Full wwPDB X-ray Structure Validation Report ⓘ

Jan 8, 2025 – 04:14 PM JST

PDB ID	:	8XTZ
Title	:	Crystal structure of Lsd18 in complex with a substrate
Authors	:	Deng, Y.M.; Hu, Y.L.; Chen, X.
Deposited on	:	2024-01-12
Resolution	:	1.85 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

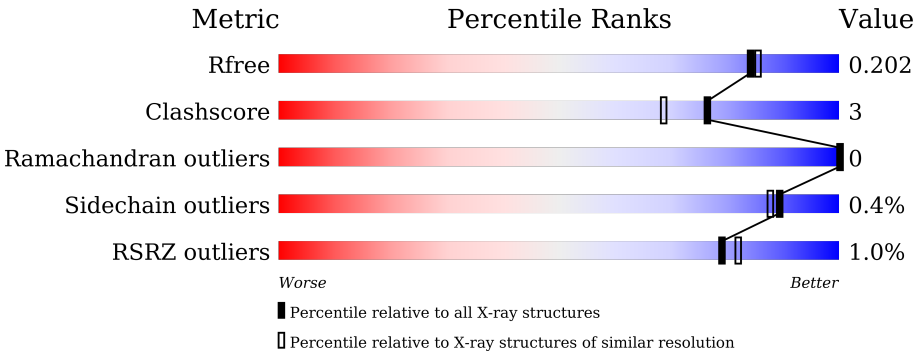
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.21
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.004 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.40

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 1.85 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	3097 (1.86-1.86)
Clashscore	180529	3359 (1.86-1.86)
Ramachandran outliers	177936	3335 (1.86-1.86)
Sidechain outliers	177891	3335 (1.86-1.86)
RSRZ outliers	164620	3097 (1.86-1.86)

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	488	91% 5% .
1	B	488	2% 89% 7% .

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 8078 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 Putative epoxidase LasC.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	468	Total	C	N	O	S	0	0	0
			3442	2150	641	638	13			
1	B	468	Total	C	N	O	S	0	1	0
			3453	2155	646	639	13			

There are 32 discrepancies between the modelled and reference sequences:

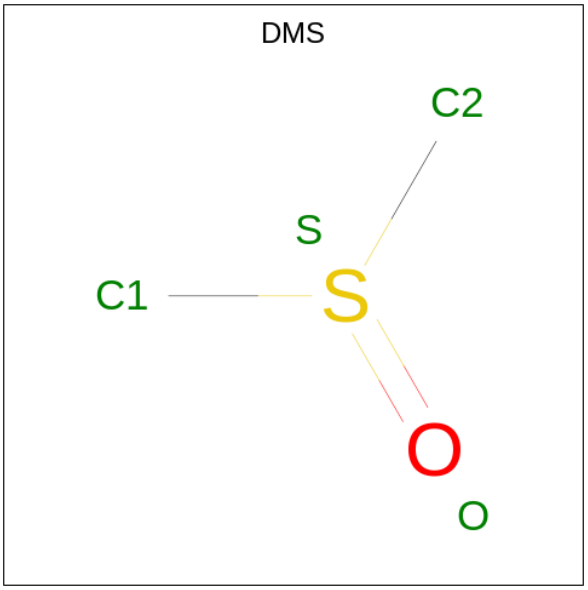
Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MET	-	initiating methionine	UNP B5M9L6
A	2	ASN	-	expression tag	UNP B5M9L6
A	3	HIS	-	expression tag	UNP B5M9L6
A	4	LYS	-	expression tag	UNP B5M9L6
A	5	VAL	-	expression tag	UNP B5M9L6
A	6	HIS	-	expression tag	UNP B5M9L6
A	7	HIS	-	expression tag	UNP B5M9L6
A	8	HIS	-	expression tag	UNP B5M9L6
A	9	HIS	-	expression tag	UNP B5M9L6
A	10	HIS	-	expression tag	UNP B5M9L6
A	11	HIS	-	expression tag	UNP B5M9L6
A	12	ILE	-	expression tag	UNP B5M9L6
A	13	GLU	-	expression tag	UNP B5M9L6
A	14	GLY	-	expression tag	UNP B5M9L6
A	15	ARG	-	expression tag	UNP B5M9L6
A	16	HIS	-	expression tag	UNP B5M9L6
B	1	MET	-	initiating methionine	UNP B5M9L6
B	2	ASN	-	expression tag	UNP B5M9L6
B	3	HIS	-	expression tag	UNP B5M9L6
B	4	LYS	-	expression tag	UNP B5M9L6
B	5	VAL	-	expression tag	UNP B5M9L6
B	6	HIS	-	expression tag	UNP B5M9L6
B	7	HIS	-	expression tag	UNP B5M9L6
B	8	HIS	-	expression tag	UNP B5M9L6
B	9	HIS	-	expression tag	UNP B5M9L6

Continued on next page...

Continued from previous page...

