



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 20, 2026 – 10:08 am BST

PDB ID : 9TP3 / pdb_00009tp3
Title : C. jejuni NrfA Nitrite Complex
Authors : Hermann, B.; Einsle, O.
Deposited on : 2025-12-17
Resolution : 2.29 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 Phenix2.2
Mogul : 1.8.4, CSD as541be (2020)
Xtriage (Phenix) : 2.2
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 : 9.0.015 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.51

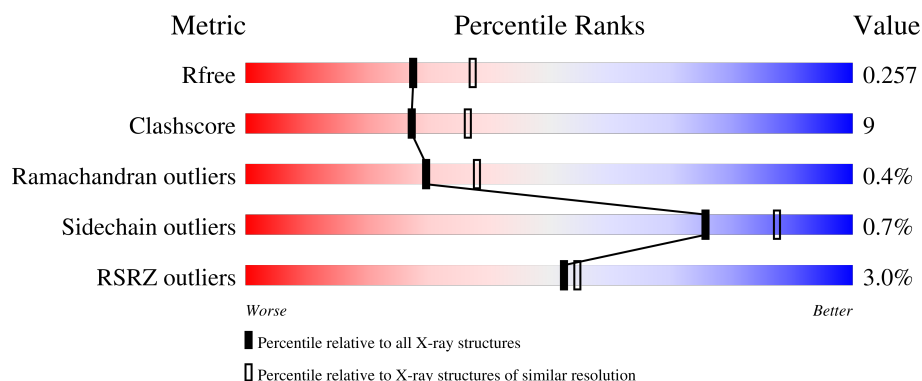
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.29 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	6319 (2.30-2.30)
Clashscore	190562	6919 (2.30-2.30)
Ramachandran outliers	187476	6854 (2.30-2.30)
Sidechain outliers	187428	6854 (2.30-2.30)
RSRZ outliers	180081	6325 (2.30-2.30)

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	620	2% 80% 10% 10%
1	B	620	4% 80% 11% 9%

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 9712 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 nitrite reductase (cytochrome; ammonia-forming).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	561	Total	C	N	O	S	0	0	0
			4489	2830	781	852	26			
1	B	563	Total	C	N	O	S	0	0	0
			4503	2839	783	855	26			

There are 20 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	611	SER	-	expression tag	UNP Q0P8Q2
A	612	ALA	-	expression tag	UNP Q0P8Q2
A	613	TRP	-	expression tag	UNP Q0P8Q2
A	614	SER	-	expression tag	UNP Q0P8Q2
A	615	HIS	-	expression tag	UNP Q0P8Q2
A	616	PRO	-	expression tag	UNP Q0P8Q2
A	617	GLN	-	expression tag	UNP Q0P8Q2
A	618	PHE	-	expression tag	UNP Q0P8Q2
A	619	GLU	-	expression tag	UNP Q0P8Q2
A	620	LYS	-	expression tag	UNP Q0P8Q2
B	611	SER	-	expression tag	UNP Q0P8Q2
B	612	ALA	-	expression tag	UNP Q0P8Q2
B	613	TRP	-	expression tag	UNP Q0P8Q2
B	614	SER	-	expression tag	UNP Q0P8Q2
B	615	HIS	-	expression tag	UNP Q0P8Q2
B	616	PRO	-	expression tag	UNP Q0P8Q2
B	617	GLN	-	expression tag	UNP Q0P8Q2
B	618	PHE	-	expression tag	UNP Q0P8Q2
B	619	GLU	-	expression tag	UNP Q0P8Q2
B	620	LYS	-	expression tag	UNP Q0P8Q2

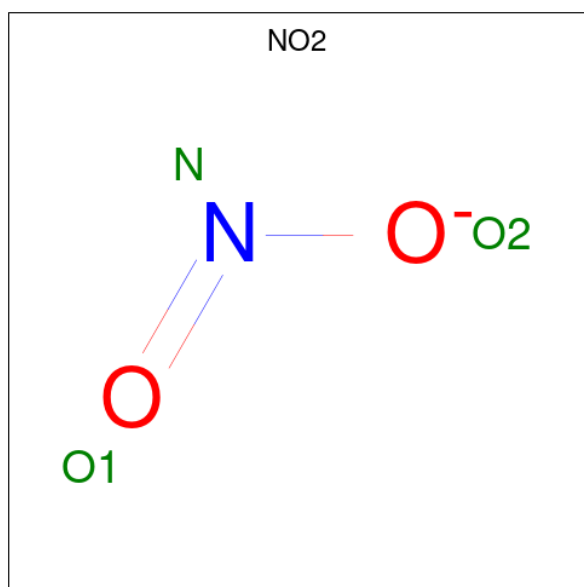
- Molecule 2 is CALCIUM ION (CCD ID: CA) (formula: Ca) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Ca	0	0
			1	1		
2	B	1	Total	Ca	0	0
			1	1		

- Molecule 3 is STRONTIUM ION (CCD ID: SR) (formula: Sr).

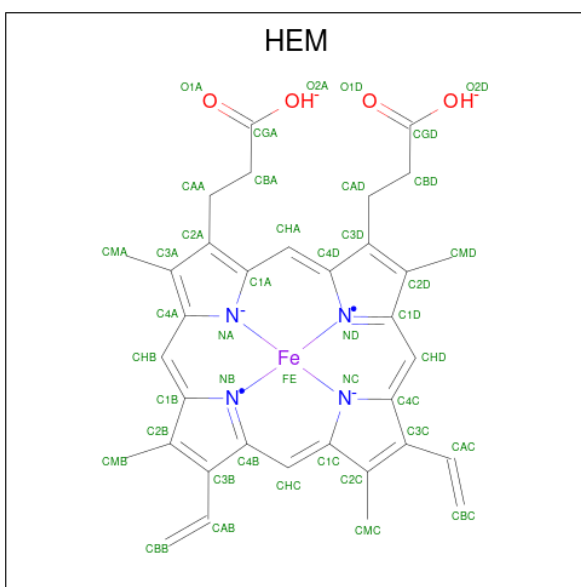
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	2	Total	Sr	0	0
			2	2		
3	B	2	Total	Sr	0	0
			2	2		

- Molecule 4 is NITRITE ION (CCD ID: NO2) (formula: NO₂) (labeled as "Ligand of Interest" by depositor).

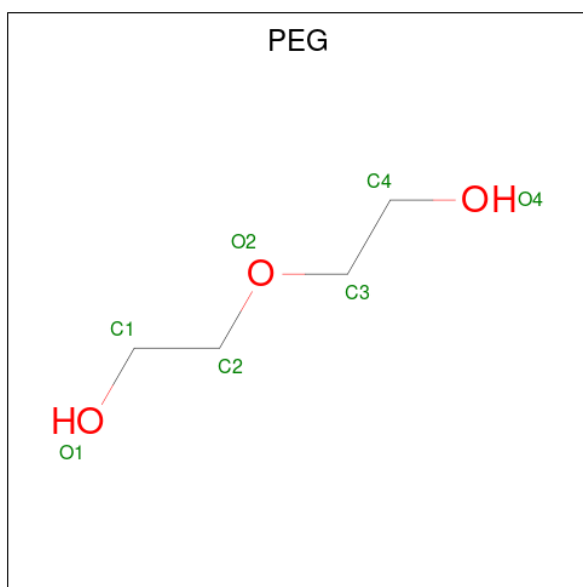


Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	N	O	0	0
			3	1	2		
4	B	1	Total	N	O	0	0
			3	1	2		

- Molecule 5 is PROTOPORPHYRIN IX CONTAINING FE (CCD ID: HEM) (formula: C₃₄H₃₂FeN₄O₄) (labeled as "Ligand of Interest" by depositor).

[illegible]

- Molecule 6 is DI(HYDROXYETHYL)ETHER (CCD ID: PEG) (formula: $C_4H_{10}O_3$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total	C	O	0	0
			7	4	3		
6	A	1	Total	C	O	0	0
			7	4	3		
6	A	1	Total	C	O	0	0
			7	4	3		

- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	144	Total	O	0	0
			144	144		
7	B	113	Total	O	0	0
			113	113		

4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	64.46Å 160.75Å 65.31Å 90.00° 118.12° 90.00°	Depositor
Resolution (Å)	80.38 – 2.29 80.38 – 2.29	Depositor EDS
% Data completeness (in resolution range)	93.7 (80.38-2.29) 93.7 (80.38-2.29)	Depositor EDS
R_{merge}	0.16	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.95 (at 2.29Å)	Xtriage
Refinement program	REFMAC 5.8.0049	Depositor
R, R_{free}	0.222 , 0.252 0.228 , 0.257	Depositor DCC
R_{free} test set	2515 reflections (4.78%)	wwPDB-VP
Wilson B-factor (Å ²)	33.7	Xtriage
Anisotropy	0.282	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.39 , 38.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.53$, $\langle L^2 \rangle = 0.37$	Xtriage
Estimated twinning fraction	0.000 for -h-l,k,h 0.000 for l,k,-h-l 0.008 for h,-k,-h-l 0.000 for -h-l,-k,l 0.008 for l,-k,h	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	9712	wwPDB-VP
Average B, all atoms (Å ²)	38.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.14% 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: SR, HEM, NO2, CA, PEG

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	0.49	0/4596	0.75	0/6207
1	B	0.50	0/4610	0.77	0/6226
All	All	0.49	0/9206	0.76	0/12433

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	4489	0	4348	76	0
1	B	4503	0	4367	78	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
3	A	2	0	0	0	0
3	B	2	0	0	0	0
4	A	3	0	0	1	0
4	B	3	0	0	1	0
5	A	215	0	150	50	0
5	B	215	0	150	53	0
6	A	21	0	30	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	A	144	0	0	1	0
7	B	113	0	0	1	0
All	All	9712	0	9045	168	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 9.

All (168) 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:A:211:CYS:SG	5:A:806:HEM:CAB	2.03	1.46
1:A:415:CYS:SG	5:A:809:HEM:CAB	2.04	1.45
1:B:384:CYS:SG	5:B:808:HEM:CAB	2.05	1.45
1:A:150:CYS:SG	5:A:805:HEM:CAB	2.04	1.43
1:B:150:CYS:SG	5:B:805:HEM:CAB	2.09	1.41
1:B:415:CYS:SG	5:B:809:HEM:CAB	2.11	1.39
1:A:387:CYS:SG	5:A:808:HEM:CAC	2.15	1.35
1:A:261:CYS:SG	5:A:807:HEM:CAC	2.19	1.30
1:A:153:CYS:SG	5:A:805:HEM:CAC	2.19	1.29
1:B:211:CYS:SG	5:B:806:HEM:CAB	2.22	1.27
1:B:153:CYS:SG	5:B:805:HEM:CAC	2.23	1.25
1:B:387:CYS:SG	5:B:808:HEM:CAC	2.24	1.24
1:B:261:CYS:SG	5:B:807:HEM:CAC	2.28	1.22
1:B:418:CYS:SG	5:B:809:HEM:CAC	2.29	1.21
1:B:258:CYS:SG	5:B:807:HEM:CAB	2.29	1.21
1:A:214:CYS:SG	5:A:806:HEM:CAC	2.29	1.20
1:A:258:CYS:SG	5:A:807:HEM:CAB	2.29	1.20
1:A:418:CYS:SG	5:A:809:HEM:CAC	2.31	1.19
1:B:384:CYS:SG	5:B:808:HEM:HAB	1.79	1.11
1:A:415:CYS:SG	5:A:809:HEM:CBB	2.41	1.08
1:B:214:CYS:SG	5:B:806:HEM:CAC	2.43	1.07
1:A:150:CYS:SG	5:A:805:HEM:HAB	1.92	1.05
1:B:415:CYS:SG	5:B:809:HEM:CBB	2.44	1.05
1:B:150:CYS:SG	5:B:805:HEM:HAB	1.93	1.03
1:A:150:CYS:SG	5:A:805:HEM:CBB	2.48	1.01
1:A:211:CYS:SG	5:A:806:HEM:CBB	2.50	0.99
1:B:214:CYS:SG	5:B:806:HEM:CBC	2.51	0.98
1:B:387:CYS:SG	5:B:808:HEM:CBC	2.50	0.98
1:B:150:CYS:SG	5:B:805:HEM:CBB	2.51	0.98
1:A:418:CYS:SG	5:A:809:HEM:CBC	2.52	0.97
1:A:387:CYS:SG	5:A:808:HEM:CBC	2.52	0.97

