



# Full wwPDB X-ray Structure Validation Report ⓘ

May 23, 2020 – 06:00 am BST

PDB ID : 3TE7  
Title : Quinone Oxidoreductase (NQ02) bound to the imidazoacridin-6-one 5a1  
Authors : Dunstan, M.S.  
Deposited on : 2011-08-12  
Resolution : 1.70 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](mailto: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.

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

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.11  
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) : 2.11

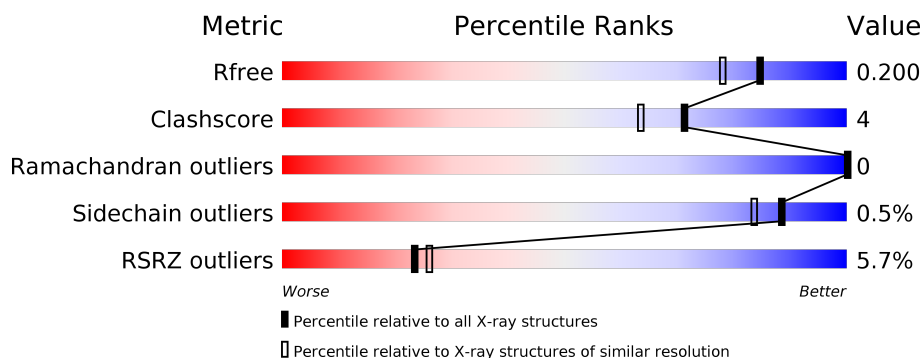
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 1.70 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	4298 (1.70-1.70)
Clashscore	141614	4695 (1.70-1.70)
Ramachandran outliers	138981	4610 (1.70-1.70)
Sidechain outliers	138945	4610 (1.70-1.70)
RSRZ outliers	127900	4222 (1.70-1.70)

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 on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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	228	<div> <div>3%</div> <div>94%</div> <div>6%</div> </div>
1	B	228	<div> <div>8%</div> <div>93%</div> <div>7%</div> </div>

## 2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 4248 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 Ribosyldihyronicotinamide dehydrogenase [quinone].

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	228	Total	C	N	O	S	0	0	0
			1809	1166	301	334	8			
1	B	228	Total	C	N	O	S	0	0	0
			1809	1166	301	334	8			

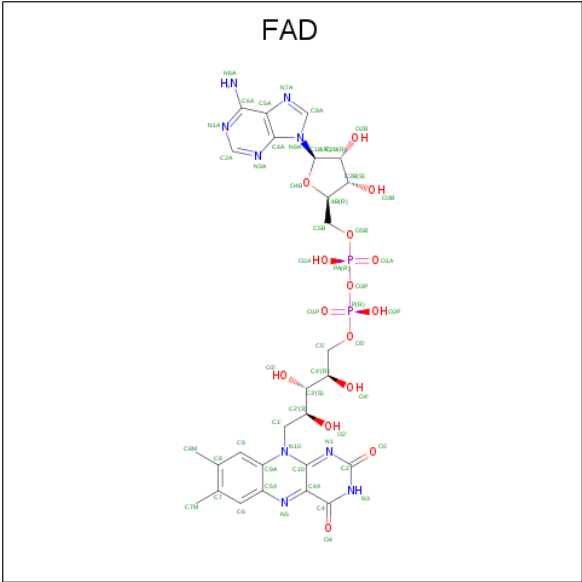
There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	46	PHE	LEU	CONFLICT	UNP P16083
B	46	PHE	LEU	CONFLICT	UNP P16083

- Molecule 2 is ZINC ION (three-letter code: ZN) (formula: Zn).

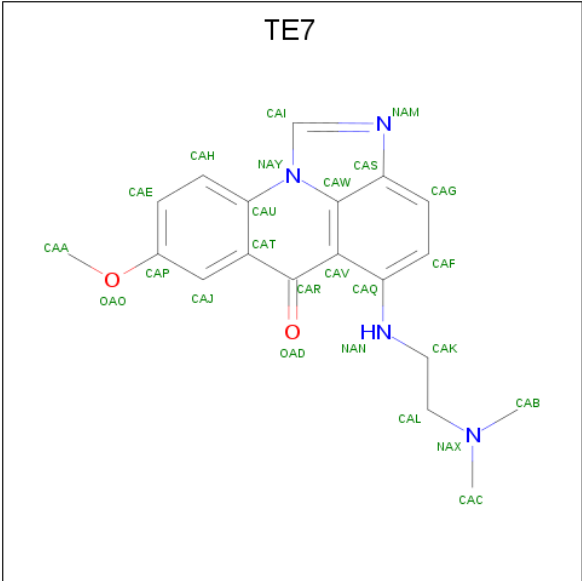
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	B	1	Total	Zn	0	0
			1	1		
2	A	1	Total	Zn	0	0
			1	1		

- Molecule 3 is FLAVIN-ADENINE DINUCLEOTIDE (three-letter code: FAD) (formula: C<sub>27</sub>H<sub>33</sub>N<sub>9</sub>O<sub>15</sub>P<sub>2</sub>).



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

- Molecule 4 is 5-{[2-(dimethylamino)ethyl]amino}-8-methoxy-6H-imidazo[4,5,1-de]acridin-6-one (three-letter code: TE7) (formula: C<sub>19</sub>H<sub>20</sub>N<sub>4</sub>O<sub>2</sub>).



