Full wwPDB X-ray Structure Validation Report ⓘ

Oct 2, 2023 – 12:46 AM EDT

PDB ID	:	6NH6
Title	:	Structure of the human endothelial nitric oxide synthase heme domain in complex with 6-(3-(3-(dimethylamino)propyl)-2,6-difluorophenethyl)-4-methylpyridin-2-amine
Authors	:	Chreifi, G.; Li, H.; Poulos, T.L.
Deposited on	:	2018-12-21
Resolution	:	2.19 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	:	FAILED
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	FAILED
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35.1

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 2.19 Å.

There are no overall percentile quality scores available for this entry.

MolProbity and EDS failed to run properly - the sequence quality summary graphics cannot be shown.

2 Entry composition

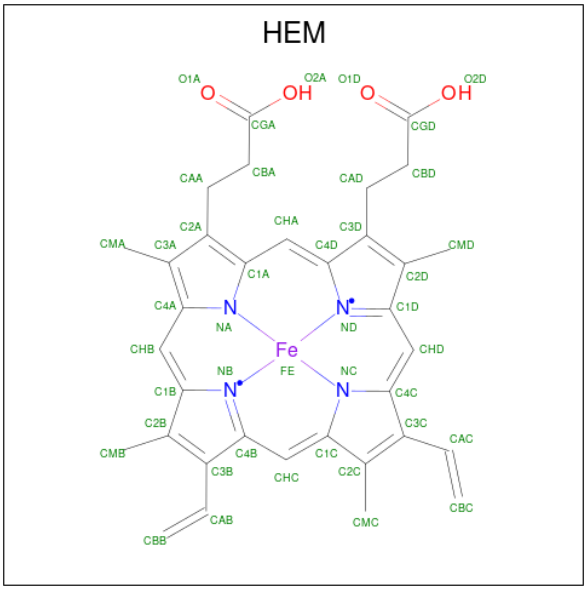
There are 10 unique types of molecules in this entry. The entry contains 14061 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Endothelial nitric oxide synthase splice variant eNOS13A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	404	Total	C	N	O	S	0	2	0
			3237	2062	570	589	16			
1	B	402	Total	C	N	O	S	0	3	0
			3221	2051	566	587	17			
1	C	401	Total	C	N	O	S	0	1	0
			3208	2043	566	583	16			
1	D	403	Total	C	N	O	S	0	3	0
			3232	2057	570	588	17			

- Molecule 2 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula: $C_{34}H_{32}FeN_4O_4$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	B	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		

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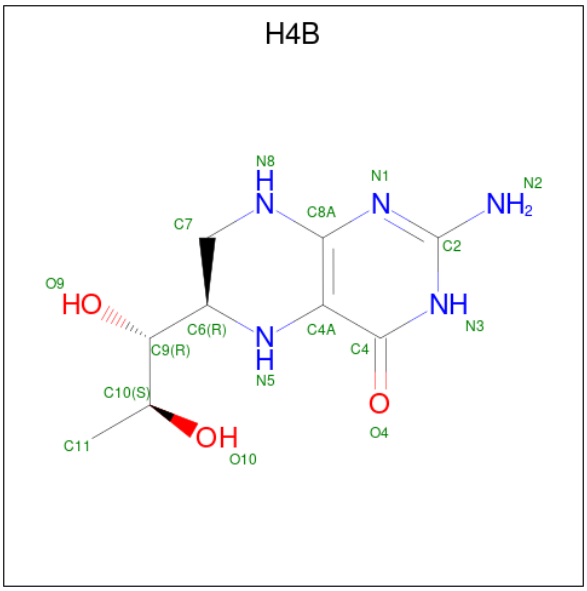
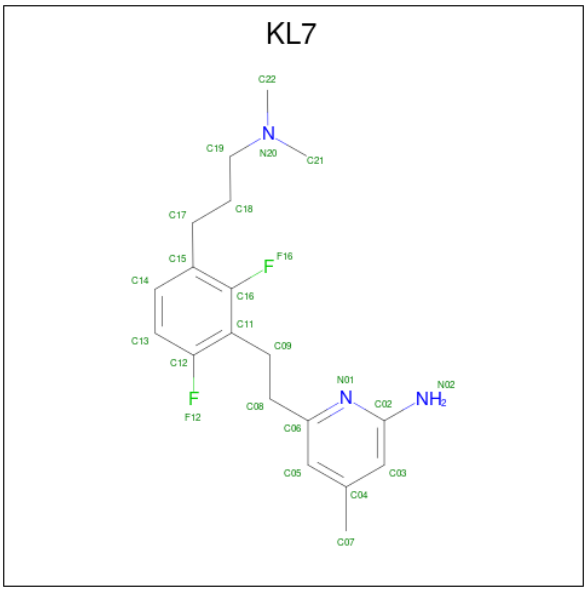
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	C	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	D	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		

- Molecule 3 is 5,6,7,8-TETRAHYDROBIOPTERIN (three-letter code: H4B) (formula: $C_9H_{15}N_5O_3$).



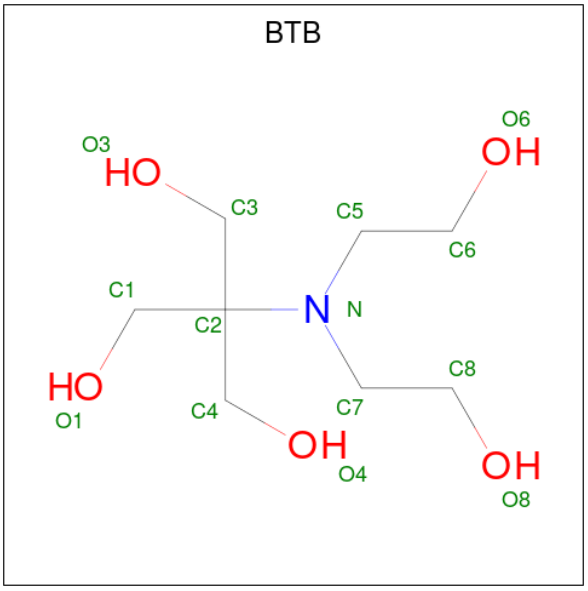
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			17	9	5	3		
3	B	1	Total	C	N	O	0	0
			17	9	5	3		
3	C	1	Total	C	N	O	0	0
			17	9	5	3		
3	D	1	Total	C	N	O	0	0
			17	9	5	3		

- Molecule 4 is 6-(2-{3-[3-(dimethylamino)propyl]-2,6-difluorophenyl}ethyl)-4-methylpyridin-2-amine (three-letter code: KL7) (formula: $C_{19}H_{25}F_2N_3$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	F	N	0	0
			24	19	2	3		
4	B	1	Total	C	F	N	0	0
			24	19	2	3		
4	C	1	Total	C	F	N	0	0
			24	19	2	3		
4	D	1	Total	C	F	N	0	0
			24	19	2	3		

- Molecule 5 is 2-[BIS-(2-HYDROXY-ETHYL)-AMINO]-2-HYDROXYMETHYL-PROPANE-1,3-DIOL (three-letter code: BTB) (formula: $C_8H_{19}NO_5$).

