WORLDWIDE PDB

PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Jun 15, 2024 – 11:43 AM EDT

PDB ID	:	1S3E
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 (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	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
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 ⓘ

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	Percentile Ranks	Value
Rfree		0.217
Clashscore		2
Ramachandran outliers		0
Sidechain outliers		2.6%
RSRZ outliers		25.2%

Worse　　　　　　　　　　　　　　　　　*Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution
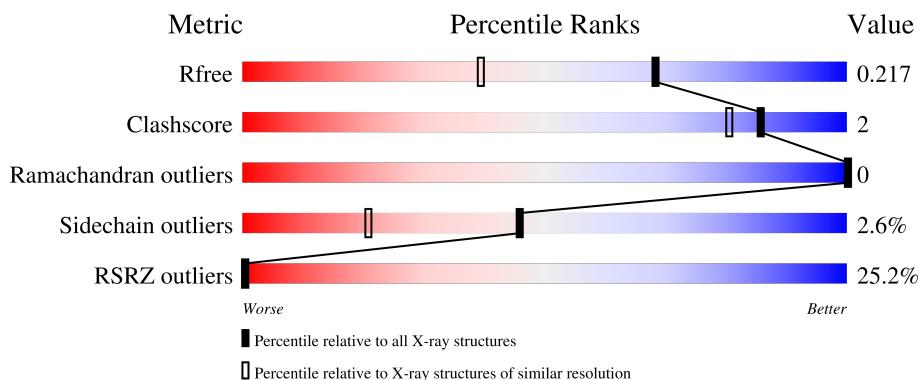
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3398 (1.60-1.60)
Clashscore	141614	3665 (1.60-1.60)
Ramachandran outliers	138981	3564 (1.60-1.60)
Sidechain outliers	138945	3563 (1.60-1.60)
RSRZ outliers	127900	3321 (1.60-1.60)

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 <=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	23% ▬ 91% · · ·
1	B	520	25% ▬ 89% 5% · 5%
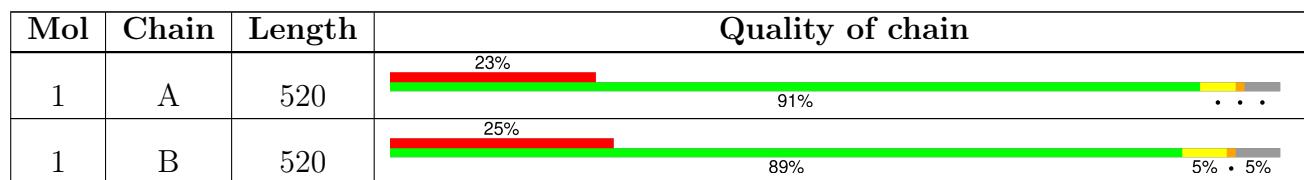
2   Entry composition ⓘ

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 (three-letter code: FAD) (formula: $C_{27}H_{33}N_9O_{15}P_2$).
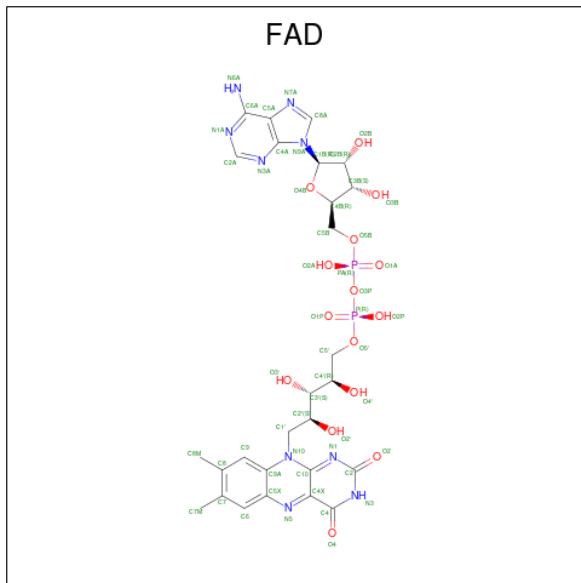
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
2	B	1	Total	C	N	O	P	0	0
			53	27	9	15	2		

