WORLDWIDE PDB
PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Aug 8, 2023 – 05:46 AM EDT

PDB ID	:	1P80
Title	:	Crystal structure of the D181Q variant of catalase HPII from E. coli
Authors	:	Chelikani, P.; Carpena, X.; Fita, I.; Loewen, P.C.
Deposited on	:	2003-05-06
Resolution	:	1.65 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 (i) 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 (i)) were used in the production of this report:

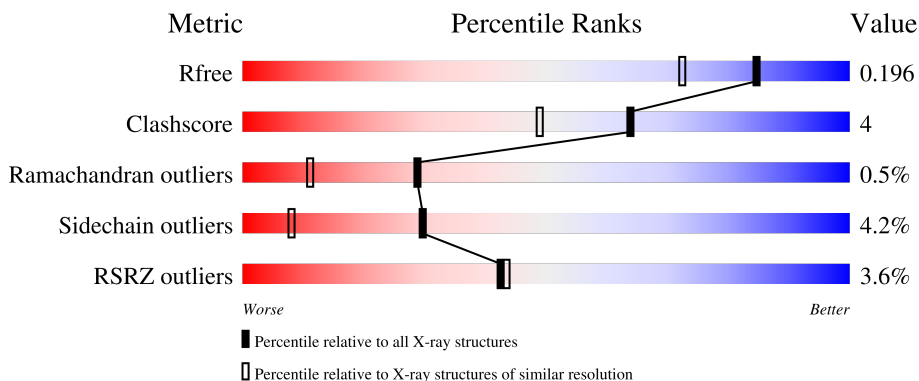|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35

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 1.65 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	Percentile Ranks	Value
Rfree		0.196
Clashscore		4
Ramachandran outliers		0.5%
Sidechain outliers		4.2%
RSRZ outliers		3.6%

Worse — *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1827 (1.66-1.66)
Clashscore	141614	1931 (1.66-1.66)
Ramachandran outliers	138981	1891 (1.66-1.66)
Sidechain outliers	138945	1891 (1.66-1.66)
RSRZ outliers	127900	1791 (1.66-1.66)

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 <=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	753	2% · 86% · 9% · ·
1	B	753	5% · 84% · 11% · ·
1	C	753	5% · 83% · 12% · ·
1	D	753	2% · 83% · 12% · · ·

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2 Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 26401 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 Catalase HPII.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	727	Total	C	N	O	S	0	1	0
			5752	3651	1008	1081	12			
1	B	727	Total	C	N	O	S	0	1	0
			5752	3651	1008	1081	12			
1	C	727	Total	C	N	O	S	0	1	0
			5752	3651	1008	1081	12			
1	D	727	Total	C	N	O	S	0	1	0
			5752	3651	1008	1081	12			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	181	GLN	ASP	engineered mutation	UNP P21179
B	181	GLN	ASP	engineered mutation	UNP P21179
C	181	GLN	ASP	engineered mutation	UNP P21179
D	181	GLN	ASP	engineered mutation	UNP P21179

- Molecule 2 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula: $C_{34}H_{32}FeN_4O_4$).

HEM

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
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	D	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	858	Total	O	0	0
			858	858		
3	B	740	Total	O	0	0
			740	740		
3	C	782	Total	O	0	0
			782	782		
3	D	841	Total	O	0	0
			841	841		

3 Residue-property plots ⓘ

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: Catalase HPII

Chain A:

- Molecule 1: Catalase HPII

Chain B:

- Molecule 1: Catalase HPII

Chain C:

MET SER GLN HIS ASN GLU LYS ASN PRO HIS GLN HIS GLN SER PRO LEU HIS ASP SER SER GLU ALA LYS PRO GLY MET D27 S28 E32 R37 Q48 D59 T60 R61 S75 E76 N77 R111 H116 E120 R121 R125 I126 V127 H128 Y137 D155 P156

I159 T168 F185 T191 I195 I205 F206 F207 H219 K222 P223 W227 D237 T249 L250 H251 N252 R267 I274 R278 K309 R320 D330 L359 R369 L375 N376 R377 H392 P393 D401 Y415 T416 I420 P436 T437

C438 P439 Y440 F443 Q444 R445 N459 P470 K478 R488 H507 P508 T516 P517 R521 L531 L552 Q556 D568 D569 Q570 L571 N572 D578 L582 K583 K584 P594 D595 G596 L606 E610 V611 R612 L616 L617 A618 K626 H629 A630

K631 L632 L633 R636 T641 A642 D643 D644 G645 T646 V647 L648 L660 C669 A673 A676 D677 N678 A681 L685 K703 F704 K705 A706 T707 I708 K709 I710 A711 D712 Q713 G714 A724 D725 G726 L733 I745 P746 K747 I748 D749 K750 I751 P752 A753

• Molecule 1: Catalase HPII

Chain D:

2%

83%   12%

MET SER GLN HIS ASN GLU LYS ASN PRO HIS GLN HIS GLN SER PRO LEU HIS ASP SER SER GLU ALA LYS PRO GLY MET D27 S28 E32 D33 R37 P38 E41 Q48 A51 P52 R61 N66 K73 G74 S75 R87 R96 R100 R111 H116

H119 E120 R125 I126 V127 H128 A129 R130 L144 T168 R183 G184 F185 T191 I205 A211 H212 K213 K222 P223 W227 D237 L245 N252 R267 I274 R278 D330 L340 E344 L359 V370 L375 N376 R377 H392 T403

N404 D405 G410 Y415 I420 P426 Y440 F443 H449 N459 N468 W469 P470 E490 H507 P508 R509 T516 P517 R521 V535 R536 P537 Q546 L552 T553 L554 D568 L571 T574 P577 D578 I582 K583 K584 I593 P594 D595

G596 D597 V598 V602 R612 D615 L616 V628 H629 L633 L648 V662 D677 K703 I710 A711 D712 Q713 E716 D722 R740 R744 K747 I748 D749 K750 I751 P752 A753

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	93.76Å 133.13Å 122.50Å 90.00° 109.50° 90.00°	Depositor
Resolution (Å)	29.80 – 1.65 21.98 – 1.65	Depositor EDS
% Data completeness (in resolution range)	96.0 (29.80-1.65) 95.5 (21.98-1.65)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	0.11	Depositor
$< I/\sigma(I) >$ [1]	2.10 (at 1.65Å)	Xtriage
Refinement program	REFMAC	Depositor
R, R_{free}	0.168 , 0.202 0.166 , 0.196	Depositor DCC
R_{free} test set	16400 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å^2)	16.2	Xtriage
Anisotropy	0.258	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 52.5	EDS
L-test for twinning[2]	$< |L| > = 0.50, < L^2 > = 0.34$	Xtriage
Estimated twinning fraction	0.014 for h,-k,-h-l	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	26401	wwPDB-VP
Average B, all atoms (Å^2)	20.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.69% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.

[2]Theoretical values of $< |L| >$, $< L^2 >$ 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: 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	0.45	0/5914	1.07	19/8041 (0.2%)
1	B	0.43	0/5914	1.05	13/8041 (0.2%)
1	C	0.44	0/5914	1.07	15/8041 (0.2%)
1	D	0.45	0/5914	1.12	25/8041 (0.3%)
All	All	0.44	0/23656	1.08	72/32164 (0.2%)

There are no bond length outliers.