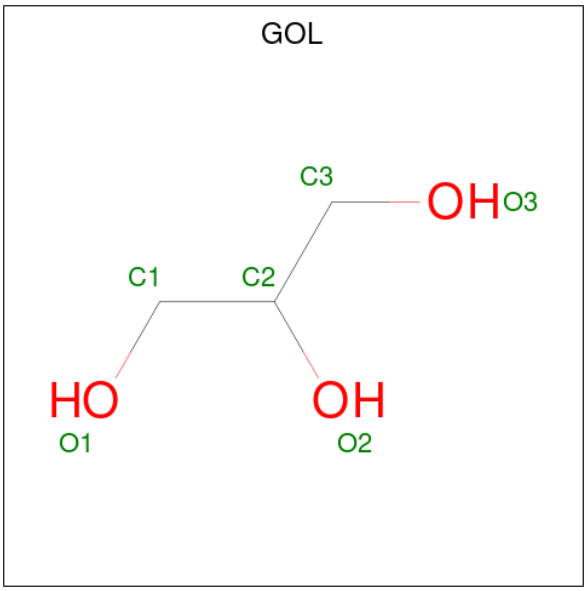


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total	C	N	O	0	0
			14	8	1	5		
5	A	1	Total	C	N	O	0	0
			14	8	1	5		
5	B	1	Total	C	N	O	0	0
			14	8	1	5		
5	B	1	Total	C	N	O	0	0
			14	8	1	5		
5	B	1	Total	C	N	O	0	0
			14	8	1	5		
5	C	1	Total	C	N	O	0	0
			14	8	1	5		
5	C	1	Total	C	N	O	0	0
			14	8	1	5		
5	C	1	Total	C	N	O	0	0
			14	8	1	5		
5	C	1	Total	C	N	O	0	0
			14	8	1	5		
5	D	1	Total	C	N	O	0	0
			14	8	1	5		
5	D	1	Total	C	N	O	0	0
			14	8	1	5		
5	D	1	Total	C	N	O	0	0
			14	8	1	5		
5	D	1	Total	C	N	O	0	0
			14	8	1	5		

- Molecule 6 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	1	Total	Zn	0	0
			1	1		
6	C	1	Total	Zn	0	0
			1	1		

- Molecule 7 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	1	Total C O 6 3 3	0	0
7	C	1	Total C O 6 3 3	0	0

- Molecule 8 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

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

- Molecule 9 is GADOLINIUM ATOM (three-letter code: GD) (formula: Gd).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	A	1	Total Gd 1 1	0	0
9	B	1	Total Gd 1 1	0	0
9	C	1	Total Gd 1 1	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	D	1	Total Gd 1 1	0	0

- Molecule 10 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
10	A	106	Total O 106 106	0	0
10	B	180	Total O 180 180	0	0
10	C	138	Total O 138 138	0	0
10	D	199	Total O 199 199	0	0

MolProbity and EDS failed to run properly - this section is therefore empty.

3 Data and refinement statistics (i)

EDS failed to run properly - this section is therefore incomplete.

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	59.86Å 152.82Å 109.19Å 90.00° 91.00° 90.00°	Depositor
Resolution (Å)	76.41 – 2.19	Depositor
% Data completeness (in resolution range)	97.8 (76.41-2.19)	Depositor
R_{merge}	0.12	Depositor
R_{sym}	0.12	Depositor
$< I/\sigma(I) >$ [1]	1.62 (at 2.18Å)	Xtriage
Refinement program	PHENIX 1.11.1-2575_1496	Depositor
R, R_{free}	0.196 , 0.247	Depositor
Wilson B-factor (Å^2)	28.6	Xtriage
Anisotropy	0.635	Xtriage
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	0.095 for h,-k,-l	Xtriage
Total number of atoms	14061	wwPDB-VP
Average B, all atoms (Å^2)	48.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.50% 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.

4 Model quality

4.1 Standard geometry

MolProbity failed to run properly - this section is therefore empty.

4.2 Too-close contacts

MolProbity failed to run properly - this section is therefore empty.

4.3 Torsion angles

4.3.1 Protein backbone

MolProbity failed to run properly - this section is therefore empty.

4.3.2 Protein sidechains

MolProbity failed to run properly - this section is therefore empty.

4.3.3 RNA

MolProbity failed to run properly - this section is therefore empty.

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

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

4.5 Carbohydrates

There are no monosaccharides in this entry.

4.6 Ligand geometry

Of 37 ligands modelled in this entry, 10 are monoatomic - leaving 27 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	BTB	A	505	-	13,13,13	0.41	0	7,16,16	0.95	0
5	BTB	B	504	9	13,13,13	0.48	0	7,16,16	0.73	0
5	BTB	D	505	-	13,13,13	0.56	0	7,16,16	0.72	0
5	BTB	A	504	9	13,13,13	0.38	0	7,16,16	0.44	0
5	BTB	C	507	-	13,13,13	0.72	0	7,16,16	0.50	0
5	BTB	D	504	9	13,13,13	0.39	0	7,16,16	0.52	0
5	BTB	D	506	-	13,13,13	2.17	2 (15%)	7,16,16	0.43	0
3	H4B	A	502	-	16,18,18	0.98	0	11,26,26	2.60	5 (45%)
7	GOL	A	507	-	5,5,5	0.40	0	5,5,5	0.31	0
7	GOL	C	509	-	5,5,5	0.40	0	5,5,5	0.55	0
5	BTB	D	507	-	13,13,13	0.58	0	7,16,16	1.35	1 (14%)
2	HEM	D	501	1	41,50,50	1.59	6 (14%)	45,82,82	1.71	11 (24%)
5	BTB	C	504	9	13,13,13	0.46	0	7,16,16	0.38	0
5	BTB	C	506	-	13,13,13	0.37	0	7,16,16	0.38	0
5	BTB	C	505	-	13,13,13	0.87	1 (7%)	7,16,16	0.78	0
4	KL7	A	503	-	25,25,25	0.52	0	34,34,34	2.37	8 (23%)
2	HEM	A	501	1	41,50,50	1.52	7 (17%)	45,82,82	1.62	10 (22%)
3	H4B	C	502	-	16,18,18	0.87	0	11,26,26	2.75	6 (54%)
5	BTB	B	506	-	13,13,13	0.40	0	7,16,16	0.51	0
3	H4B	B	502	-	16,18,18	0.94	0	11,26,26	2.71	5 (45%)
3	H4B	D	502	-	16,18,18	0.80	0	11,26,26	2.70	5 (45%)
2	HEM	C	501	1	41,50,50	1.56	7 (17%)	45,82,82	1.69	12 (26%)
2	HEM	B	501	1	41,50,50	1.46	5 (12%)	45,82,82	1.96	13 (28%)
4	KL7	C	503	-	25,25,25	0.48	0	34,34,34	2.36	9 (26%)
4	KL7	B	503	-	25,25,25	0.54	0	34,34,34	2.59	10 (29%)
5	BTB	B	505	-	13,13,13	0.36	0	7,16,16	0.61	0
4	KL7	D	503	-	25,25,25	0.68	1 (4%)	34,34,34	2.31	12 (35%)

