Full wwPDB X-ray Structure Validation Report (i)

Sep 2, 2025 – 01:04 PM EDT

PDB ID	:	9Q58 / pdb_00009q58
Title	:	Structure of human endothelial nitric oxide synthase heme domain bound with 6-((5-(2-(4,4-difluoropiperidin-1-yl)ethyl-2,3-difluorophenoxy)methyl)-4-methylpyridin-2-amine
Authors	:	Li, H.; Poulos, T.L.
Deposited on	:	2025-08-20
Resolution	:	2.03 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 (i) symbol.

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

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

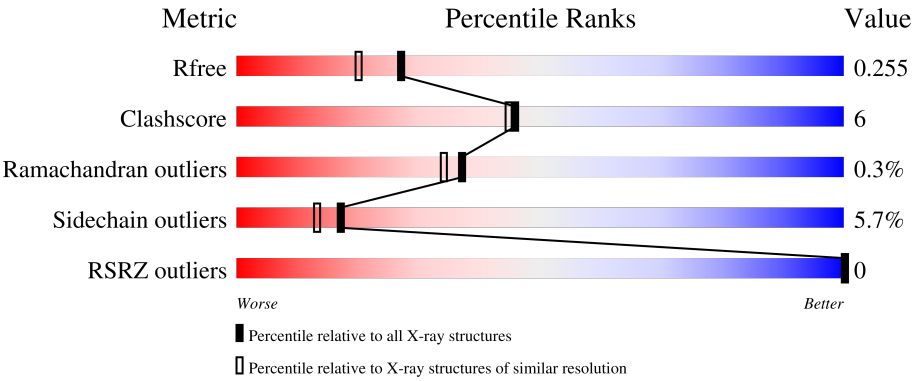
MolProbity	:	4-5-2 with Phenix2.0rc1
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.006 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.45.1

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 2.03 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	12358 (2.04-2.00)
Clashscore	180529	13897 (2.04-2.00)
Ramachandran outliers	177936	13770 (2.04-2.00)
Sidechain outliers	177891	13769 (2.04-2.00)
RSRZ outliers	164620	12358 (2.04-2.00)

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 of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	440	74% 15% • 9%
1	B	440	82% 9% 9%
1	C	440	71% 17% • 9%
1	D	440	79% 11% • 9%

2 Entry composition

There are 11 unique types of molecules in this entry. The entry contains 13740 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.

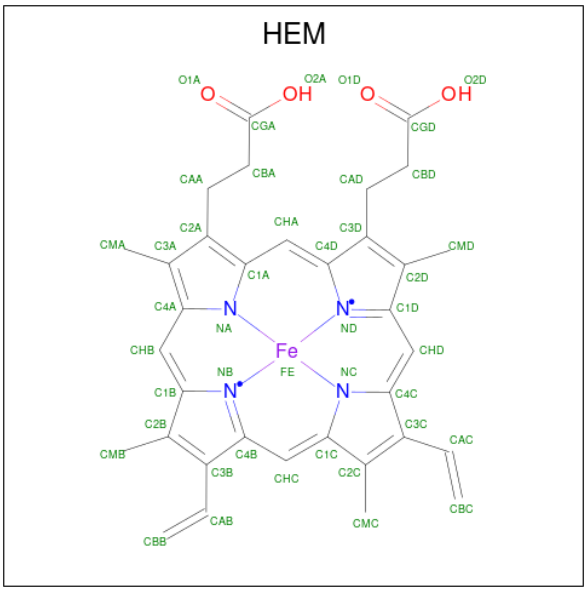
- Molecule 1 is a protein called Nitric oxide synthase 3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	400	Total	C	N	O	S	0	1	0
			3200	2038	563	583	16			
1	B	402	Total	C	N	O	S	0	3	0
			3220	2051	566	587	16			
1	C	400	Total	C	N	O	S	0	1	0
			3200	2038	563	583	16			
1	D	402	Total	C	N	O	S	0	1	0
			3212	2046	565	585	16			

There are 4 discrepancies between the modelled and reference sequences:

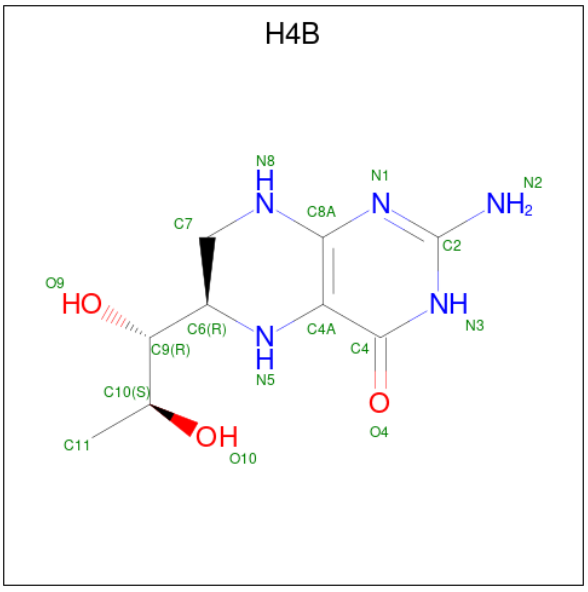
Chain	Residue	Modelled	Actual	Comment	Reference
A	298	GLU	ASP	conflict	UNP P29474
B	298	GLU	ASP	conflict	UNP P29474
C	298	GLU	ASP	conflict	UNP P29474
D	298	GLU	ASP	conflict	UNP P29474

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



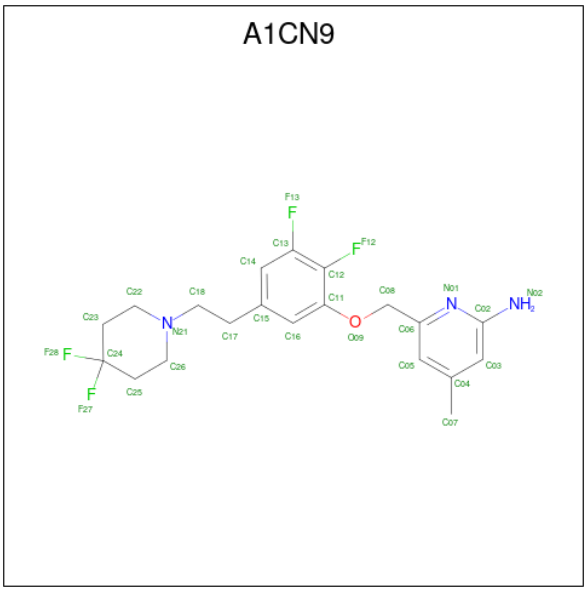
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	B	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	C	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	D	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		

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



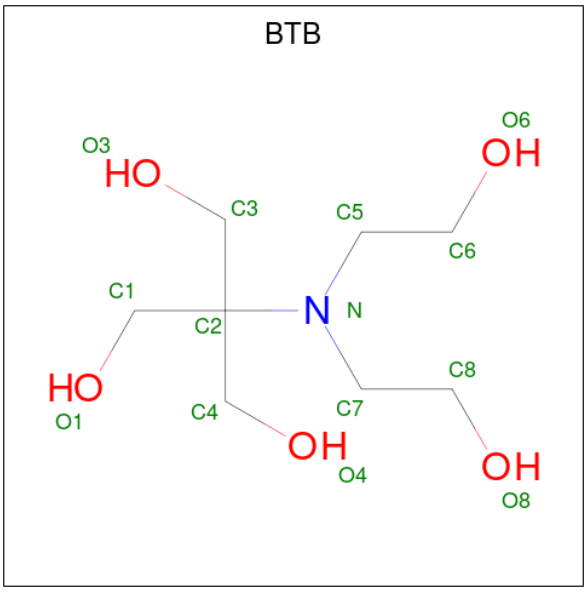
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C N O 17 9 5 3	0	0
3	B	1	Total C N O 17 9 5 3	0	0
3	C	1	Total C N O 17 9 5 3	0	0
3	D	1	Total C N O 17 9 5 3	0	0

- Molecule 4 is 6-({5-[2-(4,4-difluoropiperidin-1-yl)ethyl]-2,3-difluorophenoxy}methyl)-4-methylpyridin-2-amine (CCD ID: A1CN9) (formula: $C_{20}H_{23}F_4N_3O$) (labeled as "Ligand of Interest" by depositor).



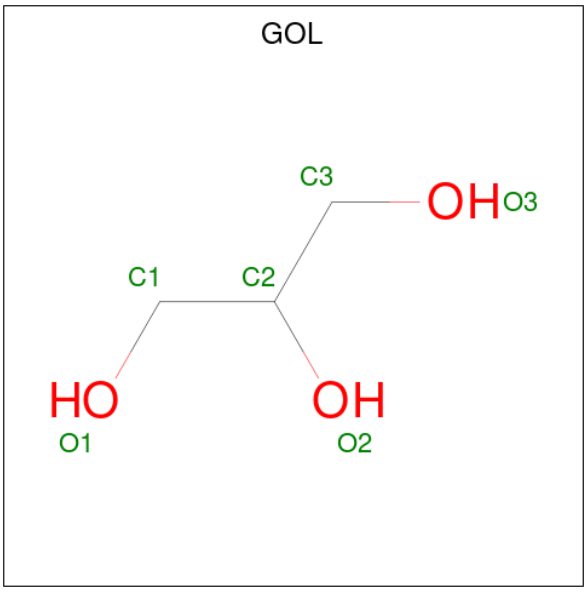
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C F N O 28 20 4 3 1	0	0
4	B	1	Total C F N O 28 20 4 3 1	0	0
4	C	1	Total C F N O 28 20 4 3 1	0	0
4	D	1	Total C F N O 28 20 4 3 1	0	0

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



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

- Molecule 6 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



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

- Molecule 7 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

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

- Molecule 8 is GADOLINIUM ATOM (CCD ID: GD) (formula: Gd).

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

- Molecule 9 is ZINC ION (CCD ID: ZN) (formula: Zn).

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

- Molecule 10 is CALCIUM ION (CCD ID: CA) (formula: Ca).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
10	A	1	Total Ca 1 1	0	0

- Molecule 11 is water.

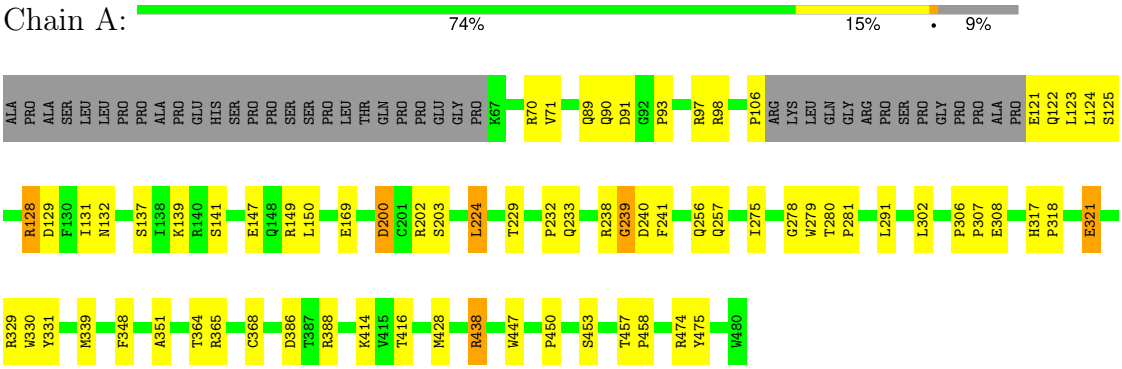
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
11	A	81	Total O 81 81	0	0
11	B	145	Total O 145 145	0	0
11	C	52	Total O 52 52	0	0
11	D	125	Total O 125 125	0	0

3 Residue-property plots (i)

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

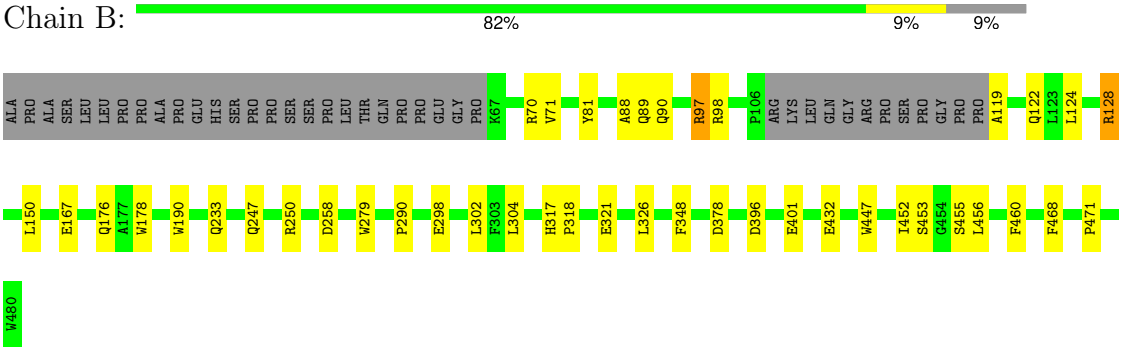
- Molecule 1: Nitric oxide synthase 3

Chain A:



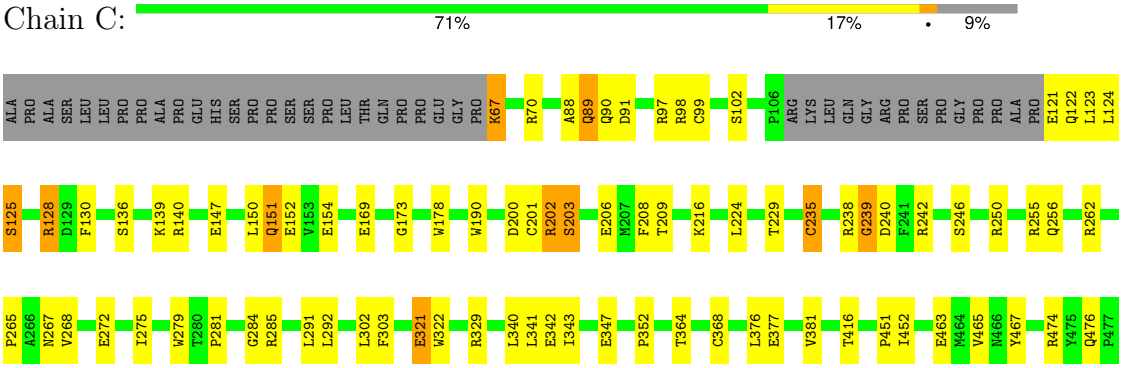
- Molecule 1: Nitric oxide synthase 3

Chain B:



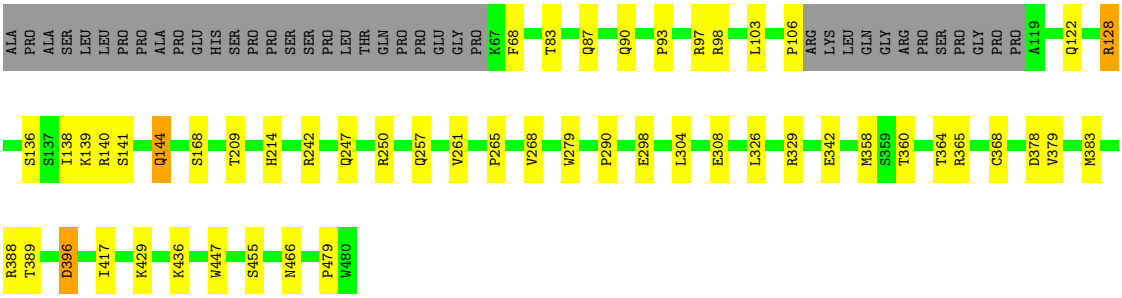
- Molecule 1: Nitric oxide synthase 3

Chain C:



• Molecule 1: Nitric oxide synthase 3

Chain D:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	60.22Å 153.34Å 109.12Å 90.00° 90.72° 90.00°	Depositor
Resolution (Å)	39.32 – 2.03 39.32 – 2.03	Depositor EDS
% Data completeness (in resolution range)	96.3 (39.32-2.03) 96.5 (39.32-2.03)	Depositor EDS
R_{merge}	0.17	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.48 (at 2.03Å)	Xtriage
Refinement program	PHENIX (1.11.1_2575: ???)	Depositor
R, R_{free}	0.205 , 0.259 0.203 , 0.255	Depositor DCC
R_{free} test set	6206 reflections (3.27%)	wwPDB-VP
Wilson B-factor (Å^2)	41.9	Xtriage
Anisotropy	0.396	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 49.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	0.159 for h,-k,-l	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	13740	wwPDB-VP
Average B, all atoms (Å^2)	65.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.43% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: H4B, CL, GD, ZN, HEM, BTB, GOL, A1CN9, CA

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	0.29	0/3294	0.51	0/4487
1	B	0.38	0/3321	0.54	0/4525
1	C	0.30	0/3294	0.50	0/4487
1	D	0.34	0/3307	0.55	0/4506
All	All	0.33	0/13216	0.53	0/18005

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3200	0	3104	36	0
1	B	3220	0	3127	27	0
1	C	3200	0	3104	46	0
1	D	3212	0	3116	28	0
2	A	43	0	30	2	0
2	B	43	0	30	3	0
2	C	43	0	30	3	0
2	D	43	0	30	3	0
3	A	17	0	15	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	17	0	15	1	0
3	C	17	0	15	1	0
3	D	17	0	15	2	0
4	A	28	0	0	0	0
4	B	28	0	0	1	0
4	C	28	0	0	1	0
4	D	28	0	0	1	0
5	A	28	0	36	3	0
5	B	28	0	35	6	0
5	C	28	0	38	2	0
5	D	28	0	35	4	0
6	A	12	0	16	0	0
6	C	12	0	16	0	0
6	D	6	0	8	0	0
7	A	1	0	0	0	0
7	B	1	0	0	0	0
7	C	1	0	0	0	0
7	D	1	0	0	0	0
8	A	1	0	0	0	0
8	B	1	0	0	0	0
8	C	1	0	0	0	0
8	D	1	0	0	0	0
9	A	1	0	0	0	0
9	C	1	0	0	0	0
10	A	1	0	0	0	0
11	A	81	0	0	3	0
11	B	145	0	0	1	0
11	C	52	0	0	1	0
11	D	125	0	0	1	0
All	All	13740	0	12815	150	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 6.

All (150) 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:247:GLN:HB2	1:D:250:ARG:HD3	1.50	0.92
1:A:97:ARG:HG2	1:A:98:ARG:HG2	1.68	0.73
5:D:505:BTB:O1	11:D:601:HOH:O	2.07	0.73
2:A:501:HEM:HBB2	2:A:501:HEM:HHC	1.71	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:321:GLU:OE2	5:B:504:BTB:O4	2.10	0.70
1:B:247:GLN:HB2	1:B:250:ARG:HD3	1.73	0.70
1:B:279:TRP:HB2	1:B:302:LEU:HD21	1.74	0.69
1:C:321:GLU:H	1:C:321:GLU:CD	2.00	0.68
1:D:298:GLU:OE1	5:D:505:BTB:O8	2.12	0.66
1:A:275:ILE:HD11	1:A:281:PRO:HB3	1.78	0.66
2:C:501:HEM:HBB2	2:C:501:HEM:HHC	1.80	0.64
1:C:262:ARG:HE	1:C:284:GLY:HA2	1.63	0.64
2:B:501:HEM:HBC2	2:B:501:HEM:HMC2	1.80	0.64
1:D:290:PRO:HB3	1:D:304:LEU:HD23	1.80	0.64
1:A:90:GLN:HG3	1:A:91:ASP:H	1.62	0.63
1:A:129:ASP:HA	1:A:132:ASN:HD22	1.65	0.62
1:C:89:GLN:HG3	1:C:90:GLN:N	2.16	0.60
1:C:238:ARG:NH1	1:C:239:GLY:O	2.35	0.60
2:D:501:HEM:HMC2	2:D:501:HEM:HBC2	1.83	0.59
2:C:501:HEM:HBC2	2:C:501:HEM:HMC2	1.83	0.59
2:B:501:HEM:HBD1	4:B:503:A1CN9:F12	1.93	0.58
1:C:200:ASP:OD1	1:C:200:ASP:N	2.36	0.58
1:A:147:GLU:HA	1:A:150:LEU:HD12	1.85	0.58
1:B:90:GLN:HB3	1:B:468:PHE:CD2	2.39	0.58
1:C:70:ARG:NH2	11:C:605:HOH:O	2.36	0.57
1:D:68:PHE:CD1	1:D:83:THR:HG22	2.40	0.56
1:A:200:ASP:OD1	1:A:200:ASP:N	2.27	0.56
2:B:501:HEM:HHC	2:B:501:HEM:HBB2	1.87	0.56
1:A:232:PRO:HB2	1:A:238:ARG:HH22	1.71	0.56
1:B:97:ARG:HB2	1:B:98:ARG:HG2	1.87	0.56
1:B:176:GLN:HB2	1:B:471:PRO:HG2	1.88	0.56
1:B:128:ARG:HG3	1:B:150:LEU:HD22	1.88	0.55
1:C:340:LEU:HD21	1:C:347:GLU:HB3	1.89	0.55
1:D:242:ARG:NH2	1:D:479:PRO:HD3	2.22	0.55
1:C:364:THR:HG21	1:C:452:ILE:HG23	1.89	0.55
1:C:125:SER:HA	1:C:128:ARG:NH1	2.22	0.54
1:A:128:ARG:O	1:A:132:ASN:ND2	2.41	0.54
1:B:290:PRO:HB3	1:B:304:LEU:HD23	1.89	0.53
1:D:279:TRP:CD1	1:D:290:PRO:HG3	2.43	0.53
1:A:149:ARG:NE	1:A:169:GLU:OE2	2.35	0.53
1:B:317:HIS:NE2	1:B:401:GLU:OE1	2.37	0.52
1:D:396:ASP:OD1	1:D:396:ASP:N	2.41	0.52
1:B:124:LEU:HD13	1:B:128:ARG:HH12	1.75	0.52
1:A:70:ARG:NH2	11:A:603:HOH:O	2.43	0.52
1:C:97:ARG:HG2	1:C:98:ARG:HG2	1.91	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:242:ARG:NH1	1:C:476:GLN:OE1	2.44	0.51
2:A:501:HEM:HMC2	2:A:501:HEM:HBC2	1.92	0.51
1:C:151:GLN:O	1:C:154:GLU:HB2	2.10	0.51
5:B:505:BTB:O8	5:B:505:BTB:O3	2.27	0.51
1:A:365:ARG:HH12	3:A:502:H4B:C4	2.24	0.51
1:B:97:ARG:HB3	1:B:97:ARG:NH1	2.26	0.51
1:C:265:PRO:HA	1:C:268:VAL:HG23	1.93	0.51
1:C:368:CYS:SG	1:C:376:LEU:HD13	2.51	0.50
1:A:233:GLN:HB3	1:A:348:PHE:CE2	2.46	0.50
1:A:202:ARG:O	1:A:203:SER:HB3	2.12	0.50
1:C:275:ILE:HD11	1:C:281:PRO:HB3	1.94	0.50
1:A:202:ARG:HA	1:A:241:PHE:HZ	1.78	0.49
2:D:501:HEM:HBB2	2:D:501:HEM:HHC	1.93	0.49
1:A:438:ARG:NH1	11:A:604:HOH:O	2.43	0.49
1:A:279:TRP:N	1:A:302:LEU:HD11	2.27	0.48
1:A:224:LEU:HB2	1:A:416:THR:HB	1.95	0.48
1:B:122:GLN:H	1:B:122:GLN:CD	2.21	0.48
1:C:173:GLY:HA3	1:C:343:ILE:HD13	1.96	0.48
1:C:341:LEU:HD12	1:C:342:GLU:H	1.77	0.48
1:A:453:SER:OG	1:B:396:ASP:OD2	2.22	0.47
1:B:178:TRP:CE3	1:B:190:TRP:HA	2.49	0.47
1:B:453:SER:HB3	1:B:456:LEU:HD12	1.95	0.47
1:A:447:TRP:NE1	11:A:606:HOH:O	2.44	0.47
1:C:208:PHE:CE1	1:C:303:PHE:HB3	2.49	0.47
1:C:235:CYS:SG	1:C:238:ARG:HD2	2.54	0.47
1:A:93:PRO:HB3	1:A:106:PRO:HB2	1.97	0.47
1:D:436:LYS:HB3	1:D:436:LYS:HE2	1.68	0.47
5:B:504:BTB:H32	5:B:504:BTB:H51	1.44	0.47
1:C:90:GLN:HG3	1:C:91:ASP:H	1.80	0.47
1:D:308:GLU:H	1:D:308:GLU:CD	2.22	0.46
1:C:279:TRP:HB2	1:C:302:LEU:HD11	1.96	0.46
1:C:128:ARG:HH11	1:C:128:ARG:HB2	1.80	0.46
1:C:178:TRP:CE3	1:C:190:TRP:HA	2.51	0.46
5:A:505:BTB:O4	5:A:505:BTB:H72	2.14	0.46
5:A:505:BTB:H11	5:A:505:BTB:H51	1.47	0.46
1:C:322:TRP:CD1	5:C:504:BTB:H61	2.51	0.46
1:C:102:SER:O	3:C:502:H4B:O10	2.27	0.45
1:D:429:LYS:HA	1:D:429:LYS:HD2	1.73	0.45
1:A:97:ARG:NH2	1:B:88:ALA:O	2.50	0.45
2:D:501:HEM:HBD1	4:D:503:A1CN9:C12	2.46	0.45
1:A:450:PRO:HG3	1:A:457:THR:HG21	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:224:LEU:HB2	1:C:416:THR:HB	1.99	0.45
2:C:501:HEM:HBD1	4:C:503:A1CN9:F12	2.06	0.45
1:D:128:ARG:HB2	1:D:128:ARG:NH1	2.31	0.45
1:D:138:ILE:O	1:D:140:ARG:HG2	2.17	0.45
1:D:298:GLU:CD	5:D:505:BTB:HO8	2.23	0.44
1:C:246:SER:OG	1:C:250:ARG:HD2	2.16	0.44
1:A:339:MET:HE3	1:A:475:TYR:CD1	2.53	0.44
1:C:465:VAL:HG12	1:C:467:TYR:HD1	1.83	0.44
1:D:298:GLU:OE2	5:D:505:BTB:O4	2.10	0.44
1:C:140:ARG:HA	1:C:140:ARG:HD3	1.80	0.44
1:C:377:GLU:O	1:C:381:VAL:HG23	2.18	0.44
1:C:88:ALA:O	1:D:97:ARG:NH2	2.49	0.44
1:C:99:CYS:HB3	1:D:466:ASN:HB3	2.00	0.43
1:B:119:ALA:HB1	1:B:122:GLN:CD	2.43	0.43
5:B:505:BTB:O8	5:B:505:BTB:O6	2.36	0.43
1:C:67:LYS:HB3	1:C:67:LYS:HE2	1.73	0.43
5:C:504:BTB:H51	5:C:504:BTB:H32	1.62	0.43
1:A:453:SER:HA	1:B:452:ILE:HG22	1.99	0.43
1:A:306:PRO:HA	1:A:307:PRO:HD3	1.93	0.43
1:D:93:PRO:HB3	1:D:106:PRO:HB3	2.00	0.43
1:D:379:VAL:O	1:D:383:MET:HG3	2.18	0.43
1:B:455:SER:HA	1:B:460:PHE:CG	2.54	0.42
1:C:250:ARG:HD3	1:C:267:ASN:OD1	2.19	0.42
1:A:238:ARG:HG2	1:A:239:GLY:N	2.33	0.42
1:A:330:TRP:CD1	1:A:331:TYR:H	2.37	0.42
1:B:447:TRP:HA	3:B:502:H4B:N1	2.34	0.42
1:D:388:ARG:HE	1:D:388:ARG:HB2	1.35	0.42
5:B:505:BTB:H11	5:B:505:BTB:H51	1.58	0.42
1:A:278:GLY:C	1:A:302:LEU:HD11	2.45	0.42
1:A:321:GLU:H	1:A:321:GLU:CD	2.26	0.42
1:A:364:THR:O	1:A:368:CYS:HB2	2.19	0.42
1:C:242:ARG:HG3	1:C:479:PRO:HB3	2.01	0.42
1:C:463:GLU:HG2	1:D:103:LEU:HA	2.02	0.42
1:D:358:MET:HE3	1:D:360:THR:OG1	2.20	0.42
5:A:504:BTB:H72	5:A:504:BTB:H12	1.66	0.42
1:C:451:PRO:HB2	1:D:455:SER:OG	2.20	0.42
1:C:124:LEU:O	1:C:128:ARG:HD3	2.20	0.42
1:B:298:GLU:CD	5:B:505:BTB:H42	2.45	0.42
1:B:317:HIS:CG	1:B:318:PRO:HD2	2.54	0.42
1:D:139:LYS:HD2	1:D:139:LYS:N	2.34	0.42
1:C:229:THR:O	1:C:352:PRO:HD2	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:89:GLN:NE2	11:B:608:HOH:O	2.49	0.41
1:B:258:ASP:OD1	1:B:258:ASP:N	2.48	0.41
1:C:201:CYS:C	1:C:202:ARG:HD2	2.45	0.41
1:D:365:ARG:HH12	3:D:502:H4B:C4	2.34	0.41
1:D:447:TRP:HA	3:D:502:H4B:N1	2.35	0.41
1:A:229:THR:O	1:A:351:ALA:HA	2.20	0.41
1:A:386:ASP:OD2	1:A:388:ARG:HG2	2.21	0.41
1:B:70:ARG:HB2	1:B:81:TYR:CE2	2.55	0.41
1:A:224:LEU:HD12	1:A:224:LEU:HA	1.87	0.41
1:A:428:MET:HG3	1:A:458:PRO:HB2	2.02	0.41
1:C:147:GLU:HA	1:C:150:LEU:HD12	2.02	0.41
1:B:233:GLN:HB3	1:B:348:PHE:CE2	2.56	0.41
1:C:97:ARG:HB2	1:C:97:ARG:NH1	2.35	0.41
1:C:201:CYS:SG	1:C:206:GLU:HB3	2.61	0.41
1:C:364:THR:O	1:C:368:CYS:HB2	2.21	0.41
1:C:130:PHE:HE2	1:C:169:GLU:HB3	1.86	0.40
1:D:261:VAL:HG11	1:D:265:PRO:HA	2.03	0.40
1:A:233:GLN:O	1:A:238:ARG:NH1	2.54	0.40
1:D:364:THR:O	1:D:368:CYS:HB2	2.20	0.40
1:B:124:LEU:HD23	1:B:124:LEU:HA	1.87	0.40
1:C:341:LEU:HD12	1:C:342:GLU:N	2.36	0.40
1:D:214:HIS:CD2	1:D:214:HIS:C	2.99	0.40
1:A:317:HIS:CG	1:A:318:PRO:HD2	2.57	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	397/440 (90%)	379 (96%)	17 (4%)	1 (0%)	37 34
1	B	401/440 (91%)	391 (98%)	10 (2%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	C	397/440 (90%)	374 (94%)	21 (5%)	2 (0%)	25 20
1	D	399/440 (91%)	387 (97%)	11 (3%)	1 (0%)	37 34
All	All	1594/1760 (91%)	1531 (96%)	59 (4%)	4 (0%)	37 34

