Full wwPDB X-ray Structure Validation Report ⓘ

Sep 2, 2023 – 02:52 PM EDT

PDB ID	:	3R1A
Title	:	Closed crystal structure of cytochrome P450 2B4 covalently bound to the mechanism-based inactivator tert-butylphenylacetylene
Authors	:	Gay, S.C.; Zhang, H.; Stout, C.D.; Hollenberg, P.F.; Halpert, J.R.
Deposited on	:	2011-03-09
Resolution	:	3.50 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references ⓘ) were used in the production of this report:

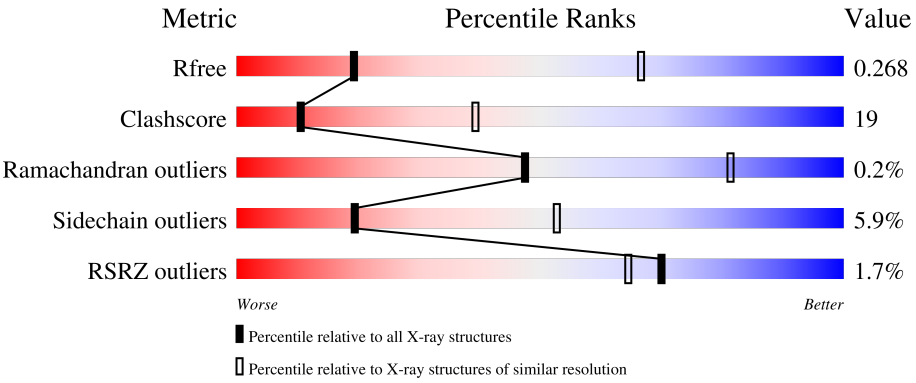
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35

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 3.50 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1659 (3.60-3.40)
Clashscore	141614	1036 (3.58-3.42)
Ramachandran outliers	138981	1005 (3.58-3.42)
Sidechain outliers	138945	1006 (3.58-3.42)
RSRZ outliers	127900	1559 (3.60-3.40)

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	% 64% 32%
1	B	476	% 64% 33%
1	C	476	61% 33%
1	D	476	63% 33%
1	E	476	60% 34%

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Mol	Chain	Length	Quality of chain
1	F	476	63% 32%
1	G	476	% 65% 30%
1	H	476	11% 66% 30%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 28813 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 2B4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	465	Total	C	N	O	S	0	0	0
			3618	2332	613	663	10			
1	B	465	Total	C	N	O	S	0	0	0
			3582	2314	595	662	11			
1	C	465	Total	C	N	O	S	0	0	0
			3637	2346	618	662	11			
1	D	465	Total	C	N	O	S	0	0	0
			3608	2327	604	666	11			
1	E	465	Total	C	N	O	S	0	0	0
			3588	2319	592	666	11			
1	F	465	Total	C	N	O	S	0	0	0
			3540	2292	581	656	11			
1	G	465	Total	C	N	O	S	0	0	0
			3545	2293	583	659	10			
1	H	464	Total	C	N	O	S	0	0	0
			3239	2079	539	612	9			

There are 264 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	21	ALA	GLU	engineered mutation	UNP P00178
A	?	-	PHE	deletion	UNP P00178
A	?	-	SER	deletion	UNP P00178
A	?	-	LEU	deletion	UNP P00178
A	?	-	LEU	deletion	UNP P00178
A	?	-	LEU	deletion	UNP P00178
A	?	-	LEU	deletion	UNP P00178
A	?	-	LEU	deletion	UNP P00178
A	?	-	ALA	deletion	UNP P00178
A	?	-	PHE	deletion	UNP P00178
A	?	-	LEU	deletion	UNP P00178
A	?	-	ALA	deletion	UNP P00178
A	?	-	GLY	deletion	UNP P00178

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Chain	Residue	Modelled	Actual	Comment	Reference
A	?	-	LEU	deletion	UNP P00178
A	?	-	LEU	deletion	UNP P00178
A	?	-	LEU	deletion	UNP P00178
A	?	-	LEU	deletion	UNP P00178
A	?	-	LEU	deletion	UNP P00178
A	?	-	PHE	deletion	UNP P00178
A	?	-	ARG	deletion	UNP P00178
A	22	LYS	GLY	engineered mutation	UNP P00178
A	23	LYS	HIS	engineered mutation	UNP P00178
A	24	THR	PRO	engineered mutation	UNP P00178
A	25	SER	LYS	engineered mutation	UNP P00178
A	26	SER	ALA	engineered mutation	UNP P00178
A	27	LYS	HIS	engineered mutation	UNP P00178
A	29	LYS	ARG	engineered mutation	UNP P00178
A	221	SER	PRO	conflict	UNP P00178
A	226	TYR	HIS	engineered mutation	UNP P00178
A	492	HIS	-	expression tag	UNP P00178
A	493	HIS	-	expression tag	UNP P00178
A	494	HIS	-	expression tag	UNP P00178
A	495	HIS	-	expression tag	UNP P00178
B	21	ALA	GLU	engineered mutation	UNP P00178
B	?	-	PHE	deletion	UNP P00178
B	?	-	SER	deletion	UNP P00178
B	?	-	LEU	deletion	UNP P00178
B	?	-	LEU	deletion	UNP P00178
B	?	-	LEU	deletion	UNP P00178
B	?	-	LEU	deletion	UNP P00178
B	?	-	LEU	deletion	UNP P00178
B	?	-	ALA	deletion	UNP P00178
B	?	-	PHE	deletion	UNP P00178
B	?	-	LEU	deletion	UNP P00178
B	?	-	ALA	deletion	UNP P00178
B	?	-	GLY	deletion	UNP P00178
B	?	-	LEU	deletion	UNP P00178
B	?	-	LEU	deletion	UNP P00178
B	?	-	LEU	deletion	UNP P00178
B	?	-	LEU	deletion	UNP P00178
B	?	-	LEU	deletion	UNP P00178
B	?	-	PHE	deletion	UNP P00178
B	?	-	ARG	deletion	UNP P00178
B	22	LYS	GLY	engineered mutation	UNP P00178
B	23	LYS	HIS	engineered mutation	UNP P00178

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Chain	Residue	Modelled	Actual	Comment	Reference
B	24	THR	PRO	engineered mutation	UNP P00178
B	25	SER	LYS	engineered mutation	UNP P00178
B	26	SER	ALA	engineered mutation	UNP P00178
B	27	LYS	HIS	engineered mutation	UNP P00178
B	29	LYS	ARG	engineered mutation	UNP P00178
B	221	SER	PRO	conflict	UNP P00178
B	226	TYR	HIS	engineered mutation	UNP P00178
B	492	HIS	-	expression tag	UNP P00178
B	493	HIS	-	expression tag	UNP P00178
B	494	HIS	-	expression tag	UNP P00178
B	495	HIS	-	expression tag	UNP P00178
C	21	ALA	GLU	engineered mutation	UNP P00178
C	?	-	PHE	deletion	UNP P00178
C	?	-	SER	deletion	UNP P00178
C	?	-	LEU	deletion	UNP P00178
C	?	-	LEU	deletion	UNP P00178
C	?	-	LEU	deletion	UNP P00178
C	?	-	LEU	deletion	UNP P00178
C	?	-	LEU	deletion	UNP P00178
C	?	-	ALA	deletion	UNP P00178
C	?	-	PHE	deletion	UNP P00178
C	?	-	LEU	deletion	UNP P00178
C	?	-	ALA	deletion	UNP P00178
C	?	-	GLY	deletion	UNP P00178
C	?	-	LEU	deletion	UNP P00178
C	?	-	LEU	deletion	UNP P00178
C	?	-	LEU	deletion	UNP P00178
C	?	-	LEU	deletion	UNP P00178
C	?	-	LEU	deletion	UNP P00178
C	?	-	PHE	deletion	UNP P00178
C	?	-	ARG	deletion	UNP P00178
C	22	LYS	GLY	engineered mutation	UNP P00178
C	23	LYS	HIS	engineered mutation	UNP P00178
C	24	THR	PRO	engineered mutation	UNP P00178
C	25	SER	LYS	engineered mutation	UNP P00178
C	26	SER	ALA	engineered mutation	UNP P00178
C	27	LYS	HIS	engineered mutation	UNP P00178
C	29	LYS	ARG	engineered mutation	UNP P00178
C	221	SER	PRO	conflict	UNP P00178
C	226	TYR	HIS	engineered mutation	UNP P00178
C	492	HIS	-	expression tag	UNP P00178
C	493	HIS	-	expression tag	UNP P00178

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Chain	Residue	Modelled	Actual	Comment	Reference
C	494	HIS	-	expression tag	UNP P00178
C	495	HIS	-	expression tag	UNP P00178
D	21	ALA	GLU	engineered mutation	UNP P00178
D	?	-	PHE	deletion	UNP P00178
D	?	-	SER	deletion	UNP P00178
D	?	-	LEU	deletion	UNP P00178
D	?	-	LEU	deletion	UNP P00178
D	?	-	LEU	deletion	UNP P00178
D	?	-	LEU	deletion	UNP P00178
D	?	-	LEU	deletion	UNP P00178
D	?	-	ALA	deletion	UNP P00178
D	?	-	PHE	deletion	UNP P00178
D	?	-	LEU	deletion	UNP P00178
D	?	-	ALA	deletion	UNP P00178
D	?	-	GLY	deletion	UNP P00178
D	?	-	LEU	deletion	UNP P00178
D	?	-	LEU	deletion	UNP P00178
D	?	-	LEU	deletion	UNP P00178
D	?	-	LEU	deletion	UNP P00178
D	?	-	LEU	deletion	UNP P00178
D	?	-	PHE	deletion	UNP P00178
D	?	-	ARG	deletion	UNP P00178
D	22	LYS	GLY	engineered mutation	UNP P00178
D	23	LYS	HIS	engineered mutation	UNP P00178
D	24	THR	PRO	engineered mutation	UNP P00178
D	25	SER	LYS	engineered mutation	UNP P00178
D	26	SER	ALA	engineered mutation	UNP P00178
D	27	LYS	HIS	engineered mutation	UNP P00178
D	29	LYS	ARG	engineered mutation	UNP P00178
D	221	SER	PRO	conflict	UNP P00178
D	226	TYR	HIS	engineered mutation	UNP P00178
D	492	HIS	-	expression tag	UNP P00178
D	493	HIS	-	expression tag	UNP P00178
D	494	HIS	-	expression tag	UNP P00178
D	495	HIS	-	expression tag	UNP P00178
E	21	ALA	GLU	engineered mutation	UNP P00178
E	?	-	PHE	deletion	UNP P00178
E	?	-	SER	deletion	UNP P00178
E	?	-	LEU	deletion	UNP P00178
E	?	-	LEU	deletion	UNP P00178
E	?	-	LEU	deletion	UNP P00178
E	?	-	LEU	deletion	UNP P00178

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Chain	Residue	Modelled	Actual	Comment	Reference
E	?	-	LEU	deletion	UNP P00178
E	?	-	ALA	deletion	UNP P00178
E	?	-	PHE	deletion	UNP P00178
E	?	-	LEU	deletion	UNP P00178
E	?	-	ALA	deletion	UNP P00178
E	?	-	GLY	deletion	UNP P00178
E	?	-	LEU	deletion	UNP P00178
E	?	-	LEU	deletion	UNP P00178
E	?	-	LEU	deletion	UNP P00178
E	?	-	LEU	deletion	UNP P00178
E	?	-	LEU	deletion	UNP P00178
E	?	-	PHE	deletion	UNP P00178
E	?	-	ARG	deletion	UNP P00178
E	22	LYS	GLY	engineered mutation	UNP P00178
E	23	LYS	HIS	engineered mutation	UNP P00178
E	24	THR	PRO	engineered mutation	UNP P00178
E	25	SER	LYS	engineered mutation	UNP P00178
E	26	SER	ALA	engineered mutation	UNP P00178
E	27	LYS	HIS	engineered mutation	UNP P00178
E	29	LYS	ARG	engineered mutation	UNP P00178
E	221	SER	PRO	conflict	UNP P00178
E	226	TYR	HIS	engineered mutation	UNP P00178
E	492	HIS	-	expression tag	UNP P00178
E	493	HIS	-	expression tag	UNP P00178
E	494	HIS	-	expression tag	UNP P00178
E	495	HIS	-	expression tag	UNP P00178
F	21	ALA	GLU	engineered mutation	UNP P00178
F	?	-	PHE	deletion	UNP P00178
F	?	-	SER	deletion	UNP P00178
F	?	-	LEU	deletion	UNP P00178
F	?	-	LEU	deletion	UNP P00178
F	?	-	LEU	deletion	UNP P00178
F	?	-	LEU	deletion	UNP P00178
F	?	-	LEU	deletion	UNP P00178
F	?	-	ALA	deletion	UNP P00178
F	?	-	PHE	deletion	UNP P00178
F	?	-	LEU	deletion	UNP P00178
F	?	-	ALA	deletion	UNP P00178
F	?	-	GLY	deletion	UNP P00178
F	?	-	LEU	deletion	UNP P00178
F	?	-	LEU	deletion	UNP P00178
F	?	-	LEU	deletion	UNP P00178

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Chain	Residue	Modelled	Actual	Comment	Reference
F	?	-	LEU	deletion	UNP P00178
F	?	-	LEU	deletion	UNP P00178
F	?	-	PHE	deletion	UNP P00178
F	?	-	ARG	deletion	UNP P00178
F	22	LYS	GLY	engineered mutation	UNP P00178
F	23	LYS	HIS	engineered mutation	UNP P00178
F	24	THR	PRO	engineered mutation	UNP P00178
F	25	SER	LYS	engineered mutation	UNP P00178
F	26	SER	ALA	engineered mutation	UNP P00178
F	27	LYS	HIS	engineered mutation	UNP P00178
F	29	LYS	ARG	engineered mutation	UNP P00178
F	221	SER	PRO	conflict	UNP P00178
F	226	TYR	HIS	engineered mutation	UNP P00178
F	492	HIS	-	expression tag	UNP P00178
F	493	HIS	-	expression tag	UNP P00178
F	494	HIS	-	expression tag	UNP P00178
F	495	HIS	-	expression tag	UNP P00178
G	21	ALA	GLU	engineered mutation	UNP P00178
G	?	-	PHE	deletion	UNP P00178
G	?	-	SER	deletion	UNP P00178
G	?	-	LEU	deletion	UNP P00178
G	?	-	LEU	deletion	UNP P00178
G	?	-	LEU	deletion	UNP P00178
G	?	-	LEU	deletion	UNP P00178
G	?	-	LEU	deletion	UNP P00178
G	?	-	ALA	deletion	UNP P00178
G	?	-	PHE	deletion	UNP P00178
G	?	-	LEU	deletion	UNP P00178
G	?	-	ALA	deletion	UNP P00178
G	?	-	GLY	deletion	UNP P00178
G	?	-	LEU	deletion	UNP P00178
G	?	-	LEU	deletion	UNP P00178
G	?	-	LEU	deletion	UNP P00178
G	?	-	LEU	deletion	UNP P00178
G	?	-	LEU	deletion	UNP P00178
G	?	-	PHE	deletion	UNP P00178
G	?	-	ARG	deletion	UNP P00178
G	22	LYS	GLY	engineered mutation	UNP P00178
G	23	LYS	HIS	engineered mutation	UNP P00178
G	24	THR	PRO	engineered mutation	UNP P00178
G	25	SER	LYS	engineered mutation	UNP P00178
G	26	SER	ALA	engineered mutation	UNP P00178

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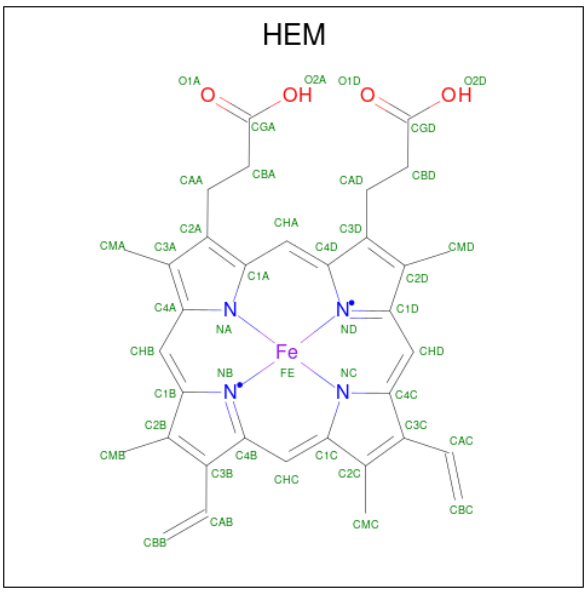
Chain	Residue	Modelled	Actual	Comment	Reference
G	27	LYS	HIS	engineered mutation	UNP P00178
G	29	LYS	ARG	engineered mutation	UNP P00178
G	221	SER	PRO	conflict	UNP P00178
G	226	TYR	HIS	engineered mutation	UNP P00178
G	492	HIS	-	expression tag	UNP P00178
G	493	HIS	-	expression tag	UNP P00178
G	494	HIS	-	expression tag	UNP P00178
G	495	HIS	-	expression tag	UNP P00178
H	21	ALA	GLU	engineered mutation	UNP P00178
H	?	-	PHE	deletion	UNP P00178
H	?	-	SER	deletion	UNP P00178
H	?	-	LEU	deletion	UNP P00178
H	?	-	LEU	deletion	UNP P00178
H	?	-	LEU	deletion	UNP P00178
H	?	-	LEU	deletion	UNP P00178
H	?	-	LEU	deletion	UNP P00178
H	?	-	ALA	deletion	UNP P00178
H	?	-	PHE	deletion	UNP P00178
H	?	-	LEU	deletion	UNP P00178
H	?	-	ALA	deletion	UNP P00178
H	?	-	GLY	deletion	UNP P00178
H	?	-	LEU	deletion	UNP P00178
H	?	-	LEU	deletion	UNP P00178
H	?	-	LEU	deletion	UNP P00178
H	?	-	LEU	deletion	UNP P00178
H	?	-	LEU	deletion	UNP P00178
H	?	-	PHE	deletion	UNP P00178
H	?	-	ARG	deletion	UNP P00178
H	22	LYS	GLY	engineered mutation	UNP P00178
H	23	LYS	HIS	engineered mutation	UNP P00178
H	24	THR	PRO	engineered mutation	UNP P00178
H	25	SER	LYS	engineered mutation	UNP P00178
H	26	SER	ALA	engineered mutation	UNP P00178
H	27	LYS	HIS	engineered mutation	UNP P00178
H	29	LYS	ARG	engineered mutation	UNP P00178
H	221	SER	PRO	conflict	UNP P00178
H	226	TYR	HIS	engineered mutation	UNP P00178
H	492	HIS	-	expression tag	UNP P00178
H	493	HIS	-	expression tag	UNP P00178
H	494	HIS	-	expression tag	UNP P00178
H	495	HIS	-	expression tag	UNP P00178

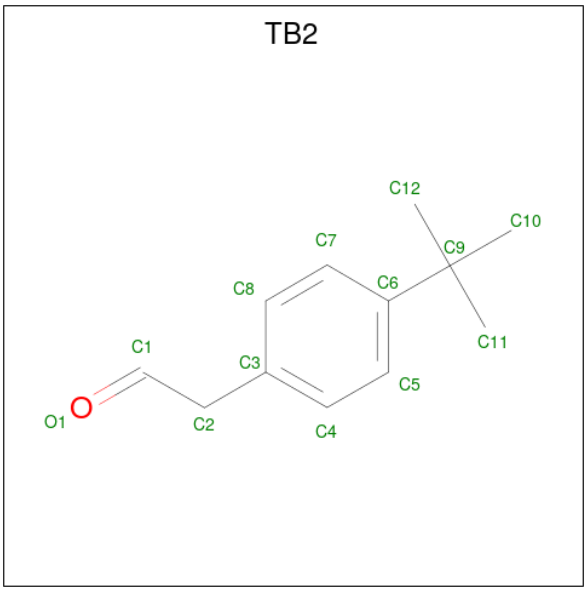
- Molecule 2 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (for-

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



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-tert-butylphenyl)acetaldehyde (three-letter code: TB2) (formula: $C_{12}H_{16}O$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O 13 12 1	0	0
3	B	1	Total C O 13 12 1	0	0
3	C	1	Total C O 13 12 1	0	0
3	D	1	Total C O 13 12 1	0	0
3	E	1	Total C O 13 12 1	0	0
3	F	1	Total C O 13 12 1	0	0
3	G	1	Total C O 13 12 1	0	0
3	H	1	Total C O 13 12 1	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total O 1 1	0	0
4	B	1	Total O 1 1	0	0
4	C	1	Total O 1 1	0	0
4	D	1	Total O 1 1	0	0

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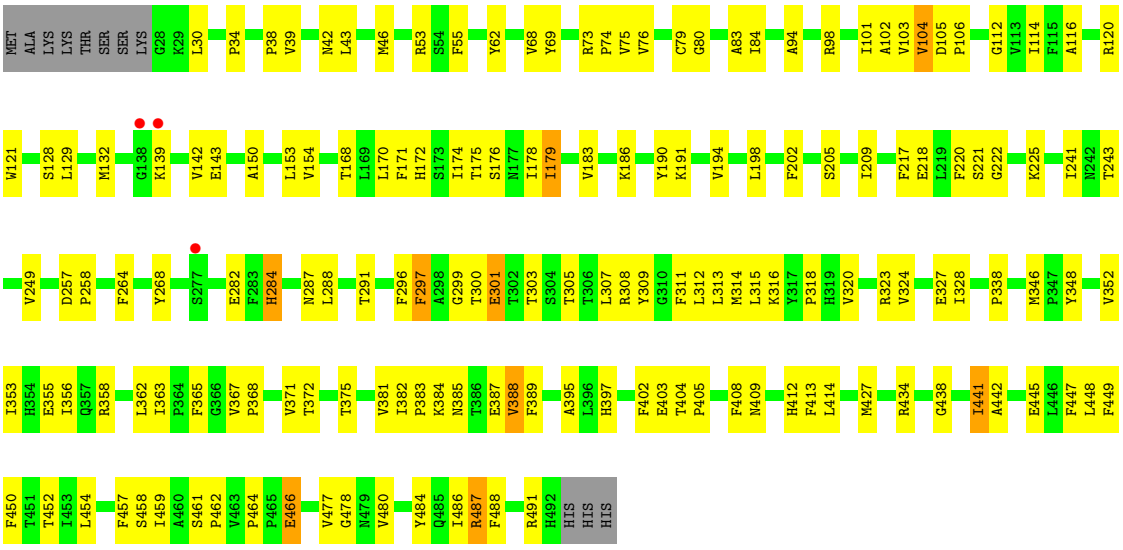
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	E	1	Total O 1 1	0	0
4	F	1	Total O 1 1	0	0
4	G	1	Total O 1 1	0	0
4	H	1	Total O 1 1	0	0

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.