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	BTB	A	505	-	-	8/21/21/21	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	BTB	B	504	9	-	3/21/21/21	-
5	BTB	D	505	-	-	12/21/21/21	-
5	BTB	A	504	9	-	5/21/21/21	-
5	BTB	C	507	-	-	3/21/21/21	-
5	BTB	D	504	9	-	6/21/21/21	-
5	BTB	D	506	-	-	3/21/21/21	-
3	H4B	A	502	-	-	2/8/17/17	0/2/2/2
7	GOL	A	507	-	-	4/4/4/4	-
7	GOL	C	509	-	-	4/4/4/4	-
5	BTB	D	507	-	-	9/21/21/21	-
2	HEM	D	501	1	-	4/12/54/54	-
5	BTB	C	504	9	-	8/21/21/21	-
5	BTB	C	506	-	-	6/21/21/21	-
5	BTB	C	505	-	-	4/21/21/21	-
4	KL7	A	503	-	-	2/11/11/11	0/2/2/2
2	HEM	A	501	1	-	8/12/54/54	-
3	H4B	C	502	-	-	3/8/17/17	0/2/2/2
5	BTB	B	506	-	-	7/21/21/21	-
3	H4B	B	502	-	-	3/8/17/17	0/2/2/2
3	H4B	D	502	-	-	4/8/17/17	0/2/2/2
2	HEM	C	501	1	-	6/12/54/54	-
2	HEM	B	501	1	-	4/12/54/54	-
4	KL7	C	503	-	-	2/11/11/11	0/2/2/2
4	KL7	B	503	-	-	3/11/11/11	0/2/2/2
5	BTB	B	505	-	-	7/21/21/21	-
4	KL7	D	503	-	-	3/11/11/11	0/2/2/2

All (29) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	D	506	BTB	C1-C2	-5.71	1.45	1.53
5	D	506	BTB	C2-N	-4.47	1.39	1.48
2	D	501	HEM	C3C-C2C	-4.38	1.34	1.40
2	C	501	HEM	FE-NB	3.69	2.15	1.96
2	A	501	HEM	C3C-CAC	3.66	1.55	1.47
2	B	501	HEM	C3C-CAC	3.62	1.55	1.47

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	501	HEM	C3C-C2C	-3.56	1.35	1.40
2	A	501	HEM	C3C-C2C	-3.52	1.35	1.40
2	C	501	HEM	C3C-CAC	3.37	1.54	1.47
2	D	501	HEM	C3C-CAC	3.30	1.54	1.47
2	A	501	HEM	CAB-C3B	3.21	1.56	1.47
2	D	501	HEM	CAB-C3B	3.07	1.55	1.47
2	B	501	HEM	C3C-C2C	-3.01	1.36	1.40
2	C	501	HEM	CAB-C3B	3.00	1.55	1.47
2	D	501	HEM	FE-ND	2.82	2.10	1.96
2	D	501	HEM	CAA-C2A	2.81	1.56	1.52
2	B	501	HEM	CAB-C3B	2.81	1.55	1.47
2	B	501	HEM	CMB-C2B	2.57	1.56	1.50
2	B	501	HEM	FE-ND	2.44	2.08	1.96
2	A	501	HEM	CAA-C2A	2.42	1.55	1.52
2	A	501	HEM	FE-ND	2.40	2.08	1.96
5	C	505	BTB	C2-N	-2.36	1.44	1.48
2	A	501	HEM	FE-NB	2.25	2.08	1.96
2	C	501	HEM	CAA-C2A	2.14	1.55	1.52
2	D	501	HEM	CHA-C4D	2.13	1.40	1.35
2	C	501	HEM	CMB-C2B	2.11	1.55	1.50
2	C	501	HEM	FE-ND	2.10	2.07	1.96
4	D	503	KL7	C15-C16	2.06	1.40	1.38
2	A	501	HEM	CMB-C2B	2.04	1.55	1.50

All (107) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	B	503	KL7	C11-C16-C15	-9.21	119.39	124.98
4	C	503	KL7	C11-C16-C15	-8.30	119.93	124.98
4	A	503	KL7	C11-C16-C15	-7.92	120.17	124.98
4	D	503	KL7	C11-C16-C15	-7.55	120.39	124.98
2	B	501	HEM	CBA-CAA-C2A	-6.61	101.35	112.62
3	B	502	H4B	C8A-C4A-C4	5.32	119.30	114.57
4	A	503	KL7	C02-N01-C06	5.12	121.98	118.10
3	A	502	H4B	C8A-C4A-C4	5.11	119.11	114.57
4	A	503	KL7	C14-C15-C16	5.05	120.11	116.43
3	C	502	H4B	C8A-C4A-C4	5.01	119.02	114.57
3	D	502	H4B	C8A-C4A-C4	4.84	118.87	114.57
4	C	503	KL7	C02-N01-C06	4.82	121.75	118.10
4	B	503	KL7	C12-C11-C16	4.82	121.21	114.57
4	D	503	KL7	C14-C15-C16	4.77	119.90	116.43
4	B	503	KL7	C09-C11-C12	-4.72	117.42	122.11

