



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 17, 2024 – 09:19 PM EST

PDB ID : 3UOI  
Title : Mycobacterium tuberculosis bacterioferritin, BfrA  
Authors : McMath, L.M.; Goulding, C.W.; TB Structural Genomics Consortium (TB-SGC)  
Deposited on : 2011-11-16  
Resolution : 1.90 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](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.

The types of validation reports are described at

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

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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 : 2.36  
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) : 2.36

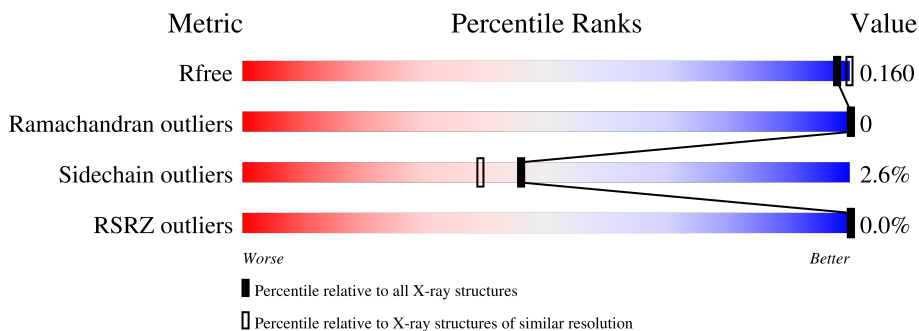
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.90 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.





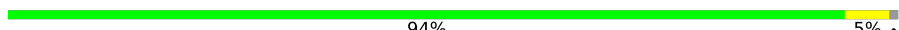







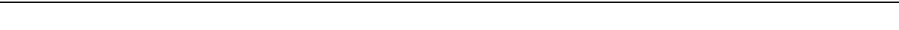

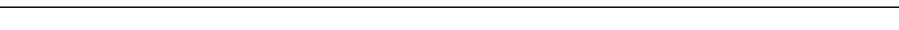
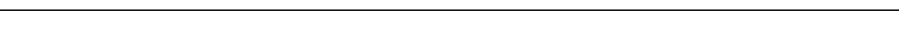



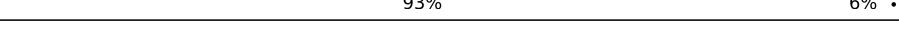
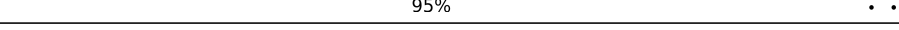

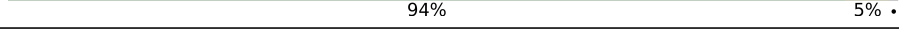
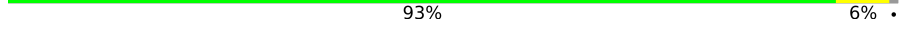
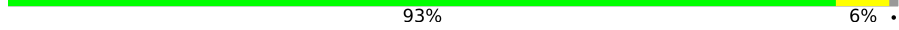
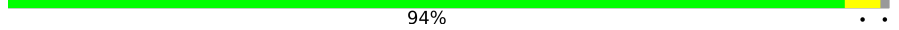
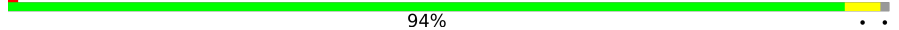
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	6207 (1.90-1.90)
Ramachandran outliers	138981	6760 (1.90-1.90)
Sidechain outliers	138945	6760 (1.90-1.90)
RSRZ outliers	127900	6082 (1.90-1.90)

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  $\geq 3$ , 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	161	92% 6% ..
1	B	161	96% ...
1	C	161	92% 7% .
1	D	161	93% 6% .
1	E	161	89% 9% .
1	F	161	92% 7% .

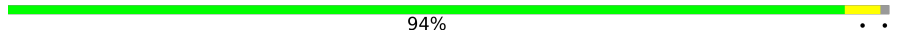



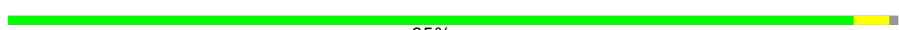





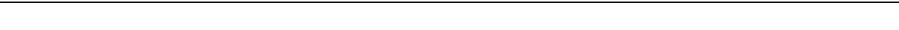

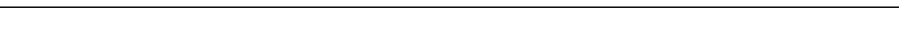
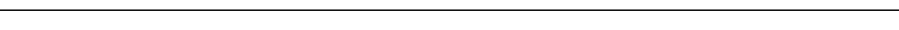
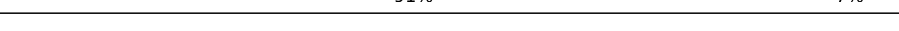


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Mol	Chain	Length	Quality of chain
1	G	161	 92% 7% ..
1	H	161	 93% 6% ..
1	I	161	 94% 5% ..
1	J	161	 89% 10% ..
1	K	161	 92% 6% ..
1	L	161	 94% ..
1	M	161	 91% 7% ..
1	N	161	 89% 9% ..
1	O	161	 94% ..
1	P	161	 91% 7% ..
1	Q	161	 91% 7% ..
1	R	161	 88% 9% ..
1	S	161	 92% 6% ..
1	T	161	 90% 9% ..
1	U	161	 88% 11% ..
1	V	161	 90% 9% ..
1	W	161	 93% 6% ..
1	X	161	 95% ..
1	a	161	 89% 10% ..
1	b	161	 94% 5% ..
1	c	161	 93% 6% ..
1	d	161	 93% 6% ..
1	e	161	 94% ..
1	f	161	 94% ..
1	g	161	 94% ..

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Mol	Chain	Length	Quality of chain
1	h	161	 94% . .
1	i	161	 93% 6% . .
1	j	161	 91% 8% . .
1	k	161	 90% 9% . .
1	l	161	 95% . .
1	m	161	 89% 9% . .
1	n	161	 88% 11% . .
1	o	161	 93% 6% . .
1	p	161	 92% 7% . .
1	q	161	 93% 5% . . .
1	r	161	 92% 7% . .
1	s	161	 93% 6% . .
1	t	161	 88% 11% . .
1	u	161	 91% 7% . .
1	v	161	 89% 9% . . .
1	w	161	 90% 9% . .
1	x	161	 92% 7% . .

## 2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 67560 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Bacterioferritin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	159	1285	802	218	258	7	0	0	0
1	B	159	1285	802	218	258	7	0	0	0
1	C	159	1285	802	218	258	7	0	0	0
1	D	159	1285	802	218	258	7	0	0	0
1	E	159	1285	802	218	258	7	0	0	0
1	F	159	1285	802	218	258	7	0	0	0
1	G	159	1285	802	218	258	7	0	0	0
1	H	159	1285	802	218	258	7	0	0	0
1	I	159	1285	802	218	258	7	0	0	0
1	J	159	1285	802	218	258	7	0	0	0
1	K	159	1285	802	218	258	7	0	0	0
1	L	159	1285	802	218	258	7	0	0	0
1	M	159	1285	802	218	258	7	0	0	0
1	N	159	1285	802	218	258	7	0	0	0
1	O	159	1285	802	218	258	7	0	0	0
1	P	159	1285	802	218	258	7	0	0	0

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	Q	159	Total 1285	C 802	N 218	O 258	S 7	0	0	0
1	R	159	Total 1285	C 802	N 218	O 258	S 7	0	0	0
1	S	159	Total 1285	C 802	N 218	O 258	S 7	0	0	0
1	T	159	Total 1285	C 802	N 218	O 258	S 7	0	0	0
1	U	159	Total 1285	C 802	N 218	O 258	S 7	0	0	0
1	V	159	Total 1285	C 802	N 218	O 258	S 7	0	0	0
1	W	159	Total 1285	C 802	N 218	O 258	S 7	0	0	0
1	X	159	Total 1285	C 802	N 218	O 258	S 7	0	0	0
1	a	159	Total 1285	C 802	N 218	O 258	S 7	0	0	0
1	b	159	Total 1285	C 802	N 218	O 258	S 7	0	0	0
1	c	159	Total 1285	C 802	N 218	O 258	S 7	0	0	0
1	d	159	Total 1285	C 802	N 218	O 258	S 7	0	0	0
1	e	159	Total 1285	C 802	N 218	O 258	S 7	0	0	0
1	f	159	Total 1285	C 802	N 218	O 258	S 7	0	0	0
1	g	159	Total 1285	C 802	N 218	O 258	S 7	0	0	0
1	h	159	Total 1285	C 802	N 218	O 258	S 7	0	0	0
1	i	159	Total 1285	C 802	N 218	O 258	S 7	0	0	0
1	j	159	Total 1285	C 802	N 218	O 258	S 7	0	0	0
1	k	159	Total 1285	C 802	N 218	O 258	S 7	0	0	0
1	l	159	Total 1285	C 802	N 218	O 258	S 7	0	0	0
1	m	159	Total 1281	C 800	N 218	O 256	S 7	0	0	0

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	n	159	Total	C	N	O	S	0	0	0
			1285	802	218	258	7			
1	o	159	Total	C	N	O	S	0	0	0
			1285	802	218	258	7			
1	p	159	Total	C	N	O	S	0	0	0
			1281	800	218	256	7			
1	q	159	Total	C	N	O	S	0	0	0
			1285	802	218	258	7			
1	r	159	Total	C	N	O	S	0	0	0
			1285	802	218	258	7			
1	s	159	Total	C	N	O	S	0	0	0
			1285	802	218	258	7			
1	t	159	Total	C	N	O	S	0	0	0
			1285	802	218	258	7			
1	u	159	Total	C	N	O	S	0	0	0
			1285	802	218	258	7			
1	v	159	Total	C	N	O	S	0	0	0
			1285	802	218	258	7			
1	w	159	Total	C	N	O	S	0	0	0
			1285	802	218	258	7			
1	x	159	Total	C	N	O	S	0	0	0
			1285	802	218	258	7			

There are 96 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	MET	-	expression tag	UNP P63697
A	0	GLY	-	expression tag	UNP P63697
B	-1	MET	-	expression tag	UNP P63697
B	0	GLY	-	expression tag	UNP P63697
C	-1	MET	-	expression tag	UNP P63697
C	0	GLY	-	expression tag	UNP P63697
D	-1	MET	-	expression tag	UNP P63697
D	0	GLY	-	expression tag	UNP P63697
E	-1	MET	-	expression tag	UNP P63697
E	0	GLY	-	expression tag	UNP P63697
F	-1	MET	-	expression tag	UNP P63697
F	0	GLY	-	expression tag	UNP P63697
G	-1	MET	-	expression tag	UNP P63697
G	0	GLY	-	expression tag	UNP P63697
H	-1	MET	-	expression tag	UNP P63697
H	0	GLY	-	expression tag	UNP P63697
I	-1	MET	-	expression tag	UNP P63697

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Chain	Residue	Modelled	Actual	Comment	Reference
I	0	GLY	-	expression tag	UNP P63697
J	-1	MET	-	expression tag	UNP P63697
J	0	GLY	-	expression tag	UNP P63697
K	-1	MET	-	expression tag	UNP P63697
K	0	GLY	-	expression tag	UNP P63697
L	-1	MET	-	expression tag	UNP P63697
L	0	GLY	-	expression tag	UNP P63697
M	-1	MET	-	expression tag	UNP P63697
M	0	GLY	-	expression tag	UNP P63697
N	-1	MET	-	expression tag	UNP P63697
N	0	GLY	-	expression tag	UNP P63697
O	-1	MET	-	expression tag	UNP P63697
O	0	GLY	-	expression tag	UNP P63697
P	-1	MET	-	expression tag	UNP P63697
P	0	GLY	-	expression tag	UNP P63697
Q	-1	MET	-	expression tag	UNP P63697
Q	0	GLY	-	expression tag	UNP P63697
R	-1	MET	-	expression tag	UNP P63697
R	0	GLY	-	expression tag	UNP P63697
S	-1	MET	-	expression tag	UNP P63697
S	0	GLY	-	expression tag	UNP P63697
T	-1	MET	-	expression tag	UNP P63697
T	0	GLY	-	expression tag	UNP P63697
U	-1	MET	-	expression tag	UNP P63697
U	0	GLY	-	expression tag	UNP P63697
V	-1	MET	-	expression tag	UNP P63697
V	0	GLY	-	expression tag	UNP P63697
W	-1	MET	-	expression tag	UNP P63697
W	0	GLY	-	expression tag	UNP P63697
X	-1	MET	-	expression tag	UNP P63697
X	0	GLY	-	expression tag	UNP P63697
a	-1	MET	-	expression tag	UNP P63697
a	0	GLY	-	expression tag	UNP P63697
b	-1	MET	-	expression tag	UNP P63697
b	0	GLY	-	expression tag	UNP P63697
c	-1	MET	-	expression tag	UNP P63697
c	0	GLY	-	expression tag	UNP P63697
d	-1	MET	-	expression tag	UNP P63697
d	0	GLY	-	expression tag	UNP P63697
e	-1	MET	-	expression tag	UNP P63697
e	0	GLY	-	expression tag	UNP P63697
f	-1	MET	-	expression tag	UNP P63697

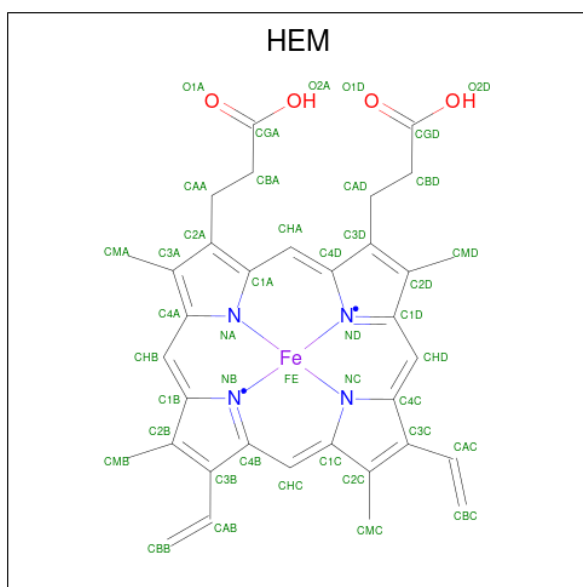
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Chain	Residue	Modelled	Actual	Comment	Reference
f	0	GLY	-	expression tag	UNP P63697
g	-1	MET	-	expression tag	UNP P63697
g	0	GLY	-	expression tag	UNP P63697
h	-1	MET	-	expression tag	UNP P63697
h	0	GLY	-	expression tag	UNP P63697
i	-1	MET	-	expression tag	UNP P63697
i	0	GLY	-	expression tag	UNP P63697
j	-1	MET	-	expression tag	UNP P63697
j	0	GLY	-	expression tag	UNP P63697
k	-1	MET	-	expression tag	UNP P63697
k	0	GLY	-	expression tag	UNP P63697
l	-1	MET	-	expression tag	UNP P63697
l	0	GLY	-	expression tag	UNP P63697
m	-1	MET	-	expression tag	UNP P63697
m	0	GLY	-	expression tag	UNP P63697
n	-1	MET	-	expression tag	UNP P63697
n	0	GLY	-	expression tag	UNP P63697
o	-1	MET	-	expression tag	UNP P63697
o	0	GLY	-	expression tag	UNP P63697
p	-1	MET	-	expression tag	UNP P63697
p	0	GLY	-	expression tag	UNP P63697
q	-1	MET	-	expression tag	UNP P63697
q	0	GLY	-	expression tag	UNP P63697
r	-1	MET	-	expression tag	UNP P63697
r	0	GLY	-	expression tag	UNP P63697
s	-1	MET	-	expression tag	UNP P63697
s	0	GLY	-	expression tag	UNP P63697
t	-1	MET	-	expression tag	UNP P63697
t	0	GLY	-	expression tag	UNP P63697
u	-1	MET	-	expression tag	UNP P63697
u	0	GLY	-	expression tag	UNP P63697
v	-1	MET	-	expression tag	UNP P63697
v	0	GLY	-	expression tag	UNP P63697
w	-1	MET	-	expression tag	UNP P63697
w	0	GLY	-	expression tag	UNP P63697
x	-1	MET	-	expression tag	UNP P63697
x	0	GLY	-	expression tag	UNP P63697

- Molecule 2 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula: C<sub>34</sub>H<sub>32</sub>FeN<sub>4</sub>O<sub>4</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
2	B	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	C	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	F	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	H	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	I	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	L	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	M	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	P	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	R	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	S	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	U	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	X	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	a	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	c	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
2	e	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	g	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	j	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	k	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	n	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	o	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	q	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	t	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	v	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	x	1	Total 43	C 34	Fe 1	N 4	O 4	0	0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	131	Total 131	O 131	0	0
3	B	120	Total 120	O 120	0	0
3	C	89	Total 89	O 89	0	0
3	D	105	Total 105	O 105	0	0
3	E	104	Total 104	O 104	0	0
3	F	102	Total 102	O 102	0	0
3	G	115	Total 115	O 115	0	0
3	H	135	Total 135	O 135	0	0
3	I	127	Total 127	O 127	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	J	142	Total O 142 142	0	0
3	K	115	Total O 115 115	0	0
3	L	116	Total O 116 116	0	0
3	M	115	Total O 115 115	0	0
3	N	122	Total O 122 122	0	0
3	O	127	Total O 127 127	0	0
3	P	127	Total O 127 127	0	0
3	Q	108	Total O 108 108	0	0
3	R	104	Total O 104 104	0	0
3	S	73	Total O 73 73	0	0
3	T	136	Total O 136 136	0	0
3	U	151	Total O 151 151	0	0
3	V	119	Total O 119 119	0	0
3	W	91	Total O 91 91	0	0
3	X	131	Total O 131 131	0	0
3	a	65	Total O 65 65	0	0
3	b	59	Total O 59 59	0	0
3	c	94	Total O 94 94	0	0
3	d	57	Total O 57 57	0	0
3	e	103	Total O 103 103	0	0
3	f	105	Total O 105 105	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	g	59	Total O 59 59	0	0
3	h	63	Total O 63 63	0	0
3	i	128	Total O 128 128	0	0
3	j	74	Total O 74 74	0	0
3	k	102	Total O 102 102	0	0
3	l	120	Total O 120 120	0	0
3	m	58	Total O 58 58	0	0
3	n	41	Total O 41 41	0	0
3	o	106	Total O 106 106	0	0
3	p	69	Total O 69 69	0	0
3	q	91	Total O 91 91	0	0
3	r	96	Total O 96 96	0	0
3	s	65	Total O 65 65	0	0
3	t	69	Total O 69 69	0	0
3	u	131	Total O 131 131	0	0
3	v	74	Total O 74 74	0	0
3	w	100	Total O 100 100	0	0
3	x	122	Total O 122 122	0	0

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

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

- Molecule 1: Bacterioferritin

Chain A:  92% 6% ..



- Molecule 1: Bacterioferritin

Chain B:  96% ...

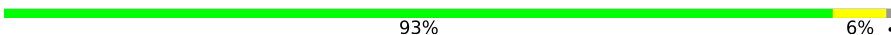


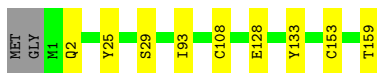
- Molecule 1: Bacterioferritin

Chain C:  92% 7% ..




- Molecule 1: Bacterioferritin

Chain D:  93% 6% ..




- Molecule 1: Bacterioferritin

Chain E:  89% 9% ..



- Molecule 1: Bacterioferritin

Chain F:  92% 7% ..



- Molecule 1: Bacterioferritin

Chain G: 92% 7%



- Molecule 1: Bacterioferritin

Chain H: 93% 6%



- Molecule 1: Bacterioferritin

Chain I: 94% 5%



- Molecule 1: Bacterioferritin

Chain J: 89% 10%



- Molecule 1: Bacterioferritin

Chain K: 92% 6%



- Molecule 1: Bacterioferritin

Chain L: 94%



- Molecule 1: Bacterioferritin

Chain M: 91% 7%



- Molecule 1: Bacterioferritin

Chain N: 89% 9% ..



- Molecule 1: Bacterioferritin

Chain O: 94% ..



- Molecule 1: Bacterioferritin

Chain P: 91% 7% ..



- Molecule 1: Bacterioferritin

Chain Q: 91% 7% ..



- Molecule 1: Bacterioferritin

Chain R: 88% 9% ..



- Molecule 1: Bacterioferritin

Chain S: 92% 6% ..



- Molecule 1: Bacterioferritin

Chain T: 90% 9% ..





- Molecule 1: Bacterioferritin

Chain U: 88% 11%



- Molecule 1: Bacterioferritin

Chain V: 90% 9%



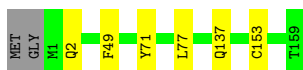
- Molecule 1: Bacterioferritin

Chain W: 93% 6%



- Molecule 1: Bacterioferritin

Chain X: 95%



- Molecule 1: Bacterioferritin

Chain a: 89% 10%



- Molecule 1: Bacterioferritin

Chain b: 94% 5%



- Molecule 1: Bacterioferritin

Chain c: 93% 6%



- Molecule 1: Bacterioferritin

Chain d: 93% 6%



- Molecule 1: Bacterioferritin

Chain e: 94%



- Molecule 1: Bacterioferritin

Chain f: 94%



- Molecule 1: Bacterioferritin

Chain g: 94%



- Molecule 1: Bacterioferritin

Chain h: 94%



- Molecule 1: Bacterioferritin

Chain i: 93% 6%



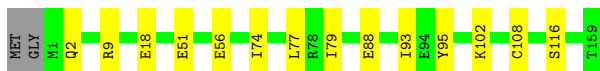
- Molecule 1: Bacterioferritin

Chain j: 91% 8%



- Molecule 1: Bacterioferritin

Chain k: 90% 9%



- Molecule 1: Bacterioferritin

Chain l: 95%



- Molecule 1: Bacterioferritin

Chain m: 89% 9%



- Molecule 1: Bacterioferritin

Chain n: 88% 11%



- Molecule 1: Bacterioferritin

Chain o: 93% 6%



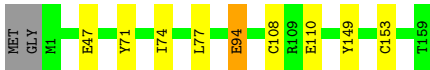
- Molecule 1: Bacterioferritin

Chain p: 92% 7%

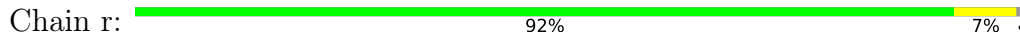


- Molecule 1: Bacterioferritin

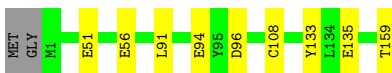
Chain q: 93% 5%



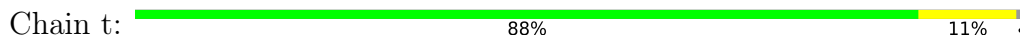
- Molecule 1: Bacterioferritin



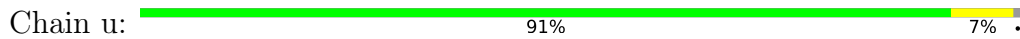
- Molecule 1: Bacterioferritin



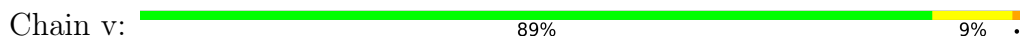
- Molecule 1: Bacterioferritin



- Molecule 1: Bacterioferritin



- Molecule 1: Bacterioferritin



- Molecule 1: Bacterioferritin



- Molecule 1: Bacterioferritin





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	122.96Å 123.22Å 175.45Å 89.95° 89.95° 90.00°	Depositor
Resolution (Å)	32.56 – 1.90 32.56 – 1.90	Depositor EDS
% Data completeness (in resolution range)	88.4 (32.56-1.90) 86.6 (32.56-1.90)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.87 (at 1.91Å)	Xtrriage
Refinement program	REFMAC 5.5.0109	Depositor
R, $R_{free}$	0.148 , 0.194 0.162 , 0.160	Depositor DCC
$R_{free}$ test set	35667 reflections (4.97%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	21.8	Xtrriage
Anisotropy	0.027	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 25.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.40$ , $\langle L^2 \rangle = 0.23$	Xtrriage
Estimated twinning fraction	0.459 for k,-h,l 0.459 for -k,h,l 0.087 for h,-k,-l 0.087 for -h,k,-l 0.470 for -h,-k,l 0.087 for k,h,-l 0.087 for -k,-h,-l	Xtrriage
Reported twinning fraction	0.315 for 1.000H, 1.000K, L 0.208 for -1.000H, -1.000K, L 0.232 for 1.000K, -1.000H, L 0.245 for -1.000K, 1.000H, L	Depositor
Outliers	0 of 718164 reflections	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	67560	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	24.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 53.20 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 4.3586e-05.*

<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

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	A	1.58	6/1304 (0.5%)	0.95	3/1763 (0.2%)
1	B	1.60	3/1304 (0.2%)	0.98	1/1763 (0.1%)
1	C	1.60	4/1304 (0.3%)	1.01	1/1763 (0.1%)
1	D	1.63	5/1304 (0.4%)	0.96	0/1763
1	E	1.56	7/1304 (0.5%)	1.05	4/1763 (0.2%)
1	F	1.62	6/1304 (0.5%)	0.98	1/1763 (0.1%)
1	G	1.67	9/1304 (0.7%)	0.99	1/1763 (0.1%)
1	H	1.64	6/1304 (0.5%)	0.96	1/1763 (0.1%)
1	I	1.57	2/1304 (0.2%)	1.00	4/1763 (0.2%)
1	J	1.66	10/1304 (0.8%)	1.02	7/1763 (0.4%)
1	K	1.57	7/1304 (0.5%)	0.94	3/1763 (0.2%)
1	L	1.60	4/1304 (0.3%)	1.00	3/1763 (0.2%)
1	M	1.64	7/1304 (0.5%)	0.96	1/1763 (0.1%)
1	N	1.71	8/1304 (0.6%)	0.98	4/1763 (0.2%)
1	O	1.62	6/1304 (0.5%)	0.98	1/1763 (0.1%)
1	P	1.69	11/1304 (0.8%)	0.95	3/1763 (0.2%)
1	Q	1.66	12/1304 (0.9%)	0.97	1/1763 (0.1%)
1	R	1.57	10/1304 (0.8%)	1.04	6/1763 (0.3%)
1	S	1.63	6/1304 (0.5%)	1.04	4/1763 (0.2%)
1	T	1.71	10/1304 (0.8%)	1.00	3/1763 (0.2%)
1	U	1.77	13/1304 (1.0%)	0.98	2/1763 (0.1%)
1	V	1.61	5/1304 (0.4%)	0.98	4/1763 (0.2%)
1	W	1.61	4/1304 (0.3%)	0.97	2/1763 (0.1%)
1	X	1.66	3/1304 (0.2%)	0.98	1/1763 (0.1%)
1	a	1.71	15/1304 (1.2%)	0.97	2/1763 (0.1%)
1	b	1.66	6/1304 (0.5%)	0.98	2/1763 (0.1%)
1	c	1.56	3/1304 (0.2%)	0.99	3/1763 (0.2%)
1	d	1.56	7/1304 (0.5%)	0.96	2/1763 (0.1%)
1	e	1.48	2/1304 (0.2%)	0.96	2/1763 (0.1%)
1	f	1.58	5/1304 (0.4%)	1.01	4/1763 (0.2%)
1	g	1.60	4/1304 (0.3%)	0.97	2/1763 (0.1%)
1	h	1.53	3/1304 (0.2%)	0.95	0/1763

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	i	1.59	8/1304 (0.6%)	0.98	3/1763 (0.2%)
1	j	1.65	7/1304 (0.5%)	1.01	3/1763 (0.2%)
1	k	1.62	7/1304 (0.5%)	0.99	2/1763 (0.1%)
1	l	1.62	5/1304 (0.4%)	0.96	0/1763
1	m	1.67	9/1300 (0.7%)	0.97	3/1758 (0.2%)
1	n	1.69	9/1304 (0.7%)	1.02	3/1763 (0.2%)
1	o	1.71	8/1304 (0.6%)	0.97	0/1763
1	p	1.59	6/1300 (0.5%)	0.95	2/1758 (0.1%)
1	q	1.56	5/1304 (0.4%)	0.96	1/1763 (0.1%)
1	r	1.60	7/1304 (0.5%)	0.99	2/1763 (0.1%)
1	s	1.60	7/1304 (0.5%)	0.96	2/1763 (0.1%)
1	t	1.77	14/1304 (1.1%)	0.99	2/1763 (0.1%)
1	u	1.72	10/1304 (0.8%)	1.01	2/1763 (0.1%)
1	v	1.67	8/1304 (0.6%)	0.99	2/1763 (0.1%)
1	w	1.61	5/1304 (0.4%)	1.05	6/1763 (0.3%)
1	x	1.68	6/1304 (0.5%)	0.94	1/1763 (0.1%)
All	All	1.63	330/62584 (0.5%)	0.98	112/84614 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	q	0	1

All (330) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	P	108	CYS	CB-SG	-10.43	1.64	1.82
1	W	108	CYS	CB-SG	-9.99	1.65	1.82
1	k	108	CYS	CB-SG	-9.76	1.65	1.82
1	N	93	ILE	C-N	9.53	1.55	1.34
1	M	153	CYS	CB-SG	-9.14	1.66	1.82
1	f	127	GLU	C-N	8.91	1.54	1.34
1	v	108	CYS	CB-SG	-8.58	1.67	1.82
1	X	153	CYS	CB-SG	-8.53	1.67	1.82
1	t	135	GLU	CD-OE2	-8.37	1.16	1.25
1	q	108	CYS	CB-SG	-8.35	1.68	1.82
1	p	51	GLU	C-N	8.18	1.52	1.34
1	s	56	GLU	CD-OE2	-8.09	1.16	1.25
1	b	56	GLU	CD-OE1	-7.90	1.17	1.25

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	w	108	CYS	CB-SG	-7.85	1.69	1.82
1	x	153	CYS	CB-SG	-7.80	1.69	1.82
1	F	108	CYS	CB-SG	-7.65	1.69	1.82
1	Q	127	GLU	CG-CD	-7.55	1.40	1.51
1	d	95	TYR	CD1-CE1	-7.49	1.28	1.39
1	N	108	CYS	CB-SG	-7.46	1.69	1.82
1	f	108	CYS	CB-SG	-7.36	1.69	1.82
1	e	108	CYS	CB-SG	-7.28	1.69	1.82
1	I	108	CYS	CB-SG	-7.27	1.69	1.82
1	A	128	GLU	CD-OE2	-7.27	1.17	1.25
1	T	94	GLU	CD-OE2	-7.25	1.17	1.25
1	S	18	GLU	CD-OE1	-7.21	1.17	1.25
1	T	56	GLU	CD-OE1	-7.19	1.17	1.25
1	t	153	CYS	CB-SG	-7.18	1.70	1.82
1	x	154	VAL	CB-CG2	-7.16	1.37	1.52
1	E	18	GLU	CD-OE1	-7.08	1.17	1.25
1	D	153	CYS	CB-SG	-7.07	1.70	1.82
1	J	108	CYS	CB-SG	-7.06	1.70	1.82
1	E	127	GLU	C-N	7.03	1.50	1.34
1	a	56	GLU	CD-OE2	-7.02	1.18	1.25
1	Q	127	GLU	CB-CG	-6.98	1.38	1.52
1	o	149	TYR	CD2-CE2	-6.96	1.28	1.39
1	m	56	GLU	CD-OE2	-6.95	1.18	1.25
1	n	56	GLU	CD-OE2	-6.95	1.18	1.25
1	C	71	TYR	CD1-CE1	-6.94	1.28	1.39
1	t	71	TYR	CD1-CE1	-6.89	1.29	1.39
1	b	56	GLU	CD-OE2	-6.88	1.18	1.25
1	K	51	GLU	CD-OE2	-6.86	1.18	1.25
1	P	13	GLU	CB-CG	-6.84	1.39	1.52
1	A	108	CYS	CB-SG	-6.82	1.70	1.82
1	K	153	CYS	CB-SG	-6.81	1.70	1.82
1	a	128	GLU	CD-OE2	-6.80	1.18	1.25
1	G	149	TYR	CD2-CE2	-6.71	1.29	1.39
1	G	51	GLU	CG-CD	6.67	1.61	1.51
1	t	71	TYR	CE1-CZ	-6.66	1.29	1.38
1	V	108	CYS	CB-SG	-6.66	1.71	1.82
1	u	133	TYR	CD2-CE2	-6.65	1.29	1.39
1	a	51	GLU	CD-OE2	6.58	1.32	1.25
1	R	18	GLU	CD-OE1	-6.53	1.18	1.25
1	a	56	GLU	CD-OE1	-6.53	1.18	1.25
1	S	51	GLU	CD-OE1	-6.52	1.18	1.25
1	U	153	CYS	CB-SG	-6.50	1.71	1.82

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	k	95	TYR	CD2-CE2	-6.48	1.29	1.39
1	h	108	CYS	CB-SG	-6.46	1.71	1.82
1	p	37	PHE	CD1-CE1	-6.45	1.26	1.39
1	o	153	CYS	CB-SG	-6.44	1.71	1.82
1	n	108	CYS	CB-SG	-6.43	1.71	1.82
1	B	51	GLU	CD-OE2	-6.42	1.18	1.25
1	t	94	GLU	CD-OE1	-6.41	1.18	1.25
1	H	56	GLU	CD-OE1	-6.38	1.18	1.25
1	J	18	GLU	C-N	6.38	1.48	1.34
1	C	128	GLU	CD-OE2	-6.36	1.18	1.25
1	J	46	ALA	CA-CB	-6.34	1.39	1.52
1	Q	39	GLU	CD-OE1	-6.34	1.18	1.25
1	K	51	GLU	CB-CG	6.33	1.64	1.52
1	K	56	GLU	CD-OE1	-6.33	1.18	1.25
1	U	88	GLU	CG-CD	-6.32	1.42	1.51
1	E	108	CYS	CB-SG	-6.32	1.71	1.82
1	n	51	GLU	CD-OE2	-6.30	1.18	1.25
1	t	135	GLU	CD-OE1	-6.30	1.18	1.25
1	a	146	GLU	CB-CG	-6.30	1.40	1.52
1	c	128	GLU	CD-OE2	-6.29	1.18	1.25
1	g	108	CYS	CB-SG	-6.28	1.71	1.82
1	m	51	GLU	CD-OE1	-6.28	1.18	1.25
1	N	153	CYS	CB-SG	-6.26	1.71	1.82
1	l	128	GLU	CD-OE2	-6.26	1.18	1.25
1	Q	47	GLU	CD-OE1	-6.25	1.18	1.25
1	R	47	GLU	CB-CG	-6.24	1.40	1.52
1	u	133	TYR	CD1-CE1	-6.24	1.29	1.39
1	n	153	CYS	CB-SG	-6.21	1.71	1.82
1	u	128	GLU	CD-OE1	-6.20	1.18	1.25
1	I	128	GLU	CD-OE1	-6.19	1.18	1.25
1	u	71	TYR	CD1-CE1	-6.18	1.30	1.39
1	g	153	CYS	CB-SG	-6.17	1.71	1.82
1	D	108	CYS	CB-SG	-6.17	1.71	1.82
1	s	108	CYS	CB-SG	-6.16	1.71	1.82
1	k	18	GLU	CD-OE2	-6.14	1.18	1.25
1	l	56	GLU	CD-OE2	-6.09	1.19	1.25
1	P	128	GLU	CD-OE2	-6.09	1.19	1.25
1	q	71	TYR	CD2-CE2	-6.07	1.30	1.39
1	l	151	ALA	C-O	-6.07	1.11	1.23
1	O	51	GLU	CD-OE1	-6.07	1.19	1.25
1	A	128	GLU	CD-OE1	-6.06	1.19	1.25
1	u	135	GLU	CD-OE1	-6.05	1.19	1.25

