



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 05:30 PM UTC

PDB ID : 3VLH / pdb_00003vlh
Title : Crystal Structure Analysis of the Arg409Leu Variants of KatG from HALOAR-CULA MARISMORTUI
Authors : Sato, T.; Higuchi, W.; Yoshimatsu, K.; Fujiwara, T.
Deposited on : 2011-12-01
Resolution : 1.73 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

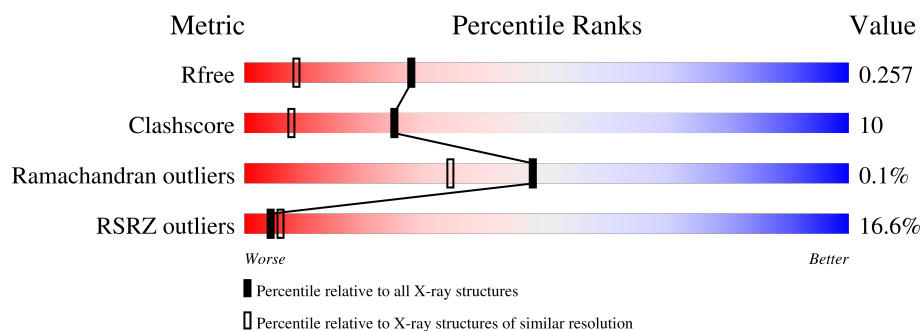
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.73 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	1187 (1.74-1.74)
Clashscore	190562	1207 (1.74-1.74)
Ramachandran outliers	187476	1200 (1.74-1.74)
RSRZ outliers	180081	1188 (1.74-1.74)

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	737	<div> <div>14%</div> <div>78%</div> <div>18%</div> <div>.</div> </div>
1	B	737	<div> <div>18%</div> <div>79%</div> <div>17%</div> <div>.</div> </div>

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 11601 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.

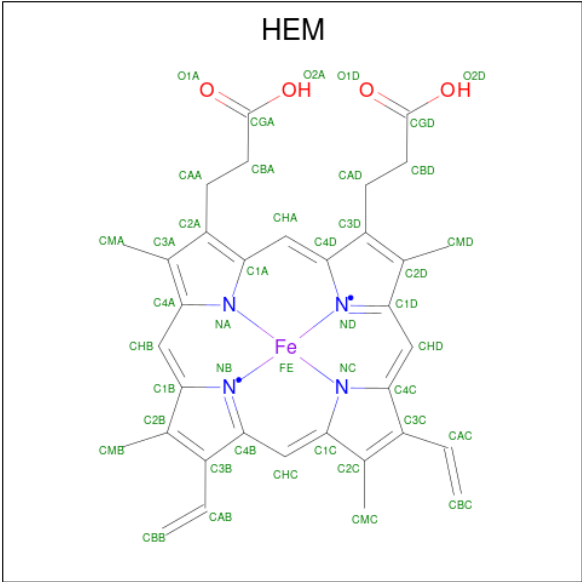
- Molecule 1 is a protein called Catalase-peroxidase 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	710	Total	C	N	O	S	0	0	0
			5590	3497	936	1138	19			
1	B	714	Total	C	N	O	S	0	0	0
			5617	3512	942	1144	19			

There are 14 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	409	LEU	ARG	engineered mutation	UNP O59651
A	732	HIS	-	expression tag	UNP O59651
A	733	HIS	-	expression tag	UNP O59651
A	734	HIS	-	expression tag	UNP O59651
A	735	HIS	-	expression tag	UNP O59651
A	736	HIS	-	expression tag	UNP O59651
A	737	HIS	-	expression tag	UNP O59651
B	409	LEU	ARG	engineered mutation	UNP O59651
B	732	HIS	-	expression tag	UNP O59651
B	733	HIS	-	expression tag	UNP O59651
B	734	HIS	-	expression tag	UNP O59651
B	735	HIS	-	expression tag	UNP O59651
B	736	HIS	-	expression tag	UNP O59651
B	737	HIS	-	expression tag	UNP O59651

- Molecule 2 is PROTOPORPHYRIN IX CONTAINING FE (CCD ID: HEM) (formula: C₃₄H₃₂FeN₄O₄).



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

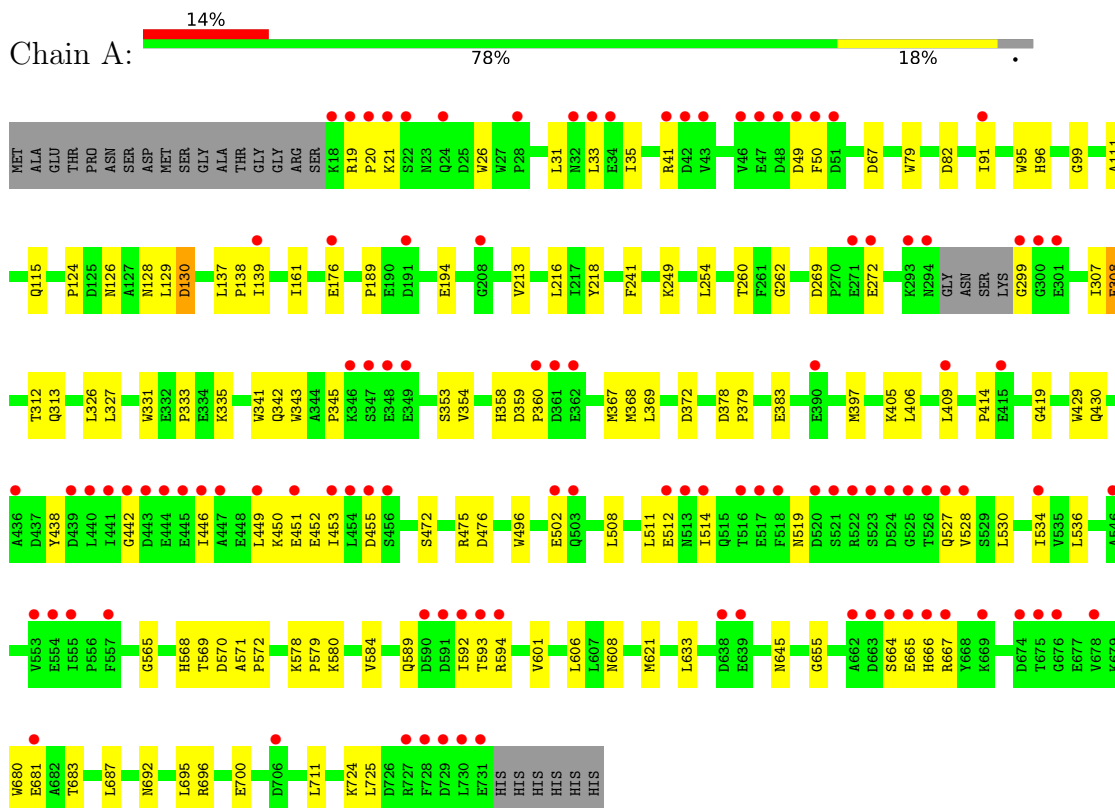
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	112	Total	O	0	0
			112	112		
3	B	196	Total	O	0	0
			196	196		

