



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 14, 2026 – 02:29 PM UTC

PDB ID : 3G93 / pdb_00003g93
Title : Single ligand occupancy crystal structure of cytochrome P450 2B4 in complex with the inhibitor 1-biphenyl-4-methyl-1H-imidazole
Authors : Gay, S.C.; Sun, L.; Maekawa, K.; Halpert, J.R.; Stout, C.D.
Deposited on : 2009-02-12
Resolution : 3.20 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

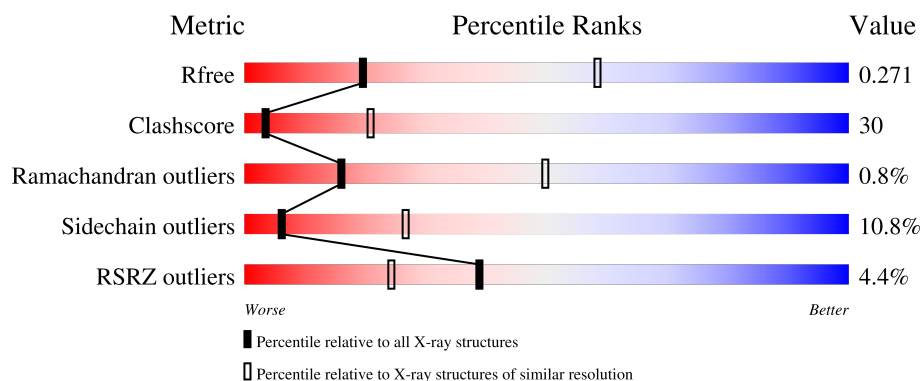
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.20 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	1466 (3.20-3.20)
Clashscore	190562	1573 (3.20-3.20)
Ramachandran outliers	187476	1548 (3.20-3.20)
Sidechain outliers	187428	1547 (3.20-3.20)
RSRZ outliers	180081	1466 (3.20-3.20)

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

Mol	Chain	Length	Quality of chain
1	A	476	4% 52%36%7% • 5%
1	B	476	5% 51%35%6% • 7%
1	C	476	3% 58%29%5% • 7%
1	D	476	4% 56%30%5% • 8%

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 13713 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	454	Total	C	N	O	S	0	0	0
			3445	2235	576	624	10			
1	B	442	Total	C	N	O	S	0	0	0
			3338	2168	553	609	8			
1	C	442	Total	C	N	O	S	0	0	0
			3352	2177	557	609	9			
1	D	440	Total	C	N	O	S	0	0	0
			3300	2141	553	598	8			

There are 132 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
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

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Chain	Residue	Modelled	Actual	Comment	Reference
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	SEE REMARK 999	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
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	SEE REMARK 999	UNP P00178
B	226	TYR	HIS	engineered mutation	UNP P00178
B	492	HIS	-	expression tag	UNP P00178

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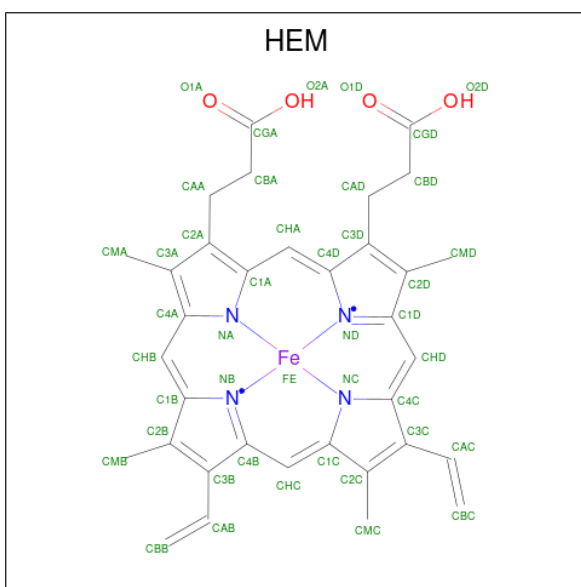
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B	494	HIS	-	expression tag	UNP P00178
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C	21	ALA	GLU	engineered mutation	UNP P00178
C	?	-	PHE	deletion	UNP P00178
C	?	-	SER	deletion	UNP P00178
C	?	-	LEU	deletion	UNP P00178
C	?	-	LEU	deletion	UNP 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
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C	27	LYS	HIS	engineered mutation	UNP P00178
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C	221	SER	PRO	SEE REMARK 999	UNP P00178
C	226	TYR	HIS	engineered mutation	UNP P00178
C	492	HIS	-	expression tag	UNP P00178
C	493	HIS	-	expression tag	UNP P00178
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

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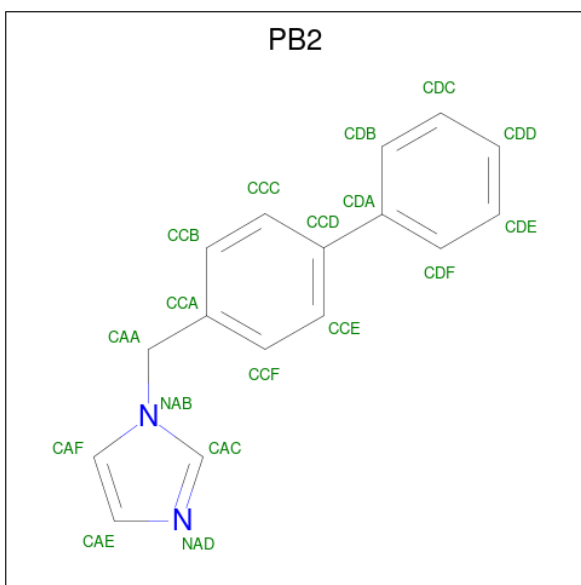
Chain	Residue	Modelled	Actual	Comment	Reference
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D	?	-	LEU	deletion	UNP P00178
D	?	-	ALA	deletion	UNP P00178
D	?	-	PHE	deletion	UNP P00178
D	?	-	LEU	deletion	UNP P00178
D	?	-	ALA	deletion	UNP P00178
D	?	-	GLY	deletion	UNP P00178
D	?	-	LEU	deletion	UNP 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	SEE REMARK 999	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

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



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

- Molecule 3 is 1-(biphenyl-4-ylmethyl)-1H-imidazole (CCD ID: PB2) (formula: $\text{C}_{16}\text{H}_{14}\text{N}_2$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	N	0	0
			18	16	2		
3	A	1	Total	C	N	0	0
			18	16	2		
3	C	1	Total	C	N	0	0
			18	16	2		
3	D	1	Total	C	N	0	0
			18	16	2		

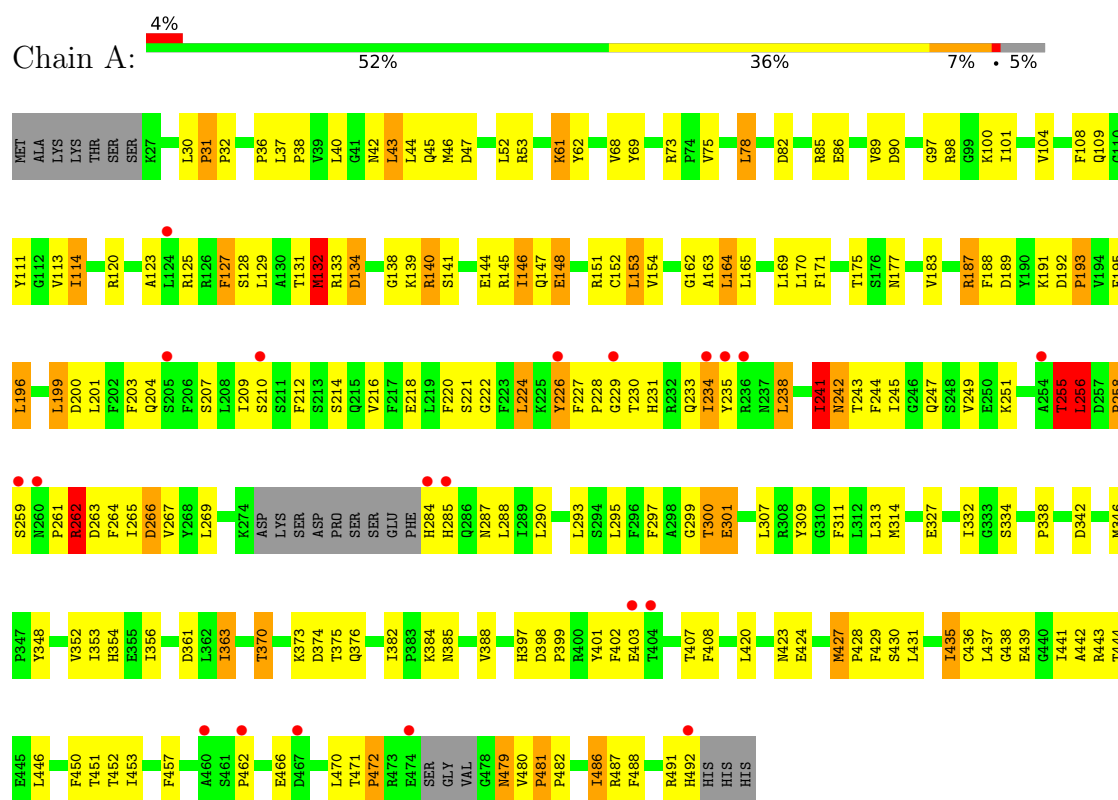
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	9	Total	O	0	0
			9	9		
4	B	9	Total	O	0	0
			9	9		
4	C	13	Total	O	0	0
			13	13		
4	D	3	Total	O	0	0
			3	3		

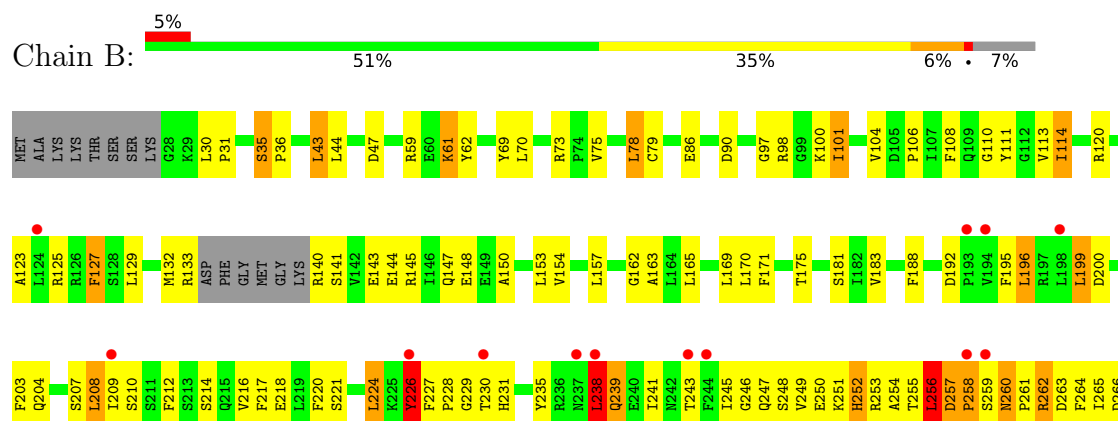
3 Residue-property plots

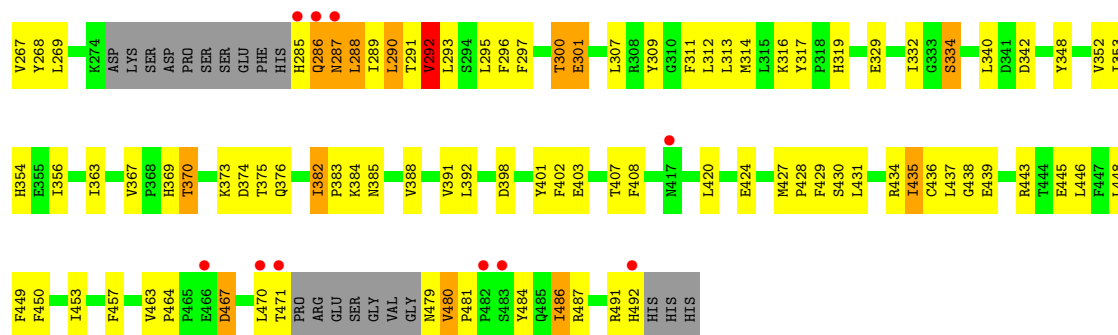
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

• Molecule 1: Cytochrome P450 2B4

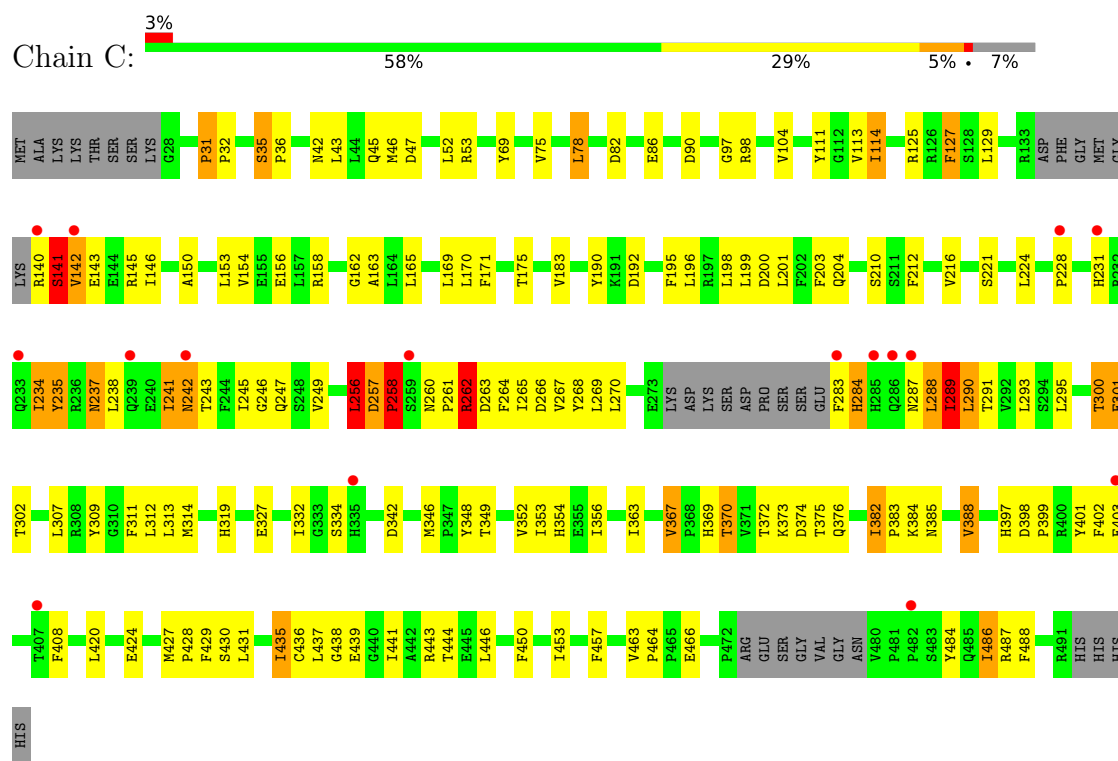


• Molecule 1: Cytochrome P450 2B4

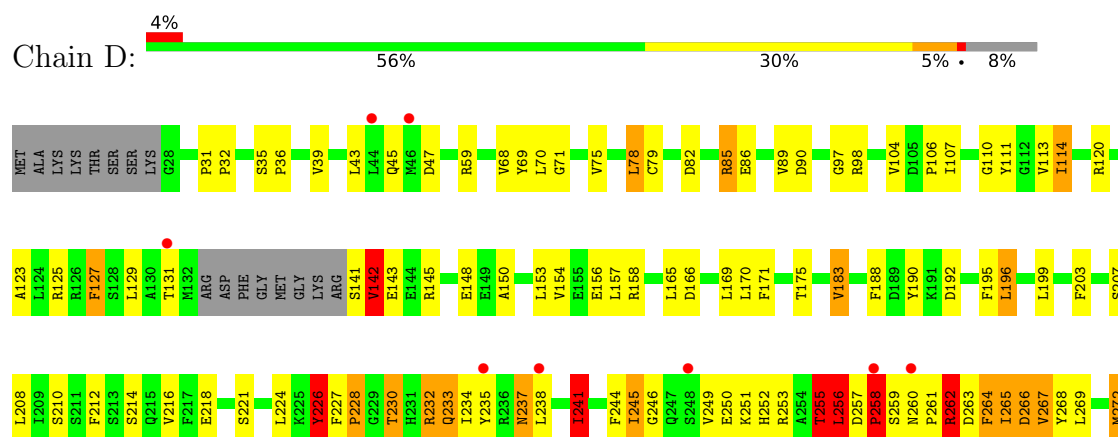


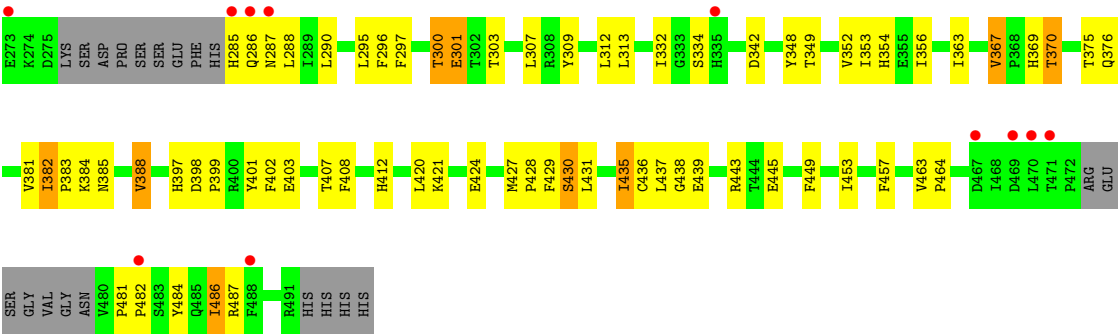


• Molecule 1: Cytochrome P450 2B4



• Molecule 1: Cytochrome P450 2B4





4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	86.91Å 151.81Å 181.58Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.75 – 3.20 48.75 – 3.20	Depositor EDS
% Data completeness (in resolution range)	90.0 (48.75-3.20) 98.3 (48.75-3.20)	Depositor EDS
R_{merge}	0.14	Depositor
R_{sym}	0.14	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.95 (at 3.19Å)	Xtriage
Refinement program	PHENIX (phenix.refine)	Depositor
R, R_{free}	0.237 , 0.270 0.240 , 0.271	Depositor DCC
R_{free} test set	1991 reflections (4.92%)	wwPDB-VP
Wilson B-factor (Å ²)	57.9	Xtriage
Anisotropy	0.394	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 76.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.88	EDS
Total number of atoms	13713	wwPDB-VP
Average B, all atoms (Å ²)	44.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.41% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: PB2, HEM