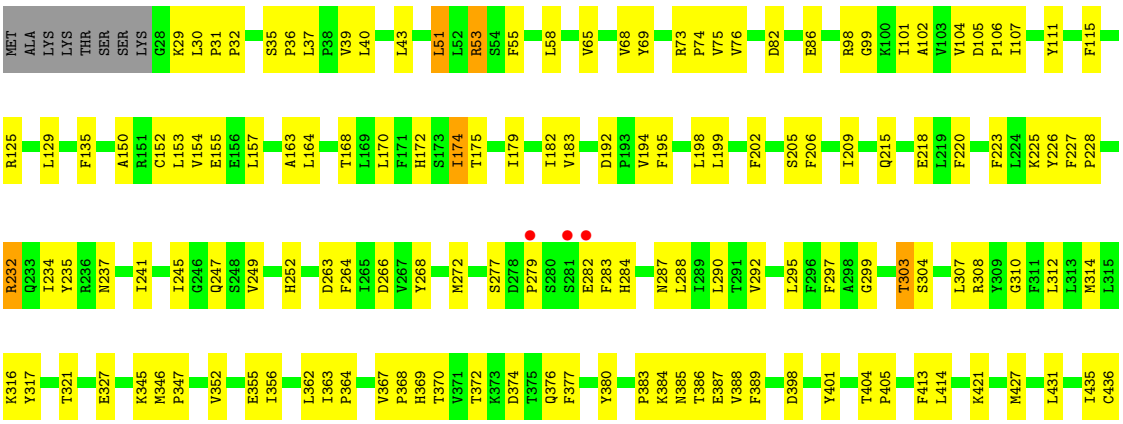
• Molecule 1: Cytochrome P450 2B4

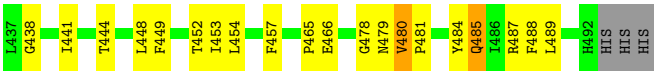
Chain A:



• Molecule 1: Cytochrome P450 2B4

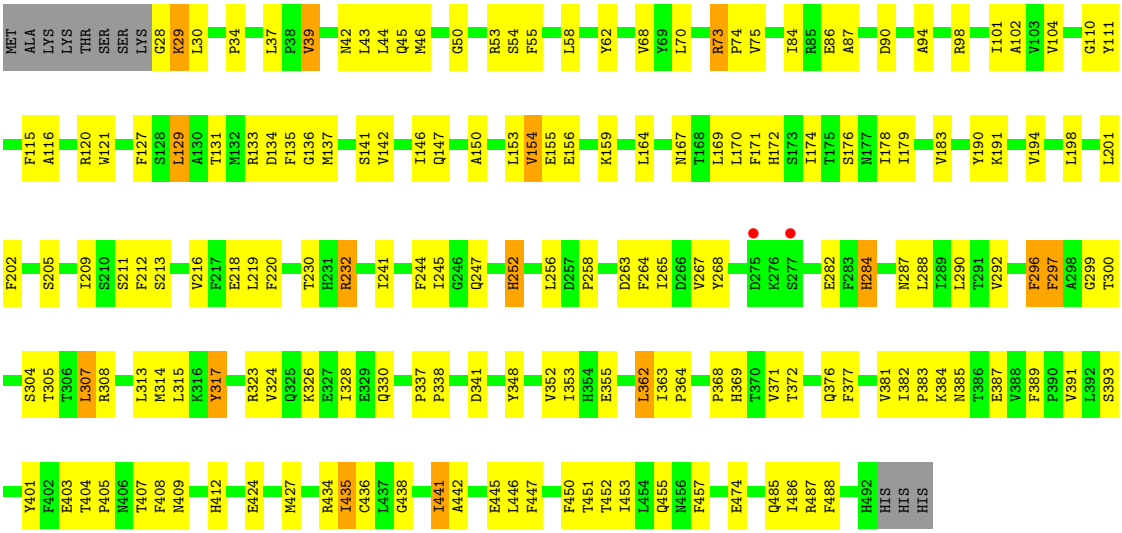
Chain B:





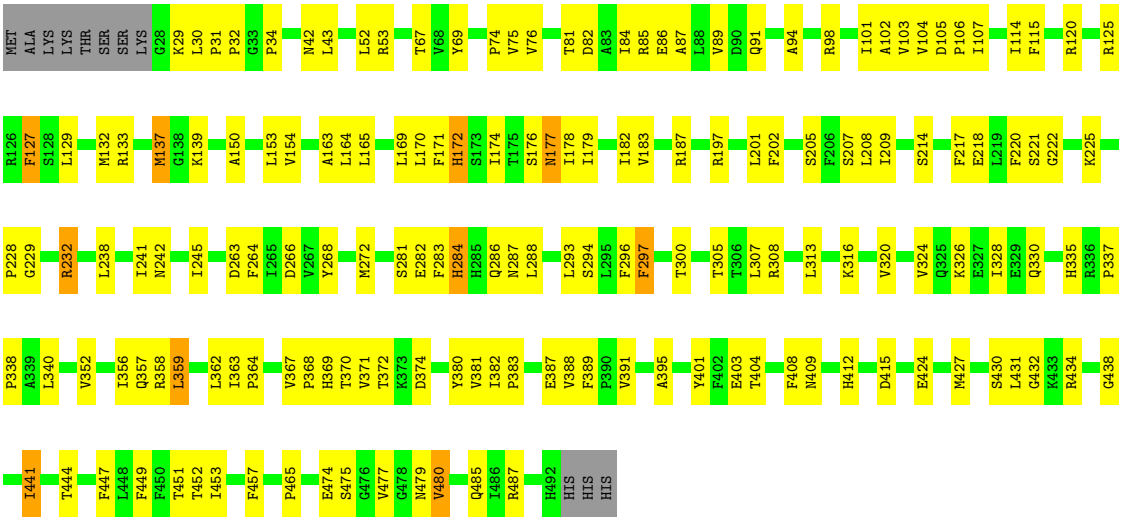
• Molecule 1: Cytochrome P450 2B4

Chain C:



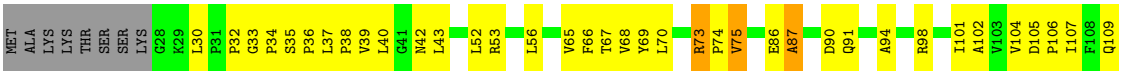
• Molecule 1: Cytochrome P450 2B4

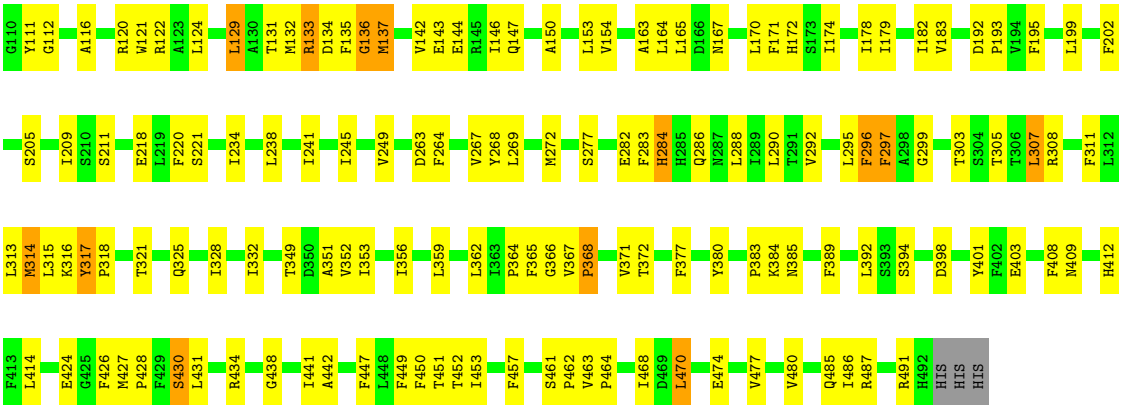
Chain D:



• Molecule 1: Cytochrome P450 2B4

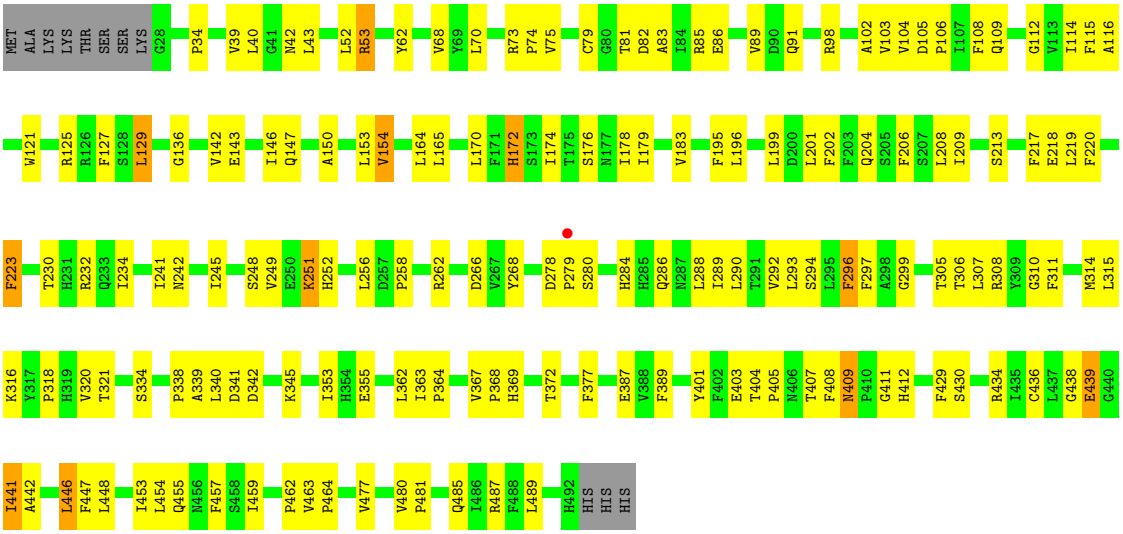
Chain E:





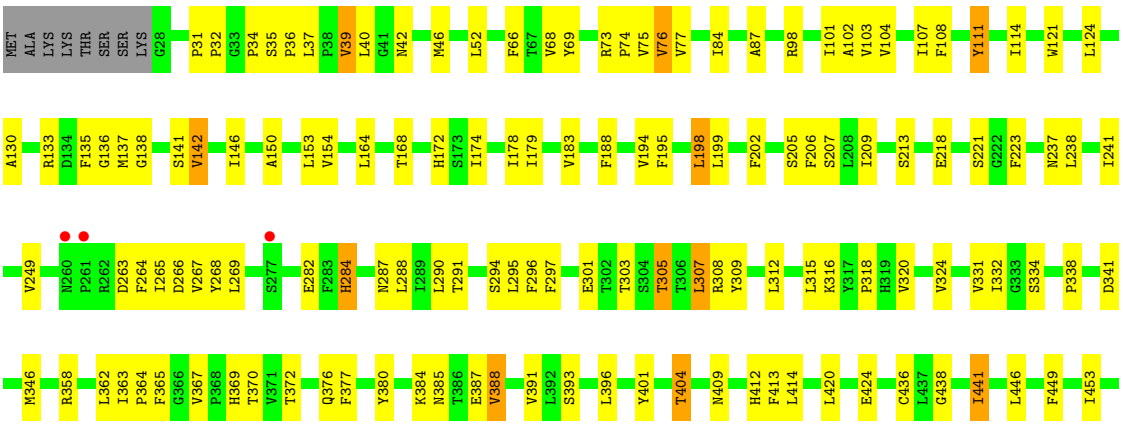
• Molecule 1: Cytochrome P450 2B4

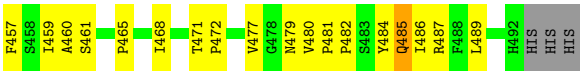
Chain F:



• Molecule 1: Cytochrome P450 2B4

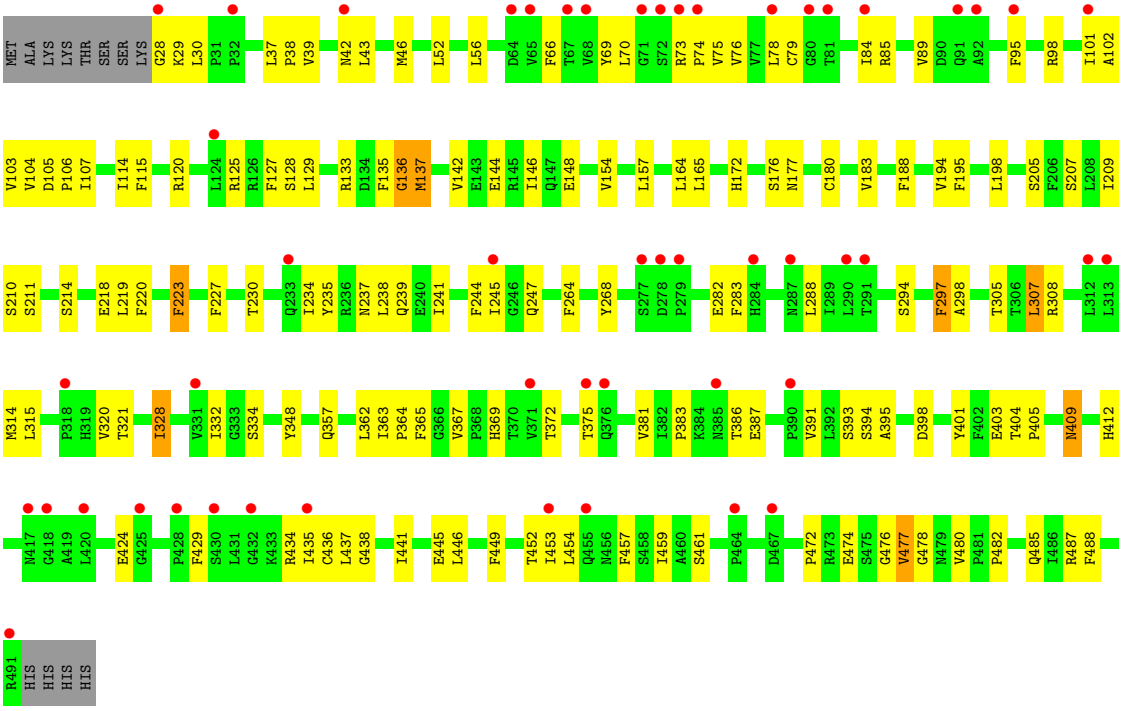
Chain G:





• Molecule 1: Cytochrome P450 2B4

Chain H:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	134.38Å 144.55Å 229.28Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	115.93 – 3.50 115.93 – 3.50	Depositor EDS
% Data completeness (in resolution range)	85.5 (115.93-3.50) 89.8 (115.93-3.50)	Depositor EDS
R_{merge}	0.16	Depositor
R_{sym}	0.16	Depositor
$< I/\sigma(I) >$ [1]	2.10 (at 3.49Å)	Xtriage
Refinement program	PHENIX 1.6.4_486	Depositor
R, R_{free}	0.206 , 0.285 0.199 , 0.268	Depositor DCC
R_{free} test set	2602 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å^2)	80.2	Xtriage
Anisotropy	0.072	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 61.3	EDS
L-test for twinning[2]	$< \|L\| > = 0.43$, $< L^2 > = 0.25$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.90	EDS
Total number of atoms	28813	wwPDB-VP
Average B, all atoms (Å^2)	73.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.16% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: HEM, TB2

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|$ >5	RMSZ	#$\|Z\|$ >5
1	A	0.23	0/3711	0.48	1/5052 (0.0%)
1	B	0.23	0/3675	0.45	0/5010
1	C	0.23	0/3730	0.46	1/5072 (0.0%)
1	D	0.23	0/3701	0.49	2/5041 (0.0%)
1	E	0.23	0/3681	0.48	3/5017 (0.1%)
1	F	0.23	0/3633	0.46	0/4960
1	G	0.22	0/3638	0.49	0/4968
1	H	0.29	1/3313 (0.0%)	0.50	3/4554 (0.1%)
All	All	0.24	1/29082 (0.0%)	0.48	10/39674 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	H	135	PHE	CA-C	-5.95	1.37	1.52

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	H	136	GLY	CA-C-N	5.99	130.38	117.20
1	D	281	SER	CB-CA-C	5.89	121.28	110.10
1	E	137	MET	N-CA-C	-5.65	95.75	111.00
1	H	334	SER	N-CA-CB	-5.64	102.04	110.50
1	E	87	ALA	N-CA-C	5.51	125.87	111.00
1	H	137	MET	N-CA-CB	-5.39	100.89	110.60
1	C	134	ASP	CB-CA-C	5.31	121.03	110.40
1	E	277	SER	CB-CA-C	-5.24	100.14	110.10
1	D	335	HIS	CB-CA-C	-5.17	100.05	110.40
1	A	301	GLU	N-CA-C	5.11	124.80	111.00

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	3618	0	3491	120	0
1	B	3582	0	3425	122	0
1	C	3637	0	3538	129	0
1	D	3608	0	3466	118	0
1	E	3588	0	3434	136	0
1	F	3540	0	3353	122	0
1	G	3545	0	3353	113	0
1	H	3239	0	2900	129	0
2	A	43	0	30	8	0
2	B	43	0	30	9	0
2	C	43	0	30	11	0
2	D	43	0	30	11	0
2	E	43	0	30	9	0
2	F	43	0	30	8	0
2	G	43	0	30	13	0
2	H	43	0	30	13	0
3	A	13	0	15	5	0
3	B	13	0	15	2	0
3	C	13	0	15	0	0
3	D	13	0	15	5	0
3	E	13	0	15	1	0
3	F	13	0	15	3	0
3	G	13	0	15	3	0
3	H	13	0	15	2	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
4	E	1	0	0	0	0
4	F	1	0	0	0	0
4	G	1	0	0	0	0
4	H	1	0	0	1	0
All	All	28813	0	27320	1039	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 19.

All (1039) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:232:ARG:HH11	1:B:232:ARG:HG2	1.00	1.15
2:H:500:HEM:HBD2	2:H:500:HEM:HHA	1.30	1.09
1:H:136:GLY:O	1:H:142:VAL:HB	1.58	1.03
1:F:136:GLY:O	1:F:142:VAL:HB	1.63	0.97
1:G:138:GLY:O	1:G:142:VAL:HG11	1.66	0.94
2:E:500:HEM:HHD	2:E:500:HEM:HBC2	1.50	0.90
2:B:500:HEM:HBC2	2:B:500:HEM:HHD	1.53	0.89
1:F:143:GLU:OE2	1:F:340:LEU:CB	2.21	0.89
1:F:305:THR:HG22	1:F:308:ARG:HH21	1.38	0.88
3:F:501:TB2:O1	3:F:501:TB2:H4	1.72	0.88
2:B:500:HEM:HBB2	2:B:500:HEM:HHC	1.53	0.87
1:B:232:ARG:HG2	1:B:232:ARG:NH1	1.79	0.86
2:E:500:HEM:HHC	2:E:500:HEM:HBB2	1.57	0.86
1:E:150:ALA:HB1	1:E:452:THR:HG21	1.56	0.85
2:G:500:HEM:HMB2	2:G:500:HEM:HBB2	1.58	0.85
1:D:52:LEU:HD22	1:D:364:PRO:HB3	1.58	0.84
2:H:500:HEM:HMC2	2:H:500:HEM:HBC2	1.59	0.84
2:G:500:HEM:HBD1	2:G:500:HEM:HMD1	1.57	0.84
2:A:500:HEM:HMB1	2:A:500:HEM:HBB2	1.58	0.84
2:G:500:HEM:HMC2	2:G:500:HEM:HBC2	1.59	0.84
2:H:500:HEM:HMB2	2:H:500:HEM:HBB2	1.59	0.83
2:D:500:HEM:HMC1	2:D:500:HEM:HBC2	1.58	0.83
2:F:500:HEM:HBB2	2:F:500:HEM:HMB2	1.61	0.83
2:F:500:HEM:HMC2	2:F:500:HEM:HBC2	1.62	0.82
1:C:136:GLY:O	1:C:142:VAL:HG13	1.79	0.82
1:H:435:ILE:HG12	1:H:436:CYS:H	1.42	0.82
2:A:500:HEM:HMC2	2:A:500:HEM:HBC2	1.61	0.81
1:F:143:GLU:OE2	1:F:340:LEU:HB3	1.81	0.80
1:G:362:LEU:HD22	1:G:362:LEU:H	1.45	0.80
1:F:75:VAL:HG12	1:F:387:GLU:HB2	1.62	0.80
2:C:500:HEM:HBC2	2:C:500:HEM:HMC2	1.62	0.80
1:H:42:ASN:HD22	1:H:69:TYR:H	1.28	0.79
2:C:500:HEM:HMB1	2:C:500:HEM:HBB2	1.64	0.79
2:D:500:HEM:HBB2	2:D:500:HEM:HMB2	1.63	0.79
1:G:362:LEU:O	1:G:364:PRO:HD3	1.81	0.79
1:D:222:GLY:HA2	1:D:225:LYS:HE3	1.64	0.78
1:C:153:LEU:HD21	1:C:453:ILE:HD11	1.64	0.78