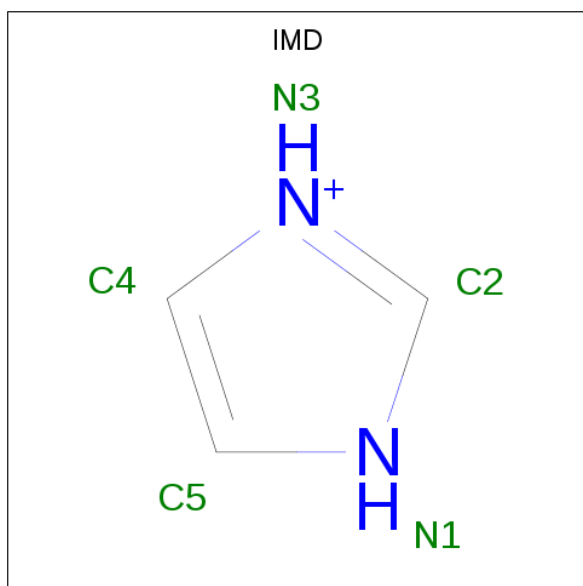
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	N	O	0	0
			25	19	4	2		

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	B	1	Total	C	N	O	0	0
			25	19	4	2		

- Molecule 5 is IMIDAZOLE (three-letter code: IMD) (formula:  $C_3H_5N_2$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	C	N	0	0
			5	3	2		

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	239	Total	O	0	0
			239	239		
6	B	228	Total	O	0	0
			228	228		

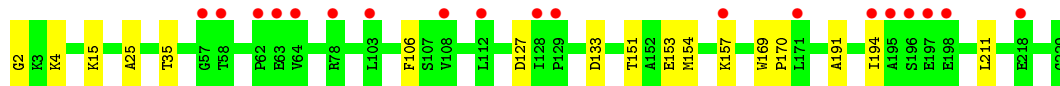
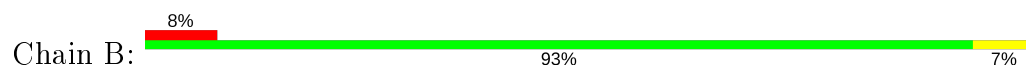
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA 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: Ribosyldihydronicotinamide dehydrogenase [quinone]



- Molecule 1: Ribosyldihydronicotinamide dehydrogenase [quinone]



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	56.91Å 84.03Å 106.55Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	38.89 – 1.70 38.89 – 1.69	Depositor EDS
% Data completeness (in resolution range)	98.7 (38.89-1.70) 98.8 (38.89-1.69)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.10 (at 1.69Å)	Xtriage
Refinement program	PHENIX 1.6.4 _486	Depositor
R, $R_{free}$	0.170 , 0.206 0.163 , 0.200	Depositor DCC
$R_{free}$ test set	2913 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	18.2	Xtriage
Anisotropy	0.349	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.32 , 47.2	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.97	EDS
Total number of atoms	4248	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	23.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.92% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: ZN, IMD, FAD, TE7

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	0/1859	0.54	0/2523
1	B	0.35	0/1859	0.53	0/2523
All	All	0.35	0/3718	0.53	0/5046

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1809	0	1763	12	0
1	B	1809	0	1763	12	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
3	A	53	0	30	1	0
3	B	53	0	30	0	0
4	A	25	0	20	2	0
4	B	25	0	20	5	0
5	A	5	0	5	2	0
6	A	239	0	0	1	0
6	B	228	0	0	5	0
All	All	4248	0	3631	26	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 4.

All (26) 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:127:ASP:HB3	6:B:256:HOH:O	1.78	0.82
4:B:1:TE7:HAB	6:B:317:HOH:O	1.90	0.71
1:B:151:THR:HG22	1:B:194:ILE:HD11	1.76	0.67
1:B:151:THR:OG1	1:B:153:GLU:HG2	1.98	0.63
1:A:106:PHE:CE1	4:B:1:TE7:HAA	2.35	0.62
1:A:106:PHE:HE1	4:B:1:TE7:HAA	1.70	0.56
1:B:151:THR:OG1	1:B:154:MET:HG3	2.05	0.55
1:A:52:ASP:O	5:A:230:IMD:H4	2.07	0.54
1:A:106:PHE:CE1	4:B:1:TE7:CAA	2.93	0.52
1:A:4:LYS:HG2	1:A:35:THR:HB	1.94	0.49
1:B:169:TRP:HB3	1:B:170:PRO:HD3	1.96	0.47
1:A:73:GLU:HG2	6:A:386:HOH:O	2.14	0.47
1:A:20:SER:O	1:A:24:VAL:HG13	2.14	0.47
1:B:191:ALA:HB1	1:B:194:ILE:HG12	1.97	0.47
1:B:4:LYS:HG2	1:B:35:THR:HB	1.98	0.46
4:A:1:TE7:HAA	1:B:106:PHE:CE1	2.52	0.45
1:B:2:GLY:HA2	6:B:295:HOH:O	2.16	0.45
1:A:106:PHE:HE1	4:B:1:TE7:CAA	2.27	0.44
1:A:169:TRP:HB3	1:A:170:PRO:HD3	1.99	0.43
1:B:25:ALA:HA	1:B:211:LEU:HD13	2.00	0.43
1:A:55:ILE:O	5:A:230:IMD:H4	2.20	0.42
1:A:101:PHE:CZ	1:A:146:VAL:HG22	2.55	0.41
3:A:232:FAD:HM72	6:B:288:HOH:O	2.19	0.41
1:A:64:VAL:HG22	1:B:15:LYS:HD2	2.03	0.41
4:A:1:TE7:HAK	4:A:1:TE7:HACB	1.10	0.40
1:B:133:ASP:HB2	6:B:342:HOH:O	2.21	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	226/228 (99%)	218 (96%)	8 (4%)	0	100	100
1	B	226/228 (99%)	219 (97%)	7 (3%)	0	100	100
All	All	452/456 (99%)	437 (97%)	15 (3%)	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	193/193 (100%)	192 (100%)	1 (0%)	88	83
1	B	193/193 (100%)	192 (100%)	1 (0%)	88	83
All	All	386/386 (100%)	384 (100%)	2 (0%)	88	83