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	u	128	GLU	CD-OE2	-6.05	1.19	1.25
1	a	95	TYR	CD2-CE2	-6.04	1.30	1.39
1	u	85	GLU	CD-OE2	-6.03	1.19	1.25
1	E	51	GLU	CG-CD	6.03	1.60	1.51
1	g	17	SER	CB-OG	-6.02	1.34	1.42
1	m	56	GLU	CD-OE1	-6.02	1.19	1.25
1	J	135	GLU	CD-OE1	-6.01	1.19	1.25
1	d	25	TYR	CD1-CE1	-5.98	1.30	1.39
1	v	21	ALA	CA-CB	-5.98	1.39	1.52
1	i	48	SER	CB-OG	-5.98	1.34	1.42
1	U	55	ALA	CA-CB	-5.97	1.40	1.52
1	t	85	GLU	CD-OE2	-5.97	1.19	1.25
1	M	25	TYR	CD2-CE2	-5.95	1.30	1.39
1	C	151	ALA	CA-CB	-5.94	1.40	1.52
1	Q	149	TYR	CD2-CE2	-5.94	1.30	1.39
1	q	153	CYS	CB-SG	-5.93	1.72	1.81
1	p	153	CYS	CB-SG	-5.93	1.72	1.81
1	M	135	GLU	CD-OE1	-5.93	1.19	1.25
1	N	106	VAL	CB-CG2	-5.93	1.40	1.52
1	P	118	VAL	CB-CG1	-5.93	1.40	1.52
1	F	124	VAL	CB-CG1	-5.92	1.40	1.52
1	f	18	GLU	CD-OE2	-5.90	1.19	1.25
1	B	13	GLU	CB-CG	-5.89	1.41	1.52
1	j	46	ALA	CA-CB	-5.88	1.40	1.52
1	R	18	GLU	CD-OE2	-5.87	1.19	1.25
1	G	135	GLU	CD-OE1	-5.86	1.19	1.25
1	V	153	CYS	CB-SG	-5.86	1.72	1.81
1	F	56	GLU	CD-OE2	-5.85	1.19	1.25
1	b	128	GLU	CD-OE1	-5.84	1.19	1.25
1	a	127	GLU	C-O	-5.84	1.12	1.23
1	w	153	CYS	CB-SG	-5.82	1.72	1.81
1	X	71	TYR	CD1-CE1	-5.81	1.30	1.39
1	G	56	GLU	CD-OE1	-5.81	1.19	1.25
1	P	53	ARG	C-N	-5.81	1.20	1.34
1	N	135	GLU	CD-OE2	-5.80	1.19	1.25
1	U	13	GLU	CB-CG	-5.79	1.41	1.52
1	o	56	GLU	CD-OE2	-5.78	1.19	1.25
1	Q	128	GLU	CD-OE1	-5.78	1.19	1.25
1	w	129	GLU	CB-CG	-5.75	1.41	1.52
1	a	47	GLU	CD-OE1	-5.74	1.19	1.25
1	J	135	GLU	CD-OE2	-5.74	1.19	1.25
1	O	133	TYR	CD1-CE1	-5.74	1.30	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	a	51	GLU	CG-CD	5.74	1.60	1.51
1	o	108	CYS	CB-SG	-5.72	1.72	1.81
1	V	149	TYR	CD1-CE1	-5.72	1.30	1.39
1	U	149	TYR	CD2-CE2	-5.71	1.30	1.39
1	P	51	GLU	CD-OE1	-5.71	1.19	1.25
1	T	128	GLU	CD-OE2	-5.70	1.19	1.25
1	n	18	GLU	CD-OE2	-5.70	1.19	1.25
1	T	56	GLU	CD-OE2	-5.68	1.19	1.25
1	G	108	CYS	CB-SG	-5.67	1.72	1.81
1	p	133	TYR	CD2-CE2	-5.66	1.30	1.39
1	t	25	TYR	C-N	-5.66	1.21	1.34
1	E	121	GLU	CD-OE1	-5.65	1.19	1.25
1	d	25	TYR	CD2-CE2	-5.65	1.30	1.39
1	B	128	GLU	CD-OE2	-5.65	1.19	1.25
1	f	153	CYS	CB-SG	-5.65	1.72	1.81
1	F	149	TYR	CD2-CE2	-5.64	1.30	1.39
1	n	149	TYR	CD2-CE2	-5.64	1.30	1.39
1	T	13	GLU	CB-CG	-5.62	1.41	1.52
1	l	87	PHE	CD2-CE2	-5.62	1.28	1.39
1	m	128	GLU	CD-OE2	-5.62	1.19	1.25
1	d	133	TYR	CD2-CE2	-5.61	1.30	1.39
1	q	149	TYR	CD2-CE2	-5.61	1.30	1.39
1	b	17	SER	CB-OG	-5.61	1.34	1.42
1	a	95	TYR	CD1-CE1	-5.61	1.30	1.39
1	V	95	TYR	CD2-CE2	-5.61	1.30	1.39
1	j	128	GLU	CD-OE2	-5.60	1.19	1.25
1	a	17	SER	CB-OG	-5.59	1.34	1.42
1	G	153	CYS	CB-SG	-5.59	1.72	1.81
1	F	29	SER	CB-OG	-5.58	1.34	1.42
1	W	71	TYR	CE2-CZ	-5.58	1.31	1.38
1	r	108	CYS	CB-SG	-5.57	1.72	1.81
1	O	94	GLU	CD-OE1	-5.55	1.19	1.25
1	o	135	GLU	CD-OE1	-5.55	1.19	1.25
1	Q	56	GLU	CD-OE2	-5.55	1.19	1.25
1	Q	128	GLU	CD-OE2	-5.55	1.19	1.25
1	E	126	ASP	C-N	-5.55	1.21	1.34
1	Q	29	SER	CB-OG	-5.54	1.35	1.42
1	h	56	GLU	CD-OE2	-5.51	1.19	1.25
1	c	128	GLU	CD-OE1	-5.50	1.19	1.25
1	m	116	SER	CB-OG	-5.49	1.35	1.42
1	R	29	SER	CB-OG	-5.49	1.35	1.42
1	p	139	GLU	CB-CG	-5.48	1.41	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	K	18	GLU	CD-OE1	-5.48	1.19	1.25
1	k	51	GLU	CG-CD	5.48	1.60	1.51
1	j	7	VAL	CB-CG1	-5.47	1.41	1.52
1	C	129	GLU	CB-CG	-5.46	1.41	1.52
1	P	133	TYR	CD2-CE2	-5.46	1.31	1.39
1	e	39	GLU	CD-OE1	-5.45	1.19	1.25
1	u	51	GLU	CG-CD	5.45	1.60	1.51
1	A	47	GLU	CD-OE1	-5.44	1.19	1.25
1	k	56	GLU	CD-OE1	-5.43	1.19	1.25
1	t	128	GLU	CD-OE1	-5.43	1.19	1.25
1	T	25	TYR	CD2-CE2	-5.43	1.31	1.39
1	A	95	TYR	CD1-CE1	-5.42	1.31	1.39
1	H	56	GLU	CD-OE2	-5.40	1.19	1.25
1	J	18	GLU	CD-OE1	-5.40	1.19	1.25
1	s	135	GLU	CD-OE2	-5.39	1.19	1.25
1	K	110	GLU	CG-CD	-5.39	1.43	1.51
1	J	21	ALA	CA-CB	-5.38	1.41	1.52
1	d	128	GLU	CD-OE2	-5.38	1.19	1.25
1	M	56	GLU	CD-OE2	-5.38	1.19	1.25
1	v	56	GLU	CD-OE1	-5.37	1.19	1.25
1	S	29	SER	CB-OG	-5.37	1.35	1.42
1	m	149	TYR	CD2-CE2	-5.36	1.31	1.39
1	Q	56	GLU	CD-OE1	-5.35	1.19	1.25
1	L	13	GLU	CB-CG	-5.35	1.42	1.52
1	S	85	GLU	CD-OE1	-5.35	1.19	1.25
1	Q	95	TYR	CE2-CZ	-5.34	1.31	1.38
1	m	153	CYS	CB-SG	-5.34	1.73	1.81
1	i	52	MET	C-N	5.33	1.46	1.34
1	r	85	GLU	CD-OE2	-5.33	1.19	1.25
1	S	85	GLU	CD-OE2	-5.32	1.19	1.25
1	b	135	GLU	CD-OE1	-5.32	1.19	1.25
1	H	59	THR	C-O	-5.32	1.13	1.23
1	H	21	ALA	CA-CB	-5.32	1.41	1.52
1	R	149	TYR	CD2-CE2	-5.32	1.31	1.39
1	r	85	GLU	CD-OE1	-5.32	1.19	1.25
1	u	71	TYR	CD2-CE2	-5.32	1.31	1.39
1	U	25	TYR	CD1-CE1	-5.31	1.31	1.39
1	V	7	VAL	C-O	-5.31	1.13	1.23
1	j	18	GLU	CG-CD	-5.31	1.44	1.51
1	o	25	TYR	CD2-CE2	-5.31	1.31	1.39
1	U	21	ALA	CA-CB	-5.30	1.41	1.52
1	t	150	SER	CB-OG	-5.30	1.35	1.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	i	49	PHE	C-N	5.30	1.46	1.34
1	N	95	TYR	CD1-CE1	-5.29	1.31	1.39
1	f	116	SER	CB-OG	-5.29	1.35	1.42
1	L	50	ASP	C-N	-5.28	1.22	1.34
1	A	29	SER	CB-OG	-5.28	1.35	1.42
1	d	71	TYR	CD2-CE2	-5.27	1.31	1.39
1	T	149	TYR	CD2-CE2	-5.27	1.31	1.39
1	w	85	GLU	CD-OE2	-5.27	1.19	1.25
1	i	108	CYS	CB-SG	-5.27	1.73	1.81
1	O	85	GLU	CD-OE1	-5.26	1.19	1.25
1	P	133	TYR	CD1-CE1	-5.26	1.31	1.39
1	a	53	ARG	C-O	-5.26	1.13	1.23
1	D	133	TYR	CD2-CE2	-5.25	1.31	1.39
1	t	135	GLU	CG-CD	-5.25	1.44	1.51
1	x	29	SER	CB-OG	-5.25	1.35	1.42
1	E	56	GLU	CD-OE2	-5.25	1.19	1.25
1	M	41	ALA	CA-CB	-5.25	1.41	1.52
1	c	56	GLU	CD-OE1	-5.24	1.19	1.25
1	k	56	GLU	CD-OE2	-5.24	1.19	1.25
1	U	87	PHE	CE2-CZ	-5.24	1.27	1.37
1	g	39	GLU	CD-OE1	-5.23	1.19	1.25
1	F	51	GLU	CD-OE2	-5.23	1.19	1.25
1	G	47	GLU	CG-CD	-5.23	1.44	1.51
1	r	37	PHE	CE2-CZ	-5.23	1.27	1.37
1	r	94	GLU	CD-OE1	-5.23	1.19	1.25
1	K	48	SER	CB-OG	-5.23	1.35	1.42
1	s	133	TYR	CD1-CE1	-5.23	1.31	1.39
1	i	85	GLU	CG-CD	-5.23	1.44	1.51
1	u	121	GLU	CD-OE2	-5.23	1.20	1.25
1	P	56	GLU	CD-OE2	-5.22	1.20	1.25
1	h	146	GLU	CB-CG	-5.22	1.42	1.52
1	R	146	GLU	CD-OE1	-5.22	1.20	1.25
1	o	51	GLU	CD-OE2	-5.20	1.20	1.25
1	s	94	GLU	CD-OE2	-5.20	1.20	1.25
1	a	42	ALA	C-O	-5.20	1.13	1.23
1	D	128	GLU	CD-OE1	-5.20	1.20	1.25
1	v	29	SER	CB-OG	-5.19	1.35	1.42
1	H	146	GLU	CB-CG	-5.19	1.42	1.52
1	v	56	GLU	CD-OE2	-5.19	1.20	1.25
1	t	13	GLU	CB-CG	-5.19	1.42	1.52
1	t	108	CYS	CB-SG	-5.18	1.73	1.81
1	m	25	TYR	CD2-CE2	-5.18	1.31	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	n	124	VAL	CB-CG2	-5.18	1.42	1.52
1	U	88	GLU	CD-OE1	-5.17	1.20	1.25
1	t	50	ASP	C-N	-5.17	1.22	1.34
1	l	39	GLU	CD-OE1	-5.17	1.20	1.25
1	x	71	TYR	CD2-CE2	-5.17	1.31	1.39
1	M	56	GLU	CD-OE1	-5.17	1.20	1.25
1	N	128	GLU	CD-OE2	-5.17	1.20	1.25
1	J	13	GLU	CB-CG	-5.16	1.42	1.52
1	v	57	GLU	CD-OE2	-5.16	1.20	1.25
1	x	149	TYR	CD2-CE2	-5.16	1.31	1.39
1	U	146	GLU	CD-OE1	-5.16	1.20	1.25
1	J	29	SER	CB-OG	-5.16	1.35	1.42
1	r	18	GLU	CD-OE2	-5.16	1.20	1.25
1	i	93	ILE	C-N	-5.15	1.22	1.34
1	r	41	ALA	C-O	-5.15	1.13	1.23
1	R	151	ALA	CA-CB	-5.14	1.41	1.52
1	S	127	GLU	CD-OE2	-5.14	1.20	1.25
1	a	154	VAL	CB-CG2	-5.14	1.42	1.52
1	R	56	GLU	CD-OE2	-5.13	1.20	1.25
1	n	121	GLU	CD-OE2	-5.13	1.20	1.25
1	d	137	GLN	C-N	5.13	1.45	1.34
1	o	18	GLU	CD-OE2	-5.12	1.20	1.25
1	s	133	TYR	CD2-CE2	-5.11	1.31	1.39
1	i	153	CYS	CB-SG	-5.11	1.73	1.81
1	H	121	GLU	CD-OE2	-5.11	1.20	1.25
1	O	146	GLU	CD-OE2	-5.11	1.20	1.25
1	b	47	GLU	CD-OE1	-5.10	1.20	1.25
1	x	149	TYR	CD1-CE1	-5.10	1.31	1.39
1	T	128	GLU	CD-OE1	-5.10	1.20	1.25
1	w	94	GLU	C-N	-5.10	1.22	1.34
1	R	48	SER	CB-OG	-5.09	1.35	1.42
1	Q	127	GLU	CD-OE1	-5.09	1.20	1.25
1	k	116	SER	CB-OG	-5.09	1.35	1.42
1	R	46	ALA	CA-CB	-5.08	1.41	1.52
1	i	26	PHE	C-O	-5.08	1.13	1.23
1	L	123	ILE	C-O	-5.08	1.13	1.23
1	W	153	CYS	CB-SG	-5.08	1.73	1.81
1	U	39	GLU	CD-OE1	-5.08	1.20	1.25
1	s	51	GLU	CD-OE1	-5.07	1.20	1.25
1	j	121	GLU	CD-OE2	-5.07	1.20	1.25
1	q	47	GLU	CD-OE1	-5.07	1.20	1.25
1	G	39	GLU	CD-OE1	-5.06	1.20	1.25

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	v	49	PHE	CD2-CE2	-5.06	1.29	1.39
1	N	56	GLU	CD-OE1	-5.06	1.20	1.25
1	D	25	TYR	CD2-CE2	-5.05	1.31	1.39
1	a	46	ALA	CA-CB	-5.05	1.41	1.52
1	T	39	GLU	CB-CG	-5.05	1.42	1.52
1	v	18	GLU	CD-OE2	-5.05	1.20	1.25
1	j	129	GLU	CB-CG	-5.04	1.42	1.52
1	G	135	GLU	CD-OE2	-5.03	1.20	1.25
1	P	27	LEU	C-O	-5.03	1.13	1.23
1	p	108	CYS	CB-SG	-5.03	1.73	1.81
1	L	25	TYR	CD2-CE2	-5.03	1.31	1.39
1	O	47	GLU	CD-OE2	-5.03	1.20	1.25
1	P	46	ALA	CA-CB	-5.03	1.41	1.52
1	n	41	ALA	CA-CB	-5.03	1.41	1.52
1	U	128	GLU	CD-OE1	-5.03	1.20	1.25
1	X	49	PHE	CE1-CZ	-5.02	1.27	1.37
1	U	56	GLU	CD-OE1	-5.02	1.20	1.25
1	j	25	TYR	CE2-CZ	-5.02	1.32	1.38
1	J	128	GLU	CD-OE1	-5.02	1.20	1.25
1	M	95	TYR	CD1-CE1	-5.02	1.31	1.39
1	m	139	GLU	CD-OE2	-5.01	1.20	1.25
1	T	25	TYR	CD1-CE1	-5.00	1.31	1.39
1	W	71	TYR	CD2-CE2	-5.00	1.31	1.39

All (112) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	9	ARG	NE-CZ-NH1	11.01	125.81	120.30
1	f	9	ARG	NE-CZ-NH1	9.71	125.15	120.30
1	q	94	GLU	O-C-N	-8.12	109.70	122.70
1	w	45	ARG	NE-CZ-NH2	8.01	124.31	120.30
1	w	94	GLU	O-C-N	-8.00	109.91	122.70
1	i	93	ILE	O-C-N	-7.99	109.92	122.70
1	i	93	ILE	C-N-CA	7.97	141.62	121.70
1	f	127	GLU	O-C-N	7.82	135.21	122.70
1	E	51	GLU	CG-CD-OE2	7.50	133.30	118.30
1	R	96	ASP	CB-CG-OD1	7.38	124.94	118.30
1	w	66	ASP	CB-CG-OD1	7.36	124.92	118.30
1	w	45	ARG	NE-CZ-NH1	-7.18	116.71	120.30
1	a	51	GLU	CG-CD-OE2	7.16	132.62	118.30
1	R	141	MET	CG-SD-CE	7.05	111.48	100.20
1	J	18	GLU	O-C-N	6.98	133.87	122.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	j	51	GLU	CG-CD-OE1	6.94	132.19	118.30
1	N	93	ILE	C-N-CA	-6.91	104.42	121.70
1	w	68	LEU	CA-CB-CG	6.64	130.57	115.30
1	k	9	ARG	NE-CZ-NH2	-6.58	117.01	120.30
1	H	100	ARG	NE-CZ-NH1	6.52	123.56	120.30
1	g	132	ASP	CB-CG-OD1	6.52	124.17	118.30
1	c	45	ARG	NE-CZ-NH1	-6.43	117.08	120.30
1	V	51	GLU	CG-CD-OE2	6.30	130.90	118.30
1	S	51	GLU	CG-CD-OE2	6.18	130.66	118.30
1	R	109	ARG	NE-CZ-NH1	6.15	123.38	120.30
1	I	66	ASP	CB-CG-OD1	6.12	123.81	118.30
1	A	77	LEU	CA-CB-CG	6.08	129.29	115.30
1	e	113	ASP	CB-CG-OD1	6.08	123.77	118.30
1	p	51	GLU	O-C-N	6.06	132.40	122.70
1	S	94	GLU	O-C-N	-6.05	113.01	122.70
1	V	66	ASP	CB-CG-OD2	6.03	123.73	118.30
1	w	94	GLU	CA-C-N	6.02	130.44	117.20
1	J	50	ASP	CB-CG-OD1	5.99	123.69	118.30
1	e	142	ASP	CB-CG-OD2	5.97	123.68	118.30
1	n	132	ASP	CB-CG-OD1	5.94	123.65	118.30
1	W	156	ARG	NE-CZ-NH2	-5.89	117.36	120.30
1	E	127	GLU	O-C-N	5.86	132.08	122.70
1	j	9	ARG	NE-CZ-NH2	-5.86	117.37	120.30
1	M	9	ARG	NE-CZ-NH1	5.83	123.22	120.30
1	n	51	GLU	CG-CD-OE1	5.80	129.90	118.30
1	a	51	GLU	CG-CD-OE1	-5.75	106.80	118.30
1	T	94	GLU	OE1-CD-OE2	-5.75	116.41	123.30
1	E	51	GLU	CG-CD-OE1	-5.75	106.81	118.30
1	L	90	ASP	CB-CG-OD2	5.74	123.47	118.30
1	N	134	LEU	CA-CB-CG	5.74	128.50	115.30
1	u	51	GLU	CG-CD-OE2	5.74	129.77	118.30
1	v	126	ASP	CB-CG-OD2	5.72	123.45	118.30
1	J	18	GLU	CA-C-N	-5.67	104.72	117.20
1	P	51	GLU	CG-CD-OE2	5.65	129.61	118.30
1	b	100	ARG	NE-CZ-NH2	-5.65	117.47	120.30
1	J	50	ASP	CB-CG-OD2	-5.64	113.22	118.30
1	c	90	ASP	CB-CG-OD2	5.64	123.37	118.30
1	f	127	GLU	CA-C-N	-5.63	104.81	117.20
1	A	90	ASP	CB-CG-OD2	5.62	123.36	118.30
1	J	90	ASP	CB-CG-OD1	5.61	123.35	118.30
1	s	91	LEU	CB-CG-CD1	-5.61	101.46	111.00
1	K	51	GLU	CG-CD-OE1	5.60	129.49	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	m	51	GLU	CG-CD-OE2	5.59	129.48	118.30
1	u	90	ASP	CB-CG-OD1	5.58	123.32	118.30
1	N	61	ARG	NE-CZ-NH1	5.57	123.09	120.30
1	S	109	ARG	NE-CZ-NH1	5.57	123.08	120.30
1	m	90	ASP	CB-CG-OD2	5.56	123.30	118.30
1	s	96	ASP	CB-CG-OD1	5.56	123.30	118.30
1	d	113	ASP	CB-CG-OD2	5.55	123.30	118.30
1	G	78	ARG	NE-CZ-NH1	5.55	123.08	120.30
1	U	100	ARG	NE-CZ-NH1	5.53	123.06	120.30
1	i	93	ILE	CA-C-N	5.51	129.32	117.20
1	j	51	GLU	CG-CD-OE2	-5.50	107.30	118.30
1	U	141	MET	CG-SD-CE	5.50	109.00	100.20
1	n	113	ASP	CB-CG-OD2	5.49	123.24	118.30
1	J	1	MET	CG-SD-CE	-5.47	91.45	100.20
1	V	4	ASP	CB-CG-OD2	5.47	123.22	118.30
1	t	134	LEU	CA-CB-CG	5.46	127.86	115.30
1	K	51	GLU	CG-CD-OE2	-5.45	107.40	118.30
1	p	73	ARG	NE-CZ-NH1	5.45	123.02	120.30
1	N	90	ASP	CB-CG-OD1	5.45	123.20	118.30
1	C	51	GLU	CG-CD-OE2	5.42	129.15	118.30
1	X	77	LEU	CA-CB-CG	5.41	127.75	115.30
1	K	9	ARG	NE-CZ-NH2	-5.41	117.59	120.30
1	Q	77	LEU	CA-CB-CG	5.39	127.70	115.30
1	S	77	LEU	CA-CB-CG	5.37	127.66	115.30
1	b	100	ARG	NE-CZ-NH1	5.37	122.98	120.30
1	P	51	GLU	OE1-CD-OE2	-5.36	116.87	123.30
1	I	73	ARG	NE-CZ-NH1	-5.34	117.63	120.30
1	F	96	ASP	CB-CG-OD1	5.33	123.10	118.30
1	W	45	ARG	NE-CZ-NH1	-5.33	117.64	120.30
1	R	119	LEU	CA-CB-CG	5.31	127.52	115.30
1	T	66	ASP	CB-CG-OD1	5.30	123.07	118.30
1	V	51	GLU	OE1-CD-OE2	-5.27	116.97	123.30
1	T	9	ARG	NE-CZ-NH1	-5.25	117.67	120.30
1	r	132	ASP	CB-CG-OD1	5.23	123.01	118.30
1	g	77	LEU	CA-CB-CG	5.23	127.33	115.30
1	k	51	GLU	CG-CD-OE1	5.23	128.76	118.30
1	m	60	ASP	CB-CG-OD2	5.21	122.99	118.30
1	r	83	LEU	CA-CB-CG	5.20	127.25	115.30
1	R	91	LEU	CA-CB-CG	5.16	127.17	115.30
1	c	96	ASP	CB-CG-OD1	5.16	122.94	118.30
1	t	141	MET	CG-SD-CE	5.15	108.44	100.20
1	B	61	ARG	NE-CZ-NH2	-5.13	117.73	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	d	108	CYS	CA-CB-SG	5.12	123.23	114.00
1	R	51	GLU	CG-CD-OE2	5.12	128.55	118.30
1	I	73	ARG	NE-CZ-NH2	5.12	122.86	120.30
1	L	144	LEU	CA-CB-CG	5.11	127.06	115.30
1	f	9	ARG	NE-CZ-NH2	-5.11	117.74	120.30
1	O	93	ILE	CB-CA-C	5.11	121.82	111.60
1	P	77	LEU	CA-CB-CG	5.06	126.93	115.30
1	I	61	ARG	NE-CZ-NH1	5.05	122.83	120.30
1	v	78	ARG	NE-CZ-NH1	-5.04	117.78	120.30
1	J	51	GLU	CG-CD-OE2	5.03	128.37	118.30
1	L	77	LEU	CA-CB-CG	5.03	126.86	115.30
1	x	96	ASP	CB-CG-OD1	5.03	122.82	118.30
1	A	156	ARG	NE-CZ-NH2	-5.02	117.79	120.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	q	94	GLU	Mainchain

## 5.2 Too-close contacts [i](#)

Due to software issues we are unable to calculate clashes - this section is therefore empty.

## 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	157/161 (98%)	155 (99%)	2 (1%)	0	100 100
1	B	157/161 (98%)	156 (99%)	1 (1%)	0	100 100
1	C	157/161 (98%)	157 (100%)	0	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	D	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	E	157/161 (98%)	157 (100%)	0	0	100	100
1	F	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	G	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	H	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	I	157/161 (98%)	157 (100%)	0	0	100	100
1	J	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	K	157/161 (98%)	157 (100%)	0	0	100	100
1	L	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	M	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	N	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	O	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	P	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	Q	157/161 (98%)	157 (100%)	0	0	100	100
1	R	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	S	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	T	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	U	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	V	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	W	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	X	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	a	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	b	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	c	157/161 (98%)	157 (100%)	0	0	100	100
1	d	157/161 (98%)	155 (99%)	2 (1%)	0	100	100
1	e	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	f	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	g	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	h	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	i	157/161 (98%)	157 (100%)	0	0	100	100
1	j	157/161 (98%)	157 (100%)	0	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	k	157/161 (98%)	157 (100%)	0	0	100	100
1	l	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	m	157/161 (98%)	155 (99%)	2 (1%)	0	100	100
1	n	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	o	157/161 (98%)	157 (100%)	0	0	100	100
1	p	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	q	157/161 (98%)	155 (99%)	2 (1%)	0	100	100
1	r	157/161 (98%)	155 (99%)	2 (1%)	0	100	100
1	s	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	t	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	u	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	v	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
1	w	157/161 (98%)	155 (99%)	2 (1%)	0	100	100
1	x	157/161 (98%)	156 (99%)	1 (1%)	0	100	100
All	All	7536/7728 (98%)	7492 (99%)	44 (1%)	0	100	100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	142/143 (99%)	138 (97%)	4 (3%)	43	36
1	B	142/143 (99%)	140 (99%)	2 (1%)	67	65
1	C	142/143 (99%)	136 (96%)	6 (4%)	30	20
1	D	142/143 (99%)	138 (97%)	4 (3%)	43	36
1	E	142/143 (99%)	135 (95%)	7 (5%)	25	15
1	F	142/143 (99%)	138 (97%)	4 (3%)	43	36
1	G	142/143 (99%)	140 (99%)	2 (1%)	67	65

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	H	142/143 (99%)	138 (97%)	4 (3%)	43	36
1	I	142/143 (99%)	139 (98%)	3 (2%)	53	48
1	J	142/143 (99%)	138 (97%)	4 (3%)	43	36
1	K	142/143 (99%)	137 (96%)	5 (4%)	36	27
1	L	142/143 (99%)	142 (100%)	0	100	100
1	M	142/143 (99%)	136 (96%)	6 (4%)	30	20
1	N	142/143 (99%)	138 (97%)	4 (3%)	43	36
1	O	142/143 (99%)	142 (100%)	0	100	100
1	P	142/143 (99%)	139 (98%)	3 (2%)	53	48
1	Q	142/143 (99%)	138 (97%)	4 (3%)	43	36
1	R	142/143 (99%)	138 (97%)	4 (3%)	43	36
1	S	142/143 (99%)	138 (97%)	4 (3%)	43	36
1	T	142/143 (99%)	137 (96%)	5 (4%)	36	27
1	U	142/143 (99%)	138 (97%)	4 (3%)	43	36
1	V	142/143 (99%)	136 (96%)	6 (4%)	30	20
1	W	142/143 (99%)	137 (96%)	5 (4%)	36	27
1	X	142/143 (99%)	140 (99%)	2 (1%)	67	65
1	a	142/143 (99%)	138 (97%)	4 (3%)	43	36
1	b	142/143 (99%)	140 (99%)	2 (1%)	67	65
1	c	142/143 (99%)	138 (97%)	4 (3%)	43	36
1	d	142/143 (99%)	140 (99%)	2 (1%)	67	65
1	e	142/143 (99%)	139 (98%)	3 (2%)	53	48
1	f	142/143 (99%)	141 (99%)	1 (1%)	84	84
1	g	142/143 (99%)	139 (98%)	3 (2%)	53	48
1	h	142/143 (99%)	138 (97%)	4 (3%)	43	36
1	i	142/143 (99%)	140 (99%)	2 (1%)	67	65
1	j	142/143 (99%)	138 (97%)	4 (3%)	43	36
1	k	142/143 (99%)	135 (95%)	7 (5%)	25	15
1	l	142/143 (99%)	141 (99%)	1 (1%)	84	84
1	m	141/143 (99%)	136 (96%)	5 (4%)	36	27
1	n	142/143 (99%)	135 (95%)	7 (5%)	25	15

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	o	142/143 (99%)	141 (99%)	1 (1%)	84	84
1	p	141/143 (99%)	137 (97%)	4 (3%)	43	36
1	q	142/143 (99%)	139 (98%)	3 (2%)	53	48
1	r	142/143 (99%)	139 (98%)	3 (2%)	53	48
1	s	142/143 (99%)	141 (99%)	1 (1%)	84	84
1	t	142/143 (99%)	138 (97%)	4 (3%)	43	36
1	u	142/143 (99%)	138 (97%)	4 (3%)	43	36
1	v	142/143 (99%)	135 (95%)	7 (5%)	25	15
1	w	142/143 (99%)	136 (96%)	6 (4%)	30	20
1	x	142/143 (99%)	137 (96%)	5 (4%)	36	27
All	All	6814/6864 (99%)	6635 (97%)	179 (3%)	46	39

All (179) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	4	ASP
1	A	51	GLU
1	A	77	LEU
1	A	159	THR
1	B	18	GLU
1	B	51	GLU
1	C	9	ARG
1	C	39	GLU
1	C	70	ASN
1	C	77	LEU
1	C	112	GLN
1	C	159	THR
1	D	2	GLN
1	D	29	SER
1	D	93	ILE
1	D	159	THR
1	E	2	GLN
1	E	30	LYS
1	E	73	ARG
1	E	74	ILE
1	E	77	LEU
1	E	93	ILE
1	E	141	MET

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	F	2	GLN
1	F	79	ILE
1	F	91	LEU
1	F	130	HIS
1	G	154	VAL
1	G	159	THR
1	H	1	MET
1	H	61	ARG
1	H	93	ILE
1	H	159	THR
1	I	2	GLN
1	I	77	LEU
1	I	159	THR
1	J	2	GLN
1	J	33	ASP
1	J	48	SER
1	J	93	ILE
1	K	2	GLN
1	K	51	GLU
1	K	74	ILE
1	K	77	LEU
1	K	159	THR
1	M	9	ARG
1	M	48	SER
1	M	76	SER
1	M	88	GLU
1	M	137	GLN
1	M	159	THR
1	N	4	ASP
1	N	74	ILE
1	N	77	LEU
1	N	81	GLN
1	P	77	LEU
1	P	78	ARG
1	P	159	THR
1	Q	2	GLN
1	Q	74	ILE
1	Q	77	LEU
1	Q	159	THR
1	R	48	SER
1	R	119	LEU
1	R	127	GLU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	R	159	THR
1	S	77	LEU
1	S	88	GLU
1	S	107	MET
1	S	159	THR
1	T	2	GLN
1	T	15	LEU
1	T	33	ASP
1	T	77	LEU
1	T	159	THR
1	U	2	GLN
1	U	77	LEU
1	U	127	GLU
1	U	159	THR
1	V	1	MET
1	V	2	GLN
1	V	39	GLU
1	V	48	SER
1	V	77	LEU
1	V	102	LYS
1	W	29	SER
1	W	48	SER
1	W	51	GLU
1	W	77	LEU
1	W	93	ILE
1	X	2	GLN
1	X	137	GLN
1	a	2	GLN
1	a	137	GLN
1	a	142	ASP
1	a	159	THR
1	b	146	GLU
1	b	159	THR
1	c	66	ASP
1	c	77	LEU
1	c	91	LEU
1	c	159	THR
1	d	156	ARG
1	d	159	THR
1	e	2	GLN
1	e	146	GLU
1	e	159	THR

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	f	20	THR
1	g	76	SER
1	g	77	LEU
1	g	159	THR
1	h	1	MET
1	h	2	GLN
1	h	9	ARG
1	h	159	THR
1	i	1	MET
1	i	2	GLN
1	j	1	MET
1	j	2	GLN
1	j	77	LEU
1	j	159	THR
1	k	2	GLN
1	k	74	ILE
1	k	77	LEU
1	k	79	ILE
1	k	88	GLU
1	k	93	ILE
1	k	102	LYS
1	l	1	MET
1	m	61	ARG
1	m	66	ASP
1	m	91	LEU
1	m	102	LYS
1	m	159	THR
1	n	2	GLN
1	n	4	ASP
1	n	30	LYS
1	n	33	ASP
1	n	76	SER
1	n	77	LEU
1	n	159	THR
1	o	77	LEU
1	p	66	ASP
1	p	77	LEU
1	p	93	ILE
1	p	95	TYR
1	q	74	ILE
1	q	77	LEU
1	q	110	GLU

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Mol	Chain	Res	Type
1	r	17	SER
1	r	137	GLN
1	r	159	THR
1	s	159	THR
1	t	9	ARG
1	t	51	GLU
1	t	70	ASN
1	t	130	HIS
1	u	1	MET
1	u	2	GLN
1	u	77	LEU
1	u	156	ARG
1	v	29	SER
1	v	76	SER
1	v	77	LEU
1	v	93	ILE
1	v	115	THR
1	v	152	GLN
1	v	159	THR
1	w	2	GLN
1	w	38	THR
1	w	70	ASN
1	w	76	SER
1	w	77	LEU
1	w	141	MET
1	x	2	GLN
1	x	77	LEU
1	x	78	ARG
1	x	93	ILE
1	x	119	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (66) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	99	ASN
1	B	12	ASN
1	B	34	ASN
1	C	70	ASN
1	C	99	ASN
1	D	34	ASN
1	E	43	HIS
1	F	99	ASN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	H	137	GLN
1	I	86	GLN
1	J	81	GLN
1	K	81	GLN
1	K	86	GLN
1	L	130	HIS
1	M	137	GLN
1	Q	2	GLN
1	Q	99	ASN
1	Q	130	HIS
1	R	86	GLN
1	S	43	HIS
1	T	12	ASN
1	T	24	GLN
1	T	99	ASN
1	U	24	GLN
1	U	81	GLN
1	U	86	GLN
1	V	81	GLN
1	V	99	ASN
1	W	24	GLN
1	X	112	GLN
1	b	34	ASN
1	c	112	GLN
1	d	81	GLN
1	d	137	GLN
1	d	152	GLN
1	e	72	GLN
1	f	24	GLN
1	f	130	HIS
1	g	2	GLN
1	g	43	HIS
1	h	2	GLN
1	h	43	HIS
1	h	112	GLN
1	k	99	ASN
1	m	24	GLN
1	p	152	GLN
1	q	24	GLN
1	q	86	GLN
1	r	86	GLN
1	t	24	GLN

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Mol	Chain	Res	Type
1	t	70	ASN
1	t	99	ASN
1	t	130	HIS
1	t	152	GLN
1	u	137	GLN
1	u	152	GLN
1	v	99	ASN
1	v	112	GLN
1	v	137	GLN
1	w	2	GLN
1	w	70	ASN
1	w	112	GLN
1	x	12	ASN
1	x	24	GLN
1	x	99	ASN
1	x	152	GLN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

