



# wwPDB X-ray Structure Validation Summary Report ⓘ

May 14, 2020 – 03:38 pm BST

PDB ID : 5D8Y  
Title : 2.05Å resolution structure of iron bound BfrB (L68A E81A) from *Pseudomonas aeruginosa*  
Authors : Lovell, S.; Battaile, K.P.; Wang, Y.; Yao, H.; Rivera, M.  
Deposited on : 2015-08-18  
Resolution : 2.05 Å(reported)

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

We welcome your comments at [validation@mail.wwpdb.org](mailto: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.

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

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

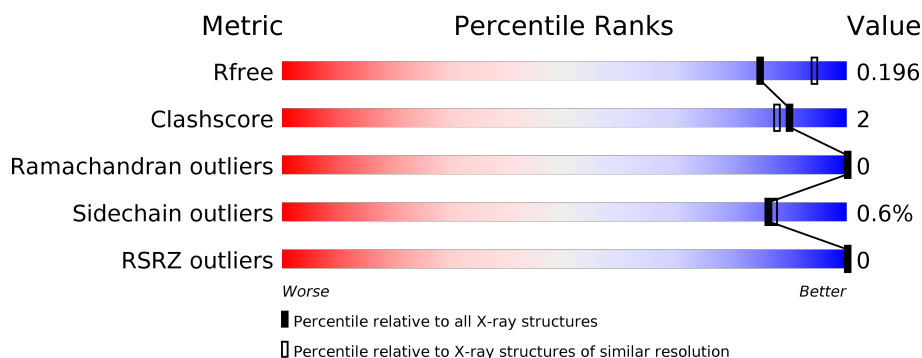
# 1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.05 Å.

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



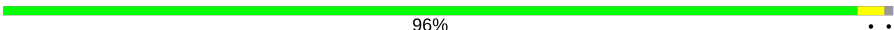
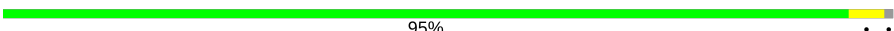

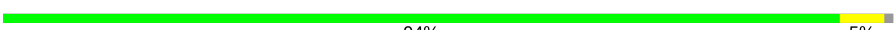








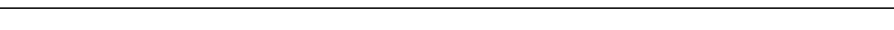


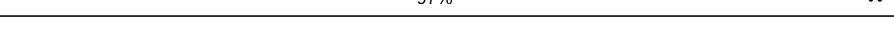
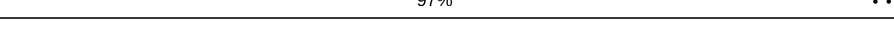
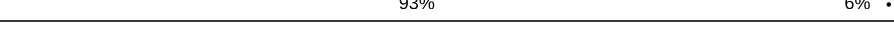
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	1692 (2.04-2.04)
Clashscore	141614	1773 (2.04-2.04)
Ramachandran outliers	138981	1752 (2.04-2.04)
Sidechain outliers	138945	1752 (2.04-2.04)
RSRZ outliers	127900	1672 (2.04-2.04)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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	158	<div> <div>94%</div> <div> <div></div> <div></div> <div></div> <div></div> </div> <div>..</div> </div>
1	B	158	<div> <div>96%</div> <div> <div></div> <div></div> <div></div> <div></div> </div> <div>..</div> </div>
1	C	158	<div> <div>95%</div> <div> <div></div> <div></div> <div></div> <div></div> </div> <div>..</div> </div>
1	D	158	<div> <div>94%</div> <div> <div></div> <div></div> <div></div> <div></div> </div> <div>5% .</div> </div>
1	E	158	<div> <div>93%</div> <div> <div></div> <div></div> <div></div> <div></div> </div> <div>6% .</div> </div>
1	F	158	<div> <div>96%</div> <div> <div></div> <div></div> <div></div> <div></div> </div> <div>..</div> </div>

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Mol	Chain	Length	Quality of chain
1	G	158	 96% ..
1	H	158	 95% ..
1	I	158	 96% ..
1	J	158	 94% 5% ..
1	K	158	 94% ..
1	L	158	 94% 5% ..
1	M	158	 96% ..
1	N	158	 94% 5% ..
1	O	158	 97% ..
1	P	158	 93% 6% ..
1	Q	158	 93% 6% ..
1	R	158	 96% ..
1	S	158	 97% ..
1	T	158	 92% 6% ..
1	U	158	 97% ..
1	V	158	 97% ..
1	W	158	 93% 6% ..
1	X	158	 96% ..

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	ACT	C	207	-	-	X	-
3	ACT	H	207	-	-	X	-
3	ACT	J	207	-	-	X	-
3	ACT	K	208	-	-	X	-
3	ACT	M	209	-	-	X	-
3	ACT	O	205	-	-	X	-
3	ACT	Q	205	-	-	X	-

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Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	ACT	T	207	-	-	X	-
3	ACT	U	208	-	-	X	-
3	ACT	V	206	-	-	X	-
3	ACT	W	206	-	-	X	-

## 2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 34099 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 Ferroxidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	156	Total	C	N	O	S	0	3	0
			1273	805	217	244	7			
1	B	156	Total	C	N	O	S	0	2	0
			1272	804	218	243	7			
1	C	156	Total	C	N	O	S	0	1	0
			1264	799	217	241	7			
1	D	156	Total	C	N	O	S	0	2	0
			1269	803	217	242	7			
1	E	156	Total	C	N	O	S	0	2	0
			1262	798	216	241	7			
1	F	156	Total	C	N	O	S	0	1	0
			1253	792	214	240	7			
1	G	156	Total	C	N	O	S	0	2	0
			1270	803	218	242	7			
1	H	156	Total	C	N	O	S	0	2	0
			1271	803	218	243	7			
1	I	156	Total	C	N	O	S	0	1	0
			1254	793	214	240	7			
1	J	156	Total	C	N	O	S	0	1	0
			1255	794	214	240	7			
1	K	156	Total	C	N	O	S	0	1	0
			1261	796	215	243	7			
1	L	156	Total	C	N	O	S	0	1	0
			1259	797	215	240	7			
1	M	156	Total	C	N	O	S	0	2	0
			1270	805	218	240	7			
1	N	156	Total	C	N	O	S	0	2	0
			1271	803	218	243	7			
1	O	156	Total	C	N	O	S	0	1	0
			1264	798	216	243	7			
1	P	156	Total	C	N	O	S	0	1	0
			1254	793	214	240	7			

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	Q	156	Total	C	N	O	S	0	1	0
			1263	798	215	243	7			
1	R	156	Total	C	N	O	S	0	2	0
			1270	802	218	243	7			
1	S	156	Total	C	N	O	S	0	2	0
			1274	805	219	243	7			
1	T	156	Total	C	N	O	S	0	1	0
			1260	796	215	242	7			
1	U	156	Total	C	N	O	S	0	2	0
			1267	801	217	242	7			
1	V	156	Total	C	N	O	S	0	1	0
			1259	795	215	242	7			
1	W	156	Total	C	N	O	S	0	1	0
			1258	795	214	242	7			
1	X	156	Total	C	N	O	S	0	1	0
			1264	798	216	243	7			

There are 48 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	68	ALA	LEU	engineered mutation	UNP Q9HY79
A	81	ALA	GLU	engineered mutation	UNP Q9HY79
B	68	ALA	LEU	engineered mutation	UNP Q9HY79
B	81	ALA	GLU	engineered mutation	UNP Q9HY79
C	68	ALA	LEU	engineered mutation	UNP Q9HY79
C	81	ALA	GLU	engineered mutation	UNP Q9HY79
D	68	ALA	LEU	engineered mutation	UNP Q9HY79
D	81	ALA	GLU	engineered mutation	UNP Q9HY79
E	68	ALA	LEU	engineered mutation	UNP Q9HY79
E	81	ALA	GLU	engineered mutation	UNP Q9HY79
F	68	ALA	LEU	engineered mutation	UNP Q9HY79
F	81	ALA	GLU	engineered mutation	UNP Q9HY79
G	68	ALA	LEU	engineered mutation	UNP Q9HY79
G	81	ALA	GLU	engineered mutation	UNP Q9HY79
H	68	ALA	LEU	engineered mutation	UNP Q9HY79
H	81	ALA	GLU	engineered mutation	UNP Q9HY79
I	68	ALA	LEU	engineered mutation	UNP Q9HY79
I	81	ALA	GLU	engineered mutation	UNP Q9HY79
J	68	ALA	LEU	engineered mutation	UNP Q9HY79
J	81	ALA	GLU	engineered mutation	UNP Q9HY79
K	68	ALA	LEU	engineered mutation	UNP Q9HY79
K	81	ALA	GLU	engineered mutation	UNP Q9HY79
L	68	ALA	LEU	engineered mutation	UNP Q9HY79

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Chain	Residue	Modelled	Actual	Comment	Reference
L	81	ALA	GLU	engineered mutation	UNP Q9HY79
M	68	ALA	LEU	engineered mutation	UNP Q9HY79
M	81	ALA	GLU	engineered mutation	UNP Q9HY79
N	68	ALA	LEU	engineered mutation	UNP Q9HY79
N	81	ALA	GLU	engineered mutation	UNP Q9HY79
O	68	ALA	LEU	engineered mutation	UNP Q9HY79
O	81	ALA	GLU	engineered mutation	UNP Q9HY79
P	68	ALA	LEU	engineered mutation	UNP Q9HY79
P	81	ALA	GLU	engineered mutation	UNP Q9HY79
Q	68	ALA	LEU	engineered mutation	UNP Q9HY79
Q	81	ALA	GLU	engineered mutation	UNP Q9HY79
R	68	ALA	LEU	engineered mutation	UNP Q9HY79
R	81	ALA	GLU	engineered mutation	UNP Q9HY79
S	68	ALA	LEU	engineered mutation	UNP Q9HY79
S	81	ALA	GLU	engineered mutation	UNP Q9HY79
T	68	ALA	LEU	engineered mutation	UNP Q9HY79
T	81	ALA	GLU	engineered mutation	UNP Q9HY79
U	68	ALA	LEU	engineered mutation	UNP Q9HY79
U	81	ALA	GLU	engineered mutation	UNP Q9HY79
V	68	ALA	LEU	engineered mutation	UNP Q9HY79
V	81	ALA	GLU	engineered mutation	UNP Q9HY79
W	68	ALA	LEU	engineered mutation	UNP Q9HY79
W	81	ALA	GLU	engineered mutation	UNP Q9HY79
X	68	ALA	LEU	engineered mutation	UNP Q9HY79
X	81	ALA	GLU	engineered mutation	UNP Q9HY79

- Molecule 2 is FE (II) ION (three-letter code: FE2) (formula: Fe).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	P	6	Total Fe 6 6	0	0
2	K	6	Total Fe 6 6	0	0
2	B	7	Total Fe 7 7	0	0
2	W	4	Total Fe 4 4	0	0
2	N	6	Total Fe 6 6	0	0
2	X	5	Total Fe 5 5	0	0
2	S	5	Total Fe 5 5	0	0

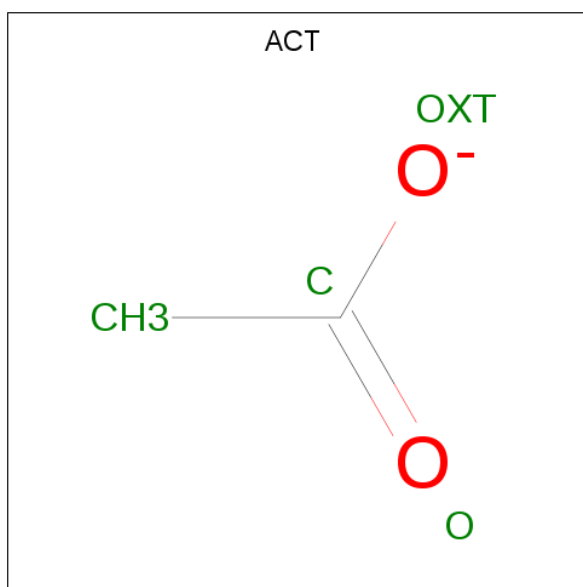
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	J	6	Total 6	Fe 6	0	0
2	E	7	Total 7	Fe 7	0	0
2	V	5	Total 5	Fe 5	0	0
2	A	8	Total 8	Fe 8	0	0
2	R	7	Total 7	Fe 7	0	0
2	M	7	Total 7	Fe 7	0	0
2	D	7	Total 7	Fe 7	0	0
2	I	6	Total 6	Fe 6	0	0
2	U	6	Total 6	Fe 6	0	0
2	L	8	Total 8	Fe 8	0	0
2	G	7	Total 7	Fe 7	0	0
2	Q	4	Total 4	Fe 4	0	0
2	H	6	Total 6	Fe 6	0	0
2	C	6	Total 6	Fe 6	0	0
2	T	6	Total 6	Fe 6	0	0
2	O	4	Total 4	Fe 4	0	0
2	F	5	Total 5	Fe 5	0	0

- Molecule 3 is ACETATE ION (three-letter code: ACT) (formula: C<sub>2</sub>H<sub>3</sub>O<sub>2</sub>).





Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			4	2	2		
3	B	1	Total	C	O	0	0
			4	2	2		
3	C	1	Total	C	O	0	0
			4	2	2		
3	D	1	Total	C	O	0	0
			4	2	2		
3	E	1	Total	C	O	0	0
			4	2	2		
3	F	1	Total	C	O	0	0
			4	2	2		
3	G	1	Total	C	O	0	0
			4	2	2		
3	H	1	Total	C	O	0	0
			4	2	2		
3	I	1	Total	C	O	0	0
			4	2	2		
3	J	1	Total	C	O	0	0
			4	2	2		
3	K	1	Total	C	O	0	0
			4	2	2		
3	L	1	Total	C	O	0	0
			4	2	2		
3	M	1	Total	C	O	0	0
			4	2	2		
3	N	1	Total	C	O	0	0
			4	2	2		

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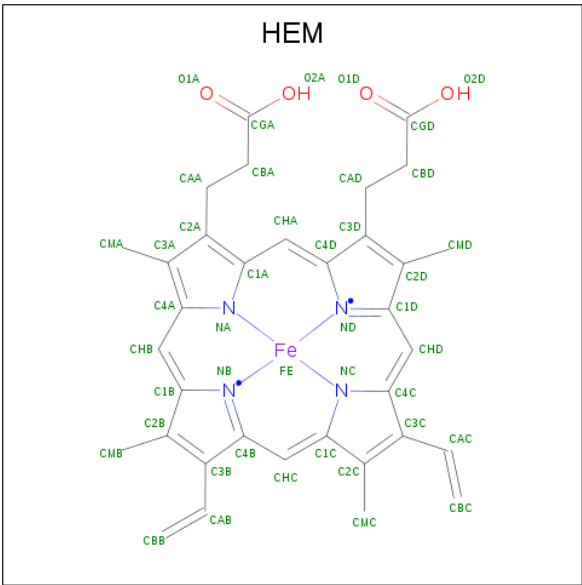
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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	O	1	Total 4	C 2	O 2	0	0
3	P	1	Total 4	C 2	O 2	0	0
3	Q	1	Total 4	C 2	O 2	0	0
3	R	1	Total 4	C 2	O 2	0	0
3	S	1	Total 4	C 2	O 2	0	0
3	T	1	Total 4	C 2	O 2	0	0
3	U	1	Total 4	C 2	O 2	0	0
3	V	1	Total 4	C 2	O 2	0	0
3	W	1	Total 4	C 2	O 2	0	0
3	X	1	Total 4	C 2	O 2	0	0

- Molecule 4 is POTASSIUM ION (three-letter code: K) (formula: K).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	G	1	Total 1	K 1	0	0
4	D	1	Total 1	K 1	0	0
4	E	1	Total 1	K 1	0	0
4	B	1	Total 1	K 1	0	0
4	A	1	Total 1	K 1	0	0
4	L	1	Total 1	K 1	0	0

- Molecule 5 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula:  $C_{34}H_{32}FeN_4O_4$ ).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	B	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
5	D	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
5	E	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
5	G	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
5	I	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
5	K	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
5	M	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
5	P	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
5	R	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
5	S	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
5	U	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
5	W	1	Total 43	C 34	Fe 1	N 4	O 4	0	0

- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	153	Total O 153 153	0	0
6	B	140	Total O 140 140	0	0
6	C	109	Total O 109 109	0	0
6	D	126	Total O 126 126	0	0
6	E	127	Total O 127 127	0	0
6	F	118	Total O 118 118	0	0
6	G	111	Total O 111 111	0	0
6	H	112	Total O 112 112	0	0
6	I	117	Total O 117 117	0	0
6	J	122	Total O 122 122	0	0
6	K	113	Total O 113 113	0	0
6	L	122	Total O 122 122	0	0
6	M	152	Total O 152 152	0	0
6	N	138	Total O 138 138	0	0
6	O	116	Total O 116 116	0	0
6	P	115	Total O 115 115	0	0
6	Q	132	Total O 132 132	0	0
6	R	118	Total O 118 118	0	0
6	S	143	Total O 143 143	0	0
6	T	136	Total O 136 136	0	0
6	U	127	Total O 127 127	0	0
6	V	103	Total O 103 103	0	0

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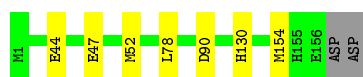
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	W	123	Total 123	O 123	0	0
6	X	127	Total 127	O 127	0	0

### 3 Residue-property plots [i](#)

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

- Molecule 1: Ferroxidase

Chain A:  94% ..



- Molecule 1: Ferroxidase

Chain B:  96% ..



- Molecule 1: Ferroxidase

Chain C:  95% ..



- Molecule 1: Ferroxidase

Chain D:  94% 5% ..



- Molecule 1: Ferroxidase

Chain E:  93% 6% ..



- Molecule 1: Ferroxidase

Chain F:  96% ..



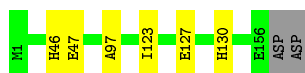
- Molecule 1: Ferroxidase

Chain G:  96% ..



- Molecule 1: Ferroxidase

Chain H:  95% ..



- Molecule 1: Ferroxidase

Chain I:  96% ..



- Molecule 1: Ferroxidase

Chain J:  94% 5% .



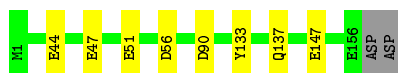
- Molecule 1: Ferroxidase

Chain K:  94% ..



- Molecule 1: Ferroxidase

Chain L:  94% 5% .



- Molecule 1: Ferroxidase

Chain M:  96% ..



- Molecule 1: Ferroxidase

Chain N: 94% 5% .



- Molecule 1: Ferroxidase

Chain O: 97% ..



- Molecule 1: Ferroxidase

Chain P: 93% 6% .



- Molecule 1: Ferroxidase

Chain Q: 93% 6% .



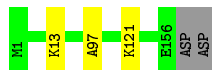
- Molecule 1: Ferroxidase

Chain R: 96% ..



- Molecule 1: Ferroxidase

Chain S: 97% ..



- Molecule 1: Ferroxidase

Chain T: 92% 6% .





- Molecule 1: Ferroxidase

Chain U: 97% ..



- Molecule 1: Ferroxidase

Chain V: 97% ..



- Molecule 1: Ferroxidase

Chain W: 93% 6% .



- Molecule 1: Ferroxidase

Chain X: 96% ..



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 32	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	125.84Å 125.84Å 272.52Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	48.75 – 2.05 48.75 – 2.05	Depositor EDS
% Data completeness (in resolution range)	97.5 (48.75-2.05) 100.0 (48.75-2.05)	Depositor EDS
$R_{merge}$	0.11	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.02 (at 2.05Å)	Xtriage
Refinement program	PHENIX	Depositor
R, $R_{free}$	0.151 , 0.196 0.152 , 0.196	Depositor DCC
$R_{free}$ test set	14740 reflections (4.87%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	24.2	Xtriage
Anisotropy	0.173	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.34 , 50.3	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.009 for -h,-k,l 0.027 for h,-h-k,-l 0.018 for -k,-h,-l	Xtriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	34099	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	27.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.68% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup> Intensities estimated from amplitudes.

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

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: HEM, K, FE2, ACT

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	0.51	0/1304	0.59	0/1761
1	B	0.52	0/1300	0.59	0/1754
1	C	0.49	0/1288	0.58	1/1737 (0.1%)
1	D	0.51	0/1297	0.57	0/1750
1	E	0.49	0/1290	0.58	0/1743
1	F	0.48	0/1277	0.57	0/1725
1	G	0.49	0/1298	0.58	0/1751
1	H	0.47	0/1299	0.58	0/1753
1	I	0.48	0/1278	0.57	0/1726
1	J	0.49	0/1279	0.59	0/1727
1	K	0.47	0/1285	0.56	0/1735
1	L	0.53	1/1283 (0.1%)	0.59	1/1731 (0.1%)
1	M	0.52	0/1298	0.59	0/1750
1	N	0.50	0/1299	0.59	0/1753
1	O	0.47	0/1288	0.57	0/1738
1	P	0.50	0/1278	0.59	0/1726
1	Q	0.53	0/1287	0.57	0/1737
1	R	0.49	0/1298	0.56	0/1752
1	S	0.48	0/1302	0.57	0/1756
1	T	0.50	0/1284	0.60	0/1733
1	U	0.48	0/1295	0.55	0/1748
1	V	0.51	0/1283	0.58	0/1732
1	W	0.46	0/1282	0.56	0/1731
1	X	0.51	0/1288	0.57	0/1738
All	All	0.50	1/30960 (0.0%)	0.58	2/41787 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	L	147	GLU	CG-CD	5.11	1.59	1.51

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	90	ASP	CB-CG-OD1	5.12	122.91	118.30
1	L	56	ASP	CB-CG-OD1	5.02	122.81	118.30

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	1273	0	1227	5	0
1	B	1272	0	1235	2	0
1	C	1264	0	1233	5	0
1	D	1269	0	1231	5	0
1	E	1262	0	1213	5	0
1	F	1253	0	1207	1	0
1	G	1270	0	1236	3	0
1	H	1271	0	1233	5	0
1	I	1254	0	1209	3	0
1	J	1255	0	1211	5	0
1	K	1261	0	1217	5	0
1	L	1259	0	1222	3	0
1	M	1270	0	1240	4	0
1	N	1271	0	1233	5	0
1	O	1264	0	1226	2	0
1	P	1254	0	1209	5	0
1	Q	1263	0	1221	7	0
1	R	1270	0	1231	3	0
1	S	1274	0	1242	2	0
1	T	1260	0	1220	7	0
1	U	1267	0	1227	2	0
1	V	1259	0	1218	3	0
1	W	1258	0	1213	6	0
1	X	1264	0	1226	3	0
2	A	8	0	0	0	0
2	B	7	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	C	6	0	0	0	0
2	D	7	0	0	0	0
2	E	7	0	0	0	0
2	F	5	0	0	0	0
2	G	7	0	0	0	0
2	H	6	0	0	0	0
2	I	6	0	0	0	0
2	J	6	0	0	0	0
2	K	6	0	0	0	0
2	L	8	0	0	0	0
2	M	7	0	0	0	0
2	N	6	0	0	0	0
2	O	4	0	0	0	0
2	P	6	0	0	0	0
2	Q	4	0	0	0	0
2	R	7	0	0	0	0
2	S	5	0	0	0	0
2	T	6	0	0	0	0
2	U	6	0	0	0	0
2	V	5	0	0	0	0
2	W	4	0	0	0	0
2	X	5	0	0	0	0
3	A	4	0	3	0	0
3	B	4	0	3	0	0
3	C	4	0	3	3	0
3	D	4	0	3	0	0
3	E	4	0	3	0	0
3	F	4	0	3	1	0
3	G	4	0	3	0	0
3	H	4	0	3	2	0
3	I	4	0	3	1	0
3	J	4	0	3	2	0
3	K	4	0	3	2	0
3	L	4	0	3	0	0
3	M	4	0	3	2	0
3	N	4	0	3	1	0
3	O	4	0	3	2	0
3	P	4	0	3	1	0
3	Q	4	0	3	2	0
3	R	4	0	3	0	0
3	S	4	0	3	1	0
3	T	4	0	3	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	U	4	0	3	2	0
3	V	4	0	3	2	0
3	W	4	0	3	2	0
3	X	4	0	3	0	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	D	1	0	0	0	0
4	E	1	0	0	0	0
4	G	1	0	0	0	0
4	L	1	0	0	0	0
5	B	43	0	30	2	0
5	D	43	0	30	1	0
5	E	43	0	30	2	0
5	G	43	0	30	1	0
5	I	43	0	30	1	0
5	K	43	0	30	2	0
5	M	43	0	30	1	0
5	P	43	0	30	1	0
5	R	43	0	30	3	0
5	S	43	0	30	3	0
5	U	43	0	30	0	0
5	W	43	0	30	4	0
6	A	153	0	0	1	0
6	B	140	0	0	1	0
6	C	109	0	0	1	0
6	D	126	0	0	2	0
6	E	127	0	0	2	0
6	F	118	0	0	0	0
6	G	111	0	0	1	0
6	H	112	0	0	1	0
6	I	117	0	0	0	0
6	J	122	0	0	0	0
6	K	113	0	0	1	0
6	L	122	0	0	0	0
6	M	152	0	0	1	0
6	N	138	0	0	2	0
6	O	116	0	0	0	0
6	P	115	0	0	1	0
6	Q	132	0	0	2	0
6	R	118	0	0	1	0
6	S	143	0	0	1	0
6	T	136	0	0	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	U	127	0	0	0	0
6	V	103	0	0	0	0
6	W	123	0	0	2	0
6	X	127	0	0	1	0
All	All	34099	0	29812	112	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 2.

The worst 5 of 112 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:K:97:ALA:HB2	3:K:208:ACT:H3	1.53	0.88
1:C:47:GLU:OE2	6:C:301:HOH:O	1.97	0.82
1:K:97:ALA:CB	3:K:208:ACT:H3	2.18	0.73
1:Q:97:ALA:HB2	3:Q:205:ACT:H3	1.73	0.71
1:D:118:ASP:OD2	6:D:301:HOH:O	2.08	0.70

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	157/158 (99%)	155 (99%)	2 (1%)	0	100	100
1	B	156/158 (99%)	155 (99%)	1 (1%)	0	100	100
1	C	155/158 (98%)	155 (100%)	0	0	100	100
1	D	156/158 (99%)	156 (100%)	0	0	100	100
1	E	156/158 (99%)	156 (100%)	0	0	100	100
1	F	155/158 (98%)	154 (99%)	1 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	G	156/158 (99%)	154 (99%)	2 (1%)	0	100	100
1	H	156/158 (99%)	154 (99%)	2 (1%)	0	100	100
1	I	155/158 (98%)	153 (99%)	2 (1%)	0	100	100
1	J	155/158 (98%)	155 (100%)	0	0	100	100
1	K	155/158 (98%)	154 (99%)	1 (1%)	0	100	100
1	L	155/158 (98%)	155 (100%)	0	0	100	100
1	M	156/158 (99%)	155 (99%)	1 (1%)	0	100	100
1	N	156/158 (99%)	156 (100%)	0	0	100	100
1	O	155/158 (98%)	153 (99%)	2 (1%)	0	100	100
1	P	155/158 (98%)	154 (99%)	1 (1%)	0	100	100
1	Q	155/158 (98%)	153 (99%)	2 (1%)	0	100	100
1	R	156/158 (99%)	156 (100%)	0	0	100	100
1	S	156/158 (99%)	155 (99%)	1 (1%)	0	100	100
1	T	155/158 (98%)	155 (100%)	0	0	100	100
1	U	156/158 (99%)	156 (100%)	0	0	100	100
1	V	155/158 (98%)	153 (99%)	2 (1%)	0	100	100
1	W	155/158 (98%)	155 (100%)	0	0	100	100
1	X	155/158 (98%)	154 (99%)	1 (1%)	0	100	100
All	All	3732/3792 (98%)	3711 (99%)	21 (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	135/142 (95%)	135 (100%)	0	100	100
1	B	136/142 (96%)	134 (98%)	2 (2%)	65	63
1	C	135/142 (95%)	135 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	D	135/142 (95%)	135 (100%)	0	100	100
1	E	133/142 (94%)	132 (99%)	1 (1%)	81	82
1	F	132/142 (93%)	129 (98%)	3 (2%)	50	44
1	G	136/142 (96%)	136 (100%)	0	100	100
1	H	136/142 (96%)	136 (100%)	0	100	100
1	I	132/142 (93%)	132 (100%)	0	100	100
1	J	132/142 (93%)	131 (99%)	1 (1%)	81	82
1	K	134/142 (94%)	133 (99%)	1 (1%)	84	84
1	L	133/142 (94%)	133 (100%)	0	100	100
1	M	135/142 (95%)	135 (100%)	0	100	100
1	N	136/142 (96%)	135 (99%)	1 (1%)	84	84
1	O	135/142 (95%)	134 (99%)	1 (1%)	84	84
1	P	132/142 (93%)	131 (99%)	1 (1%)	81	82
1	Q	134/142 (94%)	133 (99%)	1 (1%)	84	84
1	R	136/142 (96%)	135 (99%)	1 (1%)	84	84
1	S	137/142 (96%)	136 (99%)	1 (1%)	84	84
1	T	134/142 (94%)	131 (98%)	3 (2%)	52	46
1	U	135/142 (95%)	134 (99%)	1 (1%)	84	84
1	V	134/142 (94%)	134 (100%)	0	100	100
1	W	133/142 (94%)	132 (99%)	1 (1%)	81	82
1	X	135/142 (95%)	135 (100%)	0	100	100
All	All	3225/3408 (95%)	3206 (99%)	19 (1%)	86	87

5 of 19 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	N	84	GLN
1	P	121	LYS
1	T	96	LYS
1	K	154	MET
1	T	156	GLU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	J	112	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 carbohydrates in this entry.

