



Full wwPDB X-ray Structure Validation Report ⓘ

Aug 8, 2023 – 04:08 pm BST

PDB ID : 7QX0
Title : Transaminase Structure of Plurienzyme (Tr2E2) in complex with PLP
Authors : Roda, S.; Fernandez-Lopez, L.; Benedens, M.; Bollinger, A.; Thies, S.; Schumacher, J.; Coscolin, C.; Kazemi, M.; Santiago, G.; Gertzen, C.G.; Gonzalez-Alfonso, J.; Plou, F.J.; Jaeger, K.E.; Smits, S.H.; Ferrer, M.; Guallar, V.
Deposited on : 2022-01-26
Resolution : 3.50 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity : 4.02b-467
Mogul : 1.8.4, CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.35
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.35

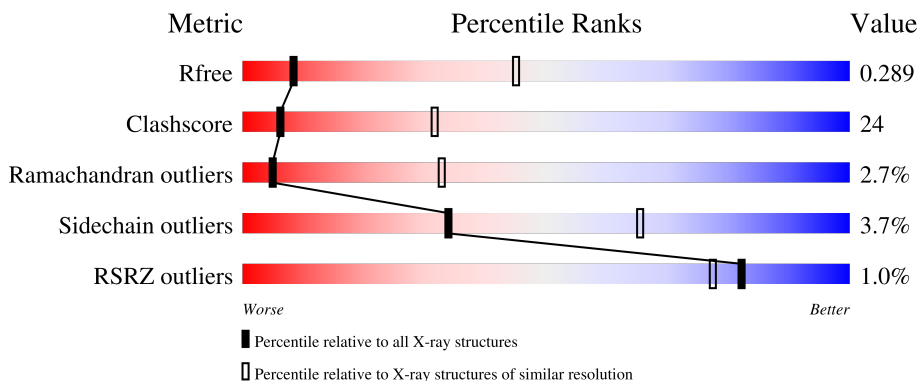
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.50 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	A	465	
1	B	465	
1	C	465	
1	D	465	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	PLP	A	501	-	-	-	X
2	PLP	B	501	-	-	X	-

2 Entry composition i

There are 2 unique types of molecules in this entry. The entry contains 26612 atoms, of which 13200 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 Aminotransferase TR2.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	H	N	O	S			
1	A	420	6484	2070	3224	568	602	20	0	0	0
1	B	443	6832	2176	3392	605	639	20	0	0	0
1	C	415	6404	2045	3181	561	597	20	0	0	0
1	D	442	6799	2167	3374	602	636	20	0	0	0

There are 40 discrepancies between the modelled and reference sequences:

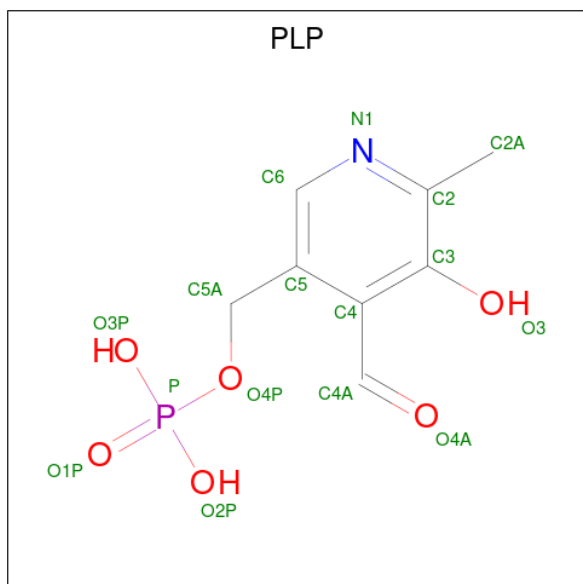
Chain	Residue	Modelled	Actual	Comment	Reference
A	172	SER	ALA	conflict	UNP A0A3G5BC54
A	173	HIS	GLN	conflict	UNP A0A3G5BC54
A	458	LEU	-	expression tag	UNP A0A3G5BC54
A	459	GLU	-	expression tag	UNP A0A3G5BC54
A	460	HIS	-	expression tag	UNP A0A3G5BC54
A	461	HIS	-	expression tag	UNP A0A3G5BC54
A	462	HIS	-	expression tag	UNP A0A3G5BC54
A	463	HIS	-	expression tag	UNP A0A3G5BC54
A	464	HIS	-	expression tag	UNP A0A3G5BC54
A	465	HIS	-	expression tag	UNP A0A3G5BC54
B	172	SER	ALA	conflict	UNP A0A3G5BC54
B	173	HIS	GLN	conflict	UNP A0A3G5BC54
B	458	LEU	-	expression tag	UNP A0A3G5BC54
B	459	GLU	-	expression tag	UNP A0A3G5BC54
B	460	HIS	-	expression tag	UNP A0A3G5BC54
B	461	HIS	-	expression tag	UNP A0A3G5BC54
B	462	HIS	-	expression tag	UNP A0A3G5BC54
B	463	HIS	-	expression tag	UNP A0A3G5BC54
B	464	HIS	-	expression tag	UNP A0A3G5BC54
B	465	HIS	-	expression tag	UNP A0A3G5BC54
C	172	SER	ALA	conflict	UNP A0A3G5BC54

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Chain	Residue	Modelled	Actual	Comment	Reference
C	173	HIS	GLN	conflict	UNP A0A3G5BC54
C	458	LEU	-	expression tag	UNP A0A3G5BC54
C	459	GLU	-	expression tag	UNP A0A3G5BC54
C	460	HIS	-	expression tag	UNP A0A3G5BC54
C	461	HIS	-	expression tag	UNP A0A3G5BC54
C	462	HIS	-	expression tag	UNP A0A3G5BC54
C	463	HIS	-	expression tag	UNP A0A3G5BC54
C	464	HIS	-	expression tag	UNP A0A3G5BC54
C	465	HIS	-	expression tag	UNP A0A3G5BC54
D	172	SER	ALA	conflict	UNP A0A3G5BC54
D	173	HIS	GLN	conflict	UNP A0A3G5BC54
D	458	LEU	-	expression tag	UNP A0A3G5BC54
D	459	GLU	-	expression tag	UNP A0A3G5BC54
D	460	HIS	-	expression tag	UNP A0A3G5BC54
D	461	HIS	-	expression tag	UNP A0A3G5BC54
D	462	HIS	-	expression tag	UNP A0A3G5BC54
D	463	HIS	-	expression tag	UNP A0A3G5BC54
D	464	HIS	-	expression tag	UNP A0A3G5BC54
D	465	HIS	-	expression tag	UNP A0A3G5BC54

- Molecule 2 is PYRIDOXAL-5'-PHOSPHATE (three-letter code: PLP) (formula: C₈H₁₀NO₆P) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
			Total	C	H	N	O			P
2	A	1	24	8	8	1	6	1	0	0

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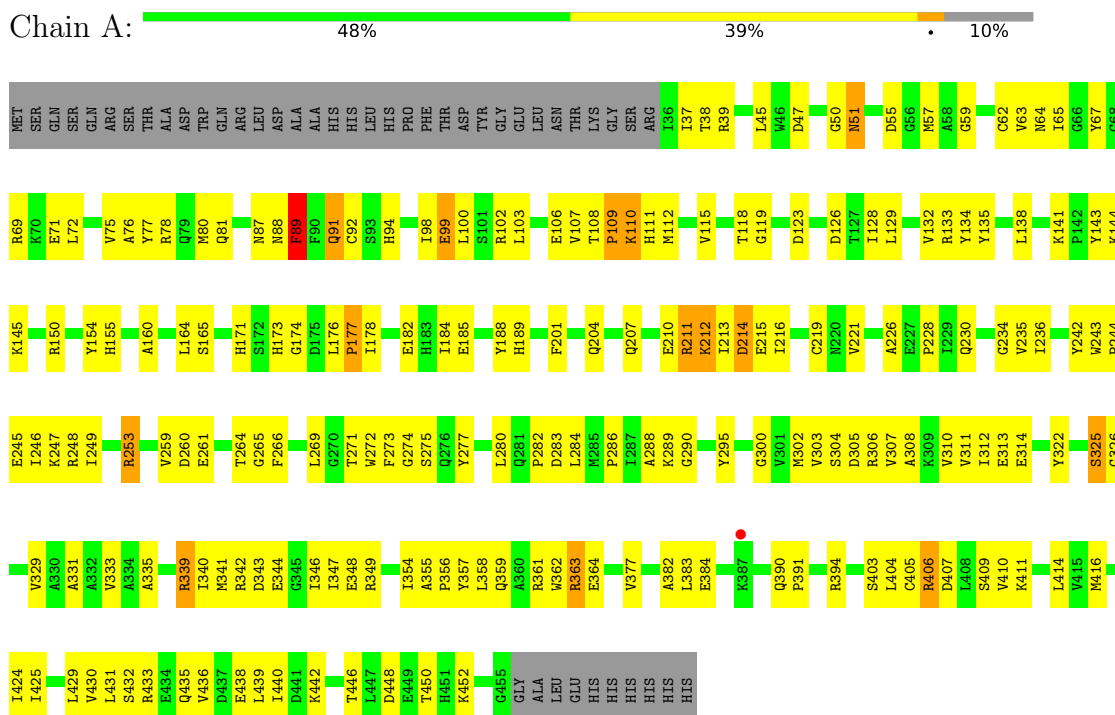
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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
2	B	1	Total	C	H	N	O	P	0	0
			24	8	8	1	6	1		
2	C	1	Total	C	H	N	O	P	0	0
			22	8	6	1	6	1		
2	D	1	Total	C	H	N	O	P	0	0
			23	8	7	1	6	1		

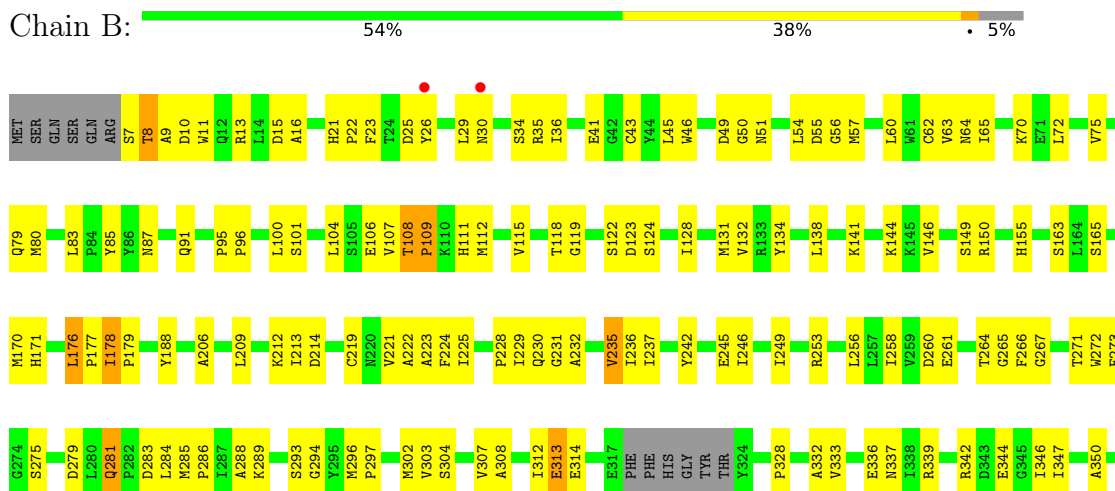
3 Residue-property plots

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

- Molecule 1: Aminotransferase TR2



- Molecule 1: Aminotransferase TR2





4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	99.92Å 107.63Å 211.64Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.62 – 3.50 49.96 – 3.50	Depositor EDS
% Data completeness (in resolution range)	99.8 (48.62-3.50) 99.8 (49.96-3.50)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.69 (at 3.48Å)	Xtrriage
Refinement program	PHENIX 1.17	Depositor
R, R_{free}	0.200 , 0.288 0.200 , 0.289	Depositor DCC
R_{free} test set	1268 reflections (4.30%)	wwPDB-VP
Wilson B-factor (Å ²)	107.0	Xtrriage
Anisotropy	0.362	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 62.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	26612	wwPDB-VP
Average B, all atoms (Å ²)	109.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 18.89% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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

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	0/3336	0.67	2/4516 (0.0%)
1	B	0.35	0/3519	0.62	0/4764
1	C	0.35	0/3296	0.69	8/4461 (0.2%)
1	D	0.60	8/3503 (0.2%)	0.76	8/4742 (0.2%)
All	All	0.43	8/13654 (0.1%)	0.69	18/18483 (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	D	0	2
All	All	0	3

