



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 09:52 PM UTC

PDB ID : 9B17 / pdb_00009b17
Title : Crystal Structure of human Tryptophan 2,3-dioxygenase in complex with PAN1 inhibitor
Authors : Geeraerts, Z.; Yeh, S.-R.
Deposited on : 2024-03-13
Resolution : 2.65 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 ⓘ 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

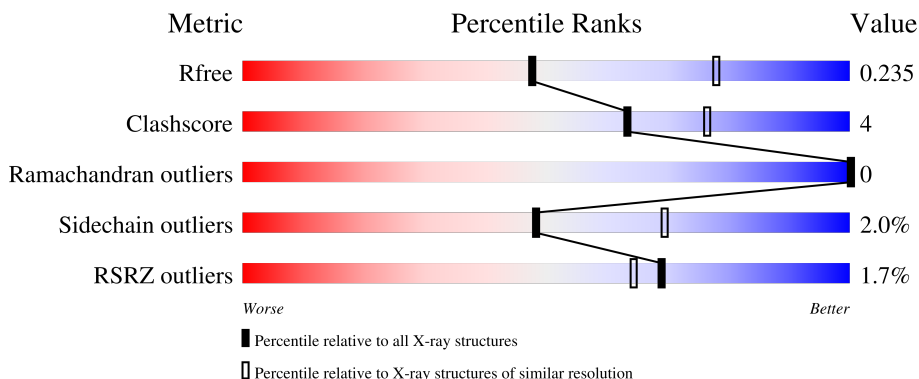
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.65 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	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	1110 (2.66-2.66)
Clashscore	190562	1141 (2.66-2.66)
Ramachandran outliers	187476	1126 (2.66-2.66)
Sidechain outliers	187428	1126 (2.66-2.66)
RSRZ outliers	180081	1110 (2.66-2.66)

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 $\leq 5\%$. 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	380	81% 10% 9%
1	B	380	81% 10% 9%
1	C	380	3% 78% 9% 12%
1	D	380	78% 11% 10%

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 11975 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 Tryptophan 2,3-dioxygenase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	346	Total	C	N	O	S	0	0	0
			2936	1886	515	524	11			
1	B	346	Total	C	N	O	S	0	0	0
			2936	1886	515	524	11			
1	C	335	Total	C	N	O	S	0	0	0
			2845	1831	500	503	11			
1	D	342	Total	C	N	O	S	0	0	0
			2899	1864	508	516	11			

There are 32 discrepancies between the modelled and reference sequences:

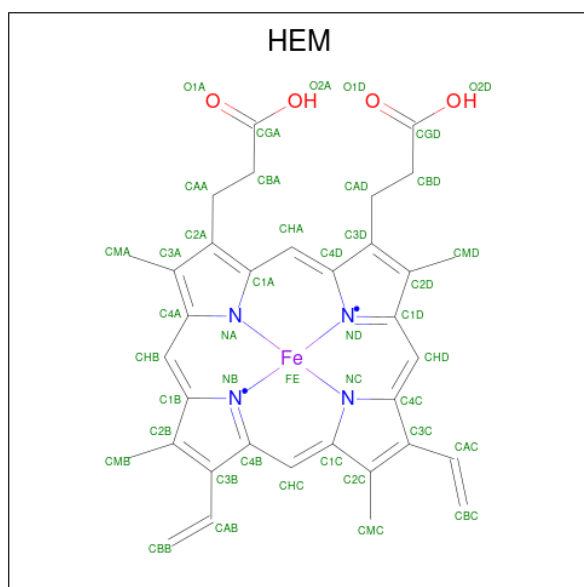
Chain	Residue	Modelled	Actual	Comment	Reference
A	17	MET	-	initiating methionine	UNP P48775
A	390	GLU	-	expression tag	UNP P48775
A	391	HIS	-	expression tag	UNP P48775
A	392	HIS	-	expression tag	UNP P48775
A	393	HIS	-	expression tag	UNP P48775
A	394	HIS	-	expression tag	UNP P48775
A	395	HIS	-	expression tag	UNP P48775
A	396	HIS	-	expression tag	UNP P48775
B	17	MET	-	initiating methionine	UNP P48775
B	390	GLU	-	expression tag	UNP P48775
B	391	HIS	-	expression tag	UNP P48775
B	392	HIS	-	expression tag	UNP P48775
B	393	HIS	-	expression tag	UNP P48775
B	394	HIS	-	expression tag	UNP P48775
B	395	HIS	-	expression tag	UNP P48775
B	396	HIS	-	expression tag	UNP P48775
C	17	MET	-	initiating methionine	UNP P48775
C	390	GLU	-	expression tag	UNP P48775
C	391	HIS	-	expression tag	UNP P48775
C	392	HIS	-	expression tag	UNP P48775
C	393	HIS	-	expression tag	UNP P48775

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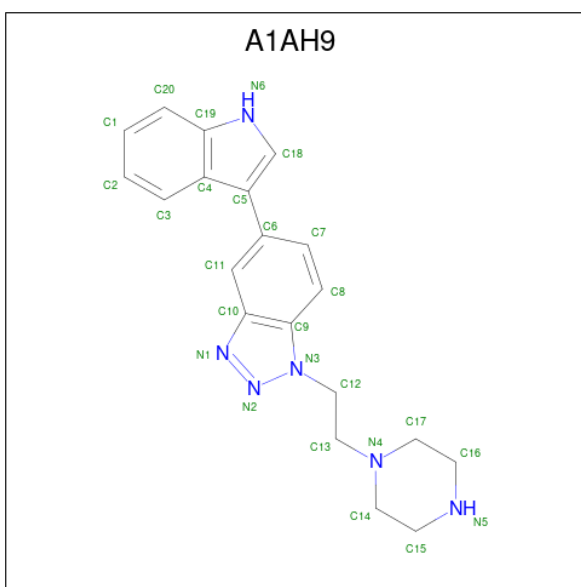
Chain	Residue	Modelled	Actual	Comment	Reference
C	394	HIS	-	expression tag	UNP P48775
C	395	HIS	-	expression tag	UNP P48775
C	396	HIS	-	expression tag	UNP P48775
D	17	MET	-	initiating methionine	UNP P48775
D	390	GLU	-	expression tag	UNP P48775
D	391	HIS	-	expression tag	UNP P48775
D	392	HIS	-	expression tag	UNP P48775
D	393	HIS	-	expression tag	UNP P48775
D	394	HIS	-	expression tag	UNP P48775
D	395	HIS	-	expression tag	UNP P48775
D	396	HIS	-	expression tag	UNP P48775

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



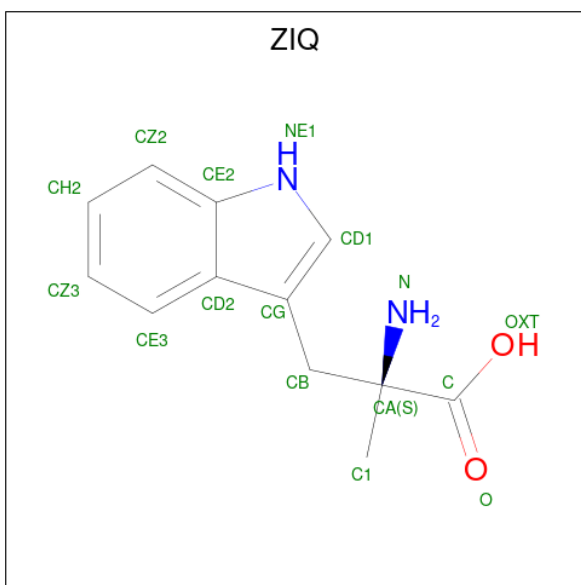
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	B	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	C	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	D	1	Total 43	C 34	Fe 1	N 4	O 4	0	0

- Molecule 3 is (5P)-5-(1H-indol-3-yl)-1-[2-(piperazin-1-yl)ethyl]-1H-1,2,3-benzotriazole (CCD ID: A1AH9) (formula: $C_{20}H_{22}N_6$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	N	0	0
			26	20	6		
3	B	1	Total	C	N	0	0
			26	20	6		
3	C	1	Total	C	N	0	0
			26	20	6		
3	D	1	Total	C	N	0	0
			26	20	6		

- Molecule 4 is alpha-methyl-L-tryptophan (CCD ID: ZIQ) (formula: $C_{12}H_{14}N_2O_2$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	N	O	0	0
			16	12	2	2		
4	B	1	Total	C	N	O	0	0
			16	12	2	2		
4	C	1	Total	C	N	O	0	0
			16	12	2	2		
4	D	1	Total	C	N	O	0	0
			16	12	2	2		

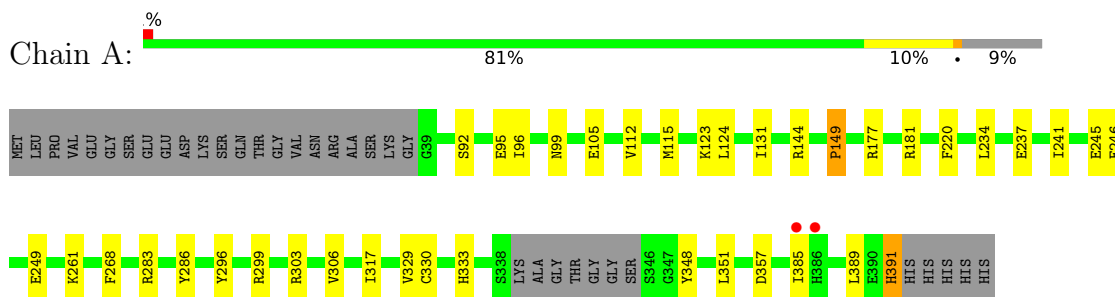
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	5	Total	O	0	0
			5	5		
5	B	5	Total	O	0	0
			5	5		
5	C	5	Total	O	0	0
			5	5		
5	D	4	Total	O	0	0
			4	4		

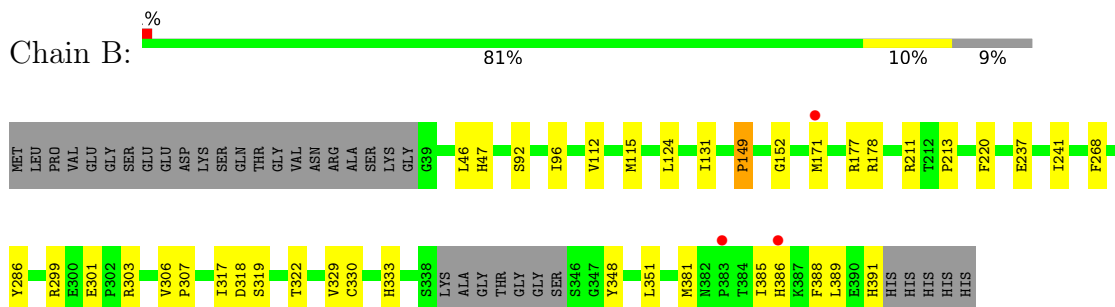
3 Residue-property plots

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.