### 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

24 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	HEM	e	200	1	41,50,50	2.07	10 (24%)	45,82,82	2.33	15 (33%)
2	HEM	H	200	1	41,50,50	1.95	5 (12%)	45,82,82	2.58	20 (44%)
2	HEM	C	200	1	41,50,50	2.61	13 (31%)	45,82,82	3.61	15 (33%)
2	HEM	S	200	1	41,50,50	2.28	13 (31%)	45,82,82	2.98	23 (51%)
2	HEM	M	200	1	41,50,50	2.15	9 (21%)	45,82,82	2.03	13 (28%)
2	HEM	k	200	1	41,50,50	2.23	9 (21%)	45,82,82	1.92	10 (22%)
2	HEM	x	200	1	41,50,50	2.28	9 (21%)	45,82,82	2.67	18 (40%)
2	HEM	j	200	1	41,50,50	2.25	11 (26%)	45,82,82	2.72	16 (35%)
2	HEM	v	200	1	41,50,50	2.36	11 (26%)	45,82,82	2.53	22 (48%)
2	HEM	n	200	1	41,50,50	2.34	10 (24%)	45,82,82	1.99	11 (24%)
2	HEM	P	200	1	41,50,50	2.23	11 (26%)	45,82,82	2.07	16 (35%)
2	HEM	F	200	1	41,50,50	2.09	7 (17%)	45,82,82	2.38	15 (33%)
2	HEM	R	200	1	41,50,50	2.19	11 (26%)	45,82,82	2.24	12 (26%)
2	HEM	U	200	1	41,50,50	2.28	11 (26%)	45,82,82	2.77	16 (35%)
2	HEM	B	200	1	41,50,50	1.96	11 (26%)	45,82,82	1.96	14 (31%)
2	HEM	a	200	1	41,50,50	2.15	8 (19%)	45,82,82	2.93	20 (44%)
2	HEM	c	200	1	41,50,50	1.86	7 (17%)	45,82,82	2.69	18 (40%)
2	HEM	q	200	1	41,50,50	1.91	7 (17%)	45,82,82	1.72	9 (20%)
2	HEM	I	200	1	41,50,50	2.66	16 (39%)	45,82,82	2.55	16 (35%)
2	HEM	L	200	1	41,50,50	2.16	11 (26%)	45,82,82	2.72	16 (35%)
2	HEM	g	200	1	41,50,50	1.96	8 (19%)	45,82,82	2.01	17 (37%)
2	HEM	X	200	1	41,50,50	2.31	11 (26%)	45,82,82	2.64	19 (42%)
2	HEM	o	200	1	41,50,50	2.16	9 (21%)	45,82,82	2.09	9 (20%)
2	HEM	t	200	1	41,50,50	2.27	13 (31%)	45,82,82	2.07	17 (37%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	HEM	e	200	1	-	6/12/54/54	-
2	HEM	H	200	1	-	4/12/54/54	-
2	HEM	C	200	1	-	8/12/54/54	-
2	HEM	S	200	1	-	4/12/54/54	-
2	HEM	M	200	1	-	8/12/54/54	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	HEM	k	200	1	-	10/12/54/54	-
2	HEM	x	200	1	-	3/12/54/54	-
2	HEM	j	200	1	-	2/12/54/54	-
2	HEM	v	200	1	-	6/12/54/54	-
2	HEM	n	200	1	-	2/12/54/54	-
2	HEM	P	200	1	-	6/12/54/54	-
2	HEM	F	200	1	-	5/12/54/54	-
2	HEM	R	200	1	-	8/12/54/54	-
2	HEM	U	200	1	-	2/12/54/54	-
2	HEM	B	200	1	-	4/12/54/54	-
2	HEM	a	200	1	-	1/12/54/54	-
2	HEM	c	200	1	-	5/12/54/54	-
2	HEM	q	200	1	-	4/12/54/54	-
2	HEM	I	200	1	-	2/12/54/54	-
2	HEM	L	200	1	-	8/12/54/54	-
2	HEM	g	200	1	-	6/12/54/54	-
2	HEM	X	200	1	-	7/12/54/54	-
2	HEM	o	200	1	-	8/12/54/54	-
2	HEM	t	200	1	-	10/12/54/54	-

All (241) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	a	200	HEM	C3D-C2D	8.84	1.55	1.36
2	n	200	HEM	C3C-C2C	-8.80	1.28	1.40
2	C	200	HEM	FE-ND	-8.76	1.53	1.96
2	e	200	HEM	C3D-C2D	8.70	1.55	1.36
2	I	200	HEM	C3C-C2C	-8.42	1.28	1.40
2	X	200	HEM	C3D-C2D	8.12	1.54	1.36
2	L	200	HEM	C3D-C2D	8.11	1.54	1.36
2	k	200	HEM	C3D-C2D	8.10	1.54	1.36
2	I	200	HEM	C3D-C2D	8.03	1.53	1.36
2	j	200	HEM	C3C-C2C	-7.98	1.29	1.40
2	F	200	HEM	C3D-C2D	7.82	1.53	1.36
2	x	200	HEM	C3D-C2D	7.82	1.53	1.36
2	o	200	HEM	C3C-C2C	-7.80	1.29	1.40
2	g	200	HEM	C3D-C2D	7.77	1.53	1.36
2	M	200	HEM	C3D-C2D	7.66	1.53	1.36

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	k	200	HEM	C3C-C2C	-7.57	1.29	1.40
2	C	200	HEM	C3D-C2D	7.55	1.52	1.36
2	H	200	HEM	C3D-C2D	7.50	1.52	1.36
2	R	200	HEM	C3D-C2D	7.41	1.52	1.36
2	U	200	HEM	C3C-C2C	-7.38	1.30	1.40
2	c	200	HEM	C3D-C2D	7.38	1.52	1.36
2	q	200	HEM	C3D-C2D	7.33	1.52	1.36
2	o	200	HEM	C3D-C2D	7.29	1.52	1.36
2	t	200	HEM	C3C-C2C	-7.29	1.30	1.40
2	B	200	HEM	C3D-C2D	7.25	1.52	1.36
2	x	200	HEM	C3C-C2C	-7.10	1.30	1.40
2	v	200	HEM	C3C-C2C	-7.08	1.30	1.40
2	P	200	HEM	C3D-C2D	7.01	1.51	1.36
2	v	200	HEM	C3D-C2D	7.00	1.51	1.36
2	U	200	HEM	C3D-C2D	6.84	1.51	1.36
2	n	200	HEM	C3D-C2D	6.59	1.50	1.36
2	t	200	HEM	C3D-C2D	6.56	1.50	1.36
2	C	200	HEM	FE-NB	6.26	2.27	1.96
2	P	200	HEM	C3C-C2C	-6.24	1.31	1.40
2	F	200	HEM	C3C-C2C	-6.20	1.31	1.40
2	S	200	HEM	C3C-C2C	-6.15	1.31	1.40
2	j	200	HEM	C3D-C2D	6.00	1.49	1.36
2	R	200	HEM	C3C-C2C	-5.86	1.32	1.40
2	S	200	HEM	CAA-C2A	5.71	1.60	1.52
2	M	200	HEM	C3C-C2C	-5.54	1.32	1.40
2	a	200	HEM	FE-ND	5.42	2.23	1.96
2	X	200	HEM	FE-NB	5.28	2.23	1.96
2	L	200	HEM	C3C-CAC	5.18	1.58	1.47
2	x	200	HEM	FE-ND	5.12	2.22	1.96
2	q	200	HEM	C3C-C2C	-5.08	1.33	1.40
2	g	200	HEM	C3C-C2C	-4.82	1.33	1.40
2	v	200	HEM	CAA-C2A	4.82	1.59	1.52
2	I	200	HEM	FE-NB	4.76	2.20	1.96
2	X	200	HEM	C3C-C2C	-4.51	1.34	1.40
2	v	200	HEM	FE-NB	4.42	2.18	1.96
2	I	200	HEM	C3C-CAC	4.34	1.56	1.47
2	S	200	HEM	C1A-NA	4.33	1.45	1.36
2	k	200	HEM	C3B-C2B	-4.28	1.28	1.37
2	I	200	HEM	C1B-NB	-4.19	1.33	1.40
2	H	200	HEM	FE-NB	4.17	2.17	1.96
2	v	200	HEM	C3B-C2B	-4.15	1.28	1.37
2	t	200	HEM	C3B-C2B	-4.12	1.28	1.37

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	R	200	HEM	FE-ND	4.07	2.17	1.96
2	R	200	HEM	FE-NB	4.07	2.17	1.96
2	c	200	HEM	C3C-C2C	-3.84	1.35	1.40
2	P	200	HEM	C3B-C2B	-3.76	1.29	1.37
2	X	200	HEM	C3C-CAC	3.76	1.55	1.47
2	S	200	HEM	C3D-C2D	3.71	1.44	1.36
2	U	200	HEM	FE-NB	3.70	2.15	1.96
2	X	200	HEM	C1B-NB	-3.69	1.33	1.40
2	U	200	HEM	C3B-C2B	-3.64	1.29	1.37
2	U	200	HEM	C4D-ND	-3.64	1.34	1.40
2	I	200	HEM	C1A-NA	3.63	1.43	1.36
2	S	200	HEM	C1B-NB	-3.57	1.34	1.40
2	M	200	HEM	C3C-CAC	3.57	1.55	1.47
2	x	200	HEM	C3B-C2B	-3.56	1.30	1.37
2	a	200	HEM	CMC-C2C	3.56	1.60	1.51
2	j	200	HEM	C3B-C2B	-3.55	1.30	1.37
2	L	200	HEM	FE-NB	3.53	2.14	1.96
2	B	200	HEM	C3C-C2C	-3.52	1.35	1.40
2	t	200	HEM	FE-ND	-3.50	1.79	1.96
2	L	200	HEM	CHA-C4D	3.48	1.43	1.35
2	P	200	HEM	C1B-NB	-3.47	1.34	1.40
2	n	200	HEM	C3B-C2B	-3.46	1.30	1.37
2	S	200	HEM	C3B-C2B	-3.45	1.30	1.37
2	j	200	HEM	C1B-NB	-3.45	1.34	1.40
2	U	200	HEM	C1B-NB	-3.43	1.34	1.40
2	R	200	HEM	C1B-NB	-3.40	1.34	1.40
2	P	200	HEM	CAA-C2A	3.35	1.57	1.52
2	S	200	HEM	CAB-C3B	3.35	1.56	1.47
2	n	200	HEM	CAA-C2A	3.34	1.56	1.52
2	I	200	HEM	C4A-NA	3.33	1.43	1.36
2	g	200	HEM	CAA-C2A	3.32	1.56	1.52
2	C	200	HEM	C3C-CAC	3.31	1.54	1.47
2	F	200	HEM	C3B-C2B	-3.30	1.30	1.37
2	e	200	HEM	C3C-CAC	3.28	1.54	1.47
2	n	200	HEM	C1B-NB	-3.24	1.34	1.40
2	X	200	HEM	CMB-C2B	3.23	1.57	1.50
2	e	200	HEM	CAA-C2A	3.21	1.56	1.52
2	C	200	HEM	CAB-C3B	3.21	1.56	1.47
2	B	200	HEM	CAB-C3B	3.19	1.56	1.47
2	v	200	HEM	C1B-NB	-3.14	1.34	1.40
2	c	200	HEM	C3C-CAC	3.14	1.54	1.47
2	L	200	HEM	CMA-C3A	3.12	1.58	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	e	200	HEM	C3C-C2C	-3.12	1.36	1.40
2	M	200	HEM	CAA-C2A	3.11	1.56	1.52
2	j	200	HEM	CAB-C3B	3.10	1.55	1.47
2	H	200	HEM	C3C-C2C	-3.10	1.36	1.40
2	U	200	HEM	FE-ND	3.08	2.12	1.96
2	X	200	HEM	FE-ND	3.05	2.12	1.96
2	P	200	HEM	CAB-C3B	3.04	1.55	1.47
2	n	200	HEM	O2D-CGD	-3.02	1.20	1.30
2	M	200	HEM	FE-NB	2.96	2.11	1.96
2	t	200	HEM	C4A-CHB	-2.96	1.32	1.41
2	X	200	HEM	CMD-C2D	2.96	1.57	1.50
2	B	200	HEM	CMD-C2D	2.94	1.57	1.50
2	n	200	HEM	C1A-CHA	-2.94	1.32	1.41
2	H	200	HEM	FE-ND	2.92	2.11	1.96
2	t	200	HEM	C4A-NA	-2.91	1.30	1.36
2	C	200	HEM	C1D-ND	2.87	1.44	1.38
2	j	200	HEM	C4A-NA	2.86	1.42	1.36
2	o	200	HEM	C1B-NB	-2.86	1.35	1.40
2	B	200	HEM	FE-NB	2.83	2.10	1.96
2	L	200	HEM	CAB-C3B	2.83	1.55	1.47
2	c	200	HEM	C3B-C2B	-2.81	1.31	1.37
2	X	200	HEM	CAB-C3B	2.80	1.55	1.47
2	k	200	HEM	C4A-CHB	-2.80	1.33	1.41
2	S	200	HEM	C3B-C4B	-2.80	1.39	1.44
2	H	200	HEM	CMB-C2B	2.79	1.56	1.50
2	t	200	HEM	C1A-NA	-2.78	1.30	1.36
2	c	200	HEM	CMB-C2B	2.77	1.56	1.50
2	P	200	HEM	C1A-NA	2.76	1.41	1.36
2	B	200	HEM	CAA-C2A	2.76	1.56	1.52
2	e	200	HEM	CAB-C3B	2.74	1.54	1.47
2	n	200	HEM	CHD-C1D	-2.74	1.33	1.41
2	S	200	HEM	CAD-C3D	2.74	1.58	1.51
2	e	200	HEM	C3B-C2B	-2.71	1.31	1.37
2	j	200	HEM	C3C-CAC	2.71	1.53	1.47
2	t	200	HEM	C2A-C3A	-2.69	1.29	1.37
2	v	200	HEM	CHD-C1D	-2.69	1.33	1.41
2	I	200	HEM	CMA-C3A	2.68	1.57	1.51
2	t	200	HEM	C1A-CHA	-2.67	1.33	1.41
2	B	200	HEM	C3C-CAC	2.67	1.53	1.47
2	g	200	HEM	CMB-C2B	2.64	1.56	1.50
2	g	200	HEM	CAB-C3B	2.61	1.54	1.47
2	L	200	HEM	FE-ND	2.59	2.09	1.96

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	v	200	HEM	C2A-C3A	-2.58	1.30	1.37
2	a	200	HEM	C3C-CAC	2.58	1.53	1.47
2	C	200	HEM	C3C-C2C	-2.57	1.36	1.40
2	M	200	HEM	C1B-NB	-2.56	1.35	1.40
2	g	200	HEM	C3C-CAC	2.52	1.53	1.47
2	k	200	HEM	O2D-CGD	-2.52	1.22	1.30
2	o	200	HEM	C3C-CAC	2.51	1.53	1.47
2	e	200	HEM	C2C-C1C	2.51	1.48	1.42
2	L	200	HEM	C3C-C2C	-2.50	1.36	1.40
2	n	200	HEM	CAB-C3B	2.48	1.54	1.47
2	M	200	HEM	CAD-C3D	2.46	1.57	1.51
2	g	200	HEM	CAD-C3D	2.44	1.57	1.51
2	C	200	HEM	C4B-NB	2.44	1.43	1.38
2	M	200	HEM	CMD-C2D	2.44	1.56	1.50
2	k	200	HEM	C2A-C3A	-2.43	1.30	1.37
2	c	200	HEM	CAB-C3B	2.43	1.54	1.47
2	C	200	HEM	CMB-C2B	2.43	1.55	1.50
2	q	200	HEM	C3B-C2B	-2.43	1.32	1.37
2	F	200	HEM	FE-NB	2.42	2.08	1.96
2	I	200	HEM	C3B-C2B	-2.41	1.32	1.37
2	j	200	HEM	CAD-C3D	2.41	1.57	1.51
2	I	200	HEM	CAB-C3B	2.41	1.54	1.47
2	C	200	HEM	CHA-C4D	2.40	1.41	1.35
2	S	200	HEM	CHD-C1D	-2.39	1.34	1.41
2	o	200	HEM	CAB-C3B	2.39	1.53	1.47
2	x	200	HEM	C1B-NB	-2.38	1.36	1.40
2	o	200	HEM	C3B-C2B	-2.38	1.32	1.37
2	U	200	HEM	O2A-CGA	-2.38	1.22	1.30
2	R	200	HEM	C1D-ND	-2.37	1.33	1.38
2	C	200	HEM	CMC-C2C	2.37	1.57	1.51
2	t	200	HEM	C3C-CAC	2.36	1.52	1.47
2	F	200	HEM	CAB-C3B	2.35	1.53	1.47
2	L	200	HEM	CAA-C2A	2.34	1.55	1.52
2	R	200	HEM	C3C-CAC	2.33	1.52	1.47
2	R	200	HEM	CAB-C3B	2.33	1.53	1.47
2	q	200	HEM	C3C-CAC	2.32	1.52	1.47
2	j	200	HEM	CMB-C2B	2.30	1.55	1.50
2	B	200	HEM	CMB-C2B	2.30	1.55	1.50
2	X	200	HEM	CAA-C2A	2.30	1.55	1.52
2	R	200	HEM	C3B-C2B	-2.30	1.32	1.37
2	P	200	HEM	CMB-C2B	2.26	1.55	1.50
2	t	200	HEM	O2D-CGD	-2.26	1.23	1.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	v	200	HEM	C4A-CHB	-2.26	1.34	1.41
2	a	200	HEM	C2C-C1C	2.24	1.47	1.42
2	j	200	HEM	O1D-CGD	2.23	1.29	1.22
2	F	200	HEM	FE-ND	2.23	2.07	1.96
2	P	200	HEM	C2A-C3A	-2.22	1.31	1.37
2	t	200	HEM	C1B-NB	-2.22	1.36	1.40
2	x	200	HEM	C3C-CAC	2.22	1.52	1.47
2	q	200	HEM	CAB-C3B	2.22	1.53	1.47
2	t	200	HEM	CAA-C2A	2.21	1.55	1.52
2	g	200	HEM	C3B-C2B	-2.21	1.32	1.37
2	B	200	HEM	C4D-C3D	-2.20	1.41	1.45
2	q	200	HEM	O2D-CGD	-2.19	1.23	1.30
2	e	200	HEM	CAD-C3D	2.19	1.57	1.51
2	I	200	HEM	FE-ND	2.19	2.07	1.96
2	a	200	HEM	CMD-C2D	2.19	1.55	1.50
2	S	200	HEM	C1D-ND	-2.18	1.34	1.38
2	S	200	HEM	C1D-C2D	-2.18	1.40	1.44
2	I	200	HEM	C4B-NB	-2.17	1.34	1.38
2	U	200	HEM	CAB-C3B	2.17	1.53	1.47
2	v	200	HEM	C1A-CHA	-2.16	1.35	1.41
2	F	200	HEM	O2A-CGA	-2.16	1.23	1.30
2	U	200	HEM	C1A-CHA	-2.15	1.35	1.41
2	k	200	HEM	CAB-C3B	2.15	1.53	1.47
2	L	200	HEM	C1D-ND	2.15	1.43	1.38
2	R	200	HEM	O2A-CGA	-2.14	1.23	1.30
2	M	200	HEM	CAB-C3B	2.14	1.53	1.47
2	I	200	HEM	CMB-C2B	2.14	1.55	1.50
2	L	200	HEM	C1B-NB	-2.13	1.36	1.40
2	k	200	HEM	C3C-CAC	2.13	1.52	1.47
2	c	200	HEM	FE-NB	2.13	2.07	1.96
2	B	200	HEM	O1A-CGA	2.12	1.29	1.22
2	o	200	HEM	C2A-C3A	-2.12	1.31	1.37
2	n	200	HEM	C3C-CAC	2.11	1.52	1.47
2	P	200	HEM	C3C-CAC	2.10	1.52	1.47
2	U	200	HEM	CAA-C2A	2.10	1.55	1.52
2	C	200	HEM	C4D-ND	2.10	1.43	1.40
2	e	200	HEM	CMC-C2C	2.08	1.56	1.51
2	o	200	HEM	FE-NB	2.08	2.07	1.96
2	R	200	HEM	CHD-C1D	-2.08	1.35	1.41
2	k	200	HEM	CAD-C3D	2.08	1.56	1.51
2	I	200	HEM	CAA-C2A	2.07	1.55	1.52
2	a	200	HEM	CAD-C3D	2.07	1.56	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	P	200	HEM	CMC-C2C	2.07	1.56	1.51
2	o	200	HEM	O2D-CGD	-2.06	1.23	1.30
2	x	200	HEM	CAA-C2A	2.06	1.55	1.52
2	I	200	HEM	C2A-C3A	-2.06	1.31	1.37
2	j	200	HEM	CMC-C2C	2.06	1.56	1.51
2	S	200	HEM	CMA-C3A	2.05	1.55	1.51
2	q	200	HEM	O2A-CGA	-2.05	1.23	1.30
2	x	200	HEM	CHC-C4B	-2.05	1.35	1.41
2	a	200	HEM	CMB-C2B	2.05	1.55	1.50
2	X	200	HEM	CAD-C3D	2.04	1.56	1.51
2	C	200	HEM	CMD-C2D	2.03	1.55	1.50
2	x	200	HEM	O2D-CGD	-2.03	1.23	1.30
2	B	200	HEM	C3B-C2B	-2.02	1.33	1.37
2	e	200	HEM	C1A-CHA	-2.02	1.35	1.41
2	I	200	HEM	O1D-CGD	2.02	1.28	1.22
2	v	200	HEM	O2D-CGD	-2.02	1.24	1.30

All (377) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	200	HEM	CHD-C1D-ND	15.96	141.77	124.43
2	C	200	HEM	CHD-C1D-C2D	-10.00	109.36	124.98
2	I	200	HEM	CBA-CAA-C2A	-8.76	97.67	112.62
2	R	200	HEM	C4D-ND-C1D	8.65	114.01	105.07
2	x	200	HEM	C4D-ND-C1D	8.52	113.88	105.07
2	L	200	HEM	C4D-ND-C1D	8.28	113.63	105.07
2	a	200	HEM	C2C-C3C-C4C	7.93	112.44	106.90
2	F	200	HEM	C4D-ND-C1D	7.89	113.22	105.07
2	c	200	HEM	C4D-ND-C1D	7.71	113.03	105.07
2	H	200	HEM	C4D-ND-C1D	7.51	112.83	105.07
2	S	200	HEM	C3D-C4D-ND	7.45	118.45	110.17
2	a	200	HEM	C4D-ND-C1D	7.41	112.73	105.07
2	o	200	HEM	C4D-ND-C1D	7.38	112.70	105.07
2	X	200	HEM	C4D-ND-C1D	7.30	112.62	105.07
2	X	200	HEM	C1B-NB-C4B	7.12	112.43	105.07
2	c	200	HEM	CBA-CAA-C2A	-7.03	100.63	112.62
2	j	200	HEM	C4D-ND-C1D	7.01	112.32	105.07
2	L	200	HEM	C4B-CHC-C1C	6.99	131.78	122.56
2	U	200	HEM	C4D-ND-C1D	6.87	112.17	105.07
2	I	200	HEM	C4D-ND-C1D	6.81	112.11	105.07
2	U	200	HEM	CBA-CAA-C2A	-6.49	101.55	112.62
2	L	200	HEM	CBA-CAA-C2A	-6.38	101.72	112.62

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	j	200	HEM	C1B-NB-C4B	6.30	111.58	105.07
2	H	200	HEM	CBA-CAA-C2A	-6.27	101.93	112.62
2	S	200	HEM	CAD-C3D-C4D	6.24	135.55	124.66
2	n	200	HEM	C4B-CHC-C1C	6.01	130.49	122.56
2	x	200	HEM	CBA-CAA-C2A	-5.96	102.44	112.62
2	C	200	HEM	CMA-C3A-C4A	-5.93	119.36	128.46
2	e	200	HEM	C4B-CHC-C1C	5.87	130.31	122.56
2	S	200	HEM	C4D-C3D-C2D	-5.80	98.45	106.90
2	v	200	HEM	C4D-ND-C1D	5.75	111.01	105.07
2	F	200	HEM	C4B-CHC-C1C	5.74	130.14	122.56
2	j	200	HEM	CHC-C4B-NB	5.74	130.66	124.43
2	R	200	HEM	C4B-CHC-C1C	5.73	130.12	122.56
2	U	200	HEM	C1B-NB-C4B	5.73	110.99	105.07
2	U	200	HEM	C2C-C3C-C4C	5.71	110.89	106.90
2	o	200	HEM	CMD-C2D-C1D	5.66	133.65	125.04
2	k	200	HEM	C4D-ND-C1D	5.51	110.76	105.07
2	x	200	HEM	C4B-CHC-C1C	5.46	129.77	122.56
2	a	200	HEM	C4C-CHD-C1D	5.45	129.75	122.56
2	H	200	HEM	C4C-CHD-C1D	5.44	129.73	122.56
2	B	200	HEM	C4B-CHC-C1C	5.40	129.69	122.56
2	c	200	HEM	C2C-C3C-C4C	5.38	110.65	106.90
2	n	200	HEM	C4D-ND-C1D	5.33	110.58	105.07
2	v	200	HEM	CHC-C4B-C3B	5.32	132.72	124.57
2	U	200	HEM	C4C-CHD-C1D	5.25	129.49	122.56
2	X	200	HEM	C4B-CHC-C1C	5.24	129.48	122.56
2	e	200	HEM	C4D-ND-C1D	5.24	110.48	105.07
2	v	200	HEM	C4B-CHC-C1C	5.18	129.40	122.56
2	S	200	HEM	C4D-ND-C1D	-5.11	99.80	105.07
2	a	200	HEM	CAA-CBA-CGA	-5.10	99.45	113.76
2	a	200	HEM	C4B-CHC-C1C	5.06	129.24	122.56
2	C	200	HEM	C4D-ND-C1D	5.03	110.27	105.07
2	H	200	HEM	C1B-NB-C4B	5.00	110.24	105.07
2	q	200	HEM	C4D-ND-C1D	4.96	110.19	105.07
2	P	200	HEM	CBD-CAD-C3D	-4.95	98.89	112.63
2	j	200	HEM	CBD-CAD-C3D	-4.92	98.96	112.63
2	S	200	HEM	CMA-C3A-C4A	-4.87	120.97	128.46
2	F	200	HEM	C2C-C3C-C4C	4.86	110.29	106.90
2	L	200	HEM	CAD-CBD-CGD	-4.84	103.19	113.60
2	S	200	HEM	C4B-CHC-C1C	4.84	128.94	122.56
2	U	200	HEM	C4B-CHC-C1C	4.78	128.87	122.56
2	k	200	HEM	C2C-C3C-C4C	4.77	110.23	106.90
2	I	200	HEM	C1B-NB-C4B	4.77	110.00	105.07

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	e	200	HEM	CHD-C1D-ND	4.77	129.61	124.43
2	x	200	HEM	CHC-C4B-NB	4.69	129.52	124.43
2	e	200	HEM	C1B-NB-C4B	4.65	109.88	105.07
2	a	200	HEM	CMA-C3A-C4A	-4.63	121.36	128.46
2	L	200	HEM	CMA-C3A-C4A	-4.61	121.38	128.46
2	U	200	HEM	C3B-C2B-C1B	4.60	109.90	106.49
2	a	200	HEM	CBD-CAD-C3D	-4.60	99.85	112.63
2	x	200	HEM	C4A-C3A-C2A	4.60	110.19	107.00
2	o	200	HEM	C4B-CHC-C1C	4.59	128.61	122.56
2	g	200	HEM	C4B-CHC-C1C	4.58	128.61	122.56
2	S	200	HEM	CBD-CAD-C3D	-4.57	99.92	112.63
2	c	200	HEM	CMA-C3A-C4A	-4.57	121.45	128.46
2	C	200	HEM	C4B-CHC-C1C	4.55	128.57	122.56
2	C	200	HEM	CMA-C3A-C2A	4.54	133.50	124.94
2	e	200	HEM	C4A-C3A-C2A	4.54	110.15	107.00
2	v	200	HEM	C4A-C3A-C2A	4.52	110.14	107.00
2	R	200	HEM	C1B-NB-C4B	4.45	109.67	105.07
2	j	200	HEM	CAA-CBA-CGA	-4.43	101.34	113.76
2	M	200	HEM	C4D-ND-C1D	4.38	109.59	105.07
2	H	200	HEM	CBD-CAD-C3D	-4.34	100.57	112.63
2	S	200	HEM	CHA-C4D-ND	-4.30	119.07	124.38
2	q	200	HEM	C4B-CHC-C1C	4.26	128.18	122.56
2	j	200	HEM	C4A-C3A-C2A	4.25	109.95	107.00
2	M	200	HEM	CAD-CBD-CGD	-4.25	104.46	113.60
2	L	200	HEM	CHB-C1B-NB	-4.23	119.15	124.38
2	a	200	HEM	C3C-C4C-NC	-4.21	102.99	110.94
2	j	200	HEM	CMC-C2C-C3C	4.20	132.54	124.68
2	t	200	HEM	C3D-C4D-ND	4.19	114.83	110.17
2	g	200	HEM	CBD-CAD-C3D	4.13	124.10	112.63
2	t	200	HEM	C4C-CHD-C1D	4.13	128.00	122.56
2	M	200	HEM	C4B-CHC-C1C	4.11	127.99	122.56
2	M	200	HEM	C1B-NB-C4B	4.03	109.24	105.07
2	x	200	HEM	C2C-C3C-C4C	4.03	109.71	106.90
2	I	200	HEM	CAA-CBA-CGA	4.00	124.97	113.76
2	B	200	HEM	C2C-C3C-C4C	3.98	109.68	106.90
2	S	200	HEM	CHD-C1D-ND	-3.98	120.11	124.43
2	x	200	HEM	C1B-NB-C4B	3.96	109.16	105.07
2	t	200	HEM	CMB-C2B-C1B	3.94	131.04	125.04
2	k	200	HEM	C4B-CHC-C1C	3.94	127.75	122.56
2	S	200	HEM	C2D-C1D-ND	3.93	114.59	109.88
2	B	200	HEM	CMA-C3A-C4A	-3.92	122.44	128.46
2	C	200	HEM	CHB-C1B-NB	-3.90	119.56	124.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	e	200	HEM	CHB-C1B-NB	3.90	129.20	124.38
2	n	200	HEM	CBA-CAA-C2A	3.89	119.25	112.62
2	M	200	HEM	CAD-C3D-C4D	3.88	131.45	124.66
2	X	200	HEM	C4A-C3A-C2A	3.85	109.67	107.00
2	c	200	HEM	C4B-CHC-C1C	3.83	127.61	122.56
2	L	200	HEM	CMA-C3A-C2A	3.81	132.12	124.94
2	o	200	HEM	CHA-C4D-ND	3.81	129.08	124.38
2	t	200	HEM	C4B-CHC-C1C	3.80	127.58	122.56
2	c	200	HEM	CMA-C3A-C2A	3.78	132.07	124.94
2	I	200	HEM	CBD-CAD-C3D	-3.77	102.14	112.63
2	X	200	HEM	CMA-C3A-C4A	-3.76	122.68	128.46
2	v	200	HEM	CAB-C3B-C2B	-3.74	116.30	128.60
2	I	200	HEM	CHC-C4B-C3B	3.73	130.28	124.57
2	c	200	HEM	C4B-C3B-C2B	3.73	110.08	107.11
2	j	200	HEM	CHD-C1D-ND	3.72	128.47	124.43
2	F	200	HEM	C1B-NB-C4B	3.72	108.91	105.07
2	S	200	HEM	CMB-C2B-C1B	-3.71	119.39	125.04
2	X	200	HEM	CMB-C2B-C1B	3.71	130.69	125.04
2	C	200	HEM	CAD-C3D-C4D	3.71	131.13	124.66
2	U	200	HEM	C4A-C3A-C2A	3.69	109.56	107.00
2	B	200	HEM	CAD-CBD-CGD	-3.68	105.68	113.60
2	L	200	HEM	C3D-C4D-ND	-3.68	106.07	110.17
2	P	200	HEM	C2D-C1D-ND	3.65	114.26	109.88
2	a	200	HEM	CMB-C2B-C1B	-3.64	119.49	125.04
2	j	200	HEM	C3B-C2B-C1B	3.62	109.17	106.49
2	a	200	HEM	CMC-C2C-C3C	3.60	131.41	124.68
2	x	200	HEM	C4B-C3B-C2B	3.59	109.97	107.11
2	C	200	HEM	CMD-C2D-C1D	-3.59	119.57	125.04
2	S	200	HEM	CHC-C4B-NB	3.58	128.32	124.43
2	U	200	HEM	C2B-C1B-NB	-3.58	105.60	109.84
2	P	200	HEM	C1D-C2D-C3D	-3.55	103.22	106.96
2	g	200	HEM	C4C-CHD-C1D	3.54	127.24	122.56
2	g	200	HEM	C4A-C3A-C2A	3.54	109.46	107.00
2	v	200	HEM	C1B-NB-C4B	3.53	108.72	105.07
2	P	200	HEM	CMC-C2C-C3C	3.53	131.29	124.68
2	X	200	HEM	C2C-C3C-C4C	3.51	109.35	106.90
2	c	200	HEM	CAD-CBD-CGD	-3.50	106.06	113.60
2	X	200	HEM	CHA-C4D-ND	3.50	128.71	124.38
2	F	200	HEM	C4C-CHD-C1D	3.48	127.15	122.56
2	C	200	HEM	CAD-C3D-C2D	-3.47	121.42	127.88
2	R	200	HEM	C4C-CHD-C1D	3.47	127.13	122.56
2	F	200	HEM	CAD-C3D-C4D	3.46	130.71	124.66

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	P	200	HEM	CHD-C1D-C2D	-3.45	119.58	124.98
2	c	200	HEM	CMD-C2D-C1D	3.45	130.29	125.04
2	I	200	HEM	C4D-C3D-C2D	-3.45	101.88	106.90
2	n	200	HEM	CMD-C2D-C1D	3.44	130.28	125.04
2	L	200	HEM	CHD-C1D-ND	3.43	128.16	124.43
2	g	200	HEM	CBA-CAA-C2A	-3.42	106.78	112.62
2	c	200	HEM	CAD-C3D-C4D	3.40	130.61	124.66
2	v	200	HEM	CHA-C4D-ND	3.39	128.56	124.38
2	j	200	HEM	CHB-C1B-NB	3.38	128.56	124.38
2	P	200	HEM	CMD-C2D-C3D	3.37	135.27	126.12
2	j	200	HEM	C2B-C1B-NB	-3.37	105.85	109.84
2	x	200	HEM	CAA-CBA-CGA	3.37	123.19	113.76
2	k	200	HEM	CHB-C1B-NB	3.37	128.54	124.38
2	H	200	HEM	C2C-C3C-C4C	3.36	109.24	106.90
2	x	200	HEM	C4C-CHD-C1D	3.36	126.99	122.56
2	v	200	HEM	C2C-C3C-C4C	3.35	109.24	106.90
2	g	200	HEM	CHD-C1D-ND	3.35	128.07	124.43
2	C	200	HEM	C3D-C4D-ND	-3.32	106.47	110.17
2	U	200	HEM	C3C-C4C-NC	-3.32	104.68	110.94
2	P	200	HEM	CMA-C3A-C4A	-3.31	123.38	128.46
2	q	200	HEM	CHC-C4B-NB	3.31	128.03	124.43
2	M	200	HEM	C3B-C2B-C1B	3.31	108.94	106.49
2	v	200	HEM	O1D-CGD-CBD	-3.31	112.45	123.08
2	M	200	HEM	CHC-C4B-C3B	3.30	129.63	124.57
2	o	200	HEM	C4C-CHD-C1D	3.27	126.87	122.56
2	P	200	HEM	CBA-CAA-C2A	-3.27	107.04	112.62
2	e	200	HEM	CMD-C2D-C1D	-3.27	120.06	125.04
2	a	200	HEM	CHD-C1D-C2D	3.27	130.08	124.98
2	S	200	HEM	CBA-CAA-C2A	-3.26	107.05	112.62
2	v	200	HEM	O2D-CGD-O1D	3.26	131.42	123.30
2	j	200	HEM	C4C-CHD-C1D	3.24	126.84	122.56
2	v	200	HEM	C1D-C2D-C3D	-3.24	103.55	106.96
2	g	200	HEM	CHC-C4B-NB	3.23	127.94	124.43
2	e	200	HEM	C3B-C2B-C1B	3.22	108.88	106.49
2	t	200	HEM	CHA-C4D-C3D	-3.21	119.31	125.33
2	U	200	HEM	CAA-CBA-CGA	3.20	122.74	113.76
2	j	200	HEM	C2C-C3C-C4C	3.19	109.13	106.90
2	j	200	HEM	C2D-C1D-ND	-3.19	106.06	109.88
2	H	200	HEM	CMC-C2C-C3C	3.15	130.58	124.68
2	a	200	HEM	CHD-C1D-ND	-3.12	121.04	124.43
2	L	200	HEM	CAD-C3D-C4D	3.11	130.10	124.66
2	g	200	HEM	C3C-C4C-NC	-3.11	105.07	110.94