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	157	LYS
1	B	157	LYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	138	GLN

### 5.3.3 RNA ⓘ

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 carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

Of 7 ligands modelled in this entry, 2 are monoatomic - leaving 5 for Mogul analysis.

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
4	TE7	B	1	-	23,28,28	1.47	2 (8%)	27,41,41	1.52	3 (11%)
4	TE7	A	1	-	23,28,28	2.44	10 (43%)	27,41,41	1.61	7 (25%)
3	FAD	B	232	-	51,58,58	2.29	19 (37%)	60,89,89	1.65	9 (15%)
5	IMD	A	230	-	3,5,5	0.39	0	4,5,5	0.56	0
3	FAD	A	232	-	51,58,58	2.28	18 (35%)	60,89,89	1.72	8 (13%)

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
4	TE7	B	1	-	-	2/8/8/8	0/4/4/4
4	TE7	A	1	-	-	2/8/8/8	0/4/4/4
5	IMD	A	230	-	-	-	0/1/1/1
3	FAD	B	232	-	-	0/30/50/50	0/6/6/6
3	FAD	A	232	-	-	3/30/50/50	0/6/6/6

All (49) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	232	FAD	C4A-N3A	-5.61	1.27	1.35
3	B	232	FAD	C4A-N3A	-5.53	1.28	1.35
4	A	1	TE7	CAT-CAU	-5.48	1.37	1.41
3	B	232	FAD	C2A-N3A	5.41	1.40	1.32
3	A	232	FAD	C2A-N3A	5.39	1.40	1.32
4	B	1	TE7	CAV-CAW	-4.89	1.38	1.43
3	B	232	FAD	C2A-N1A	4.85	1.42	1.33
3	A	232	FAD	C2A-N1A	4.80	1.42	1.33
3	A	232	FAD	O4-C4	4.54	1.36	1.24
4	A	1	TE7	CAU-NAY	-4.40	1.31	1.40
3	B	232	FAD	C4-C4X	4.10	1.48	1.41
3	B	232	FAD	O4-C4	4.07	1.34	1.24
3	B	232	FAD	C2-N1	4.02	1.46	1.38
4	A	1	TE7	CAV-CAW	-3.95	1.39	1.43
3	A	232	FAD	C5X-N5	3.90	1.41	1.35
3	A	232	FAD	C2-N1	3.90	1.45	1.38
3	A	232	FAD	C4-C4X	3.87	1.48	1.41
3	B	232	FAD	C5X-N5	3.73	1.41	1.35
3	B	232	FAD	O2'-C2'	-3.70	1.35	1.43
3	A	232	FAD	O2'-C2'	-3.54	1.35	1.43
4	A	1	TE7	CAQ-NAN	-3.50	1.28	1.36
4	A	1	TE7	CAQ-CAV	-3.40	1.38	1.42
4	A	1	TE7	CAJ-CAT	-3.38	1.34	1.41
3	B	232	FAD	C10-N1	3.31	1.37	1.33
4	A	1	TE7	CAI-NAM	-3.30	1.29	1.35
3	A	232	FAD	C4X-C10	3.27	1.42	1.38
3	B	232	FAD	C4X-C10	3.26	1.42	1.38
3	B	232	FAD	C4X-N5	3.11	1.37	1.33
3	B	232	FAD	C6A-C5A	-3.04	1.32	1.43
3	A	232	FAD	C9A-N10	3.02	1.42	1.38
3	A	232	FAD	C4X-N5	3.01	1.37	1.33
3	A	232	FAD	C6A-C5A	-2.92	1.32	1.43
3	A	232	FAD	C4-N3	2.74	1.37	1.33
3	B	232	FAD	C4-N3	2.71	1.37	1.33
3	A	232	FAD	C2B-C3B	-2.67	1.46	1.53
3	A	232	FAD	C10-N1	2.61	1.36	1.33
3	B	232	FAD	C9A-N10	2.59	1.42	1.38
3	B	232	FAD	O3'-C3'	-2.59	1.36	1.43
3	B	232	FAD	C8A-N7A	2.58	1.39	1.34
3	A	232	FAD	C8A-N7A	2.53	1.39	1.34
4	A	1	TE7	CAG-CAS	-2.40	1.37	1.41
4	A	1	TE7	OAQ-CAP	-2.40	1.32	1.37
3	B	232	FAD	C2B-C3B	-2.39	1.46	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	1	TE7	CAQ-CAV	-2.38	1.39	1.42
3	A	232	FAD	O3'-C3'	-2.19	1.37	1.43
3	B	232	FAD	C5A-C4A	-2.17	1.35	1.40
3	A	232	FAD	C5A-C4A	-2.07	1.35	1.40
3	B	232	FAD	C6A-N6A	2.07	1.41	1.34
4	A	1	TE7	CAK-NAN	-2.01	1.41	1.45

