wwPDB X-ray Structure Validation Summary Report (i)

Apr 28, 2024 – 08:08 pm BST

PDB ID	:	2XVH
Title	:	Crystal structure of bacterial flavin containing monooxygenase in complex with NADP
Authors	:	Cho, H.J.; Kang, B.S.
Deposited on	:	2010-10-26
Resolution	:	2.54 Å(reported)

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

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

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

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

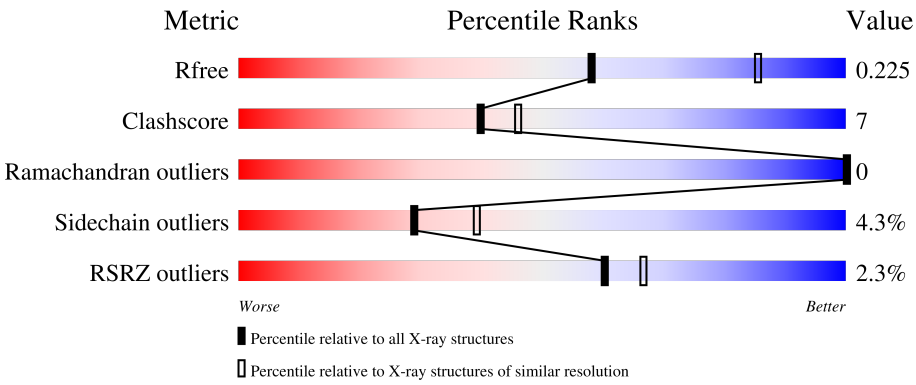
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36.2
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36.2

1 Overall quality at a glance (i)

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

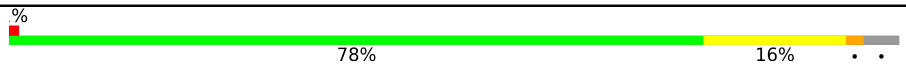
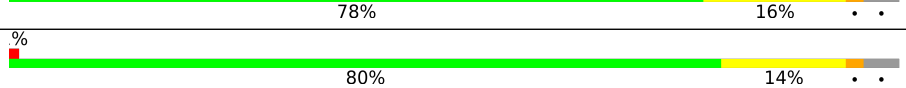
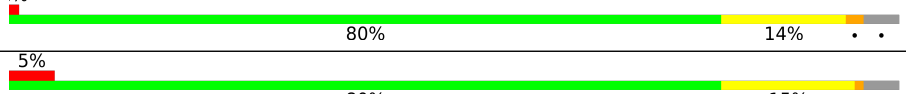
The reported resolution of this entry is 2.54 Å.

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	1284 (2.56-2.52)
Clashscore	141614	1332 (2.56-2.52)
Ramachandran outliers	138981	1315 (2.56-2.52)
Sidechain outliers	138945	1315 (2.56-2.52)
RSRZ outliers	127900	1272 (2.56-2.52)

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	464	
1	B	464	
1	C	464	

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 11325 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 FLAVIN-CONTAINING MONOOXYGENASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	445	3637	2333	602	682	20	0	0	0
1	B	445	3624	2325	599	680	20	0	1	0
1	C	446	3544	2265	587	672	20	0	1	0

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	457	LEU	-	expression tag	UNP Q83XK4
A	458	GLU	-	expression tag	UNP Q83XK4
A	459	HIS	-	expression tag	UNP Q83XK4
A	460	HIS	-	expression tag	UNP Q83XK4
A	461	HIS	-	expression tag	UNP Q83XK4
A	462	HIS	-	expression tag	UNP Q83XK4
A	463	HIS	-	expression tag	UNP Q83XK4
A	464	HIS	-	expression tag	UNP Q83XK4
B	457	LEU	-	expression tag	UNP Q83XK4
B	458	GLU	-	expression tag	UNP Q83XK4
B	459	HIS	-	expression tag	UNP Q83XK4
B	460	HIS	-	expression tag	UNP Q83XK4
B	461	HIS	-	expression tag	UNP Q83XK4
B	462	HIS	-	expression tag	UNP Q83XK4
B	463	HIS	-	expression tag	UNP Q83XK4
B	464	HIS	-	expression tag	UNP Q83XK4
C	457	LEU	-	expression tag	UNP Q83XK4
C	458	GLU	-	expression tag	UNP Q83XK4
C	459	HIS	-	expression tag	UNP Q83XK4
C	460	HIS	-	expression tag	UNP Q83XK4
C	461	HIS	-	expression tag	UNP Q83XK4
C	462	HIS	-	expression tag	UNP Q83XK4
C	463	HIS	-	expression tag	UNP Q83XK4

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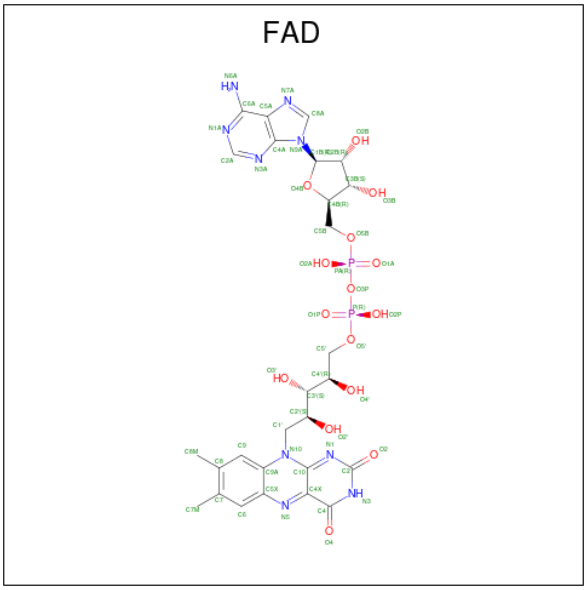
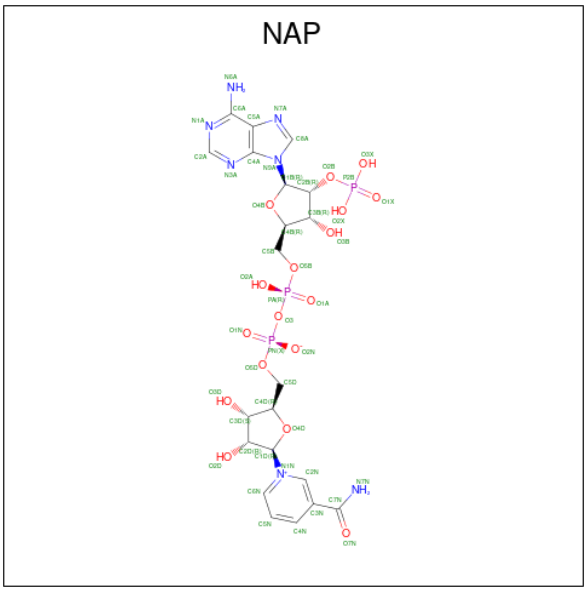
Chain	Residue	Modelled	Actual	Comment	Reference
C	464	HIS	-	expression tag	UNP Q83XK4