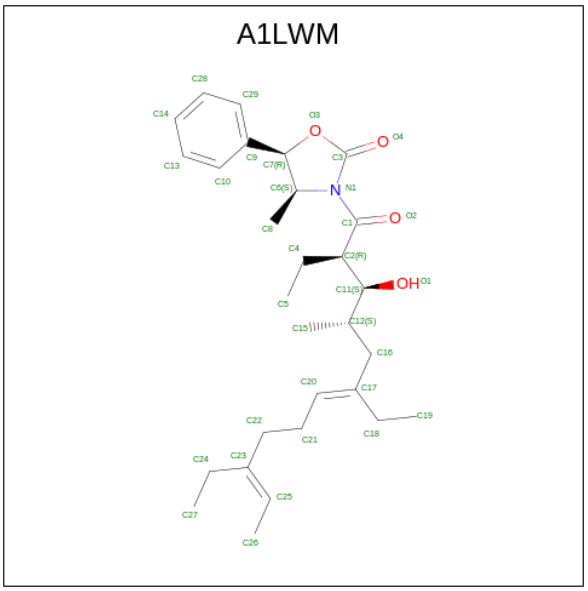
Chain	Residue	Modelled	Actual	Comment	Reference
B	10	HIS	-	expression tag	UNP B5M9L6
B	11	HIS	-	expression tag	UNP B5M9L6
B	12	ILE	-	expression tag	UNP B5M9L6
B	13	GLU	-	expression tag	UNP B5M9L6
B	14	GLY	-	expression tag	UNP B5M9L6
B	15	ARG	-	expression tag	UNP B5M9L6
B	16	HIS	-	expression tag	UNP B5M9L6

- Molecule 2 is DIMETHYL SULFOXIDE (three-letter code: DMS) (formula: C_2H_6OS).



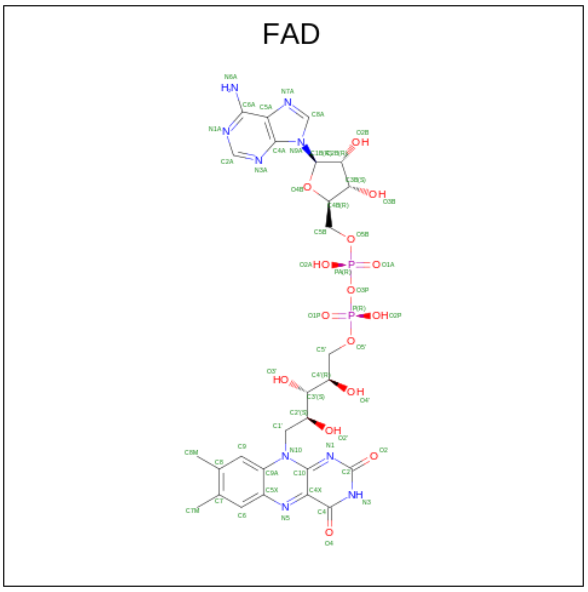
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	O	S	0	0
			4	2	1	1		
2	B	1	Total	C	O	S	0	0
			4	2	1	1		

- Molecule 3 is (4R,5S)-4-methyl-5-phenyl-3-((2R,3S,4S,6E,10E)-2,6,10-triethyl-3-hydroxy-4-methyldodeca-6,10-dienoyl)oxazolidin-2-one (three-letter code: A1LWM) (formula: $C_{29}H_{43}NO_4$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C 15 15	0	0
3	B	1	Total C 15 15	0	0

- Molecule 4 is FLAVIN-ADENINE DINUCLEOTIDE (three-letter code: FAD) (formula: $C_{27}H_{33}N_9O_{15}P_2$).



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

Continued on next page...

Continued from previous page...

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

- Molecule 5 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	1	Total	Cl	0	0
			1	1		
5	B	1	Total	Cl	0	0
			1	1		

- Molecule 6 is water.

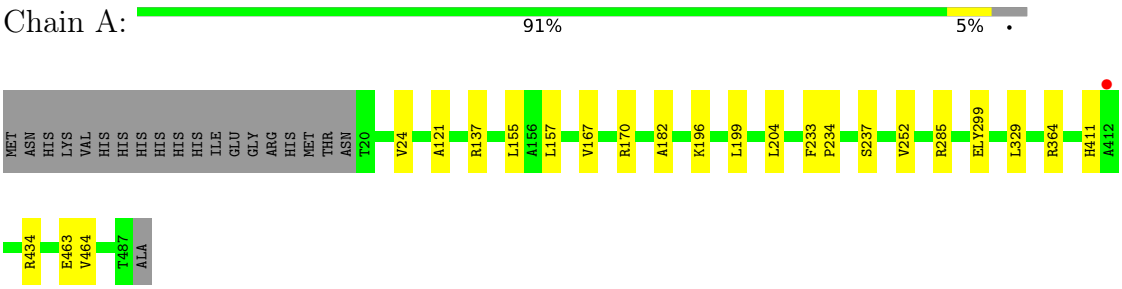
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	506	Total	O	0	0
			506	506		
6	B	531	Total	O	0	0
			531	531		

3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

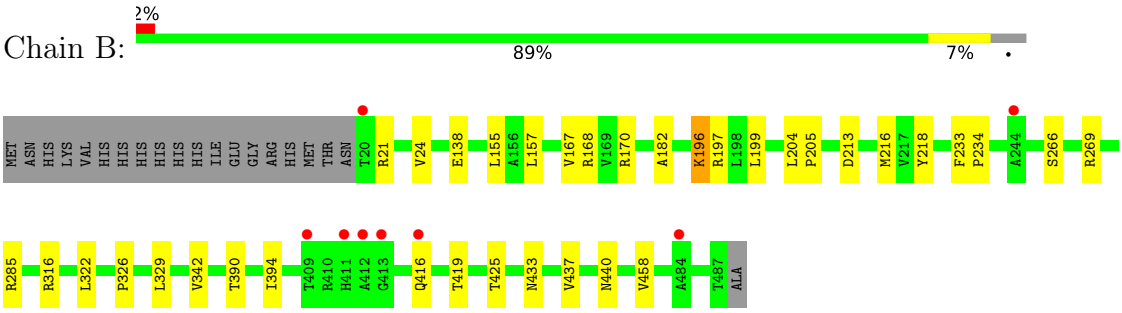
• Molecule 1: Putative epoxidase LasC

Chain A:



• Molecule 1: Putative epoxidase LasC

Chain B:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	46.65Å 61.77Å 75.69Å 74.62° 81.82° 77.04°	Depositor
Resolution (Å)	25.33 – 1.85 25.33 – 1.85	Depositor EDS
% Data completeness (in resolution range)	97.2 (25.33-1.85) 97.2 (25.33-1.85)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	5.17 (at 1.85Å)	Xtriage
Refinement program	PHENIX (1.16_3549: ???)	Depositor
R, R_{free}	0.161 , 0.203 0.161 , 0.202	Depositor DCC
R_{free} test set	3311 reflections (4.89%)	wwPDB-VP
Wilson B-factor (Å^2)	17.6	Xtriage
Anisotropy	0.088	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 44.2	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	8078	wwPDB-VP
Average B, all atoms (Å^2)	21.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 11.15% of the height of the origin peak. No significant pseudotranslation is detected.*

[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: ELY, A1LWM, DMS, CL, FAD

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	0.35	0/3497	0.53	0/4769
1	B	0.35	0/3511	0.54	0/4787
All	All	0.35	0/7008	0.53	0/9556

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	3442	0	3398	17	0
1	B	3453	0	3411	22	0
2	A	4	0	6	0	0
2	B	4	0	6	0	0
3	A	15	0	0	2	0
3	B	15	0	0	0	0
4	A	53	0	31	0	0
4	B	53	0	31	1	0
5	A	1	0	0	0	0
5	B	1	0	0	0	0
6	A	506	0	0	7	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	B	531	0	0	5	0
All	All	8078	0	6883	39	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 3.

All (39) 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:A:199:LEU:HD22	1:A:204:LEU:HD12	1.72	0.70
1:B:199:LEU:HD22	1:B:204:LEU:HD12	1.80	0.64
1:A:137:ARG:NH1	6:A:1201:HOH:O	2.23	0.61
1:B:24:VAL:HG23	1:B:182:ALA:HB2	1.82	0.60
1:B:440:ASN:ND2	6:B:1005:HOH:O	2.30	0.58
1:B:285:ARG:NH1	6:B:1014:HOH:O	2.39	0.54
1:A:463:GLU:HG3	1:A:464:VAL:HG13	1.89	0.53
1:B:390:THR:O	1:B:394:ILE:HG23	2.10	0.51
1:B:157:LEU:HD23	1:B:167:VAL:HG12	1.92	0.51
1:A:364:ARG:NH1	6:A:1205:HOH:O	2.34	0.50
1:A:233:PHE:CG	1:A:234:PRO:HD2	2.47	0.50
1:B:155:LEU:HD11	1:B:170:ARG:HB2	1.94	0.49
1:A:24:VAL:HG23	1:A:182:ALA:HB2	1.94	0.49
1:B:196:LYS:HG3	1:B:197:ARG:N	2.27	0.49
1:A:252:VAL:HG21	3:A:1102:A1LWM:C21	2.43	0.49
1:A:237:SER:HB3	3:A:1102:A1LWM:C19	2.44	0.48
1:A:157:LEU:HD23	1:A:167:VAL:HG12	1.96	0.47
1:B:233:PHE:CG	1:B:234:PRO:HD2	2.50	0.46
1:B:205:PRO:HG2	1:B:322:LEU:HD22	1.98	0.46
1:B:218:TYR:CD2	4:B:903:FAD:HM73	2.50	0.46
1:A:285:ARG:NH2	6:A:1225:HOH:O	2.48	0.46
1:B:213:ASP:OD2	1:B:269:ARG:NH2	2.50	0.45
1:A:137:ARG:NH2	6:A:1216:HOH:O	2.44	0.44
1:B:21:ARG:NH2	6:B:1032:HOH:O	2.49	0.44
1:B:216:MET:SD	1:B:266:SER:HB2	2.57	0.44
1:B:416:GLN:HA	1:B:419:THR:OG1	2.18	0.44
1:B:425:THR:HG21	1:B:458:VAL:HA	1.98	0.44
1:B:196:LYS:HB2	1:B:196:LYS:HE2	1.62	0.43
1:A:121:ALA:HB2	1:A:434:ARG:HG2	2.01	0.42
1:B:218:TYR:HH	1:B:342:VAL:HA	1.84	0.42
1:A:196:LYS:NZ	6:A:1231:HOH:O	2.51	0.42
1:B:199:LEU:HD21	1:B:329:LEU:HD21	2.00	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:155:LEU:HD11	1:A:170:ARG:HB2	2.02	0.42
1:B:316:ARG:NH2	6:B:1009:HOH:O	2.39	0.42
1:A:199:LEU:HD21	1:A:329:LEU:CD2	2.51	0.41
1:B:138:GLU:OE2	6:B:1001:HOH:O	2.22	0.41
1:B:433:ASN:O	1:B:437:VAL:HG22	2.20	0.40
1:A:411:HIS:HA	6:A:1542:HOH:O	2.20	0.40
1:A:299:ELY:HH2A	6:A:1581: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	465/488 (95%)	457 (98%)	8 (2%)	0	100	100
1	B	466/488 (96%)	459 (98%)	7 (2%)	0	100	100
All	All	931/976 (95%)	916 (98%)	15 (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	339/376 (90%)	339 (100%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	B	340/376 (90%)	337 (99%)	3 (1%)	75 70
All	All	679/752 (90%)	676 (100%)	3 (0%)	89 88

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	168	ARG
1	B	196	LYS
1	B	326	PRO