All (27) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	232	FAD	C4-N3-C2	6.59	120.71	115.14
3	A	232	FAD	C1'-N10-C9A	6.36	123.30	118.29
3	A	232	FAD	C4-N3-C2	5.93	120.14	115.14
3	A	232	FAD	N3A-C2A-N1A	-5.91	119.44	128.68
3	B	232	FAD	N3A-C2A-N1A	-5.86	119.52	128.68
4	B	1	TE7	CAA-OAO-CAP	-4.95	106.78	117.51
4	A	1	TE7	CAA-OAO-CAP	-3.60	109.69	117.51
3	B	232	FAD	C1'-N10-C9A	3.56	121.09	118.29
3	B	232	FAD	C4X-N5-C5X	3.51	120.28	116.77
4	B	1	TE7	CAR-CAT-CAU	3.39	121.54	118.59
4	A	1	TE7	CAR-CAT-CAU	3.12	121.30	118.59
3	B	232	FAD	C4-C4X-N5	3.10	122.14	118.60
4	A	1	TE7	CAT-CAR-CAV	-2.85	115.62	120.60
3	A	232	FAD	C4X-N5-C5X	2.80	119.57	116.77
3	A	232	FAD	C9A-N10-C10	-2.75	118.31	121.91
3	B	232	FAD	C10-C4X-N5	-2.63	119.44	121.26
3	A	232	FAD	C5X-C9A-N10	2.56	119.57	117.72
4	A	1	TE7	CAK-CAL-NAX	-2.54	104.23	113.08
3	A	232	FAD	C4X-C4-N3	-2.47	120.06	123.43
4	A	1	TE7	CAK-NAN-CAQ	-2.43	119.25	123.28
3	B	232	FAD	C4X-C4-N3	-2.41	120.13	123.43
3	B	232	FAD	P-O3P-PA	-2.31	124.89	132.83
3	B	232	FAD	C4-C4X-C10	-2.31	118.42	119.95
4	A	1	TE7	CAG-CAS-NAM	2.22	136.94	130.80
3	A	232	FAD	C4-C4X-N5	2.17	121.08	118.60
4	B	1	TE7	CAG-CAS-NAM	2.15	136.75	130.80
4	A	1	TE7	CAF-CAG-CAS	-2.11	118.18	120.84

There are no chirality outliers.

All (7) torsion outliers are listed below:

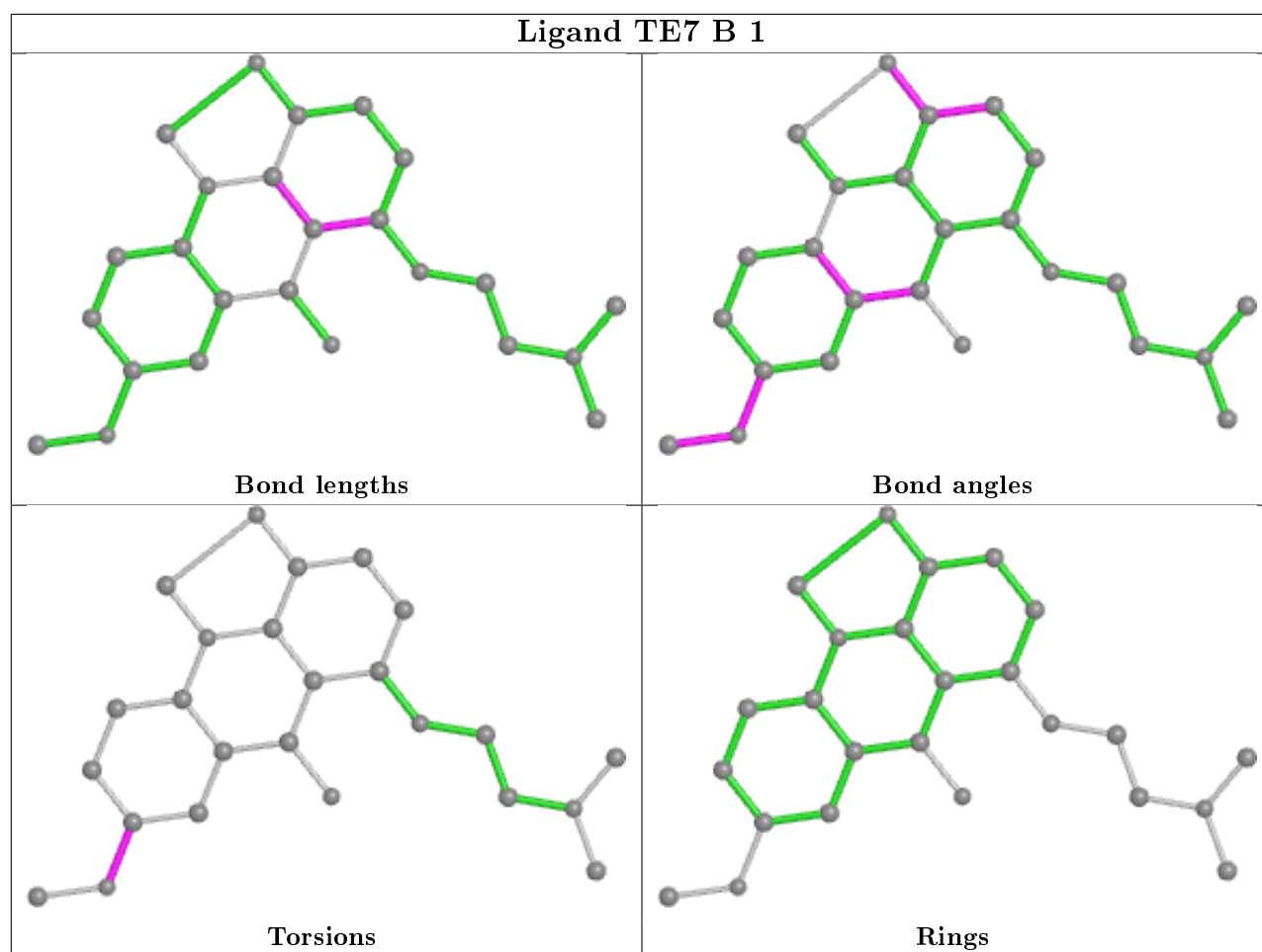
Mol	Chain	Res	Type	Atoms
3	A	232	FAD	C5B-O5B-PA-O2A
4	A	1	TE7	CAK-CAL-NAX-CAC
4	A	1	TE7	NAN-CAK-CAL-NAX
3	A	232	FAD	C5B-O5B-PA-O3P
4	B	1	TE7	CAE-CAP-OAO-CAA
3	A	232	FAD	C5B-O5B-PA-O1A
4	B	1	TE7	CAJ-CAP-OAO-CAA