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	t	200	HEM	CMA-C3A-C4A	-3.11	123.69	128.46
2	a	200	HEM	CMA-C3A-C2A	3.10	130.80	124.94
2	t	200	HEM	C4D-C3D-C2D	-3.10	102.38	106.90
2	c	200	HEM	C3C-C4C-NC	-3.10	105.09	110.94
2	B	200	HEM	CBA-CAA-C2A	-3.09	107.34	112.62
2	F	200	HEM	CAD-CBD-CGD	3.05	120.17	113.60
2	X	200	HEM	C4B-C3B-C2B	3.02	109.51	107.11
2	n	200	HEM	C2C-C3C-C4C	3.01	109.00	106.90
2	I	200	HEM	C4B-CHC-C1C	3.01	126.53	122.56
2	t	200	HEM	CMD-C2D-C1D	2.98	129.58	125.04
2	k	200	HEM	CBB-CAB-C3B	-2.97	112.82	127.62
2	B	200	HEM	C1D-C2D-C3D	-2.95	103.85	106.96
2	q	200	HEM	C4C-CHD-C1D	2.95	126.46	122.56
2	H	200	HEM	C4B-CHC-C1C	2.95	126.46	122.56
2	P	200	HEM	C2C-C3C-C4C	2.93	108.94	106.90
2	L	200	HEM	O1A-CGA-CBA	-2.92	113.69	123.08
2	L	200	HEM	CAD-C3D-C2D	-2.91	122.45	127.88
2	v	200	HEM	O1A-CGA-CBA	-2.91	113.75	123.08
2	v	200	HEM	O2A-CGA-CBA	2.89	123.33	114.03
2	X	200	HEM	CHC-C4B-NB	2.89	127.58	124.43
2	H	200	HEM	C2B-C1B-NB	-2.89	106.41	109.84
2	X	200	HEM	C2B-C1B-NB	-2.89	106.41	109.84
2	U	200	HEM	CHC-C4B-C3B	2.88	128.98	124.57
2	F	200	HEM	CHC-C4B-NB	2.88	127.56	124.43
2	R	200	HEM	C4A-C3A-C2A	2.87	109.00	107.00
2	I	200	HEM	CHD-C1D-ND	2.87	127.55	124.43
2	H	200	HEM	C4A-C3A-C2A	2.86	108.99	107.00
2	I	200	HEM	O2A-CGA-CBA	2.83	123.11	114.03
2	x	200	HEM	CMB-C2B-C1B	2.81	129.32	125.04
2	H	200	HEM	CHC-C4B-C3B	2.81	128.87	124.57
2	t	200	HEM	C4A-C3A-C2A	2.81	108.95	107.00
2	R	200	HEM	CMA-C3A-C4A	-2.80	124.15	128.46
2	t	200	HEM	CMB-C2B-C3B	-2.80	121.44	128.30
2	H	200	HEM	C3C-C4C-NC	-2.80	105.67	110.94
2	I	200	HEM	O1A-CGA-CBA	-2.79	114.10	123.08
2	v	200	HEM	CBD-CAD-C3D	-2.79	104.88	112.63
2	R	200	HEM	CHC-C4B-C3B	2.79	128.83	124.57
2	C	200	HEM	CMD-C2D-C3D	2.78	133.66	126.12
2	e	200	HEM	C2B-C1B-NB	-2.77	106.56	109.84
2	S	200	HEM	C4A-C3A-C2A	2.77	108.92	107.00
2	x	200	HEM	C2B-C1B-NB	-2.76	106.57	109.84
2	q	200	HEM	CMC-C2C-C3C	2.76	129.84	124.68

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	P	200	HEM	C4B-CHC-C1C	2.76	126.20	122.56
2	x	200	HEM	CHA-C4D-ND	2.75	127.78	124.38
2	L	200	HEM	CMD-C2D-C1D	2.75	129.22	125.04
2	S	200	HEM	CMA-C3A-C2A	2.73	130.09	124.94
2	g	200	HEM	CMC-C2C-C3C	2.73	129.78	124.68
2	C	200	HEM	CBA-CAA-C2A	-2.72	107.97	112.62
2	M	200	HEM	CHC-C4B-NB	-2.72	121.47	124.43
2	n	200	HEM	C1D-C2D-C3D	-2.72	104.10	106.96
2	e	200	HEM	CMD-C2D-C3D	2.71	133.48	126.12
2	L	200	HEM	C2D-C1D-ND	-2.70	106.65	109.88
2	S	200	HEM	C4B-C3B-C2B	2.69	109.25	107.11
2	I	200	HEM	CMD-C2D-C1D	-2.69	120.95	125.04
2	t	200	HEM	CBD-CAD-C3D	2.68	120.09	112.63
2	n	200	HEM	O2D-CGD-CBD	2.68	122.66	114.03
2	F	200	HEM	C4B-C3B-C2B	2.68	109.24	107.11
2	X	200	HEM	CMD-C2D-C1D	2.67	129.11	125.04
2	v	200	HEM	CMD-C2D-C1D	2.66	129.10	125.04
2	H	200	HEM	CBB-CAB-C3B	-2.66	114.36	127.62
2	X	200	HEM	O2A-CGA-CBA	2.66	122.57	114.03
2	S	200	HEM	CMD-C2D-C1D	-2.65	121.00	125.04
2	k	200	HEM	CAB-C3B-C2B	-2.65	119.88	128.60
2	B	200	HEM	C4A-C3A-C2A	2.64	108.84	107.00
2	g	200	HEM	C2C-C3C-C4C	2.64	108.74	106.90
2	t	200	HEM	CAA-CBA-CGA	-2.62	106.41	113.76
2	v	200	HEM	C3B-C2B-C1B	2.62	108.43	106.49
2	X	200	HEM	C2D-C1D-ND	-2.62	106.75	109.88
2	c	200	HEM	CMC-C2C-C3C	2.61	129.57	124.68
2	C	200	HEM	CMC-C2C-C3C	2.61	129.56	124.68
2	U	200	HEM	CBD-CAD-C3D	-2.61	105.38	112.63
2	a	200	HEM	O2A-CGA-O1A	2.61	129.80	123.30
2	P	200	HEM	O1A-CGA-CBA	-2.60	114.74	123.08
2	P	200	HEM	CBB-CAB-C3B	-2.59	114.73	127.62
2	c	200	HEM	CAD-C3D-C2D	-2.59	123.06	127.88
2	M	200	HEM	CBA-CAA-C2A	-2.58	108.22	112.62
2	F	200	HEM	CBA-CAA-C2A	-2.58	108.22	112.62
2	c	200	HEM	CMB-C2B-C1B	2.57	128.95	125.04
2	j	200	HEM	CMD-C2D-C1D	-2.56	121.14	125.04
2	g	200	HEM	O1D-CGD-CBD	-2.56	114.87	123.08
2	c	200	HEM	C2D-C1D-ND	-2.55	106.83	109.88
2	e	200	HEM	CHC-C4B-NB	2.55	127.20	124.43
2	I	200	HEM	O1D-CGD-CBD	-2.55	114.90	123.08
2	B	200	HEM	C4C-CHD-C1D	2.54	125.91	122.56

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	g	200	HEM	C4D-ND-C1D	2.54	107.70	105.07
2	v	200	HEM	CAD-CBD-CGD	2.54	119.07	113.60
2	B	200	HEM	CBD-CAD-C3D	-2.53	105.59	112.63
2	I	200	HEM	C4C-CHD-C1D	2.53	125.90	122.56
2	F	200	HEM	C3C-C4C-NC	-2.52	106.19	110.94
2	c	200	HEM	C3D-C4D-ND	-2.51	107.38	110.17
2	n	200	HEM	CMA-C3A-C4A	-2.50	124.62	128.46
2	R	200	HEM	C2C-C3C-C4C	2.50	108.64	106.90
2	g	200	HEM	C4D-C3D-C2D	-2.50	103.25	106.90
2	a	200	HEM	CMD-C2D-C1D	2.50	128.84	125.04
2	H	200	HEM	C4B-C3B-C2B	2.50	109.10	107.11
2	q	200	HEM	C1D-C2D-C3D	-2.49	104.34	106.96
2	M	200	HEM	CMB-C2B-C1B	-2.49	121.25	125.04
2	U	200	HEM	CMB-C2B-C3B	-2.47	122.25	128.30
2	S	200	HEM	CMB-C2B-C3B	2.45	134.31	128.30
2	k	200	HEM	C3B-C2B-C1B	2.44	108.30	106.49
2	a	200	HEM	CHB-C1B-NB	2.44	127.40	124.38
2	g	200	HEM	C4B-C3B-C2B	2.44	109.05	107.11
2	o	200	HEM	CHD-C1D-C2D	2.43	128.78	124.98
2	B	200	HEM	CHA-C4D-ND	2.43	127.38	124.38
2	v	200	HEM	CHC-C4B-NB	-2.43	121.80	124.43
2	X	200	HEM	CMB-C2B-C3B	-2.41	122.40	128.30
2	t	200	HEM	C2D-C1D-ND	2.40	112.76	109.88
2	C	200	HEM	CHC-C4B-NB	2.40	127.04	124.43
2	F	200	HEM	CMD-C2D-C1D	2.40	128.69	125.04
2	t	200	HEM	CAB-C3B-C2B	-2.40	120.71	128.60
2	e	200	HEM	CHD-C1D-C2D	-2.39	121.25	124.98
2	R	200	HEM	CAD-C3D-C4D	2.38	128.82	124.66
2	o	200	HEM	CMB-C2B-C1B	-2.37	121.43	125.04
2	X	200	HEM	CHD-C1D-C2D	2.37	128.68	124.98
2	t	200	HEM	CHD-C1D-C2D	-2.36	121.29	124.98
2	R	200	HEM	CHD-C1D-C2D	2.36	128.66	124.98
2	H	200	HEM	CHB-C1B-NB	2.35	127.29	124.38
2	H	200	HEM	O1D-CGD-CBD	-2.35	115.52	123.08
2	g	200	HEM	CBB-CAB-C3B	-2.35	115.92	127.62
2	o	200	HEM	C3C-C4C-NC	-2.35	106.50	110.94
2	v	200	HEM	CBA-CAA-C2A	2.35	116.63	112.62
2	M	200	HEM	O2A-CGA-CBA	2.35	121.58	114.03
2	I	200	HEM	C2D-C1D-ND	-2.35	107.07	109.88
2	X	200	HEM	CAA-CBA-CGA	-2.35	107.18	113.76
2	B	200	HEM	C3C-C4C-NC	-2.34	106.53	110.94
2	P	200	HEM	CMD-C2D-C1D	-2.33	121.49	125.04

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	I	200	HEM	CHC-C4B-NB	-2.33	121.90	124.43
2	x	200	HEM	C3C-C4C-NC	-2.33	106.55	110.94
2	g	200	HEM	O2D-CGD-CBD	2.33	121.51	114.03
2	F	200	HEM	C4A-C3A-C2A	2.32	108.61	107.00
2	k	200	HEM	O2D-CGD-O1D	-2.32	117.51	123.30
2	a	200	HEM	CHC-C4B-C3B	2.32	128.12	124.57
2	a	200	HEM	CBB-CAB-C3B	-2.32	116.06	127.62
2	c	200	HEM	CHA-C4D-ND	2.31	127.23	124.38
2	x	200	HEM	C1D-C2D-C3D	-2.30	104.54	106.96
2	B	200	HEM	C3B-C2B-C1B	2.30	108.19	106.49
2	e	200	HEM	C4D-C3D-C2D	-2.29	103.55	106.90
2	U	200	HEM	CAB-C3B-C2B	-2.27	121.13	128.60
2	X	200	HEM	O2D-CGD-O1D	-2.27	117.64	123.30
2	H	200	HEM	C3B-C2B-C1B	2.27	108.17	106.49
2	v	200	HEM	CAB-C3B-C4B	2.26	134.98	124.47
2	L	200	HEM	C4C-CHD-C1D	2.25	125.53	122.56
2	S	200	HEM	O2D-CGD-O1D	-2.24	117.71	123.30
2	R	200	HEM	C4D-C3D-C2D	-2.24	103.63	106.90
2	P	200	HEM	C4A-C3A-C2A	2.24	108.55	107.00
2	x	200	HEM	C3D-C4D-ND	-2.24	107.67	110.17
2	n	200	HEM	CAD-C3D-C4D	2.24	128.57	124.66
2	a	200	HEM	CMB-C2B-C3B	2.23	133.75	128.30
2	U	200	HEM	CMD-C2D-C1D	2.21	128.41	125.04
2	H	200	HEM	O2D-CGD-CBD	2.19	121.08	114.03
2	c	200	HEM	CBD-CAD-C3D	-2.19	106.54	112.63
2	o	200	HEM	C2D-C1D-ND	-2.18	107.27	109.88
2	S	200	HEM	O2A-CGA-CBA	2.18	121.04	114.03
2	M	200	HEM	CBD-CAD-C3D	2.18	118.69	112.63
2	H	200	HEM	CAA-CBA-CGA	-2.18	107.64	113.76
2	q	200	HEM	CAD-CBD-CGD	-2.17	108.93	113.60
2	P	200	HEM	C3B-C2B-C1B	2.17	108.09	106.49
2	F	200	HEM	CAB-C3B-C2B	-2.16	121.48	128.60
2	B	200	HEM	C4D-ND-C1D	2.15	107.30	105.07
2	e	200	HEM	CBB-CAB-C3B	-2.15	116.94	127.62
2	g	200	HEM	CHD-C1D-C2D	-2.15	121.62	124.98
2	v	200	HEM	C3C-C4C-NC	-2.14	106.90	110.94
2	P	200	HEM	CAD-C3D-C4D	2.14	128.40	124.66
2	n	200	HEM	O2D-CGD-O1D	-2.14	117.97	123.30
2	q	200	HEM	C3C-C4C-NC	-2.14	106.91	110.94
2	F	200	HEM	C3B-C2B-C1B	2.14	108.07	106.49
2	n	200	HEM	CMA-C3A-C2A	2.13	128.96	124.94
2	L	200	HEM	O2A-CGA-CBA	2.13	120.86	114.03

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	k	200	HEM	O2D-CGD-CBD	2.12	120.86	114.03
2	t	200	HEM	C2C-C3C-C4C	2.12	108.38	106.90
2	H	200	HEM	C3D-C4D-ND	-2.12	107.81	110.17
2	k	200	HEM	C4D-C3D-C2D	-2.12	103.81	106.90
2	R	200	HEM	C3D-C4D-ND	-2.11	107.82	110.17
2	B	200	HEM	CMC-C2C-C3C	2.08	128.58	124.68
2	S	200	HEM	O1A-CGA-CBA	-2.07	116.43	123.08
2	j	200	HEM	CAD-C3D-C4D	2.06	128.26	124.66
2	a	200	HEM	CAD-CBD-CGD	2.06	118.04	113.60
2	e	200	HEM	C4B-C3B-C2B	2.06	108.75	107.11
2	S	200	HEM	C4C-CHD-C1D	2.05	125.27	122.56
2	t	200	HEM	CAD-C3D-C2D	2.05	131.69	127.88
2	q	200	HEM	C1B-NB-C4B	2.04	107.18	105.07
2	v	200	HEM	C4B-C3B-C2B	2.03	108.72	107.11
2	M	200	HEM	CAA-C2A-C3A	-2.02	121.44	127.25
2	x	200	HEM	C2D-C1D-ND	-2.02	107.46	109.88
2	X	200	HEM	CHC-C4B-C3B	2.01	127.65	124.57
2	S	200	HEM	CBB-CAB-C3B	-2.01	117.62	127.62
2	x	200	HEM	CMD-C2D-C1D	2.01	128.10	125.04

There are no chirality outliers.

All (129) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	C	200	HEM	C1A-C2A-CAA-CBA
2	C	200	HEM	C3A-C2A-CAA-CBA
2	C	200	HEM	C2A-CAA-CBA-CGA
2	L	200	HEM	C3D-CAD-CBD-CGD
2	P	200	HEM	C1A-C2A-CAA-CBA
2	P	200	HEM	C3A-C2A-CAA-CBA
2	R	200	HEM	C1A-C2A-CAA-CBA
2	R	200	HEM	C3A-C2A-CAA-CBA
2	R	200	HEM	C4D-C3D-CAD-CBD
2	U	200	HEM	C2B-C3B-CAB-CBB
2	U	200	HEM	C4B-C3B-CAB-CBB
2	g	200	HEM	C1A-C2A-CAA-CBA
2	g	200	HEM	C3A-C2A-CAA-CBA
2	o	200	HEM	C2B-C3B-CAB-CBB
2	o	200	HEM	C4B-C3B-CAB-CBB
2	t	200	HEM	C2D-C3D-CAD-CBD
2	t	200	HEM	C4D-C3D-CAD-CBD
2	v	200	HEM	C2A-CAA-CBA-CGA

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Mol	Chain	Res	Type	Atoms
2	R	200	HEM	C2D-C3D-CAD-CBD
2	L	200	HEM	C4D-C3D-CAD-CBD
2	M	200	HEM	C4D-C3D-CAD-CBD
2	M	200	HEM	C2D-C3D-CAD-CBD
2	o	200	HEM	C2D-C3D-CAD-CBD
2	F	200	HEM	C3D-CAD-CBD-CGD
2	M	200	HEM	C3D-CAD-CBD-CGD
2	k	200	HEM	C3D-CAD-CBD-CGD
2	B	200	HEM	C2A-CAA-CBA-CGA
2	k	200	HEM	C2A-CAA-CBA-CGA
2	o	200	HEM	C4D-C3D-CAD-CBD
2	X	200	HEM	C2D-C3D-CAD-CBD
2	L	200	HEM	C2D-C3D-CAD-CBD
2	I	200	HEM	C2A-CAA-CBA-CGA
2	g	200	HEM	C2A-CAA-CBA-CGA
2	t	200	HEM	C2A-CAA-CBA-CGA
2	R	200	HEM	C3D-CAD-CBD-CGD
2	B	200	HEM	C4B-C3B-CAB-CBB
2	g	200	HEM	C4B-C3B-CAB-CBB
2	X	200	HEM	C4D-C3D-CAD-CBD
2	k	200	HEM	C4D-C3D-CAD-CBD
2	C	200	HEM	C3D-CAD-CBD-CGD
2	t	200	HEM	C3D-CAD-CBD-CGD
2	k	200	HEM	C2D-C3D-CAD-CBD
2	x	200	HEM	C2B-C3B-CAB-CBB
2	H	200	HEM	C4B-C3B-CAB-CBB
2	L	200	HEM	C4B-C3B-CAB-CBB
2	M	200	HEM	C4B-C3B-CAB-CBB
2	P	200	HEM	C4B-C3B-CAB-CBB
2	X	200	HEM	C4B-C3B-CAB-CBB
2	a	200	HEM	C4B-C3B-CAB-CBB
2	c	200	HEM	C4B-C3B-CAB-CBB
2	e	200	HEM	C4B-C3B-CAB-CBB
2	j	200	HEM	C4B-C3B-CAB-CBB
2	k	200	HEM	C4B-C3B-CAB-CBB
2	v	200	HEM	C4B-C3B-CAB-CBB
2	F	200	HEM	C2A-CAA-CBA-CGA
2	H	200	HEM	C2A-CAA-CBA-CGA
2	R	200	HEM	C2A-CAA-CBA-CGA
2	X	200	HEM	C1A-C2A-CAA-CBA
2	X	200	HEM	C3A-C2A-CAA-CBA
2	j	200	HEM	C3A-C2A-CAA-CBA

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Mol	Chain	Res	Type	Atoms
2	k	200	HEM	C1A-C2A-CAA-CBA
2	k	200	HEM	C3A-C2A-CAA-CBA
2	o	200	HEM	C1A-C2A-CAA-CBA
2	o	200	HEM	C3A-C2A-CAA-CBA
2	t	200	HEM	C1A-C2A-CAA-CBA
2	t	200	HEM	C3A-C2A-CAA-CBA
2	F	200	HEM	C4D-C3D-CAD-CBD
2	q	200	HEM	C4D-C3D-CAD-CBD
2	F	200	HEM	C2D-C3D-CAD-CBD
2	H	200	HEM	CAA-CBA-CGA-O1A
2	q	200	HEM	CAA-CBA-CGA-O1A
2	x	200	HEM	C4B-C3B-CAB-CBB
2	e	200	HEM	CAD-CBD-CGD-O1D
2	c	200	HEM	CAD-CBD-CGD-O1D
2	R	200	HEM	CAA-CBA-CGA-O2A
2	t	200	HEM	CAD-CBD-CGD-O1D
2	S	200	HEM	CAA-CBA-CGA-O2A
2	L	200	HEM	CAA-CBA-CGA-O2A
2	c	200	HEM	CAD-CBD-CGD-O2D
2	L	200	HEM	CAA-CBA-CGA-O1A
2	e	200	HEM	CAD-CBD-CGD-O2D
2	g	200	HEM	CAA-CBA-CGA-O2A
2	v	200	HEM	CAD-CBD-CGD-O2D
2	H	200	HEM	CAA-CBA-CGA-O2A
2	M	200	HEM	CAD-CBD-CGD-O2D
2	R	200	HEM	CAA-CBA-CGA-O1A
2	k	200	HEM	CAA-CBA-CGA-O2A
2	n	200	HEM	CAA-CBA-CGA-O1A
2	M	200	HEM	CAD-CBD-CGD-O1D
2	S	200	HEM	CAD-CBD-CGD-O2D
2	e	200	HEM	CAA-CBA-CGA-O1A
2	q	200	HEM	C3D-CAD-CBD-CGD
2	v	200	HEM	CAA-CBA-CGA-O1A
2	n	200	HEM	CAA-CBA-CGA-O2A
2	C	200	HEM	CAD-CBD-CGD-O2D
2	S	200	HEM	CAD-CBD-CGD-O1D
2	k	200	HEM	CAA-CBA-CGA-O1A
2	q	200	HEM	CAA-CBA-CGA-O2A
2	g	200	HEM	CAA-CBA-CGA-O1A
2	e	200	HEM	CAA-CBA-CGA-O2A
2	S	200	HEM	CAA-CBA-CGA-O1A
2	t	200	HEM	CAD-CBD-CGD-O2D

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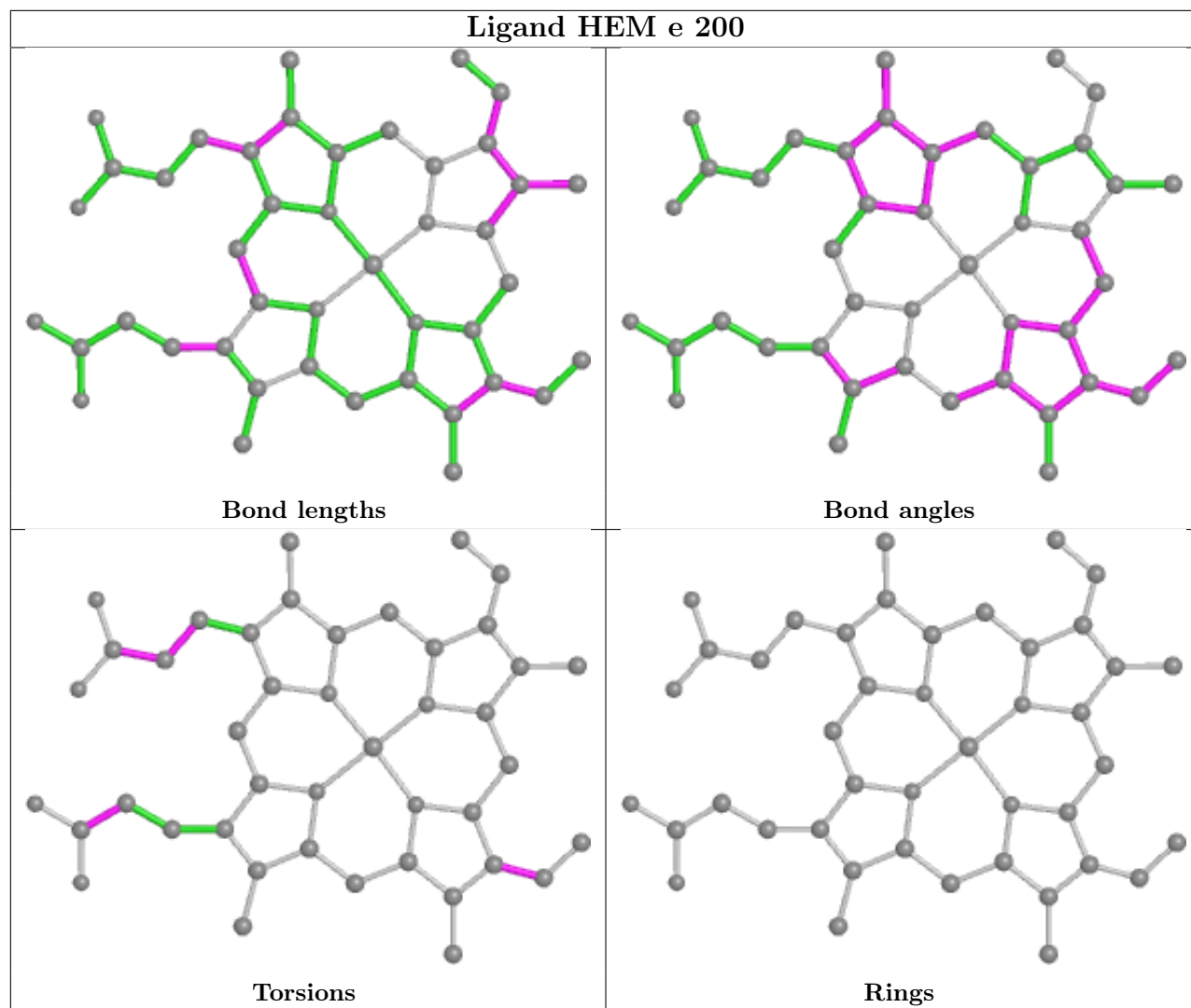
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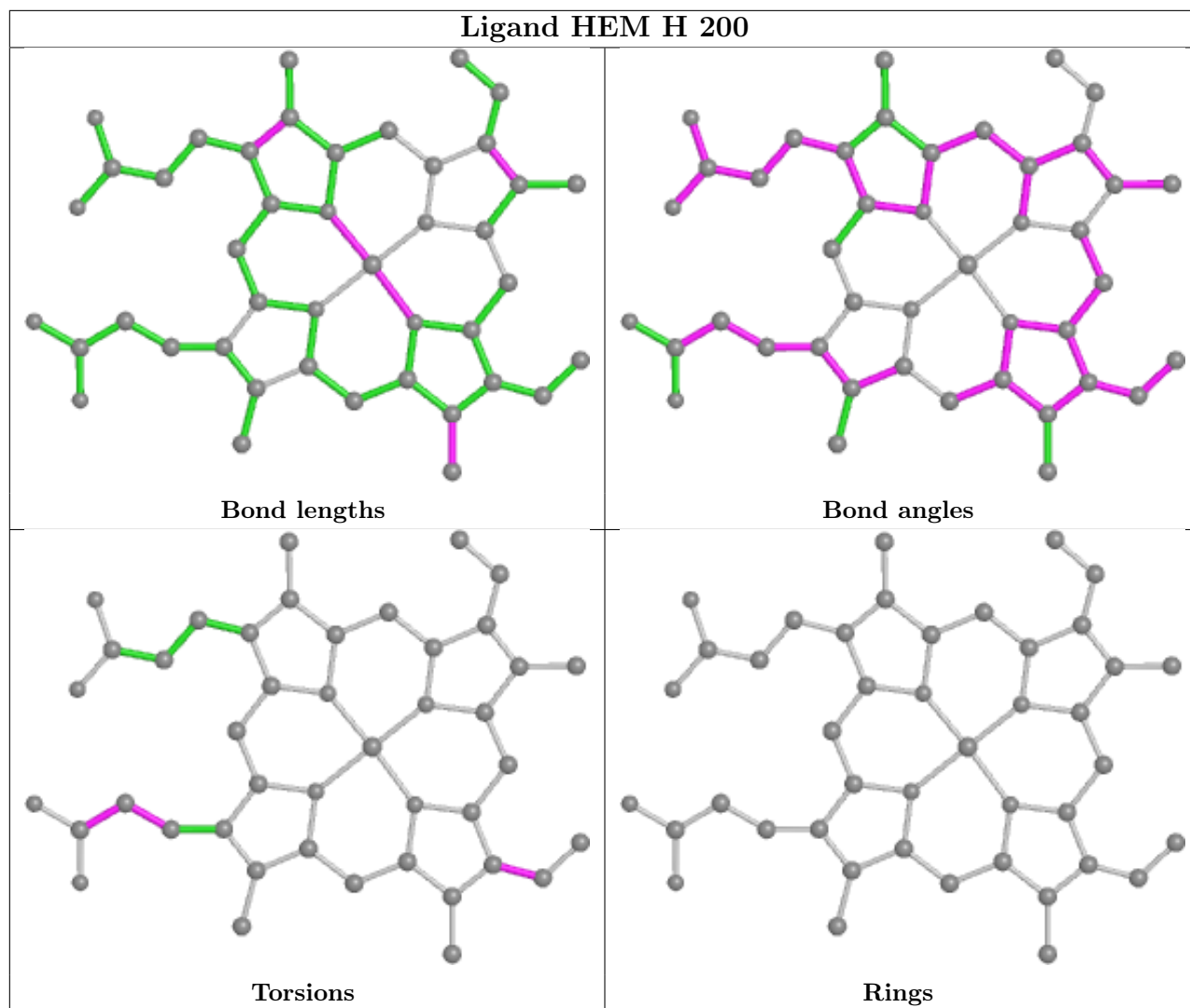
Mol	Chain	Res	Type	Atoms
2	v	200	HEM	CAA-CBA-CGA-O2A
2	L	200	HEM	CAD-CBD-CGD-O1D
2	e	200	HEM	C3D-CAD-CBD-CGD
2	L	200	HEM	CAD-CBD-CGD-O2D
2	P	200	HEM	CAA-CBA-CGA-O2A
2	X	200	HEM	CAA-CBA-CGA-O1A
2	v	200	HEM	CAD-CBD-CGD-O1D
2	C	200	HEM	CAA-CBA-CGA-O2A
2	t	200	HEM	CAA-CBA-CGA-O2A
2	P	200	HEM	CAA-CBA-CGA-O1A
2	t	200	HEM	CAA-CBA-CGA-O1A
2	c	200	HEM	CAA-CBA-CGA-O1A
2	C	200	HEM	CAA-CBA-CGA-O1A
2	X	200	HEM	CAA-CBA-CGA-O2A
2	C	200	HEM	CAD-CBD-CGD-O1D
2	P	200	HEM	C2A-CAA-CBA-CGA
2	B	200	HEM	CAA-CBA-CGA-O2A
2	o	200	HEM	CAD-CBD-CGD-O1D
2	M	200	HEM	CAA-CBA-CGA-O1A
2	M	200	HEM	CAA-CBA-CGA-O2A
2	I	200	HEM	CAA-CBA-CGA-O2A
2	c	200	HEM	CAA-CBA-CGA-O2A
2	B	200	HEM	CAA-CBA-CGA-O1A
2	x	200	HEM	CAD-CBD-CGD-O2D
2	o	200	HEM	CAD-CBD-CGD-O2D
2	F	200	HEM	CAA-CBA-CGA-O2A
2	k	200	HEM	CAD-CBD-CGD-O2D

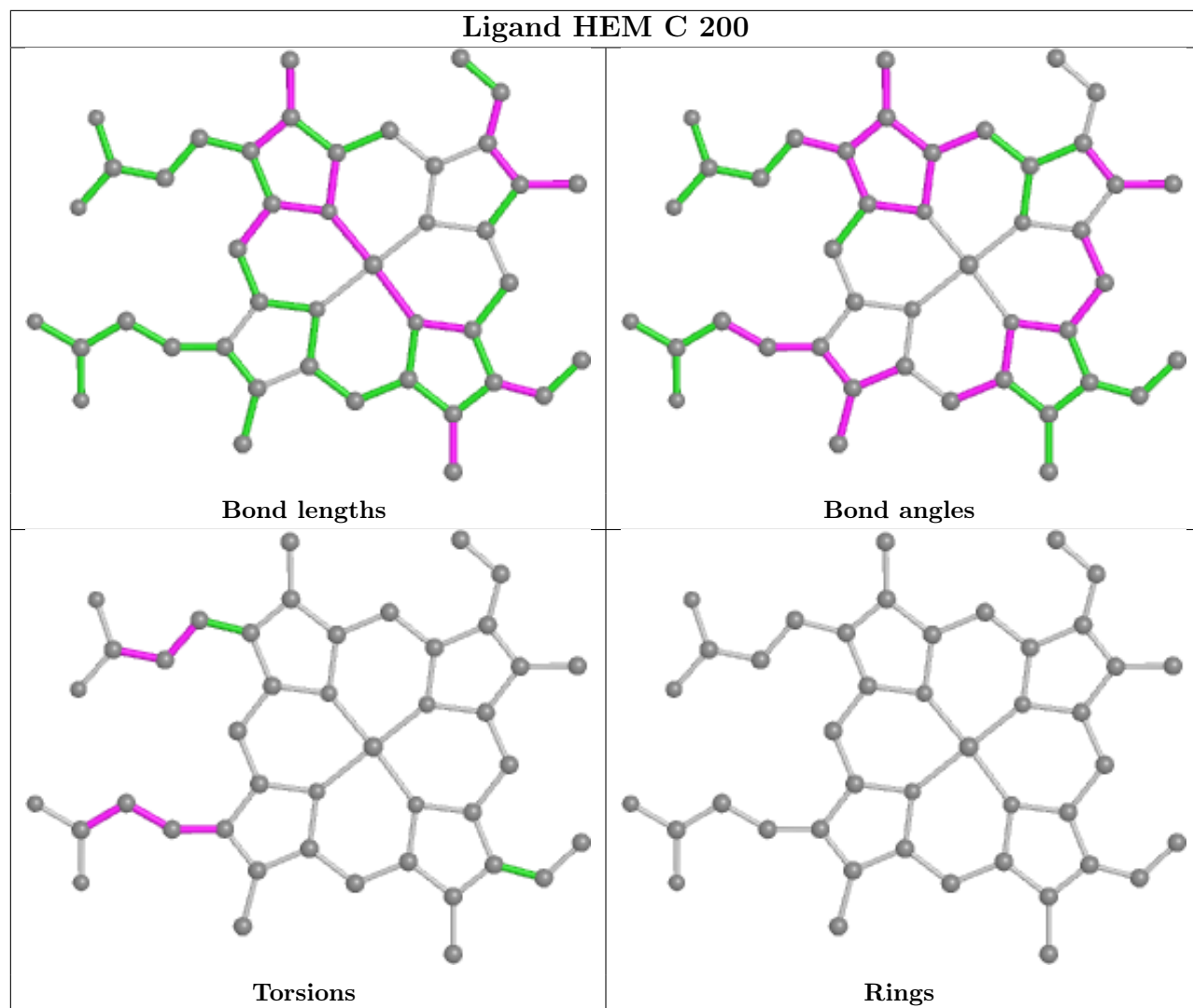
There are no ring outliers.

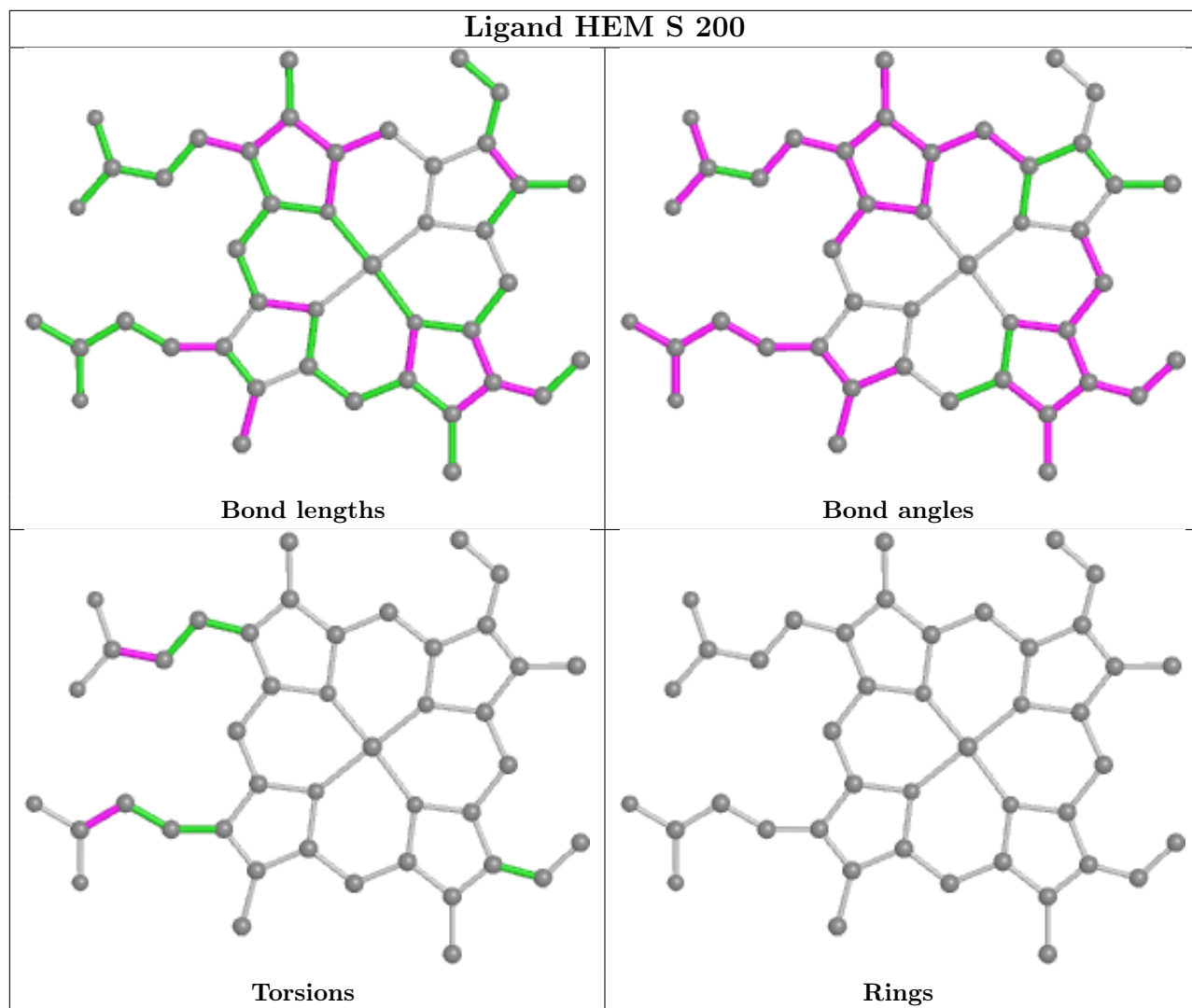
No monomer is involved in short contacts.

