



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 28, 2026 – 07:02 PM UTC

PDB ID : 1S3E / pdb_00001s3e
Title : Crystal structure of MAOB in complex with 6-hydroxy-N-propargyl-1(R)-aminoindan
Authors : Binda, C.; Hubalek, F.; Li, M.; Herzig, Y.; Sterling, J.; Edmondson, D.E.; Mattevi, A.
Deposited on : 2004-01-13
Resolution : 1.60 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	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

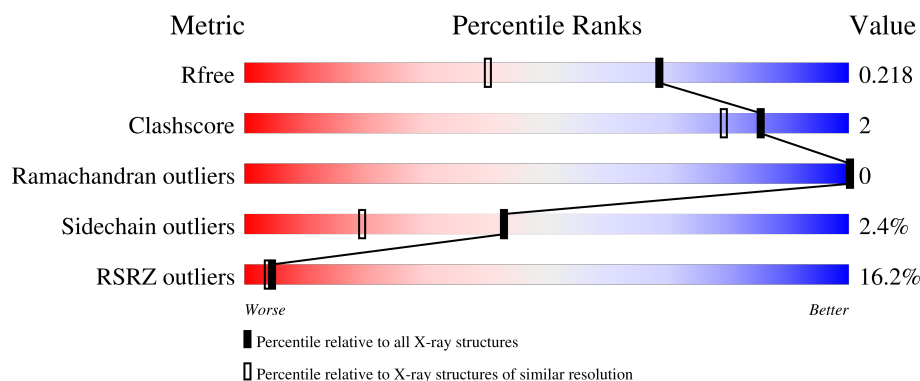
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.60 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}	180053	4673 (1.60-1.60)
Clashscore	190562	4931 (1.60-1.60)
Ramachandran outliers	187476	4831 (1.60-1.60)
Sidechain outliers	187428	4830 (1.60-1.60)
RSRZ outliers	180081	4672 (1.60-1.60)

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	15% 91% 5% .
1	B	520	16% 89% 6% 5%

2 Entry composition [i](#)

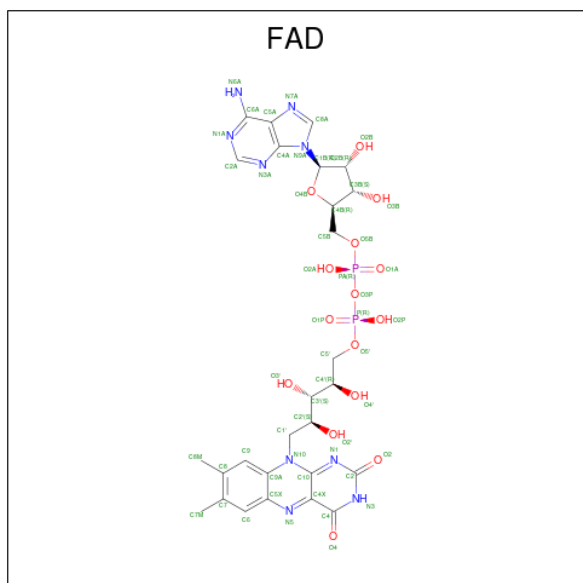
There are 4 unique types of molecules in this entry. The entry contains 8838 atoms, of which 0 are hydrogens and 0 are deuteriums.

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.

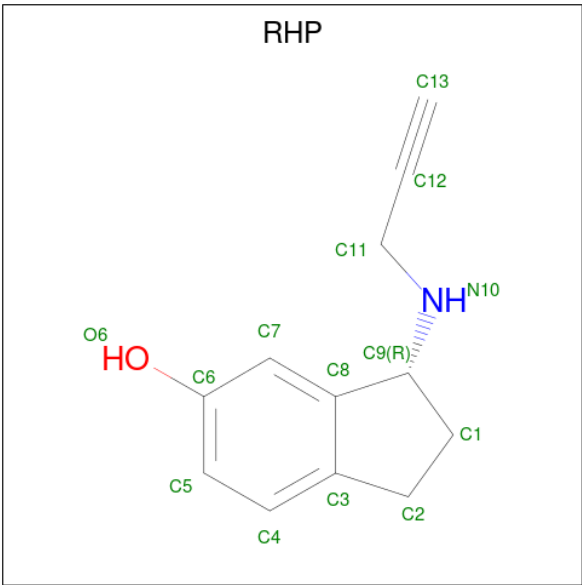
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	499	Total	C	N	O	S	0	1	0
			3972	2538	681	728	25			
1	B	494	Total	C	N	O	S	0	1	0
			3941	2519	676	721	25			