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	C	503	KL7	C14-C15-C16	4.65	119.81	116.43
4	B	503	KL7	C14-C15-C16	4.24	119.52	116.43
4	D	503	KL7	C02-N01-C06	4.21	121.29	118.10
2	B	501	HEM	CMA-C3A-C4A	-4.15	122.08	128.46
3	D	502	H4B	C4-C4A-N5	3.97	122.45	119.12
4	B	503	KL7	C02-N01-C06	3.96	121.10	118.10
4	A	503	KL7	C12-C11-C16	3.87	119.91	114.57
4	D	503	KL7	C12-C11-C16	3.82	119.84	114.57
4	C	503	KL7	C12-C11-C16	3.81	119.82	114.57
2	A	501	HEM	C3B-C2B-C1B	3.81	109.31	106.49
4	B	503	KL7	C08-C09-C11	-3.79	105.49	112.49
2	D	501	HEM	C4A-C3A-C2A	3.70	109.57	107.00
4	A	503	KL7	F16-C16-C15	3.60	121.65	117.85
2	D	501	HEM	CMA-C3A-C4A	-3.53	123.03	128.46
3	C	502	H4B	C4-C4A-N5	3.51	122.06	119.12
3	C	502	H4B	N1-C2-N3	-3.50	119.92	125.42
3	A	502	H4B	N1-C2-N3	-3.49	119.95	125.42
3	B	502	H4B	N1-C2-N3	-3.46	119.99	125.42
2	C	501	HEM	C4B-CHC-C1C	3.42	127.07	122.56
2	D	501	HEM	CAD-C3D-C2D	-3.38	121.57	127.88
3	D	502	H4B	N1-C2-N3	-3.34	120.18	125.42
2	B	501	HEM	CHD-C1D-ND	3.32	128.04	124.43
3	A	502	H4B	C2-N3-C4	3.31	121.19	115.93
2	B	501	HEM	C4D-ND-C1D	3.30	108.48	105.07
3	C	502	H4B	C2-N3-C4	3.24	121.08	115.93
2	A	501	HEM	C1B-NB-C4B	3.23	108.41	105.07
2	C	501	HEM	C4D-ND-C1D	3.22	108.40	105.07
2	C	501	HEM	CAD-C3D-C2D	-3.19	121.94	127.88
4	B	503	KL7	F16-C16-C15	3.17	121.19	117.85
4	C	503	KL7	C09-C11-C12	-3.17	118.96	122.11
3	D	502	H4B	C2-N3-C4	3.14	120.92	115.93
3	B	502	H4B	C2-N3-C4	3.12	120.88	115.93
4	D	503	KL7	F16-C16-C15	3.09	121.11	117.85
4	A	503	KL7	C05-C06-N01	-3.06	119.65	122.90
2	B	501	HEM	C4B-CHC-C1C	3.03	126.56	122.56
4	C	503	KL7	C08-C06-N01	2.97	120.38	115.95
2	C	501	HEM	C1B-NB-C4B	2.96	108.14	105.07
2	C	501	HEM	CAD-C3D-C4D	2.94	129.79	124.66
4	D	503	KL7	C09-C11-C12	-2.92	119.21	122.11
4	C	503	KL7	F16-C16-C15	2.91	120.93	117.85
3	B	502	H4B	C4-C4A-N5	2.91	121.57	119.12
3	B	502	H4B	C2-N1-C8A	2.91	121.06	114.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	D	501	HEM	C3B-C2B-C1B	2.91	108.64	106.49
2	B	501	HEM	CMA-C3A-C2A	2.91	130.42	124.94
2	C	501	HEM	C3D-C4D-ND	-2.90	106.93	110.17
2	B	501	HEM	C3D-C4D-ND	-2.88	106.95	110.17
3	C	502	H4B	C2-N1-C8A	2.88	120.98	114.54
3	D	502	H4B	C2-N1-C8A	2.87	120.97	114.54
2	A	501	HEM	C4B-CHC-C1C	2.86	126.34	122.56
2	D	501	HEM	CAD-C3D-C4D	2.85	129.64	124.66
2	D	501	HEM	CHD-C1D-ND	2.83	127.51	124.43
4	B	503	KL7	C08-C06-N01	2.83	120.16	115.95
2	A	501	HEM	C4A-C3A-C2A	2.82	108.96	107.00
5	D	507	BTB	C8-C7-N	2.81	122.57	111.59
2	D	501	HEM	C1B-NB-C4B	2.79	107.95	105.07
4	D	503	KL7	C09-C08-C06	-2.75	106.82	112.99
2	D	501	HEM	C3D-C4D-ND	-2.71	107.15	110.17
4	C	503	KL7	C05-C06-N01	-2.71	120.03	122.90
3	A	502	H4B	C2-N1-C8A	2.70	120.59	114.54
2	C	501	HEM	C3B-C2B-C1B	2.66	108.46	106.49
4	A	503	KL7	C09-C11-C12	-2.61	119.51	122.11
2	A	501	HEM	C4C-CHD-C1D	2.59	125.98	122.56
2	C	501	HEM	C4A-C3A-C2A	2.58	108.79	107.00
4	B	503	KL7	C05-C06-N01	-2.53	120.22	122.90
4	D	503	KL7	C05-C06-N01	-2.53	120.22	122.90
4	D	503	KL7	C18-C17-C15	-2.51	106.55	114.10
2	C	501	HEM	CMA-C3A-C4A	-2.49	124.64	128.46
2	B	501	HEM	CMC-C2C-C3C	2.48	129.31	124.68
2	C	501	HEM	CHC-C4B-C3B	2.44	128.30	124.57
2	D	501	HEM	C4B-CHC-C1C	2.44	125.78	122.56
2	A	501	HEM	C4D-ND-C1D	2.35	107.50	105.07
2	B	501	HEM	CHC-C4B-C3B	2.35	128.17	124.57
2	D	501	HEM	C4D-ND-C1D	2.31	107.46	105.07
2	B	501	HEM	CAD-C3D-C2D	-2.29	123.62	127.88
3	C	502	H4B	N2-C2-N3	2.28	120.79	117.25
4	B	503	KL7	C13-C12-C11	-2.27	119.91	124.02
2	B	501	HEM	O1A-CGA-CBA	-2.26	115.82	123.08
4	D	503	KL7	C17-C15-C16	2.25	122.54	120.73
2	D	501	HEM	CMC-C2C-C3C	2.25	128.89	124.68
2	B	501	HEM	C3B-C2B-C1B	2.25	108.15	106.49
2	C	501	HEM	CHD-C1D-ND	2.20	126.83	124.43
2	C	501	HEM	CMC-C2C-C3C	2.18	128.75	124.68
2	B	501	HEM	C2D-C1D-ND	-2.17	107.28	109.88
2	A	501	HEM	CMA-C3A-C4A	-2.15	125.16	128.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	501	HEM	CMC-C2C-C3C	2.15	128.69	124.68
3	A	502	H4B	C4-C4A-N5	2.14	120.92	119.12
2	A	501	HEM	C2B-C1B-NB	-2.14	107.30	109.84
4	D	503	KL7	C13-C12-C11	-2.14	120.14	124.02
4	D	503	KL7	C08-C09-C11	-2.14	108.55	112.49
2	A	501	HEM	CHC-C4B-C3B	2.13	127.82	124.57
4	C	503	KL7	C18-C17-C15	-2.11	107.74	114.10
4	A	503	KL7	C13-C12-C11	-2.07	120.28	124.02

There are no chirality outliers.

All (133) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	501	HEM	C1A-C2A-CAA-CBA
2	A	501	HEM	C3A-C2A-CAA-CBA
2	C	501	HEM	C1A-C2A-CAA-CBA
2	C	501	HEM	C3A-C2A-CAA-CBA
2	D	501	HEM	C1A-C2A-CAA-CBA
2	D	501	HEM	C3A-C2A-CAA-CBA
3	B	502	H4B	C7-C6-C9-O9
3	B	502	H4B	C7-C6-C9-C10
3	D	502	H4B	N5-C6-C9-O9
3	D	502	H4B	C7-C6-C9-O9
3	D	502	H4B	C7-C6-C9-C10
5	A	504	BTB	C1-C2-C3-O3
5	A	504	BTB	C4-C2-C3-O3
5	A	504	BTB	N-C2-C3-O3
5	A	505	BTB	N-C2-C3-O3
5	A	505	BTB	C1-C2-C4-O4
5	A	505	BTB	C3-C2-C4-O4
5	A	505	BTB	N-C2-C4-O4
5	B	504	BTB	O1-C1-C2-C3
5	B	504	BTB	O1-C1-C2-C4
5	B	505	BTB	O1-C1-C2-C3
5	B	505	BTB	O1-C1-C2-C4
5	B	505	BTB	C1-C2-C4-O4
5	B	505	BTB	C3-C2-C4-O4
5	B	505	BTB	N-C2-C4-O4
5	B	506	BTB	C1-C2-C3-O3
5	B	506	BTB	C4-C2-C3-O3
5	B	506	BTB	N-C2-C3-O3
5	B	506	BTB	C1-C2-C4-O4

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Mol	Chain	Res	Type	Atoms
5	B	506	BTB	C3-C2-C4-O4
5	B	506	BTB	N-C2-C4-O4
5	C	504	BTB	O1-C1-C2-C3
5	C	504	BTB	O1-C1-C2-C4
5	C	504	BTB	O1-C1-C2-N
5	C	504	BTB	C3-C2-C4-O4
5	C	504	BTB	N-C2-C4-O4
5	C	504	BTB	N-C7-C8-O8
5	C	505	BTB	C1-C2-C4-O4
5	C	505	BTB	C3-C2-C4-O4
5	C	505	BTB	N-C2-C4-O4
5	C	505	BTB	C8-C7-N-C5
5	C	506	BTB	C1-C2-C3-O3
5	C	506	BTB	C4-C2-C3-O3
5	C	506	BTB	N-C2-C3-O3
5	C	507	BTB	C6-C5-N-C7
5	D	504	BTB	O1-C1-C2-C3
5	D	504	BTB	O1-C1-C2-C4
5	D	504	BTB	O1-C1-C2-N
5	D	504	BTB	C3-C2-C4-O4
5	D	505	BTB	O1-C1-C2-C3
5	D	505	BTB	O1-C1-C2-C4
5	D	505	BTB	O1-C1-C2-N
5	D	505	BTB	C3-C2-C4-O4
5	D	505	BTB	C1-C2-N-C7
5	D	505	BTB	C3-C2-N-C5
5	D	505	BTB	C4-C2-N-C7
5	D	505	BTB	C8-C7-N-C5
5	D	506	BTB	C1-C2-C3-O3
5	D	506	BTB	C4-C2-C3-O3
5	D	506	BTB	N-C2-C3-O3
5	D	507	BTB	O1-C1-C2-C3
5	D	507	BTB	O1-C1-C2-C4
5	D	507	BTB	O1-C1-C2-N
5	D	507	BTB	C1-C2-C4-O4
5	D	507	BTB	C3-C2-C4-O4
5	D	507	BTB	N-C2-C4-O4
7	A	507	GOL	O1-C1-C2-C3
7	A	507	GOL	C1-C2-C3-O3
7	C	509	GOL	O1-C1-C2-C3
7	C	509	GOL	C1-C2-C3-O3
4	A	503	KL7	C18-C19-N20-C21