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.84	1/3531 (0.0%)	1.12	30/4813 (0.6%)
1	B	0.81	0/3421	1.05	20/4671 (0.4%)
1	C	0.73	1/3435 (0.0%)	1.08	19/4686 (0.4%)
1	D	0.75	1/3381 (0.0%)	1.09	24/4618 (0.5%)
All	All	0.79	3/13768 (0.0%)	1.09	93/18788 (0.5%)

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	289	ILE	CA-CB	-6.16	1.47	1.54
1	D	382	ILE	CA-CB	-5.74	1.50	1.54
1	A	382	ILE	CA-CB	-5.49	1.50	1.54

All (93) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	141	SER	N-CA-CB	-15.92	88.60	110.25
1	C	234	ILE	N-CA-C	-12.33	100.45	112.17
1	D	245	ILE	N-CA-C	-11.41	99.46	110.42
1	D	267	VAL	N-CA-C	-11.24	99.15	110.62
1	A	285	HIS	N-CA-C	10.13	122.02	110.97
1	B	256	LEU	N-CA-C	9.20	122.67	110.53
1	A	262	ARG	N-CA-C	8.80	120.48	111.07
1	A	132	MET	N-CA-C	8.23	122.58	112.54
1	C	242	ASN	N-CA-C	-8.15	102.35	111.07
1	A	382	ILE	CA-C-N	8.00	127.76	119.76
1	A	382	ILE	C-N-CA	8.00	127.76	119.76
1	D	258	PRO	CB-CA-C	7.97	124.70	111.56
1	A	242	ASN	N-CA-C	-7.77	101.93	111.33
1	D	237	ASN	CA-C-N	-7.26	110.55	120.28

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	237	ASN	C-N-CA	-7.26	110.55	120.28
1	D	226	TYR	N-CA-C	7.23	121.03	109.24
1	A	241	ILE	CB-CA-C	-7.21	102.41	112.14
1	C	289	ILE	CB-CA-C	-7.15	102.65	112.02
1	C	284	HIS	N-CA-C	7.12	118.69	111.07
1	B	241	ILE	CB-CA-C	-7.09	102.56	112.14
1	D	258	PRO	N-CA-C	-7.07	97.90	112.47
1	A	258	PRO	N-CA-C	-6.94	99.23	110.40
1	B	382	ILE	CA-C-N	6.88	126.64	119.76
1	B	382	ILE	C-N-CA	6.88	126.64	119.76
1	D	382	ILE	CA-C-N	6.88	126.64	119.76
1	D	382	ILE	C-N-CA	6.88	126.64	119.76
1	A	480	VAL	N-CA-C	6.86	116.50	108.96
1	A	471	THR	CA-C-N	6.82	128.36	119.84
1	A	471	THR	C-N-CA	6.82	128.36	119.84
1	B	238	LEU	N-CA-C	6.79	118.69	111.28
1	B	289	ILE	CB-CA-C	-6.64	103.18	112.14
1	D	256	LEU	N-CA-C	6.62	119.83	110.50
1	C	382	ILE	CA-C-N	6.56	126.32	119.76
1	C	382	ILE	C-N-CA	6.56	126.32	119.76
1	D	262	ARG	N-CA-C	6.54	118.41	111.28
1	A	189	ASP	N-CA-C	-6.54	100.75	110.23
1	B	480	VAL	N-CA-C	6.30	114.88	109.02
1	D	398	ASP	CA-C-N	6.25	126.45	119.32
1	D	398	ASP	C-N-CA	6.25	126.45	119.32
1	A	146	ILE	N-CA-C	-6.25	104.25	110.62
1	C	367	VAL	CA-C-N	6.25	126.27	119.90
1	C	367	VAL	C-N-CA	6.25	126.27	119.90
1	A	255	THR	N-CA-C	6.11	120.74	113.28
1	A	481	PRO	O-C-N	6.06	124.10	121.31
1	A	363	ILE	CA-C-N	6.00	125.56	119.19
1	A	363	ILE	C-N-CA	6.00	125.56	119.19
1	B	231	HIS	N-CA-C	5.97	118.47	110.35
1	A	256	LEU	N-CA-C	5.96	118.40	110.53
1	A	153	LEU	N-CA-C	-5.87	104.89	111.28
1	B	398	ASP	CA-C-N	5.82	125.95	119.32
1	B	398	ASP	C-N-CA	5.82	125.95	119.32
1	D	381	VAL	CA-C-N	-5.79	117.82	122.85
1	D	381	VAL	C-N-CA	-5.79	117.82	122.85
1	B	226	TYR	N-CA-C	5.76	119.21	109.76
1	D	255	THR	N-CA-C	5.75	120.30	113.16
1	D	228	PRO	CB-CA-C	-5.75	104.39	111.64

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	367	VAL	CA-C-N	5.71	125.72	119.90
1	D	367	VAL	C-N-CA	5.71	125.72	119.90
1	B	363	ILE	CA-C-N	5.69	125.22	119.19
1	B	363	ILE	C-N-CA	5.69	125.22	119.19
1	C	256	LEU	N-CA-C	5.64	118.42	110.23
1	A	199	LEU	N-CA-C	-5.62	105.25	111.71
1	C	388	VAL	N-CA-C	5.61	116.20	108.12
1	B	199	LEU	N-CA-C	-5.61	105.26	111.71
1	B	286	GLN	N-CA-C	-5.57	104.62	111.75
1	C	31	PRO	CA-C-N	5.56	125.86	119.92
1	C	31	PRO	C-N-CA	5.56	125.86	119.92
1	A	140	ARG	CA-C-N	-5.54	112.86	120.28
1	A	140	ARG	C-N-CA	-5.54	112.86	120.28
1	C	258	PRO	CB-CA-C	5.51	120.66	111.56
1	A	479	ASN	N-CA-C	-5.48	106.26	113.17
1	B	31	PRO	CA-C-N	5.46	125.45	120.21
1	B	31	PRO	C-N-CA	5.46	125.45	120.21
1	A	31	PRO	CA-C-N	5.43	125.42	120.21
1	A	31	PRO	C-N-CA	5.43	125.42	120.21
1	B	467	ASP	N-CA-C	5.35	119.80	113.16
1	B	292	VAL	CB-CA-C	-5.29	105.00	112.14
1	D	183	VAL	CB-CA-C	-5.28	105.48	111.55
1	C	235	TYR	N-CA-C	-5.25	106.89	113.72
1	D	241	ILE	CB-CA-C	-5.23	105.17	112.02
1	D	230	THR	N-CA-C	-5.23	105.70	111.71
1	B	252	HIS	N-CA-C	-5.20	105.61	111.28
1	C	262	ARG	N-CA-C	5.18	117.01	111.36
1	C	288	LEU	N-CA-C	-5.17	105.65	111.28
1	A	398	ASP	CA-C-N	5.10	125.14	119.32
1	A	398	ASP	C-N-CA	5.10	125.14	119.32
1	A	230	THR	N-CA-C	-5.07	107.16	113.19
1	C	398	ASP	CA-C-N	5.07	125.10	119.32
1	C	398	ASP	C-N-CA	5.07	125.10	119.32
1	D	388	VAL	N-CA-C	5.06	115.55	108.17
1	D	259	SER	N-CA-C	-5.03	96.92	111.00
1	A	427	MET	CA-C-N	5.02	124.74	119.82
1	A	427	MET	C-N-CA	5.02	124.74	119.82

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3445	0	3294	227	0
1	B	3338	0	3151	243	0
1	C	3352	0	3187	158	0
1	D	3300	0	3130	172	0
2	A	43	0	30	16	0
2	B	43	0	30	18	0
2	C	43	0	30	9	0
2	D	43	0	30	11	0
3	A	36	0	28	7	0
3	C	18	0	14	5	0
3	D	18	0	14	2	0
4	A	9	0	0	3	0
4	B	9	0	0	1	0
4	C	13	0	0	1	0
4	D	3	0	0	1	0
All	All	13713	0	12938	793	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 30.

All (793) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:142:VAL:HG13	1:C:146:ILE:CD1	1.40	1.52
1:C:142:VAL:CG1	1:C:146:ILE:HD12	1.55	1.36
1:B:238:LEU:HD22	1:B:239:GLN:NE2	1.41	1.31
1:B:259:SER:C	1:B:261:PRO:HD3	1.53	1.29
1:D:232:ARG:HA	1:D:233:GLN:CB	1.48	1.28
1:B:238:LEU:HD23	1:B:238:LEU:C	1.52	1.27
1:A:238:LEU:O	1:A:238:LEU:HD23	1.34	1.27
1:C:238:LEU:C	1:C:238:LEU:HD23	1.55	1.24
1:D:256:LEU:HD13	1:D:256:LEU:O	1.35	1.24
1:C:256:LEU:C	1:C:256:LEU:HD13	1.60	1.24
1:A:233:GLN:O	1:A:235:TYR:HA	1.33	1.24
1:A:238:LEU:HD23	1:A:238:LEU:C	1.52	1.23

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:238:LEU:HD23	1:C:238:LEU:O	1.41	1.20
1:D:227:PHE:CD1	1:D:228:PRO:HD2	1.78	1.17
1:A:231:HIS:CE1	1:A:233:GLN:CB	2.30	1.15
1:B:227:PHE:O	1:B:230:THR:HG23	1.48	1.13
1:A:44:LEU:CD1	1:B:238:LEU:HD11	1.79	1.12
2:A:500:HEM:HBC2	2:A:500:HEM:HHD	1.28	1.12
1:B:262:ARG:HD3	1:B:266:ASP:OD1	1.50	1.11
2:B:500:HEM:HBB2	2:B:500:HEM:HMB2	1.33	1.10
1:D:256:LEU:HD13	1:D:256:LEU:C	1.75	1.09
1:D:262:ARG:H	1:D:262:ARG:HD3	1.03	1.09
1:D:262:ARG:H	1:D:262:ARG:CD	1.59	1.09
1:D:262:ARG:HH11	1:D:262:ARG:CG	1.61	1.09
1:B:262:ARG:HG3	1:B:262:ARG:HH11	0.92	1.08
1:B:268:TYR:OH	1:B:285:HIS:HA	1.50	1.08
1:B:239:GLN:HE21	1:B:239:GLN:N	1.52	1.08
1:A:262:ARG:H	1:A:262:ARG:CD	1.60	1.08
1:A:262:ARG:H	1:A:262:ARG:HD3	1.18	1.08
1:D:232:ARG:CA	1:D:233:GLN:CB	2.30	1.08
1:C:256:LEU:HD13	1:C:256:LEU:O	1.52	1.07
1:A:262:ARG:HH11	1:A:262:ARG:HG3	0.90	1.06
1:A:262:ARG:HH11	1:A:262:ARG:CG	1.65	1.05
1:B:262:ARG:CD	1:B:262:ARG:H	1.69	1.04
1:A:231:HIS:HE1	1:A:233:GLN:CB	1.64	1.04
1:B:262:ARG:HD3	1:B:262:ARG:H	1.19	1.04
1:B:259:SER:C	1:B:261:PRO:CD	2.30	1.03
1:B:238:LEU:C	1:B:238:LEU:CD2	2.29	1.03
1:A:44:LEU:HD12	1:B:238:LEU:HD11	1.07	1.02
1:B:258:PRO:HA	1:B:260:ASN:H	1.21	1.02
1:A:284:HIS:O	1:A:288:LEU:HD23	1.58	1.01
1:B:256:LEU:HD12	1:B:256:LEU:H	1.25	1.01
1:A:238:LEU:C	1:A:238:LEU:CD2	2.30	1.00
1:C:198:LEU:HB3	1:C:241:ILE:HD11	1.41	1.00
1:B:262:ARG:HH11	1:B:262:ARG:CG	1.71	0.99
2:B:500:HEM:HBB2	2:B:500:HEM:CMB	1.93	0.98
1:C:142:VAL:HG13	1:C:146:ILE:HD11	1.45	0.98
1:A:262:ARG:HG3	1:A:262:ARG:NH1	1.73	0.98
1:A:148:GLU:CD	1:A:151:ARG:HH22	1.72	0.97
1:B:262:ARG:HG3	1:B:262:ARG:NH1	1.71	0.97
1:B:227:PHE:H	1:B:230:THR:HG21	1.28	0.96
1:C:142:VAL:CG1	1:C:146:ILE:CD1	2.24	0.95
1:A:44:LEU:HD12	1:B:238:LEU:CD1	1.96	0.95

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:256:LEU:HD13	1:B:256:LEU:O	1.66	0.95
1:A:148:GLU:HG2	1:A:151:ARG:CZ	1.96	0.95
1:A:245:ILE:O	1:A:249:VAL:HG23	1.67	0.94
1:A:287:ASN:ND2	1:B:44:LEU:CD2	2.31	0.94
1:C:238:LEU:C	1:C:238:LEU:CD2	2.35	0.94
1:A:133:ARG:HA	1:A:134:ASP:HB2	1.48	0.93
1:B:256:LEU:HD12	1:B:256:LEU:N	1.81	0.93
1:B:290:LEU:HD23	1:B:290:LEU:O	1.68	0.93
1:D:262:ARG:HG3	1:D:262:ARG:NH1	1.56	0.93
1:A:256:LEU:HD13	1:A:256:LEU:C	1.94	0.92
1:C:153:LEU:HD21	1:C:453:ILE:HD11	1.51	0.92
1:B:238:LEU:CD2	1:B:239:GLN:NE2	2.30	0.92
1:A:234:ILE:HD13	1:A:234:ILE:O	1.70	0.91
1:B:290:LEU:C	1:B:290:LEU:CD2	2.44	0.91
1:A:133:ARG:CA	1:A:134:ASP:HB2	2.00	0.91
1:C:256:LEU:C	1:C:256:LEU:CD1	2.41	0.91
1:A:148:GLU:CD	1:A:151:ARG:NH2	2.29	0.90
1:D:258:PRO:HA	1:D:260:ASN:H	1.35	0.90
1:B:251:LYS:O	1:B:255:THR:HG23	1.70	0.90
1:A:43:LEU:HD21	1:B:229:GLY:HA3	1.52	0.90
1:B:260:ASN:N	1:B:261:PRO:HD3	1.86	0.90
1:B:262:ARG:CD	1:B:262:ARG:N	2.30	0.90
1:A:256:LEU:HD13	1:A:256:LEU:O	1.72	0.90
1:D:153:LEU:HD21	1:D:453:ILE:HD11	1.53	0.90
1:A:148:GLU:HG2	1:A:151:ARG:NH1	1.86	0.89
1:B:238:LEU:HD23	1:B:238:LEU:O	1.70	0.89
1:D:227:PHE:CG	1:D:228:PRO:HD2	2.08	0.89
1:A:262:ARG:HD3	1:A:262:ARG:N	1.86	0.89
1:D:262:ARG:HD3	1:D:262:ARG:N	1.85	0.89
1:B:238:LEU:HD22	1:B:239:GLN:HE22	1.33	0.89
1:C:258:PRO:HA	1:C:260:ASN:H	1.38	0.88
2:B:500:HEM:HBC2	2:B:500:HEM:HHD	1.53	0.88
1:B:238:LEU:HD23	1:B:239:GLN:N	1.89	0.87
1:B:238:LEU:HD22	1:B:239:GLN:HE21	1.34	0.87
1:A:229:GLY:HA2	1:A:234:ILE:HD12	1.56	0.87
1:B:262:ARG:CD	1:B:266:ASP:OD1	2.23	0.86
1:B:153:LEU:HD21	1:B:453:ILE:HD11	1.57	0.86
1:D:237:ASN:O	1:D:241:ILE:HG12	1.74	0.86
1:D:262:ARG:HH11	1:D:262:ARG:HG3	0.74	0.86
1:A:153:LEU:HD21	1:A:453:ILE:HD11	1.57	0.86
2:D:500:HEM:HBC2	2:D:500:HEM:HHD	1.57	0.85

