



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 10, 2026 – 02:40 AM UTC

PDB ID : 3P99 / pdb_00003p99
Title : Sterol 14alpha-demethylase (CYP51) from Trypanosoma brucei in complex with delta7-14alpha-methylene-cyclopropyl-dihydrolanosterol
Authors : Lepesheva, G.I.; Hargrove, T.Y.; Waterman, M.R.; Wawrzak, Z.
Deposited on : 2010-10-16
Resolution : 3.00 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

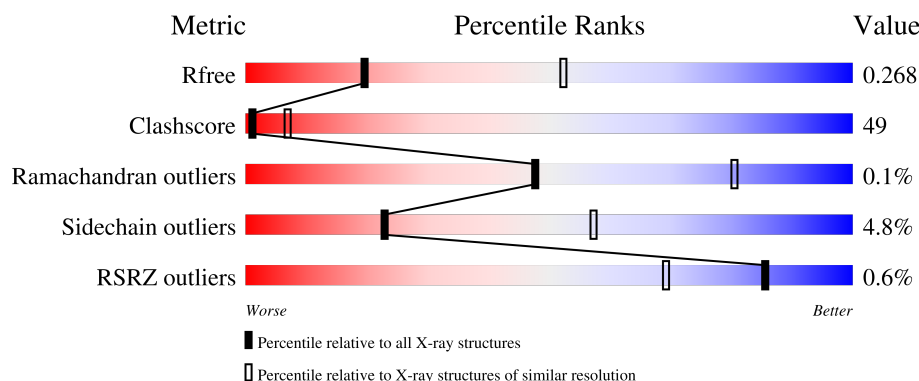
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.00 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	2672 (3.00-3.00)
Clashscore	190562	2977 (3.00-3.00)
Ramachandran outliers	187476	2877 (3.00-3.00)
Sidechain outliers	187428	2880 (3.00-3.00)
RSRZ outliers	180081	2671 (3.00-3.00)

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	453	
1	B	453	
1	C	453	
1	D	453	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard

residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	LNP	A	490	-	-	X	-
3	LNP	B	490	-	-	X	-
3	LNP	C	490	-	-	X	-
3	LNP	D	490	-	-	X	-

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 14555 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.

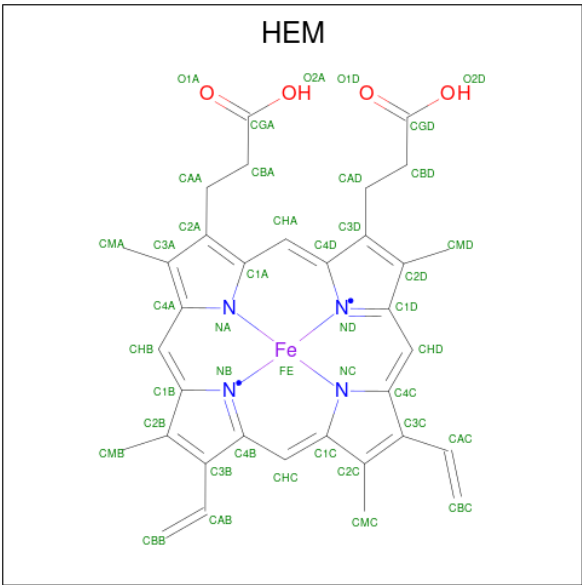
- Molecule 1 is a protein called Sterol 14-alpha-demethylase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	448	Total	C	N	O	S	0	0	0
			3557	2271	621	638	27			
1	B	448	Total	C	N	O	S	0	0	0
			3557	2271	621	638	27			
1	C	444	Total	C	N	O	S	0	0	0
			3526	2254	615	630	27			
1	D	448	Total	C	N	O	S	0	0	0
			3557	2271	621	638	27			

There are 12 discrepancies between the modelled and reference sequences:

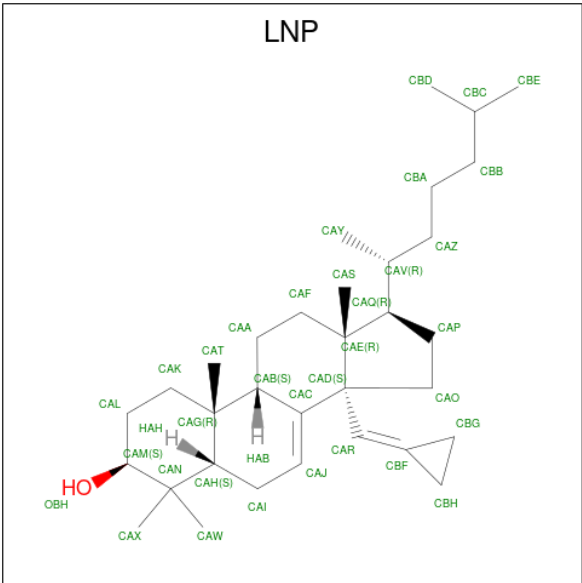
Chain	Residue	Modelled	Actual	Comment	Reference
A	29	GLY	PRO	engineered mutation	UNP Q385E8
A	30	LYS	THR	engineered mutation	UNP Q385E8
A	31	LEU	ASP	engineered mutation	UNP Q385E8
B	29	GLY	PRO	engineered mutation	UNP Q385E8
B	30	LYS	THR	engineered mutation	UNP Q385E8
B	31	LEU	ASP	engineered mutation	UNP Q385E8
C	29	GLY	PRO	engineered mutation	UNP Q385E8
C	30	LYS	THR	engineered mutation	UNP Q385E8
C	31	LEU	ASP	engineered mutation	UNP Q385E8
D	29	GLY	PRO	engineered mutation	UNP Q385E8
D	30	LYS	THR	engineered mutation	UNP Q385E8
D	31	LEU	ASP	engineered mutation	UNP Q385E8

- 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 (3alpha,9beta,10alpha,13alpha)-30-cyclopropylidenelanost-7-en-3-ol (CCD ID: LNP) (formula: C₃₃H₅₄O).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			34	33	1		
3	B	1	Total	C	O	0	0
			34	33	1		
3	C	1	Total	C	O	0	0
			34	33	1		
3	D	1	Total	C	O	0	0
			34	33	1		

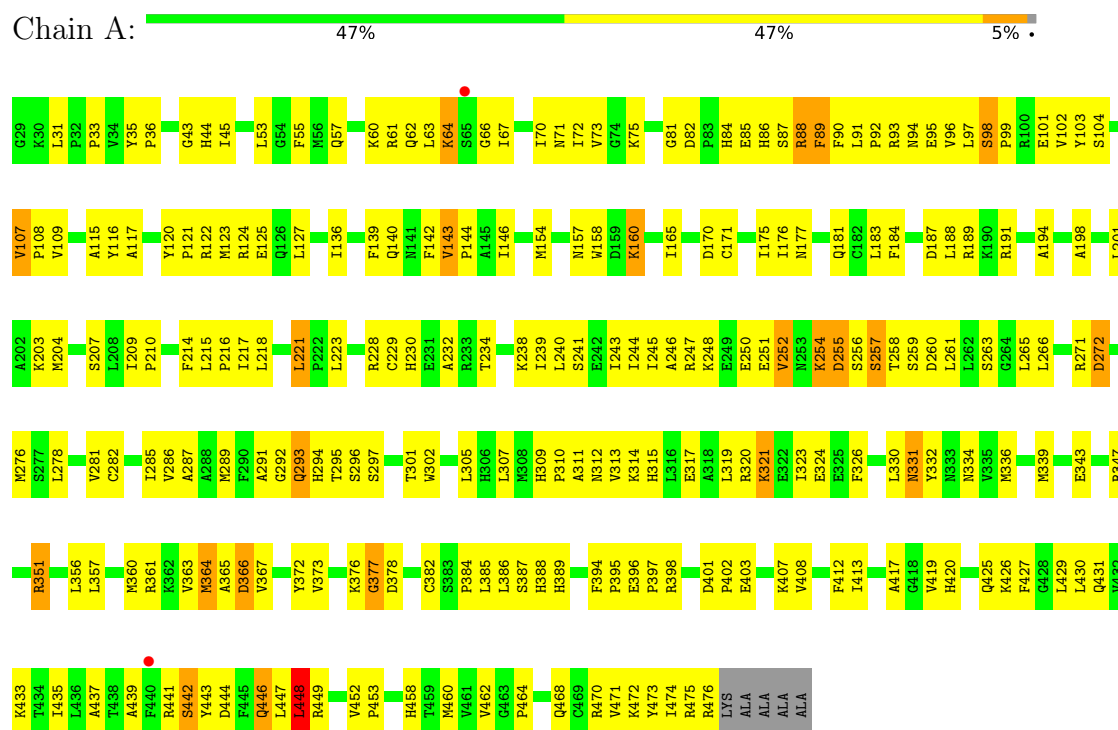
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	14	Total	O	0	0
			14	14		
4	B	13	Total	O	0	0
			13	13		
4	C	12	Total	O	0	0
			12	12		
4	D	11	Total	O	0	0
			11	11		

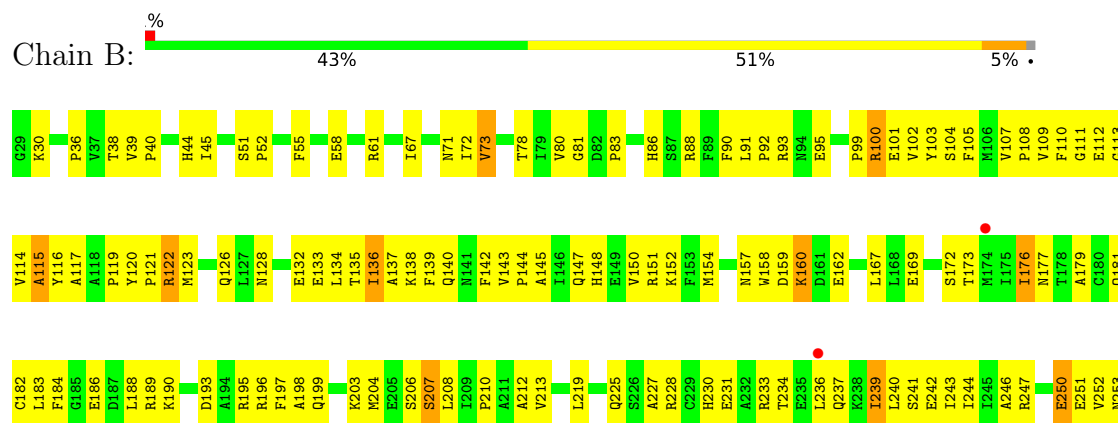
3 Residue-property plots

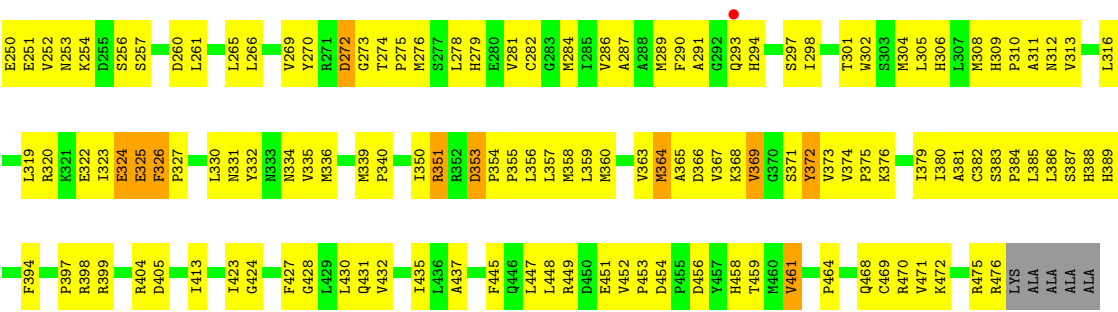
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: Sterol 14-alpha-demethylase



• Molecule 1: Sterol 14-alpha-demethylase





4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	59.61Å 80.57Å 115.80Å 107.93° 102.43° 99.57°	Depositor
Resolution (Å)	29.39 – 3.00 29.39 – 3.00	Depositor EDS
% Data completeness (in resolution range)	97.8 (29.39-3.00) 97.8 (29.39-3.00)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	0.07	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.91 (at 3.00Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.223 , 0.271 (Not available) , 0.268	Depositor DCC
R_{free} test set	1894 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å ²)	79.9	Xtriage
Anisotropy	0.030	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.29 , 62.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtriage
Estimated twinning fraction	0.015 for -h,-k,h+k+l	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	14555	wwPDB-VP
Average B, all atoms (Å ²)	84.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 36.48 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 4.9656e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹Intensities estimated from amplitudes.

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

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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

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	0.66	1/3639 (0.0%)	0.88	12/4922 (0.2%)
1	B	0.57	1/3639 (0.0%)	0.93	15/4922 (0.3%)
1	C	0.76	3/3607 (0.1%)	0.89	7/4878 (0.1%)
1	D	0.58	2/3639 (0.1%)	0.83	7/4922 (0.1%)
All	All	0.65	7/14524 (0.0%)	0.88	41/19644 (0.2%)

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	107	VAL	CA-CB	-10.09	1.47	1.53
1	D	39	VAL	CA-CB	-6.18	1.48	1.54
1	C	257	SER	C-N	5.88	1.42	1.33
1	C	39	VAL	CA-CB	-5.66	1.47	1.54
1	C	102	VAL	CA-CB	-5.49	1.47	1.54
1	B	136	ILE	CA-C	-5.15	1.46	1.52
1	D	115	ALA	C-O	-5.11	1.20	1.24

All (41) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	313	VAL	N-CA-C	-14.52	99.30	113.53
1	B	293	GLN	N-CA-C	11.02	122.98	110.97
1	A	88	ARG	N-CA-C	-9.46	100.96	111.28
1	A	89	PHE	N-CA-C	9.00	120.86	111.14
1	A	107	VAL	CB-CA-C	-8.75	105.07	114.35
1	B	252	VAL	N-CA-C	8.72	118.73	110.53
1	A	293	GLN	N-CA-C	8.21	120.14	111.03
1	B	311	ALA	N-CA-C	-8.08	102.47	111.28
1	B	100	ARG	N-CA-C	8.02	119.65	111.07
1	A	377	GLY	N-CA-C	-7.99	104.86	115.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	326	PHE	N-CA-C	7.55	121.27	110.24
1	D	272	ASP	N-CA-C	-7.49	103.71	112.92
1	B	136	ILE	CB-CA-C	-6.82	103.25	111.97
1	B	198	ALA	N-CA-C	-6.72	103.98	111.71
1	C	199	GLN	N-CA-C	6.61	118.28	111.14
1	D	461	VAL	N-CA-C	-6.55	99.00	108.17
1	B	250	GLU	N-CA-C	-6.36	104.34	111.28
1	B	239	ILE	N-CA-C	-6.08	106.80	113.43
1	C	208	LEU	N-CA-C	6.07	119.26	110.28
1	A	255	ASP	N-CA-C	5.96	118.99	110.24
1	A	257	SER	N-CA-C	-5.89	100.02	109.39
1	A	252	VAL	N-CA-C	5.76	115.94	110.53
1	B	271	ARG	N-CA-C	-5.76	106.10	113.01
1	A	425	GLN	CB-CA-C	-5.72	101.89	110.88
1	C	115	ALA	CB-CA-C	-5.71	110.00	116.63
1	D	115	ALA	CB-CA-C	-5.67	109.52	117.23
1	D	40	PRO	N-CA-C	5.62	121.50	113.47
1	C	293	GLN	N-CA-C	5.57	117.16	111.14
1	A	448	LEU	N-CA-C	-5.53	106.74	112.93
1	B	367	VAL	N-CA-C	5.39	116.67	108.80
1	C	53	LEU	N-CA-C	5.35	116.96	111.03
1	B	157	ASN	N-CA-C	5.25	120.56	114.04
1	C	469	CYS	N-CA-C	5.25	119.37	112.92
1	D	257	SER	N-CA-C	-5.22	102.61	110.70
1	C	474	ILE	CB-CA-C	-5.21	103.04	110.12
1	B	115	ALA	CB-CA-C	-5.18	110.62	116.63
1	D	194	ALA	N-CA-C	-5.04	105.79	111.28
1	B	396	GLU	CA-C-N	5.02	124.74	119.82
1	B	396	GLU	C-N-CA	5.02	124.74	119.82
1	A	82	ASP	CA-C-N	5.02	125.29	119.47
1	A	82	ASP	C-N-CA	5.02	125.29	119.47

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	3557	0	3594	354	0
1	B	3557	0	3594	326	0
1	C	3526	0	3565	339	0
1	D	3557	0	3594	380	0
2	A	43	0	30	9	0
2	B	43	0	30	6	0
2	C	43	0	30	5	0
2	D	43	0	30	6	0
3	A	34	0	54	27	0
3	B	34	0	54	36	0
3	C	34	0	54	59	0
3	D	34	0	54	45	0
4	A	14	0	0	6	0
4	B	13	0	0	6	0
4	C	12	0	0	9	0
4	D	11	0	0	5	0
All	All	14555	0	14683	1442	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 49.

All (1442) 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:A:364:MET:HA	1:A:364:MET:CE	1.54	1.34
1:A:64:LYS:HE3	1:A:64:LYS:N	1.42	1.32
1:D:284:MET:HG2	3:D:490:LNP:CBE	1.61	1.29
1:C:291:ALA:HB2	3:C:490:LNP:CAP	1.66	1.26
1:A:143:VAL:HG23	1:A:144:PRO:CD	1.64	1.25
1:D:67:ILE:HD13	1:D:369:VAL:CG1	1.67	1.24
1:D:99:PRO:HD2	4:D:484:HOH:O	1.37	1.24
1:A:364:MET:HE2	1:A:364:MET:CA	1.60	1.24
1:C:163:GLY:HA3	1:C:473:TYR:CZ	1.72	1.24
1:B:447:LEU:HD23	1:B:449:ARG:O	1.40	1.20
1:C:79:ILE:HG23	4:C:486:HOH:O	1.46	1.15
1:C:475:ARG:CG	1:C:475:ARG:HH11	1.59	1.14
1:C:102:VAL:HG12	1:C:103:TYR:CD1	1.82	1.13
1:A:221:LEU:HD12	1:A:221:LEU:H	1.09	1.13
1:A:310:PRO:O	1:A:313:VAL:HG23	1.49	1.12
1:A:143:VAL:HG23	1:A:144:PRO:HD3	1.20	1.12
1:D:154:MET:O	1:D:158:TRP:HB2	1.51	1.10
1:C:53:LEU:HD12	1:C:53:LEU:O	1.49	1.09

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:352:ARG:HG2	1:C:352:ARG:HH11	1.14	1.08
1:D:284:MET:HG2	3:D:490:LNP:HBE	1.14	1.07
1:C:214:PHE:O	1:C:215:LEU:HD12	1.52	1.07
1:D:150:VAL:O	1:D:154:MET:HG3	1.55	1.07
1:C:475:ARG:HH11	1:C:475:ARG:HG3	1.16	1.07
3:B:490:LNP:HAB	3:B:490:LNP:HASB	1.33	1.05
1:C:39:VAL:HG12	1:C:40:PRO:HD2	1.32	1.05
1:C:320:ARG:CG	1:C:320:ARG:HH11	1.69	1.05
1:C:157:ASN:O	1:C:158:TRP:HD1	1.37	1.05
3:A:490:LNP:HASB	3:A:490:LNP:HAB	1.32	1.04
1:B:364:MET:HE2	1:B:364:MET:HA	1.39	1.04
1:C:106:MET:HE2	1:C:106:MET:HA	1.33	1.04
1:A:351:ARG:HA	1:A:388:HIS:CD2	1.91	1.04
1:C:163:GLY:HA3	1:C:473:TYR:CE2	1.92	1.04
1:C:291:ALA:CB	3:C:490:LNP:HAP	1.87	1.03
1:B:309:HIS:HD2	1:B:311:ALA:HB3	1.24	1.03
1:C:102:VAL:HG12	1:C:103:TYR:HD1	1.11	1.03
1:A:124:ARG:HH21	1:A:127:LEU:HD13	1.18	1.03
1:C:241:SER:HB3	1:C:278:LEU:HD11	1.34	1.03
1:A:154:MET:HE1	1:A:439:ALA:HA	1.36	1.03
1:C:103:TYR:CE2	3:C:490:LNP:HATA	1.93	1.03
1:A:448:LEU:HD23	1:A:448:LEU:N	1.68	1.02
1:C:53:LEU:HD12	1:C:53:LEU:C	1.78	1.02
1:D:356:LEU:HD22	3:D:490:LNP:HAM	1.40	1.02
1:D:369:VAL:HG12	1:D:369:VAL:O	1.61	1.01
1:B:367:VAL:CG1	1:B:368:LYS:H	1.73	1.01
1:D:389:HIS:CE1	1:D:398:ARG:HH11	1.79	1.00
2:A:482:HEM:HMC2	2:A:482:HEM:HBC2	1.42	1.00
1:D:452:VAL:HG13	1:D:453:PRO:HD2	1.38	1.00
1:D:291:ALA:HB2	3:D:490:LNP:HAP	1.44	1.00
1:A:64:LYS:HE3	1:A:64:LYS:H	0.88	0.99
1:C:241:SER:HB3	1:C:278:LEU:CD1	1.92	0.99
1:B:44:HIS:HD2	1:B:71:ASN:H	1.00	0.99
1:D:364:MET:HA	1:D:364:MET:HE2	1.43	0.99
1:B:309:HIS:HD2	1:B:311:ALA:CB	1.75	0.99
1:C:291:ALA:HB2	3:C:490:LNP:HAP	0.99	0.98
1:A:356:LEU:HD11	3:A:490:LNP:HBGA	1.43	0.97
1:A:276:MET:HE3	1:A:281:VAL:HG22	1.45	0.97
1:A:441:ARG:HG3	4:A:21:HOH:O	1.64	0.97
3:B:490:LNP:CBH	3:B:490:LNP:HAJ	1.94	0.97
3:B:490:LNP:HAT	3:B:490:LNP:HAXA	1.46	0.97

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:103:TYR:CE1	3:D:490:LNP:HATA	2.00	0.97
1:B:367:VAL:CG1	1:B:368:LYS:N	2.28	0.97
1:A:143:VAL:HG23	1:A:144:PRO:HD2	1.47	0.96
1:B:367:VAL:HG12	1:B:368:LYS:N	1.74	0.96
1:D:136:ILE:HG23	1:D:332:TYR:OH	1.63	0.96
1:C:157:ASN:C	1:C:158:TRP:HD1	1.74	0.96
1:C:186:GLU:CG	1:C:189:ARG:HH21	1.79	0.95
1:B:44:HIS:CD2	1:B:71:ASN:H	1.84	0.95
1:D:113:GLY:O	1:D:118:ALA:HB2	1.65	0.95
1:C:352:ARG:HH11	1:C:352:ARG:CG	1.80	0.94
1:A:64:LYS:N	1:A:64:LYS:CE	2.30	0.94
1:A:317:GLU:O	1:A:321:LYS:HE3	1.65	0.94
1:C:130:LEU:HD22	3:C:490:LNP:HBEB	1.46	0.94
1:C:448:LEU:O	1:C:449:ARG:HG3	1.66	0.94
1:C:328:ALA:HA	1:C:441:ARG:HH22	1.31	0.94
1:C:73:VAL:HG12	1:C:73:VAL:O	1.65	0.94
1:D:327:PRO:HD2	1:D:334:ASN:HD21	1.31	0.93
1:C:284:MET:HG2	3:C:490:LNP:CBD	1.98	0.93
1:D:284:MET:CG	3:D:490:LNP:CBE	2.46	0.93
1:A:64:LYS:H	1:A:64:LYS:CE	1.80	0.93
1:B:389:HIS:CE1	1:B:398:ARG:HH11	1.86	0.93
1:D:67:ILE:HD13	1:D:369:VAL:HG12	1.51	0.93
1:B:193:ASP:OD1	1:B:196:ARG:HB3	1.69	0.93
1:B:113:GLY:H	1:B:117:ALA:HB1	1.33	0.93
1:B:242:GLU:O	1:B:243:ILE:HD13	1.69	0.93
3:D:490:LNP:HAXA	3:D:490:LNP:HAT	1.47	0.93
1:C:291:ALA:HA	3:C:490:LNP:HBHA	1.51	0.93
1:A:207:SER:OG	1:A:229:CYS:HB2	1.68	0.92
1:B:447:LEU:O	1:B:447:LEU:HD22	1.69	0.92
1:C:351:ARG:HA	1:C:388:HIS:CD2	2.06	0.91
1:A:364:MET:CE	1:A:364:MET:CA	2.30	0.91
1:B:389:HIS:HE1	1:B:398:ARG:HH11	1.06	0.91
1:C:475:ARG:HG3	1:C:475:ARG:NH1	1.74	0.91
1:C:207:SER:HA	1:C:225:GLN:HB3	1.51	0.91
1:C:291:ALA:HB2	3:C:490:LNP:CAO	2.02	0.91
1:D:372:TYR:N	1:D:372:TYR:CD1	2.34	0.91
1:A:447:LEU:HD22	1:A:449:ARG:H	1.32	0.90
1:A:203:LYS:HD3	1:A:232:ALA:HB2	1.53	0.90
1:C:265:LEU:O	1:C:276:MET:HE3	1.72	0.90
1:A:246:ALA:O	1:A:250:GLU:HG3	1.70	0.90
3:B:490:LNP:HAJ	3:B:490:LNP:HBH	1.54	0.90

