



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 02:28 PM UTC

PDB ID : 3BKN / pdb_00003bkn
Title : The structure of Mycobacterial bacterioferritin
Authors : Janowski, R.; Auerbach-Nevo, T.; Weiss, M.S.
Deposited on : 2007-12-07
Resolution : 2.72 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

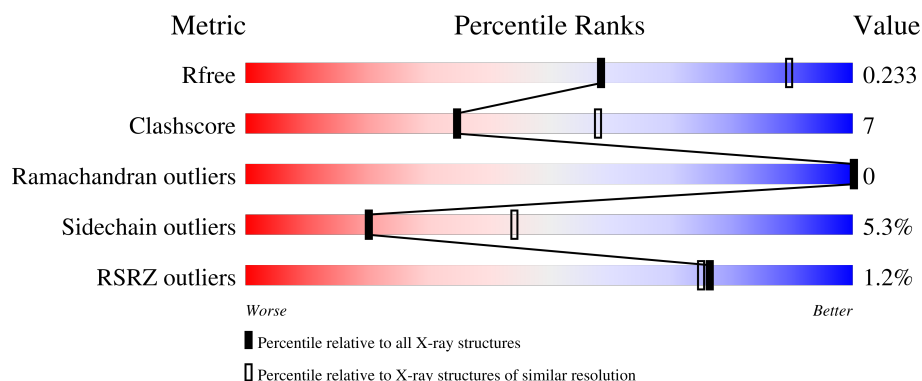
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.72 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.



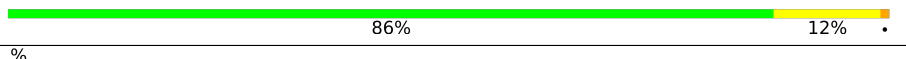
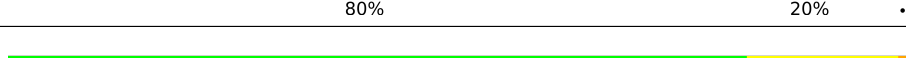
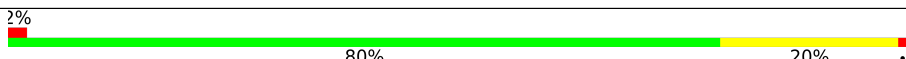
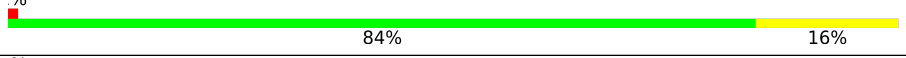
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	4348 (2.74-2.70)
Clashscore	190562	4665 (2.74-2.70)
Ramachandran outliers	187476	4584 (2.74-2.70)
Sidechain outliers	187428	4585 (2.74-2.70)
RSRZ outliers	180081	4348 (2.74-2.70)

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 $\leq 5\%$. 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	161	% 80% 20%
1	B	161	3% 82% 14% .
1	C	161	% 86% 13% .
1	D	161	2% 89% 11% .
1	E	161	% 81% 17% ..

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Mol	Chain	Length	Quality of chain
1	F	161	 87%12%
1	G	161	 86%12%
1	H	161	 80%20%
1	I	161	 83%17%
1	J	161	 80%20%
1	K	161	 84%16%
1	L	161	 88%11%

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 16205 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 Bacterioferritin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	161	Total	C	N	O	S	0	1	0
			1303	817	221	259	6			
1	B	161	Total	C	N	O	S	0	1	0
			1303	817	221	259	6			
1	C	161	Total	C	N	O	S	0	0	0
			1297	813	221	257	6			
1	D	161	Total	C	N	O	S	0	0	0
			1297	813	221	257	6			
1	E	161	Total	C	N	O	S	0	0	0
			1297	813	221	257	6			
1	F	161	Total	C	N	O	S	0	0	0
			1297	813	221	257	6			
1	G	161	Total	C	N	O	S	0	1	0
			1303	817	221	259	6			
1	H	161	Total	C	N	O	S	0	0	0
			1297	813	221	257	6			
1	I	161	Total	C	N	O	S	0	0	0
			1297	813	221	257	6			
1	J	161	Total	C	N	O	S	0	0	0
			1297	813	221	257	6			
1	K	161	Total	C	N	O	S	0	0	0
			1297	813	221	257	6			
1	L	161	Total	C	N	O	S	0	0	0
			1297	813	221	257	6			

- Molecule 2 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	2	Total	Zn	0	0
			2	2		
2	B	2	Total	Zn	0	0
			2	2		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	C	2	Total 2	Zn 2	0	0
2	D	2	Total 2	Zn 2	0	0
2	E	2	Total 2	Zn 2	0	0
2	F	2	Total 2	Zn 2	0	0
2	G	2	Total 2	Zn 2	0	0
2	H	2	Total 2	Zn 2	0	0
2	I	2	Total 2	Zn 2	0	0
2	J	2	Total 2	Zn 2	0	0
2	K	2	Total 2	Zn 2	0	0
2	L	2	Total 2	Zn 2	0	0

- Molecule 3 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

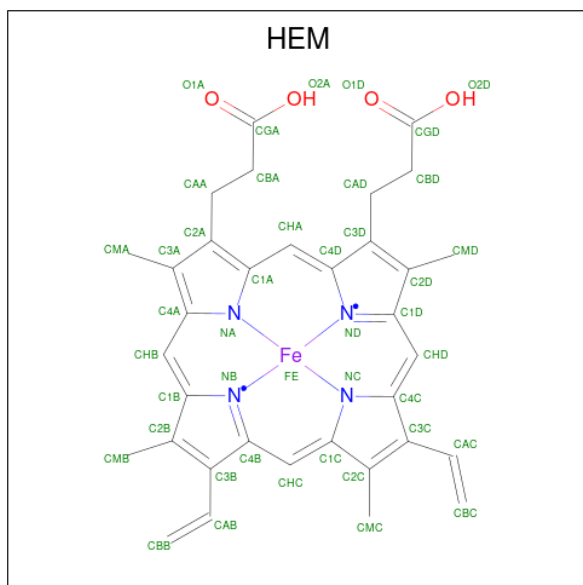
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	1	Total 1	Mg 1	0	0
3	B	2	Total 2	Mg 2	0	0
3	C	2	Total 2	Mg 2	0	0
3	E	1	Total 1	Mg 1	0	0
3	F	1	Total 1	Mg 1	0	0
3	H	1	Total 1	Mg 1	0	0
3	I	1	Total 1	Mg 1	0	0
3	J	1	Total 1	Mg 1	0	0
3	K	1	Total 1	Mg 1	0	0

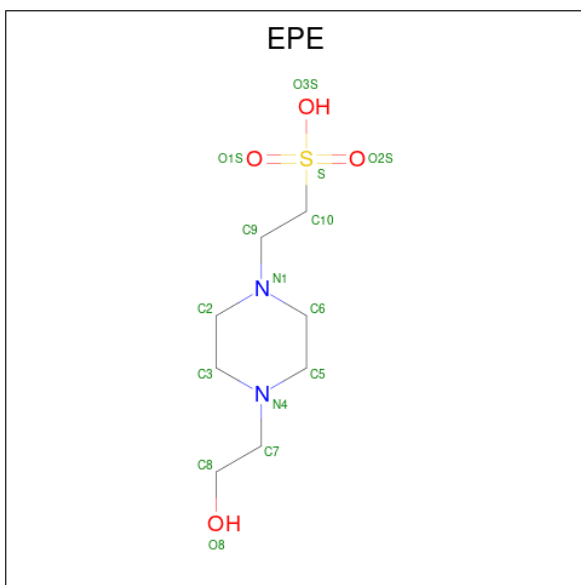
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	L	1	Total	Mg	0	0
			1	1		

- Molecule 4 is PROTOPORPHYRIN IX CONTAINING FE (CCD ID: HEM) (formula: $C_{34}H_{32}FeN_4O_4$).





Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	D	1	Total	C	N	O	S	0	0
			15	8	2	4	1		
5	J	1	Total	C	N	O	S	0	0
			15	8	2	4	1		

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	5	Total	O	0	0
			5	5		
6	B	3	Total	O	0	0
			3	3		
6	C	1	Total	O	0	0
			1	1		
6	D	2	Total	O	0	0
			2	2		
6	F	3	Total	O	0	0
			3	3		
6	G	9	Total	O	0	0
			9	9		
6	H	3	Total	O	0	0
			3	3		
6	I	6	Total	O	0	0
			6	6		
6	J	3	Total	O	0	0
			3	3		
6	K	3	Total	O	0	0
			3	3		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	L	3	Total	O	0	0
			3	3		

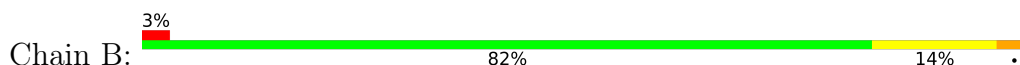
3 Residue-property plots [i](#)

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.

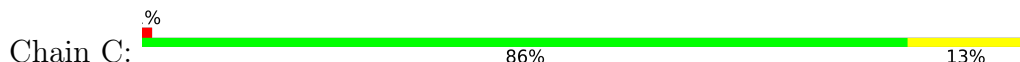
- Molecule 1: Bacterioferritin



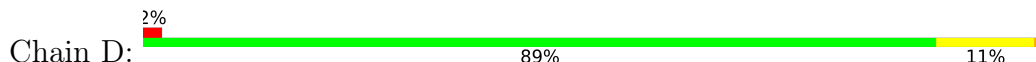
- Molecule 1: Bacterioferritin



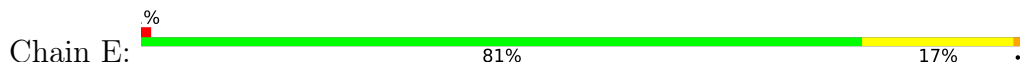
- Molecule 1: Bacterioferritin



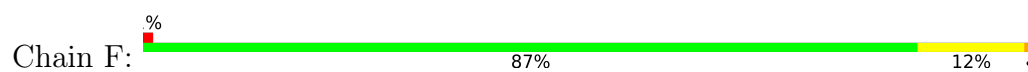
- Molecule 1: Bacterioferritin



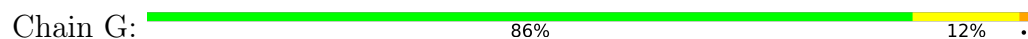
- Molecule 1: Bacterioferritin



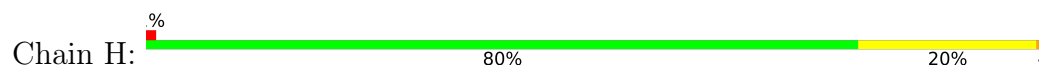
- Molecule 1: Bacterioferritin



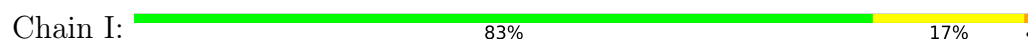
• Molecule 1: Bacterioferritin



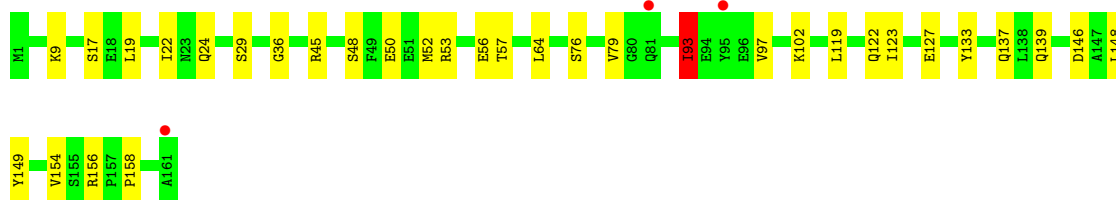
• Molecule 1: Bacterioferritin



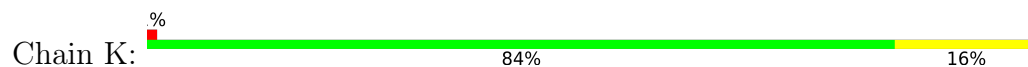
• Molecule 1: Bacterioferritin



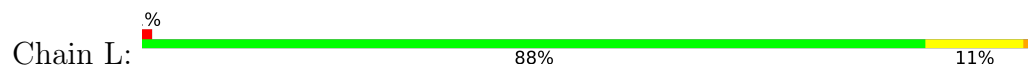
• Molecule 1: Bacterioferritin



• Molecule 1: Bacterioferritin



• Molecule 1: Bacterioferritin





4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	181.52Å 151.52Å 116.72Å 90.00° 128.08° 90.00°	Depositor
Resolution (Å)	29.64 – 2.72 29.64 – 2.72	Depositor EDS
% Data completeness (in resolution range)	98.8 (29.64-2.72) 98.7 (29.64-2.72)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	0.11	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.40 (at 2.72Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.179 , 0.228 0.186 , 0.233	Depositor DCC
R_{free} test set	2649 reflections (3.98%)	wwPDB-VP
Wilson B-factor (Å ²)	33.9	Xtriage
Anisotropy	0.257	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.29 , 27.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.020 for -h-2*1,-k,l	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	16205	wwPDB-VP
Average B, all atoms (Å ²)	46.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.83% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical 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: MG, HEM, EPE, ZN

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# $ Z > 5$	RMSZ	# $ Z > 5$
1	A	1.02	0/1326	1.04	1/1793 (0.1%)
1	B	0.98	0/1326	1.01	0/1793
1	C	0.97	1/1317 (0.1%)	1.03	0/1781
1	D	0.93	0/1317	1.02	0/1781
1	E	0.95	1/1317 (0.1%)	1.03	2/1781 (0.1%)
1	F	0.90	0/1317	0.95	0/1781
1	G	0.98	0/1326	1.01	2/1793 (0.1%)
1	H	0.96	0/1317	1.02	1/1781 (0.1%)
1	I	1.00	0/1317	1.04	0/1781
1	J	1.00	1/1317 (0.1%)	1.08	5/1781 (0.3%)
1	K	0.97	1/1317 (0.1%)	0.98	0/1781
1	L	0.91	1/1317 (0.1%)	0.99	1/1781 (0.1%)
All	All	0.96	5/15831 (0.0%)	1.02	12/21408 (0.1%)

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	J	156	ARG	C-O	-6.77	1.18	1.25
1	L	156	ARG	C-O	-5.92	1.19	1.25
1	C	156	ARG	C-O	-5.53	1.20	1.25
1	K	156	ARG	C-O	-5.41	1.20	1.25
1	E	156	ARG	C-O	-5.11	1.20	1.25

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	93	ILE	CB-CA-C	-6.52	103.22	112.22
1	A	145	GLY	N-CA-C	-5.54	104.75	112.18
1	J	79	VAL	CB-CA-C	-5.53	104.23	111.81
1	L	93	ILE	N-CA-CB	5.45	121.25	110.95

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	J	146	ASP	N-CA-C	5.38	117.56	111.11
1	G	146	ASP	N-CA-C	5.37	117.55	111.11
1	J	79	VAL	CA-C-N	-5.24	114.03	120.64
1	J	79	VAL	C-N-CA	-5.24	114.03	120.64
1	G	13	GLU	N-CA-C	-5.14	105.57	111.07
1	J	93	ILE	CB-CA-C	-5.12	105.16	112.22
1	E	12	ASN	N-CA-C	5.10	116.84	111.28
1	H	121	GLU	N-CA-C	-5.05	105.85	111.36

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	1303	0	1283	26	0
1	B	1303	0	1283	18	0
1	C	1297	0	1277	14	0
1	D	1297	0	1277	10	0
1	E	1297	0	1277	20	0
1	F	1297	0	1277	15	0
1	G	1303	0	1283	12	0
1	H	1297	0	1277	27	0
1	I	1297	0	1277	14	0
1	J	1297	0	1277	21	0
1	K	1297	0	1277	16	0
1	L	1297	0	1277	14	0
2	A	2	0	0	0	0
2	B	2	0	0	0	0
2	C	2	0	0	0	0
2	D	2	0	0	0	0
2	E	2	0	0	0	0
2	F	2	0	0	0	0
2	G	2	0	0	0	0
2	H	2	0	0	0	0
2	I	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	J	2	0	0	0	0
2	K	2	0	0	0	0
2	L	2	0	0	0	0
3	A	1	0	0	0	0
3	B	2	0	0	0	0
3	C	2	0	0	0	0
3	E	1	0	0	0	0
3	F	1	0	0	0	0
3	H	1	0	0	0	0
3	I	1	0	0	0	0
3	J	1	0	0	0	0
3	K	1	0	0	0	0
3	L	1	0	0	0	0
4	B	86	0	60	20	0
4	C	86	0	60	14	0
4	E	86	0	60	12	0
4	H	86	0	60	9	0
4	I	86	0	60	4	0
4	K	43	0	30	4	0
4	L	43	0	30	1	0
5	D	15	0	17	0	0
5	J	15	0	18	0	0
6	A	5	0	0	0	0
6	B	3	0	0	0	0
6	C	1	0	0	0	0
6	D	2	0	0	0	0
6	F	3	0	0	0	0
6	G	9	0	0	0	0
6	H	3	0	0	0	0
6	I	6	0	0	0	0
6	J	3	0	0	0	0
6	K	3	0	0	1	0
6	L	3	0	0	0	0
All	All	16205	0	15737	239	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 7.