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	357	TYR	CD1-CE1	13.23	1.59	1.39
1	D	361	ARG	CZ-NH2	-12.61	1.16	1.33
1	D	357	TYR	CE1-CZ	12.23	1.54	1.38
1	D	357	TYR	CD2-CE2	9.23	1.53	1.39
1	D	361	ARG	NE-CZ	-7.59	1.23	1.33
1	D	361	ARG	CZ-NH1	-6.21	1.25	1.33
1	D	436	VAL	CB-CG2	-5.75	1.40	1.52
1	D	357	TYR	CZ-OH	-5.55	1.28	1.37

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	361	ARG	NE-CZ-NH2	-21.03	109.78	120.30
1	D	361	ARG	NH1-CZ-NH2	10.83	131.31	119.40
1	C	383	LEU	CA-CB-CG	9.75	137.72	115.30
1	D	38	THR	OG1-CB-CG2	9.25	131.28	110.00
1	D	39	ARG	CG-CD-NE	8.99	130.68	111.80
1	D	361	ARG	CG-CD-NE	-7.13	96.82	111.80
1	D	39	ARG	CB-CG-CD	-7.09	93.16	111.60
1	D	357	TYR	CZ-CE2-CD2	6.05	125.25	119.80
1	A	394	ARG	CG-CD-NE	-5.87	99.48	111.80
1	C	203	ARG	NE-CZ-NH1	-5.82	117.39	120.30
1	C	99	GLU	CA-CB-CG	5.82	126.21	113.40
1	C	363	ARG	CG-CD-NE	-5.79	99.63	111.80
1	C	363	ARG	NE-CZ-NH2	-5.78	117.41	120.30
1	D	357	TYR	CD1-CE1-CZ	-5.73	114.64	119.80
1	C	203	ARG	CG-CD-NE	5.52	123.40	111.80
1	C	203	ARG	NE-CZ-NH2	5.28	122.94	120.30
1	A	339	ARG	CG-CD-NE	5.18	122.69	111.80
1	C	103	LEU	CA-CB-CG	5.16	127.16	115.30

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	50	GLY	Peptide
1	D	20	LEU	Peptide
1	D	357	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	3260	3224	3226	155	3
1	B	3440	3392	3393	161	0
1	C	3223	3181	3190	205	0
1	D	3425	3374	3374	148	3
2	A	16	8	8	5	0
2	B	16	8	8	7	0
2	C	16	6	7	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	D	16	7	7	4	0
All	All	13412	13200	13213	649	3

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 24.

