Full wwPDB X-ray Structure Validation Report ⓘ

Aug 4, 2026 – 10:28 PM EDT

PDB ID	:	4EJH / pdb_00004ejh
Title	:	Human Cytochrome P450 2A13 in complex with 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK)
Authors	:	DeVore, N.M.; Scott, E.E.
Deposited on	:	2012-04-06
Resolution	:	2.35 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:

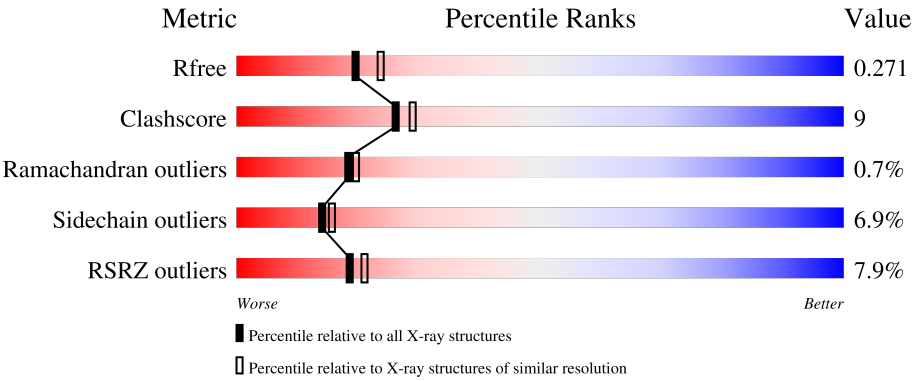
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.015 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.50

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.35 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	1596 (2.36-2.36)
Clashscore	190562	1663 (2.36-2.36)
Ramachandran outliers	187476	1646 (2.36-2.36)
Sidechain outliers	187428	1646 (2.36-2.36)
RSRZ outliers	180081	1598 (2.36-2.36)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	476	79% 16%
1	B	476	% 76% 19%
1	C	476	% 81% 15%
1	D	476	78% 17%
1	E	476	4% 73% 22%

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Mol	Chain	Length	Quality of chain
1	F	476	13% 67% 26%
1	G	476	16% 68% 25%
1	H	476	27% 63% 30%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	0QA	F	502	-	-	X	-

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 30804 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 Cytochrome P450 2A13.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	464	Total	C	N	O	S	8	2	0
			3777	2430	653	676	18			
1	B	464	Total	C	N	O	S	0	1	0
			3771	2426	653	674	18			
1	C	464	Total	C	N	O	S	0	2	0
			3776	2429	653	676	18			
1	D	464	Total	C	N	O	S	0	1	0
			3771	2426	653	674	18			
1	E	464	Total	C	N	O	S	0	1	0
			3771	2426	653	674	18			
1	F	464	Total	C	N	O	S	0	1	0
			3771	2426	653	674	18			
1	G	463	Total	C	N	O	S	0	0	0
			3737	2404	642	673	18			
1	H	459	Total	C	N	O	S	0	1	0
			3723	2396	640	669	18			

There are 96 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	23	MET	-	initiating methionine	UNP Q16696
A	24	ALA	-	expression tag	UNP Q16696
A	25	LYS	-	expression tag	UNP Q16696
A	26	LYS	-	expression tag	UNP Q16696
A	27	THR	-	expression tag	UNP Q16696
A	28	SER	-	expression tag	UNP Q16696
A	29	SER	-	expression tag	UNP Q16696
A	30	LYS	-	expression tag	UNP Q16696
A	495	HIS	-	expression tag	UNP Q16696
A	496	HIS	-	expression tag	UNP Q16696
A	497	HIS	-	expression tag	UNP Q16696
A	498	HIS	-	expression tag	UNP Q16696
B	23	MET	-	initiating methionine	UNP Q16696

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Chain	Residue	Modelled	Actual	Comment	Reference
B	24	ALA	-	expression tag	UNP Q16696
B	25	LYS	-	expression tag	UNP Q16696
B	26	LYS	-	expression tag	UNP Q16696
B	27	THR	-	expression tag	UNP Q16696
B	28	SER	-	expression tag	UNP Q16696
B	29	SER	-	expression tag	UNP Q16696
B	30	LYS	-	expression tag	UNP Q16696
B	495	HIS	-	expression tag	UNP Q16696
B	496	HIS	-	expression tag	UNP Q16696
B	497	HIS	-	expression tag	UNP Q16696
B	498	HIS	-	expression tag	UNP Q16696
C	23	MET	-	initiating methionine	UNP Q16696
C	24	ALA	-	expression tag	UNP Q16696
C	25	LYS	-	expression tag	UNP Q16696
C	26	LYS	-	expression tag	UNP Q16696
C	27	THR	-	expression tag	UNP Q16696
C	28	SER	-	expression tag	UNP Q16696
C	29	SER	-	expression tag	UNP Q16696
C	30	LYS	-	expression tag	UNP Q16696
C	495	HIS	-	expression tag	UNP Q16696
C	496	HIS	-	expression tag	UNP Q16696
C	497	HIS	-	expression tag	UNP Q16696
C	498	HIS	-	expression tag	UNP Q16696
D	23	MET	-	initiating methionine	UNP Q16696
D	24	ALA	-	expression tag	UNP Q16696
D	25	LYS	-	expression tag	UNP Q16696
D	26	LYS	-	expression tag	UNP Q16696
D	27	THR	-	expression tag	UNP Q16696
D	28	SER	-	expression tag	UNP Q16696
D	29	SER	-	expression tag	UNP Q16696
D	30	LYS	-	expression tag	UNP Q16696
D	495	HIS	-	expression tag	UNP Q16696
D	496	HIS	-	expression tag	UNP Q16696
D	497	HIS	-	expression tag	UNP Q16696
D	498	HIS	-	expression tag	UNP Q16696
E	23	MET	-	initiating methionine	UNP Q16696
E	24	ALA	-	expression tag	UNP Q16696
E	25	LYS	-	expression tag	UNP Q16696
E	26	LYS	-	expression tag	UNP Q16696
E	27	THR	-	expression tag	UNP Q16696
E	28	SER	-	expression tag	UNP Q16696
E	29	SER	-	expression tag	UNP Q16696

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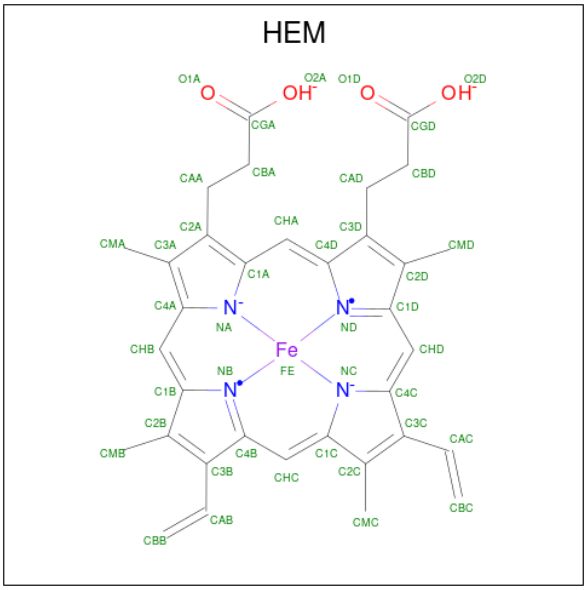
Chain	Residue	Modelled	Actual	Comment	Reference
E	30	LYS	-	expression tag	UNP Q16696
E	495	HIS	-	expression tag	UNP Q16696
E	496	HIS	-	expression tag	UNP Q16696
E	497	HIS	-	expression tag	UNP Q16696
E	498	HIS	-	expression tag	UNP Q16696
F	23	MET	-	initiating methionine	UNP Q16696
F	24	ALA	-	expression tag	UNP Q16696
F	25	LYS	-	expression tag	UNP Q16696
F	26	LYS	-	expression tag	UNP Q16696
F	27	THR	-	expression tag	UNP Q16696
F	28	SER	-	expression tag	UNP Q16696
F	29	SER	-	expression tag	UNP Q16696
F	30	LYS	-	expression tag	UNP Q16696
F	495	HIS	-	expression tag	UNP Q16696
F	496	HIS	-	expression tag	UNP Q16696
F	497	HIS	-	expression tag	UNP Q16696
F	498	HIS	-	expression tag	UNP Q16696
G	23	MET	-	initiating methionine	UNP Q16696
G	24	ALA	-	expression tag	UNP Q16696
G	25	LYS	-	expression tag	UNP Q16696
G	26	LYS	-	expression tag	UNP Q16696
G	27	THR	-	expression tag	UNP Q16696
G	28	SER	-	expression tag	UNP Q16696
G	29	SER	-	expression tag	UNP Q16696
G	30	LYS	-	expression tag	UNP Q16696
G	495	HIS	-	expression tag	UNP Q16696
G	496	HIS	-	expression tag	UNP Q16696
G	497	HIS	-	expression tag	UNP Q16696
G	498	HIS	-	expression tag	UNP Q16696
H	23	MET	-	initiating methionine	UNP Q16696
H	24	ALA	-	expression tag	UNP Q16696
H	25	LYS	-	expression tag	UNP Q16696
H	26	LYS	-	expression tag	UNP Q16696
H	27	THR	-	expression tag	UNP Q16696
H	28	SER	-	expression tag	UNP Q16696
H	29	SER	-	expression tag	UNP Q16696
H	30	LYS	-	expression tag	UNP Q16696
H	495	HIS	-	expression tag	UNP Q16696
H	496	HIS	-	expression tag	UNP Q16696
H	497	HIS	-	expression tag	UNP Q16696
H	498	HIS	-	expression tag	UNP Q16696

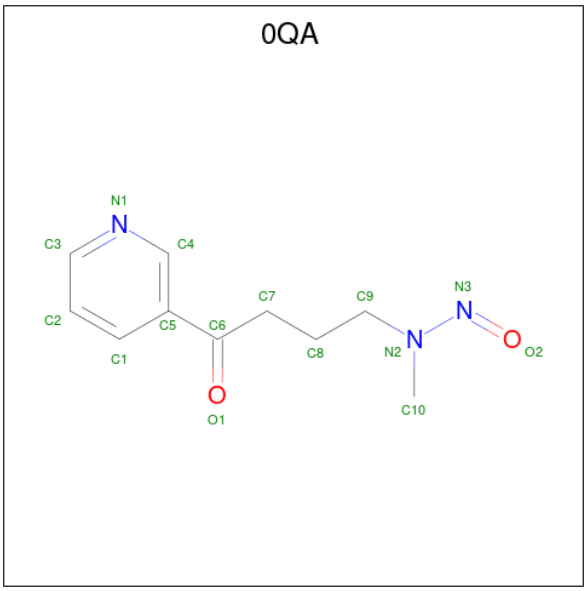
- Molecule 2 is PROTOPORPHYRIN IX CONTAINING FE (CCD ID: HEM) (formula:

$C_{34}H_{32}FeN_4O_4$).



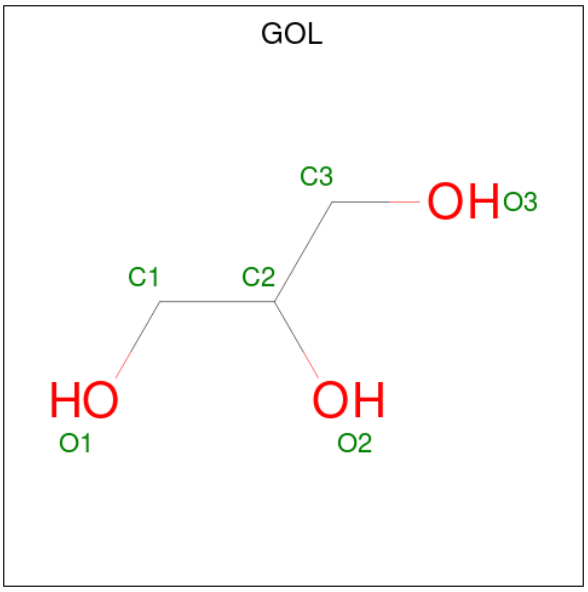
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	B	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	C	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	D	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	E	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	F	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	G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

- Molecule 3 is 4-[methyl(nitroso)amino]-1-(pyridin-3-yl)butan-1-one (CCD ID: 0QA) (formula: $C_{10}H_{13}N_3O_2$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			15	10	3	2		
3	B	1	Total	C	N	O	0	0
			15	10	3	2		
3	C	1	Total	C	N	O	0	0
			15	10	3	2		
3	D	1	Total	C	N	O	0	0
			15	10	3	2		
3	E	1	Total	C	N	O	0	0
			15	10	3	2		
3	F	1	Total	C	N	O	0	0
			15	10	3	2		

- Molecule 4 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	G	1	Total C O 6 3 3	0	0
4	H	1	Total C O 6 3 3	0	0

- Molecule 5 is water.

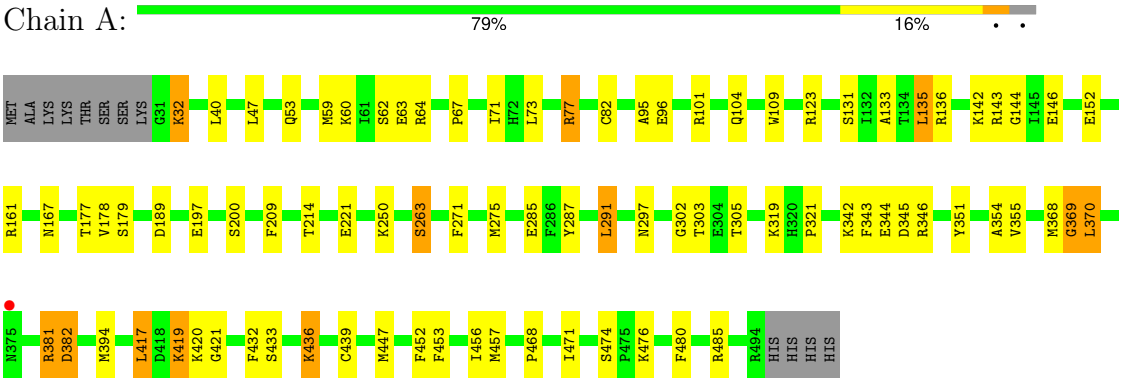
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	56	Total O 56 56	0	0
5	B	39	Total O 39 39	0	0
5	C	71	Total O 71 71	0	0
5	D	49	Total O 49 49	0	0
5	E	13	Total O 13 13	0	0
5	F	11	Total O 11 11	0	0
5	G	12	Total O 12 12	0	0
5	H	10	Total O 10 10	0	0

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.

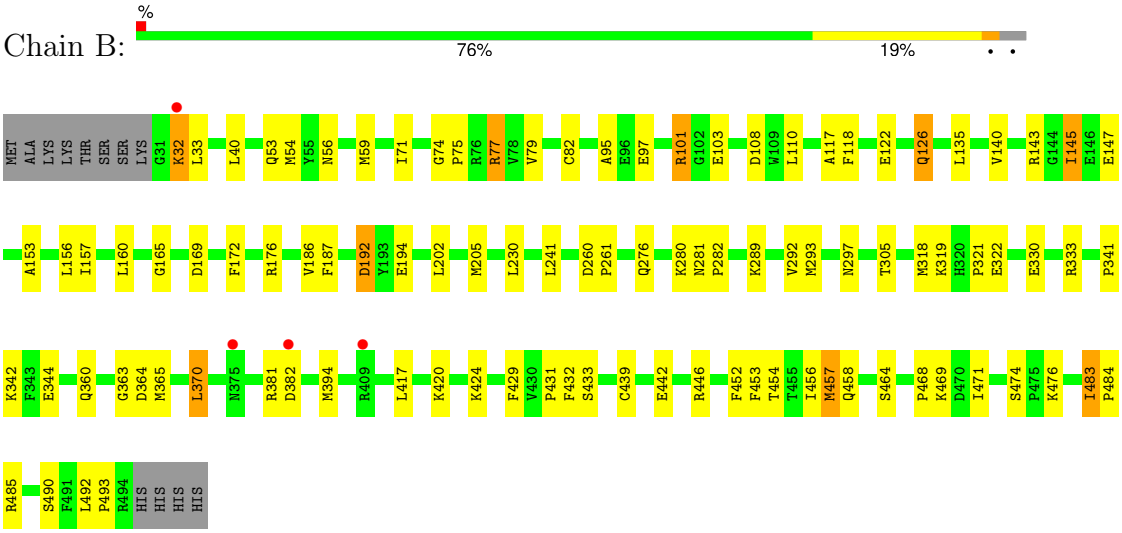
• Molecule 1: Cytochrome P450 2A13

Chain A:



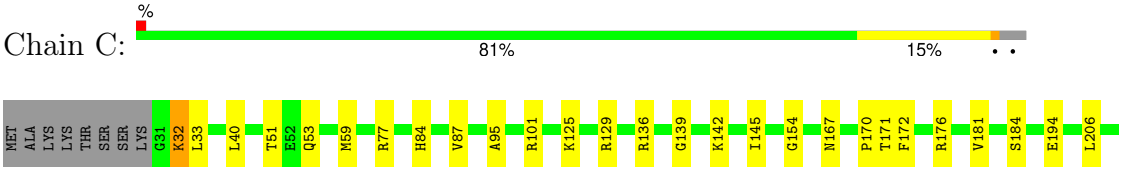
• Molecule 1: Cytochrome P450 2A13

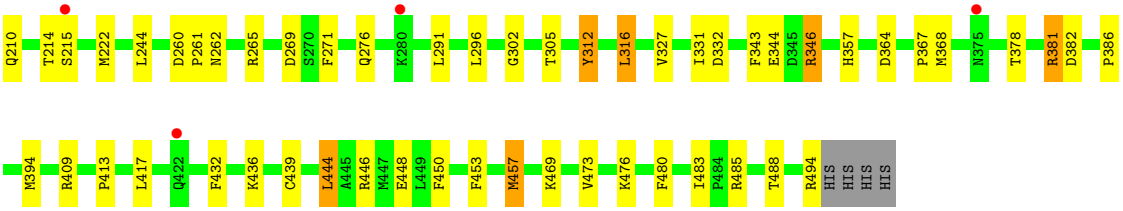
Chain B:



• Molecule 1: Cytochrome P450 2A13

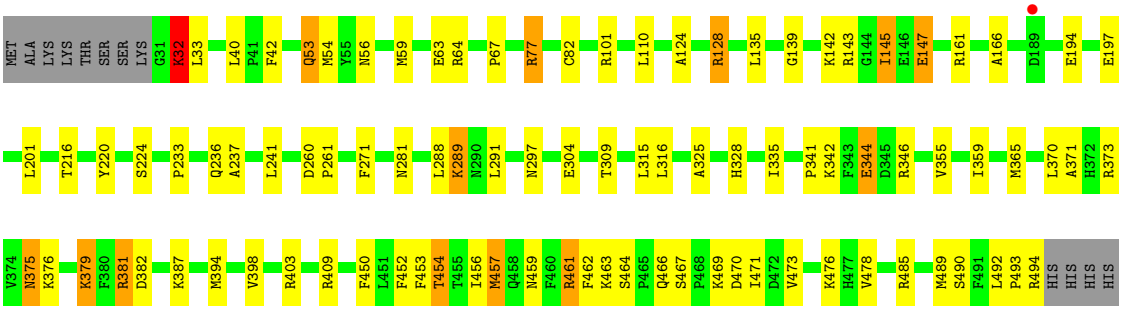
Chain C:





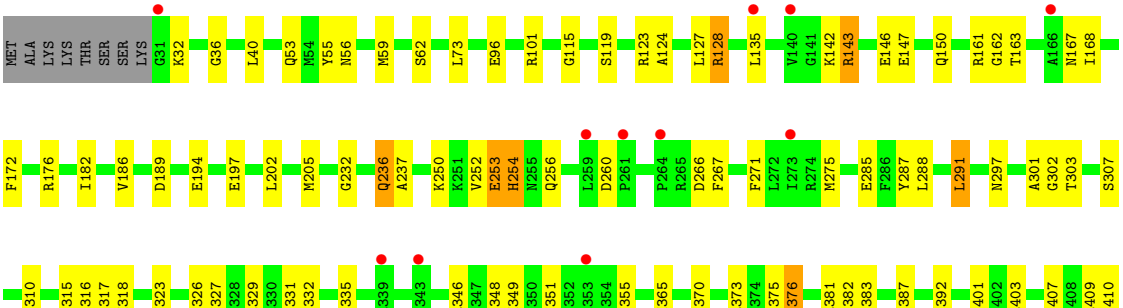
• Molecule 1: Cytochrome P450 2A13

Chain D:



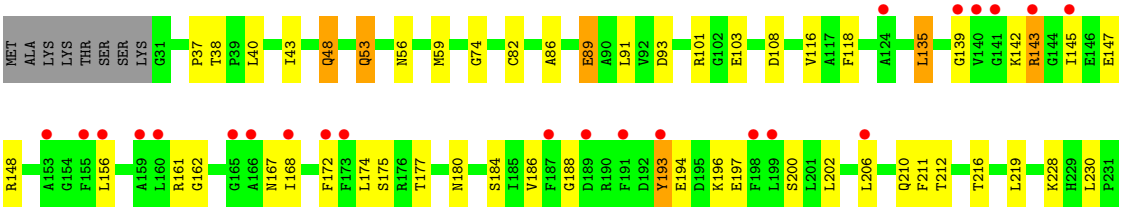
• Molecule 1: Cytochrome P450 2A13

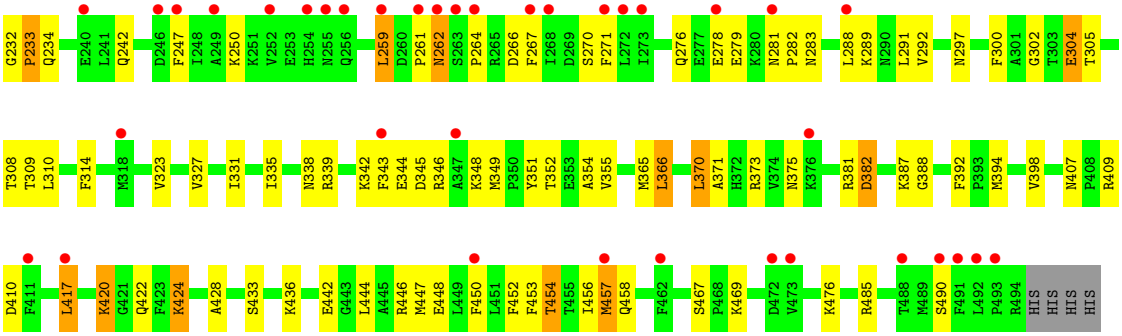
Chain E:



• Molecule 1: Cytochrome P450 2A13

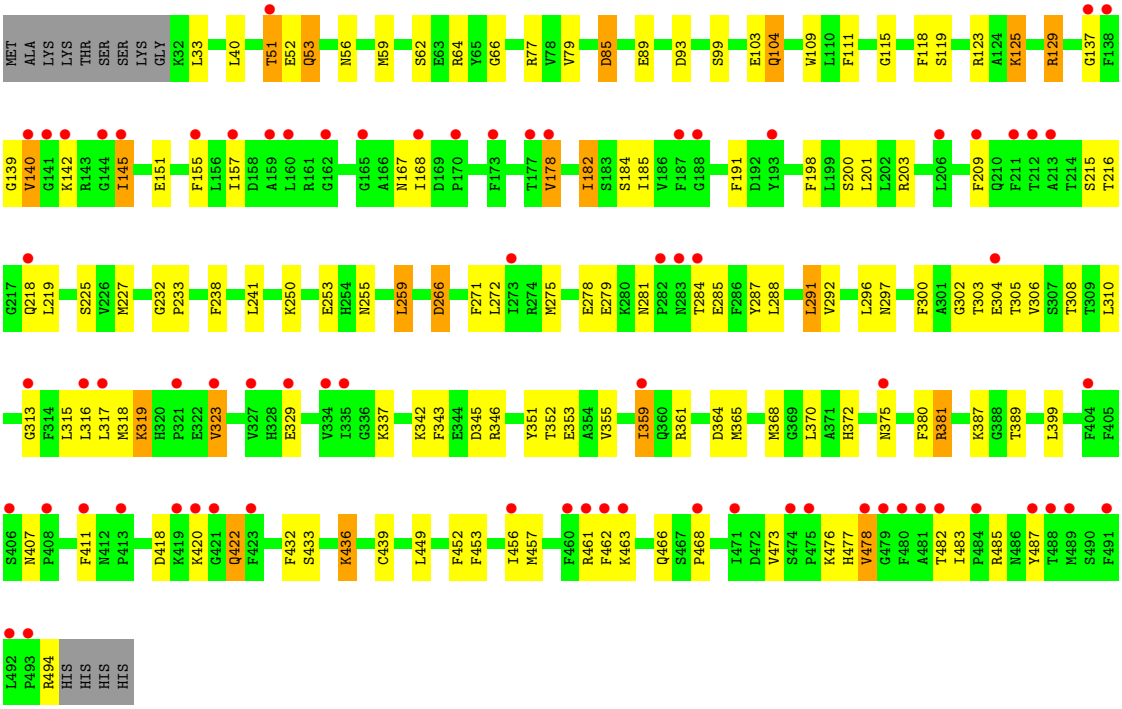
Chain F:





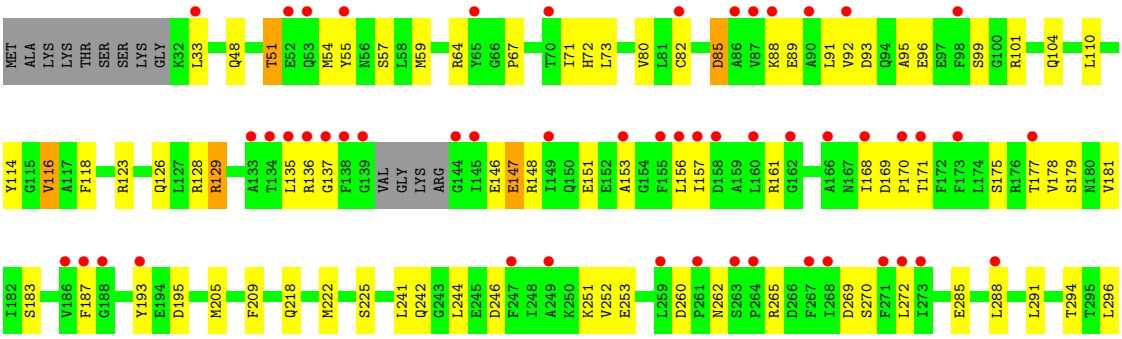
• Molecule 1: Cytochrome P450 2A13

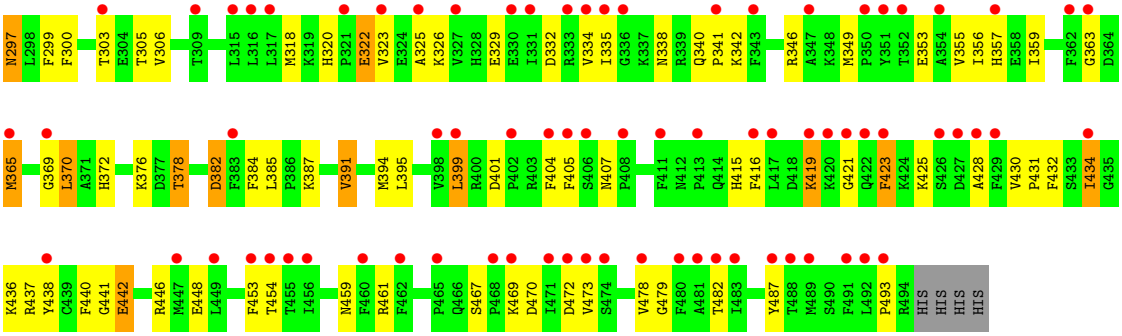
Chain G:



• Molecule 1: Cytochrome P450 2A13

Chain H:




N297 L298 F299 F300 T303 E304 T305 V306 T309 L315 L316 L317 M318 K319 H320 P321 E322 V323 E324 A325 K326 V327 H328 E329 E330 I331 D332 R333 V334 I335 G336 K337 N338 R339 Q340 P341 K342 F343 R346 A347 K348 M349 P350 Y351 T352 E353 A354 V355 I356 H357 E358 I359 F362 G363 D364
M365 G369 L370 A371 H372 K376 D377 T378 D382 P383 F384 L385 P386 K387 V391 M394 L395 V398 L399 R400 D401 P402 R403 F404 F405 S406 N407 P408 F411 M412 P413 Q414 H415 F416 L417 D418 K419 K420 G421 Q422 F423 K424 K425 S426 D427 A428 F429 V430 P431 F432 S433 I434 G435
K436 R437 Y438 C439 F440 G441 E442 R446 M447 E448 L449 F453 T454 T455 I456 N459 F460 R461 F462 P465 Q466 S467 P468 K469 D470 I471 D472 V473 S474 V478 G479 F480 A481 T482 I483 Y487 T488 M489 S490 F491 L492 P493 R494 HIS HIS HIS HIS

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	71.68Å 119.27Å 153.66Å 100.59° 101.86° 93.56°	Depositor
Resolution (Å)	69.77 – 2.35 69.77 – 2.35	Depositor EDS
% Data completeness (in resolution range)	97.5 (69.77-2.35) 97.5 (69.77-2.35)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	0.10	Depositor
$< I/\sigma(I) >$ [1]	2.17 (at 2.34Å)	Xtriage
Refinement program	REFMAC 6.1.13	Depositor
R, R_{free}	0.214 , 0.273 0.214 , 0.271	Depositor DCC
R_{free} test set	10209 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å^2)	42.3	Xtriage
Anisotropy	0.027	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 39.4	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	30804	wwPDB-VP
Average B, all atoms (Å^2)	47.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.85% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, HEM, 0QA

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	1.18	2/3880 (0.1%)	1.21	17/5224 (0.3%)
1	B	1.17	2/3871 (0.1%)	1.19	14/5212 (0.3%)
1	C	1.24	7/3879 (0.2%)	1.17	4/5223 (0.1%)
1	D	1.18	5/3871 (0.1%)	1.15	6/5212 (0.1%)
1	E	0.98	1/3871 (0.0%)	1.11	10/5212 (0.2%)
1	F	0.92	1/3871 (0.0%)	1.11	18/5212 (0.3%)
1	G	0.98	2/3834 (0.1%)	1.16	15/5170 (0.3%)
1	H	0.92	0/3822	1.10	7/5149 (0.1%)
All	All	1.08	20/30899 (0.1%)	1.15	91/41614 (0.2%)

All (20) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	87	VAL	CA-CB	6.69	1.62	1.54
1	A	133	ALA	CA-CB	6.46	1.63	1.53
1	G	79	VAL	CA-CB	6.45	1.61	1.54
1	C	84	HIS	C-O	-6.29	1.16	1.24
1	D	289	LYS	CA-C	6.25	1.60	1.52
1	B	292	VAL	CA-CB	6.15	1.61	1.54
1	D	478	VAL	CA-CB	6.04	1.62	1.54
1	F	116	VAL	CA-CB	5.74	1.62	1.54
1	D	370	LEU	N-CA	-5.69	1.39	1.46
1	C	378	THR	CA-CB	5.47	1.63	1.53
1	G	389	THR	CA-CB	5.45	1.61	1.53
1	D	32	LYS	N-CA	5.35	1.52	1.46
1	C	136	ARG	N-CA	5.32	1.52	1.46
1	C	214	THR	N-CA	5.29	1.52	1.45
1	C	450	PHE	N-CA	-5.23	1.40	1.46
1	E	182	ILE	CA-CB	5.23	1.61	1.54
1	C	444	LEU	CA-C	5.21	1.59	1.52
1	B	79	VAL	C-O	-5.19	1.18	1.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	237	ALA	CA-CB	5.11	1.61	1.53
1	A	214	THR	CA-CB	5.08	1.61	1.53

All (91) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	G	66	GLY	CA-C-N	-7.77	112.08	120.94
1	G	66	GLY	C-N-CA	-7.77	112.08	120.94
1	B	230	LEU	CA-C-N	-7.45	112.33	119.85
1	B	230	LEU	C-N-CA	-7.45	112.33	119.85
1	D	32	LYS	N-CA-C	7.41	121.48	109.40
1	F	242	GLN	N-CA-C	-7.25	103.32	111.07
1	A	480	PHE	N-CA-C	-7.04	103.68	111.36
1	E	392	PHE	CA-C-N	-7.03	111.06	119.84
1	E	392	PHE	C-N-CA	-7.03	111.06	119.84
1	G	232	GLY	CA-C-N	7.01	126.99	119.28
1	G	232	GLY	C-N-CA	7.01	126.99	119.28
1	F	74	GLY	CA-C-N	7.01	126.71	119.56
1	F	74	GLY	C-N-CA	7.01	126.71	119.56
1	B	458	GLN	N-CA-C	-6.95	103.71	111.28
1	G	407	ASN	CA-C-N	6.75	126.54	119.05
1	G	407	ASN	C-N-CA	6.75	126.54	119.05
1	B	483	ILE	CA-C-N	6.58	126.50	119.85
1	B	483	ILE	C-N-CA	6.58	126.50	119.85
1	F	161	ARG	N-CA-C	-6.53	104.08	111.07
1	A	474	SER	CA-C-N	6.48	126.39	119.85
1	A	474	SER	C-N-CA	6.48	126.39	119.85
1	C	368	MET	N-CA-C	-6.41	104.08	112.41
1	G	168	ILE	N-CA-C	6.40	117.93	108.65
1	G	227	MET	N-CA-C	6.32	118.97	111.33
1	D	304	GLU	N-CA-C	6.25	119.07	111.82
1	F	230	LEU	CA-C-N	6.22	126.58	119.92
1	F	230	LEU	C-N-CA	6.22	126.58	119.92
1	E	260	ASP	CA-C-N	6.08	125.76	119.56
1	E	260	ASP	C-N-CA	6.08	125.76	119.56
1	G	359	ILE	N-CA-C	-6.01	104.47	110.30
1	A	109	TRP	N-CA-C	-5.98	104.76	111.28
1	B	474	SER	CA-C-N	5.94	125.90	119.78
1	B	474	SER	C-N-CA	5.94	125.90	119.78
1	G	140	VAL	N-CA-C	5.94	117.33	108.54
1	E	36	GLY	CA-C-N	5.91	125.86	119.78
1	E	36	GLY	C-N-CA	5.91	125.86	119.78

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	381	ARG	CB-CA-C	-5.90	102.79	112.06
1	F	279	GLU	N-CA-C	-5.74	105.10	111.36
1	G	359	ILE	CB-CA-C	-5.74	104.64	111.81
1	H	137	GLY	CA-C-N	-5.71	115.01	123.11
1	H	137	GLY	C-N-CA	-5.71	115.01	123.11
1	D	398	VAL	N-CA-C	-5.70	106.15	111.45
1	D	288	LEU	N-CA-C	5.66	117.90	111.11
1	A	436	LYS	N-CA-C	5.65	119.43	112.54
1	H	340	GLN	CA-C-N	5.62	125.94	119.92
1	H	340	GLN	C-N-CA	5.62	125.94	119.92
1	G	432	PHE	N-CA-C	-5.61	106.33	112.72
1	A	209	PHE	N-CA-C	-5.59	105.27	111.36
1	A	381	ARG	CA-C-N	-5.56	116.60	126.45
1	A	381	ARG	C-N-CA	-5.56	116.60	126.45
1	B	32	LYS	N-CA-C	5.56	118.62	109.72
1	B	126	GLN	N-CA-C	-5.55	105.14	111.14
1	B	169	ASP	CA-C-N	-5.52	114.41	119.82
1	B	169	ASP	C-N-CA	-5.52	114.41	119.82
1	A	381	ARG	CB-CA-C	-5.51	103.69	111.95
1	D	461	ARG	N-CA-C	-5.50	102.05	110.14
1	A	474	SER	N-CA-C	-5.47	102.24	109.84
1	D	381	ARG	CB-CA-C	-5.46	103.50	112.06
1	F	366	LEU	CA-C-N	5.45	125.27	119.28
1	F	366	LEU	C-N-CA	5.45	125.27	119.28
1	H	370	LEU	N-CA-C	-5.40	100.52	108.99
1	F	86	ALA	N-CA-C	5.39	116.84	111.07
1	F	38	THR	CA-C-N	5.36	125.78	119.99
1	F	38	THR	C-N-CA	5.36	125.78	119.99
1	A	178	VAL	N-CA-C	-5.34	105.17	110.62
1	E	288	LEU	N-CA-C	5.34	117.52	111.11
1	B	74	GLY	N-CA-C	-5.33	101.47	112.34
1	G	142	LYS	N-CA-C	5.30	115.35	107.88
1	F	304	GLU	N-CA-C	5.29	118.52	111.75
1	H	378	THR	N-CA-C	5.28	116.98	108.32
1	E	266	ASP	N-CA-C	5.25	115.28	107.88
1	F	392	PHE	CA-C-N	-5.17	113.37	119.84
1	F	392	PHE	C-N-CA	-5.17	113.37	119.84
1	A	421	GLY	N-CA-C	-5.17	107.92	115.72
1	B	95	ALA	N-CA-C	5.16	117.30	111.11
1	F	259	LEU	N-CA-C	5.15	117.15	108.96
1	G	462	PHE	N-CA-C	5.13	116.88	108.52
1	F	219	LEU	N-CA-C	-5.12	105.70	111.28

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	312	TYR	N-CA-C	-5.12	105.78	111.36
1	A	382	ASP	CB-CA-C	-5.11	102.71	110.06
1	E	232	GLY	CA-C-N	5.10	126.22	119.84
1	E	232	GLY	C-N-CA	5.10	126.22	119.84
1	A	263	SER	CB-CA-C	5.10	117.95	110.87
1	C	95	ALA	N-CA-C	5.07	117.46	111.33
1	A	95	ALA	N-CA-C	5.04	116.77	111.28
1	A	146	GLU	N-CA-C	5.02	116.44	111.07
1	A	47	LEU	N-CA-C	5.02	117.48	111.71
1	B	126	GLN	CA-CB-CG	5.02	124.13	114.10
1	G	368	MET	N-CA-C	-5.01	105.89	112.41
1	H	116	VAL	N-CA-C	5.01	115.78	110.72
1	F	276	GLN	N-CA-C	-5.00	107.23	113.38

There are no chirality outliers.

There are no planarity outliers.

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	3777	0	3747	55	0
1	B	3771	0	3741	56	0
1	C	3776	0	3745	56	0
1	D	3771	0	3741	67	0
1	E	3771	0	3741	63	0
1	F	3771	0	3741	82	0
1	G	3737	0	3670	91	0
1	H	3723	0	3668	83	0
2	A	43	0	30	2	0
2	B	43	0	30	1	0
2	C	43	0	30	3	0
2	D	43	0	30	2	0
2	E	43	0	30	3	0
2	F	43	0	30	8	0
2	G	43	0	30	6	0
2	H	43	0	30	6	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	15	0	13	4	0
3	B	15	0	13	5	0
3	C	15	0	13	4	0
3	D	15	0	13	5	0
3	E	15	0	13	3	0
3	F	15	0	13	9	0
4	G	6	0	8	2	0
4	H	6	0	8	0	0
5	A	56	0	0	0	0
5	B	39	0	0	3	0
5	C	71	0	0	4	0
5	D	49	0	0	3	0
5	E	13	0	0	0	0
5	F	11	0	0	0	0
5	G	12	0	0	1	0
5	H	10	0	0	0	0
All	All	30804	0	30128	572	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 9.

All (572) 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:32:LYS:HD2	1:C:33:LEU:H	1.09	1.07
1:F:308:THR:HB	1:F:365:MET:HE1	1.39	1.04
1:D:381:ARG:O	1:D:382:ASP:HB2	1.55	1.03
1:D:143:ARG:HH12	1:D:147:GLU:HB2	1.22	1.03
3:B:502:0QA:H5	3:B:502:0QA:O1	1.58	0.99
1:A:77:ARG:HG2	1:A:77:ARG:HH11	1.26	0.98
3:F:502:0QA:H1	3:F:502:0QA:O1	1.64	0.97
1:C:59:MET:CE	1:C:394:MET:HE2	1.95	0.95
1:B:77:ARG:HG2	1:B:77:ARG:HH11	1.31	0.95
1:H:363:GLY:O	1:H:365:MET:HE2	1.69	0.91
1:D:341:PRO:HG3	1:D:454:THR:HG22	1.54	0.90
1:E:205:MET:HE1	1:E:303:THR:HG21	1.54	0.89
1:G:365:MET:HE2	1:G:365:MET:HA	1.52	0.89
1:E:172:PHE:O	1:E:176:ARG:HG3	1.72	0.89
1:C:32:LYS:HD2	1:C:33:LEU:N	1.89	0.86
1:F:59:MET:HE1	1:F:82:CYS:SG	2.16	0.86
1:D:77:ARG:HG2	1:D:77:ARG:HH11	1.40	0.86