All (239) 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:C:119:LEU:HD12	1:C:119:LEU:O	1.38	1.20
1:F:119:LEU:HD12	1:F:119:LEU:O	1.42	1.17
1:D:119:LEU:HD12	1:D:119:LEU:O	1.44	1.13
4:C:301[B]:HEM:HMB2	4:C:301[B]:HEM:HBB2	1.32	1.10
1:F:119:LEU:HD12	1:F:119:LEU:C	1.75	1.09
1:B:33:ASP:HB3	1:B:161:ALA:HB2	1.60	0.84
4:B:301[A]:HEM:HBC2	4:B:301[A]:HEM:HHD	1.60	0.83
1:F:119:LEU:C	1:F:119:LEU:CD1	2.51	0.83
1:A:23:ASN:OD1	4:B:301[A]:HEM:HBB1	1.77	0.83
1:G:119:LEU:HD12	1:G:119:LEU:O	1.79	0.83
1:A:23:ASN:OD1	4:B:301[A]:HEM:CBB	2.29	0.81
1:H:78:ARG:HH21	1:H:93:ILE:CG2	1.94	0.80
4:B:301[B]:HEM:CBD	4:B:301[B]:HEM:HHA	2.14	0.78
1:E:24:GLN:NE2	1:E:93:ILE:HD11	1.99	0.78
1:E:55:ALA:HB3	4:E:301[B]:HEM:HBC2	1.67	0.77
1:A:64:LEU:O	1:A:64:LEU:HD23	1.87	0.74
1:L:28:HIS:CD2	1:L:86:GLN:HG2	2.24	0.73
4:C:301[B]:HEM:HBB2	4:C:301[B]:HEM:CMB	2.08	0.72
1:F:119:LEU:O	1:F:119:LEU:CD1	2.31	0.72
1:C:119:LEU:O	1:C:119:LEU:CD1	2.30	0.71
1:H:109:ARG:HG2	1:H:109:ARG:HH11	1.57	0.70
4:C:301[A]:HEM:CBD	4:C:301[A]:HEM:HHA	2.22	0.70
1:D:17:SER:OG	1:D:100:ARG:NH2	2.24	0.70
1:D:119:LEU:HD12	1:D:119:LEU:C	2.17	0.70
1:G:84:ARG:NH2	1:G:142:ASP:OD1	2.27	0.68
1:D:123:ILE:O	1:D:127:GLU:HG2	1.95	0.67
1:H:78:ARG:HH21	1:H:93:ILE:HG22	1.59	0.67
1:J:45:ARG:O	1:J:48:SER:HB3	1.95	0.67
1:H:97:VAL:HG11	1:H:127:GLU:HG3	1.77	0.65
1:A:64:LEU:HD23	1:A:64:LEU:C	2.21	0.65
1:B:97:VAL:HG11	1:B:127:GLU:HG3	1.77	0.65
1:C:119:LEU:HD12	1:C:119:LEU:C	2.14	0.65
4:C:301[A]:HEM:HBA2	4:C:301[A]:HEM:CMA	2.27	0.65
1:A:9:LYS:O	1:A:13:GLU:HG2	1.96	0.64
1:H:78:ARG:NH2	1:H:93:ILE:CG2	2.60	0.64
1:K:19:LEU:HD22	4:K:301:HEM:HBB1	1.79	0.64
1:A:78:ARG:NH1	1:A:92:ALA:HB1	2.13	0.64
4:B:301[B]:HEM:HHA	4:B:301[B]:HEM:HBD1	1.80	0.64
4:E:301[A]:HEM:CMB	4:E:301[A]:HEM:HBB2	2.28	0.63
1:G:119:LEU:HD12	1:G:119:LEU:C	2.22	0.63
4:E:301[B]:HEM:HBB2	4:E:301[B]:HEM:CMB	2.28	0.63
1:A:121:GLU:OE2	1:D:109:ARG:NH2	2.31	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:L:84:ARG:NH1	1:L:146:ASP:OD1	2.32	0.63
4:C:301[B]:HEM:HBC2	4:C:301[B]:HEM:CMC	2.30	0.62
4:C:301[B]:HEM:HBC2	4:C:301[B]:HEM:HMC1	1.82	0.62
4:B:301[B]:HEM:HBD1	4:B:301[B]:HEM:CHA	2.29	0.62
1:E:55:ALA:HB3	4:E:301[B]:HEM:CBC	2.29	0.62
1:E:57:THR:HG22	1:E:119:LEU:HD11	1.81	0.61
1:J:57:THR:CG2	1:J:119:LEU:CD1	2.78	0.61
1:H:78:ARG:NH2	1:H:93:ILE:HG22	2.14	0.61
4:I:301[A]:HEM:HMC1	4:I:301[A]:HEM:HBC2	1.83	0.61
4:C:301[B]:HEM:HMB2	4:C:301[B]:HEM:CBB	2.20	0.60
1:J:97:VAL:HG11	1:J:127:GLU:HG3	1.84	0.59
1:D:119:LEU:O	1:D:119:LEU:CD1	2.36	0.59
1:J:57:THR:CG2	1:J:119:LEU:HD11	2.33	0.59
1:J:57:THR:HG21	1:J:119:LEU:CD1	2.32	0.59
1:C:117:ALA:O	1:C:121:GLU:HG3	2.04	0.58
1:L:141:MET:HE2	1:L:146:ASP:OD1	2.04	0.58
1:E:141:MET:HE2	1:E:146:ASP:OD1	2.03	0.57
1:G:97:VAL:HG11	1:G:127:GLU:HG3	1.86	0.57
1:A:57:THR:HG21	1:A:119:LEU:HD11	1.87	0.57
1:A:57:THR:CG2	1:A:119:LEU:HD11	2.34	0.57
1:B:33:ASP:CB	1:B:161:ALA:HB2	2.33	0.57
1:C:64:LEU:HD23	1:C:64:LEU:O	2.05	0.56
1:I:141:MET:HE2	1:I:146:ASP:OD1	2.05	0.56
1:J:57:THR:HG22	1:J:119:LEU:HD11	1.88	0.56
1:I:97:VAL:HG11	1:I:127:GLU:HG3	1.88	0.56
4:I:301[A]:HEM:HBC2	4:I:301[A]:HEM:CMC	2.36	0.56
1:H:27:LEU:O	1:H:31:MET:HG3	2.05	0.56
1:A:84:ARG:HB2	1:A:141:MET:HE1	1.88	0.56
4:H:301[A]:HEM:HHD	4:H:301[A]:HEM:HBC2	1.87	0.55
1:B:19:LEU:HD22	4:B:301[A]:HEM:HAB	1.87	0.55
1:H:109:ARG:HG2	1:H:109:ARG:NH1	2.22	0.55
1:H:119:LEU:HD12	1:H:119:LEU:O	2.07	0.55
4:B:301[A]:HEM:HHA	4:B:301[A]:HEM:CBA	2.36	0.55
4:B:301[B]:HEM:HHA	4:B:301[B]:HEM:HBD2	1.89	0.55
4:B:301[B]:HEM:CBD	4:B:301[B]:HEM:CHA	2.80	0.55
1:H:84:ARG:NH2	1:H:142:ASP:OD1	2.39	0.55
1:B:64:LEU:HD23	1:B:64:LEU:O	2.07	0.54
1:G:49:PHE:CE1	4:H:301[B]:HEM:HAD2	2.41	0.54
1:F:97:VAL:HG11	1:F:127:GLU:HG3	1.88	0.54
1:I:39:GLU:OE1	1:I:39:GLU:HA	2.08	0.54
1:K:64:LEU:O	1:K:64:LEU:HD23	2.08	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:K:45:ARG:O	1:K:48:SER:HB3	2.09	0.53
1:B:19:LEU:CD2	4:B:301[A]:HEM:HAB	2.37	0.53
1:B:40:LEU:HB2	1:B:153:CYS:HB3	1.90	0.53
1:F:119:LEU:CD1	1:F:123:ILE:HD12	2.38	0.53
1:J:57:THR:CG2	1:J:119:LEU:HD13	2.39	0.53
1:L:119:LEU:C	1:L:119:LEU:HD12	2.32	0.53
1:E:55:ALA:CB	4:E:301[B]:HEM:HBC2	2.37	0.53
1:D:90:ASP:O	1:D:93:ILE:HG22	2.08	0.53
1:H:57:THR:HG22	1:H:119:LEU:HD11	1.89	0.53
1:K:123:ILE:O	1:K:127:GLU:HG2	2.07	0.53
1:E:57:THR:HG22	1:E:119:LEU:CD1	2.38	0.52
1:F:119:LEU:HD11	1:F:123:ILE:HD12	1.91	0.52
4:H:301[B]:HEM:HBC2	4:H:301[B]:HEM:HHD	1.91	0.52
1:H:78:ARG:HH22	1:H:96:GLU:CD	2.18	0.52
4:B:301[A]:HEM:HBC2	4:B:301[A]:HEM:CHD	2.35	0.52
1:E:51:GLU:HA	1:E:51:GLU:OE1	2.09	0.52
1:F:149:TYR:C	1:F:149:TYR:CD2	2.87	0.52
1:H:4:ASP:CG	1:H:5:PRO:HD2	2.35	0.52
1:L:28:HIS:NE2	1:L:86:GLN:HG2	2.25	0.52
4:H:301[A]:HEM:HHD	4:H:301[A]:HEM:CBC	2.39	0.52
1:K:102:LYS:NZ	6:K:402:HOH:O	2.42	0.52
1:K:18:GLU:O	1:K:22:ILE:HG13	2.10	0.51
1:J:19:LEU:HA	1:J:22:ILE:HD12	1.93	0.51
1:J:57:THR:HG21	1:J:119:LEU:HD13	1.93	0.51
1:A:51:GLU:OE1	1:A:51:GLU:HA	2.11	0.51
1:G:36:GLY:HA3	1:I:140:LEU:HD11	1.93	0.51
1:B:45:ARG:O	1:B:48:SER:HB3	2.11	0.50
4:C:301[A]:HEM:HHA	4:C:301[A]:HEM:HBD1	1.93	0.50
1:D:98:LEU:HD13	1:D:131:ILE:CD1	2.41	0.50
1:H:28:HIS:CD2	1:H:86:GLN:HG2	2.46	0.50
1:E:55:ALA:CB	4:E:301[B]:HEM:CBC	2.90	0.49
4:H:301[B]:HEM:HBB2	4:H:301[B]:HEM:CMB	2.43	0.49
1:L:49:PHE:CZ	4:L:301:HEM:HAD2	2.47	0.49
4:C:301[A]:HEM:HBD1	4:C:301[A]:HEM:CHA	2.41	0.49
1:L:43:HIS:CE1	1:L:47:GLU:OE2	2.65	0.49
4:B:301[A]:HEM:CHA	4:B:301[A]:HEM:HBA1	2.41	0.49
1:B:9:LYS:NZ	1:B:13[A]:GLU:OE1	2.46	0.48
4:B:301[B]:HEM:HHC	4:B:301[B]:HEM:HBB2	1.95	0.48
1:L:82:THR:OG1	1:L:85:GLU:HB2	2.13	0.48
1:H:84:ARG:NH1	1:H:146:ASP:OD1	2.47	0.48
1:L:64:LEU:HD23	1:L:64:LEU:O	2.14	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:C:301[B]:HEM:HBD2	4:C:301[B]:HEM:CMD	2.42	0.48
1:C:19:LEU:HA	1:C:22:ILE:HD12	1.94	0.48
4:B:301[B]:HEM:HHC	4:B:301[B]:HEM:CBB	2.44	0.48
4:I:301[B]:HEM:HBC2	4:I:301[B]:HEM:CMC	2.44	0.48
1:E:78:ARG:HB2	1:E:89:ALA:HB1	1.96	0.48
1:H:57:THR:CG2	1:H:119:LEU:HD11	2.44	0.48
1:J:57:THR:HG22	1:J:119:LEU:CD1	2.43	0.48
1:L:109:ARG:HH11	1:L:109:ARG:HG2	1.78	0.48
4:C:301[A]:HEM:CMB	4:C:301[A]:HEM:HBB2	2.43	0.48
1:I:30:LYS:HE2	1:J:56:GLU:HG3	1.96	0.48
4:C:301[A]:HEM:HHA	4:C:301[A]:HEM:HBD2	1.94	0.47
1:B:106:VAL:O	1:B:110:GLU:HG3	2.14	0.47
1:C:109:ARG:HH21	1:C:121:GLU:CD	2.23	0.47
1:E:9:LYS:O	1:E:13:GLU:HG2	2.14	0.47
1:I:22:ILE:HD11	1:I:52:MET:HA	1.95	0.47
1:K:40:LEU:HB2	1:K:153:CYS:HB3	1.96	0.47
1:B:123:ILE:O	1:B:127:GLU:HG2	2.15	0.47
1:K:47:GLU:OE1	1:K:130:HIS:CD2	2.67	0.47
1:G:49:PHE:CE1	4:H:301[A]:HEM:HAA1	2.50	0.47
1:J:50:GLU:CG	1:J:53:ARG:HH21	2.28	0.47
1:B:64:LEU:HD23	1:B:64:LEU:C	2.40	0.46
1:K:19:LEU:CD2	4:K:301:HEM:HBB1	2.43	0.46
1:A:22:ILE:HG22	4:B:301[A]:HEM:HBB2	1.98	0.46
1:K:19:LEU:CD2	4:K:301:HEM:CBB	2.93	0.46
1:A:78:ARG:NH1	1:A:92:ALA:CB	2.79	0.46
1:H:18:GLU:O	1:H:22:ILE:HG13	2.16	0.46
1:C:97:VAL:HG11	1:C:127:GLU:HG3	1.97	0.46
1:E:64:LEU:HD23	1:E:64:LEU:O	2.16	0.46
4:E:301[A]:HEM:CMB	4:E:301[A]:HEM:CBB	2.94	0.46
1:A:94:GLU:OE1	1:A:127:GLU:HB3	2.17	0.45
1:B:84:ARG:NH2	1:B:142:ASP:OD1	2.48	0.45
1:F:45:ARG:O	1:F:48:SER:HB3	2.16	0.45
1:F:14:GLN:NE2	1:F:18:GLU:OE2	2.45	0.45
1:H:141:MET:HE2	1:H:146:ASP:OD1	2.16	0.45
1:A:97:VAL:HG11	1:A:127:GLU:HG3	1.99	0.45
1:G:19:LEU:HD22	4:H:301[B]:HEM:HBB1	1.98	0.45
4:C:301[A]:HEM:CBB	1:D:71:TYR:HE2	2.31	0.44
4:B:301[A]:HEM:HHA	4:B:301[A]:HEM:HBA1	2.00	0.44
4:B:301[B]:HEM:HBB2	4:B:301[B]:HEM:CHC	2.47	0.44
1:C:133:TYR:O	1:C:137:GLN:HG2	2.17	0.44
1:H:57:THR:CG2	1:H:119:LEU:CD1	2.95	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:K:58:ILE:HD11	1:K:123:ILE:HD13	1.97	0.44
1:A:8:LEU:HD21	1:A:65:LEU:HB2	1.98	0.44
1:J:149:TYR:C	1:J:149:TYR:CD2	2.95	0.44
1:A:52:MET:HB3	4:B:301[B]:HEM:CHB	2.47	0.44
1:F:78:ARG:HH21	1:F:93:ILE:HG22	1.83	0.44
1:J:158:PRO:HB2	1:L:137:GLN:OE1	2.18	0.44
1:H:119:LEU:HD12	1:H:119:LEU:C	2.42	0.44
1:B:17:SER:HB2	1:B:100:ARG:NH2	2.33	0.43
1:E:71:TYR:HE2	4:E:301[A]:HEM:CBB	2.31	0.43
1:C:93:ILE:HG21	1:C:93:ILE:HD13	1.74	0.43
1:A:64:LEU:C	1:A:64:LEU:CD2	2.91	0.43
1:H:109:ARG:NH1	1:H:109:ARG:CG	2.81	0.43
1:K:19:LEU:HD22	4:K:301:HEM:CBB	2.46	0.43
1:C:30:LYS:HA	1:C:30:LYS:HD2	1.81	0.43
1:E:57:THR:CG2	1:E:119:LEU:CD1	2.96	0.43
1:E:124:LEU:O	1:E:128:GLU:HG3	2.17	0.43
1:G:30:LYS:HA	1:G:30:LYS:HD2	1.65	0.43
1:H:124:LEU:O	1:H:128:GLU:HG3	2.18	0.43
4:E:301[B]:HEM:CMB	4:E:301[B]:HEM:CBB	2.96	0.43
1:F:19:LEU:HA	1:F:22:ILE:HD12	2.01	0.43
4:H:301[A]:HEM:HBC2	4:H:301[A]:HEM:CHD	2.48	0.43
1:B:119:LEU:HD23	1:B:119:LEU:C	2.43	0.43
1:J:133:TYR:O	1:J:137:GLN:HG2	2.18	0.43
1:H:45:ARG:O	1:H:48:SER:HB3	2.18	0.43
1:J:22:ILE:HG23	1:J:52:MET:HE2	2.01	0.43
1:A:47[A]:GLU:OE1	1:A:130:HIS:NE2	2.51	0.43
1:H:78:ARG:NH2	1:H:93:ILE:HG23	2.32	0.43
4:I:301[B]:HEM:HBC2	4:I:301[B]:HEM:HMC1	2.00	0.43
1:J:36:GLY:O	1:J:154:VAL:HG12	2.19	0.43
1:L:30:LYS:HD2	1:L:30:LYS:HA	1.81	0.43
1:E:33:ASP:OD1	1:E:161:ALA:HA	2.18	0.43
1:H:30:LYS:HA	1:H:30:LYS:HD2	1.73	0.43
1:J:24:GLN:OE1	1:J:93:ILE:HD11	2.19	0.42
1:H:1:MET:HE3	1:I:98:LEU:HD21	2.01	0.42
1:I:101:LEU:HA	1:I:101:LEU:HD23	1.73	0.42
1:K:37:PHE:CE1	1:K:150:ALA:HB1	2.55	0.42
1:A:140:LEU:HD23	1:A:140:LEU:HA	1.89	0.42
1:K:97:VAL:HG11	1:K:127:GLU:HG3	2.02	0.42
4:C:301[B]:HEM:CMB	4:C:301[B]:HEM:CBB	2.84	0.42
1:E:71:TYR:HE2	4:E:301[A]:HEM:HBB2	1.85	0.42
4:E:301[B]:HEM:HBB2	4:E:301[B]:HEM:HMB1	1.98	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:19:LEU:CD2	4:H:301[B]:HEM:CBB	2.98	0.42
1:J:64:LEU:HD23	1:J:64:LEU:O	2.19	0.42
1:J:123:ILE:O	1:J:127:GLU:HG2	2.19	0.42
1:J:148:LEU:HA	1:J:148:LEU:HD12	1.72	0.42
1:B:95:TYR:OH	1:B:135:GLU:OE2	2.20	0.42
1:E:107:LEU:C	1:E:107:LEU:HD23	2.45	0.42
1:A:50:GLU:HG3	1:A:53:ARG:NH2	2.35	0.42
1:C:119:LEU:CD1	1:C:119:LEU:C	2.84	0.42
1:E:19:LEU:HA	1:E:22:ILE:HD12	2.02	0.42
1:C:160:SER:O	1:C:161:ALA:C	2.62	0.41
1:A:158:PRO:HG2	1:G:149:TYR:CE1	2.56	0.41
4:B:301[A]:HEM:CBA	4:B:301[A]:HEM:CHA	2.96	0.41
1:A:123:ILE:O	1:A:127:GLU:HG2	2.21	0.41
4:E:301[A]:HEM:HBC2	1:F:55:ALA:HB3	2.02	0.41
1:I:93:ILE:HD13	1:I:93:ILE:HG21	1.74	0.41
1:F:94:GLU:HA	1:F:94:GLU:OE1	2.20	0.41
1:L:64:LEU:HD23	1:L:64:LEU:C	2.45	0.41
1:A:57:THR:HG21	1:A:119:LEU:CD1	2.50	0.41
1:I:28:HIS:CD2	1:I:86:GLN:HG2	2.55	0.41
1:K:93:ILE:HD13	1:K:93:ILE:HG21	1.76	0.41
1:B:117:ALA:O	1:B:121:GLU:HG3	2.20	0.41
1:F:39:GLU:HA	1:F:39:GLU:OE1	2.21	0.41
1:H:140:LEU:HD23	1:H:140:LEU:HA	1.95	0.41
1:A:93:ILE:HG21	1:A:93:ILE:HD13	1.84	0.41
1:C:137:GLN:OE1	1:I:158:PRO:HB2	2.21	0.41
1:I:40:LEU:CD2	1:I:83:LEU:HD22	2.51	0.41
1:B:9:LYS:HZ1	1:B:13[A]:GLU:CD	2.28	0.40
1:I:123:ILE:O	1:I:127:GLU:HG2	2.21	0.40
1:I:118:ARG:HD2	1:L:121:GLU:OE1	2.22	0.40
1:A:121:GLU:CD	1:D:109:ARG:HH22	2.30	0.40
1:E:149:TYR:CD2	1:E:149:TYR:C	3.00	0.40
1:G:133:TYR:O	1:G:137:GLN:HG2	2.20	0.40
1:K:30:LYS:HD2	1:K:30:LYS:HA	1.84	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	160/161 (99%)	159 (99%)	1 (1%)	0	100	100
1	B	160/161 (99%)	158 (99%)	2 (1%)	0	100	100
1	C	159/161 (99%)	158 (99%)	1 (1%)	0	100	100
1	D	159/161 (99%)	158 (99%)	1 (1%)	0	100	100
1	E	159/161 (99%)	158 (99%)	1 (1%)	0	100	100
1	F	159/161 (99%)	157 (99%)	2 (1%)	0	100	100
1	G	160/161 (99%)	158 (99%)	2 (1%)	0	100	100
1	H	159/161 (99%)	158 (99%)	1 (1%)	0	100	100
1	I	159/161 (99%)	158 (99%)	1 (1%)	0	100	100
1	J	159/161 (99%)	158 (99%)	1 (1%)	0	100	100
1	K	159/161 (99%)	158 (99%)	1 (1%)	0	100	100
1	L	159/161 (99%)	158 (99%)	1 (1%)	0	100	100
All	All	1911/1932 (99%)	1896 (99%)	15 (1%)	0	100	100

There are no Ramachandran outliers to report.

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	142/141 (101%)	138 (97%)	4 (3%)	38	67
1	B	142/141 (101%)	129 (91%)	13 (9%)	8	20

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	C	141/141 (100%)	134 (95%)	7 (5%)	22	46
1	D	141/141 (100%)	133 (94%)	8 (6%)	18	41
1	E	141/141 (100%)	132 (94%)	9 (6%)	16	36
1	F	141/141 (100%)	135 (96%)	6 (4%)	26	52
1	G	142/141 (101%)	132 (93%)	10 (7%)	14	32
1	H	141/141 (100%)	135 (96%)	6 (4%)	26	52
1	I	141/141 (100%)	131 (93%)	10 (7%)	13	32
1	J	141/141 (100%)	133 (94%)	8 (6%)	18	41
1	K	141/141 (100%)	136 (96%)	5 (4%)	32	59
1	L	141/141 (100%)	136 (96%)	5 (4%)	32	59
All	All	1695/1692 (100%)	1604 (95%)	91 (5%)	20	43

All (91) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	17	SER
1	A	33	ASP
1	A	34	ASN
1	A	122	GLN
1	B	9	LYS
1	B	13[A]	GLU
1	B	13[B]	GLU
1	B	33	ASP
1	B	34	ASN
1	B	78	ARG
1	B	81	GLN
1	B	93	ILE
1	B	110	GLU
1	B	119	LEU
1	B	122	GLN
1	B	123	ILE
1	B	135	GLU
1	C	17	SER
1	C	29	SER
1	C	33	ASP
1	C	34	ASN
1	C	119	LEU
1	C	122	GLN

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Mol	Chain	Res	Type
1	C	148	LEU
1	D	9	LYS
1	D	34	ASN
1	D	64	LEU
1	D	81	GLN
1	D	110	GLU
1	D	119	LEU
1	D	148	LEU
1	D	156	ARG
1	E	9	LYS
1	E	29	SER
1	E	33	ASP
1	E	34	ASN
1	E	84	ARG
1	E	93	ILE
1	E	122	GLN
1	E	123	ILE
1	E	139	GLN
1	F	9	LYS
1	F	13	GLU
1	F	17	SER
1	F	107	LEU
1	F	119	LEU
1	F	122	GLN
1	G	13	GLU
1	G	33	ASP
1	G	34	ASN
1	G	42	GLU
1	G	78	ARG
1	G	93	ILE
1	G	112	GLN
1	G	119	LEU
1	G	122	GLN
1	G	139	GLN
1	H	2	GLN
1	H	29	SER
1	H	34	ASN
1	H	42	GLU
1	H	119	LEU
1	H	122	GLN
1	I	17	SER
1	I	29	SER

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Mol	Chain	Res	Type
1	I	33	ASP
1	I	34	ASN
1	I	73	ARG
1	I	93	ILE
1	I	107	LEU
1	I	110	GLU
1	I	119	LEU
1	I	139	GLN
1	J	9	LYS
1	J	17	SER
1	J	29	SER
1	J	76	SER
1	J	93	ILE
1	J	102	LYS
1	J	122	GLN
1	J	139	GLN
1	K	13	GLU
1	K	33	ASP
1	K	107	LEU
1	K	110	GLU
1	K	122	GLN
1	L	13	GLU
1	L	78	ARG
1	L	93	ILE
1	L	109	ARG
1	L	119	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (17) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	32	GLN
1	A	43	HIS
1	E	32	GLN
1	E	86	GLN
1	F	32	GLN
1	G	43	HIS
1	H	43	HIS
1	I	32	GLN
1	I	86	GLN
1	J	32	GLN
1	J	34	ASN
1	J	122	GLN

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Mol	Chain	Res	Type
1	J	152	GLN
1	L	32	GLN
1	L	43	HIS
1	L	72	GLN
1	L	86	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 50 ligands modelled in this entry, 36 are monoatomic - leaving 14 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	$\# Z > 2$
4	HEM	I	301[B]	1	50,50,50	2.65	26 (52%)	67,82,82	2.63	21 (31%)
4	HEM	C	301[B]	1	50,50,50	2.69	27 (54%)	67,82,82	2.75	22 (32%)
4	HEM	E	301[B]	1	50,50,50	2.59	27 (54%)	67,82,82	2.75	22 (32%)
4	HEM	B	301[A]	1	50,50,50	2.61	26 (52%)	67,82,82	2.73	19 (28%)
4	HEM	I	301[A]	1	50,50,50	2.66	26 (52%)	67,82,82	2.68	21 (31%)
4	HEM	C	301[A]	1	50,50,50	2.62	26 (52%)	67,82,82	2.67	21 (31%)
4	HEM	H	301[B]	1	50,50,50	2.65	27 (54%)	67,82,82	2.76	24 (35%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	HEM	E	301[A]	1	50,50,50	2.63	27 (54%)	67,82,82	2.72	22 (32%)
4	HEM	H	301[A]	1	50,50,50	2.67	27 (54%)	67,82,82	2.73	23 (34%)
5	EPE	J	501	-	15,15,15	1.02	1 (6%)	19,20,20	1.78	5 (26%)
4	HEM	L	301	1	50,50,50	2.68	28 (56%)	67,82,82	2.72	23 (34%)
4	HEM	K	301	1	50,50,50	2.71	27 (54%)	67,82,82	2.69	23 (34%)
5	EPE	D	502	-	15,15,15	0.90	1 (6%)	19,20,20	2.01	5 (26%)
4	HEM	B	301[B]	1	50,50,50	2.64	26 (52%)	67,82,82	2.70	22 (32%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	HEM	I	301[B]	1	-	11/14/54/54	-
4	HEM	C	301[B]	1	-	10/14/54/54	-
4	HEM	E	301[B]	1	-	6/14/54/54	-
4	HEM	B	301[A]	1	-	13/14/54/54	-
4	HEM	I	301[A]	1	-	9/14/54/54	-
4	HEM	C	301[A]	1	-	12/14/54/54	-
4	HEM	H	301[B]	1	-	7/14/54/54	-
4	HEM	E	301[A]	1	-	7/14/54/54	-
4	HEM	H	301[A]	1	-	6/14/54/54	-
5	EPE	J	501	-	-	6/9/19/19	0/1/1/1
4	HEM	L	301	1	-	4/14/54/54	-
4	HEM	K	301	1	-	8/14/54/54	-
5	EPE	D	502	-	-	3/9/19/19	0/1/1/1
4	HEM	B	301[B]	1	-	12/14/54/54	-