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:30:LEU:HD21	1:H:383:PRO:HD3	1.65	0.78
1:H:305:THR:HG22	1:H:308:ARG:HE	1.49	0.78
1:G:52:LEU:HD22	1:G:364:PRO:HB3	1.65	0.77
1:C:435:ILE:HG12	1:C:436:CYS:H	1.48	0.76
1:E:86:GLU:O	1:E:90:ASP:HB2	1.84	0.75
1:G:136:GLY:O	1:G:142:VAL:HB	1.85	0.75
1:C:232:ARG:CG	1:C:232:ARG:HH11	2.00	0.75
1:A:75:VAL:HG12	1:A:387:GLU:HB2	1.68	0.74
1:H:435:ILE:HG12	1:H:436:CYS:N	2.02	0.74
1:A:102:ALA:HB2	1:A:218:GLU:HA	1.68	0.74
2:H:500:HEM:HHA	2:H:500:HEM:CBD	2.15	0.74
1:F:320:VAL:HG21	1:F:408:PHE:HE2	1.52	0.74
1:D:133:ARG:HA	1:D:137:MET:HB3	1.70	0.73
1:F:143:GLU:OE2	1:F:340:LEU:N	2.21	0.73
1:E:102:ALA:HB2	1:E:218:GLU:HA	1.69	0.73
1:D:150:ALA:HB1	1:D:452:THR:HG21	1.71	0.73
1:D:316:LYS:HG3	1:D:465:PRO:O	1.89	0.73
1:D:153:LEU:HD21	1:D:453:ILE:HD11	1.71	0.72
1:F:278:ASP:OD1	1:F:279:PRO:N	2.22	0.72
3:F:501:TB2:O1	3:F:501:TB2:C4	2.36	0.72
1:C:135:PHE:HE2	1:C:267:VAL:HG21	1.54	0.72
1:C:136:GLY:O	1:C:142:VAL:CG1	2.38	0.72
1:G:111:TYR:HB2	1:G:290:LEU:HD12	1.71	0.72
1:F:306:THR:HG21	1:F:446:LEU:HD11	1.72	0.72
1:E:292:VAL:O	1:E:296:PHE:HB2	1.90	0.72
1:H:328:ILE:HG12	1:H:332:ILE:HD12	1.72	0.71
1:B:98:ARG:HG2	1:B:115:PHE:HA	1.72	0.71
1:B:75:VAL:HG12	1:B:387:GLU:HB2	1.70	0.71
1:A:305:THR:HG22	1:A:308:ARG:HH21	1.56	0.71
1:H:441:ILE:HD12	1:H:441:ILE:H	1.56	0.71
1:A:202:PHE:CE1	1:A:241:ILE:HD13	2.25	0.70
1:D:153:LEU:HD22	1:D:174:ILE:HG21	1.71	0.70
1:C:102:ALA:HB2	1:C:218:GLU:HA	1.73	0.70
1:F:245:ILE:HG22	1:F:289:ILE:HD13	1.73	0.70
1:F:98:ARG:HG2	1:F:115:PHE:HA	1.72	0.70
1:E:136:GLY:O	1:E:142:VAL:HB	1.91	0.70
1:E:98:ARG:NH1	1:E:367:VAL:HB	2.07	0.69
1:A:320:VAL:HG21	1:A:408:PHE:HE2	1.56	0.69
1:E:328:ILE:HG23	1:E:332:ILE:HD12	1.73	0.69
1:B:232:ARG:HH11	1:B:232:ARG:CG	1.91	0.69
1:E:101:ILE:HB	1:E:104:VAL:HG22	1.75	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:70:LEU:HG	1:E:75:VAL:HG21	1.74	0.68
1:E:32:PRO:HD3	1:E:380:TYR:CZ	2.29	0.68
1:A:268:TYR:CE1	1:A:288:LEU:HB2	2.29	0.68
1:B:368:PRO:HG3	1:B:389:PHE:CE2	2.29	0.68
1:E:153:LEU:HD22	1:E:174:ILE:HG21	1.76	0.68
1:F:102:ALA:HB2	1:F:218:GLU:HA	1.76	0.68
1:A:132:MET:HE1	1:A:441:ILE:HD11	1.75	0.68
1:F:34:PRO:HB2	1:F:42:ASN:ND2	2.08	0.67
1:G:303:THR:HA	2:G:500:HEM:HBB1	1.76	0.67
1:G:135:PHE:HE2	1:G:267:VAL:HG21	1.58	0.67
1:G:73:ARG:HH12	1:G:218:GLU:HG3	1.60	0.67
1:B:485:GLN:HE21	1:B:485:GLN:HA	1.57	0.67
1:B:111:TYR:HB2	1:B:290:LEU:HD12	1.75	0.67
1:F:441:ILE:HD12	1:F:441:ILE:H	1.60	0.67
1:G:133:ARG:HA	1:G:137:MET:HB3	1.77	0.67
2:D:500:HEM:HBA1	2:D:500:HEM:HMA1	1.77	0.66
1:F:143:GLU:O	1:F:147:GLN:HB2	1.96	0.66
1:G:153:LEU:HD22	1:G:174:ILE:HG21	1.77	0.66
1:H:98:ARG:NH2	2:H:500:HEM:HBD1	2.10	0.66
1:F:108:PHE:HA	1:F:290:LEU:HD13	1.76	0.66
1:B:435:ILE:HG12	1:B:436:CYS:H	1.59	0.66
1:E:368:PRO:HG3	1:E:389:PHE:HE2	1.61	0.66
1:C:352:VAL:HG13	1:C:408:PHE:HZ	1.62	0.65
1:B:101:ILE:HB	1:B:104:VAL:HG22	1.77	0.65
1:B:153:LEU:HD22	1:B:174:ILE:HG21	1.77	0.65
1:D:98:ARG:HG2	1:D:115:PHE:HA	1.79	0.65
1:C:30:LEU:HD21	1:C:383:PRO:HD3	1.79	0.65
2:G:500:HEM:HBB2	2:G:500:HEM:CMB	2.27	0.65
1:H:30:LEU:CD2	1:H:383:PRO:HD3	2.26	0.65
1:H:103:VAL:HG23	1:H:104:VAL:HG13	1.79	0.65
1:C:98:ARG:HG2	1:C:115:PHE:HA	1.78	0.64
1:H:183:VAL:HA	1:H:264:PHE:HB3	1.78	0.64
1:A:314:MET:HB3	1:A:459:ILE:HD11	1.78	0.64
1:H:98:ARG:HG2	1:H:115:PHE:HA	1.79	0.64
1:H:314:MET:HB2	1:H:459:ILE:HD11	1.79	0.64
1:E:142:VAL:HG13	1:E:143:GLU:N	2.13	0.64
1:D:284:HIS:CD2	1:D:286:GLN:HB2	2.32	0.64
1:H:98:ARG:HH21	2:H:500:HEM:HBD1	1.62	0.64
1:F:147:GLN:HE21	1:F:339:ALA:HA	1.63	0.64
1:D:202:PHE:CE1	1:D:241:ILE:HD13	2.32	0.63
2:G:500:HEM:HBD1	2:G:500:HEM:CMD	2.24	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:153:LEU:HD13	1:B:170:LEU:HD11	1.79	0.63
1:G:315:LEU:HD13	1:G:461:SER:HB2	1.81	0.63
1:B:43:LEU:HD22	1:B:220:PHE:HZ	1.62	0.63
1:H:154:VAL:HG13	1:H:457:PHE:HE2	1.64	0.63
1:E:305:THR:HG22	1:E:308:ARG:HH21	1.63	0.63
1:G:404:THR:OG1	1:G:404:THR:O	2.11	0.63
1:H:154:VAL:HG21	1:H:452:THR:HG22	1.79	0.63
1:D:284:HIS:ND1	1:D:284:HIS:N	2.47	0.63
2:H:500:HEM:HBD2	2:H:500:HEM:CHA	2.06	0.63
1:G:75:VAL:HG12	1:G:387:GLU:HB2	1.81	0.63
1:C:435:ILE:HG12	1:C:436:CYS:N	2.14	0.62
1:D:32:PRO:HD3	1:D:380:TYR:CE1	2.34	0.62
1:D:221:SER:O	1:D:225:LYS:HB3	1.98	0.62
1:F:68:VAL:HG13	1:F:75:VAL:HG23	1.80	0.62
1:G:124:LEU:HD11	1:G:287:ASN:OD1	1.98	0.62
1:C:164:LEU:HD22	1:C:485:GLN:HB3	1.81	0.62
1:E:426:PHE:CZ	1:E:428:PRO:HG3	2.35	0.62
1:C:403:GLU:O	1:C:412:HIS:NE2	2.32	0.62
1:F:310:GLY:O	1:F:314:MET:HG2	2.00	0.62
1:G:150:ALA:O	1:G:154:VAL:HG23	1.99	0.62
1:G:282:GLU:HA	1:G:284:HIS:CE1	2.35	0.62
1:B:164:LEU:HG	1:B:487:ARG:NH2	2.15	0.62
2:G:500:HEM:HBC2	2:G:500:HEM:CMC	2.29	0.62
1:H:154:VAL:HG13	1:H:457:PHE:CE2	2.35	0.62
1:B:227:PHE:HB3	1:B:228:PRO:HD2	1.82	0.62
1:D:102:ALA:HB2	1:D:218:GLU:HA	1.81	0.61
1:G:103:VAL:HG23	1:G:104:VAL:HG13	1.82	0.61
1:C:317:TYR:CE2	1:C:408:PHE:HB3	2.36	0.61
1:A:438:GLY:HA2	1:A:441:ILE:CD1	2.30	0.61
1:E:316:LYS:HE3	1:E:317:TYR:HE1	1.65	0.61
1:E:144:GLU:HA	1:E:147:GLN:HB2	1.81	0.61
1:B:209:ILE:HG12	1:B:234:ILE:HD13	1.82	0.61
1:B:303:THR:HA	2:B:500:HEM:HBB1	1.81	0.61
1:A:34:PRO:HB2	1:A:42:ASN:ND2	2.15	0.61
1:F:268:TYR:CE1	1:F:288:LEU:HB2	2.35	0.61
1:G:114:ILE:HA	2:G:500:HEM:HBD2	1.81	0.61
2:C:500:HEM:HBB2	2:C:500:HEM:CMB	2.31	0.61
1:D:115:PHE:CE2	3:D:501:TB2:H10	2.35	0.61
1:F:245:ILE:O	1:F:249:VAL:HG23	2.00	0.61
2:A:500:HEM:HBB2	2:A:500:HEM:CMB	2.29	0.61
2:D:500:HEM:HBC2	2:D:500:HEM:CMC	2.31	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:368:PRO:HG3	1:E:389:PHE:CE2	2.36	0.61
1:F:53:ARG:HH11	1:F:53:ARG:HB2	1.65	0.61
2:H:500:HEM:HBC2	2:H:500:HEM:CMC	2.30	0.61
1:C:176:SER:HB2	1:C:300:THR:HG23	1.82	0.61
1:F:164:LEU:HG	1:F:487:ARG:NH2	2.16	0.61
1:B:53:ARG:HB2	1:B:53:ARG:HH11	1.65	0.60
1:C:137:MET:O	1:C:137:MET:HG3	2.00	0.60
1:H:70:LEU:HD12	1:H:75:VAL:HG11	1.83	0.60
1:H:128:SER:HA	1:H:264:PHE:HE2	1.67	0.60
1:E:34:PRO:HB2	1:E:42:ASN:ND2	2.15	0.60
1:F:430:SER:HB2	2:F:500:HEM:HBA2	1.83	0.60
1:G:153:LEU:HD22	1:G:174:ILE:HD13	1.84	0.60
1:A:320:VAL:O	1:A:324:VAL:HG23	2.01	0.60
1:B:282:GLU:O	1:B:287:ASN:ND2	2.35	0.60
1:E:205:SER:O	1:E:209:ILE:HG13	2.01	0.60
1:F:103:VAL:HG23	1:F:104:VAL:HG13	1.83	0.60
1:E:202:PHE:CE1	1:E:241:ILE:HD13	2.37	0.60
1:F:409:ASN:HB3	1:F:412:HIS:NE2	2.16	0.60
1:B:43:LEU:HD22	1:B:220:PHE:CZ	2.37	0.60
1:B:316:LYS:HG3	1:B:465:PRO:O	2.02	0.60
1:C:268:TYR:CE1	1:C:288:LEU:HB2	2.37	0.60
1:H:268:TYR:CD1	1:H:288:LEU:HD13	2.37	0.60
1:B:37:LEU:HD12	1:B:37:LEU:H	1.67	0.60
2:C:500:HEM:HBD1	2:C:500:HEM:HHA	1.82	0.59
1:E:146:ILE:HG12	1:E:178:ILE:HD12	1.83	0.59
1:E:299:GLY:HA2	2:E:500:HEM:HMC2	1.84	0.59
2:F:500:HEM:HBC2	2:F:500:HEM:CMC	2.31	0.59
1:D:125:ARG:O	1:D:129:LEU:HB2	2.02	0.59
1:D:362:LEU:O	1:D:364:PRO:HD3	2.02	0.59
1:H:157:LEU:HD12	1:H:488:PHE:HD2	1.66	0.59
1:G:146:ILE:HG12	1:G:178:ILE:HD12	1.83	0.59
1:F:125:ARG:O	1:F:129:LEU:HB2	2.03	0.59
1:G:312:LEU:HB2	1:G:484:TYR:CE1	2.37	0.59
1:H:205:SER:O	1:H:209:ILE:HG13	2.02	0.59
1:C:127:PHE:C	1:C:127:PHE:CD1	2.75	0.59
1:F:102:ALA:CB	1:F:218:GLU:HA	2.33	0.59
1:A:311:PHE:HD1	1:A:459:ILE:HD13	1.67	0.59
1:E:142:VAL:HG22	1:E:146:ILE:CD1	2.33	0.59
2:F:500:HEM:HBB2	2:F:500:HEM:CMB	2.32	0.59
1:G:303:THR:OG1	2:G:500:HEM:HAB	2.02	0.59
1:E:107:ILE:HG13	1:E:238:LEU:HD12	1.84	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:340:LEU:HD13	1:D:444:THR:HG23	1.86	0.58
1:G:487:ARG:HD2	1:G:489:LEU:HD21	1.85	0.58
1:C:305:THR:HG22	1:C:308:ARG:HH21	1.68	0.58
1:D:284:HIS:CE1	1:D:287:ASN:HD22	2.21	0.58
1:G:84:ILE:HD11	1:G:391:VAL:O	2.03	0.58
1:H:235:TYR:O	1:H:239:GLN:HB2	2.04	0.58
1:E:102:ALA:CB	1:E:218:GLU:HA	2.34	0.58
1:G:282:GLU:HA	1:G:284:HIS:HE1	1.68	0.58
2:D:500:HEM:HBB2	2:D:500:HEM:CMB	2.31	0.58
1:E:268:TYR:CE1	1:E:288:LEU:HB2	2.38	0.58
1:B:30:LEU:HD21	1:B:383:PRO:HD3	1.85	0.58
1:B:182:ILE:O	1:B:263:ASP:HB2	2.04	0.58
1:B:277:SER:O	1:B:279:PRO:HD3	2.03	0.58
1:C:136:GLY:C	1:C:142:VAL:HG13	2.23	0.58
1:D:82:ASP:O	1:D:86:GLU:HG3	2.04	0.58
1:B:367:VAL:O	1:B:369:HIS:HD2	1.87	0.57
1:C:438:GLY:HA2	1:C:441:ILE:CD1	2.34	0.57
1:E:313:LEU:HG	1:E:470:LEU:HD11	1.86	0.57
1:C:299:GLY:HA2	2:C:500:HEM:HMC2	1.86	0.57
1:F:82:ASP:O	1:F:86:GLU:HG3	2.04	0.57
2:H:500:HEM:HBB2	2:H:500:HEM:CMB	2.31	0.57
1:B:183:VAL:HA	1:B:264:PHE:HB3	1.86	0.57
1:E:314:MET:SD	1:E:450:PHE:HZ	2.27	0.57
2:B:500:HEM:HHA	2:B:500:HEM:HBD1	1.86	0.57
1:E:70:LEU:HD11	1:E:389:PHE:HE1	1.69	0.57
1:F:201:LEU:HB3	1:F:241:ILE:HD11	1.86	0.57
1:F:278:ASP:OD1	1:F:278:ASP:C	2.42	0.57
1:H:157:LEU:HD12	1:H:488:PHE:CD2	2.40	0.57
2:A:500:HEM:HBC2	2:A:500:HEM:CMC	2.33	0.57
1:D:177:ASN:HD22	1:D:187:ARG:HE	1.52	0.57
1:E:30:LEU:HD21	1:E:383:PRO:HD3	1.86	0.57
1:G:238:LEU:HD23	1:G:241:ILE:HD12	1.87	0.57
1:C:135:PHE:CE2	1:C:267:VAL:HG21	2.37	0.57
1:C:299:GLY:HA2	2:C:500:HEM:CMC	2.34	0.57
1:D:305:THR:HG22	1:D:308:ARG:HH21	1.70	0.57
1:C:252:HIS:HD2	1:C:265:ILE:HB	1.70	0.57
1:H:157:LEU:HD12	1:H:165:LEU:HD21	1.87	0.57
1:H:357:GLN:HE22	1:H:429:PHE:HE2	1.52	0.57
1:C:292:VAL:O	1:C:296:PHE:HB2	2.05	0.57
1:H:314:MET:HB3	1:H:321:THR:OG1	2.05	0.57
1:F:85:ARG:O	1:F:89:VAL:HB	2.05	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:153:LEU:HD21	1:F:453:ILE:HD11	1.87	0.56
1:G:183:VAL:O	1:G:265:ILE:HG13	2.05	0.56
1:D:438:GLY:HA2	1:D:441:ILE:HD12	1.87	0.56
1:E:165:LEU:HD23	1:E:486:ILE:O	2.04	0.56
1:F:268:TYR:CD1	1:F:288:LEU:HD13	2.40	0.56
1:B:205:SER:O	1:B:209:ILE:HG13	2.05	0.56
1:B:225:LYS:HG2	1:B:226:TYR:CD1	2.40	0.56
1:B:438:GLY:HA2	1:B:441:ILE:HD12	1.85	0.56
1:C:136:GLY:O	1:C:142:VAL:HG22	2.04	0.56
1:C:232:ARG:CG	1:C:232:ARG:NH1	2.65	0.56
2:C:500:HEM:HBC2	2:C:500:HEM:CMC	2.32	0.56
1:G:471:THR:O	1:G:482:PRO:HG3	2.05	0.56
1:B:168:THR:HA	1:B:308:ARG:HD3	1.87	0.56
1:G:130:ALA:HA	1:G:133:ARG:HB2	1.88	0.56
1:H:125:ARG:O	1:H:129:LEU:HB2	2.04	0.56
1:A:94:ALA:O	1:A:371:VAL:HA	2.06	0.56
1:G:137:MET:SD	1:G:441:ILE:HD11	2.45	0.56
1:H:42:ASN:O	1:H:46:MET:HG2	2.05	0.56
1:H:297:PHE:CD1	3:H:501:TB2:H10A	2.40	0.56
1:A:42:ASN:O	1:A:46:MET:HG2	2.06	0.56
1:E:372:THR:O	1:E:384:LYS:HG3	2.04	0.56
1:G:111:TYR:N	1:G:111:TYR:CD1	2.74	0.56
1:G:268:TYR:CE1	1:G:288:LEU:HB2	2.41	0.56
1:E:111:TYR:HB2	1:E:290:LEU:HD12	1.86	0.56
1:G:309:TYR:HD1	1:G:481:PRO:HB3	1.70	0.56
1:H:164:LEU:HG	1:H:487:ARG:NH2	2.20	0.56
1:A:441:ILE:HD12	1:A:441:ILE:H	1.71	0.56
1:B:449:PHE:O	1:B:453:ILE:HG13	2.06	0.56
1:D:115:PHE:HE2	3:D:501:TB2:H10	1.70	0.56
1:D:409:ASN:HB3	1:D:412:HIS:NE2	2.19	0.56
1:D:430:SER:O	1:D:431:LEU:HD23	2.05	0.56
1:E:245:ILE:O	1:E:249:VAL:HG23	2.06	0.56
1:G:409:ASN:HB3	1:G:412:HIS:CE1	2.41	0.56
1:B:237:ASN:O	1:B:241:ILE:HG13	2.06	0.55
1:C:75:VAL:HG12	1:C:387:GLU:HB2	1.89	0.55
1:D:268:TYR:CE1	1:D:288:LEU:HB2	2.41	0.55
1:E:362:LEU:HD22	1:E:362:LEU:H	1.71	0.55
1:F:292:VAL:O	1:F:296:PHE:HB2	2.06	0.55
1:H:365:PHE:HA	1:H:391:VAL:HA	1.88	0.55
1:C:171:PHE:O	1:C:174:ILE:HG12	2.06	0.55
1:D:176:SER:HB2	1:D:300:THR:HG23	1.88	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:102:ALA:HB2	1:B:218:GLU:HA	1.88	0.55
1:C:369:HIS:HE1	1:C:434:ARG:HB2	1.72	0.55
1:D:264:PHE:O	1:D:264:PHE:CD1	2.60	0.55
1:E:142:VAL:HG22	1:E:146:ILE:HD11	1.88	0.55
1:G:195:PHE:CE2	1:G:199:LEU:HD11	2.42	0.55
1:C:198:LEU:HD11	1:C:244:PHE:CD1	2.41	0.55
1:A:301:GLU:CG	3:A:501:TB2:H2	2.37	0.55
1:C:323:ARG:HD3	1:C:348:TYR:CZ	2.42	0.55
1:D:84:ILE:HD11	1:D:391:VAL:O	2.05	0.55
1:E:171:PHE:O	1:E:174:ILE:HG12	2.07	0.55
1:G:108:PHE:HA	1:G:290:LEU:HD13	1.88	0.55
1:H:70:LEU:HG	1:H:75:VAL:HG21	1.88	0.55
1:H:241:ILE:O	1:H:245:ILE:HG13	2.07	0.55
1:A:121:TRP:CZ2	1:A:434:ARG:HD3	2.42	0.55
1:F:103:VAL:HG12	1:F:217:PHE:CD2	2.41	0.55
1:E:427:MET:HE2	1:E:431:LEU:HD11	1.89	0.55
1:A:112:GLY:O	1:A:116:ALA:HB2	2.07	0.55
1:H:314:MET:CB	1:H:459:ILE:HD11	2.36	0.55
1:E:65:VAL:HG21	1:E:377:PHE:HE2	1.72	0.54
1:H:157:LEU:CD1	1:H:165:LEU:HD21	2.37	0.54
1:B:202:PHE:CE1	1:B:241:ILE:HD13	2.42	0.54
1:E:142:VAL:CG1	1:E:143:GLU:N	2.70	0.54
1:H:38:PRO:O	1:H:39:VAL:HB	2.07	0.54
1:C:315:LEU:HD11	1:C:486:ILE:HG13	1.90	0.54
1:E:87:ALA:O	1:E:91:GLN:O	2.24	0.54
1:E:394:SER:O	1:E:398:ASP:HB2	2.07	0.54
1:F:127:PHE:CD1	1:F:127:PHE:C	2.81	0.54
1:D:69:TYR:CE2	1:D:74:PRO:HB3	2.42	0.54
1:E:317:TYR:N	1:E:317:TYR:CD1	2.76	0.54
1:B:154:VAL:HG13	1:B:457:PHE:CE2	2.43	0.54
1:E:317:TYR:N	1:E:317:TYR:HD1	2.05	0.54
1:E:362:LEU:O	1:E:364:PRO:HD3	2.07	0.54
1:B:206:PHE:CD2	1:B:480:VAL:HG13	2.43	0.54
1:B:299:GLY:HA2	2:B:500:HEM:HMC3	1.90	0.54
1:C:34:PRO:HB2	1:C:42:ASN:ND2	2.23	0.54
1:C:150:ALA:O	1:C:154:VAL:HG23	2.07	0.54
1:E:133:ARG:HA	1:E:137:MET:HB3	1.90	0.54
1:F:105:ASP:HB3	1:F:106:PRO:HD3	1.88	0.54
1:G:114:ILE:HG13	1:G:294:SER:HB3	1.88	0.54
1:G:358:ARG:HG3	1:G:396:LEU:HB3	1.89	0.54
1:E:164:LEU:HD21	1:E:462:PRO:HD3	1.89	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:245:ILE:O	1:B:249:VAL:HG23	2.08	0.54
1:C:136:GLY:O	1:C:142:VAL:CG2	2.56	0.54
1:E:179:ILE:HG21	1:E:295:LEU:O	2.07	0.54
1:G:316:LYS:HA	1:G:465:PRO:HB3	1.89	0.54
1:A:55:PHE:HE1	1:A:68:VAL:HG11	1.71	0.53
1:E:209:ILE:HG12	1:E:234:ILE:HD13	1.90	0.53
1:A:284:HIS:ND1	1:A:284:HIS:N	2.56	0.53
1:A:438:GLY:HA3	2:A:500:HEM:C2C	2.43	0.53
1:H:383:PRO:HD2	1:H:386:THR:OG1	2.08	0.53
1:C:232:ARG:NH1	1:C:232:ARG:HG2	2.23	0.53
1:H:438:GLY:HA3	2:H:500:HEM:C2C	2.43	0.53
1:B:105:ASP:HB3	1:B:106:PRO:HD3	1.90	0.53
1:E:134:ASP:OD2	1:E:135:PHE:CD2	2.61	0.53
1:H:101:ILE:O	1:H:105:ASP:HB2	2.09	0.53
1:B:268:TYR:O	1:B:272:MET:HB2	2.08	0.53
1:C:232:ARG:HH11	1:C:232:ARG:HG3	1.73	0.53
1:C:404:THR:N	1:C:405:PRO:HD3	2.24	0.53
1:E:167:ASN:ND2	1:E:171:PHE:HE2	2.07	0.53
1:F:278:ASP:OD1	1:F:280:SER:N	2.42	0.53
1:F:172:HIS:HB3	1:F:199:LEU:HD22	1.91	0.53
1:F:209:ILE:HG22	1:F:477:VAL:HG11	1.91	0.53
1:H:314:MET:HB2	1:H:459:ILE:CD1	2.39	0.53
1:B:98:ARG:HH22	2:B:500:HEM:HBA2	1.74	0.53
1:B:195:PHE:O	1:B:199:LEU:HG	2.09	0.53
1:D:171:PHE:O	1:D:174:ILE:HG12	2.09	0.53
1:E:52:LEU:O	1:E:56:LEU:HG	2.09	0.53
1:A:43:LEU:HD22	1:A:220:PHE:CZ	2.43	0.53
1:B:241:ILE:O	1:B:245:ILE:HG13	2.09	0.53
2:B:500:HEM:HBB2	2:B:500:HEM:CHC	2.30	0.53
1:C:183:VAL:HA	1:C:264:PHE:HB3	1.89	0.53
1:D:172:HIS:HE1	1:D:305:THR:HG23	1.73	0.52
1:G:449:PHE:O	1:G:453:ILE:HG13	2.09	0.52
1:G:76:VAL:HB	1:G:388:VAL:HG13	1.90	0.52
1:H:472:PRO:HA	1:H:482:PRO:HD3	1.90	0.52
1:C:102:ALA:CB	1:C:218:GLU:HA	2.38	0.52
1:C:232:ARG:HH11	1:C:232:ARG:HG2	1.73	0.52
2:H:500:HEM:HHA	2:H:500:HEM:HBA2	1.91	0.52
1:A:222:GLY:HA2	1:A:225:LYS:HE2	1.90	0.52
1:B:51:LEU:HD22	1:B:55:PHE:CZ	2.44	0.52
1:C:120:ARG:HA	1:C:282:GLU:HG3	1.92	0.52
1:D:75:VAL:HG12	1:D:387:GLU:HB2	1.91	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:376:GLN:HG2	1:C:381:VAL:HG22	1.91	0.52
1:D:164:LEU:HD23	1:D:487:ARG:HB3	1.92	0.52
1:D:326:LYS:O	1:D:330:GLN:HG3	2.10	0.52
1:A:176:SER:HB2	1:A:300:THR:HG23	1.92	0.52
1:E:135:PHE:CE2	1:E:267:VAL:HG21	2.45	0.52
1:E:409:ASN:HB3	1:E:412:HIS:CD2	2.44	0.52