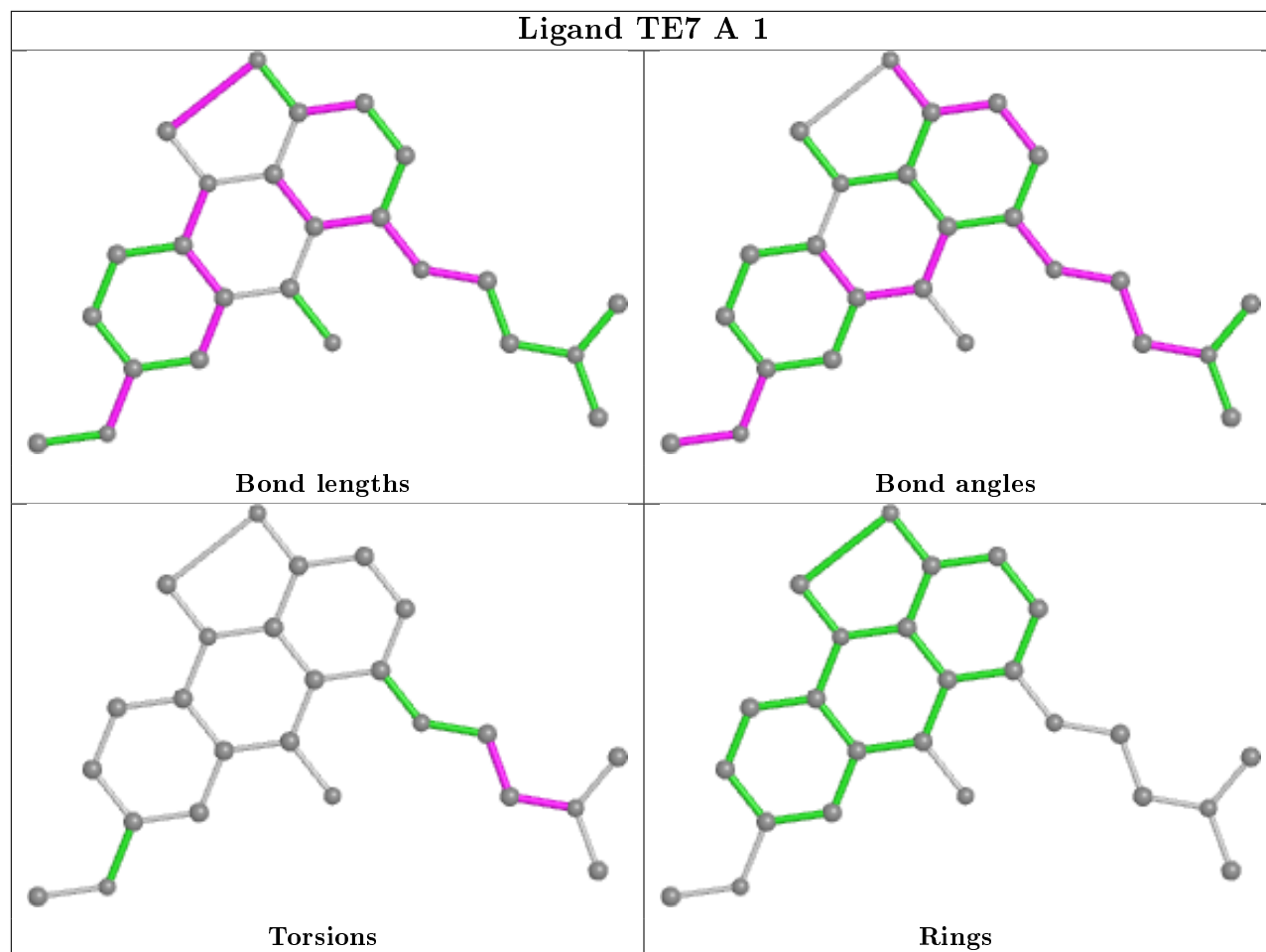
There are no ring outliers.