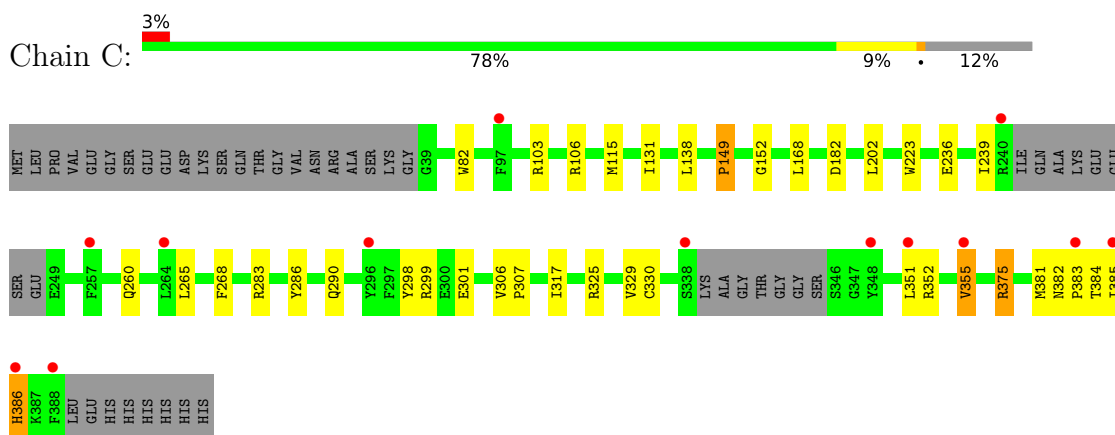
- Molecule 1: Tryptophan 2,3-dioxygenase



- Molecule 1: Tryptophan 2,3-dioxygenase

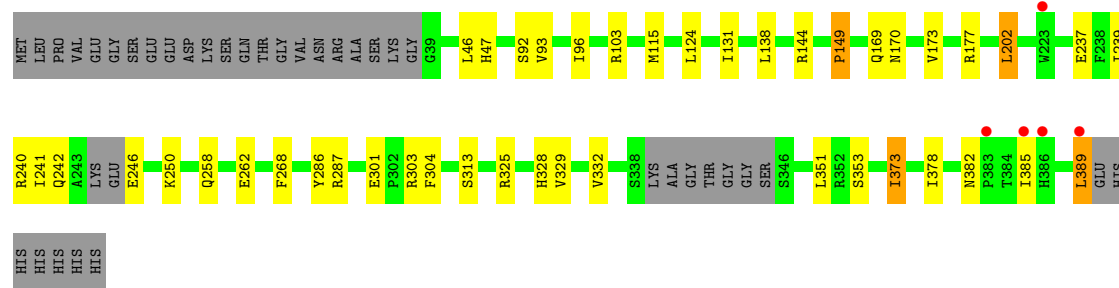


- Molecule 1: Tryptophan 2,3-dioxygenase



- Molecule 1: Tryptophan 2,3-dioxygenase

Chain D:



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	143.61Å 154.01Å 88.58Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	34.29 – 2.65 34.29 – 2.65	Depositor EDS
% Data completeness (in resolution range)	62.5 (34.29-2.65) 62.5 (34.29-2.65)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.82 (at 2.65Å)	Xtriage
Refinement program	REFMAC 5.8.0425	Depositor
R, R_{free}	0.190 , 0.234 0.194 , 0.235	Depositor DCC
R_{free} test set	1788 reflections (3.09%)	wwPDB-VP
Wilson B-factor (Å ²)	56.5	Xtriage
Anisotropy	0.243	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.29 , 43.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	11975	wwPDB-VP
Average B, all atoms (Å ²)	73.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.60% 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: ZIQ, HEM, A1AH9

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	0.57	0/3005	1.08	4/4044 (0.1%)
1	B	0.56	0/3005	1.05	1/4044 (0.0%)
1	C	0.52	0/2912	1.04	2/3918 (0.1%)
1	D	0.55	0/2966	1.04	2/3991 (0.1%)
All	All	0.55	0/11888	1.05	9/15997 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	2
1	B	0	1
1	C	0	1
1	D	0	5
All	All	0	9

There are no bond length outliers.

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	391	HIS	CA-CB-CG	6.39	120.19	113.80
1	C	182	ASP	CA-CB-CG	6.07	118.67	112.60
1	A	149	PRO	N-CA-CB	-5.77	96.25	102.60
1	D	149	PRO	N-CA-CB	-5.71	96.31	102.60
1	A	105	GLU	CB-CG-CD	5.66	122.21	112.60
1	B	149	PRO	N-CA-CB	-5.60	96.44	102.60
1	C	149	PRO	N-CA-CB	-5.26	96.81	102.60
1	D	373	ILE	N-CA-CB	-5.24	108.22	111.83

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	249	GLU	CB-CG-CD	5.06	121.20	112.60

There are no chirality outliers.