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

2 non-standard protein/DNA/RNA residues 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	$\#\|Z\| > 2$
1	ELY	B	299	1	11,12,13	0.47	0	8,13,15	0.59	0
1	ELY	A	299	1	11,12,13	0.50	0	8,13,15	0.63	0

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
1	ELY	B	299	1	-	1/12/13/15	-

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	ELY	A	299	1	-	3/12/13/15	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	299	ELY	CT1-CH1-NZ-CE
1	A	299	ELY	CT1-CH1-NZ-CH2
1	A	299	ELY	CA-CB-CG-CD
1	B	299	ELY	CA-CB-CG-CD

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	299	ELY	1	0

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 8 ligands modelled in this entry, 2 are monoatomic - leaving 6 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	$\#\|Z\| > 2$
2	DMS	A	1101	-	3,3,3	0.74	0	3,3,3	0.29	0
3	A1LWM	B	902	-	12,14,35	2.55	2 (16%)	11,16,47	2.47	4 (36%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
4	FAD	B	903	-	53,58,58	0.51	0	68,89,89	0.61	1 (1%)
2	DMS	B	901	-	3,3,3	0.68	0	3,3,3	0.22	0
4	FAD	A	1103	-	53,58,58	0.51	0	68,89,89	0.56	1 (1%)
3	A1LWM	A	1102	-	12,14,35	2.68	2 (16%)	11,16,47	2.71	5 (45%)

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
3	A1LWM	B	902	-	-	5/16/16/54	-
4	FAD	B	903	-	-	1/30/50/50	0/6/6/6
4	FAD	A	1103	-	-	1/30/50/50	0/6/6/6
3	A1LWM	A	1102	-	-	4/16/16/54	-

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	1102	A1LWM	C16-C17	8.32	1.59	1.51
3	B	902	A1LWM	C16-C17	7.78	1.59	1.51
3	B	902	A1LWM	C22-C23	3.31	1.56	1.51
3	A	1102	A1LWM	C22-C23	3.19	1.56	1.51

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	B	902	A1LWM	C26-C25-C23	-6.52	114.79	127.19
3	A	1102	A1LWM	C24-C23-C22	4.55	125.17	115.45
3	A	1102	A1LWM	C18-C17-C16	4.16	124.45	115.50
3	A	1102	A1LWM	C16-C17-C20	-3.93	115.16	122.17
3	A	1102	A1LWM	C26-C25-C23	-3.59	120.37	127.19
3	A	1102	A1LWM	C22-C23-C25	-2.95	113.99	122.19
3	B	902	A1LWM	C18-C17-C20	-2.90	116.99	122.17
3	B	902	A1LWM	C18-C17-C16	2.49	120.85	115.50
4	B	903	FAD	C5A-C6A-N6A	2.33	123.89	120.35
3	B	902	A1LWM	C24-C23-C22	2.20	120.14	115.45
4	A	1103	FAD	C5A-C6A-N6A	2.20	123.69	120.35

There are no chirality outliers.

All (11) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	1102	A1LWM	C21-C22-C23-C24
3	A	1102	A1LWM	C21-C22-C23-C25
3	B	902	A1LWM	C15-C12-C16-C17
3	B	902	A1LWM	C12-C16-C17-C18
3	B	902	A1LWM	C11-C12-C16-C17
3	B	902	A1LWM	C21-C22-C23-C25
3	B	902	A1LWM	C12-C16-C17-C20
3	A	1102	A1LWM	C12-C16-C17-C18
4	A	1103	FAD	O4B-C4B-C5B-O5B
4	B	903	FAD	O4B-C4B-C5B-O5B
3	A	1102	A1LWM	C17-C20-C21-C22

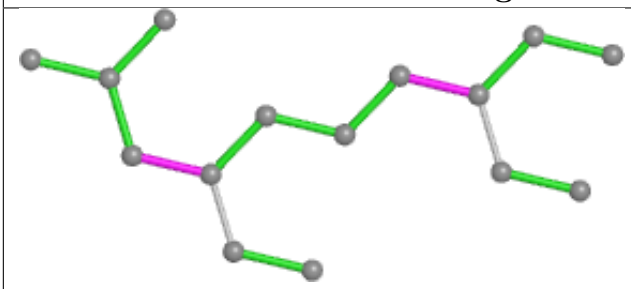
There are no ring outliers.

2 monomers are involved in 3 short contacts:

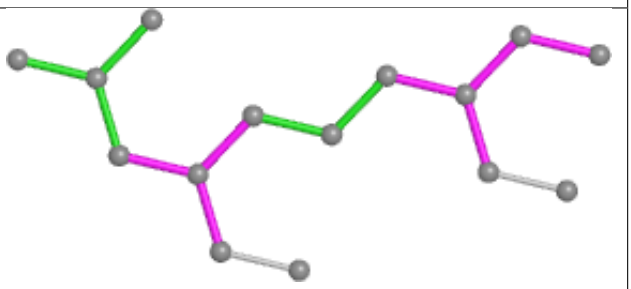
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	903	FAD	1	0
3	A	1102	A1LWM	2	0

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 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.