All (72) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	377	ARG	NE-CZ-NH2	-10.95	114.82	120.30
1	C	415	TYR	CB-CG-CD1	-10.82	114.51	121.00
1	D	278	ARG	NE-CZ-NH1	-9.39	115.60	120.30
1	D	612	ARG	CD-NE-CZ	9.15	136.41	123.60
1	C	445	ARG	NE-CZ-NH1	9.14	124.87	120.30
1	A	377	ARG	NE-CZ-NH2	-8.59	116.00	120.30
1	C	278	ARG	NE-CZ-NH1	-7.92	116.34	120.30
1	A	37	ARG	NE-CZ-NH2	-7.87	116.36	120.30
1	C	59	ASP	CB-CG-OD1	7.86	125.37	118.30
1	B	290	ARG	NE-CZ-NH2	-7.84	116.38	120.30
1	C	415	TYR	CB-CG-CD2	7.80	125.68	121.00
1	B	521	ARG	NE-CZ-NH1	7.75	124.18	120.30
1	C	125	ARG	NE-CZ-NH1	7.61	124.10	120.30
1	D	96	ARG	NE-CZ-NH2	-7.54	116.53	120.30
1	D	740	ARG	NE-CZ-NH1	7.46	124.03	120.30
1	D	521	ARG	NE-CZ-NH2	7.32	123.96	120.30
1	B	445	ARG	NE-CZ-NH1	7.27	123.93	120.30
1	D	100	ARG	CD-NE-CZ	7.10	133.54	123.60
1	D	183	ARG	NE-CZ-NH2	7.04	123.82	120.30
1	D	612	ARG	NE-CZ-NH2	6.93	123.77	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	726	GLY	N-CA-C	-6.88	95.89	113.10
1	D	130	ARG	NE-CZ-NH2	-6.80	116.90	120.30
1	A	509	ARG	NE-CZ-NH1	6.78	123.69	120.30
1	A	130	ARG	NE-CZ-NH2	-6.63	116.98	120.30
1	B	111	ARG	NE-CZ-NH1	-6.59	117.00	120.30
1	A	37	ARG	CD-NE-CZ	6.56	132.78	123.60
1	A	278	ARG	NE-CZ-NH1	-6.54	117.03	120.30
1	A	369	ARG	NE-CZ-NH2	6.51	123.56	120.30
1	D	568	ASP	CB-CG-OD2	6.43	124.08	118.30
1	D	61	ARG	NE-CZ-NH2	6.40	123.50	120.30
1	D	449	HIS	CA-CB-CG	6.19	124.12	113.60
1	D	96	ARG	NE-CZ-NH1	6.11	123.36	120.30
1	B	278	ARG	NE-CZ-NH2	-6.09	117.25	120.30
1	A	233	GLN	CG-CD-OE1	6.01	133.61	121.60
1	C	320	ARG	NE-CZ-NH2	-5.99	117.31	120.30
1	B	28	SER	N-CA-CB	5.96	119.44	110.50
1	A	542	ARG	NE-CZ-NH2	-5.94	117.33	120.30
1	C	121	ARG	NE-CZ-NH1	5.89	123.25	120.30
1	D	377	ARG	NH1-CZ-NH2	5.86	125.85	119.40
1	D	615	ASP	CB-CG-OD2	5.86	123.57	118.30
1	C	401	ASP	CB-CG-OD2	5.82	123.54	118.30
1	D	61	ARG	NE-CZ-NH1	-5.82	117.39	120.30
1	A	740	ARG	NE-CZ-NH1	5.78	123.19	120.30
1	A	278	ARG	NE-CZ-NH2	5.57	123.08	120.30
1	A	636	ARG	NE-CZ-NH2	5.57	123.08	120.30
1	D	509	ARG	NE-CZ-NH1	5.56	123.08	120.30
1	D	87	ARG	NE-CZ-NH1	5.53	123.07	120.30
1	C	320	ARG	NE-CZ-NH1	5.51	123.05	120.30
1	D	125	ARG	NE-CZ-NH2	-5.47	117.56	120.30
1	C	111	ARG	NE-CZ-NH1	-5.47	117.57	120.30
1	B	111	ARG	NH1-CZ-NH2	5.46	125.41	119.40
1	D	740	ARG	NE-CZ-NH2	-5.44	117.58	120.30
1	B	111	ARG	NE-CZ-NH2	-5.43	117.58	120.30
1	C	377	ARG	NE-CZ-NH1	-5.41	117.59	120.30
1	C	636	ARG	NE-CZ-NH2	5.39	122.99	120.30
1	B	96	ARG	NE-CZ-NH2	-5.36	117.62	120.30
1	B	61	ARG	NE-CZ-NH2	5.36	122.98	120.30
1	B	485	TYR	CB-CG-CD1	-5.34	117.79	121.00
1	A	37	ARG	NE-CZ-NH1	5.34	122.97	120.30
1	B	740	ARG	NE-CZ-NH2	-5.34	117.63	120.30
1	D	722	ASP	CB-CG-OD1	5.31	123.08	118.30
1	D	677	ASP	CB-CG-OD2	5.26	123.04	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	722	ASP	CB-CG-OD2	5.24	123.01	118.30
1	A	401	ASP	CB-CG-OD2	5.23	123.01	118.30
1	A	259	ASP	CB-CG-OD2	5.23	123.00	118.30
1	A	440	TYR	N-CA-CB	5.13	119.84	110.60
1	D	403	THR	N-CA-CB	5.13	120.04	110.30
1	A	631	LYS	N-CA-CB	5.08	119.75	110.60
1	B	445	ARG	NE-CZ-NH2	-5.06	117.77	120.30
1	A	170	GLN	CG-CD-NE2	5.05	128.83	116.70
1	C	725	ASP	N-CA-CB	5.05	119.70	110.60
1	D	582	LEU	CA-CB-CG	5.01	126.83	115.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	5752	0	5585	44	0
1	B	5752	0	5585	64	0
1	C	5752	0	5585	50	0
1	D	5752	0	5585	50	0
2	A	43	0	30	1	0
2	B	43	0	30	2	0
2	C	43	0	30	1	0
2	D	43	0	30	1	0
3	A	858	0	0	2	0
3	B	740	0	0	6	0
3	C	782	0	0	7	0
3	D	841	0	0	8	0
All	All	26401	0	22460	190	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 4.

