wwPDB X-ray Structure Validation Summary Report (i)

Jun 24, 2025 – 05:17 pm BST

PDB ID	:	7AL4 / pdb_00007al4
Title	:	Ancestral Flavin-containing monooxygenase (FMO) 1 (mammalian)
Authors	:	Nicoll, C.R.; Mattevi, A.
Deposited on	:	2020-10-05
Resolution	:	3.00 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*
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:

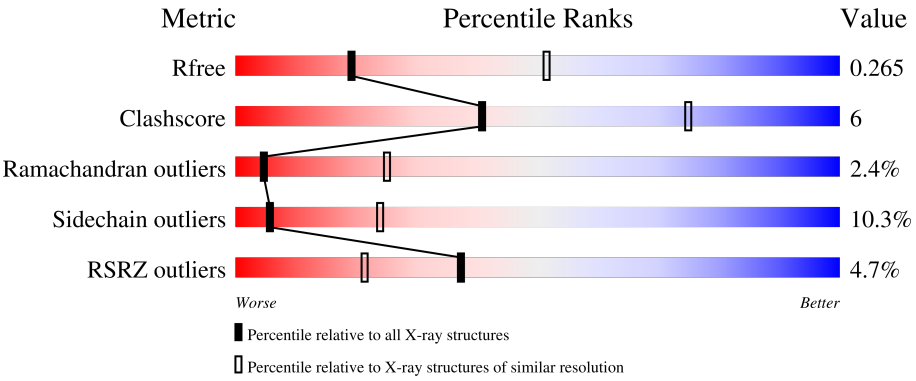
MolProbity	:	4-5-2 with Phenix2.0rc1
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.44

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 3.00 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	2511 (3.00-3.00)
Clashscore	180529	2866 (3.00-3.00)
Ramachandran outliers	177936	2778 (3.00-3.00)
Sidechain outliers	177891	2781 (3.00-3.00)
RSRZ outliers	164620	2523 (3.00-3.00)

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	531	2% 75% 18%
1	B	531	4% 77% 18%
1	C	531	11% 76% 19%
1	D	531	2% 74% 22%

2 Entry composition (i)

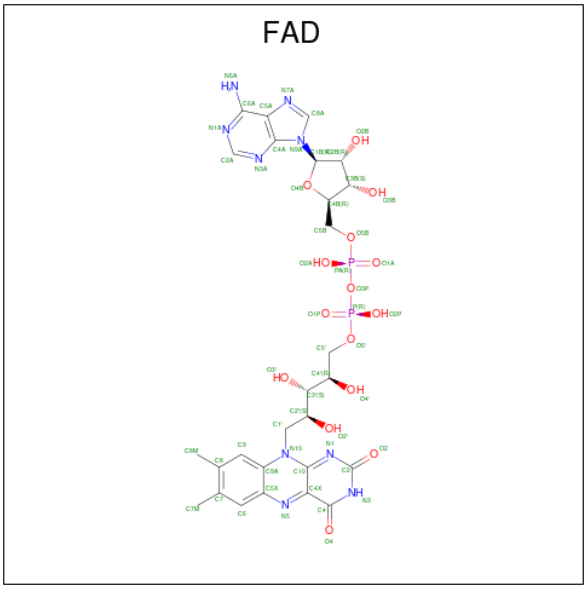
There are 7 unique types of molecules in this entry. The entry contains 17079 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Ancestral Flavin-containing monooxygenase 1 (mammalian).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	D	524	Total	C	N	O	S	0	0	0
			4153	2693	687	748	25			
1	C	520	Total	C	N	O	S	0	0	0
			4081	2633	681	744	23			
1	B	523	Total	C	N	O	S	0	0	0
			4105	2650	685	747	23			
1	A	517	Total	C	N	O	S	0	0	0
			4071	2630	679	739	23			

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



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

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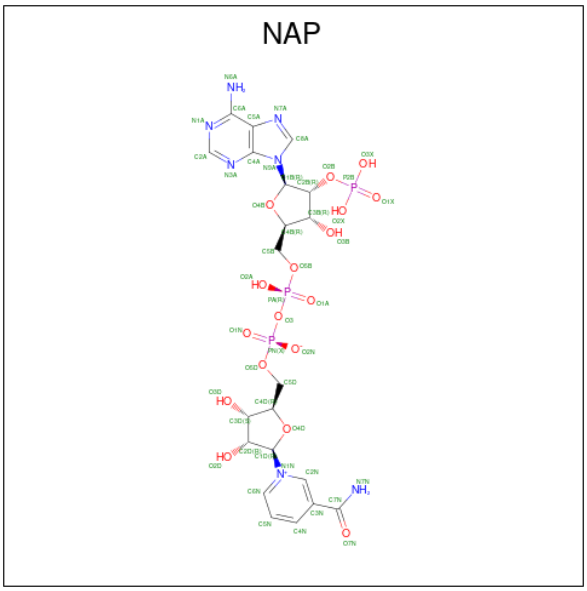
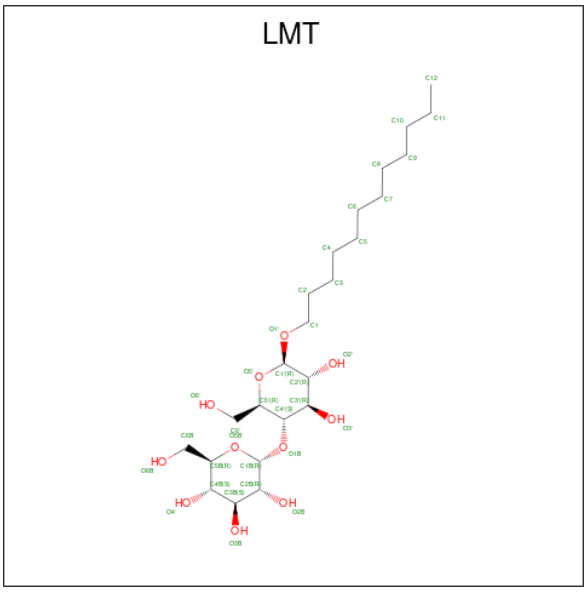
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	B	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
2	A	1	Total	C	N	O	P	0	0
			53	27	9	15	2		

- Molecule 3 is NADP NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (CCD ID: NAP) (formula: $C_{21}H_{28}N_7O_{17}P_3$).



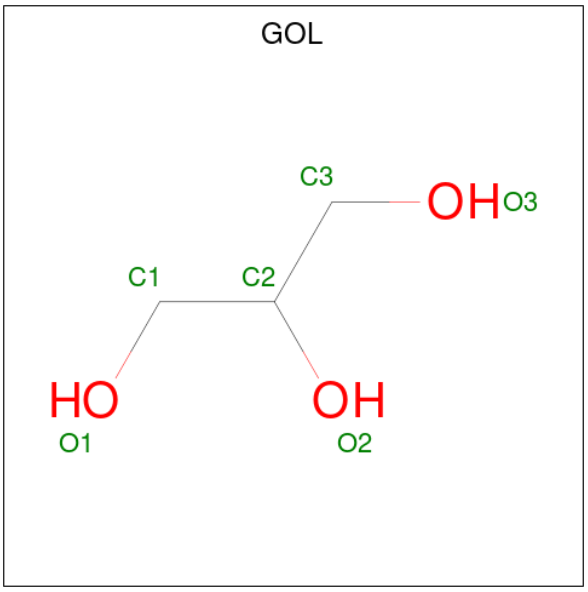
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	D	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
3	C	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
3	B	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
3	A	1	Total	C	N	O	P	0	0
			48	21	7	17	3		

- Molecule 4 is DODECYL-BETA-D-MALTOSIDE (CCD ID: LMT) (formula: $C_{24}H_{46}O_{11}$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	D	1	Total C O 35 24 11	0	0
4	B	1	Total C O 35 24 11	0	0
4	B	1	Total C O 35 24 11	0	0
4	A	1	Total C O 35 24 11	0	0
4	A	1	Total C O 35 24 11	0	0
4	A	1	Total C O 35 24 11	0	0

- Molecule 5 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	D	1	Total C O 6 3 3	0	0
5	D	1	Total C O 6 3 3	0	0

- Molecule 6 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

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

- Molecule 7 is water.

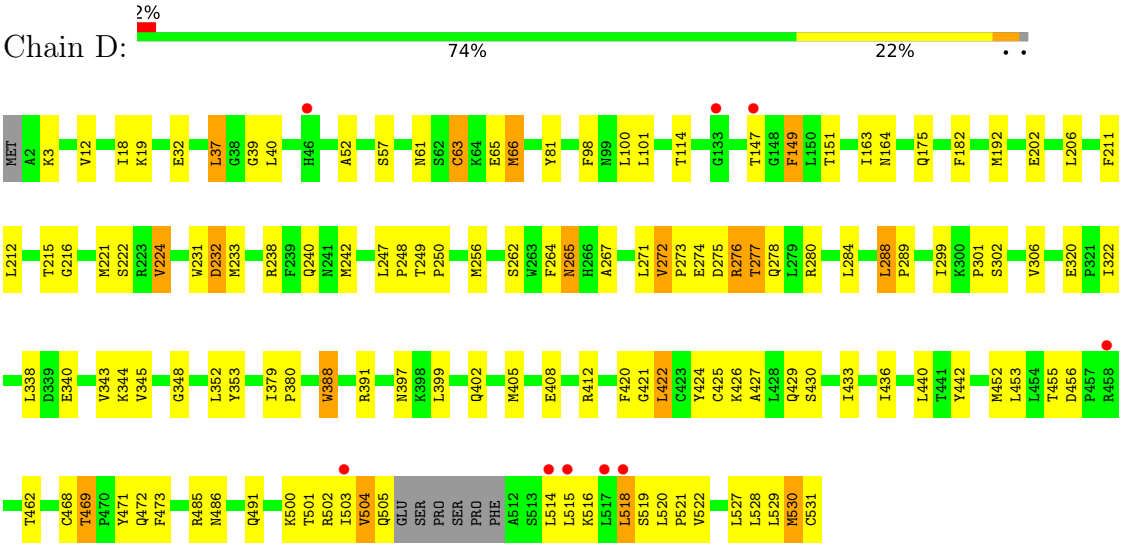
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	D	16	Total O 16 16	0	0
7	C	5	Total O 5 5	0	0
7	B	8	Total O 8 8	0	0
7	A	11	Total O 11 11	0	0

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.

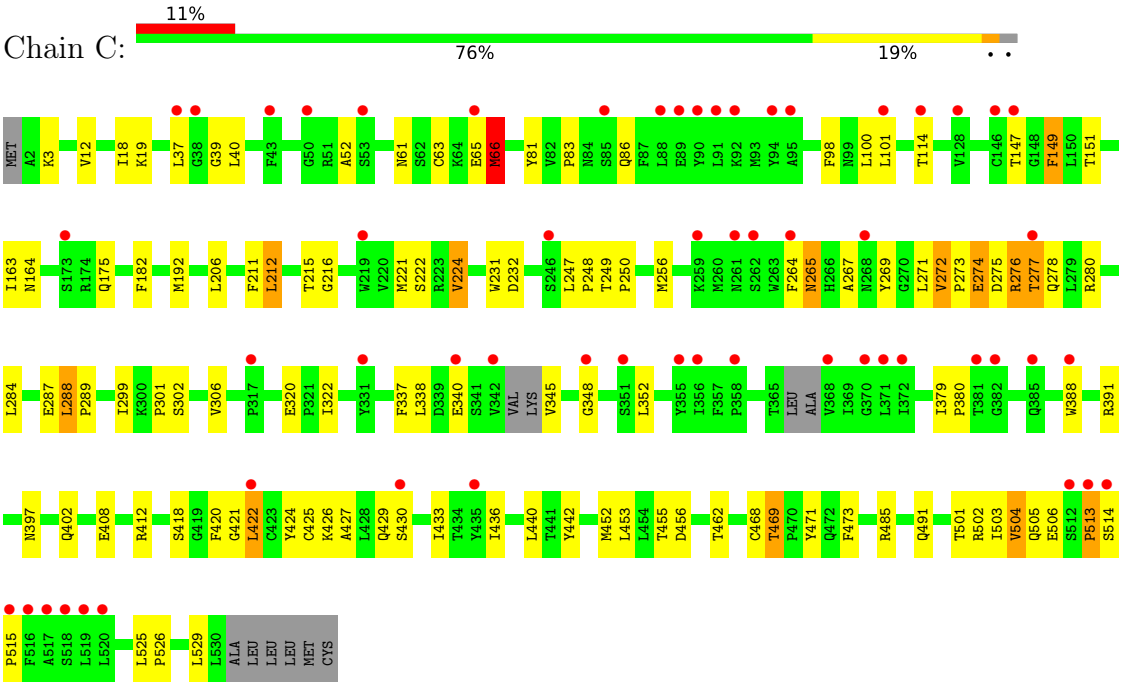
• Molecule 1: Ancestral Flavin-containing monooxygenase 1 (mammalian)