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:264:PHE:O	1:D:264:PHE:CD1	2.30	0.85
1:A:241:ILE:O	1:A:244:PHE:N	2.09	0.85
1:B:227:PHE:C	1:B:230:THR:HG23	2.02	0.85
1:B:226:TYR:O	1:B:226:TYR:CD2	2.30	0.84
2:B:500:HEM:HBD2	2:B:500:HEM:HHA	1.60	0.84
1:C:142:VAL:HG13	1:C:146:ILE:HD12	0.85	0.84
1:B:256:LEU:HD13	1:B:256:LEU:C	1.97	0.83
1:D:232:ARG:H	1:D:232:ARG:HD2	1.44	0.83
1:A:287:ASN:HD22	1:B:44:LEU:CD2	1.88	0.83
1:B:239:GLN:HE21	1:B:239:GLN:CA	1.90	0.83
1:C:257:ASP:OD1	1:C:257:ASP:C	2.22	0.83
1:A:256:LEU:HD23	1:A:266:ASP:HB2	1.61	0.82
1:B:227:PHE:HB3	1:B:230:THR:CG2	2.09	0.82
2:C:500:HEM:HBC2	2:C:500:HEM:HHD	1.61	0.82
1:A:234:ILE:HG13	1:B:212:PHE:HD2	1.45	0.81
1:D:264:PHE:CD1	1:D:264:PHE:C	2.56	0.81
1:B:258:PRO:HA	1:B:260:ASN:N	1.95	0.81
2:A:500:HEM:HHD	2:A:500:HEM:CBC	2.04	0.81
1:C:231:HIS:O	1:C:235:TYR:CB	2.30	0.80
1:A:148:GLU:CG	1:A:151:ARG:NH1	2.44	0.80
1:C:256:LEU:O	1:C:256:LEU:CD1	2.30	0.80
1:A:234:ILE:O	1:A:234:ILE:CD1	2.29	0.80
1:D:237:ASN:O	1:D:241:ILE:CD1	2.30	0.80
1:B:227:PHE:O	1:B:230:THR:CG2	2.30	0.80
1:A:234:ILE:O	1:A:234:ILE:CG1	2.30	0.80
1:D:427:MET:HE2	1:D:431:LEU:HD11	1.62	0.79
1:B:290:LEU:O	1:B:290:LEU:CD2	2.30	0.79
2:B:500:HEM:HHA	2:B:500:HEM:CBD	2.12	0.79
1:B:257:ASP:O	1:B:260:ASN:CB	2.30	0.79
1:D:226:TYR:O	1:D:226:TYR:CD2	2.36	0.79
1:D:237:ASN:O	1:D:241:ILE:CG1	2.30	0.79
1:A:256:LEU:C	1:A:256:LEU:CD1	2.57	0.78
1:B:257:ASP:OD2	1:B:260:ASN:CB	2.31	0.78
1:A:256:LEU:HB3	1:A:262:ARG:HH21	1.47	0.77
1:B:256:LEU:N	1:B:256:LEU:CD1	2.45	0.77
1:B:292:VAL:HG12	1:B:293:LEU:N	1.97	0.77
1:D:241:ILE:HD13	1:D:241:ILE:N	2.00	0.77
2:B:500:HEM:HMB2	2:B:500:HEM:CBB	2.14	0.77
1:B:262:ARG:N	1:B:262:ARG:HD2	1.98	0.76
2:A:500:HEM:HBC2	2:A:500:HEM:CHD	2.06	0.76
1:B:290:LEU:HD23	1:B:290:LEU:C	2.04	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:500:HEM:C1D	3:A:501:PB2:HAE	2.22	0.75
1:C:238:LEU:O	1:C:238:LEU:CD2	2.29	0.75
1:B:260:ASN:N	1:B:261:PRO:CD	2.39	0.75
1:D:237:ASN:O	1:D:241:ILE:HD11	1.87	0.74
1:D:262:ARG:CD	1:D:262:ARG:N	2.38	0.74
1:A:262:ARG:CG	1:A:262:ARG:NH1	2.30	0.74
2:B:500:HEM:HBC2	2:B:500:HEM:CHD	2.17	0.74
1:C:198:LEU:CB	1:C:241:ILE:HD11	2.18	0.74
1:B:238:LEU:CD2	1:B:239:GLN:HE21	1.96	0.74
1:B:268:TYR:OH	1:B:285:HIS:CA	2.35	0.74
1:B:239:GLN:NE2	1:B:239:GLN:N	2.32	0.74
2:A:500:HEM:HHB	2:A:500:HEM:CBD	2.18	0.73
1:A:287:ASN:HD22	1:B:44:LEU:HD22	1.51	0.73
1:A:192:ASP:C	1:A:192:ASP:OD1	2.30	0.73
1:A:256:LEU:HD23	1:A:266:ASP:CB	2.18	0.73
1:D:227:PHE:CG	1:D:228:PRO:CD	2.72	0.72
1:D:256:LEU:C	1:D:256:LEU:CD1	2.55	0.72
1:A:287:ASN:ND2	1:B:44:LEU:HD22	2.02	0.72
1:B:36:PRO:HG3	1:B:69:TYR:CD1	2.24	0.72
1:B:238:LEU:CD2	1:B:239:GLN:N	2.51	0.72
2:B:500:HEM:NC	2:B:500:HEM:FE	1.56	0.72
1:A:133:ARG:CB	1:A:134:ASP:HB2	2.20	0.71
2:B:500:HEM:HHB	2:B:500:HEM:CBC	2.19	0.71
1:D:227:PHE:HB3	1:D:230:THR:CG2	2.20	0.71
1:D:429:PHE:O	1:D:430:SER:CB	2.36	0.71
1:A:43:LEU:CD2	1:B:229:GLY:HA3	2.20	0.71
1:A:251:LYS:O	1:A:255:THR:HG23	1.91	0.71
1:C:384:LYS:O	1:C:385:ASN:HB2	1.90	0.71
1:B:259:SER:CA	1:B:261:PRO:HD3	2.21	0.71
1:B:265:ILE:O	1:B:268:TYR:HB3	1.91	0.70
1:B:257:ASP:OD2	1:B:257:ASP:C	2.34	0.70
1:B:227:PHE:N	1:B:230:THR:HG21	2.04	0.70
1:C:36:PRO:HG3	1:C:69:TYR:CD1	2.26	0.70
1:C:204:GLN:HG2	1:C:234:ILE:CB	2.21	0.70
1:A:224:LEU:HD12	1:B:228:PRO:HG3	1.74	0.70
1:B:290:LEU:C	1:B:290:LEU:HD22	2.16	0.69
1:A:164:LEU:HD12	1:A:487:ARG:HH11	1.57	0.69
1:A:287:ASN:ND2	1:B:44:LEU:HD21	2.06	0.69
1:A:36:PRO:HG3	1:A:69:TYR:CD1	2.27	0.69
1:A:224:LEU:HD12	1:B:228:PRO:CG	2.22	0.69
1:D:227:PHE:HB3	1:D:230:THR:HG21	1.74	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:288:LEU:N	1:A:288:LEU:HD22	2.08	0.69
1:A:262:ARG:H	1:A:262:ARG:HD2	1.54	0.69
1:B:227:PHE:HB3	1:B:230:THR:HG23	1.75	0.68
1:A:46:MET:HG3	1:B:235:TYR:CE1	2.28	0.68
1:D:258:PRO:CA	1:D:260:ASN:H	2.07	0.68
2:D:500:HEM:HBA2	2:D:500:HEM:HHA	1.76	0.68
1:D:36:PRO:HG3	1:D:69:TYR:CD1	2.29	0.67
1:A:175:THR:HB	1:A:300:THR:HG22	1.76	0.67
1:A:256:LEU:O	1:A:256:LEU:CD1	2.43	0.67
1:B:249:VAL:O	1:B:253:ARG:N	2.27	0.67
1:B:487:ARG:NH1	1:D:89:VAL:HG13	2.09	0.67
1:B:446:LEU:O	1:B:450:PHE:HB2	1.93	0.67
1:D:262:ARG:CG	1:D:262:ARG:NH1	2.30	0.67
1:B:141:SER:O	1:B:145:ARG:HG3	1.94	0.67
1:C:150:ALA:O	1:C:154:VAL:HG23	1.95	0.67
1:A:446:LEU:O	1:A:450:PHE:HB2	1.95	0.66
1:C:175:THR:HB	1:C:300:THR:HG22	1.77	0.66
2:C:500:HEM:C1D	3:C:501:PB2:HAE	2.30	0.66
1:B:175:THR:HB	1:B:300:THR:HG22	1.77	0.66
1:A:46:MET:HB2	1:B:235:TYR:CE1	2.31	0.66
1:A:148:GLU:CG	1:A:151:ARG:CZ	2.71	0.66
1:B:227:PHE:H	1:B:230:THR:CG2	2.08	0.66
1:B:245:ILE:O	1:B:249:VAL:HG23	1.96	0.66
1:C:289:ILE:HG22	1:C:290:LEU:N	2.04	0.66
1:D:175:THR:HB	1:D:300:THR:HG22	1.78	0.66
1:C:198:LEU:CD2	1:C:241:ILE:HD11	2.26	0.65
1:A:148:GLU:HG3	1:A:151:ARG:HH12	1.60	0.65
1:C:446:LEU:O	1:C:450:PHE:HB2	1.97	0.65
1:A:361:ASP:O	1:A:479:ASN:ND2	2.29	0.65
1:C:265:ILE:O	1:C:268:TYR:HB3	1.95	0.65
1:A:234:ILE:HG13	1:B:212:PHE:CD2	2.30	0.65
1:B:255:THR:OG1	1:B:262:ARG:NH2	2.30	0.65
1:A:46:MET:HB2	1:B:235:TYR:CD1	2.31	0.64
1:C:198:LEU:HB3	1:C:241:ILE:CD1	2.21	0.64
1:C:237:ASN:N	1:C:237:ASN:OD1	2.30	0.64
1:A:224:LEU:CD1	1:B:228:PRO:CG	2.75	0.64
1:A:148:GLU:CG	1:A:151:ARG:HH12	2.09	0.64
1:A:472:PRO:HA	1:A:482:PRO:HD3	1.78	0.64
1:A:200:ASP:O	1:A:204:GLN:HB2	1.98	0.64
1:A:234:ILE:O	1:A:234:ILE:HG12	1.97	0.64
1:A:384:LYS:O	1:A:385:ASN:HB2	1.96	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:140:ARG:N	1:B:144:GLU:OE1	2.30	0.64
1:B:258:PRO:CA	1:B:260:ASN:H	2.05	0.64
1:C:142:VAL:HG12	1:C:146:ILE:HD12	1.72	0.64
1:A:133:ARG:CA	1:A:134:ASP:CB	2.75	0.64
1:D:265:ILE:O	1:D:268:TYR:HB3	1.98	0.64
1:B:384:LYS:O	1:B:385:ASN:HB2	1.96	0.63
1:A:164:LEU:CD1	1:A:487:ARG:HH11	2.11	0.63
2:A:500:HEM:HHA	2:A:500:HEM:HBD1	1.80	0.63
1:C:258:PRO:HA	1:C:260:ASN:N	2.10	0.63
1:D:296:PHE:CD1	2:D:500:HEM:HBC1	2.34	0.63
1:B:259:SER:O	1:B:261:PRO:CD	2.47	0.63
1:D:258:PRO:HA	1:D:260:ASN:N	2.11	0.63
1:A:214:SER:O	1:A:218:GLU:HG3	1.98	0.63
1:D:384:LYS:O	1:D:385:ASN:HB2	1.97	0.62
1:D:429:PHE:O	1:D:430:SER:HB3	1.99	0.62
1:A:399:PRO:HB3	1:C:319:HIS:ND1	2.13	0.62
1:D:232:ARG:H	1:D:232:ARG:CD	2.12	0.62
1:B:125:ARG:O	1:B:129:LEU:HD13	1.99	0.62
1:A:154:VAL:HG13	1:A:457:PHE:HE2	1.64	0.62
1:D:78:LEU:HD22	1:D:388:VAL:CG1	2.30	0.61
1:D:227:PHE:CD1	1:D:228:PRO:CD	2.71	0.61
1:D:238:LEU:C	1:D:238:LEU:HD23	2.25	0.61
1:A:177:ASN:HD22	1:A:187:ARG:NH2	1.98	0.61
1:C:154:VAL:HG13	1:C:457:PHE:HE2	1.66	0.61
1:D:264:PHE:C	1:D:264:PHE:HD1	2.06	0.61
1:C:78:LEU:HD22	1:C:388:VAL:CG1	2.31	0.61
1:B:470:LEU:O	1:B:471:THR:C	2.45	0.60
1:C:312:LEU:HB2	1:C:484:TYR:CE1	2.37	0.60
1:C:289:ILE:O	1:C:290:LEU:C	2.41	0.60
1:A:61:LYS:HD2	1:A:62:TYR:CE2	2.37	0.60
1:B:150:ALA:O	1:B:154:VAL:HG23	2.00	0.60
1:C:200:ASP:O	1:C:204:GLN:HB2	2.02	0.60
1:A:164:LEU:HD21	1:A:462:PRO:HD3	1.82	0.60
1:B:227:PHE:CB	1:B:230:THR:CG2	2.79	0.60
1:D:439:GLU:O	1:D:443:ARG:HG3	2.01	0.60
2:B:500:HEM:HBD2	2:B:500:HEM:CHA	2.27	0.60
1:A:148:GLU:CG	1:A:151:ARG:NH2	2.64	0.60
1:D:154:VAL:HG13	1:D:457:PHE:HE2	1.66	0.60
1:A:288:LEU:N	1:A:288:LEU:CD2	2.65	0.59
3:A:496:PB2:NAD	2:B:500:HEM:NC	2.49	0.59
1:C:125:ARG:O	1:C:129:LEU:HD13	2.02	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:214:SER:O	1:D:218:GLU:HG3	2.02	0.59
1:A:287:ASN:HD22	1:B:44:LEU:HD21	1.62	0.59
2:B:500:HEM:NC	2:B:500:HEM:NB	2.44	0.59
1:A:262:ARG:CD	1:A:262:ARG:N	2.39	0.59
1:B:227:PHE:CA	1:B:230:THR:HG23	2.32	0.59
1:C:140:ARG:O	1:C:145:ARG:HG3	2.02	0.59
1:B:61:LYS:HD2	1:B:62:TYR:CE2	2.38	0.59
1:B:154:VAL:HG13	1:B:457:PHE:HE2	1.67	0.59
1:D:125:ARG:O	1:D:129:LEU:HD13	2.03	0.59
1:D:303:THR:HA	2:D:500:HEM:CBB	2.33	0.58
2:C:500:HEM:HHD	2:C:500:HEM:CBC	2.32	0.58
1:A:146:ILE:HD13	1:A:444:THR:HG22	1.84	0.58
1:C:439:GLU:O	1:C:443:ARG:HG3	2.04	0.58
1:A:125:ARG:O	1:A:129:LEU:HD13	2.04	0.58
1:A:140:ARG:O	1:A:141:SER:C	2.43	0.58
1:A:439:GLU:O	1:A:443:ARG:HG3	2.03	0.58
1:B:352:VAL:HG13	1:B:408:PHE:HZ	1.68	0.58
1:B:312:LEU:HB2	1:B:484:TYR:CE1	2.38	0.58
1:A:46:MET:CG	1:B:235:TYR:CE1	2.87	0.58
1:D:266:ASP:O	1:D:267:VAL:C	2.46	0.58
1:A:177:ASN:ND2	1:A:187:ARG:NH2	2.51	0.57
1:B:214:SER:O	1:B:218:GLU:HG3	2.04	0.57
1:C:352:VAL:HG13	1:C:408:PHE:HZ	1.69	0.57
1:A:204:GLN:OE1	1:A:204:GLN:HA	2.04	0.57
1:B:266:ASP:HA	1:B:269:LEU:HB2	1.85	0.57
1:D:183:VAL:O	1:D:265:ILE:HG12	2.03	0.57
1:A:162:GLY:O	1:A:487:ARG:HD2	2.05	0.57
1:C:162:GLY:O	1:C:487:ARG:HG2	2.05	0.57
2:C:500:HEM:NB	3:C:501:PB2:CAC	2.67	0.57
1:C:45:GLN:C	1:C:46:MET:HE2	2.30	0.57
1:D:125:ARG:NH2	1:D:435:ILE:O	2.32	0.57
1:D:354:HIS:CE1	1:D:443:ARG:HH12	2.22	0.57
1:A:154:VAL:HG13	1:A:457:PHE:CE2	2.39	0.57
1:A:354:HIS:CE1	1:A:443:ARG:HH12	2.23	0.57
1:B:259:SER:O	1:B:261:PRO:HD2	2.05	0.57
1:C:154:VAL:HG13	1:C:457:PHE:CE2	2.39	0.57
1:A:162:GLY:O	1:A:487:ARG:HG2	2.05	0.57
1:D:312:LEU:HB2	1:D:484:TYR:CE1	2.40	0.57
1:B:486:ILE:HG12	1:B:487:ARG:N	2.20	0.56
1:C:127:PHE:C	1:C:127:PHE:CD1	2.82	0.56
1:D:256:LEU:O	1:D:256:LEU:CD1	2.30	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:266:ASP:HA	1:A:269:LEU:HB2	1.87	0.56
1:A:314:MET:SD	1:A:450:PHE:HE1	2.28	0.56
1:B:248:SER:O	1:B:252:HIS:ND1	2.37	0.56
1:B:354:HIS:CE1	1:B:443:ARG:HH12	2.23	0.56
1:A:46:MET:CB	1:B:235:TYR:CE1	2.89	0.56
1:A:164:LEU:CD1	1:A:487:ARG:NH1	2.68	0.56
1:A:224:LEU:HD11	1:B:228:PRO:CD	2.36	0.56
1:B:268:TYR:CZ	1:B:285:HIS:HA	2.40	0.56
1:D:261:PRO:O	1:D:261:PRO:HG2	2.05	0.56
1:D:486:ILE:HG12	1:D:487:ARG:N	2.20	0.56
1:A:164:LEU:HD11	1:A:487:ARG:NH1	2.21	0.56
1:D:245:ILE:O	1:D:249:VAL:HG23	2.05	0.56
1:A:352:VAL:HG13	1:A:408:PHE:HZ	1.69	0.56
1:C:42:ASN:O	1:C:46:MET:HE3	2.06	0.56
2:C:500:HEM:HHA	2:C:500:HEM:CBD	2.35	0.56
1:B:200:ASP:O	1:B:204:GLN:HB2	2.06	0.56
1:D:241:ILE:CD1	1:D:241:ILE:H	2.17	0.56
1:A:128:SER:O	1:A:131:THR:OG1	2.23	0.56
1:B:487:ARG:HH12	1:D:89:VAL:HG13	1.70	0.56
2:C:500:HEM:HHA	2:C:500:HEM:HBA2	1.87	0.56
1:B:154:VAL:HG13	1:B:457:PHE:CE2	2.40	0.55
1:D:252:HIS:NE2	1:D:263:ASP:OD2	2.39	0.55
1:B:296:PHE:CD1	2:B:500:HEM:HBC1	2.40	0.55
1:A:97:GLY:C	1:A:370:THR:HB	2.32	0.55
1:C:204:GLN:HA	1:C:204:GLN:OE1	2.06	0.55
1:C:283:PHE:CG	1:C:284:HIS:N	2.70	0.55
1:D:352:VAL:HG13	1:D:408:PHE:HZ	1.70	0.55
1:D:367:VAL:HB	2:D:500:HEM:O1A	2.07	0.55
1:D:285:HIS:O	1:D:287:ASN:N	2.39	0.55
