



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 05:51 PM UTC

PDB ID : 9HYV / pdb_00009hyv
Title : DtpB in complex with photocaged nitric oxide, 100 microsecond, 100 micro-joule, SFX
Authors : Smyth, P.; Williams, L.J.; Hough, M.A.; Worrall, J.A.R.; Owen, R.L.
Deposited on : 2025-01-10
Resolution : 1.67 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

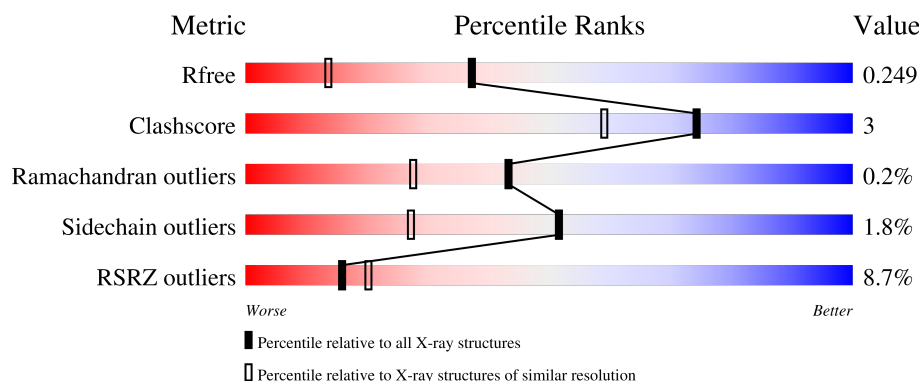
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.67 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.



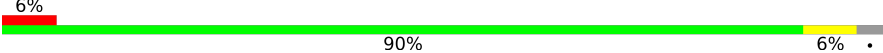
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	1054 (1.68-1.68)
Clashscore	190562	1078 (1.68-1.68)
Ramachandran outliers	187476	1068 (1.68-1.68)
Sidechain outliers	187428	1067 (1.68-1.68)
RSRZ outliers	180081	1055 (1.68-1.68)

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	316	<div> <div>8%</div> <div>91%</div> <div>...</div> </div>
1	B	316	<div> <div>7%</div> <div>86%</div> <div>10%</div> <div>..</div> </div>
1	C	316	<div> <div>16%</div> <div>85%</div> <div>11%</div> <div>..</div> </div>
1	D	316	<div> <div>8%</div> <div>90%</div> <div>5%</div> <div>..</div> </div>
1	E	316	<div> <div>6%</div> <div>88%</div> <div>9%</div> <div>.</div> </div>

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Mol	Chain	Length	Quality of chain
1	F	316	

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	NO2	B	402	-	-	X	-
3	NO2	D	402	-	-	X	-

2 Entry composition [i](#)

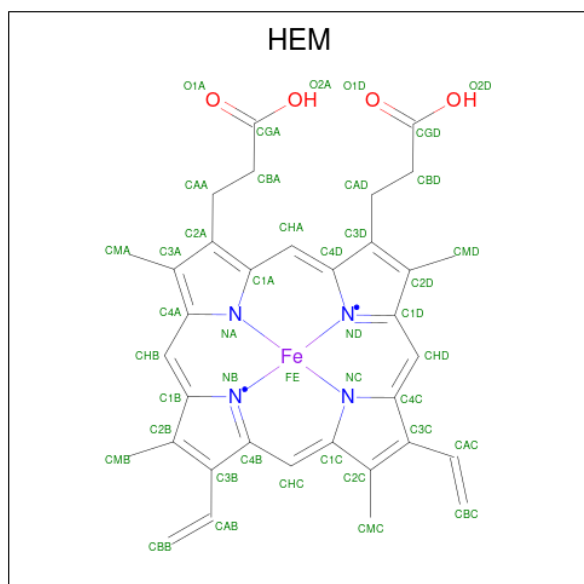
There are 4 unique types of molecules in this entry. The entry contains 15300 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Dyp-type peroxidase family.

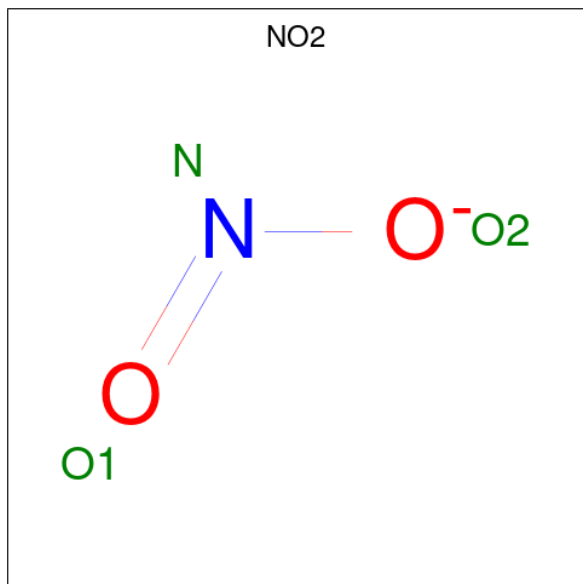
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	305	Total	C	N	O	S	0	2	0
			2337	1468	404	456	9			
1	B	306	Total	C	N	O	S	0	5	0
			2367	1488	409	461	9			
1	C	306	Total	C	N	O	S	0	5	0
			2369	1488	410	461	10			
1	D	304	Total	C	N	O	S	0	2	0
			2331	1465	404	453	9			
1	E	305	Total	C	N	O	S	0	2	0
			2330	1466	402	453	9			
1	F	305	Total	C	N	O	S	0	5	0
			2359	1481	409	459	10			

- Molecule 2 is PROTOPORPHYRIN IX CONTAINING FE (CCD ID: HEM) (formula: $C_{34}H_{32}FeN_4O_4$) (labeled as "Ligand of Interest" by depositor).



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		
2	E	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	F	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		

- Molecule 3 is NITRITE ION (CCD ID: NO2) (formula: NO₂).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	N	O	0	0
			2	1	1		
3	B	1	Total	N	O	0	0
			2	1	1		
3	C	1	Total	N	O	0	0
			2	1	1		
3	D	1	Total	N	O	0	0
			2	1	1		
3	E	1	Total	N	O	0	0
			2	1	1		
3	F	1	Total	N	O	0	0
			2	1	1		

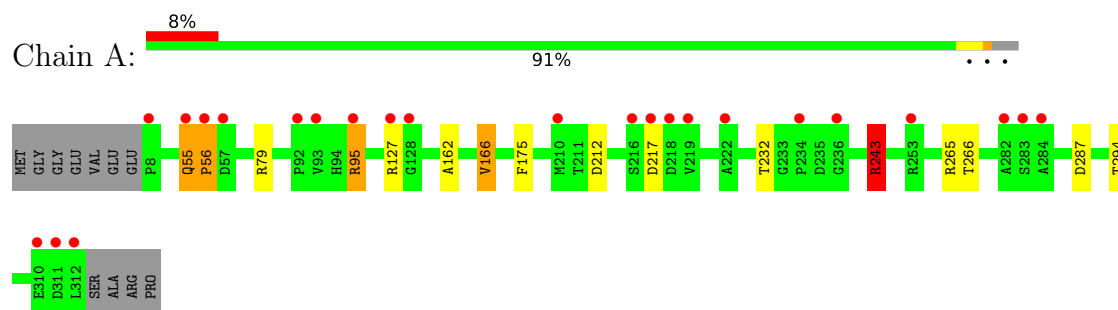
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	158	Total 158	O 158	0	0
4	B	158	Total 158	O 158	0	0
4	C	126	Total 126	O 126	0	0
4	D	168	Total 168	O 168	0	0
4	E	165	Total 165	O 165	0	0
4	F	162	Total 162	O 162	0	0

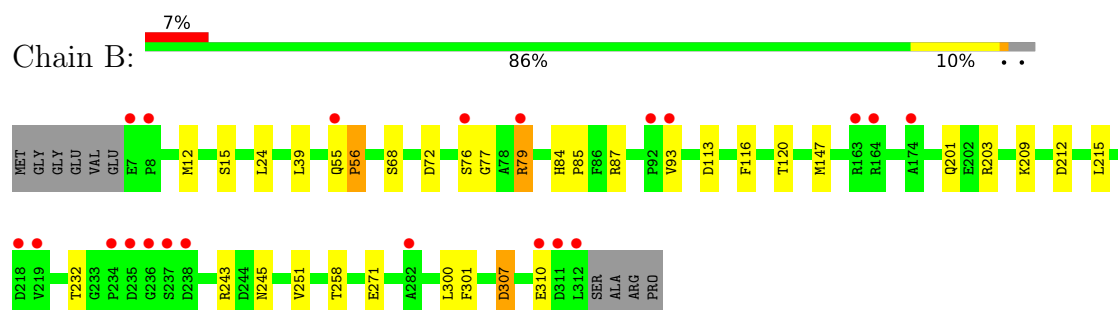
3 Residue-property plots [i](#)

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.

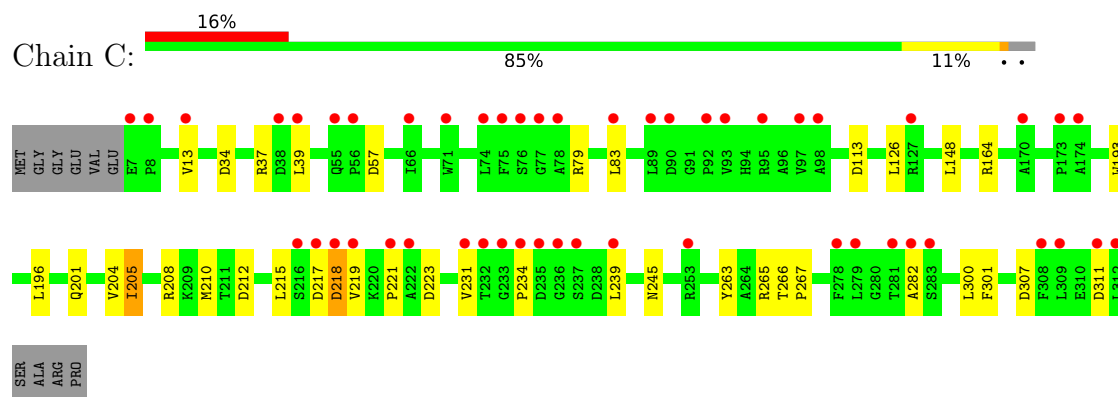
- Molecule 1: Dyp-type peroxidase family



- Molecule 1: Dyp-type peroxidase family

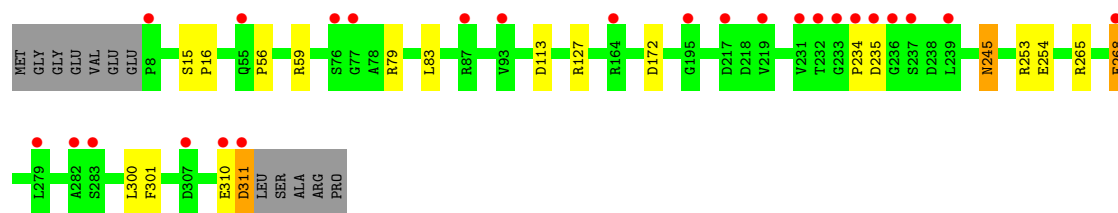


- Molecule 1: Dyp-type peroxidase family

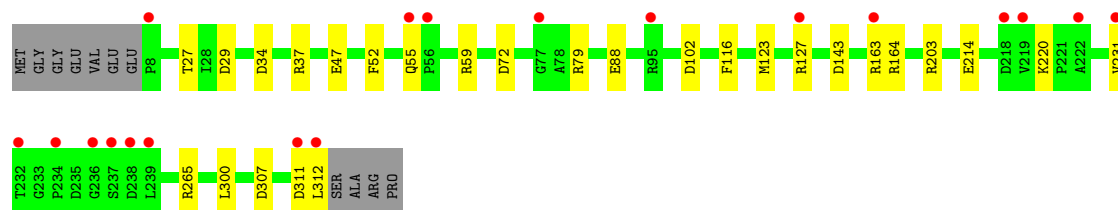
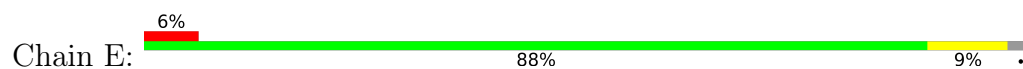