Chain D:



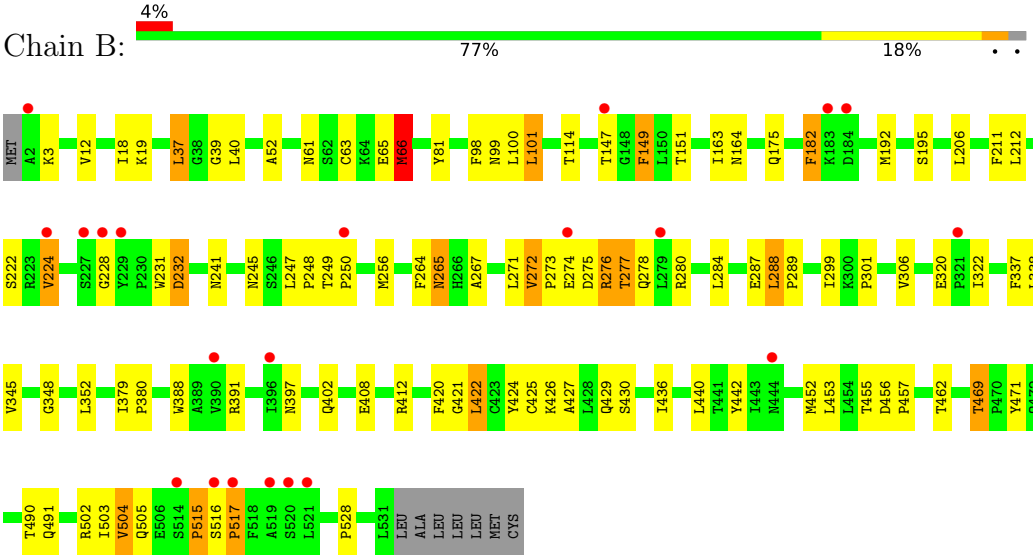
• Molecule 1: Ancestral Flavin-containing monooxygenase 1 (mammalian)

Chain C:



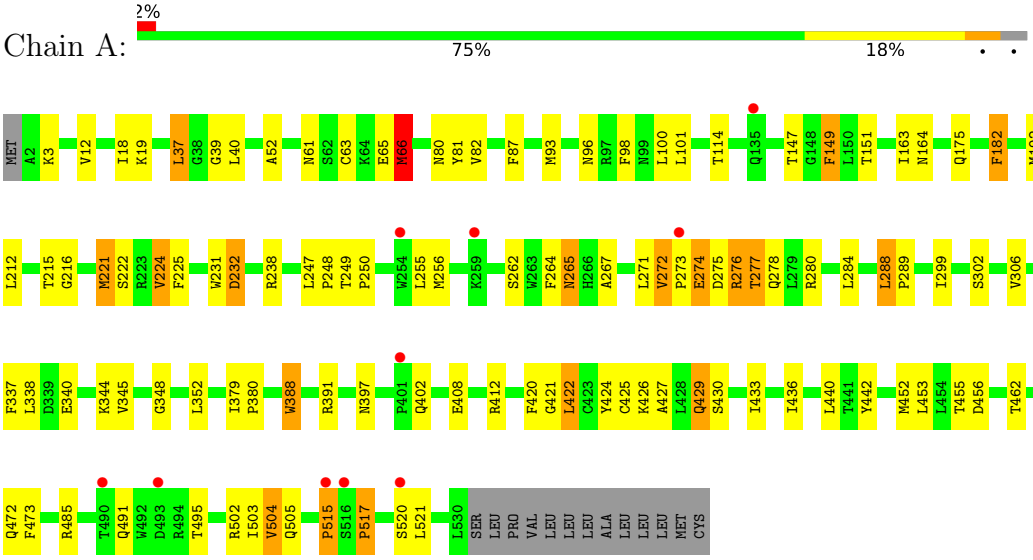
• Molecule 1: Ancestral Flavin-containing monooxygenase 1 (mammalian)

Chain B:



• Molecule 1: Ancestral Flavin-containing monooxygenase 1 (mammalian)

Chain A:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	115.92Å 92.45Å 156.69Å 90.00° 95.12° 90.00°	Depositor
Resolution (Å)	49.10 – 3.00 49.10 – 3.00	Depositor EDS
% Data completeness (in resolution range)	60.1 (49.10-3.00) 60.1 (49.10-3.00)	Depositor EDS
R_{merge}	0.24	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$	-	Xtriage
Refinement program	REFMAC 5.8.0258	Depositor
R, R_{free}	0.228 , 0.264 0.228 , 0.265	Depositor DCC
R_{free} test set	1329 reflections (2.05%)	wwPDB-VP
Wilson B-factor (Å^2)	(Not available)	Xtriage
Anisotropy	(Not available)	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.27 , 53.2	EDS
L-test for twinning[1]	$< \|L\| >$ = (Not available), $< L^2 >$ = (Not available)	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.89	EDS
Total number of atoms	17079	wwPDB-VP
Average B, all atoms (Å^2)	87.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *(Not available)*

[1]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, GOL, CL, NAP, LMT

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	1.04	0/4176	1.38	4/5672 (0.1%)
1	B	1.05	0/4211	1.39	7/5722 (0.1%)
1	C	1.05	0/4185	1.40	4/5684 (0.1%)
1	D	1.03	0/4260	1.36	1/5786 (0.0%)
All	All	1.04	0/16832	1.39	16/22864 (0.1%)

There are no bond length outliers.

The worst 5 of 16 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	528	PRO	N-CA-CB	10.15	110.28	102.36
1	B	517	PRO	N-CA-CB	7.53	111.16	103.25
1	C	515	PRO	N-CA-CB	6.88	110.47	103.25
1	C	513	PRO	N-CA-CB	6.59	110.17	103.25
1	C	526	PRO	N-CA-CB	6.55	110.13	103.25

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	4071	0	4033	63	0
1	B	4105	0	4049	60	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	4081	0	4011	51	0
1	D	4153	0	4191	57	0
2	A	53	0	31	4	0
2	B	53	0	31	2	0
2	C	53	0	31	2	0
2	D	53	0	31	3	0
3	A	48	0	25	1	0
3	B	48	0	25	4	0
3	C	48	0	25	0	0
3	D	48	0	25	1	0
4	A	105	0	138	0	0
4	B	70	0	92	2	0
4	D	35	0	46	0	0
5	D	12	0	16	0	0
6	A	1	0	0	0	0
6	B	1	0	0	0	0
6	D	1	0	0	0	0
7	A	11	0	0	0	0
7	B	8	0	0	0	0
7	C	5	0	0	1	0
7	D	16	0	0	0	0
All	All	17079	0	16800	216	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 6.

The worst 5 of 216 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:379:ILE:HB	1:A:380:PRO:HD3	1.66	0.77
1:D:379:ILE:HB	1:D:380:PRO:HD3	1.68	0.74
1:B:379:ILE:HB	1:B:380:PRO:HD3	1.69	0.73
1:C:379:ILE:HB	1:C:380:PRO:HD3	1.70	0.72
1:D:344:LYS:O	1:D:345:VAL:HG22	1.88	0.72

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	511/531 (96%)	442 (86%)	57 (11%)	12 (2%)	5 26
1	B	519/531 (98%)	445 (86%)	63 (12%)	11 (2%)	5 28
1	C	512/531 (96%)	437 (85%)	61 (12%)	14 (3%)	4 22
1	D	520/531 (98%)	438 (84%)	69 (13%)	13 (2%)	4 24
All	All	2062/2124 (97%)	1762 (86%)	250 (12%)	50 (2%)	5 25

5 of 50 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	66	MET
1	D	422	LEU
1	D	425	CYS
1	D	514	LEU
1	C	66	MET

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	443/469 (94%)	399 (90%)	44 (10%)	6 26
1	B	444/469 (95%)	401 (90%)	43 (10%)	6 27
1	C	441/469 (94%)	396 (90%)	45 (10%)	6 24
1	D	461/469 (98%)	408 (88%)	53 (12%)	4 20
All	All	1789/1876 (95%)	1604 (90%)	185 (10%)	6 24

5 of 185 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	232	ASP
1	A	63	CYS
1	B	274	GLU
1	B	408	GLU
1	A	164	ASN

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

Mol	Chain	Res	Type
1	B	505	GLN
1	A	347	ASN
1	A	61	ASN
1	A	99	ASN
1	A	472	GLN

5.3.3 RNA (i)

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 oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 19 ligands modelled in this entry, 3 are monoatomic - leaving 16 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	$\#\|Z\|>2$
3	NAP	C	602	-	45,52,52	0.90	3 (6%)	56,80,80	1.20	6 (10%)
2	FAD	B	601	-	53,58,58	0.67	0	68,89,89	0.79	3 (4%)
3	NAP	B	602	-	45,52,52	0.90	1 (2%)	56,80,80	1.37	8 (14%)
2	FAD	A	601	-	53,58,58	0.65	0	68,89,89	0.88	4 (5%)
2	FAD	D	601	-	53,58,58	0.66	0	68,89,89	0.78	1 (1%)
4	LMT	A	606	-	36,36,36	0.73	1 (2%)	47,47,47	1.60	5 (10%)
3	NAP	D	602	-	45,52,52	0.88	2 (4%)	56,80,80	1.25	7 (12%)
5	GOL	D	604	-	5,5,5	0.21	0	5,5,5	0.57	0
4	LMT	A	605	-	36,36,36	0.67	1 (2%)	47,47,47	0.88	2 (4%)
2	FAD	C	601	-	53,58,58	0.62	0	68,89,89	0.78	2 (2%)
3	NAP	A	602	-	45,52,52	0.89	2 (4%)	56,80,80	1.50	9 (16%)
4	LMT	B	603	-	36,36,36	0.63	1 (2%)	47,47,47	0.88	2 (4%)
4	LMT	B	604	-	36,36,36	0.73	1 (2%)	47,47,47	1.41	6 (12%)
4	LMT	D	603	-	36,36,36	0.77	1 (2%)	47,47,47	1.11	4 (8%)
5	GOL	D	606	-	5,5,5	0.14	0	5,5,5	0.37	0
4	LMT	A	603	-	36,36,36	0.76	1 (2%)	47,47,47	1.36	7 (14%)

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	NAP	C	602	-	-	13/31/67/67	0/5/5/5
2	FAD	B	601	-	-	12/30/50/50	0/6/6/6
3	NAP	B	602	-	-	9/31/67/67	0/5/5/5
2	FAD	A	601	-	-	12/30/50/50	0/6/6/6
2	FAD	D	601	-	-	12/30/50/50	0/6/6/6
4	LMT	A	606	-	-	12/21/61/61	0/2/2/2
3	NAP	D	602	-	-	14/31/67/67	0/5/5/5
5	GOL	D	604	-	-	2/4/4/4	-
4	LMT	A	605	-	-	10/21/61/61	0/2/2/2
2	FAD	C	601	-	-	12/30/50/50	0/6/6/6
3	NAP	A	602	-	-	10/31/67/67	0/5/5/5
4	LMT	B	603	-	-	9/21/61/61	0/2/2/2
4	LMT	B	604	-	-	10/21/61/61	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	LMT	D	603	-	-	8/21/61/61	0/2/2/2
5	GOL	D	606	-	-	0/4/4/4	-
4	LMT	A	603	-	-	11/21/61/61	0/2/2/2

The worst 5 of 14 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	606	LMT	O1'-C1'	2.88	1.45	1.40
4	D	603	LMT	O1'-C1'	2.87	1.45	1.40
4	A	605	LMT	O1'-C1'	2.80	1.45	1.40
4	A	603	LMT	O1'-C1'	2.73	1.44	1.40
4	B	604	LMT	O1'-C1'	2.70	1.44	1.40

The worst 5 of 66 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	A	606	LMT	O1'-C1'-C2'	7.03	119.28	108.30
4	A	606	LMT	C1-O1'-C1'	4.66	121.57	113.84
3	A	602	NAP	N3A-C2A-N1A	-4.51	121.63	128.68
3	D	602	NAP	N3A-C2A-N1A	-4.25	122.04	128.68
3	B	602	NAP	N3A-C2A-N1A	-4.23	122.06	128.68

There are no chirality outliers.

