Full wwPDB X-ray Structure Validation Report ⓘ

Jun 17, 2024 – 08:12 PM JST

PDB ID	:	8JT0
Title	:	Dihydrofolate reductase-like enzyme from Leptospira interrogans with additional NADP+
Authors	:	Wangkanont, K.
Deposited on	:	2023-06-20
Resolution	:	2.20 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:

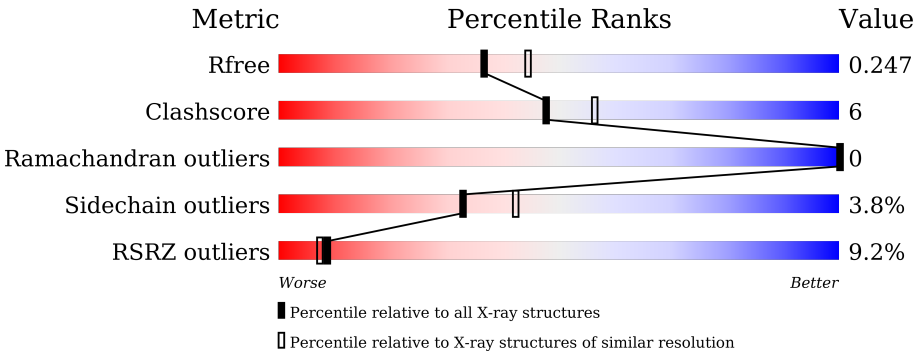
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.37.1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

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 2.20 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	4898 (2.20-2.20)
Clashscore	141614	5594 (2.20-2.20)
Ramachandran outliers	138981	5503 (2.20-2.20)
Sidechain outliers	138945	5504 (2.20-2.20)
RSRZ outliers	127900	4800 (2.20-2.20)

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	203	11% 74% 21%
1	B	203	12% 75% 20%
1	C	203	12% 86% 12%
1	D	203	3% 85% 11%
1	E	203	10% 84% 10%
1	F	203	3% 89% 6%

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Mol	Chain	Length	Quality of chain
1	G	203	4% 85% 10%
1	H	203	13% 84% 11%
1	I	203	13% 86% 13%
1	J	203	7% 89% 10%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	SO4	I	304	-	-	-	X
5	ACT	G	302	-	-	X	-
5	ACT	I	302	-	-	-	X

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 17041 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 Dihydrofolate reductase family protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	195	Total	C	N	O	S	0	0	0
			1526	988	244	289	5			
1	B	195	Total	C	N	O	S	0	0	0
			1526	988	244	289	5			
1	C	202	Total	C	N	O	S	0	1	0
			1593	1031	261	296	5			
1	D	195	Total	C	N	O	S	0	0	0
			1526	988	244	289	5			
1	E	195	Total	C	N	O	S	0	0	0
			1526	988	244	289	5			
1	F	195	Total	C	N	O	S	0	1	0
			1530	992	244	289	5			
1	G	195	Total	C	N	O	S	0	0	0
			1526	988	244	289	5			
1	H	195	Total	C	N	O	S	0	0	0
			1526	988	244	289	5			
1	I	203	Total	C	N	O	S	0	1	0
			1604	1033	266	300	5			
1	J	202	Total	C	N	O	S	0	0	0
			1585	1023	261	296	5			

There are 60 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	198	HIS	-	expression tag	UNP A0A8I0PU34
A	199	HIS	-	expression tag	UNP A0A8I0PU34
A	200	HIS	-	expression tag	UNP A0A8I0PU34
A	201	HIS	-	expression tag	UNP A0A8I0PU34
A	202	HIS	-	expression tag	UNP A0A8I0PU34
A	203	HIS	-	expression tag	UNP A0A8I0PU34
B	198	HIS	-	expression tag	UNP A0A8I0PU34
B	199	HIS	-	expression tag	UNP A0A8I0PU34
B	200	HIS	-	expression tag	UNP A0A8I0PU34

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Chain	Residue	Modelled	Actual	Comment	Reference
B	201	HIS	-	expression tag	UNP A0A8I0PU34
B	202	HIS	-	expression tag	UNP A0A8I0PU34
B	203	HIS	-	expression tag	UNP A0A8I0PU34
C	198	HIS	-	expression tag	UNP A0A8I0PU34
C	199	HIS	-	expression tag	UNP A0A8I0PU34
C	200	HIS	-	expression tag	UNP A0A8I0PU34
C	201	HIS	-	expression tag	UNP A0A8I0PU34
C	202	HIS	-	expression tag	UNP A0A8I0PU34
C	203	HIS	-	expression tag	UNP A0A8I0PU34
D	198	HIS	-	expression tag	UNP A0A8I0PU34
D	199	HIS	-	expression tag	UNP A0A8I0PU34
D	200	HIS	-	expression tag	UNP A0A8I0PU34
D	201	HIS	-	expression tag	UNP A0A8I0PU34
D	202	HIS	-	expression tag	UNP A0A8I0PU34
D	203	HIS	-	expression tag	UNP A0A8I0PU34
E	198	HIS	-	expression tag	UNP A0A8I0PU34
E	199	HIS	-	expression tag	UNP A0A8I0PU34
E	200	HIS	-	expression tag	UNP A0A8I0PU34
E	201	HIS	-	expression tag	UNP A0A8I0PU34
E	202	HIS	-	expression tag	UNP A0A8I0PU34
E	203	HIS	-	expression tag	UNP A0A8I0PU34
F	198	HIS	-	expression tag	UNP A0A8I0PU34
F	199	HIS	-	expression tag	UNP A0A8I0PU34
F	200	HIS	-	expression tag	UNP A0A8I0PU34
F	201	HIS	-	expression tag	UNP A0A8I0PU34
F	202	HIS	-	expression tag	UNP A0A8I0PU34
F	203	HIS	-	expression tag	UNP A0A8I0PU34
G	198	HIS	-	expression tag	UNP A0A8I0PU34
G	199	HIS	-	expression tag	UNP A0A8I0PU34
G	200	HIS	-	expression tag	UNP A0A8I0PU34
G	201	HIS	-	expression tag	UNP A0A8I0PU34
G	202	HIS	-	expression tag	UNP A0A8I0PU34
G	203	HIS	-	expression tag	UNP A0A8I0PU34
H	198	HIS	-	expression tag	UNP A0A8I0PU34
H	199	HIS	-	expression tag	UNP A0A8I0PU34
H	200	HIS	-	expression tag	UNP A0A8I0PU34
H	201	HIS	-	expression tag	UNP A0A8I0PU34
H	202	HIS	-	expression tag	UNP A0A8I0PU34
H	203	HIS	-	expression tag	UNP A0A8I0PU34
I	198	HIS	-	expression tag	UNP A0A8I0PU34
I	199	HIS	-	expression tag	UNP A0A8I0PU34
I	200	HIS	-	expression tag	UNP A0A8I0PU34

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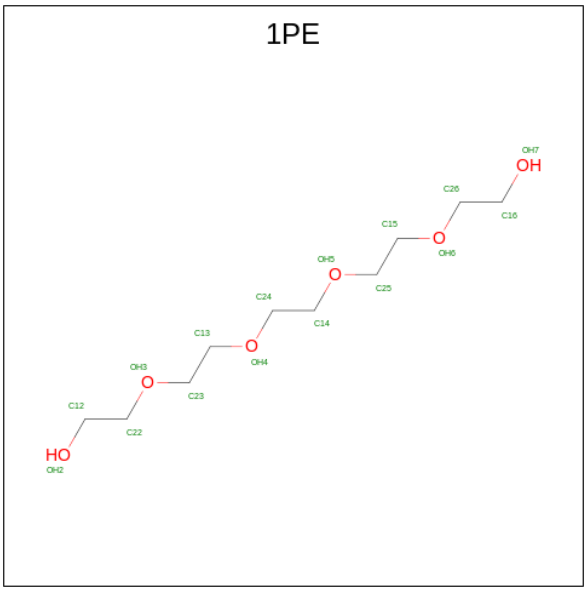
Chain	Residue	Modelled	Actual	Comment	Reference
I	201	HIS	-	expression tag	UNP A0A8I0PU34
I	202	HIS	-	expression tag	UNP A0A8I0PU34
I	203	HIS	-	expression tag	UNP A0A8I0PU34
J	198	HIS	-	expression tag	UNP A0A8I0PU34
J	199	HIS	-	expression tag	UNP A0A8I0PU34
J	200	HIS	-	expression tag	UNP A0A8I0PU34
J	201	HIS	-	expression tag	UNP A0A8I0PU34
J	202	HIS	-	expression tag	UNP A0A8I0PU34
J	203	HIS	-	expression tag	UNP A0A8I0PU34

- Molecule 2 is PENTAETHYLENE GLYCOL (three-letter code: 1PE) (formula: $C_{10}H_{22}O_6$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C O 15 10 5	0	0
2	A	1	Total C O 7 4 3	0	0
2	B	1	Total C O 13 8 5	0	0
2	C	1	Total C O 15 10 5	0	0
2	D	1	Total C O 13 8 5	0	0
2	E	1	Total C O 8 5 3	0	0
2	F	1	Total C O 10 6 4	0	0

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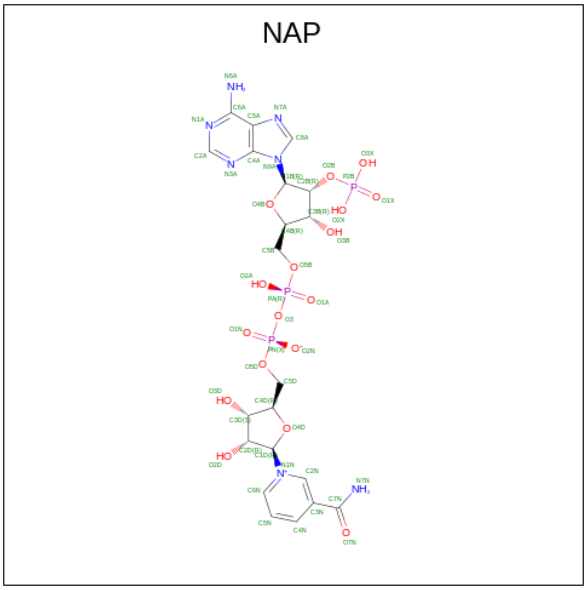
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	F	1	Total C O 16 10 6	0	0
2	G	1	Total C O 12 8 4	0	0
2	H	1	Total C O 13 8 5	0	0
2	H	1	Total C O 5 3 2	0	0
2	I	1	Total C O 16 10 6	0	0
2	J	1	Total C O 16 10 6	0	0
2	J	1	Total C O 16 10 6	0	0
2	J	1	Total C O 11 7 4	0	0

- Molecule 3 is NADP NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (three-letter code: NAP) (formula: $C_{21}H_{28}N_7O_{17}P_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C N O P 48 21 7 17 3	0	0
3	B	1	Total C N O P 48 21 7 17 3	0	0
3	C	1	Total C N O P 48 21 7 17 3	0	0

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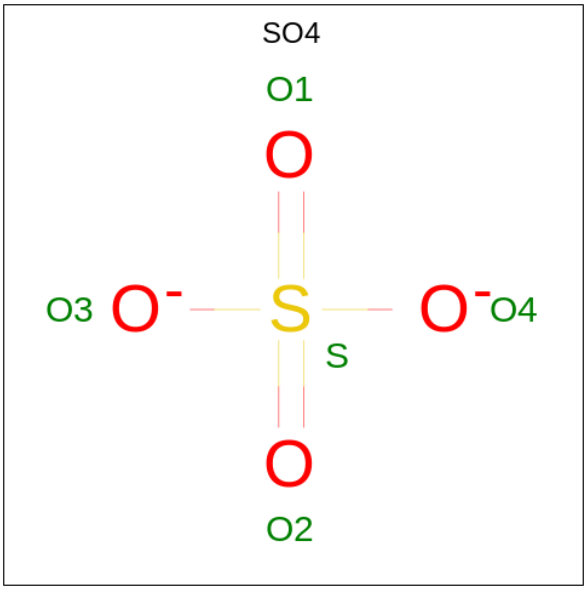
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	D	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
3	E	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
3	F	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
3	G	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
3	H	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
3	I	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
3	J	1	Total	C	N	O	P	0	0
			48	21	7	17	3		

- Molecule 4 is SULFATE ION (three-letter code: SO4) (formula: O_4S).



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

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	C	1	Total O S 5 4 1	0	0
4	C	1	Total O S 5 4 1	0	0
4	D	1	Total O S 5 4 1	0	0
4	D	1	Total O S 5 4 1	0	0
4	D	1	Total O S 5 4 1	0	0
4	D	1	Total O S 5 4 1	0	0
4	D	1	Total O S 5 4 1	0	0
4	D	1	Total O S 5 4 1	0	0
4	E	1	Total O S 5 4 1	0	0
4	E	1	Total O S 5 4 1	0	0
4	F	1	Total O S 5 4 1	0	0
4	F	1	Total O S 5 4 1	0	0
4	F	1	Total O S 5 4 1	0	0
4	F	1	Total O S 5 4 1	0	0
4	F	1	Total O S 5 4 1	0	0
4	G	1	Total O S 5 4 1	0	0
4	G	1	Total O S 5 4 1	0	0
4	G	1	Total O S 5 4 1	0	0
4	G	1	Total O S 5 4 1	0	0
4	G	1	Total O S 5 4 1	0	0
4	H	1	Total O S 5 4 1	0	0

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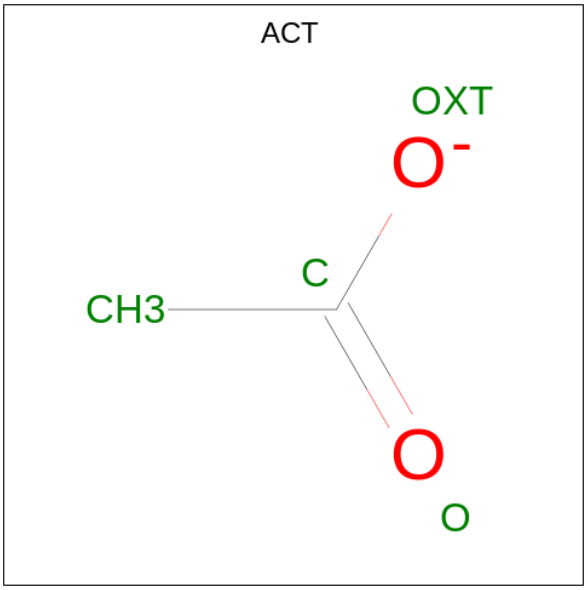
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	I	1	Total O S 5 4 1	0	0
4	I	1	Total O S 5 4 1	0	0
4	I	1	Total O S 5 4 1	0	0
4	I	1	Total O S 5 4 1	0	0
4	J	1	Total O S 5 4 1	0	0
4	J	1	Total O S 5 4 1	0	0
4	J	1	Total O S 5 4 1	0	0
4	J	1	Total O S 5 4 1	0	0
4	J	1	Total O S 5 4 1	0	0

- Molecule 5 is ACETATE ION (three-letter code: ACT) (formula: $C_2H_3O_2$).



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

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

- Molecule 6 is water.

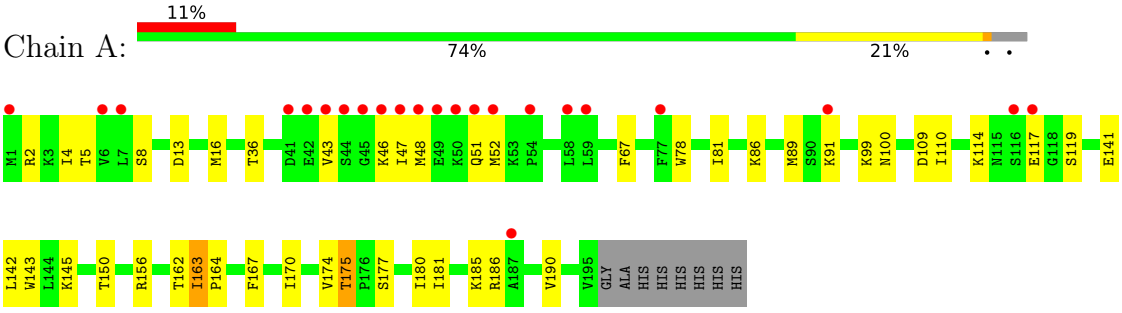
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	43	Total	O	0	0
			43	43		
6	B	37	Total	O	0	0
			37	37		
6	C	61	Total	O	0	0
			61	61		
6	D	101	Total	O	0	0
			101	101		
6	E	78	Total	O	0	0
			78	78		
6	F	103	Total	O	0	0
			103	103		
6	G	88	Total	O	0	0
			88	88		
6	H	53	Total	O	0	0
			53	53		
6	I	86	Total	O	0	0
			86	86		
6	J	75	Total	O	0	0
			75	75		

3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

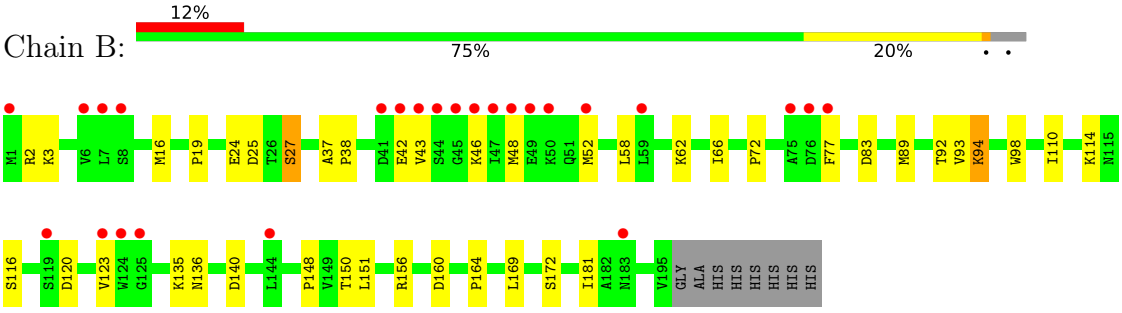
• Molecule 1: Dihydrofolate reductase family protein

Chain A:



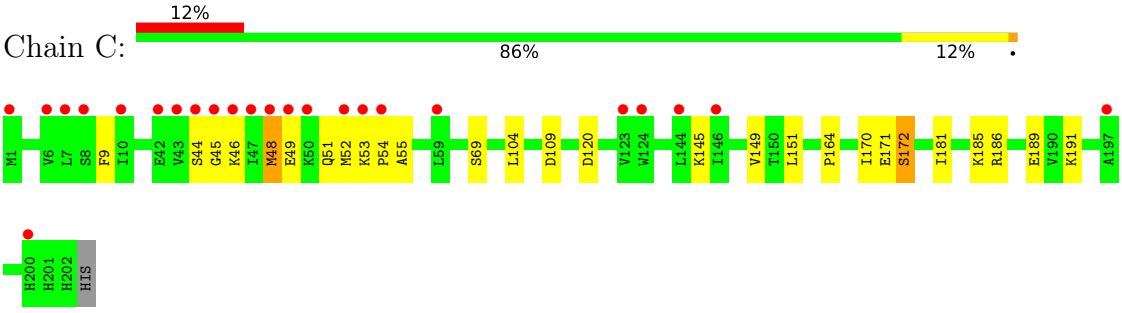
• Molecule 1: Dihydrofolate reductase family protein

