



Full wwPDB X-ray Structure Validation Report ⓘ

Dec 5, 2023 – 02:03 am GMT

PDB ID : 2UWH
Title : Cytochrome P450 BM3 mutant in complex with palmitic acid
Authors : Huang, W.-C.; Joyce, M.G.; Westlake, A.C.G.; Roberts, G.C.K.; Moody, P.C.E.
Deposited on : 2007-03-21
Resolution : 2.80 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 : 4.02b-467
Mogul : 1.8.4, CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.36
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

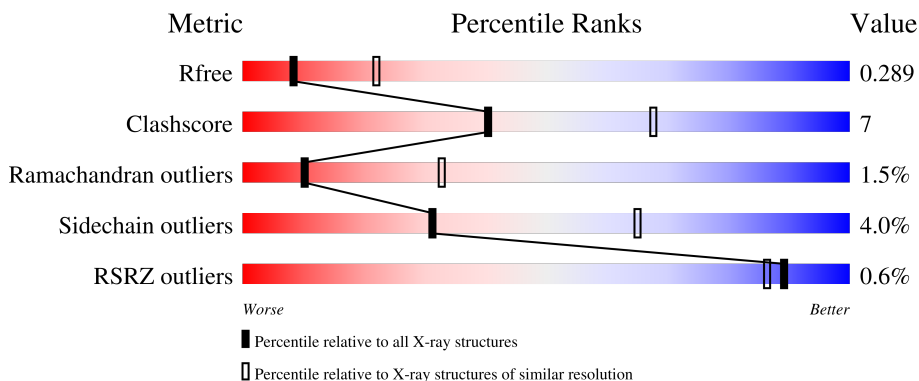
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.80 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.



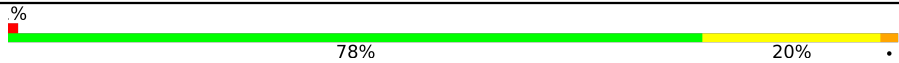
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3140 (2.80-2.80)
Clashscore	141614	3569 (2.80-2.80)
Ramachandran outliers	138981	3498 (2.80-2.80)
Sidechain outliers	138945	3500 (2.80-2.80)
RSRZ outliers	127900	3078 (2.80-2.80)

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	458	 85% 14% .
1	B	458	 79% 18% .
1	C	458	 82% 17% .
1	D	458	 81% 17% .
1	E	458	 82% 16% ..

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Mol	Chain	Length	Quality of chain
1	F	458	 <p>A horizontal bar chart representing the quality of the chain. The bar is divided into two segments: a green segment on the left labeled '78%' and a yellow segment on the right labeled '20%'. A small red square is at the beginning of the bar, and a small black dot is at the end. A '%' symbol is positioned above the bar.</p>

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 23025 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 BIFUNCTIONAL P-450\;: NADPH-P450 REDUCTASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	458	3690	2360	626	687	17	0	0	0
1	B	458	3690	2360	626	687	17	0	0	0
1	C	458	3690	2360	626	687	17	0	0	0
1	D	458	3690	2360	626	687	17	0	0	0
1	E	458	3690	2360	626	687	17	0	0	0
1	F	458	3690	2360	626	687	17	0	0	0

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	82	PHE	ALA	engineered mutation	UNP P14779
B	82	PHE	ALA	engineered mutation	UNP P14779
C	82	PHE	ALA	engineered mutation	UNP P14779
D	82	PHE	ALA	engineered mutation	UNP P14779
E	82	PHE	ALA	engineered mutation	UNP P14779
F	82	PHE	ALA	engineered mutation	UNP P14779

- Molecule 2 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula: C₃₄H₃₂FeN₄O₄).



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 PALMITIC ACID (three-letter code: PLM) (formula: C₁₆H₃₂O₂).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O 18 16 2	0	0
3	B	1	Total C O 18 16 2	0	0
3	C	1	Total C O 18 16 2	0	0
3	D	1	Total C O 18 16 2	0	0
3	E	1	Total C O 18 16 2	0	0
3	F	1	Total C O 18 16 2	0	0

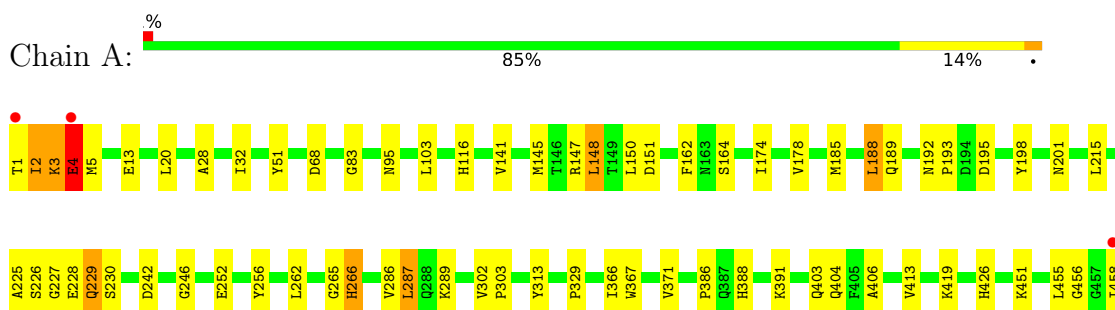
- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	89	Total O 89 89	0	0
4	B	94	Total O 94 94	0	0
4	C	88	Total O 88 88	0	0
4	D	83	Total O 83 83	0	0
4	E	83	Total O 83 83	0	0
4	F	82	Total O 82 82	0	0

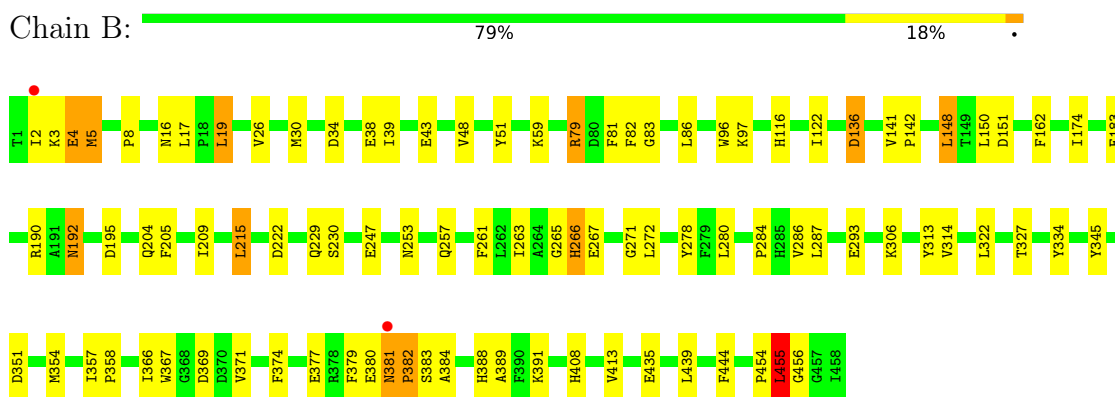
3 Residue-property plots [i](#)

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.

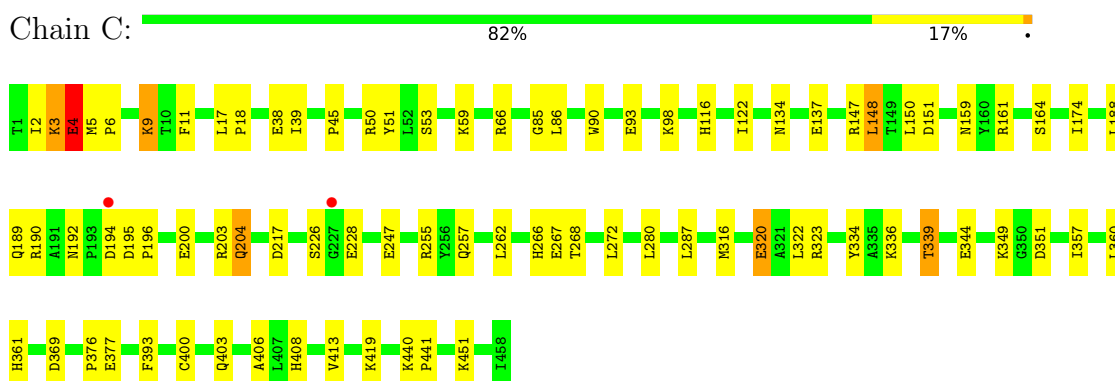
- Molecule 1: BIFUNCTIONAL P-450\ : NADPH-P450 REDUCTASE



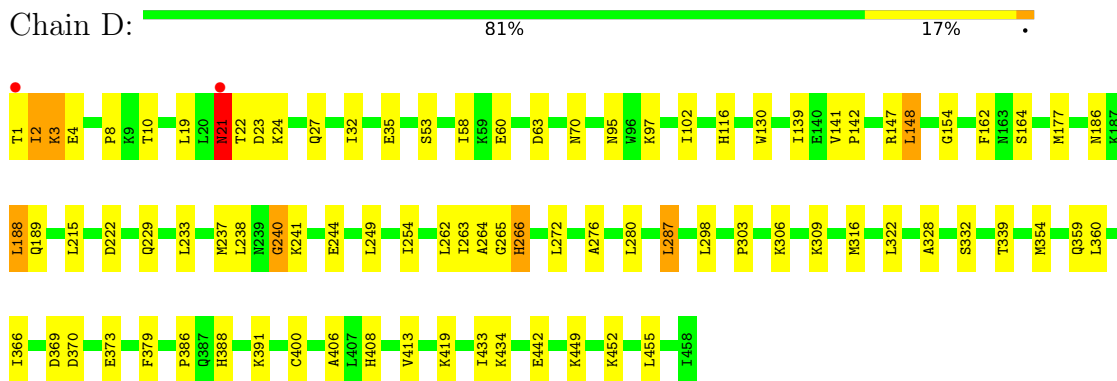
- Molecule 1: BIFUNCTIONAL P-450\ : NADPH-P450 REDUCTASE



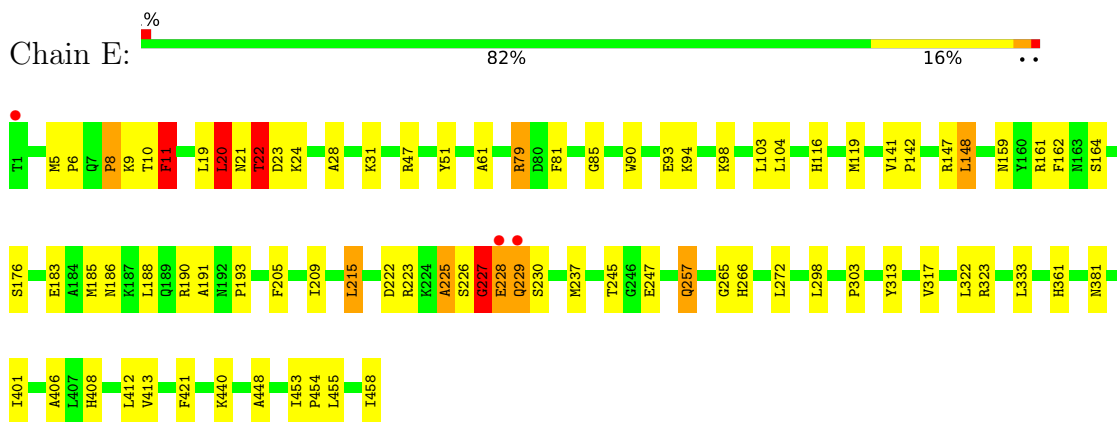
- Molecule 1: BIFUNCTIONAL P-450\ : NADPH-P450 REDUCTASE



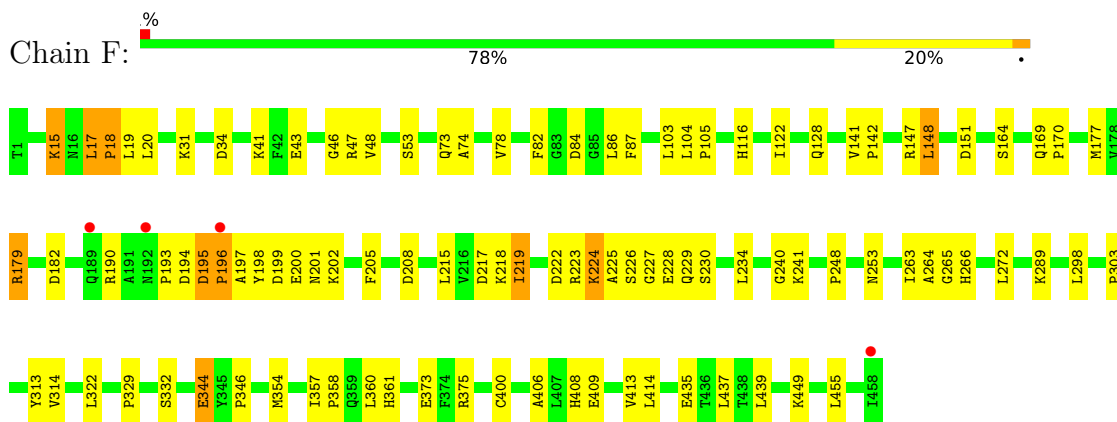
● Molecule 1: BIFUNCTIONAL P-450\ : NADPH-P450 REDUCTASE



● Molecule 1: BIFUNCTIONAL P-450\ : NADPH-P450 REDUCTASE



● Molecule 1: BIFUNCTIONAL P-450\ : NADPH-P450 REDUCTASE



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	116.83Å 147.03Å 183.40Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	114.71 – 2.80 73.52 – 2.80	Depositor EDS
% Data completeness (in resolution range)	97.8 (114.71-2.80) 97.8 (73.52-2.80)	Depositor EDS
R_{merge}	0.18	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.38 (at 2.82Å)	Xtrriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.215 , 0.299 0.210 , 0.289	Depositor DCC
R_{free} test set	3858 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å ²)	31.8	Xtrriage
Anisotropy	0.128	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 26.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	23025	wwPDB-VP
Average B, all atoms (Å ²)	22.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 44.79 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 1.4516e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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 i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: PLM, 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	0.39	0/3776	0.55	1/5104 (0.0%)
1	B	0.41	0/3776	0.55	0/5104
1	C	0.40	0/3776	0.54	0/5104
1	D	0.42	0/3776	0.57	1/5104 (0.0%)
1	E	0.41	0/3776	0.56	1/5104 (0.0%)
1	F	0.42	0/3776	0.57	1/5104 (0.0%)
All	All	0.41	0/22656	0.56	4/30624 (0.0%)

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	C	0	1
1	D	0	1
1	E	0	1
All	All	0	3

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	188	LEU	CA-CB-CG	7.08	131.60	115.30
1	A	287	LEU	CA-CB-CG	5.58	128.14	115.30
1	F	224	LYS	N-CA-C	5.42	125.63	111.00
1	E	227	GLY	N-CA-C	5.20	126.09	113.10

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	4	GLU	Peptide
1	D	21	ASN	Peptide
1	E	229	GLN	Peptide

5.2 Too-close contacts [i](#)

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	3690	0	3661	46	0
1	B	3690	0	3661	48	0
1	C	3690	0	3661	50	0
1	D	3690	0	3661	57	0
1	E	3690	0	3661	52	0
1	F	3690	0	3661	65	0
2	A	43	0	30	5	0
2	B	43	0	30	2	0
2	C	43	0	30	4	0
2	D	43	0	30	6	0
2	E	43	0	30	2	0
2	F	43	0	30	6	0
3	A	18	0	31	4	0
3	B	18	0	31	1	0
3	C	18	0	31	2	0
3	D	18	0	31	1	0
3	E	18	0	31	2	0
3	F	18	0	31	2	0
4	A	89	0	0	3	0
4	B	94	0	0	2	0
4	C	88	0	0	3	0
4	D	83	0	0	0	0
4	E	83	0	0	1	0
4	F	82	0	0	3	0
All	All	23025	0	22332	321	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 7.