All (649) 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:309:LYS:NZ	1:C:313:GLU:OE1	1.92	1.03
1:D:361:ARG:NH2	1:D:436:VAL:HG21	1.77	0.99
1:D:200:GLU:OE1	1:D:203:ARG:NH2	2.00	0.95
1:D:104:LEU:O	1:D:108:THR:OG1	1.85	0.94
1:D:21:HIS:N	1:D:26:TYR:OH	2.03	0.91
1:A:176:LEU:O	1:A:178:ILE:N	2.06	0.88
1:A:347:ILE:HD12	1:A:348:GLU:N	1.91	0.85
1:B:128:ILE:O	1:B:132:VAL:HG12	1.78	0.84
1:B:293:SER:OG	1:B:337:ASN:OD1	1.95	0.83
1:B:49:ASP:O	1:B:51:ASN:N	2.13	0.82
1:C:60:LEU:O	1:C:60:LEU:HD23	1.79	0.82
1:D:357:TYR:CE1	1:D:433:ARG:HD3	2.17	0.80
1:D:283:ASP:O	1:D:284:LEU:HD23	1.82	0.79
1:C:128:ILE:HG23	1:C:284:LEU:CD1	2.12	0.78
1:A:245:GLU:OE1	1:A:248:ARG:NH1	2.18	0.77
1:D:65:ILE:O	1:D:430:VAL:HG21	1.85	0.77
1:B:353:GLU:OE2	1:B:433:ARG:NH2	2.19	0.76
1:A:213:ILE:HD13	1:A:221:VAL:HG21	1.67	0.76
1:A:165:SER:O	1:A:171:HIS:NE2	2.19	0.76
1:D:56:GLY:O	1:D:426:SER:N	2.19	0.75
1:A:346:ILE:HD12	1:A:430:VAL:HG12	1.68	0.75
1:D:104:LEU:HD23	1:D:115:VAL:HG21	1.68	0.75
1:B:214:ASP:OD1	1:B:253:ARG:NH1	2.19	0.75
1:B:109:PRO:HB2	1:B:112:MET:HB2	1.69	0.74
1:C:188:TYR:OH	1:C:384:GLU:OE2	2.06	0.74
1:D:45:LEU:HD11	1:D:55:ASP:HB2	1.69	0.74
1:D:361:ARG:HH22	1:D:436:VAL:HG21	1.53	0.73
1:D:296:MET:HE1	1:D:329:VAL:HG12	1.69	0.73
1:A:308:ALA:O	1:A:312:ILE:HD12	1.89	0.73
1:B:209:LEU:HD23	1:B:249:ILE:HG21	1.71	0.73
1:D:361:ARG:NH2	1:D:436:VAL:CG2	2.52	0.72
1:B:163:SER:OG	1:B:176:LEU:O	2.05	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:128:ILE:HG23	1:C:284:LEU:HD12	1.72	0.71
1:D:142:PRO:O	1:D:145:LYS:HE3	1.89	0.71
1:A:188:TYR:OH	1:A:384:GLU:OE2	2.08	0.71
1:D:263:ILE:HD12	2:D:501:PLP:O3	1.91	0.70
1:D:361:ARG:HH21	1:D:436:VAL:HG21	1.54	0.70
1:D:446:THR:O	1:D:450:THR:HG23	1.90	0.70
1:C:313:GLU:HG2	1:C:314:GLU:CG	2.22	0.69
1:C:385:LEU:HD13	1:C:401:VAL:HG12	1.73	0.69
1:D:245:GLU:O	1:D:249:ILE:HD12	1.92	0.69
1:B:296:MET:HG3	1:B:333:VAL:HG21	1.74	0.69
1:C:308:ALA:O	1:C:312:ILE:HD12	1.92	0.69
1:C:105:SER:HA	1:C:109:PRO:HG3	1.74	0.68
1:B:108:THR:OG1	1:B:109:PRO:HD3	1.93	0.68
1:B:373:GLU:OE1	1:B:375:ARG:NH1	2.26	0.68
1:B:70:LYS:HD2	1:B:70:LYS:H	1.58	0.68
1:C:283:ASP:O	1:C:284:LEU:HD23	1.94	0.68
1:A:339:ARG:HD3	1:A:342:ARG:HH12	1.59	0.68
1:A:211:ARG:O	1:A:213:ILE:N	2.27	0.68
1:D:188:TYR:OH	1:D:384:GLU:OE2	2.12	0.67
1:D:242:TYR:CE1	1:D:246:ILE:HD12	2.29	0.67
1:D:357:TYR:CE2	1:D:361:ARG:NH2	2.59	0.67
1:B:8:THR:HG23	1:B:9:ALA:H	1.60	0.67
1:A:47:ASP:OD1	1:A:51:ASN:HB2	1.94	0.67
1:A:78:ARG:HA	1:A:81:GLN:HG3	1.77	0.67
1:D:361:ARG:HH21	1:D:436:VAL:CG2	2.09	0.66
1:C:400:LYS:HA	1:C:403:SER:HB3	1.76	0.66
1:B:107:VAL:HG12	1:B:107:VAL:O	1.94	0.66
1:D:296:MET:CE	1:D:329:VAL:HG12	2.25	0.66
1:D:357:TYR:CE1	1:D:361:ARG:NH1	2.64	0.66
1:D:84:PRO:O	1:D:85:TYR:O	2.14	0.66
1:B:124:SER:O	1:B:128:ILE:HD12	1.94	0.65
1:C:150:ARG:CZ	1:C:226:ALA:HB1	2.27	0.65
1:B:45:LEU:HD13	1:B:55:ASP:HB2	1.78	0.65
1:A:416:MET:HG3	1:A:425:ILE:HG22	1.79	0.65
1:D:69:ARG:NH1	1:D:71:GLU:OE1	2.30	0.64
1:B:122:SER:OG	2:B:501:PLP:O1P	2.07	0.64
1:B:230:GLN:HB2	1:B:236:ILE:HB	1.79	0.64
1:A:128:ILE:HG23	1:A:284:LEU:HD12	1.80	0.64
1:A:160:ALA:O	1:A:164:LEU:HD12	1.97	0.64
1:C:128:ILE:HD11	1:C:301:VAL:HG12	1.79	0.64
1:D:186:GLN:O	1:D:192:ARG:NH1	2.31	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:104:LEU:O	1:B:109:PRO:HG3	1.96	0.63
1:C:128:ILE:HG23	1:C:284:LEU:HD13	1.79	0.63
1:D:408:LEU:HD12	1:D:450:THR:HG22	1.80	0.63
1:C:37:ILE:HD13	1:C:45:LEU:HB3	1.80	0.63
1:D:260:ASP:OD1	2:D:501:PLP:H2A2	1.98	0.63
1:D:178:ILE:HB	1:D:179:PRO:HD2	1.81	0.63
1:B:188:TYR:CG	1:B:236:ILE:HD12	2.34	0.62
1:C:71:GLU:O	1:C:75:VAL:HG23	1.99	0.62
1:C:60:LEU:HD21	1:C:289:LYS:HE2	1.81	0.62
2:B:501:PLP:O4P	2:B:501:PLP:C4A	2.48	0.62
1:D:213:ILE:HG12	1:D:221:VAL:HG21	1.82	0.62
1:B:11:TRP:HB3	1:B:36:ILE:CD1	2.30	0.62
1:B:35:ARG:NH2	1:C:92:CYS:SG	2.73	0.62
1:B:134:TYR:O	1:B:138:LEU:HD12	1.99	0.62
1:C:313:GLU:HG2	1:C:314:GLU:HG3	1.80	0.62
1:D:357:TYR:CZ	1:D:361:ARG:NH1	2.68	0.62
1:A:62:CYS:O	1:A:64:ASN:N	2.33	0.61
1:A:329:VAL:O	1:A:333:VAL:HG23	2.00	0.61
1:C:107:VAL:HG12	1:C:107:VAL:O	2.00	0.61
1:D:296:MET:HE3	1:D:330:ALA:HB2	1.82	0.61
1:A:100:LEU:HD22	1:A:331:ALA:HA	1.82	0.61
1:A:115:VAL:HG12	1:A:302:MET:SD	2.41	0.61
1:B:427:PRO:HB2	1:B:431:LEU:HD22	1.83	0.61
1:A:283:ASP:O	1:A:284:LEU:HD23	2.00	0.61
1:A:357:TYR:CD2	1:A:436:VAL:HG11	2.36	0.61
1:C:178:ILE:HD12	1:C:179:PRO:O	2.01	0.61
1:D:39:ARG:HG3	1:D:46:TRP:HB2	1.83	0.60
1:C:57:MET:HG2	1:C:417:ARG:HG2	1.83	0.60
1:A:404:LEU:HD23	1:A:405:CYS:HA	1.84	0.60
1:A:361:ARG:HB3	1:A:440:ILE:HG13	1.83	0.60
1:D:65:ILE:O	1:D:65:ILE:HG22	2.01	0.60
1:C:135:TYR:CD2	1:C:256:LEU:HD11	2.37	0.60
1:B:146:VAL:HB	1:B:221:VAL:HA	1.82	0.60
1:D:417:ARG:HB3	1:D:424:ILE:CG1	2.31	0.59
1:B:362:TRP:CZ2	1:B:383:LEU:HG	2.37	0.59
1:D:358:LEU:HD23	1:D:358:LEU:O	2.02	0.59
1:C:124:SER:O	1:C:128:ILE:HD12	2.01	0.59
1:B:289:LYS:NZ	2:B:501:PLP:H4A	2.18	0.59
1:C:357:TYR:CD2	1:C:436:VAL:HG11	2.38	0.59
1:C:358:LEU:HD21	1:C:425:ILE:HD11	1.82	0.59
1:B:15:ASP:HB2	1:C:98:ILE:HD13	1.83	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:235:VAL:HG12	1:A:235:VAL:O	2.02	0.59
1:C:245:GLU:O	1:C:248:ARG:N	2.36	0.59
1:C:44:TYR:O	1:C:45:LEU:HD23	2.02	0.58
1:D:128:ILE:O	1:D:132:VAL:HG12	2.03	0.58
1:C:444:ARG:HA	1:C:447:LEU:HD13	1.86	0.58
1:B:56:GLY:O	1:B:426:SER:N	2.36	0.58
1:D:150:ARG:CZ	1:D:226:ALA:HB1	2.33	0.58
1:C:104:LEU:O	1:C:108:THR:OG1	2.21	0.58
1:C:443:ALA:O	1:C:447:LEU:HD12	2.03	0.58
1:D:242:TYR:CE1	1:D:246:ILE:CD1	2.87	0.58
1:B:336:GLU:OE1	1:B:339:ARG:NH1	2.35	0.58
1:C:99:GLU:O	1:C:103:LEU:HD12	2.04	0.58
1:B:308:ALA:HA	1:B:312:ILE:HD12	1.84	0.58
1:C:245:GLU:HG3	1:C:249:ILE:HD11	1.85	0.58
1:B:261:GLU:OE1	1:B:264:THR:OG1	2.20	0.58
1:C:383:LEU:O	1:C:422:THR:HG23	2.02	0.58
1:D:128:ILE:HG23	1:D:284:LEU:HD12	1.85	0.57
1:D:11:TRP:HB3	1:D:36:ILE:HD13	1.86	0.57
1:C:99:GLU:O	1:C:103:LEU:CD1	2.52	0.57
1:D:290:GLY:HA2	1:D:293:SER:HA	1.85	0.57
1:A:357:TYR:HD2	1:A:436:VAL:HG11	1.69	0.57
1:B:271:THR:OG1	1:B:273:PHE:O	2.22	0.57
1:C:128:ILE:HD11	1:C:301:VAL:CG1	2.34	0.57
1:B:361:ARG:NH1	1:B:437:ASP:OD1	2.38	0.57
1:B:382:ALA:HA	1:B:423:MET:O	2.04	0.57
1:C:45:LEU:HD21	1:C:67:TYR:CE2	2.40	0.57
1:B:275:SER:O	1:B:279:ASP:N	2.38	0.57
1:C:313:GLU:HG2	1:C:314:GLU:HG2	1.85	0.57
1:A:359:GLN:OE1	1:A:363:ARG:NH1	2.38	0.56
1:B:231:GLY:O	1:B:232:ALA:HB3	2.04	0.56
1:A:304:SER:OG	1:A:307:VAL:HG12	2.05	0.56
1:A:259:VAL:HG23	1:A:282:PRO:HB3	1.86	0.56
1:C:70:LYS:O	1:C:74:GLU:HG3	2.05	0.56
1:C:57:MET:SD	1:C:417:ARG:HG3	2.46	0.56
1:D:131:MET:HA	1:D:134:TYR:HB3	1.88	0.56
1:A:261:GLU:OE1	1:A:264:THR:OG1	2.23	0.56
1:C:296:MET:HE2	1:C:330:ALA:HA	1.86	0.56
1:D:417:ARG:HB3	1:D:424:ILE:HG12	1.86	0.56
1:C:176:LEU:O	1:C:178:ILE:N	2.38	0.56
1:D:370:LEU:HD21	1:D:451:HIS:CE1	2.41	0.56
1:D:414:LEU:HD11	1:D:439:LEU:HD12	1.88	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:325:SER:OG	1:A:326:GLY:N	2.36	0.56
1:B:100:LEU:HG	1:B:104:LEU:HD12	1.87	0.56
1:A:346:ILE:HD12	1:A:430:VAL:CG1	2.36	0.55
1:D:128:ILE:HG23	1:D:284:LEU:CD1	2.37	0.55
1:D:357:TYR:CD2	1:D:361:ARG:NH2	2.74	0.55
1:A:144:LYS:NZ	1:A:221:VAL:O	2.38	0.55
1:C:409:SER:HG	1:C:414:LEU:C	2.09	0.55
1:A:107:VAL:HG11	1:A:272:TRP:CE3	2.41	0.55
1:C:60:LEU:HD21	1:C:289:LYS:CE	2.36	0.55
1:B:289:LYS:HE3	1:C:323:THR:HG21	1.88	0.55
1:C:154:TYR:O	2:C:501:PLP:H2A3	2.07	0.55
1:D:225:ILE:HG22	1:D:258:ILE:HB	1.89	0.55
1:B:115:VAL:HG22	1:B:302:MET:CE	2.36	0.55
1:C:62:CYS:O	1:C:64:ASN:N	2.40	0.55
1:C:109:PRO:HG2	1:C:110:LYS:H	1.72	0.55
1:C:261:GLU:HG3	1:C:285:MET:SD	2.47	0.55
1:C:446:THR:O	1:C:450:THR:HG23	2.07	0.55
1:D:203:ARG:HG3	1:D:203:ARG:HH11	1.71	0.55
1:A:94:HIS:O	1:A:98:ILE:HD12	2.07	0.55
1:A:354:ILE:HD13	1:A:431:LEU:O	2.06	0.55
1:B:176:LEU:HD21	1:C:130:ARG:NE	2.21	0.55
1:D:62:CYS:O	1:D:64:ASN:N	2.39	0.55
1:B:355:ALA:HB3	1:B:356:PRO:HD3	1.89	0.54
1:C:37:ILE:CD1	1:C:45:LEU:HD13	2.37	0.54
1:C:259:VAL:HG12	1:C:261:GLU:HG2	1.88	0.54
1:A:154:TYR:O	2:A:501:PLP:H2A3	2.07	0.54
1:A:289:LYS:HE2	2:A:501:PLP:O4A	2.08	0.54
1:C:63:VAL:HG23	1:C:63:VAL:O	2.07	0.54
1:D:65:ILE:HD12	1:D:72:LEU:HD11	1.90	0.54
1:A:77:TYR:O	1:A:81:GLN:HG2	2.08	0.54
1:C:249:ILE:HD12	1:C:249:ILE:H	1.73	0.54
1:C:443:ALA:O	1:C:446:THR:N	2.41	0.54
1:D:350:ALA:O	1:D:355:ALA:HB2	2.06	0.54
1:A:409:SER:OG	1:A:414:LEU:O	2.19	0.54
1:C:115:VAL:HG22	1:C:302:MET:SD	2.47	0.54
1:D:271:THR:OG1	1:D:273:PHE:O	2.26	0.54
1:C:134:TYR:CE1	1:C:138:LEU:HD11	2.44	0.53
1:B:146:VAL:O	1:B:222:ALA:N	2.38	0.53
1:D:261:GLU:OE2	1:D:275:SER:N	2.40	0.53
1:A:37:ILE:HA	1:A:47:ASP:HA	1.90	0.53
1:C:296:MET:HE2	1:C:330:ALA:CA	2.38	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:361:ARG:HD3	1:B:433:ARG:HD3	1.91	0.53
1:B:128:ILE:HG23	1:B:284:LEU:HD22	1.90	0.53
1:C:225:ILE:HG22	1:C:258:ILE:HB	1.89	0.53
1:B:26:TYR:HD2	1:C:312:ILE:HG13	1.73	0.53
1:C:443:ALA:O	1:C:446:THR:OG1	2.23	0.53
1:D:289:LYS:HZ1	2:D:501:PLP:C4A	2.22	0.53
1:A:289:LYS:HE2	2:A:501:PLP:C4A	2.39	0.53
1:A:362:TRP:CZ2	1:A:383:LEU:HG	2.44	0.53
1:B:107:VAL:O	1:B:108:THR:HG23	2.08	0.53
1:B:404:LEU:CD1	1:B:450:THR:HG22	2.39	0.53
1:D:135:TYR:CD1	1:D:256:LEU:HD11	2.44	0.53
1:D:260:ASP:CG	2:D:501:PLP:H2A2	2.30	0.53
1:C:409:SER:OG	1:C:414:LEU:O	2.25	0.52
1:D:247:LYS:NZ	1:D:279:ASP:O	2.36	0.52
1:D:65:ILE:CG2	1:D:69:ARG:HD3	2.39	0.52
1:A:230:GLN:HB2	1:A:236:ILE:HB	1.91	0.52
1:C:53:ILE:CG2	1:C:415:VAL:HG23	2.39	0.52
1:D:126:ASP:OD1	1:D:160:ALA:HB3	2.10	0.52
1:D:357:TYR:CD1	1:D:361:ARG:NH1	2.71	0.52