Chain B:



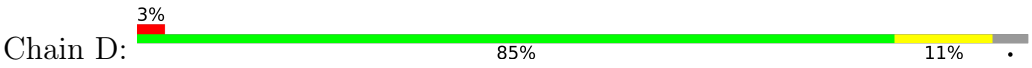
• Molecule 1: Dihydrofolate reductase family protein

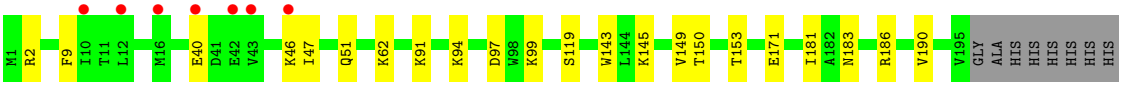
Chain C:



• Molecule 1: Dihydrofolate reductase family protein

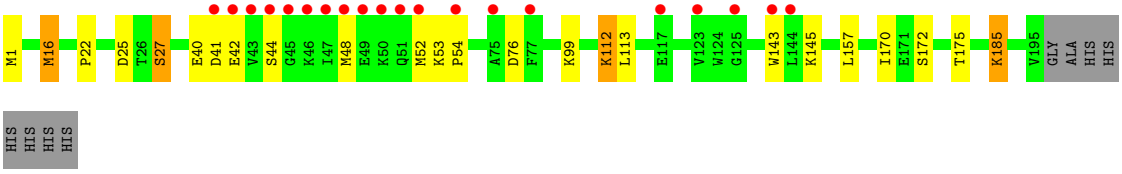
Chain D:





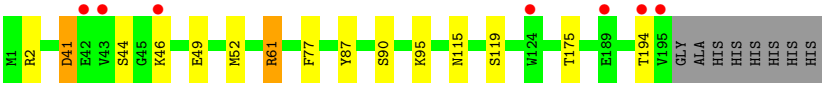
• Molecule 1: Dihydrofolate reductase family protein

Chain E:



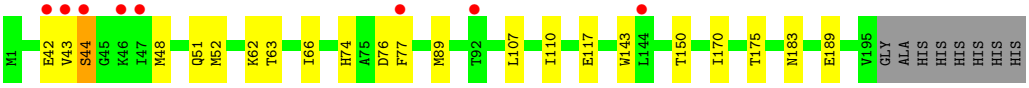
• Molecule 1: Dihydrofolate reductase family protein

Chain F:



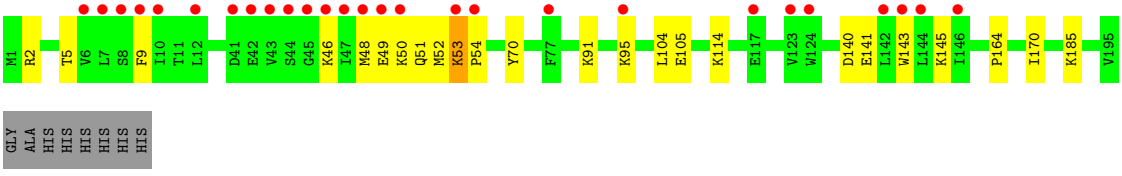
• Molecule 1: Dihydrofolate reductase family protein

Chain G:



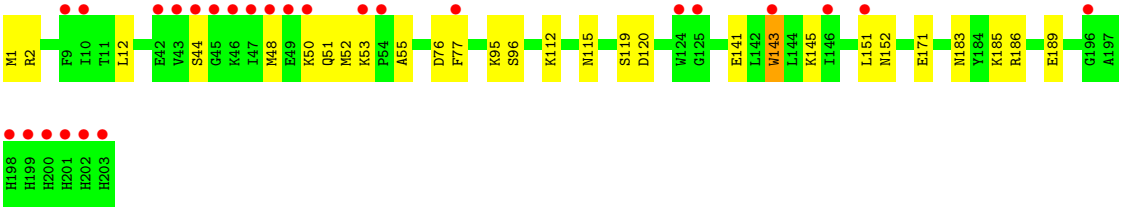
• Molecule 1: Dihydrofolate reductase family protein

Chain H:



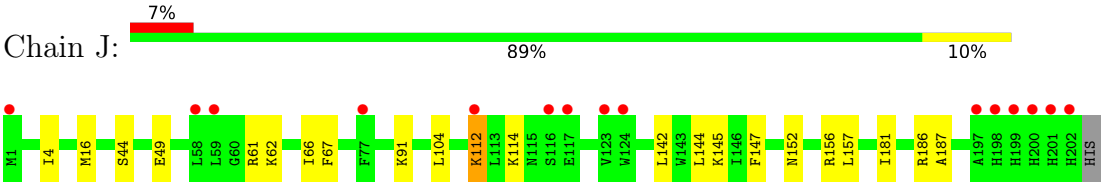
• Molecule 1: Dihydrofolate reductase family protein

Chain I:



• Molecule 1: Dihydrofolate reductase family protein

Chain J:


7%
89%
10%
M1
I4
M16
S44
E49
L58
L59
G60
R61
K62
I66
F67
F77
K91
L104
K112
L113
K114
N115
S116
E117
V123
W124
L142
W143
L144
K145
I146
F147
N152
R156
L157
I181
R186
A187
A197
H198
H199
H200
H201
H202
HIS

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 2 21 21	Depositor
Cell constants a, b, c, α, β, γ	85.23Å 138.28Å 236.57Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.96 – 2.20 29.96 – 2.20	Depositor EDS
% Data completeness (in resolution range)	99.8 (29.96-2.20) 99.8 (29.96-2.20)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.33 (at 2.20Å)	Xtriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, R_{free}	0.206 , 0.247 0.206 , 0.247	Depositor DCC
R_{free} test set	7113 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å^2)	47.5	Xtriage
Anisotropy	0.154	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 49.4	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	17041	wwPDB-VP
Average B, all atoms (Å^2)	55.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.31% 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: 1PE, NAP, SO4, ACT

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	0.41	0/1563	0.60	0/2114
1	B	0.41	0/1563	0.60	0/2114
1	C	0.41	0/1639	0.59	0/2217
1	D	0.51	0/1563	0.65	0/2114
1	E	0.43	0/1563	0.61	0/2114
1	F	0.51	0/1570	0.65	0/2124
1	G	0.50	0/1563	0.63	0/2114
1	H	0.45	0/1563	0.59	0/2114
1	I	0.46	0/1647	0.63	0/2227
1	J	0.48	0/1627	0.61	0/2201
All	All	0.46	0/15861	0.62	0/21453

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1526	0	1528	26	0
1	B	1526	0	1528	24	0
1	C	1593	0	1580	21	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	1526	0	1528	17	0
1	E	1526	0	1528	12	0
1	F	1530	0	1537	14	0
1	G	1526	0	1528	16	0
1	H	1526	0	1528	17	0
1	I	1604	0	1583	19	0
1	J	1585	0	1571	18	0
2	A	22	0	28	6	0
2	B	13	0	17	0	0
2	C	15	0	19	1	0
2	D	13	0	17	1	0
2	E	8	0	9	1	0
2	F	26	0	35	5	0
2	G	12	0	15	3	0
2	H	18	0	22	5	0
2	I	16	0	22	1	0
2	J	43	0	57	7	0
3	A	48	0	23	2	0
3	B	48	0	23	1	0
3	C	48	0	23	1	0
3	D	48	0	23	1	0
3	E	48	0	23	1	0
3	F	48	0	23	1	0
3	G	48	0	23	7	0
3	H	48	0	23	1	0
3	I	48	0	23	1	0
3	J	48	0	23	3	0
4	A	5	0	0	0	0
4	B	10	0	0	0	0
4	C	15	0	0	0	0
4	D	30	0	0	4	0
4	E	10	0	0	0	0
4	F	25	0	0	1	0
4	G	25	0	0	1	0
4	H	5	0	0	0	0
4	I	20	0	0	0	0
4	J	25	0	0	1	0
5	D	4	0	3	1	0
5	G	4	0	3	8	0
5	I	4	0	3	0	0
6	A	43	0	0	0	0
6	B	37	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	C	61	0	0	0	0
6	D	101	0	0	3	0
6	E	78	0	0	0	0
6	F	103	0	0	0	0
6	G	88	0	0	0	0
6	H	53	0	0	0	0
6	I	86	0	0	1	0
6	J	75	0	0	0	0
All	All	17041	0	15919	196	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 6.

All (196) 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)
5:G:302:ACT:H2	3:G:303:NAP:H51N	1.56	0.86
1:F:87:TYR:OH	2:F:302:1PE:H252	1.78	0.84
1:A:170:ILE:HD11	1:A:185:LYS:HB2	1.64	0.79
1:F:87:TYR:OH	2:F:302:1PE:C25	2.31	0.78
1:C:170:ILE:HD11	1:C:185:LYS:HB2	1.66	0.77
5:G:302:ACT:H2	3:G:303:NAP:C5D	2.15	0.76
1:F:46:LYS:HA	1:F:49:GLU:HG2	1.67	0.74
1:A:52:MET:SD	2:A:301:1PE:H221	2.27	0.73
1:B:92:THR:HG22	1:B:93:VAL:HG23	1.71	0.72
1:C:145:LYS:HG2	1:C:181:ILE:HD13	1.72	0.70
1:H:170:ILE:HD11	1:H:185:LYS:HB2	1.74	0.70
1:A:47:ILE:HG21	1:A:181:ILE:HD13	1.75	0.68
1:B:2:ARG:O	1:B:114:LYS:NZ	2.27	0.67
1:E:41:ASP:HB3	1:E:44:SER:HB2	1.75	0.67
1:H:9:PHE:HE1	2:H:301:1PE:H231	1.61	0.66
1:I:186:ARG:HG3	1:I:186:ARG:HH11	1.61	0.65
1:D:46:LYS:HD2	4:D:308:SO4:O3	1.98	0.64
1:I:2:ARG:HD3	1:I:119:SER:O	1.98	0.64
1:E:53:LYS:HG2	1:E:54:PRO:HD2	1.79	0.63
1:C:45:GLY:O	1:C:49:GLU:HG2	1.99	0.63
1:G:63:THR:HA	5:G:302:ACT:H3	1.81	0.63
1:D:2:ARG:HD3	1:D:119:SER:O	1.98	0.63
1:G:62:LYS:HB3	5:G:302:ACT:H1	1.81	0.62
1:B:48:MET:O	1:B:52:MET:HG3	1.98	0.62
1:A:175:THR:HG22	1:A:177:SER:H	1.65	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:J:44:SER:HB3	2:J:302:1PE:H262	1.82	0.61
1:J:186:ARG:NH2	1:J:187:ALA:O	2.33	0.60
1:C:186:ARG:HH11	1:C:186:ARG:HG3	1.66	0.60
1:B:135:LYS:NZ	1:B:136:ASN:OD1	2.32	0.60
1:G:107:LEU:N	4:G:306:SO4:O2	2.31	0.60
1:H:51:GLN:HG2	1:H:143:TRP:CZ3	2.37	0.60
1:G:44:SER:O	1:G:48:MET:HG2	2.03	0.59
1:F:49:GLU:HB2	1:G:117:GLU:OE2	2.03	0.58
2:A:301:1PE:H141	3:A:303:NAP:H5N	1.84	0.58
1:F:77:PHE:N	4:F:304:SO4:O1	2.34	0.58
1:F:46:LYS:HA	1:F:49:GLU:CG	2.34	0.58
1:I:44:SER:OG	1:I:145:LYS:NZ	2.37	0.58
1:D:47:ILE:HD13	1:D:181:ILE:HD13	1.86	0.57
1:C:171:GLU:HG2	1:C:172:SER:N	2.19	0.56
1:F:87:TYR:OH	2:F:302:1PE:H251	2.04	0.56
1:F:61:ARG:O	1:F:61:ARG:HG2	2.02	0.56
5:G:302:ACT:CH3	3:G:303:NAP:H51N	2.30	0.56
1:C:48:MET:O	1:C:52:MET:HG3	2.06	0.56
1:B:25:ASP:OD1	1:B:27:SER:OG	2.23	0.56
1:D:186:ARG:HH11	1:D:186:ARG:HG3	1.71	0.56
1:E:25:ASP:OD1	1:E:27:SER:HB3	2.06	0.56
1:F:49:GLU:HA	1:F:52:MET:SD	2.47	0.55
1:C:44:SER:OG	1:C:145:LYS:NZ	2.35	0.54
2:I:301:1PE:H252	3:I:303:NAP:H5N	1.89	0.54
1:A:48:MET:SD	1:A:145:LYS:HE3	2.47	0.54
1:G:76:ASP:OD1	1:G:77:PHE:N	2.41	0.54
1:G:74:HIS:HB3	1:G:77:PHE:HD1	1.72	0.54
1:H:48:MET:O	1:H:52:MET:HG3	2.08	0.54
1:J:91:LYS:HE3	3:J:304:NAP:H2A	1.90	0.54
1:A:109:ASP:OD1	2:A:302:1PE:OH5	2.26	0.53
1:A:190:VAL:HG11	1:B:151:LEU:HD21	1.90	0.53
1:A:174:VAL:HG12	1:A:175:THR:H	1.74	0.53
1:I:76:ASP:OD1	1:I:77:PHE:N	2.41	0.53
1:F:87:TYR:CZ	2:F:302:1PE:H252	2.44	0.53
1:I:141:GLU:HB3	1:I:143:TRP:HZ3	1.74	0.53
1:E:44:SER:OG	1:E:145:LYS:NZ	2.40	0.53
1:H:9:PHE:CE1	2:H:301:1PE:H231	2.42	0.53
1:I:186:ARG:HG3	1:I:186:ARG:NH1	2.23	0.53
1:B:89:MET:HG3	1:B:110:ILE:HD11	1.89	0.53
1:G:42:GLU:HG2	1:G:43:VAL:H	1.72	0.52
1:D:171:GLU:OE2	1:D:183:ASN:ND2	2.39	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:48:MET:O	1:E:52:MET:HG3	2.09	0.52
1:H:9:PHE:HE2	1:H:145:LYS:HE3	1.75	0.52
1:C:171:GLU:HG2	1:C:172:SER:H	1.74	0.52
1:F:41:ASP:OD1	1:F:44:SER:N	2.41	0.52
1:C:164:PRO:HA	1:D:150:THR:O	2.11	0.51
1:C:53:LYS:HD3	1:C:54:PRO:HD2	1.92	0.51
1:C:9:PHE:CE1	1:C:145:LYS:HD3	2.46	0.51
1:E:113:LEU:HA	2:E:301:1PE:H162	1.93	0.51
1:C:186:ARG:HG3	1:C:186:ARG:NH1	2.25	0.51
1:C:104:LEU:HB3	1:C:109:ASP:HB3	1.92	0.51
1:A:13:ASP:O	1:A:156:ARG:NH2	2.42	0.50
1:D:51:GLN:HG2	1:D:143:TRP:CZ3	2.47	0.50
1:F:2:ARG:HD3	1:F:119:SER:O	2.11	0.50
1:J:61:ARG:NH2	4:J:306:SO4:O3	2.34	0.50
5:G:302:ACT:H2	3:G:303:NAP:O5D	2.11	0.50
1:B:92:THR:HB	3:B:302:NAP:O1X	2.12	0.50
1:D:99:LYS:HG2	6:D:451:HOH:O	2.12	0.50
1:H:91:LYS:HE3	1:H:105:GLU:O	2.12	0.50
1:A:5:THR:HG23	1:A:141:GLU:HB3	1.93	0.49
2:G:301:1PE:H151	3:G:303:NAP:H5N	1.95	0.49
1:H:104:LEU:CD2	2:H:302:1PE:C15	2.91	0.49
1:B:62:LYS:O	1:B:66:ILE:HG13	2.13	0.49
1:C:48:MET:HE3	1:C:51:GLN:HB2	1.94	0.48
1:E:16:MET:HG2	1:E:157:LEU:N	2.28	0.48
1:J:4:ILE:HG13	1:J:114:LYS:HE2	1.94	0.48
1:J:156:ARG:HH21	1:J:156:ARG:HG2	1.78	0.48
1:E:112:LYS:O	1:E:112:LYS:HD3	2.12	0.48
1:I:141:GLU:HB3	1:I:143:TRP:CZ3	2.48	0.48
1:D:51:GLN:HG2	1:D:143:TRP:HZ3	1.79	0.48
1:H:5:THR:HG23	1:H:141:GLU:HB3	1.95	0.48
1:C:52:MET:SD	2:C:301:1PE:H262	2.54	0.48
1:I:95:LYS:HG3	1:I:96:SER:N	2.29	0.48
1:B:172:SER:HA	1:B:181:ILE:O	2.13	0.48
1:E:185:LYS:HB3	1:E:185:LYS:HE3	1.56	0.48
1:G:143:TRP:CD1	1:G:183:ASN:ND2	2.80	0.48
1:G:89:MET:HE3	1:G:110:ILE:HD11	1.96	0.48
1:I:55:ALA:HB1	1:I:120:ASP:O	2.13	0.47
1:J:61:ARG:HB3	3:J:304:NAP:H4B	1.96	0.47
1:F:61:ARG:HB2	1:F:90:SER:HB2	1.96	0.47
1:D:9:PHE:CE1	1:D:145:LYS:HD3	2.49	0.47
1:H:70:TYR:CD2	2:H:301:1PE:H151	2.49	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:95:LYS:HD3	1:H:95:LYS:HA	1.60	0.47
1:A:48:MET:HA	1:A:51:GLN:HB2	1.97	0.47
1:D:62:LYS:NZ	4:D:305:SO4:O2	2.38	0.47
1:H:51:GLN:HG2	1:H:143:TRP:CE3	2.49	0.47
1:C:151:LEU:HD21	1:D:190:VAL:HG11	1.97	0.47
1:G:63:THR:CA	5:G:302:ACT:H3	2.45	0.47
1:B:58:LEU:HB3	1:B:123:VAL:HG22	1.97	0.46
1:B:114:LYS:NZ	1:B:140:ASP:OD1	2.31	0.46
1:H:114:LYS:NZ	1:H:140:ASP:OD2	2.47	0.46
1:I:189:GLU:H	1:I:189:GLU:CD	2.18	0.46
1:J:104:LEU:HD22	2:J:303:1PE:H131	1.97	0.46
1:A:175:THR:CG2	1:A:177:SER:H	2.29	0.46
2:D:301:1PE:H152	2:D:301:1PE:H141	1.68	0.46
1:B:43:VAL:HA	1:B:46:LYS:HD2	1.97	0.46
2:G:301:1PE:H252	2:G:301:1PE:H241	1.76	0.46
1:I:48:MET:O	1:I:52:MET:HG3	2.15	0.46
1:J:67:PHE:CE1	2:J:301:1PE:H232	2.51	0.46
1:J:16:MET:HG2	1:J:157:LEU:N	2.31	0.45
1:J:62:LYS:O	1:J:66:ILE:HG13	2.16	0.45
1:A:4:ILE:HG13	1:A:114:LYS:HE2	1.99	0.45
2:A:301:1PE:H141	3:A:303:NAP:C5N	2.45	0.45
1:D:186:ARG:HG3	1:D:186:ARG:NH1	2.31	0.45
1:F:87:TYR:CE1	2:F:302:1PE:H252	2.51	0.45
1:H:51:GLN:HG2	1:H:143:TRP:HZ3	1.79	0.45
1:A:164:PRO:HA	1:B:150:THR:O	2.16	0.45
1:B:94:LYS:HA	1:B:94:LYS:HD2	1.83	0.45
1:A:99:LYS:HA	1:A:99:LYS:HD2	1.67	0.45
1:E:41:ASP:OD2	1:E:42:GLU:N	2.49	0.45
1:A:86:LYS:HE2	1:A:100:ASN:O	2.17	0.44
1:G:74:HIS:HD2	1:G:77:PHE:HE1	1.64	0.44
1:A:43:VAL:HA	1:A:46:LYS:HG2	1.99	0.44
1:C:55:ALA:HB1	1:C:120:ASP:O	2.17	0.44
1:J:147:PHE:HZ	2:J:302:1PE:H152	1.83	0.44
1:J:156:ARG:HG2	1:J:156:ARG:NH2	2.31	0.44
1:A:163:ILE:O	1:B:150:THR:HG23	2.16	0.44
1:C:44:SER:HG	1:C:145:LYS:HZ1	1.56	0.44
1:J:112:LYS:HD3	1:J:112:LYS:HA	1.63	0.44
1:B:160:ASP:OD1	1:B:160:ASP:N	2.40	0.44
3:E:302:NAP:H6N	3:E:302:NAP:H2D	1.73	0.44
1:A:78:TRP:O	1:A:81:ILE:HG22	2.18	0.44
1:G:150:THR:O	1:H:164:PRO:HA	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:J:304:NAP:H6N	3:J:304:NAP:H2D	1.76	0.44
1:B:3:LYS:HB3	1:B:120:ASP:CG	2.38	0.44
1:E:76:ASP:OD2	1:E:76:ASP:N	2.50	0.44
1:I:171:GLU:HG2	1:I:183[A]:ASN:HB2	2.00	0.44
1:D:97:ASP:OD1	6:D:402:HOH:O	2.21	0.44
1:A:180:ILE:HD11	1:B:169:LEU:HD13	2.00	0.43
1:J:145:LYS:HG2	1:J:181:ILE:HD13	1.99	0.43
1:G:52:MET:HE2	1:G:52:MET:HB2	1.88	0.43
2:J:301:1PE:H242	2:J:301:1PE:H231	1.54	0.43
1:A:67:PHE:HE1	2:A:301:1PE:H142	1.82	0.43
1:J:44:SER:CB	2:J:302:1PE:H262	2.46	0.43
1:J:142:LEU:HD22	1:J:144:LEU:HD21	1.99	0.43
1:A:89:MET:HE3	1:A:110:ILE:HD11	2.00	0.43
1:G:51:GLN:HG2	1:G:143:TRP:HZ3	1.84	0.43
5:D:302:ACT:H3	5:G:302:ACT:OXT	2.18	0.43
3:D:303:NAP:H6N	3:D:303:NAP:H2D	1.82	0.43
1:H:53:LYS:HG3	1:H:54:PRO:HD2	2.01	0.43
1:I:53:LYS:HA	1:I:53:LYS:HD2	1.66	0.43
1:A:150:THR:O	1:B:164:PRO:HA	2.18	0.43
1:D:91:LYS:NZ	4:D:307:SO4:O3	2.52	0.43
1:D:97:ASP:OD2	1:D:97:ASP:N	2.46	0.42
1:I:151:LEU:O	1:I:152:ASN:C	2.57	0.42
1:C:46:LYS:HD2	1:C:46:LYS:HA	1.81	0.42
3:F:303:NAP:H6N	3:F:303:NAP:H2D	1.80	0.42
1:I:12:LEU:HD23	1:I:12:LEU:HA	1.78	0.42
1:B:19:PRO:HD2	1:B:24:GLU:OE2	2.19	0.42
4:D:304:SO4:O2	6:D:401:HOH:O	2.21	0.41
1:I:48:MET:HE1	1:I:145:LYS:HD2	2.01	0.41
1:A:52:MET:HB2	1:A:52:MET:HE2	1.63	0.41
2:A:301:1PE:H232	2:A:301:1PE:H241	1.72	0.41
2:H:301:1PE:H232	3:H:303:NAP:H4N	2.02	0.41
1:A:51:GLN:HG2	1:A:143:TRP:CE3	2.55	0.41
1:B:72:PRO:HG3	1:B:98:TRP:CE2	2.55	0.41
1:D:171:GLU:HG2	1:D:183:ASN:HB2	2.03	0.41
3:C:302:NAP:H2D	3:C:302:NAP:H6N	1.76	0.41
1:B:37:ALA:HB3	1:B:38:PRO:HD3	2.03	0.41
2:G:301:1PE:H151	3:G:303:NAP:C5N	2.51	0.41
1:I:50:LYS:HE3	1:I:50:LYS:HB2	1.74	0.41
1:I:51:GLN:HE21	1:I:51:GLN:HB3	1.68	0.41
3:G:303:NAP:H6N	3:G:303:NAP:H2D	1.69	0.41
1:A:167:PHE:O	1:B:148:PRO:HB2	2.21	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:170:ILE:N	1:G:183:ASN:O	2.53	0.40
1:C:104:LEU:HB3	1:C:109:ASP:CB	2.51	0.40
1:H:53:LYS:HD2	1:H:53:LYS:HA	1.74	0.40
1:C:53:LYS:HD3	1:C:53:LYS:HA	1.97	0.40
1:E:170:ILE:HD11	1:E:185:LYS:HE3	2.04	0.40
1:I:112:LYS:HE3	6:I:456:HOH:O	2.21	0.40
1:J:67:PHE:HE1	2:J:301:1PE:H232	1.85	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	193/203 (95%)	185 (96%)	8 (4%)	0	100	100
1	B	193/203 (95%)	185 (96%)	8 (4%)	0	100	100
1	C	201/203 (99%)	194 (96%)	7 (4%)	0	100	100
1	D	193/203 (95%)	187 (97%)	6 (3%)	0	100	100
1	E	193/203 (95%)	185 (96%)	8 (4%)	0	100	100
1	F	194/203 (96%)	189 (97%)	5 (3%)	0	100	100
1	G	193/203 (95%)	186 (96%)	7 (4%)	0	100	100
1	H	193/203 (95%)	186 (96%)	7 (4%)	0	100	100
1	I	202/203 (100%)	197 (98%)	5 (2%)	0	100	100
1	J	200/203 (98%)	190 (95%)	10 (5%)	0	100	100
All	All	1955/2030 (96%)	1884 (96%)	71 (4%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	165/171 (96%)	153 (93%)	12 (7%)	14	15
1	B	165/171 (96%)	157 (95%)	8 (5%)	25	32
1	C	171/171 (100%)	165 (96%)	6 (4%)	36	46
1	D	165/171 (96%)	161 (98%)	4 (2%)	49	62
1	E	165/171 (96%)	154 (93%)	11 (7%)	16	18
1	F	166/171 (97%)	160 (96%)	6 (4%)	35	45
1	G	165/171 (96%)	161 (98%)	4 (2%)	49	62
1	H	165/171 (96%)	160 (97%)	5 (3%)	41	53
1	I	172/171 (101%)	168 (98%)	4 (2%)	50	63
1	J	170/171 (99%)	167 (98%)	3 (2%)	59	72
All	All	1669/1710 (98%)	1606 (96%)	63 (4%)	33	42