- Molecule 1: Dyp-type peroxidase family

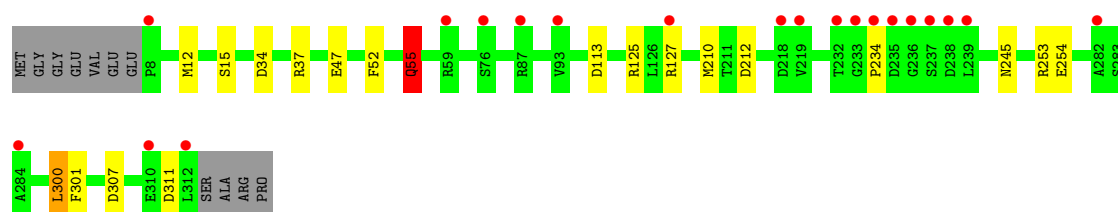
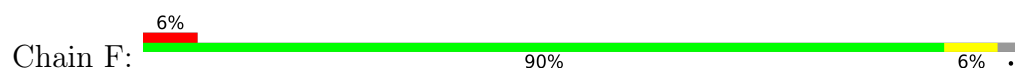




- Molecule 1: Dyp-type peroxidase family



- Molecule 1: Dyp-type peroxidase family



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	87.49Å 124.44Å 193.56Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	45.14 – 1.67 45.14 – 1.67	Depositor EDS
% Data completeness (in resolution range)	99.9 (45.14-1.67) 99.9 (45.14-1.67)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.68 (at 1.67Å)	Xtriage
Refinement program	REFMAC 5.8.0425	Depositor
R, R_{free}	0.216 , 0.244 0.223 , 0.249	Depositor DCC
R_{free} test set	2043 reflections (0.84%)	wwPDB-VP
Wilson B-factor (Å ²)	19.4	Xtriage
Anisotropy	0.028	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 28.5	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	0.93	EDS
Total number of atoms	15300	wwPDB-VP
Average B, all atoms (Å ²)	24.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.73% 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: NO2, 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	0.66	0/2387	1.15	12/3242 (0.4%)
1	B	0.69	0/2418	1.12	7/3288 (0.2%)
1	C	0.64	0/2419	1.13	3/3285 (0.1%)
1	D	0.68	0/2384	1.13	6/3237 (0.2%)
1	E	0.66	0/2383	1.12	8/3237 (0.2%)
1	F	0.67	0/2412	1.10	4/3274 (0.1%)
All	All	0.67	0/14403	1.12	40/19563 (0.2%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	3
1	B	0	2
1	D	0	2
1	E	0	3
All	All	0	10

There are no bond length outliers.

All (40) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	55	GLN	CB-CA-C	10.49	125.89	109.42
1	A	243	ARG	CD-NE-CZ	9.89	138.25	124.40
1	F	55	GLN	CB-CA-C	9.27	123.02	109.11
1	D	311	ASP	CA-CB-CG	8.17	120.77	112.60
1	A	243	ARG	NE-CZ-NH1	-7.86	113.64	121.50
1	A	232	THR	CA-CB-OG1	-7.17	98.85	109.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	F	113	ASP	CA-CB-CG	7.04	119.64	112.60
1	A	243	ARG	NE-CZ-NH2	7.00	125.50	119.20
1	B	113	ASP	CA-CB-CG	6.25	118.85	112.60
1	E	163	ARG	CB-CA-C	-6.25	100.42	110.79
1	A	79	ARG	CB-CA-C	-6.24	99.42	108.84
1	B	93	VAL	N-CA-CB	-6.11	106.63	111.64
1	A	266	THR	CA-CB-OG1	-6.10	100.45	109.60
1	C	223	ASP	CA-CB-CG	6.03	118.63	112.60
1	D	268	GLU	CB-CG-CD	6.01	122.82	112.60
1	F	212	ASP	CA-CB-CG	5.78	118.38	112.60
1	B	55	GLN	N-CA-CB	-5.76	100.92	110.02
1	D	56	PRO	N-CA-CB	-5.75	96.28	102.60
1	C	113	ASP	CA-CB-CG	5.72	118.32	112.60
1	A	56	PRO	N-CA-CB	-5.71	96.31	102.60
1	E	52	PHE	CA-CB-CG	-5.71	108.08	113.80
1	A	212	ASP	CA-CB-CG	5.69	118.29	112.60
1	D	172	ASP	CB-CA-C	5.65	118.16	111.15
1	E	163	ARG	N-CA-CB	5.60	118.36	110.12
1	A	294	THR	CA-CB-OG1	-5.53	101.31	109.60
1	E	88	GLU	N-CA-CB	5.50	118.14	109.83
1	A	287	ASP	CA-CB-CG	5.43	118.03	112.60
1	A	175	PHE	CA-CB-CG	-5.43	108.37	113.80
1	A	127	ARG	N-CA-CB	5.40	117.96	109.69
1	D	113	ASP	CA-CB-CG	5.40	118.00	112.60
1	E	47	GLU	CG-CD-OE1	-5.35	106.09	118.40
1	C	212	ASP	CA-CB-CG	5.30	117.90	112.60
1	E	127	ARG	N-CA-CB	5.29	118.10	109.69
1	D	245	ASN	CB-CA-C	-5.26	100.99	109.72
1	B	212	ASP	CA-CB-CG	5.25	117.85	112.60
1	B	56	PRO	N-CA-CB	-5.24	96.84	102.60
1	F	311	ASP	CA-CB-CG	5.23	117.83	112.60
1	E	143	ASP	CA-CB-CG	5.15	117.75	112.60
1	E	29	ASP	CA-CB-CG	5.10	117.70	112.60
1	B	307	ASP	CA-CB-CG	5.07	117.67	112.60

There are no chirality outliers.

All (10) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	243	ARG	Sidechain
1	A	265	ARG	Sidechain
1	A	95	ARG	Sidechain

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Mol	Chain	Res	Type	Group
1	B	203	ARG	Sidechain
1	B	79	ARG	Sidechain
1	D	265	ARG	Sidechain
1	D	59	ARG	Sidechain
1	E	203	ARG	Sidechain
1	E	265	ARG	Sidechain
1	E	59	ARG	Sidechain

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	2337	0	2261	5	0
1	B	2367	0	2276	23	1
1	C	2369	0	2290	25	1
1	D	2331	0	2259	8	0
1	E	2330	0	2255	10	0
1	F	2359	0	2286	12	0
2	A	43	0	30	2	0
2	B	43	0	30	1	0
2	C	43	0	30	1	0
2	D	43	0	30	2	0
2	E	43	0	30	1	0
2	F	43	0	30	1	0
3	A	2	0	0	0	0
3	B	2	0	0	2	0
3	C	2	0	0	1	0
3	D	2	0	0	2	0
3	E	2	0	0	0	0
3	F	2	0	0	0	0
4	A	158	0	0	4	0
4	B	158	0	0	10	0
4	C	126	0	0	2	0
4	D	168	0	0	0	0
4	E	165	0	0	1	0
4	F	162	0	0	5	0
All	All	15300	0	13807	87	1

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 3.