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:143:ARG:NH1	1:D:147:GLU:HB2	1.91	0.85
1:C:125:LYS:HE2	1:C:129:ARG:HH22	1.39	0.85
1:G:216:THR:HG21	1:G:233:PRO:HG2	1.56	0.85
1:C:59:MET:CE	1:C:394:MET:CE	2.56	0.84
1:B:59:MET:HE3	1:B:394:MET:HE2	1.60	0.84
1:A:381:ARG:O	1:A:382:ASP:HB2	1.79	0.83
1:G:53:GLN:OE1	1:G:53:GLN:HA	1.77	0.82
1:A:342:LYS:HE3	1:A:344:GLU:OE1	1.80	0.81
1:F:139:GLY:O	1:F:145:ILE:HB	1.81	0.81
1:E:450:PHE:O	1:E:454:THR:HB	1.82	0.80
1:F:433:SER:HB3	2:F:501:HEM:HBA1	1.64	0.79
1:B:165:GLY:O	1:B:490:SER:HB2	1.82	0.79
1:G:476:LYS:HG3	1:G:477:HIS:H	1.47	0.78
1:H:187:PHE:CE1	1:H:251:LYS:HB3	2.20	0.77
1:C:59:MET:HE3	1:C:394:MET:CE	2.15	0.77
1:F:271:PHE:CD2	1:F:291:LEU:HB2	2.19	0.77
1:C:327:VAL:HG11	1:C:457:MET:CE	2.15	0.76
1:C:305:THR:HG21	3:C:502:0QA:O2	1.86	0.75
1:F:262:ASN:O	1:F:264:PRO:HD3	1.85	0.75
1:F:302:GLY:HA2	2:F:501:HEM:HMC3	1.68	0.75
1:H:73:LEU:HB3	1:H:222:MET:HG2	1.67	0.75
1:A:59:MET:HE1	1:A:82:CYS:SG	2.27	0.74
1:D:452:PHE:O	1:D:456:ILE:HD12	1.87	0.74
1:A:77:ARG:HH11	1:A:77:ARG:CG	1.99	0.74
1:B:453:PHE:HD2	1:B:457:MET:HE1	1.52	0.74
3:D:502:0QA:H5	3:D:502:0QA:O1	1.88	0.73
1:G:182:ILE:HD11	1:G:302:GLY:HA3	1.70	0.73
1:C:59:MET:HE1	1:C:394:MET:HE2	1.68	0.73
1:D:143:ARG:HH12	1:D:147:GLU:CB	2.00	0.73
1:B:59:MET:HE1	1:B:82:CYS:SG	2.29	0.72
1:C:32:LYS:CD	1:C:33:LEU:H	1.96	0.72
1:D:59:MET:HE1	1:D:82:CYS:SG	2.30	0.72
1:A:142:LYS:HG3	1:A:143:ARG:N	2.04	0.72
3:C:502:0QA:H5	3:C:502:0QA:O1	1.88	0.72
1:D:381:ARG:O	1:D:382:ASP:CB	2.27	0.72
1:H:320:HIS:HB3	1:H:323:VAL:HG22	1.72	0.71
1:B:77:ARG:HH11	1:B:77:ARG:CG	2.00	0.71
1:F:305:THR:HA	1:F:365:MET:HE2	1.71	0.71
1:A:433:SER:HB3	2:A:501:HEM:HBA1	1.73	0.70
1:F:308:THR:CB	1:F:365:MET:HE1	2.18	0.70
1:F:174:LEU:HD21	1:F:314:PHE:HE1	1.56	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:114:TYR:CE1	1:H:123:ARG:NH1	2.59	0.70
1:F:271:PHE:CE2	1:F:291:LEU:HB2	2.27	0.70
3:A:502:0QA:H5	3:A:502:0QA:O1	1.89	0.69
1:E:376:LYS:HA	1:E:387:LYS:HG3	1.73	0.69
1:A:342:LYS:HG3	1:A:344:GLU:HG3	1.74	0.69
1:H:178:VAL:HG11	1:H:306:VAL:HB	1.74	0.69
1:B:143:ARG:O	1:B:147:GLU:HG2	1.92	0.69
1:H:407:ASN:O	1:H:415:HIS:NE2	2.25	0.69
1:C:327:VAL:HG11	1:C:457:MET:HE3	1.73	0.69
2:H:501:HEM:HBB2	2:H:501:HEM:HMB1	1.75	0.68
1:E:335:ILE:HD11	1:E:349:MET:HE1	1.74	0.68
1:G:109:TRP:CH2	1:G:238:PHE:HB3	2.28	0.68
1:H:441:GLY:HA3	2:H:501:HEM:C3C	2.29	0.68
1:H:372:HIS:O	1:H:391:VAL:N	2.23	0.68
1:H:92:VAL:HG23	1:H:434:ILE:HG13	1.76	0.67
1:G:315:LEU:HB2	1:G:487:TYR:CE2	2.29	0.67
1:C:265:ARG:HB2	1:C:269:ASP:OD1	1.94	0.67
1:C:453:PHE:O	1:C:457:MET:HG2	1.93	0.67
1:G:478:VAL:HG12	1:G:478:VAL:O	1.94	0.67
1:C:125:LYS:CE	1:C:129:ARG:HH22	2.08	0.67
1:A:60:LYS:HG3	1:D:403:ARG:NH2	2.10	0.66
1:F:407:ASN:HB3	1:F:410:ASP:HB2	1.77	0.66
1:H:54:MET:HB2	1:H:479:GLY:HA2	1.78	0.66
2:D:501:HEM:C4D	3:D:502:0QA:H1	2.28	0.66
1:F:297:ASN:HA	3:F:502:0QA:N1	2.11	0.66
1:D:341:PRO:CG	1:D:454:THR:HG22	2.26	0.66
1:H:146:GLU:C	1:H:148:ARG:H	2.05	0.65
1:D:309:THR:OG1	1:D:365:MET:HE3	1.96	0.65
1:C:59:MET:HE3	1:C:394:MET:HE3	1.79	0.65
1:E:302:GLY:HA2	2:E:501:HEM:HMC2	1.79	0.65
1:F:323:VAL:O	1:F:327:VAL:HG23	1.96	0.65
1:B:59:MET:HE2	1:B:59:MET:HA	1.78	0.65
1:F:433:SER:CB	2:F:501:HEM:HBA1	2.26	0.65
1:F:450:PHE:O	1:F:454:THR:HB	1.96	0.65
1:H:179:SER:O	1:H:183:SER:HB2	1.97	0.65
1:C:139:GLY:HA2	1:C:142:LYS:HD2	1.78	0.64
1:F:288:LEU:O	1:F:292:VAL:HG23	1.97	0.64
1:A:381:ARG:O	1:A:382:ASP:CB	2.42	0.64
1:D:409:ARG:HG2	5:D:631:HOH:O	1.98	0.64
1:E:453:PHE:O	1:E:457:MET:HB2	1.97	0.64
1:D:53:GLN:HG3	1:D:56:ASN:HB2	1.80	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:166:ALA:O	1:D:490:SER:HB3	1.98	0.64
1:E:297:ASN:HA	3:E:502:0QA:N1	2.13	0.64
1:C:453:PHE:O	1:C:457:MET:CG	2.46	0.64
1:B:122:GLU:HA	1:B:122:GLU:OE2	1.97	0.64
1:D:59:MET:HA	1:D:59:MET:HE2	1.79	0.64
1:C:77:ARG:NH2	1:C:386:PRO:HG2	2.13	0.63
1:C:302:GLY:HA2	2:C:501:HEM:HMC3	1.78	0.63
1:E:301:ALA:HA	3:E:502:0QA:H3	1.80	0.63
1:E:332:ASP:OD2	1:E:494:ARG:NH2	2.28	0.63
1:F:118:PHE:HE2	1:F:370:LEU:HD11	1.63	0.63
1:F:345:ASP:O	1:F:349:MET:HG3	1.98	0.63
1:F:145:ILE:HD12	1:F:148:ARG:HB3	1.81	0.63
2:E:501:HEM:HMB1	2:E:501:HEM:HBB2	1.81	0.63
1:G:355:VAL:O	1:G:359:ILE:HG12	1.98	0.63
1:D:143:ARG:HG3	1:D:143:ARG:HH11	1.64	0.62
1:F:448:GLU:O	1:F:452:PHE:CD2	2.51	0.62
1:H:372:HIS:NE2	2:H:501:HEM:O1A	2.29	0.62
1:C:77:ARG:HH22	1:C:386:PRO:HG2	1.64	0.62
1:D:77:ARG:HH11	1:D:77:ARG:CG	2.11	0.62
1:F:216:THR:HG21	1:F:233:PRO:HG2	1.81	0.62
1:A:342:LYS:HG3	1:A:344:GLU:CG	2.30	0.61
1:D:375:ASN:O	1:D:387:LYS:HG3	2.00	0.61
1:G:476:LYS:HG3	1:G:477:HIS:N	2.15	0.61
1:C:332:ASP:CG	1:C:494:ARG:HH22	2.08	0.61
1:H:104:GLN:NE2	1:H:118:PHE:CE1	2.69	0.61
1:E:53:GLN:HG3	1:E:56:ASN:HB2	1.81	0.61
1:G:33:LEU:HD21	1:G:77:ARG:HD2	1.82	0.61
3:C:502:0QA:O1	3:C:502:0QA:C9	2.48	0.61
3:D:502:0QA:O1	3:D:502:0QA:C9	2.48	0.61
1:E:205:MET:CE	1:E:303:THR:HG21	2.30	0.61
1:F:343:PHE:CE1	1:F:447:MET:HA	2.37	0.60
1:F:174:LEU:HD21	1:F:314:PHE:CE1	2.37	0.59
1:D:59:MET:HE3	1:D:394:MET:CE	2.33	0.59
1:D:379:LYS:HD3	5:D:640:HOH:O	2.02	0.59
1:A:179:SER:HB2	1:A:303:THR:HG23	1.83	0.59
1:D:341:PRO:HG3	1:D:454:THR:CG2	2.30	0.59
1:D:342:LYS:HE2	1:D:344:GLU:OE1	2.02	0.59
1:H:432:PHE:CG	1:H:442:GLU:HG3	2.37	0.59
1:F:375:ASN:O	1:F:387:LYS:HG3	2.02	0.59
2:D:501:HEM:HMB1	2:D:501:HEM:HBB2	1.84	0.59
1:F:40:LEU:HD22	1:F:43:ILE:HD11	1.85	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:172:PHE:O	1:C:176:ARG:HG3	2.02	0.59
1:G:215:SER:N	4:G:502:GOL:O3	2.28	0.59
1:B:77:ARG:NH1	5:B:612:HOH:O	2.35	0.58
1:G:285:GLU:OE1	1:G:285:GLU:HA	2.03	0.58
1:A:297:ASN:HA	3:A:502:0QA:N1	2.18	0.58
1:B:453:PHE:CD2	1:B:457:MET:HE1	2.37	0.58
2:G:501:HEM:HMB1	2:G:501:HEM:HBB2	1.84	0.58
1:G:123:ARG:HA	1:G:285:GLU:HG3	1.86	0.58
1:A:142:LYS:HG3	1:A:144:GLY:H	1.68	0.58
1:E:254:HIS:ND1	1:E:254:HIS:C	2.62	0.58
1:D:220:TYR:CZ	1:D:224:SER:HB2	2.39	0.58
1:F:420:LYS:HE2	1:F:422:GLN:HE21	1.68	0.58
1:A:197:GLU:O	1:A:200:SER:HB3	2.04	0.57
1:H:129:ARG:HG3	1:H:129:ARG:HH11	1.68	0.57
1:G:125:LYS:O	1:G:129:ARG:HB2	2.05	0.57
1:F:305:THR:HA	1:F:365:MET:CE	2.34	0.57
1:A:59:MET:HE3	1:A:394:MET:CE	2.35	0.57
1:G:209:PHE:HE2	1:G:300:PHE:HD1	1.52	0.57
1:B:77:ARG:HG2	1:B:77:ARG:NH1	2.11	0.57
1:G:178:VAL:HG11	1:G:303:THR:O	2.05	0.57
2:C:501:HEM:C4D	3:C:502:0QA:H1	2.33	0.56
1:C:210:GLN:HG3	1:C:483:ILE:HG13	1.87	0.56
1:E:142:LYS:HG2	1:E:143:ARG:HH22	1.70	0.56
1:F:373:ARG:HD3	1:F:388:GLY:HA2	1.86	0.56
1:F:143:ARG:O	1:F:147:GLU:HG2	2.05	0.56
1:G:315:LEU:HB2	1:G:487:TYR:HE2	1.68	0.56
1:G:375:ASN:O	1:G:387:LYS:HG3	2.06	0.56
1:H:51:THR:HG23	1:H:218:GLN:HB2	1.88	0.56
1:F:381:ARG:O	1:F:382:ASP:HB2	2.04	0.56
1:H:372:HIS:HE1	1:H:437:ARG:HB2	1.70	0.56
1:G:151:GLU:O	1:G:155:PHE:HD2	1.88	0.56
1:A:468:PRO:HA	1:A:471:ILE:HD12	1.87	0.56
1:D:124:ALA:O	1:D:128:ARG:HB2	2.06	0.56
1:H:382:ASP:OD1	1:H:382:ASP:N	2.39	0.56
1:H:114:TYR:HE1	1:H:123:ARG:NH1	2.03	0.56
1:F:476:LYS:HB2	1:F:485:ARG:HA	1.87	0.55
1:G:278:GLU:HG2	1:G:284:THR:OG1	2.05	0.55
1:B:453:PHE:O	1:B:457:MET:HB2	2.06	0.55
1:G:178:VAL:CG1	1:G:303:THR:HA	2.36	0.55
1:H:401:ASP:HB3	1:H:404:PHE:HB2	1.88	0.55
1:G:319:LYS:HE2	1:G:473:VAL:HG22	1.88	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:365:MET:HE2	1:G:365:MET:CA	2.30	0.55
1:H:104:GLN:NE2	1:H:118:PHE:HE1	2.04	0.55
1:G:365:MET:HA	1:G:365:MET:CE	2.32	0.55
1:G:215:SER:HB3	4:G:502:GOL:O3	2.05	0.55
1:E:142:LYS:HG2	1:E:143:ARG:NH2	2.22	0.55
1:A:77:ARG:HG2	1:A:77:ARG:NH1	2.08	0.54
1:G:361:ARG:NH1	1:G:399:LEU:O	2.37	0.54
1:H:95:ALA:O	1:H:99:SER:HB3	2.07	0.54
1:A:142:LYS:CG	1:A:144:GLY:H	2.21	0.54
1:D:355:VAL:O	1:D:359:ILE:HG13	2.08	0.54
1:E:275:MET:HE3	1:E:287:TYR:HA	1.90	0.54
1:H:355:VAL:O	1:H:359:ILE:HG12	2.08	0.54
1:A:123:ARG:HA	1:A:285:GLU:HG3	1.89	0.54
1:F:448:GLU:O	1:F:452:PHE:HD2	1.91	0.54
1:B:101:ARG:HD2	1:B:117:ALA:O	2.08	0.54
1:F:89:GLU:O	1:F:93:ASP:HB2	2.08	0.54
1:F:103:GLU:HB2	1:F:108:ASP:OD2	2.08	0.54
1:G:139:GLY:CA	1:G:145:ILE:HG12	2.38	0.54
1:F:59:MET:HA	1:F:59:MET:HE2	1.90	0.53
1:E:253:GLU:HA	1:E:256:GLN:HG3	1.90	0.53
1:G:453:PHE:O	1:G:457:MET:HG3	2.08	0.53
1:G:478:VAL:HG22	1:G:482:THR:HG23	1.89	0.53
1:E:101:ARG:CZ	1:E:370:LEU:HD23	2.38	0.53
1:E:444:LEU:O	1:E:448:GLU:HG3	2.09	0.53
1:F:354:ALA:HB2	1:F:417:LEU:HD13	1.90	0.53
1:A:419:LYS:HB2	1:A:420:LYS:HE2	1.89	0.53
1:F:259:LEU:O	1:F:261:PRO:HD3	2.08	0.53
1:H:407:ASN:H	1:H:415:HIS:HE1	1.56	0.53
1:G:139:GLY:HA2	1:G:145:ILE:HG12	1.90	0.53
1:A:67:PRO:HG3	1:D:63:GLU:O	2.09	0.53
1:D:59:MET:HE3	1:D:394:MET:HE2	1.90	0.53
1:E:332:ASP:CG	1:E:494:ARG:HH22	2.16	0.53
2:F:501:HEM:ND	3:F:502:0QA:C10	2.71	0.53
1:H:101:ARG:NH1	2:H:501:HEM:O2A	2.42	0.53
1:F:53:GLN:HG3	1:F:56:ASN:OD1	2.09	0.52
1:A:319:LYS:C	1:A:321:PRO:HD3	2.33	0.52
1:G:433:SER:HB3	2:G:501:HEM:HBA1	1.91	0.52
1:A:104:GLN:NE2	1:A:221:GLU:OE2	2.43	0.52
1:C:327:VAL:HG11	1:C:457:MET:HE2	1.90	0.52
1:C:244:LEU:HB3	1:C:296:LEU:HD11	1.92	0.52
1:A:302:GLY:HA2	2:A:501:HEM:HMC3	1.90	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:502:0QA:O1	3:B:502:0QA:C9	2.44	0.52
1:G:288:LEU:O	1:G:292:VAL:HG23	2.09	0.52
1:G:461:ARG:HB3	1:G:494:ARG:HD3	1.91	0.52
1:B:321:PRO:HD2	1:B:322:GLU:OE2	2.10	0.52
1:F:271:PHE:HB3	1:F:291:LEU:HD13	1.90	0.52
1:F:373:ARG:NH1	1:F:388:GLY:O	2.43	0.52
1:D:110:LEU:HD22	1:D:241:LEU:HB3	1.92	0.52
1:E:123:ARG:O	1:E:127:LEU:HG	2.08	0.52
1:C:181:VAL:O	1:C:184:SER:HB2	2.09	0.52
3:F:502:0QA:O1	3:F:502:0QA:C10	2.49	0.52
1:H:265:ARG:HB2	1:H:269:ASP:OD2	2.09	0.52
1:H:363:GLY:O	1:H:365:MET:CE	2.49	0.52
1:C:271:PHE:CE2	1:C:291:LEU:HB2	2.45	0.51
1:G:439:CYS:HB2	2:G:501:HEM:NA	2.25	0.51
1:A:381:ARG:HB3	1:D:64[B]:ARG:HH21	1.74	0.51
1:H:322:GLU:O	1:H:325:ALA:HB3	2.10	0.51
1:A:271:PHE:CD2	1:A:291:LEU:HB2	2.45	0.51
1:G:99:SER:HB2	1:G:436:LYS:HB3	1.92	0.51
1:H:96:GLU:OE1	1:H:96:GLU:HA	2.10	0.51
1:H:469:LYS:HG3	1:H:469:LYS:O	2.10	0.51
1:F:118:PHE:CE2	1:F:370:LEU:HD11	2.44	0.51
1:F:327:VAL:O	1:F:331:ILE:HG13	2.11	0.51
2:H:501:HEM:HBB2	2:H:501:HEM:CMB	2.38	0.51
1:B:432:PHE:HB3	1:B:439:CYS:HB3	1.93	0.51
1:C:476:LYS:HB2	1:C:485:ARG:HA	1.92	0.51
1:A:342:LYS:HG2	1:A:345:ASP:OD2	2.11	0.51
1:B:442:GLU:OE1	1:B:446:ARG:NE	2.41	0.51
1:H:341:PRO:HG2	1:H:454:THR:HG22	1.92	0.51
1:F:180:ASN:ND2	1:F:193:TYR:HE1	2.09	0.51
1:H:305:THR:HA	1:H:365:MET:HG3	1.92	0.51
1:A:161:ARG:HG2	1:A:161:ARG:HH11	1.76	0.50
1:B:305:THR:HG21	3:B:502:0QA:O2	2.11	0.50
1:G:259:LEU:HD21	1:G:272:LEU:HB3	1.94	0.50
1:F:142:LYS:HE3	1:F:143:ARG:NH2	2.25	0.50
1:F:180:ASN:HD22	1:F:193:TYR:HE1	1.58	0.50
1:G:308:THR:HG22	1:G:365:MET:HE1	1.93	0.50
1:B:59:MET:HE2	1:B:59:MET:CA	2.41	0.50
1:C:332:ASP:OD2	1:C:494:ARG:NH2	2.38	0.50
1:G:104:GLN:N	1:G:104:GLN:HE21	2.10	0.50
1:G:103:GLU:C	1:G:104:GLN:HE21	2.19	0.50
1:F:211:PHE:CE1	1:F:233:PRO:HB2	2.47	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:316:LEU:O	1:G:317:LEU:HB2	2.10	0.50
1:F:211:PHE:HE1	1:F:233:PRO:HB2	1.77	0.50
1:G:476:LYS:CG	1:G:477:HIS:H	2.17	0.50
1:E:161:ARG:O	1:E:163:THR:N	2.45	0.49
1:A:368:MET:O	1:A:369:GLY:C	2.55	0.49
1:E:412:ASN:OD1	1:E:414:GLN:HB2	2.11	0.49
1:B:452:PHE:O	1:B:456:ILE:HD12	2.12	0.49
1:H:55:TYR:CE2	1:H:59:MET:HG2	2.47	0.49
1:H:187:PHE:CE1	1:H:251:LYS:CB	2.94	0.49
1:H:423:PHE:CD1	1:H:423:PHE:C	2.90	0.49
1:A:59:MET:HE3	1:A:394:MET:HE2	1.93	0.49
1:B:297:ASN:HD22	3:B:502:0QA:C4	2.25	0.49
1:H:55:TYR:CE2	1:H:59:MET:CG	2.95	0.49
1:B:318:MET:SD	1:B:464:SER:HB3	2.52	0.49
1:D:161:ARG:NH2	1:D:459:ASN:OD1	2.44	0.49
1:E:375:ASN:O	1:E:387:LYS:HE2	2.13	0.49
3:A:502:0QA:O1	3:A:502:0QA:C9	2.49	0.49
1:F:305:THR:CA	1:F:365:MET:HE2	2.39	0.49
1:B:172:PHE:O	1:B:176:ARG:HG3	2.12	0.49
1:H:487:TYR:CD1	1:H:487:TYR:C	2.91	0.49
1:C:51:THR:HG22	1:C:222:MET:CE	2.43	0.49
1:E:124:ALA:O	1:E:128:ARG:HB2	2.12	0.49
1:G:380:PHE:O	1:G:381:ARG:C	2.56	0.49
1:H:244:LEU:HB3	1:H:296:LEU:HD11	1.95	0.49
1:B:110:LEU:HD22	1:B:241:LEU:HB3	1.95	0.48
1:C:327:VAL:CG1	1:C:457:MET:HE3	2.41	0.48
1:A:60:LYS:HG3	1:D:403:ARG:HH21	1.75	0.48
1:A:101:ARG:NH1	1:A:370:LEU:HB3	2.27	0.48
1:A:453:PHE:HD2	1:A:457:MET:CE	2.25	0.48
1:B:192:ASP:C	1:B:194:GLU:H	2.20	0.48
2:F:501:HEM:ND	3:F:502:0QA:H3	2.28	0.48
1:G:313:GLY:HA2	1:G:359:ILE:HD12	1.96	0.48
1:H:288:LEU:O	1:H:291:LEU:HB3	2.12	0.48
1:G:255:ASN:ND2	1:G:266:ASP:OD1	2.46	0.48
1:A:275:MET:HE3	1:A:287:TYR:HA	1.95	0.48
1:B:289:LYS:NZ	1:B:293:MET:HE2	2.29	0.48
1:E:375:ASN:O	1:E:387:LYS:HG3	2.13	0.48
1:F:59:MET:HE3	1:F:394:MET:HE2	1.95	0.48
1:A:131:SER:O	1:A:135:LEU:HB2	2.13	0.48
1:C:206:LEU:O	1:C:210:GLN:HB2	2.12	0.48
1:C:453:PHE:O	1:C:457:MET:HG3	2.14	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:197:GLU:O	1:D:201:LEU:HG	2.14	0.48
1:D:457:MET:HE2	1:D:462:PHE:CZ	2.48	0.48
1:F:381:ARG:O	1:F:382:ASP:CB	2.61	0.48
1:F:351:TYR:O	1:F:355:VAL:HG23	2.14	0.48
1:G:317:LEU:HD23	1:G:323:VAL:HG23	1.96	0.48
1:A:63:GLU:O	1:D:67:PRO:HG3	2.14	0.47
1:C:59:MET:HE1	1:C:394:MET:CE	2.36	0.47
1:B:360:GLN:HG2	5:B:633:HOH:O	2.13	0.47
1:H:51:THR:HG23	1:H:218:GLN:CB	2.44	0.47
1:B:381:ARG:O	1:B:382:ASP:HB2	2.14	0.47
1:F:188:GLY:N	1:F:266:ASP:HB3	2.29	0.47
1:H:175:SER:O	1:H:179:SER:HB3	2.14	0.47
1:H:440:PHE:CD1	1:H:440:PHE:C	2.92	0.47
1:A:32:LYS:HD2	1:A:32:LYS:HA	1.52	0.47
1:D:101:ARG:O	1:D:373:ARG:HG2	2.15	0.47
1:F:398:VAL:HG12	1:F:428:ALA:HB1	1.97	0.47
1:H:187:PHE:CE1	1:H:251:LYS:HD3	2.50	0.47
1:A:432:PHE:HB3	1:A:439:CYS:HB3	1.96	0.47
1:C:51:THR:OG1	1:C:215:SER:OG	2.32	0.47
1:D:315:LEU:HG	1:D:473:VAL:HG12	1.97	0.47
1:E:418:ASP:OD1	1:E:420:LYS:HB2	2.14	0.47
1:G:418:ASP:OD1	1:G:422:GLN:HB2	2.14	0.47
1:H:187:PHE:HE1	1:H:251:LYS:HB3	1.73	0.47
1:H:394:MET:O	1:H:395:LEU:C	2.57	0.47
1:A:152:GLU:HG3	1:A:177:THR:HG23	1.96	0.47
1:D:77:ARG:HG2	1:D:77:ARG:NH1	2.18	0.47
1:F:344:GLU:C	1:F:346:ARG:H	2.22	0.47
1:G:104:GLN:OE1	1:G:118:PHE:CE1	2.68	0.47
1:G:487:TYR:C	1:G:487:TYR:CD1	2.93	0.47
1:A:161:ARG:HG2	1:A:161:ARG:NH1	2.30	0.47
1:D:297:ASN:HA	3:D:502:0QA:N1	2.30	0.47
1:D:467:SER:HB3	1:D:470:ASP:OD2	2.15	0.47
1:B:363:GLY:O	1:B:364:ASP:C	2.58	0.47
1:E:348:LYS:HB2	1:E:348:LYS:HE2	1.61	0.47
1:E:401:ASP:OD2	1:E:403:ARG:HG2	2.15	0.47
1:F:206:LEU:HD13	1:F:304:GLU:OE1	2.15	0.47
1:G:111:PHE:CG	1:G:118:PHE:CD2	3.03	0.47
1:A:271:PHE:CE2	1:A:291:LEU:HB2	2.50	0.46
1:H:369:GLY:O	1:H:370:LEU:HD12	2.15	0.46
1:B:118:PHE:HE2	1:B:370:LEU:HD11	1.79	0.46
1:D:476:LYS:NZ	5:D:604:HOH:O	2.38	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:424:LYS:HB3	1:F:424:LYS:HE2	1.54	0.46
1:H:405:PHE:HB3	1:H:415:HIS:CE1	2.50	0.46
1:G:209:PHE:CE1	1:G:304:GLU:HG2	2.50	0.46
1:B:140:VAL:HA	1:B:145:ILE:HG21	1.97	0.46
1:D:143:ARG:NH1	1:D:143:ARG:HG3	2.27	0.46
1:H:357:HIS:HB3	1:H:416:PHE:CZ	2.49	0.46
1:A:351:TYR:O	1:A:355:VAL:HG23	2.16	0.46
1:C:473:VAL:HG22	5:C:605:HOH:O	2.15	0.46
1:D:145:ILE:HD12	1:D:145:ILE:HA	1.75	0.46
1:F:156:LEU:HB2	1:F:177:THR:HG21	1.97	0.46
1:G:64:ARG:HB3	1:G:64:ARG:NH2	2.30	0.46
1:H:209:PHE:CZ	1:H:300:PHE:HD1	2.34	0.46
1:B:281:ASN:HA	1:B:282:PRO:HD2	1.79	0.46
1:E:55:TYR:C	1:E:55:TYR:CD2	2.93	0.46
1:F:37:PRO:HB2	1:F:48:GLN:NE2	2.30	0.46
1:G:182:ILE:HD11	1:G:302:GLY:CA	2.43	0.46
1:H:73:LEU:CB	1:H:222:MET:HG2	2.42	0.46
1:A:305:THR:HG23	3:A:502:0QA:H3	1.97	0.46
1:F:197:GLU:O	1:F:200:SER:HB3	2.15	0.46
1:D:341:PRO:CB	1:D:454:THR:HG21	2.46	0.46
1:E:302:GLY:HA2	2:E:501:HEM:CMC	2.45	0.46
1:G:111:PHE:CD2	1:G:118:PHE:HD2	2.33	0.46
1:C:343:PHE:O	1:C:346:ARG:HB2	2.16	0.46
1:H:430:VAL:N	1:H:431:PRO:HD3	2.31	0.46
1:F:331:ILE:HG23	1:F:335:ILE:HD12	1.97	0.45
1:H:175:SER:O	1:H:179:SER:CB	2.64	0.45
1:H:423:PHE:CE1	1:H:425:LYS:HG3	2.52	0.45
1:B:330:GLU:HG2	1:B:333:ARG:NH2	2.31	0.45
1:D:476:LYS:HB2	1:D:485:ARG:HA	1.98	0.45
1:D:54:MET:HE3	1:D:54:MET:HB3	1.86	0.45
1:B:341:PRO:HG2	1:B:454:THR:HG22	1.98	0.45
1:G:64:ARG:HB3	1:G:64:ARG:CZ	2.46	0.45
1:H:399:LEU:HD23	1:H:428:ALA:O	2.17	0.45
1:E:59:MET:O	1:E:62:SER:HB3	2.17	0.45
1:E:326:LYS:HD2	1:E:351:TYR:CZ	2.52	0.45
1:E:454:THR:HG22	1:E:455:THR:N	2.32	0.45
1:H:384:PHE:C	1:H:385:LEU:HD23	2.42	0.45
1:B:433:SER:HB3	2:B:501:HEM:HBA1	1.99	0.45
1:C:409:ARG:HE	1:C:409:ARG:HB3	1.68	0.45
2:F:501:HEM:NA	3:F:502:0QA:H2	2.32	0.45
1:G:111:PHE:CG	1:G:118:PHE:HD2	2.35	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:145:ILE:HD13	1:G:145:ILE:HA	1.83	0.45
1:D:32:LYS:HA	1:D:32:LYS:HD2	1.85	0.45
1:F:442:GLU:O	1:F:446:ARG:HG3	2.17	0.45
1:A:136:ARG:O	1:A:142:LYS:HE3	2.17	0.45
1:C:409:ARG:HG2	5:C:630:HOH:O	2.15	0.45
1:E:168:ILE:HD11	1:E:491:PHE:CD1	2.52	0.45
1:G:51:THR:HG23	1:G:218:GLN:HB2	1.99	0.45
1:G:271:PHE:CE1	1:G:291:LEU:HB2	2.51	0.45
1:G:315:LEU:C	1:G:316:LEU:O	2.58	0.45
1:B:342:LYS:HE2	1:B:344:GLU:OE1	2.16	0.45
1:E:252:VAL:O	1:E:256:GLN:HG3	2.17	0.45
1:G:352:THR:O	1:G:353:GLU:C	2.58	0.45
1:H:461:ARG:NH1	1:H:493:PRO:O	2.47	0.45
1:C:170:PRO:O	1:C:171:THR:C	2.59	0.45
1:C:364:ASP:CG	1:C:364:ASP:O	2.60	0.44
1:G:370:LEU:HD12	1:G:370:LEU:HA	1.81	0.44
1:H:67:PRO:HA	1:H:82:CYS:HB2	1.99	0.44
1:B:53:GLN:HG2	1:B:56:ASN:OD1	2.16	0.44
1:D:271:PHE:CD2	1:D:291:LEU:HB2	2.51	0.44
1:D:335:ILE:HD13	1:D:341:PRO:HB3	1.99	0.44
1:F:172:PHE:HA	1:F:175:SER:OG	2.16	0.44
1:G:275:MET:HE3	1:G:287:TYR:HA	1.98	0.44
1:A:452:PHE:O	1:A:456:ILE:HD12	2.17	0.44
1:H:123:ARG:HA	1:H:285:GLU:HG3	1.99	0.44
1:A:142:LYS:HG3	1:A:143:ARG:H	1.79	0.44
1:B:260:ASP:HA	1:B:261:PRO:HD2	1.81	0.44
1:D:59:MET:HE2	1:D:59:MET:CA	2.46	0.44
1:D:139:GLY:O	1:D:145:ILE:HB	2.18	0.44
1:G:157:ILE:HD11	1:G:456:ILE:HA	1.98	0.44
1:G:310:LEU:HD23	1:G:453:PHE:CE2	2.53	0.44
1:H:89:GLU:O	1:H:93:ASP:HB2	2.17	0.44
1:G:478:VAL:O	1:G:478:VAL:CG1	2.65	0.44
1:C:51:THR:HG22	1:C:222:MET:HE3	1.98	0.44
1:C:367:PRO:HD2	1:C:480:PHE:O	2.18	0.44
1:F:186:VAL:HA	1:F:267:PHE:CB	2.48	0.44
1:C:271:PHE:CG	1:C:291:LEU:HD13	2.52	0.44
1:C:312:TYR:O	1:C:316:LEU:HD22	2.18	0.44
1:G:85:ASP:HB3	1:G:381:ARG:HH12	1.83	0.44
1:F:232:GLY:O	1:F:234:GLN:N	2.51	0.44
1:G:191:PHE:CD2	1:G:198:PHE:CD1	3.06	0.44
1:G:271:PHE:CD1	1:G:291:LEU:HB2	2.52	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:103:GLU:HB2	1:B:108:ASP:OD2	2.18	0.44
1:F:197:GLU:OE1	1:F:247:PHE:CE1	2.71	0.44
1:E:101:ARG:NH2	1:E:370:LEU:HD23	2.33	0.43
1:H:128:ARG:NH2	1:H:438:TYR:CD2	2.85	0.43
1:H:441:GLY:HA3	2:H:501:HEM:CAC	2.48	0.43
1:E:291:LEU:HD12	1:E:291:LEU:O	2.18	0.43
1:A:476:LYS:HB2	1:A:485:ARG:HA	2.01	0.43
1:E:451:LEU:HD23	1:E:451:LEU:HA	1.86	0.43
1:C:444:LEU:O	1:C:448:GLU:HG3	2.19	0.43
1:A:343:PHE:CE1	1:A:447:MET:HA	2.53	0.43
1:E:115:GLY:O	1:E:119:SER:HB3	2.19	0.43
1:E:381:ARG:C	1:E:383:PHE:H	2.27	0.43
1:G:449:LEU:O	1:G:453:PHE:HB2	2.17	0.43
1:H:116:VAL:CG1	1:H:294:THR:HG23	2.47	0.43
1:H:116:VAL:HG12	1:H:294:THR:HG23	2.01	0.43
1:B:202:LEU:HD23	1:B:205:MET:CE	2.48	0.43
1:E:351:TYR:O	1:E:355:VAL:HG23	2.18	0.43
1:F:135:LEU:HD12	1:F:135:LEU:HA	1.82	0.43
1:G:316:LEU:C	1:G:318:MET:H	2.26	0.43
1:H:64:ARG:HE	1:H:64:ARG:HB2	1.70	0.43
1:H:161:ARG:HH22	1:H:459:ASN:HD22	1.65	0.43
1:C:154:GLY:HA3	5:C:650:HOH:O	2.18	0.43
1:D:453:PHE:O	1:D:457:MET:HB2	2.19	0.43
1:H:55:TYR:CE2	1:H:59:MET:HG3	2.53	0.43
1:H:440:PHE:C	1:H:442:GLU:H	2.26	0.43
1:E:315:LEU:HA	1:E:318:MET:HE3	2.01	0.43
1:C:432:PHE:HB3	1:C:439:CYS:HB3	2.00	0.43
1:E:407:ASN:HB3	1:E:410:ASP:HB2	2.01	0.43
1:F:175:SER:HB2	1:F:202:LEU:HD22	2.01	0.43
1:C:260:ASP:HA	1:C:261:PRO:HD2	1.92	0.42
1:G:296:LEU:HA	1:G:296:LEU:HD12	1.81	0.42
1:A:59:MET:HE3	1:A:394:MET:HE3	2.01	0.42
1:B:145:ILE:HD12	1:B:145:ILE:HA	1.72	0.42
1:B:186:VAL:HG23	1:B:187:PHE:CD1	2.54	0.42
1:C:357:HIS:NE2	1:C:446:ARG:NH2	2.67	0.42
1:D:471:ILE:HG22	1:D:473:VAL:HG13	2.01	0.42
1:E:202:LEU:HA	1:E:205:MET:HE2	2.02	0.42
1:F:452:PHE:O	1:F:456:ILE:HG13	2.20	0.42
1:F:467:SER:C	1:F:469:LYS:H	2.27	0.42
1:D:325:ALA:O	1:D:328:HIS:HB2	2.19	0.42
1:D:492:LEU:HA	1:D:493:PRO:HD3	1.81	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:317:LEU:HD13	1:E:457:MET:CE	2.49	0.42
1:E:467:SER:O	1:E:470:ASP:HB2	2.20	0.42
1:F:172:PHE:HA	1:F:175:SER:HG	1.83	0.42
1:G:53:GLN:HB3	1:G:56:ASN:HB2	2.01	0.42
1:E:161:ARG:C	1:E:163:THR:N	2.77	0.42
1:G:305:THR:HG22	1:G:365:MET:HG3	2.00	0.42
1:A:436:LYS:HE2	1:C:262:ASN:OD1	2.19	0.42
1:B:319:LYS:HD2	1:B:468:PRO:O	2.19	0.42
1:B:476:LYS:HB2	1:B:485:ARG:HA	2.01	0.42
1:C:381:ARG:O	1:C:382:ASP:HB2	2.20	0.42
1:D:216:THR:HG21	1:D:233:PRO:HG2	2.01	0.42
1:G:89:GLU:O	1:G:93:ASP:HB2	2.19	0.42
1:G:411:PHE:O	1:G:411:PHE:CD2	2.72	0.42
1:H:153:ALA:HA	1:H:156:LEU:HB3	2.02	0.42
1:H:260:ASP:C	1:H:262:ASN:H	2.26	0.42
1:D:341:PRO:CB	1:D:454:THR:CG2	2.98	0.42
1:F:300:PHE:CD2	3:F:502:0QA:C2	3.02	0.42
1:B:429:PHE:CZ	1:B:431:PRO:HG3	2.55	0.42
1:E:161:ARG:C	1:E:163:THR:H	2.26	0.42
1:G:323:VAL:HG21	1:G:411:PHE:HE2	1.84	0.42
1:H:356:ILE:HG12	1:H:453:PHE:HD2	1.85	0.42
1:A:77:ARG:CG	1:A:77:ARG:NH1	2.73	0.42
1:B:71:ILE:HD12	1:B:71:ILE:HA	1.92	0.42
1:E:310:LEU:HD23	1:E:453:PHE:CE1	2.55	0.42
3:E:502:0QA:H2	3:E:502:0QA:H6	1.63	0.42
1:G:59:MET:O	1:G:62:SER:HB3	2.20	0.42
1:A:71:ILE:HD12	1:A:71:ILE:HA	1.93	0.42
1:D:59:MET:HE3	1:D:394:MET:HE3	2.00	0.42
1:E:96:GLU:O	1:E:375:ASN:ND2	2.52	0.42
1:G:343:PHE:CE2	1:G:346:ARG:NH2	2.88	0.42
1:F:281:ASN:OD1	1:F:282:PRO:HD2	2.20	0.42
2:F:501:HEM:C4D	3:F:502:0QA:C10	3.03	0.42
1:G:302:GLY:HA2	2:G:501:HEM:CMC	2.50	0.42
1:G:288:LEU:O	1:G:291:LEU:HB3	2.20	0.41
1:H:73:LEU:HB3	1:H:222:MET:CG	2.44	0.41
1:E:271:PHE:O	1:E:275:MET:HG3	2.21	0.41
1:E:291:LEU:HD12	1:E:291:LEU:C	2.45	0.41
1:H:71:ILE:HG13	1:H:72:HIS:N	2.35	0.41
1:C:167:ASN:ND2	1:C:488:THR:OG1	2.45	0.41
1:E:146:GLU:O	1:E:150:GLN:HG3	2.19	0.41
1:E:236:GLN:O	1:E:237:ALA:C	2.61	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:501:HEM:C1A	3:F:502:0QA:H2	2.55	0.41
1:G:477:HIS:HB2	1:G:483:ILE:HD12	2.02	0.41
1:B:75:PRO:HA	5:B:603:HOH:O	2.20	0.41
1:B:153:ALA:O	1:B:157:ILE:HG12	2.21	0.41
1:B:424:LYS:HE3	1:B:424:LYS:HB3	1.90	0.41
1:D:462:PHE:HB3	1:D:489:MET:HE3	2.03	0.41
1:E:143:ARG:O	1:E:147:GLU:HG2	2.20	0.41
1:E:186:VAL:HA	1:E:267:PHE:HB3	2.03	0.41
1:F:143:ARG:NE	1:F:143:ARG:H	2.18	0.41
1:F:344:GLU:C	1:F:346:ARG:N	2.78	0.41
1:H:299:PHE:O	1:H:303:THR:HB	2.20	0.41
1:A:453:PHE:CD2	1:A:457:MET:CE	3.03	0.41
1:B:54:MET:HE3	1:B:54:MET:HB3	1.95	0.41
1:B:341:PRO:CG	1:B:454:THR:HG22	2.50	0.41
1:B:483:ILE:HA	1:B:484:PRO:HD2	1.90	0.41
1:C:101:ARG:NH1	2:C:501:HEM:O2A	2.48	0.41
1:D:281:ASN:OD1	1:D:281:ASN:C	2.63	0.41
1:H:146:GLU:C	1:H:148:ARG:N	2.73	0.41
1:C:331:ILE:CD1	1:C:457:MET:HB2	2.50	0.41
1:D:291:LEU:O	1:D:291:LEU:HD12	2.20	0.41
1:E:429:PHE:CZ	1:E:431:PRO:HG3	2.56	0.41
1:F:420:LYS:HE2	1:F:422:GLN:NE2	2.34	0.41
1:H:116:VAL:HB	1:H:294:THR:HG23	2.03	0.41
1:B:453:PHE:O	1:B:457:MET:HE3	2.20	0.41
1:C:436:LYS:NZ	5:C:631:HOH:O	2.52	0.41
1:D:101:ARG:HD3	1:D:371:ALA:O	2.20	0.41
1:E:365:MET:HE2	1:E:365:MET:HB2	1.88	0.41
1:B:492:LEU:HA	1:B:493:PRO:HD3	1.92	0.41
1:G:250:LYS:CE	5:G:605:HOH:O	2.69	0.41
1:G:279:GLU:C	1:G:281:ASN:H	2.29	0.41
1:B:192:ASP:C	1:B:194:GLU:N	2.79	0.41
1:D:461:ARG:HB3	1:D:494:ARG:HD2	2.03	0.41
1:D:464:SER:C	1:D:466:GLN:H	2.28	0.41
3:D:502:0QA:H10	3:D:502:0QA:H8	1.78	0.41
1:E:323:VAL:O	1:E:327:VAL:HG23	2.21	0.41
1:E:430:VAL:N	1:E:431:PRO:CD	2.83	0.41
1:F:335:ILE:HA	1:F:339:ARG:NH2	2.36	0.41
1:G:452:PHE:O	1:G:453:PHE:C	2.62	0.41
1:H:169:ASP:HA	1:H:170:PRO:HD3	1.89	0.41
1:H:178:VAL:CG1	1:H:306:VAL:HB	2.47	0.41
1:A:354:ALA:HB2	1:A:417:LEU:HD13	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:309:THR:O	1:F:310:LEU:C	2.64	0.41
1:F:453:PHE:O	1:F:457:MET:HB2	2.20	0.40
1:G:297:ASN:HD22	1:G:297:ASN:HA	1.66	0.40
1:G:351:TYR:O	1:G:355:VAL:HG23	2.21	0.40
1:G:433:SER:CB	2:G:501:HEM:HBA1	2.51	0.40
1:H:110:LEU:HD22	1:H:241:LEU:HB3	2.03	0.40
1:H:297:ASN:HD22	1:H:297:ASN:HA	1.58	0.40
1:B:156:LEU:O	1:B:160:LEU:HG	2.21	0.40
3:B:502:0QA:H6	3:B:502:0QA:H1	1.62	0.40
1:D:260:ASP:HA	1:D:261:PRO:HD3	1.87	0.40
1:D:341:PRO:CG	1:D:454:THR:CG2	2.96	0.40
1:F:444:LEU:O	1:F:448:GLU:HG3	2.21	0.40
1:G:372:HIS:NE2	2:G:501:HEM:O1A	2.49	0.40
1:E:123:ARG:HA	1:E:285:GLU:HG3	2.03	0.40
1:F:53:GLN:CG	1:F:56:ASN:OD1	2.69	0.40
1:G:115:GLY:O	1:G:119:SER:HB3	2.21	0.40
1:G:200:SER:O	1:G:203:ARG:HB3	2.20	0.40
1:D:450:PHE:O	1:D:454:THR:HB	2.21	0.40
1:F:101:ARG:HD3	1:F:371:ALA:O	2.21	0.40
1:H:181:VAL:HG11	1:H:448:GLU:OE2	2.21	0.40
1:H:346:ARG:HG3	1:H:353:GLU:CD	2.47	0.40
1:E:458:GLN:OE1	1:E:459:ASN:ND2	2.54	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	464/476 (98%)	439 (95%)	24 (5%)	1 (0%)	43 52
1	B	463/476 (97%)	445 (96%)	18 (4%)	0	100 100
1	C	464/476 (98%)	443 (96%)	20 (4%)	1 (0%)	43 52