5 of 156 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	D	601	FAD	N10-C1'-C2'-O2'
2	D	601	FAD	N10-C1'-C2'-C3'
2	D	601	FAD	C5'-O5'-P-O1P
2	D	601	FAD	C5'-O5'-P-O2P
2	C	601	FAD	N10-C1'-C2'-O2'

There are no ring outliers.

8 monomers are involved in 19 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	601	FAD	2	0
3	B	602	NAP	4	0
2	A	601	FAD	4	0
2	D	601	FAD	3	0

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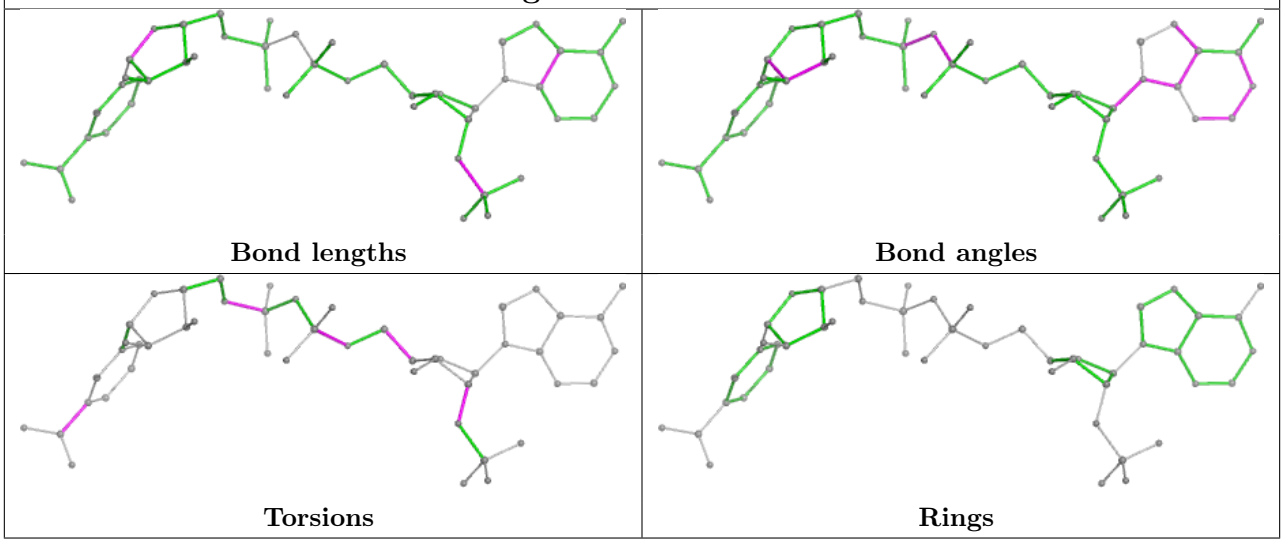
Continued from previous page...

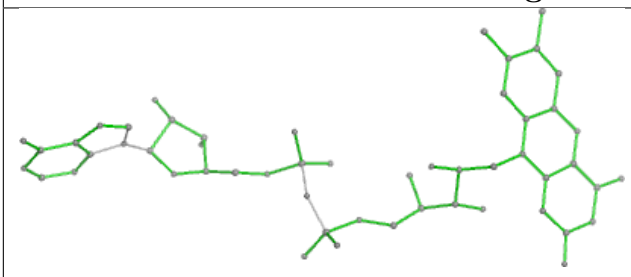
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	602	NAP	1	0
2	C	601	FAD	2	0
3	A	602	NAP	1	0
4	B	604	LMT	2	0

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.