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Mol	Chain	Res	Type	Atoms
4	B	503	KL7	C18-C19-N20-C22
4	C	503	KL7	C18-C19-N20-C21
4	D	503	KL7	C18-C19-N20-C22
4	D	503	KL7	C18-C19-N20-C21
5	D	504	BTB	N-C5-C6-O6
5	D	507	BTB	N-C5-C6-O6
2	C	501	HEM	C4D-C3D-CAD-CBD
5	D	505	BTB	N-C5-C6-O6
5	D	507	BTB	N-C7-C8-O8
2	A	501	HEM	C2A-CAA-CBA-CGA
2	C	501	HEM	C2A-CAA-CBA-CGA
2	D	501	HEM	C2A-CAA-CBA-CGA
7	A	507	GOL	O1-C1-C2-O2
4	D	503	KL7	C15-C17-C18-C19
4	A	503	KL7	C18-C19-N20-C22
4	B	503	KL7	C18-C19-N20-C21
4	C	503	KL7	C18-C19-N20-C22
2	C	501	HEM	C2D-C3D-CAD-CBD
7	C	509	GOL	O1-C1-C2-O2
5	D	507	BTB	C8-C7-N-C5
2	B	501	HEM	C2A-CAA-CBA-CGA
7	A	507	GOL	O2-C2-C3-O3
4	B	503	KL7	C15-C17-C18-C19
7	C	509	GOL	O2-C2-C3-O3
5	B	506	BTB	N-C7-C8-O8
5	A	504	BTB	C8-C7-N-C5
5	A	505	BTB	N-C7-C8-O8
2	A	501	HEM	C4B-C3B-CAB-CBB
2	B	501	HEM	C4B-C3B-CAB-CBB
2	C	501	HEM	C4B-C3B-CAB-CBB
2	D	501	HEM	C4B-C3B-CAB-CBB
3	B	502	H4B	N5-C6-C9-O9
5	A	505	BTB	C1-C2-C3-O3
5	A	505	BTB	C4-C2-C3-O3
5	C	504	BTB	C1-C2-C4-O4
5	D	504	BTB	C1-C2-C4-O4
5	A	504	BTB	O1-C1-C2-N
5	B	504	BTB	O1-C1-C2-N
5	B	505	BTB	O1-C1-C2-N
5	C	506	BTB	N-C2-C4-O4
5	C	507	BTB	C3-C2-N-C7
5	D	505	BTB	C1-C2-N-C5

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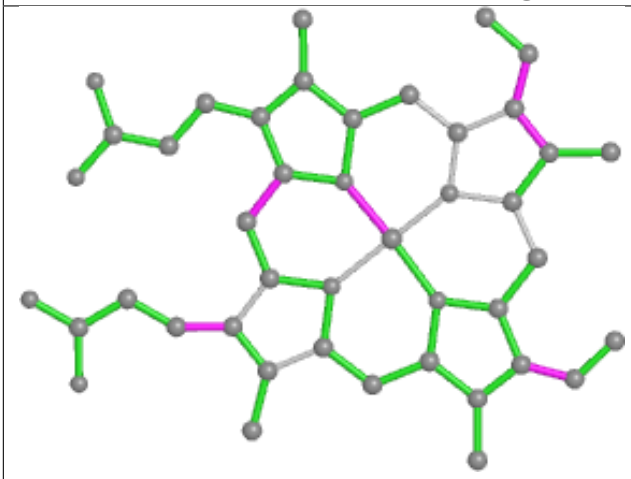
Mol	Chain	Res	Type	Atoms
5	D	505	BTB	C3-C2-N-C7
5	D	505	BTB	C4-C2-N-C5
3	D	502	H4B	N5-C6-C9-C10
2	A	501	HEM	C4D-C3D-CAD-CBD
2	B	501	HEM	CAA-CBA-CGA-O1A
3	C	502	H4B	C7-C6-C9-O9
2	A	501	HEM	CAD-CBD-CGD-O2D
2	A	501	HEM	C2D-C3D-CAD-CBD
2	B	501	HEM	CAA-CBA-CGA-O2A
2	A	501	HEM	CAD-CBD-CGD-O1D
5	C	504	BTB	N-C5-C6-O6
3	A	502	H4B	C7-C6-C9-O9
5	A	505	BTB	N-C5-C6-O6
3	C	502	H4B	C7-C6-C9-C10
3	A	502	H4B	N5-C6-C9-O9
3	C	502	H4B	N5-C6-C9-O9
5	B	505	BTB	C1-C2-C3-O3
5	C	506	BTB	C1-C2-C4-O4
5	C	506	BTB	C3-C2-C4-O4
5	C	507	BTB	O1-C1-C2-C3

There are no ring outliers.

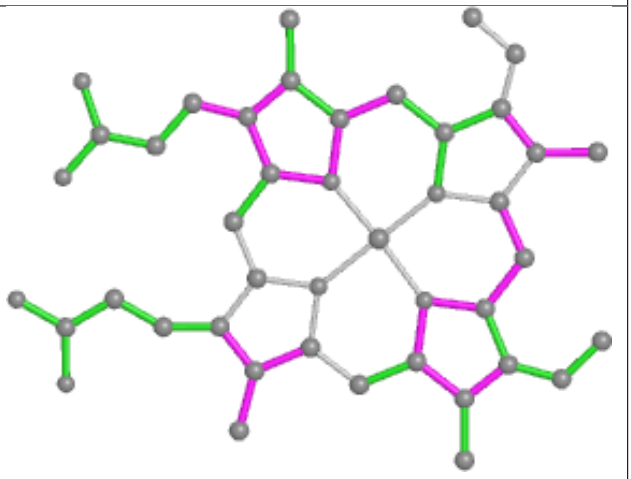
No monomer is involved in short contacts.

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 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.

