Full wwPDB X-ray Structure Validation Report ⓘ

Jul 28, 2021 – 04:26 PM EDT

PDB ID	:	1L8A
Title	:	E. COLI PYRUVATE DEHYDROGENASE
Authors	:	Furey, W.; Arjunan, P.
Deposited on	:	2002-03-19
Resolution	:	1.85 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 following versions of software and data (see references ⓘ) were used in the production of this report:

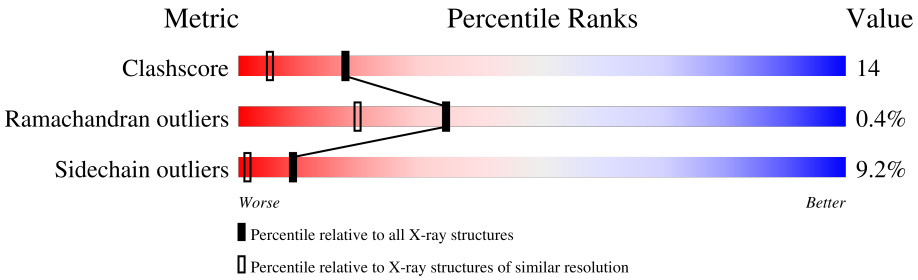
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.22

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 1.85 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	2625 (1.86-1.86)
Ramachandran outliers	138981	2592 (1.86-1.86)
Sidechain outliers	138945	2592 (1.86-1.86)

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	886	65% 21% · 10%
1	B	886	65% 20% 5% 10%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 13418 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.

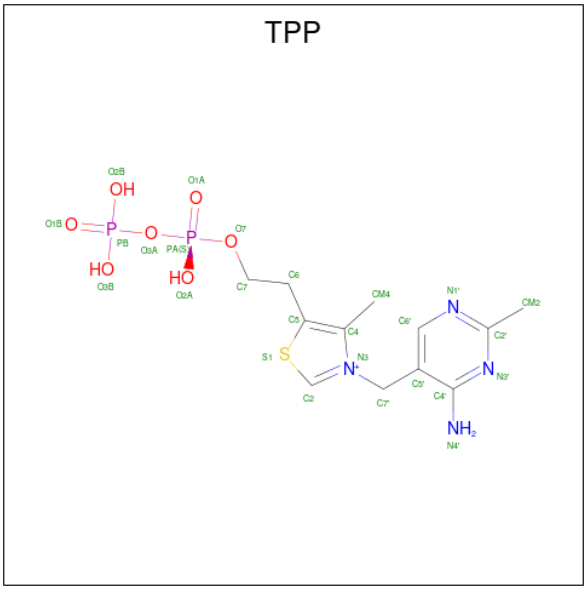
- Molecule 1 is a protein called Pyruvate dehydrogenase E1 component.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	801	Total	C	N	O	S	0	0	0
			6341	4018	1093	1204	26			
1	B	801	Total	C	N	O	S	0	0	0
			6341	4018	1093	1204	26			

- Molecule 2 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Mg	0	0
			1	1		
2	B	1	Total	Mg	0	0
			1	1		

- Molecule 3 is THIAMINE DIPHOSPHATE (three-letter code: TPP) (formula: $C_{12}H_{19}N_4O_7P_2S$).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	S	0	0
			26	12	4	7	2	1		
3	B	1	Total	C	N	O	P	S	0	0
			26	12	4	7	2	1		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	330	Total	O	0	0
			330	330		
4	B	352	Total	O	0	0
			352	352		

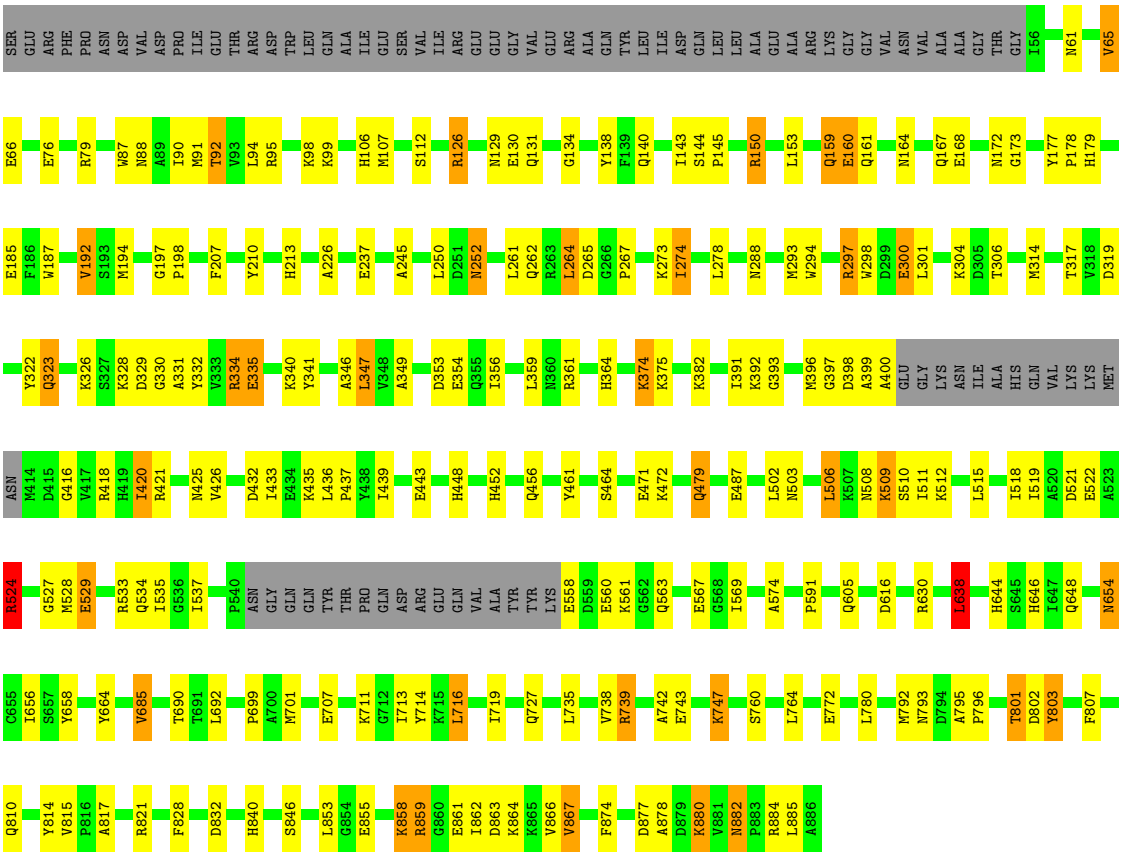
3 Residue-property plots (i)

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.