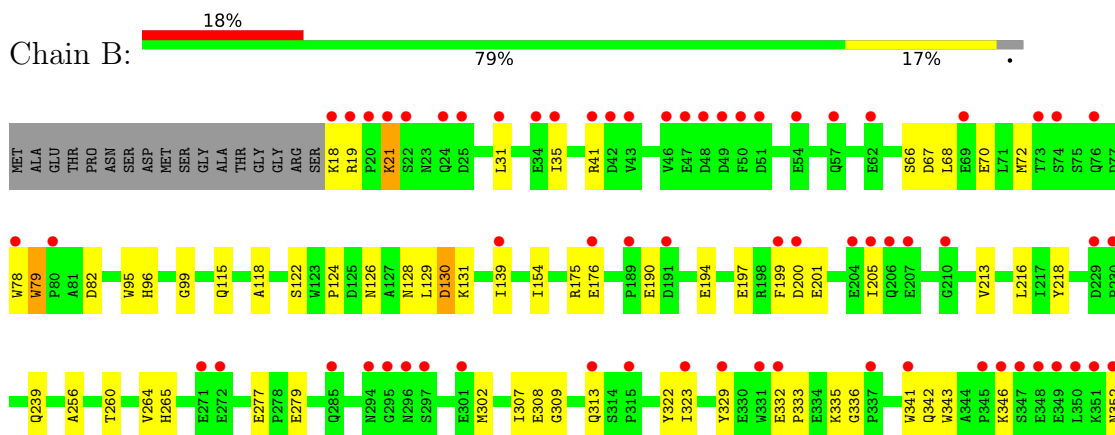
3 Residue-property plots

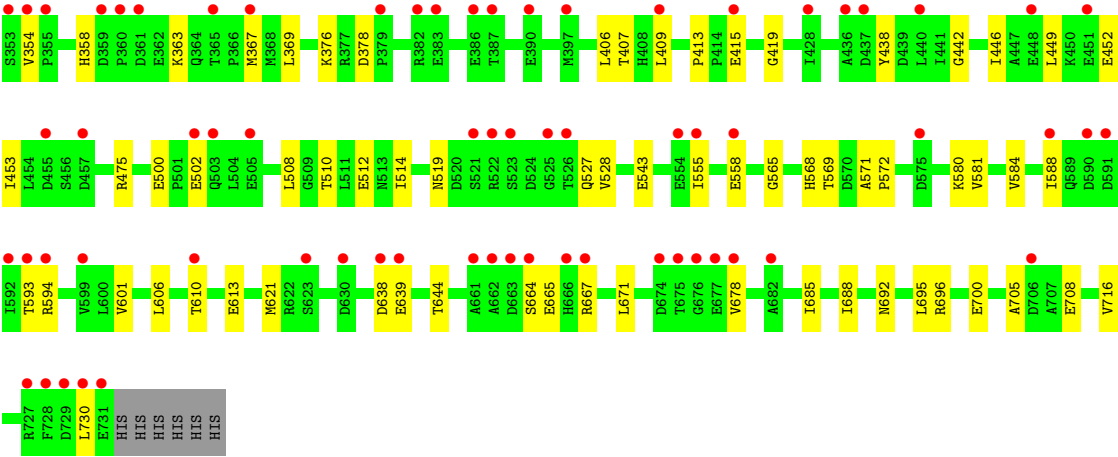
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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-peroxidase 2



• Molecule 1: Catalase-peroxidase 2





4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	317.15Å 81.86Å 75.56Å 90.00° 99.98° 90.00°	Depositor
Resolution (Å)	37.07 – 1.73 37.07 – 1.73	Depositor EDS
% Data completeness (in resolution range)	98.5 (37.07-1.73) 98.7 (37.07-1.73)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.57 (at 1.73Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.249 , 0.268 (Not available) , 0.257	Depositor DCC
R_{free} test set	9624 reflections (4.92%)	wwPDB-VP
Wilson B-factor (Å ²)	25.8	Xtriage
Anisotropy	0.310	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.39 , 29.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	11601	wwPDB-VP
Average B, all atoms (Å ²)	31.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.64% 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: 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	0.37	0/5725	0.89	23/7779 (0.3%)
1	B	0.33	0/5753	0.87	18/7817 (0.2%)
All	All	0.35	0/11478	0.88	41/15596 (0.3%)

There are no bond length outliers.

All (41) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	99	GLY	N-CA-C	7.52	122.75	114.40
1	B	260	THR	N-CA-C	-7.43	103.67	112.89
1	A	260	THR	N-CA-C	-7.41	103.50	112.54
1	A	580	LYS	N-CA-C	-6.95	104.94	113.41
1	B	705	ALA	N-CA-C	6.70	118.58	111.28
1	B	129	LEU	N-CA-C	-6.37	105.47	113.18
1	A	419	GLY	CA-C-N	6.35	126.48	119.87
1	A	419	GLY	C-N-CA	6.35	126.48	119.87
1	B	79	TRP	CA-C-N	6.31	126.33	119.90
1	B	79	TRP	C-N-CA	6.31	126.33	119.90
1	A	129	LEU	N-CA-C	-6.25	105.62	113.18
1	A	308	GLU	N-CA-C	6.24	119.30	108.76
1	B	99	GLY	N-CA-C	6.17	121.25	114.40
1	A	472	SER	N-CA-C	6.00	120.07	112.87
1	A	725	LEU	N-CA-C	5.91	117.73	111.28
1	A	327	LEU	N-CA-C	5.76	119.49	112.23
1	B	419	GLY	CA-C-N	5.70	126.19	120.04
1	B	419	GLY	C-N-CA	5.70	126.19	120.04
1	A	111	ALA	N-CA-C	5.69	119.03	111.75
1	A	115	GLN	N-CA-C	-5.66	105.64	112.54
1	B	569	THR	N-CA-C	5.63	117.57	108.34
1	B	378	ASP	CA-C-N	5.53	124.99	119.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	378	ASP	C-N-CA	5.53	124.99	119.24
1	B	130	ASP	N-CA-C	-5.49	105.37	111.36
1	B	200	ASP	N-CA-C	-5.48	105.39	112.68
1	A	130	ASP	N-CA-C	-5.47	105.31	111.28
1	A	569	THR	N-CA-C	5.47	117.31	108.34
1	A	79	TRP	CA-C-N	5.46	125.77	119.93
1	A	79	TRP	C-N-CA	5.46	125.77	119.93
1	B	115	GLN	N-CA-C	-5.43	105.91	112.54
1	A	378	ASP	CA-C-N	5.40	124.85	119.24
1	A	378	ASP	C-N-CA	5.40	124.85	119.24
1	B	308	GLU	N-CA-C	5.34	118.16	109.24
1	B	197	GLU	N-CA-C	-5.25	104.04	110.61
1	A	687	LEU	N-CA-C	5.22	118.91	112.54
1	A	262	GLY	N-CA-C	5.19	121.67	112.02
1	A	312	THR	N-CA-C	5.13	117.21	109.41
1	A	680	TRP	N-CA-C	5.12	116.77	109.14
1	B	500	GLU	CA-C-N	5.01	126.10	119.84
1	B	500	GLU	C-N-CA	5.01	126.10	119.84
1	A	655	GLY	N-CA-C	-5.01	109.16	114.67

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	5590	0	5235	110	0
1	B	5617	0	5263	107	0
2	A	43	0	30	2	0
2	B	43	0	30	0	0
3	A	112	0	0	0	0
3	B	196	0	0	0	0
All	All	11601	0	10558	215	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 10.