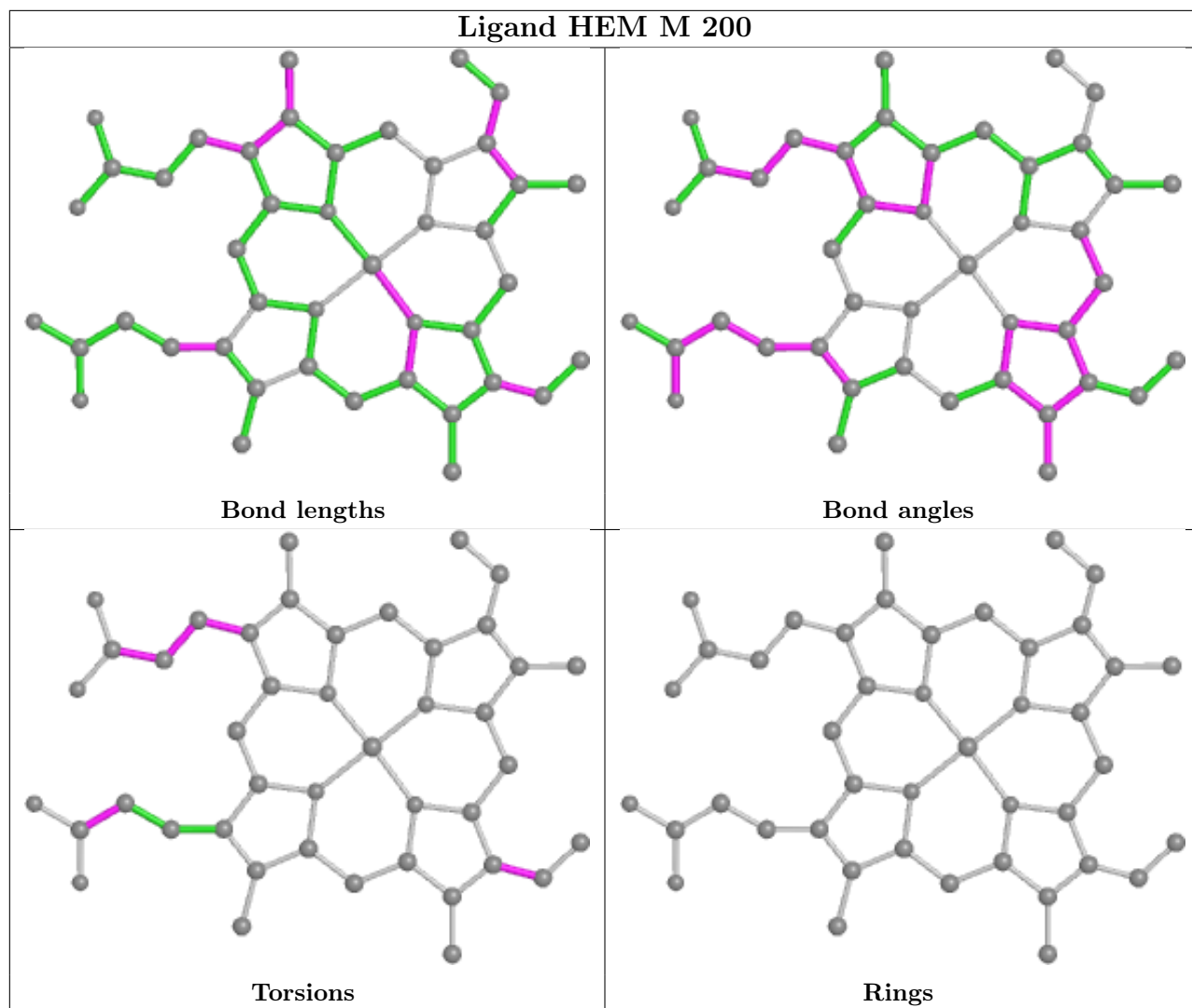
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

