



# wwPDB X-ray Structure Validation Summary Report ⓘ

May 29, 2020 – 08:29 pm BST

PDB ID : 3NRZ  
Title : Crystal Structure of Bovine Xanthine Oxidase in Complex with Hypoxanthine  
Authors : Cao, H.; Paufl, J.M.; Hille, R.  
Deposited on : 2010-07-01  
Resolution : 1.80 Å(reported)

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

We welcome your comments at [validation@mail.wwpdb.org](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

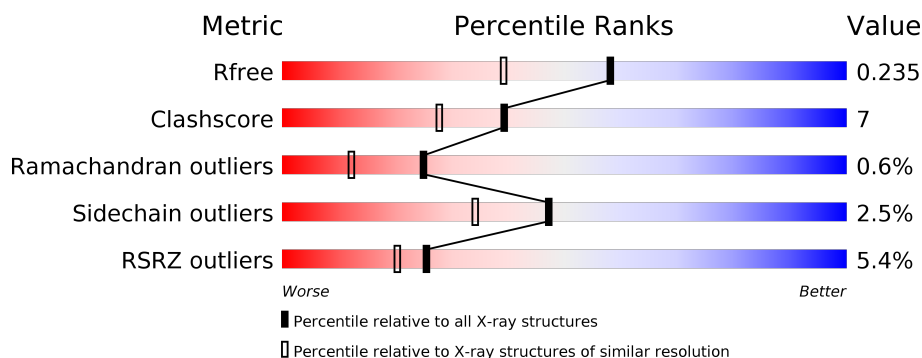
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 1.80 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	5950 (1.80-1.80)
Clashscore	141614	6793 (1.80-1.80)
Ramachandran outliers	138981	6697 (1.80-1.80)
Sidechain outliers	138945	6696 (1.80-1.80)
RSRZ outliers	127900	5850 (1.80-1.80)

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	164	<div> <div>7%</div> <div> <div></div> <div>93%</div> <div>6%</div> </div> <div>.</div> </div>
1	J	164	<div> <div>9%</div> <div> <div></div> <div>92%</div> <div>8%</div> </div> <div>.</div> </div>
2	B	305	<div> <div>8%</div> <div> <div></div> <div>85%</div> <div>13%</div> </div> <div>.</div> </div>
2	K	305	<div> <div>10%</div> <div> <div></div> <div>88%</div> <div>11%</div> </div> <div>.</div> </div>
3	C	756	<div> <div>3%</div> <div> <div></div> <div>82%</div> <div>16%</div> </div> <div>.</div> </div>
3	L	756	<div> <div>4%</div> <div> <div></div> <div>87%</div> <div>11%</div> </div> <div>..</div> </div>

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
7	MOS	C	1328	-	-	X	-

## 2 Entry composition

There are 9 unique types of molecules in this entry. The entry contains 20353 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 Xanthine dehydrogenase/oxidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	164	Total	C	N	O	S	0	0	0
			1255	788	225	230	12			
1	J	164	Total	C	N	O	S	0	0	0
			1255	788	225	230	12			

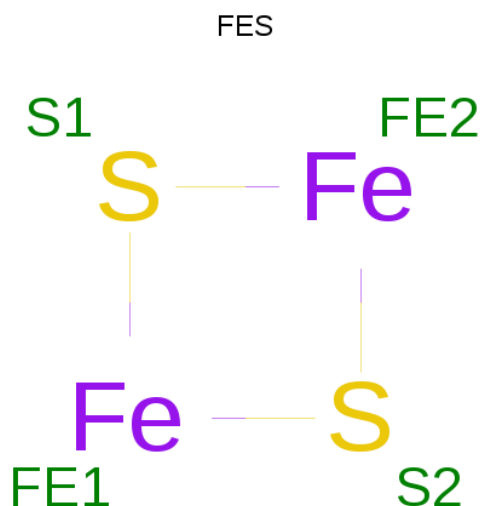
- Molecule 2 is a protein called Xanthine dehydrogenase/oxidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	305	Total	C	N	O	S	0	0	0
			2389	1539	402	435	13			
2	K	305	Total	C	N	O	S	0	0	0
			2389	1539	402	435	13			

- Molecule 3 is a protein called Xanthine dehydrogenase/oxidase.

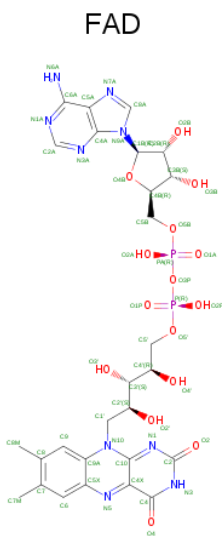
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	756	Total	C	N	O	S	0	0	0
			5832	3686	1005	1106	35			
3	L	745	Total	C	N	O	S	0	0	0
			5761	3643	992	1093	33			

- Molecule 4 is FE2/S2 (INORGANIC) CLUSTER (three-letter code: FES) (formula: Fe<sub>2</sub>S<sub>2</sub>).