All (321) 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:D:1:THR:HA	1:D:2:ILE:HG23	1.25	1.18
1:A:1:THR:HA	1:A:2:ILE:HB	1.13	1.06
3:A:1460:PLM:O1	4:A:2089:HOH:O	1.81	0.97
1:A:1:THR:CA	1:A:2:ILE:HB	2.00	0.92
1:F:224:LYS:N	1:F:225:ALA:HB3	1.84	0.91
1:A:1:THR:HA	1:A:2:ILE:CB	1.97	0.90
1:C:4:GLU:HG3	1:C:6:PRO:HD3	1.52	0.88
1:F:224:LYS:H	1:F:225:ALA:HB3	1.36	0.87
1:F:196:PRO:HA	1:F:199:ASP:CG	1.97	0.85
1:D:162:PHE:HE1	1:D:215:LEU:HD21	1.42	0.84
1:C:226:SER:HB3	1:C:228:GLU:HG2	1.59	0.83
1:D:1:THR:HA	1:D:2:ILE:CG2	2.09	0.82
1:D:148:LEU:HD21	1:D:413:VAL:HG21	1.63	0.80
1:D:370:ASP:HB2	1:D:373:GLU:HG3	1.62	0.80
1:B:382:PRO:O	1:B:384:ALA:N	2.16	0.79
1:A:148:LEU:HD21	1:A:413:VAL:HG21	1.63	0.78
1:F:148:LEU:HD21	1:F:413:VAL:HG21	1.68	0.76
1:C:148:LEU:HD21	1:C:413:VAL:HG21	1.67	0.75
1:E:22:THR:HB	1:E:24:LYS:H	1.51	0.75
1:B:150:LEU:HD22	1:B:174:ILE:HD11	1.67	0.75
1:C:226:SER:CB	1:C:228:GLU:HG2	2.16	0.75
1:B:148:LEU:HD21	1:B:413:VAL:HG21	1.68	0.74
1:E:94:LYS:O	1:E:98:LYS:HB2	1.88	0.74
1:E:225:ALA:C	1:E:227:GLY:H	1.91	0.74
1:F:190:ARG:O	1:F:190:ARG:HG3	1.88	0.73
1:F:179:ARG:HB3	1:F:208:ASP:OD2	1.89	0.73
1:B:192:ASN:HB2	1:B:195:ASP:HB2	1.71	0.73
1:E:98:LYS:HE3	1:E:247:GLU:HB2	1.71	0.73
1:C:86:LEU:HB3	2:C:1459:HEM:HBD2	1.70	0.72
1:E:228:GLU:O	1:E:230:SER:N	2.20	0.72
1:B:454:PRO:HA	1:B:455:LEU:CB	2.19	0.72
1:E:148:LEU:HD21	1:E:413:VAL:HG21	1.70	0.72
1:C:90:TRP:HB2	1:C:93:GLU:HG3	1.73	0.71
1:F:18:PRO:C	1:F:20:LEU:H	1.94	0.71
1:D:162:PHE:CE1	1:D:215:LEU:HD21	2.26	0.71
1:F:373:GLU:HB3	1:F:375:ARG:HD3	1.73	0.71
1:A:20:LEU:HB2	1:A:189:GLN:NE2	2.05	0.70
1:E:147:ARG:HG2	1:E:164:SER:HB3	1.72	0.70
1:F:18:PRO:O	1:F:20:LEU:N	2.26	0.69
1:D:366:ILE:HD12	1:D:386:PRO:HG2	1.76	0.68
1:A:20:LEU:HB2	1:A:189:GLN:CD	2.15	0.67
1:E:9:LYS:HB3	1:E:11:PHE:CE2	2.30	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:141:VAL:HB	1:D:142:PRO:HD3	1.77	0.66
1:C:11:PHE:CD2	1:C:18:PRO:HG2	2.31	0.66
1:D:102:ILE:HD12	1:D:249:LEU:HD13	1.77	0.66
1:A:3:LYS:HB3	1:A:4:GLU:O	1.96	0.65
1:D:22:THR:HG22	1:D:23:ASP:H	1.61	0.65
1:E:79:ARG:HH11	1:E:79:ARG:HG3	1.60	0.65
1:F:47:ARG:HD3	1:F:73:GLN:HE21	1.61	0.65
1:C:255:ARG:HD3	4:C:2051:HOH:O	1.96	0.64
1:F:199:ASP:O	1:F:200:GLU:HB3	1.98	0.63
1:E:223:ARG:HH21	1:E:228:GLU:HB2	1.63	0.63
1:E:162:PHE:CE1	1:E:215:LEU:HD21	2.34	0.62
1:D:8:PRO:HB2	1:D:19:LEU:CD1	2.30	0.62
1:C:85:GLY:HA2	1:C:257:GLN:NE2	2.15	0.61
1:B:162:PHE:HE1	1:B:215:LEU:HD21	1.63	0.61
1:D:3:LYS:HD3	1:D:4:GLU:H	1.65	0.61
1:D:388:HIS:HD2	1:D:391:LYS:NZ	1.98	0.61
1:F:264:ALA:HA	3:F:1460:PLM:HG2	1.83	0.61
1:E:21:ASN:O	1:E:23:ASP:N	2.30	0.60
1:A:141:VAL:O	1:A:145:MET:HG2	2.02	0.60
1:A:426:HIS:HE1	4:A:2029:HOH:O	1.85	0.60
1:B:8:PRO:HB2	1:B:19:LEU:HD13	1.84	0.59
1:B:388:HIS:HD2	1:B:391:LYS:NZ	2.00	0.59
1:D:8:PRO:HB2	1:D:19:LEU:HD11	1.84	0.59
1:B:4:GLU:O	1:B:5:MET:HB3	2.03	0.58
1:F:193:PRO:HA	1:F:198:TYR:HD2	1.68	0.58
1:D:116:HIS:HD2	1:D:408:HIS:NE2	2.01	0.58
1:E:47:ARG:NH1	3:E:1460:PLM:O2	2.37	0.58
1:B:454:PRO:HA	1:B:455:LEU:HB2	1.86	0.57
1:F:223:ARG:O	1:F:223:ARG:HG3	2.03	0.57
1:D:53:SER:HB3	1:D:359:GLN:HB3	1.86	0.57
1:A:403:GLN:NE2	4:A:2080:HOH:O	2.37	0.57
1:D:186:ASN:O	1:D:189:GLN:HG3	2.05	0.57
1:C:11:PHE:HD2	1:C:18:PRO:HG2	1.69	0.57
1:D:22:THR:HB	1:D:24:LYS:H	1.69	0.56
1:C:204:GLN:HA	1:C:204:GLN:HE21	1.69	0.56
1:C:349:LYS:HE3	1:D:22:THR:HG23	1.87	0.56
1:E:28:ALA:O	1:E:31:LYS:HB3	2.05	0.56
1:E:116:HIS:HD2	1:E:408:HIS:NE2	2.04	0.56
1:E:141:VAL:HB	1:E:142:PRO:HD3	1.86	0.56
1:F:406:ALA:HB2	2:F:1459:HEM:HHC	1.88	0.56
1:A:3:LYS:HB3	1:A:4:GLU:HG3	1.88	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:4:GLU:C	1:A:4:GLU:CD	2.64	0.56
1:F:46:GLY:HA3	4:F:2008:HOH:O	2.05	0.56
1:D:154:GLY:HA3	1:D:162:PHE:HE2	1.71	0.55
1:F:195:ASP:HB2	1:F:196:PRO:C	2.25	0.55
2:A:1459:HEM:HBB2	2:A:1459:HEM:HMB2	1.88	0.55
1:D:264:ALA:HA	3:D:1460:PLM:HG1	1.88	0.55
1:A:147:ARG:HG2	1:A:164:SER:HB3	1.89	0.55
1:C:150:LEU:HD22	1:C:174:ILE:HD11	1.88	0.55
1:E:406:ALA:HB2	2:E:1459:HEM:HHC	1.87	0.55
1:F:198:TYR:O	1:F:201:ASN:HB2	2.07	0.55
1:A:192:ASN:N	1:A:193:PRO:HD3	2.22	0.55
1:C:400:CYS:HA	2:C:1459:HEM:CHA	2.37	0.55
1:C:280:LEU:HD22	1:C:287:LEU:HA	1.89	0.54
1:D:21:ASN:HB2	1:D:189:GLN:CB	2.38	0.54
1:E:225:ALA:C	1:E:227:GLY:N	2.60	0.54
1:E:272:LEU:HD13	1:E:322:LEU:HG	1.89	0.54
1:F:196:PRO:O	1:F:198:TYR:N	2.41	0.54
2:A:1459:HEM:HBB2	2:A:1459:HEM:CMB	2.38	0.54
1:C:98:LYS:HZ3	1:C:247:GLU:HB2	1.72	0.54
1:C:272:LEU:HD13	1:C:322:LEU:HG	1.90	0.54
1:E:161:ARG:HA	4:E:2035:HOH:O	2.08	0.54
1:C:38:GLU:HG3	1:C:39:ILE:HG22	1.91	0.53
1:E:22:THR:O	1:E:23:ASP:HB2	2.07	0.53
1:F:104:LEU:N	1:F:105:PRO:HD2	2.23	0.53
1:B:280:LEU:HD22	1:B:287:LEU:HA	1.90	0.53
1:B:345:TYR:HE1	4:B:2001:HOH:O	1.91	0.53
1:A:265:GLY:HA2	2:A:1459:HEM:C3C	2.44	0.53
1:D:238:LEU:HD23	1:D:254:ILE:HD13	1.90	0.53
1:F:344:GLU:O	1:F:346:PRO:HD3	2.09	0.53
1:C:188:LEU:HD13	3:C:1460:PLM:H22	1.91	0.52
1:C:440:LYS:HG3	1:C:441:PRO:HD2	1.92	0.52
1:B:293:GLU:OE1	1:B:314:VAL:HG23	2.10	0.52
1:E:10:THR:O	1:E:11:PHE:C	2.48	0.52
1:A:28:ALA:O	1:A:32:ILE:HD12	2.10	0.52
1:B:272:LEU:HD13	1:B:322:LEU:HG	1.91	0.52
1:C:406:ALA:HB2	2:C:1459:HEM:HHC	1.91	0.52
1:A:116:HIS:HE1	1:A:303:PRO:O	1.92	0.51
1:A:262:LEU:O	1:A:266:HIS:HD2	1.93	0.51
1:B:454:PRO:HA	1:B:455:LEU:HB3	1.92	0.51
1:E:103:LEU:HD21	1:E:237:MET:HG2	1.93	0.51
1:C:316:MET:CE	1:C:377:GLU:HA	2.40	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:280:LEU:HB3	1:D:287:LEU:HD22	1.92	0.51
1:F:141:VAL:HB	1:F:142:PRO:HD3	1.93	0.51
1:B:271:GLY:HA3	1:B:327:THR:HG21	1.93	0.51
1:A:51:TYR:OH	3:A:1460:PLM:O2	2.29	0.50
1:C:161:ARG:HA	4:C:2038:HOH:O	2.11	0.50
1:F:177:MET:HG3	1:F:263:ILE:HD13	1.92	0.50
1:F:84:ASP:OD1	1:F:253:ASN:ND2	2.40	0.50
1:E:90:TRP:HB2	1:E:93:GLU:HG3	1.93	0.50
1:F:272:LEU:HD13	1:F:322:LEU:HG	1.92	0.50
1:A:151:ASP:OD1	1:A:162:PHE:HB2	2.12	0.50
1:D:272:LEU:HD13	1:D:322:LEU:HG	1.92	0.50
1:C:9:LYS:HD3	1:C:11:PHE:CE1	2.47	0.49
1:E:323:ARG:HA	1:E:361:HIS:HD1	1.77	0.49
1:D:272:LEU:HD22	2:D:1459:HEM:HBB1	1.93	0.49
1:F:409:GLU:O	1:F:413:VAL:HG23	2.13	0.49
1:B:116:HIS:HD2	1:B:408:HIS:NE2	2.11	0.49
1:C:393:PHE:CD2	1:C:403:GLN:HG3	2.48	0.49
1:E:51:TYR:OH	3:E:1460:PLM:O1	2.26	0.49
1:A:419:LYS:O	1:A:451:LYS:HD2	2.12	0.48
1:E:191:ALA:O	1:E:193:PRO:HD3	2.13	0.48
1:F:298:LEU:HD22	1:F:303:PRO:HB3	1.95	0.48
1:B:162:PHE:CE1	1:B:215:LEU:HD21	2.45	0.48
1:A:227:GLY:O	1:A:229:GLN:N	2.46	0.48
1:A:229:GLN:HG3	1:A:230:SER:N	2.28	0.48
1:F:223:ARG:O	1:F:223:ARG:CG	2.62	0.48
1:A:188:LEU:HD23	3:A:1460:PLM:H21	1.95	0.48
1:A:265:GLY:HA2	2:A:1459:HEM:C2C	2.48	0.48
1:A:455:LEU:HG	1:A:456:GLY:H	1.79	0.48
1:A:198:TYR:HA	1:A:201:ASN:HD22	1.79	0.47
1:B:388:HIS:HD2	1:B:391:LYS:HZ2	1.61	0.47
1:C:116:HIS:HD2	1:C:408:HIS:NE2	2.13	0.47
1:E:323:ARG:HA	1:E:361:HIS:ND1	2.29	0.47
1:E:104:LEU:HA	1:E:401:ILE:HD11	1.96	0.47
1:A:406:ALA:HB2	2:A:1459:HEM:HHC	1.97	0.47
1:C:262:LEU:O	1:C:266:HIS:HD2	1.97	0.47
1:E:265:GLY:HA2	2:E:1459:HEM:C3C	2.50	0.47
1:F:240:GLY:HA2	4:F:2046:HOH:O	2.15	0.47
1:F:272:LEU:HD22	2:F:1459:HEM:HBB1	1.96	0.47
1:B:357:ILE:N	1:B:358:PRO:HD2	2.29	0.47
1:B:366:ILE:HG21	1:B:389:ALA:HB1	1.97	0.47
1:C:17:LEU:HD11	1:C:188:LEU:O	2.14	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:328:ALA:HB3	2:D:1459:HEM:HHB	1.96	0.47
1:D:240:GLY:O	1:D:241:LYS:HB2	2.15	0.47
1:D:332:SER:HB3	1:D:354:MET:SD	2.54	0.47
1:A:388:HIS:HA	1:A:391:LYS:HE3	1.97	0.46
1:C:419:LYS:O	1:C:451:LYS:HD2	2.14	0.46
1:F:122:ILE:HD12	1:F:151:ASP:HB3	1.97	0.46
1:B:96:TRP:CZ3	1:B:97:LYS:HD2	2.50	0.46
1:B:116:HIS:CD2	1:B:408:HIS:NE2	2.83	0.46
1:E:298:LEU:HD22	1:E:303:PRO:HB3	1.98	0.46
1:F:223:ARG:HD2	1:F:234:LEU:HD23	1.98	0.46
1:A:3:LYS:CB	1:A:4:GLU:O	2.62	0.46
1:B:26:VAL:O	1:B:30:MET:HG3	2.16	0.46
1:D:2:ILE:HG13	1:D:3:LYS:H	1.80	0.46
1:E:183:GLU:HG2	1:E:205:PHE:CD1	2.50	0.46
1:B:253:ASN:O	1:B:257:GLN:HG2	2.16	0.46
1:B:82:PHE:HE1	1:B:263:ILE:HD12	1.81	0.46
1:B:86:LEU:HB3	2:B:1459:HEM:HBD2	1.97	0.46
3:C:1460:PLM:HG3	3:C:1460:PLM:HD1	1.72	0.46
1:F:17:LEU:C	1:F:18:PRO:O	2.54	0.46
1:C:39:ILE:HA	1:C:51:TYR:O	2.16	0.45
1:F:18:PRO:C	1:F:20:LEU:N	2.60	0.45
1:F:116:HIS:HD2	1:F:408:HIS:NE2	2.13	0.45
1:D:27:GLN:NE2	1:D:433:ILE:HB	2.32	0.45
1:D:276:ALA:O	1:D:280:LEU:HG	2.16	0.45
1:F:193:PRO:HA	1:F:198:TYR:CD2	2.50	0.45
1:D:388:HIS:HD2	1:D:391:LYS:HZ1	1.63	0.45
1:C:393:PHE:CG	1:C:403:GLN:HG3	2.51	0.45
1:F:329:PRO:O	1:F:358:PRO:HD3	2.16	0.45
1:C:122:ILE:HD12	1:C:151:ASP:HB3	1.97	0.45
1:A:3:LYS:HA	1:A:4:GLU:HB3	1.99	0.45
1:A:366:ILE:HD12	1:A:386:PRO:HG2	1.99	0.45
1:B:284:PRO:HA	1:B:287:LEU:HB3	1.99	0.45
1:B:38:GLU:HG3	1:B:39:ILE:HG22	1.99	0.45
1:B:379:PHE:O	1:B:381:ASN:N	2.50	0.45
1:E:22:THR:HB	1:E:24:LYS:N	2.27	0.45
1:F:31:LYS:O	1:F:34:ASP:HB2	2.17	0.45
1:E:313:TYR:O	1:E:317:VAL:HG23	2.17	0.45
1:A:162:PHE:CE1	1:A:215:LEU:HD21	2.52	0.45
1:F:169:GLN:HB3	1:F:170:PRO:CD	2.46	0.45
1:F:265:GLY:HA2	2:F:1459:HEM:C3C	2.51	0.45
1:A:4:GLU:CD	1:A:5:MET:N	2.71	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:278:TYR:HA	1:B:444:PHE:CZ	2.53	0.44
1:A:329:PRO:HD2	3:A:1460:PLM:HA1	1.99	0.44
1:E:421:PHE:HB3	1:E:448:ALA:HB1	1.99	0.44
1:E:159:ASN:ND2	1:E:228:GLU:HB3	2.33	0.44
1:A:150:LEU:HD22	1:A:174:ILE:HD11	1.99	0.44
1:D:58:ILE:HD12	1:D:360:LEU:HD13	1.99	0.44
1:B:334:TYR:HA	1:B:351:ASP:O	2.18	0.44
1:C:66:ARG:HH21	1:C:339:THR:HG23	1.82	0.44
1:D:265:GLY:HA2	2:D:1459:HEM:C2C	2.53	0.44
1:E:81:PHE:HB3	1:E:209:ILE:HG12	2.00	0.44
1:F:224:LYS:CA	1:F:225:ALA:HB3	2.47	0.44
1:D:21:ASN:HB2	1:D:189:GLN:HB3	1.99	0.44
1:F:215:LEU:HA	1:F:218:LYS:HG2	1.99	0.44
1:B:51:TYR:OH	3:B:1460:PLM:O2	2.34	0.43
1:D:32:ILE:HA	1:D:35:GLU:HG2	1.99	0.43
1:F:128:GLN:HG2	4:F:2023:HOH:O	2.18	0.43
1:C:400:CYS:HA	2:C:1459:HEM:C4D	2.53	0.43
1:D:4:GLU:OE2	1:D:4:GLU:HA	2.16	0.43
1:F:82:PHE:HE2	1:F:263:ILE:HD12	1.83	0.43
1:F:435:GLU:HG2	1:F:439:LEU:CD2	2.48	0.43
1:B:81:PHE:HB3	1:B:209:ILE:HG12	1.99	0.43
1:B:286:VAL:HG11	1:B:374:PHE:HE2	1.84	0.43
1:D:265:GLY:HA2	2:D:1459:HEM:C3C	2.52	0.43
1:D:298:LEU:HB2	1:D:419:LYS:HD2	2.01	0.43
1:E:20:LEU:O	1:E:21:ASN:HB2	2.18	0.43
1:E:9:LYS:HE2	1:E:19:LEU:HD22	2.00	0.43
1:D:366:ILE:CD1	1:D:386:PRO:HG2	2.45	0.43
1:D:406:ALA:HB2	2:D:1459:HEM:HHC	1.99	0.43
1:E:5:MET:HA	1:E:6:PRO:HD3	1.92	0.43
1:F:314:VAL:HG13	1:F:414:LEU:HD23	2.00	0.43
1:A:3:LYS:CB	1:A:4:GLU:HG3	2.47	0.43
1:E:245:THR:HB	1:E:247:GLU:HG3	2.01	0.43
1:B:136:ASP:OD1	1:B:136:ASP:N	2.43	0.43
1:C:147:ARG:HG2	1:C:164:SER:HB3	2.01	0.43
1:C:217:ASP:OD1	1:C:255:ARG:NH1	2.45	0.43
1:F:87:PHE:HA	2:F:1459:HEM:HAD1	2.01	0.43
1:F:190:ARG:O	1:F:190:ARG:CG	2.61	0.43
1:A:95:ASN:HD22	1:A:95:ASN:HA	1.59	0.42
1:B:435:GLU:HG2	1:B:439:LEU:CD2	2.49	0.42
1:F:215:LEU:O	1:F:219:ILE:HG23	2.18	0.42
1:D:154:GLY:HA3	1:D:162:PHE:CE2	2.51	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:332:SER:HB3	1:F:354:MET:SD	2.59	0.42
1:A:174:ILE:O	1:A:178:VAL:HG23	2.20	0.42
1:C:3:LYS:O	1:C:4:GLU:O	2.38	0.42
1:C:357:ILE:HG22	1:C:361:HIS:CE1	2.55	0.42
1:D:177:MET:HG3	1:D:263:ILE:HG12	2.02	0.42
1:D:262:LEU:O	1:D:266:HIS:HD2	2.02	0.42
1:F:289:LYS:HD3	1:F:313:TYR:CZ	2.54	0.42
1:B:16:ASN:HB2	1:B:43:GLU:O	2.19	0.42
1:B:122:ILE:HG22	1:B:148:LEU:HD12	2.02	0.42
1:F:357:ILE:HG22	1:F:361:HIS:CE1	2.54	0.42
1:C:320:GLU:OE2	1:C:323:ARG:NE	2.44	0.42
1:E:79:ARG:HH11	1:E:79:ARG:CG	2.30	0.42
1:F:86:LEU:HB3	2:F:1459:HEM:HBD2	2.01	0.42
1:F:223:ARG:HH22	1:F:230:SER:HB2	1.84	0.42
1:D:130:TRP:CZ2	1:D:139:ILE:HG21	2.55	0.42
1:F:435:GLU:HG2	1:F:439:LEU:HD22	2.02	0.42
1:C:320:GLU:HG3	1:C:376:PRO:HA	2.01	0.42
1:F:15:LYS:HB3	1:F:43:GLU:HB3	2.01	0.42
1:F:455:LEU:HD12	1:F:455:LEU:HA	1.93	0.42
1:D:316:MET:HG2	1:D:379:PHE:HB2	2.01	0.42
1:A:302:VAL:HG21	1:A:458:ILE:HB	2.01	0.41
1:B:266:HIS:CG	1:B:267:GLU:N	2.87	0.41
1:C:200:GLU:HB3	4:C:2046:HOH:O	2.19	0.41
1:C:323:ARG:HG2	1:C:361:HIS:HB3	2.02	0.41
1:C:336:LYS:O	1:C:349:LYS:HG3	2.19	0.41
1:B:261:PHE:O	1:B:265:GLY:HA3	2.20	0.41
1:C:266:HIS:CG	1:C:267:GLU:N	2.87	0.41
1:D:102:ILE:HD12	1:D:249:LEU:CD1	2.46	0.41
1:E:119:MET:HB3	1:E:412:LEU:HD23	2.01	0.41
1:F:400:CYS:HA	2:F:1459:HEM:CHA	2.50	0.41
1:D:147:ARG:HG2	1:D:164:SER:HB3	2.02	0.41
1:D:233:LEU:O	1:D:237:MET:HG3	2.20	0.41
1:F:226:SER:HA	1:F:227:GLY:HA3	1.53	0.41
1:B:79:ARG:HG2	1:B:83:GLY:O	2.20	0.41
1:B:141:VAL:HB	1:B:142:PRO:CD	2.50	0.41
1:D:70:ASN:HB3	1:D:332:SER:OG	2.21	0.41
1:F:74:ALA:O	1:F:78:VAL:HG23	2.19	0.41
1:A:367:TRP:HB2	1:A:371:VAL:HG12	2.02	0.41
1:E:116:HIS:HE1	1:E:303:PRO:O	2.02	0.41
1:C:5:MET:SD	1:C:50:ARG:HG2	2.61	0.41
1:E:185:MET:HA	1:E:188:LEU:HD12	2.01	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:2:ILE:HG13	1:C:344:GLU:HA	2.03	0.41
1:E:8:PRO:C	1:E:9:LYS:HD3	2.41	0.41
1:A:242:ASP:O	1:A:246:GLY:N	2.53	0.41
1:B:38:GLU:HG2	4:B:2010:HOH:O	2.21	0.41
1:B:367:TRP:HB2	1:B:371:VAL:HG12	2.03	0.41
1:E:186:ASN:O	1:E:190:ARG:HB2	2.21	0.41
1:B:183:GLU:HG2	1:B:205:PHE:CD1	2.55	0.41
1:D:434:LYS:HB2	1:D:442:GLU:HB2	2.03	0.41
1:E:85:GLY:HA2	1:E:257:GLN:HE22	1.86	0.41
1:F:147:ARG:HG2	1:F:164:SER:HB3	2.03	0.41
1:A:185:MET:HA	1:A:188:LEU:HD22	2.03	0.40
1:B:313:TYR:HE1	1:B:377:GLU:OE2	2.04	0.40
1:C:53:SER:O	1:C:360:LEU:HA	2.21	0.40
1:C:134:ASN:O	1:C:137:GLU:HG2	2.20	0.40
1:D:102:ILE:CD1	1:D:249:LEU:HD13	2.50	0.40
1:D:309:LYS:HA	1:D:309:LYS:HD3	1.91	0.40
1:B:265:GLY:HA2	2:B:1459:HEM:C3C	2.57	0.40
1:D:116:HIS:HE1	1:D:303:PRO:O	2.04	0.40
1:E:11:PHE:CD1	1:E:11:PHE:N	2.88	0.40
1:F:53:SER:O	1:F:360:LEU:HA	2.21	0.40
1:A:83:GLY:HA3	1:A:256:TYR:CD1	2.56	0.40
1:A:229:GLN:HE21	1:A:229:GLN:HB2	1.63	0.40
1:A:289:LYS:HE3	1:A:313:TYR:CE1	2.56	0.40
1:C:334:TYR:HA	1:C:351:ASP:O	2.22	0.40
1:D:400:CYS:HA	2:D:1459:HEM:CHA	2.51	0.40
1:E:61:ALA:HB1	1:E:333:LEU:HD13	2.03	0.40
1:F:103:LEU:C	1:F:105:PRO:HD2	2.41	0.40
1:F:196:PRO:HA	1:F:199:ASP:CB	2.49	0.40
1:F:437:LEU:HD22	3:F:1460:PLM:H71	2.03	0.40
1:C:195:ASP:HA	1:C:196:PRO:HD3	1.94	0.40
1:D:60:GLU:O	1:D:63:ASP:HB2	2.22	0.40
1:E:148:LEU:CD2	1:E:413:VAL:HG21	2.46	0.40
1:E:453:ILE:HA	1:E:454:PRO:HD3	1.95	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	456/458 (100%)	426 (93%)	25 (6%)	5 (1%)	14	41
1	B	456/458 (100%)	425 (93%)	22 (5%)	9 (2%)	7	24
1	C	456/458 (100%)	429 (94%)	22 (5%)	5 (1%)	14	41
1	D	456/458 (100%)	421 (92%)	32 (7%)	3 (1%)	22	53
1	E	456/458 (100%)	410 (90%)	38 (8%)	8 (2%)	8	28
1	F	456/458 (100%)	415 (91%)	31 (7%)	10 (2%)	6	22
All	All	2736/2748 (100%)	2526 (92%)	170 (6%)	40 (2%)	10	33