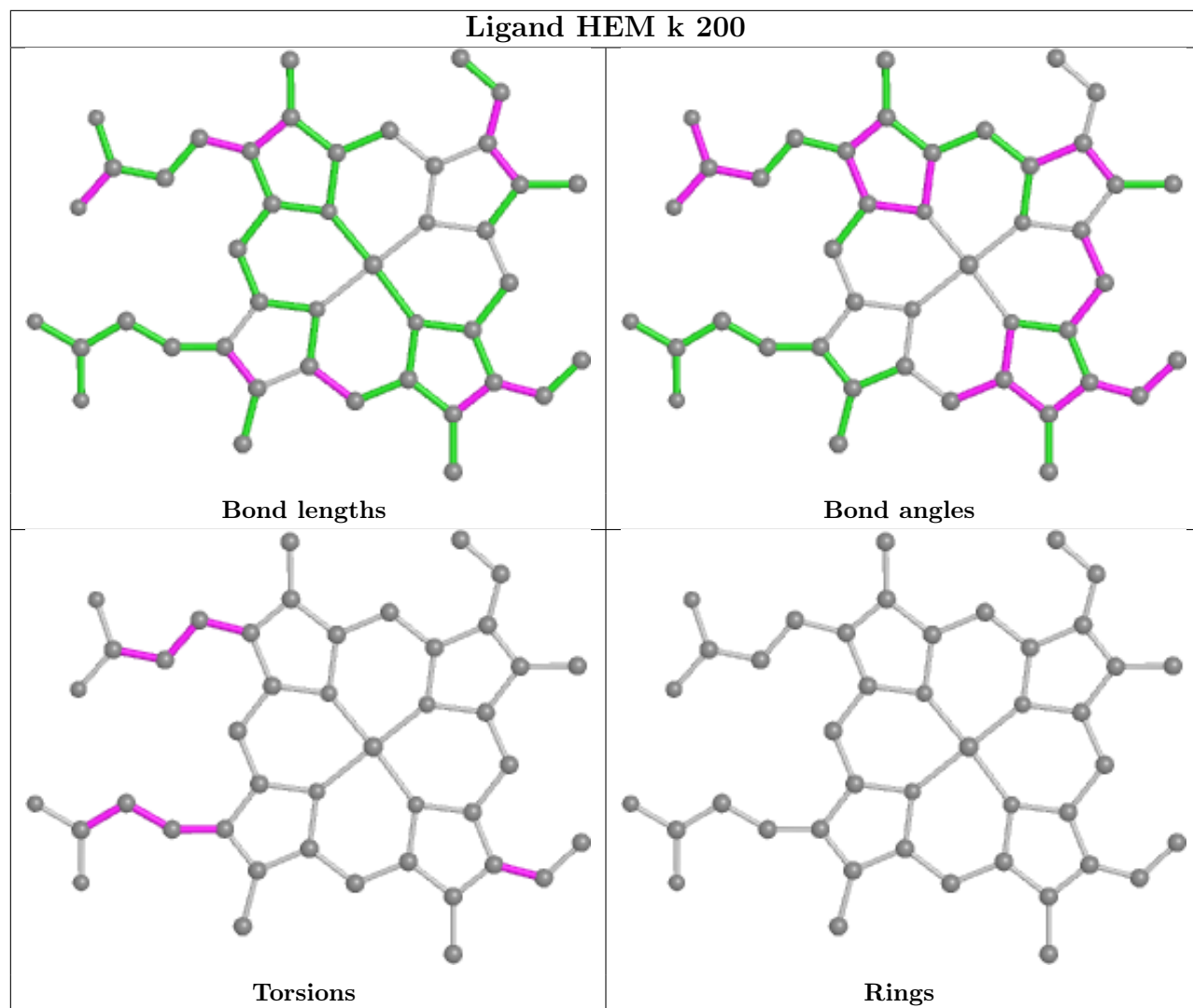


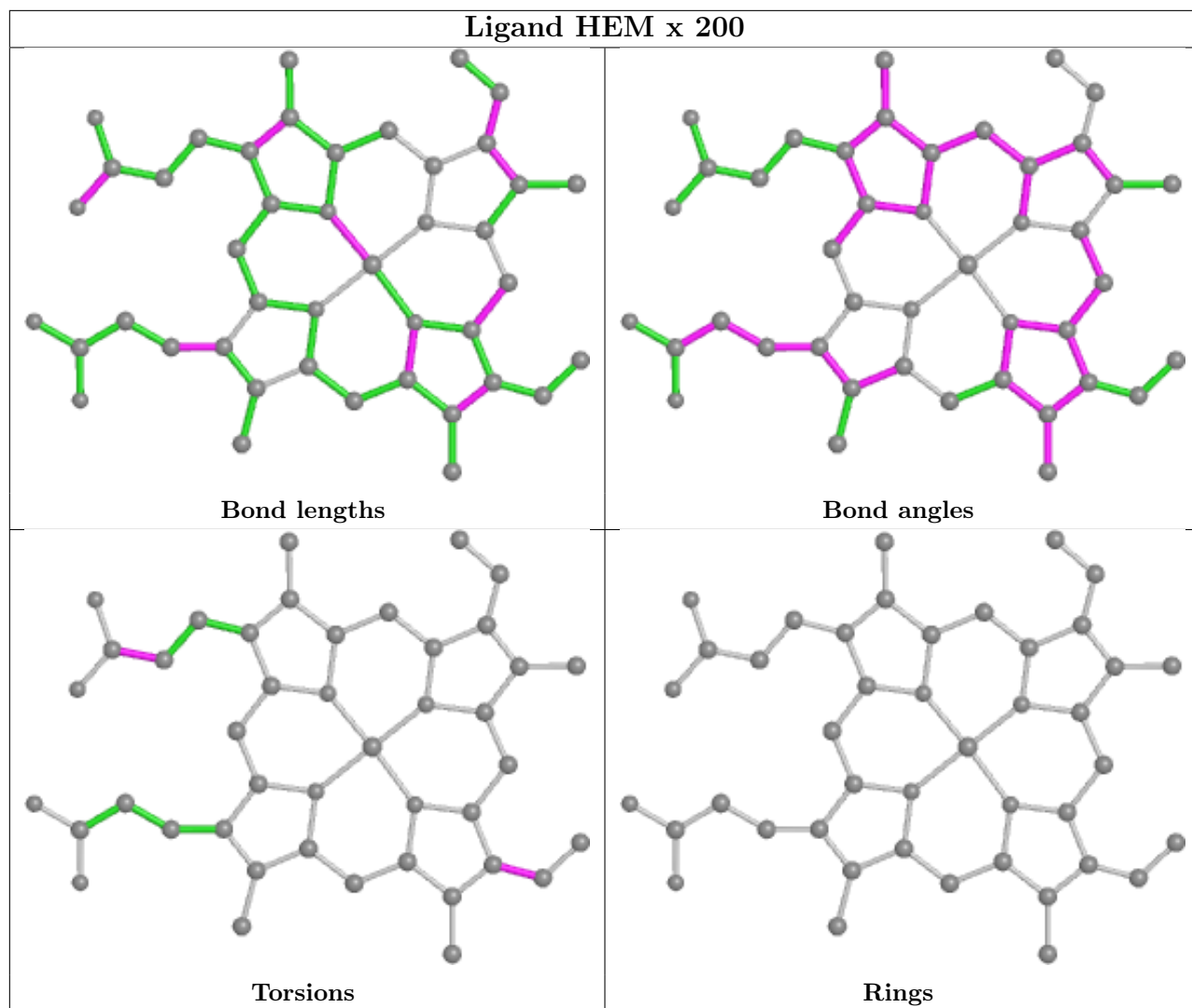




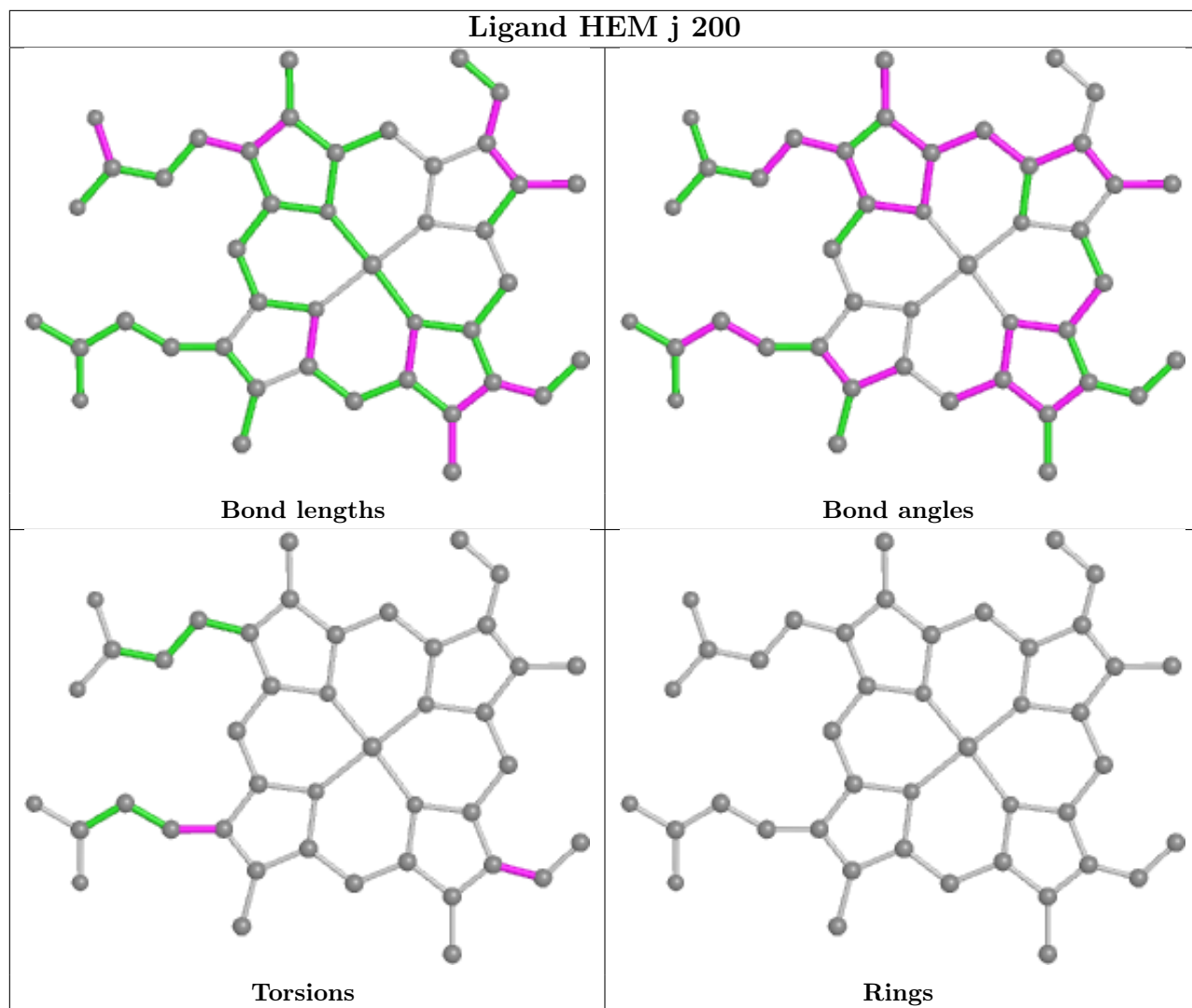


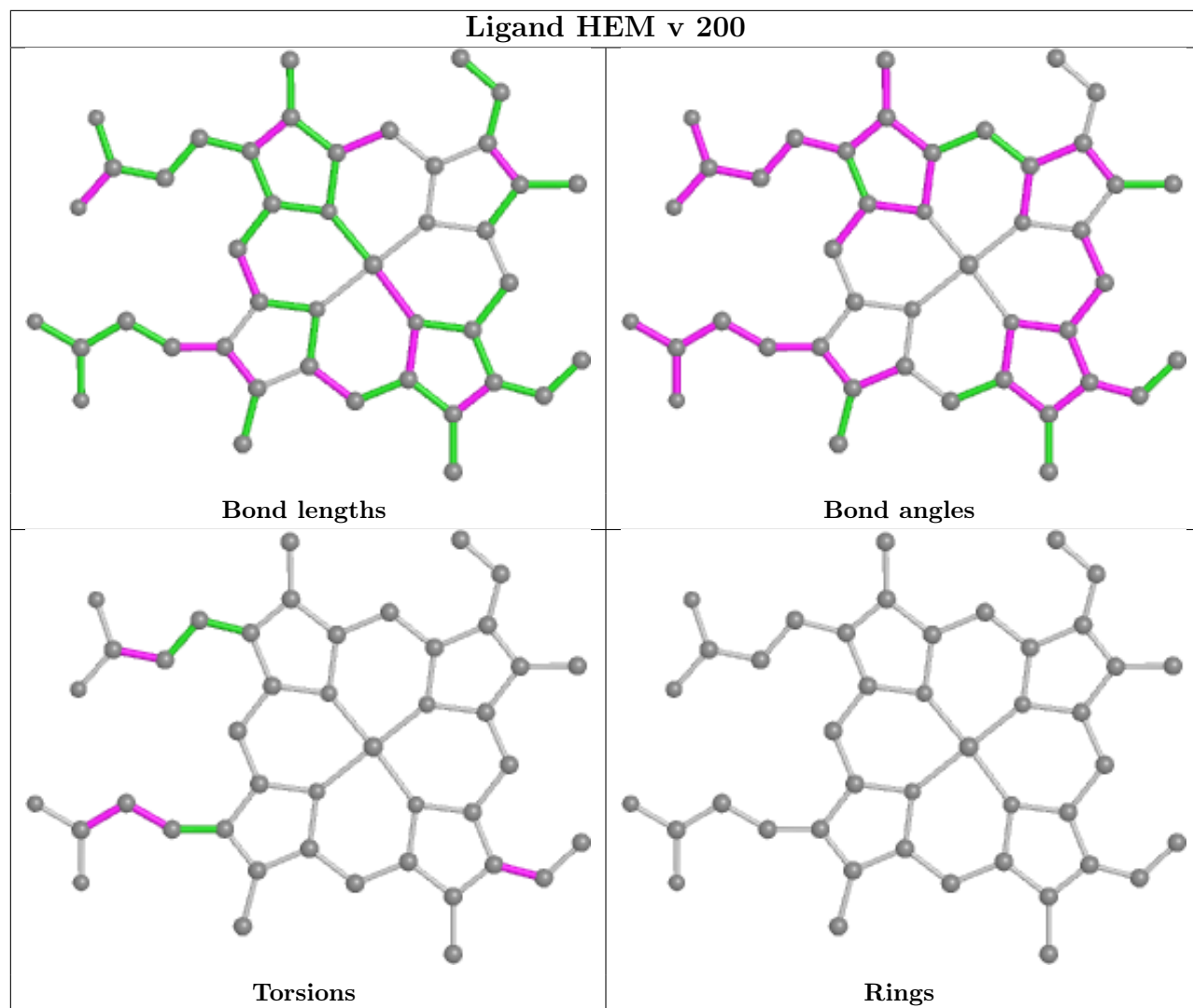


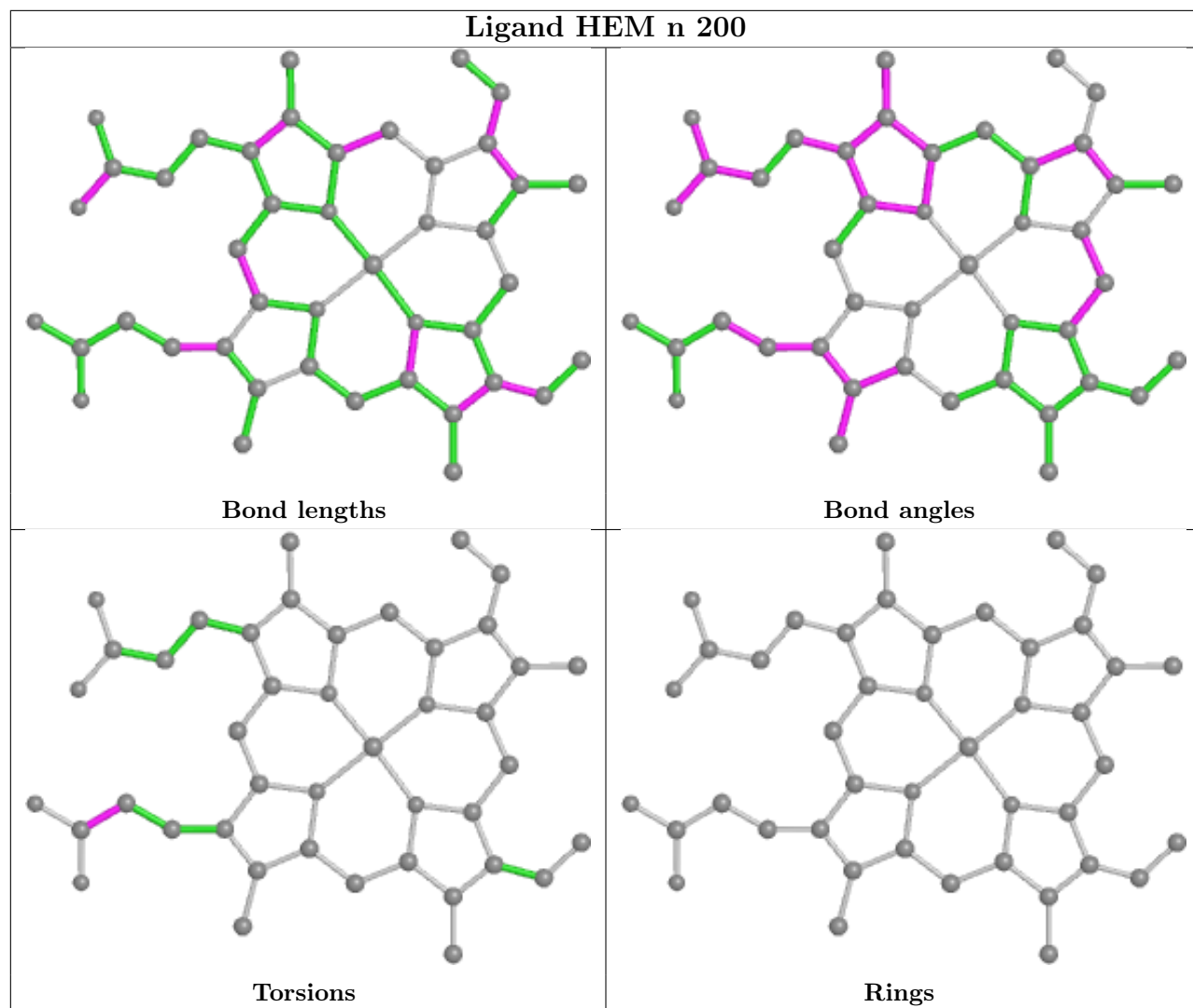


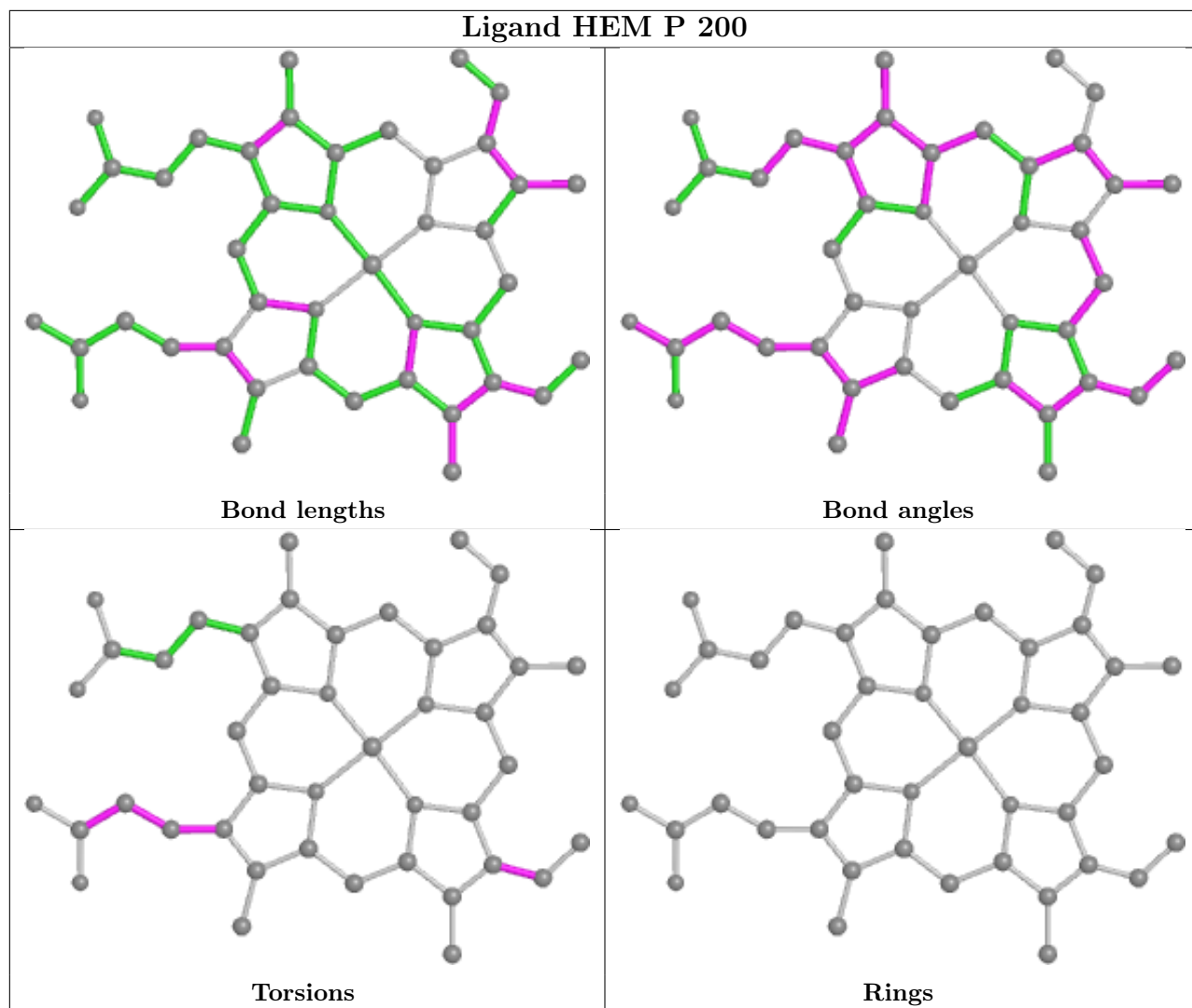


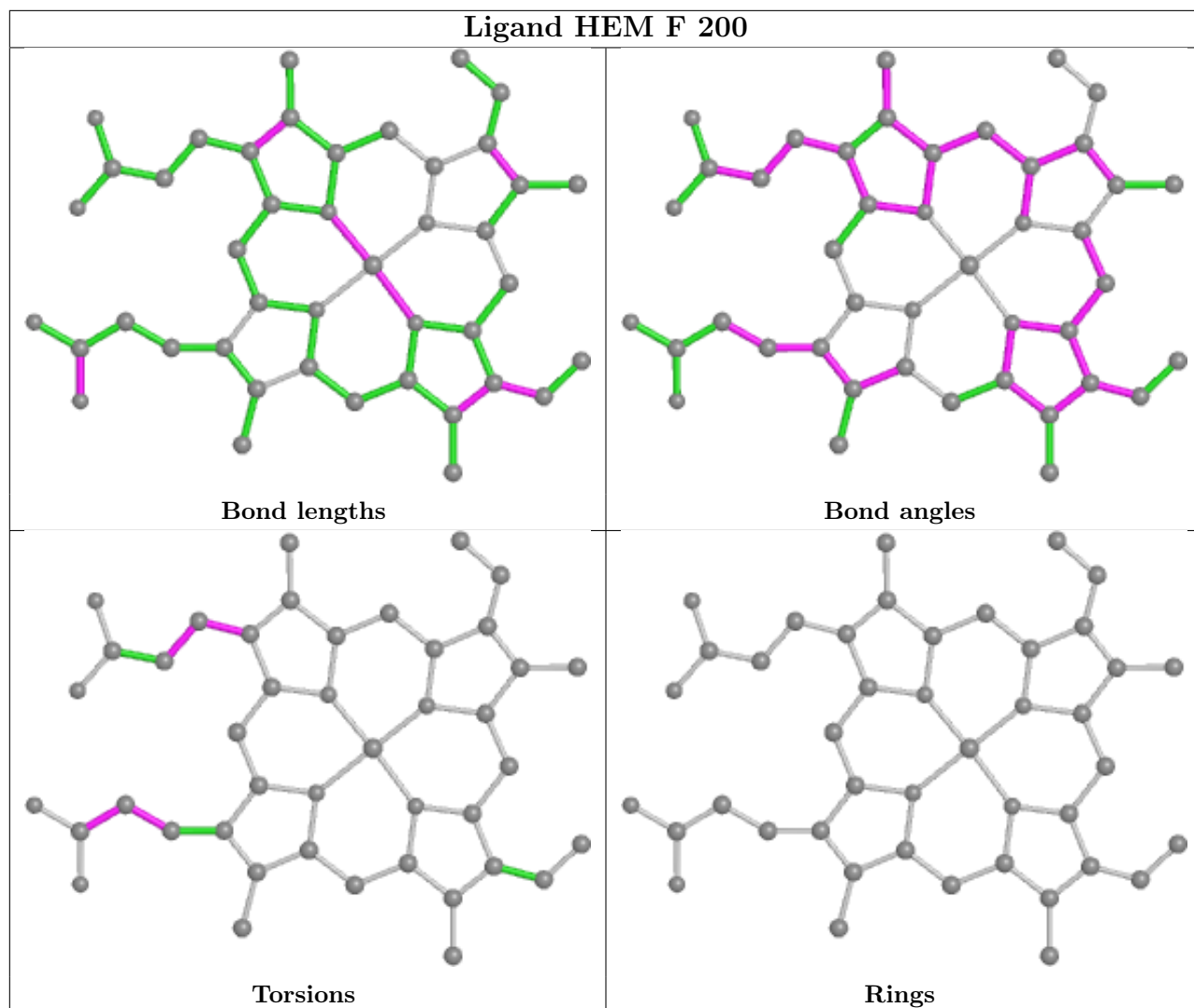


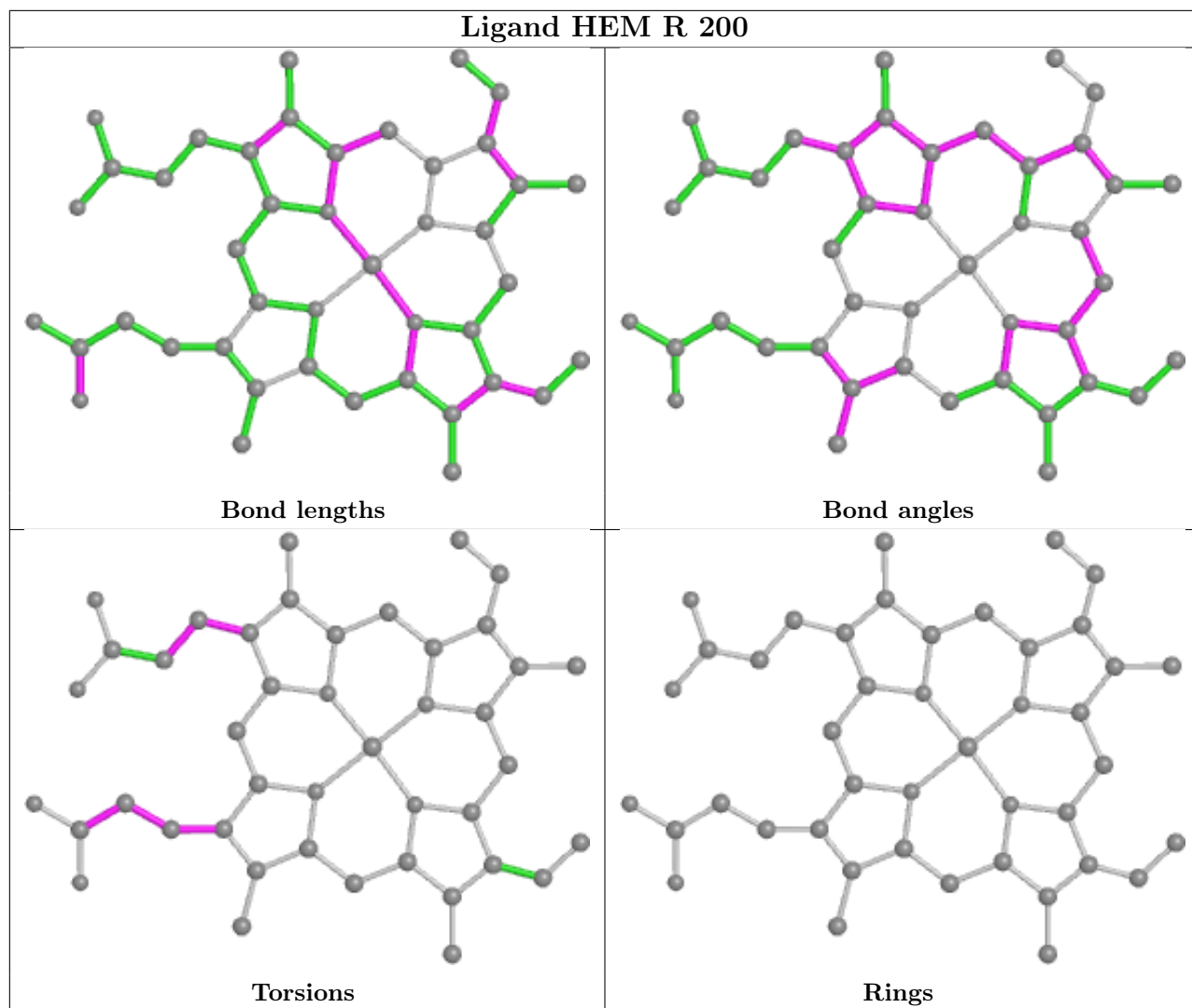


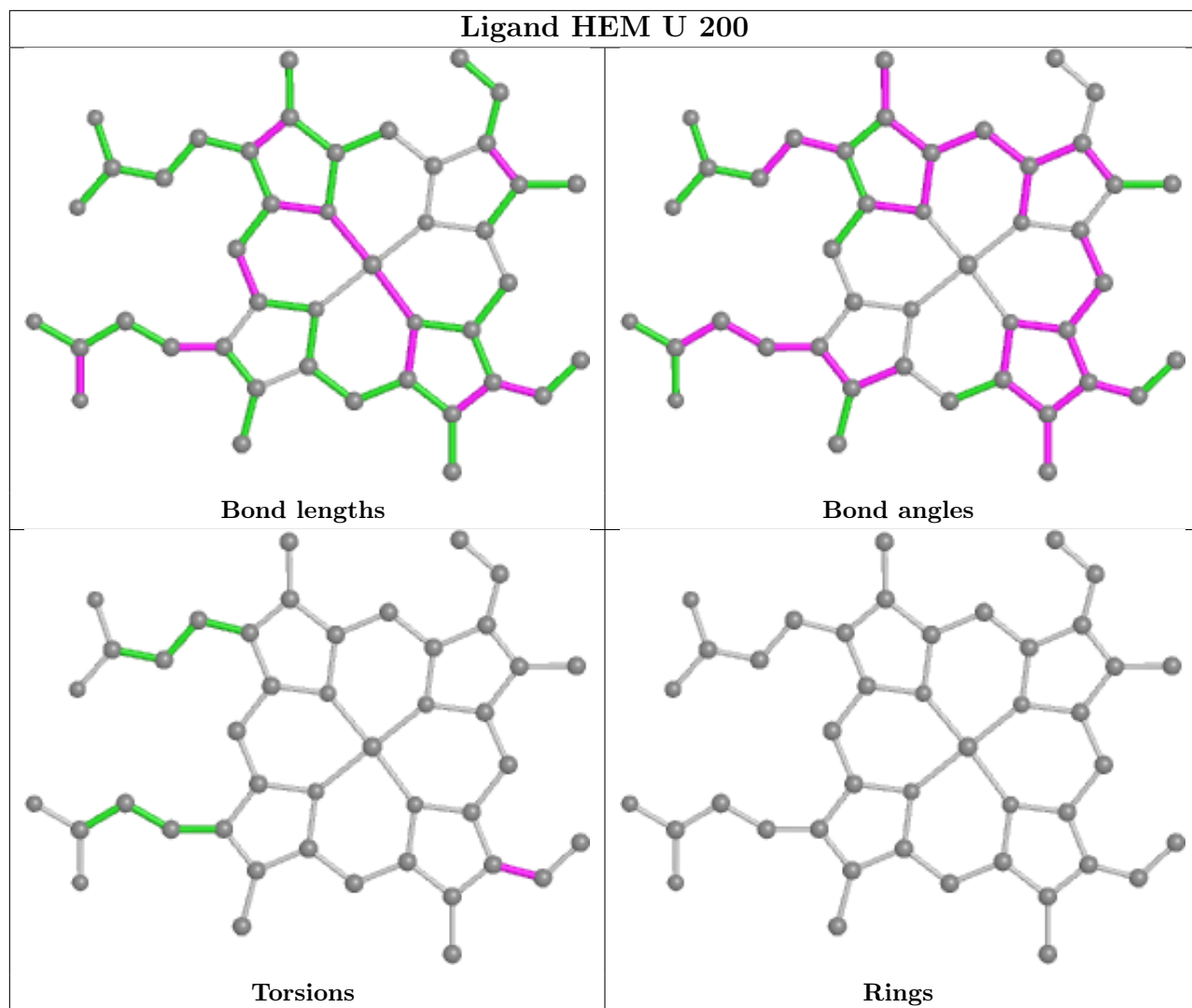


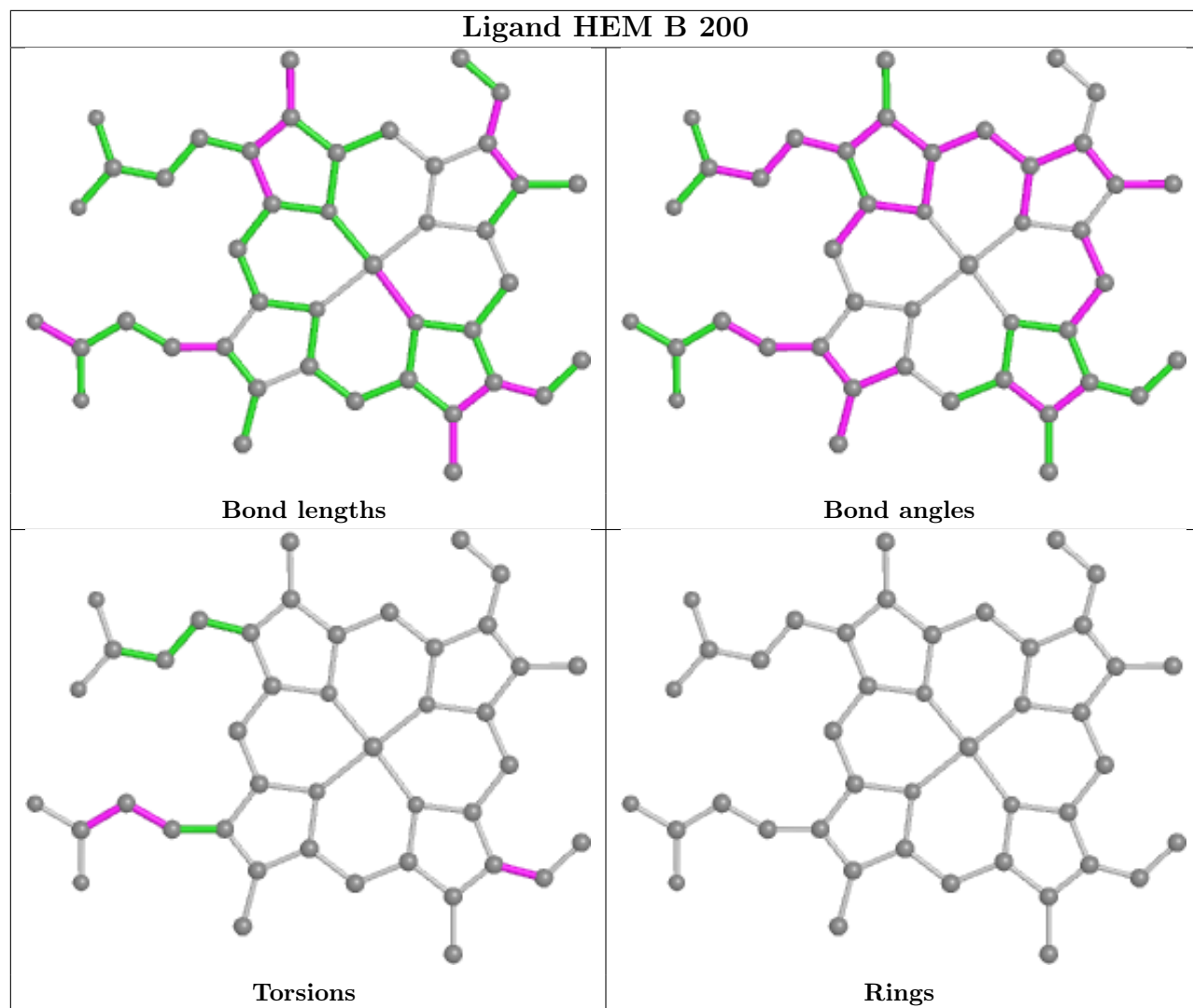




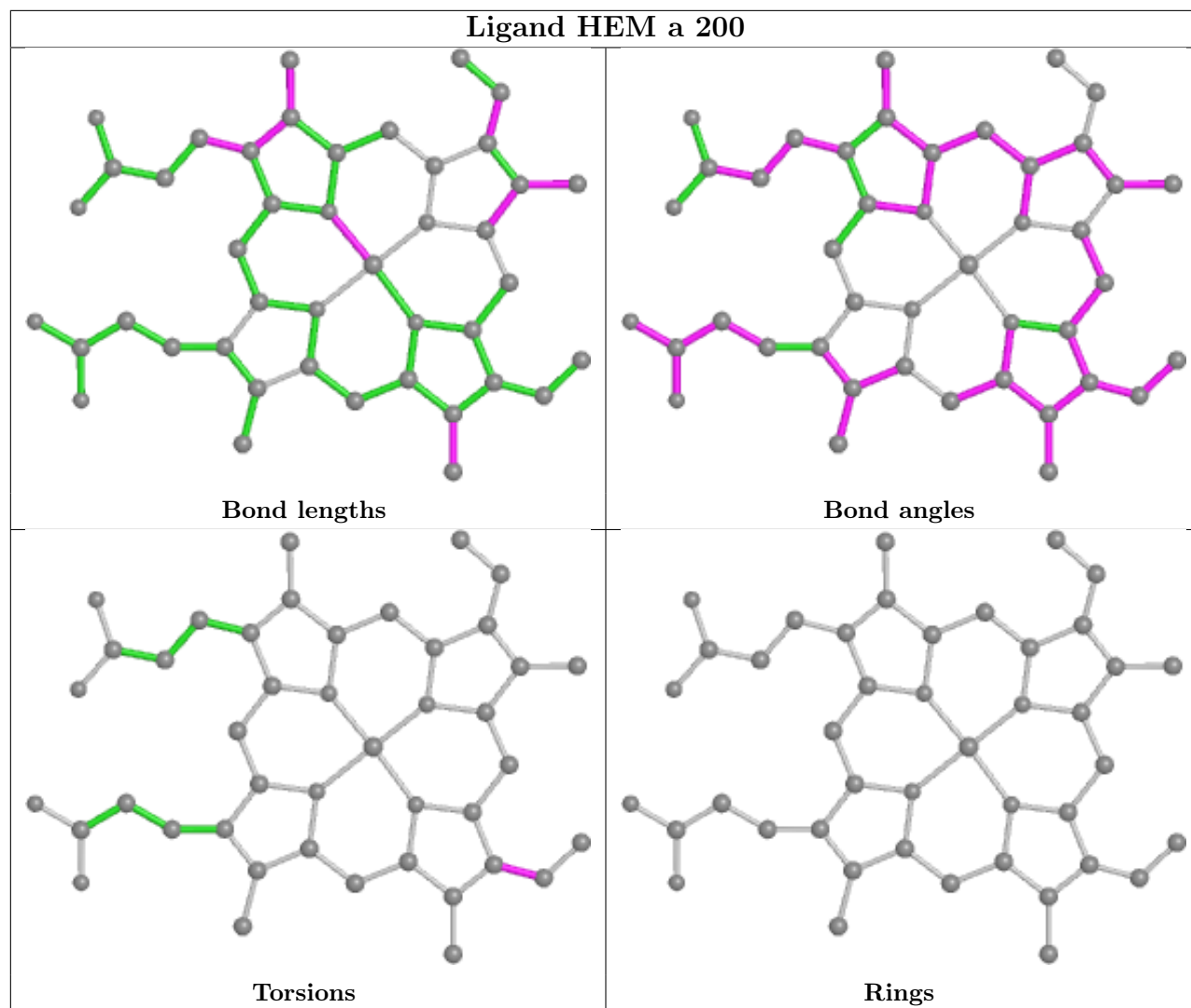


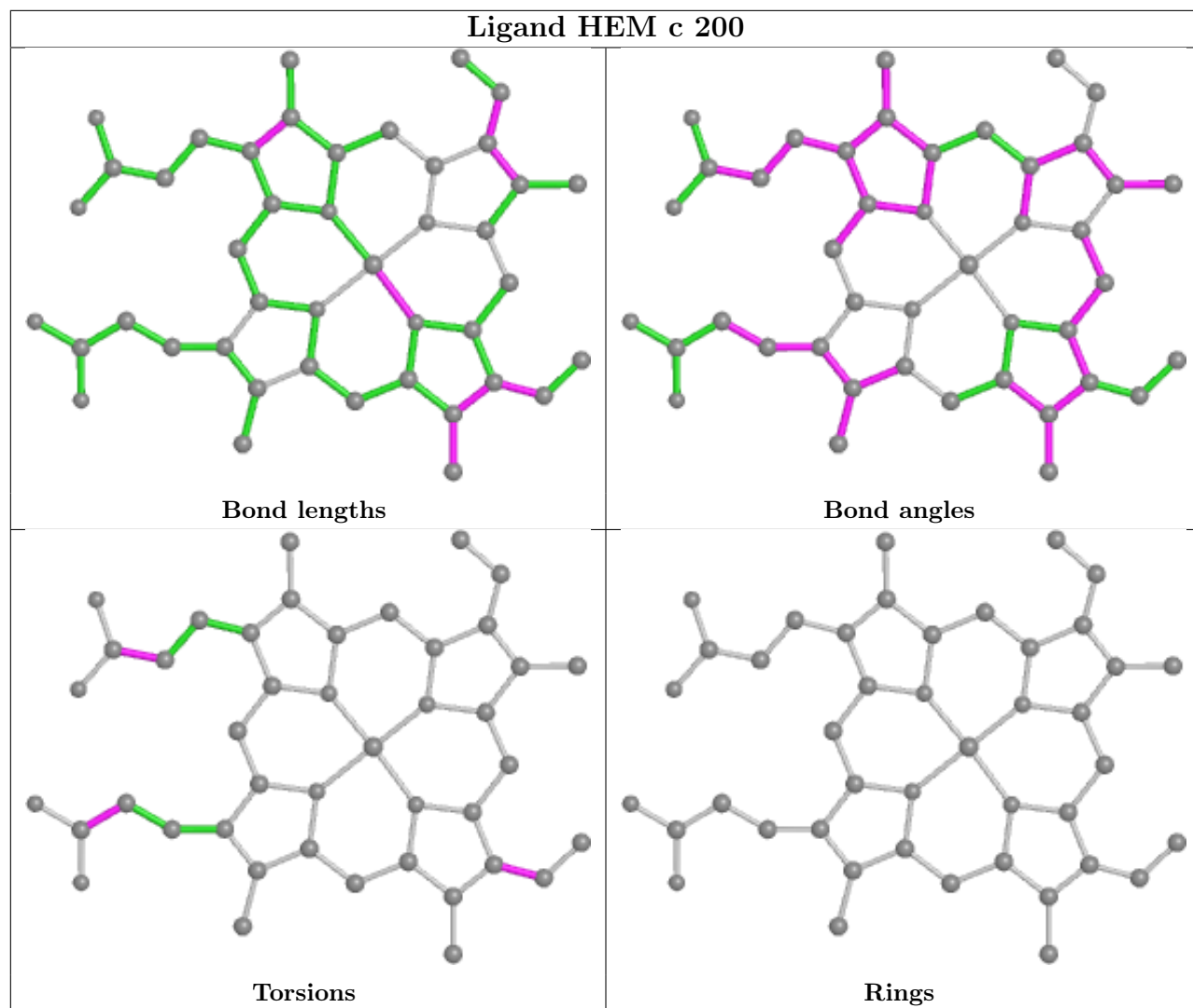


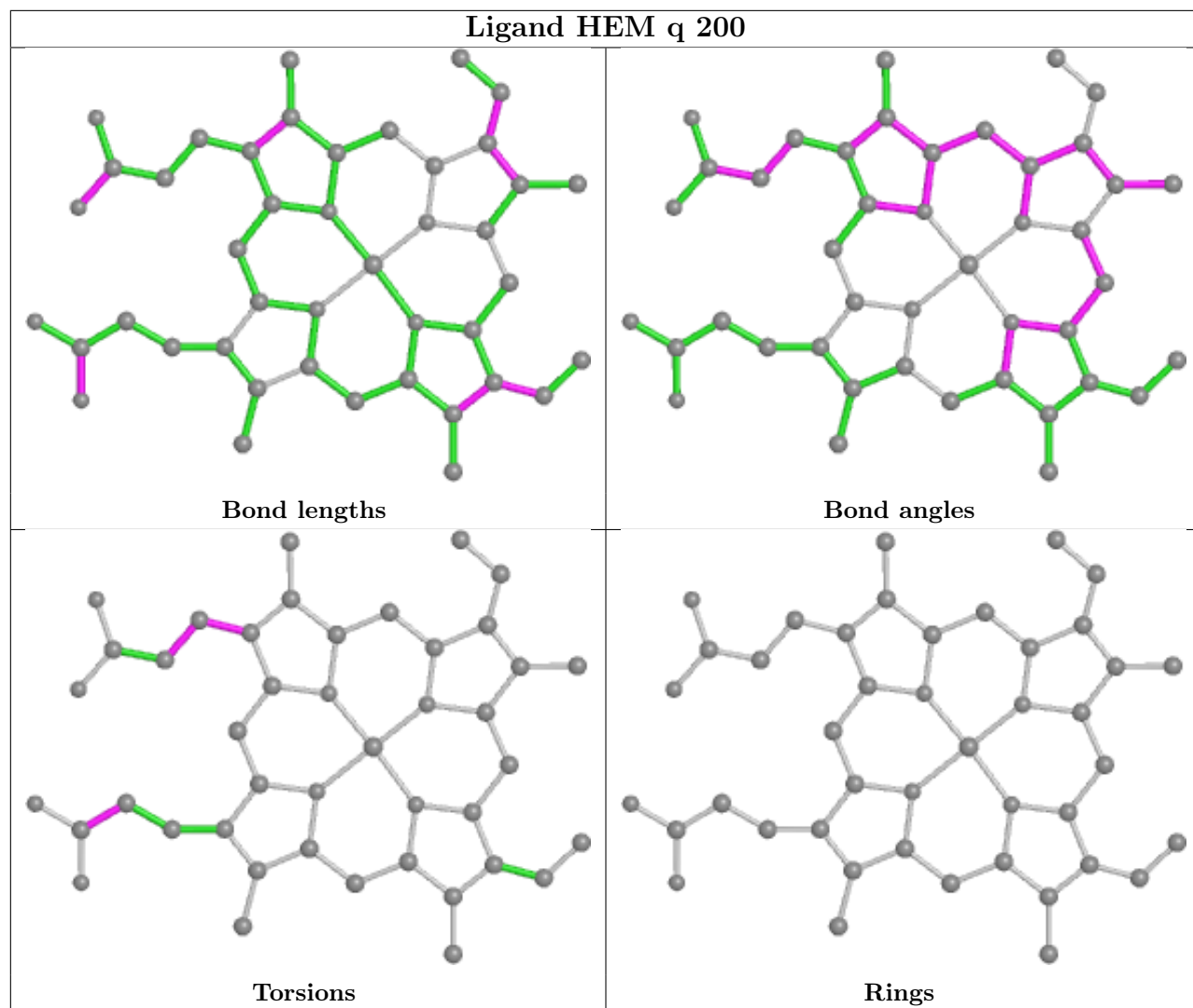


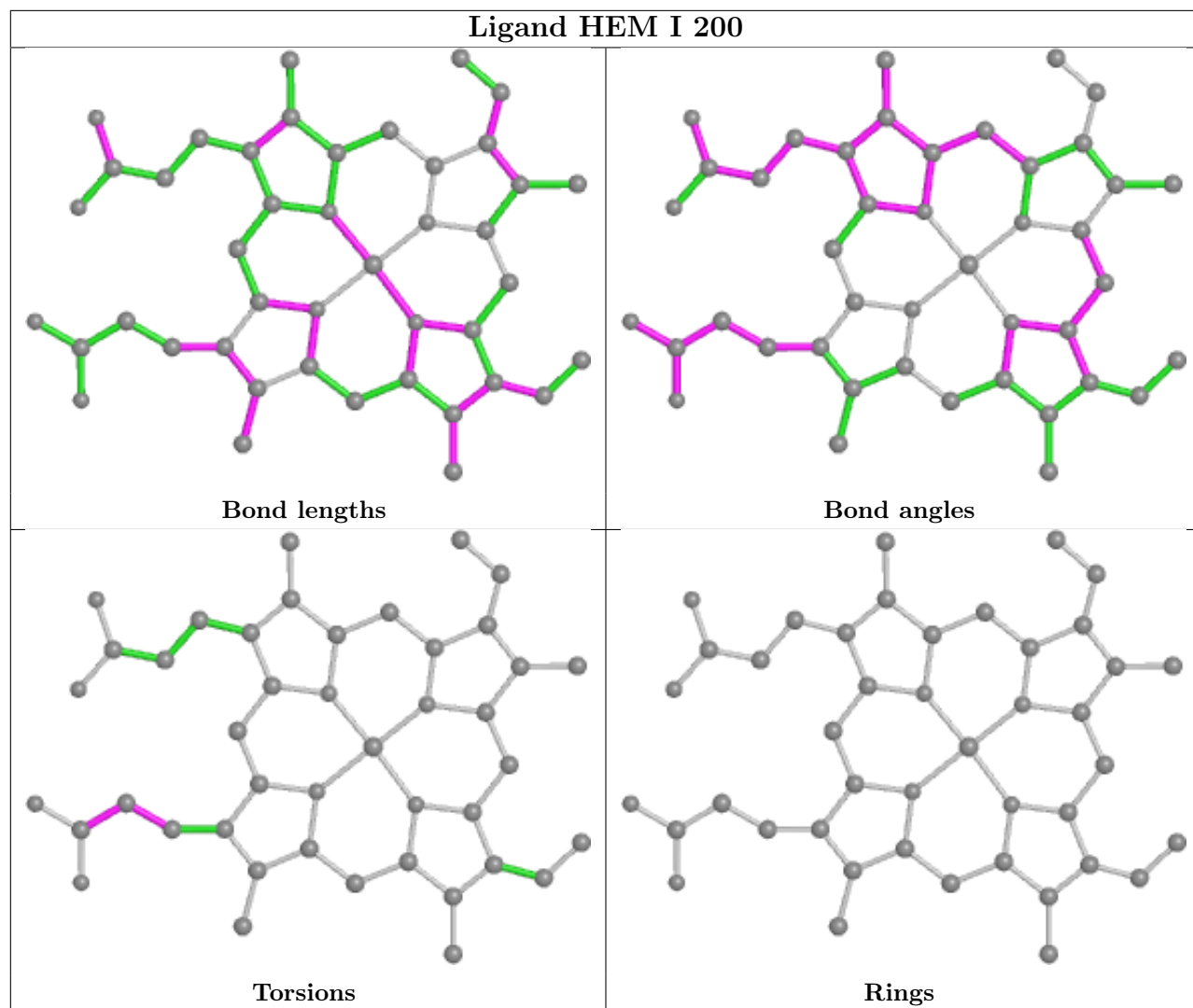


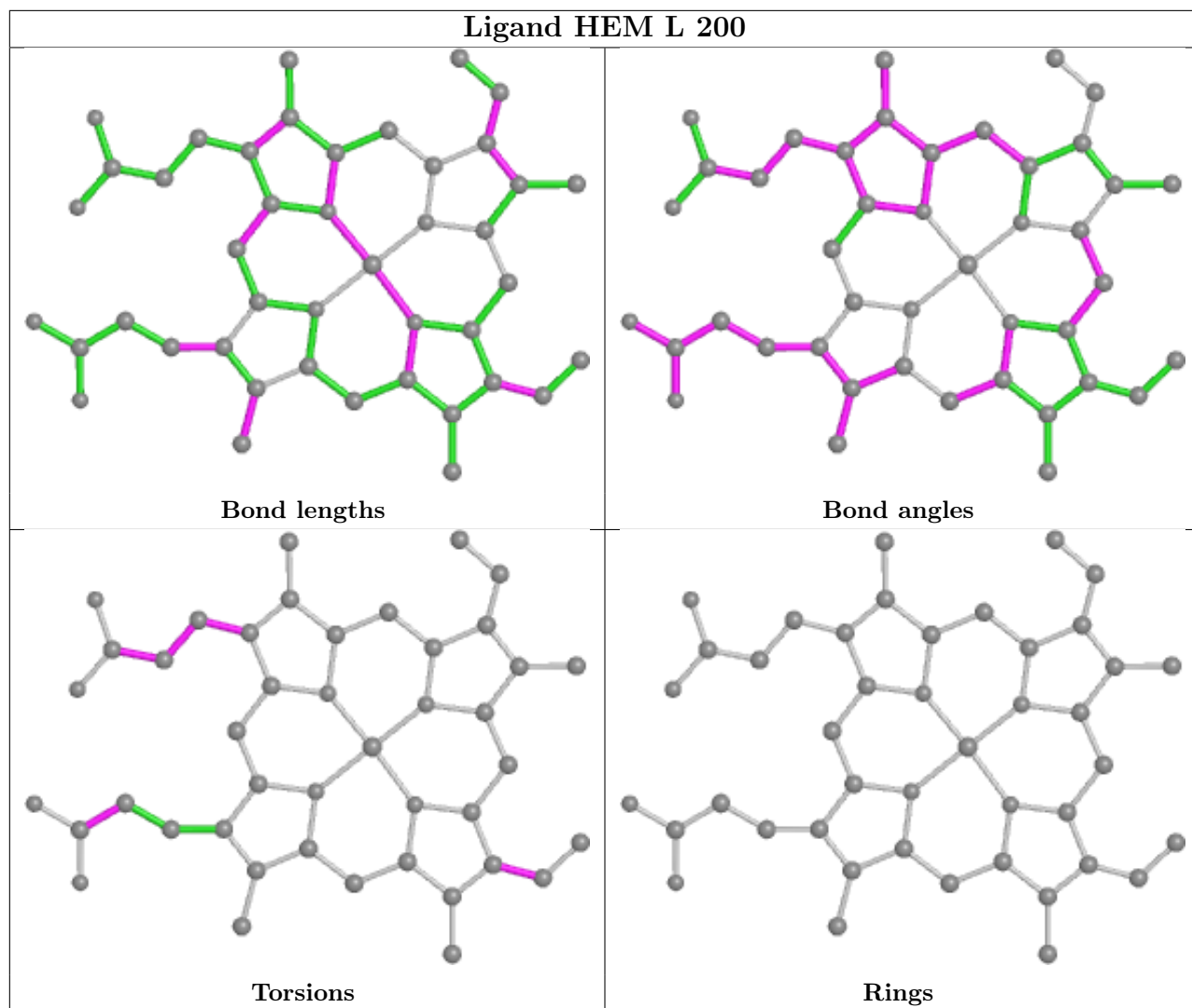


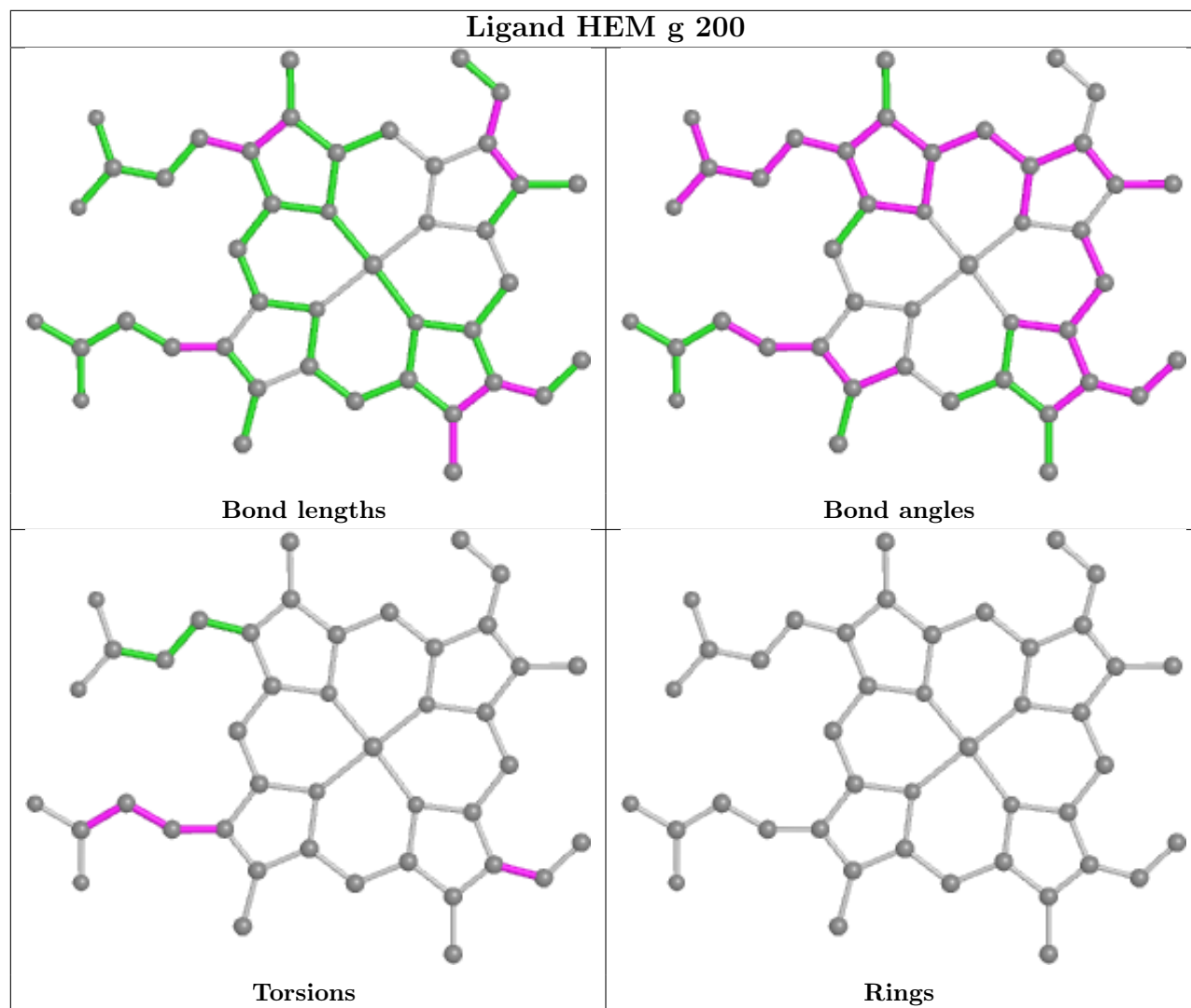


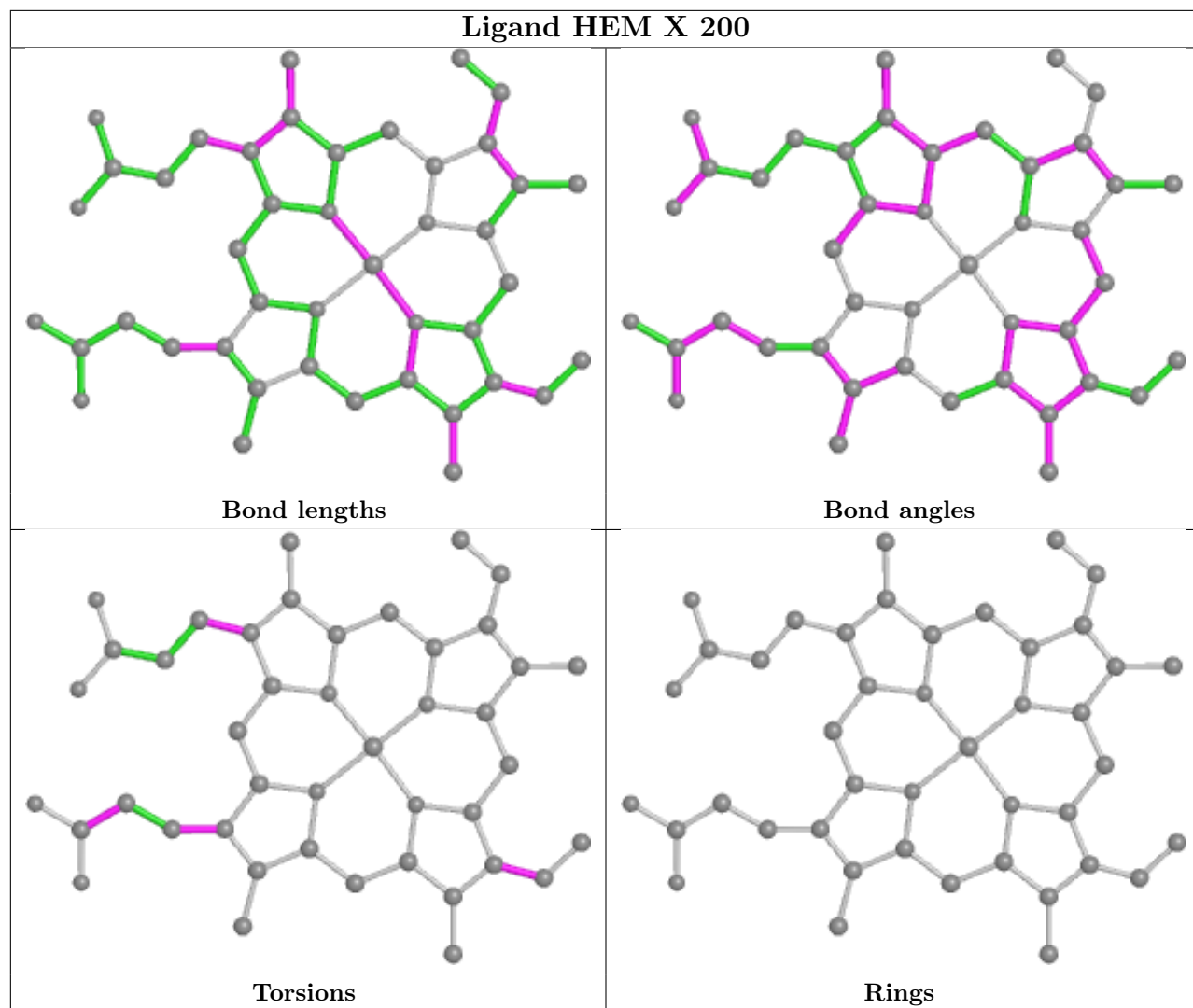


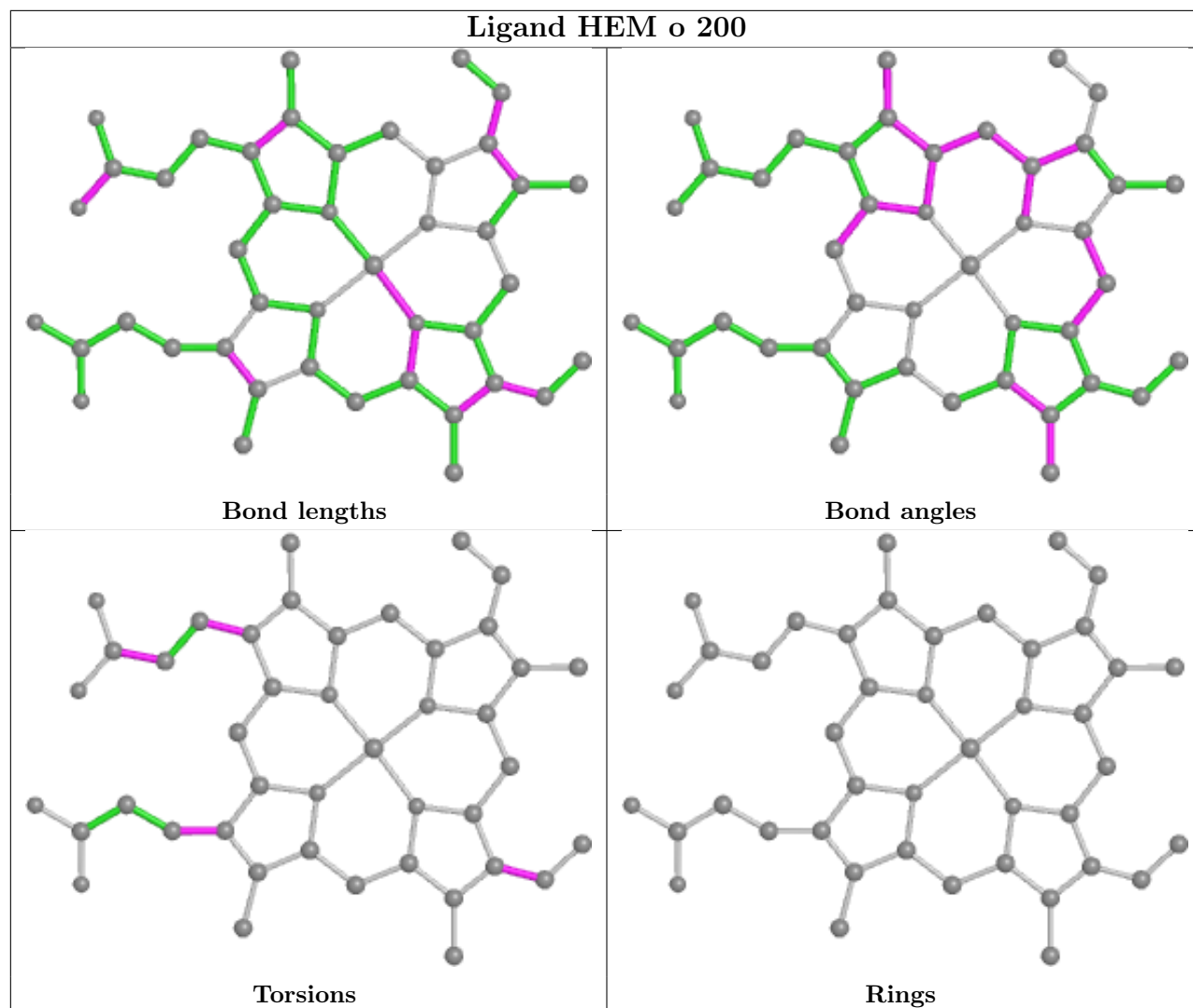




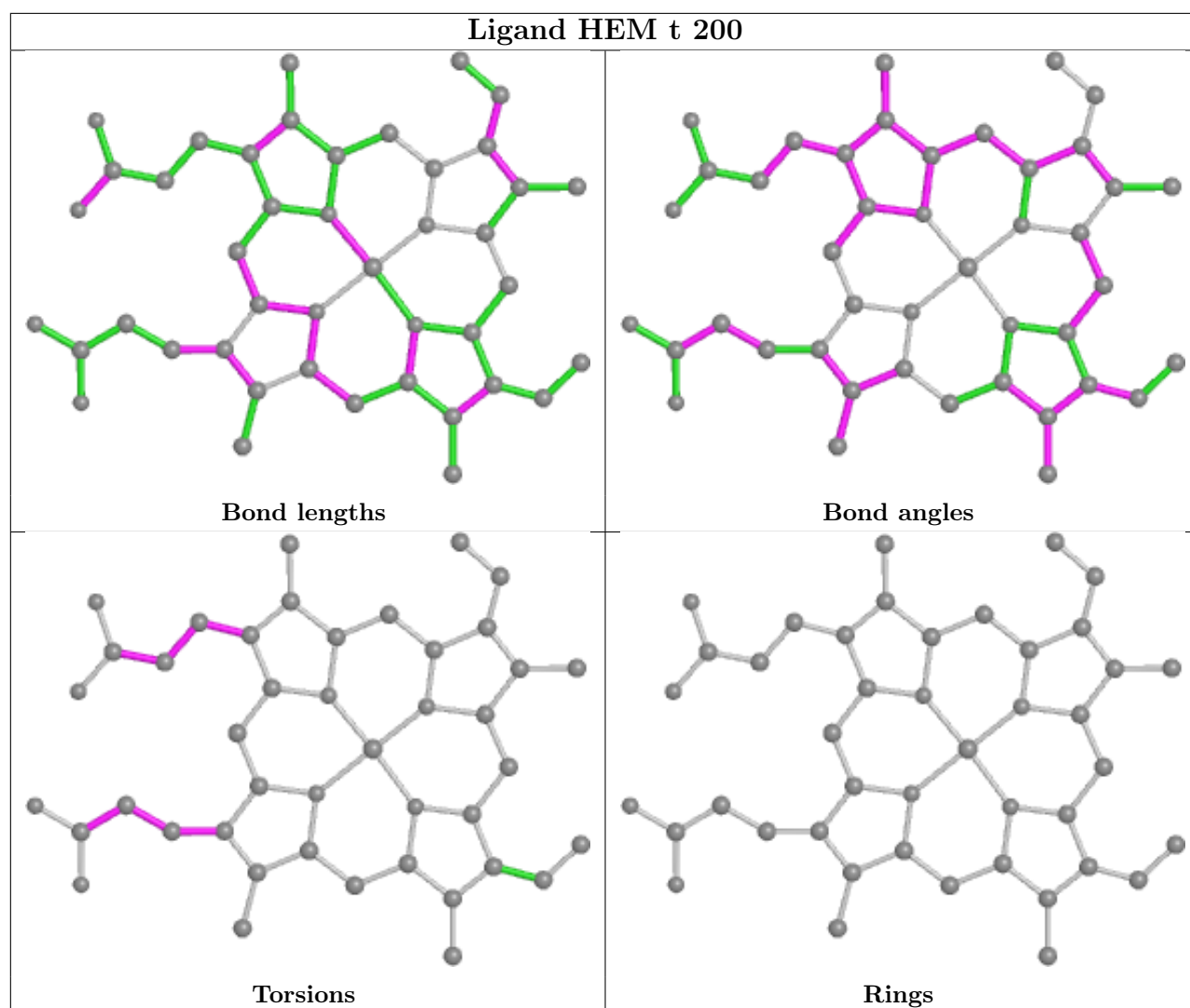












## 5.7 Other polymers [i](#)

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 [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