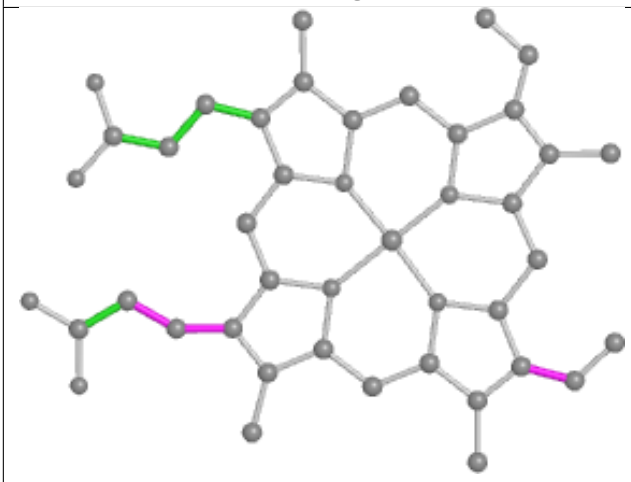
Ligand HEM D 501



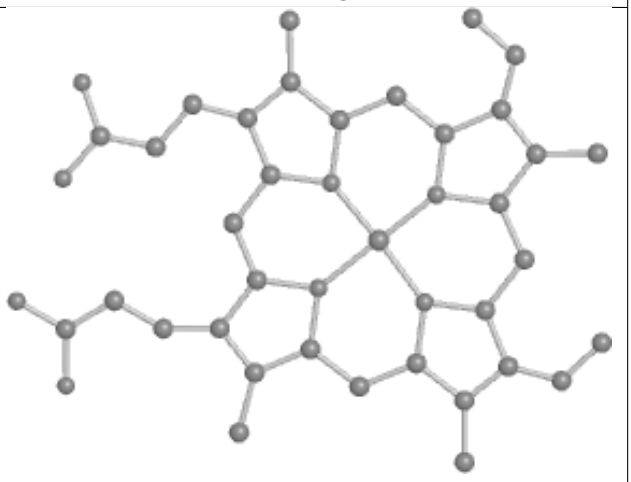
Bond lengths



Bond angles

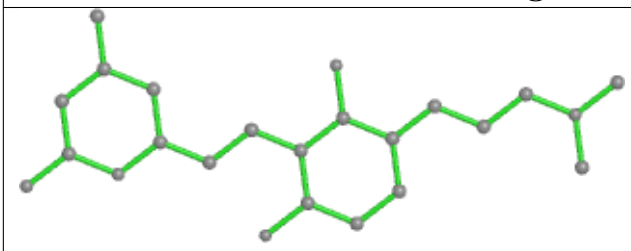


Torsions

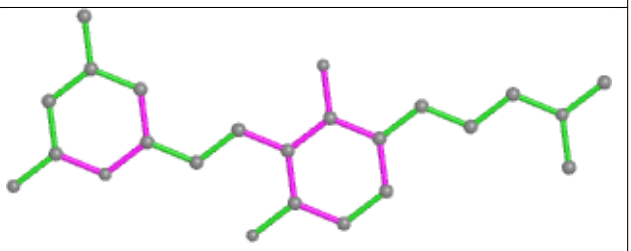


Rings

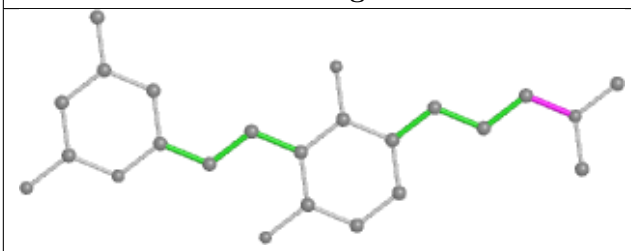
Ligand KL7 A 503



Bond lengths



Bond angles



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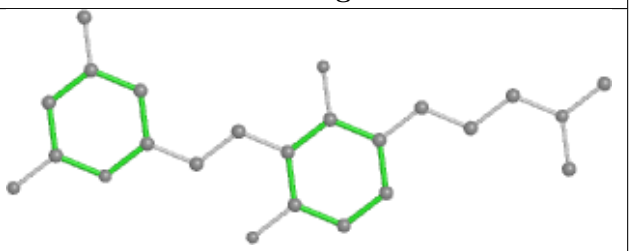
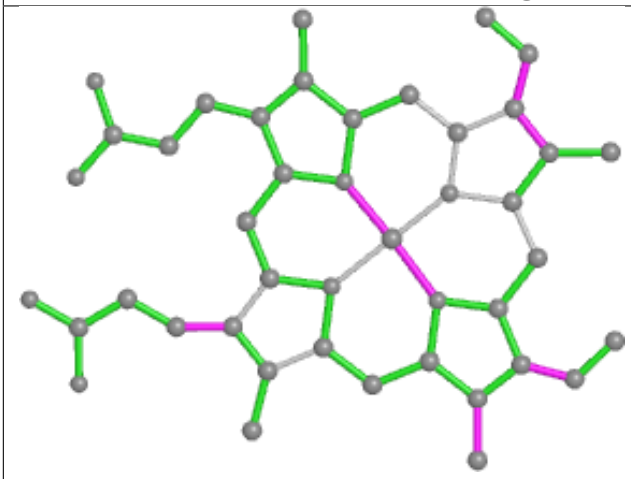
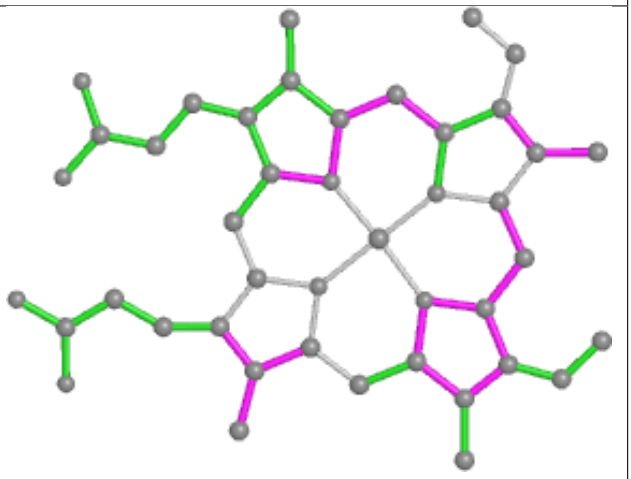