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	D	463/476 (97%)	444 (96%)	18 (4%)	1 (0%)	43 52
1	E	463/476 (97%)	434 (94%)	28 (6%)	1 (0%)	43 52
1	F	463/476 (97%)	413 (89%)	44 (10%)	6 (1%)	9 8
1	G	461/476 (97%)	417 (90%)	36 (8%)	8 (2%)	7 6
1	H	456/476 (96%)	396 (87%)	53 (12%)	7 (2%)	8 7
All	All	3697/3808 (97%)	3431 (93%)	241 (6%)	25 (1%)	18 20

All (25) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	346	ARG
1	G	364	ASP
1	G	468	PRO
1	A	369	GLY
1	E	162	GLY
1	F	338	ASN
1	G	137	GLY
1	G	225	SER
1	G	337	LYS
1	H	85	ASP
1	H	419	LYS
1	G	345	ASP
1	G	381	ARG
1	H	147	GLU
1	H	193	TYR
1	D	42	PHE
1	F	212	THR
1	F	382	ASP
1	H	171	THR
1	H	322	GLU
1	F	162	GLY
1	F	193	TYR
1	H	421	GLY
1	F	233	PRO
1	G	478	VAL

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	410/419 (98%)	391 (95%)	19 (5%)	24 31
1	B	409/419 (98%)	390 (95%)	19 (5%)	24 31
1	C	410/419 (98%)	398 (97%)	12 (3%)	37 49
1	D	409/419 (98%)	386 (94%)	23 (6%)	19 23
1	E	409/419 (98%)	377 (92%)	32 (8%)	11 12
1	F	409/419 (98%)	376 (92%)	33 (8%)	11 12
1	G	403/419 (96%)	370 (92%)	33 (8%)	10 11
1	H	403/419 (96%)	348 (86%)	55 (14%)	3 3
All	All	3262/3352 (97%)	3036 (93%)	226 (7%)	14 16

All (226) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	32	LYS
1	A	40	LEU
1	A	53	GLN
1	A	62	SER
1	A	64[A]	ARG
1	A	64[B]	ARG
1	A	73	LEU
1	A	77	ARG
1	A	96	GLU
1	A	135	LEU
1	A	167	ASN
1	A	189	ASP
1	A	250	LYS
1	A	263	SER
1	A	291	LEU
1	A	346	ARG
1	A	370	LEU
1	A	417	LEU
1	A	419	LYS
1	B	32	LYS
1	B	33	LEU
1	B	40	LEU
1	B	77	ARG

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Mol	Chain	Res	Type
1	B	97	GLU
1	B	101	ARG
1	B	126	GLN
1	B	135	LEU
1	B	145	ILE
1	B	192	ASP
1	B	276	GLN
1	B	280	LYS
1	B	365	MET
1	B	370	LEU
1	B	417	LEU
1	B	420	LYS
1	B	457	MET
1	B	469	LYS
1	B	471	ILE
1	C	32	LYS
1	C	40	LEU
1	C	53	GLN
1	C	145	ILE
1	C	194	GLU
1	C	276	GLN
1	C	316	LEU
1	C	344	GLU
1	C	413	PRO
1	C	417	LEU
1	C	457	MET
1	C	469	LYS
1	D	32	LYS
1	D	33	LEU
1	D	40	LEU
1	D	53	GLN
1	D	77	ARG
1	D	128	ARG
1	D	135	LEU
1	D	142	LYS
1	D	145	ILE
1	D	147	GLU
1	D	194	GLU
1	D	236	GLN
1	D	289	LYS
1	D	316	LEU
1	D	344	GLU

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Mol	Chain	Res	Type
1	D	346	ARG
1	D	375	ASN
1	D	376	LYS
1	D	379	LYS
1	D	454	THR
1	D	457	MET
1	D	463	LYS
1	D	469	LYS
1	E	32	LYS
1	E	40	LEU
1	E	73	LEU
1	E	128	ARG
1	E	135	LEU
1	E	143	ARG
1	E	167	ASN
1	E	189	ASP
1	E	194	GLU
1	E	197	GLU
1	E	236	GLN
1	E	250	LYS
1	E	253	GLU
1	E	254	HIS
1	E	291	LEU
1	E	307	SER
1	E	316	LEU
1	E	329	GLU
1	E	331	ILE
1	E	346	ARG
1	E	373	ARG
1	E	376	LYS
1	E	382	ASP
1	E	409	ARG
1	E	417	LEU
1	E	424	LYS
1	E	434	ILE
1	E	446	ARG
1	E	454	THR
1	E	457	MET
1	E	467	SER
1	E	490	SER
1	F	48	GLN
1	F	53	GLN