1:D:45:LEU:CD1	1:D:55:ASP:HB2	2.37	0.52
1:D:189:HIS:CD2	1:D:198:PRO:HA	2.44	0.52
1:A:71:GLU:O	1:A:75:VAL:HG13	2.09	0.52
1:A:271:THR:OG1	1:A:273:PHE:O	2.27	0.52
1:B:108:THR:HB	1:B:273:PHE:HE2	1.75	0.52
1:B:223:ALA:HB2	1:B:256:LEU:HB2	1.92	0.52
1:D:442:LYS:O	1:D:446:THR:OG1	2.24	0.52
1:A:55:ASP:OD2	1:A:59:GLY:N	2.40	0.52
1:A:414:LEU:HD21	1:A:439:LEU:HD12	1.91	0.52
1:B:141:LYS:HD2	1:B:144:LYS:HD2	1.90	0.52
1:C:368:HIS:CG	1:C:369:PRO:HD2	2.44	0.52
1:D:354:ILE:HD13	1:D:431:LEU:O	2.10	0.52
1:B:213:ILE:HD13	1:B:221:VAL:HG21	1.91	0.52
1:C:118:THR:OG1	1:C:123:ASP:HB3	2.09	0.52
1:C:430:VAL:CG1	1:C:430:VAL:O	2.58	0.52
1:A:390:GLN:HB3	1:A:391:PRO:HD3	1.91	0.52
1:B:438:GLU:HG2	1:B:442:LYS:HE2	1.92	0.51
1:C:210:GLU:HA	1:C:213:ILE:HD12	1.93	0.51
1:A:242:TYR:CZ	1:A:246:ILE:HD11	2.45	0.51
1:C:242:TYR:CZ	1:C:246:ILE:HD11	2.45	0.51
1:A:112:MET:HE3	1:A:302:MET:HB2	1.91	0.51
1:D:190:PHE:O	1:D:394:ARG:NH2	2.42	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:141:LYS:HD3	1:C:144:LYS:HD2	1.92	0.51
1:A:414:LEU:HD21	1:A:439:LEU:CD1	2.40	0.51
1:C:132:VAL:HG23	1:C:256:LEU:HD12	1.93	0.51
1:C:342:ARG:HG3	1:C:343:ASP:N	2.26	0.51
1:D:110:LYS:O	1:D:112:MET:N	2.43	0.51
1:A:284:LEU:HD21	1:A:307:VAL:HG11	1.92	0.51
1:A:355:ALA:HB3	1:A:356:PRO:HD3	1.93	0.51
1:B:177:PRO:O	1:B:178:ILE:O	2.29	0.51
1:B:362:TRP:CZ3	1:B:425:ILE:HD13	2.46	0.51
1:D:21:His:O	1:D:26:TYR:HE1	1.94	0.51
1:D:268:ARG:NH1	1:D:427:PRO:O	2.41	0.51
1:B:237:ILE:HD13	1:B:377:VAL:HG23	1.93	0.51
1:B:427:PRO:CB	1:B:431:LEU:HD22	2.41	0.51
1:D:100:LEU:O	1:D:104:LEU:HB2	2.11	0.51
1:A:65:ILE:CD1	1:A:341:MET:HG3	2.42	0.50
1:B:155:His:H	1:B:165:SER:HB3	1.76	0.50
1:B:260:ASP:HA	1:B:286:PRO:HD2	1.93	0.50
1:C:72:LEU:HD23	1:C:295:TYR:HD2	1.76	0.50
1:A:102:ARG:NE	1:A:106:GLU:OE2	2.42	0.50
1:A:118:THR:HG22	1:A:300:GLY:HA2	1.93	0.50
1:A:88:ASN:O	1:A:89:PHE:HB2	2.11	0.50
1:B:272:TRP:CD1	1:B:347:ILE:HD11	2.47	0.50
1:A:135:TYR:CE1	1:A:310:VAL:HG21	2.47	0.50
1:A:215:GLU:OE1	1:A:215:GLU:N	2.45	0.50
1:A:452:LYS:HE2	1:A:452:LYS:HA	1.93	0.50
1:D:404:LEU:CD2	1:D:408:LEU:HD11	2.40	0.50
1:A:235:VAL:HB	1:A:382:ALA:HB2	1.93	0.50
1:B:296:MET:HE3	1:B:297:PRO:HD2	1.93	0.50
1:D:176:LEU:O	1:D:178:ILE:N	2.44	0.50
1:D:357:TYR:CD1	1:D:433:ARG:HD3	2.46	0.50
1:A:230:GLN:O	1:A:234:GLY:O	2.30	0.50
1:A:433:ARG:HB3	1:A:433:ARG:CZ	2.41	0.50
1:C:55:ASP:OD2	1:C:67:TYR:OH	2.25	0.50
1:D:287:ILE:O	1:D:288:ALA:HB2	2.12	0.50
1:D:214:ASP:OD1	1:D:253:ARG:NH2	2.45	0.49
1:A:123:ASP:OD2	1:A:322:TYR:OH	2.30	0.49
1:C:188:TYR:CD1	1:C:236:ILE:HG23	2.47	0.49
1:D:366:GLY:HA2	1:D:371:VAL:HG11	1.95	0.49
1:D:382:ALA:HB2	1:D:424:ILE:HG22	1.93	0.49
1:A:76:ALA:HB2	1:A:333:VAL:HG22	1.93	0.49
1:B:123:ASP:OD1	1:C:123:ASP:OD1	2.31	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:131:MET:HA	1:B:134:TYR:HB3	1.93	0.49
1:A:347:ILE:HG22	1:A:429:LEU:HD13	1.95	0.49
1:A:100:LEU:HD13	1:A:335:ALA:N	2.27	0.49
1:B:224:PHE:CE2	1:B:246:ILE:HD13	2.47	0.49
1:B:432:SER:OG	1:B:435:GLN:HG3	2.13	0.49
1:B:178:ILE:HB	1:B:179:PRO:HD2	1.93	0.49
1:C:357:TYR:CD2	1:C:433:ARG:HG2	2.47	0.49
1:B:131:MET:SD	1:B:284:LEU:HD21	2.52	0.49
1:D:146:VAL:HG23	1:D:220:ASN:O	2.13	0.49
1:A:109:PRO:O	1:A:110:LYS:C	2.51	0.49
1:A:425:ILE:CD1	1:A:439:LEU:HD21	2.43	0.49
1:A:446:THR:O	1:A:450:THR:OG1	2.30	0.49
1:B:285:MET:HB2	1:B:302:MET:HB2	1.94	0.49
1:B:392:LEU:HD11	1:B:394:ARG:HH12	1.78	0.49
1:D:231:GLY:O	1:D:232:ALA:HB3	2.12	0.49
1:A:72:LEU:HD12	1:A:295:TYR:CD1	2.48	0.49
1:A:108:THR:HB	1:A:110:LYS:HE3	1.94	0.48
1:C:144:LYS:NZ	1:C:221:VAL:O	2.45	0.48
1:D:24:THR:HG22	1:D:26:TYR:H	1.78	0.48
1:B:85:TYR:CE1	1:C:59:GLY:HA3	2.49	0.48
1:B:289:LYS:NZ	2:B:501:PLP:C4A	2.76	0.48
1:C:355:ALA:HB3	1:C:356:PRO:HD3	1.96	0.48
1:A:38:THR:OG1	1:A:39:ARG:N	2.46	0.48
1:D:231:GLY:O	1:D:232:ALA:CB	2.61	0.48
1:A:111:HIS:O	1:A:305:ASP:N	2.45	0.48
1:B:62:CYS:HB3	1:B:289:LYS:HB3	1.95	0.48
1:A:129:LEU:O	1:A:132:VAL:HG12	2.13	0.48
1:C:246:ILE:HA	1:C:249:ILE:HD13	1.94	0.48
1:A:404:LEU:HD23	1:A:405:CYS:N	2.28	0.48
1:B:237:ILE:HG13	1:B:375:ARG:HD2	1.95	0.48
1:C:417:ARG:HB2	1:C:424:ILE:HD11	1.95	0.48
1:D:11:TRP:HB3	1:D:36:ILE:CD1	2.43	0.48
1:A:228:PRO:HD2	1:A:264:THR:HG21	1.96	0.48
1:C:112:MET:SD	1:C:302:MET:HB2	2.53	0.48
1:C:115:VAL:HG22	1:C:302:MET:CE	2.44	0.48
1:A:80:MET:HG3	1:A:329:VAL:HG21	1.94	0.48
1:A:382:ALA:HB2	1:A:424:ILE:HG22	1.95	0.48
1:B:231:GLY:O	1:B:232:ALA:CB	2.61	0.48
1:C:261:GLU:OE1	1:C:264:THR:OG1	2.32	0.48
1:A:173:HIS:HB2	1:A:176:LEU:HD21	1.94	0.48
1:A:204:GLN:O	1:A:207:GLN:N	2.46	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:149:SER:OG	1:B:150:ARG:N	2.47	0.48
1:B:289:LYS:HZ1	2:B:501:PLP:C4A	2.26	0.48
1:C:64:ASN:HB2	1:C:341:MET:HE1	1.95	0.48
1:C:108:THR:H	1:C:109:PRO:CD	2.27	0.48
1:C:260:ASP:OD1	1:C:262:VAL:HG23	2.14	0.48
1:C:350:ALA:O	1:C:355:ALA:CB	2.62	0.48
1:B:433:ARG:O	1:B:436:VAL:HG22	2.14	0.47
1:C:176:LEU:O	1:C:177:PRO:C	2.52	0.47
1:A:108:THR:O	1:A:112:MET:O	2.31	0.47
1:A:243:TRP:N	1:A:244:PRO:HD2	2.29	0.47
1:A:347:ILE:HG22	1:A:429:LEU:CD1	2.45	0.47
1:C:58:ALA:C	1:C:63:VAL:HG22	2.34	0.47
1:A:245:GLU:O	1:A:249:ILE:HG13	2.14	0.47
1:A:404:LEU:HD23	1:A:405:CYS:CA	2.45	0.47
1:B:188:TYR:CD1	1:B:236:ILE:HD12	2.48	0.47
1:B:246:ILE:HA	1:B:249:ILE:HD12	1.96	0.47
1:B:45:LEU:HD13	1:B:55:ASP:CB	2.44	0.47
1:D:128:ILE:HG21	1:D:258:ILE:HG21	1.97	0.47
1:D:203:ARG:HG3	1:D:241:SER:OG	2.13	0.47
1:D:370:LEU:HD11	1:D:451:HIS:HA	1.94	0.47
1:B:62:CYS:O	1:B:64:ASN:N	2.48	0.47
1:C:128:ILE:HD12	1:C:128:ILE:H	1.79	0.47
1:D:8:THR:OG1	1:D:48:SER:HB2	2.14	0.47
1:B:34:SER:OG	1:C:91:GLN:O	2.12	0.47
1:B:347:ILE:HG22	1:B:429:LEU:HD12	1.97	0.47
1:C:109:PRO:O	1:C:110:LYS:HG2	2.15	0.47
1:C:132:VAL:CG2	1:C:256:LEU:HD12	2.45	0.47
1:C:404:LEU:C	1:C:404:LEU:HD23	2.34	0.47
1:D:55:ASP:OD2	1:D:59:GLY:N	2.44	0.47
1:B:96:PRO:HG2	1:B:328:PRO:O	2.15	0.47
1:C:150:ARG:HA	1:C:184:ILE:H	1.80	0.47
1:C:65:ILE:O	1:C:430:VAL:HG21	2.15	0.47
1:C:245:GLU:O	1:C:249:ILE:HD12	2.14	0.47
1:D:361:ARG:HA	1:D:364:GLU:HG3	1.96	0.47
1:A:91:GLN:HB2	1:A:92:CYS:SG	2.55	0.46
1:C:98:ILE:O	1:C:101:SER:OG	2.27	0.46
1:C:153:ALA:O	1:C:165:SER:HB3	2.14	0.46
1:C:229:ILE:HD13	1:C:238:PRO:HD3	1.95	0.46
1:D:71:GLU:O	1:D:75:VAL:HG13	2.15	0.46
1:B:289:LYS:HZ2	2:B:501:PLP:H4A	1.81	0.46
1:C:272:TRP:CD1	1:C:347:ILE:CD1	2.99	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:91:GLN:HG3	1:C:36:ILE:HD13	1.97	0.46
1:C:94:HIS:CE1	1:C:326:GLY:O	2.68	0.46
1:C:116:PHE:CE2	1:C:117:PHE:O	2.68	0.46
1:C:324:TYR:HB2	1:C:327:HIS:HD2	1.81	0.46
1:D:19:HIS:CE1	1:D:20:LEU:O	2.68	0.46
1:D:295:TYR:O	1:D:296:MET:HG2	2.15	0.46
1:A:176:LEU:O	1:A:178:ILE:HG23	2.15	0.46
1:B:294:GLY:O	1:C:85:TYR:HB2	2.15	0.46
1:C:260:ASP:OD1	2:C:501:PLP:H2A2	2.16	0.46
1:D:112:MET:CE	1:D:282:PRO:HD2	2.45	0.46
1:D:207:GLN:NE2	1:D:245:GLU:OE1	2.49	0.46
1:A:134:TYR:CZ	1:A:138:LEU:HD21	2.50	0.46
1:A:404:LEU:O	1:A:407:ASP:N	2.49	0.46
1:B:43:CYS:O	1:B:54:LEU:HD12	2.16	0.46
1:B:176:LEU:N	1:B:177:PRO:HD3	2.30	0.46
1:B:224:PHE:HE2	1:B:246:ILE:HD13	1.80	0.46
1:D:225:ILE:CG2	1:D:258:ILE:HD12	2.45	0.46
1:B:26:TYR:HD2	1:C:312:ILE:CG1	2.29	0.46
1:B:357:TYR:CD1	1:B:436:VAL:HG21	2.50	0.46
1:C:185:GLU:OE2	1:C:192:ARG:NH2	2.49	0.46
1:A:214:ASP:OD1	1:A:214:ASP:N	2.48	0.46
1:B:104:LEU:O	1:B:109:PRO:CG	2.63	0.46
1:B:242:TYR:CE1	1:B:246:ILE:HD12	2.50	0.46
1:B:388:SER:OG	1:B:390:GLN:OE1	2.34	0.46
1:C:235:VAL:HB	1:C:382:ALA:HB2	1.97	0.46
1:C:403:SER:O	1:C:406:ARG:NH1	2.49	0.46
1:A:77:TYR:O	1:A:81:GLN:NE2	2.49	0.46
1:A:188:TYR:CD1	1:A:236:ILE:CD1	2.99	0.46
1:D:112:MET:HE1	1:D:282:PRO:HG2	1.97	0.46
1:D:387:LYS:HB3	1:D:393:GLU:HB2	1.98	0.46
1:A:307:VAL:O	1:A:311:VAL:HG23	2.16	0.46
1:C:125:ASN:HA	1:C:128:ILE:HD13	1.98	0.46
1:C:143:TYR:HD1	1:C:219:CYS:O	1.99	0.46
1:C:426:SER:O	1:C:426:SER:OG	2.25	0.46
1:D:110:LYS:O	1:D:113:ASN:OD1	2.34	0.46
1:B:289:LYS:HE3	1:C:323:THR:CG2	2.46	0.45
1:B:404:LEU:HD12	1:B:450:THR:HG22	1.98	0.45
1:C:47:ASP:OD2	1:C:48:SER:N	2.49	0.45
1:C:152:ASN:HD22	1:C:236:ILE:HD12	1.81	0.45
1:A:184:ILE:HG13	1:A:185:GLU:N	2.32	0.45
1:B:283:ASP:HA	1:B:304:SER:HB3	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:344:GLU:HB2	1:B:346:ILE:HG13	1.97	0.45
1:C:108:THR:HB	1:C:273:PHE:HE2	1.81	0.45
1:D:355:ALA:HB3	1:D:356:PRO:HD3	1.98	0.45
1:A:45:LEU:HD11	1:A:67:TYR:CE1	2.51	0.45
1:A:115:VAL:HG23	1:A:115:VAL:O	2.16	0.45
1:B:11:TRP:HB3	1:B:36:ILE:HD13	1.98	0.45
1:B:445:ARG:O	1:B:449:GLU:HG3	2.16	0.45
1:C:354:ILE:CD1	1:C:431:LEU:O	2.64	0.45
1:D:408:LEU:HA	1:D:411:LYS:HG2	1.99	0.45
1:B:64:ASN:ND2	1:B:266:PHE:O	2.46	0.45
1:B:16:ALA:HB1	1:B:30:ASN:CB	2.46	0.45
1:B:170:MET:O	1:B:176:LEU:HD22	2.16	0.45
1:B:235:VAL:HB	1:B:382:ALA:HB2	1.97	0.45
1:B:297:PRO:HA	1:C:324:TYR:CZ	2.52	0.45
1:A:87:ASN:N	1:A:87:ASN:HD22	2.14	0.45
1:A:102:ARG:NH2	1:A:106:GLU:OE1	2.50	0.45
1:B:60:LEU:HD21	1:C:89:PHE:CZ	2.52	0.45
1:C:272:TRP:CD1	1:C:347:ILE:HD11	2.51	0.45
1:A:188:TYR:CG	1:A:236:ILE:HD12	2.51	0.45
1:A:313:GLU:HG2	1:A:314:GLU:H	1.82	0.45
1:B:303:VAL:HG13	1:B:307:VAL:CG2	2.46	0.45
1:C:122:SER:HB3	1:C:157:SER:H	1.82	0.45
1:A:119:GLY:H	1:A:322:TYR:HE1	1.65	0.45
1:A:141:LYS:HE2	1:A:143:TYR:CE2	2.52	0.45
1:B:431:LEU:HD23	1:B:436:VAL:HG12	1.98	0.45
1:C:349:ARG:O	1:C:353:GLU:HB2	2.16	0.45
1:B:396:GLU:OE1	1:B:397:GLU:OE1	2.35	0.45
1:C:61:TRP:HA	1:C:426:SER:OG	2.17	0.45
1:A:410:VAL:HG23	1:A:411:LYS:N	2.32	0.44
1:B:261:GLU:HG3	1:B:285:MET:SD	2.57	0.44
1:C:146:VAL:HG23	1:C:220:ASN:O	2.17	0.44