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

RHP

C13

C12

C11

NH N10

O6
HO
C6

C7

C8

C9(R)

C5

C1

C4

C3

C2
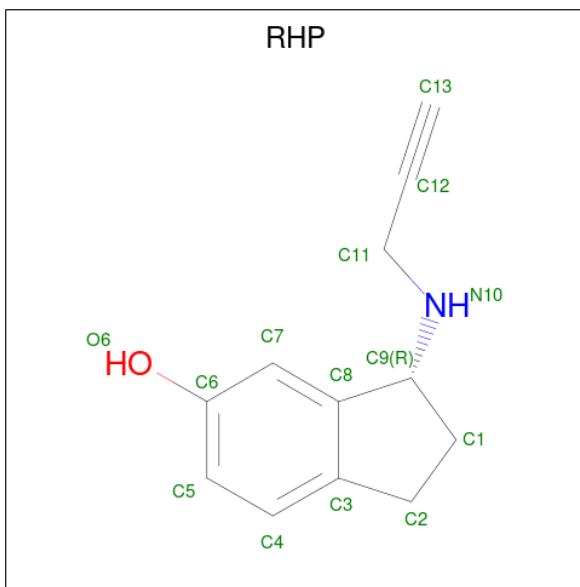
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			14	12	1	1		
3	B	1	Total	C	N	O	0	0
			14	12	1	1		

• 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		

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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

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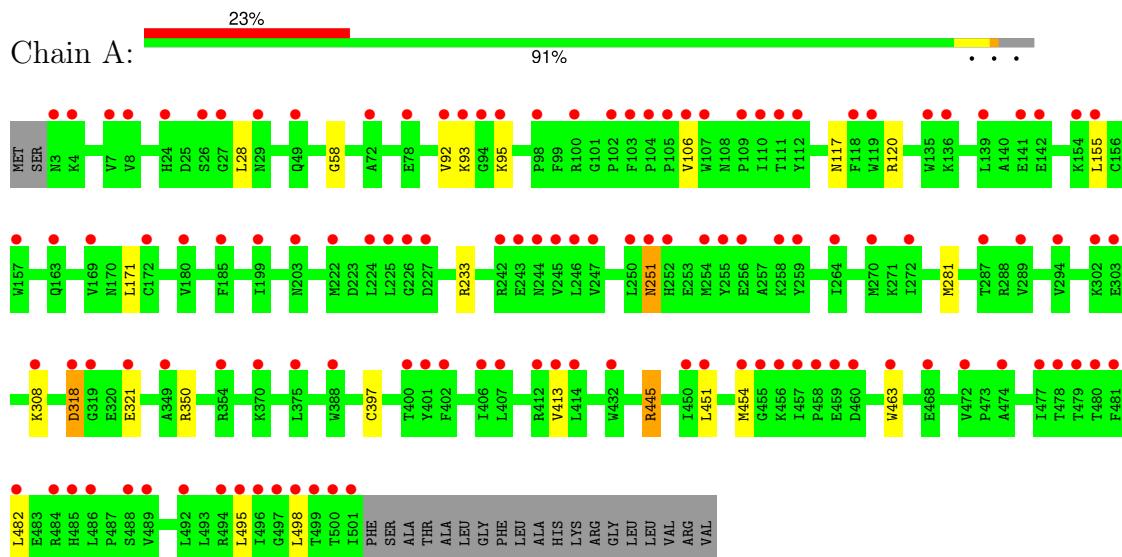
• Molecule 1: Amine oxidase [flavin-containing] B