All (215) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:95:TRP:CH2	1:A:218:TYR:HE1	1.06	1.68
1:A:95:TRP:HH2	1:A:218:TYR:CE1	1.10	1.65
1:B:95:TRP:HH2	1:B:218:TYR:CE2	1.15	1.64
1:B:95:TRP:CH2	1:B:218:TYR:HE2	1.16	1.60
1:A:95:TRP:CH2	1:A:218:TYR:CE1	1.91	1.29
1:B:95:TRP:CH2	1:B:218:TYR:CE2	1.98	1.26
1:B:35:ILE:HD11	1:B:601:VAL:HG12	1.36	1.04
1:A:397:MET:HE2	1:A:397:MET:HA	1.50	0.94
1:A:95:TRP:HH2	1:A:218:TYR:CD1	1.89	0.89
1:A:95:TRP:CZ3	1:A:218:TYR:HE1	1.89	0.89
1:B:565:GLY:H	1:B:568:HIS:HD2	1.20	0.86
1:A:565:GLY:H	1:A:568:HIS:HD2	1.22	0.86
1:A:95:TRP:CH2	1:A:218:TYR:CD1	2.64	0.85
1:B:594:ARG:H	1:B:594:ARG:HE	1.23	0.85
1:B:692:ASN:HD22	1:B:695:LEU:H	1.22	0.84
1:B:593:THR:H	1:B:594:ARG:HH21	1.26	0.82
1:A:692:ASN:HD22	1:A:695:LEU:H	1.28	0.81
1:B:588:ILE:HD11	1:B:685:ILE:HD11	1.60	0.81
1:B:688:ILE:HD12	1:B:695:LEU:HD12	1.61	0.80
1:B:313:GLN:HA	1:B:354:VAL:HG22	1.62	0.80
1:A:91:ILE:HD11	1:A:161:ILE:HG13	1.65	0.79
1:B:555:ILE:HD12	1:B:716:VAL:HG13	1.64	0.79
1:A:35:ILE:HD11	1:A:601:VAL:HG12	1.62	0.78
1:A:326:LEU:HD13	1:A:368:MET:HE2	1.67	0.77
1:B:610:THR:HG23	1:B:613:GLU:H	1.52	0.75
1:A:665:GLU:H	1:A:667:ARG:HH21	1.33	0.74
1:B:367:MET:HE1	1:B:369:LEU:HD23	1.67	0.74
1:A:326:LEU:HD13	1:A:368:MET:CE	2.18	0.74
1:A:124:PRO:HG3	1:A:194:GLU:HG3	1.71	0.73
1:B:323:ILE:HD12	1:B:323:ILE:H	1.54	0.73
1:A:41:ARG:H	1:A:41:ARG:HD3	1.54	0.72
1:A:342:GLN:HB2	1:A:367:MET:HE2	1.71	0.71
1:B:519:ASN:HD21	1:B:528:VAL:H	1.37	0.71
1:A:326:LEU:HB2	1:A:368:MET:HE2	1.70	0.70
1:B:558:GLU:HG3	1:B:730:LEU:HD11	1.73	0.70
1:B:78:TRP:HZ3	1:B:131:LYS:HG3	1.57	0.70
1:B:452:GLU:HG3	1:B:514:ILE:HD12	1.74	0.69
1:A:19:ARG:HD3	1:A:19:ARG:N	2.07	0.69
1:A:594:ARG:H	1:A:594:ARG:HE	1.38	0.69
1:A:519:ASN:HD21	1:A:528:VAL:H	1.41	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:154:ILE:HD12	1:B:175:ARG:NE	2.09	0.68
1:A:502:GLU:CD	1:A:502:GLU:H	2.01	0.67
1:A:91:ILE:CD1	1:A:161:ILE:HG13	2.23	0.67
1:A:589:GLN:O	1:A:592:ILE:HD12	1.94	0.67
1:B:95:TRP:CZ2	1:B:218:TYR:CE2	2.77	0.66
1:B:688:ILE:O	1:B:688:ILE:HD13	1.95	0.66
1:B:154:ILE:HD12	1:B:175:ARG:CZ	2.26	0.65
1:B:199:PHE:HB3	1:B:205:ILE:HD13	1.78	0.65
1:B:19:ARG:H	1:B:19:ARG:HD2	1.62	0.64
1:B:571:ALA:HB3	1:B:572:PRO:HD3	1.79	0.64
1:A:593:THR:H	1:A:594:ARG:HH21	1.44	0.64
1:A:397:MET:HA	1:A:397:MET:CE	2.27	0.64
1:B:665:GLU:H	1:B:667:ARG:NH2	1.95	0.64
1:A:313:GLN:HA	1:A:354:VAL:HG22	1.80	0.64
1:A:299:GLY:N	1:A:359:ASP:HB2	2.13	0.63
1:B:502:GLU:H	1:B:502:GLU:CD	2.04	0.63
1:B:588:ILE:HD11	1:B:685:ILE:CD1	2.29	0.63
1:A:189:PRO:HB3	1:B:18:LYS:HG3	1.82	0.62
1:A:308:GLU:H	1:A:342:GLN:HE22	1.47	0.62
1:B:124:PRO:HG3	1:B:194:GLU:HG3	1.81	0.62
1:B:95:TRP:CH2	1:B:218:TYR:CD2	2.81	0.61
1:A:664:SER:HB2	1:A:667:ARG:HB2	1.82	0.61
1:B:688:ILE:CD1	1:B:695:LEU:HD12	2.29	0.61
1:A:49:ASP:CG	1:A:50:PHE:H	2.09	0.61
1:B:332:GLU:HG2	1:B:346:LYS:HE2	1.83	0.61
1:A:594:ARG:H	1:A:594:ARG:NE	1.98	0.60
1:B:406:LEU:O	1:B:409:LEU:HD22	2.01	0.60
1:B:265:HIS:CD2	1:B:302:MET:HE2	2.36	0.60
1:A:368:MET:HE3	1:A:372:ASP:HB3	1.83	0.60
1:B:610:THR:HG22	1:B:613:GLU:CG	2.32	0.59
1:B:323:ILE:HD12	1:B:323:ILE:N	2.17	0.59
1:A:584:VAL:HG13	1:A:621:MET:HG2	1.84	0.59
1:A:333:PRO:HD3	1:A:343:TRP:CZ3	2.36	0.59
1:B:584:VAL:HG13	1:B:621:MET:HG2	1.85	0.59
1:A:19:ARG:HD3	1:A:19:ARG:H	1.68	0.58
1:A:511:LEU:CD1	1:A:534:ILE:HD13	2.34	0.58
1:B:332:GLU:CG	1:B:346:LYS:HE2	2.34	0.57
1:B:610:THR:HG22	1:B:613:GLU:HG3	1.85	0.57
1:A:368:MET:CE	1:A:372:ASP:HB3	2.34	0.57
1:B:352:ASN:O	1:B:363:LYS:HE3	2.05	0.56
1:A:593:THR:H	1:A:594:ARG:NH2	2.03	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:565:GLY:H	1:A:568:HIS:CD2	2.12	0.56
1:A:452:GLU:HG3	1:A:514:ILE:HD12	1.88	0.56
1:B:67:ASP:HB3	1:B:139:ILE:HD11	1.88	0.55
1:B:336:GLY:HA3	1:B:342:GLN:NE2	2.21	0.55
1:A:397:MET:HE2	1:A:397:MET:CA	2.29	0.55
1:A:406:LEU:O	1:A:409:LEU:HD22	2.07	0.55
1:B:332:GLU:HG3	1:B:346:LYS:HG2	1.87	0.55
1:B:79:TRP:CZ2	1:B:302:MET:HE3	2.42	0.55
1:B:696:ARG:O	1:B:700:GLU:HG3	2.06	0.55
1:A:326:LEU:HB2	1:A:368:MET:CE	2.37	0.54
1:A:326:LEU:CB	1:A:368:MET:HE2	2.37	0.54
1:A:41:ARG:HD3	1:A:41:ARG:N	2.22	0.54
1:A:449:LEU:O	1:A:453:ILE:HG12	2.07	0.54
1:A:508:LEU:O	1:A:512:GLU:HG3	2.07	0.54
1:B:508:LEU:O	1:B:512:GLU:HG3	2.08	0.54
1:B:67:ASP:HB3	1:B:139:ILE:CD1	2.38	0.54
1:A:496:TRP:CD1	1:A:578:LYS:HE2	2.42	0.53
1:B:176:GLU:CD	1:B:176:GLU:H	2.15	0.53
1:A:31:LEU:HB3	1:A:33:LEU:CD1	2.37	0.53
1:B:19:ARG:HD2	1:B:19:ARG:N	2.22	0.53
1:B:41:ARG:N	1:B:41:ARG:HD3	2.24	0.53
1:A:666:HIS:O	1:A:683:THR:HA	2.10	0.52
1:B:581:VAL:HG13	1:B:588:ILE:CD1	2.40	0.52
1:A:530:LEU:O	1:A:534:ILE:HG12	2.10	0.52
1:A:665:GLU:H	1:A:667:ARG:NH2	2.04	0.52
1:B:199:PHE:CB	1:B:205:ILE:HD13	2.40	0.52
1:B:442:GLY:O	1:B:446:ILE:HG13	2.10	0.51
1:B:565:GLY:H	1:B:568:HIS:CD2	2.12	0.51
1:A:313:GLN:HG3	1:A:353:SER:O	2.09	0.51