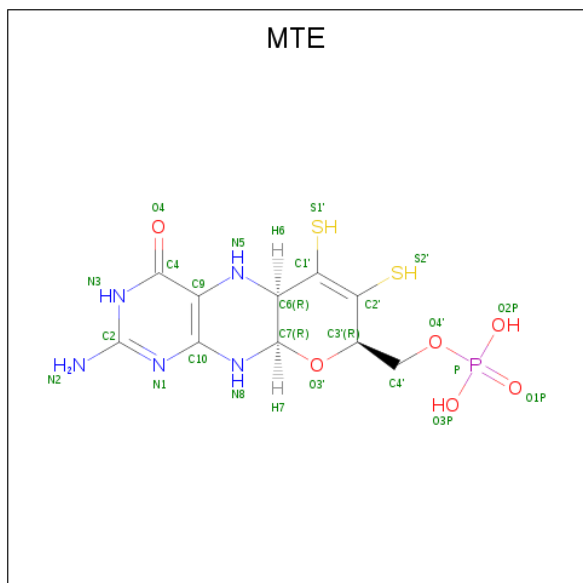
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total 4	Fe 2	S 2	0	0
4	A	1	Total 4	Fe 2	S 2	0	0
4	J	1	Total 4	Fe 2	S 2	0	0
4	J	1	Total 4	Fe 2	S 2	0	0

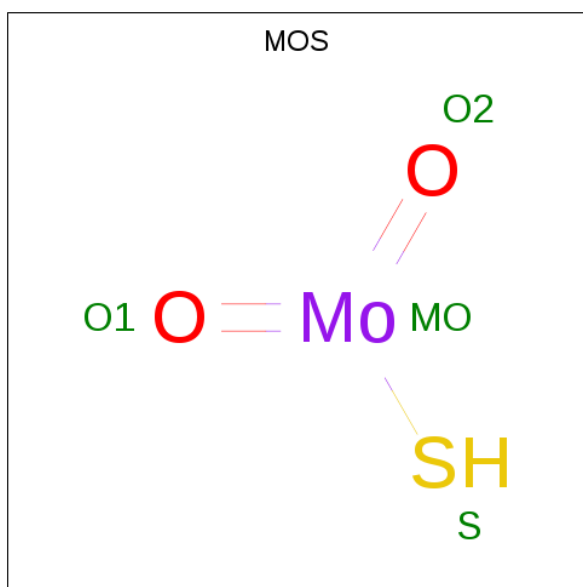
- Molecule 5 is FLAVIN-ADENINE DINUCLEOTIDE (three-letter code: FAD) (formula:  $\text{C}_{27}\text{H}_{33}\text{N}_9\text{O}_{15}\text{P}_2$ ).



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

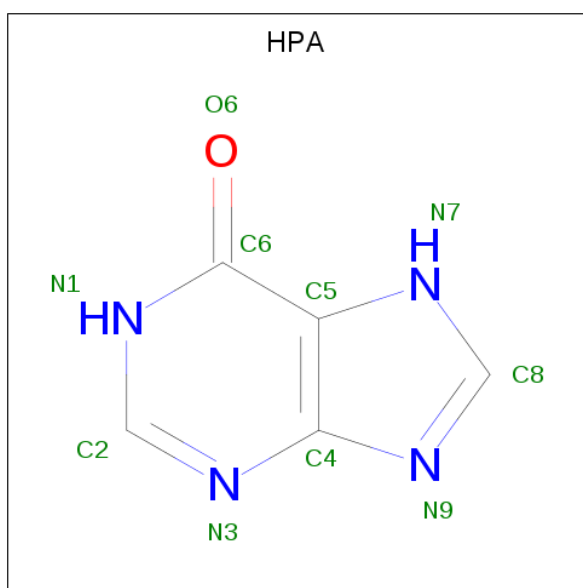
- Molecule 6 is PHOSPHONIC ACIDMONO-(2-AMINO-5,6-DIMERCAPTO-4-OXO-3,7,8A, 9,10,10A-HEXAHYDRO-4H-8-OXA-1,3,9,10-TETRAAZA-ANTHRACEN-7-YLMETHYL) ESTER (three-letter code: MTE) (formula:  $C_{10}H_{14}N_5O_6P S_2$ ).





Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
7	C	1	Total	Mo	O	S	0	0
			4	1	2	1		
7	L	1	Total	Mo	O	S	0	0
			4	1	2	1		

- Molecule 8 is HYPOXANTHINE (three-letter code: HPA) (formula:  $C_5H_4N_4O$ ).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
8	C	1	Total	C	N	O	0	0
			10	5	4	1		
8	L	1	Total	C	N	O	0	0
			10	5	4	1		

- Molecule 9 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	114	Total 114	O 114	0	0
9	B	114	Total 114	O 114	0	0
9	C	436	Total 436	O 436	0	0
9	J	98	Total 98	O 98	0	0
9	K	75	Total 75	O 75	0	0
9	L	437	Total 437	O 437	0	0



### 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.

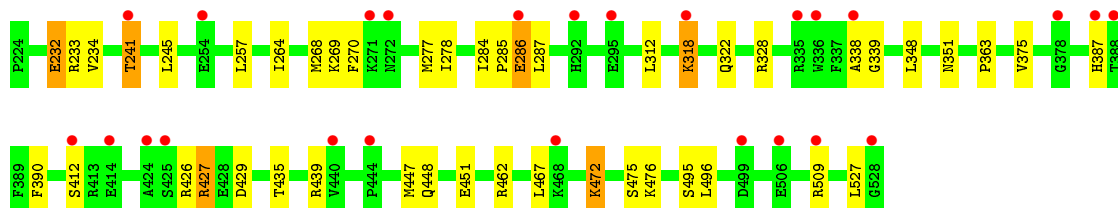
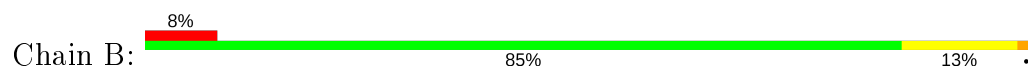
- Molecule 1: Xanthine dehydrogenase/oxidase



