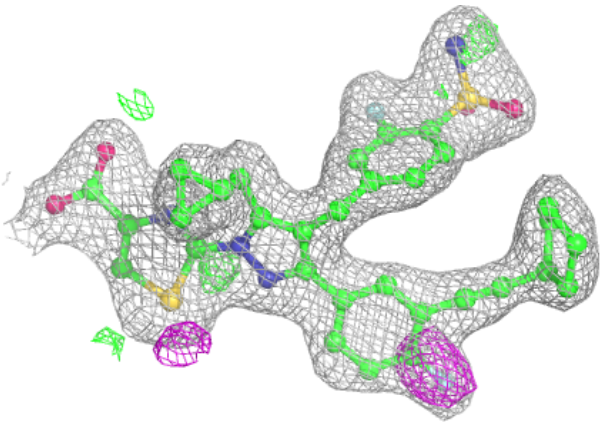
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

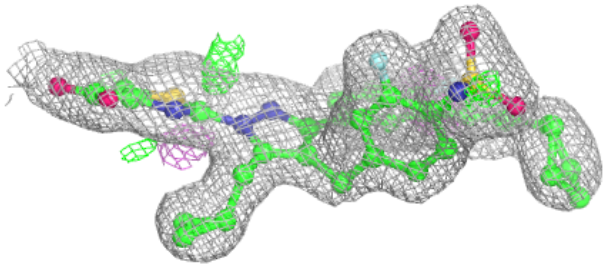
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
5	GOL	E	402	6/6	0.51	0.23	60,66,75,78	0
5	GOL	C	500	6/6	0.65	0.34	65,68,68,70	0
5	GOL	F	500	6/6	0.71	0.33	67,75,78,79	0
5	GOL	B	500	6/6	0.77	0.36	58,65,66,68	0
5	GOL	E	401	6/6	0.85	0.23	48,57,61,68	0
5	GOL	E	403	6/6	0.87	0.25	40,45,47,54	0
3	P8M	C	502	43/43	0.95	0.12	30,39,44,47	0
4	NAI	C	503	44/44	0.96	0.10	25,37,48,51	0
2	PO4	A	501	5/5	0.97	0.10	34,35,47,48	0
4	NAI	D	503	44/44	0.97	0.09	33,37,43,52	0
3	P8M	D	502	43/43	0.97	0.10	33,39,53,56	0
4	NAI	B	503	44/44	0.97	0.10	24,33,41,50	0
3	P8M	A	502	43/43	0.98	0.10	27,35,55,57	0
3	P8M	B	502	43/43	0.98	0.09	24,32,49,52	0
4	NAI	E	406	44/44	0.98	0.09	15,27,32,36	0
4	NAI	F	503	44/44	0.98	0.10	19,27,32,39	0
2	PO4	B	501	5/5	0.98	0.07	32,38,41,44	0
2	PO4	D	501	5/5	0.98	0.08	30,35,36,36	0
3	P8M	E	405	43/43	0.98	0.10	20,28,34,37	0
3	P8M	F	502	43/43	0.98	0.10	23,29,37,46	0
4	NAI	A	503	44/44	0.98	0.08	22,29,39,44	0
2	PO4	F	501	5/5	0.98	0.09	23,28,32,33	0
2	PO4	E	404	5/5	0.99	0.09	29,29,33,33	0
2	PO4	C	501	5/5	0.99	0.08	34,41,43,45	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 P8M C 502:

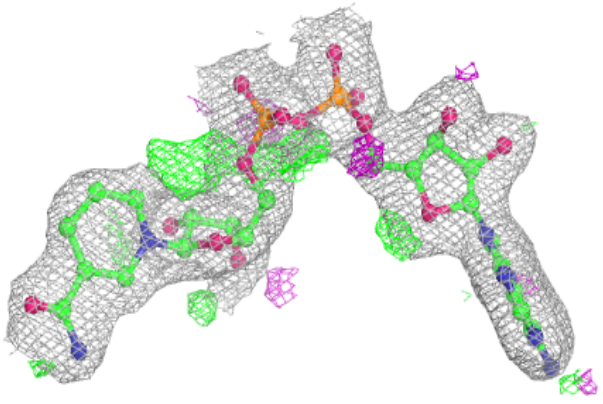
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