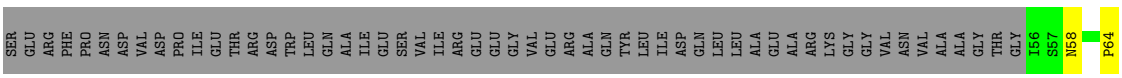
• Molecule 1: Pyruvate dehydrogenase E1 component

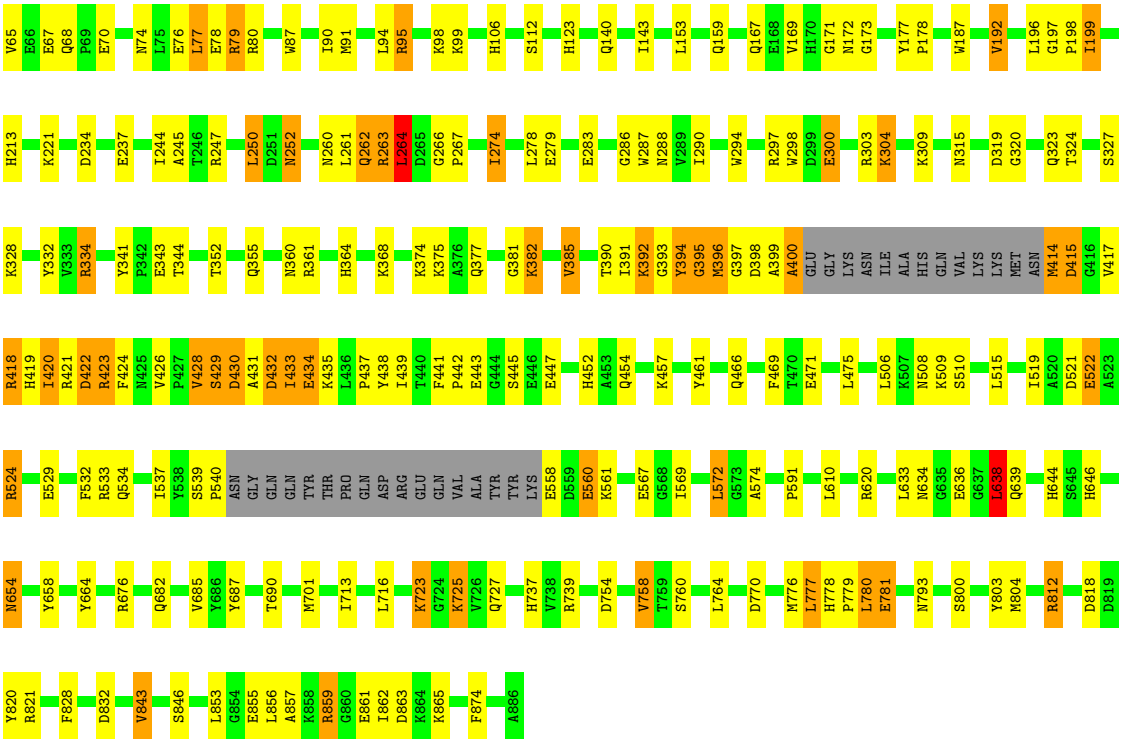
Chain A:



• Molecule 1: Pyruvate dehydrogenase E1 component

Chain B:




V65 E66 E67 Q68 P69 E70 N74 L75 E76 L77 E78 R79 R80 W87 I90 M91 L94 R95 K98 K99 H106 S112 H123 Q140 I143 L153 Q159 Q167 E168 V169 H170 G171 N172 G173 Y177 P178 W187 V192 L196 G197 P198 I199
H213 K221 D234 E237 I244 A245 T246 R247 L250 D251 N252 N260 L261 Q262 R263 L264 D265 G266 P267 I274 L278 E279 E283 G286 W287 N288 V289 I290 W294 R297 W298 D299 E300 R303 K304 K309 N315 D319 G320 Q323 T324 S327
K328 Y332 V333 R334 Y341 P342 E343 T344 T352 Q355 N360 R361 H364 K368 K374 K375 A376 Q377 G381 K382 V385 T390 I391 K392 G393 Y394 G395 M396 G397 D398 A399 A400 GLU GLY LYS ASN ILE ALA HIS GLN VAL LYS LYS MET ASN M414 D415 G416 V417
R418 H419 I420 R421 D422 R423 F424 N425 V426 P427 V428 S429 D430 A431 D432 I433 E434 K435 L436 P437 Y438 I439 T440 F441 P442 E443 G444 S445 E446 E447 H452 A453 Q454 K457 Y461 Q466 F469 T470 E471 L475 L506 K507 N508 K509 S510 L515 I519 A520 D521 E522 A523
R524 E529 F532 R533 Q534 I537 Y538 S539 P540 ASN GLY GLN GLN TYR THR PRO GLN ASP ARG GLU GLN VAL ALA TYR TYR LYS E558 D559 E560 K561 E567 G568 I569 L572 G573 A574 P591 L610 R620 L633 N634 G635 E636 G637 L638 Q639 H644 S645 H646
N654 Y658 Y664 R676 Q682 V685 Y686 Y687 T690 M701 I713 L716 K723 G724 K725 V726 Q727 H737 V738 R739 D754 V758 T759 S760 L764 D770 M776 L777 H778 P779 L780 E781 N793 S800 Y803 M804 R812 D818 D819
Y820 R821 F828 D832 V843 S846 L853 G854 E855 L856 A857 K858 R859 G860 E861 I862 D863 K864 K865 F874 A886

4 Data and refinement statistics (i)

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

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	81.69Å 141.60Å 82.46Å 90.00° 102.40° 90.00°	Depositor
Resolution (Å)	8.00 – 1.85	Depositor
% Data completeness (in resolution range)	85.4 (8.00-1.85)	Depositor
R_{merge}	0.05	Depositor
R_{sym}	0.05	Depositor
Refinement program	X-PLOR 3.851	Depositor
R, R_{free}	0.189 , 0.236	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	13418	wwPDB-VP
Average B, all atoms (Å^2)	17.0	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: MG, TPP

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	0.36	0/6484	0.62	2/8766 (0.0%)
1	B	0.38	0/6484	0.67	9/8766 (0.1%)
All	All	0.37	0/12968	0.65	11/17532 (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
All	All	0	2

There are no bond length outliers.

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	394	TYR	O-C-N	-13.41	100.41	123.20
1	B	394	TYR	CA-C-N	11.27	138.73	116.20
1	B	400	ALA	N-CA-CB	-8.41	98.32	110.10
1	A	524	ARG	NE-CZ-NH2	8.27	124.43	120.30
1	B	303	ARG	NE-CZ-NH2	8.20	124.40	120.30
1	B	264	LEU	N-CA-C	7.74	131.89	111.00
1	B	533	ARG	NE-CZ-NH2	7.31	123.95	120.30
1	A	638	LEU	CA-CB-CG	6.26	129.71	115.30
1	B	638	LEU	CA-CB-CG	5.95	128.98	115.30
1	B	394	TYR	C-N-CA	-5.43	110.91	122.30
1	B	395	GLY	N-CA-C	-5.36	99.71	113.10

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	803	TYR	Sidechain
1	B	803	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	6341	0	6179	178	0
1	B	6341	0	6179	178	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
3	A	26	0	16	3	0
3	B	26	0	16	3	0
4	A	330	0	0	11	0
4	B	352	0	0	9	0
All	All	13418	0	12390	343	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 14.

