



Full wwPDB X-ray Structure Validation Report ⓘ

May 23, 2020 – 08:48 pm BST

PDB ID : 2VTB
Title : Structure of cryptochrome 3 - DNA complex
Authors : Pokorny, R.; Klar, T.; Hennecke, U.; Carell, T.; Batschauer, A.; Essen, L.-O.
Deposited on : 2008-05-13
Resolution : 2.01 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 following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.11
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.11

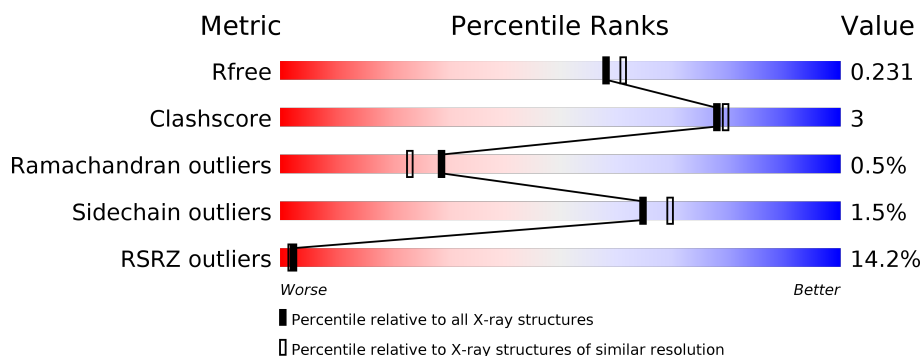
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.01 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	8085 (2.00-2.00)
Clashscore	141614	9178 (2.00-2.00)
Ramachandran outliers	138981	9054 (2.00-2.00)
Sidechain outliers	138945	9053 (2.00-2.00)
RSRZ outliers	127900	7900 (2.00-2.00)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on 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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	526	<div> <div>10%</div> <div>90%</div> <div>5%</div> </div>
1	C	526	<div> <div>13%</div> <div>89%</div> <div>5% 6%</div> </div>
1	D	526	<div> <div>12%</div> <div>87%</div> <div>8%</div> </div>
1	E	526	<div> <div>10%</div> <div>88%</div> <div>6% 6%</div> </div>
1	F	526	<div> <div>22%</div> <div>85%</div> <div>6% 9%</div> </div>
2	B	525	<div> <div>12%</div> <div>88%</div> <div>6% 6%</div> </div>

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Mol	Chain	Length	Quality of chain
3	G	5	<div><div></div><div>40%60%</div></div>
3	H	5	<div><div></div><div>40%40%20%</div></div>
3	I	5	<div><div></div><div>100%</div></div>
3	J	5	<div><div></div><div>20%40%40%20%</div></div>
3	K	5	<div><div></div><div>20%60%20%</div></div>
3	L	5	<div><div></div><div>40%40%20%20%20%</div></div>

2 Entry composition

There are 8 unique types of molecules in this entry. The entry contains 26329 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 CRYPTOCHROME DASH.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	500	Total	C	N	O	S	0	1	0
			4068	2603	707	738	20			
1	C	495	Total	C	N	O	S	0	1	0
			4042	2593	699	730	20			
1	D	484	Total	C	N	O	S	43	7	0
			3933	2523	674	715	21			
1	E	496	Total	C	N	O	S	0	0	0
			4042	2591	700	731	20			
1	F	480	Total	C	N	O	S	0	1	0
			3896	2503	667	705	21			

- Molecule 2 is a protein called CRYPTOCHROME DASH.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	491	Total	C	N	O	S	9	1	0
			3995	2564	688	723	20			

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	353	ASN	GLN	conflict	UNP Q84KJ5

- Molecule 3 is a DNA chain called 5'-D(*DT*DT*DT*DT*DTP)-3'.

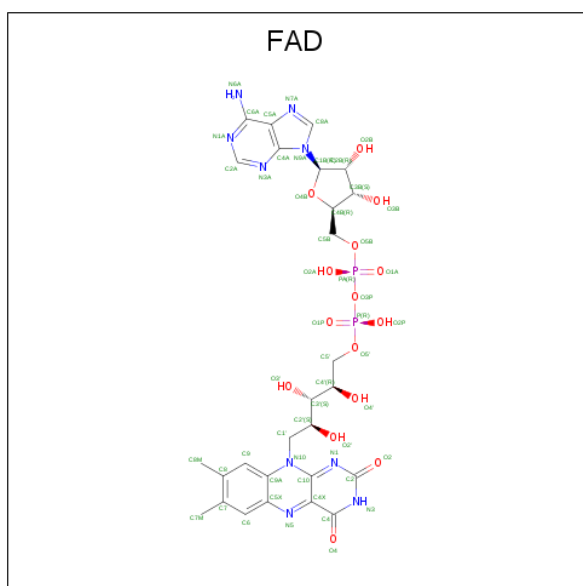
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	G	5	Total	C	N	O	P	0	0	0
			95	51	10	31	3			
3	H	5	Total	C	N	O	P	0	0	0
			95	51	10	31	3			
3	I	5	Total	C	N	O	P	0	0	0
			95	51	10	31	3			

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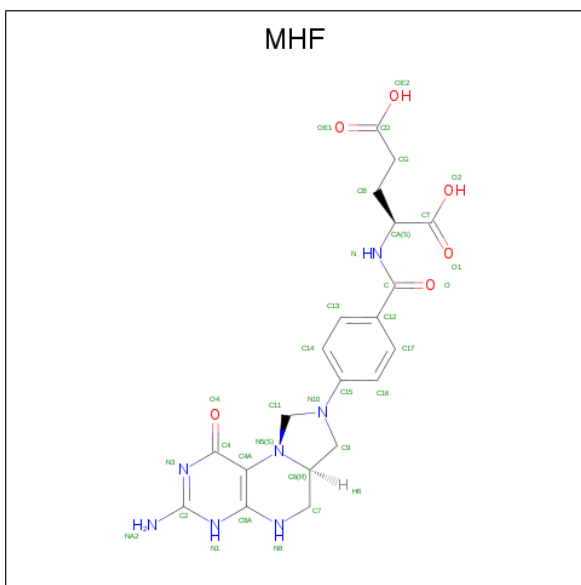
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	J	5	Total	C	N	O	P	9	0	0
			95	51	10	31	3			
3	K	4	Total	C	N	O	P	0	0	0
			78	41	8	26	3			
3	L	4	Total	C	N	O	P	0	0	0
			62	31	6	22	3			

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



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

- Molecule 5 is 5,10-METHENYL-6,7,8-TRIHYDROFOLIC ACID (three-letter code: MHF) (formula: $C_{20}H_{23}N_7O_6$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total 33	C 20	N 7	O 6	0	0
5	B	1	Total 33	C 20	N 7	O 6	0	0
5	C	1	Total 33	C 20	N 7	O 6	0	0
5	D	1	Total 33	C 20	N 7	O 6	0	0
5	E	1	Total 33	C 20	N 7	O 6	0	0
5	F	1	Total 33	C 20	N 7	O 6	0	0

- Molecule 6 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	D	1	Total Cl 1 1	0	0
6	E	1	Total Cl 1 1	0	0
6	B	2	Total Cl 2 2	0	0
6	C	2	Total Cl 2 2	0	0
6	A	1	Total Cl 1 1	0	0
6	F	1	Total Cl 1 1	0	0

- Molecule 7 is ACETATE ION (three-letter code: ACT) (formula: $C_2H_3O_2$).



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

- Molecule 8 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	274	Total	O	0	0
			274	274		
8	B	178	Total	O	0	0
			178	178		
8	C	257	Total	O	0	0
			257	257		
8	D	209	Total	O	0	0
			209	209		
8	E	233	Total	O	0	0
			233	233		
8	F	120	Total	O	0	0
			120	120		
8	G	7	Total	O	0	0
			7	7		
8	H	4	Total	O	0	0
			4	4		
8	I	10	Total	O	0	0
			10	10		
8	J	5	Total	O	0	0
			5	5		

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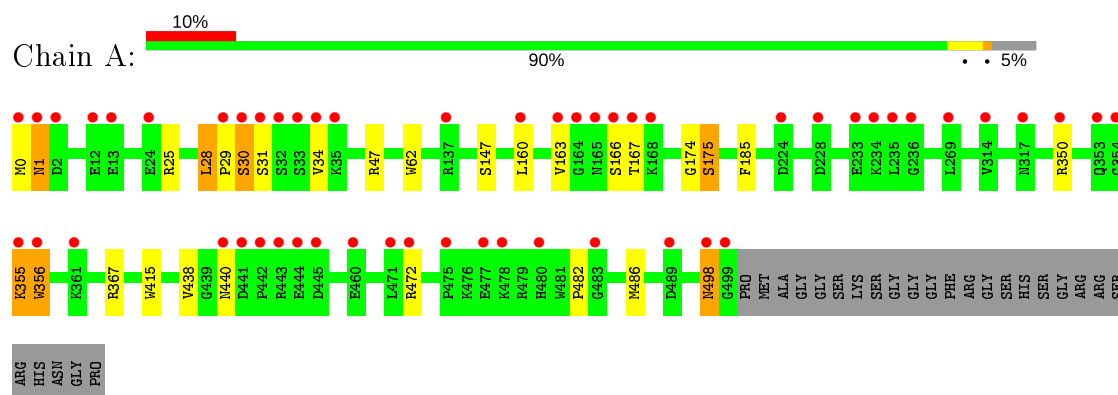
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	K	7	Total	O	0	0
			7	7		
8	L	1	Total	O	0	0
			1	1		

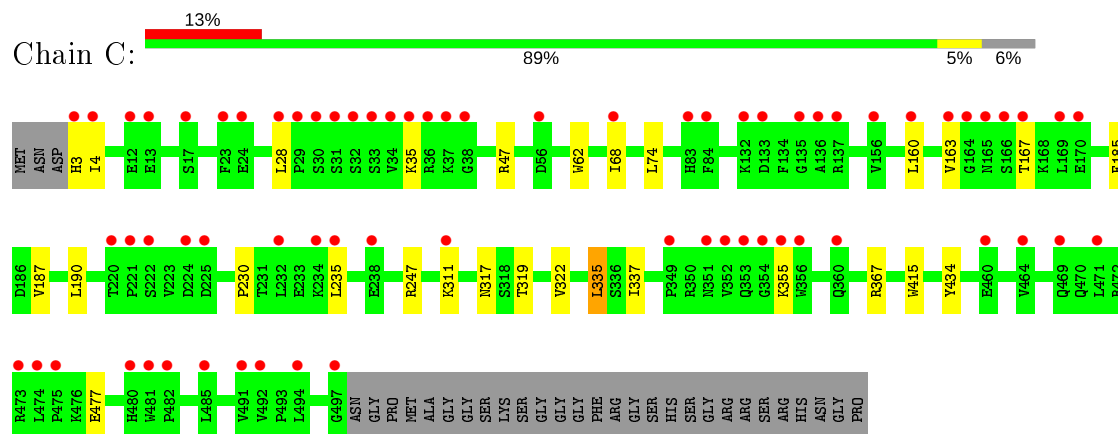
3 Residue-property plots [i](#)

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

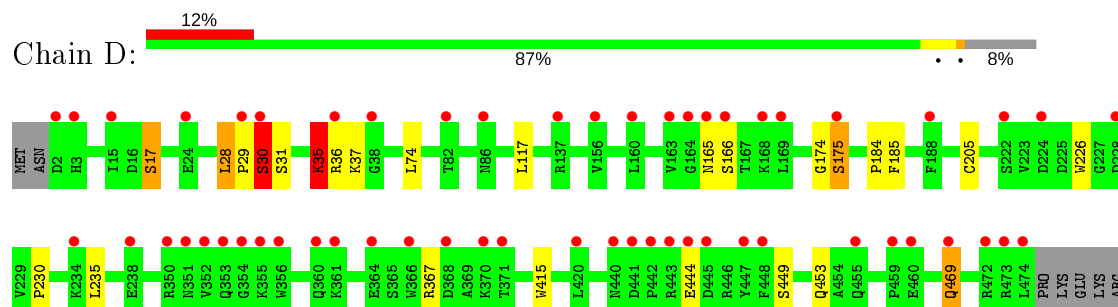
• Molecule 1: CRYPTOCHROME DASH

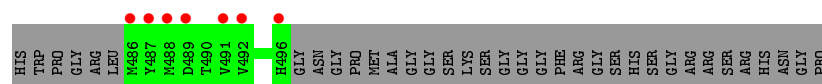


• Molecule 1: CRYPTOCHROME DASH

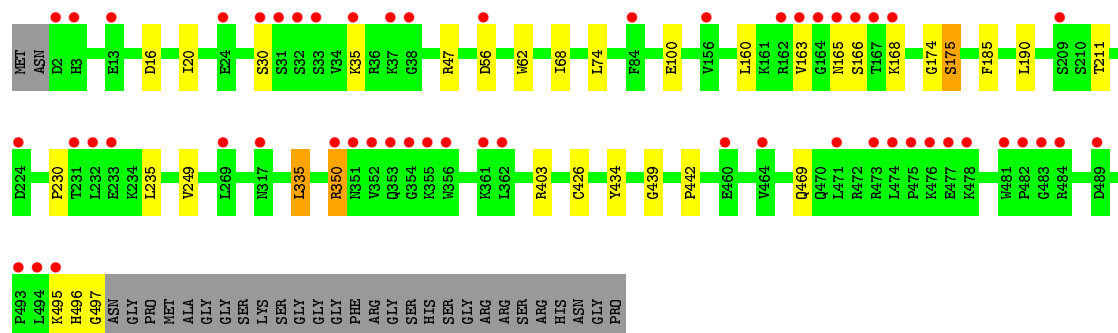
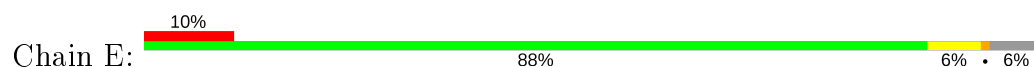


• Molecule 1: CRYPTOCHROME DASH

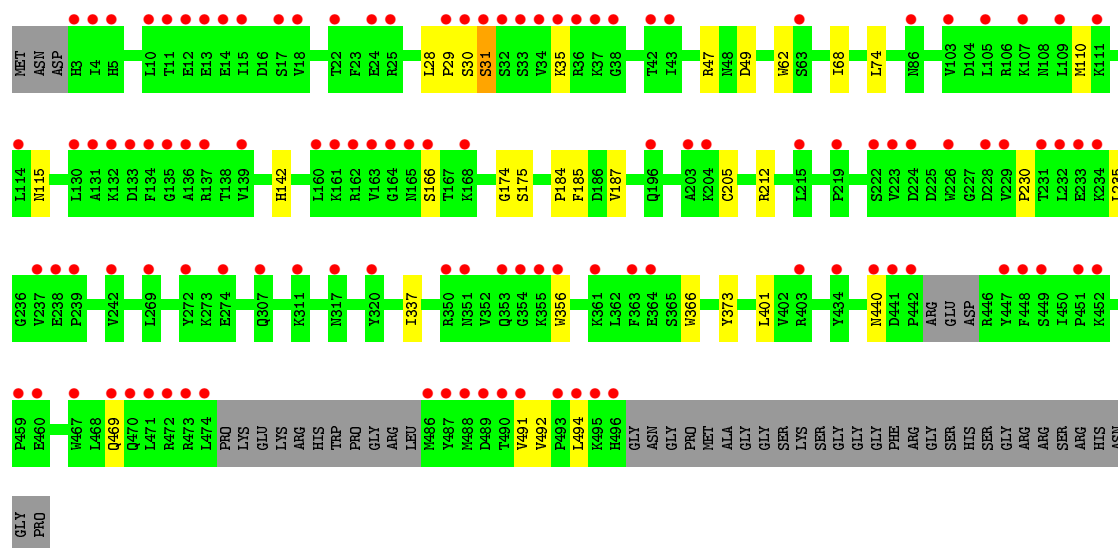
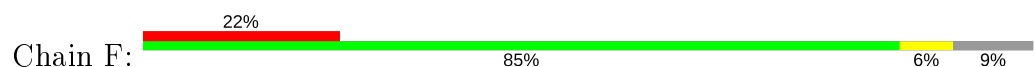




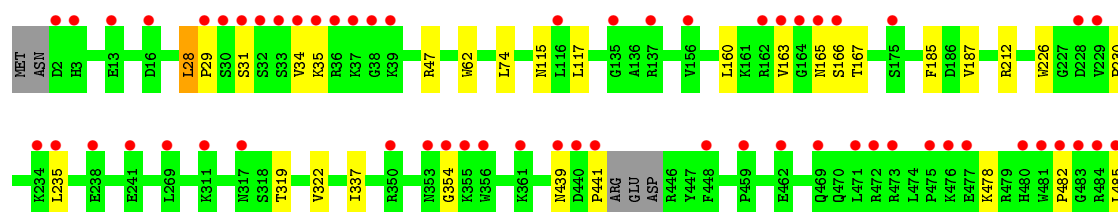
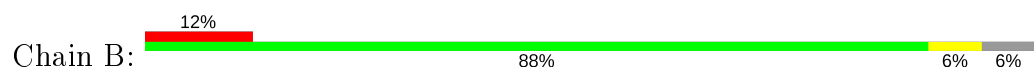
● Molecule 1: CRYPTOCHROME DASH

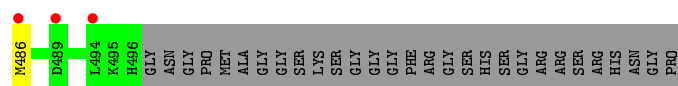


● Molecule 1: CRYPTOCHROME DASH



● Molecule 2: CRYPTOCHROME DASH

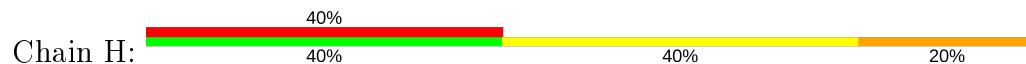




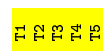
- Molecule 3: 5'-D(*DT*DT*DT*DT*DTP)-3'



- Molecule 3: 5'-D(*DT*DT*DT*DT*DTP)-3'



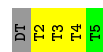
- Molecule 3: 5'-D(*DT*DT*DT*DT*DTP)-3'



- Molecule 3: 5'-D(*DT*DT*DT*DT*DTP)-3'



- Molecule 3: 5'-D(*DT*DT*DT*DT*DTP)-3'



- Molecule 3: 5'-D(*DT*DT*DT*DT*DTP)-3'



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	120.73 Å 136.08 Å 211.48 Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	15.03 – 2.01 15.02 – 2.01	Depositor EDS
% Data completeness (in resolution range)	99.2 (15.03-2.01) 99.2 (15.02-2.01)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.94 (at 2.01 Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.184 , 0.222 0.195 , 0.231	Depositor DCC
R_{free} test set	1518 reflections (0.66%)	wwPDB-VP
Wilson B-factor (Å ²)	29.2	Xtriage
Anisotropy	0.032	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.41 , 63.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	26329	wwPDB-VP
Average B, all atoms (Å ²)	43.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 37.07 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 4.5360e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹ Intensities estimated from amplitudes.

² Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: MHF, ACT, FAD, TCP, CL

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	0.40	0/4181	0.54	0/5656
1	C	0.40	0/4157	0.55	0/5625
1	D	0.57	4/4042 (0.1%)	0.73	8/5471 (0.1%)
1	E	0.40	0/4154	0.55	0/5622
1	F	0.35	0/4004	0.49	0/5419
2	B	0.37	0/4106	0.52	0/5561
3	G	0.68	0/83	1.58	1/124 (0.8%)
3	H	0.71	0/83	1.79	1/124 (0.8%)
3	I	0.81	0/83	1.86	3/124 (2.4%)
3	J	0.98	0/83	8.87	7/124 (5.6%)
3	K	0.74	0/64	1.67	1/94 (1.1%)
3	L	0.78	0/46	1.73	1/67 (1.5%)
All	All	0.43	4/25086 (0.0%)	0.81	22/34011 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	D	0	2
3	J	1	0
All	All	1	2

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	35[A]	LYS	C-N	-18.77	0.90	1.34
1	D	37[A]	LYS	C-N	-15.39	1.05	1.33
1	D	36	ARG	C-N	9.70	1.56	1.34
1	D	30	SER	C-N	5.17	1.46	1.34

All (22) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	J	1	DT	O4'-C1'-N1	90.06	171.04	108.00
1	D	30	SER	O-C-N	-31.84	71.76	122.70
3	J	1	DT	C6-N1-C1'	-22.21	87.08	120.40
3	J	1	DT	C2-N1-C1'	19.79	149.86	118.20
3	J	1	DT	N1-C1'-C2'	-18.01	78.39	112.60
1	D	36	ARG	O-C-N	-10.44	106.00	122.70
3	H	1	DT	P-O3'-C3'	9.57	131.18	119.70
1	D	36	ARG	C-N-CA	8.58	143.14	121.70
3	I	1	DT	O4'-C1'-N1	7.58	113.31	108.00
1	D	30	SER	CA-C-N	-7.12	101.55	117.20
1	D	36	ARG	CA-C-N	7.05	132.71	117.20
1	D	30	SER	C-N-CA	-6.67	105.03	121.70
1	D	35[A]	LYS	CA-C-N	-6.23	103.50	117.20
3	I	4	DT	O4'-C1'-N1	-6.00	103.80	108.00
3	I	5	DT	O4'-C1'-N1	5.86	112.10	108.00
3	J	1	DT	C6-C5-C7	-5.68	119.49	122.90
3	K	4	DT	O4'-C1'-N1	-5.68	104.03	108.00
3	G	5	DT	O4'-C1'-N1	5.61	111.92	108.00
1	D	35[A]	LYS	O-C-N	5.41	131.36	122.70
3	J	1	DT	N1-C2-O2	5.35	127.38	123.10
3	L	2	DT	O4'-C1'-N1	5.22	111.65	108.00
3	J	1	DT	C5-C4-O4	-5.01	121.39	124.90

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
3	J	1	DT	C1'

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	D	30	SER	Mainchain
1	D	35[A]	LYS	Mainchain

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	4068	0	3988	21	0
1	C	4042	0	3967	20	0
1	D	3933	0	3840	18	0
1	E	4042	0	3957	27	0
1	F	3896	0	3812	20	0
2	B	3995	0	3896	24	0
3	G	95	0	64	2	0
3	H	95	0	64	3	0
3	I	95	0	64	4	0
3	J	95	0	64	3	0
3	K	78	0	51	3	0
3	L	62	0	38	2	0
4	A	53	0	31	0	0
4	B	53	0	31	0	0
4	C	53	0	31	0	0
4	D	53	0	31	0	0
4	E	53	0	31	0	0
4	F	53	0	31	0	0
5	A	33	0	21	0	0
5	B	33	0	21	0	0
5	C	33	0	21	0	0
5	D	33	0	21	0	0
5	E	33	0	21	0	0
5	F	33	0	21	0	0
6	A	1	0	0	0	0
6	B	2	0	0	0	0
6	C	2	0	0	0	0
6	D	1	0	0	0	0
6	E	1	0	0	0	0
6	F	1	0	0	0	0
7	B	4	0	3	0	0
8	A	274	0	0	3	0
8	B	178	0	0	1	0
8	C	257	0	0	1	0
8	D	209	0	0	3	0
8	E	233	0	0	2	0
8	F	120	0	0	1	0
8	G	7	0	0	0	0
8	H	4	0	0	0	0
8	I	10	0	0	0	0
8	J	5	0	0	0	0
8	K	7	0	0	0	0
8	L	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	26329	0	24120	141	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 3.

All (141) 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:D:74:LEU:HD21	1:D:235:LEU:HD11	1.40	0.99
3:I:2:DT:H72	3:I:3:TCP:H72	1.49	0.95
1:A:34:VAL:HG11	1:A:62:TRP:CH2	2.06	0.90
1:D:17:SER:CB	8:D:2004:HOH:O	2.21	0.89
2:B:74:LEU:HD21	2:B:235:LEU:HD11	1.55	0.88
2:B:160:LEU:HD22	2:B:167:THR:HG21	1.57	0.87
2:B:47:ARG:HD3	8:B:2049:HOH:O	1.75	0.86
1:D:74:LEU:HD23	1:D:235:LEU:HD21	1.56	0.85
1:E:190:LEU:HD23	1:E:335:LEU:HD13	1.60	0.84
1:C:74:LEU:HD21	1:C:235:LEU:HD11	1.59	0.82
3:J:2:DT:H72	3:J:3:TCP:H72	1.60	0.82
1:D:17:SER:OG	8:D:2004:HOH:O	1.98	0.80
1:F:74:LEU:HD21	1:F:235:LEU:HD11	1.61	0.80
3:G:2:DT:H72	3:G:3:TCP:H72	1.61	0.80
3:H:2:DT:H72	3:H:3:TCP:H72	1.64	0.79
1:E:350:ARG:CZ	1:E:350:ARG:HB2	2.12	0.79
1:C:74:LEU:HD23	1:C:235:LEU:HD21	1.64	0.79
1:E:74:LEU:HD21	1:E:235:LEU:HD11	1.63	0.79
1:D:17:SER:HB3	8:D:2004:HOH:O	1.83	0.78
1:C:74:LEU:HD22	1:C:230:PRO:HG3	1.69	0.75
3:L:2:DT:H72	3:L:3:TCP:H72	1.68	0.75
1:E:47:ARG:HD3	8:E:2070:HOH:O	1.87	0.73
3:K:2:DT:H72	3:K:3:TCP:H72	1.71	0.72
2:B:28:LEU:HD23	2:B:29:PRO:HD2	1.73	0.71
2:B:160:LEU:HD22	2:B:167:THR:CG2	2.20	0.71
1:F:74:LEU:HD22	1:F:230:PRO:HG3	1.75	0.68
1:A:482:PRO:O	1:A:486:MET:CE	2.42	0.68
2:B:74:LEU:HD22	2:B:230:PRO:HG3	1.77	0.67
2:B:74:LEU:HD22	2:B:230:PRO:CG	2.26	0.67
1:C:74:LEU:CD2	1:C:235:LEU:HD21	2.27	0.65
2:B:439:ASN:HD22	2:B:441:PRO:HD2	1.62	0.65
1:C:74:LEU:HD22	1:C:230:PRO:CG	2.28	0.64
2:B:74:LEU:HD23	2:B:235:LEU:HD21	1.79	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:74:LEU:HD21	1:D:235:LEU:CD1	2.24	0.62
1:C:74:LEU:HD21	1:C:235:LEU:CD1	2.29	0.62
2:B:74:LEU:HD21	2:B:235:LEU:CD1	2.29	0.61
3:I:2:DT:C7	3:I:3:TCP:H72	2.28	0.61
1:A:31:SER:O	1:A:34:VAL:HG12	2.01	0.61
1:C:3:HIS:CG	1:C:4:ILE:H	2.19	0.60
1:F:373:TYR:CE1	1:F:494:LEU:HD21	2.36	0.60
1:A:47:ARG:HD3	8:A:2087:HOH:O	2.01	0.60
1:E:74:LEU:HD23	1:E:235:LEU:HD21	1.83	0.60
1:E:190:LEU:CD2	1:E:335:LEU:HD13	2.31	0.59
1:A:160:LEU:HD22	1:A:167:THR:HG21	1.84	0.59
1:C:47:ARG:HD3	8:C:2070:HOH:O	2.02	0.58
1:F:74:LEU:CD2	1:F:235:LEU:HD21	2.34	0.58
1:E:174:GLY:O	1:E:175:SER:OG	2.17	0.58
1:A:498:ASN:HD22	1:A:498:ASN:N	2.01	0.57
1:F:74:LEU:HD22	1:F:230:PRO:CG	2.32	0.57
1:E:74:LEU:HD22	1:E:230:PRO:CG	2.33	0.57
1:F:174:GLY:O	1:F:175:SER:OG	2.16	0.57
1:E:350:ARG:CB	1:E:350:ARG:CZ	2.83	0.57
1:A:28:LEU:HD23	1:A:29:PRO:HD2	1.86	0.56
1:A:438:VAL:O	8:A:2243:HOH:O	2.17	0.56
1:D:165:ASN:O	1:D:166:SER:OG	2.13	0.56
1:F:47:ARG:HD3	8:F:2021:HOH:O	2.04	0.56
1:A:482:PRO:O	1:A:486:MET:HE2	2.08	0.54
1:F:74:LEU:HD23	1:F:235:LEU:HD21	1.88	0.54
1:C:190:LEU:HD23	1:C:335:LEU:HD13	1.90	0.53
1:E:74:LEU:CD2	1:E:235:LEU:HD21	2.38	0.53
1:F:184:PRO:HD3	1:F:205[A]:CYS:SG	2.49	0.53
1:E:160:LEU:O	1:E:163:VAL:HG22	2.09	0.52
1:F:28:LEU:HD23	1:F:29:PRO:HD2	1.91	0.52
1:F:74:LEU:HD21	1:F:235:LEU:CD1	2.35	0.52
2:B:160:LEU:O	2:B:163:VAL:HG22	2.10	0.52
1:F:62:TRP:HA	1:F:68:ILE:HD11	1.90	0.51
1:E:74:LEU:HD22	1:E:230:PRO:HG3	1.91	0.51
1:A:0:MET:O	1:A:1:ASN:CB	2.59	0.50
1:E:350:ARG:NH2	1:E:439:GLY:O	2.44	0.50
1:D:74:LEU:CD2	1:D:235:LEU:HD21	2.34	0.50
1:E:74:LEU:HD21	1:E:235:LEU:CD1	2.39	0.50
3:K:2:DT:C5	3:K:3:TCP:C5	2.95	0.50
1:C:311:LYS:CE	1:E:249:VAL:HG13	2.43	0.49
1:F:49:ASP:OD2	1:F:142:HIS:HD2	1.96	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:74:LEU:CD2	1:D:235:LEU:HD11	2.29	0.48
1:E:56:ASP:OD1	1:E:211:THR:OG1	2.16	0.47
1:A:147:SER:OG	8:A:2094:HOH:O	2.20	0.47
1:D:367:ARG:HG3	1:D:415:TRP:CE2	2.50	0.47
2:B:439:ASN:ND2	2:B:441:PRO:HD2	2.27	0.47
1:C:160:LEU:O	1:C:163:VAL:HG22	2.15	0.47
1:E:16:ASP:O	1:E:20:ILE:HD13	2.14	0.47
1:A:355:LYS:HG3	1:A:356:TRP:N	2.30	0.46
1:F:110:MET:HE2	1:F:115:ASN:HD21	1.80	0.46
1:A:160:LEU:HD22	1:A:167:THR:CG2	2.45	0.46
2:B:319:THR:O	2:B:322:VAL:HG12	2.15	0.46
1:D:184:PRO:HD3	1:D:205[A]:CYS:SG	2.56	0.46
1:D:444:GLU:OE1	3:J:1:DT:H1'	2.15	0.46
1:E:165:ASN:O	1:E:166:SER:OG	2.22	0.46
1:E:434:TYR:CE2	3:K:3:TCP:H71	2.49	0.46
1:C:367:ARG:HG3	1:C:415:TRP:CE2	2.51	0.46
1:E:174:GLY:O	1:E:175:SER:CB	2.64	0.46
1:E:496:HIS:O	1:E:497:GLY:C	2.54	0.46
1:E:190:LEU:HD23	1:E:335:LEU:CD1	2.38	0.46
1:C:62:TRP:HA	1:C:68:ILE:HD11	1.97	0.45
1:F:28:LEU:HD22	1:F:30:SER:O	2.16	0.45
3:L:2:DT:C7	3:L:3:TCP:H72	2.40	0.45
1:A:367:ARG:HG3	1:A:415:TRP:CE2	2.51	0.45
2:B:74:LEU:CD2	2:B:235:LEU:HD21	2.46	0.45
1:C:311:LYS:NZ	1:E:249:VAL:HG13	2.32	0.45
1:F:366:TRP:CD2	1:F:401:LEU:HD12	2.52	0.44
3:J:2:DT:C7	3:J:3:TCP:H72	2.40	0.44
1:C:319:THR:O	1:C:322:VAL:HG12	2.17	0.44
3:G:2:DT:C7	3:G:3:TCP:H72	2.40	0.44
1:A:160:LEU:O	1:A:163:VAL:HG22	2.17	0.44
1:A:482:PRO:O	1:A:486:MET:HE3	2.16	0.44
2:B:74:LEU:HD22	2:B:230:PRO:HG2	1.97	0.44
1:F:187:VAL:HG21	1:F:337:ILE:HG21	2.00	0.44
2:B:117:LEU:HD12	2:B:226:TRP:HA	2.00	0.43
2:B:28:LEU:HD23	2:B:29:PRO:CD	2.46	0.43
3:I:2:DT:C5	3:I:3:TCP:C5	3.01	0.43
2:B:34:VAL:HG13	2:B:34:VAL:O	2.17	0.43
1:C:187:VAL:HG21	1:C:337:ILE:HG21	2.00	0.43
1:A:174:GLY:O	1:A:175:SER:HB2	2.19	0.43
1:D:469:GLN:HE21	1:D:469:GLN:HB3	1.71	0.43
1:C:190:LEU:HD23	1:C:335:LEU:CD1	2.49	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:74:LEU:HD22	1:D:230:PRO:CG	2.48	0.43
1:E:350:ARG:CZ	1:E:442:PRO:HG3	2.48	0.43
1:A:350:ARG:HB3	1:A:440:ASN:OD1	2.18	0.43
1:F:491:VAL:HG13	1:F:492:VAL:HG22	2.00	0.43
1:C:311:LYS:HZ2	1:E:100:GLU:CD	2.22	0.42
1:A:34:VAL:O	1:A:34:VAL:HG13	2.19	0.42
2:B:165:ASN:O	2:B:166:SER:OG	2.29	0.42
1:F:28:LEU:HD23	1:F:29:PRO:CD	2.49	0.42
1:A:29:PRO:O	1:A:30:SER:O	2.38	0.41
1:E:426:CYS:SG	8:E:2210:HOH:O	2.62	0.41
2:B:478:LYS:HB3	2:B:486:MET:HE3	2.02	0.41
1:D:174:GLY:O	1:D:175:SER:OG	2.24	0.41
2:B:34:VAL:HG11	2:B:62:TRP:CZ3	2.56	0.41
1:C:3:HIS:CG	1:C:4:ILE:N	2.85	0.41
2:B:187:VAL:HG21	2:B:337:ILE:HG21	2.03	0.41
1:E:62:TRP:HA	1:E:68:ILE:HD11	2.02	0.41
1:A:355:LYS:CG	1:A:356:TRP:N	2.83	0.41
1:D:28:LEU:HD23	1:D:29:PRO:HD2	2.03	0.41
1:F:30:SER:OG	1:F:31:SER:N	2.54	0.41
1:D:449:SER:O	1:D:453:GLN:HG2	2.20	0.41
2:B:439:ASN:ND2	2:B:441:PRO:HG2	2.36	0.40
1:D:117:LEU:HD12	1:D:226:TRP:HA	2.03	0.40
3:H:2:DT:C7	3:H:3:TCP:H72	2.41	0.40
2:B:115:ASN:HB3	2:B:226:TRP:CZ3	2.56	0.40
1:C:434:TYR:CE2	3:I:3:TCP:H71	2.57	0.40
3:H:1:DT:H4'	3:H:2:DT:OP2	2.22	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	499/526 (95%)	479 (96%)	14 (3%)	6 (1%)	13	7
1	C	494/526 (94%)	475 (96%)	19 (4%)	0	100	100
1	D	481/526 (91%)	460 (96%)	19 (4%)	2 (0%)	34	30
1	E	494/526 (94%)	472 (96%)	20 (4%)	2 (0%)	34	30
1	F	475/526 (90%)	456 (96%)	16 (3%)	3 (1%)	25	19
2	B	487/525 (93%)	465 (96%)	19 (4%)	3 (1%)	25	19
All	All	2930/3155 (93%)	2807 (96%)	107 (4%)	16 (0%)	29	23