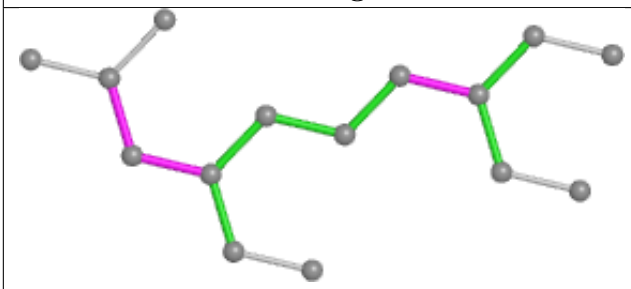
Ligand A1LWM B 902



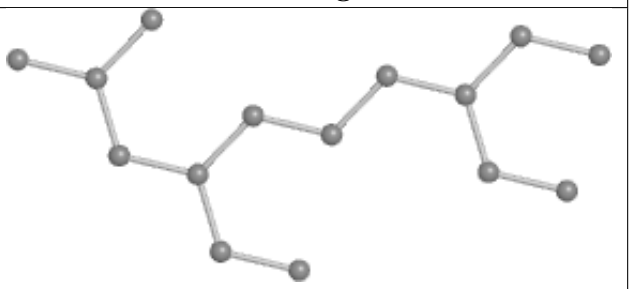
Bond lengths



Bond angles

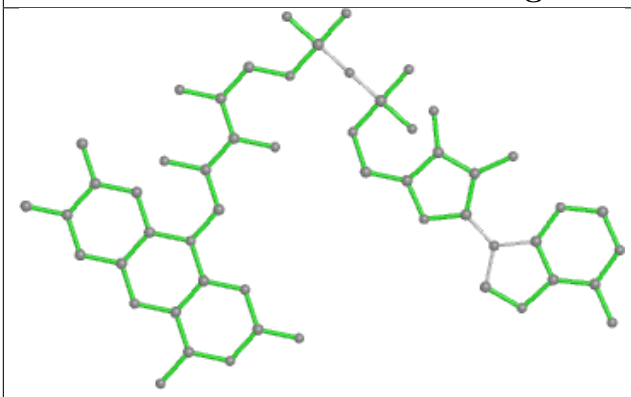


Torsions

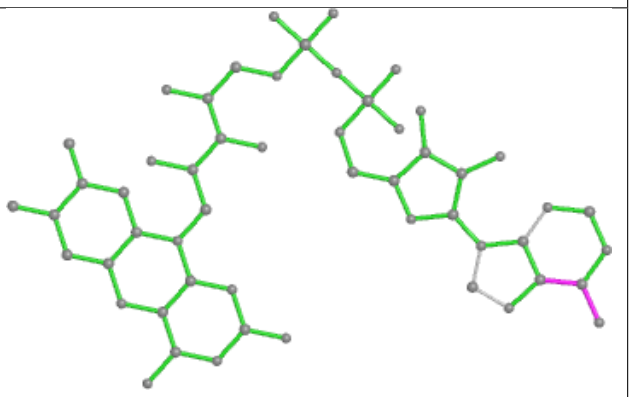


Rings

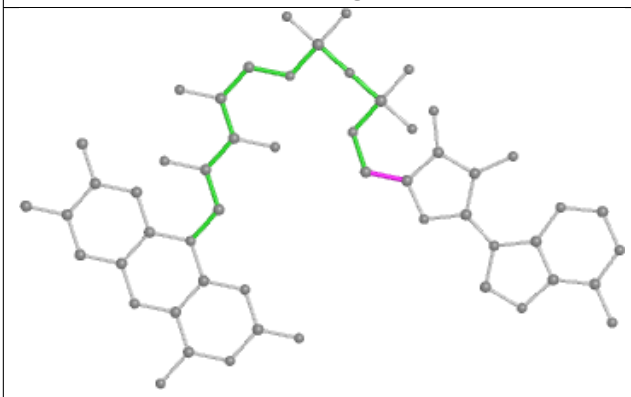
Ligand FAD B 903



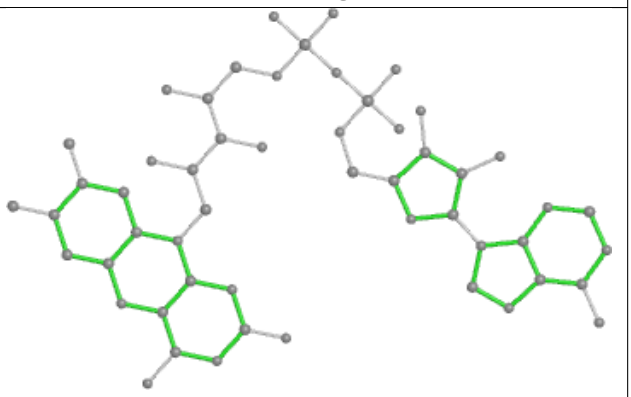
Bond lengths



Bond angles

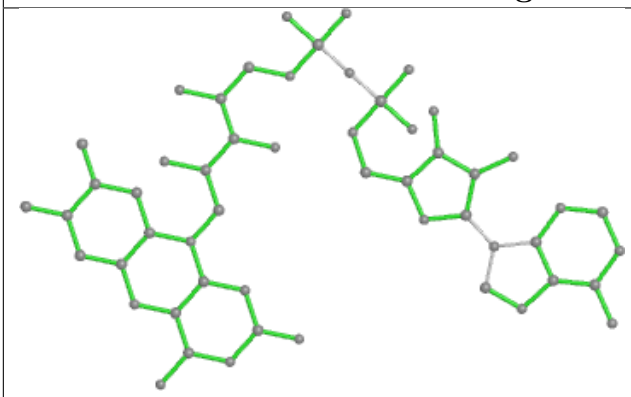


Torsions

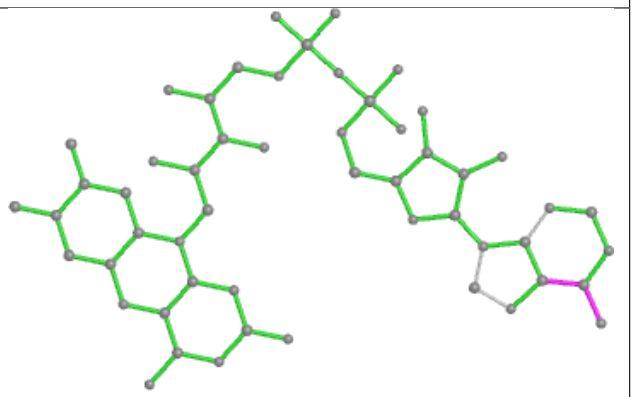


Rings

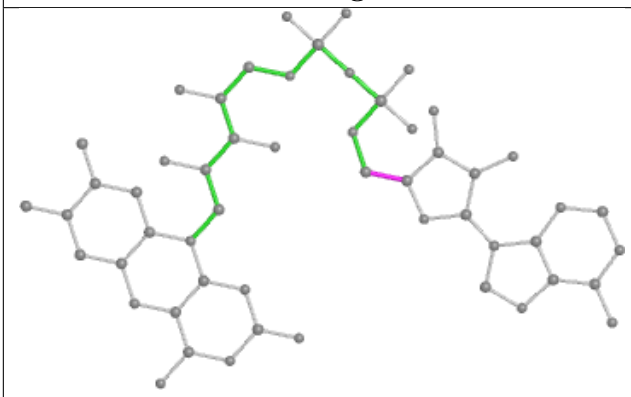
Ligand FAD A 1103



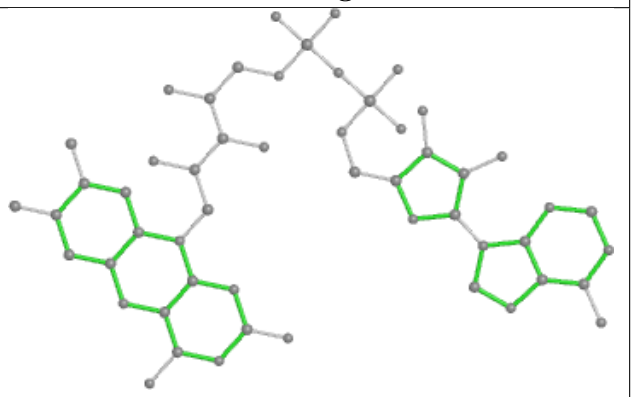
Bond lengths



Bond angles

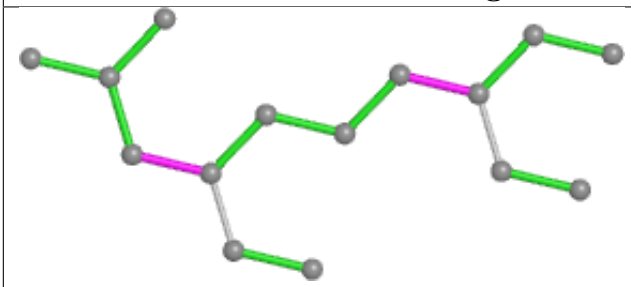


Torsions