All (343) 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:801:THR:HG22	1:A:803:TYR:H	1.13	1.08
1:A:61:ASN:HD21	1:A:294:TRP:H	1.06	0.92
1:A:364:HIS:HE1	1:A:391:ILE:H	1.16	0.88
1:B:620:ARG:HH12	1:B:682:GLN:HE21	1.18	0.88
1:A:867:VAL:HG22	1:B:779:PRO:HG3	1.58	0.85
1:B:364:HIS:HE1	1:B:391:ILE:H	1.24	0.84
1:A:261:LEU:HB2	1:A:323:GLN:HE22	1.42	0.83
1:A:522:GLU:HG2	1:B:264:LEU:HD12	1.61	0.83
1:A:882:ASN:HD22	1:A:884:ARG:H	1.26	0.83
1:B:288:ASN:HB2	1:B:382:LYS:HE3	1.62	0.81
1:A:727:GLN:HE22	1:A:793:ASN:H	1.29	0.78

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:801:THR:HG22	1:A:803:TYR:N	1.97	0.77
1:B:287:TRP:CE3	1:B:385:VAL:HG22	2.19	0.77
1:A:508:ASN:HD22	1:A:511:ILE:H	1.33	0.77
1:A:79:ARG:HH12	1:A:425:ASN:HD22	1.31	0.76
1:A:252:ASN:HD22	1:A:252:ASN:H	1.34	0.76
1:A:334:ARG:HB3	1:A:356:ILE:HD13	1.66	0.76
1:B:418:ARG:HA	1:B:421:ARG:HG2	1.68	0.75
1:A:61:ASN:ND2	1:A:294:TRP:H	1.83	0.75
1:A:261:LEU:HB2	1:A:323:GLN:NE2	2.02	0.75
1:A:801:THR:CG2	1:A:803:TYR:H	1.97	0.74
1:B:856:LEU:HB2	1:B:862:ILE:CD1	2.17	0.74
1:B:853:LEU:O	1:B:862:ILE:HD11	1.89	0.73
1:A:61:ASN:HD21	1:A:294:TRP:N	1.86	0.73
1:A:364:HIS:CE1	1:A:391:ILE:H	2.03	0.73
1:B:426:VAL:HG12	1:B:428:VAL:HG12	1.71	0.73
1:B:252:ASN:H	1:B:252:ASN:HD22	1.36	0.72
1:B:638:LEU:HD22	1:B:828:PHE:HB3	1.71	0.71
1:B:396:MET:HB2	1:B:400:ALA:H	1.54	0.71
1:B:64:PRO:HG2	1:B:67:GLU:HB2	1.73	0.71
1:B:245:ALA:HA	1:B:250:LEU:HD22	1.71	0.71
1:A:326:LYS:HE2	1:A:391:ILE:HG23	1.72	0.70
1:A:506:LEU:HD13	1:A:515:LEU:HD12	1.73	0.70
1:A:524:ARG:HG3	1:A:529:GLU:HG2	1.73	0.70
1:B:421:ARG:HB2	1:B:426:VAL:HB	1.73	0.70
1:A:326:LYS:HE3	1:A:361:ARG:CZ	2.23	0.69
1:A:503:ASN:ND2	1:A:534:GLN:HE22	1.91	0.69
1:A:140:GLN:O	1:A:143:ILE:HG13	1.92	0.69
1:A:326:LYS:HE3	1:A:361:ARG:NH1	2.08	0.69
1:B:452:HIS:HD2	1:B:461:TYR:OH	1.76	0.68
1:A:297:ARG:HB3	1:A:359:LEU:HD23	1.74	0.68
1:B:727:GLN:HE22	1:B:793:ASN:H	1.41	0.68
1:A:192:VAL:HG22	4:A:891:HOH:O	1.93	0.67
1:A:527:GLY:HA2	1:A:529:GLU:OE2	1.94	0.67
1:A:638:LEU:HD22	1:A:828:PHE:HB3	1.77	0.67
1:B:414:MET:SD	1:B:434:GLU:HB3	2.35	0.67
1:A:727:GLN:NE2	1:A:793:ASN:H	1.92	0.67
1:B:300:GLU:O	1:B:304:LYS:HG3	1.95	0.67
1:A:396:MET:HB3	1:A:399:ALA:HB3	1.77	0.66
1:A:713:ILE:HB	1:A:764:LEU:HD11	1.77	0.66
1:A:192:VAL:HG23	1:B:639:GLN:NE2	2.11	0.66
1:A:393:GLY:HA3	1:A:400:ALA:O	1.95	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:832:ASP:OD2	1:B:169:VAL:HB	1.96	0.66
1:A:61:ASN:HD22	1:A:293:MET:H	1.42	0.65
1:A:426:VAL:CG1	1:A:439:ILE:HD11	2.27	0.65
1:B:506:LEU:HD23	1:B:515:LEU:HD12	1.77	0.65
1:B:74:ASN:OD1	1:B:76:GLU:HG2	1.97	0.65
1:A:735:LEU:O	1:A:738:VAL:HG22	1.97	0.64
1:A:330:GLY:HA3	1:A:353:ASP:O	1.98	0.64
1:A:364:HIS:HE1	1:A:391:ILE:N	1.94	0.64
1:A:65:VAL:HG22	4:A:1026:HOH:O	1.97	0.64
1:A:328:LYS:HG3	1:A:332:TYR:CD2	2.33	0.63
1:B:725:LYS:HE3	1:B:754:ASP:OD2	1.99	0.63
1:A:882:ASN:ND2	1:A:884:ARG:H	1.96	0.63
1:A:801:THR:HG21	1:A:807:PHE:HD2	1.64	0.62
1:A:262:GLN:HA	1:A:267:PRO:HA	1.80	0.62
1:B:274:ILE:HG13	1:B:319:ASP:OD2	2.00	0.62
1:B:171:GLY:O	1:B:173:GLY:N	2.32	0.61
1:A:61:ASN:ND2	1:A:293:MET:H	1.97	0.61
1:A:508:ASN:O	1:A:512:LYS:HB3	2.00	0.61
1:B:87:TRP:CZ3	1:B:421:ARG:HB3	2.36	0.61
1:B:469:PHE:H	1:B:682:GLN:HE22	1.48	0.61
1:A:177:TYR:CD1	1:A:192:VAL:HG11	2.36	0.61
1:B:620:ARG:HH12	1:B:682:GLN:NE2	1.96	0.61
1:B:856:LEU:HB2	1:B:862:ILE:HD11	1.82	0.61
1:A:522:GLU:CG	1:B:264:LEU:HD12	2.31	0.61
1:B:262:GLN:HG3	1:B:266:GLY:O	2.01	0.61
1:B:395:GLY:HA3	1:B:424:PHE:CE1	2.36	0.60
1:A:99:LYS:NZ	1:A:167:GLN:HE21	1.99	0.60
1:A:858:LYS:HD3	1:A:858:LYS:N	2.16	0.60
1:A:98:LYS:HE2	1:A:436:LEU:HD12	1.84	0.60
1:A:331:ALA:HA	1:A:334:ARG:HG2	1.83	0.59
1:A:160:GLU:HG2	1:A:161:GLN:N	2.18	0.59
1:B:727:GLN:NE2	1:B:793:ASN:H	2.01	0.58
1:A:129:ASN:HD22	1:A:131:GLN:H	1.51	0.58
1:B:76:GLU:CD	1:B:76:GLU:H	2.06	0.58
