



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 20, 2024 – 11:40 PM EDT

PDB ID : 1S3B
Title : Crystal structure of MAOB in complex with N-methyl-N-propargyl-1(R)-aminindan
Authors : Binda, C.; Hubalek, F.; Li, M.; Herzig, Y.; Sterling, J.; Edmondson, D.E.; Mattevi, A.
Deposited on : 2004-01-13
Resolution : 1.65 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 : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 1.20.1
EDS : 3.0
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4 : 9.0.003 (Gargrove)
Density-Fitness : 1.0.11
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

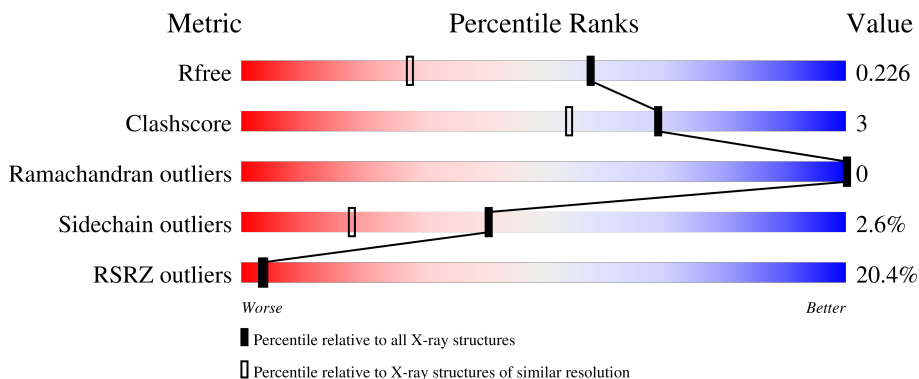
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.65 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	2328 (1.66-1.66)
Clashscore	180529	2515 (1.66-1.66)
Ramachandran outliers	177936	2475 (1.66-1.66)
Sidechain outliers	177891	2475 (1.66-1.66)
RSRZ outliers	164620	2328 (1.66-1.66)

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 $\leq 5\%$. 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	520	
1	B	520	

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 8864 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 Amine oxidase [flavin-containing] B.

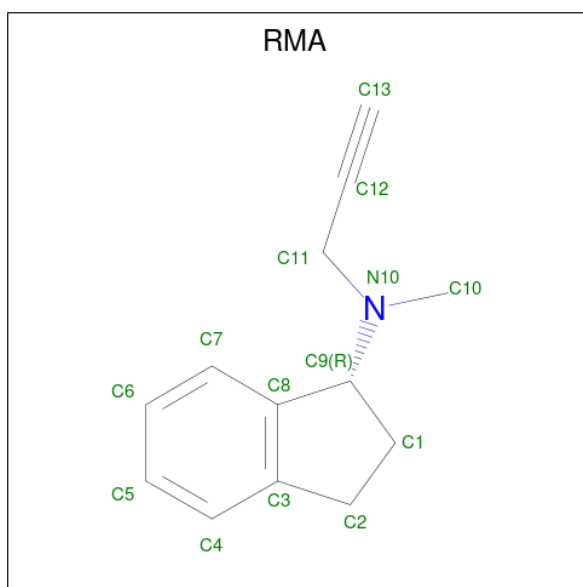
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	499	Total 3971	2538	681	728	24	0	0	0
1	B	494	Total 3940	2519	676	721	24	0	0	0

- 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	Total 53	27	9	15	2	0	0
2	B	1	Total 53	27	9	15	2	0	0

- Molecule 3 is N-[(1S)-2,3-DIHYDRO-1H-INDEN-1-YL]-N-METHYL-N-PROP-2-YNYLAMINE (three-letter code: RMA) (formula: $C_{13}H_{15}N$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	N	0	0
			14	13	1		
3	B	1	Total	C	N	0	0
			14	13	1		

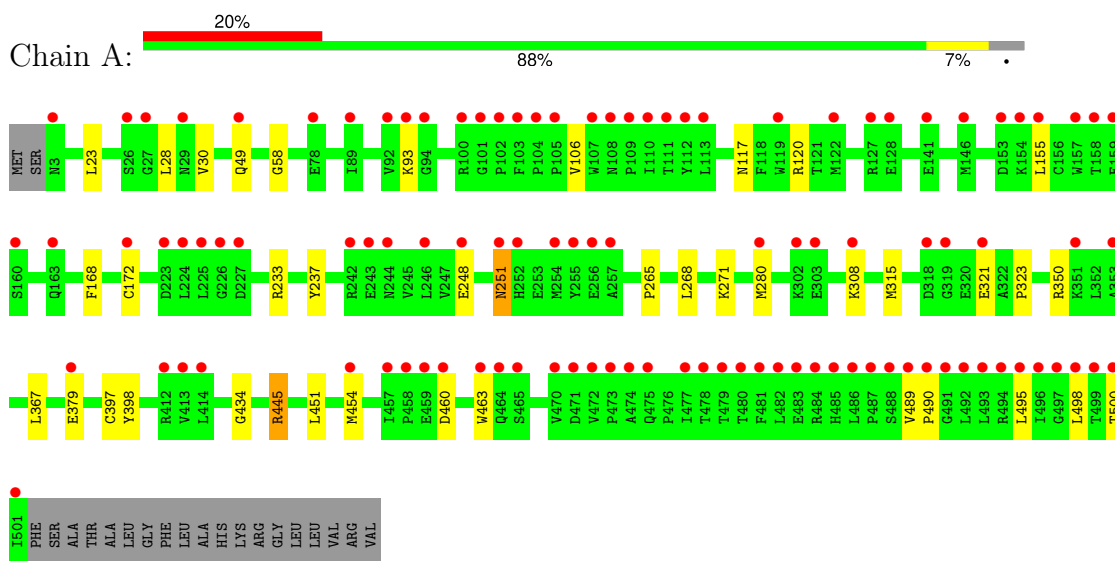
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	376	Total	O	0	0
			376	376		
4	B	443	Total	O	0	0
			443	443		