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:110:PHE:HZ	3:C:490:LNP:CAS	1.85	0.90
1:D:427:PHE:CE2	1:D:431:GLN:NE2	2.38	0.90
1:B:99:PRO:O	1:B:102:VAL:HB	1.72	0.89
3:A:490:LNP:HASB	3:A:490:LNP:CAB	2.01	0.89
1:D:389:HIS:HE1	1:D:398:ARG:HH11	0.93	0.89
1:B:388:HIS:HE1	1:B:413:ILE:H	1.19	0.89
1:B:351:ARG:HA	1:B:388:HIS:CD2	2.08	0.89
1:A:343:GLU:O	1:A:347:ARG:HG3	1.72	0.89
3:B:490:LNP:HASB	3:B:490:LNP:CAB	2.01	0.89
1:A:247:ARG:O	1:A:251:GLU:HG3	1.73	0.88
1:C:110:PHE:HZ	3:C:490:LNP:HASA	1.38	0.88
1:C:176:ILE:CD1	1:C:198:ALA:HB2	2.02	0.88
1:D:372:TYR:HD1	1:D:372:TYR:H	0.92	0.88
1:A:389:HIS:CE1	1:A:398:ARG:HH11	1.91	0.88
1:B:246:ALA:O	1:B:250:GLU:HG3	1.74	0.88
1:C:106:MET:HA	1:C:106:MET:CE	2.03	0.88
1:D:44:HIS:HD2	1:D:71:ASN:H	1.19	0.88
1:A:62:GLN:C	1:A:64:LYS:HZ2	1.82	0.88
1:A:447:LEU:HD22	1:A:449:ARG:N	1.86	0.88
1:D:207:SER:OG	1:D:229:CYS:HB2	1.74	0.88
1:B:132:GLU:O	1:B:135:THR:HG23	1.74	0.87
1:B:237:GLN:HG3	1:B:278:LEU:HD22	1.54	0.87
1:B:276:MET:HG2	1:B:280:GLU:HB3	1.55	0.87
1:D:73:VAL:HG11	1:D:215:LEU:HD11	1.54	0.87
1:B:331:ASN:C	1:B:331:ASN:HD22	1.80	0.87
1:D:284:MET:CG	3:D:490:LNP:HBE	2.04	0.86
1:A:240:LEU:O	1:A:244:ILE:HG13	1.75	0.86
1:C:106:MET:HE1	1:C:208:LEU:CD1	2.05	0.86
1:D:287:ALA:CB	3:D:490:LNP:HBBA	2.06	0.86
1:C:176:ILE:HD13	1:C:198:ALA:HB2	1.55	0.86
1:C:186:GLU:HG2	1:C:189:ARG:HH21	1.37	0.86
1:A:143:VAL:CG2	1:A:144:PRO:CD	2.52	0.86
1:B:247:ARG:O	1:B:251:GLU:HG3	1.75	0.85
1:B:465:THR:OG1	1:B:468:GLN:HB2	1.73	0.85
1:A:124:ARG:HH21	1:A:127:LEU:CD1	1.88	0.85
1:B:325:GLU:OE2	1:C:136:ILE:HD13	1.74	0.85
1:D:173:THR:O	1:D:176:ILE:HG22	1.76	0.85
1:A:221:LEU:HD12	1:A:221:LEU:N	1.90	0.85
1:A:92:PRO:HB3	1:A:96:VAL:HG21	1.58	0.85
1:A:187:ASP:OD1	1:A:188:LEU:N	2.08	0.85
1:C:67:ILE:HD13	1:C:369:VAL:HG12	1.58	0.85

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:103:TYR:CD1	3:D:490:LNP:HATA	2.10	0.85
1:A:92:PRO:HB3	1:A:96:VAL:CG2	2.06	0.85
3:D:490:LNP:HAB	3:D:490:LNP:HASB	1.58	0.85
1:B:83:PRO:HG2	1:B:390:ASP:OD1	1.77	0.85
1:A:64:LYS:HE3	1:A:64:LYS:CA	2.07	0.84
1:C:157:ASN:C	1:C:158:TRP:CD1	2.55	0.84
1:A:93:ARG:HD2	1:A:95:GLU:HB2	1.58	0.84
1:B:322:GLU:OE1	1:B:339:MET:HA	1.77	0.84
1:C:309:HIS:ND1	1:C:310:PRO:HD2	1.92	0.84
1:A:136:ILE:HG23	1:A:332:TYR:OH	1.77	0.84
1:C:320:ARG:HH11	1:C:320:ARG:HG3	1.39	0.84
1:A:452:VAL:HG13	1:A:453:PRO:HD2	1.58	0.84
1:B:309:HIS:CD2	1:B:311:ALA:CB	2.61	0.84
3:C:490:LNP:HASB	3:C:490:LNP:HAB	1.59	0.84
1:A:442:SER:O	1:A:443:TYR:CD1	2.30	0.83
1:C:287:ALA:CB	3:C:490:LNP:HBBA	2.07	0.83
1:B:240:LEU:O	1:B:244:ILE:HG13	1.79	0.83
1:D:104:SER:O	1:D:107:VAL:HG23	1.77	0.83
1:D:146:ILE:HG12	1:D:182:CYS:SG	2.19	0.83
1:A:157:ASN:C	1:A:158:TRP:HD1	1.86	0.83
1:D:291:ALA:HA	3:D:490:LNP:HBHA	1.57	0.83
1:C:310:PRO:O	1:C:313:VAL:HG23	1.78	0.83
1:A:139:PHE:CD2	1:A:430:LEU:HD22	2.13	0.83
1:B:253:ASN:O	1:B:254:LYS:HD2	1.78	0.82
1:B:307:LEU:HD23	1:B:400:TRP:HH2	1.43	0.82
1:B:454:ASP:O	1:B:465:THR:HG23	1.78	0.82
1:C:351:ARG:HA	1:C:388:HIS:HD2	1.41	0.82
1:D:452:VAL:HG13	1:D:453:PRO:CD	2.09	0.82
1:A:35:TYR:CD1	1:A:36:PRO:HD2	2.13	0.82
1:C:103:TYR:CD2	3:C:490:LNP:HATA	2.15	0.82
1:C:332:TYR:CE1	1:C:336:MET:HE3	2.14	0.82
1:D:287:ALA:HB1	3:D:490:LNP:HAZA	1.60	0.82
1:A:351:ARG:HA	1:A:388:HIS:HD2	1.42	0.82
1:A:221:LEU:H	1:A:221:LEU:CD1	1.89	0.82
1:B:291:ALA:HA	3:B:490:LNP:HBHA	1.61	0.82
1:C:157:ASN:O	1:C:158:TRP:CD1	2.30	0.81
1:D:250:GLU:HG2	1:D:254:LYS:HE2	1.62	0.81
1:D:351:ARG:HD2	1:D:394:PHE:CD2	2.15	0.81
3:C:490:LNP:HASB	3:C:490:LNP:CAB	2.10	0.81
1:D:291:ALA:HB2	3:D:490:LNP:CAP	2.10	0.81
1:A:217:ILE:O	1:A:221:LEU:HD11	1.81	0.81

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:447:LEU:H	1:B:447:LEU:CD1	1.93	0.81
1:B:270:TYR:OH	1:B:276:MET:HG3	1.81	0.81
1:A:60:LYS:HE3	1:A:386:LEU:HD11	1.61	0.80
1:D:139:PHE:HD2	1:D:336:MET:HE1	1.46	0.80
1:A:93:ARG:CD	1:A:95:GLU:OE2	2.30	0.80
1:C:320:ARG:HH11	1:C:320:ARG:HG2	1.45	0.80
1:D:309:HIS:HD2	1:D:311:ALA:H	1.28	0.80
1:C:106:MET:HE1	1:C:208:LEU:HD13	1.64	0.80
1:C:214:PHE:O	1:C:215:LEU:CD1	2.30	0.80
1:C:154:MET:HE1	1:C:439:ALA:HA	1.62	0.80
1:A:107:VAL:HG13	1:A:117:ALA:HB2	1.63	0.80
1:B:88:ARG:NH2	1:B:367:VAL:CG1	2.45	0.80
1:A:291:ALA:O	1:A:295:THR:CG2	2.30	0.80
1:B:367:VAL:HG13	1:B:368:LYS:H	1.47	0.80
1:C:475:ARG:CG	1:C:475:ARG:NH1	2.30	0.80
1:D:44:HIS:CD2	1:D:71:ASN:H	1.99	0.80
1:D:113:GLY:H	1:D:117:ALA:CB	1.95	0.80
1:C:237:GLN:HG3	1:C:278:LEU:HD22	1.63	0.79
1:D:94:ASN:H	1:D:94:ASN:ND2	1.80	0.79
1:C:214:PHE:C	1:C:215:LEU:HD12	2.07	0.79
1:D:351:ARG:HA	1:D:388:HIS:CD2	2.17	0.79
1:A:154:MET:HE1	1:A:439:ALA:CA	2.10	0.79
1:B:72:ILE:HG22	1:B:73:VAL:HG23	1.62	0.79
1:A:295:THR:OG1	2:A:482:HEM:HAB	1.81	0.79
1:D:184:PHE:CZ	1:D:289:MET:HE3	2.17	0.79
1:A:336:MET:HE1	1:A:430:LEU:HD13	1.64	0.79
1:D:67:ILE:HD13	1:D:369:VAL:HG11	1.61	0.79
1:D:102:VAL:HG12	1:D:103:TYR:CD2	2.16	0.79
1:D:32:PRO:HA	1:D:372:TYR:HD2	1.48	0.79
1:D:276:MET:SD	1:D:284:MET:HE3	2.22	0.79
1:C:39:VAL:HG12	1:C:40:PRO:CD	2.13	0.79
1:A:447:LEU:C	1:A:448:LEU:HD23	2.08	0.78
1:C:357:LEU:HD11	1:C:462:VAL:HG21	1.64	0.78
1:D:364:MET:HA	1:D:364:MET:CE	2.13	0.78
1:B:287:ALA:HB1	3:B:490:LNP:HBB	1.65	0.78
1:A:157:ASN:O	1:A:158:TRP:HD1	1.66	0.78
1:C:207:SER:HB2	1:C:229:CYS:HB2	1.64	0.78
1:B:126:GLN:O	1:B:284:MET:HE1	1.84	0.78
1:C:258:THR:O	1:C:263:SER:HB2	1.84	0.78
1:C:474:ILE:HG22	1:C:474:ILE:O	1.81	0.78
1:D:113:GLY:H	1:D:117:ALA:HB1	1.47	0.78