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



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

- Molecule 3 is (3R)-3-(PROP-2-YNYLAMINO)INDAN-5-OL (CCD ID: RHP) (formula: $C_{12}H_{13}NO$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			14	12	1	1		
3	B	1	Total	C	N	O	0	0
			14	12	1	1		

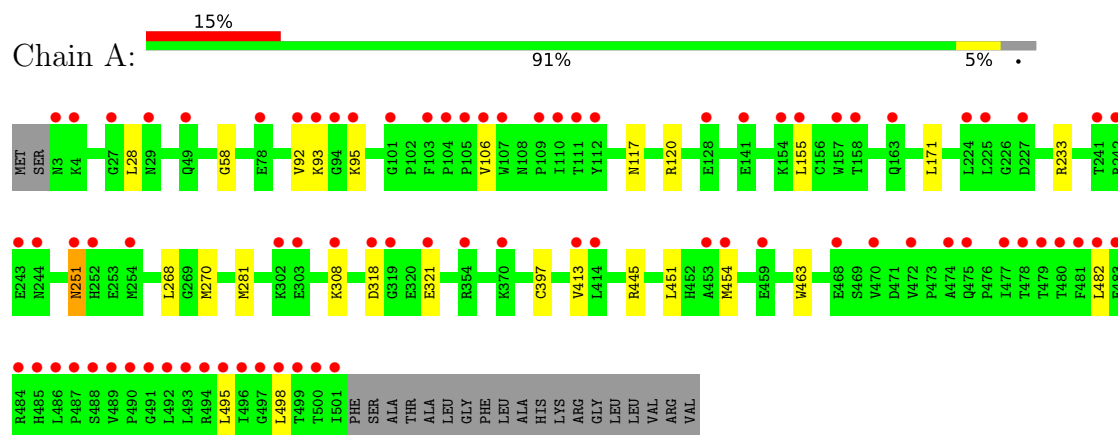
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	359	Total	O	0	0
			359	359		
4	B	432	Total	O	0	0
			432	432		

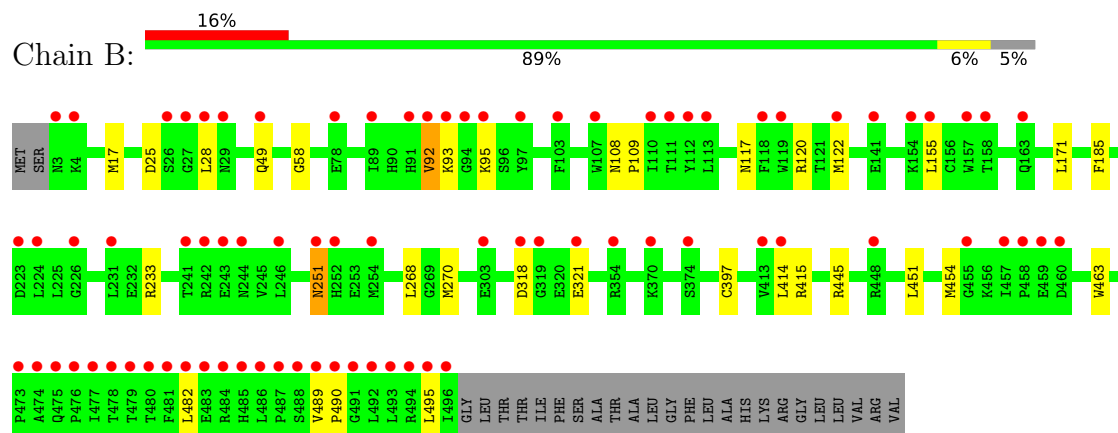
3 Residue-property plots

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: Amine oxidase [flavin-containing] B



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



4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 2	Depositor
Cell constants a, b, c, α , β , γ	131.96Å 224.06Å 86.63Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	15.00 – 1.60 15.00 – 1.60	Depositor EDS
% Data completeness (in resolution range)	88.6 (15.00-1.60) 88.5 (15.00-1.60)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.41 (at 1.60Å)	Xtriage
Refinement program	REFMAC 5.1.24	Depositor
R, R_{free}	0.198 , 0.216 0.199 , 0.218	Depositor DCC
R_{free} test set	3823 reflections (2.56%)	wwPDB-VP
Wilson B-factor (Å ²)	15.9	Xtriage
Anisotropy	0.222	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.40 , 69.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.009 for 1/2*h-1/2*k,-3/2*h-1/2*k,-l 0.011 for 1/2*h+1/2*k,3/2*h-1/2*k,-l	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	8838	wwPDB-VP
Average B, all atoms (Å ²)	37.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.96% 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