### 5.6 Ligand geometry ⓘ

Of 186 ligands modelled in this entry, 150 are monoatomic - leaving 36 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	E	208	1	27,50,50	1.62	5 (18%)	17,82,82	2.39	9 (52%)
3	ACT	G	209	2	1,3,3	2.40	1 (100%)	0,3,3	0.00	-
5	HEM	R	208	1	27,50,50	1.64	4 (14%)	17,82,82	2.29	10 (58%)
5	HEM	S	206	1	27,50,50	1.64	4 (14%)	17,82,82	2.15	7 (41%)
3	ACT	X	206	2	1,3,3	1.46	0	0,3,3	0.00	-
3	ACT	V	206	2	1,3,3	1.78	0	0,3,3	0.00	-
3	ACT	K	208	2	1,3,3	2.26	1 (100%)	0,3,3	0.00	-
3	ACT	D	209	2	1,3,3	2.37	1 (100%)	0,3,3	0.00	-
3	ACT	S	207	2	1,3,3	2.22	1 (100%)	0,3,3	0.00	-
5	HEM	K	207	1	27,50,50	1.76	4 (14%)	17,82,82	2.07	7 (41%)
5	HEM	G	208	1	27,50,50	1.64	4 (14%)	17,82,82	2.20	8 (47%)
3	ACT	R	209	2	1,3,3	1.61	0	0,3,3	0.00	-

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
5	HEM	M	208	1	27,50,50	1.73	4 (14%)	17,82,82	2.28	7 (41%)
3	ACT	U	208	2	1,3,3	2.01	1 (100%)	0,3,3	0.00	-
3	ACT	A	209	2	1,3,3	2.12	1 (100%)	0,3,3	0.00	-
3	ACT	N	207	2	1,3,3	2.41	1 (100%)	0,3,3	0.00	-
3	ACT	H	207	2	1,3,3	2.44	1 (100%)	0,3,3	0.00	-
5	HEM	U	207	1	27,50,50	1.60	4 (14%)	17,82,82	2.38	7 (41%)
3	ACT	M	209	2	1,3,3	2.66	1 (100%)	0,3,3	0.00	-
5	HEM	B	208	1	27,50,50	1.73	4 (14%)	17,82,82	2.29	7 (41%)
3	ACT	E	209	2	1,3,3	2.72	1 (100%)	0,3,3	0.00	-
3	ACT	C	207	2	1,3,3	1.17	0	0,3,3	0.00	-
3	ACT	I	208	2	1,3,3	2.28	1 (100%)	0,3,3	0.00	-
3	ACT	B	209	2	1,3,3	2.32	1 (100%)	0,3,3	0.00	-
5	HEM	D	208	1	27,50,50	1.63	4 (14%)	17,82,82	2.33	6 (35%)
3	ACT	P	208	2	1,3,3	2.06	1 (100%)	0,3,3	0.00	-
5	HEM	I	207	1	27,50,50	1.70	4 (14%)	17,82,82	2.31	7 (41%)
5	HEM	P	207	1	27,50,50	1.75	4 (14%)	17,82,82	1.98	5 (29%)
5	HEM	W	205	1	27,50,50	1.59	4 (14%)	17,82,82	2.21	7 (41%)
3	ACT	Q	205	2	1,3,3	2.49	1 (100%)	0,3,3	0.00	-
3	ACT	L	209	2	1,3,3	2.55	1 (100%)	0,3,3	0.00	-
3	ACT	W	206	2	1,3,3	1.81	0	0,3,3	0.00	-
3	ACT	J	207	2	1,3,3	2.12	1 (100%)	0,3,3	0.00	-
3	ACT	T	207	2	1,3,3	2.44	1 (100%)	0,3,3	0.00	-
3	ACT	O	205	2	1,3,3	1.77	0	0,3,3	0.00	-
3	ACT	F	206	2	1,3,3	2.42	1 (100%)	0,3,3	0.00	-

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	E	208	1	-	0/6/54/54	-
5	HEM	W	205	1	-	0/6/54/54	-
5	HEM	S	206	1	-	0/6/54/54	-
5	HEM	G	208	1	-	0/6/54/54	-
5	HEM	R	208	1	-	0/6/54/54	-
5	HEM	M	208	1	-	0/6/54/54	-
5	HEM	D	208	1	-	0/6/54/54	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	HEM	U	207	1	-	0/6/54/54	-
5	HEM	I	207	1	-	0/6/54/54	-
5	HEM	K	207	1	-	0/6/54/54	-
5	HEM	P	207	1	-	0/6/54/54	-
5	HEM	B	208	1	-	0/6/54/54	-

The worst 5 of 67 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	K	207	HEM	C3B-C2B	-4.72	1.33	1.40
5	B	208	HEM	C3B-C2B	-4.43	1.34	1.40
5	E	208	HEM	C3B-C2B	-4.21	1.34	1.40
5	P	207	HEM	C3C-C2C	-4.18	1.34	1.40
5	P	207	HEM	C3B-C2B	-4.12	1.34	1.40

The worst 5 of 87 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	D	208	HEM	CBD-CAD-C3D	-4.67	103.88	112.48
5	B	208	HEM	CBD-CAD-C3D	-4.62	103.96	112.48
5	I	207	HEM	CMC-C2C-C3C	4.48	133.06	124.68
5	E	208	HEM	CMC-C2C-C3C	4.37	132.86	124.68
5	G	208	HEM	CMB-C2B-C3B	4.26	132.65	124.68

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

27 monomers are involved in 49 short contacts:

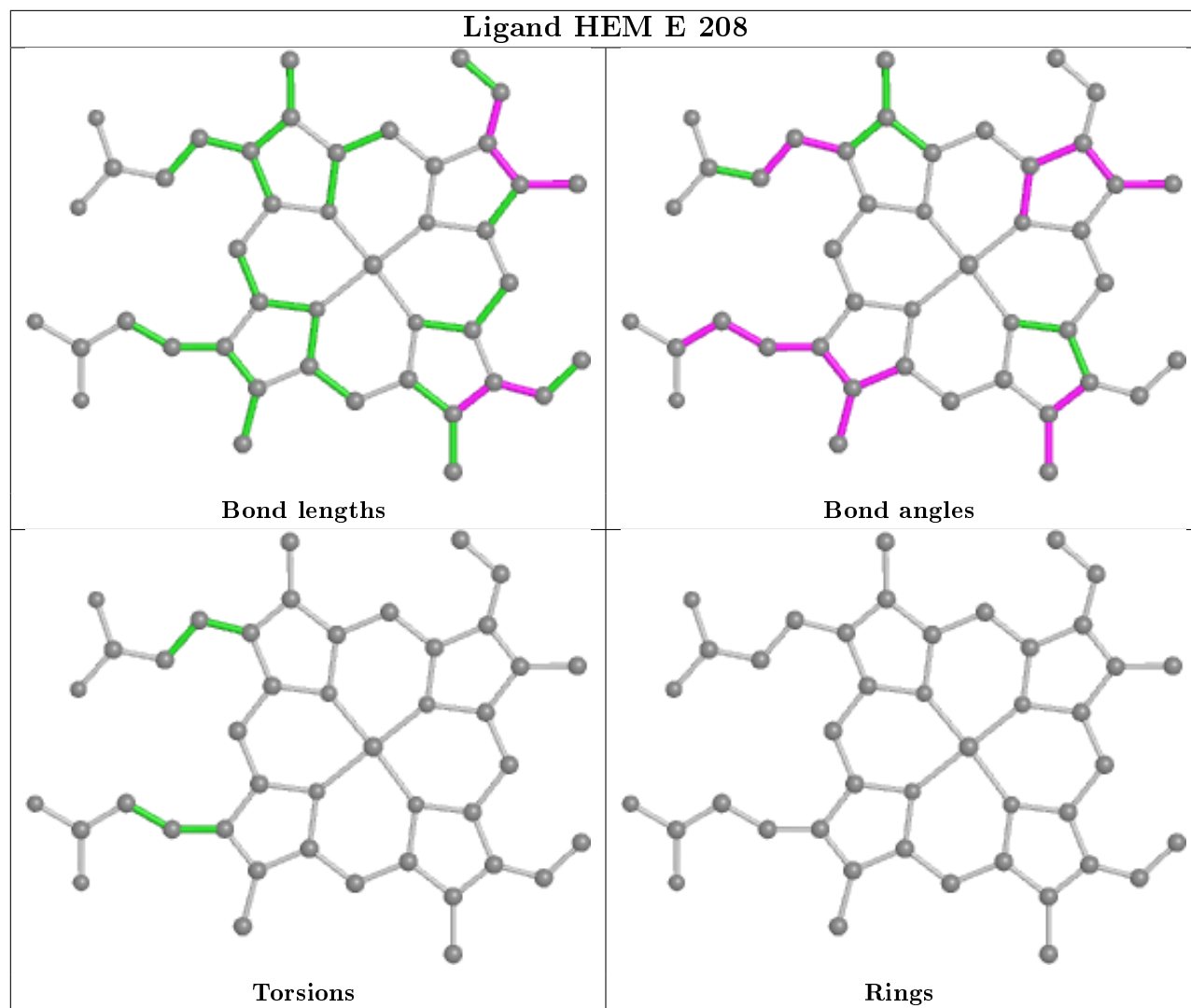
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	E	208	HEM	2	0
5	R	208	HEM	3	0
5	S	206	HEM	3	0
3	V	206	ACT	2	0
3	K	208	ACT	2	0
3	S	207	ACT	1	0
5	K	207	HEM	2	0
5	G	208	HEM	1	0
5	M	208	HEM	1	0
3	U	208	ACT	2	0
3	N	207	ACT	1	0

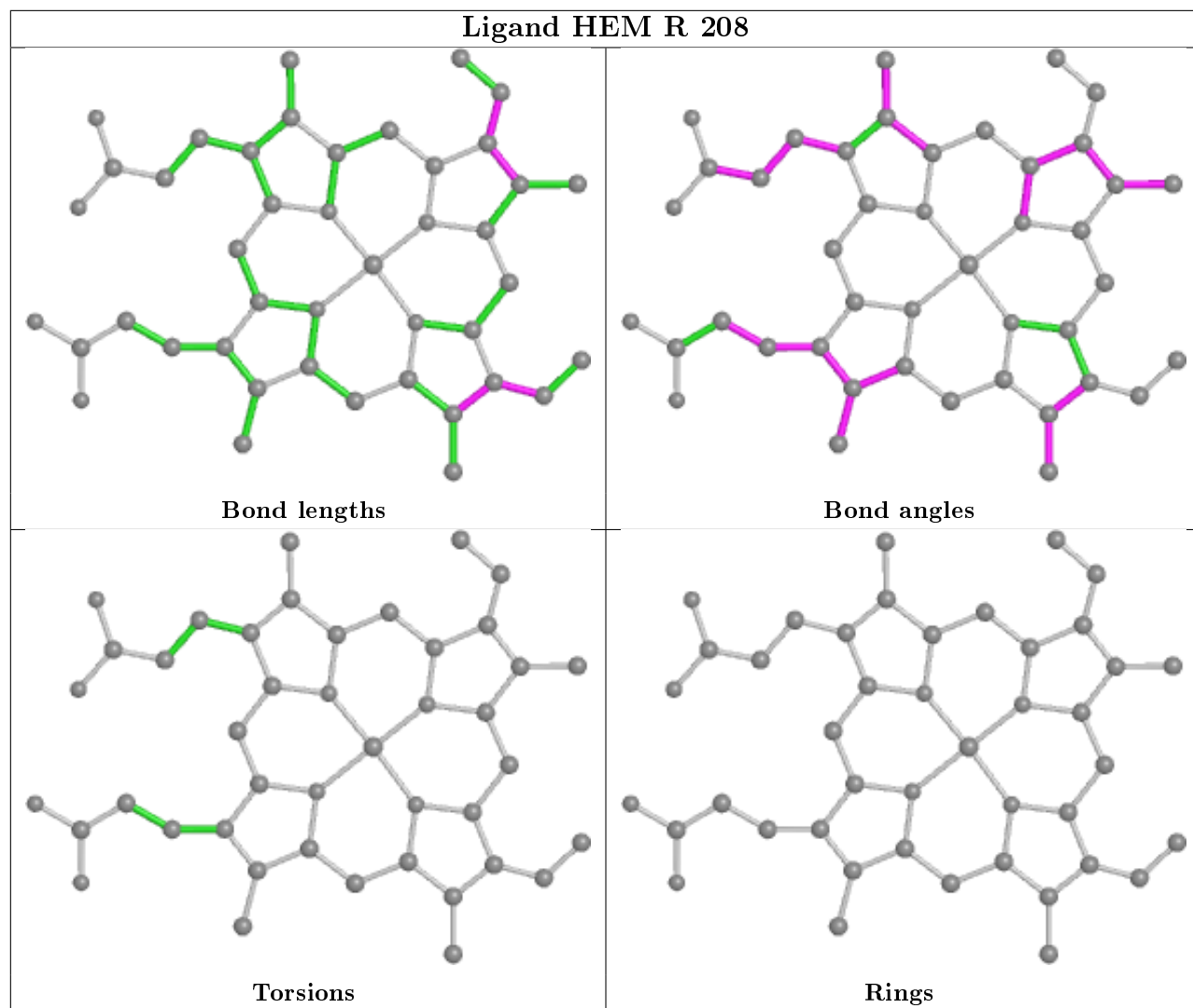
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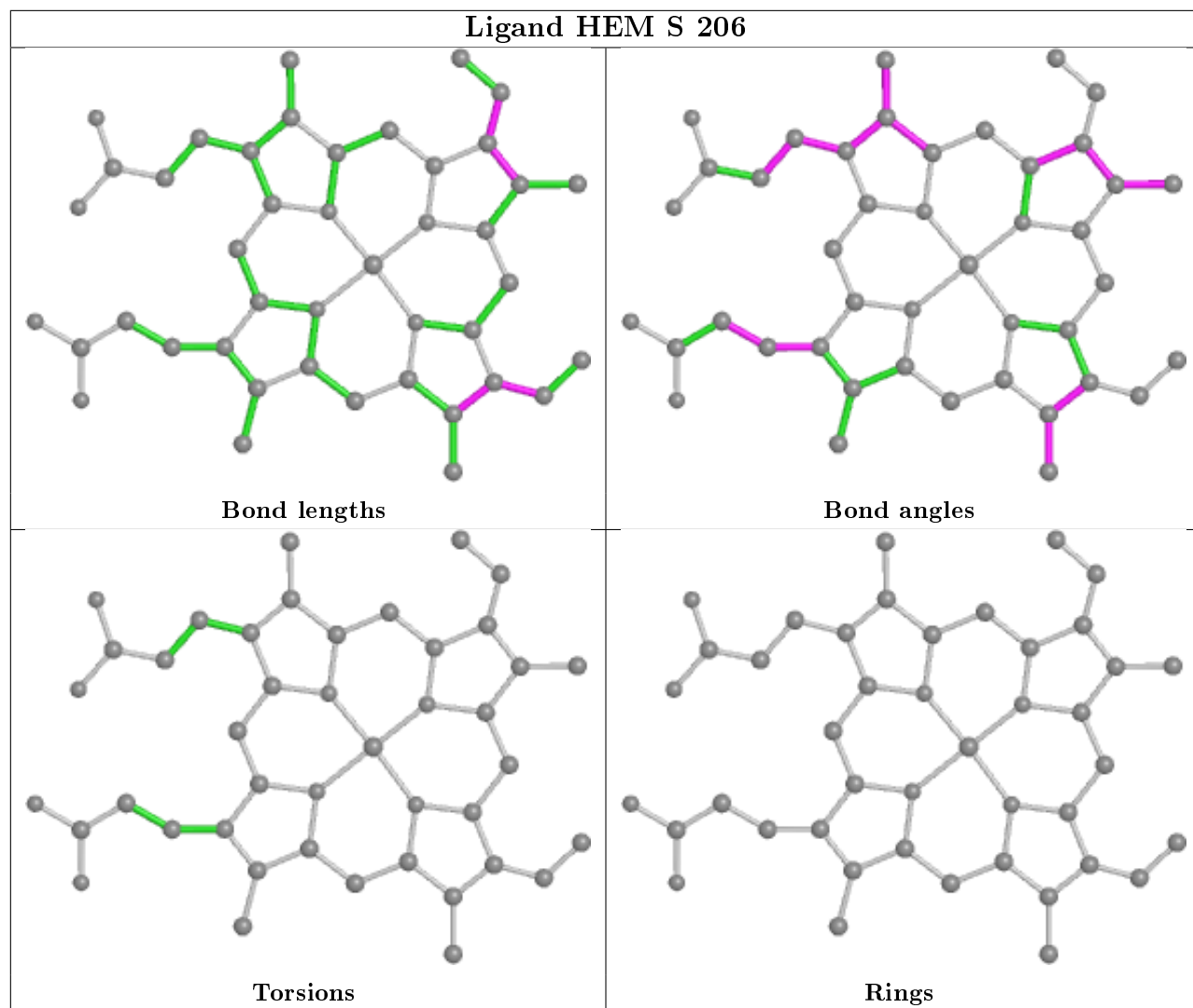
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Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	H	207	ACT	2	0
3	M	209	ACT	2	0
5	B	208	HEM	2	0
3	C	207	ACT	3	0
3	I	208	ACT	1	0
5	D	208	HEM	1	0
3	P	208	ACT	1	0
5	I	207	HEM	1	0
5	P	207	HEM	1	0
5	W	205	HEM	4	0
3	Q	205	ACT	2	0
3	W	206	ACT	2	0
3	J	207	ACT	2	0
3	T	207	ACT	2	0
3	O	205	ACT	2	0
3	F	206	ACT	1	0