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:203:LYS:HE2	1:D:228:ARG:O	1.82	0.78
1:C:274:THR:HG22	1:C:275:PRO:HD2	1.64	0.78
1:A:143:VAL:CG2	1:A:144:PRO:HD3	2.09	0.78
1:A:448:LEU:N	1:A:448:LEU:CD2	2.46	0.78
1:B:447:LEU:H	1:B:447:LEU:HD13	1.49	0.78
1:C:110:PHE:CZ	3:C:490:LNP:CAS	2.66	0.78
1:B:365:ALA:O	1:B:367:VAL:HG23	1.83	0.77
1:C:284:MET:HG2	3:C:490:LNP:HBDA	1.65	0.77
1:A:351:ARG:O	1:A:388:HIS:HD2	1.67	0.77
1:C:143:VAL:HB	1:C:144:PRO:HD3	1.65	0.77
1:D:195:ARG:O	1:D:199:GLN:HG3	1.83	0.77
1:D:32:PRO:HA	1:D:372:TYR:CD2	2.19	0.77
1:D:327:PRO:HD2	1:D:334:ASN:ND2	1.98	0.77
1:B:36:PRO:O	1:B:44:HIS:HE1	1.66	0.77
1:A:241:SER:O	1:A:245:ILE:HG13	1.85	0.77
1:A:389:HIS:HE1	1:A:398:ARG:HH11	1.30	0.77
1:C:291:ALA:CA	3:C:490:LNP:HAO	2.14	0.77
1:B:107:VAL:HB	1:B:108:PRO:HD3	1.66	0.76
1:B:310:PRO:HD3	1:B:447:LEU:HD12	1.66	0.76
1:C:139:PHE:HD1	1:C:142:PHE:HD2	1.33	0.76
1:C:475:ARG:HH11	1:C:475:ARG:HG2	1.49	0.76
1:C:103:TYR:CD2	3:C:490:LNP:HAA	2.21	0.76
3:A:490:LNP:CBH	3:A:490:LNP:HAJ	2.16	0.76
1:D:88:ARG:HA	1:D:88:ARG:HH11	1.50	0.76
1:C:241:SER:CB	1:C:278:LEU:HD11	2.14	0.75
1:C:258:THR:O	1:C:263:SER:CB	2.34	0.75
1:C:291:ALA:HA	3:C:490:LNP:HAO	1.68	0.75
1:A:124:ARG:NH2	1:A:127:LEU:HD13	1.99	0.75
1:B:309:HIS:CD2	1:B:311:ALA:HB3	2.16	0.75
1:C:320:ARG:CG	1:C:320:ARG:NH1	2.42	0.75
1:A:447:LEU:HD22	1:A:449:ARG:HB2	1.69	0.75
1:B:103:TYR:CE1	3:B:490:LNP:HATA	2.22	0.75
1:C:44:HIS:CD2	1:C:71:ASN:H	2.04	0.75
1:B:186:GLU:O	1:B:190:LYS:HG3	1.87	0.75
1:D:272:ASP:OD1	1:D:272:ASP:C	2.29	0.75
1:D:305:LEU:CD2	1:D:453:PRO:HG2	2.17	0.75
1:B:83:PRO:HB2	1:B:408:VAL:HG11	1.68	0.74
1:D:452:VAL:CG1	1:D:453:PRO:HD2	2.14	0.74
1:A:447:LEU:CD2	1:A:449:ARG:HB2	2.17	0.74
1:B:167:LEU:HD11	1:B:304:MET:SD	2.26	0.74
1:B:357:LEU:HD22	1:B:385:LEU:HD22	1.68	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:276:MET:HE3	1:D:281:VAL:HG22	1.67	0.74
1:D:154:MET:O	1:D:158:TRP:CB	2.34	0.74
1:D:284:MET:HA	3:D:490:LNP:HBEA	1.69	0.74
1:B:236:LEU:O	1:B:240:LEU:HG	1.86	0.74
1:B:302:TRP:CZ2	1:B:464:PRO:HB3	2.23	0.74
1:A:447:LEU:HD22	1:A:449:ARG:CB	2.16	0.74
1:C:452:VAL:HG13	1:C:453:PRO:HD2	1.69	0.74
1:B:253:ASN:C	1:B:254:LYS:HD2	2.13	0.74
1:C:270:TYR:HB3	4:C:485:HOH:O	1.87	0.74
1:B:348:GLU:OE1	1:B:348:GLU:HA	1.88	0.74
1:C:103:TYR:CE2	3:C:490:LNP:HAAA	2.21	0.73
1:D:139:PHE:CE2	1:D:430:LEU:HD22	2.23	0.73
1:D:214:PHE:O	1:D:215:LEU:HD12	1.86	0.73
1:D:120:TYR:N	1:D:121:PRO:HD2	2.03	0.73
1:A:471:VAL:CG1	1:A:472:LYS:N	2.51	0.73
1:D:284:MET:HA	3:D:490:LNP:CBE	2.18	0.73
1:D:330:LEU:HD23	1:D:334:ASN:HD22	1.51	0.73
2:C:482:HEM:HMD3	3:C:490:LNP:HAZ	1.71	0.73
1:D:330:LEU:HD23	1:D:334:ASN:ND2	2.03	0.73
1:C:186:GLU:HG3	1:C:189:ARG:HH21	1.52	0.73
3:C:490:LNP:HAK	3:C:490:LNP:HAWB	1.70	0.73
1:D:109:VAL:CG2	1:D:208:LEU:HD21	2.18	0.73
1:D:142:PHE:O	1:D:146:ILE:HG13	1.88	0.73
1:C:291:ALA:CB	3:C:490:LNP:HAO	2.19	0.73
1:C:368:LYS:HD2	1:C:372:TYR:O	1.88	0.72
1:D:67:ILE:CD1	1:D:369:VAL:CG1	2.59	0.72
1:D:250:GLU:HB3	1:D:254:LYS:HD2	1.70	0.72
1:A:177:ASN:OD1	1:A:194:ALA:CB	2.36	0.72
1:B:364:MET:HA	1:B:364:MET:CE	2.17	0.72
1:D:110:PHE:HZ	3:D:490:LNP:HASA	1.53	0.72
1:D:73:VAL:HG11	1:D:215:LEU:CD1	2.18	0.72
1:D:308:MET:HE2	1:D:445:PHE:CB	2.19	0.72
1:C:188:LEU:HD12	1:C:188:LEU:O	1.89	0.72
1:C:351:ARG:CA	1:C:388:HIS:HD2	2.03	0.72
1:A:343:GLU:HB2	1:A:433:LYS:HD3	1.71	0.72
1:A:449:ARG:HG3	4:A:28:HOH:O	1.89	0.72
1:B:305:LEU:HD13	1:B:453:PRO:HG2	1.72	0.72
1:A:175:ILE:HG13	1:A:297:SER:HA	1.71	0.72
1:A:254:LYS:O	1:A:254:LYS:HG2	1.87	0.72
1:B:354:PRO:HG3	1:B:388:HIS:CD2	2.25	0.72
1:C:306:HIS:O	1:C:312:ASN:ND2	2.20	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:115:ALA:H	1:D:126:GLN:HE22	1.38	0.72
1:C:110:PHE:CZ	3:C:490:LNP:HASA	2.23	0.71
1:C:284:MET:HG2	3:C:490:LNP:HBD	1.72	0.71
1:A:93:ARG:HD3	1:A:95:GLU:OE2	1.90	0.71
1:A:289:MET:O	1:A:293:GLN:HB2	1.90	0.71
1:D:146:ILE:CG1	1:D:182:CYS:SG	2.78	0.71
1:A:309:HIS:HD2	1:A:311:ALA:HB3	1.55	0.71
1:D:351:ARG:HA	1:D:388:HIS:HD2	1.55	0.71
1:B:295:THR:OG1	1:B:296:SER:N	2.22	0.71
1:A:291:ALA:O	1:A:295:THR:HG21	1.89	0.71
1:D:204:MET:HE1	1:D:286:VAL:HG11	1.72	0.71
1:D:126:GLN:HB3	1:D:284:MET:HE2	1.71	0.71
1:D:139:PHE:CD2	1:D:336:MET:HE1	2.26	0.71
1:D:210:PRO:O	1:D:213:VAL:HG23	1.89	0.71
1:B:309:HIS:CD2	1:B:311:ALA:HB2	2.24	0.71
1:B:39:VAL:HG12	1:B:40:PRO:HD2	1.73	0.70
1:D:284:MET:CB	3:D:490:LNP:HBEA	2.21	0.70
1:D:326:PHE:CE2	1:D:334:ASN:OD1	2.44	0.70
1:C:291:ALA:HB2	3:C:490:LNP:HAO	1.71	0.70
1:A:336:MET:CE	1:A:430:LEU:HD13	2.20	0.70
1:A:104:SER:O	1:A:107:VAL:HG23	1.91	0.70
1:A:351:ARG:CA	1:A:388:HIS:HD2	2.03	0.70
1:B:260:ASP:C	1:B:260:ASP:OD1	2.29	0.70
1:C:130:LEU:CD2	3:C:490:LNP:HBEB	2.22	0.70
1:B:284:MET:SD	3:B:490:LNP:CBD	2.80	0.70
1:B:453:PRO:HG3	1:B:468:GLN:O	1.91	0.70
1:A:116:TYR:HE1	3:A:490:LNP:HAYA	1.56	0.70
1:D:357:LEU:O	1:D:384:PRO:HD2	1.91	0.70
1:A:357:LEU:O	1:A:384:PRO:HD2	1.92	0.70
1:B:116:TYR:OH	3:B:490:LNP:HAF	1.92	0.70
1:B:344:ARG:HG3	4:B:487:HOH:O	1.92	0.70
1:C:106:MET:CE	1:C:208:LEU:HD22	2.23	0.69
1:B:133:GLU:HG3	1:B:261:LEU:HD12	1.74	0.69
1:C:113:GLY:H	1:C:117:ALA:CB	2.05	0.69
1:C:216:PRO:HG2	4:C:14:HOH:O	1.91	0.69
1:D:139:PHE:O	1:D:143:VAL:HG23	1.93	0.69
1:B:287:ALA:HB1	3:B:490:LNP:CBB	2.23	0.69
1:B:360:MET:O	1:B:361:ARG:NH1	2.25	0.69
1:D:119:PRO:HB2	1:D:121:PRO:HD2	1.72	0.69
1:D:191:ARG:NH2	1:D:242:GLU:OE1	2.25	0.69
3:D:490:LNP:HAXA	3:D:490:LNP:CAT	2.22	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:357:LEU:HD11	1:A:462:VAL:HG21	1.75	0.69
1:A:214:PHE:C	1:A:216:PRO:HD3	2.17	0.69
1:A:426:LYS:O	1:A:430:LEU:HB2	1.91	0.69
1:D:389:HIS:HE1	1:D:398:ARG:NH1	1.78	0.69
1:C:427:PHE:CE2	1:C:431:GLN:NE2	2.61	0.69
3:C:490:LNP:CBH	3:C:490:LNP:HAJ	2.22	0.69
1:D:269:VAL:CG1	1:D:273:GLY:HA2	2.23	0.69
1:D:287:ALA:HB3	3:D:490:LNP:HBBA	1.74	0.69
3:D:490:LNP:HASB	3:D:490:LNP:CAB	2.19	0.69
1:A:61:ARG:O	1:A:64:LYS:NZ	2.23	0.69
1:C:39:VAL:CG1	1:C:40:PRO:HD2	2.17	0.69
1:D:150:VAL:O	1:D:154:MET:CG	2.38	0.69
1:A:93:ARG:CD	1:A:95:GLU:HB2	2.23	0.68
1:A:351:ARG:O	1:A:388:HIS:CD2	2.46	0.68
1:C:67:ILE:CD1	1:C:369:VAL:HG12	2.22	0.68
1:C:309:HIS:ND1	1:C:310:PRO:CD	2.57	0.68
1:C:251:GLU:OE1	1:C:252:VAL:HG23	1.93	0.68
1:D:291:ALA:HB2	3:D:490:LNP:HAO	1.74	0.68
1:A:157:ASN:C	1:A:158:TRP:CD1	2.71	0.68
1:B:302:TRP:CH2	1:B:464:PRO:HB3	2.28	0.68
1:C:375:PRO:O	1:C:378:ASP:HB2	1.94	0.68
1:B:133:GLU:O	1:B:138:LYS:HG3	1.94	0.68
1:A:140:GLN:HA	1:A:140:GLN:NE2	2.08	0.68
1:C:308:MET:HB2	1:C:445:PHE:O	1.93	0.68
1:B:322:GLU:OE1	1:B:339:MET:HG2	1.94	0.67
1:C:44:HIS:HD2	1:C:71:ASN:H	1.40	0.67
3:C:490:LNP:HAF	3:C:490:LNP:HAYA	1.76	0.67
1:C:186:GLU:HG3	1:C:189:ARG:NH2	2.09	0.67
1:B:368:LYS:HE2	1:B:373:VAL:HG22	1.76	0.67
1:B:388:HIS:CE1	1:B:413:ILE:H	2.09	0.67
1:C:186:GLU:CG	1:C:189:ARG:NH2	2.55	0.67
1:C:214:PHE:C	1:C:215:LEU:CD1	2.67	0.67
1:D:175:ILE:HG13	1:D:297:SER:HA	1.76	0.67
1:D:291:ALA:HB2	3:D:490:LNP:CAO	2.24	0.67
1:C:163:GLY:CA	1:C:473:TYR:CE2	2.72	0.67
1:B:284:MET:SD	3:B:490:LNP:HBDA	2.34	0.67
1:A:447:LEU:CD2	1:A:449:ARG:H	2.04	0.67
1:C:128:ASN:O	1:C:132:GLU:HG3	1.95	0.67
1:C:244:ILE:HD11	1:C:266:LEU:HD11	1.76	0.67
1:D:356:LEU:HD11	3:D:490:LNP:HBGA	1.76	0.67
1:A:217:ILE:O	1:A:217:ILE:HG12	1.95	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:86:HIS:O	1:B:90:PHE:HD1	1.78	0.67
1:D:366:ASP:OD1	1:D:376:LYS:N	2.20	0.67
1:D:371:SER:HB2	1:D:372:TYR:CD1	2.30	0.67
1:B:287:ALA:CB	3:B:490:LNP:HBB	2.24	0.66
1:A:62:GLN:C	1:A:64:LYS:NZ	2.53	0.66
1:A:102:VAL:HG11	1:A:360:MET:HB3	1.77	0.66
1:D:73:VAL:O	1:D:73:VAL:HG12	1.95	0.66
1:D:252:VAL:HG12	1:D:252:VAL:O	1.95	0.66
1:C:356:LEU:HD21	3:C:490:LNP:HAWB	1.77	0.66
1:D:109:VAL:HG23	1:D:208:LEU:HD21	1.77	0.66
2:D:482:HEM:HMD2	3:D:490:LNP:HAZ	1.77	0.66
1:D:452:VAL:CG1	1:D:453:PRO:CD	2.72	0.66
1:A:364:MET:CE	1:A:364:MET:N	2.58	0.66
1:A:471:VAL:HG12	1:A:472:LYS:N	2.11	0.66
1:D:139:PHE:CD2	1:D:430:LEU:HD22	2.30	0.66
1:A:395:PRO:HG3	1:A:407:LYS:NZ	2.11	0.66
1:B:322:GLU:OE1	1:B:339:MET:CA	2.44	0.66
1:C:274:THR:CG2	1:C:275:PRO:HD2	2.26	0.66
1:B:184:PHE:O	1:B:189:ARG:NH1	2.28	0.66
1:D:102:VAL:HG12	1:D:103:TYR:CE2	2.31	0.66
1:D:308:MET:HE2	1:D:445:PHE:HB2	1.77	0.65
1:A:291:ALA:O	1:A:295:THR:HG23	1.95	0.65
1:C:154:MET:O	1:C:158:TRP:HB2	1.96	0.65
1:C:352:ARG:HG2	1:C:352:ARG:NH1	1.96	0.65
1:D:305:LEU:HD23	1:D:453:PRO:HG2	1.77	0.65
1:A:217:ILE:O	1:A:221:LEU:CD1	2.44	0.65
1:D:36:PRO:O	1:D:44:HIS:HE1	1.79	0.65
1:D:276:MET:SD	1:D:284:MET:CE	2.83	0.65
1:B:30:LYS:O	1:B:373:VAL:N	2.29	0.65
1:C:187:ASP:OD1	1:C:188:LEU:N	2.29	0.65
1:B:176:ILE:HD13	1:B:176:ILE:O	1.97	0.65
1:C:239:ILE:O	1:C:243:ILE:HG12	1.97	0.65
1:D:287:ALA:CB	3:D:490:LNP:CBB	2.73	0.65
1:B:102:VAL:HG11	1:B:360:MET:HB2	1.78	0.65
1:B:159:ASP:OD1	1:B:160:LYS:N	2.30	0.65
1:C:176:ILE:HG23	1:C:194:ALA:HB1	1.78	0.65
1:C:356:LEU:CD2	3:C:490:LNP:HAWB	2.27	0.65
1:A:447:LEU:HD22	1:A:449:ARG:CA	2.26	0.65
1:A:177:ASN:OD1	1:A:194:ALA:HB2	1.97	0.65
1:C:73:VAL:O	1:C:73:VAL:CG1	2.39	0.65
1:D:207:SER:CB	1:D:229:CYS:HB2	2.27	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:282:CYS:O	1:D:286:VAL:HG23	1.97	0.65
1:A:429:LEU:O	1:A:433:LYS:HG3	1.96	0.64
2:A:482:HEM:HBC2	2:A:482:HEM:CMC	2.21	0.64
1:C:445:PHE:HD2	1:C:471:VAL:HG11	1.62	0.64
1:D:359:LEU:HD22	2:D:482:HEM:HBA2	1.78	0.64
1:A:447:LEU:CD2	1:A:449:ARG:CB	2.74	0.64
1:D:32:PRO:HG3	1:D:372:TYR:HB2	1.80	0.64
1:D:356:LEU:CD2	3:D:490:LNP:HAM	2.22	0.64
1:D:323:ILE:HA	1:D:326:PHE:CD1	2.32	0.64
1:A:57:GLN:O	1:A:61:ARG:HG3	1.97	0.64
1:A:351:ARG:CA	1:A:388:HIS:CD2	2.74	0.64
1:A:364:MET:N	1:A:364:MET:HE3	2.12	0.64
1:C:287:ALA:HB1	3:C:490:LNP:HBBA	1.79	0.64
1:A:331:ASN:ND2	1:A:334:ASN:OD1	2.30	0.64
1:B:88:ARG:HH22	1:B:367:VAL:CG1	2.09	0.64
1:D:67:ILE:CD1	1:D:369:VAL:HG12	2.26	0.64
1:A:143:VAL:CG2	1:A:144:PRO:HD2	2.21	0.64
1:B:241:SER:HB3	1:B:278:LEU:HD11	1.79	0.64
1:C:139:PHE:CD1	1:C:142:PHE:HD2	2.13	0.64
1:C:184:PHE:O	1:C:189:ARG:NH1	2.30	0.64
1:D:365:ALA:O	1:D:367:VAL:HG13	1.98	0.64
1:A:93:ARG:HG3	1:A:95:GLU:HB2	1.79	0.64
1:C:368:LYS:HE2	1:C:370:GLY:O	1.98	0.64
1:C:225:GLN:HG3	1:C:228:ARG:HH21	1.63	0.64
1:C:287:ALA:HB1	3:C:490:LNP:HAZA	1.79	0.64
1:B:181:GLN:HA	1:B:189:ARG:NH1	2.13	0.64
1:B:389:HIS:ND1	1:B:397:PRO:HB2	2.13	0.64
1:D:252:VAL:HG23	4:D:25:HOH:O	1.97	0.64
1:D:284:MET:CA	3:D:490:LNP:HBEA	2.27	0.64
1:D:464:PRO:HB2	1:D:469:CYS:SG	2.38	0.64
1:A:92:PRO:CB	1:A:96:VAL:CG2	2.76	0.63
1:C:330:LEU:HA	1:C:334:ASN:HD22	1.62	0.63
1:A:351:ARG:C	1:A:388:HIS:HD2	2.06	0.63
1:B:120:TYR:N	1:B:121:PRO:CD	2.61	0.63
1:C:103:TYR:CZ	3:C:490:LNP:HATA	2.33	0.63
1:D:203:LYS:HD3	1:D:232:ALA:HB2	1.79	0.63
1:C:139:PHE:HD1	1:C:142:PHE:CD2	2.15	0.63
1:C:207:SER:CB	1:C:229:CYS:HB2	2.28	0.63
1:A:93:ARG:CG	1:A:95:GLU:HB2	2.28	0.63
1:C:109:VAL:HG23	1:C:208:LEU:HD21	1.80	0.63
1:B:143:VAL:HG11	1:B:331:ASN:O	1.97	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:351:ARG:O	1:B:388:HIS:CD2	2.51	0.63
1:B:389:HIS:CE1	1:B:398:ARG:NH1	2.63	0.63
1:B:331:ASN:ND2	1:B:333:ASN:H	1.97	0.63
3:C:490:LNP:OBH	3:C:490:LNP:HAT	1.98	0.63
1:D:184:PHE:HZ	1:D:289:MET:HE3	1.64	0.63
1:B:167:LEU:HD21	1:B:304:MET:HB3	1.79	0.63
1:C:154:MET:HE1	1:C:439:ALA:CA	2.29	0.63
1:C:320:ARG:HG3	1:C:320:ARG:NH1	2.09	0.63
3:C:490:LNP:HAJ	3:C:490:LNP:HBH	1.80	0.63
1:B:44:HIS:HD2	1:B:71:ASN:N	1.84	0.62
1:D:94:ASN:H	1:D:94:ASN:HD22	1.46	0.62
1:A:363:VAL:C	1:A:364:MET:HE3	2.24	0.62
3:A:490:LNP:HAYA	3:A:490:LNP:HAF	1.80	0.62
1:D:250:GLU:O	1:D:254:LYS:N	2.28	0.62
1:A:351:ARG:HD2	1:A:394:PHE:CE2	2.34	0.62
1:A:309:HIS:CD2	1:A:311:ALA:HB3	2.34	0.62
1:B:447:LEU:HD13	1:B:447:LEU:N	2.14	0.62
1:D:456:ASP:OD2	1:D:458:HIS:CE1	2.52	0.62
1:A:376:LYS:HG3	1:A:377:GLY:N	2.13	0.62
1:B:447:LEU:CD2	1:B:449:ARG:O	2.32	0.62
1:D:326:PHE:CD2	1:D:334:ASN:CG	2.77	0.62
1:C:247:ARG:O	1:C:251:GLU:N	2.27	0.62
1:C:204:MET:HE1	1:C:286:VAL:HG11	1.80	0.62
1:D:389:HIS:CE1	1:D:398:ARG:NH1	2.60	0.62
1:A:446:GLN:O	1:A:471:VAL:HG13	1.98	0.62
1:D:360:MET:HG2	1:D:381:ALA:HB2	1.81	0.62
1:A:331:ASN:ND2	1:A:334:ASN:CG	2.57	0.61
1:B:114:VAL:N	1:B:117:ALA:HB3	2.15	0.61
1:B:159:ASP:OD1	1:B:160:LYS:HG2	2.00	0.61
1:B:310:PRO:O	1:B:313:VAL:HG23	2.00	0.61
1:A:66:GLY:O	1:A:81:GLY:N	2.33	0.61
1:C:185:GLY:O	1:C:189:ARG:HG3	2.01	0.61
1:A:124:ARG:NH2	1:A:127:LEU:CD1	2.60	0.61
1:B:88:ARG:NH2	1:B:367:VAL:HG13	2.15	0.61
1:B:58:GLU:OE1	1:B:61:ARG:NH2	2.34	0.61
1:B:287:ALA:CB	3:B:490:LNP:CBB	2.78	0.61
1:C:328:ALA:HA	1:C:441:ARG:NH2	2.11	0.61
1:C:351:ARG:NH2	1:C:397:PRO:O	2.33	0.61
1:D:146:ILE:HG23	1:D:178:THR:HB	1.82	0.61
1:A:207:SER:CB	1:A:229:CYS:HB2	2.30	0.61
1:B:400:TRP:CE3	1:B:400:TRP:O	2.54	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:136:ILE:CG2	1:D:332:TYR:OH	2.44	0.61
1:A:442:SER:C	1:A:443:TYR:CD1	2.78	0.61
1:C:173:THR:O	1:C:176:ILE:HG22	2.01	0.61
1:D:87:SER:HB2	1:D:91:LEU:CD1	2.30	0.61
1:A:181:GLN:OE1	1:A:189:ARG:CZ	2.49	0.61
1:A:447:LEU:CD2	1:A:449:ARG:N	2.61	0.61
1:B:113:GLY:H	1:B:117:ALA:CB	2.11	0.61
1:C:445:PHE:HD2	1:C:471:VAL:CG1	2.12	0.61
1:C:448:LEU:N	1:C:448:LEU:HD23	2.15	0.61
1:A:265:LEU:O	1:A:276:MET:HE2	2.01	0.61
1:A:287:ALA:HB1	3:A:490:LNP:HAZA	1.81	0.61
1:B:109:VAL:CG2	1:B:208:LEU:HD21	2.31	0.61
1:B:454:ASP:N	1:B:468:GLN:OE1	2.34	0.61
1:C:102:VAL:HG12	1:C:103:TYR:CE1	2.35	0.61
1:C:191:ARG:HA	1:C:191:ARG:NE	2.15	0.61
1:D:110:PHE:CZ	3:D:490:LNP:HASA	2.35	0.61
1:D:428:GLY:O	1:D:432:VAL:HG23	2.01	0.61
1:A:67:ILE:HD12	1:A:67:ILE:N	2.16	0.61
1:B:364:MET:CE	1:B:364:MET:CA	2.79	0.61
1:A:115:ALA:HB2	3:A:490:LNP:HBDA	1.83	0.61
1:A:125:GLU:OE1	1:A:271:ARG:HD3	2.01	0.61
1:A:265:LEU:O	1:A:276:MET:CE	2.49	0.61
1:B:364:MET:HE2	1:B:364:MET:CA	2.21	0.61
1:B:366:ASP:OD1	1:B:376:LYS:N	2.30	0.61
1:C:359:LEU:HD22	2:C:482:HEM:HBA2	1.81	0.61
1:A:240:LEU:HD12	1:A:282:CYS:HB2	1.83	0.60
1:D:451:GLU:OE1	1:D:451:GLU:HA	2.00	0.60
1:B:401:ASP:O	1:B:404:ARG:HG2	2.01	0.60
1:A:475:ARG:HB2	1:A:475:ARG:NH1	2.17	0.60
1:B:295:THR:OG1	2:B:482:HEM:HAB	2.02	0.60
1:C:302:TRP:O	1:C:306:HIS:CD2	2.55	0.60
3:D:490:LNP:HAYA	3:D:490:LNP:HAF	1.81	0.60
1:A:92:PRO:HB3	1:A:96:VAL:HG23	1.81	0.60
1:D:330:LEU:HD22	1:D:334:ASN:HB3	1.82	0.60
1:A:292:GLY:HA2	2:A:482:HEM:HMC1	1.83	0.60
1:B:148:HIS:C	1:B:148:HIS:CD2	2.80	0.60
1:B:437:ALA:O	1:B:441:ARG:HB2	2.01	0.60
1:C:352:ARG:CG	1:C:352:ARG:NH1	2.49	0.60
1:D:184:PHE:O	1:D:189:ARG:NH1	2.34	0.60
1:D:363:VAL:HG21	1:D:374:VAL:HG11	1.83	0.60
1:D:458:HIS:CD2	1:D:459:THR:HG23	2.36	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:351:ARG:HD2	1:B:394:PHE:CD2	2.36	0.60
1:C:191:ARG:HA	1:C:191:ARG:HE	1.65	0.60
1:D:176:ILE:HB	1:D:293:GLN:HE22	1.67	0.60
1:A:331:ASN:HD22	1:A:331:ASN:N	1.99	0.60
1:C:154:MET:O	1:C:158:TRP:N	2.34	0.60
1:C:356:LEU:HD23	3:C:490:LNP:HAL	1.83	0.60
1:D:102:VAL:HG12	1:D:103:TYR:HD2	1.64	0.60
1:D:164:GLU:HG3	1:D:448:LEU:HD11	1.82	0.60
1:B:306:HIS:HB3	1:B:400:TRP:CE3	2.37	0.60
1:C:351:ARG:O	1:C:388:HIS:HD2	1.85	0.60
1:D:266:LEU:HD23	1:D:281:VAL:HG21	1.83	0.60
1:B:103:TYR:CE1	3:B:490:LNP:CAT	2.85	0.60
1:C:113:GLY:H	1:C:117:ALA:HB3	1.67	0.60
1:C:352:ARG:HH12	1:C:398:ARG:CZ	2.14	0.60
1:C:356:LEU:HG	3:C:490:LNP:HAW	1.84	0.60
1:C:396:GLU:N	1:C:397:PRO:HD3	2.17	0.60
1:D:331:ASN:OD1	1:D:334:ASN:CG	2.45	0.60
1:A:251:GLU:HA	1:A:256:SER:H	1.66	0.59
1:A:471:VAL:HG13	1:A:472:LYS:H	1.67	0.59
1:B:120:TYR:HB2	1:B:121:PRO:HD3	1.83	0.59
2:B:482:HEM:HAD1	3:B:490:LNP:HAYB	1.83	0.59
1:C:352:ARG:HD2	1:C:400:TRP:HB2	1.84	0.59
1:D:160:LYS:H	1:D:160:LYS:HD3	1.67	0.59
1:B:320:ARG:HA	1:B:323:ILE:HG12	1.84	0.59
1:C:106:MET:HE2	1:C:106:MET:CA	2.21	0.59
1:A:157:ASN:O	1:A:158:TRP:CD1	2.52	0.59
1:C:110:PHE:CZ	3:C:490:LNP:HAS	2.37	0.59
1:C:448:LEU:O	1:C:449:ARG:CG	2.45	0.59
1:B:388:HIS:HE1	1:B:413:ILE:N	1.95	0.59
1:A:295:THR:OG1	2:A:482:HEM:CAB	2.49	0.59
1:B:309:HIS:O	1:B:312:ASN:O	2.21	0.59
1:B:103:TYR:CD1	3:B:490:LNP:CAT	2.85	0.59
1:B:193:ASP:OD1	1:B:196:ARG:CB	2.49	0.59
1:B:362:LYS:HG3	1:B:364:MET:CE	2.33	0.59
1:D:110:PHE:HZ	3:D:490:LNP:CAS	2.14	0.59
1:D:241:SER:O	1:D:245:ILE:HG13	2.02	0.59
1:B:270:TYR:OH	1:B:276:MET:CG	2.51	0.59
1:B:310:PRO:HD3	1:B:447:LEU:CD1	2.33	0.59
1:C:407:LYS:HG2	4:C:27:HOH:O	2.03	0.59
3:A:490:LNP:HAYA	3:A:490:LNP:HAS	1.84	0.59
1:D:382:CYS:O	1:D:384:PRO:HD3	2.03	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:103:TYR:CE2	3:C:490:LNP:CAA	2.86	0.58
1:B:415:PHE:CD2	1:B:425:GLN:HB3	2.38	0.58
1:D:335:VAL:HG11	1:D:430:LEU:HD12	1.85	0.58
1:D:363:VAL:HG21	1:D:374:VAL:CG1	2.33	0.58
1:A:441:ARG:CG	4:A:21:HOH:O	2.36	0.58
1:C:323:ILE:HA	1:C:326:PHE:CD1	2.39	0.58
1:C:351:ARG:HH22	1:C:397:PRO:C	2.10	0.58
1:D:86:HIS:CE1	1:D:387:SER:HB3	2.39	0.58
1:D:172:SER:HA	1:D:297:SER:HB2	1.84	0.58
1:D:350:ILE:HG23	1:D:355:PRO:HD2	1.86	0.58
1:A:62:GLN:HA	1:A:64:LYS:NZ	2.19	0.58
1:B:103:TYR:CD1	3:B:490:LNP:HATA	2.38	0.58
1:B:109:VAL:HG23	1:B:208:LEU:HD21	1.85	0.58
1:C:222:PRO:O	1:C:223:LEU:HD23	2.03	0.58
1:C:319:LEU:O	1:C:323:ILE:HG12	2.04	0.58
1:A:109:VAL:HG13	1:A:286:VAL:HG11	1.86	0.58
1:B:105:PHE:HA	1:B:219:LEU:HD21	1.86	0.58
3:B:490:LNP:HAXA	3:B:490:LNP:CAT	2.29	0.58
1:C:103:TYR:HD2	3:C:490:LNP:HAA	1.68	0.58
1:C:287:ALA:HB3	3:C:490:LNP:HBBA	1.85	0.58
1:C:441:ARG:HD2	1:C:441:ARG:O	2.03	0.58
1:D:120:TYR:N	1:D:121:PRO:CD	2.67	0.58
1:D:284:MET:CG	3:D:490:LNP:HBEA	2.34	0.58
1:A:94:ASN:O	1:A:98:SER:HB2	2.04	0.58
1:A:218:LEU:HA	1:A:221:LEU:CD1	2.34	0.58
1:A:43:GLY:HA3	1:A:71:ASN:O	2.04	0.58
1:A:142:PHE:O	1:A:146:ILE:HG13	2.03	0.58
3:A:490:LNP:HAJ	3:A:490:LNP:HBH	1.84	0.58
1:B:331:ASN:ND2	1:B:333:ASN:N	2.51	0.58
3:B:490:LNP:CAB	3:B:490:LNP:CAS	2.71	0.58
1:C:83:PRO:HB2	1:C:408:VAL:HG11	1.86	0.58
1:A:91:LEU:N	1:A:92:PRO:CD	2.66	0.57
1:A:437:ALA:O	1:A:441:ARG:HB2	2.04	0.57
1:C:102:VAL:CG1	1:C:103:TYR:CD1	2.73	0.57
1:A:96:VAL:O	1:A:97:LEU:HD23	2.04	0.57
1:D:427:PHE:O	1:D:431:GLN:HG3	2.04	0.57
1:A:45:ILE:HD13	1:D:221:LEU:CD2	2.34	0.57