1:D:401:TYR:CE2	1:D:424:GLU:HB2	2.41	0.55
1:B:162:GLY:O	1:B:487:ARG:HG2	2.06	0.55
1:C:162:GLY:O	1:C:487:ARG:CG	2.54	0.55
1:C:245:ILE:HD13	1:C:289:ILE:HG21	1.89	0.55
1:A:332:ILE:HG12	1:A:342:ASP:OD2	2.07	0.55
1:A:486:ILE:HG12	1:A:487:ARG:N	2.21	0.55
1:C:162:GLY:O	1:C:487:ARG:HD2	2.06	0.55
1:C:258:PRO:CA	1:C:260:ASN:H	2.17	0.55
1:D:303:THR:HA	2:D:500:HEM:HBB1	1.88	0.55
1:B:162:GLY:O	1:B:487:ARG:HD2	2.06	0.55
1:A:127:PHE:CD1	1:A:127:PHE:C	2.85	0.55
1:C:142:VAL:HG12	1:C:444:THR:HG21	1.88	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:354:HIS:CE1	1:C:443:ARG:HH12	2.24	0.55
1:D:154:VAL:HG13	1:D:457:PHE:CE2	2.40	0.55
1:D:285:HIS:C	1:D:287:ASN:H	2.15	0.55
1:D:309:TYR:CE2	1:D:313:LEU:HD12	2.42	0.55
1:A:438:GLY:HA3	2:A:500:HEM:C3C	2.42	0.54
1:B:257:ASP:OD2	1:B:258:PRO:N	2.40	0.54
1:B:353:ILE:HA	1:B:356:ILE:HD12	1.89	0.54
1:D:266:ASP:O	1:D:269:LEU:N	2.40	0.54
1:A:247:GLN:O	1:A:251:LYS:HG3	2.06	0.54
1:A:443:ARG:NH1	4:A:3:HOH:O	2.24	0.54
1:A:299:GLY:HA2	3:A:501:PB2:CAF	2.37	0.54
1:D:233:GLN:O	1:D:234:ILE:C	2.48	0.54
1:D:244:PHE:O	1:D:245:ILE:C	2.50	0.54
1:B:238:LEU:HD23	1:B:239:GLN:CA	2.37	0.54
1:D:150:ALA:O	1:D:154:VAL:HG23	2.07	0.54
1:D:227:PHE:O	1:D:230:THR:HG23	2.08	0.54
1:D:353:ILE:HA	1:D:356:ILE:HD12	1.89	0.54
1:C:287:ASN:N	1:C:287:ASN:HD22	2.05	0.54
1:B:163:ALA:C	1:B:487:ARG:HG3	2.33	0.54
1:B:314:MET:SD	1:B:450:PHE:HE1	2.31	0.54
1:C:198:LEU:HD23	1:C:241:ILE:HD11	1.89	0.54
1:C:311:PHE:HA	1:C:314:MET:HE2	1.90	0.54
1:C:486:ILE:HG12	1:C:487:ARG:N	2.21	0.54
1:A:222:GLY:O	1:B:101:ILE:HG13	2.08	0.54
1:B:86:GLU:O	1:B:90:ASP:HB2	2.07	0.54
1:D:255:THR:OG1	1:D:262:ARG:NH2	2.41	0.54
1:B:97:GLY:C	1:B:370:THR:HB	2.33	0.54
1:B:162:GLY:O	1:B:487:ARG:CG	2.57	0.53
1:B:226:TYR:O	1:B:226:TYR:CG	2.59	0.53
1:D:375:THR:HG22	1:D:376:GLN:N	2.23	0.53
1:A:78:LEU:HD22	1:A:388:VAL:CG1	2.38	0.53
1:A:263:ASP:O	1:A:267:VAL:HG23	2.08	0.53
1:B:169:LEU:HD12	1:B:169:LEU:O	2.09	0.53
1:C:257:ASP:OD1	1:C:258:PRO:N	2.41	0.53
1:D:348:TYR:O	1:D:352:VAL:HG23	2.08	0.53
1:A:163:ALA:C	1:A:487:ARG:HG3	2.32	0.53
1:A:162:GLY:O	1:A:487:ARG:CG	2.56	0.53
1:A:207:SER:HB3	1:B:209:ILE:HG12	1.90	0.53
1:B:291:THR:O	1:B:295:LEU:HD13	2.09	0.53
1:C:401:TYR:CE2	1:C:424:GLU:HB2	2.43	0.53
1:A:314:MET:SD	1:A:450:PHE:CE1	3.02	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:78:LEU:HD22	1:B:388:VAL:CG1	2.38	0.53
1:B:227:PHE:CB	1:B:230:THR:HG23	2.38	0.53
1:C:142:VAL:CG1	1:C:444:THR:HG21	2.39	0.53
1:C:309:TYR:CE2	1:C:313:LEU:HD12	2.43	0.53
1:D:127:PHE:CD1	1:D:127:PHE:C	2.87	0.53
1:A:401:TYR:CE2	1:A:424:GLU:HB2	2.42	0.53
1:C:353:ILE:HA	1:C:356:ILE:HD12	1.90	0.53
1:B:295:LEU:N	1:B:295:LEU:HD12	2.23	0.53
1:A:348:TYR:O	1:A:352:VAL:HG23	2.08	0.52
1:C:141:SER:O	1:C:142:VAL:C	2.51	0.52
2:C:500:HEM:HBC2	2:C:500:HEM:CHD	2.30	0.52
1:D:226:TYR:CD2	1:D:226:TYR:C	2.85	0.52
1:A:86:GLU:O	1:A:90:ASP:HB2	2.09	0.52
1:A:466:GLU:HG2	1:C:53:ARG:NH2	2.24	0.52
1:B:314:MET:SD	1:B:450:PHE:CE1	3.02	0.52
1:B:227:PHE:CA	1:B:230:THR:CG2	2.88	0.52
1:A:231:HIS:ND1	1:A:233:GLN:CB	2.71	0.52
1:B:204:GLN:OE1	1:B:204:GLN:HA	2.08	0.52
1:B:311:PHE:HA	1:B:314:MET:HE2	1.92	0.52
1:D:78:LEU:HD22	1:D:388:VAL:HG12	1.90	0.52
1:A:125:ARG:HD2	1:A:437:LEU:CD1	2.39	0.52
1:D:445:GLU:O	1:D:449:PHE:HB2	2.09	0.52
1:C:266:ASP:HA	1:C:269:LEU:HB2	1.91	0.52
1:A:353:ILE:HA	1:A:356:ILE:HD12	1.92	0.52
1:B:212:PHE:O	1:B:216:VAL:HG23	2.09	0.52
1:C:163:ALA:C	1:C:487:ARG:HG3	2.35	0.52
1:C:283:PHE:CD2	1:C:284:HIS:N	2.77	0.52
1:D:238:LEU:HD23	1:D:238:LEU:O	2.10	0.52
1:A:132:MET:O	1:A:139:LYS:CB	2.58	0.51
1:A:375:THR:HG22	1:A:376:GLN:N	2.24	0.51
1:B:375:THR:HG22	1:B:376:GLN:N	2.25	0.51
1:C:212:PHE:O	1:C:216:VAL:HG23	2.10	0.51
1:D:263:ASP:O	1:D:266:ASP:OD2	2.28	0.51
1:B:127:PHE:CD1	1:B:127:PHE:C	2.89	0.51
1:C:243:THR:O	1:C:247:GLN:HG3	2.11	0.51
1:C:263:ASP:O	1:C:267:VAL:HG23	2.11	0.51
1:A:241:ILE:O	1:A:242:ASN:C	2.53	0.51
1:A:435:ILE:HG12	1:A:436:CYS:N	2.25	0.51
1:C:169:LEU:O	1:C:169:LEU:HD12	2.10	0.51
1:C:314:MET:SD	1:C:450:PHE:HE1	2.33	0.51
1:D:212:PHE:O	1:D:216:VAL:HG23	2.11	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:302:THR:OG1	3:C:501:PB2:HAA	2.10	0.51
1:C:375:THR:HG22	1:C:376:GLN:N	2.25	0.51
1:B:250:GLU:O	1:B:254:ALA:N	2.35	0.51
1:C:332:ILE:HG12	1:C:342:ASP:OD2	2.10	0.51
1:A:153:LEU:CD1	1:A:170:LEU:HD21	2.41	0.50
1:B:401:TYR:CE2	1:B:424:GLU:HB2	2.45	0.50
1:A:148:GLU:HG2	1:A:151:ARG:NH2	2.22	0.50
1:B:153:LEU:HD11	1:B:170:LEU:HD21	1.93	0.50
1:A:100:LYS:O	1:B:73:ARG:HD3	2.11	0.50
1:B:439:GLU:O	1:B:443:ARG:HG3	2.12	0.50
1:C:97:GLY:C	1:C:370:THR:HB	2.37	0.50
1:B:203:PHE:HE1	1:B:301:GLU:HB2	1.77	0.50
1:D:141:SER:O	1:D:145:ARG:HG3	2.11	0.50
1:A:42:ASN:O	1:A:46:MET:HE3	2.11	0.50
1:B:239:GLN:NE2	1:B:239:GLN:CA	2.64	0.50
1:B:348:TYR:O	1:B:352:VAL:HG23	2.11	0.50
1:C:348:TYR:O	1:C:352:VAL:HG23	2.12	0.50
1:A:73:ARG:HD3	1:B:100:LYS:O	2.10	0.50
1:A:311:PHE:HA	1:A:314:MET:HE2	1.94	0.50
1:B:195:PHE:CE1	1:B:199:LEU:HD22	2.47	0.50
1:B:262:ARG:NE	1:B:266:ASP:OD1	2.44	0.50
1:C:78:LEU:HD22	1:C:388:VAL:HG12	1.94	0.50
1:A:98:ARG:NH1	1:B:220:PHE:CE2	2.79	0.50
1:B:227:PHE:N	1:B:230:THR:CG2	2.73	0.50
1:C:245:ILE:O	1:C:249:VAL:HG23	2.11	0.50
1:D:203:PHE:HE1	1:D:301:GLU:HB2	1.77	0.50
1:D:332:ILE:HG12	1:D:342:ASP:OD2	2.12	0.50
1:A:234:ILE:HA	1:A:235:TYR:CB	2.42	0.49
1:D:363:ILE:HG12	3:D:501:PB2:HCB	1.94	0.49
1:A:45:GLN:C	1:A:46:MET:HE2	2.38	0.49
1:B:125:ARG:NH2	1:B:435:ILE:O	2.37	0.49
1:C:262:ARG:NE	1:C:266:ASP:OD1	2.44	0.49
1:D:252:HIS:O	1:D:256:LEU:HB3	2.12	0.49
1:D:367:VAL:O	1:D:369:HIS:CD2	2.65	0.49
1:A:241:ILE:HG22	1:A:242:ASN:N	2.23	0.49
1:C:290:LEU:O	1:C:293:LEU:N	2.45	0.49
1:A:220:PHE:CE2	1:B:98:ARG:NH1	2.81	0.49
1:D:169:LEU:HD12	1:D:169:LEU:O	2.12	0.49
1:A:486:ILE:HD13	1:A:488:PHE:CZ	2.48	0.49
1:C:327:GLU:HG2	1:C:346:MET:HE3	1.94	0.49
1:A:134:ASP:O	1:A:134:ASP:OD1	2.30	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:133:ARG:HA	1:A:134:ASP:CB	2.28	0.49
1:C:245:ILE:CG2	1:C:289:ILE:HD13	2.43	0.49
1:C:314:MET:SD	1:C:450:PHE:CE1	3.06	0.49
1:D:153:LEU:HD11	1:D:170:LEU:HD21	1.93	0.49
1:D:237:ASN:O	1:D:238:LEU:C	2.52	0.49
1:C:245:ILE:HD13	1:C:289:ILE:CG2	2.43	0.48
1:D:238:LEU:O	1:D:241:ILE:HG12	2.12	0.48
1:C:203:PHE:HE1	1:C:301:GLU:HB2	1.78	0.48
1:D:233:GLN:C	1:D:235:TYR:N	2.68	0.48
1:A:262:ARG:HD3	1:A:266:ASP:OD2	2.14	0.48
1:B:153:LEU:CD1	1:B:170:LEU:HD21	2.44	0.48
1:B:262:ARG:CG	1:B:262:ARG:NH1	2.43	0.48
1:D:253:ARG:O	1:D:256:LEU:HD12	2.13	0.48
1:A:164:LEU:HG	1:A:487:ARG:HD3	1.96	0.48
1:A:209:ILE:HG12	1:B:207:SER:HB3	1.94	0.48
1:A:491:ARG:O	1:A:492:HIS:C	2.56	0.48
1:A:140:ARG:O	1:A:144:GLU:HG3	2.13	0.48
1:B:332:ILE:HG12	1:B:342:ASP:OD2	2.14	0.48
1:A:224:LEU:CD1	1:B:228:PRO:HG2	2.43	0.48
1:A:256:LEU:N	1:A:256:LEU:HD12	2.28	0.48
1:B:78:LEU:HD22	1:B:388:VAL:HG12	1.96	0.48
1:B:436:CYS:SG	2:B:500:HEM:NC	2.86	0.48
1:C:241:ILE:O	1:C:242:ASN:C	2.54	0.48
1:C:241:ILE:O	1:C:245:ILE:HG13	2.14	0.48
1:C:435:ILE:HG12	1:C:436:CYS:N	2.28	0.48
1:A:125:ARG:NH2	1:A:435:ILE:O	2.36	0.47
1:B:188:PHE:CD1	1:B:195:PHE:HD2	2.32	0.47
1:A:327:GLU:CB	4:A:9:HOH:O	2.61	0.47
1:A:195:PHE:CE1	1:A:199:LEU:HD22	2.49	0.47
1:A:256:LEU:HD23	1:A:266:ASP:HB3	1.97	0.47
1:B:132:MET:O	1:B:133:ARG:C	2.57	0.47
1:B:263:ASP:O	1:B:267:VAL:HG23	2.14	0.47
1:B:329:GLU:OE1	1:B:334:SER:HB2	2.15	0.47
1:B:463:VAL:CG1	1:B:467:ASP:HB2	2.44	0.47
1:C:192:ASP:OD1	1:C:192:ASP:C	2.57	0.47
2:D:500:HEM:HHA	2:D:500:HEM:CBA	2.43	0.47
1:B:125:ARG:HD2	1:B:437:LEU:CD1	2.44	0.47
1:D:45:GLN:O	4:D:11:HOH:O	2.20	0.47
1:A:238:LEU:O	1:A:238:LEU:CD2	2.30	0.47
1:A:262:ARG:NE	1:A:266:ASP:OD1	2.47	0.47
1:B:208:LEU:HG	1:B:209:ILE:N	2.28	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:367:VAL:O	1:B:369:HIS:CD2	2.67	0.47
1:B:484:TYR:C	1:B:484:TYR:CD2	2.93	0.47
1:C:125:ARG:HD2	1:C:437:LEU:CD1	2.43	0.47
1:C:195:PHE:CE1	1:C:199:LEU:HD22	2.49	0.47
1:A:227:PHE:CE1	1:B:70:LEU:HB3	2.49	0.47
1:B:445:GLU:O	1:B:449:PHE:HB2	2.15	0.47
1:C:314:MET:HE3	1:C:314:MET:HB2	1.66	0.47
1:D:195:PHE:CE1	1:D:199:LEU:HD22	2.50	0.47
1:D:262:ARG:NE	1:D:266:ASP:OD1	2.48	0.47
1:D:427:MET:CE	1:D:431:LEU:HD11	2.38	0.47
2:A:500:HEM:HH A	2:A:500:HEM:HBD2	1.93	0.47
1:B:171:PHE:CE2	1:B:307:LEU:HB3	2.49	0.47
1:B:429:PHE:O	1:B:430:SER:HB3	2.15	0.47
1:C:86:GLU:O	1:C:90:ASP:HB2	2.14	0.47
1:C:153:LEU:CD1	1:C:170:LEU:HD21	2.45	0.47
1:D:85:ARG:NH1	1:D:424:GLU:OE1	2.48	0.47
1:D:86:GLU:O	1:D:90:ASP:HB2	2.15	0.47
1:D:125:ARG:HD2	1:D:437:LEU:CD1	2.44	0.47
1:D:183:VAL:O	1:D:263:ASP:OD1	2.33	0.47
1:B:165:LEU:C	1:B:165:LEU:HD12	2.40	0.47
1:B:309:TYR:CE2	1:B:313:LEU:HD12	2.50	0.47
1:C:125:ARG:HA	1:C:437:LEU:HD11	1.95	0.47
1:C:183:VAL:HA	1:C:264:PHE:HB3	1.97	0.47
2:A:500:HEM:CHD	3:A:501:PB2:HAE	2.45	0.47
1:B:208:LEU:HD13	1:B:226:TYR:HB2	1.96	0.47
1:D:435:ILE:HG12	1:D:436:CYS:N	2.29	0.47
1:B:491:ARG:O	1:B:492:HIS:C	2.58	0.47
1:C:142:VAL:CG1	1:C:146:ILE:HD11	2.23	0.47
1:A:397:HIS:O	1:A:399:PRO:HD3	2.15	0.46
1:C:484:TYR:C	1:C:484:TYR:CD2	2.93	0.46
1:A:229:GLY:HA3	1:B:43:LEU:CD2	2.45	0.46
1:B:183:VAL:HA	1:B:264:PHE:HB3	1.98	0.46
1:B:183:VAL:O	1:B:265:ILE:HG12	2.15	0.46
1:A:165:LEU:HD12	1:A:165:LEU:C	2.39	0.46
1:B:125:ARG:HA	1:B:437:LEU:HD11	1.98	0.46
1:B:227:PHE:O	1:B:228:PRO:C	2.56	0.46
1:C:98:ARG:NH1	2:C:500:HEM:O2D	2.47	0.46
1:A:98:ARG:NH2	4:A:8:HOH:O	2.43	0.46
1:A:191:LYS:HA	1:A:196:LEU:HD21	1.97	0.46
1:A:342:ASP:O	1:A:346:MET:HG3	2.16	0.46
1:A:37:LEU:HD22	1:B:287:ASN:HB3	1.97	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:35:SER:HA	1:B:36:PRO:HD3	1.79	0.46
1:A:256:LEU:HB3	1:A:262:ARG:NH2	2.25	0.46
1:A:427:MET:N	1:A:428:PRO:CD	2.79	0.46
2:A:500:HEM:C4C	3:A:501:PB2:HAE	2.50	0.46
1:D:125:ARG:HA	1:D:437:LEU:HD11	1.97	0.46
1:C:397:HIS:O	1:C:399:PRO:HD3	2.16	0.46
1:D:111:TYR:HA	1:D:114:ILE:HG13	1.97	0.46
1:A:169:LEU:HD12	1:A:169:LEU:O	2.16	0.46
1:A:203:PHE:HE1	1:A:301:GLU:HB2	1.81	0.46
1:B:434:ARG:HG2	2:B:500:HEM:O2D	2.16	0.46
1:B:463:VAL:HA	1:B:464:PRO:HD3	1.81	0.46
1:C:146:ILE:HD13	1:C:444:THR:HG22	1.98	0.46
1:C:256:LEU:HD13	1:C:257:ASP:N	2.24	0.46
1:C:429:PHE:O	1:C:430:SER:HB3	2.15	0.46
1:A:147:GLN:NE2	1:A:338:PRO:O	2.48	0.46
1:B:243:THR:O	1:B:247:GLN:HG3	2.17	0.46
1:B:382:ILE:HA	1:B:383:PRO:HD3	1.74	0.46
1:C:256:LEU:HD21	1:C:270:LEU:HD11	1.98	0.46