All (87) 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:77:GLY:N	4:B:501:HOH:O	2.02	0.92
1:C:34:ASP:OD1	1:C:37[A]:ARG:NH1	2.03	0.92
1:B:68:SER:OG	1:B:79:ARG:NH2	2.08	0.86
1:F:245[B]:ASN:ND2	4:F:501:HOH:O	2.13	0.80
1:B:245:ASN:ND2	3:B:402:NO2:O2	2.18	0.76
1:E:55:GLN:HB3	4:F:654:HOH:O	1.86	0.74
1:B:72:ASP:OD1	1:B:79:ARG:NH1	2.22	0.73
1:C:201:GLN:O	1:C:205:ILE:HD13	1.91	0.71
1:B:76:SER:C	4:B:501:HOH:O	2.35	0.68
1:C:245:ASN:ND2	3:C:402:NO2:O2	2.28	0.66
1:B:271:GLU:OE2	4:B:502:HOH:O	2.15	0.63
2:A:401:HEM:HMC1	2:A:401:HEM:HBC2	1.79	0.62
1:C:193:TRP:CH2	1:C:205:ILE:HD11	2.34	0.62
1:C:193:TRP:HH2	1:C:205:ILE:HD11	1.63	0.62
1:F:125[B]:ARG:NE	4:F:502:HOH:O	2.32	0.62
1:B:76:SER:CA	4:B:501:HOH:O	2.47	0.62
1:B:201:GLN:HE22	1:B:209:LYS:NZ	1.99	0.60
1:B:84[A]:HIS:HD2	1:B:85:PRO:O	1.85	0.60
1:A:162:ALA:O	1:A:166:VAL:HG13	2.02	0.60
1:B:84[A]:HIS:CD2	1:B:85:PRO:O	2.56	0.59
2:B:401:HEM:HMC1	2:B:401:HEM:HBC2	1.85	0.59
1:F:12:MET:HE3	1:F:15:SER:OG	2.03	0.59
1:C:210[B]:MET:SD	4:E:664:HOH:O	2.57	0.58
1:C:300:LEU:C	1:C:300:LEU:HD23	2.29	0.58
1:F:210[A]:MET:HG2	4:F:625:HOH:O	2.04	0.57
2:C:401:HEM:HMC2	2:C:401:HEM:HBC2	1.85	0.57
1:E:214:GLU:OE2	1:E:220:LYS:NZ	2.36	0.56
1:C:193:TRP:HH2	1:C:205:ILE:CD1	2.19	0.55
1:E:34:ASP:OD1	1:E:37:ARG:NH2	2.40	0.55
1:B:12:MET:CE	1:B:15:SER:OG	2.54	0.55
1:B:12:MET:HE3	1:B:15:SER:OG	2.07	0.54
1:F:34:ASP:OD1	1:F:37:ARG:NH1	2.41	0.53
1:C:39:LEU:HD22	1:C:126:LEU:HD11	1.90	0.53
1:E:55:GLN:CB	4:F:654:HOH:O	2.49	0.53
1:C:300:LEU:HD23	1:C:301:PHE:N	2.25	0.51
1:C:205:ILE:HD12	1:C:205:ILE:N	2.25	0.51
1:B:215:LEU:O	4:B:503:HOH:O	2.19	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:79:ARG:NH2	1:C:83:LEU:O	2.44	0.50
2:F:401:HEM:HBC2	2:F:401:HEM:HMC2	1.94	0.50
2:D:401:HEM:NB	3:D:402:NO2:N	2.60	0.49
1:C:205:ILE:CD1	1:C:205:ILE:N	2.75	0.49
1:B:251[A]:VAL:HG12	1:E:123:MET:HG3	1.94	0.48
1:D:310:GLU:O	1:D:311:ASP:C	2.55	0.48
1:B:76:SER:HA	4:B:501:HOH:O	2.12	0.48
1:F:127:ARG:HH11	1:F:127:ARG:HG3	1.80	0.47
1:C:231:VAL:HG23	1:C:239:LEU:HB2	1.97	0.47
1:B:116:PHE:O	1:B:120[B]:THR:HG23	2.14	0.47
1:B:39:LEU:C	1:B:39:LEU:HD13	2.40	0.47
1:C:204:VAL:HG12	1:C:205:ILE:HD12	1.97	0.47
1:A:95:ARG:HG3	4:A:623:HOH:O	2.13	0.47
1:E:300:LEU:C	1:E:300:LEU:HD23	2.40	0.47
1:C:219:VAL:O	1:C:221:PRO:HD3	2.16	0.46
1:F:300:LEU:HD23	1:F:301:PHE:N	2.31	0.46
1:B:243:ARG:HD2	3:B:402:NO2:N	2.31	0.45
1:F:52:PHE:CE1	1:F:55:GLN:NE2	2.84	0.45
4:B:585:HOH:O	1:C:210[B]:MET:CE	2.64	0.45
1:D:127:ARG:CZ	1:F:254:GLU:HG3	2.47	0.45
2:A:401:HEM:HBC2	2:A:401:HEM:CMC	2.46	0.44
1:B:201:GLN:HE22	1:B:209:LYS:HZ2	1.65	0.44
1:A:243:ARG:CD	4:A:593:HOH:O	2.66	0.44
1:C:218:ASP:OD1	1:C:218:ASP:N	2.51	0.44
1:C:13[A]:VAL:HG13	1:C:263:TYR:CD1	2.53	0.43
1:E:311:ASP:O	1:E:312:LEU:C	2.61	0.43
1:D:79:ARG:NH2	1:D:83:LEU:O	2.49	0.43
1:D:15:SER:HB2	1:D:16:PRO:HD2	2.01	0.43
1:D:253:ARG:HG3	1:D:253:ARG:HH11	1.83	0.43
1:F:253:ARG:HH11	1:F:253:ARG:HG3	1.84	0.43
1:F:300:LEU:HD23	1:F:300:LEU:C	2.44	0.43
1:C:210[A]:MET:HG2	4:C:608:HOH:O	2.18	0.42
1:B:300:LEU:HD23	1:B:301:PHE:N	2.35	0.42
4:B:585:HOH:O	1:C:210[B]:MET:HE2	2.19	0.42
1:C:266:THR:OG1	1:C:267:PRO:HD2	2.20	0.42
1:E:27:THR:HA	1:E:102:ASP:HB2	2.02	0.41
1:C:164:ARG:O	1:C:265:ARG:HD2	2.20	0.41
1:B:147:MET:HE1	1:E:116:PHE:CE2	2.55	0.41
1:D:254:GLU:OE2	1:F:127:ARG:HD2	2.21	0.41
2:D:401:HEM:HMC2	2:D:401:HEM:HBC2	2.02	0.41
2:E:401:HEM:HBC2	2:E:401:HEM:HMC2	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:243:ARG:HD3	4:A:593:HOH:O	2.20	0.41
1:D:300:LEU:HD23	1:D:301:PHE:N	2.36	0.41
1:A:55:GLN:NE2	4:A:507:HOH:O	2.54	0.41
1:D:245:ASN:ND2	3:D:402:NO2:N	2.68	0.41
1:B:258:THR:HG23	4:B:646:HOH:O	2.21	0.41
1:E:72:ASP:OD1	1:E:79:ARG:HD2	2.21	0.40
1:B:15:SER:HB3	4:B:572:HOH:O	2.21	0.40
1:C:57:ASP:HB2	4:C:596:HOH:O	2.20	0.40
1:C:208:ARG:HD2	1:C:215:LEU:HD21	2.02	0.40

All (1) 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)
1:B:271:GLU:OE1	1:C:282:ALA:CB[4_555]	1.90	0.30

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	305/316 (96%)	299 (98%)	6 (2%)	0	100	100
1	B	309/316 (98%)	305 (99%)	4 (1%)	0	100	100
1	C	309/316 (98%)	302 (98%)	6 (2%)	1 (0%)	36	21
1	D	304/316 (96%)	295 (97%)	7 (2%)	2 (1%)	18	5
1	E	305/316 (96%)	299 (98%)	6 (2%)	0	100	100
1	F	308/316 (98%)	302 (98%)	5 (2%)	1 (0%)	36	21
All	All	1840/1896 (97%)	1802 (98%)	34 (2%)	4 (0%)	43	27

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	235	ASP
1	D	234	PRO
1	F	234	PRO
1	C	234	PRO

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	246/252 (98%)	241 (98%)	5 (2%)	48	23
1	B	247/252 (98%)	241 (98%)	6 (2%)	43	17
1	C	249/252 (99%)	242 (97%)	7 (3%)	38	12
1	D	245/252 (97%)	244 (100%)	1 (0%)	84	78
1	E	244/252 (97%)	241 (99%)	3 (1%)	63	43
1	F	249/252 (99%)	245 (98%)	4 (2%)	55	32
All	All	1480/1512 (98%)	1454 (98%)	26 (2%)	51	27

All (26) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	55	GLN
1	A	56	PRO
1	A	166	VAL
1	A	217	ASP
1	A	243	ARG
1	B	24	LEU
1	B	56	PRO
1	B	87	ARG
1	B	232	THR
1	B	307	ASP
1	B	310	GLU
1	C	148	LEU
1	C	196	LEU
1	C	205	ILE
1	C	217	ASP

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Mol	Chain	Res	Type
1	C	218	ASP
1	C	307	ASP
1	C	311	ASP
1	D	268	GLU
1	E	164	ARG
1	E	231	VAL
1	E	307	ASP
1	F	47	GLU
1	F	55	GLN
1	F	300	LEU
1	F	307	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	55	GLN
1	B	201	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

12 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	$\# Z > 2$
3	NO2	A	402	2	0,1,2	-	-	-		
2	HEM	F	401	1,3	50,50,50	1.44	7 (14%)	67,82,82	1.78	18 (26%)
2	HEM	B	401	1,3	50,50,50	1.49	9 (18%)	67,82,82	1.80	20 (29%)
2	HEM	C	401	1,3	50,50,50	1.60	12 (24%)	67,82,82	1.78	12 (17%)
2	HEM	D	401	1,3	50,50,50	1.65	11 (22%)	67,82,82	1.98	20 (29%)
3	NO2	B	402	2	0,1,2	-	-	-		
3	NO2	C	402	2	0,1,2	-	-	-		
3	NO2	E	402	2	0,1,2	-	-	-		
3	NO2	D	402	2	0,1,2	-	-	-		
2	HEM	E	401	1,3	50,50,50	1.54	12 (24%)	67,82,82	1.84	14 (20%)
3	NO2	F	402	2	0,1,2	-	-	-		
2	HEM	A	401	1,3	50,50,50	1.42	7 (14%)	67,82,82	1.72	19 (28%)

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	F	401	1,3	-	5/14/54/54	-
2	HEM	B	401	1,3	-	6/14/54/54	-
2	HEM	C	401	1,3	-	5/14/54/54	-
2	HEM	D	401	1,3	-	5/14/54/54	-
2	HEM	E	401	1,3	-	6/14/54/54	-
2	HEM	A	401	1,3	-	5/14/54/54	-

All (58) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	401	HEM	FE-NB	4.60	2.09	1.94
2	D	401	HEM	FE-NC	4.11	2.08	1.95
2	D	401	HEM	C1A-NA	-3.89	1.32	1.39
2	A	401	HEM	FE-NC	3.79	2.07	1.95
2	E	401	HEM	C4B-NB	-3.78	1.31	1.38
2	A	401	HEM	C1C-NC	-3.71	1.32	1.39
2	B	401	HEM	FE-NC	3.71	2.07	1.95
2	E	401	HEM	C4D-ND	-3.70	1.33	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	F	401	HEM	FE-NC	3.66	2.07	1.95
2	C	401	HEM	C4D-ND	-3.57	1.34	1.40
2	A	401	HEM	FE-NB	3.49	2.05	1.94
2	F	401	HEM	FE-NB	3.46	2.05	1.94
2	E	401	HEM	FE-NC	3.42	2.06	1.95
2	B	401	HEM	FE-NB	3.41	2.05	1.94
2	F	401	HEM	C1B-NB	-3.40	1.34	1.40
2	E	401	HEM	FE-NB	3.36	2.05	1.94
2	C	401	HEM	FE-NC	3.22	2.05	1.95
2	D	401	HEM	C1B-NB	-3.14	1.34	1.40
2	B	401	HEM	C1B-NB	-3.08	1.34	1.40
2	A	401	HEM	C1B-NB	-3.03	1.35	1.40
2	D	401	HEM	C4D-ND	-3.03	1.35	1.40
2	D	401	HEM	FE-NB	2.86	2.03	1.94
2	E	401	HEM	C1B-NB	-2.82	1.35	1.40
2	B	401	HEM	CBA-CAA	2.71	1.61	1.51
2	C	401	HEM	C1D-ND	-2.64	1.33	1.38
2	A	401	HEM	FE-NA	2.60	2.03	1.95
2	B	401	HEM	FE-NA	2.59	2.03	1.95
2	A	401	HEM	C4B-NB	-2.55	1.33	1.38
2	D	401	HEM	O2A-CGA	-2.54	1.22	1.30
2	F	401	HEM	FE-NA	2.51	2.03	1.95
2	D	401	HEM	FE-NA	2.47	2.03	1.95
2	C	401	HEM	O2A-CGA	-2.41	1.22	1.30
2	B	401	HEM	C1A-NA	-2.39	1.35	1.39
2	C	401	HEM	C4B-NB	-2.38	1.34	1.38
2	D	401	HEM	C4D-C3D	2.37	1.49	1.45
2	E	401	HEM	C1D-ND	-2.35	1.34	1.38
2	D	401	HEM	O2D-CGD	-2.30	1.23	1.30
2	F	401	HEM	CHD-C4C	-2.26	1.33	1.38
2	B	401	HEM	CBA-CGA	-2.26	1.45	1.50
2	B	401	HEM	CHB-C1B	2.24	1.43	1.38
2	D	401	HEM	C1B-C2B	-2.24	1.40	1.44
2	F	401	HEM	C4B-NB	-2.22	1.34	1.38
2	C	401	HEM	FE-NA	2.21	2.02	1.95
2	D	401	HEM	C4A-NA	-2.21	1.35	1.39
2	E	401	HEM	CMA-C3A	2.21	1.55	1.50
2	A	401	HEM	C3B-C4B	2.18	1.49	1.44
2	E	401	HEM	FE-NA	2.16	2.02	1.95
2	C	401	HEM	C3B-C4B	2.16	1.49	1.44
2	C	401	HEM	C1B-NB	-2.14	1.36	1.40
2	C	401	HEM	CHD-C4C	-2.13	1.34	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	401	HEM	C4D-C3D	2.13	1.48	1.45
2	B	401	HEM	O1A-CGA	2.12	1.29	1.22
2	E	401	HEM	C1A-C2A	-2.12	1.40	1.44
2	C	401	HEM	C3C-C4C	-2.11	1.42	1.46
2	E	401	HEM	C3C-C2C	2.11	1.41	1.37
2	C	401	HEM	C1D-C2D	2.03	1.48	1.44
2	E	401	HEM	C3B-C4B	2.03	1.48	1.44
2	F	401	HEM	O2D-CGD	-2.00	1.24	1.30