5.1 Standard geometry

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

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	0.47	0/4074	0.77	0/5530
1	B	0.46	1/4043 (0.0%)	0.76	0/5487
All	All	0.47	1/8117 (0.0%)	0.76	0/11017

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	17	MET	SD-CE	-5.21	1.66	1.79

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	3972	0	3968	17	0
1	B	3941	0	3938	21	1
2	A	53	0	29	1	0
2	B	53	0	29	1	0
3	A	14	0	13	1	0
3	B	14	0	13	1	0
4	A	359	0	0	1	0
4	B	432	0	0	4	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	8838	0	7990	36	1

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

All (36) 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	4:B:1022:HOH:O	1.55	1.06
1:A:28:LEU:HD11	1:A:454:MET:HE1	1.70	0.73
1:B:28:LEU:HD11	1:B:454:MET:HE1	1.73	0.71
1:A:117:ASN:HD22	1:A:120:ARG:HH21	1.39	0.69
1:B:117:ASN:HD22	1:B:120:ARG:HH21	1.39	0.68
1:B:251:ASN:HD22	1:B:251:ASN:H	1.43	0.66
1:A:251:ASN:HD22	1:A:251:ASN:H	1.43	0.66
1:A:445:ARG:HD2	1:A:463:TRP:CH2	2.34	0.63
1:A:451:LEU:HA	1:A:454:MET:HE2	1.82	0.62
1:B:445:ARG:HD2	1:B:463:TRP:CH2	2.34	0.61
1:B:445:ARG:HD3	4:B:602:HOH:O	2.01	0.61
1:B:451:LEU:HA	1:B:454:MET:HE2	1.85	0.59
1:B:445:ARG:HD2	1:B:463:TRP:CZ2	2.42	0.54
1:B:233:ARG:HG3	1:B:251:ASN:HD21	1.73	0.53
1:A:445:ARG:HD3	4:A:628:HOH:O	2.09	0.52
1:A:445:ARG:HD2	1:A:463:TRP:CZ2	2.44	0.51
1:A:233:ARG:HG3	1:A:251:ASN:HD21	1.76	0.51
1:A:321:GLU:H	1:A:321:GLU:CD	2.20	0.50
1:B:321:GLU:H	1:B:321:GLU:CD	2.19	0.50
1:B:414:LEU:HD12	4:B:859:HOH:O	2.12	0.49
1:A:58:GLY:HA2	2:A:600:FAD:C4X	2.47	0.44
1:A:268:LEU:HD23	1:B:270:MET:HE1	1.98	0.44
1:A:270:MET:HE1	1:B:268:LEU:HD23	2.00	0.44
1:A:171:LEU:HD21	3:A:601:RHP:H21	1.99	0.44
1:B:108:ASN:HA	1:B:109:PRO:HD3	1.88	0.44
1:A:308:LYS:HE2	1:A:308:LYS:HB2	1.78	0.43
1:A:251:ASN:H	1:A:251:ASN:ND2	2.15	0.43
1:B:171:LEU:HD21	3:B:601:RHP:H21	2.00	0.42
1:A:117:ASN:HD22	1:A:120:ARG:NH2	2.11	0.42
1:B:58:GLY:HA2	2:B:600:FAD:C4X	2.50	0.42
1:B:117:ASN:HD22	1:B:120:ARG:NH2	2.13	0.41
1:B:415:ARG:NH1	4:B:897:HOH:O	2.52	0.41
1:B:251:ASN:H	1:B:251:ASN:ND2	2.15	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:122:MET:HE1	1:B:185:PHE:HE2	1.84	0.41
1:B:489:VAL:N	1:B:490:PRO:HD2	2.36	0.41
1:A:281:MET:HB3	1:A:413:VAL:HG21	2.04	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]	1.59	0.61

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	498/520 (96%)	487 (98%)	11 (2%)	0	100	100
1	B	493/520 (95%)	481 (98%)	12 (2%)	0	100	100
All	All	991/1040 (95%)	968 (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	428/444 (96%)	417 (97%)	11 (3%)	40	17

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	B	425/444 (96%)	416 (98%)	9 (2%)	47	23
All	All	853/888 (96%)	833 (98%)	20 (2%)	43	20