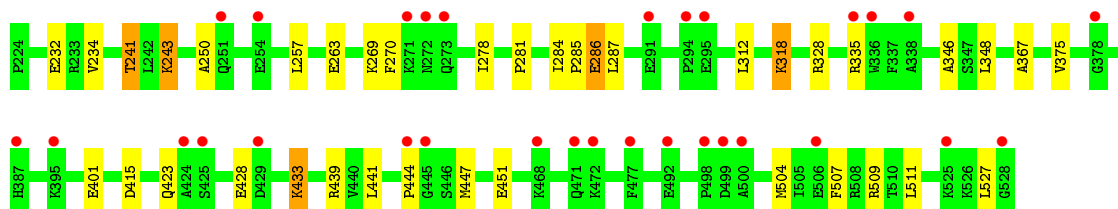
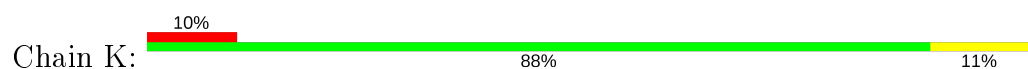
- Molecule 1: Xanthine dehydrogenase/oxidase



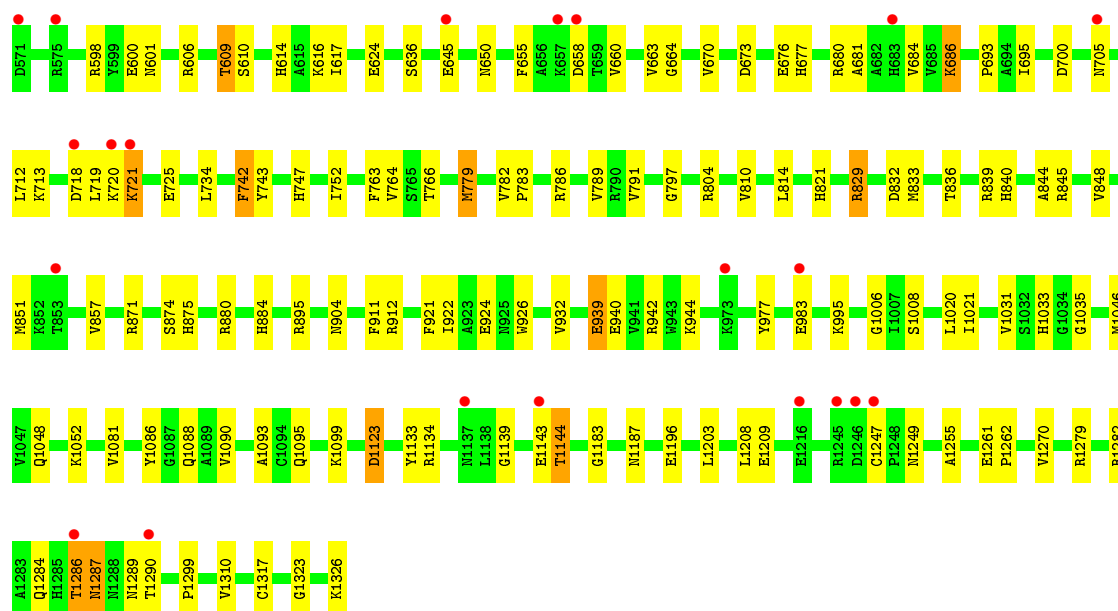
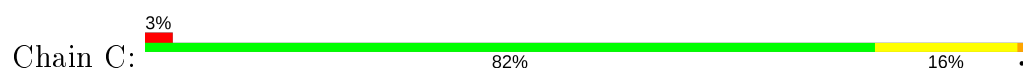
- Molecule 2: Xanthine dehydrogenase/oxidase



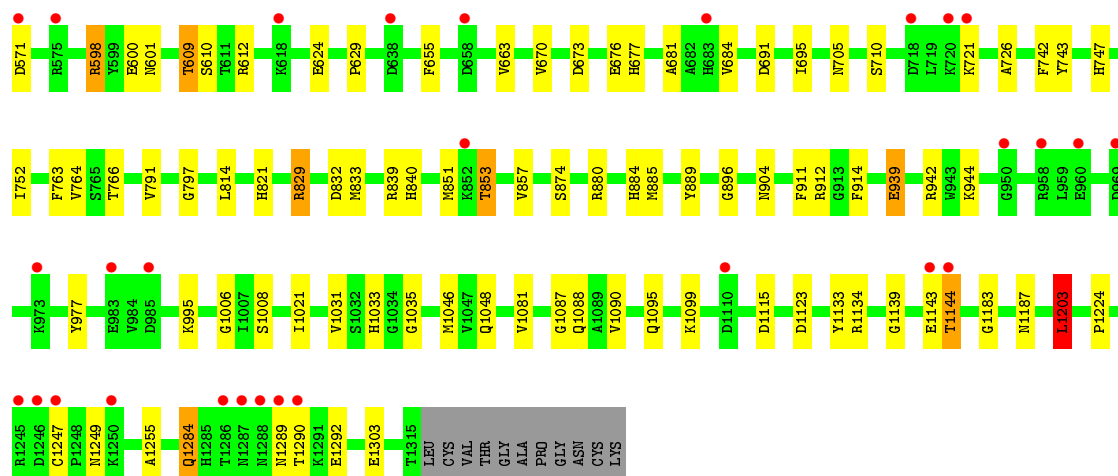
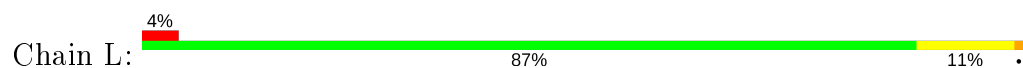
- Molecule 2: Xanthine dehydrogenase/oxidase