All (40) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	3	LYS
1	B	380	GLU
1	B	383	SER
1	C	4	GLU
1	D	2	ILE
1	E	8	PRO
1	E	227	GLY
1	E	229	GLN
1	F	196	PRO
1	F	197	ALA
1	A	2	ILE
1	A	225	ALA
1	B	229	GLN
1	C	3	LYS
1	D	21	ASN
1	E	11	PHE
1	E	20	LEU
1	E	22	THR
1	E	226	SER
1	F	19	LEU

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Mol	Chain	Res	Type
1	A	226	SER
1	B	381	ASN
1	B	382	PRO
1	E	225	ALA
1	F	18	PRO
1	F	194	ASP
1	F	195	ASP
1	B	455	LEU
1	C	159	ASN
1	C	192	ASN
1	F	248	PRO
1	F	344	GLU
1	A	4	GLU
1	A	228	GLU
1	B	5	MET
1	F	222	ASP
1	D	240	GLY
1	F	229	GLN
1	C	45	PRO
1	B	456	GLY

5.3.2 Protein sidechains [i](#)

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	400/401 (100%)	386 (96%)	14 (4%)	36	70
1	B	400/401 (100%)	377 (94%)	23 (6%)	20	50
1	C	400/401 (100%)	387 (97%)	13 (3%)	38	72
1	D	400/401 (100%)	383 (96%)	17 (4%)	29	62
1	E	400/401 (100%)	385 (96%)	15 (4%)	33	67
1	F	400/401 (100%)	385 (96%)	15 (4%)	33	67
All	All	2400/2406 (100%)	2303 (96%)	97 (4%)	31	65

All (97) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	3	LYS
1	A	4	GLU
1	A	13	GLU
1	A	68	ASP
1	A	103	LEU
1	A	148	LEU
1	A	188	LEU
1	A	195	ASP
1	A	229	GLN
1	A	252	GLU
1	A	266	HIS
1	A	286	VAL
1	A	287	LEU
1	A	404	GLN
1	B	2	ILE
1	B	4	GLU
1	B	17	LEU
1	B	19	LEU
1	B	34	ASP
1	B	48	VAL
1	B	59	LYS
1	B	79	ARG
1	B	136	ASP
1	B	148	LEU
1	B	151	ASP
1	B	190	ARG
1	B	192	ASN
1	B	204	GLN
1	B	215	LEU
1	B	222	ASP
1	B	230	SER
1	B	247	GLU
1	B	266	HIS
1	B	306	LYS
1	B	354	MET
1	B	369	ASP
1	B	455	LEU
1	C	4	GLU
1	C	9	LYS
1	C	59	LYS
1	C	148	LEU
1	C	189	GLN
1	C	190	ARG

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Mol	Chain	Res	Type
1	C	194	ASP
1	C	203	ARG
1	C	204	GLN
1	C	268	THR
1	C	320	GLU
1	C	339	THR
1	C	369	ASP
1	D	3	LYS
1	D	10	THR
1	D	95	ASN
1	D	97	LYS
1	D	148	LEU
1	D	188	LEU
1	D	222	ASP
1	D	229	GLN
1	D	244	GLU
1	D	266	HIS
1	D	287	LEU
1	D	306	LYS
1	D	339	THR
1	D	369	ASP
1	D	449	LYS
1	D	452	LYS
1	D	455	LEU
1	E	11	PHE
1	E	20	LEU
1	E	22	THR
1	E	79	ARG
1	E	148	LEU
1	E	176	SER
1	E	215	LEU
1	E	222	ASP
1	E	228	GLU
1	E	257	GLN
1	E	266	HIS
1	E	381	ASN
1	E	440	LYS
1	E	455	LEU
1	E	458	ILE
1	F	15	LYS
1	F	17	LEU
1	F	41	LYS

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Mol	Chain	Res	Type
1	F	48	VAL
1	F	148	LEU
1	F	179	ARG
1	F	182	ASP
1	F	202	LYS
1	F	205	PHE
1	F	217	ASP
1	F	219	ILE
1	F	228	GLU
1	F	241	LYS
1	F	266	HIS
1	F	449	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (61) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	27	GLN
1	A	73	GLN
1	A	95	ASN
1	A	109	GLN
1	A	116	HIS
1	A	189	GLN
1	A	201	ASN
1	A	204	GLN
1	A	266	HIS
1	A	388	HIS
1	A	403	GLN
1	A	426	HIS
1	B	92	HIS
1	B	116	HIS
1	B	189	GLN
1	B	201	ASN
1	B	204	GLN
1	B	388	HIS
1	B	403	GLN
1	B	426	HIS
1	C	21	ASN
1	C	95	ASN
1	C	109	GLN
1	C	116	HIS
1	C	204	GLN
1	C	266	HIS

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Mol	Chain	Res	Type
1	C	388	HIS
1	C	426	HIS
1	D	27	GLN
1	D	73	GLN
1	D	92	HIS
1	D	95	ASN
1	D	109	GLN
1	D	116	HIS
1	D	201	ASN
1	D	204	GLN
1	D	239	ASN
1	D	266	HIS
1	D	285	HIS
1	D	388	HIS
1	D	403	GLN
1	E	95	ASN
1	E	109	GLN
1	E	116	HIS
1	E	189	GLN
1	E	201	ASN
1	E	204	GLN
1	E	359	GLN
1	E	381	ASN
1	E	388	HIS
1	E	403	GLN
1	E	426	HIS
1	F	27	GLN
1	F	73	GLN
1	F	95	ASN
1	F	116	HIS
1	F	169	GLN
1	F	189	GLN
1	F	266	HIS
1	F	388	HIS
1	F	403	GLN

5.3.3 RNA

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 monosaccharides 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	C	1459	1	41,50,50	2.77	17 (41%)	45,82,82	3.06	24 (53%)
3	PLM	A	1460	-	17,17,17	0.47	0	17,17,17	0.83	1 (5%)
2	HEM	B	1459	1	41,50,50	2.76	15 (36%)	45,82,82	3.12	25 (55%)
3	PLM	D	1460	-	17,17,17	0.51	0	17,17,17	0.93	1 (5%)
2	HEM	D	1459	1	41,50,50	2.78	17 (41%)	45,82,82	3.06	22 (48%)
2	HEM	E	1459	1	41,50,50	2.78	18 (43%)	45,82,82	3.01	27 (60%)
2	HEM	A	1459	1	41,50,50	2.82	18 (43%)	45,82,82	3.13	23 (51%)
3	PLM	C	1460	-	17,17,17	0.51	0	17,17,17	0.87	0
3	PLM	B	1460	-	17,17,17	0.52	0	17,17,17	0.89	2 (11%)
3	PLM	E	1460	-	17,17,17	0.49	0	17,17,17	0.91	0
2	HEM	F	1459	1	41,50,50	2.78	15 (36%)	45,82,82	3.02	25 (55%)
3	PLM	F	1460	-	17,17,17	0.50	0	17,17,17	1.32	2 (11%)

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	C	1459	1	-	8/12/54/54	-
3	PLM	A	1460	-	-	11/15/15/15	-
2	HEM	B	1459	1	-	4/12/54/54	-
3	PLM	D	1460	-	-	9/15/15/15	-
2	HEM	D	1459	1	-	8/12/54/54	-
2	HEM	E	1459	1	-	4/12/54/54	-
2	HEM	A	1459	1	-	6/12/54/54	-
3	PLM	C	1460	-	-	10/15/15/15	-
3	PLM	B	1460	-	-	8/15/15/15	-
3	PLM	E	1460	-	-	8/15/15/15	-
2	HEM	F	1459	1	-	6/12/54/54	-
3	PLM	F	1460	-	-	10/15/15/15	-