All (16) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1	ASN
1	A	30	SER
1	E	30	SER
1	A	355	LYS
1	A	356	TRP
2	B	31	SER
1	D	30	SER
2	B	482	PRO
1	E	175	SER
1	F	31	SER
1	A	175	SER
2	B	354	GLY
1	F	356	TRP
1	A	166	SER
1	D	175	SER
1	F	166	SER

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	440/459 (96%)	435 (99%)	5 (1%)	73	78
1	C	438/459 (95%)	429 (98%)	9 (2%)	53	57

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	D	426/459 (93%)	420 (99%)	6 (1%)	67	72
1	E	437/459 (95%)	429 (98%)	8 (2%)	59	63
1	F	422/459 (92%)	417 (99%)	5 (1%)	71	76
2	B	432/459 (94%)	427 (99%)	5 (1%)	71	76
All	All	2595/2754 (94%)	2557 (98%)	38 (2%)	65	69

All (38) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	25	ARG
1	A	28	LEU
1	A	185	PHE
1	A	472	ARG
1	A	498	ASN
2	B	28	LEU
2	B	35	LYS
2	B	185	PHE
2	B	212	ARG
2	B	485	LEU
1	C	28	LEU
1	C	35	LYS
1	C	167	THR
1	C	185	PHE
1	C	247	ARG
1	C	317	ASN
1	C	335	LEU
1	C	355	LYS
1	C	477	GLU
1	D	17	SER
1	D	28	LEU
1	D	31[A]	SER
1	D	35[A]	LYS
1	D	185	PHE
1	D	469	GLN
1	E	35	LYS
1	E	168	LYS
1	E	185	PHE
1	E	335	LEU
1	E	350	ARG
1	E	403	ARG
1	E	469	GLN

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Mol	Chain	Res	Type
1	E	495	LYS
1	F	35	LYS
1	F	185	PHE
1	F	212	ARG
1	F	440	ASN
1	F	469	GLN

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (13) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	480	HIS
1	A	498	ASN
2	B	277	ASN
2	B	456	ASN
1	D	86	ASN
1	D	277	ASN
1	D	360	GLN
1	D	469	GLN
1	E	157	ASN
1	F	86	ASN
1	F	142	HIS
1	F	277	ASN
1	F	469	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

6 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	TCP	G	3	3	16,19,19	1.41	3 (18%)	17,27,27	3.29	2 (11%)
3	TCP	K	3	3	16,19,19	1.36	2 (12%)	17,27,27	3.54	3 (17%)
3	TCP	L	3	3	16,19,19	1.42	2 (12%)	17,27,27	3.34	1 (5%)
3	TCP	I	3	3	16,19,19	1.39	2 (12%)	17,27,27	3.39	3 (17%)
3	TCP	J	3	3	16,19,19	1.42	2 (12%)	17,27,27	3.35	3 (17%)
3	TCP	H	3	3	16,19,19	1.39	2 (12%)	17,27,27	3.37	2 (11%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	TCP	G	3	3	-	1/4/19/19	0/2/2/2
3	TCP	K	3	3	-	1/4/19/19	0/2/2/2
3	TCP	L	3	3	-	1/4/19/19	0/2/2/2
3	TCP	I	3	3	-	1/4/19/19	0/2/2/2
3	TCP	J	3	3	-	1/4/19/19	0/2/2/2
3	TCP	H	3	3	-	1/4/19/19	0/2/2/2

All (13) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	I	3	TCP	O5'-CP	3.57	1.60	1.42
3	L	3	TCP	O5'-CP	3.52	1.59	1.42
3	J	3	TCP	O5'-CP	3.52	1.59	1.42
3	H	3	TCP	O5'-CP	3.47	1.59	1.42
3	G	3	TCP	O5'-CP	3.45	1.59	1.42
3	J	3	TCP	C4-N3	3.44	1.39	1.33
3	K	3	TCP	O5'-CP	3.41	1.59	1.42
3	L	3	TCP	C4-N3	3.41	1.39	1.33
3	I	3	TCP	C4-N3	3.20	1.38	1.33
3	H	3	TCP	C4-N3	3.17	1.38	1.33
3	K	3	TCP	C4-N3	3.11	1.38	1.33
3	G	3	TCP	C4-N3	3.06	1.38	1.33
3	G	3	TCP	C6-C5	-2.04	1.34	1.40

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	K	3	TCP	C4-N3-C2	13.63	126.65	115.14

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	H	3	TCP	C4-N3-C2	13.16	126.25	115.14
3	L	3	TCP	C4-N3-C2	13.10	126.20	115.14
3	I	3	TCP	C4-N3-C2	13.08	126.19	115.14
3	J	3	TCP	C4-N3-C2	13.07	126.18	115.14
3	G	3	TCP	C4-N3-C2	12.83	125.97	115.14
3	K	3	TCP	C4'-O4'-C1'	-2.92	102.41	109.45
3	I	3	TCP	C4'-O4'-C1'	-2.48	103.45	109.45
3	J	3	TCP	C4'-O4'-C1'	-2.37	103.73	109.45
3	G	3	TCP	C4'-O4'-C1'	-2.27	103.97	109.45
3	H	3	TCP	C4'-O4'-C1'	-2.17	104.21	109.45
3	I	3	TCP	O4'-C1'-C2'	-2.10	102.28	106.25
3	J	3	TCP	O4'-C1'-C2'	-2.10	102.28	106.25
3	K	3	TCP	C2'-C1'-N1	-2.05	109.53	114.27

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	G	3	TCP	O4'-C1'-N1-C6
3	K	3	TCP	O4'-C1'-N1-C6
3	L	3	TCP	O4'-C1'-N1-C6
3	I	3	TCP	O4'-C1'-N1-C6
3	J	3	TCP	O4'-C1'-N1-C6
3	H	3	TCP	O4'-C1'-N1-C6

There are no ring outliers.

6 monomers are involved in 15 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	G	3	TCP	2	0
3	K	3	TCP	3	0
3	L	3	TCP	2	0
3	I	3	TCP	4	0
3	J	3	TCP	2	0
3	H	3	TCP	2	0

5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry

Of 21 ligands modelled in this entry, 8 are monoatomic - leaving 13 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	MHF	E	999	-	28,36,36	1.33	2 (7%)	30,52,52	1.64	6 (20%)
5	MHF	C	999	-	28,36,36	1.41	2 (7%)	30,52,52	1.68	6 (20%)
7	ACT	B	1500	-	1,3,3	1.72	0	0,3,3	0.00	-
4	FAD	B	998	-	51,58,58	1.41	7 (13%)	60,89,89	1.53	8 (13%)
4	FAD	A	998	-	51,58,58	1.42	7 (13%)	60,89,89	1.59	9 (15%)
4	FAD	D	998	-	51,58,58	1.42	7 (13%)	60,89,89	1.57	9 (15%)
4	FAD	C	998	-	51,58,58	1.44	7 (13%)	60,89,89	1.71	8 (13%)
4	FAD	F	998	-	51,58,58	1.38	7 (13%)	60,89,89	1.53	9 (15%)
4	FAD	E	998	-	51,58,58	1.50	7 (13%)	60,89,89	1.54	8 (13%)
5	MHF	F	999	-	28,36,36	1.37	2 (7%)	30,52,52	1.70	6 (20%)
5	MHF	D	999	-	28,36,36	1.26	2 (7%)	30,52,52	1.60	6 (20%)
5	MHF	B	999	-	28,36,36	1.34	2 (7%)	30,52,52	1.73	7 (23%)
5	MHF	A	999	-	28,36,36	1.31	2 (7%)	30,52,52	1.67	7 (23%)

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
5	MHF	E	999	-	-	2/15/42/42	0/4/4/4
5	MHF	C	999	-	-	2/15/42/42	0/4/4/4
4	FAD	B	998	-	-	2/30/50/50	0/6/6/6
4	FAD	A	998	-	-	3/30/50/50	0/6/6/6
4	FAD	D	998	-	-	3/30/50/50	0/6/6/6
4	FAD	C	998	-	-	2/30/50/50	0/6/6/6
4	FAD	F	998	-	-	3/30/50/50	0/6/6/6

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	FAD	E	998	-	-	2/30/50/50	0/6/6/6
5	MHF	F	999	-	-	2/15/42/42	0/4/4/4
5	MHF	D	999	-	-	2/15/42/42	0/4/4/4
5	MHF	B	999	-	-	2/15/42/42	0/4/4/4
5	MHF	A	999	-	-	3/15/42/42	0/4/4/4

All (54) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	F	999	MHF	C4-C4A	5.37	1.48	1.41
5	B	999	MHF	C4-C4A	5.17	1.48	1.41
5	C	999	MHF	C4-C4A	5.08	1.48	1.41
5	E	999	MHF	C4-C4A	4.97	1.48	1.41
5	D	999	MHF	C4-C4A	4.62	1.47	1.41
5	A	999	MHF	C4-C4A	4.58	1.47	1.41
4	B	998	FAD	C10-N1	4.49	1.39	1.33
4	D	998	FAD	C4X-N5	4.45	1.39	1.33
4	E	998	FAD	C10-N1	4.35	1.38	1.33
4	E	998	FAD	C2A-N3A	4.31	1.39	1.32
4	D	998	FAD	C10-N1	4.25	1.38	1.33
4	C	998	FAD	C2A-N3A	4.23	1.38	1.32
4	E	998	FAD	C4X-N5	4.13	1.39	1.33
4	B	998	FAD	C4X-N5	4.08	1.39	1.33
4	A	998	FAD	C2A-N3A	3.98	1.38	1.32
4	C	998	FAD	C4X-N5	3.98	1.39	1.33
4	E	998	FAD	C1'-N10	3.97	1.52	1.48
4	F	998	FAD	C2A-N3A	3.95	1.38	1.32
4	C	998	FAD	C10-N1	3.90	1.38	1.33
4	A	998	FAD	C4X-N5	3.90	1.38	1.33
4	A	998	FAD	C10-N1	3.84	1.38	1.33
4	F	998	FAD	C10-N1	3.80	1.38	1.33
5	A	999	MHF	C4A-C8A	3.79	1.48	1.41
4	F	998	FAD	C4X-N5	3.79	1.38	1.33
5	C	999	MHF	C4A-C8A	3.74	1.48	1.41
4	D	998	FAD	C2A-N3A	3.68	1.38	1.32
4	B	998	FAD	C2A-N3A	3.59	1.37	1.32
4	A	998	FAD	C1'-N10	3.57	1.51	1.48
4	D	998	FAD	C1'-N10	3.54	1.51	1.48
5	B	999	MHF	C4A-C8A	3.48	1.48	1.41
4	C	998	FAD	C1'-N10	3.44	1.51	1.48
5	E	999	MHF	C4A-C8A	3.43	1.48	1.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	F	999	MHF	C4A-C8A	3.43	1.48	1.41
5	D	999	MHF	C4A-C8A	3.28	1.47	1.41
4	B	998	FAD	C1'-N10	3.25	1.51	1.48
4	A	998	FAD	C4-N3	3.23	1.38	1.33
4	F	998	FAD	C1'-N10	3.22	1.51	1.48
4	E	998	FAD	C4-N3	3.01	1.38	1.33
4	D	998	FAD	C4-N3	2.95	1.38	1.33
4	E	998	FAD	C5X-N5	2.87	1.40	1.35
4	B	998	FAD	C4-N3	2.86	1.38	1.33
4	F	998	FAD	C4-N3	2.79	1.37	1.33
4	A	998	FAD	C5X-N5	2.76	1.39	1.35
4	C	998	FAD	C4-N3	2.68	1.37	1.33
4	C	998	FAD	C5X-N5	2.61	1.39	1.35
4	C	998	FAD	C2A-N1A	2.59	1.38	1.33
4	D	998	FAD	C5X-N5	2.59	1.39	1.35
4	E	998	FAD	C2A-N1A	2.59	1.38	1.33
4	F	998	FAD	C2A-N1A	2.52	1.38	1.33
4	B	998	FAD	C2A-N1A	2.46	1.38	1.33
4	B	998	FAD	C5X-N5	2.35	1.39	1.35
4	F	998	FAD	C5X-N5	2.32	1.39	1.35
4	D	998	FAD	C2A-N1A	2.24	1.38	1.33
4	A	998	FAD	C2A-N1A	2.20	1.38	1.33

All (89) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	C	998	FAD	C4-N3-C2	6.88	120.95	115.14
4	A	998	FAD	C4-N3-C2	5.95	120.17	115.14
4	E	998	FAD	C4-N3-C2	5.61	119.88	115.14
4	C	998	FAD	C1'-N10-C9A	5.59	122.70	118.29
4	B	998	FAD	N3A-C2A-N1A	-5.53	120.03	128.68
4	D	998	FAD	C4-N3-C2	5.45	119.74	115.14
4	A	998	FAD	N3A-C2A-N1A	-5.42	120.20	128.68
4	F	998	FAD	C4-N3-C2	5.41	119.71	115.14
4	D	998	FAD	N3A-C2A-N1A	-5.31	120.39	128.68
4	B	998	FAD	C4-N3-C2	5.24	119.57	115.14
4	C	998	FAD	N3A-C2A-N1A	-5.23	120.50	128.68
4	E	998	FAD	N3A-C2A-N1A	-5.21	120.53	128.68
4	F	998	FAD	N3A-C2A-N1A	-5.11	120.69	128.68
5	B	999	MHF	N5-C11-N10	-4.54	96.89	103.38
4	F	998	FAD	C1'-N10-C9A	4.50	121.84	118.29
5	F	999	MHF	N5-C11-N10	-4.49	96.95	103.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	D	998	FAD	C1'-N10-C9A	4.36	121.73	118.29
4	E	998	FAD	C1'-N10-C9A	4.14	121.55	118.29
5	E	999	MHF	N5-C11-N10	-4.11	97.50	103.38
5	D	999	MHF	N5-C11-N10	-4.04	97.60	103.38
4	A	998	FAD	C1'-N10-C9A	4.00	121.44	118.29
4	B	998	FAD	C1'-N10-C9A	3.97	121.42	118.29
5	A	999	MHF	N5-C11-N10	-3.96	97.72	103.38
5	C	999	MHF	C4-C4A-C8A	3.94	117.52	114.44
5	B	999	MHF	C4-C4A-C8A	3.88	117.47	114.44
5	C	999	MHF	N5-C11-N10	-3.85	97.87	103.38
5	A	999	MHF	C4-C4A-C8A	3.75	117.37	114.44
5	B	999	MHF	C4-N3-C2	3.73	121.86	115.93
5	E	999	MHF	C4-N3-C2	3.72	121.85	115.93
5	A	999	MHF	C4-N3-C2	3.69	121.80	115.93
5	C	999	MHF	C4-N3-C2	3.68	121.78	115.93
5	F	999	MHF	C4-N3-C2	3.67	121.76	115.93
5	E	999	MHF	C4-C4A-C8A	3.63	117.28	114.44
4	B	998	FAD	C4X-N5-C5X	3.61	120.38	116.77
4	E	998	FAD	C4X-N5-C5X	3.47	120.24	116.77
5	D	999	MHF	C4-C4A-C8A	3.44	117.13	114.44
5	F	999	MHF	C4-C4A-C8A	3.42	117.12	114.44
5	D	999	MHF	C4-N3-C2	3.39	121.32	115.93
5	F	999	MHF	C2-N1-C8A	3.38	122.13	114.54
5	D	999	MHF	C2-N1-C8A	3.27	121.87	114.54
4	A	998	FAD	C10-C4X-N5	-3.20	119.05	121.26
4	C	998	FAD	C4X-C4-N3	-3.14	119.14	123.43
4	F	998	FAD	C10-C4X-N5	-3.13	119.09	121.26
4	F	998	FAD	C4X-N5-C5X	3.13	119.90	116.77
4	D	998	FAD	C4-C4X-N5	3.10	122.14	118.60
5	A	999	MHF	C2-N1-C8A	3.06	121.39	114.54
5	E	999	MHF	C2-N1-C8A	3.05	121.37	114.54
4	C	998	FAD	C4X-N5-C5X	3.03	119.80	116.77
5	C	999	MHF	C2-N1-C8A	3.03	121.32	114.54
4	E	998	FAD	C10-C4X-N5	-3.03	119.17	121.26
5	C	999	MHF	C4A-C4-N3	-2.91	117.16	123.14
4	B	998	FAD	C5X-C9A-N10	2.89	119.81	117.72
4	D	998	FAD	C5X-C9A-N10	2.88	119.80	117.72
4	A	998	FAD	C4X-C4-N3	-2.87	119.51	123.43
5	B	999	MHF	C2-N1-C8A	2.86	120.96	114.54
5	A	999	MHF	C4A-C4-N3	-2.86	117.27	123.14
5	B	999	MHF	C4A-C4-N3	-2.84	117.30	123.14
4	A	998	FAD	C4X-N5-C5X	2.83	119.60	116.77