All (20) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	92	VAL
1	A	93	LYS
1	A	95	LYS
1	A	106	VAL
1	A	155	LEU
1	A	251	ASN
1	A	318	ASP
1	A	397	CYS
1	A	482	LEU
1	A	495	LEU
1	A	498	LEU
1	B	92	VAL
1	B	93	LYS
1	B	95	LYS
1	B	155	LEU
1	B	251	ASN
1	B	318	ASP
1	B	397	CYS
1	B	482	LEU
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	90	HIS
1	A	117	ASN
1	A	251	ASN
1	B	117	ASN
1	B	251	ASN

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 oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

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	1,3	58,58,58	1.09	4 (6%)	85,89,89	1.55	16 (18%)
3	RHP	B	601	2	14,15,15	1.44	2 (14%)	18,20,20	2.25	5 (27%)
3	RHP	A	601	2	14,15,15	1.43	2 (14%)	18,20,20	2.19	4 (22%)
2	FAD	A	600	1,3	58,58,58	1.07	5 (8%)	85,89,89	1.51	16 (18%)

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	1,3	-	2/34/50/50	0/6/6/6
3	RHP	B	601	2	-	2/3/13/13	0/2/2/2
3	RHP	A	601	2	-	2/3/13/13	0/2/2/2
2	FAD	A	600	1,3	-	1/34/50/50	0/6/6/6

All (13) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	601	RHP	C12-C13	4.22	1.30	1.18

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	601	RHP	C12-C13	4.19	1.30	1.18
2	A	600	FAD	C4X-N5	4.13	1.39	1.30
2	B	600	FAD	C4X-N5	4.08	1.39	1.30
2	B	600	FAD	C10-N1	2.88	1.39	1.33
2	A	600	FAD	C10-N1	2.75	1.38	1.33
2	B	600	FAD	C2A-N1A	2.51	1.38	1.33
2	A	600	FAD	C2A-N1A	2.45	1.38	1.33
2	B	600	FAD	C2A-N3A	2.28	1.38	1.33
3	A	601	RHP	C11-C12	2.26	1.54	1.46
3	B	601	RHP	C11-C12	2.23	1.53	1.46
2	A	600	FAD	C2A-N3A	2.15	1.37	1.33
2	A	600	FAD	C8A-N7A	2.13	1.35	1.31

All (41) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	601	RHP	C11-C12-C13	-7.06	125.76	176.85
3	B	601	RHP	C11-C12-C13	-7.05	125.81	176.85
2	B	600	FAD	N3A-C2A-N1A	-5.52	120.23	128.58
2	A	600	FAD	N3A-C2A-N1A	-5.42	120.37	128.58
2	B	600	FAD	N9A-C8A-N7A	-4.11	108.11	113.94
2	A	600	FAD	N9A-C8A-N7A	-3.79	108.56	113.94
2	B	600	FAD	C5A-C4A-N3A	-3.71	121.61	126.72
2	B	600	FAD	C9A-C5X-N5	-3.65	118.58	122.45
2	B	600	FAD	C5A-N7A-C8A	3.65	109.19	103.45
2	A	600	FAD	C5A-C4A-N3A	-3.54	121.84	126.72
2	A	600	FAD	C9A-C5X-N5	-3.32	118.94	122.45
2	A	600	FAD	C5A-N7A-C8A	3.24	108.54	103.45
2	B	600	FAD	C2A-N3A-C4A	3.10	119.40	111.83
2	A	600	FAD	C9A-N10-C10	-2.92	116.31	120.75
3	B	601	RHP	C5-C4-C3	-2.91	117.59	121.39
2	A	600	FAD	C2A-N3A-C4A	2.90	118.92	111.83
2	B	600	FAD	C4A-C5A-N7A	-2.89	107.28	110.58
2	A	600	FAD	C4-N3-C2	-2.83	120.62	125.64
2	B	600	FAD	C4-N3-C2	-2.71	120.83	125.64
2	B	600	FAD	C10-C4X-N5	-2.70	119.28	124.81
3	A	601	RHP	C5-C4-C3	-2.70	117.86	121.39
2	B	600	FAD	C9A-N10-C10	-2.69	116.65	120.75
2	A	600	FAD	C4X-C4-N3	2.68	120.06	113.25
3	A	601	RHP	C11-N10-C9	2.65	119.05	113.80
2	B	600	FAD	C4X-C4-N3	2.62	119.93	113.25
3	B	601	RHP	C11-N10-C9	2.62	119.00	113.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	600	FAD	C4A-C5A-N7A	-2.55	107.67	110.58
3	A	601	RHP	C12-C11-N10	2.53	120.50	112.51
2	A	600	FAD	C10-C4X-N5	-2.45	119.81	124.81
2	B	600	FAD	C4-C4X-N5	2.44	121.58	118.21
3	B	601	RHP	C12-C11-N10	2.43	120.18	112.51
3	B	601	RHP	C1-C9-C8	-2.16	101.56	103.17
2	B	600	FAD	N3A-C4A-N9A	2.16	130.84	127.17
2	A	600	FAD	C4-C4X-N5	2.12	121.14	118.21
2	A	600	FAD	C4X-C10-N10	2.06	119.43	116.48
2	B	600	FAD	O4-C4-C4X	-2.05	121.13	126.53
2	A	600	FAD	O4-C4-C4X	-2.04	121.14	126.53
2	B	600	FAD	C4A-N9A-C8A	2.04	107.88	105.74
2	A	600	FAD	N3A-C4A-N9A	2.03	130.62	127.17
2	B	600	FAD	C5'-C4'-C3'	-2.01	108.42	112.22
2	A	600	FAD	C5'-C4'-C3'	-2.01	108.44	112.22

