Full wwPDB X-ray Structure Validation Report ⓘ

Jul 31, 2023 – 08:47 PM EDT

PDB ID	:	3PGH
Title	:	CYCLOOXYGENASE-2 (PROSTAGLANDIN SYNTHASE-2) COMPLEXED WITH A NON-SELECTIVE INHIBITOR, FLURBIPROFEN
Authors	:	Kurumbail, R.; Stallings, W.
Deposited on	:	1996-12-18
Resolution	:	2.50 Å(reported)

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

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

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

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

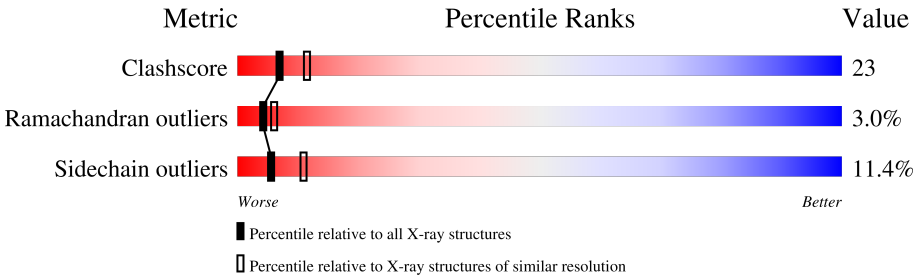
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.34

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.50 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	5346 (2.50-2.50)
Ramachandran outliers	138981	5231 (2.50-2.50)
Sidechain outliers	138945	5233 (2.50-2.50)

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

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	587	51% 35% 7% • 6%
1	B	587	52% 35% 7% • 6%
1	C	587	51% 34% 8% • 6%
1	D	587	52% 34% 7% • 6%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 18304 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.

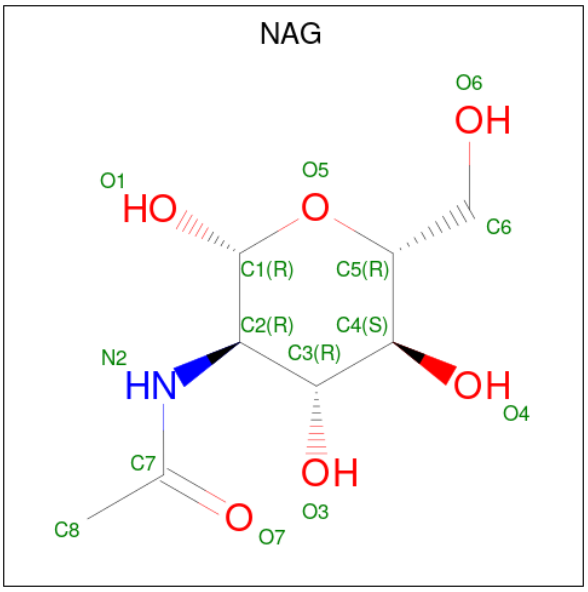
- Molecule 1 is a protein called CYCLOOXYGENASE-2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	552	Total	C	N	O	S	0	0	0
			4473	2886	748	814	25			
1	B	552	Total	C	N	O	S	0	0	0
			4473	2886	748	814	25			
1	C	552	Total	C	N	O	S	0	0	0
			4473	2886	748	814	25			
1	D	552	Total	C	N	O	S	0	0	0
			4473	2886	748	814	25			

There are 8 discrepancies between the modelled and reference sequences:

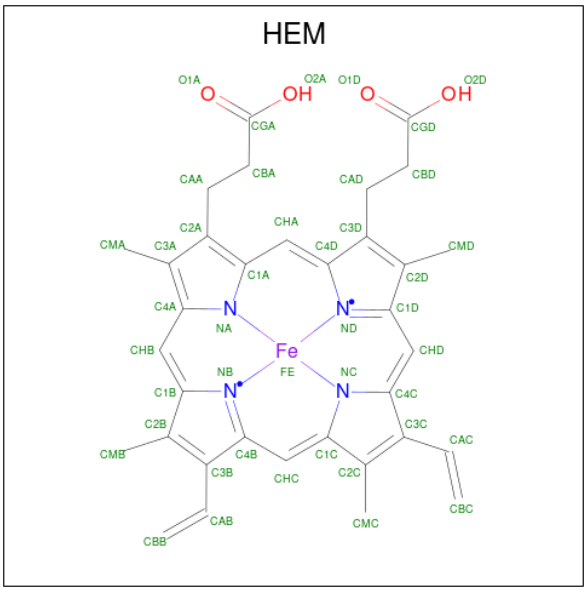
Chain	Residue	Modelled	Actual	Comment	Reference
A	310	GLN	ASN	conflict	UNP Q05769
A	333	LYS	ARG	conflict	UNP Q05769
B	310	GLN	ASN	conflict	UNP Q05769
B	333	LYS	ARG	conflict	UNP Q05769
C	310	GLN	ASN	conflict	UNP Q05769
C	333	LYS	ARG	conflict	UNP Q05769
D	310	GLN	ASN	conflict	UNP Q05769
D	333	LYS	ARG	conflict	UNP Q05769

- Molecule 2 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



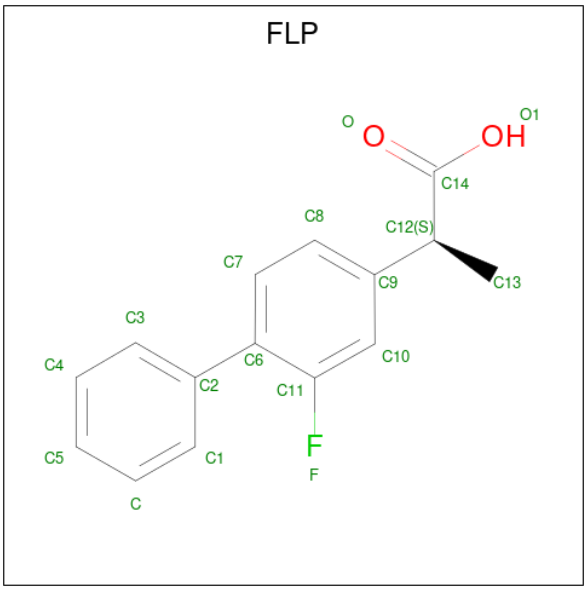
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C N O 14 8 1 5	0	0
2	A	1	Total C N O 14 8 1 5	0	0
2	A	1	Total C N O 14 8 1 5	0	0
2	B	1	Total C N O 14 8 1 5	0	0
2	B	1	Total C N O 14 8 1 5	0	0
2	B	1	Total C N O 14 8 1 5	0	0
2	C	1	Total C N O 14 8 1 5	0	0
2	C	1	Total C N O 14 8 1 5	0	0
2	C	1	Total C N O 14 8 1 5	0	0
2	D	1	Total C N O 14 8 1 5	0	0
2	D	1	Total C N O 14 8 1 5	0	0
2	D	1	Total C N O 14 8 1 5	0	0

- Molecule 3 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula: $C_{34}H_{32}FeN_4O_4$).



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

- Molecule 4 is FLURBIPROFEN (three-letter code: FLP) (formula: $C_{15}H_{13}FO_2$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	F	O	0	0
			18	15	1	2		
4	B	1	Total	C	F	O	0	0
			18	15	1	2		
4	C	1	Total	C	F	O	0	0
			18	15	1	2		
4	D	1	Total	C	F	O	0	0
			18	15	1	2		

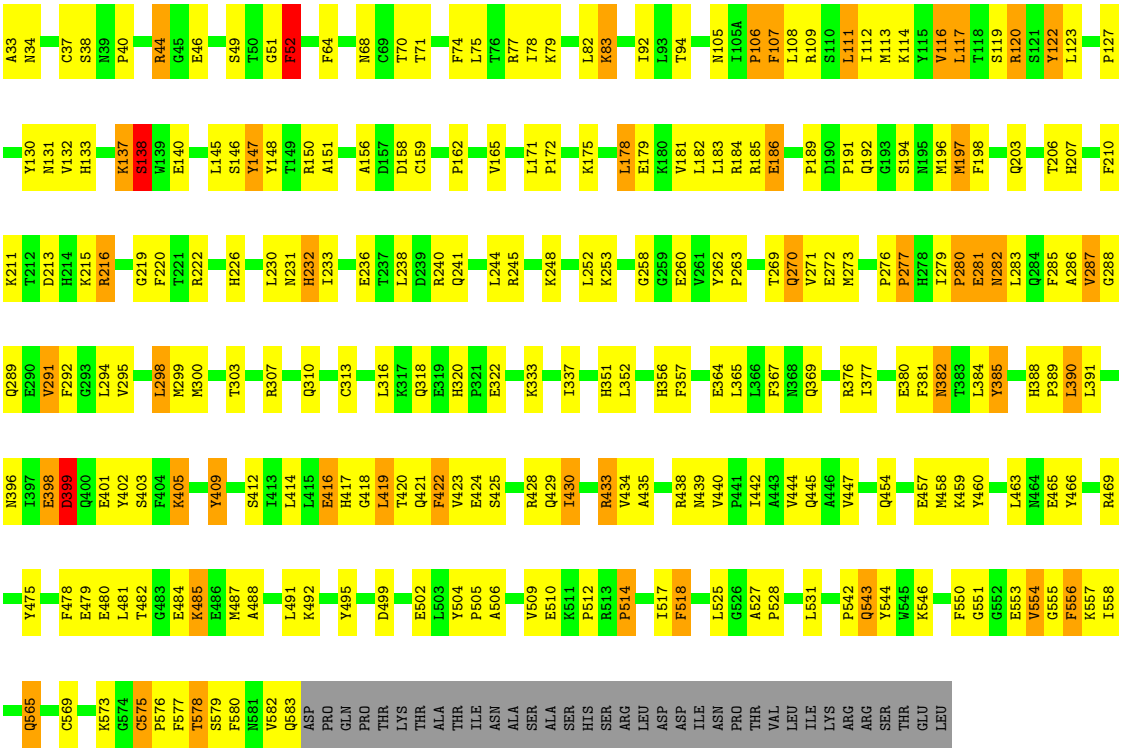
3 Residue-property plots (i)

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

Note EDS was not executed.

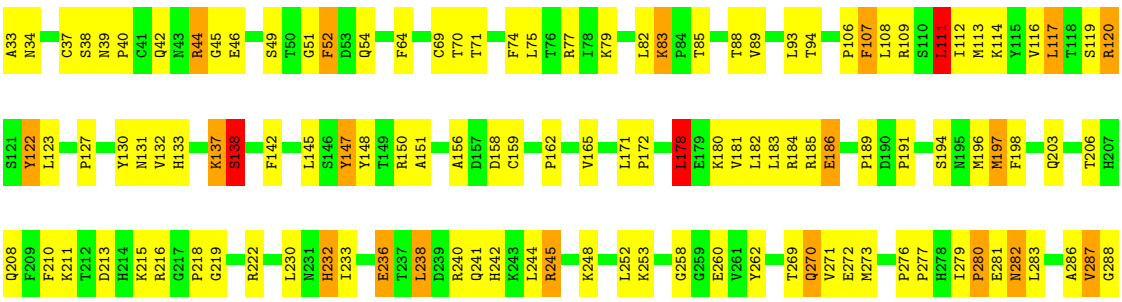
- Molecule 1: CYCLOOXYGENASE-2

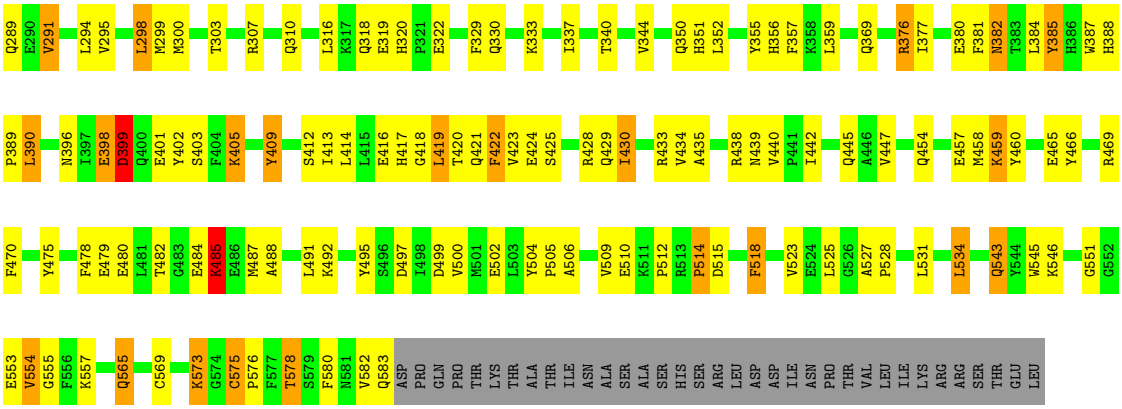
Chain A:



- Molecule 1: CYCLOOXYGENASE-2

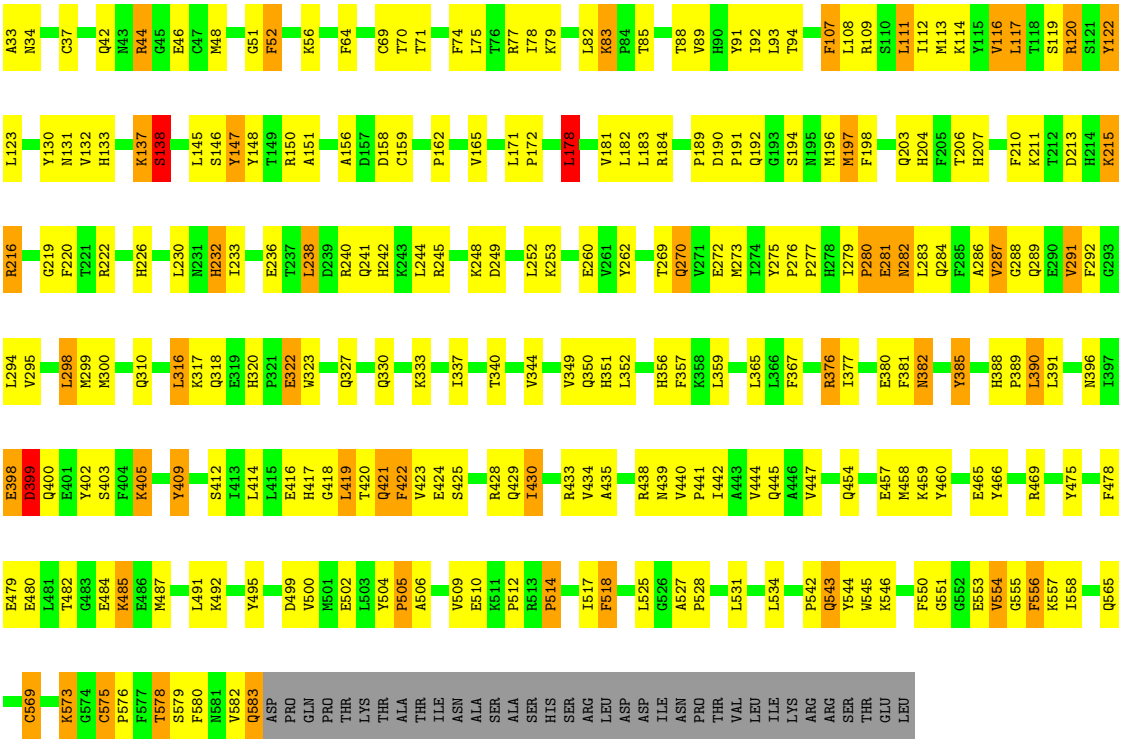
Chain B:





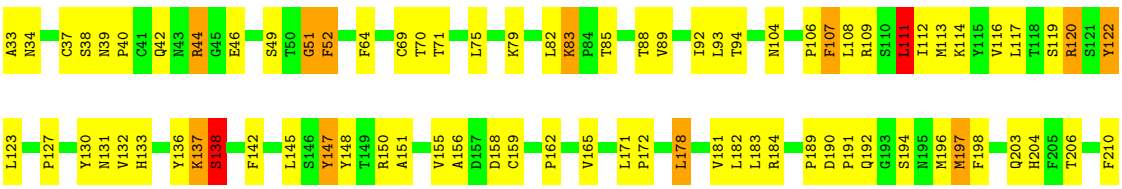
• Molecule 1: CYCLOOXYGENASE-2

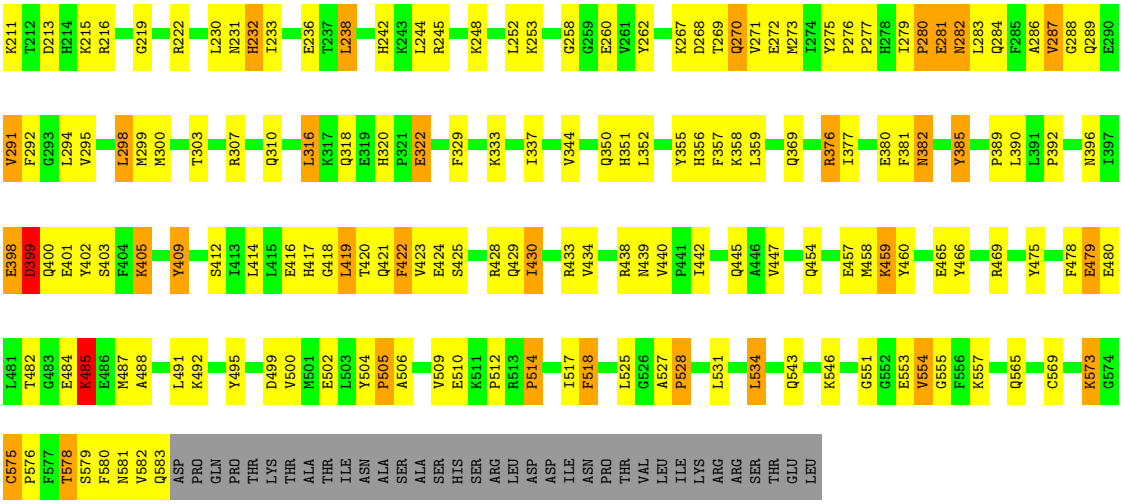
Chain C:



• Molecule 1: CYCLOOXYGENASE-2

Chain D:




K211 T212 D213 H214 K215 R216 G219 R222 L230 N231 H232 I233 E236 T237 L238 H242 K243 L244 R245 K248 L252 K253 G258 G259 E260 V261 Y262 K267 D268 T269 Q270 V271 E272 M273 I274 Y275 P276 P277 H278 I279 P280 E281 N282 L283 Q284 F285 A286 V287 G288 Q289 E290
V291 F292 G293 L294 V295 L298 M299 M300 T303 R307 Q310 L316 K317 Q318 E319 H320 P321 E322 F329 K333 I337 V344 Q350 H351 L352 Y355 H356 F357 K358 L359 Q369 R376 I377 E380 F381 N382 Y385 P389 L390 L391 P392 N396 I397
E398 D399 Q400 E401 Y402 S403 F404 K405 Y409 S412 I413 L414 L415 E416 H417 G418 L419 T420 Q421 F422 V423 E424 S425 R428 Q429 I430 R433 V434 R438 N439 V440 P441 I442 Q445 A446 V447 Q454 E457 M458 K459 Y460 E465 Y466 R469 Y475 F478 E479 E480
L481 T482 G483 E484 K485 E486 M487 A488 L491 K492 Y495 D499 V500 M501 E502 L503 Y504 P505 A506 V509 E510 K511 P512 R513 P514 I517 F518 L525 G526 A527 P528 L531 L534 Q543 K546 G551 G552 E553 V554 G555 F556 K557 Q565 C569 K573 G574
C575 P576 F577 T578 S579 F580 N581 V582 Q583 ASP PRO GLN PRO THR LYS THR ALA THR ILE ASN ALA SER ALA SER HIS SER ARG LEU ASP ASP ILE ASN PRO THR VAL LEU LEU ILE LYS ARG ARG SER THR GLU LEU

4 Data and refinement statistics (i)

Xtriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α, β, γ	179.50Å 133.80Å 117.10Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	8.00 – 2.50	Depositor
% Data completeness (in resolution range)	63.1 (8.00-2.50)	Depositor
R_{merge}	0.11	Depositor
R_{sym}	0.11	Depositor
Refinement program	X-PLOR 3.1	Depositor
R, R_{free}	0.236 , 0.316	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	18304	wwPDB-VP
Average B, all atoms (Å^2)	15.0	wwPDB-VP

5 Model quality

5.1 Standard geometry

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

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	0.67	1/4600 (0.0%)	0.85	5/6237 (0.1%)
1	B	0.68	1/4600 (0.0%)	0.86	6/6237 (0.1%)
1	C	0.65	0/4600	0.86	5/6237 (0.1%)
1	D	0.67	1/4600 (0.0%)	0.85	6/6237 (0.1%)
All	All	0.67	3/18400 (0.0%)	0.86	22/24948 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	B	0	1
1	C	0	2
1	D	0	1
All	All	0	5

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	313	CYS	CB-SG	-5.72	1.72	1.81
1	B	236	GLU	CG-CD	5.45	1.60	1.51
1	D	479	GLU	CG-CD	5.12	1.59	1.51

All (22) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	390	LEU	CA-CB-CG	6.90	131.17	115.30
1	B	287	VAL	N-CA-C	6.78	129.30	111.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	287	VAL	N-CA-C	6.43	128.35	111.00
1	A	390	LEU	CA-CB-CG	6.42	130.08	115.30
1	A	287	VAL	N-CA-C	6.42	128.32	111.00
1	C	287	VAL	N-CA-C	6.33	128.09	111.00
1	B	390	LEU	CA-CB-CG	5.97	129.03	115.30
1	B	258	GLY	N-CA-C	-5.67	98.94	113.10
1	B	111	LEU	CA-CB-CG	5.66	128.31	115.30
1	A	171	LEU	CA-CB-CG	5.65	128.31	115.30
1	C	390	LEU	CA-CB-CG	5.53	128.01	115.30
1	B	485	LYS	N-CA-C	5.52	125.90	111.00
1	D	258	GLY	N-CA-C	-5.48	99.41	113.10
1	B	178	LEU	CA-CB-CG	5.30	127.50	115.30
1	A	281	GLU	N-CA-C	-5.30	96.69	111.00
1	A	258	GLY	N-CA-C	-5.29	99.86	113.10
1	D	111	LEU	CA-CB-CG	5.21	127.29	115.30
1	D	281	GLU	N-CA-C	-5.14	97.12	111.00
1	C	171	LEU	CA-CB-CG	5.12	127.07	115.30
1	D	485	LYS	N-CA-C	5.10	124.78	111.00
1	C	178	LEU	CA-CB-CG	5.06	126.94	115.30
1	C	281	GLU	N-CA-C	-5.01	97.48	111.00

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	147	TYR	Sidechain
1	B	147	TYR	Sidechain
1	C	147	TYR	Sidechain
1	C	91	TYR	Sidechain
1	D	147	TYR	Sidechain

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	4473	0	4374	207	0
1	B	4473	0	4374	217	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	4473	0	4375	215	0
1	D	4473	0	4375	201	0
2	A	42	0	39	4	0
2	B	42	0	39	3	0
2	C	42	0	39	0	0
2	D	42	0	39	0	0
3	A	43	0	30	6	0
3	B	43	0	30	9	0
3	C	43	0	30	6	0
3	D	43	0	30	9	0
4	A	18	0	12	1	0
4	B	18	0	12	6	0
4	C	18	0	12	3	0
4	D	18	0	12	3	0
All	All	18304	0	17822	829	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 23.

All (829) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:424:GLU:HA	1:C:428:ARG:HH21	1.27	0.97
1:A:458:MET:HE2	1:A:460:TYR:HE1	1.27	0.96
1:A:424:GLU:HA	1:A:428:ARG:HH21	1.31	0.96
1:D:424:GLU:HA	1:D:428:ARG:HH21	1.30	0.95
1:B:479:GLU:HG2	1:B:485:LYS:NZ	1.82	0.95
1:C:230:LEU:HG	1:C:337:ILE:HG12	1.50	0.93
1:C:458:MET:HE2	1:C:460:TYR:HE1	1.32	0.93
1:A:230:LEU:HG	1:A:337:ILE:HG12	1.52	0.92
1:D:230:LEU:HG	1:D:337:ILE:HG12	1.52	0.91
1:A:479:GLU:HG2	1:A:485:LYS:NZ	1.85	0.91
1:A:430:ILE:HG23	1:A:582:VAL:HG11	1.53	0.90
1:C:253:LYS:HE3	1:C:269:THR:HG22	1.53	0.89
1:B:230:LEU:HG	1:B:337:ILE:HG12	1.55	0.89
1:D:458:MET:HE2	1:D:460:TYR:HE1	1.39	0.89
1:B:424:GLU:HA	1:B:428:ARG:HH21	1.38	0.88
1:B:458:MET:HE2	1:B:460:TYR:HE1	1.37	0.87
1:A:291:VAL:HG22	1:A:294:LEU:HD12	1.57	0.87
1:B:430:ILE:HG23	1:B:582:VAL:HG11	1.57	0.86
1:D:156:ALA:HB3	1:D:159:CYS:SG	2.15	0.86