Chain B:
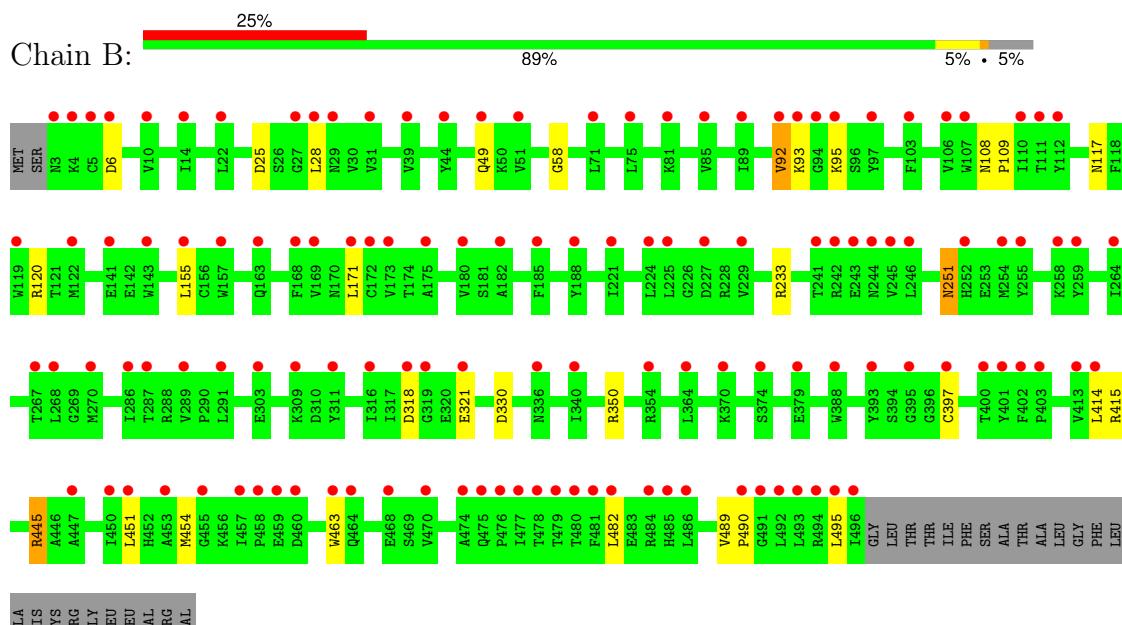
4 Data and refinement statistics ⓘ

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 47.04　–　1.60	Depositor EDS
% Data completeness (in resolution range)	88.6 (15.00-1.60) 88.6 (47.04-1.60)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.41 (at 1.60Å)	Xtriage
Refinement program	REFMAC 5.1.24	Depositor
R, R_{free}	0.198　,　0.216 0.199　,　0.217	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)	0.39 , 76.0	EDS
L-test for twinning[2]	$< |L| > = 0.50, < L^2 > = 0.33$	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.*

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[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: 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	0.36	0/4074	0.64	3/5530 (0.1%)
1	B	0.36	0/4043	0.64	4/5487 (0.1%)
All	All	0.36	0/8117	0.64	7/11017 (0.1%)

There are no bond length outliers.

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	445	ARG	NE-CZ-NH2	-6.90	116.85	120.30
1	A	445	ARG	NE-CZ-NH2	-6.47	117.06	120.30
1	A	445	ARG	NE-CZ-NH1	5.83	123.22	120.30
1	B	445	ARG	NE-CZ-NH1	5.71	123.16	120.30
1	B	6	ASP	CB-CG-OD2	5.40	123.16	118.30
1	B	330	ASP	CB-CG-OD2	5.21	122.99	118.30
1	A	318	ASP	CB-CG-OD2	5.15	122.93	118.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3972	0	3968	16	0
1	B	3941	0	3938	19	1