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	E	999	MHF	C4A-C4-N3	-2.78	117.44	123.14
5	A	999	MHF	C12-C-N	2.77	122.38	117.06
5	B	999	MHF	C12-C-N	2.76	122.36	117.06
4	D	998	FAD	C10-C4X-N5	-2.68	119.40	121.26
4	C	998	FAD	C5X-C9A-N10	2.64	119.63	117.72
5	C	999	MHF	C12-C-N	2.64	122.12	117.06
4	E	998	FAD	C5X-C9A-N10	2.63	119.62	117.72
4	B	998	FAD	C10-C4X-N5	-2.60	119.46	121.26
4	F	998	FAD	C4X-C4-N3	-2.59	119.89	123.43
5	F	999	MHF	C4A-C4-N3	-2.58	117.83	123.14
4	E	998	FAD	C4X-C4-N3	-2.54	119.96	123.43
4	A	998	FAD	C4-C4X-N5	2.50	121.45	118.60
4	A	998	FAD	C5X-C9A-N10	2.50	119.52	117.72
5	D	999	MHF	C12-C-N	2.49	121.84	117.06
4	D	998	FAD	C4X-N5-C5X	2.49	119.26	116.77
5	E	999	MHF	C12-C-N	2.43	121.73	117.06
4	B	998	FAD	C4-C4X-N5	2.41	121.35	118.60
5	D	999	MHF	C4A-C4-N3	-2.38	118.25	123.14
4	F	998	FAD	C4-C4X-N5	2.38	121.32	118.60
4	C	998	FAD	C10-C4X-N5	-2.37	119.62	121.26
4	E	998	FAD	C4-C4X-N5	2.29	121.21	118.60
4	D	998	FAD	C4-C4X-C10	-2.26	118.45	119.95
4	A	998	FAD	C9A-N10-C10	-2.23	118.99	121.91
4	D	998	FAD	C9A-N10-C10	-2.22	119.00	121.91
4	F	998	FAD	C9A-N10-C10	-2.21	119.02	121.91
5	F	999	MHF	C12-C-N	2.20	121.28	117.06
4	C	998	FAD	C9A-N10-C10	-2.18	119.05	121.91
5	B	999	MHF	O-C-C12	-2.17	117.06	120.94
4	F	998	FAD	C5X-C9A-N10	2.15	119.27	117.72
5	A	999	MHF	O-C-C12	-2.02	117.33	120.94
4	B	998	FAD	C4X-C4-N3	-2.02	120.67	123.43

There are no chirality outliers.

All (28) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	C	999	MHF	C14-C15-N10-C9
5	F	999	MHF	C16-C15-N10-C9
5	A	999	MHF	C16-C15-N10-C9
5	F	999	MHF	C14-C15-N10-C9
5	D	999	MHF	C14-C15-N10-C9
5	D	999	MHF	C16-C15-N10-C9

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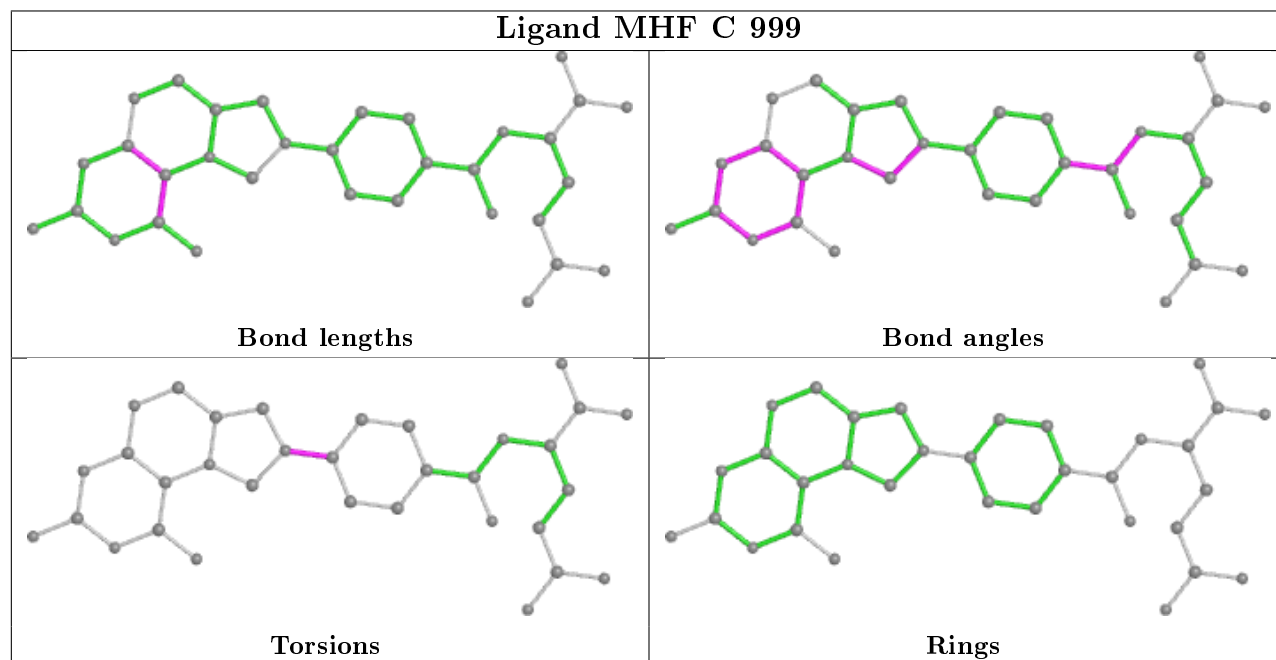
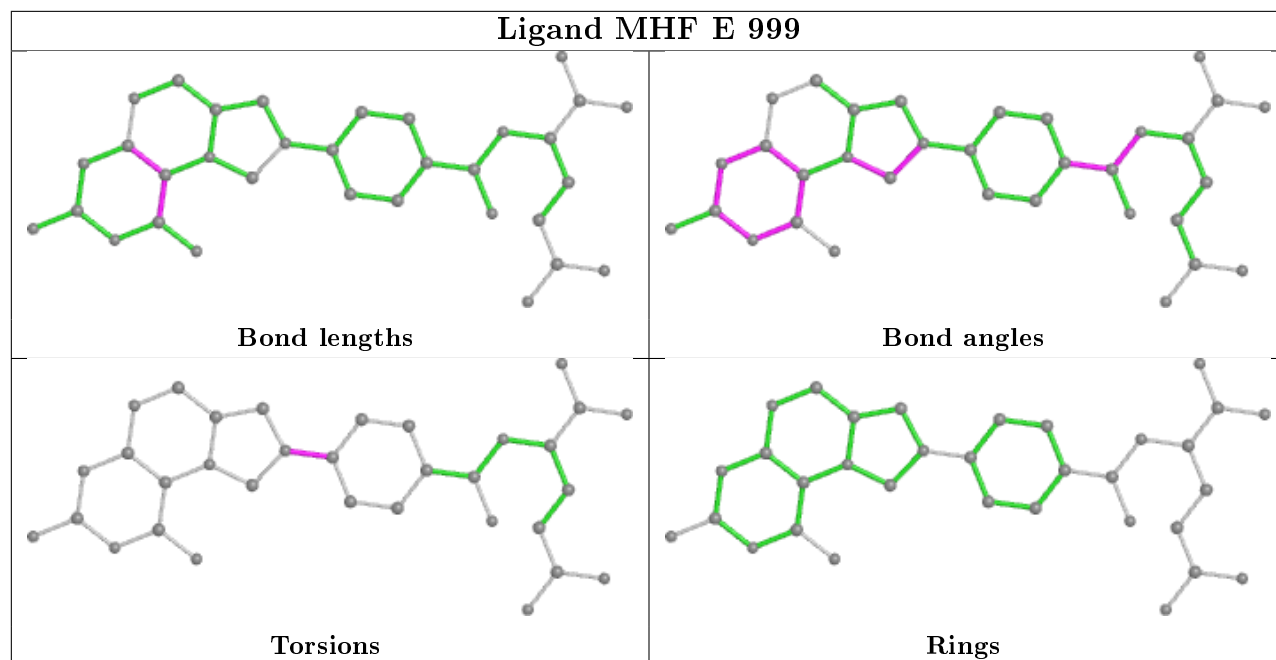
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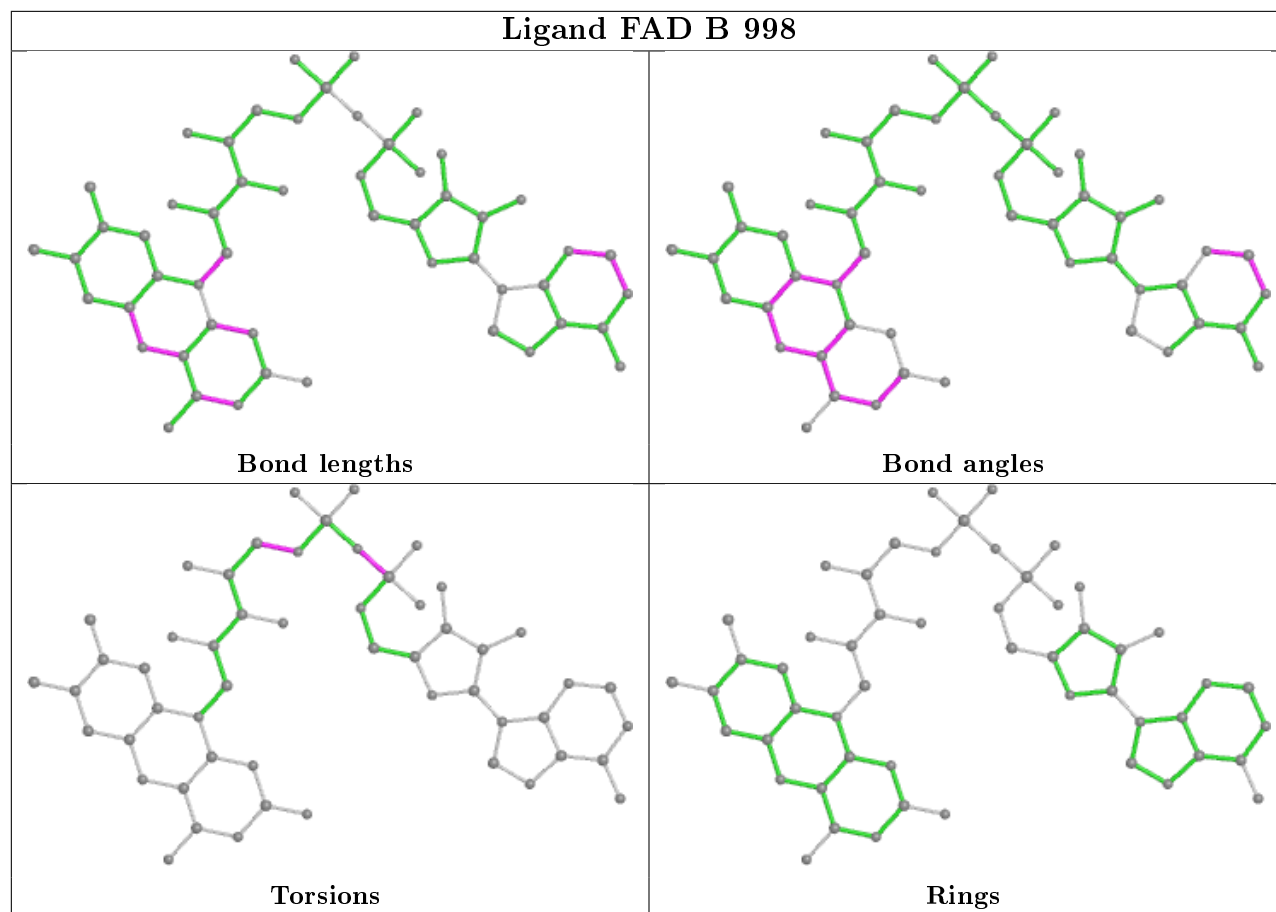
Mol	Chain	Res	Type	Atoms
5	B	999	MHF	C16-C15-N10-C9
5	A	999	MHF	C14-C15-N10-C9
5	E	999	MHF	C16-C15-N10-C9
5	C	999	MHF	C16-C15-N10-C9
5	B	999	MHF	C14-C15-N10-C9
5	E	999	MHF	C14-C15-N10-C9
4	D	998	FAD	P-O3P-PA-O1A
4	A	998	FAD	C4'-C5'-O5'-P
4	E	998	FAD	C4'-C5'-O5'-P
4	B	998	FAD	C4'-C5'-O5'-P
4	D	998	FAD	C4'-C5'-O5'-P
4	C	998	FAD	C4'-C5'-O5'-P
4	F	998	FAD	C4'-C5'-O5'-P
4	B	998	FAD	P-O3P-PA-O1A
4	A	998	FAD	C5B-O5B-PA-O3P
4	D	998	FAD	C5B-O5B-PA-O3P
4	C	998	FAD	C5B-O5B-PA-O3P
4	F	998	FAD	C5B-O5B-PA-O3P
4	A	998	FAD	P-O3P-PA-O2A
4	F	998	FAD	P-O3P-PA-O1A
4	E	998	FAD	P-O3P-PA-O1A
5	A	999	MHF	CA-CB-CG-CD

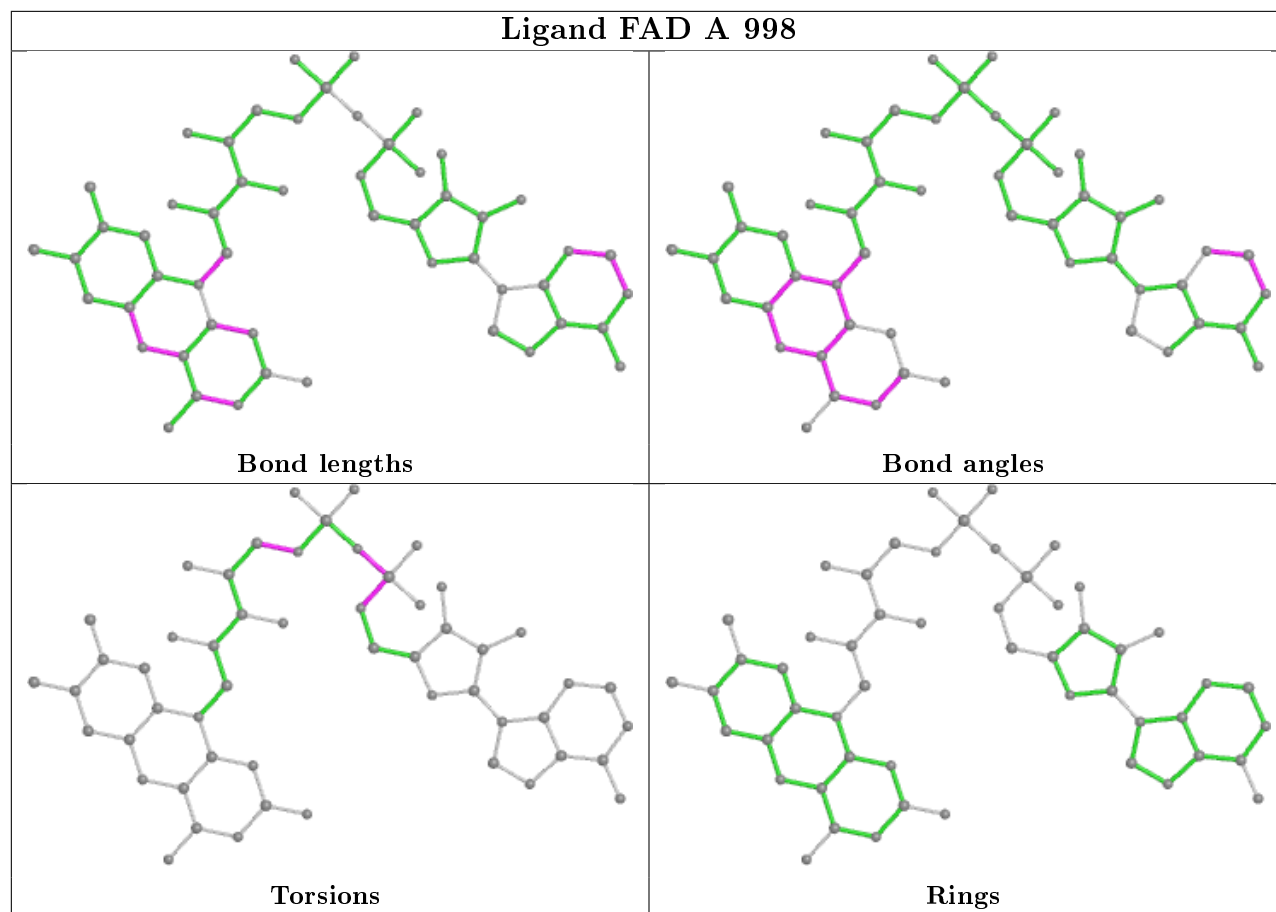
There are no ring outliers.