All (190) 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:B:392[B]:HIS:ND1	1:B:415:TYR:HB2	1.16	1.49
1:A:392[B]:HIS:ND1	1:A:415:TYR:HB2	1.30	1.41
1:D:392[B]:HIS:ND1	1:D:415:TYR:HB2	1.50	1.26
1:C:392[B]:HIS:ND1	1:C:415:TYR:HB2	1.47	1.25
1:B:392[B]:HIS:ND1	1:B:415:TYR:CB	2.00	1.22
1:B:392[B]:HIS:CE1	1:B:415:TYR:HB2	1.73	1.22
1:A:392[B]:HIS:ND1	1:A:415:TYR:CB	2.17	1.08
1:A:392[B]:HIS:CE1	1:A:415:TYR:HB2	2.01	0.96
1:D:750:LYS:HD3	1:D:751:ILE:H	1.42	0.85
1:B:552:LEU:HD22	1:B:556:GLN:HG3	1.70	0.74
1:D:392[B]:HIS:CE1	1:D:415:TYR:HB2	2.24	0.73
1:B:612:ARG:HD3	1:B:670:GLY:HA2	1.70	0.73
1:A:682:ASN:HB3	1:A:707:THR:HG21	1.71	0.72
1:D:744:ARG:HA	1:D:747:LYS:HD3	1.73	0.71
1:B:710:ILE:HD13	1:B:718:ILE:HG13	1.76	0.68
1:C:392[B]:HIS:CE1	1:C:415:TYR:HB2	2.27	0.68
1:C:708:ILE:HG13	1:C:710:ILE:HG12	1.76	0.67
1:C:552:LEU:HD21	1:C:571:LEU:HD12	1.78	0.66
1:A:748:ILE:O	1:A:751:ILE:HG13	1.96	0.65
1:C:583:LYS:O	1:C:584:LYS:HB3	1.96	0.65
1:C:267:ARG:HG3	3:C:3862:HOH:O	1.98	0.65
1:D:111:ARG:HB3	3:D:3414:HOH:O	1.95	0.64
1:D:267:ARG:HG3	3:D:2871:HOH:O	1.98	0.63
1:D:27:ASP:O	1:D:28:SER:HB2	1.97	0.63
1:D:552:LEU:HD11	1:D:571:LEU:HD23	1.82	0.62
1:A:28:SER:HB2	1:D:245:LEU:HD13	1.82	0.62
1:B:583:LYS:H	1:B:583:LYS:NZ	1.97	0.61
1:A:709:LYS:HA	1:A:709:LYS:HE3	1.83	0.61
1:C:392[B]:HIS:ND1	1:C:415:TYR:CB	2.43	0.61
1:C:704:PHE:O	1:C:707:THR:HG22	2.01	0.61
1:B:583:LYS:O	1:B:584:LYS:HB3	2.01	0.60
1:B:144:LEU:HD11	1:B:370:VAL:HG13	1.83	0.60
1:B:468:ASN:HD22	1:D:27:ASP:N	1.99	0.60
1:B:27:ASP:OD2	1:D:468:ASN:ND2	2.30	0.60
1:C:748:ILE:O	1:C:751:ILE:HG22	2.02	0.59
1:D:61:ARG:HH11	1:D:66:ASN:HA	1.69	0.58
1:A:144:LEU:HD11	1:A:370:VAL:HG13	1.86	0.57
1:A:27:ASP:O	1:A:28:SER:C	2.42	0.57
1:B:267:ARG:HG3	3:B:2872:HOH:O	2.03	0.57
1:C:137:TYR:HB2	1:C:159:ILE:CD1	2.34	0.57
1:C:274:ILE:HD12	2:C:760:HEM:HMB1	1.87	0.56
1:B:330:ASP:OD1	1:B:629:HIS:HE1	1.90	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:521:ARG:HH21	1:B:745:ILE:HG21	1.72	0.55
1:B:51:ALA:HB1	1:B:52:PRO:HD2	1.89	0.54
1:D:330:ASP:OD1	1:D:629:HIS:HE1	1.91	0.54
1:A:36:HIS:CD2	1:A:36:HIS:H	2.25	0.53
1:B:359:LEU:H	1:B:507:HIS:HD2	1.55	0.53
1:B:521:ARG:HH21	1:B:745:ILE:HD13	1.73	0.53
1:D:359:LEU:H	1:D:507:HIS:HD2	1.56	0.53
1:C:610:GLU:OE1	1:C:643:ASP:HA	2.08	0.53
1:C:416:THR:HA	3:C:4199:HOH:O	2.08	0.53
1:A:751:ILE:O	1:A:751:ILE:HD12	2.09	0.53
1:D:222:LYS:HB3	1:D:223:PRO:HD2	1.91	0.53
1:B:392[B]:HIS:CE1	1:B:415:TYR:CB	2.68	0.52
1:B:535:VAL:O	1:B:537:PRO:HD3	2.10	0.52
1:D:274:ILE:HD12	2:D:760:HEM:HMB1	1.91	0.52
1:D:748:ILE:O	1:D:751:ILE:HG22	2.10	0.52
1:D:535:VAL:O	1:D:537:PRO:HD3	2.09	0.52
1:A:689:TYR:OH	1:A:710:ILE:HG21	2.10	0.51
1:C:330:ASP:OD1	1:C:629:HIS:HE1	1.93	0.51
1:C:578:ASP:HB2	1:C:582:LEU:O	2.09	0.51
1:B:438:CYS:HB2	1:B:439:PRO:HD2	1.91	0.51
1:D:598:VAL:HG13	1:D:628:VAL:CG2	2.41	0.51
1:B:748:ILE:O	1:B:751:ILE:HG22	2.11	0.51
1:B:521:ARG:NH2	1:B:745:ILE:HG21	2.26	0.51
1:A:222:LYS:HB3	1:A:223:PRO:HD2	1.93	0.50
1:B:578:ASP:HB3	1:B:582:LEU:O	2.11	0.50
1:C:309:LYS:HB3	1:C:660:LEU:HD21	1.93	0.50
1:B:552:LEU:HD21	1:B:571:LEU:HD12	1.94	0.50
1:C:745:ILE:HD13	3:C:3866:HOH:O	2.10	0.50
1:C:222:LYS:HB3	1:C:223:PRO:HD2	1.93	0.49
1:B:416:THR:HG21	3:D:3414:HOH:O	2.11	0.49
1:B:37:ARG:HD2	3:B:3832:HOH:O	2.12	0.49
1:A:583:LYS:O	1:A:584:LYS:HB3	2.12	0.49
3:B:1589:HOH:O	1:D:73:LYS:HD2	2.11	0.49
1:A:29:LEU:HD22	3:C:3355:HOH:O	2.12	0.49
1:C:443:PHE:CZ	1:C:470:PRO:HD2	2.47	0.49
1:B:126:ILE:CD1	1:C:120:GLU:HB2	2.43	0.49
1:C:631:LYS:HG3	1:C:633:LEU:HD13	1.95	0.49
1:B:195:ILE:HD11	1:B:436:PRO:HA	1.95	0.49
1:A:37:ARG:HA	1:A:38:PRO:HD3	1.75	0.48
1:D:629:HIS:HD2	3:D:2510:HOH:O	1.96	0.48
1:A:612:ARG:HH11	1:A:669:CYS:CB	2.27	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:51:ALA:HB1	1:D:52:PRO:HD2	1.96	0.48
1:A:750:LYS:O	1:A:750:LYS:HE3	2.14	0.48
1:D:359:LEU:H	1:D:507:HIS:CD2	2.32	0.48
1:A:29:LEU:HD13	3:C:3355:HOH:O	2.13	0.48
1:A:128:HIS:HA	1:A:168:THR:O	2.14	0.48
1:A:443:PHE:CZ	1:A:470:PRO:HD2	2.48	0.48
1:C:137:TYR:HB2	1:C:159:ILE:HD13	1.96	0.48
1:D:546:GLN:HG3	3:D:3688:HOH:O	2.13	0.47
1:A:459:ASN:ND2	1:B:219:HIS:HB3	2.30	0.47
1:D:577:PRO:HG2	3:D:4041:HOH:O	2.14	0.47
1:A:274:ILE:HD12	2:A:760:HEM:HMB1	1.96	0.47
1:A:28:SER:CB	1:D:245:LEU:HD22	2.45	0.47
1:A:335:GLU:OE1	1:A:369:ARG:HD3	2.14	0.47
1:B:222:LYS:HB3	1:B:223:PRO:HD2	1.97	0.47
1:A:395:HIS:HE1	3:A:4187:HOH:O	1.98	0.46
1:B:745:ILE:O	1:B:748:ILE:HG12	2.14	0.46
1:C:626:LYS:HG3	1:C:733:LEU:HG	1.95	0.46
1:A:612:ARG:HE	1:A:669:CYS:HB3	1.80	0.46
1:D:583:LYS:O	1:D:584:LYS:HB3	2.16	0.46
1:C:751:ILE:HG13	1:C:752:PRO:HD2	1.98	0.46
1:A:711:ALA:HB3	3:A:4038:HOH:O	2.16	0.45
1:B:36:HIS:H	1:B:36:HIS:HD1	1.63	0.45
1:B:119:HIS:CE1	1:D:420:ILE:HG21	2.52	0.45
1:B:459:ASN:H	1:B:459:ASN:HD22	1.65	0.45
1:B:521:ARG:NH2	1:B:745:ILE:HD13	2.31	0.45
1:B:274:ILE:HD12	2:B:760:HEM:HMB1	1.98	0.45
1:A:120:GLU:HB2	1:D:126:ILE:CD1	2.46	0.45
1:B:251:HIS:CE1	1:B:507:HIS:HB3	2.52	0.45
1:D:128:HIS:HA	1:D:168:THR:O	2.17	0.45
1:D:443:PHE:CZ	1:D:470:PRO:HD2	2.52	0.45
1:D:578:ASP:HB3	1:D:582:LEU:O	2.16	0.45
1:B:507:HIS:N	1:B:508:PRO:CD	2.80	0.45
1:A:126:ILE:CD1	1:D:120:GLU:HB2	2.47	0.44
1:D:37:ARG:HA	1:D:38:PRO:HD3	1.85	0.44
1:B:128:HIS:HA	1:B:168:THR:O	2.17	0.44
1:D:574:THR:HG22	3:D:2568:HOH:O	2.16	0.44
1:A:696:ALA:HB1	1:A:728:PHE:CZ	2.52	0.44
1:B:521:ARG:HD3	3:B:3992:HOH:O	2.17	0.44
1:A:278:ARG:HH12	1:A:487:GLU:CD	2.21	0.44
1:A:38:PRO:HG2	1:A:51:ALA:HB2	1.99	0.44
1:B:359:LEU:H	1:B:507:HIS:CD2	2.33	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:690:LYS:HG3	1:A:751:ILE:HD11	1.98	0.44
1:B:426:PRO:HB2	1:D:116:HIS:CD2	2.53	0.44
1:C:552:LEU:HD22	1:C:556:GLN:HG3	1.99	0.44
1:C:438:CYS:HB2	1:C:439:PRO:HD2	1.99	0.44
1:C:251:HIS:CE1	1:C:507:HIS:HB3	2.53	0.44
1:D:516:THR:HB	1:D:517:PRO:HD2	2.00	0.44
1:A:126:ILE:HD11	1:D:120:GLU:HB2	2.00	0.43
1:B:344:GLU:H	1:B:344:GLU:CD	2.20	0.43
1:B:411:ARG:HG2	2:B:760:HEM:C2C	2.53	0.43
1:D:144:LEU:HD11	1:D:370:VAL:HG13	2.00	0.43
1:A:426:PRO:HB2	1:C:116:HIS:CD2	2.53	0.43
1:B:603:VAL:HG11	1:B:666:ILE:HD12	2.00	0.43
1:B:120:GLU:HB2	1:C:126:ILE:CD1	2.49	0.43
1:D:703:LYS:HE2	3:D:3690:HOH:O	2.18	0.43
1:C:219:HIS:HB3	1:D:459:ASN:ND2	2.34	0.43
1:B:420:ILE:HG21	1:D:119:HIS:CE1	2.53	0.43
1:B:710:ILE:CD1	1:B:718:ILE:HG13	2.46	0.43
1:B:392[B]:HIS:ND1	1:B:415:TYR:HB3	2.16	0.43
1:B:682:ASN:HB3	1:B:707:THR:HG21	2.00	0.43
1:C:359:LEU:H	1:C:507:HIS:CD2	2.37	0.43
1:C:392[A]:HIS:ND1	1:C:393:PRO:HD2	2.34	0.43
1:C:618:ALA:HB1	1:C:725:ASP:HB2	2.01	0.43
1:C:359:LEU:H	1:C:507:HIS:HD2	1.67	0.42
1:D:211:ALA:CB	1:D:410:GLY:HA3	2.49	0.42
1:C:195:ILE:HD11	1:C:436:PRO:HA	2.02	0.42
1:C:207:PHE:O	1:C:249:THR:HA	2.19	0.42
1:D:404:ASN:O	1:D:405:ASP:C	2.57	0.42
1:B:267:ARG:HG2	1:B:332:PRO:HB3	2.01	0.42
1:A:612:ARG:HH11	1:A:669:CYS:HB2	1.84	0.42
1:B:331:PHE:HA	1:B:332:PRO:HD3	1.92	0.42
1:B:669:CYS:SG	1:B:670:GLY:N	2.93	0.42
1:C:128:HIS:HA	1:C:168:THR:O	2.19	0.42
1:C:516:THR:HB	1:C:517:PRO:HD2	2.02	0.42
1:B:207:PHE:O	1:B:249:THR:HA	2.20	0.42
1:B:498:SER:HA	1:B:499:PRO:HD3	1.93	0.42
1:C:48:GLN:NE2	3:C:4048:HOH:O	2.53	0.42
1:D:521:ARG:HH11	1:D:521:ARG:HD3	1.65	0.42
1:B:552:LEU:CD2	1:B:556:GLN:HG3	2.45	0.41
1:C:610:GLU:O	1:C:610:GLU:HG3	2.20	0.41
1:D:602:VAL:HG13	1:D:662:VAL:HA	2.01	0.41
1:A:251:HIS:CE1	1:A:507:HIS:HB3	2.55	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:378:ASN:HB3	1:A:379:PRO:HD2	2.02	0.41
1:B:27:ASP:HB3	3:B:3519:HOH:O	2.20	0.41
1:B:416:THR:HA	3:B:4196:HOH:O	2.19	0.41
1:C:745:ILE:N	1:C:746:PRO:HD2	2.35	0.41
1:A:119:HIS:CE1	1:C:420:ILE:HG21	2.56	0.41
1:B:37:ARG:HA	1:B:38:PRO:HD3	1.88	0.41
1:B:443:PHE:CZ	1:B:470:PRO:HD2	2.55	0.41
1:A:457:PRO:HG2	1:C:37:ARG:HH21	1.86	0.41
1:C:76:GLU:O	1:C:77:ASN:HB2	2.19	0.41
1:C:155:ASP:HA	1:C:156:PRO:HD2	1.93	0.41
1:D:61:ARG:NH1	1:D:66:ASN:HA	2.33	0.41
1:D:750:LYS:HD3	1:D:751:ILE:N	2.22	0.40
1:A:512:TRP:CH2	1:A:520:GLN:HB3	2.56	0.40
1:C:507:HIS:N	1:C:508:PRO:CD	2.83	0.40
1:D:593:ILE:HA	1:D:594:PRO:HD2	1.94	0.40
1:A:97:ALA:O	1:A:101:GLY:HA3	2.22	0.40
1:B:144:LEU:HD11	1:B:370:VAL:CG1	2.50	0.40
1:B:364:LEU:HD11	1:B:580:ASN:HB2	2.04	0.40
1:C:678:ASN:HB3	1:C:681:ALA:HB3	2.03	0.40
1:B:116:HIS:CD2	1:D:426:PRO:HB2	2.55	0.40
1:C:222:LYS:HB3	1:C:223:PRO:CD	2.51	0.40
1:C:507:HIS:N	1:C:508:PRO:HD2	2.36	0.40
1:C:747:LYS:HE2	3:C:3968:HOH:O	2.21	0.40
1:A:211:ALA:CB	1:A:410:GLY:HA3	2.52	0.40
1:B:507:HIS:N	1:B:508:PRO:HD2	2.36	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	726/753 (96%)	705 (97%)	17 (2%)	4 (1%)	25	8

