Full wwPDB X-ray Structure Validation Report ⓘ

Nov 23, 2023 – 12:21 AM JST

PDB ID	:	7XXP
Title	:	F316A-glycine-streptothricin F complex
Authors	:	Wang, Y.L.; Li, T.L.
Deposited on	:	2022-05-30
Resolution	:	2.05 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:

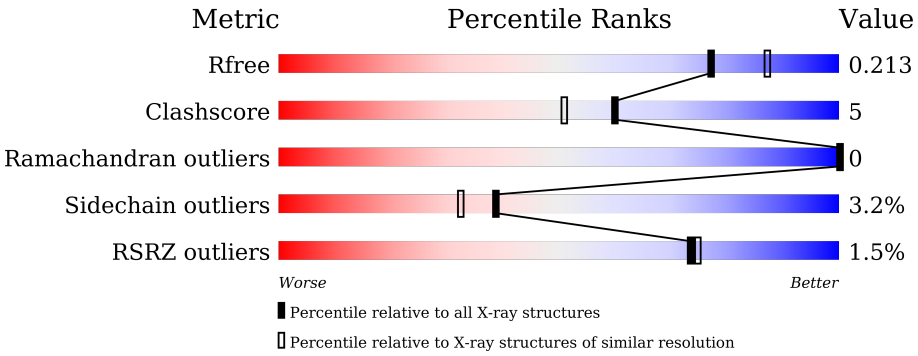
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 2.05 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	2684 (2.08-2.04)
Clashscore	141614	2801 (2.08-2.04)
Ramachandran outliers	138981	2768 (2.08-2.04)
Sidechain outliers	138945	2768 (2.08-2.04)
RSRZ outliers	127900	2646 (2.08-2.04)

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	508	84% 10% • 5%
1	B	508	% 87% 7% • 5%
1	C	508	88% 6% • 5%
1	D	508	5% 85% 8% • 6%
1	E	508	84% 9% • 5%
1	F	508	% 87% 7% • 5%

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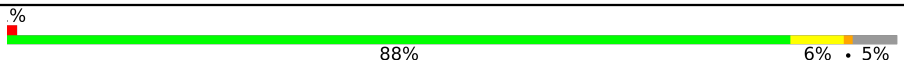
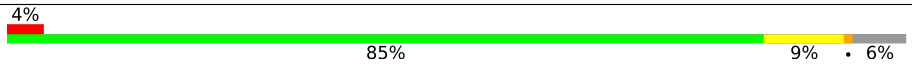
Mol	Chain	Length	Quality of chain
1	G	508	
1	H	508	

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 31707 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 N-formimidoyl fortimicin A synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	482	Total	C	N	O	S	0	0	0
			3648	2287	660	689	12			
1	B	482	Total	C	N	O	S	0	0	0
			3648	2287	660	689	12			
1	C	482	Total	C	N	O	S	0	0	0
			3648	2287	660	689	12			
1	D	479	Total	C	N	O	S	0	0	0
			3624	2274	656	682	12			
1	E	482	Total	C	N	O	S	0	0	0
			3648	2287	660	689	12			
1	F	482	Total	C	N	O	S	0	0	0
			3648	2287	660	689	12			
1	G	482	Total	C	N	O	S	0	0	0
			3648	2287	660	689	12			
1	H	479	Total	C	N	O	S	0	0	0
			3624	2274	656	682	12			

There are 144 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-16	MET	-	initiating methionine	UNP A0A125SZC1
A	-15	GLY	-	expression tag	UNP A0A125SZC1
A	-14	SER	-	expression tag	UNP A0A125SZC1
A	-13	SER	-	expression tag	UNP A0A125SZC1
A	-12	HIS	-	expression tag	UNP A0A125SZC1
A	-11	HIS	-	expression tag	UNP A0A125SZC1
A	-10	SER	-	expression tag	UNP A0A125SZC1
A	-9	SER	-	expression tag	UNP A0A125SZC1
A	-8	GLY	-	expression tag	UNP A0A125SZC1
A	-7	LEU	-	expression tag	UNP A0A125SZC1
A	-6	VAL	-	expression tag	UNP A0A125SZC1
A	-5	PRO	-	expression tag	UNP A0A125SZC1
A	-4	ARG	-	expression tag	UNP A0A125SZC1

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-3	GLY	-	expression tag	UNP A0A125SZC1
A	-2	SER	-	expression tag	UNP A0A125SZC1
A	-1	HIS	-	expression tag	UNP A0A125SZC1
A	0	MET	-	expression tag	UNP A0A125SZC1
A	316	ALA	PHE	engineered mutation	UNP A0A125SZC1
B	-16	MET	-	initiating methionine	UNP A0A125SZC1
B	-15	GLY	-	expression tag	UNP A0A125SZC1
B	-14	SER	-	expression tag	UNP A0A125SZC1
B	-13	SER	-	expression tag	UNP A0A125SZC1
B	-12	HIS	-	expression tag	UNP A0A125SZC1
B	-11	HIS	-	expression tag	UNP A0A125SZC1
B	-10	SER	-	expression tag	UNP A0A125SZC1
B	-9	SER	-	expression tag	UNP A0A125SZC1
B	-8	GLY	-	expression tag	UNP A0A125SZC1
B	-7	LEU	-	expression tag	UNP A0A125SZC1
B	-6	VAL	-	expression tag	UNP A0A125SZC1
B	-5	PRO	-	expression tag	UNP A0A125SZC1
B	-4	ARG	-	expression tag	UNP A0A125SZC1
B	-3	GLY	-	expression tag	UNP A0A125SZC1
B	-2	SER	-	expression tag	UNP A0A125SZC1
B	-1	HIS	-	expression tag	UNP A0A125SZC1
B	0	MET	-	expression tag	UNP A0A125SZC1
B	316	ALA	PHE	engineered mutation	UNP A0A125SZC1
C	-16	MET	-	initiating methionine	UNP A0A125SZC1
C	-15	GLY	-	expression tag	UNP A0A125SZC1
C	-14	SER	-	expression tag	UNP A0A125SZC1
C	-13	SER	-	expression tag	UNP A0A125SZC1
C	-12	HIS	-	expression tag	UNP A0A125SZC1
C	-11	HIS	-	expression tag	UNP A0A125SZC1
C	-10	SER	-	expression tag	UNP A0A125SZC1
C	-9	SER	-	expression tag	UNP A0A125SZC1
C	-8	GLY	-	expression tag	UNP A0A125SZC1
C	-7	LEU	-	expression tag	UNP A0A125SZC1
C	-6	VAL	-	expression tag	UNP A0A125SZC1
C	-5	PRO	-	expression tag	UNP A0A125SZC1
C	-4	ARG	-	expression tag	UNP A0A125SZC1
C	-3	GLY	-	expression tag	UNP A0A125SZC1
C	-2	SER	-	expression tag	UNP A0A125SZC1
C	-1	HIS	-	expression tag	UNP A0A125SZC1
C	0	MET	-	expression tag	UNP A0A125SZC1
C	316	ALA	PHE	engineered mutation	UNP A0A125SZC1
D	-16	MET	-	initiating methionine	UNP A0A125SZC1

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-15	GLY	-	expression tag	UNP A0A125SZC1
D	-14	SER	-	expression tag	UNP A0A125SZC1
D	-13	SER	-	expression tag	UNP A0A125SZC1
D	-12	HIS	-	expression tag	UNP A0A125SZC1
D	-11	HIS	-	expression tag	UNP A0A125SZC1
D	-10	SER	-	expression tag	UNP A0A125SZC1
D	-9	SER	-	expression tag	UNP A0A125SZC1
D	-8	GLY	-	expression tag	UNP A0A125SZC1
D	-7	LEU	-	expression tag	UNP A0A125SZC1
D	-6	VAL	-	expression tag	UNP A0A125SZC1
D	-5	PRO	-	expression tag	UNP A0A125SZC1
D	-4	ARG	-	expression tag	UNP A0A125SZC1
D	-3	GLY	-	expression tag	UNP A0A125SZC1
D	-2	SER	-	expression tag	UNP A0A125SZC1
D	-1	HIS	-	expression tag	UNP A0A125SZC1
D	0	MET	-	expression tag	UNP A0A125SZC1
D	316	ALA	PHE	engineered mutation	UNP A0A125SZC1
E	-16	MET	-	initiating methionine	UNP A0A125SZC1
E	-15	GLY	-	expression tag	UNP A0A125SZC1
E	-14	SER	-	expression tag	UNP A0A125SZC1
E	-13	SER	-	expression tag	UNP A0A125SZC1
E	-12	HIS	-	expression tag	UNP A0A125SZC1
E	-11	HIS	-	expression tag	UNP A0A125SZC1
E	-10	SER	-	expression tag	UNP A0A125SZC1
E	-9	SER	-	expression tag	UNP A0A125SZC1
E	-8	GLY	-	expression tag	UNP A0A125SZC1
E	-7	LEU	-	expression tag	UNP A0A125SZC1
E	-6	VAL	-	expression tag	UNP A0A125SZC1
E	-5	PRO	-	expression tag	UNP A0A125SZC1
E	-4	ARG	-	expression tag	UNP A0A125SZC1
E	-3	GLY	-	expression tag	UNP A0A125SZC1
E	-2	SER	-	expression tag	UNP A0A125SZC1
E	-1	HIS	-	expression tag	UNP A0A125SZC1
E	0	MET	-	expression tag	UNP A0A125SZC1
E	316	ALA	PHE	engineered mutation	UNP A0A125SZC1
F	-16	MET	-	initiating methionine	UNP A0A125SZC1
F	-15	GLY	-	expression tag	UNP A0A125SZC1
F	-14	SER	-	expression tag	UNP A0A125SZC1
F	-13	SER	-	expression tag	UNP A0A125SZC1
F	-12	HIS	-	expression tag	UNP A0A125SZC1
F	-11	HIS	-	expression tag	UNP A0A125SZC1
F	-10	SER	-	expression tag	UNP A0A125SZC1

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Chain	Residue	Modelled	Actual	Comment	Reference
F	-9	SER	-	expression tag	UNP A0A125SZC1
F	-8	GLY	-	expression tag	UNP A0A125SZC1
F	-7	LEU	-	expression tag	UNP A0A125SZC1
F	-6	VAL	-	expression tag	UNP A0A125SZC1
F	-5	PRO	-	expression tag	UNP A0A125SZC1
F	-4	ARG	-	expression tag	UNP A0A125SZC1
F	-3	GLY	-	expression tag	UNP A0A125SZC1
F	-2	SER	-	expression tag	UNP A0A125SZC1
F	-1	HIS	-	expression tag	UNP A0A125SZC1
F	0	MET	-	expression tag	UNP A0A125SZC1
F	316	ALA	PHE	engineered mutation	UNP A0A125SZC1
G	-16	MET	-	initiating methionine	UNP A0A125SZC1
G	-15	GLY	-	expression tag	UNP A0A125SZC1
G	-14	SER	-	expression tag	UNP A0A125SZC1
G	-13	SER	-	expression tag	UNP A0A125SZC1
G	-12	HIS	-	expression tag	UNP A0A125SZC1
G	-11	HIS	-	expression tag	UNP A0A125SZC1
G	-10	SER	-	expression tag	UNP A0A125SZC1
G	-9	SER	-	expression tag	UNP A0A125SZC1
G	-8	GLY	-	expression tag	UNP A0A125SZC1
G	-7	LEU	-	expression tag	UNP A0A125SZC1
G	-6	VAL	-	expression tag	UNP A0A125SZC1
G	-5	PRO	-	expression tag	UNP A0A125SZC1
G	-4	ARG	-	expression tag	UNP A0A125SZC1
G	-3	GLY	-	expression tag	UNP A0A125SZC1
G	-2	SER	-	expression tag	UNP A0A125SZC1
G	-1	HIS	-	expression tag	UNP A0A125SZC1
G	0	MET	-	expression tag	UNP A0A125SZC1
G	316	ALA	PHE	engineered mutation	UNP A0A125SZC1
H	-16	MET	-	initiating methionine	UNP A0A125SZC1
H	-15	GLY	-	expression tag	UNP A0A125SZC1
H	-14	SER	-	expression tag	UNP A0A125SZC1
H	-13	SER	-	expression tag	UNP A0A125SZC1
H	-12	HIS	-	expression tag	UNP A0A125SZC1
H	-11	HIS	-	expression tag	UNP A0A125SZC1
H	-10	SER	-	expression tag	UNP A0A125SZC1
H	-9	SER	-	expression tag	UNP A0A125SZC1
H	-8	GLY	-	expression tag	UNP A0A125SZC1
H	-7	LEU	-	expression tag	UNP A0A125SZC1
H	-6	VAL	-	expression tag	UNP A0A125SZC1
H	-5	PRO	-	expression tag	UNP A0A125SZC1
H	-4	ARG	-	expression tag	UNP A0A125SZC1

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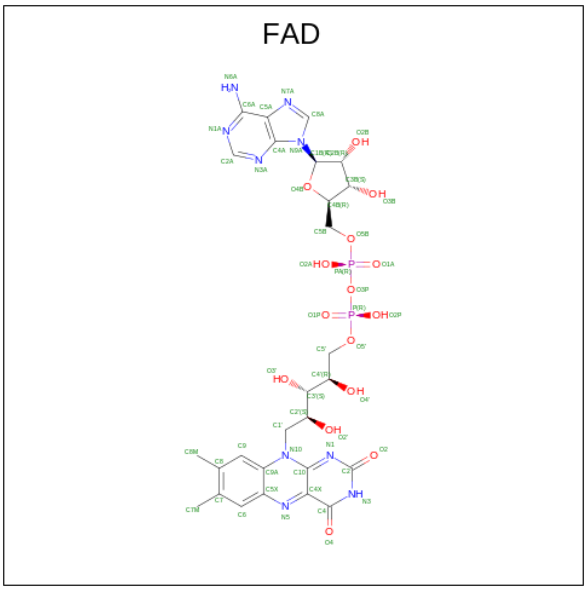
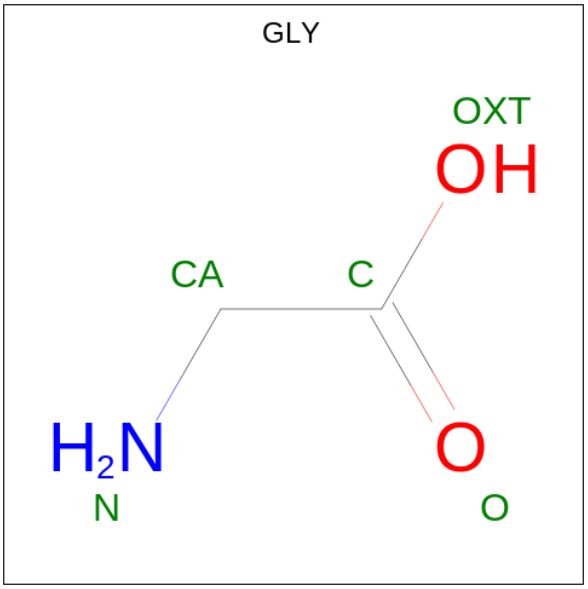
Chain	Residue	Modelled	Actual	Comment	Reference
H	-3	GLY	-	expression tag	UNP A0A125SZC1
H	-2	SER	-	expression tag	UNP A0A125SZC1
H	-1	HIS	-	expression tag	UNP A0A125SZC1
H	0	MET	-	expression tag	UNP A0A125SZC1
H	316	ALA	PHE	engineered mutation	UNP A0A125SZC1

- Molecule 2 is FLAVIN-ADENINE DINUCLEOTIDE (three-letter code: FAD) (formula: $C_{27}H_{33}N_9O_{15}P_2$) (labeled as "Ligand of Interest" by depositor).



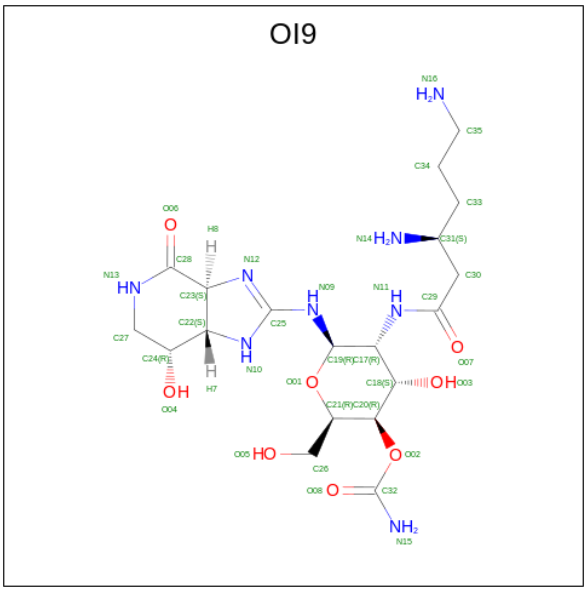
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
2	B	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
2	C	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
2	D	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
2	E	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
2	F	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
2	G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

- Molecule 3 is GLYCINE (three-letter code: GLY) (formula: $C_2H_5NO_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			5	2	1	2		
3	B	1	Total	C	N	O	0	0
			5	2	1	2		
3	C	1	Total	C	N	O	0	0
			5	2	1	2		
3	D	1	Total	C	N	O	0	0
			5	2	1	2		
3	E	1	Total	C	N	O	0	0
			5	2	1	2		
3	F	1	Total	C	N	O	0	0
			5	2	1	2		
3	G	1	Total	C	N	O	0	0
			5	2	1	2		
3	H	1	Total	C	N	O	0	0
			5	2	1	2		

- Molecule 4 is Streptothricin F (three-letter code: OI9) (formula: $C_{19}H_{34}N_8O_8$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C N O 35 19 8 8	0	0
4	B	1	Total C N O 35 19 8 8	0	0
4	C	1	Total C N O 35 19 8 8	0	0
4	D	1	Total C N O 35 19 8 8	0	0
4	E	1	Total C N O 35 19 8 8	0	0
4	F	1	Total C N O 35 19 8 8	0	0
4	G	1	Total C N O 35 19 8 8	0	0
4	H	1	Total C N O 35 19 8 8	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	255	Total O 255 255	0	0
5	B	261	Total O 261 261	0	0
5	C	234	Total O 234 234	0	0
5	D	160	Total O 160 160	0	0

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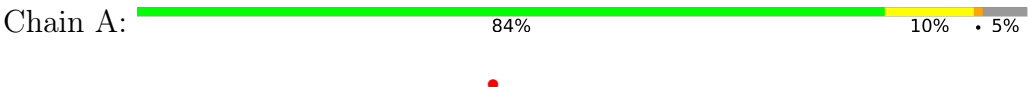
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	E	252	Total O 252 252	0	0
5	F	267	Total O 267 267	0	0
5	G	237	Total O 237 237	0	0
5	H	161	Total O 161 161	0	0

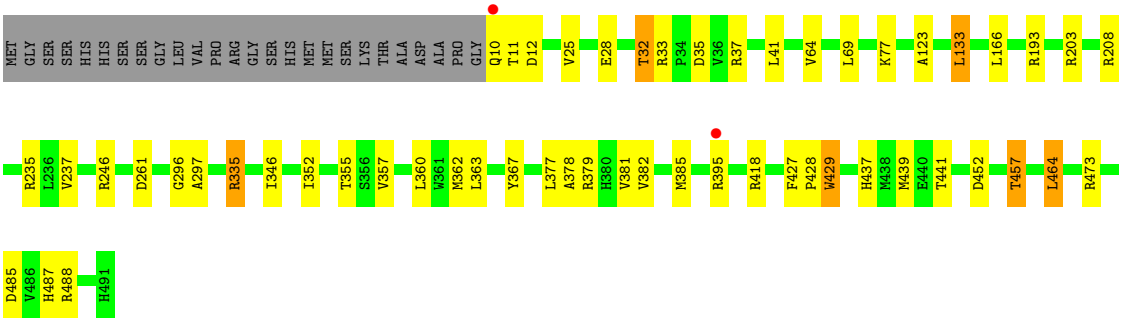
3 Residue-property plots (i)

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: N-formimidoyl fortimicin A synthase

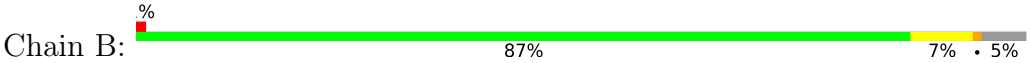
Chain A:

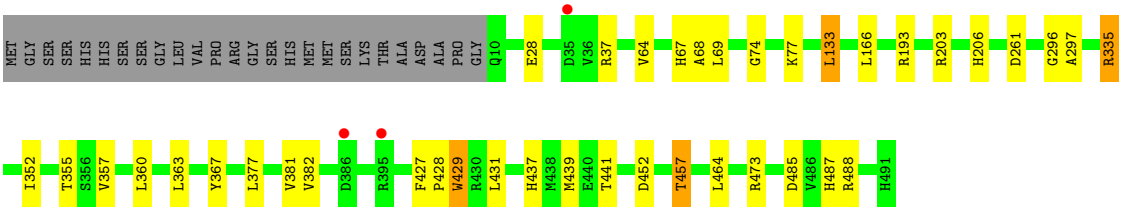




• Molecule 1: N-formimidoyl fortimicin A synthase

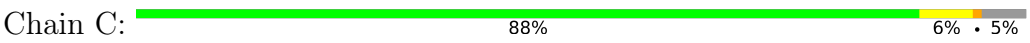
Chain B:

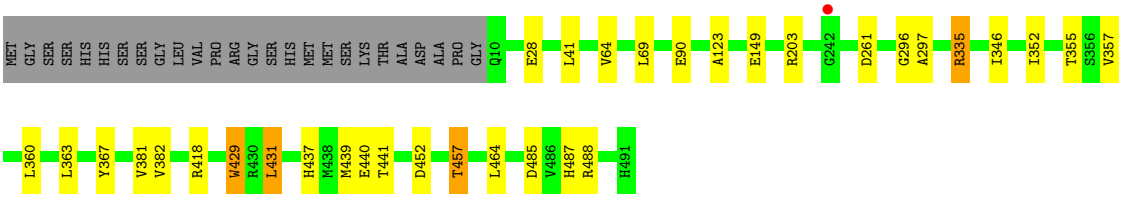




• Molecule 1: N-formimidoyl fortimicin A synthase

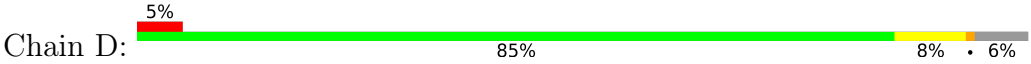
Chain C:

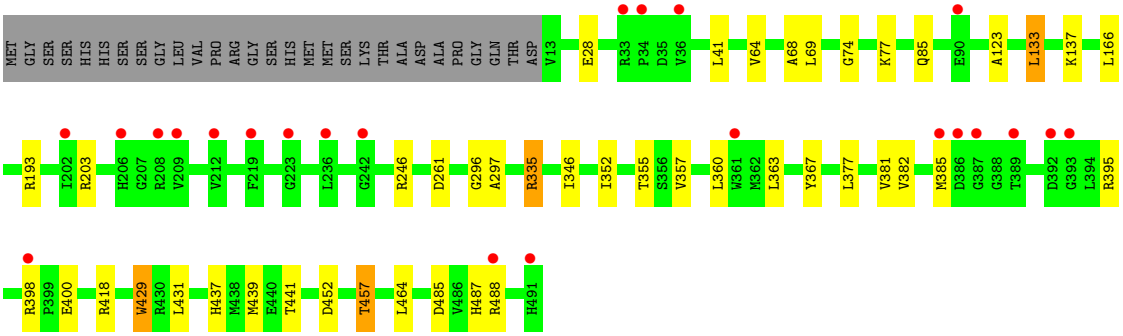




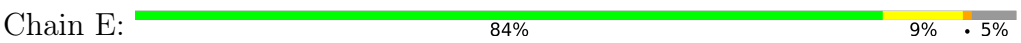
• Molecule 1: N-formimidoyl fortimicin A synthase

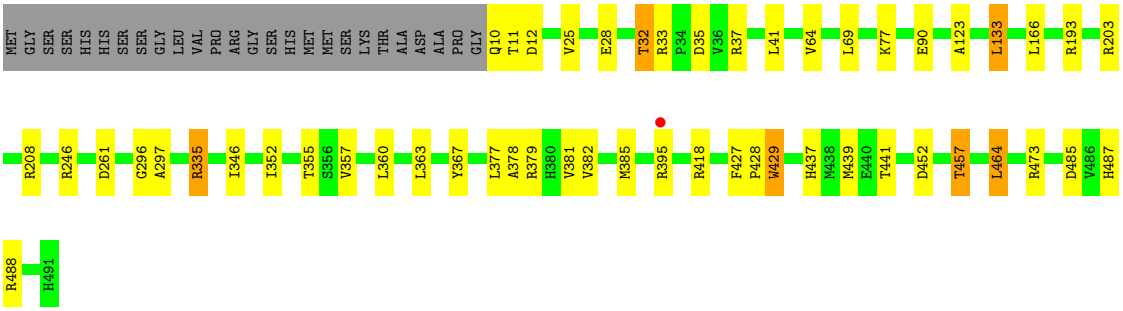
Chain D:



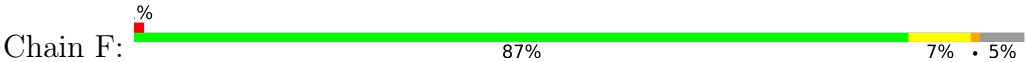


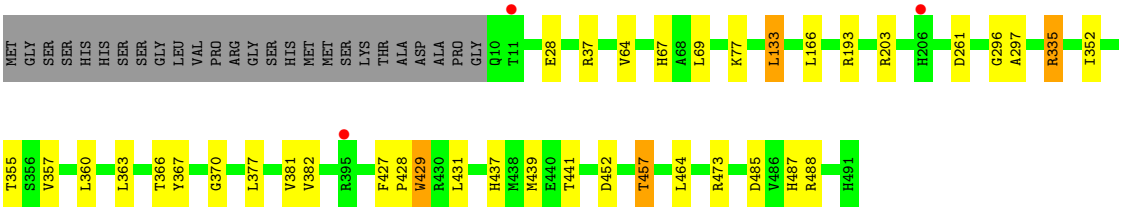
• Molecule 1: N-formimidoyl fortimicin A synthase



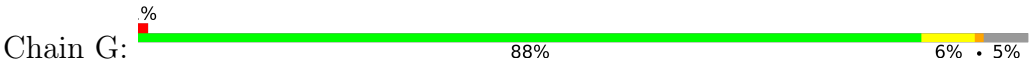


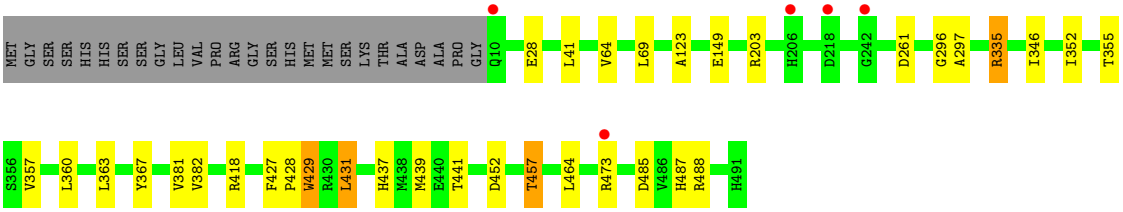
• Molecule 1: N-formimidoyl fortimicin A synthase



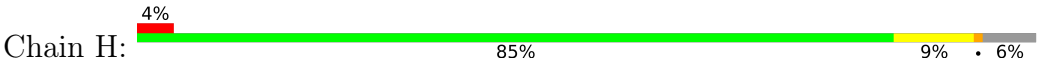


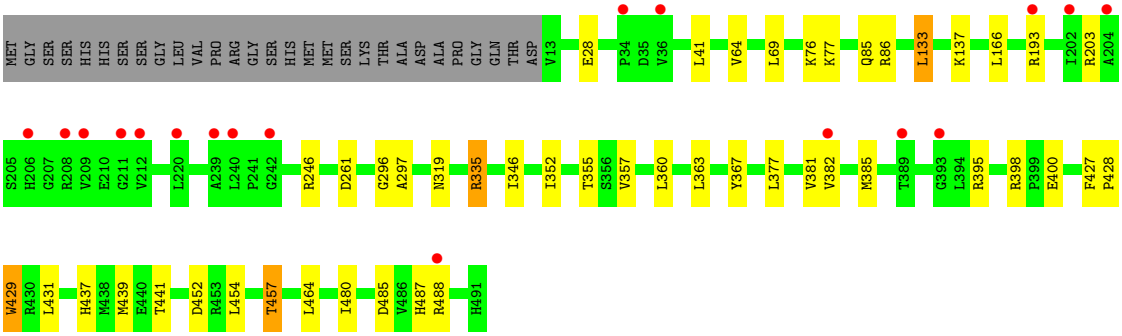
• Molecule 1: N-formimidoyl fortimicin A synthase





• Molecule 1: N-formimidoyl fortimicin A synthase




MET GLY SER SER HIS HIS SER SER GLY LEU VAL PRO ARG GLY SER HIS MET MET SER LYS THR ALA ASP ALA PRO GLY GLN THR ASP V13 E28 P34 D35 V36 L41 V64 L69 K76 K77 Q85 R86 L133 K137 L166 R193 I202 R203 A204
S205 H206 G207 R208 V209 E210 G211 V212 L220 A239 L240 P241 G242 R246 D261 G296 A297 N319 R335 I346 I352 T355 S356 V357 L360 L363 Y367 L377 V381 V382 M385 T389 G393 L394 R396 R398 P399 E400 F427 P428
W429 R430 L431 H437 M438 M439 E440 T441 D452 R453 L454 T457 L464 I480 D485 V486 H487 R488 H491

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	103.31Å 106.40Å 135.54Å 90.01° 90.01° 96.21°	Depositor
Resolution (Å)	29.92 – 2.05 29.90 – 2.05	Depositor EDS
% Data completeness (in resolution range)	96.9 (29.92-2.05) 96.9 (29.90-2.05)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.16 (at 2.05Å)	Xtriage
Refinement program	REFMAC 5.8.0267	Depositor
R, R_{free}	0.188 , 0.208 0.194 , 0.213	Depositor DCC
R_{free} test set	17604 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å^2)	25.2	Xtriage
Anisotropy	0.049	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.37 , 25.9	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.470 for -h,-k,l 0.007 for k,h,-l 0.008 for -k,-h,-l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	31707	wwPDB-VP
Average B, all atoms (Å^2)	31.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.73% 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: FAD, OI9

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	0.68	0/3730	0.80	2/5083 (0.0%)
1	B	0.68	0/3730	0.78	0/5083
1	C	0.70	2/3730 (0.1%)	0.78	0/5083
1	D	0.64	0/3706	0.77	0/5050
1	E	0.68	0/3730	0.80	1/5083 (0.0%)
1	F	0.68	0/3730	0.78	0/5083
1	G	0.69	0/3730	0.78	0/5083
1	H	0.65	0/3706	0.77	0/5050
All	All	0.67	2/29792 (0.0%)	0.78	3/40598 (0.0%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	90	GLU	CD-OE1	5.89	1.32	1.25
1	C	90	GLU	CD-OE2	5.26	1.31	1.25

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	246	ARG	NE-CZ-NH1	-5.79	117.41	120.30
1	E	246	ARG	NE-CZ-NH1	-5.78	117.41	120.30
1	A	235	ARG	NE-CZ-NH2	-5.15	117.73	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	3648	0	3580	45	0
1	B	3648	0	3580	32	0
1	C	3648	0	3580	32	0
1	D	3624	0	3561	41	0
1	E	3648	0	3580	40	0
1	F	3648	0	3580	31	0
1	G	3648	0	3580	31	0
1	H	3624	0	3561	43	0
2	A	53	0	31	1	0
2	B	53	0	31	2	0
2	C	53	0	31	2	0
2	D	53	0	31	2	0
2	E	53	0	31	1	0
2	F	53	0	31	2	0
2	G	53	0	31	1	0
2	H	53	0	31	1	0
3	A	5	0	2	0	0
3	B	5	0	2	0	0
3	C	5	0	2	0	0
3	D	5	0	2	0	0
3	E	5	0	2	0	0
3	F	5	0	2	0	0
3	G	5	0	2	0	0
3	H	5	0	2	0	0
4	A	35	0	0	0	0
4	B	35	0	0	0	0
4	C	35	0	0	0	0
4	D	35	0	0	0	0
4	E	35	0	0	0	0
4	F	35	0	0	0	0
4	G	35	0	0	0	0
4	H	35	0	0	0	0
5	A	255	0	0	5	0
5	B	261	0	0	1	0
5	C	234	0	0	2	0
5	D	160	0	0	1	0
5	E	252	0	0	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	F	267	0	0	1	0
5	G	237	0	0	1	0
5	H	161	0	0	4	0
All	All	31707	0	28866	269	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 5.