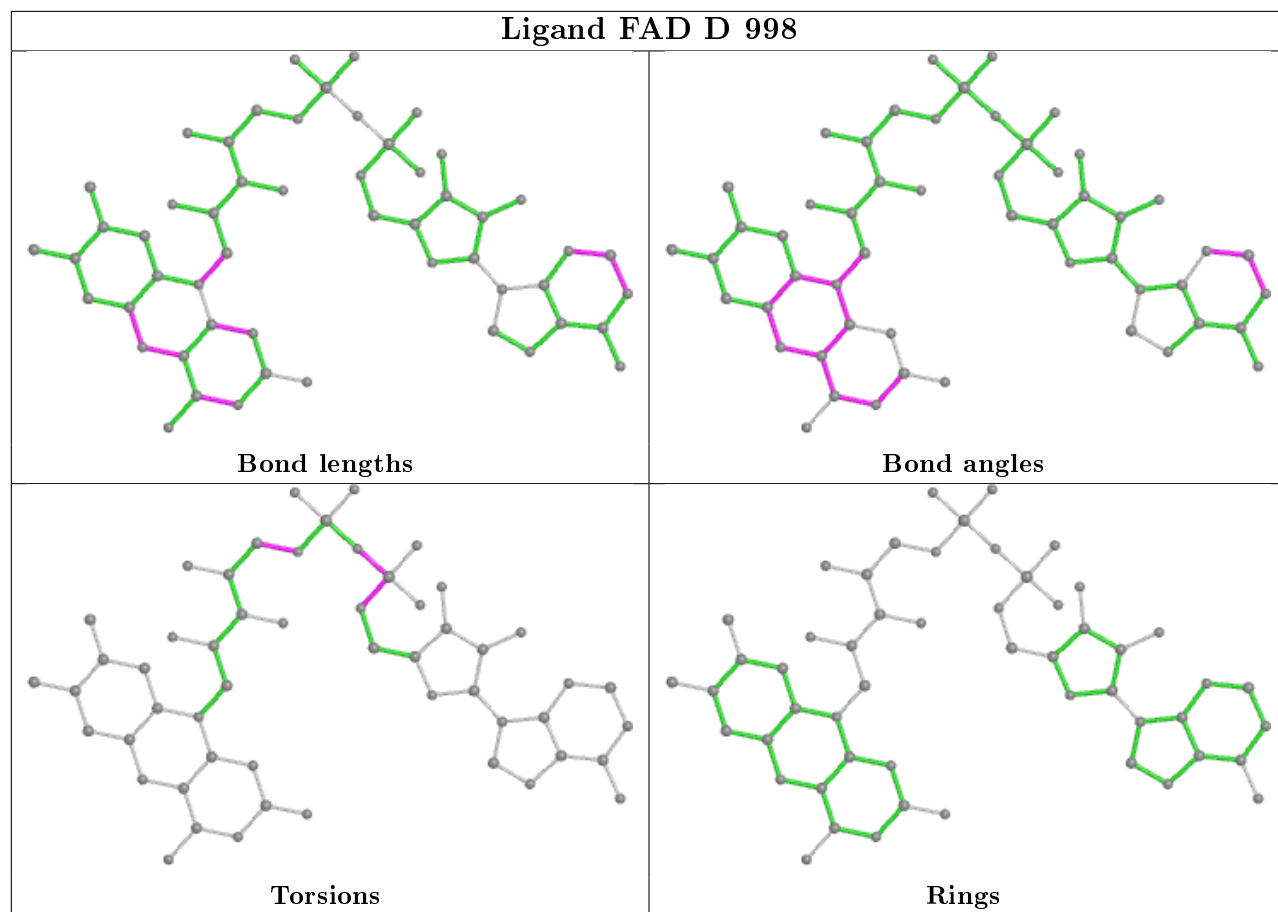
No monomer is involved in short contacts.

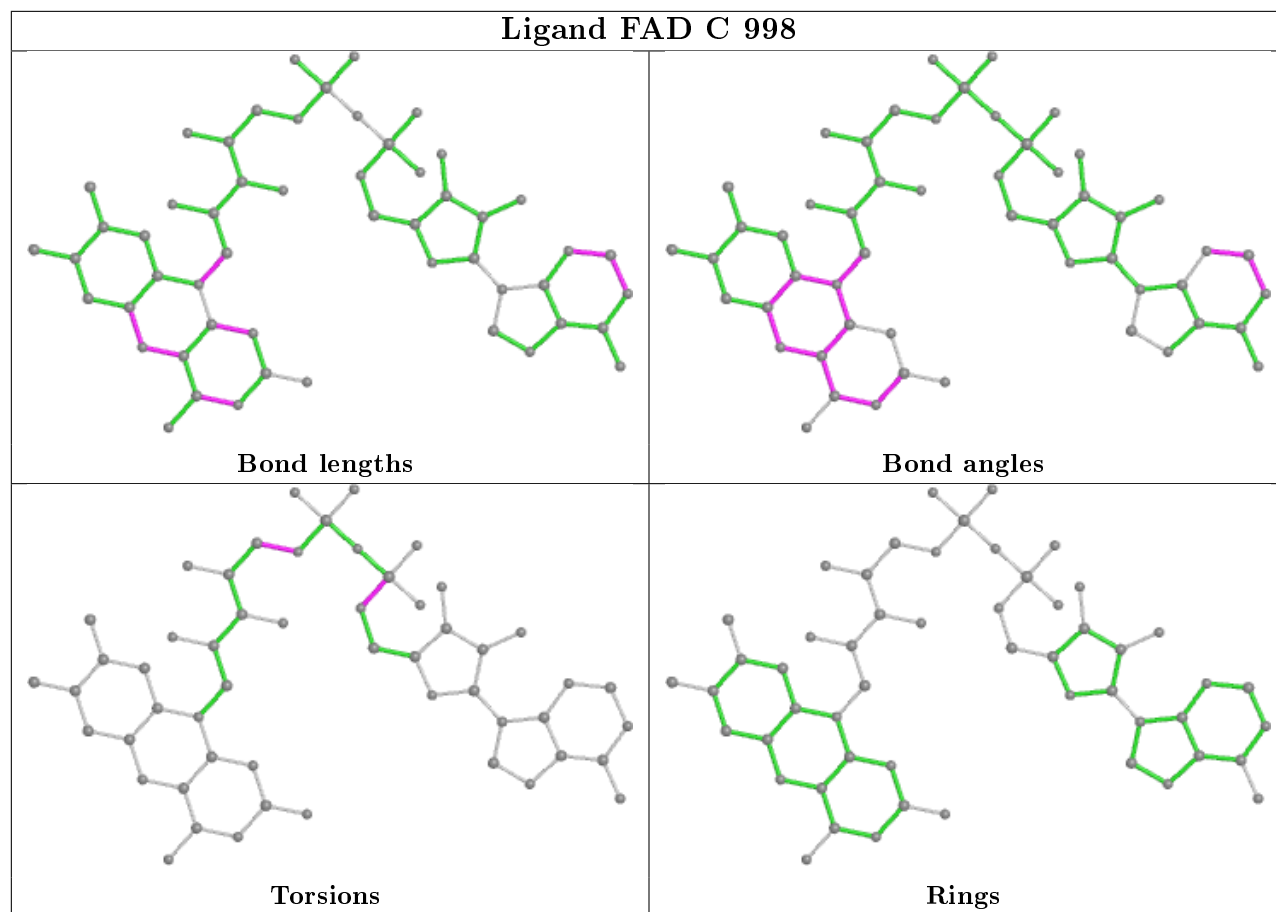
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