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	726/753 (96%)	710 (98%)	12 (2%)	4 (1%)	25	8
1	C	726/753 (96%)	710 (98%)	14 (2%)	2 (0%)	41	22
1	D	726/753 (96%)	708 (98%)	14 (2%)	4 (1%)	25	8
All	All	2904/3012 (96%)	2833 (98%)	57 (2%)	14 (0%)	29	11

All (14) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	28	SER
1	B	725	ASP
1	D	28	SER
1	D	751	ILE
1	A	28	SER
1	A	709	LYS
1	D	750	LYS
1	A	711	ALA
1	B	584	LYS
1	A	75	SER
1	C	584	LYS
1	C	75	SER
1	B	75	SER
1	D	75	SER

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	613/636 (96%)	596 (97%)	17 (3%)	43	18
1	B	613/636 (96%)	590 (96%)	23 (4%)	33	10
1	C	613/636 (96%)	579 (94%)	34 (6%)	21	4
1	D	613/636 (96%)	581 (95%)	32 (5%)	23	5
All	All	2452/2544 (96%)	2346 (96%)	106 (4%)	30	7

All (106) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	73	LYS
1	A	185	PHE
1	A	191	THR
1	A	205	ILE
1	A	227	TRP
1	A	237	ASP
1	A	252	ASN
1	A	375	LEU
1	A	392[A]	HIS
1	A	392[B]	HIS
1	A	440	TYR
1	A	459	ASN
1	A	552	LEU
1	A	707	THR
1	A	709	LYS
1	A	712	ASP
1	A	750	LYS
1	B	27	ASP
1	B	37	ARG
1	B	185	PHE
1	B	191	THR
1	B	205	ILE
1	B	227	TRP
1	B	247	PRO
1	B	252	ASN
1	B	344	GLU
1	B	375	LEU
1	B	392[A]	HIS
1	B	392[B]	HIS
1	B	440	TYR
1	B	459	ASN
1	B	552	LEU
1	B	562	LEU
1	B	565	GLU
1	B	568	ASP
1	B	571	LEU
1	B	583	LYS
1	B	612	ARG
1	B	633	LEU
1	B	751	ILE
1	C	37	ARG
1	C	61	ARG

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Mol	Chain	Res	Type
1	C	159	ILE
1	C	185	PHE
1	C	191	THR
1	C	205	ILE
1	C	227	TRP
1	C	237	ASP
1	C	252	ASN
1	C	369	ARG
1	C	375	LEU
1	C	377	ARG
1	C	392[A]	HIS
1	C	392[B]	HIS
1	C	415	TYR
1	C	440	TYR
1	C	459	ASN
1	C	478	LYS
1	C	488	ARG
1	C	521	ARG
1	C	531	LEU
1	C	568	ASP
1	C	571	LEU
1	C	584	LYS
1	C	606	LEU
1	C	612	ARG
1	C	616	LEU
1	C	633	LEU
1	C	648	LEU
1	C	660	LEU
1	C	685	LEU
1	C	709	LYS
1	C	733	LEU
1	C	750	LYS
1	D	28	SER
1	D	41	GLU
1	D	48	GLN
1	D	185	PHE
1	D	191	THR
1	D	205	ILE
1	D	213	LYS
1	D	227	TRP
1	D	237	ASP
1	D	252	ASN

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Mol	Chain	Res	Type
1	D	340	LEU
1	D	344	GLU
1	D	375	LEU
1	D	392[A]	HIS
1	D	392[B]	HIS
1	D	415	TYR
1	D	440	TYR
1	D	459	ASN
1	D	490	GLU
1	D	552	LEU
1	D	554	LEU
1	D	574	THR
1	D	582	LEU
1	D	598	VAL
1	D	616	LEU
1	D	633	LEU
1	D	648	LEU
1	D	713	GLN
1	D	747	LYS
1	D	749	ASP
1	D	750	LYS
1	D	751	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (25) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	36	HIS
1	A	252	ASN
1	A	459	ASN
1	A	515	GLN
1	A	713	GLN
1	B	252	ASN
1	B	459	ASN
1	B	507	HIS
1	B	629	HIS
1	C	252	ASN
1	C	459	ASN
1	C	507	HIS
1	C	556	GLN
1	C	572	ASN
1	C	629	HIS
1	C	671	ASN

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Mol	Chain	Res	Type
1	D	48	GLN
1	D	252	ASN
1	D	449	HIS
1	D	459	ASN
1	D	507	HIS
1	D	556	GLN
1	D	629	HIS
1	D	671	ASN
1	D	713	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

4 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	B	760	1	41,50,50	1.52	6 (14%)	45,82,82	1.51	9 (20%)
2	HEM	C	760	1	41,50,50	1.49	4 (9%)	45,82,82	1.29	6 (13%)
2	HEM	D	760	1	41,50,50	1.47	5 (12%)	45,82,82	1.28	6 (13%)
2	HEM	A	760	1	41,50,50	1.47	5 (12%)	45,82,82	1.36	6 (13%)

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	B	760	1	-	4/12/54/54	-
2	HEM	C	760	1	-	2/12/54/54	-
2	HEM	D	760	1	-	2/12/54/54	-
2	HEM	A	760	1	-	4/12/54/54	-