- Molecule 3: Xanthine dehydrogenase/oxidase



• Molecule 3: Xanthine dehydrogenase/oxidase



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	133.02Å 73.64Å 138.70Å 90.00° 97.05° 90.00°	Depositor
Resolution (Å)	23.50 – 1.80 23.46 – 1.80	Depositor EDS
% Data completeness (in resolution range)	95.1 (23.50-1.80) 95.1 (23.46-1.80)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.84 (at 1.80Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, $R_{free}$	0.197 , 0.234 0.196 , 0.235	Depositor DCC
$R_{free}$ test set	11843 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	20.4	Xtriage
Anisotropy	0.040	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.39 , 59.3	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.010 for l,-k,h	Xtriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	20353	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 3.04% 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 [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: MOS, HPA, FES, FAD, MTE

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	0.61	0/1277	0.70	0/1723
1	J	0.57	0/1277	0.64	0/1723
2	B	0.50	0/2438	0.62	0/3290
2	K	0.48	0/2438	0.60	0/3290
3	C	0.60	0/5960	0.73	6/8072 (0.1%)
3	L	0.59	0/5888	0.72	6/7974 (0.1%)
All	All	0.57	0/19278	0.69	12/26072 (0.0%)

There are no bond length outliers.

The worst 5 of 12 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	839	ARG	NE-CZ-NH2	-14.73	112.94	120.30
3	L	839	ARG	NE-CZ-NH2	-14.27	113.17	120.30
3	L	829	ARG	NE-CZ-NH2	-12.69	113.96	120.30
3	L	839	ARG	NE-CZ-NH1	10.21	125.41	120.30
3	C	829	ARG	NE-CZ-NH2	-10.18	115.21	120.30

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	1255	0	1265	11	0
1	J	1255	0	1265	9	0
2	B	2389	0	2459	35	0
2	K	2389	0	2459	38	0
3	C	5832	0	5759	119	1
3	L	5761	0	5685	83	0
4	A	8	0	0	0	0
4	J	8	0	0	0	0
5	B	53	0	31	0	0
5	K	53	0	31	3	0
6	C	24	0	10	0	0
6	L	24	0	10	0	0
7	C	4	0	0	2	0
7	L	4	0	0	1	0
8	C	10	0	4	1	0
8	L	10	0	4	0	0
9	A	114	0	0	3	1
9	B	114	0	0	11	0
9	C	436	0	0	13	0
9	J	98	0	0	1	0
9	K	75	0	0	5	0
9	L	437	0	0	9	0
All	All	20353	0	18982	283	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 7.

The worst 5 of 283 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)
3:C:1081:VAL:HG21	9:C:1338:HOH:O	1.25	1.29
3:C:1052:LYS:HE3	9:C:1342:HOH:O	1.23	1.27
3:L:1081:VAL:HG21	9:L:1366:HOH:O	1.11	1.26
3:C:764:VAL:HB	9:C:1472:HOH:O	1.09	1.23
2:B:241:THR:HB	9:B:558:HOH:O	1.44	1.18

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)
3:C:871:ARG:NH1	9:A:173:HOH:O[1_565]	2.17	0.03

## 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	162/164 (99%)	155 (96%)	6 (4%)	1 (1%)	25	12
1	J	162/164 (99%)	154 (95%)	8 (5%)	0	100	100
2	B	303/305 (99%)	291 (96%)	12 (4%)	0	100	100
2	K	303/305 (99%)	292 (96%)	10 (3%)	1 (0%)	41	27
3	C	754/756 (100%)	733 (97%)	15 (2%)	6 (1%)	19	7
3	L	743/756 (98%)	724 (97%)	13 (2%)	6 (1%)	19	7
All	All	2427/2450 (99%)	2349 (97%)	64 (3%)	14 (1%)	25	12

5 of 14 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	C	721	LYS
3	C	1008	SER
3	C	1144	THR
3	L	721	LYS
3	L	1008	SER

### 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	137/137 (100%)	134 (98%)	3 (2%)	52	39
1	J	137/137 (100%)	136 (99%)	1 (1%)	84	81
2	B	261/261 (100%)	249 (95%)	12 (5%)	27	13

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	K	261/261 (100%)	251 (96%)	10 (4%)	33	18
3	C	632/632 (100%)	619 (98%)	13 (2%)	53	42
3	L	624/632 (99%)	612 (98%)	12 (2%)	57	46
All	All	2052/2060 (100%)	2001 (98%)	51 (2%)	47	34

5 of 51 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	C	1123	ASP
1	J	93	SER
3	L	939	GLU
3	C	1286	THR
2	K	241	THR

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 39 such sidechains are listed below:

Mol	Chain	Res	Type
3	C	1284	GLN
1	J	146	ASN
3	L	1212	HIS
3	C	1285	HIS
3	C	1287	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 carbohydrates in this entry.