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:253:LYS:CE	1:C:269:THR:HG22	2.06	0.86
1:D:405:LYS:H	1:D:405:LYS:HD2	1.42	0.85
1:B:156:ALA:HB3	1:B:159:CYS:SG	2.17	0.85
1:A:458:MET:HE2	1:A:460:TYR:CE1	2.12	0.84
1:B:291:VAL:HG22	1:B:294:LEU:HD12	1.59	0.83
1:C:458:MET:HE2	1:C:460:TYR:CE1	2.15	0.82
1:B:458:MET:HE2	1:B:460:TYR:CE1	2.14	0.82
1:C:479:GLU:HG2	1:C:485:LYS:NZ	1.95	0.81
1:D:430:ILE:HG23	1:D:582:VAL:HG11	1.61	0.80
1:C:291:VAL:HG22	1:C:294:LEU:HD12	1.64	0.80
1:A:253:LYS:HE3	1:A:269:THR:HG22	1.65	0.79
1:D:291:VAL:HG22	1:D:294:LEU:HD12	1.61	0.79
1:D:458:MET:HE2	1:D:460:TYR:CE1	2.18	0.78
1:C:430:ILE:HG23	1:C:582:VAL:HG11	1.63	0.78
1:A:420:THR:HG23	1:A:576:PRO:HG3	1.65	0.78
1:D:380:GLU:HG2	1:D:466:TYR:CE1	2.18	0.78
1:B:527:ALA:HB3	1:B:528:PRO:HD3	1.63	0.78
1:B:454:GLN:HA	1:B:457:GLU:HG2	1.65	0.78
1:C:156:ALA:HB3	1:C:159:CYS:SG	2.24	0.78
1:D:398:GLU:HG2	1:D:425:SER:OG	1.83	0.78
1:A:184:ARG:HA	1:A:438:ARG:O	1.84	0.77
1:A:398:GLU:HG2	1:A:425:SER:OG	1.84	0.77
1:A:479:GLU:HG2	1:A:485:LYS:HZ2	1.48	0.77
1:B:184:ARG:HA	1:B:438:ARG:O	1.84	0.77
1:A:156:ALA:HB3	1:A:159:CYS:SG	2.25	0.76
1:D:447:VAL:HG13	3:D:682:HEM:HBA2	1.67	0.76
1:D:527:ALA:HB3	1:D:528:PRO:HD3	1.68	0.76
1:B:380:GLU:HG2	1:B:466:TYR:CE1	2.21	0.75
1:B:405:LYS:H	1:B:405:LYS:HD2	1.52	0.75
1:A:380:GLU:HG2	1:A:466:TYR:CE1	2.22	0.74
1:B:120:ARG:HG2	1:B:531:LEU:HD12	1.69	0.74
1:C:83:LYS:HB2	1:C:83:LYS:NZ	2.02	0.74
1:C:479:GLU:HG2	1:C:485:LYS:HZ2	1.53	0.74
1:B:420:THR:HG23	1:B:576:PRO:HG3	1.69	0.74
1:C:380:GLU:HG2	1:C:466:TYR:CE1	2.22	0.74
1:B:398:GLU:HG2	1:B:425:SER:OG	1.85	0.74
1:C:382:ASN:HD21	3:C:682:HEM:HAD2	1.52	0.73
1:C:184:ARG:HA	1:C:438:ARG:O	1.89	0.73
1:C:120:ARG:HG2	1:C:531:LEU:HD12	1.70	0.73
1:C:398:GLU:HG2	1:C:425:SER:OG	1.88	0.73
1:A:123:LEU:O	1:A:469:ARG:NH2	2.22	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:197:MET:HE2	1:C:197:MET:HA	1.71	0.73
1:D:382:ASN:HD21	3:D:682:HEM:HAD2	1.54	0.73
1:C:197:MET:HA	1:C:197:MET:CE	2.18	0.72
1:B:333:LYS:O	1:B:337:ILE:HG13	1.90	0.72
1:C:123:LEU:O	1:C:469:ARG:NH2	2.22	0.72
1:D:280:PRO:CG	1:D:283:LEU:HD12	2.20	0.71
1:C:405:LYS:H	1:C:405:LYS:HD2	1.55	0.71
1:D:196:MET:HG2	1:D:429:GLN:HG2	1.73	0.71
1:D:420:THR:HG23	1:D:576:PRO:HG3	1.71	0.71
1:D:553:GLU:HG3	1:D:557:LYS:NZ	2.06	0.71
1:A:280:PRO:CG	1:A:283:LEU:HD12	2.20	0.70
1:C:420:THR:OG1	1:C:573:LYS:HB3	1.91	0.70
1:D:333:LYS:O	1:D:337:ILE:HG13	1.91	0.70
1:B:281:GLU:O	1:B:283:LEU:N	2.25	0.70
1:B:108:LEU:O	1:B:112:ILE:HG12	1.92	0.70
1:D:253:LYS:HE3	1:D:269:THR:HG22	1.72	0.70
1:A:120:ARG:HG2	1:A:531:LEU:HD12	1.72	0.70
1:A:295:VAL:CG1	1:A:298:LEU:HD22	2.22	0.69
1:A:333:LYS:O	1:A:337:ILE:HG13	1.91	0.69
1:A:382:ASN:HD21	3:A:682:HEM:HAD2	1.56	0.69
1:D:479:GLU:HG2	1:D:485:LYS:NZ	2.07	0.69
1:C:398:GLU:HG3	1:C:421:GLN:NE2	2.06	0.69
1:B:291:VAL:CG2	1:B:294:LEU:HD12	2.21	0.69
1:C:286:ALA:O	1:C:287:VAL:HG22	1.93	0.69
1:B:382:ASN:HD21	3:B:682:HEM:HAD2	1.56	0.68
1:B:83:LYS:HB2	1:B:83:LYS:NZ	2.08	0.68
1:C:295:VAL:CG1	1:C:298:LEU:HD22	2.23	0.68
1:D:120:ARG:HG2	1:D:531:LEU:HD12	1.76	0.68
1:B:479:GLU:HG2	1:B:485:LYS:HZ1	1.59	0.68
1:C:295:VAL:HG12	1:C:298:LEU:HD22	1.76	0.68
1:C:403:SER:HB2	1:C:405:LYS:HD2	1.76	0.68
1:A:253:LYS:CE	1:A:269:THR:HG22	2.24	0.67
1:B:287:VAL:HG11	1:B:299:MET:SD	2.34	0.67
1:D:295:VAL:CG1	1:D:298:LEU:HD22	2.25	0.67
1:B:458:MET:CE	1:B:460:TYR:HE1	2.08	0.67
1:C:454:GLN:HA	1:C:457:GLU:HG2	1.74	0.67
1:A:403:SER:HB2	1:A:405:LYS:HD2	1.76	0.67
1:D:291:VAL:CG2	1:D:294:LEU:HD12	2.23	0.67
1:D:454:GLN:HA	1:D:457:GLU:HG2	1.75	0.67
1:C:291:VAL:CG2	1:C:294:LEU:HD12	2.25	0.67
1:A:286:ALA:O	1:A:287:VAL:HG22	1.95	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:196:MET:HG2	1:B:429:GLN:HG2	1.77	0.67
1:C:420:THR:HG23	1:C:576:PRO:HG3	1.75	0.67
1:A:291:VAL:CG2	1:A:294:LEU:HD12	2.25	0.67
1:A:295:VAL:HG12	1:A:298:LEU:HD22	1.76	0.66
1:B:495:TYR:HE2	1:B:502:GLU:HG3	1.60	0.66
1:A:213:ASP:OD1	1:A:215:LYS:HE2	1.96	0.66
1:A:194:SER:OG	1:A:351:HIS:HE1	1.78	0.66
1:D:108:LEU:O	1:D:112:ILE:HG12	1.95	0.66
1:D:458:MET:CE	1:D:460:TYR:HE1	2.08	0.66
1:A:191:PRO:HD2	1:A:433:ARG:HG3	1.75	0.66
1:A:527:ALA:HB3	1:A:528:PRO:HD3	1.77	0.66
1:D:123:LEU:O	1:D:469:ARG:NH2	2.29	0.66
1:A:83:LYS:NZ	1:A:83:LYS:HB2	2.11	0.66
1:D:276:PRO:HG2	1:D:409:TYR:CD2	2.29	0.66
1:B:280:PRO:CG	1:B:283:LEU:HD12	2.26	0.65
1:D:148:TYR:HD1	1:D:377:ILE:HG13	1.61	0.65
1:A:276:PRO:HG2	1:A:409:TYR:CD2	2.31	0.65
1:B:183:LEU:HD21	1:B:445:GLN:HB3	1.77	0.65
1:A:458:MET:CE	1:A:460:TYR:HE1	2.08	0.65
1:A:546:LYS:HD2	1:B:46:GLU:OE2	1.97	0.65
1:B:381:PHE:O	1:B:385:TYR:HB2	1.96	0.65
1:C:527:ALA:HB3	1:C:528:PRO:HD3	1.78	0.65
1:A:381:PHE:O	1:A:385:TYR:HB2	1.97	0.65
1:B:475:TYR:HA	1:B:480:GLU:OE2	1.97	0.65
1:D:280:PRO:HG3	1:D:283:LEU:HD12	1.79	0.64
1:D:83:LYS:HB2	1:D:83:LYS:NZ	2.12	0.64
1:D:295:VAL:HG12	1:D:298:LEU:HD22	1.79	0.64
1:C:132:VAL:HG21	1:C:219:GLY:HA3	1.80	0.64
1:D:184:ARG:HA	1:D:438:ARG:O	1.98	0.64
1:B:197:MET:HA	1:B:197:MET:CE	2.28	0.64
1:B:132:VAL:HG21	1:B:219:GLY:HA3	1.80	0.64
1:D:276:PRO:O	1:D:279:ILE:HG12	1.97	0.64
1:A:197:MET:HA	1:A:197:MET:CE	2.29	0.63
1:A:454:GLN:HA	1:A:457:GLU:HG2	1.80	0.63
1:B:215:LYS:NZ	1:B:222:ARG:HH21	1.96	0.63
1:C:46:GLU:OE2	1:D:546:LYS:HD2	1.99	0.63
1:D:120:ARG:HD3	4:D:701:FLP:O	1.99	0.63
1:D:420:THR:OG1	1:D:573:LYS:HB3	1.99	0.63
1:B:148:TYR:HD1	1:B:377:ILE:HG13	1.63	0.63
1:C:196:MET:HG2	1:C:429:GLN:HG2	1.80	0.62
1:B:123:LEU:O	1:B:469:ARG:NH2	2.32	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:276:PRO:HG2	1:C:409:TYR:CD2	2.34	0.62
1:D:114:LYS:HD3	1:D:369:GLN:NE2	2.14	0.62
1:C:333:LYS:O	1:C:337:ILE:HG13	1.98	0.62
1:A:506:ALA:O	1:A:510:GLU:HB2	1.99	0.62
1:C:85:THR:O	1:C:89:VAL:HG23	2.00	0.62
1:B:398:GLU:HG3	1:B:421:GLN:NE2	2.15	0.62
1:C:504:TYR:HB3	1:C:505:PRO:HD3	1.80	0.62
1:C:506:ALA:O	1:C:510:GLU:HB2	1.99	0.62
1:A:38:SER:OG	1:A:40:PRO:HD3	1.99	0.62
1:C:131:ASN:HA	1:C:150:ARG:HG2	1.82	0.62
1:D:475:TYR:HA	1:D:480:GLU:OE2	1.99	0.62
1:C:191:PRO:HD2	1:C:433:ARG:HG3	1.80	0.62
1:D:211:LYS:HZ1	1:D:236:GLU:HG2	1.64	0.62
1:D:506:ALA:O	1:D:510:GLU:HB2	1.99	0.62
1:C:491:LEU:HD11	1:C:509:VAL:HG11	1.82	0.62
1:A:287:VAL:HG11	1:A:299:MET:SD	2.40	0.61
1:B:253:LYS:HE3	1:B:269:THR:HG22	1.81	0.61
1:A:504:TYR:HB3	1:A:505:PRO:HD3	1.82	0.61
1:C:150:ARG:NH2	1:C:458:MET:O	2.33	0.61
1:C:108:LEU:O	1:C:112:ILE:HG12	2.00	0.61
1:A:398:GLU:HG3	1:A:421:GLN:NE2	2.16	0.61
1:A:475:TYR:HA	1:A:480:GLU:OE2	2.00	0.61
1:B:145:LEU:HD23	1:B:376:ARG:CZ	2.31	0.61
1:B:276:PRO:HG2	1:B:409:TYR:CD2	2.35	0.61
1:D:183:LEU:HD21	1:D:445:GLN:HB3	1.81	0.61
1:C:381:PHE:O	1:C:385:TYR:HB2	2.00	0.61
1:B:405:LYS:H	1:B:405:LYS:CD	2.14	0.61
1:A:116:VAL:O	1:A:120:ARG:HB2	2.00	0.60
1:A:491:LEU:HD11	1:A:509:VAL:HG11	1.82	0.60
1:D:145:LEU:HD23	1:D:376:ARG:CZ	2.31	0.60
1:D:281:GLU:O	1:D:283:LEU:N	2.34	0.60
1:D:381:PHE:O	1:D:385:TYR:HB2	2.00	0.60
1:A:46:GLU:OE2	1:B:546:LYS:HD2	2.01	0.60
1:A:575:CYS:N	1:A:576:PRO:HD3	2.17	0.60
1:D:197:MET:CE	1:D:197:MET:HA	2.31	0.60
1:A:132:VAL:HG21	1:A:219:GLY:HA3	1.82	0.60
1:A:281:GLU:O	1:A:283:LEU:N	2.34	0.60
1:A:147:TYR:OH	2:A:671:NAG:H62	2.01	0.60
1:B:211:LYS:NZ	1:B:236:GLU:CG	2.65	0.60
1:C:148:TYR:HD1	1:C:377:ILE:HG13	1.64	0.60
1:C:183:LEU:HD21	1:C:445:GLN:HB3	1.83	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:215:LYS:NZ	1:D:222:ARG:HH21	2.00	0.60
1:A:148:TYR:HD1	1:A:377:ILE:HG13	1.66	0.59
1:B:475:TYR:CD1	1:B:480:GLU:HG2	2.37	0.59
1:D:132:VAL:HG21	1:D:219:GLY:HA3	1.83	0.59
1:D:211:LYS:NZ	1:D:236:GLU:CG	2.66	0.59
1:D:398:GLU:O	1:D:399:ASP:HB2	2.02	0.59
1:B:420:THR:OG1	1:B:573:LYS:HB3	2.03	0.59
1:B:215:LYS:HD3	1:B:215:LYS:N	2.18	0.59
1:B:506:ALA:O	1:B:510:GLU:HB2	2.01	0.59
1:C:75:LEU:HG	1:C:79:LYS:HE2	1.83	0.59
1:C:133:HIS:CD2	1:C:147:TYR:HE2	2.21	0.59
1:C:281:GLU:O	1:C:283:LEU:N	2.35	0.59
1:A:495:TYR:HE2	1:A:502:GLU:HG3	1.68	0.59
1:B:479:GLU:HG2	1:B:485:LYS:HZ2	1.65	0.59
1:C:546:LYS:HD2	1:D:46:GLU:OE2	2.03	0.59
1:A:131:ASN:HA	1:A:150:ARG:HG2	1.85	0.59
1:A:412:SER:O	1:A:416:GLU:HB2	2.02	0.59
1:C:213:ASP:OD1	1:C:215:LYS:HE2	2.02	0.59
1:A:424:GLU:HA	1:A:428:ARG:NH2	2.11	0.58
1:C:475:TYR:HA	1:C:480:GLU:OE2	2.03	0.58
1:D:287:VAL:HG11	1:D:299:MET:SD	2.44	0.58
1:D:504:TYR:HB3	1:D:505:PRO:HD3	1.85	0.58
1:B:447:VAL:HG13	3:B:682:HEM:HBA2	1.85	0.58
1:B:479:GLU:HG2	1:B:485:LYS:CE	2.31	0.58
1:B:180:LYS:O	1:B:438:ARG:NH2	2.36	0.58
1:C:398:GLU:O	1:C:399:ASP:HB2	2.04	0.57
1:D:398:GLU:HG3	1:D:421:GLN:NE2	2.19	0.57
1:A:553:GLU:O	1:A:557:LYS:HE3	2.05	0.57
1:D:197:MET:HA	1:D:197:MET:HE2	1.87	0.57
1:D:211:LYS:NZ	1:D:236:GLU:HG2	2.18	0.57
1:D:253:LYS:CE	1:D:269:THR:HG22	2.34	0.57
1:A:108:LEU:O	1:A:112:ILE:HG12	2.04	0.57
1:A:150:ARG:NH2	1:A:458:MET:O	2.38	0.57
1:B:253:LYS:CE	1:B:269:THR:HG22	2.34	0.57
1:C:495:TYR:HE2	1:C:502:GLU:HG3	1.70	0.57
1:A:196:MET:HG2	1:A:429:GLN:HG2	1.86	0.57
1:C:525:LEU:O	1:C:528:PRO:HD2	2.04	0.57
1:D:575:CYS:N	1:D:576:PRO:HD3	2.20	0.57
1:A:276:PRO:O	1:A:279:ILE:HG12	2.05	0.57
1:A:398:GLU:O	1:A:399:ASP:HB2	2.05	0.57
1:B:89:VAL:O	1:B:93:LEU:HD23	2.04	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:211:LYS:HZ1	1:B:236:GLU:HG2	1.70	0.57
1:A:133:HIS:HD2	1:A:147:TYR:OH	1.87	0.56
1:A:475:TYR:CD1	1:A:480:GLU:HG2	2.40	0.56
1:C:116:VAL:O	1:C:120:ARG:HB2	2.05	0.56
1:C:287:VAL:HG11	1:C:299:MET:SD	2.44	0.56
1:A:420:THR:OG1	1:A:573:LYS:HB3	2.04	0.56
1:B:83:LYS:HB2	1:B:83:LYS:HZ3	1.69	0.56
1:B:211:LYS:NZ	1:B:236:GLU:HG2	2.20	0.56
1:B:504:TYR:HB3	1:B:505:PRO:HD3	1.88	0.56
1:D:403:SER:HB2	1:D:405:LYS:HD2	1.87	0.56
1:C:107:PHE:CD1	1:C:107:PHE:N	2.72	0.56
1:C:475:TYR:CD1	1:C:480:GLU:HG2	2.41	0.56
1:D:402:TYR:OH	1:D:417:HIS:HE1	1.89	0.56
1:B:442:ILE:O	1:B:445:GLN:HG2	2.06	0.56
1:D:131:ASN:HA	1:D:150:ARG:HG2	1.87	0.56
1:B:75:LEU:HG	1:B:79:LYS:HE2	1.87	0.55
1:D:405:LYS:H	1:D:405:LYS:CD	2.15	0.55
1:B:295:VAL:CG1	1:B:298:LEU:HD22	2.37	0.55
1:D:286:ALA:O	1:D:287:VAL:HG22	2.07	0.55
1:C:458:MET:CE	1:C:460:TYR:HE1	2.12	0.55
1:A:203:GLN:HB3	1:A:298:LEU:HD11	1.89	0.55
1:C:405:LYS:H	1:C:405:LYS:CD	2.14	0.55
1:D:211:LYS:HZ1	1:D:236:GLU:CG	2.19	0.55
1:D:553:GLU:HG3	1:D:557:LYS:HZ1	1.72	0.55
1:A:543:GLN:NE2	1:B:127:PRO:O	2.40	0.55
1:B:280:PRO:HG3	1:B:283:LEU:HD12	1.87	0.55
1:C:211:LYS:NZ	1:C:236:GLU:CG	2.70	0.55
1:D:133:HIS:CD2	1:D:147:TYR:HE2	2.25	0.55
1:D:495:TYR:HE2	1:D:502:GLU:HG3	1.72	0.55
1:A:183:LEU:HD21	1:A:445:GLN:HB3	1.89	0.54
1:A:525:LEU:O	1:A:528:PRO:HD2	2.07	0.54
1:C:276:PRO:O	1:C:279:ILE:HG12	2.07	0.54
1:A:211:LYS:NZ	1:A:236:GLU:CG	2.71	0.54
1:A:211:LYS:HZ1	1:A:236:GLU:CG	2.21	0.54
1:B:419:LEU:HD23	1:B:419:LEU:H	1.72	0.54
1:C:553:GLU:HG3	1:C:557:LYS:HE3	1.90	0.54
1:B:181:VAL:HG12	1:B:487:MET:HG2	1.90	0.54
3:B:682:HEM:HBC2	3:B:682:HEM:HHD	1.90	0.54
1:C:215:LYS:HD3	1:C:215:LYS:N	2.22	0.54
1:D:203:GLN:HB3	1:D:298:LEU:HD11	1.89	0.54
1:C:318:GLN:NE2	1:C:318:GLN:HA	2.22	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:509:VAL:HG12	1:A:509:VAL:O	2.08	0.54
3:A:682:HEM:HBC2	3:A:682:HEM:HHD	1.89	0.54
1:C:575:CYS:N	1:C:576:PRO:HD3	2.23	0.54
1:A:107:PHE:CD1	1:A:107:PHE:N	2.73	0.54
1:B:107:PHE:CD1	1:B:107:PHE:N	2.74	0.54
1:C:478:PHE:CZ	1:C:495:TYR:HB2	2.43	0.54
1:B:116:VAL:O	1:B:120:ARG:HB2	2.08	0.54
1:B:478:PHE:CZ	1:B:495:TYR:HB2	2.43	0.54
1:C:253:LYS:HE2	1:C:269:THR:HG22	1.90	0.54
1:D:479:GLU:HG2	1:D:485:LYS:HZ2	1.73	0.54
1:A:215:LYS:HD3	1:A:215:LYS:N	2.23	0.53
1:B:133:HIS:CD2	1:B:147:TYR:HE2	2.26	0.53
1:B:211:LYS:HZ1	1:B:236:GLU:CG	2.20	0.53
1:A:433:ARG:HD3	1:A:435:ALA:O	2.09	0.53
1:B:553:GLU:HG3	1:B:557:LYS:HE3	1.91	0.53
1:D:215:LYS:HZ1	1:D:222:ARG:HH21	1.56	0.53
1:B:286:ALA:O	1:B:287:VAL:HG22	2.08	0.53
1:C:137:LYS:O	1:C:138:SER:O	2.27	0.53
1:C:145:LEU:HD23	1:C:376:ARG:CZ	2.39	0.53
1:C:215:LYS:NZ	1:C:222:ARG:HH21	2.06	0.53
1:D:181:VAL:HG12	1:D:487:MET:HG2	1.90	0.53
1:B:131:ASN:HA	1:B:150:ARG:HG2	1.90	0.53
1:C:83:LYS:HB2	1:C:83:LYS:HZ2	1.74	0.53
1:C:114:LYS:HE2	1:C:365:LEU:O	2.08	0.53
1:D:238:LEU:HD22	1:D:242:HIS:CD2	2.44	0.53
1:A:215:LYS:NZ	1:A:222:ARG:HH21	2.07	0.53
1:B:64:PHE:HD2	1:B:70:THR:O	1.91	0.53
1:B:418:GLY:O	1:B:420:THR:N	2.41	0.53
1:C:320:HIS:HE1	1:C:551:GLY:O	1.92	0.53
1:A:183:LEU:HD22	1:A:442:ILE:HG12	1.90	0.53
1:B:206:THR:HB	1:B:210:PHE:CD2	2.44	0.53
1:B:355:TYR:HE2	4:B:701:FLP:O1	1.91	0.53
1:C:478:PHE:CE2	1:C:492:LYS:HA	2.43	0.53
1:D:418:GLY:O	1:D:420:THR:N	2.42	0.53
1:A:479:GLU:HG2	1:A:485:LYS:HZ1	1.70	0.53
1:B:398:GLU:O	1:B:399:ASP:HB2	2.09	0.53
1:D:206:THR:HB	1:D:210:PHE:CD2	2.44	0.53
1:B:402:TYR:OH	1:B:417:HIS:HE1	1.92	0.53
1:B:523:VAL:HA	4:B:701:FLP:H3	1.91	0.53
1:D:273:MET:SD	1:D:286:ALA:O	2.67	0.53
1:D:475:TYR:CD1	1:D:480:GLU:HG2	2.43	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:238:LEU:HD22	1:B:242:HIS:NE2	2.24	0.52
1:B:575:CYS:N	1:B:576:PRO:HD3	2.24	0.52
1:A:478:PHE:CZ	1:A:495:TYR:HB2	2.45	0.52
1:B:433:ARG:H	1:B:439:ASN:ND2	2.07	0.52
1:A:137:LYS:HB2	1:A:137:LYS:HZ2	1.73	0.52
1:B:33:ALA:N	1:B:158:ASP:O	2.42	0.52
1:B:112:ILE:HB	1:B:357:PHE:CZ	2.45	0.52
1:C:423:VAL:HG13	1:C:578:THR:HG23	1.92	0.52
1:C:433:ARG:H	1:C:439:ASN:ND2	2.08	0.52
1:D:389:PRO:HG3	1:D:440:VAL:HG22	1.92	0.52
1:A:64:PHE:HD2	1:A:70:THR:O	1.93	0.52
1:A:127:PRO:O	1:B:543:GLN:NE2	2.43	0.52
1:A:280:PRO:HG2	1:A:283:LEU:HD12	1.92	0.52
1:A:418:GLY:O	1:A:420:THR:N	2.43	0.52
1:B:94:THR:O	1:B:356:HIS:CE1	2.63	0.52
1:C:203:GLN:HB3	1:C:298:LEU:HD11	1.91	0.52
1:C:402:TYR:OH	1:C:417:HIS:HE1	1.93	0.52
1:D:318:GLN:NE2	1:D:318:GLN:HA	2.25	0.52
1:A:145:LEU:HD23	1:A:376:ARG:CZ	2.38	0.52
1:A:178:LEU:O	1:A:182:LEU:HB2	2.10	0.52
1:B:203:GLN:HG3	3:B:682:HEM:C2C	2.45	0.52
1:B:44:ARG:HD2	1:B:469:ARG:HD2	1.92	0.52
1:B:119:SER:O	1:B:122:TYR:HD1	1.93	0.52
1:D:419:LEU:HD23	1:D:419:LEU:H	1.75	0.52
1:A:402:TYR:OH	1:A:417:HIS:HE1	1.93	0.52
1:B:203:GLN:HB3	1:B:298:LEU:HD11	1.92	0.52
1:C:194:SER:OG	1:C:351:HIS:HE1	1.93	0.52
1:D:215:LYS:HD3	1:D:215:LYS:N	2.24	0.52
1:B:423:VAL:HG13	1:B:578:THR:HG23	1.90	0.51
1:C:509:VAL:HG12	1:C:509:VAL:O	2.10	0.51
1:D:382:ASN:ND2	3:D:682:HEM:HAD2	2.22	0.51
1:C:192:GLN:OE1	1:C:517:ILE:HG22	2.10	0.51
1:C:382:ASN:ND2	3:C:682:HEM:HAD2	2.24	0.51
1:C:553:GLU:O	1:C:557:LYS:HG2	2.10	0.51
1:D:150:ARG:NH2	1:D:458:MET:O	2.43	0.51
1:D:107:PHE:CD1	1:D:107:PHE:N	2.74	0.51
1:B:38:SER:OG	1:B:40:PRO:HD3	2.09	0.51
1:B:238:LEU:HD22	1:B:242:HIS:CD2	2.45	0.51
1:B:403:SER:HB2	1:B:405:LYS:HD2	1.92	0.51
1:C:83:LYS:HB2	1:C:83:LYS:HZ3	1.73	0.51
1:C:206:THR:HB	1:C:210:PHE:CD2	2.45	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:276:PRO:HG2	1:D:409:TYR:CG	2.45	0.51
1:B:470:PHE:CG	1:B:525:LEU:HD22	2.46	0.51
3:C:682:HEM:HBC2	3:C:682:HEM:HHD	1.92	0.51
1:D:260:GLU:HB2	1:D:262:TYR:CE2	2.45	0.51
1:B:509:VAL:HG12	1:B:509:VAL:O	2.11	0.51
1:A:74:PHE:O	1:A:77:ARG:HB2	2.11	0.51
1:A:389:PRO:HG3	1:A:440:VAL:HG22	1.92	0.51
1:C:133:HIS:CD2	1:C:147:TYR:CE2	2.99	0.51
1:D:553:GLU:O	1:D:557:LYS:HG2	2.11	0.51
1:A:419:LEU:HD23	1:A:419:LEU:H	1.75	0.51
1:D:232:HIS:CD2	1:D:233:ILE:HG13	2.46	0.51
1:B:281:GLU:C	1:B:283:LEU:H	2.15	0.50
1:C:113:MET:HA	1:C:116:VAL:HG13	1.94	0.50
1:C:412:SER:O	1:C:416:GLU:HB2	2.11	0.50
1:D:42:GLN:O	1:D:69:CYS:HB2	2.10	0.50
1:A:211:LYS:NZ	1:A:236:GLU:HG2	2.26	0.50
1:B:525:LEU:O	1:B:528:PRO:HD2	2.11	0.50
1:D:447:VAL:HG13	3:D:682:HEM:CBA	2.39	0.50
1:A:211:LYS:HZ1	1:A:236:GLU:HG2	1.76	0.50
1:C:119:SER:O	1:C:122:TYR:HD1	1.94	0.50
1:A:150:ARG:HD2	1:A:380:GLU:OE2	2.10	0.50
1:B:276:PRO:O	1:B:279:ILE:HG12	2.11	0.50
1:D:491:LEU:HD11	1:D:509:VAL:HG11	1.94	0.50
3:D:682:HEM:HBC2	3:D:682:HEM:HHD	1.94	0.50
1:C:424:GLU:HA	1:C:428:ARG:NH2	2.11	0.50
1:D:38:SER:OG	1:D:40:PRO:HD3	2.11	0.50
1:A:553:GLU:O	1:A:557:LYS:HG2	2.11	0.50
1:C:211:LYS:HZ1	1:C:236:GLU:CG	2.25	0.50
1:C:232:HIS:CD2	1:C:233:ILE:HG13	2.47	0.50
1:D:275:TYR:CD2	1:D:284:GLN:HG2	2.46	0.50
1:A:181:VAL:HG12	1:A:487:MET:HG2	1.92	0.50
1:A:414:LEU:HD11	1:A:419:LEU:CD2	2.42	0.50
1:C:198:PHE:HB2	1:C:580:PHE:HB3	1.94	0.50
1:D:75:LEU:HG	1:D:79:LYS:HE2	1.92	0.50
1:D:119:SER:O	1:D:122:TYR:HD1	1.95	0.50
1:C:211:LYS:NZ	1:C:236:GLU:HG2	2.26	0.50
1:A:433:ARG:H	1:A:439:ASN:ND2	2.09	0.50
1:B:197:MET:HA	1:B:197:MET:HE2	1.93	0.50
1:B:260:GLU:HB2	1:B:262:TYR:CE2	2.47	0.50
1:B:478:PHE:CE2	1:B:492:LYS:HA	2.47	0.50
1:D:509:VAL:HG12	1:D:509:VAL:O	2.12	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:295:VAL:HG12	1:B:298:LEU:HD22	1.92	0.49
1:C:553:GLU:O	1:C:557:LYS:HE3	2.12	0.49
1:A:175:LYS:HD2	1:A:179:GLU:OE2	2.12	0.49
1:A:260:GLU:HB2	1:A:262:TYR:CE2	2.47	0.49
1:B:389:PRO:HB2	1:B:434:VAL:HA	1.94	0.49
1:B:527:ALA:HA	4:B:701:FLP:C7	2.41	0.49
1:C:414:LEU:HD11	1:C:419:LEU:CD2	2.41	0.49
1:C:269:THR:O	1:C:270:GLN:HB2	2.13	0.49
1:A:273:MET:SD	1:A:286:ALA:O	2.70	0.49
1:B:183:LEU:HD22	1:B:442:ILE:HG12	1.94	0.49
1:C:275:TYR:CD2	1:C:284:GLN:HG2	2.48	0.49
1:C:398:GLU:HG3	1:C:421:GLN:HE22	1.75	0.49
1:D:33:ALA:N	1:D:158:ASP:O	2.46	0.49
1:D:122:TYR:CD2	1:D:122:TYR:O	2.66	0.49
1:B:203:GLN:HG3	3:B:682:HEM:C1C	2.48	0.49
1:C:112:ILE:HB	1:C:357:PHE:CZ	2.47	0.49
1:D:33:ALA:HB3	1:D:158:ASP:OD2	2.12	0.49
1:B:382:ASN:ND2	3:B:682:HEM:HAD2	2.24	0.49
1:C:389:PRO:HG3	1:C:440:VAL:HG22	1.94	0.49
1:D:94:THR:O	1:D:356:HIS:CE1	2.65	0.49
1:A:206:THR:HB	1:A:210:PHE:CD2	2.47	0.49
1:B:303:THR:O	1:B:307:ARG:HD3	2.13	0.49
1:C:33:ALA:N	1:C:158:ASP:O	2.46	0.49
1:C:414:LEU:HD11	1:C:419:LEU:HD23	1.93	0.49
1:D:64:PHE:HD2	1:D:70:THR:O	1.95	0.49
1:D:423:VAL:HG13	1:D:578:THR:HG23	1.95	0.49
1:B:273:MET:SD	1:B:286:ALA:O	2.71	0.49
1:B:318:GLN:HA	1:B:318:GLN:NE2	2.27	0.49
1:B:423:VAL:CG1	1:B:578:THR:HG23	2.43	0.49
1:C:350:GLN:HE22	1:C:359:LEU:H	1.61	0.49
1:D:89:VAL:O	1:D:93:LEU:HD23	2.13	0.49
1:A:423:VAL:HG13	1:A:578:THR:HG23	1.95	0.48
1:C:133:HIS:HD2	1:C:147:TYR:OH	1.95	0.48
1:D:344:VAL:HG12	1:D:534:LEU:HD21	1.93	0.48
1:A:113:MET:HA	1:A:116:VAL:HG13	1.94	0.48
1:B:85:THR:O	1:B:89:VAL:HG23	2.14	0.48
1:C:74:PHE:O	1:C:77:ARG:HB2	2.13	0.48
1:D:133:HIS:HD2	1:D:147:TYR:OH	1.96	0.48