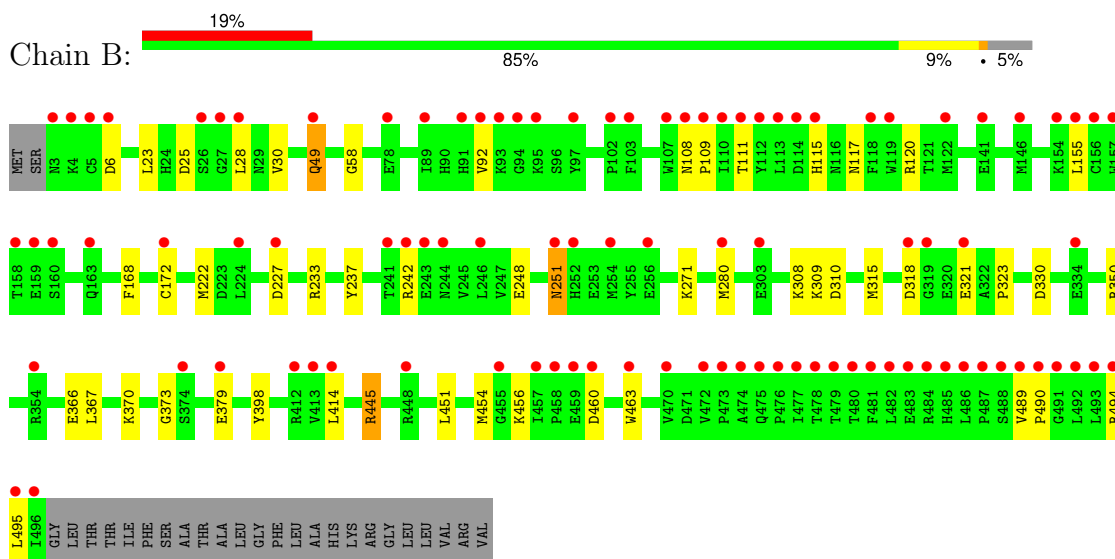
3 Residue-property plots [i](#)

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: Amine oxidase [flavin-containing] B



- Molecule 1: Amine oxidase [flavin-containing] B



4 Data and refinement statistics i

Property	Value	Source
Space group	C 2 2 2	Depositor
Cell constants a, b, c, α , β , γ	130.76Å 222.91Å 86.17Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	15.00 – 1.65 15.00 – 1.65	Depositor EDS
% Data completeness (in resolution range)	98.1 (15.00-1.65) 97.9 (15.00-1.65)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.25 (at 1.65Å)	Xtrriage
Refinement program	REFMAC 5.1.24	Depositor
R, R_{free}	0.203 , 0.223 0.207 , 0.226	Depositor DCC
R_{free} test set	3732 reflections (2.53%)	wwPDB-VP
Wilson B-factor (Å ²)	14.6	Xtrriage
Anisotropy	0.301	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.42 , 70.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.012 for 1/2*h-1/2*k,-3/2*h-1/2*k,-l 0.015 for 1/2*h+1/2*k,3/2*h-1/2*k,-l	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	8864	wwPDB-VP
Average B, all atoms (Å ²)	40.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.21% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ 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: FAD, RMA

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	0.38	0/4068	0.65	2/5522 (0.0%)
1	B	0.36	0/4037	0.65	7/5479 (0.1%)
All	All	0.37	0/8105	0.65	9/11001 (0.1%)

There are no bond length outliers.

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	445	ARG	NE-CZ-NH2	-6.55	117.02	120.30
1	A	315	MET	CG-SD-CE	5.82	109.51	100.20
1	B	315	MET	CG-SD-CE	5.82	109.51	100.20
1	A	445	ARG	NE-CZ-NH2	-5.68	117.46	120.30
1	B	227	ASP	CB-CG-OD2	5.38	123.15	118.30
1	B	445	ARG	NE-CZ-NH1	5.25	122.92	120.30
1	B	310	ASP	CB-CG-OD2	5.13	122.92	118.30
1	B	6	ASP	CB-CG-OD2	5.11	122.90	118.30
1	B	330	ASP	CB-CG-OD2	5.08	122.88	118.30

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	3971	0	3967	23	0
1	B	3940	0	3937	31	1
2	A	53	0	29	2	0
2	B	53	0	29	1	0
3	A	14	0	15	2	0
3	B	14	0	15	1	0
4	A	376	0	0	2	0
4	B	443	0	0	5	0
All	All	8864	0	7992	54	1

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 3.