1:C:152:ASN:C	1:C:167:MET:HE2	2.37	0.44
1:C:207:GLN:CG	1:C:207:GLN:O	2.65	0.44
1:C:301:VAL:HG23	1:C:301:VAL:O	2.16	0.44
1:D:225:ILE:HG22	1:D:258:ILE:HD12	1.99	0.44
1:A:69:ARG:NH1	1:A:344:GLU:OE1	2.50	0.44
1:A:247:LYS:HD2	1:A:280:LEU:HD23	1.99	0.44
1:B:75:VAL:HG21	1:B:336:GLU:CG	2.47	0.44
1:C:349:ARG:HG3	1:C:353:GLU:HB2	1.98	0.44
1:D:146:VAL:HB	1:D:221:VAL:HA	1.99	0.44
1:D:431:LEU:HD23	1:D:436:VAL:HG12	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:182:GLU:HG3	1:A:216:ILE:HD11	1.99	0.44
1:A:211:ARG:O	1:A:215:GLU:OE1	2.36	0.44
1:A:431:LEU:HG	1:A:435:GLN:HB2	1.99	0.44
1:B:228:PRO:O	1:B:229:ILE:HG13	2.17	0.44
1:C:166:GLY:O	1:C:168:LYS:HD2	2.16	0.44
1:D:233:GLY:O	1:D:236:ILE:HD11	2.17	0.44
1:A:253:ARG:HG3	1:A:253:ARG:HH11	1.82	0.44
1:A:406:ARG:HD2	1:A:407:ASP:N	2.32	0.44
1:C:237:ILE:HD12	1:C:375:ARG:HD2	1.99	0.44
1:C:349:ARG:O	1:C:350:ALA:C	2.55	0.44
1:B:7:SER:HB2	1:B:10:ASP:HB2	2.00	0.44
1:B:60:LEU:O	1:B:289:LYS:HE2	2.17	0.44
1:C:102:ARG:HB3	1:C:102:ARG:NH1	2.33	0.44
1:C:363:ARG:NH2	1:C:376:GLY:N	2.65	0.44
1:C:385:LEU:CD1	1:C:401:VAL:HG12	2.45	0.44
1:C:429:LEU:N	1:C:429:LEU:HD23	2.32	0.44
1:D:404:LEU:HD23	1:D:408:LEU:HG	1.98	0.44
1:A:277:TYR:CE2	1:A:377:VAL:HG11	2.53	0.44
1:A:339:ARG:O	1:A:343:ASP:HB2	2.17	0.44
1:D:110:LYS:HE3	1:D:111:HIS:N	2.33	0.44
1:D:152:ASN:CG	1:D:152:ASN:O	2.56	0.44
1:A:99:GLU:O	1:A:103:LEU:HD12	2.17	0.44
1:A:404:LEU:HD23	1:A:404:LEU:C	2.38	0.44
1:B:13:ARG:HB2	1:B:13:ARG:CZ	2.47	0.44
1:B:165:SER:O	1:B:171:HIS:NE2	2.50	0.44
1:B:350:ALA:HA	1:B:354:ILE:HG12	2.00	0.44
1:C:74:GLU:O	1:C:78:ARG:HG2	2.18	0.44
1:C:412:ASN:O	1:C:442:LYS:HD3	2.17	0.44
1:C:109:PRO:O	1:C:110:LYS:CG	2.66	0.44
1:C:190:PHE:CD1	1:C:190:PHE:C	2.90	0.44
1:C:354:ILE:HD13	1:C:431:LEU:HB3	2.00	0.44
1:D:176:LEU:O	1:D:177:PRO:C	2.56	0.44
1:A:214:ASP:N	1:A:215:GLU:OE1	2.51	0.44
1:B:357:TYR:HE1	1:B:436:VAL:CG2	2.30	0.44
1:C:430:VAL:O	1:C:430:VAL:HG12	2.17	0.44
1:D:60:LEU:HD12	1:D:60:LEU:HA	1.90	0.44
1:A:342:ARG:HH11	1:A:342:ARG:HG2	1.83	0.43
1:B:267:GLY:HA2	1:B:271:THR:O	2.18	0.43
1:C:382:ALA:HB2	1:C:424:ILE:HG22	1.99	0.43
1:D:128:ILE:CG2	1:D:258:ILE:HD13	2.48	0.43
2:A:501:PLP:H4A	2:A:501:PLP:O4P	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:57:MET:SD	1:C:417:ARG:CG	3.06	0.43
1:C:112:MET:SD	1:C:302:MET:CB	3.06	0.43
1:A:260:ASP:HA	1:A:286:PRO:HD2	2.00	0.43
1:B:132:VAL:HG23	1:B:256:LEU:HD12	2.00	0.43
1:C:269:LEU:HD22	1:C:377:VAL:HG12	2.01	0.43
1:B:313:GLU:C	1:B:314:GLU:HG3	2.38	0.43
1:C:209:LEU:O	1:C:213:ILE:HD12	2.18	0.43
1:C:223:ALA:HB2	1:C:256:LEU:HB2	2.00	0.43
1:C:357:TYR:HD2	1:C:433:ARG:HG2	1.83	0.43
1:B:7:SER:O	1:B:9:ALA:N	2.51	0.43
1:B:206:ALA:HB1	1:B:245:GLU:HB3	2.00	0.43
1:C:408:LEU:HD12	1:C:450:THR:HG22	2.00	0.43
1:B:46:TRP:HA	1:B:51:ASN:O	2.18	0.43
1:C:83:LEU:HD11	1:C:86:TYR:HB2	2.01	0.43
1:C:235:VAL:HG12	1:C:237:ILE:CD1	2.49	0.43
1:C:396:GLU:O	1:C:397:GLU:HB2	2.18	0.43
1:D:31:THR:HG23	1:D:32:LYS:N	2.33	0.43
1:D:87:ASN:OD1	1:D:88:ASN:N	2.51	0.43
1:A:261:GLU:OE2	1:A:275:SER:N	2.46	0.43
1:B:75:VAL:HG21	1:B:336:GLU:HG2	2.00	0.43
1:B:79:GLN:HG2	1:B:332:ALA:HB2	2.00	0.43
1:B:206:ALA:CB	1:B:245:GLU:HB3	2.49	0.43
1:B:209:LEU:CD2	1:B:249:ILE:HG21	2.45	0.43
1:D:416:MET:HG3	1:D:425:ILE:CG2	2.49	0.43
1:B:265:GLY:O	1:B:266:PHE:HB2	2.18	0.43
1:C:112:MET:O	1:C:113:ASN:ND2	2.52	0.43
1:A:303:VAL:HG13	1:A:307:VAL:HG13	2.01	0.43
1:B:22:PRO:HB2	1:B:23:PHE:CD2	2.53	0.43
1:C:94:HIS:HE1	1:C:326:GLY:O	2.02	0.43
1:D:200:GLU:OE1	1:D:200:GLU:HA	2.19	0.43
1:B:45:LEU:HD21	1:C:86:TYR:CE1	2.54	0.42
1:C:313:GLU:CG	1:C:314:GLU:HG2	2.49	0.42
1:C:413:GLY:O	1:C:442:LYS:HE3	2.19	0.42
1:A:176:LEU:O	1:A:177:PRO:C	2.54	0.42
1:A:432:SER:OG	1:A:435:GLN:HG3	2.18	0.42
1:B:225:ILE:HA	1:B:258:ILE:O	2.19	0.42
1:C:58:ALA:CA	1:C:63:VAL:HG22	2.48	0.42
1:C:109:PRO:O	1:C:110:LYS:CB	2.67	0.42
1:C:414:LEU:HD11	1:C:439:LEU:CD1	2.49	0.42
1:D:21:HIS:O	1:D:22:PRO:C	2.58	0.42
1:A:108:THR:O	1:A:112:MET:HB2	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:11:TRP:CB	1:B:36:ILE:CD1	2.95	0.42
1:B:85:TYR:CE1	1:C:59:GLY:CA	3.02	0.42
1:C:95:PRO:N	1:C:96:PRO:CD	2.83	0.42
1:D:260:ASP:HA	1:D:286:PRO:HD2	2.02	0.42
1:A:129:LEU:O	1:A:129:LEU:HD12	2.20	0.42
1:B:57:MET:HE2	1:B:425:ILE:HA	2.00	0.42
1:C:303:VAL:HG13	1:C:307:VAL:HG23	2.02	0.42
1:A:361:ARG:HG3	1:A:361:ARG:HH11	1.84	0.42
1:B:62:CYS:SG	1:C:85:TYR:CE2	3.13	0.42
1:B:83:LEU:HD21	1:B:85:TYR:CE2	2.54	0.42
1:C:138:LEU:HD22	1:C:314:GLU:O	2.20	0.42
1:A:47:ASP:OD2	1:A:51:ASN:ND2	2.52	0.42
1:A:150:ARG:NH2	1:A:226:ALA:HB1	2.34	0.42
1:D:25:ASP:O	1:D:26:TYR:HB2	2.20	0.42
1:D:190:PHE:CD1	1:D:373:GLU:HB2	2.55	0.42
1:A:110:LYS:HG3	1:A:112:MET:HG2	2.01	0.42
1:A:210:GLU:OE1	1:A:248:ARG:NH2	2.53	0.42
1:B:87:ASN:OD1	1:B:87:ASN:C	2.58	0.42
1:C:323:THR:O	1:C:324:TYR:C	2.57	0.42
1:C:440:ILE:O	1:C:443:ALA:HB3	2.19	0.42
1:D:99:GLU:O	1:D:102:ARG:N	2.53	0.42
1:D:109:PRO:O	1:D:110:LYS:C	2.57	0.42
1:D:313:GLU:O	1:D:314:GLU:C	2.58	0.42
1:B:357:TYR:CE1	1:B:436:VAL:CG2	3.03	0.42
1:C:336:GLU:O	1:C:340:ILE:HG12	2.20	0.42
1:D:108:THR:O	1:D:109:PRO:C	2.57	0.42
1:A:118:THR:OG1	1:A:123:ASP:HB3	2.20	0.42
1:C:229:ILE:HD12	1:C:237:ILE:HG12	2.02	0.42
1:C:412:ASN:O	1:C:442:LYS:CD	2.68	0.42
1:D:229:ILE:HD13	1:D:237:ILE:HG12	2.00	0.42
1:B:368:HIS:ND1	1:B:369:PRO:HD2	2.35	0.42
1:C:44:TYR:C	1:C:45:LEU:HD23	2.40	0.42
1:C:47:ASP:CG	1:C:48:SER:N	2.73	0.42
1:C:105:SER:CA	1:C:109:PRO:HG3	2.46	0.42
1:C:334:ALA:O	1:C:338:ILE:HG13	2.19	0.42
1:D:369:PRO:HB2	1:D:451:HIS:CD2	2.55	0.42
1:B:16:ALA:HB1	1:B:30:ASN:HB3	2.01	0.41
1:B:95:PRO:HA	1:B:96:PRO:HD3	1.94	0.41
1:C:57:MET:HE2	1:C:417:ARG:HG3	2.02	0.41
1:C:117:PHE:O	1:C:325:SER:OG	2.37	0.41
1:C:370:LEU:CD2	1:C:386:VAL:O	2.68	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:454:ILE:HG13	1:D:455:GLY:H	1.85	0.41
1:A:108:THR:HA	1:A:110:LYS:HE2	2.01	0.41
1:D:253:ARG:HH11	1:D:253:ARG:HG3	1.85	0.41
1:A:269:LEU:HD12	1:A:274:GLY:HA2	2.01	0.41
1:B:65:ILE:HD11	1:B:72:LEU:HD11	2.03	0.41
1:C:107:VAL:O	1:C:107:VAL:CG1	2.67	0.41
1:C:324:TYR:HD1	1:C:324:TYR:O	2.03	0.41
1:D:245:GLU:OE1	1:D:249:ILE:HD11	2.21	0.41
1:D:368:HIS:CG	1:D:369:PRO:HD2	2.55	0.41
1:D:406:ARG:O	1:D:410:VAL:HG13	2.20	0.41
1:A:115:VAL:CG1	1:A:302:MET:SD	3.06	0.41
1:A:164:LEU:HD12	1:A:164:LEU:H	1.85	0.41
1:A:342:ARG:HH11	1:A:342:ARG:CG	2.33	0.41
1:A:347:ILE:HD12	1:A:347:ILE:C	2.40	0.41
1:A:364:GLU:HG3	1:B:353:GLU:O	2.20	0.41
1:C:209:LEU:HG	1:C:249:ILE:HG21	2.03	0.41
1:C:404:LEU:CD2	1:C:408:LEU:HG	2.50	0.41
1:D:228:PRO:HG3	1:D:259:VAL:CG1	2.50	0.41
1:A:37:ILE:CD1	1:A:45:LEU:HD23	2.51	0.41
1:B:80:MET:HE1	1:C:76:ALA:HB3	2.02	0.41
1:B:283:ASP:HA	1:B:304:SER:CB	2.50	0.41
1:B:431:LEU:HD12	1:B:431:LEU:HA	1.90	0.41
1:D:77:TYR:O	1:D:81:GLN:HG2	2.20	0.41
1:D:108:THR:HG22	1:D:109:PRO:HD2	2.02	0.41
1:B:296:MET:CG	1:B:333:VAL:HG21	2.46	0.41
1:C:109:PRO:CG	1:C:110:LYS:H	2.33	0.41
1:C:235:VAL:HG12	1:C:235:VAL:O	2.18	0.41
1:D:373:GLU:OE1	1:D:375:ARG:HD3	2.21	0.41
1:A:243:TRP:N	1:A:244:PRO:CD	2.84	0.41
1:B:21:HIS:HB3	1:C:88:ASN:O	2.20	0.41
1:B:111:HIS:HE1	1:B:281:GLN:HA	1.86	0.41
1:C:37:ILE:HD12	1:C:45:LEU:HD13	2.02	0.41
1:C:313:GLU:O	1:C:314:GLU:HG3	2.20	0.41
1:D:150:ARG:NH2	1:D:230:GLN:HG3	2.35	0.41
1:D:188:TYR:CD1	1:D:236:ILE:HG23	2.56	0.41
1:D:261:GLU:O	1:D:265:GLY:HA3	2.20	0.41
1:D:357:TYR:CZ	1:D:361:ARG:CZ	3.03	0.41
1:A:129:LEU:HD11	1:A:133:ARG:NH2	2.35	0.41
1:A:358:LEU:HD21	1:A:425:ILE:HD11	2.02	0.41
1:B:272:TRP:HZ2	1:B:342:ARG:HB3	1.86	0.41
1:C:206:ALA:HB2	1:C:242:TYR:CD1	2.55	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:229:ILE:CG2	1:C:237:ILE:HG13	2.50	0.41
1:C:262:VAL:HG13	1:C:288:ALA:HB3	2.02	0.41
1:D:85:TYR:HE2	1:D:90:PHE:HE1	1.69	0.41
1:A:173:HIS:O	1:A:176:LEU:CD2	2.69	0.41
1:A:349:ARG:HG3	1:A:349:ARG:HH11	1.84	0.41
1:B:390:GLN:OE1	1:B:391:PRO:HD3	2.20	0.41
1:C:103:LEU:HD23	1:C:338:ILE:CG2	2.51	0.41
1:C:359:GLN:NE2	1:C:380:VAL:O	2.53	0.41
1:D:24:THR:CG2	1:D:29:LEU:HD12	2.51	0.41
1:A:47:ASP:OD1	1:A:47:ASP:C	2.60	0.41
1:D:259:VAL:HG23	1:D:282:PRO:HB3	2.03	0.41
1:D:361:ARG:O	1:D:364:GLU:HB2	2.20	0.41
1:A:414:LEU:CD2	1:A:439:LEU:HD12	2.52	0.40
1:B:25:ASP:HA	1:C:316:GLY:HA2	2.02	0.40
1:C:365:LEU:HD23	1:C:365:LEU:N	2.36	0.40
1:A:71:GLU:HG3	1:A:340:ILE:HD11	2.04	0.40
1:A:143:TYR:HD2	1:A:219:CYS:O	2.03	0.40
1:A:265:GLY:O	1:A:266:PHE:HB2	2.21	0.40
1:A:438:GLU:HG2	1:A:442:LYS:HE2	2.02	0.40
1:B:118:THR:OG1	1:B:119:GLY:N	2.54	0.40
1:B:176:LEU:N	1:B:177:PRO:CD	2.84	0.40
1:B:212:LYS:HA	1:B:212:LYS:HD3	1.91	0.40
1:B:357:TYR:CE1	1:B:436:VAL:HG21	2.55	0.40
1:C:349:ARG:HG3	1:C:353:GLU:CB	2.51	0.40
2:C:501:PLP:C4A	2:C:501:PLP:O4P	2.69	0.40
1:D:35:ARG:HA	1:D:35:ARG:NE	2.36	0.40
1:D:65:ILE:CD1	1:D:72:LEU:HD11	2.50	0.40
1:A:188:TYR:CD1	1:A:236:ILE:HD12	2.57	0.40
1:A:364:GLU:HA	1:B:356:PRO:CB	2.51	0.40
1:B:26:TYR:CD2	1:C:312:ILE:HG13	2.52	0.40
2:B:501:PLP:O3P	1:C:323:THR:OG1	2.36	0.40
1:D:231:GLY:HA3	1:D:263:ILE:HD13	2.02	0.40
1:D:436:VAL:CG2	1:D:437:ASP:N	2.84	0.40
1:D:436:VAL:HG23	1:D:437:ASP:N	2.35	0.40
1:A:155:HIS:H	1:A:165:SER:HB3	1.87	0.40
2:A:501:PLP:O4A	2:A:501:PLP:O3	2.27	0.40
1:B:437:ASP:O	1:B:441:ASP:OD1	2.38	0.40
1:C:126:ASP:OD1	1:C:158:THR:OG1	2.35	0.40
1:D:64:ASN:HB2	1:D:341:MET:CE	2.51	0.40
1:A:176:LEU:HB2	1:A:177:PRO:HD3	2.03	0.40
1:A:189:HIS:HA	1:A:201:PHE:CE2	2.57	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:273:PHE:O	1:C:276:GLN:HG2	2.21	0.40
1:C:288:ALA:O	1:C:291:LEU:HB3	2.21	0.40