All (20) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	760	HEM	C3C-C2C	-4.70	1.33	1.40
2	A	760	HEM	C3C-C2C	-4.65	1.33	1.40
2	D	760	HEM	C3C-C2C	-4.56	1.34	1.40
2	C	760	HEM	C3C-C2C	-4.54	1.34	1.40
2	B	760	HEM	C3C-CAC	3.22	1.54	1.47
2	D	760	HEM	C3C-CAC	3.17	1.54	1.47
2	A	760	HEM	C3C-CAC	3.14	1.54	1.47
2	C	760	HEM	C3C-CAC	3.11	1.54	1.47
2	C	760	HEM	CAB-C3B	2.98	1.55	1.47
2	B	760	HEM	CAB-C3B	2.52	1.54	1.47
2	D	760	HEM	CAB-C3B	2.51	1.54	1.47
2	A	760	HEM	CAB-C3B	2.49	1.54	1.47
2	A	760	HEM	CMD-C2D	2.24	1.55	1.50
2	B	760	HEM	CAA-C2A	2.22	1.55	1.52
2	B	760	HEM	CMB-C2B	2.22	1.55	1.50
2	D	760	HEM	CMD-C2D	2.11	1.55	1.50
2	D	760	HEM	CMB-C2B	2.06	1.55	1.50
2	C	760	HEM	CAA-C2A	2.05	1.55	1.52
2	A	760	HEM	CMB-C2B	2.05	1.55	1.50
2	B	760	HEM	CMD-C2D	2.01	1.55	1.50

All (27) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	760	HEM	CMA-C3A-C4A	-3.80	122.62	128.46
2	B	760	HEM	CMA-C3A-C4A	-3.52	123.05	128.46
2	D	760	HEM	CMA-C3A-C4A	-3.27	123.44	128.46
2	B	760	HEM	O2D-CGD-O1D	3.23	131.34	123.30
2	A	760	HEM	O1D-CGD-CBD	-3.04	113.30	123.08
2	B	760	HEM	O2A-CGA-O1A	2.94	130.63	123.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	D	760	HEM	O2A-CGA-O1A	2.89	130.51	123.30
2	C	760	HEM	O1D-CGD-CBD	-2.88	113.84	123.08
2	B	760	HEM	CMC-C2C-C3C	2.87	130.05	124.68
2	B	760	HEM	O1D-CGD-CBD	-2.86	113.89	123.08
2	A	760	HEM	CMA-C3A-C2A	2.85	130.31	124.94
2	B	760	HEM	O1A-CGA-CBA	-2.69	114.42	123.08
2	B	760	HEM	CMA-C3A-C2A	2.61	129.87	124.94
2	C	760	HEM	O1A-CGA-CBA	-2.61	114.70	123.08
2	A	760	HEM	O2A-CGA-O1A	2.53	129.61	123.30
2	C	760	HEM	C4C-CHD-C1D	2.52	125.89	122.56
2	D	760	HEM	C4B-CHC-C1C	2.44	125.78	122.56
2	C	760	HEM	O2A-CGA-O1A	2.44	129.37	123.30
2	B	760	HEM	C4C-CHD-C1D	2.42	125.75	122.56
2	D	760	HEM	O1A-CGA-CBA	-2.42	115.32	123.08
2	D	760	HEM	CMA-C3A-C2A	2.41	129.48	124.94
2	B	760	HEM	CAA-CBA-CGA	-2.40	107.03	113.76
2	D	760	HEM	CAA-CBA-CGA	-2.25	107.45	113.76
2	A	760	HEM	CMC-C2C-C3C	2.21	128.81	124.68
2	C	760	HEM	CMC-C2C-C3C	2.18	128.76	124.68
2	A	760	HEM	O1A-CGA-CBA	-2.13	116.25	123.08
2	C	760	HEM	CMA-C3A-C4A	-2.07	125.28	128.46

There are no chirality outliers.
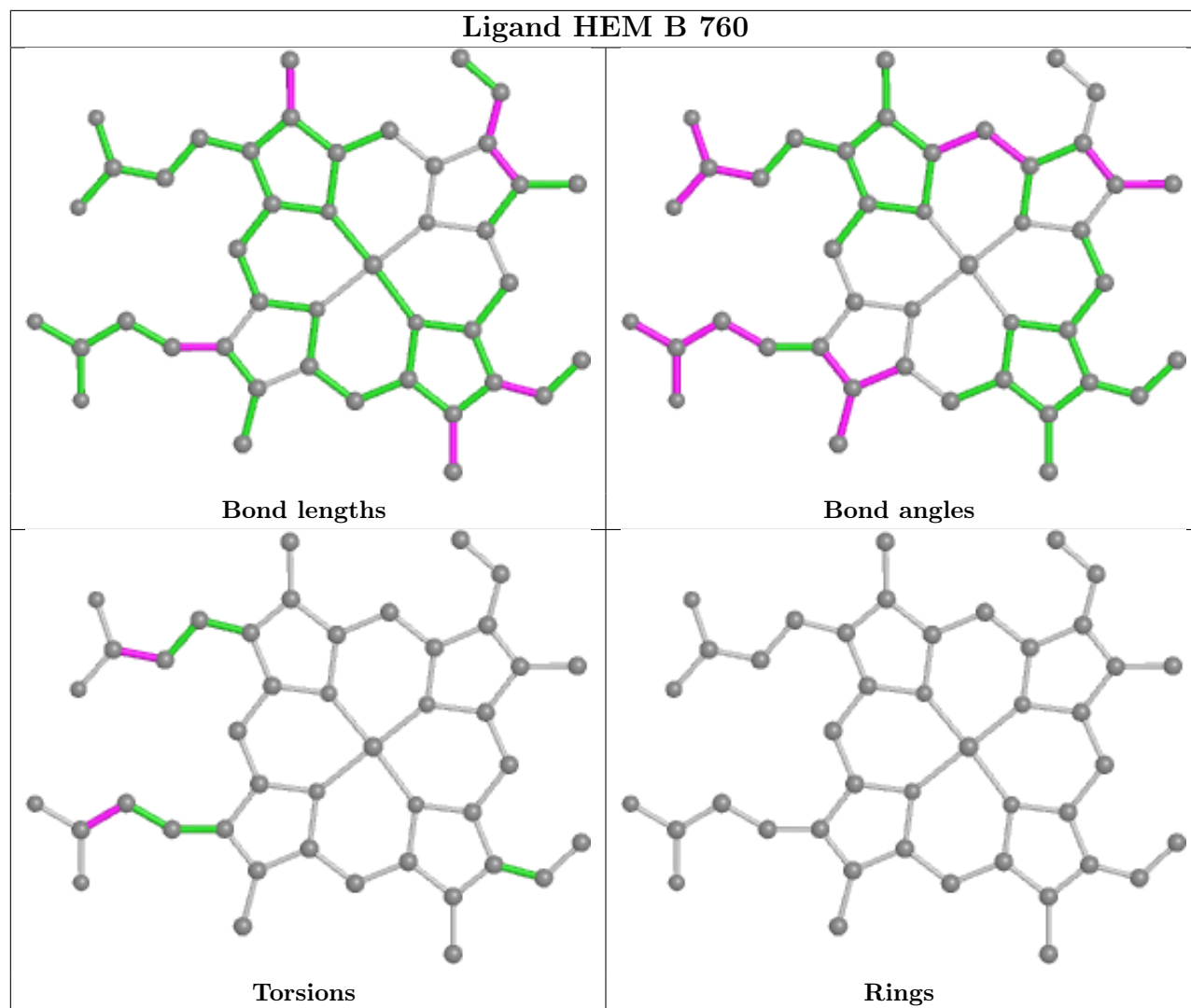
All (12) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	760	HEM	CAA-CBA-CGA-O2A
2	D	760	HEM	CAA-CBA-CGA-O1A
2	B	760	HEM	CAA-CBA-CGA-O1A
2	A	760	HEM	CAA-CBA-CGA-O1A
2	A	760	HEM	CAA-CBA-CGA-O2A
2	C	760	HEM	CAA-CBA-CGA-O2A
2	D	760	HEM	CAA-CBA-CGA-O2A
2	C	760	HEM	CAA-CBA-CGA-O1A
2	B	760	HEM	CAD-CBD-CGD-O2D
2	A	760	HEM	CAD-CBD-CGD-O2D
2	A	760	HEM	CAD-CBD-CGD-O1D
2	B	760	HEM	CAD-CBD-CGD-O1D