All (54) 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:92:VAL:HB	1:B:318:ASP:OD2	1.79	0.83
1:A:28:LEU:HD11	1:A:454:MET:HE1	1.64	0.78
1:B:28:LEU:HD11	1:B:454:MET:HE1	1.67	0.75
1:B:117:ASN:HD22	1:B:120:ARG:HH21	1.37	0.72
1:A:117:ASN:HD22	1:A:120:ARG:HH21	1.38	0.71
1:B:92:VAL:CG2	1:B:318:ASP:OD2	2.42	0.68
1:B:414:LEU:HD12	4:B:811:HOH:O	1.95	0.67
1:B:251:ASN:HD22	1:B:251:ASN:H	1.44	0.66
1:B:92:VAL:CB	1:B:318:ASP:OD2	2.44	0.65
1:A:251:ASN:HD22	1:A:251:ASN:H	1.43	0.64
1:A:451:LEU:HA	1:A:454:MET:HE2	1.81	0.60
1:B:451:LEU:HA	1:B:454:MET:HE2	1.83	0.60
1:A:445:ARG:HD2	1:A:463:TRP:CH2	2.39	0.58
1:B:92:VAL:HG23	1:B:318:ASP:OD2	2.04	0.57
1:B:445:ARG:HD3	4:B:616:HOH:O	2.04	0.56
1:B:445:ARG:HD2	1:B:463:TRP:CH2	2.40	0.56
1:A:445:ARG:HD2	1:A:463:TRP:CZ2	2.42	0.54
1:A:271:LYS:HE2	4:A:767:HOH:O	2.12	0.50
1:A:445:ARG:HD3	4:A:623:HOH:O	2.11	0.50
1:B:445:ARG:HD2	1:B:463:TRP:CZ2	2.46	0.50
1:A:233:ARG:HG3	1:A:251:ASN:HD21	1.77	0.50
1:B:233:ARG:HG3	1:B:251:ASN:HD21	1.77	0.50
1:B:168:PHE:CE1	1:B:172:CYS:SG	3.05	0.50
1:A:321:GLU:H	1:A:321:GLU:CD	2.15	0.49
1:B:321:GLU:H	1:B:321:GLU:CD	2.17	0.48
1:A:58:GLY:HA2	2:A:600:FAD:C4X	2.44	0.48

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:398:TYR:CZ	3:A:601:RMA:H111	2.48	0.48
1:B:58:GLY:HA2	2:B:600:FAD:C4X	2.46	0.46
1:B:222:MET:HE3	4:B:859:HOH:O	2.15	0.46
1:B:237:TYR:HB3	1:B:248:GLU:HB3	1.98	0.45
1:B:398:TYR:CZ	3:B:601:RMA:H111	2.51	0.45
1:A:168:PHE:CE1	1:A:172:CYS:SG	3.09	0.45
1:B:308:LYS:HB2	1:B:308:LYS:HE2	1.88	0.45
1:B:366:GLU:O	1:B:370:LYS:HG3	2.17	0.44
1:A:237:TYR:HB3	1:A:248:GLU:HB3	1.99	0.44
1:A:265:PRO:HD2	1:A:268:LEU:HD12	2.00	0.44
1:B:111:THR:HG22	1:B:115:HIS:CD2	2.52	0.43
1:A:308:LYS:HB2	1:A:308:LYS:HE2	1.87	0.43
1:B:323:PRO:HD2	1:B:367:LEU:HD22	2.00	0.43
1:A:323:PRO:HD2	1:A:367:LEU:HD22	2.00	0.43
1:A:117:ASN:HD22	1:A:120:ARG:NH2	2.12	0.43
1:A:251:ASN:H	1:A:251:ASN:ND2	2.13	0.43
1:B:251:ASN:H	1:B:251:ASN:ND2	2.13	0.43
1:A:172:CYS:SG	3:A:601:RMA:H6	2.59	0.42
1:B:454:MET:HE3	1:B:456:LYS:HG3	2.02	0.42
1:B:489:VAL:N	1:B:490:PRO:HD2	2.35	0.42
1:B:108:ASN:HA	1:B:109:PRO:HD3	1.87	0.42
1:B:309:LYS:NZ	1:B:373:GLY:O	2.53	0.41
1:B:271:LYS:HE2	4:B:858:HOH:O	2.20	0.41
1:A:489:VAL:N	1:A:490:PRO:HD2	2.35	0.41
1:A:23:LEU:HB2	1:A:30:VAL:HG11	2.03	0.41
1:B:494:ARG:NH1	4:B:926:HOH:O	2.54	0.40
1:A:434:GLY:O	2:A:600:FAD:H1'2	2.21	0.40
1:B:23:LEU:HB2	1:B:30:VAL:HG11	2.02	0.40

