



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 12, 2026 – 09:22 PM UTC

PDB ID : 5CX7 / pdb_00005cx7
Title : Crystal Structure of PduOC:Heme Complex
Authors : Geremia, S.; Hickey, N.; Ortiz de Orue Lucana, D.
Deposited on : 2015-07-28
Resolution : 1.97 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

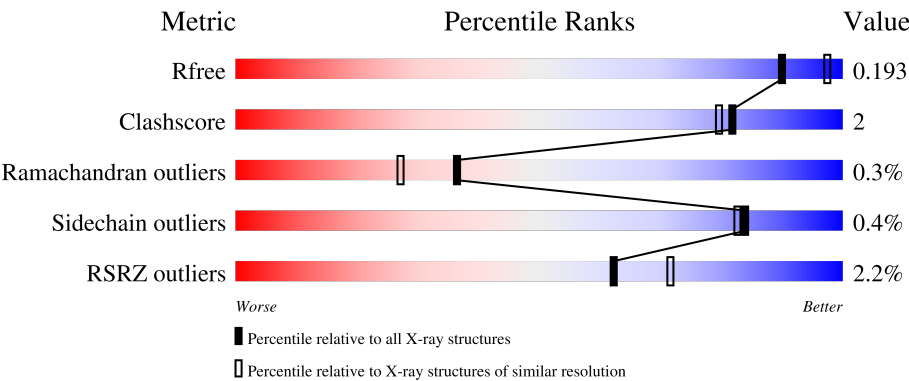
MolProbity : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal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

1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 1.97 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R _{free}	180053	1506 (1.98-1.98)
Clashscore	190562	1534 (1.98-1.98)
Ramachandran outliers	187476	1518 (1.98-1.98)
Sidechain outliers	187428	1518 (1.98-1.98)
RSRZ outliers	180081	1506 (1.98-1.98)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	147	% 87%7%6%
1	B	147	% 88%5%6%
1	C	147	% 86%6%..6%
1	D	147	3% 88%5%6%
1	E	147	% 87%5%..5%

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Mol	Chain	Length	Quality of chain
1	F	147	
1	G	147	
1	H	147	
1	I	147	
1	J	147	
1	K	147	
1	L	147	
1	M	147	
1	N	147	
1	O	147	
1	P	147	

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

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	GOL	C	202	-	X	-	-

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 18350 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 ATP:cob(I)alamin adenosyltransferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	138	Total	C	N	O	S	0	0	0
			1024	647	179	195	3			
1	B	138	Total	C	N	O	S	0	0	0
			1024	647	179	195	3			
1	C	138	Total	C	N	O	S	0	0	0
			1024	647	179	195	3			
1	D	138	Total	C	N	O	S	0	0	0
			1024	647	179	195	3			
1	E	139	Total	C	N	O	S	0	0	0
			1031	652	180	196	3			
1	F	138	Total	C	N	O	S	0	0	0
			1024	647	179	195	3			
1	G	138	Total	C	N	O	S	0	0	0
			1024	647	179	195	3			
1	H	138	Total	C	N	O	S	0	0	0
			1024	647	179	195	3			
1	I	138	Total	C	N	O	S	0	0	0
			1024	647	179	195	3			
1	J	138	Total	C	N	O	S	0	0	0
			1024	647	179	195	3			
1	K	138	Total	C	N	O	S	0	0	0
			1024	647	179	195	3			
1	L	138	Total	C	N	O	S	0	0	0
			1024	647	179	195	3			
1	M	138	Total	C	N	O	S	0	0	0
			1024	647	179	195	3			
1	N	138	Total	C	N	O	S	0	0	0
			1024	647	179	195	3			
1	O	138	Total	C	N	O	S	0	0	0
			1024	647	179	195	3			
1	P	138	Total	C	N	O	S	0	0	0
			1024	647	179	195	3			

There are 64 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	GLY	-	expression tag	UNP A0A0F0IPG3
A	2	ALA	-	expression tag	UNP A0A0F0IPG3
A	3	MET	-	expression tag	UNP A0A0F0IPG3
A	4	ALA	-	expression tag	UNP A0A0F0IPG3
B	1	GLY	-	expression tag	UNP A0A0F0IPG3
B	2	ALA	-	expression tag	UNP A0A0F0IPG3
B	3	MET	-	expression tag	UNP A0A0F0IPG3
B	4	ALA	-	expression tag	UNP A0A0F0IPG3
C	1	GLY	-	expression tag	UNP A0A0F0IPG3
C	2	ALA	-	expression tag	UNP A0A0F0IPG3
C	3	MET	-	expression tag	UNP A0A0F0IPG3
C	4	ALA	-	expression tag	UNP A0A0F0IPG3
D	1	GLY	-	expression tag	UNP A0A0F0IPG3
D	2	ALA	-	expression tag	UNP A0A0F0IPG3
D	3	MET	-	expression tag	UNP A0A0F0IPG3
D	4	ALA	-	expression tag	UNP A0A0F0IPG3
E	1	GLY	-	expression tag	UNP A0A0F0IPG3
E	2	ALA	-	expression tag	UNP A0A0F0IPG3
E	3	MET	-	expression tag	UNP A0A0F0IPG3
E	4	ALA	-	expression tag	UNP A0A0F0IPG3
F	1	GLY	-	expression tag	UNP A0A0F0IPG3
F	2	ALA	-	expression tag	UNP A0A0F0IPG3
F	3	MET	-	expression tag	UNP A0A0F0IPG3
F	4	ALA	-	expression tag	UNP A0A0F0IPG3
G	1	GLY	-	expression tag	UNP A0A0F0IPG3
G	2	ALA	-	expression tag	UNP A0A0F0IPG3
G	3	MET	-	expression tag	UNP A0A0F0IPG3
G	4	ALA	-	expression tag	UNP A0A0F0IPG3
H	1	GLY	-	expression tag	UNP A0A0F0IPG3
H	2	ALA	-	expression tag	UNP A0A0F0IPG3
H	3	MET	-	expression tag	UNP A0A0F0IPG3
H	4	ALA	-	expression tag	UNP A0A0F0IPG3
I	1	GLY	-	expression tag	UNP A0A0F0IPG3
I	2	ALA	-	expression tag	UNP A0A0F0IPG3
I	3	MET	-	expression tag	UNP A0A0F0IPG3
I	4	ALA	-	expression tag	UNP A0A0F0IPG3
J	1	GLY	-	expression tag	UNP A0A0F0IPG3
J	2	ALA	-	expression tag	UNP A0A0F0IPG3
J	3	MET	-	expression tag	UNP A0A0F0IPG3
J	4	ALA	-	expression tag	UNP A0A0F0IPG3
K	1	GLY	-	expression tag	UNP A0A0F0IPG3
K	2	ALA	-	expression tag	UNP A0A0F0IPG3

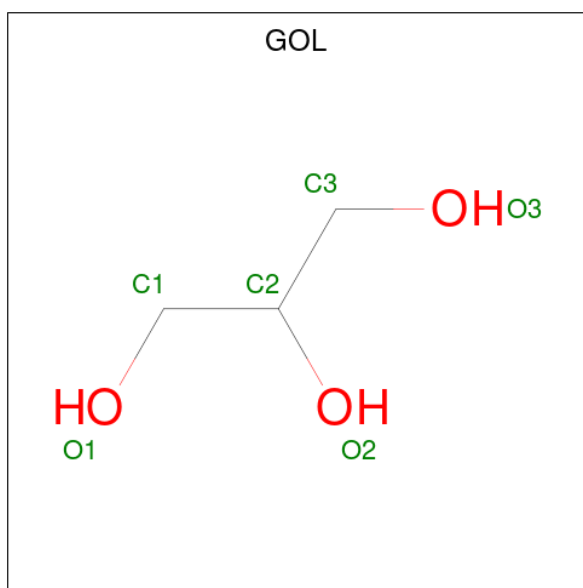
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Chain	Residue	Modelled	Actual	Comment	Reference
K	3	MET	-	expression tag	UNP A0A0F0IPG3
K	4	ALA	-	expression tag	UNP A0A0F0IPG3
L	1	GLY	-	expression tag	UNP A0A0F0IPG3
L	2	ALA	-	expression tag	UNP A0A0F0IPG3
L	3	MET	-	expression tag	UNP A0A0F0IPG3
L	4	ALA	-	expression tag	UNP A0A0F0IPG3
M	1	GLY	-	expression tag	UNP A0A0F0IPG3
M	2	ALA	-	expression tag	UNP A0A0F0IPG3
M	3	MET	-	expression tag	UNP A0A0F0IPG3
M	4	ALA	-	expression tag	UNP A0A0F0IPG3
N	1	GLY	-	expression tag	UNP A0A0F0IPG3
N	2	ALA	-	expression tag	UNP A0A0F0IPG3
N	3	MET	-	expression tag	UNP A0A0F0IPG3
N	4	ALA	-	expression tag	UNP A0A0F0IPG3
O	1	GLY	-	expression tag	UNP A0A0F0IPG3
O	2	ALA	-	expression tag	UNP A0A0F0IPG3
O	3	MET	-	expression tag	UNP A0A0F0IPG3
O	4	ALA	-	expression tag	UNP A0A0F0IPG3
P	1	GLY	-	expression tag	UNP A0A0F0IPG3
P	2	ALA	-	expression tag	UNP A0A0F0IPG3
P	3	MET	-	expression tag	UNP A0A0F0IPG3
P	4	ALA	-	expression tag	UNP A0A0F0IPG3

- # HEM

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
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		
2	E	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	G	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	K	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	O	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		

- Molecule 3 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



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

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	C	1	Total 6	C 3	O 3	0	0
3	D	1	Total 6	C 3	O 3	0	0
3	D	1	Total 6	C 3	O 3	0	0
3	E	1	Total 6	C 3	O 3	0	0
3	F	1	Total 6	C 3	O 3	0	0
3	G	1	Total 6	C 3	O 3	0	0
3	G	1	Total 6	C 3	O 3	0	0
3	G	1	Total 6	C 3	O 3	0	0
3	H	1	Total 6	C 3	O 3	0	0
3	I	1	Total 6	C 3	O 3	0	0
3	I	1	Total 6	C 3	O 3	0	0
3	I	1	Total 6	C 3	O 3	0	0
3	I	1	Total 6	C 3	O 3	0	0
3	J	1	Total 6	C 3	O 3	0	0
3	K	1	Total 6	C 3	O 3	0	0
3	K	1	Total 6	C 3	O 3	0	0
3	K	1	Total 6	C 3	O 3	0	0
3	M	1	Total 6	C 3	O 3	0	0
3	N	1	Total 6	C 3	O 3	0	0
3	O	1	Total 6	C 3	O 3	0	0
3	P	1	Total 6	C 3	O 3	0	0

- Molecule 4 is SODIUM ION (CCD ID: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	2	Total	Na	0	0
			2	2		
4	B	1	Total	Na	0	0
			1	1		
4	D	1	Total	Na	0	0
			1	1		
4	E	1	Total	Na	0	0
			1	1		
4	F	1	Total	Na	0	0
			1	1		
4	G	1	Total	Na	0	0
			1	1		
4	H	2	Total	Na	0	0
			2	2		
4	I	2	Total	Na	0	0
			2	2		
4	J	2	Total	Na	0	0
			2	2		
4	L	1	Total	Na	0	0
			1	1		
4	M	2	Total	Na	0	0
			2	2		
4	N	1	Total	Na	0	0
			1	1		
4	P	1	Total	Na	0	0
			1	1		

- Molecule 5 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	C	1	Total	Cl	0	0
			1	1		
5	D	1	Total	Cl	0	0
			1	1		
5	I	1	Total	Cl	0	0
			1	1		
5	J	1	Total	Cl	0	0
			1	1		

- Molecule 6 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	H	1	Total 1	Mg 1	0	0
6	P	1	Total 1	Mg 1	0	0

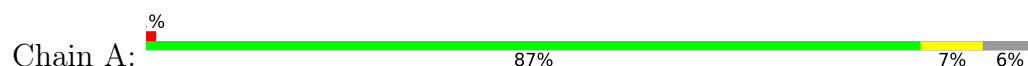
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	123	Total 123	O 123	0	0
7	B	87	Total 87	O 87	0	0
7	C	109	Total 109	O 109	0	0
7	D	85	Total 85	O 85	0	0
7	E	108	Total 108	O 108	0	0
7	F	76	Total 76	O 76	0	0
7	G	103	Total 103	O 103	0	0
7	H	102	Total 102	O 102	0	0
7	I	83	Total 83	O 83	0	0
7	J	71	Total 71	O 71	0	0
7	K	100	Total 100	O 100	0	0
7	L	72	Total 72	O 72	0	0
7	M	62	Total 62	O 62	0	0
7	N	72	Total 72	O 72	0	0
7	O	88	Total 88	O 88	0	0
7	P	100	Total 100	O 100	0	0

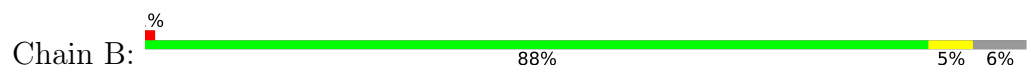
3 Residue-property plots [i](#)

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.

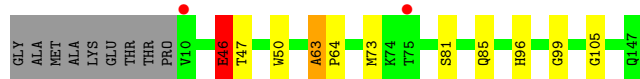
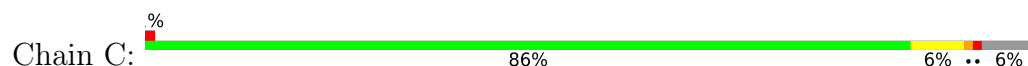
- Molecule 1: ATP:cob(I)alamin adenosyltransferase



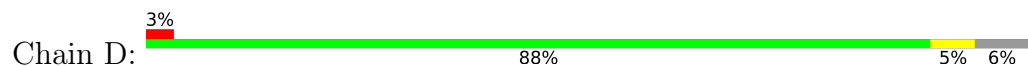
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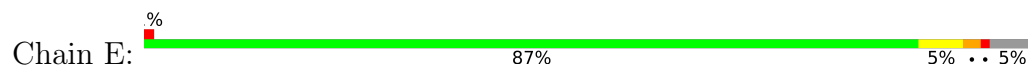
- Molecule 1: ATP:cob(I)alamin adenosyltransferase



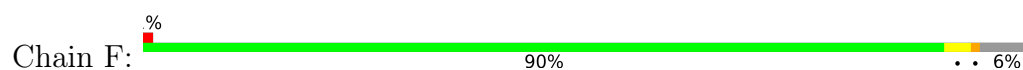
- Molecule 1: ATP:cob(I)alamin adenosyltransferase



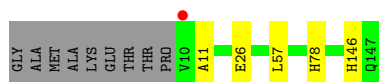
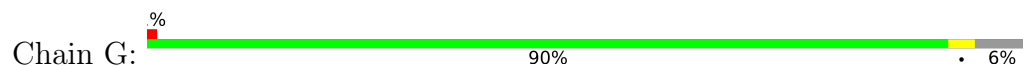
- Molecule 1: ATP:cob(I)alamin adenosyltransferase



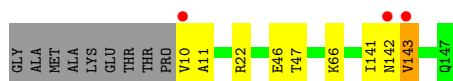
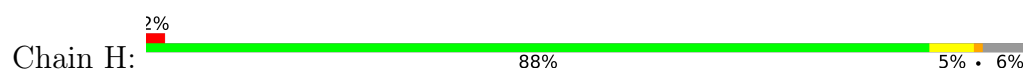
- Molecule 1: ATP:cob(I)alamin adenosyltransferase



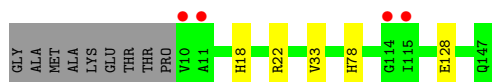
- Molecule 1: ATP:cob(I)alamin adenosyltransferase



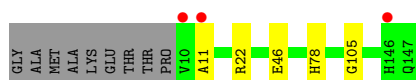
- Molecule 1: ATP:cob(I)alamin adenosyltransferase