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:153:CYS:HG	5:B:805:HEM:CAC	1.68	0.95
1:A:211:CYS:SG	5:A:806:HEM:HAB	2.07	0.94
1:A:258:CYS:SG	5:A:807:HEM:CBB	2.58	0.92
1:A:153:CYS:SG	5:A:805:HEM:HAC	2.08	0.91
1:B:418:CYS:SG	5:B:809:HEM:CBC	2.60	0.89
1:A:214:CYS:SG	5:A:806:HEM:CBC	2.61	0.89
1:B:258:CYS:SG	5:B:807:HEM:CBB	2.60	0.88
1:B:384:CYS:SG	5:B:808:HEM:CBB	2.63	0.87
1:B:366:HIS:NE2	4:B:804:NO2:O2	2.07	0.87
1:A:261:CYS:SG	5:A:807:HEM:CBC	2.65	0.84
1:B:211:CYS:SG	5:B:806:HEM:CBB	2.66	0.82
1:A:415:CYS:SG	5:A:809:HEM:HAB	2.16	0.81
1:A:485:GLU:CD	1:A:531:LYS:HE2	2.06	0.80
1:B:211:CYS:SG	5:B:806:HEM:HAB	2.19	0.80
1:A:415:CYS:SG	5:A:809:HEM:C3B	2.75	0.79
1:B:153:CYS:SG	5:B:805:HEM:HAC	2.22	0.79
1:A:211:CYS:SG	5:A:806:HEM:C3B	2.75	0.79
1:A:261:CYS:SG	5:A:807:HEM:C3C	2.77	0.77
1:A:387:CYS:SG	5:A:808:HEM:HAC	2.24	0.75
1:B:415:CYS:SG	5:B:809:HEM:HAB	2.22	0.75
5:B:807:HEM:HBD1	5:B:807:HEM:HMD1	1.70	0.73
1:B:261:CYS:SG	5:B:807:HEM:HAC	2.28	0.72
5:B:805:HEM:HMC1	5:B:805:HEM:HBC2	1.70	0.72
1:B:153:CYS:SG	5:B:805:HEM:CBC	2.77	0.72
1:B:261:CYS:SG	5:B:807:HEM:CBC	2.77	0.72
1:B:241:ASP:OD1	7:B:901:HOH:O	2.08	0.71
1:B:284:ASP:OD2	1:B:287:LYS:NZ	2.22	0.70
1:B:415:CYS:SG	5:B:809:HEM:C3B	2.83	0.70
1:A:261:CYS:SG	5:A:807:HEM:HAC	2.29	0.69
1:A:387:CYS:SG	5:A:808:HEM:C3C	2.84	0.69
1:B:418:CYS:SG	5:B:809:HEM:C3C	2.85	0.69
1:A:153:CYS:SG	5:A:805:HEM:C3C	2.86	0.69
1:A:153:CYS:SG	5:A:805:HEM:CBC	2.80	0.69
1:B:387:CYS:SG	5:B:808:HEM:C3C	2.86	0.68
1:B:153:CYS:SG	5:B:805:HEM:C3C	2.85	0.66
1:B:372:TYR:CE1	5:B:808:HEM:HMC3	2.32	0.65
1:A:418:CYS:SG	5:A:809:HEM:C3C	2.90	0.64
1:B:261:CYS:SG	5:B:807:HEM:C3C	2.89	0.64
1:A:214:CYS:SG	5:A:806:HEM:C3C	2.91	0.63
1:A:188:VAL:HG22	1:A:191:ILE:HD12	1.79	0.63
1:B:411:ILE:HD12	1:B:427:LYS:HG3	1.80	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:192:VAL:O	1:A:195:SER:HB3	1.98	0.62
1:B:258:CYS:SG	5:B:807:HEM:C3B	2.92	0.61
1:A:505:SER:HB3	1:A:509:HIS:CE1	2.36	0.61
1:A:224:LEU:HD13	1:A:253:MET:HE1	1.82	0.60
1:A:372:TYR:CE1	5:A:808:HEM:HMC3	2.37	0.60
1:B:48:LEU:C	1:B:49:LEU:HD23	2.28	0.59
1:A:258:CYS:SG	5:A:807:HEM:HAB	2.39	0.58
1:B:173:PHE:CD1	1:B:181:MET:HE3	2.39	0.58
5:A:807:HEM:HMD1	5:A:807:HEM:HBD1	1.85	0.58
1:B:47:SER:OG	1:B:48:LEU:N	2.38	0.57
1:A:185:ILE:HB	1:A:205:LYS:HD3	1.85	0.57
1:B:385:VAL:HG13	1:B:389:MET:HB2	1.87	0.57
5:B:809:HEM:HBC2	5:B:809:HEM:HMC2	1.87	0.56
1:B:211:CYS:SG	5:B:806:HEM:C3B	2.98	0.56
1:A:192:VAL:O	1:A:195:SER:CB	2.54	0.56
1:A:121:GLN:HE21	1:A:125:MET:HE3	1.72	0.55
1:A:258:CYS:SG	5:A:807:HEM:C3B	2.98	0.55
1:A:485:GLU:OE2	1:A:531:LYS:CE	2.54	0.55
1:B:540:GLY:O	1:B:541:ILE:O	2.24	0.55
1:B:48:LEU:O	1:B:49:LEU:HD23	2.07	0.55
1:A:150:CYS:CB	5:A:805:HEM:CAB	2.85	0.54
1:A:291:ASN:OD1	1:A:293:THR:OG1	2.21	0.54
1:B:258:CYS:SG	5:B:807:HEM:HAB	2.42	0.54
1:B:153:CYS:HG	5:B:805:HEM:CBC	2.19	0.54
1:A:366:HIS:NE2	4:A:804:NO2:O2	2.30	0.54
1:B:384:CYS:CB	5:B:808:HEM:CAB	2.86	0.54
1:B:120:VAL:HG23	1:B:154:HIS:O	2.07	0.54
1:A:391:TYR:CG	1:A:398:LYS:HE3	2.44	0.53
1:B:289:TRP:NE1	1:B:295:LYS:HA	2.23	0.53
1:B:387:CYS:SG	5:B:808:HEM:HAC	2.43	0.53
1:B:411:ILE:CD1	1:B:427:LYS:HG3	2.37	0.53
1:A:120:VAL:HG12	5:A:807:HEM:HBD1	1.92	0.52
5:A:809:HEM:HBC2	5:A:809:HEM:HMC2	1.92	0.51
1:A:506:THR:HG22	1:A:506:THR:O	2.12	0.50
1:A:485:GLU:OE2	1:A:531:LYS:HE2	2.10	0.50
1:A:150:CYS:SG	5:A:805:HEM:C3B	2.95	0.50
1:A:485:GLU:CD	1:A:531:LYS:CE	2.82	0.50
1:B:270:THR:OG1	1:B:272:GLU:HG2	2.12	0.49
5:B:806:HEM:HMC2	5:B:806:HEM:HBC2	1.94	0.49
1:A:334:ILE:HB	1:A:517:MET:HE2	1.95	0.49
1:A:418:CYS:HG	5:A:809:HEM:CAC	2.24	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:244:GLN:HG2	1:B:253:MET:HE2	1.95	0.48
1:A:66:GLN:HA	1:A:69:MET:HE2	1.95	0.48
1:A:69:MET:HE3	1:A:402:HIS:HB2	1.94	0.48
1:A:153:CYS:HG	5:A:805:HEM:CAC	2.20	0.47
1:B:384:CYS:SG	5:B:808:HEM:C3B	2.99	0.47
1:A:150:CYS:CB	5:A:805:HEM:HAB	2.45	0.47
1:A:224:LEU:CD1	1:A:253:MET:HE1	2.44	0.47
1:B:179:TRP:CD1	1:B:299:GLU:HG3	2.50	0.47
1:B:150:CYS:CB	5:B:805:HEM:CAB	2.89	0.47
1:B:49:LEU:HD22	1:B:59:TRP:HA	1.96	0.46
1:B:102:TRP:CE3	1:B:107:PHE:HB3	2.50	0.46
1:B:165:VAL:HG21	1:B:184:ASN:HB3	1.97	0.46
1:A:350:ALA:HB2	1:A:360:GLN:HB3	1.98	0.46
1:B:505:SER:HB3	1:B:509:HIS:CE1	2.50	0.46
1:A:608:ASP:O	1:A:609:LYS:HB2	2.16	0.46
1:B:289:TRP:CD1	1:B:295:LYS:HA	2.51	0.46
1:A:504:ASN:O	5:A:808:HEM:HAA2	2.16	0.45
1:A:461:GLU:OE1	1:A:541:ILE:HD13	2.15	0.45
1:A:385:VAL:HG13	1:A:389:MET:HB2	1.98	0.45
5:A:807:HEM:HMD1	5:A:807:HEM:CBD	2.45	0.45
1:B:150:CYS:CB	5:B:805:HEM:HAB	2.46	0.45
1:A:504:ASN:HB3	5:A:808:HEM:HAA1	1.99	0.45
1:B:384:CYS:CB	5:B:808:HEM:HAB	2.46	0.45
1:B:541:ILE:CG2	1:B:544:PHE:HB2	2.46	0.45
1:B:214:CYS:SG	5:B:806:HEM:C3C	3.07	0.44
1:A:69:MET:HE1	1:A:400:THR:O	2.17	0.44
1:B:571:HIS:HD2	1:B:575:GLU:OE1	2.01	0.44
1:A:182:ILE:HD13	1:A:182:ILE:HA	1.92	0.43
1:B:463:GLY:HA2	1:B:479:ILE:HD11	2.00	0.43
1:A:193:GLU:HG2	1:A:194:ASN:ND2	2.34	0.43
1:A:250:ARG:NE	7:A:903:HOH:O	2.51	0.43
1:B:412:ASN:HB2	1:B:423:GLU:OE2	2.19	0.43
5:B:809:HEM:HBC2	5:B:809:HEM:CMC	2.49	0.43
1:B:261:CYS:CB	5:B:807:HEM:C3C	3.02	0.42
5:A:805:HEM:CMC	5:A:805:HEM:HBC2	2.50	0.42
1:A:132:LYS:HD3	1:A:289:TRP:CD2	2.54	0.42
5:A:809:HEM:HBC2	5:A:809:HEM:CMC	2.50	0.42
1:B:195:SER:HB2	1:B:197:GLU:OE1	2.19	0.42
1:B:411:ILE:HD12	1:B:427:LYS:CG	2.49	0.42
1:A:277:MET:HG3	1:A:309:VAL:HG13	2.02	0.42
5:B:808:HEM:HBC2	5:B:808:HEM:HMC2	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:B:808:HEM:HBC2	5:B:808:HEM:CMC	2.50	0.42
5:A:806:HEM:HMC2	5:A:806:HEM:HBC2	2.02	0.41
1:B:332:PHE:HB3	1:B:370:GLU:O	2.20	0.41
1:A:519:LEU:HD21	1:B:522:VAL:HG21	2.03	0.41
5:A:808:HEM:HBC2	5:A:808:HEM:CMC	2.51	0.41
1:B:465:MET:O	1:B:469:GLN:HG3	2.21	0.41
1:A:214:CYS:SG	5:A:806:HEM:HAC	2.43	0.41
1:B:365:GLN:O	1:B:366:HIS:C	2.64	0.40
5:B:806:HEM:HBC2	5:B:806:HEM:CMC	2.51	0.40
1:A:49:LEU:HD23	1:A:59:TRP:HA	2.04	0.40
1:A:372:TYR:CE2	1:A:378:ALA:HB2	2.56	0.40
1:B:158:THR:HB	1:B:159:PRO:HD3	2.03	0.40
1:B:309:VAL:HG12	1:B:310:LYS:N	2.37	0.40
1:A:107:PHE:HA	1:A:129:ARG:HD3	2.02	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	559/620 (90%)	539 (96%)	19 (3%)	1 (0%)	43	55
1	B	561/620 (90%)	525 (94%)	32 (6%)	4 (1%)	18	23
All	All	1120/1240 (90%)	1064 (95%)	51 (5%)	5 (0%)	30	38

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	541	ILE
1	B	484	LYS
1	A	194	ASN
1	B	282	VAL

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Mol	Chain	Res	Type
1	B	568	VAL

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	481/531 (91%)	478 (99%)	3 (1%)	78	89
1	B	483/531 (91%)	479 (99%)	4 (1%)	73	86
All	All	964/1062 (91%)	957 (99%)	7 (1%)	76	87

All (7) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	182	ILE
1	A	223	ARG
1	A	394	GLU
1	B	68	LYS
1	B	191	ILE
1	B	531	LYS
1	B	541	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	121	GLN
1	A	194	ASN
1	A	555	GLN
1	B	121	GLN
1	B	360	GLN
1	B	412	ASN
1	B	441	GLN
1	B	571	HIS

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 21 ligands modelled in this entry, 6 are monoatomic - leaving 15 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
5	HEM	B	808	1,3	50,50,50	2.40	10 (20%)	66,82,82	2.42	19 (28%)
6	PEG	A	810	-	6,6,6	0.51	0	5,5,5	0.51	0
5	HEM	A	809	1	50,50,50	2.44	10 (20%)	66,82,82	2.31	14 (21%)
5	HEM	B	807	1,3	50,50,50	2.39	11 (22%)	66,82,82	2.21	14 (21%)
5	HEM	B	805	1,4	50,50,50	2.35	8 (16%)	66,82,82	2.34	17 (25%)
5	HEM	A	808	1,3	50,50,50	2.37	10 (20%)	66,82,82	2.50	21 (31%)
5	HEM	B	809	1	50,50,50	2.40	9 (18%)	66,82,82	2.29	14 (21%)
5	HEM	A	807	1,3	50,50,50	2.46	12 (24%)	66,82,82	2.27	15 (22%)
5	HEM	A	805	1,4	50,50,50	2.36	8 (16%)	66,82,82	2.35	18 (27%)
6	PEG	A	811	-	6,6,6	0.48	0	5,5,5	0.21	0
4	NO2	B	804	5	1,2,2	0.05	0	0,1,1	-	-
5	HEM	B	806	1	50,50,50	2.39	11 (22%)	66,82,82	2.25	16 (24%)
6	PEG	A	812	-	6,6,6	0.48	0	5,5,5	0.17	0
5	HEM	A	806	1	50,50,50	2.43	11 (22%)	66,82,82	2.27	15 (22%)
4	NO2	A	804	5	1,2,2	0.04	0	0,1,1	-	-

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	HEM	B	808	1,3	-	1/14/54/54	-
6	PEG	A	810	-	-	1/4/4/4	-
5	HEM	A	809	1	-	4/14/54/54	-
5	HEM	B	807	1,3	-	4/14/54/54	-
5	HEM	B	805	1,4	-	5/14/54/54	-
5	HEM	A	808	1,3	-	3/14/54/54	-
5	HEM	B	809	1	-	4/14/54/54	-
5	HEM	A	807	1,3	-	2/14/54/54	-
5	HEM	A	805	1,4	-	3/14/54/54	-
6	PEG	A	811	-	-	3/4/4/4	-
5	HEM	B	806	1	-	2/14/54/54	-
6	PEG	A	812	-	-	3/4/4/4	-
5	HEM	A	806	1	-	4/14/54/54	-

All (100) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	809	HEM	FE-NB	12.06	2.32	1.94
5	A	807	HEM	FE-NB	12.04	2.32	1.94
5	B	806	HEM	FE-NB	11.87	2.31	1.94
5	A	806	HEM	FE-NB	11.81	2.31	1.94
5	B	807	HEM	FE-NB	11.78	2.31	1.94
5	A	805	HEM	FE-NB	11.52	2.30	1.94
5	A	809	HEM	FE-NB	11.39	2.30	1.94
5	B	805	HEM	FE-NB	11.36	2.30	1.94
5	B	808	HEM	FE-NB	11.28	2.29	1.94
5	A	808	HEM	FE-NB	10.72	2.28	1.94
5	A	809	HEM	C1B-NB	-5.96	1.30	1.40
5	A	808	HEM	C1B-NB	-5.83	1.30	1.40
5	B	808	HEM	C1B-NB	-5.67	1.30	1.40
5	A	807	HEM	C1B-NB	-5.65	1.30	1.40
5	A	806	HEM	C1B-NB	-5.45	1.30	1.40
5	B	807	HEM	C1B-NB	-5.39	1.31	1.40
5	B	806	HEM	C1B-NB	-5.33	1.31	1.40
5	A	805	HEM	C1B-NB	-5.31	1.31	1.40
5	B	809	HEM	C1B-NB	-5.24	1.31	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	805	HEM	C1B-NB	-5.15	1.31	1.40
5	A	808	HEM	C4B-NB	-4.59	1.29	1.38
5	B	808	HEM	C4B-NB	-4.54	1.29	1.38
5	A	805	HEM	C4B-NB	-4.48	1.29	1.38
5	B	805	HEM	C4B-NB	-4.30	1.29	1.38
5	B	809	HEM	FE-NC	4.15	2.09	1.95
5	B	805	HEM	FE-NC	4.13	2.09	1.95
5	A	807	HEM	C4B-NB	-4.09	1.30	1.38
5	A	806	HEM	C4B-NB	-4.02	1.30	1.38
5	A	806	HEM	FE-NC	3.93	2.08	1.95
5	A	808	HEM	C4D-ND	-3.92	1.33	1.40
5	A	809	HEM	C4B-NB	-3.91	1.30	1.38
5	B	806	HEM	C4B-NB	-3.89	1.30	1.38
5	B	807	HEM	C4B-NB	-3.87	1.30	1.38
5	B	809	HEM	CBC-CAC	3.82	1.49	1.30
5	A	809	HEM	CBC-CAC	3.79	1.49	1.30
5	A	809	HEM	FE-NC	3.78	2.07	1.95
5	B	808	HEM	FE-NC	3.75	2.07	1.95
5	B	809	HEM	CBB-CAB	3.72	1.48	1.30
5	A	806	HEM	CBB-CAB	3.71	1.48	1.30
5	B	806	HEM	FE-NC	3.71	2.07	1.95
5	A	807	HEM	C4D-ND	-3.70	1.33	1.40
5	A	809	HEM	CBB-CAB	3.69	1.48	1.30
5	B	805	HEM	CBB-CAB	3.69	1.48	1.30
5	B	805	HEM	CBC-CAC	3.69	1.48	1.30
5	A	805	HEM	CBC-CAC	3.68	1.48	1.30
5	B	807	HEM	CBB-CAB	3.67	1.48	1.30
5	B	808	HEM	CBB-CAB	3.67	1.48	1.30
5	A	808	HEM	CBC-CAC	3.66	1.48	1.30
5	B	806	HEM	CBB-CAB	3.65	1.48	1.30
5	A	807	HEM	CBC-CAC	3.64	1.48	1.30
5	B	807	HEM	CBC-CAC	3.63	1.48	1.30
5	A	807	HEM	CBB-CAB	3.61	1.48	1.30
5	A	805	HEM	FE-NC	3.61	2.07	1.95
5	A	808	HEM	FE-NC	3.59	2.07	1.95
5	A	805	HEM	CBB-CAB	3.58	1.48	1.30
5	A	806	HEM	CBC-CAC	3.57	1.48	1.30
5	B	808	HEM	CBC-CAC	3.54	1.47	1.30
5	B	807	HEM	FE-NC	3.54	2.07	1.95
5	B	806	HEM	CBC-CAC	3.51	1.47	1.30
5	A	805	HEM	C4D-ND	-3.48	1.34	1.40
5	A	808	HEM	CBB-CAB	3.48	1.47	1.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	809	HEM	C4B-NB	-3.48	1.31	1.38
5	B	808	HEM	C4D-ND	-3.40	1.34	1.40
5	B	805	HEM	C4D-ND	-3.36	1.34	1.40
5	A	807	HEM	FE-NC	3.33	2.06	1.95
5	A	806	HEM	C4D-ND	-3.31	1.34	1.40
5	A	809	HEM	C4D-ND	-3.26	1.34	1.40
5	B	806	HEM	C4D-ND	-2.93	1.35	1.40
5	B	807	HEM	C4D-ND	-2.83	1.35	1.40
5	B	809	HEM	C4D-ND	-2.73	1.35	1.40
5	A	808	HEM	C4C-NC	-2.65	1.34	1.39
5	A	806	HEM	C4C-NC	-2.63	1.34	1.39
5	B	806	HEM	C4C-NC	-2.58	1.34	1.39
5	B	808	HEM	C3C-C4C	-2.57	1.41	1.46
5	A	809	HEM	C4C-NC	-2.50	1.34	1.39
5	A	809	HEM	C1D-ND	-2.50	1.33	1.38
5	B	808	HEM	C4C-NC	-2.49	1.34	1.39
5	B	806	HEM	C3C-C4C	-2.48	1.41	1.46
5	B	807	HEM	C1D-ND	-2.43	1.33	1.38
5	B	805	HEM	C1C-C2C	-2.40	1.40	1.45
5	A	808	HEM	C3C-C4C	-2.39	1.41	1.46
5	B	807	HEM	C4C-NC	-2.36	1.35	1.39
5	A	806	HEM	C3C-C4C	-2.33	1.41	1.46
5	A	807	HEM	C4C-NC	-2.31	1.35	1.39
5	A	809	HEM	C3C-C4C	-2.30	1.42	1.46
5	A	807	HEM	C1C-C2C	-2.29	1.40	1.45
5	A	807	HEM	C1D-ND	-2.25	1.34	1.38
5	A	805	HEM	C1C-C2C	-2.22	1.40	1.45
5	A	806	HEM	C1C-C2C	-2.21	1.41	1.45
5	B	808	HEM	C1C-C2C	-2.19	1.41	1.45
5	B	807	HEM	C1C-C2C	-2.16	1.41	1.45
5	A	807	HEM	C1A-NA	-2.16	1.35	1.39
5	B	807	HEM	C3C-C4C	-2.14	1.42	1.46
5	A	808	HEM	C1A-NA	-2.12	1.35	1.39
5	B	806	HEM	C1C-C2C	-2.06	1.41	1.45
5	A	807	HEM	C3C-C4C	-2.05	1.42	1.46
5	B	809	HEM	CHB-C1B	2.04	1.42	1.38
5	A	806	HEM	C1D-ND	-2.04	1.34	1.38
5	B	806	HEM	C1D-ND	-2.04	1.34	1.38
5	B	809	HEM	C3C-C4C	-2.03	1.42	1.46