1:B:440:PHE:HA	1:B:443:TYR:O	2.03	0.57
1:B:193:ASP:OD1	1:B:193:ASP:N	2.36	0.57
1:B:265:LEU:HD23	4:B:7:HOH:O	2.04	0.57
1:A:92:PRO:CB	1:A:96:VAL:HG23	2.34	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:107:VAL:HG13	1:A:117:ALA:CB	2.34	0.57
1:B:331:ASN:HD21	1:B:334:ASN:H	1.51	0.57
1:B:367:VAL:HG12	1:B:368:LYS:H	1.41	0.57
1:D:109:VAL:HG21	1:D:208:LEU:HD21	1.85	0.57
1:A:93:ARG:HG3	1:A:95:GLU:H	1.70	0.57
1:B:351:ARG:HD2	1:B:394:PHE:CE2	2.40	0.57
1:A:62:GLN:HG2	4:A:489:HOH:O	2.04	0.57
1:A:376:LYS:C	1:A:378:ASP:H	2.10	0.57
1:A:471:VAL:CG1	1:A:472:LYS:H	2.17	0.57
1:B:143:VAL:HB	1:B:144:PRO:HD3	1.86	0.57
1:C:39:VAL:CG1	1:C:40:PRO:CD	2.80	0.57
1:A:320:ARG:O	1:A:324:GLU:HB2	2.05	0.57
1:A:447:LEU:HD23	1:A:448:LEU:N	2.20	0.57
1:C:265:LEU:O	1:C:276:MET:CE	2.48	0.57
1:A:63:LEU:N	1:A:64:LYS:HZ2	2.03	0.57
1:A:357:LEU:C	1:A:384:PRO:HD2	2.30	0.57
1:D:31:LEU:HD22	1:D:375:PRO:HG3	1.86	0.57
1:D:308:MET:HE2	1:D:445:PHE:HB3	1.86	0.57
1:D:326:PHE:CD2	1:D:334:ASN:OD1	2.58	0.57
1:B:310:PRO:CD	1:B:447:LEU:CD1	2.83	0.56
1:D:148:HIS:O	1:D:152:LYS:HG3	2.05	0.56
1:D:309:HIS:HE1	1:D:451:GLU:OE1	1.87	0.56
1:A:442:SER:O	1:A:443:TYR:CG	2.58	0.56
1:B:102:VAL:HG12	1:B:103:TYR:CD1	2.40	0.56
1:D:287:ALA:HB3	3:D:490:LNP:CBB	2.33	0.56
1:A:259:SER:HA	1:A:263:SER:OG	2.03	0.56
1:C:396:GLU:N	1:C:397:PRO:CD	2.68	0.56
1:D:107:VAL:O	1:D:110:PHE:O	2.24	0.56
1:D:143:VAL:HB	1:D:144:PRO:HD3	1.87	0.56
1:D:389:HIS:HA	1:D:397:PRO:HB3	1.85	0.56
1:D:427:PHE:CD2	1:D:431:GLN:NE2	2.72	0.56
1:A:215:LEU:O	1:A:218:LEU:HB2	2.06	0.56
1:C:320:ARG:HG2	1:C:320:ARG:NH1	2.16	0.56
1:A:93:ARG:O	1:A:96:VAL:HG22	2.06	0.56
1:B:270:TYR:HD1	1:B:274:THR:O	1.88	0.56
1:C:287:ALA:CB	3:C:490:LNP:CBB	2.82	0.56
1:C:412:PHE:C	1:C:412:PHE:CD2	2.83	0.56
1:A:295:THR:OG1	1:A:296:SER:N	2.36	0.56
1:C:390:ASP:OD1	1:C:390:ASP:C	2.49	0.56
1:A:62:GLN:CA	1:A:64:LYS:NZ	2.68	0.56
1:A:90:PHE:O	1:A:419:VAL:HG23	2.06	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:331:ASN:ND2	1:A:334:ASN:ND2	2.53	0.56
1:A:364:MET:HA	1:A:364:MET:HE2	0.67	0.56
1:C:101:GLU:H	1:C:101:GLU:CD	2.14	0.56
1:C:309:HIS:CE1	1:C:310:PRO:HD2	2.39	0.56
1:C:339:MET:HE2	1:C:342:ALA:HB3	1.87	0.56
1:D:368:LYS:HD2	1:D:373:VAL:CG2	2.36	0.56
1:B:114:VAL:H	1:B:117:ALA:HB3	1.70	0.56
1:C:92:PRO:HG2	1:C:97:LEU:HD12	1.88	0.56
1:D:272:ASP:OD1	1:D:274:THR:N	2.29	0.56
1:D:131:ALA:HB2	1:D:423:ILE:HD12	1.88	0.56
1:D:327:PRO:CD	1:D:334:ASN:HD21	2.12	0.56
1:A:44:HIS:HD2	1:A:70:ILE:HB	1.71	0.56
1:C:103:TYR:CD2	3:C:490:LNP:CAA	2.88	0.56
1:C:120:TYR:HB2	1:C:121:PRO:HD3	1.88	0.56
1:C:246:ALA:O	1:C:250:GLU:HG3	2.06	0.56
1:A:87:SER:O	1:A:88:ARG:C	2.45	0.55
1:B:113:GLY:N	1:B:117:ALA:HB1	2.13	0.55
1:B:384:PRO:O	1:B:388:HIS:HB2	2.06	0.55
1:A:85:GLU:OE1	1:A:88:ARG:HG3	2.06	0.55
1:A:395:PRO:HG3	1:A:407:LYS:HZ2	1.70	0.55
1:C:120:TYR:O	1:C:123:MET:HB3	2.07	0.55
1:B:426:LYS:HE3	1:C:409:GLU:OE1	2.06	0.55
1:B:330:LEU:HD22	1:B:334:ASN:CB	2.35	0.55
1:B:362:LYS:HG3	1:B:364:MET:HE3	1.88	0.55
1:C:113:GLY:H	1:C:117:ALA:HB1	1.71	0.55
1:C:154:MET:HG2	1:C:158:TRP:CE3	2.42	0.55
1:D:155:ALA:O	1:D:159:ASP:HB3	2.06	0.55
1:B:110:PHE:O	1:B:233:ARG:NH2	2.38	0.55
1:D:122:ARG:HD2	1:D:270:TYR:CE2	2.41	0.55
1:D:274:THR:HG22	1:D:275:PRO:N	2.21	0.55
1:B:145:ALA:O	1:B:148:HIS:HB3	2.07	0.55
1:C:268:ALA:HB3	1:C:276:MET:CE	2.37	0.55
1:C:305:LEU:HD13	1:C:453:PRO:HG2	1.87	0.55
1:D:269:VAL:HG13	1:D:273:GLY:C	2.31	0.55
1:A:33:PRO:HB2	1:A:63:LEU:HD13	1.88	0.55
1:C:339:MET:HE2	1:C:342:ALA:CB	2.37	0.55
1:D:115:ALA:H	1:D:126:GLN:NE2	2.05	0.55
1:D:331:ASN:OD1	1:D:334:ASN:ND2	2.39	0.55
1:A:317:GLU:HB3	1:A:321:LYS:NZ	2.22	0.55
1:C:163:GLY:HA3	1:C:473:TYR:CE1	2.37	0.55
1:D:278:LEU:HD23	1:D:278:LEU:O	2.07	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:371:SER:HB2	1:D:372:TYR:CE1	2.42	0.55
1:A:139:PHE:HA	1:A:142:PHE:HB2	1.88	0.55
1:A:139:PHE:CE2	1:A:430:LEU:HD22	2.42	0.55
1:D:43:GLY:HA3	1:D:71:ASN:O	2.07	0.55
1:D:176:ILE:HG23	1:D:177:ASN:N	2.20	0.55
1:A:188:LEU:HD13	1:A:243:ILE:HG13	1.89	0.55
1:A:351:ARG:HD2	1:A:394:PHE:CD2	2.42	0.55
1:D:448:LEU:HD21	1:D:472:LYS:HB2	1.89	0.55
1:A:61:ARG:C	1:A:64:LYS:HZ1	2.12	0.54
1:B:184:PHE:CG	1:B:188:LEU:HD23	2.42	0.54
1:C:336:MET:HE1	1:C:430:LEU:HD13	1.89	0.54
1:D:98:SER:OG	1:D:120:TYR:OH	2.20	0.54
1:D:107:VAL:N	1:D:108:PRO:HD2	2.22	0.54
1:A:447:LEU:CD2	1:A:449:ARG:HG3	2.37	0.54
1:D:58:GLU:OE2	1:D:61:ARG:NH2	2.37	0.54
1:A:356:LEU:HD11	3:A:490:LNP:CBG	2.29	0.54
1:A:396:GLU:N	1:A:397:PRO:HD3	2.22	0.54
1:B:114:VAL:HG22	1:B:280:GLU:HG3	1.88	0.54
1:B:150:VAL:HG11	1:B:438:THR:HB	1.89	0.54
1:B:276:MET:HG2	1:B:280:GLU:CB	2.31	0.54
1:D:92:PRO:HG2	1:D:97:LEU:HD12	1.89	0.54
1:D:235:GLU:O	1:D:239:ILE:HG13	2.08	0.54
1:A:331:ASN:ND2	1:A:331:ASN:N	2.55	0.54
1:B:317:GLU:O	1:B:321:LYS:HG2	2.06	0.54
1:B:322:GLU:OE1	1:B:339:MET:CB	2.56	0.54
1:C:159:ASP:N	1:C:159:ASP:OD1	2.38	0.54
1:C:394:PHE:O	1:C:397:PRO:HD3	2.08	0.54
1:A:92:PRO:HB2	1:A:97:LEU:HG	1.90	0.54
1:A:160:LYS:HG2	1:A:473:TYR:OH	2.08	0.54
1:D:104:SER:O	1:D:106:MET:N	2.41	0.54
1:D:214:PHE:C	1:D:215:LEU:HD12	2.32	0.54
1:B:270:TYR:OH	1:B:276:MET:SD	2.65	0.54
1:C:351:ARG:O	1:C:388:HIS:CD2	2.60	0.54
1:A:452:VAL:HG13	1:A:453:PRO:CD	2.32	0.54
1:B:142:PHE:CD1	1:B:182:CYS:HB3	2.42	0.54
1:D:286:VAL:O	1:D:290:PHE:HB2	2.08	0.54
1:D:291:ALA:CB	3:D:490:LNP:HAO	2.38	0.54
1:D:357:LEU:HD22	1:D:385:LEU:HD22	1.88	0.54
1:B:277:SER:O	1:B:280:GLU:N	2.41	0.54
1:C:384:PRO:O	1:C:388:HIS:ND1	2.41	0.54
1:A:181:GLN:HA	1:A:189:ARG:NH1	2.23	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:307:LEU:CD2	1:B:400:TRP:HH2	2.16	0.54
1:D:363:VAL:HG12	1:D:376:LYS:HA	1.90	0.54
1:B:105:PHE:HZ	3:B:490:LNP:HAXB	1.73	0.53
1:B:158:TRP:CZ3	1:B:445:PHE:HZ	2.26	0.53
1:A:64:LYS:CE	1:A:64:LYS:CA	2.82	0.53
1:A:103:TYR:CD1	3:A:490:LNP:HATA	2.43	0.53
1:B:145:ALA:HB1	1:B:181:GLN:HG3	1.90	0.53
1:B:306:HIS:HB3	1:B:400:TRP:CD2	2.42	0.53
1:B:452:VAL:HG13	1:B:453:PRO:HD2	1.91	0.53
1:D:284:MET:CB	3:D:490:LNP:CBE	2.85	0.53
1:D:316:LEU:O	1:D:319:LEU:HB3	2.07	0.53
1:C:106:MET:CE	1:C:208:LEU:CD2	2.86	0.53
1:C:180:CYS:O	1:C:184:PHE:HB2	2.08	0.53
1:C:196:ARG:O	1:C:200:LEU:HG	2.08	0.53
1:C:351:ARG:HG2	1:C:388:HIS:CD2	2.44	0.53
1:C:385:LEU:O	1:C:389:HIS:HD2	1.92	0.53
1:D:102:VAL:HG11	1:D:360:MET:HB2	1.89	0.53
1:A:136:ILE:HG23	1:A:332:TYR:CZ	2.43	0.53
1:A:218:LEU:HD23	1:A:218:LEU:O	2.09	0.53
1:B:295:THR:OG1	2:B:482:HEM:CAB	2.57	0.53
1:B:331:ASN:ND2	1:B:334:ASN:H	2.07	0.53
1:D:185:GLY:O	1:D:188:LEU:N	2.40	0.53
1:D:301:THR:O	1:D:305:LEU:CD1	2.57	0.53
2:D:482:HEM:CMD	3:D:490:LNP:HAZ	2.38	0.53
1:B:39:VAL:HG12	1:B:40:PRO:CD	2.38	0.53
1:B:44:HIS:HB3	1:B:55:PHE:CZ	2.44	0.53
1:B:351:ARG:CA	1:B:388:HIS:CD2	2.88	0.53
1:A:314:LYS:HE2	1:A:314:LYS:HA	1.90	0.53
1:A:447:LEU:HD21	1:A:449:ARG:CG	2.39	0.53
1:A:453:PRO:HG3	1:A:468:GLN:O	2.09	0.53
1:C:456:ASP:OD1	1:C:456:ASP:C	2.52	0.53
1:B:115:ALA:HA	1:B:123:MET:HG3	1.89	0.53
1:B:243:ILE:HG22	1:B:243:ILE:O	2.09	0.53
1:C:176:ILE:CD1	1:C:198:ALA:CB	2.84	0.53
1:D:143:VAL:HG21	1:D:332:TYR:HA	1.91	0.53
1:D:246:ALA:O	1:D:249:GLU:HB3	2.09	0.53
1:D:309:HIS:CD2	1:D:310:PRO:HD2	2.43	0.53
1:A:90:PHE:HB3	1:A:417:ALA:O	2.09	0.53
1:B:173:THR:O	1:B:177:ASN:OD1	2.27	0.53
1:D:351:ARG:HD2	1:D:394:PHE:CE2	2.44	0.53
1:A:217:ILE:O	1:A:217:ILE:CG1	2.57	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:111:GLY:O	1:B:112:GLU:C	2.53	0.52
1:B:181:GLN:HA	1:B:189:ARG:HH11	1.74	0.52
1:B:351:ARG:O	1:B:388:HIS:HD2	1.91	0.52
1:C:106:MET:HE1	1:C:208:LEU:CD2	2.39	0.52
1:D:44:HIS:HB3	1:D:55:PHE:CZ	2.45	0.52
1:D:167:LEU:HD23	1:D:305:LEU:HD11	1.90	0.52
1:B:356:LEU:HD11	3:B:490:LNP:HBGA	1.91	0.52
2:B:482:HEM:HBC2	2:B:482:HEM:CMC	2.39	0.52
1:C:106:MET:HE1	1:C:208:LEU:HD11	1.87	0.52
1:D:102:VAL:C	1:D:103:TYR:HD2	2.18	0.52
1:A:86:HIS:O	1:A:89:PHE:HB3	2.10	0.52
1:A:95:GLU:O	1:A:364:MET:HB2	2.09	0.52
1:A:215:LEU:N	1:A:216:PRO:HD3	2.24	0.52
1:D:80:VAL:HG12	1:D:80:VAL:O	2.10	0.52
1:A:62:GLN:CA	1:A:64:LYS:HZ1	2.23	0.52
1:C:103:TYR:HE2	3:C:490:LNP:HAAA	1.71	0.52
1:B:423:ILE:HD11	2:B:482:HEM:HMD2	1.91	0.52
1:C:109:VAL:CG2	1:C:208:LEU:HD21	2.40	0.52
1:B:284:MET:SD	3:B:490:LNP:HBD	2.49	0.52
1:B:365:ALA:O	1:B:366:ASP:C	2.51	0.52
1:D:159:ASP:OD1	1:D:160:LYS:HD3	2.09	0.52
1:B:78:THR:HG21	1:B:374:VAL:HG22	1.92	0.52
1:B:104:SER:HA	1:B:107:VAL:HG23	1.92	0.52
1:B:244:ILE:HD13	1:B:266:LEU:HD11	1.92	0.52
1:C:401:ASP:OD1	1:C:401:ASP:C	2.52	0.52
1:D:448:LEU:HD12	1:D:470:ARG:HB3	1.91	0.52
1:A:120:TYR:N	1:A:121:PRO:CD	2.73	0.52
1:B:135:THR:O	1:B:138:LYS:N	2.36	0.52
1:C:389:HIS:HA	1:C:397:PRO:HB3	1.92	0.52
1:D:173:THR:O	1:D:176:ILE:CG2	2.55	0.52
1:A:31:LEU:HD23	1:A:373:VAL:O	2.10	0.52
1:A:175:ILE:HG13	1:A:297:SER:CA	2.40	0.52
1:B:134:LEU:O	1:B:139:PHE:HE1	1.93	0.52
1:C:107:VAL:HB	1:C:108:PRO:HD3	1.92	0.52
1:C:356:LEU:CD2	3:C:490:LNP:CAW	2.88	0.52
1:D:53:LEU:O	1:D:57:GLN:HB2	2.10	0.52
1:D:326:PHE:HE2	1:D:334:ASN:OD1	1.93	0.52
1:A:453:PRO:HB2	1:A:464:PRO:HB2	1.90	0.52
1:B:330:LEU:HD22	1:B:334:ASN:HB3	1.91	0.52
1:C:141:ASN:O	1:C:144:PRO:HD2	2.10	0.52
1:D:87:SER:HB2	1:D:91:LEU:HD11	1.91	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:139:PHE:CE2	1:B:430:LEU:HD22	2.45	0.51
1:B:225:GLN:O	1:B:228:ARG:N	2.35	0.51
1:B:307:LEU:HD23	1:B:400:TRP:CH2	2.33	0.51
1:D:320:ARG:HA	1:D:323:ILE:CG1	2.39	0.51
1:D:339:MET:HE1	1:D:437:ALA:HB2	1.92	0.51
1:A:183:LEU:O	1:A:260:ASP:HB2	2.09	0.51
1:B:88:ARG:HH22	1:B:367:VAL:HG13	1.71	0.51
1:D:323:ILE:HA	1:D:326:PHE:HD1	1.75	0.51
1:A:218:LEU:HA	1:A:221:LEU:HD11	1.93	0.51
1:C:287:ALA:HB1	3:C:490:LNP:CBB	2.39	0.51
1:C:153:PHE:O	1:C:157:ASN:HB2	2.11	0.51
1:D:159:ASP:O	1:D:475:ARG:NH2	2.42	0.51
1:B:143:VAL:HG21	1:B:332:TYR:HA	1.92	0.51
1:C:143:VAL:HG21	1:C:332:TYR:HA	1.92	0.51
1:B:253:ASN:C	1:B:254:LYS:CD	2.82	0.51
1:C:188:LEU:HD12	1:C:188:LEU:C	2.32	0.51
1:D:168:LEU:HD22	1:D:464:PRO:O	2.10	0.51
1:A:94:ASN:HA	1:A:97:LEU:O	2.11	0.51
1:A:317:GLU:HB3	1:A:321:LYS:HZ2	1.76	0.51
1:B:343:GLU:HB2	1:B:433:LYS:HD3	1.92	0.51
1:B:447:LEU:HD22	1:B:447:LEU:C	2.35	0.51
1:C:30:LYS:NZ	1:C:371:SER:O	2.27	0.51
1:D:67:ILE:HD11	1:D:85:GLU:HG3	1.93	0.51
1:D:172:SER:HA	1:D:297:SER:CB	2.41	0.51
1:D:176:ILE:HB	1:D:293:GLN:NE2	2.26	0.51
1:A:35:TYR:CG	1:A:36:PRO:HD2	2.45	0.51
1:C:348:GLU:HA	1:C:348:GLU:OE1	2.11	0.51
1:C:348:GLU:HG3	1:C:400:TRP:CD1	2.46	0.51
1:D:272:ASP:OD1	1:D:274:THR:OG1	2.29	0.51
1:A:62:GLN:HA	1:A:64:LYS:HZ1	1.74	0.51
1:B:291:ALA:HB2	3:B:490:LNP:HAP	1.93	0.51
1:D:470:ARG:HB2	4:D:4:HOH:O	2.10	0.51
1:B:81:GLY:HA3	1:B:386:LEU:HD23	1.92	0.51
1:D:251:GLU:C	1:D:251:GLU:OE1	2.53	0.51
1:C:154:MET:CE	1:C:439:ALA:HA	2.38	0.50
1:C:163:GLY:C	1:C:473:TYR:CE2	2.89	0.50
1:D:119:PRO:C	1:D:121:PRO:HD2	2.35	0.50
1:D:284:MET:HA	3:D:490:LNP:HBEB	1.92	0.50
1:A:102:VAL:HG11	1:A:360:MET:CB	2.40	0.50
1:A:250:GLU:O	1:A:254:LYS:O	2.29	0.50
1:B:143:VAL:HB	1:B:144:PRO:CD	2.40	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:176:ILE:HD11	1:C:198:ALA:HB2	1.92	0.50
1:D:174:MET:O	1:D:178:THR:HG23	2.11	0.50
1:D:192:LEU:HD21	1:D:197:PHE:HD1	1.75	0.50
1:B:210:PRO:C	1:B:212:ALA:H	2.19	0.50
1:B:250:GLU:O	1:B:254:LYS:O	2.29	0.50
1:C:67:ILE:HD13	1:C:369:VAL:CG1	2.36	0.50
1:C:351:ARG:C	1:C:388:HIS:HD2	2.19	0.50
1:D:113:GLY:H	1:D:117:ALA:HB3	1.73	0.50
1:D:67:ILE:HD13	1:D:369:VAL:HG13	1.76	0.50
1:D:175:ILE:HG13	1:D:297:SER:CA	2.41	0.50
1:D:287:ALA:HB1	3:D:490:LNP:CBB	2.41	0.50
1:A:427:PHE:O	1:A:431:GLN:HG3	2.11	0.50
1:B:448:LEU:HD12	1:B:470:ARG:HB3	1.94	0.50
1:C:41:ILE:HG22	1:C:41:ILE:O	2.11	0.50
1:D:112:GLU:H	1:D:279:HIS:HE1	1.60	0.50
1:A:209:ILE:HG23	1:D:223:LEU:HD22	1.92	0.50
1:A:302:TRP:HZ3	1:A:452:VAL:HG11	1.76	0.50
1:A:320:ARG:NH2	1:A:444:ASP:OD2	2.42	0.50
1:C:323:ILE:HA	1:C:326:PHE:CE1	2.47	0.50
1:C:452:VAL:HG13	1:C:453:PRO:CD	2.41	0.50
1:A:45:ILE:HD13	1:D:221:LEU:HD22	1.91	0.50
1:B:172:SER:HA	1:B:297:SER:HB2	1.93	0.50
1:B:196:ARG:O	1:B:196:ARG:HG2	2.11	0.50
1:D:244:ILE:HD13	1:D:266:LEU:HD11	1.94	0.50
1:A:103:TYR:HE1	2:A:482:HEM:O2A	1.94	0.50
1:A:321:LYS:HA	1:A:324:GLU:HB2	1.94	0.50
1:B:443:TYR:HA	1:B:474:ILE:O	2.11	0.50
3:B:490:LNP:HAJ	3:B:490:LNP:CBF	2.41	0.50
1:D:324:GLU:OE1	1:D:325:GLU:OE1	2.30	0.50
1:B:139:PHE:CD2	1:B:430:LEU:HD22	2.46	0.50
1:B:172:SER:HA	1:B:297:SER:CB	2.42	0.50
1:C:106:MET:CE	1:C:208:LEU:HD13	2.38	0.50
1:D:388:HIS:HE1	1:D:413:ILE:H	1.58	0.50
1:A:107:VAL:HB	1:A:108:PRO:HD3	1.94	0.49
1:B:67:ILE:HD13	1:B:369:VAL:HG12	1.93	0.49
1:B:431:GLN:O	1:B:435:ILE:HG13	2.12	0.49
1:C:91:LEU:N	1:C:92:PRO:CD	2.75	0.49
1:D:177:ASN:ND2	1:D:194:ALA:CB	2.75	0.49
1:D:196:ARG:O	1:D:199:GLN:HB2	2.12	0.49
1:B:152:LYS:HD2	1:B:152:LYS:O	2.12	0.49
1:C:102:VAL:CG1	1:C:103:TYR:CE1	2.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:193:ASP:OD1	1:D:193:ASP:N	2.30	0.49
1:D:351:ARG:CA	1:D:388:HIS:HD2	2.25	0.49
1:B:207:SER:HB2	1:B:225:GLN:HB3	1.95	0.49
1:C:146:ILE:O	1:C:150:VAL:HG23	2.13	0.49
1:C:302:TRP:NE1	1:C:464:PRO:HD3	2.26	0.49
1:C:427:PHE:CD2	1:C:431:GLN:NE2	2.80	0.49
1:D:104:SER:C	1:D:106:MET:N	2.69	0.49
1:D:368:LYS:HD2	1:D:373:VAL:HG22	1.94	0.49
1:A:260:ASP:OD1	1:A:263:SER:N	2.31	0.49
1:B:291:ALA:HA	3:B:490:LNP:CBH	2.36	0.49
1:B:363:VAL:HG12	1:B:376:LYS:HA	1.93	0.49
1:C:197:PHE:CZ	1:C:289:MET:HG3	2.47	0.49
1:C:352:ARG:HH12	1:C:398:ARG:NH2	2.10	0.49
1:D:110:PHE:CZ	3:D:490:LNP:CAS	2.95	0.49
1:D:310:PRO:O	1:D:313:VAL:HG22	2.11	0.49
1:D:334:ASN:O	1:D:339:MET:HG3	2.12	0.49
1:A:366:ASP:N	1:A:366:ASP:OD1	2.43	0.49
1:A:447:LEU:CD2	1:A:449:ARG:CG	2.91	0.49
1:B:119:PRO:HA	4:B:483:HOH:O	2.11	0.49
1:B:128:ASN:O	1:B:132:GLU:HG2	2.12	0.49
1:D:126:GLN:CB	1:D:284:MET:HE2	2.41	0.49
1:D:305:LEU:HD23	1:D:453:PRO:CG	2.41	0.49
1:A:291:ALA:HA	3:A:490:LNP:HBHA	1.94	0.49
1:C:278:LEU:O	1:C:278:LEU:HD23	2.13	0.49
1:B:116:TYR:HE1	3:B:490:LNP:HAS	1.77	0.49
1:A:389:HIS:HE1	1:A:398:ARG:HD2	1.78	0.49
1:B:203:LYS:O	1:B:206:SER:OG	2.30	0.49
1:B:322:GLU:OE1	1:B:339:MET:CG	2.61	0.49
1:C:183:LEU:C	1:C:184:PHE:HD2	2.20	0.49
1:C:367:VAL:HG23	1:C:374:VAL:HB	1.93	0.49
1:D:86:HIS:NE2	1:D:387:SER:OG	2.35	0.49
1:A:109:VAL:HG13	1:A:286:VAL:CG1	2.43	0.49
1:A:154:MET:HE1	1:A:439:ALA:CB	2.42	0.49
1:A:323:ILE:HA	1:A:326:PHE:CD1	2.47	0.49
1:B:100:ARG:O	1:B:101:GLU:C	2.54	0.49
1:B:310:PRO:HG2	1:B:447:LEU:HD11	1.95	0.49
1:C:176:ILE:CG2	1:C:177:ASN:N	2.75	0.49
1:D:137:ALA:O	1:D:140:GLN:NE2	2.45	0.49
1:D:254:LYS:C	1:D:256:SER:H	2.21	0.49
1:A:93:ARG:N	1:A:96:VAL:HG22	2.28	0.49
1:C:189:ARG:O	1:C:192:LEU:O	2.31	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:191:ARG:NE	1:C:191:ARG:CA	2.74	0.49
1:A:207:SER:HB3	4:A:486:HOH:O	2.13	0.48
1:A:281:VAL:O	1:A:285:ILE:HG13	2.13	0.48
1:B:251:GLU:O	1:B:254:LYS:O	2.30	0.48
1:B:357:LEU:HD11	1:B:462:VAL:HG21	1.94	0.48
3:B:490:LNP:HAAA	3:B:490:LNP:HAKA	1.61	0.48
1:D:158:TRP:HZ3	1:D:445:PHE:HZ	1.60	0.48
1:A:291:ALA:HB2	3:A:490:LNP:HAP	1.95	0.48
1:C:445:PHE:CD2	1:C:471:VAL:HG11	2.47	0.48
1:A:447:LEU:HD21	1:A:449:ARG:HB2	1.94	0.48
1:A:216:PRO:C	1:A:218:LEU:H	2.22	0.48
1:A:334:ASN:OD1	1:A:334:ASN:N	2.44	0.48
1:B:330:LEU:CD2	1:B:334:ASN:HD22	2.27	0.48
1:B:358:MET:SD	1:B:383:SER:HB2	2.54	0.48
1:C:167:LEU:HD11	1:C:304:MET:CE	2.43	0.48
1:C:375:PRO:HG2	1:C:378:ASP:OD1	2.14	0.48
1:D:294:HIS:O	1:D:298:ILE:HG13	2.13	0.48
1:D:364:MET:CE	1:D:364:MET:CA	2.88	0.48
1:D:366:ASP:HA	1:D:374:VAL:O	2.13	0.48
1:A:66:GLY:C	1:A:67:ILE:HD12	2.38	0.48
1:A:140:GLN:HA	1:A:140:GLN:HE21	1.78	0.48
1:C:240:LEU:HB2	1:C:278:LEU:HD21	1.95	0.48
1:C:276:MET:HG2	1:C:281:VAL:HG23	1.95	0.48
1:D:177:ASN:ND2	1:D:194:ALA:HB2	2.28	0.48
1:D:181:GLN:NE2	1:D:189:ARG:CZ	2.76	0.48
1:B:260:ASP:OD1	1:B:260:ASP:O	2.31	0.48
1:C:427:PHE:O	1:C:431:GLN:HG3	2.13	0.48
1:D:109:VAL:HG13	1:D:204:MET:HE2	1.95	0.48
1:D:159:ASP:C	1:D:475:ARG:HH22	2.21	0.48
1:D:265:LEU:O	1:D:276:MET:CE	2.61	0.48
1:D:298:ILE:CD1	1:D:461:VAL:HG12	2.43	0.48
1:D:424:GLY:HA3	2:D:482:HEM:C3C	2.48	0.48
1:D:456:ASP:C	1:D:456:ASP:OD1	2.56	0.48
1:A:388:HIS:HE1	1:A:413:ILE:H	1.62	0.48
1:B:400:TRP:O	1:B:400:TRP:CD2	2.66	0.48
1:D:46:ILE:HG22	1:D:50:LYS:HE3	1.95	0.48
1:D:284:MET:HG2	3:D:490:LNP:HBEA	1.80	0.48
1:A:72:ILE:HG22	1:A:73:VAL:HG23	1.94	0.48
1:B:45:ILE:HB	1:B:72:ILE:HG23	1.96	0.48
1:B:139:PHE:O	1:B:143:VAL:HG23	2.14	0.48
1:C:215:LEU:CD1	1:C:215:LEU:N	2.75	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:308:MET:CE	1:D:445:PHE:HB3	2.43	0.48
1:A:92:PRO:CB	1:A:96:VAL:HG21	2.37	0.48
1:A:94:ASN:O	1:A:98:SER:CB	2.62	0.48
1:B:93:ARG:HG3	1:B:95:GLU:H	1.79	0.48
1:D:67:ILE:HG21	1:D:369:VAL:HG11	1.94	0.48
1:A:116:TYR:CE1	3:A:490:LNP:HAYA	2.43	0.48
1:A:447:LEU:C	1:A:449:ARG:H	2.22	0.48
3:A:490:LNP:HAF	3:A:490:LNP:CAY	2.44	0.48
1:B:446:GLN:HB2	1:B:472:LYS:HB3	1.95	0.48
1:D:86:HIS:HE1	1:D:387:SER:HB3	1.79	0.48
1:A:363:VAL:C	1:A:364:MET:CE	2.86	0.47
1:B:71:ASN:OD1	1:B:71:ASN:C	2.57	0.47
1:C:200:LEU:O	1:C:204:MET:HG3	2.13	0.47
1:B:243:ILE:O	1:B:243:ILE:CG2	2.61	0.47
1:B:352:ARG:HD2	1:B:400:TRP:HB2	1.96	0.47
1:D:234:THR:O	1:D:238:LYS:HB2	2.14	0.47
1:C:158:TRP:CD1	1:C:158:TRP:N	2.73	0.47
1:D:91:LEU:N	1:D:92:PRO:CD	2.77	0.47
1:D:284:MET:CA	3:D:490:LNP:CBE	2.88	0.47
1:A:93:ARG:CG	1:A:95:GLU:OE2	2.63	0.47
1:B:310:PRO:CD	1:B:447:LEU:HD12	2.40	0.47
1:B:400:TRP:CZ2	1:B:402:PRO:HG3	2.48	0.47
1:C:130:LEU:CD2	3:C:490:LNP:CBE	2.91	0.47
1:C:174:MET:O	1:C:178:THR:HG23	2.14	0.47
1:C:184:PHE:N	1:C:184:PHE:CD2	2.82	0.47
1:C:284:MET:HA	3:C:490:LNP:HBDA	1.94	0.47
1:D:48:PHE:O	1:D:52:PRO:HG3	2.15	0.47
1:D:260:ASP:OD1	1:D:260:ASP:C	2.57	0.47
1:A:98:SER:OG	1:A:101:GLU:OE1	2.32	0.47
1:A:216:PRO:C	1:A:218:LEU:N	2.71	0.47
1:A:384:PRO:O	1:A:388:HIS:HB2	2.14	0.47
1:B:325:GLU:CD	1:C:136:ILE:HD13	2.38	0.47
1:C:110:PHE:O	1:C:283:GLY:HA3	2.13	0.47
1:C:152:LYS:HB2	1:C:152:LYS:NZ	2.29	0.47
1:D:167:LEU:HD23	1:D:305:LEU:CD1	2.44	0.47
1:D:306:HIS:O	1:D:312:ASN:ND2	2.46	0.47