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	203	SER
1	A	239	GLY
1	D	144	GLN
1	C	239	GLY

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	341/373 (91%)	316 (93%)	25 (7%)	11 7
1	B	344/373 (92%)	337 (98%)	7 (2%)	50 53
1	C	341/373 (91%)	314 (92%)	27 (8%)	10 6
1	D	342/373 (92%)	322 (94%)	20 (6%)	17 13
All	All	1368/1492 (92%)	1289 (94%)	79 (6%)	17 13

All (79) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	71	VAL
1	A	89	GLN
1	A	121	GLU
1	A	122	GLN
1	A	123	LEU
1	A	124	LEU
1	A	125	SER
1	A	128	ARG

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Mol	Chain	Res	Type
1	A	131	ILE
1	A	137	SER
1	A	139	LYS
1	A	141	SER
1	A	200	ASP
1	A	224	LEU
1	A	240	ASP
1	A	256	GLN
1	A	257	GLN
1	A	280	THR
1	A	291	LEU
1	A	308	GLU
1	A	321	GLU
1	A	329	ARG
1	A	414	LYS
1	A	438	ARG
1	A	474	ARG
1	B	71	VAL
1	B	97	ARG
1	B	128	ARG
1	B	167	GLU
1	B	326	LEU
1	B	378	ASP
1	B	432	GLU
1	C	67	LYS
1	C	89	GLN
1	C	121	GLU
1	C	122	GLN
1	C	123	LEU
1	C	125	SER
1	C	128	ARG
1	C	136	SER
1	C	139	LYS
1	C	151	GLN
1	C	152	GLU
1	C	202	ARG
1	C	203	SER
1	C	209	THR
1	C	216	LYS
1	C	235	CYS
1	C	240	ASP
1	C	255	ARG

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Mol	Chain	Res	Type
1	C	256	GLN
1	C	272	GLU
1	C	285	ARG
1	C	291	LEU
1	C	292	LEU
1	C	321	GLU
1	C	329	ARG
1	C	474	ARG
1	C	478	ASP
1	D	87	GLN
1	D	90	GLN
1	D	98	ARG
1	D	122	GLN
1	D	128	ARG
1	D	136	SER
1	D	141	SER
1	D	144	GLN
1	D	168[A]	SER
1	D	168[B]	SER
1	D	209	THR
1	D	257	GLN
1	D	268	VAL
1	D	326	LEU
1	D	329	ARG
1	D	342	GLU
1	D	378	ASP
1	D	389	THR
1	D	396	ASP
1	D	417	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	87	GLN
1	A	122	GLN
1	A	132	ASN
1	A	194	GLN
1	A	213	ASN
1	A	294	GLN
1	B	403	ASN
1	B	408	HIS
1	C	126	GLN

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Mol	Chain	Res	Type
1	C	408	HIS
1	D	408	HIS

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 36 ligands modelled in this entry, 11 are monoatomic - leaving 25 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
2	HEM	C	501	1	42,50,50	1.56	6 (14%)	46,82,82	1.61	10 (21%)
4	A1CN9	C	503	-	30,30,30	0.61	0	39,43,43	1.17	3 (7%)
5	BTB	C	504	8	13,13,13	0.41	0	7,16,16	0.79	0
5	BTB	D	505	-	13,13,13	0.58	0	7,16,16	1.09	1 (14%)
6	GOL	C	507	-	5,5,5	0.35	0	5,5,5	0.26	0
5	BTB	A	504	8	13,13,13	0.43	0	7,16,16	0.88	0
5	BTB	C	505	-	13,13,13	0.44	0	7,16,16	0.74	0
4	A1CN9	B	503	-	30,30,30	0.74	0	39,43,43	1.25	2 (5%)
4	A1CN9	A	503	-	30,30,30	0.63	0	39,43,43	1.60	7 (17%)
3	H4B	D	502	-	16,18,18	0.87	0	14,26,26	2.82	6 (42%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
6	GOL	A	507	-	5,5,5	0.35	0	5,5,5	0.30	0
6	GOL	A	506	-	5,5,5	0.32	0	5,5,5	0.42	0
4	A1CN9	D	503	-	30,30,30	0.62	0	39,43,43	1.20	3 (7%)
3	H4B	C	502	-	16,18,18	0.90	0	14,26,26	2.29	4 (28%)
5	BTB	B	505	-	13,13,13	0.42	0	7,16,16	1.22	1 (14%)
2	HEM	A	501	1	42,50,50	1.50	6 (14%)	46,82,82	1.83	10 (21%)
6	GOL	C	506	-	5,5,5	0.34	0	5,5,5	0.46	0
5	BTB	D	504	8	13,13,13	0.67	0	7,16,16	0.92	0
6	GOL	D	506	-	5,5,5	0.31	0	5,5,5	0.41	0
2	HEM	B	501	1	42,50,50	1.52	8 (19%)	46,82,82	1.77	11 (23%)
3	H4B	B	502	-	16,18,18	0.88	1 (6%)	14,26,26	2.45	6 (42%)
5	BTB	A	505	-	13,13,13	0.71	0	7,16,16	1.04	1 (14%)
2	HEM	D	501	1	42,50,50	1.48	6 (14%)	46,82,82	2.09	14 (30%)
5	BTB	B	504	8	13,13,13	0.47	0	7,16,16	0.53	0
3	H4B	A	502	-	16,18,18	0.89	0	14,26,26	2.45	5 (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
2	HEM	C	501	1	-	6/12/54/54	-
4	A1CN9	C	503	-	-	3/10/22/22	0/3/3/3
5	BTB	C	504	8	-	9/21/21/21	-
5	BTB	D	505	-	-	7/21/21/21	-
6	GOL	C	507	-	-	4/4/4/4	-
5	BTB	A	504	8	-	2/21/21/21	-
5	BTB	C	505	-	-	7/21/21/21	-
4	A1CN9	B	503	-	-	3/10/22/22	0/3/3/3
4	A1CN9	A	503	-	-	3/10/22/22	0/3/3/3
3	H4B	D	502	-	-	0/8/17/17	0/2/2/2
6	GOL	A	507	-	-	4/4/4/4	-
6	GOL	A	506	-	-	2/4/4/4	-
4	A1CN9	D	503	-	-	3/10/22/22	0/3/3/3
3	H4B	C	502	-	-	0/8/17/17	0/2/2/2
5	BTB	B	505	-	-	12/21/21/21	-

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

All (27) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	501	HEM	C3C-C2C	-4.33	1.34	1.40
2	A	501	HEM	C3C-C2C	-3.57	1.35	1.40
2	B	501	HEM	C3C-CAC	3.33	1.55	1.47
2	A	501	HEM	C3C-CAC	3.32	1.55	1.47
2	D	501	HEM	C3C-C2C	-3.31	1.35	1.40
2	D	501	HEM	C3C-CAC	3.31	1.55	1.47
2	C	501	HEM	C3C-CAC	3.27	1.55	1.47
2	A	501	HEM	CAB-C3B	3.25	1.56	1.47
2	C	501	HEM	CAB-C3B	3.23	1.56	1.47
2	A	501	HEM	FE-NB	3.21	2.15	1.98
2	D	501	HEM	C3C-C4C	3.20	1.46	1.41
2	B	501	HEM	C3C-C2C	-3.18	1.36	1.40
2	C	501	HEM	FE-NB	3.06	2.15	1.98
2	D	501	HEM	CAB-C3B	3.00	1.55	1.47
2	B	501	HEM	FE-NB	3.00	2.14	1.98
2	B	501	HEM	CAB-C3B	2.84	1.55	1.47
2	B	501	HEM	CMD-C2D	2.69	1.56	1.50
2	D	501	HEM	CMB-C2B	2.69	1.56	1.50
2	B	501	HEM	CMB-C2B	2.41	1.55	1.50
2	A	501	HEM	C3C-C4C	2.31	1.44	1.41
2	B	501	HEM	C3C-C4C	2.25	1.44	1.41
2	B	501	HEM	CMC-C2C	2.24	1.56	1.51
2	C	501	HEM	C3C-C4C	2.22	1.44	1.41
2	D	501	HEM	FE-NB	2.21	2.10	1.98
2	C	501	HEM	CMD-C2D	2.12	1.55	1.50
2	A	501	HEM	CMB-C2B	2.10	1.55	1.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	502	H4B	C4-N3	2.04	1.36	1.33