There are no chirality outliers.

All (7) torsion outliers are listed below:

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

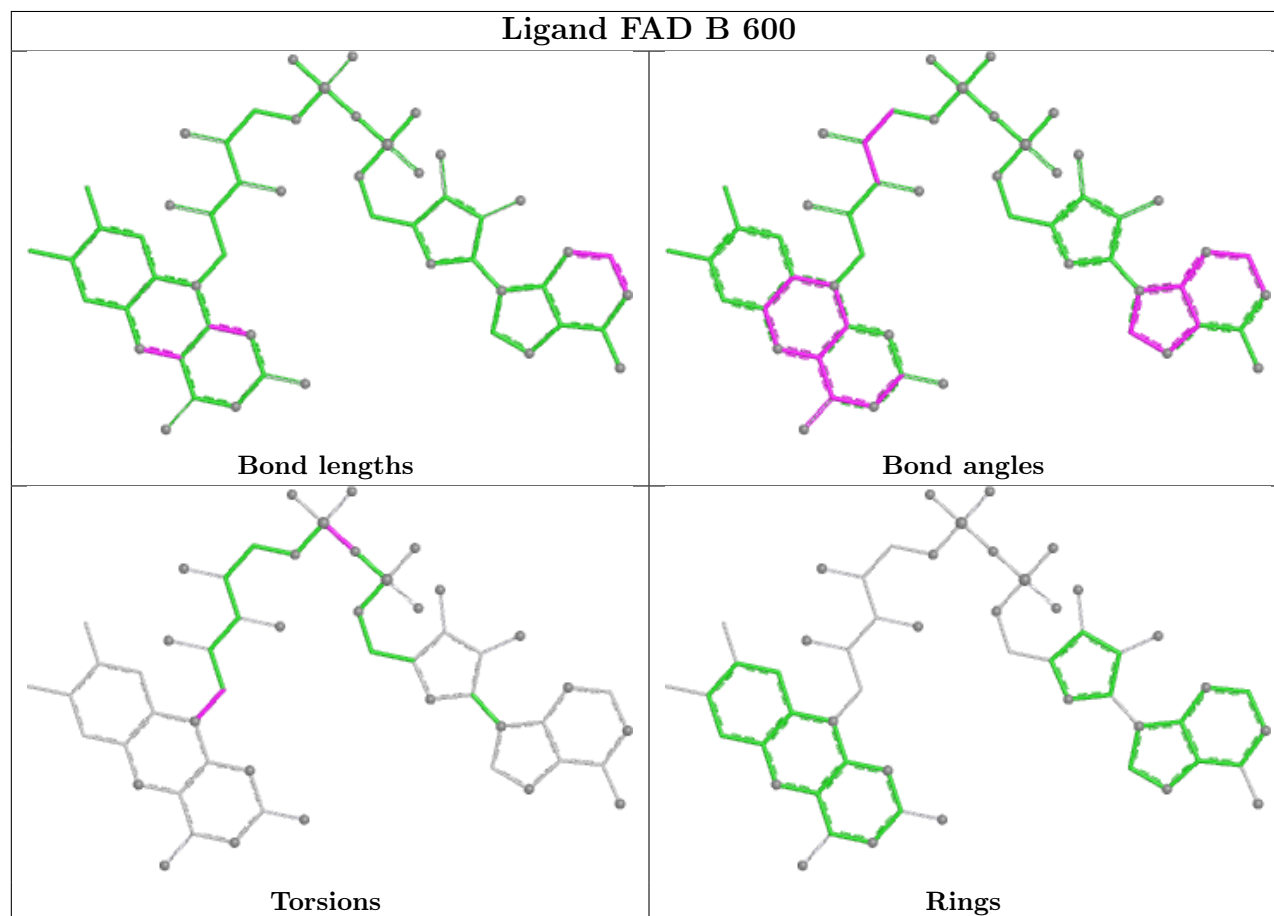
There are no ring outliers.