- Molecule 2 is FLAVIN-ADENINE DINUCLEOTIDE (three-letter code: FAD) (formula: $C_{27}H_{33}N_9O_{15}P_2$).



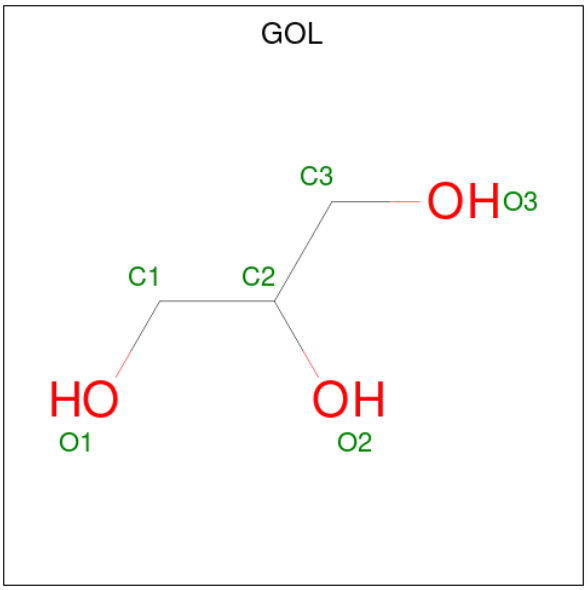
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
2	A	1	53	27	9	15	2	0	0
			Total	C	N	O	P		
2	B	1	53	27	9	15	2	0	0
			Total	C	N	O	P		
2	C	1	53	27	9	15	2	0	0

- Molecule 3 is NADP NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (three-letter code: NAP) (formula: $C_{21}H_{28}N_7O_{17}P_3$).



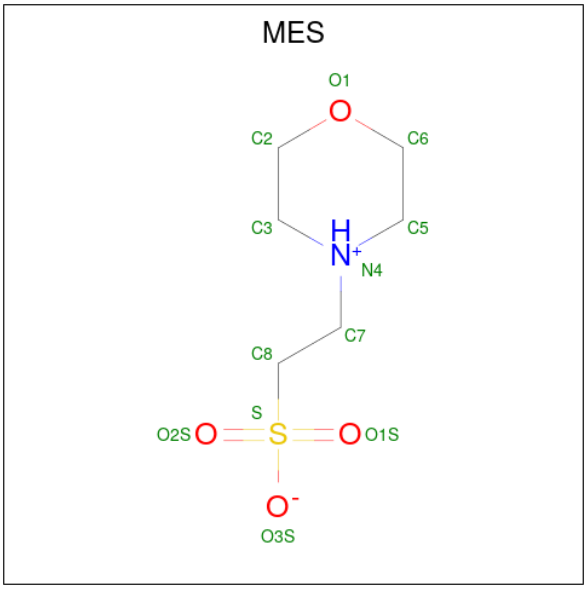
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
3	A	1	48	21	7	17	3	0	0
			Total	C	N	O	P		
3	B	1	48	21	7	17	3	0	0
			Total	C	N	O	P		
3	C	1	48	21	7	17	3	0	0

- Molecule 4 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
4	B	1	6	3	3	0	0

- Molecule 5 is 2-(N-MORPHOLINO)-ETHANESULFONIC ACID (three-letter code: MES) (formula: $C_6H_{13}NO_4S$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	S		
5	C	1	12	6	1	4	1	0	0

- Molecule 6 is water.

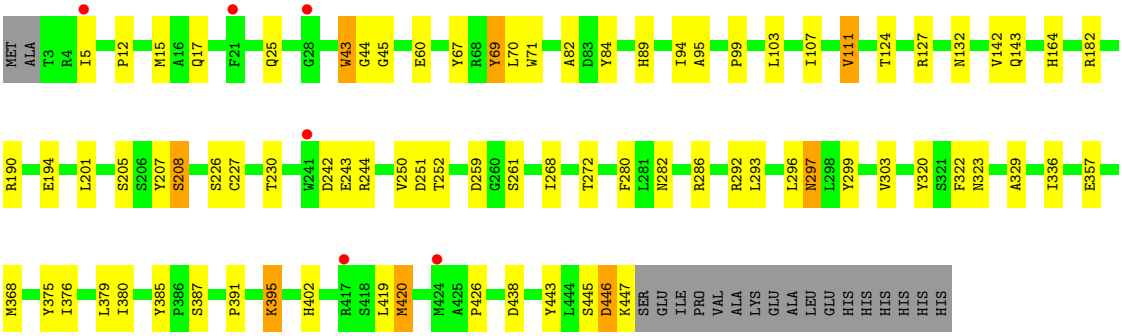
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
6	A	59	59	59	0	0
			Total	O		
6	B	84	84	84	0	0
			Total	O		
6	C	56	56	56	0	0

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.