1:D:320:HIS:HE1	1:D:551:GLY:O	1.95	0.48
1:A:133:HIS:CD2	1:A:147:TYR:HE1	2.31	0.48
1:A:137:LYS:O	1:A:138:SER:O	2.30	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:244:LEU:HD11	1:B:288:GLY:HA2	1.95	0.48
1:C:352:LEU:HD11	1:C:518:PHE:CZ	2.47	0.48
3:D:682:HEM:HHD	3:D:682:HEM:CBC	2.44	0.48
1:A:147:TYR:OH	2:A:671:NAG:C6	2.61	0.48
1:C:478:PHE:HZ	1:C:495:TYR:HB2	1.78	0.48
1:D:245:ARG:HD3	1:D:329:PHE:CD2	2.48	0.48
1:A:398:GLU:HG2	1:A:425:SER:HG	1.78	0.48
1:B:172:PRO:HG3	1:B:495:TYR:CE1	2.49	0.48
1:C:442:ILE:O	1:C:445:GLN:HG2	2.13	0.48
1:B:210:PHE:HB3	3:B:682:HEM:HBD1	1.95	0.48
1:D:172:PRO:HG3	1:D:495:TYR:CE1	2.48	0.48
1:C:350:GLN:HE22	1:C:359:LEU:N	2.11	0.48
1:A:197:MET:HA	1:A:197:MET:HE2	1.94	0.48
1:C:280:PRO:CG	1:C:283:LEU:HD12	2.44	0.48
1:D:238:LEU:HD22	1:D:242:HIS:NE2	2.29	0.48
1:A:320:HIS:HE1	1:A:551:GLY:O	1.96	0.48
1:B:553:GLU:O	1:B:557:LYS:HE3	2.14	0.48
1:D:137:LYS:O	1:D:138:SER:O	2.32	0.48
1:A:33:ALA:HB3	1:A:158:ASP:OD2	2.14	0.47
1:A:75:LEU:HG	1:A:79:LYS:HE2	1.94	0.47
1:A:232:HIS:CD2	1:A:233:ILE:HG13	2.49	0.47
1:A:276:PRO:HG2	1:A:409:TYR:CG	2.49	0.47
1:D:244:LEU:HD11	1:D:288:GLY:HA2	1.96	0.47
1:A:140:GLU:OE2	2:A:671:NAG:O5	2.32	0.47
1:C:137:LYS:HZ2	1:C:137:LYS:HB2	1.79	0.47
1:A:172:PRO:HG3	1:A:495:TYR:CE1	2.50	0.47
1:B:438:ARG:NH1	1:B:487:MET:HG3	2.29	0.47
1:C:64:PHE:HD2	1:C:70:THR:O	1.97	0.47
1:C:385:TYR:OH	4:C:701:FLP:H	2.15	0.47
1:D:85:THR:O	1:D:89:VAL:HG23	2.14	0.47
1:A:94:THR:O	1:A:356:HIS:CE1	2.68	0.47
1:B:42:GLN:O	1:B:69:CYS:HB2	2.14	0.47
1:B:414:LEU:HD11	1:B:419:LEU:CD2	2.44	0.47
1:C:260:GLU:HB2	1:C:262:TYR:CE2	2.49	0.47
1:A:108:LEU:O	1:A:111:LEU:HB3	2.14	0.47
1:A:577:PHE:CE1	1:D:267:LYS:NZ	2.79	0.47
1:B:119:SER:O	1:B:122:TYR:CD1	2.68	0.47
1:B:213:ASP:OD1	1:B:215:LYS:HE2	2.14	0.47
1:B:320:HIS:HE1	1:B:551:GLY:O	1.98	0.47
1:C:181:VAL:HG12	1:C:487:MET:HG2	1.96	0.47
1:D:527:ALA:HA	4:D:701:FLP:C7	2.44	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:178:LEU:O	1:C:182:LEU:HB2	2.15	0.47
1:A:294:LEU:HD22	1:A:409:TYR:CE1	2.50	0.47
1:B:232:HIS:CD2	1:B:233:ILE:HG13	2.49	0.47
1:C:389:PRO:HB2	1:C:434:VAL:HA	1.96	0.47
1:C:543:GLN:NE2	1:D:127:PRO:O	2.48	0.47
1:D:104:ASN:ND2	1:D:358:LYS:HB2	2.30	0.47
1:D:116:VAL:O	1:D:120:ARG:HB2	2.14	0.47
1:B:150:ARG:NH2	1:B:458:MET:O	2.47	0.47
1:B:215:LYS:HZ3	1:B:222:ARG:HH21	1.62	0.47
1:A:280:PRO:HG3	1:A:283:LEU:HD12	1.97	0.47
1:B:114:LYS:HD3	1:B:369:GLN:NE2	2.29	0.47
1:D:137:LYS:HB2	1:D:137:LYS:HZ2	1.80	0.47
1:A:389:PRO:HB2	1:A:434:VAL:HA	1.97	0.47
1:B:113:MET:HA	1:B:116:VAL:HG13	1.97	0.47
1:B:137:LYS:HZ2	1:B:137:LYS:HB2	1.80	0.47
1:B:352:LEU:HD11	1:B:518:PHE:CZ	2.49	0.47
1:B:421:GLN:OE1	1:B:421:GLN:HA	2.15	0.47
3:B:682:HEM:HHD	3:B:682:HEM:CBC	2.44	0.47
1:A:83:LYS:HB2	1:A:83:LYS:HZ3	1.80	0.46
1:C:273:MET:SD	1:C:286:ALA:O	2.73	0.46
1:C:447:VAL:HG13	3:C:682:HEM:HBA2	1.97	0.46
1:D:119:SER:O	1:D:122:TYR:CD1	2.68	0.46
1:A:482:THR:HG22	1:A:509:VAL:HG12	1.98	0.46
1:B:420:THR:HA	1:B:576:PRO:HG2	1.98	0.46
1:D:155:VAL:HG12	1:D:459:LYS:NZ	2.31	0.46
1:A:33:ALA:N	1:A:158:ASP:O	2.48	0.46
1:B:230:LEU:HD13	1:B:233:ILE:HD12	1.96	0.46
1:C:108:LEU:O	1:C:111:LEU:HB3	2.16	0.46
1:C:183:LEU:HD22	1:C:442:ILE:HG12	1.97	0.46
1:C:419:LEU:HD23	1:C:419:LEU:H	1.78	0.46
1:D:230:LEU:N	1:D:230:LEU:HD23	2.30	0.46
1:D:269:THR:O	1:D:270:GLN:HB2	2.14	0.46
1:A:210:PHE:CE1	1:A:382:ASN:HA	2.50	0.46
1:A:244:LEU:HD11	1:A:288:GLY:HA2	1.96	0.46
1:B:387:TRP:HZ2	4:B:701:FLP:H5	1.81	0.46
1:D:83:LYS:HB2	1:D:83:LYS:HZ2	1.80	0.46
1:B:319:GLU:HG3	1:B:554:VAL:HG11	1.96	0.46
1:C:89:VAL:O	1:C:93:LEU:HD23	2.14	0.46
1:C:203:GLN:O	1:C:207:HIS:ND1	2.48	0.46
1:C:482:THR:HG22	1:C:509:VAL:HG12	1.96	0.46
1:D:442:ILE:O	1:D:445:GLN:HG2	2.14	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:137:LYS:O	1:B:138:SER:O	2.33	0.46
1:B:478:PHE:HZ	1:B:495:TYR:HB2	1.80	0.46
1:C:34:ASN:HB3	1:C:37:CYS:SG	2.55	0.46
1:C:119:SER:O	1:C:122:TYR:CD1	2.68	0.46
1:C:385:TYR:CZ	4:C:701:FLP:H	2.50	0.46
1:C:553:GLU:HG3	1:C:557:LYS:CE	2.46	0.46
1:D:112:ILE:HB	1:D:357:PHE:CZ	2.50	0.46
1:C:109:ARG:HG3	1:C:357:PHE:CE1	2.50	0.46
1:C:122:TYR:O	1:C:122:TYR:CD2	2.69	0.46
1:D:198:PHE:HB2	1:D:580:PHE:HB3	1.98	0.46
1:A:114:LYS:HE2	1:A:365:LEU:O	2.16	0.46
1:D:178:LEU:O	1:D:182:LEU:HB2	2.16	0.46
1:D:465:GLU:OE1	1:D:465:GLU:HA	2.16	0.46
1:A:544:TYR:OH	1:B:142:PHE:HB2	2.16	0.46
1:C:189:PRO:CB	1:C:430:ILE:HD12	2.46	0.46
1:C:204:HIS:ND1	1:C:292:PHE:CE2	2.84	0.46
1:C:388:HIS:CE1	1:C:447:VAL:HG11	2.51	0.46
1:D:113:MET:HA	1:D:116:VAL:HG13	1.97	0.46
1:D:355:TYR:HE2	4:D:701:FLP:O1	1.99	0.46
1:C:146:SER:O	1:C:220:PHE:HA	2.16	0.45
1:D:280:PRO:HG2	1:D:283:LEU:HD12	1.97	0.45
1:A:151:ALA:O	1:A:469:ARG:NH1	2.50	0.45
1:A:391:LEU:HD21	3:A:682:HEM:HHC	1.98	0.45
1:A:414:LEU:HD11	1:A:419:LEU:HD23	1.97	0.45
1:B:482:THR:HG22	1:B:509:VAL:HG12	1.97	0.45
3:C:682:HEM:HHD	3:C:682:HEM:CBC	2.45	0.45
1:D:231:ASN:OD1	1:D:231:ASN:C	2.55	0.45
1:B:276:PRO:HG2	1:B:409:TYR:CG	2.51	0.45
1:B:414:LEU:HD11	1:B:419:LEU:HD23	1.98	0.45
1:C:85:THR:OG1	1:C:88:THR:HG23	2.16	0.45
1:D:414:LEU:HD11	1:D:419:LEU:HD23	1.98	0.45
1:A:112:ILE:HB	1:A:357:PHE:CZ	2.52	0.45
1:A:269:THR:O	1:A:270:GLN:HB2	2.17	0.45
1:B:147:TYR:OH	2:B:671:NAG:C6	2.64	0.45
1:B:491:LEU:HD11	1:B:509:VAL:HG11	1.96	0.45
1:C:181:VAL:CG2	1:C:509:VAL:HG21	2.47	0.45
1:A:183:LEU:HD23	1:A:183:LEU:HA	1.71	0.45
1:D:414:LEU:HD11	1:D:419:LEU:CD2	2.46	0.45
1:D:412:SER:O	1:D:416:GLU:HB2	2.17	0.45
1:A:303:THR:O	1:A:307:ARG:HD3	2.17	0.45
1:B:553:GLU:O	1:B:557:LYS:HG2	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:465:GLU:HA	1:C:465:GLU:OE1	2.17	0.45
1:C:510:GLU:O	1:C:512:PRO:HD3	2.17	0.45
1:D:34:ASN:HB3	1:D:37:CYS:SG	2.57	0.45
1:A:367:PHE:CD1	1:A:542:PRO:HG3	2.51	0.45
1:A:398:GLU:HG3	1:A:421:GLN:CD	2.37	0.45
1:C:238:LEU:HD22	1:C:242:HIS:NE2	2.32	0.45
1:C:398:GLU:HG3	1:C:421:GLN:CD	2.37	0.45
1:D:210:PHE:CE1	1:D:382:ASN:HA	2.52	0.45
1:A:294:LEU:HD22	1:A:409:TYR:CD1	2.52	0.45
1:C:418:GLY:O	1:C:420:THR:N	2.49	0.45
1:D:133:HIS:CD2	1:D:147:TYR:CE2	3.04	0.45
1:D:203:GLN:HG3	3:D:682:HEM:C1C	2.52	0.45
1:B:389:PRO:HG3	1:B:440:VAL:HG22	1.98	0.45
1:B:554:VAL:CG1	1:B:555:GLY:N	2.80	0.45
1:C:210:PHE:HB3	3:C:682:HEM:HBD1	1.99	0.45
1:C:500:VAL:HG12	1:C:500:VAL:O	2.17	0.45
1:D:44:ARG:HD2	1:D:469:ARG:HD2	1.98	0.45
1:A:185:ARG:HB2	1:A:186:GLU:H	1.65	0.44
1:D:151:ALA:O	1:D:469:ARG:NH1	2.50	0.44
1:A:575:CYS:N	1:A:576:PRO:CD	2.80	0.44
1:C:216:ARG:HB3	1:C:220:PHE:CD2	2.53	0.44
1:D:83:LYS:HG3	1:D:83:LYS:O	2.17	0.44
1:A:105:ASN:O	1:A:106:PRO:HD3	2.18	0.44
1:A:482:THR:OG1	1:A:488:ALA:HB2	2.17	0.44
1:A:553:GLU:HG3	1:A:557:LYS:CE	2.47	0.44
1:B:33:ALA:HB3	1:B:158:ASP:OD2	2.18	0.44
1:C:244:LEU:HD11	1:C:288:GLY:HA2	2.00	0.44
1:D:155:VAL:HG12	1:D:459:LYS:HZ3	1.83	0.44
1:A:192:GLN:OE1	1:A:517:ILE:HG22	2.17	0.44
1:A:388:HIS:CE1	1:A:447:VAL:HG11	2.52	0.44
1:A:442:ILE:O	1:A:445:GLN:HG2	2.18	0.44
1:C:151:ALA:O	1:C:469:ARG:NH1	2.50	0.44
1:D:194:SER:OG	1:D:351:HIS:HE1	2.00	0.44
1:D:213:ASP:OD1	1:D:215:LYS:HE2	2.18	0.44
1:D:478:PHE:CZ	1:D:495:TYR:HB2	2.52	0.44
1:A:51:GLY:O	1:A:52:PHE:CB	2.66	0.44
1:A:138:SER:HB2	1:B:330:GLN:HB3	2.00	0.44
1:A:478:PHE:HZ	1:A:495:TYR:HB2	1.81	0.44
1:A:525:LEU:N	1:A:525:LEU:HD23	2.32	0.44
1:D:316:LEU:HA	1:D:316:LEU:HD12	1.87	0.44
1:B:113:MET:O	1:B:117:LEU:HB2	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:122:TYR:CD2	1:B:122:TYR:O	2.71	0.44
1:B:240:ARG:O	1:B:241:GLN:C	2.56	0.44
1:B:344:VAL:HG12	1:B:534:LEU:HD21	1.99	0.44
1:C:183:LEU:HD23	1:C:183:LEU:HA	1.84	0.44
1:D:389:PRO:HB2	1:D:434:VAL:HA	1.98	0.44
1:A:120:ARG:HD3	4:A:701:FLP:O	2.18	0.44
1:A:382:ASN:ND2	3:A:682:HEM:HAD2	2.29	0.44
1:A:478:PHE:O	1:A:481:LEU:HB3	2.18	0.44
1:B:44:ARG:HD2	1:B:469:ARG:CD	2.48	0.44
1:C:33:ALA:HB3	1:C:158:ASP:OD2	2.17	0.44
1:C:276:PRO:HG2	1:C:409:TYR:CG	2.52	0.44
1:D:433:ARG:H	1:D:439:ASN:ND2	2.15	0.44
1:B:189:PRO:CB	1:B:430:ILE:HD12	2.48	0.44
1:B:350:GLN:HE22	1:B:359:LEU:N	2.16	0.44
1:D:482:THR:HG22	1:D:509:VAL:HG12	2.00	0.44
1:A:133:HIS:CD2	1:A:147:TYR:CE1	3.06	0.44
1:A:230:LEU:HD23	1:A:230:LEU:N	2.31	0.44
3:A:682:HEM:HHD	3:A:682:HEM:CBC	2.47	0.44
1:B:388:HIS:N	1:B:389:PRO:CD	2.81	0.44
1:C:197:MET:CE	1:C:197:MET:CA	2.93	0.44
1:D:109:ARG:HG3	1:D:357:PHE:CE1	2.53	0.44
1:D:500:VAL:HG12	1:D:500:VAL:O	2.17	0.44
1:A:352:LEU:HD11	1:A:518:PHE:CZ	2.52	0.43
1:A:565:GLN:HG3	1:D:268:ASP:OD1	2.18	0.43
1:B:197:MET:HA	1:B:197:MET:HE3	2.00	0.43
1:D:482:THR:OG1	1:D:488:ALA:HB2	2.17	0.43
1:A:147:TYR:OH	2:A:671:NAG:C5	2.66	0.43
1:B:114:LYS:HB2	1:B:114:LYS:HE3	1.86	0.43
1:B:269:THR:O	1:B:270:GLN:HB2	2.17	0.43
1:C:352:LEU:HD11	1:C:518:PHE:HZ	1.81	0.43
1:A:92:ILE:HD12	1:A:92:ILE:H	1.83	0.43
1:A:114:LYS:HD3	1:A:369:GLN:NE2	2.32	0.43
1:A:119:SER:O	1:A:122:TYR:HD1	2.02	0.43
1:A:364:GLU:HA	1:A:367:PHE:CD2	2.53	0.43
1:B:133:HIS:CD2	1:B:147:TYR:CE2	3.07	0.43
1:B:172:PRO:HG3	1:B:495:TYR:CD1	2.53	0.43
1:B:178:LEU:O	1:B:182:LEU:HB2	2.18	0.43
1:C:122:TYR:CE1	1:C:123:LEU:CD2	3.01	0.43
1:C:210:PHE:CE1	1:C:382:ASN:HA	2.53	0.43
1:D:232:HIS:HD2	1:D:233:ILE:HG13	1.82	0.43
1:A:553:GLU:HG3	1:A:557:LYS:NZ	2.33	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:198:PHE:HB2	1:B:580:PHE:HB3	1.99	0.43
1:B:435:ALA:HB2	1:B:518:PHE:HA	2.00	0.43
1:C:420:THR:HG1	1:C:573:LYS:HB3	1.82	0.43
1:D:39:ASN:N	1:D:40:PRO:CD	2.82	0.43
1:D:423:VAL:CG1	1:D:578:THR:HG23	2.48	0.43
1:A:203:GLN:O	1:A:207:HIS:ND1	2.51	0.43
1:A:318:GLN:HA	1:A:318:GLN:NE2	2.33	0.43
1:A:478:PHE:CE2	1:A:492:LYS:HA	2.53	0.43
1:B:232:HIS:HD2	1:B:233:ILE:HG13	1.84	0.43
1:C:230:LEU:N	1:C:230:LEU:HD23	2.33	0.43
1:C:396:ASN:HA	1:C:400:GLN:O	2.19	0.43
1:D:92:ILE:HD12	1:D:92:ILE:H	1.82	0.43
1:D:172:PRO:HG3	1:D:495:TYR:CD1	2.54	0.43
1:A:281:GLU:C	1:A:283:LEU:H	2.22	0.43
1:C:544:TYR:O	1:C:546:LYS:N	2.51	0.43
1:D:189:PRO:CB	1:D:430:ILE:HD12	2.48	0.43
1:D:198:PHE:CZ	1:D:352:LEU:HD13	2.53	0.43
1:A:113:MET:O	1:A:117:LEU:HB2	2.18	0.43
1:B:34:ASN:HB3	1:B:37:CYS:SG	2.58	0.43
1:B:218:PRO:HB2	1:B:458:MET:SD	2.58	0.43
1:B:421:GLN:OE1	1:B:424:GLU:HB2	2.19	0.43
1:C:172:PRO:HG3	1:C:495:TYR:CE1	2.54	0.43
1:C:190:ASP:HA	1:C:191:PRO:HD2	1.84	0.43
1:A:197:MET:HA	1:A:197:MET:HE3	2.01	0.43
1:B:459:LYS:HB3	1:B:459:LYS:HE2	1.75	0.43
1:C:117:LEU:HD12	1:C:117:LEU:HA	1.85	0.43
1:C:367:PHE:CD1	1:C:542:PRO:HG3	2.53	0.43
1:C:525:LEU:N	1:C:525:LEU:HD23	2.33	0.43
1:D:380:GLU:HG2	1:D:466:TYR:HE1	1.77	0.43
1:A:544:TYR:O	1:A:546:LYS:N	2.52	0.43
1:C:148:TYR:CE1	1:C:377:ILE:HD11	2.54	0.43
1:D:148:TYR:CD1	1:D:377:ILE:HG13	2.49	0.43
1:A:557:LYS:HA	1:A:557:LYS:HD3	1.81	0.42
1:B:350:GLN:HE22	1:B:359:LEU:H	1.66	0.42
1:B:478:PHE:CD1	1:B:491:LEU:HB3	2.54	0.42
1:C:554:VAL:CG1	1:C:555:GLY:N	2.82	0.42
1:A:34:ASN:HB3	1:A:37:CYS:SG	2.59	0.42
1:A:405:LYS:HD2	1:A:405:LYS:H	1.84	0.42
1:B:39:ASN:N	1:B:40:PRO:CD	2.82	0.42
1:B:215:LYS:N	1:B:215:LYS:CD	2.81	0.42
1:B:352:LEU:HD11	1:B:518:PHE:HZ	1.83	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:349:VAL:CG1	4:C:701:FLP:H132	2.49	0.42
1:D:396:ASN:HA	1:D:400:GLN:O	2.19	0.42
1:D:525:LEU:O	1:D:528:PRO:HD2	2.19	0.42
1:B:183:LEU:HD23	1:B:183:LEU:HA	1.78	0.42
1:B:396:ASN:HA	1:B:401:GLU:HA	2.02	0.42
1:C:420:THR:HA	1:C:576:PRO:HG2	2.01	0.42
1:D:85:THR:OG1	1:D:88:THR:HG23	2.19	0.42
1:D:183:LEU:HD22	1:D:442:ILE:HG12	2.01	0.42
1:A:554:VAL:CG1	1:A:555:GLY:N	2.83	0.42
1:C:240:ARG:O	1:C:241:GLN:C	2.58	0.42
1:D:396:ASN:HA	1:D:401:GLU:HA	2.01	0.42
1:A:263:PRO:HB2	1:A:285:PHE:HB3	2.01	0.42
1:C:316:LEU:HD12	1:C:316:LEU:HA	1.89	0.42
1:C:424:GLU:O	1:C:428:ARG:NE	2.51	0.42
1:D:92:ILE:HD12	1:D:92:ILE:N	2.34	0.42
1:D:303:THR:O	1:D:307:ARG:HD3	2.20	0.42
1:A:44:ARG:HD2	1:A:469:ARG:HD2	2.01	0.42
1:B:45:GLY:HA3	1:B:69:CYS:SG	2.59	0.42
1:B:497:ASP:HB3	1:B:500:VAL:HG23	2.02	0.42
1:C:340:THR:O	1:C:344:VAL:HG23	2.20	0.42
1:C:578:THR:HG22	1:C:579:SER:H	1.84	0.42
1:D:230:LEU:HD13	1:D:233:ILE:HD12	2.01	0.42
1:A:109:ARG:HG3	1:A:357:PHE:CE1	2.54	0.42
1:A:216:ARG:HB3	1:A:220:PHE:CD2	2.54	0.42
1:B:565:GLN:HA	1:B:565:GLN:HE21	1.85	0.42
1:C:388:HIS:HB3	1:C:444:VAL:HG21	2.02	0.42
1:C:435:ALA:HB2	1:C:518:PHE:HA	2.01	0.42
1:D:403:SER:HB2	1:D:405:LYS:CD	2.49	0.42
1:D:478:PHE:CE2	1:D:492:LYS:HA	2.54	0.42
1:A:83:LYS:O	1:A:83:LYS:HG3	2.20	0.42
1:B:194:SER:OG	1:B:351:HIS:HE1	2.03	0.42
1:C:74:PHE:CZ	1:C:78:ILE:HD11	2.55	0.42
1:C:94:THR:O	1:C:356:HIS:CE1	2.73	0.42
1:C:249:ASP:CG	1:C:317:LYS:NZ	2.73	0.42
1:A:510:GLU:O	1:A:512:PRO:HD3	2.20	0.42
1:B:208:GLN:HB3	1:B:232:HIS:ND1	2.35	0.42
1:B:245:ARG:HD3	1:B:329:PHE:CD2	2.55	0.42
1:B:387:TRP:HZ2	4:B:701:FLP:C5	2.33	0.42
1:B:398:GLU:HG3	1:B:421:GLN:CD	2.40	0.42
1:C:92:ILE:HD12	1:C:92:ILE:N	2.35	0.42
1:C:287:VAL:HG23	1:C:288:GLY:N	2.34	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:525:LEU:N	1:D:525:LEU:HD23	2.35	0.42
1:C:215:LYS:N	1:C:215:LYS:CD	2.82	0.42
1:C:330:GLN:HB3	1:D:138:SER:HB2	2.02	0.42
1:A:578:THR:HG22	1:A:579:SER:H	1.85	0.41
1:B:151:ALA:O	1:B:469:ARG:NH1	2.53	0.41
1:B:206:THR:HG21	1:B:385:TYR:CE1	2.55	0.41
1:B:210:PHE:CE1	1:B:382:ASN:HA	2.54	0.41
1:B:388:HIS:C	1:B:390:LEU:H	2.24	0.41
1:C:292:PHE:N	1:C:292:PHE:CD1	2.88	0.41
1:A:189:PRO:CB	1:A:430:ILE:HD12	2.50	0.41
1:A:405:LYS:H	1:A:405:LYS:CD	2.33	0.41
1:B:479:GLU:HG3	1:B:488:ALA:HB1	2.02	0.41
1:D:352:LEU:HD11	1:D:518:PHE:CZ	2.55	0.41
1:D:478:PHE:CD1	1:D:491:LEU:HB3	2.56	0.41
1:D:510:GLU:O	1:D:512:PRO:HD3	2.19	0.41
1:A:191:PRO:HG3	1:A:433:ARG:NH2	2.35	0.41
1:B:185:ARG:HB2	1:B:186:GLU:H	1.68	0.41
1:C:44:ARG:HD2	1:C:469:ARG:HD2	2.03	0.41
1:D:108:LEU:O	1:D:111:LEU:HB3	2.20	0.41
1:D:210:PHE:HB3	3:D:682:HEM:HBD1	2.03	0.41
1:D:215:LYS:N	1:D:215:LYS:CD	2.83	0.41
1:D:554:VAL:CG1	1:D:555:GLY:N	2.81	0.41
1:A:396:ASN:HA	1:A:401:GLU:HA	2.03	0.41
1:A:465:GLU:HA	1:A:465:GLU:OE1	2.20	0.41
1:B:482:THR:OG1	1:B:488:ALA:HB2	2.20	0.41
1:C:238:LEU:HD22	1:C:242:HIS:CD2	2.54	0.41
1:C:557:LYS:O	1:C:558:ILE:C	2.57	0.41
1:D:150:ARG:HD2	1:D:380:GLU:OE2	2.20	0.41
1:A:40:PRO:O	1:A:68:ASN:HB3	2.20	0.41
1:A:92:ILE:HD12	1:A:92:ILE:N	2.36	0.41
1:B:191:PRO:HB2	1:B:515:ASP:HB3	2.00	0.41
1:B:340:THR:O	1:B:344:VAL:HG23	2.20	0.41
1:C:92:ILE:HD12	1:C:92:ILE:H	1.85	0.41
1:C:403:SER:HB2	1:C:405:LYS:CD	2.48	0.41
1:A:388:HIS:HB3	1:A:444:VAL:HG21	2.03	0.41
1:B:40:PRO:HB3	2:B:661:NAG:H62	2.03	0.41
1:C:232:HIS:HD2	1:C:233:ILE:HG13	1.85	0.41
1:C:298:LEU:HD12	1:C:298:LEU:HA	1.80	0.41
1:A:388:HIS:C	1:A:390:LEU:H	2.24	0.41
1:B:355:TYR:CE2	4:B:701:FLP:O1	2.71	0.41
1:B:465:GLU:OE1	1:B:465:GLU:HA	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:554:VAL:HG12	1:B:555:GLY:N	2.36	0.41
1:C:475:TYR:HD1	1:C:480:GLU:HG2	1.85	0.41
1:B:74:PHE:O	1:B:77:ARG:HB2	2.20	0.41
1:B:382:ASN:HD21	3:B:682:HEM:CAD	2.29	0.41
1:C:388:HIS:C	1:C:390:LEU:H	2.24	0.41
1:D:554:VAL:HG12	1:D:555:GLY:N	2.36	0.41
1:A:49:SER:O	1:B:320:HIS:CD2	2.74	0.41
1:A:198:PHE:HB2	1:A:580:PHE:HB3	2.02	0.41
1:A:210:PHE:HB3	3:A:682:HEM:HBD1	2.03	0.41
1:A:292:PHE:N	1:A:292:PHE:CD1	2.89	0.41
1:A:557:LYS:O	1:A:558:ILE:C	2.59	0.41
1:B:83:LYS:O	1:B:83:LYS:HG3	2.20	0.41
1:B:211:LYS:NZ	1:B:236:GLU:HG3	2.35	0.41
1:B:413:ILE:HG12	2:B:681:NAG:O6	2.21	0.41
1:B:510:GLU:O	1:B:512:PRO:HD3	2.21	0.41
1:C:42:GLN:O	1:C:69:CYS:HB2	2.20	0.41
1:C:320:HIS:HB3	1:C:323:TRP:CG	2.56	0.41
1:C:322:GLU:HG3	1:D:51:GLY:O	2.21	0.41
1:C:435:ALA:HB3	1:C:512:PRO:HG3	2.03	0.41
1:C:544:TYR:OH	1:D:142:PHE:HB2	2.20	0.41
1:D:204:HIS:ND1	1:D:292:PHE:CE2	2.88	0.41
1:D:398:GLU:HG3	1:D:421:GLN:HE22	1.86	0.41
1:A:146:SER:O	1:A:220:PHE:HA	2.21	0.41
1:A:381:PHE:HA	1:A:384:LEU:HG	2.03	0.41
1:A:565:GLN:HA	1:A:565:GLN:HE21	1.86	0.41
1:C:51:GLY:O	1:D:322:GLU:HG3	2.21	0.41
1:D:575:CYS:N	1:D:576:PRO:CD	2.84	0.41
1:D:578:THR:HG22	1:D:579:SER:H	1.85	0.41
1:A:74:PHE:CZ	1:A:78:ILE:HD11	2.56	0.40
1:A:215:LYS:N	1:A:215:LYS:CD	2.84	0.40
1:A:240:ARG:O	1:A:241:GLN:C	2.60	0.40
1:B:280:PRO:O	1:B:281:GLU:CB	2.68	0.40
1:B:412:SER:O	1:B:416:GLU:HB2	2.21	0.40
1:B:420:THR:HG1	1:B:573:LYS:HB3	1.86	0.40
1:D:350:GLN:HE22	1:D:359:LEU:H	1.70	0.40
1:B:108:LEU:O	1:B:111:LEU:HB3	2.21	0.40
1:B:198:PHE:CZ	1:B:352:LEU:HD13	2.56	0.40
1:B:381:PHE:HA	1:B:384:LEU:HG	2.03	0.40
1:C:148:TYR:HE1	1:C:377:ILE:HD11	1.86	0.40
1:C:150:ARG:HD2	1:C:380:GLU:OE2	2.22	0.40
1:C:276:PRO:HD2	1:C:279:ILE:HD11	2.02	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:320:HIS:CD2	1:D:49:SER:O	2.74	0.40
1:C:327:GLN:HG3	1:D:136:TYR:CE2	2.56	0.40
1:C:550:PHE:CD2	1:C:556:PHE:CD1	3.09	0.40
1:D:191:PRO:HD2	1:D:433:ARG:HG3	2.02	0.40
1:D:192:GLN:OE1	1:D:517:ILE:HG22	2.21	0.40
1:D:196:MET:SD	1:D:392:PRO:HD3	2.62	0.40
1:A:550:PHE:CD2	1:A:556:PHE:CD1	3.09	0.40
1:B:85:THR:OG1	1:B:88:THR:HG23	2.21	0.40
1:B:181:VAL:CG2	1:B:509:VAL:HG21	2.51	0.40
1:C:211:LYS:HZ1	1:C:236:GLU:HG3	1.87	0.40
1:C:495:TYR:CE2	1:C:502:GLU:HG3	2.55	0.40
1:D:114:LYS:HE3	1:D:114:LYS:HB2	1.91	0.40
1:D:190:ASP:HA	1:D:191:PRO:HD2	1.87	0.40
1:A:231:ASN:OD1	1:A:231:ASN:C	2.58	0.40
1:A:276:PRO:HA	1:A:277:PRO:HD2	1.83	0.40
1:A:320:HIS:CD2	1:B:49:SER:O	2.74	0.40
1:A:388:HIS:N	1:A:389:PRO:CD	2.85	0.40
1:B:117:LEU:HD12	1:B:117:LEU:HA	1.85	0.40
1:C:569:CYS:HA	1:C:575:CYS:HA	2.03	0.40
1:D:203:GLN:HG3	3:D:682:HEM:C2C	2.56	0.40
1:D:281:GLU:C	1:D:283:LEU:H	2.24	0.40
1:A:122:TYR:CE1	1:A:123:LEU:CD2	3.05	0.40
1:A:424:GLU:CA	1:A:428:ARG:HH21	2.16	0.40
1:A:553:GLU:HG3	1:A:557:LYS:HE3	2.02	0.40
1:B:109:ARG:HG3	1:B:357:PHE:CE1	2.57	0.40
1:B:479:GLU:CD	1:B:479:GLU:N	2.75	0.40
1:C:48:MET:O	1:C:56:LYS:N	2.55	0.40
1:C:281:GLU:C	1:C:283:LEU:H	2.24	0.40
1:C:391:LEU:HB2	1:C:441:PRO:HG2	2.03	0.40
1:C:583:GLN:H	1:C:583:GLN:CD	2.25	0.40
1:D:294:LEU:HD22	1:D:409:TYR:CD1	2.56	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	550/587 (94%)	473 (86%)	62 (11%)	15 (3%)	5	7
1	B	550/587 (94%)	484 (88%)	49 (9%)	17 (3%)	4	5
1	C	550/587 (94%)	479 (87%)	54 (10%)	17 (3%)	4	5
1	D	550/587 (94%)	477 (87%)	57 (10%)	16 (3%)	4	6
All	All	2200/2348 (94%)	1913 (87%)	222 (10%)	65 (3%)	4	6