All (63) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	2	ARG
1	A	8	SER
1	A	16	MET
1	A	36	THR
1	A	91	LYS
1	A	117	GLU
1	A	119	SER
1	A	142	LEU
1	A	162	THR
1	A	163	ILE
1	A	175	THR
1	A	186	ARG
1	B	16	MET
1	B	27	SER
1	B	42	GLU
1	B	77	PHE

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Mol	Chain	Res	Type
1	B	83	ASP
1	B	94	LYS
1	B	116	SER
1	B	156	ARG
1	C	48	MET
1	C	69	SER
1	C	149	VAL
1	C	172	SER
1	C	189	GLU
1	C	191	LYS
1	D	40	GLU
1	D	94	LYS
1	D	149	VAL
1	D	153	THR
1	E	1	MET
1	E	16	MET
1	E	22	PRO
1	E	27	SER
1	E	40	GLU
1	E	99	LYS
1	E	112	LYS
1	E	143	TRP
1	E	172	SER
1	E	175	THR
1	E	185	LYS
1	F	41	ASP
1	F	61	ARG
1	F	95	LYS
1	F	115	ASN
1	F	175	THR
1	F	194	THR
1	G	44	SER
1	G	66	ILE
1	G	175	THR
1	G	189	GLU
1	H	2	ARG
1	H	46	LYS
1	H	49	GLU
1	H	50	LYS
1	H	53	LYS
1	I	1	MET
1	I	115	ASN

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Mol	Chain	Res	Type
1	I	143	TRP
1	I	185	LYS
1	J	49	GLU
1	J	112	LYS
1	J	152	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	183	ASN
1	D	115	ASN
1	F	136	ASN
1	G	51	GLN
1	I	51	GLN
1	J	152	ASN
1	J	201	HIS

5.3.3 RNA

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates

There are no monosaccharides in this entry.

5.6 Ligand geometry

62 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	$\#\|Z\|>2$
2	1PE	E	301	-	7,7,15	0.58	0	6,6,14	0.77	0
4	SO4	D	306	-	4,4,4	0.17	0	6,6,6	0.23	0
2	1PE	B	301	-	12,12,15	0.93	0	11,11,14	0.74	0
4	SO4	D	304	-	4,4,4	0.14	0	6,6,6	0.29	0
4	SO4	F	305	-	4,4,4	0.43	0	6,6,6	0.05	0
2	1PE	J	303	-	10,10,15	0.69	0	9,9,14	0.78	0
4	SO4	G	308	-	4,4,4	0.43	0	6,6,6	0.06	0
4	SO4	I	306	-	4,4,4	0.42	0	6,6,6	0.05	0
4	SO4	D	308	-	4,4,4	0.21	0	6,6,6	0.53	0
4	SO4	J	309	-	4,4,4	0.44	0	6,6,6	0.05	0
3	NAP	I	303	-	45,52,52	4.44	14 (31%)	56,80,80	1.23	3 (5%)
2	1PE	A	302	-	6,6,15	0.60	0	5,5,14	0.96	0
2	1PE	I	301	-	15,15,15	0.97	0	14,14,14	0.68	0
4	SO4	B	304	-	4,4,4	0.43	0	6,6,6	0.05	0
4	SO4	H	304	-	4,4,4	0.44	0	6,6,6	0.07	0
4	SO4	I	307	-	4,4,4	0.41	0	6,6,6	0.05	0
4	SO4	D	305	-	4,4,4	0.16	0	6,6,6	0.30	0
5	ACT	I	302	-	3,3,3	1.03	0	3,3,3	0.81	0
4	SO4	C	303	-	4,4,4	0.16	0	6,6,6	0.18	0
5	ACT	D	302	-	3,3,3	1.04	0	3,3,3	0.82	0
4	SO4	E	304	-	4,4,4	0.41	0	6,6,6	0.06	0
2	1PE	J	301	-	15,15,15	0.74	0	14,14,14	0.81	0
2	1PE	D	301	-	12,12,15	0.98	0	11,11,14	0.82	0
4	SO4	B	303	-	4,4,4	0.15	0	6,6,6	0.22	0
4	SO4	E	303	-	4,4,4	0.14	0	6,6,6	0.30	0
3	NAP	E	302	-	45,52,52	4.45	14 (31%)	56,80,80	1.21	4 (7%)
4	SO4	F	304	-	4,4,4	0.13	0	6,6,6	0.23	0
3	NAP	F	303	-	45,52,52	4.44	14 (31%)	56,80,80	1.21	3 (5%)
2	1PE	F	301	-	9,9,15	0.94	0	8,8,14	0.89	0
3	NAP	A	303	-	45,52,52	4.43	14 (31%)	56,80,80	1.21	3 (5%)
2	1PE	C	301	-	14,14,15	0.73	0	13,13,14	0.87	0
4	SO4	F	308	-	4,4,4	0.41	0	6,6,6	0.05	0
4	SO4	G	307	-	4,4,4	0.10	0	6,6,6	0.16	0
2	1PE	H	302	-	4,4,15	0.55	0	3,3,14	0.61	0
4	SO4	I	304	-	4,4,4	0.18	0	6,6,6	0.24	0
4	SO4	A	304	-	4,4,4	0.18	0	6,6,6	0.23	0
3	NAP	J	304	-	45,52,52	4.44	14 (31%)	56,80,80	1.21	4 (7%)
3	NAP	B	302	-	45,52,52	4.43	15 (33%)	56,80,80	1.23	3 (5%)
4	SO4	C	304	-	4,4,4	0.15	0	6,6,6	0.21	0
3	NAP	H	303	-	45,52,52	4.42	14 (31%)	56,80,80	1.35	5 (8%)
4	SO4	F	307	-	4,4,4	0.17	0	6,6,6	0.16	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
4	SO4	I	305	-	4,4,4	0.16	0	6,6,6	0.42	0
4	SO4	J	306	-	4,4,4	0.20	0	6,6,6	0.14	0
4	SO4	D	309	-	4,4,4	0.44	0	6,6,6	0.05	0
4	SO4	J	308	-	4,4,4	0.41	0	6,6,6	0.05	0
4	SO4	G	306	-	4,4,4	0.12	0	6,6,6	0.16	0
2	1PE	H	301	-	12,12,15	0.82	0	11,11,14	0.83	0
2	1PE	G	301	-	11,11,15	0.84	0	10,10,14	0.67	0
5	ACT	G	302	-	3,3,3	0.93	0	3,3,3	0.84	0
3	NAP	C	302	-	45,52,52	4.42	14 (31%)	56,80,80	1.24	5 (8%)
3	NAP	G	303	-	45,52,52	4.43	14 (31%)	56,80,80	1.18	5 (8%)
4	SO4	D	307	-	4,4,4	0.19	0	6,6,6	0.41	0
4	SO4	J	307	-	4,4,4	0.13	0	6,6,6	0.29	0
2	1PE	F	302	-	15,15,15	0.66	0	14,14,14	0.90	0
4	SO4	C	305	-	4,4,4	0.15	0	6,6,6	0.21	0
3	NAP	D	303	-	45,52,52	4.43	14 (31%)	56,80,80	1.25	5 (8%)
4	SO4	F	306	-	4,4,4	0.20	0	6,6,6	0.34	0
4	SO4	G	305	-	4,4,4	0.16	0	6,6,6	0.18	0
4	SO4	J	305	-	4,4,4	0.13	0	6,6,6	0.28	0
2	1PE	A	301	-	14,14,15	0.72	0	13,13,14	0.75	0
4	SO4	G	304	-	4,4,4	0.13	0	6,6,6	0.21	0
2	1PE	J	302	-	15,15,15	1.14	1 (6%)	14,14,14	0.85	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	1PE	E	301	-	-	3/5/5/13	-
2	1PE	B	301	-	-	7/10/10/13	-
2	1PE	J	303	-	-	5/8/8/13	-
3	NAP	I	303	-	-	11/31/67/67	0/5/5/5
2	1PE	A	302	-	-	0/4/4/13	-
2	1PE	I	301	-	-	6/13/13/13	-
2	1PE	J	301	-	-	7/13/13/13	-
2	1PE	D	301	-	-	4/10/10/13	-
3	NAP	E	302	-	-	11/31/67/67	0/5/5/5
3	NAP	F	303	-	-	8/31/67/67	0/5/5/5
2	1PE	F	301	-	-	5/7/7/13	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAP	A	303	-	-	11/31/67/67	0/5/5/5
2	1PE	C	301	-	-	8/12/12/13	-
2	1PE	H	302	-	-	2/2/2/13	-
3	NAP	J	304	-	-	12/31/67/67	0/5/5/5
3	NAP	B	302	-	-	12/31/67/67	0/5/5/5
3	NAP	H	303	-	-	11/31/67/67	0/5/5/5
2	1PE	H	301	-	-	2/10/10/13	-
2	1PE	G	301	-	-	5/9/9/13	-
3	NAP	C	302	-	-	12/31/67/67	0/5/5/5
3	NAP	G	303	-	-	13/31/67/67	0/5/5/5
2	1PE	F	302	-	-	6/13/13/13	-
3	NAP	D	303	-	-	8/31/67/67	0/5/5/5
2	1PE	A	301	-	-	11/12/12/13	-
2	1PE	J	302	-	-	11/13/13/13	-