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
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
All	All	8838	0	7990	35	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 (35) 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: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: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:A:451:LEU:HD23	1:A:454:MET:HE1	1.83	0.58
1:B:451:LEU:HD23	1:B:454:MET:HE1	1.86	0.56
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:B:414:LEU:HD12	4:B:859:HOH:O	2.12	0.49
1:A:321:GLU:H	1:A:321:GLU:CD	2.20	0.46
1:B:321:GLU:H	1:B:321:GLU:CD	2.19	0.45
1:B:454:MET:HE2	1:B:454:MET:HB2	1.56	0.45
1:A:58:GLY:HA2	2:A:600:FAD:C4X	2.47	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:28:LEU:HD11	1:A:454:MET:HE1	2.00	0.43
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:B:28:LEU:HD11	1:B:454:MET:HE1	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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
1:A:454:MET:HB2	1:A:454:MET:HE2	1.57	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 ⓘ

5.3.1   Protein backbone ⓘ

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 ⓘ

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%)	416 (97%)	12 (3%)	43	18
1	B	425/444 (96%)	415 (98%)	10 (2%)	49	24
All	All	853/888 (96%)	831 (97%)	22 (3%)	46	21

All (22) 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	350	ARG
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	350	ARG
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 (4) such sidechains are listed below:

Mol	Chain	Res	Type
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 monosaccharides 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	A	600	1,3	54,58,58	1.13	4 (7%)	71,89,89	1.40	11 (15%)
2	FAD	B	600	1,3	54,58,58	1.17	4 (7%)	71,89,89	1.40	9 (12%)
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%)

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	A	600	1,3	-	1/30/50/50	0/6/6/6
2	FAD	B	600	1,3	-	2/30/50/50	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

All (12) 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
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	C2A-N3A	3.81	1.38	1.32
2	A	600	FAD	C2A-N3A	3.65	1.37	1.32
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
3	A	601	RHP	C11-C12	2.26	1.54	1.46
3	B	601	RHP	C11-C12	2.23	1.53	1.46

All (29) 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	-6.22	120.23	128.67
2	A	600	FAD	N3A-C2A-N1A	-6.12	120.37	128.67
2	B	600	FAD	C9A-C5X-N5	-3.65	118.58	122.45
2	A	600	FAD	C9A-C5X-N5	-3.32	118.94	122.45
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	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
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	A	600	FAD	C4-C4X-N5	2.12	121.14	118.21
2	A	600	FAD	C1B-N9A-C4A	-2.10	122.94	126.64
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

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	600	FAD	O4-C4-C4X	-2.04	121.14	126.53
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	A	600	FAD	1	0
2	B	600	FAD	1	0
3	B	601	RHP	1	0
3	A	601	RHP	1	0