## 5.6 Ligand geometry

12 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
7	MOS	L	1328	6	0,3,3	0.00	-	-		
8	HPA	C	1	-	8,11,11	2.20	4 (50%)	5,15,15	2.09	2 (40%)
5	FAD	B	606	-	51,58,58	1.46	7 (13%)	60,89,89	1.69	7 (11%)
8	HPA	L	1	-	8,11,11	1.68	2 (25%)	5,15,15	2.55	2 (40%)
4	FES	A	602	1	0,4,4	0.00	-	-		
4	FES	J	601	1	0,4,4	0.00	-	-		
6	MTE	C	1327	7	21,26,26	1.60	2 (9%)	21,40,40	2.10	8 (38%)
4	FES	J	602	1	0,4,4	0.00	-	-		
6	MTE	L	1327	7	21,26,26	1.66	3 (14%)	21,40,40	2.34	6 (28%)
4	FES	A	601	1	0,4,4	0.00	-	-		
5	FAD	K	606	-	51,58,58	1.45	6 (11%)	60,89,89	1.76	11 (18%)
7	MOS	C	1328	6	0,3,3	0.00	-	-		

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
8	HPA	C	1	-	-	-	0/2/2/2
5	FAD	B	606	-	-	1/30/50/50	0/6/6/6
8	HPA	L	1	-	-	-	0/2/2/2
4	FES	J	601	1	-	-	0/1/1/1
4	FES	A	602	1	-	-	0/1/1/1
6	MTE	C	1327	7	-	2/6/34/34	0/3/3/3
4	FES	J	602	1	-	-	0/1/1/1
6	MTE	L	1327	7	-	3/6/34/34	0/3/3/3
4	FES	A	601	1	-	-	0/1/1/1
5	FAD	K	606	-	-	0/30/50/50	0/6/6/6



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

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	C	1327	MTE	C4-C9	5.79	1.49	1.41
6	L	1327	MTE	C4-C9	5.29	1.48	1.41
5	B	606	FAD	C10-N1	4.87	1.39	1.33
5	K	606	FAD	C2A-N3A	4.46	1.39	1.32
5	K	606	FAD	C10-N1	4.44	1.39	1.33

The worst 5 of 36 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	L	1327	MTE	C4-C9-N5	6.87	124.89	119.12
5	K	606	FAD	C4-N3-C2	6.60	120.71	115.14
5	B	606	FAD	N3A-C2A-N1A	-5.96	119.36	128.68
5	K	606	FAD	N3A-C2A-N1A	-5.96	119.37	128.68
5	B	606	FAD	C4-N3-C2	5.88	120.10	115.14

There are no chirality outliers.

5 of 6 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	C	1327	MTE	C4'-O4'-P-O3P
6	L	1327	MTE	C4'-O4'-P-O3P
6	C	1327	MTE	C3'-C4'-O4'-P
6	L	1327	MTE	C3'-C4'-O4'-P
6	L	1327	MTE	C4'-O4'-P-O2P