All (163) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	808	HEM	C1B-NB-C4B	12.49	117.97	105.07
5	B	808	HEM	C1B-NB-C4B	12.36	117.84	105.07
5	A	809	HEM	C1B-NB-C4B	12.07	117.54	105.07
5	B	805	HEM	C1B-NB-C4B	11.81	117.27	105.07
5	B	809	HEM	C1B-NB-C4B	11.81	117.27	105.07
5	B	807	HEM	C1B-NB-C4B	11.80	117.26	105.07
5	A	805	HEM	C1B-NB-C4B	11.61	117.06	105.07
5	A	806	HEM	C1B-NB-C4B	11.40	116.85	105.07
5	B	806	HEM	C1B-NB-C4B	11.31	116.76	105.07
5	A	807	HEM	C1B-NB-C4B	11.22	116.67	105.07
5	A	808	HEM	CHC-C4B-NB	6.64	131.63	124.42
5	A	807	HEM	C4C-NC-C1C	6.22	111.44	105.35
5	B	808	HEM	CHC-C4B-NB	6.14	131.08	124.42
5	B	805	HEM	CHC-C4B-NB	6.00	130.93	124.42
5	A	805	HEM	CHC-C4B-NB	5.79	130.70	124.42
5	B	807	HEM	C4C-NC-C1C	5.50	110.74	105.35
5	B	806	HEM	C4C-NC-C1C	5.48	110.72	105.35
5	B	808	HEM	C4C-NC-C1C	5.38	110.62	105.35
5	B	809	HEM	CHC-C4B-NB	5.22	130.09	124.42
5	A	808	HEM	C4C-NC-C1C	4.98	110.22	105.35
5	A	809	HEM	C4C-NC-C1C	4.95	110.19	105.35
5	A	806	HEM	CHC-C4B-NB	4.90	129.75	124.42
5	A	806	HEM	C4C-NC-C1C	4.80	110.05	105.35
5	A	805	HEM	C4C-NC-C1C	4.72	109.97	105.35
5	A	808	HEM	C2B-C1B-NB	-4.70	104.27	109.84
5	A	809	HEM	CHC-C4B-NB	4.68	129.50	124.42
5	B	809	HEM	CHD-C1D-ND	4.59	129.41	124.42
5	B	805	HEM	CHD-C1D-ND	4.49	129.30	124.42
5	A	805	HEM	CHD-C1D-ND	4.39	129.19	124.42
5	B	806	HEM	CHC-C4B-NB	4.33	129.12	124.42
5	A	809	HEM	CHD-C1D-ND	4.31	129.10	124.42
5	B	809	HEM	C2B-C1B-NB	-4.20	104.87	109.84
5	B	809	HEM	C4C-NC-C1C	4.10	109.37	105.35
5	B	805	HEM	C2B-C1B-NB	-4.06	105.03	109.84
5	A	808	HEM	C4A-NA-C1A	4.01	109.28	105.35
5	A	805	HEM	C4A-NA-C1A	3.99	109.25	105.35
5	B	805	HEM	C4C-NC-C1C	3.98	109.24	105.35
5	A	806	HEM	CHD-C1D-ND	3.97	128.73	124.42
5	B	808	HEM	C2B-C1B-NB	-3.96	105.15	109.84
5	B	807	HEM	CHA-C4D-ND	3.88	129.16	124.37
5	A	809	HEM	C2B-C1B-NB	-3.80	105.34	109.84
5	B	805	HEM	CHA-C4D-ND	3.75	129.00	124.37
5	B	806	HEM	C2B-C1B-NB	-3.72	105.43	109.84

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	805	HEM	C2B-C1B-NB	-3.69	105.46	109.84
5	B	806	HEM	C4A-NA-C1A	3.66	108.93	105.35
5	B	809	HEM	CHD-C1D-C2D	-3.65	119.28	124.98
5	A	806	HEM	C4A-NA-C1A	3.63	108.91	105.35
5	B	807	HEM	CHC-C4B-NB	3.63	128.36	124.42
5	A	807	HEM	CHC-C1C-NC	3.62	128.36	124.44
5	A	809	HEM	CHD-C1D-C2D	-3.62	119.33	124.98
5	B	806	HEM	CHD-C1D-ND	3.60	128.33	124.42
5	A	806	HEM	CHB-C4A-NA	3.54	130.36	123.85
5	B	808	HEM	C4A-NA-C1A	3.53	108.81	105.35
5	A	807	HEM	CHC-C4B-NB	3.52	128.24	124.42
5	A	807	HEM	CHD-C1D-ND	3.49	128.21	124.42
5	B	806	HEM	CHC-C1C-NC	3.46	128.18	124.44
5	A	805	HEM	CHA-C4D-ND	3.45	128.63	124.37
5	A	806	HEM	CHA-C4D-ND	3.42	128.59	124.37
5	A	809	HEM	CHA-C4D-ND	3.41	128.58	124.37
5	A	808	HEM	CHD-C1D-ND	3.41	128.12	124.42
5	B	809	HEM	C4A-NA-C1A	3.39	108.67	105.35
5	B	808	HEM	CHA-C4D-ND	3.35	128.50	124.37
5	A	807	HEM	C4A-NA-C1A	3.32	108.60	105.35
5	A	807	HEM	CHA-C4D-ND	3.30	128.44	124.37
5	B	807	HEM	C2B-C1B-NB	-3.29	105.94	109.84
5	A	805	HEM	CHB-C4A-NA	3.28	129.88	123.85
5	A	809	HEM	C4A-NA-C1A	3.27	108.55	105.35
5	A	806	HEM	C2B-C1B-NB	-3.25	105.98	109.84
5	B	807	HEM	CHA-C4D-C3D	-3.21	119.31	125.33
5	A	807	HEM	C2B-C1B-NB	-3.17	106.08	109.84
5	A	807	HEM	CHD-C1D-C2D	-3.13	120.09	124.98
5	B	806	HEM	CHB-C4A-NA	3.13	129.60	123.85
5	B	808	HEM	CBA-CAA-C2A	-3.12	103.96	112.63
5	A	808	HEM	CHA-C4D-ND	3.11	128.20	124.37
5	B	805	HEM	O2D-CGD-CBD	3.08	123.94	114.03
5	B	805	HEM	C4A-NA-C1A	3.08	108.36	105.35
5	B	805	HEM	CHB-C4A-NA	3.05	129.47	123.85
5	A	805	HEM	CHC-C1C-NC	3.04	127.72	124.44
5	B	805	HEM	CAA-CBA-CGA	-3.01	107.12	113.60
5	B	808	HEM	CHA-C4D-C3D	-2.99	119.72	125.33
5	A	805	HEM	CHD-C1D-C2D	-2.97	120.34	124.98
5	A	808	HEM	CBA-CAA-C2A	-2.95	104.42	112.63
5	B	809	HEM	CHB-C4A-NA	2.93	129.24	123.85
5	B	808	HEM	CHD-C1D-ND	2.93	127.60	124.42
5	A	807	HEM	CHA-C4D-C3D	-2.93	119.83	125.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	806	HEM	CHD-C1D-C2D	-2.92	120.42	124.98
5	B	805	HEM	CHD-C1D-C2D	-2.91	120.43	124.98
5	B	809	HEM	CHA-C4D-ND	2.91	127.96	124.37
5	A	808	HEM	CHA-C4D-C3D	-2.89	119.89	125.33
5	B	806	HEM	CHD-C1D-C2D	-2.89	120.46	124.98
5	B	807	HEM	CHD-C1D-ND	2.89	127.55	124.42
5	A	809	HEM	CHB-C4A-NA	2.88	129.15	123.85
5	A	806	HEM	CHC-C1C-NC	2.88	127.55	124.44
5	B	806	HEM	CHA-C4D-ND	2.87	127.91	124.37
5	A	807	HEM	CHB-C4A-NA	2.86	129.11	123.85
5	A	806	HEM	CHA-C4D-C3D	-2.84	120.00	125.33
5	B	808	HEM	CMD-C2D-C1D	2.82	129.33	125.04
5	A	808	HEM	CHB-C4A-NA	2.72	128.85	123.85
5	A	808	HEM	CHD-C1D-C2D	-2.71	120.74	124.98
5	A	808	HEM	O2A-CGA-O1A	-2.67	116.64	123.30
5	B	807	HEM	CHC-C1C-NC	2.66	127.32	124.44
5	B	808	HEM	CHB-C4A-NA	2.66	128.73	123.85
5	B	807	HEM	CHB-C4A-NA	2.60	128.64	123.85
5	A	808	HEM	O2D-CGD-CBD	2.59	122.37	114.03
5	A	805	HEM	C4C-CHD-C1D	-2.59	120.47	126.06
5	B	805	HEM	CHC-C1C-NC	2.58	127.23	124.44
5	A	808	HEM	C2A-C1A-NA	-2.58	107.27	110.15
5	A	805	HEM	CMD-C2D-C1D	2.57	128.96	125.04
5	B	808	HEM	O2D-CGD-CBD	2.56	122.25	114.03
5	B	807	HEM	CHD-C1D-C2D	-2.56	120.99	124.98
5	B	809	HEM	CHC-C1C-NC	2.53	127.17	124.44
5	B	807	HEM	CAD-C3D-C2D	2.52	132.58	127.88
5	A	807	HEM	O2A-CGA-CBA	2.52	122.12	114.03
5	A	809	HEM	CHC-C1C-NC	2.46	127.10	124.44
5	B	805	HEM	O2D-CGD-O1D	-2.44	117.22	123.30
5	B	805	HEM	CBB-CAB-C3B	-2.44	115.50	127.62
5	A	807	HEM	CHD-C4C-NC	2.43	127.07	124.44
5	A	805	HEM	CBB-CAB-C3B	-2.43	115.52	127.62
5	B	805	HEM	CHA-C4D-C3D	-2.43	120.76	125.33
5	B	808	HEM	CBB-CAB-C3B	-2.39	115.75	127.62
5	B	806	HEM	CHD-C4C-NC	2.38	127.01	124.44
5	A	808	HEM	CBB-CAB-C3B	-2.37	115.81	127.62
5	A	806	HEM	C1A-CHA-C4D	-2.37	120.71	126.34
5	A	809	HEM	CHA-C4D-C3D	-2.37	120.89	125.33
5	B	806	HEM	CAD-C3D-C4D	2.36	128.78	124.66
5	B	806	HEM	CHA-C4D-C3D	-2.35	120.91	125.33
5	A	809	HEM	C1A-CHA-C4D	-2.35	120.76	126.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	B	807	HEM	C4A-NA-C1A	2.33	107.63	105.35
5	A	805	HEM	CHA-C4D-C3D	-2.32	120.96	125.33
5	A	805	HEM	C2A-C1A-NA	-2.32	107.55	110.15
5	B	808	HEM	C2A-C1A-NA	-2.31	107.56	110.15
5	A	808	HEM	CMD-C2D-C1D	2.30	128.54	125.04
5	B	808	HEM	CHD-C4C-NC	2.28	126.90	124.44
5	A	808	HEM	CHD-C4C-NC	2.28	126.90	124.44
5	B	808	HEM	O2A-CGA-CBA	2.26	121.31	114.03
5	B	806	HEM	C3A-C4A-NA	-2.25	106.65	110.08
5	A	806	HEM	C3A-C4A-NA	-2.25	106.66	110.08
5	B	808	HEM	CHD-C1D-C2D	-2.24	121.48	124.98
5	A	807	HEM	C4C-CHD-C1D	-2.23	121.24	126.06
5	B	807	HEM	CHD-C4C-NC	2.21	126.83	124.44
5	B	807	HEM	C1A-CHA-C4D	-2.19	121.14	126.34
5	A	807	HEM	CAD-C3D-C2D	2.18	131.94	127.88
5	B	805	HEM	C4C-CHD-C1D	-2.18	121.35	126.06
5	B	809	HEM	C3A-C4A-NA	-2.18	106.76	110.08
5	A	809	HEM	CAD-CBD-CGD	-2.18	108.91	113.60
5	B	806	HEM	C1A-CHA-C4D	-2.16	121.21	126.34
5	A	809	HEM	O2A-CGA-CBA	2.15	120.93	114.03
5	B	808	HEM	CHC-C1C-NC	2.13	126.75	124.44
5	A	805	HEM	C3A-C4A-NA	-2.12	106.85	110.08
5	A	805	HEM	CAA-CBA-CGA	-2.12	109.05	113.60
5	B	808	HEM	CAD-C3D-C4D	2.12	128.35	124.66
5	A	808	HEM	C3A-C4A-NA	-2.09	106.89	110.08
5	A	806	HEM	CMD-C2D-C1D	2.09	128.23	125.04
5	B	806	HEM	O2A-CGA-CBA	2.09	120.75	114.03
5	B	809	HEM	C1A-CHA-C4D	-2.09	121.38	126.34
5	A	808	HEM	C4C-CHD-C1D	-2.08	121.58	126.06
5	A	806	HEM	CAA-CBA-CGA	-2.08	109.14	113.60
5	A	808	HEM	O2A-CGA-CBA	2.07	120.69	114.03
5	A	805	HEM	O2D-CGD-O1D	-2.05	118.20	123.30
5	A	808	HEM	CHC-C1C-NC	2.01	126.62	124.44
5	B	809	HEM	C2A-C1A-NA	-2.01	107.90	110.15
5	B	805	HEM	O2A-CGA-CBA	2.01	120.48	114.03
5	B	809	HEM	O2D-CGD-CBD	2.01	120.48	114.03

There are no chirality outliers.