1:A:92:PRO:CB	1:A:97:LEU:HG	2.44	0.47
1:A:385:LEU:O	1:A:389:HIS:HD2	1.96	0.47
1:B:101:GLU:CD	1:B:101:GLU:H	2.22	0.47
1:C:79:ILE:CG2	4:C:486:HOH:O	2.28	0.47
1:C:203:LYS:HD3	1:C:232:ALA:HB2	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:86:HIS:O	1:A:89:PHE:N	2.48	0.47
1:A:92:PRO:HG2	1:A:97:LEU:CD1	2.44	0.47
1:A:93:ARG:HD2	1:A:95:GLU:CB	2.38	0.47
1:A:191:ARG:CG	1:A:239:ILE:HG23	2.45	0.47
1:A:331:ASN:ND2	1:A:331:ASN:H	2.12	0.47
1:B:356:LEU:N	1:B:356:LEU:HD23	2.30	0.47
1:C:53:LEU:HB3	4:C:19:HOH:O	2.14	0.47
1:C:291:ALA:HA	3:C:490:LNP:CBH	2.33	0.47
1:C:355:PRO:HA	1:C:462:VAL:O	2.15	0.47
1:D:287:ALA:HB1	3:D:490:LNP:CAZ	2.37	0.47
1:A:320:ARG:CZ	1:A:476:ARG:NH1	2.78	0.47
1:B:239:ILE:HG22	1:B:239:ILE:O	2.14	0.47
1:D:139:PHE:HB3	1:D:332:TYR:CE1	2.49	0.47
1:D:250:GLU:HG2	1:D:254:LYS:CE	2.41	0.47
1:A:94:ASN:OD1	1:A:420:HIS:NE2	2.47	0.47
1:B:122:ARG:O	1:B:126:GLN:HG3	2.15	0.47
1:C:40:PRO:HG2	1:C:41:ILE:H	1.80	0.47
1:C:246:ALA:O	1:C:250:GLU:N	2.42	0.47
1:A:248:LYS:O	1:A:252:VAL:HG23	2.14	0.47
1:B:51:SER:HB3	4:B:22:HOH:O	2.14	0.47
1:B:147:GLN:HG2	1:B:151:ARG:NH1	2.29	0.47
1:B:270:TYR:CD1	1:B:274:THR:O	2.67	0.47
1:B:368:LYS:CE	1:B:373:VAL:HG22	2.44	0.47
1:C:41:ILE:O	1:C:41:ILE:CG2	2.63	0.47
1:A:287:ALA:CB	3:A:490:LNP:HBB	2.43	0.46
1:A:302:TRP:HZ3	1:A:452:VAL:CG1	2.28	0.46
1:B:449:ARG:HB2	1:B:451:GLU:O	2.15	0.46
1:D:104:SER:C	1:D:106:MET:H	2.21	0.46
1:A:171:CYS:O	1:A:175:ILE:HG12	2.14	0.46
1:B:100:ARG:C	1:B:102:VAL:N	2.67	0.46
1:B:300:THR:OG1	1:B:432:VAL:HG22	2.14	0.46
1:C:120:TYR:N	1:C:121:PRO:CD	2.78	0.46
1:C:171:CYS:O	1:C:175:ILE:HG12	2.14	0.46
1:C:351:ARG:NH1	1:C:397:PRO:O	2.47	0.46
1:D:454:ASP:N	1:D:468:GLN:OE1	2.42	0.46
1:B:162:GLU:OE2	1:B:472:LYS:HE2	2.16	0.46
3:B:490:LNP:HAI	3:B:490:LNP:HAWB	1.53	0.46
1:C:284:MET:CG	3:C:490:LNP:HBDA	2.43	0.46
1:D:197:PHE:CE2	1:D:289:MET:HG3	2.50	0.46
1:D:326:PHE:CE2	1:D:334:ASN:CG	2.94	0.46
1:A:72:ILE:O	1:A:73:VAL:C	2.55	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:139:PHE:N	1:A:139:PHE:CD1	2.84	0.46
1:A:252:VAL:O	1:C:238:LYS:HE2	2.14	0.46
1:A:331:ASN:HD21	1:A:334:ASN:CG	2.18	0.46
1:A:96:VAL:HG23	1:A:97:LEU:N	2.30	0.46
1:B:91:LEU:N	1:B:92:PRO:CD	2.79	0.46
1:B:287:ALA:CB	3:B:490:LNP:HBBA	2.46	0.46
1:D:77:VAL:HG22	1:D:379:ILE:HB	1.98	0.46
1:D:158:TRP:CZ3	1:D:445:PHE:CZ	3.04	0.46
1:D:470:ARG:C	1:D:471:VAL:HG23	2.40	0.46
1:B:103:TYR:HD2	1:B:116:TYR:CZ	2.33	0.46
1:C:357:LEU:CD1	1:C:462:VAL:HG21	2.41	0.46
3:C:490:LNP:HAWB	3:C:490:LNP:CAK	2.43	0.46
1:D:252:VAL:O	1:D:252:VAL:CG1	2.64	0.46
1:D:332:TYR:CE1	1:D:336:MET:HE3	2.50	0.46
1:A:250:GLU:O	1:A:251:GLU:C	2.57	0.46
1:A:287:ALA:HB1	3:A:490:LNP:CBB	2.46	0.46
1:B:113:GLY:N	1:B:117:ALA:CB	2.77	0.46
1:B:210:PRO:C	1:B:212:ALA:N	2.73	0.46
1:B:305:LEU:CD1	1:B:453:PRO:HG2	2.44	0.46
1:C:216:PRO:CD	4:C:14:HOH:O	2.64	0.46
1:C:276:MET:HE2	1:C:276:MET:HB2	1.58	0.46
1:D:388:HIS:CE1	1:D:413:ILE:H	2.34	0.46
1:D:447:LEU:C	1:D:449:ARG:H	2.24	0.46
1:C:122:ARG:O	1:C:126:GLN:HG3	2.16	0.46
1:C:247:ARG:NH1	1:C:263:SER:OG	2.49	0.46
1:D:99:PRO:O	1:D:103:TYR:N	2.48	0.46
1:A:443:TYR:CE2	1:A:473:TYR:CD1	3.03	0.46
1:D:114:VAL:O	1:D:115:ALA:HB3	2.16	0.46
1:D:107:VAL:N	1:D:108:PRO:CD	2.79	0.46
1:D:120:TYR:OH	4:D:484:HOH:O	2.21	0.46
1:D:159:ASP:OD1	1:D:159:ASP:N	2.48	0.46
1:D:238:LYS:O	1:D:242:GLU:HG3	2.16	0.46
1:D:424:GLY:HA3	2:D:482:HEM:HBC2	1.98	0.46
1:A:139:PHE:N	1:A:139:PHE:HD1	2.14	0.45
1:A:165:ILE:O	1:A:470:ARG:HA	2.15	0.45
1:A:443:TYR:CE2	1:A:473:TYR:HD1	2.34	0.45
1:B:366:ASP:OD1	1:B:376:LYS:HB3	2.16	0.45
1:C:116:TYR:O	1:C:117:ALA:C	2.59	0.45
1:C:277:SER:C	1:C:279:HIS:N	2.70	0.45
1:D:270:TYR:O	1:D:273:GLY:N	2.39	0.45
1:A:312:ASN:HB3	1:A:315:HIS:HB2	1.97	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:331:ASN:HD22	1:A:331:ASN:H	1.65	0.45
1:A:447:LEU:HD21	1:A:449:ARG:HG3	1.97	0.45
1:B:107:VAL:N	1:B:108:PRO:CD	2.79	0.45
1:B:310:PRO:CG	1:B:447:LEU:HD11	2.46	0.45
1:D:301:THR:O	1:D:305:LEU:HD12	2.16	0.45
1:B:357:LEU:O	1:B:384:PRO:HD2	2.16	0.45
1:C:251:GLU:OE1	1:C:252:VAL:CG2	2.64	0.45
1:C:315:HIS:CE1	1:C:402:PRO:HD2	2.51	0.45
3:C:490:LNP:HAT	3:C:490:LNP:CAM	2.46	0.45
1:A:103:TYR:CE1	2:A:482:HEM:O2A	2.70	0.45
1:A:301:THR:O	1:A:305:LEU:HG	2.16	0.45
1:B:320:ARG:O	1:B:324:GLU:HB2	2.16	0.45
1:C:124:ARG:NH2	1:C:127:LEU:HD12	2.31	0.45
1:C:124:ARG:NH2	1:C:127:LEU:CD1	2.79	0.45
1:C:172:SER:HA	1:C:297:SER:CB	2.47	0.45
1:D:351:ARG:O	1:D:388:HIS:CD2	2.69	0.45
1:D:475:ARG:HG2	1:D:476:ARG:N	2.32	0.45
1:B:291:ALA:O	1:B:295:THR:CG2	2.65	0.45
1:B:331:ASN:C	1:B:331:ASN:ND2	2.54	0.45
1:C:127:LEU:HD23	3:C:490:LNP:HBEA	1.98	0.45
1:C:351:ARG:HH22	1:C:397:PRO:CA	2.29	0.45
1:D:240:LEU:O	1:D:244:ILE:HG13	2.16	0.45
1:D:326:PHE:HA	1:D:327:PRO:HD3	1.83	0.45
3:D:490:LNP:HAAA	3:D:490:LNP:HAKA	1.54	0.45
1:C:274:THR:HG22	1:C:275:PRO:CD	2.40	0.45
1:D:44:HIS:CB	1:D:55:PHE:CZ	2.99	0.45
1:A:188:LEU:CD1	1:A:243:ILE:HG13	2.47	0.45
1:B:309:HIS:O	1:B:312:ASN:N	2.49	0.45
1:B:460:MET:HG2	3:B:490:LNP:CAW	2.46	0.45
1:C:130:LEU:HD21	1:C:288:ALA:HB2	1.99	0.45
1:A:287:ALA:HB1	3:A:490:LNP:HBB	1.98	0.45
1:A:356:LEU:O	1:A:384:PRO:HG2	2.17	0.45
1:A:395:PRO:HG3	1:A:407:LYS:HZ1	1.82	0.45
1:B:423:ILE:HD11	2:B:482:HEM:CMD	2.46	0.45
1:C:80:VAL:O	1:C:80:VAL:HG12	2.16	0.45
1:D:298:ILE:HD12	1:D:461:VAL:HG12	1.99	0.45
1:D:330:LEU:CD2	1:D:334:ASN:HB3	2.46	0.45
1:C:437:ALA:O	1:C:441:ARG:HB2	2.17	0.45
1:D:339:MET:CE	1:D:437:ALA:HB2	2.47	0.45
1:D:365:ALA:O	1:D:366:ASP:C	2.60	0.45
1:A:365:ALA:O	1:A:366:ASP:C	2.59	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:270:TYR:C	1:B:272:ASP:N	2.73	0.45
1:B:307:LEU:HD13	1:B:319:LEU:HD22	1.99	0.45
1:C:60:LYS:HB2	1:C:65:SER:O	2.16	0.45
1:D:87:SER:HB2	1:D:91:LEU:HD12	1.98	0.45
1:D:291:ALA:CA	3:D:490:LNP:HAO	2.46	0.45
1:D:322:GLU:O	1:D:326:PHE:CE1	2.69	0.45
1:A:257:SER:O	1:A:257:SER:OG	2.30	0.44
1:B:158:TRP:HZ3	1:B:445:PHE:HZ	1.63	0.44
1:B:240:LEU:C	1:B:244:ILE:HG13	2.39	0.44
1:B:277:SER:O	1:B:278:LEU:C	2.60	0.44
1:D:353:ASP:OD1	1:D:353:ASP:N	2.50	0.44
1:A:53:LEU:O	1:A:57:GLN:HG3	2.18	0.44
1:B:36:PRO:O	1:B:44:HIS:CE1	2.56	0.44
1:C:95:GLU:N	1:C:95:GLU:OE1	2.50	0.44
1:D:44:HIS:HD2	1:D:71:ASN:N	2.00	0.44
1:D:274:THR:HG23	1:D:275:PRO:HD2	2.00	0.44
1:A:93:ARG:HG3	1:A:95:GLU:N	2.31	0.44
1:B:102:VAL:CG1	1:B:360:MET:HB2	2.45	0.44
1:B:240:LEU:O	1:B:244:ILE:N	2.48	0.44
3:B:490:LNP:HAT	3:B:490:LNP:CAX	2.31	0.44
1:D:122:ARG:O	1:D:126:GLN:HG3	2.17	0.44
1:D:136:ILE:O	1:D:139:PHE:HB2	2.17	0.44
1:D:158:TRP:CZ2	1:D:165:ILE:CD1	3.00	0.44
3:A:490:LNP:HAAA	3:A:490:LNP:HAKA	1.57	0.44
3:C:490:LNP:HAY	3:C:490:LNP:HBA	1.70	0.44
1:A:247:ARG:O	1:A:251:GLU:CG	2.57	0.44
1:A:376:LYS:C	1:A:378:ASP:N	2.76	0.44
1:B:449:ARG:HG3	4:B:6:HOH:O	2.17	0.44
1:C:172:SER:HA	1:C:297:SER:HB2	1.99	0.44
1:D:88:ARG:HH11	1:D:88:ARG:CA	2.26	0.44
1:D:320:ARG:HA	1:D:323:ILE:HG12	1.98	0.44
1:D:351:ARG:O	1:D:388:HIS:HD2	2.00	0.44
1:A:44:HIS:HB3	1:A:55:PHE:CZ	2.53	0.44
1:A:292:GLY:HA2	2:A:482:HEM:CMC	2.47	0.44
1:A:387:SER:C	1:A:389:HIS:H	2.26	0.44
1:B:80:VAL:HG12	1:B:80:VAL:O	2.17	0.44
1:B:277:SER:OG	1:B:280:GLU:OE1	2.36	0.44
1:C:112:GLU:HA	1:C:117:ALA:CB	2.47	0.44
1:D:197:PHE:HE2	1:D:289:MET:HG3	1.83	0.44
1:A:108:PRO:HB2	1:A:229:CYS:SG	2.57	0.44
1:A:210:PRO:CG	1:A:460:MET:HE2	2.47	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:218:LEU:CD2	1:A:223:LEU:HD11	2.47	0.44
1:C:92:PRO:HG2	1:C:97:LEU:CD1	2.47	0.44
1:A:71:ASN:OD1	1:A:71:ASN:C	2.61	0.44
1:A:396:GLU:N	1:A:397:PRO:CD	2.80	0.44
1:B:104:SER:O	1:B:107:VAL:HG23	2.18	0.44
1:B:135:THR:O	1:B:138:LYS:HB2	2.18	0.44
1:B:147:GLN:HE22	1:B:330:LEU:HG	1.83	0.44
1:D:274:THR:HG22	1:D:275:PRO:O	2.18	0.44
1:D:431:GLN:O	1:D:435:ILE:HG13	2.18	0.44
1:A:401:ASP:C	1:A:403:GLU:H	2.25	0.44
1:C:120:TYR:O	1:C:123:MET:HE2	2.17	0.44
1:C:136:ILE:HG23	1:C:332:TYR:OH	2.18	0.44
1:C:183:LEU:HD13	1:C:261:LEU:HD22	1.98	0.44
1:D:35:TYR:CD1	1:D:36:PRO:HD2	2.52	0.44
1:D:335:VAL:HA	1:D:339:MET:SD	2.58	0.44
1:A:307:LEU:HD13	1:A:319:LEU:CD2	2.48	0.43
1:B:135:THR:OG1	1:B:138:LYS:HG2	2.17	0.43
1:C:309:HIS:HA	1:C:310:PRO:HD3	1.87	0.43
1:D:366:ASP:HB3	1:D:373:VAL:CG1	2.47	0.43
1:B:183:LEU:O	1:B:260:ASP:HB2	2.17	0.43
1:B:320:ARG:NH2	1:B:444:ASP:OD2	2.51	0.43
1:C:332:TYR:HD2	1:C:333:ASN:OD1	2.01	0.43
1:D:45:ILE:HB	1:D:72:ILE:HG23	2.00	0.43
1:A:210:PRO:HG3	1:A:460:MET:HE2	2.00	0.43
1:A:339:MET:HE1	1:A:433:LYS:O	2.18	0.43
3:A:490:LNP:HAT	3:A:490:LNP:HALA	1.81	0.43
1:B:204:MET:HE1	1:B:286:VAL:HG11	2.00	0.43
1:B:326:PHE:HB3	1:B:330:LEU:HD21	2.00	0.43
1:B:385:LEU:O	1:B:389:HIS:HD2	2.00	0.43
1:C:331:ASN:O	1:C:334:ASN:HB2	2.17	0.43
3:C:490:LNP:HAF	3:C:490:LNP:CAY	2.44	0.43
1:A:44:HIS:CB	1:A:55:PHE:CZ	3.01	0.43
1:A:96:VAL:C	1:A:97:LEU:HD23	2.42	0.43
1:A:435:ILE:O	1:A:439:ALA:N	2.43	0.43
3:A:490:LNP:HAWA	3:A:490:LNP:HAI	1.54	0.43
1:B:449:ARG:C	1:B:451:GLU:N	2.75	0.43
1:D:192:LEU:HD13	1:D:239:ILE:HD13	1.99	0.43
1:D:301:THR:O	1:D:302:TRP:C	2.61	0.43
1:A:107:VAL:HB	1:A:108:PRO:CD	2.48	0.43
1:A:183:LEU:HD13	1:A:261:LEU:HD22	1.99	0.43
1:A:251:GLU:HA	1:A:255:ASP:HA	1.99	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:256:SER:C	1:A:258:THR:N	2.76	0.43
1:A:382:CYS:O	1:A:384:PRO:HD3	2.19	0.43
1:B:302:TRP:CZ2	1:B:464:PRO:CB	2.99	0.43
1:C:53:LEU:N	4:C:19:HOH:O	2.35	0.43
1:D:322:GLU:O	1:D:326:PHE:HE1	2.01	0.43
1:A:85:GLU:O	1:A:88:ARG:HB2	2.18	0.43
1:A:452:VAL:CG1	1:A:453:PRO:CD	2.97	0.43
1:A:460:MET:HE3	1:A:460:MET:HB2	1.82	0.43
1:B:208:LEU:HB2	1:B:460:MET:HE1	1.99	0.43
1:C:101:GLU:CD	1:C:101:GLU:N	2.77	0.43
1:D:298:ILE:HD12	1:D:461:VAL:CG1	2.49	0.43
1:D:322:GLU:CD	1:D:340:PRO:HD2	2.44	0.43
1:D:385:LEU:O	1:D:389:HIS:HD2	2.00	0.43
1:D:452:VAL:CG1	1:D:453:PRO:N	2.81	0.43
1:B:116:TYR:CE1	3:B:490:LNP:HAS	2.53	0.43
1:B:227:ALA:O	1:B:231:GLU:HB2	2.19	0.43
1:D:68:PHE:HE1	1:D:70:ILE:HG23	1.83	0.43
1:D:164:GLU:HG3	1:D:448:LEU:CD1	2.49	0.43
1:D:184:PHE:CZ	1:D:289:MET:CE	2.98	0.43
1:D:250:GLU:OE2	1:D:254:LYS:HE3	2.18	0.43
1:D:355:PRO:HG2	2:D:482:HEM:HMB1	2.01	0.43
1:D:358:MET:HE3	1:D:358:MET:HB3	1.92	0.43
1:D:385:LEU:O	1:D:389:HIS:CD2	2.71	0.43
1:A:84:HIS:CE1	1:A:408:VAL:HG13	2.54	0.43
1:A:91:LEU:N	1:A:92:PRO:HD2	2.34	0.43
1:A:252:VAL:HG13	1:C:234:THR:HG23	2.00	0.43
1:A:301:THR:O	1:A:302:TRP:C	2.62	0.43
1:A:389:HIS:CE1	1:A:398:ARG:NH1	2.73	0.43
1:C:40:PRO:HG2	1:C:41:ILE:N	2.33	0.43
1:D:404:ARG:O	1:D:405:ASP:OD1	2.37	0.43
1:A:103:TYR:CG	3:A:490:LNP:HATA	2.54	0.43
1:A:444:ASP:N	1:A:474:ILE:O	2.48	0.43
1:B:58:GLU:OE1	1:B:61:ARG:CZ	2.67	0.43
1:B:331:ASN:HD22	1:B:332:TYR:N	2.16	0.43
1:B:429:LEU:O	1:B:433:LYS:HG3	2.19	0.43
1:B:446:GLN:HG3	1:B:474:ILE:HD11	2.01	0.43
1:C:35:TYR:HA	1:C:36:PRO:HD3	1.80	0.43
1:D:56:MET:HB3	1:D:386:LEU:HD13	2.01	0.43
1:D:113:GLY:N	1:D:117:ALA:HB3	2.34	0.43
1:D:154:MET:O	1:D:158:TRP:CA	2.66	0.43
1:B:93:ARG:HD2	1:B:95:GLU:HB2	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:197:PHE:C	1:B:199:GLN:N	2.75	0.43
1:B:302:TRP:NE1	1:B:464:PRO:HD3	2.34	0.43
1:B:425:GLN:HG3	4:B:9:HOH:O	2.18	0.43
1:B:475:ARG:NH1	1:B:475:ARG:HB2	2.34	0.43
1:C:35:TYR:HD2	1:C:44:HIS:CE1	2.37	0.43
1:C:241:SER:CA	1:C:278:LEU:HD11	2.49	0.43
1:D:98:SER:HA	1:D:99:PRO:HD3	1.77	0.43
1:D:192:LEU:CD2	1:D:197:PHE:HD1	2.31	0.43
1:D:305:LEU:HD12	1:D:305:LEU:N	2.34	0.43
1:A:122:ARG:HH12	1:A:272:ASP:HB3	1.84	0.42
1:A:351:ARG:HA	1:A:388:HIS:NE2	2.29	0.42
1:A:365:ALA:O	1:A:367:VAL:HG13	2.19	0.42
1:A:443:TYR:CD2	1:A:473:TYR:HD1	2.36	0.42
1:B:348:GLU:OE2	1:B:404:ARG:NE	2.52	0.42
3:B:490:LNP:CBF	3:B:490:LNP:CAJ	2.97	0.42
1:C:321:LYS:HA	1:C:324:GLU:HB2	2.01	0.42
1:D:272:ASP:OD1	1:D:274:THR:CB	2.67	0.42
1:A:266:LEU:HD23	1:A:281:VAL:HG21	2.00	0.42
1:A:294:HIS:O	1:A:295:THR:C	2.61	0.42
1:B:231:GLU:O	1:B:234:THR:HB	2.18	0.42
1:B:351:ARG:O	1:B:388:HIS:HB3	2.19	0.42
1:C:415:PHE:CE2	2:C:482:HEM:HBB2	2.55	0.42
1:D:34:VAL:HG12	1:D:35:TYR:N	2.34	0.42
1:D:77:VAL:HA	1:D:379:ILE:O	2.20	0.42
1:D:103:TYR:CZ	3:D:490:LNP:HATA	2.51	0.42
1:D:249:GLU:O	1:D:249:GLU:HG2	2.19	0.42
1:D:399:ARG:O	1:D:404:ARG:NH2	2.52	0.42
1:A:64:LYS:N	1:A:64:LYS:CD	2.81	0.42
1:A:343:GLU:CB	1:A:433:LYS:HD3	2.46	0.42
1:B:136:ILE:O	1:B:137:ALA:C	2.61	0.42
1:C:69:THR:HG21	1:C:76:ARG:CZ	2.48	0.42
1:C:210:PRO:C	1:C:212:ALA:N	2.75	0.42
1:C:287:ALA:HB3	3:C:490:LNP:CBB	2.47	0.42
1:C:336:MET:CE	1:C:430:LEU:HD13	2.49	0.42
1:C:395:PRO:O	1:C:404:ARG:NH1	2.52	0.42
1:D:44:HIS:HB3	1:D:55:PHE:CE1	2.54	0.42
1:B:239:ILE:O	1:B:239:ILE:CG2	2.67	0.42
1:A:66:GLY:O	1:A:81:GLY:CA	2.68	0.42
1:B:308:MET:O	1:B:309:HIS:C	2.63	0.42
1:B:367:VAL:O	1:B:373:VAL:HG13	2.19	0.42
1:B:449:ARG:NE	1:B:451:GLU:O	2.52	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:291:ALA:CA	3:C:490:LNP:HBHA	2.35	0.42
1:B:308:MET:HG3	1:B:309:HIS:N	2.33	0.42
1:B:348:GLU:HG2	1:B:401:ASP:C	2.45	0.42
1:C:107:VAL:CG1	1:C:112:GLU:HG2	2.50	0.42
1:D:270:TYR:C	1:D:272:ASP:N	2.77	0.42
1:A:157:ASN:N	1:A:157:ASN:HD22	2.17	0.42
1:B:52:PRO:HB2	1:B:385:LEU:HD23	2.01	0.42
1:C:103:TYR:OH	2:C:482:HEM:O2A	2.20	0.42
1:A:326:PHE:HB3	1:A:330:LEU:HD22	2.01	0.42
1:B:183:LEU:HD12	1:B:289:MET:HE1	2.02	0.42
1:C:412:PHE:CD2	1:C:412:PHE:O	2.72	0.42
1:D:309:HIS:CE1	1:D:451:GLU:OE1	2.71	0.42
1:D:266:LEU:CD2	1:D:281:VAL:HG21	2.50	0.42
1:D:306:HIS:O	1:D:312:ASN:HB2	2.20	0.42
1:A:73:VAL:O	1:A:75:LYS:NZ	2.52	0.42
1:C:210:PRO:O	1:C:212:ALA:N	2.53	0.42
1:D:111:GLY:N	1:D:233:ARG:HH21	2.18	0.42
1:A:287:ALA:CB	3:A:490:LNP:CBB	2.97	0.41
1:B:52:PRO:HB2	1:B:385:LEU:CD2	2.50	0.41
1:C:363:VAL:HG12	1:C:376:LYS:HA	2.02	0.41
1:C:467:SER:C	1:C:469:CYS:H	2.27	0.41
3:C:490:LNP:HAI	3:C:490:LNP:HAWA	1.64	0.41
1:D:71:ASN:OD1	1:D:74:GLY:HA2	2.20	0.41
1:D:238:LYS:HG2	1:D:242:GLU:OE2	2.20	0.41
1:A:99:PRO:HD3	1:A:361:ARG:HD2	2.02	0.41
1:A:115:ALA:HA	1:A:123:MET:HG3	2.03	0.41
1:A:473:TYR:O	1:A:473:TYR:CG	2.72	0.41
1:B:210:PRO:O	1:B:213:VAL:HG23	2.20	0.41
1:C:192:LEU:HD12	1:C:192:LEU:HA	1.82	0.41
1:C:244:ILE:CD1	1:C:266:LEU:HD11	2.45	0.41
1:D:58:GLU:CD	1:D:61:ARG:HH21	2.25	0.41
1:A:170:ASP:O	1:A:171:CYS:C	2.63	0.41
1:A:295:THR:HG23	1:A:295:THR:H	1.53	0.41
1:A:389:HIS:ND1	1:A:397:PRO:HB3	2.35	0.41
1:A:453:PRO:HB3	1:A:468:GLN:HB2	2.03	0.41
1:B:135:THR:O	1:B:138:LYS:CB	2.67	0.41
1:B:158:TRP:O	1:B:443:TYR:OH	2.35	0.41
1:B:260:ASP:O	1:B:261:LEU:C	2.63	0.41
1:B:305:LEU:O	1:B:306:HIS:C	2.63	0.41
1:B:354:PRO:HA	1:B:355:PRO:HD3	1.94	0.41
1:D:97:LEU:HD22	1:D:380:ILE:HG21	2.00	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:61:ARG:HB3	4:A:488:HOH:O	2.20	0.41
1:B:143:VAL:N	1:B:144:PRO:HD2	2.35	0.41
1:B:427:PHE:O	1:B:431:GLN:HG3	2.20	0.41
1:D:60:LYS:HE3	1:D:60:LYS:HB2	1.84	0.41
1:D:251:GLU:HB3	4:D:25:HOH:O	2.19	0.41
1:A:184:PHE:CZ	1:A:289:MET:HE3	2.56	0.41
1:B:362:LYS:CG	1:B:364:MET:CE	2.99	0.41
1:B:449:ARG:C	1:B:451:GLU:H	2.28	0.41
1:C:184:PHE:HD2	1:C:184:PHE:N	2.19	0.41
1:C:214:PHE:C	1:C:215:LEU:HD13	2.45	0.41
1:D:122:ARG:CD	1:D:270:TYR:CE2	3.03	0.41
1:D:250:GLU:HA	1:D:253:ASN:HB2	2.01	0.41
1:A:175:ILE:HD13	1:A:435:ILE:HD11	2.02	0.41
1:A:234:THR:O	1:A:238:LYS:HG3	2.20	0.41
1:A:260:ASP:OD1	1:A:260:ASP:C	2.64	0.41
1:B:179:ALA:O	1:B:183:LEU:HD12	2.20	0.41
3:B:490:LNP:HAS	3:B:490:LNP:HAV	1.79	0.41
1:C:210:PRO:O	1:C:213:VAL:HG23	2.21	0.41
1:C:243:ILE:O	1:C:247:ARG:HG3	2.19	0.41
2:C:482:HEM:HBC2	2:C:482:HEM:HHD	2.01	0.41
1:D:176:ILE:CG2	1:D:177:ASN:N	2.83	0.41
1:A:176:ILE:HD13	1:A:198:ALA:HB2	2.01	0.41
1:B:231:GLU:O	1:B:234:THR:CB	2.69	0.41
1:C:114:VAL:CG2	1:C:280:GLU:HA	2.50	0.41
1:D:358:MET:SD	1:D:383:SER:HB2	2.60	0.41
1:A:73:VAL:O	1:A:73:VAL:HG12	2.21	0.41
1:C:298:ILE:HD13	1:C:463:GLY:HA3	2.02	0.41
1:D:139:PHE:CB	1:D:332:TYR:HE1	2.34	0.41
1:D:274:THR:CG2	1:D:275:PRO:N	2.83	0.41
1:A:207:SER:OG	1:A:229:CYS:CB	2.55	0.41
1:A:218:LEU:HA	1:A:221:LEU:HD13	1.99	0.41
3:A:490:LNP:CBH	3:A:490:LNP:CAJ	2.94	0.41
1:B:154:MET:HG3	1:B:158:TRP:HB2	2.02	0.41
1:B:167:LEU:HD21	1:B:304:MET:CB	2.47	0.41
1:C:98:SER:HA	1:C:99:PRO:HD3	1.69	0.41
1:C:171:CYS:HA	1:C:174:MET:HE3	2.03	0.41
1:C:277:SER:HB2	1:C:280:GLU:H	1.85	0.41
1:C:282:CYS:O	1:C:286:VAL:HG23	2.20	0.41
1:C:352:ARG:HG2	1:C:353:ASP:OD1	2.21	0.41
1:D:32:PRO:HG3	1:D:372:TYR:CB	2.49	0.41
1:D:150:VAL:HG13	1:D:174:MET:SD	2.61	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:301:THR:O	1:D:305:LEU:HD13	2.21	0.41
1:A:184:PHE:HB3	1:A:188:LEU:HD23	2.01	0.41
1:B:139:PHE:O	1:B:140:GLN:C	2.63	0.41
1:C:142:PHE:HE1	1:C:182:CYS:O	2.04	0.41
1:D:332:TYR:CZ	1:D:336:MET:HE3	2.55	0.41
1:A:136:ILE:CG2	1:A:332:TYR:OH	2.61	0.40
1:D:167:LEU:HD21	1:D:304:MET:HB2	2.03	0.40
1:D:185:GLY:O	1:D:186:GLU:C	2.63	0.40
1:A:116:TYR:CE1	3:A:490:LNP:CAY	3.04	0.40
3:A:490:LNP:CAB	3:A:490:LNP:CAS	2.71	0.40
1:B:91:LEU:N	1:B:92:PRO:HD2	2.36	0.40
1:C:94:ASN:OD1	1:C:420:HIS:CE1	2.74	0.40
1:C:277:SER:O	1:C:278:LEU:C	2.64	0.40
1:D:183:LEU:HD13	1:D:261:LEU:HD22	2.03	0.40
1:A:191:ARG:HH21	1:A:239:ILE:HG12	1.87	0.40
1:A:228:ARG:C	1:A:230:HIS:N	2.79	0.40
1:A:356:LEU:HD12	2:A:482:HEM:HMA3	2.04	0.40
1:A:412:PHE:CD2	1:A:412:PHE:C	2.99	0.40
1:B:169:GLU:O	1:B:173:THR:N	2.54	0.40
1:C:310:PRO:O	1:C:313:VAL:CG2	2.61	0.40
1:C:395:PRO:C	1:C:397:PRO:HD3	2.47	0.40
1:A:201:LEU:O	1:A:204:MET:N	2.54	0.40
1:A:401:ASP:HA	1:A:402:PRO:HD2	1.95	0.40
1:B:287:ALA:HB1	3:B:490:LNP:CAZ	2.52	0.40
1:C:86:HIS:HE1	1:C:411:ALA:O	2.04	0.40
1:C:216:PRO:HD2	4:C:14:HOH:O	2.19	0.40
1:C:455:PRO:HB2	1:C:457:TYR:CZ	2.57	0.40
1:D:56:MET:HE1	1:D:383:SER:OG	2.20	0.40
1:D:354:PRO:HA	1:D:355:PRO:HD2	1.78	0.40
1:D:471:VAL:HG12	1:D:472:LYS:N	2.36	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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	446/453 (98%)	425 (95%)	21 (5%)	0	100	100
1	B	446/453 (98%)	415 (93%)	30 (7%)	1 (0%)	43	76
1	C	440/453 (97%)	421 (96%)	18 (4%)	1 (0%)	43	76
1	D	446/453 (98%)	419 (94%)	27 (6%)	0	100	100
All	All	1778/1812 (98%)	1680 (94%)	96 (5%)	2 (0%)	48	80