All (103) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	401	HEM	CHC-C4B-NB	6.84	131.79	124.42
2	C	401	HEM	C1B-NB-C4B	5.66	111.91	105.21
2	F	401	HEM	CHD-C4C-NC	5.56	130.51	124.45
2	E	401	HEM	C1B-NB-C4B	5.26	111.44	105.21
2	E	401	HEM	CHC-C4B-NB	5.26	130.09	124.42
2	E	401	HEM	CHB-C1B-NB	4.62	130.09	124.37
2	F	401	HEM	CHC-C4B-NB	4.44	129.20	124.42
2	C	401	HEM	CHB-C1B-NB	4.41	129.82	124.37
2	D	401	HEM	C3B-C4B-NB	-4.33	106.36	109.47
2	D	401	HEM	CHD-C4C-NC	4.09	128.91	124.45
2	C	401	HEM	CHD-C1D-ND	4.05	128.79	124.42
2	B	401	HEM	CHC-C4B-NB	4.05	128.78	124.42
2	E	401	HEM	CHA-C4D-ND	4.01	129.32	124.37
2	C	401	HEM	CHC-C4B-NB	3.96	128.69	124.42
2	C	401	HEM	C3B-C4B-NB	-3.94	106.64	109.47
2	B	401	HEM	CHD-C4C-NC	3.90	128.70	124.45
2	D	401	HEM	C1B-NB-C4B	3.84	109.75	105.21
2	B	401	HEM	C4C-NC-C1C	3.71	111.86	105.82
2	A	401	HEM	C1B-NB-C4B	3.68	109.56	105.21
2	A	401	HEM	CHD-C4C-NC	3.49	128.25	124.45
2	D	401	HEM	C3B-C2B-C1B	3.49	109.03	106.41
2	E	401	HEM	C3B-C4B-NB	-3.47	106.97	109.47
2	F	401	HEM	C1B-NB-C4B	3.30	109.11	105.21
2	A	401	HEM	CHD-C1D-ND	3.29	127.97	124.42
2	F	401	HEM	CHD-C1D-C2D	-3.28	119.86	125.03
2	E	401	HEM	CHD-C1D-C2D	-3.26	119.88	125.03
2	A	401	HEM	C1A-CHA-C4D	-3.26	118.58	126.25
2	D	401	HEM	C1C-CHC-C4B	-3.18	119.26	126.02
2	F	401	HEM	C4C-NC-C1C	3.16	110.97	105.82
2	D	401	HEM	C3D-C4D-ND	3.15	113.63	110.17

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	401	HEM	CHD-C1D-C2D	-3.14	120.08	125.03
2	A	401	HEM	CHB-C1B-NB	3.08	128.18	124.37
2	C	401	HEM	CMD-C2D-C1D	3.07	129.84	125.03
2	A	401	HEM	CHD-C1D-C2D	-3.07	120.18	125.03
2	B	401	HEM	O2D-CGD-CBD	3.07	123.69	114.00
2	E	401	HEM	CHA-C4D-C3D	-3.07	119.57	125.23
2	D	401	HEM	CHB-C1B-NB	3.02	128.10	124.37
2	A	401	HEM	CHA-C4D-ND	3.00	128.08	124.37
2	F	401	HEM	C2D-C1D-ND	2.96	113.32	109.90
2	F	401	HEM	CMD-C2D-C1D	2.91	129.58	125.03
2	A	401	HEM	CHA-C4D-C3D	-2.90	119.88	125.23
2	E	401	HEM	CHD-C4C-NC	2.88	127.59	124.45
2	C	401	HEM	CHA-C4D-ND	2.87	127.92	124.37
2	D	401	HEM	CMD-C2D-C1D	2.84	129.47	125.03
2	A	401	HEM	CHA-C1A-NA	2.82	128.98	123.86
2	E	401	HEM	C2D-C1D-ND	2.82	113.16	109.90
2	C	401	HEM	CHD-C1D-C2D	-2.81	120.59	125.03
2	E	401	HEM	C3C-C2C-C1C	-2.80	104.39	107.05
2	B	401	HEM	C3D-C4D-ND	2.77	113.21	110.17
2	B	401	HEM	CHA-C1A-NA	2.72	128.79	123.86
2	B	401	HEM	C1B-NB-C4B	2.69	108.39	105.21
2	D	401	HEM	CHD-C1D-C2D	-2.63	120.87	125.03
2	F	401	HEM	CHA-C4D-C3D	-2.63	120.38	125.23
2	D	401	HEM	CHA-C4D-C3D	-2.61	120.41	125.23
2	B	401	HEM	C2D-C1D-ND	2.55	112.86	109.90
2	A	401	HEM	O2D-CGD-CBD	2.52	121.97	114.00
2	A	401	HEM	C4A-NA-C1A	2.50	109.90	105.82
2	A	401	HEM	CMD-C2D-C1D	2.50	128.94	125.03
2	C	401	HEM	C4D-ND-C1D	2.47	108.14	105.21
2	A	401	HEM	C4B-C3B-C2B	-2.46	105.02	107.28
2	B	401	HEM	C3B-C4B-NB	-2.43	107.72	109.47
2	B	401	HEM	CHA-C4D-C3D	-2.42	120.77	125.23
2	B	401	HEM	CAD-C3D-C4D	2.42	128.91	124.70
2	C	401	HEM	CBB-CAB-C3B	-2.39	115.59	127.53
2	A	401	HEM	CBB-CAB-C3B	-2.35	115.78	127.53
2	F	401	HEM	C4C-CHD-C1D	-2.34	121.04	126.02
2	C	401	HEM	O2A-CGA-CBA	2.34	121.39	114.00
2	B	401	HEM	C4C-CHD-C1D	-2.33	121.06	126.02
2	E	401	HEM	CHD-C1D-ND	2.31	126.91	124.42
2	F	401	HEM	C1D-C2D-C3D	-2.30	104.56	106.98
2	B	401	HEM	CAB-C3B-C2B	-2.30	120.97	128.43
2	B	401	HEM	CHD-C1D-ND	2.30	126.89	124.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	F	401	HEM	C3A-C4A-NA	-2.28	106.48	110.14
2	A	401	HEM	C2A-C1A-NA	-2.27	107.63	110.15
2	D	401	HEM	CAD-CBD-CGD	-2.27	107.66	113.67
2	F	401	HEM	C4A-C3A-C2A	2.26	109.40	106.82
2	B	401	HEM	O2A-CGA-CBA	2.24	121.08	114.00
2	A	401	HEM	CHC-C4B-NB	2.23	126.83	124.42
2	A	401	HEM	CAB-C3B-C2B	-2.23	121.19	128.43
2	F	401	HEM	C1A-CHA-C4D	-2.23	121.01	126.25
2	F	401	HEM	CHD-C1D-ND	2.21	126.80	124.42
2	F	401	HEM	C3D-C4D-ND	2.20	112.59	110.17
2	B	401	HEM	CMB-C2B-C1B	2.19	128.46	125.03
2	D	401	HEM	CAB-C3B-C2B	-2.19	121.31	128.43
2	E	401	HEM	O2D-CGD-CBD	2.19	120.91	114.00
2	D	401	HEM	C2D-C1D-ND	2.18	112.43	109.90
2	A	401	HEM	C3B-C2B-C1B	2.15	108.03	106.41
2	D	401	HEM	O2D-CGD-CBD	2.15	120.78	114.00
2	B	401	HEM	CHB-C4A-NA	2.15	127.75	123.86
2	E	401	HEM	CAB-C3B-C2B	-2.14	121.49	128.43
2	D	401	HEM	CMC-C2C-C1C	-2.12	120.99	124.73
2	F	401	HEM	CHA-C4D-ND	2.12	126.99	124.37
2	B	401	HEM	C4D-ND-C1D	-2.12	102.70	105.21
2	D	401	HEM	CHD-C1D-ND	2.11	126.69	124.42
2	D	401	HEM	O2D-CGD-O1D	-2.08	117.98	123.33
2	C	401	HEM	C1D-C2D-C3D	-2.08	104.80	106.98
2	E	401	HEM	CBB-CAB-C3B	-2.07	117.17	127.53
2	A	401	HEM	CMB-C2B-C3B	-2.05	123.45	128.43
2	D	401	HEM	C2A-C1A-NA	-2.04	107.89	110.15
2	F	401	HEM	CAB-C3B-C2B	2.03	135.02	128.43
2	D	401	HEM	C4D-C3D-C2D	-2.03	103.94	106.89
2	F	401	HEM	O2A-CGA-CBA	2.00	120.33	114.00
2	B	401	HEM	CHC-C1C-NC	2.00	126.63	124.45

There are no chirality outliers.

All (32) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	401	HEM	C2B-C3B-CAB-CBB
2	B	401	HEM	C2B-C3B-CAB-CBB
2	C	401	HEM	C2B-C3B-CAB-CBB
2	D	401	HEM	C2B-C3B-CAB-CBB
2	E	401	HEM	C2B-C3B-CAB-CBB
2	B	401	HEM	C4B-C3B-CAB-CBB

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Mol	Chain	Res	Type	Atoms
2	E	401	HEM	C4B-C3B-CAB-CBB
2	F	401	HEM	CAD-CBD-CGD-O2D
2	B	401	HEM	CAA-CBA-CGA-O2A
2	A	401	HEM	CAD-CBD-CGD-O1D
2	D	401	HEM	CAD-CBD-CGD-O1D
2	E	401	HEM	CAD-CBD-CGD-O1D
2	D	401	HEM	CAD-CBD-CGD-O2D
2	E	401	HEM	CAD-CBD-CGD-O2D
2	A	401	HEM	CAD-CBD-CGD-O2D
2	B	401	HEM	CAD-CBD-CGD-O2D
2	C	401	HEM	CAD-CBD-CGD-O2D
2	F	401	HEM	CAA-CBA-CGA-O2A
2	C	401	HEM	CAD-CBD-CGD-O1D
2	F	401	HEM	CAA-CBA-CGA-O1A
2	F	401	HEM	CAD-CBD-CGD-O1D
2	A	401	HEM	CAA-CBA-CGA-O1A
2	B	401	HEM	CAD-CBD-CGD-O1D
2	D	401	HEM	CAA-CBA-CGA-O2A
2	E	401	HEM	CAA-CBA-CGA-O2A
2	C	401	HEM	CAA-CBA-CGA-O2A
2	F	401	HEM	C4B-C3B-CAB-CBB
2	A	401	HEM	CAA-CBA-CGA-O2A
2	B	401	HEM	CAA-CBA-CGA-O1A
2	C	401	HEM	CAA-CBA-CGA-O1A
2	E	401	HEM	CAA-CBA-CGA-O1A
2	D	401	HEM	CAA-CBA-CGA-O1A