1:A:106:HIS:HD2	4:A:958:HOH:O	1.86	0.58
1:A:179:HIS:HD2	1:A:616:ASP:OD2	1.87	0.58
1:B:423:ARG:CZ	1:B:423:ARG:HB2	2.34	0.58
1:A:793:ASN:HD22	1:A:795:ALA:H	1.52	0.57
1:B:263:ARG:NH1	4:B:1056:HOH:O	2.36	0.57
1:B:244:ILE:HD13	1:B:247:ARG:HD2	1.86	0.57
1:B:364:HIS:CE1	1:B:391:ILE:H	2.14	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:264:LEU:HD12	1:B:522:GLU:HG3	1.86	0.57
1:A:878:ALA:HA	1:B:777:LEU:HG	1.86	0.57
1:B:65:VAL:HA	1:B:68:GLN:HG2	1.85	0.57
1:B:646:HIS:HE1	1:B:690:THR:OG1	1.86	0.57
1:B:654:ASN:H	1:B:654:ASN:HD22	1.52	0.57
1:A:864:LYS:HD3	1:B:779:PRO:O	2.04	0.57
1:A:716:LEU:HD13	1:A:739:ARG:CZ	2.34	0.57
1:B:859:ARG:HG3	1:B:859:ARG:HH11	1.69	0.56
1:B:140:GLN:O	1:B:143:ILE:HG13	2.04	0.56
1:A:508:ASN:HD21	1:A:510:SER:HB3	1.69	0.56
1:A:304:LYS:HE2	1:A:347:LEU:HG	1.88	0.56
1:A:245:ALA:HA	1:A:250:LEU:HD12	1.87	0.56
1:A:274:ILE:HG13	1:A:319:ASP:OD2	2.06	0.56
1:A:323:GLN:O	1:A:326:LYS:HB2	2.06	0.56
3:B:887:TPP:H2	4:B:1240:HOH:O	2.05	0.55
1:A:79:ARG:NH1	1:A:425:ASN:HD22	2.03	0.55
1:A:317:THR:HB	1:A:322:TYR:CE1	2.41	0.55
1:B:213:HIS:O	1:B:561:LYS:HD3	2.06	0.55
1:B:320:GLY:O	1:B:324:THR:HG23	2.06	0.54
1:B:423:ARG:HG3	1:B:424:PHE:CD1	2.41	0.54
1:A:518:ILE:O	1:A:519:ILE:HD12	2.08	0.54
1:A:420:ILE:HG13	1:A:421:ARG:N	2.22	0.54
1:B:506:LEU:CD2	1:B:515:LEU:HD12	2.37	0.54
1:B:863:ASP:OD1	1:B:865:LYS:HB2	2.07	0.54
3:A:887:TPP:H2	4:A:1041:HOH:O	2.06	0.53
1:A:177:TYR:CG	1:A:192:VAL:HG11	2.43	0.53
1:B:287:TRP:HE3	1:B:385:VAL:HG22	1.69	0.53
1:A:273:LYS:HG2	4:A:1067:HOH:O	2.08	0.53
1:B:856:LEU:HB2	1:B:862:ILE:HD13	1.87	0.53
1:B:192:VAL:CG2	4:B:921:HOH:O	2.57	0.53
1:B:87:TRP:HZ3	1:B:421:ARG:HB3	1.74	0.53
1:A:87:TRP:HE3	1:A:420:ILE:HD11	1.74	0.53
1:A:654:ASN:HD22	1:A:654:ASN:H	1.56	0.53
1:A:340:LYS:HG2	1:A:341:TYR:CE1	2.44	0.53
1:B:262:GLN:HA	1:B:267:PRO:HA	1.89	0.53
1:A:452:HIS:HD2	1:A:461:TYR:OH	1.92	0.52
1:B:540:PRO:HA	1:B:560:GLU:HB3	1.91	0.52
1:A:772:GLU:HG3	1:A:814:TYR:HE2	1.75	0.52
1:B:713:ILE:HB	1:B:764:LEU:HD11	1.91	0.52
1:A:452:HIS:HE1	4:A:1202:HOH:O	1.93	0.52
1:B:415:ASP:O	1:B:418:ARG:HB3	2.09	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:352:THR:OG1	1:B:355:GLN:HG3	2.10	0.52
1:B:723:LYS:HD3	1:B:723:LYS:N	2.23	0.52
1:A:91:MET:O	1:A:95:ARG:HG3	2.09	0.52
1:A:646:HIS:HE1	1:A:690:THR:OG1	1.92	0.52
1:B:309:LYS:CB	1:B:343:GLU:HG3	2.39	0.52
1:B:778:HIS:HB3	1:B:781:GLU:OE1	2.10	0.51
1:A:537:ILE:HB	1:A:558:GLU:HG2	1.90	0.51
1:A:61:ASN:ND2	1:A:293:MET:N	2.58	0.51
1:A:853:LEU:O	1:A:862:ILE:HD11	2.10	0.51
1:A:884:ARG:NH1	4:A:1046:HOH:O	2.44	0.51
1:A:328:LYS:HG3	1:A:332:TYR:CE2	2.46	0.51
1:A:846:SER:HB2	1:A:874:PHE:HB3	1.92	0.51
1:A:864:LYS:HB3	1:B:780:LEU:HD23	1.92	0.51
1:B:58:ASN:ND2	1:B:315:ASN:HD21	2.08	0.51
1:A:509:LYS:HA	1:A:512:LYS:HE2	1.92	0.51
1:B:861:GLU:O	1:B:862:ILE:CG2	2.59	0.51
1:A:727:GLN:HE22	1:A:792:MET:HB3	1.76	0.50
1:B:423:ARG:HB2	1:B:423:ARG:NH1	2.27	0.50
1:B:192:VAL:HG23	4:B:921:HOH:O	2.10	0.50
1:B:426:VAL:HG13	1:B:439:ILE:HD11	1.92	0.50
1:B:334:ARG:HG2	4:B:1110:HOH:O	2.11	0.50
1:B:396:MET:HA	1:B:420:ILE:HD12	1.93	0.50
1:B:454:GLN:HE22	1:B:457:LYS:NZ	2.09	0.50
1:B:177:TYR:HB3	1:B:178:PRO:CD	2.41	0.50
1:A:664:TYR:CG	1:A:701:MET:HB2	2.47	0.50
1:B:421:ARG:CD	1:B:433:ILE:HD11	2.42	0.50
1:A:177:TYR:HB3	1:A:178:PRO:CD	2.42	0.49
1:A:323:GLN:OE1	1:A:326:LYS:HD2	2.12	0.49
1:A:508:ASN:ND2	1:A:511:ILE:H	2.05	0.49
1:B:396:MET:HB2	1:B:399:ALA:HB3	1.94	0.49
1:B:654:ASN:H	1:B:654:ASN:ND2	2.09	0.49
1:A:524:ARG:HG3	1:A:529:GLU:CG	2.42	0.49
1:A:654:ASN:H	1:A:654:ASN:ND2	2.11	0.49
1:A:815:VAL:HG12	1:A:817:ALA:H	1.77	0.49
1:B:861:GLU:O	1:B:862:ILE:HG23	2.13	0.49
1:B:417:VAL:HA	1:B:420:ILE:HG12	1.93	0.49
1:B:442:PRO:HG2	1:B:445:SER:HB3	1.93	0.49
1:B:569:ILE:HD11	3:B:887:TPP:H61	1.93	0.49
1:A:262:GLN:HG3	1:A:323:GLN:HE21	1.77	0.49