All (269) 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:E:10:GLN:HB2	1:E:35:ASP:O	1.65	0.96
1:A:10:GLN:HB2	1:A:35:ASP:O	1.65	0.95
1:H:319:ASN:HB3	5:H:811:HOH:O	1.65	0.94
1:A:355:THR:HG22	1:A:357:VAL:H	1.39	0.88
1:E:355:THR:HG22	1:E:357:VAL:H	1.40	0.87
1:A:439:MET:HE2	1:C:439:MET:HE2	1.57	0.87
1:B:355:THR:HG22	1:B:357:VAL:H	1.40	0.87
1:H:355:THR:HG22	1:H:357:VAL:H	1.40	0.86
1:F:355:THR:HG22	1:F:357:VAL:H	1.40	0.86
1:G:355:THR:HG22	1:G:357:VAL:H	1.41	0.86
1:A:439:MET:CE	1:C:439:MET:CE	2.54	0.85
1:A:439:MET:CE	1:C:439:MET:HE2	2.07	0.84
1:E:439:MET:CE	1:G:439:MET:CE	2.55	0.84
1:D:355:THR:HG22	1:D:357:VAL:H	1.40	0.83
1:C:355:THR:HG22	1:C:357:VAL:H	1.41	0.83
1:E:439:MET:HE2	1:G:439:MET:HE2	1.61	0.82
1:E:439:MET:CE	1:G:439:MET:HE2	2.09	0.82
1:A:439:MET:HE2	1:C:439:MET:CE	2.14	0.78
1:B:439:MET:CE	1:D:439:MET:CE	2.63	0.77
1:C:355:THR:HG21	1:C:360:LEU:HD23	1.66	0.76
1:G:355:THR:HG21	1:G:360:LEU:HD23	1.67	0.76
1:F:439:MET:CE	1:H:439:MET:CE	2.63	0.76
1:B:355:THR:HG21	1:B:360:LEU:HD23	1.66	0.76
1:A:439:MET:HE3	1:C:439:MET:CE	2.16	0.75
1:E:439:MET:HE3	1:G:439:MET:CE	2.16	0.75
1:F:355:THR:HG21	1:F:360:LEU:HD23	1.66	0.75
1:D:355:THR:HG21	1:D:360:LEU:HD23	1.68	0.74
1:B:352:ILE:HD13	1:B:377:LEU:HD22	1.69	0.74
1:E:355:THR:HG21	1:E:360:LEU:HD23	1.68	0.74
1:E:439:MET:HE2	1:G:439:MET:CE	2.15	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:206:HIS:O	1:H:86:ARG:HD2	1.88	0.73
1:H:355:THR:HG21	1:H:360:LEU:HD23	1.68	0.73
1:F:352:ILE:HD13	1:F:377:LEU:HD22	1.70	0.73
1:H:352:ILE:HD13	1:H:377:LEU:HD22	1.71	0.73
1:F:439:MET:HE3	1:H:439:MET:CE	2.19	0.72
1:F:439:MET:CE	1:H:439:MET:HE2	2.20	0.72
1:A:355:THR:HG21	1:A:360:LEU:HD23	1.69	0.72
1:E:37:ARG:HD2	1:E:193:ARG:HH22	1.54	0.72
1:D:352:ILE:HD13	1:D:377:LEU:HD22	1.71	0.72
1:B:439:MET:CE	1:D:439:MET:HE2	2.21	0.70
1:F:431:LEU:HD11	1:H:431:LEU:HD11	1.73	0.70
1:A:37:ARG:HD2	1:A:193:ARG:HH22	1.54	0.70
1:E:90:GLU:HG2	5:E:853:HOH:O	1.91	0.70
1:E:439:MET:CE	1:G:439:MET:HE3	2.22	0.70
1:D:246:ARG:NH1	1:D:400:GLU:OE1	2.24	0.70
1:B:439:MET:HE3	1:D:439:MET:CE	2.21	0.70
1:H:246:ARG:NH1	1:H:400:GLU:OE1	2.24	0.70
1:C:352:ILE:HG23	1:C:363:LEU:CD1	2.24	0.68
1:B:439:MET:CE	1:D:439:MET:HE3	2.24	0.68
1:B:439:MET:HE2	1:D:439:MET:CE	2.24	0.67
1:A:439:MET:CE	1:C:439:MET:HE3	2.23	0.67
1:B:439:MET:HE2	1:D:439:MET:HE2	1.77	0.67
1:E:352:ILE:HG23	1:E:363:LEU:CD1	2.24	0.67
1:G:352:ILE:HG23	1:G:363:LEU:CD1	2.24	0.67
1:B:352:ILE:HG23	1:B:363:LEU:CD1	2.25	0.67
1:A:352:ILE:HG23	1:A:363:LEU:CD1	2.24	0.67
1:E:352:ILE:HD13	1:E:377:LEU:HD22	1.77	0.67
1:F:431:LEU:CD1	1:H:431:LEU:HD11	2.25	0.67
1:B:431:LEU:HD11	1:D:431:LEU:HD11	1.74	0.66
1:F:439:MET:HE2	1:H:439:MET:HE2	1.77	0.66
1:F:352:ILE:HG23	1:F:363:LEU:CD1	2.25	0.66
1:F:431:LEU:HD11	1:H:431:LEU:CD1	2.25	0.66
1:H:352:ILE:HG23	1:H:363:LEU:CD1	2.26	0.66
1:F:439:MET:HE2	1:H:439:MET:CE	2.26	0.66
1:F:439:MET:CE	1:H:439:MET:HE3	2.25	0.65
1:G:149:GLU:HG3	5:G:917:HOH:O	1.97	0.65
1:B:431:LEU:CD1	1:D:431:LEU:HD11	2.26	0.65
1:B:431:LEU:HD11	1:D:431:LEU:CD1	2.27	0.65
1:D:352:ILE:HG23	1:D:363:LEU:CD1	2.26	0.64
1:A:352:ILE:HD13	1:A:377:LEU:HD22	1.78	0.64
1:C:429:TRP:CE2	1:C:431:LEU:HD11	2.36	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:133:LEU:HD13	1:A:166:LEU:HD22	1.83	0.60
1:E:363:LEU:HD13	1:E:381:VAL:HG21	1.84	0.60
1:E:133:LEU:HD13	1:E:166:LEU:HD22	1.83	0.60
1:B:429:TRP:CZ3	1:B:439:MET:HE1	2.37	0.60
1:G:429:TRP:CE2	1:G:431:LEU:HD11	2.37	0.60
1:F:133:LEU:HD13	1:F:166:LEU:HD22	1.84	0.60
1:A:429:TRP:CZ3	1:A:439:MET:HE1	2.37	0.59
1:A:363:LEU:HD13	1:A:381:VAL:HG21	1.84	0.59
1:D:429:TRP:CZ3	1:D:439:MET:HE1	2.37	0.59
1:A:382:VAL:HA	1:A:385:MET:CE	2.33	0.59
1:E:429:TRP:CZ3	1:E:439:MET:HE1	2.37	0.58
1:F:429:TRP:CZ3	1:F:439:MET:HE1	2.37	0.58
1:H:429:TRP:CZ3	1:H:439:MET:HE1	2.37	0.58
1:E:382:VAL:HA	1:E:385:MET:CE	2.33	0.58
1:G:429:TRP:CZ3	1:G:439:MET:HE1	2.38	0.58
1:C:429:TRP:CZ3	1:C:439:MET:HE1	2.39	0.58
1:A:25:VAL:HG21	1:A:363:LEU:HD22	1.86	0.58
1:A:437:HIS:O	1:A:441:THR:HG23	2.04	0.58
1:H:382:VAL:HA	1:H:385:MET:CE	2.34	0.58
1:D:133:LEU:HD13	1:D:166:LEU:HD22	1.86	0.58
1:D:363:LEU:HD13	1:D:381:VAL:HG21	1.86	0.58
1:E:437:HIS:O	1:E:441:THR:HG23	2.04	0.58
1:E:25:VAL:HG21	1:E:363:LEU:HD22	1.85	0.57
1:H:133:LEU:HD13	1:H:166:LEU:HD22	1.86	0.57
1:C:437:HIS:O	1:C:441:THR:HG23	2.04	0.57
1:D:382:VAL:HA	1:D:385:MET:CE	2.35	0.57
1:G:437:HIS:O	1:G:441:THR:HG23	2.05	0.57
1:F:437:HIS:O	1:F:441:THR:HG23	2.05	0.57
1:B:437:HIS:O	1:B:441:THR:HG23	2.05	0.57
1:D:437:HIS:O	1:D:441:THR:HG23	2.05	0.57
1:H:363:LEU:HD13	1:H:381:VAL:HG21	1.86	0.56
1:B:133:LEU:HD13	1:B:166:LEU:HD22	1.86	0.56
1:H:437:HIS:O	1:H:441:THR:HG23	2.05	0.56
1:F:363:LEU:HD13	1:F:381:VAL:HG21	1.88	0.55
1:H:319:ASN:CB	5:H:811:HOH:O	2.35	0.55
1:A:32:THR:CG2	5:A:1034:HOH:O	2.53	0.55
1:H:382:VAL:HA	1:H:385:MET:HE2	1.89	0.55
1:A:10:GLN:CB	1:A:35:ASP:O	2.50	0.55
1:E:382:VAL:HA	1:E:385:MET:HE2	1.89	0.55
1:H:76:LYS:NZ	5:H:801:HOH:O	2.39	0.55
1:C:363:LEU:HD13	1:C:381:VAL:HG21	1.90	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:363:LEU:HD13	1:B:381:VAL:HG21	1.88	0.54
1:F:431:LEU:CD1	1:H:431:LEU:CD1	2.85	0.54
1:A:32:THR:HG23	5:A:1034:HOH:O	2.07	0.54
1:G:363:LEU:HD13	1:G:381:VAL:HG21	1.90	0.53
1:F:261:ASP:OD2	1:F:335:ARG:HD3	2.09	0.53
1:B:261:ASP:OD2	1:B:335:ARG:HD3	2.09	0.53
1:C:261:ASP:OD2	1:C:335:ARG:HD3	2.08	0.53
1:D:261:ASP:OD2	1:D:335:ARG:HD3	2.09	0.53
1:A:261:ASP:OD2	1:A:335:ARG:HD3	2.09	0.53
1:E:261:ASP:OD2	1:E:335:ARG:HD3	2.09	0.53
1:C:429:TRP:NE1	1:C:431:LEU:HD11	2.23	0.53
1:A:382:VAL:HA	1:A:385:MET:HE2	1.90	0.53
1:D:382:VAL:HA	1:D:385:MET:HE2	1.91	0.52
1:G:429:TRP:NE1	1:G:431:LEU:HD11	2.23	0.52
1:G:429:TRP:CD1	1:G:431:LEU:HD11	2.44	0.52
1:E:10:GLN:CB	1:E:35:ASP:O	2.50	0.52
1:H:261:ASP:OD2	1:H:335:ARG:HD3	2.09	0.52
1:E:346:ILE:HG13	1:E:464:LEU:CD2	2.39	0.52
1:C:149:GLU:HG3	5:C:940:HOH:O	2.09	0.52
1:A:346:ILE:HG13	1:A:464:LEU:CD2	2.40	0.51
1:B:431:LEU:CD1	1:D:431:LEU:CD1	2.86	0.51
1:G:261:ASP:OD2	1:G:335:ARG:HD3	2.09	0.51
1:C:429:TRP:CD1	1:C:431:LEU:HD11	2.45	0.51
1:E:90:GLU:CG	5:E:853:HOH:O	2.51	0.51
1:G:346:ILE:HG13	1:G:464:LEU:CD2	2.41	0.51
1:A:64:VAL:HG13	1:A:69:LEU:HD22	1.93	0.50
1:D:346:ILE:HG13	1:D:464:LEU:CD2	2.41	0.50
1:H:319:ASN:CG	5:H:811:HOH:O	2.48	0.50
1:H:346:ILE:HG13	1:H:464:LEU:CD2	2.41	0.50
1:C:352:ILE:HD12	1:C:363:LEU:HD12	1.94	0.50
1:C:346:ILE:HG13	1:C:464:LEU:CD2	2.42	0.50
1:G:352:ILE:HD12	1:G:363:LEU:HD12	1.94	0.49
1:D:381:VAL:HG12	1:D:385:MET:CE	2.43	0.49
1:E:32:THR:HG23	1:E:33:ARG:HG2	1.94	0.49
1:A:381:VAL:HG12	1:A:385:MET:CE	2.43	0.49
1:E:381:VAL:HG12	1:E:385:MET:CE	2.43	0.49
1:F:28:GLU:HB3	1:F:382:VAL:HG21	1.95	0.49
1:B:64:VAL:HG13	1:B:69:LEU:HD22	1.94	0.49
1:F:64:VAL:HG13	1:F:69:LEU:HD22	1.94	0.49
1:H:381:VAL:HG12	1:H:385:MET:CE	2.42	0.49
1:B:457:THR:HG21	1:B:487:HIS:CD2	2.48	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:28:GLU:HB3	1:B:382:VAL:HG21	1.95	0.48
1:D:28:GLU:HB3	1:D:382:VAL:HG21	1.96	0.48
1:A:457:THR:HG21	1:A:487:HIS:CD2	2.49	0.48
1:E:64:VAL:HG13	1:E:69:LEU:HD22	1.93	0.48
1:D:64:VAL:HG13	1:D:69:LEU:HD22	1.96	0.48
1:A:32:THR:HG23	1:A:33:ARG:HG2	1.95	0.47
1:G:457:THR:HG21	1:G:487:HIS:CD2	2.49	0.47
1:C:352:ILE:CD1	1:C:363:LEU:HD12	2.44	0.47
1:G:352:ILE:CD1	1:G:363:LEU:HD12	2.44	0.47
1:A:28:GLU:HB3	1:A:382:VAL:HG21	1.97	0.47
1:C:457:THR:HG21	1:C:487:HIS:CD2	2.50	0.47
1:D:457:THR:HG21	1:D:487:HIS:CD2	2.50	0.47
1:C:28:GLU:HB3	1:C:382:VAL:HG21	1.97	0.47
1:F:457:THR:HG21	1:F:487:HIS:CD2	2.49	0.47
1:A:25:VAL:HG22	1:A:378:ALA:HA	1.97	0.47
1:H:28:GLU:HB3	1:H:382:VAL:HG21	1.96	0.47
1:A:355:THR:HG22	1:A:357:VAL:N	2.20	0.46
1:E:457:THR:HG21	1:E:487:HIS:CD2	2.49	0.46
2:F:701:FAD:H9	2:F:701:FAD:H1'2	1.82	0.46
1:A:335:ARG:HG2	5:A:1002:HOH:O	2.15	0.46
1:B:355:THR:HB	1:B:360:LEU:O	2.16	0.46
1:E:346:ILE:HG13	1:E:464:LEU:HD21	1.98	0.46
1:H:457:THR:HG21	1:H:487:HIS:CD2	2.50	0.46
1:A:355:THR:HB	1:A:360:LEU:O	2.16	0.46
1:E:28:GLU:HB3	1:E:382:VAL:HG21	1.97	0.46
1:G:123:ALA:HB1	1:G:418:ARG:HD2	1.98	0.46
1:H:355:THR:HB	1:H:360:LEU:O	2.16	0.46
1:C:123:ALA:HB1	1:C:418:ARG:HD2	1.98	0.45
1:E:379:ARG:HD3	5:E:995:HOH:O	2.15	0.45
1:E:355:THR:HB	1:E:360:LEU:O	2.16	0.45
1:E:25:VAL:HG22	1:E:378:ALA:HA	1.97	0.45
2:D:701:FAD:N1	2:D:701:FAD:O2'	2.43	0.45
1:G:28:GLU:HB3	1:G:382:VAL:HG21	1.97	0.45
1:H:381:VAL:HG12	1:H:385:MET:HE1	1.97	0.45
1:H:296:GLY:HA3	1:H:297:ALA:HB2	1.99	0.45
1:D:355:THR:HB	1:D:360:LEU:O	2.16	0.45
1:B:355:THR:HG22	1:B:357:VAL:N	2.21	0.45
1:B:439:MET:HE3	1:D:439:MET:HE2	1.92	0.45
1:A:346:ILE:HG13	1:A:464:LEU:HD21	1.99	0.45
1:F:355:THR:HB	1:F:360:LEU:O	2.16	0.45
1:D:296:GLY:HA3	1:D:297:ALA:HB2	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:701:FAD:H9	2:A:701:FAD:H1'2	1.76	0.44
1:D:363:LEU:HD12	1:D:363:LEU:HA	1.87	0.44
1:F:355:THR:HG22	1:F:357:VAL:N	2.21	0.44
1:E:381:VAL:HG12	1:E:385:MET:HE1	2.00	0.44
1:C:355:THR:HG22	1:C:357:VAL:N	2.21	0.44
1:H:64:VAL:HG13	1:H:69:LEU:HD22	1.99	0.44
1:A:363:LEU:HD12	1:A:363:LEU:HA	1.85	0.44
2:E:701:FAD:H9	2:E:701:FAD:H1'2	1.73	0.43
2:H:701:FAD:H9	2:H:701:FAD:H1'2	1.78	0.43
1:E:485:ASP:OD1	1:E:488:ARG:NH1	2.52	0.43
1:G:355:THR:HB	1:G:360:LEU:O	2.18	0.43
2:G:701:FAD:H9	2:G:701:FAD:H1'2	1.75	0.43
1:H:395:ARG:O	1:H:398:ARG:HG3	2.18	0.43
1:B:296:GLY:HA3	1:B:297:ALA:HB2	2.00	0.43
1:G:296:GLY:HA3	1:G:297:ALA:HB2	2.00	0.43
2:D:701:FAD:H9	2:D:701:FAD:H1'2	1.73	0.43
1:F:67:HIS:HE1	5:F:1050:HOH:O	2.00	0.43
1:C:296:GLY:HA3	1:C:297:ALA:HB2	2.00	0.43
1:D:123:ALA:HB1	1:D:418:ARG:HD2	2.01	0.43
1:D:355:THR:HG22	1:D:357:VAL:N	2.21	0.43
1:A:296:GLY:HA3	1:A:297:ALA:HB2	2.00	0.43
1:C:64:VAL:HG13	1:C:69:LEU:HD22	2.00	0.43
1:F:352:ILE:HG23	1:F:363:LEU:HD12	2.00	0.43
1:G:355:THR:HG22	1:G:357:VAL:N	2.21	0.43
1:C:355:THR:HB	1:C:360:LEU:O	2.18	0.43
1:D:395:ARG:O	1:D:398:ARG:HG3	2.19	0.43
1:F:296:GLY:HA3	1:F:297:ALA:HB2	2.00	0.43
1:A:32:THR:HG21	5:A:1034:HOH:O	2.18	0.43
2:B:701:FAD:H9	2:B:701:FAD:H1'2	1.83	0.43
1:C:352:ILE:HG23	1:C:363:LEU:HD12	1.99	0.43
1:A:485:ASP:OD1	1:A:488:ARG:NH1	2.52	0.42
1:D:246:ARG:NH1	1:D:400:GLU:HG2	2.34	0.42
1:E:296:GLY:HA3	1:E:297:ALA:HB2	2.00	0.42
1:E:352:ILE:HG23	1:E:363:LEU:HD12	2.01	0.42
1:F:297:ALA:HB1	2:F:701:FAD:HM73	2.01	0.42
1:H:485:ASP:OD1	1:H:488:ARG:NH1	2.53	0.42
1:D:485:ASP:OD1	1:D:488:ARG:NH1	2.53	0.42
1:B:67:HIS:HE1	5:B:1045:HOH:O	2.01	0.42
1:F:366:THR:HB	1:F:370:GLY:CA	2.50	0.42
1:G:64:VAL:HG13	1:G:69:LEU:HD22	2.00	0.42
1:D:381:VAL:HG12	1:D:385:MET:HE1	2.00	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:485:ASP:OD1	1:F:488:ARG:NH1	2.53	0.42
1:G:352:ILE:HG23	1:G:363:LEU:HD12	2.00	0.42
1:C:440:GLU:OE1	5:C:801:HOH:O	2.22	0.42
1:C:485:ASP:OD1	1:C:488:ARG:NH1	2.53	0.42
1:H:246:ARG:NH1	1:H:400:GLU:HG2	2.34	0.42
1:H:355:THR:HG22	1:H:357:VAL:N	2.21	0.42
1:B:485:ASP:OD1	1:B:488:ARG:NH1	2.53	0.42
1:B:297:ALA:HB1	2:B:701:FAD:HM73	2.02	0.41
2:C:701:FAD:H9	2:C:701:FAD:H1'2	1.77	0.41
1:E:123:ALA:HB1	1:E:418:ARG:HD2	2.02	0.41
1:E:427:PHE:N	1:E:428:PRO:HA	2.36	0.41
1:H:363:LEU:HD12	1:H:363:LEU:HA	1.86	0.41
1:F:427:PHE:N	1:F:428:PRO:HA	2.36	0.41
1:C:297:ALA:HB1	2:C:701:FAD:HM73	2.02	0.41
1:A:237:VAL:HG21	1:A:362:MET:HE1	2.03	0.41
1:A:427:PHE:N	1:A:428:PRO:HA	2.36	0.41
1:H:431:LEU:HD21	1:H:439:MET:HE3	2.01	0.41
1:A:382:VAL:HA	1:A:385:MET:HE3	2.02	0.41
1:D:335:ARG:HG2	5:D:923:HOH:O	2.20	0.41
1:A:381:VAL:HG12	1:A:385:MET:HE1	2.03	0.41
1:B:427:PHE:N	1:B:428:PRO:HA	2.36	0.41
1:G:427:PHE:N	1:G:428:PRO:HA	2.35	0.41
1:A:352:ILE:HG23	1:A:363:LEU:HD12	2.01	0.41
1:G:485:ASP:OD1	1:G:488:ARG:NH1	2.53	0.41
1:H:427:PHE:N	1:H:428:PRO:HA	2.36	0.41
1:D:431:LEU:HD21	1:D:439:MET:HE3	2.03	0.40
1:D:381:VAL:O	1:D:385:MET:HE2	2.21	0.40
1:E:439:MET:HE3	1:G:439:MET:HE2	1.85	0.40
1:A:379:ARG:HD3	5:A:987:HOH:O	2.20	0.40
1:A:123:ALA:HB1	1:A:418:ARG:HD2	2.02	0.40
1:C:363:LEU:HD12	1:C:363:LEU:HA	1.84	0.40
1:D:68:ALA:O	1:D:74:GLY:HA3	2.21	0.40
1:B:68:ALA:O	1:B:74:GLY:HA3	2.21	0.40
1:H:454:LEU:HA	1:H:480:ILE:HG12	2.04	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	480/508 (94%)	468 (98%)	12 (2%)	0	100	100
1	B	480/508 (94%)	468 (98%)	12 (2%)	0	100	100
1	C	480/508 (94%)	467 (97%)	13 (3%)	0	100	100
1	D	477/508 (94%)	463 (97%)	14 (3%)	0	100	100
1	E	480/508 (94%)	468 (98%)	12 (2%)	0	100	100
1	F	480/508 (94%)	468 (98%)	12 (2%)	0	100	100
1	G	480/508 (94%)	467 (97%)	13 (3%)	0	100	100
1	H	477/508 (94%)	463 (97%)	14 (3%)	0	100	100
All	All	3834/4064 (94%)	3732 (97%)	102 (3%)	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	375/395 (95%)	359 (96%)	16 (4%)	29	22
1	B	375/395 (95%)	363 (97%)	12 (3%)	39	32
1	C	375/395 (95%)	367 (98%)	8 (2%)	53	48
1	D	372/395 (94%)	360 (97%)	12 (3%)	39	32
1	E	375/395 (95%)	359 (96%)	16 (4%)	29	22
1	F	375/395 (95%)	363 (97%)	12 (3%)	39	32

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	G	375/395 (95%)	366 (98%)	9 (2%)	49 43
1	H	372/395 (94%)	360 (97%)	12 (3%)	39 32
All	All	2994/3160 (95%)	2897 (97%)	97 (3%)	39 32

All (97) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	11	THR
1	A	12	ASP
1	A	32	THR
1	A	41	LEU
1	A	77	LYS
1	A	133	LEU
1	A	203	ARG
1	A	208	ARG
1	A	335	ARG
1	A	367	TYR
1	A	395	ARG
1	A	429	TRP
1	A	452	ASP
1	A	457	THR
1	A	464	LEU
1	A	473	ARG
1	B	37	ARG
1	B	77	LYS
1	B	133	LEU
1	B	193	ARG
1	B	203	ARG
1	B	335	ARG
1	B	367	TYR
1	B	429	TRP
1	B	452	ASP
1	B	457	THR
1	B	464	LEU
1	B	473	ARG
1	C	41	LEU
1	C	203	ARG
1	C	335	ARG
1	C	367	TYR
1	C	429	TRP
1	C	431	LEU

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Mol	Chain	Res	Type
1	C	452	ASP
1	C	457	THR
1	D	41	LEU
1	D	77	LYS
1	D	85	GLN
1	D	133	LEU
1	D	137	LYS
1	D	193	ARG
1	D	203	ARG
1	D	335	ARG
1	D	367	TYR
1	D	429	TRP
1	D	452	ASP
1	D	457	THR
1	E	11	THR
1	E	12	ASP
1	E	32	THR
1	E	41	LEU
1	E	77	LYS
1	E	133	LEU
1	E	203	ARG
1	E	208	ARG
1	E	335	ARG
1	E	367	TYR
1	E	395	ARG
1	E	429	TRP
1	E	452	ASP
1	E	457	THR
1	E	464	LEU
1	E	473	ARG
1	F	37	ARG
1	F	77	LYS
1	F	133	LEU
1	F	193	ARG
1	F	203	ARG
1	F	335	ARG
1	F	367	TYR
1	F	429	TRP
1	F	452	ASP
1	F	457	THR
1	F	464	LEU
1	F	473	ARG

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Mol	Chain	Res	Type
1	G	41	LEU
1	G	203	ARG
1	G	335	ARG
1	G	367	TYR
1	G	429	TRP
1	G	431	LEU
1	G	452	ASP
1	G	457	THR
1	G	473	ARG
1	H	41	LEU
1	H	77	LYS
1	H	85	GLN
1	H	133	LEU
1	H	137	LYS
1	H	193	ARG
1	H	203	ARG
1	H	335	ARG
1	H	367	TYR
1	H	429	TRP
1	H	452	ASP
1	H	457	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	245	HIS
1	B	10	GLN
1	B	67	HIS
1	C	10	GLN
1	C	67	HIS
1	C	245	HIS
1	E	245	HIS
1	F	10	GLN
1	G	10	GLN
1	G	245	HIS

5.3.3 RNA

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

24 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	$\#\|Z\| > 2$
4	OI9	A	703	-	34,37,37	2.61	6 (17%)	38,52,52	2.38	11 (28%)
4	OI9	C	703	-	34,37,37	2.47	12 (35%)	38,52,52	2.10	10 (26%)
4	OI9	D	703	-	34,37,37	2.31	8 (23%)	38,52,52	2.20	10 (26%)
2	FAD	D	701	-	53,58,58	0.73	1 (1%)	68,89,89	0.96	4 (5%)
4	OI9	F	703	-	34,37,37	2.53	10 (29%)	38,52,52	2.14	12 (31%)
2	FAD	E	701	-	53,58,58	0.74	0	68,89,89	0.89	2 (2%)
4	OI9	H	703	-	34,37,37	2.34	7 (20%)	38,52,52	2.04	7 (18%)
3	GLY	H	702	-	4,4,4	1.17	0	3,4,4	1.13	0
2	FAD	B	701	-	53,58,58	0.77	2 (3%)	68,89,89	0.84	2 (2%)
2	FAD	G	701	-	53,58,58	0.62	0	68,89,89	0.89	5 (7%)
2	FAD	A	701	-	53,58,58	0.72	1 (1%)	68,89,89	0.86	3 (4%)
4	OI9	E	703	-	34,37,37	2.50	8 (23%)	38,52,52	2.43	13 (34%)
4	OI9	B	703	-	34,37,37	2.49	9 (26%)	38,52,52	2.12	9 (23%)
3	GLY	F	702	-	4,4,4	0.97	0	3,4,4	0.87	0
2	FAD	F	701	-	53,58,58	0.75	1 (1%)	68,89,89	0.87	2 (2%)
3	GLY	E	702	-	4,4,4	1.16	1 (25%)	3,4,4	0.86	0
4	OI9	G	703	-	34,37,37	2.45	14 (41%)	38,52,52	2.19	10 (26%)
3	GLY	B	702	-	4,4,4	1.13	0	3,4,4	0.91	0
2	FAD	H	701	-	53,58,58	0.69	0	68,89,89	0.90	3 (4%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
3	GLY	A	702	-	4,4,4	1.03	0	3,4,4	1.16	0
3	GLY	C	702	-	4,4,4	0.67	0	3,4,4	1.60	1 (33%)
3	GLY	G	702	-	4,4,4	0.75	0	3,4,4	1.15	0
2	FAD	C	701	-	53,58,58	0.63	0	68,89,89	0.92	3 (4%)
3	GLY	D	702	-	4,4,4	1.31	1 (25%)	3,4,4	0.65	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
4	OI9	A	703	-	-	5/22/67/67	0/3/3/3
4	OI9	C	703	-	-	6/22/67/67	0/3/3/3
4	OI9	D	703	-	-	8/22/67/67	0/3/3/3
2	FAD	D	701	-	-	2/30/50/50	0/6/6/6
4	OI9	F	703	-	-	6/22/67/67	0/3/3/3
2	FAD	E	701	-	-	2/30/50/50	0/6/6/6
4	OI9	H	703	-	-	4/22/67/67	0/3/3/3
3	GLY	H	702	-	-	0/2/2/2	-
2	FAD	B	701	-	-	1/30/50/50	0/6/6/6
2	FAD	G	701	-	-	3/30/50/50	0/6/6/6
2	FAD	A	701	-	-	2/30/50/50	0/6/6/6
4	OI9	E	703	-	-	3/22/67/67	0/3/3/3
4	OI9	B	703	-	-	5/22/67/67	0/3/3/3
3	GLY	F	702	-	-	0/2/2/2	-
2	FAD	F	701	-	-	1/30/50/50	0/6/6/6
3	GLY	E	702	-	-	0/2/2/2	-
4	OI9	G	703	-	-	10/22/67/67	0/3/3/3
3	GLY	B	702	-	-	0/2/2/2	-
2	FAD	H	701	-	-	2/30/50/50	0/6/6/6
3	GLY	A	702	-	-	0/2/2/2	-
3	GLY	C	702	-	-	0/2/2/2	-
3	GLY	G	702	-	-	0/2/2/2	-
2	FAD	C	701	-	-	3/30/50/50	0/6/6/6
3	GLY	D	702	-	-	0/2/2/2	-