1:A:724:LYS:HB2	1:A:724:LYS:NZ	2.25	0.51
1:B:692:ASN:ND2	1:B:695:LEU:H	2.02	0.51
1:B:95:TRP:CZ2	1:B:218:TYR:CD2	2.98	0.51
1:B:610:THR:CG2	1:B:613:GLU:HG3	2.41	0.51
1:A:633:LEU:HD23	1:A:681:GLU:HG3	1.93	0.50
1:A:326:LEU:CD1	1:A:368:MET:HE2	2.39	0.50
1:B:580:LYS:HE3	1:B:594:ARG:HH12	1.76	0.50
1:B:323:ILE:H	1:B:323:ILE:CD1	2.22	0.50
1:B:78:TRP:CZ3	1:B:131:LYS:HG3	2.44	0.50
1:B:688:ILE:HD12	1:B:695:LEU:CD1	2.36	0.50
1:A:82:ASP:OD2	1:A:358:HIS:HE1	1.95	0.49
1:B:449:LEU:O	1:B:453:ILE:HG13	2.12	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:95:TRP:CZ2	1:A:218:TYR:CE1	2.85	0.49
1:A:442:GLY:O	1:A:446:ILE:HG13	2.13	0.49
1:B:154:ILE:HD13	1:B:407:THR:HB	1.94	0.49
1:B:581:VAL:HG13	1:B:588:ILE:HD13	1.94	0.49
1:B:610:THR:CG2	1:B:613:GLU:H	2.22	0.49
1:A:96:HIS:HD2	1:A:126:ASN:OD1	1.96	0.49
1:A:213:VAL:HB	1:A:216:LEU:HD12	1.95	0.49
1:A:33:LEU:HD12	1:A:33:LEU:N	2.28	0.48
1:A:95:TRP:CZ2	1:A:218:TYR:CD1	3.00	0.48
1:A:645:ASN:HA	1:A:711:LEU:HD23	1.94	0.48
1:B:213:VAL:HB	1:B:216:LEU:HD12	1.95	0.48
1:B:82:ASP:OD2	1:B:358:HIS:HE1	1.97	0.48
1:B:329:TYR:O	1:B:376:LYS:NZ	2.47	0.48
1:B:333:PRO:HD3	1:B:343:TRP:CZ3	2.49	0.48
1:B:31:LEU:HD12	1:B:688:ILE:HD11	1.96	0.48
1:B:413:PRO:HB2	1:B:415:GLU:OE1	2.13	0.48
1:B:594:ARG:H	1:B:594:ARG:NE	2.01	0.48
1:A:49:ASP:CG	1:A:50:PHE:N	2.70	0.48
1:B:128:ASN:HA	1:B:130:ASP:OD2	2.14	0.48
1:B:671:LEU:HD23	1:B:678:VAL:HA	1.96	0.48
1:B:96:HIS:HD2	1:B:126:ASN:OD1	1.97	0.47
1:A:571:ALA:HB3	1:A:572:PRO:HD3	1.96	0.47
1:A:645:ASN:CB	1:A:711:LEU:HD23	2.45	0.47
1:A:21:LYS:HD3	1:A:26:TRP:CE2	2.49	0.47
1:A:95:TRP:CZ3	1:A:218:TYR:CE1	2.79	0.47
1:B:475:ARG:HB2	1:B:606:LEU:HD22	1.97	0.47
1:B:307:ILE:HG22	1:B:367:MET:HE3	1.97	0.47
1:A:367:MET:HE1	1:A:369:LEU:HD23	1.97	0.47
1:A:82:ASP:OD2	1:A:358:HIS:CE1	2.68	0.46
1:A:307:ILE:HG22	1:A:367:MET:HE3	1.96	0.46
1:B:205:ILE:HG12	1:B:239:GLN:OE1	2.16	0.46
1:B:332:GLU:HG3	1:B:346:LYS:CG	2.45	0.46
1:B:19:ARG:C	1:B:21:LYS:H	2.24	0.46
1:A:326:LEU:HD13	1:A:368:MET:HE3	1.97	0.46
1:B:190:GLU:H	1:B:190:GLU:CD	2.25	0.45
1:A:67:ASP:HB3	1:A:139:ILE:CD1	2.47	0.45
1:B:671:LEU:CD2	1:B:678:VAL:HG22	2.47	0.45
1:B:664:SER:HB3	1:B:667:ARG:HB2	1.99	0.45
1:A:335:LYS:HE3	1:A:341:TRP:CE2	2.52	0.44
1:A:41:ARG:HD2	1:B:41:ARG:HD2	2.00	0.44
1:A:592:ILE:N	1:A:592:ILE:HD13	2.33	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:450:LYS:HG2	1:A:536:LEU:HG	2.00	0.44
1:A:594:ARG:HE	1:A:594:ARG:N	2.13	0.44
1:A:696:ARG:O	1:A:700:GLU:HG3	2.18	0.44
1:B:68:LEU:O	1:B:72:MET:HG2	2.17	0.44
1:B:264:VAL:HG11	1:B:369:LEU:HD21	2.00	0.44
1:A:358:HIS:O	1:A:360:PRO:HD3	2.18	0.43
1:B:335:LYS:HE3	1:B:341:TRP:CE2	2.52	0.43
1:B:584:VAL:HG13	1:B:621:MET:HE3	1.99	0.43
1:A:578:LYS:HA	1:A:579:PRO:HD3	1.87	0.43
1:B:438:TYR:CG	1:B:527:GLN:HB2	2.52	0.43
1:B:644:THR:HB	1:B:708:GLU:OE1	2.18	0.43
1:A:331:TRP:CZ3	1:A:345:PRO:HD3	2.52	0.43
1:B:124:PRO:HG3	1:B:194:GLU:CG	2.46	0.43
1:A:49:ASP:O	1:A:50:PHE:C	2.61	0.43
1:A:269:ASP:HB3	1:A:272:GLU:OE1	2.19	0.43
1:A:405:LYS:HA	1:A:429:TRP:CZ2	2.54	0.43
1:B:367:MET:SD	1:B:367:MET:C	3.02	0.43
1:B:510:THR:O	1:B:514:ILE:HG12	2.19	0.43
1:B:638:ASP:OD2	1:B:639:GLU:HG3	2.18	0.43
1:B:95:TRP:CD1	1:B:96:HIS:HD1	2.37	0.43
1:B:342:GLN:HB2	1:B:367:MET:HE2	2.01	0.43
1:A:128:ASN:HA	1:A:130:ASP:OD2	2.19	0.42
1:A:241:PHE:HE1	2:A:800:HEM:HBB1	1.83	0.42
1:A:379:PRO:O	1:A:383:GLU:HG3	2.18	0.42
1:A:475:ARG:HB2	1:A:606:LEU:HD22	1.99	0.42
1:A:645:ASN:CA	1:A:711:LEU:HD23	2.49	0.42
1:B:256:ALA:HA	1:B:322:TYR:CE2	2.54	0.42
1:A:665:GLU:N	1:A:667:ARG:HH21	2.09	0.42
1:A:342:GLN:HB2	1:A:367:MET:CE	2.45	0.42
1:A:570:ASP:OD1	1:A:572:PRO:HD2	2.19	0.42
1:A:645:ASN:HA	1:A:711:LEU:CD2	2.50	0.42
1:A:476:ASP:CG	1:A:608:ASN:HD21	2.27	0.42
1:B:555:ILE:CD1	1:B:716:VAL:HG13	2.41	0.42
1:B:264:VAL:HG22	1:B:309:GLY:O	2.20	0.42
1:A:176:GLU:H	1:A:176:GLU:CD	2.20	0.41
1:A:249:LYS:NZ	1:A:249:LYS:HB3	2.35	0.41
1:B:122:SER:HB3	1:B:277:GLU:HG3	2.02	0.41
1:A:438:TYR:CG	1:A:527:GLN:HB2	2.55	0.41
1:B:201:GLU:OE1	1:B:201:GLU:HA	2.21	0.41
1:A:452:GLU:CG	1:A:514:ILE:HD12	2.51	0.41
1:B:664:SER:CB	1:B:667:ARG:HB2	2.50	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:19:ARG:HB2	1:A:20:PRO:HD2	2.03	0.41
1:A:137:LEU:HB3	1:A:138:PRO:HD3	2.02	0.41
1:A:414:PRO:HD3	1:A:430:GLN:HB3	2.01	0.41
1:A:511:LEU:HD12	1:A:534:ILE:HD13	2.01	0.41
1:A:593:THR:N	1:A:594:ARG:HH21	2.16	0.41
1:A:409:LEU:H	1:A:409:LEU:CD2	2.34	0.40
1:A:451:GLU:HG2	1:A:455:ASP:OD2	2.21	0.40
1:B:118:ALA:HB2	1:B:279:GLU:CD	2.46	0.40
1:A:254:LEU:O	2:A:800:HEM:HBC2	2.22	0.40
1:B:66:SER:O	1:B:70:GLU:HG3	2.22	0.40
1:B:543:GLU:HG3	1:B:555:ILE:HG12	2.03	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	706/737 (96%)	688 (98%)	18 (2%)	0	100	100
1	B	712/737 (97%)	690 (97%)	21 (3%)	1 (0%)	48	34
All	All	1418/1474 (96%)	1378 (97%)	39 (3%)	1 (0%)	48	34