All (9) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	144	ARG	Sidechain
1	A	181	ARG	Sidechain
1	B	299	ARG	Sidechain
1	C	375	ARG	Sidechain
1	D	103	ARG	Sidechain
1	D	144	ARG	Sidechain
1	D	177	ARG	Sidechain
1	D	240	ARG	Sidechain
1	D	287	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	2936	0	2917	18	0
1	B	2936	0	2917	23	0
1	C	2845	0	2832	29	0
1	D	2899	0	2884	24	0
2	A	43	0	30	2	0
2	B	43	0	30	3	0
2	C	43	0	30	1	0
2	D	43	0	30	4	0
3	A	26	0	0	0	0
3	B	26	0	0	0	0
3	C	26	0	0	0	0
3	D	26	0	0	0	0
4	A	16	0	0	0	0
4	B	16	0	0	1	0
4	C	16	0	0	1	0
4	D	16	0	0	0	0
5	A	5	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	B	5	0	0	0	0
5	C	5	0	0	0	0
5	D	4	0	0	0	0
All	All	11975	0	11670	94	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 (94) 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:C:329:VAL:HG22	1:C:351:LEU:HB3	1.54	0.89
1:D:93:VAL:HG21	1:D:115:MET:HE3	1.56	0.86
1:D:303:ARG:HB2	1:D:389:LEU:HD13	1.64	0.79
1:C:223:TRP:CG	1:C:290:GLN:HE21	2.07	0.73
1:D:329:VAL:HG22	1:D:351:LEU:HB3	1.74	0.69
1:B:115:MET:HE3	1:B:317:ILE:HD13	1.75	0.69
1:B:329:VAL:HG22	1:B:351:LEU:HB3	1.74	0.69
2:A:401:HEM:HBC2	2:A:401:HEM:HHD	1.77	0.67
1:C:301:GLU:HG3	1:C:381:MET:HE2	1.76	0.67
2:D:401:HEM:HBC2	2:D:401:HEM:HHD	1.78	0.66
1:B:115:MET:HE3	1:B:317:ILE:CD1	2.26	0.65
2:B:401:HEM:HBC2	2:B:401:HEM:HHD	1.78	0.65
1:C:223:TRP:CD1	1:C:290:GLN:HE21	2.15	0.64
1:D:382:ASN:HB2	1:D:385:ILE:HG12	1.79	0.63
1:C:383:PRO:HA	1:C:386:HIS:CG	2.34	0.62
1:D:202:LEU:C	1:D:202:LEU:HD13	2.24	0.62
1:A:115:MET:HE3	1:A:317:ILE:CD1	2.30	0.62
1:D:115:MET:HA	1:D:115:MET:HE2	1.82	0.61
1:C:115:MET:HE3	1:C:317:ILE:CD1	2.30	0.61
1:C:352:ARG:O	1:C:355:VAL:HG12	2.02	0.59
1:D:239:ILE:O	1:D:242:GLN:HG2	2.04	0.58
1:C:299:ARG:HH12	1:C:375:ARG:HH12	1.53	0.56
1:A:220:PHE:HD1	1:A:385:ILE:HG12	1.71	0.55
1:C:382:ASN:OD1	1:C:384:THR:OG1	2.22	0.54
1:A:329:VAL:HG22	1:A:351:LEU:HB3	1.89	0.53
1:B:220:PHE:CD1	1:B:385:ILE:HG21	2.42	0.53
1:C:325:ARG:O	1:C:329:VAL:HG23	2.09	0.53
2:A:401:HEM:HHD	2:A:401:HEM:CBC	2.41	0.51
1:B:115:MET:CE	1:B:317:ILE:HD13	2.41	0.50
1:A:299:ARG:HD3	1:C:138:LEU:HD13	1.93	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:268:PHE:HA	1:D:286:TYR:OH	2.12	0.49
1:B:268:PHE:HA	1:B:286:TYR:OH	2.13	0.49
1:B:237:GLU:O	1:B:241:ILE:HG13	2.14	0.48
1:C:268:PHE:HA	1:C:286:TYR:HH	1.78	0.48
1:C:268:PHE:HA	1:C:286:TYR:OH	2.12	0.48
1:B:211:ARG:HE	4:B:403:ZIQ:C	2.25	0.48
1:D:237:GLU:O	1:D:241:ILE:HG12	2.14	0.48
1:C:329:VAL:HG22	1:C:351:LEU:CB	2.37	0.47
1:C:381:MET:HE3	1:C:386:HIS:HB2	1.96	0.47
1:C:131:ILE:CD1	1:D:124:LEU:HD22	2.44	0.47
1:A:283:ARG:NH1	1:A:357:ASP:O	2.48	0.47
1:B:303:ARG:HD3	1:B:389:LEU:HA	1.97	0.47
1:A:268:PHE:HA	1:A:286:TYR:OH	2.15	0.46
1:B:301:GLU:OE1	1:C:106:ARG:NH2	2.40	0.46
1:A:131:ILE:CD1	1:B:124:LEU:HD22	2.46	0.46
2:D:401:HEM:CMB	2:D:401:HEM:HBB2	2.46	0.46
1:B:385:ILE:O	1:B:388:PHE:HD2	1.99	0.46
1:A:245:GLU:O	1:A:246:GLU:C	2.59	0.45
1:A:268:PHE:HA	1:A:286:TYR:HH	1.80	0.45
1:C:383:PRO:HA	1:C:386:HIS:ND1	2.30	0.45
1:C:202:LEU:CD2	1:C:283:ARG:NH2	2.79	0.45
1:D:202:LEU:C	1:D:202:LEU:CD1	2.89	0.45
1:D:258:GLN:HG3	1:D:262:GLU:OE2	2.16	0.45
1:B:177:ARG:O	1:B:178:ARG:NH1	2.50	0.44
1:D:301:GLU:CB	1:D:389:LEU:HD12	2.48	0.44
2:D:401:HEM:HHH	2:D:401:HEM:CBC	2.47	0.44
1:C:152:GLY:HA3	2:C:401:HEM:C1D	2.53	0.43
2:B:401:HEM:CMB	2:B:401:HEM:HBB2	2.48	0.43
1:A:303:ARG:HD3	1:A:389:LEU:HA	2.00	0.43
1:C:223:TRP:CG	1:C:290:GLN:NE2	2.83	0.43
1:B:319:SER:O	1:B:322:THR:HG22	2.19	0.43
1:D:304:PHE:CD2	1:D:389:LEU:HD11	2.54	0.43
1:D:303:ARG:HD3	1:D:389:LEU:HA	2.00	0.43
1:D:246:GLU:HA	1:D:250:LYS:HD3	2.01	0.43
1:A:237:GLU:O	1:A:241:ILE:HG13	2.19	0.42
1:A:124:LEU:HD22	1:B:131:ILE:CD1	2.49	0.42
1:B:333:HIS:HB2	1:B:348:TYR:CE1	2.54	0.42
1:A:296:TYR:HB3	1:C:138:LEU:HD21	2.02	0.42
1:B:46:LEU:O	1:B:47:HIS:C	2.63	0.42
1:D:173:VAL:HG11	1:D:353:SER:OG	2.18	0.42
1:C:236:GLU:HA	1:C:239:ILE:HD12	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:325:ARG:O	1:D:329:VAL:HG23	2.20	0.42
1:C:298:TYR:CD1	1:C:381:MET:HG3	2.55	0.42
2:D:401:HEM:HBC2	2:D:401:HEM:CHD	2.46	0.41
1:C:131:ILE:HD12	1:D:124:LEU:HD22	2.01	0.41
1:A:92:SER:O	1:A:96:ILE:HG13	2.20	0.41
1:D:46:LEU:O	1:D:47:HIS:C	2.64	0.41
1:C:168:LEU:HG	1:C:283:ARG:NH2	2.35	0.41
1:B:92:SER:O	1:B:96:ILE:HG13	2.20	0.41
1:A:95:GLU:HG3	1:A:99:ASN:OD1	2.20	0.41
1:C:82:TRP:CH2	1:D:131:ILE:HG21	2.55	0.41
1:C:103:ARG:HA	4:C:403:ZIQ:OXT	2.20	0.41
1:D:373:ILE:HD11	1:D:378:ILE:HG12	2.03	0.41
1:B:112:VAL:HG21	1:B:306:VAL:HG13	2.02	0.41
1:A:112:VAL:HG21	1:A:306:VAL:HG13	2.02	0.40
1:A:333:HIS:HB2	1:A:348:TYR:CE1	2.57	0.40
1:B:152:GLY:HA3	2:B:401:HEM:C1D	2.56	0.40
1:B:386:HIS:HD1	1:B:386:HIS:C	2.28	0.40
1:B:213:PRO:HB2	1:B:388:PHE:CE1	2.57	0.40
1:D:92:SER:O	1:D:96:ILE:HG13	2.21	0.40
1:C:306:VAL:N	1:C:307:PRO:CD	2.85	0.40
1:D:328:HIS:O	1:D:332:VAL:HG23	2.22	0.40
1:A:234:LEU:HD13	1:A:261:LYS:HG3	2.03	0.40
1:B:385:ILE:O	1:B:386:HIS:C	2.64	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	342/380 (90%)	330 (96%)	12 (4%)	0	100	100
1	B	342/380 (90%)	332 (97%)	10 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	C	329/380 (87%)	319 (97%)	10 (3%)	0	100	100
1	D	336/380 (88%)	328 (98%)	8 (2%)	0	100	100
All	All	1349/1520 (89%)	1309 (97%)	40 (3%)	0	100	100

There are no Ramachandran outliers to report.

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	322/348 (92%)	317 (98%)	5 (2%)	55	74
1	B	322/348 (92%)	315 (98%)	7 (2%)	45	67
1	C	312/348 (90%)	305 (98%)	7 (2%)	45	67
1	D	318/348 (91%)	311 (98%)	7 (2%)	45	67
All	All	1274/1392 (92%)	1248 (98%)	26 (2%)	48	69

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

Mol	Chain	Res	Type
1	A	123	LYS
1	A	149	PRO
1	A	177	ARG
1	A	330	CYS
1	A	391	HIS
1	B	149	PRO
1	B	171	MET
1	B	307	PRO
1	B	318	ASP
1	B	330	CYS
1	B	381	MET
1	B	391	HIS
1	C	149	PRO
1	C	260	GLN

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Mol	Chain	Res	Type
1	C	265	LEU
1	C	330	CYS
1	C	355	VAL
1	C	385	ILE
1	C	386	HIS
1	D	138	LEU
1	D	149	PRO
1	D	169	GLN
1	D	170	ASN
1	D	202	LEU
1	D	313	SER
1	D	389	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	107	ASN
1	A	309	GLN
1	B	58	GLN
1	B	183	ASN
1	B	189	ASN
1	B	253	GLN
1	B	275	HIS
1	B	309	GLN
1	B	367	ASN
1	C	309	GLN
1	D	183	ASN
1	D	290	GLN
1	D	309	GLN
1	D	327	ASN
1	D	382	ASN

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 [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
2	HEM	A	401	1	50,50,50	1.57	9 (18%)	67,82,82	1.73	16 (23%)
3	A1AH9	C	402	-	30,30,30	0.65	0	42,42,42	0.72	0
2	HEM	D	401	1	50,50,50	1.64	10 (20%)	67,82,82	1.84	19 (28%)
3	A1AH9	A	402	-	30,30,30	0.63	0	42,42,42	0.76	1 (2%)
4	ZIQ	D	403	-	14,17,17	0.64	0	20,25,25	1.02	1 (5%)
3	A1AH9	D	402	-	30,30,30	0.66	1 (3%)	42,42,42	0.88	0
4	ZIQ	B	403	-	14,17,17	0.66	0	20,25,25	1.20	3 (15%)
2	HEM	B	401	1	50,50,50	1.53	8 (16%)	67,82,82	1.74	17 (25%)
4	ZIQ	C	403	-	14,17,17	0.58	0	20,25,25	0.94	1 (5%)
3	A1AH9	B	402	-	30,30,30	0.64	1 (3%)	42,42,42	0.81	1 (2%)
4	ZIQ	A	403	-	14,17,17	0.64	0	20,25,25	1.17	1 (5%)
2	HEM	C	401	1	50,50,50	1.65	8 (16%)	67,82,82	1.77	15 (22%)

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	401	1	-	2/14/54/54	-
3	A1AH9	C	402	-	-	7/9/17/17	1/5/5/5
2	HEM	D	401	1	-	2/14/54/54	-
3	A1AH9	A	402	-	-	7/9/17/17	1/5/5/5

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	ZIQ	D	403	-	-	0/11/11/11	0/2/2/2
3	A1AH9	D	402	-	-	8/9/17/17	0/5/5/5
4	ZIQ	B	403	-	-	4/11/11/11	0/2/2/2
2	HEM	B	401	1	-	3/14/54/54	-
4	ZIQ	C	403	-	-	6/11/11/11	0/2/2/2
3	A1AH9	B	402	-	-	5/9/17/17	0/5/5/5
4	ZIQ	A	403	-	-	2/11/11/11	0/2/2/2
2	HEM	C	401	1	-	3/14/54/54	-