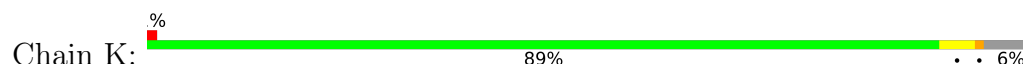
- Molecule 1: ATP:cob(I)alamin adenosyltransferase



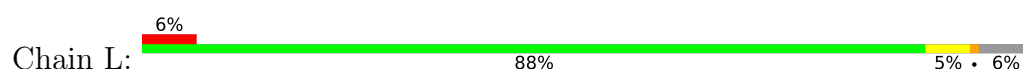
- Molecule 1: ATP:cob(I)alamin adenosyltransferase



- Molecule 1: ATP:cob(I)alamin adenosyltransferase



- Molecule 1: ATP:cob(I)alamin adenosyltransferase



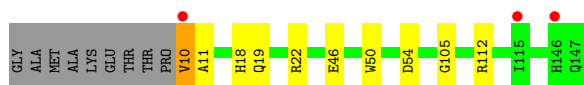
- Molecule 1: ATP:cob(I)alamin adenosyltransferase

Chain M:  4% 86% 7% • 6%

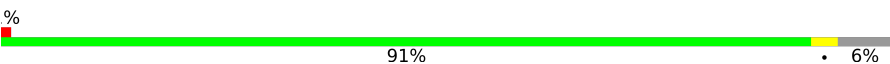


- Molecule 1: ATP:cob(I)alamin adenosyltransferase

Chain N:  2% 87% 6% • 6%



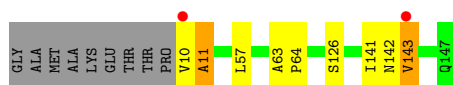
- Molecule 1: ATP:cob(I)alamin adenosyltransferase

Chain O:  0% 91% • 6%



- Molecule 1: ATP:cob(I)alamin adenosyltransferase

Chain P:  0% 88% 5% • 6%



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	71.30Å 130.12Å 120.75Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	33.07 – 1.97 33.07 – 1.97	Depositor EDS
% Data completeness (in resolution range)	98.0 (33.07-1.97) 99.9 (33.07-1.97)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.26 (at 1.97Å)	Xtriage
Refinement program	REFMAC 5.8.0103	Depositor
R, R_{free}	0.158 , 0.186 0.166 , 0.193	Depositor DCC
R_{free} test set	7923 reflections (4.08%)	wwPDB-VP
Wilson B-factor (Å ²)	20.0	Xtriage
Anisotropy	0.079	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.39 , 49.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.52$, $\langle L^2 \rangle = 0.36$	Xtriage
Estimated twinning fraction	0.138 for h,-k,-l	Xtriage
Reported twinning fraction	0.204 for H, K, L 0.796 for -h,-k,l	Depositor
Outliers	0 of 155209 reflections	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	18350	wwPDB-VP
Average B, all atoms (Å ²)	23.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.85% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, CL, HEM, MG, NA

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	1.45	6/1043 (0.6%)	1.21	3/1421 (0.2%)
1	B	1.16	0/1043	1.01	2/1421 (0.1%)
1	C	1.36	4/1043 (0.4%)	1.15	3/1421 (0.2%)
1	D	1.16	1/1043 (0.1%)	1.06	4/1421 (0.3%)
1	E	1.44	5/1051 (0.5%)	1.24	11/1432 (0.8%)
1	F	1.15	0/1043	1.01	1/1421 (0.1%)
1	G	1.25	0/1043	1.02	0/1421
1	H	1.25	4/1043 (0.4%)	1.13	5/1421 (0.4%)
1	I	1.21	2/1043 (0.2%)	1.04	0/1421
1	J	1.10	0/1043	0.94	1/1421 (0.1%)
1	K	1.26	4/1043 (0.4%)	1.14	3/1421 (0.2%)
1	L	1.10	1/1043 (0.1%)	1.00	2/1421 (0.1%)
1	M	1.07	1/1043 (0.1%)	0.98	2/1421 (0.1%)
1	N	1.13	2/1043 (0.2%)	1.06	5/1421 (0.4%)
1	O	1.05	0/1043	1.00	2/1421 (0.1%)
1	P	1.23	4/1043 (0.4%)	1.16	5/1421 (0.4%)
All	All	1.22	34/16696 (0.2%)	1.08	49/22747 (0.2%)

All (34) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	142	ASN	N-CA	12.53	1.63	1.46
1	E	10	VAL	C-O	-8.49	1.12	1.24
1	L	142	ASN	CA-CB	8.26	1.63	1.52
1	E	143	VAL	N-CA	-6.83	1.37	1.46
1	H	142	ASN	CA-C	6.77	1.61	1.53
1	P	143	VAL	CA-C	-6.58	1.47	1.52
1	P	142	ASN	CA-C	6.36	1.61	1.53
1	A	129	GLN	N-CA	6.35	1.54	1.46
1	C	63	ALA	CA-C	6.28	1.59	1.52
1	K	63	ALA	N-CA	-6.10	1.41	1.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	P	143	VAL	N-CA	6.05	1.56	1.45
1	H	143	VAL	CA-C	-5.97	1.47	1.52
1	N	22	ARG	CA-CB	-5.86	1.44	1.53
1	A	75	THR	N-CA	-5.77	1.38	1.45
1	H	143	VAL	N-CA	5.75	1.55	1.45
1	A	137	ALA	C-O	5.74	1.30	1.24
1	E	36	VAL	N-CA	-5.73	1.39	1.46
1	D	142	ASN	CA-CB	5.67	1.60	1.52
1	K	78	HIS	N-CA	5.61	1.53	1.46
1	C	73	MET	SD-CE	-5.59	1.65	1.79
1	K	63	ALA	CA-C	5.55	1.58	1.52
1	I	128	GLU	CA-C	5.50	1.59	1.52
1	E	141	ILE	C-O	-5.37	1.16	1.24
1	I	33	VAL	C-O	-5.36	1.18	1.23
1	C	96	HIS	N-CA	5.30	1.52	1.46
1	M	132	ASP	N-CA	5.28	1.52	1.46
1	A	18	HIS	N-CA	-5.24	1.40	1.46
1	H	66	LYS	C-O	5.18	1.30	1.24
1	A	134	ALA	C-O	5.13	1.30	1.24
1	A	131	MET	CA-C	5.10	1.59	1.52
1	P	141	ILE	C-O	-5.10	1.16	1.24
1	N	19	GLN	CD-OE1	-5.10	1.13	1.23
1	C	46	GLU	CD-OE2	5.08	1.35	1.25
1	K	79	GLU	CD-OE1	5.06	1.34	1.25

All (49) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	H	143	VAL	N-CA-C	-9.38	96.51	109.46
1	E	141	ILE	CA-C-O	-9.26	111.32	119.38
1	P	143	VAL	N-CA-C	-9.20	96.76	109.46
1	E	141	ILE	CA-C-N	-8.63	109.89	122.93
1	E	141	ILE	C-N-CA	-8.63	109.89	122.93
1	C	46	GLU	CG-CD-OE1	-8.12	99.72	118.40
1	P	142	ASN	N-CA-C	8.02	122.45	111.39
1	E	142	ASN	N-CA-C	7.17	119.29	110.91
1	A	30	GLN	CB-CG-CD	-7.14	100.46	112.60
1	H	142	ASN	N-CA-C	7.09	121.18	111.39
1	H	141	ILE	CA-C-O	-7.06	113.24	119.38
1	B	105	GLY	N-CA-C	7.04	120.03	111.93
1	K	128	GLU	OE1-CD-OE2	-6.88	106.40	122.90
1	N	10	VAL	CB-CA-C	6.80	124.33	111.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	46	GLU	CG-CD-OE2	-6.76	102.85	118.40
1	N	22	ARG	CB-CG-CD	-6.69	95.91	111.30
1	N	19	GLN	CG-CD-NE2	6.67	126.40	116.40
1	E	10	VAL	CA-C-O	-6.66	111.17	119.43
1	E	143	VAL	N-CA-C	-6.65	99.00	108.65
1	N	105	GLY	N-CA-C	6.59	119.51	111.93
1	J	105	GLY	N-CA-C	6.57	119.48	111.93
1	A	143	VAL	CA-CB-CG2	6.22	120.98	110.40
1	E	112	ARG	CG-CD-NE	-6.22	98.32	112.00
1	F	19	GLN	CG-CD-NE2	6.13	125.59	116.40
1	H	143	VAL	CA-C-O	-6.07	116.88	121.68
1	L	142	ASN	CB-CA-C	5.92	121.00	112.12
1	M	105	GLY	N-CA-C	5.92	118.74	111.93
1	K	73	MET	CG-SD-CE	5.89	113.86	100.90
1	O	105	GLY	N-CA-C	5.81	118.61	111.93
1	C	105	GLY	N-CA-C	5.70	118.60	112.33
1	E	105	GLY	N-CA-C	5.69	118.47	111.93
1	O	126	SER	N-CA-C	-5.65	103.07	110.53
1	M	46	GLU	CA-CB-CG	-5.65	102.80	114.10
1	H	141	ILE	N-CA-C	-5.63	107.64	113.10
1	E	142	ASN	CB-CG-ND2	5.58	124.77	116.40
1	E	142	ASN	CA-C-O	5.50	129.70	122.44
1	E	126	SER	N-CA-C	-5.50	103.65	110.41
1	C	46	GLU	CA-CB-CG	-5.46	103.18	114.10
1	D	46	GLU	CG-CD-OE1	5.39	130.81	118.40
1	K	79	GLU	CA-CB-CG	-5.38	103.34	114.10
1	P	143	VAL	CA-C-O	-5.34	117.46	121.68
1	D	105	GLY	N-CA-C	5.27	117.99	111.93
1	N	11	ALA	N-CA-C	5.20	117.04	110.33
1	L	146	HIS	CA-CB-CG	5.18	118.98	113.80
1	B	143	VAL	N-CA-C	5.15	116.43	108.44
1	P	126	SER	N-CA-C	-5.15	103.73	110.53
1	P	141	ILE	CA-C-O	-5.15	114.90	119.38
1	D	126	SER	N-CA-C	-5.13	103.76	110.53
1	A	126	SER	N-CA-C	-5.05	103.81	110.43

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1024	0	1025	1	0
1	B	1024	0	1025	4	0
1	C	1024	0	1025	6	0
1	D	1024	0	1025	7	0
1	E	1031	0	1033	6	0
1	F	1024	0	1025	4	0
1	G	1024	0	1025	5	0
1	H	1024	0	1025	5	0
1	I	1024	0	1025	4	0
1	J	1024	0	1025	3	0
1	K	1024	0	1025	3	0
1	L	1024	0	1025	4	0
1	M	1024	0	1025	5	0
1	N	1024	0	1025	6	0
1	O	1024	0	1025	1	0
1	P	1024	0	1025	2	0
2	A	43	0	30	1	0
2	C	43	0	30	7	0
2	E	43	0	30	3	0
2	G	43	0	30	4	0
2	I	43	0	30	5	0
2	K	43	0	30	2	0
2	M	43	0	30	4	0
2	O	43	0	30	3	0
3	A	18	0	24	0	0
3	B	6	0	8	0	0
3	C	6	0	8	0	0
3	D	12	0	16	0	0
3	E	6	0	7	0	0
3	F	6	0	8	0	0
3	G	18	0	24	1	0
3	H	6	0	8	0	0
3	I	24	0	32	1	0
3	J	6	0	8	0	0
3	K	18	0	24	0	0
3	M	6	0	8	0	0
3	N	6	0	8	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	O	6	0	8	0	0
3	P	6	0	8	0	0
4	A	2	0	0	0	0
4	B	1	0	0	0	0
4	D	1	0	0	0	0
4	E	1	0	0	0	0
4	F	1	0	0	0	0
4	G	1	0	0	0	0
4	H	2	0	0	0	0
4	I	2	0	0	0	0
4	J	2	0	0	0	0
4	L	1	0	0	0	0
4	M	2	0	0	0	0
4	N	1	0	0	0	0
4	P	1	0	0	0	0
5	C	1	0	0	0	0
5	D	1	0	0	0	0
5	I	1	0	0	0	0
5	J	1	0	0	0	0
6	H	1	0	0	0	0
6	P	1	0	0	0	0
7	A	123	0	0	1	2
7	B	87	0	0	2	0
7	C	109	0	0	3	0
7	D	85	0	0	2	0
7	E	108	0	0	0	2
7	F	76	0	0	4	0
7	G	103	0	0	5	0
7	H	102	0	0	4	0
7	I	83	0	0	1	0
7	J	71	0	0	2	0
7	K	100	0	0	2	0
7	L	72	0	0	1	0
7	M	62	0	0	1	0
7	N	72	0	0	2	0
7	O	88	0	0	1	0
7	P	100	0	0	0	0
All	All	18350	0	16847	83	2

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 2.