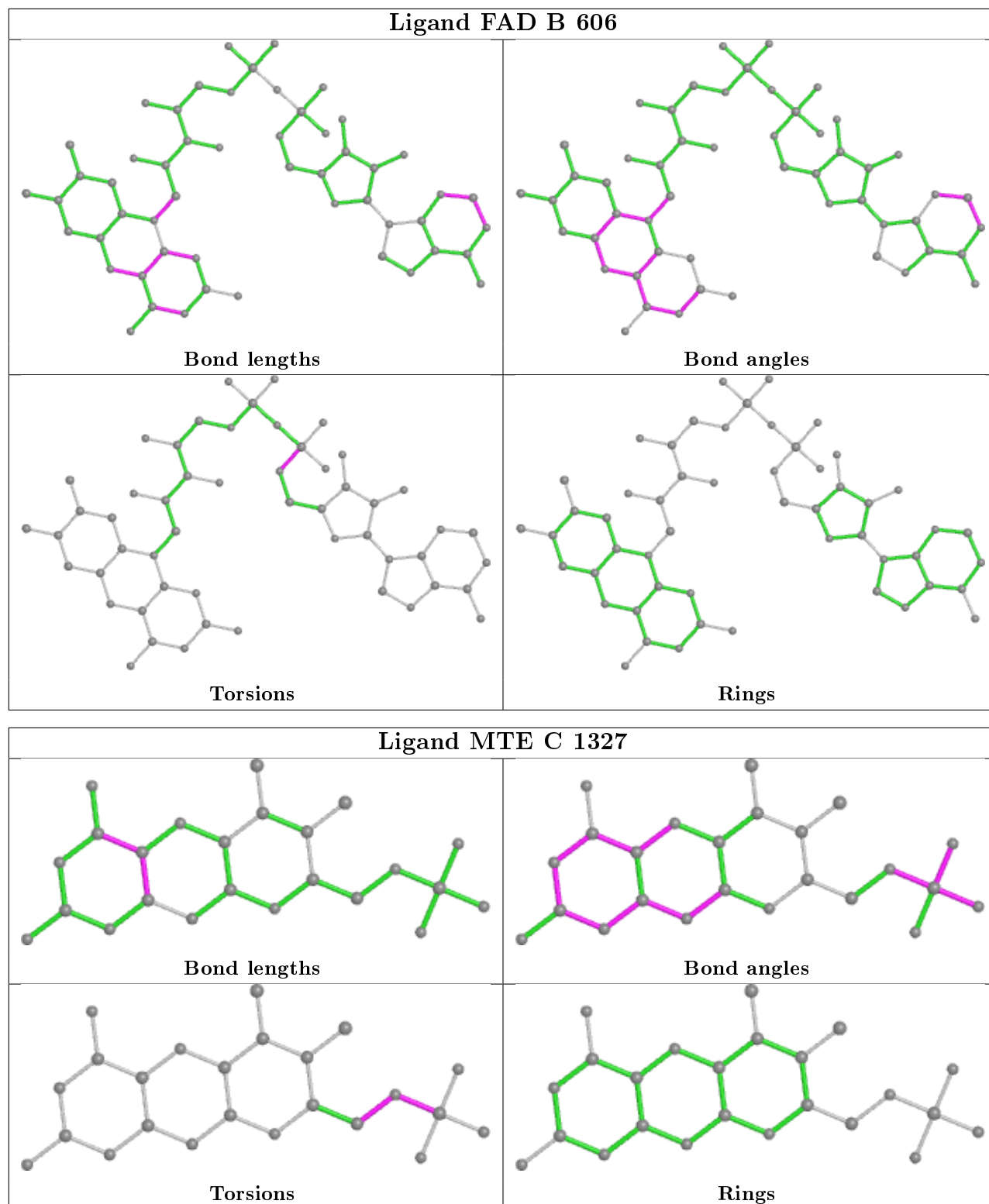
There are no ring outliers.

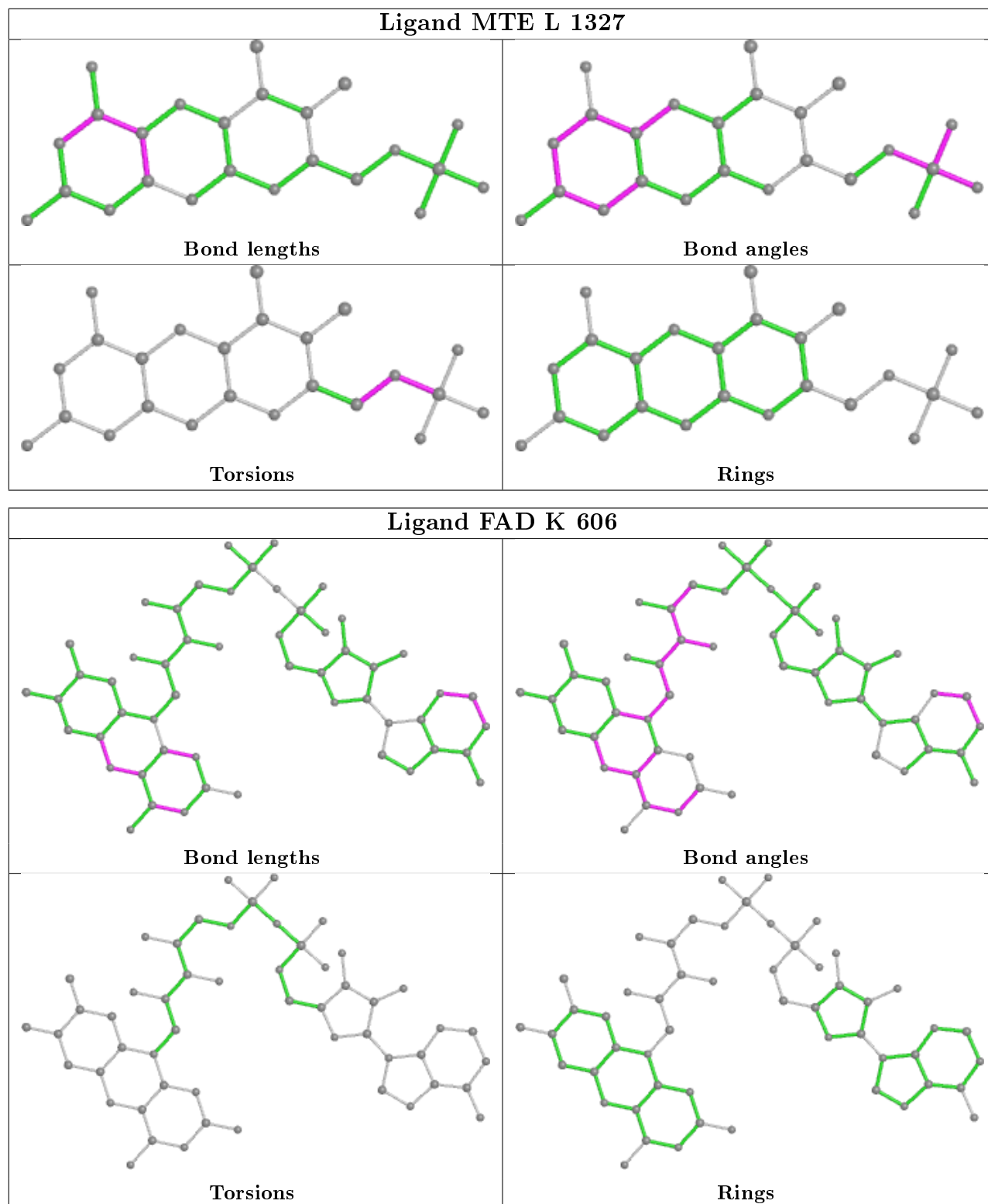
4 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	L	1328	MOS	1	0
8	C	1	HPA	1	0
5	K	606	FAD	3	0
7	C	1328	MOS	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 ⓘ