All (65) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	52	PHE
1	A	82	LEU
1	A	130	TYR
1	A	138	SER
1	A	282	ASN
1	A	398	GLU
1	A	419	LEU
1	A	514	PRO
1	B	52	PHE
1	B	82	LEU
1	B	130	TYR
1	B	138	SER
1	B	282	ASN
1	B	398	GLU
1	B	419	LEU
1	B	514	PRO
1	C	52	PHE
1	C	82	LEU
1	C	138	SER
1	C	282	ASN
1	C	398	GLU
1	C	419	LEU
1	C	514	PRO
1	D	52	PHE
1	D	82	LEU
1	D	130	TYR
1	D	138	SER
1	D	282	ASN
1	D	398	GLU
1	D	419	LEU

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Mol	Chain	Res	Type
1	D	514	PRO
1	A	422	PHE
1	B	422	PHE
1	B	499	ASP
1	C	130	TYR
1	C	422	PHE
1	C	545	TRP
1	D	422	PHE
1	A	277	PRO
1	A	499	ASP
1	B	277	PRO
1	B	399	ASP
1	C	277	PRO
1	C	499	ASP
1	D	277	PRO
1	D	399	ASP
1	D	499	ASP
1	A	280	PRO
1	A	399	ASP
1	B	162	PRO
1	C	399	ASP
1	A	162	PRO
1	B	280	PRO
1	B	545	TRP
1	B	573	LYS
1	C	162	PRO
1	C	280	PRO
1	C	573	LYS
1	D	162	PRO
1	D	280	PRO
1	D	573	LYS
1	A	226	HIS
1	C	226	HIS
1	B	51	GLY
1	D	51	GLY