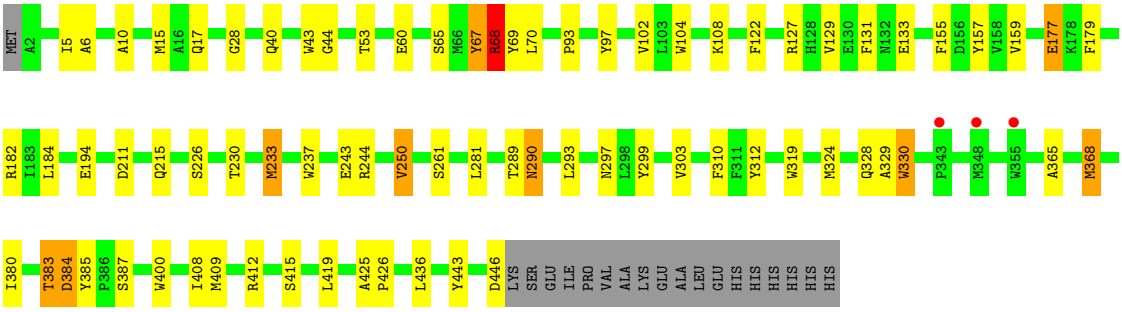
• Molecule 1: FLAVIN-CONTAINING MONOOXYGENASE

Chain A:



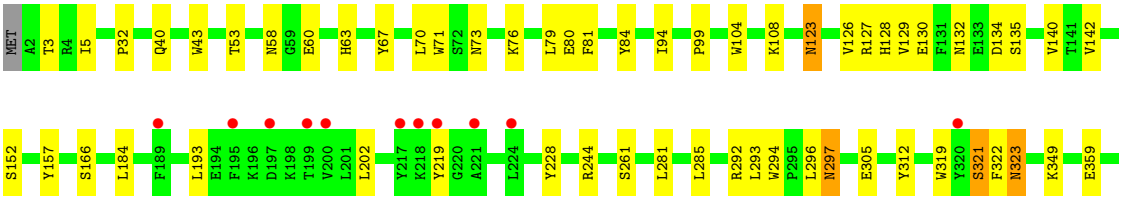
• Molecule 1: FLAVIN-CONTAINING MONOOXYGENASE

Chain B:



• Molecule 1: FLAVIN-CONTAINING MONOOXYGENASE

Chain C:



T364
A365
E366
E367
M368
Y369
Y375
L379
I390
F397
W400
I408
F411
Y416
R417
S418
L419
M420
M424
A425
P426
P431
W432
I433
D434
L444
S445
D446
K447
SER
GLU
ILE
PRO
VAL
ALA
LYS
GLU
ALA
LEU
GLU
HIS
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4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	159.21Å 71.14Å 141.36Å 90.00° 90.05° 90.00°	Depositor
Resolution (Å)	50.01 – 2.54 47.83 – 2.54	Depositor EDS
% Data completeness (in resolution range)	98.4 (50.01-2.54) 93.0 (47.83-2.54)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	307.43 (at 2.54Å)	Xtriage
Refinement program	REFMAC 5.5.0088	Depositor
R, R_{free}	0.184 , 0.226 0.184 , 0.225	Depositor DCC
R_{free} test set	2482 reflections (5.10%)	wwPDB-VP
Wilson B-factor (Å^2)	43.4	Xtriage
Anisotropy	0.237	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 35.6	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.29$	Xtriage
Estimated twinning fraction	0.024 for -h,-k,l	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	11325	wwPDB-VP
Average B, all atoms (Å^2)	49.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.44% 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 (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: MES, NAP, GOL, FAD

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	0.63	2/3751 (0.1%)	0.57	0/5098
1	B	0.64	4/3741 (0.1%)	0.59	0/5089
1	C	0.60	1/3655 (0.0%)	0.58	0/4982
All	All	0.63	7/11147 (0.1%)	0.58	0/15169

The worst 5 of 7 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	320	TYR	CD1-CE1	-7.51	1.28	1.39
1	B	67	TYR	CE2-CZ	-6.80	1.29	1.38
1	B	67	TYR	CD1-CE1	-5.85	1.30	1.39
1	B	69	TYR	CD2-CE2	-5.84	1.30	1.39
1	B	68	ARG	CG-CD	-5.33	1.38	1.51

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3637	0	3395	47	0
1	B	3624	0	3365	63	0
1	C	3544	0	3222	46	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	A	53	0	31	2	0
2	B	53	0	31	2	0
2	C	53	0	31	0	0
3	A	48	0	25	4	0
3	B	48	0	25	1	0
3	C	48	0	25	2	0
4	B	6	0	8	1	0
5	C	12	0	12	0	0
6	A	59	0	0	1	0
6	B	84	0	0	2	0
6	C	56	0	0	1	0
All	All	11325	0	10170	155	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 7.

The worst 5 of 155 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:B:68:ARG:HH11	1:B:68:ARG:HG2	0.97	1.09
1:B:68:ARG:HH11	1:B:68:ARG:CG	1.84	0.91
1:C:58:ASN:HD21	1:C:123:ASN:HD21	1.19	0.90
1:B:383:THR:HG22	1:B:385:TYR:H	1.35	0.90
1:B:365:ALA:HA	1:B:368:MET:HE2	1.54	0.89

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	443/464 (96%)	430 (97%)	13 (3%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	444/464 (96%)	429 (97%)	15 (3%)	0	100	100
1	C	445/464 (96%)	427 (96%)	18 (4%)	0	100	100
All	All	1332/1392 (96%)	1286 (96%)	46 (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	382/405 (94%)	362 (95%)	20 (5%)	23	30
1	B	378/405 (93%)	360 (95%)	18 (5%)	25	34
1	C	360/405 (89%)	349 (97%)	11 (3%)	40	54
All	All	1120/1215 (92%)	1071 (96%)	49 (4%)	29	38