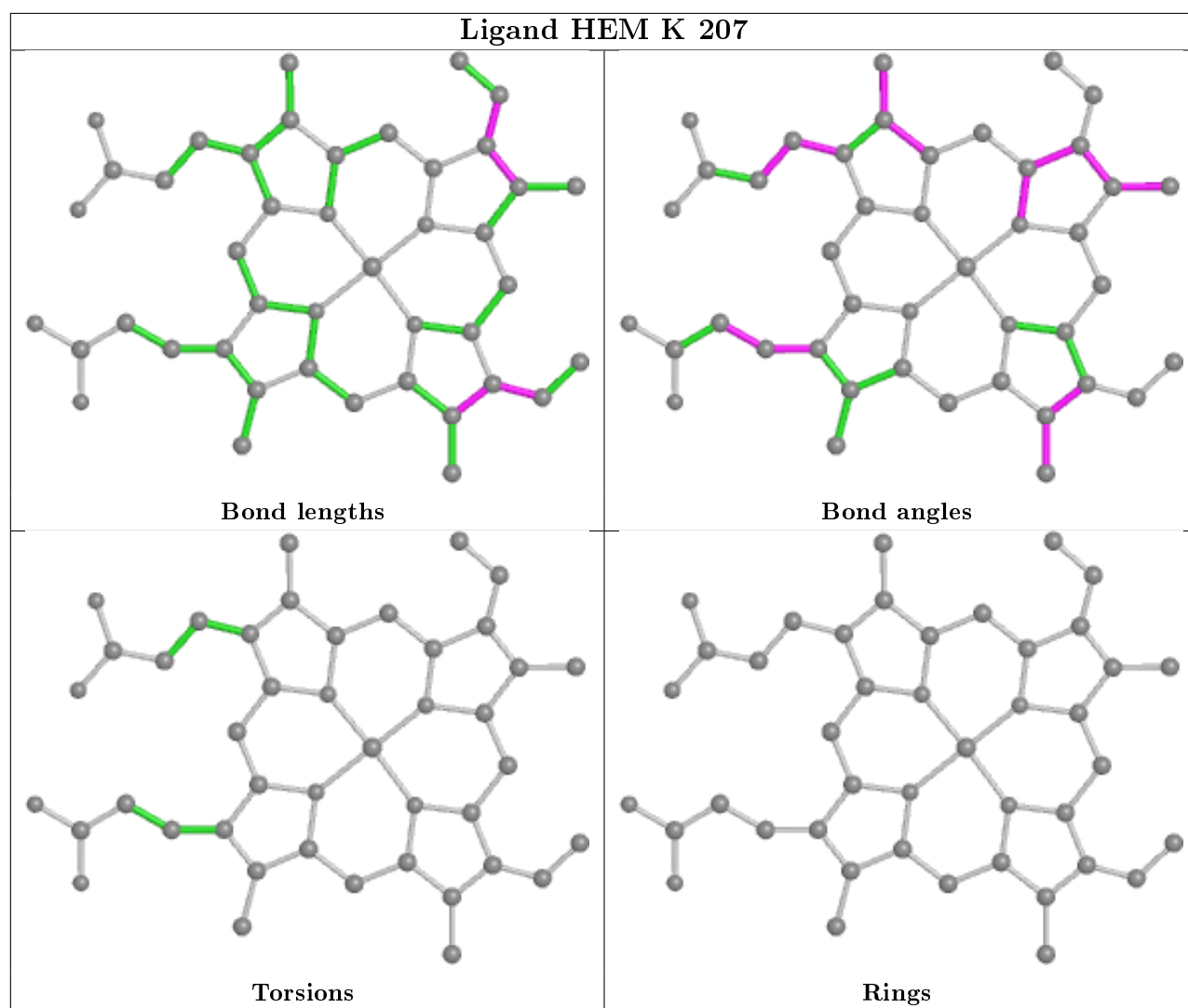
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