There are no ring outliers.
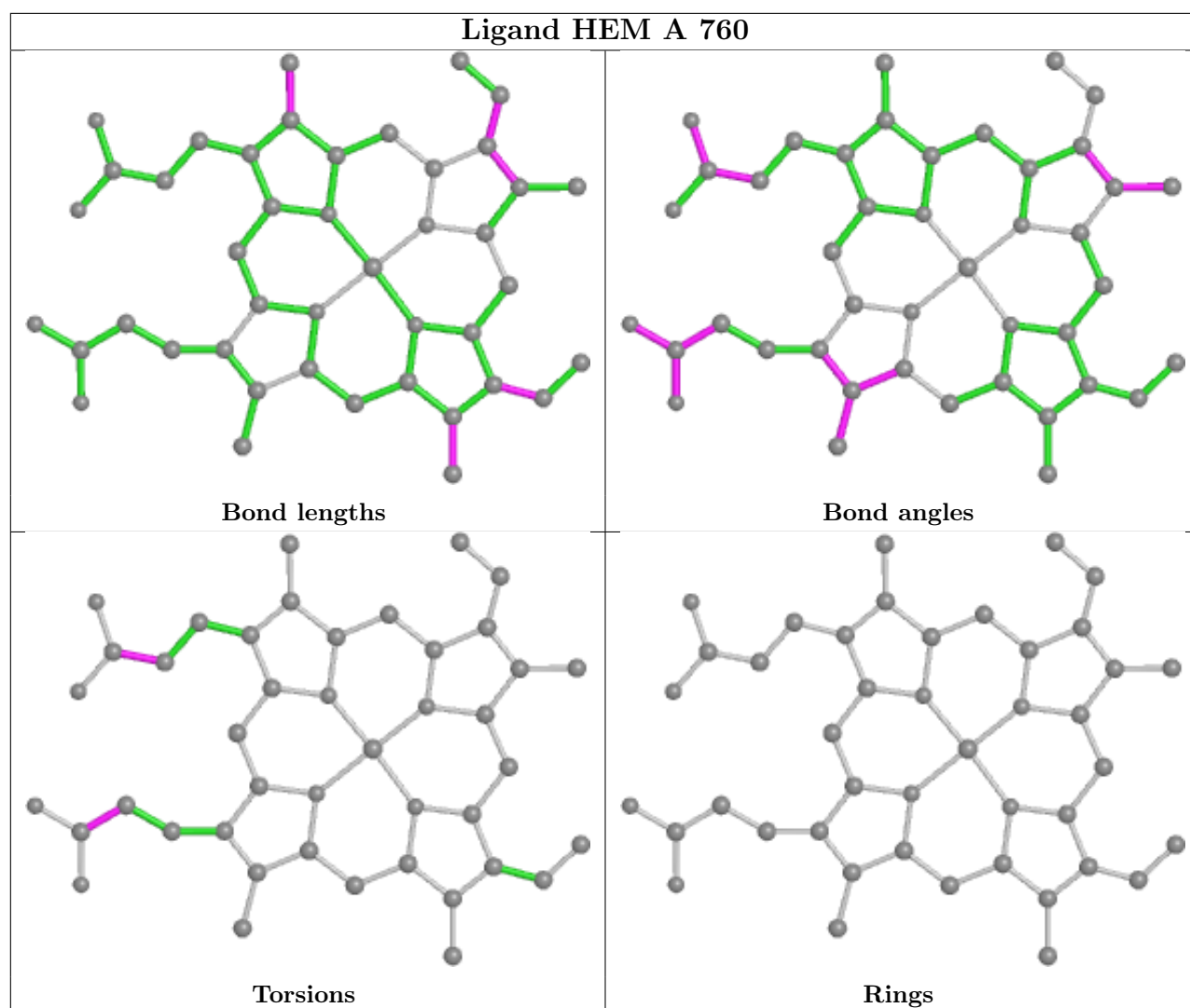
4 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	760	HEM	2	0
2	C	760	HEM	1	0
2	D	760	HEM	1	0
2	A	760	HEM	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 then 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 B 760

Bond lengths

Bond angles

Torsions

Rings

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Ligand HEM C 760

Bond lengths

Bond angles

Torsions

Rings

Ligand HEM D 760

Bond lengths

Bond angles

Torsions

Rings

Ligand HEM A 760
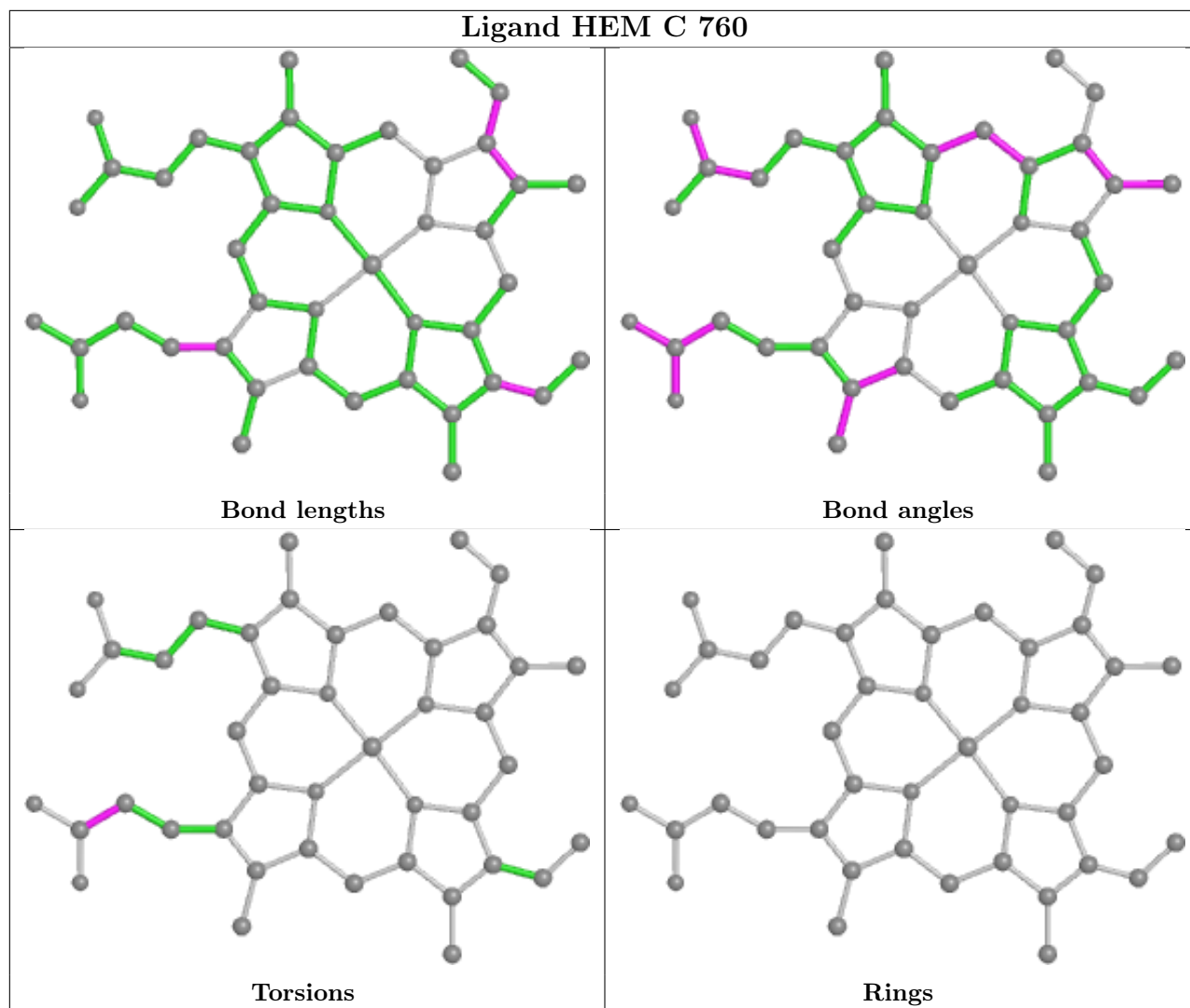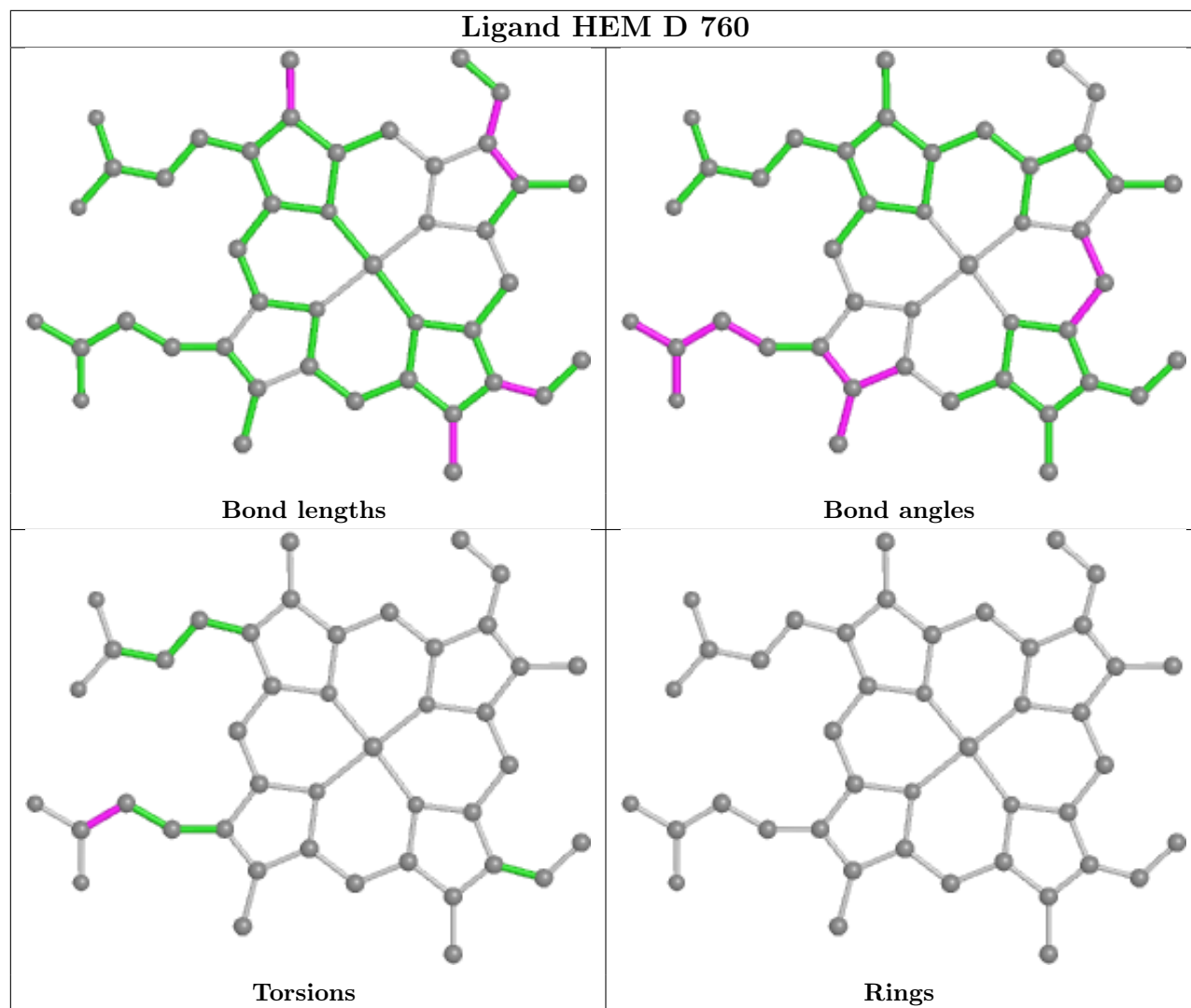
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å²)	Q<0.9
1	A	727/753 (96%)	-0.32	16 (2%)	62	63	10, 16, 31, 54	0
1	B	727/753 (96%)	-0.15	37 (5%)	28	27	10, 18, 38, 48	0
1	C	727/753 (96%)	-0.20	34 (4%)	31	30	10, 18, 38, 47	0
1	D	727/753 (96%)	-0.30	18 (2%)	57	58	9, 16, 31, 50	0
All	All	2908/3012 (96%)	-0.24	105 (3%)	42	43	9, 17, 36, 54	0