4 monomers are involved in 10 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	1	TE7	5	0
4	A	1	TE7	2	0
5	A	230	IMD	2	0
3	A	232	FAD	1	0

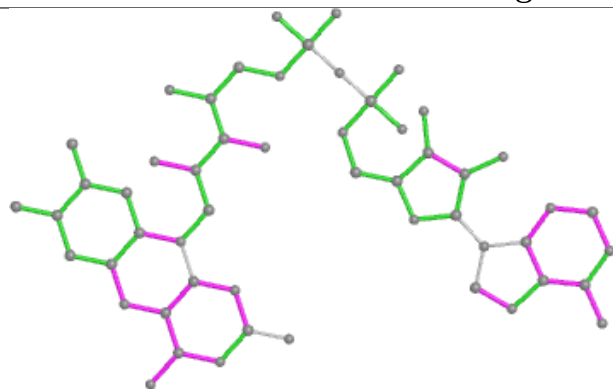
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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



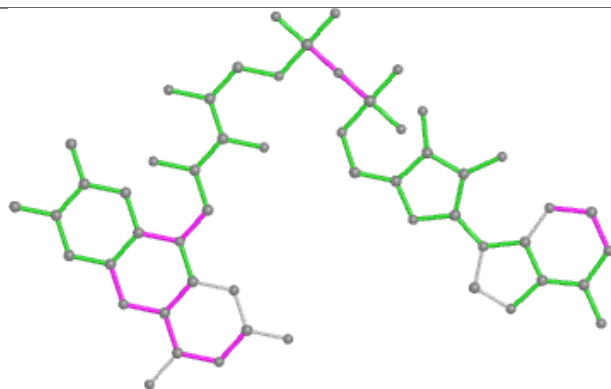




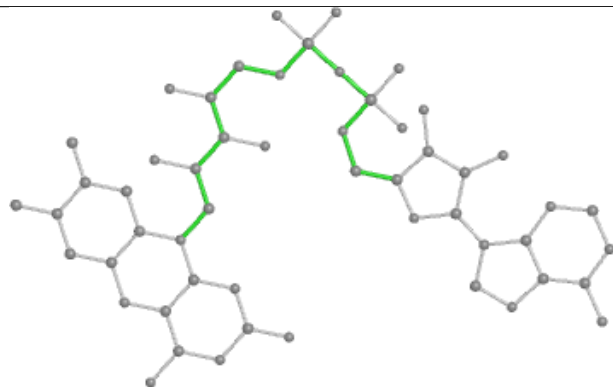
## Ligand FAD B 232



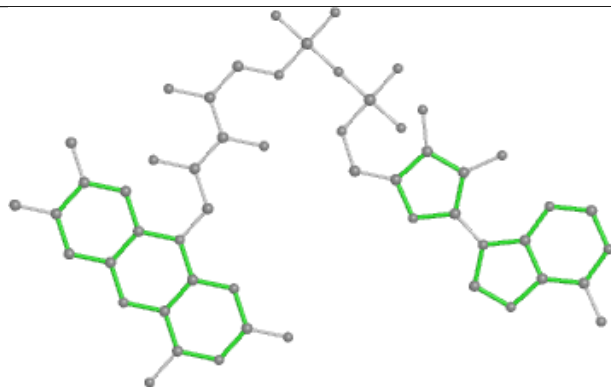
Bond lengths



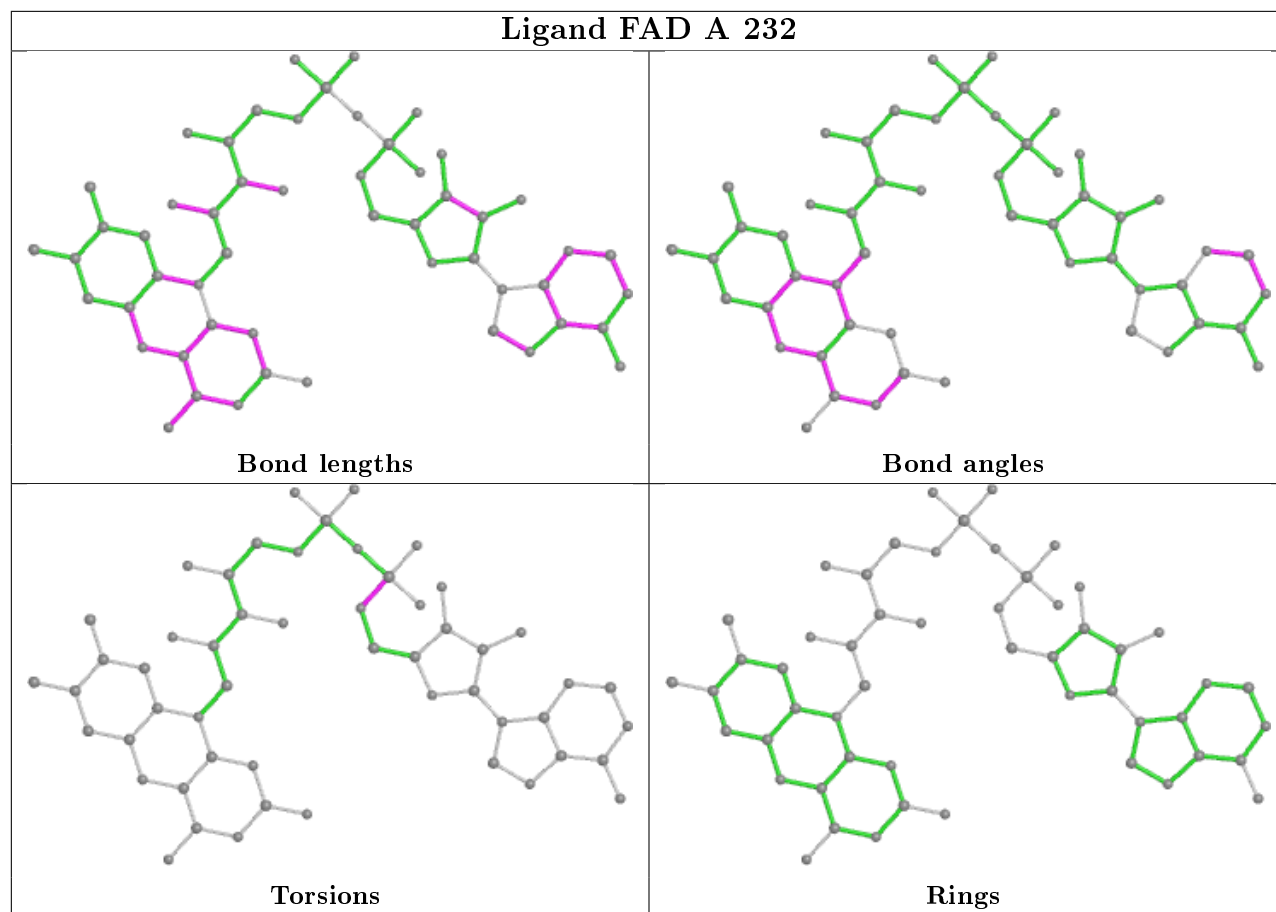
Bond angles



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

### 6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	228/228 (100%)	0.08	7 (3%)	49	53	7, 17, 40, 79	0
1	B	228/228 (100%)	0.32	19 (8%)	11	13	7, 21, 47, 73	0
All	All	456/456 (100%)	0.20	26 (5%)	23	26	7, 19, 46, 79	0

All (26) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	58	THR	4.5
1	B	57	GLY	4.0
1	B	198	GLU	3.9
1	B	63	GLU	3.1
1	A	198	GLU	3.0
1	B	108	VAL	3.0