There are no chain breaks in this entry.

## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	164/164 (100%)	0.32	12 (7%) 15 11	8, 19, 36, 45	0
1	J	164/164 (100%)	0.39	14 (8%) 10 8	11, 21, 41, 52	0
2	B	305/305 (100%)	0.55	25 (8%) 11 9	16, 27, 41, 45	0
2	K	305/305 (100%)	0.61	30 (9%) 7 5	19, 32, 44, 50	0
3	C	756/756 (100%)	0.01	21 (2%) 53 47	10, 18, 30, 38	0
3	L	745/756 (98%)	0.09	29 (3%) 39 33	10, 20, 33, 56	0
All	All	2439/2450 (99%)	0.22	131 (5%) 25 20	8, 21, 39, 56	0

The worst 5 of 131 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	J	2	THR	8.4
3	L	1290	THR	8.0
1	A	63	ASP	7.4
3	L	1288	ASN	7.3
1	J	61	LEU	7.2

### 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

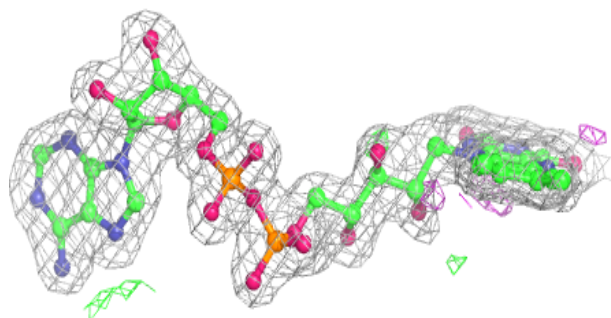
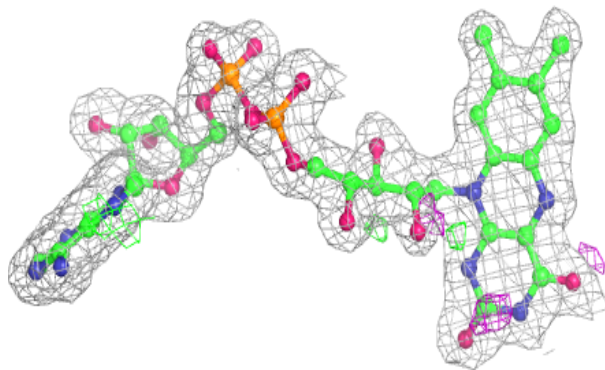
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 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
8	HPA	C	1	10/10	0.75	0.19	25,27,29,29	0
8	HPA	L	1	10/10	0.81	0.15	25,26,28,29	0
5	FAD	K	606	53/53	0.96	0.09	17,24,27,29	0
6	MTE	C	1327	24/24	0.97	0.08	11,14,25,28	0
5	FAD	B	606	53/53	0.97	0.09	15,18,24,27	0
6	MTE	L	1327	24/24	0.98	0.07	12,16,26,29	0
4	FES	J	601	4/4	0.99	0.07	11,11,12,13	0
7	MOS	L	1328	4/4	0.99	0.09	23,26,27,35	0
7	MOS	C	1328	4/4	0.99	0.10	22,26,27,35	0
4	FES	A	601	4/4	1.00	0.09	10,10,11,11	0
4	FES	J	602	4/4	1.00	0.06	13,13,14,14	0
4	FES	A	602	4/4	1.00	0.06	11,12,12,13	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.