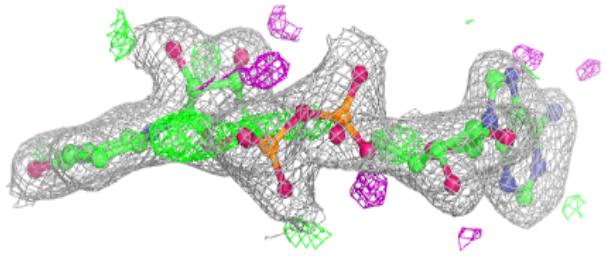


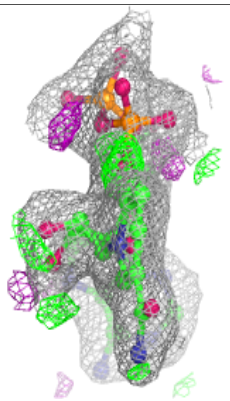


Electron density around NAI C 503:

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

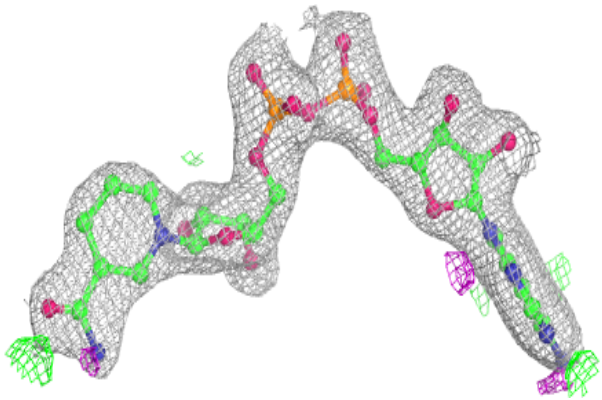


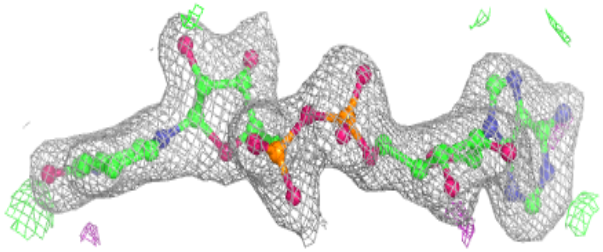


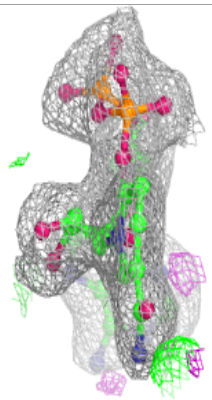


Electron density around NAI D 503:

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

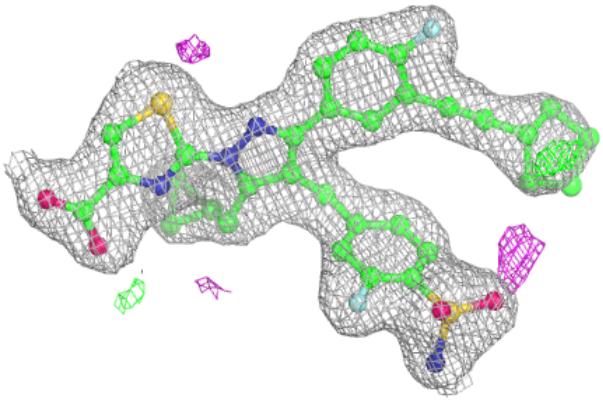


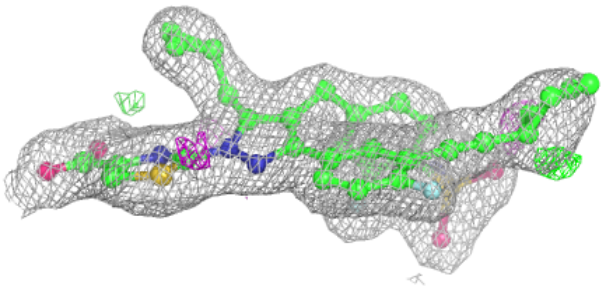


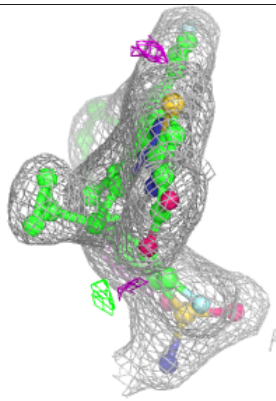


Electron density around P8M D 502:

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

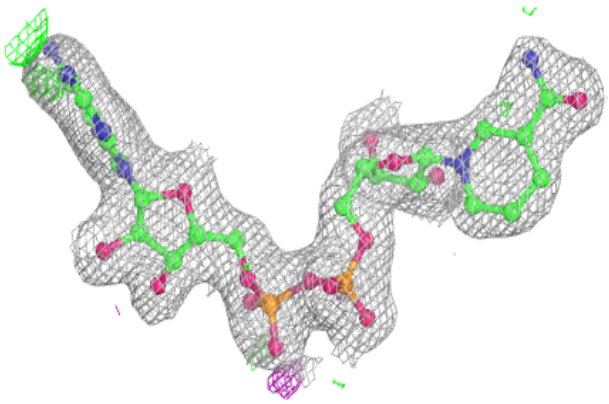


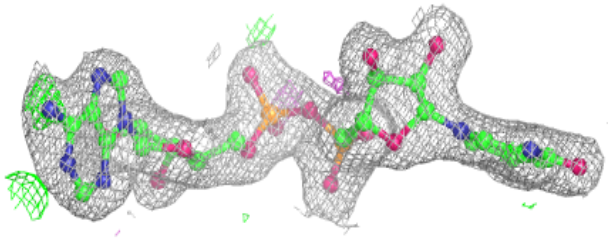


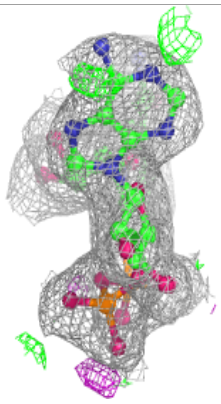


Electron density around NAI B 503:

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

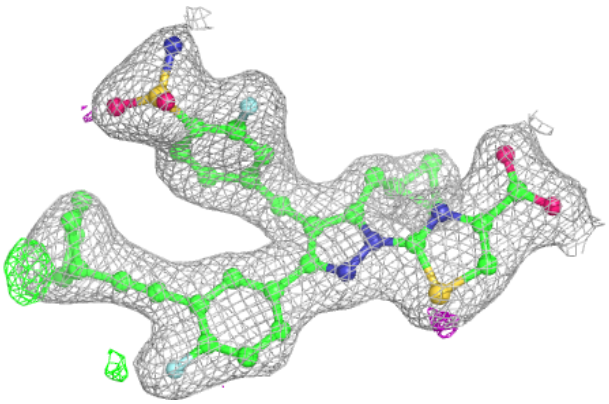


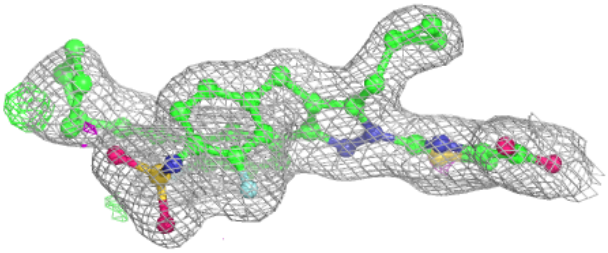


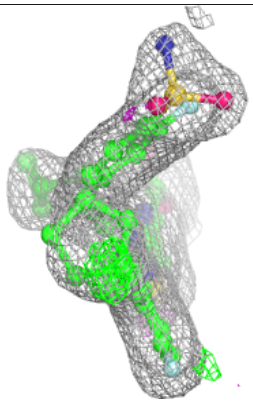


Electron density around P8M A 502:

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

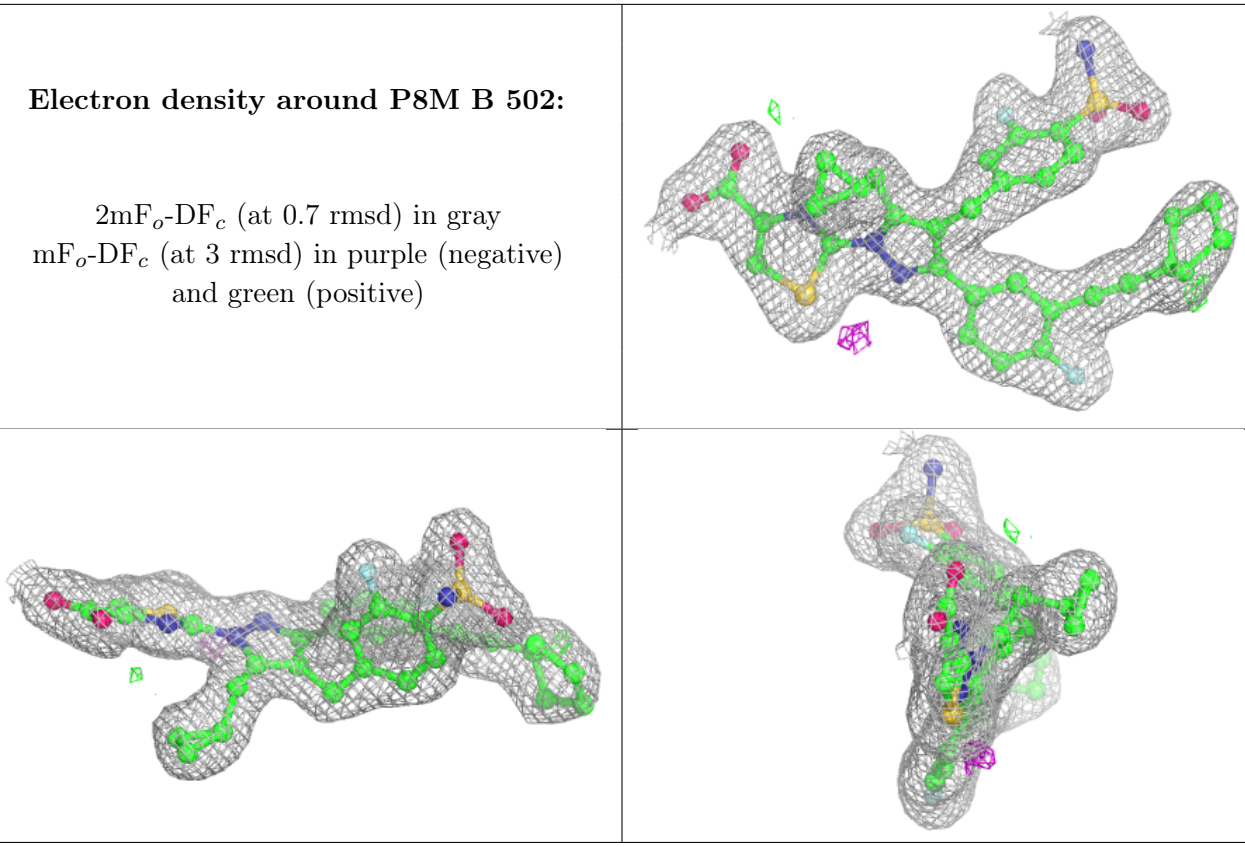






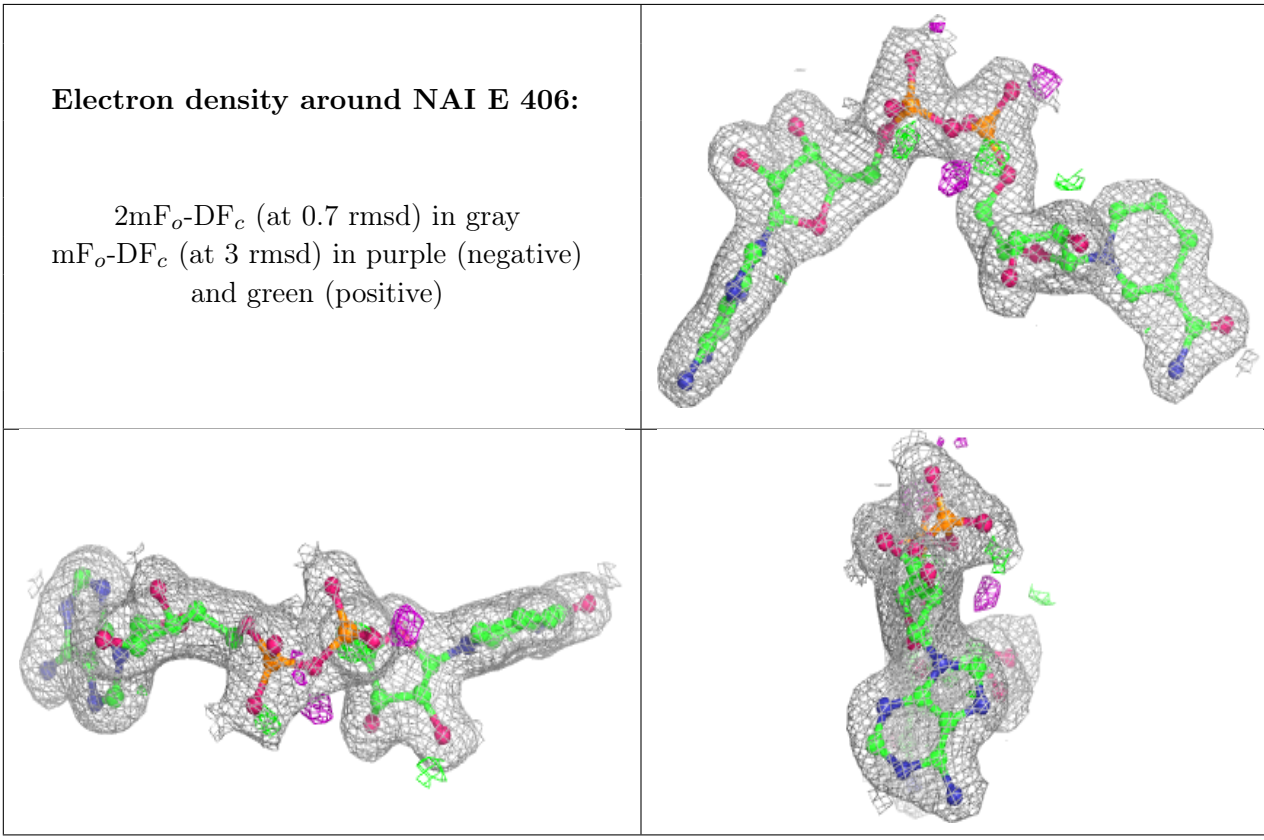
Electron density around P8M B 502:

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



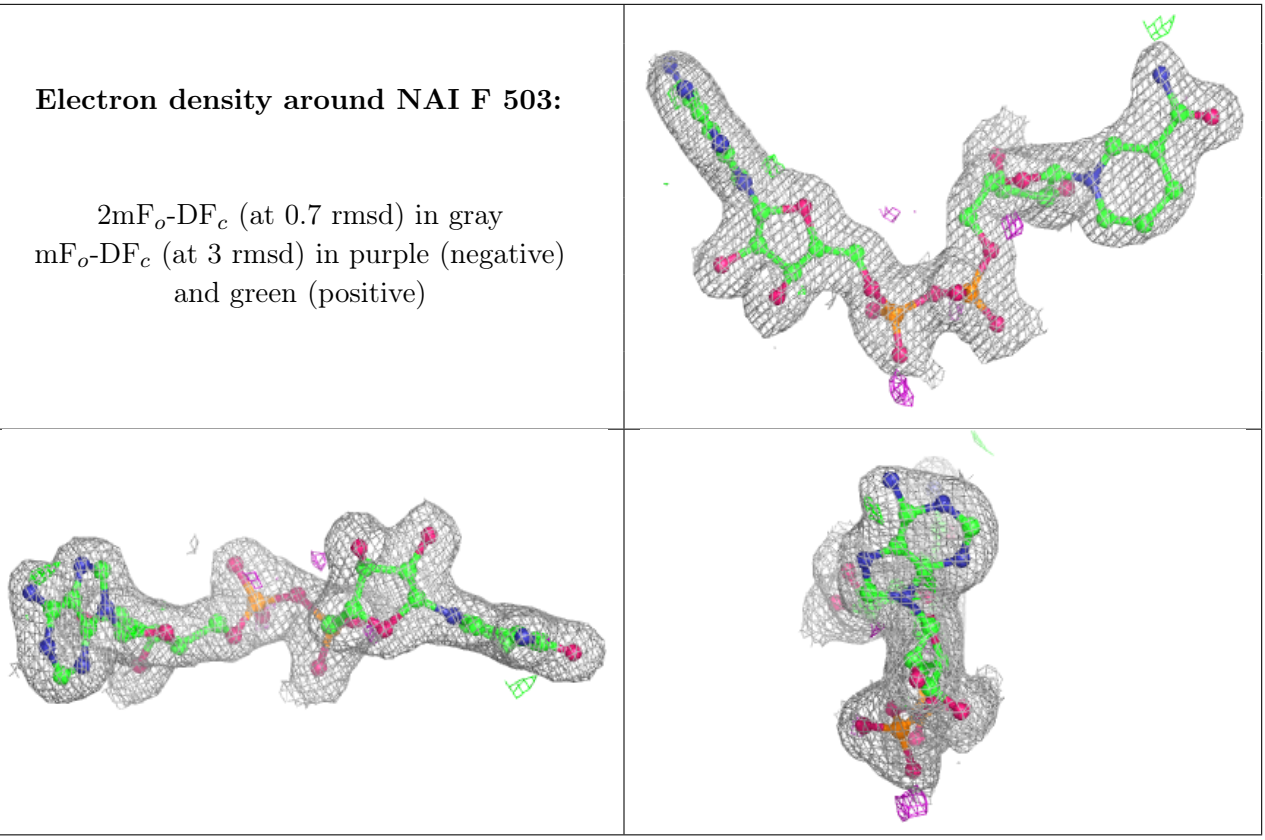
Electron density around NAI E 406:

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



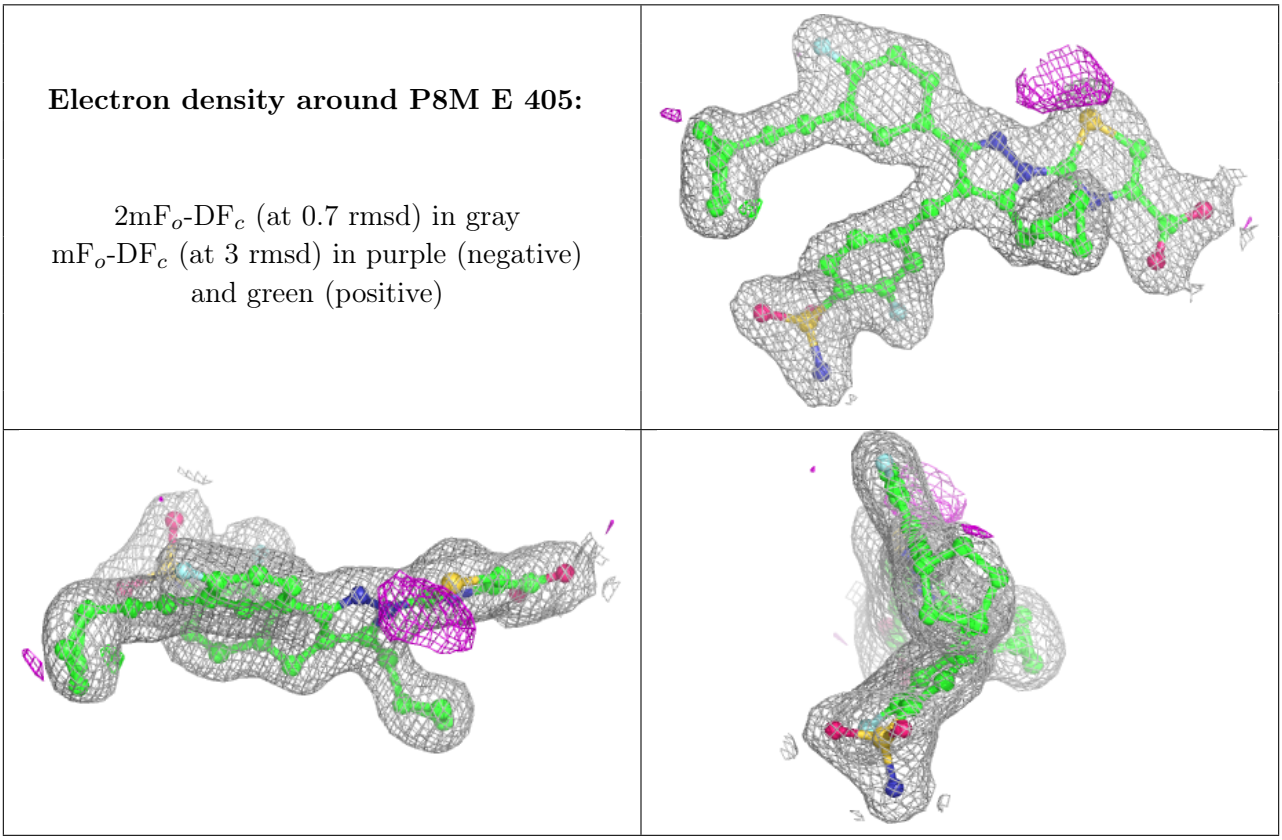
Electron density around NAI F 503:

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



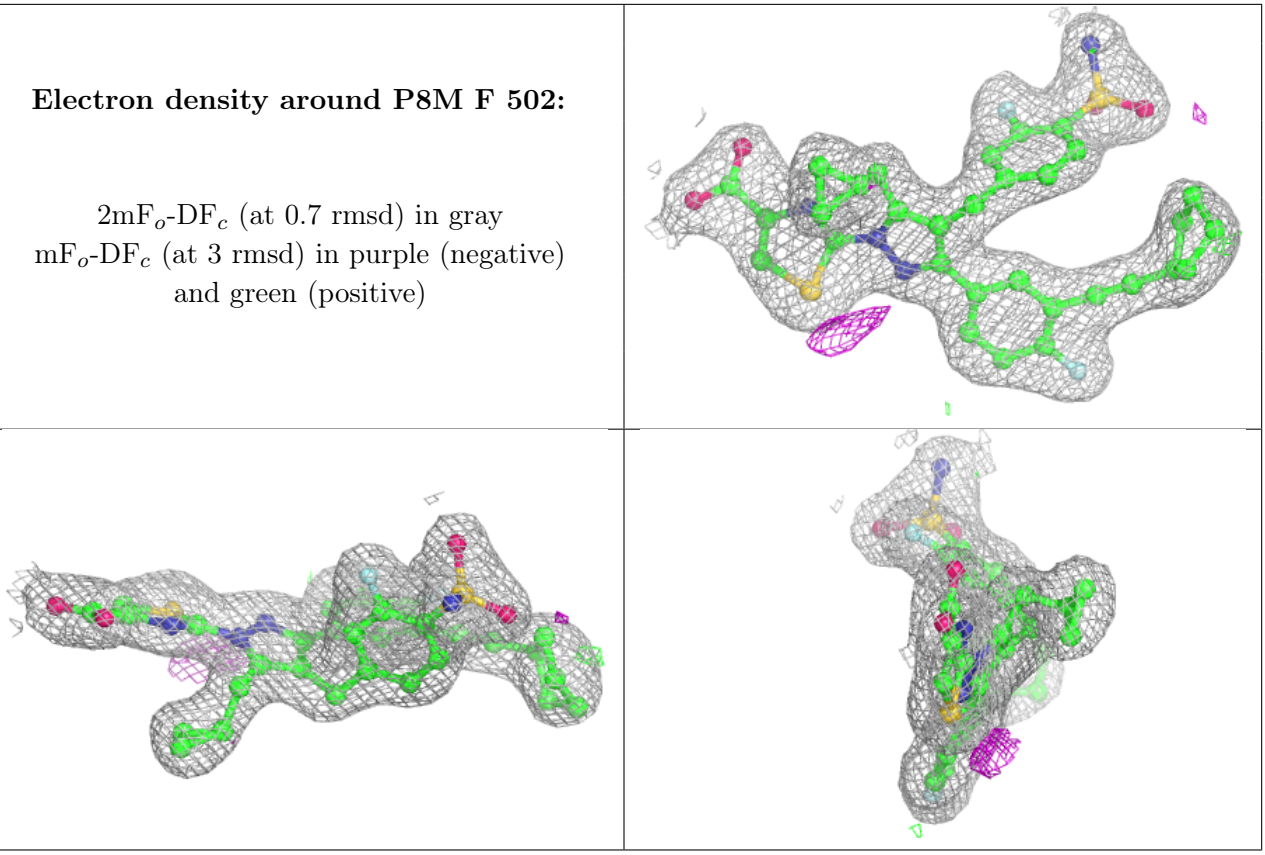
Electron density around P8M E 405:

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



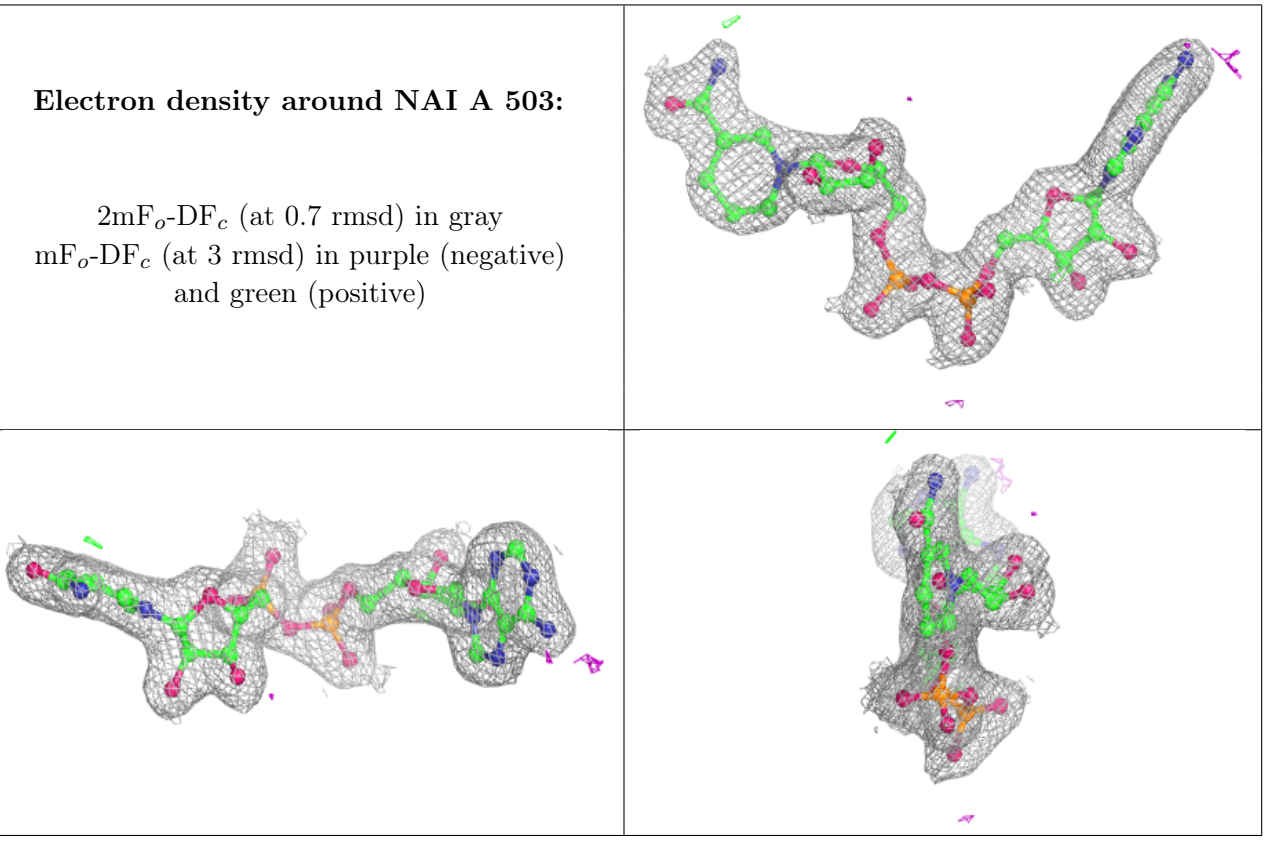
Electron density around P8M F 502:

$2mF_o$-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 503:

$2mF_o$-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.