All (81) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	703	OI9	C27-N13	9.09	1.55	1.46
4	E	703	OI9	C27-N13	8.81	1.55	1.46
4	B	703	OI9	C27-N13	8.43	1.55	1.46
4	H	703	OI9	C27-N13	8.31	1.54	1.46
4	D	703	OI9	C27-N13	7.64	1.54	1.46
4	F	703	OI9	C27-N13	7.11	1.53	1.46
4	C	703	OI9	C23-C28	-6.85	1.39	1.52
4	G	703	OI9	C23-C28	-6.30	1.40	1.52
4	D	703	OI9	C23-C28	-6.26	1.40	1.52
4	B	703	OI9	C23-C28	-6.15	1.40	1.52
4	A	703	OI9	C27-C24	6.14	1.58	1.52
4	C	703	OI9	C27-N13	6.07	1.52	1.46
4	H	703	OI9	C23-C28	-5.99	1.40	1.52
4	A	703	OI9	C23-C28	-5.81	1.41	1.52
4	F	703	OI9	C23-C28	-5.71	1.41	1.52
4	G	703	OI9	C27-N13	5.70	1.52	1.46
4	E	703	OI9	C23-C28	-5.62	1.41	1.52
4	A	703	OI9	C28-N13	5.33	1.43	1.33
4	E	703	OI9	C27-C24	5.23	1.57	1.52
4	E	703	OI9	C28-N13	5.19	1.42	1.33
4	H	703	OI9	C28-N13	5.00	1.42	1.33
4	F	703	OI9	C19-N09	4.91	1.49	1.43
4	D	703	OI9	C28-N13	4.87	1.42	1.33
4	F	703	OI9	C28-N13	4.69	1.41	1.33
4	B	703	OI9	C28-N13	4.57	1.41	1.33
4	B	703	OI9	C19-N09	4.49	1.48	1.43
4	C	703	OI9	O01-C19	-4.38	1.37	1.43
4	G	703	OI9	C27-C24	4.26	1.56	1.52
4	C	703	OI9	C28-N13	4.25	1.41	1.33
4	F	703	OI9	C27-C24	4.07	1.56	1.52
4	G	703	OI9	O02-C20	4.02	1.51	1.44
4	C	703	OI9	C27-C24	3.80	1.56	1.52
4	C	703	OI9	C24-C22	3.65	1.56	1.53
4	H	703	OI9	C19-N09	3.64	1.47	1.43
4	G	703	OI9	C28-N13	3.54	1.40	1.33
4	D	703	OI9	C19-N09	3.52	1.47	1.43
4	E	703	OI9	C19-N09	3.44	1.47	1.43
4	F	703	OI9	C33-C31	3.43	1.58	1.53
4	F	703	OI9	C18-C17	3.38	1.59	1.53
4	C	703	OI9	O02-C20	3.38	1.50	1.44
4	G	703	OI9	O01-C19	-3.34	1.39	1.43
4	D	703	OI9	C30-C31	3.22	1.58	1.53
4	H	703	OI9	C24-C22	3.09	1.55	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	703	OI9	C18-C17	3.06	1.59	1.53
4	G	703	OI9	C23-N12	-3.03	1.43	1.47
4	G	703	OI9	C30-C31	3.03	1.58	1.53
4	B	703	OI9	O02-C20	3.03	1.49	1.44
4	G	703	OI9	C20-C21	3.02	1.60	1.52
4	G	703	OI9	C24-C22	2.93	1.55	1.53
4	A	703	OI9	C19-N09	2.83	1.46	1.43
4	F	703	OI9	C29-N11	2.80	1.40	1.34
4	B	703	OI9	C19-C17	2.74	1.55	1.53
4	A	703	OI9	C18-C17	2.69	1.58	1.53
2	F	701	FAD	O2'-C2'	-2.66	1.37	1.43
4	H	703	OI9	O02-C20	2.59	1.48	1.44
4	E	703	OI9	O04-C24	2.56	1.48	1.43
4	C	703	OI9	C23-N12	-2.52	1.44	1.47
4	C	703	OI9	C19-N09	2.51	1.46	1.43
4	D	703	OI9	C30-C29	2.43	1.57	1.51
4	C	703	OI9	O08-C32	2.41	1.25	1.21
4	B	703	OI9	C29-N11	2.36	1.39	1.34
4	D	703	OI9	O08-C32	2.36	1.25	1.21
4	B	703	OI9	C27-C24	2.32	1.54	1.52
4	G	703	OI9	O03-C18	2.31	1.48	1.43
4	D	703	OI9	O02-C20	2.31	1.48	1.44
2	D	701	FAD	C1'-C2'	-2.27	1.49	1.52
4	G	703	OI9	O08-C32	2.27	1.25	1.21
2	B	701	FAD	O2'-C2'	-2.26	1.38	1.43
4	H	703	OI9	C27-C24	2.22	1.54	1.52
4	F	703	OI9	O02-C20	2.20	1.48	1.44
3	D	702	GLY	OXT-C	-2.19	1.23	1.30
4	E	703	OI9	C17-N11	2.15	1.49	1.45
4	G	703	OI9	C30-C29	2.14	1.56	1.51
4	E	703	OI9	C18-C17	2.13	1.57	1.53
2	A	701	FAD	C1'-C2'	-2.13	1.49	1.52
4	F	703	OI9	C30-C31	2.10	1.56	1.53
3	E	702	GLY	OXT-C	-2.08	1.23	1.30
4	C	703	OI9	O04-C24	2.07	1.47	1.43
4	G	703	OI9	C19-N09	2.07	1.45	1.43
4	C	703	OI9	C30-C31	2.06	1.56	1.53
2	B	701	FAD	C1'-C2'	-2.04	1.49	1.52

All (107) bond angle outliers are listed below:

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	E	703	OI9	C22-N10-C25	-6.31	106.51	112.56
4	A	703	OI9	C22-N10-C25	-6.25	106.57	112.56
4	C	703	OI9	O01-C19-C17	5.95	113.03	108.97
4	D	703	OI9	O01-C19-C17	5.77	112.91	108.97
4	E	703	OI9	O01-C19-C17	5.74	112.89	108.97
4	B	703	OI9	O02-C32-N15	5.71	119.46	110.58
4	C	703	OI9	C22-N10-C25	-5.65	107.14	112.56
4	D	703	OI9	C24-C27-N13	5.64	115.67	109.83
4	F	703	OI9	C24-C27-N13	5.63	115.66	109.83
4	D	703	OI9	C22-N10-C25	-5.57	107.22	112.56
4	H	703	OI9	C22-N10-C25	-5.42	107.37	112.56
4	B	703	OI9	C24-C27-N13	5.36	115.38	109.83
4	E	703	OI9	O02-C32-N15	5.34	118.88	110.58
4	G	703	OI9	O01-C19-C17	5.31	112.60	108.97
4	G	703	OI9	C24-C27-N13	5.27	115.29	109.83
4	G	703	OI9	C22-N10-C25	-5.22	107.56	112.56
4	A	703	OI9	O01-C19-C17	5.13	112.47	108.97
4	H	703	OI9	C24-C27-N13	5.10	115.12	109.83
4	H	703	OI9	O01-C19-C17	5.00	112.38	108.97
4	A	703	OI9	C24-C27-N13	4.96	114.97	109.83
4	A	703	OI9	O02-C32-N15	4.84	118.10	110.58
4	F	703	OI9	O02-C32-N15	4.82	118.08	110.58
4	C	703	OI9	C24-C27-N13	4.78	114.78	109.83
4	E	703	OI9	C24-C27-N13	4.69	114.69	109.83
4	F	703	OI9	C22-N10-C25	-4.52	108.23	112.56
4	A	703	OI9	C17-N11-C29	4.44	129.44	122.90
4	B	703	OI9	O01-C19-C17	4.42	111.98	108.97
4	B	703	OI9	C22-N10-C25	-4.38	108.36	112.56
4	H	703	OI9	O02-C32-N15	4.22	117.14	110.58
4	F	703	OI9	O01-C19-C17	3.89	111.62	108.97
4	G	703	OI9	C26-C21-C20	3.89	124.65	113.33
4	D	703	OI9	O02-C32-N15	3.87	116.59	110.58
4	A	703	OI9	O08-C32-N15	-3.79	119.26	125.51
4	G	703	OI9	O02-C32-N15	3.71	116.34	110.58
4	E	703	OI9	C17-N11-C29	3.67	128.31	122.90
4	B	703	OI9	O02-C32-O08	-3.65	120.00	123.69
4	E	703	OI9	O05-C26-C21	-3.65	98.78	111.29
4	H	703	OI9	C18-C17-N11	-3.54	103.93	110.62
4	E	703	OI9	C21-O01-C19	3.48	117.25	112.52
4	D	703	OI9	C30-C29-N11	3.43	120.82	116.33
4	D	703	OI9	C17-N11-C29	3.41	127.92	122.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	F	703	OI9	O02-C32-O08	-3.32	120.33	123.69
4	C	703	OI9	O02-C32-N15	3.26	115.64	110.58
4	G	703	OI9	C17-N11-C29	3.24	127.67	122.90
4	C	703	OI9	O01-C21-C26	-3.22	98.42	106.44
4	A	703	OI9	C21-O01-C19	3.20	116.86	112.52
4	A	703	OI9	C18-C17-N11	-3.08	104.79	110.62
4	C	703	OI9	C21-O01-C19	3.08	116.70	112.52
4	E	703	OI9	O08-C32-N15	-3.07	120.45	125.51
4	E	703	OI9	O02-C32-O08	-3.07	120.59	123.69
4	B	703	OI9	O08-C32-N15	-3.04	120.49	125.51
4	G	703	OI9	O02-C20-C21	3.04	114.31	108.22
4	A	703	OI9	O05-C26-C21	-3.03	100.90	111.29
4	F	703	OI9	O05-C26-C21	-3.02	100.93	111.29
4	H	703	OI9	O08-C32-N15	-3.02	120.54	125.51
2	E	701	FAD	O2A-PA-O1A	2.99	127.02	112.24
4	F	703	OI9	C17-N11-C29	2.96	127.25	122.90
4	C	703	OI9	C17-N11-C29	2.93	127.21	122.90
4	B	703	OI9	O05-C26-C21	-2.90	101.36	111.29
4	G	703	OI9	O04-C24-C22	2.86	116.36	109.77
4	G	703	OI9	O08-C32-N15	-2.82	120.86	125.51
4	E	703	OI9	C18-C17-N11	-2.76	105.41	110.62
4	F	703	OI9	C22-C23-N12	2.74	107.24	104.75
2	E	701	FAD	C4'-C3'-C2'	2.71	119.00	113.36
4	A	703	OI9	C30-C29-N11	2.70	119.87	116.33
4	H	703	OI9	O05-C26-C21	-2.70	102.04	111.29
4	D	703	OI9	O08-C32-N15	-2.69	121.07	125.51
2	D	701	FAD	O2A-PA-O1A	2.68	125.48	112.24
2	C	701	FAD	O2P-P-O1P	2.67	125.46	112.24
2	D	701	FAD	O2P-P-O1P	2.60	125.10	112.24
2	F	701	FAD	C4'-C3'-C2'	2.59	118.76	113.36
2	H	701	FAD	O2P-P-O1P	2.55	124.86	112.24
4	A	703	OI9	C19-N09-C25	2.55	127.59	123.30
4	C	703	OI9	O04-C24-C22	2.55	115.63	109.77
4	B	703	OI9	C22-C23-N12	2.54	107.06	104.75
4	E	703	OI9	C19-N09-C25	2.52	127.54	123.30
2	C	701	FAD	C5A-C6A-N6A	2.51	124.16	120.35
4	F	703	OI9	O08-C32-N15	-2.50	121.39	125.51
2	B	701	FAD	C4'-C3'-C2'	2.49	118.54	113.36
4	C	703	OI9	O08-C32-N15	-2.49	121.41	125.51
4	F	703	OI9	C21-O01-C19	2.49	115.89	112.52
2	F	701	FAD	O2A-PA-O1A	2.48	124.50	112.24
2	A	701	FAD	O2A-PA-O1A	2.48	124.49	112.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	701	FAD	C4'-C3'-C2'	2.42	118.41	113.36
4	B	703	OI9	C17-N11-C29	2.39	126.42	122.90
2	H	701	FAD	O2A-PA-O1A	2.35	123.87	112.24
4	F	703	OI9	C19-C17-N11	2.34	113.98	111.12
4	F	703	OI9	C33-C31-N14	2.34	115.83	109.03
2	G	701	FAD	O2P-P-O1P	2.31	123.67	112.24
2	G	701	FAD	C4-N3-C2	-2.31	121.37	125.64
2	G	701	FAD	C5A-C6A-N6A	2.27	123.81	120.35
2	C	701	FAD	C4-N3-C2	-2.26	121.46	125.64
4	G	703	OI9	C19-C17-N11	-2.25	108.37	111.12
2	B	701	FAD	O2A-PA-O1A	2.25	123.35	112.24
4	D	703	OI9	O05-C26-C21	-2.17	103.86	111.29
4	E	703	OI9	C22-C23-N12	-2.15	102.79	104.75
3	C	702	GLY	OXT-C-CA	2.11	121.86	113.45
2	G	701	FAD	O4-C4-C4X	-2.09	121.05	126.60
2	H	701	FAD	C5A-C6A-N6A	2.09	123.53	120.35
2	A	701	FAD	C5A-C6A-N6A	2.08	123.51	120.35
2	D	701	FAD	C5A-C6A-N6A	2.07	123.50	120.35
4	E	703	OI9	O04-C24-C27	2.07	113.65	109.61
2	G	701	FAD	O2A-PA-O1A	2.06	122.42	112.24
4	D	703	OI9	O07-C29-N11	-2.03	119.53	122.95
4	C	703	OI9	C34-C33-C31	-2.03	106.83	115.59
2	D	701	FAD	C1'-C2'-C3'	-2.01	104.17	109.79
4	D	703	OI9	C22-C23-C28	-2.00	109.17	116.61

There are no chirality outliers.

All (63) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	703	OI9	C29-C30-C31-N14
4	D	703	OI9	C18-C20-O02-C32
4	D	703	OI9	C21-C20-O02-C32
4	D	703	OI9	C29-C30-C31-C33
4	D	703	OI9	C29-C30-C31-N14
4	D	703	OI9	C30-C31-C33-C34
4	D	703	OI9	N14-C31-C33-C34
4	F	703	OI9	C30-C31-C33-C34
4	F	703	OI9	N14-C31-C33-C34
4	G	703	OI9	C29-C30-C31-C33
4	G	703	OI9	C29-C30-C31-N14
4	C	703	OI9	C30-C29-N11-C17
4	D	703	OI9	C30-C29-N11-C17

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Mol	Chain	Res	Type	Atoms
4	G	703	OI9	C30-C29-N11-C17
4	G	703	OI9	C20-C21-C26-O05
4	A	703	OI9	C30-C29-N11-C17
4	B	703	OI9	C30-C29-N11-C17
4	E	703	OI9	C30-C29-N11-C17
4	F	703	OI9	C30-C29-N11-C17
4	H	703	OI9	C30-C29-N11-C17
4	A	703	OI9	O07-C29-N11-C17
4	B	703	OI9	O07-C29-N11-C17
4	C	703	OI9	O07-C29-N11-C17
4	D	703	OI9	O07-C29-N11-C17
4	E	703	OI9	O07-C29-N11-C17
4	F	703	OI9	O07-C29-N11-C17
4	G	703	OI9	O07-C29-N11-C17
4	H	703	OI9	O07-C29-N11-C17
4	C	703	OI9	O01-C21-C26-O05
4	G	703	OI9	O01-C21-C26-O05
4	C	703	OI9	C20-C21-C26-O05
4	G	703	OI9	C31-C33-C34-C35
2	C	701	FAD	O4B-C4B-C5B-O5B
4	E	703	OI9	C33-C34-C35-N16
2	D	701	FAD	C2'-C1'-N10-C10
2	H	701	FAD	C2'-C1'-N10-C10
2	A	701	FAD	O4B-C4B-C5B-O5B
2	E	701	FAD	O4B-C4B-C5B-O5B
4	H	703	OI9	C33-C34-C35-N16
2	G	701	FAD	O4B-C4B-C5B-O5B
4	B	703	OI9	C33-C34-C35-N16
4	F	703	OI9	C33-C34-C35-N16
4	A	703	OI9	C31-C33-C34-C35
4	B	703	OI9	C18-C20-O02-C32
4	C	703	OI9	C18-C20-O02-C32
4	F	703	OI9	C18-C20-O02-C32
4	G	703	OI9	C18-C20-O02-C32
4	G	703	OI9	C21-C20-O02-C32
4	H	703	OI9	C18-C20-O02-C32
4	A	703	OI9	C29-C30-C31-C33
2	D	701	FAD	O4B-C4B-C5B-O5B
2	B	701	FAD	O4B-C4B-C5B-O5B
2	F	701	FAD	O4B-C4B-C5B-O5B
2	C	701	FAD	C2'-C1'-N10-C10
2	G	701	FAD	C2'-C1'-N10-C10

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Mol	Chain	Res	Type	Atoms
2	H	701	FAD	O4B-C4B-C5B-O5B
2	G	701	FAD	O4'-C4'-C5'-O5'
4	B	703	OI9	O07-C29-C30-C31
4	G	703	OI9	C33-C34-C35-N16
4	C	703	OI9	C29-C30-C31-N14
2	A	701	FAD	C3B-C4B-C5B-O5B
2	C	701	FAD	C3B-C4B-C5B-O5B
2	E	701	FAD	C3B-C4B-C5B-O5B

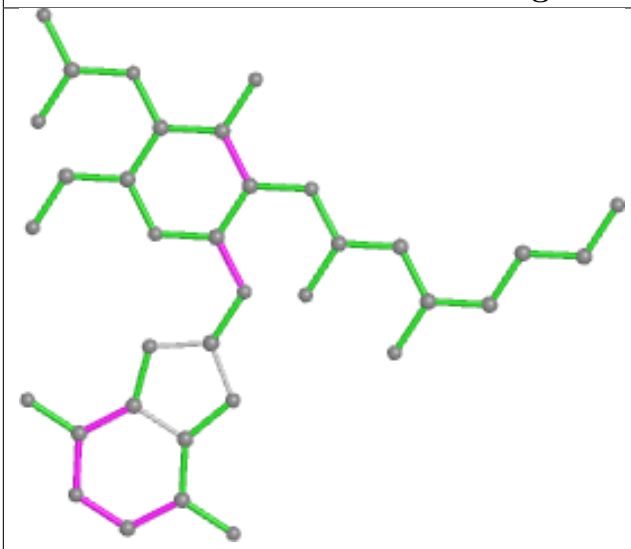
There are no ring outliers.

8 monomers are involved in 12 short contacts:

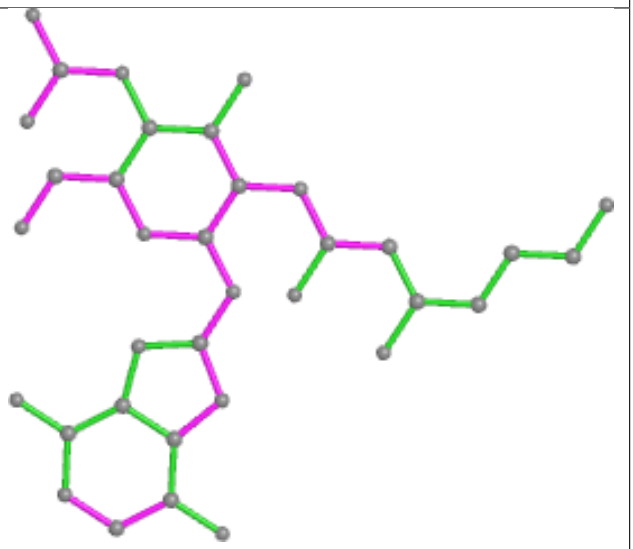
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	D	701	FAD	2	0
2	E	701	FAD	1	0
2	B	701	FAD	2	0
2	G	701	FAD	1	0
2	A	701	FAD	1	0
2	F	701	FAD	2	0
2	H	701	FAD	1	0
2	C	701	FAD	2	0

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.

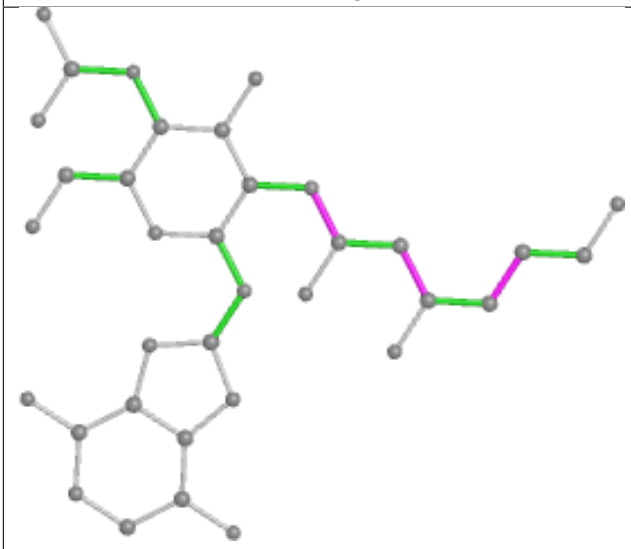
Ligand OI9 A 703



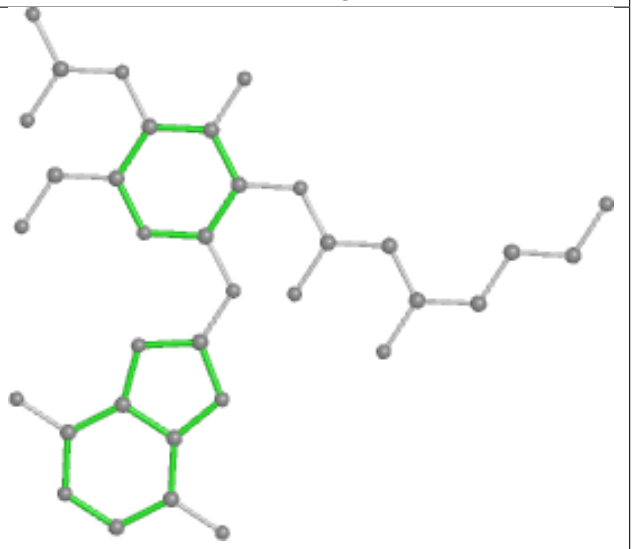
Bond lengths



Bond angles

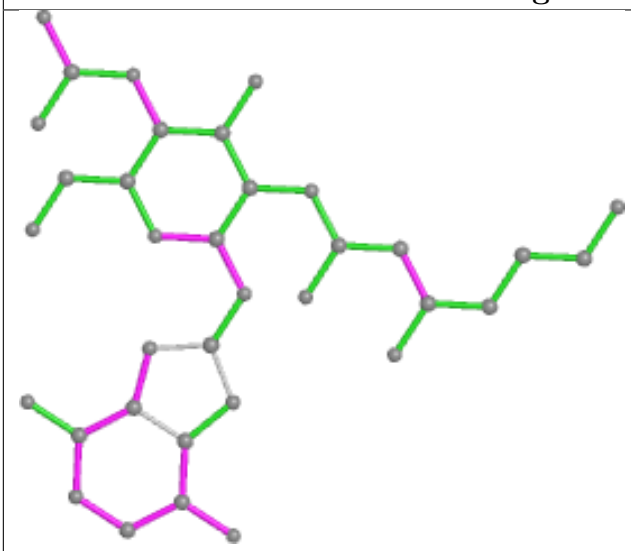


Torsions



Rings

Ligand OI9 C 703



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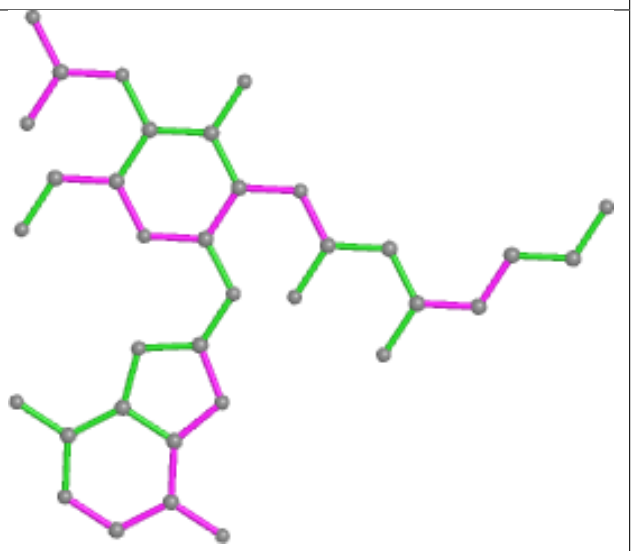

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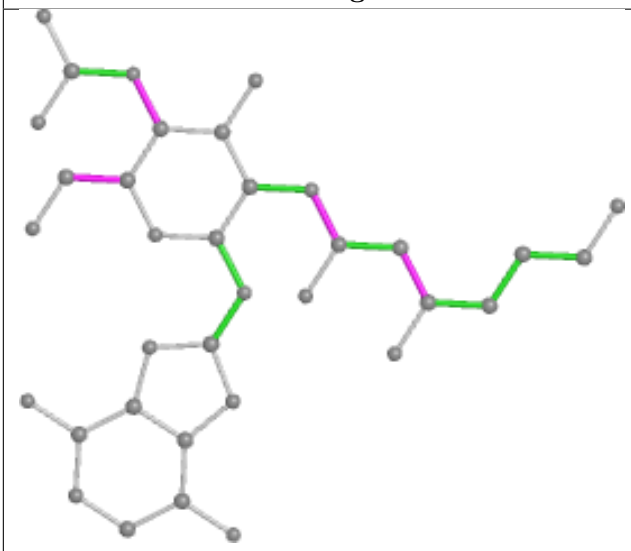

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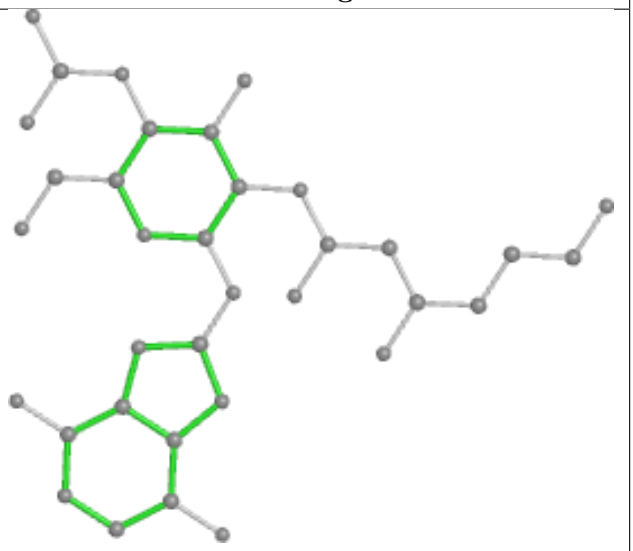
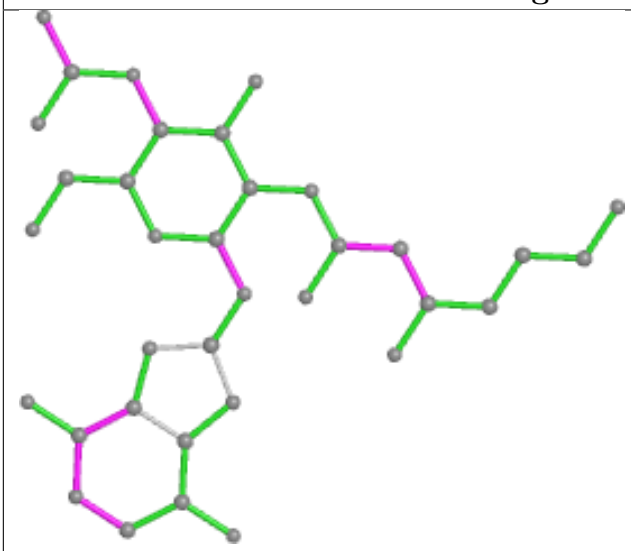


Rings

Ligand OI9 D 703



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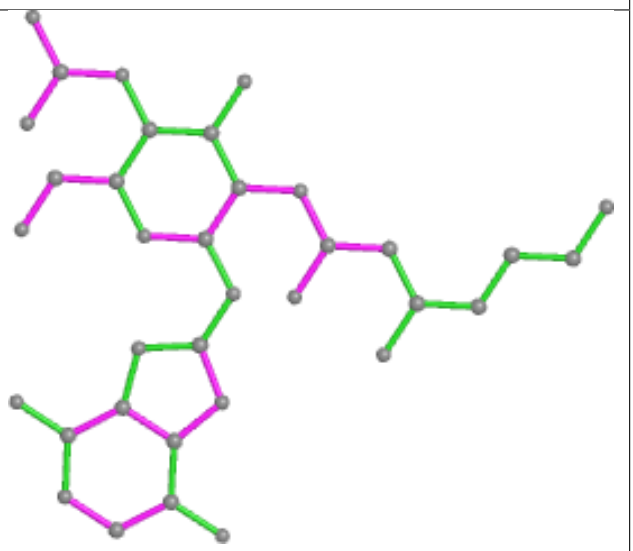

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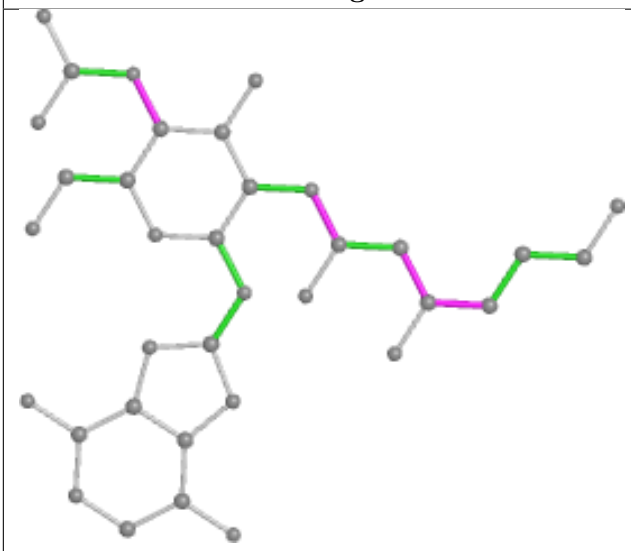