Rings

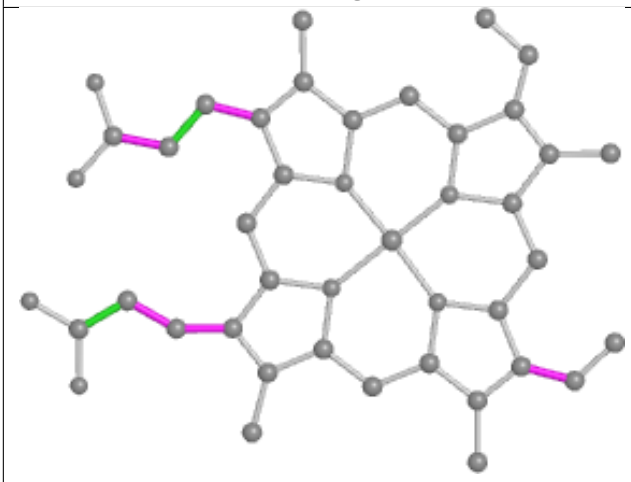
Ligand HEM A 501



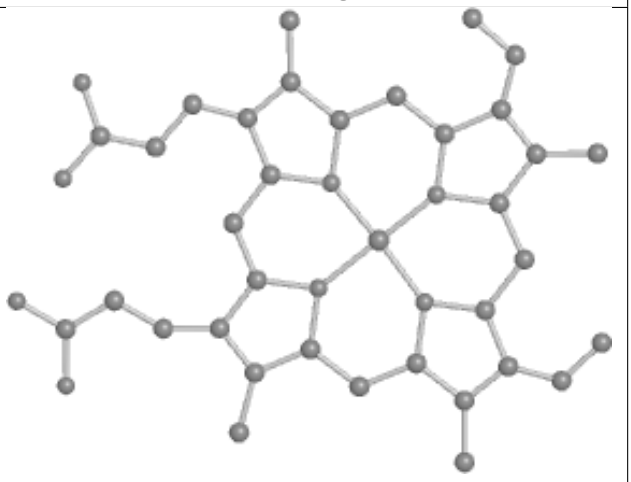
Bond lengths



Bond angles

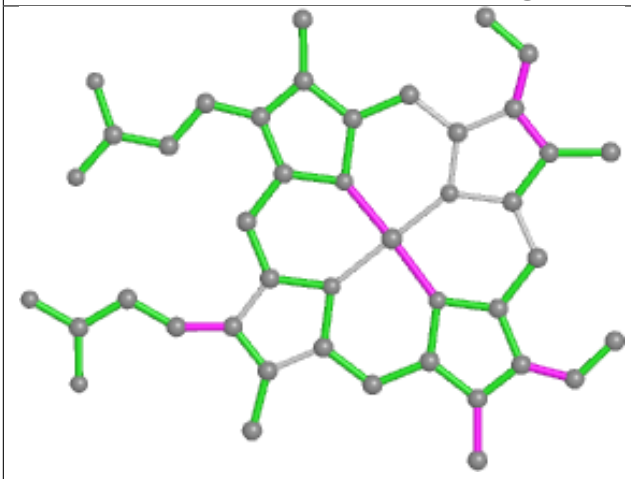


Torsions

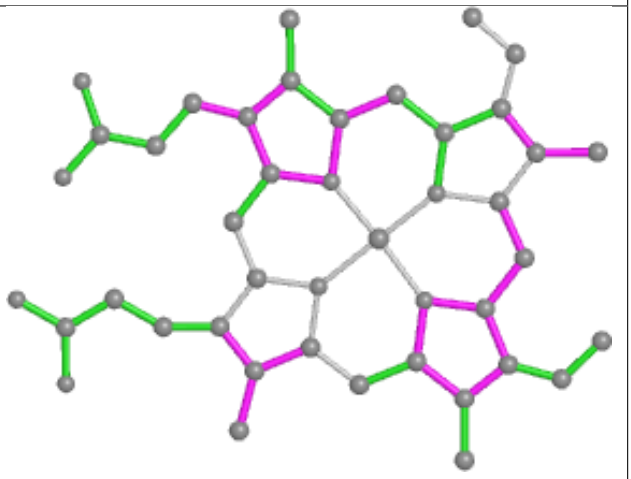


Rings

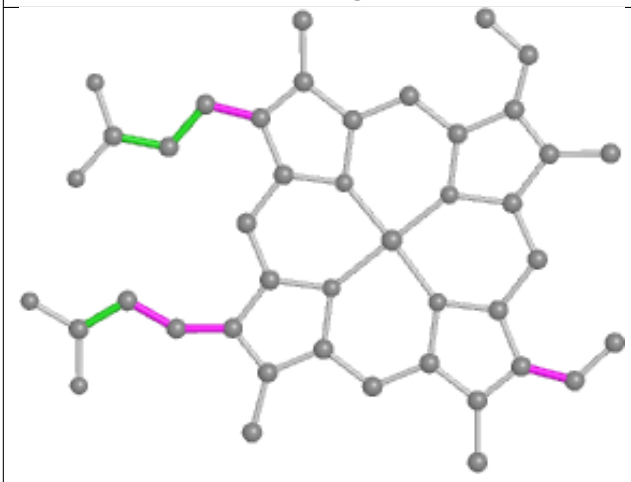
Ligand HEM C 501



Bond lengths



Bond angles



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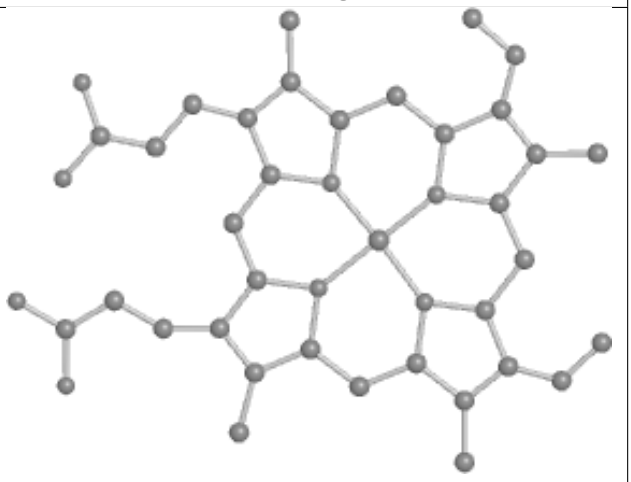
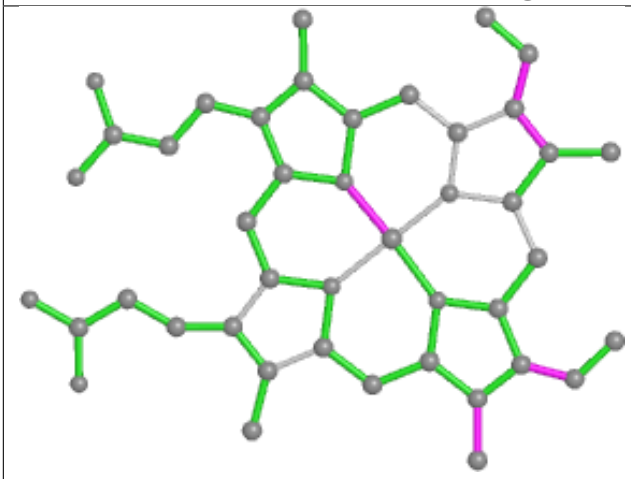
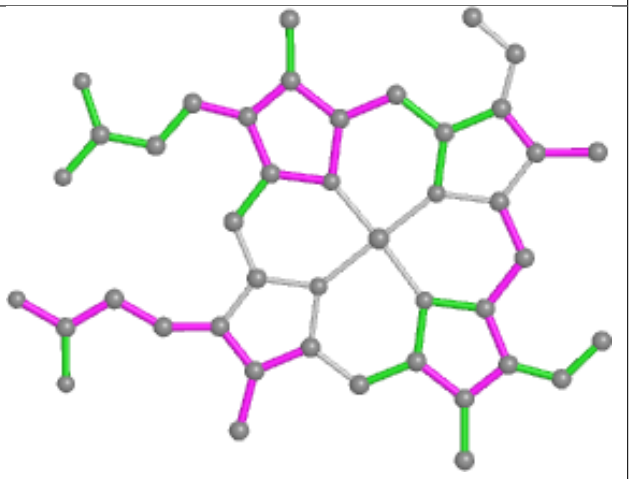