1:C:311:PHE:HA	1:C:314:MET:CE	2.45	0.46
1:C:427:MET:N	1:C:428:PRO:CD	2.79	0.45
1:A:111:TYR:HA	1:A:114:ILE:HG13	1.99	0.45
1:B:269:LEU:HD23	1:B:269:LEU:HA	1.70	0.45
1:B:435:ILE:HG12	1:B:436:CYS:N	2.31	0.45
1:D:97:GLY:C	1:D:370:THR:HB	2.41	0.45
1:D:232:ARG:CD	1:D:232:ARG:N	2.78	0.45
1:B:36:PRO:HG3	1:B:69:TYR:CE1	2.51	0.45
2:B:500:HEM:NC	2:B:500:HEM:ND	2.63	0.45
1:D:443:ARG:HE	1:D:443:ARG:HB3	1.64	0.45
1:A:101:ILE:HD11	1:B:224:LEU:HD22	1.98	0.45
1:C:201:LEU:HD12	1:C:201:LEU:O	2.16	0.45
1:C:363:ILE:CD1	3:C:501:PB2:HCB	2.46	0.45
1:B:248:SER:OG	1:B:252:HIS:CE1	2.69	0.45
1:C:125:ARG:NH2	1:C:435:ILE:O	2.35	0.45
1:D:251:LYS:O	1:D:255:THR:HG23	2.16	0.45
1:D:354:HIS:HE1	1:D:443:ARG:HH12	1.62	0.45
1:B:208:LEU:HD13	1:B:226:TYR:CB	2.47	0.45
1:D:262:ARG:H	1:D:262:ARG:HD2	1.66	0.45
1:A:125:ARG:HA	1:A:437:LEU:HD11	1.99	0.45
2:A:500:HEM:HHC	2:A:500:HEM:HBB2	1.98	0.45
1:C:256:LEU:HD21	1:C:270:LEU:CD1	2.47	0.45
1:C:438:GLY:O	1:C:439:GLU:C	2.59	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:484:TYR:C	1:D:484:TYR:CD2	2.94	0.45
1:A:148:GLU:O	1:A:151:ARG:HB3	2.17	0.45
1:C:35:SER:HA	1:C:36:PRO:HD3	1.77	0.45
1:C:165:LEU:HD12	1:C:165:LEU:C	2.41	0.45
1:C:256:LEU:HD22	1:C:257:ASP:N	2.32	0.45
1:C:373:LYS:O	1:C:374:ASP:C	2.59	0.45
1:B:120:ARG:O	1:B:123:ALA:HB3	2.17	0.45
1:C:153:LEU:HD11	1:C:170:LEU:HD21	1.98	0.44
1:C:171:PHE:CE2	1:C:307:LEU:HB3	2.52	0.44
1:C:463:VAL:HA	1:C:464:PRO:HD3	1.82	0.44
1:D:463:VAL:HA	1:D:464:PRO:HD3	1.83	0.44
1:A:192:ASP:O	1:A:193:PRO:C	2.61	0.44
1:B:143:GLU:CD	1:B:340:LEU:CB	2.90	0.44
1:C:183:VAL:O	1:C:265:ILE:HG12	2.17	0.44
1:D:31:PRO:HA	1:D:32:PRO:HD2	1.82	0.44
1:D:106:PRO:O	1:D:110:GLY:N	2.46	0.44
1:D:296:PHE:CD1	2:D:500:HEM:CBC	3.00	0.44
1:C:204:GLN:CG	1:C:234:ILE:CB	2.93	0.44
1:C:245:ILE:O	1:C:246:GLY:C	2.60	0.44
1:A:402:PHE:O	1:A:403:GLU:C	2.60	0.44
1:B:285:HIS:O	1:B:286:GLN:C	2.59	0.44
1:C:486:ILE:HD13	1:C:488:PHE:CZ	2.53	0.44
1:A:224:LEU:CD1	1:B:228:PRO:CD	2.96	0.44
1:A:231:HIS:HB3	1:A:234:ILE:CG2	2.47	0.44
2:A:500:HEM:HBD2	2:A:500:HEM:CHA	2.47	0.44
1:B:78:LEU:HD12	1:B:78:LEU:HA	1.77	0.44
1:B:147:GLN:HG3	1:B:448:LEU:HD13	2.00	0.44
1:C:402:PHE:O	1:C:403:GLU:C	2.60	0.44
1:D:165:LEU:C	1:D:165:LEU:HD12	2.43	0.44
1:D:228:PRO:O	1:D:228:PRO:CG	2.65	0.44
1:D:272:MET:HB3	1:D:272:MET:HE3	1.51	0.44
1:A:85:ARG:O	1:A:89:VAL:HB	2.17	0.44
1:A:241:ILE:C	1:A:243:THR:N	2.72	0.44
2:B:500:HEM:CMB	2:B:500:HEM:CBB	2.73	0.44
1:C:111:TYR:HA	1:C:114:ILE:HG13	2.00	0.44
1:D:188:PHE:CD1	1:D:195:PHE:HD2	2.36	0.44
1:A:470:LEU:HD23	1:A:470:LEU:HA	1.58	0.44
1:B:143:GLU:CD	1:B:340:LEU:HB2	2.41	0.44
1:B:290:LEU:O	1:B:290:LEU:HD22	2.14	0.44
1:B:480:VAL:HA	1:B:481:PRO:HD3	1.78	0.44
1:C:290:LEU:O	1:C:291:THR:C	2.61	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:233:GLN:O	1:D:235:TYR:N	2.51	0.44
1:A:78:LEU:HD22	1:A:388:VAL:HG12	2.00	0.44
3:A:501:PB2:CCE	1:B:217:PHE:CD1	3.00	0.44
1:B:227:PHE:HB3	1:B:230:THR:HG22	1.98	0.44
1:D:142:VAL:O	1:D:143:GLU:C	2.60	0.44
1:D:269:LEU:HA	1:D:269:LEU:HD23	1.73	0.44
1:A:212:PHE:O	1:A:216:VAL:HG23	2.18	0.43
1:A:429:PHE:O	1:A:430:SER:HB3	2.18	0.43
1:B:59:ARG:HD2	1:B:79:CYS:HB3	2.00	0.43
1:B:354:HIS:CE1	1:B:443:ARG:NH1	2.85	0.43
1:B:438:GLY:O	1:B:439:GLU:C	2.60	0.43
1:D:127:PHE:O	1:D:131:THR:HG23	2.18	0.43
1:A:52:LEU:HD12	1:A:52:LEU:HA	1.92	0.43
1:B:192:ASP:O	1:B:196:LEU:HD22	2.19	0.43
1:D:153:LEU:CD1	1:D:170:LEU:HD21	2.48	0.43
1:C:31:PRO:HA	1:C:32:PRO:HD2	1.81	0.43
1:D:382:ILE:HA	1:D:383:PRO:HD3	1.74	0.43
1:A:36:PRO:HG3	1:A:69:TYR:CE1	2.52	0.43
1:B:429:PHE:O	1:B:430:SER:CB	2.66	0.43
1:D:127:PHE:CZ	1:D:264:PHE:HB2	2.53	0.43
1:A:171:PHE:CE2	1:A:307:LEU:HB3	2.53	0.43
1:B:238:LEU:HD23	1:B:239:GLN:HA	2.00	0.43
1:C:261:PRO:O	1:C:261:PRO:HG2	2.18	0.43
1:D:430:SER:HB2	2:D:500:HEM:HAA2	2.00	0.43
1:A:152:CYS:O	1:A:153:LEU:C	2.61	0.43
2:A:500:HEM:CBD	2:A:500:HEM:CHA	2.84	0.43
1:C:290:LEU:HD23	1:C:290:LEU:HA	1.74	0.43
1:D:70:LEU:N	1:D:70:LEU:HD23	2.34	0.43
1:B:391:VAL:O	1:B:392:LEU:C	2.61	0.43
1:D:228:PRO:O	1:D:228:PRO:HG2	2.19	0.43
1:A:481:PRO:HA	1:A:482:PRO:HD2	1.83	0.43
1:C:354:HIS:HE1	1:C:443:ARG:HH12	1.66	0.43
1:A:141:SER:O	1:A:145:ARG:HG3	2.19	0.43
1:A:436:CYS:SG	1:A:438:GLY:N	2.91	0.43
1:D:244:PHE:CD2	1:D:244:PHE:C	2.97	0.43
1:D:245:ILE:O	1:D:246:GLY:C	2.61	0.43
1:A:441:ILE:H	1:A:441:ILE:HG13	1.70	0.43
1:B:171:PHE:CD2	1:B:307:LEU:HB3	2.54	0.43
1:C:429:PHE:O	1:C:430:SER:CB	2.67	0.43
1:D:82:ASP:O	1:D:86:GLU:HG3	2.19	0.43
1:D:156:GLU:HG3	1:D:190:TYR:CE2	2.54	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:481:PRO:HA	1:D:482:PRO:HD3	1.92	0.43
1:C:287:ASN:N	1:C:287:ASN:ND2	2.66	0.42
1:C:487:ARG:NH2	4:C:504:HOH:O	2.30	0.42
1:D:166:ASP:OD1	1:D:166:ASP:C	2.62	0.42
1:D:257:ASP:O	1:D:260:ASN:O	2.37	0.42
1:D:367:VAL:O	1:D:369:HIS:HD2	2.01	0.42
1:A:162:GLY:O	1:A:487:ARG:CD	2.67	0.42
1:A:183:VAL:HA	1:A:264:PHE:HB3	2.01	0.42
1:A:188:PHE:HB2	1:A:195:PHE:CD2	2.54	0.42
1:C:141:SER:O	1:C:143:GLU:N	2.51	0.42
1:C:382:ILE:HA	1:C:383:PRO:HD3	1.73	0.42
2:C:500:HEM:C1B	3:C:501:PB2:HAC	2.53	0.42
1:A:199:LEU:HD12	1:A:199:LEU:HA	1.94	0.42
1:B:111:TYR:CD2	1:B:111:TYR:N	2.87	0.42
1:C:82:ASP:O	1:C:86:GLU:HG3	2.20	0.42
1:D:375:THR:CG2	1:D:376:GLN:N	2.83	0.42
1:A:30:LEU:HD13	1:B:108:PHE:CD1	2.55	0.42
1:A:258:PRO:CB	1:A:259:SER:HA	2.50	0.42
1:A:451:THR:O	1:A:452:THR:C	2.62	0.42
1:D:171:PHE:CE2	1:D:307:LEU:HB3	2.53	0.42
1:D:412:HIS:O	1:D:421:LYS:HE3	2.20	0.42
1:A:38:PRO:C	1:A:40:LEU:H	2.28	0.42
1:A:269:LEU:HD23	1:A:269:LEU:HA	1.69	0.42
1:A:293:LEU:O	1:A:297:PHE:HD2	2.03	0.42
1:B:145:ARG:NH1	1:B:181:SER:OG	2.52	0.42
1:B:311:PHE:HA	1:B:314:MET:CE	2.49	0.42
1:C:284:HIS:ND1	1:C:284:HIS:C	2.77	0.42
1:C:342:ASP:O	1:C:346:MET:HG3	2.19	0.42
1:D:192:ASP:O	1:D:196:LEU:HD22	2.19	0.42
1:D:261:PRO:O	1:D:261:PRO:CG	2.64	0.42
1:A:228:PRO:O	1:B:43:LEU:HD21	2.19	0.42
1:D:106:PRO:O	1:D:107:ILE:C	2.62	0.42
1:B:111:TYR:HA	1:B:114:ILE:HG13	2.01	0.42
1:B:427:MET:N	1:B:428:PRO:CD	2.83	0.42
1:D:285:HIS:C	1:D:287:ASN:N	2.73	0.42
1:A:363:ILE:HD12	2:A:500:HEM:HMB1	2.02	0.42
1:C:162:GLY:O	1:C:487:ARG:CD	2.68	0.42
1:A:183:VAL:O	1:A:265:ILE:HG12	2.20	0.42
1:B:245:ILE:O	1:B:246:GLY:C	2.63	0.42
1:B:354:HIS:HE1	1:B:443:ARG:HH12	1.65	0.42
1:C:36:PRO:HG3	1:C:69:TYR:CE1	2.55	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:52:LEU:HD12	1:C:52:LEU:HA	1.89	0.42
1:D:438:GLY:O	1:D:439:GLU:C	2.62	0.42
1:A:31:PRO:HA	1:A:32:PRO:HD2	1.85	0.42
1:A:69:TYR:OH	1:B:108:PHE:HB3	2.20	0.42
1:A:201:LEU:HD12	1:A:201:LEU:O	2.20	0.42
1:C:156:GLU:HG3	1:C:190:TYR:CE2	2.54	0.42
1:C:349:THR:O	1:C:353:ILE:HG13	2.20	0.42
1:D:354:HIS:CE1	1:D:443:ARG:NH1	2.87	0.42
1:A:120:ARG:O	1:A:123:ALA:HB3	2.20	0.41
1:B:402:PHE:O	1:B:403:GLU:C	2.62	0.41
1:D:297:PHE:HA	1:D:300:THR:OG1	2.19	0.41
1:D:349:THR:O	1:D:353:ILE:HG13	2.20	0.41
1:A:153:LEU:HD11	1:A:170:LEU:HD21	2.01	0.41
1:C:78:LEU:HD12	1:C:78:LEU:HA	1.84	0.41
2:D:500:HEM:HHA	2:D:500:HEM:CBD	2.50	0.41
1:A:373:LYS:O	1:A:374:ASP:C	2.63	0.41
1:A:429:PHE:O	1:A:430:SER:CB	2.68	0.41
1:B:157:LEU:HD23	1:B:157:LEU:HA	1.87	0.41
1:B:239:GLN:NE2	1:B:239:GLN:H	2.11	0.41
1:B:257:ASP:CG	1:B:258:PRO:N	2.77	0.41
1:D:59:ARG:HD2	1:D:79:CYS:HB3	2.02	0.41
1:D:120:ARG:O	1:D:123:ALA:HB3	2.21	0.41
1:D:244:PHE:O	1:D:244:PHE:CD2	2.74	0.41
1:D:266:ASP:C	1:D:268:TYR:N	2.73	0.41
1:C:269:LEU:HA	1:C:269:LEU:HD23	1.74	0.41
1:D:175:THR:HA	1:D:445:GLU:OE1	2.21	0.41
1:D:309:TYR:HE2	1:D:313:LEU:HD12	1.84	0.41
1:A:108:PHE:CD1	1:B:30:LEU:HD13	2.55	0.41
1:A:437:LEU:HB3	2:A:500:HEM:CMD	2.51	0.41
1:B:203:PHE:CD1	1:B:301:GLU:HG3	2.56	0.41
1:D:199:LEU:HD12	1:D:199:LEU:HA	1.97	0.41
1:A:82:ASP:O	1:A:86:GLU:HG3	2.21	0.41
1:A:226:TYR:CE2	1:B:226:TYR:CE2	3.09	0.41
1:A:229:GLY:C	1:A:231:HIS:H	2.28	0.41
1:A:402:PHE:CE2	1:A:423:ASN:ND2	2.88	0.41
1:B:59:ARG:NH2	4:B:18:HOH:O	2.53	0.41
1:C:372:THR:O	1:C:384:LYS:HD2	2.20	0.41
1:D:85:ARG:O	1:D:89:VAL:HB	2.21	0.41
1:D:157:LEU:HD23	1:D:157:LEU:HA	1.94	0.41
1:A:53:ARG:HH21	1:C:466:GLU:CB	2.33	0.41
1:A:148:GLU:OE2	1:A:151:ARG:NH2	2.30	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:309:TYR:CE2	1:A:313:LEU:HD12	2.56	0.41
1:D:241:ILE:HD13	1:D:241:ILE:H	1.75	0.41
1:D:269:LEU:HD23	1:D:272:MET:HE2	2.02	0.41
1:A:78:LEU:HD12	1:A:78:LEU:HA	1.85	0.41
1:A:145:ARG:O	1:A:146:ILE:C	2.59	0.41
1:A:288:LEU:HD13	1:A:288:LEU:HA	1.90	0.41
1:A:442:ALA:HB2	2:A:500:HEM:HMC2	2.02	0.41
3:A:496:PB2:CAE	2:B:500:HEM:ND	2.83	0.41
1:B:162:GLY:O	1:B:487:ARG:CD	2.69	0.41
1:B:288:LEU:HD13	1:B:288:LEU:HA	1.71	0.41
1:B:297:PHE:HA	1:B:300:THR:OG1	2.21	0.41
1:C:199:LEU:HD12	1:C:199:LEU:HA	1.93	0.41
1:C:201:LEU:HD12	1:C:201:LEU:C	2.46	0.41
1:C:257:ASP:O	1:C:260:ASN:O	2.39	0.41
1:C:354:HIS:CE1	1:C:443:ARG:NH1	2.89	0.41
1:D:207:SER:O	1:D:208:LEU:HD12	2.21	0.41
3:D:501:PB2:HDF	3:D:501:PB2:HCE	1.84	0.41
1:B:106:PRO:O	1:B:110:GLY:N	2.47	0.41
1:B:255:THR:HG1	1:B:262:ARG:HH22	1.68	0.41
1:C:142:VAL:HG21	1:C:441:ILE:HG23	2.03	0.41
1:D:402:PHE:O	1:D:403:GLU:C	2.64	0.41
1:A:125:ARG:HD2	1:A:437:LEU:HD13	2.03	0.40
1:A:224:LEU:HD22	1:B:101:ILE:HD11	2.03	0.40
1:B:257:ASP:C	1:B:260:ASN:CB	2.93	0.40
1:B:373:LYS:O	1:B:374:ASP:C	2.62	0.40
1:C:237:ASN:O	1:C:238:LEU:C	2.57	0.40
1:D:98:ARG:NH1	2:D:500:HEM:O2D	2.52	0.40
1:D:397:HIS:O	1:D:399:PRO:HD3	2.21	0.40
1:D:427:MET:N	1:D:428:PRO:CD	2.83	0.40
1:B:188:PHE:HB2	1:B:195:PHE:CD2	2.55	0.40
1:C:327:GLU:HG2	1:C:346:MET:CE	2.51	0.40
1:D:85:ARG:HE	1:D:85:ARG:HB2	1.64	0.40
1:A:375:THR:CG2	1:A:376:GLN:N	2.84	0.40
1:B:199:LEU:HD12	1:B:199:LEU:HA	1.95	0.40
1:D:39:VAL:O	1:D:71:GLY:HA2	2.21	0.40
1:A:384:LYS:O	1:A:385:ASN:CB	2.68	0.40
1:B:316:LYS:HD3	1:B:317:TYR:CE1	2.57	0.40
1:B:319:HIS:CD2	1:B:319:HIS:H	2.39	0.40
1:B:375:THR:CG2	1:B:376:GLN:N	2.84	0.40
1:A:30:LEU:HD13	1:B:108:PHE:CE1	2.56	0.40
1:C:264:PHE:CD1	1:C:264:PHE:C	3.00	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:367:VAL:O	1:C:369:HIS:CD2	2.74	0.40
1:D:69:TYR:C	1:D:70:LEU:HD23	2.47	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	448/476 (94%)	420 (94%)	23 (5%)	5 (1%)	11	43
1	B	434/476 (91%)	408 (94%)	24 (6%)	2 (0%)	24	59
1	C	434/476 (91%)	406 (94%)	26 (6%)	2 (0%)	24	59
1	D	432/476 (91%)	403 (93%)	24 (6%)	5 (1%)	10	42
All	All	1748/1904 (92%)	1637 (94%)	97 (6%)	14 (1%)	16	50