5.3.2 Protein sidechains (i)

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

The Analysed column shows the number of residues for which the sidechain conformation was

analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	493/525 (94%)	436 (88%)	57 (12%)	5	10
1	B	493/525 (94%)	437 (89%)	56 (11%)	5	11
1	C	493/525 (94%)	437 (89%)	56 (11%)	5	11
1	D	493/525 (94%)	437 (89%)	56 (11%)	5	11
All	All	1972/2100 (94%)	1747 (89%)	225 (11%)	5	11

All (225) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	44	ARG
1	A	52	PHE
1	A	71	THR
1	A	83	LYS
1	A	106	PRO
1	A	107	PHE
1	A	111	LEU
1	A	116	VAL
1	A	117	LEU
1	A	120	ARG
1	A	122	TYR
1	A	137	LYS
1	A	138	SER
1	A	165	VAL
1	A	178	LEU
1	A	186	GLU
1	A	197	MET
1	A	216	ARG
1	A	232	HIS
1	A	238	LEU
1	A	245	ARG
1	A	248	LYS
1	A	252	LEU
1	A	270	GLN
1	A	271	VAL
1	A	272	GLU
1	A	282	ASN
1	A	289	GLN
1	A	291	VAL
1	A	298	LEU
1	A	300	MET

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Mol	Chain	Res	Type
1	A	310	GLN
1	A	316	LEU
1	A	322	GLU
1	A	382	ASN
1	A	385	TYR
1	A	399	ASP
1	A	405	LYS
1	A	409	TYR
1	A	416	GLU
1	A	422	PHE
1	A	430	ILE
1	A	433	ARG
1	A	459	LYS
1	A	463	LEU
1	A	484	GLU
1	A	485	LYS
1	A	514	PRO
1	A	518	PHE
1	A	543	GLN
1	A	554	VAL
1	A	556	PHE
1	A	565	GLN
1	A	569	CYS
1	A	575	CYS
1	A	578	THR
1	A	583	GLN
1	B	44	ARG
1	B	52	PHE
1	B	54	GLN
1	B	71	THR
1	B	83	LYS
1	B	106	PRO
1	B	107	PHE
1	B	111	LEU
1	B	117	LEU
1	B	120	ARG
1	B	122	TYR
1	B	137	LYS
1	B	138	SER
1	B	165	VAL
1	B	171	LEU
1	B	178	LEU