All (84) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	D	501	HEM	CBA-CAA-C2A	-7.42	100.07	112.54
2	B	501	HEM	CBA-CAA-C2A	-6.27	101.99	112.54
3	A	502	H4B	C8A-C4A-C4	6.18	120.12	114.50
3	C	502	H4B	C8A-C4A-C4	5.95	119.91	114.50
3	B	502	H4B	C8A-C4A-C4	5.81	119.79	114.50
4	A	503	A1CN9	C02-N01-C06	5.54	122.21	118.07
3	D	502	H4B	C8A-C4A-C4	5.53	119.53	114.50
2	A	501	HEM	C4B-CHC-C1C	5.15	129.35	122.56
3	D	502	H4B	C11-C10-C9	-5.14	105.82	112.11
2	A	501	HEM	CBA-CAA-C2A	-4.99	104.15	112.54
4	B	503	A1CN9	C02-N01-C06	4.78	121.64	118.07
2	B	501	HEM	C4B-CHC-C1C	4.08	127.95	122.56
2	D	501	HEM	C3B-C4B-NB	-4.02	106.58	109.47
4	D	503	A1CN9	C25-C24-C23	-3.88	110.48	114.33
2	D	501	HEM	C4B-CHC-C1C	3.84	127.62	122.56
4	C	503	A1CN9	C02-N01-C06	3.73	120.86	118.07
3	D	502	H4B	N1-C2-N3	-3.72	119.78	125.48
3	D	502	H4B	C2-N3-C4	3.71	121.11	115.96
2	C	501	HEM	C4B-CHC-C1C	3.57	127.28	122.56
3	B	502	H4B	C2-N3-C4	3.51	120.84	115.96
2	C	501	HEM	C3B-C2B-C1B	3.46	109.01	106.41
2	C	501	HEM	C3B-C4B-NB	-3.37	107.05	109.47
4	A	503	A1CN9	C25-C26-N21	-3.36	107.73	111.16
2	D	501	HEM	C1B-NB-C4B	3.24	109.05	105.21
2	A	501	HEM	C3B-C4B-NB	-3.17	107.19	109.47
3	B	502	H4B	N1-C2-N3	-3.16	120.64	125.48
2	A	501	HEM	C3D-C4D-ND	-3.15	106.72	110.17
3	A	502	H4B	C2-N3-C4	3.10	120.28	115.96
2	C	501	HEM	C1B-NB-C4B	3.09	108.87	105.21
3	C	502	H4B	N1-C2-N3	-3.06	120.79	125.48
3	A	502	H4B	N1-C2-N3	-3.03	120.83	125.48
3	C	502	H4B	C2-N3-C4	2.98	120.11	115.96
2	A	501	HEM	C1B-NB-C4B	2.98	108.73	105.21
4	B	503	A1CN9	C25-C26-N21	-2.95	108.14	111.16
2	A	501	HEM	C4D-ND-C1D	2.93	108.68	105.21
2	D	501	HEM	C4D-ND-C1D	2.90	108.64	105.21
2	C	501	HEM	C4C-CHD-C1D	2.86	126.33	122.56

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	D	502	H4B	C2-N1-C8A	2.84	121.34	114.59
4	A	503	A1CN9	C05-C06-N01	-2.82	119.52	122.73
4	D	503	A1CN9	C02-N01-C06	2.73	120.11	118.07
2	B	501	HEM	C3D-C4D-ND	-2.68	107.23	110.17
2	D	501	HEM	C3B-C2B-C1B	2.67	108.42	106.41
2	D	501	HEM	C4C-CHD-C1D	2.60	125.99	122.56
4	A	503	A1CN9	O09-C11-C12	2.59	119.83	115.92
3	A	502	H4B	C2-N1-C8A	2.59	120.75	114.59
3	A	502	H4B	C11-C10-C9	-2.58	108.95	112.11
4	A	503	A1CN9	N02-C02-N01	2.58	120.73	116.59
4	A	503	A1CN9	C25-C24-C23	-2.56	111.79	114.33
2	A	501	HEM	C3B-C2B-C1B	2.55	108.33	106.41
3	C	502	H4B	C2-N1-C8A	2.55	120.64	114.59
2	D	501	HEM	C3D-C4D-ND	-2.53	107.40	110.17
2	D	501	HEM	C2D-C1D-ND	-2.52	106.99	109.90
3	B	502	H4B	C2-N1-C8A	2.49	120.50	114.59
4	D	503	A1CN9	O09-C11-C12	2.47	119.65	115.92
2	D	501	HEM	CHA-C4D-ND	2.46	127.42	124.37
3	B	502	H4B	N2-C2-N3	2.44	120.89	117.22
2	B	501	HEM	CMC-C2C-C3C	2.43	129.54	124.68
4	C	503	A1CN9	O09-C11-C12	2.39	119.52	115.92
2	B	501	HEM	CHC-C4B-C3B	2.37	128.20	124.57
2	D	501	HEM	CHD-C1D-ND	2.36	126.98	124.44
5	D	505	BTB	O4-C4-C2	2.36	116.96	111.40
2	A	501	HEM	CHA-C4D-ND	2.28	127.20	124.37
2	C	501	HEM	CHC-C4B-C3B	2.28	128.06	124.57
2	C	501	HEM	C4A-C3A-C2A	2.28	108.58	107.00
2	B	501	HEM	CMA-C3A-C4A	-2.27	125.13	128.46
5	A	505	BTB	O1-C1-C2	-2.26	106.08	111.40
2	C	501	HEM	C2B-C1B-NB	-2.21	107.30	109.84
2	B	501	HEM	CAD-CBD-CGD	-2.21	107.81	113.67
2	A	501	HEM	C4A-C3A-C2A	2.20	108.53	107.00
4	A	503	A1CN9	O09-C08-C06	2.18	115.59	109.56
3	D	502	H4B	N2-C2-N1	2.17	120.48	117.22
2	C	501	HEM	CHB-C1B-NB	2.15	127.03	124.37
2	D	501	HEM	CBD-CAD-C3D	-2.14	106.60	112.53
2	D	501	HEM	CHC-C4B-C3B	2.14	127.84	124.57
3	B	502	H4B	C4A-C4-N3	-2.14	118.52	123.91
2	B	501	HEM	CMD-C2D-C1D	2.10	128.32	125.03
2	B	501	HEM	CAD-C3D-C2D	-2.08	123.98	127.87
5	B	505	BTB	C8-C7-N	-2.08	103.48	111.59
2	B	501	HEM	C4D-ND-C1D	2.05	107.64	105.21

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	C	503	A1CN9	C25-C24-C23	-2.05	112.30	114.33
2	C	501	HEM	C4D-ND-C1D	2.04	107.63	105.21
2	D	501	HEM	C2B-C1B-NB	-2.04	107.50	109.84
2	A	501	HEM	C2D-C1D-ND	-2.03	107.55	109.90
2	B	501	HEM	C4D-C3D-C2D	2.01	109.81	106.89

There are no chirality outliers.

All (100) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	C	501	HEM	C1A-C2A-CAA-CBA
2	C	501	HEM	C3A-C2A-CAA-CBA
2	C	501	HEM	C2A-CAA-CBA-CGA
4	D	503	A1CN9	C12-C11-O09-C08
5	A	504	BTB	O1-C1-C2-N
5	A	505	BTB	C1-C2-C3-O3
5	A	505	BTB	C4-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	504	BTB	O1-C1-C2-N
5	B	504	BTB	C1-C2-C4-O4
5	B	504	BTB	C3-C2-C4-O4
5	B	504	BTB	N-C2-C4-O4
5	B	505	BTB	C1-C2-C3-O3
5	B	505	BTB	C4-C2-C3-O3
5	B	505	BTB	N-C2-C3-O3
5	B	505	BTB	C1-C2-N-C5
5	B	505	BTB	C1-C2-N-C7
5	B	505	BTB	C3-C2-N-C5
5	B	505	BTB	C3-C2-N-C7
5	B	505	BTB	C4-C2-N-C5
5	B	505	BTB	C4-C2-N-C7
5	C	504	BTB	O1-C1-C2-C3
5	C	504	BTB	O1-C1-C2-N
5	C	504	BTB	C1-C2-C3-O3
5	C	504	BTB	C4-C2-C3-O3
5	C	504	BTB	N-C2-C3-O3
5	C	504	BTB	C1-C2-C4-O4

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Mol	Chain	Res	Type	Atoms
5	C	504	BTB	C3-C2-C4-O4
5	C	504	BTB	N-C2-C4-O4
5	C	505	BTB	C1-C2-N-C5
5	C	505	BTB	C1-C2-N-C7
5	C	505	BTB	C3-C2-N-C5
5	C	505	BTB	C3-C2-N-C7
5	C	505	BTB	C4-C2-N-C5
5	C	505	BTB	C4-C2-N-C7
5	D	504	BTB	O1-C1-C2-N
5	D	505	BTB	O1-C1-C2-N
5	D	505	BTB	C1-C2-C4-O4
5	D	505	BTB	C3-C2-C4-O4
5	D	505	BTB	N-C2-C4-O4
6	A	506	GOL	C1-C2-C3-O3
6	A	507	GOL	C1-C2-C3-O3
6	C	507	GOL	O1-C1-C2-C3
6	D	506	GOL	O1-C1-C2-C3
4	D	503	A1CN9	C15-C17-C18-N21
4	A	503	A1CN9	C17-C18-N21-C22
4	C	503	A1CN9	C17-C18-N21-C22
4	B	503	A1CN9	C17-C18-N21-C22
5	A	505	BTB	N-C7-C8-O8
5	D	505	BTB	N-C7-C8-O8
6	A	506	GOL	O2-C2-C3-O3
5	B	505	BTB	N-C5-C6-O6
4	A	503	A1CN9	C17-C18-N21-C26
5	D	505	BTB	N-C5-C6-O6
6	A	507	GOL	O1-C1-C2-C3
6	C	506	GOL	C1-C2-C3-O3
6	C	507	GOL	C1-C2-C3-O3
5	A	504	BTB	O1-C1-C2-C3
6	A	507	GOL	O2-C2-C3-O3
6	C	507	GOL	O1-C1-C2-O2
4	B	503	A1CN9	C17-C18-N21-C26
5	B	505	BTB	N-C7-C8-O8
4	A	503	A1CN9	C15-C17-C18-N21
4	C	503	A1CN9	C15-C17-C18-N21
2	A	501	HEM	C2A-CAA-CBA-CGA
2	B	501	HEM	C2A-CAA-CBA-CGA
5	C	505	BTB	N-C7-C8-O8
6	A	507	GOL	O1-C1-C2-O2
6	C	506	GOL	O2-C2-C3-O3

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Mol	Chain	Res	Type	Atoms
6	C	507	GOL	O2-C2-C3-O3
6	D	506	GOL	O1-C1-C2-O2
5	C	504	BTB	N-C7-C8-O8
5	D	505	BTB	C4-C2-C3-O3
2	A	501	HEM	C4B-C3B-CAB-CBB
2	C	501	HEM	C4B-C3B-CAB-CBB
2	D	501	HEM	C4B-C3B-CAB-CBB
5	D	504	BTB	O1-C1-C2-C4
5	A	505	BTB	C4-C2-N-C7
5	B	505	BTB	N-C2-C4-O4
4	B	503	A1CN9	C15-C17-C18-N21
5	B	504	BTB	N-C7-C8-O8
4	D	503	A1CN9	C16-C11-O09-C08
2	C	501	HEM	CAD-CBD-CGD-O2D
4	C	503	A1CN9	C17-C18-N21-C26
2	B	501	HEM	C4B-C3B-CAB-CBB
2	A	501	HEM	C3D-CAD-CBD-CGD
2	C	501	HEM	CAD-CBD-CGD-O1D
3	B	502	H4B	C7-C6-C9-O9
2	B	501	HEM	CAD-CBD-CGD-O2D
3	B	502	H4B	N5-C6-C9-O9
2	B	501	HEM	CAD-CBD-CGD-O1D
2	D	501	HEM	CAD-CBD-CGD-O2D
5	A	505	BTB	C3-C2-N-C7
2	A	501	HEM	CAA-CBA-CGA-O2A
2	D	501	HEM	CAD-CBD-CGD-O1D

There are no ring outliers.

17 monomers are involved in 31 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	501	HEM	3	0
4	C	503	A1CN9	1	0
5	C	504	BTB	2	0
5	D	505	BTB	4	0
5	A	504	BTB	1	0
4	B	503	A1CN9	1	0
3	D	502	H4B	2	0
4	D	503	A1CN9	1	0
3	C	502	H4B	1	0
5	B	505	BTB	4	0
2	A	501	HEM	2	0

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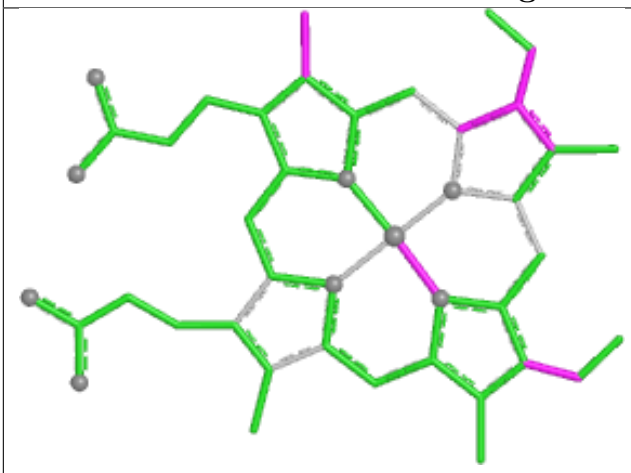
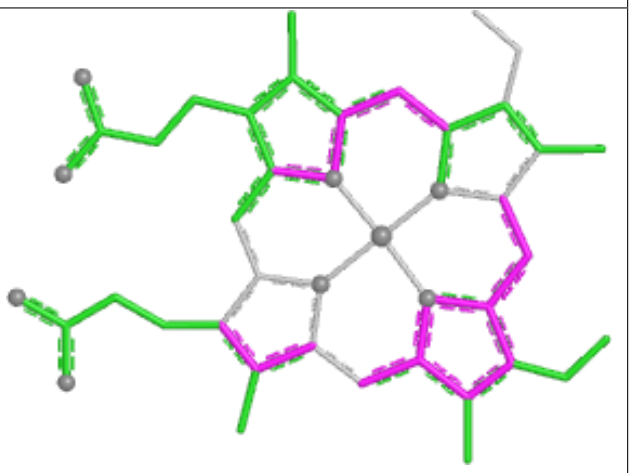
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	501	HEM	3	0
3	B	502	H4B	1	0
5	A	505	BTB	2	0
2	D	501	HEM	3	0
5	B	504	BTB	2	0
3	A	502	H4B	1	0