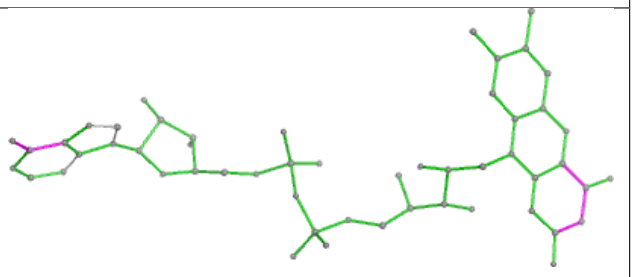
Ligand NAP C 602



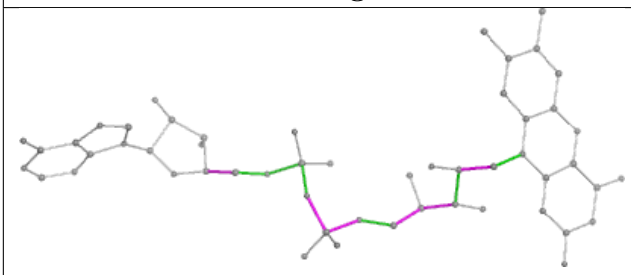
Ligand FAD B 601



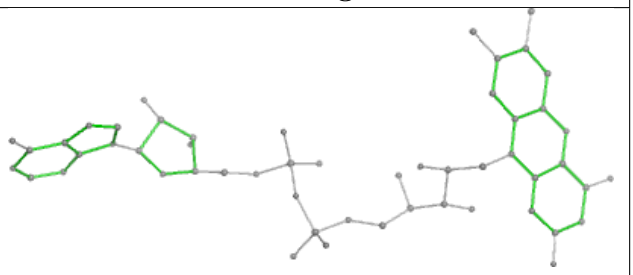
Bond lengths



Bond angles

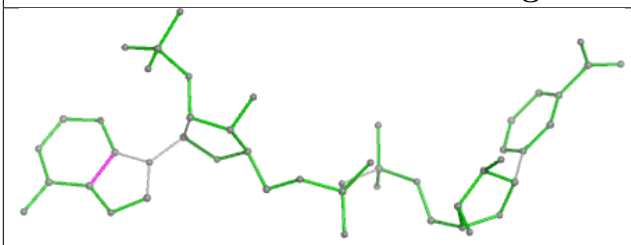


Torsions

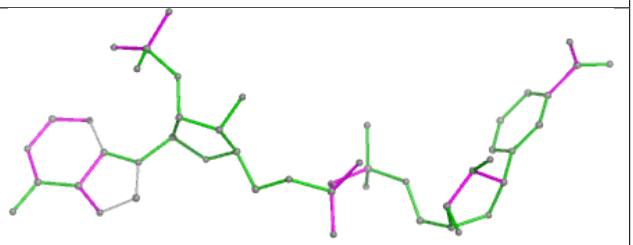


Rings

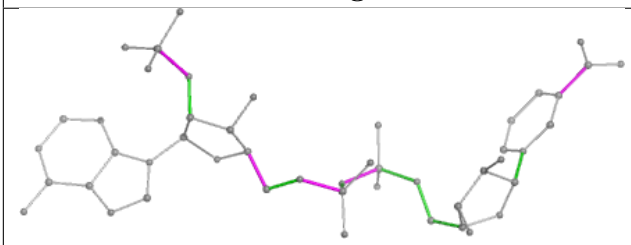
Ligand NAP B 602



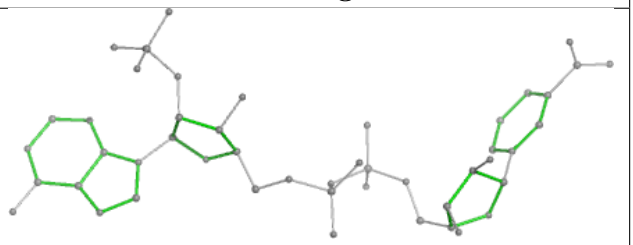
Bond lengths



Bond angles

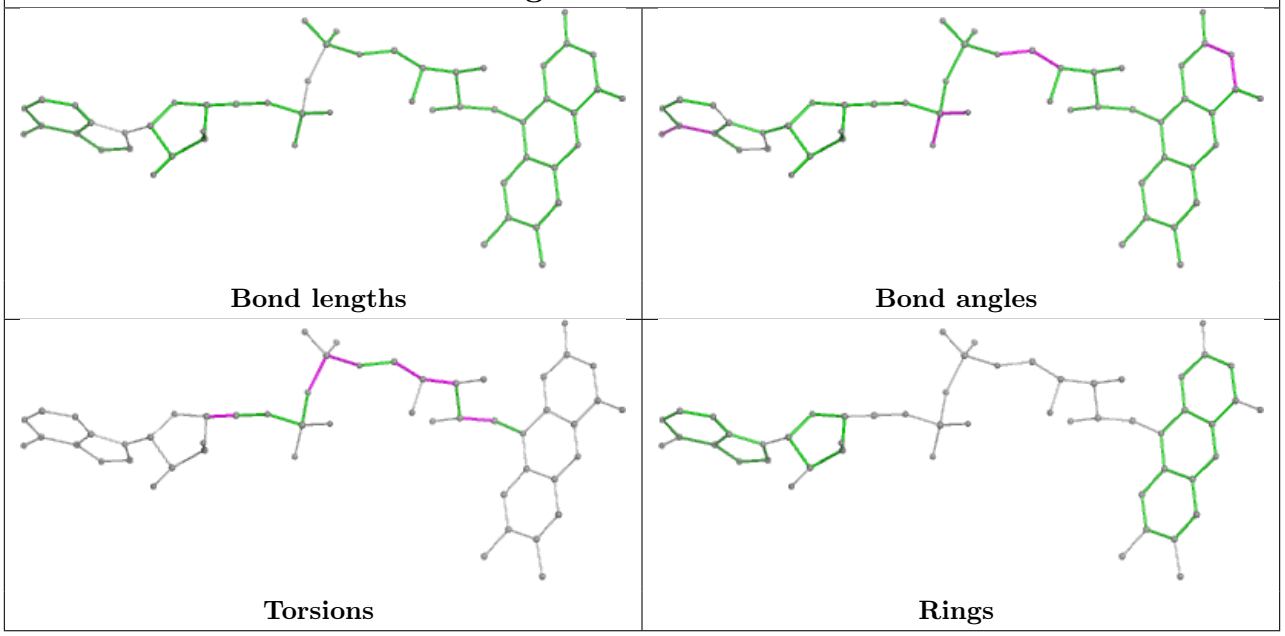


Torsions

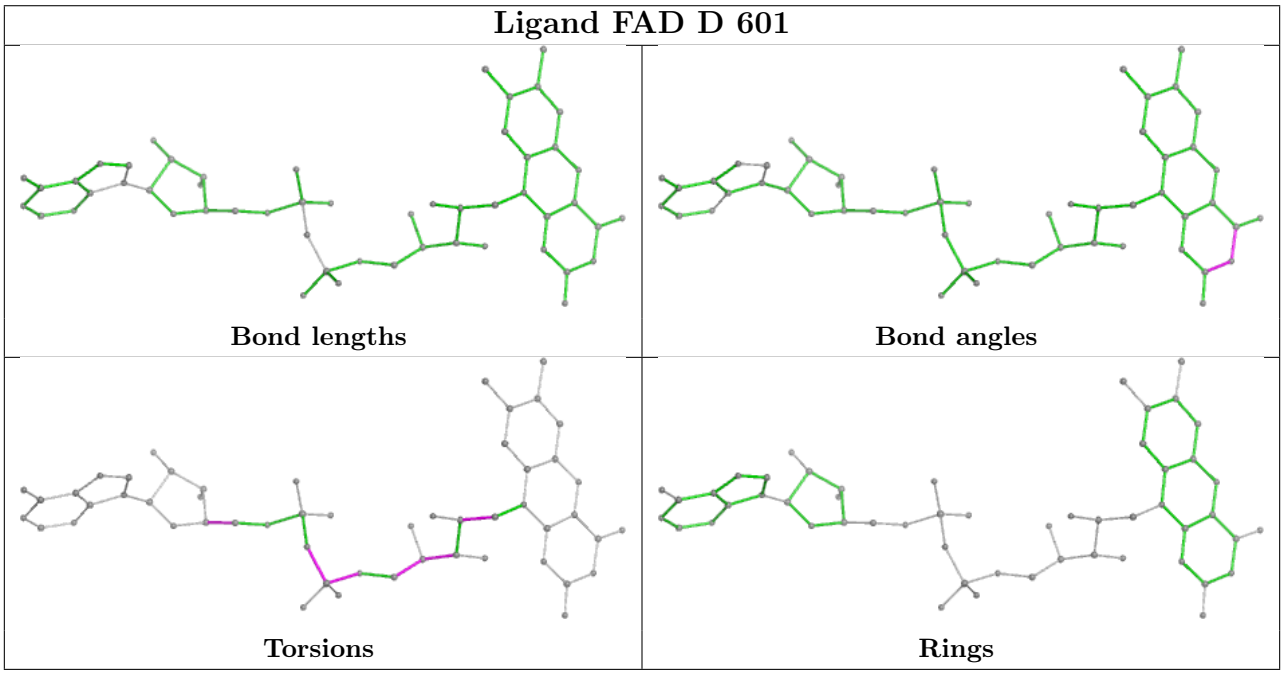


Rings

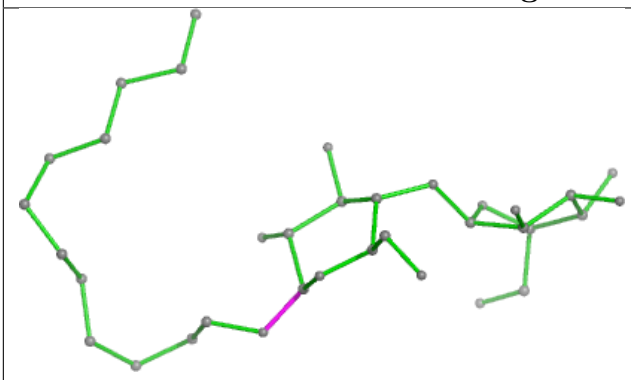
Ligand FAD A 601



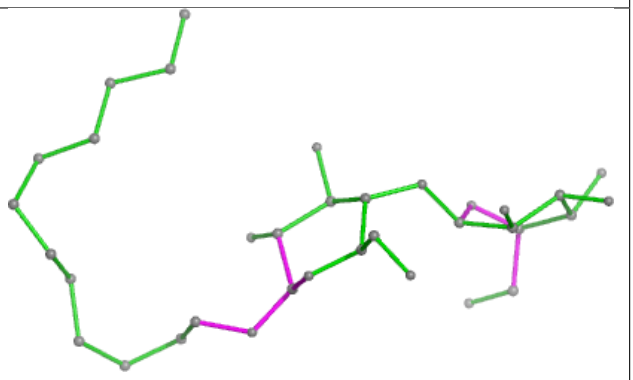
Ligand FAD D 601



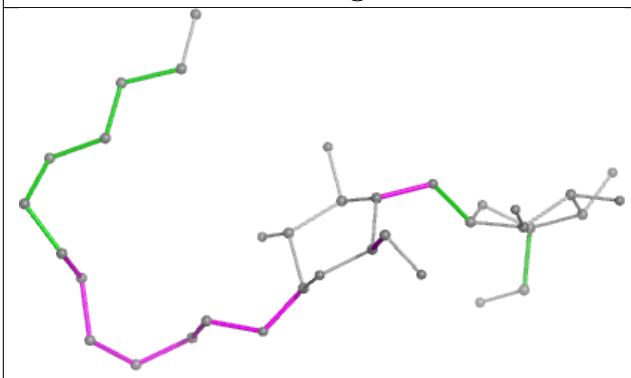
Ligand LMT A 606



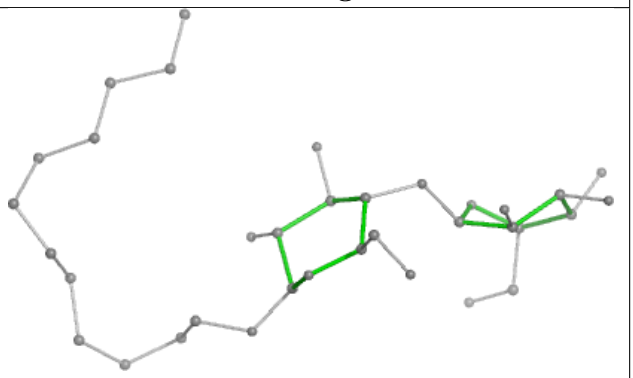