All (322) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	C	301[B]	HEM	C4D-C3D	-5.57	1.35	1.45
4	L	301	HEM	C4D-C3D	-5.46	1.35	1.45
4	C	301[A]	HEM	C4D-C3D	-5.21	1.36	1.45
4	H	301[A]	HEM	C4D-C3D	-4.95	1.36	1.45
4	K	301	HEM	C4D-C3D	-4.91	1.36	1.45

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	I	301[A]	HEM	C3B-C4B	-4.80	1.35	1.44
4	E	301[B]	HEM	C4D-C3D	-4.78	1.36	1.45
4	E	301[A]	HEM	C4D-C3D	-4.77	1.36	1.45
4	K	301	HEM	C3B-C4B	-4.76	1.35	1.44
4	B	301[B]	HEM	FE-NB	4.74	2.09	1.94
4	B	301[B]	HEM	C4D-C3D	-4.73	1.37	1.45
4	I	301[A]	HEM	C4D-C3D	-4.70	1.37	1.45
4	B	301[A]	HEM	CHA-C4D	4.66	1.47	1.38
4	L	301	HEM	FE-NB	4.64	2.09	1.94
4	C	301[A]	HEM	FE-NB	4.62	2.09	1.94
4	C	301[B]	HEM	C3B-C4B	-4.61	1.36	1.44
4	B	301[A]	HEM	C4D-C3D	-4.59	1.37	1.45
4	I	301[B]	HEM	C3B-C4B	-4.58	1.36	1.44
4	H	301[B]	HEM	C4D-C3D	-4.57	1.37	1.45
4	E	301[A]	HEM	C3B-C4B	-4.57	1.36	1.44
4	I	301[B]	HEM	C4D-C3D	-4.56	1.37	1.45
4	L	301	HEM	C3D-C2D	4.54	1.46	1.36
4	H	301[A]	HEM	CHA-C4D	4.49	1.47	1.38
4	H	301[B]	HEM	C3B-C2B	4.49	1.46	1.37
4	H	301[B]	HEM	CHD-C4C	4.48	1.47	1.38
4	H	301[A]	HEM	FE-NB	4.47	2.08	1.94
4	B	301[B]	HEM	CHA-C4D	4.46	1.47	1.38
4	K	301	HEM	FE-NB	4.43	2.08	1.94
4	L	301	HEM	CHD-C4C	4.40	1.47	1.38
4	H	301[B]	HEM	C3D-C2D	4.39	1.46	1.36
4	B	301[B]	HEM	C3B-C2B	4.38	1.46	1.37
4	B	301[A]	HEM	FE-NB	4.37	2.08	1.94
4	C	301[A]	HEM	C3B-C4B	-4.35	1.36	1.44
4	I	301[B]	HEM	C3D-C2D	4.35	1.46	1.36
4	E	301[B]	HEM	C3B-C4B	-4.32	1.36	1.44
4	L	301	HEM	C3B-C4B	-4.31	1.36	1.44
4	H	301[B]	HEM	FE-NB	4.28	2.08	1.94
4	E	301[A]	HEM	CHC-C1C	4.27	1.46	1.38
4	H	301[B]	HEM	CHA-C4D	4.27	1.47	1.38
4	B	301[A]	HEM	C3D-C2D	4.26	1.46	1.36
4	B	301[B]	HEM	CHC-C1C	4.26	1.46	1.38
4	B	301[A]	HEM	CHD-C4C	4.24	1.46	1.38
4	B	301[A]	HEM	FE-NC	4.23	2.09	1.95
4	I	301[A]	HEM	FE-NB	4.23	2.07	1.94
4	E	301[A]	HEM	FE-NB	4.22	2.07	1.94
4	H	301[A]	HEM	C3B-C4B	-4.21	1.36	1.44
4	K	301	HEM	FE-NC	4.21	2.09	1.95

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	I	301[A]	HEM	C3D-C2D	4.19	1.45	1.36
4	I	301[B]	HEM	FE-ND	4.17	2.07	1.94
4	C	301[B]	HEM	C3D-C2D	4.17	1.45	1.36
4	I	301[A]	HEM	CHA-C4D	4.17	1.46	1.38
4	E	301[B]	HEM	CHC-C1C	4.17	1.46	1.38
4	H	301[B]	HEM	C3B-C4B	-4.16	1.36	1.44
4	I	301[B]	HEM	C3C-C2C	4.15	1.45	1.37
4	K	301	HEM	CHB-C1B	4.14	1.46	1.38
4	B	301[B]	HEM	C3D-C2D	4.14	1.45	1.36
4	C	301[B]	HEM	CHC-C1C	4.14	1.46	1.38
4	E	301[A]	HEM	C1B-NB	-4.13	1.33	1.40
4	E	301[A]	HEM	CHA-C4D	4.13	1.46	1.38
4	H	301[B]	HEM	FE-NC	4.13	2.08	1.95
4	E	301[B]	HEM	FE-NB	4.12	2.07	1.94
4	I	301[A]	HEM	FE-ND	4.12	2.07	1.94
4	I	301[A]	HEM	CHC-C1C	4.12	1.46	1.38
4	I	301[A]	HEM	C3C-C2C	4.11	1.45	1.37
4	I	301[A]	HEM	C3B-C2B	4.10	1.45	1.37
4	E	301[A]	HEM	C3D-C2D	4.10	1.45	1.36
4	E	301[B]	HEM	CHA-C4D	4.09	1.46	1.38
4	C	301[A]	HEM	FE-ND	4.09	2.07	1.94
4	C	301[B]	HEM	FE-NB	4.08	2.07	1.94
4	H	301[A]	HEM	C3C-C2C	4.06	1.45	1.37
4	L	301	HEM	CHC-C1C	4.05	1.46	1.38
4	I	301[B]	HEM	FE-NB	4.05	2.07	1.94
4	L	301	HEM	C3B-C2B	4.04	1.45	1.37
4	H	301[B]	HEM	C1B-NB	-4.04	1.33	1.40
4	C	301[B]	HEM	C3B-C2B	4.04	1.45	1.37
4	K	301	HEM	CHA-C4D	4.04	1.46	1.38
4	C	301[B]	HEM	FE-NC	4.03	2.08	1.95
4	H	301[A]	HEM	CHC-C1C	4.02	1.46	1.38
4	I	301[B]	HEM	C3B-C2B	4.02	1.45	1.37
4	I	301[B]	HEM	CHB-C1B	4.02	1.46	1.38
4	I	301[B]	HEM	CHD-C4C	4.02	1.46	1.38
4	I	301[B]	HEM	CHA-C4D	4.01	1.46	1.38
4	C	301[B]	HEM	C4D-ND	-4.01	1.33	1.40
4	E	301[B]	HEM	FE-NC	4.01	2.08	1.95
4	H	301[A]	HEM	FE-NC	4.01	2.08	1.95
4	H	301[A]	HEM	C3B-C2B	4.01	1.45	1.37
4	K	301	HEM	CHD-C4C	4.01	1.46	1.38
4	E	301[A]	HEM	FE-NC	4.00	2.08	1.95
4	C	301[A]	HEM	CHD-C4C	4.00	1.46	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	K	301	HEM	CHC-C1C	3.99	1.46	1.38
4	K	301	HEM	C3D-C2D	3.97	1.45	1.36
4	H	301[A]	HEM	C3D-C2D	3.97	1.45	1.36
4	C	301[B]	HEM	FE-ND	3.96	2.07	1.94
4	I	301[A]	HEM	CHD-C4C	3.96	1.46	1.38
4	B	301[B]	HEM	CHD-C4C	3.95	1.46	1.38
4	B	301[B]	HEM	FE-ND	3.95	2.07	1.94
4	E	301[A]	HEM	CHD-C4C	3.93	1.46	1.38
4	B	301[B]	HEM	CHA-C1A	3.91	1.48	1.39
4	L	301	HEM	CHA-C4D	3.91	1.46	1.38
4	B	301[A]	HEM	C3B-C2B	3.91	1.45	1.37
4	K	301	HEM	FE-ND	3.90	2.06	1.94
4	L	301	HEM	CHB-C1B	3.89	1.46	1.38
4	L	301	HEM	C3C-C2C	3.89	1.45	1.37
4	C	301[A]	HEM	C3D-C2D	3.89	1.45	1.36
4	I	301[B]	HEM	FE-NC	3.88	2.08	1.95
4	H	301[B]	HEM	CHC-C1C	3.87	1.46	1.38
4	B	301[B]	HEM	FE-NC	3.87	2.07	1.95
4	C	301[A]	HEM	CHC-C1C	3.87	1.46	1.38
4	K	301	HEM	C3C-C2C	3.86	1.45	1.37
4	L	301	HEM	FE-ND	3.85	2.06	1.94
4	K	301	HEM	C3B-C2B	3.84	1.45	1.37
4	I	301[B]	HEM	CHC-C1C	3.83	1.45	1.38
4	L	301	HEM	FE-NC	3.83	2.07	1.95
4	C	301[A]	HEM	FE-NC	3.82	2.07	1.95
4	H	301[A]	HEM	CHB-C1B	3.79	1.46	1.38
4	I	301[A]	HEM	CHB-C1B	3.78	1.46	1.38
4	C	301[B]	HEM	C3C-C2C	3.77	1.44	1.37
4	I	301[A]	HEM	FE-NC	3.77	2.07	1.95
4	C	301[B]	HEM	CHB-C1B	3.77	1.46	1.38
4	B	301[B]	HEM	CHB-C1B	3.76	1.46	1.38
4	E	301[B]	HEM	FE-ND	3.76	2.06	1.94
4	H	301[A]	HEM	C1B-NB	-3.75	1.33	1.40
4	B	301[A]	HEM	C3B-C4B	-3.75	1.37	1.44
4	E	301[B]	HEM	C4C-NC	-3.74	1.32	1.39
4	H	301[B]	HEM	FE-ND	3.73	2.06	1.94
4	B	301[A]	HEM	FE-NA	3.72	2.07	1.95
4	I	301[B]	HEM	C4D-ND	-3.72	1.33	1.40
4	I	301[B]	HEM	FE-NA	3.71	2.07	1.95
4	E	301[A]	HEM	FE-ND	3.71	2.06	1.94
4	K	301	HEM	FE-NA	3.70	2.07	1.95
4	H	301[B]	HEM	C3C-C2C	3.69	1.44	1.37

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	301[A]	HEM	CHC-C1C	3.69	1.45	1.38
4	B	301[B]	HEM	FE-NA	3.69	2.07	1.95
4	H	301[B]	HEM	C4D-ND	-3.69	1.33	1.40
4	C	301[A]	HEM	CHA-C4D	3.68	1.45	1.38
4	L	301	HEM	FE-NA	3.66	2.07	1.95
4	E	301[B]	HEM	C3B-C2B	3.66	1.44	1.37
4	C	301[A]	HEM	C3C-C2C	3.66	1.44	1.37
4	I	301[A]	HEM	FE-NA	3.66	2.07	1.95
4	B	301[A]	HEM	C3C-C2C	3.65	1.44	1.37
4	E	301[A]	HEM	C3C-C2C	3.64	1.44	1.37
4	H	301[A]	HEM	C4D-ND	-3.64	1.33	1.40
4	H	301[A]	HEM	FE-NA	3.62	2.07	1.95
4	C	301[A]	HEM	CHB-C1B	3.62	1.45	1.38
4	H	301[A]	HEM	CHA-C1A	3.60	1.47	1.39
4	E	301[B]	HEM	C4D-ND	-3.60	1.34	1.40
4	E	301[B]	HEM	CHB-C1B	3.60	1.45	1.38
4	B	301[B]	HEM	C3C-C2C	3.60	1.44	1.37
4	K	301	HEM	C4D-ND	-3.60	1.34	1.40
4	C	301[B]	HEM	CHD-C4C	3.59	1.45	1.38
4	K	301	HEM	CHB-C4A	3.58	1.47	1.39
4	B	301[A]	HEM	FE-ND	3.58	2.05	1.94
4	K	301	HEM	C1B-NB	-3.58	1.34	1.40
4	L	301	HEM	CHD-C1D	3.57	1.47	1.39
4	H	301[A]	HEM	FE-ND	3.57	2.05	1.94
4	C	301[A]	HEM	C4D-ND	-3.57	1.34	1.40
4	B	301[A]	HEM	CHB-C1B	3.56	1.45	1.38
4	C	301[A]	HEM	C1B-NB	-3.55	1.34	1.40
4	E	301[B]	HEM	C1B-NB	-3.55	1.34	1.40
4	C	301[A]	HEM	C3B-C2B	3.54	1.44	1.37
4	E	301[B]	HEM	C3D-C2D	3.52	1.44	1.36
4	C	301[B]	HEM	C1B-NB	-3.52	1.34	1.40
4	B	301[B]	HEM	C3B-C4B	-3.52	1.38	1.44
4	C	301[A]	HEM	C4C-NC	-3.50	1.33	1.39
4	C	301[B]	HEM	FE-NA	3.49	2.06	1.95
4	C	301[B]	HEM	CHA-C4D	3.48	1.45	1.38
4	E	301[A]	HEM	C3B-C2B	3.47	1.44	1.37
4	B	301[A]	HEM	C1B-NB	-3.47	1.34	1.40
4	H	301[B]	HEM	C1A-NA	-3.46	1.33	1.39
4	C	301[B]	HEM	C1A-NA	-3.45	1.33	1.39
4	E	301[A]	HEM	FE-NA	3.44	2.06	1.95
4	L	301	HEM	C4D-ND	-3.44	1.34	1.40
4	I	301[A]	HEM	C4D-ND	-3.43	1.34	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	K	301	HEM	C4C-NC	-3.42	1.33	1.39
4	C	301[B]	HEM	C4C-NC	-3.41	1.33	1.39
4	I	301[A]	HEM	C1B-NB	-3.38	1.34	1.40
4	H	301[B]	HEM	FE-NA	3.38	2.06	1.95
4	E	301[B]	HEM	C3C-C2C	3.37	1.44	1.37
4	H	301[A]	HEM	CHD-C4C	3.36	1.45	1.38
4	L	301	HEM	C1B-NB	-3.35	1.34	1.40
4	E	301[A]	HEM	C4A-NA	-3.35	1.33	1.39
4	B	301[A]	HEM	CHA-C1A	3.34	1.46	1.39
4	E	301[B]	HEM	CHA-C1A	3.34	1.46	1.39
4	B	301[B]	HEM	CHD-C1D	3.33	1.46	1.39
4	H	301[B]	HEM	CHA-C1A	3.33	1.46	1.39
4	E	301[B]	HEM	CHD-C4C	3.32	1.44	1.38
4	E	301[B]	HEM	FE-NA	3.32	2.06	1.95
4	H	301[B]	HEM	CHD-C1D	3.30	1.46	1.39
4	E	301[A]	HEM	CHA-C1A	3.30	1.46	1.39
4	I	301[A]	HEM	CHA-C1A	3.29	1.46	1.39
4	B	301[A]	HEM	C4D-ND	-3.29	1.34	1.40
4	K	301	HEM	CHD-C1D	3.28	1.46	1.39
4	E	301[B]	HEM	CHC-C4B	3.27	1.46	1.39
5	J	501	EPE	C10-S	3.27	1.82	1.77
4	E	301[A]	HEM	C4D-ND	-3.27	1.34	1.40
4	B	301[B]	HEM	C4A-NA	-3.26	1.33	1.39
4	B	301[A]	HEM	C4B-NB	-3.25	1.32	1.38
4	E	301[A]	HEM	CHC-C4B	3.24	1.46	1.39
4	E	301[A]	HEM	CHD-C1D	3.24	1.46	1.39
4	I	301[B]	HEM	CHC-C4B	3.22	1.46	1.39
4	I	301[B]	HEM	CHA-C1A	3.22	1.46	1.39
4	H	301[A]	HEM	C4C-NC	-3.21	1.33	1.39
4	I	301[A]	HEM	C1A-NA	-3.21	1.33	1.39
4	C	301[A]	HEM	CHA-C1A	3.20	1.46	1.39
4	I	301[A]	HEM	CHB-C4A	3.18	1.46	1.39
4	L	301	HEM	CHA-C1A	3.16	1.46	1.39
4	C	301[A]	HEM	FE-NA	3.15	2.05	1.95
4	K	301	HEM	CHA-C1A	3.15	1.46	1.39
4	I	301[B]	HEM	C4C-NC	-3.14	1.33	1.39
4	C	301[A]	HEM	C1A-NA	-3.14	1.33	1.39
4	E	301[A]	HEM	CHB-C1B	3.13	1.44	1.38
4	C	301[B]	HEM	CHC-C4B	3.13	1.46	1.39
4	H	301[A]	HEM	CHC-C4B	3.13	1.46	1.39
4	K	301	HEM	CHC-C4B	3.13	1.46	1.39
4	C	301[A]	HEM	C1C-NC	-3.13	1.33	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	H	301[B]	HEM	C4A-NA	-3.12	1.33	1.39
4	C	301[A]	HEM	CHD-C1D	3.11	1.46	1.39
4	E	301[A]	HEM	C1A-NA	-3.11	1.33	1.39
4	I	301[B]	HEM	CHB-C4A	3.11	1.46	1.39
4	L	301	HEM	C1A-NA	-3.10	1.33	1.39
4	H	301[B]	HEM	C1C-NC	-3.09	1.33	1.39
4	B	301[A]	HEM	C1C-NC	-3.09	1.33	1.39
4	E	301[A]	HEM	C4C-NC	-3.09	1.33	1.39
4	B	301[A]	HEM	CHD-C1D	3.08	1.46	1.39
4	E	301[B]	HEM	C4A-NA	-3.08	1.33	1.39
4	B	301[A]	HEM	CHB-C4A	3.08	1.46	1.39
4	C	301[B]	HEM	CHB-C4A	3.07	1.46	1.39
4	L	301	HEM	CHB-C4A	3.06	1.46	1.39
4	I	301[B]	HEM	CHD-C1D	3.05	1.46	1.39
4	E	301[B]	HEM	C1D-ND	-3.04	1.32	1.38
4	I	301[A]	HEM	CHC-C4B	3.04	1.46	1.39
4	H	301[A]	HEM	C4B-NB	-3.03	1.32	1.38
4	I	301[B]	HEM	C1A-NA	-3.03	1.33	1.39
4	B	301[B]	HEM	C1C-NC	-3.02	1.33	1.39
4	C	301[B]	HEM	C4A-NA	-3.02	1.33	1.39
4	B	301[B]	HEM	C1B-NB	-3.02	1.35	1.40
4	B	301[B]	HEM	CHC-C4B	3.02	1.46	1.39
4	H	301[A]	HEM	C4A-NA	-3.00	1.34	1.39
4	H	301[B]	HEM	C4B-NB	-2.99	1.33	1.38
4	C	301[B]	HEM	CHA-C1A	2.98	1.46	1.39
4	C	301[B]	HEM	C1D-ND	-2.98	1.33	1.38
4	I	301[B]	HEM	C1B-NB	-2.98	1.35	1.40
4	I	301[B]	HEM	C4A-NA	-2.97	1.34	1.39
5	D	502	EPE	C10-S	2.96	1.81	1.77
4	C	301[B]	HEM	C4B-NB	-2.93	1.33	1.38
4	H	301[B]	HEM	C4C-NC	-2.91	1.34	1.39
4	E	301[B]	HEM	CHB-C4A	2.90	1.45	1.39
4	L	301	HEM	CHC-C4B	2.89	1.45	1.39
4	L	301	HEM	C2A-C3A	2.88	1.46	1.38
4	I	301[A]	HEM	C4C-NC	-2.87	1.34	1.39
4	B	301[A]	HEM	CHC-C4B	2.87	1.45	1.39
4	C	301[A]	HEM	C4A-NA	-2.87	1.34	1.39
4	B	301[A]	HEM	C4A-NA	-2.86	1.34	1.39
4	E	301[B]	HEM	C1A-NA	-2.86	1.34	1.39
4	I	301[A]	HEM	CHD-C1D	2.86	1.45	1.39
4	H	301[A]	HEM	CHD-C1D	2.85	1.45	1.39
4	L	301	HEM	C4A-NA	-2.84	1.34	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	E	301[B]	HEM	CHD-C1D	2.82	1.45	1.39
4	K	301	HEM	C4A-NA	-2.82	1.34	1.39
4	C	301[A]	HEM	C4B-NB	-2.81	1.33	1.38
4	C	301[A]	HEM	C1D-ND	-2.80	1.33	1.38
4	I	301[A]	HEM	C4A-NA	-2.80	1.34	1.39
4	K	301	HEM	C1C-NC	-2.79	1.34	1.39
4	H	301[B]	HEM	CHC-C4B	2.79	1.45	1.39
4	K	301	HEM	C1A-NA	-2.79	1.34	1.39
4	B	301[B]	HEM	C4D-ND	-2.78	1.35	1.40
4	E	301[A]	HEM	C1D-ND	-2.78	1.33	1.38
4	H	301[A]	HEM	CHB-C4A	2.78	1.45	1.39
4	H	301[B]	HEM	CHB-C1B	2.77	1.44	1.38
4	I	301[A]	HEM	C1D-ND	-2.77	1.33	1.38
4	K	301	HEM	C4B-NB	-2.77	1.33	1.38
4	C	301[A]	HEM	CHB-C4A	2.75	1.45	1.39
4	B	301[B]	HEM	CHB-C4A	2.74	1.45	1.39
4	B	301[A]	HEM	C1A-NA	-2.72	1.34	1.39
4	H	301[A]	HEM	C1D-ND	-2.72	1.33	1.38
4	H	301[A]	HEM	C1C-NC	-2.71	1.34	1.39
4	C	301[A]	HEM	CHC-C4B	2.70	1.45	1.39
4	E	301[A]	HEM	C1C-NC	-2.70	1.34	1.39
4	E	301[A]	HEM	CHB-C4A	2.70	1.45	1.39
4	C	301[B]	HEM	C1C-NC	-2.69	1.34	1.39
4	B	301[B]	HEM	C4C-NC	-2.69	1.34	1.39
4	I	301[B]	HEM	C2A-C3A	2.68	1.45	1.38
4	B	301[B]	HEM	C2A-C3A	2.68	1.45	1.38
4	L	301	HEM	C1C-NC	-2.68	1.34	1.39
4	H	301[A]	HEM	C1A-NA	-2.67	1.34	1.39
4	I	301[B]	HEM	C1D-ND	-2.66	1.33	1.38
4	E	301[B]	HEM	C1C-NC	-2.66	1.34	1.39
4	H	301[A]	HEM	C2A-C3A	2.65	1.45	1.38
4	C	301[A]	HEM	C2A-C3A	2.61	1.45	1.38
4	K	301	HEM	C2A-C3A	2.61	1.45	1.38
4	B	301[B]	HEM	C4B-NB	-2.59	1.33	1.38
4	E	301[A]	HEM	C4B-NB	-2.58	1.33	1.38
4	E	301[B]	HEM	C4B-NB	-2.57	1.33	1.38
4	L	301	HEM	C4B-NB	-2.57	1.33	1.38
4	B	301[A]	HEM	C2A-C3A	2.57	1.45	1.38
4	I	301[A]	HEM	C2A-C3A	2.56	1.45	1.38
4	K	301	HEM	C1D-ND	-2.53	1.33	1.38
4	B	301[B]	HEM	C1D-ND	-2.53	1.33	1.38
4	E	301[B]	HEM	C2A-C3A	2.52	1.45	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	C	301[B]	HEM	CHD-C1D	2.47	1.44	1.39
4	C	301[B]	HEM	C2A-C3A	2.46	1.45	1.38
4	I	301[A]	HEM	C1C-NC	-2.45	1.35	1.39
4	L	301	HEM	C4C-NC	-2.45	1.35	1.39
4	I	301[A]	HEM	C4B-NB	-2.44	1.34	1.38
4	I	301[B]	HEM	C1C-NC	-2.43	1.35	1.39
4	H	301[B]	HEM	CHB-C4A	2.42	1.44	1.39
4	B	301[A]	HEM	C1D-ND	-2.41	1.34	1.38
4	I	301[B]	HEM	C4B-NB	-2.37	1.34	1.38
4	B	301[B]	HEM	C1A-NA	-2.35	1.35	1.39
4	K	301	HEM	O2D-CGD	-2.29	1.23	1.30
4	H	301[B]	HEM	C2A-C3A	2.27	1.44	1.38
4	H	301[B]	HEM	C1D-ND	-2.27	1.34	1.38
4	B	301[A]	HEM	C4C-NC	-2.18	1.35	1.39
4	L	301	HEM	C1D-ND	-2.13	1.34	1.38
4	H	301[A]	HEM	O2A-CGA	-2.12	1.23	1.30
4	H	301[B]	HEM	O2D-CGD	-2.12	1.23	1.30
4	L	301	HEM	O2D-CGD	-2.10	1.23	1.30
4	C	301[B]	HEM	O2A-CGA	-2.07	1.24	1.30
4	E	301[A]	HEM	O2D-CGD	-2.05	1.24	1.30
4	L	301	HEM	O2A-CGA	-2.03	1.24	1.30
4	E	301[B]	HEM	O2A-CGA	-2.02	1.24	1.30
4	E	301[A]	HEM	C2A-C3A	2.02	1.44	1.38