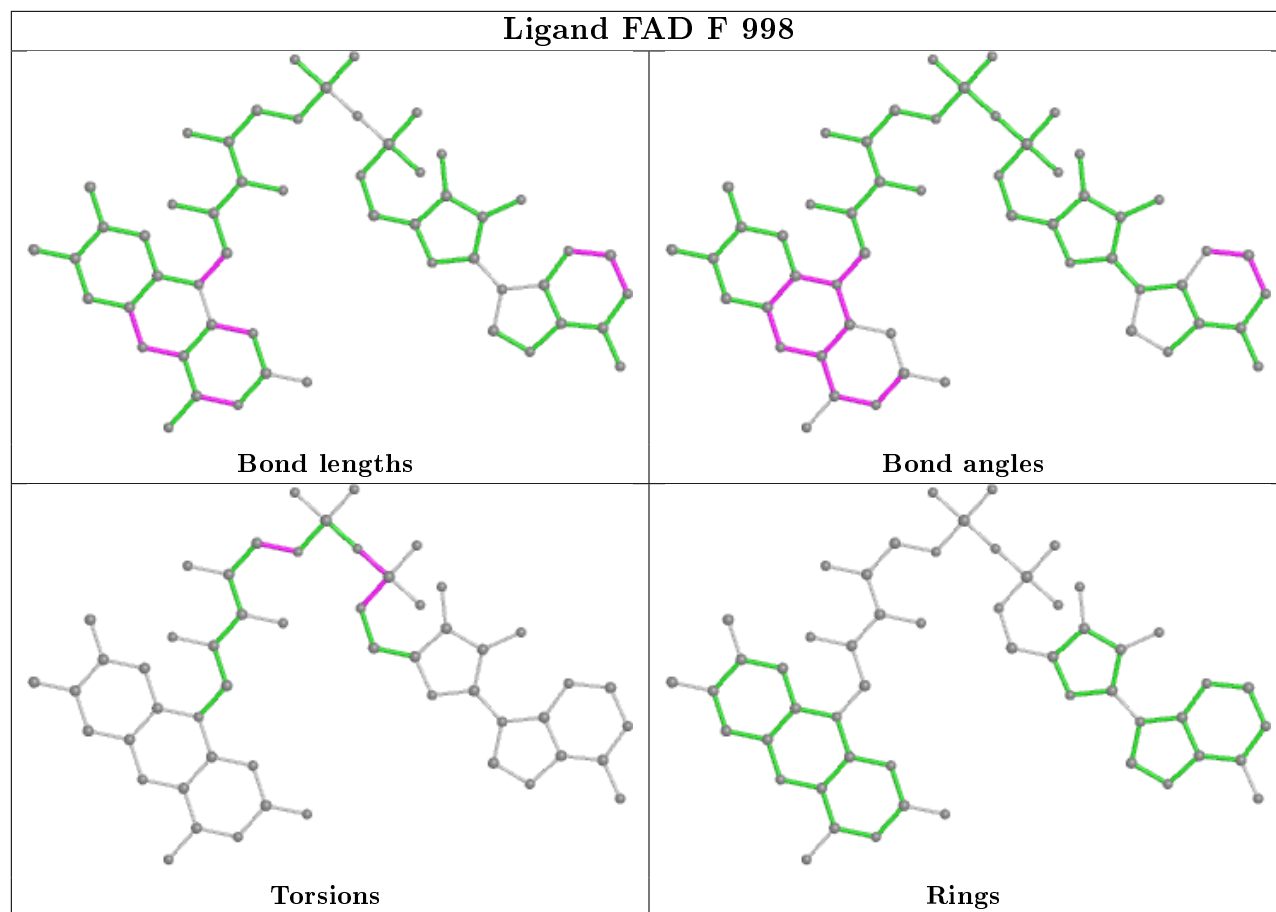




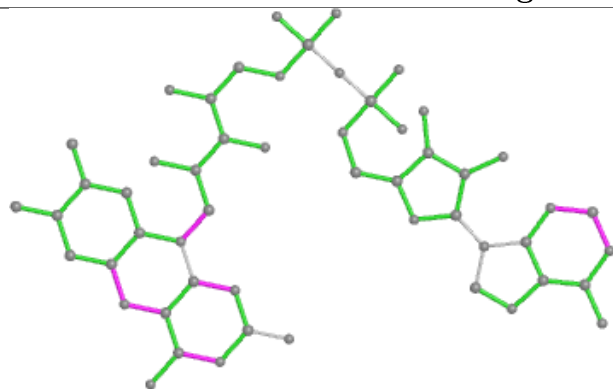




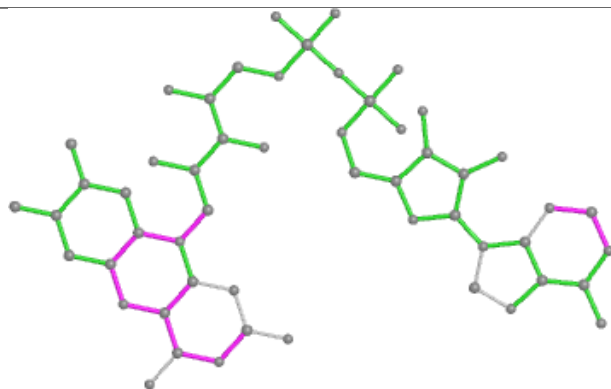




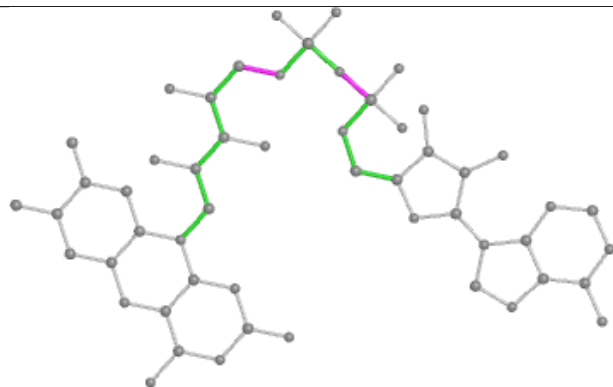
Ligand FAD E 998



Bond lengths



Bond angles

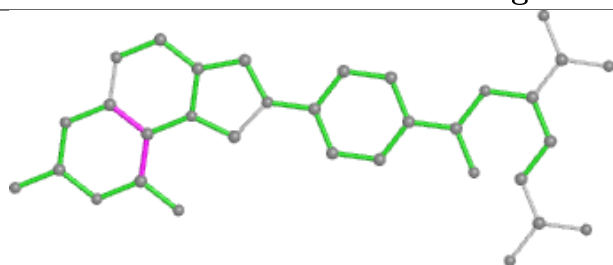


Torsions

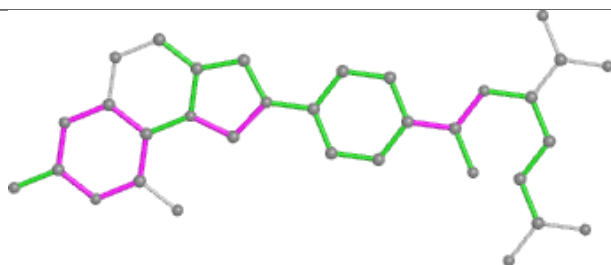


Rings

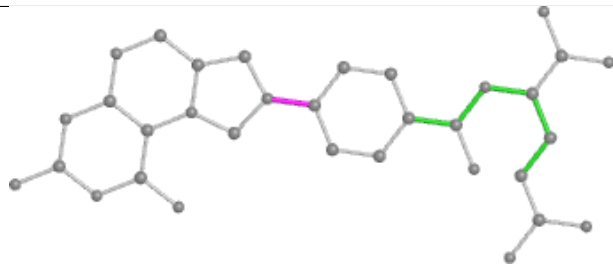
Ligand MHF F 999



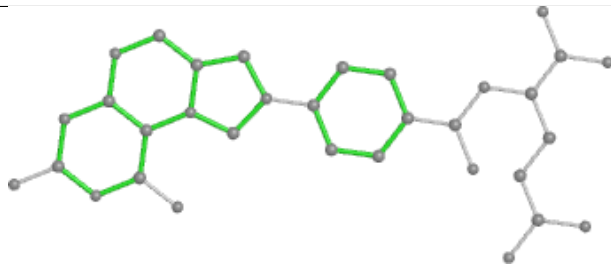
Bond lengths



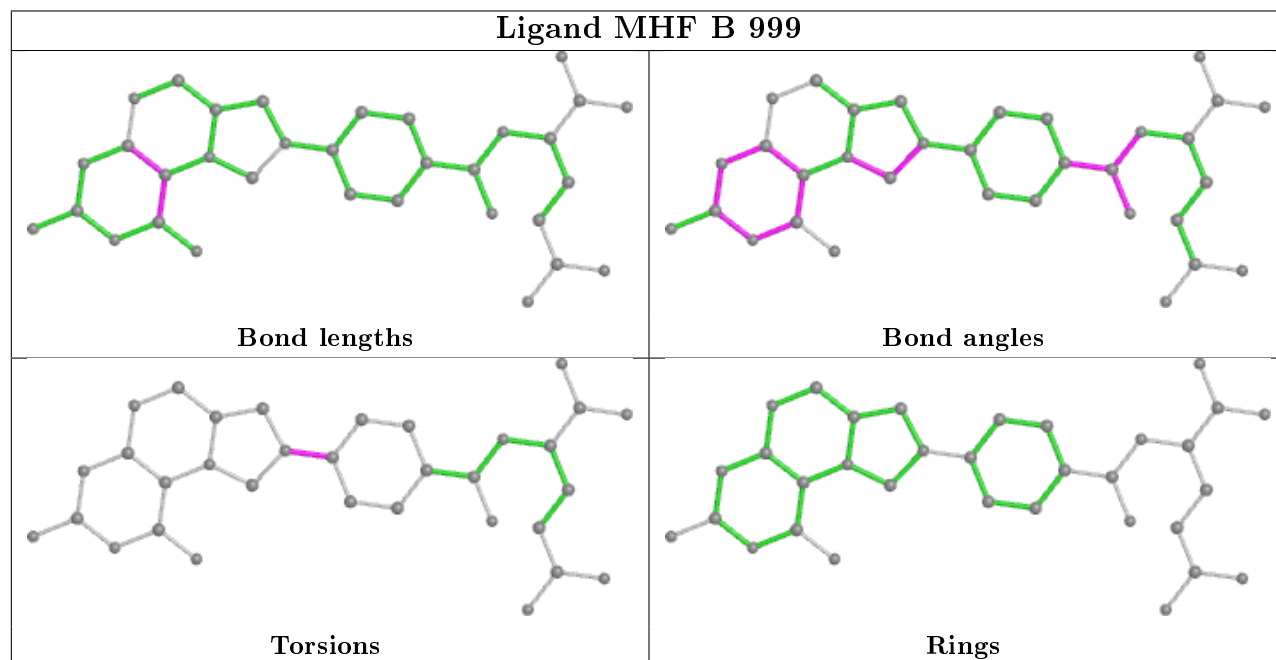
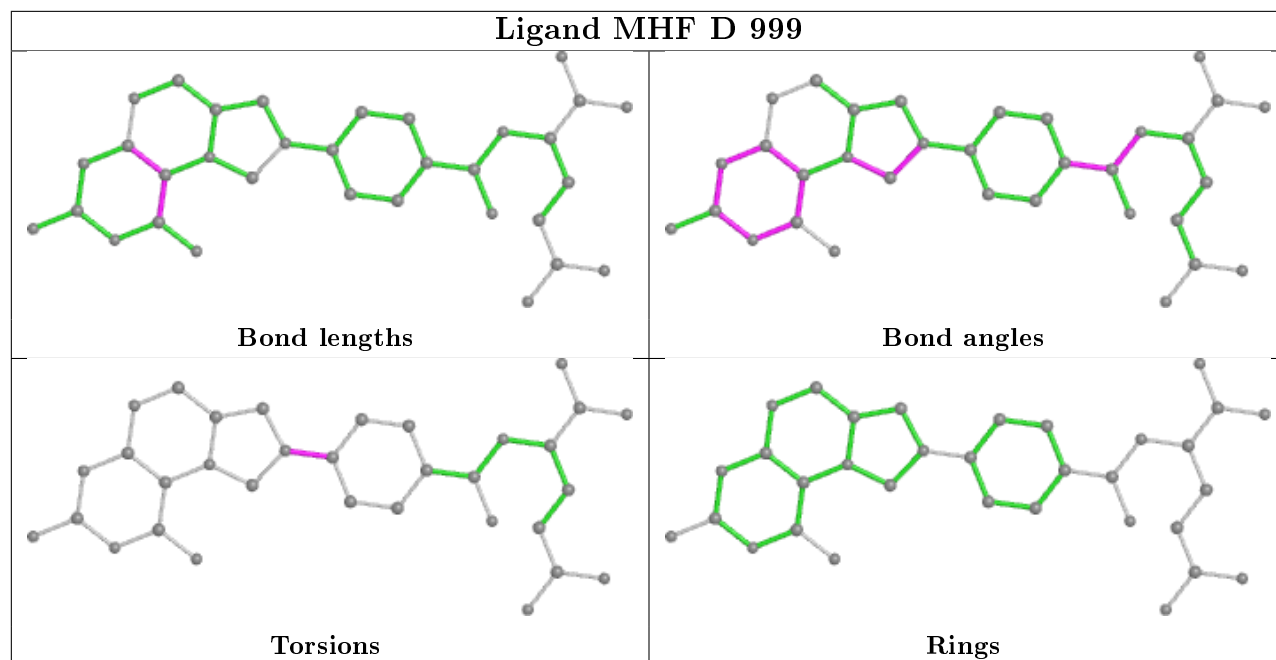
Bond angles

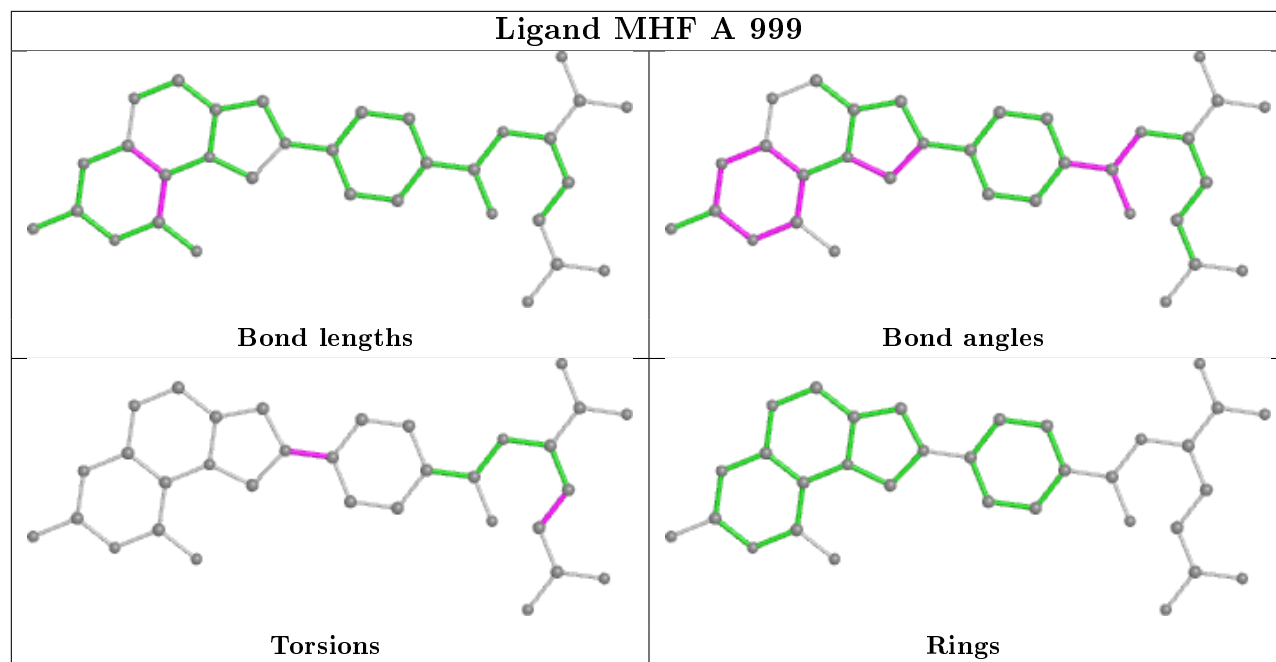


Torsions



Rings





5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	D	2

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	D	37[A]:LYS	C	38:GLY	N	1.05
1	D	35[A]:LYS	C	36:ARG	N	0.90

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, 95th 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	500/526 (95%)	0.81	53 (10%) 6 5	36, 41, 59, 67	0
1	C	495/526 (94%)	0.96	69 (13%) 2 2	35, 41, 57, 68	0
1	D	478/526 (90%)	0.85	63 (13%) 3 2	36, 41, 57, 64	0
1	E	496/526 (94%)	0.78	54 (10%) 5 5	35, 41, 59, 69	0
1	F	480/526 (91%)	1.34	115 (23%) 0 0	35, 41, 56, 65	0
2	B	491/525 (93%)	0.90	62 (12%) 3 3	36, 41, 58, 69	1 (0%)
3	G	4/5 (80%)	0.68	0 100 100	40, 45, 47, 52	0
3	H	4/5 (80%)	2.79	2 (50%) 0 0	50, 59, 61, 62	0
3	I	4/5 (80%)	0.35	0 100 100	34, 36, 44, 45	0
3	J	4/5 (80%)	1.45	1 (25%) 0 0	47, 56, 61, 66	1 (25%)
3	K	3/5 (60%)	0.20	0 100 100	40, 40, 40, 49	0
3	L	3/5 (60%)	2.49	2 (66%) 0 0	70, 70, 74, 76	0
All	All	2962/3185 (92%)	0.94	421 (14%) 2 2	34, 41, 58, 76	2 (0%)

All (421) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	32	SER	14.2
1	F	32	SER	14.1
1	F	31	SER	11.6
1	F	166	SER	11.0
2	B	483	GLY	10.6
1	A	166	SER	10.4
1	F	33	SER	10.4
1	C	33	SER	10.2
1	A	354	GLY	10.1
1	C	31	SER	10.0
1	C	32	SER	10.0

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Mol	Chain	Res	Type	RSRZ
2	B	31	SER	9.6
1	F	354	GLY	9.5
1	C	165	ASN	9.2
2	B	33	SER	9.1
2	B	38	GLY	9.0
2	B	485	LEU	9.0
2	B	166	SER	8.8
1	C	29	PRO	8.8
1	A	0	MET	8.6
1	E	32	SER	8.6
1	D	474	LEU	8.5
1	D	30	SER	8.5
1	C	38	GLY	8.4
1	E	481	TRP	8.4
1	D	442	PRO	8.4
1	C	34	VAL	8.3
1	D	486	MET	8.1
1	A	31	SER	7.6
1	A	498	ASN	7.6
1	A	165	ASN	7.5
1	D	473	ARG	7.5
1	E	33	SER	7.4
1	C	481	TRP	7.3
1	F	473	ARG	7.3
1	E	164	GLY	7.3
1	E	31	SER	7.1
3	H	1	DT	7.0
1	F	34	VAL	6.8
2	B	37	LYS	6.8
1	A	34	VAL	6.6
1	E	166	SER	6.5
1	F	474	LEU	6.5
1	D	38	GLY	6.5
1	E	165	ASN	6.4
1	A	32	SER	6.4
1	D	165	ASN	6.4
1	D	166	SER	6.4
1	C	35	LYS	6.3
1	F	29	PRO	6.2
2	B	2	ASP	6.2
1	D	2	ASP	6.1
1	F	13	GLU	6.0

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Mol	Chain	Res	Type	RSRZ
2	B	165	ASN	6.0
2	B	484	ARG	6.0
2	B	355	LYS	5.9
2	B	353	ASN	5.9
1	F	311	LYS	5.9
1	E	30	SER	5.8
1	D	356	TRP	5.7
1	F	17	SER	5.7
1	D	444	GLU	5.7
1	F	165	ASN	5.7
2	B	473	ARG	5.6
1	C	355	LYS	5.5
1	E	350	ARG	5.5
2	B	30	SER	5.5
1	F	37	LYS	5.5
1	E	473	ARG	5.4
1	A	442	PRO	5.4
1	F	442	PRO	5.4
1	F	18	VAL	5.4
2	B	486	MET	5.4
1	A	164	GLY	5.4
1	D	472	ARG	5.3
1	F	168	LYS	5.3
1	F	30	SER	5.3
1	A	499	GLY	5.1
1	C	353	GLN	5.1
1	C	354	GLY	5.1
1	A	29	PRO	5.0
1	E	489	ASP	5.0
1	F	38	GLY	5.0
1	C	166	SER	5.0
1	A	33	SER	4.9
1	F	486	MET	4.9
1	F	355	LYS	4.9
1	E	3	HIS	4.8
1	D	443	ARG	4.8
1	A	355	LYS	4.7
1	C	37	LYS	4.7
1	F	269	LEU	4.6
1	D	487	TYR	4.6
1	F	350	ARG	4.5
1	A	30	SER	4.5

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Mol	Chain	Res	Type	RSRZ
2	B	34	VAL	4.5
1	F	223	VAL	4.5
1	D	355	LYS	4.5
1	F	493	PRO	4.5
1	F	226	TRP	4.4
1	A	356	TRP	4.3
1	E	354	GLY	4.3
1	D	469	GLN	4.3
1	C	3	HIS	4.3
1	F	441	ASP	4.3
1	E	2	ASP	4.3
1	E	471	LEU	4.2
1	C	13	GLU	4.2
1	D	445	ASP	4.2
1	A	1	ASN	4.2
1	C	30	SER	4.2
1	A	224	ASP	4.2
1	F	228	ASP	4.2
1	F	86	ASN	4.1
1	F	459	PRO	4.1
1	E	356	TRP	4.1
1	C	137	ARG	4.1
1	E	361	LYS	4.0
2	B	35	LYS	4.0
1	A	353	GLN	4.0
1	E	224	ASP	4.0
1	F	460	GLU	4.0
1	C	356	TRP	4.0
1	D	361	LYS	4.0
1	E	477	GLU	4.0
1	A	443	ARG	4.0
2	B	439	ASN	4.0
1	E	37	LYS	3.9
2	B	350	ARG	3.9
1	F	35	LYS	3.9
1	D	29	PRO	3.9
1	C	464	VAL	3.9
1	F	469	GLN	3.9
2	B	29	PRO	3.9
1	F	136	ALA	3.9
2	B	163	VAL	3.9
1	E	163	VAL	3.8

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Mol	Chain	Res	Type	RSRZ
2	B	481[A]	TRP	3.8
1	E	493	PRO	3.8
1	F	487	TYR	3.8
1	F	107	LYS	3.8
1	F	36	ARG	3.7
3	J	5	DT	3.7
1	F	3	HIS	3.7
1	C	163	VAL	3.7
1	F	231	THR	3.7
1	C	232	LEU	3.7
1	F	356	TRP	3.7
1	A	269	LEU	3.6
1	E	353	GLN	3.6
1	F	22	THR	3.6
1	C	12	GLU	3.6
1	C	497	GLY	3.6
1	D	354	GLY	3.6
1	A	236	GLY	3.6
1	F	14	GLU	3.6
1	F	132	LYS	3.6
1	C	164	GLY	3.6
1	C	136	ALA	3.5
1	A	444	GLU	3.5
1	D	3	HIS	3.5
1	F	131	ALA	3.5
1	F	491	VAL	3.5
1	C	222	SER	3.4
1	F	164	GLY	3.4
1	C	225	ASP	3.4
1	F	105	LEU	3.4
1	C	492	VAL	3.4
3	L	4	DT	3.4
1	A	489	ASP	3.4
2	B	164	GLY	3.4
2	B	472	ARG	3.4
1	A	163	VAL	3.3
1	A	440	ASN	3.3
1	A	13	GLU	3.3
1	F	196	GLN	3.3
2	B	234	LYS	3.3
1	D	137	ARG	3.3
2	B	162	ARG	3.3

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Mol	Chain	Res	Type	RSRZ
1	D	238	GLU	3.3
1	E	167	THR	3.3
1	D	228	ASP	3.3
1	F	224	ASP	3.3
1	F	134	PHE	3.3
1	E	168	LYS	3.3
1	D	489	ASP	3.3
1	C	480	HIS	3.2
1	E	476	LYS	3.2
2	B	476	LYS	3.2
1	D	351	ASN	3.2
1	F	215	LEU	3.2
1	E	13	GLU	3.2
1	F	307	GLN	3.2
1	D	459	PRO	3.2
1	F	137	ARG	3.2
1	F	133	ASP	3.2
1	C	220	THR	3.2
2	B	482	PRO	3.1
2	B	489	ASP	3.1
1	C	24	GLU	3.1
2	B	135	GLY	3.1
1	C	311	LYS	3.1
2	B	311	LYS	3.1
1	A	235	LEU	3.1
1	C	485	LEU	3.1
1	D	448	PHE	3.1
1	F	135	GLY	3.0
1	A	35	LYS	3.0
1	C	238	GLU	3.0
1	D	168	LYS	3.0
1	E	233	GLU	3.0
1	E	494	LEU	3.0
1	C	224	ASP	3.0
2	B	228	ASP	3.0
1	A	24	GLU	3.0
1	A	471	LEU	2.9
1	F	111	LYS	2.9
1	F	364	GLU	2.9
1	D	164	GLY	2.9
1	F	139	VAL	2.9
1	A	12	GLU	2.9