Bond lengths



Bond angles

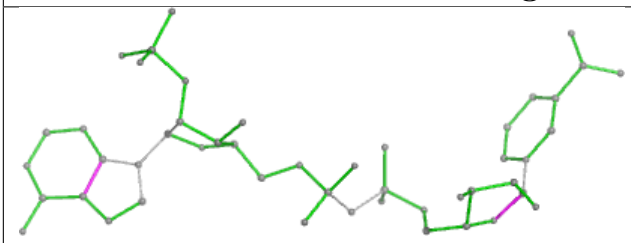


Torsions

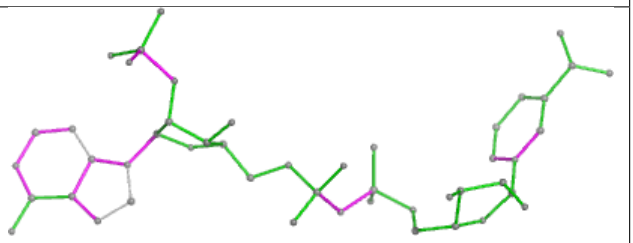


Rings

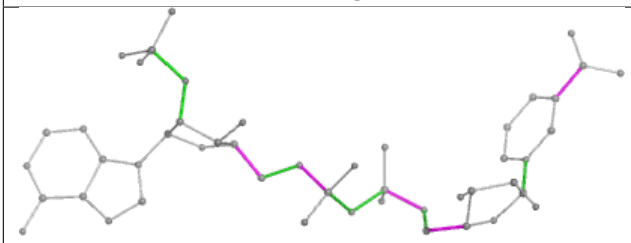
Ligand NAP D 602



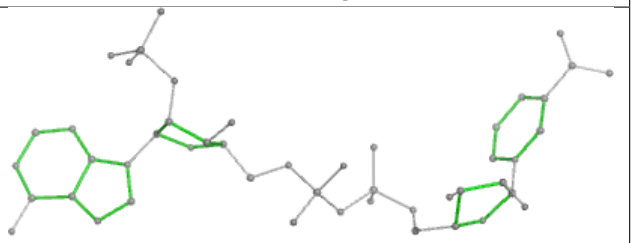
Bond lengths



Bond angles

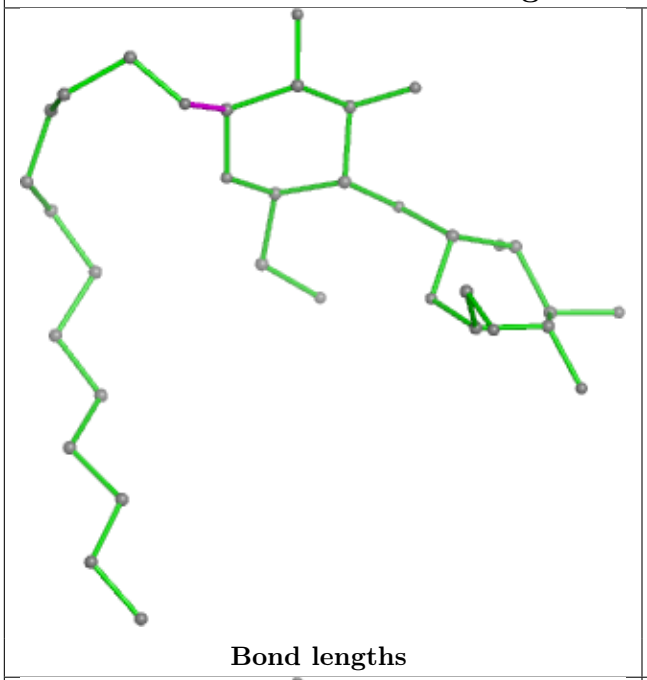


Torsions

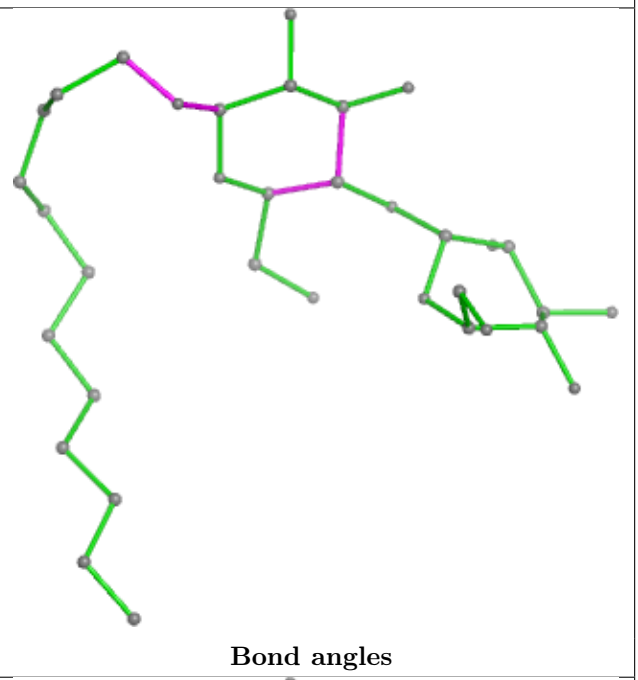


Rings

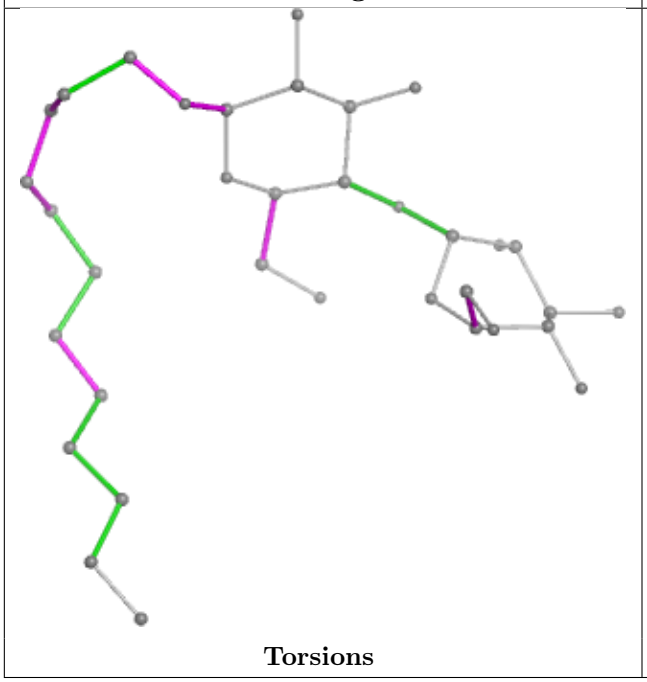
Ligand LMT A 605



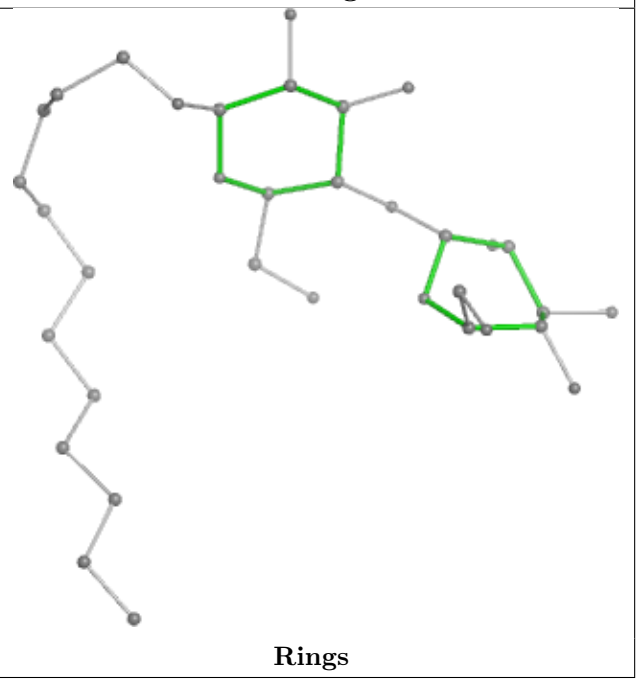
Bond lengths



Bond angles

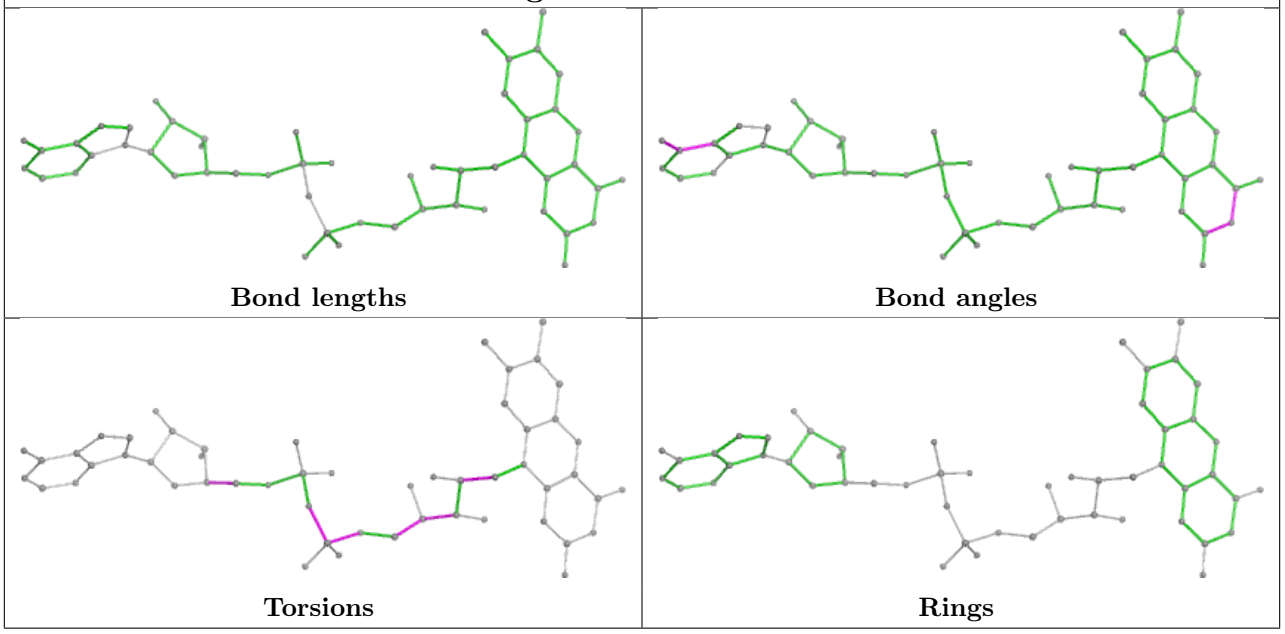


Torsions



Rings

Ligand FAD C 601



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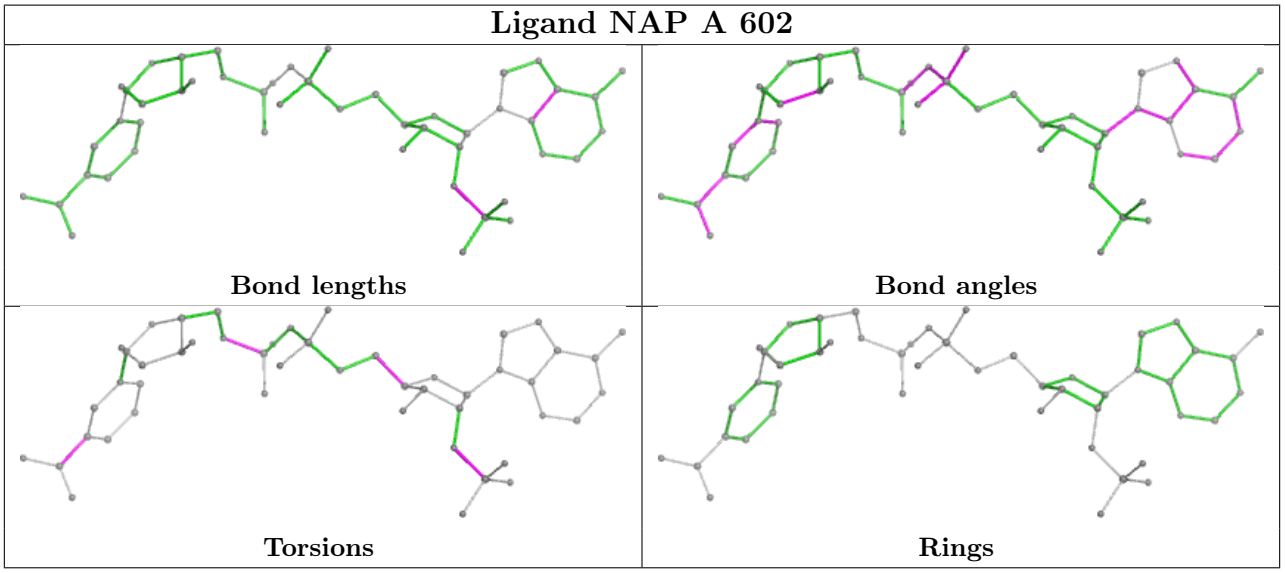
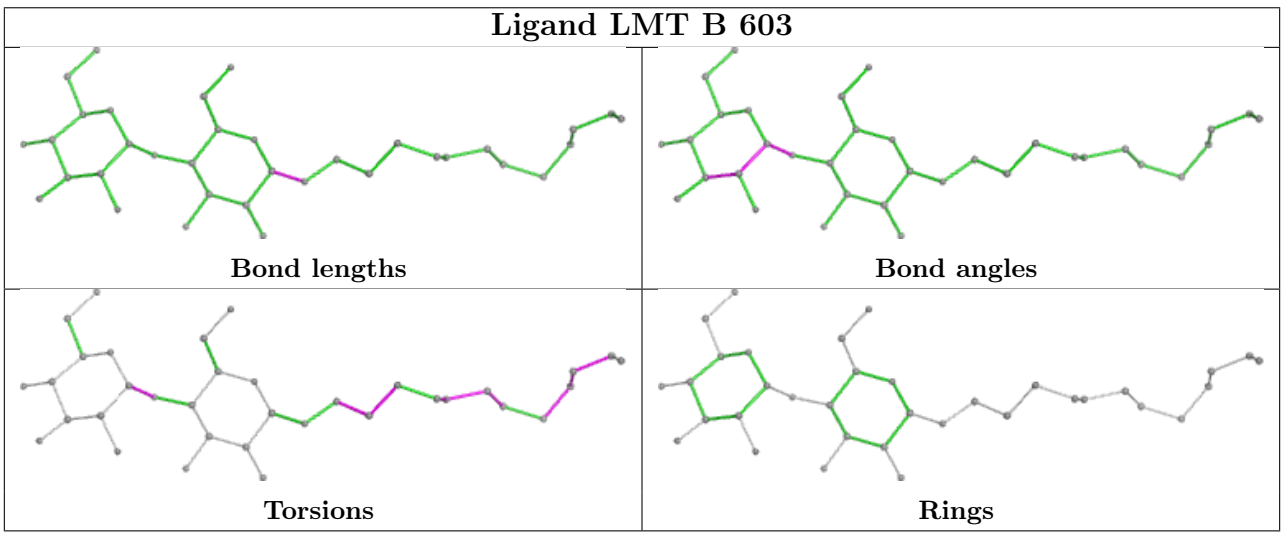
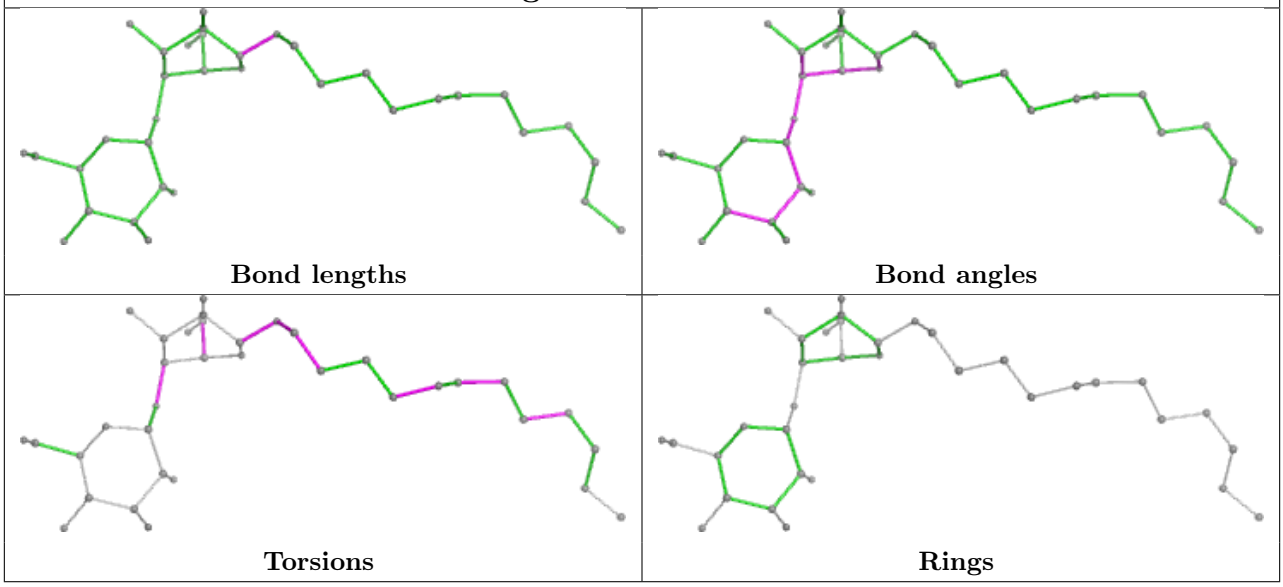