All (273) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	H	301[B]	HEM	C3B-C2B-C1B	-11.20	98.00	106.41
4	H	301[A]	HEM	C3B-C2B-C1B	-11.07	98.10	106.41
4	B	301[B]	HEM	C3B-C2B-C1B	-10.88	98.24	106.41
4	E	301[B]	HEM	C3B-C2B-C1B	-10.82	98.29	106.41
4	C	301[B]	HEM	C3B-C2B-C1B	-10.76	98.33	106.41
4	B	301[A]	HEM	C3B-C2B-C1B	-10.41	98.60	106.41
4	E	301[A]	HEM	C3B-C2B-C1B	-10.23	98.73	106.41
4	I	301[A]	HEM	C3B-C2B-C1B	-10.17	98.78	106.41
4	L	301	HEM	C3B-C2B-C1B	-10.08	98.84	106.41
4	I	301[B]	HEM	C3B-C2B-C1B	-9.88	98.99	106.41
4	K	301	HEM	C3B-C2B-C1B	-9.70	99.12	106.41
4	C	301[A]	HEM	C3B-C2B-C1B	-9.47	99.30	106.41
4	B	301[A]	HEM	C3B-C4B-NB	7.62	114.94	109.47
4	L	301	HEM	C3B-C4B-NB	7.60	114.93	109.47
4	C	301[B]	HEM	C3C-C2C-C1C	-7.44	100.01	107.05

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	K	301	HEM	C3C-C2C-C1C	-7.24	100.20	107.05
4	C	301[A]	HEM	C3B-C4B-NB	7.19	114.63	109.47
4	C	301[B]	HEM	C3D-C4D-ND	6.73	117.55	110.17
4	I	301[B]	HEM	C3C-C2C-C1C	-6.72	100.69	107.05
4	E	301[B]	HEM	C3C-C2C-C1C	-6.66	100.74	107.05
4	I	301[A]	HEM	C3B-C4B-NB	6.59	114.20	109.47
4	L	301	HEM	C3D-C4D-ND	6.58	117.38	110.17
4	B	301[B]	HEM	C3B-C4B-NB	6.55	114.17	109.47
4	L	301	HEM	C3C-C2C-C1C	-6.48	100.92	107.05
4	C	301[A]	HEM	C3D-C4D-ND	6.41	117.20	110.17
4	I	301[B]	HEM	C3D-C4D-ND	6.33	117.11	110.17
4	H	301[B]	HEM	C3C-C2C-C1C	-6.31	101.08	107.05
4	I	301[A]	HEM	C3C-C2C-C1C	-6.28	101.10	107.05
4	I	301[A]	HEM	C3D-C4D-ND	6.24	117.01	110.17
4	E	301[A]	HEM	C3C-C2C-C1C	-6.20	101.18	107.05
4	B	301[B]	HEM	C3D-C4D-ND	6.19	116.96	110.17
5	D	502	EPE	C5-N4-C3	6.15	122.08	108.84
4	K	301	HEM	C3D-C4D-ND	6.12	116.88	110.17
4	C	301[A]	HEM	C3C-C2C-C1C	-6.11	101.26	107.05
4	H	301[B]	HEM	C3D-C4D-ND	6.07	116.83	110.17
4	K	301	HEM	C3B-C4B-NB	6.01	113.78	109.47
4	E	301[A]	HEM	C3B-C4B-NB	5.98	113.76	109.47
4	H	301[B]	HEM	C2B-C1B-NB	5.87	116.58	109.84
4	H	301[A]	HEM	C3B-C4B-NB	5.86	113.67	109.47
4	H	301[A]	HEM	C3C-C2C-C1C	-5.81	101.55	107.05
4	E	301[A]	HEM	C3D-C4D-ND	5.77	116.50	110.17
4	H	301[B]	HEM	C3B-C4B-NB	5.75	113.60	109.47
4	B	301[B]	HEM	C3C-C2C-C1C	-5.68	101.67	107.05
4	H	301[A]	HEM	C1D-C2D-C3D	-5.63	101.06	106.98
4	K	301	HEM	C1D-C2D-C3D	-5.55	101.14	106.98
4	E	301[B]	HEM	C1D-C2D-C3D	-5.51	101.19	106.98
4	H	301[A]	HEM	C3D-C4D-ND	5.50	116.20	110.17
4	I	301[B]	HEM	C3B-C4B-NB	5.46	113.39	109.47
4	B	301[A]	HEM	C1D-C2D-C3D	-5.44	101.26	106.98
4	C	301[B]	HEM	C1D-C2D-C3D	-5.44	101.26	106.98
4	E	301[B]	HEM	C3B-C4B-NB	5.32	113.29	109.47
4	L	301	HEM	C2A-C1A-NA	5.32	116.05	110.15
4	B	301[A]	HEM	C3D-C4D-ND	5.32	116.00	110.17
4	B	301[A]	HEM	C3C-C2C-C1C	-5.29	102.04	107.05
4	B	301[A]	HEM	C2A-C1A-NA	5.28	116.01	110.15
4	C	301[B]	HEM	C2A-C1A-NA	5.24	115.96	110.15
4	I	301[B]	HEM	C2A-C1A-NA	5.22	115.95	110.15

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	I	301[B]	HEM	C1D-C2D-C3D	-5.22	101.49	106.98
4	K	301	HEM	C2A-C1A-NA	5.18	115.90	110.15
4	I	301[A]	HEM	C1D-C2D-C3D	-5.06	101.66	106.98
4	B	301[A]	HEM	C2B-C1B-NB	5.05	115.64	109.84
4	B	301[B]	HEM	C2B-C1B-NB	5.03	115.62	109.84
4	E	301[B]	HEM	C3D-C4D-ND	5.03	115.68	110.17
4	E	301[B]	HEM	C2B-C1B-NB	4.93	115.51	109.84
4	H	301[B]	HEM	C4A-C3A-C2A	-4.85	101.26	106.82
4	H	301[B]	HEM	C1D-C2D-C3D	-4.84	101.89	106.98
4	E	301[A]	HEM	C2B-C1B-NB	4.81	115.37	109.84
4	H	301[A]	HEM	C2B-C1B-NB	4.71	115.26	109.84
4	H	301[B]	HEM	C2A-C1A-NA	4.67	115.34	110.15
4	C	301[A]	HEM	C1D-C2D-C3D	-4.53	102.21	106.98
4	L	301	HEM	C2B-C1B-NB	4.53	115.05	109.84
4	I	301[A]	HEM	C2A-C1A-NA	4.53	115.17	110.15
4	C	301[A]	HEM	CMB-C2B-C1B	4.50	132.07	125.03
4	E	301[B]	HEM	C2A-C1A-NA	4.49	115.13	110.15
4	E	301[B]	HEM	CAD-CBD-CGD	-4.48	101.77	113.67
4	E	301[A]	HEM	C1D-C2D-C3D	-4.48	102.27	106.98
4	H	301[A]	HEM	C2A-C1A-NA	4.48	115.12	110.15
5	J	501	EPE	C5-N4-C3	4.47	118.48	108.84
4	E	301[A]	HEM	CAA-CBA-CGA	-4.45	101.86	113.67
4	C	301[A]	HEM	C2B-C1B-NB	4.45	114.95	109.84
4	C	301[B]	HEM	C3B-C4B-NB	4.44	112.66	109.47
4	L	301	HEM	C1D-C2D-C3D	-4.44	102.31	106.98
4	E	301[A]	HEM	C4A-C3A-C2A	-4.43	101.74	106.82
4	C	301[B]	HEM	CMB-C2B-C1B	4.41	131.92	125.03
4	C	301[A]	HEM	C2A-C1A-NA	4.39	115.02	110.15
4	E	301[A]	HEM	CMC-C2C-C1C	4.35	132.39	124.73
4	L	301	HEM	CMB-C2B-C1B	4.34	131.81	125.03
4	H	301[B]	HEM	C3A-C4A-NA	4.28	117.01	110.14
4	I	301[B]	HEM	CMB-C2B-C1B	4.22	131.63	125.03
4	B	301[B]	HEM	C3A-C4A-NA	4.19	116.86	110.14
4	C	301[B]	HEM	CMC-C2C-C1C	4.16	132.05	124.73
4	I	301[A]	HEM	C2B-C1B-NB	4.16	114.62	109.84
4	C	301[A]	HEM	C4A-C3A-C2A	-4.14	102.07	106.82
4	B	301[B]	HEM	C1D-C2D-C3D	-4.13	102.64	106.98
4	C	301[B]	HEM	C2D-C1D-ND	4.12	114.67	109.90
4	I	301[A]	HEM	CMB-C2B-C1B	4.11	131.46	125.03
4	B	301[B]	HEM	CAA-C2A-C1A	4.09	132.93	124.94
4	B	301[A]	HEM	CMC-C2C-C1C	4.09	131.93	124.73
4	E	301[A]	HEM	C3A-C4A-NA	4.04	116.63	110.14

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	K	301	HEM	C2D-C1D-ND	4.00	114.52	109.90
4	E	301[A]	HEM	CMB-C2B-C1B	3.99	131.27	125.03
4	B	301[A]	HEM	C2D-C1D-ND	3.98	114.50	109.90
4	E	301[B]	HEM	C2D-C1D-ND	3.96	114.48	109.90
4	K	301	HEM	CMB-C2B-C1B	3.95	131.20	125.03
4	E	301[B]	HEM	CMC-C2C-C1C	3.88	131.56	124.73
4	I	301[B]	HEM	C2D-C1D-ND	3.87	114.38	109.90
4	I	301[B]	HEM	C2B-C1B-NB	3.87	114.29	109.84
4	H	301[A]	HEM	C2D-C1D-ND	3.86	114.37	109.90
4	I	301[A]	HEM	C4A-C3A-C2A	-3.85	102.41	106.82
4	H	301[A]	HEM	C3A-C4A-NA	3.83	116.28	110.14
4	C	301[A]	HEM	C3A-C4A-NA	3.82	116.27	110.14
4	E	301[A]	HEM	C2A-C1A-NA	3.81	114.38	110.15
4	I	301[A]	HEM	C2D-C1D-ND	3.81	114.30	109.90
4	H	301[A]	HEM	CMB-C2B-C1B	3.75	130.90	125.03
4	E	301[B]	HEM	CMB-C2B-C1B	3.75	130.90	125.03
4	C	301[A]	HEM	CMC-C2C-C1C	3.74	131.32	124.73
4	K	301	HEM	C2B-C1B-NB	3.73	114.13	109.84
4	C	301[B]	HEM	C2B-C1B-NB	3.71	114.10	109.84
4	B	301[B]	HEM	C2A-C1A-NA	3.69	114.25	110.15
4	H	301[A]	HEM	CAA-C2A-C1A	3.66	132.09	124.94
4	L	301	HEM	C2C-C1C-NC	3.63	116.36	109.64
4	B	301[B]	HEM	C4A-C3A-C2A	-3.61	102.68	106.82
4	I	301[B]	HEM	C4A-C3A-C2A	-3.53	102.77	106.82
4	H	301[B]	HEM	CMC-C2C-C1C	3.53	130.94	124.73
4	H	301[A]	HEM	CMC-C2C-C1C	3.52	130.93	124.73
4	L	301	HEM	CHA-C4D-C3D	-3.52	118.74	125.23
4	I	301[A]	HEM	CBA-CAA-C2A	-3.49	102.90	112.53
4	L	301	HEM	C4A-C3A-C2A	-3.43	102.89	106.82
4	I	301[B]	HEM	C2C-C1C-NC	3.42	115.96	109.64
4	E	301[B]	HEM	C3A-C4A-NA	3.42	115.62	110.14
4	C	301[A]	HEM	CMD-C2D-C1D	3.41	130.37	125.03
4	E	301[B]	HEM	C4A-C3A-C2A	-3.38	102.94	106.82
4	K	301	HEM	C2C-C1C-NC	3.37	115.86	109.64
4	H	301[A]	HEM	C4A-C3A-C2A	-3.36	102.97	106.82
4	C	301[B]	HEM	C4A-C3A-C2A	-3.36	102.97	106.82
4	K	301	HEM	CMC-C2C-C1C	3.36	130.64	124.73
4	I	301[A]	HEM	C3A-C4A-NA	3.34	115.49	110.14
4	B	301[B]	HEM	CMB-C2B-C1B	3.33	130.24	125.03
4	I	301[A]	HEM	CMC-C2C-C1C	3.32	130.57	124.73
4	K	301	HEM	C3A-C4A-NA	3.31	115.45	110.14
4	H	301[B]	HEM	C2C-C1C-NC	3.29	115.72	109.64

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	E	301[B]	HEM	C2C-C1C-NC	3.28	115.70	109.64
4	B	301[B]	HEM	CMC-C2C-C1C	3.26	130.47	124.73
4	B	301[A]	HEM	C2C-C1C-NC	3.26	115.66	109.64
4	L	301	HEM	C3A-C4A-NA	3.25	115.36	110.14
4	K	301	HEM	C4A-C3A-C2A	-3.25	103.09	106.82
4	B	301[A]	HEM	CMB-C2B-C1B	3.24	130.09	125.03
4	E	301[A]	HEM	C2D-C1D-ND	3.21	113.62	109.90
4	I	301[B]	HEM	C3A-C4A-NA	3.19	115.26	110.14
4	C	301[B]	HEM	C2C-C1C-NC	3.18	115.51	109.64
4	K	301	HEM	CBD-CAD-C3D	-3.17	103.76	112.53
5	D	502	EPE	C7-N4-C5	3.17	119.69	111.24
4	B	301[A]	HEM	C3A-C4A-NA	3.14	115.18	110.14
4	H	301[B]	HEM	C2D-C1D-ND	3.07	113.45	109.90
4	B	301[A]	HEM	C4A-C3A-C2A	-3.06	103.31	106.82
4	E	301[A]	HEM	C2C-C1C-NC	3.06	115.30	109.64
4	I	301[A]	HEM	C2C-C1C-NC	3.04	115.25	109.64
4	B	301[B]	HEM	C2C-C1C-NC	3.02	115.23	109.64
4	C	301[B]	HEM	CHC-C1C-NC	-3.00	121.18	124.45
4	H	301[A]	HEM	CMD-C2D-C1D	2.99	129.71	125.03
4	B	301[B]	HEM	C2D-C1D-ND	2.99	113.36	109.90
4	B	301[A]	HEM	CAC-C3C-C4C	2.98	131.95	124.82
4	L	301	HEM	CMC-C2C-C1C	2.97	129.96	124.73
5	J	501	EPE	O2S-S-C10	2.95	111.19	106.73
4	B	301[A]	HEM	C1A-C2A-C3A	-2.95	102.31	106.87
4	C	301[A]	HEM	C2C-C1C-NC	2.93	115.06	109.64
4	L	301	HEM	C1A-C2A-C3A	-2.93	102.34	106.87
4	L	301	HEM	CHC-C1C-C2C	-2.92	119.40	125.49
4	E	301[B]	HEM	CMD-C2D-C1D	2.90	129.57	125.03
4	K	301	HEM	C1A-C2A-C3A	-2.90	102.38	106.87
4	H	301[A]	HEM	C1A-C2A-C3A	-2.88	102.41	106.87
4	I	301[B]	HEM	CMC-C2C-C1C	2.86	129.76	124.73
4	H	301[A]	HEM	CHB-C4A-C3A	-2.85	119.15	127.43
4	C	301[A]	HEM	CHB-C4A-C3A	-2.85	119.16	127.43
4	B	301[B]	HEM	CHC-C4B-NB	-2.84	121.37	124.42
4	C	301[B]	HEM	CHA-C4D-C3D	-2.84	120.00	125.23
4	E	301[B]	HEM	CBA-CAA-C2A	-2.82	104.73	112.53
4	H	301[B]	HEM	CHB-C1B-C2B	-2.82	118.94	126.95
4	C	301[B]	HEM	C3A-C4A-NA	2.80	114.63	110.14
4	B	301[B]	HEM	CHB-C4A-C3A	-2.79	119.33	127.43
4	H	301[A]	HEM	C2C-C1C-NC	2.79	114.79	109.64
4	K	301	HEM	CHA-C4D-C3D	-2.77	120.12	125.23
4	I	301[B]	HEM	C1A-C2A-C3A	-2.76	102.59	106.87

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	C	301[B]	HEM	CBB-CAB-C3B	-2.75	113.77	127.53
4	C	301[B]	HEM	C1A-C2A-C3A	-2.73	102.65	106.87
5	J	501	EPE	C7-N4-C5	2.72	118.50	111.24
4	E	301[A]	HEM	CHB-C4A-C3A	-2.71	119.56	127.43
4	H	301[A]	HEM	CHA-C4D-C3D	-2.69	120.27	125.23
4	C	301[A]	HEM	C2D-C1D-ND	2.68	113.00	109.90
4	E	301[A]	HEM	CBD-CAD-C3D	-2.68	105.13	112.53
4	E	301[B]	HEM	C1A-C2A-C3A	-2.65	102.76	106.87
4	L	301	HEM	CMD-C2D-C1D	2.64	129.16	125.03
4	H	301[B]	HEM	CMA-C3A-C4A	2.63	129.43	125.42
4	H	301[B]	HEM	CBA-CAA-C2A	-2.62	105.29	112.53
4	E	301[B]	HEM	CAD-C3D-C4D	2.62	129.26	124.70
4	C	301[B]	HEM	CHD-C4C-C3C	-2.61	120.81	125.21
4	I	301[A]	HEM	CHD-C4C-C3C	-2.60	120.83	125.21
4	B	301[B]	HEM	C1A-C2A-C3A	-2.59	102.86	106.87
4	H	301[B]	HEM	CHB-C4A-C3A	-2.56	119.98	127.43
4	C	301[A]	HEM	CHA-C4D-C3D	-2.56	120.51	125.23
4	E	301[A]	HEM	CAA-C2A-C1A	2.54	129.90	124.94
4	K	301	HEM	CMD-C2D-C1D	2.54	129.00	125.03
4	I	301[A]	HEM	CHA-C4D-C3D	-2.51	120.61	125.23
5	D	502	EPE	O3S-S-C10	2.50	110.90	106.00
4	H	301[A]	HEM	CHD-C4C-C3C	-2.49	121.00	125.21
5	D	502	EPE	C7-N4-C3	2.49	117.88	111.24
4	B	301[B]	HEM	CMA-C3A-C2A	2.49	130.90	125.62
4	E	301[A]	HEM	CHA-C4D-C3D	-2.48	120.66	125.23
4	E	301[A]	HEM	CBB-CAB-C3B	-2.47	115.16	127.53
4	B	301[B]	HEM	CMD-C2D-C1D	2.47	128.90	125.03
4	B	301[A]	HEM	C4C-C3C-C2C	-2.46	104.68	106.81
4	H	301[A]	HEM	C4C-C3C-C2C	-2.42	104.72	106.81
4	B	301[A]	HEM	CHA-C4D-C3D	-2.41	120.79	125.23
4	H	301[B]	HEM	CHA-C4D-C3D	-2.41	120.79	125.23
4	B	301[B]	HEM	CHA-C4D-C3D	-2.40	120.80	125.23
4	L	301	HEM	C2D-C1D-ND	2.40	112.67	109.90
4	C	301[B]	HEM	C4D-ND-C1D	-2.39	102.38	105.21
4	C	301[A]	HEM	CMA-C3A-C2A	2.37	130.65	125.62
4	E	301[B]	HEM	CHB-C4A-C3A	-2.37	120.55	127.43
4	I	301[B]	HEM	CBB-CAB-C3B	-2.36	115.73	127.53
4	E	301[A]	HEM	CHC-C1C-NC	-2.35	121.89	124.45
4	C	301[B]	HEM	C4B-C3B-C2B	2.35	109.44	107.28
4	I	301[A]	HEM	C1A-C2A-C3A	-2.35	103.23	106.87
4	K	301	HEM	CBB-CAB-C3B	-2.35	115.80	127.53
4	H	301[A]	HEM	CHC-C1C-NC	-2.35	121.90	124.45