All (37) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	401	HEM	FE-NB	5.16	2.10	1.94
2	A	401	HEM	FE-NB	4.59	2.09	1.94
2	B	401	HEM	FE-NB	4.44	2.08	1.94
2	D	401	HEM	FE-NB	4.25	2.08	1.94
2	C	401	HEM	FE-NC	4.22	2.09	1.95
2	D	401	HEM	C1B-NB	-3.99	1.33	1.40
2	B	401	HEM	C1B-NB	-3.89	1.33	1.40
2	B	401	HEM	FE-NC	3.75	2.07	1.95
2	A	401	HEM	C1B-NB	-3.54	1.34	1.40
2	C	401	HEM	C1B-NB	-3.53	1.34	1.40
2	C	401	HEM	C1C-C2C	-3.36	1.38	1.45
2	D	401	HEM	FE-NC	3.31	2.06	1.95
2	D	401	HEM	C4B-NB	-3.29	1.32	1.38
2	D	401	HEM	C3C-C4C	-3.19	1.40	1.46
2	D	401	HEM	C4D-ND	-3.09	1.34	1.40
2	C	401	HEM	C4D-ND	-3.08	1.34	1.40
2	B	401	HEM	C1C-C2C	-3.04	1.39	1.45
2	A	401	HEM	FE-NC	3.04	2.05	1.95
2	B	401	HEM	C4B-NB	-2.85	1.33	1.38
2	C	401	HEM	C4B-NB	-2.72	1.33	1.38
2	A	401	HEM	C4B-NB	-2.71	1.33	1.38
2	A	401	HEM	C1C-C2C	-2.67	1.40	1.45
2	C	401	HEM	C3C-C4C	-2.66	1.41	1.46
2	D	401	HEM	C1C-NC	-2.56	1.34	1.39
2	A	401	HEM	C3C-C4C	-2.53	1.41	1.46
2	A	401	HEM	C1D-ND	-2.41	1.34	1.38
2	D	401	HEM	C1A-C2A	-2.37	1.39	1.44
3	D	402	A1AH9	C11-C6	-2.33	1.36	1.39
3	B	402	A1AH9	C11-C6	-2.32	1.36	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	401	HEM	C1C-C2C	-2.31	1.40	1.45
2	A	401	HEM	C1C-NC	-2.30	1.35	1.39
2	C	401	HEM	FE-ND	-2.27	1.87	1.94
2	A	401	HEM	C4D-ND	-2.20	1.36	1.40
2	D	401	HEM	C1D-ND	-2.18	1.34	1.38
2	B	401	HEM	C1C-NC	-2.16	1.35	1.39
2	B	401	HEM	C1A-C2A	-2.05	1.40	1.44
2	B	401	HEM	C1D-ND	-2.03	1.34	1.38

All (75) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	401	HEM	CHA-C4D-ND	4.81	130.32	124.37
2	D	401	HEM	CHC-C4B-NB	4.75	129.53	124.42
2	C	401	HEM	CHC-C4B-NB	4.62	129.40	124.42
2	B	401	HEM	CHA-C4D-ND	4.42	129.83	124.37
2	D	401	HEM	C1B-NB-C4B	4.25	110.25	105.21
2	B	401	HEM	CHC-C4B-NB	4.25	129.00	124.42
2	C	401	HEM	CHA-C4D-ND	4.14	129.49	124.37
2	D	401	HEM	CHD-C1D-ND	4.06	128.80	124.42
2	D	401	HEM	CHB-C1B-NB	3.94	129.25	124.37
2	A	401	HEM	CHC-C4B-NB	3.91	128.63	124.42
2	C	401	HEM	CBD-CAD-C3D	-3.84	101.92	112.53
2	B	401	HEM	C1B-NB-C4B	3.84	109.75	105.21
4	A	403	ZIQ	O-C-CA	-3.70	116.14	122.78
2	A	401	HEM	CHD-C4C-NC	3.69	128.47	124.45
2	A	401	HEM	C1B-NB-C4B	3.67	109.55	105.21
2	B	401	HEM	CHD-C1D-ND	3.62	128.31	124.42
2	D	401	HEM	O2D-CGD-CBD	3.60	125.37	114.00
2	C	401	HEM	CHD-C1D-ND	3.60	128.29	124.42
2	C	401	HEM	CHB-C1B-NB	3.53	128.74	124.37
2	C	401	HEM	CAC-C3C-C4C	3.32	132.75	124.82
2	D	401	HEM	CBD-CAD-C3D	-3.29	103.43	112.53
4	D	403	ZIQ	O-C-CA	-3.27	116.91	122.78
2	A	401	HEM	CBD-CAD-C3D	-3.26	103.52	112.53
4	B	403	ZIQ	O-C-CA	-3.23	116.99	122.78
2	C	401	HEM	CAC-C3C-C2C	-3.17	118.12	128.43
2	A	401	HEM	O2D-CGD-CBD	3.16	123.99	114.00
2	B	401	HEM	CHB-C1B-NB	3.16	128.27	124.37
2	D	401	HEM	CHA-C4D-ND	3.14	128.25	124.37
2	C	401	HEM	C1B-NB-C4B	3.12	108.91	105.21
2	D	401	HEM	O2D-CGD-O1D	-3.07	115.44	123.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	401	HEM	CHB-C1B-NB	3.04	128.13	124.37
2	B	401	HEM	O2D-CGD-CBD	3.01	123.52	114.00
2	B	401	HEM	CHD-C4C-NC	3.00	127.72	124.45
4	C	403	ZIQ	O-C-CA	-2.98	117.44	122.78
2	A	401	HEM	O2D-CGD-O1D	-2.89	115.90	123.33
2	A	401	HEM	CHD-C1D-ND	2.86	127.50	124.42
2	A	401	HEM	CHA-C4D-C3D	-2.80	120.06	125.23
2	B	401	HEM	O2A-CGA-CBA	2.74	122.66	114.00
2	B	401	HEM	C1A-CHA-C4D	-2.74	119.81	126.25
2	A	401	HEM	CMD-C2D-C1D	2.72	129.29	125.03
2	A	401	HEM	C1A-CHA-C4D	-2.68	119.94	126.25
2	B	401	HEM	CBD-CAD-C3D	-2.68	105.13	112.53
2	B	401	HEM	C3B-C4B-NB	-2.66	107.56	109.47
4	B	403	ZIQ	CB-CA-C	2.66	112.75	109.10
2	A	401	HEM	O2A-CGA-O1A	-2.61	116.61	123.33
2	D	401	HEM	C4C-NC-C1C	2.61	110.08	105.82
2	B	401	HEM	CHA-C4D-C3D	-2.60	120.44	125.23
2	B	401	HEM	C4C-NC-C1C	2.57	110.01	105.82
2	B	401	HEM	O2A-CGA-O1A	-2.50	116.90	123.33
2	D	401	HEM	O2A-CGA-CBA	2.47	121.82	114.00
2	D	401	HEM	CHD-C4C-NC	2.46	127.14	124.45
2	C	401	HEM	C4B-C3B-C2B	-2.46	105.02	107.28
2	A	401	HEM	C4C-NC-C1C	2.44	109.81	105.82
2	A	401	HEM	C4B-C3B-C2B	-2.40	105.08	107.28
3	A	402	A1AH9	C13-C12-N3	2.36	115.48	111.56
2	D	401	HEM	C4B-C3B-C2B	-2.35	105.12	107.28
2	C	401	HEM	C1A-CHA-C4D	-2.35	120.73	126.25
2	D	401	HEM	CHD-C1D-C2D	-2.31	121.38	125.03
4	B	403	ZIQ	C1-CA-CB	-2.24	107.68	110.82
2	D	401	HEM	C1A-CHA-C4D	-2.24	120.99	126.25
2	D	401	HEM	CAC-C3C-C4C	2.24	130.16	124.82
2	A	401	HEM	O2A-CGA-CBA	2.20	120.95	114.00
2	B	401	HEM	CAC-C3C-C4C	2.19	130.06	124.82
2	C	401	HEM	CHD-C1D-C2D	-2.15	121.63	125.03
2	C	401	HEM	CHA-C4D-C3D	-2.13	121.31	125.23
2	C	401	HEM	CHD-C4C-NC	2.11	126.75	124.45
2	D	401	HEM	CAD-C3D-C4D	2.10	128.36	124.70
2	B	401	HEM	CHA-C1A-NA	2.08	127.64	123.86
2	B	401	HEM	CHD-C1D-C2D	-2.05	121.78	125.03
2	D	401	HEM	CHA-C4D-C3D	-2.05	121.45	125.23
2	C	401	HEM	C4D-ND-C1D	2.04	107.62	105.21
2	C	401	HEM	C4C-NC-C1C	2.04	109.14	105.82

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	401	HEM	CHA-C1A-NA	2.03	127.54	123.86
3	B	402	A1AH9	C13-C12-N3	2.01	114.91	111.56
2	D	401	HEM	O2A-CGA-O1A	-2.00	118.18	123.33

There are no chirality outliers.

All (49) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	C	401	HEM	C2C-C3C-CAC-CBC
3	A	402	A1AH9	C13-C12-N3-C9
3	A	402	A1AH9	C13-C12-N3-N2
3	A	402	A1AH9	N3-C12-C13-N4
3	B	402	A1AH9	C13-C12-N3-C9
3	B	402	A1AH9	C13-C12-N3-N2
3	C	402	A1AH9	C13-C12-N3-C9
3	C	402	A1AH9	C13-C12-N3-N2
3	D	402	A1AH9	C13-C12-N3-C9
3	D	402	A1AH9	C13-C12-N3-N2
3	D	402	A1AH9	N3-C12-C13-N4
4	B	403	ZIQ	OXT-C-CA-C1
4	C	403	ZIQ	C-CA-CB-CG
4	C	403	ZIQ	O-C-CA-C1
4	C	403	ZIQ	OXT-C-CA-C1
3	B	402	A1AH9	N3-C12-C13-N4
3	C	402	A1AH9	N3-C12-C13-N4
4	B	403	ZIQ	O-C-CA-C1
4	C	403	ZIQ	O-C-CA-CB
4	C	403	ZIQ	OXT-C-CA-CB
3	D	402	A1AH9	C4-C5-C6-C11
3	D	402	A1AH9	C4-C5-C6-C7
3	C	402	A1AH9	C4-C5-C6-C7
3	C	402	A1AH9	C4-C5-C6-C11
4	B	403	ZIQ	O-C-CA-CB
4	B	403	ZIQ	OXT-C-CA-CB
2	A	401	HEM	CAA-CBA-CGA-O1A
2	D	401	HEM	CAA-CBA-CGA-O1A
4	C	403	ZIQ	C1-CA-CB-CG
2	C	401	HEM	CAA-CBA-CGA-O1A
2	B	401	HEM	CAA-CBA-CGA-O1A
2	C	401	HEM	CAA-CBA-CGA-O2A
4	A	403	ZIQ	O-C-CA-C1
4	A	403	ZIQ	OXT-C-CA-C1