1:E:284:HIS:HB2	1:E:286:GLN:HB2	1.91	0.52
1:H:230:THR:O	1:H:234:ILE:HG13	2.10	0.52
1:H:369:HIS:O	1:H:387:GLU:HA	2.10	0.52
1:B:82:ASP:O	1:B:86:GLU:HG3	2.10	0.52
1:E:164:LEU:HD22	1:E:485:GLN:HB3	1.92	0.52
1:C:136:GLY:HA2	1:C:141:SER:OG	2.09	0.52
1:G:413:PHE:O	1:G:414:LEU:HD23	2.10	0.52
1:H:320:VAL:HG13	1:H:348:TYR:OH	2.10	0.52
1:A:139:LYS:HA	1:A:142:VAL:HG12	1.91	0.51
1:G:111:TYR:N	1:G:111:TYR:HD1	2.07	0.51
1:F:487:ARG:HD2	1:F:489:LEU:HD21	1.91	0.51
1:H:114:ILE:HG13	1:H:294:SER:HB3	1.92	0.51
1:A:358:ARG:HH12	1:A:397:HIS:HD2	1.58	0.51
1:B:364:PRO:HG3	1:B:479:ASN:ND2	2.25	0.51
1:D:430:SER:CB	2:D:500:HEM:HBA2	2.39	0.51
1:F:52:LEU:HD22	1:F:364:PRO:HB3	1.92	0.51
1:F:368:PRO:HG3	1:F:389:PHE:HE2	1.76	0.51
1:H:176:SER:HB3	1:H:195:PHE:HZ	1.75	0.51
1:B:195:PHE:CZ	1:B:199:LEU:HD11	2.46	0.51
1:C:147:GLN:O	1:C:150:ALA:HB3	2.10	0.51
1:D:102:ALA:HB1	1:D:217:PHE:HD2	1.75	0.51
1:D:163:ALA:HA	1:D:487:ARG:NH1	2.25	0.51
1:D:205:SER:O	1:D:209:ILE:HG13	2.10	0.51
1:F:103:VAL:HG12	1:F:217:PHE:HD2	1.74	0.51
1:G:135:PHE:CE2	1:G:267:VAL:HG21	2.44	0.51
1:C:87:ALA:HB2	1:C:377:PHE:CZ	2.46	0.51
1:G:363:ILE:N	1:G:363:ILE:HD12	2.26	0.51
1:C:252:HIS:CD2	1:C:265:ILE:HB	2.46	0.51
1:F:114:ILE:HG13	1:F:294:SER:HB3	1.92	0.51
1:F:242:ASN:HD21	1:F:293:LEU:HD22	1.75	0.51
1:A:128:SER:HA	1:A:264:PHE:HE2	1.75	0.51
1:H:244:PHE:HA	1:H:247:GLN:HG2	1.93	0.51
1:A:441:ILE:O	1:A:445:GLU:HG3	2.11	0.50
1:B:107:ILE:HD11	1:B:235:TYR:HD1	1.76	0.50
1:C:326:LYS:O	1:C:330:GLN:HG3	2.11	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:174:ILE:O	1:D:178:ILE:HG12	2.11	0.50
1:H:157:LEU:CD1	1:H:488:PHE:CD2	2.95	0.50
1:A:98:ARG:NH1	1:A:367:VAL:HB	2.25	0.50
1:H:211:SER:HA	1:H:474:GLU:CG	2.42	0.50
1:H:268:TYR:CE1	1:H:288:LEU:HB2	2.46	0.50
1:A:98:ARG:HE	1:A:434:ARG:NH1	2.10	0.50
1:E:109:GLN:O	1:E:111:TYR:CD1	2.65	0.50
1:H:409:ASN:HB3	1:H:412:HIS:CD2	2.46	0.50
1:B:65:VAL:HG21	1:B:377:PHE:HE2	1.75	0.50
1:E:299:GLY:HA2	2:E:500:HEM:CMC	2.42	0.50
1:F:268:TYR:HE1	1:F:288:LEU:HB2	1.74	0.50
1:A:139:LYS:HA	1:A:142:VAL:CG1	2.42	0.50
1:B:268:TYR:CD1	1:B:288:LEU:HD13	2.47	0.50
1:C:438:GLY:O	1:C:442:ALA:HB3	2.12	0.50
2:D:500:HEM:HBD1	2:D:500:HEM:HHA	1.94	0.50
1:E:94:ALA:O	1:E:371:VAL:HA	2.12	0.50
1:A:102:ALA:CB	1:A:218:GLU:HA	2.38	0.50
1:A:438:GLY:O	1:A:442:ALA:CB	2.60	0.49
1:B:268:TYR:CE2	1:B:283:PHE:HD1	2.30	0.49
1:C:129:LEU:HD22	1:C:133:ARG:NH1	2.27	0.49
1:F:404:THR:OG1	1:F:407:THR:HB	2.11	0.49
1:F:409:ASN:HB3	1:F:412:HIS:CD2	2.46	0.49
1:G:39:VAL:HG12	1:G:40:LEU:N	2.27	0.49
1:H:43:LEU:HD22	1:H:220:PHE:CZ	2.47	0.49
1:H:102:ALA:HB2	1:H:218:GLU:HA	1.94	0.49
1:H:30:LEU:HD21	1:H:383:PRO:CD	2.39	0.49
1:H:362:LEU:H	1:H:362:LEU:HD22	1.77	0.49
1:A:114:ILE:HG12	2:A:500:HEM:HAD1	1.94	0.49
1:A:314:MET:SD	1:A:450:PHE:HZ	2.35	0.49
1:D:403:GLU:O	1:D:404:THR:CG2	2.59	0.49
1:E:321:THR:O	1:E:325:GLN:HG3	2.12	0.49
1:F:202:PHE:CE1	1:F:241:ILE:HD13	2.47	0.49
1:A:34:PRO:HG3	1:A:62:TYR:CZ	2.48	0.49
1:A:413:PHE:O	1:A:414:LEU:HD23	2.13	0.49
1:D:164:LEU:HD13	1:D:485:GLN:HB3	1.93	0.49
1:A:438:GLY:HA2	1:A:441:ILE:HD12	1.94	0.49
1:B:345:LYS:O	1:B:347:PRO:HD3	2.13	0.49
1:B:435:ILE:HG12	1:B:436:CYS:N	2.26	0.49
1:D:438:GLY:HA2	1:D:441:ILE:CD1	2.43	0.49
1:F:311:PHE:O	1:F:315:LEU:HG	2.13	0.49
1:A:84:ILE:HD12	1:A:395:ALA:HB2	1.94	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:316:LYS:C	1:A:318:PRO:HD3	2.32	0.49
1:C:205:SER:O	1:C:209:ILE:HG13	2.12	0.49
1:E:352:VAL:O	1:E:356:ILE:HG13	2.12	0.49
1:F:252:HIS:CD2	1:F:262:ARG:HH21	2.30	0.49
1:F:342:ASP:HA	1:F:345:LYS:HE3	1.94	0.49
1:G:102:ALA:HB2	1:G:218:GLU:HA	1.95	0.49
1:H:43:LEU:HD22	1:H:220:PHE:HZ	1.78	0.49
1:H:194:VAL:O	1:H:198:LEU:HD23	2.13	0.49
1:A:80:GLY:O	1:A:84:ILE:HG13	2.12	0.49
1:C:146:ILE:HG12	1:C:178:ILE:HD12	1.95	0.49
1:E:316:LYS:C	1:E:317:TYR:HD1	2.15	0.49
1:H:395:ALA:HA	1:H:398:ASP:HB2	1.94	0.49
1:A:174:ILE:HG13	1:A:175:THR:N	2.28	0.49
1:E:34:PRO:O	1:E:36:PRO:HD3	2.11	0.49
1:F:143:GLU:OE2	1:F:340:LEU:HB2	2.06	0.49
1:G:307:LEU:HD23	1:G:446:LEU:HD23	1.95	0.49
1:A:194:VAL:O	1:A:198:LEU:HD23	2.12	0.49
1:B:352:VAL:O	1:B:356:ILE:HG13	2.13	0.49
1:C:70:LEU:HD22	1:C:219:LEU:HD11	1.93	0.49
1:D:127:PHE:CD1	1:D:127:PHE:C	2.85	0.49
1:E:112:GLY:O	1:E:116:ALA:HB2	2.13	0.49
1:G:36:PRO:HG3	1:G:69:TYR:CD1	2.48	0.49
1:C:44:LEU:HB2	1:C:45:GLN:NE2	2.27	0.49
1:D:132:MET:HG2	1:D:182:ILE:HG21	1.95	0.49
1:G:268:TYR:CD1	1:G:288:LEU:HD13	2.48	0.49
1:H:157:LEU:CD1	1:H:165:LEU:CD2	2.91	0.49
1:B:111:TYR:HB2	1:B:290:LEU:CD1	2.42	0.48
1:B:295:LEU:HD23	2:B:500:HEM:HBC1	1.95	0.48
1:D:114:ILE:HG13	1:D:294:SER:HB3	1.95	0.48
1:D:352:VAL:O	1:D:356:ILE:HG13	2.13	0.48
1:H:445:GLU:O	1:H:449:PHE:HB2	2.13	0.48
1:D:324:VAL:O	1:D:328:ILE:HG13	2.13	0.48
1:E:122:ARG:HB2	1:E:122:ARG:CZ	2.42	0.48
1:F:153:LEU:HD22	1:F:174:ILE:HG21	1.93	0.48
1:H:404:THR:N	1:H:405:PRO:HD3	2.28	0.48
1:E:68:VAL:HG22	1:E:69:TYR:N	2.28	0.48
1:E:129:LEU:O	1:E:133:ARG:HB2	2.13	0.48
1:H:441:ILE:O	1:H:445:GLU:HG3	2.13	0.48
1:A:150:ALA:O	1:A:154:VAL:HG23	2.13	0.48
1:B:297:PHE:CE1	3:B:501:TB2:H7	2.48	0.48
1:C:427:MET:HG3	1:C:427:MET:O	2.14	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:430:SER:O	1:E:431:LEU:HD23	2.14	0.48
1:F:98:ARG:HB2	1:F:434:ARG:NH1	2.28	0.48
1:F:143:GLU:HG3	1:F:448:LEU:HD11	1.96	0.48
1:F:311:PHE:HA	1:F:314:MET:HB2	1.95	0.48
1:H:85:ARG:O	1:H:89:VAL:HB	2.14	0.48
1:H:210:SER:HB3	1:H:478:GLY:O	2.12	0.48
1:B:297:PHE:CD1	3:B:501:TB2:H7	2.48	0.48
1:C:183:VAL:HA	1:C:264:PHE:CB	2.44	0.48
1:F:316:LYS:C	1:F:318:PRO:HD3	2.34	0.48
1:A:315:LEU:HD11	1:A:486:ILE:HG13	1.95	0.48
1:B:398:ASP:OD2	1:B:401:TYR:HD1	1.95	0.48
1:E:52:LEU:HD13	1:E:365:PHE:HD2	1.78	0.48
1:H:357:GLN:NE2	1:H:429:PHE:HE2	2.11	0.48
1:H:401:TYR:CD2	1:H:424:GLU:HB2	2.49	0.48
1:B:284:HIS:HB2	1:B:287:ASN:H	1.79	0.48
1:D:85:ARG:HA	1:D:89:VAL:HG23	1.96	0.48
1:D:313:LEU:HD22	1:D:408:PHE:CD1	2.49	0.48
1:E:134:ASP:OD2	1:E:135:PHE:CE2	2.67	0.48
2:F:500:HEM:HMA1	2:F:500:HEM:CBA	2.42	0.48
1:H:107:ILE:HD11	1:H:235:TYR:HA	1.95	0.48
1:H:144:GLU:O	1:H:148:GLU:HB3	2.14	0.48
1:B:163:ALA:HA	1:B:487:ARG:NH1	2.29	0.48
1:E:297:PHE:CD1	3:E:501:TB2:H5	2.49	0.48
1:G:315:LEU:HD21	1:G:459:ILE:HB	1.96	0.48
1:H:364:PRO:HD2	1:H:477:VAL:O	2.14	0.48
1:B:370:THR:HA	1:B:386:THR:O	2.13	0.48
1:C:30:LEU:HD21	1:C:383:PRO:CD	2.42	0.48
1:C:438:GLY:HA2	1:C:441:ILE:HD12	1.96	0.48
1:D:87:ALA:O	1:D:91:GLN:O	2.32	0.48
1:D:228:PRO:HG3	1:G:213:SER:HB3	1.95	0.48
1:D:369:HIS:NE2	2:D:500:HEM:O2A	2.46	0.48
1:G:107:ILE:HG21	1:G:238:LEU:HD13	1.96	0.48
1:C:30:LEU:CD2	1:C:383:PRO:HD3	2.43	0.48
1:C:190:TYR:O	1:C:191:LYS:HD2	2.14	0.48
1:D:30:LEU:HD22	1:D:383:PRO:HD3	1.95	0.48
1:E:163:ALA:HA	1:E:487:ARG:NH1	2.28	0.48
1:G:66:PHE:CE2	1:G:77:VAL:HG21	2.49	0.48
1:H:43:LEU:HD13	1:H:219:LEU:HD23	1.96	0.48
1:H:364:PRO:HA	1:H:393:SER:HB2	1.94	0.48
1:A:384:LYS:O	1:A:385:ASN:HB2	2.14	0.47
1:E:32:PRO:O	1:E:66:PHE:HB2	2.14	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:98:ARG:HB2	1:F:434:ARG:HH12	1.78	0.47
1:H:164:LEU:HG	1:H:487:ARG:CZ	2.44	0.47
1:A:353:ILE:HD11	1:A:447:PHE:HA	1.96	0.47
1:H:120:ARG:HG3	1:H:282:GLU:OE1	2.14	0.47
1:C:362:LEU:C	1:C:363:ILE:HD12	2.34	0.47
1:D:120:ARG:HA	1:D:282:GLU:HG3	1.96	0.47
1:E:349:THR:O	1:E:353:ILE:HG13	2.14	0.47
1:C:457:PHE:CD1	1:C:488:PHE:HB3	2.50	0.47
1:F:121:TRP:CZ2	1:F:434:ARG:HD3	2.49	0.47
1:G:34:PRO:HB2	1:G:42:ASN:ND2	2.29	0.47
1:G:69:TYR:CE2	1:G:74:PRO:HB3	2.49	0.47
1:H:127:PHE:CE1	1:H:268:TYR:HD2	2.32	0.47
1:H:146:ILE:HG23	1:H:449:PHE:CZ	2.49	0.47
1:D:177:ASN:ND2	1:D:187:ARG:HB2	2.30	0.47
1:E:120:ARG:O	1:E:124:LEU:HG	2.14	0.47
1:D:30:LEU:HB3	1:D:31:PRO:HD2	1.96	0.47
1:E:195:PHE:CE2	1:E:199:LEU:HD11	2.50	0.47
1:F:305:THR:HG22	1:F:308:ARG:NH2	2.19	0.47
1:F:404:THR:HG1	1:F:407:THR:HB	1.80	0.47
1:G:32:PRO:HD3	1:G:380:TYR:CZ	2.50	0.47
1:G:263:ASP:O	1:G:266:ASP:HB2	2.14	0.47
1:A:43:LEU:HD22	1:A:220:PHE:HZ	1.78	0.47
1:B:321:THR:HG23	1:B:454:LEU:HD21	1.96	0.47
1:C:307:LEU:HD23	1:C:446:LEU:HD23	1.97	0.47
1:E:307:LEU:HD12	1:E:311:PHE:HE2	1.79	0.47
1:E:384:LYS:HG2	1:E:385:ASN:CG	2.35	0.47
1:E:457:PHE:HA	1:E:491:ARG:HG3	1.97	0.47
1:F:150:ALA:O	1:F:154:VAL:HG23	2.13	0.47
1:H:211:SER:HA	1:H:474:GLU:HG3	1.96	0.47
1:A:150:ALA:HB1	1:A:452:THR:HG21	1.97	0.47
1:B:37:LEU:HD12	1:B:37:LEU:N	2.30	0.47
1:E:263:ASP:O	1:E:267:VAL:HG23	2.15	0.47
1:E:317:TYR:CE2	1:E:408:PHE:HB3	2.50	0.47
1:F:429:PHE:HB3	1:F:436:CYS:HB3	1.97	0.47
1:G:316:LYS:HG3	1:G:465:PRO:O	2.15	0.47
1:A:268:TYR:CG	1:A:288:LEU:HD13	2.50	0.47
1:A:323:ARG:HD3	1:A:348:TYR:CZ	2.50	0.47
1:B:125:ARG:O	1:B:129:LEU:HB2	2.15	0.47
1:B:316:LYS:HD3	1:B:317:TYR:HE1	1.80	0.47
1:C:43:LEU:HD22	1:C:220:PHE:HZ	1.80	0.47
1:D:174:ILE:HB	1:D:449:PHE:CZ	2.50	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:195:PHE:O	1:F:199:LEU:HG	2.15	0.47
1:G:265:ILE:HG23	1:G:288:LEU:HD21	1.97	0.47
1:H:107:ILE:HG13	1:H:238:LEU:HD12	1.97	0.47
1:H:188:PHE:HB2	1:H:195:PHE:CD2	2.50	0.47
1:B:268:TYR:CE1	1:B:288:LEU:HB2	2.49	0.47
1:B:479:ASN:O	1:B:481:PRO:HD3	2.14	0.47
1:G:206:PHE:CE1	3:G:501:TB2:H2	2.50	0.47
1:H:307:LEU:HD23	1:H:446:LEU:HD23	1.96	0.47
1:H:404:THR:HG23	1:H:404:THR:O	2.15	0.47
1:B:102:ALA:CB	1:B:218:GLU:HA	2.44	0.46
1:C:434:ARG:HD2	2:C:500:HEM:O2D	2.14	0.46
1:D:107:ILE:HG13	1:D:238:LEU:HD12	1.97	0.46
1:E:43:LEU:HD22	1:E:220:PHE:CZ	2.49	0.46
1:F:34:PRO:HG3	1:F:62:TYR:CZ	2.50	0.46
1:F:40:LEU:O	1:F:43:LEU:HB2	2.15	0.46
1:G:295:LEU:HD23	2:G:500:HEM:HAC	1.96	0.46
1:H:66:PHE:HE1	1:H:79:CYS:SG	2.37	0.46
1:B:327:GLU:HG2	1:B:346:MET:HG2	1.97	0.46
1:F:248:SER:HA	1:F:251:LYS:HB2	1.98	0.46
1:G:31:PRO:HA	1:G:380:TYR:CD1	2.51	0.46
1:G:413:PHE:O	1:G:420:LEU:HA	2.16	0.46
1:D:241:ILE:O	1:D:245:ILE:HG13	2.15	0.46
1:D:268:TYR:CG	1:D:288:LEU:HD13	2.51	0.46
1:E:52:LEU:HD22	1:E:364:PRO:HB3	1.96	0.46
1:F:314:MET:HA	1:F:314:MET:CE	2.44	0.46
1:A:76:VAL:HG21	1:A:382:ILE:HD13	1.97	0.46
1:A:464:PRO:HB2	1:A:466:GLU:HG2	1.98	0.46
1:B:232:ARG:NH1	1:B:232:ARG:CG	2.60	0.46
1:E:30:LEU:CD2	1:E:383:PRO:HD3	2.45	0.46
1:E:154:VAL:HG13	1:E:457:PHE:CE2	2.51	0.46
1:H:237:ASN:O	1:H:241:ILE:HG13	2.14	0.46
1:A:301:GLU:HG3	3:A:501:TB2:H2	1.96	0.46
1:B:36:PRO:HG3	1:B:69:TYR:CD1	2.51	0.46
1:B:135:PHE:CZ	1:B:263:ASP:HA	2.50	0.46
1:B:384:LYS:O	1:B:385:ASN:HB2	2.14	0.46
1:C:43:LEU:HD22	1:C:220:PHE:CZ	2.51	0.46
1:C:268:TYR:CG	1:C:288:LEU:HD13	2.51	0.46
1:E:307:LEU:HD21	1:E:449:PHE:HB2	1.97	0.46
1:F:196:LEU:HD23	1:F:199:LEU:HD12	1.98	0.46
1:H:177:ASN:HA	1:H:180:CYS:HB2	1.96	0.46
1:H:223:PHE:HE2	1:H:227:PHE:CE2	2.33	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:363:ILE:N	1:H:363:ILE:HD12	2.31	0.46
1:H:364:PRO:HG2	1:H:476:GLY:O	2.15	0.46
1:E:167:ASN:ND2	1:E:171:PHE:CE2	2.83	0.46
1:H:328:ILE:O	1:H:332:ILE:HB	2.16	0.46
1:A:42:ASN:OD1	1:A:69:TYR:HB2	2.15	0.46
1:C:150:ALA:HB1	1:C:452:THR:HG21	1.96	0.46
1:D:263:ASP:O	1:D:266:ASP:HB2	2.15	0.46
1:D:357:GLN:HE21	2:D:500:HEM:CBB	2.28	0.46
1:F:409:ASN:HD22	1:F:411:GLY:H	1.62	0.46
1:G:362:LEU:H	1:G:362:LEU:CD2	2.21	0.46
1:H:66:PHE:HE1	1:H:79:CYS:HG	1.63	0.46
1:H:369:HIS:HE1	1:H:434:ARG:HB2	1.81	0.46
1:A:358:ARG:NH1	1:A:397:HIS:HD2	2.14	0.46
1:C:127:PHE:O	1:C:131:THR:OG1	2.31	0.46
1:C:404:THR:OG1	1:C:407:THR:HB	2.15	0.46
2:D:500:HEM:HBA1	2:D:500:HEM:CMA	2.46	0.46
1:F:147:GLN:O	1:F:150:ALA:HB3	2.15	0.46
1:F:438:GLY:O	1:F:439:GLU:C	2.53	0.46
1:G:316:LYS:C	1:G:318:PRO:HD3	2.35	0.46
1:A:362:LEU:H	1:A:362:LEU:HD22	1.80	0.46
1:D:137:MET:SD	1:D:441:ILE:HD11	2.56	0.46
1:F:43:LEU:HD22	1:F:220:PHE:HZ	1.81	0.46
1:G:305:THR:CG2	1:G:308:ARG:HH21	2.29	0.46
1:H:298:ALA:CB	4:H:8:HOH:O	2.64	0.46
1:A:94:ALA:HB1	1:A:375:THR:OG1	2.15	0.46
1:A:205:SER:O	1:A:209:ILE:HG13	2.16	0.46
1:C:324:VAL:O	1:C:328:ILE:HG13	2.16	0.46
1:E:403:GLU:O	1:E:412:HIS:NE2	2.49	0.46
1:E:461:SER:OG	1:E:462:PRO:HD2	2.15	0.46
1:G:332:ILE:HD13	1:G:338:PRO:HB3	1.96	0.46
1:H:165:LEU:HD21	1:H:488:PHE:HD2	1.80	0.46
1:B:150:ALA:HB1	1:B:452:THR:HG21	1.98	0.45
1:C:73:ARG:HA	1:C:74:PRO:HD3	1.77	0.45
1:D:104:VAL:HG21	3:D:501:TB2:H11	1.99	0.45
1:F:164:LEU:HD11	1:F:462:PRO:HG3	1.97	0.45
1:F:204:GLN:O	1:F:208:LEU:HG	2.15	0.45
1:G:205:SER:O	1:G:209:ILE:HG13	2.16	0.45
1:H:125:ARG:NH1	1:H:437:LEU:HD11	2.31	0.45
1:A:315:LEU:HD21	1:A:459:ILE:HB	1.98	0.45
1:C:384:LYS:O	1:C:385:ASN:HB2	2.17	0.45
1:C:486:ILE:HG12	1:C:487:ARG:N	2.31	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:297:PHE:CD1	3:D:501:TB2:H12B	2.51	0.45
1:E:463:VAL:HA	1:E:464:PRO:HD3	1.84	0.45
1:F:143:GLU:OE2	1:F:340:LEU:CA	2.64	0.45
1:F:367:VAL:O	1:F:369:HIS:HD2	2.00	0.45
1:G:98:ARG:NH1	1:G:367:VAL:HB	2.31	0.45
1:G:183:VAL:HA	1:G:264:PHE:HB3	1.98	0.45
1:H:103:VAL:HB	1:H:234:ILE:HD12	1.98	0.45
1:H:154:VAL:HG12	1:H:154:VAL:O	2.16	0.45
1:A:217:PHE:O	1:A:221:SER:HB3	2.16	0.45
1:A:445:GLU:O	1:A:449:PHE:HB2	2.15	0.45
1:A:459:ILE:HB	1:A:486:ILE:HD11	1.98	0.45
1:C:284:HIS:HB2	1:C:287:ASN:H	1.81	0.45
1:C:314:MET:SD	1:C:450:PHE:HZ	2.40	0.45
1:C:364:PRO:HA	1:C:393:SER:HB2	1.97	0.45
1:C:438:GLY:HA3	2:C:500:HEM:C2C	2.51	0.45
1:E:351:ALA:HB2	1:E:414:LEU:HD21	1.99	0.45
1:F:105:ASP:O	1:F:109:GLN:N	2.49	0.45
1:H:268:TYR:OH	1:H:283:PHE:HA	2.17	0.45
1:B:125:ARG:NH1	2:B:500:HEM:O1D	2.49	0.45
1:B:427:MET:HE2	1:B:431:LEU:HD11	1.99	0.45
1:C:441:ILE:HD12	1:C:441:ILE:H	1.81	0.45
1:D:103:VAL:HG23	1:D:104:VAL:HG13	1.98	0.45
1:D:264:PHE:CD1	1:D:264:PHE:C	2.89	0.45
1:G:137:MET:O	1:G:137:MET:HG3	2.15	0.45
1:F:103:VAL:HG23	1:F:104:VAL:N	2.32	0.45
1:A:309:TYR:CE2	1:A:313:LEU:HD11	2.52	0.45
1:C:201:LEU:HB3	1:C:241:ILE:HD11	1.99	0.45
1:D:31:PRO:HA	1:D:380:TYR:CD1	2.51	0.45
1:E:32:PRO:HD3	1:E:380:TYR:OH	2.17	0.45
1:E:131:THR:O	1:E:135:PHE:HD2	2.00	0.45
1:G:164:LEU:HD23	1:G:487:ARG:HB3	1.98	0.45
3:G:501:TB2:O1	3:G:501:TB2:C8	2.60	0.45
1:A:312:LEU:HD13	1:A:484:TYR:CD1	2.52	0.45
1:D:43:LEU:HD22	1:D:220:PHE:HZ	1.82	0.45
1:F:363:ILE:HD12	1:F:363:ILE:N	2.32	0.45
1:G:87:ALA:HB2	1:G:377:PHE:CE1	2.52	0.45
1:G:237:ASN:O	1:G:241:ILE:HG13	2.17	0.45
1:D:401:TYR:CD2	1:D:424:GLU:HB2	2.52	0.45
1:E:120:ARG:HA	1:E:282:GLU:HG3	1.99	0.45
1:H:30:LEU:HD23	1:H:381:VAL:O	2.17	0.45
1:H:449:PHE:O	1:H:453:ILE:HG13	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:206:PHE:CZ	1:B:478:GLY:HA3	2.52	0.45
1:B:263:ASP:H	1:B:266:ASP:HB2	1.82	0.45
1:C:156:GLU:HG2	1:C:190:TYR:HD2	1.81	0.45
1:D:102:ALA:HB1	1:D:217:PHE:CD2	2.51	0.45
1:D:441:ILE:HD12	1:D:441:ILE:H	1.81	0.45
1:A:103:VAL:O	1:A:106:PRO:HD2	2.17	0.45
1:A:299:GLY:HA2	2:A:500:HEM:CMC	2.47	0.45
1:A:353:ILE:CD1	1:A:447:PHE:HA	2.47	0.45
1:E:174:ILE:HD12	1:E:449:PHE:CD1	2.51	0.45
2:E:500:HEM:HBD1	2:E:500:HEM:HHA	1.99	0.45
1:F:164:LEU:HD22	1:F:485:GLN:HB3	1.98	0.45
1:A:105:ASP:N	1:A:106:PRO:CD	2.80	0.44
1:A:324:VAL:O	1:A:328:ILE:HG13	2.17	0.44
1:C:213:SER:HB2	1:C:230:THR:OG1	2.17	0.44
1:E:392:LEU:HD22	1:E:427:MET:HG3	1.99	0.44
1:F:104:VAL:HG21	3:F:501:TB2:H10	1.98	0.44
1:F:112:GLY:O	1:F:116:ALA:HB2	2.15	0.44
1:A:120:ARG:HA	1:A:282:GLU:HG3	1.99	0.44