5 of 49 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	250	VAL
1	B	419	LEU
1	B	290	ASN
1	B	368	MET
1	B	446	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 24 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	290	ASN
1	C	48	ASN
1	C	40	GLN
1	C	123	ASN
1	A	282	ASN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

8 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	$\#\|Z\| > 2$
3	NAP	C	1450	-	45,52,52	1.77	4 (8%)	56,80,80	1.09	3 (5%)
4	GOL	B	1448	-	5,5,5	0.38	0	5,5,5	0.42	0
5	MES	C	1449	-	12,12,12	2.24	1 (8%)	14,16,16	2.51	6 (42%)
2	FAD	B	1447	-	53,58,58	1.06	3 (5%)	68,89,89	1.48	10 (14%)
3	NAP	B	1449	-	45,52,52	1.74	4 (8%)	56,80,80	1.09	2 (3%)
2	FAD	C	1448	-	53,58,58	1.14	4 (7%)	68,89,89	1.45	11 (16%)
2	FAD	A	1448	-	53,58,58	1.18	4 (7%)	68,89,89	1.38	8 (11%)
3	NAP	A	1449	-	45,52,52	1.71	4 (8%)	56,80,80	1.16	3 (5%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAP	C	1450	-	-	7/31/67/67	0/5/5/5
4	GOL	B	1448	-	-	4/4/4/4	-
5	MES	C	1449	-	-	6/6/14/14	0/1/1/1
2	FAD	B	1447	-	-	5/30/50/50	0/6/6/6
3	NAP	B	1449	-	-	8/31/67/67	0/5/5/5
2	FAD	C	1448	-	-	5/30/50/50	0/6/6/6
2	FAD	A	1448	-	-	4/30/50/50	0/6/6/6
3	NAP	A	1449	-	-	1/31/67/67	0/5/5/5

The worst 5 of 24 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	1450	NAP	O7N-C7N	9.28	1.41	1.24
3	B	1449	NAP	O7N-C7N	9.14	1.41	1.24
3	A	1449	NAP	O7N-C7N	8.84	1.41	1.24
5	C	1449	MES	C8-S	-7.22	1.67	1.77
2	A	1448	FAD	C4X-N5	4.33	1.39	1.30

The worst 5 of 43 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	1447	FAD	N3A-C2A-N1A	-6.58	118.40	128.68
3	A	1449	NAP	N3A-C2A-N1A	-5.91	119.44	128.68
2	C	1448	FAD	N3A-C2A-N1A	-5.72	119.73	128.68
2	A	1448	FAD	N3A-C2A-N1A	-5.72	119.74	128.68
3	B	1449	NAP	N3A-C2A-N1A	-5.62	119.89	128.68

There are no chirality outliers.

5 of 40 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	1448	FAD	N10-C1'-C2'-O2'
2	A	1448	FAD	N10-C1'-C2'-C3'
2	B	1447	FAD	N10-C1'-C2'-O2'
2	B	1447	FAD	N10-C1'-C2'-C3'
2	C	1448	FAD	N10-C1'-C2'-O2'

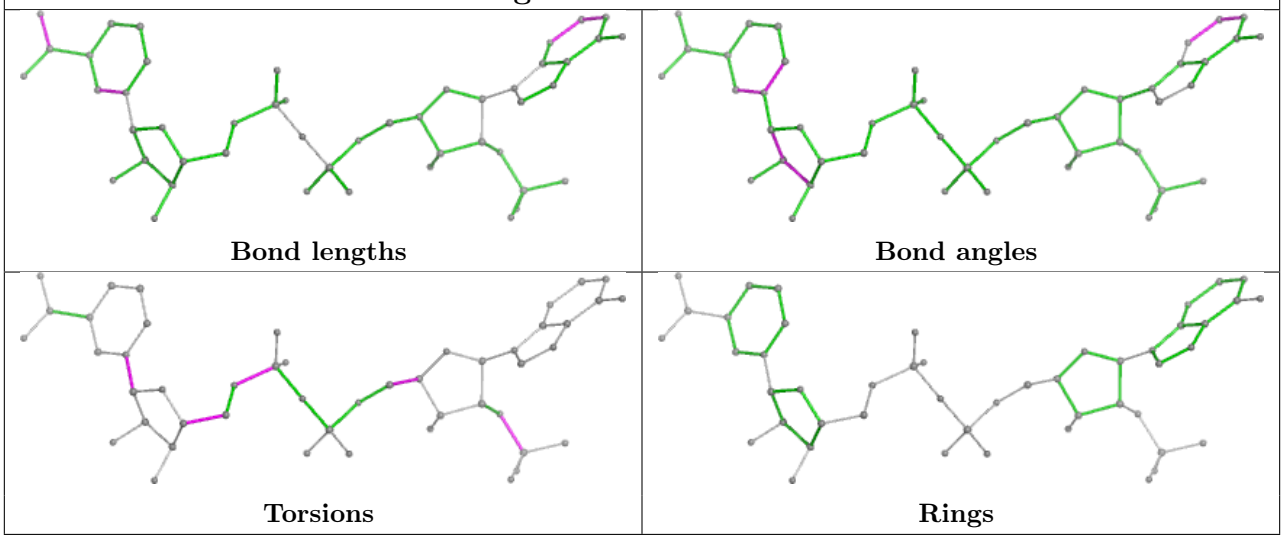
There are no ring outliers.