All (39) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	807	HEM	C4D-C3D-CAD-CBD

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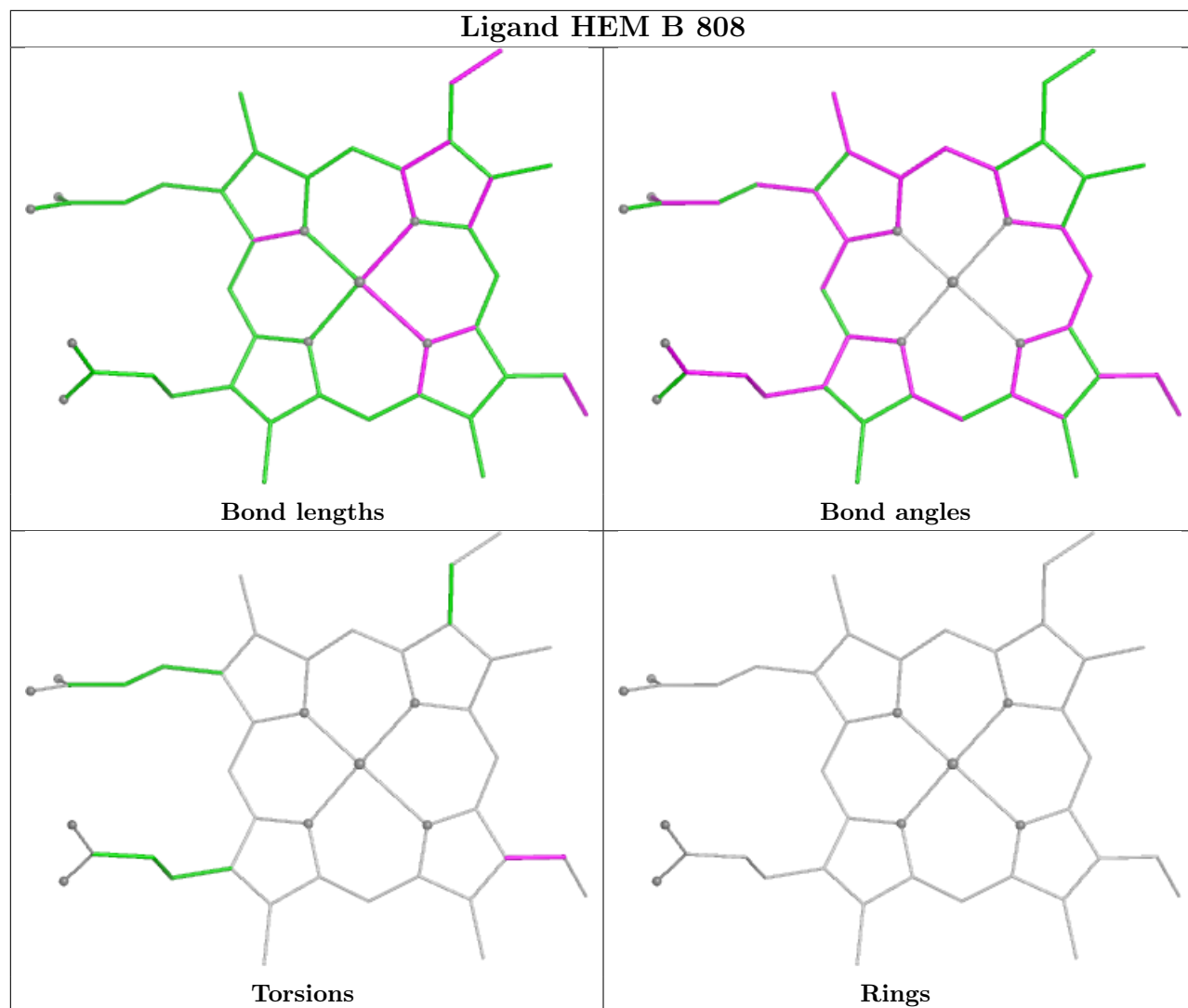
Mol	Chain	Res	Type	Atoms
5	B	807	HEM	C4D-C3D-CAD-CBD
5	A	807	HEM	C2D-C3D-CAD-CBD
5	B	807	HEM	C2D-C3D-CAD-CBD
5	A	809	HEM	C2A-CAA-CBA-CGA
5	B	809	HEM	C2A-CAA-CBA-CGA
6	A	811	PEG	O2-C3-C4-O4
5	A	809	HEM	C3D-CAD-CBD-CGD
6	A	810	PEG	O2-C3-C4-O4
5	B	809	HEM	C3D-CAD-CBD-CGD
6	A	812	PEG	O1-C1-C2-O2
6	A	811	PEG	O1-C1-C2-O2
6	A	811	PEG	C4-C3-O2-C2
6	A	812	PEG	C1-C2-O2-C3
5	B	805	HEM	C4B-C3B-CAB-CBB
5	B	805	HEM	CAA-CBA-CGA-O1A
5	A	806	HEM	CAA-CBA-CGA-O1A
5	B	809	HEM	CAD-CBD-CGD-O1D
5	A	806	HEM	CAD-CBD-CGD-O1D
5	A	809	HEM	CAD-CBD-CGD-O2D
5	B	805	HEM	CAA-CBA-CGA-O2A
5	A	809	HEM	CAD-CBD-CGD-O1D
5	B	806	HEM	CAA-CBA-CGA-O1A
5	A	806	HEM	CAA-CBA-CGA-O2A
6	A	812	PEG	O2-C3-C4-O4
5	A	805	HEM	CAA-CBA-CGA-O2A
5	A	806	HEM	CAD-CBD-CGD-O2D
5	A	805	HEM	CAA-CBA-CGA-O1A
5	B	809	HEM	CAD-CBD-CGD-O2D
5	B	806	HEM	CAA-CBA-CGA-O2A
5	A	805	HEM	C4B-C3B-CAB-CBB
5	A	808	HEM	C4B-C3B-CAB-CBB
5	B	808	HEM	C4B-C3B-CAB-CBB
5	A	808	HEM	CAD-CBD-CGD-O2D
5	B	807	HEM	CAD-CBD-CGD-O2D
5	A	808	HEM	CAD-CBD-CGD-O1D
5	B	805	HEM	CAD-CBD-CGD-O1D
5	B	805	HEM	CAD-CBD-CGD-O2D
5	B	807	HEM	CAD-CBD-CGD-O1D

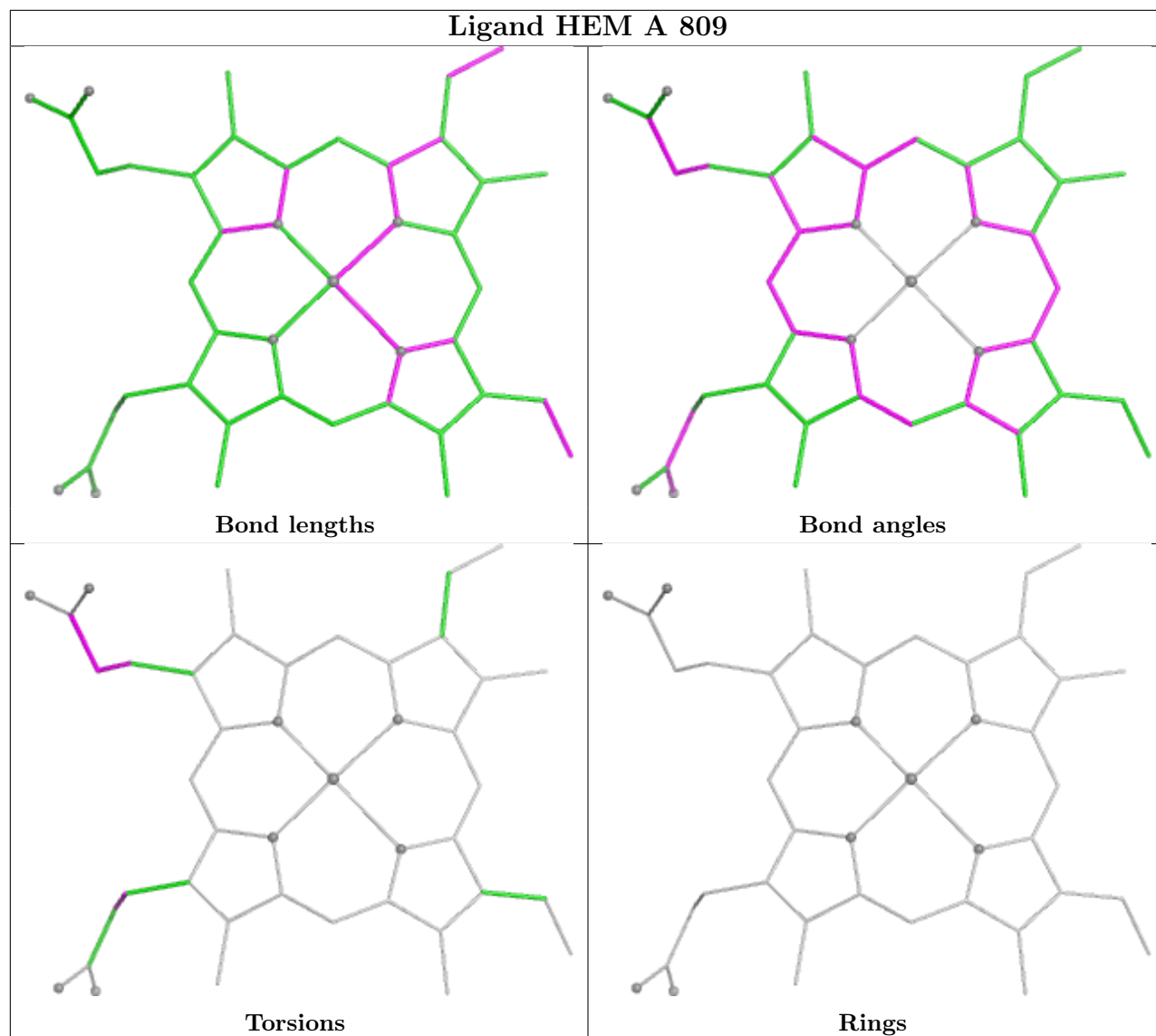
There are no ring outliers.

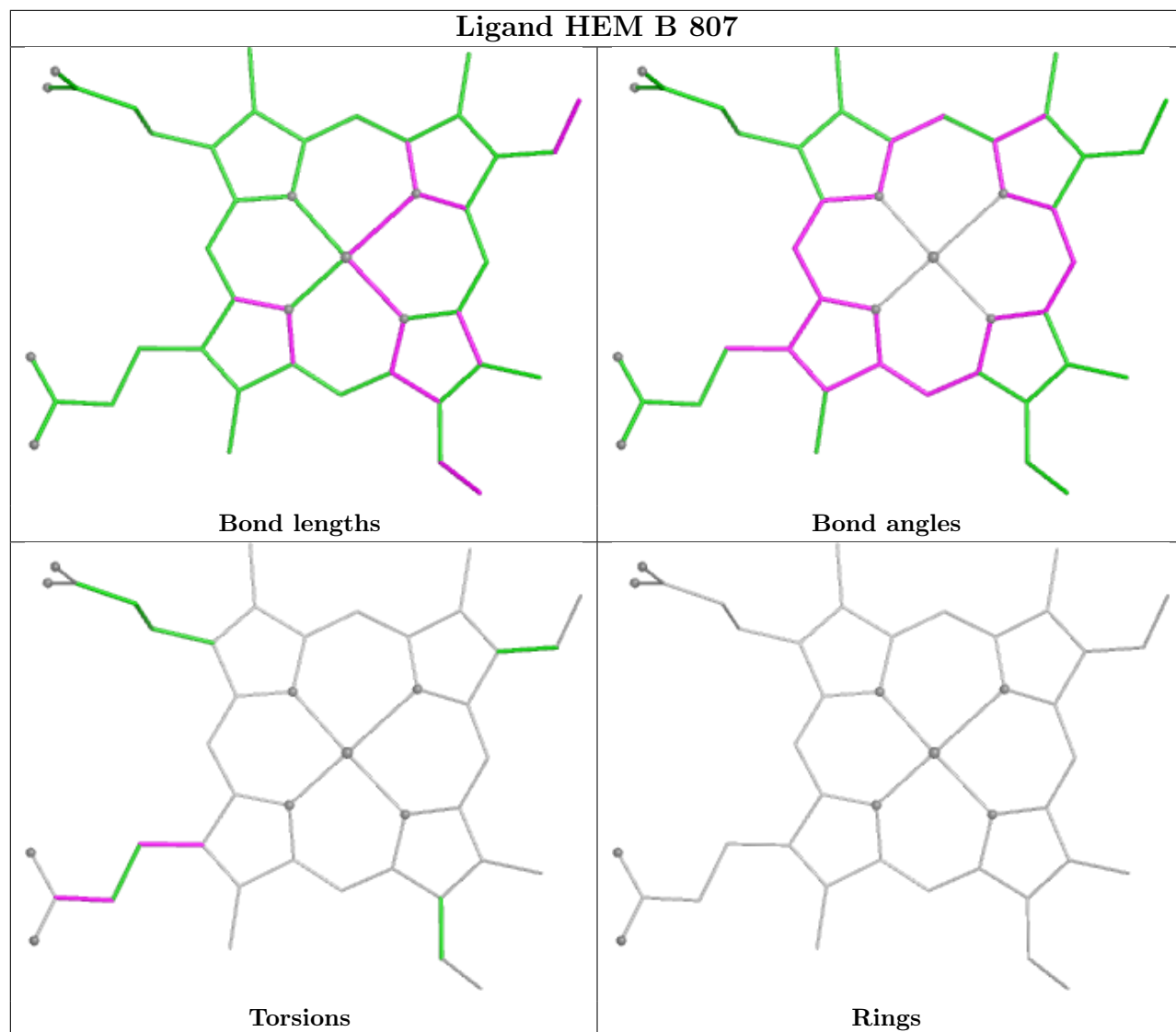
12 monomers are involved in 105 short contacts:

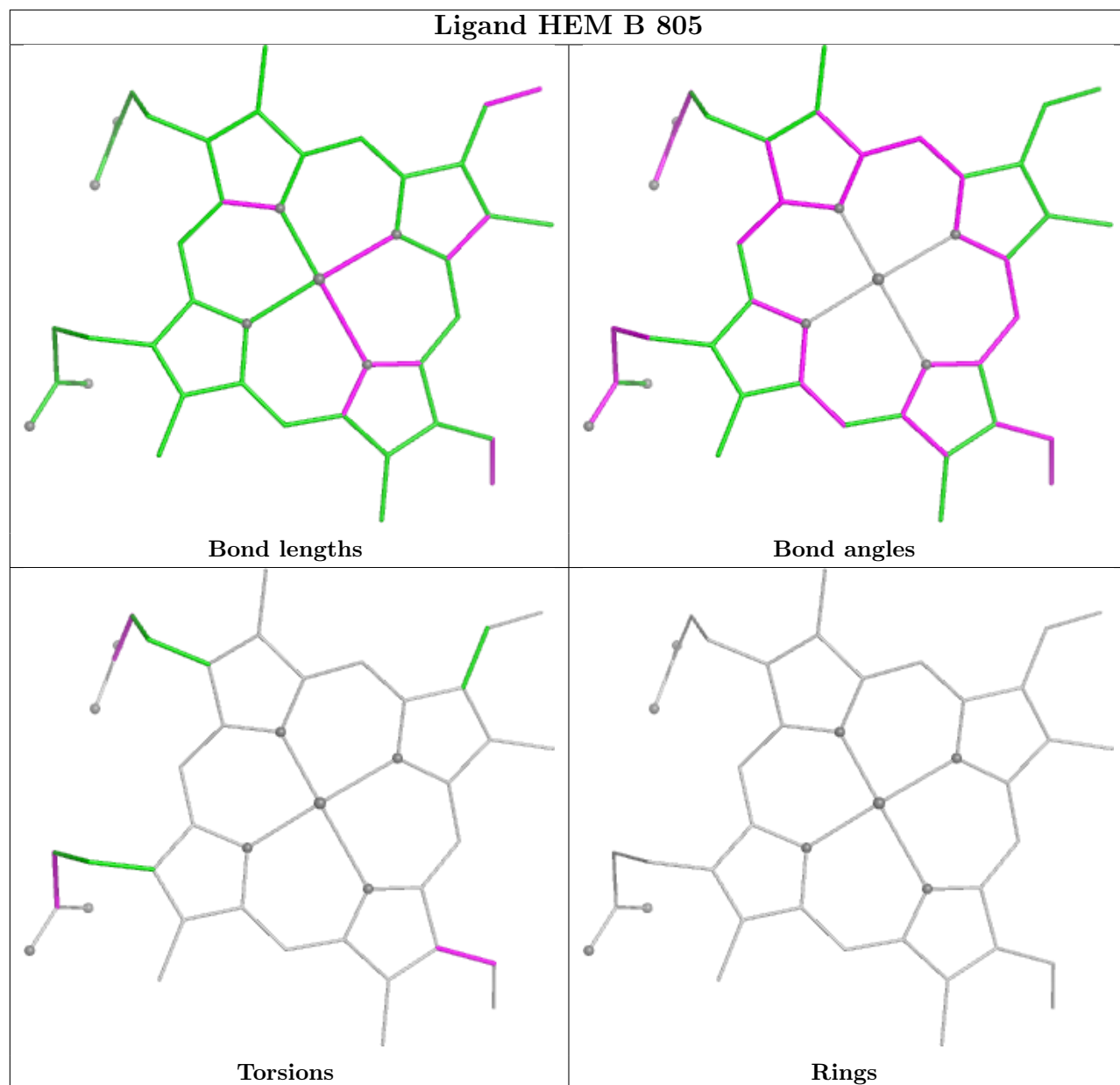
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	B	808	HEM	13	0
5	A	809	HEM	10	0
5	B	807	HEM	10	0
5	B	805	HEM	12	0
5	A	808	HEM	8	0
5	B	809	HEM	9	0
5	A	807	HEM	11	0
5	A	805	HEM	12	0
4	B	804	NO2	1	0
5	B	806	HEM	9	0
5	A	806	HEM	9	0
4	A	804	NO2	1	0