1:A:438:GLY:O	1:A:442:ALA:HB3	2.17	0.44
1:B:107:ILE:HD11	1:B:235:TYR:CD1	2.52	0.44
1:C:441:ILE:O	1:C:445:GLU:HG3	2.17	0.44
1:D:30:LEU:CD2	1:D:383:PRO:HD3	2.48	0.44
1:D:150:ALA:O	1:D:154:VAL:HG23	2.17	0.44
1:D:154:VAL:HG13	1:D:457:PHE:CE2	2.52	0.44
1:D:242:ASN:OD1	1:D:293:LEU:HD22	2.16	0.44
1:F:146:ILE:HG12	1:F:178:ILE:HD12	1.99	0.44
1:G:460:ALA:HB3	1:G:487:ARG:HG2	1.98	0.44
1:H:37:LEU:N	1:H:37:LEU:HD12	2.32	0.44
1:H:238:LEU:HD23	1:H:241:ILE:HD12	1.99	0.44
1:A:30:LEU:HD21	1:A:383:PRO:HD2	1.99	0.44
1:A:153:LEU:HD13	1:A:170:LEU:HD11	1.99	0.44
1:C:110:GLY:O	1:C:116:ALA:HA	2.17	0.44
1:D:207:SER:HA	1:D:480:VAL:HG21	1.99	0.44
1:E:43:LEU:HD22	1:E:220:PHE:HZ	1.83	0.44
1:F:299:GLY:HA2	2:F:500:HEM:CMC	2.47	0.44
1:H:362:LEU:O	1:H:364:PRO:HD3	2.17	0.44
1:A:190:TYR:O	1:A:191:LYS:HD2	2.18	0.44
1:A:457:PHE:CD1	1:A:488:PHE:HB3	2.52	0.44
1:B:192:ASP:HB3	1:B:195:PHE:HB3	1.97	0.44
1:B:312:LEU:HB2	1:B:484:TYR:CE1	2.53	0.44
1:C:94:ALA:O	1:C:371:VAL:HA	2.18	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:320:VAL:O	1:G:324:VAL:HG23	2.18	0.44
1:C:202:PHE:CE1	1:C:241:ILE:HD13	2.52	0.44
1:C:241:ILE:O	1:C:245:ILE:HG13	2.18	0.44
1:D:34:PRO:HB2	1:D:42:ASN:ND2	2.31	0.44
1:D:101:ILE:CG2	1:D:104:VAL:HG22	2.48	0.44
1:D:183:VAL:HA	1:D:264:PHE:HB3	1.99	0.44
1:D:208:LEU:O	1:D:214:SER:HB2	2.17	0.44
1:G:42:ASN:O	1:G:46:MET:HG2	2.17	0.44
1:G:331:VAL:HG21	1:G:346:MET:HG2	1.99	0.44
1:C:101:ILE:CG2	1:C:104:VAL:HG22	2.47	0.44
1:F:223:PHE:C	1:F:223:PHE:CD2	2.90	0.44
1:G:284:HIS:ND1	1:G:284:HIS:N	2.66	0.44
1:A:183:VAL:HA	1:A:264:PHE:HB3	2.00	0.44
1:A:441:ILE:CD1	1:A:441:ILE:H	2.29	0.44
1:C:111:TYR:HB2	1:C:290:LEU:HD12	1.99	0.44
1:D:133:ARG:HG2	1:D:137:MET:HG2	1.99	0.44
1:E:129:LEU:HD22	1:E:133:ARG:HD3	1.98	0.44
1:E:183:VAL:HA	1:E:264:PHE:HB3	2.00	0.44
1:E:401:TYR:CE2	1:E:424:GLU:HB2	2.53	0.44
1:F:179:ILE:HG13	1:F:299:GLY:HA3	2.00	0.44
1:G:301:GLU:O	1:G:305:THR:OG1	2.35	0.44
1:H:52:LEU:HD13	1:H:364:PRO:HB3	1.99	0.44
1:A:142:VAL:HG13	1:A:143:GLU:N	2.33	0.44
1:C:37:LEU:N	1:C:37:LEU:HD12	2.33	0.44
1:C:363:ILE:HD12	1:C:363:ILE:N	2.33	0.44
1:A:362:LEU:HD22	1:A:362:LEU:N	2.32	0.44
1:C:155:GLU:O	1:C:159:LYS:HG3	2.18	0.44
1:C:263:ASP:O	1:C:267:VAL:HG23	2.18	0.44
1:B:51:LEU:HB2	1:B:215:GLN:OE1	2.18	0.43
1:B:223:PHE:C	1:B:223:PHE:CD2	2.90	0.43
1:C:84:ILE:HD11	1:C:391:VAL:O	2.17	0.43
1:C:317:TYR:CD1	1:C:317:TYR:N	2.86	0.43
1:F:355:GLU:OE1	1:F:355:GLU:HA	2.18	0.43
1:A:367:VAL:CG2	2:A:500:HEM:HAA2	2.49	0.43
1:B:363:ILE:HD12	1:B:363:ILE:N	2.33	0.43
1:B:421:LYS:HB3	1:B:421:LYS:HE2	1.75	0.43
1:C:256:LEU:O	1:C:258:PRO:HD3	2.17	0.43
1:D:105:ASP:N	1:D:106:PRO:CD	2.81	0.43
2:E:500:HEM:HBB2	2:E:500:HEM:CHC	2.36	0.43
1:F:223:PHE:C	1:F:223:PHE:HD2	2.22	0.43
1:F:320:VAL:HG21	1:F:408:PHE:CE2	2.42	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:401:TYR:CE2	1:G:424:GLU:HB2	2.54	0.43
1:G:485:GLN:HE21	1:G:485:GLN:HA	1.83	0.43
1:D:370:THR:HG22	1:D:387:GLU:HG2	2.00	0.43
1:D:432:GLY:C	1:D:434:ARG:H	2.22	0.43
1:F:75:VAL:HG12	1:F:387:GLU:CB	2.42	0.43
1:H:367:VAL:CG2	2:H:500:HEM:HAA1	2.48	0.43
1:A:287:ASN:O	1:A:291:THR:HB	2.18	0.43
1:B:164:LEU:HD13	1:B:485:GLN:HB3	1.99	0.43
1:C:337:PRO:HA	1:C:338:PRO:HD3	1.93	0.43
1:D:409:ASN:HB3	1:D:412:HIS:CD2	2.53	0.43
1:D:447:PHE:O	1:D:451:THR:HG23	2.18	0.43
1:E:447:PHE:O	1:E:451:THR:HG23	2.18	0.43
1:F:368:PRO:HG3	1:F:389:PHE:CE2	2.53	0.43
1:G:73:ARG:NH1	1:G:218:GLU:HG3	2.32	0.43
1:G:287:ASN:O	1:G:291:THR:HB	2.19	0.43
1:H:457:PHE:HB3	1:H:488:PHE:HB3	2.01	0.43
1:A:352:VAL:O	1:A:356:ILE:HG13	2.18	0.43
1:B:36:PRO:HG3	1:B:69:TYR:CE1	2.54	0.43
1:C:247:GLN:HE21	1:C:247:GLN:HB3	1.64	0.43
1:H:268:TYR:CG	1:H:288:LEU:HD13	2.54	0.43
1:A:170:LEU:HD13	1:A:170:LEU:O	2.18	0.43
1:A:314:MET:CB	1:A:459:ILE:HD11	2.48	0.43
3:A:501:TB2:C8	3:A:501:TB2:O1	2.61	0.43
1:B:53:ARG:HB2	1:B:53:ARG:NH1	2.31	0.43
1:D:284:HIS:HD2	1:D:286:GLN:HB2	1.83	0.43
1:F:321:THR:HG23	1:F:454:LEU:HD21	2.00	0.43
1:B:183:VAL:HG11	1:B:292:VAL:HG13	2.01	0.43
1:C:37:LEU:HD12	1:C:37:LEU:H	1.84	0.43
1:E:153:LEU:HD21	1:E:453:ILE:HD11	2.01	0.43
1:E:211:SER:HA	1:E:474:GLU:OE2	2.18	0.43
1:F:230:THR:O	1:F:234:ILE:HG13	2.19	0.43
1:F:404:THR:N	1:F:405:PRO:HD3	2.33	0.43
1:G:384:LYS:O	1:G:385:ASN:HB2	2.19	0.43
1:A:105:ASP:N	1:A:106:PRO:HD2	2.33	0.43
1:B:73:ARG:HA	1:B:74:PRO:HD3	1.86	0.43
1:E:316:LYS:HE3	1:E:317:TYR:CE1	2.51	0.43
2:E:500:HEM:HHD	2:E:500:HEM:CBC	2.36	0.43
1:F:256:LEU:O	1:F:258:PRO:HD3	2.19	0.43
1:F:353:ILE:HD13	1:F:447:PHE:HA	2.00	0.43
1:G:472:PRO:HA	1:G:482:PRO:HD3	1.99	0.43
1:H:103:VAL:HG11	1:H:214:SER:OG	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:402:PHE:O	1:A:405:PRO:HG3	2.18	0.43
1:C:42:ASN:O	1:C:46:MET:HG2	2.19	0.43
1:C:102:ALA:HB2	1:C:218:GLU:CD	2.39	0.43
1:C:211:SER:HA	1:C:474:GLU:HG2	2.01	0.43
1:D:229:GLY:O	1:D:232:ARG:HB2	2.19	0.43
1:F:79:CYS:O	1:F:83:ALA:HB3	2.18	0.43
1:F:241:ILE:O	1:F:245:ILE:HG13	2.19	0.43
1:G:68:VAL:O	1:G:75:VAL:HG22	2.19	0.43
1:G:69:TYR:HA	1:G:73:ARG:O	2.18	0.43
1:G:101:ILE:CG2	1:G:104:VAL:HG22	2.48	0.43
1:B:362:LEU:O	1:B:478:GLY:HA2	2.19	0.42
1:B:404:THR:N	1:B:405:PRO:HD3	2.34	0.42
1:C:50:GLY:O	1:C:54:SER:HB2	2.19	0.42
1:E:192:ASP:HA	1:E:193:PRO:HD3	1.89	0.42
1:E:311:PHE:O	1:E:315:LEU:HG	2.19	0.42
1:E:135:PHE:HE2	1:E:267:VAL:HG21	1.84	0.42
1:G:37:LEU:N	1:G:37:LEU:HD12	2.34	0.42
2:G:500:HEM:HMB2	2:G:500:HEM:CBB	2.41	0.42
1:H:315:LEU:HD22	1:H:461:SER:HB2	2.01	0.42
1:A:129:LEU:C	1:A:129:LEU:HD23	2.40	0.42
1:A:427:MET:O	1:A:427:MET:HG3	2.20	0.42
1:B:58:LEU:HD23	1:B:58:LEU:HA	1.88	0.42
1:B:157:LEU:HD22	1:B:488:PHE:CD2	2.54	0.42
1:B:376:GLN:HA	1:B:380:TYR:O	2.19	0.42
1:C:368:PRO:HG3	1:C:389:PHE:CE2	2.54	0.42
1:D:475:SER:HA	1:D:479:ASN:OD1	2.19	0.42
1:G:154:VAL:HG13	1:G:457:PHE:HE2	1.83	0.42
1:A:76:VAL:HB	1:A:388:VAL:HG13	2.02	0.42
1:A:154:VAL:HG13	1:A:457:PHE:HE2	1.84	0.42
1:B:32:PRO:HD3	1:B:380:TYR:CZ	2.55	0.42
1:B:153:LEU:HD12	1:B:153:LEU:O	2.18	0.42
1:B:163:ALA:HA	1:B:487:ARG:HH12	1.84	0.42
1:B:457:PHE:HA	1:B:489:LEU:O	2.19	0.42
1:C:73:ARG:HH12	1:C:218:GLU:HG3	1.84	0.42
1:C:284:HIS:ND1	1:C:284:HIS:N	2.67	0.42
1:D:75:VAL:HG11	1:D:389:PHE:HE1	1.84	0.42
1:D:197:ARG:NH2	1:D:201:LEU:HD21	2.34	0.42
1:F:116:ALA:C	1:F:121:TRP:HB2	2.39	0.42
1:F:442:ALA:O	1:F:446:LEU:HB2	2.18	0.42
1:H:164:LEU:HD22	1:H:485:GLN:HB3	2.01	0.42
1:C:86:GLU:O	1:C:90:ASP:HB2	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:202:PHE:CZ	1:C:297:PHE:HA	2.54	0.42
1:D:382:ILE:HA	1:D:383:PRO:HD3	1.86	0.42
1:E:38:PRO:O	1:E:39:VAL:HB	2.19	0.42
1:E:98:ARG:HE	1:E:434:ARG:NH1	2.17	0.42
1:F:195:PHE:CE2	1:F:199:LEU:HD11	2.55	0.42
1:F:429:PHE:O	1:F:430:SER:HB3	2.20	0.42
1:G:315:LEU:HD11	1:G:486:ILE:HG13	2.01	0.42
1:H:223:PHE:C	1:H:223:PHE:CD2	2.93	0.42
1:H:438:GLY:HA2	1:H:441:ILE:HD13	2.00	0.42
1:A:98:ARG:HH21	1:A:434:ARG:HH11	1.66	0.42
1:A:404:THR:HG23	1:A:412:HIS:HE2	1.84	0.42
1:A:409:ASN:HB3	1:A:412:HIS:CE1	2.55	0.42
1:B:194:VAL:O	1:B:198:LEU:HD23	2.19	0.42
1:E:284:HIS:ND1	1:E:284:HIS:N	2.68	0.42
1:E:353:ILE:HD13	1:E:447:PHE:HA	2.01	0.42
1:F:480:VAL:HA	1:F:481:PRO:HD3	1.80	0.42
1:G:362:LEU:O	1:G:479:ASN:N	2.52	0.42
1:F:73:ARG:HA	1:F:74:PRO:HD3	1.79	0.42
1:G:370:THR:HG22	1:G:387:GLU:HG2	2.02	0.42
1:H:133:ARG:HA	1:H:137:MET:HB3	2.01	0.42
1:H:365:PHE:CE1	1:H:477:VAL:HA	2.54	0.42
1:A:303:THR:HG21	1:A:445:GLU:OE1	2.20	0.42
1:A:403:GLU:O	1:A:412:HIS:NE2	2.52	0.42
1:E:39:VAL:HG12	1:E:40:LEU:N	2.34	0.42
1:E:316:LYS:HD2	1:E:468:ILE:O	2.20	0.42
1:G:194:VAL:O	1:G:198:LEU:HD23	2.20	0.42
1:B:40:LEU:HD12	1:H:227:PHE:CZ	2.55	0.42
1:C:28:GLY:O	1:C:29:LYS:CB	2.67	0.42
1:C:353:ILE:HD11	1:C:447:PHE:HA	2.02	0.42
1:E:68:VAL:O	1:E:75:VAL:HG23	2.19	0.42
1:E:487:ARG:HG3	1:E:487:ARG:O	2.20	0.42
1:F:338:PRO:HD3	1:F:455:GLN:OE1	2.19	0.42
1:H:95:PHE:CE2	1:H:375:THR:HG21	2.55	0.42
1:H:223:PHE:CE2	1:H:227:PHE:CE2	3.07	0.42
1:D:284:HIS:CE1	1:D:287:ASN:ND2	2.88	0.42
1:D:337:PRO:HA	1:D:338:PRO:HD3	1.92	0.42
1:H:207:SER:OG	1:H:480:VAL:HG21	2.20	0.42
1:C:167:ASN:OD1	1:C:167:ASN:N	2.53	0.41
1:D:359:LEU:HD12	1:D:359:LEU:HA	1.88	0.41
1:E:37:LEU:N	1:E:37:LEU:HD12	2.35	0.41
1:E:142:VAL:O	1:E:146:ILE:HG13	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:31:PRO:HG2	1:G:76:VAL:CG1	2.50	0.41
1:G:436:CYS:SG	1:G:438:GLY:N	2.93	0.41
1:H:75:VAL:HG23	1:H:75:VAL:O	2.19	0.41
1:H:297:PHE:HB3	3:H:501:TB2:H11B	2.02	0.41
1:A:79:CYS:O	1:A:83:ALA:HB3	2.20	0.41
1:A:171:PHE:O	1:A:174:ILE:HG12	2.20	0.41
1:A:257:ASP:HA	1:A:258:PRO:HD3	1.86	0.41
1:A:403:GLU:O	1:A:404:THR:CG2	2.68	0.41
1:A:461:SER:OG	1:A:462:PRO:HD2	2.21	0.41
1:B:316:LYS:O	1:B:465:PRO:HB3	2.19	0.41
1:D:43:LEU:HD22	1:D:220:PHE:CZ	2.55	0.41
1:D:363:ILE:O	1:D:363:ILE:HG22	2.19	0.41
1:E:109:GLN:O	1:E:111:TYR:HD1	2.02	0.41
1:F:183:VAL:HG12	1:F:183:VAL:O	2.21	0.41
1:G:401:TYR:CD2	1:G:424:GLU:HB2	2.55	0.41
2:H:500:HEM:HBD2	2:H:500:HEM:HBA2	2.02	0.41
1:A:179:ILE:HG13	1:A:299:GLY:HA3	2.03	0.41
1:B:183:VAL:HG12	1:B:183:VAL:O	2.21	0.41
1:C:304:SER:O	1:C:308:ARG:N	2.54	0.41
1:D:137:MET:C	1:D:139:LYS:H	2.23	0.41
1:E:33:GLY:HA3	1:E:67:THR:O	2.19	0.41
1:F:362:LEU:N	1:F:362:LEU:HD22	2.35	0.41
1:A:101:ILE:O	1:A:102:ALA:C	2.59	0.41
1:A:363:ILE:N	1:A:363:ILE:HD12	2.36	0.41
1:B:30:LEU:CD2	1:B:383:PRO:HD3	2.49	0.41
1:C:58:LEU:O	1:C:62:TYR:HB2	2.21	0.41
1:C:382:ILE:HA	1:C:383:PRO:HD3	1.90	0.41
1:C:436:CYS:HB2	2:C:500:HEM:NA	2.35	0.41
1:D:363:ILE:HD11	3:D:501:TB2:H2A	2.01	0.41
1:E:174:ILE:HB	1:E:449:PHE:CE1	2.55	0.41
1:E:362:LEU:HD22	1:E:362:LEU:N	2.35	0.41
1:E:474:GLU:HB3	1:E:480:VAL:HG22	2.02	0.41
1:F:457:PHE:HA	1:F:489:LEU:O	2.20	0.41
1:G:188:PHE:CD1	1:G:188:PHE:N	2.88	0.41
1:H:114:ILE:CG1	1:H:294:SER:HB3	2.50	0.41
1:A:202:PHE:CD1	1:A:297:PHE:CD2	3.09	0.41
1:A:362:LEU:O	1:A:478:GLY:HA2	2.21	0.41
1:B:99:GLY:N	1:B:368:PRO:O	2.52	0.41
1:C:176:SER:HB2	1:C:300:THR:CG2	2.47	0.41
1:C:369:HIS:NE2	2:C:500:HEM:O2A	2.53	0.41
1:D:320:VAL:O	1:D:324:VAL:HG23	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:316:LYS:HG2	1:E:317:TYR:CE1	2.55	0.41
3:G:501:TB2:H11B	3:G:501:TB2:H5	1.88	0.41
1:B:153:LEU:CD1	1:B:170:LEU:HD11	2.47	0.41
1:B:312:LEU:HD13	1:B:484:TYR:CD1	2.55	0.41
1:C:121:TRP:CZ2	1:C:434:ARG:HD3	2.56	0.41
1:C:212:PHE:CE2	1:C:216:VAL:HG21	2.56	0.41
1:D:94:ALA:O	1:D:371:VAL:HA	2.21	0.41
2:D:500:HEM:HMB2	2:D:500:HEM:CBB	2.44	0.41
1:G:32:PRO:HD3	1:G:380:TYR:CE1	2.56	0.41
1:G:202:PHE:CE1	1:G:241:ILE:HD13	2.56	0.41
1:G:365:PHE:HA	1:G:391:VAL:HA	2.03	0.41
1:G:486:ILE:HG12	1:G:487:ARG:H	1.86	0.41
1:H:98:ARG:HB2	1:H:434:ARG:CZ	2.51	0.41
1:H:105:ASP:N	1:H:106:PRO:CD	2.83	0.41
1:B:355:GLU:HA	1:B:355:GLU:OE1	2.21	0.41
1:C:451:THR:O	1:C:455:GLN:N	2.50	0.41
1:D:485:GLN:HE21	1:D:485:GLN:HA	1.85	0.41
1:E:111:TYR:HB2	1:E:290:LEU:CD1	2.49	0.41
1:E:132:MET:HG2	1:E:182:ILE:HG21	2.02	0.41
1:F:206:PHE:CD2	1:F:480:VAL:HG13	2.55	0.41
1:H:78:LEU:HD13	1:H:84:ILE:HA	2.02	0.41
1:H:223:PHE:C	1:H:223:PHE:HD2	2.24	0.41
1:A:104:VAL:HG21	3:A:501:TB2:H10	2.03	0.41
1:A:382:ILE:HA	1:A:383:PRO:HD3	1.96	0.41
1:B:111:TYR:CD1	1:B:111:TYR:N	2.88	0.41
1:B:362:LEU:HD22	1:B:362:LEU:H	1.85	0.41
1:C:55:PHE:HE1	1:C:68:VAL:HG11	1.86	0.41
1:C:355:GLU:OE1	1:C:355:GLU:HA	2.19	0.41
1:C:409:ASN:HB3	1:C:412:HIS:CE1	2.56	0.41
1:D:84:ILE:HG21	1:D:427:MET:SD	2.61	0.41
1:D:404:THR:HG23	1:D:412:HIS:NE2	2.35	0.41
1:F:463:VAL:HA	1:F:464:PRO:HD3	1.83	0.41
1:G:76:VAL:HB	1:G:388:VAL:CG1	2.51	0.41
1:G:121:TRP:NE1	2:G:500:HEM:O1D	2.52	0.41
1:A:38:PRO:O	1:A:39:VAL:HB	2.21	0.41
1:A:174:ILE:O	1:A:178:ILE:HG12	2.21	0.41
1:A:365:PHE:CE1	1:A:477:VAL:HA	2.56	0.41
1:B:31:PRO:HG2	1:B:76:VAL:HG13	2.02	0.41
1:B:175:THR:OG1	1:B:304:SER:HB2	2.21	0.41
1:C:194:VAL:O	1:C:198:LEU:HD23	2.20	0.41
1:C:401:TYR:CD2	1:C:424:GLU:HB2	2.55	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:31:PRO:HG2	1:D:76:VAL:HG13	2.03	0.41
1:D:81:THR:HB	1:D:401:TYR:CE1	2.56	0.41
1:D:98:ARG:NH1	1:D:367:VAL:HB	2.36	0.41
1:D:174:ILE:HD12	1:D:449:PHE:CG	2.56	0.41
1:D:363:ILE:HD12	1:D:363:ILE:N	2.36	0.41
1:E:269:LEU:O	1:E:272:MET:HB3	2.20	0.41
1:E:288:LEU:O	1:E:292:VAL:HG23	2.21	0.41
1:G:316:LYS:HB2	1:G:468:ILE:HG21	2.02	0.41
1:G:364:PRO:O	1:G:393:SER:N	2.53	0.41
1:G:369:HIS:HE2	2:G:500:HEM:CGA	2.34	0.41
1:H:28:GLY:O	1:H:29:LYS:CB	2.69	0.41
1:H:73:ARG:HA	1:H:74:PRO:HD3	1.86	0.41
1:H:177:ASN:N	1:H:177:ASN:HD22	2.19	0.41
1:H:321:THR:HG23	1:H:454:LEU:HD22	2.02	0.41
1:A:413:PHE:CD2	1:A:413:PHE:N	2.89	0.41
1:C:317:TYR:N	1:C:317:TYR:HD1	2.19	0.41
1:E:73:ARG:HA	1:E:74:PRO:HD3	1.98	0.41
1:E:105:ASP:N	1:E:106:PRO:CD	2.84	0.41
1:E:438:GLY:HA3	2:E:500:HEM:C2C	2.56	0.41
1:A:73:ARG:HA	1:A:74:PRO:HD3	1.88	0.40
1:A:327:GLU:HG2	1:A:346:MET:HG2	2.02	0.40
1:A:355:GLU:OE1	1:A:355:GLU:HA	2.22	0.40
1:A:486:ILE:HG12	1:A:487:ARG:N	2.36	0.40
1:B:444:THR:CG2	1:B:448:LEU:HD12	2.51	0.40
1:D:272:MET:HG3	1:D:283:PHE:O	2.21	0.40
1:F:70:LEU:HB3	1:F:219:LEU:HG	2.04	0.40
1:F:81:THR:HB	1:F:401:TYR:CE1	2.56	0.40
1:G:307:LEU:HD22	1:G:307:LEU:HA	1.87	0.40
1:A:338:PRO:O	1:A:448:LEU:HD22	2.20	0.40
1:B:153:LEU:HD12	1:B:157:LEU:HG	2.04	0.40
1:B:183:VAL:HA	1:B:264:PHE:CB	2.52	0.40
1:C:313:LEU:HD13	1:C:408:PHE:CD1	2.56	0.40
1:D:358:ARG:NH2	1:D:359:LEU:HD13	2.36	0.40
1:F:53:ARG:HB2	1:F:53:ARG:NH1	2.34	0.40
1:F:91:GLN:NE2	1:F:377:PHE:HD1	2.20	0.40
1:F:438:GLY:HA3	2:F:500:HEM:C2C	2.56	0.40
1:G:269:LEU:HD23	1:G:269:LEU:HA	1.86	0.40
1:B:152:CYS:O	1:B:155:GLU:HB3	2.21	0.40
1:B:268:TYR:HE1	1:B:288:LEU:HB2	1.86	0.40
1:E:442:ALA:HB1	2:E:500:HEM:CBB	2.51	0.40
1:F:142:VAL:HG21	1:F:441:ILE:HG23	2.02	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:56:LEU:CD2	1:H:394:SER:HB3	2.52	0.40
1:A:301:GLU:HG2	3:A:501:TB2:H2	2.03	0.40
1:B:310:GLY:O	1:B:314:MET:HG2	2.21	0.40
1:B:413:PHE:O	1:B:414:LEU:HD23	2.22	0.40
1:D:176:SER:HB2	1:D:300:THR:CG2	2.51	0.40
1:E:121:TRP:CZ2	1:E:434:ARG:HD3	2.56	0.40
1:E:268:TYR:OH	1:E:283:PHE:HA	2.22	0.40
1:E:307:LEU:HD12	1:E:311:PHE:CE2	2.57	0.40
1:G:164:LEU:HD23	1:G:164:LEU:HA	1.87	0.40
1:A:98:ARG:HH21	1:A:434:ARG:HD2	1.87	0.40
1:A:454:LEU:O	1:A:491:ARG:NH1	2.55	0.40
1:B:68:VAL:O	1:B:75:VAL:HG22	2.21	0.40
1:D:84:ILE:HD12	1:D:395:ALA:HB2	2.03	0.40
1:D:202:PHE:CD1	1:D:241:ILE:HD13	2.57	0.40
1:D:362:LEU:HD22	1:D:362:LEU:N	2.36	0.40
1:E:105:ASP:N	1:E:106:PRO:HD2	2.36	0.40
1:F:164:LEU:HD23	1:F:164:LEU:HA	1.80	0.40
1:F:314:MET:HB3	1:F:459:ILE:CD1	2.51	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	463/476 (97%)	435 (94%)	28 (6%)	0	100	100
1	B	463/476 (97%)	433 (94%)	28 (6%)	2 (0%)	34	72
1	C	463/476 (97%)	435 (94%)	26 (6%)	2 (0%)	34	72
1	D	463/476 (97%)	433 (94%)	29 (6%)	1 (0%)	47	81
1	E	463/476 (97%)	432 (93%)	29 (6%)	2 (0%)	34	72
1	F	463/476 (97%)	429 (93%)	34 (7%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	G	463/476 (97%)	434 (94%)	29 (6%)	0	100 100
1	H	462/476 (97%)	432 (94%)	30 (6%)	0	100 100
All	All	3703/3808 (97%)	3463 (94%)	233 (6%)	7 (0%)	47 81