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

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:25:ASP:O	1:B:49:GLN:NE2[4_565]	2.01	0.19

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	497/520 (96%)	486 (98%)	11 (2%)	0	100	100
1	B	492/520 (95%)	480 (98%)	12 (2%)	0	100	100
All	All	989/1040 (95%)	966 (98%)	23 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	427/444 (96%)	414 (97%)	13 (3%)	36	13
1	B	424/444 (96%)	415 (98%)	9 (2%)	48	26
All	All	851/888 (96%)	829 (97%)	22 (3%)	41	18

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

Mol	Chain	Res	Type
1	A	49	GLN
1	A	93	LYS
1	A	106	VAL
1	A	155	LEU
1	A	251	ASN
1	A	280	MET
1	A	350	ARG
1	A	379	GLU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	397	CYS
1	A	460	ASP
1	A	495	LEU
1	A	498	LEU
1	A	500	THR
1	B	49	GLN
1	B	155	LEU
1	B	242	ARG
1	B	251	ASN
1	B	280	MET
1	B	350	ARG
1	B	379	GLU
1	B	460	ASP
1	B	495	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	117	ASN
1	A	251	ASN
1	B	117	ASN
1	B	170	ASN
1	B	251	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

4 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	FAD	B	600	3,1	54,58,58	1.09	4 (7%)	71,89,89	1.49	10 (14%)
3	RMA	B	601	2	14,15,15	2.86	3 (21%)	15,20,20	8.56	7 (46%)
2	FAD	A	600	3,1	54,58,58	1.14	4 (7%)	71,89,89	1.48	10 (14%)
3	RMA	A	601	2	14,15,15	2.82	3 (21%)	15,20,20	8.64	7 (46%)

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	FAD	B	600	3,1	-	2/30/50/50	0/6/6/6
3	RMA	B	601	2	-	4/6/16/16	0/2/2/2
2	FAD	A	600	3,1	-	2/30/50/50	0/6/6/6
3	RMA	A	601	2	-	4/6/16/16	0/2/2/2

All (14) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	601	RMA	C10-N10	-8.17	1.29	1.46
3	A	601	RMA	C10-N10	-8.13	1.29	1.46
3	B	601	RMA	C11-C12	5.00	1.54	1.46
3	A	601	RMA	C11-C12	4.86	1.54	1.46
3	B	601	RMA	C12-C13	4.16	1.30	1.18
3	A	601	RMA	C12-C13	4.09	1.30	1.18
2	A	600	FAD	C4X-N5	3.97	1.39	1.30
2	B	600	FAD	C4X-N5	3.78	1.38	1.30
2	A	600	FAD	C2A-N3A	3.61	1.37	1.32
2	B	600	FAD	C2A-N3A	3.48	1.37	1.32
2	A	600	FAD	C10-N1	3.01	1.39	1.33
2	B	600	FAD	C10-N1	2.64	1.38	1.33
2	B	600	FAD	C2A-N1A	2.55	1.38	1.33
2	A	600	FAD	C2A-N1A	2.54	1.38	1.33

All (34) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	601	RMA	C11-C12-C13	-32.33	125.19	177.63
3	B	601	RMA	C11-C12-C13	-31.98	125.76	177.63
2	A	600	FAD	N3A-C2A-N1A	-6.40	119.98	128.67
2	B	600	FAD	N3A-C2A-N1A	-6.37	120.02	128.67
3	A	601	RMA	C12-C11-N10	5.24	121.69	112.19
3	B	601	RMA	C12-C11-N10	5.07	121.39	112.19
2	B	600	FAD	C9A-C5X-N5	-4.19	118.00	122.45
3	A	601	RMA	C11-N10-C9	3.63	118.63	113.65
3	B	601	RMA	C11-N10-C9	3.59	118.57	113.65
2	A	600	FAD	C9A-C5X-N5	-3.39	118.85	122.45
2	A	600	FAD	C4-N3-C2	-3.09	120.15	125.64
2	A	600	FAD	C9A-N10-C10	-3.07	116.07	120.75
2	B	600	FAD	C9A-N10-C10	-2.92	116.30	120.75
3	B	601	RMA	C6-C7-C8	-2.88	117.53	120.99
2	A	600	FAD	C4X-C4-N3	2.75	120.25	113.25
2	B	600	FAD	C4-N3-C2	-2.72	120.81	125.64
3	A	601	RMA	C6-C7-C8	-2.71	117.75	120.99
2	A	600	FAD	C5'-C4'-C3'	-2.68	107.16	112.22
3	A	601	RMA	C2-C1-C9	2.65	108.58	105.91
2	B	600	FAD	C4X-C4-N3	2.61	119.89	113.25
2	A	600	FAD	C10-C4X-N5	-2.58	119.53	124.81
3	B	601	RMA	C2-C1-C9	2.56	108.49	105.91
3	B	601	RMA	C3-C8-C9	2.54	112.22	110.62
2	B	600	FAD	C5'-C4'-C3'	-2.52	107.46	112.22
2	B	600	FAD	C10-C4X-N5	-2.48	119.75	124.81
3	A	601	RMA	C3-C8-C9	2.46	112.17	110.62
2	A	600	FAD	C1B-N9A-C4A	-2.38	122.46	126.64
2	B	600	FAD	O4-C4-C4X	-2.35	120.32	126.53
3	B	601	RMA	C5-C4-C3	-2.24	117.59	120.88
2	A	600	FAD	C4-C4X-N5	2.18	121.22	118.21
2	A	600	FAD	O4-C4-C4X	-2.12	120.94	126.53
2	B	600	FAD	C4-C4X-N5	2.11	121.12	118.21
2	B	600	FAD	C1B-N9A-C4A	-2.09	122.97	126.64
3	A	601	RMA	C5-C4-C3	-2.01	117.94	120.88