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	211	ALA
1	B	340	PRO

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	390/391 (100%)	372 (95%)	18 (5%)	24	58
1	B	390/391 (100%)	371 (95%)	19 (5%)	22	56
1	C	386/391 (99%)	361 (94%)	25 (6%)	15	47
1	D	390/391 (100%)	377 (97%)	13 (3%)	33	67
All	All	1556/1564 (100%)	1481 (95%)	75 (5%)	23	57

All (75) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	64	LYS
1	A	98	SER
1	A	143	VAL
1	A	160	LYS
1	A	221	LEU
1	A	254	LYS

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Mol	Chain	Res	Type
1	A	272	ASP
1	A	278	LEU
1	A	321	LYS
1	A	331	ASN
1	A	351	ARG
1	A	364	MET
1	A	366	ASP
1	A	372	TYR
1	A	442	SER
1	A	446	GLN
1	A	448	LEU
1	A	458	HIS
1	B	38	THR
1	B	73	VAL
1	B	122	ARG
1	B	160	LYS
1	B	176	ILE
1	B	195	ARG
1	B	207	SER
1	B	230	HIS
1	B	271	ARG
1	B	278	LEU
1	B	280	GLU
1	B	331	ASN
1	B	351	ARG
1	B	356	LEU
1	B	364	MET
1	B	368	LYS
1	B	378	ASP
1	B	388	HIS
1	B	447	LEU
1	C	38	THR
1	C	53	LEU
1	C	65	SER
1	C	106	MET
1	C	124	ARG
1	C	152	LYS
1	C	159	ASP
1	C	251	GLU
1	C	274	THR
1	C	277	SER
1	C	290	PHE

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Mol	Chain	Res	Type
1	C	320	ARG
1	C	351	ARG
1	C	352	ARG
1	C	353	ASP
1	C	364	MET
1	C	367	VAL
1	C	378	ASP
1	C	390	ASP
1	C	396	GLU
1	C	412	PHE
1	C	423	ILE
1	C	446	GLN
1	C	447	LEU
1	C	475	ARG
1	D	62	GLN
1	D	94	ASN
1	D	122	ARG
1	D	160	LYS
1	D	193	ASP
1	D	196	ARG
1	D	324	GLU
1	D	325	GLU
1	D	351	ARG
1	D	353	ASP
1	D	364	MET
1	D	369	VAL
1	D	372	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (47) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	44	HIS
1	A	140	GLN
1	A	157	ASN
1	A	253	ASN
1	A	306	HIS
1	A	309	HIS
1	A	331	ASN
1	A	388	HIS
1	A	389	HIS
1	A	458	HIS
1	B	44	HIS

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Mol	Chain	Res	Type
1	B	84	HIS
1	B	148	HIS
1	B	253	ASN
1	B	279	HIS
1	B	306	HIS
1	B	309	HIS
1	B	315	HIS
1	B	331	ASN
1	B	388	HIS
1	B	389	HIS
1	B	458	HIS
1	C	44	HIS
1	C	57	GLN
1	C	157	ASN
1	C	279	HIS
1	C	306	HIS
1	C	315	HIS
1	C	329	GLN
1	C	334	ASN
1	C	388	HIS
1	C	389	HIS
1	C	431	GLN
1	D	44	HIS
1	D	62	GLN
1	D	94	ASN
1	D	126	GLN
1	D	177	ASN
1	D	181	GLN
1	D	279	HIS
1	D	309	HIS
1	D	334	ASN
1	D	388	HIS
1	D	389	HIS
1	D	425	GLN
1	D	431	GLN
1	D	458	HIS

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

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$
3	LNP	C	490	-	36,38,38	1.04	3 (8%)	51,62,62	2.00	11 (21%)
3	LNP	D	490	-	36,38,38	1.15	5 (13%)	51,62,62	1.94	10 (19%)
2	HEM	C	482	1	50,50,50	1.88	10 (20%)	67,82,82	1.29	5 (7%)
2	HEM	A	482	1	50,50,50	1.90	9 (18%)	67,82,82	1.34	6 (8%)
3	LNP	A	490	-	36,38,38	0.99	3 (8%)	51,62,62	2.21	11 (21%)
3	LNP	B	490	-	36,38,38	1.05	3 (8%)	51,62,62	1.86	11 (21%)
2	HEM	B	482	1	50,50,50	1.86	10 (20%)	67,82,82	1.29	3 (4%)
2	HEM	D	482	1	50,50,50	1.87	10 (20%)	67,82,82	1.31	4 (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
3	LNP	C	490	-	-	4/11/89/89	0/5/5/5
3	LNP	D	490	-	-	2/11/89/89	0/5/5/5
2	HEM	C	482	1	-	7/14/54/54	-
2	HEM	A	482	1	-	3/14/54/54	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	LNP	A	490	-	-	3/11/89/89	0/5/5/5
3	LNP	B	490	-	-	8/11/89/89	0/5/5/5
2	HEM	B	482	1	-	0/14/54/54	-
2	HEM	D	482	1	-	6/14/54/54	-

All (53) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	482	HEM	C3D-C2D	7.94	1.53	1.36
2	B	482	HEM	C3D-C2D	7.90	1.53	1.36
2	C	482	HEM	C3D-C2D	7.86	1.53	1.36
2	D	482	HEM	C3D-C2D	7.84	1.53	1.36
2	C	482	HEM	FE-ND	5.63	2.12	1.94
2	D	482	HEM	FE-ND	5.28	2.11	1.94
2	A	482	HEM	FE-NB	4.83	2.09	1.94
2	A	482	HEM	FE-ND	4.28	2.08	1.94
2	B	482	HEM	FE-ND	4.16	2.07	1.94
2	B	482	HEM	FE-NB	3.81	2.06	1.94
2	C	482	HEM	FE-NA	3.75	2.07	1.95
2	A	482	HEM	FE-NA	3.36	2.06	1.95
2	B	482	HEM	FE-NA	3.24	2.05	1.95
2	D	482	HEM	FE-NC	3.22	2.05	1.95
2	B	482	HEM	FE-NC	3.18	2.05	1.95
2	D	482	HEM	FE-NB	3.16	2.04	1.94
3	D	490	LNP	CAI-CAJ	2.92	1.56	1.50
2	D	482	HEM	CAB-C3B	2.91	1.55	1.47
2	C	482	HEM	FE-NC	2.85	2.04	1.95
2	A	482	HEM	CAC-C3C	2.82	1.54	1.47
2	A	482	HEM	CAB-C3B	2.80	1.54	1.47
2	B	482	HEM	CAB-C3B	2.78	1.54	1.47
2	B	482	HEM	CAC-C3C	2.78	1.54	1.47
2	C	482	HEM	CAB-C3B	2.76	1.54	1.47
2	D	482	HEM	CAC-C3C	2.76	1.54	1.47
2	C	482	HEM	CAC-C3C	2.73	1.54	1.47
2	D	482	HEM	FE-NA	2.72	2.04	1.95
2	A	482	HEM	FE-NC	2.65	2.03	1.95
3	B	490	LNP	CAR-CBF	2.50	1.34	1.32
3	D	490	LNP	CBH-CBG	2.41	1.57	1.52
3	C	490	LNP	CBH-CBG	2.39	1.57	1.52
3	B	490	LNP	CBH-CBG	2.36	1.57	1.52
3	A	490	LNP	CBH-CBG	2.35	1.57	1.52
3	A	490	LNP	CAR-CBF	2.34	1.34	1.32

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	490	LNP	CAR-CBF	2.32	1.34	1.32
3	D	490	LNP	CAG-CAH	-2.22	1.53	1.56
2	B	482	HEM	CMB-C2B	2.16	1.55	1.50
3	D	490	LNP	CAR-CBF	2.13	1.34	1.32
2	C	482	HEM	CMA-C3A	2.12	1.55	1.50
3	A	490	LNP	CAG-CAB	-2.08	1.53	1.56
2	C	482	HEM	CMC-C2C	2.08	1.55	1.50
3	B	490	LNP	CAG-CAB	-2.06	1.53	1.56
2	A	482	HEM	CMA-C3A	2.06	1.55	1.50
2	A	482	HEM	CMD-C2D	2.06	1.55	1.50
3	D	490	LNP	CAG-CAB	-2.05	1.53	1.56
2	D	482	HEM	CMC-C2C	2.05	1.55	1.50
2	B	482	HEM	CMA-C3A	2.04	1.55	1.50
2	C	482	HEM	CMD-C2D	2.03	1.54	1.50
2	C	482	HEM	CMB-C2B	2.03	1.54	1.50
2	D	482	HEM	CMA-C3A	2.03	1.54	1.50
2	B	482	HEM	CMC-C2C	2.02	1.54	1.50
2	D	482	HEM	CMD-C2D	2.02	1.54	1.50
3	C	490	LNP	CAG-CAB	-2.01	1.53	1.56

All (61) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	490	LNP	CAH-CAN-CAM	8.06	117.22	107.58
3	C	490	LNP	CAN-CAH-CAG	-6.25	111.53	117.18
3	D	490	LNP	CAH-CAN-CAM	5.90	114.64	107.58
3	C	490	LNP	CAE-CAQ-CAV	-5.56	112.73	119.28
3	C	490	LNP	CAH-CAN-CAM	5.55	114.22	107.58
3	A	490	LNP	CAE-CAQ-CAV	-5.53	112.77	119.28
3	B	490	LNP	CAE-CAQ-CAV	-5.52	112.78	119.28
2	B	482	HEM	C4D-ND-C1D	5.37	111.57	105.21
2	C	482	HEM	C4D-ND-C1D	5.34	111.53	105.21
2	D	482	HEM	C4D-ND-C1D	5.33	111.52	105.21
2	A	482	HEM	C4D-ND-C1D	5.25	111.42	105.21
3	D	490	LNP	CAN-CAH-CAG	-5.07	112.59	117.18
3	D	490	LNP	CAE-CAQ-CAV	-4.92	113.49	119.28
3	A	490	LNP	CAB-CAG-CAH	4.74	114.75	106.97
3	B	490	LNP	CAI-CAH-CAG	4.72	116.69	110.46
3	B	490	LNP	CAH-CAN-CAM	4.55	113.03	107.58
3	A	490	LNP	CAK-CAG-CAH	4.23	113.02	108.02
3	A	490	LNP	CAI-CAH-CAG	4.20	116.00	110.46
3	D	490	LNP	CAB-CAG-CAH	4.10	113.70	106.97

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	490	LNP	CAN-CAH-CAG	-3.90	113.65	117.18
3	D	490	LNP	CAI-CAJ-CAC	-3.83	118.33	125.14
3	A	490	LNP	CAI-CAJ-CAC	-3.81	118.37	125.14
3	A	490	LNP	CAA-CAB-CAG	-3.70	107.73	113.92
3	C	490	LNP	CAB-CAG-CAH	3.69	113.04	106.97
3	B	490	LNP	CAB-CAG-CAH	3.41	112.57	106.97
3	C	490	LNP	CAI-CAJ-CAC	-3.35	119.18	125.14
3	B	490	LNP	CAK-CAG-CAH	3.35	111.98	108.02
3	D	490	LNP	CAL-CAK-CAG	-3.31	107.15	112.74
3	D	490	LNP	CAA-CAB-CAG	-3.30	108.41	113.92
3	C	490	LNP	CAA-CAB-CAG	-3.28	108.43	113.92
3	A	490	LNP	CAT-CAG-CAH	-3.16	107.10	112.94
3	A	490	LNP	CAL-CAK-CAG	-3.10	107.52	112.74
3	C	490	LNP	CAG-CAB-CAC	-2.97	108.02	112.54
3	A	490	LNP	CAK-CAL-CAM	-2.95	107.17	111.48
3	B	490	LNP	CAA-CAB-CAG	-2.88	109.11	113.92
3	D	490	LNP	CAI-CAH-CAG	2.87	114.25	110.46
3	B	490	LNP	CAT-CAG-CAH	-2.73	107.89	112.94
3	C	490	LNP	CAI-CAH-CAG	2.54	113.81	110.46
2	D	482	HEM	C1B-NB-C4B	2.50	108.16	105.21
3	B	490	LNP	CAK-CAL-CAM	-2.47	107.87	111.48
3	B	490	LNP	CAI-CAJ-CAC	-2.47	120.76	125.14
2	A	482	HEM	C3B-C4B-NB	-2.43	107.72	109.47
3	D	490	LNP	CAH-CAI-CAJ	-2.43	108.52	112.99
2	A	482	HEM	C1B-NB-C4B	2.43	108.08	105.21
2	D	482	HEM	C3B-C4B-NB	-2.38	107.76	109.47
3	C	490	LNP	CAA-CAF-CAE	-2.37	108.76	112.85
2	D	482	HEM	C3B-C2B-C1B	2.37	108.19	106.41
3	C	490	LNP	CAT-CAG-CAH	-2.36	108.58	112.94
3	C	490	LNP	CAI-CAH-CAN	-2.33	109.39	112.97
3	B	490	LNP	CAL-CAK-CAG	-2.32	108.83	112.74
3	D	490	LNP	CAT-CAG-CAH	-2.31	108.67	112.94
2	A	482	HEM	C3B-C2B-C1B	2.27	108.12	106.41
2	B	482	HEM	C1B-NB-C4B	2.23	107.85	105.21
3	A	490	LNP	CAT-CAG-CAB	-2.22	106.17	109.89
2	C	482	HEM	CHC-C4B-NB	2.19	126.78	124.42
2	C	482	HEM	C1B-NB-C4B	2.19	107.80	105.21
2	A	482	HEM	CHD-C4C-NC	2.16	126.80	124.45
2	C	482	HEM	C3B-C2B-C1B	2.13	108.01	106.41
2	A	482	HEM	C2A-C1A-NA	-2.06	107.87	110.15
2	B	482	HEM	C3B-C2B-C1B	2.02	107.93	106.41
2	C	482	HEM	C2A-C1A-NA	-2.02	107.91	110.15

There are no chirality outliers.