All (83) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:57:LEU:HD22	7:G:392:HOH:O	1.47	1.14
1:H:22:ARG:HG3	7:H:317:HOH:O	1.63	0.97
1:M:46:GLU:OE2	1:M:49:THR:OG1	1.86	0.92
2:G:201:HEM:HBC2	2:G:201:HEM:HHD	1.62	0.81
1:G:26:GLU:HG3	7:G:343:HOH:O	1.81	0.79
1:I:18:HIS:CE1	1:I:22:ARG:HD2	2.18	0.79
1:N:46:GLU:HG3	7:N:307:HOH:O	1.83	0.78
1:D:49:THR:HG23	7:D:353:HOH:O	1.84	0.77
1:O:46:GLU:HG3	7:O:302:HOH:O	1.83	0.77
1:C:81:SER:HB3	7:C:302:HOH:O	1.83	0.77
2:O:201:HEM:HMC2	2:O:201:HEM:HBC2	1.72	0.71
1:M:18:HIS:CE1	1:M:22:ARG:HD2	2.24	0.71
1:A:46:GLU:HG3	7:A:301:HOH:O	1.91	0.70
2:C:201:HEM:HMD1	1:D:22:ARG:HH21	1.60	0.67
1:D:38:SER:HB2	7:D:353:HOH:O	1.95	0.66
1:F:46:GLU:HG3	7:F:301:HOH:O	1.96	0.64
1:B:32:GLN:CD	7:B:304:HOH:O	2.40	0.64
2:M:201:HEM:HHC	2:M:201:HEM:HBB2	1.80	0.63
2:E:201:HEM:HHC	2:E:201:HEM:HBB2	1.79	0.63
1:B:18:HIS:CE1	1:B:22:ARG:HD2	2.34	0.62
1:E:141:ILE:O	1:E:142:ASN:HB2	2.00	0.62
2:I:201:HEM:HHC	2:I:201:HEM:HBB2	1.80	0.62
1:H:11:ALA:N	7:H:303:HOH:O	2.33	0.61
1:B:46:GLU:HG3	7:B:302:HOH:O	2.00	0.61
1:L:26:GLU:HG3	7:L:356:HOH:O	2.03	0.59
2:A:201:HEM:HHC	2:A:201:HEM:HBB2	1.86	0.57
1:J:46:GLU:HG3	7:J:301:HOH:O	2.05	0.56
2:O:201:HEM:HBC2	2:O:201:HEM:CMC	2.34	0.56
1:D:19:GLN:HE22	1:D:22:ARG:HH11	1.51	0.56
1:C:50:TRP:CE3	2:C:201:HEM:HAB	2.42	0.54
2:I:201:HEM:HBC2	2:I:201:HEM:HHD	1.89	0.54
1:F:11:ALA:N	7:F:302:HOH:O	2.41	0.54
2:K:201:HEM:HBB2	2:K:201:HEM:HHC	1.89	0.54
3:G:202:GOL:H32	1:H:47:THR:HG23	1.90	0.52
2:O:201:HEM:HBB2	2:O:201:HEM:HHC	1.92	0.52
1:I:22:ARG:NH1	2:I:201:HEM:O1A	2.43	0.52
2:M:201:HEM:HMC1	2:M:201:HEM:HBC2	1.91	0.52
1:G:57:LEU:CD2	7:G:392:HOH:O	2.28	0.51
1:I:78:HIS:HD2	7:I:336:HOH:O	1.92	0.51
1:F:10:VAL:HG13	7:F:302:HOH:O	2.11	0.51
1:C:85:GLN:NE2	7:C:302:HOH:O	2.43	0.51
2:G:201:HEM:HHD	2:G:201:HEM:CBC	2.39	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:J:78:HIS:HD2	7:J:312:HOH:O	1.95	0.49
1:H:46:GLU:HG3	7:H:301:HOH:O	2.12	0.49
1:M:78:HIS:HD2	7:M:335:HOH:O	1.94	0.49
2:M:201:HEM:HAB	1:N:50:TRP:CE3	2.48	0.48
2:C:201:HEM:HMC1	2:C:201:HEM:HBC2	1.95	0.48
1:P:10:VAL:HG13	1:P:11:ALA:O	2.14	0.48
2:I:201:HEM:HBD2	1:J:22:ARG:CZ	2.45	0.47
2:C:201:HEM:HMD1	1:D:22:ARG:NH2	2.26	0.47
1:K:46:GLU:HG3	7:K:301:HOH:O	2.15	0.47
1:N:10:VAL:HG22	1:N:112:ARG:CD	2.44	0.47
3:I:203:GOL:C1	1:K:71:VAL:O	2.63	0.46
2:C:201:HEM:CMD	1:D:22:ARG:NH2	2.79	0.46
1:C:46:GLU:HG3	1:C:47:THR:N	2.28	0.46
2:E:201:HEM:HBC2	2:E:201:HEM:HMC2	1.97	0.46
1:C:99:GLY:HA2	7:C:317:HOH:O	2.17	0.45
1:G:146:HIS:CE1	7:G:341:HOH:O	2.70	0.45
1:N:10:VAL:HG22	1:N:112:ARG:HD2	1.97	0.45
1:E:18:HIS:CD2	2:E:201:HEM:NB	2.86	0.44
1:K:78:HIS:HD2	7:K:354:HOH:O	2.00	0.44
1:E:141:ILE:O	1:E:142:ASN:CB	2.59	0.44
1:F:79:GLU:CD	7:F:303:HOH:O	2.61	0.44
1:E:146:HIS:ND1	1:E:147:GLN:O	2.52	0.43
1:G:78:HIS:HD2	7:G:344:HOH:O	2.01	0.43
1:M:46:GLU:HG3	1:M:47:THR:N	2.30	0.43
2:G:201:HEM:HBC2	2:G:201:HEM:CHD	2.37	0.43
2:M:201:HEM:NC	1:N:18:HIS:CD2	2.87	0.42
2:G:201:HEM:HMB1	2:G:201:HEM:HAB	1.81	0.42
1:M:63:ALA:HB3	1:M:64:PRO:HD3	2.02	0.42
2:K:201:HEM:HAA1	1:L:22:ARG:NH2	2.35	0.42
1:I:18:HIS:CD2	2:I:201:HEM:NC	2.88	0.41
2:C:201:HEM:CGD	1:D:22:ARG:HH22	2.31	0.41
1:E:10:VAL:HB	1:E:112:ARG:HD2	2.02	0.41
1:H:10:VAL:HG22	7:H:303:HOH:O	2.19	0.41
2:C:201:HEM:HMB2	2:C:201:HEM:HHB	1.78	0.41
1:E:10:VAL:HB	1:E:112:ARG:HB3	2.02	0.41
1:L:132:ASP:OD1	1:L:132:ASP:C	2.64	0.41
1:P:63:ALA:HB3	1:P:64:PRO:HD3	2.02	0.41
1:B:78:HIS:CD2	1:B:131:MET:HE3	2.56	0.41
1:C:63:ALA:HB3	1:C:64:PRO:HD3	2.03	0.40
1:N:54:ASP:HA	7:N:354:HOH:O	2.21	0.40
1:L:69:THR:OG1	1:L:101:VAL:HA	2.21	0.40

All (2) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:A:399:HOH:O	7:E:319:HOH:O[2_655]	2.13	0.07
7:A:407:HOH:O	7:E:371:HOH:O[2_655]	2.15	0.05

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	136/147 (92%)	136 (100%)	0	0	100	100
1	B	136/147 (92%)	136 (100%)	0	0	100	100
1	C	136/147 (92%)	135 (99%)	1 (1%)	0	100	100
1	D	136/147 (92%)	135 (99%)	1 (1%)	0	100	100
1	E	137/147 (93%)	135 (98%)	2 (2%)	0	100	100
1	F	136/147 (92%)	135 (99%)	0	1 (1%)	18	9
1	G	136/147 (92%)	134 (98%)	1 (1%)	1 (1%)	18	9
1	H	136/147 (92%)	134 (98%)	2 (2%)	0	100	100
1	I	136/147 (92%)	135 (99%)	1 (1%)	0	100	100
1	J	136/147 (92%)	135 (99%)	0	1 (1%)	18	9
1	K	136/147 (92%)	135 (99%)	1 (1%)	0	100	100
1	L	136/147 (92%)	134 (98%)	1 (1%)	1 (1%)	18	9
1	M	136/147 (92%)	135 (99%)	0	1 (1%)	18	9
1	N	136/147 (92%)	134 (98%)	2 (2%)	0	100	100
1	O	136/147 (92%)	135 (99%)	0	1 (1%)	18	9
1	P	136/147 (92%)	134 (98%)	1 (1%)	1 (1%)	18	9
All	All	2177/2352 (93%)	2157 (99%)	13 (1%)	7 (0%)	36	27

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	P	11	ALA
1	F	11	ALA
1	O	11	ALA
1	G	11	ALA
1	J	11	ALA
1	L	11	ALA
1	M	11	ALA

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	106/112 (95%)	106 (100%)	0	100	100
1	B	106/112 (95%)	106 (100%)	0	100	100
1	C	106/112 (95%)	105 (99%)	1 (1%)	70	67
1	D	106/112 (95%)	106 (100%)	0	100	100
1	E	107/112 (96%)	106 (99%)	1 (1%)	70	67
1	F	106/112 (95%)	106 (100%)	0	100	100
1	G	106/112 (95%)	106 (100%)	0	100	100
1	H	106/112 (95%)	105 (99%)	1 (1%)	70	67
1	I	106/112 (95%)	106 (100%)	0	100	100
1	J	106/112 (95%)	106 (100%)	0	100	100
1	K	106/112 (95%)	106 (100%)	0	100	100
1	L	106/112 (95%)	105 (99%)	1 (1%)	70	67
1	M	106/112 (95%)	106 (100%)	0	100	100
1	N	106/112 (95%)	106 (100%)	0	100	100
1	O	106/112 (95%)	106 (100%)	0	100	100
1	P	106/112 (95%)	104 (98%)	2 (2%)	50	44
All	All	1697/1792 (95%)	1691 (100%)	6 (0%)	84	82

All (6) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	46	GLU
1	E	112	ARG
1	H	143	VAL
1	L	142	ASN
1	P	57	LEU
1	P	143	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (22) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	142	ASN
1	B	78	HIS
1	C	43	HIS
1	D	19	GLN
1	F	43	HIS
1	F	78	HIS
1	G	15	HIS
1	G	43	HIS
1	G	78	HIS
1	I	43	HIS
1	I	78	HIS
1	J	43	HIS
1	J	78	HIS
1	K	43	HIS
1	K	78	HIS
1	L	43	HIS
1	M	43	HIS
1	M	78	HIS
1	N	78	HIS
1	N	146	HIS
1	O	43	HIS
1	P	43	HIS

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 57 ligands modelled in this entry, 24 are monoatomic - leaving 33 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
3	GOL	D	202	-	5,5,5	0.31	0	5,5,5	1.43	1 (20%)
3	GOL	I	202	-	5,5,5	0.92	0	5,5,5	1.74	2 (40%)
3	GOL	G	203	-	5,5,5	0.58	0	5,5,5	0.58	0
3	GOL	E	202	-	5,5,5	0.76	0	5,5,5	1.88	1 (20%)
3	GOL	F	201	-	5,5,5	0.52	0	5,5,5	1.01	0
2	HEM	A	201	1	50,50,50	1.56	5 (10%)	67,82,82	2.39	19 (28%)
2	HEM	K	201	1	50,50,50	1.85	10 (20%)	67,82,82	2.38	22 (32%)
2	HEM	C	201	1	50,50,50	1.84	12 (24%)	67,82,82	2.73	30 (44%)
3	GOL	I	205	-	5,5,5	1.02	1 (20%)	5,5,5	2.36	1 (20%)
3	GOL	A	203	-	5,5,5	1.31	1 (20%)	5,5,5	1.52	2 (40%)
2	HEM	E	201	1	50,50,50	1.72	7 (14%)	67,82,82	2.03	14 (20%)
3	GOL	H	201	-	5,5,5	1.04	0	5,5,5	1.17	0
3	GOL	P	202	-	5,5,5	0.44	0	5,5,5	0.69	0
2	HEM	G	201	1	50,50,50	1.71	14 (28%)	67,82,82	2.46	25 (37%)
3	GOL	I	203	-	5,5,5	0.31	0	5,5,5	1.19	1 (20%)
3	GOL	K	203	-	5,5,5	0.27	0	5,5,5	0.74	0
3	GOL	N	201	-	5,5,5	0.35	0	5,5,5	0.78	0
2	HEM	I	201	1	50,50,50	1.91	14 (28%)	67,82,82	1.78	18 (26%)
2	HEM	O	201	1	50,50,50	1.54	9 (18%)	67,82,82	2.00	23 (34%)
2	HEM	M	201	1	50,50,50	1.59	10 (20%)	67,82,82	1.74	15 (22%)
3	GOL	A	204	-	5,5,5	0.35	0	5,5,5	0.53	0
3	GOL	G	204	-	5,5,5	0.59	0	5,5,5	1.10	1 (20%)
3	GOL	C	202	-	5,5,5	0.58	0	5,5,5	1.94	2 (40%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	GOL	J	201	-	5,5,5	0.47	0	5,5,5	1.40	2 (40%)
3	GOL	I	204	-	5,5,5	0.65	0	5,5,5	0.45	0
3	GOL	O	202	-	5,5,5	0.53	0	5,5,5	1.60	1 (20%)
3	GOL	K	204	-	5,5,5	0.60	0	5,5,5	1.27	1 (20%)
3	GOL	G	202	-	5,5,5	0.91	0	5,5,5	1.46	0
3	GOL	D	201	-	5,5,5	0.84	0	5,5,5	1.93	1 (20%)
3	GOL	A	202	-	5,5,5	0.61	0	5,5,5	2.31	2 (40%)
3	GOL	K	202	-	5,5,5	0.51	0	5,5,5	0.44	0
3	GOL	M	202	-	5,5,5	0.41	0	5,5,5	0.67	0
3	GOL	B	201	-	5,5,5	0.70	0	5,5,5	0.88	0

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
3	GOL	D	202	-	-	2/4/4/4	-
3	GOL	I	202	-	-	2/4/4/4	-
3	GOL	G	203	-	-	2/4/4/4	-
3	GOL	E	202	-	-	0/4/4/4	-
3	GOL	F	201	-	-	2/4/4/4	-
2	HEM	A	201	1	-	5/14/54/54	-
2	HEM	K	201	1	-	7/14/54/54	-
2	HEM	C	201	1	-	6/14/54/54	-
3	GOL	I	205	-	-	2/4/4/4	-
3	GOL	A	203	-	-	1/4/4/4	-
2	HEM	E	201	1	-	7/14/54/54	-
3	GOL	H	201	-	-	2/4/4/4	-
3	GOL	P	202	-	-	0/4/4/4	-
2	HEM	G	201	1	-	8/14/54/54	-
3	GOL	I	203	-	-	4/4/4/4	-
3	GOL	K	203	-	-	0/4/4/4	-
3	GOL	N	201	-	-	2/4/4/4	-
2	HEM	I	201	1	-	8/14/54/54	-
2	HEM	O	201	1	-	5/14/54/54	-
2	HEM	M	201	1	-	7/14/54/54	-
3	GOL	A	204	-	-	2/4/4/4	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	GOL	G	204	-	-	3/4/4/4	-
3	GOL	C	202	-	-	4/4/4/4	-
3	GOL	J	201	-	-	2/4/4/4	-
3	GOL	I	204	-	-	2/4/4/4	-
3	GOL	O	202	-	-	2/4/4/4	-
3	GOL	K	204	-	-	2/4/4/4	-
3	GOL	G	202	-	-	4/4/4/4	-
3	GOL	D	201	-	-	1/4/4/4	-
3	GOL	A	202	-	-	3/4/4/4	-
3	GOL	K	202	-	-	1/4/4/4	-
3	GOL	M	202	-	-	0/4/4/4	-
3	GOL	B	201	-	-	2/4/4/4	-

All (83) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	201	HEM	FE-NB	6.47	2.14	1.94
2	K	201	HEM	C4B-NB	-5.61	1.27	1.38
2	M	201	HEM	FE-NB	5.59	2.12	1.94
2	C	201	HEM	C4B-NB	-5.57	1.27	1.38
2	A	201	HEM	C1B-NB	-5.50	1.30	1.40
2	I	201	HEM	FE-NB	4.95	2.10	1.94
2	E	201	HEM	FE-NB	4.89	2.10	1.94
2	K	201	HEM	FE-NB	4.78	2.09	1.94
2	G	201	HEM	FE-NC	4.44	2.09	1.95
2	A	201	HEM	FE-NC	4.35	2.09	1.95
2	I	201	HEM	C4B-NB	-4.34	1.30	1.38
2	O	201	HEM	FE-NB	4.24	2.07	1.94
2	E	201	HEM	C4D-ND	-4.22	1.32	1.40
2	E	201	HEM	FE-NC	3.98	2.08	1.95
2	I	201	HEM	C1C-C2C	-3.83	1.37	1.45
2	E	201	HEM	C1B-NB	-3.83	1.33	1.40
2	G	201	HEM	C1B-C2B	-3.64	1.37	1.44
2	K	201	HEM	C1C-C2C	-3.63	1.38	1.45
2	C	201	HEM	C3B-C4B	3.56	1.51	1.44
2	I	201	HEM	C4D-ND	-3.43	1.34	1.40
2	K	201	HEM	C4C-NC	-3.32	1.33	1.39
2	K	201	HEM	C3C-C4C	-3.31	1.40	1.46
2	E	201	HEM	C4B-NB	-3.30	1.32	1.38
2	I	201	HEM	C1B-NB	-3.15	1.34	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	M	201	HEM	C4D-ND	-3.13	1.34	1.40
2	I	201	HEM	C4C-NC	-3.10	1.33	1.39
2	O	201	HEM	FE-NC	3.09	2.05	1.95
2	I	201	HEM	FE-NC	3.08	2.05	1.95
2	M	201	HEM	C4B-NB	-3.07	1.32	1.38
2	O	201	HEM	O2A-CGA	-3.04	1.20	1.30
2	O	201	HEM	C1C-C2C	-2.99	1.39	1.45
2	A	201	HEM	C4D-ND	-2.89	1.35	1.40
2	A	201	HEM	FE-NB	2.88	2.03	1.94
2	K	201	HEM	C1B-C2B	-2.88	1.38	1.44
2	K	201	HEM	C1B-NB	-2.88	1.35	1.40
2	M	201	HEM	C1B-NB	-2.84	1.35	1.40
2	I	201	HEM	C1D-ND	-2.83	1.33	1.38
2	O	201	HEM	C3B-C4B	2.75	1.50	1.44
2	O	201	HEM	C1D-ND	-2.72	1.33	1.38
2	C	201	HEM	C3C-C4C	-2.70	1.41	1.46
2	I	201	HEM	C1C-NC	-2.69	1.34	1.39
2	M	201	HEM	FE-ND	-2.69	1.86	1.94
2	O	201	HEM	C1B-NB	-2.67	1.35	1.40
2	I	201	HEM	CHD-C4C	-2.67	1.33	1.38
2	E	201	HEM	C4D-C3D	2.63	1.49	1.45
2	C	201	HEM	C3C-C2C	2.58	1.42	1.37
2	M	201	HEM	FE-NC	2.57	2.03	1.95
2	G	201	HEM	C1C-NC	-2.54	1.34	1.39
2	C	201	HEM	FE-NA	2.51	2.03	1.95
2	G	201	HEM	FE-NB	2.51	2.02	1.94
2	C	201	HEM	C4D-ND	-2.50	1.35	1.40
2	C	201	HEM	CHB-C4A	-2.49	1.33	1.39
2	O	201	HEM	C4B-NB	-2.49	1.34	1.38
2	G	201	HEM	C1B-NB	-2.46	1.36	1.40
2	G	201	HEM	CHB-C4A	-2.45	1.33	1.39
2	K	201	HEM	CHB-C4A	-2.43	1.34	1.39
3	A	203	GOL	O2-C2	2.42	1.50	1.43
2	G	201	HEM	O2D-CGD	-2.42	1.22	1.30
2	C	201	HEM	C1B-C2B	-2.41	1.39	1.44
2	G	201	HEM	C4A-NA	-2.41	1.35	1.39
2	G	201	HEM	FE-NA	2.40	2.03	1.95
2	G	201	HEM	CHB-C1B	2.34	1.43	1.38
2	C	201	HEM	CMB-C2B	2.34	1.55	1.50
2	A	201	HEM	C1C-C2C	-2.32	1.40	1.45
2	I	201	HEM	FE-ND	-2.32	1.87	1.94
2	K	201	HEM	FE-NA	2.32	2.02	1.95