All (100) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	1459	HEM	CBD-CGD	-7.23	1.33	1.50
2	B	1459	HEM	CBD-CGD	-7.02	1.34	1.50
2	F	1459	HEM	CBD-CGD	-6.94	1.34	1.50
2	E	1459	HEM	CBD-CGD	-6.92	1.34	1.50
2	C	1459	HEM	CBD-CGD	-6.74	1.34	1.50
2	D	1459	HEM	CBD-CGD	-6.73	1.34	1.50
2	D	1459	HEM	CBA-CGA	-6.70	1.35	1.50
2	A	1459	HEM	CBA-CGA	-6.67	1.35	1.50
2	C	1459	HEM	CBA-CGA	-6.59	1.35	1.50
2	E	1459	HEM	CBA-CGA	-6.49	1.35	1.50
2	F	1459	HEM	CBA-CGA	-6.48	1.35	1.50
2	B	1459	HEM	CBA-CGA	-6.46	1.35	1.50
2	E	1459	HEM	C3B-C2B	5.35	1.48	1.37
2	D	1459	HEM	C3C-C2C	5.34	1.47	1.40
2	B	1459	HEM	C3C-C2C	5.34	1.47	1.40
2	C	1459	HEM	C3C-C2C	5.26	1.47	1.40
2	A	1459	HEM	C3B-C2B	5.23	1.47	1.37
2	F	1459	HEM	C3D-C2D	5.21	1.47	1.36
2	E	1459	HEM	C3C-C2C	5.13	1.47	1.40
2	D	1459	HEM	C3B-C2B	5.12	1.47	1.37
2	D	1459	HEM	C3D-C2D	5.11	1.47	1.36
2	A	1459	HEM	C3D-C2D	5.10	1.47	1.36
2	F	1459	HEM	C3B-C2B	5.07	1.47	1.37
2	B	1459	HEM	C3B-C2B	4.99	1.47	1.37
2	A	1459	HEM	C3C-C2C	4.98	1.47	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	1459	HEM	C3D-C2D	4.95	1.47	1.36
2	C	1459	HEM	CHA-C4D	4.83	1.47	1.35
2	C	1459	HEM	C3B-C2B	4.81	1.47	1.37
2	E	1459	HEM	CHB-C1B	4.78	1.47	1.35
2	F	1459	HEM	C3C-C2C	4.77	1.47	1.40
2	E	1459	HEM	C3D-C2D	4.77	1.46	1.36
2	E	1459	HEM	CHA-C4D	4.73	1.47	1.35
2	F	1459	HEM	CHB-C1B	4.71	1.47	1.35
2	F	1459	HEM	CHA-C4D	4.68	1.47	1.35
2	B	1459	HEM	C3D-C2D	4.68	1.46	1.36
2	A	1459	HEM	CHA-C4D	4.68	1.47	1.35
2	A	1459	HEM	CHB-C1B	4.60	1.46	1.35
2	D	1459	HEM	CHA-C4D	4.57	1.46	1.35
2	C	1459	HEM	CHB-C1B	4.47	1.46	1.35
2	B	1459	HEM	CHB-C1B	4.46	1.46	1.35
2	B	1459	HEM	CHA-C4D	4.45	1.46	1.35
2	D	1459	HEM	CHB-C1B	4.34	1.46	1.35
2	B	1459	HEM	CBB-CAB	4.34	1.51	1.30
2	F	1459	HEM	CBB-CAB	4.32	1.51	1.30
2	A	1459	HEM	CBB-CAB	4.22	1.51	1.30
2	E	1459	HEM	CBB-CAB	4.19	1.51	1.30
2	D	1459	HEM	CBB-CAB	4.18	1.51	1.30
2	C	1459	HEM	CBB-CAB	4.18	1.51	1.30
2	F	1459	HEM	CBC-CAC	3.39	1.51	1.29
2	A	1459	HEM	CBC-CAC	3.39	1.51	1.29
2	E	1459	HEM	CBC-CAC	3.38	1.51	1.29
2	C	1459	HEM	CBC-CAC	3.37	1.51	1.29
2	D	1459	HEM	CBC-CAC	3.35	1.51	1.29
2	B	1459	HEM	CBC-CAC	3.35	1.51	1.29
2	C	1459	HEM	C4D-ND	-3.21	1.34	1.40
2	B	1459	HEM	C4D-ND	-3.10	1.35	1.40
2	F	1459	HEM	C4D-ND	-2.95	1.35	1.40
2	F	1459	HEM	C1B-NB	-2.95	1.35	1.40
2	A	1459	HEM	C4D-ND	-2.87	1.35	1.40
2	B	1459	HEM	C1B-NB	-2.80	1.35	1.40
2	C	1459	HEM	C1B-NB	-2.76	1.35	1.40
2	D	1459	HEM	C3B-C4B	2.71	1.50	1.44
2	D	1459	HEM	C4D-ND	-2.71	1.35	1.40
2	A	1459	HEM	C1B-NB	-2.69	1.35	1.40
2	D	1459	HEM	C2C-C1C	2.64	1.48	1.42
2	D	1459	HEM	C1B-NB	-2.64	1.35	1.40
2	E	1459	HEM	C4D-ND	-2.62	1.35	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	F	1459	HEM	C1D-C2D	2.57	1.49	1.44
2	E	1459	HEM	C2C-C1C	2.48	1.48	1.42
2	B	1459	HEM	C2C-C1C	2.48	1.48	1.42
2	C	1459	HEM	C1D-C2D	2.45	1.49	1.44
2	D	1459	HEM	C1D-C2D	2.44	1.49	1.44
2	A	1459	HEM	C2C-C1C	2.42	1.48	1.42
2	A	1459	HEM	C3B-C4B	2.39	1.49	1.44
2	F	1459	HEM	C2C-C1C	2.37	1.47	1.42
2	E	1459	HEM	C1B-NB	-2.36	1.36	1.40
2	C	1459	HEM	C2C-C1C	2.35	1.47	1.42
2	E	1459	HEM	C1D-C2D	2.33	1.49	1.44
2	E	1459	HEM	C4D-C3D	2.33	1.49	1.45
2	A	1459	HEM	C4D-C3D	2.32	1.49	1.45
2	C	1459	HEM	C3B-C4B	2.29	1.49	1.44
2	C	1459	HEM	CHD-C1D	2.24	1.47	1.41
2	A	1459	HEM	C1D-C2D	2.23	1.48	1.44
2	B	1459	HEM	C4D-C3D	2.23	1.48	1.45
2	A	1459	HEM	C3C-CAC	2.22	1.52	1.47
2	D	1459	HEM	C4D-C3D	2.20	1.48	1.45
2	B	1459	HEM	C3B-C4B	2.19	1.49	1.44
2	D	1459	HEM	CHD-C1D	2.15	1.47	1.41
2	C	1459	HEM	C1B-C2B	2.14	1.48	1.44
2	B	1459	HEM	C4A-CHB	2.13	1.46	1.41
2	A	1459	HEM	CHC-C4B	2.12	1.47	1.41
2	D	1459	HEM	CHC-C4B	2.11	1.47	1.41
2	E	1459	HEM	CHD-C1D	2.10	1.47	1.41
2	F	1459	HEM	C3B-C4B	2.09	1.49	1.44
2	E	1459	HEM	C3B-C4B	2.08	1.49	1.44
2	A	1459	HEM	C4A-CHB	2.08	1.46	1.41
2	E	1459	HEM	C1A-CHA	2.06	1.46	1.41
2	C	1459	HEM	C4D-C3D	2.06	1.48	1.45
2	E	1459	HEM	C4A-CHB	2.05	1.46	1.41
2	F	1459	HEM	CHD-C1D	2.04	1.46	1.41

All (152) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1459	HEM	C4B-C3B-C2B	-6.96	101.59	107.11
2	B	1459	HEM	C4B-C3B-C2B	-6.88	101.65	107.11
2	E	1459	HEM	C4B-C3B-C2B	-6.82	101.70	107.11
2	F	1459	HEM	C4B-C3B-C2B	-6.78	101.73	107.11
2	C	1459	HEM	C2B-C1B-NB	6.72	117.80	109.84

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	1459	HEM	C2B-C1B-NB	6.67	117.75	109.84
2	B	1459	HEM	C4A-C3A-C2A	-6.67	102.35	107.00
2	C	1459	HEM	C4B-C3B-C2B	-6.51	101.95	107.11
2	D	1459	HEM	C4A-C3A-C2A	-6.46	102.50	107.00
2	B	1459	HEM	C2B-C1B-NB	6.42	117.45	109.84
2	D	1459	HEM	C4B-C3B-C2B	-6.25	102.15	107.11
2	A	1459	HEM	C2D-C1D-ND	6.20	117.31	109.88
2	A	1459	HEM	C4A-C3A-C2A	-6.19	102.69	107.00
2	F	1459	HEM	C2B-C1B-NB	6.17	117.15	109.84
2	A	1459	HEM	C2B-C1B-NB	6.09	117.06	109.84
2	C	1459	HEM	C4A-C3A-C2A	-6.07	102.77	107.00
2	C	1459	HEM	C3B-C2B-C1B	-6.01	102.03	106.49
2	D	1459	HEM	C3B-C2B-C1B	-5.97	102.06	106.49
2	C	1459	HEM	C3D-C4D-ND	5.89	116.73	110.17
2	D	1459	HEM	C3D-C4D-ND	5.84	116.66	110.17
2	F	1459	HEM	C4A-C3A-C2A	-5.81	102.95	107.00
2	B	1459	HEM	C2D-C1D-ND	5.77	116.79	109.88
2	E	1459	HEM	C2B-C1B-NB	5.67	116.55	109.84
2	E	1459	HEM	C2D-C1D-ND	5.58	116.56	109.88
2	E	1459	HEM	C4A-C3A-C2A	-5.57	103.12	107.00
2	F	1459	HEM	C3D-C4D-ND	5.56	116.35	110.17
2	B	1459	HEM	C3B-C2B-C1B	-5.54	102.38	106.49
2	A	1459	HEM	C3D-C4D-ND	5.50	116.28	110.17
2	D	1459	HEM	C2D-C1D-ND	5.48	116.44	109.88
2	C	1459	HEM	C2D-C1D-ND	5.42	116.37	109.88
2	F	1459	HEM	C3B-C2B-C1B	-5.40	102.48	106.49
2	F	1459	HEM	C2D-C1D-ND	5.40	116.35	109.88
2	E	1459	HEM	C3D-C4D-ND	5.38	116.15	110.17
2	A	1459	HEM	C2C-C3C-C4C	-5.37	103.15	106.90
2	B	1459	HEM	C3D-C4D-ND	5.35	116.12	110.17
2	A	1459	HEM	C3B-C2B-C1B	-5.23	102.61	106.49
2	A	1459	HEM	C1D-C2D-C3D	-5.20	101.49	106.96
2	E	1459	HEM	C3B-C2B-C1B	-4.96	102.81	106.49
2	F	1459	HEM	C1D-C2D-C3D	-4.86	101.84	106.96
2	E	1459	HEM	CAD-CBD-CGD	4.77	123.86	113.60
2	C	1459	HEM	C1D-C2D-C3D	-4.73	101.98	106.96
2	B	1459	HEM	C2C-C3C-C4C	-4.69	103.62	106.90
2	B	1459	HEM	C1D-C2D-C3D	-4.64	102.08	106.96
2	E	1459	HEM	C1D-C2D-C3D	-4.52	102.21	106.96
2	D	1459	HEM	C1D-C2D-C3D	-4.50	102.23	106.96
2	E	1459	HEM	C2C-C3C-C4C	-4.29	103.90	106.90
2	F	1459	HEM	CAD-CBD-CGD	4.21	122.67	113.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	1459	HEM	C2C-C3C-C4C	-4.19	103.97	106.90
2	C	1459	HEM	C1B-NB-C4B	-4.12	100.81	105.07
2	A	1459	HEM	C3C-C4C-NC	4.09	118.66	110.94
3	F	1460	PLM	C3-C2-C1	-3.95	104.53	114.47
2	A	1459	HEM	CAD-CBD-CGD	3.90	122.00	113.60
2	D	1459	HEM	CAD-CBD-CGD	3.80	121.78	113.60
2	B	1459	HEM	C1B-NB-C4B	-3.80	101.15	105.07
2	F	1459	HEM	C2C-C3C-C4C	-3.79	104.25	106.90
2	C	1459	HEM	C2C-C3C-C4C	-3.74	104.28	106.90
2	B	1459	HEM	C3C-C4C-NC	3.67	117.87	110.94
2	E	1459	HEM	C3C-C4C-NC	3.65	117.83	110.94
2	F	1459	HEM	C3C-C4C-NC	3.56	117.67	110.94
2	C	1459	HEM	CHC-C4B-NB	-3.49	120.63	124.43
2	D	1459	HEM	C3C-C4C-NC	3.48	117.51	110.94
2	D	1459	HEM	CHC-C4B-NB	-3.47	120.66	124.43
2	F	1459	HEM	C1B-NB-C4B	-3.44	101.52	105.07
2	B	1459	HEM	CAD-CBD-CGD	3.43	121.00	113.60
2	D	1459	HEM	C1B-NB-C4B	-3.39	101.57	105.07
2	C	1459	HEM	C3C-C4C-NC	3.38	117.33	110.94
2	F	1459	HEM	CAA-CBA-CGA	3.29	122.99	113.76
2	A	1459	HEM	C1B-NB-C4B	-3.29	101.68	105.07
2	A	1459	HEM	CHD-C1D-C2D	-3.26	119.89	124.98
2	C	1459	HEM	CBB-CAB-C3B	-3.24	111.49	127.62
2	B	1459	HEM	CMC-C2C-C3C	3.14	130.55	124.68
2	E	1459	HEM	C1B-NB-C4B	-3.12	101.85	105.07
2	A	1459	HEM	CHC-C4B-NB	-3.11	121.05	124.43
2	C	1459	HEM	CMC-C2C-C3C	3.11	130.50	124.68
2	D	1459	HEM	C4D-C3D-C2D	-3.03	102.47	106.90
2	C	1459	HEM	CAD-CBD-CGD	3.03	120.11	113.60
2	D	1459	HEM	CBB-CAB-C3B	-3.00	112.70	127.62
2	B	1459	HEM	CHD-C1D-C2D	-3.00	120.30	124.98
2	E	1459	HEM	CAA-CBA-CGA	3.00	122.16	113.76
2	A	1459	HEM	CBB-CAB-C3B	-2.98	112.81	127.62
2	A	1459	HEM	CAA-CBA-CGA	2.95	122.03	113.76
2	A	1459	HEM	C4D-ND-C1D	-2.94	102.04	105.07
2	B	1459	HEM	C4D-C3D-C2D	-2.91	102.66	106.90
2	C	1459	HEM	C4D-C3D-C2D	-2.91	102.66	106.90
2	E	1459	HEM	C4C-CHD-C1D	2.91	126.39	122.56
2	E	1459	HEM	CMC-C2C-C3C	2.89	130.09	124.68
2	B	1459	HEM	CBB-CAB-C3B	-2.86	113.39	127.62
2	B	1459	HEM	CHC-C4B-NB	-2.85	121.33	124.43
2	F	1459	HEM	C4D-C3D-C2D	-2.83	102.77	106.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	1459	HEM	CAD-C3D-C4D	2.83	129.60	124.66
2	F	1459	HEM	C4C-CHD-C1D	2.83	126.29	122.56
2	E	1459	HEM	C4D-C3D-C2D	-2.82	102.79	106.90
2	D	1459	HEM	CMC-C2C-C3C	2.80	129.93	124.68
2	D	1459	HEM	C4D-ND-C1D	-2.80	102.18	105.07
2	E	1459	HEM	CMD-C2D-C1D	2.79	129.29	125.04
2	A	1459	HEM	C4D-C3D-C2D	-2.76	102.87	106.90
2	F	1459	HEM	CHA-C4D-C3D	-2.75	120.16	125.33
2	C	1459	HEM	C4D-ND-C1D	-2.74	102.25	105.07
2	A	1459	HEM	CMC-C2C-C3C	2.73	129.79	124.68
2	D	1459	HEM	C4C-CHD-C1D	2.72	126.15	122.56
2	D	1459	HEM	CHB-C1B-C2B	-2.71	119.23	126.72
2	F	1459	HEM	CMD-C2D-C1D	2.71	129.16	125.04
2	E	1459	HEM	C4D-ND-C1D	-2.69	102.29	105.07
2	B	1459	HEM	CAD-C3D-C4D	2.68	129.33	124.66
2	D	1459	HEM	CHD-C1D-ND	-2.66	121.54	124.43
2	E	1459	HEM	CHC-C4B-NB	-2.66	121.54	124.43
2	B	1459	HEM	C4D-ND-C1D	-2.65	102.34	105.07
2	F	1459	HEM	CHD-C1D-ND	-2.62	121.58	124.43
2	F	1459	HEM	CBB-CAB-C3B	-2.62	114.60	127.62
2	F	1459	HEM	CMC-C2C-C3C	2.60	129.53	124.68
2	C	1459	HEM	CMD-C2D-C1D	2.59	128.99	125.04
2	C	1459	HEM	CHB-C1B-C2B	-2.56	119.63	126.72
2	B	1459	HEM	C4C-CHD-C1D	2.56	125.94	122.56
2	F	1459	HEM	CHC-C4B-NB	-2.55	121.66	124.43
2	A	1459	HEM	C4C-CHD-C1D	2.54	125.91	122.56
2	E	1459	HEM	CBB-CAB-C3B	-2.48	115.26	127.62
2	E	1459	HEM	CHA-C4D-ND	-2.48	121.32	124.38
2	B	1459	HEM	CHB-C1B-C2B	-2.46	119.93	126.72
2	B	1459	HEM	CMD-C2D-C1D	2.44	128.75	125.04
2	E	1459	HEM	O2D-CGD-CBD	2.42	121.80	114.03
3	F	1460	PLM	O1-C1-C2	2.37	121.66	114.03
3	B	1460	PLM	O1-C1-O2	-2.36	117.41	123.30
2	D	1459	HEM	CMD-C2D-C1D	2.36	128.63	125.04
2	E	1459	HEM	O1D-CGD-CBD	-2.34	115.55	123.08
2	A	1459	HEM	CHB-C1B-C2B	-2.34	120.25	126.72
2	F	1459	HEM	O2A-CGA-CBA	2.34	121.54	114.03
2	F	1459	HEM	C4D-ND-C1D	-2.32	102.68	105.07
2	B	1459	HEM	CBA-CAA-C2A	2.31	116.56	112.62
2	D	1459	HEM	CHA-C4D-C3D	-2.27	121.06	125.33
2	C	1459	HEM	CHD-C1D-C2D	-2.27	121.43	124.98
2	E	1459	HEM	CHD-C1D-C2D	-2.26	121.45	124.98