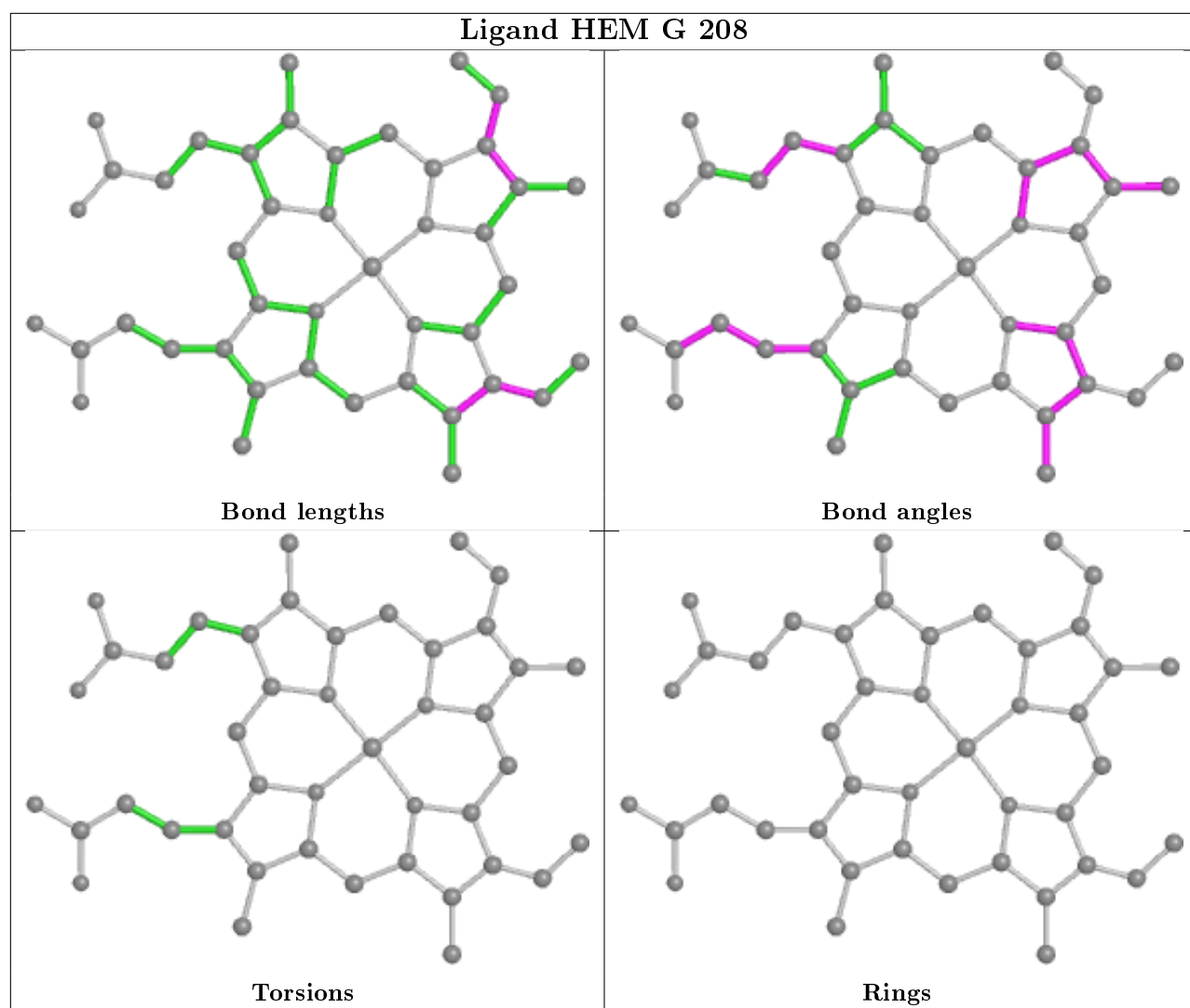


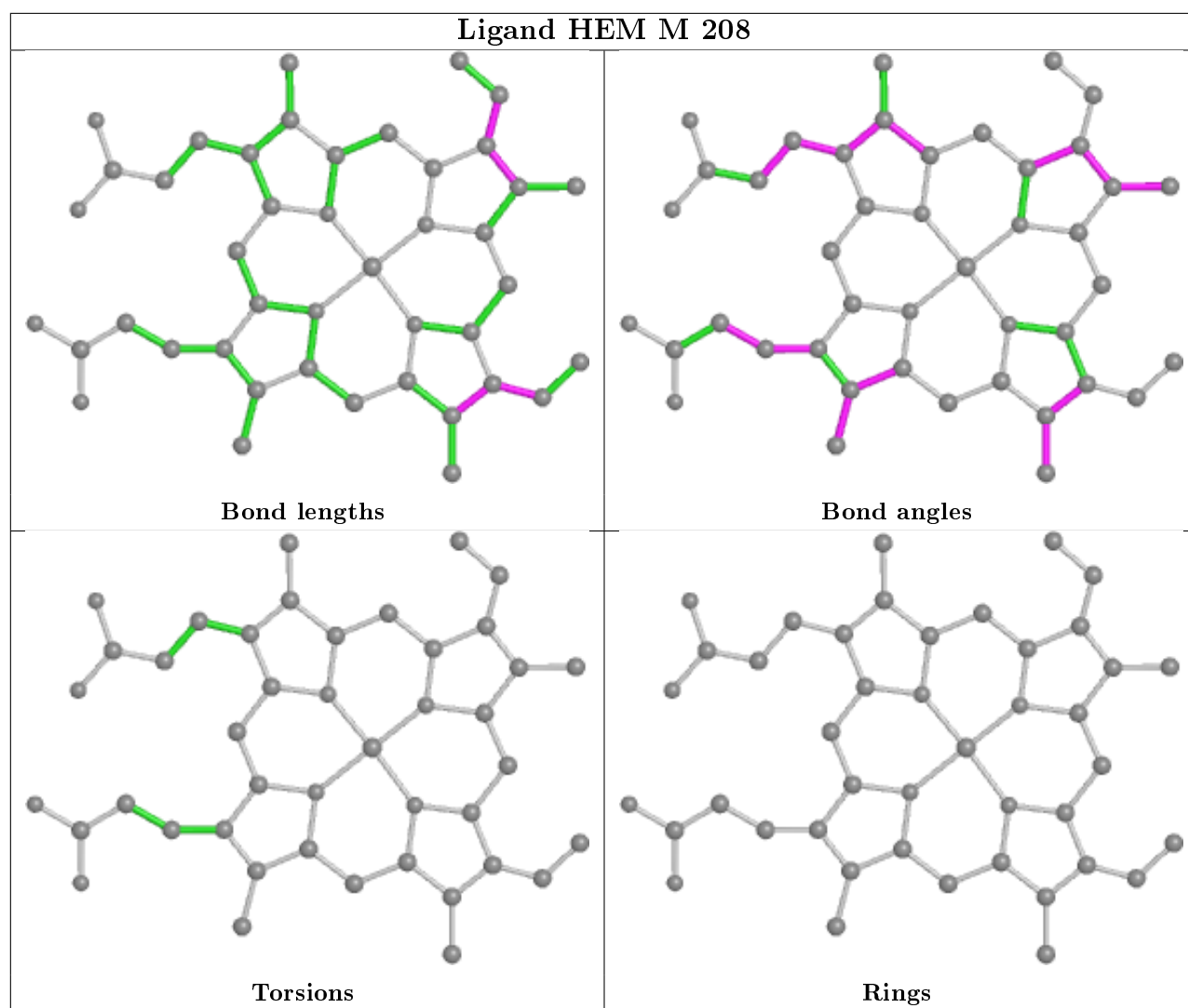


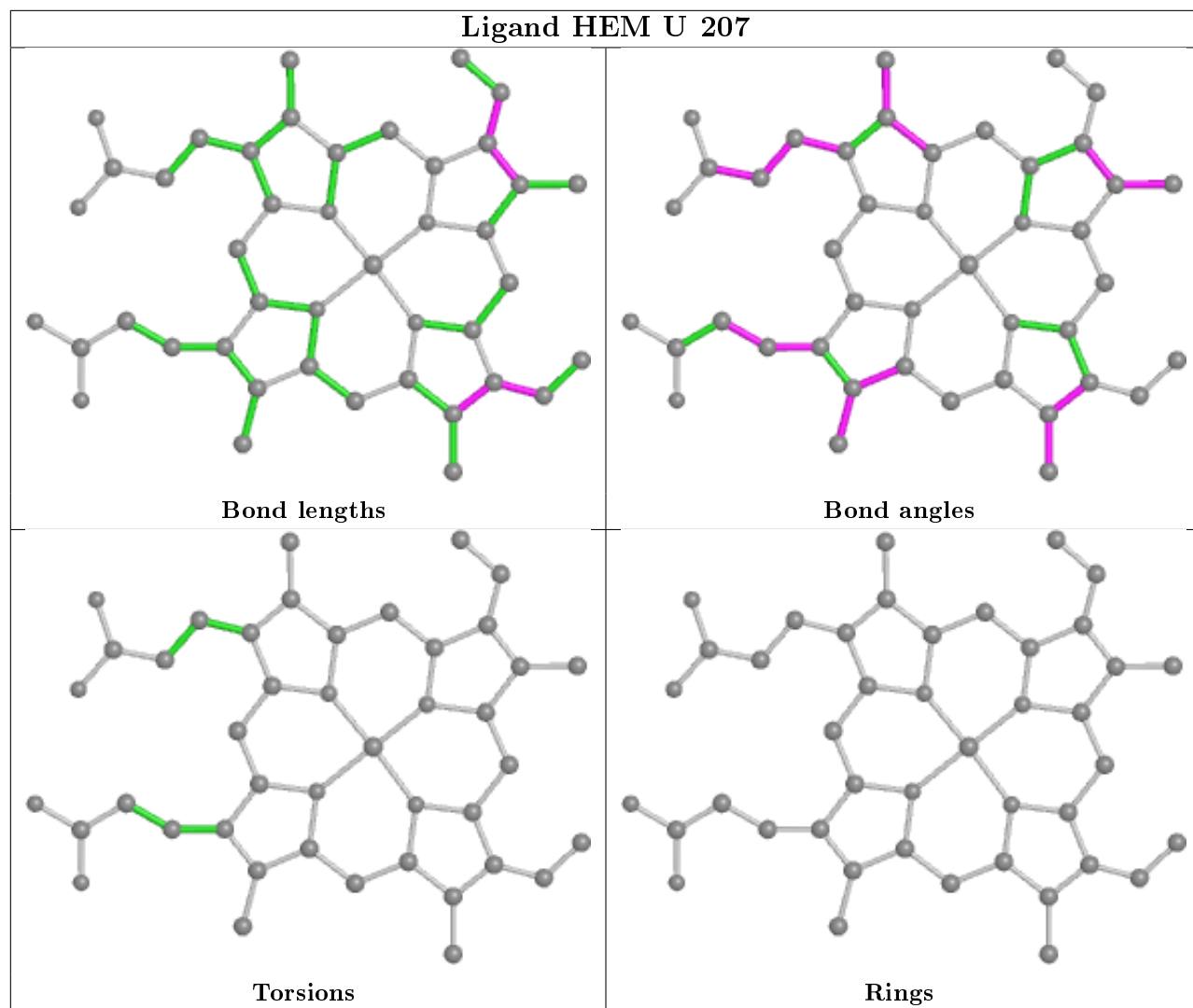


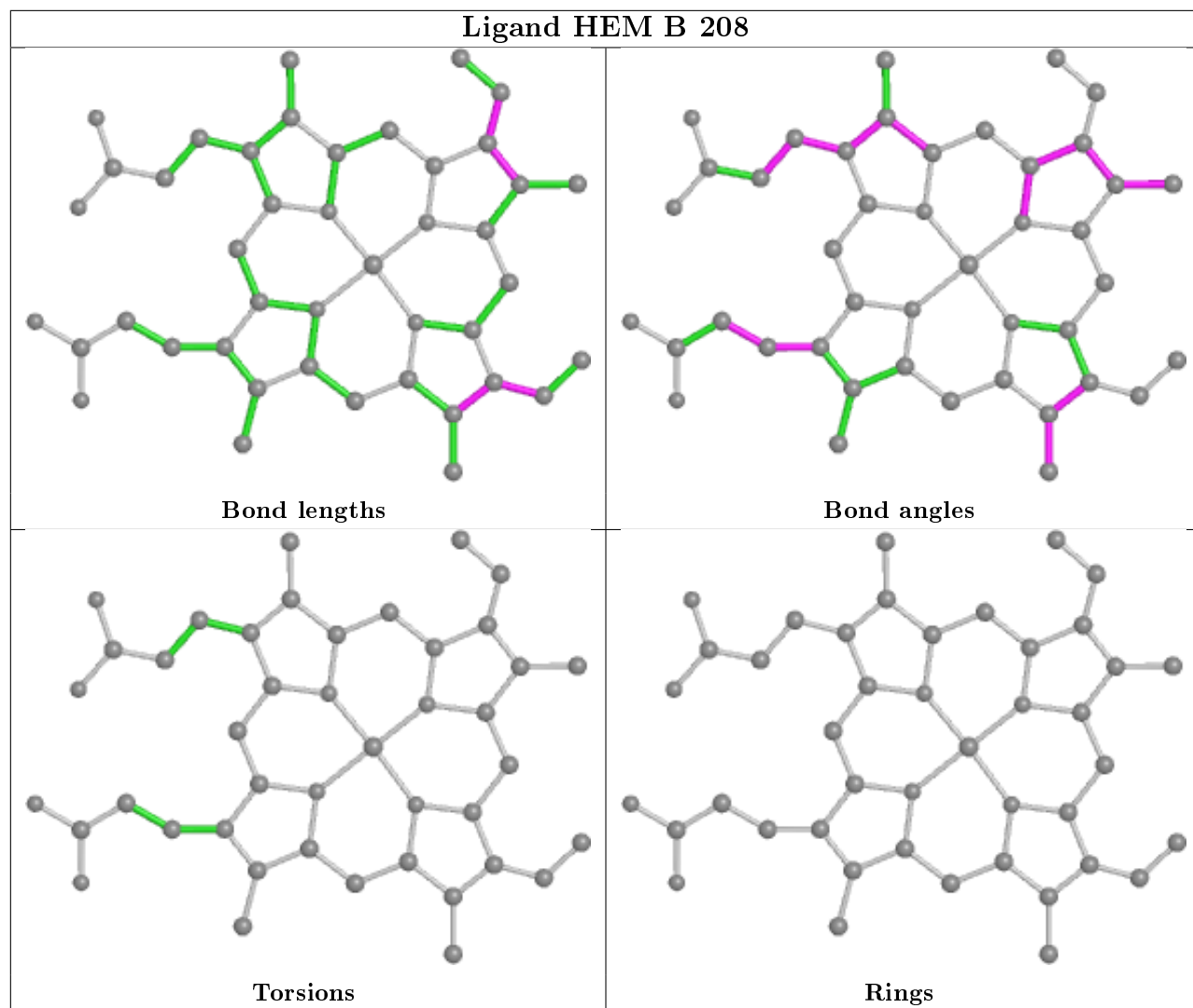


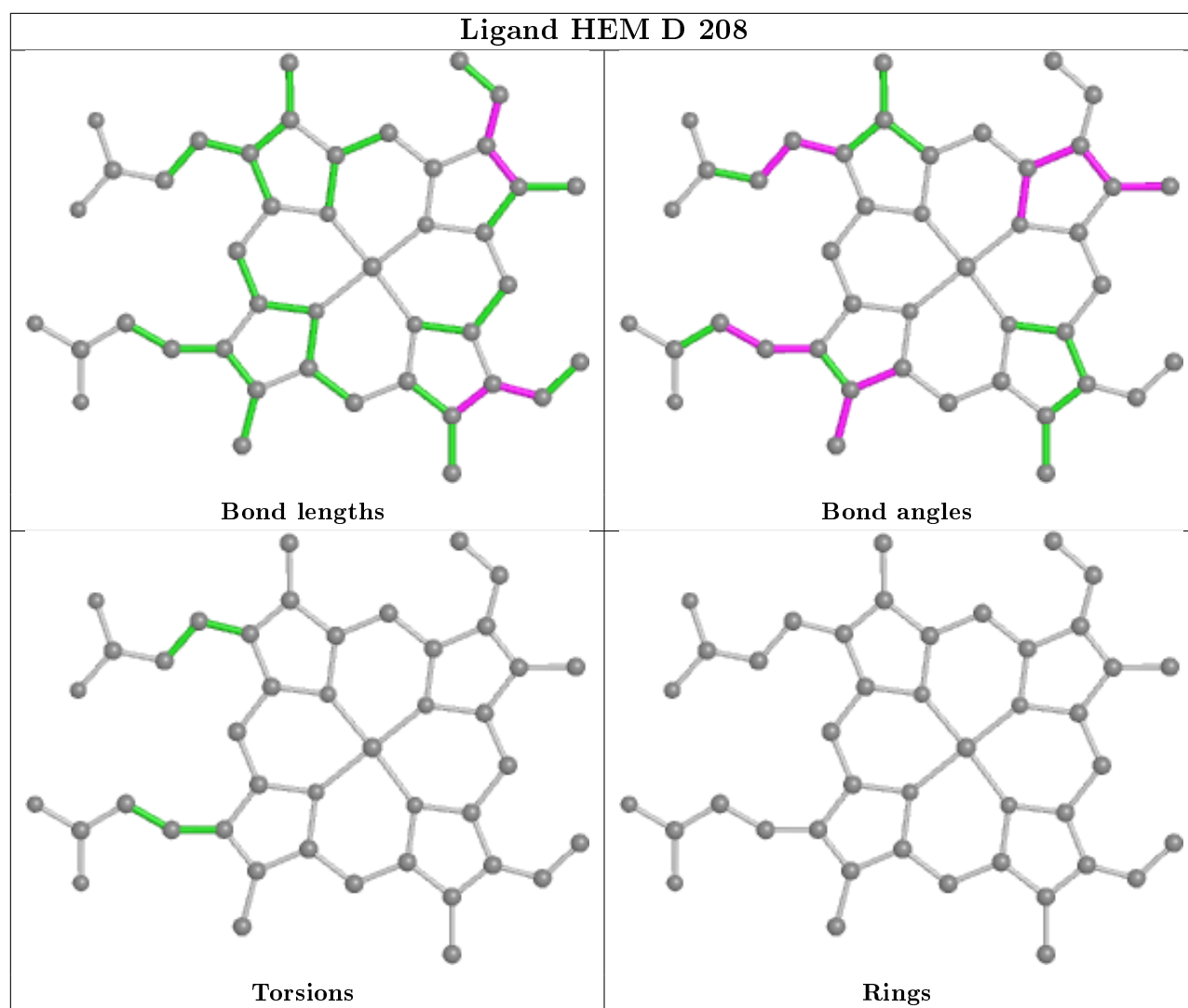




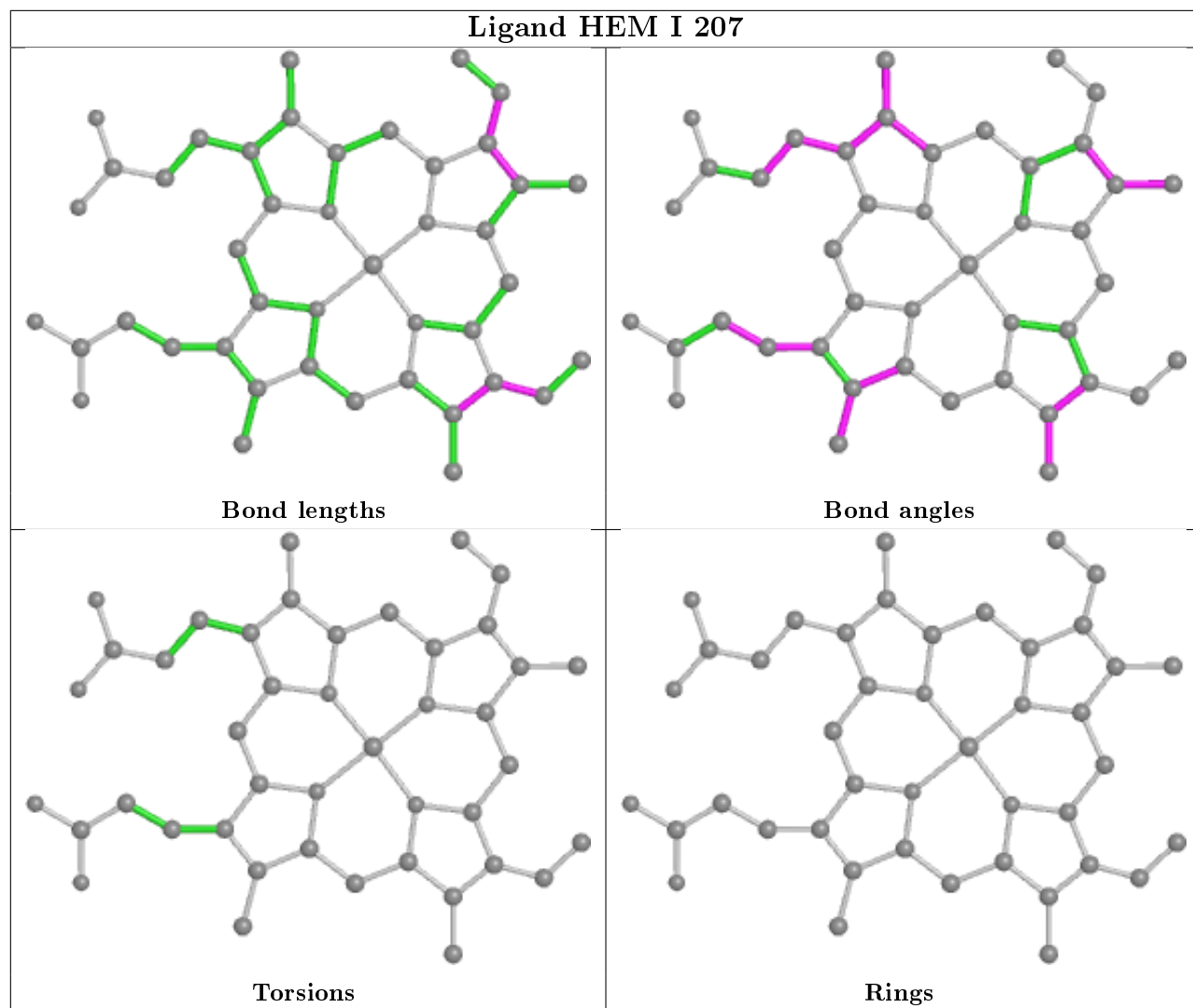


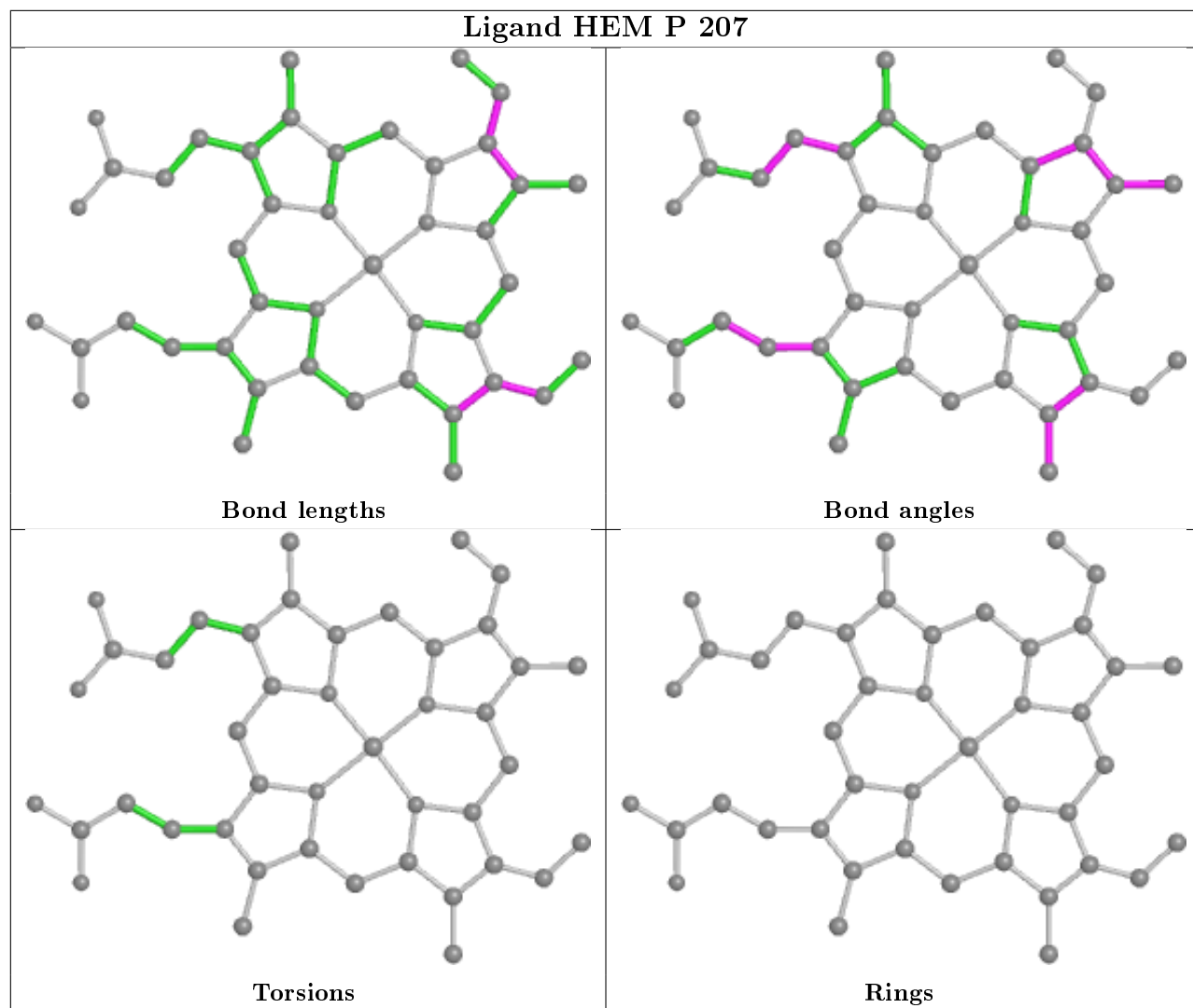




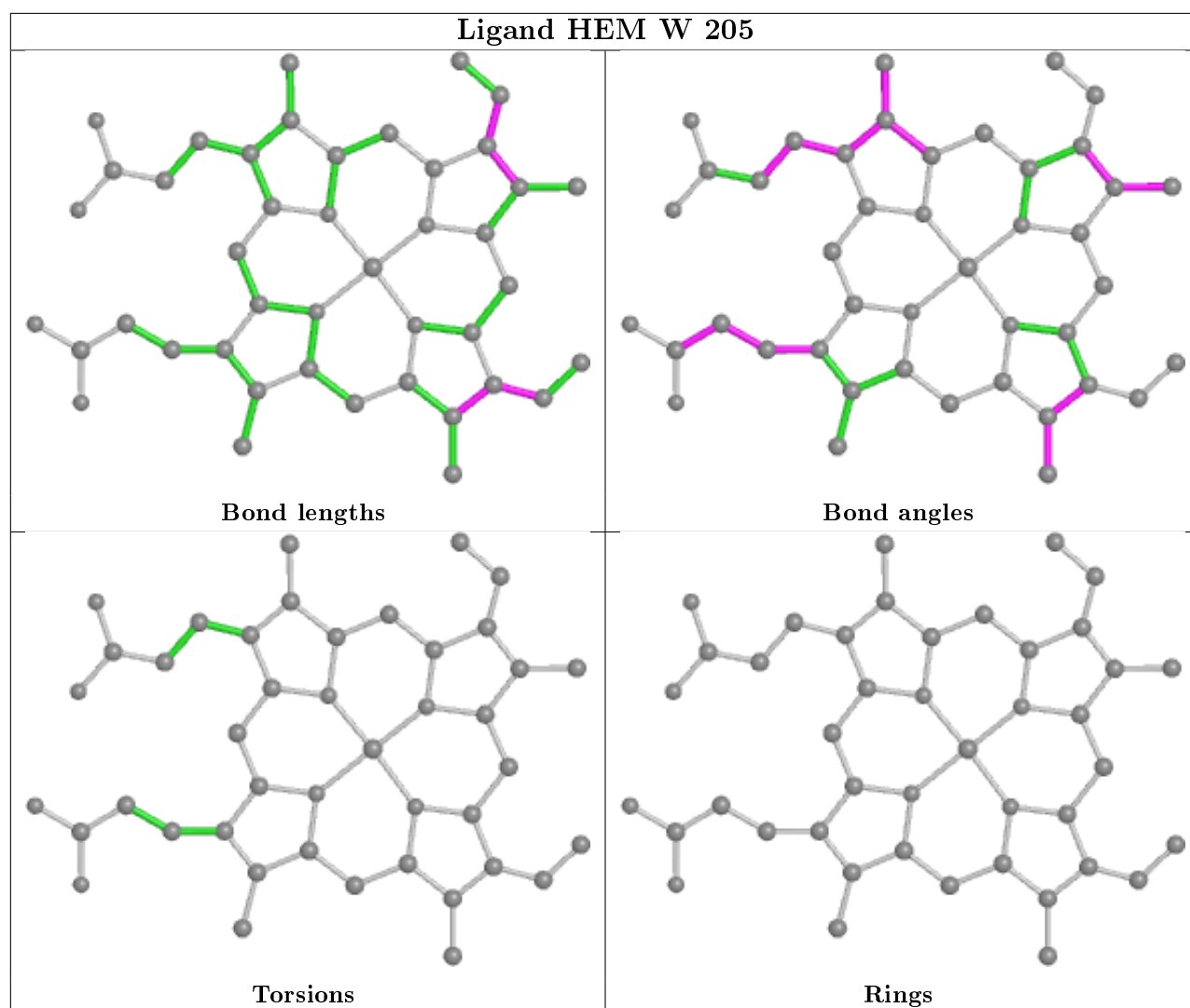


## Ligand HEM I 207









## 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	156/158 (98%)	-0.78	0 100 100	17, 22, 33, 49	0
1	B	156/158 (98%)	-0.85	0 100 100	17, 23, 35, 54	0
1	C	156/158 (98%)	-0.88	0 100 100	19, 25, 38, 49	0
1	D	156/158 (98%)	-0.89	0 100 100	18, 23, 35, 48	0
1	E	156/158 (98%)	-0.85	0 100 100	19, 25, 37, 52	0
1	F	156/158 (98%)	-0.87	0 100 100	19, 26, 38, 51	0
1	G	156/158 (98%)	-0.84	0 100 100	19, 26, 39, 54	0
1	H	156/158 (98%)	-0.87	0 100 100	19, 25, 38, 51	0
1	I	156/158 (98%)	-0.87	0 100 100	20, 26, 37, 55	0
1	J	156/158 (98%)	-0.85	0 100 100	20, 26, 36, 50	0
1	K	156/158 (98%)	-0.85	0 100 100	20, 26, 38, 48	0
1	L	156/158 (98%)	-0.86	0 100 100	18, 25, 39, 53	0
1	M	156/158 (98%)	-0.76	0 100 100	18, 22, 34, 50	0
1	N	156/158 (98%)	-0.86	0 100 100	18, 24, 36, 49	0
1	O	156/158 (98%)	-0.85	0 100 100	21, 27, 39, 56	0
1	P	156/158 (98%)	-0.90	0 100 100	20, 26, 37, 51	0
1	Q	156/158 (98%)	-0.93	0 100 100	18, 23, 35, 49	0
1	R	156/158 (98%)	-0.89	0 100 100	19, 24, 36, 51	0
1	S	156/158 (98%)	-0.87	0 100 100	17, 23, 34, 51	0
1	T	156/158 (98%)	-0.88	0 100 100	18, 23, 36, 54	0
1	U	156/158 (98%)	-0.86	0 100 100	19, 25, 37, 51	0
1	V	156/158 (98%)	-0.86	0 100 100	20, 26, 38, 48	0
1	W	156/158 (98%)	-0.87	0 100 100	19, 26, 37, 51	0
1	X	156/158 (98%)	-0.88	0 100 100	19, 25, 36, 49	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
All	All	3744/3792 (98%)	-0.86	0 100 100	17, 25, 37, 56	0

There are no RSRZ outliers to report.

## 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 carbohydrates in this entry.

## 6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
2	FE2	F	205	1/1	0.20	0.12	101,101,101,101	0
2	FE2	N	206	1/1	0.29	0.15	103,103,103,103	0
2	FE2	W	204	1/1	0.39	0.14	99,99,99,99	0
2	FE2	P	206	1/1	0.49	0.14	105,105,105,105	0
2	FE2	A	208	1/1	0.50	0.09	95,95,95,95	0
2	FE2	I	206	1/1	0.53	0.14	98,98,98,98	0
2	FE2	D	207	1/1	0.55	0.09	96,96,96,96	0
2	FE2	C	206	1/1	0.57	0.09	103,103,103,103	0
2	FE2	H	206	1/1	0.58	0.08	98,98,98,98	0
2	FE2	R	207	1/1	0.63	0.10	106,106,106,106	0
2	FE2	U	206	1/1	0.64	0.09	101,101,101,101	0
2	FE2	K	206	1/1	0.65	0.10	98,98,98,98	0
2	FE2	Q	204	1/1	0.67	0.11	99,99,99,99	0
2	FE2	G	207	1/1	0.67	0.11	99,99,99,99	0
2	FE2	S	205	1/1	0.68	0.07	97,97,97,97	0
2	FE2	E	207	1/1	0.68	0.09	89,89,89,89	0
2	FE2	X	205	1/1	0.72	0.12	98,98,98,98	0
2	FE2	V	205	1/1	0.73	0.09	100,100,100,100	0
2	FE2	T	206	1/1	0.73	0.13	97,97,97,97	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
2	FE2	J	206	1/1	0.74	0.18	104,104,104,104	0
2	FE2	L	208	1/1	0.74	0.07	98,98,98,98	0
2	FE2	O	204	1/1	0.76	0.08	89,89,89,89	0
2	FE2	B	207	1/1	0.85	0.08	95,95,95,95	0
3	ACT	F	206	4/4	0.88	0.18	33,37,40,43	0
2	FE2	M	207	1/1	0.89	0.11	99,99,99,99	0
3	ACT	O	205	4/4	0.90	0.19	35,38,39,40	0
2	FE2	R	206	1/1	0.91	0.04	63,63,63,63	0
2	FE2	G	206	1/1	0.91	0.06	67,67,67,67	0
3	ACT	C	207	4/4	0.91	0.18	38,38,39,45	0
3	ACT	D	209	4/4	0.92	0.22	32,38,38,41	0
3	ACT	H	207	4/4	0.92	0.12	39,42,42,42	0
3	ACT	G	209	4/4	0.92	0.16	33,39,42,45	0
5	HEM	D	208	43/43	0.93	0.11	24,32,47,51	0
2	FE2	N	205	1/1	0.93	0.04	69,69,69,69	0
2	FE2	R	205	1/1	0.93	0.03	65,65,65,65	0
3	ACT	M	209	4/4	0.93	0.15	32,33,39,42	0
5	HEM	E	208	43/43	0.93	0.12	24,31,51,57	0
3	ACT	W	206	4/4	0.93	0.13	37,41,44,44	0
5	HEM	R	208	43/43	0.94	0.09	21,29,45,52	0
3	ACT	L	209	4/4	0.94	0.17	32,37,39,39	0
5	HEM	U	207	43/43	0.94	0.10	23,31,50,56	0
2	FE2	Q	203	1/1	0.94	0.05	54,54,54,54	0
5	HEM	W	205	43/43	0.94	0.10	25,32,47,48	0
5	HEM	P	207	43/43	0.94	0.10	25,34,50,59	0
5	HEM	G	208	43/43	0.94	0.10	23,34,48,55	0
3	ACT	K	208	4/4	0.94	0.15	35,38,39,40	0
5	HEM	S	206	43/43	0.95	0.08	18,29,44,50	0
3	ACT	B	209	4/4	0.95	0.21	27,32,35,36	0