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Mol	Chain	Res	Type	Atoms
3	C	402	A1AH9	C18-C5-C6-C7
3	D	402	A1AH9	C18-C5-C6-C7
3	D	402	A1AH9	C18-C5-C6-C11
2	B	401	HEM	CAA-CBA-CGA-O2A
2	D	401	HEM	CAA-CBA-CGA-O2A
2	A	401	HEM	CAA-CBA-CGA-O2A
2	B	401	HEM	C4C-C3C-CAC-CBC
3	A	402	A1AH9	C18-C5-C6-C7
3	B	402	A1AH9	C18-C5-C6-C7
3	B	402	A1AH9	C18-C5-C6-C11
3	D	402	A1AH9	C12-C13-N4-C14
3	A	402	A1AH9	C4-C5-C6-C7
3	A	402	A1AH9	C18-C5-C6-C11
3	C	402	A1AH9	C18-C5-C6-C11
3	A	402	A1AH9	C4-C5-C6-C11

All (2) ring outliers are listed below:

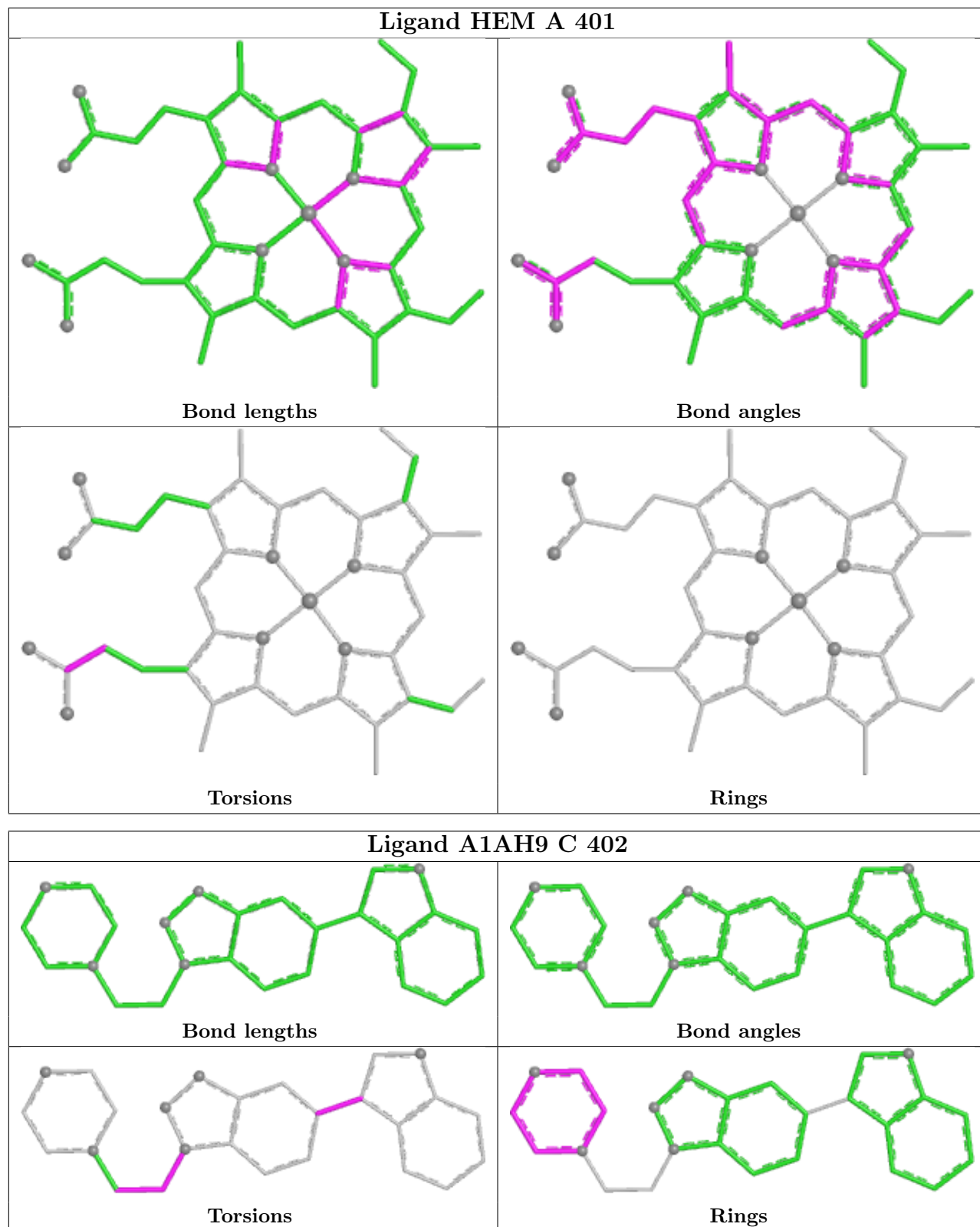
Mol	Chain	Res	Type	Atoms
3	A	402	A1AH9	C14-C15-C16-C17-N4-N5
3	C	402	A1AH9	C14-C15-C16-C17-N4-N5

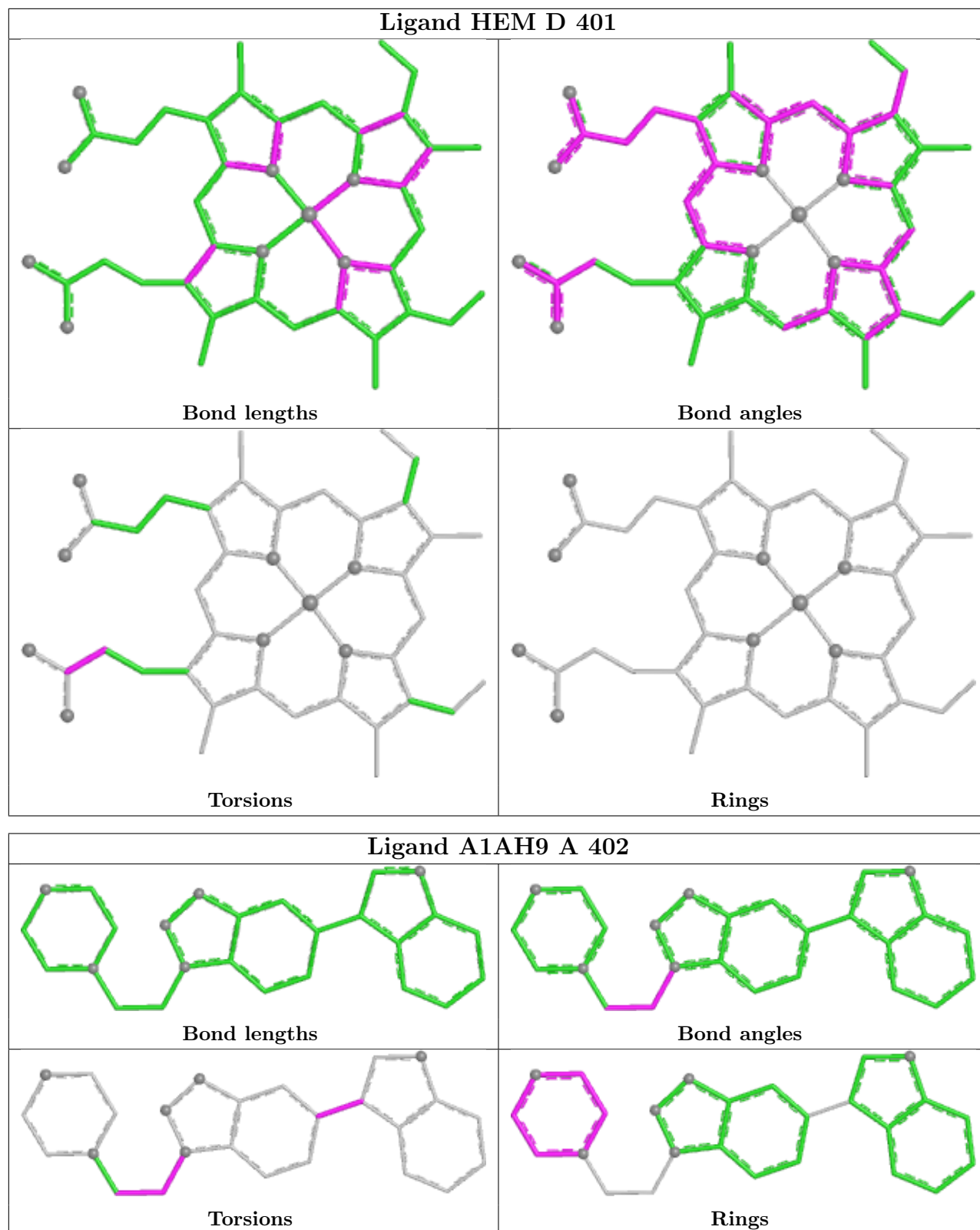
6 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	401	HEM	2	0
2	D	401	HEM	4	0
4	B	403	ZIQ	1	0
2	B	401	HEM	3	0
4	C	403	ZIQ	1	0
2	C	401	HEM	1	0