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	21	LYS

5.3.2 Protein sidechains [i](#)

There are no protein residues with a non-rotameric sidechain to report in this entry.

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

2 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	A	800	1	50,50,50	2.15	12 (24%)	67,82,82	4.99	36 (53%)
2	HEM	B	800	1	50,50,50	2.29	9 (18%)	67,82,82	7.18	46 (68%)

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	A	800	1	-	5/14/54/54	-
2	HEM	B	800	1	-	4/14/54/54	-

All (21) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	800	HEM	FE-NA	7.31	2.19	1.95

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	800	HEM	FE-NC	7.18	2.18	1.95
2	A	800	HEM	FE-NA	7.00	2.18	1.95
2	B	800	HEM	CBC-CAC	5.29	1.55	1.30
2	A	800	HEM	CBB-CAB	5.27	1.55	1.30
2	B	800	HEM	FE-NB	5.17	2.10	1.94
2	B	800	HEM	CBB-CAB	5.16	1.55	1.30
2	A	800	HEM	CBC-CAC	5.15	1.55	1.30
2	A	800	HEM	FE-NB	4.80	2.09	1.94
2	A	800	HEM	FE-NC	4.44	2.09	1.95
2	B	800	HEM	CBD-CGD	-4.01	1.41	1.50
2	B	800	HEM	CBA-CGA	-3.97	1.41	1.50
2	A	800	HEM	CBD-CGD	-3.92	1.41	1.50
2	A	800	HEM	CBA-CGA	-3.59	1.42	1.50
2	A	800	HEM	FE-ND	3.44	2.05	1.94
2	A	800	HEM	O1A-CGA	2.61	1.30	1.22
2	B	800	HEM	O1A-CGA	2.48	1.30	1.22
2	A	800	HEM	C4D-ND	-2.21	1.36	1.40
2	A	800	HEM	CBD-CAD	2.18	1.59	1.51
2	B	800	HEM	CBD-CAD	2.09	1.59	1.51
2	A	800	HEM	CAC-C3C	2.07	1.52	1.47

All (82) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	800	HEM	C3B-C2B-C1B	-17.72	93.11	106.41
2	B	800	HEM	CHC-C4B-NB	-15.26	108.00	124.42
2	B	800	HEM	CHD-C4C-NC	-15.26	107.84	124.45
2	B	800	HEM	CHA-C4D-ND	-13.81	107.28	124.37
2	B	800	HEM	C1C-CHC-C4B	13.38	154.46	126.02
2	A	800	HEM	C3B-C4B-NB	12.86	118.71	109.47
2	B	800	HEM	CHB-C1B-NB	-12.57	108.81	124.37
2	B	800	HEM	CHD-C4C-C3C	11.85	145.19	125.21
2	B	800	HEM	C2D-C1D-ND	11.71	123.44	109.90
2	B	800	HEM	CHC-C1C-NC	-11.60	111.82	124.45
2	B	800	HEM	CHD-C1D-ND	-11.58	111.96	124.42
2	A	800	HEM	CHC-C4B-NB	-11.45	112.10	124.42
2	B	800	HEM	C2B-C1B-NB	11.44	122.99	109.84
2	B	800	HEM	C4B-C3B-C2B	11.18	117.56	107.28
2	A	800	HEM	CHD-C1D-ND	-11.07	112.51	124.42
2	B	800	HEM	C4C-C3C-C2C	10.80	116.17	106.81
2	B	800	HEM	C4A-CHB-C1B	10.77	151.58	126.25
2	A	800	HEM	CHB-C1B-NB	-10.44	111.45	124.37

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	800	HEM	CHC-C4B-C3B	9.99	145.01	125.07
2	A	800	HEM	CHD-C4C-C3C	9.55	141.31	125.21
2	B	800	HEM	C4C-CHD-C1D	9.35	145.89	126.02
2	B	800	HEM	C1D-C2D-C3D	-9.25	97.25	106.98
2	B	800	HEM	C4D-ND-C1D	-9.14	94.38	105.21
2	A	800	HEM	C1D-C2D-C3D	-9.07	97.44	106.98
2	A	800	HEM	C4A-CHB-C1B	9.05	147.52	126.25
2	A	800	HEM	C4C-C3C-C2C	8.78	114.43	106.81
2	A	800	HEM	CHD-C4C-NC	-8.59	115.10	124.45
2	A	800	HEM	C2D-C1D-ND	8.53	119.76	109.90
2	B	800	HEM	C1A-CHA-C4D	8.50	146.23	126.25
2	B	800	HEM	CMD-C2D-C1D	8.04	137.60	125.03
2	A	800	HEM	CHA-C4D-ND	-8.02	114.44	124.37
2	B	800	HEM	O2A-CGA-O1A	-8.00	102.77	123.33
2	B	800	HEM	CHB-C4A-NA	-7.76	109.79	123.86
2	A	800	HEM	C4C-CHD-C1D	7.72	142.43	126.02
2	A	800	HEM	CHB-C4A-NA	-7.27	110.68	123.86
2	A	800	HEM	C1B-NB-C4B	-7.18	96.71	105.21
2	B	800	HEM	CHA-C1A-NA	-6.67	111.77	123.86
2	A	800	HEM	C1C-CHC-C4B	6.15	139.09	126.02
2	B	800	HEM	C3C-C2C-C1C	-6.09	101.28	107.05
2	B	800	HEM	CHA-C1A-C2A	6.03	138.50	125.30
2	A	800	HEM	C2B-C1B-NB	5.94	116.67	109.84
2	B	800	HEM	CHC-C1C-C2C	5.93	137.81	125.49
2	B	800	HEM	CHA-C4D-C3D	5.69	135.72	125.23
2	A	800	HEM	C1A-CHA-C4D	5.62	139.47	126.25
2	A	800	HEM	C4B-C3B-C2B	-5.60	102.14	107.28
2	B	800	HEM	C3D-C4D-ND	5.14	115.81	110.17
2	B	800	HEM	O2A-CGA-CBA	5.11	130.14	114.00
2	A	800	HEM	CMA-C3A-C4A	-5.08	117.68	125.42
2	A	800	HEM	CAC-C3C-C4C	-4.88	113.18	124.82
2	A	800	HEM	CHB-C4A-C3A	4.81	141.38	127.43
2	B	800	HEM	CAD-C3D-C4D	-4.69	116.52	124.70
2	A	800	HEM	CHA-C4D-C3D	4.63	133.76	125.23
2	B	800	HEM	O2D-CGD-CBD	4.58	128.48	114.00
2	A	800	HEM	C4D-ND-C1D	-4.57	99.79	105.21
2	B	800	HEM	C1B-NB-C4B	-4.56	99.80	105.21
2	B	800	HEM	CAA-CBA-CGA	-4.53	101.65	113.67
2	A	800	HEM	CAA-CBA-CGA	-4.48	101.77	113.67
2	B	800	HEM	CHB-C4A-C3A	4.47	140.41	127.43
2	A	800	HEM	CMA-C3A-C2A	4.33	134.80	125.62
2	B	800	HEM	CMB-C2B-C1B	4.23	131.65	125.03