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	I	201	HEM	FE-NA	2.30	2.02	1.95
2	M	201	HEM	C3C-C2C	2.28	1.41	1.37
2	G	201	HEM	C1A-C2A	-2.26	1.40	1.44
2	M	201	HEM	C3B-C4B	2.26	1.49	1.44
2	G	201	HEM	C1C-C2C	-2.23	1.40	1.45
2	I	201	HEM	C3C-C4C	-2.22	1.42	1.46
2	I	201	HEM	C3B-C4B	2.22	1.49	1.44
2	E	201	HEM	C1B-C2B	-2.21	1.40	1.44
2	G	201	HEM	C3C-C4C	-2.19	1.42	1.46
2	G	201	HEM	C1D-ND	-2.16	1.34	1.38
2	M	201	HEM	C1D-ND	-2.14	1.34	1.38
2	C	201	HEM	C1B-NB	-2.11	1.36	1.40
2	C	201	HEM	C1C-C2C	-2.09	1.41	1.45
2	M	201	HEM	C1C-C2C	-2.08	1.41	1.45
3	I	205	GOL	O2-C2	2.06	1.49	1.43
2	O	201	HEM	CHA-C1A	-2.02	1.34	1.39
2	K	201	HEM	C3B-C4B	2.02	1.48	1.44

All (184) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	201	HEM	CHC-C4B-NB	8.76	133.85	124.42
2	K	201	HEM	CHB-C1B-NB	8.68	135.10	124.37
2	C	201	HEM	CHB-C1B-NB	8.45	134.82	124.37
2	G	201	HEM	C3B-C4B-NB	-7.76	103.89	109.47
2	A	201	HEM	C3B-C4B-NB	-7.44	104.13	109.47
2	A	201	HEM	C1B-NB-C4B	7.32	113.88	105.21
2	E	201	HEM	C3B-C4B-NB	-6.62	104.71	109.47
2	C	201	HEM	CHC-C1C-NC	6.17	131.17	124.45
2	G	201	HEM	C1B-NB-C4B	6.11	112.44	105.21
2	O	201	HEM	C3B-C4B-NB	-5.69	105.38	109.47
2	E	201	HEM	CHC-C4B-NB	5.62	130.47	124.42
2	E	201	HEM	C1B-NB-C4B	5.58	111.82	105.21
2	K	201	HEM	C1B-NB-C4B	5.50	111.72	105.21
2	O	201	HEM	C1B-NB-C4B	5.45	111.66	105.21
2	A	201	HEM	CHD-C1D-ND	5.36	130.19	124.42
2	E	201	HEM	CHD-C1D-C2D	-5.26	116.72	125.03
2	G	201	HEM	C3B-C2B-C1B	5.23	110.34	106.41
2	K	201	HEM	CHA-C4D-ND	5.23	130.83	124.37
2	G	201	HEM	CHD-C4C-NC	5.19	130.10	124.45
2	E	201	HEM	CHD-C1D-ND	5.18	130.00	124.42
3	I	205	GOL	C3-C2-C1	-5.10	93.09	111.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	201	HEM	CHB-C1B-C2B	-5.00	112.73	126.95
2	C	201	HEM	C3B-C4B-NB	-4.89	105.95	109.47
2	C	201	HEM	C4C-NC-C1C	4.87	113.76	105.82
2	C	201	HEM	CAD-C3D-C4D	4.80	133.06	124.70
2	A	201	HEM	CHD-C1D-C2D	-4.77	117.49	125.03
2	M	201	HEM	CHA-C4D-ND	4.77	130.27	124.37
2	C	201	HEM	CHA-C4D-ND	4.75	130.24	124.37
2	I	201	HEM	C1B-NB-C4B	4.70	110.78	105.21
2	K	201	HEM	C3B-C4B-NB	-4.51	106.23	109.47
2	M	201	HEM	CHD-C1D-ND	4.47	129.24	124.42
2	G	201	HEM	CHB-C1B-NB	4.36	129.76	124.37
2	O	201	HEM	CHB-C1B-NB	4.32	129.71	124.37
2	O	201	HEM	CHC-C4B-NB	4.29	129.04	124.42
2	M	201	HEM	CHB-C1B-NB	4.22	129.59	124.37
2	G	201	HEM	C4C-C3C-C2C	4.19	110.45	106.81
2	C	201	HEM	C1B-NB-C4B	4.18	110.15	105.21
2	O	201	HEM	CHA-C4D-ND	4.14	129.49	124.37
3	D	201	GOL	C3-C2-C1	-4.14	96.63	111.80
2	I	201	HEM	CHA-C4D-ND	4.12	129.47	124.37
2	K	201	HEM	C4A-CHB-C1B	-4.12	116.56	126.25
2	C	201	HEM	O2D-CGD-O1D	-4.08	112.84	123.33
2	K	201	HEM	CHC-C1C-NC	4.07	128.89	124.45
2	G	201	HEM	CHA-C4D-C3D	-4.07	117.73	125.23
2	G	201	HEM	C3D-C4D-ND	4.04	114.60	110.17
2	C	201	HEM	CHC-C4B-C3B	4.02	133.09	125.07
2	C	201	HEM	CHD-C4C-NC	3.99	128.79	124.45
2	C	201	HEM	C4A-CHB-C1B	-3.94	116.98	126.25
2	M	201	HEM	C1B-NB-C4B	3.92	109.85	105.21
2	K	201	HEM	CHB-C1B-C2B	-3.92	115.82	126.95
2	K	201	HEM	CHD-C4C-NC	3.86	128.66	124.45
2	C	201	HEM	C3B-C2B-C1B	-3.82	103.54	106.41
3	E	202	GOL	C3-C2-C1	-3.77	97.99	111.80
2	O	201	HEM	CHD-C1D-ND	3.73	128.44	124.42
2	K	201	HEM	C4C-CHD-C1D	-3.73	118.09	126.02
2	C	201	HEM	C4C-CHD-C1D	-3.70	118.16	126.02
2	C	201	HEM	CHC-C4B-NB	-3.65	120.50	124.42
2	G	201	HEM	C4C-NC-C1C	3.64	111.75	105.82
3	A	202	GOL	O1-C1-C2	-3.62	94.10	110.38
2	K	201	HEM	CMB-C2B-C1B	-3.62	119.38	125.03
2	C	201	HEM	CAD-C3D-C2D	-3.58	121.17	127.87
2	G	201	HEM	CHC-C4B-NB	3.54	128.24	124.42
2	A	201	HEM	C3B-C2B-C1B	3.53	109.06	106.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	K	201	HEM	C4C-NC-C1C	3.52	111.57	105.82
2	O	201	HEM	CAA-C2A-C1A	3.50	131.78	124.94
2	A	201	HEM	CBA-CAA-C2A	-3.50	102.86	112.53
3	C	202	GOL	O1-C1-C2	-3.47	94.76	110.38
2	I	201	HEM	C4C-NC-C1C	3.46	111.46	105.82
2	M	201	HEM	CAD-CBD-CGD	-3.44	104.53	113.67
2	I	201	HEM	C3B-C4B-NB	-3.43	107.00	109.47
2	I	201	HEM	CMB-C2B-C1B	3.40	130.35	125.03
2	I	201	HEM	CHB-C1B-NB	3.40	128.57	124.37
2	K	201	HEM	CAD-C3D-C4D	3.39	130.61	124.70
2	C	201	HEM	CAA-CBA-CGA	-3.32	104.85	113.67
2	C	201	HEM	C3C-C2C-C1C	3.28	110.15	107.05
2	M	201	HEM	C3B-C4B-NB	-3.28	107.11	109.47
2	G	201	HEM	CAB-C3B-C2B	-3.27	117.79	128.43
2	C	201	HEM	C2C-C1C-NC	-3.26	103.60	109.64
2	G	201	HEM	CHD-C1D-C2D	-3.24	119.92	125.03
2	M	201	HEM	CHC-C4B-NB	3.22	127.89	124.42
3	I	202	GOL	O2-C2-C1	3.20	122.44	109.18
2	I	201	HEM	CHD-C1D-ND	3.15	127.82	124.42
2	M	201	HEM	C4A-CHB-C1B	-3.14	118.87	126.25
2	G	201	HEM	C4D-ND-C1D	-3.14	101.49	105.21
2	K	201	HEM	CHA-C4D-C3D	-3.10	119.51	125.23
2	G	201	HEM	CAD-C3D-C4D	3.07	130.04	124.70
2	A	201	HEM	C4C-CHD-C1D	-3.05	119.54	126.02
2	C	201	HEM	CHA-C4D-C3D	-2.98	119.74	125.23
2	E	201	HEM	C2D-C1D-ND	2.91	113.27	109.90
2	M	201	HEM	C4C-CHD-C1D	-2.91	119.83	126.02
3	A	202	GOL	O2-C2-C3	2.90	121.20	109.18
2	E	201	HEM	C4C-CHD-C1D	-2.89	119.87	126.02
2	G	201	HEM	C4C-CHD-C1D	-2.89	119.89	126.02
2	M	201	HEM	CHA-C4D-C3D	-2.88	119.92	125.23
2	G	201	HEM	CHD-C1D-ND	2.84	127.48	124.42
2	E	201	HEM	CHA-C1A-NA	2.80	128.93	123.86
2	I	201	HEM	CHA-C4D-C3D	-2.79	120.07	125.23
2	I	201	HEM	O2A-CGA-O1A	-2.79	116.15	123.33
2	I	201	HEM	CHC-C1C-NC	2.79	127.49	124.45
2	A	201	HEM	CHB-C1B-NB	2.78	127.81	124.37
2	G	201	HEM	C2B-C1B-NB	-2.78	106.65	109.84
2	O	201	HEM	C4C-C3C-C2C	2.76	109.21	106.81
2	A	201	HEM	C2B-C1B-NB	-2.73	106.70	109.84
2	C	201	HEM	CHB-C4A-C3A	-2.71	119.55	127.43
3	O	202	GOL	O2-C2-C3	2.70	120.38	109.18

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	O	201	HEM	C3C-C2C-C1C	-2.66	104.53	107.05
2	E	201	HEM	C1D-C2D-C3D	-2.64	104.21	106.98
2	G	201	HEM	O2D-CGD-CBD	2.63	122.30	114.00
2	O	201	HEM	CHA-C4D-C3D	-2.61	120.41	125.23
2	G	201	HEM	CHA-C4D-ND	2.61	127.59	124.37
2	K	201	HEM	CMA-C3A-C4A	2.60	129.38	125.42
2	A	201	HEM	CBD-CAD-C3D	-2.58	105.40	112.53
2	M	201	HEM	CHB-C1B-C2B	-2.56	119.67	126.95
2	O	201	HEM	O2A-CGA-O1A	-2.56	116.74	123.33
2	E	201	HEM	C2A-C1A-NA	-2.56	107.32	110.15
2	K	201	HEM	CAA-C2A-C1A	2.54	129.90	124.94
2	G	201	HEM	CAB-C3B-C4B	2.53	135.57	124.39
2	I	201	HEM	CHD-C1D-C2D	-2.53	121.04	125.03
2	G	201	HEM	CMB-C2B-C3B	-2.52	122.32	128.43
2	K	201	HEM	O2D-CGD-CBD	2.52	121.97	114.00
2	E	201	HEM	CBA-CAA-C2A	-2.50	105.62	112.53
2	G	201	HEM	C4D-C3D-C2D	-2.46	103.31	106.89
2	C	201	HEM	C4A-C3A-C2A	-2.44	104.02	106.82
2	I	201	HEM	O2A-CGA-CBA	2.43	121.66	114.00
2	C	201	HEM	CMB-C2B-C3B	2.42	134.28	128.43
2	I	201	HEM	CHC-C4B-NB	2.40	127.00	124.42
2	G	201	HEM	O2D-CGD-O1D	-2.38	117.20	123.33
2	M	201	HEM	CHD-C1D-C2D	-2.38	121.27	125.03
2	A	201	HEM	O2D-CGD-CBD	2.38	121.51	114.00
2	M	201	HEM	C4D-ND-C1D	2.33	107.97	105.21
2	A	201	HEM	CHD-C4C-NC	2.32	126.98	124.45
3	I	203	GOL	O1-C1-C2	2.32	120.83	110.38
2	G	201	HEM	C2D-C1D-ND	2.31	112.57	109.90
2	O	201	HEM	CAB-C3B-C2B	-2.30	120.94	128.43
3	C	202	GOL	O2-C2-C3	2.29	118.66	109.18
2	K	201	HEM	CHC-C4B-C3B	2.28	129.62	125.07
2	K	201	HEM	CAC-C3C-C4C	-2.27	119.40	124.82
2	O	201	HEM	C4A-NA-C1A	-2.27	102.13	105.82
2	K	201	HEM	CMB-C2B-C3B	2.27	133.91	128.43
3	J	201	GOL	O1-C1-C2	-2.25	100.24	110.38
2	O	201	HEM	C4D-ND-C1D	2.25	107.87	105.21
2	G	201	HEM	O2A-CGA-CBA	2.24	121.07	114.00
2	E	201	HEM	C4A-CHB-C1B	-2.23	121.00	126.25
2	A	201	HEM	O2D-CGD-O1D	-2.22	117.61	123.33
2	K	201	HEM	CAD-C3D-C2D	-2.22	123.72	127.87
2	I	201	HEM	C4A-CHB-C1B	-2.21	121.05	126.25
2	K	201	HEM	CHD-C1D-C2D	-2.20	121.55	125.03

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	O	201	HEM	O2A-CGA-CBA	2.20	120.95	114.00
3	A	203	GOL	C3-C2-C1	-2.20	103.72	111.80
2	O	201	HEM	O2D-CGD-CBD	2.20	120.94	114.00
2	A	201	HEM	C2A-C1A-NA	-2.20	107.72	110.15
2	I	201	HEM	CAA-CBA-CGA	2.18	119.43	113.67
3	G	204	GOL	O2-C2-C3	2.17	118.18	109.18
2	O	201	HEM	CBD-CAD-C3D	2.17	118.52	112.53
2	I	201	HEM	CAB-C3B-C2B	-2.17	121.39	128.43
2	C	201	HEM	O2A-CGA-CBA	2.16	120.82	114.00
2	C	201	HEM	C2B-C1B-NB	2.16	112.32	109.84
2	A	201	HEM	O2A-CGA-CBA	2.15	120.81	114.00
2	C	201	HEM	O2D-CGD-CBD	2.13	120.72	114.00
3	J	201	GOL	O2-C2-C3	2.12	117.97	109.18
2	C	201	HEM	C3A-C4A-NA	2.11	113.52	110.14
2	M	201	HEM	CHB-C4A-C3A	-2.10	121.34	127.43
3	D	202	GOL	O1-C1-C2	-2.10	100.94	110.38
2	C	201	HEM	CMC-C2C-C1C	-2.08	121.07	124.73
2	O	201	HEM	O1D-CGD-CBD	-2.08	116.50	123.09
3	A	203	GOL	O2-C2-C3	2.08	117.78	109.18
2	E	201	HEM	CHB-C4A-NA	2.07	127.61	123.86
3	K	204	GOL	O1-C1-C2	-2.06	101.08	110.38
2	M	201	HEM	CMA-C3A-C2A	2.06	130.00	125.62
2	A	201	HEM	C1D-C2D-C3D	-2.06	104.81	106.98
2	I	201	HEM	CBD-CAD-C3D	-2.06	106.84	112.53
2	O	201	HEM	C2D-C1D-ND	-2.05	107.53	109.90
2	K	201	HEM	CBA-CAA-C2A	2.05	118.21	112.53
2	C	201	HEM	CMA-C3A-C2A	2.05	129.97	125.62
3	I	202	GOL	C3-C2-C1	-2.05	104.28	111.80
2	I	201	HEM	CAC-C3C-C4C	2.04	129.70	124.82
2	O	201	HEM	CMA-C3A-C4A	-2.03	122.33	125.42
2	O	201	HEM	CHB-C4A-C3A	-2.03	121.53	127.43
2	O	201	HEM	CAA-C2A-C3A	-2.02	122.54	127.07
2	E	201	HEM	CAD-C3D-C4D	2.01	128.21	124.70
2	C	201	HEM	CAB-C3B-C2B	-2.01	121.90	128.43
2	A	201	HEM	CHA-C1A-NA	2.01	127.50	123.86
2	A	201	HEM	C2D-C1D-ND	2.01	112.22	109.90
2	O	201	HEM	CMA-C3A-C2A	2.01	129.88	125.62

There are no chirality outliers.