5	HEM	I	207	43/43	0.95	0.08	24,31,47,59	0
2	FE2	D	206	1/1	0.95	0.09	65,65,65,65	0
3	ACT	A	209	4/4	0.95	0.12	30,32,35,36	0
5	HEM	K	207	43/43	0.95	0.11	23,33,45,50	0
3	ACT	I	208	4/4	0.95	0.12	33,36,37,37	0
2	FE2	N	201	1/1	0.96	0.06	51,51,51,51	0
3	ACT	Q	205	4/4	0.96	0.06	33,35,36,37	0
2	FE2	P	205	1/1	0.96	0.03	69,69,69,69	0
2	FE2	U	204	1/1	0.96	0.05	55,55,55,55	0
2	FE2	R	203	1/1	0.96	0.04	56,56,56,56	0
2	FE2	C	203	1/1	0.96	0.04	56,56,56,56	0
2	FE2	O	203	1/1	0.96	0.03	52,52,52,52	0
5	HEM	B	208	43/43	0.96	0.08	21,29,44,49	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
2	FE2	I	205	1/1	0.96	0.04	69,69,69,69	0
2	FE2	P	204	1/1	0.96	0.03	68,68,68,68	0
5	HEM	M	208	43/43	0.96	0.08	18,29,47,51	0
3	ACT	S	207	4/4	0.96	0.16	32,36,36,37	0
3	ACT	U	208	4/4	0.96	0.13	26,37,37,40	0
3	ACT	E	209	4/4	0.97	0.08	33,35,39,42	0
3	ACT	J	207	4/4	0.97	0.15	34,36,37,40	0
3	ACT	N	207	4/4	0.97	0.15	27,37,37,39	0
2	FE2	A	206	1/1	0.97	0.06	60,60,60,60	0
3	ACT	V	206	4/4	0.97	0.08	35,36,42,43	0
2	FE2	L	206	1/1	0.97	0.05	70,70,70,70	0
2	FE2	K	203	1/1	0.97	0.04	51,51,51,51	0
2	FE2	U	205	1/1	0.97	0.04	59,59,59,59	0
2	FE2	H	204	1/1	0.97	0.04	64,64,64,64	0
3	ACT	P	208	4/4	0.97	0.10	28,35,37,41	0
3	ACT	X	206	4/4	0.97	0.17	35,39,40,45	0
2	FE2	M	206	1/1	0.97	0.03	57,57,57,57	0
2	FE2	A	207	1/1	0.97	0.05	62,62,62,62	0
2	FE2	S	203	1/1	0.97	0.04	51,51,51,51	0
2	FE2	X	204	1/1	0.97	0.03	60,60,60,60	0
2	FE2	D	205	1/1	0.97	0.03	52,52,52,52	0
2	FE2	J	204	1/1	0.97	0.04	52,52,52,52	0
2	FE2	I	204	1/1	0.97	0.07	52,52,52,52	0
2	FE2	V	202	1/1	0.98	0.03	41,41,41,41	0
2	FE2	B	205	1/1	0.98	0.04	51,51,51,51	0
2	FE2	R	204	1/1	0.98	0.03	36,36,36,36	0
2	FE2	H	205	1/1	0.98	0.03	60,60,60,60	0
2	FE2	U	203	1/1	0.98	0.04	45,45,45,45	0
2	FE2	F	201	1/1	0.98	0.04	37,37,37,37	0
2	FE2	T	203	1/1	0.98	0.05	50,50,50,50	0
2	FE2	V	204	1/1	0.98	0.06	62,62,62,62	0
2	FE2	F	204	1/1	0.98	0.04	53,53,53,53	0
3	ACT	T	207	4/4	0.98	0.14	32,36,36,37	0
2	FE2	L	207	1/1	0.98	0.05	56,56,56,56	0
2	FE2	W	203	1/1	0.98	0.05	55,55,55,55	0
2	FE2	P	203	1/1	0.98	0.04	55,55,55,55	0
2	FE2	K	205	1/1	0.98	0.03	61,61,61,61	0
2	FE2	B	206	1/1	0.98	0.04	60,60,60,60	0
2	FE2	G	205	1/1	0.98	0.03	53,53,53,53	0
2	FE2	J	205	1/1	0.98	0.04	61,61,61,61	0
2	FE2	J	201	1/1	0.98	0.04	42,42,42,42	0
2	FE2	C	205	1/1	0.98	0.04	62,62,62,62	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
2	FE2	E	204	1/1	0.99	0.03	47,47,47,47	0
2	FE2	M	201	1/1	0.99	0.04	38,38,38,38	0
2	FE2	D	204	1/1	0.99	0.03	40,40,40,40	0
2	FE2	N	202	1/1	0.99	0.05	39,39,39,39	0
2	FE2	K	202	1/1	0.99	0.03	41,41,41,41	0
2	FE2	F	203	1/1	0.99	0.02	42,42,42,42	0
2	FE2	J	203	1/1	0.99	0.03	43,43,43,43	0
2	FE2	G	203	1/1	0.99	0.05	40,40,40,40	0
2	FE2	C	204	1/1	0.99	0.03	41,41,41,41	0
2	FE2	C	202	1/1	0.99	0.04	39,39,39,39	0
2	FE2	W	202	1/1	0.99	0.03	40,40,40,40	0
2	FE2	X	203	1/1	0.99	0.03	57,57,57,57	0
2	FE2	H	203	1/1	0.99	0.02	39,39,39,39	0
2	FE2	R	201	1/1	0.99	0.04	43,43,43,43	0
2	FE2	A	201	1/1	0.99	0.03	37,37,37,37	0
2	FE2	G	204	1/1	0.99	0.04	43,43,43,43	0
2	FE2	T	202	1/1	0.99	0.04	32,32,32,32	0
2	FE2	B	204	1/1	0.99	0.03	33,33,33,33	0
2	FE2	A	203	1/1	0.99	0.03	33,33,33,33	0
2	FE2	A	204	1/1	0.99	0.06	45,45,45,45	0
2	FE2	B	201	1/1	0.99	0.04	41,41,41,41	0
2	FE2	G	202	1/1	0.99	0.04	38,38,38,38	0
2	FE2	D	202	1/1	0.99	0.03	37,37,37,37	0
4	K	D	210	1/1	0.99	0.04	32,32,32,32	0
2	FE2	N	204	1/1	0.99	0.03	36,36,36,36	0
2	FE2	T	205	1/1	0.99	0.04	59,59,59,59	0
2	FE2	S	201	1/1	0.99	0.04	33,33,33,33	0
2	FE2	O	202	1/1	0.99	0.03	41,41,41,41	0
2	FE2	J	202	1/1	0.99	0.05	34,34,34,34	0
2	FE2	L	203	1/1	0.99	0.03	34,34,34,34	0
2	FE2	L	204	1/1	0.99	0.05	55,55,55,55	0
2	FE2	L	201	1/1	0.99	0.04	40,40,40,40	0
2	FE2	I	201	1/1	0.99	0.03	36,36,36,36	0
2	FE2	D	201	1/1	0.99	0.04	38,38,38,38	0
2	FE2	E	201	1/1	0.99	0.06	34,34,34,34	0
4	K	L	210	1/1	0.99	0.04	30,30,30,30	0
3	ACT	R	209	4/4	0.99	0.09	29,30,37,41	0
2	FE2	H	202	1/1	0.99	0.04	35,35,35,35	0
2	FE2	Q	202	1/1	0.99	0.03	37,37,37,37	0
2	FE2	T	201	1/1	0.99	0.02	39,39,39,39	0
2	FE2	P	202	1/1	0.99	0.03	37,37,37,37	0
2	FE2	K	201	1/1	0.99	0.04	33,33,33,33	0