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	366	GLY
1	B	39	VAL
1	B	29	LYS
1	D	29	LYS
1	C	29	LYS
1	C	39	VAL
1	E	136	GLY

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	385/421 (91%)	363 (94%)	22 (6%)	20 53
1	B	379/421 (90%)	362 (96%)	17 (4%)	27 61
1	C	389/421 (92%)	368 (95%)	21 (5%)	22 55
1	D	384/421 (91%)	358 (93%)	26 (7%)	16 48
1	E	381/421 (90%)	358 (94%)	23 (6%)	19 52
1	F	370/421 (88%)	344 (93%)	26 (7%)	15 46
1	G	371/421 (88%)	342 (92%)	29 (8%)	12 42
1	H	304/421 (72%)	294 (97%)	10 (3%)	38 68
All	All	2963/3368 (88%)	2789 (94%)	174 (6%)	19 53

All (174) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	53	ARG
1	A	104	VAL
1	A	168	THR
1	A	172	HIS
1	A	179	ILE
1	A	186	LYS
1	A	243	THR
1	A	249	VAL
1	A	284	HIS
1	A	296	PHE
1	A	297	PHE
1	A	307	LEU
1	A	368	PRO
1	A	372	THR
1	A	381	VAL
1	A	388	VAL
1	A	389	PHE
1	A	441	ILE
1	A	458	SER
1	A	466	GLU
1	A	480	VAL
1	A	487	ARG
1	B	35	SER
1	B	51	LEU
1	B	53	ARG
1	B	172	HIS
1	B	174	ILE
1	B	179	ILE
1	B	232	ARG
1	B	247	GLN
1	B	252	HIS
1	B	303	THR
1	B	307	LEU
1	B	372	THR
1	B	374	ASP
1	B	388	VAL
1	B	466	GLU
1	B	480	VAL
1	B	485	GLN
1	C	39	VAL
1	C	53	ARG
1	C	73	ARG
1	C	129	LEU

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Mol	Chain	Res	Type
1	C	154	VAL
1	C	169	LEU
1	C	170	LEU
1	C	172	HIS
1	C	179	ILE
1	C	232	ARG
1	C	252	HIS
1	C	284	HIS
1	C	296	PHE
1	C	297	PHE
1	C	307	LEU
1	C	317	TYR
1	C	341	ASP
1	C	362	LEU
1	C	372	THR
1	C	435	ILE
1	C	441	ILE
1	D	53	ARG
1	D	67	THR
1	D	127	PHE
1	D	137	MET
1	D	165	LEU
1	D	169	LEU
1	D	170	LEU
1	D	172	HIS
1	D	177	ASN
1	D	179	ILE
1	D	232	ARG
1	D	284	HIS
1	D	296	PHE
1	D	297	PHE
1	D	307	LEU
1	D	359	LEU
1	D	368	PRO
1	D	372	THR
1	D	374	ASP
1	D	381	VAL
1	D	388	VAL
1	D	415	ASP
1	D	441	ILE
1	D	474	GLU
1	D	477	VAL

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Mol	Chain	Res	Type
1	D	480	VAL
1	E	35	SER
1	E	53	ARG
1	E	73	ARG
1	E	75	VAL
1	E	129	LEU
1	E	133	ARG
1	E	170	LEU
1	E	172	HIS
1	E	221	SER
1	E	284	HIS
1	E	296	PHE
1	E	297	PHE
1	E	303	THR
1	E	307	LEU
1	E	314	MET
1	E	317	TYR
1	E	318	PRO
1	E	359	LEU
1	E	368	PRO
1	E	430	SER
1	E	441	ILE
1	E	470	LEU
1	E	477	VAL
1	F	39	VAL
1	F	53	ARG
1	F	129	LEU
1	F	154	VAL
1	F	165	LEU
1	F	170	LEU
1	F	172	HIS
1	F	176	SER
1	F	213	SER
1	F	223	PHE
1	F	232	ARG
1	F	251	LYS
1	F	266	ASP
1	F	284	HIS
1	F	286	GLN
1	F	296	PHE
1	F	297	PHE
1	F	307	LEU

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Mol	Chain	Res	Type
1	F	334	SER
1	F	341	ASP
1	F	372	THR
1	F	403	GLU
1	F	409	ASN
1	F	439	GLU
1	F	441	ILE
1	F	446	LEU
1	G	35	SER
1	G	39	VAL
1	G	76	VAL
1	G	111	TYR
1	G	141	SER
1	G	142	VAL
1	G	168	THR
1	G	172	HIS
1	G	179	ILE
1	G	198	LEU
1	G	207	SER
1	G	221	SER
1	G	223	PHE
1	G	249	VAL
1	G	284	HIS
1	G	296	PHE
1	G	297	PHE
1	G	305	THR
1	G	307	LEU
1	G	334	SER
1	G	341	ASP
1	G	372	THR
1	G	376	GLN
1	G	388	VAL
1	G	404	THR
1	G	441	ILE
1	G	477	VAL
1	G	480	VAL
1	G	485	GLN
1	H	76	VAL
1	H	172	HIS
1	H	223	PHE
1	H	297	PHE
1	H	307	LEU

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Mol	Chain	Res	Type
1	H	328	ILE
1	H	372	THR
1	H	403	GLU
1	H	409	ASN
1	H	477	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (21) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	397	HIS
1	B	485	GLN
1	C	147	GLN
1	C	247	GLN
1	D	91	GLN
1	D	177	ASN
1	D	287	ASN
1	D	357	GLN
1	D	485	GLN
1	F	147	GLN
1	F	397	HIS
1	F	409	ASN
1	G	147	GLN
1	G	455	GLN
1	G	456	ASN
1	G	485	GLN
1	H	42	ASN
1	H	45	GLN
1	H	177	ASN
1	H	357	GLN
1	H	369	HIS

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides 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	$\#\|Z\| > 2$
2	HEM	C	500	1	41,50,50	1.93	6 (14%)	45,82,82	1.67	8 (17%)
2	HEM	G	500	1	41,50,50	1.98	6 (14%)	45,82,82	1.59	5 (11%)
2	HEM	F	500	1	41,50,50	1.96	7 (17%)	45,82,82	1.66	7 (15%)
3	TB2	A	501	1	13,13,13	0.62	0	18,18,18	1.70	2 (11%)
2	HEM	D	500	1	41,50,50	1.95	7 (17%)	45,82,82	1.64	7 (15%)
3	TB2	F	501	1	13,13,13	0.55	0	18,18,18	1.24	1 (5%)
3	TB2	B	501	1	13,13,13	0.62	0	18,18,18	1.04	1 (5%)
2	HEM	A	500	1	41,50,50	1.95	6 (14%)	45,82,82	1.59	6 (13%)
2	HEM	B	500	1	41,50,50	1.98	6 (14%)	45,82,82	1.79	8 (17%)
3	TB2	C	501	1	13,13,13	0.67	0	18,18,18	1.35	2 (11%)
3	TB2	E	501	1	13,13,13	0.60	0	18,18,18	1.03	2 (11%)
2	HEM	E	500	4,1	41,50,50	1.97	6 (14%)	45,82,82	1.72	8 (17%)
2	HEM	H	500	-	41,50,50	1.97	8 (19%)	45,82,82	1.71	5 (11%)
3	TB2	H	501	1	13,13,13	0.65	0	18,18,18	1.02	1 (5%)
3	TB2	D	501	1	13,13,13	0.67	0	18,18,18	1.20	1 (5%)
3	TB2	G	501	1	13,13,13	0.73	0	18,18,18	1.03	1 (5%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	HEM	C	500	1	-	2/12/54/54	-
2	HEM	G	500	1	-	5/12/54/54	-
2	HEM	F	500	1	-	4/12/54/54	-
3	TB2	A	501	1	-	0/9/9/9	0/1/1/1
2	HEM	D	500	1	-	4/12/54/54	-
3	TB2	F	501	1	-	6/9/9/9	0/1/1/1
3	TB2	B	501	1	-	0/9/9/9	0/1/1/1
2	HEM	A	500	1	-	4/12/54/54	-
2	HEM	B	500	1	-	10/12/54/54	-
3	TB2	C	501	1	-	6/9/9/9	0/1/1/1
3	TB2	E	501	1	-	0/9/9/9	0/1/1/1
2	HEM	E	500	4,1	-	7/12/54/54	-
2	HEM	H	500	-	-	5/12/54/54	-
3	TB2	H	501	1	-	6/9/9/9	0/1/1/1
3	TB2	D	501	1	-	0/9/9/9	0/1/1/1
3	TB2	G	501	1	-	6/9/9/9	0/1/1/1

All (52) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	G	500	HEM	C3D-C2D	8.41	1.54	1.36
2	H	500	HEM	C3D-C2D	8.06	1.53	1.36
2	F	500	HEM	C3D-C2D	8.05	1.53	1.36
2	D	500	HEM	C3D-C2D	7.99	1.53	1.36
2	A	500	HEM	C3D-C2D	7.98	1.53	1.36
2	B	500	HEM	C3D-C2D	7.96	1.53	1.36
2	E	500	HEM	C3D-C2D	7.95	1.53	1.36
2	C	500	HEM	C3D-C2D	7.84	1.53	1.36
2	B	500	HEM	C3C-C2C	-4.79	1.33	1.40
2	E	500	HEM	C3C-C2C	-4.67	1.33	1.40
2	D	500	HEM	C3C-C2C	-4.45	1.34	1.40
2	F	500	HEM	C3C-C2C	-4.31	1.34	1.40
2	A	500	HEM	C3C-C2C	-4.31	1.34	1.40
2	C	500	HEM	C3C-C2C	-4.21	1.34	1.40
2	G	500	HEM	C3C-C2C	-4.17	1.34	1.40
2	H	500	HEM	C3C-C2C	-4.14	1.34	1.40
2	A	500	HEM	C3C-CAC	3.69	1.55	1.47
2	H	500	HEM	C3C-CAC	3.65	1.55	1.47
2	C	500	HEM	C3C-CAC	3.63	1.55	1.47
2	F	500	HEM	C3C-CAC	3.61	1.55	1.47
2	D	500	HEM	C3C-CAC	3.60	1.55	1.47

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	500	HEM	C3C-CAC	3.56	1.55	1.47
2	G	500	HEM	C3C-CAC	3.53	1.55	1.47
2	B	500	HEM	C3C-CAC	3.50	1.55	1.47
2	F	500	HEM	CAB-C3B	2.90	1.55	1.47
2	C	500	HEM	CAB-C3B	2.89	1.55	1.47
2	D	500	HEM	CAB-C3B	2.88	1.55	1.47
2	A	500	HEM	CAB-C3B	2.86	1.55	1.47
2	H	500	HEM	CAB-C3B	2.83	1.55	1.47
2	G	500	HEM	CAB-C3B	2.80	1.55	1.47
2	E	500	HEM	CAB-C3B	2.80	1.55	1.47
2	B	500	HEM	FE-ND	2.78	2.10	1.96
2	B	500	HEM	CAB-C3B	2.73	1.54	1.47
2	H	500	HEM	FE-NB	2.59	2.09	1.96
2	G	500	HEM	FE-NB	2.59	2.09	1.96
2	F	500	HEM	FE-NB	2.52	2.09	1.96
2	A	500	HEM	FE-ND	2.51	2.09	1.96
2	E	500	HEM	FE-NB	2.39	2.08	1.96
2	C	500	HEM	FE-ND	2.39	2.08	1.96
2	F	500	HEM	CAA-C2A	2.30	1.55	1.52
2	E	500	HEM	FE-ND	2.28	2.08	1.96
2	D	500	HEM	CAA-C2A	2.26	1.55	1.52
2	F	500	HEM	FE-ND	2.17	2.07	1.96
2	C	500	HEM	FE-NB	2.17	2.07	1.96
2	A	500	HEM	FE-NB	2.15	2.07	1.96
2	H	500	HEM	FE-ND	2.14	2.07	1.96
2	G	500	HEM	FE-ND	2.09	2.07	1.96
2	H	500	HEM	CAA-C2A	2.05	1.55	1.52
2	D	500	HEM	FE-NB	2.05	2.07	1.96
2	D	500	HEM	FE-ND	2.05	2.07	1.96
2	H	500	HEM	CMB-C2B	2.03	1.55	1.50
2	B	500	HEM	FE-NB	2.03	2.06	1.96

All (65) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	H	500	HEM	C4D-ND-C1D	6.80	112.10	105.07
2	B	500	HEM	C4D-ND-C1D	6.36	111.65	105.07
2	G	500	HEM	C4D-ND-C1D	6.26	111.54	105.07
2	F	500	HEM	C4D-ND-C1D	6.20	111.48	105.07
2	D	500	HEM	C4D-ND-C1D	6.20	111.48	105.07
2	E	500	HEM	C4D-ND-C1D	6.19	111.47	105.07
2	C	500	HEM	C4D-ND-C1D	6.11	111.39	105.07

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	501	TB2	O1-C1-C2	-6.11	109.57	126.64
2	A	500	HEM	C4D-ND-C1D	5.77	111.04	105.07
3	F	501	TB2	O1-C1-C2	-4.12	115.13	126.64
3	C	501	TB2	O1-C1-C2	-4.09	115.20	126.64
2	B	500	HEM	C4C-CHD-C1D	3.79	127.56	122.56
2	E	500	HEM	C4C-CHD-C1D	3.54	127.23	122.56
3	D	501	TB2	O1-C1-C2	-3.44	117.01	126.64
2	C	500	HEM	C4C-CHD-C1D	3.24	126.83	122.56
2	F	500	HEM	C4C-CHD-C1D	3.17	126.74	122.56
2	B	500	HEM	CAD-C3D-C4D	3.14	130.14	124.66
2	G	500	HEM	C4C-CHD-C1D	3.12	126.68	122.56
2	A	500	HEM	C4B-CHC-C1C	3.09	126.64	122.56
2	H	500	HEM	C4C-CHD-C1D	3.07	126.61	122.56
2	A	500	HEM	CAD-CBD-CGD	-3.07	107.00	113.60
2	C	500	HEM	CBA-CAA-C2A	-3.06	107.39	112.62
2	E	500	HEM	C4B-CHC-C1C	3.06	126.60	122.56
2	F	500	HEM	CMA-C3A-C4A	-2.96	123.91	128.46
2	D	500	HEM	CMA-C3A-C4A	-2.90	124.01	128.46
2	A	500	HEM	C1B-NB-C4B	2.76	107.92	105.07
2	B	500	HEM	C1B-NB-C4B	2.75	107.91	105.07
2	B	500	HEM	CAD-CBD-CGD	-2.64	107.92	113.60
2	H	500	HEM	C4B-CHC-C1C	2.61	126.00	122.56
2	D	500	HEM	C4B-CHC-C1C	2.60	125.99	122.56
2	H	500	HEM	C1B-NB-C4B	2.59	107.75	105.07
2	E	500	HEM	C1B-NB-C4B	2.59	107.75	105.07
2	D	500	HEM	C1B-NB-C4B	2.58	107.74	105.07
2	D	500	HEM	C4C-CHD-C1D	2.58	125.96	122.56
2	C	500	HEM	C4B-CHC-C1C	2.56	125.94	122.56
2	H	500	HEM	CAD-C3D-C4D	2.55	129.12	124.66
3	G	501	TB2	C3-C2-C1	-2.55	108.36	114.17
2	E	500	HEM	CAD-CBD-CGD	-2.48	108.28	113.60
2	F	500	HEM	C1B-NB-C4B	2.47	107.63	105.07
2	A	500	HEM	C4C-CHD-C1D	2.47	125.82	122.56
2	B	500	HEM	C3B-C2B-C1B	2.47	108.32	106.49
3	C	501	TB2	C3-C2-C1	-2.47	108.55	114.17
2	G	500	HEM	C1B-NB-C4B	2.38	107.53	105.07
3	B	501	TB2	O1-C1-C2	-2.37	120.01	126.64
2	E	500	HEM	C3B-C2B-C1B	2.36	108.24	106.49
2	C	500	HEM	C1B-NB-C4B	2.33	107.48	105.07
2	C	500	HEM	C3B-C2B-C1B	2.23	108.14	106.49
2	G	500	HEM	C4B-CHC-C1C	2.23	125.50	122.56
2	D	500	HEM	CAD-CBD-CGD	-2.23	108.81	113.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	500	HEM	CAD-C3D-C4D	2.23	128.55	124.66
2	B	500	HEM	CHD-C1D-ND	2.21	126.83	124.43
3	H	501	TB2	O1-C1-C2	-2.19	120.50	126.64
2	F	500	HEM	CAA-CBA-CGA	-2.14	107.75	113.76
2	C	500	HEM	CAD-CBD-CGD	-2.14	109.00	113.60
2	F	500	HEM	C3B-C2B-C1B	2.13	108.06	106.49
2	F	500	HEM	C4B-CHC-C1C	2.12	125.36	122.56
2	D	500	HEM	C3B-C2B-C1B	2.09	108.03	106.49
2	E	500	HEM	CAD-C3D-C4D	2.09	128.31	124.66
2	B	500	HEM	C4B-CHC-C1C	2.07	125.30	122.56
3	E	501	TB2	O1-C1-C2	-2.05	120.89	126.64
3	A	501	TB2	C3-C2-C1	-2.04	109.52	114.17
2	E	500	HEM	CAA-CBA-CGA	-2.03	108.08	113.76
3	E	501	TB2	C3-C2-C1	-2.02	109.56	114.17
2	A	500	HEM	CAA-CBA-CGA	-2.01	108.12	113.76
2	G	500	HEM	C3B-C2B-C1B	2.00	107.97	106.49

There are no chirality outliers.

All (65) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	500	HEM	C1A-C2A-CAA-CBA
2	A	500	HEM	C3A-C2A-CAA-CBA
2	B	500	HEM	C1A-C2A-CAA-CBA
2	B	500	HEM	C2A-CAA-CBA-CGA
2	D	500	HEM	C1A-C2A-CAA-CBA
2	D	500	HEM	C3A-C2A-CAA-CBA
2	F	500	HEM	C1A-C2A-CAA-CBA
2	F	500	HEM	C3A-C2A-CAA-CBA
2	G	500	HEM	C4D-C3D-CAD-CBD
2	H	500	HEM	C1A-C2A-CAA-CBA
2	H	500	HEM	C3A-C2A-CAA-CBA
2	H	500	HEM	C2D-C3D-CAD-CBD
2	H	500	HEM	C4D-C3D-CAD-CBD
2	B	500	HEM	C2D-C3D-CAD-CBD
2	G	500	HEM	C2D-C3D-CAD-CBD
2	B	500	HEM	C4D-C3D-CAD-CBD
2	H	500	HEM	C3D-CAD-CBD-CGD
2	C	500	HEM	C4D-C3D-CAD-CBD
2	G	500	HEM	C3D-CAD-CBD-CGD
2	E	500	HEM	C4D-C3D-CAD-CBD
2	C	500	HEM	C2D-C3D-CAD-CBD

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Mol	Chain	Res	Type	Atoms
2	E	500	HEM	C2D-C3D-CAD-CBD
2	B	500	HEM	C4B-C3B-CAB-CBB
2	E	500	HEM	C4B-C3B-CAB-CBB
2	B	500	HEM	C3A-C2A-CAA-CBA
2	E	500	HEM	CAD-CBD-CGD-O1D
2	B	500	HEM	CAD-CBD-CGD-O2D
2	E	500	HEM	CAA-CBA-CGA-O2A
2	E	500	HEM	CAA-CBA-CGA-O1A
2	B	500	HEM	CAD-CBD-CGD-O1D
2	B	500	HEM	CAA-CBA-CGA-O2A
2	E	500	HEM	CAD-CBD-CGD-O2D
2	B	500	HEM	CAA-CBA-CGA-O1A
2	D	500	HEM	C4D-C3D-CAD-CBD
3	G	501	TB2	C5-C6-C9-C10
3	F	501	TB2	C5-C6-C9-C12
3	H	501	TB2	C5-C6-C9-C10
3	G	501	TB2	C7-C6-C9-C10
3	C	501	TB2	C5-C6-C9-C10
2	G	500	HEM	CAA-CBA-CGA-O1A
3	H	501	TB2	C7-C6-C9-C10
2	A	500	HEM	CAD-CBD-CGD-O2D
3	F	501	TB2	C7-C6-C9-C12
3	C	501	TB2	C7-C6-C9-C10
2	F	500	HEM	CAD-CBD-CGD-O2D
3	F	501	TB2	C5-C6-C9-C10
3	G	501	TB2	C5-C6-C9-C12
3	G	501	TB2	C5-C6-C9-C11
3	G	501	TB2	C7-C6-C9-C11
3	F	501	TB2	C5-C6-C9-C11
3	G	501	TB2	C7-C6-C9-C12
3	H	501	TB2	C5-C6-C9-C11
3	H	501	TB2	C5-C6-C9-C12
3	C	501	TB2	C5-C6-C9-C11
3	C	501	TB2	C5-C6-C9-C12
3	C	501	TB2	C7-C6-C9-C11
3	H	501	TB2	C7-C6-C9-C12
2	A	500	HEM	CAD-CBD-CGD-O1D
2	G	500	HEM	CAA-CBA-CGA-O2A
3	F	501	TB2	C7-C6-C9-C10
3	H	501	TB2	C7-C6-C9-C11
3	C	501	TB2	C7-C6-C9-C12
3	F	501	TB2	C7-C6-C9-C11

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Mol	Chain	Res	Type	Atoms
2	D	500	HEM	C2D-C3D-CAD-CBD
2	F	500	HEM	CAD-CBD-CGD-O1D

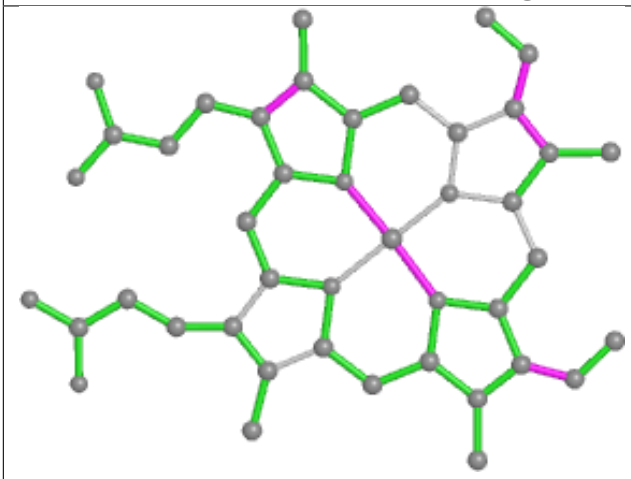
There are no ring outliers.

15 monomers are involved in 103 short contacts:

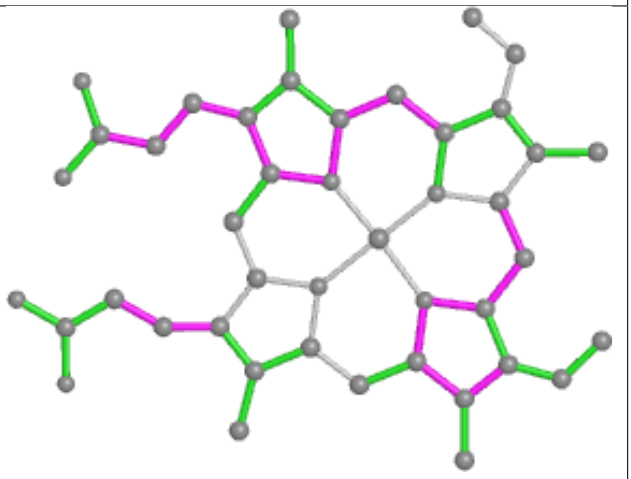
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	500	HEM	11	0
2	G	500	HEM	13	0
2	F	500	HEM	8	0
3	A	501	TB2	5	0
2	D	500	HEM	11	0
3	F	501	TB2	3	0
3	B	501	TB2	2	0
2	A	500	HEM	8	0
2	B	500	HEM	9	0
3	E	501	TB2	1	0
2	E	500	HEM	9	0
2	H	500	HEM	13	0
3	H	501	TB2	2	0
3	D	501	TB2	5	0
3	G	501	TB2	3	0

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.