All (142) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	H	303	NAP	C2D-C1D	-15.80	1.29	1.53
3	E	302	NAP	C2D-C1D	-15.78	1.29	1.53
3	J	304	NAP	C2D-C1D	-15.72	1.29	1.53
3	I	303	NAP	C2D-C1D	-15.69	1.30	1.53
3	F	303	NAP	C2D-C1D	-15.68	1.30	1.53
3	G	303	NAP	C2D-C1D	-15.67	1.30	1.53
3	A	303	NAP	C2D-C1D	-15.66	1.30	1.53
3	B	302	NAP	C2D-C1D	-15.57	1.30	1.53
3	D	303	NAP	C2D-C1D	-15.54	1.30	1.53
3	C	302	NAP	C2D-C1D	-15.50	1.30	1.53
3	E	302	NAP	O4B-C1B	14.72	1.61	1.41
3	J	304	NAP	O4B-C1B	14.67	1.61	1.41
3	B	302	NAP	O4B-C1B	14.67	1.61	1.41
3	F	303	NAP	O4B-C1B	14.65	1.61	1.41
3	D	303	NAP	O4B-C1B	14.63	1.61	1.41
3	A	303	NAP	O4B-C1B	14.61	1.61	1.41
3	C	302	NAP	O4B-C1B	14.58	1.61	1.41
3	H	303	NAP	O4D-C1D	14.53	1.61	1.41
3	B	302	NAP	O4D-C1D	14.53	1.61	1.41
3	G	303	NAP	O4B-C1B	14.48	1.61	1.41
3	I	303	NAP	O4B-C1B	14.47	1.61	1.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	I	303	NAP	O4D-C1D	14.47	1.61	1.41
3	D	303	NAP	O4D-C1D	14.42	1.61	1.41
3	G	303	NAP	O4D-C1D	14.41	1.61	1.41
3	C	302	NAP	O4D-C1D	14.37	1.61	1.41
3	J	304	NAP	O4D-C1D	14.36	1.61	1.41
3	H	303	NAP	O4B-C1B	14.34	1.61	1.41
3	F	303	NAP	O4D-C1D	14.31	1.61	1.41
3	E	302	NAP	O4D-C1D	14.21	1.60	1.41
3	A	303	NAP	O4D-C1D	14.20	1.60	1.41
3	E	302	NAP	O4D-C4D	-6.68	1.30	1.45
3	F	303	NAP	O4D-C4D	-6.65	1.30	1.45
3	I	303	NAP	O4D-C4D	-6.57	1.30	1.45
3	A	303	NAP	O4D-C4D	-6.57	1.30	1.45
3	D	303	NAP	O4D-C4D	-6.57	1.30	1.45
3	J	304	NAP	O4D-C4D	-6.53	1.30	1.45
3	I	303	NAP	O4B-C4B	-6.47	1.30	1.45
3	C	302	NAP	O4D-C4D	-6.46	1.30	1.45
3	B	302	NAP	C7N-N7N	6.45	1.45	1.33
3	D	303	NAP	O4B-C4B	-6.44	1.30	1.45
3	F	303	NAP	O4B-C4B	-6.44	1.30	1.45
3	J	304	NAP	O4B-C4B	-6.42	1.30	1.45
3	H	303	NAP	O4B-C4B	-6.41	1.30	1.45
3	G	303	NAP	O4B-C4B	-6.40	1.30	1.45
3	C	302	NAP	O4B-C4B	-6.39	1.30	1.45
3	E	302	NAP	O4B-C4B	-6.38	1.30	1.45
3	G	303	NAP	O4D-C4D	-6.38	1.30	1.45
3	B	302	NAP	O4B-C4B	-6.37	1.30	1.45
3	A	303	NAP	O4B-C4B	-6.37	1.30	1.45
3	A	303	NAP	C7N-N7N	6.36	1.45	1.33
3	B	302	NAP	O4D-C4D	-6.32	1.30	1.45
3	G	303	NAP	C7N-N7N	6.30	1.45	1.33
3	H	303	NAP	O4D-C4D	-6.27	1.31	1.45
3	E	302	NAP	C7N-N7N	6.27	1.44	1.33
3	J	304	NAP	C7N-N7N	6.26	1.44	1.33
3	H	303	NAP	C7N-N7N	6.22	1.44	1.33
3	I	303	NAP	C7N-N7N	6.18	1.44	1.33
3	F	303	NAP	C7N-N7N	6.18	1.44	1.33
3	D	303	NAP	C7N-N7N	6.16	1.44	1.33
3	C	302	NAP	C7N-N7N	6.14	1.44	1.33
3	H	303	NAP	O3B-C3B	-3.33	1.35	1.43
3	J	304	NAP	O3B-C3B	-3.29	1.35	1.43
3	A	303	NAP	O3B-C3B	-3.28	1.35	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	G	303	NAP	O3B-C3B	-3.27	1.35	1.43
3	E	302	NAP	O7N-C7N	-3.26	1.17	1.24
3	B	302	NAP	O3B-C3B	-3.26	1.35	1.43
3	F	303	NAP	O7N-C7N	-3.24	1.17	1.24
3	I	303	NAP	O3B-C3B	-3.24	1.35	1.43
3	E	302	NAP	O3B-C3B	-3.23	1.35	1.43
3	G	303	NAP	O7N-C7N	-3.23	1.18	1.24
3	I	303	NAP	O7N-C7N	-3.22	1.18	1.24
3	C	302	NAP	O3B-C3B	-3.21	1.35	1.43
3	D	303	NAP	O3B-C3B	-3.21	1.35	1.43
3	C	302	NAP	O3D-C3D	-3.20	1.35	1.43
3	C	302	NAP	O7N-C7N	-3.20	1.18	1.24
3	D	303	NAP	O7N-C7N	-3.18	1.18	1.24
3	A	303	NAP	O3D-C3D	-3.18	1.35	1.43
3	F	303	NAP	O3B-C3B	-3.18	1.35	1.43
3	E	302	NAP	O3D-C3D	-3.16	1.35	1.43
3	J	304	NAP	O7N-C7N	-3.15	1.18	1.24
3	J	304	NAP	O3D-C3D	-3.14	1.35	1.43
3	B	302	NAP	O3D-C3D	-3.10	1.35	1.43
3	H	303	NAP	O3D-C3D	-3.09	1.35	1.43
3	I	303	NAP	O3D-C3D	-3.09	1.35	1.43
3	G	303	NAP	O3D-C3D	-3.04	1.35	1.43
3	A	303	NAP	O7N-C7N	-3.03	1.18	1.24
3	F	303	NAP	O3D-C3D	-3.00	1.35	1.43
3	B	302	NAP	O7N-C7N	-2.98	1.18	1.24
3	H	303	NAP	O7N-C7N	-2.98	1.18	1.24
3	B	302	NAP	C6A-N6A	2.97	1.44	1.34
3	D	303	NAP	C5A-C4A	-2.97	1.33	1.40
3	C	302	NAP	C6A-N6A	2.93	1.44	1.34
3	F	303	NAP	C5A-C4A	-2.93	1.33	1.40
3	J	304	NAP	C6A-N6A	2.93	1.44	1.34
3	D	303	NAP	C6A-N6A	2.92	1.44	1.34
3	G	303	NAP	C6A-N6A	2.91	1.44	1.34
3	A	303	NAP	C6A-N6A	2.90	1.44	1.34
3	C	302	NAP	C5A-C4A	-2.90	1.33	1.40
3	I	303	NAP	C5A-C4A	-2.89	1.33	1.40
3	D	303	NAP	O3D-C3D	-2.89	1.36	1.43
3	E	302	NAP	C6A-N6A	2.88	1.44	1.34
3	H	303	NAP	C5A-C4A	-2.88	1.33	1.40
3	G	303	NAP	C5A-C4A	-2.86	1.33	1.40
3	J	304	NAP	C5A-C4A	-2.85	1.33	1.40
3	H	303	NAP	C6A-N6A	2.85	1.44	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	I	303	NAP	C6A-N6A	2.84	1.44	1.34
3	F	303	NAP	C6A-N6A	2.82	1.44	1.34
3	E	302	NAP	C5A-C4A	-2.82	1.33	1.40
3	B	302	NAP	C5A-C4A	-2.81	1.33	1.40
3	C	302	NAP	P2B-O2B	2.80	1.64	1.59
3	A	303	NAP	C5A-C4A	-2.80	1.33	1.40
3	I	303	NAP	P2B-O2B	2.76	1.64	1.59
3	E	302	NAP	P2B-O2B	2.65	1.64	1.59
3	F	303	NAP	P2B-O2B	2.64	1.64	1.59
3	A	303	NAP	P2B-O2B	2.61	1.64	1.59
3	H	303	NAP	P2B-O2B	2.60	1.64	1.59
3	J	304	NAP	P2B-O2B	2.51	1.64	1.59
2	J	302	1PE	C24-C14	2.46	1.61	1.49
3	A	303	NAP	O2D-C2D	2.45	1.48	1.43
3	D	303	NAP	P2B-O2B	2.44	1.63	1.59
3	I	303	NAP	C4N-C3N	-2.42	1.35	1.39
3	G	303	NAP	C4N-C3N	-2.41	1.35	1.39
3	G	303	NAP	P2B-O2B	2.41	1.63	1.59
3	B	302	NAP	O2D-C2D	2.40	1.48	1.43
3	G	303	NAP	O2D-C2D	2.37	1.48	1.43
3	E	302	NAP	O2D-C2D	2.37	1.48	1.43
3	D	303	NAP	C4N-C3N	-2.36	1.35	1.39
3	I	303	NAP	O2D-C2D	2.34	1.48	1.43
3	C	302	NAP	O2D-C2D	2.33	1.48	1.43
3	J	304	NAP	O2D-C2D	2.29	1.48	1.43
3	A	303	NAP	C4N-C3N	-2.27	1.35	1.39
3	F	303	NAP	O2D-C2D	2.27	1.48	1.43
3	D	303	NAP	O2D-C2D	2.26	1.48	1.43
3	B	302	NAP	P2B-O2B	2.25	1.63	1.59
3	J	304	NAP	C4N-C3N	-2.24	1.35	1.39
3	F	303	NAP	C4N-C3N	-2.24	1.35	1.39
3	C	302	NAP	C4N-C3N	-2.19	1.35	1.39
3	E	302	NAP	C4N-C3N	-2.13	1.35	1.39
3	H	303	NAP	C4N-C3N	-2.12	1.35	1.39
3	B	302	NAP	C4N-C3N	-2.06	1.35	1.39
3	B	302	NAP	C2A-N3A	2.03	1.35	1.32
3	H	303	NAP	O2D-C2D	2.02	1.47	1.43

All (40) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	E	302	NAP	N3A-C2A-N1A	-5.66	119.82	128.68

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	H	303	NAP	N3A-C2A-N1A	-5.62	119.90	128.68
3	J	304	NAP	N3A-C2A-N1A	-5.60	119.93	128.68
3	C	302	NAP	N3A-C2A-N1A	-5.59	119.94	128.68
3	A	303	NAP	N3A-C2A-N1A	-5.55	120.00	128.68
3	F	303	NAP	N3A-C2A-N1A	-5.54	120.02	128.68
3	I	303	NAP	N3A-C2A-N1A	-5.54	120.03	128.68
3	G	303	NAP	N3A-C2A-N1A	-5.51	120.06	128.68
3	B	302	NAP	N3A-C2A-N1A	-5.51	120.06	128.68
3	D	303	NAP	N3A-C2A-N1A	-5.46	120.15	128.68
3	H	303	NAP	O4D-C1D-C2D	-3.64	101.61	106.93
3	F	303	NAP	O4D-C1D-C2D	-3.19	102.26	106.93
3	E	302	NAP	O4D-C1D-C2D	-3.08	102.42	106.93
3	C	302	NAP	O4D-C1D-C2D	-3.00	102.54	106.93
3	H	303	NAP	PN-O3-PA	-2.95	122.71	132.83
3	D	303	NAP	O4D-C1D-C2D	-2.93	102.65	106.93
3	J	304	NAP	O4D-C1D-C2D	-2.71	102.96	106.93
3	A	303	NAP	O4D-C1D-C2D	-2.69	103.00	106.93
3	D	303	NAP	C1B-N9A-C4A	-2.59	122.09	126.64
3	H	303	NAP	C5D-C4D-C3D	-2.56	105.57	115.18
3	I	303	NAP	O4D-C1D-C2D	-2.47	103.31	106.93
3	B	302	NAP	O4D-C1D-C2D	-2.46	103.34	106.93
3	C	302	NAP	C1B-N9A-C4A	-2.35	122.51	126.64
3	I	303	NAP	C1B-N9A-C4A	-2.34	122.53	126.64
3	F	303	NAP	C6N-N1N-C2N	-2.34	119.84	121.97
3	B	302	NAP	PN-O3-PA	-2.33	124.83	132.83
3	G	303	NAP	C1B-N9A-C4A	-2.27	122.65	126.64
3	A	303	NAP	PN-O3-PA	-2.19	125.33	132.83
3	C	302	NAP	C5D-C4D-C3D	-2.18	107.02	115.18
3	J	304	NAP	C1B-N9A-C4A	-2.16	122.84	126.64
3	C	302	NAP	C6N-N1N-C2N	-2.15	120.01	121.97
3	E	302	NAP	PN-O3-PA	-2.15	125.44	132.83
3	H	303	NAP	C1B-N9A-C4A	-2.10	122.96	126.64
3	D	303	NAP	C5D-C4D-C3D	-2.09	107.36	115.18
3	G	303	NAP	C2N-C3N-C4N	2.08	120.62	118.26
3	G	303	NAP	PN-O3-PA	-2.06	125.76	132.83
3	G	303	NAP	C5D-C4D-C3D	-2.03	107.58	115.18
3	J	304	NAP	PN-O3-PA	-2.02	125.91	132.83
3	D	303	NAP	C6N-N1N-C2N	-2.01	120.14	121.97
3	E	302	NAP	C5D-C4D-C3D	-2.00	107.68	115.18

There are no chirality outliers.

All (191) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	303	NAP	C5B-O5B-PA-O1A
3	A	303	NAP	O4D-C1D-N1N-C2N
3	A	303	NAP	O4D-C1D-N1N-C6N
3	A	303	NAP	C2D-C1D-N1N-C2N
3	A	303	NAP	C2D-C1D-N1N-C6N
3	B	302	NAP	C5B-O5B-PA-O1A
3	B	302	NAP	C5B-O5B-PA-O3
3	B	302	NAP	C5D-O5D-PN-O1N
3	B	302	NAP	O4D-C1D-N1N-C2N
3	B	302	NAP	O4D-C1D-N1N-C6N
3	B	302	NAP	C2D-C1D-N1N-C2N
3	B	302	NAP	C2D-C1D-N1N-C6N
3	C	302	NAP	C5B-O5B-PA-O1A
3	C	302	NAP	C5B-O5B-PA-O3
3	C	302	NAP	O4D-C1D-N1N-C2N
3	C	302	NAP	O4D-C1D-N1N-C6N
3	C	302	NAP	C2D-C1D-N1N-C2N
3	C	302	NAP	C2D-C1D-N1N-C6N
3	D	303	NAP	O4D-C1D-N1N-C2N
3	D	303	NAP	O4D-C1D-N1N-C6N
3	D	303	NAP	C2D-C1D-N1N-C2N
3	D	303	NAP	C2D-C1D-N1N-C6N
3	E	302	NAP	C5B-O5B-PA-O1A
3	E	302	NAP	O4D-C1D-N1N-C2N
3	E	302	NAP	O4D-C1D-N1N-C6N
3	E	302	NAP	C2D-C1D-N1N-C2N
3	E	302	NAP	C2D-C1D-N1N-C6N
3	F	303	NAP	C5B-O5B-PA-O1A
3	F	303	NAP	O4D-C1D-N1N-C2N
3	F	303	NAP	O4D-C1D-N1N-C6N
3	F	303	NAP	C2D-C1D-N1N-C2N
3	F	303	NAP	C2D-C1D-N1N-C6N
3	G	303	NAP	C5B-O5B-PA-O1A
3	G	303	NAP	C5B-O5B-PA-O3
3	G	303	NAP	C5D-O5D-PN-O1N
3	G	303	NAP	O4D-C1D-N1N-C2N
3	G	303	NAP	O4D-C1D-N1N-C6N
3	G	303	NAP	C2D-C1D-N1N-C2N
3	G	303	NAP	C2D-C1D-N1N-C6N
3	H	303	NAP	C5B-O5B-PA-O1A
3	H	303	NAP	C5B-O5B-PA-O3
3	H	303	NAP	C5D-O5D-PN-O1N
3	H	303	NAP	C5D-O5D-PN-O2N

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Mol	Chain	Res	Type	Atoms
3	H	303	NAP	O4D-C1D-N1N-C2N
3	H	303	NAP	O4D-C1D-N1N-C6N
3	H	303	NAP	C2D-C1D-N1N-C2N
3	H	303	NAP	C2D-C1D-N1N-C6N
3	I	303	NAP	C5B-O5B-PA-O1A
3	I	303	NAP	O4D-C1D-N1N-C2N
3	I	303	NAP	O4D-C1D-N1N-C6N
3	I	303	NAP	C2D-C1D-N1N-C2N
3	I	303	NAP	C2D-C1D-N1N-C6N
3	J	304	NAP	C5B-O5B-PA-O1A
3	J	304	NAP	C5B-O5B-PA-O3
3	J	304	NAP	C5D-O5D-PN-O1N
3	J	304	NAP	O4D-C1D-N1N-C2N
3	J	304	NAP	O4D-C1D-N1N-C6N
3	J	304	NAP	C2D-C1D-N1N-C2N
3	J	304	NAP	C2D-C1D-N1N-C6N
2	J	302	1PE	C16-C26-OH6-C15
2	A	301	1PE	C23-C13-OH4-C24
2	J	301	1PE	C23-C13-OH4-C24
2	J	302	1PE	C14-C24-OH4-C13
2	D	301	1PE	C15-C25-OH5-C14
2	C	301	1PE	OH5-C14-C24-OH4
2	F	301	1PE	OH4-C13-C23-OH3
2	A	301	1PE	OH4-C13-C23-OH3
2	C	301	1PE	C14-C24-OH4-C13
2	J	302	1PE	OH6-C15-C25-OH5
2	I	301	1PE	OH6-C15-C25-OH5
2	F	302	1PE	OH4-C13-C23-OH3
2	H	302	1PE	C16-C26-OH6-C15
2	A	301	1PE	OH6-C15-C25-OH5
2	E	301	1PE	OH6-C15-C25-OH5
2	J	301	1PE	OH6-C15-C25-OH5
2	F	301	1PE	OH5-C14-C24-OH4
2	B	301	1PE	OH5-C14-C24-OH4
2	J	302	1PE	OH4-C13-C23-OH3
2	C	301	1PE	OH6-C15-C25-OH5
2	G	301	1PE	OH5-C14-C24-OH4
2	F	301	1PE	C14-C24-OH4-C13
2	D	301	1PE	OH4-C13-C23-OH3
2	A	301	1PE	OH7-C16-C26-OH6
2	J	302	1PE	OH7-C16-C26-OH6
2	J	303	1PE	OH2-C12-C22-OH3

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Mol	Chain	Res	Type	Atoms
2	G	301	1PE	OH6-C15-C25-OH5
2	H	302	1PE	OH7-C16-C26-OH6
2	J	302	1PE	OH5-C14-C24-OH4
2	E	301	1PE	OH7-C16-C26-OH6
2	J	302	1PE	OH2-C12-C22-OH3
2	H	301	1PE	OH5-C14-C24-OH4
2	J	301	1PE	OH4-C13-C23-OH3
2	F	301	1PE	OH2-C12-C22-OH3
2	G	301	1PE	C23-C13-OH4-C24
3	G	303	NAP	C4D-C5D-O5D-PN
2	A	301	1PE	OH5-C14-C24-OH4
3	D	303	NAP	C4D-C5D-O5D-PN
3	H	303	NAP	C4D-C5D-O5D-PN
3	H	303	NAP	PA-O3-PN-O5D
2	B	301	1PE	C12-C22-OH3-C23
2	F	302	1PE	C24-C14-OH5-C25
2	H	301	1PE	C14-C24-OH4-C13
3	A	303	NAP	C4D-C5D-O5D-PN
3	E	302	NAP	C4D-C5D-O5D-PN
3	I	303	NAP	C4D-C5D-O5D-PN
3	J	304	NAP	C4D-C5D-O5D-PN
2	J	301	1PE	C14-C24-OH4-C13
2	J	302	1PE	C12-C22-OH3-C23
2	A	301	1PE	C14-C24-OH4-C13
2	B	301	1PE	C23-C13-OH4-C24
2	F	301	1PE	C23-C13-OH4-C24
2	A	301	1PE	C15-C25-OH5-C14
2	C	301	1PE	C24-C14-OH5-C25
3	A	303	NAP	C5B-O5B-PA-O3
3	A	303	NAP	C5D-O5D-PN-O3
3	B	302	NAP	C5D-O5D-PN-O3
3	C	302	NAP	C5D-O5D-PN-O3
3	D	303	NAP	C5B-O5B-PA-O3
3	E	302	NAP	C5B-O5B-PA-O3
3	E	302	NAP	C5D-O5D-PN-O3
3	F	303	NAP	C5B-O5B-PA-O3
3	G	303	NAP	C5D-O5D-PN-O3
3	I	303	NAP	C5B-O5B-PA-O3
3	I	303	NAP	C5D-O5D-PN-O3
3	J	304	NAP	C5D-O5D-PN-O3
2	B	301	1PE	C14-C24-OH4-C13
2	I	301	1PE	C23-C13-OH4-C24