There are no chirality outliers.

All (12) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	601	RMA	C12-C11-N10-C10
3	A	601	RMA	C12-C11-N10-C9

Continued on next page...

Continued from previous page...

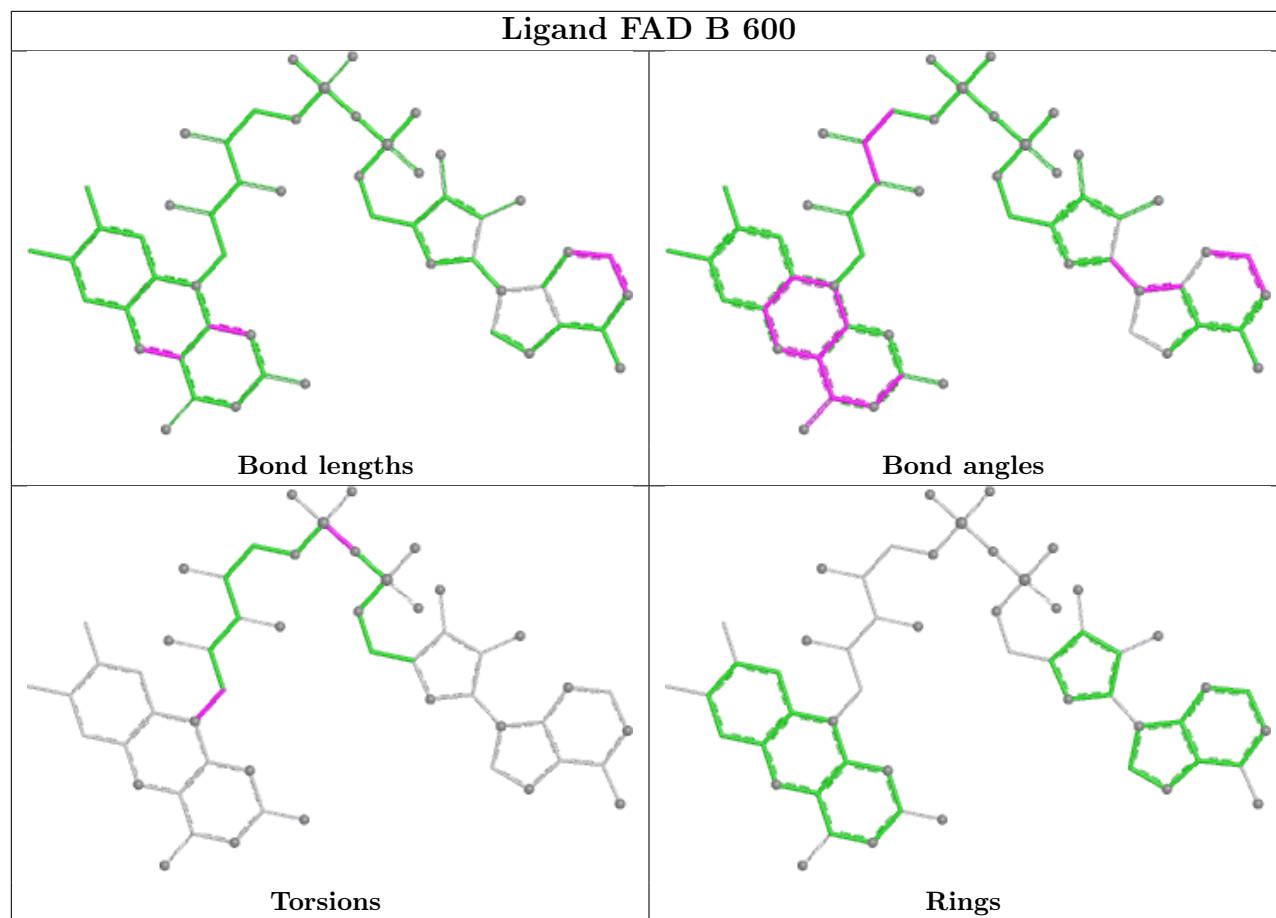
Mol	Chain	Res	Type	Atoms
3	A	601	RMA	C8-C9-N10-C11
3	B	601	RMA	C12-C11-N10-C10
3	B	601	RMA	C12-C11-N10-C9
2	B	600	FAD	PA-O3P-P-O5'
3	B	601	RMA	C1-C9-N10-C11
2	A	600	FAD	C2'-C1'-N10-C10
2	B	600	FAD	C2'-C1'-N10-C10
3	B	601	RMA	C8-C9-N10-C11
2	A	600	FAD	PA-O3P-P-O5'
3	A	601	RMA	C1-C9-N10-C11