All (100) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	I	201	HEM	C3D-CAD-CBD-CGD
2	M	201	HEM	C1A-C2A-CAA-CBA
3	A	202	GOL	O1-C1-C2-O2
3	B	201	GOL	C1-C2-C3-O3
3	C	202	GOL	C1-C2-C3-O3
3	F	201	GOL	C1-C2-C3-O3
3	F	201	GOL	O2-C2-C3-O3
3	G	202	GOL	O1-C1-C2-C3
3	G	202	GOL	C1-C2-C3-O3
3	G	204	GOL	C1-C2-C3-O3
3	H	201	GOL	O1-C1-C2-C3
3	I	202	GOL	O1-C1-C2-C3
3	I	203	GOL	O1-C1-C2-C3
3	I	203	GOL	C1-C2-C3-O3
3	I	204	GOL	O1-C1-C2-C3
3	I	205	GOL	O1-C1-C2-C3
3	J	201	GOL	O1-C1-C2-C3
3	K	204	GOL	O1-C1-C2-C3
3	N	201	GOL	C1-C2-C3-O3
3	O	202	GOL	O1-C1-C2-C3
2	M	201	HEM	C2A-CAA-CBA-CGA
2	M	201	HEM	C3A-C2A-CAA-CBA
3	C	202	GOL	O1-C1-C2-O2
3	H	201	GOL	O1-C1-C2-O2
2	E	201	HEM	C3D-CAD-CBD-CGD
3	A	202	GOL	O1-C1-C2-C3
3	A	204	GOL	C1-C2-C3-O3
3	C	202	GOL	O1-C1-C2-C3
3	D	202	GOL	C1-C2-C3-O3
3	G	203	GOL	C1-C2-C3-O3
3	G	204	GOL	O1-C1-C2-C3
3	A	202	GOL	O2-C2-C3-O3
3	A	204	GOL	O2-C2-C3-O3
3	B	201	GOL	O2-C2-C3-O3
3	G	202	GOL	O1-C1-C2-O2
3	G	202	GOL	O2-C2-C3-O3
3	G	204	GOL	O2-C2-C3-O3
3	I	203	GOL	O1-C1-C2-O2
3	I	203	GOL	O2-C2-C3-O3
3	K	204	GOL	O1-C1-C2-O2
3	N	201	GOL	O2-C2-C3-O3
3	O	202	GOL	O1-C1-C2-O2
2	C	201	HEM	C3D-CAD-CBD-CGD

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Mol	Chain	Res	Type	Atoms
2	G	201	HEM	C4D-C3D-CAD-CBD
2	C	201	HEM	C4B-C3B-CAB-CBB
3	C	202	GOL	O2-C2-C3-O3
3	I	202	GOL	O1-C1-C2-O2
3	I	205	GOL	O1-C1-C2-O2
3	A	203	GOL	O1-C1-C2-O2
3	G	203	GOL	O2-C2-C3-O3
2	G	201	HEM	C2D-C3D-CAD-CBD
2	M	201	HEM	C3D-CAD-CBD-CGD
3	K	202	GOL	O2-C2-C3-O3
2	I	201	HEM	C2A-CAA-CBA-CGA
2	A	201	HEM	C4B-C3B-CAB-CBB
2	E	201	HEM	C4B-C3B-CAB-CBB
2	G	201	HEM	C4B-C3B-CAB-CBB
2	G	201	HEM	C4C-C3C-CAC-CBC
2	I	201	HEM	C4B-C3B-CAB-CBB
2	I	201	HEM	C4C-C3C-CAC-CBC
2	K	201	HEM	C4B-C3B-CAB-CBB
2	M	201	HEM	C4B-C3B-CAB-CBB
2	O	201	HEM	C4B-C3B-CAB-CBB
3	J	201	GOL	O1-C1-C2-O2
3	D	202	GOL	O2-C2-C3-O3
2	E	201	HEM	C2A-CAA-CBA-CGA
2	A	201	HEM	CAA-CBA-CGA-O1A
2	O	201	HEM	CAD-CBD-CGD-O1D
3	I	204	GOL	O1-C1-C2-O2
2	I	201	HEM	CAA-CBA-CGA-O2A
2	A	201	HEM	CAA-CBA-CGA-O2A
2	C	201	HEM	CAD-CBD-CGD-O2D
2	I	201	HEM	CAA-CBA-CGA-O1A
2	M	201	HEM	CAD-CBD-CGD-O1D
2	M	201	HEM	CAD-CBD-CGD-O2D
2	C	201	HEM	CAD-CBD-CGD-O1D
2	O	201	HEM	CAD-CBD-CGD-O2D
2	E	201	HEM	CAA-CBA-CGA-O1A
2	E	201	HEM	CAA-CBA-CGA-O2A
2	E	201	HEM	CAD-CBD-CGD-O1D
2	G	201	HEM	CAA-CBA-CGA-O1A
2	E	201	HEM	CAD-CBD-CGD-O2D
2	G	201	HEM	CAA-CBA-CGA-O2A
2	A	201	HEM	CAD-CBD-CGD-O2D
2	C	201	HEM	CAA-CBA-CGA-O2A

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Mol	Chain	Res	Type	Atoms
2	K	201	HEM	CAD-CBD-CGD-O2D
2	C	201	HEM	CAA-CBA-CGA-O1A
2	G	201	HEM	CAD-CBD-CGD-O2D
2	I	201	HEM	CAD-CBD-CGD-O1D
2	K	201	HEM	CAA-CBA-CGA-O2A
2	A	201	HEM	CAD-CBD-CGD-O1D
3	D	201	GOL	O1-C1-C2-O2
2	K	201	HEM	CAA-CBA-CGA-O1A
2	G	201	HEM	CAD-CBD-CGD-O1D
2	K	201	HEM	CAD-CBD-CGD-O1D
2	I	201	HEM	CAD-CBD-CGD-O2D
2	K	201	HEM	C1A-C2A-CAA-CBA
2	O	201	HEM	C2D-C3D-CAD-CBD
2	O	201	HEM	C3D-CAD-CBD-CGD
2	K	201	HEM	C3A-C2A-CAA-CBA

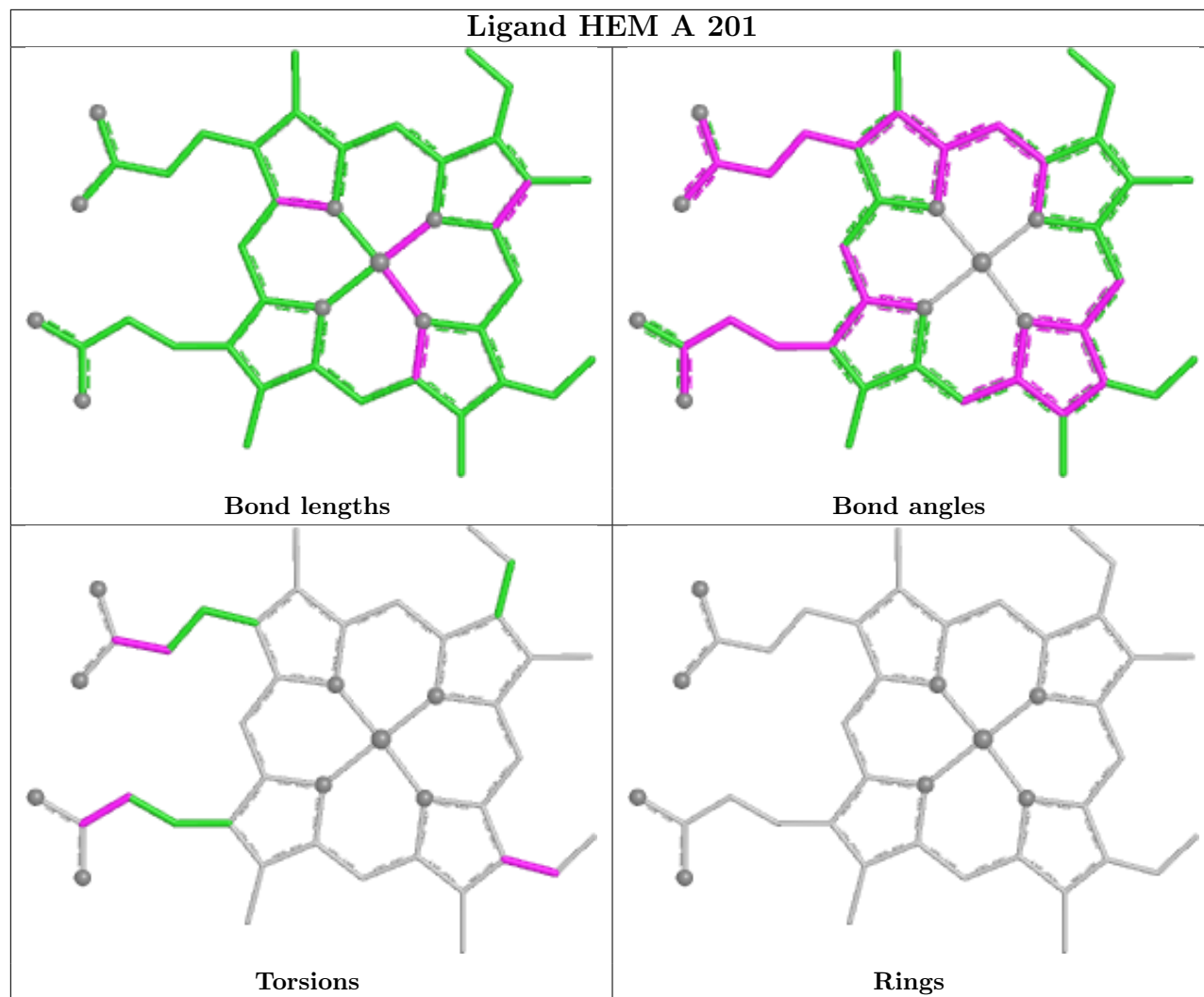
There are no ring outliers.

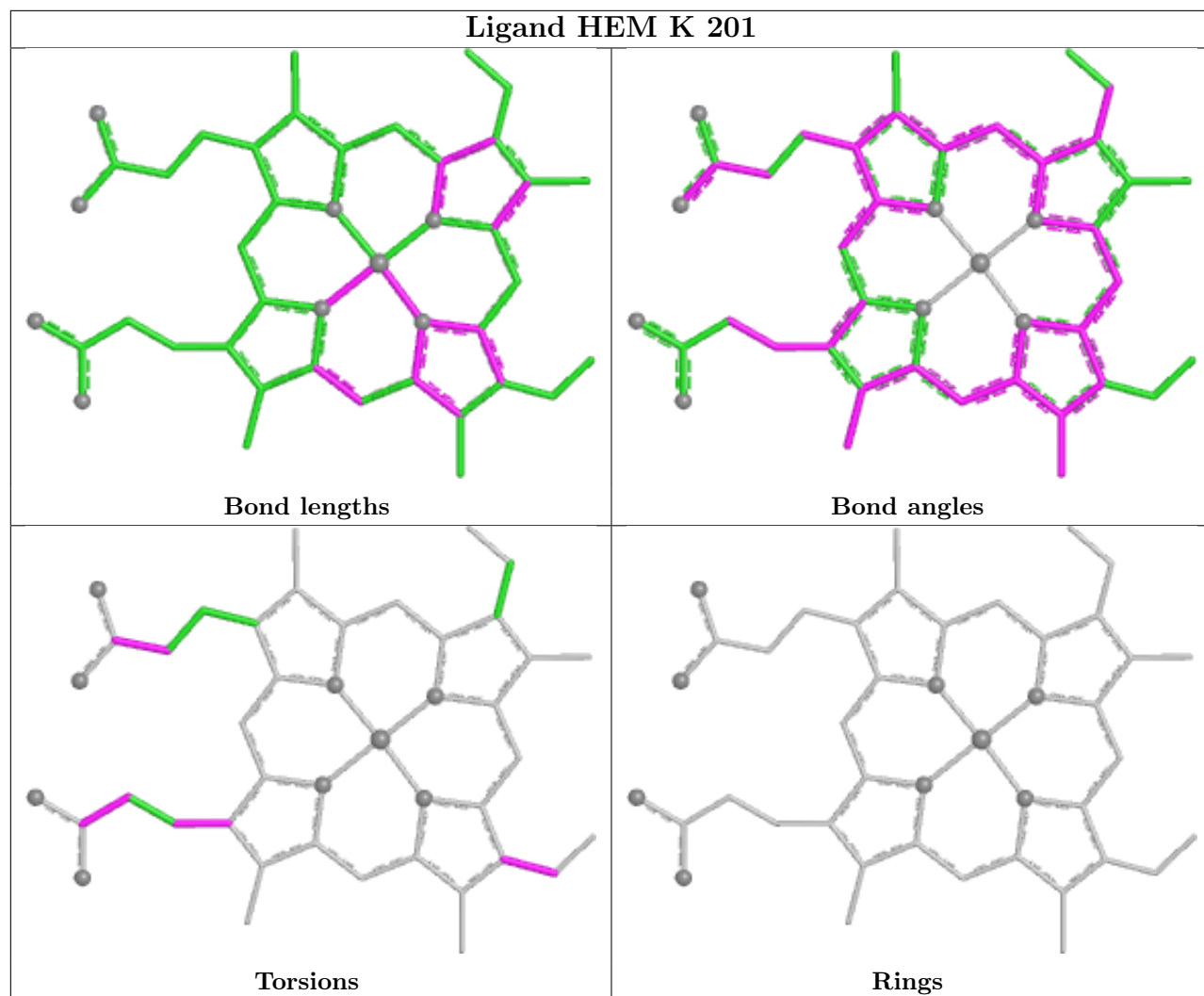
10 monomers are involved in 31 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	201	HEM	1	0
2	K	201	HEM	2	0
2	C	201	HEM	7	0
2	E	201	HEM	3	0
2	G	201	HEM	4	0
3	I	203	GOL	1	0
2	I	201	HEM	5	0
2	O	201	HEM	3	0
2	M	201	HEM	4	0
3	G	202	GOL	1	0