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Mol	Chain	Res	Type
1	B	186	GLU
1	B	197	MET
1	B	216	ARG
1	B	232	HIS
1	B	238	LEU
1	B	245	ARG
1	B	248	LYS
1	B	252	LEU
1	B	270	GLN
1	B	271	VAL
1	B	272	GLU
1	B	282	ASN
1	B	289	GLN
1	B	291	VAL
1	B	298	LEU
1	B	300	MET
1	B	310	GLN
1	B	316	LEU
1	B	322	GLU
1	B	376	ARG
1	B	382	ASN
1	B	385	TYR
1	B	399	ASP
1	B	405	LYS
1	B	409	TYR
1	B	422	PHE
1	B	430	ILE
1	B	459	LYS
1	B	484	GLU
1	B	485	LYS
1	B	514	PRO
1	B	518	PHE
1	B	534	LEU
1	B	543	GLN
1	B	554	VAL
1	B	565	GLN
1	B	569	CYS
1	B	575	CYS
1	B	578	THR
1	B	583	GLN
1	C	44	ARG
1	C	52	PHE

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Mol	Chain	Res	Type
1	C	71	THR
1	C	83	LYS
1	C	107	PHE
1	C	111	LEU
1	C	116	VAL
1	C	117	LEU
1	C	120	ARG
1	C	122	TYR
1	C	137	LYS
1	C	138	SER
1	C	165	VAL
1	C	178	LEU
1	C	197	MET
1	C	215	LYS
1	C	216	ARG
1	C	232	HIS
1	C	238	LEU
1	C	245	ARG
1	C	248	LYS
1	C	252	LEU
1	C	270	GLN
1	C	272	GLU
1	C	282	ASN
1	C	289	GLN
1	C	291	VAL
1	C	298	LEU
1	C	300	MET
1	C	310	GLN
1	C	316	LEU
1	C	322	GLU
1	C	376	ARG
1	C	382	ASN
1	C	385	TYR
1	C	399	ASP
1	C	405	LYS
1	C	409	TYR
1	C	421	GLN
1	C	422	PHE
1	C	430	ILE
1	C	459	LYS
1	C	484	GLU
1	C	485	LYS

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Mol	Chain	Res	Type
1	C	505	PRO
1	C	514	PRO
1	C	518	PHE
1	C	534	LEU
1	C	543	GLN
1	C	554	VAL
1	C	556	PHE
1	C	565	GLN
1	C	569	CYS
1	C	575	CYS
1	C	578	THR
1	C	583	GLN
1	D	44	ARG
1	D	52	PHE
1	D	71	THR
1	D	83	LYS
1	D	106	PRO
1	D	107	PHE
1	D	111	LEU
1	D	117	LEU
1	D	120	ARG
1	D	122	TYR
1	D	137	LYS
1	D	138	SER
1	D	165	VAL
1	D	171	LEU
1	D	178	LEU
1	D	197	MET
1	D	216	ARG
1	D	232	HIS
1	D	238	LEU
1	D	248	LYS
1	D	252	LEU
1	D	270	GLN
1	D	271	VAL
1	D	272	GLU
1	D	282	ASN
1	D	289	GLN
1	D	291	VAL
1	D	298	LEU
1	D	300	MET
1	D	310	GLN

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Mol	Chain	Res	Type
1	D	316	LEU
1	D	322	GLU
1	D	376	ARG
1	D	382	ASN
1	D	385	TYR
1	D	399	ASP
1	D	405	LYS
1	D	409	TYR
1	D	422	PHE
1	D	430	ILE
1	D	459	LYS
1	D	484	GLU
1	D	485	LYS
1	D	505	PRO
1	D	514	PRO
1	D	518	PHE
1	D	528	PRO
1	D	534	LEU
1	D	543	GLN
1	D	554	VAL
1	D	565	GLN
1	D	569	CYS
1	D	575	CYS
1	D	578	THR
1	D	581	ASN
1	D	583	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (76) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	42	GLN
1	A	95	HIS
1	A	101	ASN
1	A	133	HIS
1	A	203	GLN
1	A	232	HIS
1	A	318	GLN
1	A	320	HIS
1	A	350	GLN
1	A	351	HIS
1	A	356	HIS
1	A	369	GLN

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Mol	Chain	Res	Type
1	A	382	ASN
1	A	396	ASN
1	A	411	ASN
1	A	417	HIS
1	A	454	GLN
1	A	464	ASN
1	A	543	GLN
1	B	42	GLN
1	B	101	ASN
1	B	105	ASN
1	B	133	HIS
1	B	203	GLN
1	B	232	HIS
1	B	318	GLN
1	B	320	HIS
1	B	350	GLN
1	B	351	HIS
1	B	356	HIS
1	B	369	GLN
1	B	382	ASN
1	B	396	ASN
1	B	411	ASN
1	B	417	HIS
1	B	454	GLN
1	B	464	ASN
1	C	90	HIS
1	C	95	HIS
1	C	101	ASN
1	C	133	HIS
1	C	203	GLN
1	C	232	HIS
1	C	278	HIS
1	C	318	GLN
1	C	320	HIS
1	C	350	GLN
1	C	351	HIS
1	C	356	HIS
1	C	369	GLN
1	C	382	ASN
1	C	396	ASN
1	C	411	ASN
1	C	417	HIS

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Mol	Chain	Res	Type
1	C	454	GLN
1	C	464	ASN
1	C	543	GLN
1	D	95	HIS
1	D	101	ASN
1	D	105	ASN
1	D	133	HIS
1	D	203	GLN
1	D	232	HIS
1	D	318	GLN
1	D	320	HIS
1	D	350	GLN
1	D	351	HIS
1	D	356	HIS
1	D	369	GLN
1	D	382	ASN
1	D	396	ASN
1	D	411	ASN
1	D	417	HIS
1	D	454	GLN
1	D	464	ASN
1	D	581	ASN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

20 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	HEM	D	682	1	41,50,50	1.53	5 (12%)	45,82,82	0.96	1 (2%)
2	NAG	C	681	1	14,14,15	0.62	0	17,19,21	0.83	0
3	HEM	C	682	1	41,50,50	1.54	6 (14%)	45,82,82	0.99	2 (4%)
2	NAG	A	681	1	14,14,15	0.78	0	17,19,21	0.77	0
2	NAG	B	681	1	14,14,15	0.75	0	17,19,21	0.90	0
2	NAG	A	671	1	14,14,15	0.74	0	17,19,21	1.58	5 (29%)
2	NAG	B	661	1	14,14,15	0.52	0	17,19,21	1.02	1 (5%)
2	NAG	D	671	1	14,14,15	0.64	0	17,19,21	1.48	3 (17%)
2	NAG	A	661	1	14,14,15	0.57	0	17,19,21	0.90	1 (5%)
2	NAG	C	671	1	14,14,15	0.81	1 (7%)	17,19,21	1.60	4 (23%)
4	FLP	D	701	-	18,19,19	1.34	2 (11%)	22,26,26	1.80	2 (9%)
3	HEM	B	682	1	41,50,50	1.48	5 (12%)	45,82,82	1.10	2 (4%)
2	NAG	B	671	1	14,14,15	0.78	0	17,19,21	1.41	3 (17%)
2	NAG	D	661	1	14,14,15	0.67	0	17,19,21	0.94	1 (5%)
2	NAG	C	661	1	14,14,15	0.27	0	17,19,21	0.88	1 (5%)
4	FLP	C	701	-	18,19,19	1.35	2 (11%)	22,26,26	1.76	2 (9%)
3	HEM	A	682	1	41,50,50	1.60	8 (19%)	45,82,82	0.95	0
4	FLP	B	701	-	18,19,19	1.54	4 (22%)	22,26,26	2.01	2 (9%)
4	FLP	A	701	-	18,19,19	1.47	5 (27%)	22,26,26	1.90	3 (13%)
2	NAG	D	681	1	14,14,15	0.79	0	17,19,21	0.87	0

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	HEM	D	682	1	-	2/12/54/54	-
2	NAG	C	681	1	-	2/6/23/26	0/1/1/1
3	HEM	C	682	1	-	4/12/54/54	-
2	NAG	A	681	1	-	2/6/23/26	0/1/1/1
2	NAG	B	681	1	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NAG	A	671	1	-	2/6/23/26	0/1/1/1
2	NAG	B	661	1	-	0/6/23/26	0/1/1/1
2	NAG	D	671	1	-	2/6/23/26	0/1/1/1
2	NAG	A	661	1	-	0/6/23/26	0/1/1/1
2	NAG	C	671	1	-	2/6/23/26	0/1/1/1
4	FLP	D	701	-	-	0/8/12/12	0/2/2/2
3	HEM	B	682	1	-	3/12/54/54	-
2	NAG	B	671	1	-	2/6/23/26	0/1/1/1
2	NAG	D	661	1	-	0/6/23/26	0/1/1/1
2	NAG	C	661	1	-	0/6/23/26	0/1/1/1
4	FLP	C	701	-	-	0/8/12/12	0/2/2/2
3	HEM	A	682	1	-	2/12/54/54	-
4	FLP	B	701	-	-	0/8/12/12	0/2/2/2
4	FLP	A	701	-	-	0/8/12/12	0/2/2/2
2	NAG	D	681	1	-	2/6/23/26	0/1/1/1

All (38) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	682	HEM	C3C-CAC	-5.16	1.37	1.47
3	A	682	HEM	C3C-CAC	-4.78	1.38	1.47
3	A	682	HEM	C3C-C2C	-4.75	1.33	1.40
3	C	682	HEM	C3C-CAC	-4.70	1.38	1.47
3	C	682	HEM	C3C-C2C	-4.60	1.34	1.40
3	B	682	HEM	C3C-CAC	-4.47	1.38	1.47
3	B	682	HEM	C3C-C2C	-3.84	1.35	1.40
3	D	682	HEM	C3C-C2C	-3.72	1.35	1.40
3	B	682	HEM	CAB-C3B	-3.56	1.37	1.47
4	C	701	FLP	C7-C8	3.36	1.43	1.36
3	D	682	HEM	CAB-C3B	-3.28	1.38	1.47
3	A	682	HEM	CAB-C3B	-3.21	1.38	1.47
4	A	701	FLP	C8-C9	3.19	1.44	1.39
4	A	701	FLP	C7-C8	3.17	1.43	1.36
4	B	701	FLP	C8-C9	3.05	1.44	1.39
4	B	701	FLP	C10-C11	2.98	1.41	1.36
3	C	682	HEM	CAB-C3B	-2.96	1.39	1.47
3	D	682	HEM	CBB-CAB	2.77	1.44	1.30
3	C	682	HEM	CBB-CAB	2.74	1.43	1.30
4	D	701	FLP	C7-C8	2.72	1.42	1.36
3	A	682	HEM	CBB-CAB	2.66	1.43	1.30
3	B	682	HEM	CBB-CAB	2.47	1.42	1.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	701	FLP	C10-C11	2.45	1.40	1.36
4	C	701	FLP	C10-C11	2.44	1.40	1.36
4	B	701	FLP	C7-C8	2.33	1.41	1.36
3	C	682	HEM	C1B-NB	-2.28	1.36	1.40
3	A	682	HEM	C1B-NB	-2.25	1.36	1.40
3	A	682	HEM	CBC-CAC	2.24	1.44	1.29
3	C	682	HEM	CBC-CAC	2.21	1.43	1.29
4	A	701	FLP	C-C1	2.19	1.41	1.36
3	D	682	HEM	CBC-CAC	2.17	1.43	1.29
3	A	682	HEM	O2D-CGD	-2.16	1.23	1.30
4	B	701	FLP	C9-C12	-2.14	1.49	1.52
4	D	701	FLP	C11-C6	2.10	1.43	1.41
2	C	671	NAG	C1-C2	2.10	1.55	1.52
3	B	682	HEM	CBC-CAC	2.08	1.43	1.29
3	A	682	HEM	C4D-ND	-2.02	1.36	1.40
4	A	701	FLP	C4-C3	2.00	1.41	1.36

All (33) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	B	701	FLP	C10-C11-C6	-7.40	120.54	124.07
4	A	701	FLP	C10-C11-C6	-6.76	120.84	124.07
4	C	701	FLP	C10-C11-C6	-6.55	120.94	124.07
4	D	701	FLP	C10-C11-C6	-6.13	121.14	124.07
4	D	701	FLP	F-C11-C6	4.10	120.26	116.90
4	A	701	FLP	F-C11-C6	4.01	120.19	116.90
4	B	701	FLP	F-C11-C6	3.62	119.87	116.90
2	D	671	NAG	C1-C2-N2	3.48	116.43	110.49
2	A	671	NAG	C4-C3-C2	-3.31	106.17	111.02
2	B	671	NAG	C4-C3-C2	-3.29	106.19	111.02
2	C	671	NAG	C1-O5-C5	3.07	116.35	112.19
2	D	671	NAG	C4-C3-C2	-3.05	106.55	111.02
2	C	671	NAG	C1-C2-N2	3.01	115.62	110.49
2	B	661	NAG	C3-C4-C5	-2.71	105.41	110.24
2	B	671	NAG	C6-C5-C4	-2.63	106.85	113.00
4	C	701	FLP	F-C11-C6	2.58	119.02	116.90
3	D	682	HEM	C4C-CHD-C1D	2.54	125.91	122.56
2	C	671	NAG	C2-N2-C7	-2.50	119.35	122.90
2	D	661	NAG	C3-C4-C5	-2.48	105.81	110.24
2	A	671	NAG	O5-C1-C2	-2.47	107.39	111.29
2	A	661	NAG	C3-C4-C5	-2.43	105.90	110.24
2	A	671	NAG	C1-C2-N2	2.36	114.51	110.49

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	B	682	HEM	CMA-C3A-C4A	-2.34	124.86	128.46
2	C	671	NAG	C4-C3-C2	-2.31	107.63	111.02
3	B	682	HEM	C4C-CHD-C1D	2.31	125.61	122.56
4	A	701	FLP	O1-C14-O	-2.23	119.02	124.09
3	C	682	HEM	C4B-CHC-C1C	2.19	125.44	122.56
2	B	671	NAG	C1-O5-C5	2.16	115.12	112.19
2	A	671	NAG	C6-C5-C4	-2.12	108.03	113.00
2	C	661	NAG	C3-C4-C5	-2.08	106.52	110.24
3	C	682	HEM	C4B-C3B-C2B	-2.05	105.49	107.11
2	A	671	NAG	C1-O5-C5	2.05	114.97	112.19
2	D	671	NAG	C1-O5-C5	2.03	114.95	112.19

There are no chirality outliers.

All (27) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	671	NAG	O5-C5-C6-O6
2	A	671	NAG	O5-C5-C6-O6
2	C	671	NAG	O5-C5-C6-O6
2	D	671	NAG	O5-C5-C6-O6
2	B	671	NAG	C4-C5-C6-O6
2	C	671	NAG	C4-C5-C6-O6
2	D	671	NAG	C4-C5-C6-O6
2	A	671	NAG	C4-C5-C6-O6
2	D	681	NAG	C4-C5-C6-O6
2	D	681	NAG	O5-C5-C6-O6
2	A	681	NAG	C4-C5-C6-O6
2	A	681	NAG	O5-C5-C6-O6
2	C	681	NAG	C4-C5-C6-O6
3	B	682	HEM	C2B-C3B-CAB-CBB
2	B	681	NAG	O5-C5-C6-O6
2	B	681	NAG	C4-C5-C6-O6
2	C	681	NAG	O5-C5-C6-O6
3	B	682	HEM	CAA-CBA-CGA-O2A
3	C	682	HEM	CAA-CBA-CGA-O2A
3	D	682	HEM	CAA-CBA-CGA-O2A
3	B	682	HEM	CAA-CBA-CGA-O1A
3	A	682	HEM	CAA-CBA-CGA-O1A
3	C	682	HEM	CAA-CBA-CGA-O1A
3	D	682	HEM	CAA-CBA-CGA-O1A
3	A	682	HEM	CAA-CBA-CGA-O2A
3	C	682	HEM	CAD-CBD-CGD-O2D

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Mol	Chain	Res	Type	Atoms
3	C	682	HEM	CAD-CBD-CGD-O1D

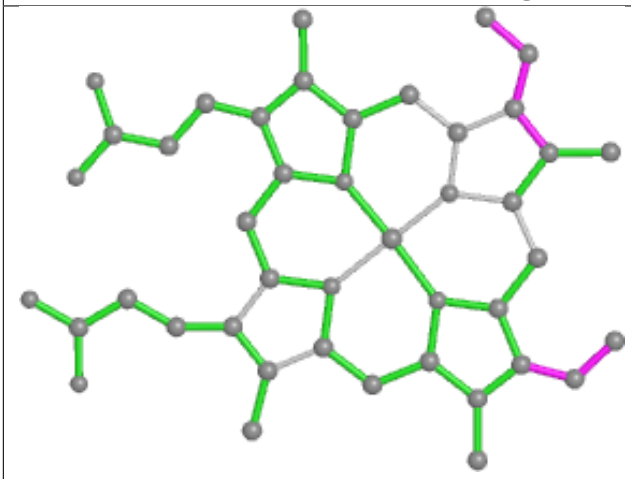
There are no ring outliers.