1:B:288:ASN:CB	1:B:382:LYS:HE3	2.38	0.49
1:B:421:ARG:NE	1:B:433:ILE:HD11	2.28	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:654:ASN:HD22	1:A:654:ASN:N	2.11	0.48
1:B:381:GLY:C	1:B:382:LYS:HG3	2.33	0.48
1:A:298:TRP:CE2	1:A:359:LEU:HB3	2.48	0.48
1:A:801:THR:HB	4:A:895:HOH:O	2.14	0.48
1:A:264:LEU:HD13	1:A:265:ASP:OD2	2.13	0.48
1:A:314:MET:HA	1:A:322:TYR:OH	2.14	0.48
1:B:429:SER:OG	1:B:431:ALA:HB3	2.14	0.48
1:A:194:MET:HE1	3:B:887:TPP:H72	1.95	0.48
1:B:654:ASN:HD22	1:B:654:ASN:N	2.09	0.48
1:A:471:GLU:OE2	1:A:591:PRO:HD2	2.14	0.48
1:A:864:LYS:O	1:A:867:VAL:HG13	2.14	0.48
1:B:91:MET:O	1:B:95:ARG:HG2	2.13	0.48
1:A:840:HIS:HE1	4:A:1022:HOH:O	1.97	0.47
1:B:196:LEU:HA	1:B:199:ILE:HD11	1.95	0.47
1:B:395:GLY:HA3	1:B:424:PHE:HE1	1.79	0.47
1:B:396:MET:H	1:B:396:MET:HG2	1.55	0.47
1:B:426:VAL:HG13	1:B:439:ILE:CD1	2.44	0.47
1:B:309:LYS:HG2	1:B:343:GLU:CG	2.45	0.47
1:A:197:GLY:N	1:A:198:PRO:HD2	2.29	0.47
1:B:716:LEU:HD13	1:B:739:ARG:CZ	2.44	0.47
1:A:503:ASN:HD21	1:A:534:GLN:HE22	1.62	0.47
1:B:199:ILE:HG12	1:B:237:GLU:HB3	1.97	0.47
1:B:294:TRP:HB3	1:B:298:TRP:CD1	2.50	0.47
3:A:887:TPP:H62	1:B:264:LEU:H	1.80	0.47
1:B:244:ILE:CD1	1:B:247:ARG:HD2	2.45	0.47
1:B:364:HIS:HD2	4:B:1224:HOH:O	1.97	0.47
1:B:644:HIS:HB3	1:B:804:MET:CE	2.44	0.47
1:B:423:ARG:CZ	1:B:423:ARG:CB	2.92	0.47
1:B:537:ILE:O	1:B:558:GLU:HA	2.15	0.47
1:B:861:GLU:C	1:B:862:ILE:HG23	2.35	0.47
1:A:261:LEU:HD23	1:A:274:ILE:HD11	1.96	0.46
1:A:300:GLU:O	1:A:304:LYS:HG2	2.15	0.46
1:A:796:PRO:HG3	1:A:859:ARG:NE	2.30	0.46
1:B:99:LYS:NZ	1:B:167:GLN:HE21	2.12	0.46
1:B:288:ASN:HB2	1:B:382:LYS:CE	2.41	0.46
1:B:395:GLY:HA3	1:B:423:ARG:HD3	1.96	0.46
1:A:518:ILE:C	1:A:519:ILE:HD12	2.36	0.46
1:A:87:TRP:CE3	1:A:420:ILE:HD11	2.51	0.46
1:A:213:HIS:HB3	1:A:560:GLU:O	2.15	0.46
1:B:393:GLY:HA3	1:B:400:ALA:CB	2.45	0.46
1:B:432:ASP:O	1:B:437:PRO:HD3	2.15	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:454:GLN:HE22	1:B:457:LYS:HZ2	1.61	0.46
1:A:821:ARG:HD2	1:A:855:GLU:CG	2.46	0.46
1:A:66:GLU:H	1:A:66:GLU:CD	2.18	0.46
1:A:863:ASP:O	1:A:866:VAL:HB	2.15	0.46
1:B:78:GLU:OE2	1:B:123:HIS:HE1	1.99	0.46
1:A:138:TYR:HB2	1:A:226:ALA:HA	1.98	0.46
1:A:328:LYS:HB3	1:A:332:TYR:HB3	1.98	0.46
1:A:719:ILE:HD12	1:A:742:ALA:HB1	1.98	0.46
1:A:262:GLN:HG3	1:A:323:GLN:NE2	2.31	0.46
1:B:159:GLN:HG2	1:B:438:TYR:CE1	2.51	0.46
1:A:743:GLU:O	1:A:747:LYS:HB2	2.15	0.46
1:B:737:HIS:HE1	4:B:906:HOH:O	1.98	0.46
1:A:521:ASP:CG	1:B:263:ARG:HD2	2.37	0.45
1:B:567:GLU:HG3	1:B:574:ALA:HA	1.98	0.45
1:B:178:PRO:HA	1:B:187:TRP:CG	2.52	0.45
1:B:855:GLU:O	1:B:859:ARG:HG2	2.15	0.45
1:A:416:GLY:O	1:A:420:ILE:HG23	2.16	0.45
1:A:801:THR:CG2	1:A:802:ASP:N	2.78	0.45
1:A:880:LYS:HD3	4:A:1080:HOH:O	2.15	0.45
1:B:328:LYS:HG3	1:B:332:TYR:CD2	2.51	0.45
1:A:192:VAL:HG23	1:B:639:GLN:HE21	1.80	0.45
1:A:334:ARG:HG3	1:A:335:GLU:N	2.32	0.45
1:B:309:LYS:HB2	1:B:343:GLU:HG3	1.98	0.45
1:B:532:PHE:CG	1:B:537:ILE:HD11	2.52	0.45
1:B:664:TYR:CG	1:B:701:MET:HB2	2.51	0.45
1:B:859:ARG:HG3	1:B:859:ARG:NH1	2.32	0.45
1:A:252:ASN:HD22	1:A:252:ASN:N	2.03	0.45
1:B:106:HIS:CD2	1:B:106:HIS:N	2.85	0.45
1:B:846:SER:HB2	1:B:874:PHE:HB3	1.99	0.45
1:A:288:ASN:HD21	1:A:375:LYS:HE2	1.82	0.45
1:B:91:MET:O	1:B:95:ARG:CG	2.65	0.45
1:A:90:ILE:HG23	1:A:94:LEU:HD23	1.99	0.45
1:B:471:GLU:OE2	1:B:591:PRO:HD2	2.17	0.45
1:B:532:PHE:CD1	1:B:537:ILE:HD11	2.52	0.45
1:A:867:VAL:CG2	1:B:779:PRO:HG3	2.38	0.45
1:B:112:SER:HB3	1:B:392:LYS:HA	1.98	0.45
1:B:508:ASN:OD1	1:B:510:SER:HB3	2.17	0.45
1:B:421:ARG:HG3	1:B:422:ASP:N	2.31	0.44
1:B:297:ARG:HG3	1:B:360:ASN:OD1	2.17	0.44
1:B:279:GLU:O	1:B:283:GLU:HB2	2.17	0.44
1:A:300:GLU:HG3	1:A:301:LEU:N	2.31	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:274:ILE:HG13	1:B:274:ILE:H	1.48	0.44
1:A:630:ARG:HH12	1:A:644:HIS:HD1	1.65	0.44
1:B:68:GLN:HE22	1:B:368:LYS:NZ	2.16	0.44