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Mol	Chain	Res	Type
1	F	89	GLU
1	F	91	LEU
1	F	135	LEU
1	F	143	ARG
1	F	167	ASN
1	F	168	ILE
1	F	184	SER
1	F	194	GLU
1	F	196	LYS
1	F	210	GLN
1	F	228	LYS
1	F	250	LYS
1	F	262	ASN
1	F	270	SER
1	F	278	GLU
1	F	283	ASN
1	F	289	LYS
1	F	342	LYS
1	F	348	LYS
1	F	352	THR
1	F	366	LEU
1	F	370	LEU
1	F	409	ARG
1	F	417	LEU
1	F	420	LYS
1	F	424	LYS
1	F	436	LYS
1	F	454	THR
1	F	457	MET
1	F	458	GLN
1	F	490	SER
1	G	40	LEU
1	G	51	THR
1	G	52	GLU
1	G	53	GLN
1	G	85	ASP
1	G	104	GLN
1	G	125	LYS
1	G	129	ARG
1	G	140	VAL
1	G	145	ILE
1	G	167	ASN

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Mol	Chain	Res	Type
1	G	178	VAL
1	G	182	ILE
1	G	184	SER
1	G	185	ILE
1	G	201	LEU
1	G	219	LEU
1	G	241	LEU
1	G	253	GLU
1	G	259	LEU
1	G	266	ASP
1	G	291	LEU
1	G	306	VAL
1	G	319	LYS
1	G	323	VAL
1	G	329	GLU
1	G	342	LYS
1	G	420	LYS
1	G	422	GLN
1	G	436	LYS
1	G	463	LYS
1	G	466	GLN
1	G	485	ARG
1	H	33	LEU
1	H	48	GLN
1	H	51	THR
1	H	57	SER
1	H	80	VAL
1	H	85	ASP
1	H	88	LYS
1	H	91	LEU
1	H	126	GLN
1	H	129	ARG
1	H	135	LEU
1	H	136	ARG
1	H	147	GLU
1	H	151	GLU
1	H	157	ILE
1	H	168	ILE
1	H	177	THR
1	H	195	ASP
1	H	205	MET
1	H	225	SER

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Mol	Chain	Res	Type
1	H	242	GLN
1	H	246	ASP
1	H	252	VAL
1	H	253	GLU
1	H	270	SER
1	H	272	LEU
1	H	297	ASN
1	H	318	MET
1	H	326	LYS
1	H	329	GLU
1	H	332	ASP
1	H	334	VAL
1	H	335	ILE
1	H	338	ASN
1	H	342	LYS
1	H	349	MET
1	H	365	MET
1	H	376	LYS
1	H	378	THR
1	H	382	ASP
1	H	387	LYS
1	H	391	VAL
1	H	399	LEU
1	H	419	LYS
1	H	423	PHE
1	H	434	ILE
1	H	436	LYS
1	H	442	GLU
1	H	446	ARG
1	H	467	SER
1	H	470	ASP
1	H	472	ASP
1	H	473	VAL
1	H	478	VAL
1	H	482	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (40) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	466	GLN
1	B	53	GLN
1	B	276	GLN

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Mol	Chain	Res	Type
1	B	297	ASN
1	B	414	GLN
1	C	72	HIS
1	C	126	GLN
1	C	164	HIS
1	C	276	GLN
1	D	53	GLN
1	D	164	HIS
1	D	229	HIS
1	D	235	GLN
1	D	236	GLN
1	D	297	ASN
1	D	357	HIS
1	D	422	GLN
1	D	477	HIS
1	E	72	HIS
1	E	210	GLN
1	E	375	ASN
1	E	414	GLN
1	F	84	HIS
1	F	126	GLN
1	F	229	HIS
1	F	283	ASN
1	F	407	ASN
1	F	422	GLN
1	F	486	ASN
1	G	72	HIS
1	G	94	GLN
1	G	104	GLN
1	G	210	GLN
1	G	414	GLN
1	G	458	GLN
1	H	236	GLN
1	H	255	ASN
1	H	340	GLN
1	H	360	GLN
1	H	459	ASN

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 oligosaccharides in this entry.

5.6 Ligand geometry (i)

16 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
3	0QA	D	502	-	13,15,15	0.62	0	13,18,18	1.65	5 (38%)
2	HEM	B	501	1	50,50,50	1.92	15 (30%)	67,82,82	1.42	10 (14%)
2	HEM	H	501	1	50,50,50	1.88	8 (16%)	67,82,82	1.38	8 (11%)
3	0QA	A	502	2	13,15,15	0.44	0	13,18,18	2.25	4 (30%)
2	HEM	G	501	1	50,50,50	2.19	13 (26%)	67,82,82	1.37	9 (13%)
2	HEM	E	501	3,1	50,50,50	1.92	11 (22%)	67,82,82	1.20	6 (8%)
2	HEM	C	501	1	50,50,50	2.12	11 (22%)	67,82,82	1.42	7 (10%)
3	0QA	E	502	2	13,15,15	0.70	0	13,18,18	1.62	4 (30%)
3	0QA	F	502	2	13,15,15	0.54	0	13,18,18	1.51	2 (15%)
3	0QA	B	502	-	13,15,15	0.62	0	13,18,18	2.09	6 (46%)
3	0QA	C	502	-	13,15,15	0.61	0	13,18,18	1.64	5 (38%)
4	GOL	G	502	-	5,5,5	0.59	0	5,5,5	0.59	0
2	HEM	D	501	1	50,50,50	1.97	15 (30%)	67,82,82	1.31	5 (7%)
2	HEM	A	501	3,1	50,50,50	2.02	16 (32%)	67,82,82	1.31	5 (7%)
2	HEM	F	501	3,1	50,50,50	1.93	9 (18%)	67,82,82	1.29	7 (10%)
4	GOL	H	502	-	5,5,5	1.29	1 (20%)	5,5,5	2.74	2 (40%)

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
3	0QA	D	502	-	-	7/12/12/12	0/1/1/1
2	HEM	B	501	1	-	4/14/54/54	-
2	HEM	H	501	1	-	6/14/54/54	-
3	0QA	A	502	2	-	5/12/12/12	0/1/1/1
2	HEM	G	501	1	-	6/14/54/54	-
2	HEM	E	501	3,1	-	4/14/54/54	-
2	HEM	C	501	1	-	5/14/54/54	-
3	0QA	E	502	2	-	6/12/12/12	0/1/1/1
3	0QA	F	502	2	-	6/12/12/12	0/1/1/1
3	0QA	B	502	-	-	6/12/12/12	0/1/1/1
3	0QA	C	502	-	-	7/12/12/12	0/1/1/1
4	GOL	G	502	-	-	2/4/4/4	-
2	HEM	D	501	1	-	4/14/54/54	-
2	HEM	A	501	3,1	-	6/14/54/54	-
2	HEM	F	501	3,1	-	5/14/54/54	-
4	GOL	H	502	-	-	2/4/4/4	-

All (99) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	501	HEM	C3D-C2D	8.52	1.55	1.36
2	G	501	HEM	C3D-C2D	8.29	1.54	1.36
2	E	501	HEM	C3D-C2D	7.81	1.53	1.36
2	H	501	HEM	C3D-C2D	7.80	1.53	1.36
2	A	501	HEM	C3D-C2D	7.55	1.53	1.36
2	F	501	HEM	C3D-C2D	7.04	1.51	1.36
2	G	501	HEM	FE-NB	6.74	2.15	1.94
2	B	501	HEM	C3D-C2D	5.63	1.48	1.36
2	G	501	HEM	FE-ND	5.62	2.12	1.94
2	D	501	HEM	C3D-C2D	5.57	1.48	1.36
2	C	501	HEM	FE-ND	5.54	2.12	1.94
2	F	501	HEM	FE-ND	5.46	2.11	1.94
2	H	501	HEM	FE-ND	5.08	2.10	1.94
2	D	501	HEM	FE-ND	4.67	2.09	1.94
2	A	501	HEM	FE-ND	4.63	2.09	1.94
2	F	501	HEM	FE-NB	4.46	2.08	1.94
2	D	501	HEM	CMA-C3A	4.39	1.59	1.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	501	HEM	FE-ND	4.32	2.08	1.94
2	C	501	HEM	FE-NB	3.92	2.07	1.94
2	B	501	HEM	CMD-C2D	3.90	1.58	1.50
2	C	501	HEM	CAC-C3C	3.72	1.57	1.47
2	A	501	HEM	FE-NC	3.68	2.07	1.95
2	E	501	HEM	CAC-C3C	3.62	1.57	1.47
2	E	501	HEM	FE-NB	3.45	2.05	1.94
2	D	501	HEM	FE-NC	3.43	2.06	1.95
2	A	501	HEM	CMB-C2B	3.36	1.57	1.50
2	A	501	HEM	CMA-C3A	3.32	1.57	1.50
2	A	501	HEM	CAC-C3C	3.23	1.56	1.47
2	D	501	HEM	FE-NB	3.23	2.04	1.94
2	H	501	HEM	CAB-C3B	3.22	1.56	1.47
2	B	501	HEM	CAC-C3C	3.21	1.55	1.47
2	E	501	HEM	CAB-C3B	3.20	1.55	1.47
2	D	501	HEM	CAB-C3B	3.20	1.55	1.47
2	F	501	HEM	CAC-C3C	3.14	1.55	1.47
2	C	501	HEM	CAB-C3B	3.04	1.55	1.47
2	G	501	HEM	CAC-C3C	2.99	1.55	1.47
2	G	501	HEM	CAB-C3B	2.99	1.55	1.47
2	F	501	HEM	CMB-C2B	2.98	1.56	1.50
2	E	501	HEM	FE-ND	2.95	2.04	1.94
2	G	501	HEM	CMB-C2B	2.94	1.56	1.50
2	B	501	HEM	CMB-C2B	2.90	1.56	1.50
2	G	501	HEM	C1B-NB	-2.90	1.35	1.40
2	C	501	HEM	CMA-C3A	2.90	1.56	1.50
2	H	501	HEM	FE-NC	2.89	2.04	1.95
2	B	501	HEM	CMC-C2C	2.84	1.56	1.50
2	D	501	HEM	CAC-C3C	2.73	1.54	1.47
2	H	501	HEM	CAC-C3C	2.69	1.54	1.47
2	F	501	HEM	CAB-C3B	2.67	1.54	1.47
2	H	501	HEM	C2A-C3A	-2.66	1.32	1.38
2	H	501	HEM	CMB-C2B	2.65	1.56	1.50
2	E	501	HEM	CMA-C3A	2.61	1.56	1.50
2	A	501	HEM	CMD-C2D	2.60	1.56	1.50
2	E	501	HEM	CMB-C2B	2.57	1.56	1.50
2	C	501	HEM	CMD-C2D	2.57	1.56	1.50
2	E	501	HEM	FE-NA	2.56	2.03	1.95
2	D	501	HEM	CMD-C2D	2.54	1.56	1.50
2	B	501	HEM	CHC-C4B	-2.54	1.33	1.39
2	B	501	HEM	C3C-C2C	-2.53	1.32	1.37
2	B	501	HEM	C2A-C3A	-2.52	1.32	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	501	HEM	C1B-NB	-2.52	1.35	1.40
2	F	501	HEM	CMD-C2D	2.52	1.55	1.50
2	B	501	HEM	CAA-C2A	2.51	1.57	1.51
2	B	501	HEM	CAB-C3B	2.46	1.54	1.47
2	D	501	HEM	CMC-C2C	2.44	1.55	1.50
2	A	501	HEM	CMC-C2C	2.42	1.55	1.50
2	F	501	HEM	CMC-C2C	2.42	1.55	1.50
2	B	501	HEM	C1B-NB	-2.42	1.36	1.40
2	A	501	HEM	CAB-C3B	2.37	1.53	1.47
2	D	501	HEM	C4D-ND	-2.35	1.36	1.40
2	D	501	HEM	CMB-C2B	2.32	1.55	1.50
2	H	501	HEM	CMD-C2D	2.30	1.55	1.50
2	D	501	HEM	C3C-C2C	-2.29	1.32	1.37
2	D	501	HEM	CAA-C2A	2.28	1.57	1.51
2	B	501	HEM	CHB-C4A	-2.26	1.34	1.39
2	G	501	HEM	O2D-CGD	-2.25	1.23	1.30
2	B	501	HEM	C3B-C2B	-2.22	1.32	1.37
4	H	502	GOL	O2-C2	-2.22	1.36	1.43
2	D	501	HEM	C2A-C3A	-2.21	1.33	1.38
2	A	501	HEM	C3C-C2C	-2.21	1.32	1.37
2	C	501	HEM	C3B-C2B	-2.21	1.32	1.37
2	E	501	HEM	C1B-NB	-2.19	1.36	1.40
2	C	501	HEM	C4B-NB	-2.18	1.34	1.38
2	G	501	HEM	CMC-C2C	2.17	1.55	1.50
2	A	501	HEM	C1C-NC	-2.16	1.35	1.39
2	C	501	HEM	FE-NC	2.16	2.02	1.95
2	B	501	HEM	C4D-ND	-2.14	1.36	1.40
2	F	501	HEM	CAA-C2A	2.13	1.56	1.51
2	A	501	HEM	FE-NB	2.11	2.01	1.94
2	G	501	HEM	FE-NA	2.11	2.02	1.95
2	E	501	HEM	C1C-NC	-2.09	1.35	1.39
2	D	501	HEM	O2A-CGA	-2.09	1.23	1.30
2	A	501	HEM	O2D-CGD	-2.07	1.24	1.30
2	A	501	HEM	C4A-NA	-2.05	1.35	1.39
2	G	501	HEM	CAA-C2A	2.05	1.56	1.51
2	A	501	HEM	C2A-C3A	-2.04	1.33	1.38
2	G	501	HEM	CMA-C3A	2.03	1.54	1.50
2	E	501	HEM	CMD-C2D	2.03	1.54	1.50
2	A	501	HEM	C1B-NB	-2.02	1.36	1.40
2	G	501	HEM	CMD-C2D	2.01	1.54	1.50

All (85) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	501	HEM	C4D-ND-C1D	6.09	112.42	105.21
2	A	501	HEM	C4D-ND-C1D	4.86	110.96	105.21
4	H	502	GOL	O3-C3-C2	-4.85	88.56	110.38
3	A	502	0QA	C8-C7-C6	-4.80	104.99	113.61
3	B	502	0QA	C8-C7-C6	-4.78	105.04	113.61
2	G	501	HEM	C4D-ND-C1D	4.72	110.80	105.21
2	B	501	HEM	CMD-C2D-C1D	4.61	132.23	125.03
2	D	501	HEM	C4D-ND-C1D	4.44	110.46	105.21
3	A	502	0QA	C9-C8-C7	-4.35	100.96	111.97
2	F	501	HEM	C4D-ND-C1D	4.11	110.08	105.21
2	H	501	HEM	C4D-ND-C1D	4.09	110.05	105.21
2	E	501	HEM	C4D-ND-C1D	4.05	110.00	105.21
2	H	501	HEM	CAA-CBA-CGA	-3.83	103.50	113.67
3	D	502	0QA	C8-C7-C6	-3.69	106.99	113.61
3	C	502	0QA	C8-C7-C6	-3.69	107.00	113.61
2	B	501	HEM	C1D-C2D-C3D	-3.55	103.25	106.98
2	B	501	HEM	CBD-CAD-C3D	-3.46	102.97	112.53
4	H	502	GOL	O2-C2-C3	-3.35	95.33	109.18
2	C	501	HEM	C4C-C3C-C2C	3.30	109.68	106.81
2	B	501	HEM	C4D-ND-C1D	3.22	109.02	105.21
2	A	501	HEM	CAA-CBA-CGA	-3.21	105.16	113.67
2	F	501	HEM	CAD-C3D-C4D	3.18	130.24	124.70
2	H	501	HEM	C1D-C2D-C3D	-3.06	103.76	106.98
2	G	501	HEM	C3C-C2C-C1C	3.02	109.90	107.05
2	H	501	HEM	CHD-C4C-NC	3.00	127.72	124.45
3	B	502	0QA	C9-C8-C7	-3.00	104.36	111.97
3	E	502	0QA	C5-C4-N1	-2.99	119.05	123.50
2	G	501	HEM	CAD-C3D-C4D	2.95	129.83	124.70
2	G	501	HEM	CHC-C1C-NC	2.94	127.65	124.45
3	E	502	0QA	C3-N1-C4	2.91	121.96	116.85
2	E	501	HEM	CAA-CBA-CGA	-2.88	106.03	113.67
3	E	502	0QA	C8-C7-C6	-2.87	108.46	113.61
2	F	501	HEM	CHD-C4C-NC	2.82	127.52	124.45
2	F	501	HEM	CAA-CBA-CGA	-2.81	106.20	113.67
2	D	501	HEM	O2A-CGA-CBA	2.76	122.72	114.00
2	H	501	HEM	CBD-CAD-C3D	-2.73	104.98	112.53
3	A	502	0QA	C3-N1-C4	2.73	121.63	116.85
3	F	502	0QA	C3-N1-C4	2.72	121.62	116.85
3	F	502	0QA	C8-C7-C6	-2.71	108.75	113.61
2	D	501	HEM	C1B-NB-C4B	2.56	108.24	105.21
2	B	501	HEM	O2A-CGA-CBA	2.53	122.01	114.00
2	C	501	HEM	O2A-CGA-CBA	2.51	121.94	114.00
2	E	501	HEM	O2D-CGD-CBD	2.51	121.92	114.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	501	HEM	CHD-C1D-ND	2.50	127.11	124.42
2	C	501	HEM	O2D-CGD-CBD	2.49	121.87	114.00
2	H	501	HEM	C3B-C4B-NB	-2.48	107.69	109.47
3	B	502	0QA	C1-C5-C4	2.47	120.37	117.61
2	E	501	HEM	CAD-C3D-C4D	2.46	128.98	124.70
2	A	501	HEM	O2A-CGA-CBA	2.44	121.70	114.00
3	A	502	0QA	C5-C4-N1	-2.43	119.88	123.50
2	D	501	HEM	O2D-CGD-CBD	2.43	121.68	114.00
3	D	502	0QA	C1-C5-C4	2.42	120.31	117.61
2	B	501	HEM	O2D-CGD-CBD	2.42	121.64	114.00
3	B	502	0QA	C5-C4-N1	-2.41	119.91	123.50
3	C	502	0QA	C1-C5-C4	2.40	120.29	117.61
2	B	501	HEM	CAD-CBD-CGD	-2.40	107.30	113.67
2	G	501	HEM	C4D-C3D-C2D	-2.39	103.41	106.89
3	C	502	0QA	C3-N1-C4	2.29	120.86	116.85
3	D	502	0QA	C3-N1-C4	2.28	120.85	116.85
2	E	501	HEM	C4D-C3D-C2D	-2.27	103.59	106.89
3	B	502	0QA	C2-C1-C5	-2.27	118.14	120.36
3	B	502	0QA	C3-N1-C4	2.26	120.81	116.85
2	H	501	HEM	C2A-C1A-NA	-2.25	107.66	110.15
2	F	501	HEM	O2D-CGD-CBD	2.23	121.04	114.00
2	C	501	HEM	CBC-CAC-C3C	-2.22	116.41	127.53
2	E	501	HEM	O2D-CGD-O1D	-2.19	117.71	123.33
2	G	501	HEM	O2A-CGA-CBA	2.18	120.90	114.00
2	G	501	HEM	CHB-C4A-NA	2.18	127.81	123.86
2	F	501	HEM	C1D-C2D-C3D	-2.16	104.71	106.98
3	D	502	0QA	C2-C1-C5	-2.13	118.27	120.36
2	C	501	HEM	O1D-CGD-CBD	-2.12	116.36	123.09
2	G	501	HEM	CHC-C4B-NB	-2.12	122.14	124.42
2	D	501	HEM	O2A-CGA-O1A	-2.12	117.89	123.33
2	H	501	HEM	CAD-C3D-C4D	2.10	128.37	124.70
3	C	502	0QA	C2-C1-C5	-2.10	118.30	120.36
3	C	502	0QA	C5-C4-N1	-2.09	120.39	123.50
2	F	501	HEM	C4C-C3C-C2C	2.09	108.63	106.81
3	D	502	0QA	C5-C4-N1	-2.09	120.39	123.50
2	B	501	HEM	O1A-CGA-CBA	-2.07	116.54	123.09
3	E	502	0QA	C1-C5-C4	2.05	119.89	117.61
2	B	501	HEM	CAD-C3D-C4D	2.04	128.26	124.70
2	A	501	HEM	CBC-CAC-C3C	-2.03	117.38	127.53
2	B	501	HEM	CHA-C4D-ND	2.02	126.87	124.37
2	G	501	HEM	CHC-C4B-C3B	2.02	129.10	125.07
2	C	501	HEM	O2A-CGA-O1A	-2.00	118.18	123.33

There are no chirality outliers.