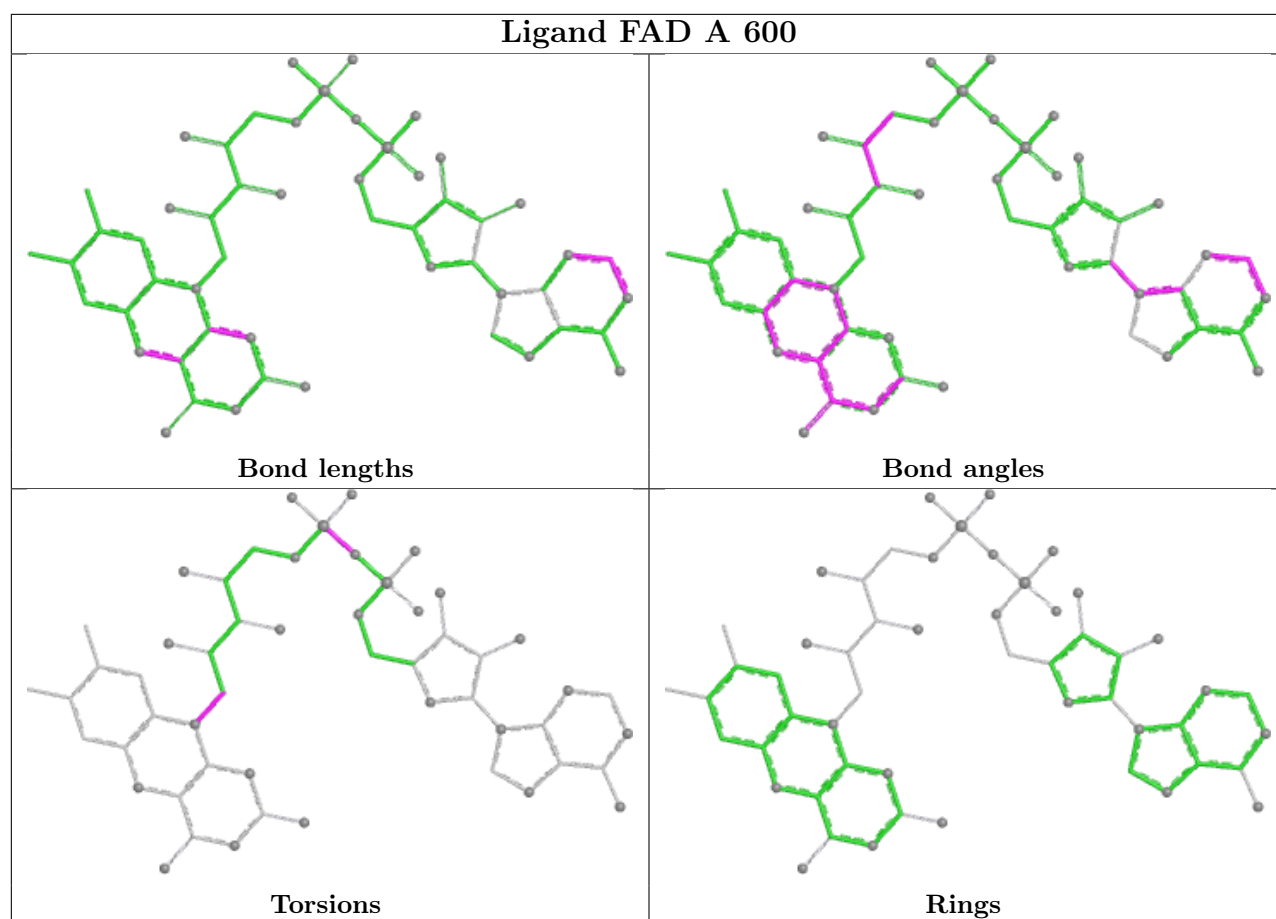
There are no ring outliers.