All (3) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:81:GLN:OE1	1:D:70:LYS:NZ[4_545]	1.69	0.51
1:A:81:GLN:OE1	1:D:70:LYS:HZ3[4_545]	1.44	0.16
1:A:81:GLN:OE1	1:D:70:LYS:HZ2[4_545]	1.57	0.03

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	418/465 (90%)	366 (88%)	41 (10%)	11 (3%)	5	33
1	B	439/465 (94%)	389 (89%)	39 (9%)	11 (2%)	5	34
1	C	411/465 (88%)	354 (86%)	45 (11%)	12 (3%)	4	31
1	D	438/465 (94%)	382 (87%)	44 (10%)	12 (3%)	5	33
All	All	1706/1860 (92%)	1491 (87%)	169 (10%)	46 (3%)	5	33

All (46) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	51	ASN
1	A	63	VAL
1	A	89	PHE
1	A	211	ARG
1	A	212	LYS
1	B	8	THR

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Mol	Chain	Res	Type
1	B	50	GLY
1	B	108	THR
1	B	109	PRO
1	B	178	ILE
1	C	109	PRO
1	C	110	LYS
1	D	8	THR
1	D	85	TYR
1	D	288	ALA
1	A	110	LYS
1	A	177	PRO
1	B	392	LEU
1	C	90	PHE
1	C	177	PRO
1	D	314	GLU
1	C	288	ALA
1	C	392	LEU
1	C	394	ARG
1	D	59	GLY
1	B	391	PRO
1	C	63	VAL
1	C	443	ALA
1	C	444	ARG
1	D	167	MET
1	D	177	PRO
1	D	232	ALA
1	D	392	LEU
1	C	108	THR
1	C	306	ARG
1	D	111	HIS
1	A	109	PRO
1	A	288	ALA
1	B	176	LEU
1	B	288	ALA
1	D	63	VAL
1	A	290	GLY
1	D	315	GLY
1	A	174	GLY
1	B	63	VAL
1	B	235	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	340/378 (90%)	325 (96%)	15 (4%)	28	62
1	B	359/378 (95%)	347 (97%)	12 (3%)	38	68
1	C	337/378 (89%)	327 (97%)	10 (3%)	41	71
1	D	356/378 (94%)	342 (96%)	14 (4%)	32	64
All	All	1392/1512 (92%)	1341 (96%)	51 (4%)	34	65

All (51) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	57	MET
1	A	89	PHE
1	A	91	GLN
1	A	99	GLU
1	A	126	ASP
1	A	145	LYS
1	A	212	LYS
1	A	214	ASP
1	A	253	ARG
1	A	306	ARG
1	A	325	SER
1	A	363	ARG
1	A	403	SER
1	A	406	ARG
1	A	448	ASP
1	B	29	LEU
1	B	41	GLU
1	B	101	SER
1	B	106	GLU
1	B	219	CYS
1	B	281	GLN
1	B	313	GLU
1	B	370	LEU
1	B	387	LYS

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Mol	Chain	Res	Type
1	B	394	ARG
1	B	400	LYS
1	B	444	ARG
1	C	70	LYS
1	C	126	ASP
1	C	241	SER
1	C	292	SER
1	C	295	TYR
1	C	306	ARG
1	C	342	ARG
1	C	388	SER
1	C	407	ASP
1	C	412	ASN
1	D	10	ASP
1	D	35	ARG
1	D	62	CYS
1	D	86	TYR
1	D	88	ASN
1	D	89	PHE
1	D	110	LYS
1	D	135	TYR
1	D	167	MET
1	D	175	ASP
1	D	241	SER
1	D	253	ARG
1	D	361	ARG
1	D	451	HIS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	113	ASN
1	C	337	ASN
1	D	113	ASN
1	D	155	HIS
1	D	207	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

4 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	PLP	A	501	-	16,16,16	1.26	3 (18%)	20,23,23	2.26	5 (25%)
2	PLP	B	501	-	16,16,16	1.23	2 (12%)	20,23,23	1.65	3 (15%)
2	PLP	C	501	1	16,16,16	1.31	3 (18%)	20,23,23	1.31	4 (20%)
2	PLP	D	501	-	16,16,16	1.47	5 (31%)	20,23,23	1.55	5 (25%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	PLP	A	501	-	-	3/8/8/8	0/1/1/1
2	PLP	B	501	-	-	7/8/8/8	0/1/1/1
2	PLP	C	501	1	-	7/8/8/8	0/1/1/1
2	PLP	D	501	-	-	1/8/8/8	0/1/1/1

All (13) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	501	PLP	C2-N1	2.57	1.38	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	501	PLP	C2-N1	2.57	1.38	1.33
2	D	501	PLP	C2-N1	2.53	1.38	1.33
2	A	501	PLP	C2-N1	2.49	1.38	1.33
2	D	501	PLP	C3-C2	-2.41	1.38	1.40
2	A	501	PLP	C3-C2	-2.30	1.38	1.40
2	C	501	PLP	C3-C2	-2.20	1.38	1.40
2	A	501	PLP	C6-N1	2.20	1.39	1.34
2	D	501	PLP	C4-C5	-2.18	1.39	1.42
2	D	501	PLP	C6-N1	2.17	1.39	1.34
2	B	501	PLP	C6-N1	2.14	1.38	1.34
2	D	501	PLP	C4-C3	-2.07	1.37	1.40
2	C	501	PLP	C6-N1	2.06	1.38	1.34

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	501	PLP	O4A-C4A-C4	-5.05	113.90	124.91
2	A	501	PLP	C3-C4-C4A	-4.95	112.88	119.90
2	A	501	PLP	O4P-C5A-C5	4.63	118.17	109.35
2	B	501	PLP	C3-C4-C5	4.28	121.55	118.26
2	B	501	PLP	O4A-C4A-C4	-3.44	117.42	124.91
2	D	501	PLP	C3-C4-C4A	-2.98	115.67	119.90
2	D	501	PLP	C2A-C2-C3	-2.96	117.24	120.89
2	A	501	PLP	C3-C4-C5	2.85	120.44	118.26
2	B	501	PLP	O4P-C5A-C5	2.70	114.50	109.35
2	D	501	PLP	C2A-C2-N1	2.63	122.81	117.67
2	D	501	PLP	C4-C3-C2	2.50	121.74	120.19
2	C	501	PLP	C3-C4-C4A	-2.44	116.44	119.90
2	A	501	PLP	C2A-C2-N1	2.33	122.22	117.67
2	D	501	PLP	C5-C6-N1	-2.20	120.16	123.82
2	C	501	PLP	O4P-P-O1P	2.18	112.58	106.47
2	C	501	PLP	C3-C4-C5	2.10	119.87	118.26
2	C	501	PLP	C5-C6-N1	-2.06	120.39	123.82

There are no chirality outliers.