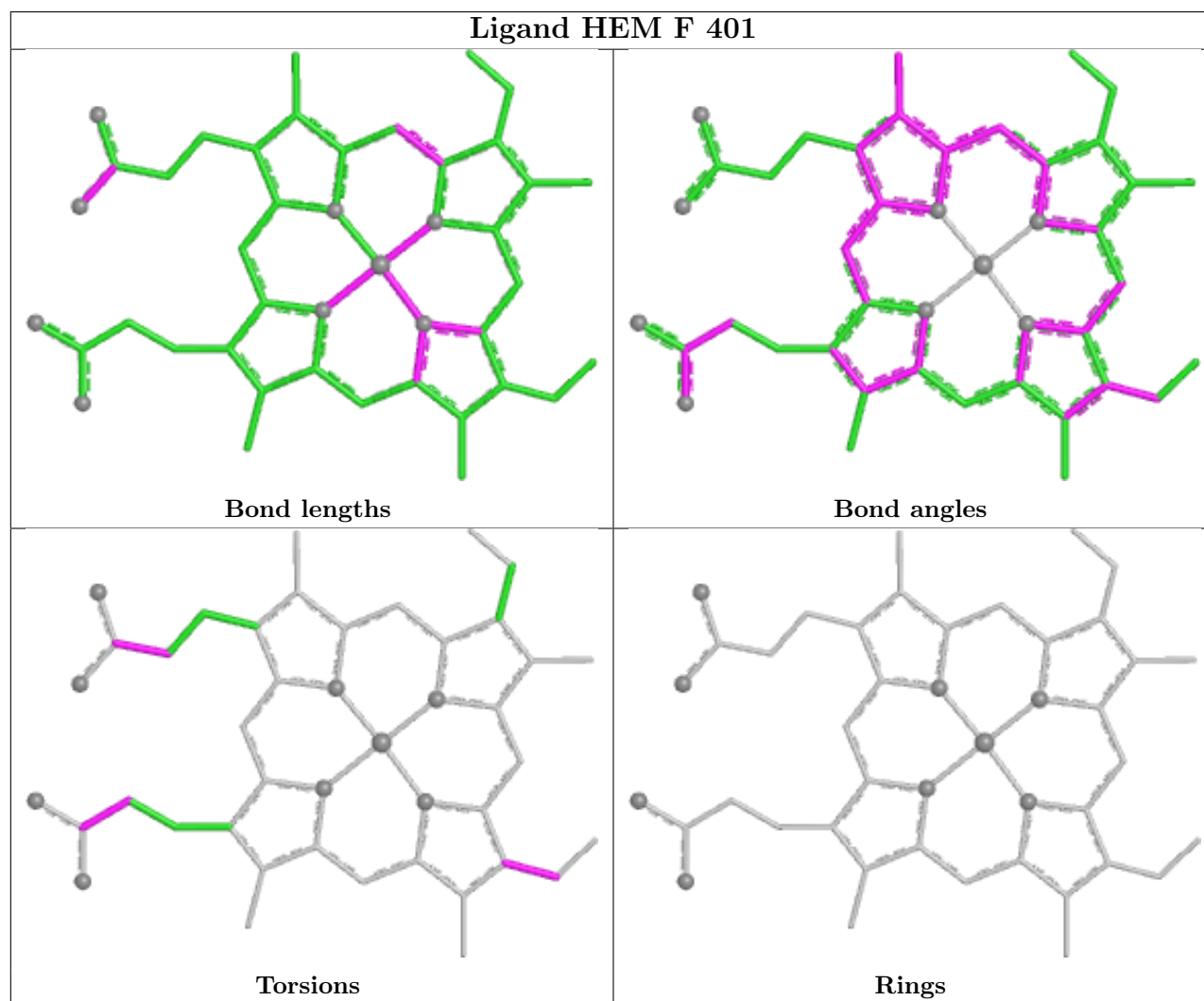
There are no ring outliers.

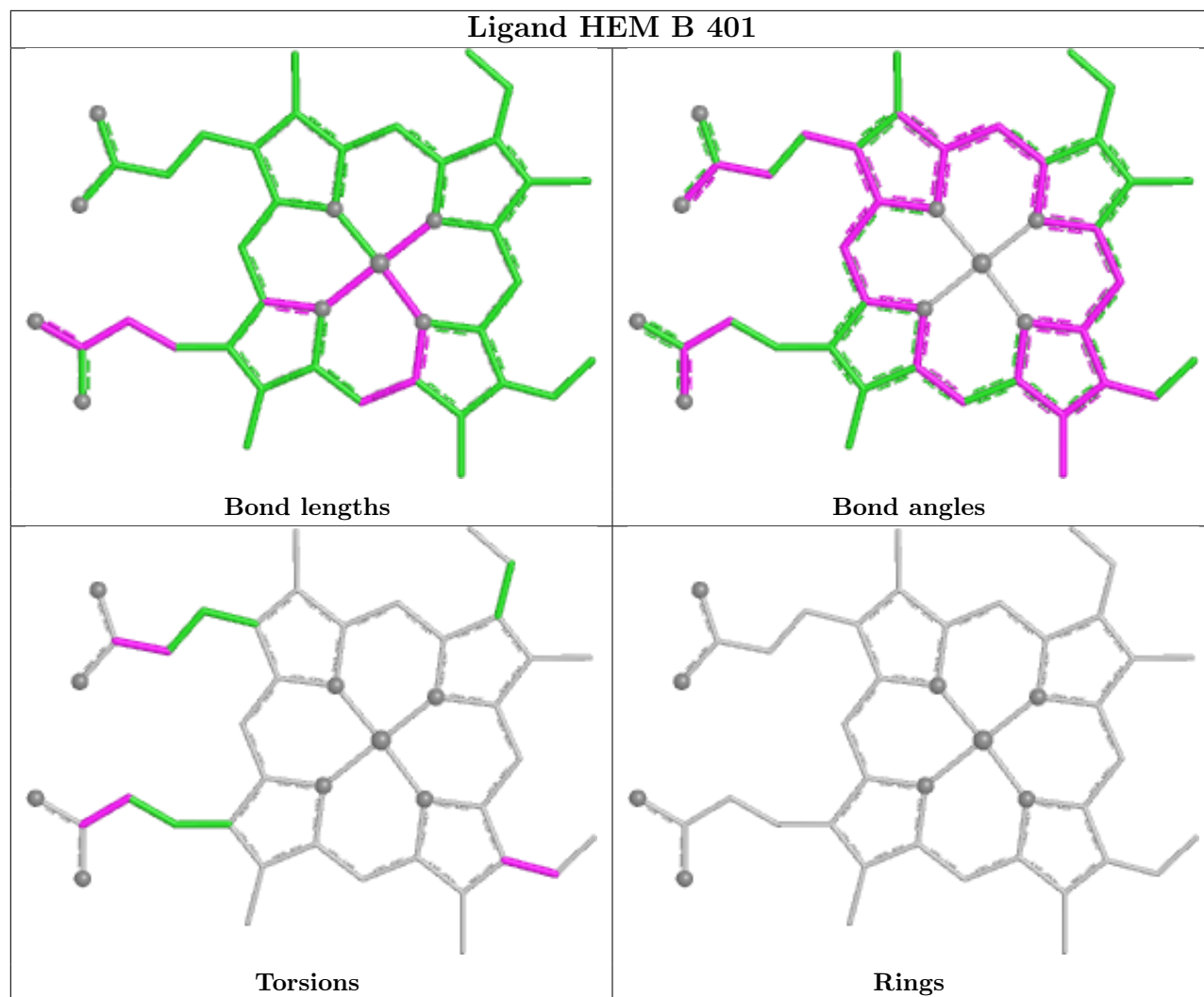
9 monomers are involved in 12 short contacts:

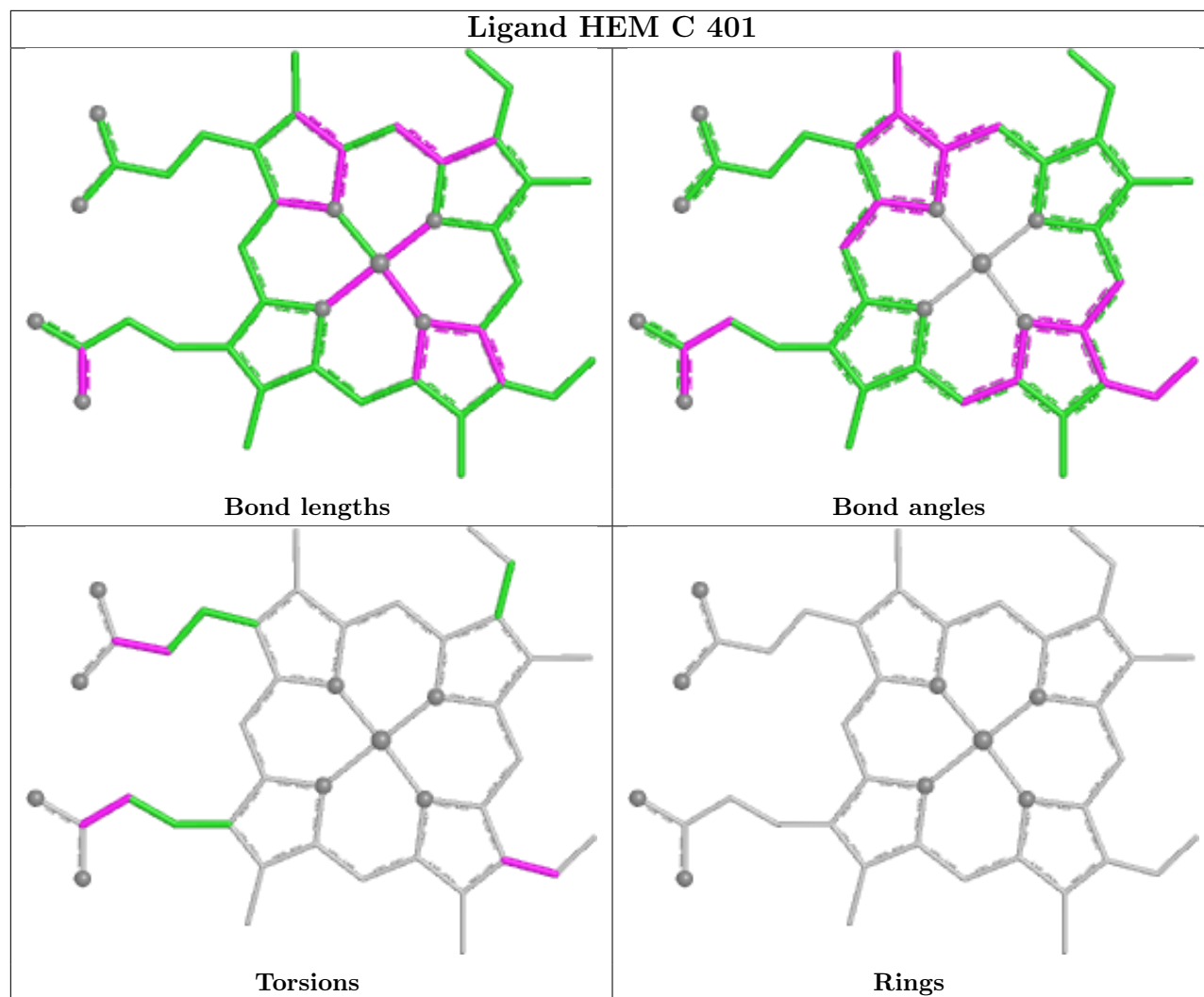
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	F	401	HEM	1	0
2	B	401	HEM	1	0
2	C	401	HEM	1	0
2	D	401	HEM	2	0
3	B	402	NO2	2	0
3	C	402	NO2	1	0
3	D	402	NO2	2	0
2	E	401	HEM	1	0
2	A	401	HEM	2	0