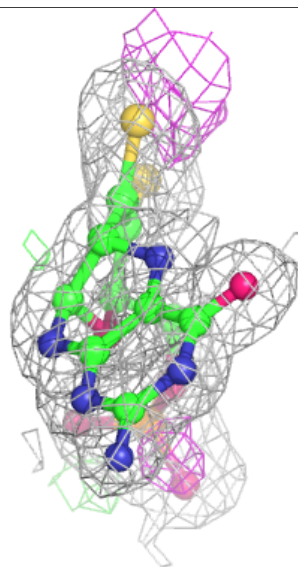
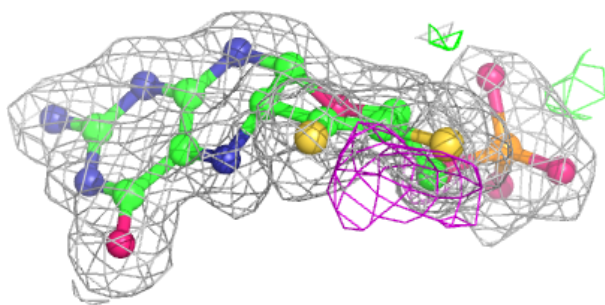
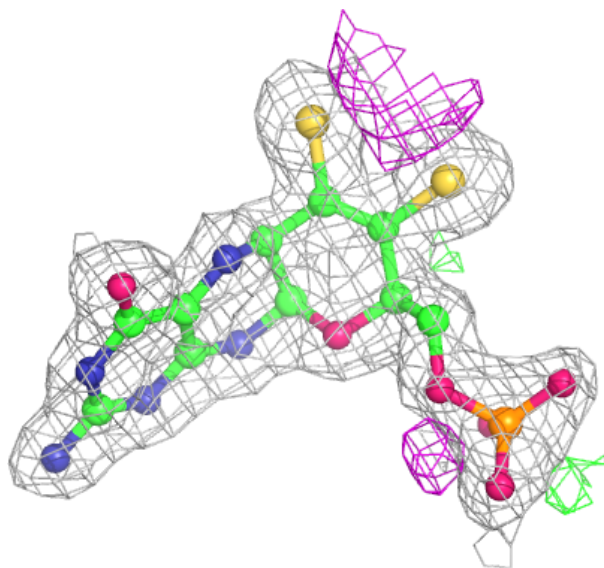
**Electron density around FAD K 606:**

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



**Electron density around MTE C 1327:**

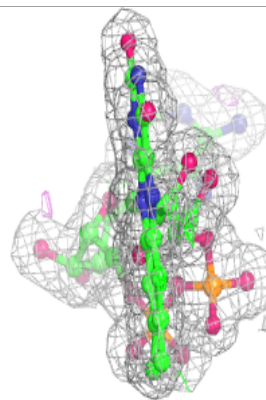
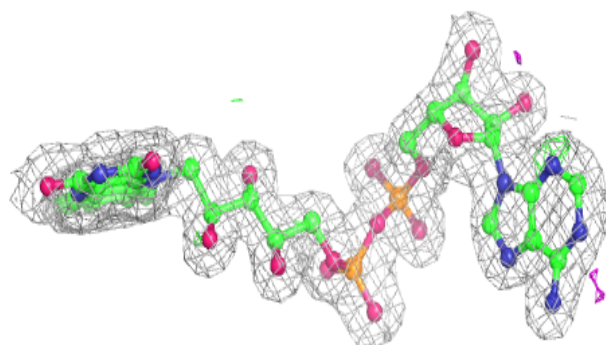
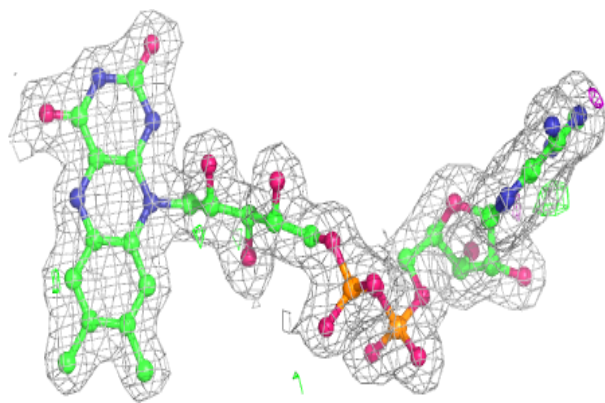
2mF<sub>o</sub>-DF<sub>c</sub> (at 0.7 rmsd) in gray  
mF<sub>o</sub>-DF<sub>c</sub> (at 3 rmsd) in purple (negative)  
and green (positive)





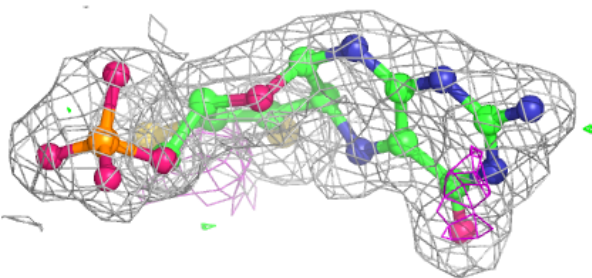
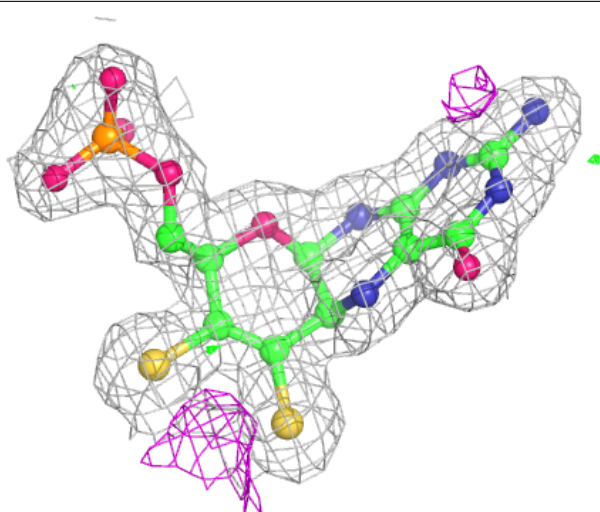
**Electron density around FAD B 606:**

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



**Electron density around MTE L 1327:**

$2mF_o-DF_c$  (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.