All (81) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	501	HEM	C2C-C3C-CAC-CBC
2	A	501	HEM	C4C-C3C-CAC-CBC
2	B	501	HEM	C2C-C3C-CAC-CBC
2	B	501	HEM	C4C-C3C-CAC-CBC
2	C	501	HEM	C2C-C3C-CAC-CBC
2	D	501	HEM	C2C-C3C-CAC-CBC
2	E	501	HEM	C2C-C3C-CAC-CBC
2	F	501	HEM	C2C-C3C-CAC-CBC
2	F	501	HEM	C4C-C3C-CAC-CBC
2	H	501	HEM	C2C-C3C-CAC-CBC
3	A	502	0QA	C10-N2-N3-O2
3	A	502	0QA	C8-C9-N2-N3
3	A	502	0QA	C6-C7-C8-C9
3	B	502	0QA	C10-N2-N3-O2
3	B	502	0QA	C8-C9-N2-N3
3	B	502	0QA	C6-C7-C8-C9
3	C	502	0QA	C9-N2-N3-O2
3	C	502	0QA	C8-C9-N2-N3
3	C	502	0QA	C6-C7-C8-C9
3	D	502	0QA	C9-N2-N3-O2
3	D	502	0QA	C8-C9-N2-N3
3	D	502	0QA	C6-C7-C8-C9
3	E	502	0QA	C10-N2-N3-O2
3	E	502	0QA	C9-N2-N3-O2
3	E	502	0QA	C8-C9-N2-C10
3	F	502	0QA	C9-N2-N3-O2
3	F	502	0QA	C8-C9-N2-C10
4	G	502	GOL	C1-C2-C3-O3
3	C	502	0QA	C7-C8-C9-N2
3	D	502	0QA	C7-C8-C9-N2
3	E	502	0QA	C7-C8-C9-N2
3	C	502	0QA	O1-C6-C7-C8
3	D	502	0QA	O1-C6-C7-C8
4	G	502	GOL	O2-C2-C3-O3
3	C	502	0QA	C5-C6-C7-C8
3	D	502	0QA	C5-C6-C7-C8
2	D	501	HEM	C4C-C3C-CAC-CBC
2	H	501	HEM	C4C-C3C-CAC-CBC
4	H	502	GOL	O2-C2-C3-O3
3	B	502	0QA	C5-C6-C7-C8

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Mol	Chain	Res	Type	Atoms
3	F	502	0QA	C7-C8-C9-N2
3	B	502	0QA	O1-C6-C7-C8
2	C	501	HEM	C4C-C3C-CAC-CBC
2	E	501	HEM	C4C-C3C-CAC-CBC
3	A	502	0QA	C5-C6-C7-C8
3	F	502	0QA	C8-C9-N2-N3
4	H	502	GOL	C1-C2-C3-O3
3	B	502	0QA	C7-C8-C9-N2
3	A	502	0QA	O1-C6-C7-C8
3	E	502	0QA	C5-C6-C7-C8
3	F	502	0QA	C5-C6-C7-C8
2	C	501	HEM	CAA-CBA-CGA-O1A
2	E	501	HEM	CAA-CBA-CGA-O1A
2	C	501	HEM	CAA-CBA-CGA-O2A
2	D	501	HEM	CAA-CBA-CGA-O1A
2	E	501	HEM	CAA-CBA-CGA-O2A
2	A	501	HEM	CAA-CBA-CGA-O1A
2	B	501	HEM	CAA-CBA-CGA-O2A
2	H	501	HEM	CAA-CBA-CGA-O1A
2	H	501	HEM	CAD-CBD-CGD-O1D
2	F	501	HEM	CAA-CBA-CGA-O1A
2	B	501	HEM	CAA-CBA-CGA-O1A
2	A	501	HEM	CAA-CBA-CGA-O2A
2	D	501	HEM	CAA-CBA-CGA-O2A
2	H	501	HEM	CAD-CBD-CGD-O2D
2	F	501	HEM	CAA-CBA-CGA-O2A
2	H	501	HEM	CAA-CBA-CGA-O2A
3	E	502	0QA	O1-C6-C7-C8
3	F	502	0QA	O1-C6-C7-C8
2	G	501	HEM	C4C-C3C-CAC-CBC
2	G	501	HEM	CAA-CBA-CGA-O1A
2	G	501	HEM	CAD-CBD-CGD-O2D
2	G	501	HEM	CAA-CBA-CGA-O2A
2	A	501	HEM	CAD-CBD-CGD-O2D
2	C	501	HEM	CAD-CBD-CGD-O2D
2	G	501	HEM	C2C-C3C-CAC-CBC
2	G	501	HEM	CAD-CBD-CGD-O1D
3	C	502	0QA	C8-C9-N2-C10
3	D	502	0QA	C8-C9-N2-C10
2	F	501	HEM	CAD-CBD-CGD-O2D
2	A	501	HEM	CAD-CBD-CGD-O1D

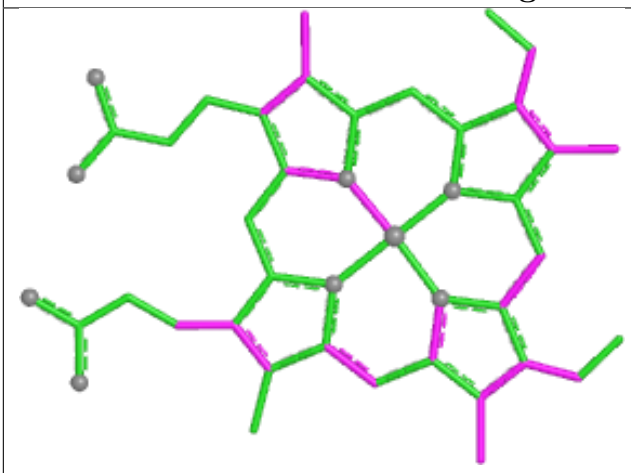
There are no ring outliers.

15 monomers are involved in 56 short contacts:

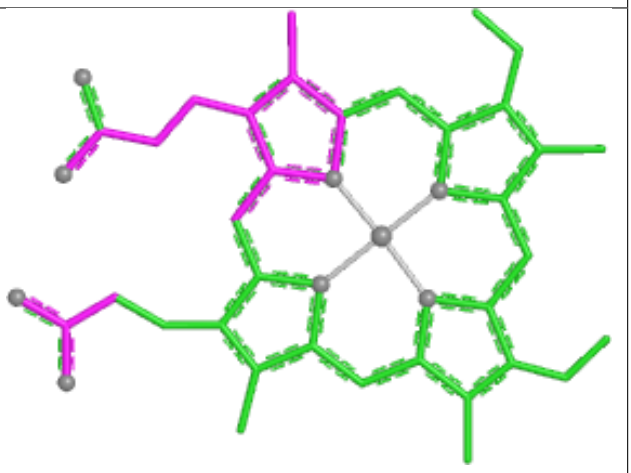
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	502	0QA	5	0
2	B	501	HEM	1	0
2	H	501	HEM	6	0
3	A	502	0QA	4	0
2	G	501	HEM	6	0
2	E	501	HEM	3	0
2	C	501	HEM	3	0
3	E	502	0QA	3	0
3	F	502	0QA	9	0
3	B	502	0QA	5	0
3	C	502	0QA	4	0
4	G	502	GOL	2	0
2	D	501	HEM	2	0
2	A	501	HEM	2	0
2	F	501	HEM	8	0

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

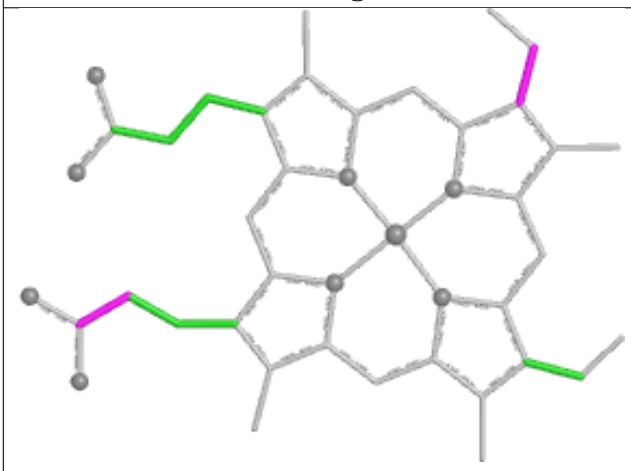
Ligand HEM B 501



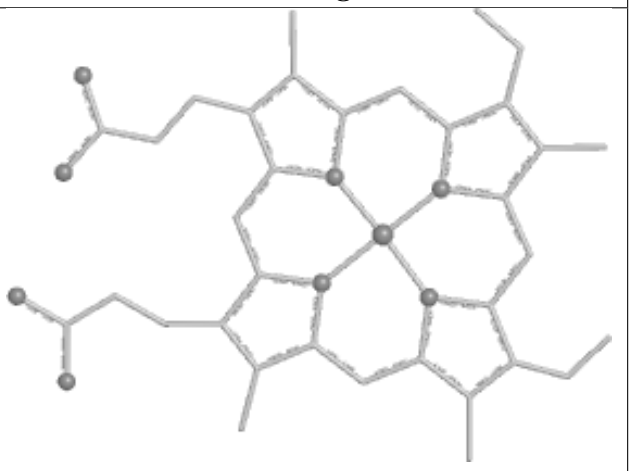
Bond lengths



Bond angles

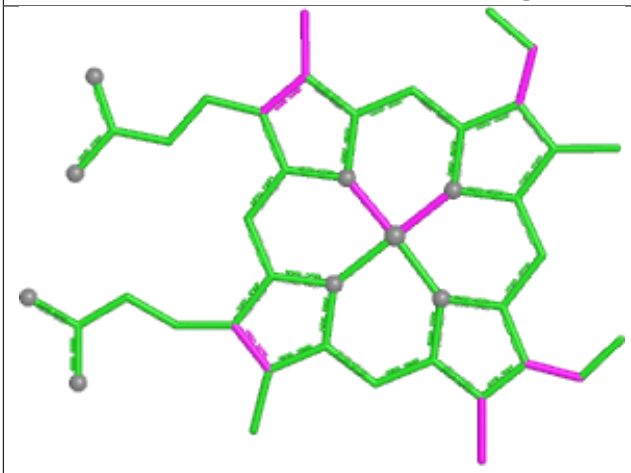


Torsions



Rings

Ligand HEM H 501



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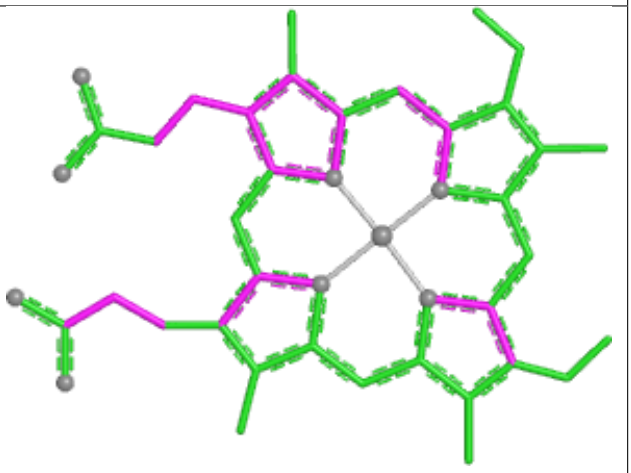

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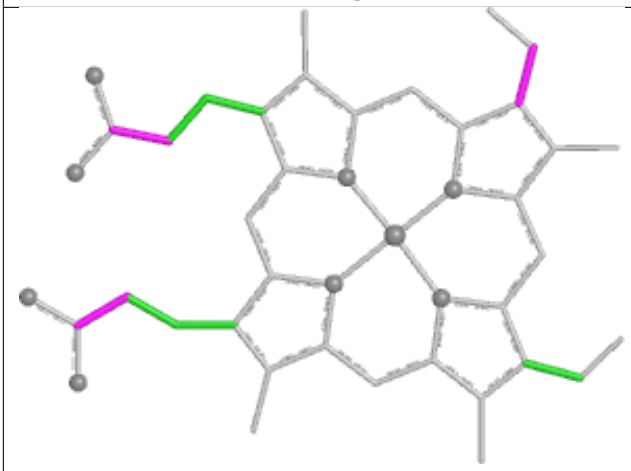

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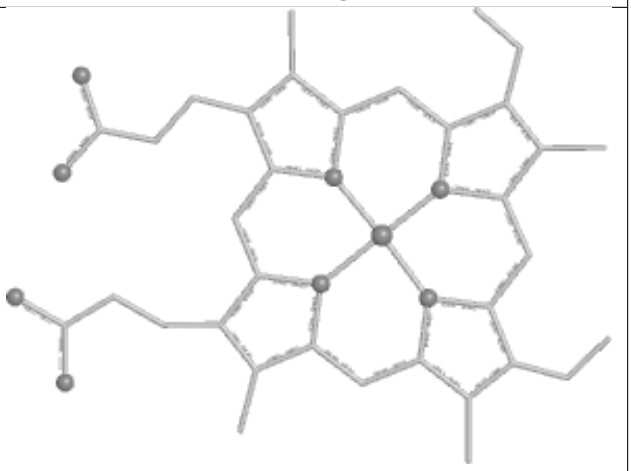
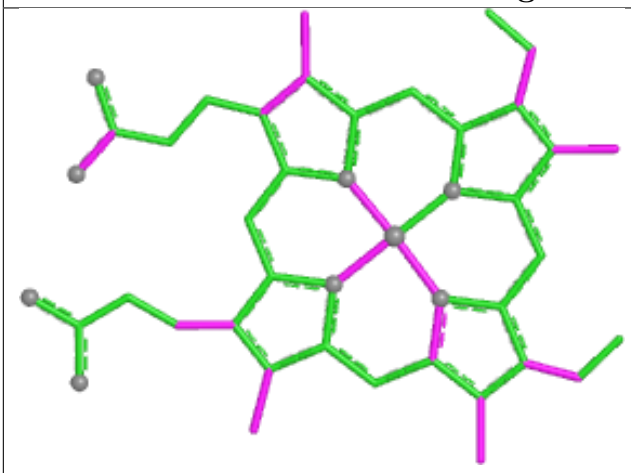


Rings

Ligand HEM G 501



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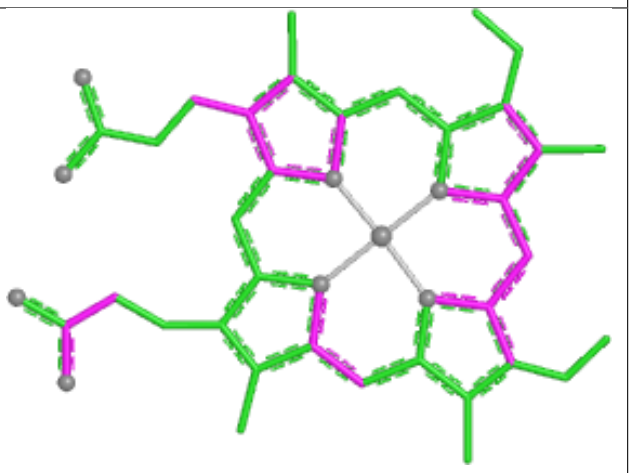

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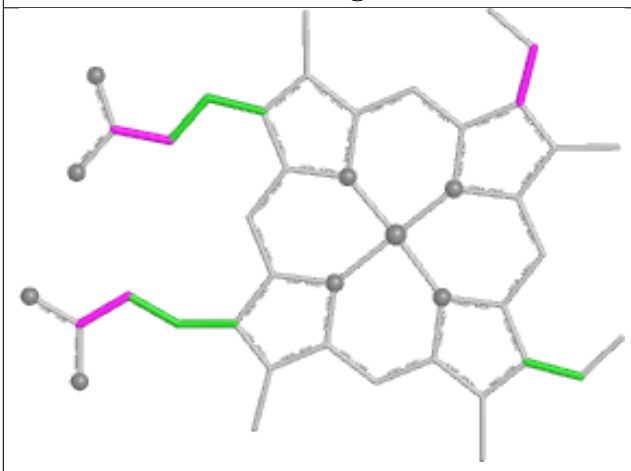

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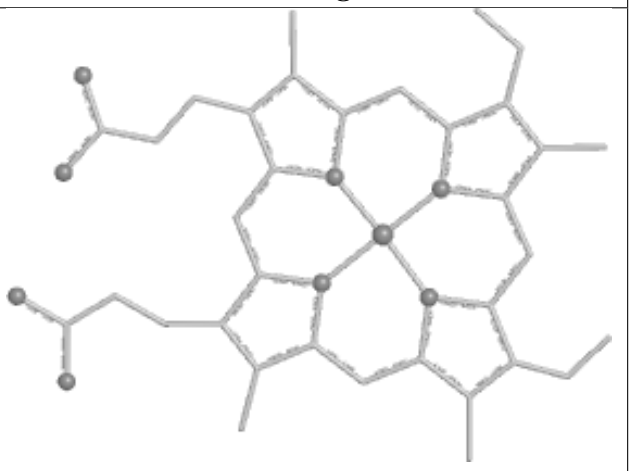

Rings

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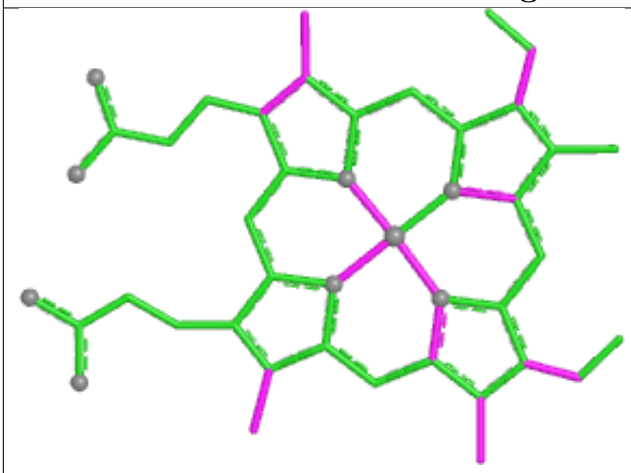

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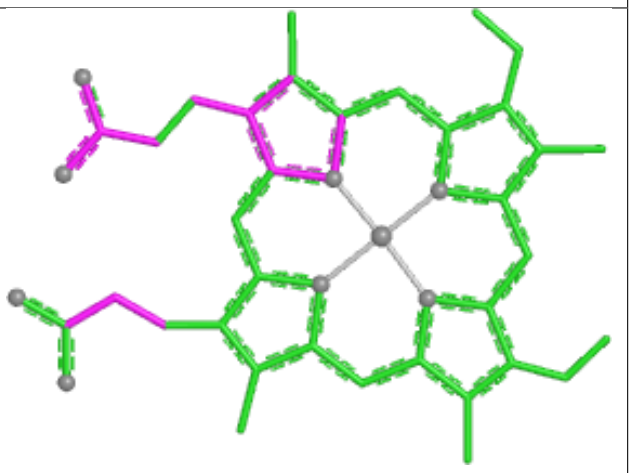

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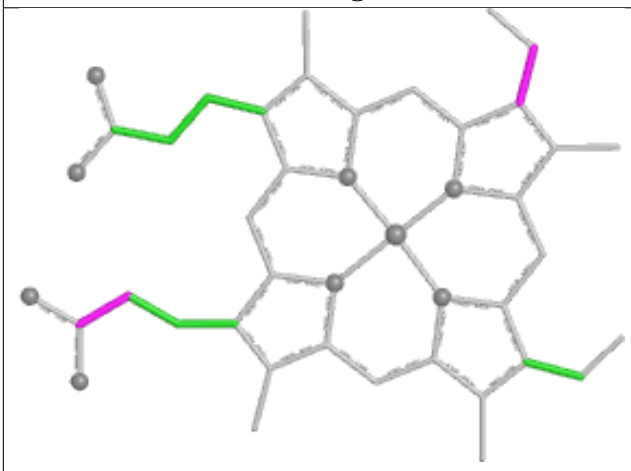

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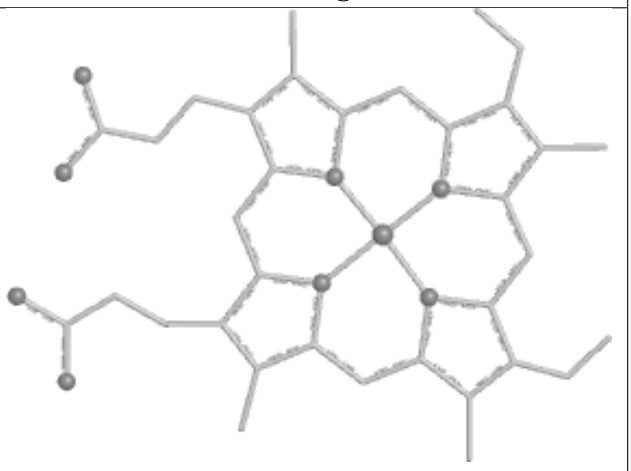
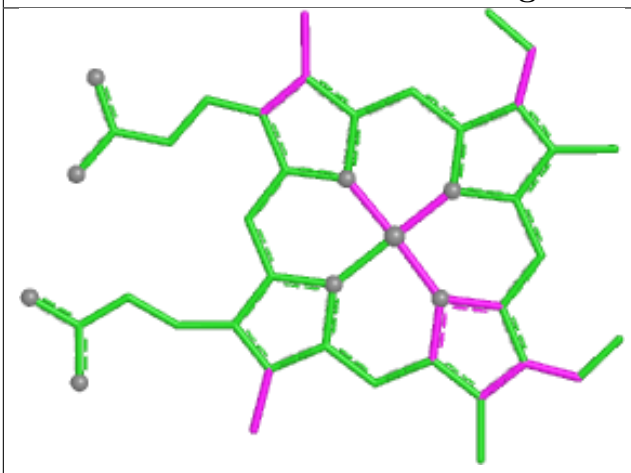


Rings

Ligand HEM C 501



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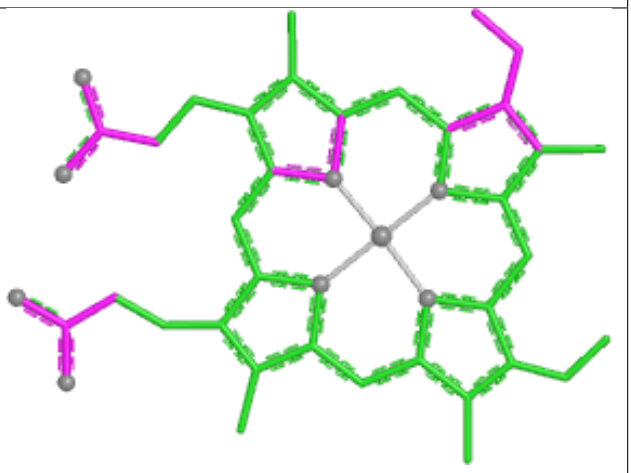

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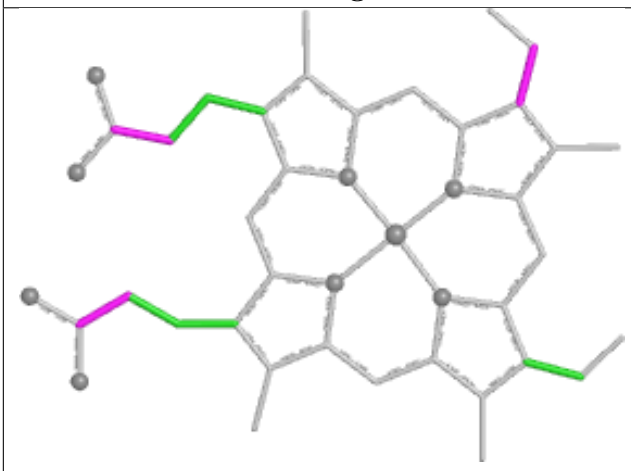

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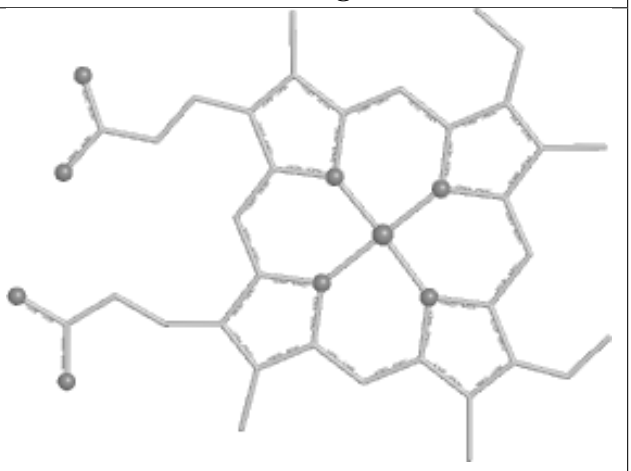