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

Ligand FAD A 600

Bond lengths

Bond angles

Torsions

Rings

Ligand FAD B 600

Bond lengths

Bond angles

Torsions

Rings
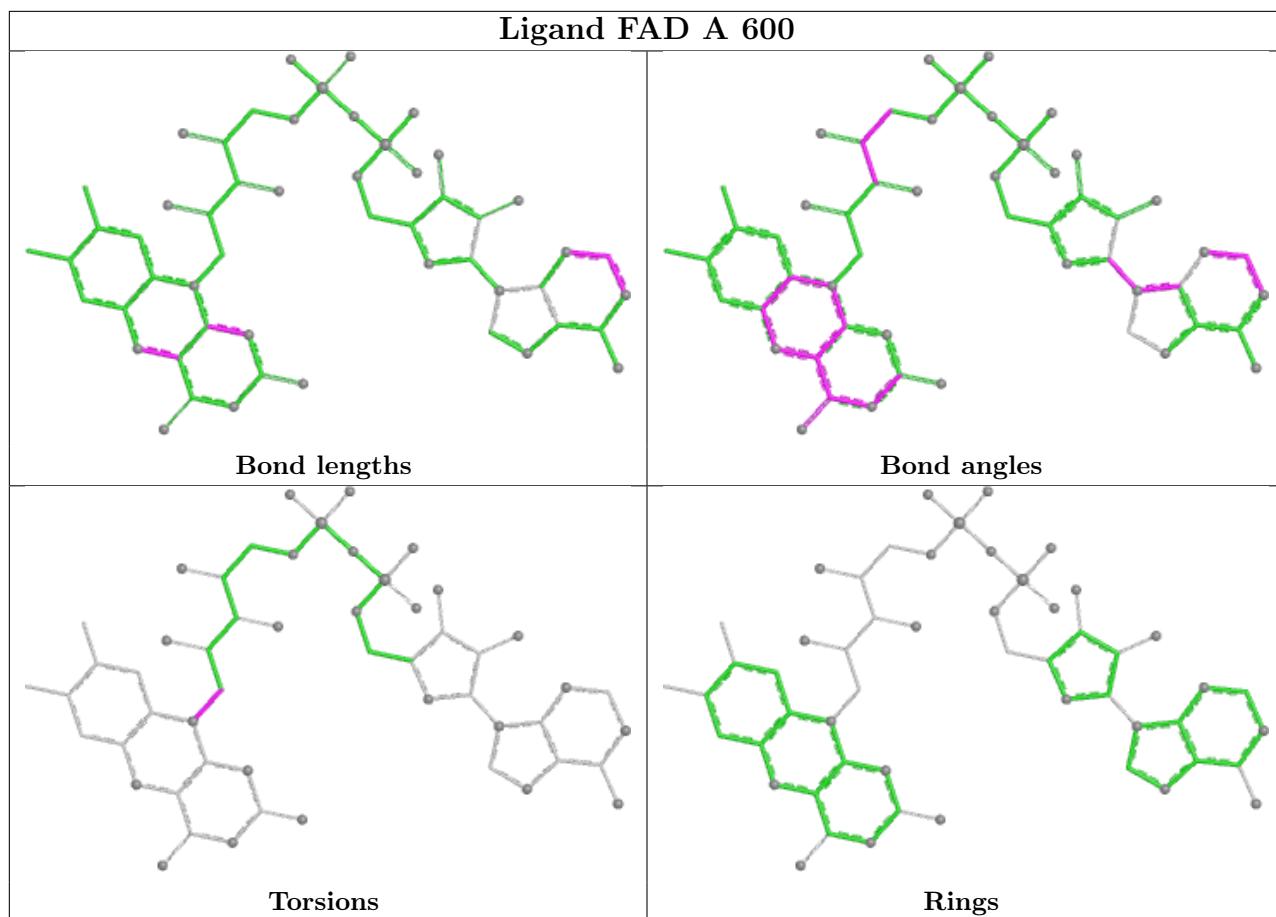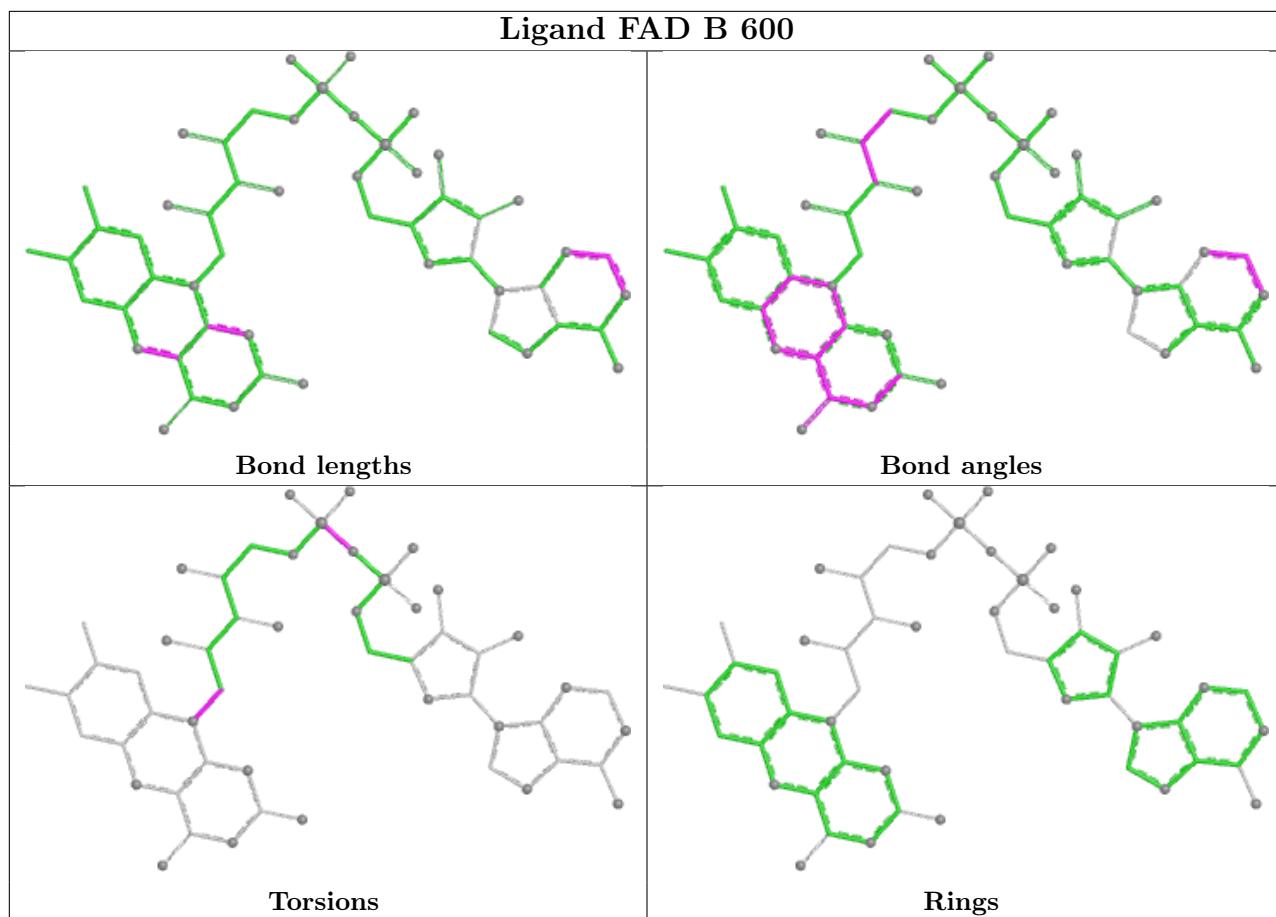
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