1:B:524:ARG:HA	1:B:529:GLU:OE1	2.18	0.44
1:A:569:ILE:HD11	3:A:887:TPP:H61	2.00	0.44
1:A:374:LYS:HD3	1:A:374:LYS:HA	1.66	0.44
1:A:432:ASP:OD2	1:A:435:LYS:HE2	2.18	0.44
1:A:877:ASP:HB3	1:A:880:LYS:HD2	1.99	0.44
1:B:419:HIS:O	1:B:423:ARG:HG2	2.18	0.44
1:B:633:LEU:HG	1:B:636:GLU:HB2	2.00	0.43
1:B:821:ARG:HD2	1:B:855:GLU:HG3	1.99	0.43
1:A:144:SER:OG	1:A:145:PRO:HD3	2.18	0.43
1:A:656:ILE:HG12	1:A:685:VAL:HG13	2.00	0.43
1:A:713:ILE:HG12	1:A:714:TYR:N	2.32	0.43
1:B:426:VAL:CG1	1:B:439:ILE:HD11	2.48	0.43
1:B:800:SER:OG	1:B:843:VAL:HG22	2.18	0.43
1:A:323:GLN:OE1	1:A:323:GLN:HA	2.19	0.43
1:B:676:ARG:HD3	1:B:687:TYR:OH	2.18	0.43
1:A:262:GLN:OE1	1:A:326:LYS:NZ	2.47	0.43
1:B:260:ASN:HA	1:B:390:THR:O	2.18	0.43
1:B:261:LEU:HA	1:B:274:ILE:HD11	2.01	0.43
1:B:286:GLY:O	1:B:382:LYS:NZ	2.51	0.43
1:A:178:PRO:HA	1:A:187:TRP:CG	2.52	0.43
1:B:237:GLU:HG2	1:B:572:LEU:HD11	2.00	0.43
1:A:487:GLU:HG3	1:A:699:PRO:HA	2.01	0.43
1:B:77:LEU:CD2	1:B:447:GLU:HG3	2.47	0.43
1:B:341:TYR:HB2	1:B:344:THR:OG1	2.18	0.43
1:B:309:LYS:HG2	1:B:343:GLU:HG3	2.01	0.43
1:B:430:ASP:HA	1:B:433:ILE:HB	2.00	0.43
1:A:207:PHE:O	1:A:210:TYR:HB3	2.19	0.43
1:B:87:TRP:CD2	1:B:426:VAL:HG11	2.54	0.43
1:A:436:LEU:N	1:A:437:PRO:HD3	2.34	0.42
1:A:567:GLU:HG3	1:A:574:ALA:HA	2.01	0.42
1:B:452:HIS:HE1	4:B:1014:HOH:O	2.01	0.42
1:B:153:LEU:HD21	1:B:441:PHE:HE1	1.85	0.42
1:B:323:GLN:HE21	1:B:361:ARG:HH22	1.66	0.42
1:A:519:ILE:HD11	1:A:528:MET:CE	2.49	0.42
1:B:221:LYS:HB2	4:B:1072:HOH:O	2.19	0.42
1:A:159:GLN:HE21	1:A:159:GLN:HB2	1.65	0.42
1:A:535:ILE:HB	1:A:563:GLN:HB3	2.00	0.42
1:B:324:THR:O	1:B:328:LYS:HG2	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:261:LEU:HA	1:A:274:ILE:HD11	2.00	0.42
1:B:197:GLY:N	1:B:198:PRO:HD2	2.35	0.42
1:B:812:ARG:HD2	1:B:820:TYR:HD2	1.85	0.42
1:A:107:MET:HB2	1:A:107:MET:HE2	1.62	0.42
1:A:864:LYS:CB	1:B:780:LEU:HD23	2.49	0.42
1:A:443:GLU:HG3	1:A:448:HIS:CE1	2.55	0.41
1:A:143:ILE:C	1:A:143:ILE:HD12	2.41	0.41
1:A:294:TRP:HB3	1:A:298:TRP:CD1	2.54	0.41
1:A:707:GLU:O	1:A:711:LYS:HG2	2.20	0.41
1:A:326:LYS:HZ3	1:A:392:LYS:H	1.68	0.41
1:A:436:LEU:N	1:A:437:PRO:CD	2.83	0.41
1:A:658:TYR:CD2	1:A:760:SER:HB2	2.56	0.41
1:A:772:GLU:OE1	1:A:772:GLU:HA	2.20	0.41
1:B:529:GLU:O	1:B:532:PHE:HB2	2.20	0.41
1:A:112:SER:HB3	1:A:392:LYS:HA	2.02	0.41
1:A:522:GLU:CD	1:B:264:LEU:HD12	2.41	0.41
1:A:807:PHE:O	1:A:810:GLN:HG2	2.21	0.41
1:A:150:ARG:NH2	4:A:1071:HOH:O	2.37	0.41
1:B:199:ILE:HD13	1:B:572:LEU:HD13	2.02	0.41
1:B:213:HIS:HB3	1:B:560:GLU:O	2.20	0.41
1:A:126:ARG:HG2	1:A:134:GLY:HA2	2.02	0.41
1:B:658:TYR:CD2	1:B:760:SER:HB2	2.55	0.41
1:A:605:GLN:HE21	1:A:648:GLN:HE22	1.69	0.41
1:A:237:GLU:H	1:A:237:GLU:CD	2.23	0.41
1:A:328:LYS:HD2	1:A:332:TYR:CD1	2.56	0.41
1:B:374:LYS:NZ	1:B:377:GLN:HE22	2.19	0.41
1:B:395:GLY:CA	1:B:423:ARG:HD3	2.50	0.41
1:B:634:ASN:HB2	1:B:832:ASP:O	2.21	0.41
1:B:758:VAL:O	1:B:758:VAL:HG22	2.20	0.41
1:B:396:MET:HB2	1:B:400:ALA:N	2.29	0.41
1:A:346:ALA:HA	1:A:349:ALA:HB2	2.01	0.40
1:A:479:GLN:NE2	1:A:479:GLN:HA	2.34	0.40
1:B:435:LYS:HG2	1:B:435:LYS:O	2.21	0.40
1:A:88:ASN:O	1:A:92:THR:HG23	2.19	0.40
1:B:654:ASN:ND2	1:B:654:ASN:N	2.69	0.40
1:A:331:ALA:HA	1:A:353:ASP:OD2	2.22	0.40
1:B:857:ALA:N	1:B:862:ILE:HG12	2.37	0.40
1:A:164:ASN:HB3	1:A:173:GLY:HA2	2.03	0.40
1:A:716:LEU:HD13	1:A:739:ARG:NE	2.37	0.40
1:A:884:ARG:NH2	1:B:770:ASP:OD2	2.55	0.40
1:B:79:ARG:HG3	1:B:80:ARG:N	2.37	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:244:ILE:CD1	1:B:247:ARG:NH1	2.84	0.40
1:B:421:ARG:HD3	1:B:428:VAL:HG13	2.02	0.40
1:B:812:ARG:NE	1:B:820:TYR:HB3	2.37	0.40
1:B:290:ILE:CD1	1:B:375:LYS:HD3	2.51	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	795/886 (90%)	756 (95%)	38 (5%)	1 (0%)	51	36
1	B	795/886 (90%)	754 (95%)	36 (4%)	5 (1%)	25	12
All	All	1590/1772 (90%)	1510 (95%)	74 (5%)	6 (0%)	34	19