Rings

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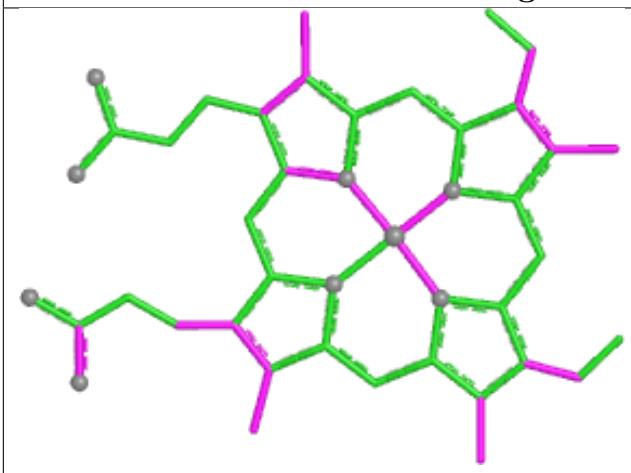

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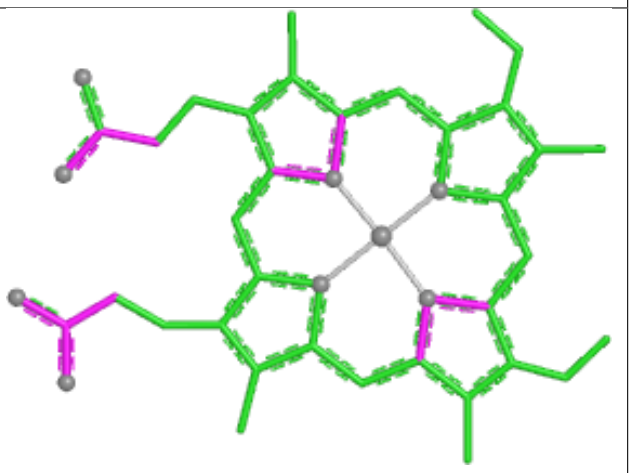

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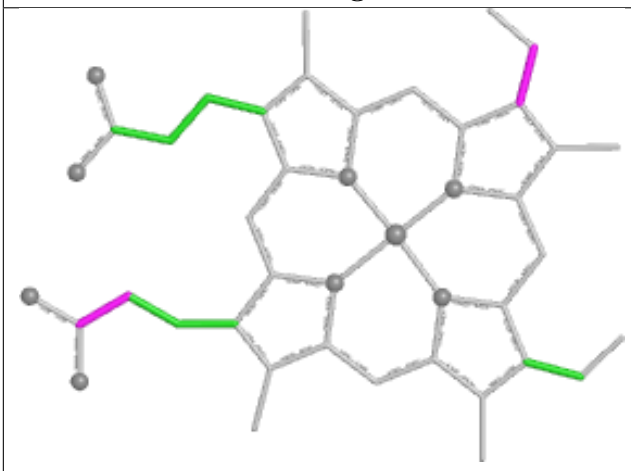

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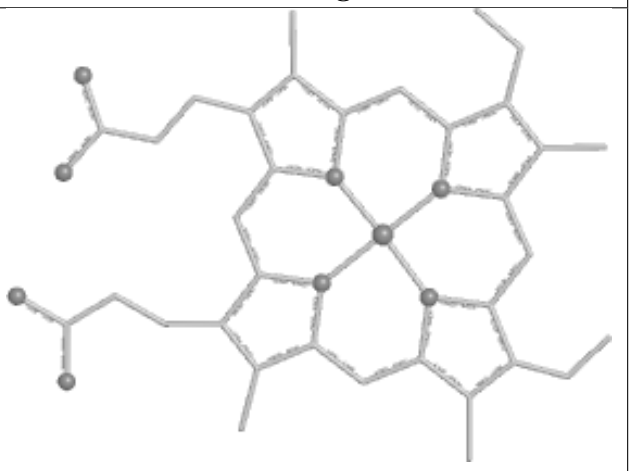
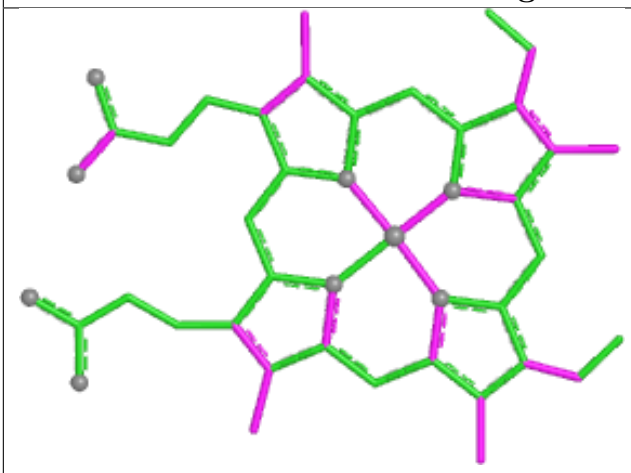


Rings

Ligand HEM A 501



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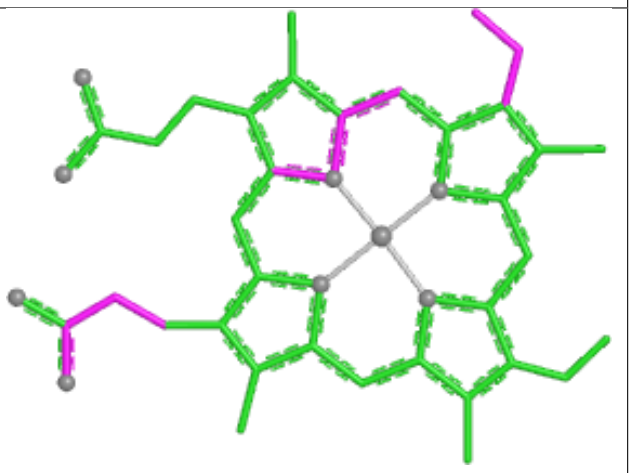
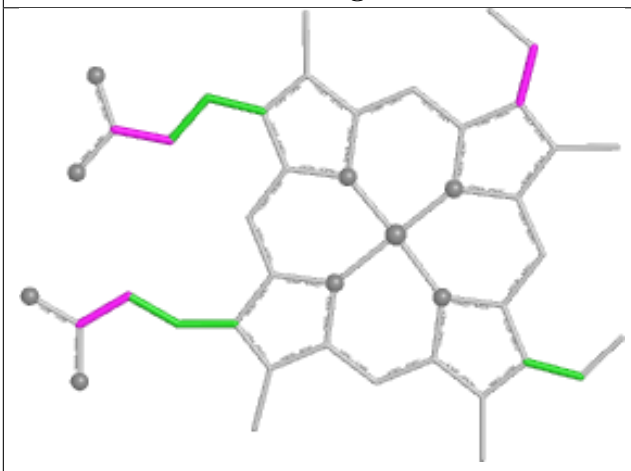


Bond angles



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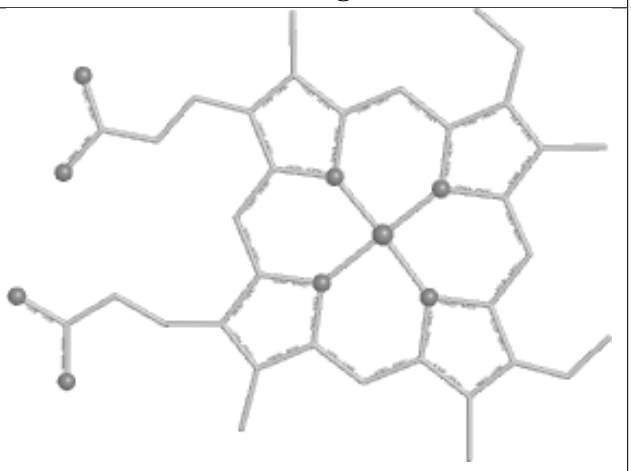

Rings

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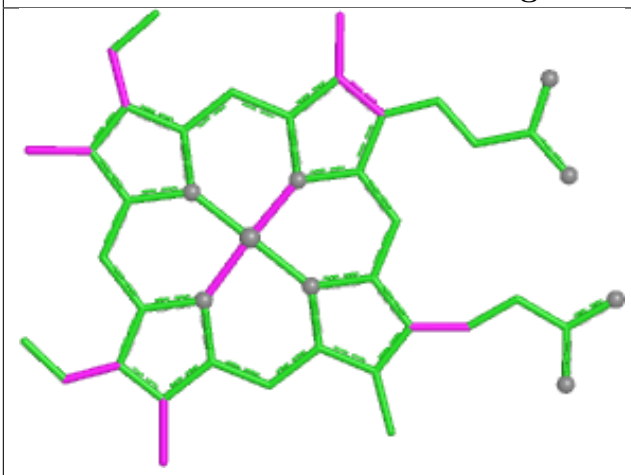

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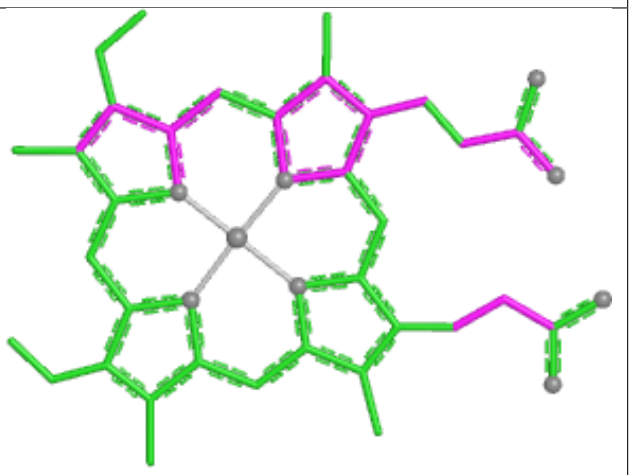

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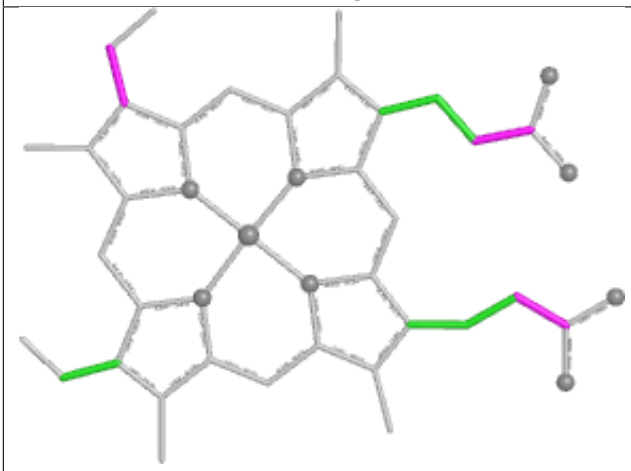
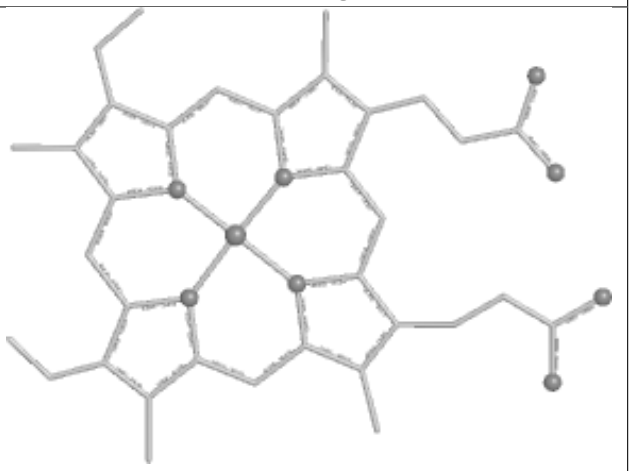


Torsions



Rings

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} 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	464/476 (97%)	-0.02	1 (0%) 91 92	20, 35, 53, 63	2 (0%)
1	B	464/476 (97%)	-0.05	4 (0%) 81 84	15, 35, 54, 62	1 (0%)
1	C	464/476 (97%)	-0.15	4 (0%) 81 84	16, 33, 48, 58	2 (0%)
1	D	464/476 (97%)	-0.03	1 (0%) 91 92	15, 35, 55, 63	1 (0%)
1	E	464/476 (97%)	0.45	19 (4%) 41 47	26, 48, 70, 78	1 (0%)
1	F	464/476 (97%)	1.05	60 (12%) 7 9	27, 60, 85, 91	1 (0%)
1	G	463/476 (97%)	1.10	74 (15%) 5 5	29, 59, 78, 88	0
1	H	459/476 (96%)	1.48	128 (27%) 1 1	28, 71, 92, 96	1 (0%)
All	All	3706/3808 (97%)	0.48	291 (7%) 18 21	15, 44, 81, 96	9 (0%)

All (291) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	H	471	ILE	7.1
1	G	471	ILE	5.7
1	H	462	PHE	5.1
1	H	273	ILE	4.9
1	H	133	ALA	4.8
1	H	138	PHE	4.6
1	H	416	PHE	4.5
1	G	408	PRO	4.4
1	H	168	ILE	4.3
1	G	173	PHE	4.2
1	F	168	ILE	4.1
1	F	140	VAL	4.1
1	H	468	PRO	4.1
1	F	247	PHE	4.1
1	G	140	VAL	3.9
1	H	406	SER	3.9

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Mol	Chain	Res	Type	RSRZ
1	F	172	PHE	3.8
1	G	475	PRO	3.8
1	H	272	LEU	3.6
1	H	271	PHE	3.6
1	H	259	LEU	3.6
1	E	273	ILE	3.6
1	H	453	PHE	3.5
1	H	261	PRO	3.5
1	D	189	ASP	3.5
1	H	267	PHE	3.5
1	H	491	PHE	3.5
1	G	317	LEU	3.5
1	G	478	VAL	3.4
1	H	408	PRO	3.4
1	H	493	PRO	3.4
1	F	252	VAL	3.4
1	H	334	VAL	3.4
1	H	335	ILE	3.4
1	G	209	PHE	3.4
1	G	491	PHE	3.4
1	H	144	GLY	3.4
1	F	491	PHE	3.4
1	H	264	PRO	3.4
1	H	398	VAL	3.4
1	H	145	ILE	3.3
1	F	191	PHE	3.3
1	H	473	VAL	3.3
1	F	288	LEU	3.3
1	F	492	LEU	3.3
1	G	468	PRO	3.3
1	G	323	VAL	3.3
1	H	160	LEU	3.2
1	H	173	PHE	3.2
1	F	249	ALA	3.2
1	F	273	ILE	3.2
1	H	405	PHE	3.2
1	E	166	ALA	3.2
1	F	166	ALA	3.2
1	H	153	ALA	3.2
1	H	157	ILE	3.2
1	F	267	PHE	3.2
1	G	462	PHE	3.1

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Mol	Chain	Res	Type	RSRZ
1	H	139	GLY	3.1
1	H	135	LEU	3.1
1	H	429	PHE	3.1
1	H	413	PRO	3.1
1	H	315	LEU	3.1
1	F	271	PHE	3.0
1	H	317	LEU	3.0
1	H	492	LEU	3.0
1	E	343	PHE	3.0
1	H	303	THR	3.0
1	G	479	GLY	3.0
1	G	159	ALA	3.0
1	G	168	ILE	3.0
1	H	488	THR	3.0
1	H	363	GLY	3.0
1	G	282	PRO	3.0
1	H	53	GLN	2.9
1	H	351	TYR	2.9
1	H	423	PHE	2.9
1	H	399	LEU	2.9
1	H	149	ILE	2.9
1	G	423	PHE	2.9
1	H	474	SER	2.9
1	H	327	VAL	2.9
1	G	188	GLY	2.8
1	H	350	PRO	2.8
1	F	256	GLN	2.8
1	H	481	ALA	2.8
1	H	87	VAL	2.8
1	E	31	GLY	2.8
1	H	98	PHE	2.8
1	H	347	ALA	2.8
1	H	309	THR	2.8
1	H	417	LEU	2.8
1	F	462	PHE	2.8
1	G	138	PHE	2.8
1	H	155	PHE	2.8
1	H	323	VAL	2.8
1	H	171	THR	2.8
1	H	331	ILE	2.8
1	H	188	GLY	2.8
1	F	347	ALA	2.8

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Mol	Chain	Res	Type	RSRZ
1	F	488	THR	2.7
1	G	335	ILE	2.7
1	H	472	ASP	2.7
1	F	165	GLY	2.7
1	H	137	GLY	2.7
1	G	492	LEU	2.7
1	G	273	ILE	2.7
1	G	420	LYS	2.7
1	H	489	MET	2.7
1	F	156	LEU	2.7
1	E	421	GLY	2.7
1	G	137	GLY	2.7
1	H	421	GLY	2.7
1	E	493	PRO	2.7
1	H	316	LEU	2.7
1	G	487	TYR	2.7
1	H	487	TYR	2.7
1	H	343	PHE	2.7
1	E	420	LYS	2.7
1	G	375	ASN	2.7
1	H	158	ASP	2.7
1	H	478	VAL	2.7
1	H	170	PRO	2.7
1	H	166	ALA	2.6
1	G	480	PHE	2.6
1	G	421	GLY	2.6
1	E	492	LEU	2.6
1	G	177	THR	2.6
1	H	454	THR	2.6
1	F	318	MET	2.6
1	H	321	PRO	2.6
1	H	341	PRO	2.6
1	E	468	PRO	2.6
1	F	264	PRO	2.6
1	F	493	PRO	2.6
1	G	170	PRO	2.6
1	F	206	LEU	2.6
1	G	206	LEU	2.6
1	G	329	GLU	2.6
1	F	490	SER	2.6
1	F	343	PHE	2.5
1	H	482	THR	2.5

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Mol	Chain	Res	Type	RSRZ
1	H	88	LYS	2.5
1	G	165	GLY	2.5
1	G	484	PRO	2.5
1	G	304	GLU	2.5
1	G	488	THR	2.5
1	F	198	PHE	2.5
1	B	409	ARG	2.5
1	F	272	LEU	2.5
1	H	86	ALA	2.5
1	F	261	PRO	2.5
1	H	352	THR	2.4
1	F	173	PHE	2.4
1	H	33	LEU	2.4
1	F	255	ASN	2.4
1	G	218	GLN	2.4
1	F	143	ARG	2.4
1	G	481	ALA	2.4
1	H	52	GLU	2.4
1	G	157	ILE	2.4
1	H	383	PHE	2.4
1	H	469	LYS	2.4
1	H	156	LEU	2.4
1	H	449	LEU	2.4
1	G	313	GLY	2.4
1	G	284	THR	2.4
1	G	142	LYS	2.4
1	H	438	TYR	2.4
1	A	375	ASN	2.4
1	F	124	ALA	2.4
1	G	213	ALA	2.4
1	G	406	SER	2.4
1	G	474	SER	2.4
1	E	453	PHE	2.4
1	G	187	PHE	2.4
1	H	404	PHE	2.4
1	H	456	ILE	2.4
1	H	55	TYR	2.3
1	H	65	TYR	2.3
1	F	139	GLY	2.3
1	H	455	THR	2.3
1	G	155	PHE	2.3
1	H	247	PHE	2.3

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Mol	Chain	Res	Type	RSRZ
1	H	268	ILE	2.3
1	H	411	PHE	2.3
1	H	136	ARG	2.3
1	F	246	ASP	2.3
1	H	428	ALA	2.3
1	G	51	THR	2.3
1	F	411	PHE	2.3
1	F	450	PHE	2.3
1	G	178	VAL	2.3
1	H	186	VAL	2.3
1	H	82	CYS	2.3
1	F	262	ASN	2.3
1	G	493	PRO	2.3
1	H	447	MET	2.3
1	G	359	ILE	2.3
1	F	473	VAL	2.3
1	G	327	VAL	2.3
1	H	362	PHE	2.3
1	G	160	LEU	2.3
1	H	419	LYS	2.3
1	F	472	ASP	2.3
1	F	457	MET	2.3
1	H	365	MET	2.3
1	F	240	GLU	2.3
1	F	199	LEU	2.2
1	G	334	VAL	2.3
1	G	460	PHE	2.2
1	H	187	PHE	2.2
1	H	288	LEU	2.2
1	H	249	ALA	2.2
1	E	140	VAL	2.2
1	F	187	PHE	2.2
1	H	92	VAL	2.2
1	B	375	ASN	2.2
1	G	162	GLY	2.2
1	H	70	THR	2.2
1	H	177	THR	2.2
1	F	263	SER	2.2
1	G	316	LEU	2.2
1	G	211	PHE	2.2
1	H	480	PHE	2.2
1	B	32	LYS	2.2

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Mol	Chain	Res	Type	RSRZ
1	C	422	GLN	2.2
1	F	376	LYS	2.2
1	F	153	ALA	2.2
1	H	90	ALA	2.2
1	H	325	ALA	2.2
1	F	193	TYR	2.2
1	E	339	ARG	2.2
1	H	427	ASP	2.2
1	H	460	PHE	2.2
1	E	261	PRO	2.2
1	H	402	PRO	2.2
1	C	215	SER	2.2
1	G	482	THR	2.2
1	F	417	LEU	2.1
1	B	382	ASP	2.1
1	G	283	ASN	2.1
1	E	419	LYS	2.1
1	G	411	PHE	2.1
1	H	465	PRO	2.1
1	H	369	GLY	2.1
1	G	193	TYR	2.1
1	G	419	LYS	2.1
1	G	456	ILE	2.1
1	H	434	ILE	2.1
1	F	189	ASP	2.1
1	H	422	GLN	2.1
1	G	141	GLY	2.1
1	G	212	THR	2.1
1	H	134	THR	2.1
1	H	426	SER	2.1
1	E	259	LEU	2.1
1	E	451	LEU	2.1
1	F	259	LEU	2.1
1	F	281	ASN	2.1
1	F	254	HIS	2.1
1	H	357	HIS	2.1
1	G	413	PRO	2.1
1	F	141	GLY	2.1
1	G	144	GLY	2.1
1	H	162	GLY	2.1
1	C	280	LYS	2.1
1	E	353	GLU	2.1

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Mol	Chain	Res	Type	RSRZ
1	H	330	GLU	2.1
1	F	160	LEU	2.1
1	C	375	ASN	2.1
1	F	145	ILE	2.1
1	F	268	ILE	2.1
1	G	145	ILE	2.1
1	H	483	ILE	2.1
1	E	264	PRO	2.1
1	F	155	PHE	2.1
1	G	404	PHE	2.1
1	H	333	ARG	2.1
1	G	463	LYS	2.0
1	H	263	SER	2.0
1	F	159	ALA	2.0
1	E	135	LEU	2.0
1	G	321	PRO	2.0
1	H	193	TYR	2.0
1	G	461	ARG	2.0
1	H	336	GLY	2.0
1	H	420	LYS	2.0
1	F	278	GLU	2.0
1	G	489	MET	2.0
1	H	354	ALA	2.0

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

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

6.3 Carbohydrates (i)

There are no oligosaccharides in this entry.