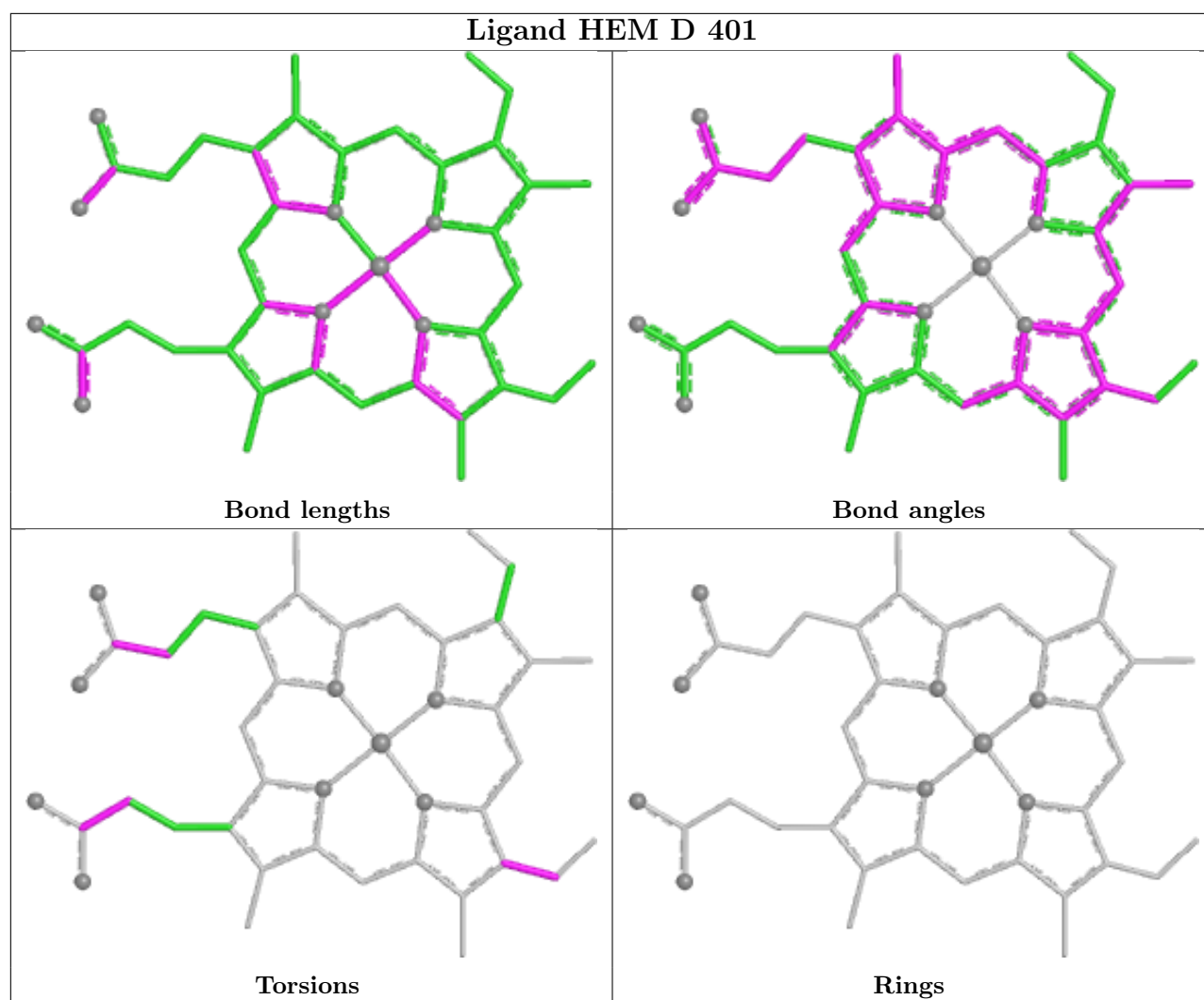
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths,

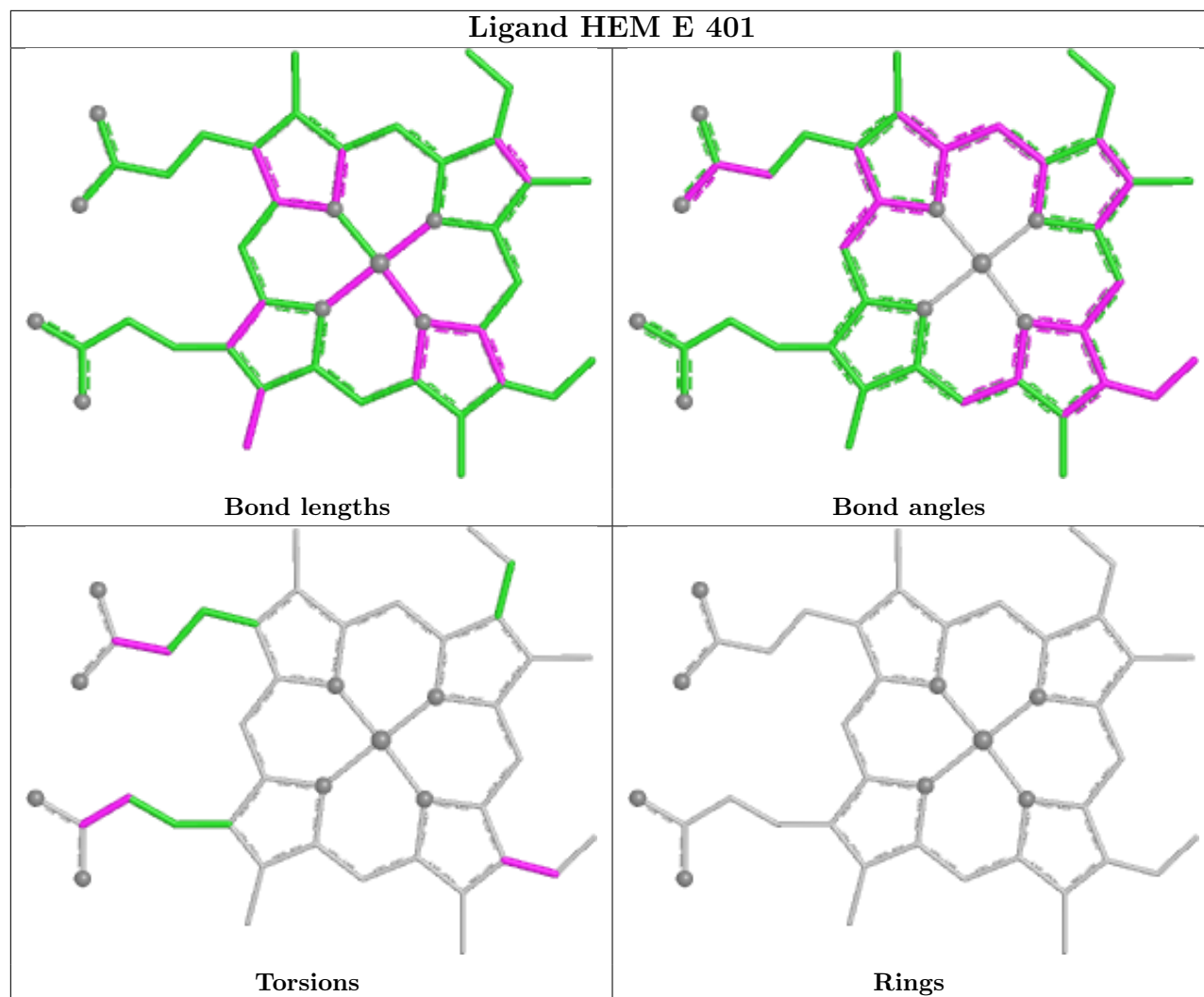
bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 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.

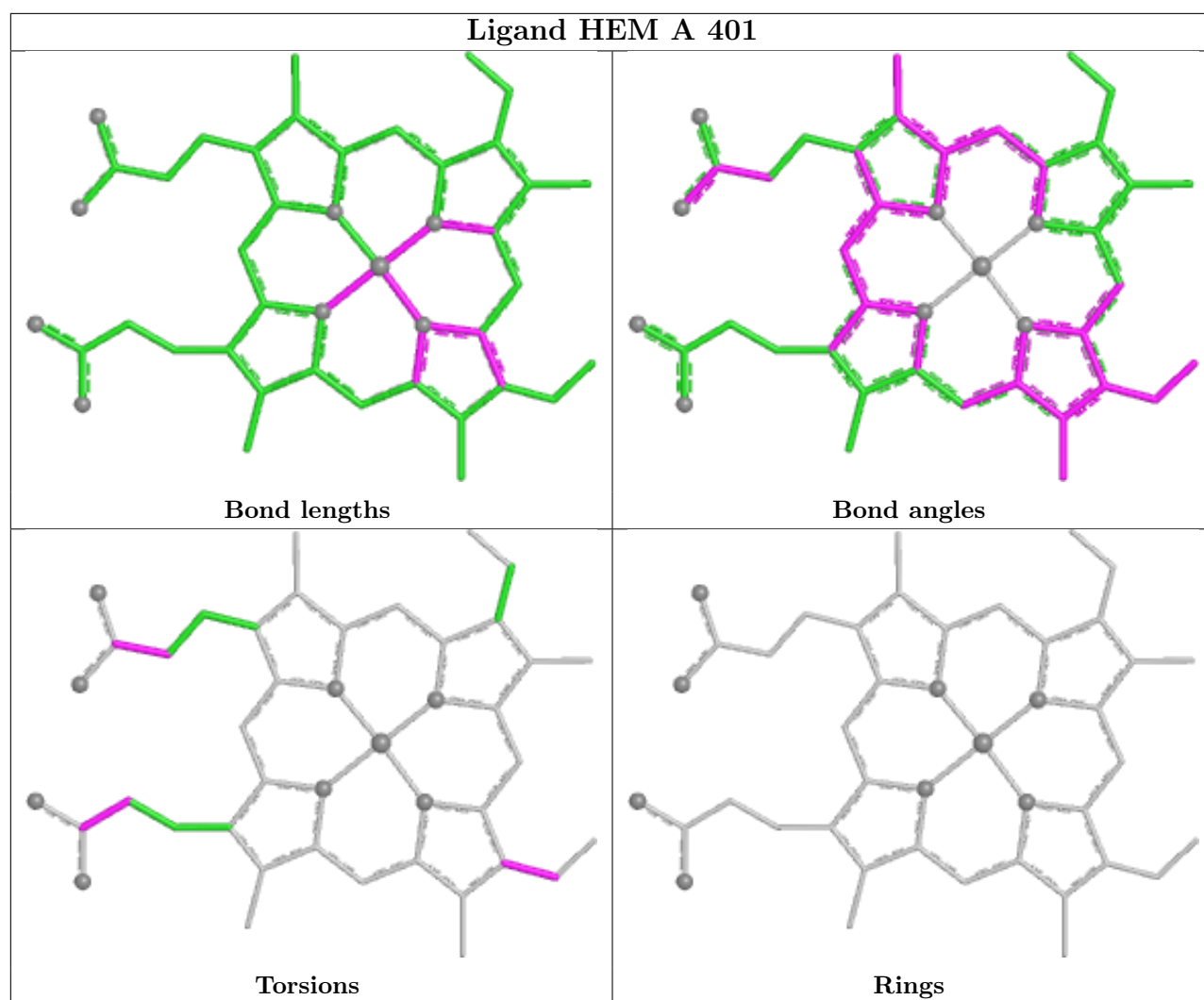












5.7 Other polymers [i](#)

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	305/316 (96%)	0.44	24 (7%) 18 24	8, 21, 44, 65	2 (0%)
1	B	306/316 (96%)	0.23	21 (6%) 23 29	7, 18, 44, 77	5 (1%)
1	C	306/316 (96%)	1.03	50 (16%) 4 5	10, 26, 57, 95	5 (1%)
1	D	304/316 (96%)	0.31	25 (8%) 17 22	10, 19, 43, 94	2 (0%)
1	E	305/316 (96%)	0.34	19 (6%) 26 34	10, 19, 47, 81	2 (0%)
1	F	305/316 (96%)	0.31	20 (6%) 24 30	8, 19, 45, 81	5 (1%)
All	All	1831/1896 (96%)	0.44	159 (8%) 16 20	7, 20, 48, 95	21 (1%)