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	1460	PLM	O1-C1-C2	2.26	121.28	114.03
2	E	1459	HEM	CHD-C1D-ND	-2.25	121.99	124.43
2	A	1459	HEM	CHA-C4D-C3D	-2.24	121.12	125.33
2	C	1459	HEM	CHA-C4D-C3D	-2.24	121.13	125.33
2	B	1459	HEM	O2D-CGD-CBD	2.23	121.18	114.03
2	F	1459	HEM	CHC-C4B-C3B	-2.22	121.17	124.57
2	F	1459	HEM	CHB-C1B-C2B	-2.20	120.65	126.72
2	C	1459	HEM	CAA-CBA-CGA	2.16	119.82	113.76
2	B	1459	HEM	CHC-C4B-C3B	-2.15	121.28	124.57
2	A	1459	HEM	C4B-CHC-C1C	2.15	125.39	122.56
2	C	1459	HEM	CMA-C3A-C2A	2.13	128.96	124.94
2	E	1459	HEM	CHC-C4B-C3B	-2.11	121.34	124.57
2	B	1459	HEM	CMA-C3A-C2A	2.10	128.91	124.94
2	C	1459	HEM	C4C-CHD-C1D	2.09	125.32	122.56
2	D	1459	HEM	O2D-CGD-CBD	2.09	120.75	114.03
2	E	1459	HEM	CHB-C1B-C2B	-2.09	120.93	126.72
3	A	1460	PLM	O1-C1-C2	2.07	120.69	114.03
2	F	1459	HEM	O2D-CGD-CBD	2.07	120.69	114.03
2	A	1459	HEM	O1D-CGD-CBD	-2.07	116.44	123.08
2	C	1459	HEM	CHD-C1D-ND	-2.06	122.19	124.43
3	D	1460	PLM	O1-C1-C2	2.05	120.62	114.03

There are no chirality outliers.

All (92) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	C	1459	HEM	C4D-C3D-CAD-CBD
2	C	1459	HEM	C2D-C3D-CAD-CBD
3	C	1460	PLM	C4-C5-C6-C7
3	C	1460	PLM	C8-C9-CA-CB
3	A	1460	PLM	C3-C4-C5-C6
3	D	1460	PLM	CB-CC-CD-CE
3	A	1460	PLM	C8-C9-CA-CB
3	E	1460	PLM	CB-CC-CD-CE
3	C	1460	PLM	CC-CD-CE-CF
3	F	1460	PLM	CB-CC-CD-CE
3	A	1460	PLM	C2-C3-C4-C5
3	B	1460	PLM	C5-C6-C7-C8
3	B	1460	PLM	CA-CB-CC-CD
3	F	1460	PLM	C7-C8-C9-CA
3	A	1460	PLM	CB-CC-CD-CE
3	E	1460	PLM	C1-C2-C3-C4

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Mol	Chain	Res	Type	Atoms
3	F	1460	PLM	C1-C2-C3-C4
3	B	1460	PLM	C6-C7-C8-C9
3	C	1460	PLM	CD-CE-CF-CG
3	E	1460	PLM	C8-C9-CA-CB
3	D	1460	PLM	CC-CD-CE-CF
3	F	1460	PLM	C8-C9-CA-CB
3	E	1460	PLM	C4-C5-C6-C7
3	C	1460	PLM	C3-C4-C5-C6
3	A	1460	PLM	C5-C6-C7-C8
2	F	1459	HEM	C4D-C3D-CAD-CBD
3	F	1460	PLM	C3-C4-C5-C6
3	E	1460	PLM	CD-CE-CF-CG
3	A	1460	PLM	C9-CA-CB-CC
3	C	1460	PLM	C5-C6-C7-C8
2	F	1459	HEM	C2D-C3D-CAD-CBD
3	B	1460	PLM	C2-C3-C4-C5
3	D	1460	PLM	C9-CA-CB-CC
3	D	1460	PLM	C4-C5-C6-C7
2	C	1459	HEM	C2B-C3B-CAB-CBB
2	D	1459	HEM	C2B-C3B-CAB-CBB
3	A	1460	PLM	CC-CD-CE-CF
3	F	1460	PLM	C5-C6-C7-C8
2	D	1459	HEM	C4D-C3D-CAD-CBD
3	D	1460	PLM	CD-CE-CF-CG
3	D	1460	PLM	C5-C6-C7-C8
2	A	1459	HEM	C2D-C3D-CAD-CBD
2	D	1459	HEM	C2D-C3D-CAD-CBD
3	A	1460	PLM	C7-C8-C9-CA
2	A	1459	HEM	C4D-C3D-CAD-CBD
3	B	1460	PLM	CC-CD-CE-CF
3	F	1460	PLM	CD-CE-CF-CG
3	C	1460	PLM	CB-CC-CD-CE
3	C	1460	PLM	C2-C3-C4-C5
2	C	1459	HEM	C4B-C3B-CAB-CBB
2	C	1459	HEM	CAA-CBA-CGA-O2A
2	E	1459	HEM	CAA-CBA-CGA-O2A
2	F	1459	HEM	CAA-CBA-CGA-O2A
2	B	1459	HEM	CAD-CBD-CGD-O2D
2	D	1459	HEM	CAA-CBA-CGA-O2A
3	B	1460	PLM	C1-C2-C3-C4
2	A	1459	HEM	CAA-CBA-CGA-O2A
2	B	1459	HEM	CAA-CBA-CGA-O2A

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Mol	Chain	Res	Type	Atoms
2	E	1459	HEM	CAD-CBD-CGD-O2D
2	C	1459	HEM	CAD-CBD-CGD-O2D
2	D	1459	HEM	CAD-CBD-CGD-O2D
2	A	1459	HEM	CAD-CBD-CGD-O2D
2	B	1459	HEM	CAD-CBD-CGD-O1D
2	F	1459	HEM	CAD-CBD-CGD-O2D
2	E	1459	HEM	CAA-CBA-CGA-O1A
3	F	1460	PLM	C9-CA-CB-CC
2	A	1459	HEM	CAA-CBA-CGA-O1A
2	B	1459	HEM	CAA-CBA-CGA-O1A
2	C	1459	HEM	CAA-CBA-CGA-O1A
2	D	1459	HEM	CAA-CBA-CGA-O1A
2	F	1459	HEM	CAA-CBA-CGA-O1A
2	E	1459	HEM	CAD-CBD-CGD-O1D
2	D	1459	HEM	CAD-CBD-CGD-O1D
2	A	1459	HEM	CAD-CBD-CGD-O1D
2	C	1459	HEM	CAD-CBD-CGD-O1D
3	A	1460	PLM	O1-C1-C2-C3
3	D	1460	PLM	C6-C7-C8-C9
2	F	1459	HEM	CAD-CBD-CGD-O1D
3	D	1460	PLM	O2-C1-C2-C3
3	B	1460	PLM	C9-CA-CB-CC
3	A	1460	PLM	CD-CE-CF-CG
3	C	1460	PLM	O1-C1-C2-C3
3	E	1460	PLM	O2-C1-C2-C3
2	D	1459	HEM	C4B-C3B-CAB-CBB
3	A	1460	PLM	O2-C1-C2-C3
3	C	1460	PLM	O2-C1-C2-C3
3	F	1460	PLM	C6-C7-C8-C9
3	D	1460	PLM	O1-C1-C2-C3
3	E	1460	PLM	O1-C1-C2-C3
3	B	1460	PLM	CD-CE-CF-CG
3	F	1460	PLM	CC-CD-CE-CF
3	E	1460	PLM	CC-CD-CE-CF

There are no ring outliers.

12 monomers are involved in 37 short contacts:

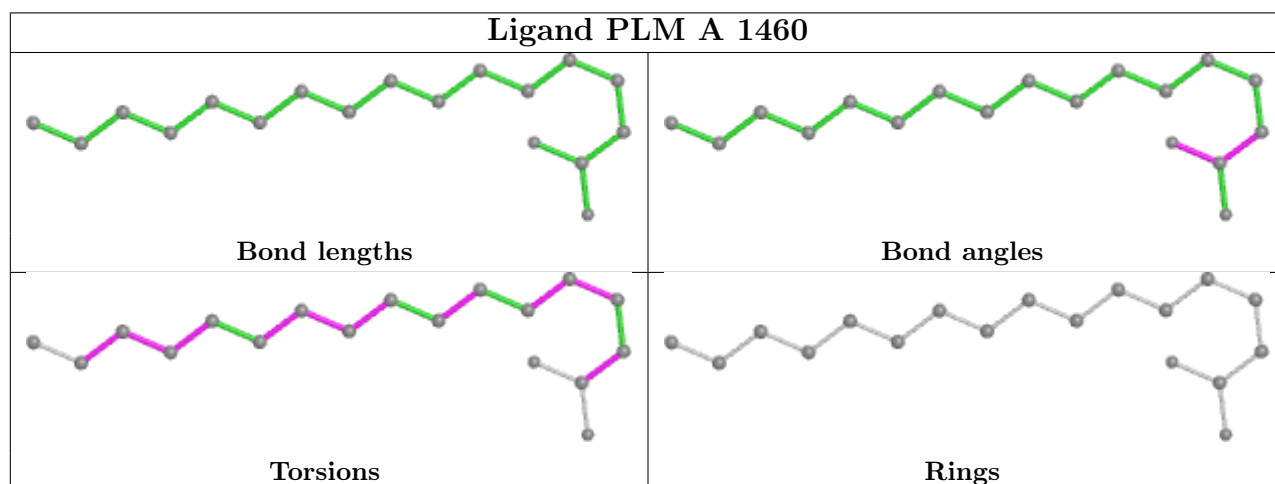
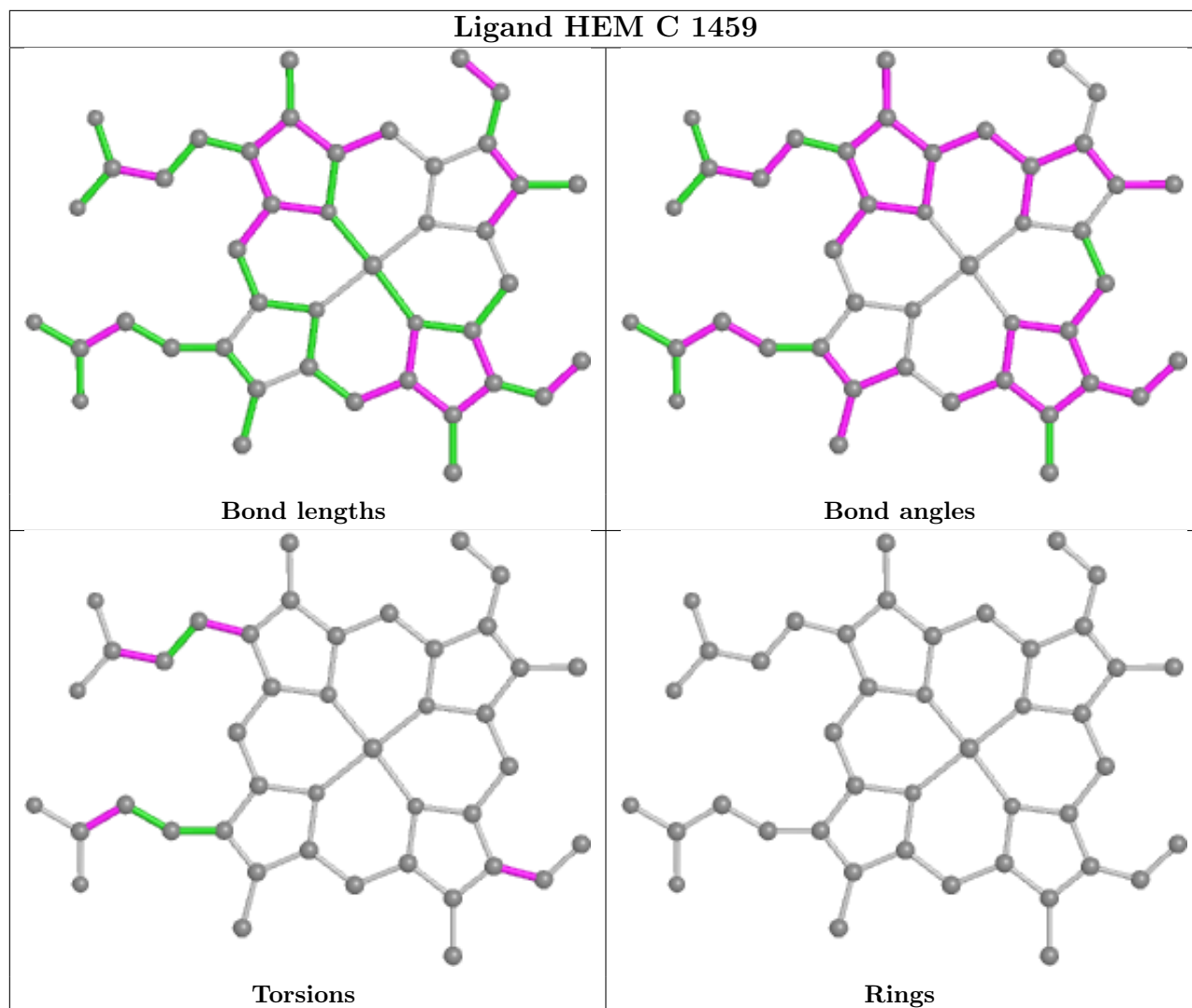
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	1459	HEM	4	0
3	A	1460	PLM	4	0
2	B	1459	HEM	2	0