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	800	HEM	CAA-C2A-C1A	-4.17	116.79	124.94
2	B	800	HEM	C3B-C4B-NB	-4.07	106.54	109.47
2	B	800	HEM	CAA-C2A-C3A	3.92	135.85	127.07
2	A	800	HEM	C4D-C3D-C2D	3.75	112.35	106.89
2	B	800	HEM	O1D-CGD-CBD	-3.69	111.38	123.09
2	B	800	HEM	CAC-C3C-C4C	-3.68	116.04	124.82
2	A	800	HEM	CMD-C2D-C1D	3.52	130.53	125.03
2	A	800	HEM	C3C-C2C-C1C	-3.48	103.75	107.05
2	B	800	HEM	CAD-C3D-C2D	3.40	134.23	127.87
2	A	800	HEM	O2A-CGA-CBA	3.38	124.68	114.00
2	B	800	HEM	CMC-C2C-C3C	3.34	136.50	128.43
2	A	800	HEM	C4C-NC-C1C	3.10	110.88	105.82
2	A	800	HEM	CAD-C3D-C4D	-2.98	119.51	124.70
2	A	800	HEM	O2A-CGA-O1A	-2.90	115.88	123.33
2	B	800	HEM	CMB-C2B-C3B	2.81	135.23	128.43
2	A	800	HEM	CHA-C1A-C2A	2.35	130.44	125.30
2	A	800	HEM	CBB-CAB-C3B	-2.26	116.21	127.53
2	A	800	HEM	C2A-C1A-NA	-2.25	107.66	110.15
2	B	800	HEM	CAB-C3B-C4B	-2.24	114.49	124.39
2	B	800	HEM	CMA-C3A-C2A	2.20	130.30	125.62
2	A	800	HEM	O2D-CGD-CBD	2.09	120.61	114.00
2	B	800	HEM	C4C-NC-C1C	2.04	109.14	105.82

There are no chirality outliers.

All (9) torsion outliers are listed below:

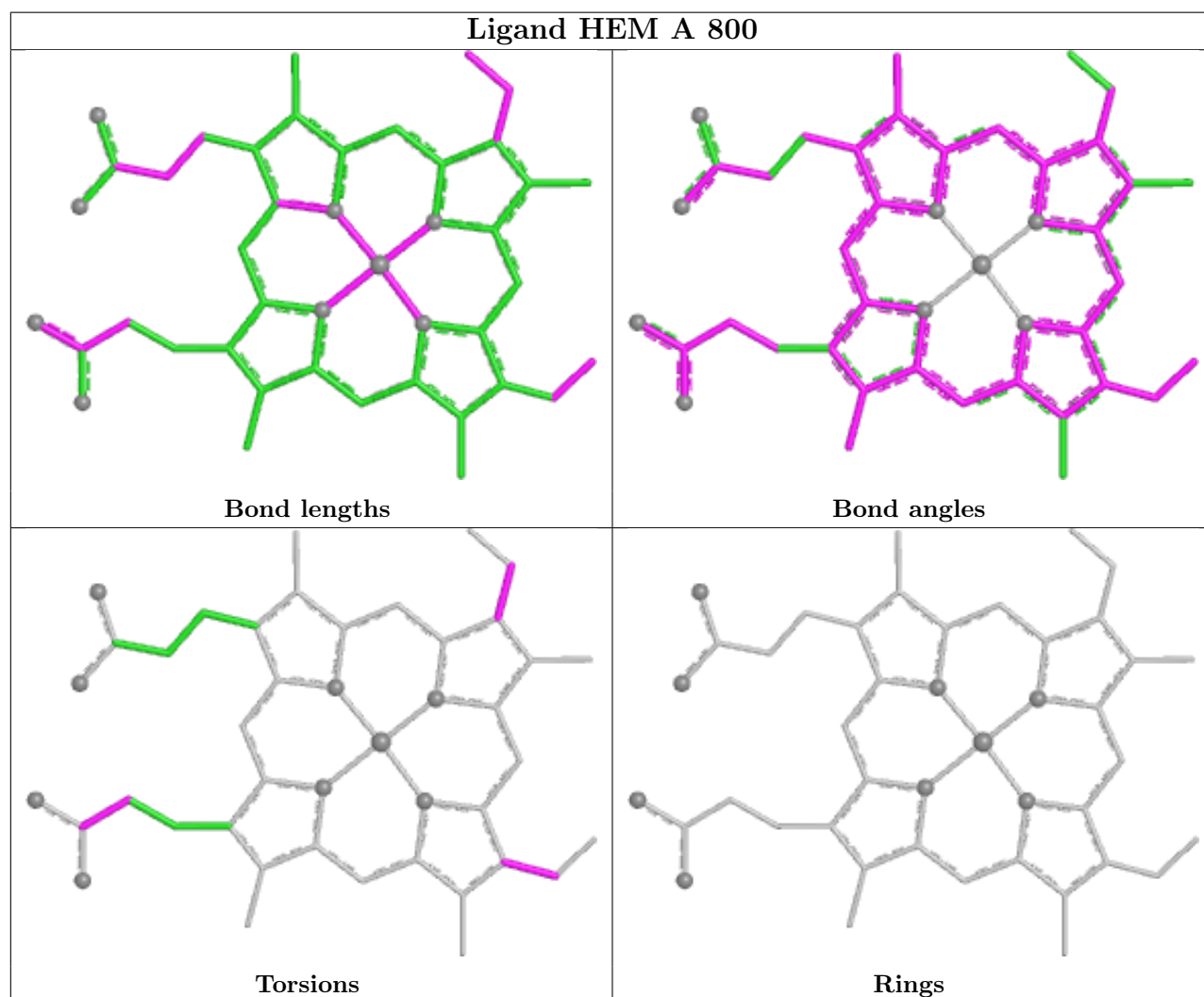
Mol	Chain	Res	Type	Atoms
2	A	800	HEM	C4B-C3B-CAB-CBB
2	A	800	HEM	C2B-C3B-CAB-CBB
2	A	800	HEM	C2C-C3C-CAC-CBC
2	B	800	HEM	CAA-CBA-CGA-O1A
2	A	800	HEM	CAA-CBA-CGA-O1A
2	B	800	HEM	CAA-CBA-CGA-O2A
2	A	800	HEM	CAA-CBA-CGA-O2A
2	B	800	HEM	C2B-C3B-CAB-CBB
2	B	800	HEM	CAD-CBD-CGD-O2D

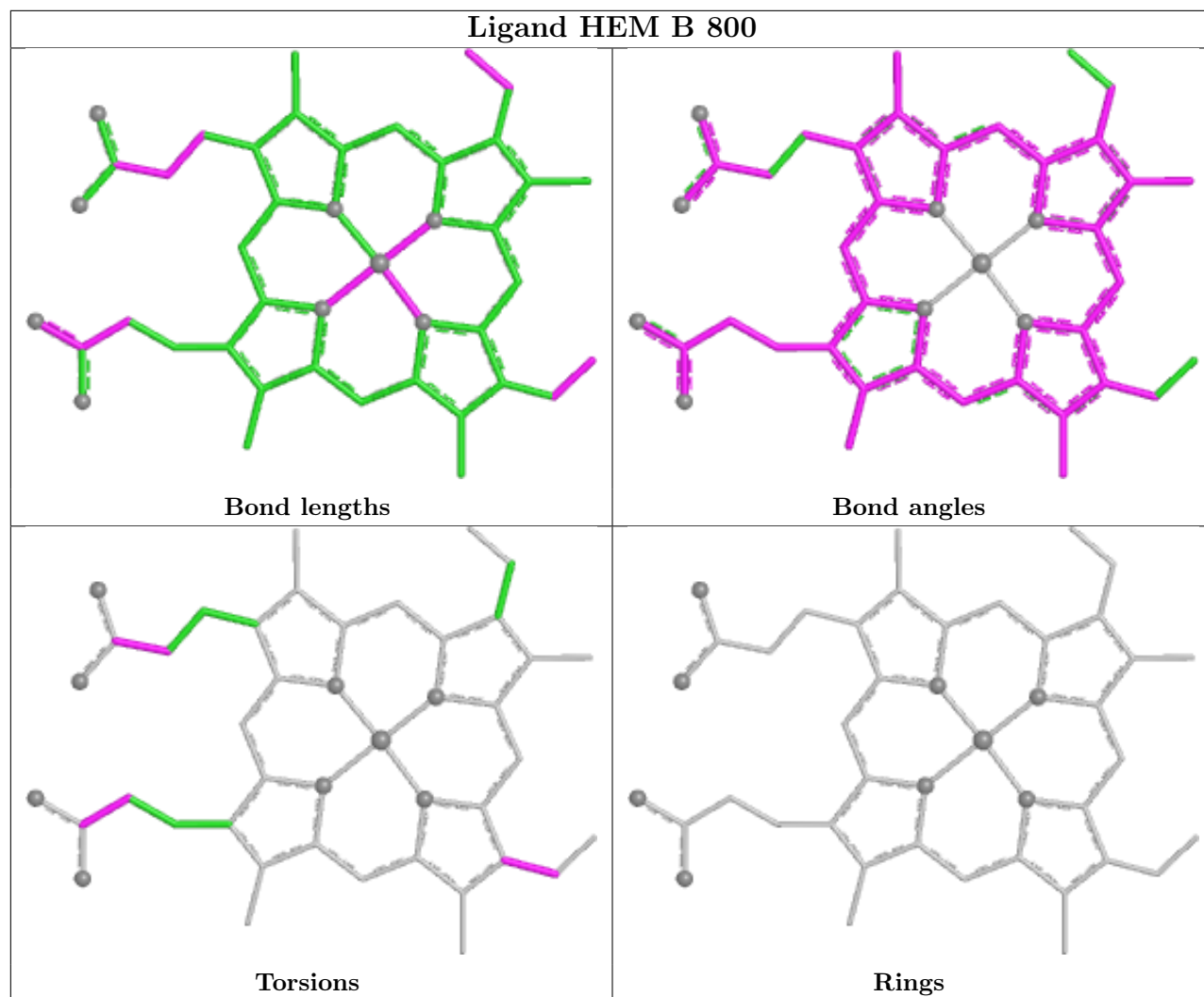
There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	800	HEM	2	0