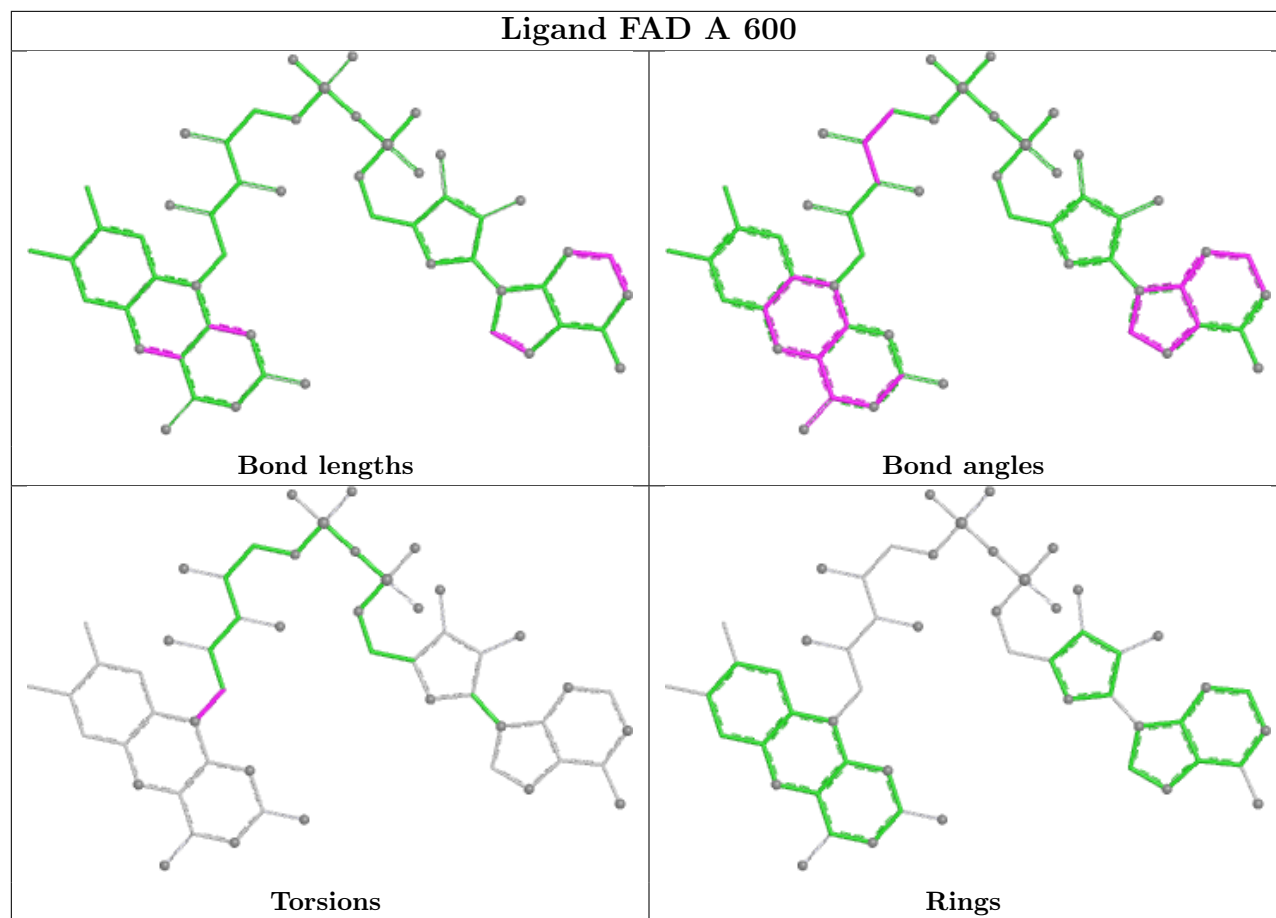
4 monomers are involved in 4 short contacts:

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

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less 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%)	0.90	80 (16%) 5 4	26, 34, 51, 76	2 (0%)
1	B	494/520 (95%)	0.94	81 (16%) 4 4	26, 34, 48, 69	2 (0%)
All	All	993/1040 (95%)	0.92	161 (16%) 4 4	26, 34, 49, 76	4 (0%)