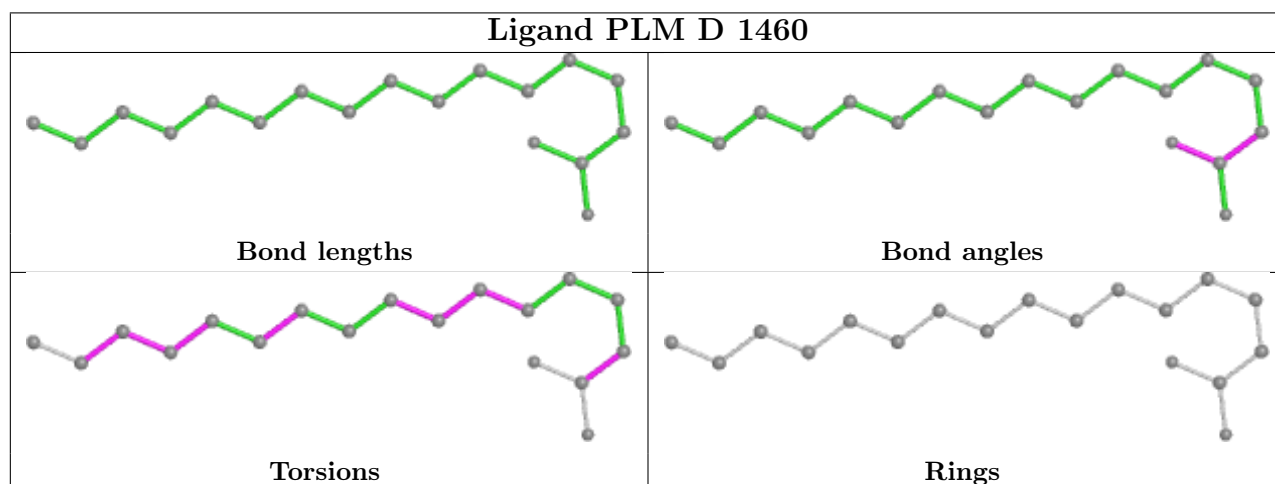
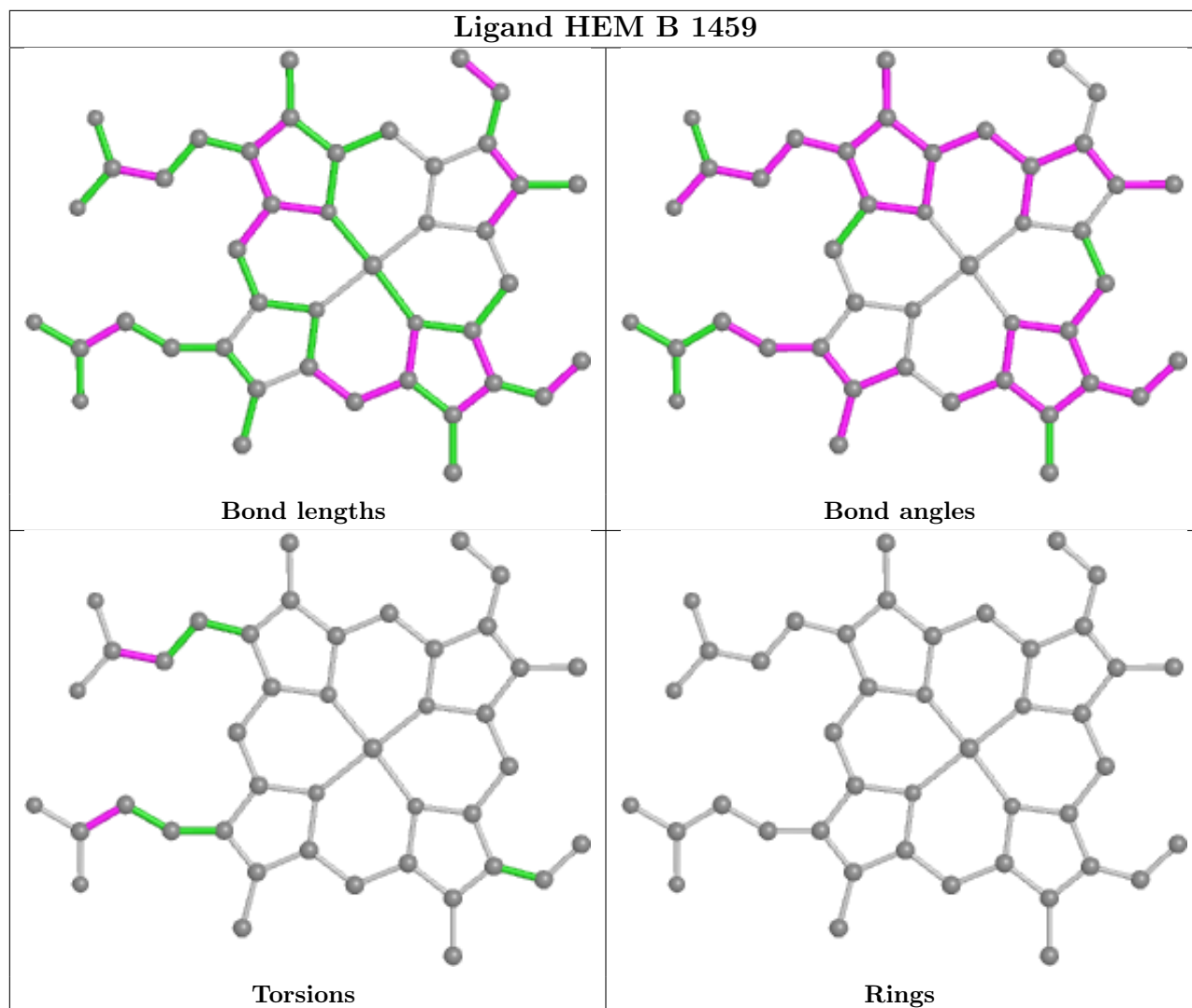
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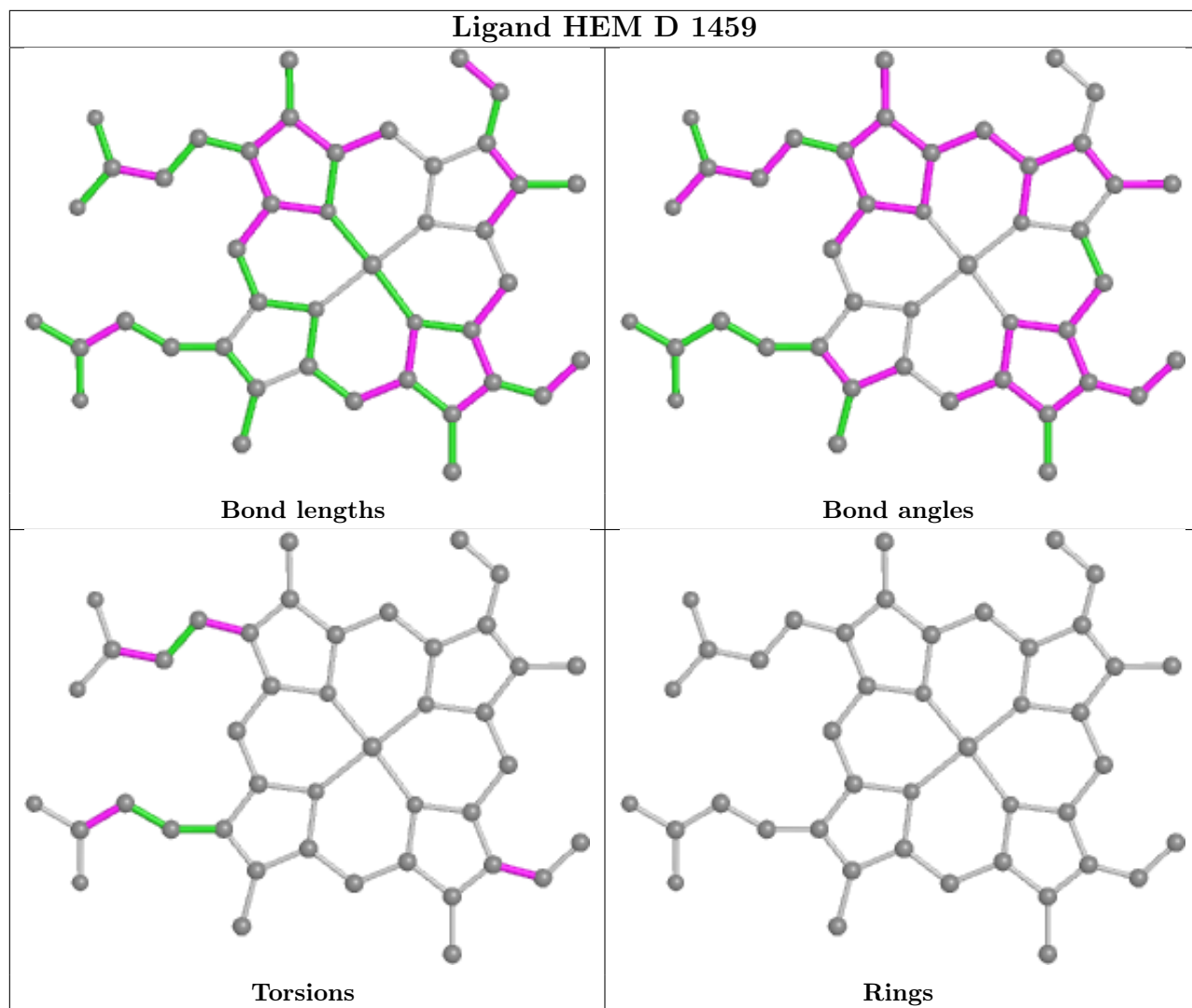
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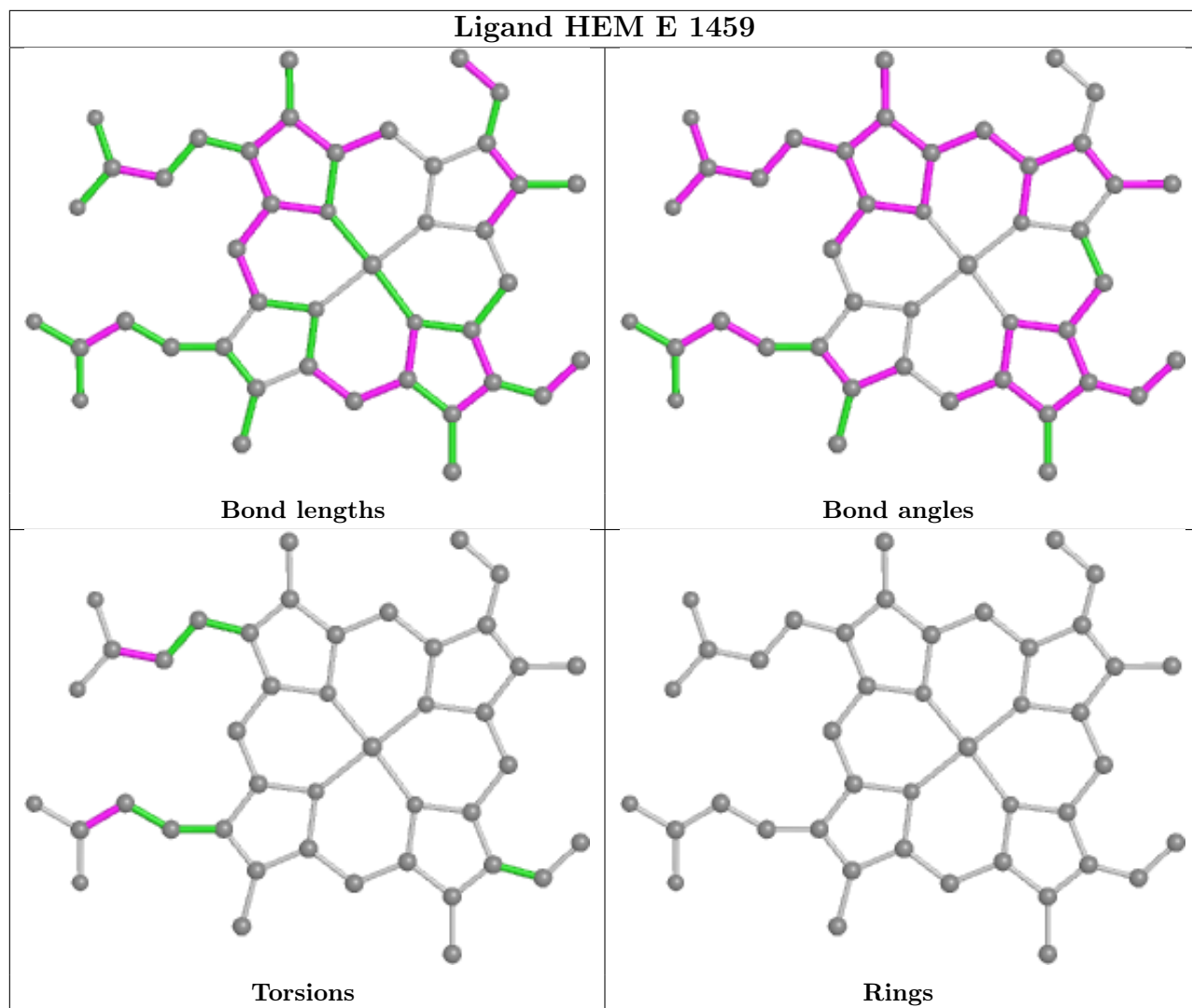
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	1460	PLM	1	0
2	D	1459	HEM	6	0
2	E	1459	HEM	2	0
2	A	1459	HEM	5	0
3	C	1460	PLM	2	0
3	B	1460	PLM	1	0
3	E	1460	PLM	2	0
2	F	1459	HEM	6	0
3	F	1460	PLM	2	0

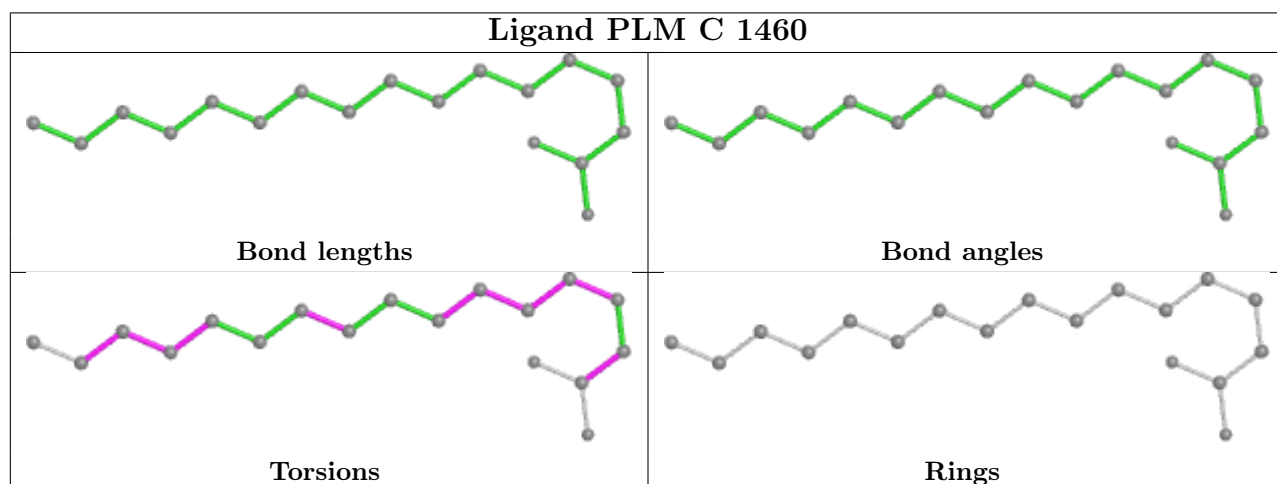
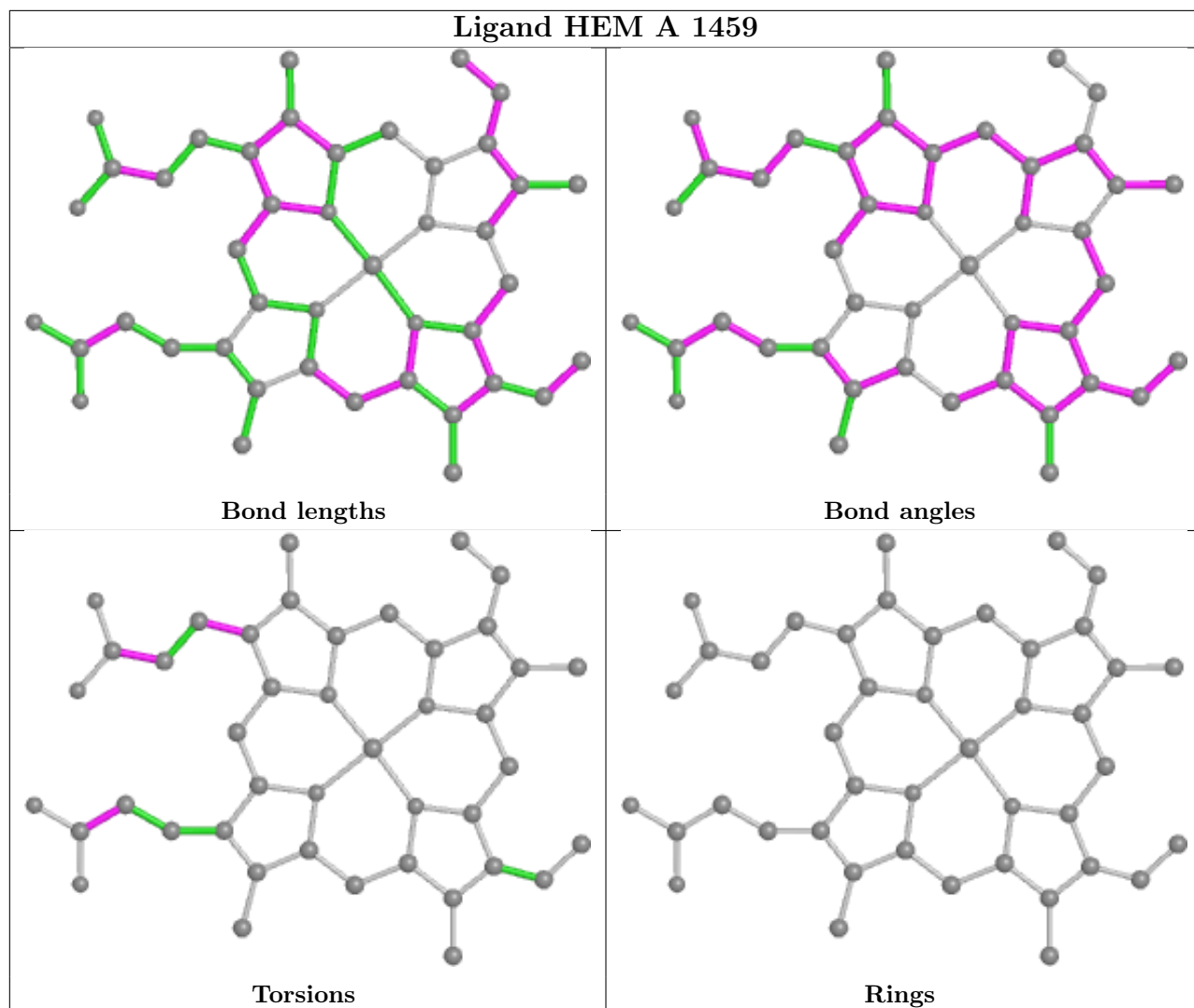
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.