Rings

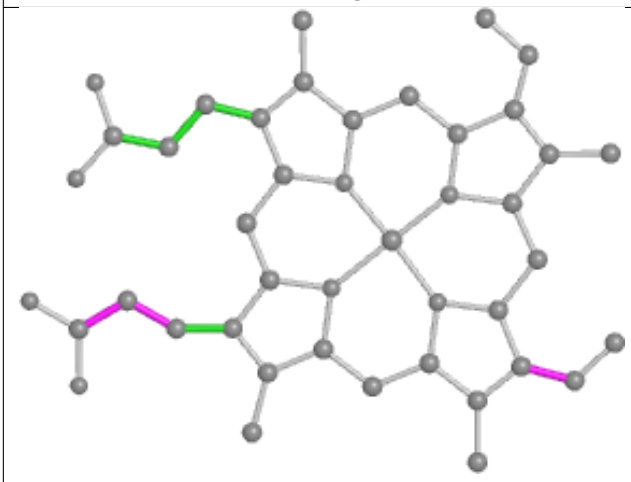
Ligand HEM B 501



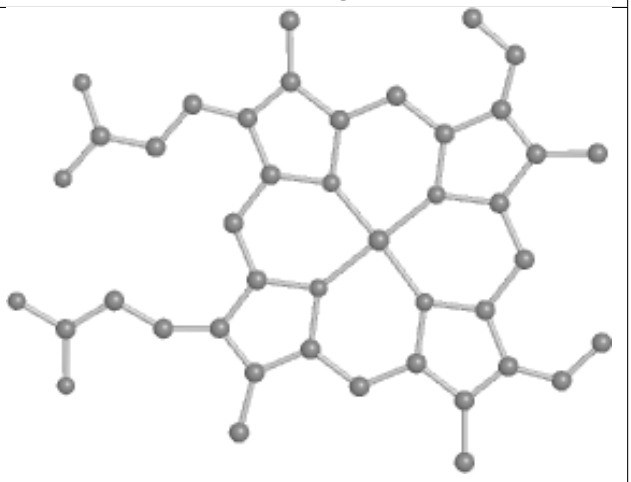
Bond lengths



Bond angles

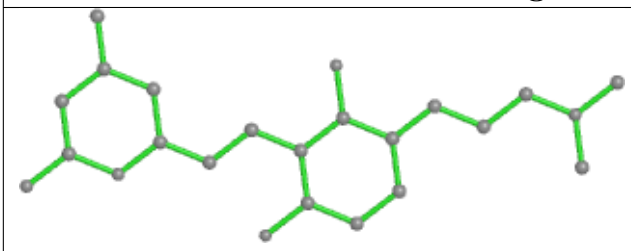


Torsions



Rings

Ligand KL7 C 503



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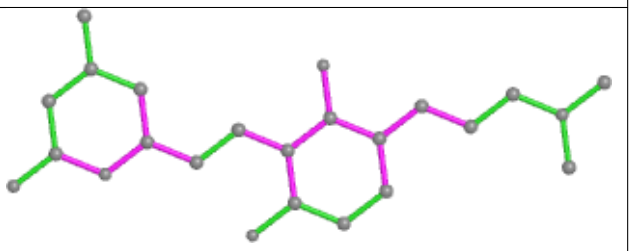
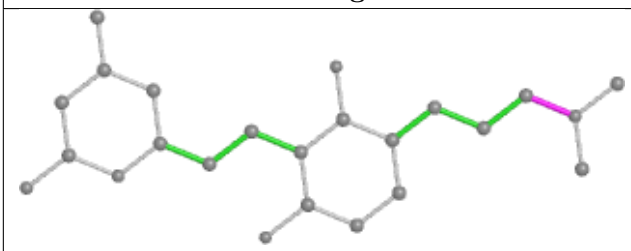


Bond angles



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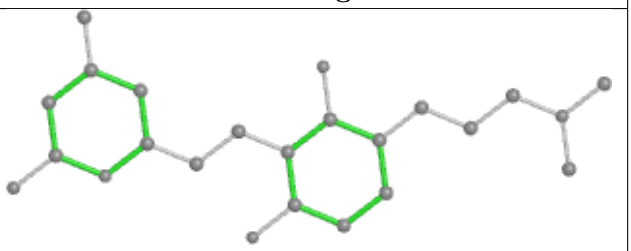
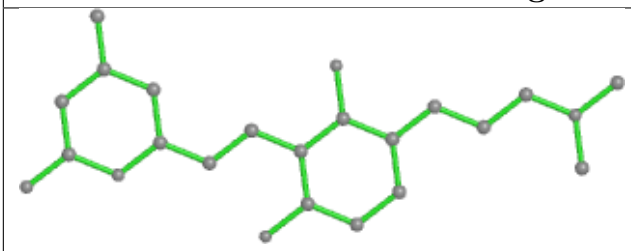
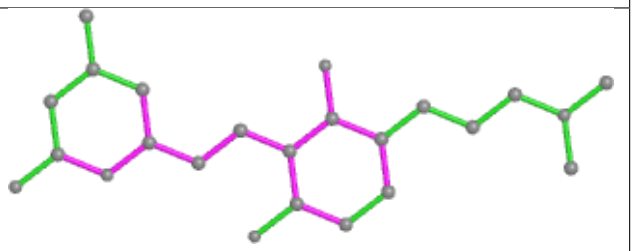


Rings

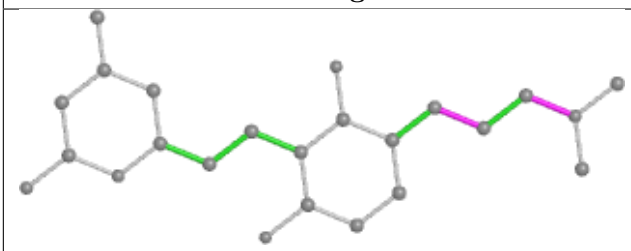
Ligand KL7 B 503



Bond lengths



Bond angles



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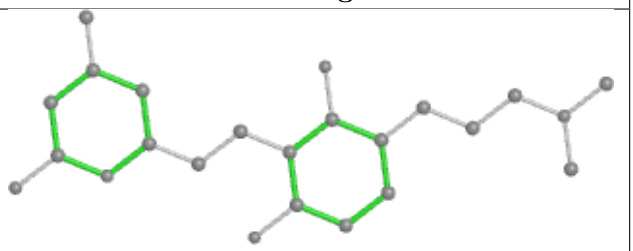
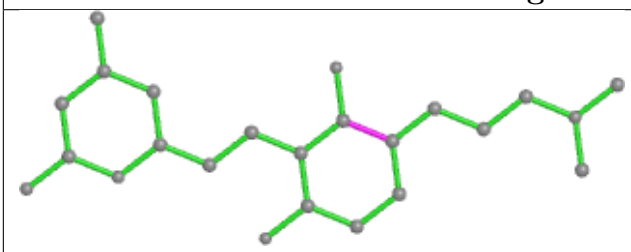
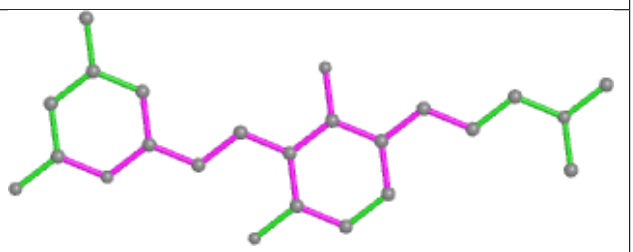


Rings

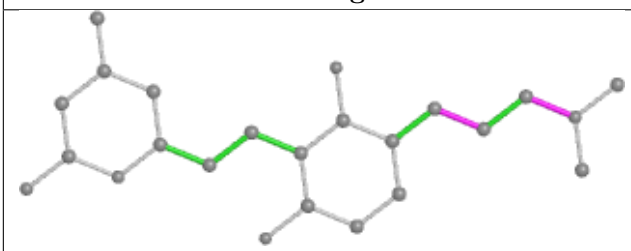
Ligand KL7 D 503



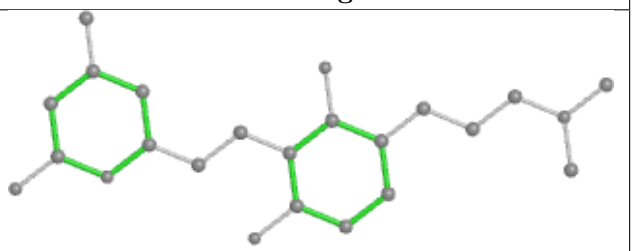
Bond lengths



Bond angles



Torsions



Rings

4.7 Other polymers

There are no such residues in this entry.

4.8 Polymer linkage issues

There are no chain breaks in this entry.

5 Fit of model and data

5.1 Protein, DNA and RNA chains

EDS failed to run properly - this section is therefore empty.

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

EDS failed to run properly - this section is therefore empty.

5.3 Carbohydrates

EDS failed to run properly - this section is therefore empty.

5.4 Ligands

EDS failed to run properly - this section is therefore empty.

5.5 Other polymers

EDS failed to run properly - this section is therefore empty.