6 monomers are involved in 12 short contacts:

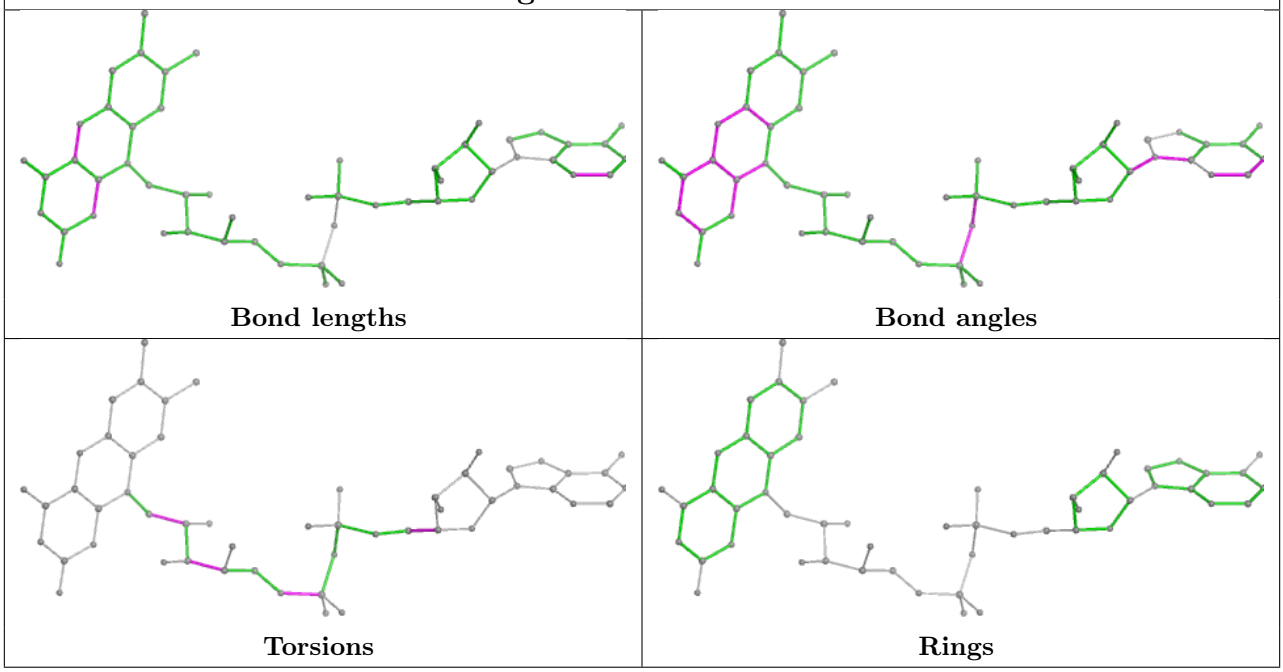
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	1450	NAP	2	0
4	B	1448	GOL	1	0
2	B	1447	FAD	2	0
3	B	1449	NAP	1	0
2	A	1448	FAD	2	0
3	A	1449	NAP	4	0

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.