1	A	108	VAL	3.0
1	B	171	LEU	2.8
1	A	196	SER	2.8
1	B	64	VAL	2.8
1	B	78	ARG	2.7
1	B	129	PRO	2.7
1	B	195	ALA	2.6
1	B	196	SER	2.6
1	A	197	GLU	2.5
1	B	157	LYS	2.4
1	B	194	ILE	2.4
1	B	103	LEU	2.3
1	A	194	ILE	2.2
1	A	62	PRO	2.2
1	A	195	ALA	2.2
1	B	112	LEU	2.1
1	B	218	GLU	2.1
1	B	62	PRO	2.1

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	RSRZ
1	B	128	ILE	2.1
1	B	197	GLU	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 carbohydrates in this entry.

## 6.4 Ligands [i](#)

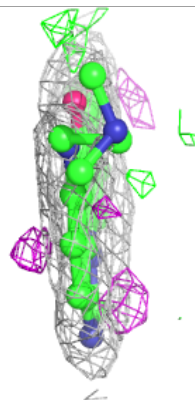
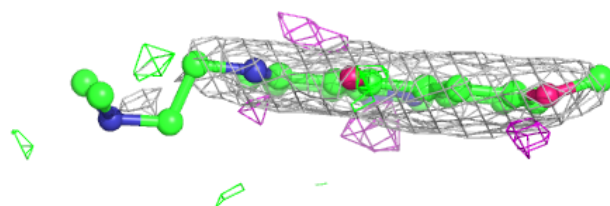
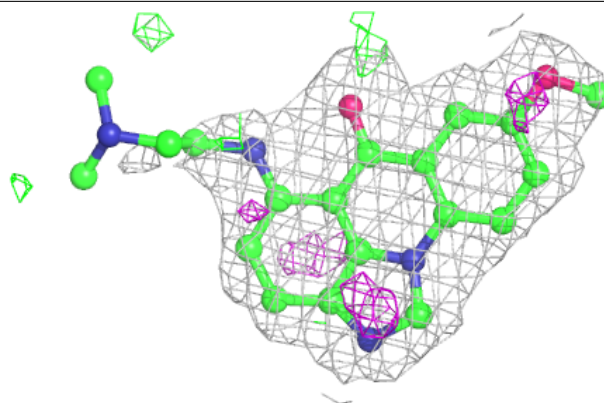
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
5	IMD	A	230	5/5	0.86	0.10	19,26,28,30	0
4	TE7	B	1	25/25	0.88	0.17	23,35,78,80	0
4	TE7	A	1	25/25	0.88	0.14	16,26,62,66	0
3	FAD	B	232	53/53	0.93	0.11	8,16,30,35	0
3	FAD	A	232	53/53	0.93	0.10	11,18,33,38	0
2	ZN	B	231	1/1	0.99	0.03	27,27,27,27	0
2	ZN	A	231	1/1	0.99	0.04	20,20,20,20	0