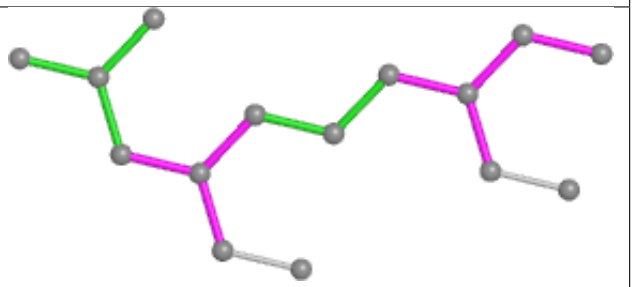


Rings

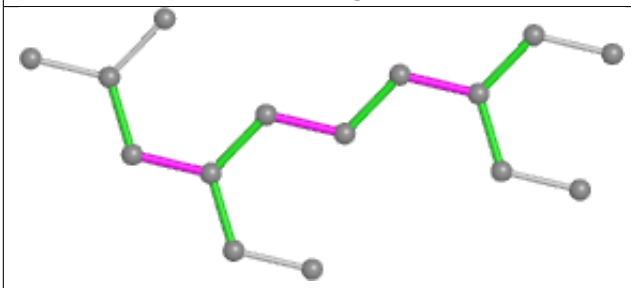
Ligand A1LWM A 1102



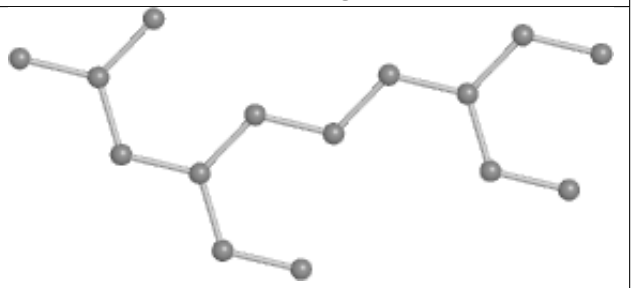
Bond lengths



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^{th} 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	467/488 (95%)	-0.36	1 (0%)	92	93	10, 17, 34, 43	0
1	B	467/488 (95%)	-0.39	8 (1%)	69	72	10, 17, 34, 61	1 (0%)
All	All	934/976 (95%)	-0.37	9 (0%)	79	82	10, 17, 34, 61	1 (0%)

All (9) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	411	HIS	6.5
1	B	412	ALA	4.5
1	B	409	THR	2.8
1	B	484	ALA	2.8
1	B	20	THR	2.3
1	B	416	GLN	2.2
1	A	412	ALA	2.1
1	B	244	ALA	2.1
1	B	413	GLY	2.1