All (33) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	D	482	HEM	C2B-C3B-CAB-CBB
2	D	482	HEM	C2C-C3C-CAC-CBC
2	D	482	HEM	C4C-C3C-CAC-CBC
3	B	490	LNP	CAY-CAV-CAZ-CBA
3	B	490	LNP	CAQ-CAV-CAZ-CBA
3	C	490	LNP	CAY-CAV-CAZ-CBA
3	B	490	LNP	CBA-CBB-CBC-CBD
3	B	490	LNP	CBA-CBB-CBC-CBE
3	A	490	LNP	CAV-CAZ-CBA-CBB
3	B	490	LNP	CAE-CAQ-CAV-CAZ
3	C	490	LNP	CBA-CBB-CBC-CBD
3	C	490	LNP	CAV-CAZ-CBA-CBB
3	B	490	LNP	CAE-CAQ-CAV-CAY
3	C	490	LNP	CBA-CBB-CBC-CBE
3	A	490	LNP	CAZ-CBA-CBB-CBC
3	D	490	LNP	CAV-CAZ-CBA-CBB
2	C	482	HEM	C2B-C3B-CAB-CBB
3	B	490	LNP	CAP-CAQ-CAV-CAY
2	D	482	HEM	C4B-C3B-CAB-CBB
3	D	490	LNP	CBA-CBB-CBC-CBD
3	B	490	LNP	CAP-CAQ-CAV-CAZ
3	A	490	LNP	CAY-CAV-CAZ-CBA
2	C	482	HEM	CAD-CBD-CGD-O1D
2	C	482	HEM	CAD-CBD-CGD-O2D
2	C	482	HEM	C4D-C3D-CAD-CBD
2	C	482	HEM	CAA-CBA-CGA-O2A
2	C	482	HEM	C4B-C3B-CAB-CBB
2	C	482	HEM	CAA-CBA-CGA-O1A
2	D	482	HEM	CAD-CBD-CGD-O1D
2	D	482	HEM	CAD-CBD-CGD-O2D
2	A	482	HEM	C2B-C3B-CAB-CBB
2	A	482	HEM	CAD-CBD-CGD-O2D
2	A	482	HEM	CAD-CBD-CGD-O1D

There are no ring outliers.

8 monomers are involved in 189 short contacts:

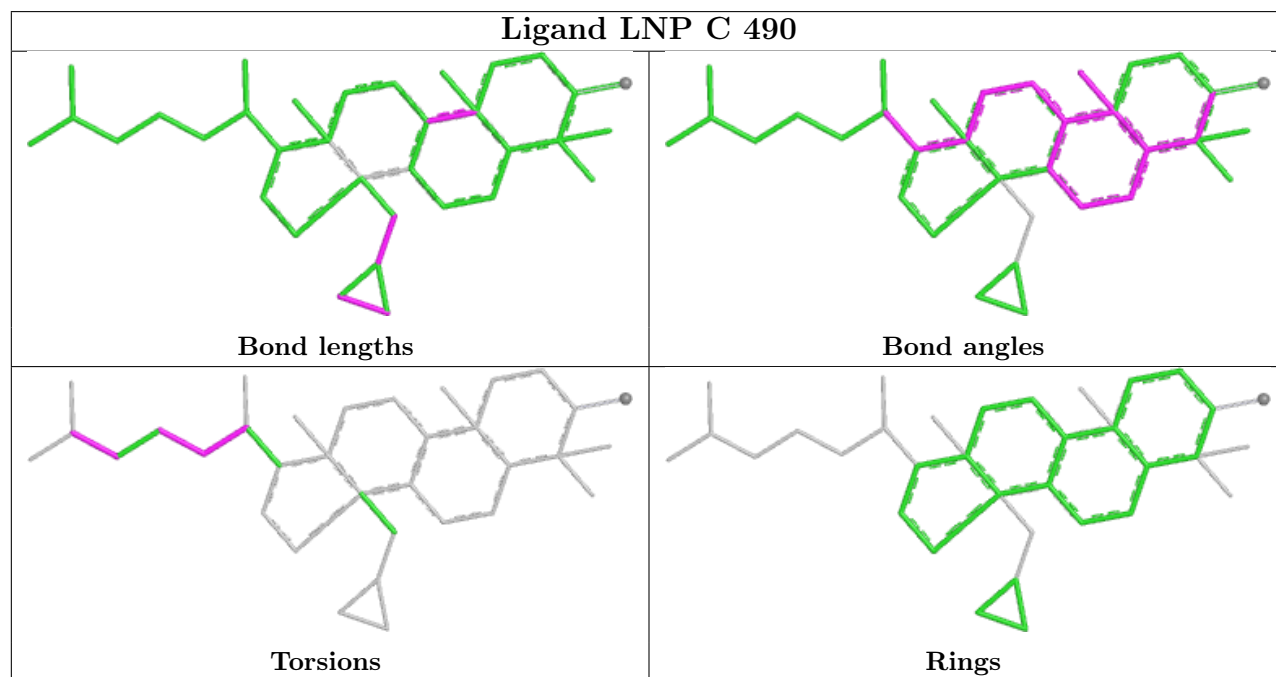
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	490	LNP	59	0
3	D	490	LNP	45	0

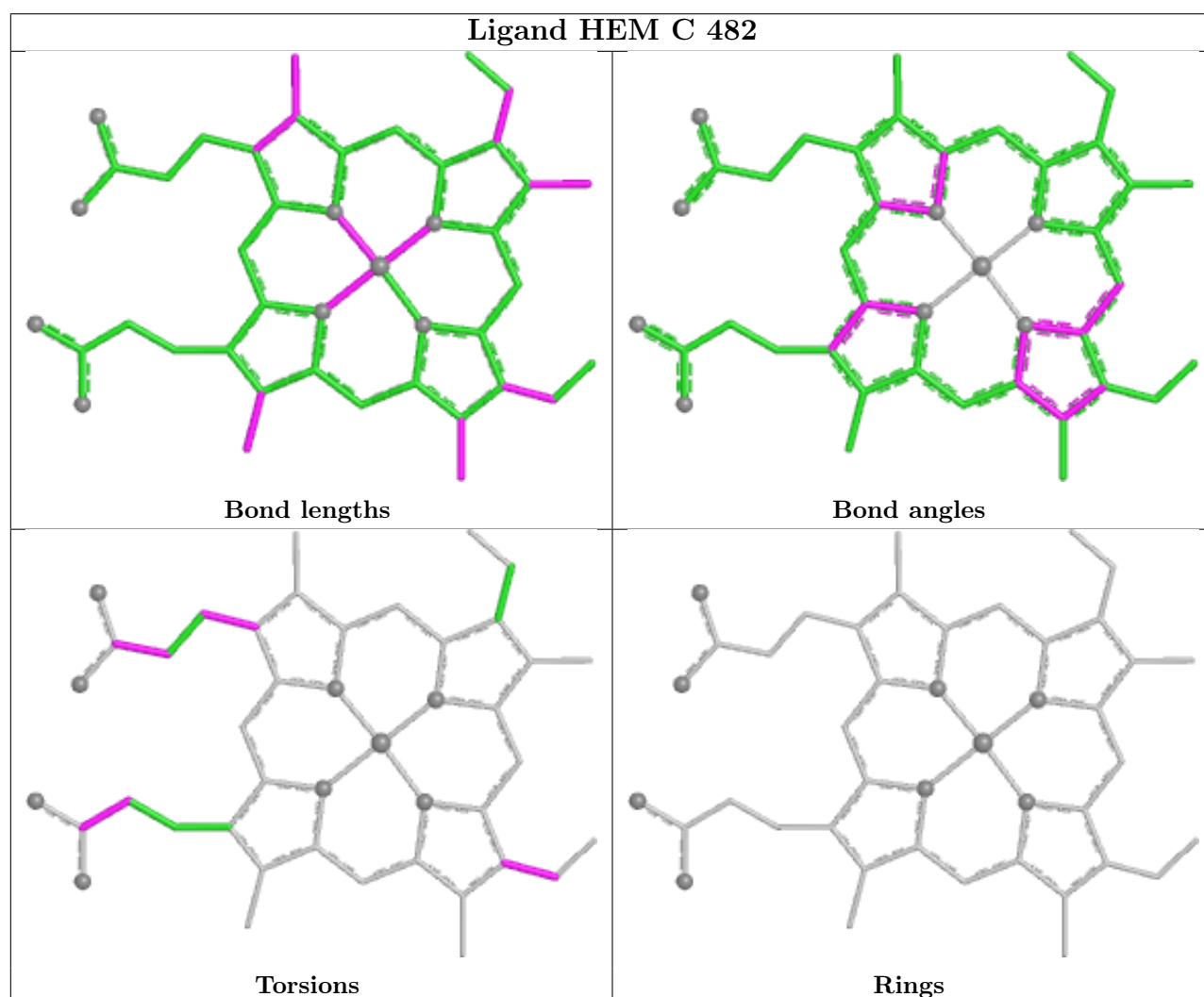
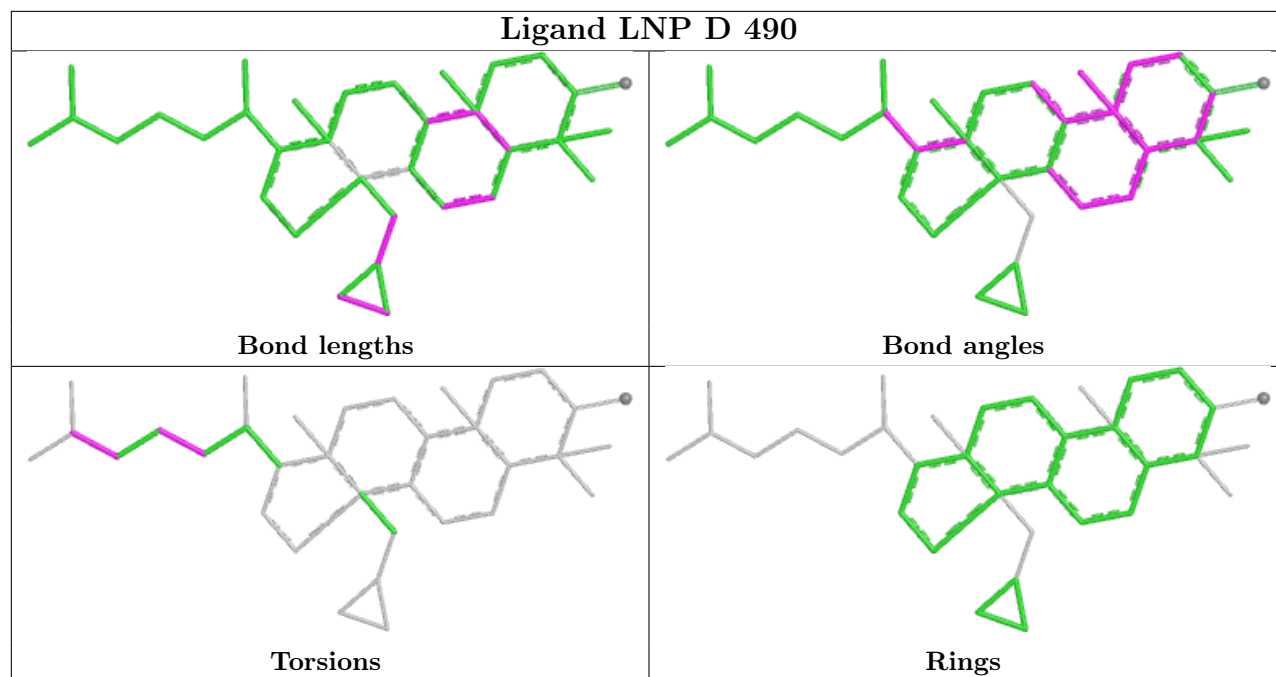
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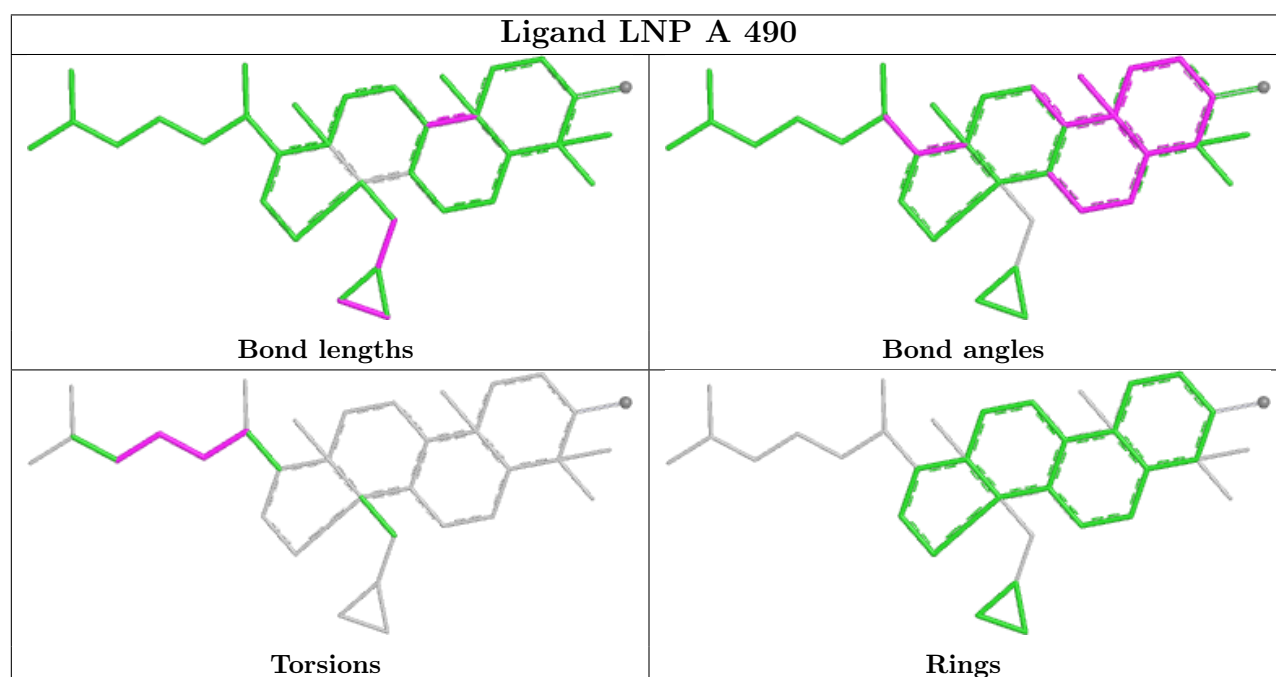
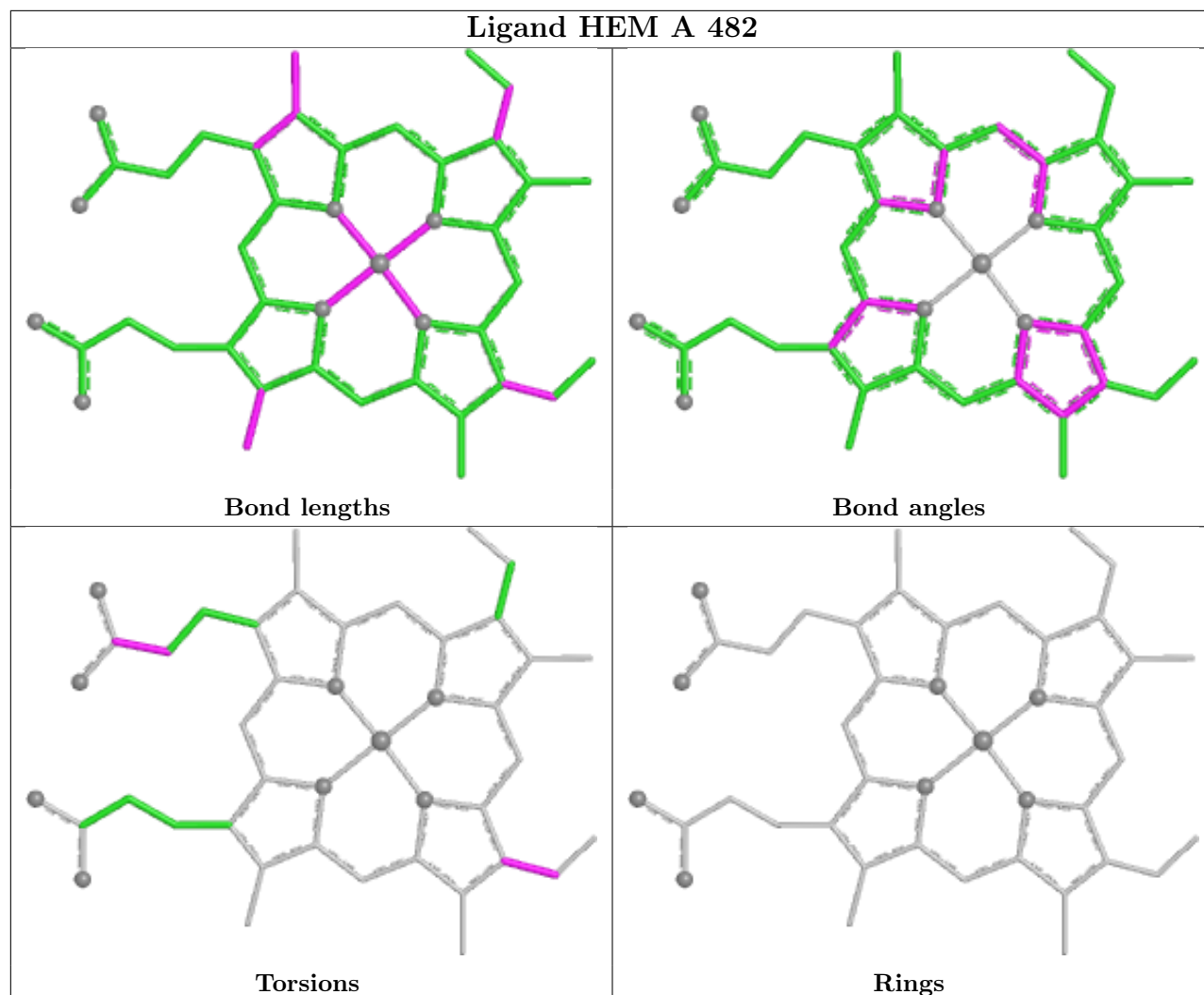
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Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	482	HEM	5	0
2	A	482	HEM	9	0
3	A	490	LNP	27	0
3	B	490	LNP	36	0
2	B	482	HEM	6	0
2	D	482	HEM	6	0

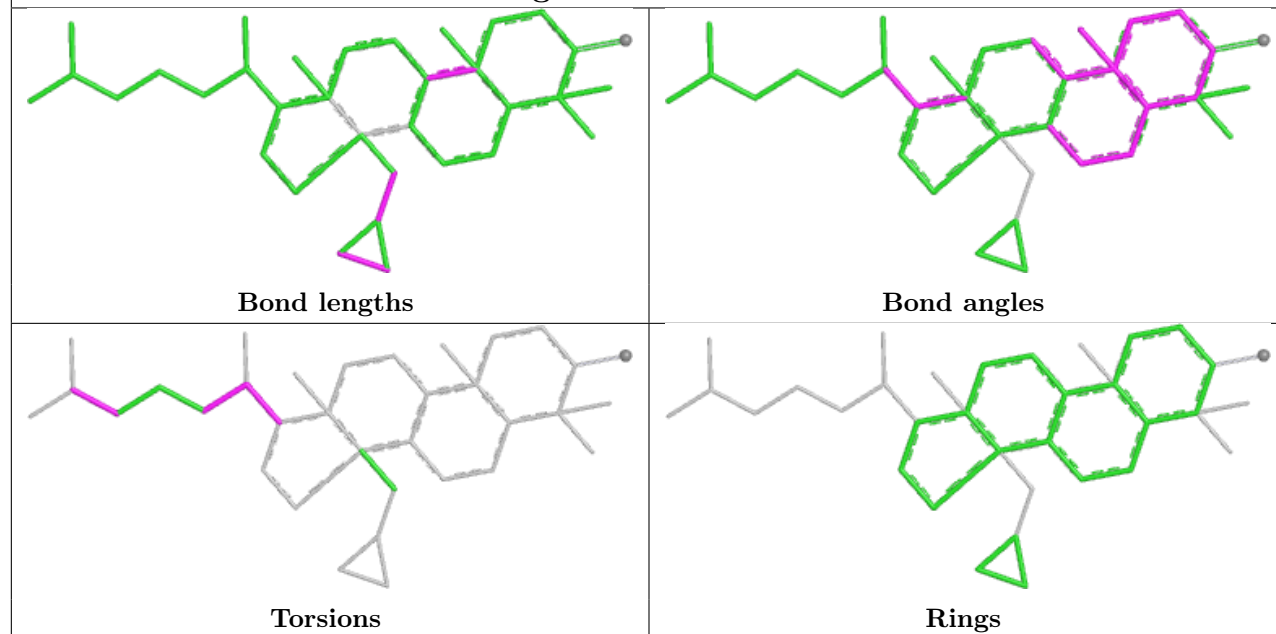
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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