4 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	600	FAD	1	0
3	B	601	RMA	1	0
2	A	600	FAD	2	0
3	A	601	RMA	2	0

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





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, 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	499/520 (95%)	1.15	106 (21%) 3 3	28, 37, 55, 78	0
1	B	494/520 (95%)	1.18	97 (19%) 4 4	28, 37, 52, 72	0
All	All	993/1040 (95%)	1.17	203 (20%) 3 4	28, 37, 53, 78	0

All (203) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	496	ILE	7.8
1	B	495	LEU	6.6
1	A	501	ILE	6.2
1	B	92	VAL	6.1
1	B	481	PHE	5.6
1	B	157	TRP	5.2
1	A	103	PHE	5.2
1	A	497	GLY	5.1
1	B	103	PHE	5.1
1	A	252	HIS	5.1
1	A	498	LEU	4.9
1	A	481	PHE	4.9
1	A	480	THR	4.9
1	B	494	ARG	4.8
1	A	460	ASP	4.8
1	B	493	LEU	4.8
1	B	93	LYS	4.7
1	B	482	LEU	4.7
1	B	107	TRP	4.6
1	A	111	THR	4.6
1	B	95	LYS	4.6
1	A	500	THR	4.6
1	A	479	THR	4.6
1	A	482	LEU	4.5

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	B	89	ILE	4.5
1	B	49	GLN	4.5
1	A	499	THR	4.4
1	A	107	TRP	4.4
1	B	110	ILE	4.3
1	B	492	LEU	4.3
1	B	460	ASP	4.3
1	A	413	VAL	4.2
1	A	486	LEU	4.2
1	B	489	VAL	4.2
1	B	254	MET	4.1
1	A	492	LEU	4.1
1	A	470	VAL	4.1
1	B	119	TRP	4.1
1	B	3	ASN	4.0
1	B	243	GLU	4.0
1	B	158	THR	4.0
1	A	157	TRP	4.0
1	B	252	HIS	3.9
1	B	112	TYR	3.9
1	A	496	ILE	3.9
1	B	224	LEU	3.9
1	A	494	ARG	3.8
1	A	224	LEU	3.8
1	A	92	VAL	3.8
1	A	227	ASP	3.8
1	A	319	GLY	3.8
1	B	479	THR	3.7
1	B	490	PRO	3.7
1	B	475	GLN	3.7
1	A	105	PRO	3.7
1	B	246	LEU	3.7
1	A	471	ASP	3.6
1	B	455	GLY	3.6
1	B	111	THR	3.6
1	A	495	LEU	3.6
1	A	493	LEU	3.5
1	B	155	LEU	3.5
1	B	172	CYS	3.5
1	A	89	ILE	3.5
1	A	109	PRO	3.5
1	B	118	PHE	3.5

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	B	26	SER	3.5
1	A	489	VAL	3.4
1	A	483	GLU	3.4
1	A	484	ARG	3.4
1	A	3	ASN	3.4
1	A	475	GLN	3.4
1	A	155	LEU	3.4
1	A	321	GLU	3.4
1	B	491	GLY	3.4
1	A	478	THR	3.3
1	A	49	GLN	3.3
1	B	474	ALA	3.3
1	B	227	ASP	3.2
1	A	93	LYS	3.2
1	B	318	ASP	3.2
1	B	303	GLU	3.2
1	A	154	LYS	3.2
1	A	488	SER	3.1
1	B	473	PRO	3.1
1	B	321	GLU	3.1
1	B	244	ASN	3.1
1	B	485	HIS	3.1
1	B	141	GLU	3.1
1	B	154	LYS	3.0
1	B	242	ARG	3.0
1	A	474	ALA	3.0
1	B	457	ILE	3.0
1	B	486	LEU	3.0
1	B	241	THR	3.0
1	B	160	SER	3.0
1	A	254	MET	3.0
1	B	122	MET	3.0
1	B	319	GLY	3.0
1	A	477	ILE	3.0
1	A	491	GLY	2.9
1	A	29	ASN	2.9
1	A	243	GLU	2.9
1	B	379	GLU	2.9
1	B	114	ASP	2.9
1	A	141	GLU	2.8
1	B	94	GLY	2.8
1	A	242	ARG	2.8

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	B	413	VAL	2.8
1	A	112	TYR	2.8
1	A	487	PRO	2.8
1	A	414	LEU	2.8
1	A	110	ILE	2.8
1	A	251	ASN	2.8
1	B	476	PRO	2.8
1	B	97	TYR	2.8
1	B	113	LEU	2.7
1	B	251	ASN	2.7
1	A	101	GLY	2.7
1	A	473	PRO	2.7
1	B	109	PRO	2.7
1	B	463	TRP	2.7
1	A	246	LEU	2.7
1	A	412	ARG	2.7
1	B	477	ILE	2.7
1	A	226	GLY	2.7
1	B	484	ARG	2.7
1	A	128	GLU	2.6
1	A	244	ASN	2.6
1	A	303	GLU	2.6
1	A	113	LEU	2.6
1	B	27	GLY	2.6
1	B	280	MET	2.6
1	B	354	ARG	2.6
1	B	78	GLU	2.5
1	B	374	SER	2.5
1	B	488	SER	2.5
1	B	483	GLU	2.5
1	A	102	PRO	2.5
1	A	490	PRO	2.5
1	B	472	VAL	2.5
1	B	459	GLU	2.5
1	A	100	ARG	2.4
1	B	480	THR	2.4
1	A	256	GLU	2.4
1	A	122	MET	2.4
1	A	308	LYS	2.4
1	A	351	LYS	2.4
1	B	91	HIS	2.4
1	A	472	VAL	2.4