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

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^{th} 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
1	ELY	A	299	13/14	0.89	0.11	19,30,35,35	0
1	ELY	B	299	13/14	0.93	0.09	19,28,38,42	0

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

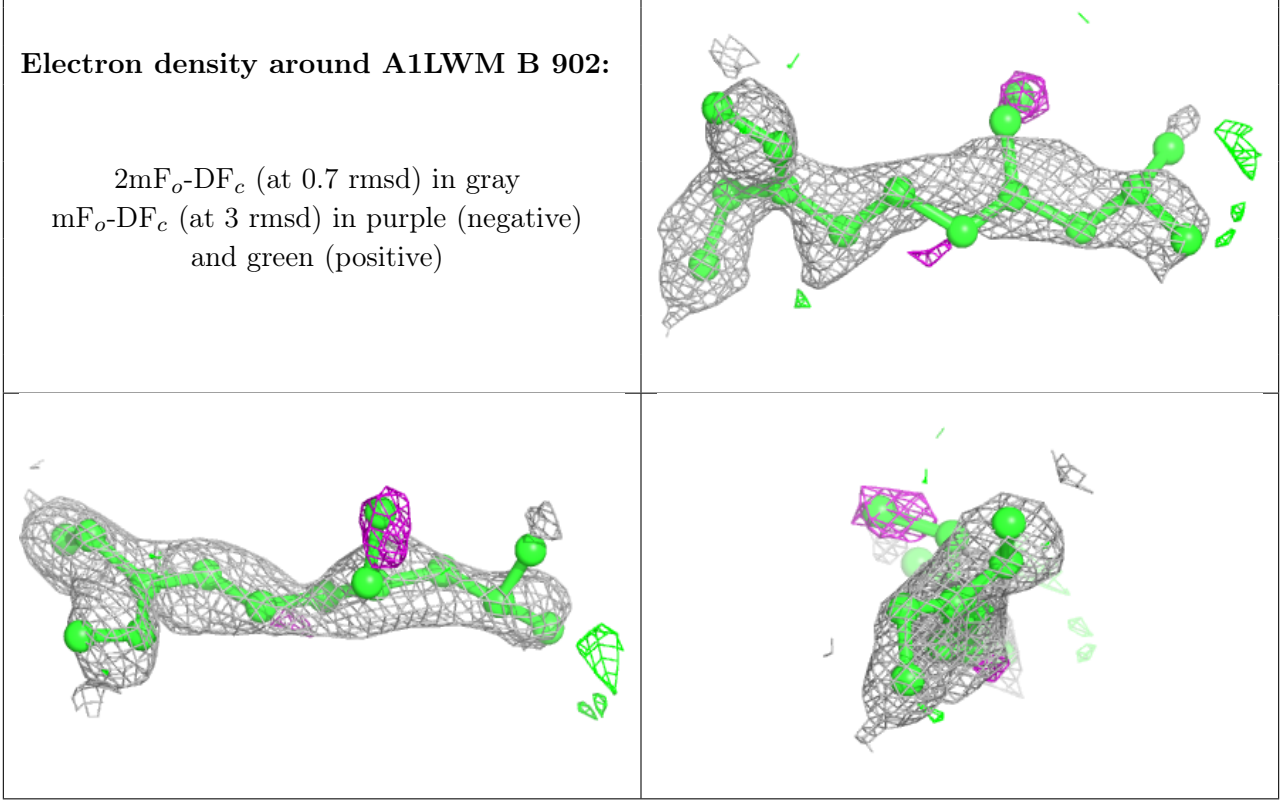
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' 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	A1LWM	B	902	15/34	0.75	0.20	25,43,51,57	0
3	A1LWM	A	1102	15/34	0.81	0.18	14,37,49,53	0
2	DMS	A	1101	4/4	0.96	0.08	10,15,21,25	0
2	DMS	B	901	4/4	0.97	0.06	11,17,20,22	0
4	FAD	A	1103	53/53	0.97	0.06	9,12,18,20	0
4	FAD	B	903	53/53	0.97	0.05	9,13,18,21	0
5	CL	A	1104	1/1	0.99	0.03	21,21,21,21	0
5	CL	B	904	1/1	0.99	0.04	22,22,22,22	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.