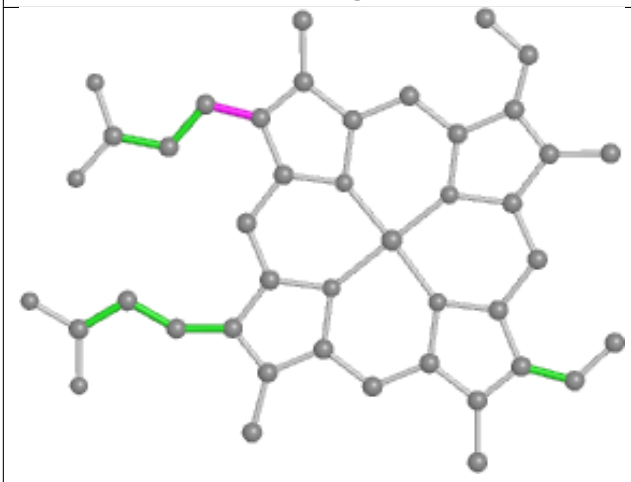
Ligand HEM C 500



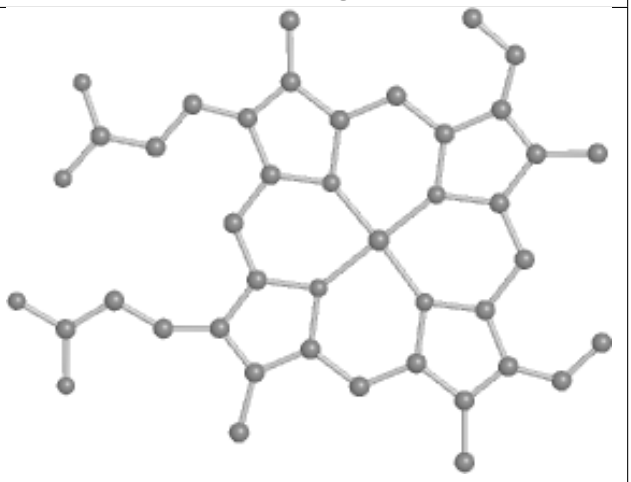
Bond lengths



Bond angles

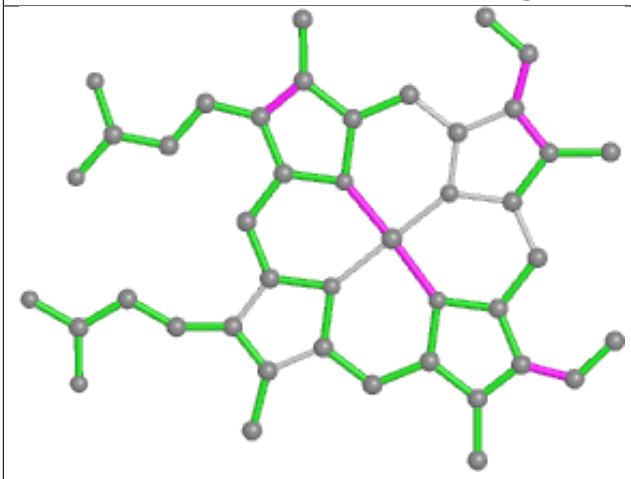


Torsions

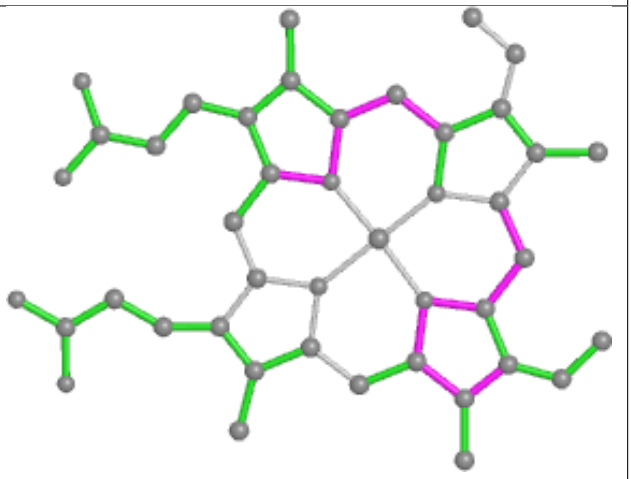


Rings

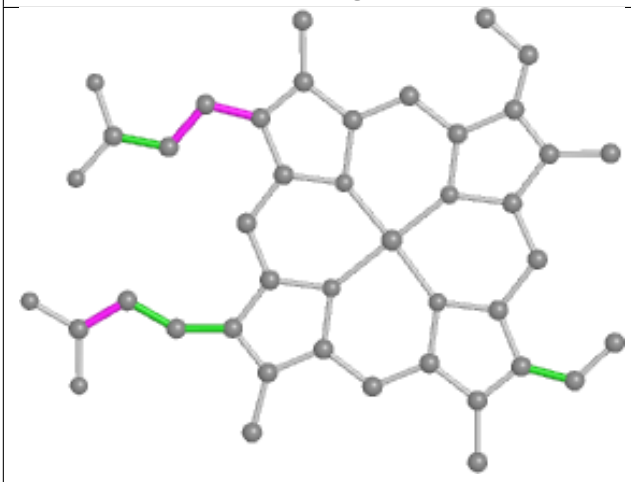
Ligand HEM G 500



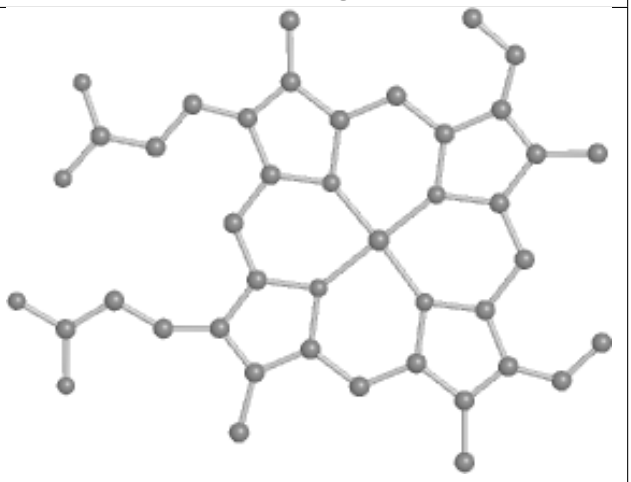
Bond lengths



Bond angles

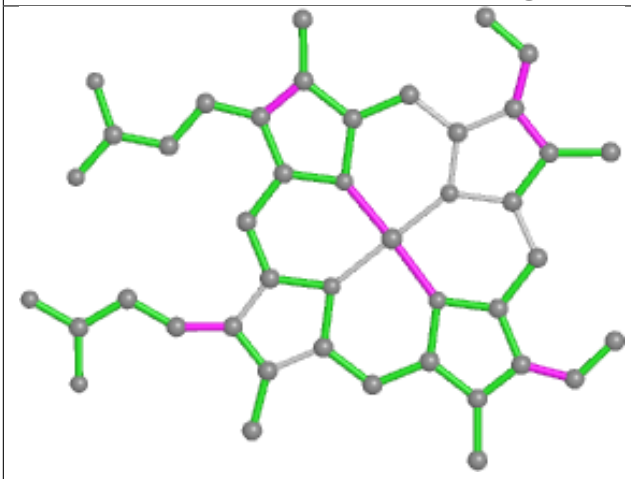


Torsions

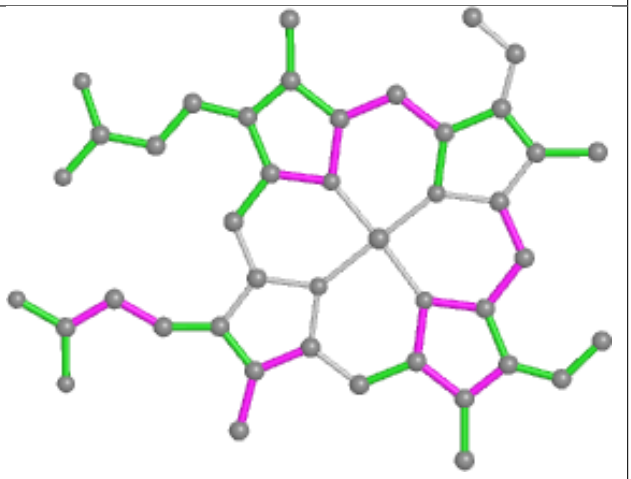


Rings

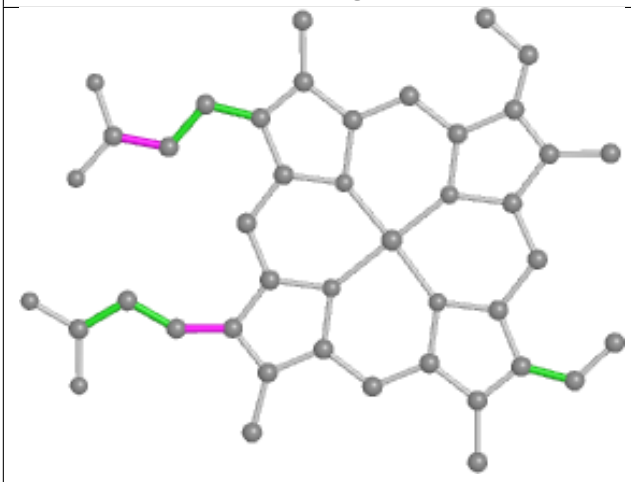
Ligand HEM F 500



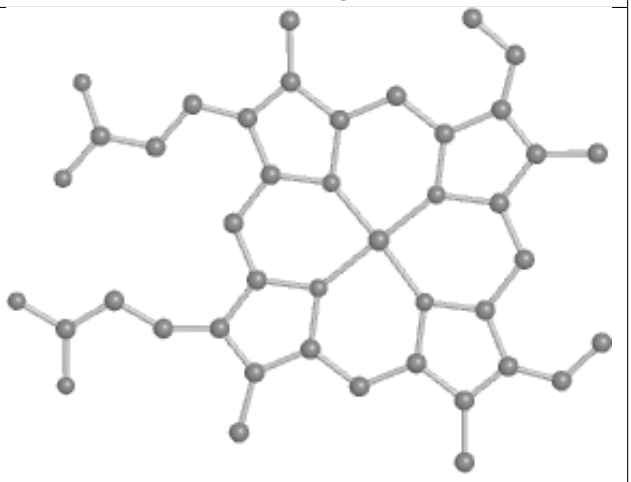
Bond lengths



Bond angles

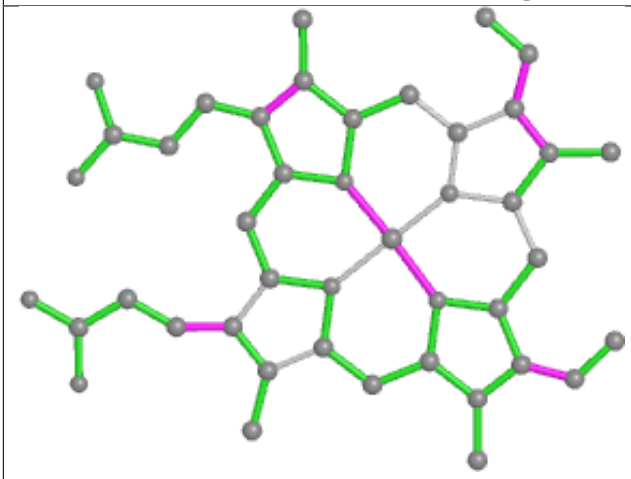


Torsions

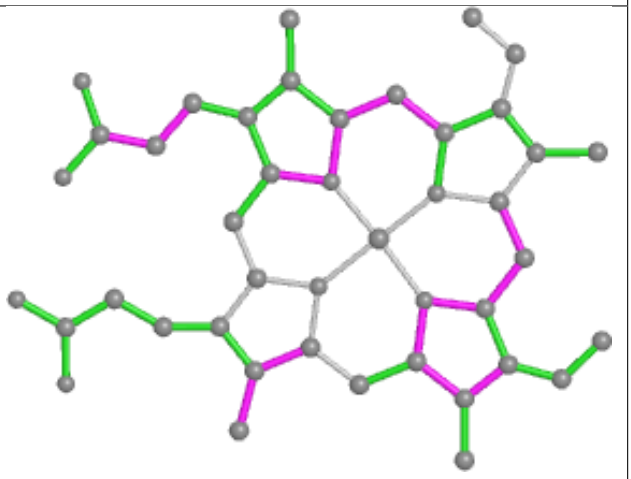


Rings

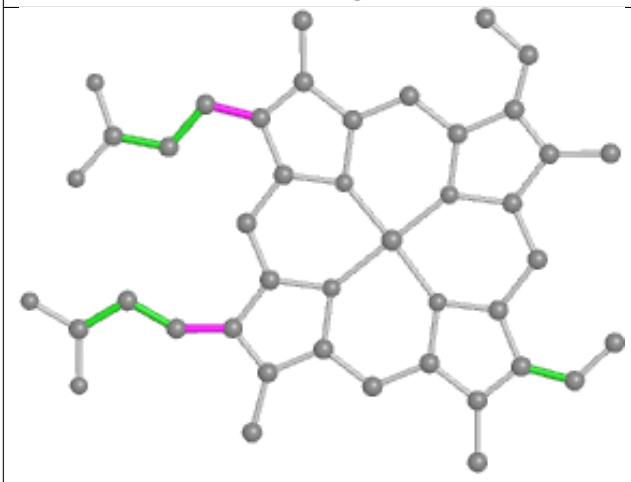
Ligand HEM D 500



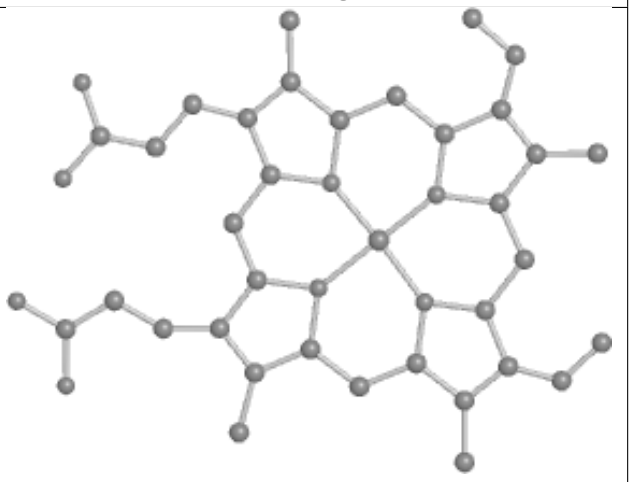
Bond lengths



Bond angles

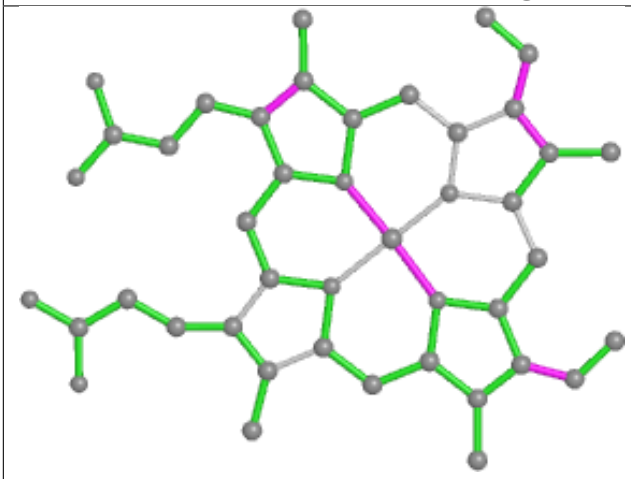


Torsions

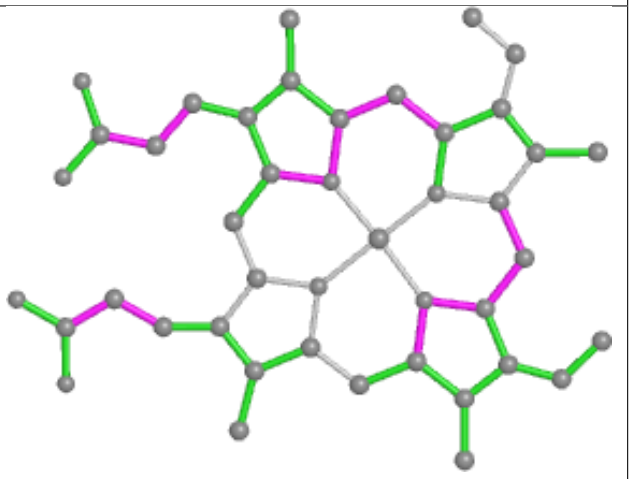


Rings

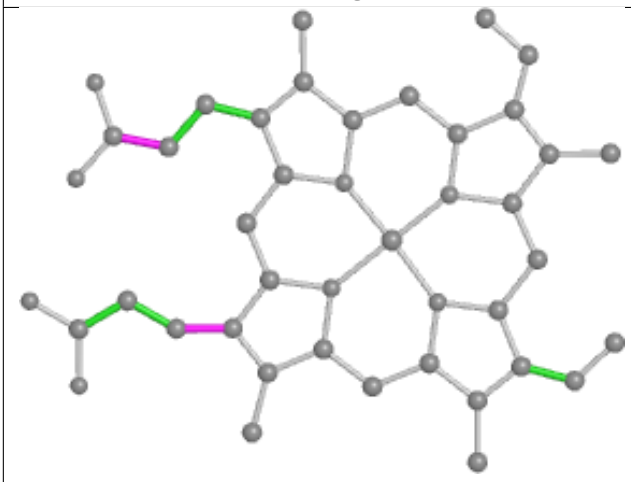
Ligand HEM A 500



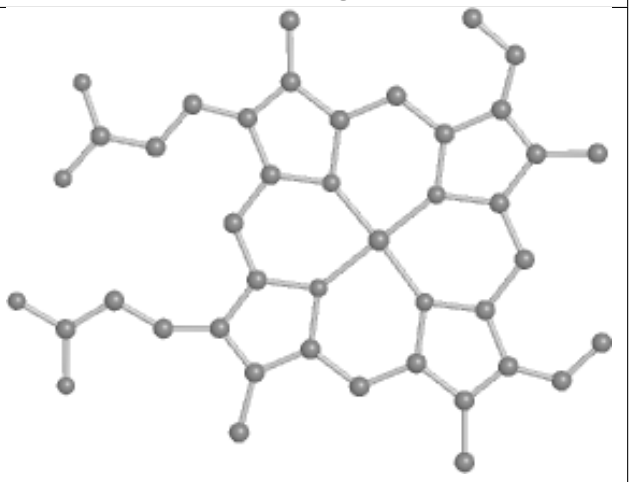
Bond lengths



Bond angles

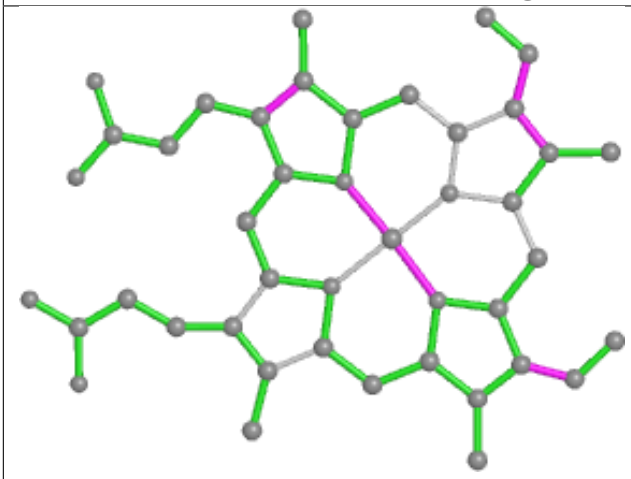


Torsions

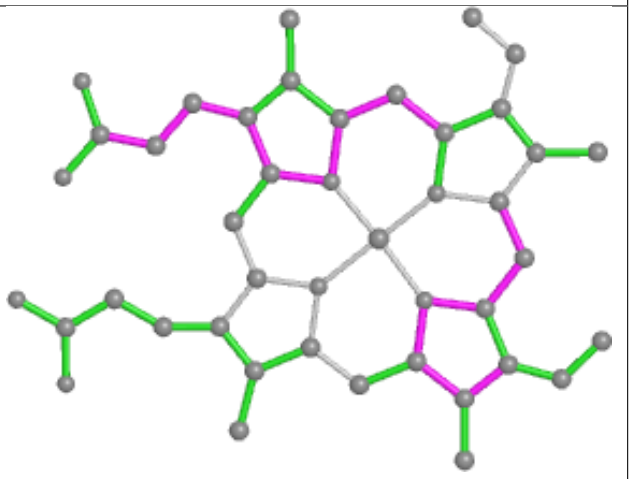


Rings

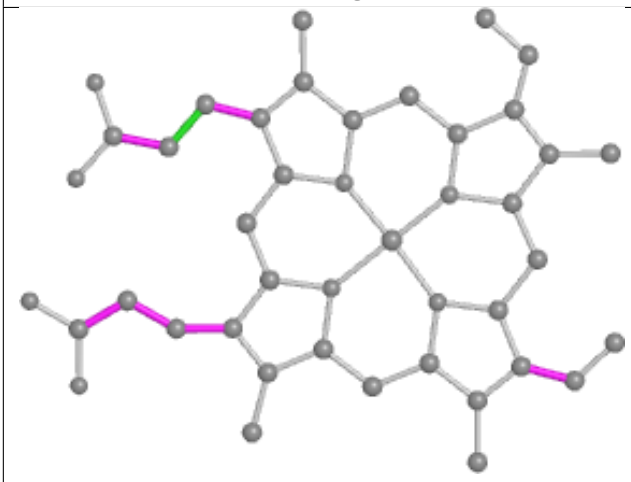
Ligand HEM B 500



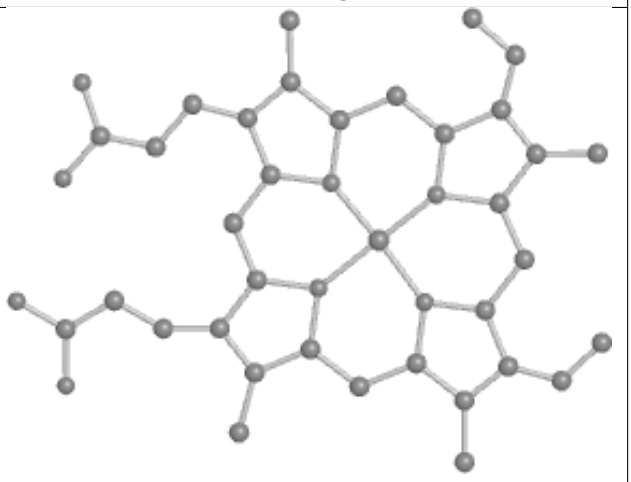
Bond lengths



Bond angles

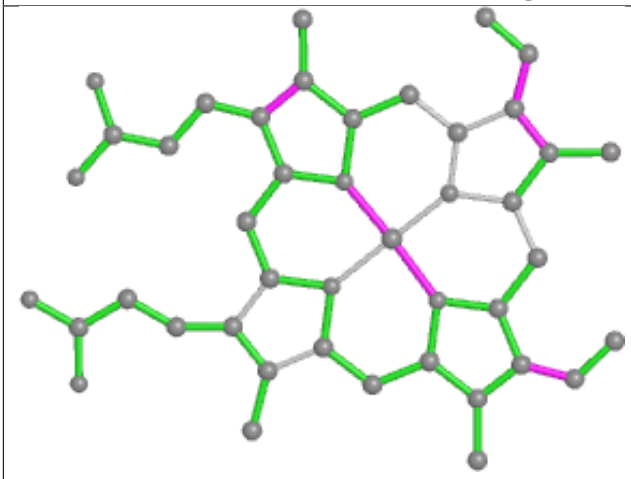


Torsions

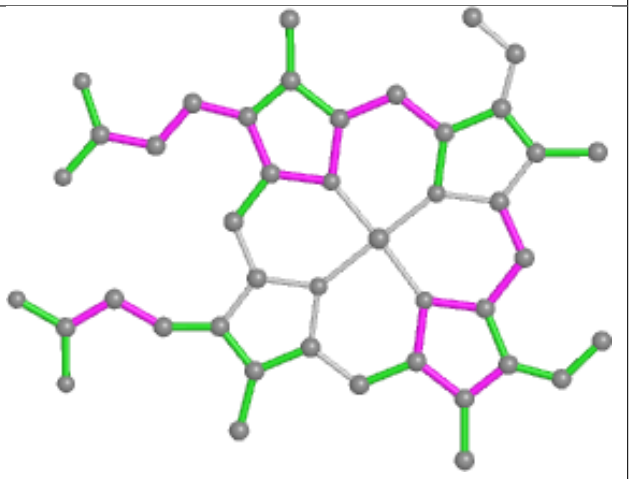


Rings

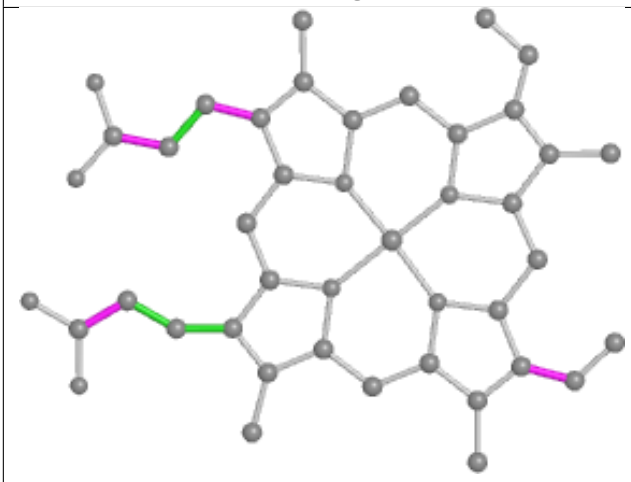
Ligand HEM E 500



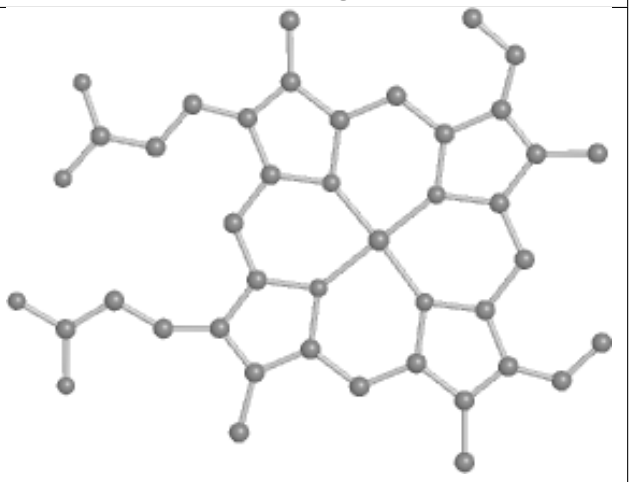
Bond lengths



Bond angles

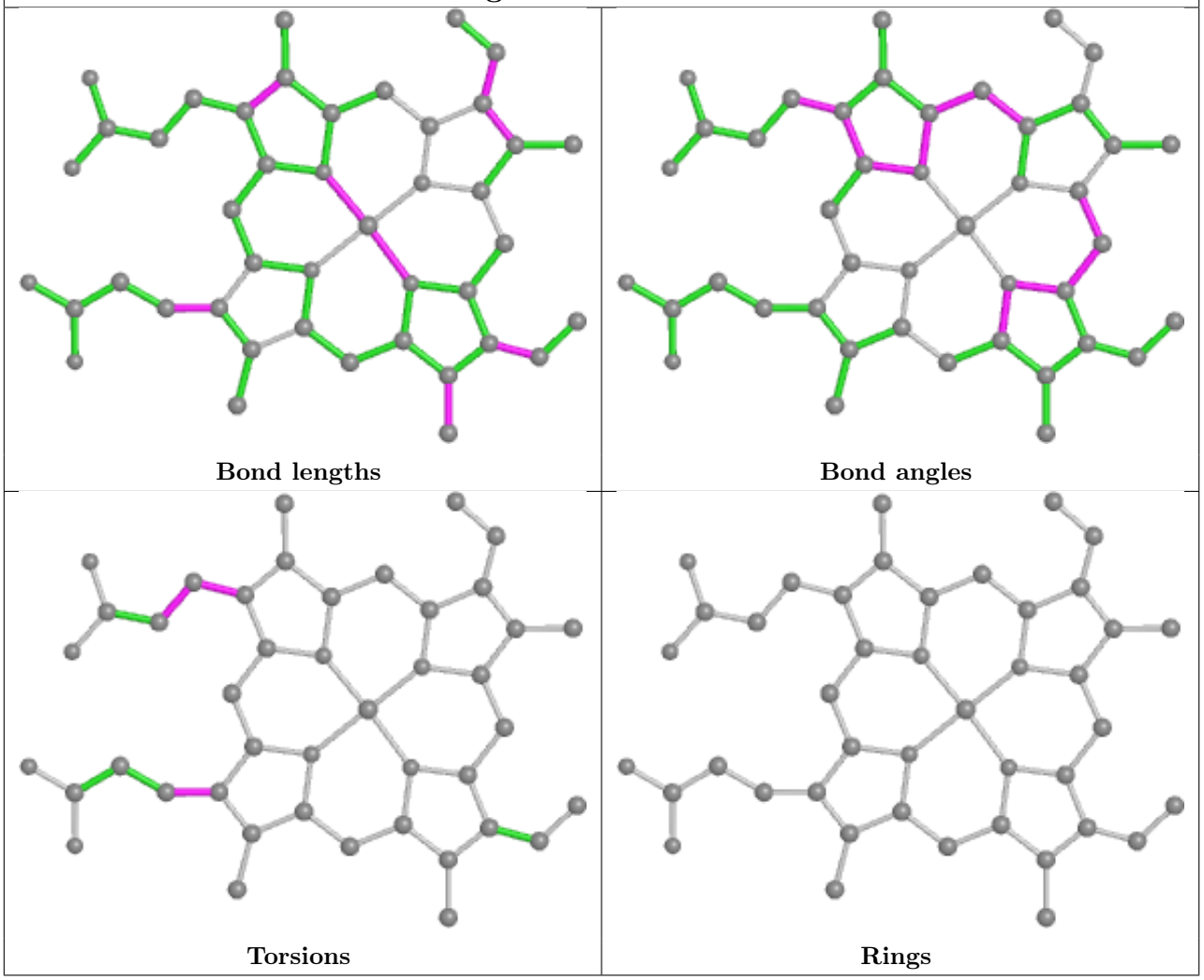


Torsions



Rings

Ligand HEM H 500



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	465/476 (97%)	-0.21	3 (0%) 89 86	40, 59, 81, 119	0
1	B	465/476 (97%)	-0.21	3 (0%) 89 86	41, 67, 94, 143	0
1	C	465/476 (97%)	-0.08	2 (0%) 92 90	43, 67, 102, 147	0
1	D	465/476 (97%)	-0.30	0 100 100	41, 58, 82, 101	0
1	E	465/476 (97%)	-0.15	0 100 100	49, 65, 87, 108	0
1	F	465/476 (97%)	-0.16	1 (0%) 95 93	40, 68, 96, 114	0
1	G	465/476 (97%)	-0.07	3 (0%) 89 86	49, 75, 115, 133	0
1	H	464/476 (97%)	0.71	51 (10%) 5 6	93, 121, 143, 156	0
All	All	3719/3808 (97%)	-0.06	63 (1%) 70 64	40, 68, 126, 156	0

All (63) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	H	72	SER	4.8
1	H	425	GLY	4.3
1	H	430	SER	4.2
1	H	73	ARG	4.2
1	H	80	GLY	4.0
1	H	81	THR	3.8
1	C	277	SER	3.8
1	H	92	ALA	3.6
1	H	375	THR	3.6
1	H	455	GLN	3.4
1	H	287	ASN	3.4
1	A	138	GLY	3.4
1	H	78	LEU	3.1
1	H	467	ASP	3.0
1	H	91	GLN	3.0
1	H	278	ASP	2.9

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Mol	Chain	Res	Type	RSRZ
1	H	74	PRO	2.9
1	H	491	ARG	2.8
1	H	284	HIS	2.8
1	H	428	PRO	2.8
1	H	64	ASP	2.7
1	H	65	VAL	2.7
1	G	261	PRO	2.6
1	H	290	LEU	2.6
1	F	279	PRO	2.6
1	H	67	THR	2.6
1	A	139	LYS	2.6
1	H	233	GLN	2.6
1	H	291	THR	2.5
1	H	101	ILE	2.5
1	G	260	ASN	2.4
1	H	453	ILE	2.4
1	H	32	PRO	2.4
1	H	418	GLY	2.4
1	H	417	ASN	2.4
1	H	28	GLY	2.4
1	H	245	ILE	2.4
1	B	282	GLU	2.3
1	H	313	LEU	2.3
1	H	277	SER	2.3
1	H	464	PRO	2.3
1	H	390	PRO	2.3
1	H	124	LEU	2.3
1	H	420	LEU	2.2
1	G	277	SER	2.2
1	H	279	PRO	2.2