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	172	ASN
1	B	397	GLY
1	A	397	GLY
1	B	394	TYR
1	B	521	ASP
1	B	428	VAL

5.3.2 Protein sidechains (i)

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

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

analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	665/735 (90%)	606 (91%)	59 (9%)	9 2
1	B	665/735 (90%)	602 (90%)	63 (10%)	8 1
All	All	1330/1470 (90%)	1208 (91%)	122 (9%)	9 1

All (122) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	65	VAL
1	A	76	GLU
1	A	92	THR
1	A	126	ARG
1	A	130	GLU
1	A	150	ARG
1	A	153	LEU
1	A	159	GLN
1	A	160	GLU
1	A	168	GLU
1	A	172	ASN
1	A	185	GLU
1	A	192	VAL
1	A	252	ASN
1	A	264	LEU
1	A	274	ILE
1	A	278	LEU
1	A	297	ARG
1	A	300	GLU
1	A	306	THR
1	A	323	GLN
1	A	329	ASP
1	A	334	ARG
1	A	335	GLU
1	A	347	LEU
1	A	354	GLU
1	A	374	LYS
1	A	382	LYS
1	A	398	ASP
1	A	418	ARG
1	A	420	ILE
1	A	433	ILE
1	A	456	GLN
1	A	464	SER

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Mol	Chain	Res	Type
1	A	472	LYS
1	A	479	GLN
1	A	502	LEU
1	A	506	LEU
1	A	509	LYS
1	A	524	ARG
1	A	529	GLU
1	A	533	ARG
1	A	561	LYS
1	A	638	LEU
1	A	654	ASN
1	A	685	VAL
1	A	692	LEU
1	A	716	LEU
1	A	739	ARG
1	A	747	LYS
1	A	780	LEU
1	A	801	THR
1	A	858	LYS
1	A	859	ARG
1	A	861	GLU
1	A	867	VAL
1	A	880	LYS
1	A	882	ASN
1	A	885	LEU
1	B	70	GLU
1	B	77	LEU
1	B	79	ARG
1	B	90	ILE
1	B	94	LEU
1	B	95	ARG
1	B	98	LYS
1	B	192	VAL
1	B	199	ILE
1	B	234	ASP
1	B	250	LEU
1	B	252	ASN
1	B	262	GLN
1	B	263	ARG
1	B	264	LEU
1	B	274	ILE
1	B	278	LEU

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Mol	Chain	Res	Type
1	B	300	GLU
1	B	304	LYS
1	B	327	SER
1	B	334	ARG
1	B	382	LYS
1	B	385	VAL
1	B	392	LYS
1	B	396	MET
1	B	398	ASP
1	B	414	MET
1	B	415	ASP
1	B	418	ARG
1	B	420	ILE
1	B	422	ASP
1	B	423	ARG
1	B	429	SER
1	B	430	ASP
1	B	432	ASP
1	B	433	ILE
1	B	434	GLU
1	B	443	GLU
1	B	466	GLN
1	B	475	LEU
1	B	509	LYS
1	B	519	ILE
1	B	522	GLU
1	B	524	ARG
1	B	534	GLN
1	B	539	SER
1	B	560	GLU
1	B	572	LEU
1	B	610	LEU
1	B	638	LEU
1	B	654	ASN
1	B	685	VAL
1	B	723	LYS
1	B	725	LYS
1	B	758	VAL
1	B	776	MET
1	B	777	LEU
1	B	780	LEU
1	B	781	GLU

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Mol	Chain	Res	Type
1	B	812	ARG
1	B	818	ASP
1	B	843	VAL
1	B	859	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (58) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	61	ASN
1	A	68	GLN
1	A	106	HIS
1	A	123	HIS
1	A	129	ASN
1	A	140	GLN
1	A	159	GLN
1	A	164	ASN
1	A	167	GLN
1	A	179	HIS
1	A	188	GLN
1	A	222	GLN
1	A	252	ASN
1	A	364	HIS
1	A	425	ASN
1	A	452	HIS
1	A	454	GLN
1	A	503	ASN
1	A	508	ASN
1	A	563	GLN
1	A	605	GLN
1	A	639	GLN
1	A	646	HIS
1	A	654	ASN
1	A	695	ASN
1	A	727	GLN
1	A	737	HIS
1	A	790	GLN
1	A	793	ASN
1	A	840	HIS
1	A	882	ASN
1	B	58	ASN
1	B	68	GLN
1	B	106	HIS

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Mol	Chain	Res	Type
1	B	123	HIS
1	B	167	GLN
1	B	172	ASN
1	B	222	GLN
1	B	252	ASN
1	B	262	GLN
1	B	312	GLN
1	B	323	GLN
1	B	364	HIS
1	B	377	GLN
1	B	452	HIS
1	B	454	GLN
1	B	456	GLN
1	B	503	ASN
1	B	534	GLN
1	B	639	GLN
1	B	646	HIS
1	B	654	ASN
1	B	682	GLN
1	B	727	GLN
1	B	737	HIS
1	B	790	GLN
1	B	836	ASN
1	B	840	HIS

5.3.3 RNA

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates

There are no monosaccharides in this entry.

5.6 Ligand geometry

Of 4 ligands modelled in this entry, 2 are monoatomic - leaving 2 for Mogul analysis.