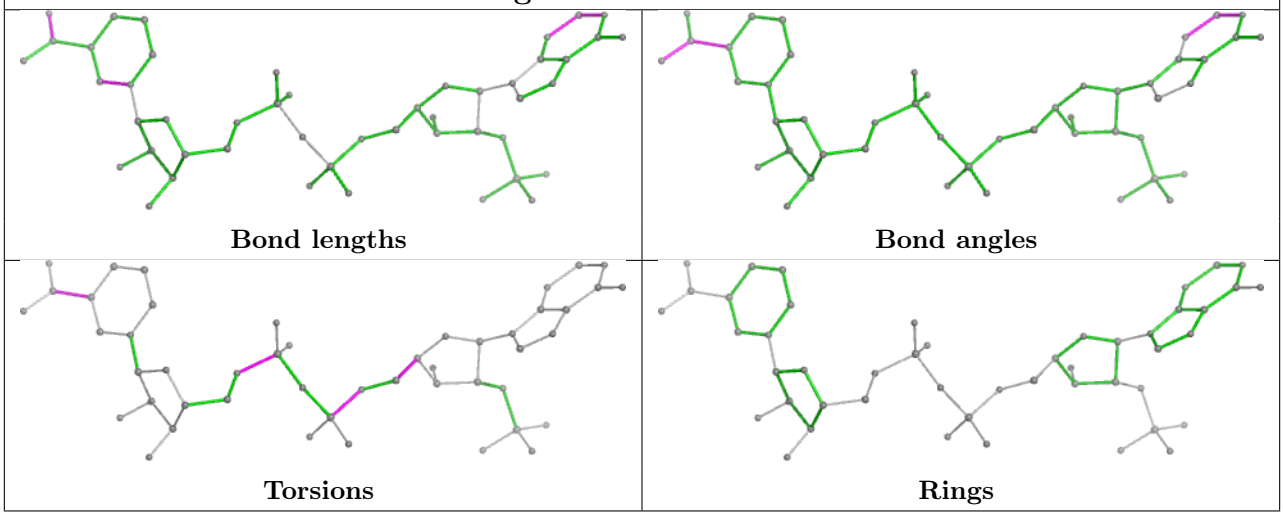
Ligand NAP C 1450



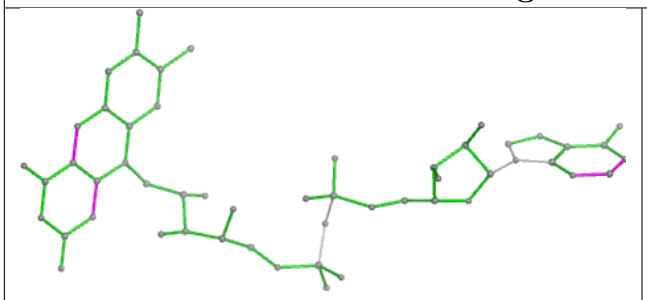
Ligand FAD B 1447



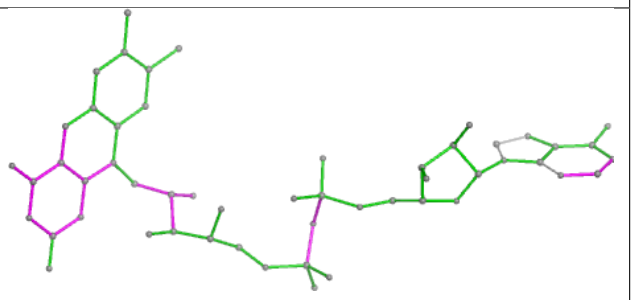
Ligand NAP B 1449



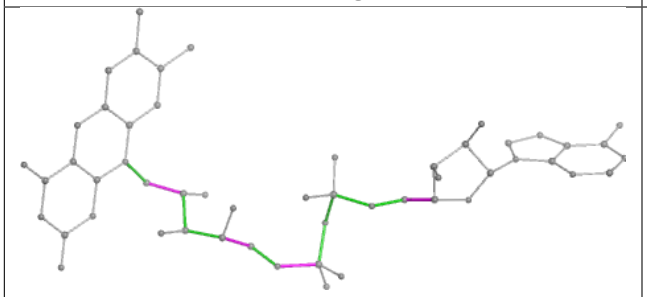
Ligand FAD C 1448



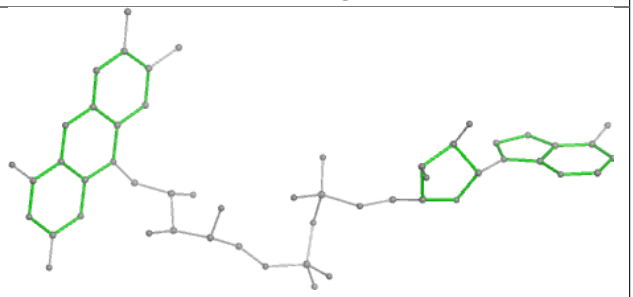
Bond lengths



Bond angles

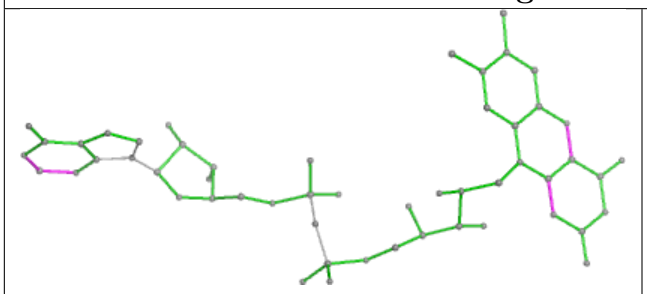


Torsions



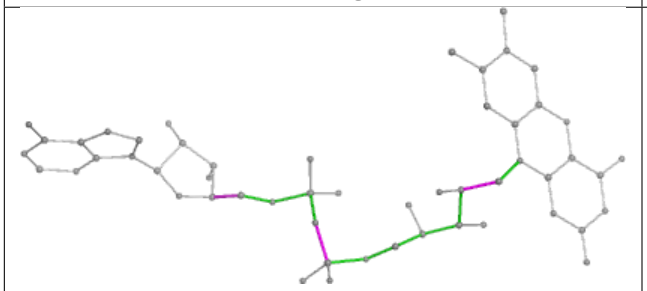
Rings

Ligand FAD A 1448



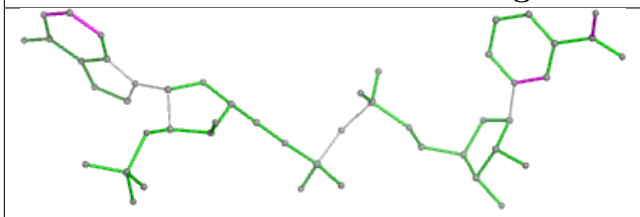
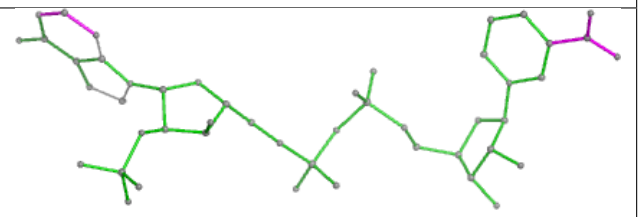
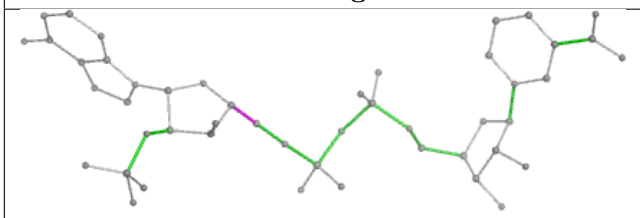
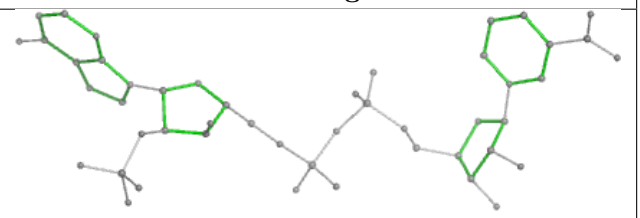
Bond lengths

Bond angles



Torsions

Rings

Ligand NAP A 1449	
 Bond lengths	 Bond angles
 Torsions	 Rings

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data (i)

6.1 Protein, DNA and RNA chains (i)

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, 95th 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	445/464 (95%)	0.01	6 (1%)	77	82	26, 50, 72, 85	0
1	B	445/464 (95%)	-0.10	3 (0%)	87	90	23, 43, 66, 77	0
1	C	446/464 (96%)	0.10	22 (4%)	29	35	24, 56, 94, 117	0
All	All	1336/1392 (95%)	0.01	31 (2%)	60	67	23, 48, 84, 117	0

The worst 5 of 31 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	197	ASP	4.6
1	C	221	ALA	3.9
1	A	28	GLY	3.8
1	C	408	ILE	3.8
1	C	200	VAL	3.7

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)