All (18) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	501	PLP	C4-C5-C5A-O4P
2	A	501	PLP	C6-C5-C5A-O4P
2	B	501	PLP	C3-C4-C4A-O4A
2	B	501	PLP	C5-C4-C4A-O4A

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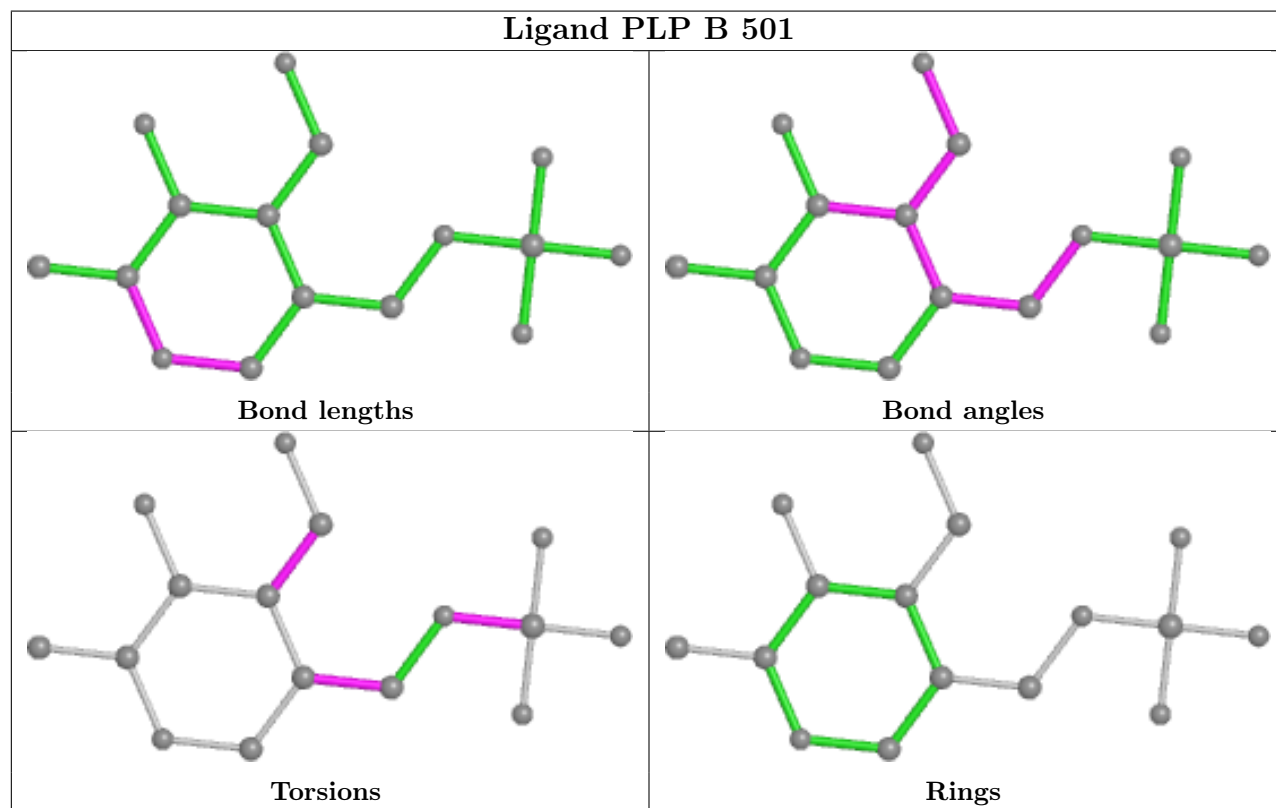
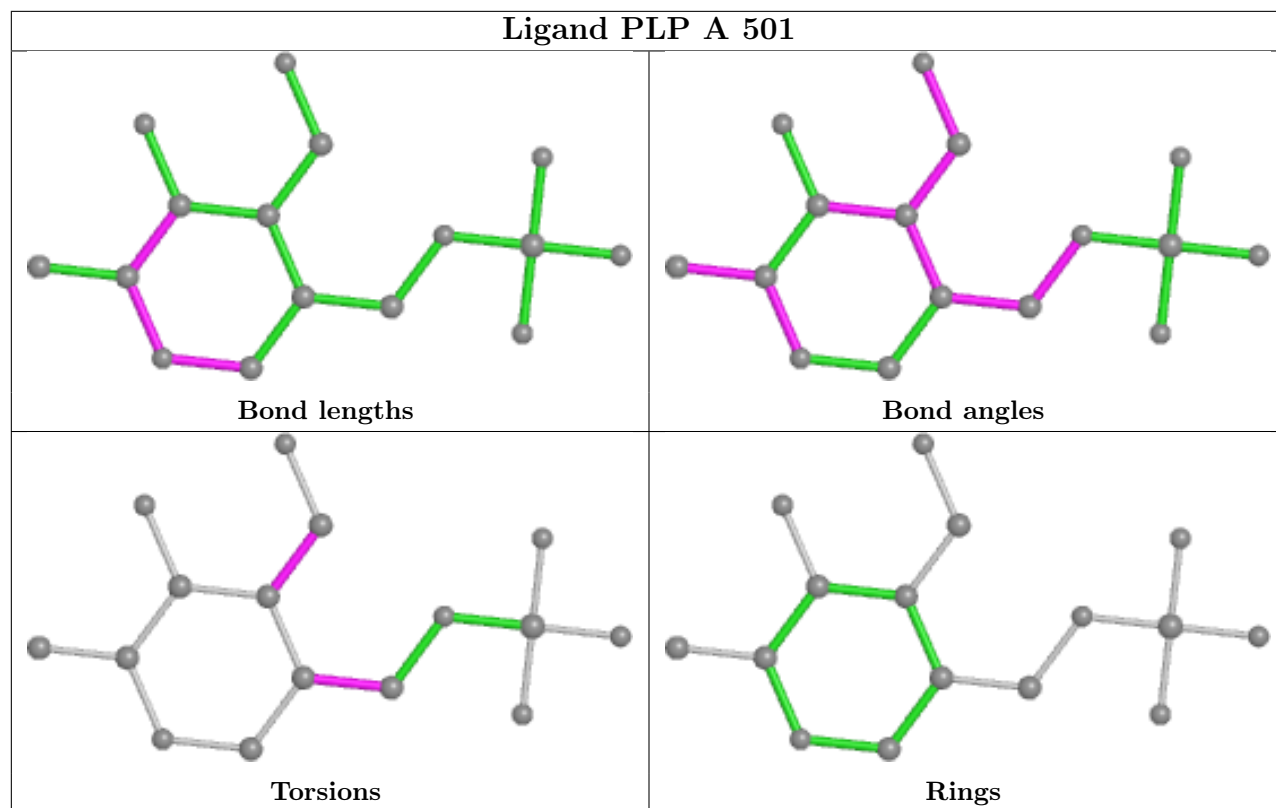
Mol	Chain	Res	Type	Atoms
2	B	501	PLP	C4-C5-C5A-O4P
2	B	501	PLP	C6-C5-C5A-O4P
2	B	501	PLP	C5A-O4P-P-O1P
2	B	501	PLP	C5A-O4P-P-O2P
2	B	501	PLP	C5A-O4P-P-O3P
2	C	501	PLP	C3-C4-C4A-O4A
2	C	501	PLP	C5-C4-C4A-O4A
2	C	501	PLP	C4-C5-C5A-O4P
2	C	501	PLP	C6-C5-C5A-O4P
2	C	501	PLP	C5A-O4P-P-O1P
2	C	501	PLP	C5A-O4P-P-O2P
2	C	501	PLP	C5A-O4P-P-O3P
2	D	501	PLP	C3-C4-C4A-O4A
2	A	501	PLP	C3-C4-C4A-O4A

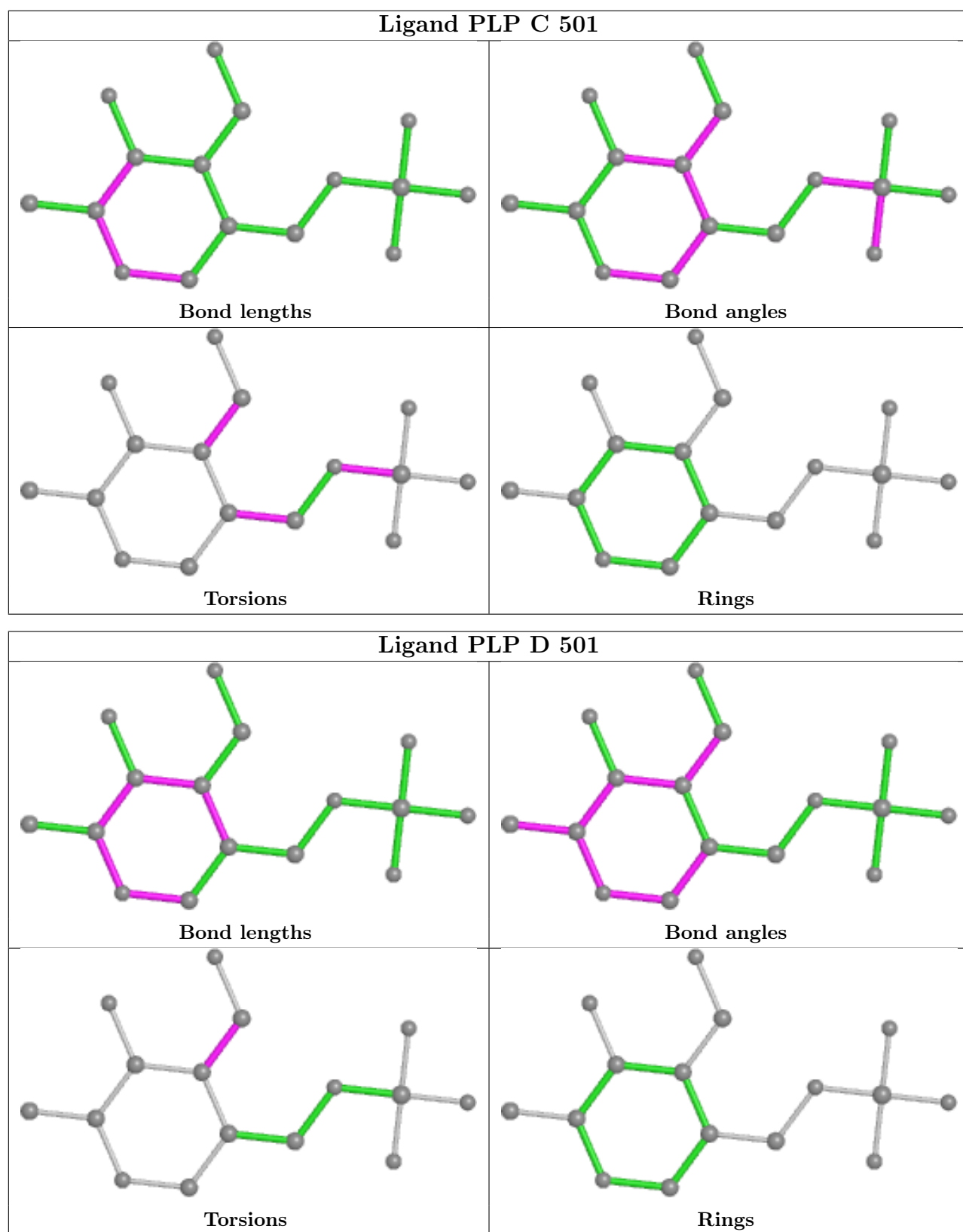
There are no ring outliers.