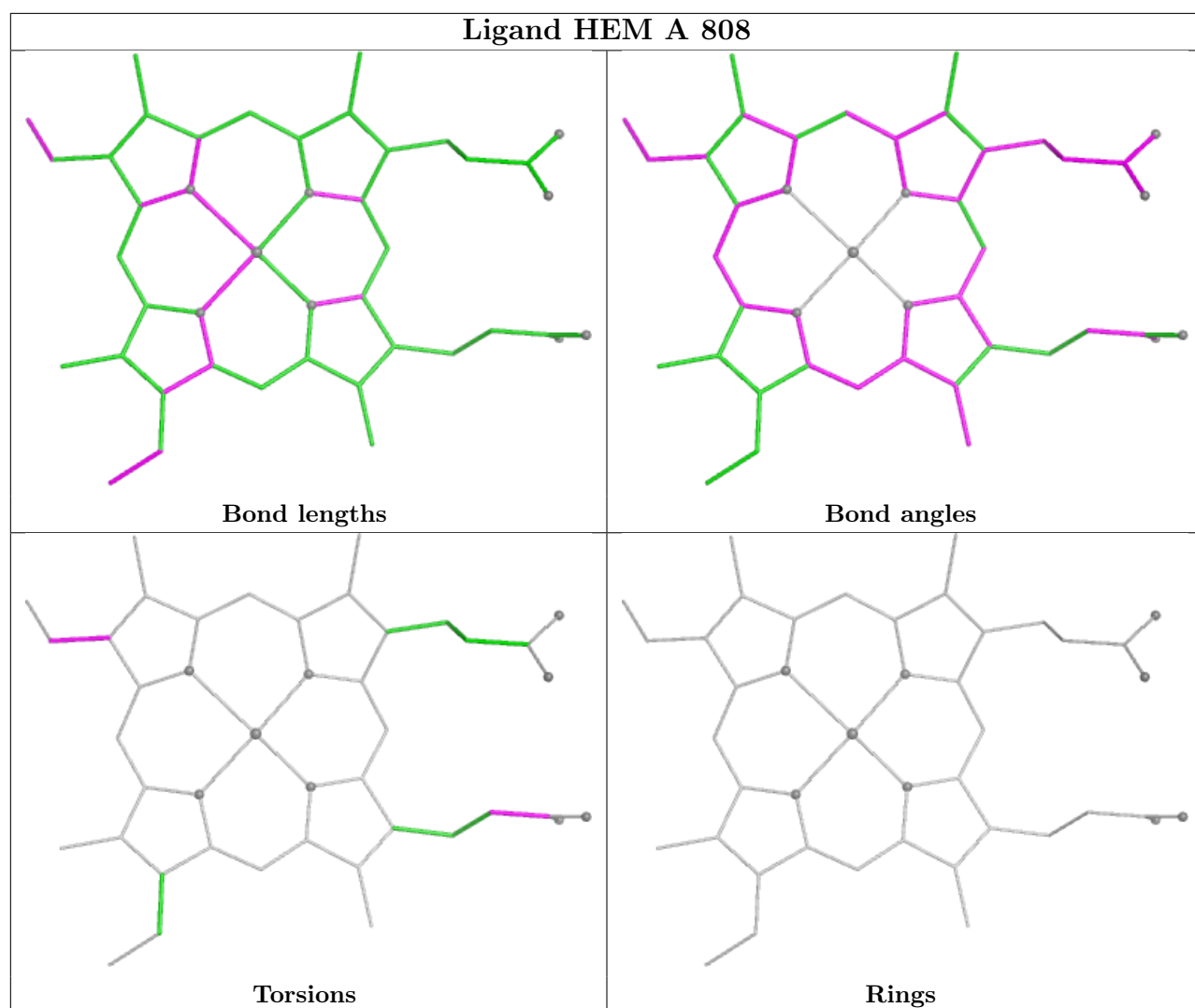
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less 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.