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

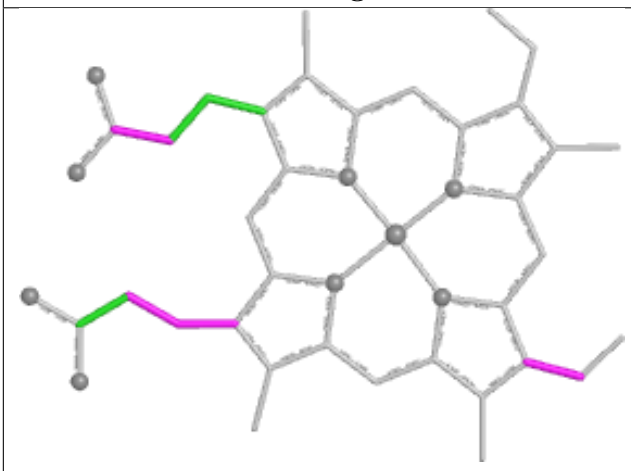
Ligand HEM C 501



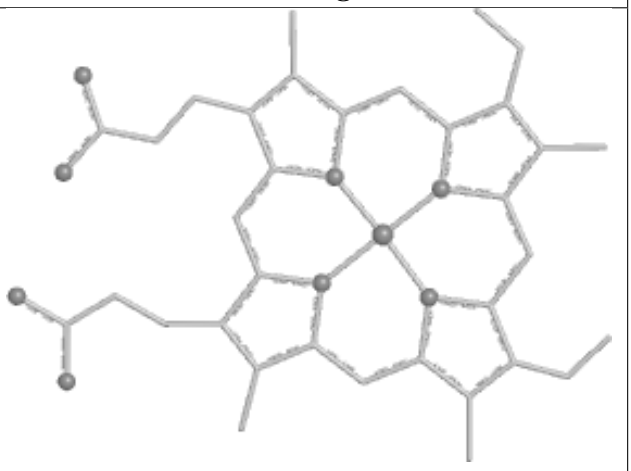
Bond lengths



Bond angles

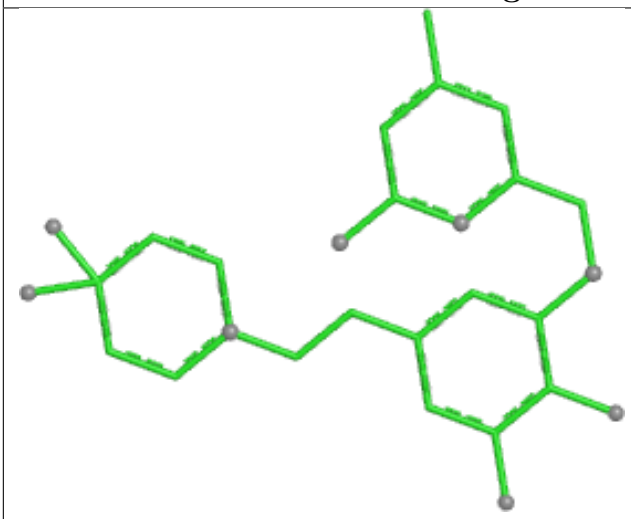


Torsions

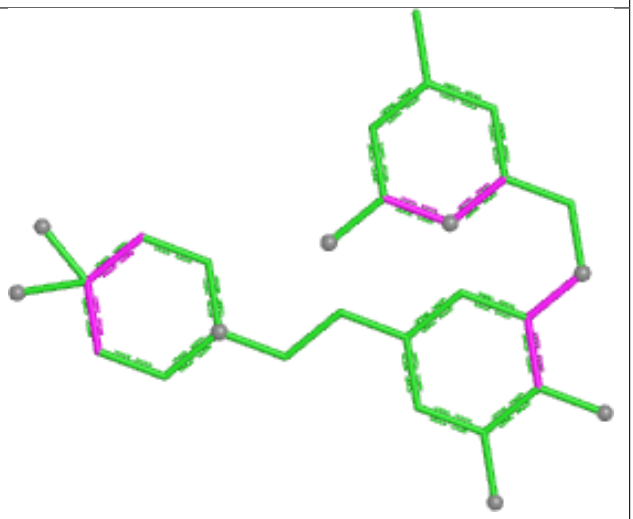


Rings

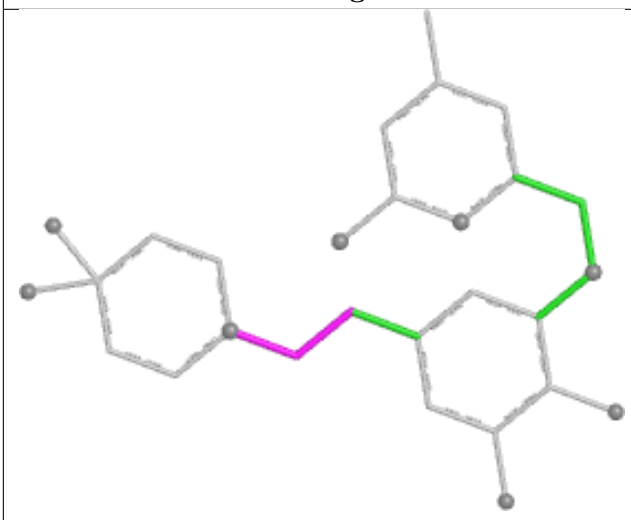
Ligand A1CN9 C 503



Bond lengths



Bond angles



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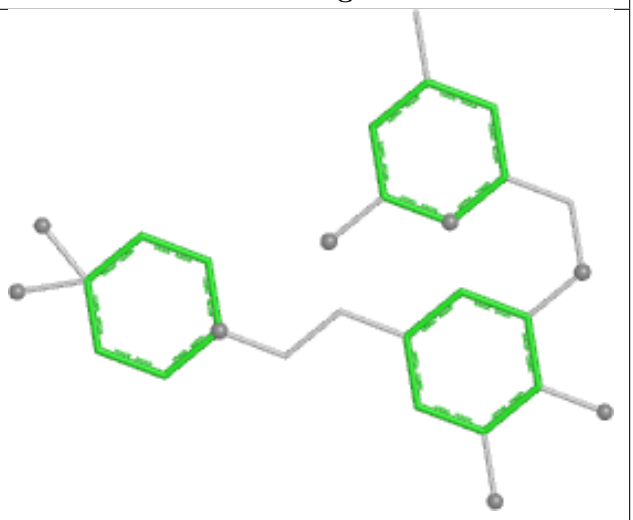
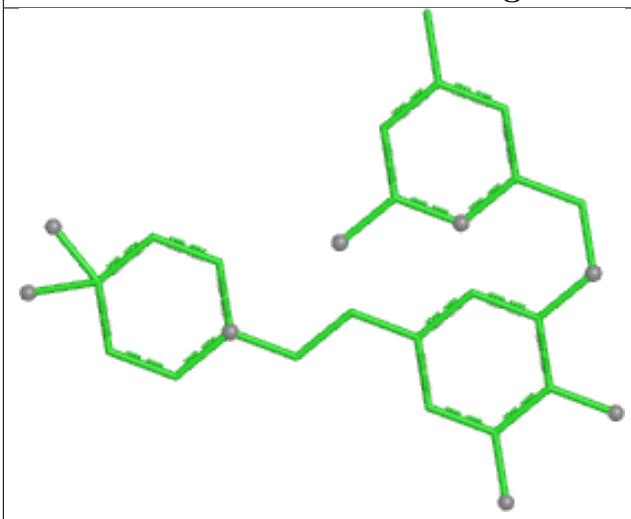
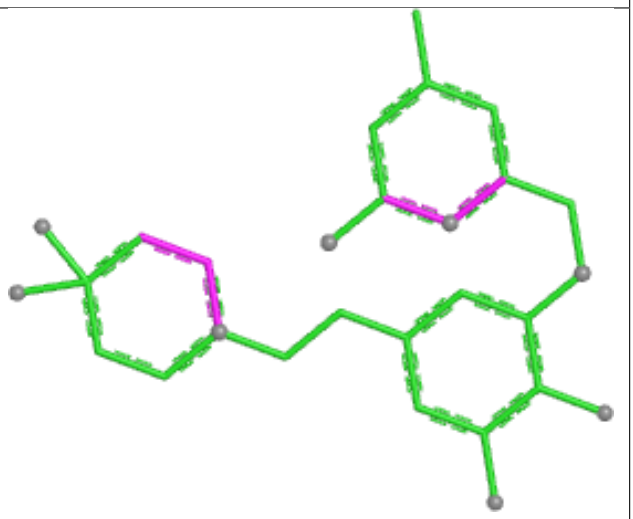