All (161) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	501	ILE	7.4
1	B	496	ILE	7.2
1	B	495	LEU	7.1
1	A	500	THR	5.8
1	A	252	HIS	5.4
1	B	107	TRP	5.3
1	A	92	VAL	5.2
1	B	481	PHE	5.0
1	A	481	PHE	4.9
1	A	482	LEU	4.8
1	B	494	ARG	4.7
1	A	107	TRP	4.7
1	A	495	LEU	4.7
1	A	486	LEU	4.6
1	B	318	ASP	4.5
1	B	482	LEU	4.5
1	B	157	TRP	4.4
1	A	498	LEU	4.4
1	B	493	LEU	4.3
1	B	49	GLN	4.3
1	A	480	THR	4.2
1	B	103	PHE	4.2
1	A	493	LEU	4.2
1	A	318	ASP	4.2

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Mol	Chain	Res	Type	RSRZ
1	B	95	LYS	4.1
1	A	489	VAL	4.1
1	A	492	LEU	4.1
1	A	494	ARG	4.0
1	B	92	VAL	4.0
1	A	319	GLY	4.0
1	A	157	TRP	4.0
1	B	457	ILE	3.9
1	B	303	GLU	3.9
1	A	49	GLN	3.9
1	B	252	HIS	3.9
1	B	112	TYR	3.8
1	A	478	THR	3.8
1	B	243	GLU	3.8
1	B	254	MET	3.7
1	A	484	ARG	3.7
1	B	93	LYS	3.7
1	A	479	THR	3.7
1	A	496	ILE	3.6
1	B	89	ILE	3.6
1	B	370	LYS	3.6
1	B	3	ASN	3.6
1	A	497	GLY	3.6
1	B	492	LEU	3.6
1	B	479	THR	3.5
1	B	26	SER	3.5
1	A	370	LYS	3.5
1	B	119	TRP	3.4
1	B	489	VAL	3.4
1	A	483	GLU	3.4
1	A	251	ASN	3.4
1	B	244	ASN	3.4
1	B	154	LYS	3.3
1	A	321	GLU	3.3
1	A	413	VAL	3.3
1	B	163	GLN	3.3
1	A	104	PRO	3.2
1	B	246	LEU	3.2
1	A	243	GLU	3.2
1	A	227	ASP	3.2
1	B	477	ILE	3.2
1	B	490	PRO	3.2

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Mol	Chain	Res	Type	RSRZ
1	A	475	GLN	3.2
1	A	111	THR	3.2
1	B	485	HIS	3.2
1	B	155	LEU	3.1
1	A	499	THR	3.1
1	B	321	GLU	3.1
1	B	224	LEU	3.1
1	A	103	PHE	3.1
1	A	3	ASN	3.1
1	B	242	ARG	3.0
1	B	484	ARG	3.0
1	B	158	THR	3.0
1	B	491	GLY	2.9
1	A	487	PRO	2.9
1	A	254	MET	2.9
1	B	414	LEU	2.9
1	B	27	GLY	2.9
1	B	475	GLN	2.8
1	B	226	GLY	2.8
1	A	154	LYS	2.8
1	A	224	LEU	2.8
1	B	110	ILE	2.8
1	B	354	ARG	2.8
1	A	95	LYS	2.8
1	B	28	LEU	2.7
1	A	453	ALA	2.7
1	B	4	LYS	2.7
1	A	354	ARG	2.7
1	B	458	PRO	2.7
1	A	468	GLU	2.7
1	A	106	VAL	2.7
1	B	473	PRO	2.6
1	B	374	SER	2.6
1	A	242	ARG	2.6
1	A	128	GLU	2.6
1	B	483	GLU	2.6
1	A	163	GLN	2.6
1	B	474	ALA	2.6
1	A	105	PRO	2.6
1	A	470	VAL	2.6
1	A	109	PRO	2.6
1	B	487	PRO	2.5