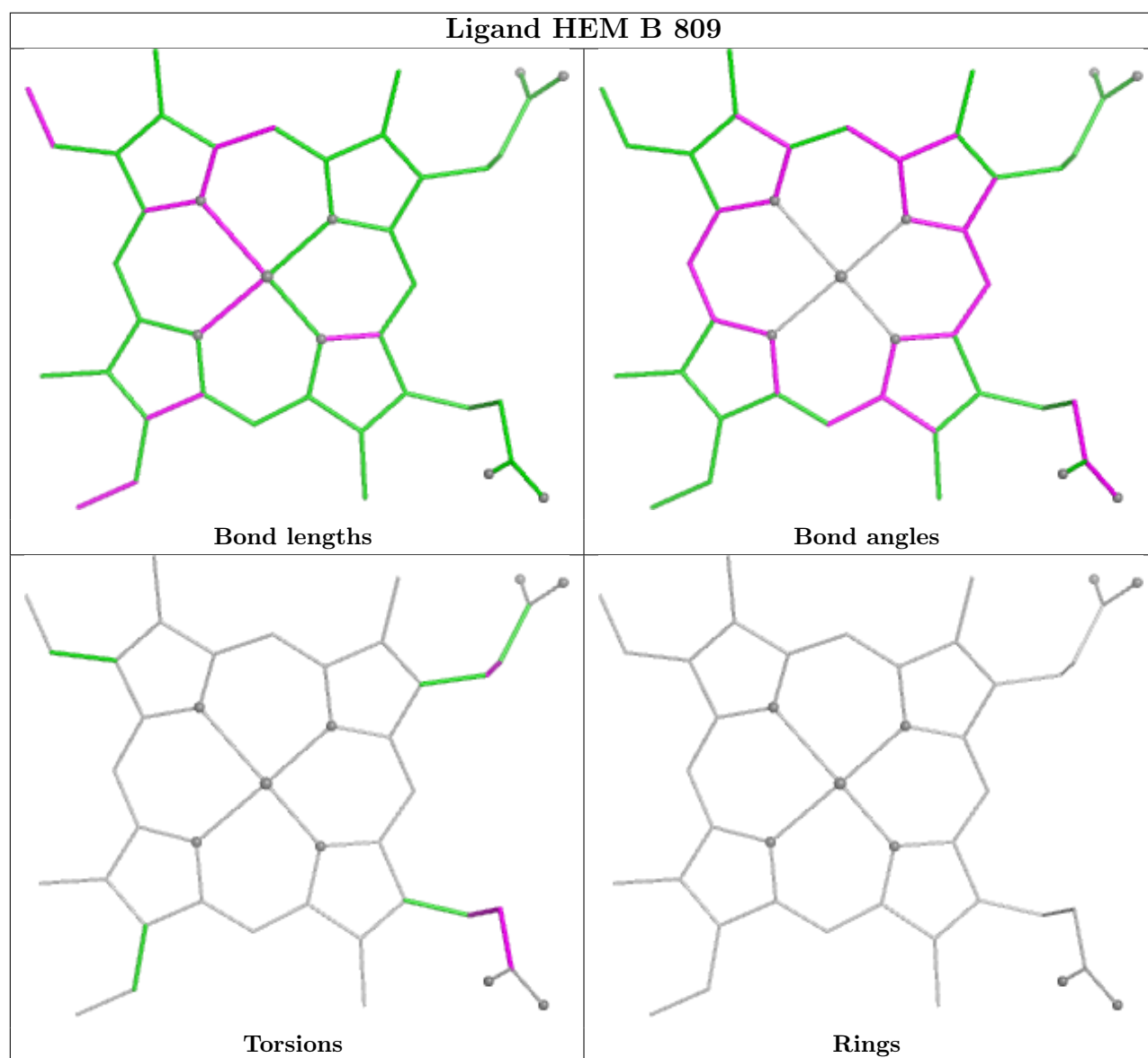


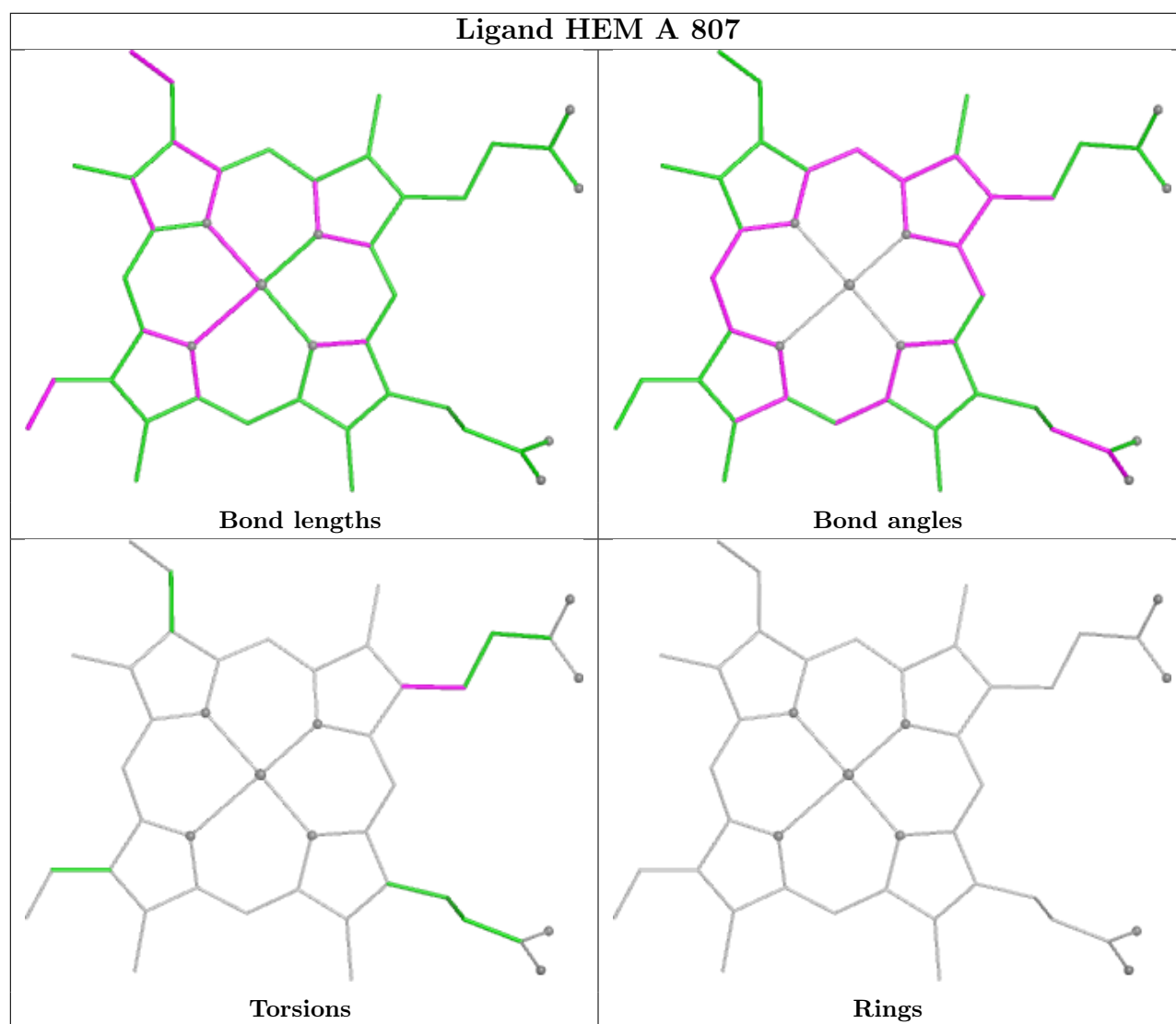


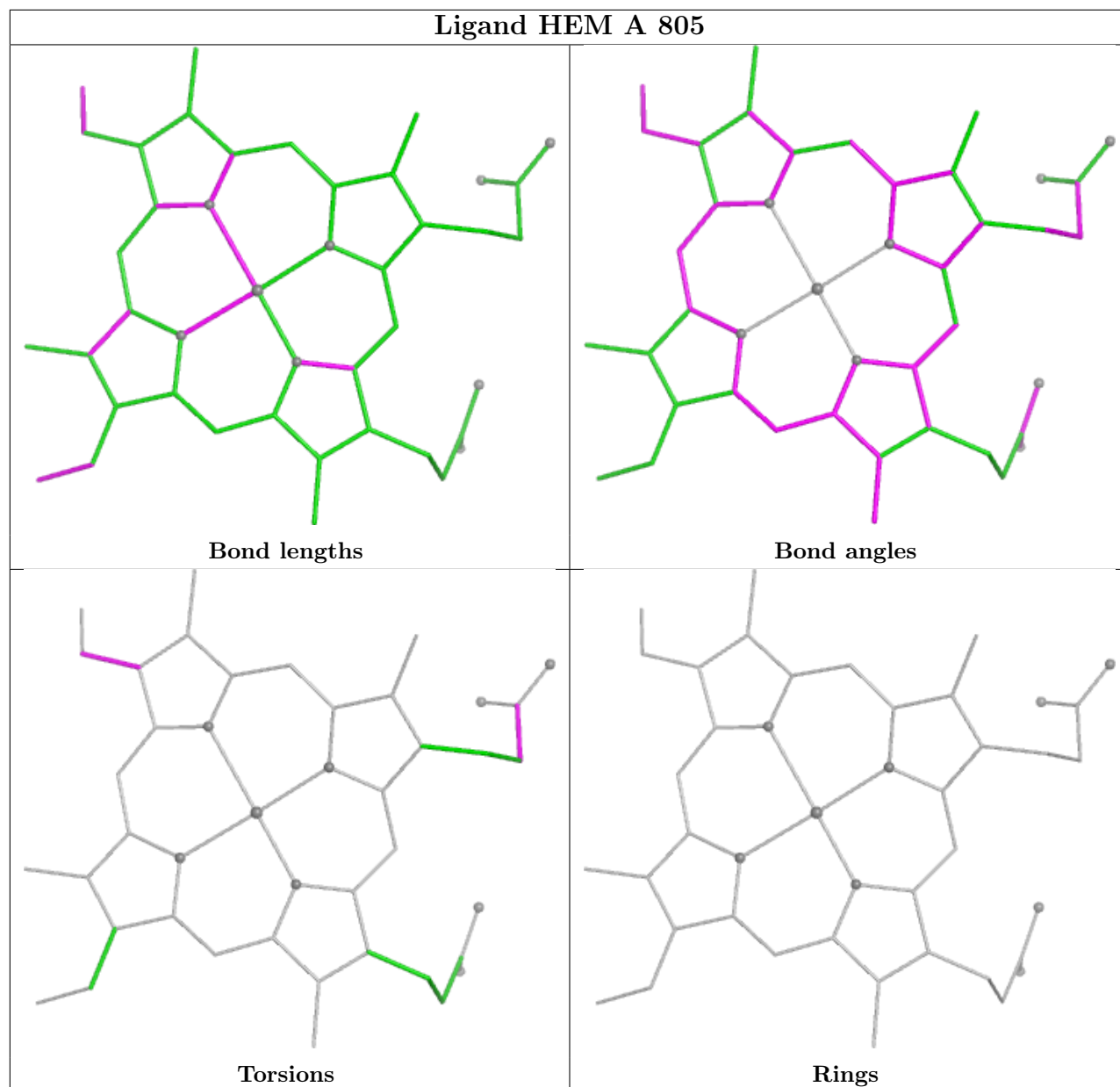


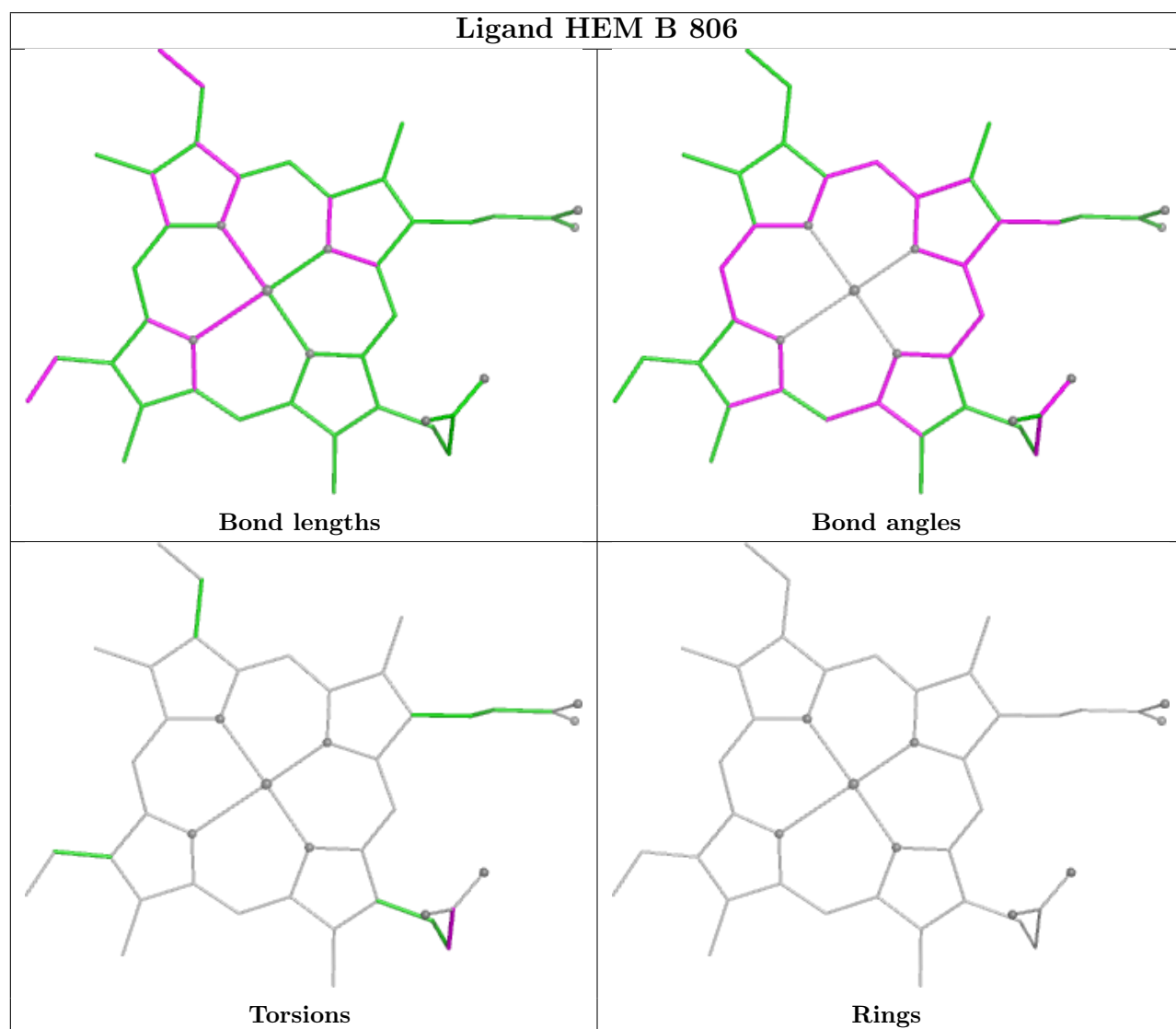
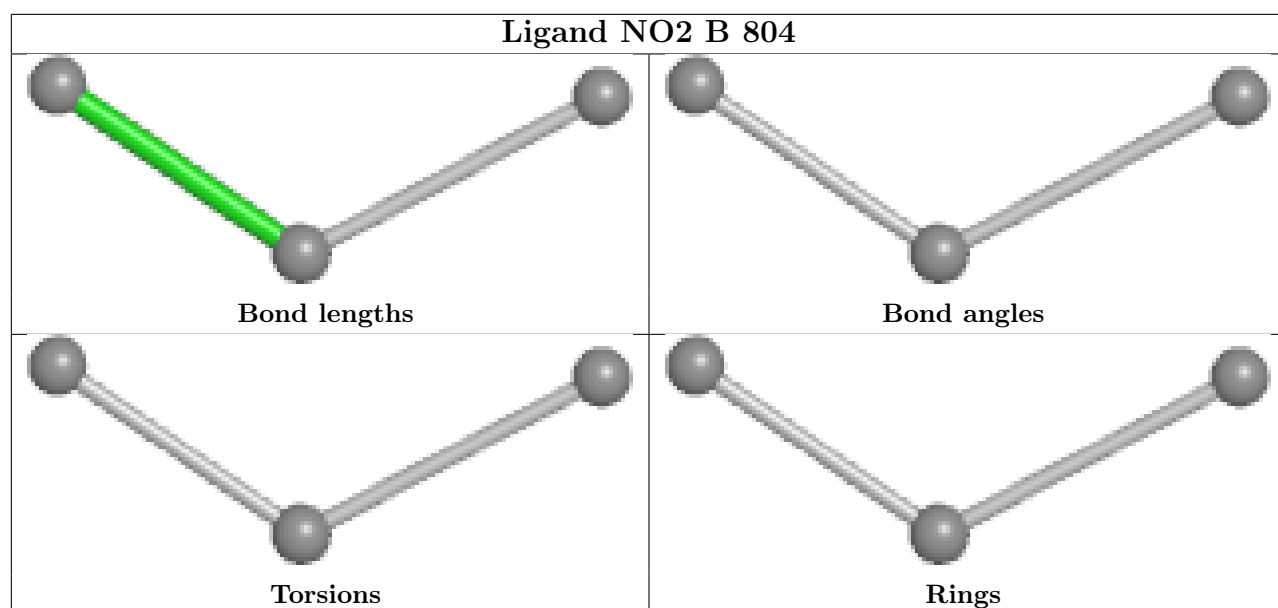


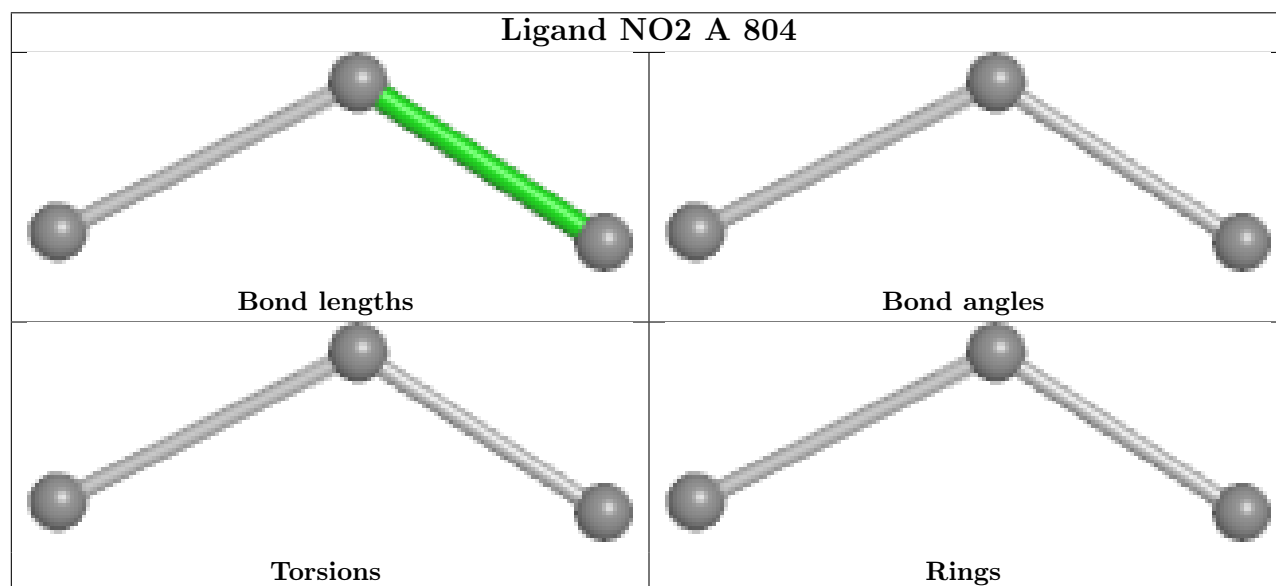
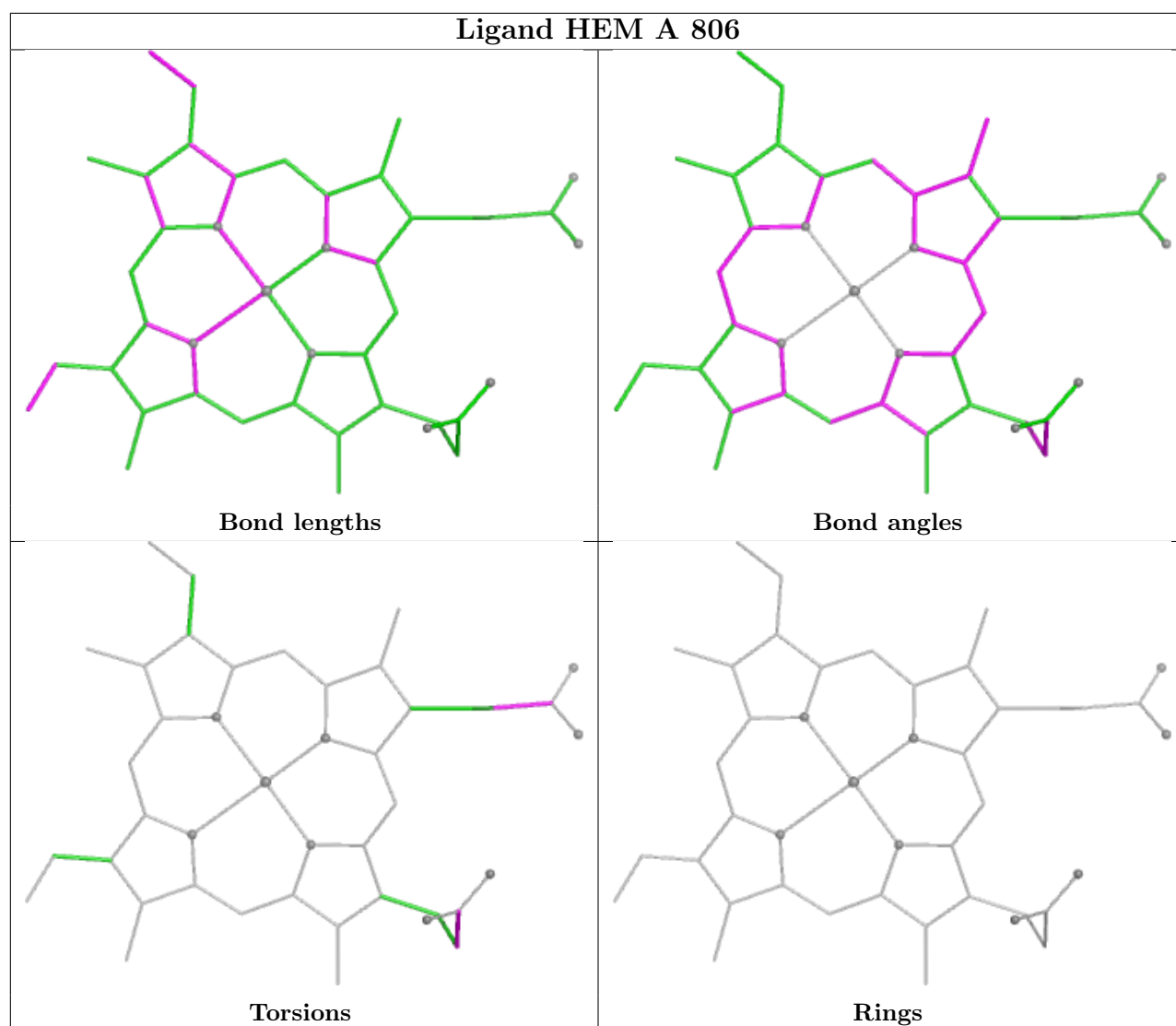












5.7 Other polymers

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, 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	561/620 (90%)	0.33	11 (1%) 65 66	24, 36, 54, 77	1 (0%)
1	B	563/620 (90%)	0.48	23 (4%) 41 43	24, 37, 63, 86	1 (0%)
All	All	1124/1240 (90%)	0.41	34 (3%) 52 54	24, 37, 60, 86	2 (0%)

All (34) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	396	ALA	4.2
1	B	309	VAL	3.9
1	B	48	LEU	3.5
1	B	395	GLY	3.2
1	B	285	SER	2.9
1	B	464	ASN	2.9
1	B	311	GLU	2.8
1	B	394	GLU	2.8
1	B	306	GLY	2.8
1	A	570	ASN	2.6
1	B	188	VAL	2.6
1	B	470	SER	2.5
1	B	397	LYS	2.5
1	A	192	VAL	2.4
1	A	189	ASP	2.4
1	B	177	ASN	2.4
1	A	391	TYR	2.3
1	B	47	SER	2.3
1	A	191	ILE	2.3
1	B	543	ASP	2.2
1	A	275	LYS	2.2
1	B	243	VAL	2.2
1	B	282	VAL	2.2
1	A	166	ALA	2.2

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Mol	Chain	Res	Type	RSRZ
1	B	542	LYS	2.1
1	A	463	GLY	2.1
1	B	281	ILE	2.1
1	B	49	LEU	2.1
1	A	396	ALA	2.1
1	A	471	ASP	2.1
1	B	64	PRO	2.1
1	A	285	SER	2.0
1	B	209	VAL	2.0
1	B	50	SER	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
6	PEG	A	810	7/7	0.84	0.16	50,53,55,55	0
6	PEG	A	812	7/7	0.88	0.14	38,39,42,44	0
4	NO2	A	804	3/3	0.90	0.16	41,41,45,46	0
6	PEG	A	811	7/7	0.91	0.13	56,58,59,59	0
4	NO2	B	804	3/3	0.91	0.18	37,37,40,41	0
5	HEM	B	806	43/43	0.92	0.12	40,42,45,50	0
5	HEM	A	806	43/43	0.92	0.12	37,41,43,44	0
5	HEM	A	808	43/43	0.94	0.10	25,29,31,32	0
5	HEM	B	807	43/43	0.94	0.10	29,30,31,33	0
5	HEM	B	808	43/43	0.94	0.10	25,30,31,32	0
5	HEM	B	809	43/43	0.95	0.10	30,34,42,46	0
5	HEM	A	807	43/43	0.95	0.09	27,29,31,32	0
5	HEM	A	809	43/43	0.95	0.09	31,32,35,41	0