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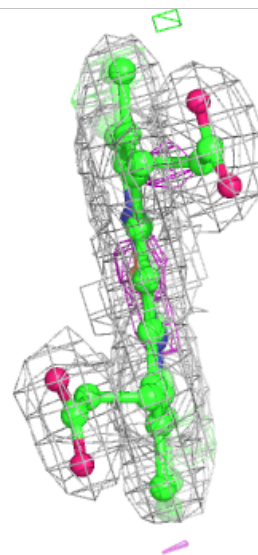
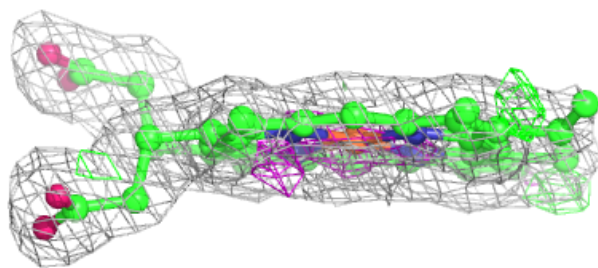
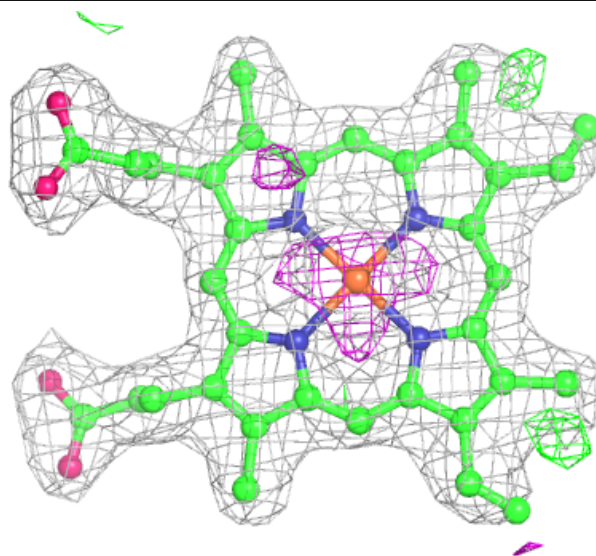
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
2	FE2	S	202	1/1	0.99	0.04	39,39,39,39	0
2	FE2	W	201	1/1	0.99	0.04	33,33,33,33	0
2	FE2	V	203	1/1	0.99	0.07	54,54,54,54	0
2	FE2	E	206	1/1	0.99	0.05	59,59,59,59	0
2	FE2	X	202	1/1	0.99	0.03	38,38,38,38	0
2	FE2	S	204	1/1	0.99	0.03	39,39,39,39	0
2	FE2	E	205	1/1	0.99	0.03	37,37,37,37	0
2	FE2	I	203	1/1	0.99	0.03	44,44,44,44	0
2	FE2	U	201	1/1	0.99	0.04	35,35,35,35	0
2	FE2	I	202	1/1	0.99	0.04	41,41,41,41	0
2	FE2	C	201	1/1	0.99	0.03	34,34,34,34	0
2	FE2	K	204	1/1	0.99	0.03	43,43,43,43	0
2	FE2	F	202	1/1	0.99	0.03	37,37,37,37	0
2	FE2	B	203	1/1	0.99	0.03	31,31,31,31	0
2	FE2	V	201	1/1	0.99	0.04	35,35,35,35	0
2	FE2	M	204	1/1	0.99	0.06	45,45,45,45	0
2	FE2	L	202	1/1	1.00	0.04	38,38,38,38	0
4	K	B	210	1/1	1.00	0.05	35,35,35,35	0
2	FE2	M	205	1/1	1.00	0.05	36,36,36,36	0
2	FE2	T	204	1/1	1.00	0.04	38,38,38,38	0
2	FE2	H	201	1/1	1.00	0.05	42,42,42,42	0
4	K	E	210	1/1	1.00	0.06	38,38,38,38	0
2	FE2	G	201	1/1	1.00	0.05	35,35,35,35	0
2	FE2	E	202	1/1	1.00	0.04	40,40,40,40	0
2	FE2	O	201	1/1	1.00	0.03	36,36,36,36	0
2	FE2	R	202	1/1	1.00	0.03	33,33,33,33	0
2	FE2	M	203	1/1	1.00	0.03	32,32,32,32	0
4	K	A	210	1/1	1.00	0.06	26,26,26,26	0
2	FE2	P	201	1/1	1.00	0.04	34,34,34,34	0
2	FE2	B	202	1/1	1.00	0.05	39,39,39,39	0
2	FE2	M	202	1/1	1.00	0.05	41,41,41,41	0
4	K	G	210	1/1	1.00	0.04	31,31,31,31	0
2	FE2	Q	201	1/1	1.00	0.03	33,33,33,33	0
2	FE2	D	203	1/1	1.00	0.04	33,33,33,33	0
2	FE2	L	205	1/1	1.00	0.04	40,40,40,40	0
2	FE2	N	203	1/1	1.00	0.04	32,32,32,32	0
2	FE2	A	202	1/1	1.00	0.05	36,36,36,36	0
2	FE2	A	205	1/1	1.00	0.04	39,39,39,39	0
2	FE2	E	203	1/1	1.00	0.05	44,44,44,44	0
2	FE2	X	201	1/1	1.00	0.03	33,33,33,33	0
2	FE2	U	202	1/1	1.00	0.03	39,39,39,39	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 D 208:**

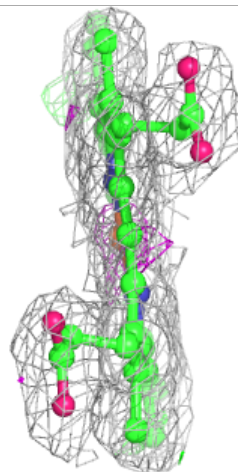
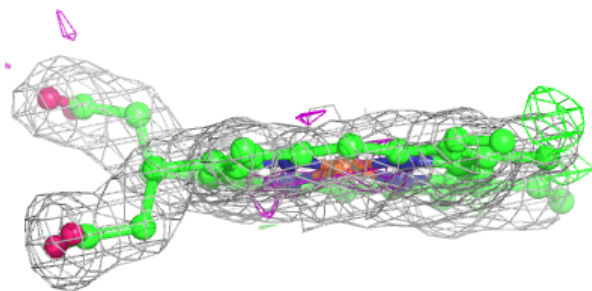
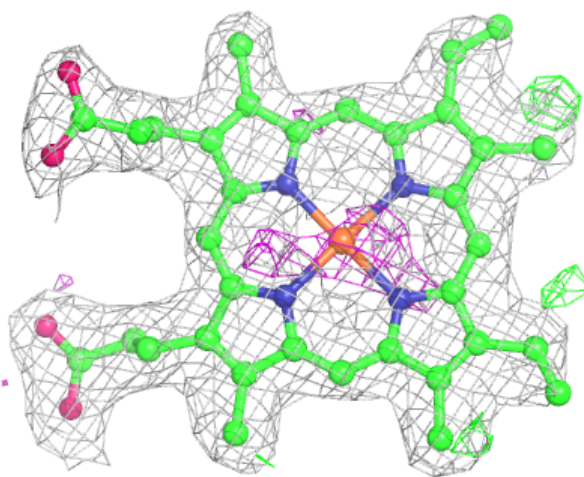
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





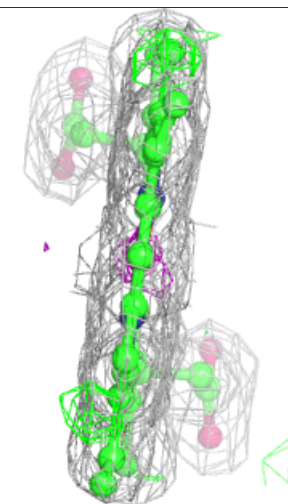
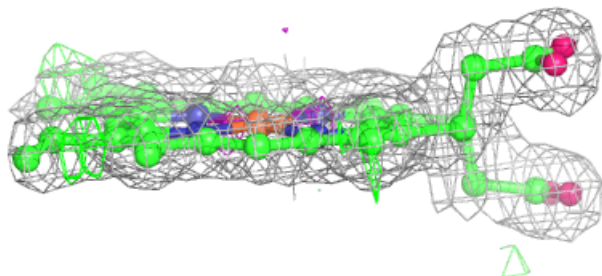
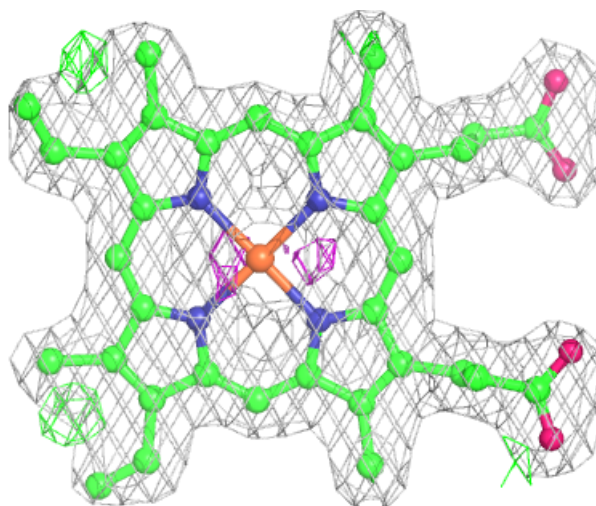
**Electron density around HEM E 208:**

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



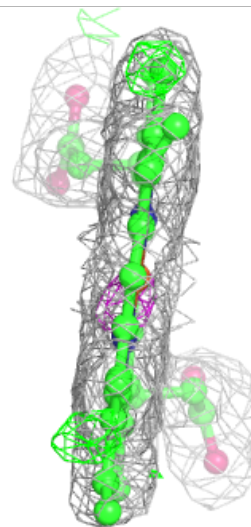
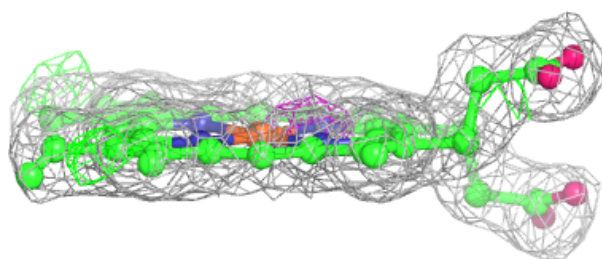
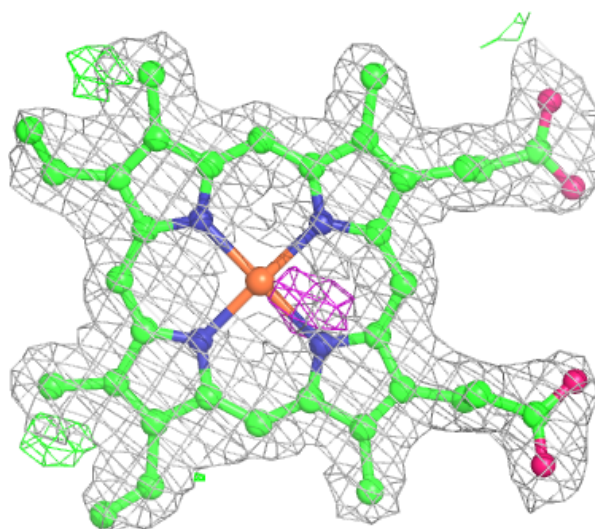
**Electron density around HEM R 208:**