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Mol	Chain	Res	Type	RSRZ
2	B	477	GLU	2.9
1	E	35	LYS	2.9
1	F	160	LEU	2.9
1	C	469	GLN	2.8
1	C	234	LYS	2.8
1	E	355	LYS	2.8
2	B	241	GLU	2.8
2	B	475	PRO	2.8
1	F	317	ASN	2.8
1	C	167	THR	2.8
1	F	11	THR	2.8
1	C	474	LEU	2.8
2	B	3	HIS	2.8
1	D	366	TRP	2.8
2	B	356	TRP	2.8
2	B	462	GLU	2.8
2	B	175	SER	2.8
1	D	447	TYR	2.8
1	A	168	LYS	2.8
1	C	491	VAL	2.8
1	E	484	ARG	2.8
1	A	317	ASN	2.8
1	F	10	LEU	2.8
1	C	17	SER	2.8
1	C	352	VAL	2.7
1	F	5	HIS	2.7
1	D	188	PHE	2.7
1	F	109	LEU	2.7
1	D	156	VAL	2.7
1	F	449	SER	2.7
1	A	233	GLU	2.7
1	F	496	HIS	2.7
1	F	163	VAL	2.7
1	F	489	ASP	2.7
1	F	470	GLN	2.7
1	F	4	ILE	2.7
1	C	23	PHE	2.7
2	B	480	HIS	2.7
1	E	475	PRO	2.7
1	F	114	LEU	2.7
1	C	83	HIS	2.7
1	A	475	PRO	2.7

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Mol	Chain	Res	Type	RSRZ
1	E	38	GLY	2.7
1	C	471	LEU	2.7
1	F	494	LEU	2.7
1	C	132	LYS	2.6
2	B	137	ARG	2.6
1	D	460	GLU	2.6
1	F	233	GLU	2.6
1	F	351	ASN	2.6
1	F	222	SER	2.6
1	C	160	LEU	2.6
1	E	474	LEU	2.6
1	C	4	ILE	2.6
1	A	2	ASP	2.6
2	B	238	GLU	2.6
1	D	492	VAL	2.6
1	E	317	ASN	2.6
1	F	203	ALA	2.6
2	B	317	ASN	2.6
1	C	36	ARG	2.6
1	F	452	LYS	2.6
1	C	351	ASN	2.6
1	E	482	PRO	2.6
1	A	477	GLU	2.6
1	F	103	VAL	2.5
1	F	161	LYS	2.5
1	F	448	PHE	2.5
2	B	440	ASP	2.5
1	F	274	GLU	2.5
1	D	371	THR	2.5
1	D	15	ILE	2.5
1	D	224	ASP	2.5
1	F	403	ARG	2.5
1	C	482	PRO	2.5
1	F	234	LYS	2.5
1	C	28	LEU	2.5
3	H	5	DT	2.5
2	B	16	ASP	2.5
1	F	239	PRO	2.5
1	C	473	ARG	2.5
2	B	36	ARG	2.5
1	A	445	ASP	2.5
1	D	368	ASP	2.5

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Mol	Chain	Res	Type	RSRZ
1	E	483	GLY	2.5
1	F	130	LEU	2.4
1	F	472	ARG	2.4
1	C	221	PRO	2.4
1	A	472	ARG	2.4
1	D	86	ASN	2.4
1	E	351	ASN	2.4
1	C	349	PRO	2.4
1	C	475	PRO	2.4
1	A	441	ASP	2.4
1	F	440	ASN	2.4
1	F	490	THR	2.4
1	F	242	VAL	2.4
1	A	234	LYS	2.4
1	A	350	ARG	2.4
1	F	24	GLU	2.3
2	B	13	GLU	2.3
1	F	232	LEU	2.3
1	F	467	TRP	2.3
1	D	163	VAL	2.3
2	B	156	VAL	2.3
1	A	167	THR	2.3
1	A	478	LYS	2.3
1	F	162	ARG	2.3
1	A	483	GLY	2.3
1	F	229	VAL	2.3
1	F	237	VAL	2.3
1	D	441	ASP	2.3
1	C	169	LEU	2.3
1	E	495	LYS	2.3
1	F	12	GLU	2.3
1	F	495	LYS	2.3
1	D	222	SER	2.3
1	A	137	ARG	2.3
1	F	25	ARG	2.3
2	B	116	LEU	2.3
1	E	460	GLU	2.3
1	F	434	TYR	2.2
1	A	480	HIS	2.2
1	D	24	GLU	2.2
1	D	364	GLU	2.2
1	F	361	LYS	2.2

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Mol	Chain	Res	Type	RSRZ
1	D	420	LEU	2.2
1	E	269	LEU	2.2
2	B	235	LEU	2.2
1	F	320	TYR	2.2
1	C	156	VAL	2.2
1	E	209	SER	2.2
2	B	441	PRO	2.2
3	L	2	DT	2.2
1	D	360	GLN	2.2
1	F	42	THR	2.2
1	F	353	GLN	2.2
1	D	160	LEU	2.2
1	D	169	LEU	2.2
1	F	63	SER	2.2
1	A	228	ASP	2.2
1	E	24	GLU	2.2
1	D	36	ARG	2.2
1	D	440	ASN	2.2
1	C	494	LEU	2.2
1	C	84	PHE	2.2
1	D	352	VAL	2.2
1	E	84	PHE	2.2
1	A	361	LYS	2.2
2	B	354	GLY	2.2
1	A	160	LEU	2.2
1	C	235	LEU	2.2
1	E	362	LEU	2.2
1	F	204	LYS	2.2
1	F	488	MET	2.2
1	C	133	ASP	2.2
1	E	478	LYS	2.2
1	E	232	LEU	2.1
1	E	156	VAL	2.1
1	F	238	GLU	2.1
1	D	175	SER	2.1
1	F	15	ILE	2.1
2	B	471	LEU	2.1
1	A	314	VAL	2.1
1	E	464	VAL	2.1
1	A	460	GLU	2.1
1	C	170	GLU	2.1
1	D	234	LYS	2.1

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Mol	Chain	Res	Type	RSRZ
1	D	350	ARG	2.1
1	F	219	PRO	2.1
2	B	459	PRO	2.1
1	C	56	ASP	2.1
1	E	162	ARG	2.1
1	F	43	ILE	2.1
1	E	352	VAL	2.1
2	B	39	LYS	2.1
1	D	370	LYS	2.1
2	B	361	LYS	2.1
1	D	488	MET	2.1
2	B	229	VAL	2.1
1	D	455	GLN	2.1
2	B	448	PHE	2.1
1	D	496	HIS	2.1
1	F	272	TYR	2.1
1	C	460	GLU	2.0
1	F	451	PRO	2.0
1	D	491	VAL	2.0
1	C	360	GLN	2.0
1	E	56	ASP	2.0
1	F	471	LEU	2.0
2	B	494	LEU	2.0
1	D	82	THR	2.0
1	E	231	THR	2.0
1	C	135	GLY	2.0
1	F	363	PHE	2.0
1	F	447	TYR	2.0
1	C	68	ILE	2.0
2	B	269	LEU	2.0
1	D	353	GLN	2.0
2	B	469	GLN	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [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, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	TCP	L	3	18/18	0.70	0.31	72,73,73,73	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
3	TCP	J	3	18/18	0.81	0.20	45,46,50,51	0
3	TCP	H	3	18/18	0.81	0.21	45,46,51,52	0
3	TCP	G	3	18/18	0.89	0.15	37,39,42,43	0
3	TCP	I	3	18/18	0.91	0.14	33,34,35,38	0
3	TCP	K	3	18/18	0.92	0.14	37,38,39,41	0

6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

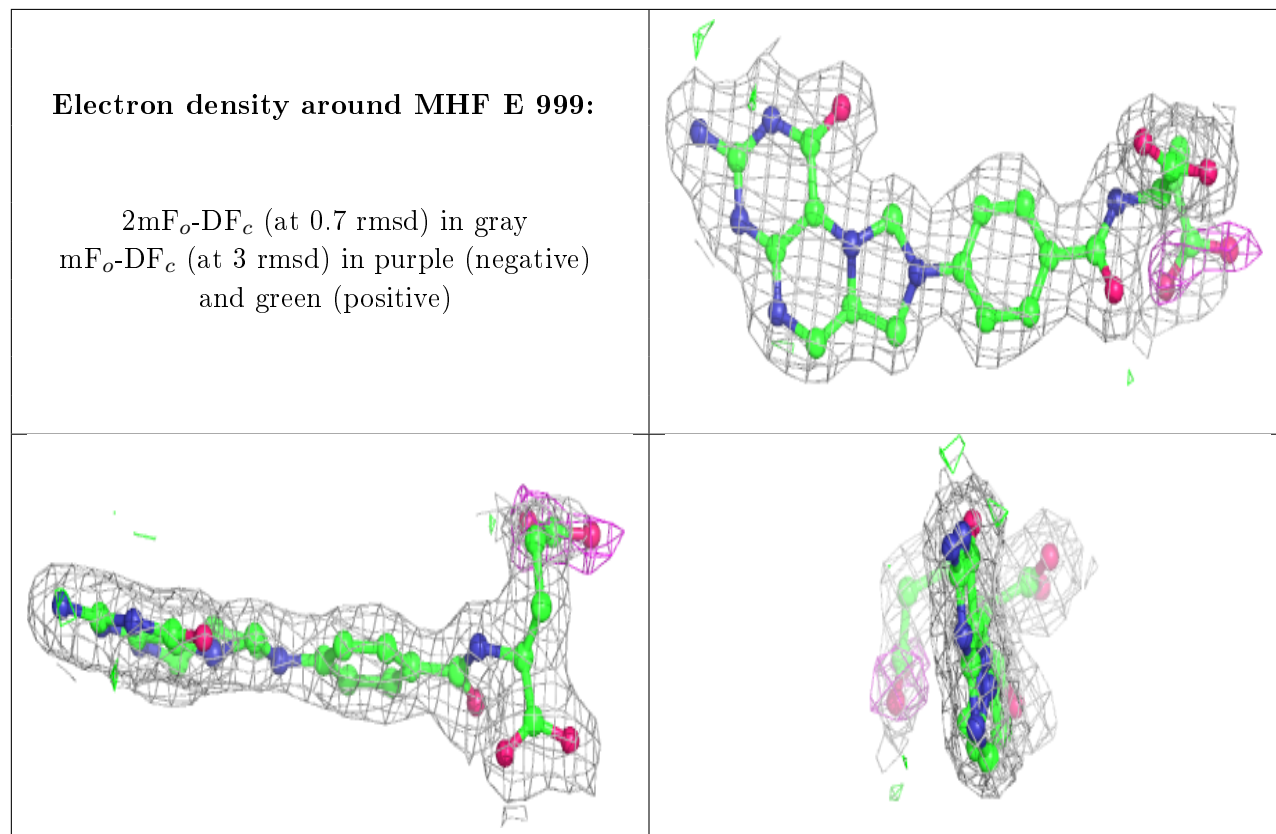
6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th 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(\AA^2)	Q<0.9
7	ACT	B	1500	4/4	0.71	0.19	63,64,64,64	0
5	MHF	E	999	33/33	0.84	0.18	35,36,45,48	0
5	MHF	A	999	33/33	0.84	0.17	35,36,44,47	0
5	MHF	F	999	33/33	0.86	0.16	35,36,44,47	0
5	MHF	B	999	33/33	0.87	0.15	35,37,44,48	0
5	MHF	C	999	33/33	0.87	0.16	34,37,45,49	0
6	CL	F	1498	1/1	0.89	0.10	69,69,69,69	0
5	MHF	D	999	33/33	0.89	0.14	35,37,44,47	0
4	FAD	F	998	53/53	0.94	0.13	34,34,36,37	0
4	FAD	A	998	53/53	0.94	0.14	34,35,36,37	0
4	FAD	D	998	53/53	0.94	0.14	34,34,36,37	0
4	FAD	B	998	53/53	0.95	0.12	34,35,36,36	0
4	FAD	C	998	53/53	0.95	0.13	34,35,37,38	0
4	FAD	E	998	53/53	0.96	0.12	34,35,37,37	0
6	CL	B	1499	1/1	0.96	0.07	70,70,70,70	0
6	CL	B	1498	1/1	0.96	0.06	52,52,52,52	0
6	CL	C	1499	1/1	0.98	0.06	48,48,48,48	0
6	CL	D	1498	1/1	0.99	0.05	47,47,47,47	0
6	CL	C	1500	1/1	0.99	0.04	53,53,53,53	0
6	CL	A	1501	1/1	0.99	0.06	46,46,46,46	0
6	CL	E	1499	1/1	0.99	0.04	44,44,44,44	0

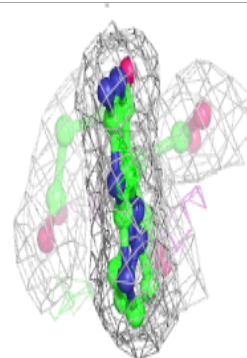
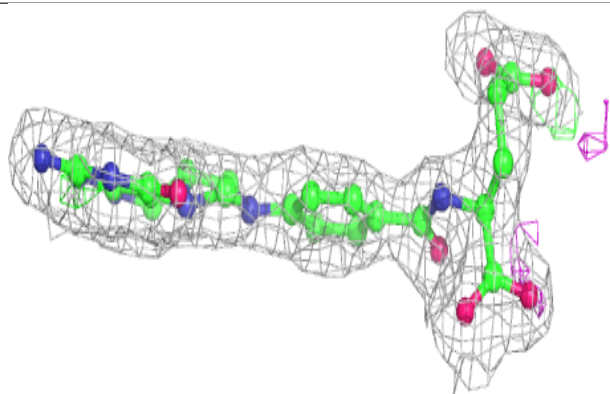
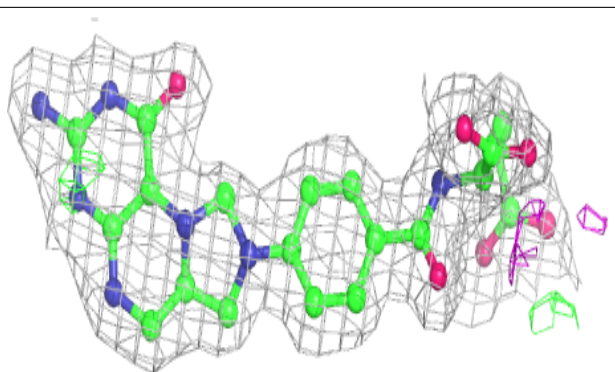
The following is a graphical depiction of the model fit to experimental electron density of all

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.

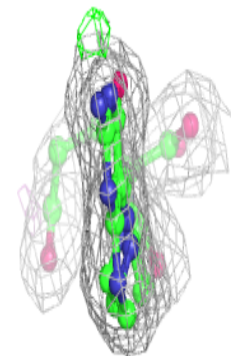
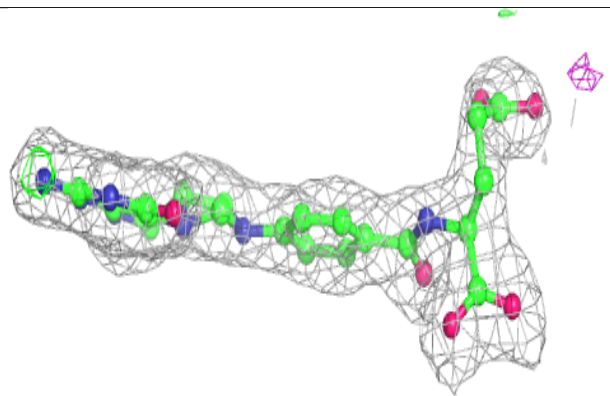
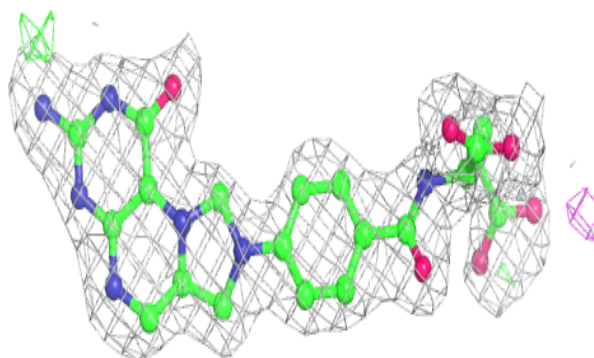


Electron density around MHF A 999:

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

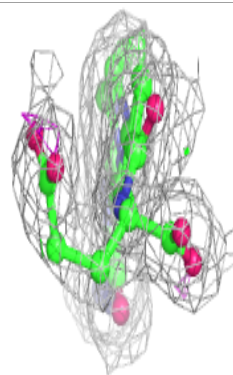
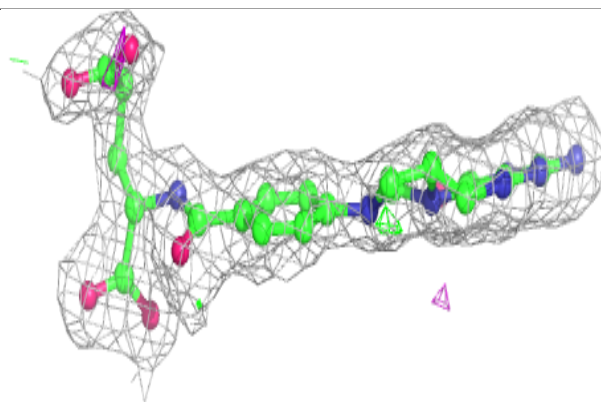
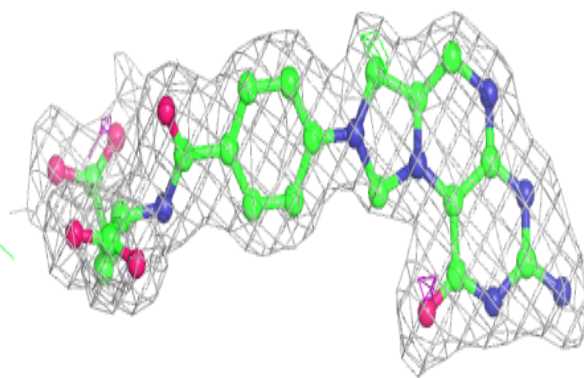
**Electron density around MHF F 999:**

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

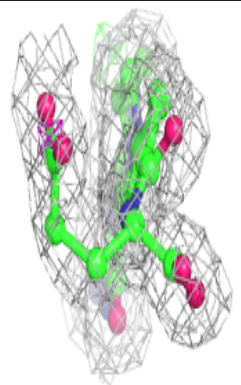
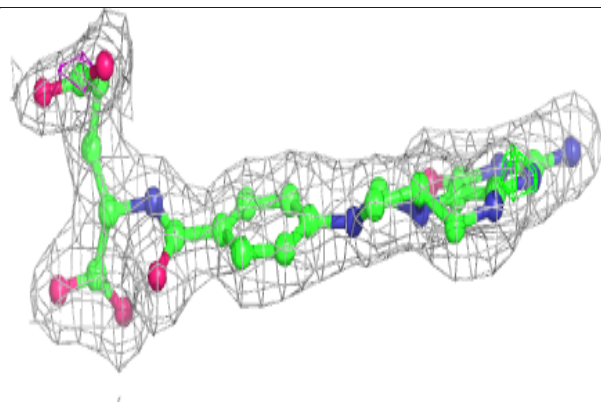
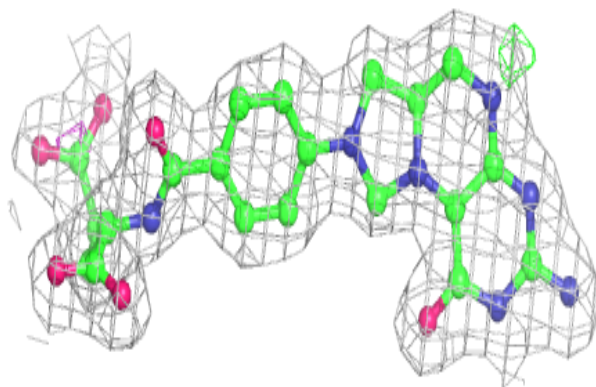


Electron density around MHF B 999:

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

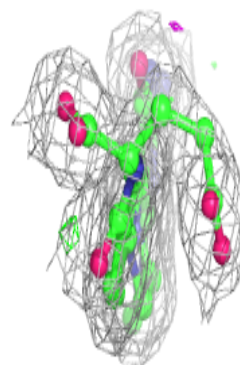
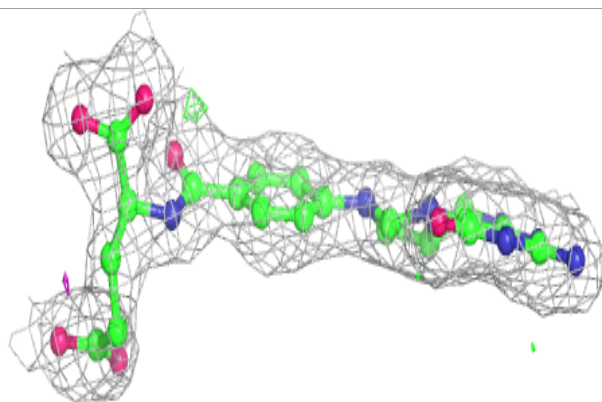
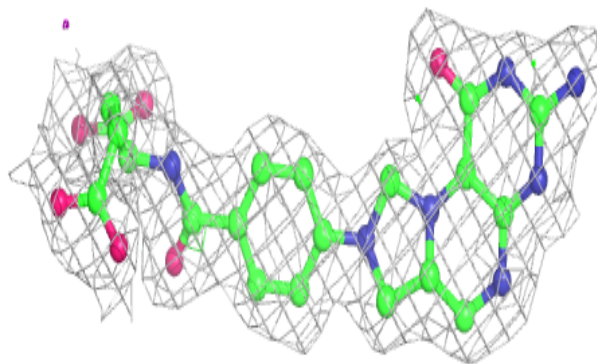
**Electron density around MHF C 999:**

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

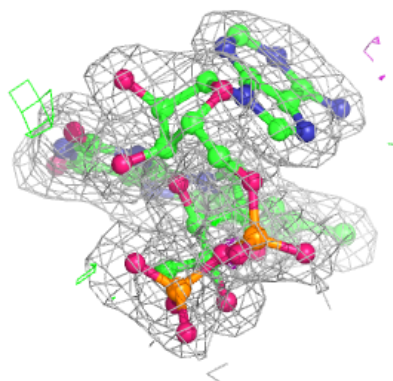
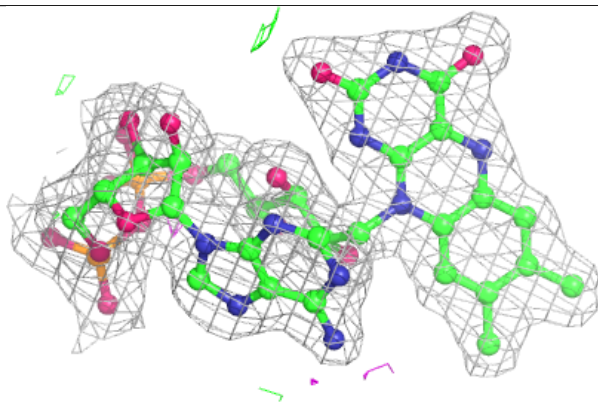
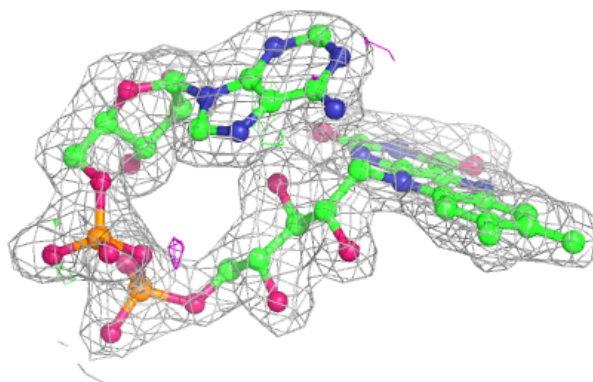


Electron density around MHF D 999:

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

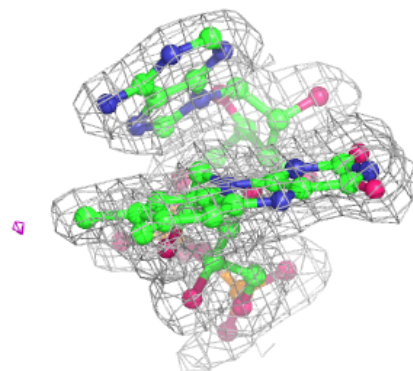
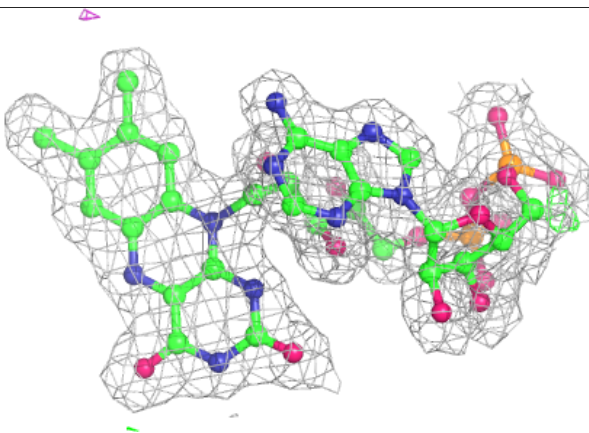
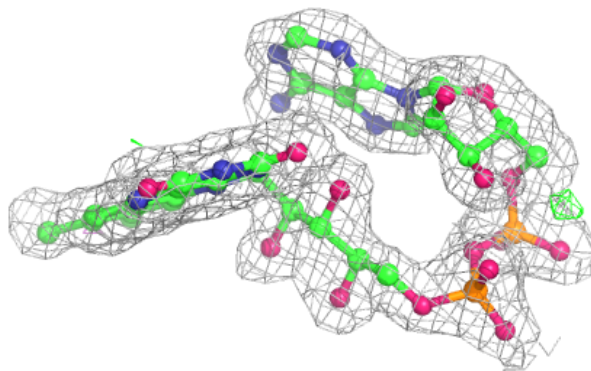
**Electron density around FAD F 998:**

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

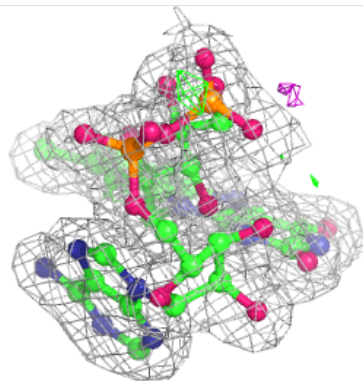
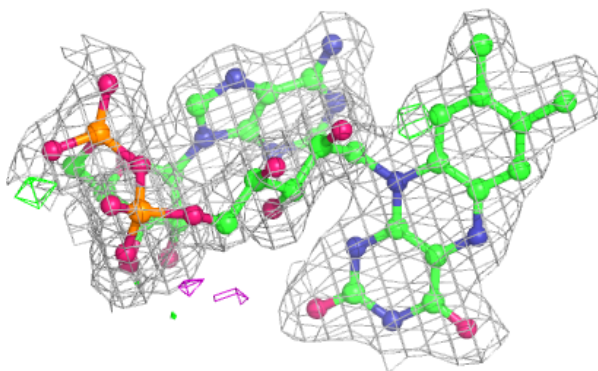
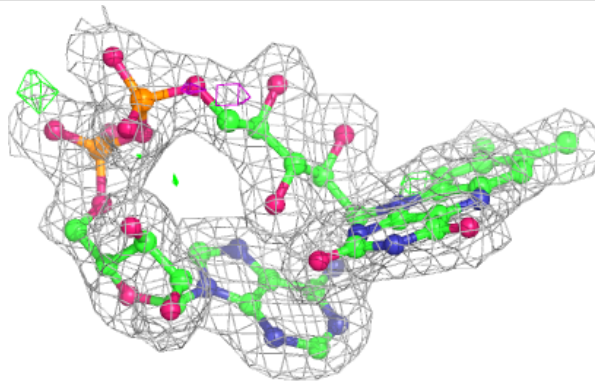


Electron density around FAD A 998:

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

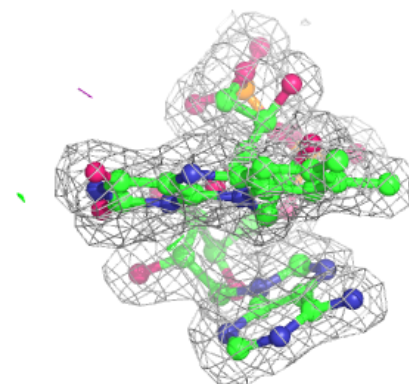
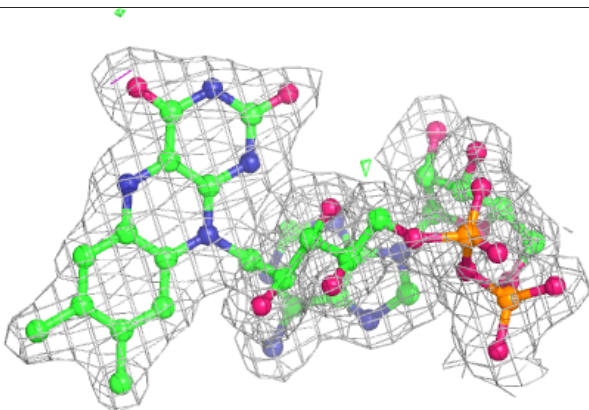
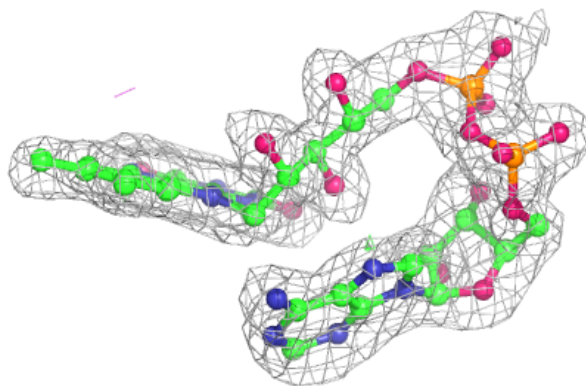
**Electron density around FAD D 998:**

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

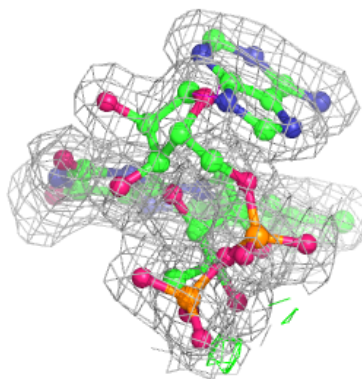
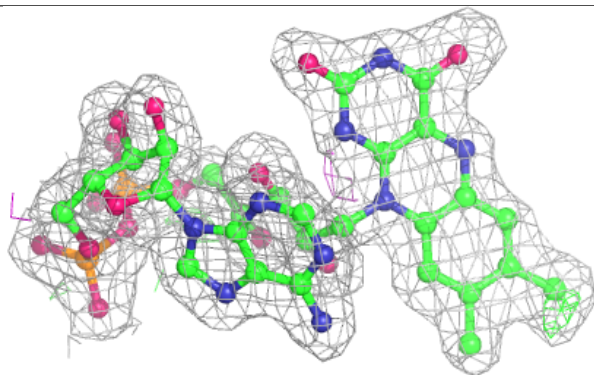
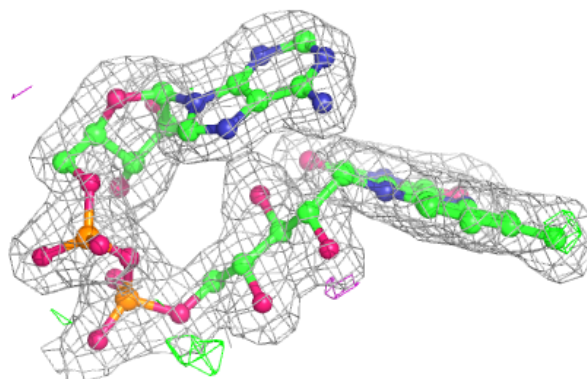


Electron density around FAD B 998:

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

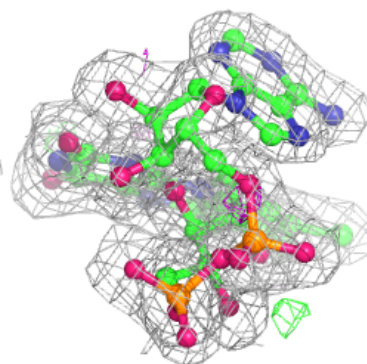
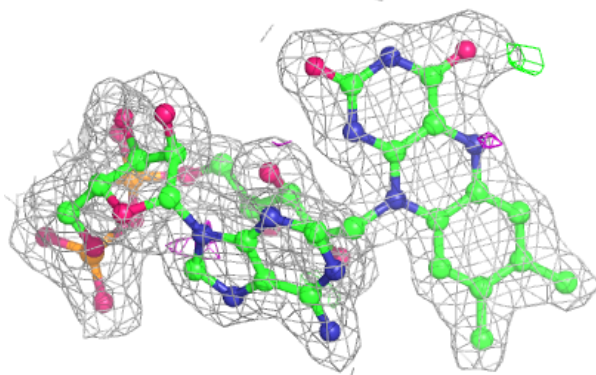
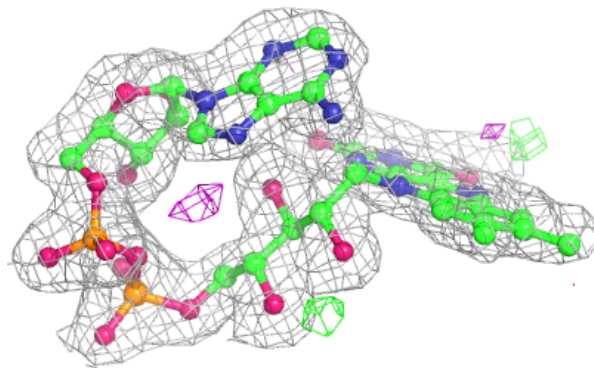
**Electron density around FAD C 998:**

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



Electron density around FAD E 998:

$2mF_o - DF_c$ (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.