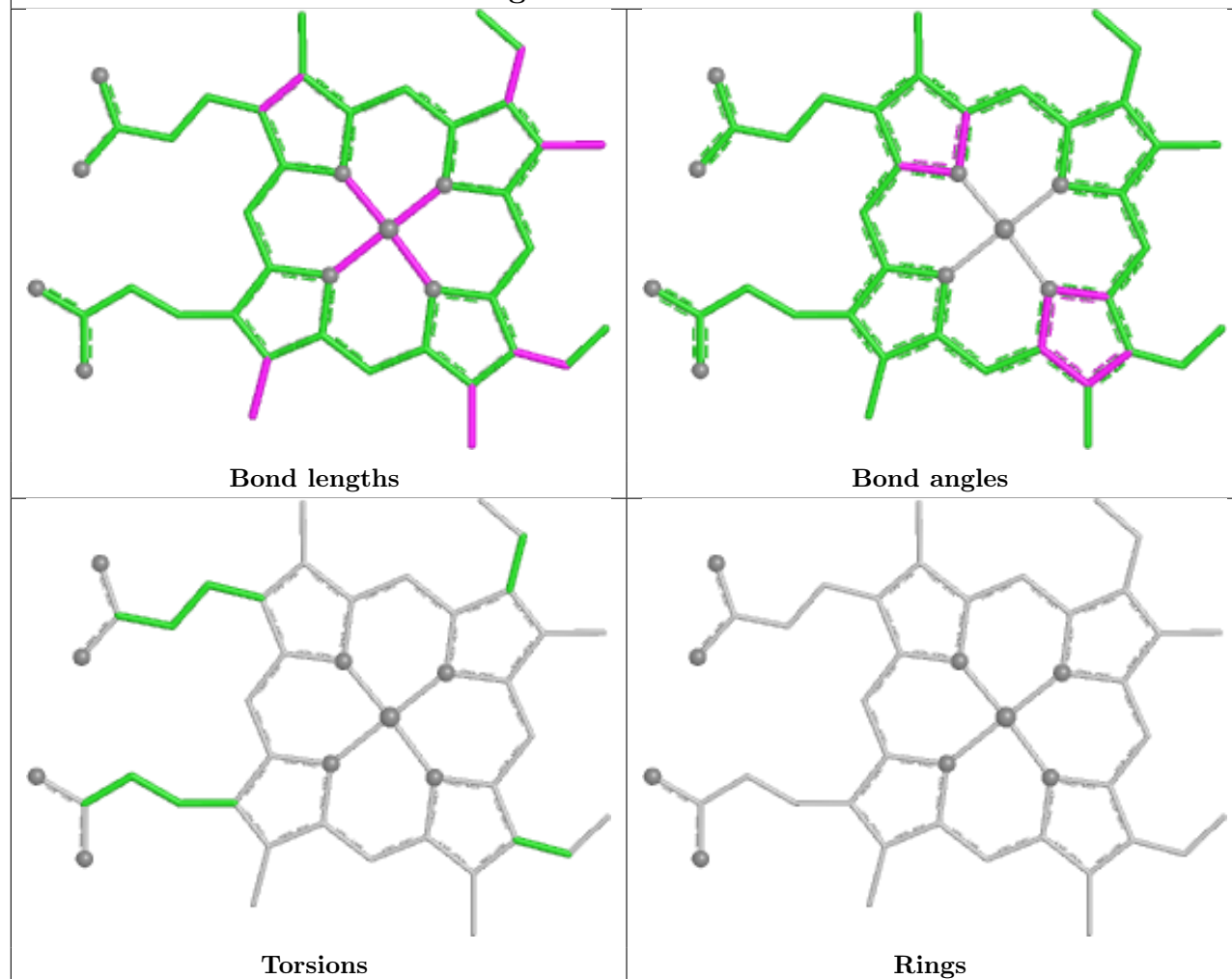


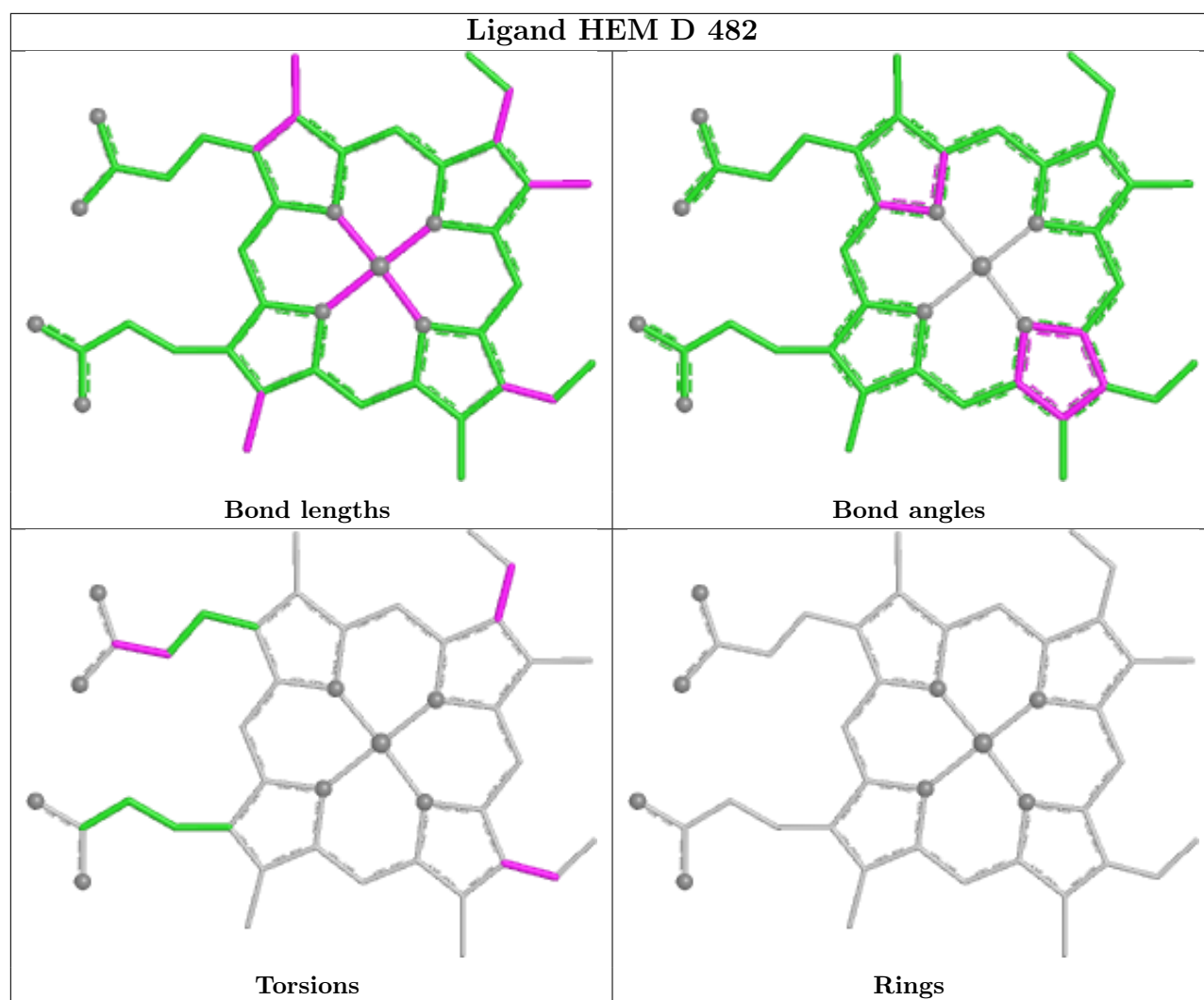


Ligand LNP B 490



Ligand HEM B 482





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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	448/453 (98%)	-0.03	2 (0%) 88 76	27, 80, 104, 123	0
1	B	448/453 (98%)	0.04	4 (0%) 81 61	50, 90, 133, 166	0
1	C	444/453 (98%)	-0.12	2 (0%) 87 72	44, 73, 100, 131	0
1	D	448/453 (98%)	-0.07	2 (0%) 88 76	41, 86, 138, 209	0
All	All	1788/1812 (98%)	-0.04	10 (0%) 85 69	27, 81, 124, 209	0

All (10) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	440	PHE	3.7
1	D	293	GLN	2.8
1	B	236	LEU	2.8
1	C	213	VAL	2.7
1	B	436	LEU	2.6
1	B	174	MET	2.6
1	B	440	PHE	2.5
1	A	65	SER	2.5
1	C	258	THR	2.5
1	D	109	VAL	2.3

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](#)

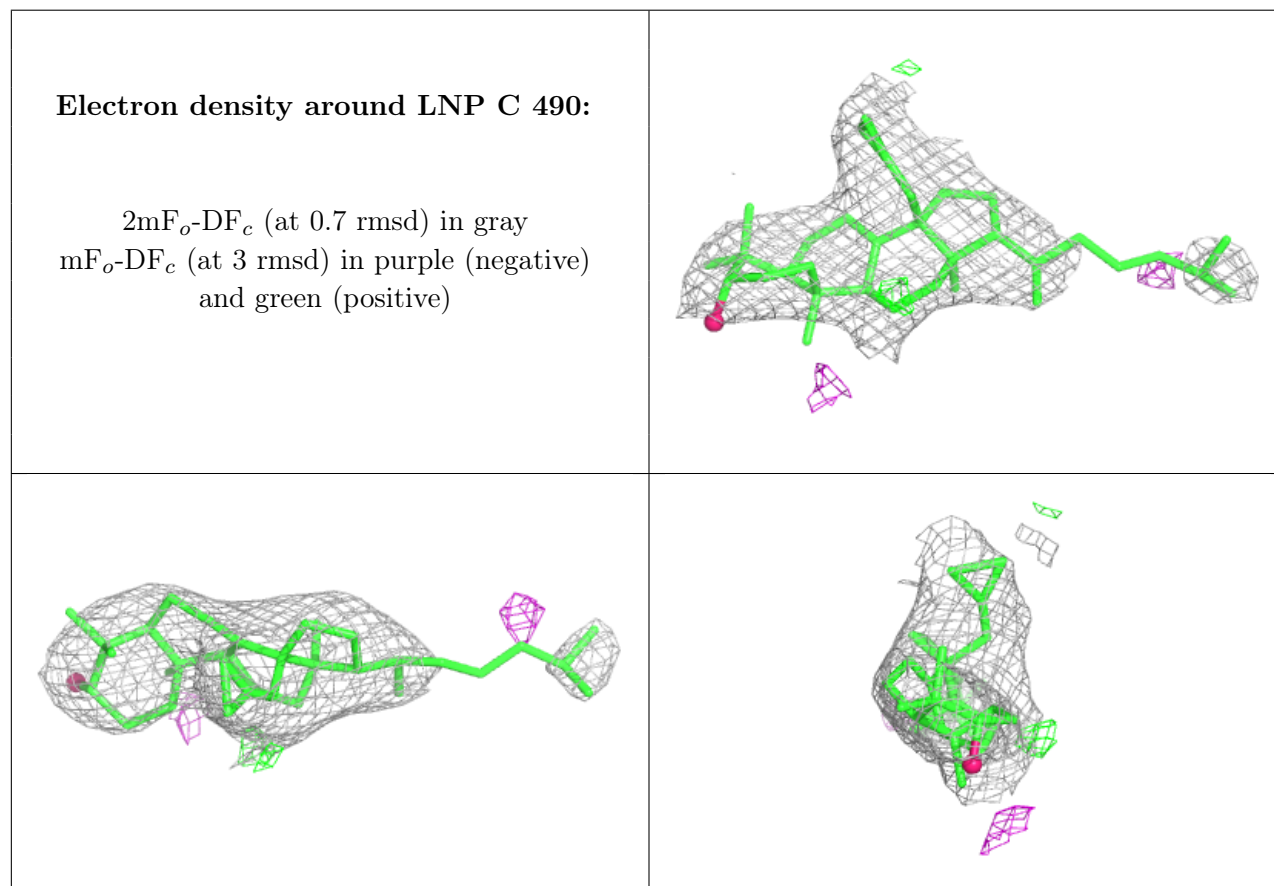
There are no oligosaccharides in this entry.

6.4 Ligands ⓘ

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.

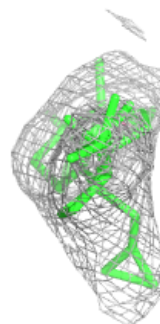
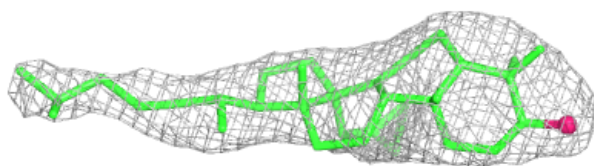
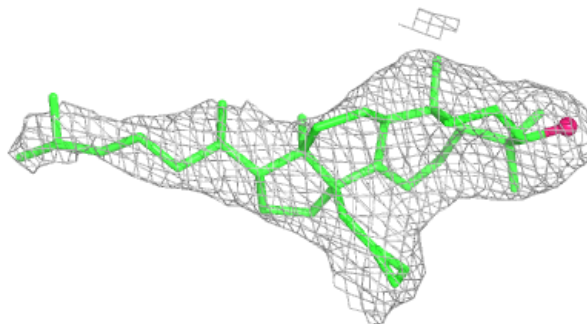
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	LNP	C	490	34/34	0.90	0.14	53,75,80,82	0
3	LNP	A	490	34/34	0.91	0.13	62,70,76,78	0
3	LNP	D	490	34/34	0.92	0.20	56,64,75,77	34
3	LNP	B	490	34/34	0.93	0.17	54,66,71,72	34
2	HEM	A	482	43/43	0.96	0.09	37,50,57,60	0
2	HEM	C	482	43/43	0.97	0.09	35,43,50,55	0
2	HEM	D	482	43/43	0.97	0.10	32,41,50,57	0
2	HEM	B	482	43/43	0.97	0.08	40,48,55,61	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.

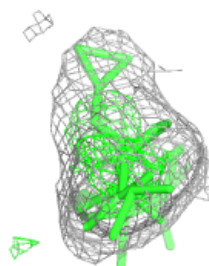
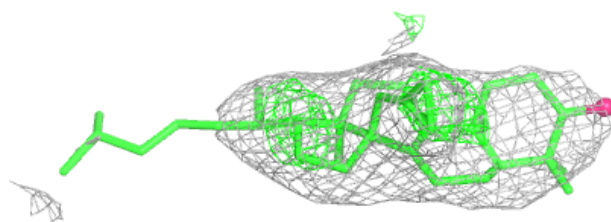
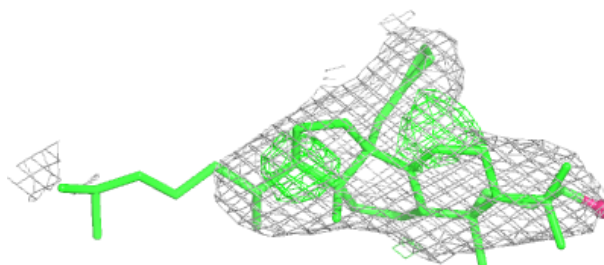


Electron density around LNP A 490:

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

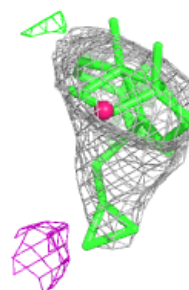
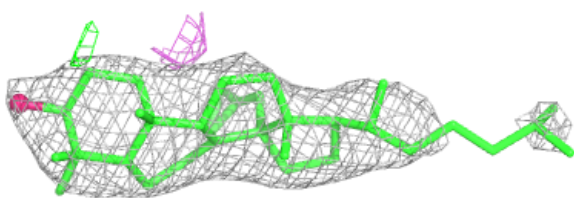
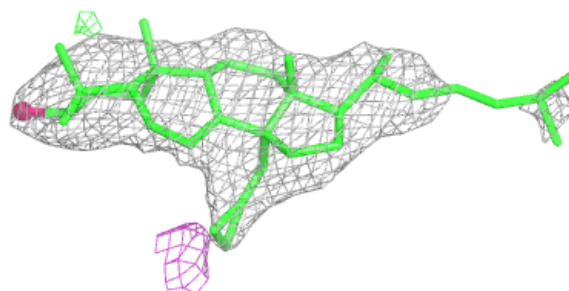
**Electron density around LNP D 490:**

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

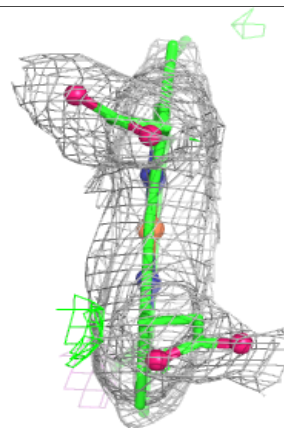
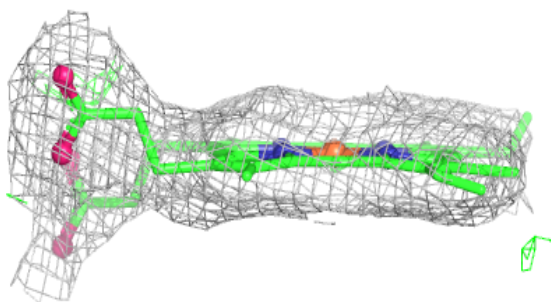
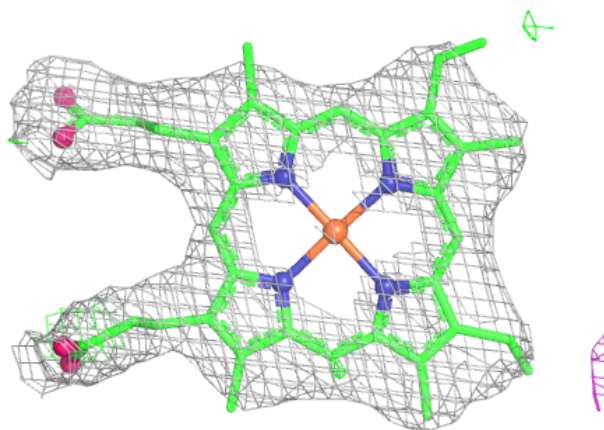


Electron density around LNP B 490:

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

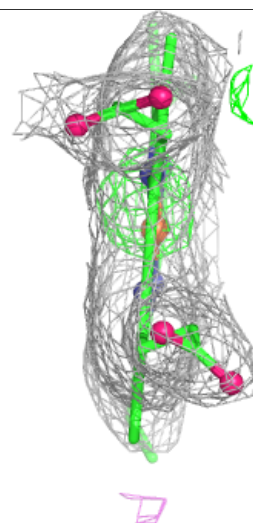
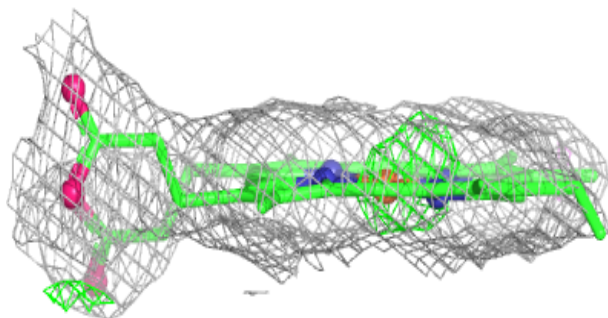
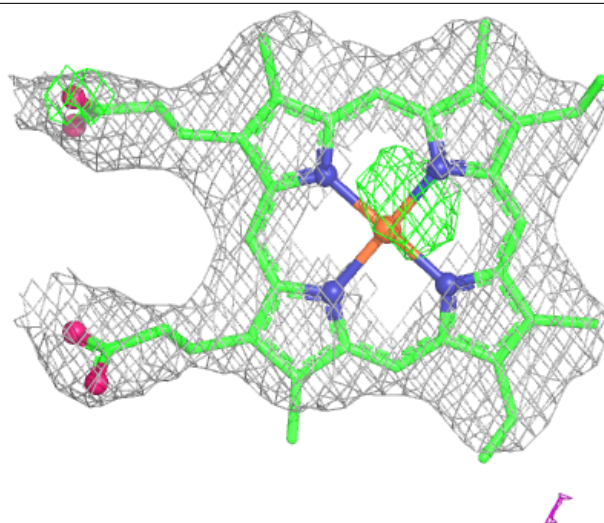
**Electron density around HEM A 482:**

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



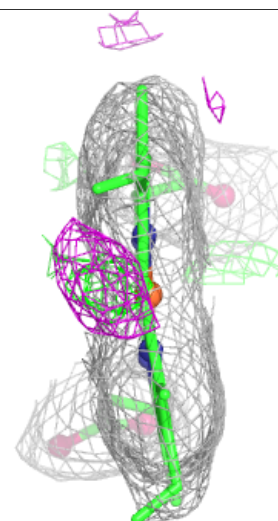
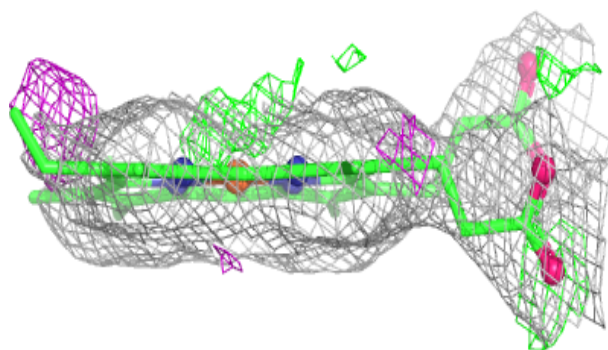
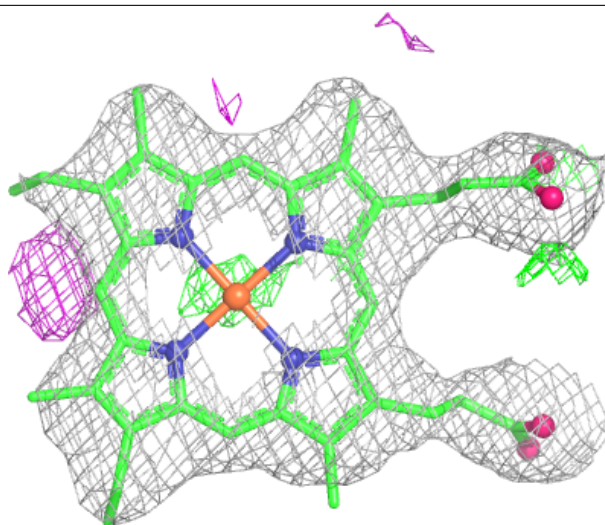
Electron density around HEM C 482:

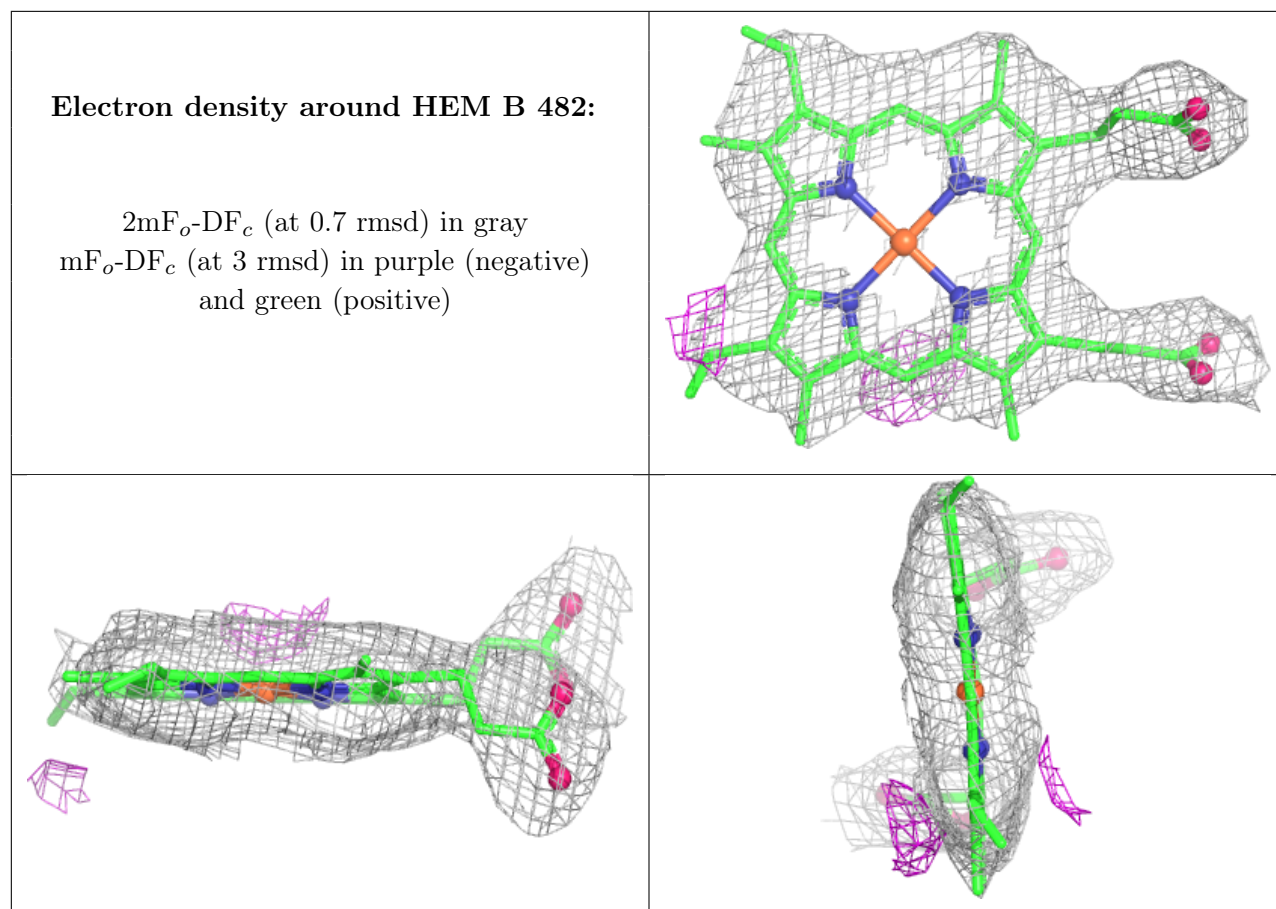
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around HEM D 482:

$2mF_o-DF_c$ (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.