All (105) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	27	ASP	10.3
1	A	711	ALA	8.4
1	A	28	SER	8.1
1	D	28	SER	7.2
1	D	27	ASP	7.1
1	C	28	SER	6.4
1	A	710	ILE	6.1
1	C	27	ASP	5.5
1	C	726	GLY	5.3
1	B	726	GLY	5.2
1	A	712	ASP	5.2
1	B	27	ASP	4.9
1	B	713	GLN	4.8
1	D	749	ASP	4.6
1	C	594	PRO	4.5
1	B	750	LYS	4.3
1	D	750	LYS	4.2
1	B	712	ASP	4.2
1	D	712	ASP	4.2
1	B	32	GLU	3.9
1	B	596	GLY	3.9

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Mol	Chain	Res	Type	RSRZ
1	A	713	GLN	3.8
1	A	32	GLU	3.8
1	D	713	GLN	3.8
1	C	750	LYS	3.7
1	A	750	LYS	3.7
1	B	749	ASP	3.6
1	B	646	THR	3.6
1	C	712	ASP	3.5
1	A	709	LYS	3.5
1	B	677	ASP	3.4
1	B	28	SER	3.4
1	D	32	GLU	3.2
1	C	725	ASP	3.2
1	C	569	ASP	3.2
1	B	583	LYS	3.1
1	A	749	ASP	3.0
1	D	711	ALA	3.0
1	B	569	ASP	3.0
1	C	673	ALA	3.0
1	B	642	ALA	3.0
1	C	714	GLY	2.9
1	B	710	ILE	2.9
1	C	645	GLY	2.9
1	C	617	LEU	2.8
1	B	644	ASP	2.8
1	B	673	ALA	2.8
1	C	703	LYS	2.8
1	B	568	ASP	2.8
1	C	32	GLU	2.8
1	C	677	ASP	2.8
1	C	646	THR	2.8
1	C	595	ASP	2.7
1	C	724	ALA	2.7
1	B	647	VAL	2.7
1	B	709	LYS	2.7
1	D	596	GLY	2.7
1	B	711	ALA	2.7
1	C	669	CYS	2.7
1	C	641	THR	2.6
1	B	612	ARG	2.6
1	D	568	ASP	2.6
1	D	583	LYS	2.6

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Mol	Chain	Res	Type	RSRZ
1	B	37	ARG	2.6
1	C	568	ASP	2.6
1	D	594	PRO	2.6
1	A	369	ARG	2.5
1	B	572	ASN	2.5
1	C	596	GLY	2.5
1	B	641	THR	2.5
1	D	33	ASP	2.5
1	D	710	ILE	2.5
1	B	595	ASP	2.5
1	B	727	SER	2.4
1	C	612	ARG	2.4
1	B	714	GLY	2.4
1	C	644	ASP	2.4
1	C	583	LYS	2.4
1	A	596	GLY	2.3
1	D	612	ARG	2.3
1	A	283	GLU	2.2
1	C	610	GLU	2.2
1	B	722	ASP	2.2
1	C	711	ALA	2.2
1	B	639	GLU	2.2
1	A	565	GLU	2.2
1	C	749	ASP	2.2
1	B	706	ALA	2.2
1	D	677	ASP	2.2
1	C	713	GLN	2.2
1	B	725	ASP	2.2
1	C	572	ASN	2.1
1	A	726	GLY	2.1
1	B	610	GLU	2.1
1	B	597	ASP	2.1
1	B	643	ASP	2.1
1	D	595	ASP	2.1
1	B	369	ARG	2.1
1	A	716	GLU	2.1
1	C	706	ALA	2.1
1	B	552	LEU	2.1
1	D	716	GLU	2.1
1	C	676	ALA	2.0
1	C	643	ASP	2.0
1	C	552	LEU	2.0