12 monomers are involved in 50 short contacts:

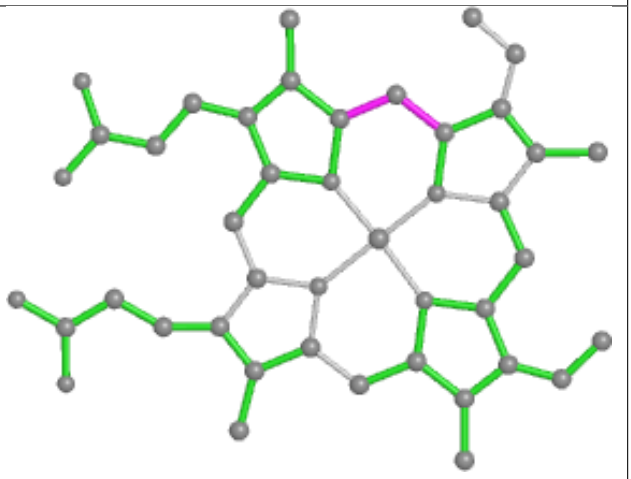
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	682	HEM	9	0
3	C	682	HEM	6	0
2	B	681	NAG	1	0
2	A	671	NAG	4	0
2	B	661	NAG	1	0
4	D	701	FLP	3	0
3	B	682	HEM	9	0
2	B	671	NAG	1	0
4	C	701	FLP	3	0
3	A	682	HEM	6	0
4	B	701	FLP	6	0
4	A	701	FLP	1	0

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

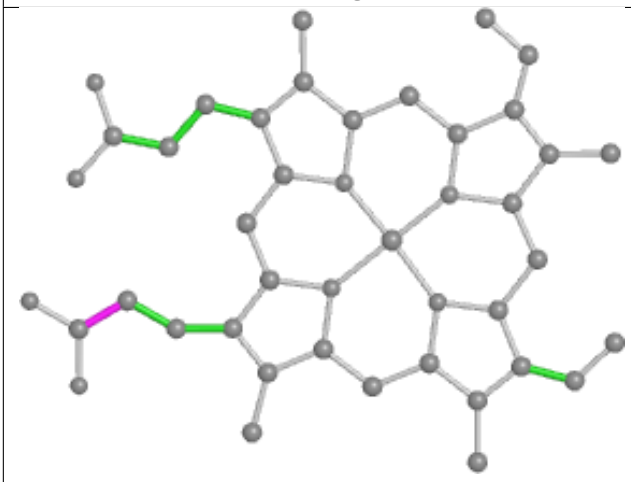
Ligand HEM D 682



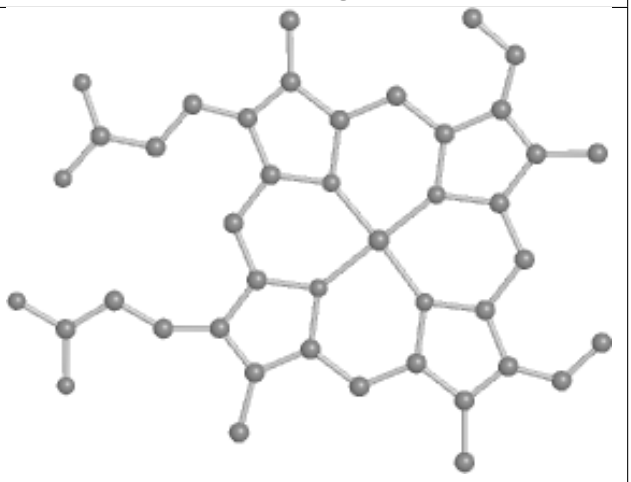
Bond lengths



Bond angles

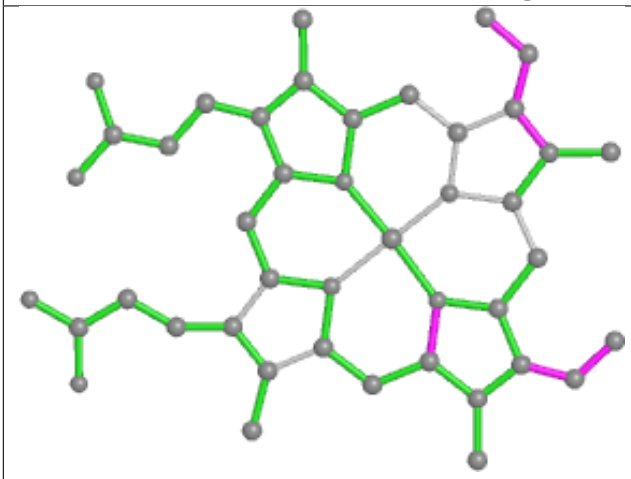


Torsions

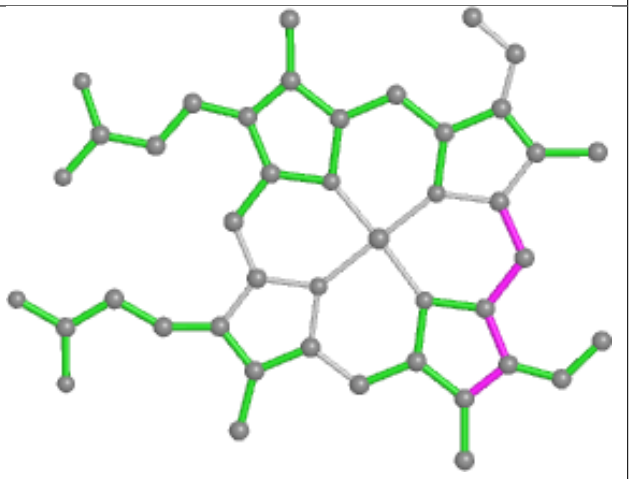


Rings

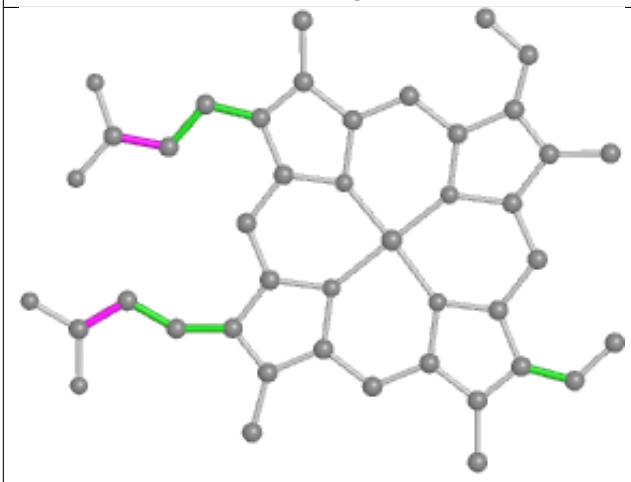
Ligand HEM C 682



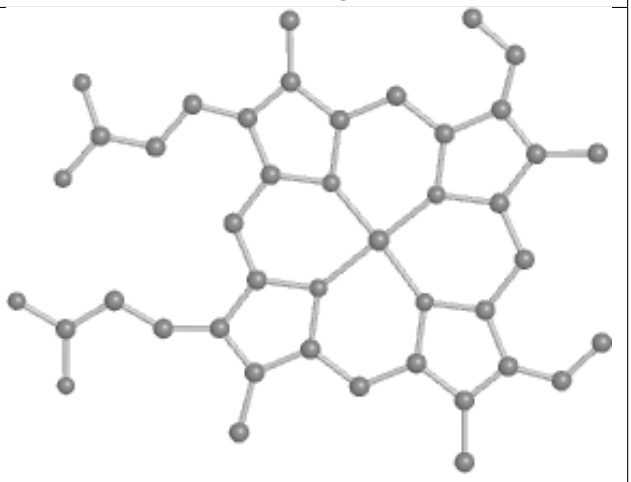
Bond lengths



Bond angles

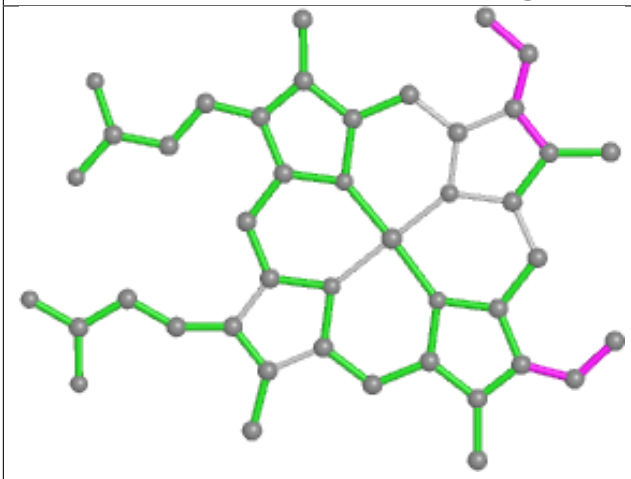


Torsions

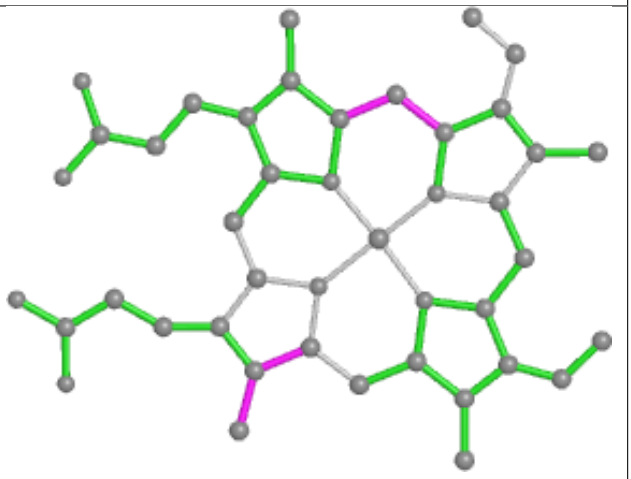


Rings

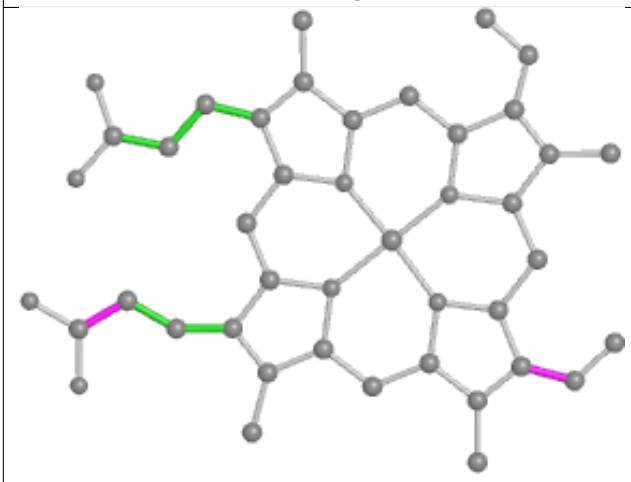
Ligand HEM B 682



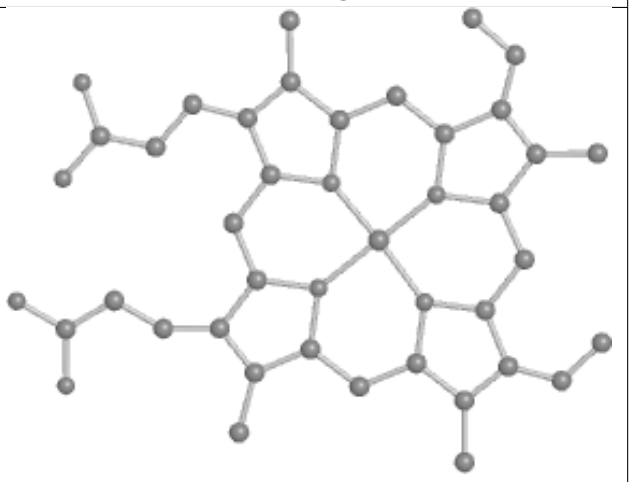
Bond lengths



Bond angles

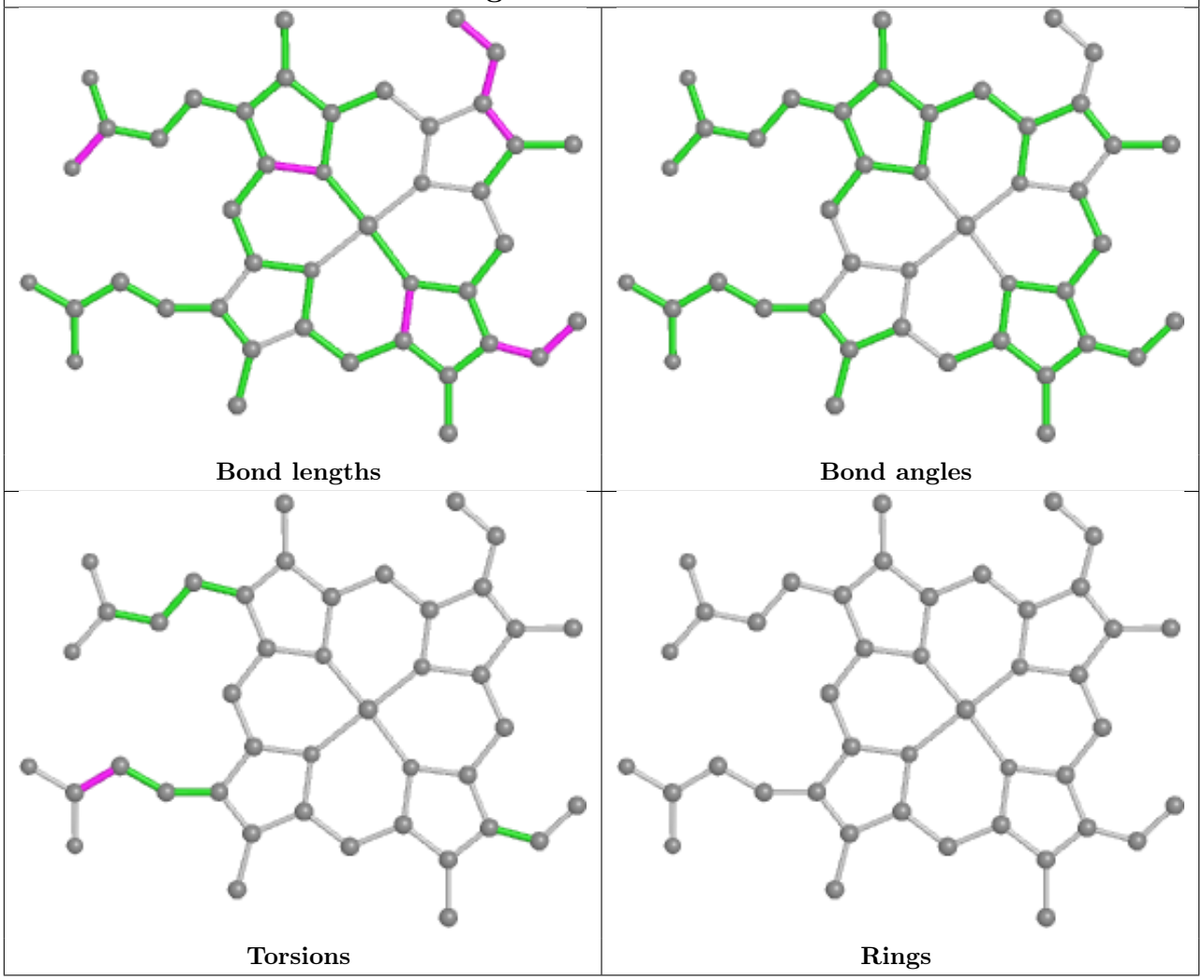


Torsions



Rings

Ligand HEM A 682



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

EDS was not executed - this section is therefore empty.

6.2 Non-standard residues in protein, DNA, RNA chains

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.