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





5.7 Other polymers [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	710/737 (96%)	0.85	105 (14%) 5 7	16, 25, 50, 72	0
1	B	714/737 (96%)	1.18	132 (18%) 3 4	21, 31, 49, 71	0
All	All	1424/1474 (96%)	1.01	237 (16%) 4 6	16, 29, 49, 72	0

All (237) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	300	GLY	14.9
1	A	50	PHE	10.7
1	B	50	PHE	10.0
1	A	730	LEU	9.0
1	A	20	PRO	7.3
1	B	730	LEU	7.0
1	A	18	LYS	6.8
1	B	20	PRO	6.7
1	B	49	ASP	6.5
1	A	299	GLY	6.5
1	B	43	VAL	6.4
1	A	49	ASP	6.0
1	B	18	LYS	5.8
1	A	19	ARG	5.5
1	B	21	LYS	5.2
1	B	19	ARG	5.1
1	A	48	ASP	5.1
1	B	409	LEU	5.0
1	A	591	ASP	5.0
1	B	590	ASP	4.9
1	B	48	ASP	4.9
1	B	729	ASP	4.9
1	A	663	ASP	4.8
1	A	191	ASP	4.8

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Mol	Chain	Res	Type	RSRZ
1	B	437	ASP	4.7
1	A	664	SER	4.7
1	A	525	GLY	4.7
1	A	675	THR	4.5
1	B	664	SER	4.5
1	B	731	GLU	4.5
1	B	638	ASP	4.5
1	B	727	ARG	4.4
1	A	43	VAL	4.3
1	A	590	ASP	4.3
1	A	455	ASP	4.2
1	A	21	LYS	4.2
1	B	667	ARG	4.2
1	B	41	ARG	4.2
1	A	47	GLU	4.1
1	B	593	THR	4.1
1	A	523	SER	4.0
1	A	729	ASP	4.0
1	A	521	SER	3.9
1	B	191	ASP	3.9
1	B	295	GLY	3.8
1	B	591	ASP	3.8
1	A	706	ASP	3.8
1	A	446	ILE	3.7
1	A	24	GLN	3.7
1	A	514	ILE	3.7
1	A	667	ARG	3.7
1	A	361	ASP	3.7
1	B	505	GLU	3.7
1	A	347	SER	3.7
1	A	592	ILE	3.6
1	B	663	ASP	3.6
1	A	41	ARG	3.6
1	A	440	LEU	3.5
1	A	666	HIS	3.5
1	A	522	ARG	3.5
1	B	200	ASP	3.5
1	B	347	SER	3.5
1	A	176	GLU	3.4
1	B	728	PHE	3.4
1	A	454	LEU	3.4
1	B	455	ASP	3.4

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Mol	Chain	Res	Type	RSRZ
1	A	272	GLU	3.4
1	A	46	VAL	3.4
1	A	360	PRO	3.4
1	B	337	PRO	3.4
1	A	441	ILE	3.3
1	A	390	GLU	3.3
1	A	449	LEU	3.3
1	A	348	GLU	3.3
1	A	638	ASP	3.3
1	A	727	ARG	3.3
1	A	681	GLU	3.2
1	B	205	ILE	3.2
1	B	448	GLU	3.2
1	B	623	SER	3.2
1	B	522	ARG	3.2
1	A	444	GLU	3.2
1	B	354	VAL	3.2
1	B	592	ILE	3.2
1	B	436	ALA	3.2
1	B	42	ASP	3.2
1	B	348	GLU	3.2
1	B	350	LEU	3.1
1	A	594	ARG	3.1
1	A	301	GLU	3.1
1	B	457	ASP	3.1
1	B	525	GLY	3.1
1	B	294	ASN	3.1
1	A	553	VAL	3.1
1	A	665	GLU	3.1
1	A	731	GLU	3.1
1	A	349	GLU	3.0
1	A	451	GLU	3.0
1	A	502	GLU	3.0
1	A	524	ASP	3.0
1	B	355	PRO	3.0
1	B	415	GLU	3.0
1	B	558	GLU	3.0
1	A	674	ASP	3.0
1	B	297	SER	3.0
1	B	351	LYS	3.0
1	B	594	ARG	3.0
1	A	593	THR	3.0

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Mol	Chain	Res	Type	RSRZ
1	B	272	GLU	3.0
1	A	32	ASN	3.0
1	A	442	GLY	3.0
1	A	42	ASP	2.9
1	B	359	ASP	2.9
1	B	678	VAL	2.9
1	B	271	GLU	2.9
1	B	554	GLU	2.9
1	B	80	PRO	2.9
1	B	639	GLU	2.9
1	B	440	LEU	2.9
1	B	22	SER	2.9
1	A	512	GLU	2.8
1	B	204	GLU	2.8
1	B	341	TRP	2.8
1	B	73	THR	2.8
1	B	229	ASP	2.8
1	B	666	HIS	2.8
1	A	409	LEU	2.8
1	B	555	ILE	2.8
1	B	47	GLU	2.8
1	B	331	TRP	2.8
1	B	207	GLU	2.8
1	B	383	GLU	2.8
1	B	323	ILE	2.8
1	A	662	ALA	2.7
1	A	34	GLU	2.7
1	A	294	ASN	2.7
1	B	345	PRO	2.7
1	B	502	GLU	2.7
1	B	662	ALA	2.7
1	A	520	ASP	2.7
1	A	415	GLU	2.7
1	A	517	GLU	2.7
1	B	313	GLN	2.7
1	B	329	TYR	2.7
1	A	51	ASP	2.7
1	B	51	ASP	2.7
1	A	555	ILE	2.6
1	B	25	ASP	2.6
1	A	271	GLU	2.6
1	B	349	GLU	2.6

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Mol	Chain	Res	Type	RSRZ
1	B	677	GLU	2.6
1	A	436	ALA	2.6
1	B	523	SER	2.6
1	B	46	VAL	2.6
1	A	293	LYS	2.6
1	B	379	PRO	2.6
1	B	54	GLU	2.6
1	B	706	ASP	2.6
1	A	503	GLN	2.6
1	B	57	GLN	2.6
1	A	528	VAL	2.6
1	B	360	PRO	2.6
1	B	176	GLU	2.5
1	B	397	MET	2.5
1	B	69	GLU	2.5
1	A	453	ILE	2.5
1	A	554	GLU	2.5
1	A	639	GLU	2.5
1	A	728	PHE	2.5
1	A	546	ALA	2.5
1	B	451	GLU	2.5
1	B	78	TRP	2.4
1	A	456	SER	2.4
1	B	74	SER	2.4
1	B	34	GLU	2.4
1	B	346	LYS	2.4
1	A	28	PRO	2.4
1	A	526	THR	2.4
1	B	382	ARG	2.4
1	A	91	ILE	2.4
1	B	139	ILE	2.4
1	B	367	MET	2.4
1	B	206	GLN	2.3
1	B	332	GLU	2.3
1	A	346	LYS	2.3
1	A	557	PHE	2.3
1	B	24	GLN	2.3
1	B	301	GLU	2.3
1	B	630	ASP	2.3
1	B	674	ASP	2.3
1	B	675	THR	2.3
1	A	447	ALA	2.3