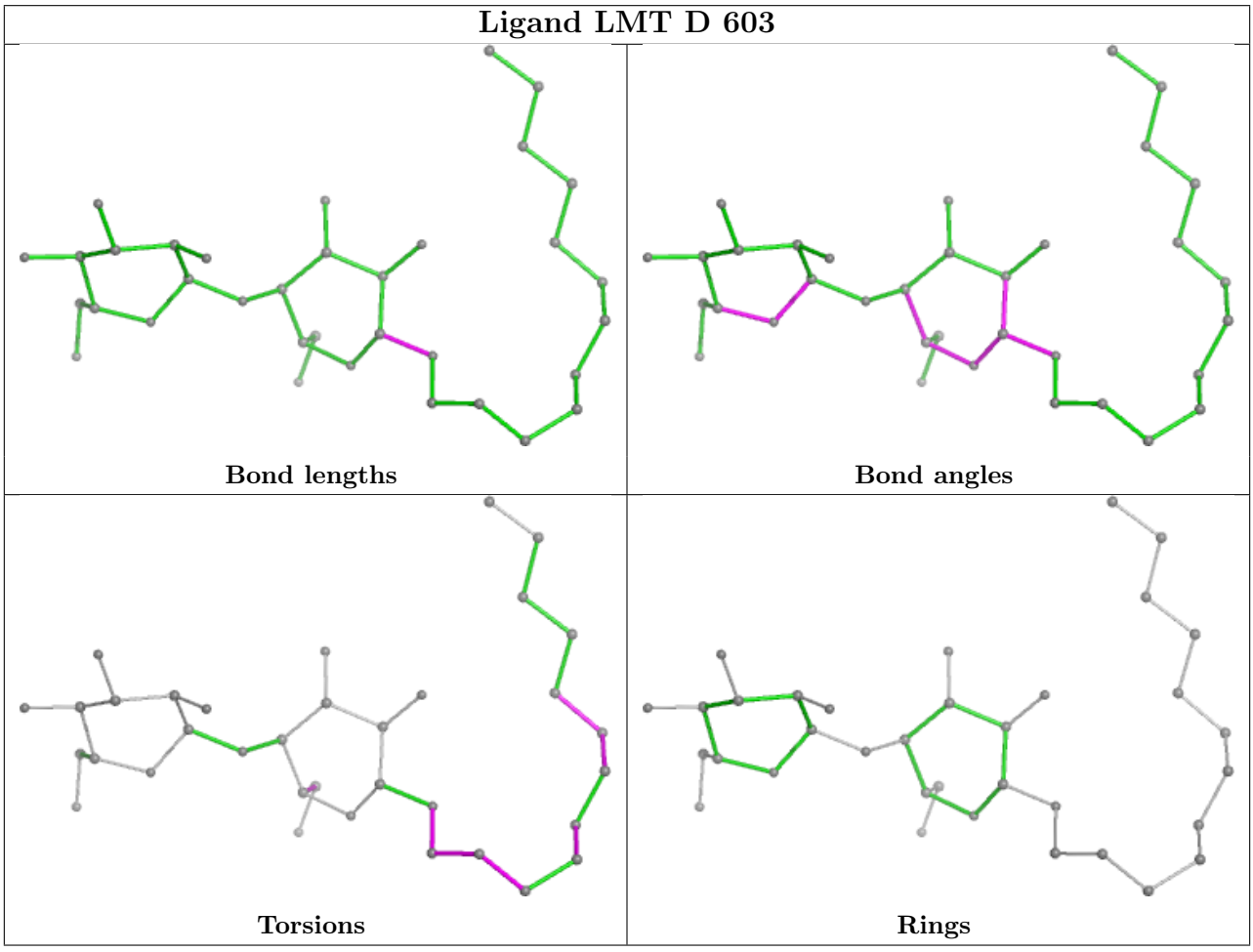
Ligand LMT B 603

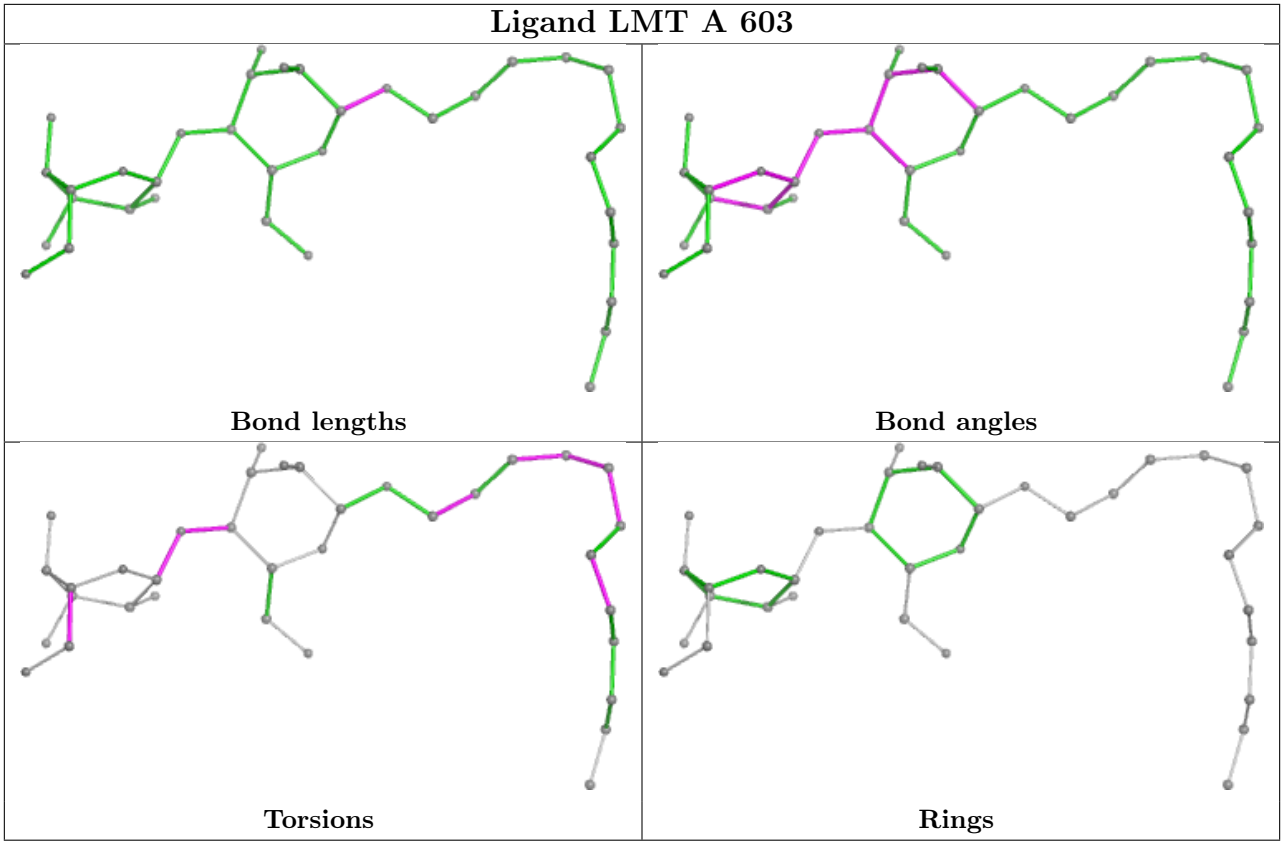


Ligand LMT B 604



Ligand LMT D 603





5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	A	2
1	B	1
1	C	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	505:GLN	C	513:GLU	N	16.04
1	B	506:GLU	C	514:SER	N	15.75
1	C	506:GLU	C	512:SER	N	11.59
1	A	521:LEU	C	527:LEU	N	11.20

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	517/531 (97%)	-0.11	10 (1%) 66 44	28, 61, 116, 167	0
1	B	523/531 (98%)	0.18	21 (4%) 43 25	38, 83, 144, 190	0
1	C	520/531 (97%)	0.84	57 (10%) 12 7	62, 136, 181, 217	0
1	D	524/531 (98%)	-0.24	9 (1%) 69 47	26, 56, 116, 222	0
All	All	2084/2124 (98%)	0.17	97 (4%) 37 21	26, 77, 162, 222	0

The worst 5 of 97 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	89	GLU	6.5
1	C	101	LEU	6.2
1	C	95	ALA	6.1
1	C	147	THR	5.3
1	C	368	VAL	5.2

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 oligosaccharides in this entry.

6.4 Ligands

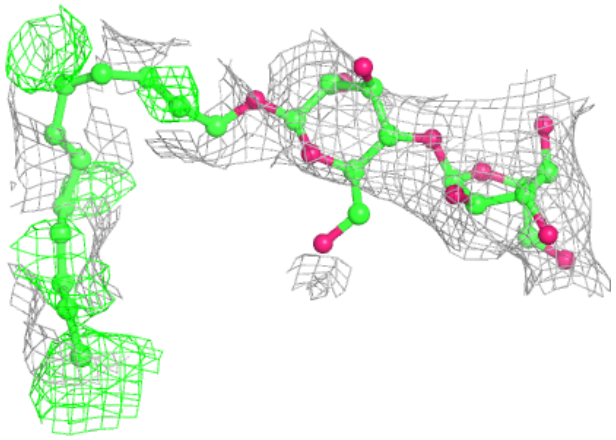
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

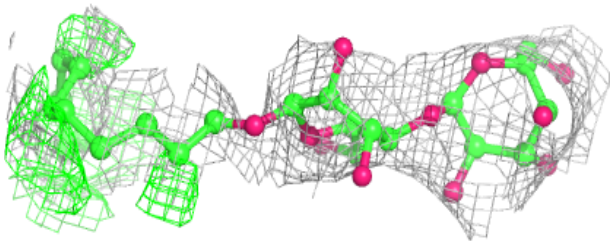
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	LMT	A	603	35/35	0.11	0.18	95,139,166,169	0
4	LMT	A	605	35/35	0.42	0.16	109,147,183,190	0
4	LMT	B	604	35/35	0.57	0.14	103,134,154,157	0
4	LMT	A	606	35/35	0.62	0.16	96,153,175,179	0
4	LMT	D	603	35/35	0.63	0.15	88,129,141,146	0
4	LMT	B	603	35/35	0.71	0.13	84,146,161,163	0
6	CL	A	604	1/1	0.81	0.18	84,84,84,84	0
3	NAP	C	602	48/48	0.87	0.11	121,138,148,151	0
2	FAD	C	601	53/53	0.89	0.11	101,125,144,148	0
5	GOL	D	604	6/6	0.90	0.07	43,45,46,46	0
5	GOL	D	606	6/6	0.92	0.20	89,93,96,96	0
3	NAP	B	602	48/48	0.92	0.09	73,89,115,121	0
3	NAP	D	602	48/48	0.94	0.09	65,86,92,98	0
2	FAD	B	601	53/53	0.94	0.08	44,52,71,82	0
2	FAD	A	601	53/53	0.94	0.09	33,42,56,61	0
6	CL	B	605	1/1	0.95	0.10	56,56,56,56	0
3	NAP	A	602	48/48	0.95	0.08	48,65,106,117	0
2	FAD	D	601	53/53	0.96	0.08	32,36,43,45	0
6	CL	D	605	1/1	0.98	0.04	43,43,43,43	0

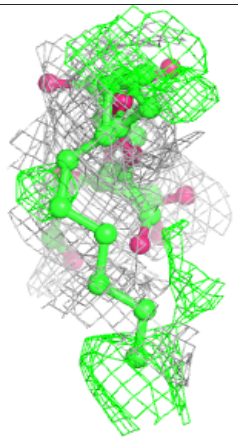
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around LMT A 603:

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

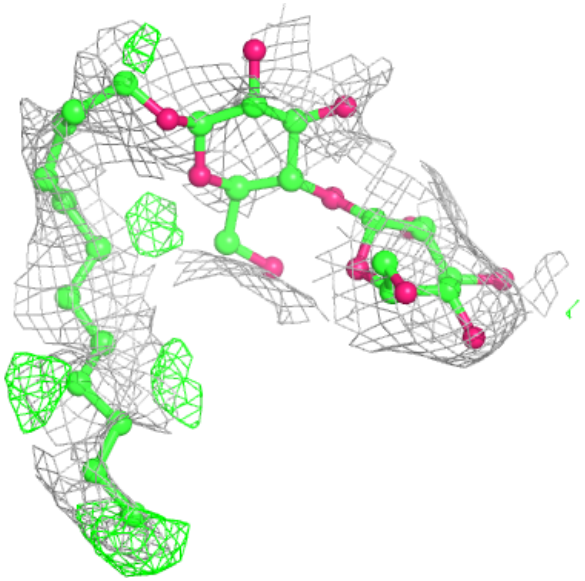


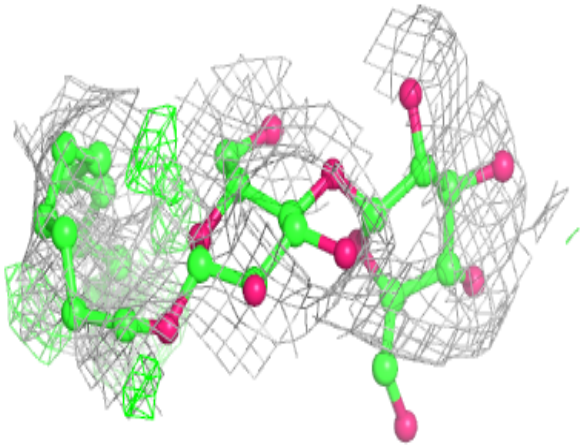


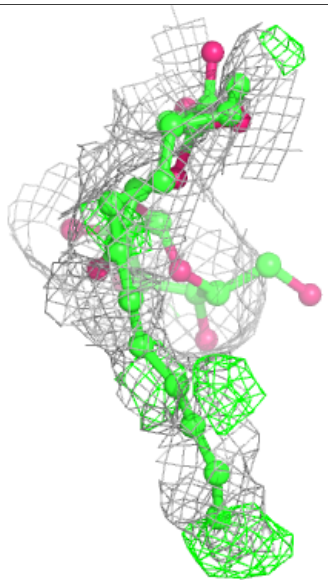


Electron density around LMT A 605:

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

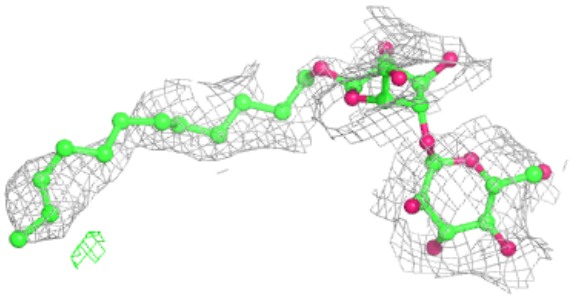


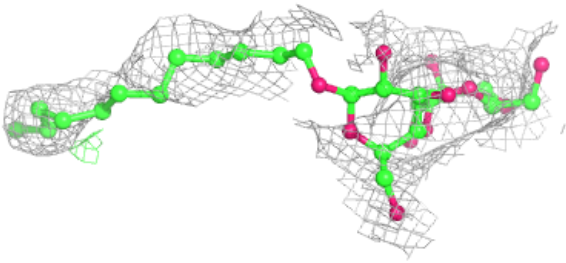


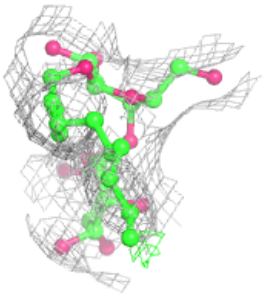


Electron density around LMT B 604:

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

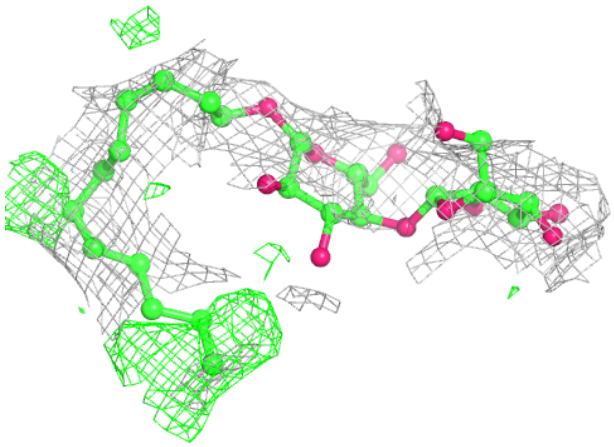


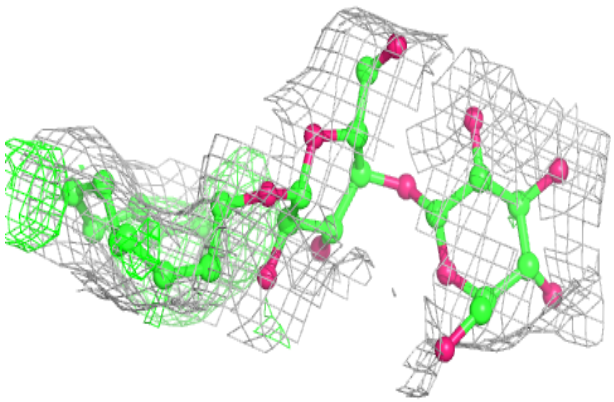


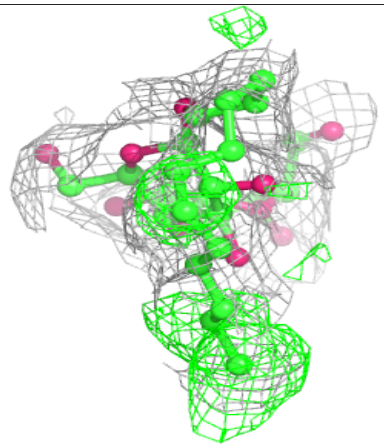


Electron density around LMT A 606:

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

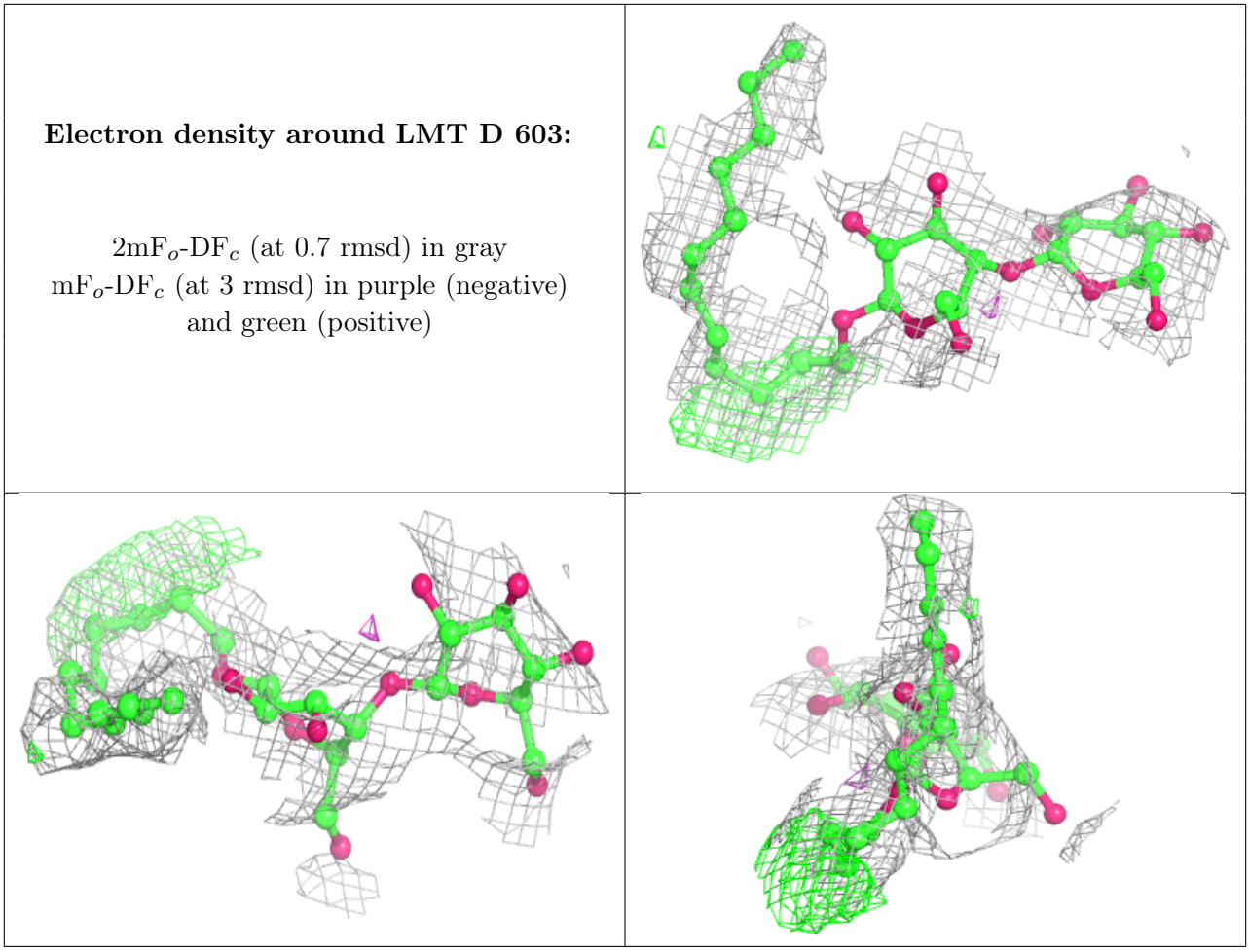






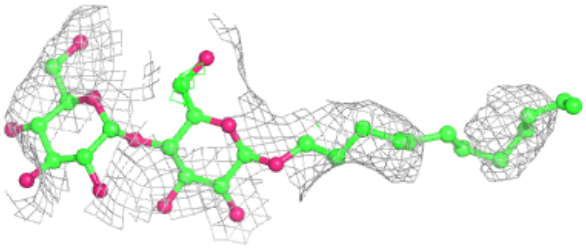
Electron density around LMT D 603:

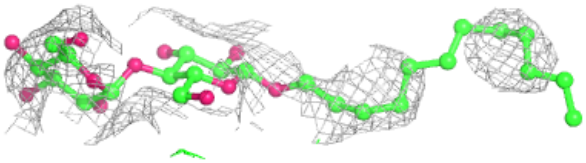
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

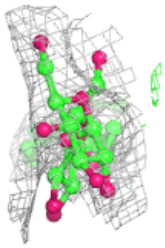


Electron density around LMT B 603:

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

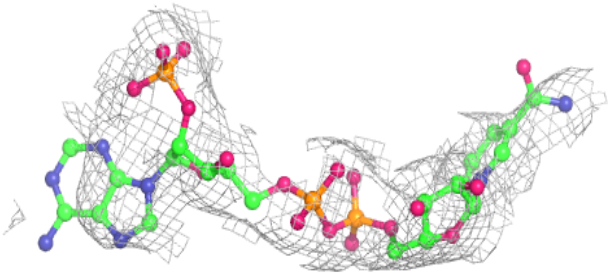


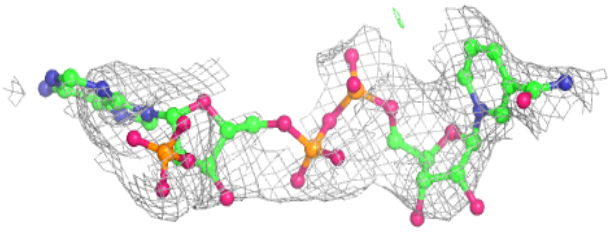


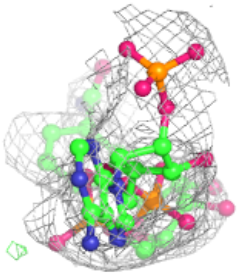


Electron density around NAP C 602:

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

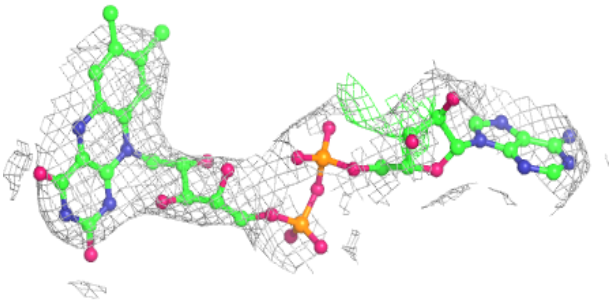


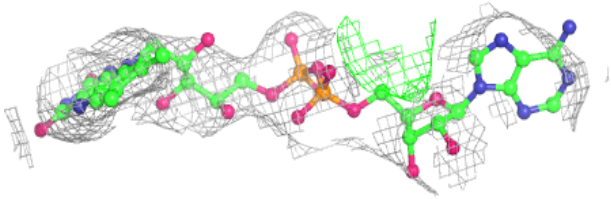


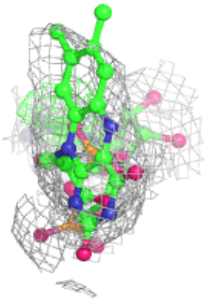


Electron density around FAD C 601:

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

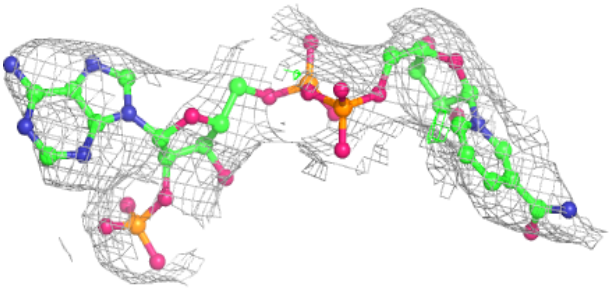


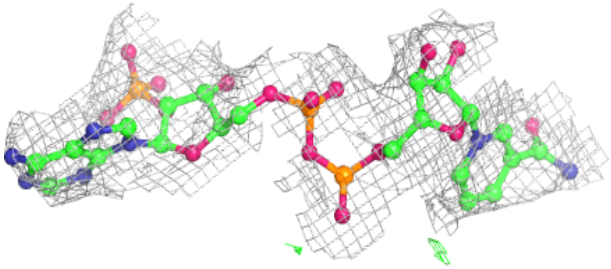


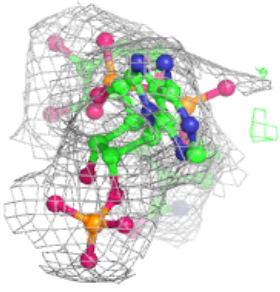


Electron density around NAP B 602:

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

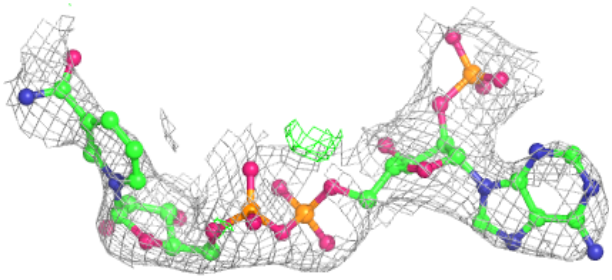


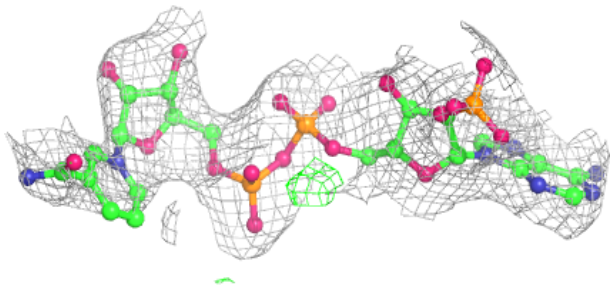


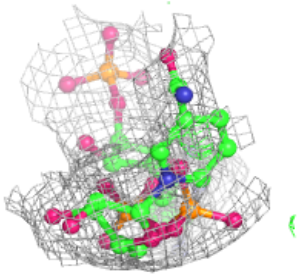


Electron density around NAP D 602:

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

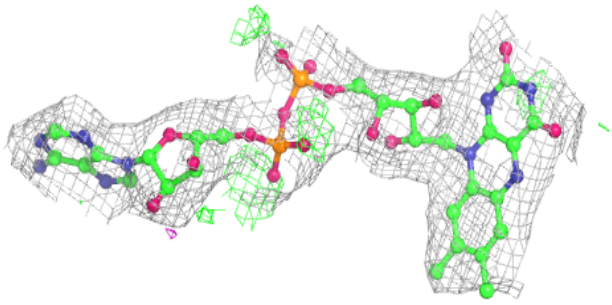


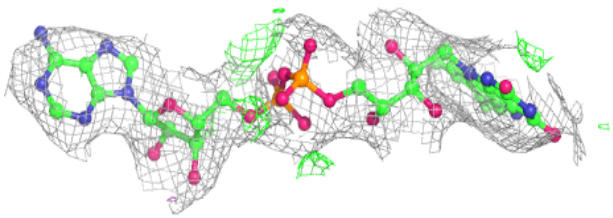


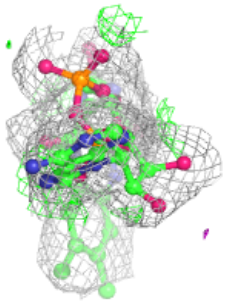


Electron density around FAD B 601:

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

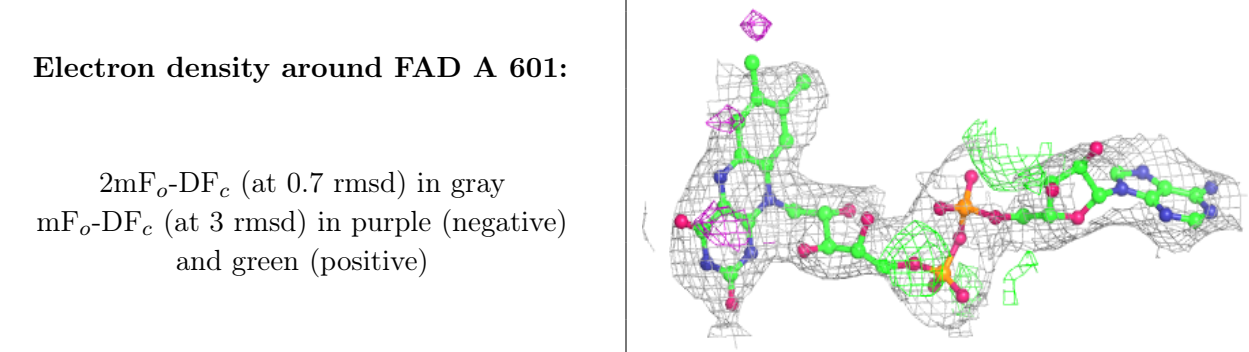


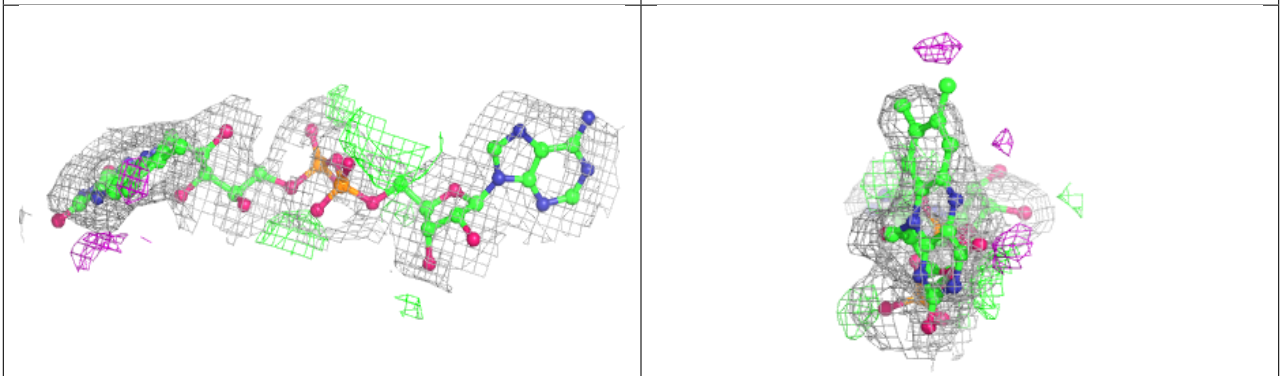




Electron density around FAD A 601:

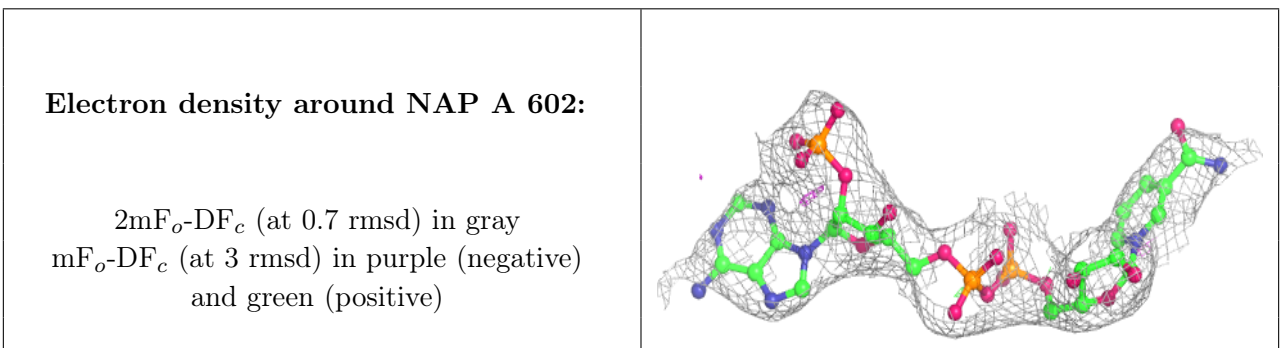
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

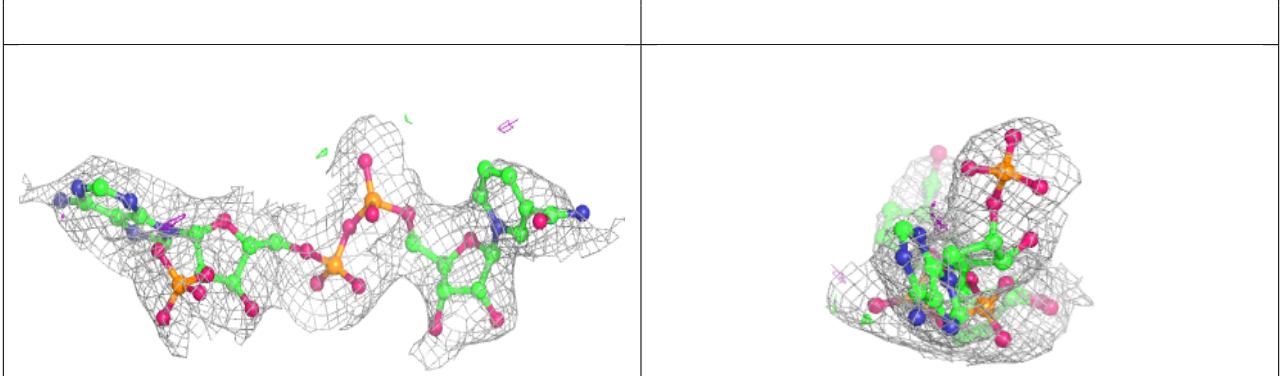




Electron density around NAP A 602:

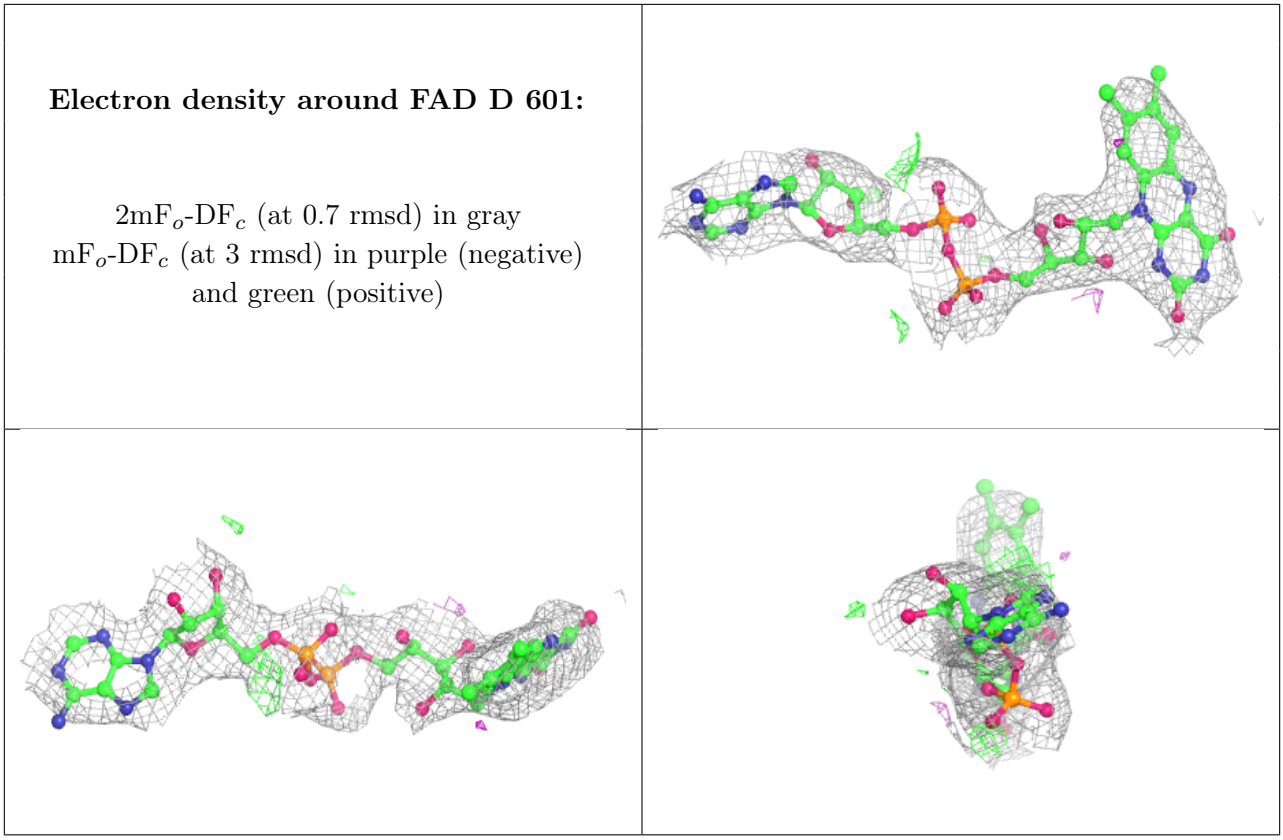
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)





Electron density around FAD D 601:

$2mF_o$-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.