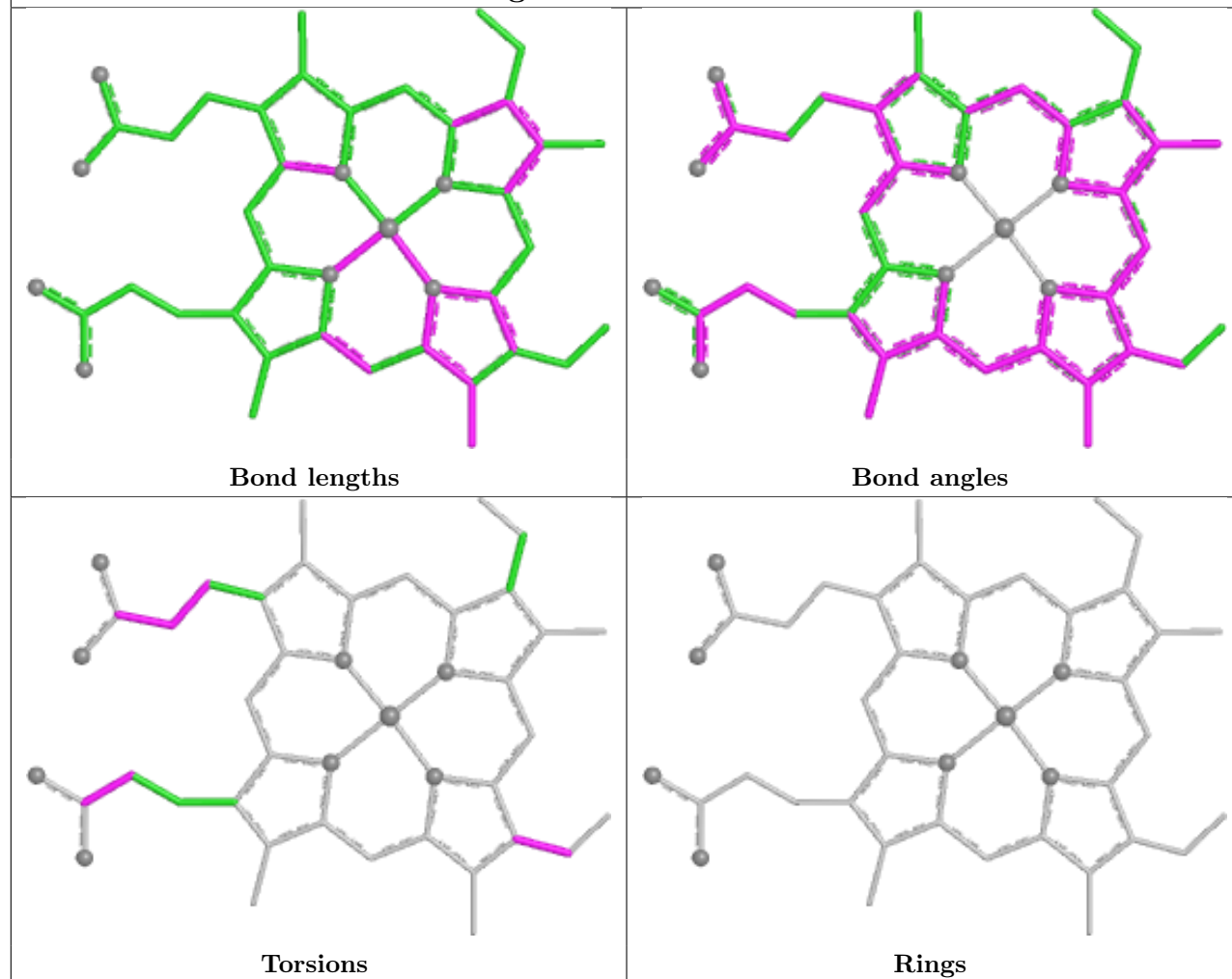
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

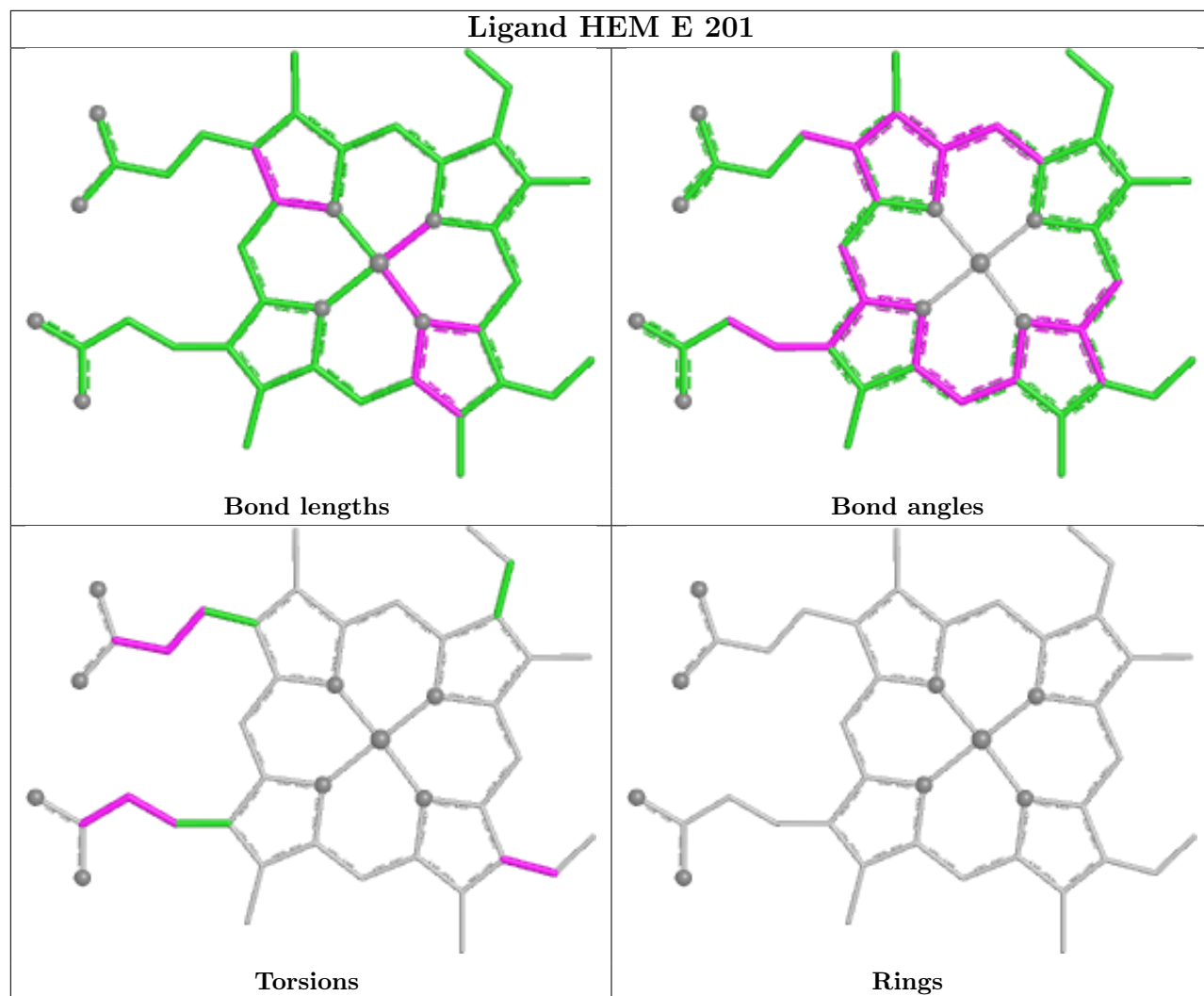
equivalents in the CSD to analyse the geometry.