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	E	301[B]	HEM	CBB-CAB-C3B	-2.34	115.82	127.53
4	I	301[A]	HEM	CMD-C2D-C1D	2.30	128.62	125.03
4	I	301[A]	HEM	CHB-C4A-C3A	-2.28	120.80	127.43
4	K	301	HEM	CAA-C2A-C1A	2.27	129.37	124.94
4	E	301[B]	HEM	CHD-C1D-C2D	-2.25	121.47	125.03
4	K	301	HEM	C4D-ND-C1D	-2.25	102.55	105.21
4	L	301	HEM	CHB-C4A-C3A	-2.24	120.91	127.43
4	E	301[A]	HEM	CMA-C3A-C4A	2.24	128.83	125.42
4	H	301[B]	HEM	CMB-C2B-C1B	2.23	128.52	125.03
4	H	301[A]	HEM	CBD-CAD-C3D	-2.23	106.37	112.53
4	I	301[B]	HEM	CHA-C4D-C3D	-2.23	121.12	125.23
4	I	301[B]	HEM	CHA-C1A-C2A	-2.23	120.42	125.30
4	B	301[A]	HEM	CHB-C4A-C3A	-2.23	120.97	127.43
4	C	301[A]	HEM	C1A-C2A-C3A	-2.22	103.43	106.87
4	E	301[A]	HEM	CMD-C2D-C1D	2.21	128.49	125.03
4	L	301	HEM	CBA-CAA-C2A	-2.21	106.43	112.53
4	C	301[A]	HEM	CBB-CAB-C3B	-2.19	116.58	127.53
4	H	301[B]	HEM	CHC-C1C-C2C	-2.19	120.94	125.49
4	L	301	HEM	CHA-C1A-C2A	-2.18	120.53	125.30
4	B	301[A]	HEM	CHD-C1D-C2D	-2.18	121.59	125.03
4	H	301[B]	HEM	CBB-CAB-C3B	-2.17	116.67	127.53
4	C	301[A]	HEM	CAD-C3D-C4D	2.16	128.46	124.70
4	H	301[B]	HEM	CHC-C4B-NB	-2.15	122.11	124.42
5	J	501	EPE	C7-N4-C3	2.15	116.97	111.24
4	C	301[B]	HEM	CHA-C1A-C2A	-2.14	120.61	125.30
4	H	301[B]	HEM	CMD-C2D-C1D	2.14	128.37	125.03
4	I	301[B]	HEM	CHA-C4D-ND	-2.12	121.74	124.37
4	K	301	HEM	CHC-C1C-NC	-2.12	122.14	124.45
4	C	301[A]	HEM	CAC-C3C-C4C	2.12	129.87	124.82
4	I	301[A]	HEM	CMA-C3A-C4A	2.10	128.62	125.42
4	E	301[B]	HEM	CHC-C1C-NC	-2.10	122.17	124.45
4	H	301[A]	HEM	CBB-CAB-C3B	-2.10	117.04	127.53
4	I	301[B]	HEM	CMA-C3A-C4A	2.09	128.60	125.42
4	H	301[B]	HEM	CMB-C2B-C3B	2.08	133.47	128.43
5	J	501	EPE	O2S-S-O1S	-2.08	107.06	113.82
4	B	301[B]	HEM	C4C-C3C-C2C	-2.08	105.01	106.81
4	H	301[B]	HEM	CAC-C3C-C4C	2.06	129.75	124.82
4	C	301[B]	HEM	CMA-C3A-C4A	2.06	128.56	125.42
4	K	301	HEM	CHB-C4A-C3A	-2.06	121.46	127.43
4	B	301[B]	HEM	C4D-C3D-C2D	-2.05	103.91	106.89
4	L	301	HEM	CBB-CAB-C3B	-2.04	117.31	127.53
4	L	301	HEM	CMA-C3A-C2A	2.03	129.94	125.62

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	D	502	EPE	O2S-S-C10	2.03	109.79	106.73
4	I	301[B]	HEM	CMD-C2D-C1D	2.03	128.20	125.03
4	I	301[A]	HEM	C4D-ND-C1D	-2.02	102.81	105.21
4	K	301	HEM	CHD-C4C-C3C	-2.02	121.81	125.21
4	I	301[B]	HEM	CHD-C4C-C3C	-2.01	121.81	125.21
4	L	301	HEM	CAC-C3C-C4C	2.00	129.60	124.82

There are no chirality outliers.

All (114) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	B	301[A]	HEM	C1A-C2A-CAA-CBA
4	B	301[A]	HEM	C2A-CAA-CBA-CGA
4	B	301[A]	HEM	C2D-C3D-CAD-CBD
4	B	301[B]	HEM	C1A-C2A-CAA-CBA
4	C	301[A]	HEM	C1A-C2A-CAA-CBA
4	C	301[A]	HEM	C3A-C2A-CAA-CBA
4	C	301[B]	HEM	C2A-CAA-CBA-CGA
4	C	301[B]	HEM	C2D-C3D-CAD-CBD
4	C	301[B]	HEM	C4D-C3D-CAD-CBD
4	E	301[A]	HEM	C2C-C3C-CAC-CBC
4	E	301[A]	HEM	C4C-C3C-CAC-CBC
4	E	301[B]	HEM	C2A-CAA-CBA-CGA
4	E	301[B]	HEM	C2C-C3C-CAC-CBC
4	E	301[B]	HEM	C4C-C3C-CAC-CBC
4	H	301[A]	HEM	C2B-C3B-CAB-CBB
4	H	301[A]	HEM	C4B-C3B-CAB-CBB
4	H	301[B]	HEM	C2D-C3D-CAD-CBD
4	H	301[B]	HEM	C4D-C3D-CAD-CBD
4	I	301[A]	HEM	C2D-C3D-CAD-CBD
4	I	301[B]	HEM	C2D-C3D-CAD-CBD
4	I	301[B]	HEM	C4D-C3D-CAD-CBD
4	K	301	HEM	C1A-C2A-CAA-CBA
5	D	502	EPE	C8-C7-N4-C5
5	J	501	EPE	C10-C9-N1-C6
5	J	501	EPE	C8-C7-N4-C5
5	J	501	EPE	C9-C10-S-O2S
5	D	502	EPE	N4-C7-C8-O8
4	B	301[B]	HEM	C4D-C3D-CAD-CBD
4	I	301[A]	HEM	C4D-C3D-CAD-CBD
4	B	301[B]	HEM	C3D-CAD-CBD-CGD
4	C	301[A]	HEM	C3D-CAD-CBD-CGD

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Mol	Chain	Res	Type	Atoms
4	E	301[A]	HEM	C3D-CAD-CBD-CGD
4	H	301[A]	HEM	C3D-CAD-CBD-CGD
4	H	301[B]	HEM	C2A-CAA-CBA-CGA
4	I	301[A]	HEM	C3D-CAD-CBD-CGD
4	I	301[B]	HEM	C2A-CAA-CBA-CGA
4	K	301	HEM	C3D-CAD-CBD-CGD
4	L	301	HEM	C2A-CAA-CBA-CGA
4	L	301	HEM	C3D-CAD-CBD-CGD
4	B	301[A]	HEM	C4D-C3D-CAD-CBD
4	C	301[A]	HEM	C4D-C3D-CAD-CBD
4	B	301[A]	HEM	C3A-C2A-CAA-CBA
4	B	301[B]	HEM	C3A-C2A-CAA-CBA
4	K	301	HEM	C3A-C2A-CAA-CBA
5	J	501	EPE	C9-C10-S-O3S
4	B	301[B]	HEM	C2D-C3D-CAD-CBD
4	C	301[A]	HEM	C2D-C3D-CAD-CBD
4	B	301[A]	HEM	C3D-CAD-CBD-CGD
4	C	301[A]	HEM	C2A-CAA-CBA-CGA
4	C	301[B]	HEM	C3D-CAD-CBD-CGD
4	I	301[B]	HEM	C3D-CAD-CBD-CGD
4	H	301[B]	HEM	C1A-C2A-CAA-CBA
4	E	301[A]	HEM	C2A-CAA-CBA-CGA
4	B	301[A]	HEM	C2B-C3B-CAB-CBB
4	I	301[B]	HEM	C3A-C2A-CAA-CBA
4	K	301	HEM	C4D-C3D-CAD-CBD
5	J	501	EPE	C10-C9-N1-C2
4	B	301[B]	HEM	C2A-CAA-CBA-CGA
4	E	301[B]	HEM	C3D-CAD-CBD-CGD
4	K	301	HEM	C2A-CAA-CBA-CGA
4	C	301[B]	HEM	C3A-C2A-CAA-CBA
5	J	501	EPE	C9-C10-S-O1S
4	B	301[B]	HEM	C2C-C3C-CAC-CBC
4	I	301[A]	HEM	C2B-C3B-CAB-CBB
4	B	301[A]	HEM	C4C-C3C-CAC-CBC
4	B	301[B]	HEM	C4C-C3C-CAC-CBC
4	I	301[A]	HEM	C4B-C3B-CAB-CBB
4	K	301	HEM	C2D-C3D-CAD-CBD
4	C	301[A]	HEM	C2C-C3C-CAC-CBC
4	I	301[B]	HEM	C1A-C2A-CAA-CBA
4	B	301[A]	HEM	C4B-C3B-CAB-CBB
4	C	301[A]	HEM	C4C-C3C-CAC-CBC
4	B	301[B]	HEM	CAD-CBD-CGD-O1D

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Mol	Chain	Res	Type	Atoms
4	H	301[B]	HEM	CAD-CBD-CGD-O2D
4	I	301[A]	HEM	CAD-CBD-CGD-O2D
4	H	301[A]	HEM	C2D-C3D-CAD-CBD
4	C	301[B]	HEM	CAA-CBA-CGA-O2A
4	I	301[B]	HEM	CAA-CBA-CGA-O1A
4	B	301[A]	HEM	CAA-CBA-CGA-O1A
4	I	301[A]	HEM	CAD-CBD-CGD-O1D
4	I	301[A]	HEM	CAA-CBA-CGA-O1A
4	I	301[B]	HEM	CAA-CBA-CGA-O2A
4	I	301[B]	HEM	CAD-CBD-CGD-O2D
4	C	301[B]	HEM	CAA-CBA-CGA-O1A
4	I	301[A]	HEM	CAA-CBA-CGA-O2A
4	B	301[A]	HEM	CAD-CBD-CGD-O1D
4	H	301[B]	HEM	CAD-CBD-CGD-O1D
4	B	301[A]	HEM	CAA-CBA-CGA-O2A
4	I	301[B]	HEM	CAD-CBD-CGD-O1D
4	B	301[B]	HEM	CAD-CBD-CGD-O2D
4	L	301	HEM	C2D-C3D-CAD-CBD
4	B	301[A]	HEM	CAD-CBD-CGD-O2D
4	L	301	HEM	C2B-C3B-CAB-CBB
4	B	301[B]	HEM	CAA-CBA-CGA-O2A
4	E	301[A]	HEM	C2D-C3D-CAD-CBD
4	C	301[B]	HEM	CAD-CBD-CGD-O2D
4	I	301[B]	HEM	C4B-C3B-CAB-CBB
4	C	301[A]	HEM	CAA-CBA-CGA-O1A
4	B	301[B]	HEM	CAA-CBA-CGA-O1A
4	C	301[A]	HEM	CAA-CBA-CGA-O2A
4	C	301[B]	HEM	CAD-CBD-CGD-O1D
5	D	502	EPE	C8-C7-N4-C3
4	H	301[B]	HEM	C3A-C2A-CAA-CBA
4	C	301[A]	HEM	CAD-CBD-CGD-O2D
4	K	301	HEM	CAD-CBD-CGD-O2D
4	C	301[B]	HEM	C1A-C2A-CAA-CBA
4	E	301[A]	HEM	CAD-CBD-CGD-O2D
4	C	301[A]	HEM	CAD-CBD-CGD-O1D
4	E	301[B]	HEM	CAA-CBA-CGA-O2A
4	K	301	HEM	CAD-CBD-CGD-O1D
4	H	301[A]	HEM	CAA-CBA-CGA-O2A
4	H	301[A]	HEM	CAA-CBA-CGA-O1A
4	E	301[A]	HEM	CAD-CBD-CGD-O1D
4	E	301[B]	HEM	CAA-CBA-CGA-O1A

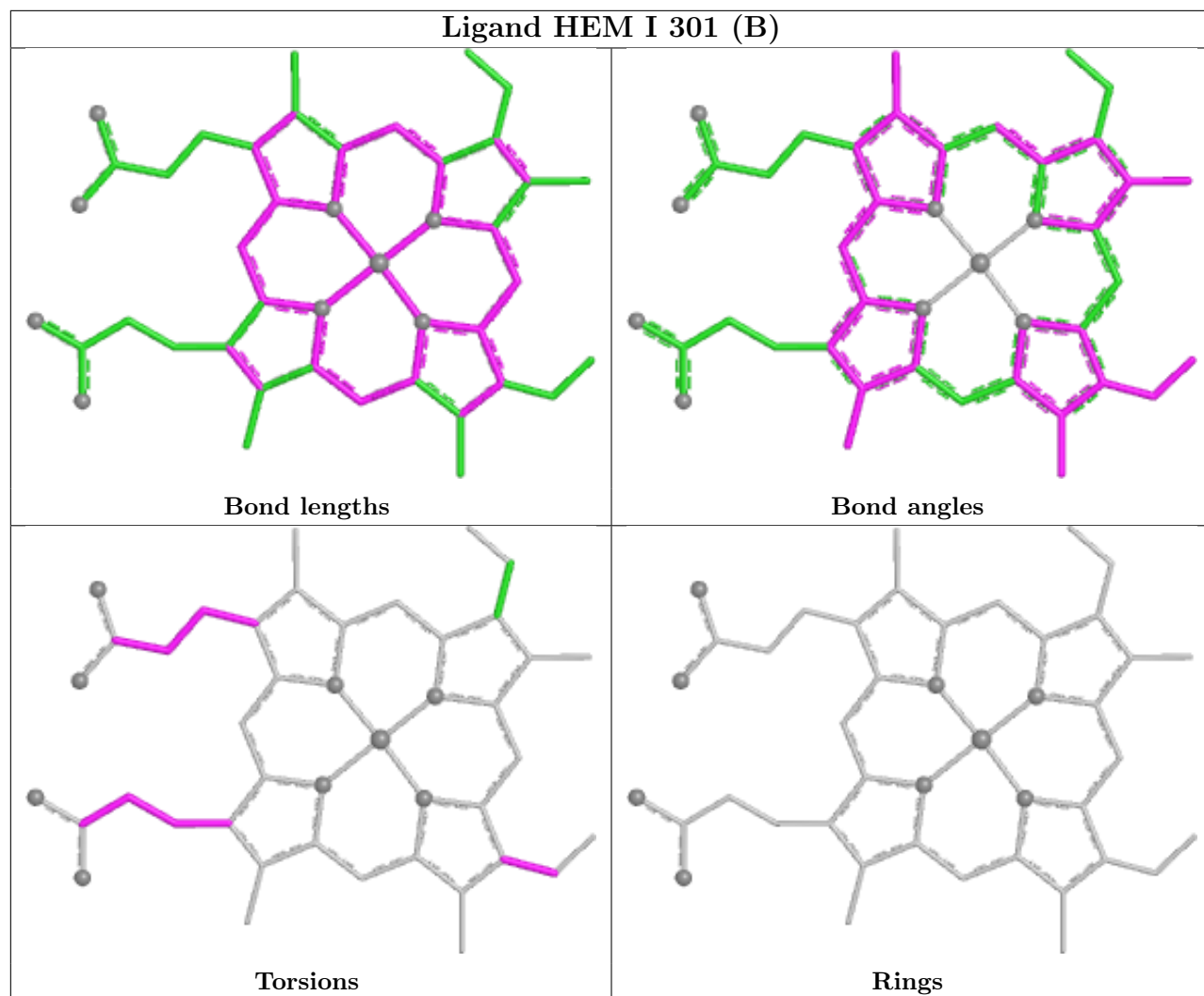
There are no ring outliers.

12 monomers are involved in 64 short contacts:

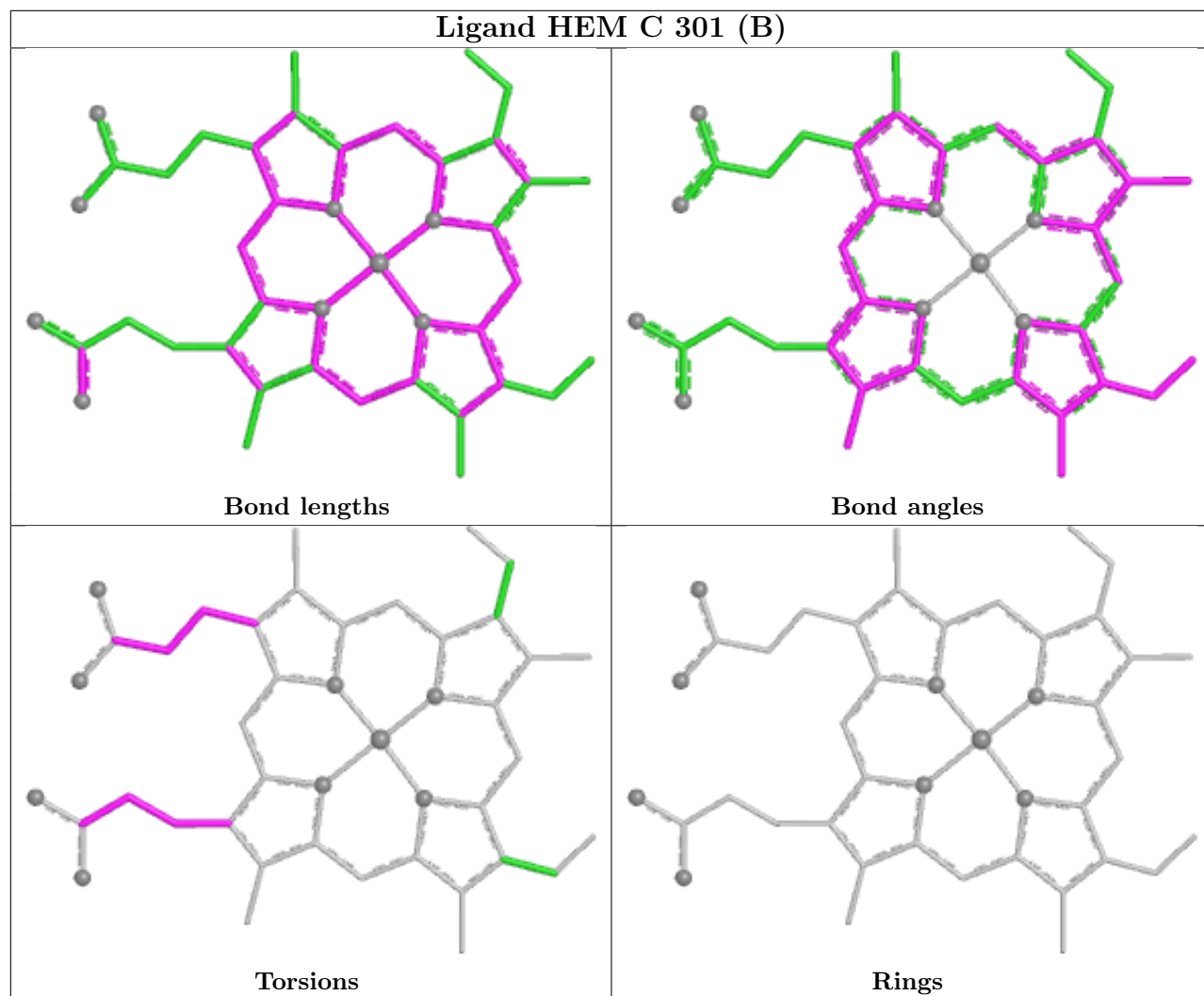
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	I	301[B]	HEM	2	0
4	C	301[B]	HEM	7	0
4	E	301[B]	HEM	7	0
4	B	301[A]	HEM	11	0
4	I	301[A]	HEM	2	0
4	C	301[A]	HEM	7	0
4	H	301[B]	HEM	5	0
4	E	301[A]	HEM	5	0
4	H	301[A]	HEM	4	0
4	L	301	HEM	1	0
4	K	301	HEM	4	0
4	B	301[B]	HEM	9	0

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 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.