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



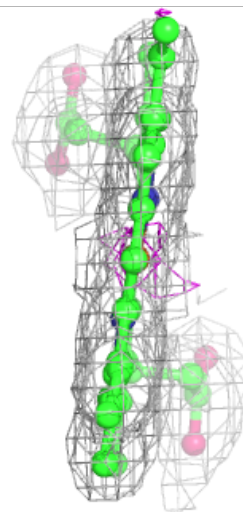
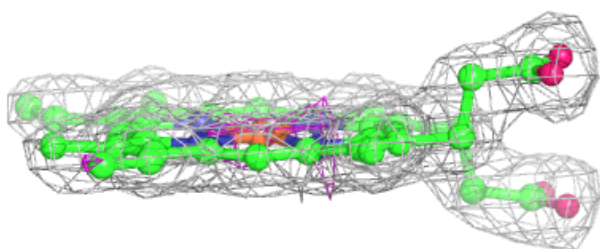
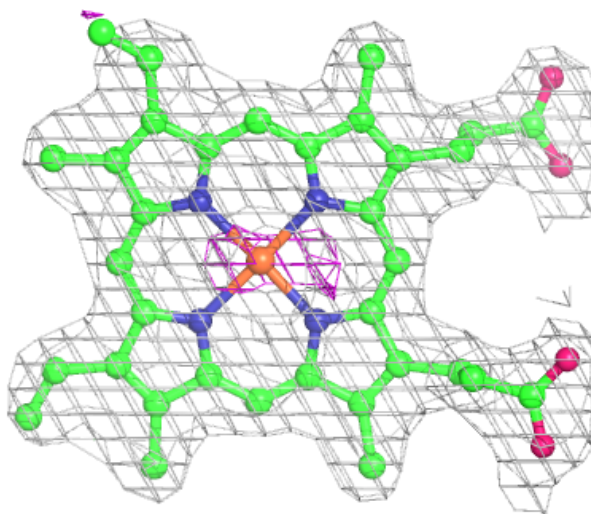
**Electron density around HEM U 207:**

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



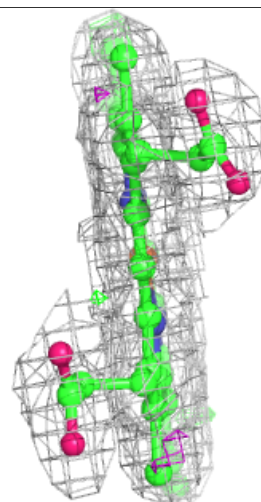
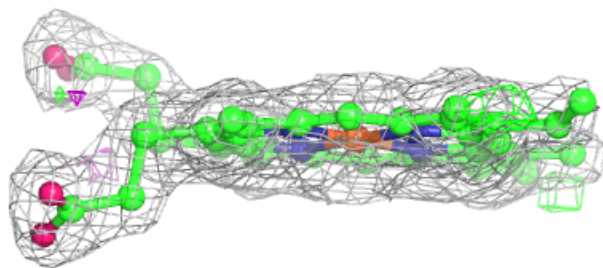
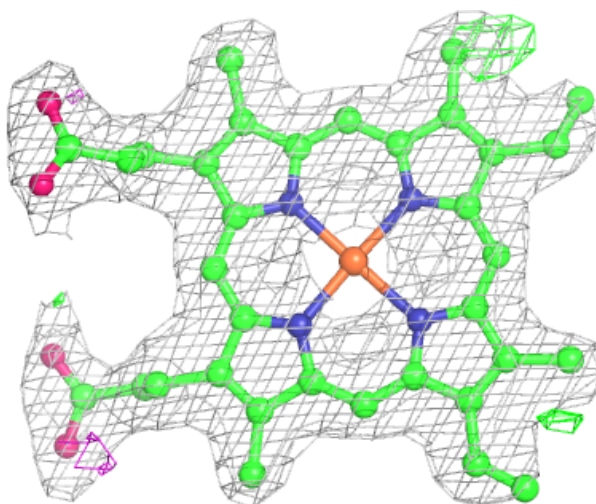
**Electron density around HEM W 205:**

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



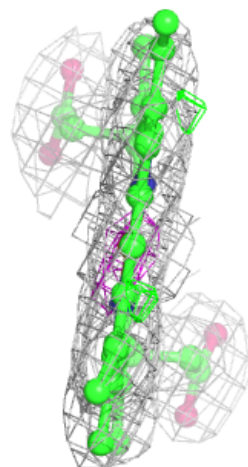
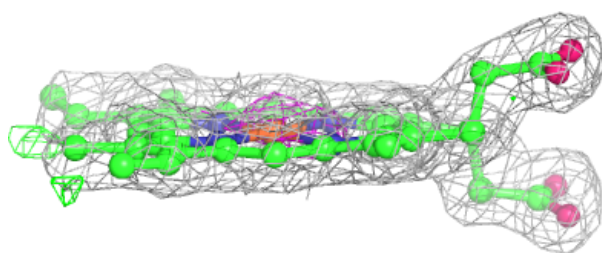
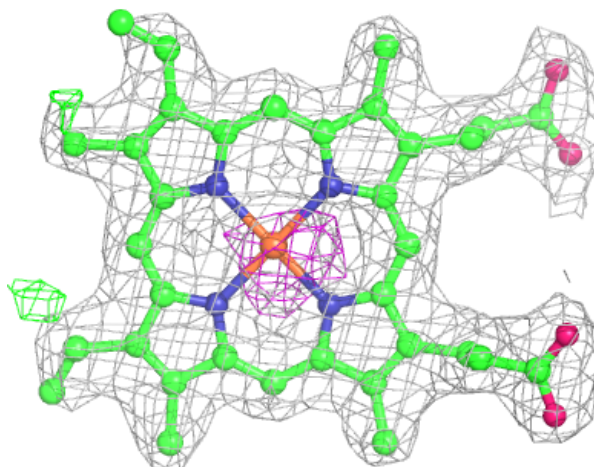
**Electron density around HEM P 207:**

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



**Electron density around HEM G 208:**

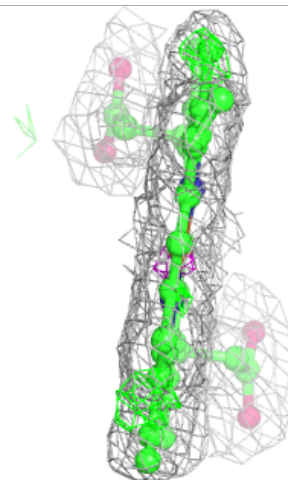
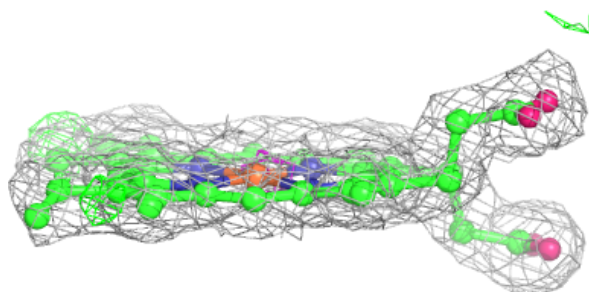
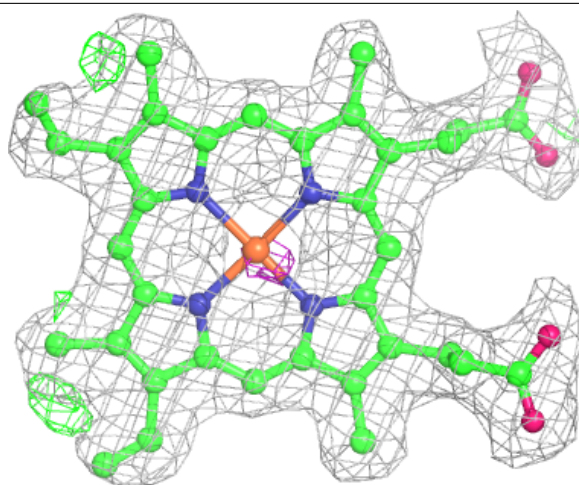
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





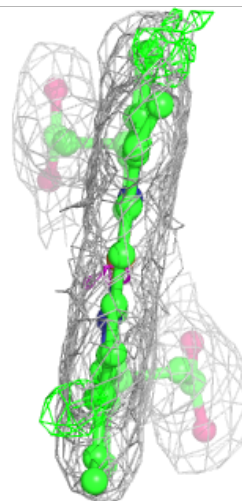
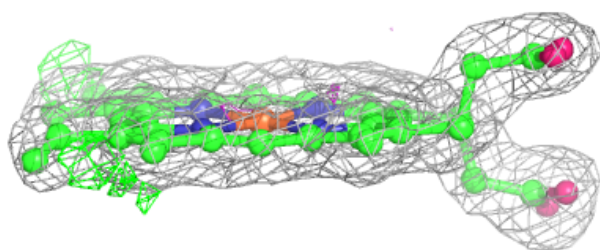
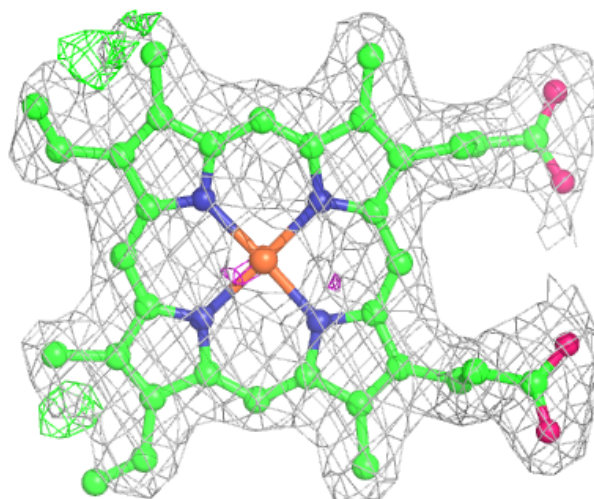
**Electron density around HEM S 206:**

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



**Electron density around HEM I 207:**

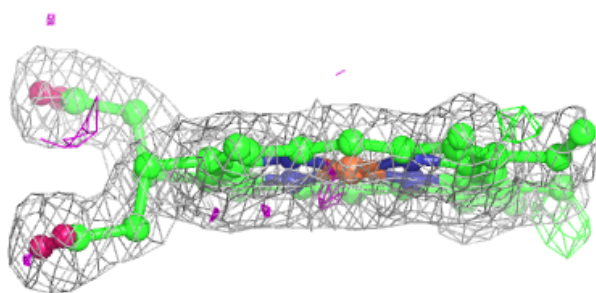
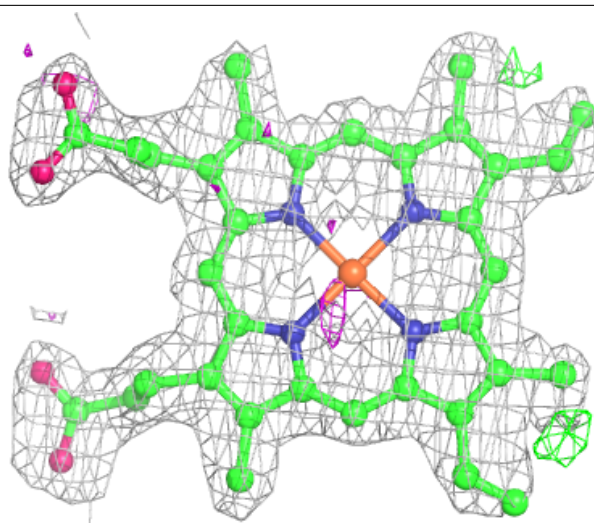
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





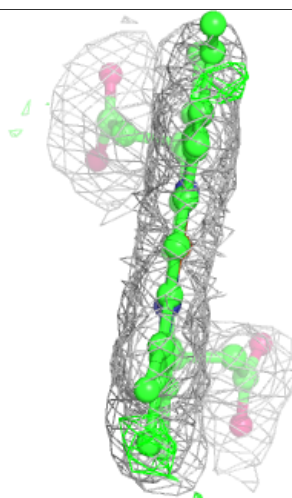
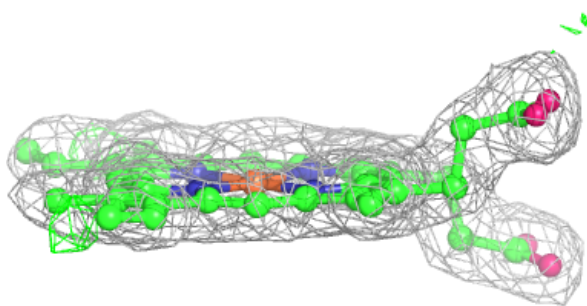
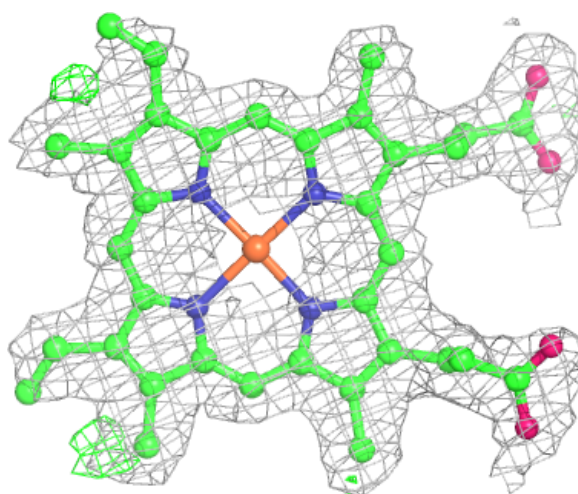
**Electron density around HEM K 207:**

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



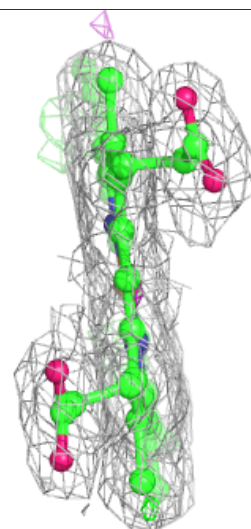
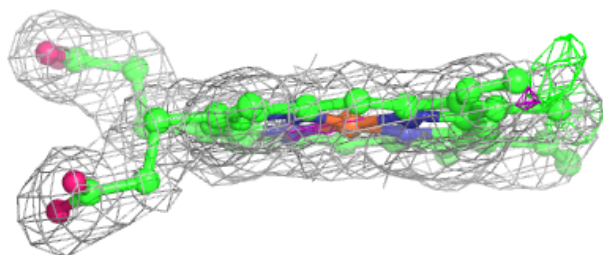
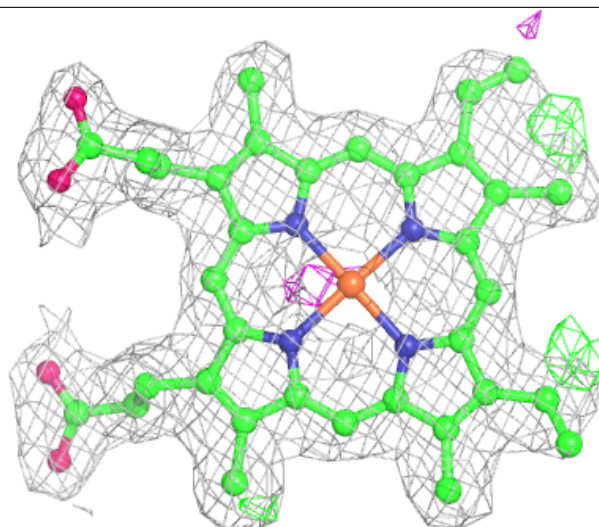
**Electron density around HEM B 208:**

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



**Electron density around HEM M 208:**

$2mF_o-DF_c$  (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.