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Mol	Chain	Res	Type	Atoms
3	B	302	NAP	C4D-C5D-O5D-PN
3	C	302	NAP	C4D-C5D-O5D-PN
3	F	303	NAP	C4D-C5D-O5D-PN
3	A	303	NAP	C5D-O5D-PN-O2N
3	B	302	NAP	C5D-O5D-PN-O2N
3	C	302	NAP	C5D-O5D-PN-O2N
3	E	302	NAP	C5D-O5D-PN-O2N
3	G	303	NAP	C5D-O5D-PN-O2N
3	I	303	NAP	C5D-O5D-PN-O2N
3	J	304	NAP	C5D-O5D-PN-O2N
2	I	301	1PE	C13-C23-OH3-C22
3	B	302	NAP	C3B-C4B-C5B-O5B
2	J	303	1PE	C23-C13-OH4-C24
2	A	301	1PE	C25-C15-OH6-C26
2	I	301	1PE	C14-C24-OH4-C13
3	J	304	NAP	C3B-C4B-C5B-O5B
2	G	301	1PE	C24-C14-OH5-C25
2	J	301	1PE	C16-C26-OH6-C15
2	J	302	1PE	C15-C25-OH5-C14
2	E	301	1PE	C16-C26-OH6-C15
2	A	301	1PE	C13-C23-OH3-C22
2	I	301	1PE	C24-C14-OH5-C25
2	B	301	1PE	C13-C23-OH3-C22
3	E	302	NAP	O4D-C4D-C5D-O5D
3	G	303	NAP	C4N-C3N-C7N-N7N
2	J	302	1PE	C23-C13-OH4-C24
2	J	301	1PE	C25-C15-OH6-C26
2	C	301	1PE	C16-C26-OH6-C15
3	C	302	NAP	O4D-C4D-C5D-O5D
3	I	303	NAP	O4D-C4D-C5D-O5D
2	B	301	1PE	C15-C25-OH5-C14
3	J	304	NAP	O4D-C4D-C5D-O5D
2	G	301	1PE	OH7-C16-C26-OH6
3	G	303	NAP	C4N-C3N-C7N-O7N
2	F	302	1PE	OH5-C14-C24-OH4
2	F	302	1PE	C15-C25-OH5-C14
2	J	303	1PE	OH5-C14-C24-OH4
2	I	301	1PE	C16-C26-OH6-C15
2	J	302	1PE	C24-C14-OH5-C25
2	J	303	1PE	C12-C22-OH3-C23
2	A	301	1PE	C12-C22-OH3-C23
3	C	302	NAP	C3B-C4B-C5B-O5B

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Mol	Chain	Res	Type	Atoms
3	E	302	NAP	C3D-C4D-C5D-O5D
2	C	301	1PE	C15-C25-OH5-C14
3	H	303	NAP	C5D-O5D-PN-O3
3	A	303	NAP	O4D-C4D-C5D-O5D
3	B	302	NAP	O4D-C4D-C5D-O5D
3	F	303	NAP	O4D-C4D-C5D-O5D
2	C	301	1PE	C25-C15-OH6-C26
2	B	301	1PE	OH4-C13-C23-OH3
2	F	302	1PE	C14-C24-OH4-C13
2	J	303	1PE	C24-C14-OH5-C25
3	A	303	NAP	C5D-O5D-PN-O1N
3	C	302	NAP	C3D-C4D-C5D-O5D
3	D	303	NAP	O4D-C4D-C5D-O5D
3	G	303	NAP	O4D-C4D-C5D-O5D
3	I	303	NAP	C3D-C4D-C5D-O5D
2	C	301	1PE	OH2-C12-C22-OH3
2	D	301	1PE	C12-C22-OH3-C23
2	F	302	1PE	C13-C23-OH3-C22
2	D	301	1PE	C24-C14-OH5-C25
3	D	303	NAP	C3B-C4B-C5B-O5B
2	J	301	1PE	OH5-C14-C24-OH4
2	A	301	1PE	C16-C26-OH6-C15

There are no ring outliers.

32 monomers are involved in 54 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	E	301	1PE	1	0
4	D	304	SO4	1	0
2	J	303	1PE	1	0
4	D	308	SO4	1	0
3	I	303	NAP	1	0
2	A	302	1PE	1	0
2	I	301	1PE	1	0
4	D	305	SO4	1	0
5	D	302	ACT	1	0
2	J	301	1PE	3	0
2	D	301	1PE	1	0
3	E	302	NAP	1	0
4	F	304	SO4	1	0
3	F	303	NAP	1	0
3	A	303	NAP	2	0

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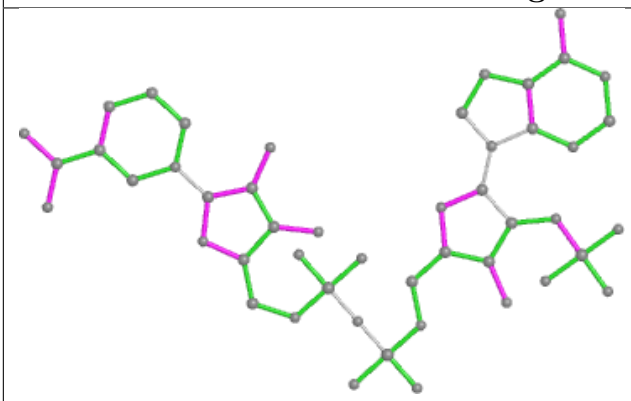
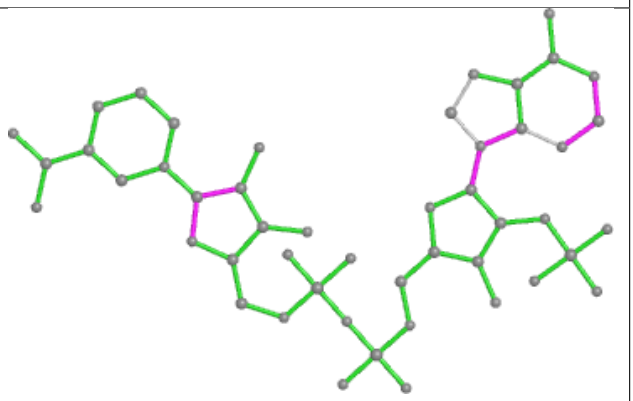
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	301	1PE	1	0
2	H	302	1PE	1	0
3	J	304	NAP	3	0
3	B	302	NAP	1	0
3	H	303	NAP	1	0
4	J	306	SO4	1	0
4	G	306	SO4	1	0
2	H	301	1PE	4	0
2	G	301	1PE	3	0
5	G	302	ACT	8	0
3	C	302	NAP	1	0
3	G	303	NAP	7	0
4	D	307	SO4	1	0
2	F	302	1PE	5	0
3	D	303	NAP	1	0
2	A	301	1PE	5	0
2	J	302	1PE	3	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.