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Mol	Chain	Res	Type	RSRZ
1	B	682	ALA	2.3
1	A	518	PHE	2.3
1	B	503	GLN	2.3
1	B	661	ALA	2.3
1	A	33	LEU	2.3
1	B	296	ASN	2.3
1	A	443	ASP	2.3
1	B	386	GLU	2.2
1	A	208	GLY	2.2
1	B	199	PHE	2.2
1	B	676	GLY	2.2
1	B	76	GLN	2.2
1	B	390	GLU	2.2
1	B	230	PRO	2.2
1	A	516	THR	2.2
1	A	669	LYS	2.2
1	A	678	VAL	2.2
1	B	353	SER	2.2
1	B	575	ASP	2.2
1	B	62	GLU	2.2
1	A	139	ILE	2.2
1	B	35	ILE	2.2
1	B	610	THR	2.2
1	A	22	SER	2.2
1	B	599	VAL	2.1
1	B	210	GLY	2.1
1	B	31	LEU	2.1
1	B	352	ASN	2.1
1	B	387	THR	2.1
1	A	527	GLN	2.1
1	B	588	ILE	2.1
1	A	362	GLU	2.1
1	A	439	ASP	2.1
1	B	521	SER	2.1
1	B	428	ILE	2.1
1	B	365	THR	2.1
1	B	526	THR	2.1
1	B	189	PRO	2.1
1	A	676	GLY	2.0
1	B	285	GLN	2.0
1	B	361	ASP	2.0
1	B	315	PRO	2.0

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Mol	Chain	Res	Type	RSRZ
1	A	445	GLU	2.0
1	A	513	ASN	2.0
1	A	534	ILE	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](#)

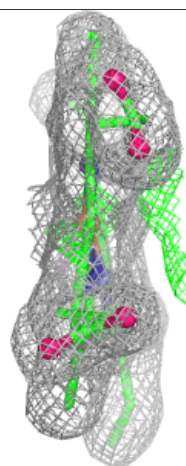
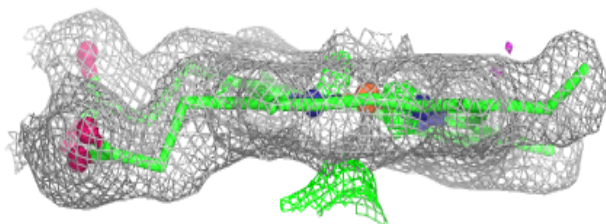
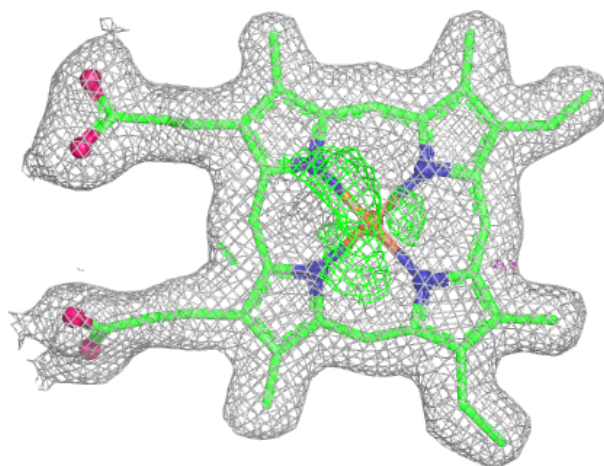
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

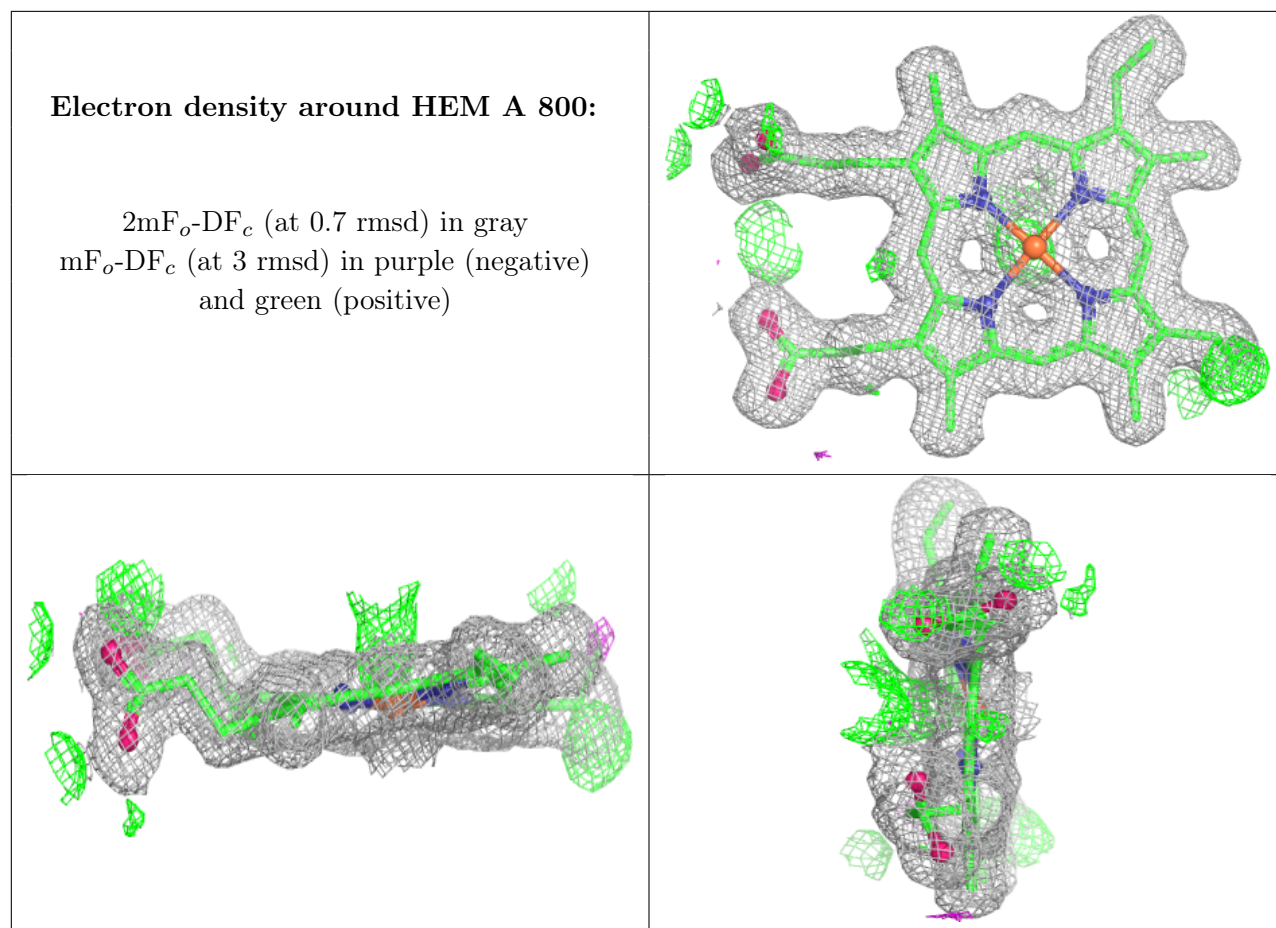
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	HEM	B	800	43/43	0.97	0.09	23,27,29,30	0
2	HEM	A	800	43/43	0.98	0.07	15,19,23,32	0

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 B 800:

$2mF_o-DF_c$ (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.