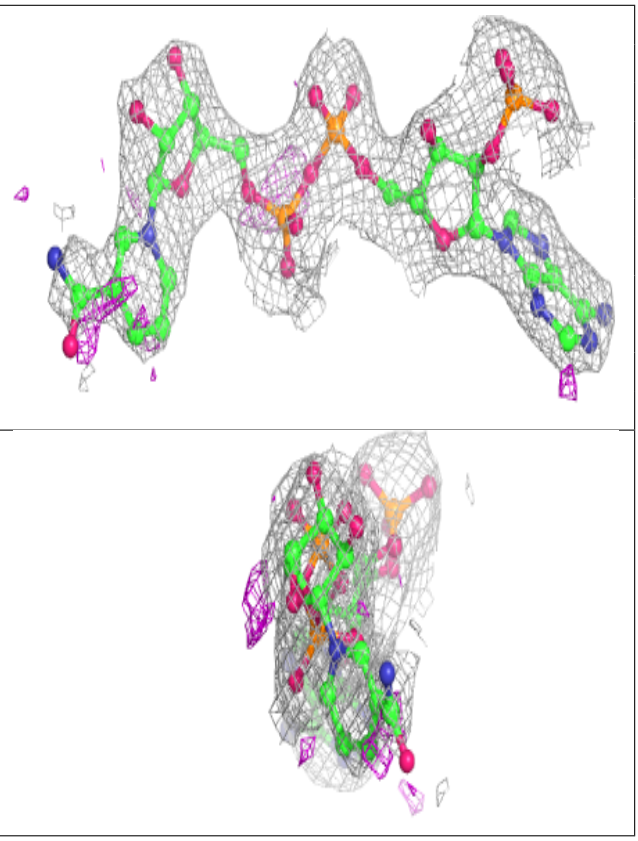
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists 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	MES	C	1449	12/12	0.68	0.35	135,135,136,136	0
4	GOL	B	1448	6/6	0.76	0.33	58,61,61,61	0
3	NAP	C	1450	48/48	0.91	0.17	65,70,78,78	0
3	NAP	A	1449	48/48	0.95	0.13	44,49,56,57	0
3	NAP	B	1449	48/48	0.97	0.13	34,41,45,46	0
2	FAD	C	1448	53/53	0.97	0.15	23,34,38,40	0
2	FAD	A	1448	53/53	0.98	0.14	25,32,36,37	0
2	FAD	B	1447	53/53	0.98	0.15	21,26,31,33	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.

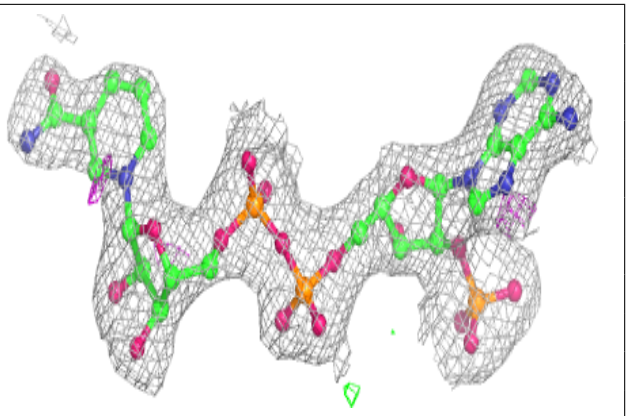
Electron density around NAP C 1450:

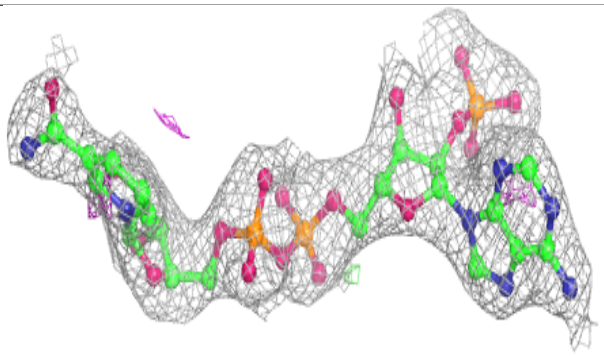
2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)

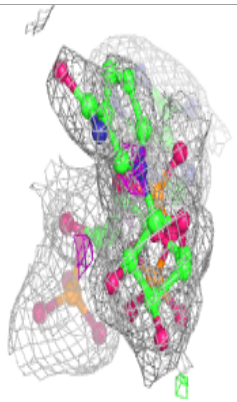


Electron density around NAP A 1449:

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

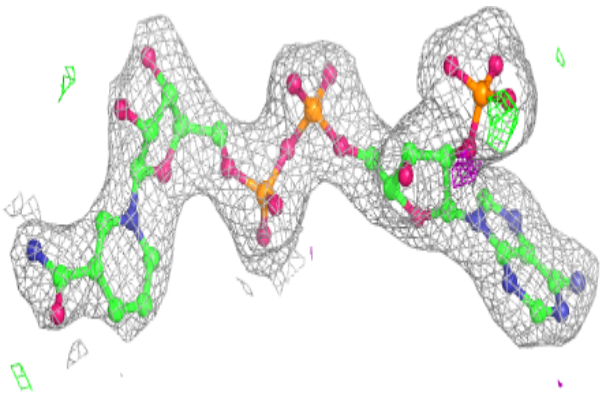


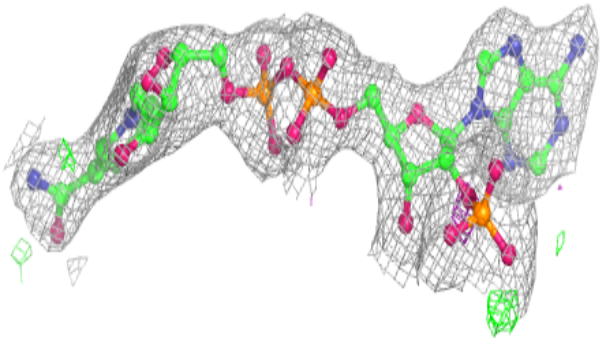


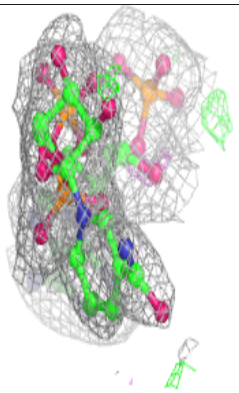


Electron density around NAP B 1449:

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

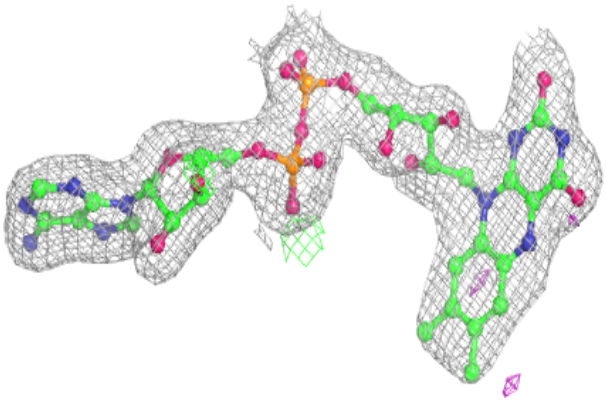


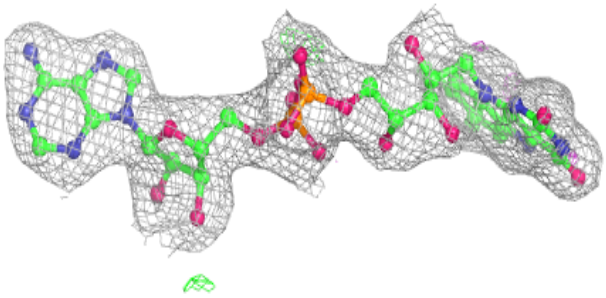


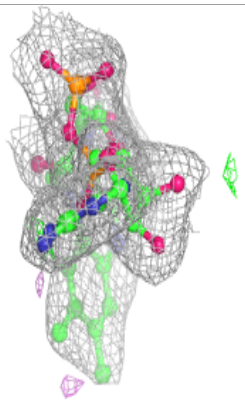


Electron density around FAD C 1448:

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

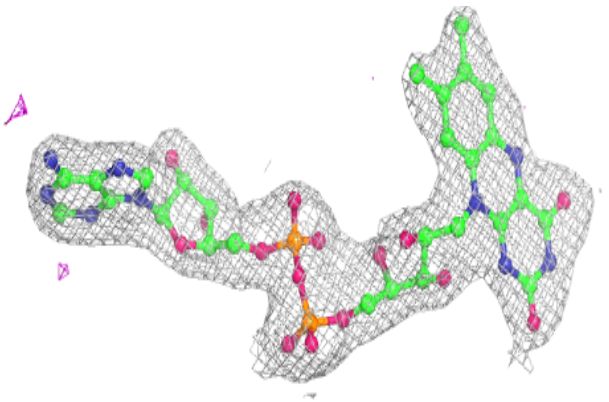


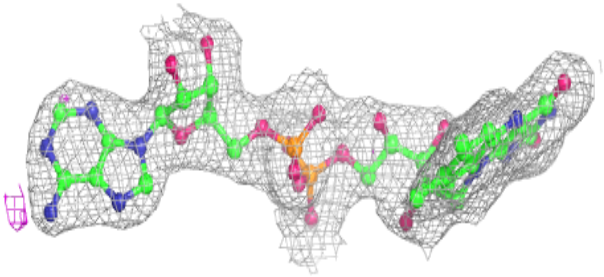


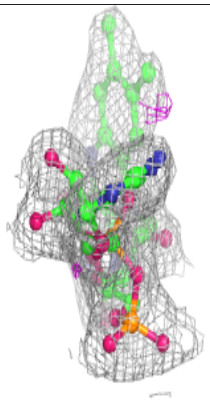


Electron density around FAD A 1448:

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







Electron density around FAD B 1447:

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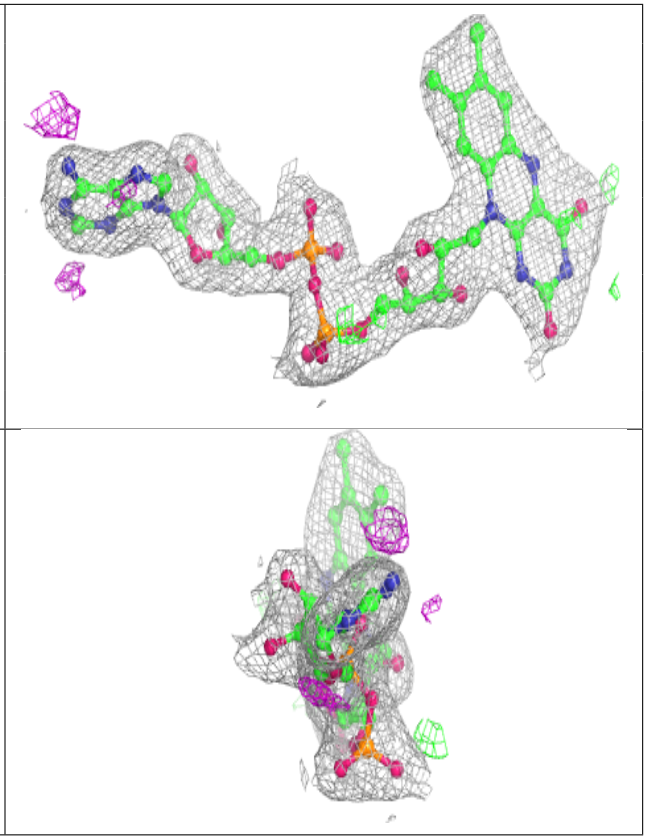
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



6.5 Other polymers (i)

There are no such residues in this entry.