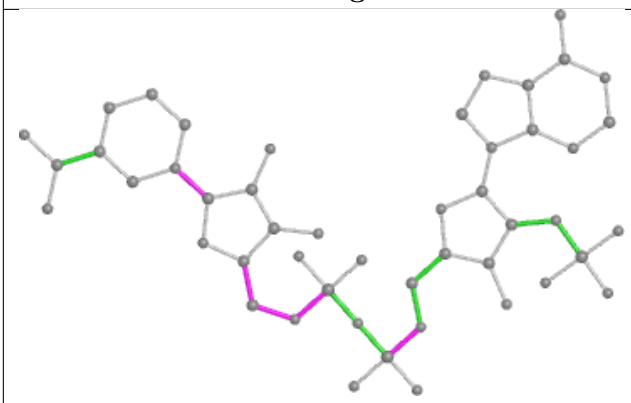
Ligand NAP I 303



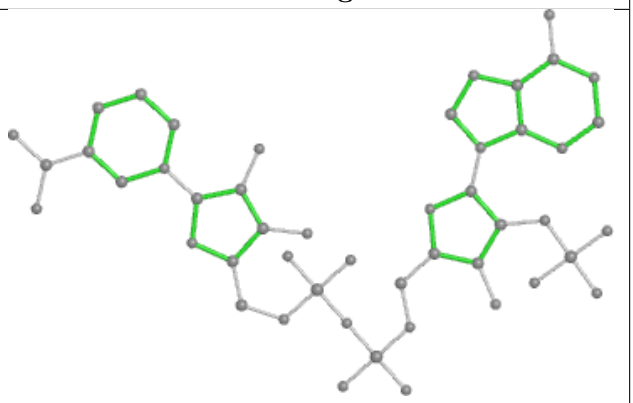
Bond lengths



Bond angles

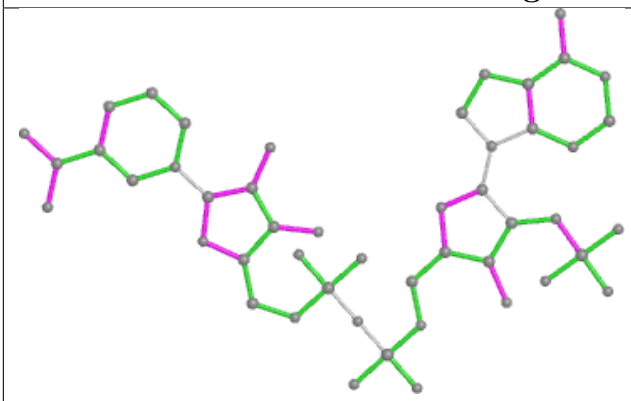


Torsions

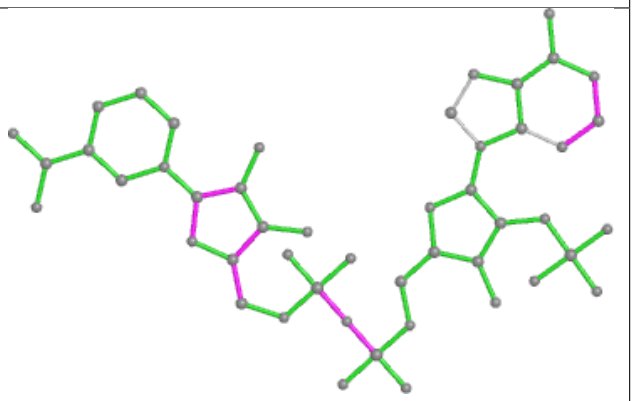


Rings

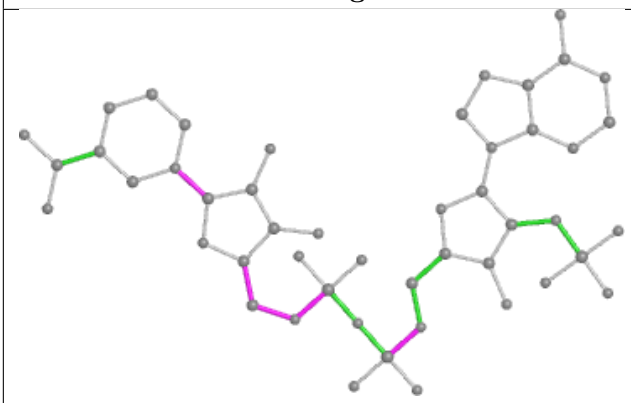
Ligand NAP E 302



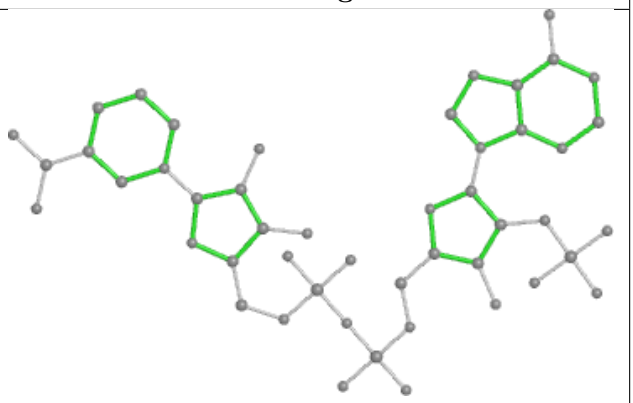
Bond lengths



Bond angles

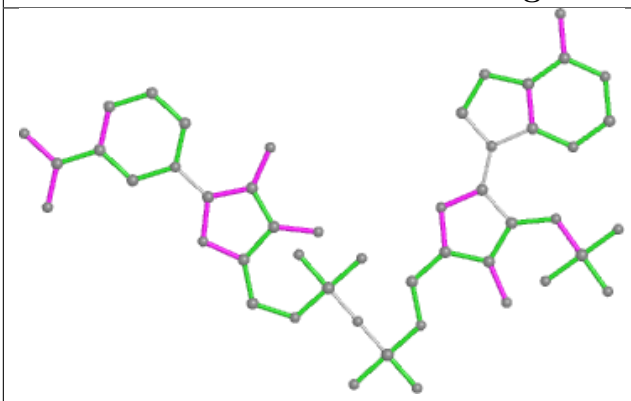


Torsions

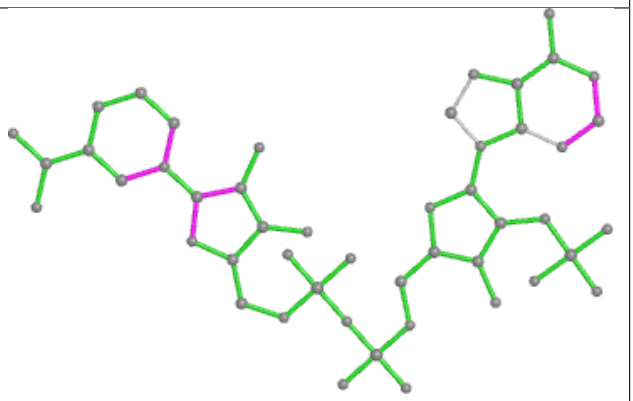


Rings

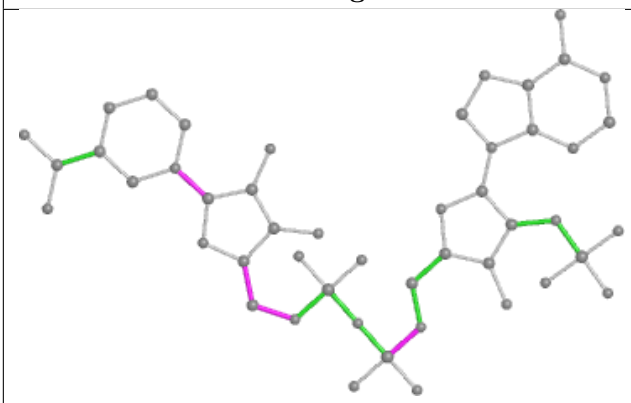
Ligand NAP F 303



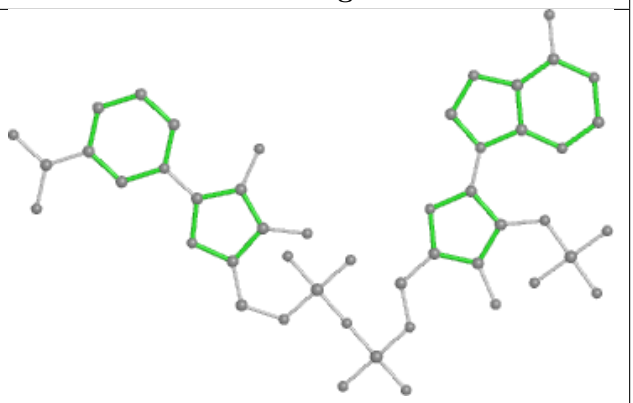
Bond lengths



Bond angles

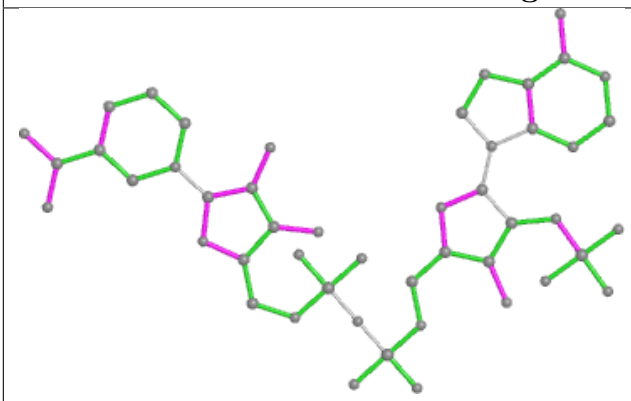


Torsions

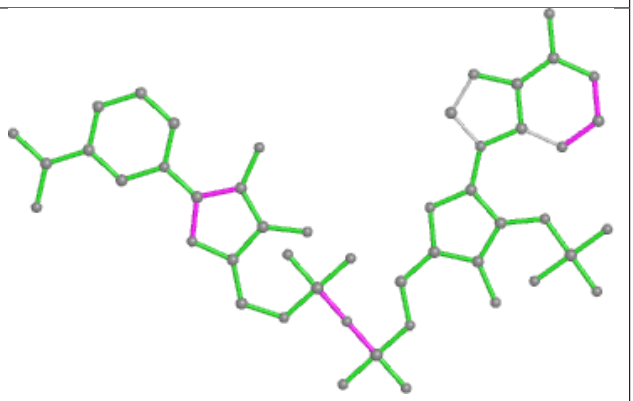


Rings

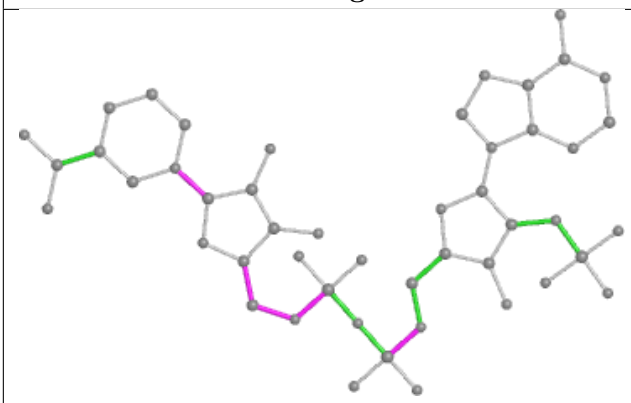
Ligand NAP A 303



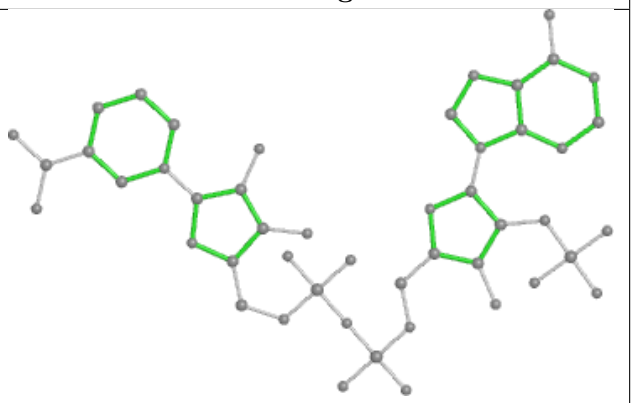
Bond lengths



Bond angles

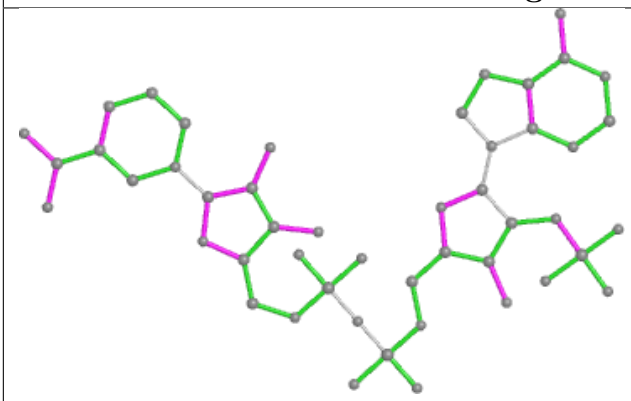


Torsions

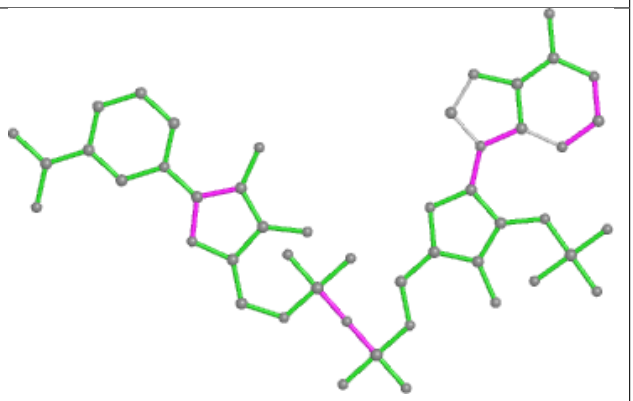


Rings

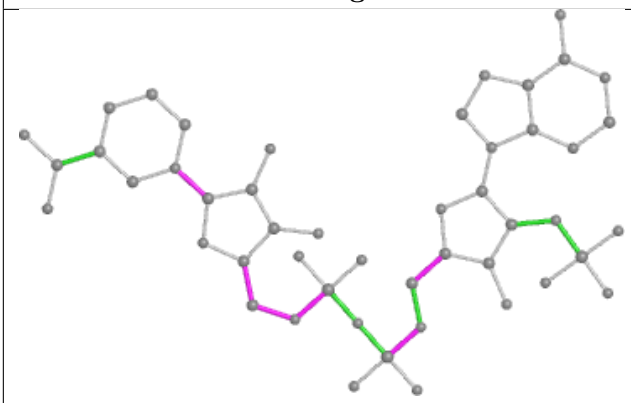
Ligand NAP J 304



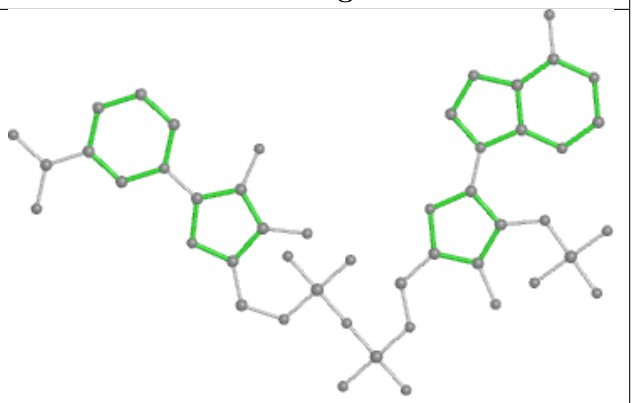
Bond lengths



Bond angles

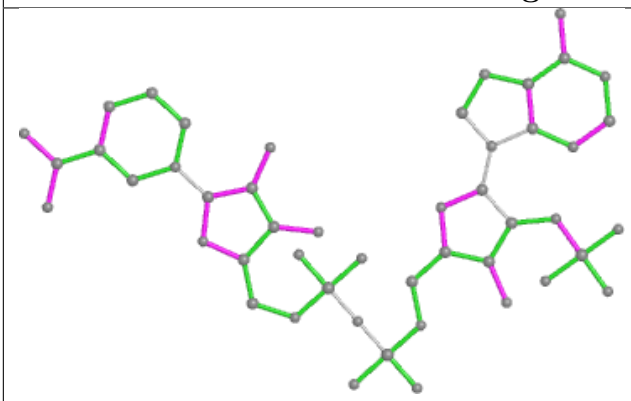


Torsions



Rings

Ligand NAP B 302



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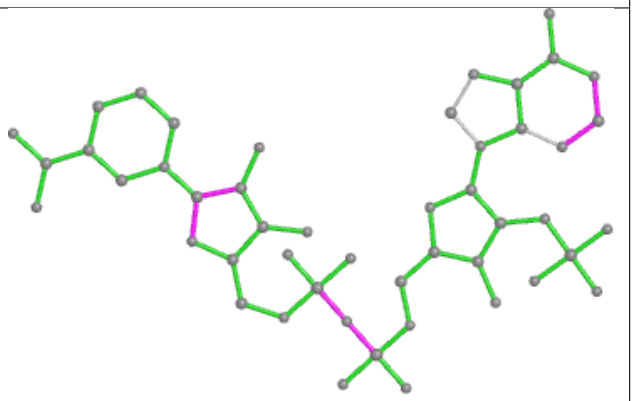
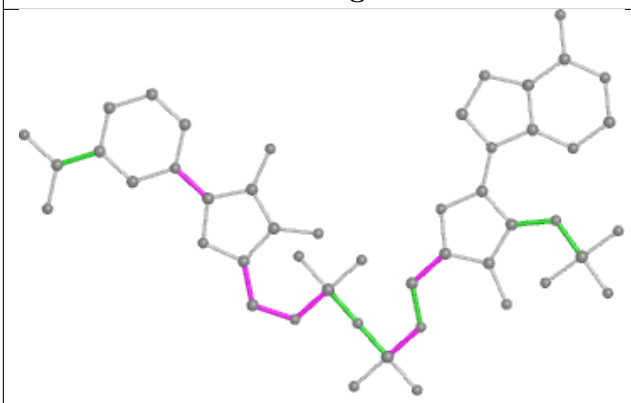
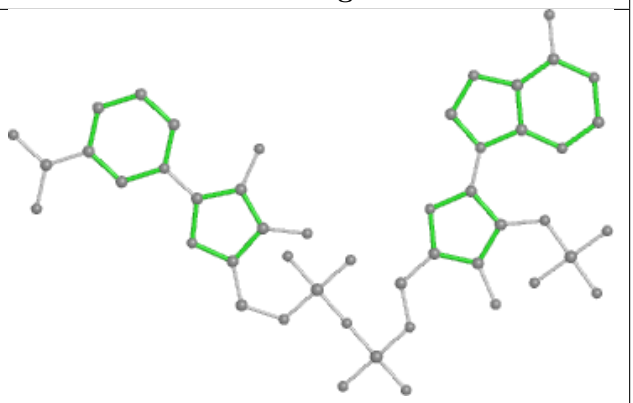


Bond angles

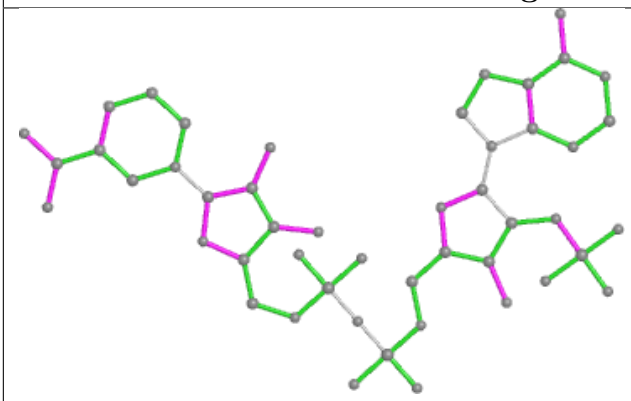


Torsions



Rings

Ligand NAP H 303



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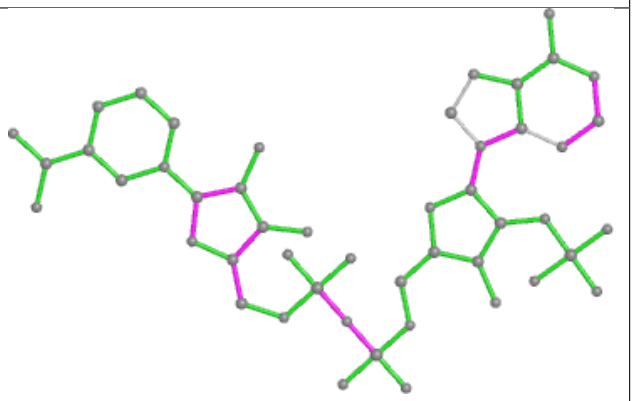
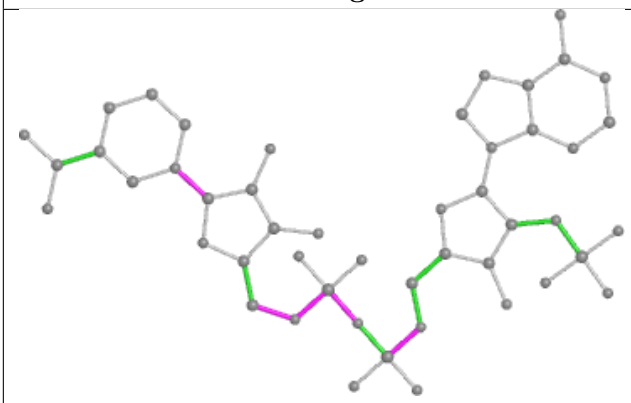
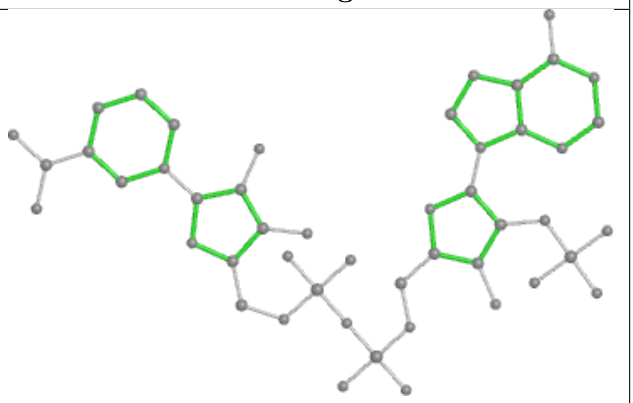


Bond angles

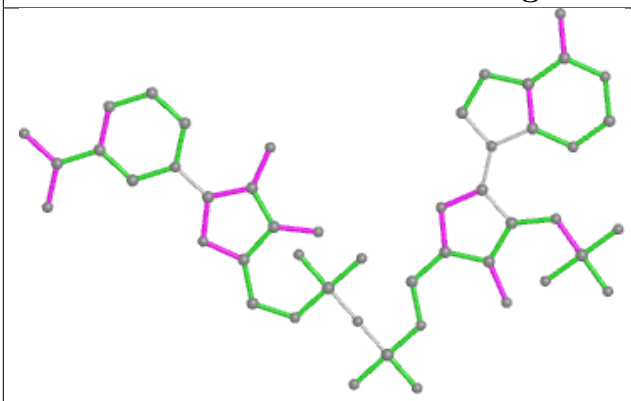


Torsions

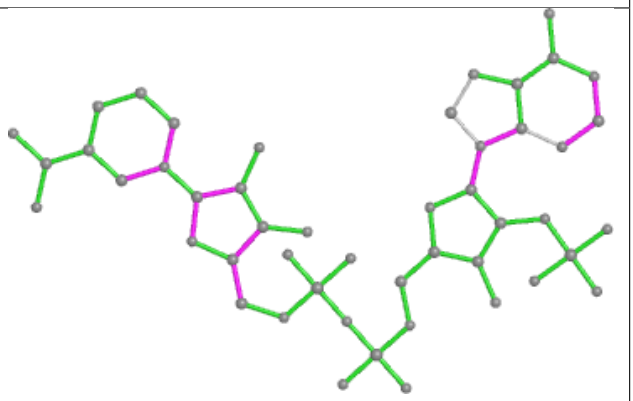


Rings

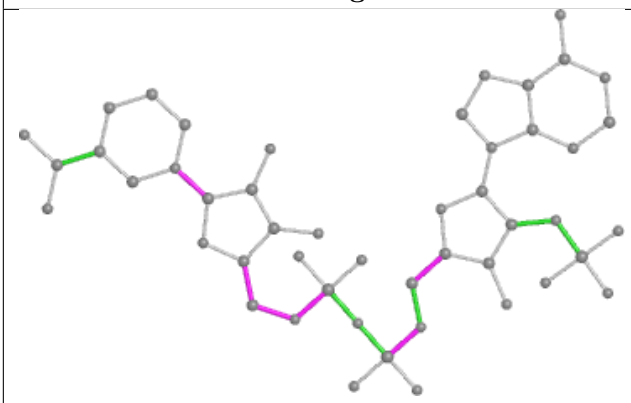
Ligand NAP C 302



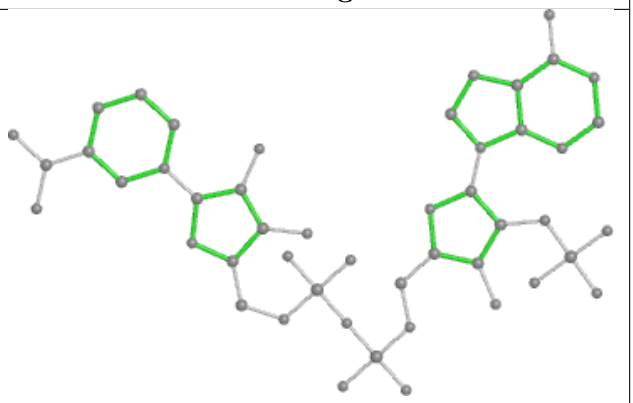
Bond lengths



Bond angles

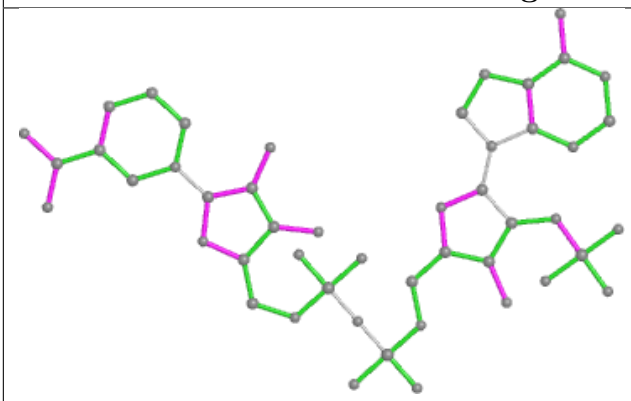


Torsions

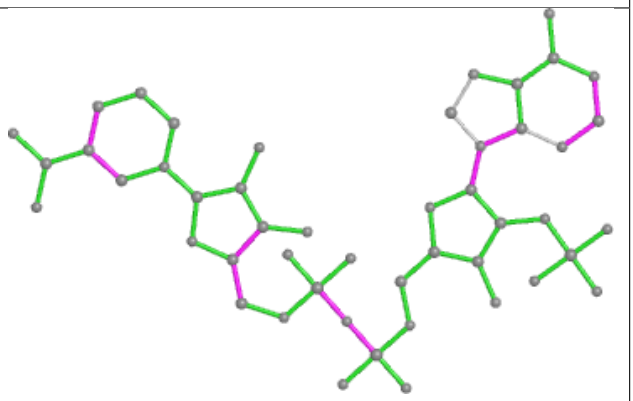


Rings

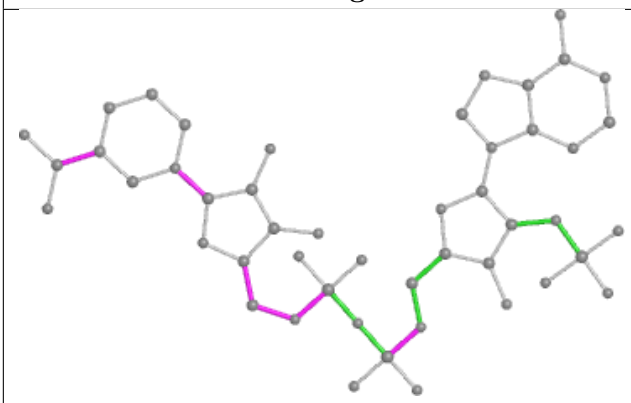
Ligand NAP G 303



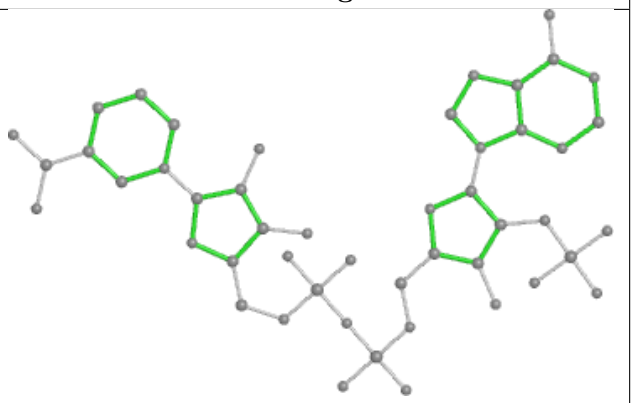
Bond lengths



Bond angles

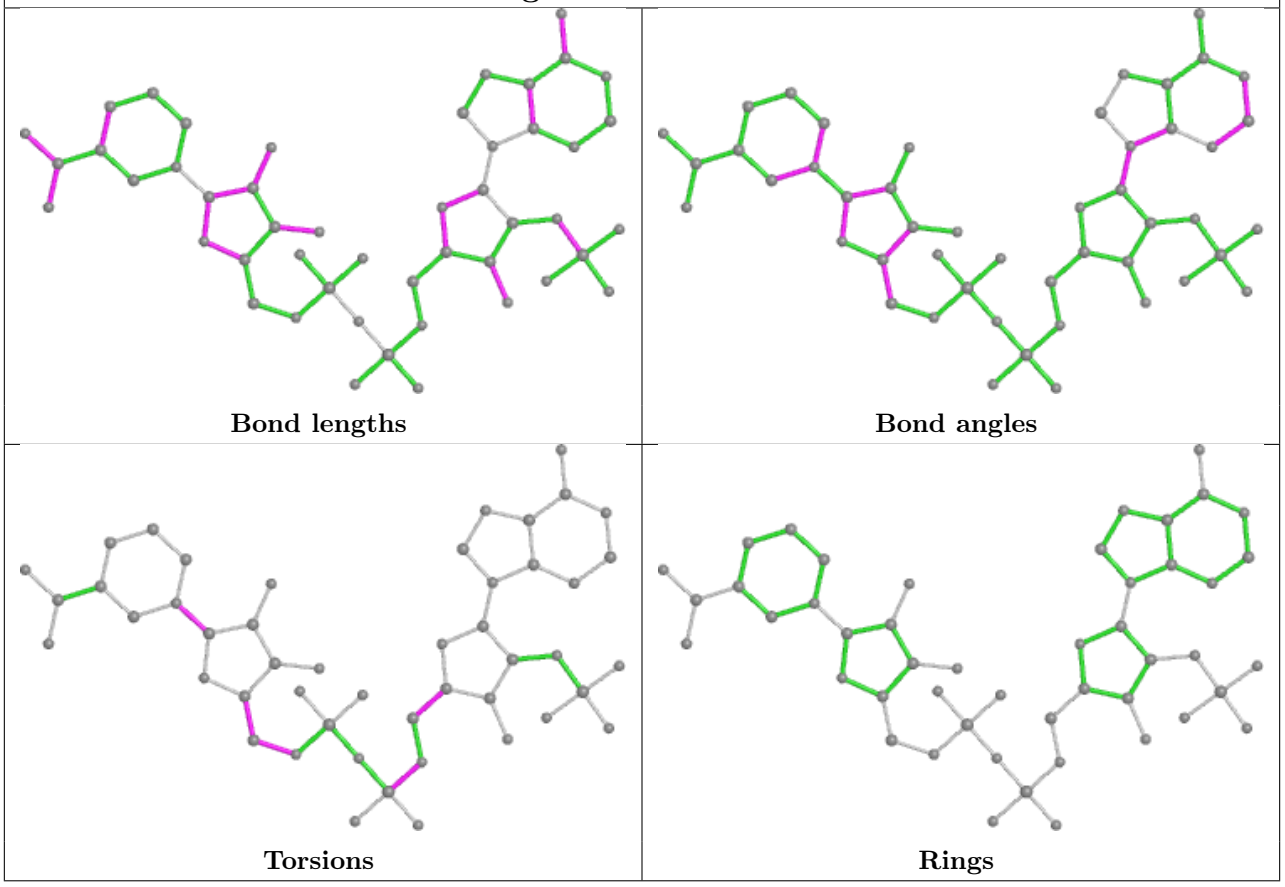


Torsions



Rings

Ligand NAP D 303



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	195/203 (96%)	0.48	23 (11%) 4 4	46, 62, 100, 121	0
1	B	195/203 (96%)	0.69	25 (12%) 3 3	45, 67, 98, 108	0
1	C	202/203 (99%)	0.39	24 (11%) 4 4	37, 53, 88, 111	0
1	D	195/203 (96%)	-0.05	7 (3%) 42 41	32, 42, 64, 79	0
1	E	195/203 (96%)	0.37	20 (10%) 6 5	39, 55, 98, 122	0
1	F	195/203 (96%)	-0.06	7 (3%) 42 41	32, 45, 72, 91	0
1	G	195/203 (96%)	-0.04	8 (4%) 37 35	35, 46, 73, 87	0
1	H	195/203 (96%)	0.38	27 (13%) 2 2	39, 52, 96, 115	0
1	I	203/203 (100%)	0.43	26 (12%) 3 3	33, 48, 93, 114	0
1	J	202/203 (99%)	0.09	15 (7%) 14 13	33, 50, 74, 91	0
All	All	1972/2030 (97%)	0.27	182 (9%) 9 7	32, 52, 87, 122	0