All (14) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	134	ASP
1	D	233	GLN
1	D	286	GLN
1	B	258	PRO
1	C	142	VAL
1	D	258	PRO
1	D	430	SER
1	A	261	PRO
1	B	260	ASN
1	A	472	PRO
1	C	258	PRO
1	D	142	VAL
1	A	193	PRO

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Mol	Chain	Res	Type
1	A	138	GLY

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	355/421 (84%)	317 (89%)	38 (11%)	6	27
1	B	340/421 (81%)	303 (89%)	37 (11%)	6	26
1	C	344/421 (82%)	311 (90%)	33 (10%)	8	32
1	D	335/421 (80%)	295 (88%)	40 (12%)	5	23
All	All	1374/1684 (82%)	1226 (89%)	148 (11%)	6	27

All (148) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	43	LEU
1	A	47	ASP
1	A	61	LYS
1	A	68	VAL
1	A	75	VAL
1	A	78	LEU
1	A	104	VAL
1	A	109	GLN
1	A	113	VAL
1	A	114	ILE
1	A	127	PHE
1	A	132	MET
1	A	148	GLU
1	A	164	LEU
1	A	187	ARG
1	A	196	LEU
1	A	210	SER
1	A	221	SER
1	A	224	LEU
1	A	226	TYR

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Mol	Chain	Res	Type
1	A	234	ILE
1	A	238	LEU
1	A	241	ILE
1	A	255	THR
1	A	256	LEU
1	A	262	ARG
1	A	266	ASP
1	A	290	LEU
1	A	295	LEU
1	A	300	THR
1	A	301	GLU
1	A	334	SER
1	A	370	THR
1	A	407	THR
1	A	420	LEU
1	A	431	LEU
1	A	435	ILE
1	A	486	ILE
1	B	35	SER
1	B	43	LEU
1	B	47	ASP
1	B	61	LYS
1	B	75	VAL
1	B	78	LEU
1	B	101	ILE
1	B	104	VAL
1	B	113	VAL
1	B	114	ILE
1	B	127	PHE
1	B	148	GLU
1	B	196	LEU
1	B	208	LEU
1	B	210	SER
1	B	221	SER
1	B	224	LEU
1	B	226	TYR
1	B	238	LEU
1	B	239	GLN
1	B	256	LEU
1	B	257	ASP
1	B	262	ARG
1	B	287	ASN

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Mol	Chain	Res	Type
1	B	288	LEU
1	B	290	LEU
1	B	292	VAL
1	B	300	THR
1	B	301	GLU
1	B	334	SER
1	B	370	THR
1	B	407	THR
1	B	420	LEU
1	B	431	LEU
1	B	435	ILE
1	B	479	ASN
1	B	486	ILE
1	C	35	SER
1	C	43	LEU
1	C	47	ASP
1	C	75	VAL
1	C	78	LEU
1	C	104	VAL
1	C	113	VAL
1	C	114	ILE
1	C	127	PHE
1	C	141	SER
1	C	158	ARG
1	C	196	LEU
1	C	210	SER
1	C	221	SER
1	C	224	LEU
1	C	228	PRO
1	C	237	ASN
1	C	241	ILE
1	C	256	LEU
1	C	257	ASP
1	C	262	ARG
1	C	288	LEU
1	C	289	ILE
1	C	290	LEU
1	C	295	LEU
1	C	300	THR
1	C	301	GLU
1	C	334	SER
1	C	370	THR

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Mol	Chain	Res	Type
1	C	420	LEU
1	C	431	LEU
1	C	435	ILE
1	C	486	ILE
1	D	35	SER
1	D	43	LEU
1	D	47	ASP
1	D	68	VAL
1	D	75	VAL
1	D	78	LEU
1	D	85	ARG
1	D	104	VAL
1	D	113	VAL
1	D	114	ILE
1	D	127	PHE
1	D	142	VAL
1	D	148	GLU
1	D	158	ARG
1	D	196	LEU
1	D	210	SER
1	D	221	SER
1	D	224	LEU
1	D	226	TYR
1	D	232	ARG
1	D	241	ILE
1	D	250	GLU
1	D	255	THR
1	D	256	LEU
1	D	262	ARG
1	D	264	PHE
1	D	265	ILE
1	D	266	ASP
1	D	272	MET
1	D	288	LEU
1	D	290	LEU
1	D	295	LEU
1	D	300	THR
1	D	301	GLU
1	D	334	SER
1	D	370	THR
1	D	407	THR
1	D	420	LEU

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Mol	Chain	Res	Type
1	D	435	ILE
1	D	486	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (22) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	231	HIS
1	A	247	GLN
1	A	287	ASN
1	A	319	HIS
1	A	354	HIS
1	A	406	ASN
1	B	239	GLN
1	B	247	GLN
1	B	319	HIS
1	B	354	HIS
1	B	406	ASN
1	C	109	GLN
1	C	287	ASN
1	C	354	HIS
1	C	406	ASN
1	D	109	GLN
1	D	247	GLN
1	D	319	HIS
1	D	335	HIS
1	D	354	HIS
1	D	357	GLN
1	D	406	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry

8 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	D	500	1,3	50,50,50	1.85	9 (18%)	67,82,82	1.82	20 (29%)
3	PB2	A	501	2	20,20,20	2.11	7 (35%)	26,26,26	1.21	1 (3%)
3	PB2	C	501	2	20,20,20	2.22	7 (35%)	26,26,26	0.92	0
2	HEM	B	500	1,3	50,50,50	3.08	19 (38%)	67,82,82	2.20	30 (44%)
2	HEM	C	500	1,3	50,50,50	2.65	18 (36%)	67,82,82	2.14	26 (38%)
3	PB2	D	501	2	20,20,20	2.19	6 (30%)	26,26,26	1.27	4 (15%)
2	HEM	A	500	1,3	50,50,50	2.27	17 (34%)	67,82,82	2.08	28 (41%)
3	PB2	A	496	2	20,20,20	2.01	7 (35%)	26,26,26	1.41	5 (19%)

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	D	500	1,3	-	9/14/54/54	-
3	PB2	A	501	2	-	0/8/8/8	0/3/3/3
3	PB2	C	501	2	-	0/8/8/8	0/3/3/3
2	HEM	B	500	1,3	-	5/14/54/54	-
2	HEM	C	500	1,3	-	10/14/54/54	-
3	PB2	D	501	2	-	0/8/8/8	0/3/3/3
2	HEM	A	500	1,3	-	8/14/54/54	-
3	PB2	A	496	2	-	0/8/8/8	0/3/3/3

All (90) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	500	HEM	FE-NC	-11.80	1.56	1.95

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	500	HEM	FE-NB	-10.20	1.63	1.94
2	C	500	HEM	FE-ND	-9.19	1.66	1.94
2	D	500	HEM	C3D-C2D	7.30	1.52	1.36
2	A	500	HEM	FE-NC	-7.18	1.71	1.95
2	C	500	HEM	C3D-C2D	6.03	1.49	1.36
2	B	500	HEM	C3D-C2D	6.00	1.49	1.36
2	C	500	HEM	FE-NB	5.65	2.12	1.94
2	A	500	HEM	C3D-C2D	5.63	1.48	1.36
2	B	500	HEM	C3C-C2C	-5.02	1.27	1.37
2	D	500	HEM	FE-NA	4.96	2.11	1.95
2	A	500	HEM	C3B-C2B	-4.94	1.27	1.37
3	C	501	PB2	CCC-CCD	4.69	1.48	1.39
2	C	500	HEM	C2A-C3A	-4.67	1.26	1.38
3	D	501	PB2	CDB-CDA	4.65	1.48	1.39
3	C	501	PB2	CDB-CDA	4.54	1.48	1.39
2	A	500	HEM	C3C-C2C	-4.45	1.28	1.37
3	A	501	PB2	CCC-CCD	4.42	1.48	1.39
3	D	501	PB2	CCC-CCD	4.37	1.48	1.39
3	A	501	PB2	CDB-CDA	4.35	1.48	1.39
2	C	500	HEM	FE-NC	-4.19	1.81	1.95
2	C	500	HEM	C3B-C2B	-4.17	1.28	1.37
2	B	500	HEM	C3B-C2B	-4.15	1.28	1.37
2	A	500	HEM	C2A-C3A	-4.08	1.28	1.38
3	A	496	PB2	CDB-CDA	4.07	1.47	1.39
2	C	500	HEM	FE-NA	-3.94	1.82	1.95
2	C	500	HEM	CHB-C1B	-3.84	1.30	1.38
2	B	500	HEM	C2A-C3A	-3.81	1.29	1.38
3	A	496	PB2	CCC-CCD	3.80	1.47	1.39
2	A	500	HEM	CHB-C4A	-3.70	1.31	1.39
2	C	500	HEM	C3C-C2C	-3.66	1.29	1.37
2	C	500	HEM	CHB-C4A	-3.57	1.31	1.39
2	B	500	HEM	CHB-C4A	-3.55	1.31	1.39
3	D	501	PB2	CAC-NAB	3.39	1.43	1.35
2	B	500	HEM	CHC-C1C	-3.36	1.31	1.38
2	D	500	HEM	FE-NB	3.32	2.05	1.94
3	C	501	PB2	CAC-NAB	3.25	1.43	1.35
2	C	500	HEM	CHA-C1A	-3.19	1.32	1.39
2	D	500	HEM	CAB-C3B	3.18	1.55	1.47
2	B	500	HEM	CHC-C4B	-3.17	1.32	1.39
2	C	500	HEM	CHA-C4D	-3.14	1.32	1.38
2	D	500	HEM	FE-ND	3.13	2.04	1.94
2	B	500	HEM	FE-NA	3.12	2.05	1.95

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	500	HEM	CHB-C1B	-3.08	1.32	1.38
2	A	500	HEM	CHD-C4C	-3.08	1.32	1.38
2	B	500	HEM	CHD-C4C	-3.06	1.32	1.38
2	B	500	HEM	FE-ND	3.04	2.04	1.94
2	A	500	HEM	FE-ND	-2.98	1.85	1.94
3	A	501	PB2	CAC-NAB	2.97	1.42	1.35
2	B	500	HEM	CHB-C1B	-2.96	1.32	1.38
3	C	501	PB2	CCF-CCA	2.92	1.44	1.38
2	D	500	HEM	CAC-C3C	2.91	1.55	1.47
3	A	496	PB2	CAC-NAB	2.85	1.42	1.35
2	A	500	HEM	C3C-C4C	-2.77	1.41	1.46
3	D	501	PB2	CDE-CDD	2.70	1.44	1.38
2	B	500	HEM	CHA-C4D	-2.67	1.33	1.38
3	C	501	PB2	CAF-CAE	2.60	1.41	1.35
3	D	501	PB2	CAF-CAE	2.51	1.41	1.35
2	B	500	HEM	CHD-C1D	-2.50	1.33	1.39
3	A	496	PB2	CAF-NAB	-2.49	1.31	1.37
3	A	496	PB2	CDE-CDD	2.49	1.43	1.38
3	A	501	PB2	CDE-CDD	2.49	1.43	1.38
3	A	501	PB2	CAF-NAB	-2.48	1.31	1.37
2	A	500	HEM	CHA-C4D	-2.45	1.33	1.38
2	A	500	HEM	O2A-CGA	-2.37	1.23	1.30
3	A	496	PB2	CCF-CCA	2.35	1.43	1.38
2	C	500	HEM	O2A-CGA	-2.34	1.23	1.30
2	A	500	HEM	O2D-CGD	-2.32	1.23	1.30
2	C	500	HEM	O2D-CGD	-2.32	1.23	1.30
2	D	500	HEM	C3C-C2C	-2.28	1.32	1.37
2	C	500	HEM	CHD-C4C	-2.28	1.33	1.38
2	C	500	HEM	CAB-C3B	2.28	1.53	1.47
2	A	500	HEM	CHD-C1D	-2.27	1.34	1.39
3	A	501	PB2	CCF-CCA	2.27	1.43	1.38
2	D	500	HEM	C2A-C3A	-2.24	1.33	1.38
3	A	501	PB2	CAF-CAE	2.23	1.40	1.35
2	A	500	HEM	CHC-C4B	-2.21	1.34	1.39
2	B	500	HEM	C3C-C4C	-2.20	1.42	1.46
2	B	500	HEM	O2D-CGD	-2.20	1.23	1.30
2	D	500	HEM	C3B-C2B	-2.19	1.32	1.37
3	C	501	PB2	CAF-NAB	-2.16	1.32	1.37
3	A	496	PB2	CAF-CAE	2.13	1.40	1.35
2	C	500	HEM	C1B-C2B	-2.13	1.40	1.44
3	C	501	PB2	CDE-CDD	2.09	1.42	1.38
2	A	500	HEM	CHA-C1A	-2.08	1.34	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	500	HEM	CAB-C3B	2.07	1.52	1.47
2	B	500	HEM	CHA-C1A	-2.05	1.34	1.39
2	C	500	HEM	C1B-NB	-2.04	1.36	1.40
2	B	500	HEM	O2A-CGA	-2.03	1.24	1.30
3	D	501	PB2	CCF-CCA	2.00	1.42	1.38

All (114) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	500	HEM	C4D-ND-C1D	5.15	111.30	105.21
2	C	500	HEM	C3D-C4D-ND	4.99	115.65	110.17
2	B	500	HEM	C3B-C4B-NB	4.85	112.95	109.47
2	B	500	HEM	C1C-CHC-C4B	-4.71	116.02	126.02
2	B	500	HEM	CAA-CBA-CGA	-4.67	101.29	113.67
2	C	500	HEM	C4A-NA-C1A	-4.37	98.69	105.82
2	D	500	HEM	CAD-C3D-C4D	4.36	132.29	124.70
2	A	500	HEM	C1C-CHC-C4B	-4.16	117.18	126.02
2	B	500	HEM	C1B-NB-C4B	-4.12	100.33	105.21
2	A	500	HEM	CHD-C4C-NC	3.87	128.66	124.45
2	B	500	HEM	C4C-NC-C1C	-3.84	99.56	105.82
2	A	500	HEM	CAD-C3D-C4D	3.83	131.37	124.70
2	C	500	HEM	CHA-C4D-C3D	-3.75	118.32	125.23
2	C	500	HEM	C2A-C1A-NA	3.60	114.15	110.15
2	A	500	HEM	C1B-NB-C4B	-3.57	100.97	105.21
2	A	500	HEM	CHD-C4C-C3C	-3.50	119.30	125.21
2	C	500	HEM	CHC-C1C-NC	3.47	128.23	124.45
2	A	500	HEM	C4A-NA-C1A	-3.46	100.18	105.82
2	B	500	HEM	C2D-C1D-ND	3.45	113.89	109.90
2	A	500	HEM	CHB-C1B-NB	3.35	128.51	124.37
2	C	500	HEM	CHB-C4A-C3A	-3.33	117.77	127.43
2	D	500	HEM	CHB-C1B-NB	3.32	128.47	124.37
2	C	500	HEM	C1A-CHA-C4D	-3.32	118.44	126.25
2	A	500	HEM	CAB-C3B-C2B	-3.31	117.66	128.43
2	B	500	HEM	CHD-C4C-C3C	-3.31	119.62	125.21
2	B	500	HEM	C4A-NA-C1A	-3.30	100.44	105.82
2	D	500	HEM	CAA-C2A-C1A	3.27	131.32	124.94
2	D	500	HEM	CAD-C3D-C2D	-3.24	121.80	127.87
2	B	500	HEM	CAD-CBD-CGD	-3.23	105.10	113.67
2	C	500	HEM	CAA-CBA-CGA	-3.22	105.12	113.67
2	C	500	HEM	C2B-C1B-NB	3.18	113.50	109.84
2	B	500	HEM	C2B-C1B-NB	3.17	113.49	109.84
2	A	500	HEM	C3D-C4D-ND	3.17	113.65	110.17

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	500	HEM	CAA-CBA-CGA	-3.14	105.33	113.67
2	C	500	HEM	C1B-NB-C4B	-3.11	101.52	105.21
2	A	500	HEM	C1A-CHA-C4D	-3.08	119.00	126.25
2	C	500	HEM	C4A-CHB-C1B	-3.04	119.10	126.25
2	D	500	HEM	CAA-C2A-C3A	-2.95	120.45	127.07
2	B	500	HEM	CHD-C1D-C2D	-2.94	120.38	125.03
2	A	500	HEM	CHB-C1B-C2B	-2.92	118.66	126.95
2	C	500	HEM	CAD-C3D-C4D	2.89	129.74	124.70
2	B	500	HEM	C3D-C4D-ND	2.89	113.34	110.17
2	C	500	HEM	CHC-C4B-NB	-2.89	121.31	124.42
2	C	500	HEM	C1C-CHC-C4B	-2.88	119.91	126.02
2	D	500	HEM	CHD-C1D-ND	2.86	127.50	124.42
3	A	496	PB2	CCB-CCC-CCD	-2.78	117.55	121.12
2	D	500	HEM	O1A-CGA-CBA	-2.77	114.31	123.09
2	B	500	HEM	CMC-C2C-C1C	2.75	129.56	124.73
2	B	500	HEM	C4C-CHD-C1D	-2.73	120.21	126.02
2	B	500	HEM	C1A-CHA-C4D	-2.70	119.90	126.25
2	C	500	HEM	C2D-C1D-ND	2.67	112.99	109.90
2	D	500	HEM	CMC-C2C-C3C	-2.67	121.97	128.43
3	A	496	PB2	CCA-CAA-NAB	-2.66	107.27	112.39
2	C	500	HEM	C4C-CHD-C1D	-2.66	120.36	126.02
2	A	500	HEM	CHC-C4B-NB	-2.66	121.56	124.42
2	C	500	HEM	CAA-C2A-C1A	2.66	130.13	124.94
2	B	500	HEM	CAD-C3D-C4D	2.65	129.31	124.70
2	A	500	HEM	C3B-C4B-NB	2.65	111.37	109.47
2	C	500	HEM	C4D-C3D-C2D	-2.64	103.06	106.89
2	B	500	HEM	C4A-CHB-C1B	-2.63	120.07	126.25
2	B	500	HEM	CHB-C1B-C2B	-2.61	119.52	126.95
2	A	500	HEM	CAB-C3B-C4B	2.60	135.87	124.39
2	C	500	HEM	CAB-C3B-C2B	-2.59	120.00	128.43
2	A	500	HEM	C3B-C2B-C1B	2.59	108.36	106.41
2	A	500	HEM	C2B-C1B-NB	2.58	112.81	109.84
2	D	500	HEM	C2A-C1A-NA	-2.56	107.31	110.15
2	A	500	HEM	CHB-C4A-C3A	-2.53	120.10	127.43
2	C	500	HEM	C3C-C2C-C1C	2.52	109.43	107.05
2	B	500	HEM	C1D-C2D-C3D	-2.50	104.35	106.98
2	A	500	HEM	CHC-C1C-NC	2.48	127.16	124.45
2	B	500	HEM	CHC-C1C-C2C	-2.48	120.34	125.49
2	C	500	HEM	CHB-C1B-C2B	-2.46	119.95	126.95
2	D	500	HEM	CAA-CBA-CGA	-2.46	107.14	113.67
2	A	500	HEM	C3A-C4A-NA	2.46	114.08	110.14
2	B	500	HEM	CHD-C4C-NC	2.45	127.12	124.45