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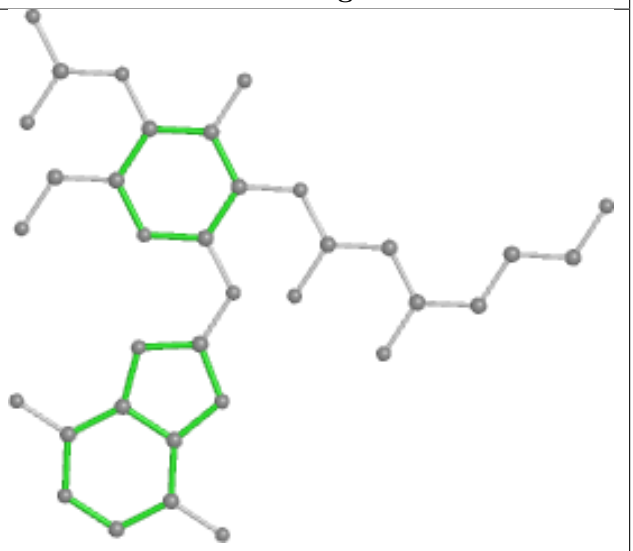
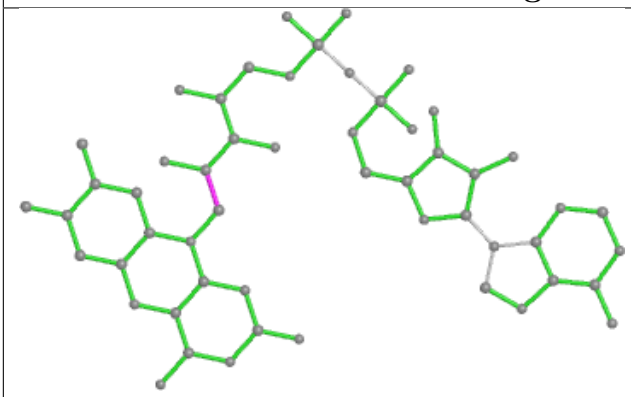


Rings

Ligand FAD D 701



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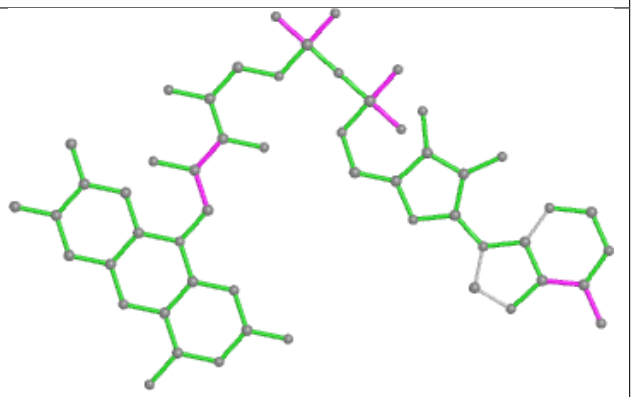

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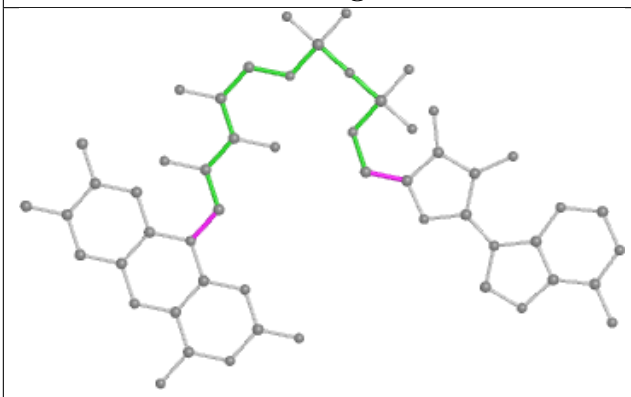

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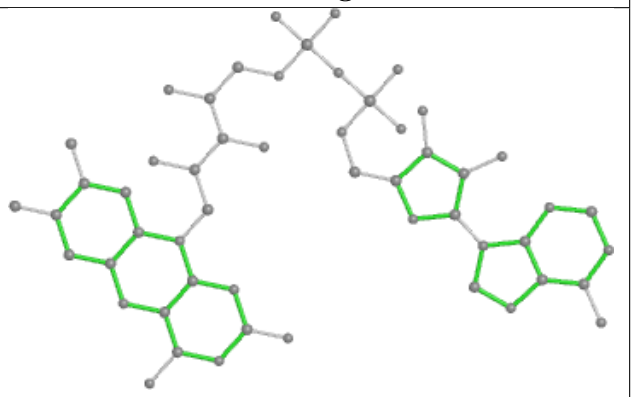
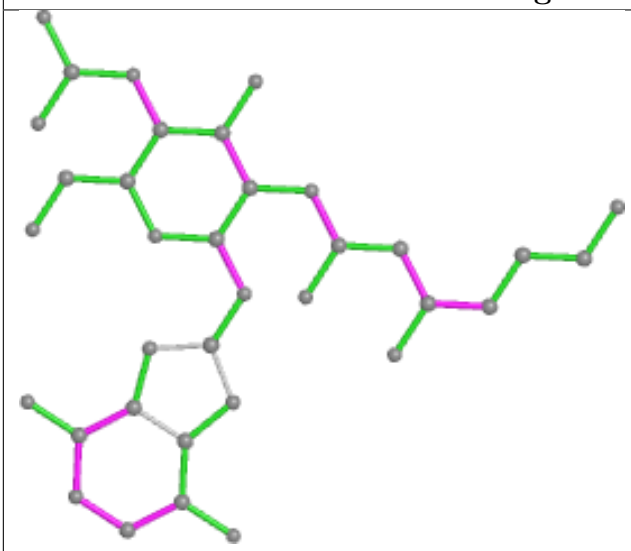


Rings

Ligand OI9 F 703



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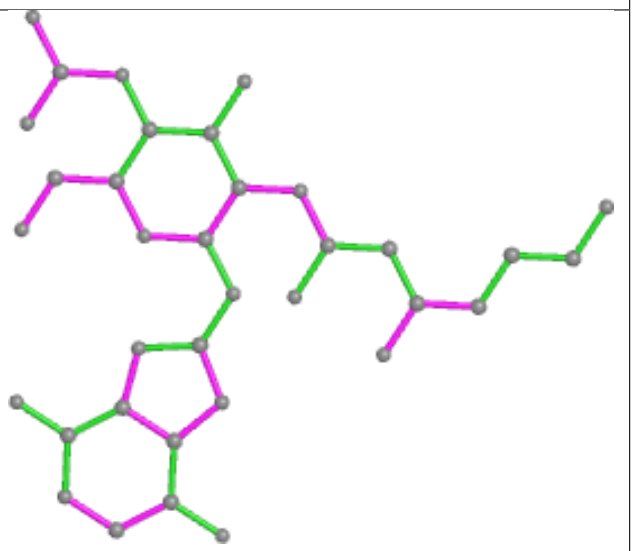

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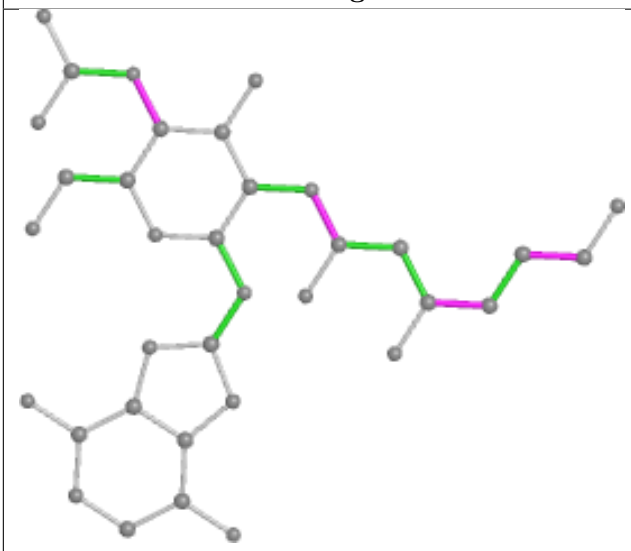

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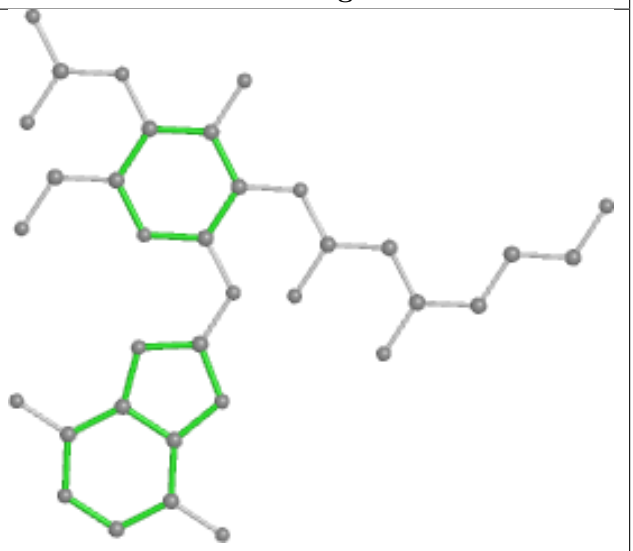
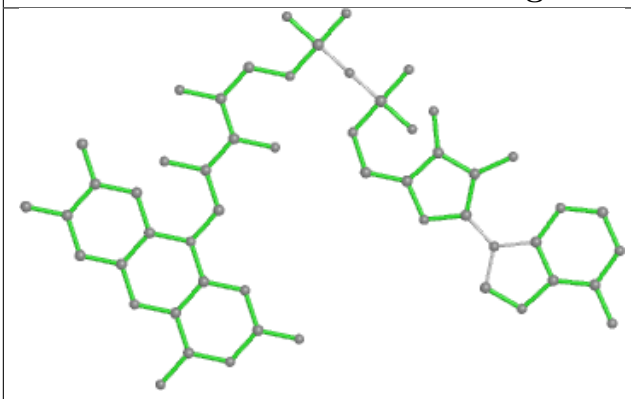


Rings

Ligand FAD E 701



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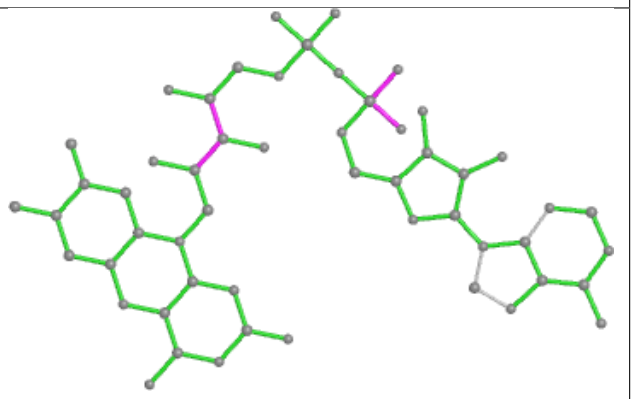

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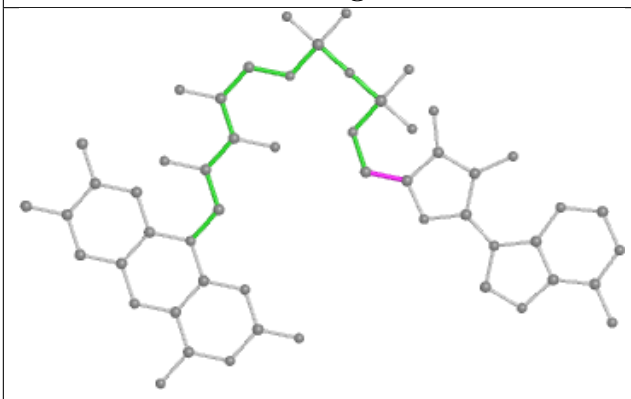

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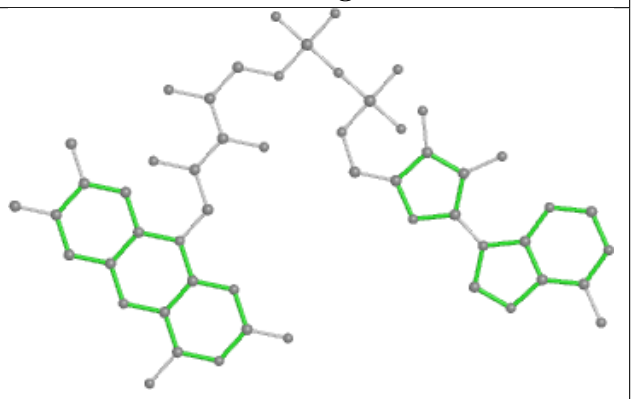
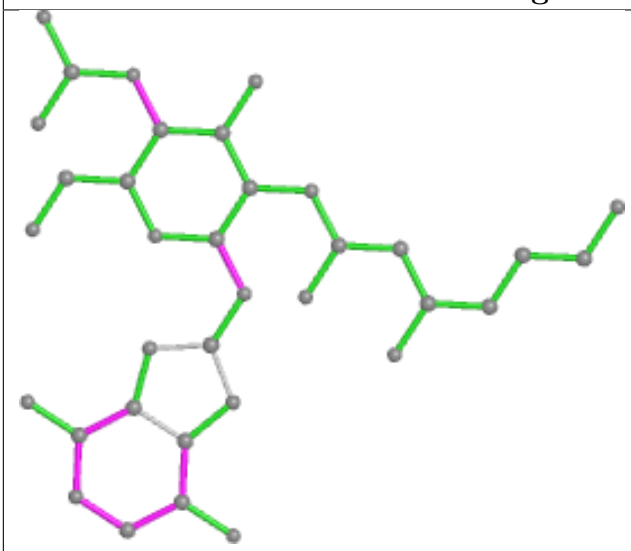


Rings

Ligand OI9 H 703



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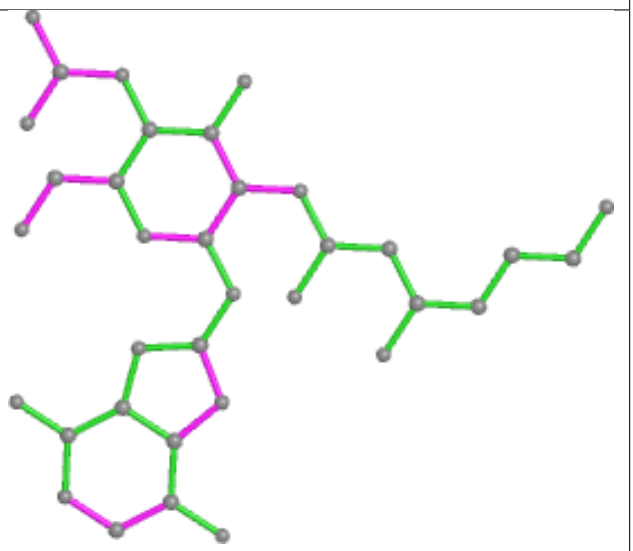

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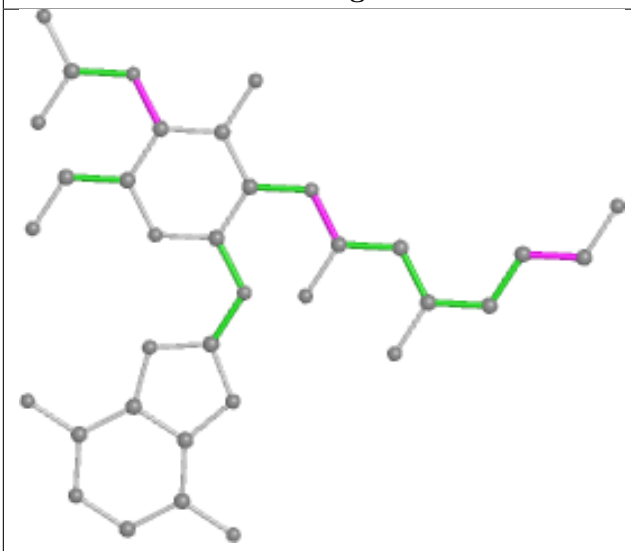

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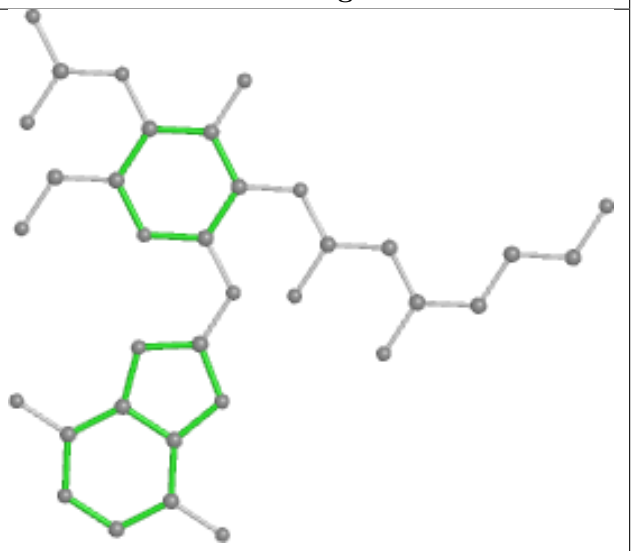
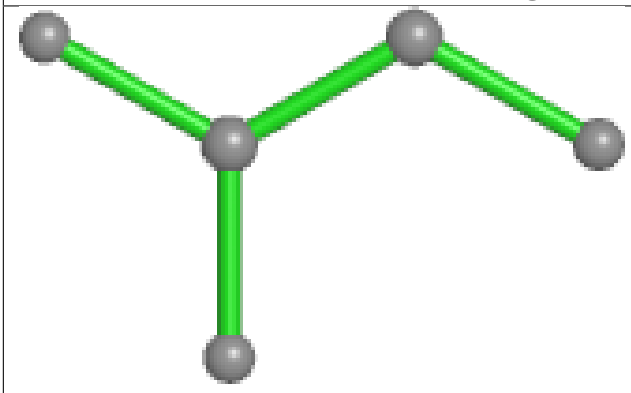


Rings

Ligand GLY H 702



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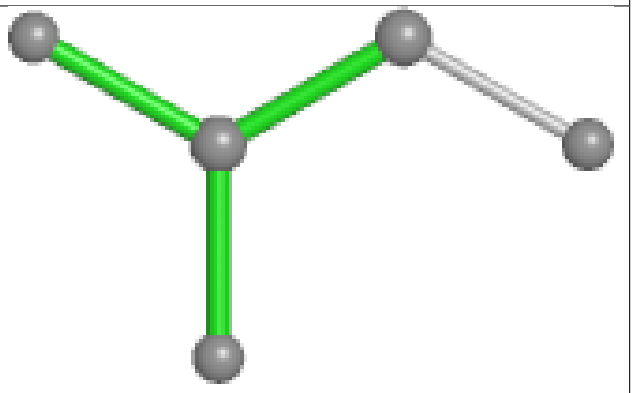

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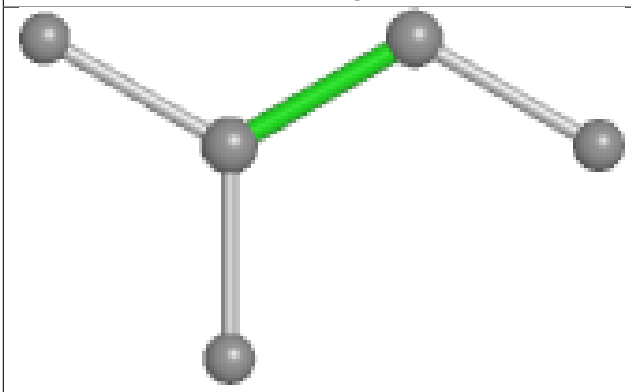

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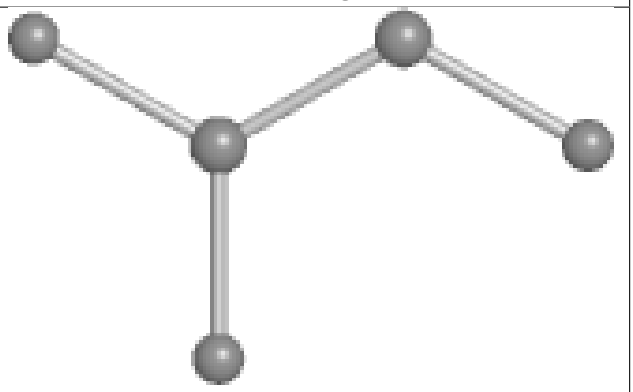
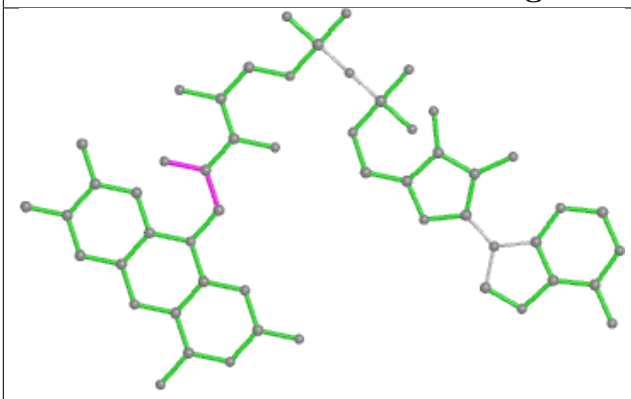


Rings

Ligand FAD B 701



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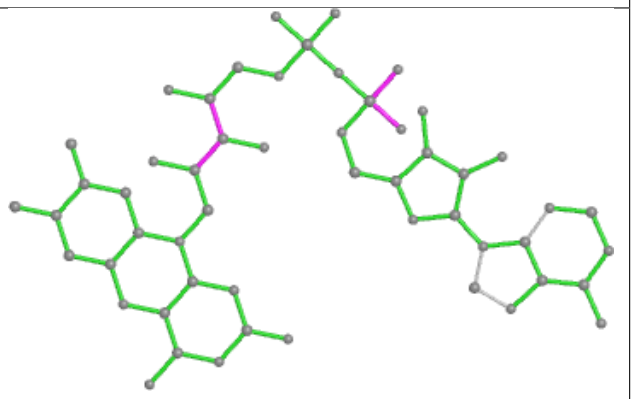

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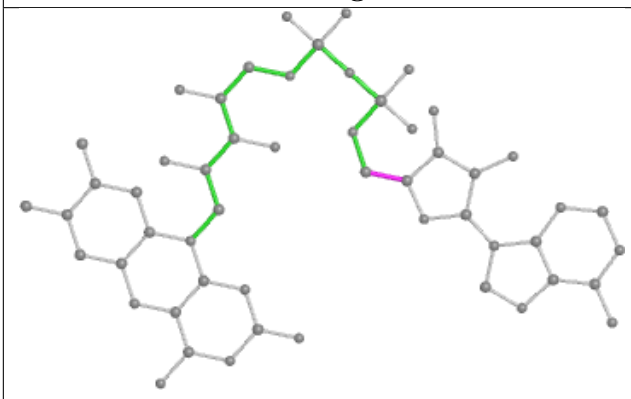

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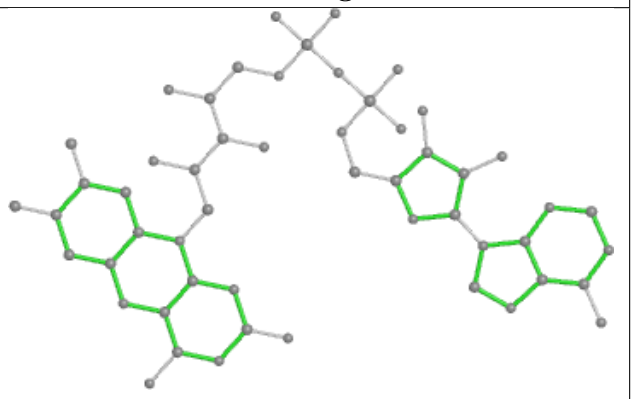
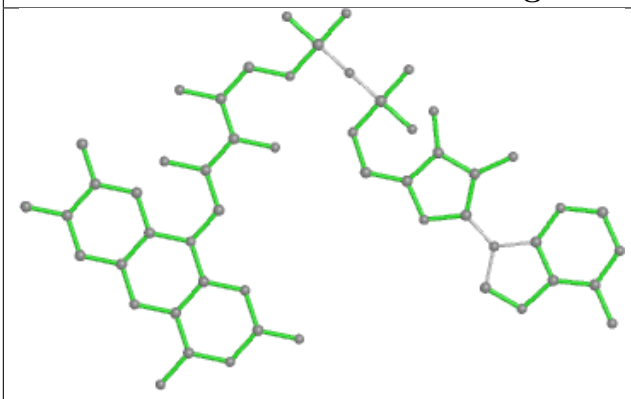


Rings

Ligand FAD G 701



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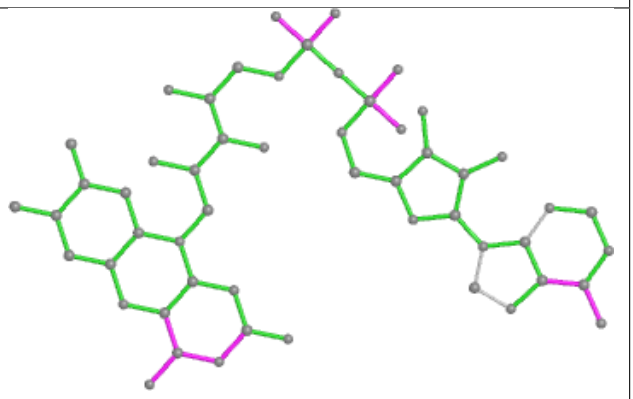

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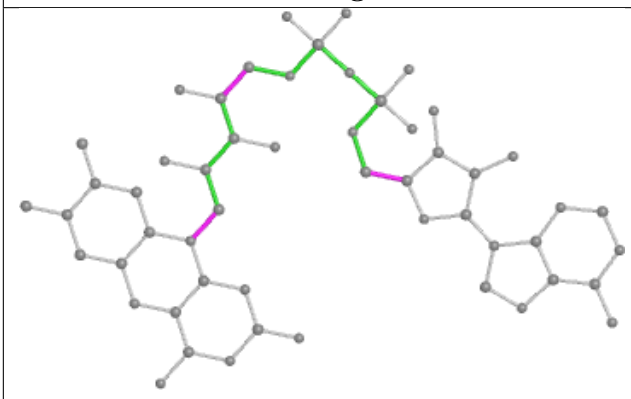

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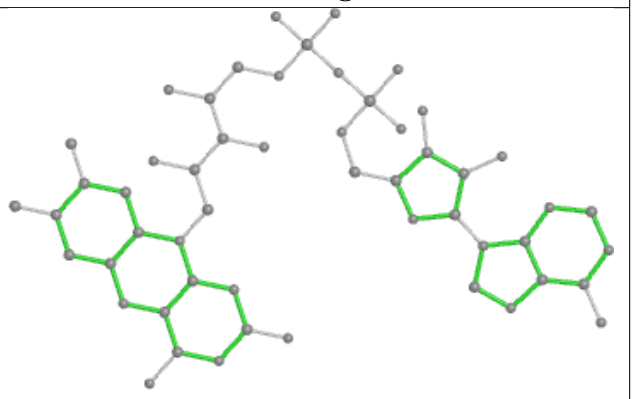
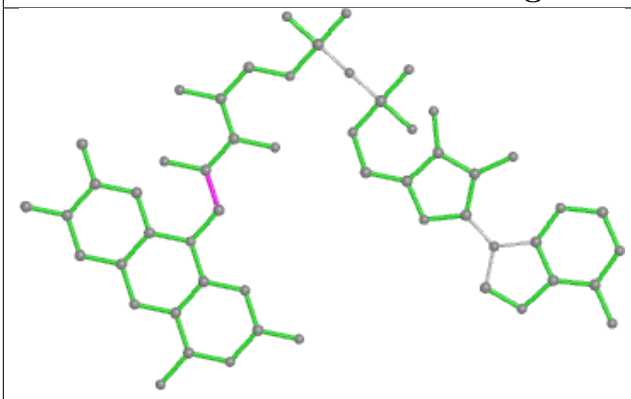


Rings

Ligand FAD A 701



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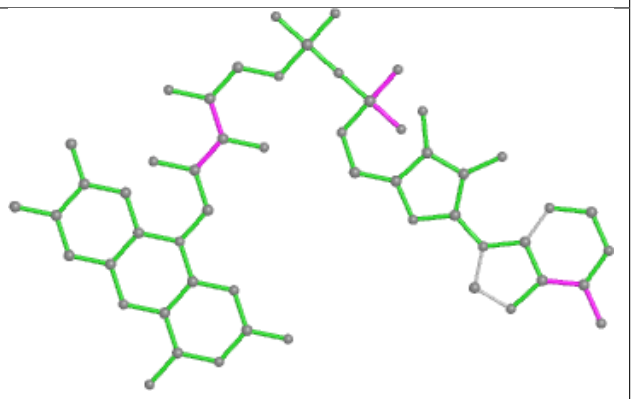

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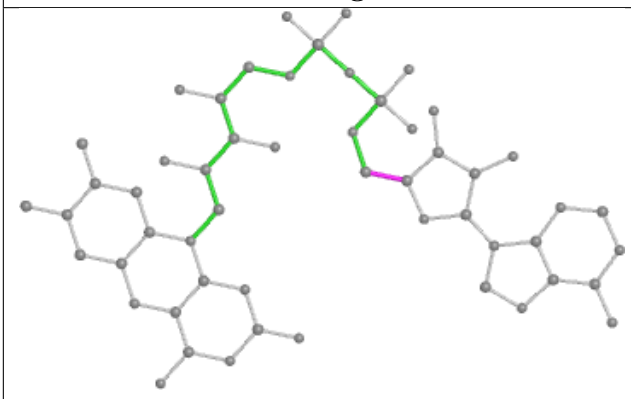

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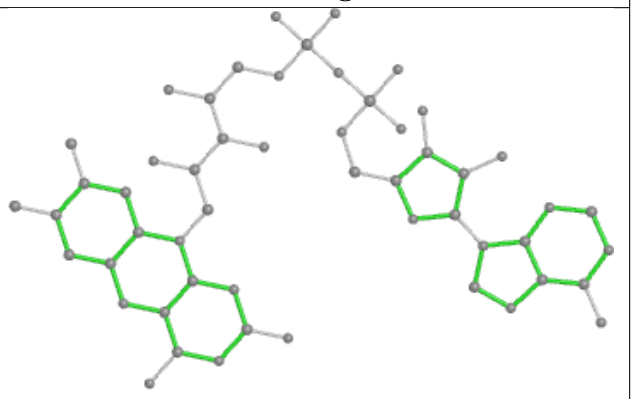
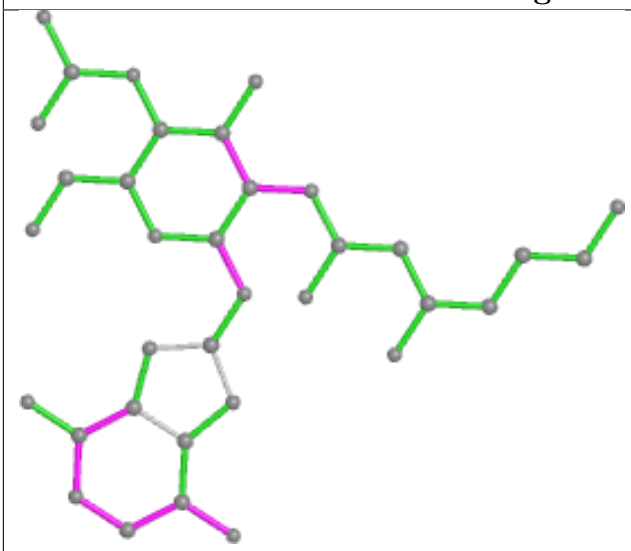