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Mol	Chain	Res	Type	RSRZ
1	A	244	ASN	2.5
1	A	112	TYR	2.5
1	A	29	ASN	2.5
1	B	78	GLU	2.5
1	B	480	THR	2.5
1	A	93	LYS	2.4
1	B	486	LEU	2.4
1	B	251	ASN	2.4
1	A	477	ILE	2.4
1	A	78	GLU	2.4
1	A	490	PRO	2.4
1	B	488	SER	2.4
1	B	113	LEU	2.4
1	B	94	GLY	2.3
1	B	455	GLY	2.3
1	A	155	LEU	2.3
1	B	478	THR	2.3
1	A	110	ILE	2.3
1	A	27	GLY	2.3
1	A	474	ALA	2.3
1	A	141	GLU	2.3
1	B	141	GLU	2.3
1	A	303	GLU	2.3
1	A	94	GLY	2.3
1	A	101	GLY	2.2
1	A	485	HIS	2.2
1	A	459	GLU	2.2
1	A	472	VAL	2.2
1	B	448	ARG	2.2
1	A	225	LEU	2.2
1	B	122	MET	2.2
1	B	118	PHE	2.2
1	B	97	TYR	2.2
1	A	241	THR	2.2
1	A	488	SER	2.2
1	B	223	ASP	2.2
1	A	491	GLY	2.2
1	B	241	THR	2.2
1	B	476	PRO	2.2
1	B	91	HIS	2.1
1	B	231	LEU	2.1
1	B	413	VAL	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	308	LYS	2.1
1	A	414	LEU	2.1
1	A	454	MET	2.1
1	B	460	ASP	2.1
1	A	158	THR	2.1
1	B	111	THR	2.1
1	B	29	ASN	2.0
1	A	302	LYS	2.0
1	B	459	GLU	2.0
1	B	319	GLY	2.0
1	A	4	LYS	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 oligosaccharides in this entry.

6.4 Ligands [i](#)

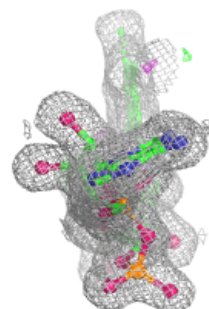
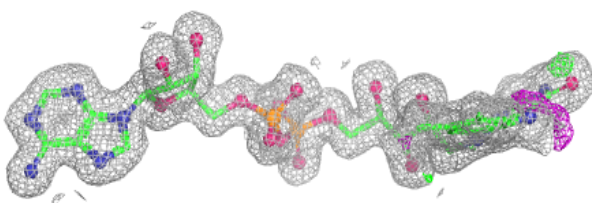
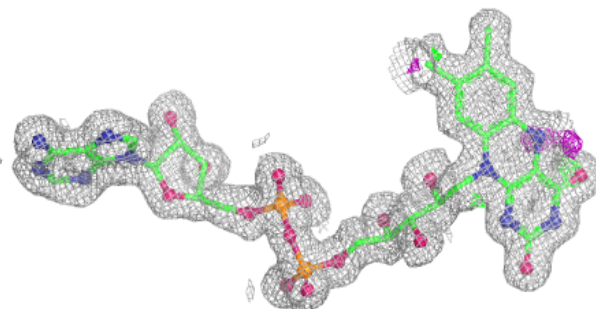
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists 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	RHP	B	601	14/14	0.80	0.16	38,44,45,46	0
3	RHP	A	601	14/14	0.83	0.15	38,44,45,46	0
2	FAD	A	600	53/53	0.98	0.06	27,29,31,31	0
2	FAD	B	600	53/53	0.98	0.07	27,29,31,31	0

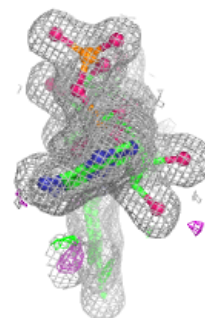
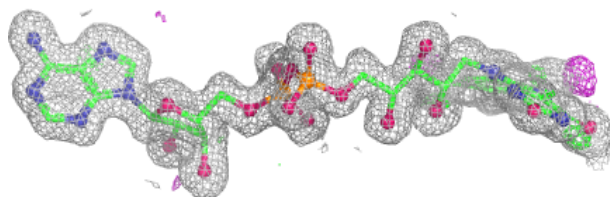
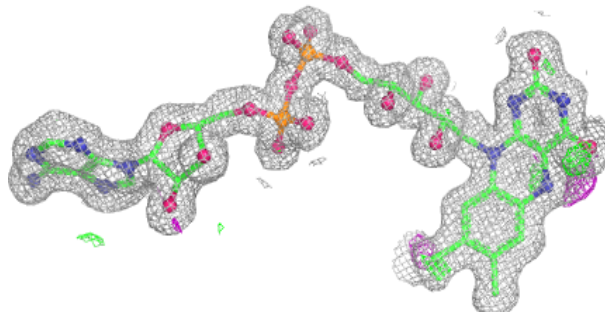
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

There are no such residues in this entry.