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	500	HEM	C3A-C4A-NA	2.44	114.05	110.14
2	A	500	HEM	CMC-C2C-C3C	-2.42	122.56	128.43
2	D	500	HEM	CAB-C3B-C2B	-2.41	120.58	128.43
2	D	500	HEM	CMD-C2D-C1D	2.41	128.81	125.03
3	A	496	PB2	CCE-CCF-CCA	-2.39	117.86	121.00
2	C	500	HEM	CHB-C4A-NA	2.38	128.17	123.86
2	A	500	HEM	CMC-C2C-C1C	2.37	128.90	124.73
2	D	500	HEM	CMC-C2C-C1C	2.34	128.85	124.73
2	C	500	HEM	C1D-C2D-C3D	-2.34	104.52	106.98
2	B	500	HEM	C3A-C4A-NA	2.31	113.84	110.14
2	A	500	HEM	C2D-C1D-ND	2.29	112.55	109.90
2	C	500	HEM	CHA-C1A-C2A	-2.28	120.30	125.30
2	B	500	HEM	CMB-C2B-C1B	2.27	128.58	125.03
2	D	500	HEM	CAD-CBD-CGD	-2.26	107.66	113.67
2	C	500	HEM	CMD-C2D-C1D	2.26	128.56	125.03
2	D	500	HEM	C3B-C4B-NB	-2.26	107.85	109.47
2	A	500	HEM	C4D-C3D-C2D	-2.26	103.61	106.89
2	D	500	HEM	C3C-C2C-C1C	2.25	109.17	107.05
2	A	500	HEM	CHD-C1D-C2D	-2.24	121.49	125.03
2	D	500	HEM	CHB-C4A-NA	2.24	127.92	123.86
3	A	496	PB2	CDF-CDA-CDB	2.21	121.63	117.68
2	D	500	HEM	C3D-C4D-ND	-2.20	107.75	110.17
2	B	500	HEM	CHB-C4A-C3A	-2.20	121.04	127.43
2	D	500	HEM	C3B-C2B-C1B	2.20	108.06	106.41
3	D	501	PB2	CAF-NAB-CAC	2.18	109.42	106.71
2	A	500	HEM	CAD-CBD-CGD	-2.17	107.91	113.67
2	B	500	HEM	CBC-CAC-C3C	-2.17	116.68	127.53
2	B	500	HEM	CBB-CAB-C3B	-2.17	116.69	127.53
2	B	500	HEM	C2C-C1C-NC	2.16	113.64	109.64
3	D	501	PB2	CCE-CCD-CDA	-2.12	117.59	121.25
2	B	500	HEM	CHB-C1B-NB	2.12	126.99	124.37
3	D	501	PB2	CCE-CCF-CCA	-2.10	118.23	121.00
2	B	500	HEM	CHC-C4B-C3B	-2.09	120.89	125.07
3	A	496	PB2	CCC-CCD-CCE	2.09	121.41	117.68
3	A	501	PB2	CCC-CCD-CCE	2.06	121.36	117.68
2	A	500	HEM	C4C-NC-C1C	-2.04	102.49	105.82
3	D	501	PB2	CCB-CCC-CCD	-2.03	118.52	121.12
2	B	500	HEM	O2D-CGD-CBD	2.01	120.37	114.00
2	A	500	HEM	CBC-CAC-C3C	-2.01	117.50	127.53

There are no chirality outliers.

All (32) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	500	HEM	C2D-C3D-CAD-CBD
2	A	500	HEM	C4D-C3D-CAD-CBD
2	B	500	HEM	C2D-C3D-CAD-CBD
2	B	500	HEM	C4D-C3D-CAD-CBD
2	D	500	HEM	C2D-C3D-CAD-CBD
2	D	500	HEM	C4D-C3D-CAD-CBD
2	C	500	HEM	C4D-C3D-CAD-CBD
2	D	500	HEM	C1A-C2A-CAA-CBA
2	C	500	HEM	C2D-C3D-CAD-CBD
2	D	500	HEM	C3A-C2A-CAA-CBA
2	C	500	HEM	C1A-C2A-CAA-CBA
2	A	500	HEM	C4B-C3B-CAB-CBB
2	C	500	HEM	C4B-C3B-CAB-CBB
2	B	500	HEM	C3D-CAD-CBD-CGD
2	C	500	HEM	C3D-CAD-CBD-CGD
2	D	500	HEM	C4C-C3C-CAC-CBC
2	C	500	HEM	C3A-C2A-CAA-CBA
2	D	500	HEM	CAA-CBA-CGA-O1A
2	D	500	HEM	CAA-CBA-CGA-O2A
2	B	500	HEM	CAA-CBA-CGA-O1A
2	B	500	HEM	CAA-CBA-CGA-O2A
2	C	500	HEM	CAD-CBD-CGD-O2D
2	C	500	HEM	CAD-CBD-CGD-O1D
2	D	500	HEM	CAD-CBD-CGD-O2D
2	A	500	HEM	CAA-CBA-CGA-O2A
2	C	500	HEM	CAA-CBA-CGA-O2A
2	A	500	HEM	CAA-CBA-CGA-O1A
2	D	500	HEM	CAD-CBD-CGD-O1D
2	A	500	HEM	C4C-C3C-CAC-CBC
2	C	500	HEM	CAA-CBA-CGA-O1A
2	A	500	HEM	CAD-CBD-CGD-O2D
2	A	500	HEM	CAD-CBD-CGD-O1D

There are no ring outliers.

8 monomers are involved in 60 short contacts:

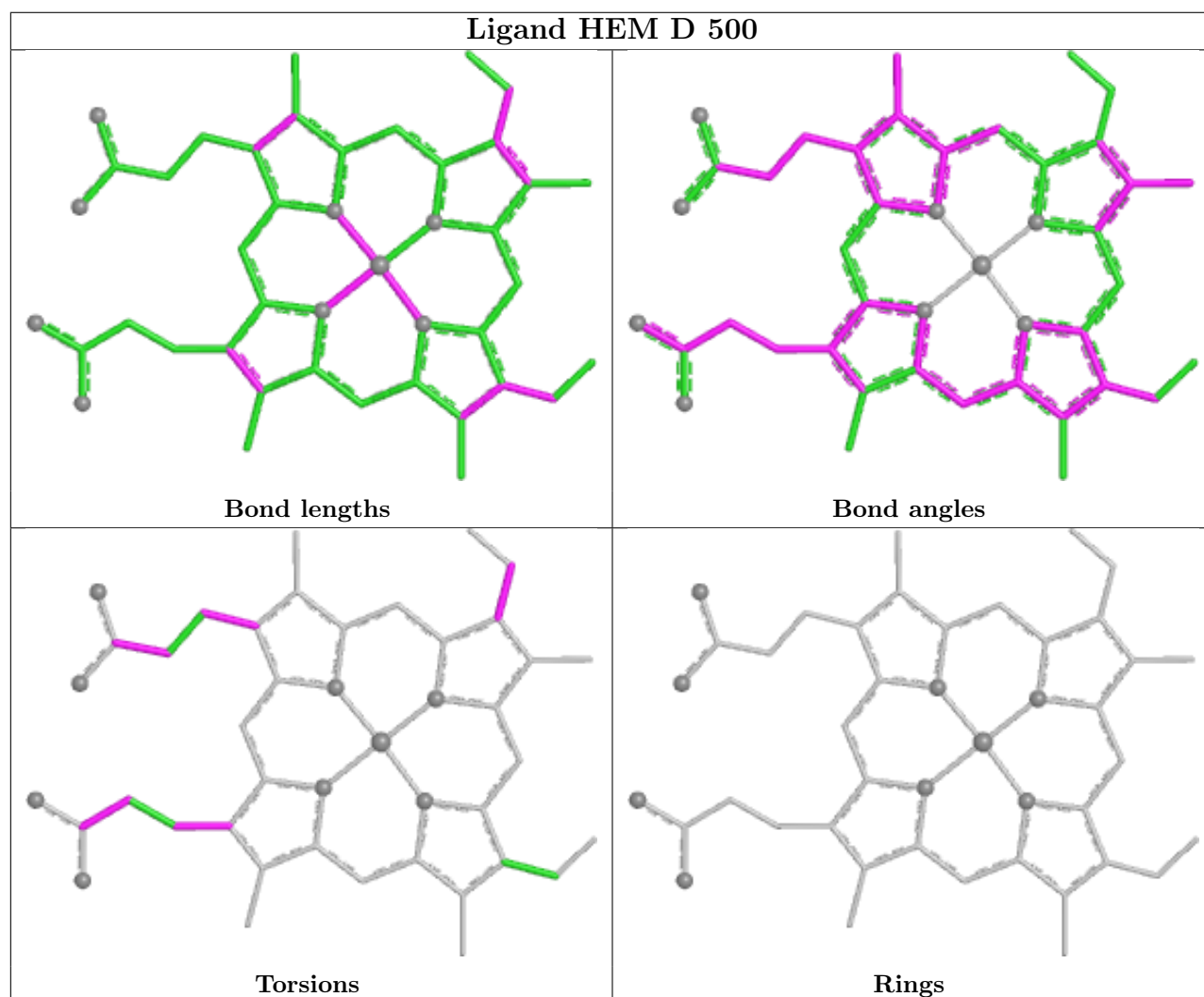
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	D	500	HEM	11	0
3	A	501	PB2	5	0
3	C	501	PB2	5	0
2	B	500	HEM	18	0
2	C	500	HEM	9	0
3	D	501	PB2	2	0

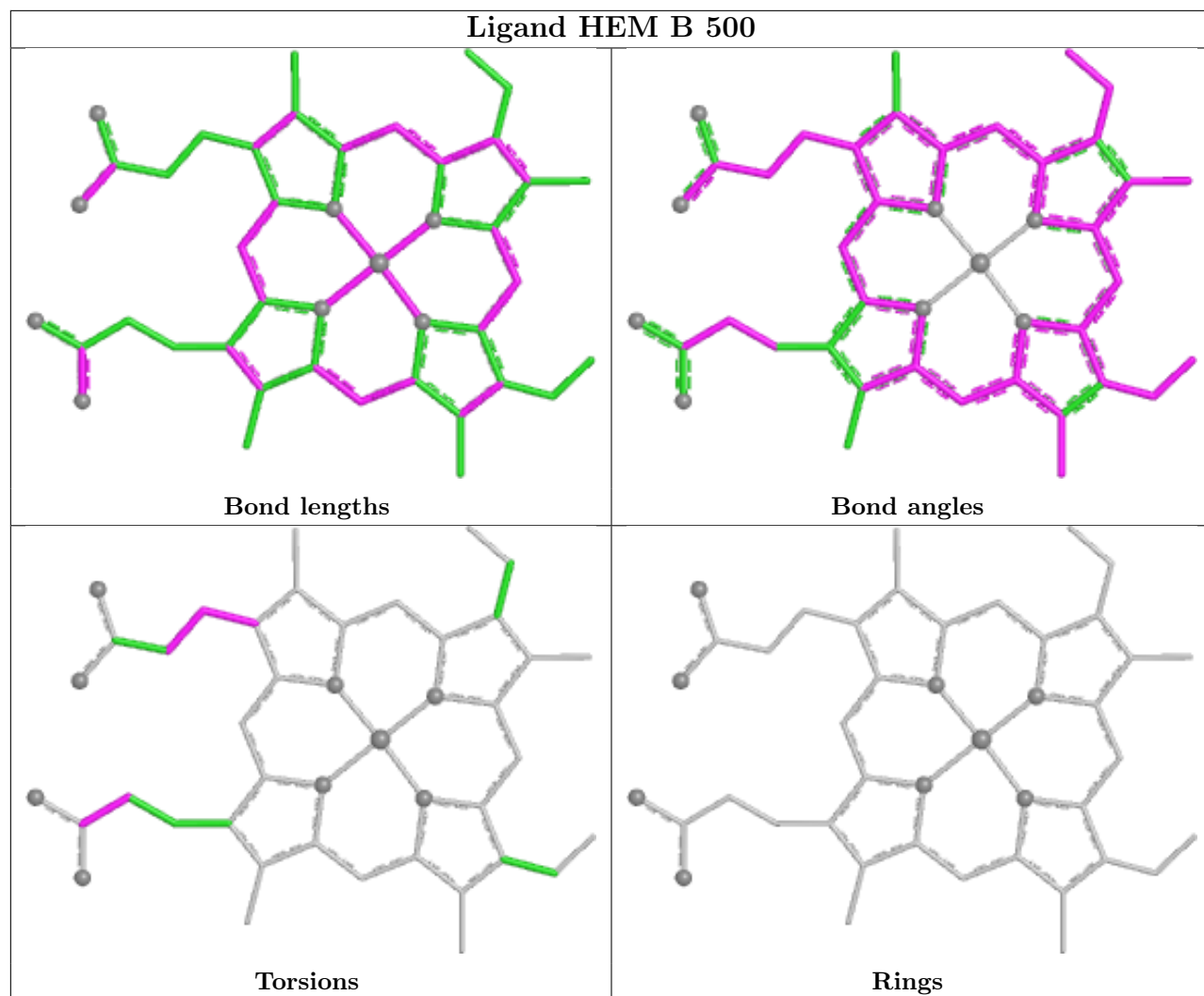
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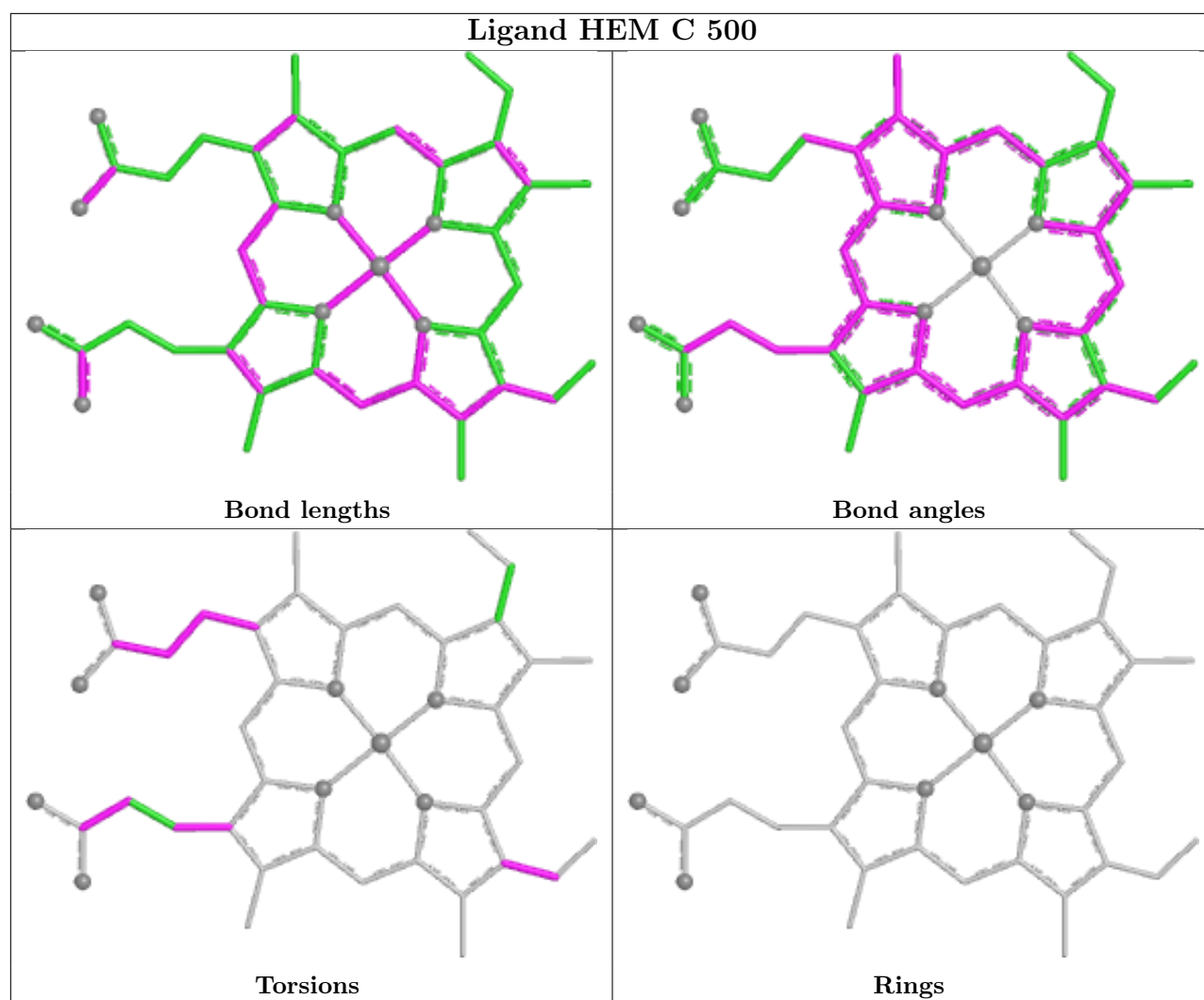
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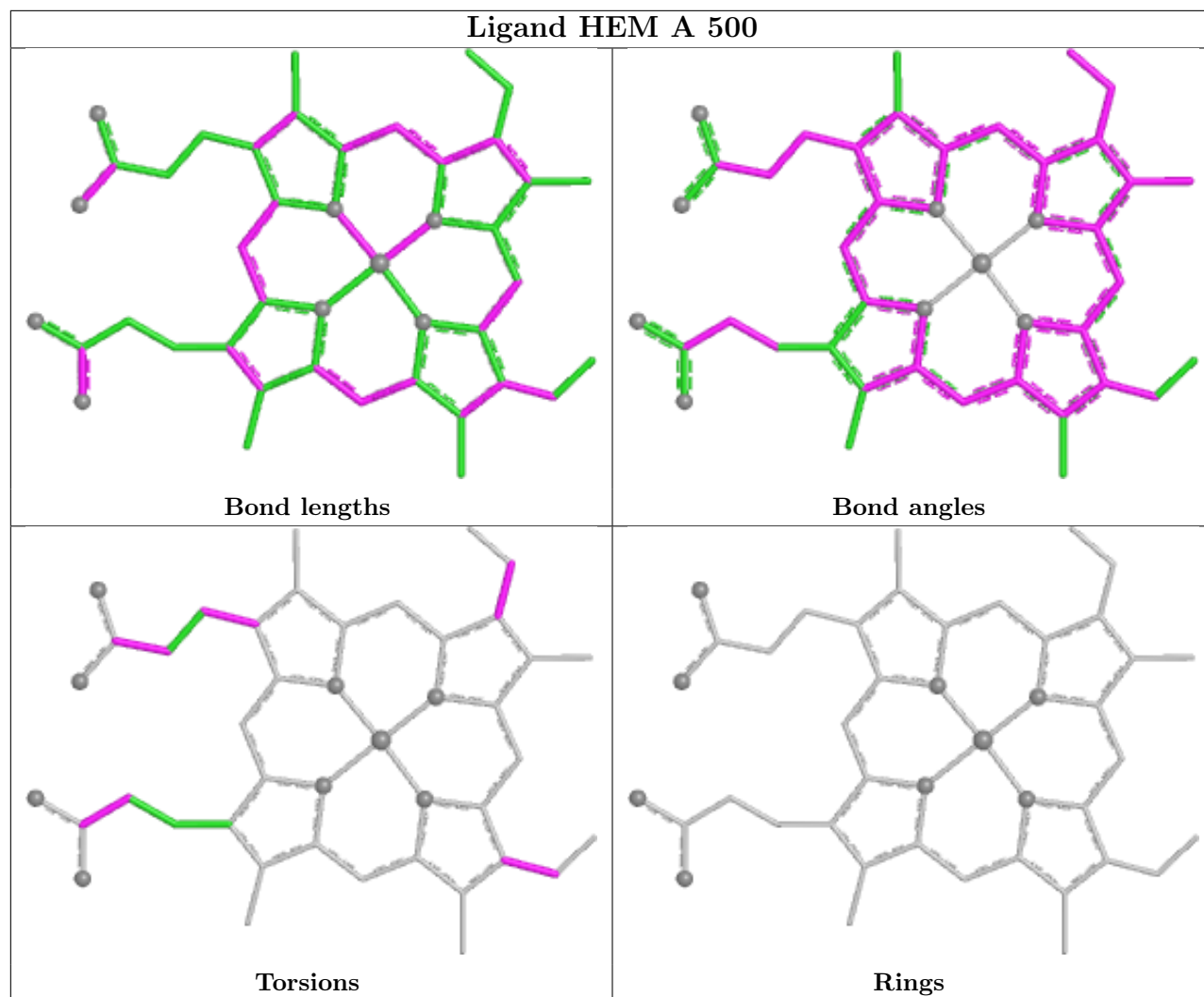
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	500	HEM	16	0
3	A	496	PB2	2	0