All (182) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	47	ILE	9.7
1	C	47	ILE	9.0
1	E	43	VAL	8.7
1	E	47	ILE	7.5
1	H	47	ILE	7.4
1	B	43	VAL	6.8
1	I	200	HIS	6.8
1	I	46	LYS	6.6
1	I	201	HIS	6.3
1	B	47	ILE	6.3
1	H	43	VAL	6.2
1	A	43	VAL	6.0
1	C	45	GLY	5.8

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Mol	Chain	Res	Type	RSRZ
1	A	44	SER	5.8
1	E	77	PHE	5.6
1	B	46	LYS	5.6
1	E	46	LYS	5.5
1	E	44	SER	5.4
1	A	42	GLU	5.3
1	B	44	SER	5.3
1	I	47	ILE	5.3
1	I	199	HIS	5.3
1	A	46	LYS	5.1
1	I	43	VAL	5.0
1	H	46	LYS	5.0
1	I	202	HIS	4.9
1	I	198	HIS	4.7
1	A	45	GLY	4.7
1	J	197	ALA	4.7
1	H	42	GLU	4.6
1	J	200	HIS	4.5
1	B	77	PHE	4.5
1	E	42	GLU	4.5
1	E	50	LYS	4.5
1	A	48	MET	4.4
1	C	42	GLU	4.3
1	C	43	VAL	4.2
1	H	50	LYS	4.1
1	C	46	LYS	4.1
1	J	201	HIS	4.1
1	I	45	GLY	4.1
1	E	48	MET	3.9
1	H	45	GLY	3.9
1	A	49	GLU	3.8
1	B	75	ALA	3.8
1	C	48	MET	3.8
1	H	54	PRO	3.8
1	B	52	MET	3.7
1	G	43	VAL	3.7
1	I	48	MET	3.7
1	C	144	LEU	3.7
1	I	54	PRO	3.6
1	B	48	MET	3.6
1	E	54	PRO	3.6
1	H	7	LEU	3.5

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Mol	Chain	Res	Type	RSRZ
1	H	144	LEU	3.5
1	G	42	GLU	3.5
1	C	44	SER	3.5
1	A	50	LYS	3.5
1	B	45	GLY	3.4
1	C	123	VAL	3.4
1	H	49	GLU	3.4
1	I	42	GLU	3.4
1	F	42	GLU	3.4
1	C	197	ALA	3.3
1	J	202	HIS	3.3
1	E	41	ASP	3.3
1	J	199	HIS	3.3
1	H	77	PHE	3.3
1	J	77	PHE	3.3
1	B	49	GLU	3.3
1	A	1	MET	3.2
1	H	124	TRP	3.2
1	B	41	ASP	3.2
1	F	43	VAL	3.1
1	H	6	VAL	3.1
1	B	125	GLY	3.1
1	B	50	LYS	3.1
1	C	6	VAL	3.1
1	F	195	VAL	3.1
1	I	203	HIS	3.1
1	G	77	PHE	3.1
1	B	42	GLU	3.0
1	H	9	PHE	3.0
1	C	8	SER	3.0
1	H	10	ILE	3.0
1	I	196	GLY	2.9
1	C	50	LYS	2.9
1	A	54	PRO	2.9
1	A	77	PHE	2.9
1	B	8	SER	2.9
1	J	59	LEU	2.9
1	E	123	VAL	2.8
1	B	1	MET	2.8
1	H	44	SER	2.8
1	C	10	ILE	2.8
1	I	44	SER	2.8

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Mol	Chain	Res	Type	RSRZ
1	I	50	LYS	2.8
1	F	46	LYS	2.7
1	A	6	VAL	2.7
1	F	189	GLU	2.7
1	H	117	GLU	2.7
1	J	117	GLU	2.7
1	H	8	SER	2.7
1	D	46	LYS	2.7
1	J	1	MET	2.7
1	A	187	ALA	2.7
1	A	7	LEU	2.6
1	A	59	LEU	2.6
1	C	1	MET	2.6
1	G	46	LYS	2.6
1	I	10	ILE	2.6
1	B	123	VAL	2.6
1	I	9	PHE	2.6
1	I	125	GLY	2.6
1	C	146	ILE	2.6
1	C	124	TRP	2.6
1	E	117	GLU	2.6
1	C	7	LEU	2.5
1	C	59	LEU	2.5
1	E	49	GLU	2.5
1	H	143	TRP	2.5
1	I	49	GLU	2.5
1	G	47	ILE	2.5
1	C	52	MET	2.5
1	G	144	LEU	2.5
1	H	142	LEU	2.5
1	C	49	GLU	2.4
1	C	200	HIS	2.4
1	B	183	ASN	2.4
1	E	125	GLY	2.4
1	I	151	LEU	2.4
1	J	198	HIS	2.4
1	I	143	TRP	2.4
1	B	144	LEU	2.4
1	J	116	SER	2.4
1	F	124	TRP	2.4
1	D	12	LEU	2.4
1	B	124	TRP	2.3

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Mol	Chain	Res	Type	RSRZ
1	F	194	THR	2.3
1	H	95	LYS	2.3
1	E	75	ALA	2.3
1	B	6	VAL	2.3
1	A	52	MET	2.3
1	G	92	THR	2.3
1	E	143	TRP	2.3
1	C	53	LYS	2.3
1	G	44	SER	2.3
1	I	77	PHE	2.2
1	A	51	GLN	2.2
1	A	116	SER	2.2
1	B	119	SER	2.2
1	B	59	LEU	2.2
1	B	76	ASP	2.2
1	H	41	ASP	2.2
1	J	123	VAL	2.2
1	J	58	LEU	2.2
1	D	40	GLU	2.2
1	C	54	PRO	2.2
1	J	112	LYS	2.2
1	D	43	VAL	2.2
1	I	53	LYS	2.2
1	H	12	LEU	2.2
1	H	48	MET	2.2
1	E	51	GLN	2.2
1	A	91	LYS	2.1
1	H	123	VAL	2.1
1	D	10	ILE	2.1
1	A	41	ASP	2.1
1	B	7	LEU	2.1
1	I	124	TRP	2.1
1	E	45	GLY	2.1
1	E	144	LEU	2.1
1	J	124	TRP	2.1
1	A	58	LEU	2.1
1	H	146	ILE	2.1
1	I	146	ILE	2.1
1	A	117	GLU	2.0
1	E	52	MET	2.0
1	H	53	LYS	2.0
1	D	42	GLU	2.0

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Mol	Chain	Res	Type	RSRZ
1	D	16	MET	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
4	SO4	I	304	5/5	0.54	0.47	57,58,64,71	5
2	1PE	J	302	16/16	0.65	0.32	50,64,73,81	0
5	ACT	I	302	4/4	0.68	0.51	46,48,48,48	4
4	SO4	I	305	5/5	0.69	0.33	57,62,67,70	5
4	SO4	F	308	5/5	0.70	0.39	42,49,53,54	5
4	SO4	D	305	5/5	0.71	0.33	57,59,68,68	5
2	1PE	F	302	16/16	0.74	0.37	62,70,76,79	0
4	SO4	F	307	5/5	0.77	0.37	52,62,74,75	5
4	SO4	D	308	5/5	0.78	0.23	50,66,72,73	5
4	SO4	J	307	5/5	0.78	0.23	75,77,90,93	5
2	1PE	E	301	8/16	0.78	0.37	69,74,77,78	0
2	1PE	J	303	11/16	0.79	0.25	68,71,77,80	0
4	SO4	B	303	5/5	0.79	0.23	66,66,68,71	5
4	SO4	B	304	5/5	0.80	0.23	83,87,90,91	5
4	SO4	C	304	5/5	0.80	0.28	59,64,68,68	5
2	1PE	F	301	10/16	0.81	0.18	42,60,70,72	0
4	SO4	H	304	5/5	0.81	0.26	65,67,70,72	5
4	SO4	J	308	5/5	0.82	0.27	58,62,65,72	5
4	SO4	E	304	5/5	0.83	0.25	67,70,73,79	5
2	1PE	C	301	15/16	0.83	0.22	60,62,74,78	0
4	SO4	I	306	5/5	0.83	0.34	66,67,70,81	5
4	SO4	D	307	5/5	0.84	0.17	49,49,60,60	5

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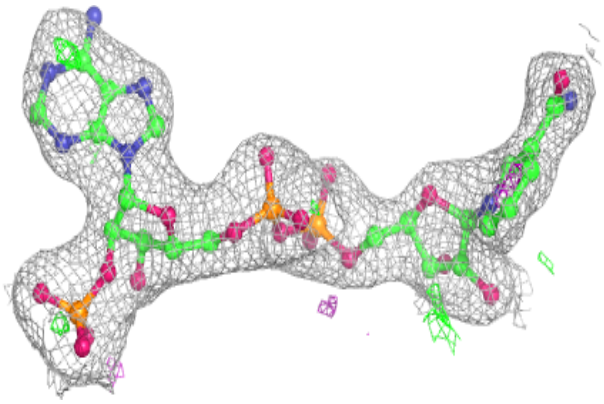
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	1PE	H	301	13/16	0.84	0.23	61,65,73,78	0
4	SO4	D	306	5/5	0.84	0.19	51,56,67,75	5
4	SO4	J	306	5/5	0.85	0.24	60,63,68,69	5
4	SO4	F	305	5/5	0.85	0.28	55,56,58,64	5
4	SO4	G	305	5/5	0.85	0.25	64,65,73,73	5
5	ACT	G	302	4/4	0.85	0.40	44,52,53,56	4
2	1PE	B	301	13/16	0.85	0.19	61,69,73,76	0
4	SO4	G	307	5/5	0.86	0.21	47,50,54,58	5
2	1PE	D	301	13/16	0.86	0.21	48,58,64,67	0
4	SO4	D	309	5/5	0.87	0.20	54,56,62,65	5
2	1PE	H	302	5/16	0.87	0.28	67,74,78,78	0
5	ACT	D	302	4/4	0.87	0.39	47,47,49,49	4
4	SO4	A	304	5/5	0.87	0.17	62,65,72,73	5
2	1PE	G	301	12/16	0.87	0.29	59,64,68,69	0
2	1PE	A	301	15/16	0.88	0.23	58,67,75,79	0
4	SO4	G	308	5/5	0.88	0.22	60,63,73,74	5
2	1PE	I	301	16/16	0.88	0.20	53,63,68,69	0
4	SO4	G	306	5/5	0.88	0.24	60,63,67,72	5
4	SO4	I	307	5/5	0.89	0.18	67,68,69,70	5
4	SO4	J	309	5/5	0.89	0.45	68,69,72,73	5
4	SO4	J	305	5/5	0.89	0.22	81,82,84,85	5
4	SO4	C	305	5/5	0.89	0.24	57,64,68,70	5
2	1PE	A	302	7/16	0.89	0.28	73,77,79,84	0
4	SO4	F	306	5/5	0.90	0.20	48,48,52,55	5
4	SO4	C	303	5/5	0.90	0.21	72,74,78,79	5
2	1PE	J	301	16/16	0.91	0.16	52,62,77,82	0
3	NAP	B	302	48/48	0.94	0.13	50,59,74,79	0
4	SO4	E	303	5/5	0.94	0.12	63,63,68,72	5
3	NAP	I	303	48/48	0.94	0.12	34,47,55,58	0
4	SO4	G	304	5/5	0.95	0.10	64,65,69,77	5
3	NAP	H	303	48/48	0.95	0.10	41,51,57,61	0
3	NAP	A	303	48/48	0.95	0.12	41,54,67,72	0
3	NAP	J	304	48/48	0.95	0.12	40,50,70,73	0
3	NAP	C	302	48/48	0.95	0.10	42,49,62,67	0
3	NAP	D	303	48/48	0.95	0.12	32,41,53,54	0
3	NAP	G	303	48/48	0.96	0.11	36,46,52,57	0
4	SO4	F	304	5/5	0.96	0.16	57,61,68,71	5
3	NAP	E	302	48/48	0.96	0.12	42,50,57,63	0
4	SO4	D	304	5/5	0.97	0.14	54,55,59,63	5
3	NAP	F	303	48/48	0.98	0.14	30,36,42,45	0

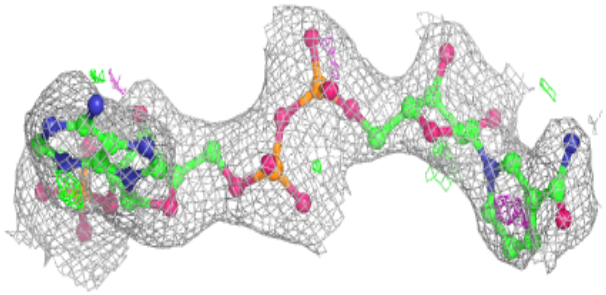
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers

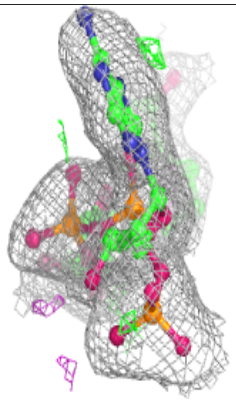
as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around NAP B 302:

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

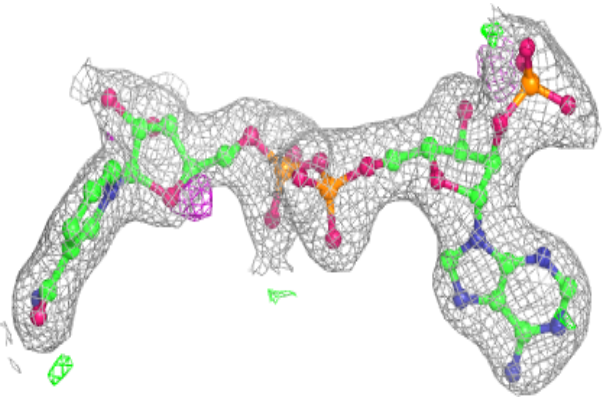


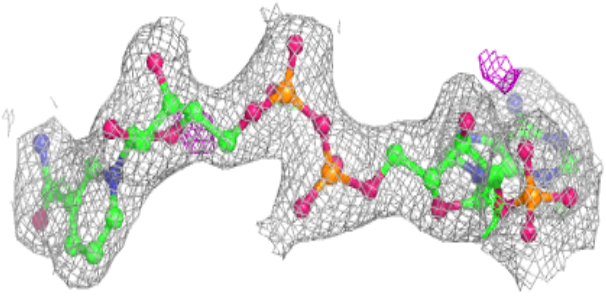


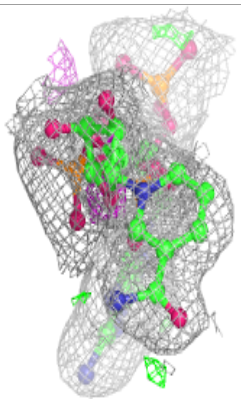


Electron density around NAP I 303:

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

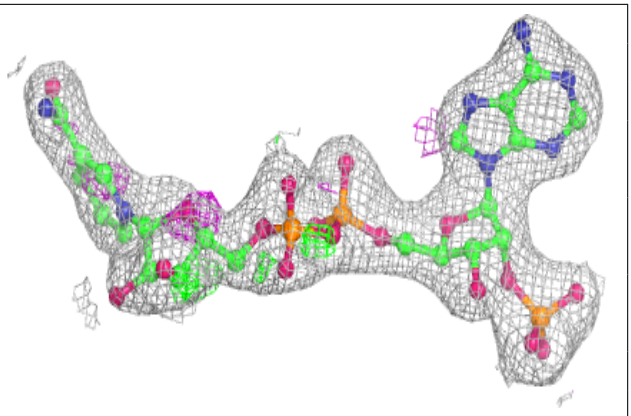


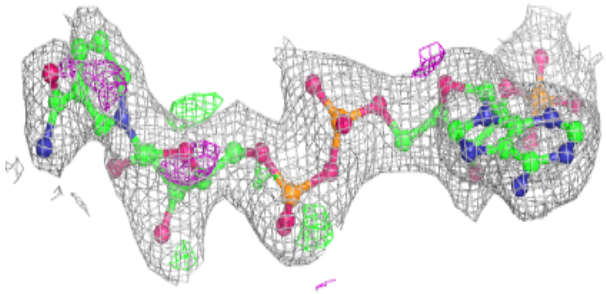


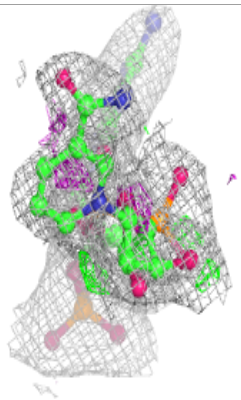


Electron density around NAP H 303:

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

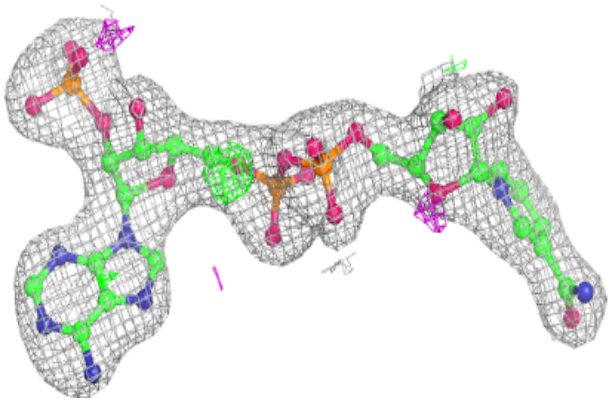


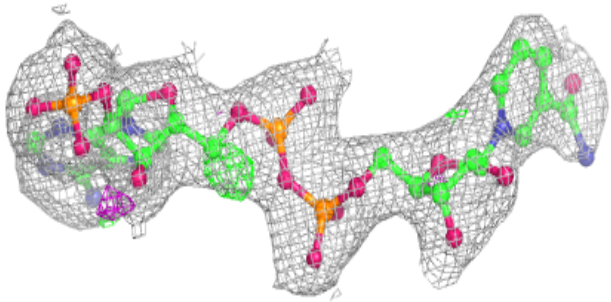


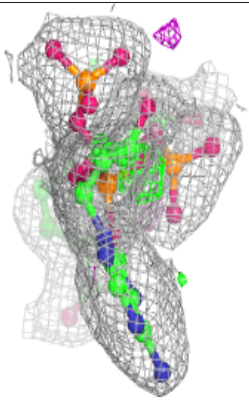


Electron density around NAP A 303:

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

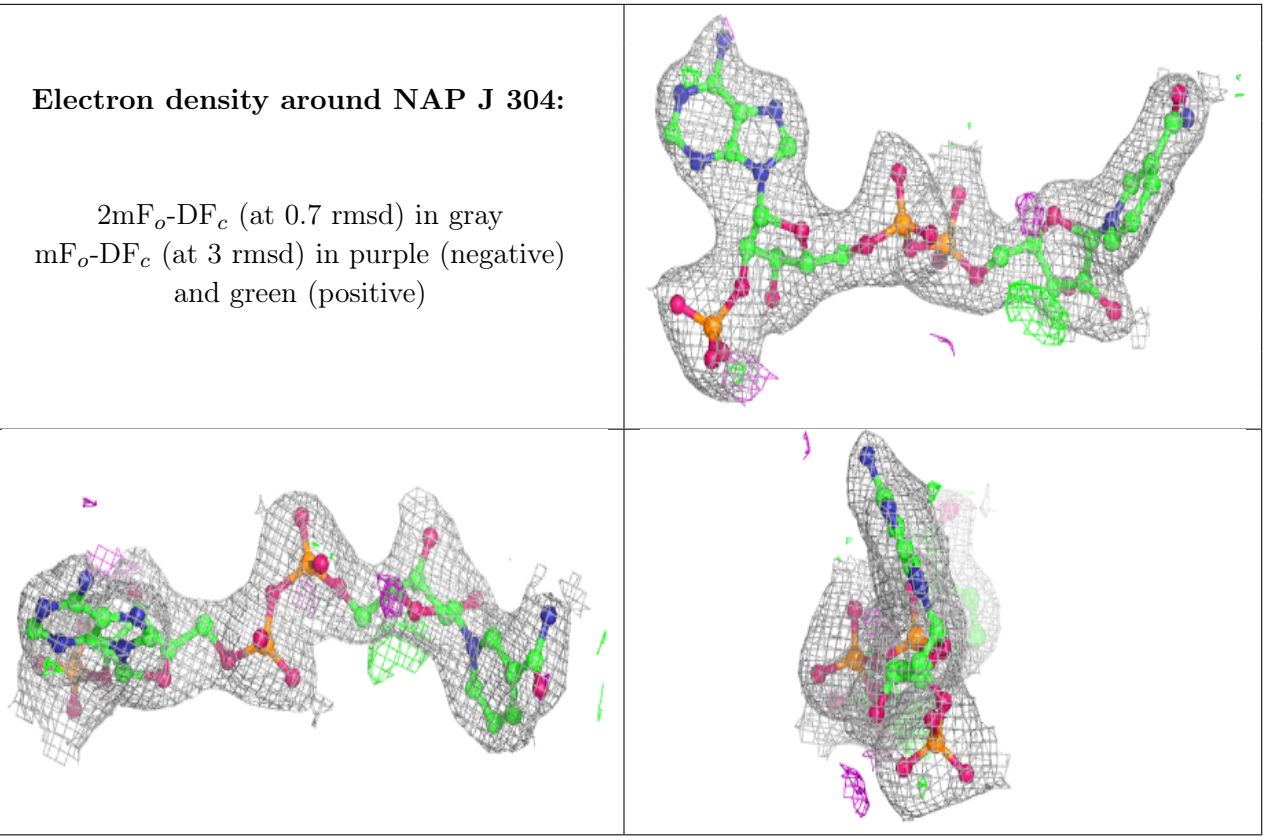






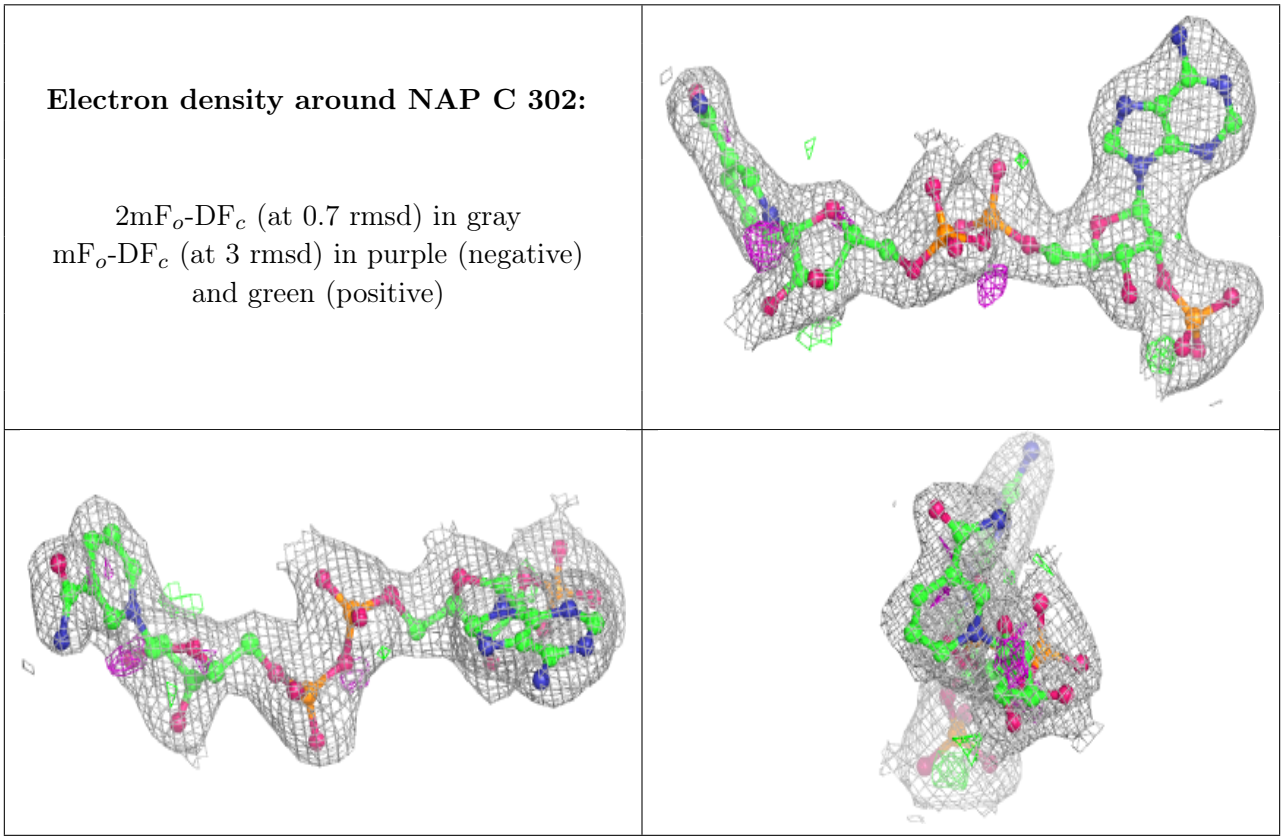
Electron density around NAP J 304:

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



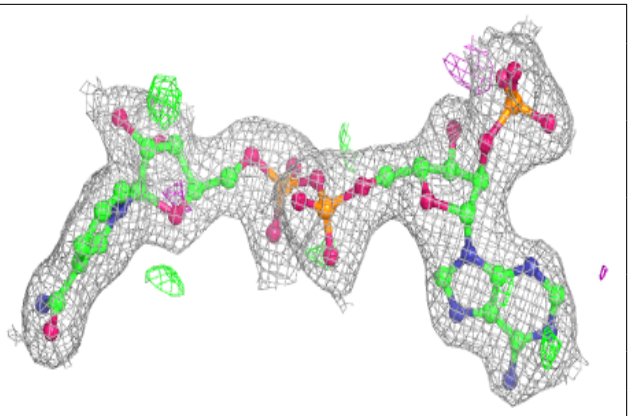
Electron density around NAP C 302:

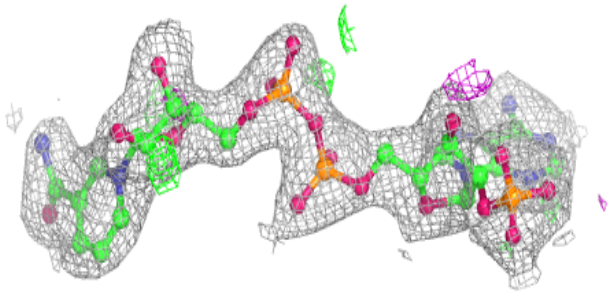
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

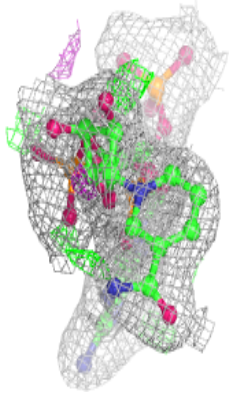


Electron density around NAP D 303:

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

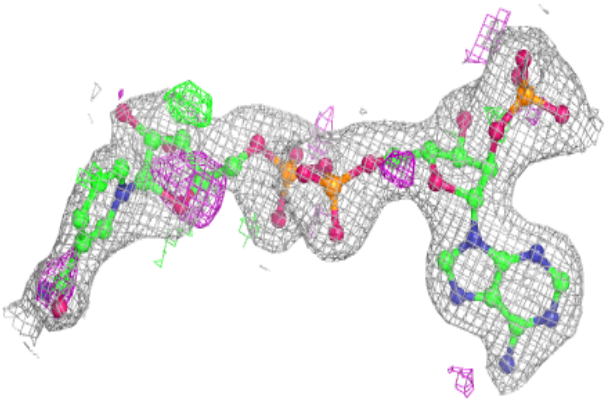


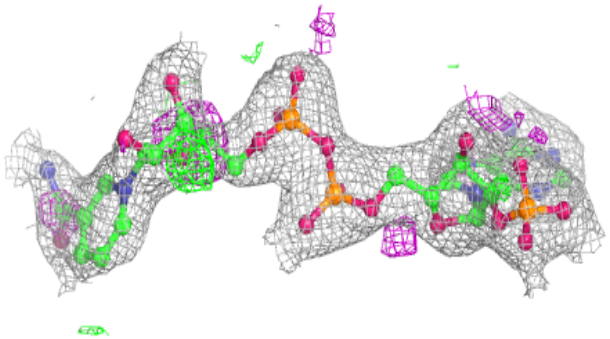


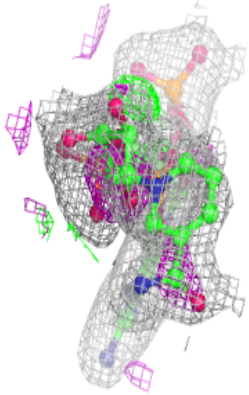


Electron density around NAP G 303:

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

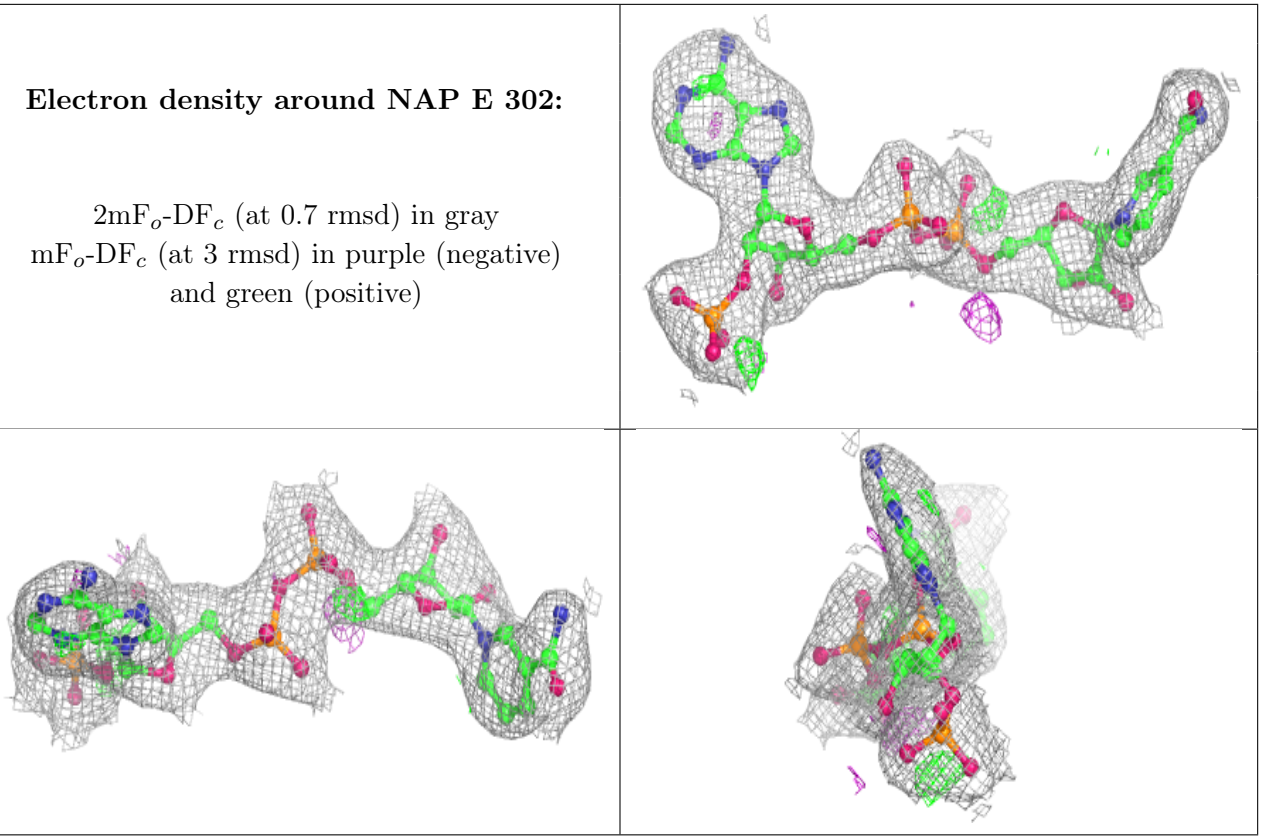






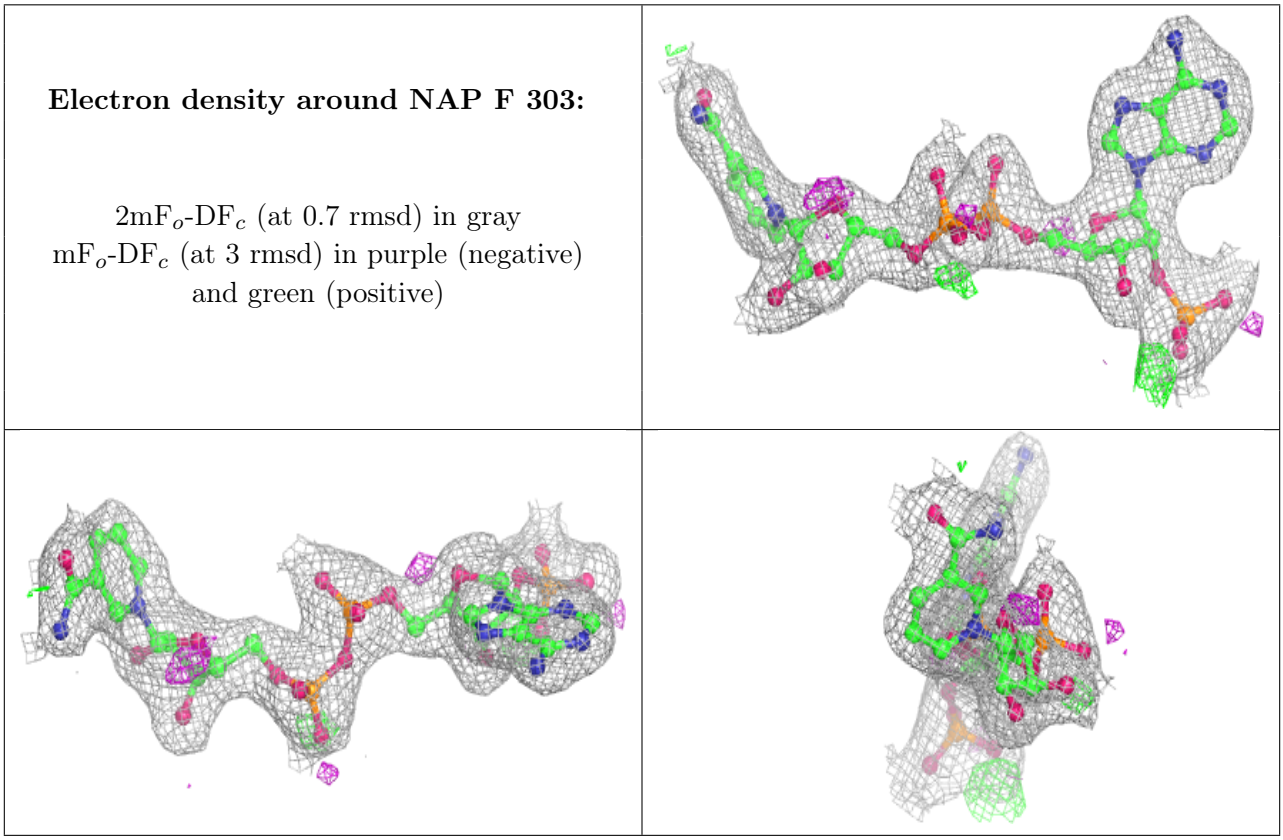
Electron density around NAP E 302:

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



Electron density around NAP F 303:

$2mF_o$-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.