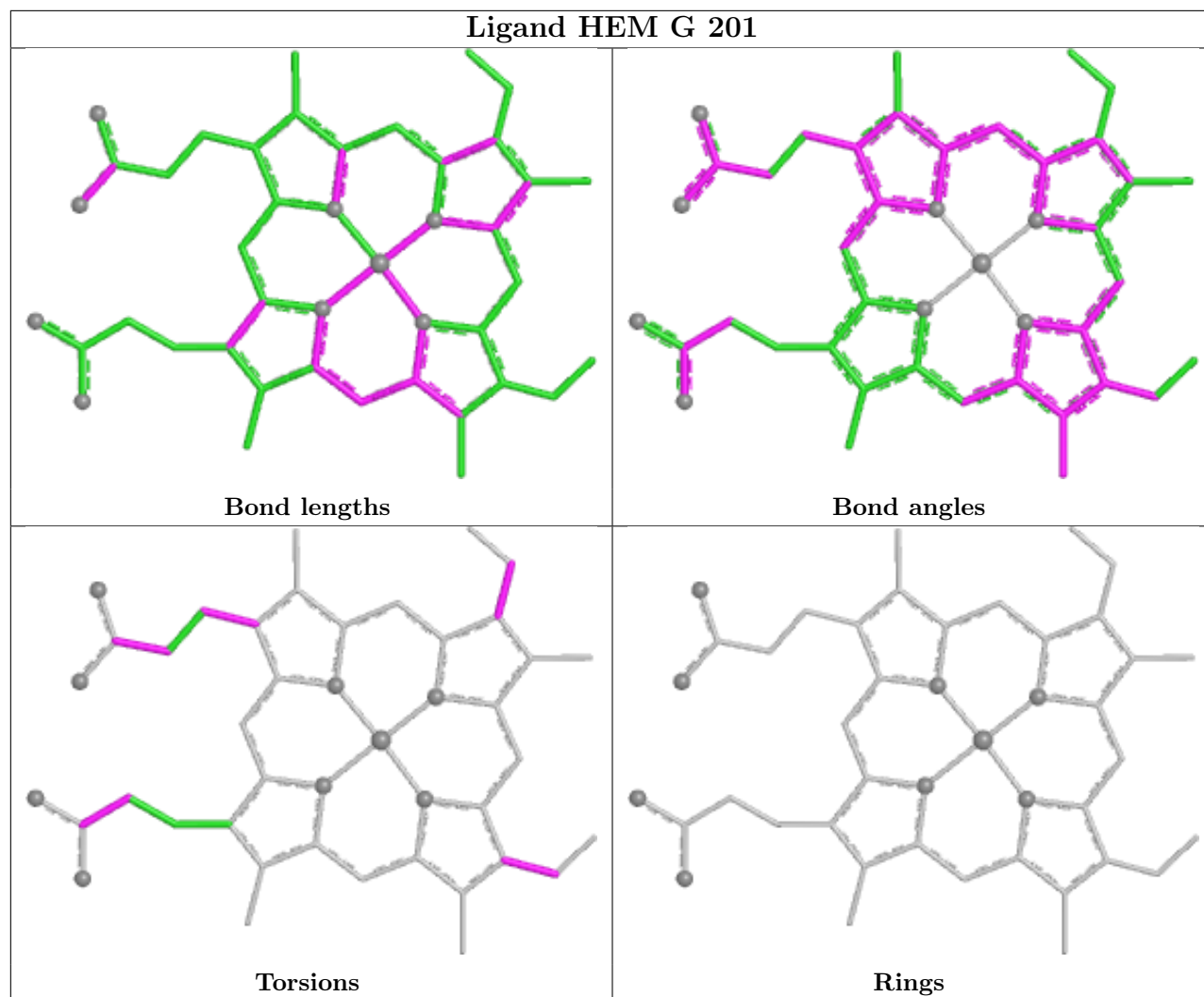




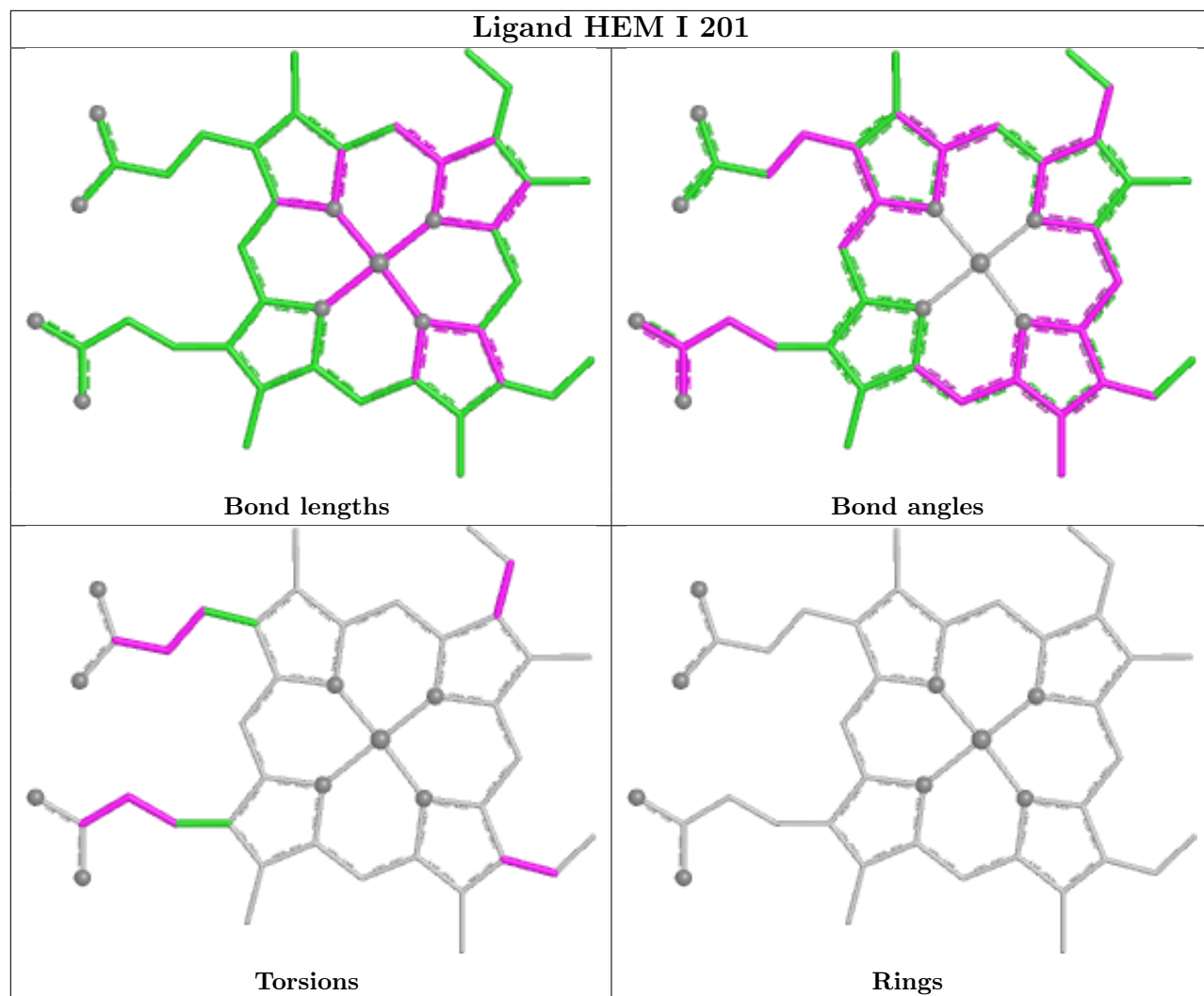
Ligand HEM C 201

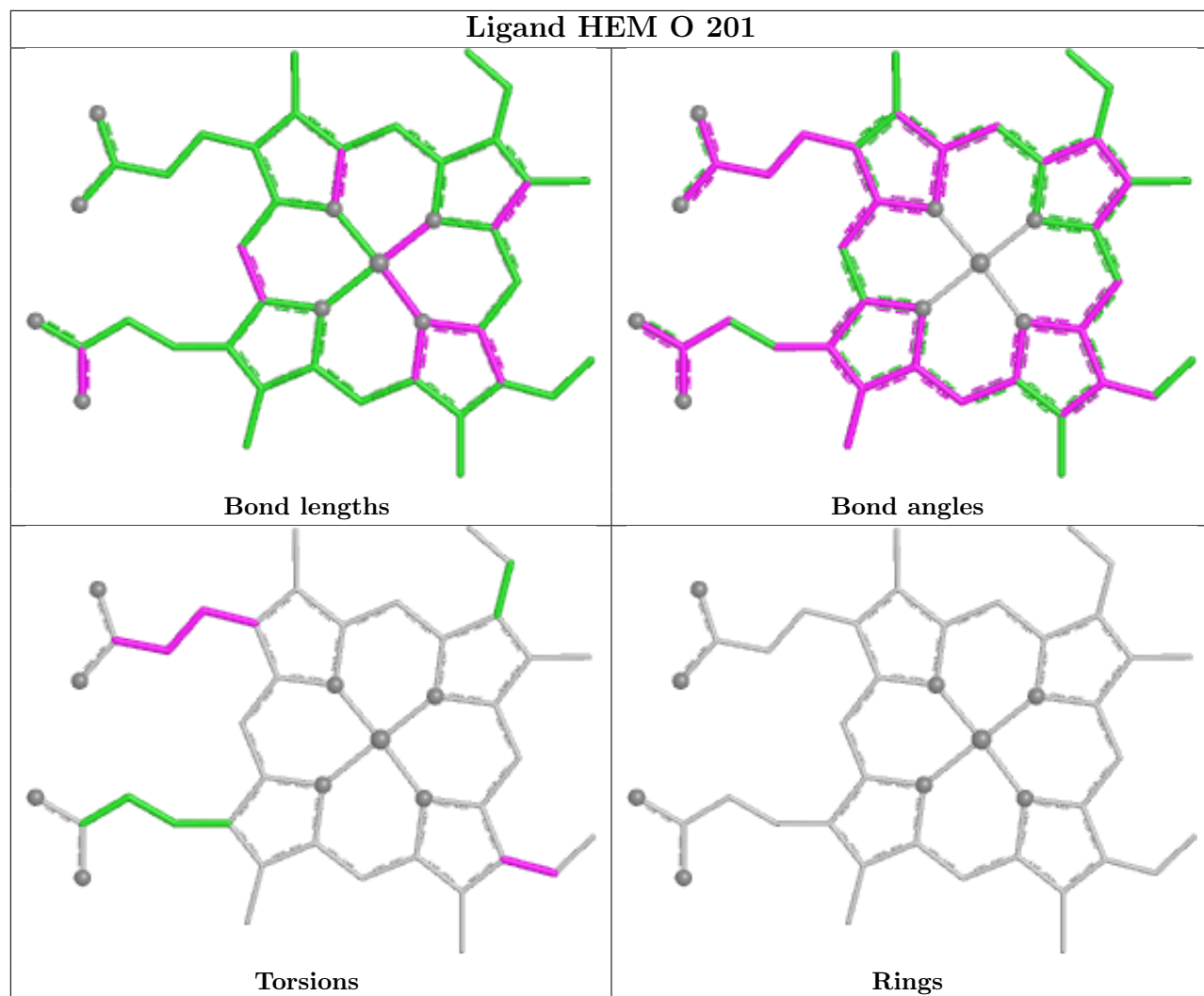


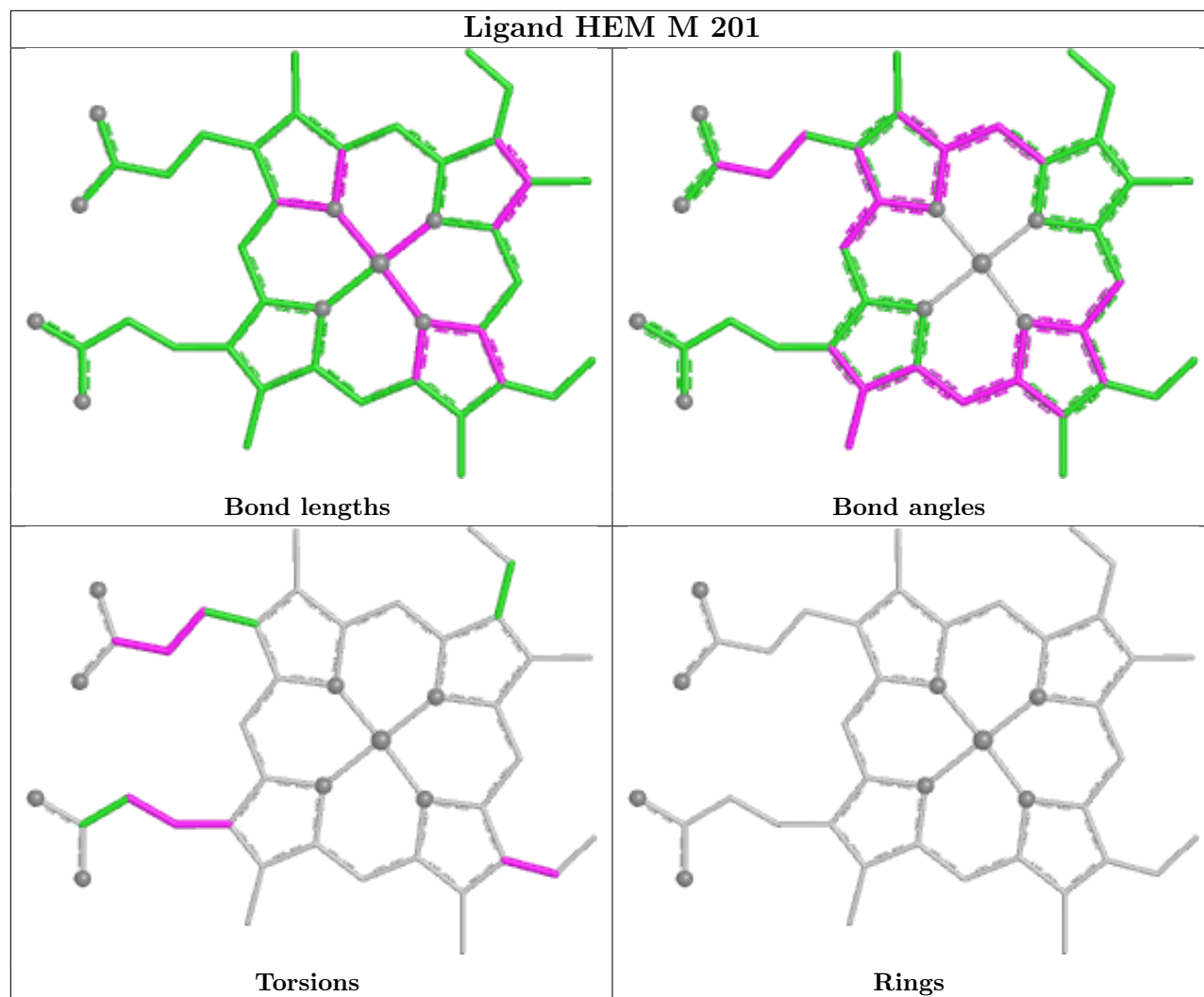




Ligand HEM I 201







5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ > 2	OWAB(Å ²)	Q < 0.9
1	A	138/147 (93%)	-0.17	1 (0%) 84 89	9, 16, 26, 36	0
1	B	138/147 (93%)	-0.00	2 (1%) 73 81	13, 20, 34, 51	0
1	C	138/147 (93%)	-0.20	2 (1%) 73 81	11, 15, 26, 48	0
1	D	138/147 (93%)	0.07	5 (3%) 46 56	11, 21, 36, 56	0
1	E	139/147 (94%)	-0.14	1 (0%) 84 89	10, 17, 31, 50	0
1	F	138/147 (93%)	0.02	2 (1%) 73 81	12, 19, 37, 59	0
1	G	138/147 (93%)	-0.15	1 (0%) 84 89	11, 17, 30, 41	0
1	H	138/147 (93%)	-0.11	3 (2%) 62 71	11, 17, 33, 50	0
1	I	138/147 (93%)	0.19	4 (2%) 53 63	12, 20, 38, 78	0
1	J	138/147 (93%)	0.28	3 (2%) 62 71	15, 24, 39, 63	0
1	K	138/147 (93%)	-0.10	2 (1%) 73 81	12, 17, 27, 44	0
1	L	138/147 (93%)	0.47	9 (6%) 25 33	16, 24, 43, 54	0
1	M	138/147 (93%)	0.38	6 (4%) 40 49	15, 25, 45, 54	0
1	N	138/147 (93%)	0.32	3 (2%) 62 71	15, 23, 44, 64	0
1	O	138/147 (93%)	0.12	2 (1%) 73 81	14, 21, 34, 54	0
1	P	138/147 (93%)	-0.03	2 (1%) 73 81	12, 18, 34, 60	0
All	All	2209/2352 (93%)	0.06	48 (2%) 62 71	9, 19, 38, 78	0

All (48) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	I	10	VAL	7.2
1	P	10	VAL	6.8
1	I	11	ALA	6.2
1	C	10	VAL	5.5
1	M	10	VAL	5.3

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Mol	Chain	Res	Type	RSRZ
1	F	10	VAL	4.9
1	D	10	VAL	4.4
1	O	10	VAL	4.3
1	L	10	VAL	4.3
1	J	10	VAL	4.2
1	H	10	VAL	4.1
1	N	10	VAL	3.9
1	F	146	HIS	3.9
1	K	10	VAL	3.7
1	B	10	VAL	3.2
1	A	10	VAL	3.0
1	G	10	VAL	3.0
1	L	143	VAL	2.9
1	H	143	VAL	2.6
1	D	142	ASN	2.6
1	M	11	ALA	2.6
1	L	140	ALA	2.5
1	M	142	ASN	2.5
1	L	141	ILE	2.5
1	L	144	GLY	2.5
1	K	146	HIS	2.5
1	M	139	ALA	2.5
1	P	143	VAL	2.5
1	M	143	VAL	2.4
1	L	139	ALA	2.3
1	N	115	ILE	2.3
1	L	11	ALA	2.2
1	D	113	ASP	2.2
1	H	142	ASN	2.2
1	N	146	HIS	2.2
1	I	114	GLY	2.2
1	J	146	HIS	2.1
1	D	139	ALA	2.1
1	J	11	ALA	2.1
1	E	9	PRO	2.1
1	M	146	HIS	2.1
1	O	140	ALA	2.1
1	I	115	ILE	2.0
1	C	75	THR	2.0
1	D	143	VAL	2.0
1	B	140	ALA	2.0
1	L	142	ASN	2.0

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Mol	Chain	Res	Type	RSRZ
1	L	22	ARG	2.0

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

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	GOL	I	202	6/6	0.75	0.19	30,36,39,46	0
3	GOL	A	203	6/6	0.76	0.17	31,32,36,38	0
3	GOL	I	204	6/6	0.76	0.16	33,44,47,51	0
3	GOL	A	204	6/6	0.83	0.14	44,45,50,50	0
4	NA	P	201	1/1	0.83	0.11	47,47,47,47	0
4	NA	J	204	1/1	0.86	0.14	45,45,45,45	0
4	NA	N	202	1/1	0.87	0.14	54,54,54,54	0
3	GOL	H	201	6/6	0.88	0.14	20,24,33,42	0
3	GOL	I	205	6/6	0.88	0.13	17,20,23,27	0
4	NA	A	206	1/1	0.88	0.15	54,54,54,54	0
3	GOL	J	201	6/6	0.89	0.11	28,30,32,35	0
3	GOL	N	201	6/6	0.89	0.12	26,29,34,43	0
3	GOL	G	203	6/6	0.89	0.11	33,40,41,42	0
3	GOL	C	202	6/6	0.90	0.10	21,25,26,26	0
3	GOL	P	202	6/6	0.90	0.09	21,21,26,37	0
3	GOL	O	202	6/6	0.91	0.09	25,27,30,30	0
2	HEM	I	201	43/43	0.91	0.16	32,46,64,69	0
3	GOL	D	201	6/6	0.91	0.09	23,25,29,33	0
4	NA	G	205	1/1	0.91	0.16	46,46,46,46	0
3	GOL	G	202	6/6	0.91	0.11	28,34,36,40	0
3	GOL	K	203	6/6	0.91	0.09	30,32,34,34	0
3	GOL	I	203	6/6	0.91	0.12	22,35,46,48	0

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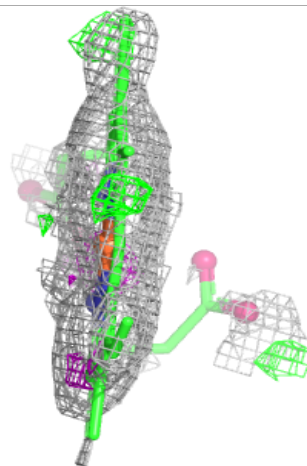
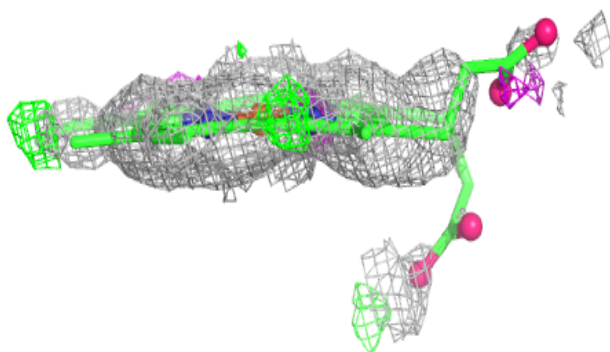
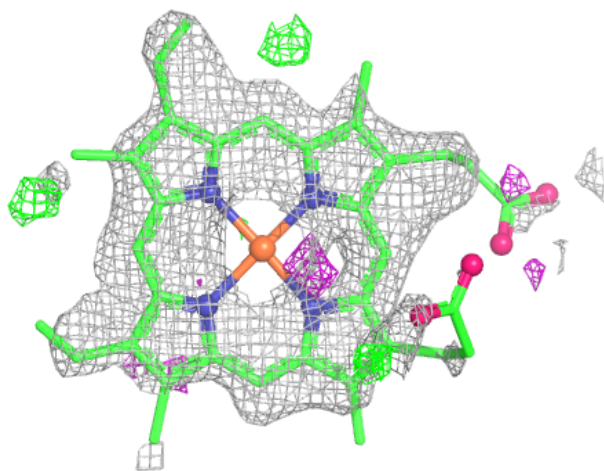
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
5	CL	C	203	1/1	0.91	0.11	54,54,54,54	0
2	HEM	M	201	43/43	0.92	0.14	37,45,63,68	0
4	NA	H	204	1/1	0.92	0.07	37,37,37,37	0
4	NA	I	206	1/1	0.92	0.16	51,51,51,51	0
4	NA	J	202	1/1	0.92	0.11	47,47,47,47	0
3	GOL	B	201	6/6	0.92	0.12	19,22,30,46	0
3	GOL	K	202	6/6	0.92	0.11	25,29,34,39	0
4	NA	A	205	1/1	0.92	0.15	45,45,45,45	0
3	GOL	F	201	6/6	0.92	0.10	22,23,27,37	0
6	MG	H	202	1/1	0.92	0.16	31,31,31,31	0
6	MG	P	203	1/1	0.92	0.11	32,32,32,32	0
3	GOL	A	202	6/6	0.93	0.08	18,20,20,20	0
4	NA	D	203	1/1	0.93	0.08	41,41,41,41	0
3	GOL	D	202	6/6	0.93	0.09	21,35,38,43	0
4	NA	H	203	1/1	0.93	0.10	49,49,49,49	0
3	GOL	E	202	6/6	0.93	0.09	18,21,27,29	0
3	GOL	G	204	6/6	0.93	0.11	18,21,35,49	0
4	NA	I	208	1/1	0.93	0.08	46,46,46,46	0
4	NA	E	203	1/1	0.94	0.12	48,48,48,48	0
4	NA	B	202	1/1	0.94	0.13	46,46,46,46	0
5	CL	J	203	1/1	0.94	0.12	48,48,48,48	0
4	NA	M	203	1/1	0.94	0.08	40,40,40,40	0
2	HEM	E	201	43/43	0.94	0.12	26,34,58,69	0
4	NA	M	204	1/1	0.95	0.12	47,47,47,47	0
2	HEM	A	201	43/43	0.95	0.10	25,32,59,62	0
2	HEM	C	201	43/43	0.95	0.11	21,28,42,57	0
2	HEM	K	201	43/43	0.95	0.11	21,28,41,44	0
5	CL	D	204	1/1	0.95	0.09	46,46,46,46	0
4	NA	F	202	1/1	0.95	0.12	45,45,45,45	0
3	GOL	K	204	6/6	0.95	0.08	21,24,25,26	0
3	GOL	M	202	6/6	0.95	0.07	21,24,27,32	0
2	HEM	O	201	43/43	0.96	0.10	19,26,36,39	0
4	NA	L	201	1/1	0.96	0.07	44,44,44,44	0
5	CL	I	207	1/1	0.96	0.06	40,40,40,40	0
2	HEM	G	201	43/43	0.97	0.08	16,22,34,39	0