6.4 Ligands (i)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} 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.

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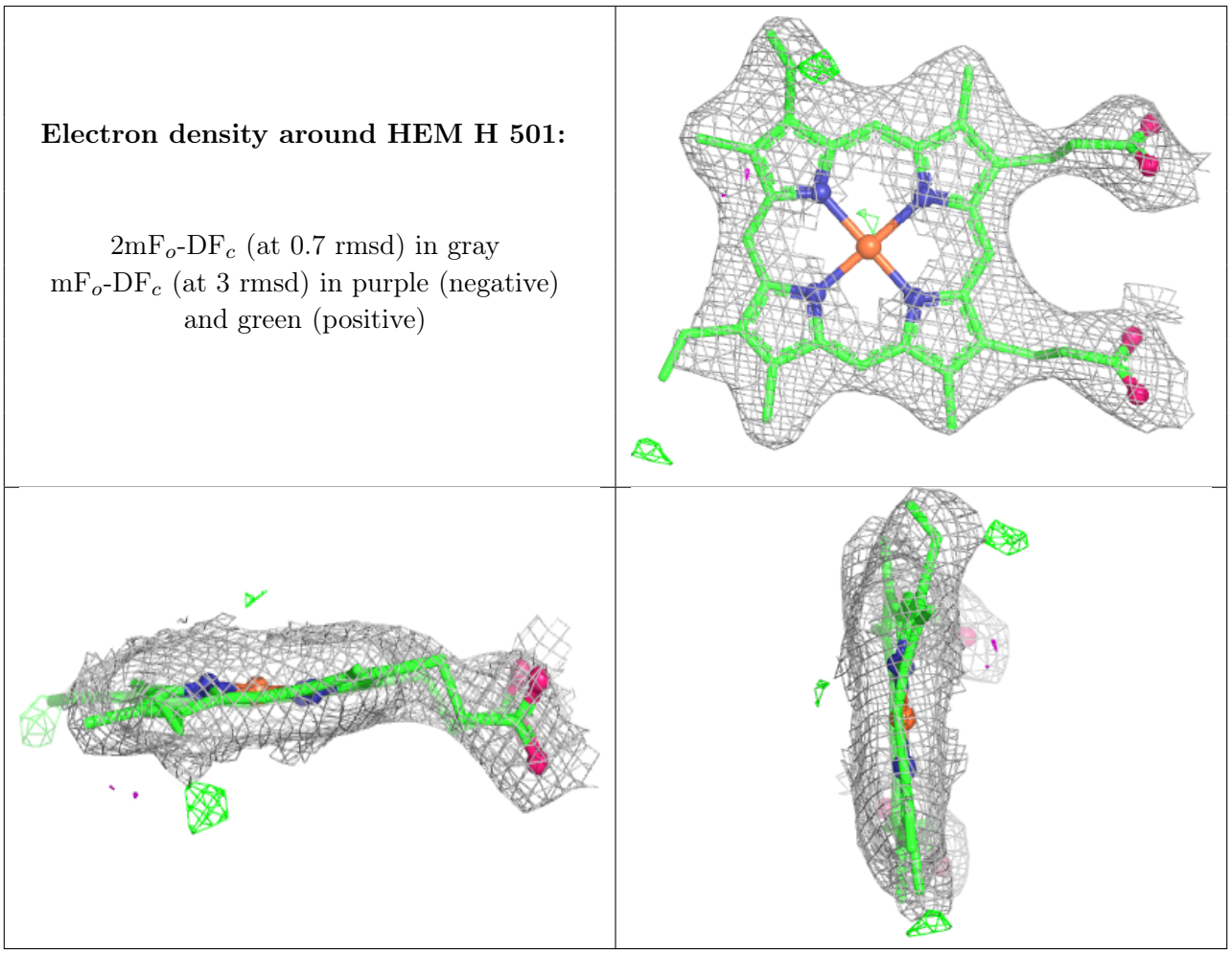
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	GOL	G	502	6/6	0.81	0.14	54,56,58,58	0
3	0QA	C	502	15/15	0.87	0.16	48,55,58,67	0
3	0QA	A	502	15/15	0.89	0.16	57,62,71,72	0
3	0QA	B	502	15/15	0.90	0.13	42,51,59,59	0
4	GOL	H	502	6/6	0.91	0.17	33,36,42,50	0
3	0QA	E	502	15/15	0.92	0.17	71,74,76,78	0
3	0QA	F	502	15/15	0.92	0.16	84,85,86,87	0
3	0QA	D	502	15/15	0.93	0.14	48,55,58,67	0
2	HEM	H	501	43/43	0.96	0.10	47,52,60,63	0
2	HEM	F	501	43/43	0.97	0.09	37,49,54,59	0
2	HEM	E	501	43/43	0.98	0.07	30,35,37,39	0
2	HEM	A	501	43/43	0.98	0.07	21,27,31,36	0
2	HEM	G	501	43/43	0.98	0.08	33,38,43,47	0
2	HEM	B	501	43/43	0.98	0.07	18,25,29,32	0
2	HEM	C	501	43/43	0.98	0.06	12,22,27,28	0
2	HEM	D	501	43/43	0.98	0.07	18,26,29,30	0

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

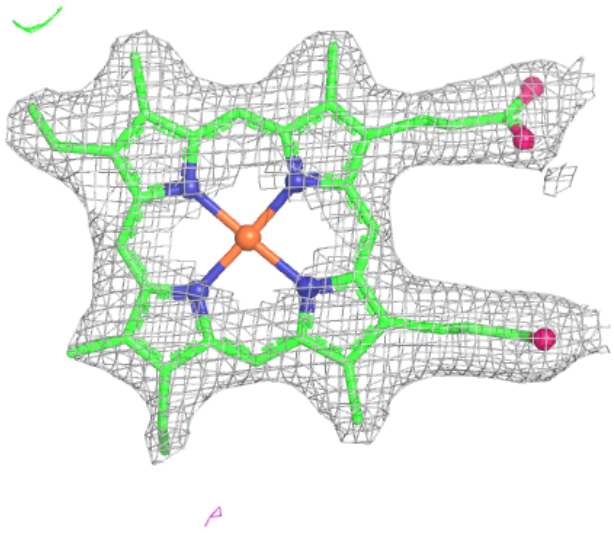
Electron density around HEM H 501:

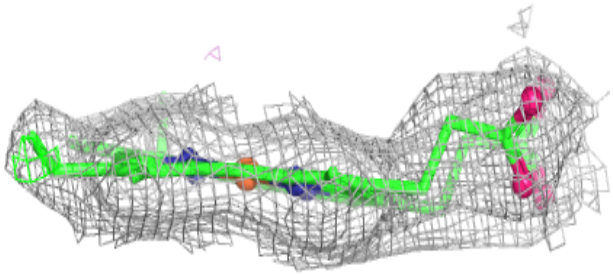
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

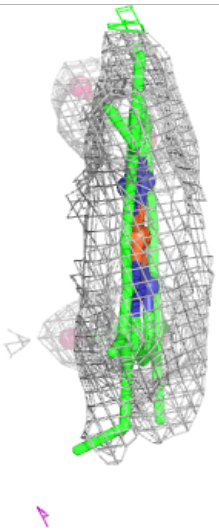


Electron density around HEM F 501:

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

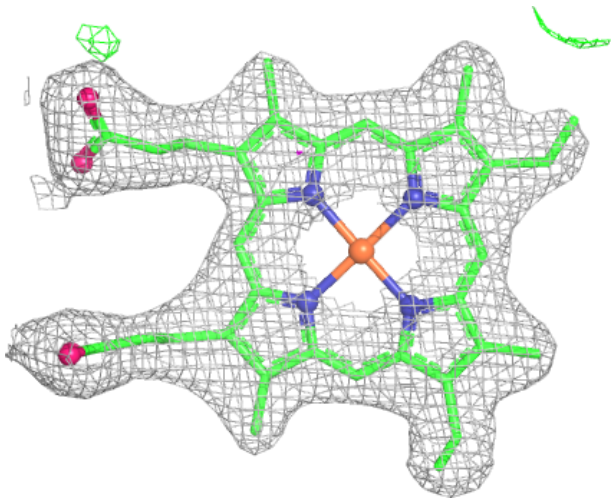


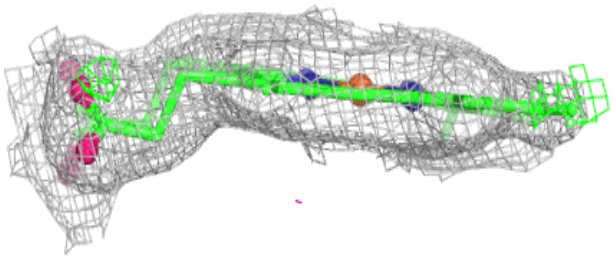


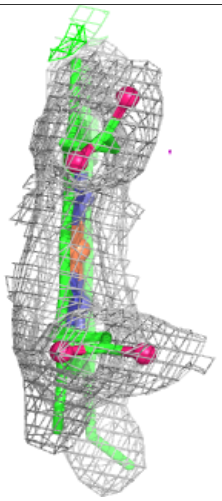


Electron density around HEM E 501:

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

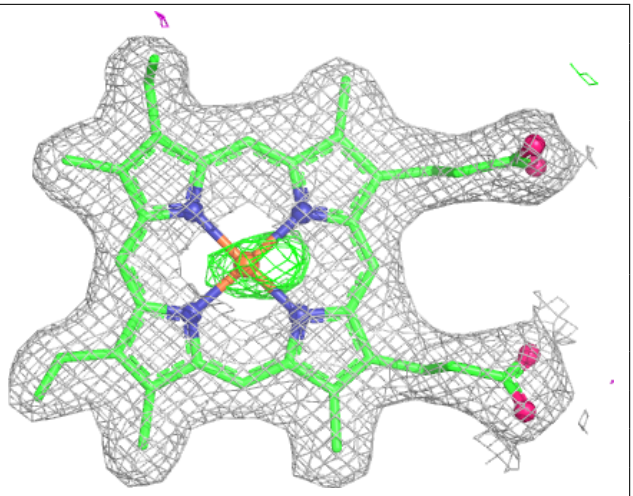


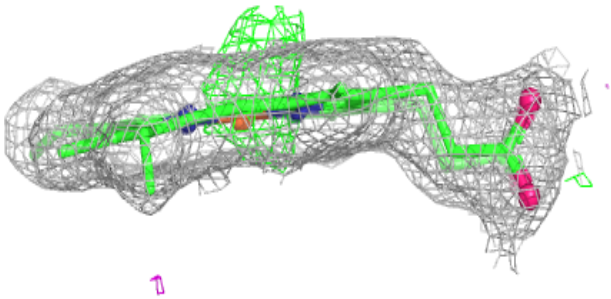


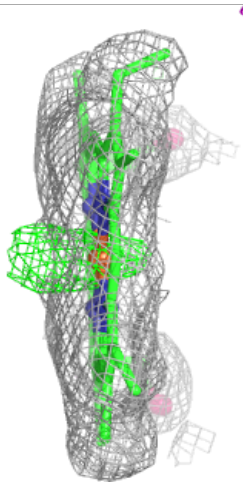


Electron density around HEM A 501:

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

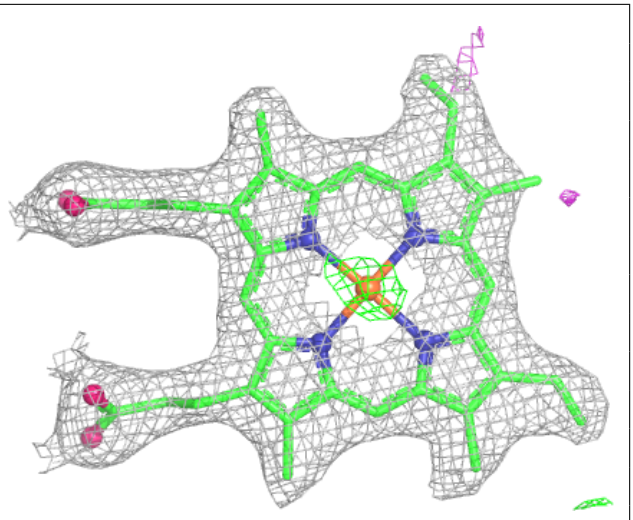


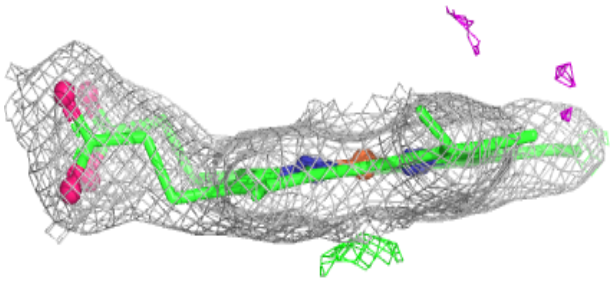


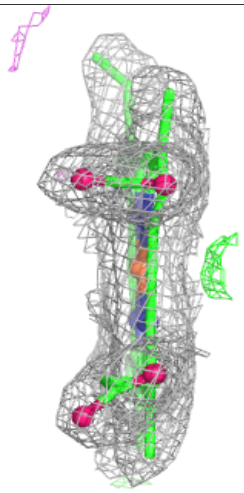


Electron density around HEM G 501:

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

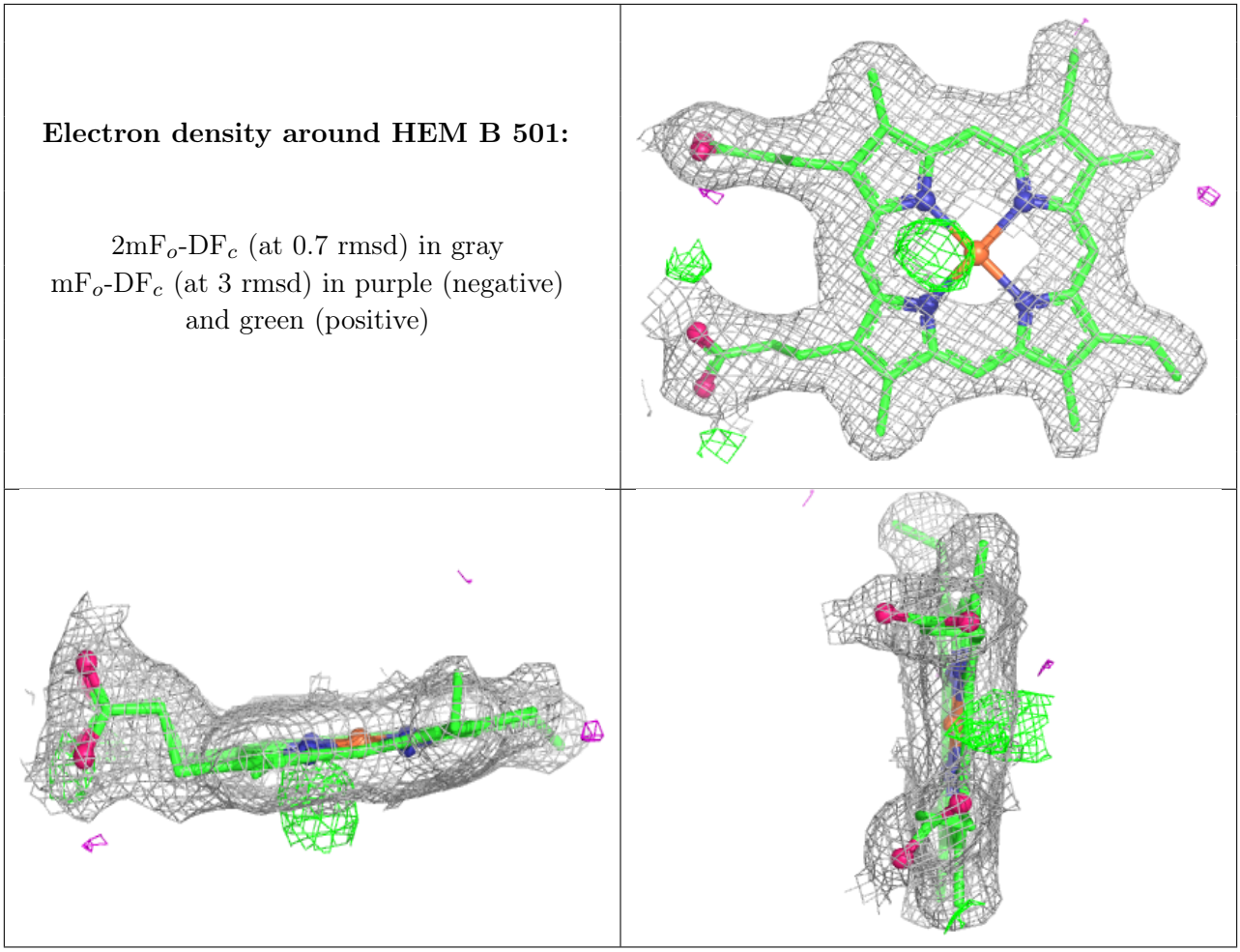






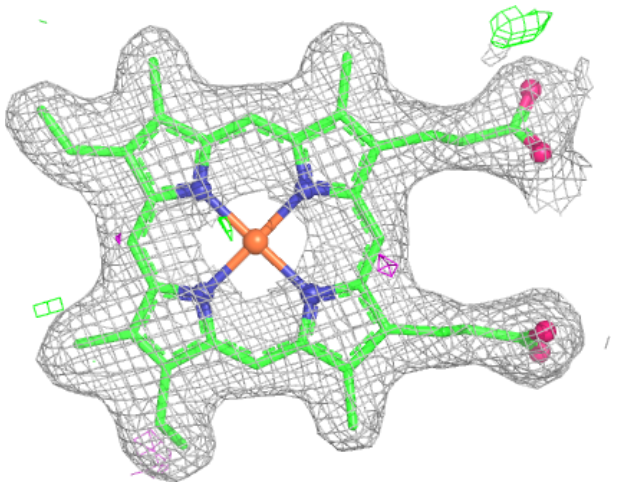
Electron density around HEM B 501:

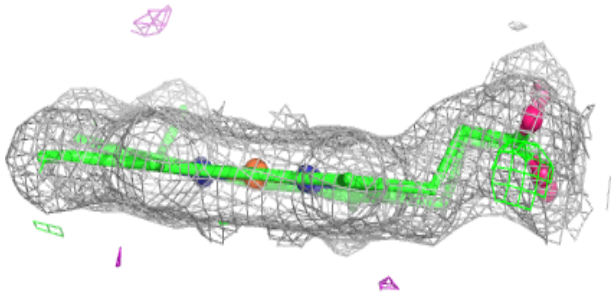
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

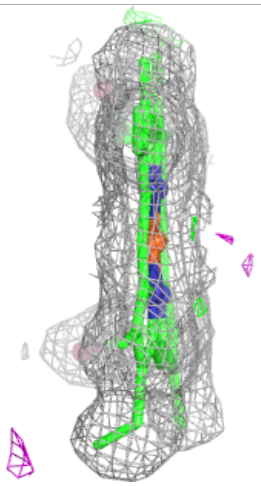


Electron density around HEM C 501:

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

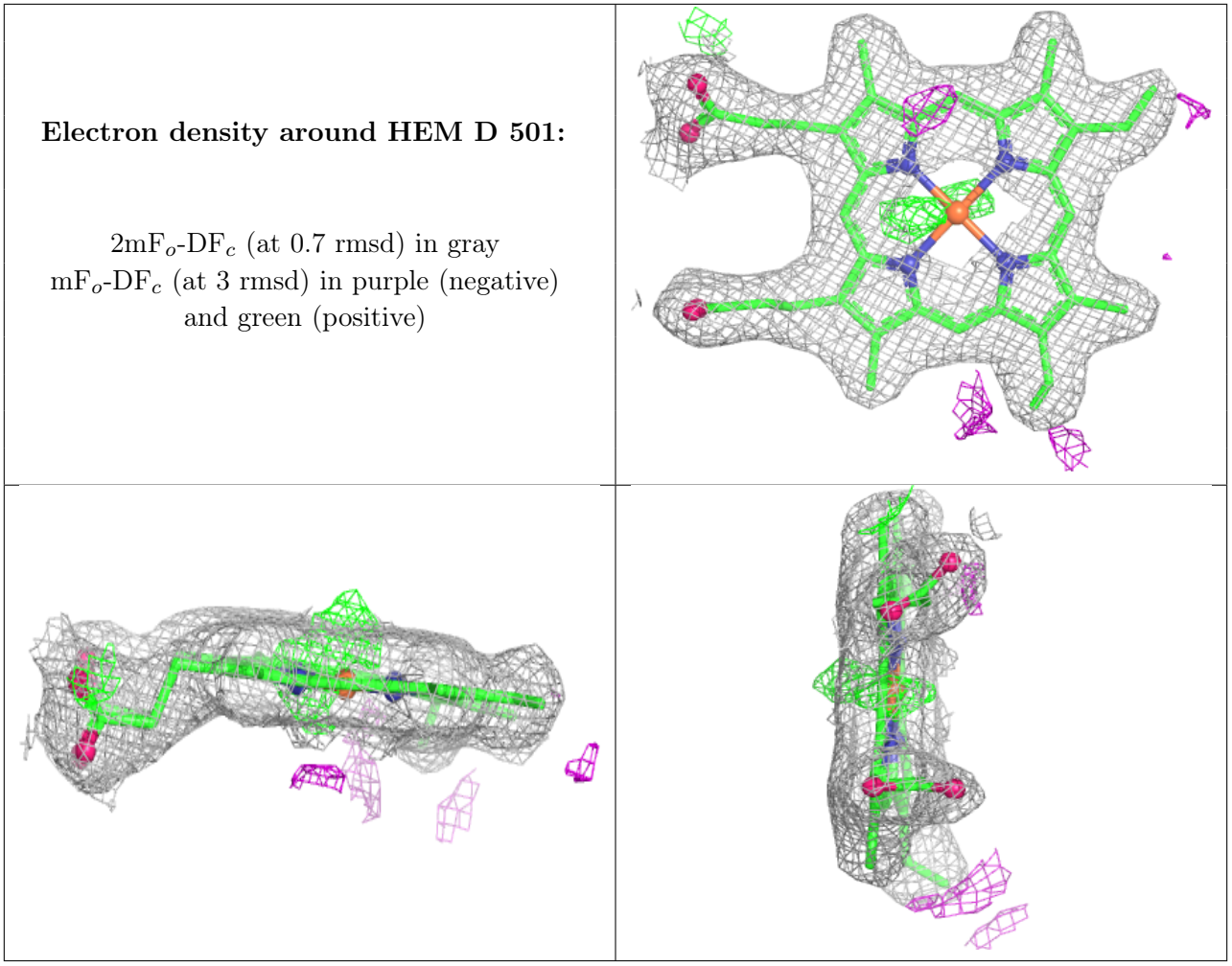






Electron density around HEM D 501:

$2mF_o$-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.