Rings

Ligand OI9 E 703



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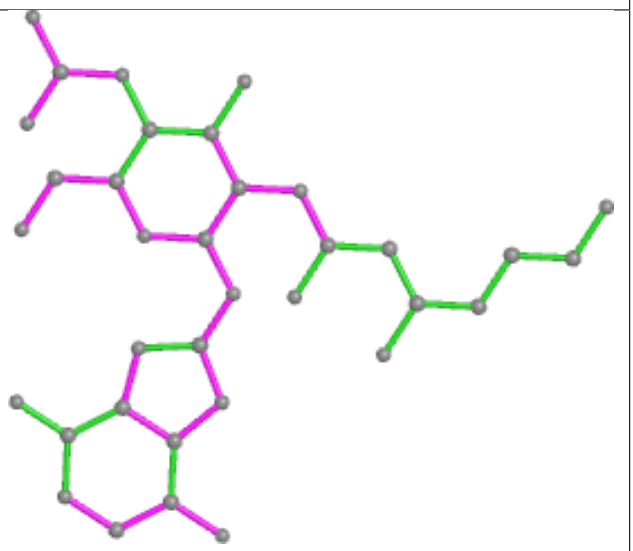
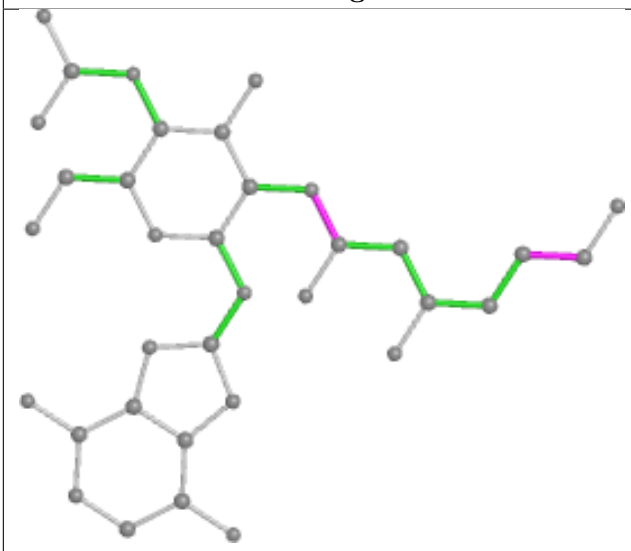


Bond angles



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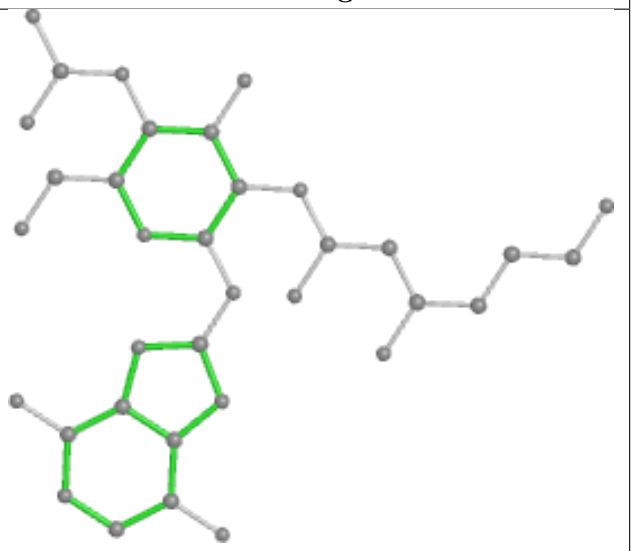
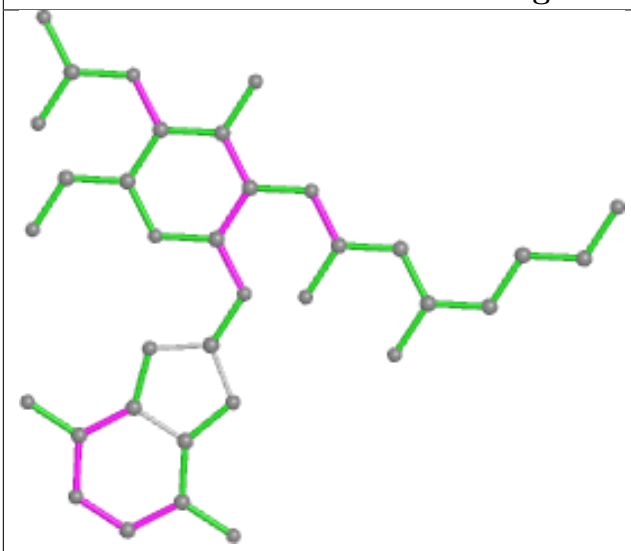


Rings

Ligand OI9 B 703



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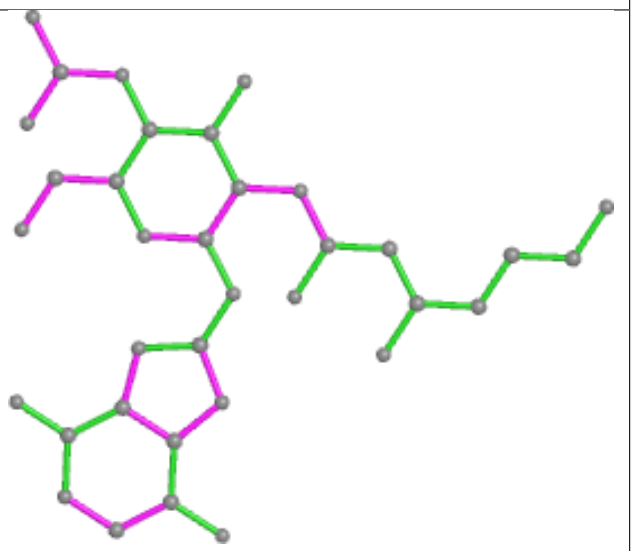

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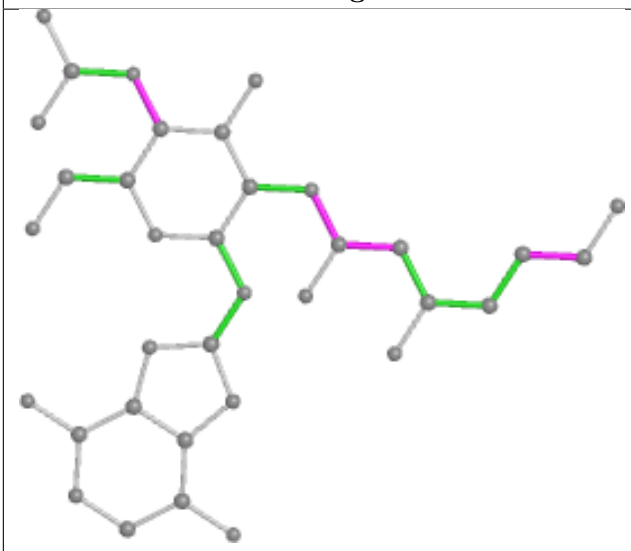

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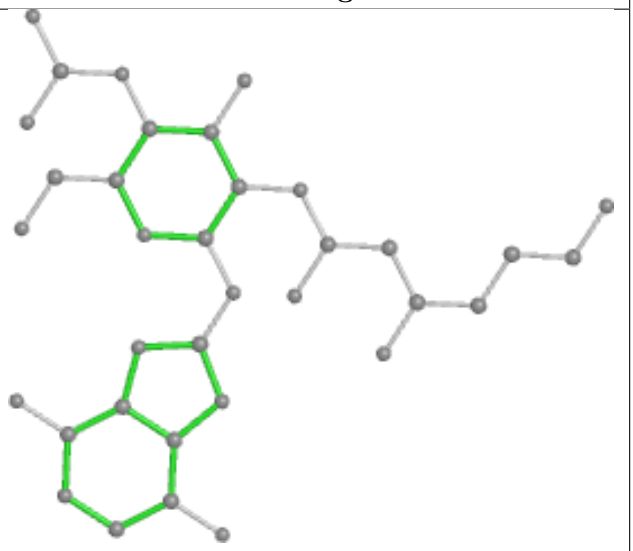
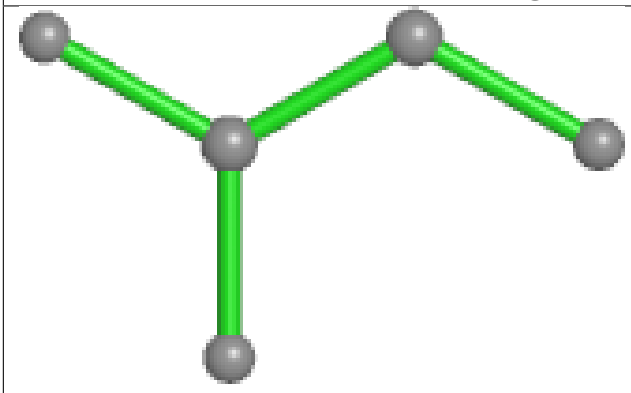


Rings

Ligand GLY F 702



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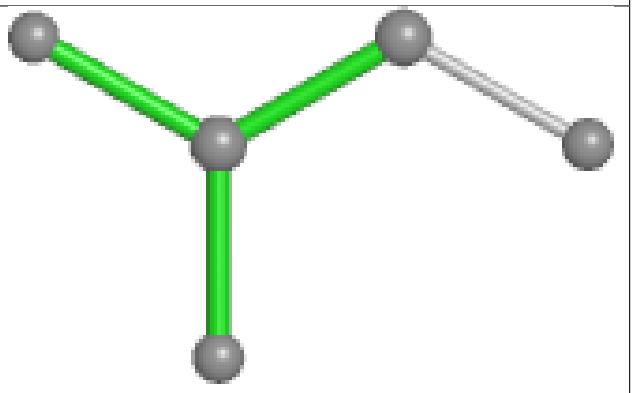

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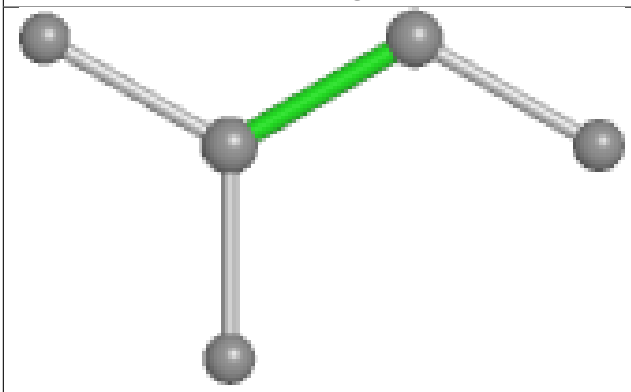

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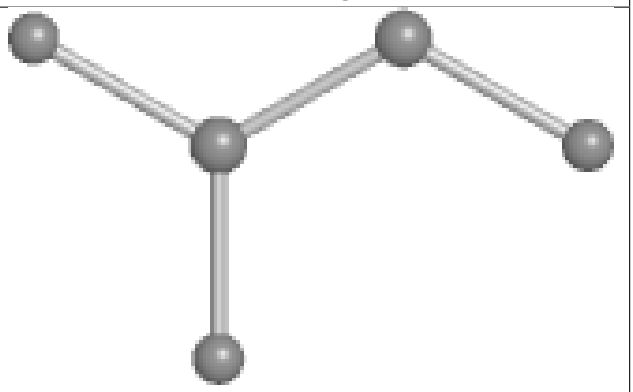
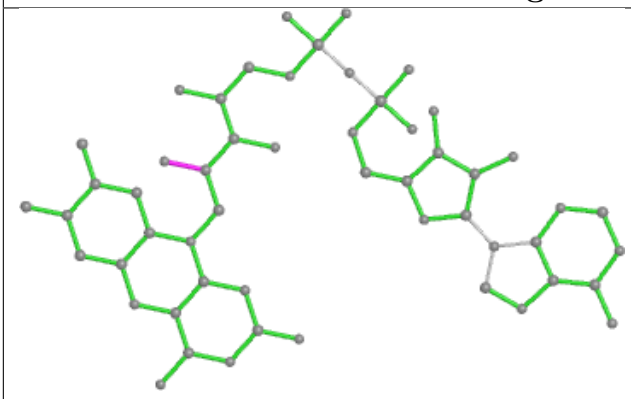
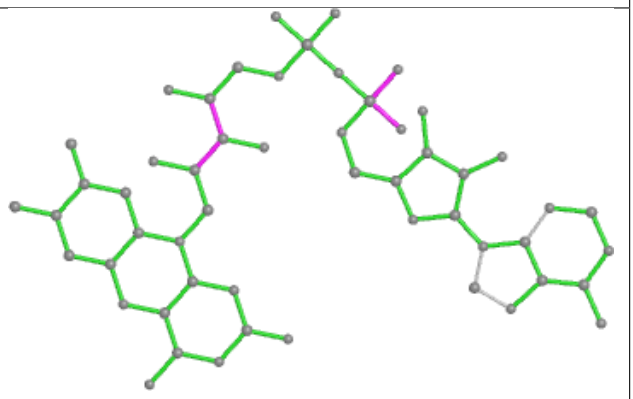


Rings

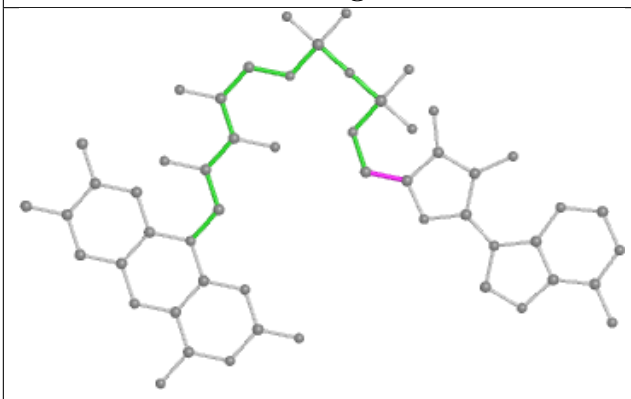
Ligand FAD F 701



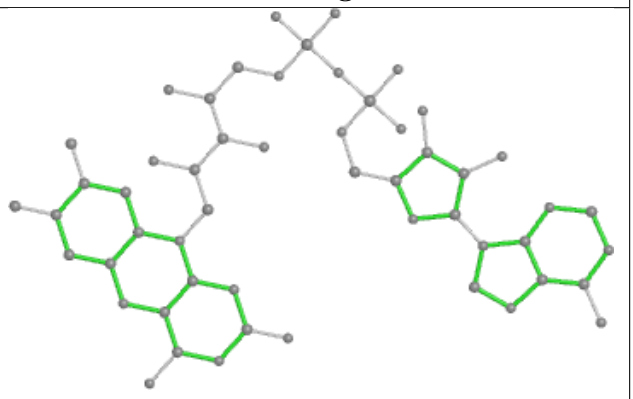
Bond lengths



Bond angles

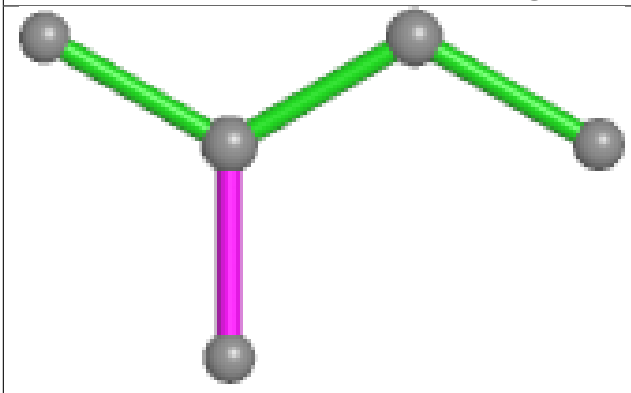


Torsions



Rings

Ligand GLY E 702



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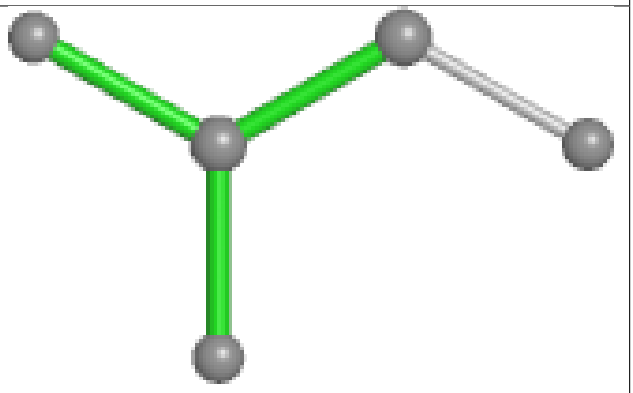
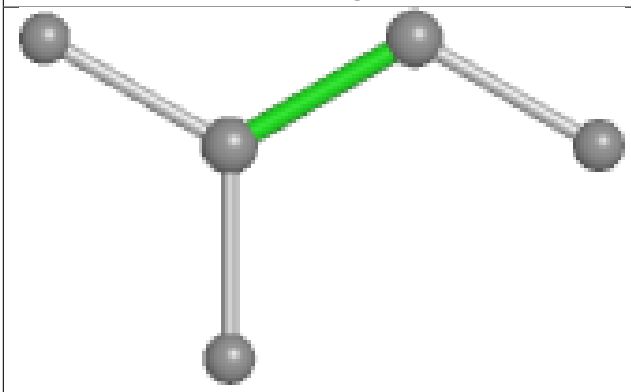
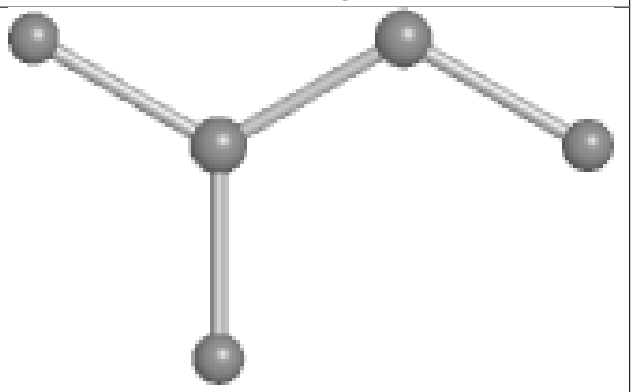


Bond angles

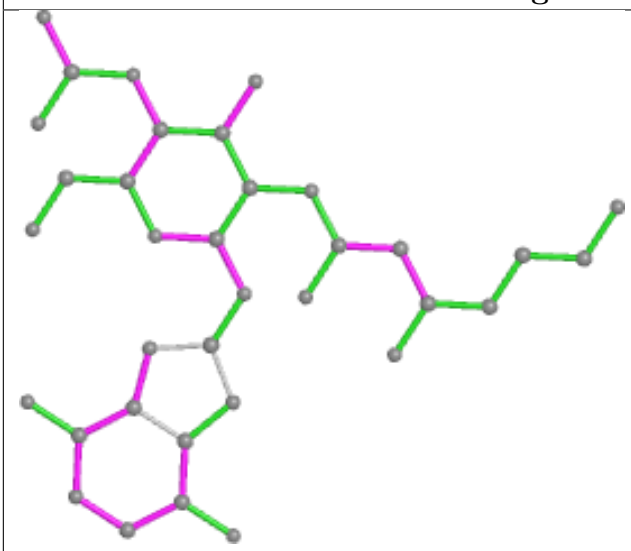


Torsions



Rings

Ligand OI9 G 703



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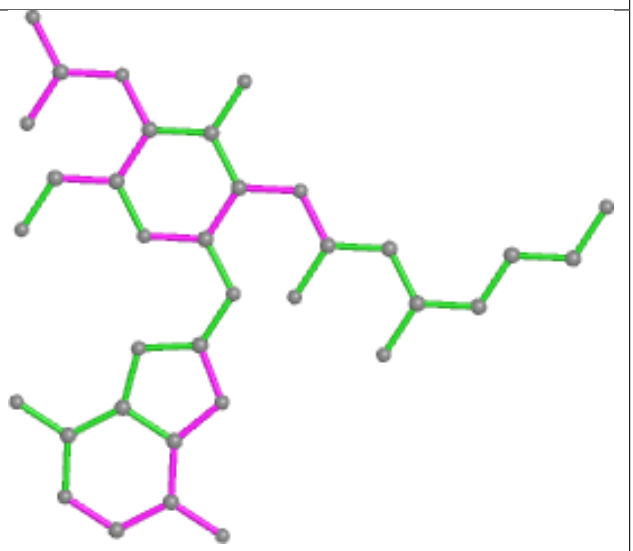
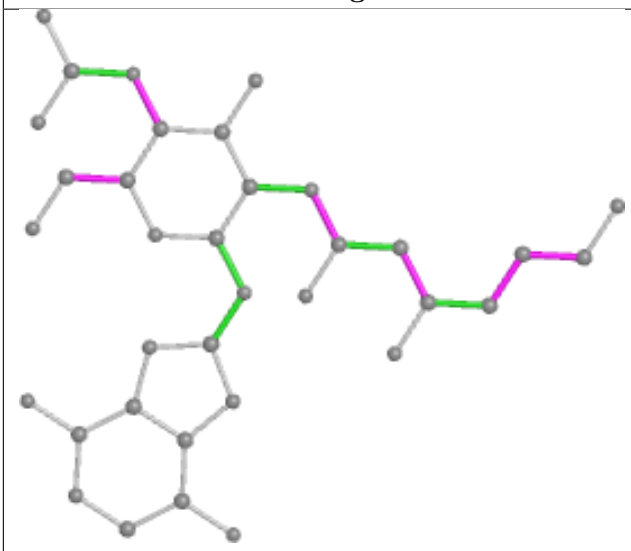
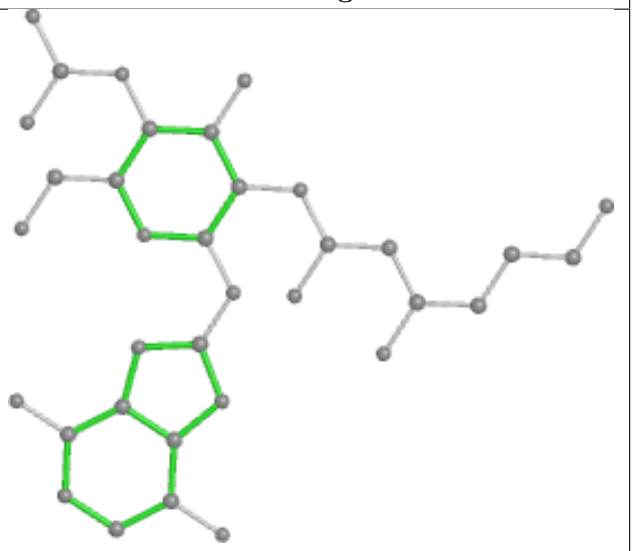


Bond angles

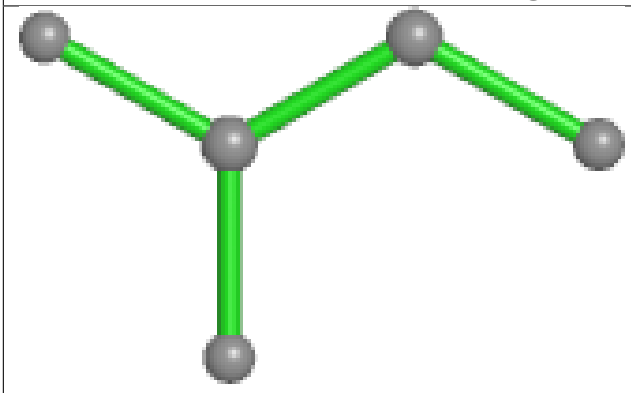


Torsions

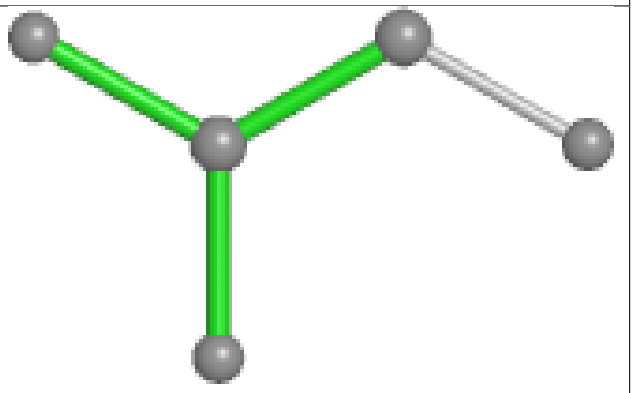


Rings

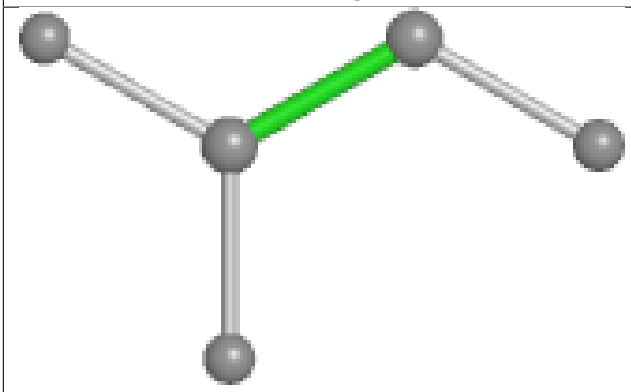
Ligand GLY B 702



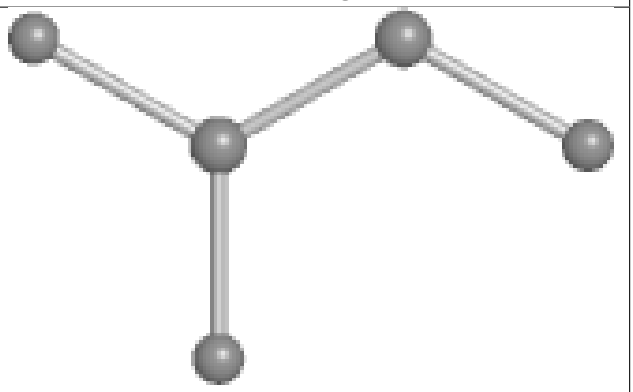
Bond lengths



Bond angles

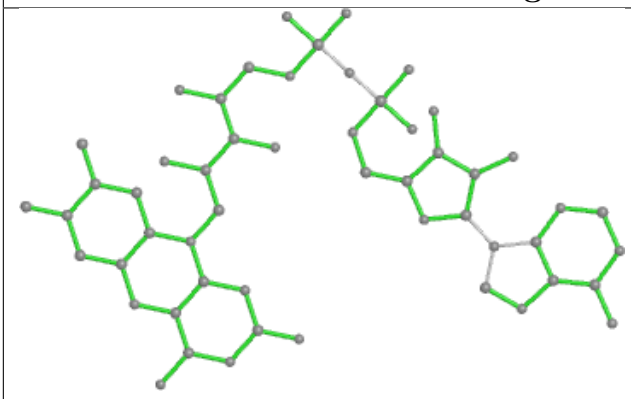


Torsions

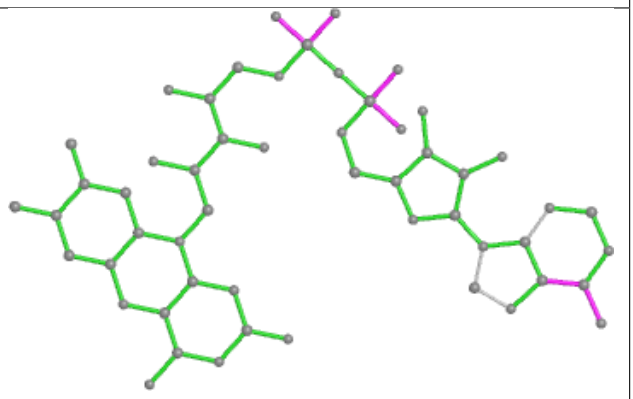


Rings

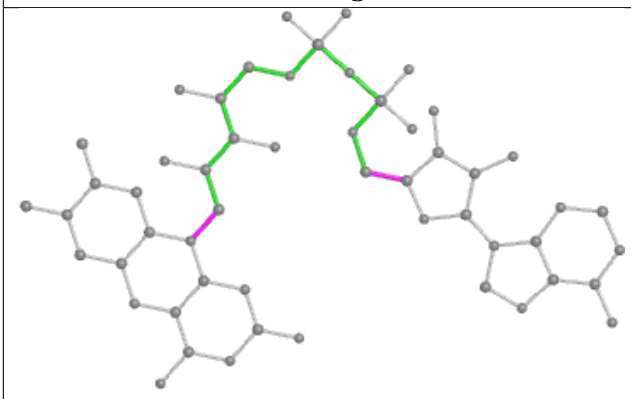
Ligand FAD H 701



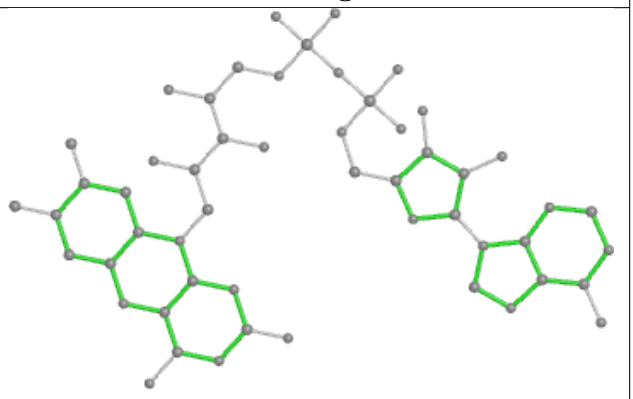
Bond lengths



Bond angles

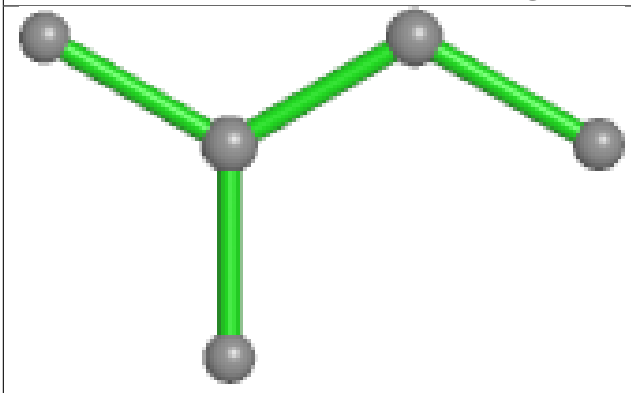


Torsions

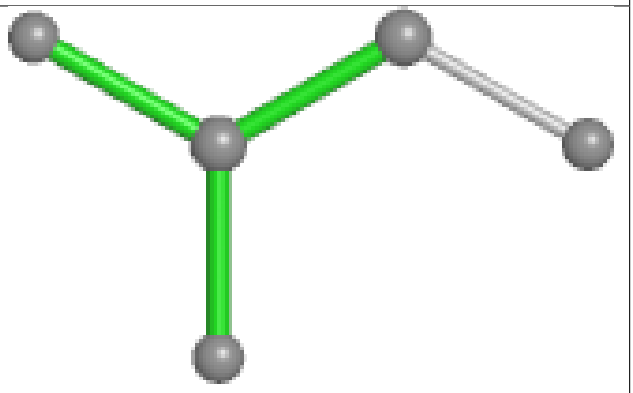


Rings

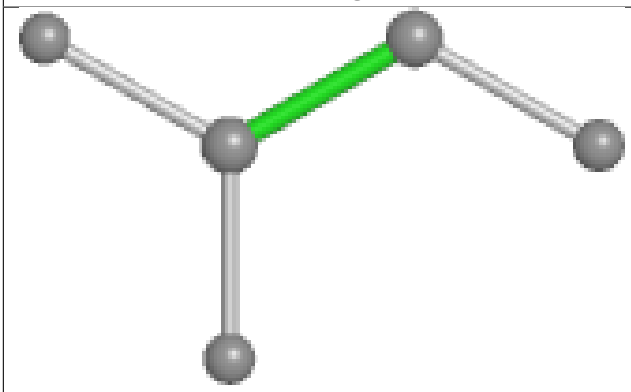
Ligand GLY A 702



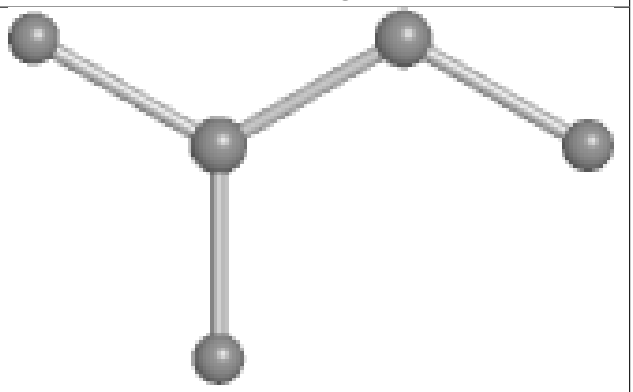
Bond lengths



Bond angles

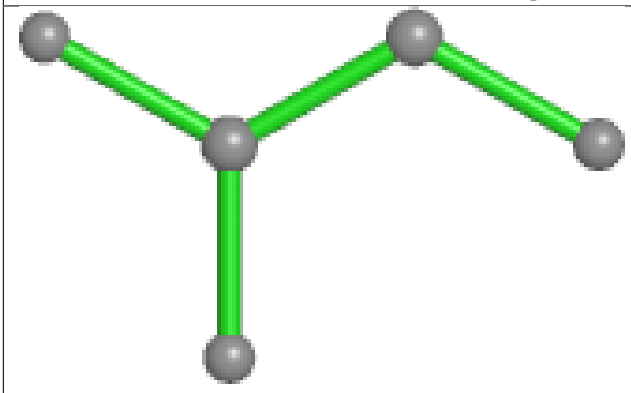


Torsions



Rings

Ligand GLY C 702



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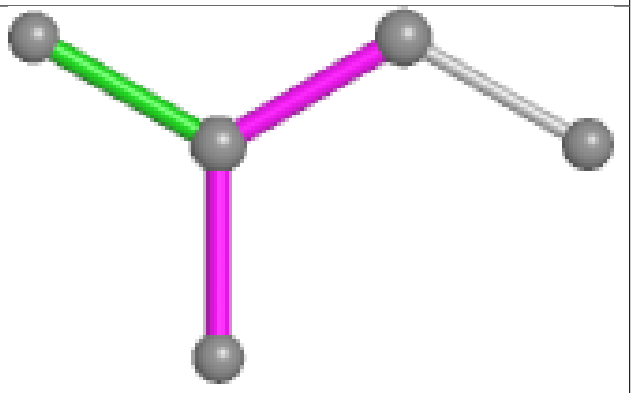
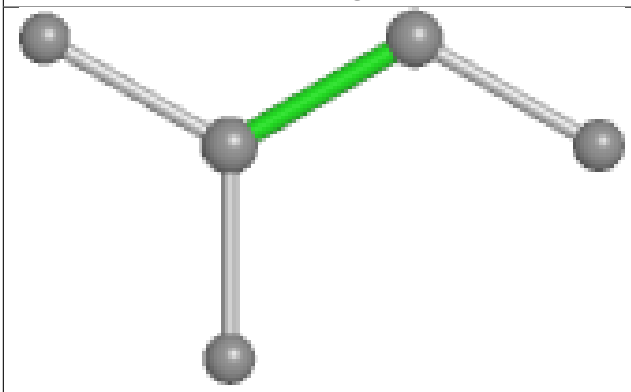
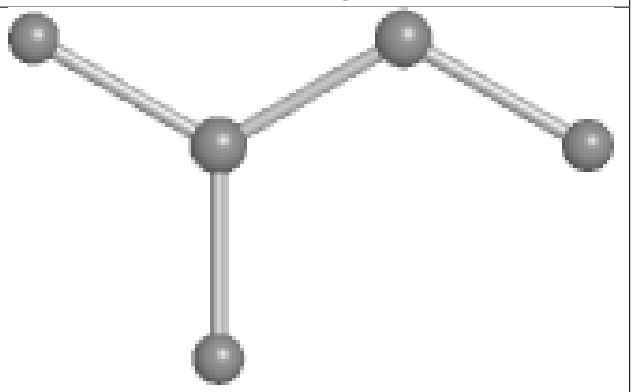