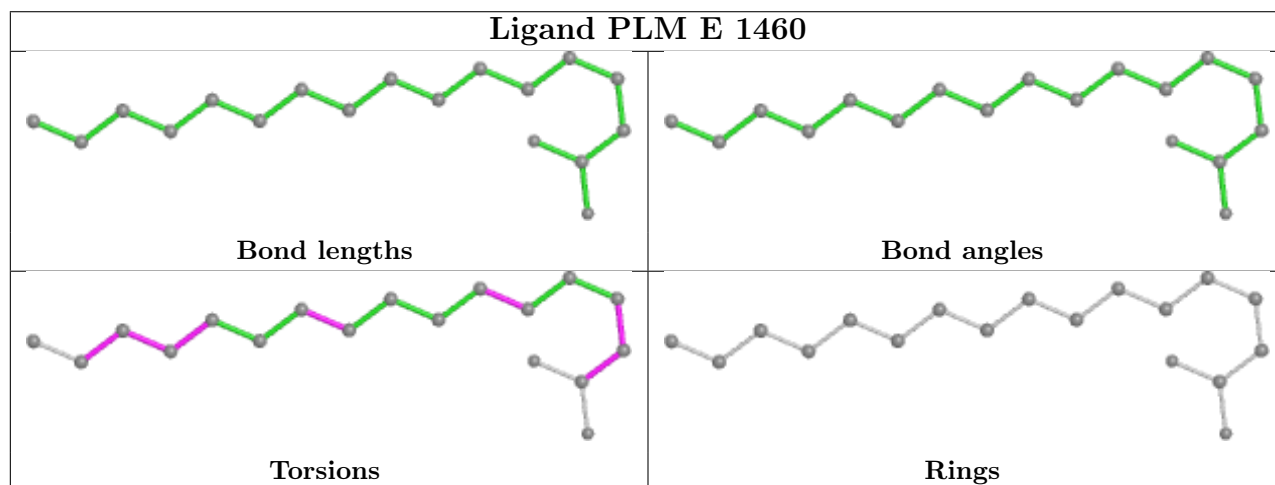
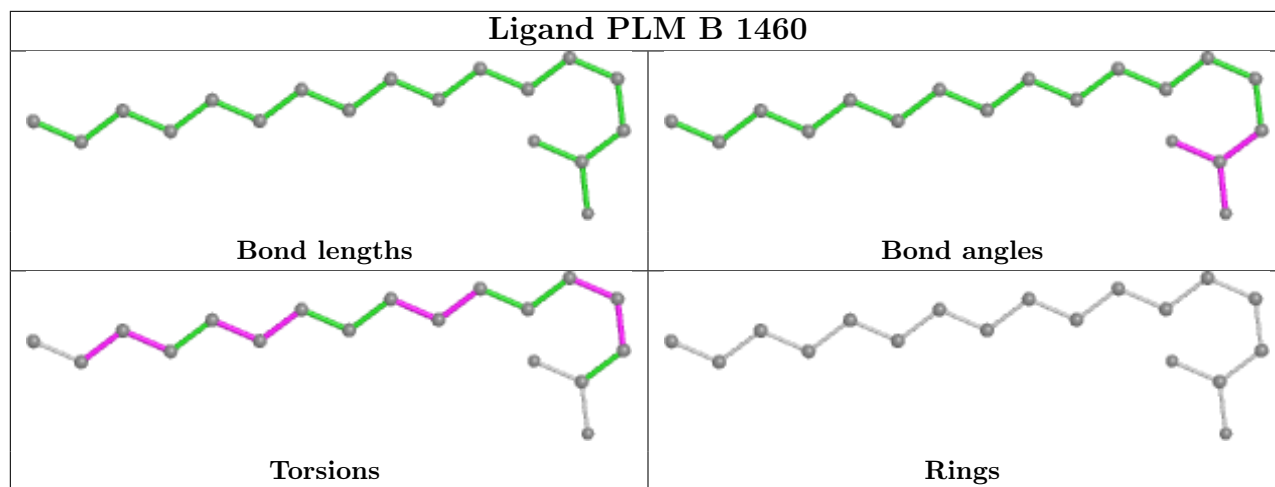


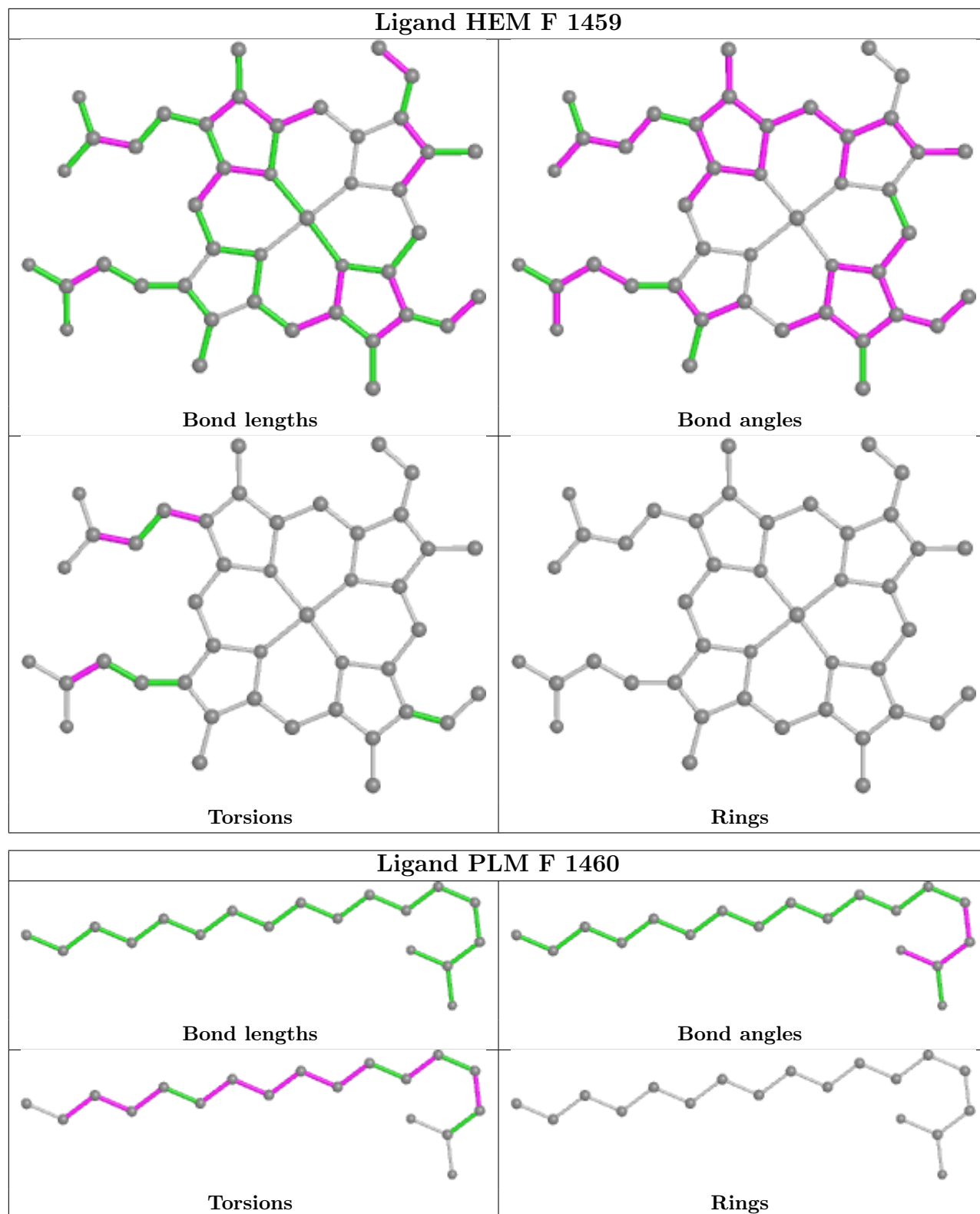












5.7 Other polymers [\(i\)](#)

There are no such residues in this entry.

5.8 Polymer linkage issues

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	458/458 (100%)	-0.34	3 (0%) 87 84	13, 21, 36, 46	0
1	B	458/458 (100%)	-0.35	2 (0%) 92 91	13, 21, 36, 46	0
1	C	458/458 (100%)	-0.32	2 (0%) 92 91	13, 21, 36, 46	0
1	D	458/458 (100%)	-0.29	2 (0%) 92 91	13, 21, 36, 46	0
1	E	458/458 (100%)	-0.26	3 (0%) 87 84	13, 21, 36, 46	0
1	F	458/458 (100%)	-0.26	4 (0%) 84 80	13, 21, 36, 46	0
All	All	2748/2748 (100%)	-0.30	16 (0%) 89 86	13, 21, 36, 46	0

All (16) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	2	ILE	4.8
1	B	381	ASN	3.9
1	A	1	THR	3.7
1	F	192	ASN	3.6
1	D	1	THR	3.5
1	C	227	GLY	3.0
1	A	4	GLU	2.7
1	F	196	PRO	2.6
1	E	229	GLN	2.5
1	A	458	ILE	2.5
1	E	228	GLU	2.4
1	D	21	ASN	2.3
1	F	458	ILE	2.3
1	C	194	ASP	2.3
1	E	1	THR	2.2
1	F	189	GLN	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 monosaccharides in this entry.

6.4 Ligands [i](#)

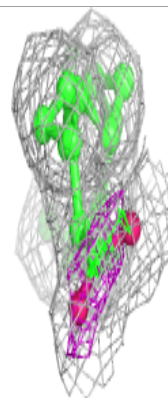
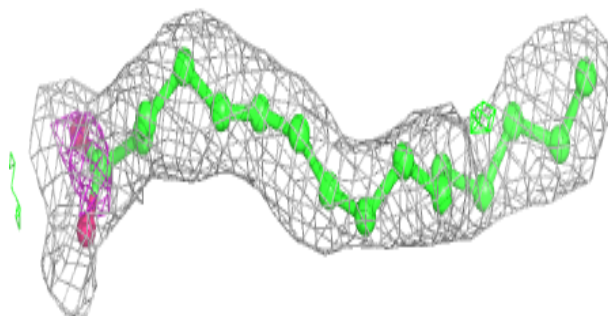
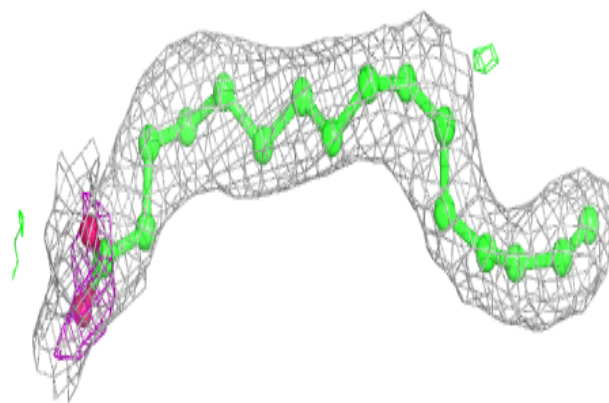
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists 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	PLM	A	1460	18/18	0.83	0.23	20,20,20,20	0
3	PLM	C	1460	18/18	0.87	0.21	19,19,19,19	0
3	PLM	B	1460	18/18	0.88	0.18	19,19,19,19	0
3	PLM	F	1460	18/18	0.88	0.30	19,19,19,19	0
3	PLM	D	1460	18/18	0.89	0.20	19,19,19,19	0
3	PLM	E	1460	18/18	0.92	0.18	20,20,20,20	0
2	HEM	D	1459	43/43	0.96	0.15	13,16,18,28	0
2	HEM	F	1459	43/43	0.96	0.17	13,16,18,28	0
2	HEM	E	1459	43/43	0.97	0.15	13,16,18,28	0
2	HEM	B	1459	43/43	0.97	0.17	13,16,18,28	0
2	HEM	C	1459	43/43	0.97	0.15	13,16,18,28	0
2	HEM	A	1459	43/43	0.97	0.18	13,16,18,28	0

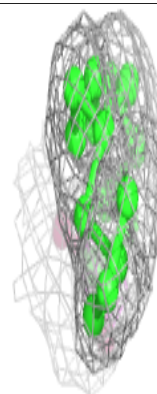
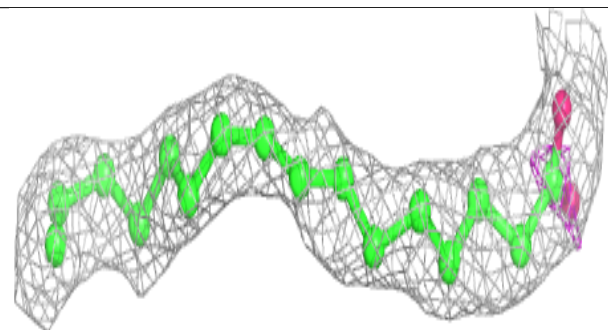
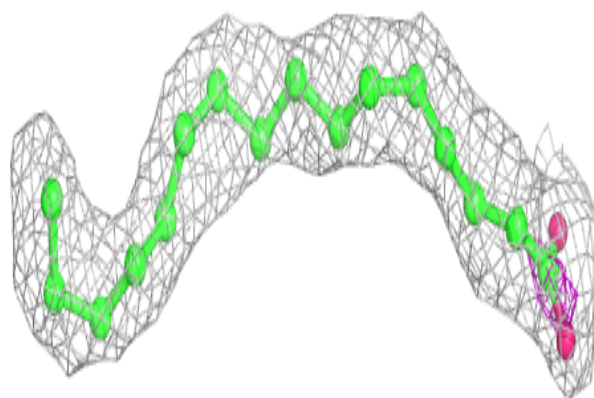
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around PLM A 1460:

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

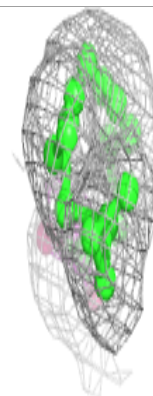
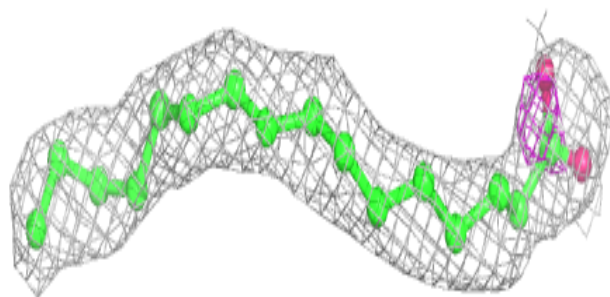
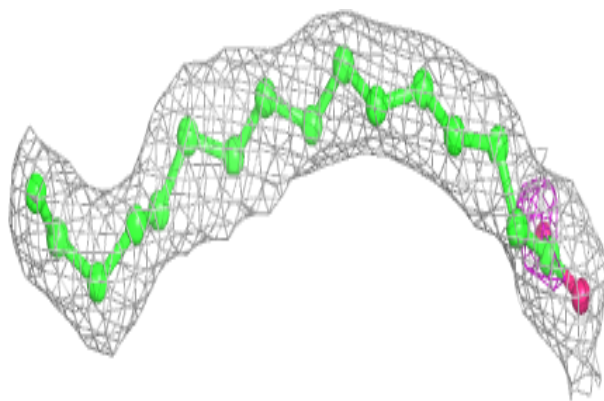
**Electron density around PLM C 1460:**

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

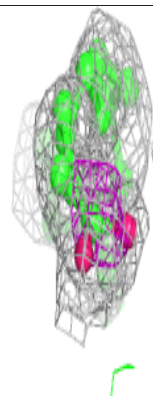
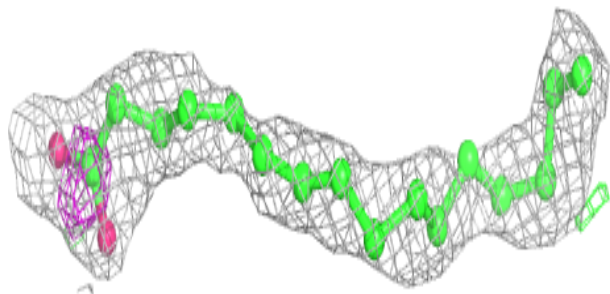
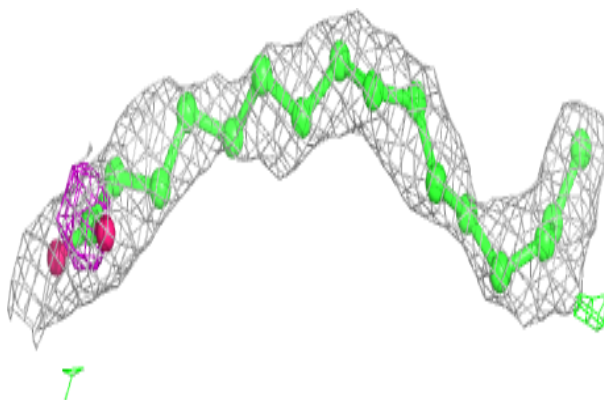