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%)	1.52	122 (24%)	0	0	28, 34, 51, 76	1 (0%)
1	B	494/520 (95%)	1.57	128 (25%)	0	0	26, 34, 48, 69	1 (0%)
All	All	993/1040 (95%)	1.54	250 (25%)	0	0	26, 34, 49, 76	2 (0%)

All (250) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	495	LEU	11.1
1	A	500	THR	9.5
1	A	499	THR	9.1
1	B	496	ILE	9.0
1	A	107	TRP	7.5
1	A	252	HIS	7.5
1	A	501	ILE	7.5
1	B	494	ARG	6.7
1	A	498	LEU	6.6
1	B	107	TRP	6.5
1	B	244	ASN	6.3
1	A	103	PHE	6.1
1	B	492	LEU	6.0
1	B	481	PHE	5.9
1	A	354	ARG	5.8
1	A	478	THR	5.7
1	B	482	LEU	5.7
1	A	246	LEU	5.6
1	B	242	ARG	5.6
1	B	243	GLU	5.5
1	A	479	THR	5.3
1	A	482	LEU	5.2
1	B	252	HIS	5.2
1	B	93	LYS	5.1

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Mol	Chain	Res	Type	RSRZ
1	A	496	ILE	5.0
1	A	243	GLU	5.0
1	B	493	LEU	4.8
1	A	242	ARG	4.7
1	A	495	LEU	4.5
1	A	494	ARG	4.4
1	A	480	THR	4.4
1	B	3	ASN	4.3
1	A	484	ARG	4.1
1	A	3	ASN	4.1
1	B	459	GLU	4.1
1	A	251	ASN	4.1
1	B	478	THR	4.0
1	B	157	TRP	4.0
1	A	4	LYS	4.0
1	A	92	VAL	4.0
1	B	119	TRP	3.9
1	A	106	VAL	3.8
1	B	491	GLY	3.8
1	A	93	LYS	3.8
1	A	226	GLY	3.8
1	B	490	PRO	3.8
1	B	303	GLU	3.7
1	A	497	GLY	3.7
1	A	459	GLU	3.7
1	A	49	GLN	3.7
1	B	103	PHE	3.6
1	A	110	ILE	3.6
1	A	227	ASP	3.6
1	B	95	LYS	3.6
1	A	105	PRO	3.6
1	B	49	GLN	3.5
1	B	354	ARG	3.5
1	B	110	ILE	3.4
1	A	451	LEU	3.4
1	B	475	GLN	3.4
1	A	458	PRO	3.4
1	A	302	LYS	3.4
1	B	414	LEU	3.4
1	B	27	GLY	3.3
1	B	254	MET	3.3
1	A	259	TYR	3.3

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Mol	Chain	Res	Type	RSRZ
1	A	78	GLU	3.3
1	B	453	ALA	3.3
1	A	245	VAL	3.3
1	A	112	TYR	3.3
1	A	308	LYS	3.2
1	B	5	CYS	3.2
1	B	479	THR	3.2
1	B	457	ILE	3.2
1	A	163	GLN	3.2
1	A	481	PHE	3.1
1	B	477	ILE	3.1
1	A	318	ASP	3.1
1	B	229	VAL	3.1
1	B	450	ILE	3.0
1	B	224	LEU	3.0
1	B	4	LYS	3.0
1	A	142	GLU	3.0
1	B	92	VAL	3.0
1	B	319	GLY	3.0
1	A	406	ILE	3.0
1	B	485	HIS	3.0
1	A	486	LEU	3.0
1	B	155	LEU	3.0
1	A	457	ILE	3.0
1	B	289	VAL	3.0
1	A	460	ASP	2.9
1	B	267	THR	2.9
1	B	318	ASP	2.9
1	B	270	MET	2.9
1	A	468	GLU	2.9
1	B	28	LEU	2.9
1	A	244	ASN	2.9
1	B	112	TYR	2.9
1	A	100	ARG	2.8
1	B	268	LEU	2.8
1	A	454	MET	2.8
1	A	104	PRO	2.8
1	A	119	TRP	2.8
1	A	26	SER	2.8
1	A	169	VAL	2.8
1	A	224	LEU	2.8
1	B	393	TYR	2.8

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Mol	Chain	Res	Type	RSRZ
1	B	225	LEU	2.7
1	A	321	GLU	2.7
1	B	241	THR	2.7
1	A	256	GLU	2.7
1	A	155	LEU	2.7
1	B	246	LEU	2.7
1	A	264	ILE	2.7
1	A	118	PHE	2.7
1	B	264	ILE	2.6
1	B	259	TYR	2.6
1	B	474	ALA	2.6
1	A	463	TRP	2.6
1	B	480	THR	2.6
1	A	349	ALA	2.6
1	B	39	VAL	2.6
1	B	470	VAL	2.6
1	A	29	ASN	2.6
1	A	157	TRP	2.5
1	A	270	MET	2.5
1	A	414	LEU	2.5
1	A	456	LYS	2.5
1	B	476	PRO	2.5
1	B	97	TYR	2.5
1	B	468	GLU	2.5
1	B	397	CYS	2.5
1	A	102	PRO	2.5
1	A	319	GLY	2.5
1	B	89	ILE	2.5
1	A	413	VAL	2.5
1	A	472	VAL	2.5
1	B	171	LEU	2.5
1	A	154	LYS	2.5
1	B	44	TYR	2.5
1	A	94	GLY	2.5
1	B	402	PHE	2.5
1	B	484	ARG	2.5
1	A	272	ILE	2.5
1	B	340	ILE	2.5
1	B	188	TYR	2.5
1	B	227	ASP	2.5
1	B	141	GLU	2.5
1	B	321	GLU	2.5