Rings

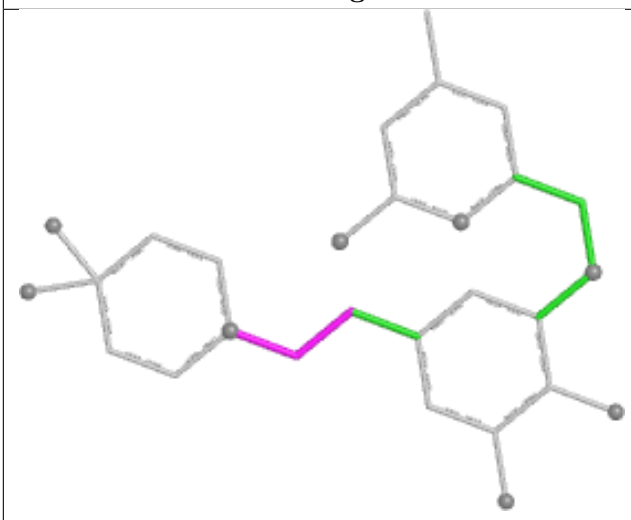
Ligand A1CN9 B 503



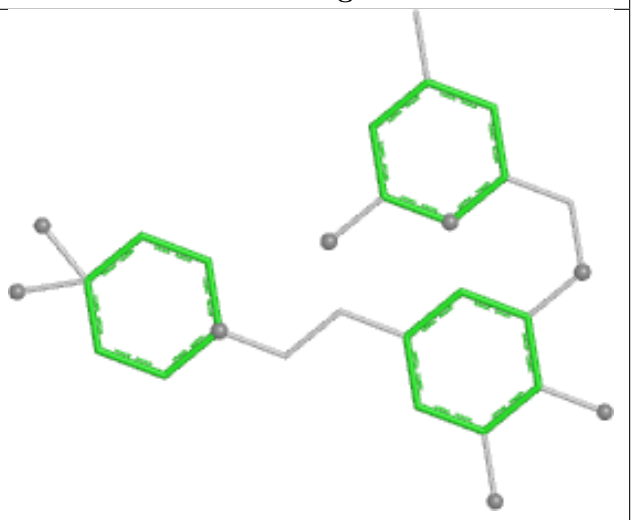
Bond lengths



Bond angles

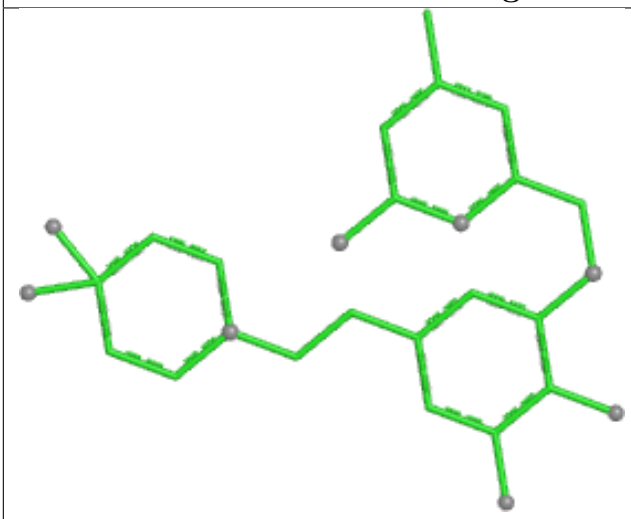


Torsions

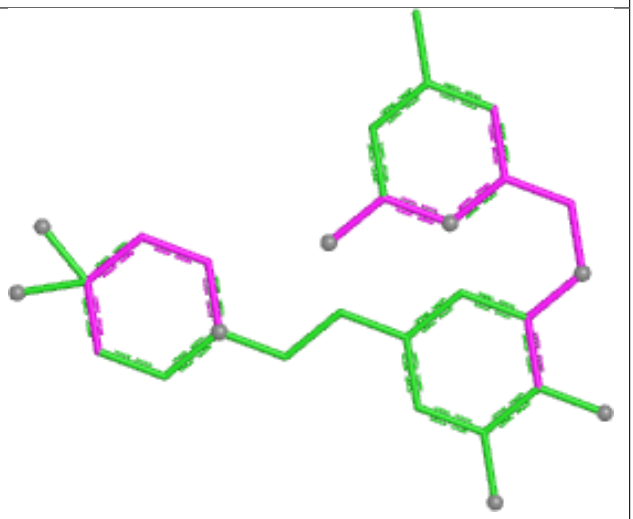


Rings

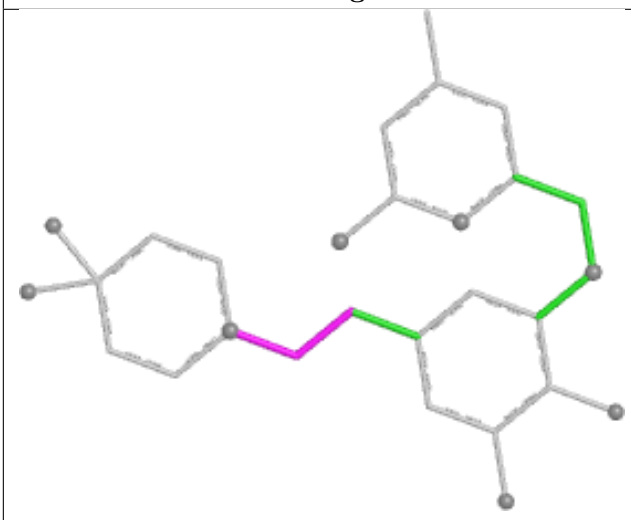
Ligand A1CN9 A 503



Bond lengths



Bond angles



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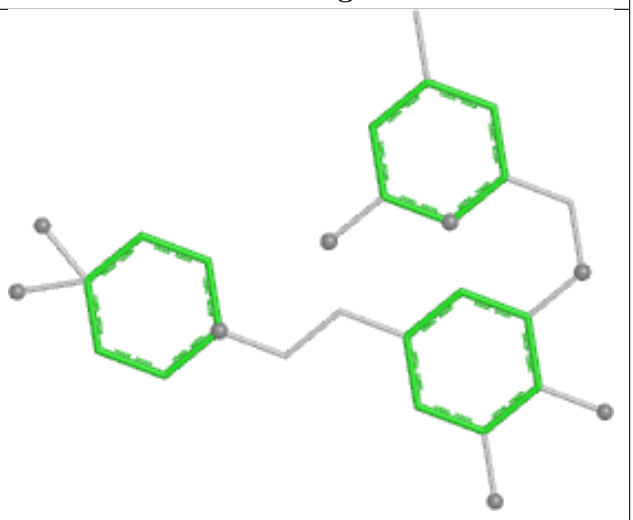
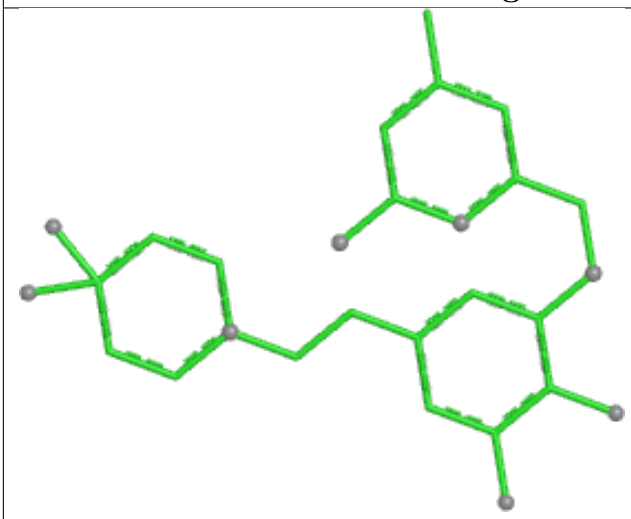
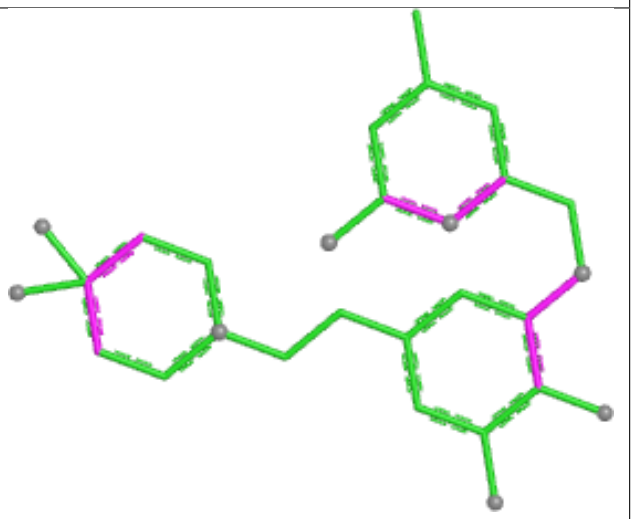


Rings

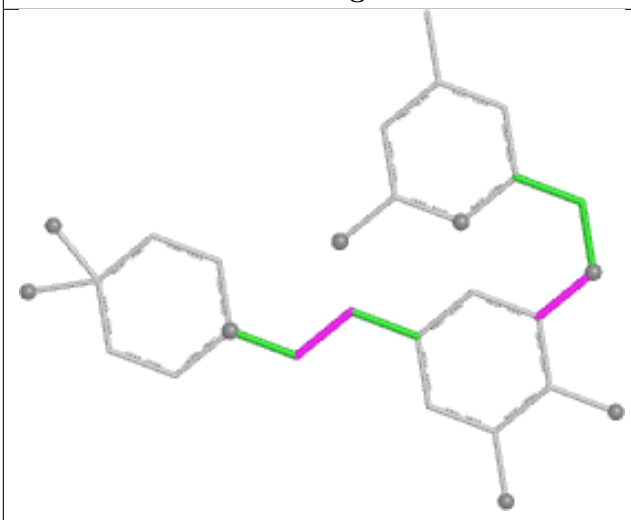
Ligand A1CN9 D 503



Bond lengths



Bond angles



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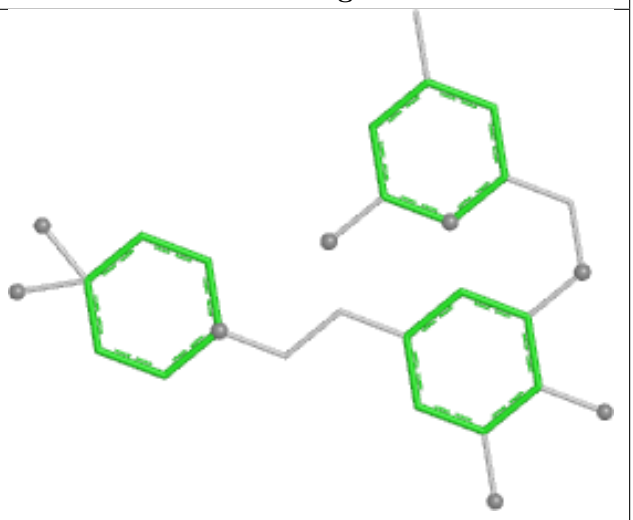
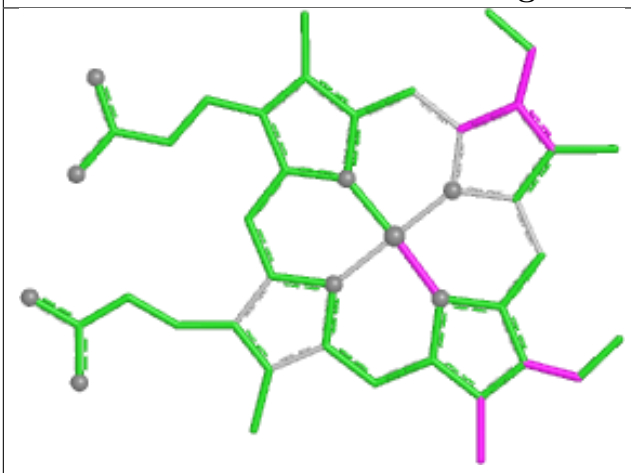
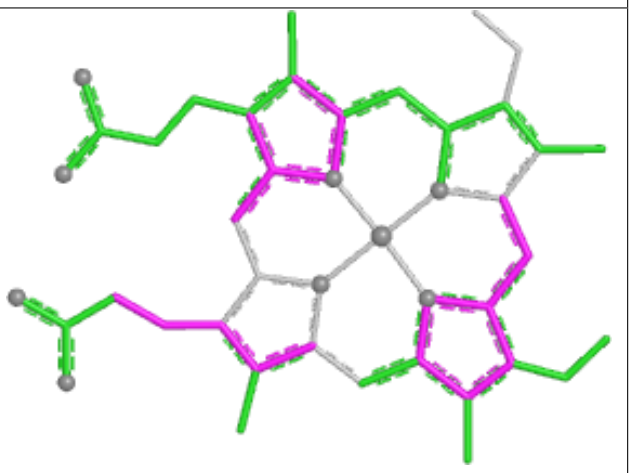