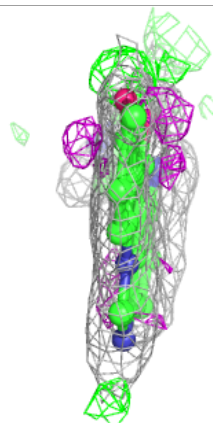
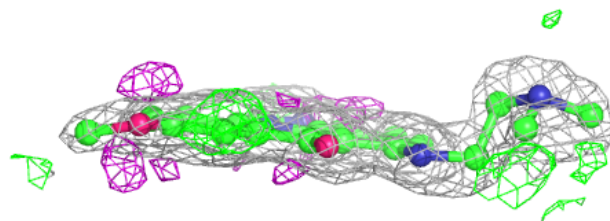
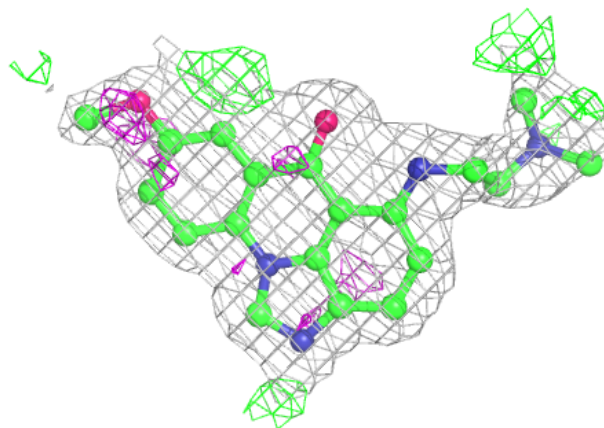
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

**Electron density around TE7 B 1:**

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

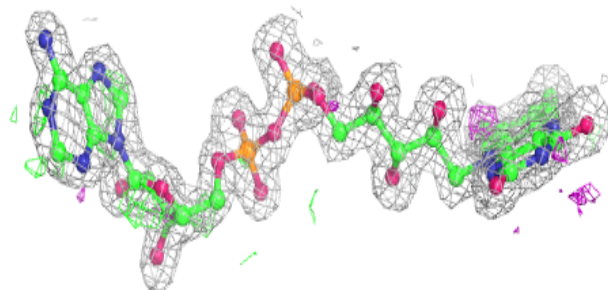
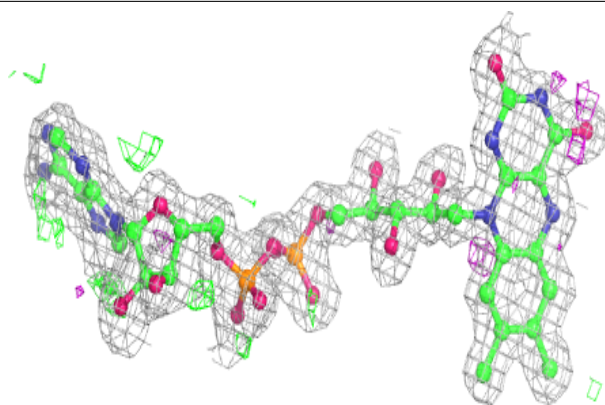
**Electron density around TE7 A 1:**

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

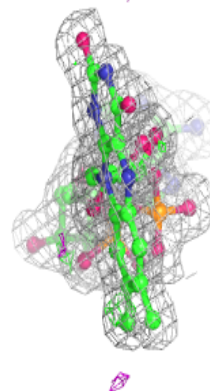
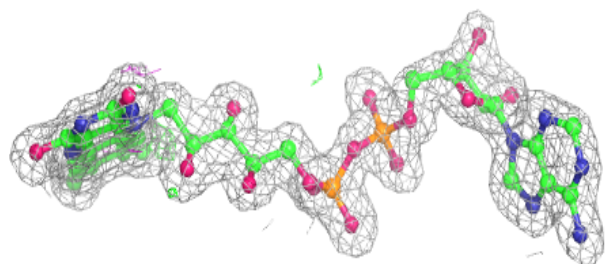
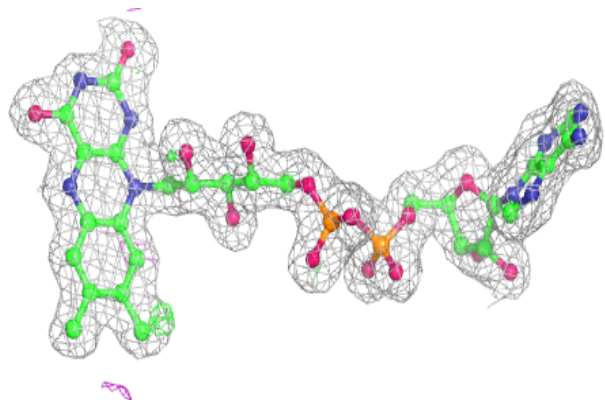


**Electron density around FAD B 232:**

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

**Electron density around FAD A 232:**

$2mF_o-DF_c$  (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.