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Mol	Chain	Res	Type	RSRZ
1	A	72	ALA	2.5
1	B	175	ALA	2.5
1	A	488	SER	2.5
1	B	31	VAL	2.5
1	B	85	VAL	2.5
1	B	163	GLN	2.5
1	B	29	ASN	2.4
1	A	250	LEU	2.4
1	A	258	LYS	2.4
1	B	182	ALA	2.4
1	B	447	ALA	2.4
1	A	141	GLU	2.4
1	A	492	LEU	2.4
1	B	168	PHE	2.4
1	B	143	TRP	2.4
1	B	464	GLN	2.4
1	B	221	ILE	2.4
1	B	486	LEU	2.4
1	B	370	LYS	2.4
1	B	75	LEU	2.3
1	A	474	ALA	2.3
1	B	455	GLY	2.3
1	A	95	LYS	2.3
1	B	173	VAL	2.3
1	A	401	TYR	2.3
1	A	109	PRO	2.3
1	B	403	PRO	2.3
1	B	169	VAL	2.3
1	B	14	ILE	2.3
1	A	303	GLU	2.3
1	B	185	PHE	2.3
1	A	24	HIS	2.3
1	A	489	VAL	2.3
1	B	245	VAL	2.3
1	B	463	TRP	2.3
1	A	450	ILE	2.3
1	B	286	ILE	2.3
1	A	370	LYS	2.3
1	A	402	PHE	2.3
1	B	374	SER	2.2
1	A	199	ILE	2.2
1	A	136	LYS	2.2

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Mol	Chain	Res	Type	RSRZ
1	B	122	MET	2.2
1	B	460	ASP	2.2
1	B	51	VAL	2.2
1	B	180	VAL	2.2
1	A	455	GLY	2.2
1	A	135	TRP	2.2
1	A	254	MET	2.2
1	B	311	TYR	2.2
1	A	485	HIS	2.2
1	A	111	THR	2.2
1	A	180	VAL	2.2
1	B	71	LEU	2.2
1	B	291	LEU	2.2
1	B	364	LEU	2.2
1	B	388	TRP	2.2
1	B	94	GLY	2.2
1	B	309	LYS	2.2
1	A	203	ASN	2.2
1	A	27	GLY	2.2
1	B	258	LYS	2.2
1	A	388	TRP	2.2
1	A	432	TRP	2.2
1	A	255	TYR	2.1
1	B	413	VAL	2.1
1	B	6	ASP	2.1
1	B	316	ILE	2.1
1	B	255	TYR	2.1
1	B	10	VAL	2.1
1	B	172[A]	CYS	2.1
1	A	407	LEU	2.1
1	A	222	MET	2.1
1	A	185	PHE	2.1
1	B	400	THR	2.1
1	A	294	VAL	2.1
1	A	139	LEU	2.1
1	B	22	LEU	2.1
1	B	395	GLY	2.1
1	B	81	LYS	2.1
1	A	287	THR	2.1
1	B	111	THR	2.1
1	B	287	THR	2.1
1	B	401	TYR	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	8	VAL	2.1
1	A	225	LEU	2.1
1	B	451	LEU	2.1
1	B	379	GLU	2.1
1	A	172[A]	CYS	2.1
1	B	336	ASN	2.1
1	A	477	ILE	2.1
1	A	412	ARG	2.0
1	A	289	VAL	2.0
1	A	98	PRO	2.0
1	B	458	PRO	2.0
1	A	7	VAL	2.0
1	A	247	VAL	2.0
1	B	106	VAL	2.0
1	A	375	LEU	2.0
1	A	400	THR	2.0

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

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

## 6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

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	0.67	0.26	38,44,45,46	0
3	RHP	A	601	14/14	0.76	0.21	38,44,45,46	0
2	FAD	A	600	53/53	0.91	0.13	27,29,31,31	0
2	FAD	B	600	53/53	0.94	0.14	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:

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

Electron density around FAD B 600:

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

6.5 Other polymers ⓘ

There are no such residues in this entry.