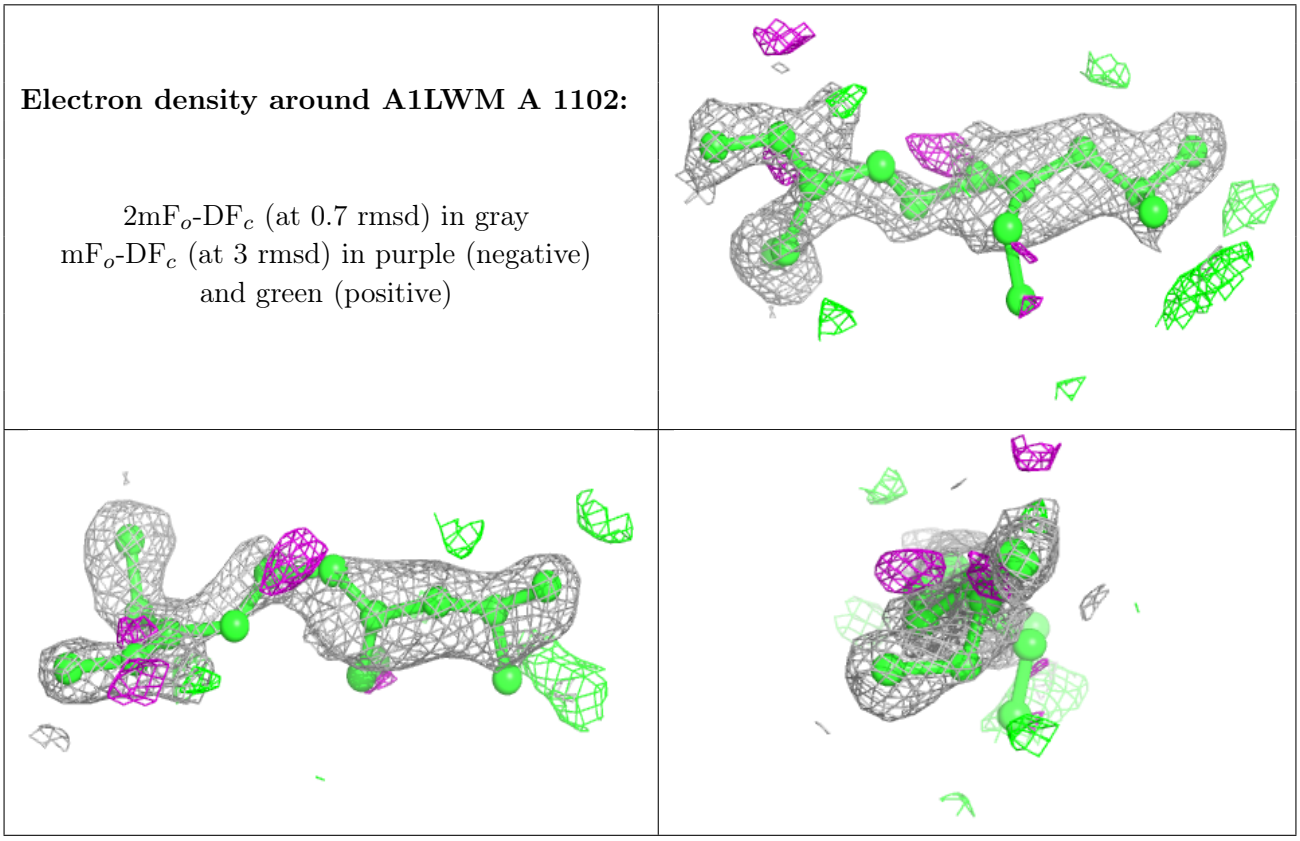
Electron density around A1LWM B 902:

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



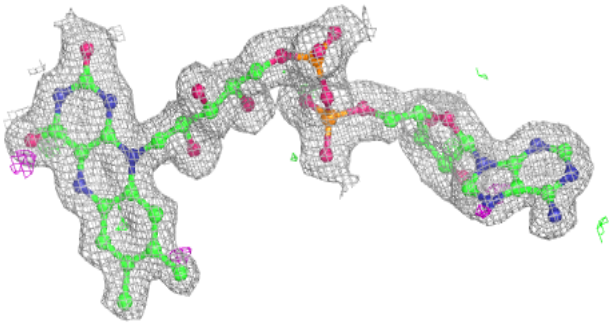
Electron density around A1LWM A 1102:

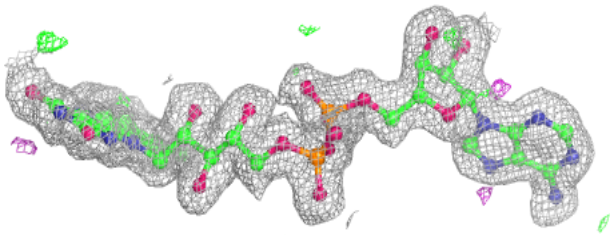
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

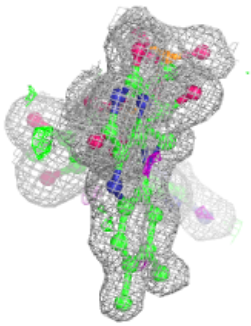


Electron density around FAD A 1103:

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

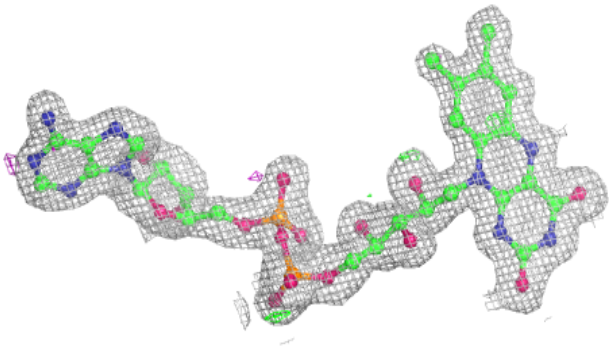


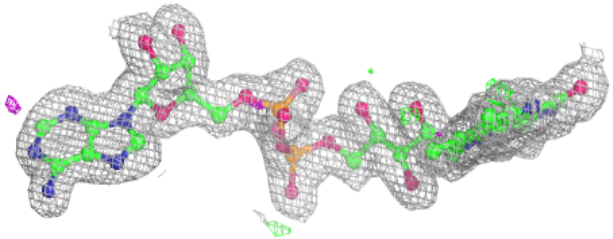


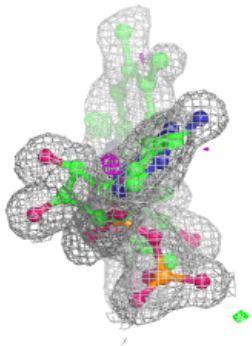


Electron density around FAD B 903:

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







6.5 Other polymers (i)

There are no such residues in this entry.