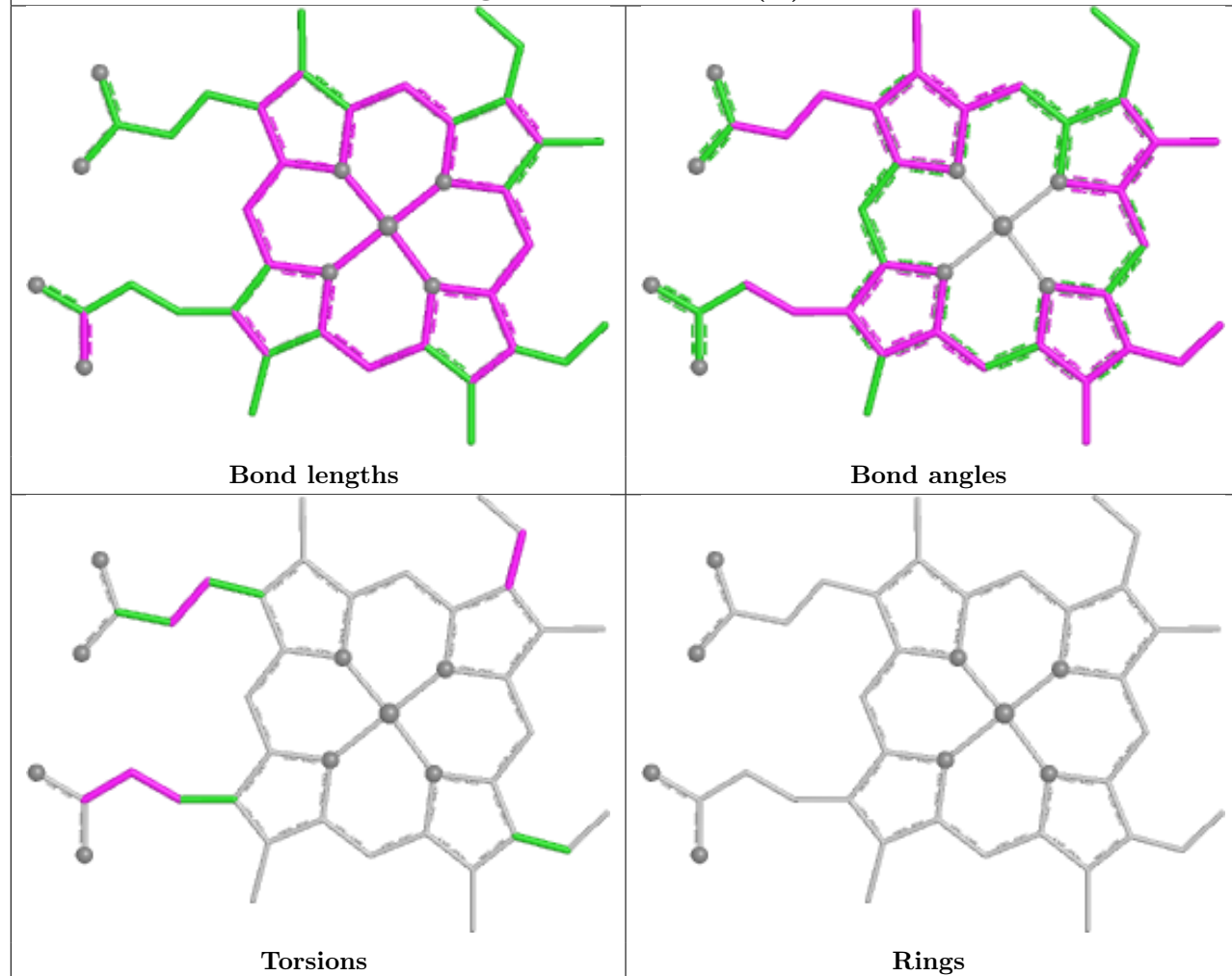
Ligand HEM I 301 (B)



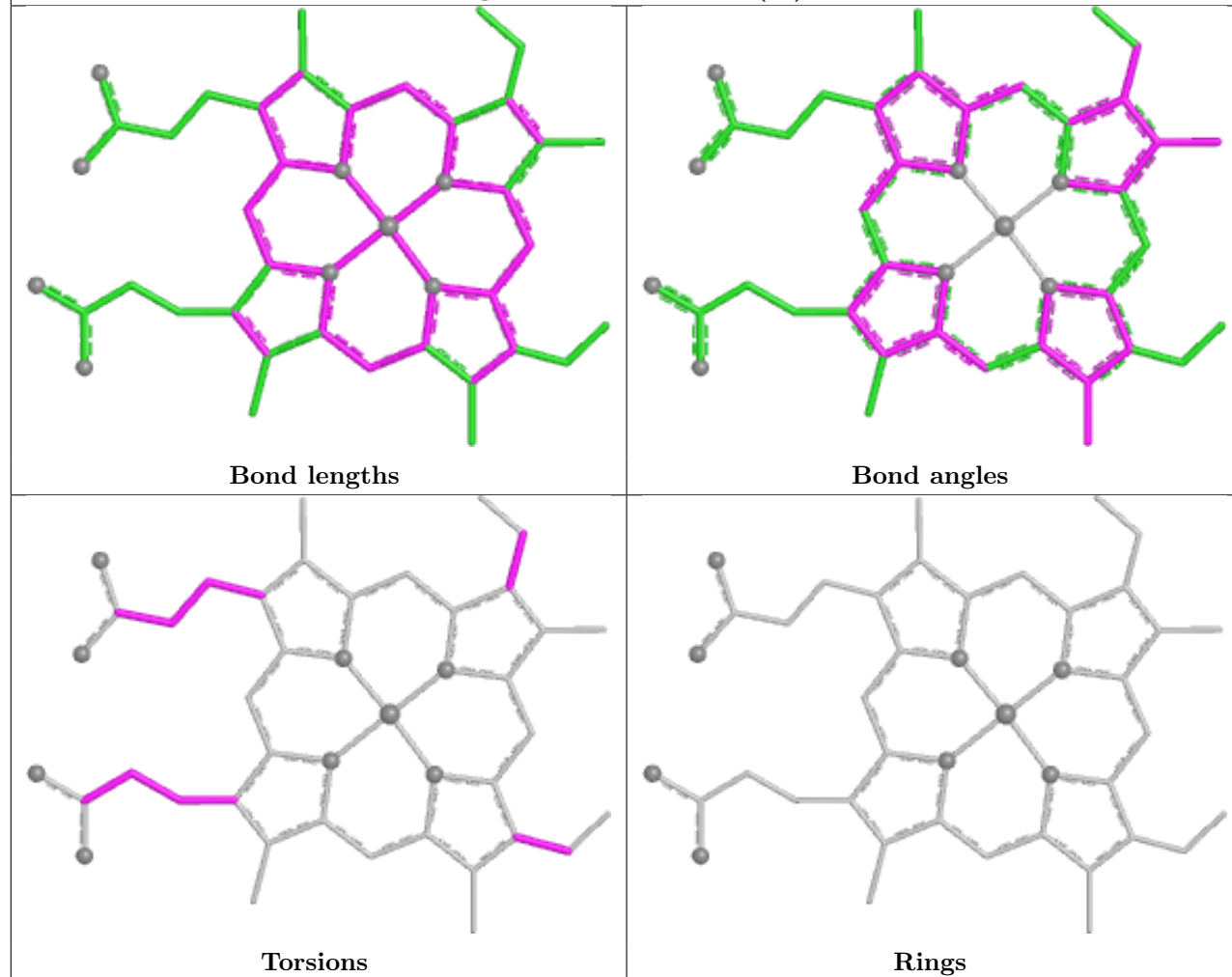
Ligand HEM C 301 (B)



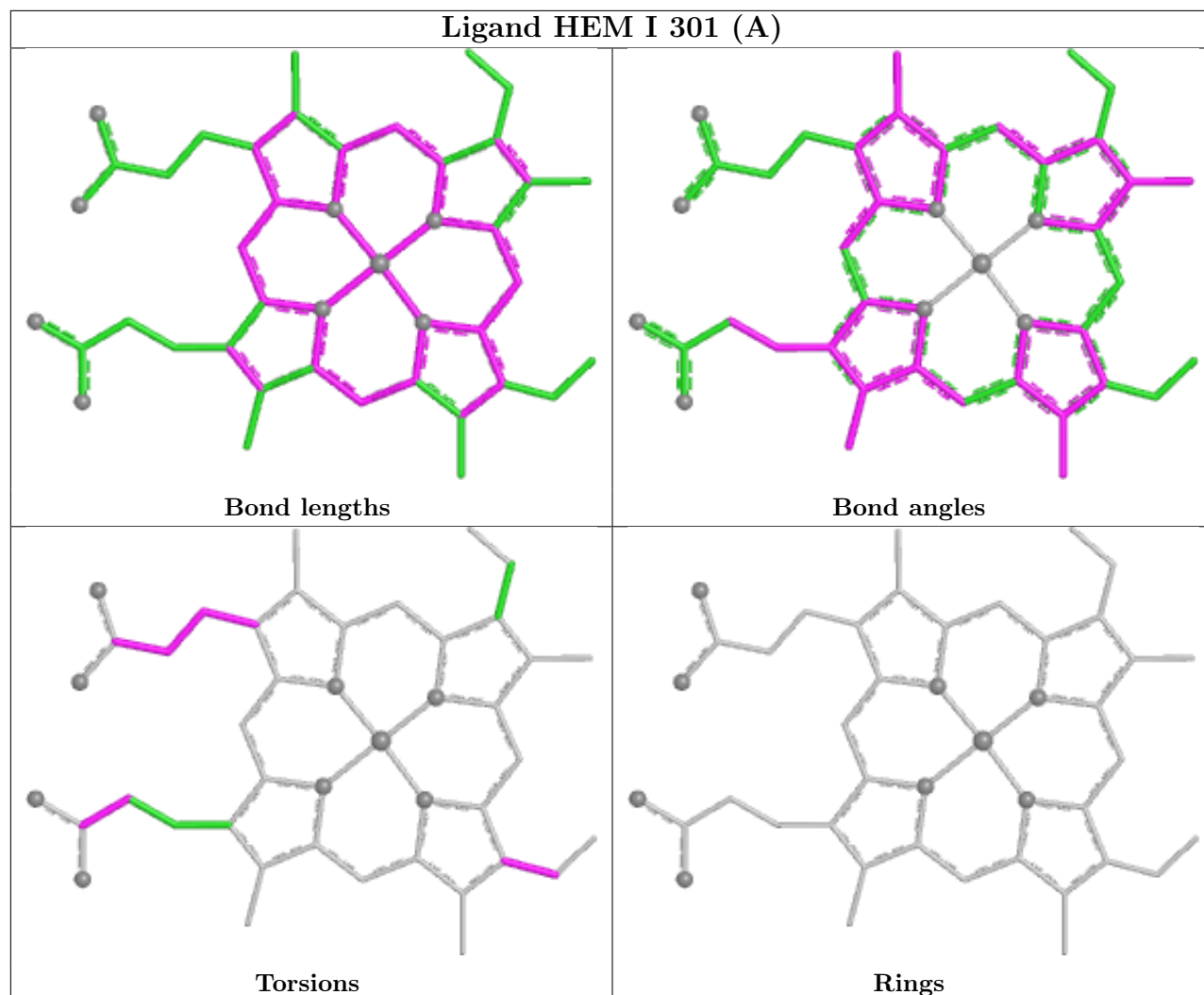
Ligand HEM E 301 (B)



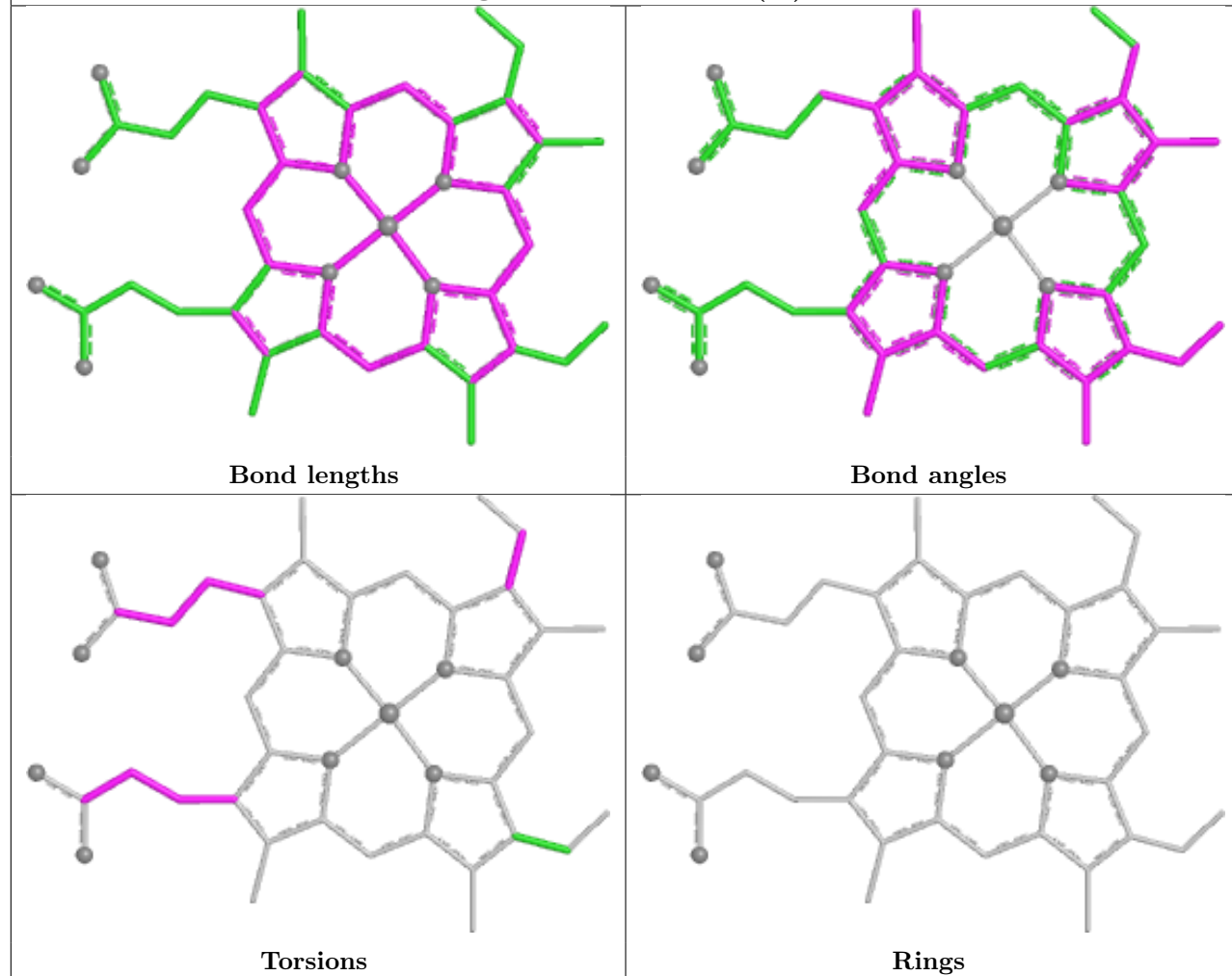
Ligand HEM B 301 (A)



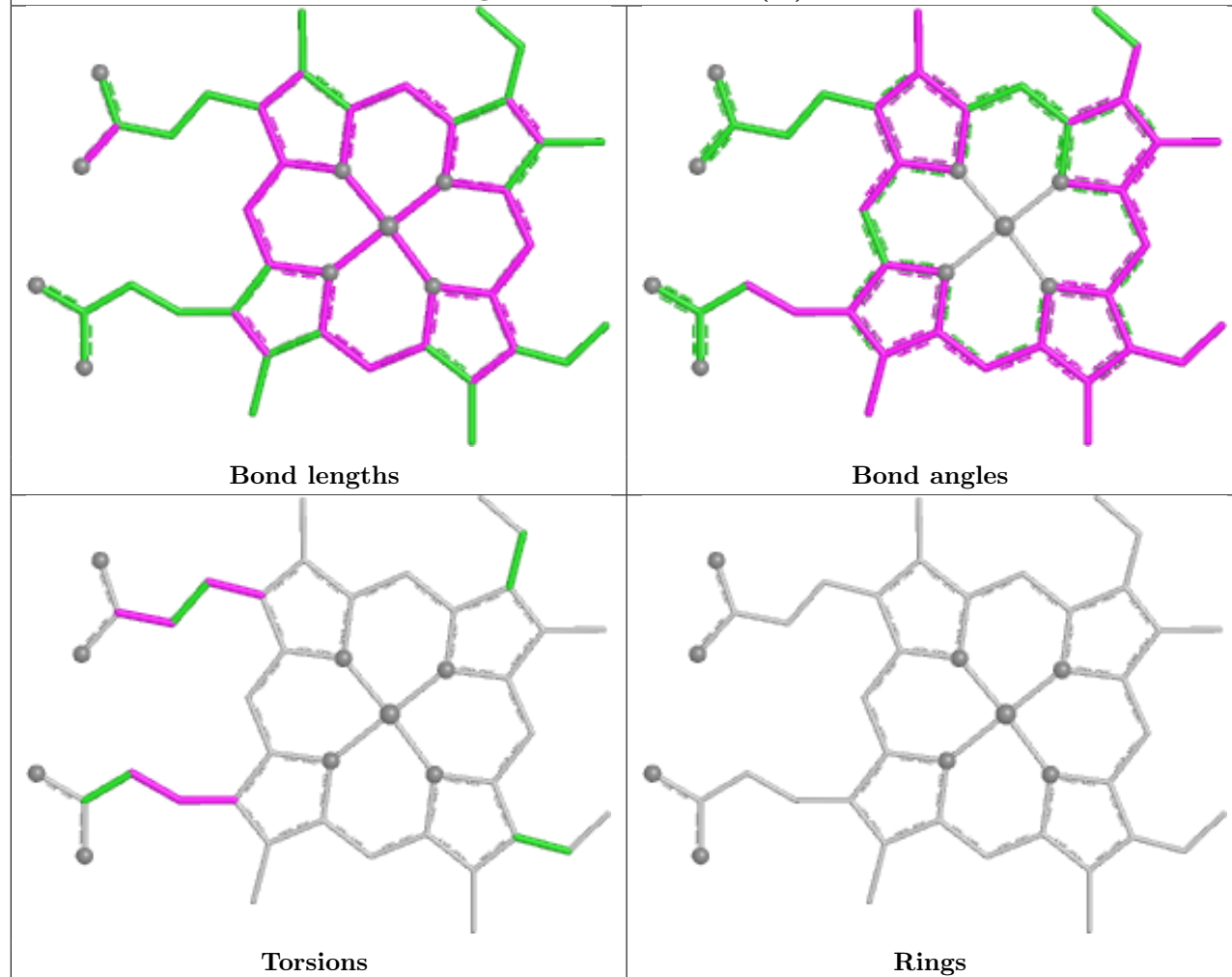
Ligand HEM I 301 (A)



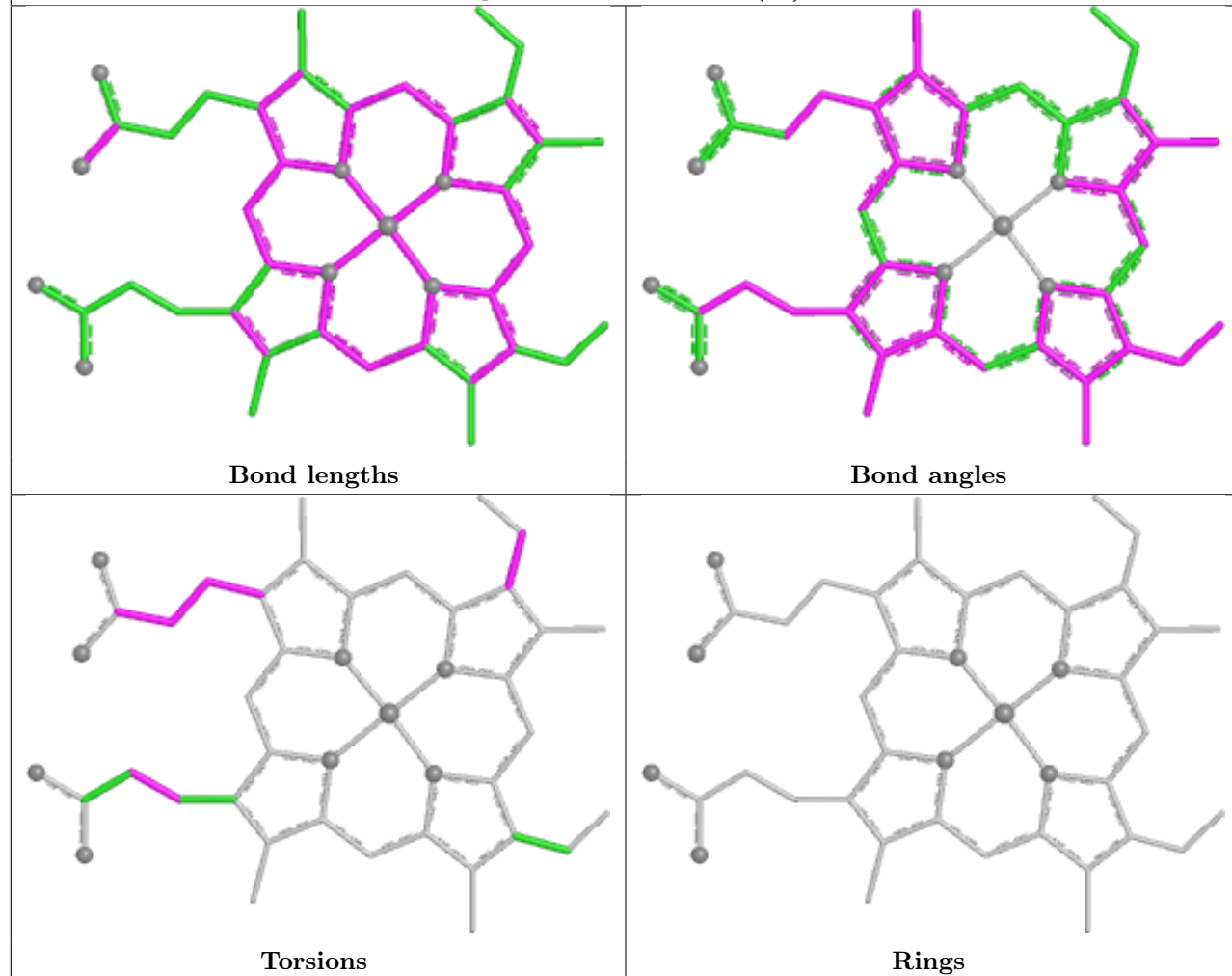
Ligand HEM C 301 (A)