Electron density around PLM B 1460:

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

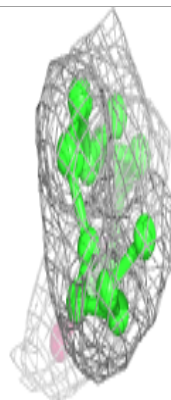
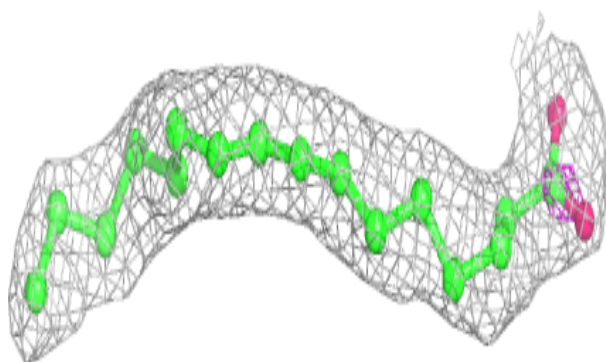
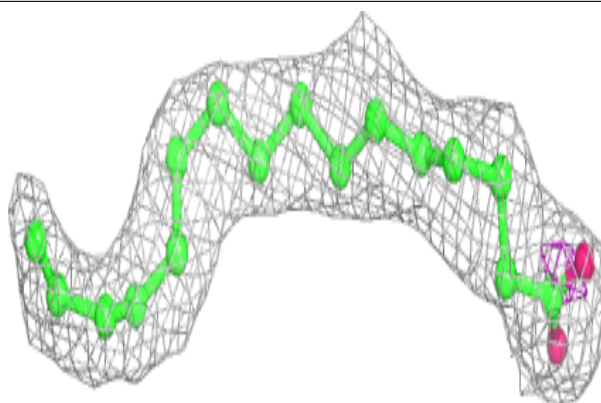
**Electron density around PLM F 1460:**

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

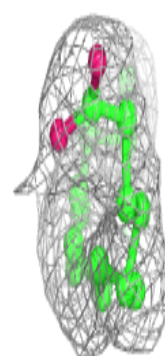
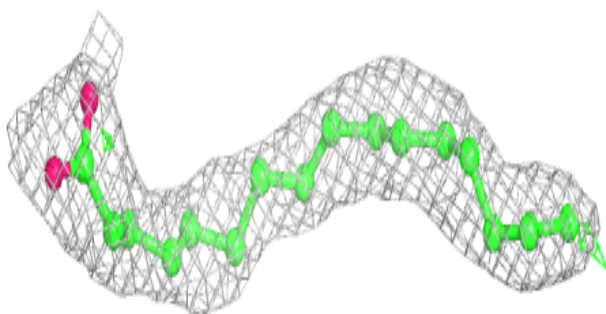
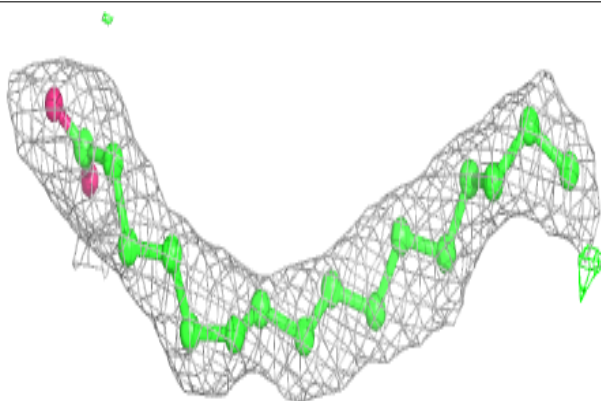


Electron density around PLM D 1460:

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

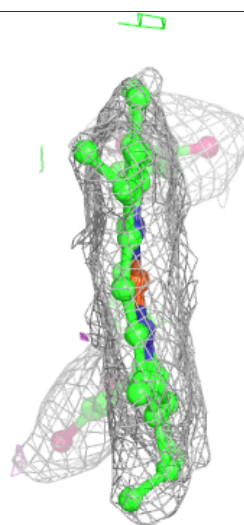
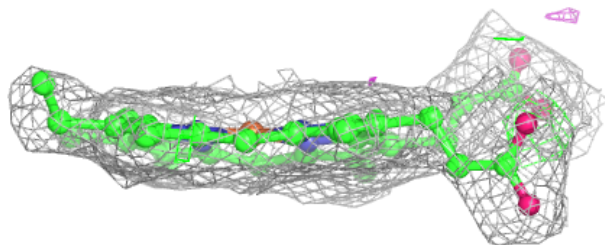
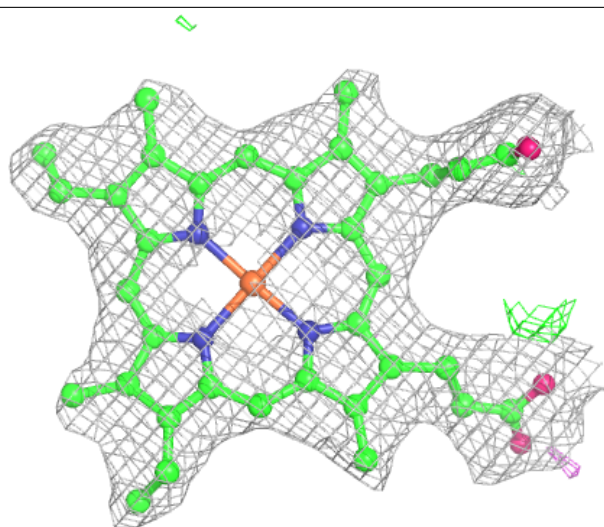
**Electron density around PLM E 1460:**

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



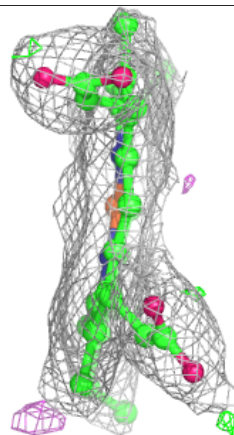
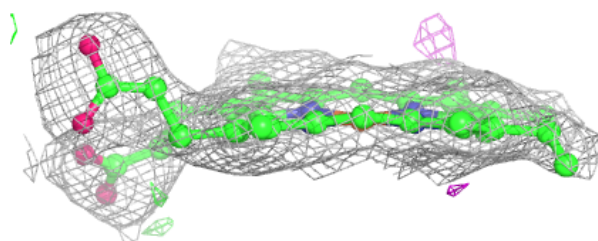
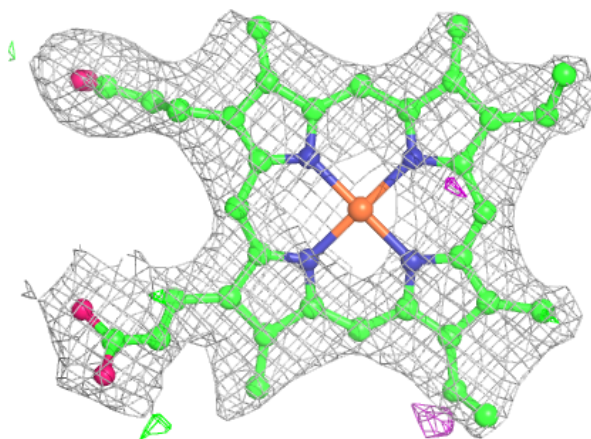
Electron density around HEM D 1459:

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



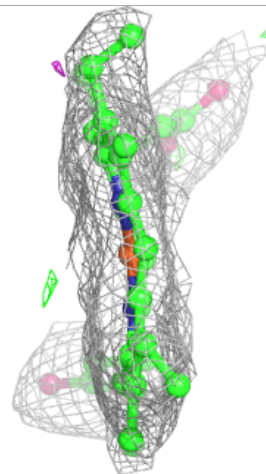
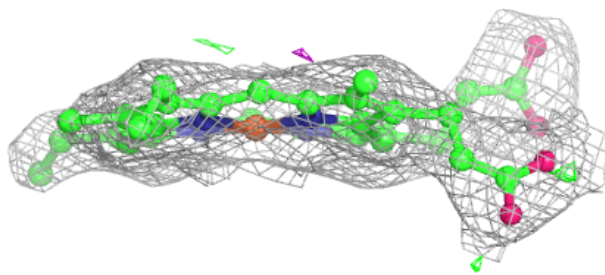
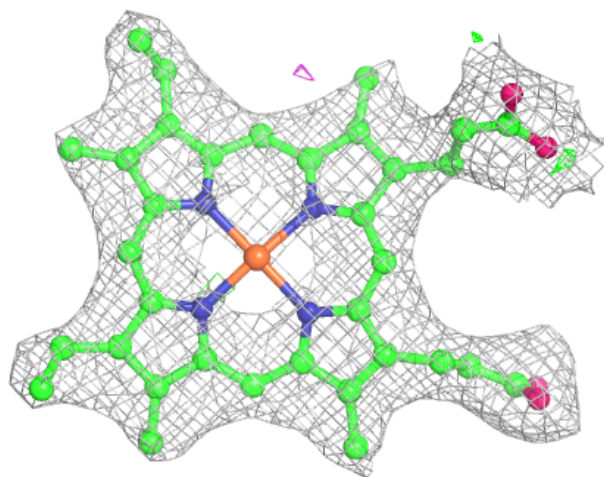
Electron density around HEM F 1459:

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



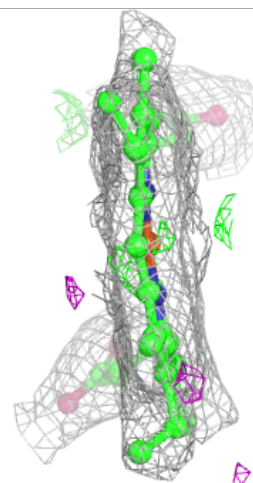
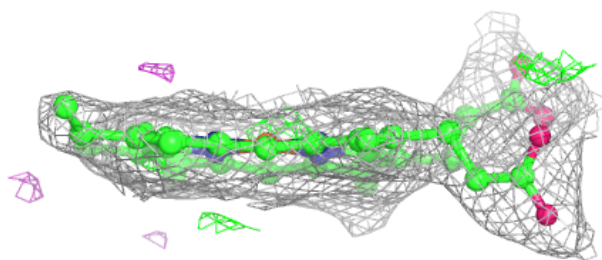
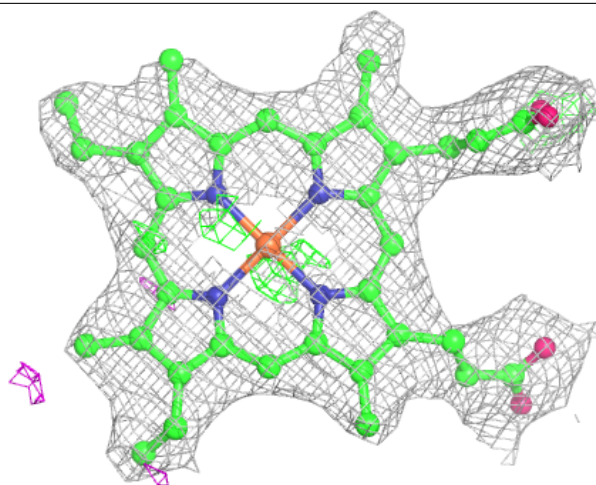
Electron density around HEM E 1459:

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



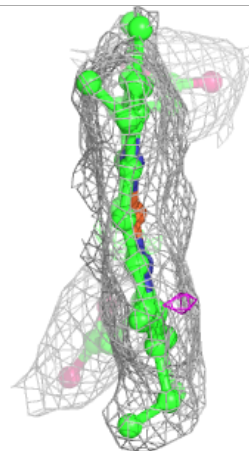
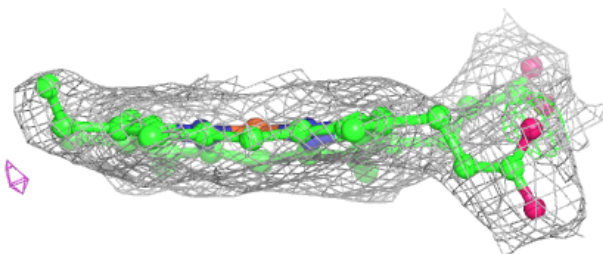
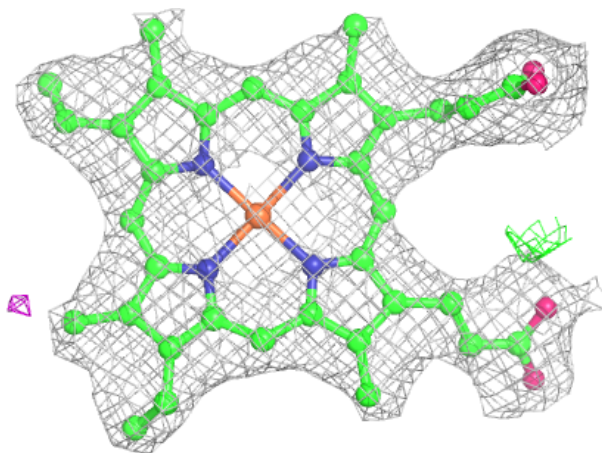
Electron density around HEM B 1459:

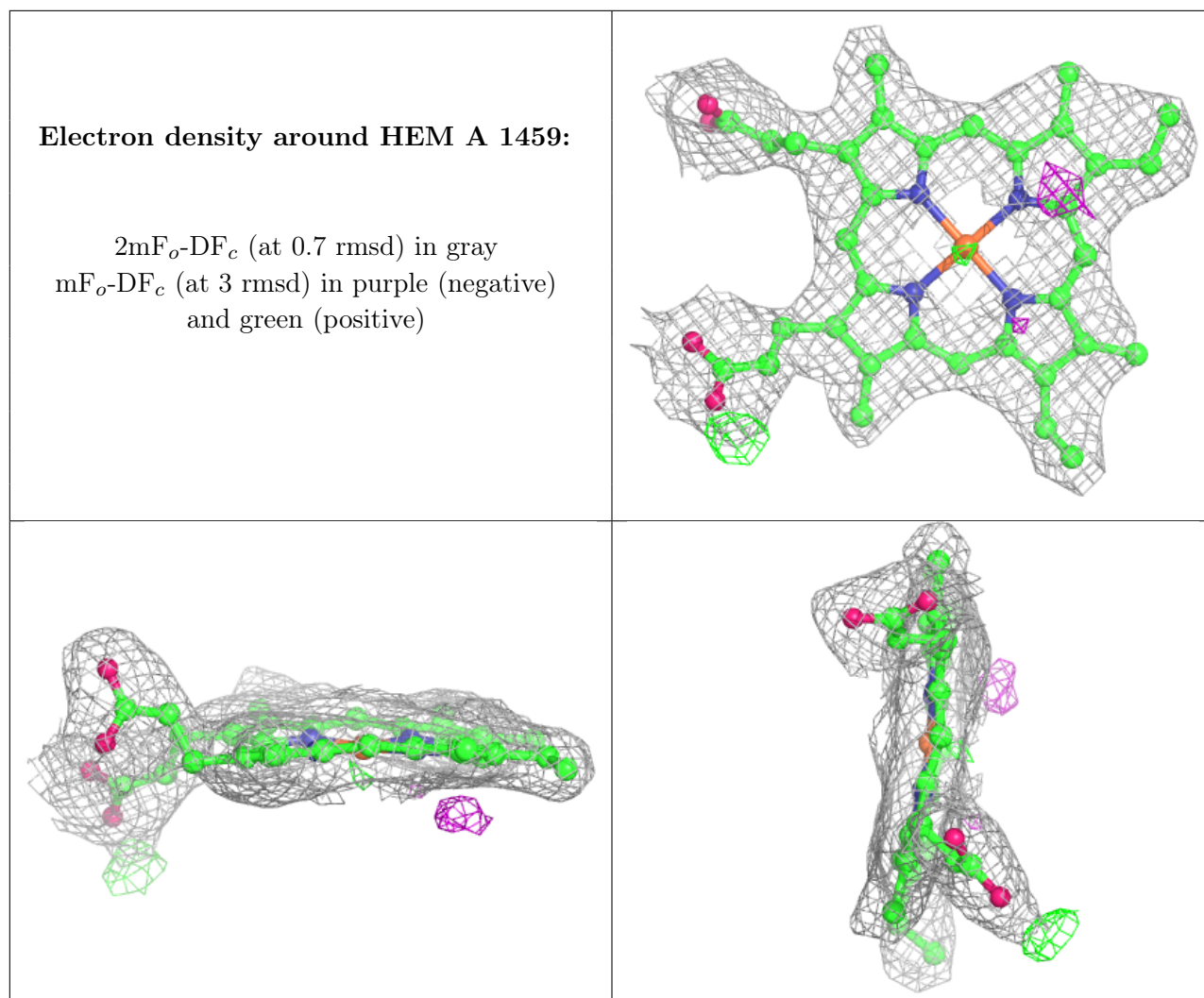
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around HEM C 1459:

$2mF_o-DF_c$ (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.