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	TPP	A	887	2	22,27,27	1.75	5 (22%)	29,40,40	1.07	1 (3%)
3	TPP	B	887	2	22,27,27	1.65	5 (22%)	29,40,40	1.06	1 (3%)

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	TPP	A	887	2	-	2/16/17/17	0/2/2/2
3	TPP	B	887	2	-	4/16/17/17	0/2/2/2

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	887	TPP	C6-C5	-3.77	1.49	1.50
3	B	887	TPP	C4'-N3'	3.61	1.40	1.35
3	A	887	TPP	C5'-C4'	3.57	1.49	1.42
3	B	887	TPP	C5'-C4'	3.28	1.48	1.42
3	A	887	TPP	C4'-N3'	3.07	1.39	1.35
3	B	887	TPP	C6-C5	-2.90	1.49	1.50
3	A	887	TPP	C4-N3	2.80	1.42	1.39
3	A	887	TPP	C2'-N1'	2.55	1.38	1.34
3	B	887	TPP	C2'-N1'	2.52	1.38	1.34
3	B	887	TPP	C4-N3	2.15	1.41	1.39

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	887	TPP	C6'-N1'-C2'	2.54	120.28	115.96
3	B	887	TPP	C6'-N1'-C2'	2.49	120.20	115.96

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	B	887	TPP	C4-C5-C6-C7
3	B	887	TPP	C5-C6-C7-O7
3	B	887	TPP	PB-O3A-PA-O7
3	A	887	TPP	C4-C5-C6-C7
3	A	887	TPP	PA-O3A-PB-O2B
3	B	887	TPP	PA-O3A-PB-O2B

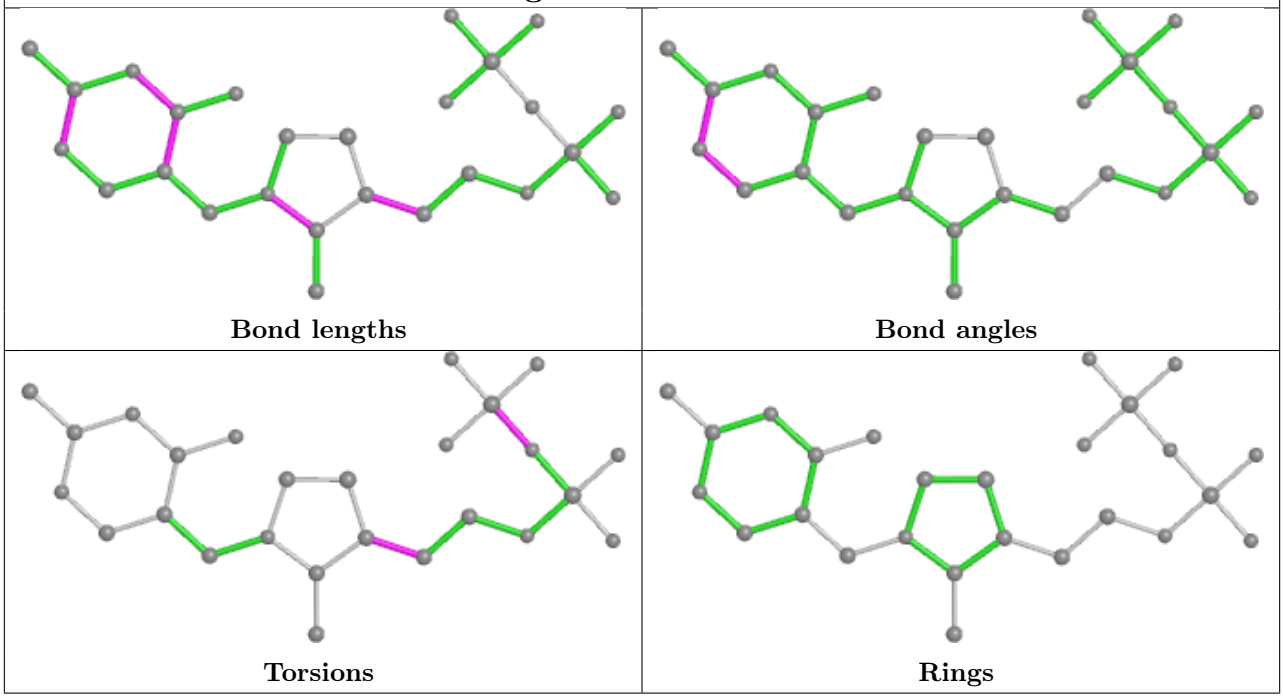
There are no ring outliers.

2 monomers are involved in 6 short contacts:

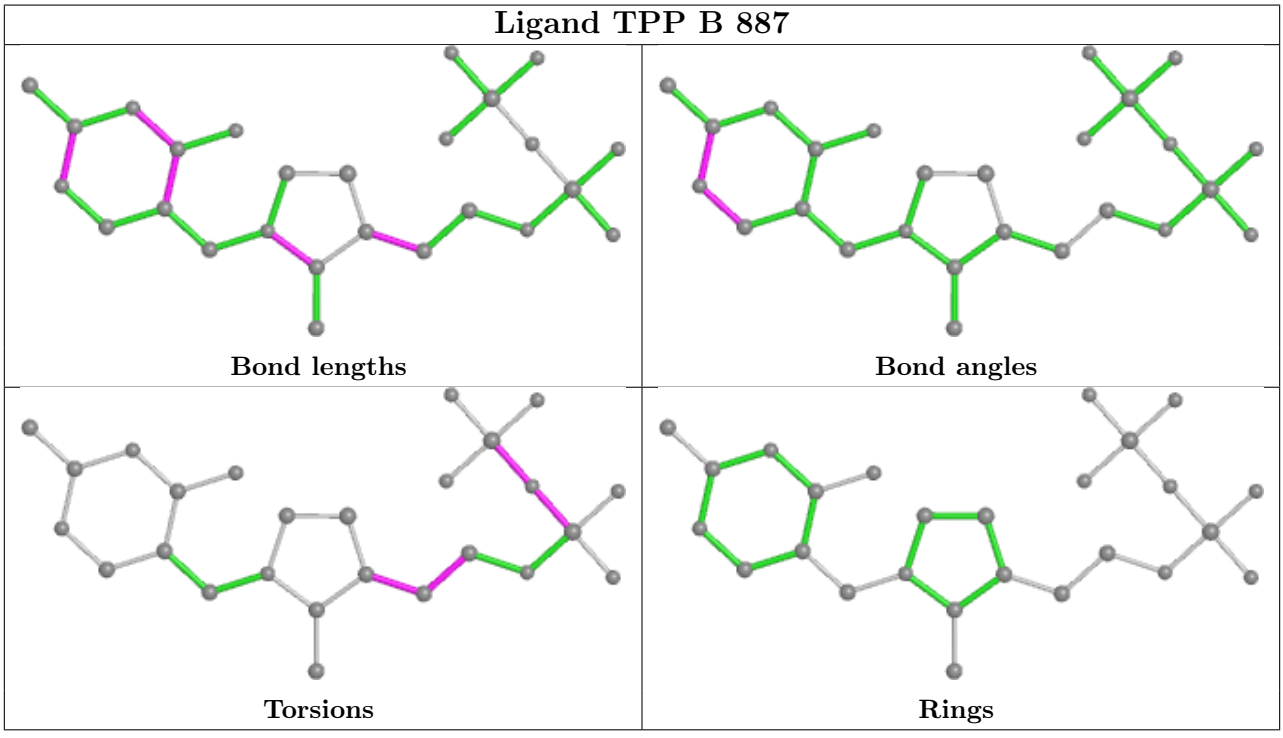
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	887	TPP	3	0
3	B	887	TPP	3	0

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

Ligand TPP A 887



Ligand TPP B 887



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.