1	C	275	ASP	2.2
1	H	331	VAL	2.2
1	A	277	SER	2.2
1	H	385	ASN	2.2
1	H	432	GLY	2.2
1	B	279	PRO	2.1
1	H	84	ILE	2.1
1	H	312	LEU	2.1
1	H	318	PRO	2.1
1	H	435	ILE	2.0
1	H	68	VAL	2.0
1	H	71	GLY	2.0

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Mol	Chain	Res	Type	RSRZ
1	H	42	ASN	2.0
1	H	371	VAL	2.0
1	B	281	SER	2.0
1	H	95	PHE	2.0
1	H	376	GLN	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 monosaccharides in this entry.

6.4 Ligands (i)

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

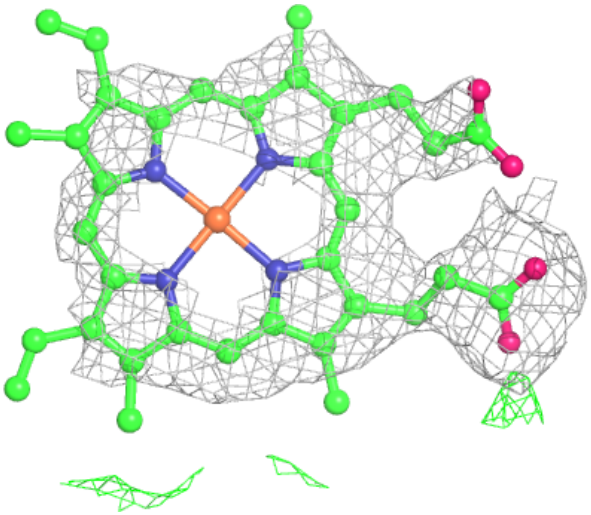
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	TB2	E	501	13/13	0.93	0.43	48,53,58,59	0
3	TB2	H	501	13/13	0.93	0.40	96,103,107,110	0
3	TB2	F	501	13/13	0.94	0.47	46,51,63,66	0
2	HEM	H	500	43/43	0.94	0.38	92,106,114,114	0
3	TB2	D	501	13/13	0.95	0.41	48,56,60,60	0
3	TB2	B	501	13/13	0.95	0.47	54,60,67,69	0
3	TB2	G	501	13/13	0.96	0.42	57,62,73,77	0
2	HEM	G	500	43/43	0.97	0.34	59,70,89,98	0
2	HEM	C	500	43/43	0.97	0.33	45,56,66,72	0
3	TB2	A	501	13/13	0.97	0.41	42,49,57,57	0
2	HEM	F	500	43/43	0.97	0.34	43,53,62,72	0
3	TB2	C	501	13/13	0.97	0.38	40,51,55,57	0
2	HEM	E	500	43/43	0.98	0.29	48,55,60,62	0
2	HEM	B	500	43/43	0.98	0.33	41,59,68,72	0
2	HEM	A	500	43/43	0.98	0.31	39,49,54,57	0
2	HEM	D	500	43/43	0.98	0.30	36,44,53,55	0

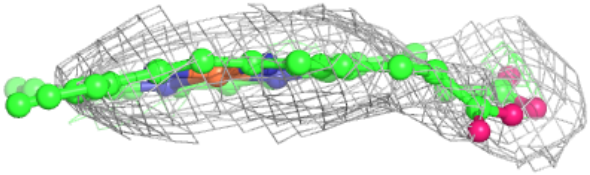
The following is a graphical depiction of the model fit to experimental electron density of all

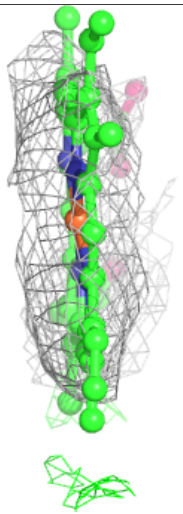
instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around HEM H 500:

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

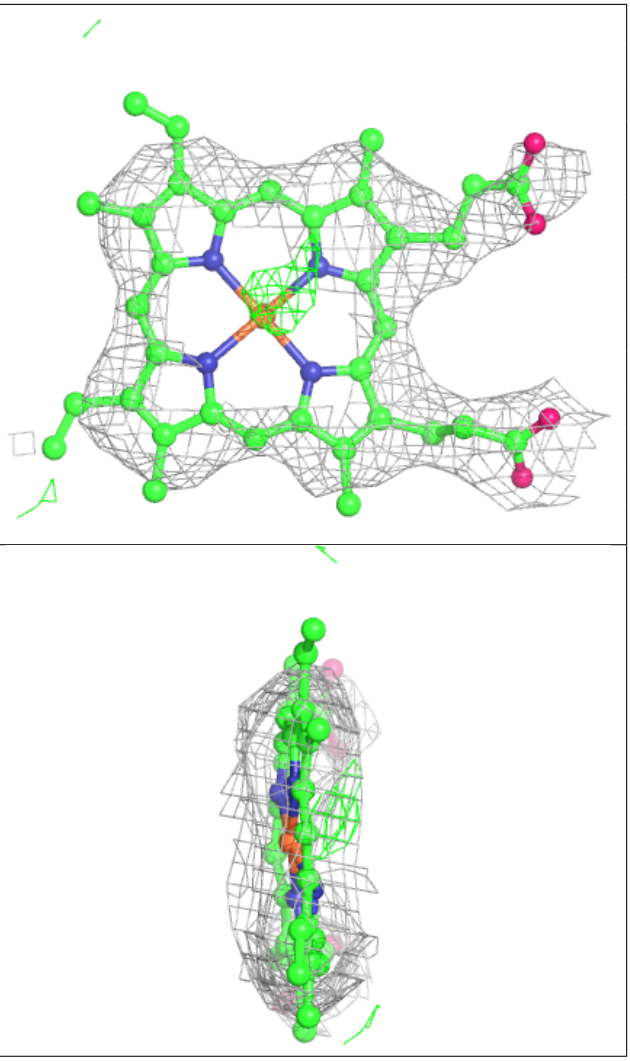






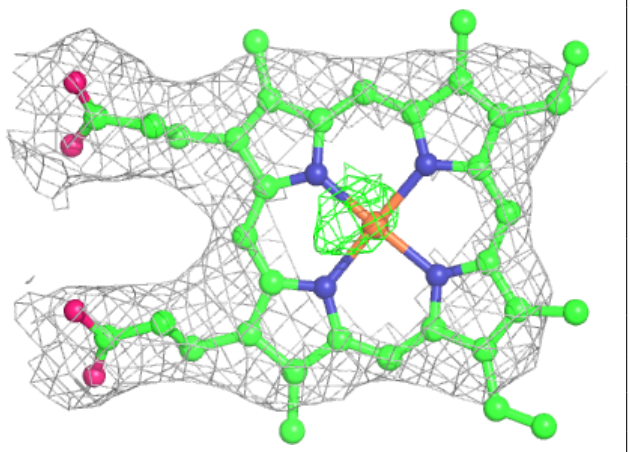
Electron density around HEM G 500:

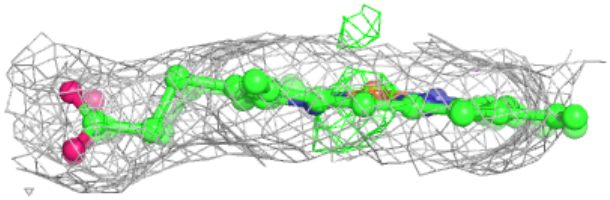
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

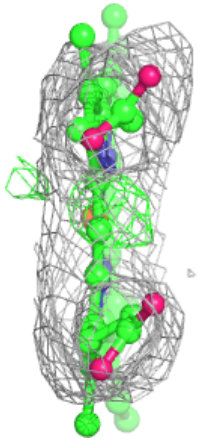


Electron density around HEM C 500:

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

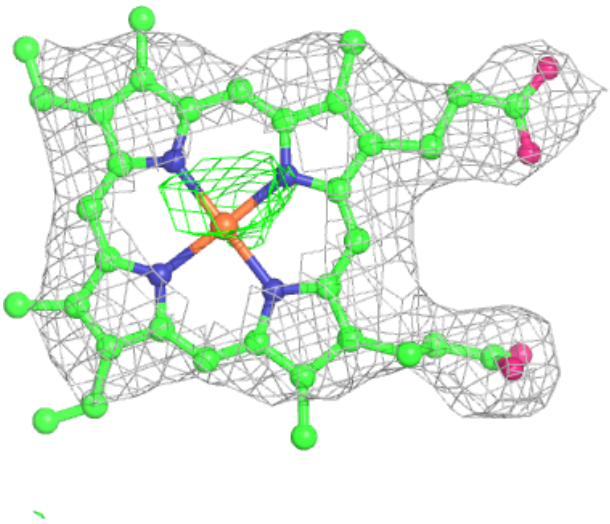


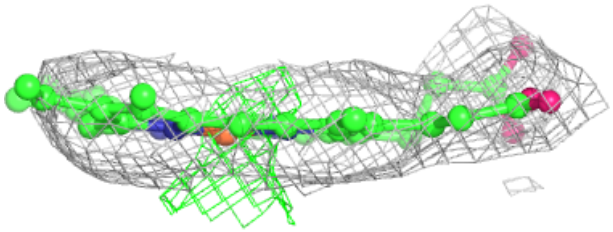


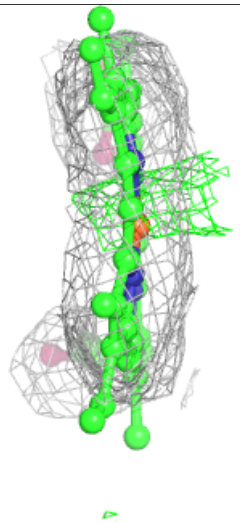


Electron density around HEM F 500:

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

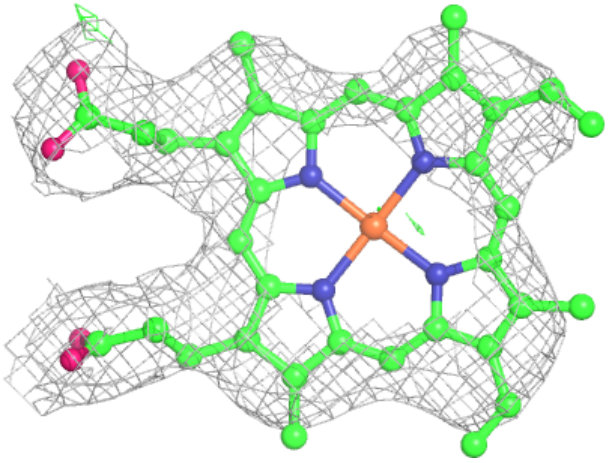


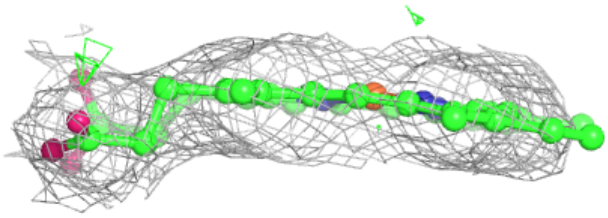


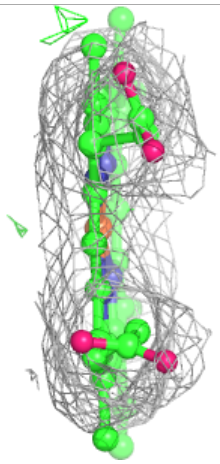


Electron density around HEM E 500:

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

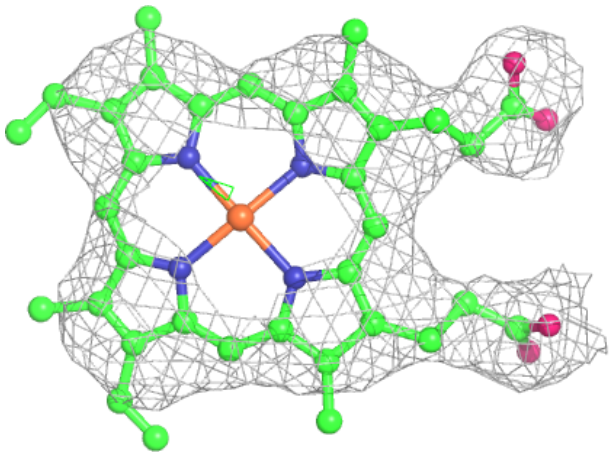


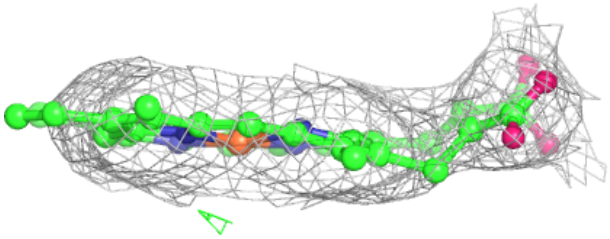


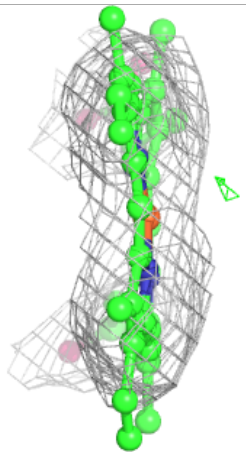


Electron density around HEM B 500:

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

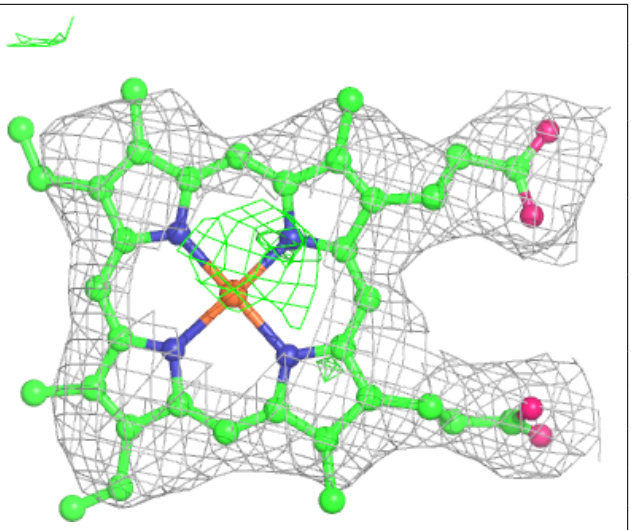


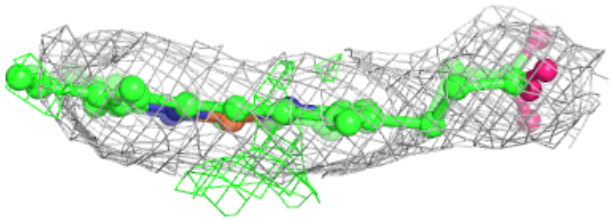


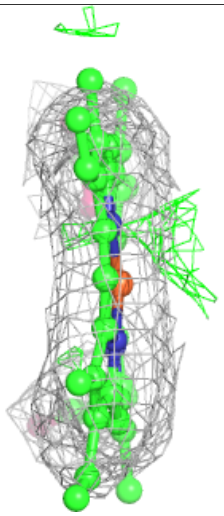


Electron density around HEM A 500:

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

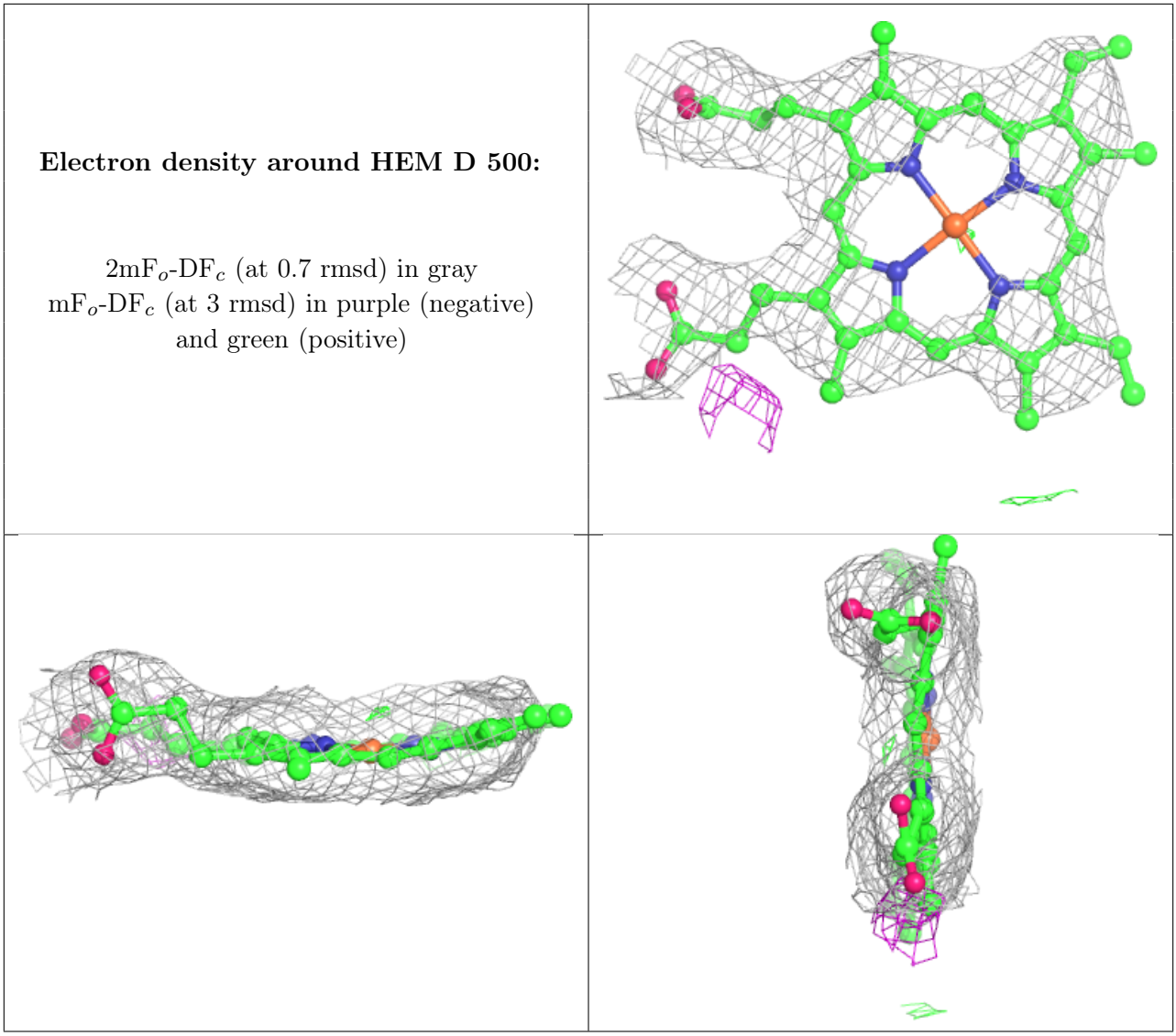






Electron density around HEM D 500:

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



6.5 Other polymers

There are no such residues in this entry.