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









5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ > 2		OWAB(Å ²)	Q < 0.9
1	A	454/476 (95%)	0.45	20 (4%)	39 24	20, 41, 82, 104	0
1	B	442/476 (92%)	0.43	23 (5%)	33 21	21, 41, 76, 100	0
1	C	442/476 (92%)	0.33	16 (3%)	46 28	21, 40, 78, 120	0
1	D	440/476 (92%)	0.43	19 (4%)	40 24	21, 42, 81, 108	0
All	All	1778/1904 (93%)	0.41	78 (4%)	39 24	20, 41, 81, 120	0

All (78) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	285	HIS	5.2
1	B	286	GLN	4.3
1	B	285	HIS	4.0
1	A	492	HIS	3.9
1	A	285	HIS	3.7
1	B	492	HIS	3.7
1	A	234	ILE	3.5
1	C	286	GLN	3.4
1	C	142	VAL	3.4
1	C	283	PHE	3.3
1	A	259	SER	3.2
1	B	466	GLU	3.2
1	B	417	ASN	3.2
1	A	467	ASP	3.1
1	B	194	VAL	3.1
1	B	237	ASN	3.1
1	D	335	HIS	3.1
1	A	284	HIS	3.0
1	A	226	TYR	3.0
1	D	44	LEU	2.9
1	D	273	GLU	2.9

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Mol	Chain	Res	Type	RSRZ
1	D	469	ASP	2.8
1	B	287	ASN	2.8
1	C	233	GLN	2.8
1	C	239	GLN	2.7
1	B	230	THR	2.7
1	C	287	ASN	2.7
1	B	198	LEU	2.7
1	D	286	GLN	2.7
1	D	287	ASN	2.7
1	B	244	PHE	2.7
1	A	260	ASN	2.7
1	D	471	THR	2.6
1	B	483	SER	2.6
1	C	407	THR	2.6
1	D	488	PHE	2.5
1	A	235	TYR	2.5
1	B	124	LEU	2.5
1	B	482	PRO	2.5
1	D	482	PRO	2.5
1	C	140	ARG	2.5
1	B	259	SER	2.4
1	D	46	MET	2.4
1	B	470	LEU	2.4
1	D	470	LEU	2.4
1	B	258	PRO	2.4
1	C	242	ASN	2.4
1	B	226	TYR	2.4
1	C	259	SER	2.4
1	B	243	THR	2.3
1	A	210	SER	2.3
1	D	235	TYR	2.3
1	B	471	THR	2.3
1	C	335	HIS	2.3
1	A	462	PRO	2.3
1	D	258	PRO	2.2
1	A	254	ALA	2.2
1	C	228	PRO	2.2
1	C	285	HIS	2.2
1	A	403	GLU	2.2
1	C	231	HIS	2.2
1	B	193	PRO	2.2
1	B	238	LEU	2.1

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Mol	Chain	Res	Type	RSRZ
1	C	403	GLU	2.1
1	D	131	THR	2.1
1	A	205	SER	2.1
1	A	474	GLU	2.1
1	D	248	SER	2.1
1	D	467	ASP	2.1
1	C	482	PRO	2.1
1	D	260	ASN	2.1
1	A	404	THR	2.1
1	A	460	ALA	2.1
1	A	236	ARG	2.0
1	A	229	GLY	2.0
1	A	124	LEU	2.0
1	D	238	LEU	2.0
1	B	209	ILE	2.0

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

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

6.3 Carbohydrates [i](#)

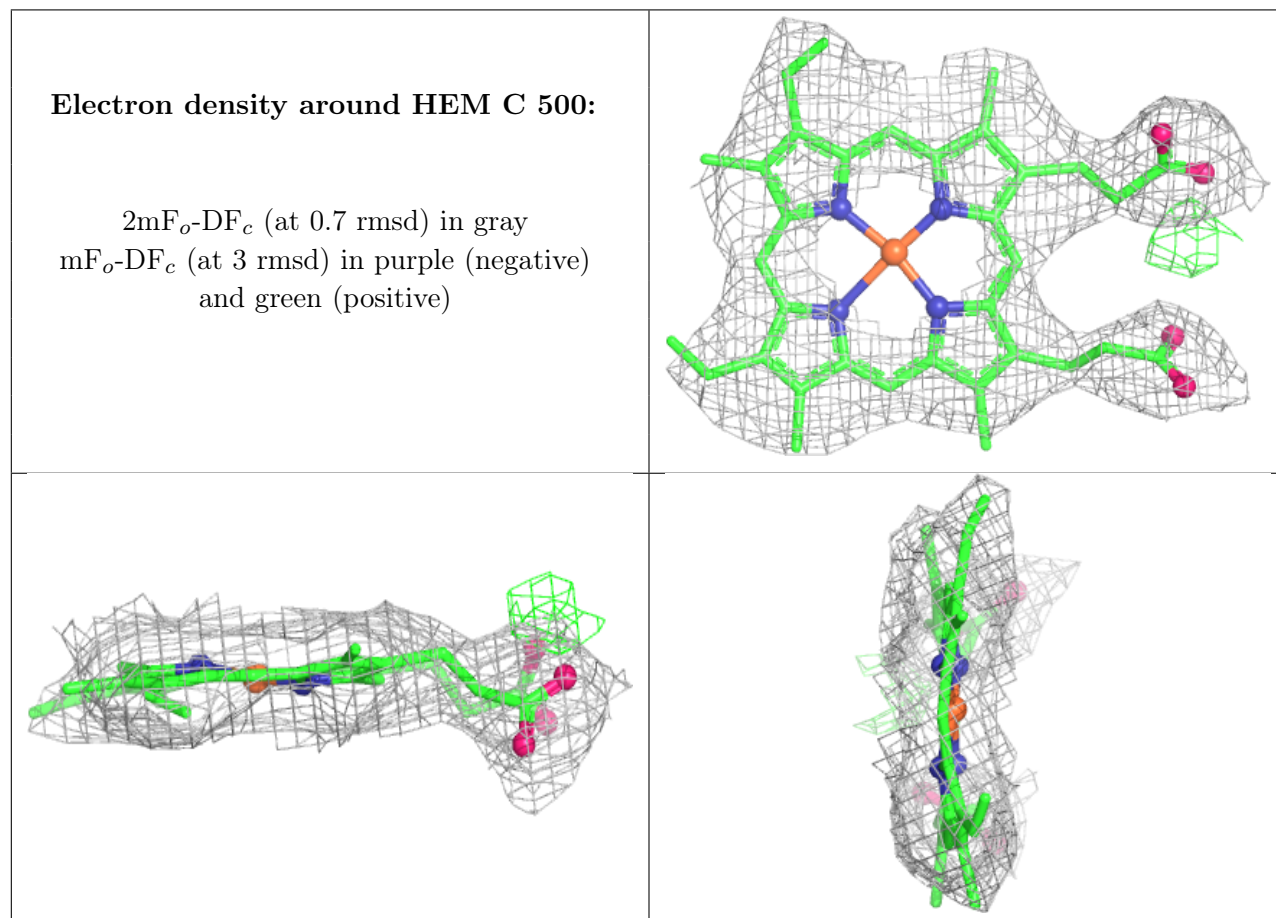
There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

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

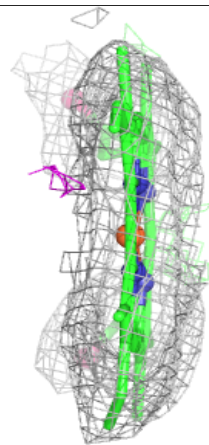
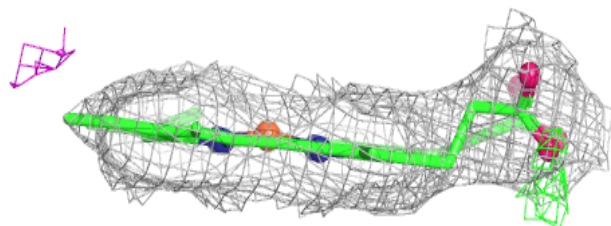
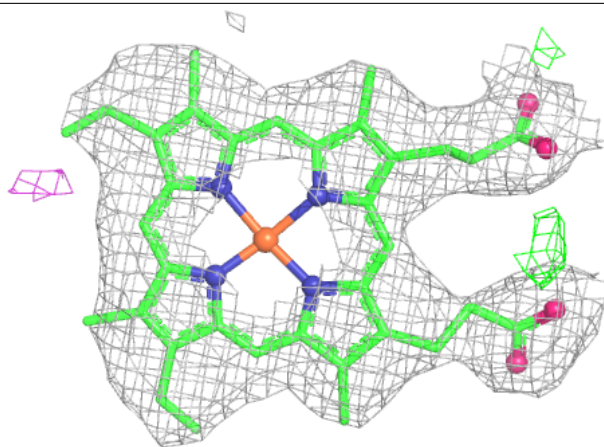
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	PB2	D	501	18/18	0.95	0.12	15,24,37,39	0
3	PB2	A	501	18/18	0.96	0.10	21,28,41,50	0
3	PB2	A	496	18/18	0.96	0.09	16,26,34,35	0
3	PB2	C	501	18/18	0.96	0.10	13,21,35,37	0
2	HEM	C	500	43/43	0.96	0.10	23,37,50,56	0
2	HEM	A	500	43/43	0.97	0.08	14,24,34,43	0
2	HEM	D	500	43/43	0.97	0.09	14,26,42,55	0
2	HEM	B	500	43/43	0.97	0.09	7,24,51,54	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.



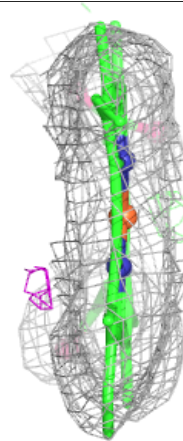
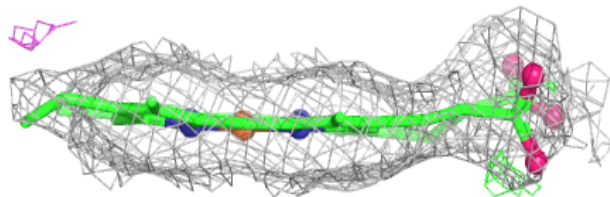
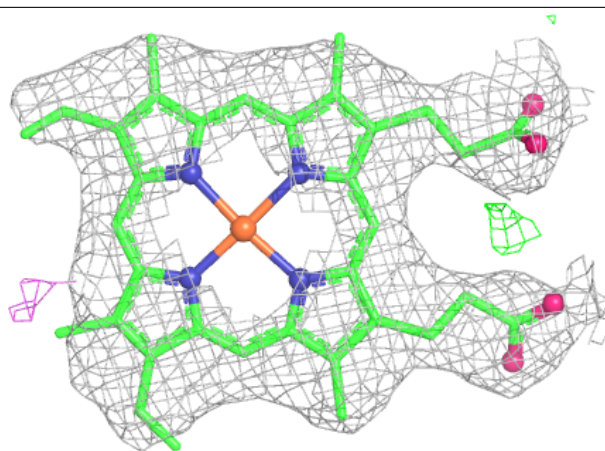
Electron density around HEM A 500:

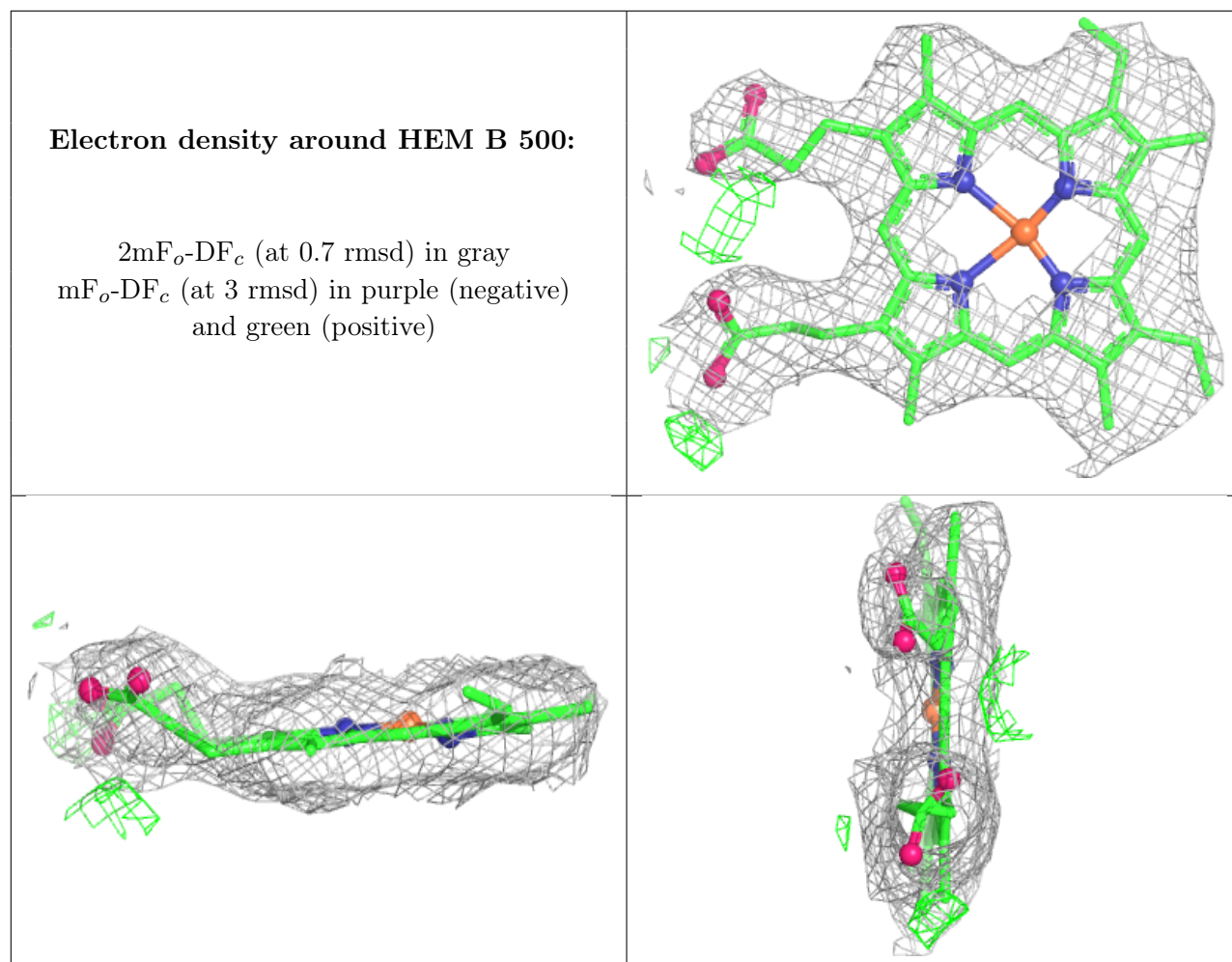
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



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.