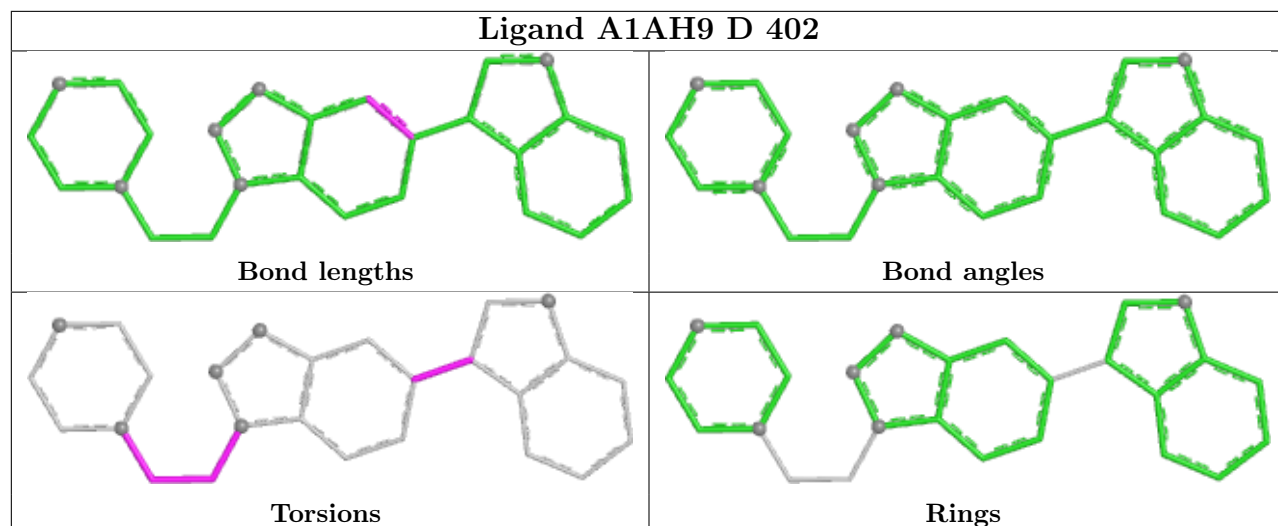
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

equivalents in the CSD to analyse the geometry.

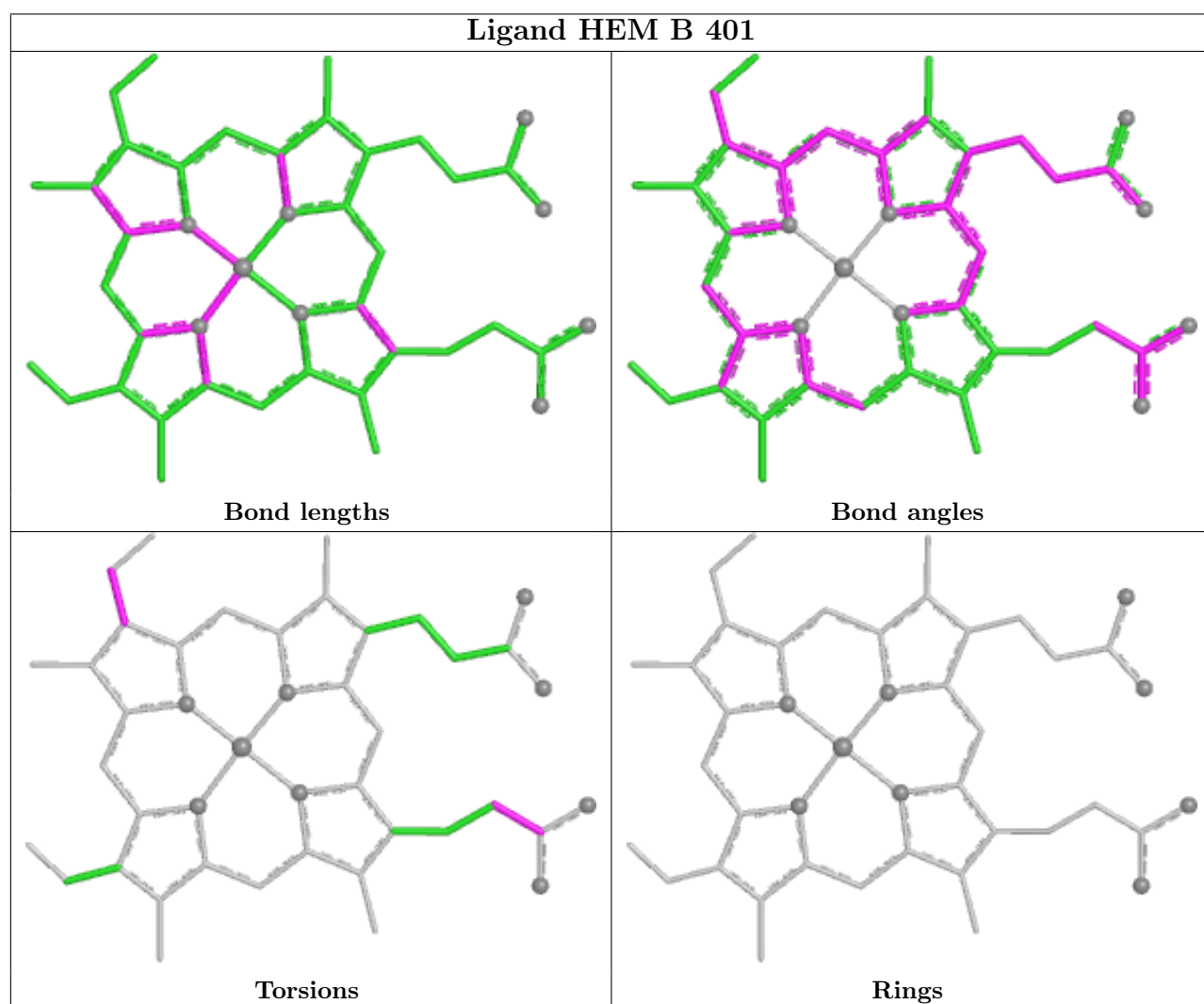


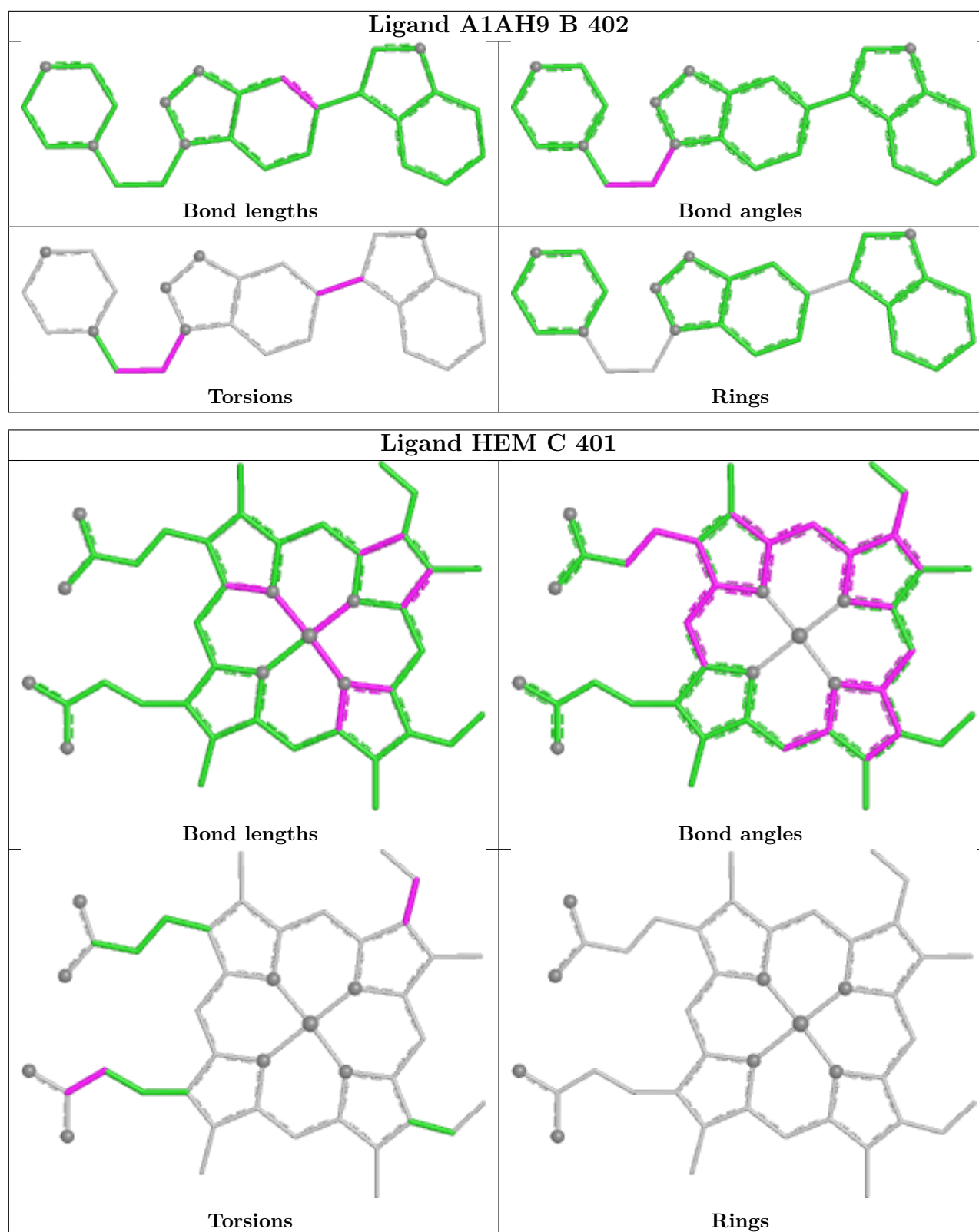


Ligand A1AH9 D 402



Ligand HEM B 401





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(Å ²)	Q<0.9
1	A	346/380 (91%)	-0.20	2 (0%) 85 83	29, 55, 110, 182	0
1	B	346/380 (91%)	-0.16	3 (0%) 81 78	28, 61, 120, 184	0
1	C	335/380 (88%)	0.11	13 (3%) 43 35	38, 89, 161, 208	0
1	D	342/380 (90%)	-0.10	5 (1%) 72 67	30, 66, 132, 187	0
All	All	1369/1520 (90%)	-0.09	23 (1%) 69 64	28, 66, 136, 208	0