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

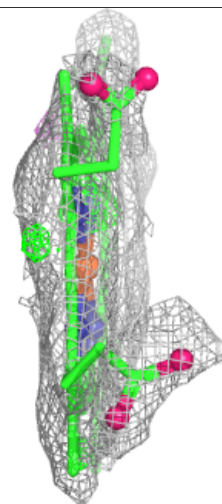
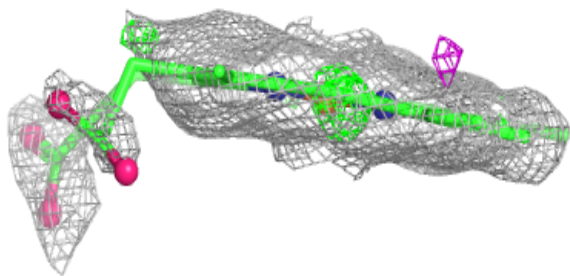
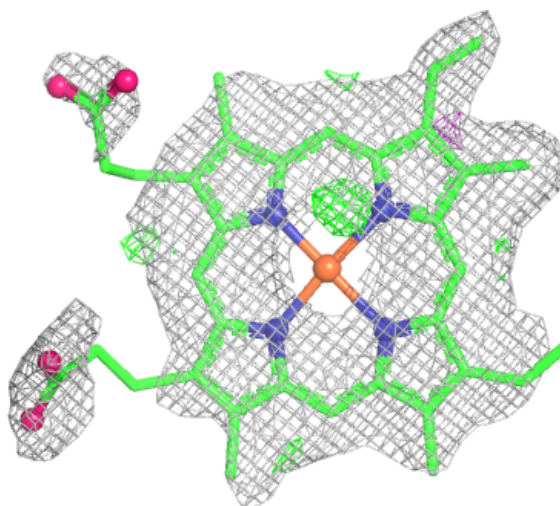
Electron density around HEM I 201:

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



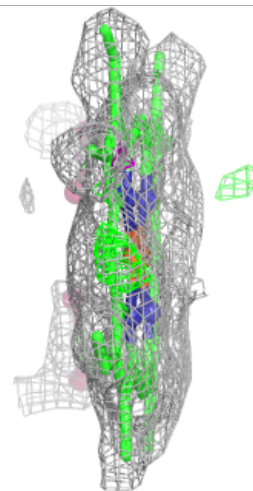
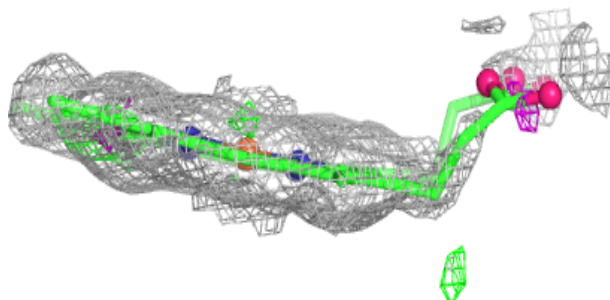
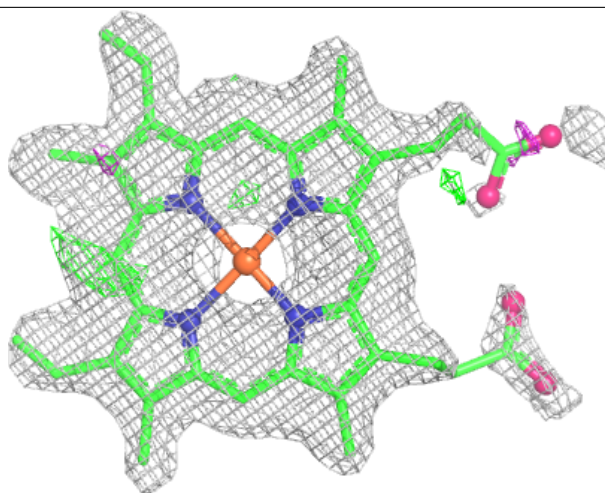
Electron density around HEM M 201:

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and green (positive)



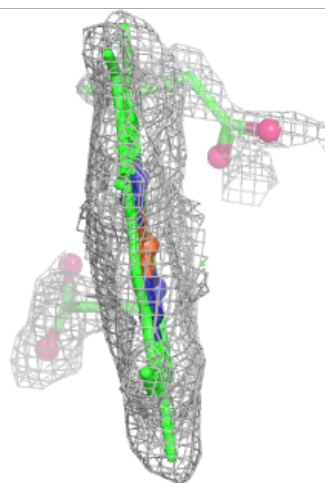
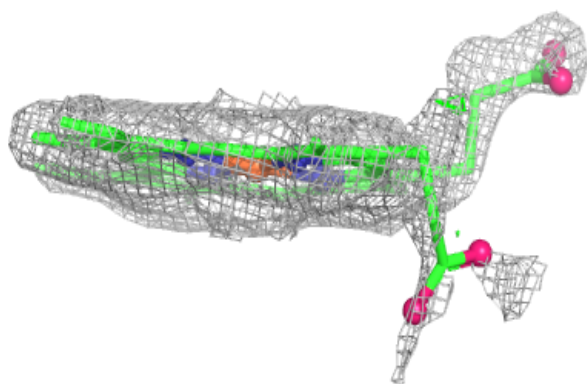
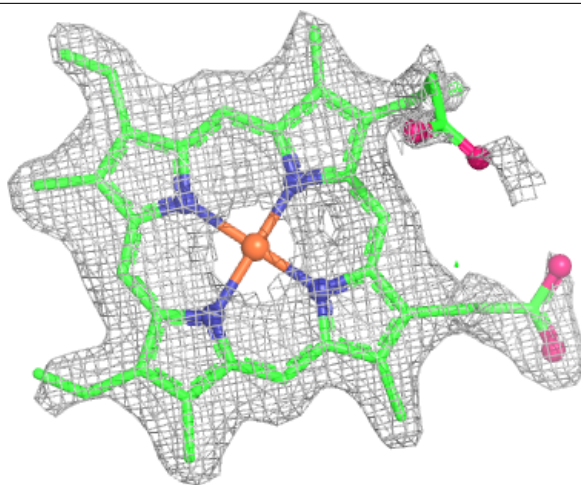
Electron density around HEM E 201:

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



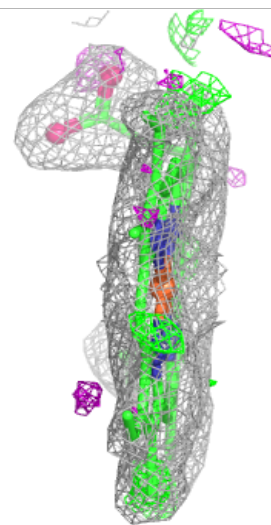
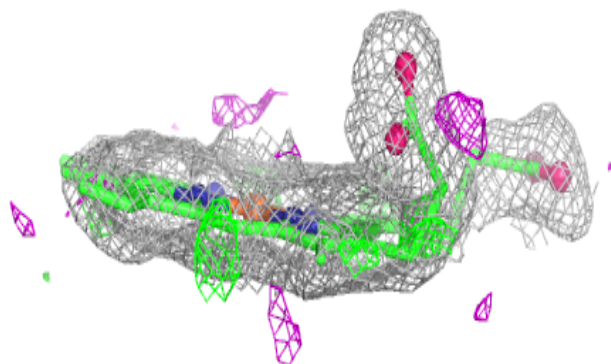
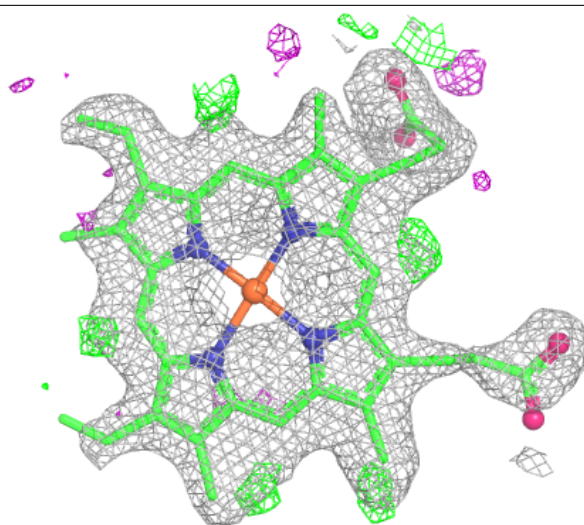
Electron density around HEM A 201:

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and green (positive)



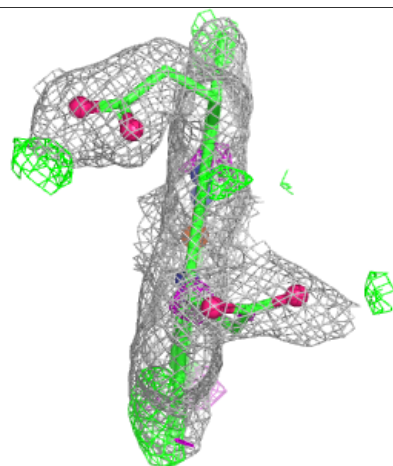
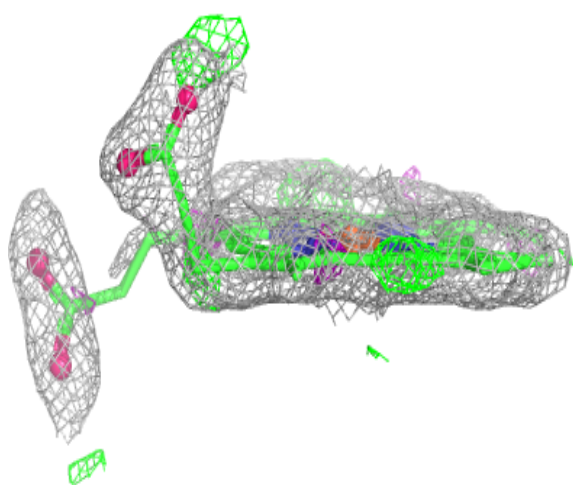
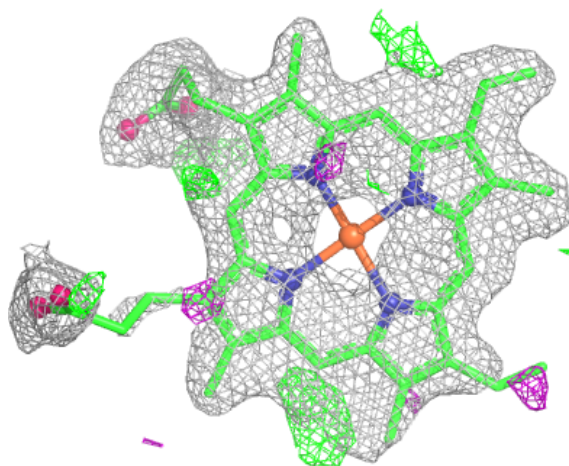
Electron density around HEM C 201:

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



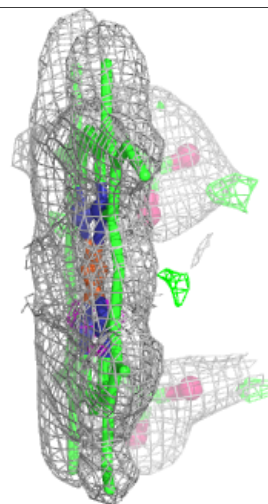
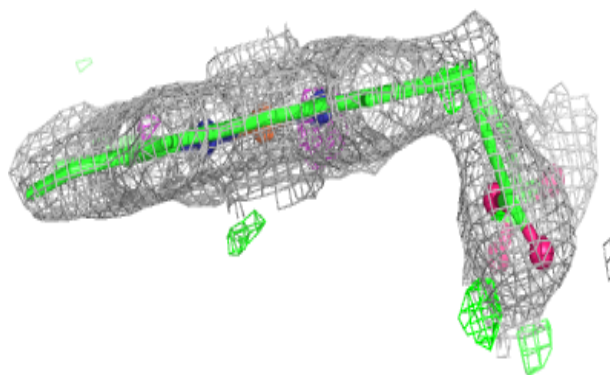
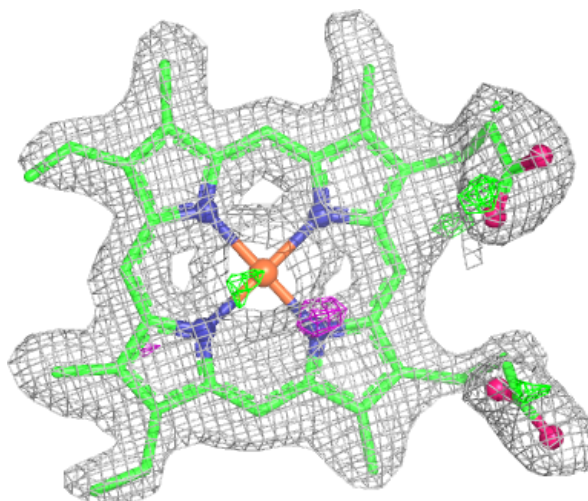
Electron density around HEM K 201:

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



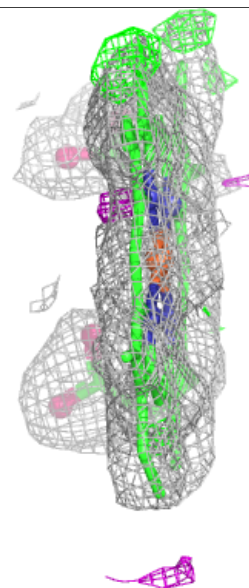
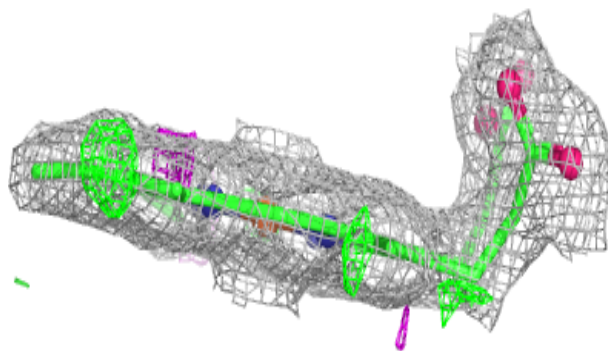
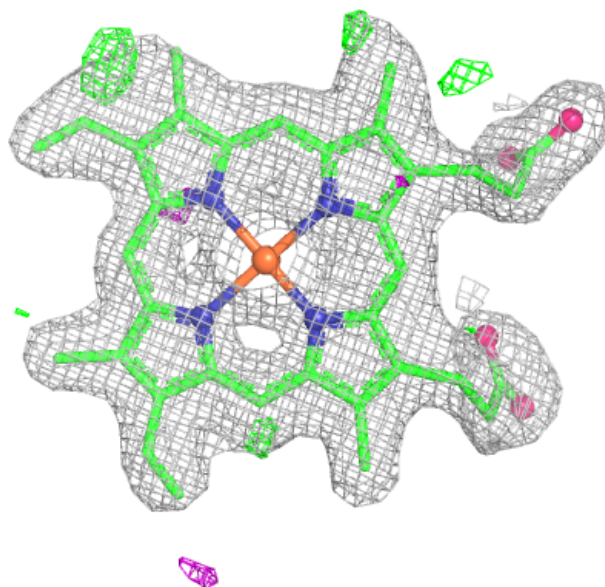
Electron density around HEM O 201:

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



Electron density around HEM G 201:

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



6.5 Other polymers ⓘ

There are no such residues in this entry.