Bond angles

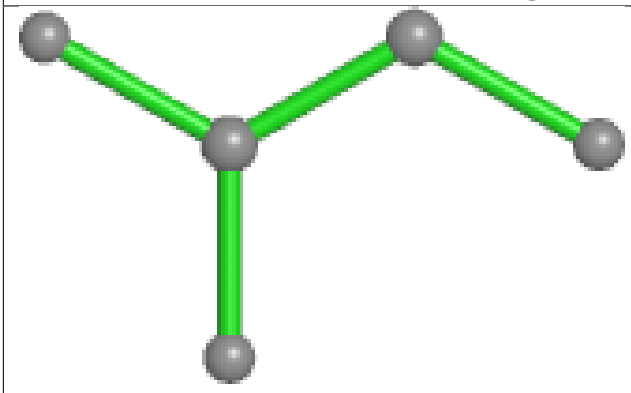


Torsions

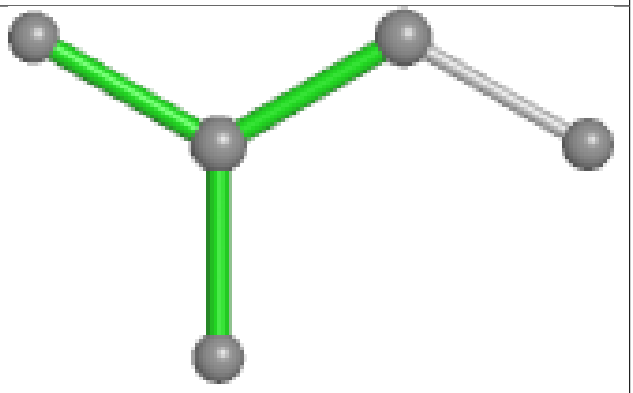


Rings

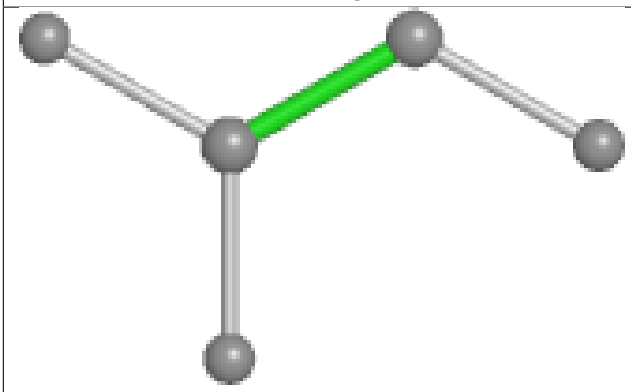
Ligand GLY G 702



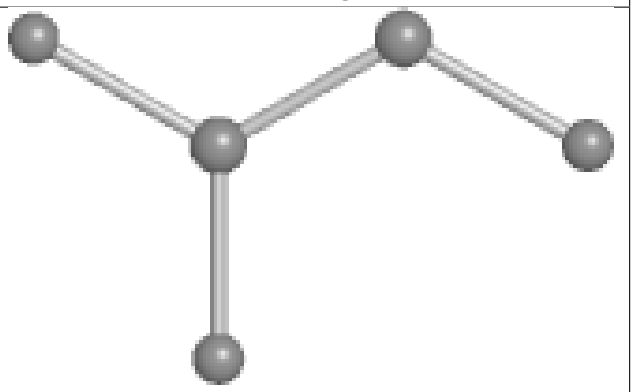
Bond lengths



Bond angles

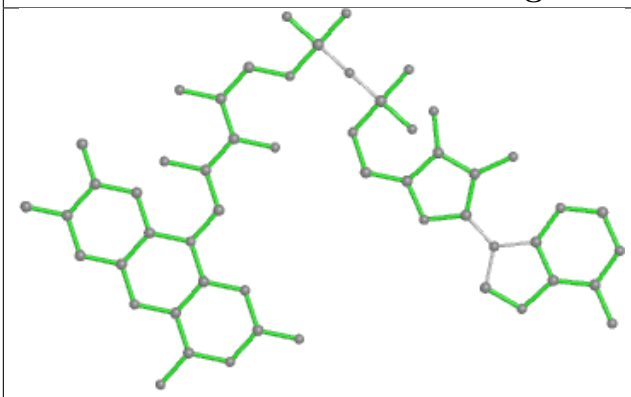


Torsions

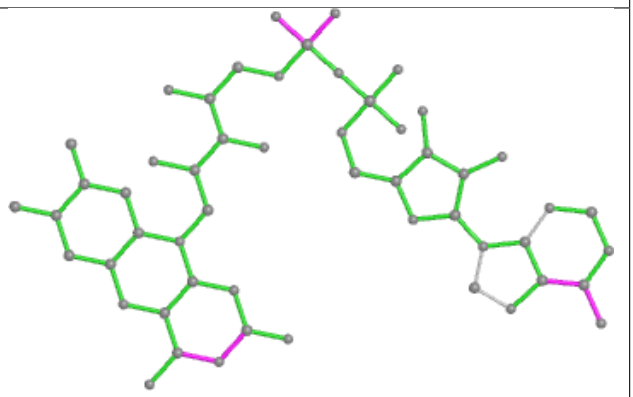


Rings

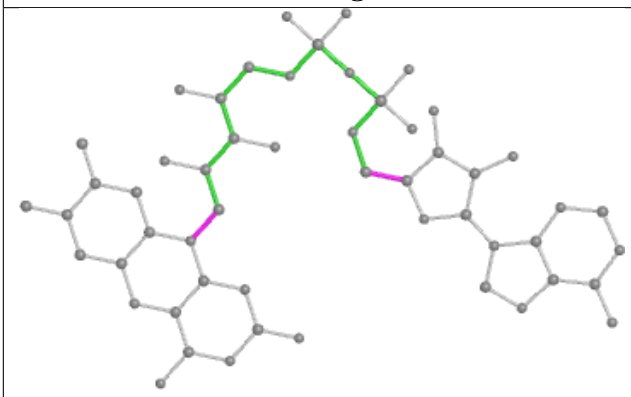
Ligand FAD C 701



Bond lengths



Bond angles



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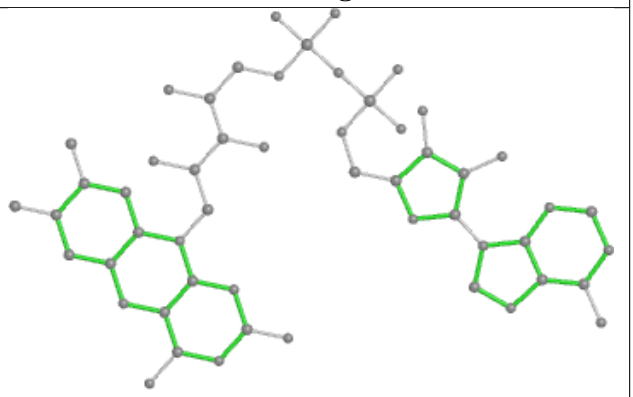
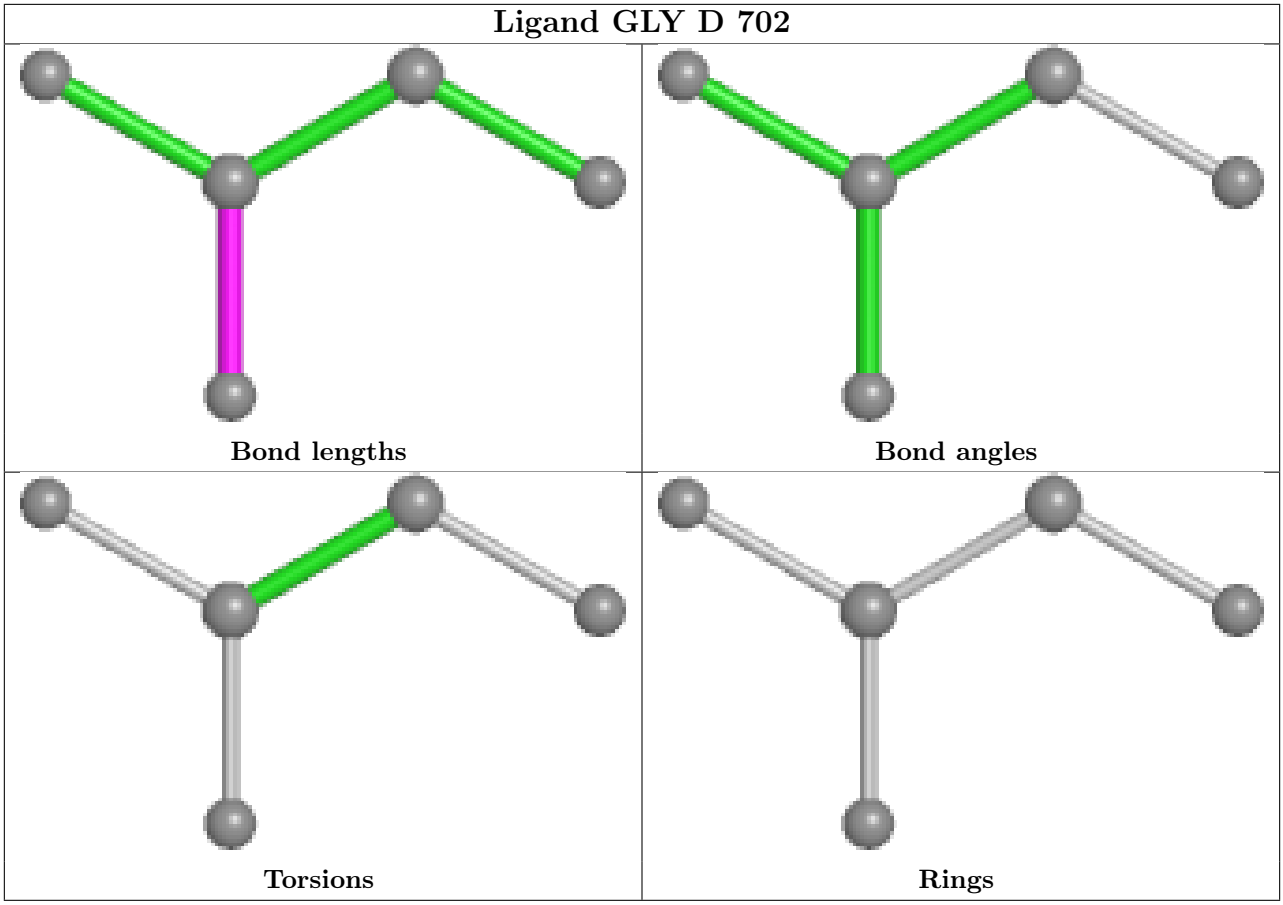


Rings



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	482/508 (94%)	-0.25	2 (0%)	92	93	15, 27, 48, 76	0
1	B	482/508 (94%)	-0.25	3 (0%)	89	90	14, 24, 47, 68	0
1	C	482/508 (94%)	-0.22	1 (0%)	95	95	14, 26, 55, 79	0
1	D	479/508 (94%)	0.19	23 (4%)	30	31	16, 37, 74, 94	0
1	E	482/508 (94%)	-0.22	1 (0%)	95	95	15, 27, 49, 78	0
1	F	482/508 (94%)	-0.23	3 (0%)	89	90	13, 24, 46, 68	0
1	G	482/508 (94%)	-0.20	5 (1%)	82	83	14, 26, 55, 81	0
1	H	479/508 (94%)	0.14	18 (3%)	40	42	16, 37, 75, 95	0
All	All	3850/4064 (94%)	-0.13	56 (1%)	73	75	13, 28, 60, 95	0

All (56) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	36	VAL	5.2
1	D	34	PRO	4.4
1	H	242	GLY	4.0
1	D	209	VAL	3.7
1	H	240	LEU	3.6
1	H	393	GLY	3.5
1	D	242	GLY	3.4
1	H	34	PRO	3.4
1	H	211	GLY	3.4
1	D	206	HIS	3.3
1	H	36	VAL	3.3
1	D	389	THR	3.2
1	F	395	ARG	3.1
1	H	220	LEU	3.1
1	D	392	ASP	3.1
1	H	389	THR	3.0

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	H	209	VAL	3.0
1	A	10	GLN	2.9
1	D	202	ILE	2.9
1	H	208	ARG	2.9
1	H	212	VAL	2.8
1	D	223	GLY	2.8
1	D	33	ARG	2.8
1	H	206	HIS	2.8
1	H	193	ARG	2.8
1	H	382	VAL	2.7
1	H	488	ARG	2.7
1	D	208	ARG	2.6
1	G	206	HIS	2.6
1	G	242	GLY	2.6
1	A	395	ARG	2.6
1	H	202	ILE	2.6
1	D	387	GLY	2.6
1	H	239	ALA	2.5
1	D	236	LEU	2.5
1	G	473	ARG	2.5
1	H	204	ALA	2.4
1	E	395	ARG	2.4
1	D	212	VAL	2.3
1	B	35	ASP	2.3
1	D	393	GLY	2.3
1	F	11	THR	2.3
1	D	90	GLU	2.3
1	D	386	ASP	2.2
1	D	398	ARG	2.2
1	C	242	GLY	2.2
1	G	10	GLN	2.2
1	D	491	HIS	2.2
1	B	386	ASP	2.1
1	F	206	HIS	2.1
1	D	361	TRP	2.1
1	D	385	MET	2.1
1	D	488	ARG	2.1
1	B	395	ARG	2.1
1	D	219	PHE	2.1
1	G	218	ASP	2.0

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

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

6.3 Carbohydrates (i)

There are no 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.

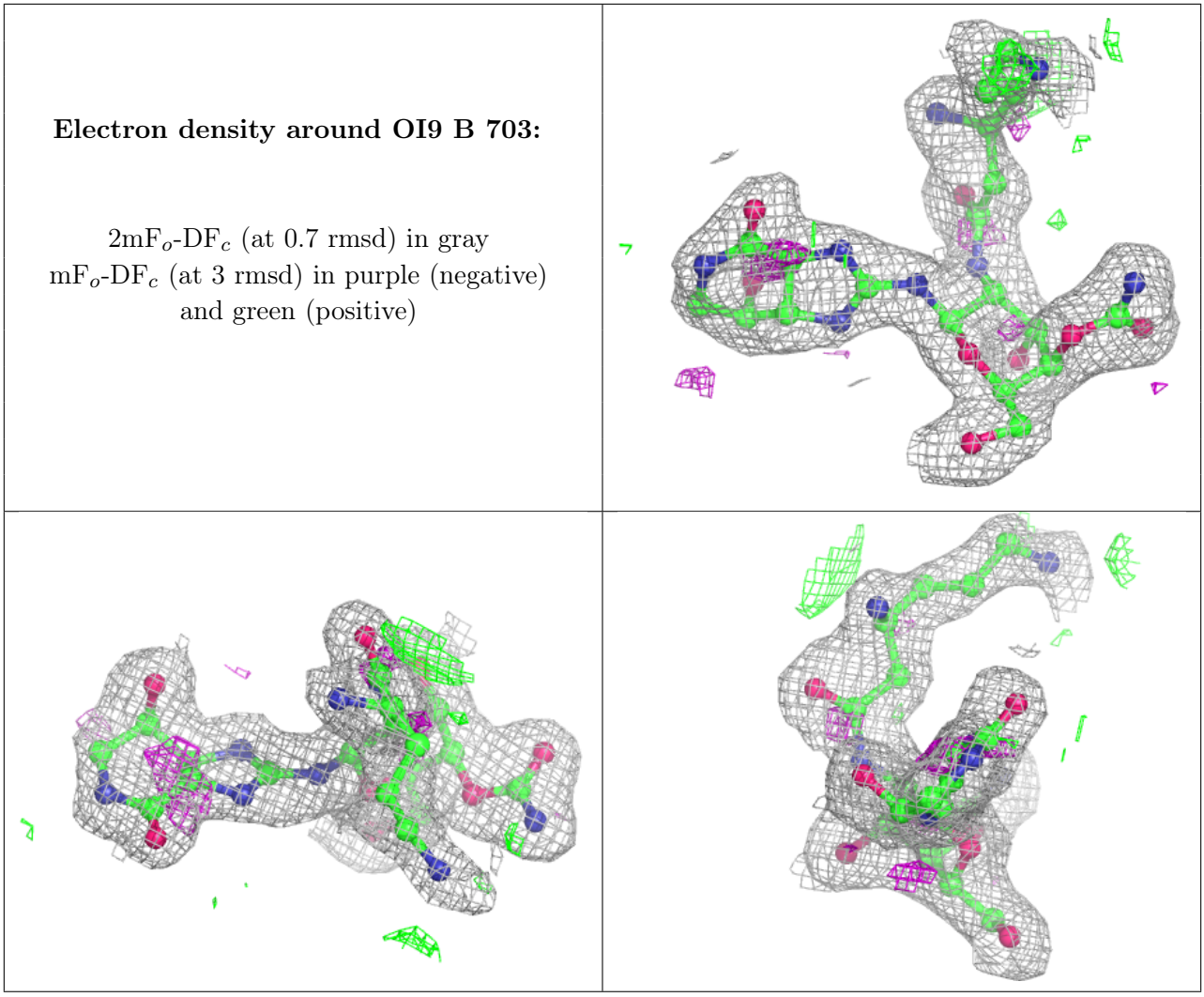
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	OI9	B	703	35/35	0.90	0.14	28,35,54,57	0
4	OI9	D	703	35/35	0.91	0.13	33,40,66,67	0
4	OI9	E	703	35/35	0.92	0.13	24,31,63,65	0
4	OI9	F	703	35/35	0.92	0.14	28,35,67,72	0
4	OI9	C	703	35/35	0.93	0.12	24,34,58,61	0
3	GLY	G	702	5/5	0.93	0.13	23,24,26,27	0
4	OI9	G	703	35/35	0.93	0.14	25,35,78,84	0
4	OI9	H	703	35/35	0.93	0.14	32,39,82,85	0
4	OI9	A	703	35/35	0.94	0.12	23,30,61,66	0
2	FAD	G	701	53/53	0.96	0.10	22,25,34,35	0
2	FAD	H	701	53/53	0.96	0.10	27,34,49,51	0
3	GLY	C	702	5/5	0.96	0.12	22,25,25,26	0
2	FAD	D	701	53/53	0.96	0.10	26,33,48,51	0
3	GLY	A	702	5/5	0.97	0.10	21,23,25,25	0
3	GLY	B	702	5/5	0.97	0.09	17,18,19,19	0
2	FAD	C	701	53/53	0.97	0.09	20,24,34,35	0
2	FAD	E	701	53/53	0.97	0.10	17,20,22,23	0
2	FAD	A	701	53/53	0.98	0.10	17,20,22,23	0
3	GLY	D	702	5/5	0.98	0.10	29,32,34,36	0
3	GLY	E	702	5/5	0.98	0.10	19,21,22,22	0
3	GLY	F	702	5/5	0.98	0.08	18,18,20,20	0
2	FAD	F	701	53/53	0.98	0.10	13,16,21,22	0
3	GLY	H	702	5/5	0.98	0.07	30,31,34,35	0
2	FAD	B	701	53/53	0.98	0.09	13,15,19,21	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.

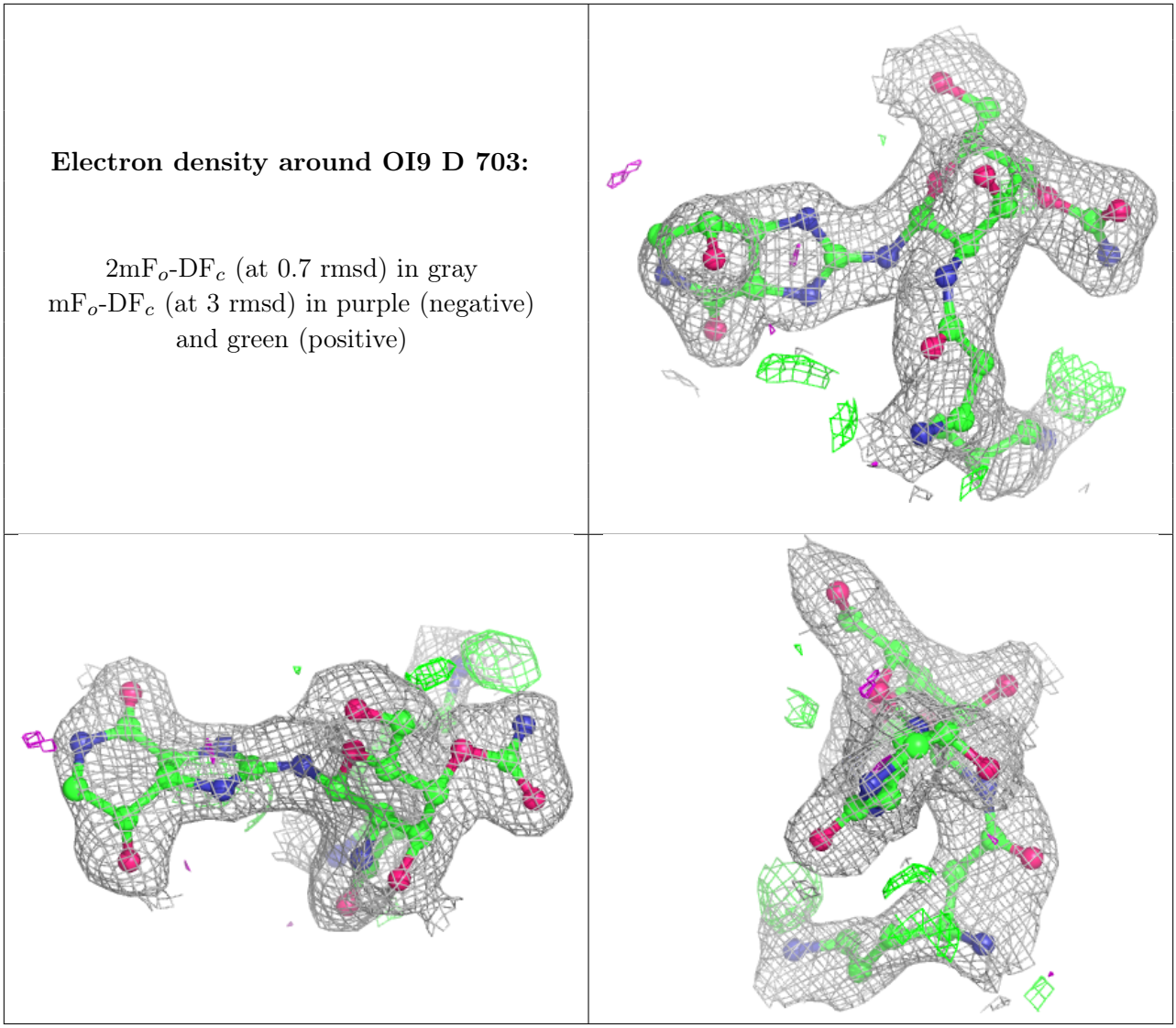
Electron density around OI9 B 703:

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



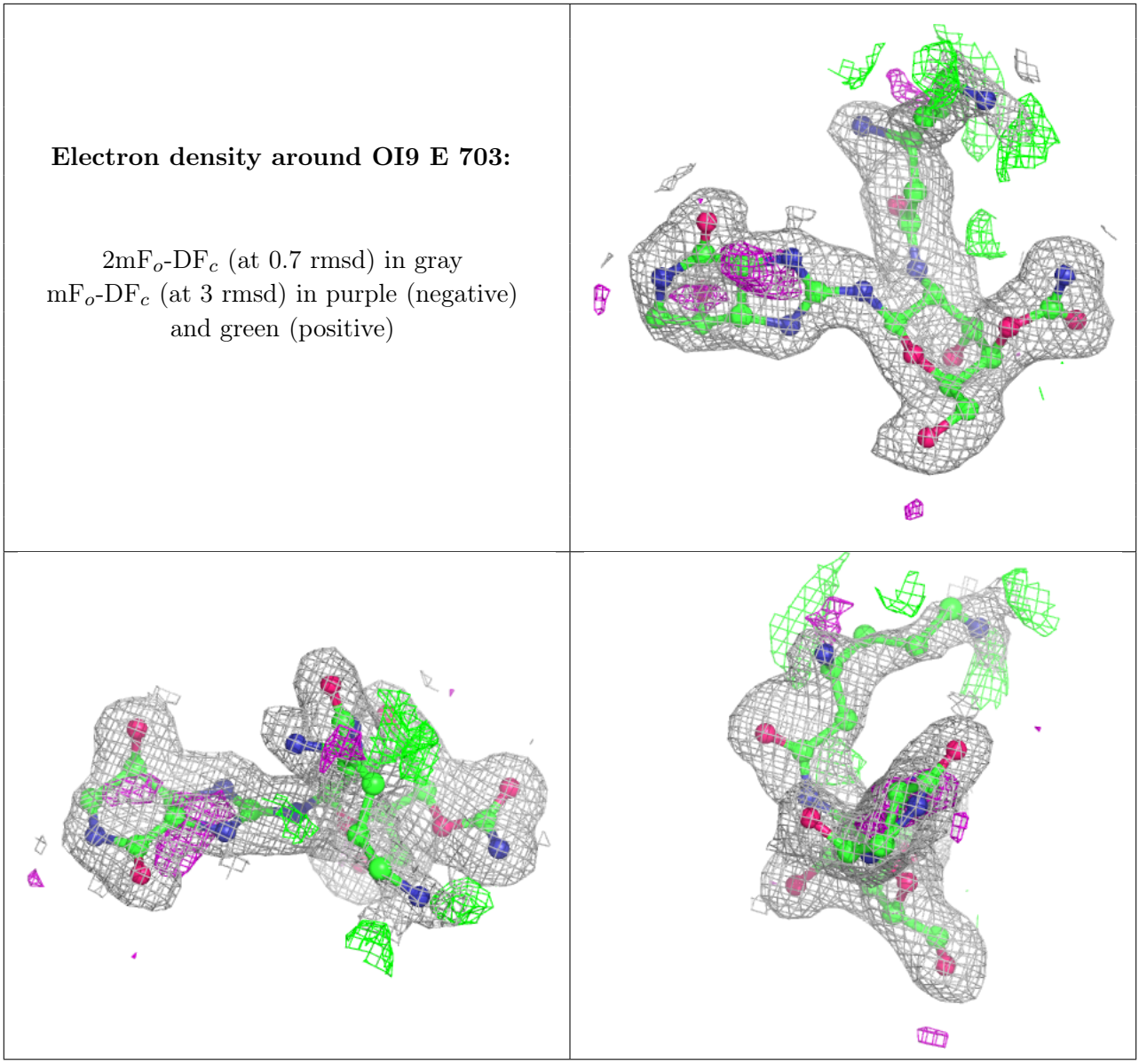
Electron density around OI9 D 703:

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



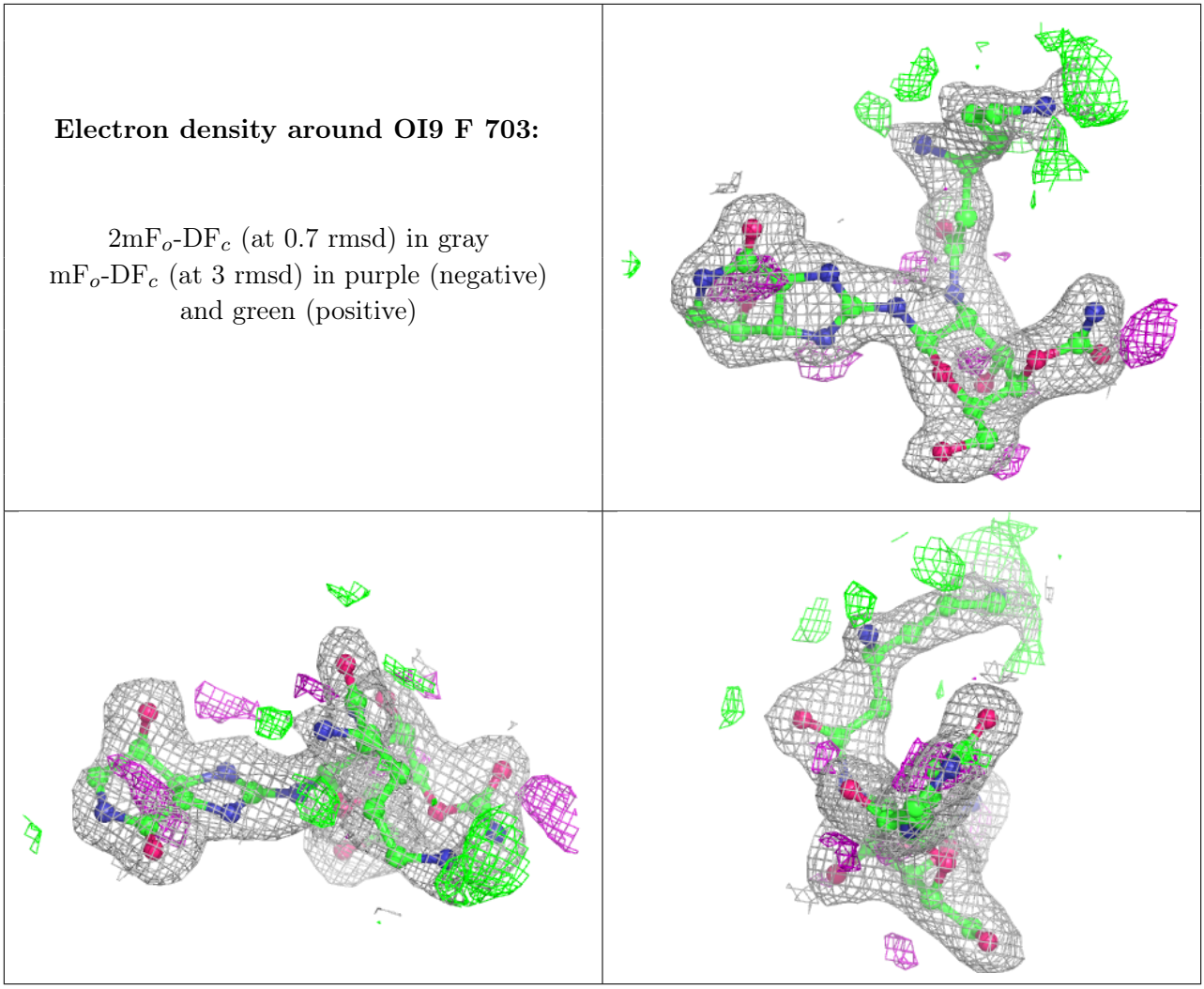
Electron density around OI9 E 703:

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



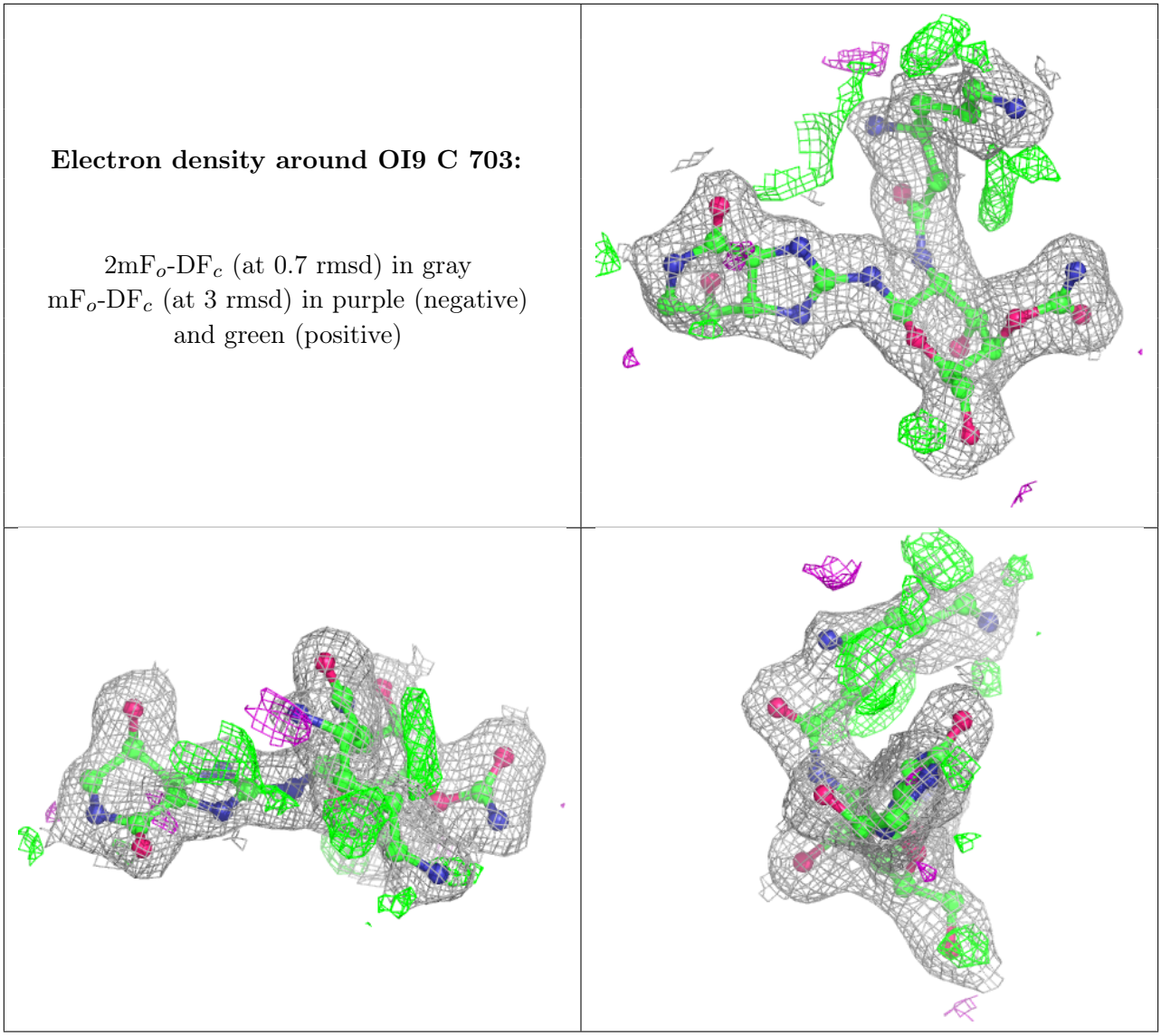
Electron density around OI9 F 703:

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



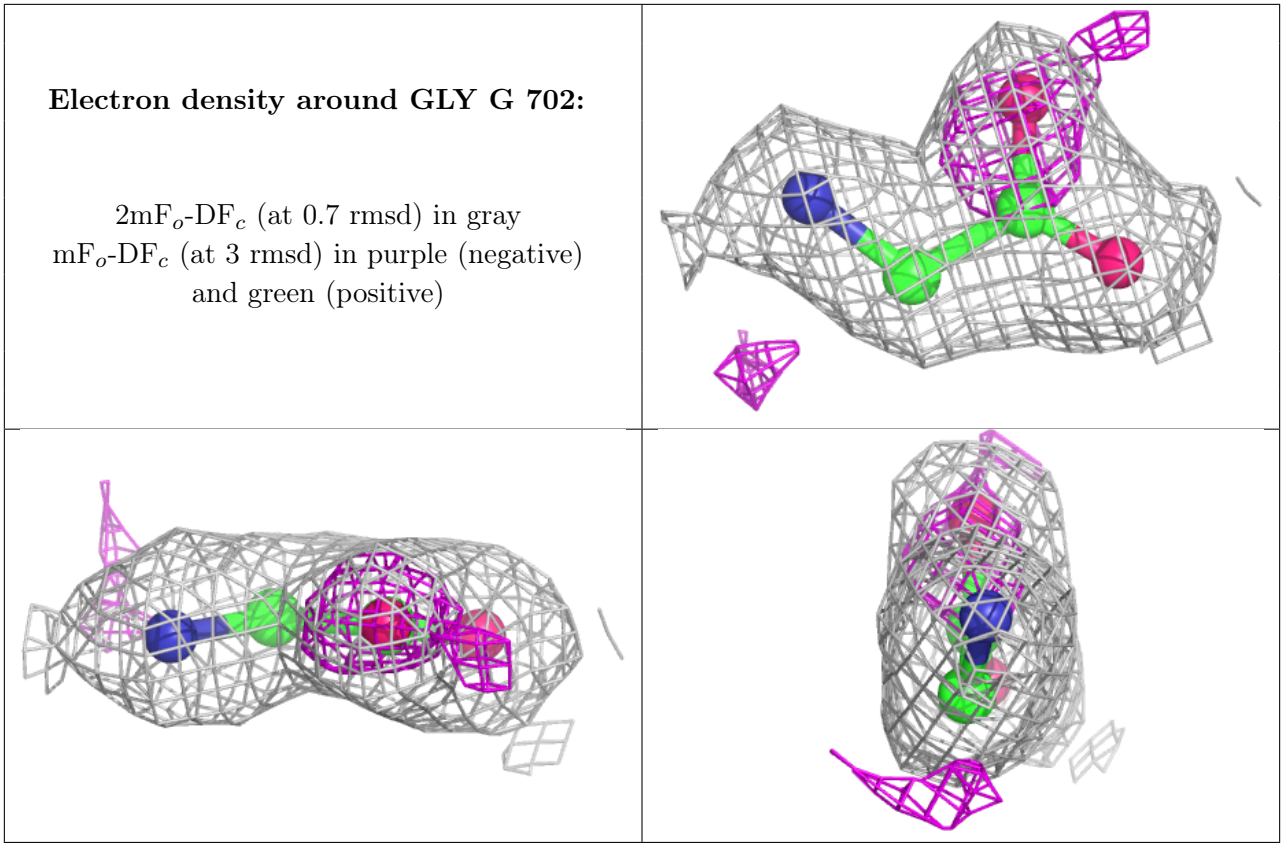
Electron density around OI9 C 703:

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



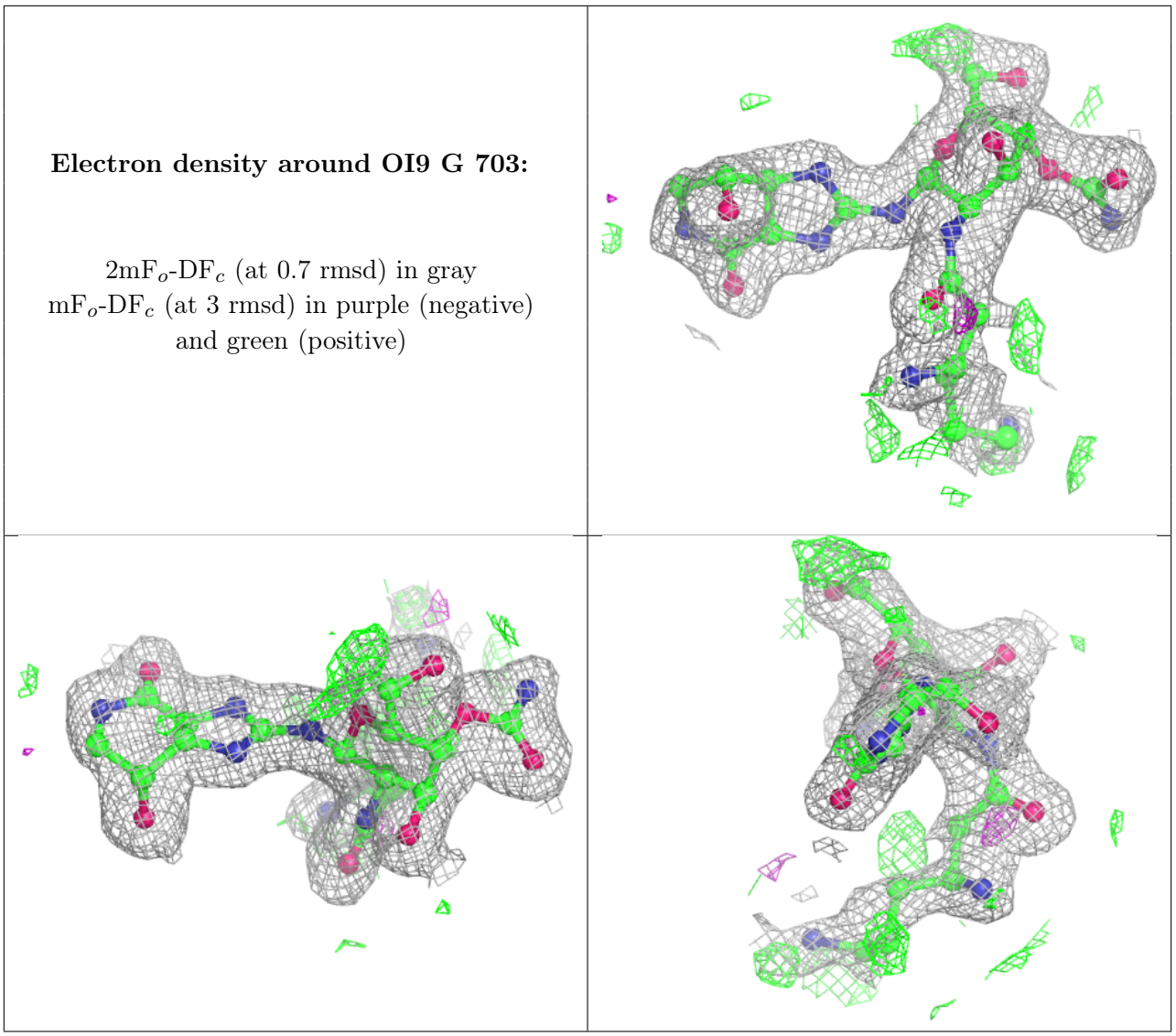
Electron density around GLY G 702:

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



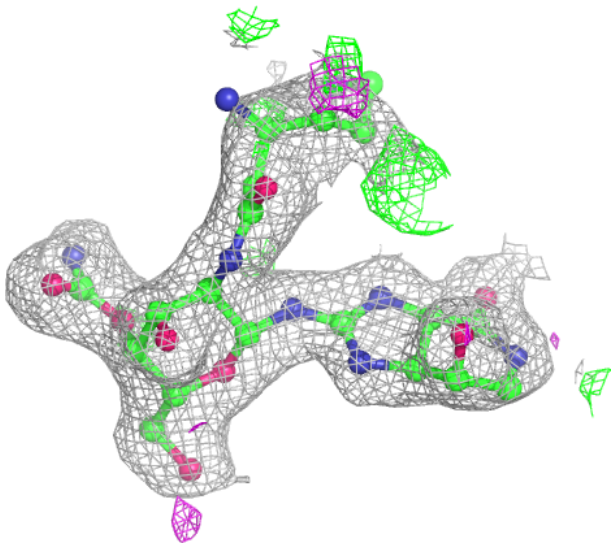
Electron density around OI9 G 703:

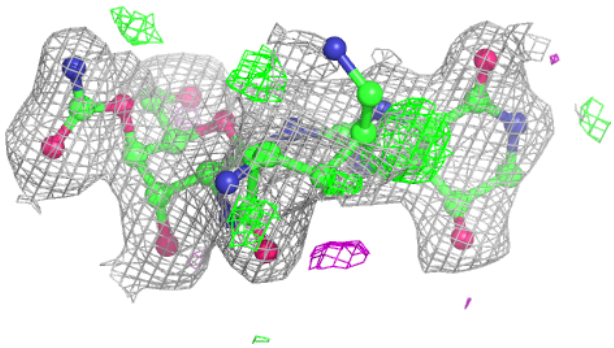
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

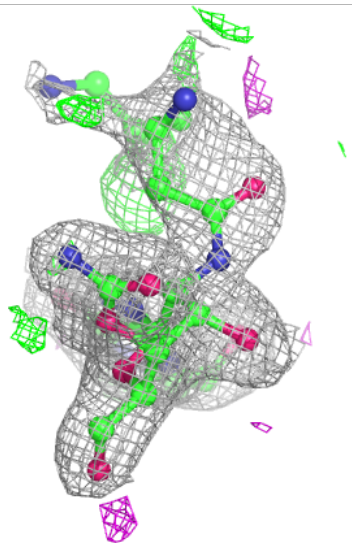


Electron density around OI9 H 703:

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

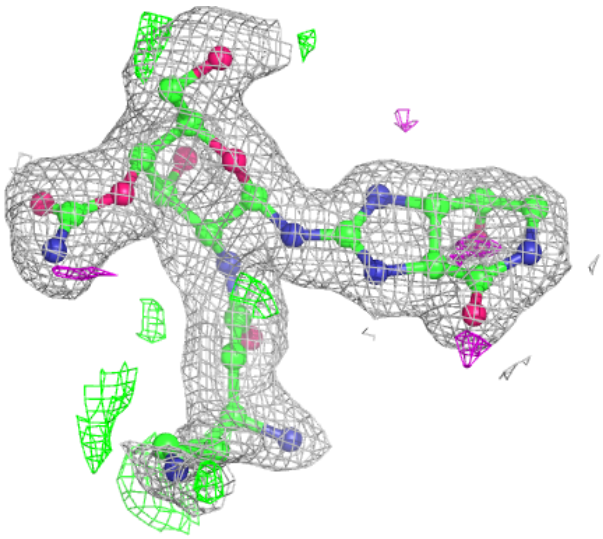


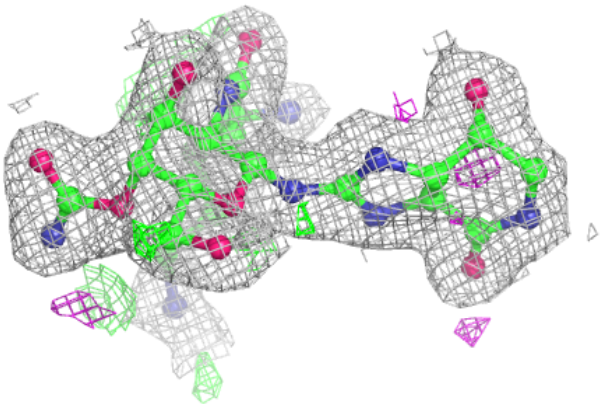


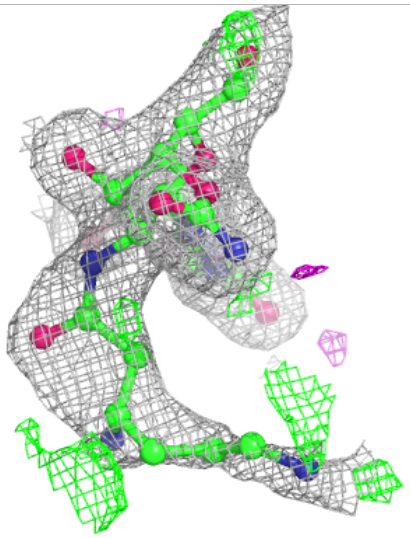


Electron density around OI9 A 703:

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

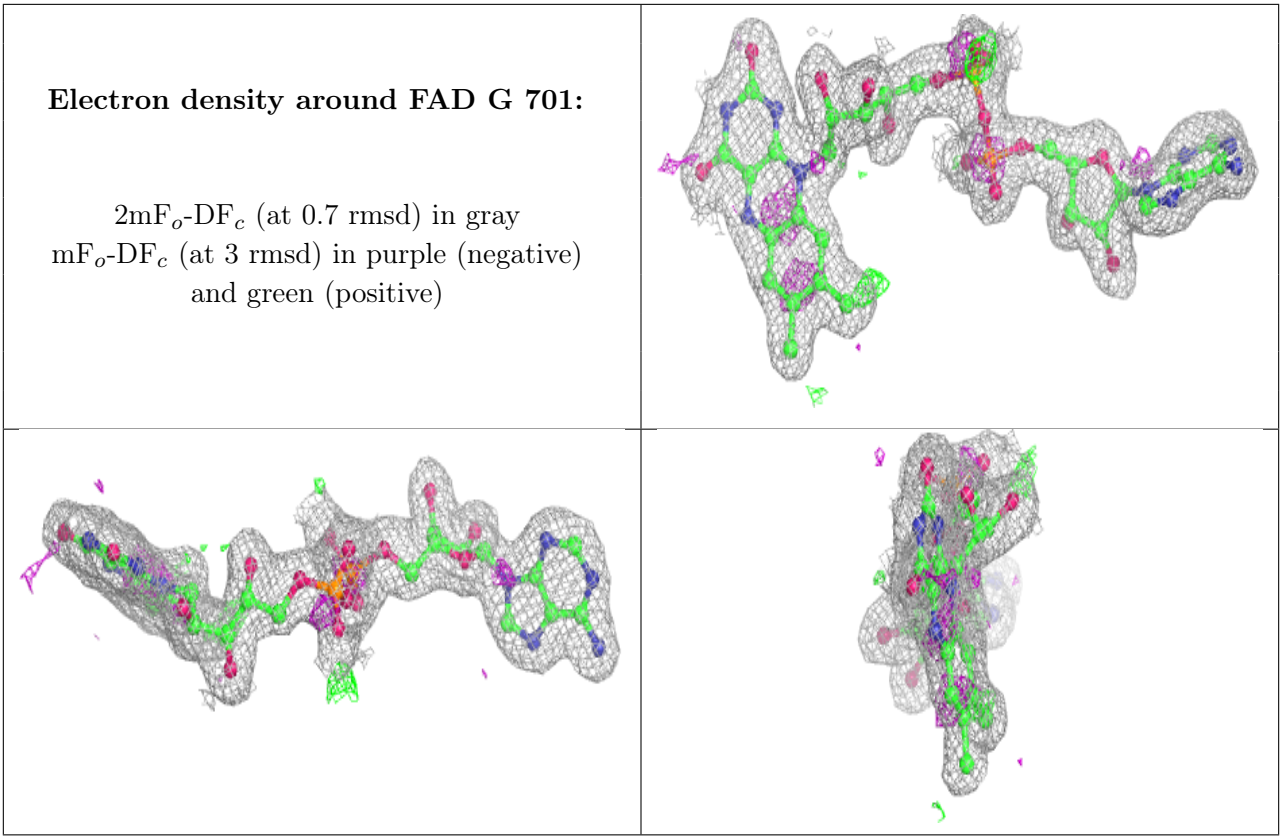






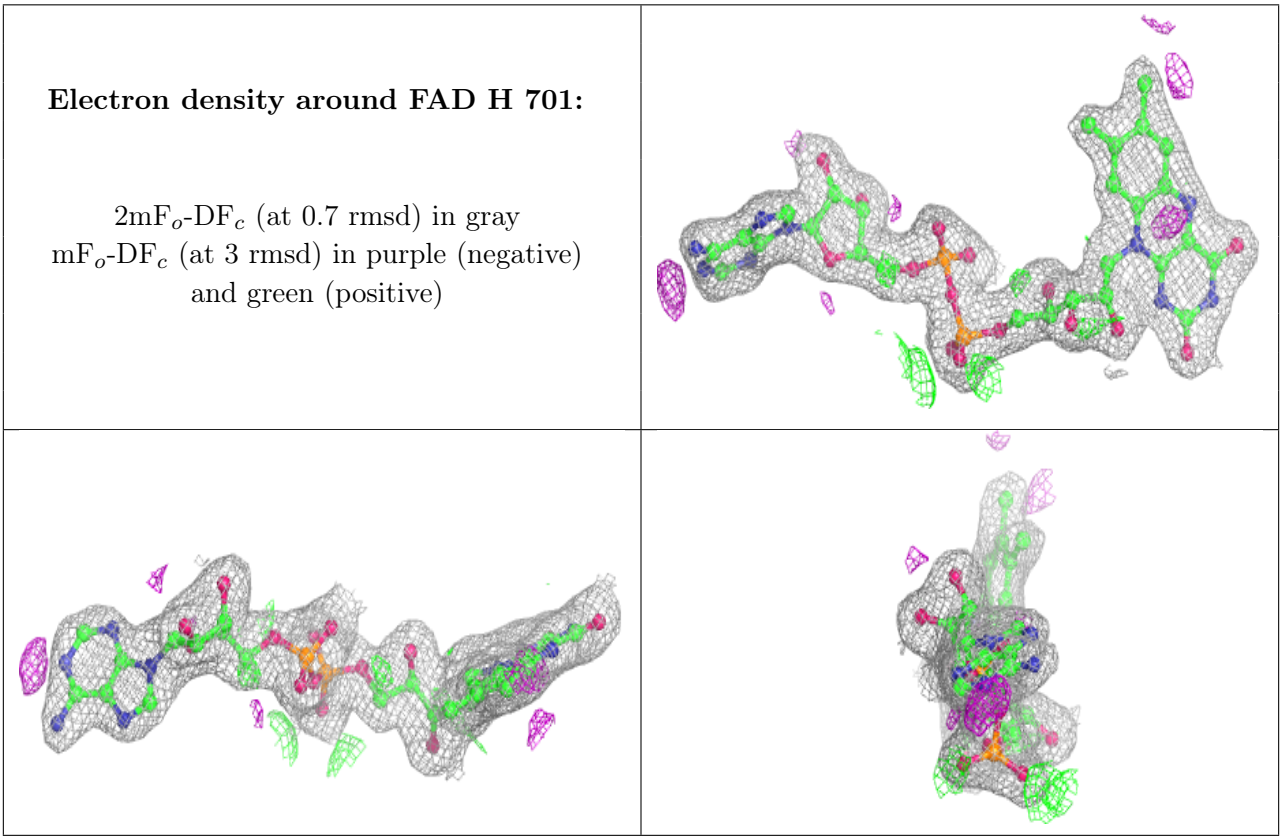
Electron density around FAD G 701:

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



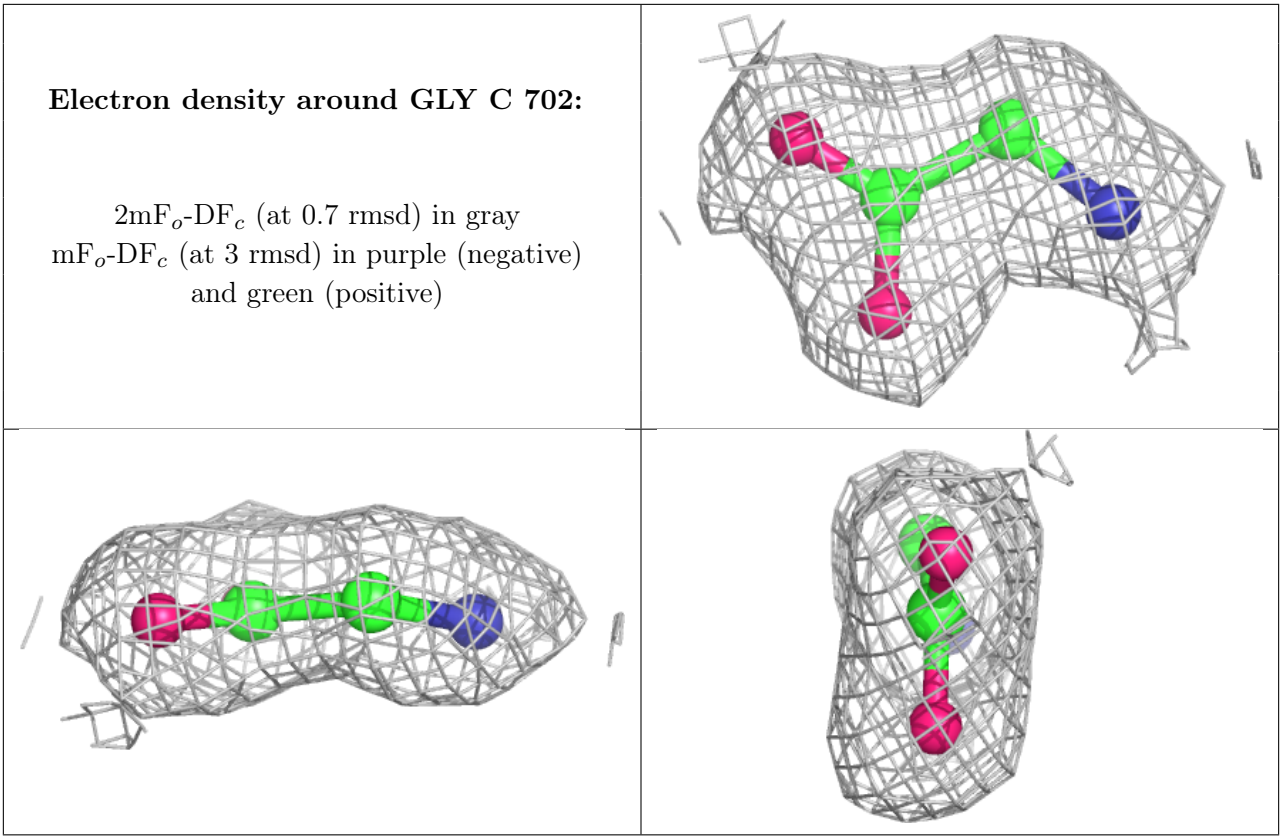
Electron density around FAD H 701:

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



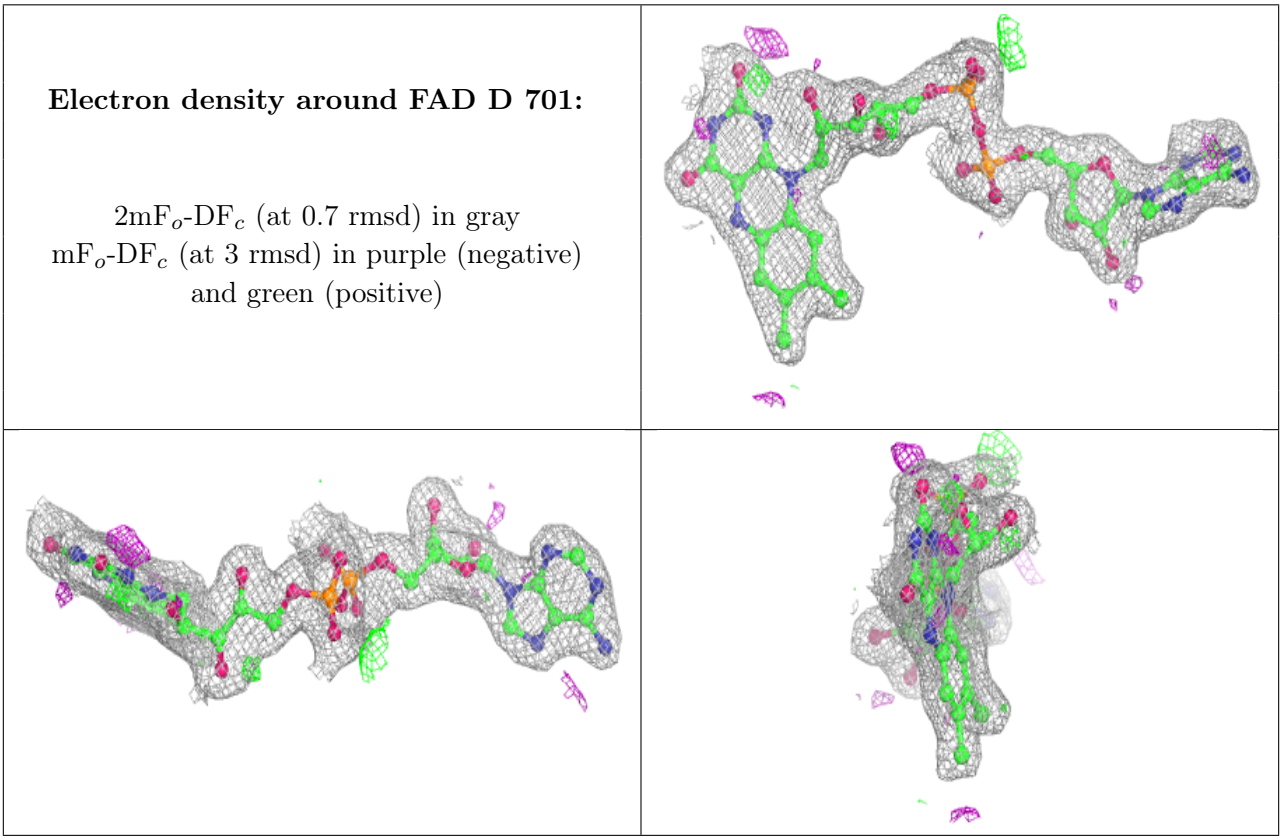
Electron density around GLY C 702:

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



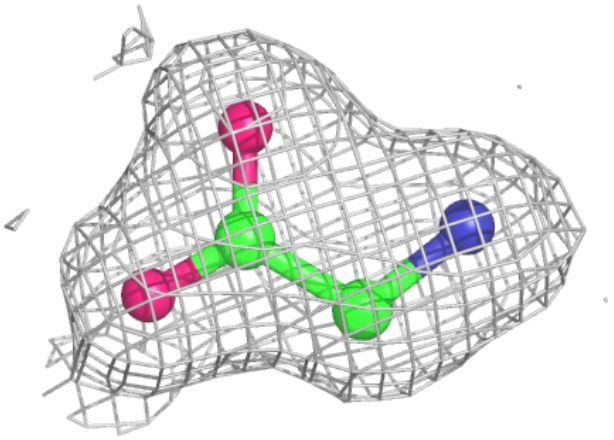
Electron density around FAD D 701:

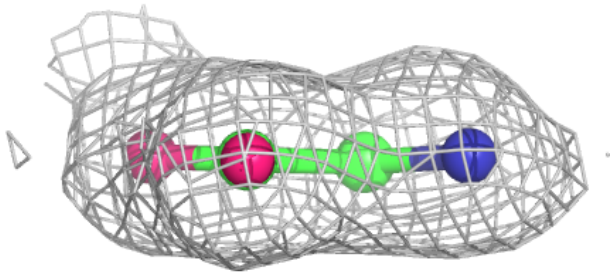
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

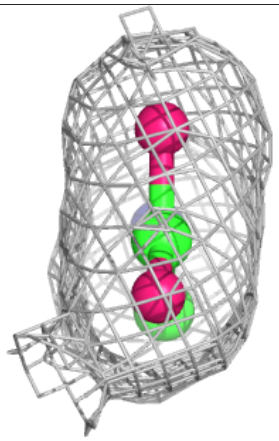


Electron density around GLY A 702:

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

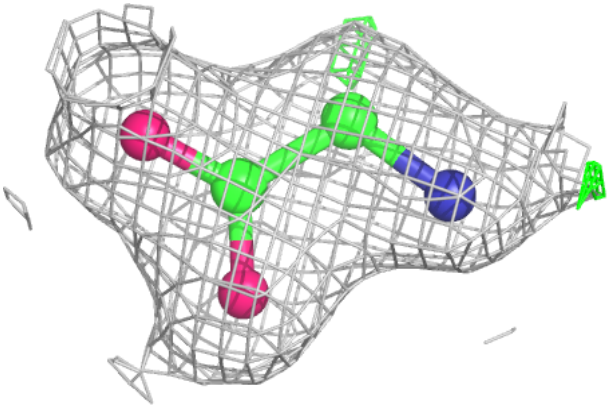


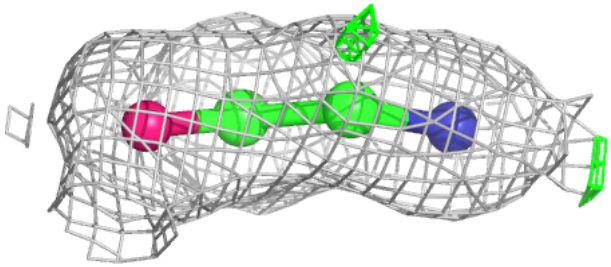


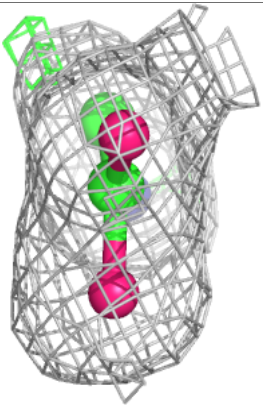


Electron density around GLY B 702:

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

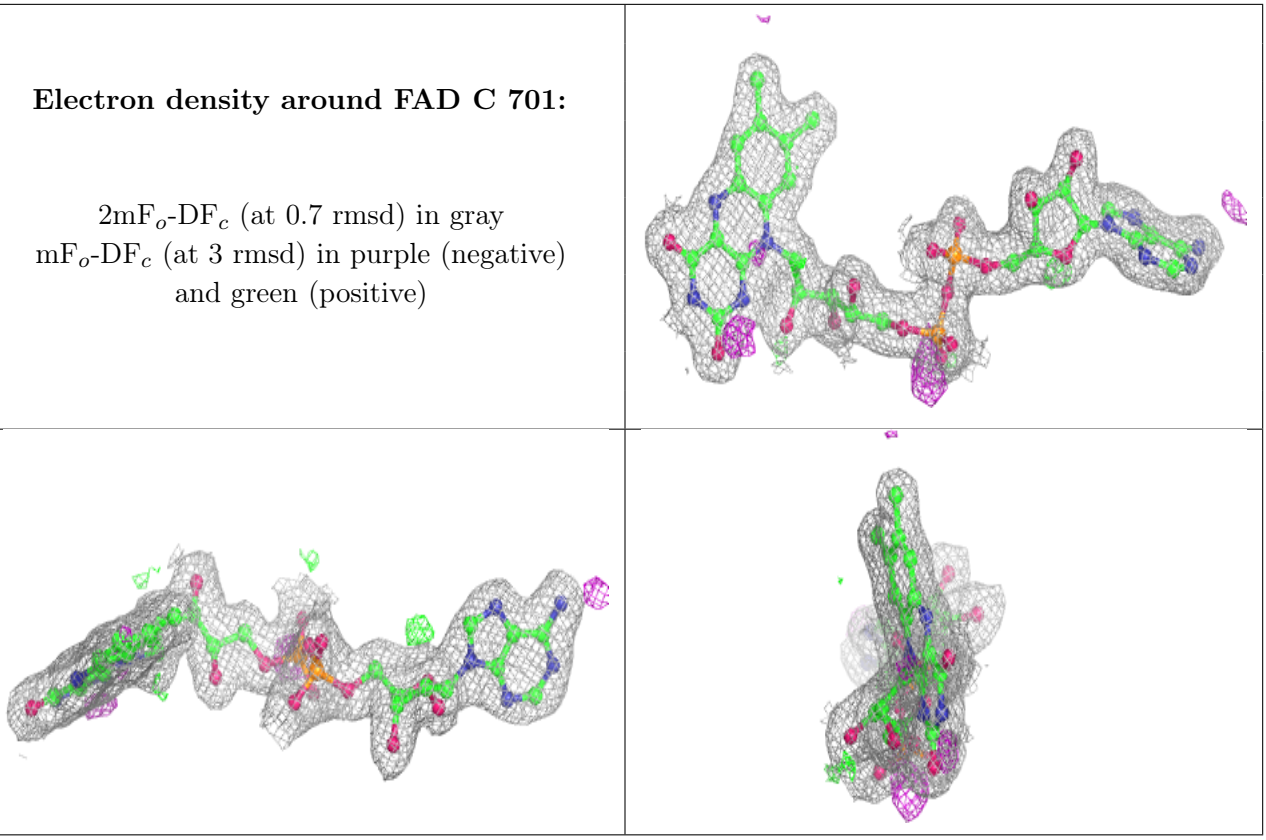






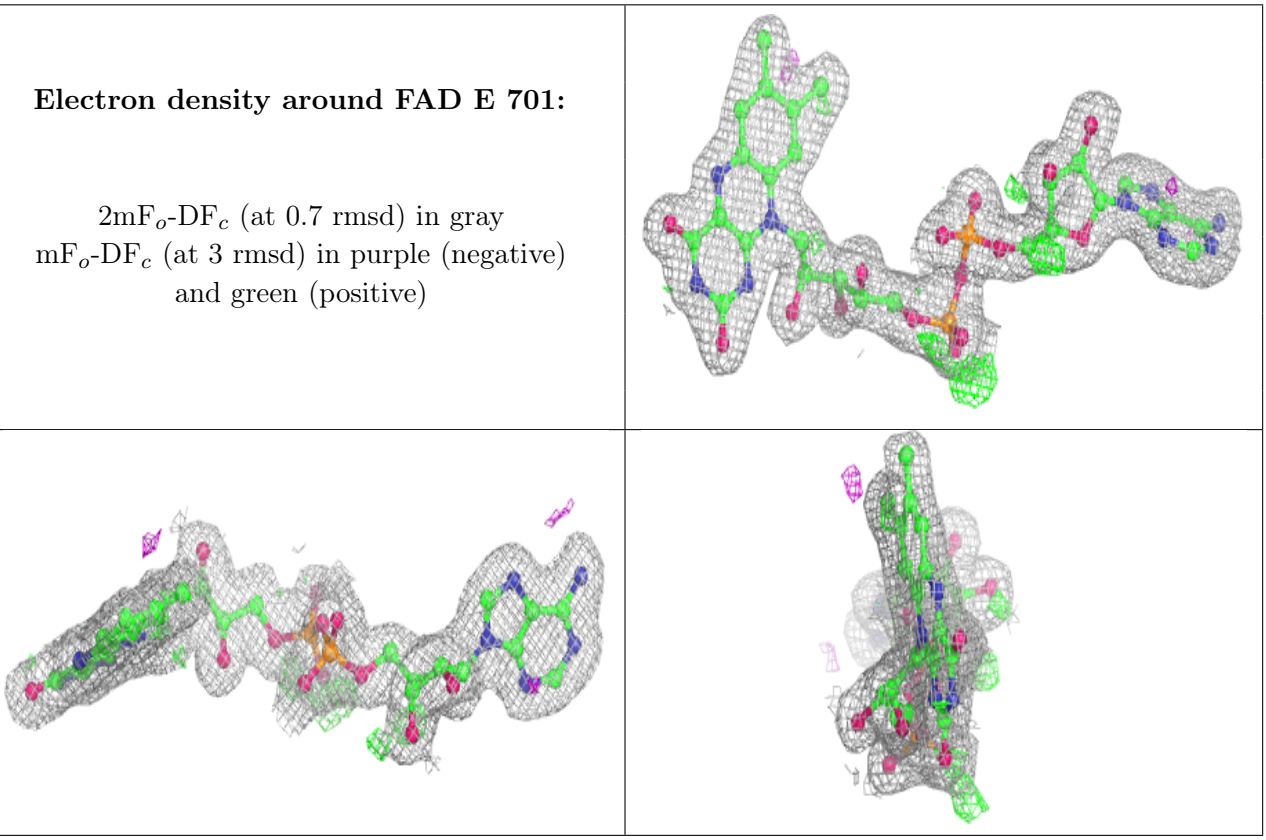
Electron density around FAD C 701:

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



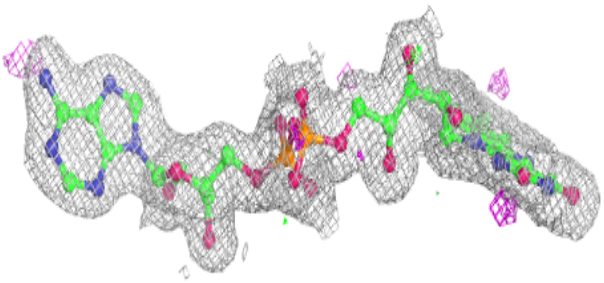
Electron density around FAD E 701:

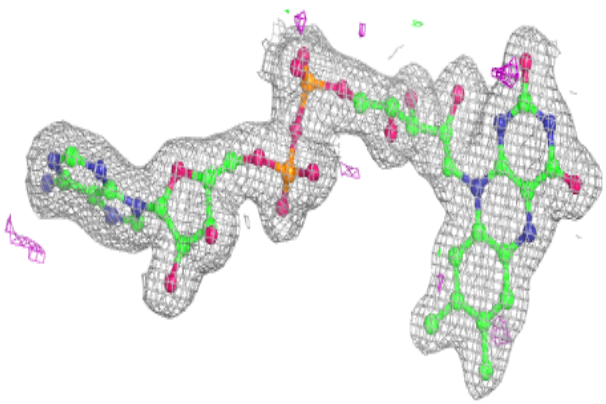
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

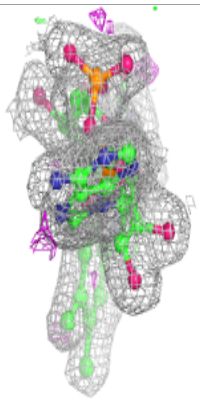


Electron density around FAD A 701:

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

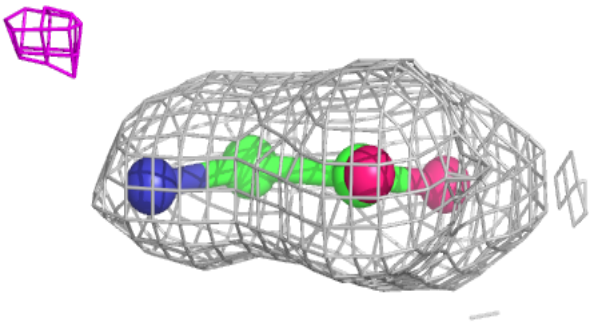


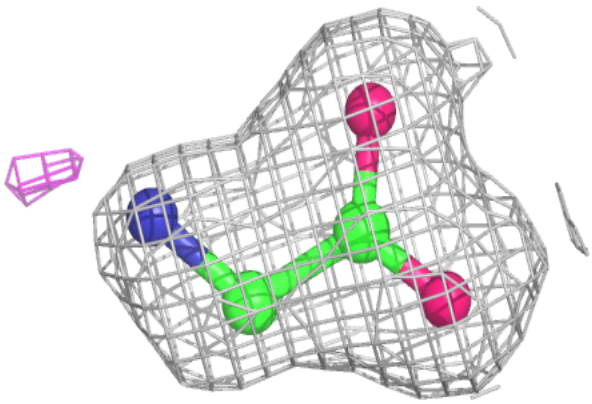


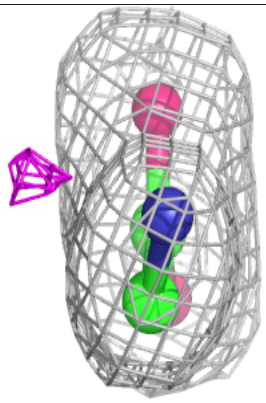


Electron density around GLY D 702:

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

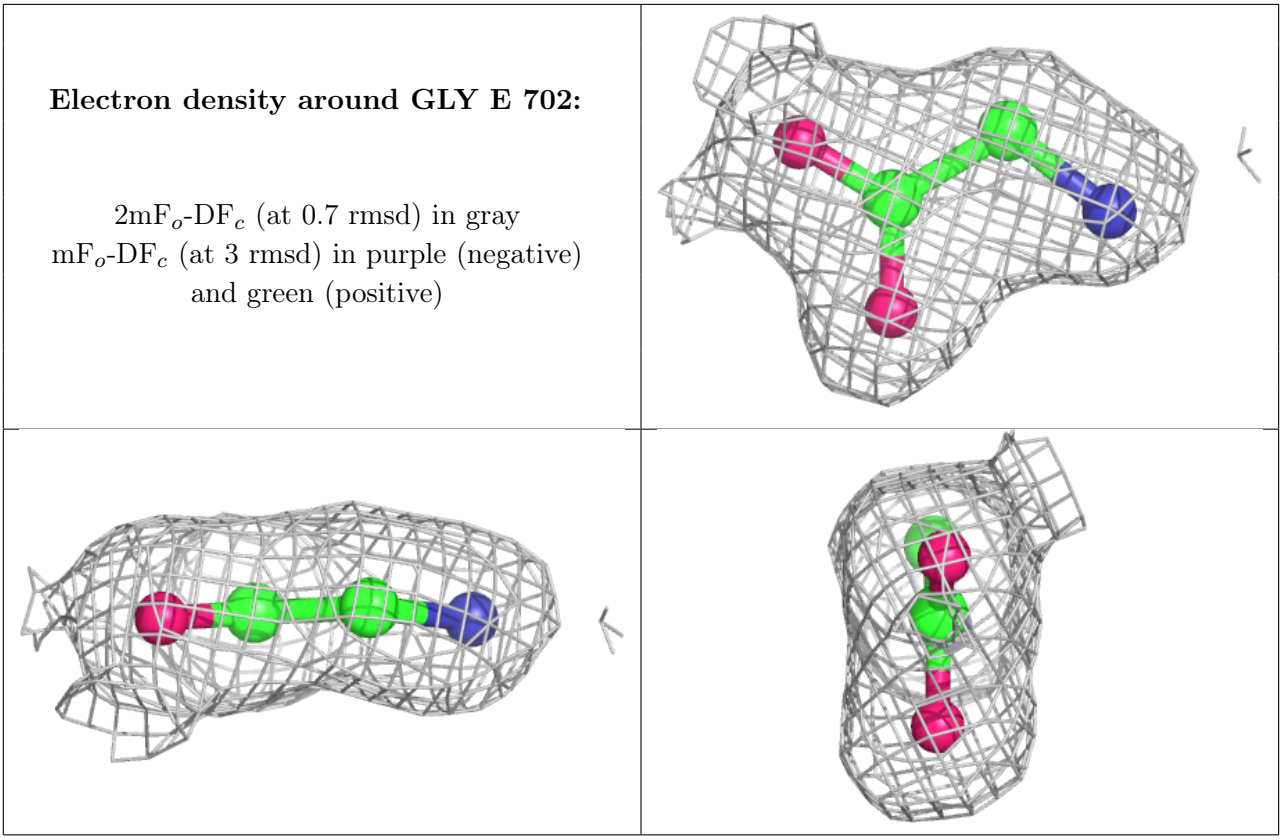






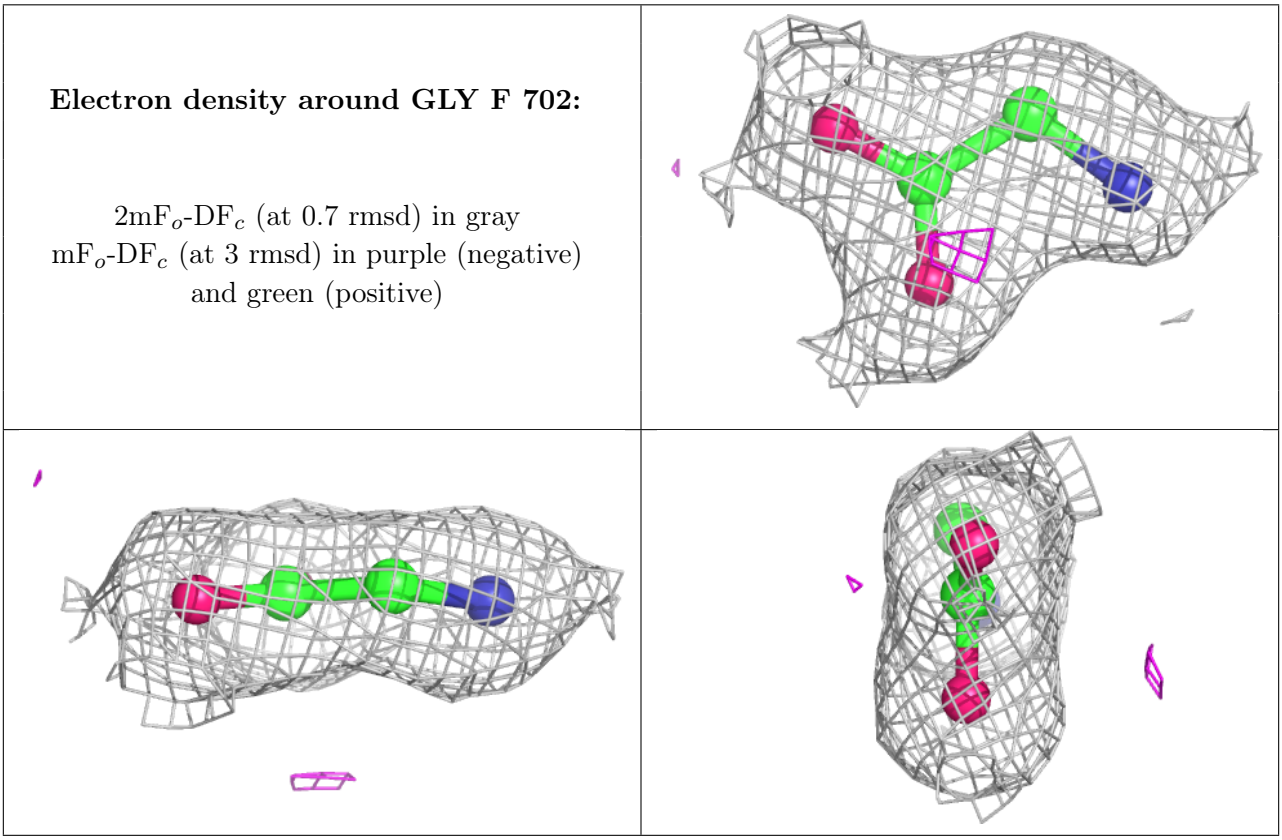
Electron density around GLY E 702:

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



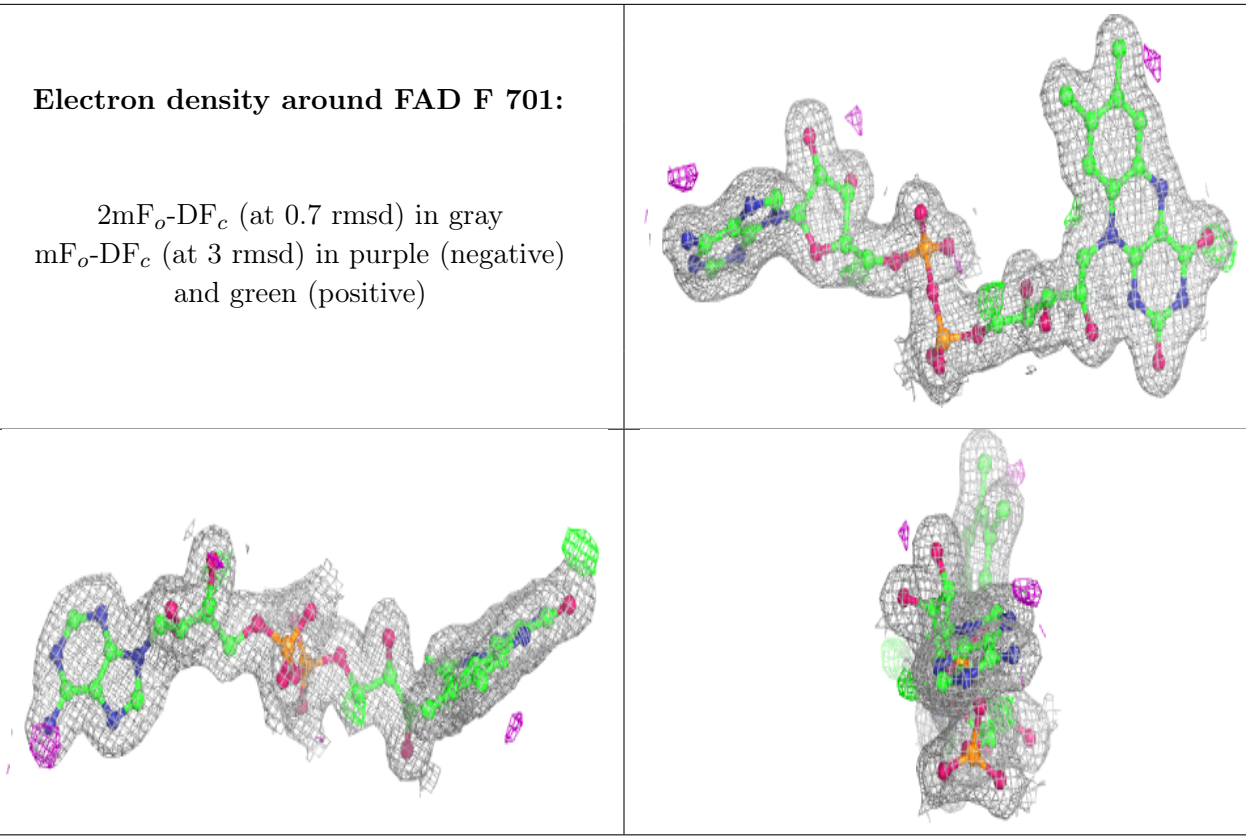
Electron density around GLY F 702:

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



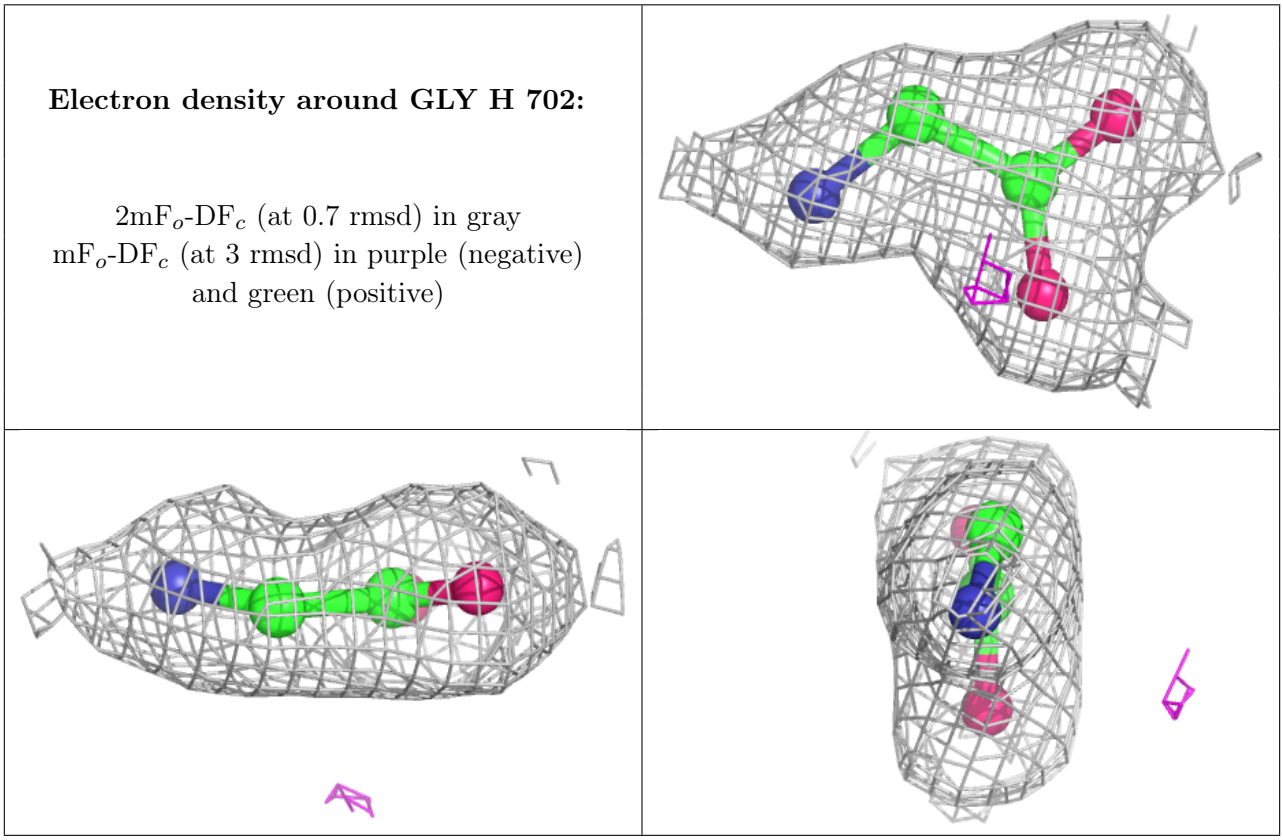
Electron density around FAD F 701:

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



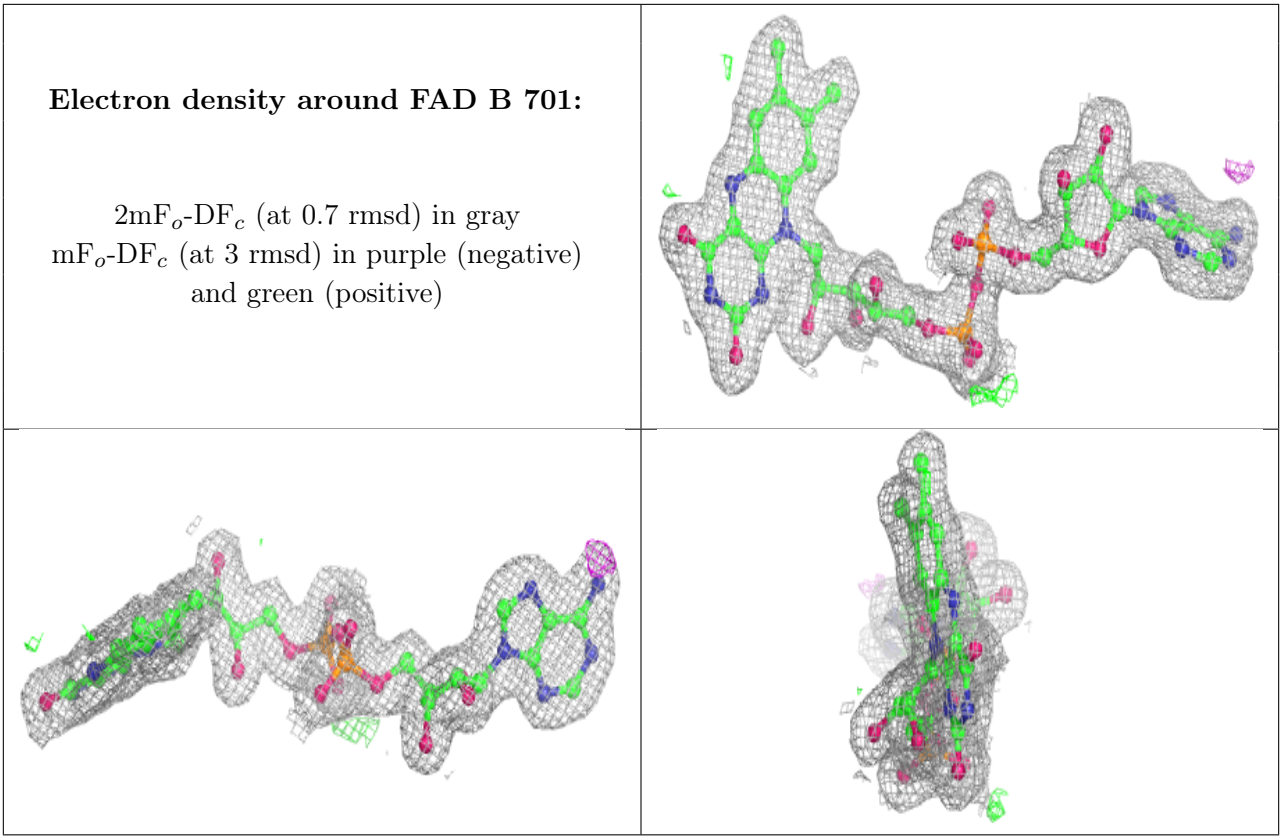
Electron density around GLY H 702:

$2mF_o$-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 701:

$2mF_o$-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.