Rings

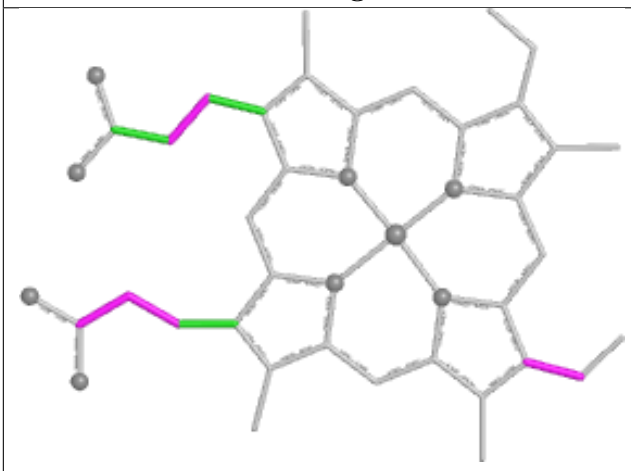
Ligand HEM A 501



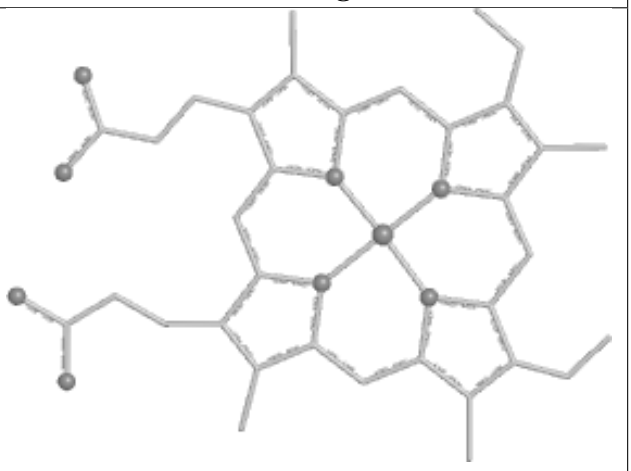
Bond lengths



Bond angles

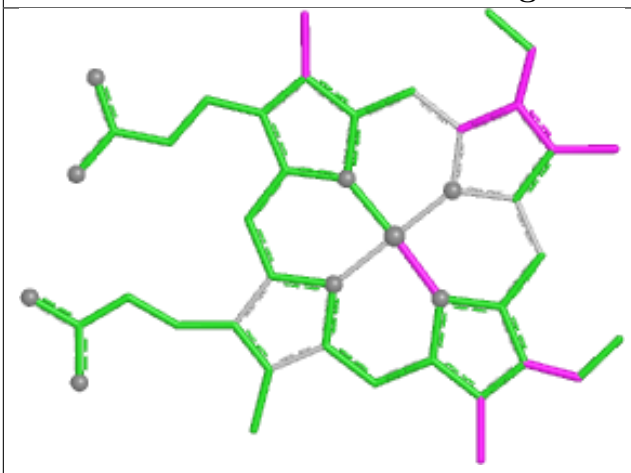


Torsions

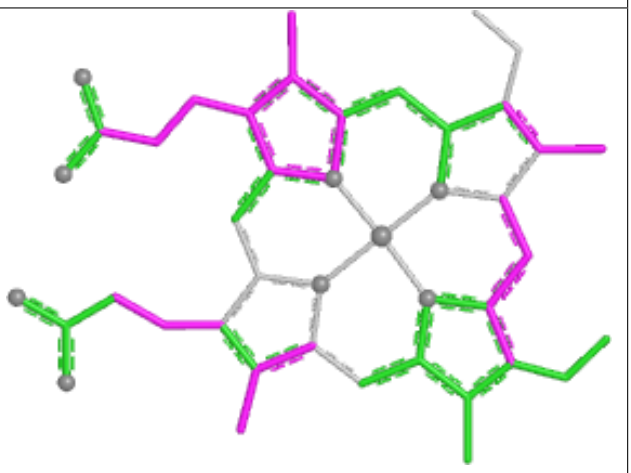


Rings

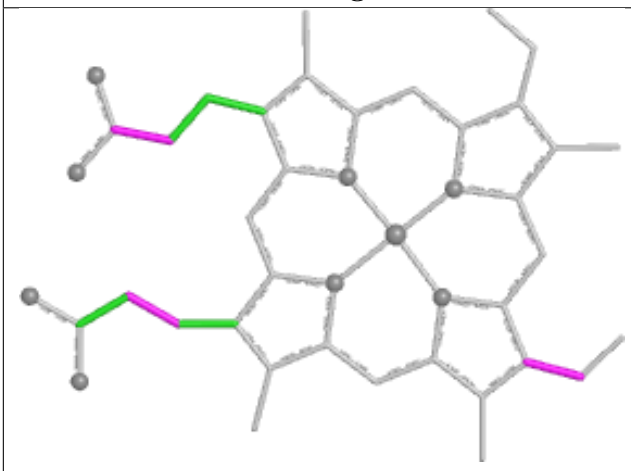
Ligand HEM B 501



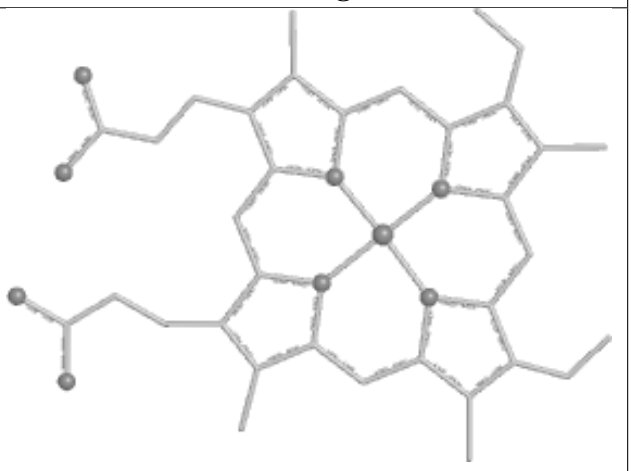
Bond lengths



Bond angles

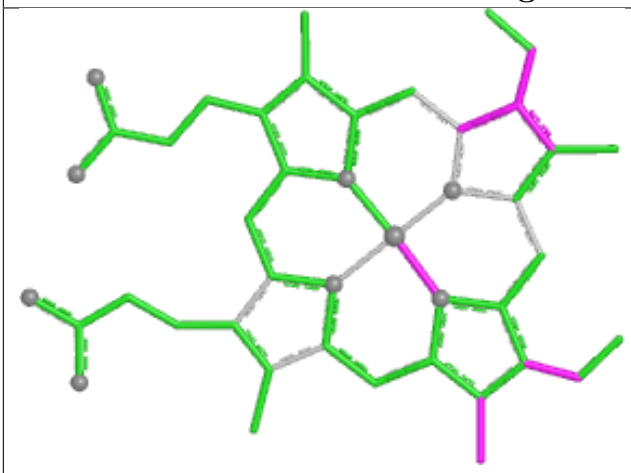


Torsions

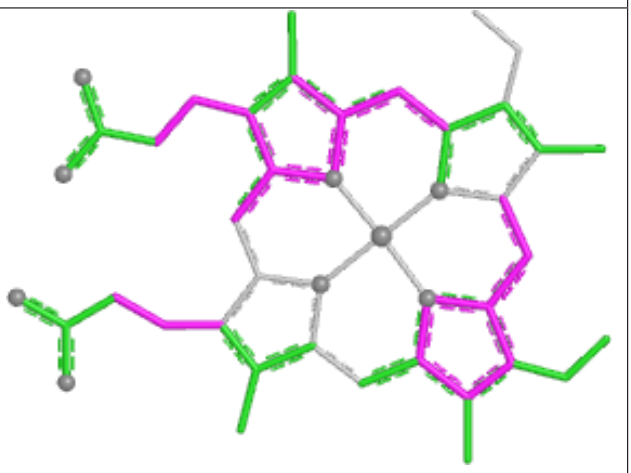


Rings

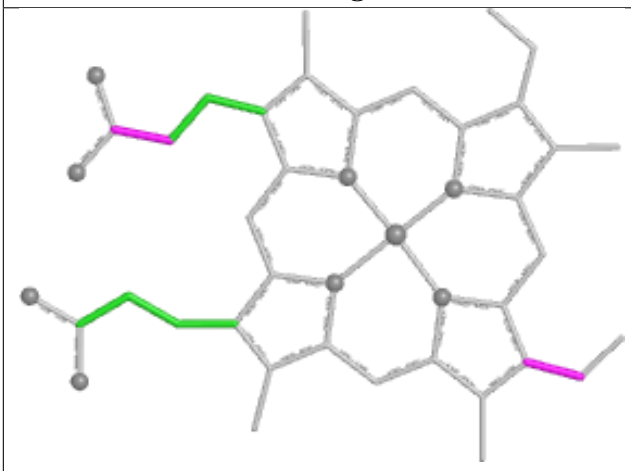
Ligand HEM D 501



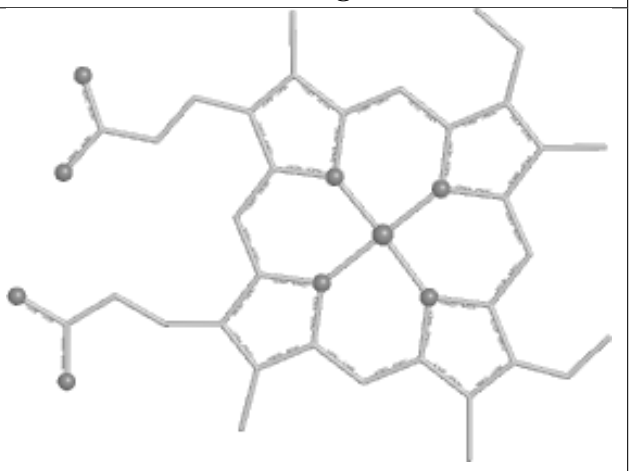
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	400/440 (90%)	-1.18	0	100	100	32, 66, 116, 151	1 (0%)
1	B	402/440 (91%)	-1.46	0	100	100	27, 49, 80, 134	3 (0%)
1	C	400/440 (90%)	-0.89	0	100	100	33, 71, 129, 162	1 (0%)
1	D	402/440 (91%)	-1.38	0	100	100	33, 50, 91, 142	1 (0%)
All	All	1604/1760 (91%)	-1.23	0	100	100	27, 58, 114, 162	6 (0%)

There are no RSRZ outliers to report.

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

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

6.3 Carbohydrates

There are no oligosaccharides in this entry.

6.4 Ligands

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
6	GOL	A	507	6/6	0.95	0.04	90,92,95,95	0
6	GOL	C	506	6/6	0.97	0.04	57,81,89,91	0
6	GOL	C	507	6/6	0.97	0.03	91,94,98,101	0
5	BTB	C	505	14/14	0.98	0.04	66,85,93,93	0

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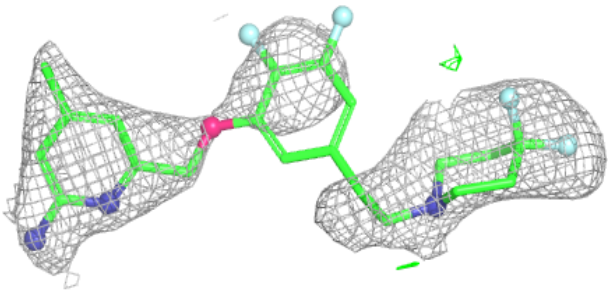
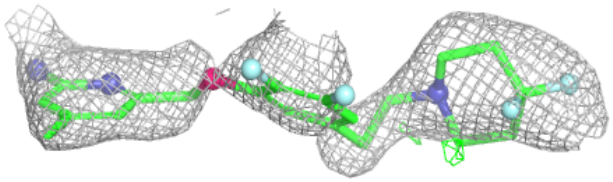
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
5	BTB	D	505	14/14	0.98	0.04	66,97,103,108	0
4	A1CN9	C	503	28/28	0.98	0.08	51,108,138,143	0
5	BTB	A	505	14/14	0.98	0.04	42,74,86,86	0
5	BTB	B	505	14/14	0.98	0.03	56,98,103,104	0
5	BTB	A	504	14/14	0.99	0.03	46,81,91,92	0
3	H4B	B	502	17/17	0.99	0.03	31,52,57,57	0
5	BTB	B	504	14/14	0.99	0.04	47,68,91,92	0
3	H4B	C	502	17/17	0.99	0.04	61,68,84,85	0
5	BTB	C	504	14/14	0.99	0.04	84,98,114,114	0
3	H4B	D	502	17/17	0.99	0.03	41,57,62,65	0
4	A1CN9	A	503	28/28	0.99	0.06	50,94,124,126	0
6	GOL	A	506	6/6	0.99	0.02	52,65,70,70	0
4	A1CN9	B	503	28/28	0.99	0.06	34,115,133,135	0
3	H4B	A	502	17/17	0.99	0.03	56,63,74,80	0
4	A1CN9	D	503	28/28	0.99	0.07	30,121,131,133	0
6	GOL	D	506	6/6	0.99	0.03	58,67,69,75	0
7	CL	A	508	1/1	0.99	0.05	74,74,74,74	0
7	CL	C	508	1/1	0.99	0.06	78,78,78,78	0
7	CL	D	507	1/1	0.99	0.04	59,59,59,59	0
5	BTB	D	504	14/14	1.00	0.03	34,59,78,82	0
2	HEM	C	501	43/43	1.00	0.04	55,67,100,107	0
2	HEM	D	501	43/43	1.00	0.03	26,40,72,94	0
7	CL	B	506	1/1	1.00	0.02	66,66,66,66	0
2	HEM	A	501	43/43	1.00	0.03	36,57,94,105	0
2	HEM	B	501	43/43	1.00	0.02	26,36,71,83	0
8	GD	A	509	1/1	1.00	0.02	117,117,117,117	0
8	GD	B	507	1/1	1.00	0.01	55,55,55,55	0
8	GD	C	509	1/1	1.00	0.02	154,154,154,154	0
8	GD	D	508	1/1	1.00	0.01	54,54,54,54	0
9	ZN	A	510	1/1	1.00	0.01	46,46,46,46	0
9	ZN	C	510	1/1	1.00	0.01	54,54,54,54	0
10	CA	A	511	1/1	1.00	0.03	68,68,68,68	0

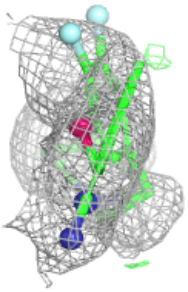
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around A1CN9 C 503:

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

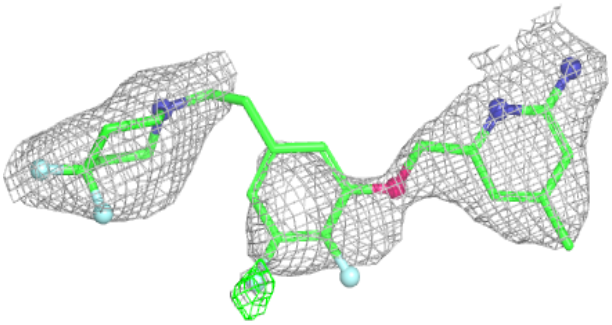


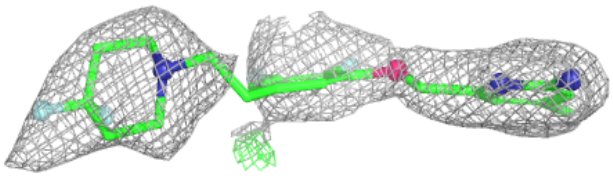


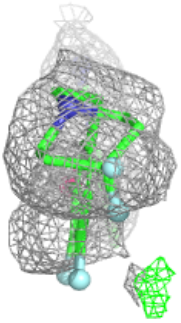


Electron density around A1CN9 A 503:

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

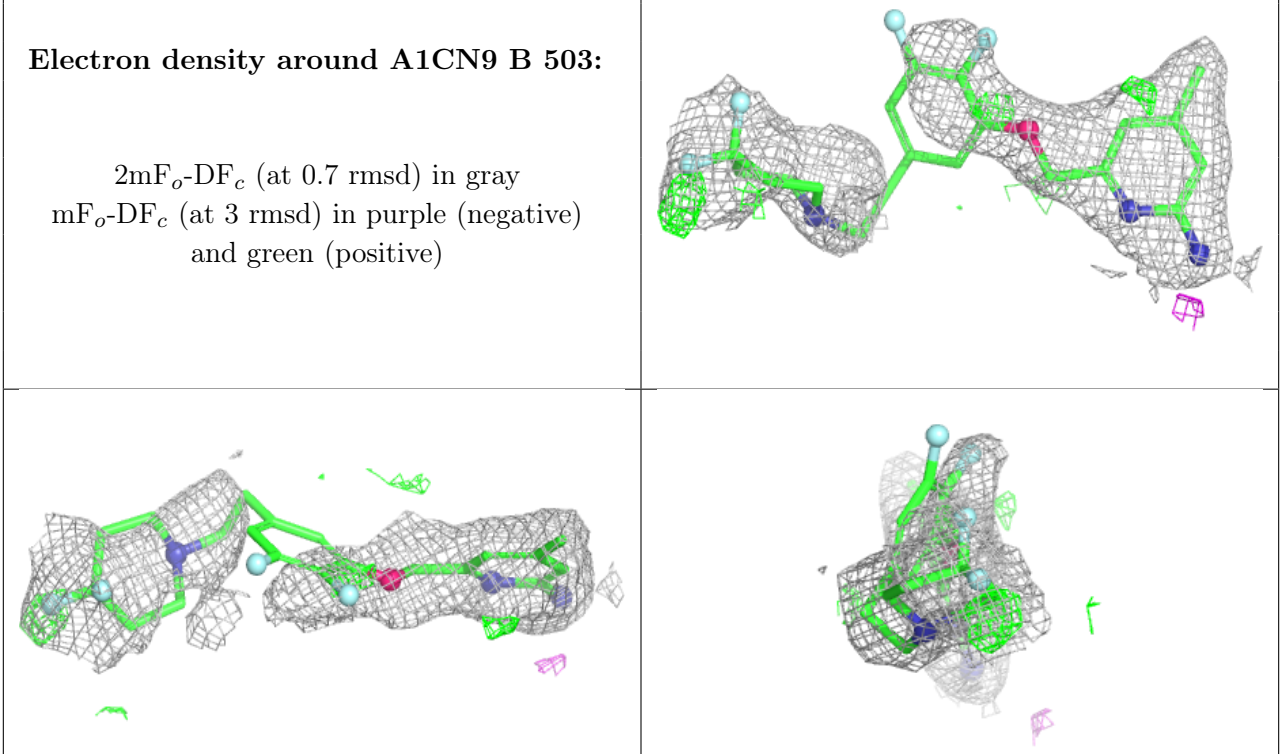






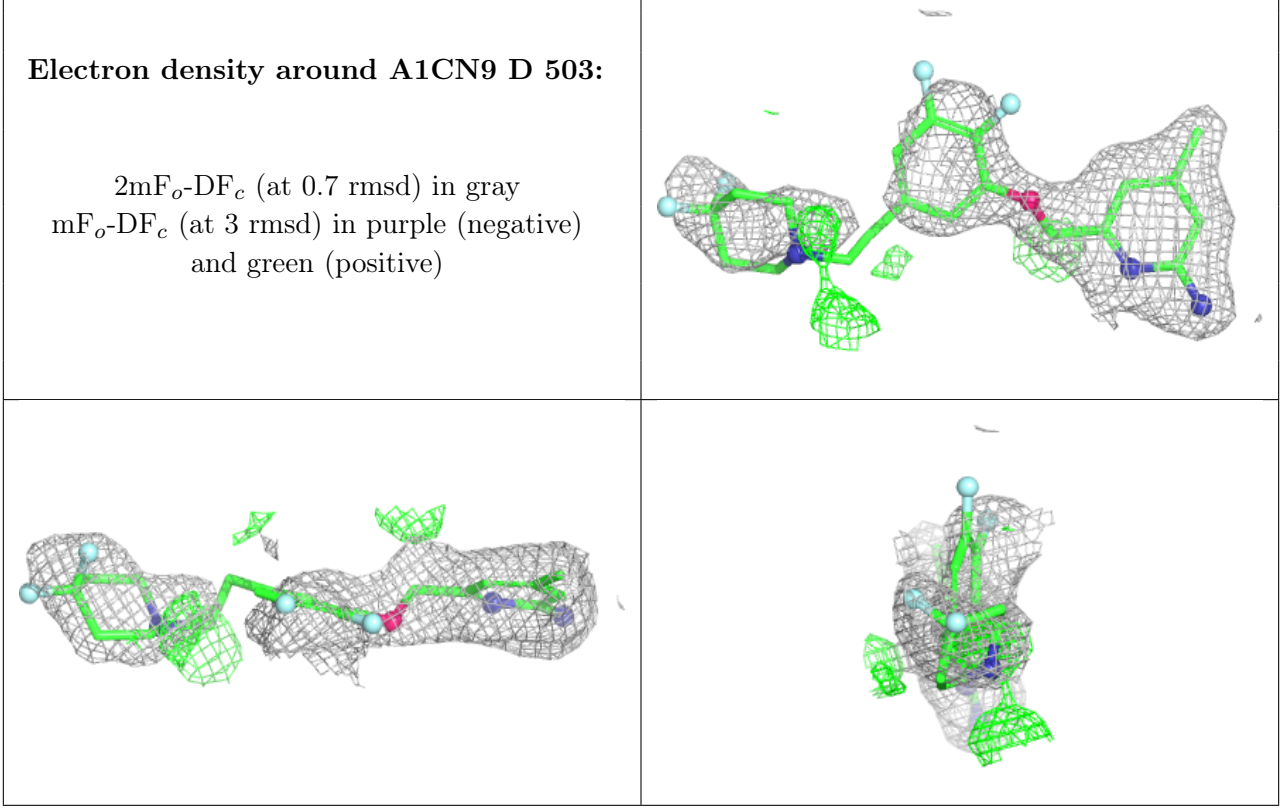
Electron density around A1CN9 B 503:

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



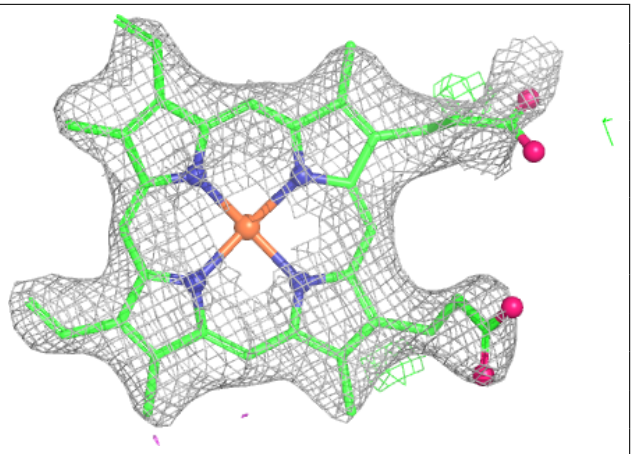
Electron density around A1CN9 D 503:

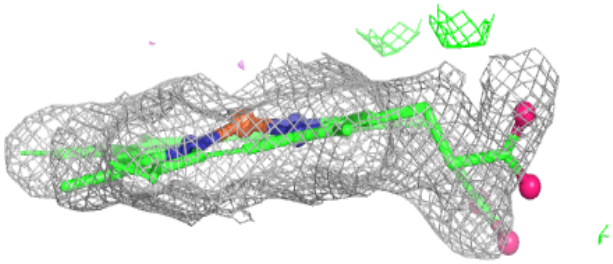
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

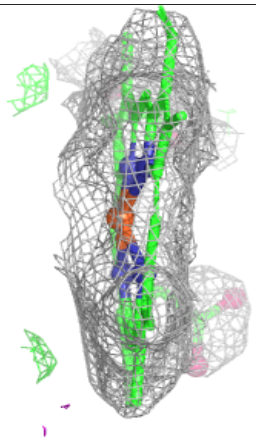


Electron density around HEM C 501:

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







Electron density around HEM D 501:

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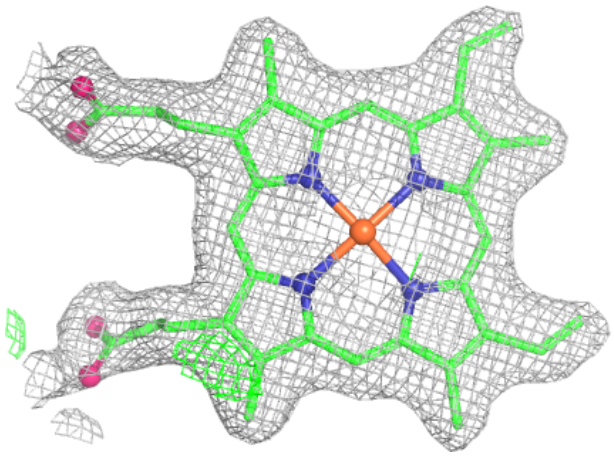
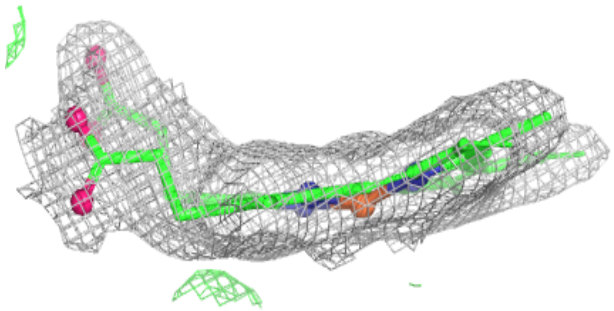
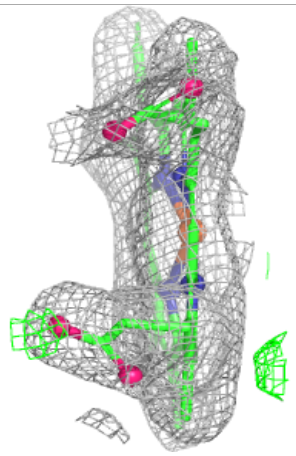
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

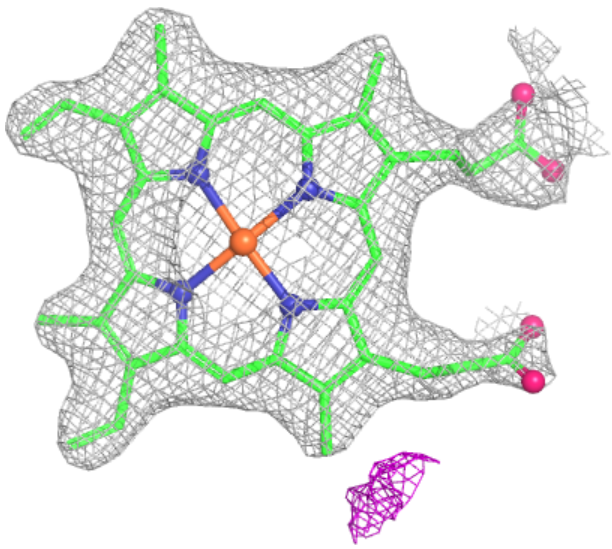


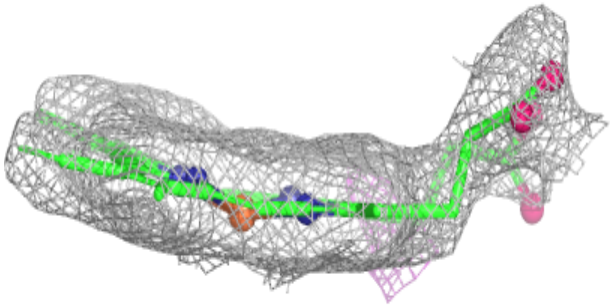


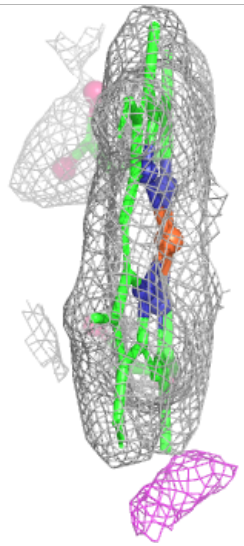


Electron density around HEM A 501:

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

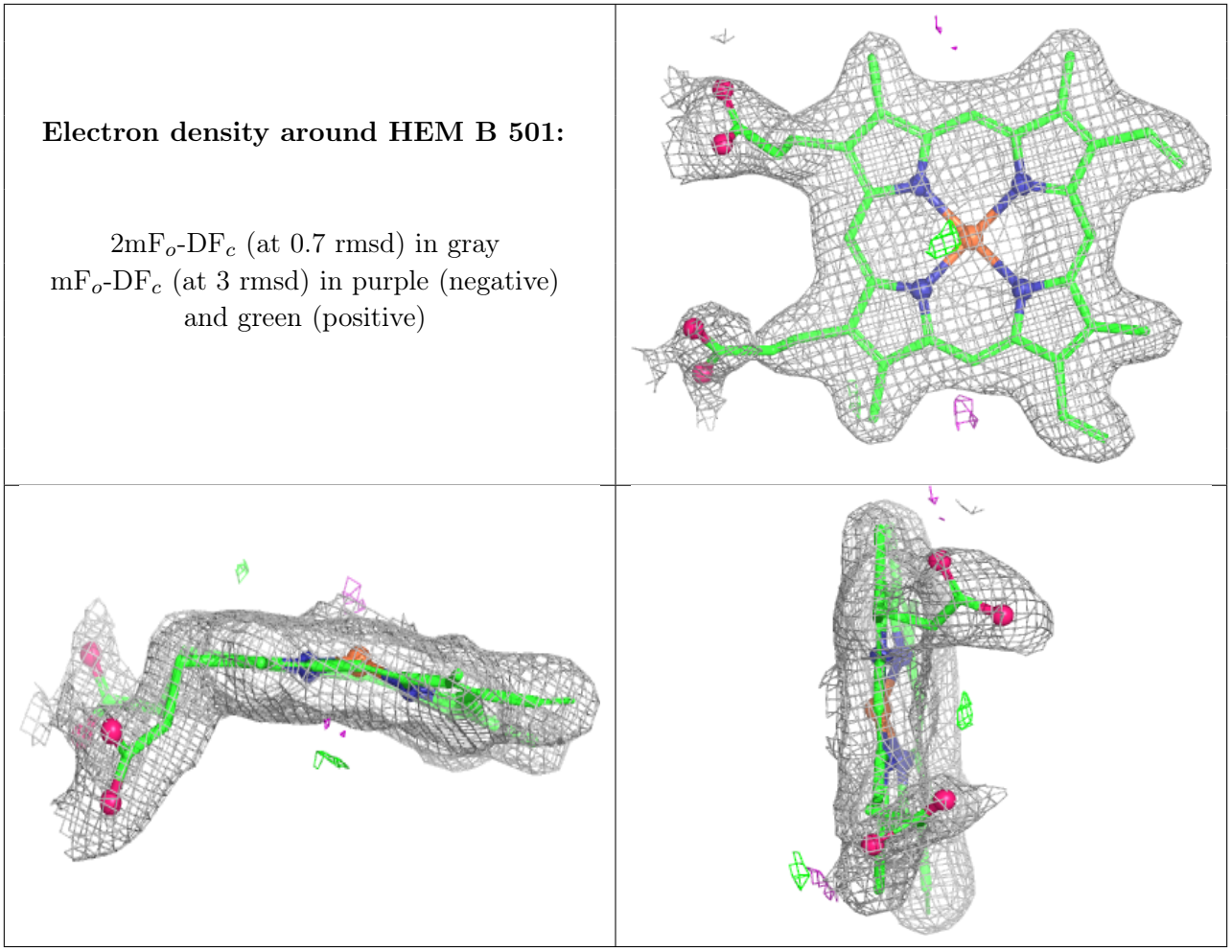






Electron density around HEM B 501:

$2mF_o$-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.