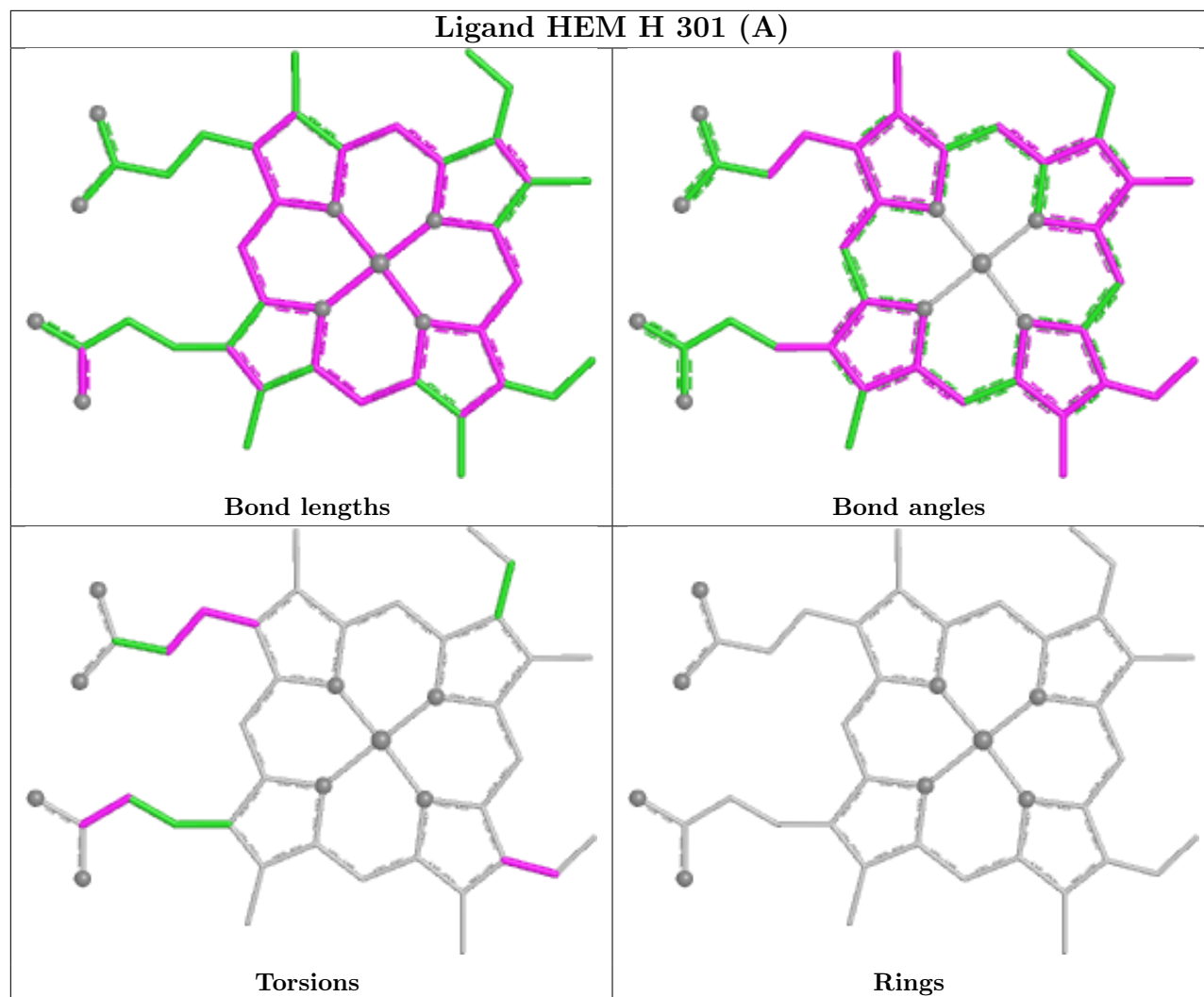


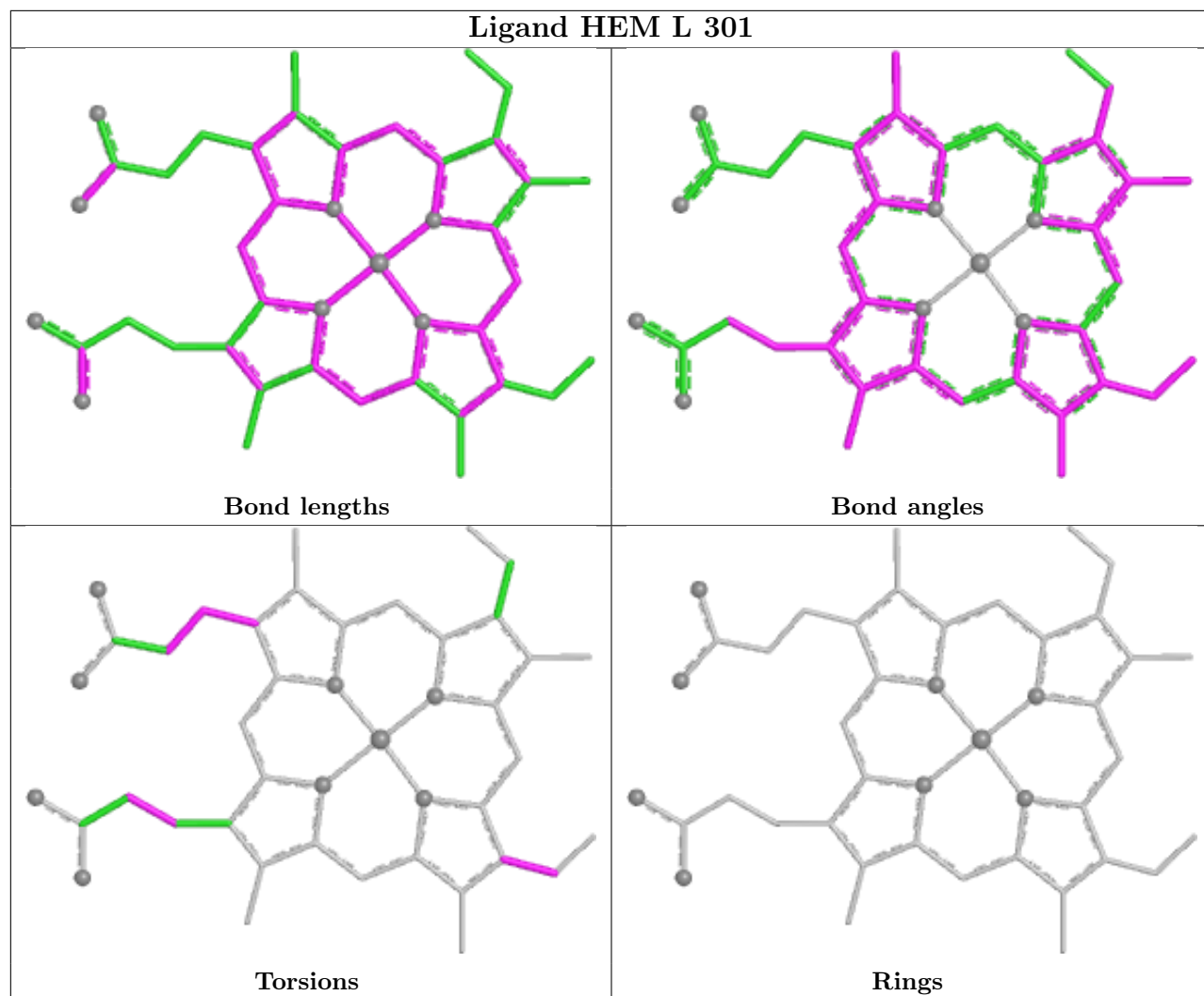
Ligand HEM H 301 (B)

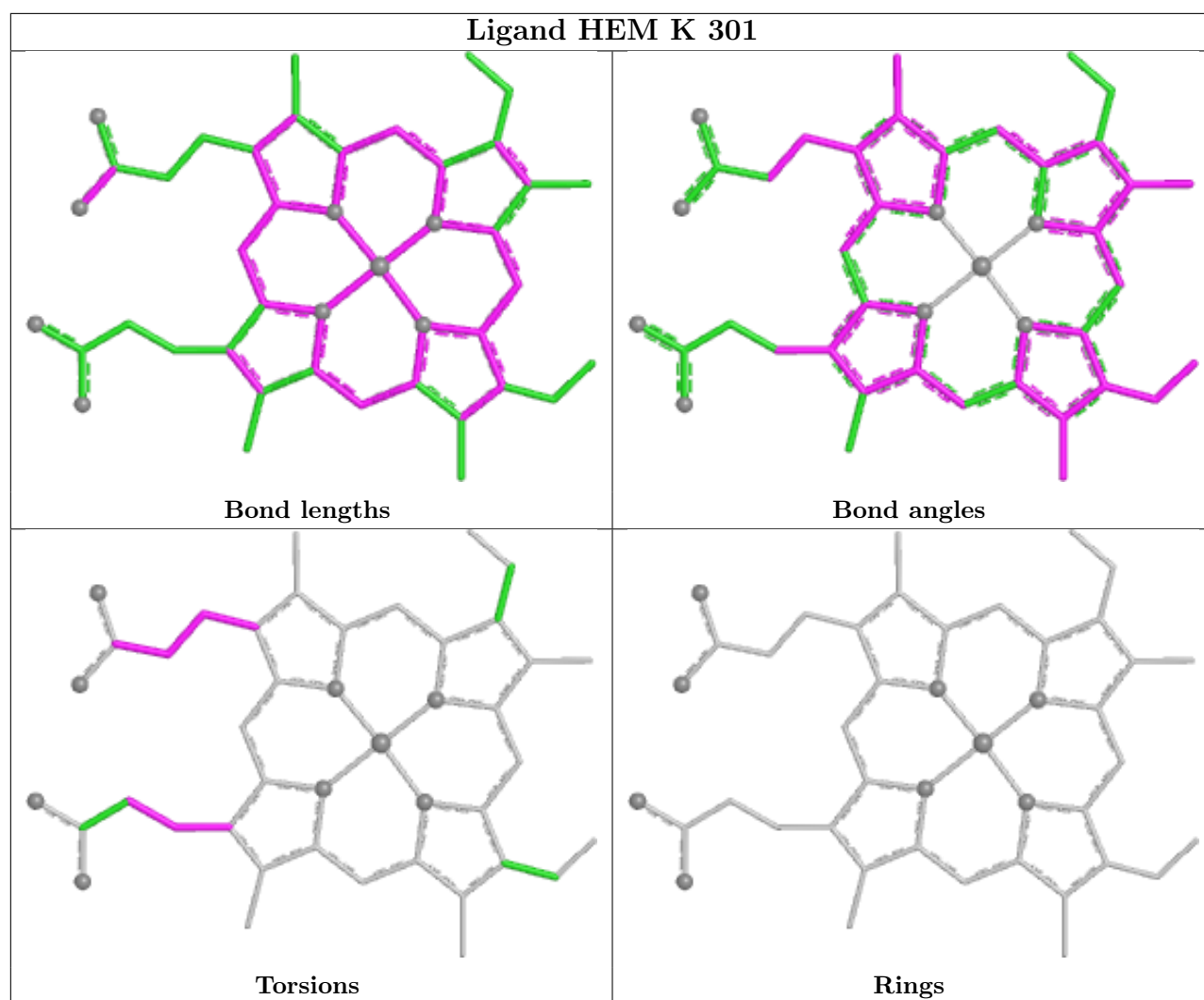


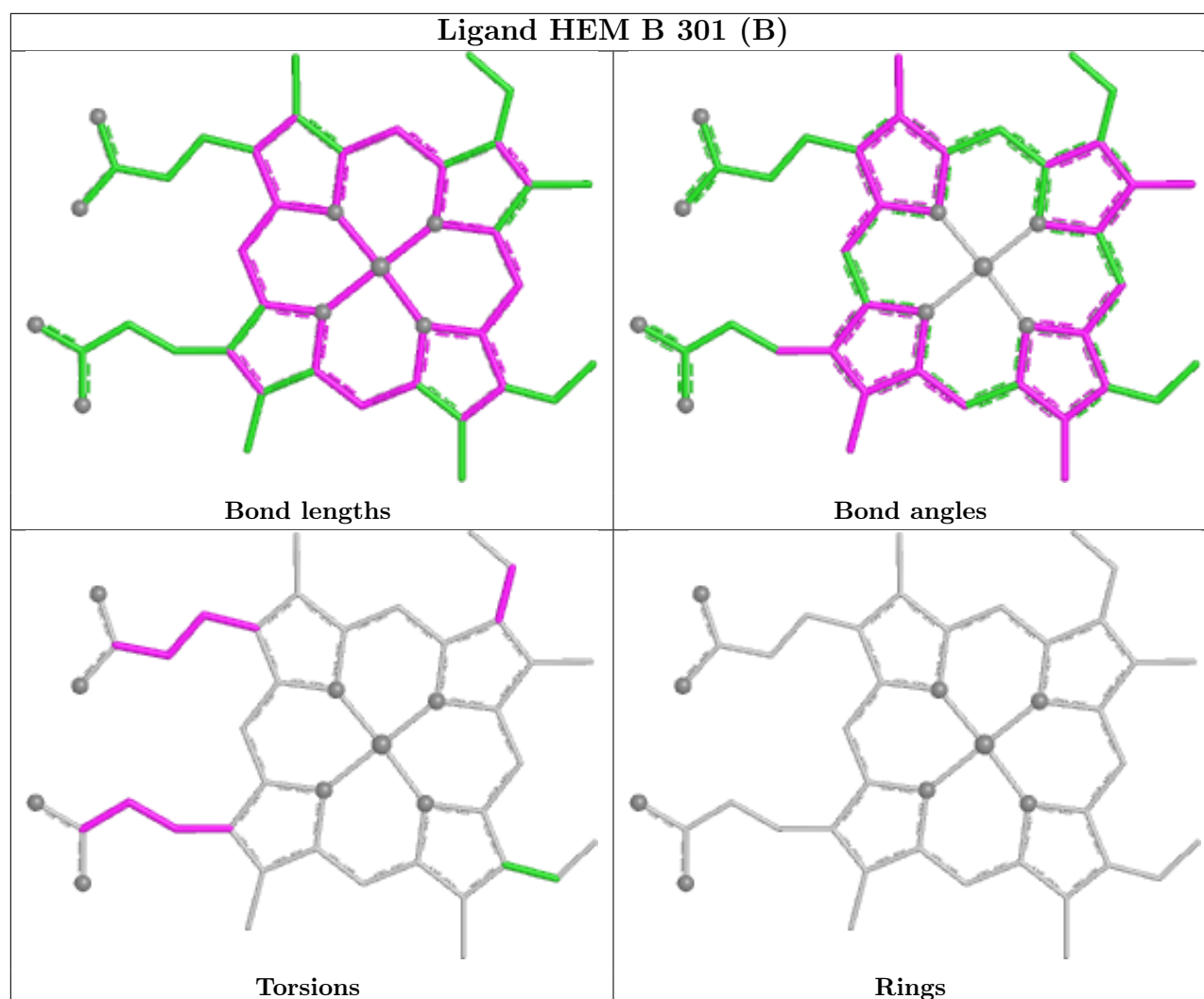
Ligand HEM E 301 (A)











5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	161/161 (100%)	-0.05	2 (1%) 76 75	28, 45, 53, 63	11 (6%)
1	B	161/161 (100%)	0.07	5 (3%) 51 48	30, 45, 54, 62	9 (5%)
1	C	161/161 (100%)	0.14	2 (1%) 76 75	33, 45, 53, 63	9 (5%)
1	D	161/161 (100%)	0.09	3 (1%) 66 63	35, 45, 53, 62	11 (6%)
1	E	161/161 (100%)	0.28	2 (1%) 76 75	34, 45, 53, 63	12 (7%)
1	F	161/161 (100%)	0.26	1 (0%) 85 85	33, 45, 53, 62	12 (7%)
1	G	161/161 (100%)	0.03	0 100 100	30, 45, 53, 65	10 (6%)
1	H	161/161 (100%)	0.10	2 (1%) 76 75	35, 45, 53, 63	15 (9%)
1	I	161/161 (100%)	0.00	0 100 100	36, 45, 53, 63	9 (5%)
1	J	161/161 (100%)	0.09	3 (1%) 66 63	35, 45, 53, 65	10 (6%)
1	K	161/161 (100%)	0.00	1 (0%) 85 85	35, 45, 54, 63	10 (6%)
1	L	161/161 (100%)	0.22	2 (1%) 76 75	36, 45, 53, 63	11 (6%)
All	All	1932/1932 (100%)	0.10	23 (1%) 76 75	28, 45, 54, 65	129 (6%)

All (23) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	H	122	GLN	3.2
1	D	80	GLY	2.8
1	J	95	TYR	2.6
1	L	35	TRP	2.6
1	C	143	LYS	2.5
1	J	81	GLN	2.5
1	A	161	ALA	2.4
1	F	142	ASP	2.4
1	D	96	GLU	2.4
1	B	13[A]	GLU	2.4
1	D	81	GLN	2.3

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Mol	Chain	Res	Type	RSRZ
1	B	118	ARG	2.2
1	H	161	ALA	2.2
1	A	160	SER	2.2
1	B	161	ALA	2.1
1	C	161	ALA	2.1
1	J	161	ALA	2.1
1	K	119	LEU	2.1
1	E	161	ALA	2.1
1	B	155	SER	2.0
1	L	34	ASN	2.0
1	E	50	GLU	2.0
1	B	46	ALA	2.0

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

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides 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(Å ²)	Q<0.9
3	MG	E	401	1/1	0.81	0.25	60,60,60,60	0
3	MG	B	402	1/1	0.83	0.20	50,50,50,50	0
3	MG	J	401	1/1	0.84	0.19	57,57,57,57	0
3	MG	A	401	1/1	0.85	0.32	51,51,51,51	0
3	MG	L	401	1/1	0.88	0.18	50,50,50,50	0
3	MG	C	401	1/1	0.89	0.28	57,57,57,57	0
3	MG	H	401	1/1	0.89	0.16	47,47,47,47	0
3	MG	I	401	1/1	0.90	0.23	51,51,51,51	0
5	EPE	D	502	15/15	0.90	0.16	49,55,66,67	15
4	HEM	B	301[A]	43/43	0.91	0.15	40,43,57,61	43
4	HEM	B	301[B]	43/43	0.91	0.15	48,49,59,62	43

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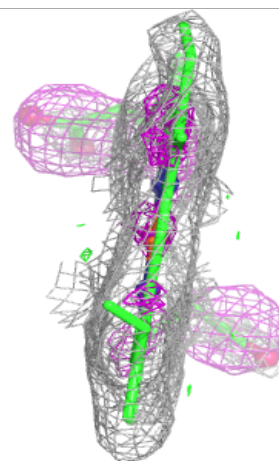
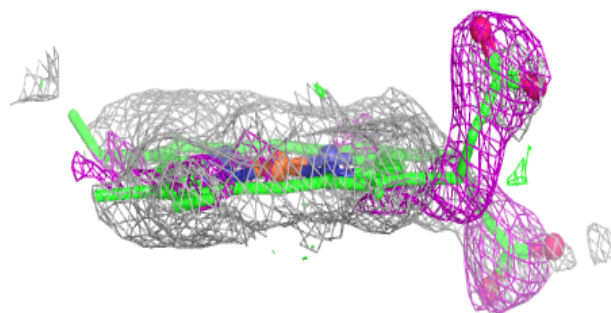
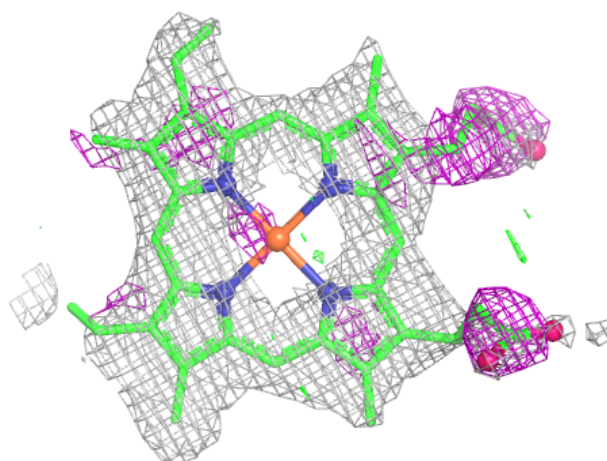
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
4	HEM	E	301[A]	43/43	0.91	0.16	47,49,58,60	43
4	HEM	E	301[B]	43/43	0.91	0.16	45,48,55,57	43
4	HEM	H	301[A]	43/43	0.91	0.16	30,32,44,46	43
4	HEM	H	301[B]	43/43	0.91	0.16	50,51,59,63	43
3	MG	B	401	1/1	0.91	0.32	58,58,58,58	0
5	EPE	J	501	15/15	0.91	0.16	57,61,71,73	15
3	MG	K	401	1/1	0.92	0.09	40,40,40,40	0
4	HEM	C	301[A]	43/43	0.92	0.15	41,45,56,59	43
4	HEM	C	301[B]	43/43	0.92	0.15	40,42,55,58	43
4	HEM	K	301	43/43	0.93	0.14	46,46,55,56	43
4	HEM	I	301[A]	43/43	0.93	0.14	40,44,53,59	43
4	HEM	I	301[B]	43/43	0.93	0.14	56,57,64,70	43
4	HEM	L	301	43/43	0.94	0.13	52,54,57,60	43
3	MG	F	401	1/1	0.95	0.22	46,46,46,46	0
3	MG	C	402	1/1	0.95	0.16	55,55,55,55	0
2	ZN	L	201	1/1	0.99	0.09	43,43,43,43	0
2	ZN	L	202	1/1	0.99	0.11	65,65,65,65	0
2	ZN	A	201	1/1	0.99	0.10	39,39,39,39	0
2	ZN	B	201	1/1	0.99	0.09	41,41,41,41	0
2	ZN	C	202	1/1	0.99	0.12	49,49,49,49	0
2	ZN	D	202	1/1	0.99	0.13	48,48,48,48	0
2	ZN	F	202	1/1	0.99	0.10	60,60,60,60	0
2	ZN	I	201	1/1	1.00	0.09	44,44,44,44	0
2	ZN	I	202	1/1	1.00	0.13	53,53,53,53	0
2	ZN	J	201	1/1	1.00	0.09	41,41,41,41	0
2	ZN	J	202	1/1	1.00	0.10	48,48,48,48	0
2	ZN	K	201	1/1	1.00	0.10	43,43,43,43	0
2	ZN	K	202	1/1	1.00	0.11	55,55,55,55	0
2	ZN	A	202	1/1	1.00	0.13	53,53,53,53	0
2	ZN	D	201	1/1	1.00	0.10	39,39,39,39	0
2	ZN	B	202	1/1	1.00	0.10	53,53,53,53	0
2	ZN	E	201	1/1	1.00	0.13	44,44,44,44	0
2	ZN	E	202	1/1	1.00	0.12	55,55,55,55	0
2	ZN	F	201	1/1	1.00	0.08	48,48,48,48	0
2	ZN	C	201	1/1	1.00	0.10	44,44,44,44	0
2	ZN	G	201	1/1	1.00	0.09	37,37,37,37	0
2	ZN	G	202	1/1	1.00	0.10	49,49,49,49	0
2	ZN	H	201	1/1	1.00	0.08	43,43,43,43	0
2	ZN	H	202	1/1	1.00	0.10	52,52,52,52	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.