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	B	412	ARG	2.4
1	A	223	ASP	2.4
1	B	108	ASN	2.4
1	A	302	LYS	2.4
1	B	487	PRO	2.4
1	A	159	GLU	2.4
1	A	104	PRO	2.3
1	B	163	GLN	2.3
1	A	459	GLU	2.3
1	A	318	ASP	2.3
1	A	158	THR	2.3
1	A	225	LEU	2.3
1	A	465	SER	2.3
1	B	4	LYS	2.3
1	A	94	GLY	2.3
1	A	485	HIS	2.3
1	B	159	GLU	2.3
1	A	26	SER	2.3
1	A	172	CYS	2.2
1	A	153	ASP	2.2
1	A	280	MET	2.2
1	B	5	CYS	2.2
1	A	458	PRO	2.2
1	B	458	PRO	2.2
1	A	78	GLU	2.2
1	A	457	ILE	2.2
1	B	115	HIS	2.2
1	A	353	ALA	2.2
1	A	127	ARG	2.2
1	B	448	ARG	2.2
1	A	27	GLY	2.2
1	A	163	GLN	2.2
1	A	379	GLU	2.2
1	A	255	TYR	2.2
1	B	28	LEU	2.2
1	B	414	LEU	2.2
1	B	334	GLU	2.1
1	A	108	ASN	2.1
1	A	119	TRP	2.1
1	A	146	MET	2.1
1	A	160	SER	2.1
1	A	248	GLU	2.1

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	B	256	GLU	2.1
1	B	6	ASP	2.1
1	A	463	TRP	2.1
1	A	454	MET	2.1
1	B	470	VAL	2.1
1	B	478	THR	2.0
1	B	146	MET	2.0
1	B	102	PRO	2.0
1	B	156	CYS	2.0
1	A	257	ALA	2.0
1	A	464	GLN	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](#)

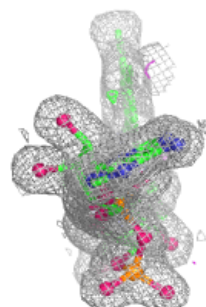
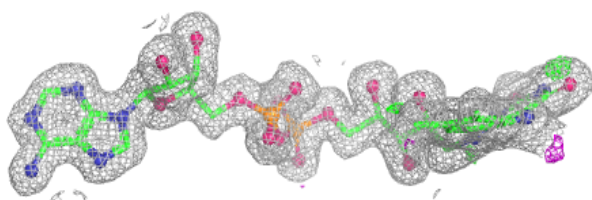
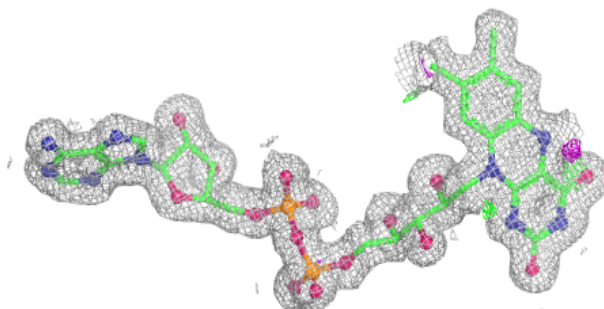
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	RMA	A	601	14/14	0.88	0.13	37,43,44,44	0
3	RMA	B	601	14/14	0.91	0.11	38,42,43,44	0
2	FAD	A	600	53/53	0.98	0.07	29,31,33,33	0
2	FAD	B	600	53/53	0.98	0.07	28,31,33,33	0

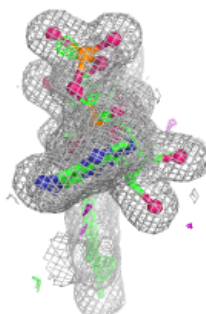
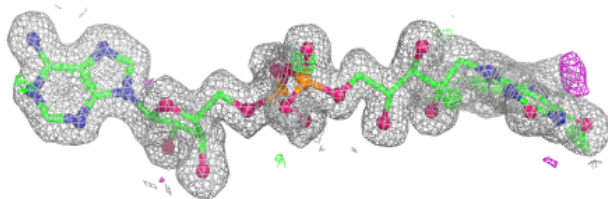
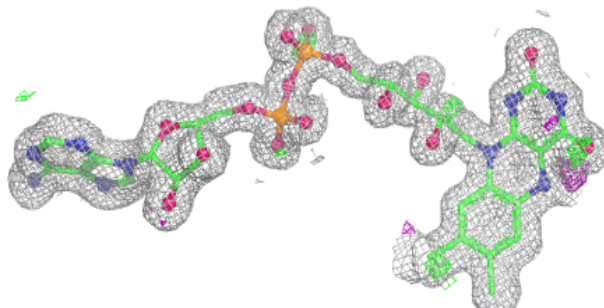
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around FAD A 600:

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

**Electron density around FAD B 600:**

$2mF_o-DF_c$ (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.