4 monomers are involved in 19 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	501	PLP	5	0
2	B	501	PLP	7	0
2	C	501	PLP	3	0
2	D	501	PLP	4	0

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





5.7 Other polymers [\(i\)](#)

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

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

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	420/465 (90%)	-0.12	1 (0%) 95 93	67, 89, 126, 167	0
1	B	443/465 (95%)	-0.15	2 (0%) 91 88	65, 89, 129, 159	8 (1%)
1	C	415/465 (89%)	0.08	8 (1%) 66 61	52, 103, 140, 160	0
1	D	442/465 (95%)	-0.03	6 (1%) 75 69	71, 99, 136, 161	9 (2%)
All	All	1720/1860 (92%)	-0.05	17 (0%) 82 77	52, 95, 135, 167	17 (0%)

All (17) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	30	ASN	4.3
1	C	185	GLU	3.4
1	D	365	LEU	3.3
1	D	385	LEU	3.1
1	C	372	GLY	3.1
1	C	393	GLU	3.0
1	D	439	LEU	2.9
1	C	387	LYS	2.8
1	C	392	LEU	2.7
1	D	173	HIS	2.6
1	B	26	TYR	2.6
1	D	390	GLN	2.5
1	C	175	ASP	2.2
1	A	387	LYS	2.2
1	C	439	LEU	2.1
1	D	371	VAL	2.1
1	C	388	SER	2.0

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

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

6.3 Carbohydrates [i](#)

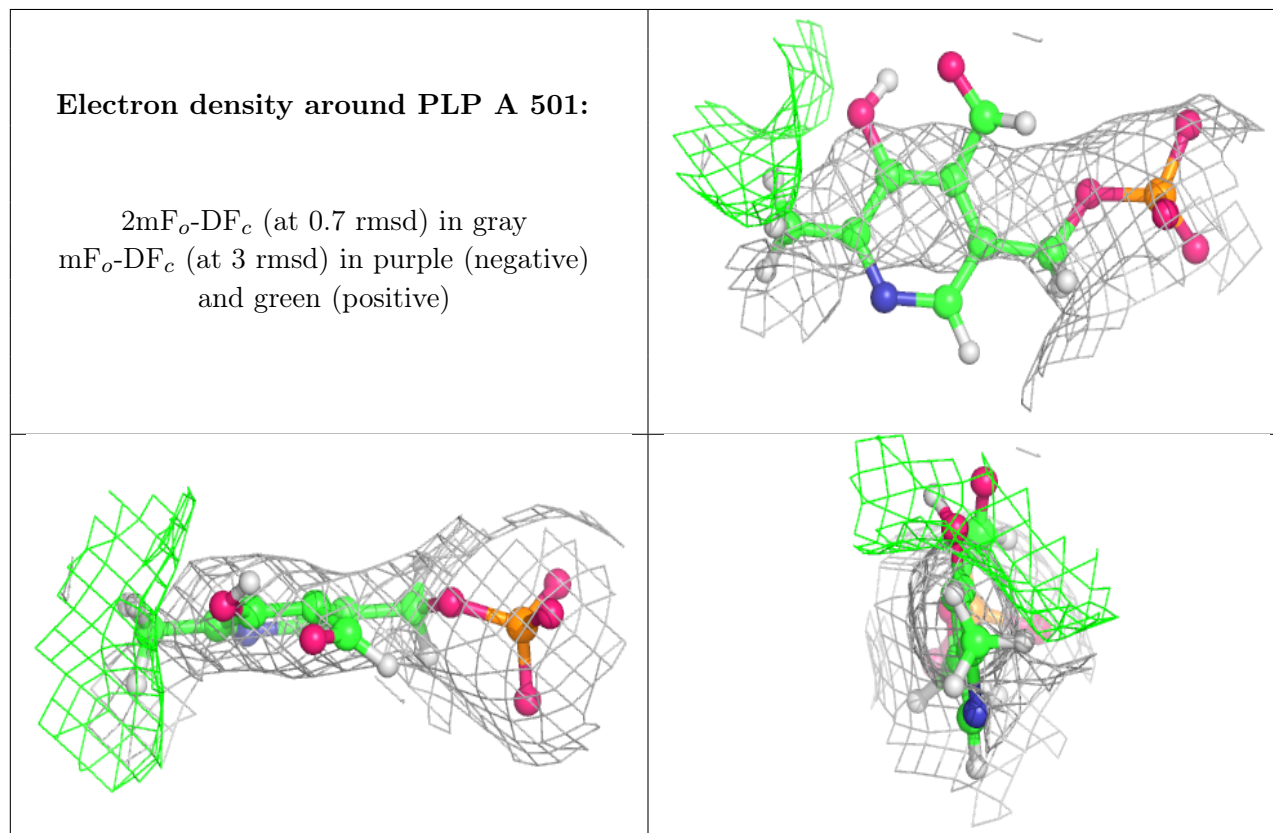
There are no monosaccharides in this entry.

6.4 Ligands [i](#)

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

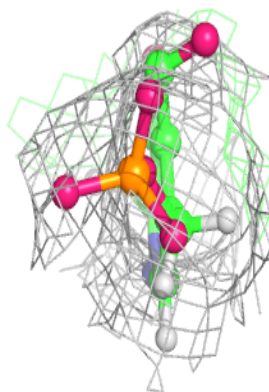
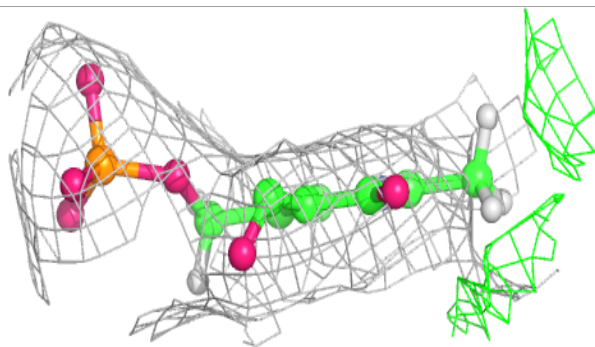
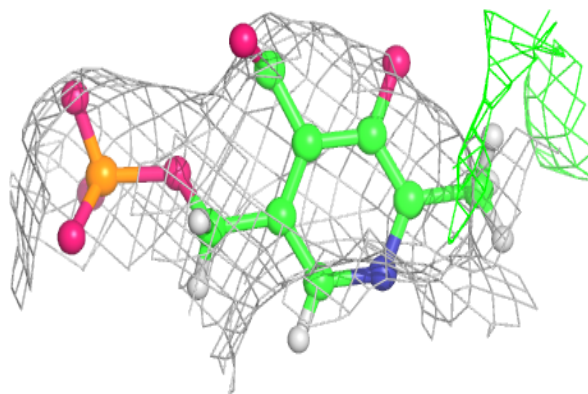
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	PLP	A	501	16/16	0.60	0.56	77,94,121,146	24
2	PLP	C	501	16/16	0.80	0.56	79,104,119,125	22
2	PLP	B	501	16/16	0.92	0.29	68,90,108,109	0
2	PLP	D	501	16/16	0.93	0.35	71,89,107,112	23

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

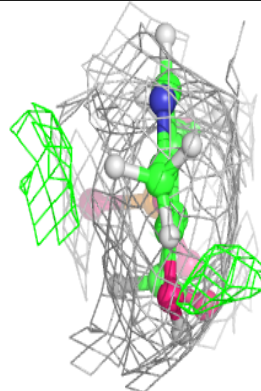
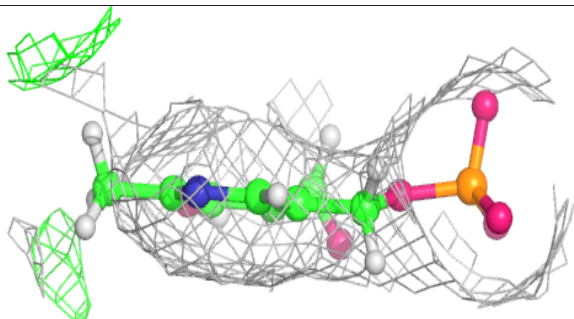
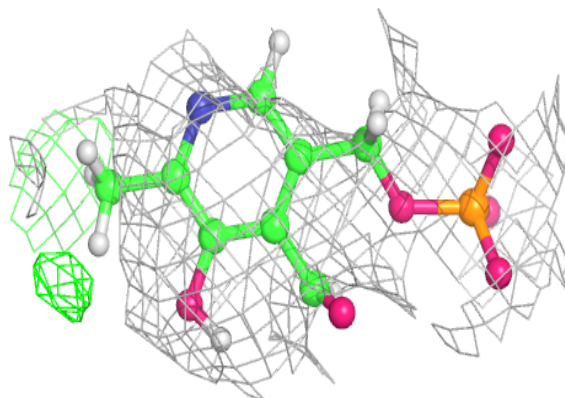


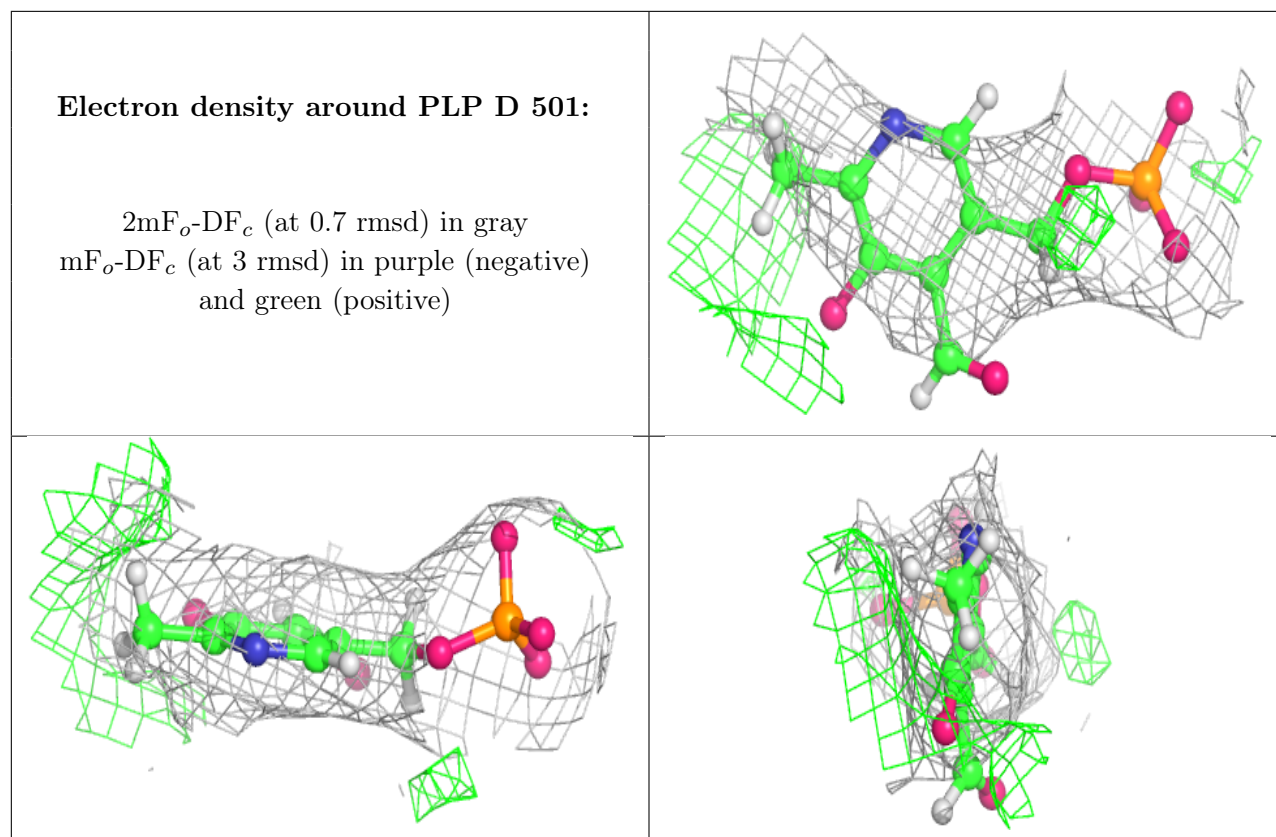
Electron density around PLP C 501:

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

**Electron density around PLP B 501:**

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





6.5 Other polymers [i](#)

There are no such residues in this entry.