All (23) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	385	ILE	3.7
1	C	97	PHE	3.5
1	C	388	PHE	3.5
1	C	338	SER	3.4
1	D	383	PRO	3.4
1	B	386	HIS	3.2
1	C	351	LEU	2.8
1	D	389	LEU	2.8
1	B	171	MET	2.7
1	C	385	ILE	2.7
1	C	296	TYR	2.6
1	D	385	ILE	2.6
1	C	348	TYR	2.6
1	C	257	PHE	2.4
1	C	240	ARG	2.3
1	D	386	HIS	2.3
1	C	264	LEU	2.2
1	C	355	VAL	2.2
1	B	383	PRO	2.2
1	D	223	TRP	2.1
1	C	383	PRO	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	386	HIS	2.1
1	C	386	HIS	2.1

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](#)

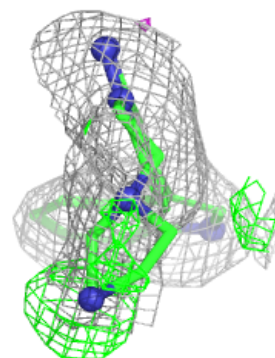
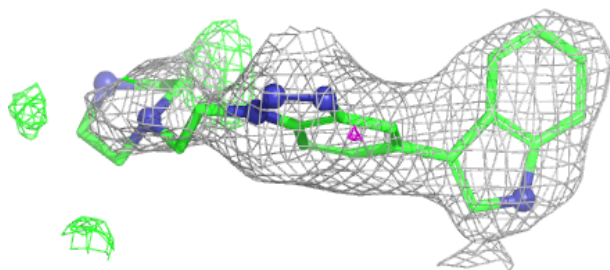
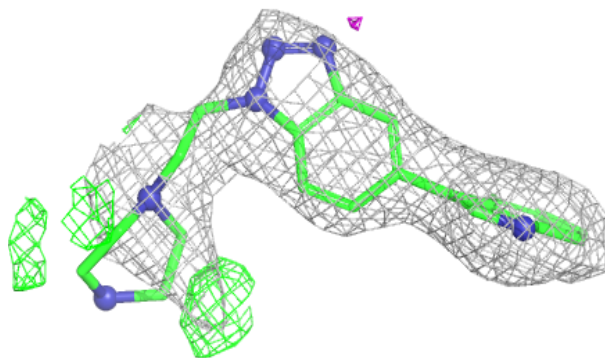
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q<0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
3	A1AH9	A	402	26/26	0.86	0.15	53,74,145,149	0
3	A1AH9	B	402	26/26	0.86	0.16	57,73,135,140	0
4	ZIQ	C	403	16/16	0.89	0.11	80,85,101,106	0
4	ZIQ	D	403	16/16	0.89	0.13	75,82,115,127	0
3	A1AH9	C	402	26/26	0.90	0.16	68,100,152,154	0
3	A1AH9	D	402	26/26	0.90	0.12	50,66,113,115	0
4	ZIQ	B	403	16/16	0.93	0.10	56,63,76,91	0
2	HEM	C	401	43/43	0.93	0.12	72,93,120,143	0
4	ZIQ	A	403	16/16	0.93	0.10	40,44,52,57	0
2	HEM	B	401	43/43	0.96	0.09	59,70,81,83	0
2	HEM	A	401	43/43	0.98	0.06	39,55,66,75	0
2	HEM	D	401	43/43	0.98	0.05	38,45,54,62	0

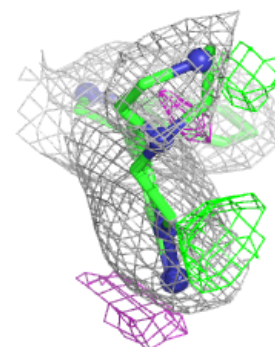
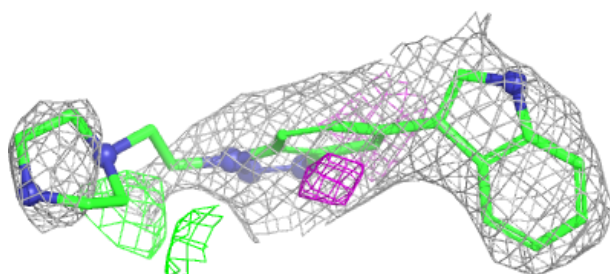
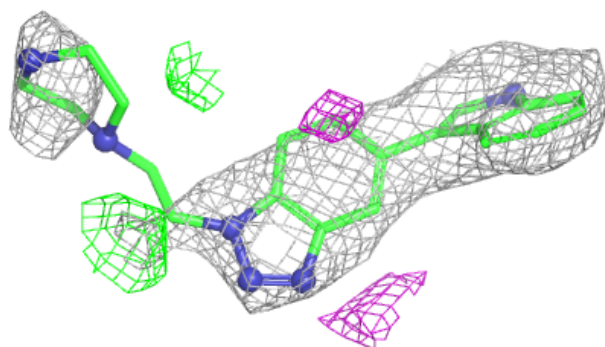
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around A1AH9 A 402:

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

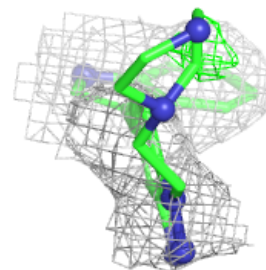
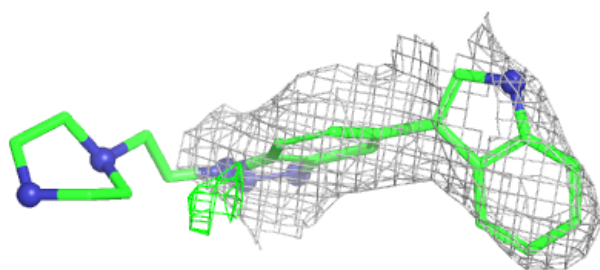
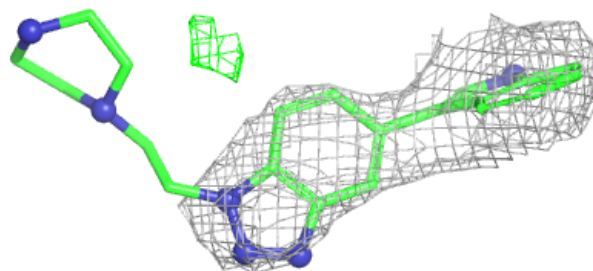
**Electron density around A1AH9 B 402:**

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

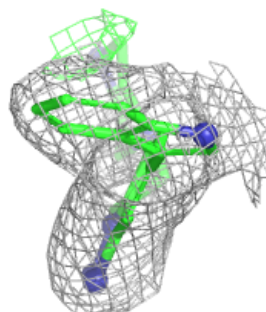
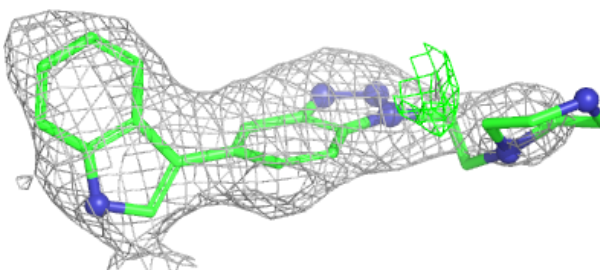
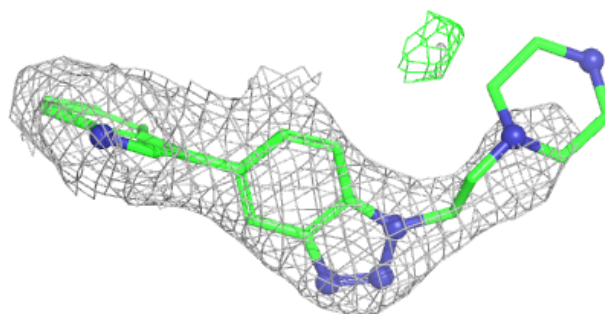


Electron density around A1AH9 C 402:

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

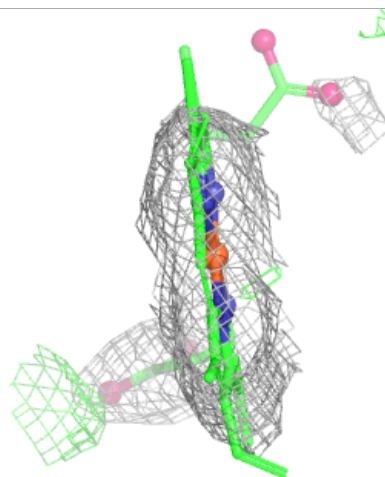
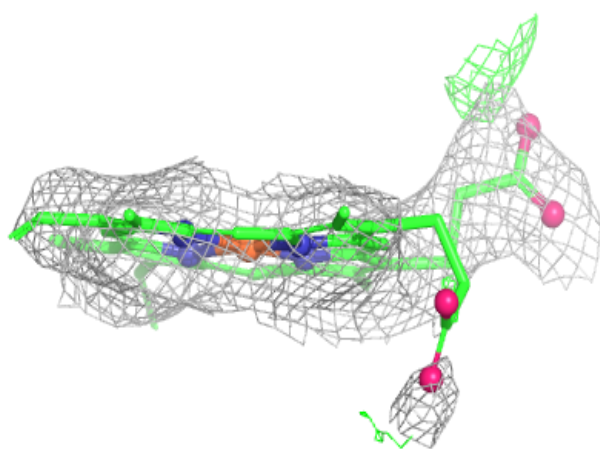
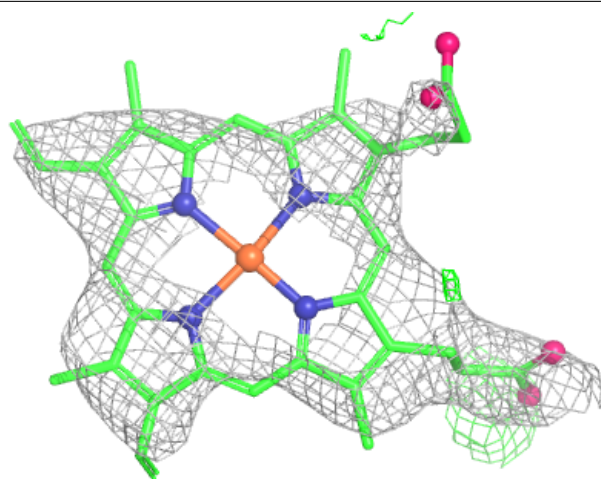
**Electron density around A1AH9 D 402:**