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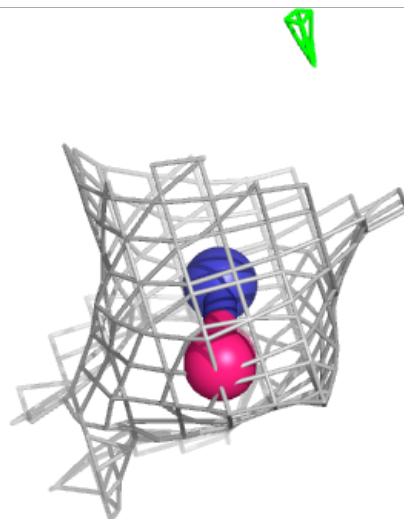
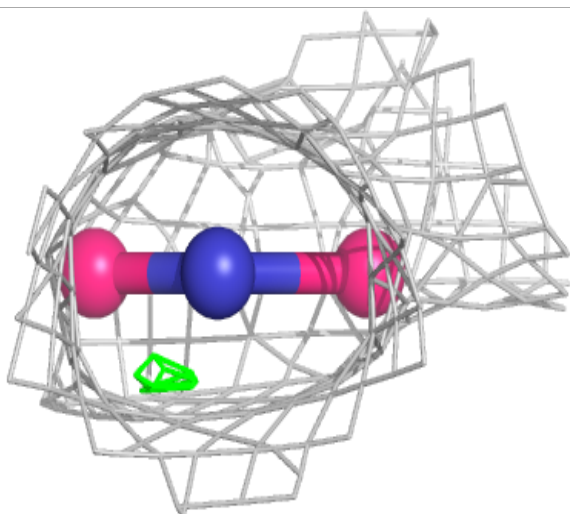
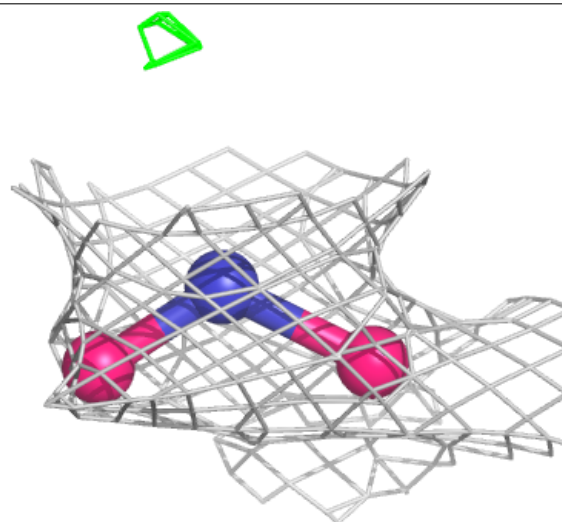
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
5	HEM	B	805	43/43	0.95	0.10	25,30,34,35	0
5	HEM	A	805	43/43	0.96	0.09	27,28,29,31	0
2	CA	B	801	1/1	0.98	0.04	28,28,28,28	0
3	SR	B	803	1/1	0.99	0.09	51,51,51,51	0
2	CA	A	801	1/1	0.99	0.02	21,21,21,21	0
3	SR	A	802	1/1	0.99	0.07	52,52,52,52	0
3	SR	B	802	1/1	0.99	0.09	46,46,46,46	0
3	SR	A	803	1/1	1.00	0.06	42,42,42,42	1

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.

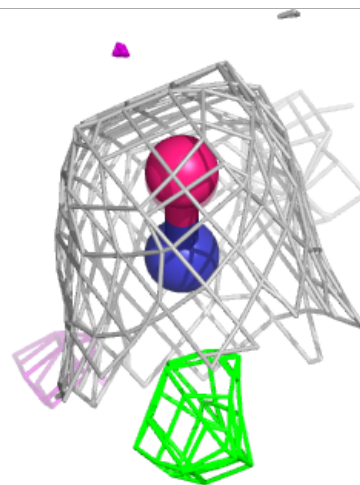
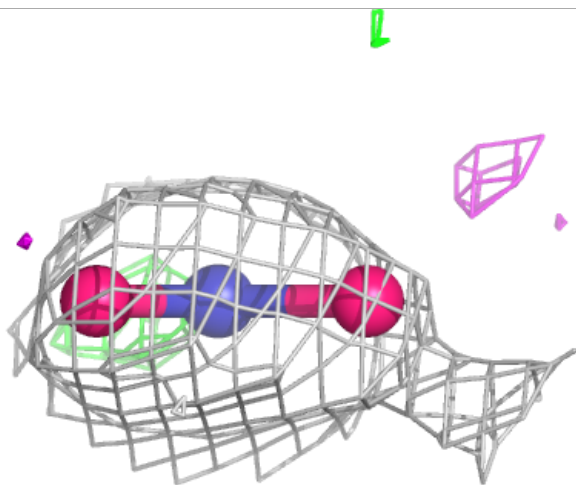
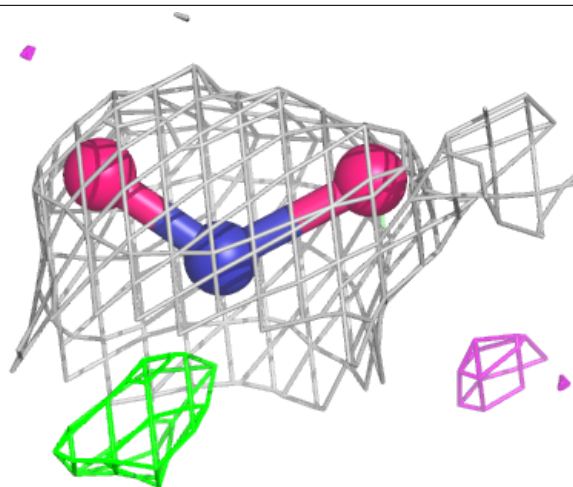
Electron density around NO2 A 804:

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



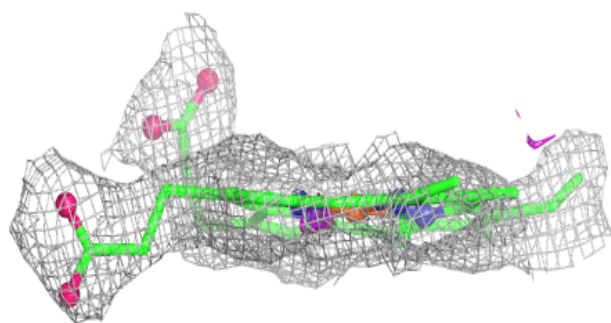
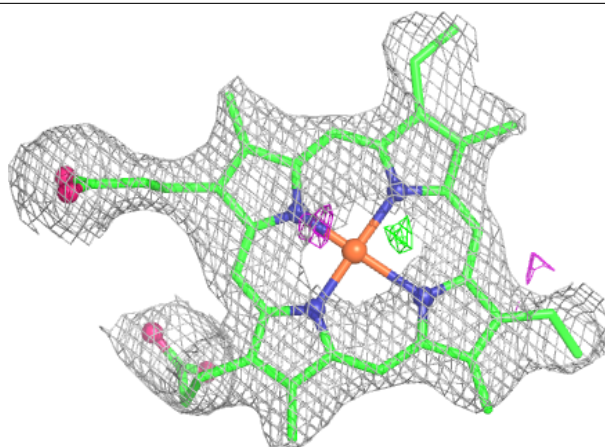
Electron density around NO2 B 804:

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



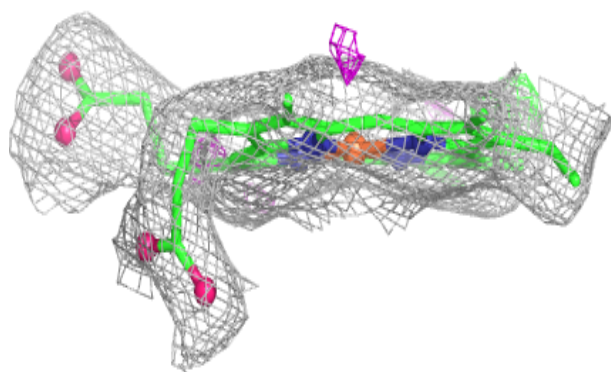
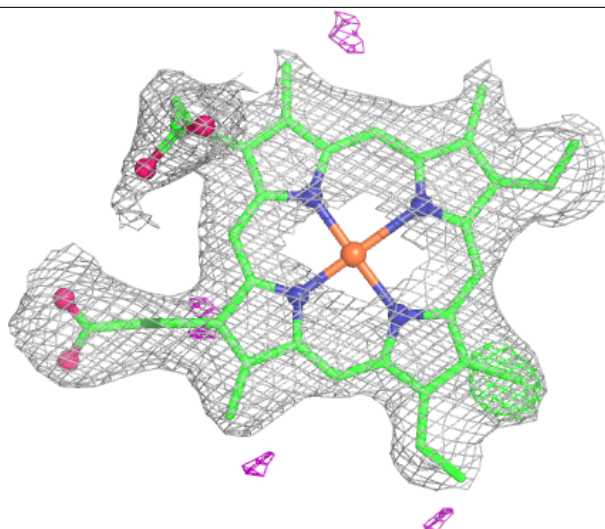
Electron density around HEM B 806:

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



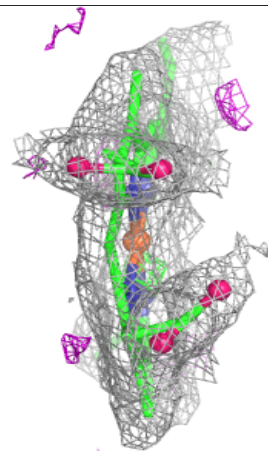
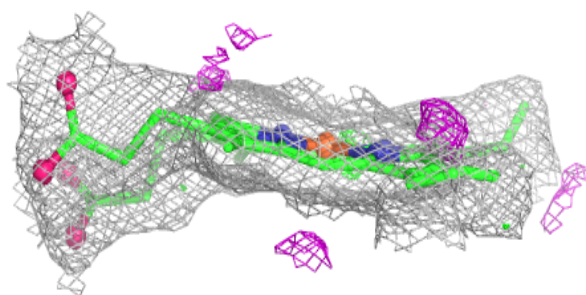
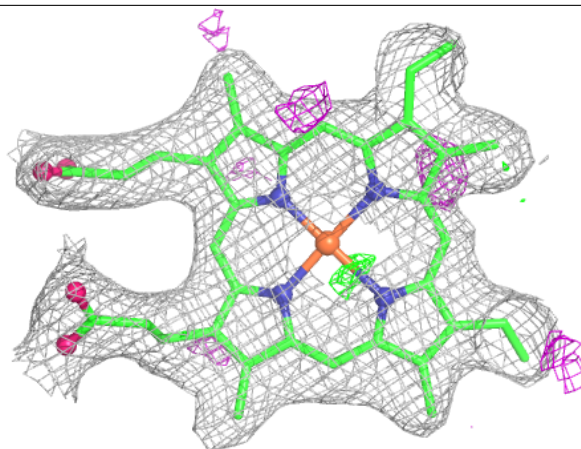
Electron density around HEM A 806:

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



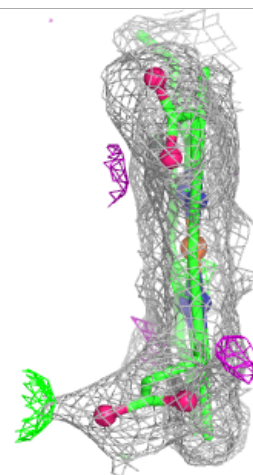
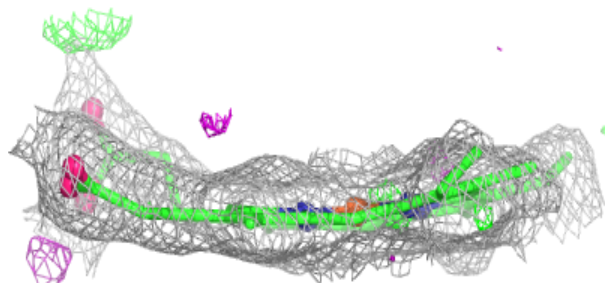
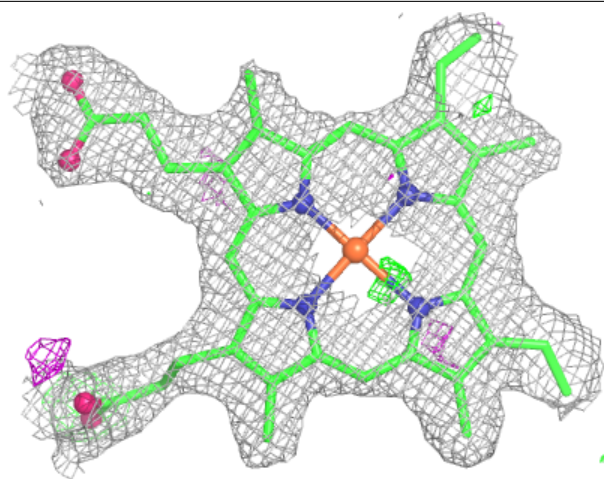
Electron density around HEM A 808:

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



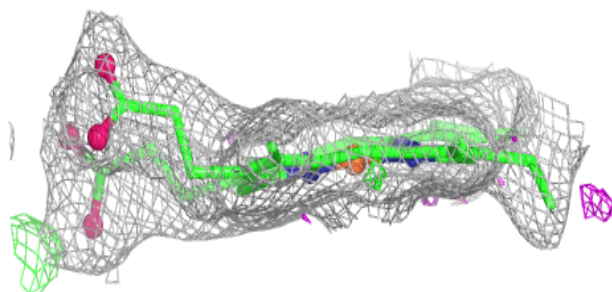
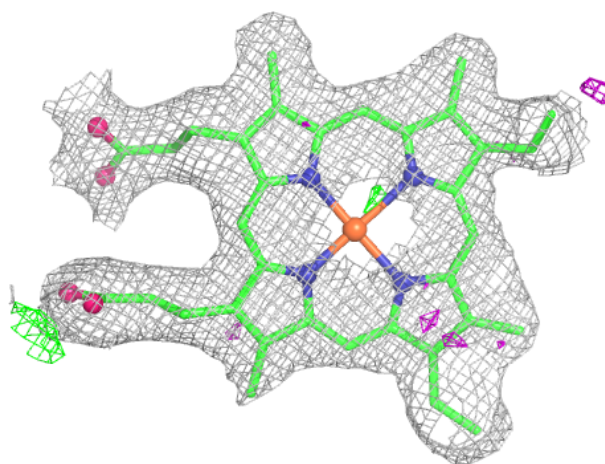
Electron density around HEM B 807:

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



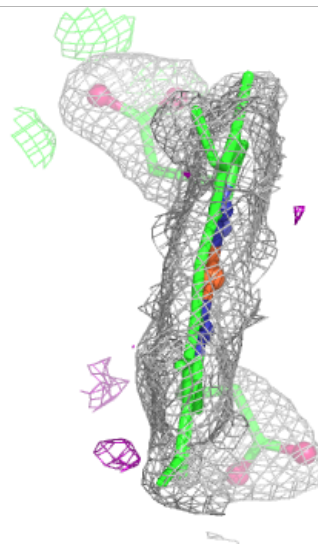
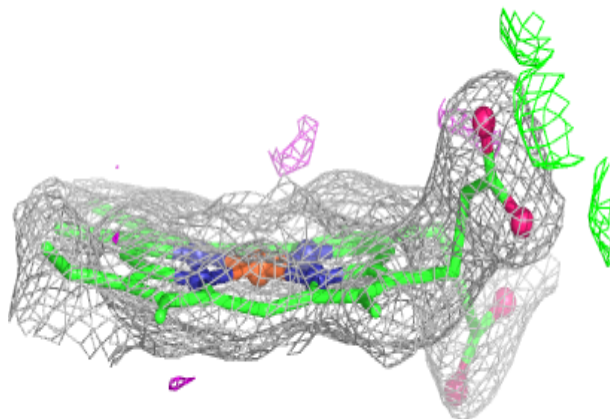
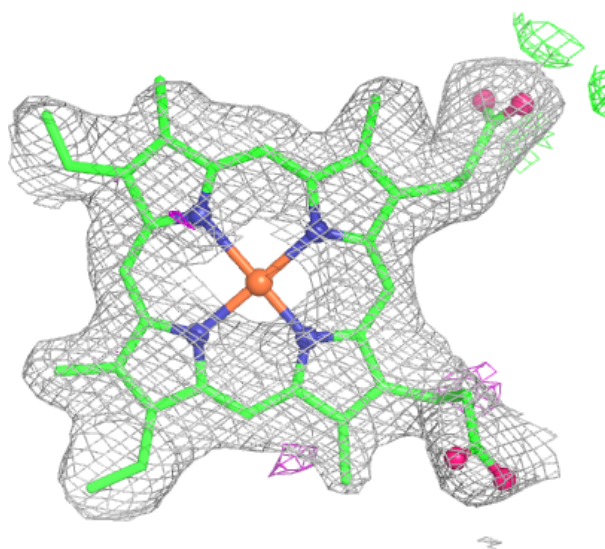
Electron density around HEM B 808:

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



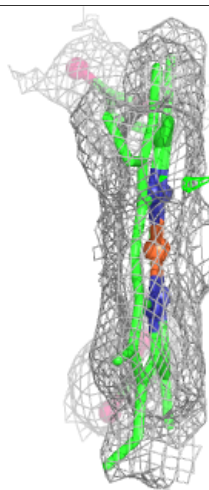
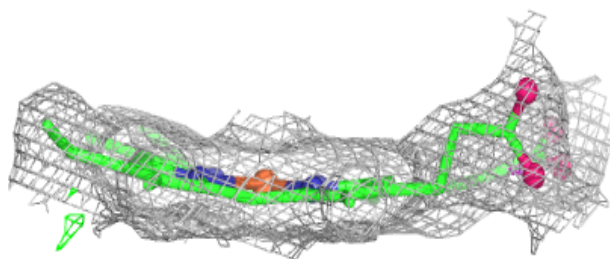
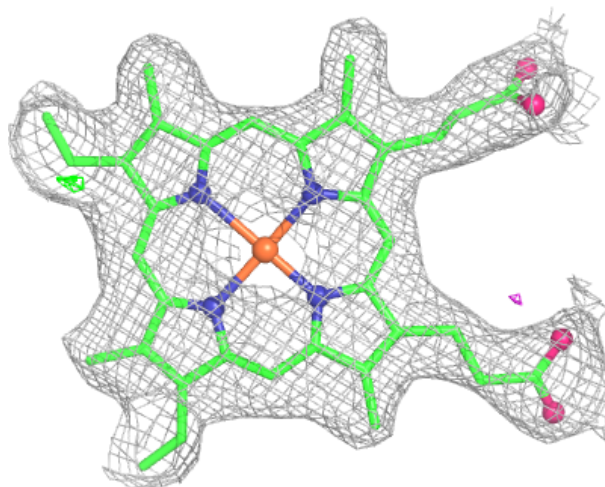
Electron density around HEM B 809:

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



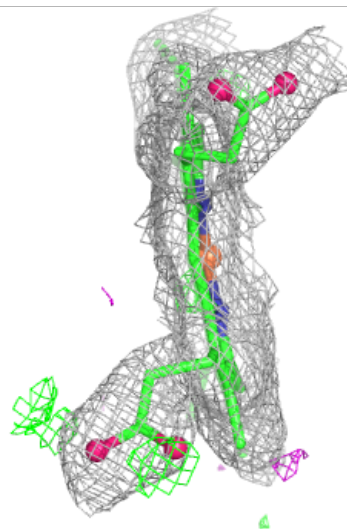
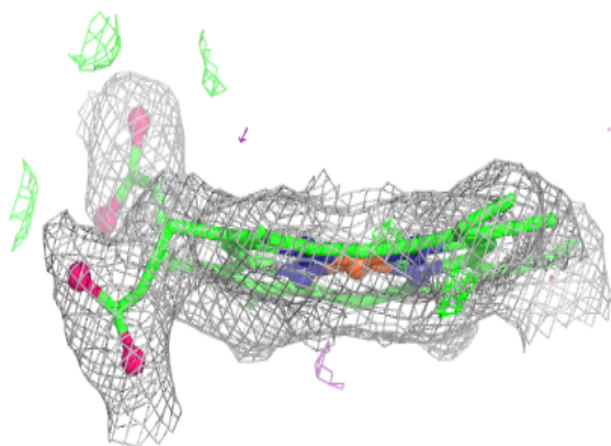
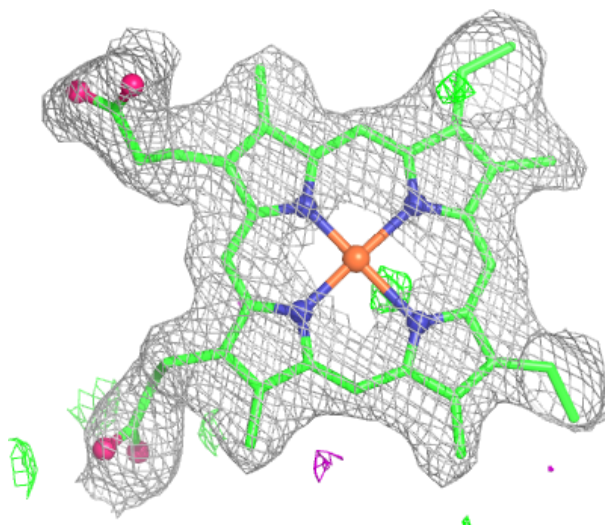
Electron density around HEM A 807:

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



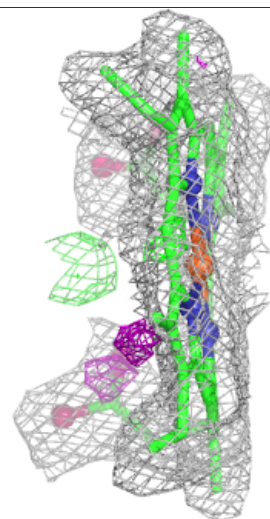
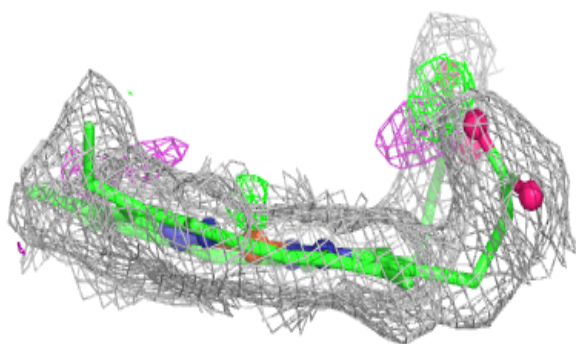
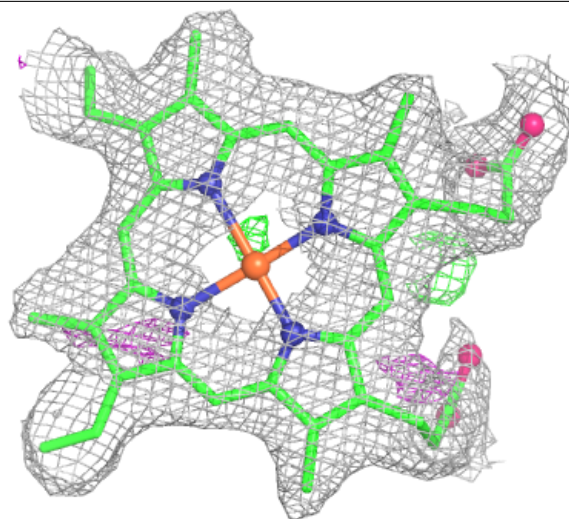
Electron density around HEM A 809:

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



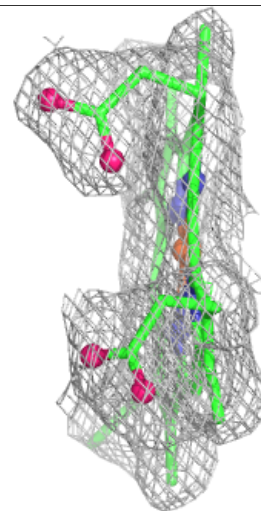
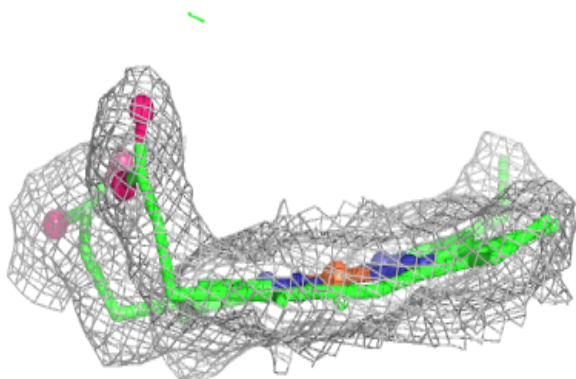
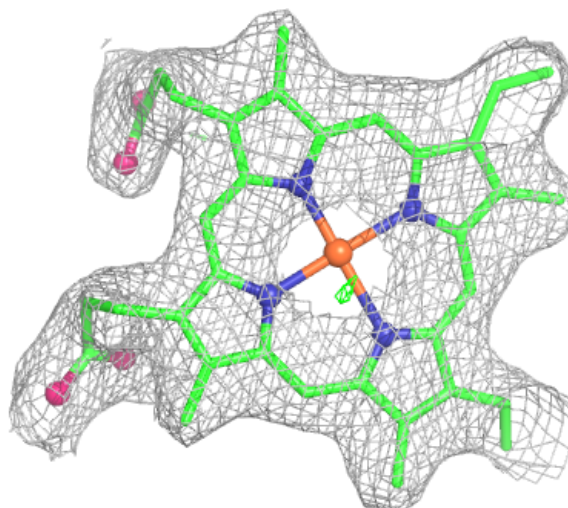
Electron density around HEM B 805:

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



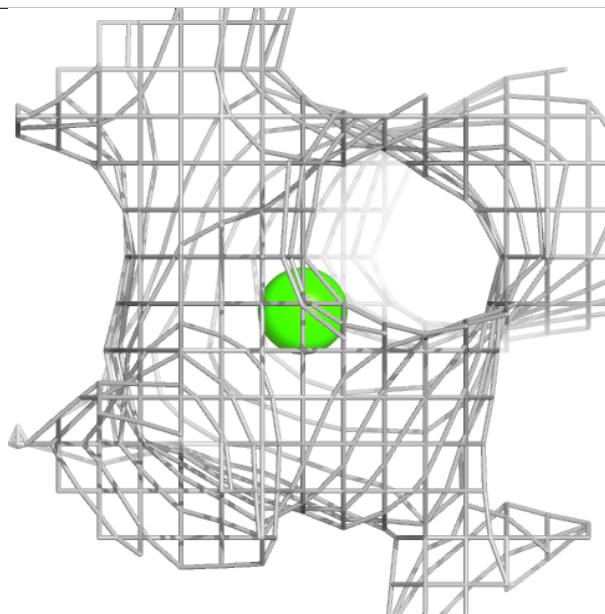
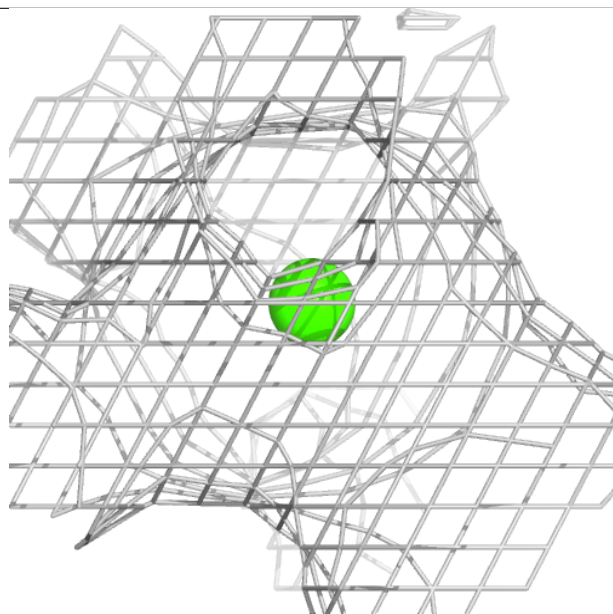
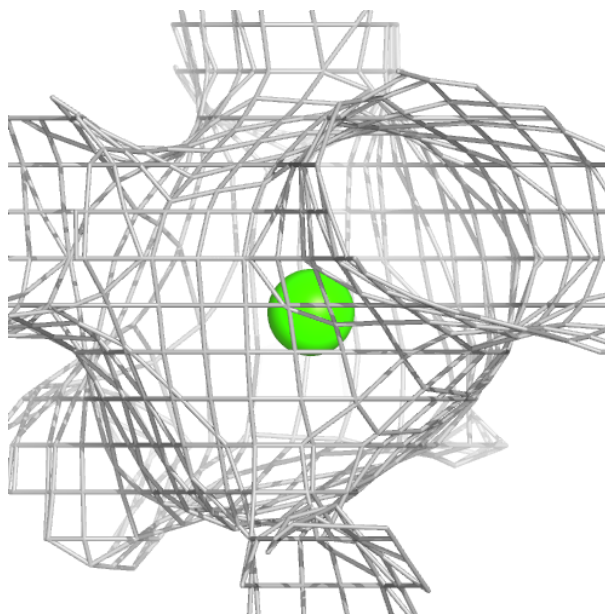
Electron density around HEM A 805:

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



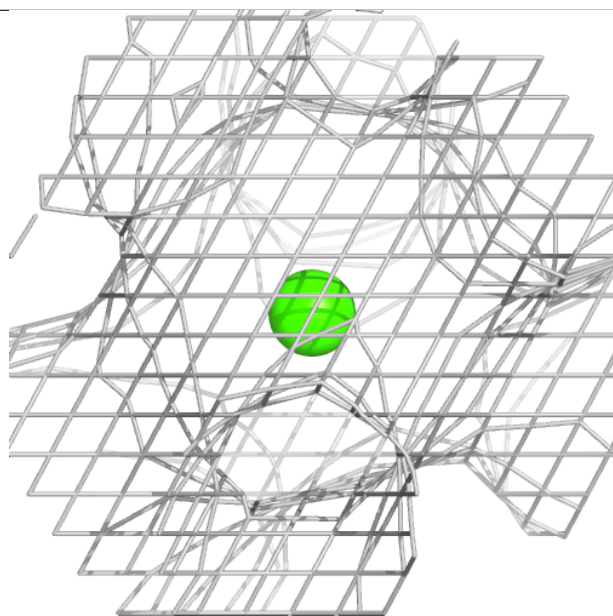
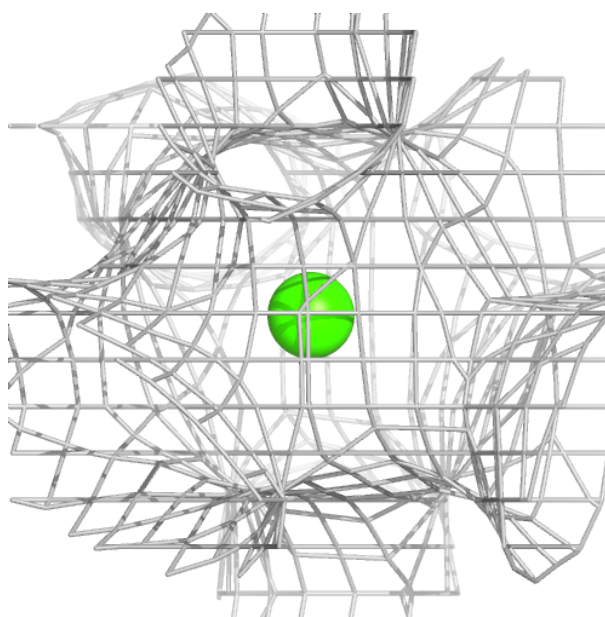
Electron density around CA B 801:

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



Electron density around CA A 801:

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



6.5 Other polymers ⓘ

There are no such residues in this entry.