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	159/161 (98%)	-0.32	0 100 100	16, 24, 32, 39	0
1	B	159/161 (98%)	-0.32	0 100 100	15, 25, 33, 41	0
1	C	159/161 (98%)	-0.24	0 100 100	16, 25, 33, 39	0
1	D	159/161 (98%)	-0.28	0 100 100	16, 24, 33, 43	0
1	E	159/161 (98%)	-0.14	0 100 100	16, 25, 34, 42	0
1	F	159/161 (98%)	-0.23	0 100 100	16, 24, 32, 39	0
1	G	159/161 (98%)	-0.26	0 100 100	16, 23, 32, 36	0
1	H	159/161 (98%)	-0.27	0 100 100	12, 22, 30, 41	0
1	I	159/161 (98%)	-0.37	0 100 100	14, 22, 31, 36	0
1	J	159/161 (98%)	-0.35	0 100 100	14, 22, 30, 41	0
1	K	159/161 (98%)	-0.31	0 100 100	15, 25, 33, 37	0
1	L	159/161 (98%)	-0.32	0 100 100	14, 24, 33, 42	0
1	M	159/161 (98%)	-0.29	0 100 100	17, 26, 34, 45	0
1	N	159/161 (98%)	-0.31	0 100 100	17, 24, 34, 39	0
1	O	159/161 (98%)	-0.27	0 100 100	16, 22, 31, 40	0
1	P	159/161 (98%)	-0.30	0 100 100	13, 23, 31, 38	0
1	Q	159/161 (98%)	-0.14	0 100 100	16, 26, 36, 44	0
1	R	159/161 (98%)	-0.17	0 100 100	16, 24, 32, 46	0
1	S	159/161 (98%)	-0.27	0 100 100	13, 20, 29, 35	0
1	T	159/161 (98%)	-0.29	0 100 100	12, 20, 28, 42	0
1	U	159/161 (98%)	-0.28	0 100 100	13, 21, 30, 39	0
1	V	159/161 (98%)	-0.37	0 100 100	15, 22, 30, 36	0
1	W	159/161 (98%)	-0.22	0 100 100	17, 26, 35, 42	0
1	X	159/161 (98%)	-0.33	0 100 100	14, 23, 31, 44	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	a	159/161 (98%)	-0.29	0 100 100	13, 22, 31, 38	0
1	b	159/161 (98%)	-0.25	0 100 100	14, 23, 32, 40	0
1	c	159/161 (98%)	-0.32	0 100 100	17, 25, 34, 40	0
1	d	159/161 (98%)	-0.27	0 100 100	17, 25, 34, 43	0
1	e	159/161 (98%)	-0.28	0 100 100	20, 28, 36, 46	0
1	f	159/161 (98%)	-0.28	1 (0%) 89 90	17, 25, 34, 42	0
1	g	159/161 (98%)	-0.24	0 100 100	15, 24, 32, 39	0
1	h	159/161 (98%)	-0.35	0 100 100	16, 23, 32, 42	0
1	i	159/161 (98%)	-0.36	0 100 100	15, 22, 34, 38	0
1	j	159/161 (98%)	-0.34	0 100 100	14, 22, 30, 39	0
1	k	159/161 (98%)	-0.22	0 100 100	14, 23, 33, 38	0
1	l	159/161 (98%)	-0.32	0 100 100	14, 23, 32, 39	0
1	m	159/161 (98%)	-0.26	0 100 100	15, 22, 33, 38	0
1	n	159/161 (98%)	-0.25	0 100 100	15, 23, 32, 42	0
1	o	159/161 (98%)	-0.29	0 100 100	16, 24, 30, 36	0
1	p	159/161 (98%)	-0.32	0 100 100	18, 24, 31, 41	0
1	q	159/161 (98%)	-0.22	0 100 100	20, 28, 36, 43	0
1	r	159/161 (98%)	-0.22	0 100 100	18, 27, 36, 43	0
1	s	159/161 (98%)	-0.34	0 100 100	14, 23, 31, 37	0
1	t	159/161 (98%)	-0.33	0 100 100	14, 21, 30, 34	0
1	u	159/161 (98%)	-0.29	0 100 100	13, 21, 29, 37	0
1	v	159/161 (98%)	-0.38	0 100 100	14, 22, 32, 39	0
1	w	159/161 (98%)	-0.28	0 100 100	16, 25, 34, 44	0
1	x	159/161 (98%)	-0.26	0 100 100	14, 21, 29, 38	0
All	All	7632/7728 (98%)	-0.28	1 (0%) 100 100	12, 24, 33, 46	0

All (1) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	f	144	LEU	2.3

## 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 monosaccharides in this entry.

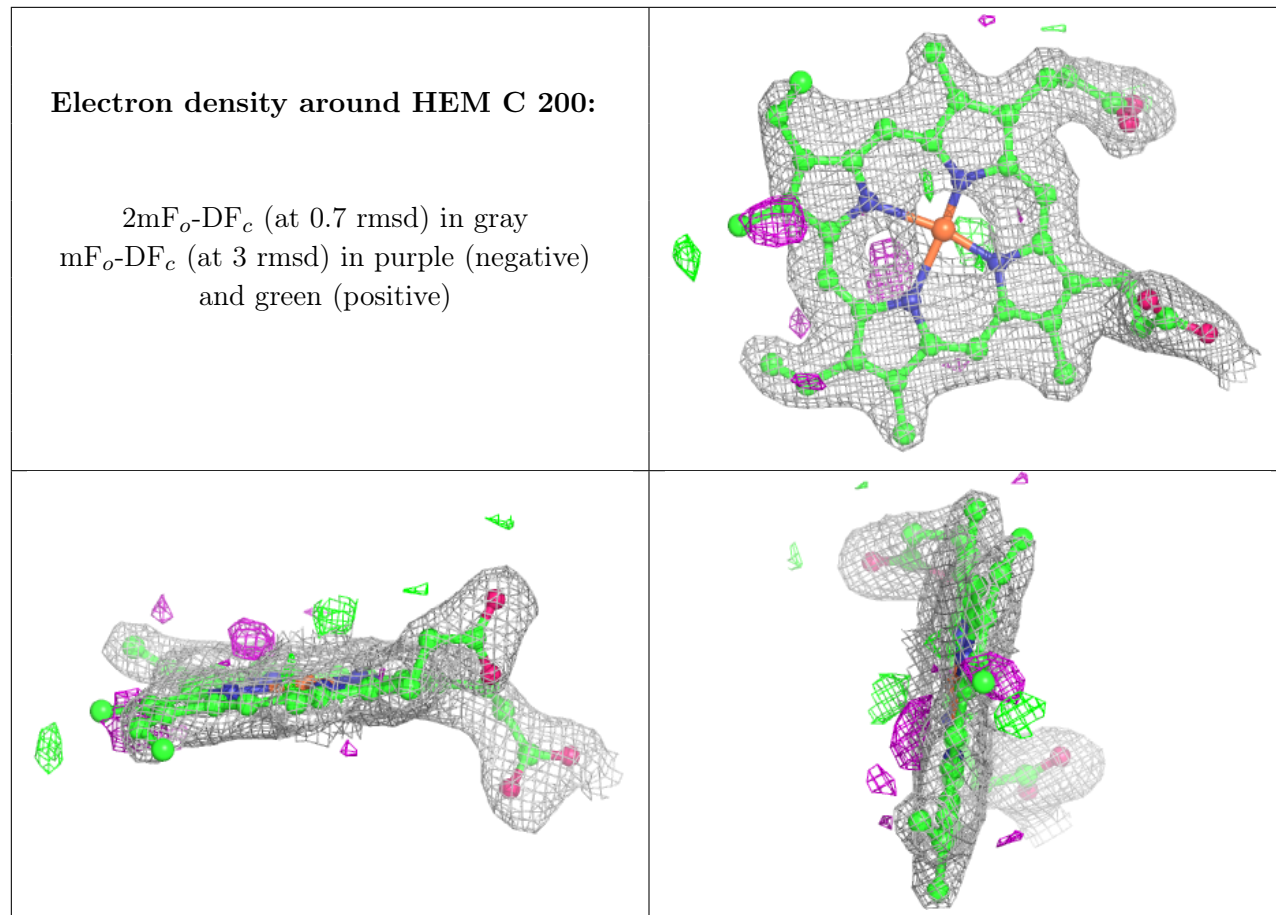
## 6.4 Ligands [i](#)

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	HEM	C	200	43/43	0.96	0.15	18,31,44,47	0
2	HEM	P	200	43/43	0.96	0.14	12,25,37,39	0
2	HEM	R	200	43/43	0.96	0.15	21,28,38,40	0
2	HEM	n	200	43/43	0.96	0.13	10,21,34,37	0
2	HEM	q	200	43/43	0.96	0.10	25,32,42,45	0
2	HEM	v	200	43/43	0.96	0.12	14,24,33,35	0
2	HEM	x	200	43/43	0.96	0.12	10,22,34,38	0
2	HEM	X	200	43/43	0.97	0.10	13,24,37,41	0
2	HEM	a	200	43/43	0.97	0.11	13,22,29,33	0
2	HEM	c	200	43/43	0.97	0.12	17,27,40,43	0
2	HEM	e	200	43/43	0.97	0.14	19,31,38,40	0
2	HEM	g	200	43/43	0.97	0.14	17,29,40,42	0
2	HEM	k	200	43/43	0.97	0.12	10,21,34,37	0
2	HEM	H	200	43/43	0.97	0.10	14,24,32,35	0
2	HEM	o	200	43/43	0.97	0.11	12,22,37,44	0
2	HEM	L	200	43/43	0.97	0.11	14,21,42,48	0
2	HEM	t	200	43/43	0.97	0.12	10,21,34,37	0
2	HEM	B	200	43/43	0.97	0.11	18,27,38,45	0
2	HEM	F	200	43/43	0.97	0.12	16,28,46,52	0
2	HEM	U	200	43/43	0.98	0.10	10,20,26,33	0
2	HEM	I	200	43/43	0.98	0.11	10,21,34,37	0
2	HEM	j	200	43/43	0.98	0.11	6,18,36,37	0
2	HEM	M	200	43/43	0.98	0.11	14,24,43,53	0
2	HEM	S	200	43/43	0.98	0.12	8,16,30,33	0

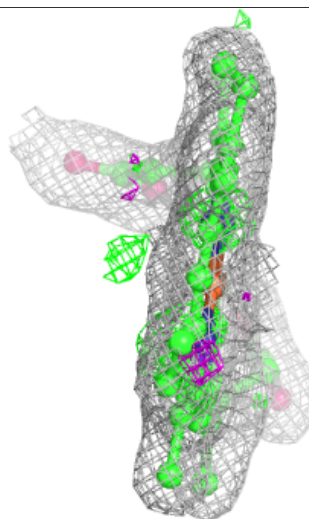
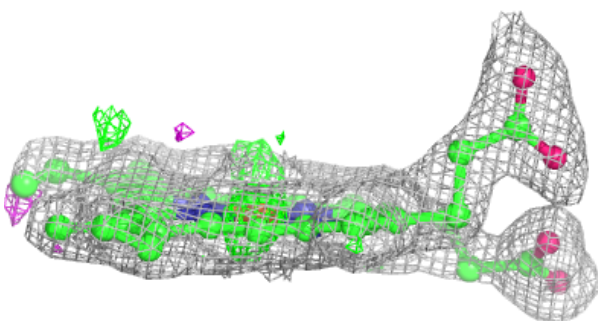
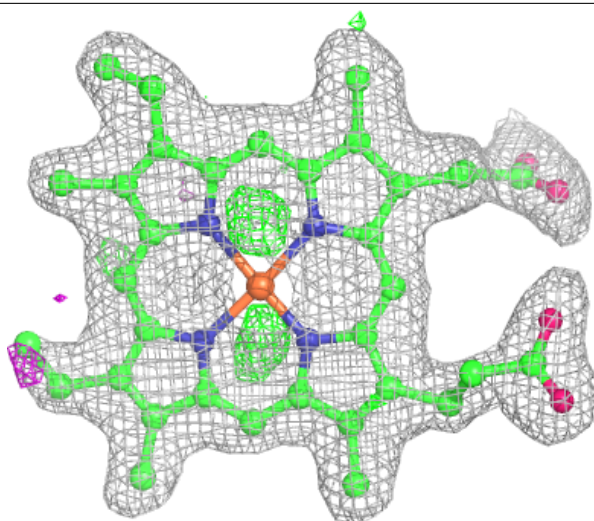
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different

orientation to approximate a three-dimensional view.



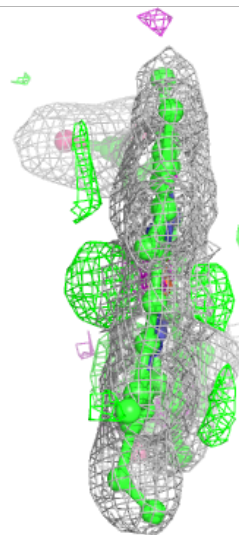
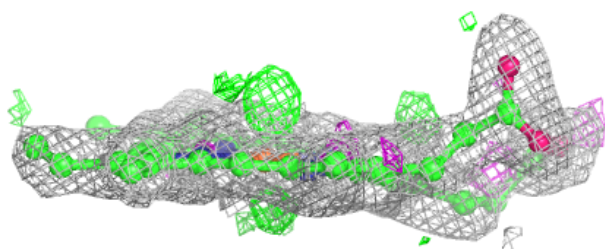
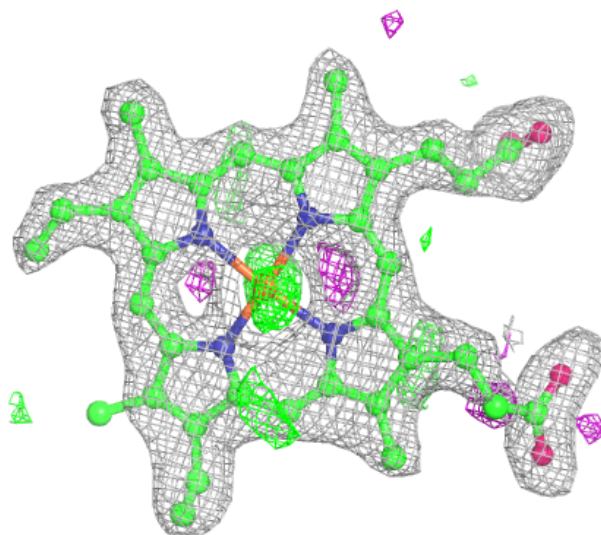
**Electron density around HEM P 200:**

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



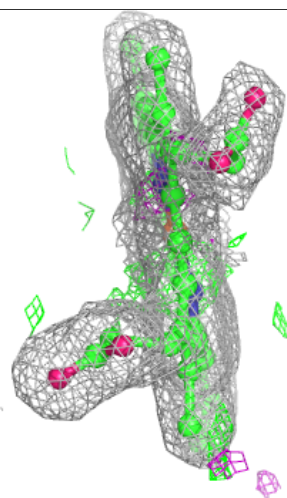
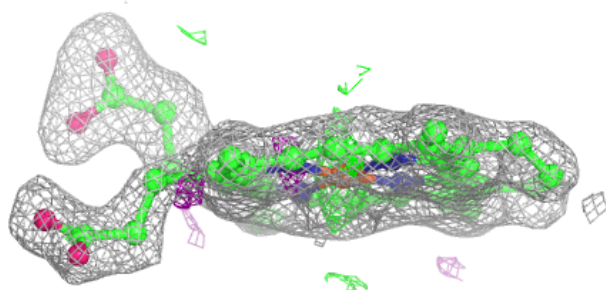
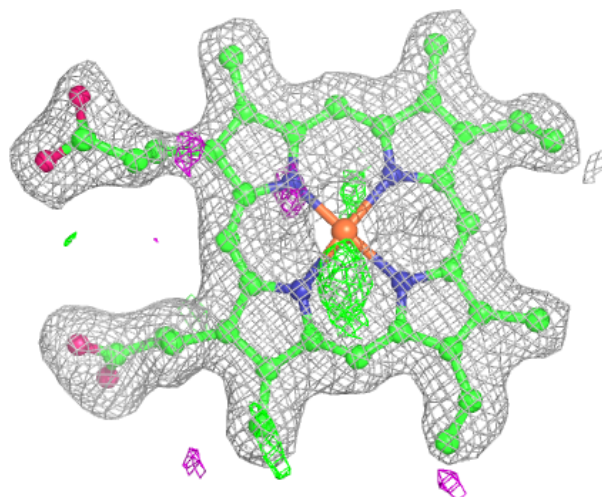
**Electron density around HEM R 200:**

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

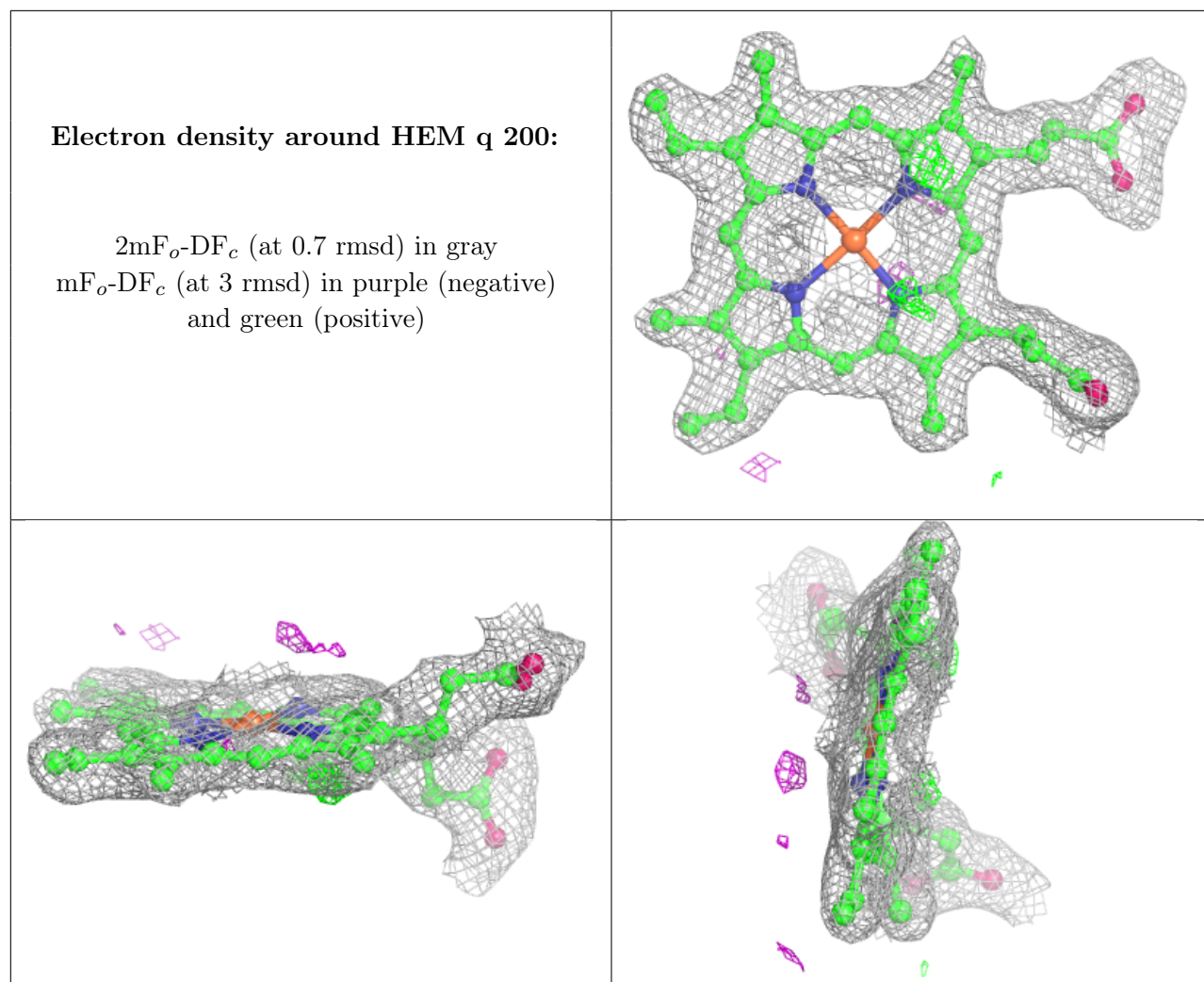


**Electron density around HEM n 200:**

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

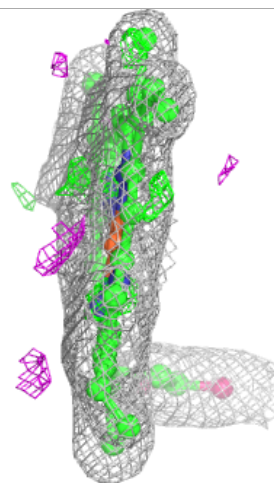
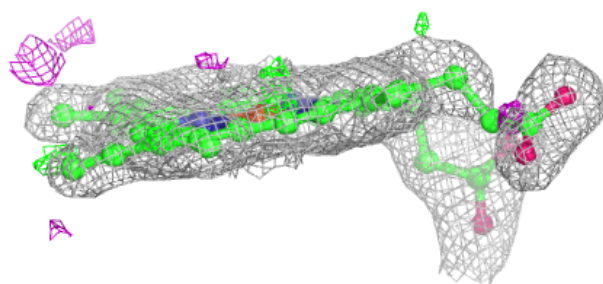
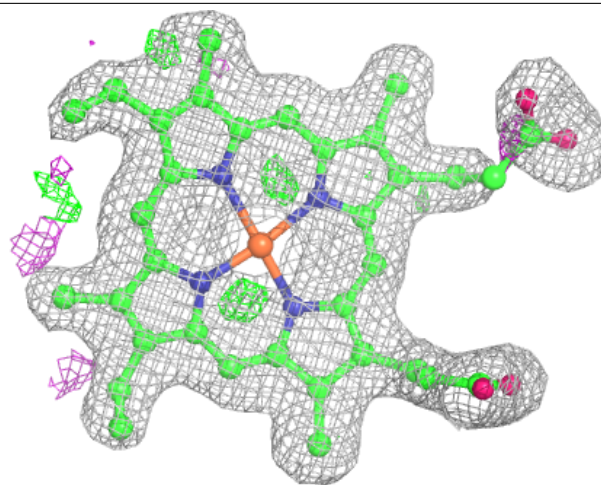


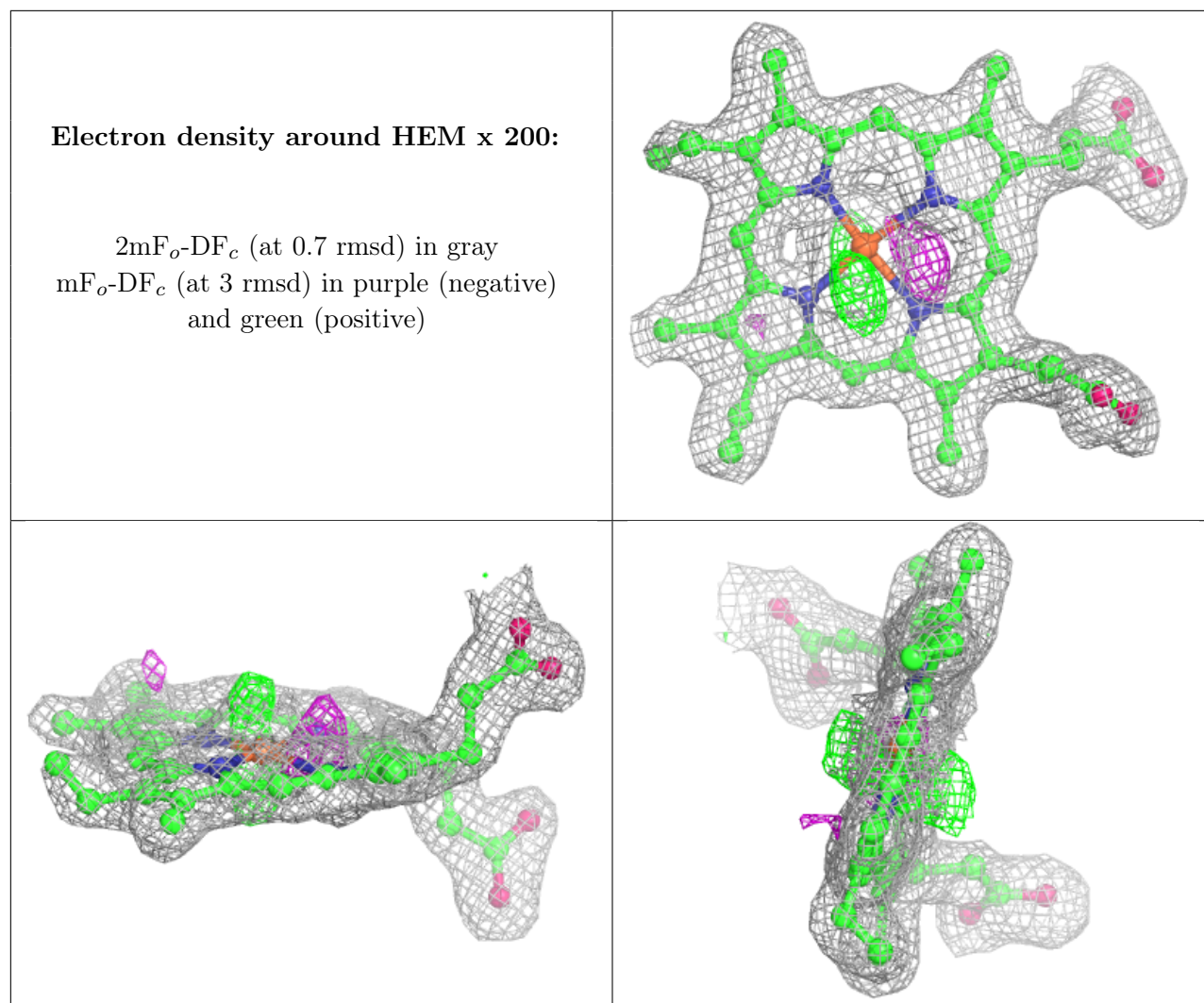




**Electron density around HEM v 200:**

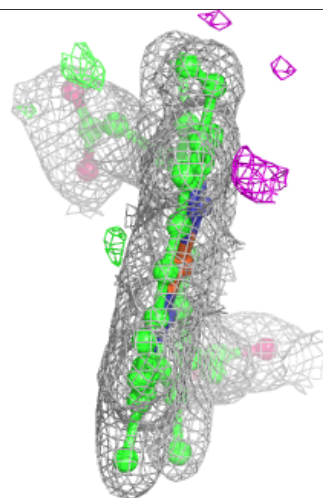
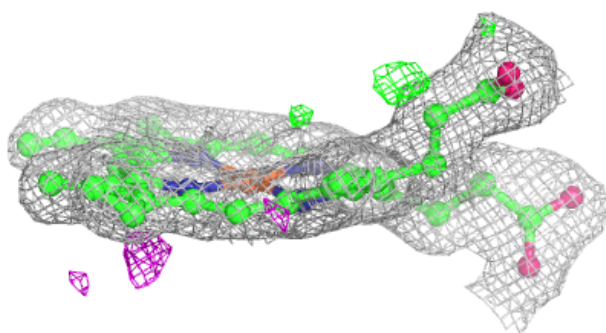
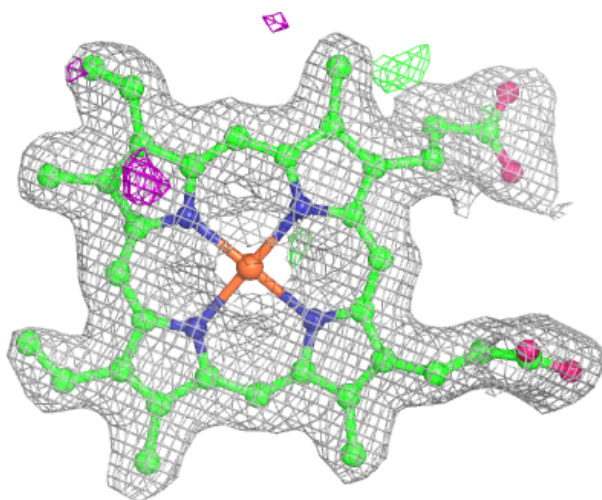
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

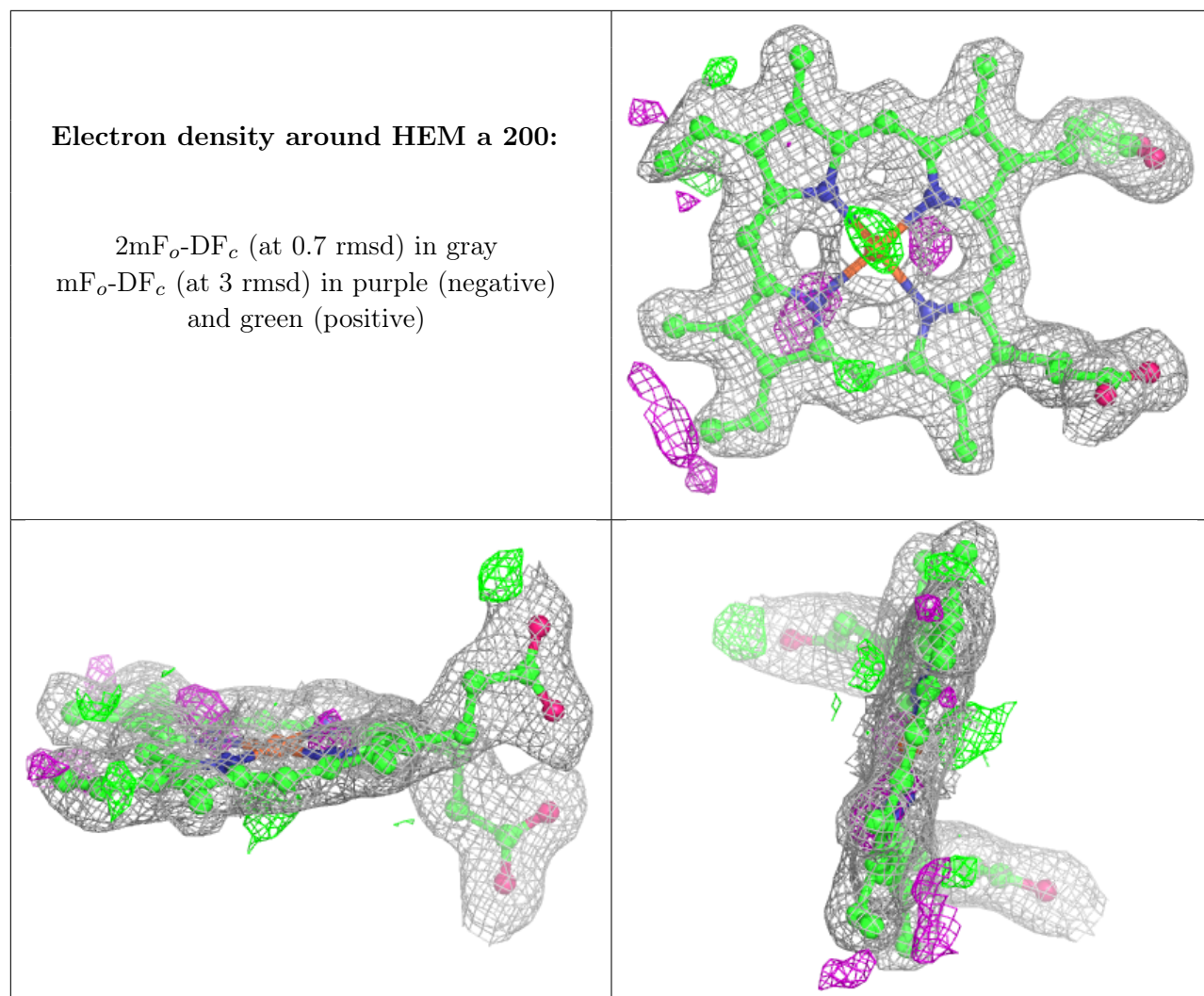




**Electron density around HEM X 200:**

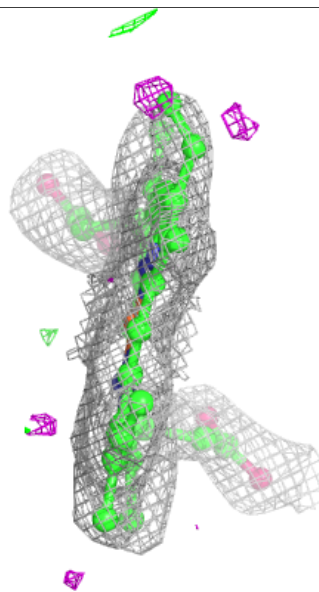
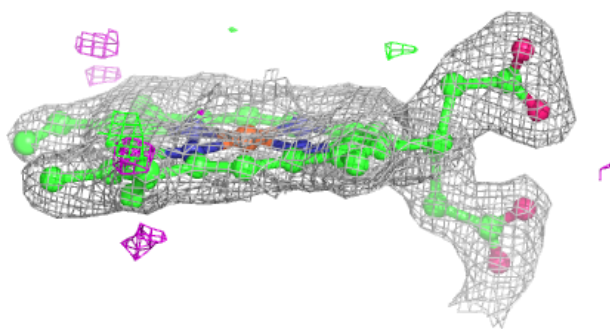
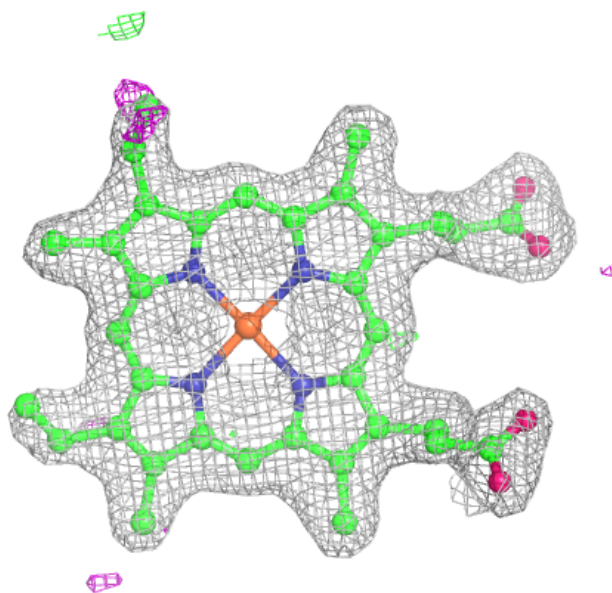
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