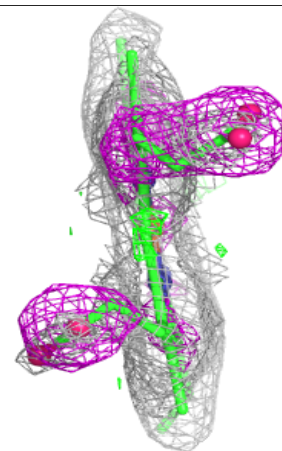
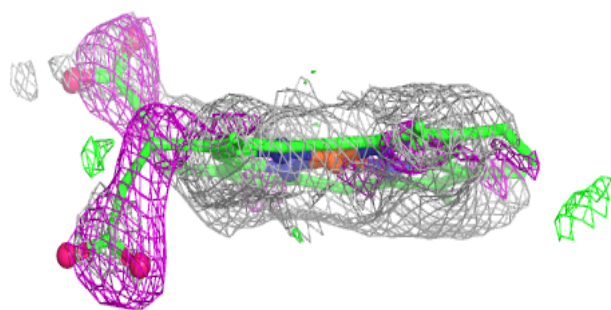
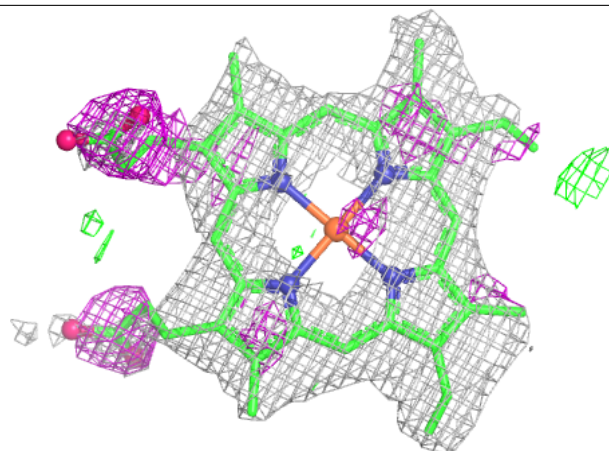
Electron density around HEM B 301 (A):

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



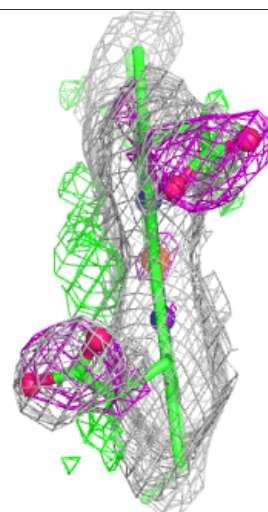
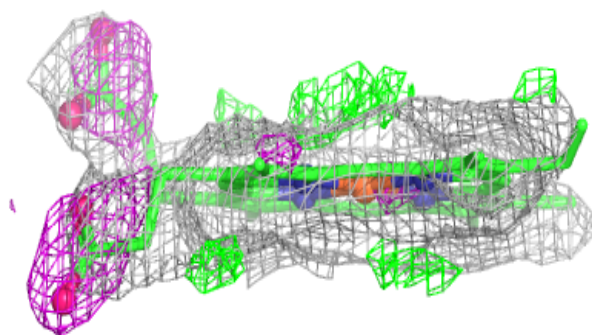
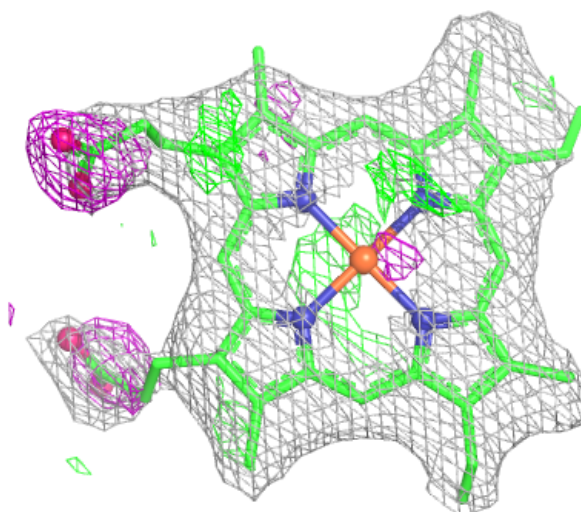
Electron density around HEM B 301 (B):

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



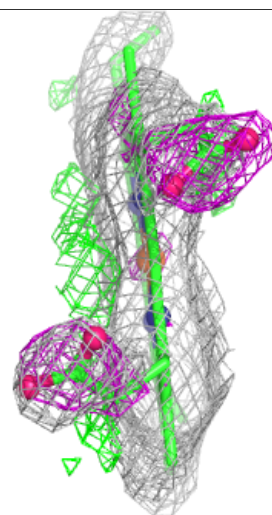
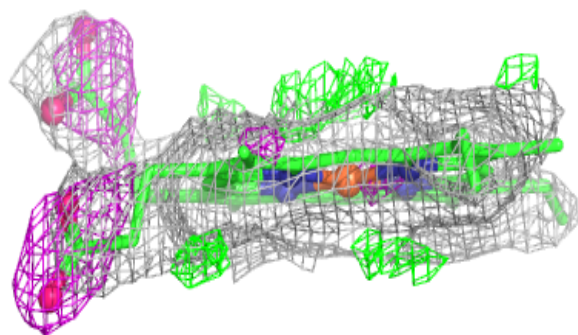
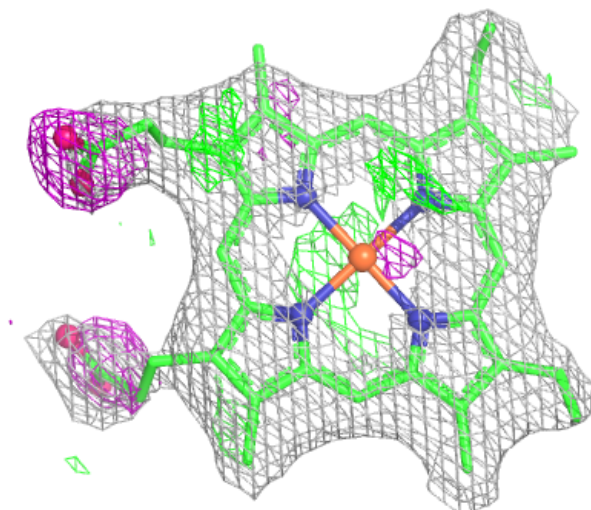
Electron density around HEM E 301 (A):

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



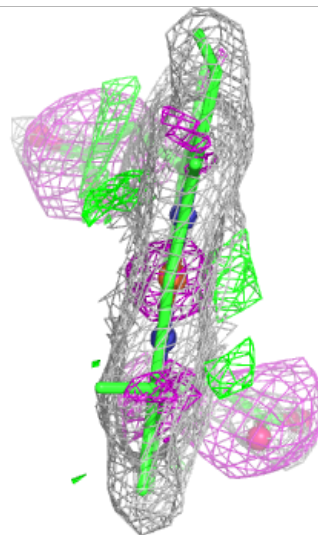
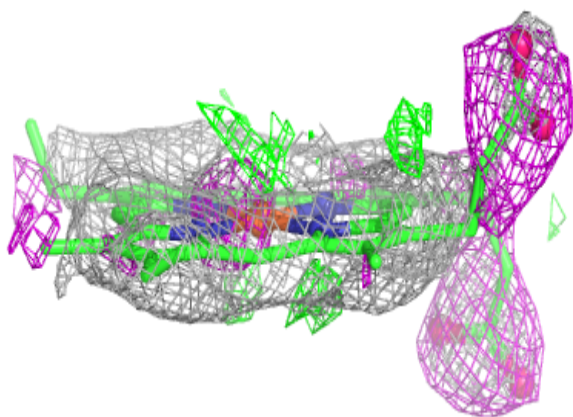
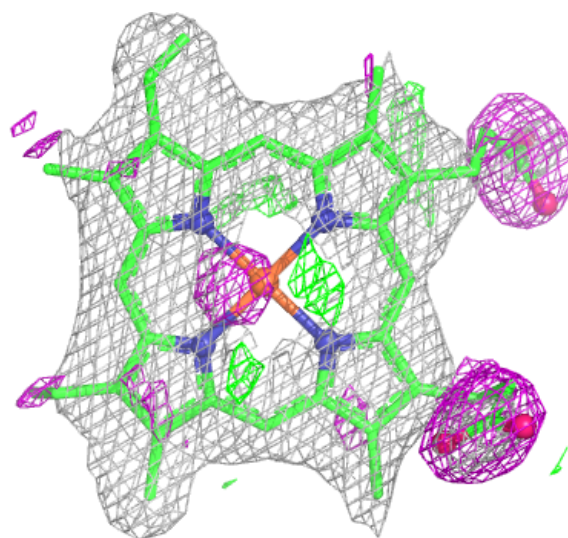
Electron density around HEM E 301 (B):

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and green (positive)



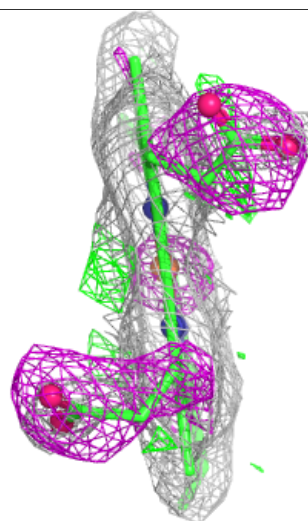
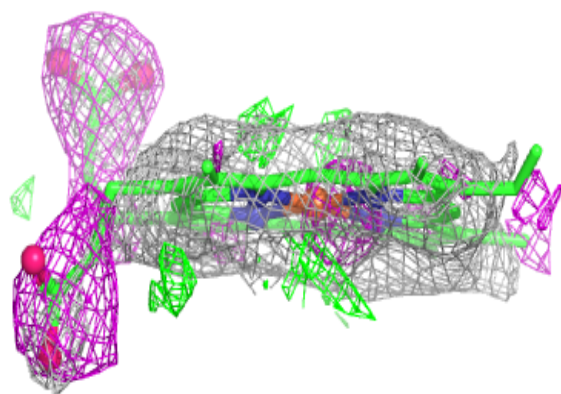
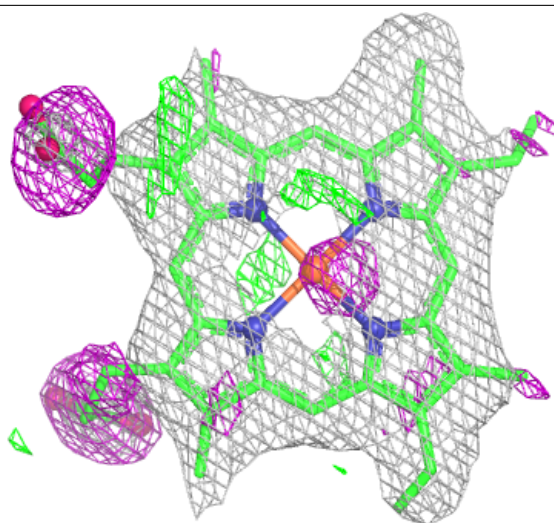
Electron density around HEM H 301 (A):

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



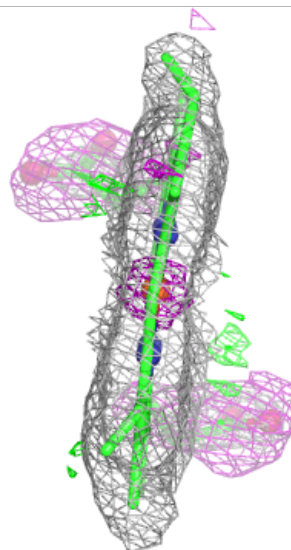
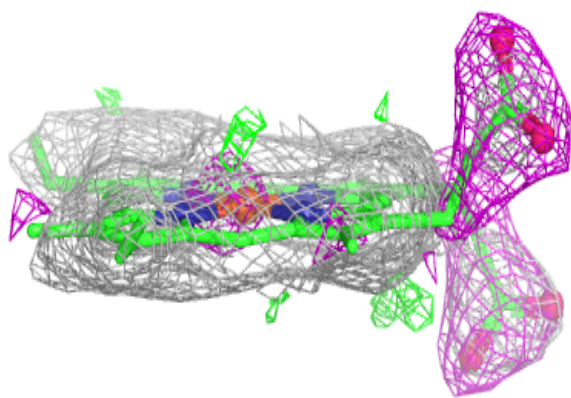
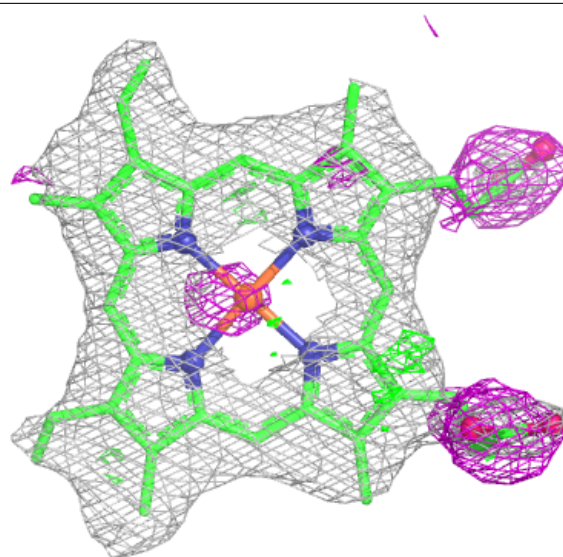
Electron density around HEM H 301 (B):

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



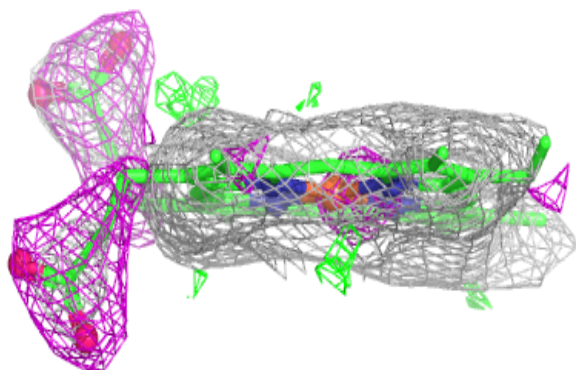
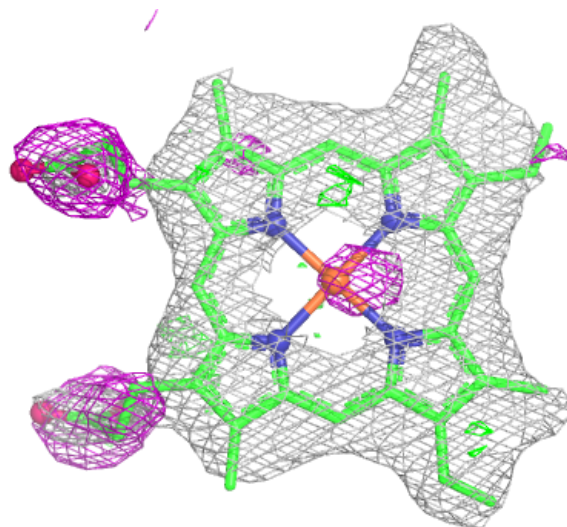
Electron density around HEM C 301 (A):

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



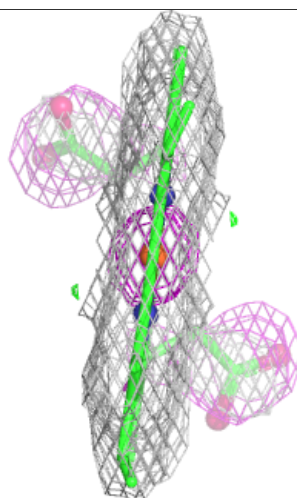
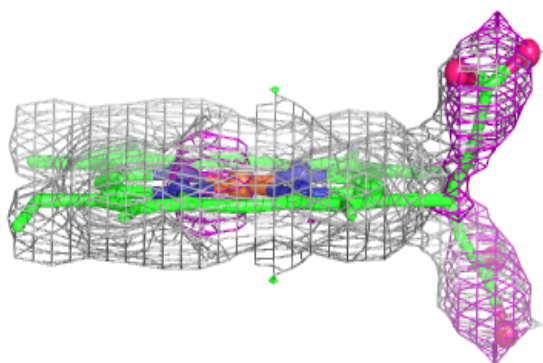
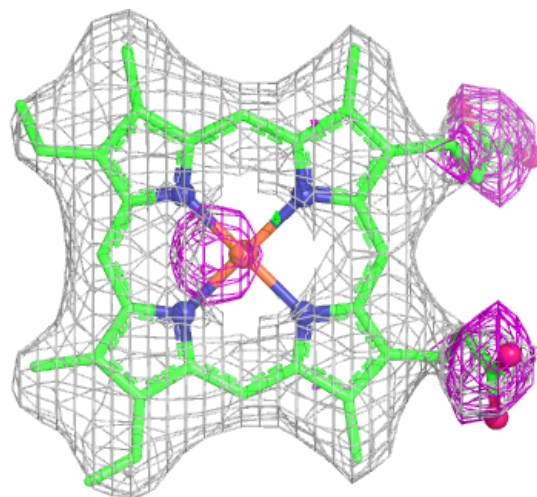
Electron density around HEM C 301 (B):

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



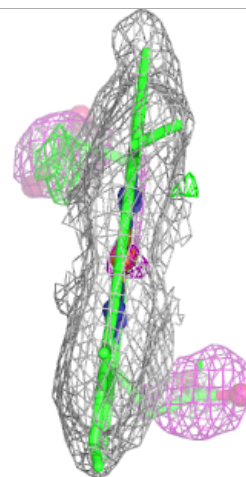
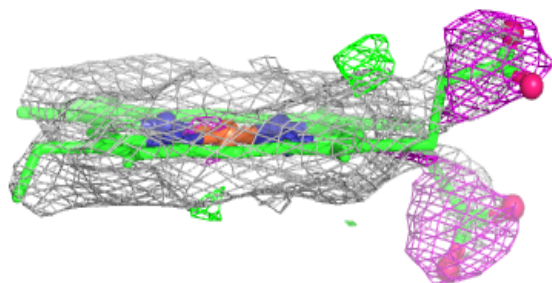
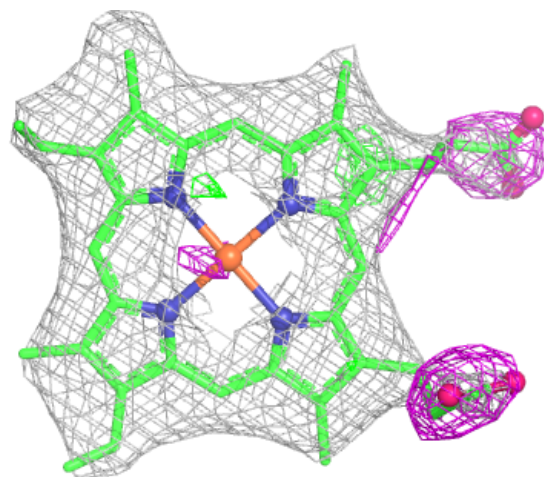
Electron density around HEM K 301:

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



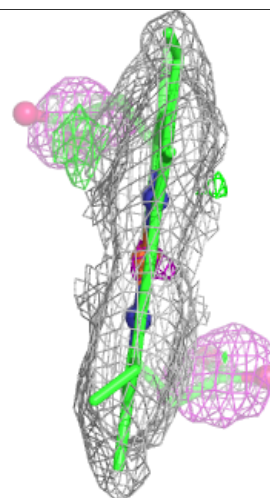
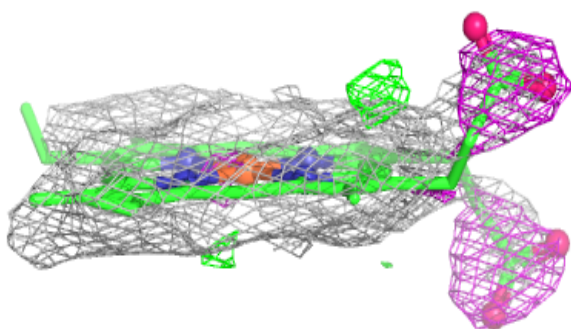
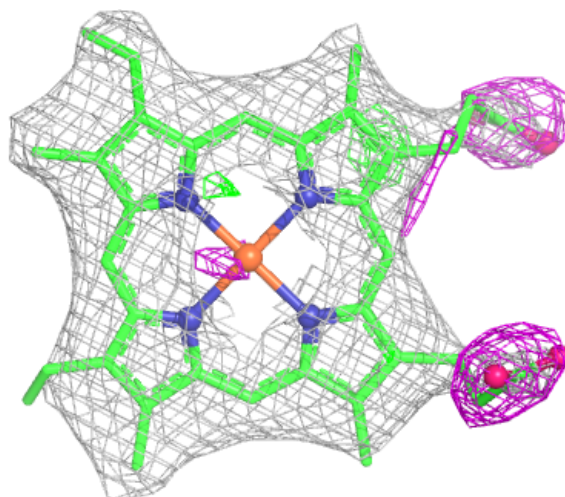
Electron density around HEM I 301 (A):

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



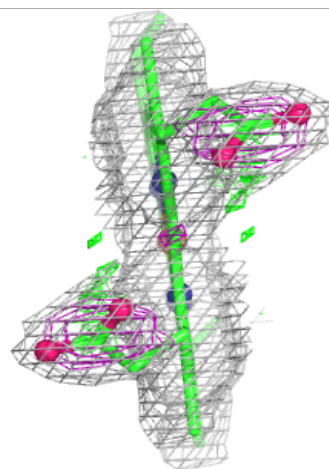
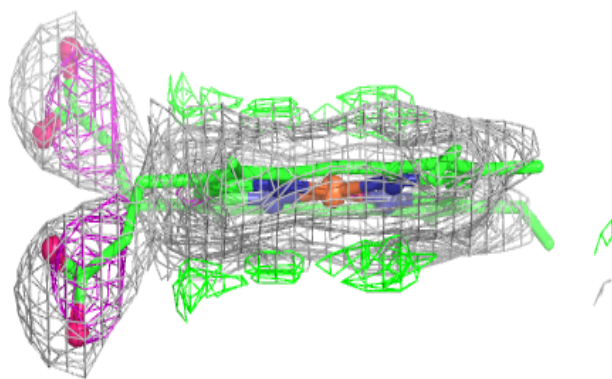
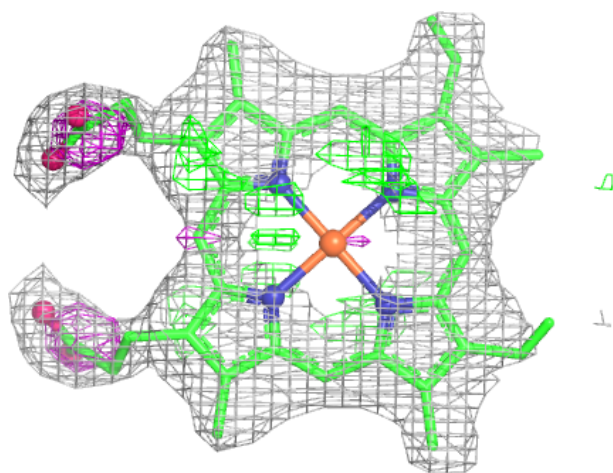
Electron density around HEM I 301 (B):

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



Electron density around HEM L 301:

$2mF_o-DF_c$ (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.