All (159) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	234	PRO	6.5
1	C	8	PRO	6.2
1	F	234	PRO	6.1
1	D	234	PRO	5.3
1	F	8	PRO	5.2
1	D	236	GLY	5.0
1	E	312	LEU	5.0
1	C	170	ALA	4.8
1	C	312	LEU	4.5
1	C	233	GLY	4.5
1	F	236	GLY	4.4
1	D	8	PRO	4.4
1	C	219	VAL	4.4
1	D	311	ASP	4.2
1	C	218	ASP	4.1
1	C	235	ASP	4.1
1	C	7	GLU	4.1
1	C	222	ALA	4.0
1	E	239	LEU	3.9

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Mol	Chain	Res	Type	RSRZ
1	C	93	VAL	3.9
1	F	282	ALA	3.9
1	D	233	GLY	3.7
1	B	234	PRO	3.6
1	C	239	LEU	3.6
1	C	75	PHE	3.5
1	E	234	PRO	3.5
1	C	78	ALA	3.5
1	C	282	ALA	3.5
1	F	312	LEU	3.4
1	C	77	GLY	3.4
1	F	237	SER	3.4
1	D	232	THR	3.4
1	D	231	VAL	3.4
1	A	312	LEU	3.3
1	B	237	SER	3.3
1	C	231	VAL	3.3
1	A	216	SER	3.3
1	A	219	VAL	3.2
1	B	282	ALA	3.2
1	B	8	PRO	3.2
1	D	239	LEU	3.2
1	F	233	GLY	3.2
1	C	283	SER	3.2
1	D	219	VAL	3.1
1	A	95	ARG	3.1
1	A	234	PRO	3.1
1	C	217	ASP	3.1
1	D	282	ALA	3.1
1	D	237	SER	3.1
1	B	312	LEU	3.1
1	C	221	PRO	3.0
1	C	236	GLY	3.0
1	B	235	ASP	3.0
1	E	56	PRO	3.0
1	D	310	GLU	3.0
1	B	76	SER	2.9
1	F	127	ARG	2.9
1	E	8	PRO	2.9
1	C	279	LEU	2.9
1	C	71	TRP	2.9
1	C	127	ARG	2.9

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Mol	Chain	Res	Type	RSRZ
1	D	235	ASP	2.9
1	F	219	VAL	2.9
1	C	95	ARG	2.9
1	E	232	THR	2.8
1	C	174	ALA	2.8
1	A	8	PRO	2.8
1	E	163	ARG	2.8
1	A	222	ALA	2.8
1	A	282	ALA	2.8
1	E	231	VAL	2.8
1	D	217	ASP	2.8
1	E	237	SER	2.8
1	A	236	GLY	2.8
1	E	236	GLY	2.8
1	C	278	PHE	2.7
1	C	308	PHE	2.7
1	E	219	VAL	2.7
1	F	76	SER	2.7
1	E	77	GLY	2.7
1	A	218	ASP	2.7
1	C	76	SER	2.7
1	B	92	PRO	2.7
1	F	310	GLU	2.7
1	F	93	VAL	2.6
1	A	128	GLY	2.6
1	A	127	ARG	2.6
1	E	127	ARG	2.6
1	C	90	ASP	2.6
1	C	66	ILE	2.6
1	D	76	SER	2.6
1	C	92	PRO	2.6
1	C	281	THR	2.6
1	B	218	ASP	2.6
1	E	218	ASP	2.6
1	A	210	MET	2.6
1	F	238	ASP	2.5
1	C	89	LEU	2.5
1	F	239	LEU	2.5
1	A	93	VAL	2.5
1	B	79	ARG	2.5
1	B	93	VAL	2.5
1	B	163	ARG	2.5

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Mol	Chain	Res	Type	RSRZ
1	A	57	ASP	2.5
1	B	311	ASP	2.5
1	D	77	GLY	2.5
1	E	95	ARG	2.5
1	F	218	ASP	2.5
1	F	235	ASP	2.5
1	B	55	GLN	2.5
1	A	311	ASP	2.5
1	D	307	ASP	2.5
1	E	238	ASP	2.5
1	C	232	THR	2.5
1	A	284	ALA	2.4
1	D	279	LEU	2.4
1	C	216	SER	2.4
1	C	13[A]	VAL	2.4
1	C	97	VAL	2.4
1	C	74	LEU	2.4
1	B	310	GLU	2.3
1	B	238	ASP	2.3
1	C	83	LEU	2.3
1	B	236	GLY	2.3
1	C	56	PRO	2.3
1	C	309	LEU	2.3
1	C	311	ASP	2.3
1	F	232	THR	2.3
1	E	311	ASP	2.3
1	B	174	ALA	2.2
1	D	283	SER	2.2
1	C	38	ASP	2.2
1	D	93	VAL	2.2
1	D	268	GLU	2.2
1	A	253	ARG	2.2
1	E	222	ALA	2.2
1	A	283	SER	2.2
1	F	59	ARG	2.2
1	A	55	GLN	2.1
1	D	55	GLN	2.1
1	A	56	PRO	2.1
1	A	92	PRO	2.1
1	C	173	PRO	2.1
1	B	219	VAL	2.1
1	C	98	ALA	2.1

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Mol	Chain	Res	Type	RSRZ
1	C	39	LEU	2.1
1	B	7	GLU	2.1
1	D	164	ARG	2.1
1	F	87	ARG	2.1
1	A	310	GLU	2.1
1	D	195	GLY	2.0
1	F	284	ALA	2.0
1	C	55	GLN	2.0
1	B	164	ARG	2.0
1	E	55	GLN	2.0
1	C	253	ARG	2.0
1	D	87	ARG	2.0
1	A	217	ASP	2.0
1	C	237	SER	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
3	NO2	D	402	2/3	0.82	0.22	15,15,15,16	2
3	NO2	C	402	2/3	0.93	0.14	16,16,16,16	2
3	NO2	E	402	2/3	0.95	0.11	13,13,13,13	2
3	NO2	A	402	2/3	0.96	0.17	13,13,13,15	2
3	NO2	F	402	2/3	0.96	0.10	12,12,12,13	2
2	HEM	C	401	43/43	0.97	0.07	16,20,26,28	0
2	HEM	E	401	43/43	0.98	0.05	12,14,21,26	0
2	HEM	F	401	43/43	0.98	0.06	11,14,19,23	0
2	HEM	A	401	43/43	0.98	0.07	14,17,20,26	0

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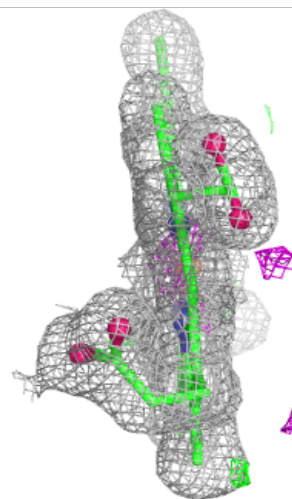
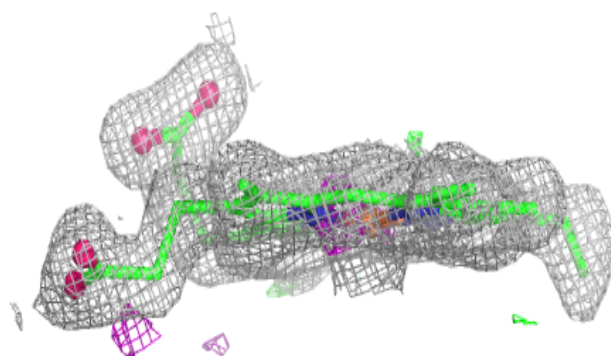
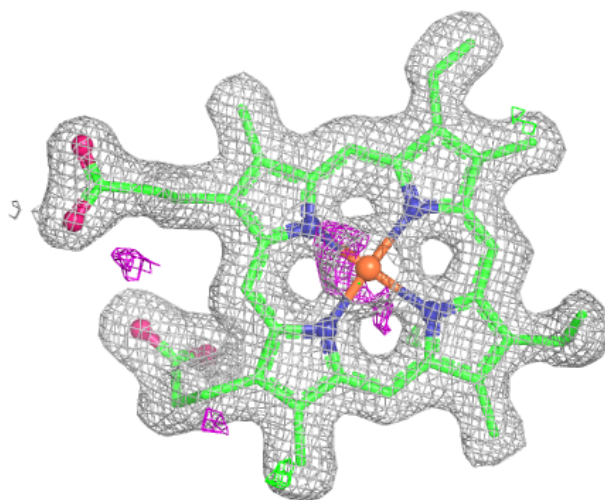
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
3	NO2	B	402	2/3	0.98	0.14	10,10,10,12	2
2	HEM	B	401	43/43	0.99	0.05	8,11,18,21	0
2	HEM	D	401	43/43	0.99	0.06	13,15,21,23	0

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.

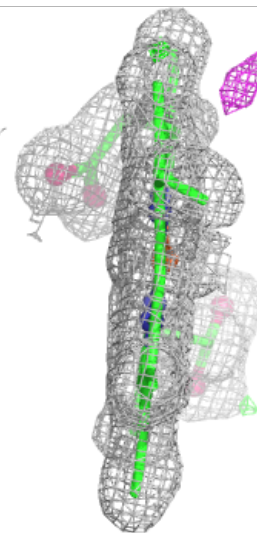
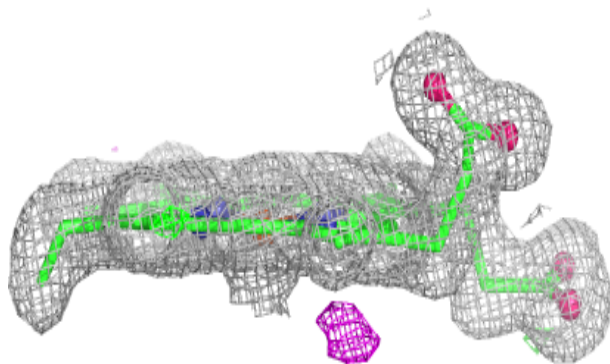
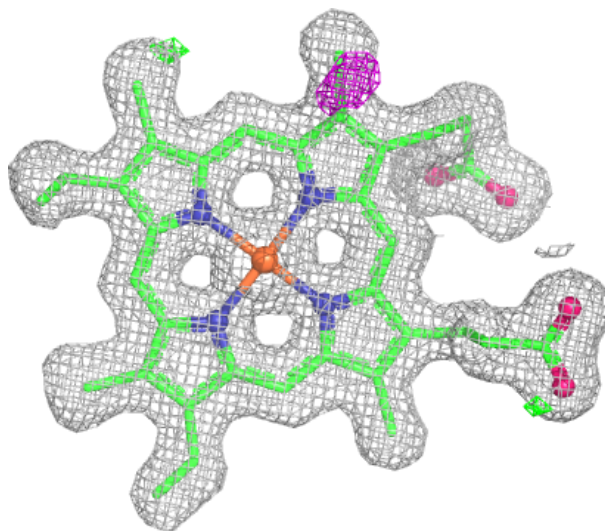
Electron density around HEM C 401:

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



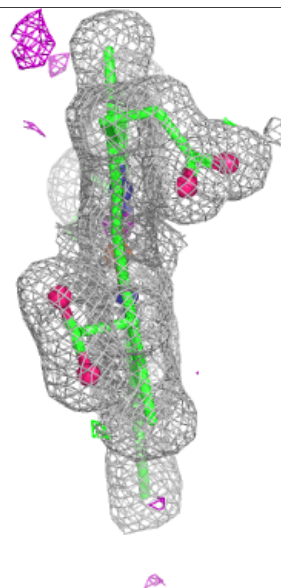
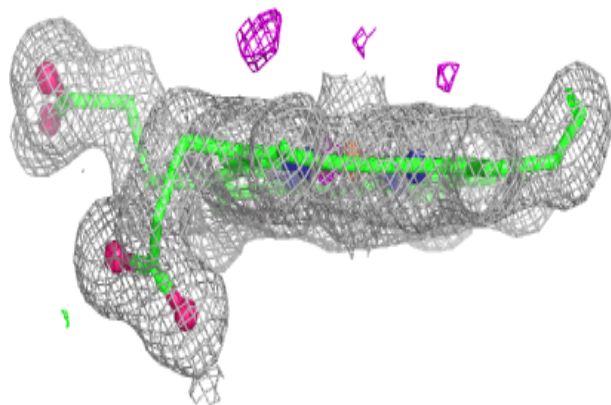
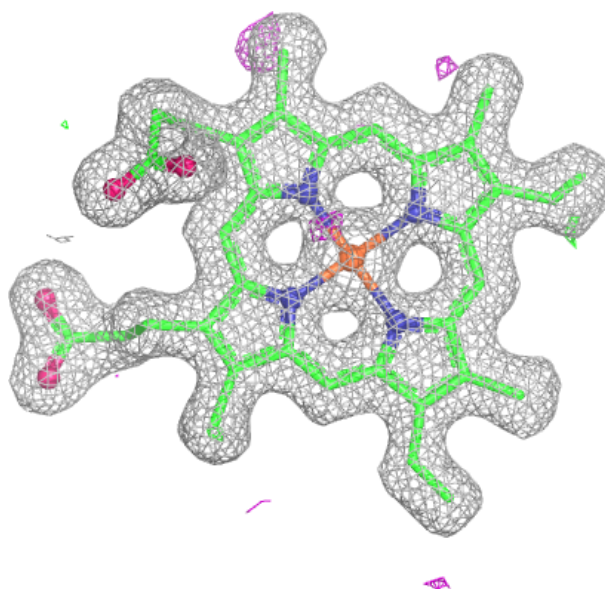
Electron density around HEM E 401:

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



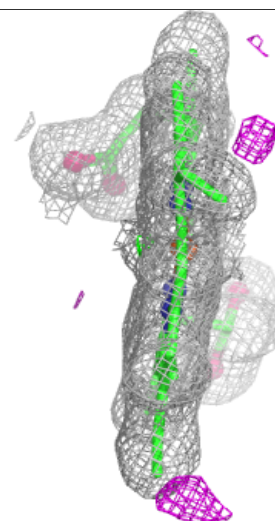
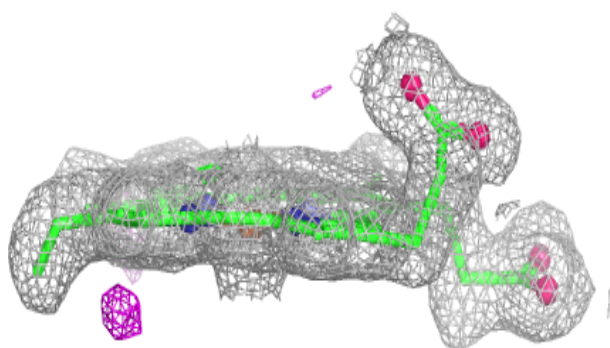
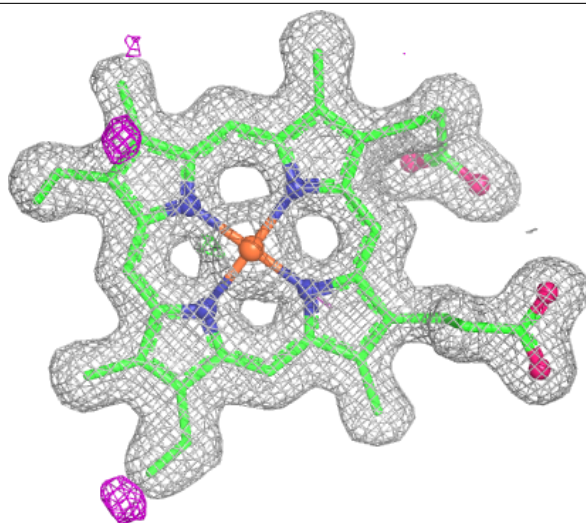
Electron density around HEM F 401:

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



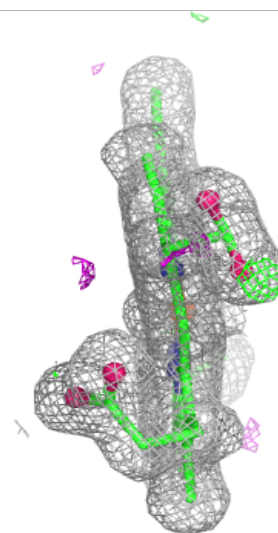
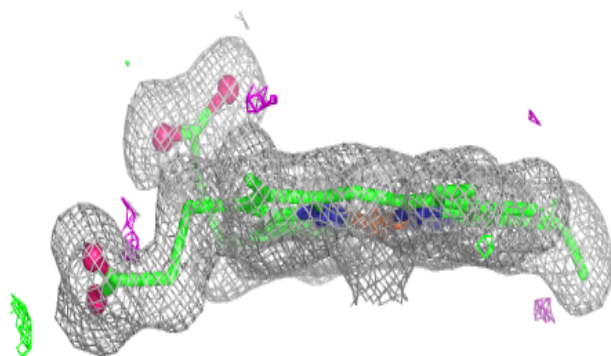
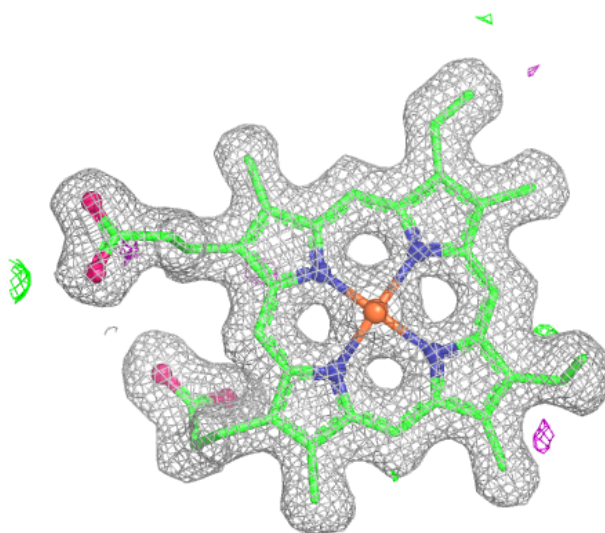
Electron density around HEM A 401:

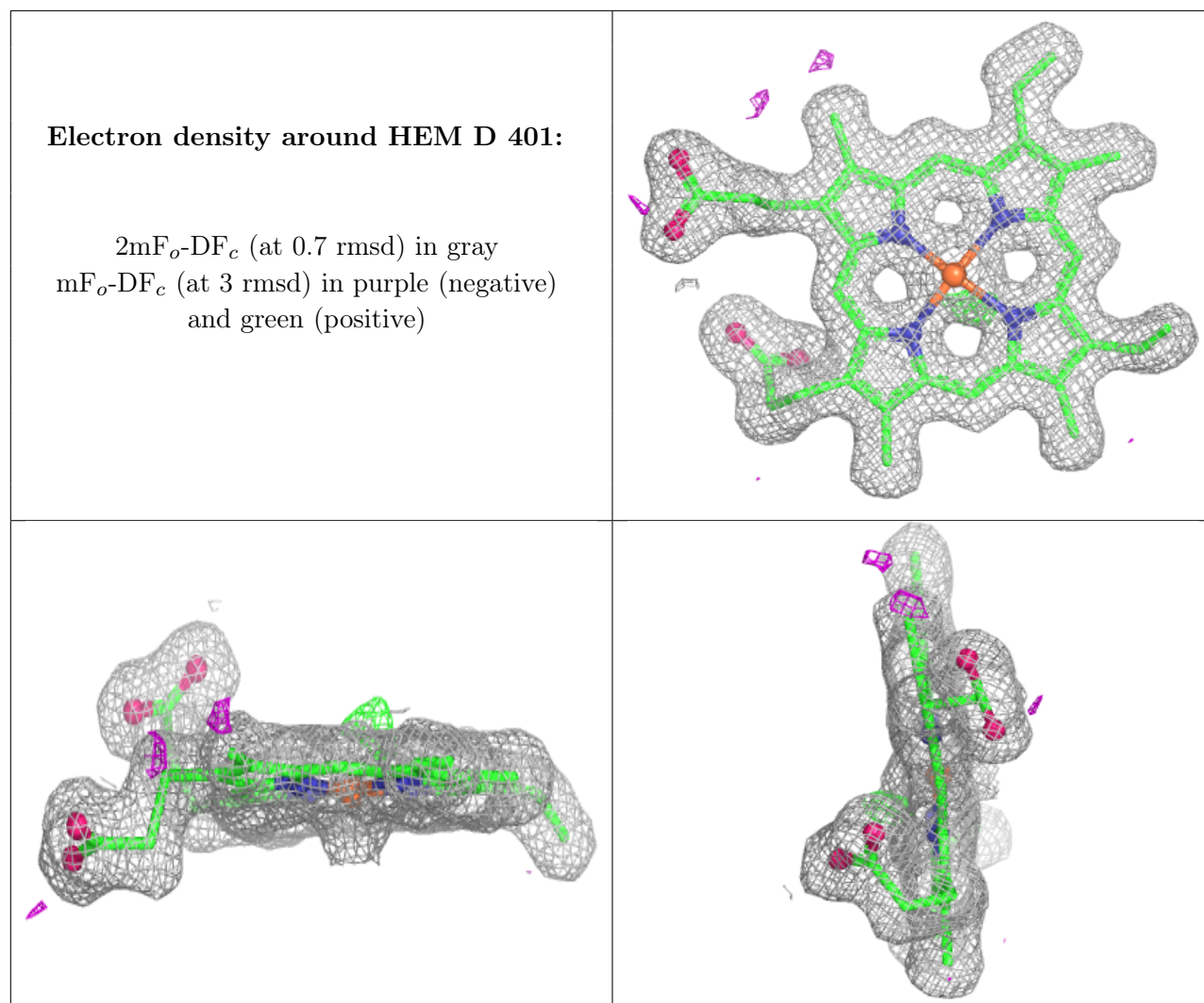
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around HEM B 401:

$2mF_o-DF_c$ (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.