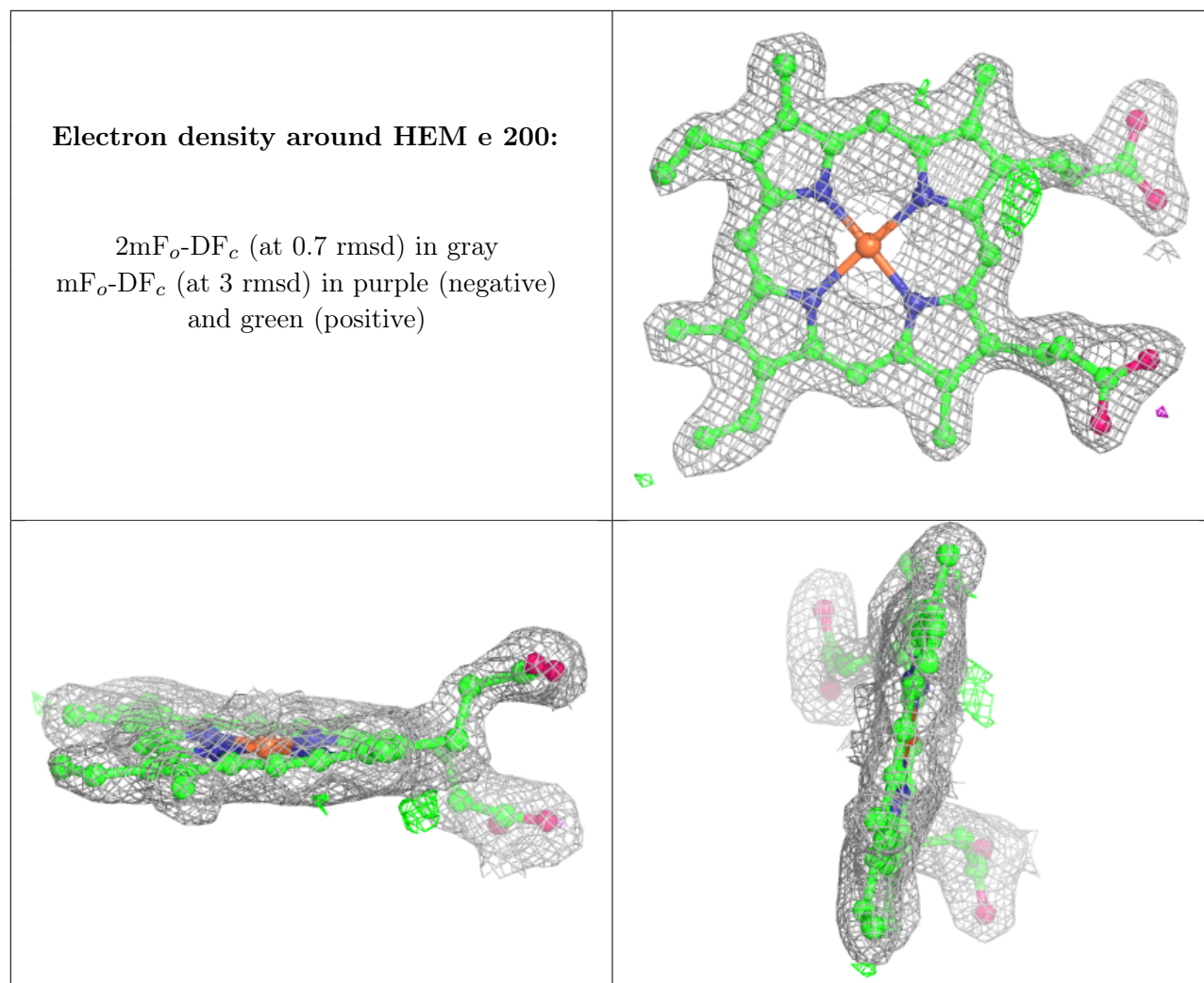


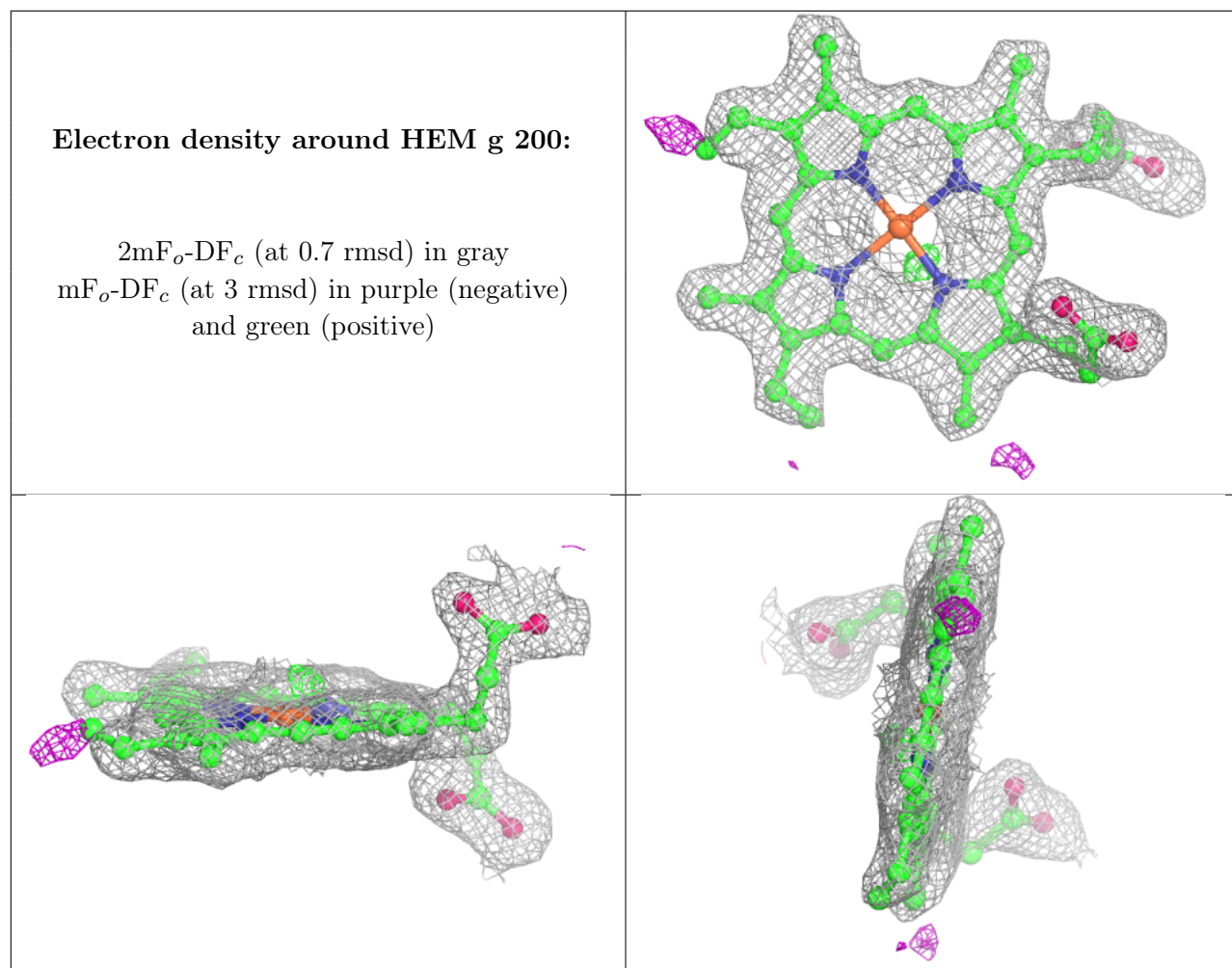


**Electron density around HEM c 200:**

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



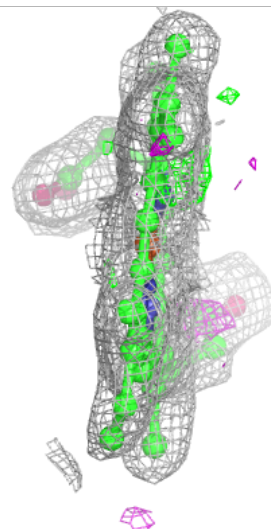
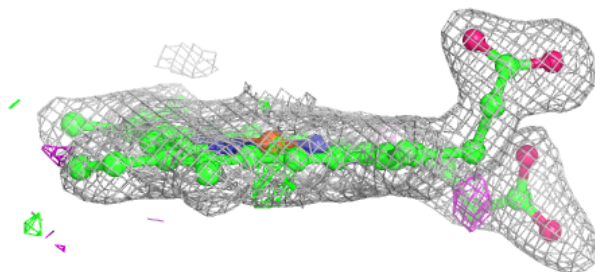
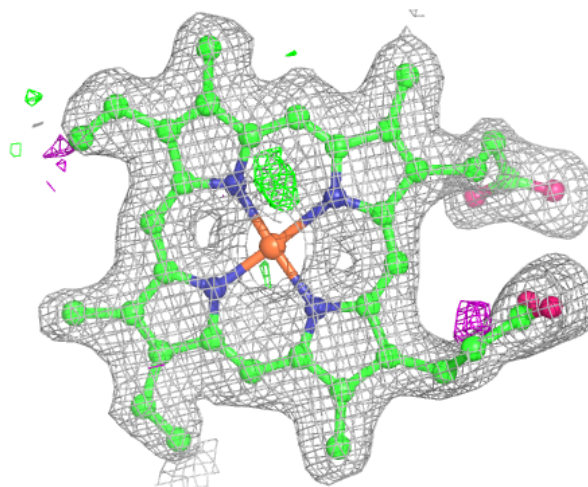






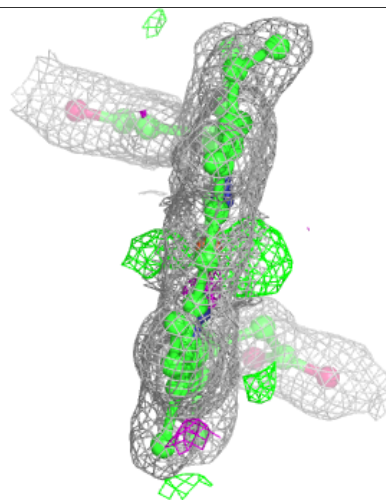
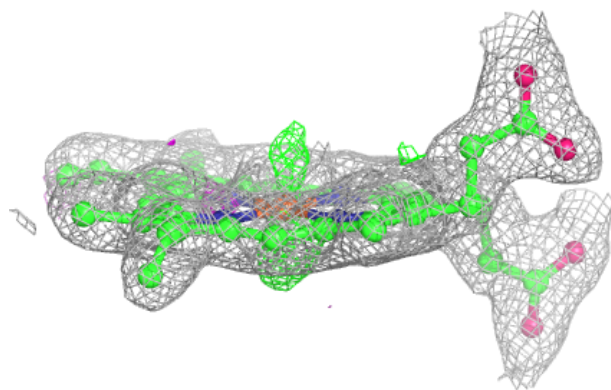
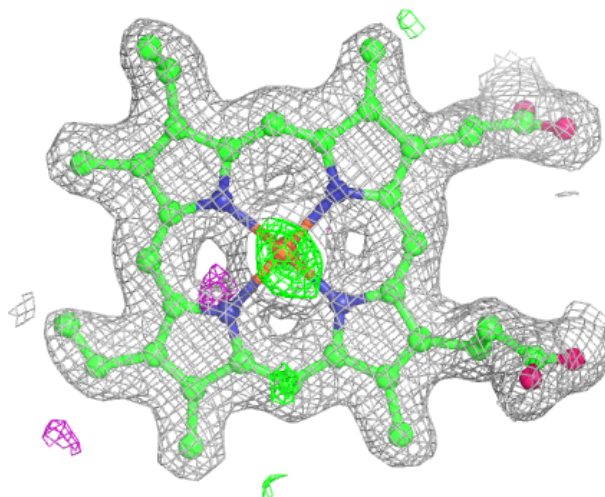
**Electron density around HEM k 200:**

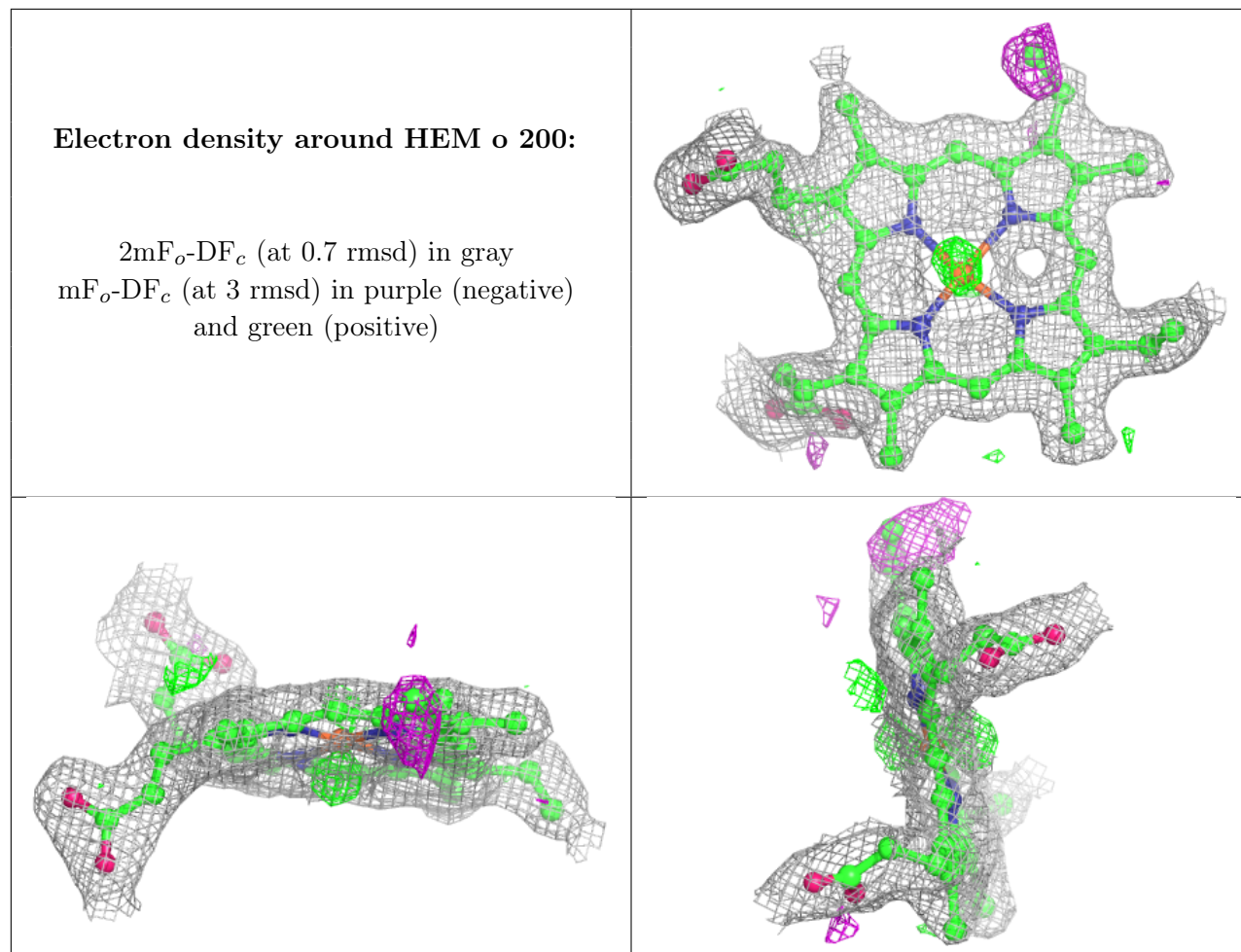
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



**Electron density around HEM H 200:**

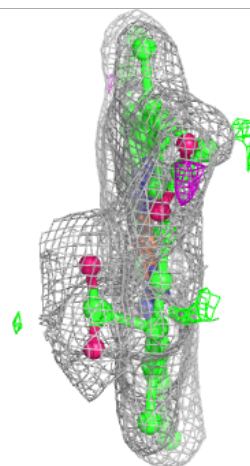
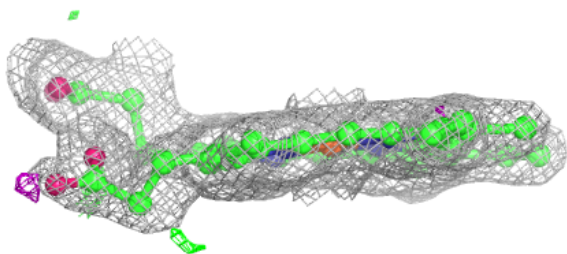
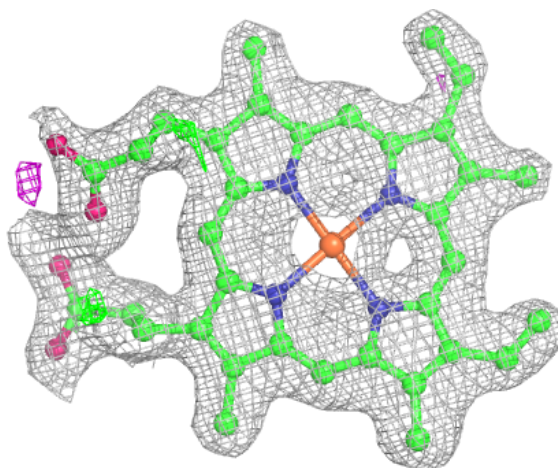
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





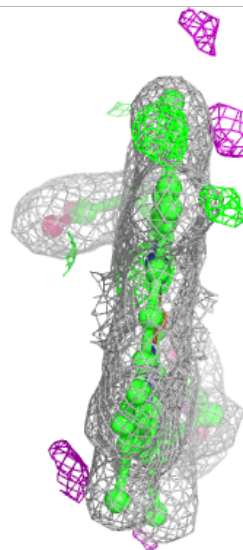
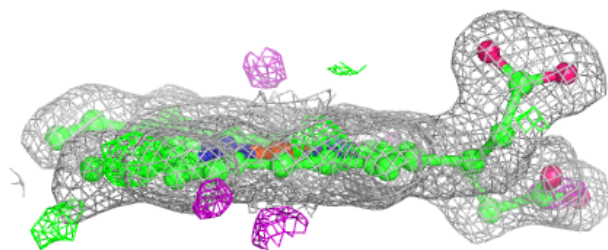
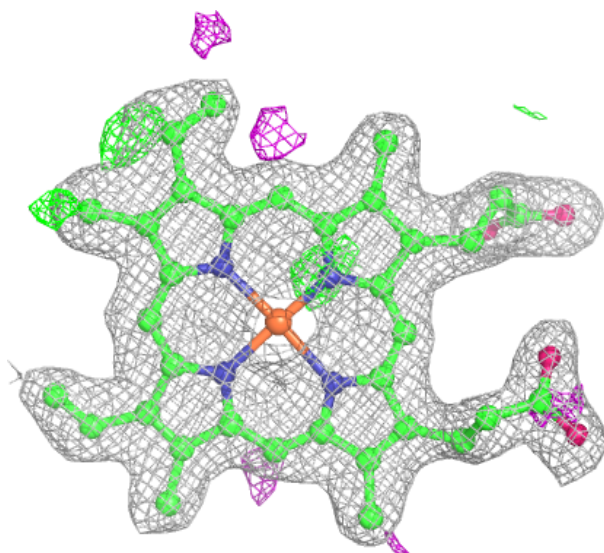
**Electron density around HEM L 200:**

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



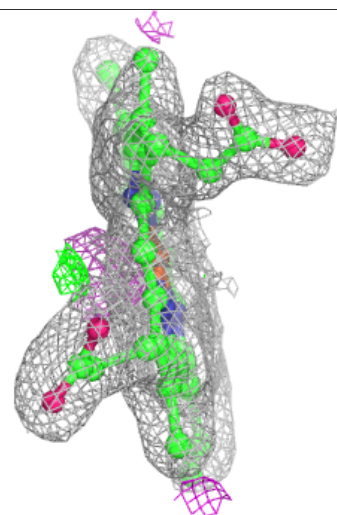
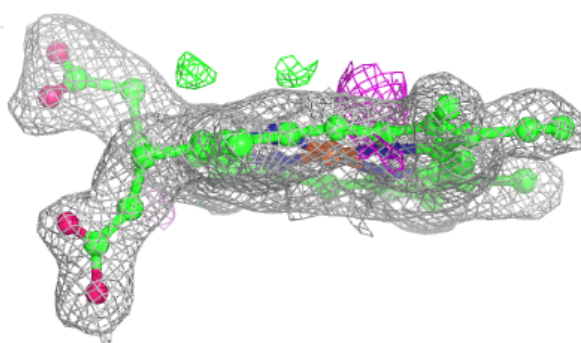
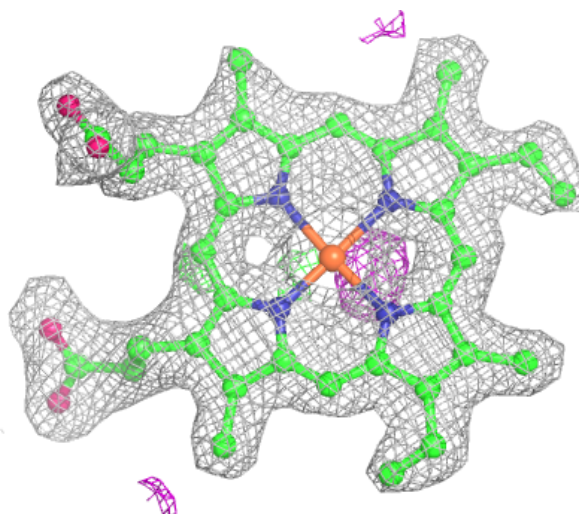
**Electron density around HEM t 200:**

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



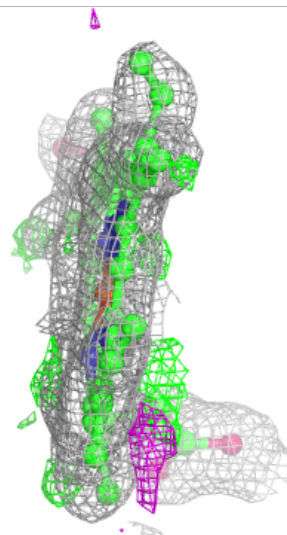
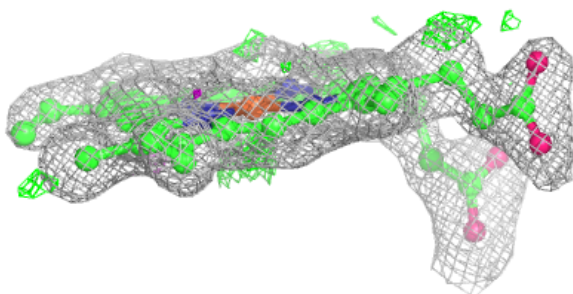
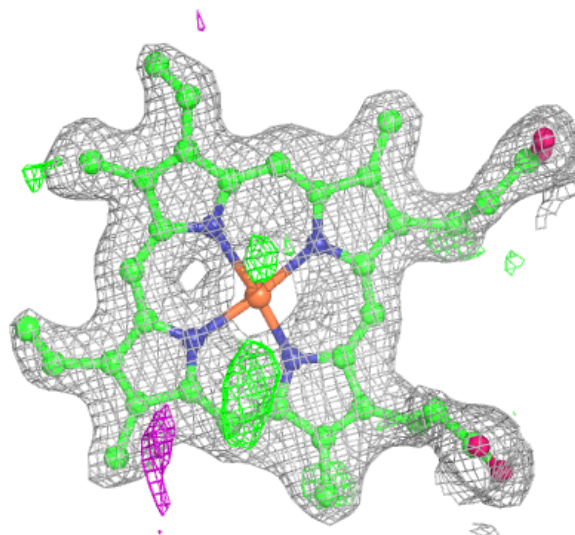
**Electron density around HEM B 200:**

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



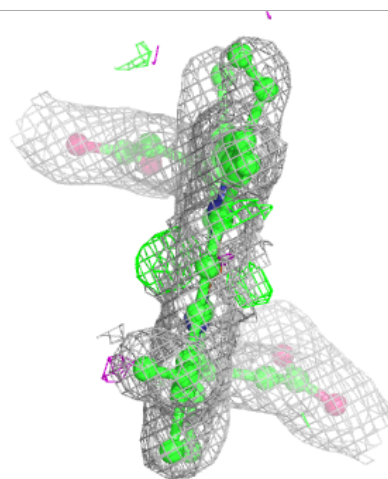
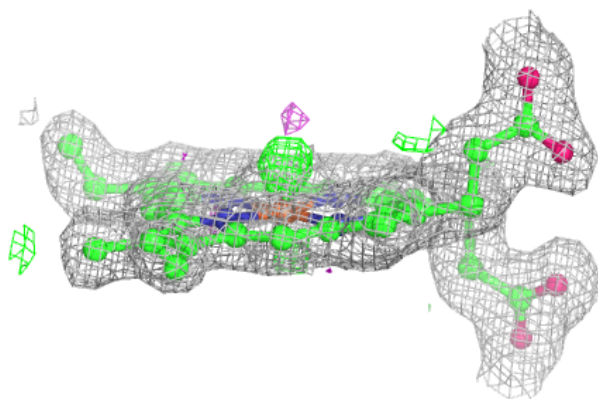
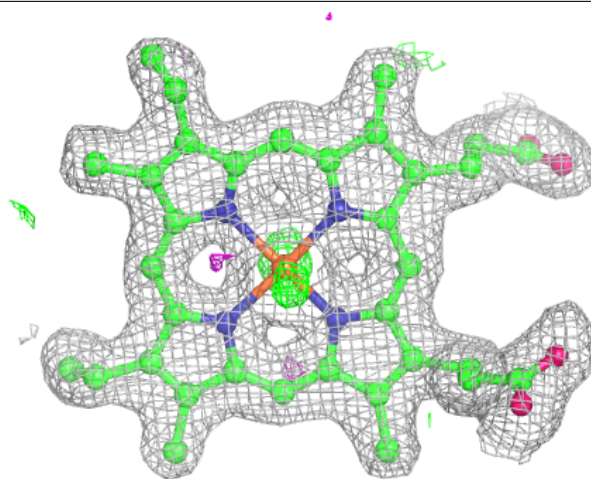
**Electron density around HEM F 200:**

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



**Electron density around HEM U 200:**

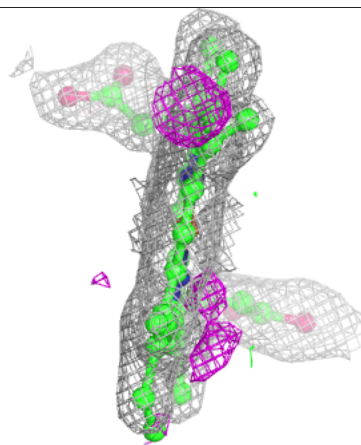
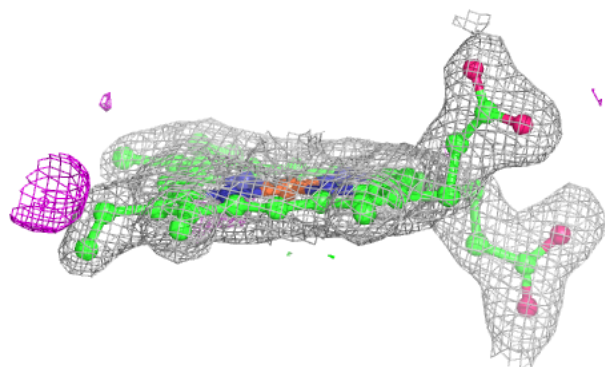
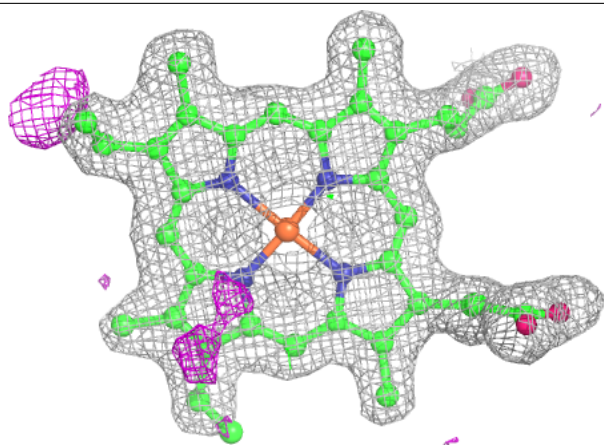
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





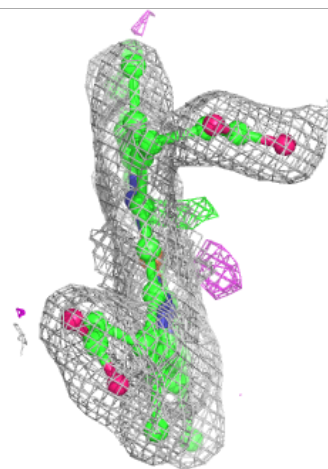
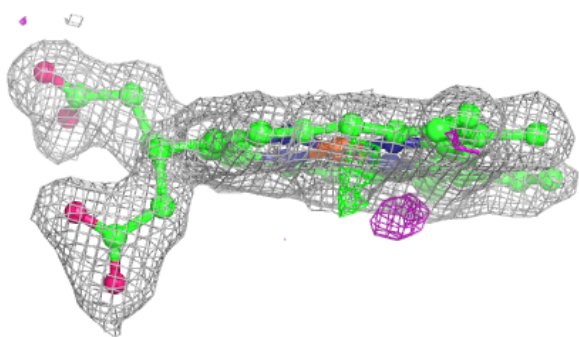
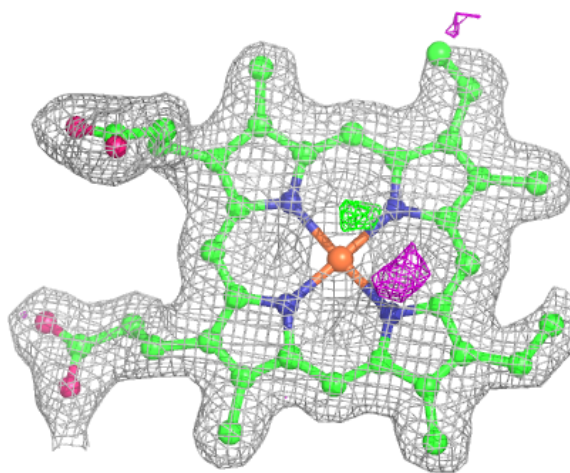
**Electron density around HEM I 200:**

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



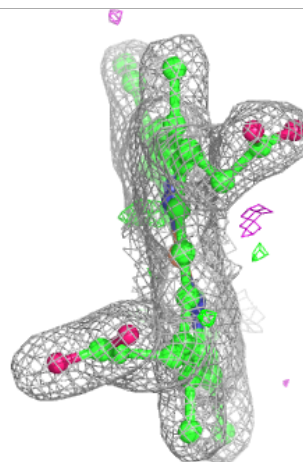
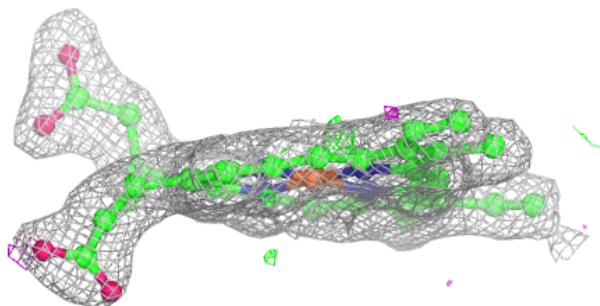
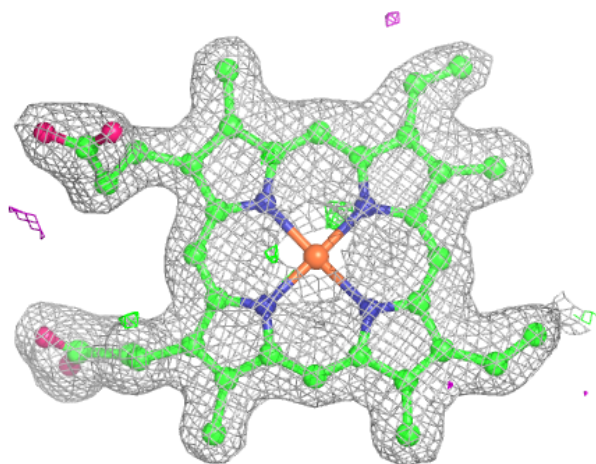
**Electron density around HEM j 200:**

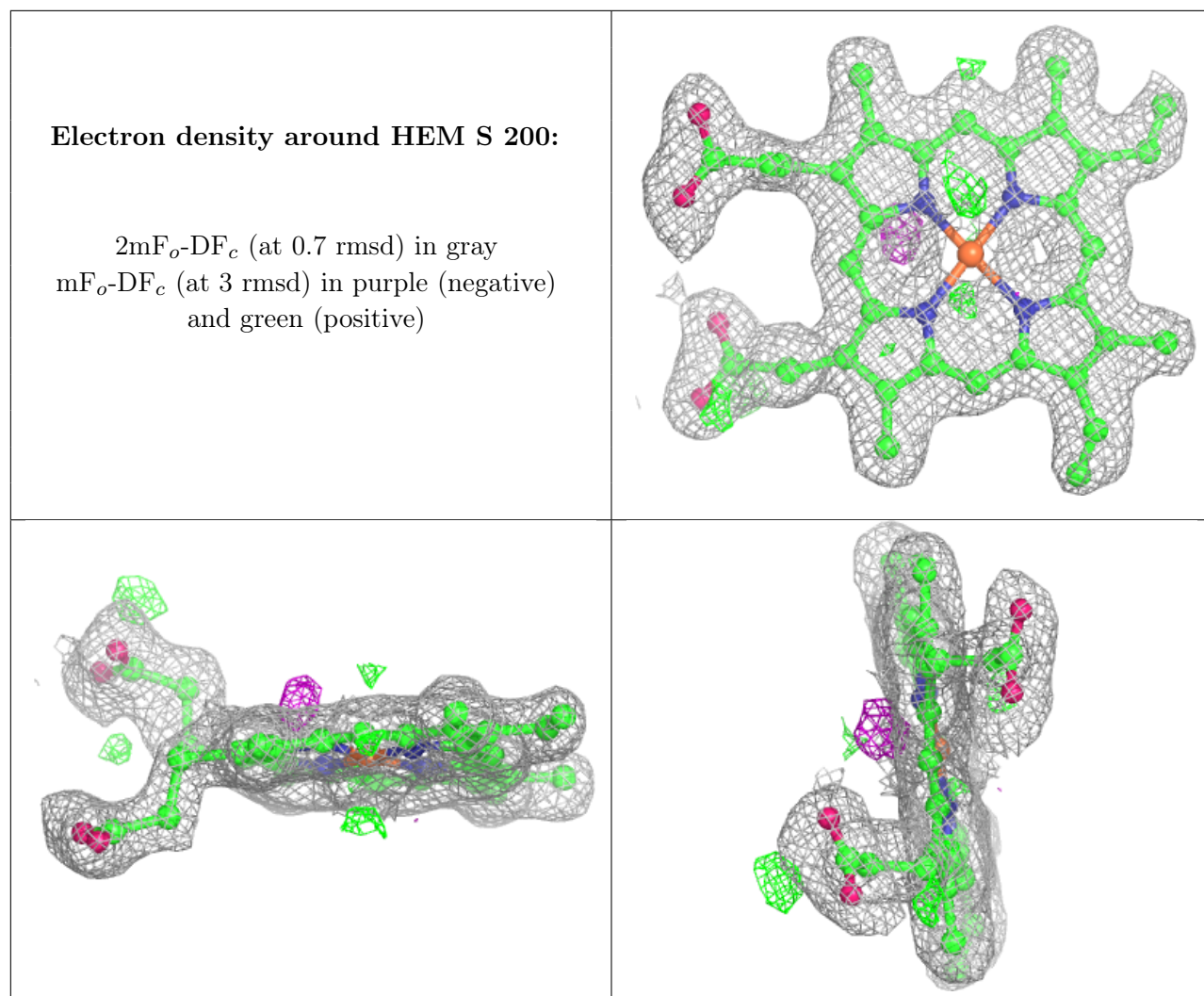
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



**Electron density around HEM M 200:**

$2mF_o-DF_c$  (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.