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

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

6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

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
2	HEM	A	760	43/43	0.99	0.06	9,10,12,12	0
2	HEM	B	760	43/43	0.99	0.05	10,12,13,15	0
2	HEM	C	760	43/43	0.99	0.06	10,11,13,14	0
2	HEM	D	760	43/43	0.99	0.06	9,11,12,13	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.
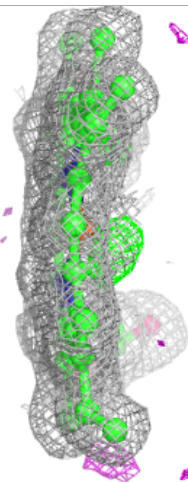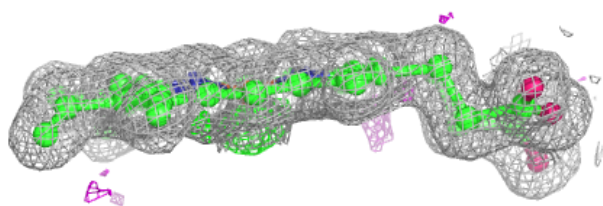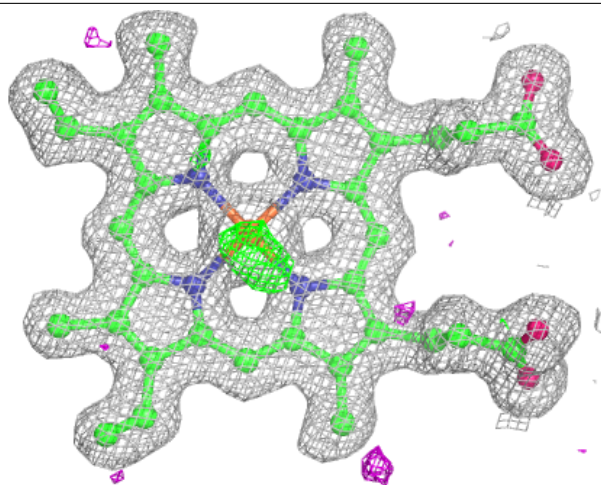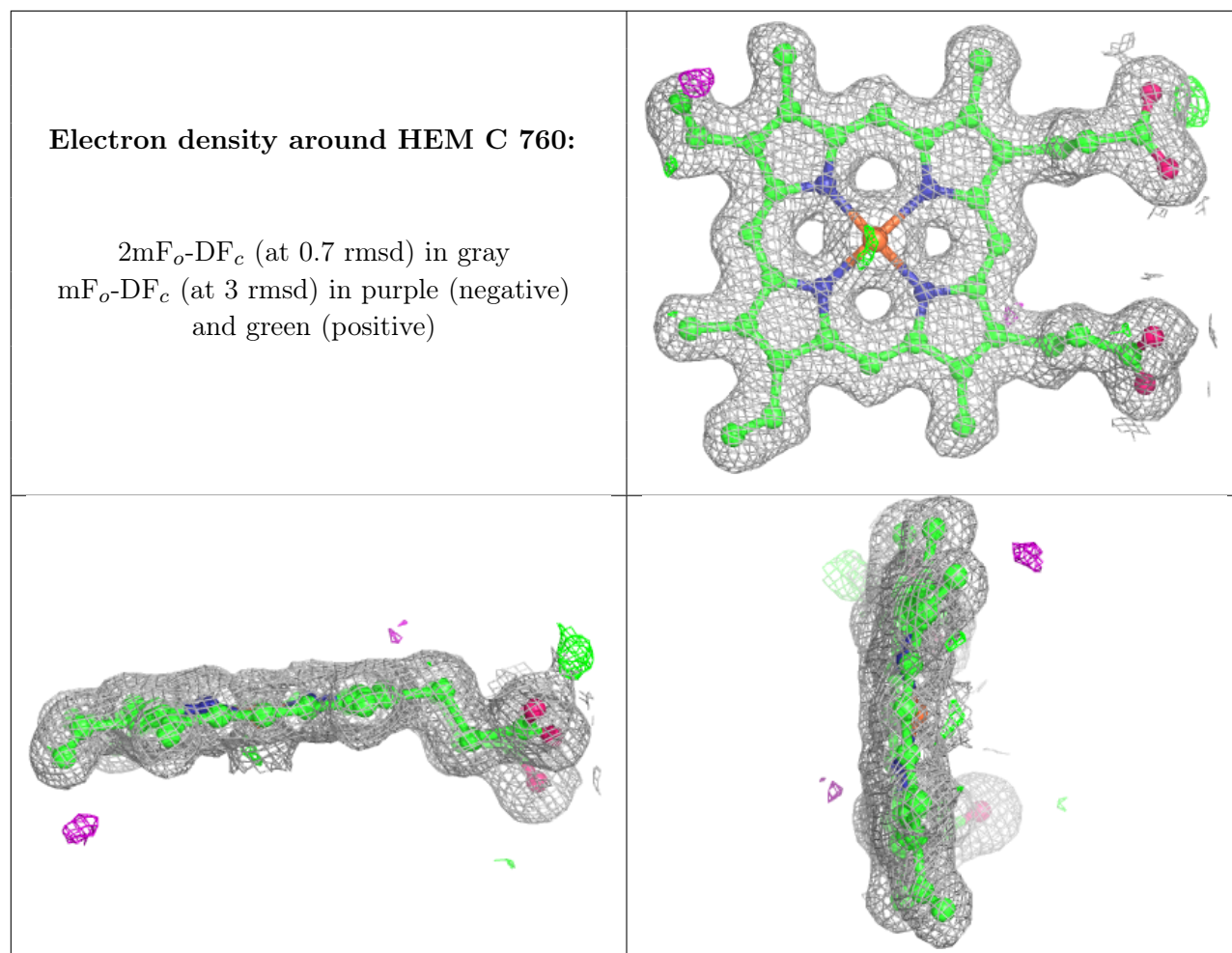
Electron density around HEM A 760:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
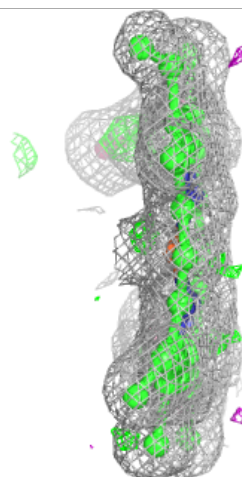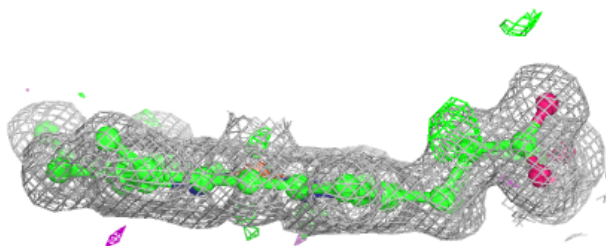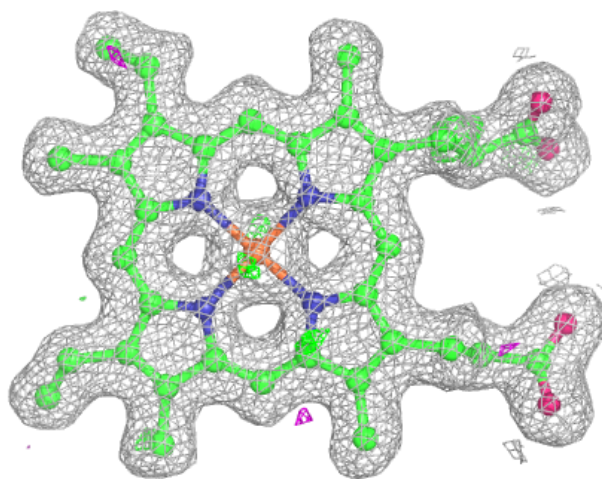
Electron density around HEM B 760:

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

Electron density around HEM C 760:

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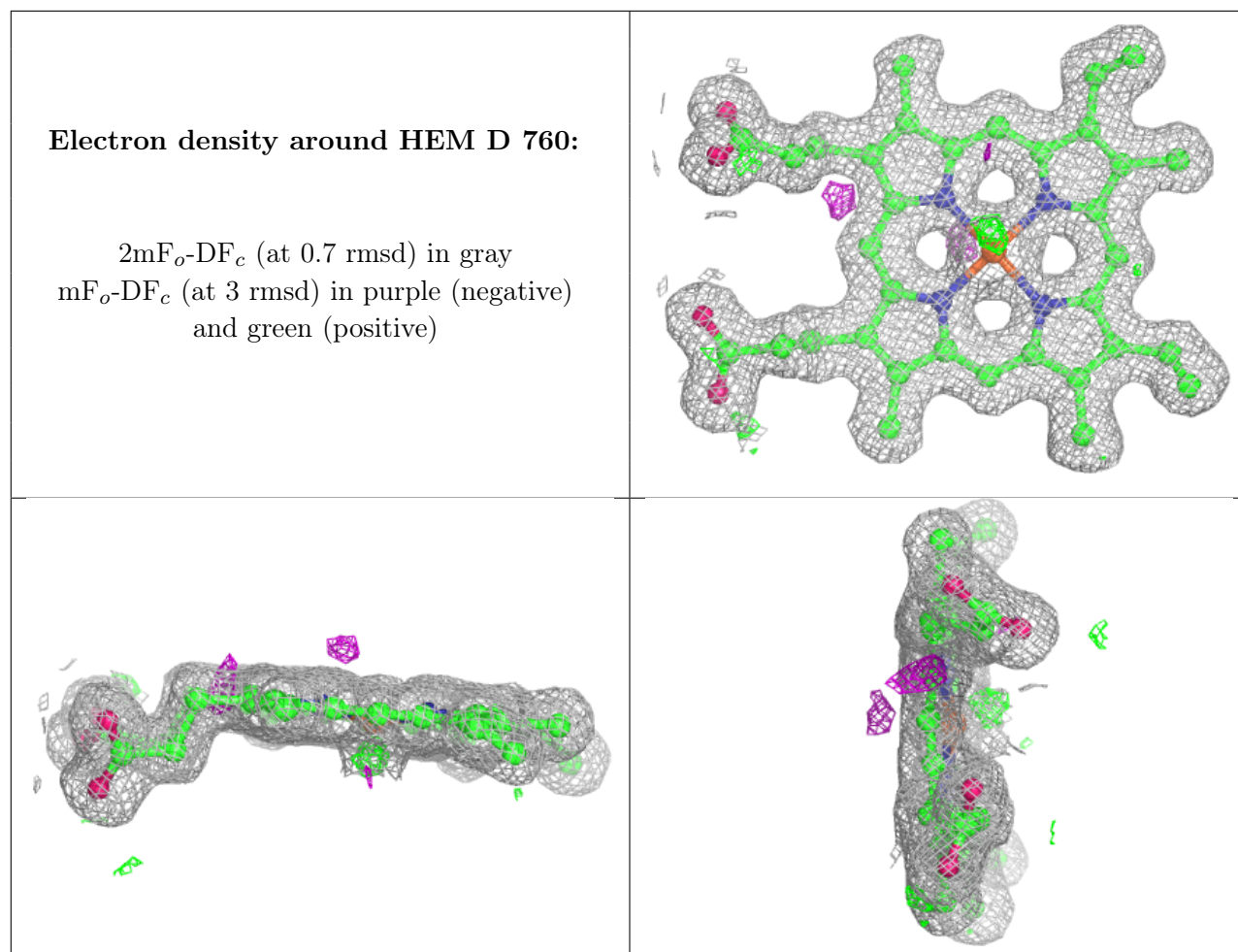$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)

Electron density around HEM D 760:

$2mF_o$-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.