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



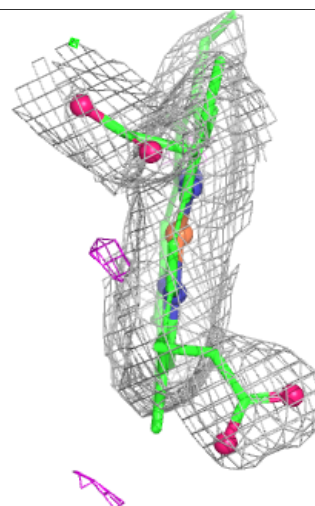
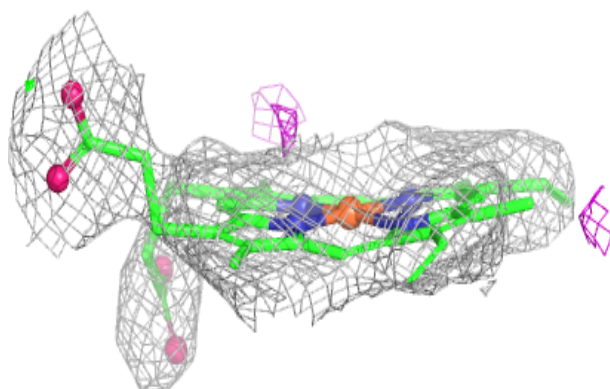
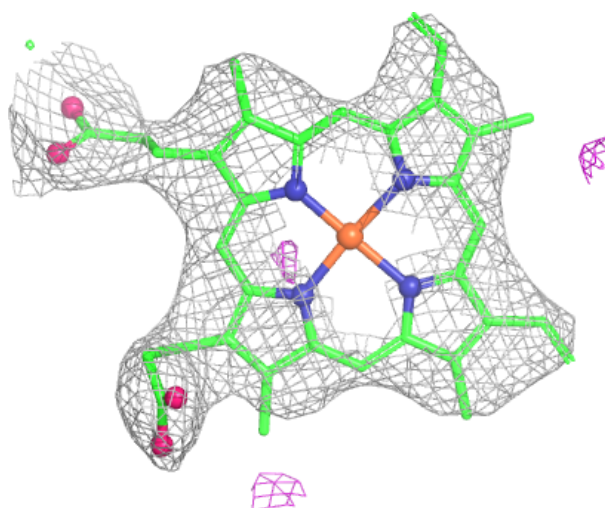
Electron density around HEM C 401:

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



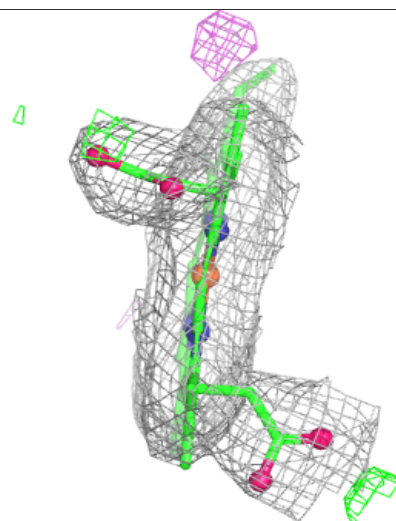
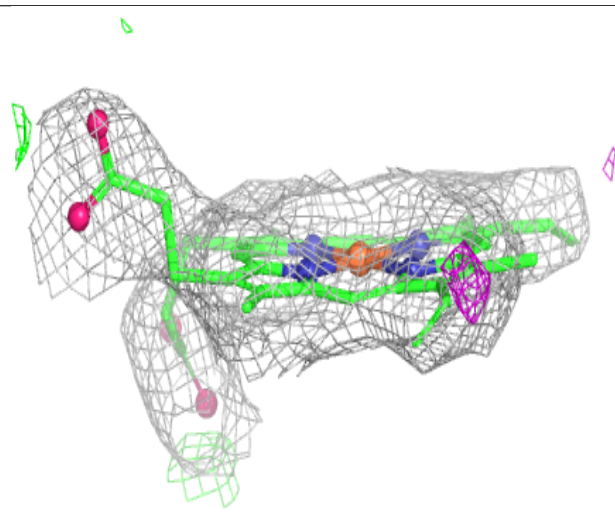
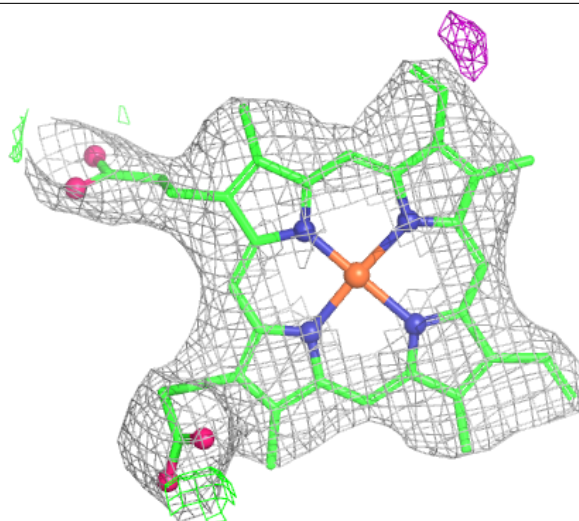
Electron density around HEM B 401:

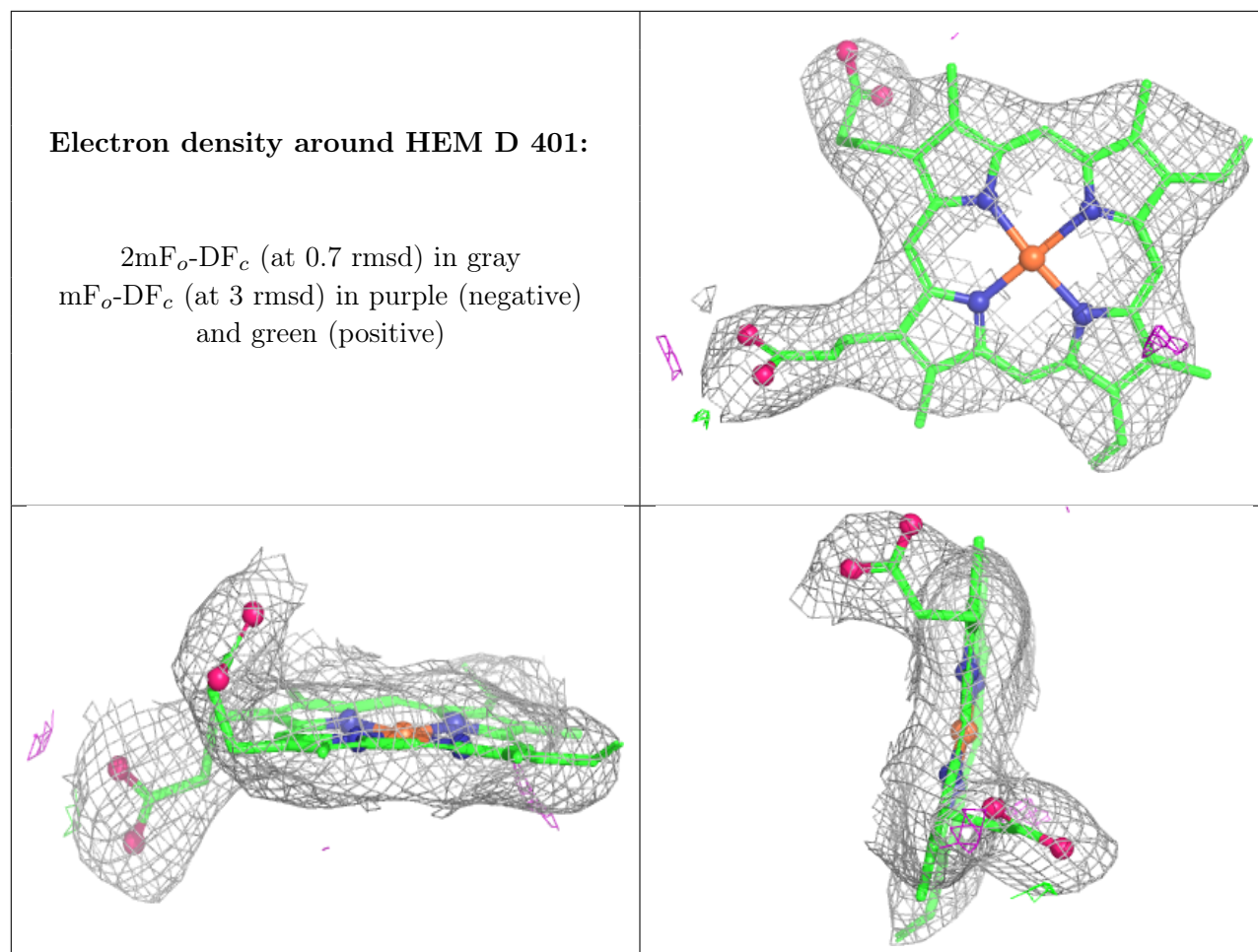
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



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)





6.5 Other polymers [i](#)

There are no such residues in this entry.