



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 15, 2024 – 06:19 PM EDT

PDB ID : 4U96
Title : Coupling of remote alternating-access transport mechanisms for protons and substrates in the multidrug efflux pump AcrB
Authors : Pos, K.M.
Deposited on : 2014-08-05
Resolution : 2.20 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.37.1
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) : 2.37.1

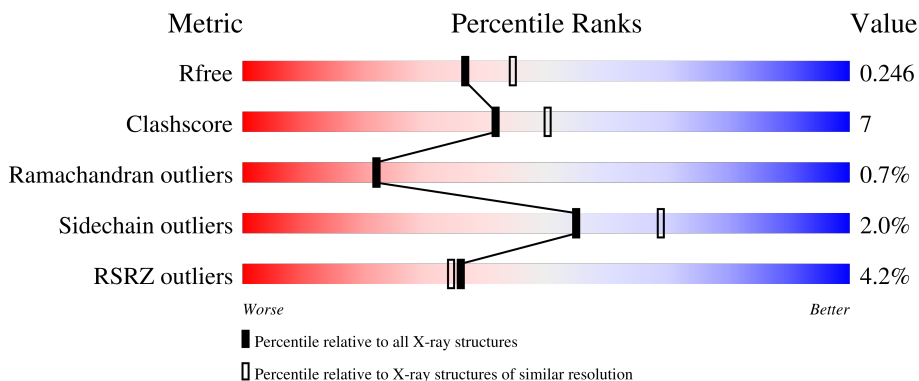
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.20 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	4898 (2.20-2.20)
Clashscore	141614	5594 (2.20-2.20)
Ramachandran outliers	138981	5503 (2.20-2.20)
Sidechain outliers	138945	5504 (2.20-2.20)
RSRZ outliers	127900	4800 (2.20-2.20)

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

Mol	Chain	Length	Quality of chain
1	A	1057	 10% 79% 18% ..
1	B	1057	 2% 84% 13% ..
1	C	1057	 % 85% 11% ..
2	D	169	 % 88% 5% 8%
2	E	169	 9% 74% 14% • 10%

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

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	LMT	A	1102	-	-	-	X

2 Entry composition i

There are 4 unique types of molecules in this entry. The entry contains 28556 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 Multidrug efflux pump subunit AcrB.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	1044	7937	5103	1312	1478	44	0	0	0
1	B	1033	7843	5049	1292	1458	44	0	0	0
1	C	1033	7843	5049	1292	1458	44	0	0	0

There are 27 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	971	ALA	ARG	engineered mutation	UNP P31224
A	1050	LEU	-	expression tag	UNP P31224
A	1051	GLU	-	expression tag	UNP P31224
A	1052	HIS	-	expression tag	UNP P31224
A	1053	HIS	-	expression tag	UNP P31224
A	1054	HIS	-	expression tag	UNP P31224
A	1055	HIS	-	expression tag	UNP P31224
A	1056	HIS	-	expression tag	UNP P31224
A	1057	HIS	-	expression tag	UNP P31224
B	971	ALA	ARG	engineered mutation	UNP P31224
B	1050	LEU	-	expression tag	UNP P31224
B	1051	GLU	-	expression tag	UNP P31224
B	1052	HIS	-	expression tag	UNP P31224
B	1053	HIS	-	expression tag	UNP P31224
B	1054	HIS	-	expression tag	UNP P31224
B	1055	HIS	-	expression tag	UNP P31224
B	1056	HIS	-	expression tag	UNP P31224
B	1057	HIS	-	expression tag	UNP P31224
C	971	ALA	ARG	engineered mutation	UNP P31224
C	1050	LEU	-	expression tag	UNP P31224
C	1051	GLU	-	expression tag	UNP P31224
C	1052	HIS	-	expression tag	UNP P31224
C	1053	HIS	-	expression tag	UNP P31224

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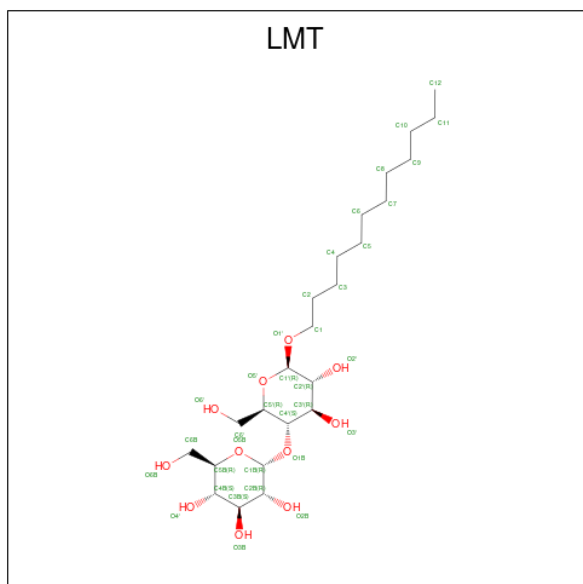
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Chain	Residue	Modelled	Actual	Comment	Reference
C	1054	HIS	-	expression tag	UNP P31224
C	1055	HIS	-	expression tag	UNP P31224
C	1056	HIS	-	expression tag	UNP P31224
C	1057	HIS	-	expression tag	UNP P31224

- Molecule 2 is a protein called DARPin.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace	
			Total	C	N	O				S
2	D	156	1177	741	206	229	1	0	0	0
2	E	152	1151	726	202	222	1	0	0	0

- Molecule 3 is DODECYL-BETA-D-MALTOSE (three-letter code: LMT) (formula: $C_{24}H_{46}O_{11}$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
3	A	1	35	24	11	0	0
3	A	1	35	24	11	0	0
3	A	1	27	16	11	0	0
3	B	1	35	24	11	0	0
3	B	1	35	24	11	0	0

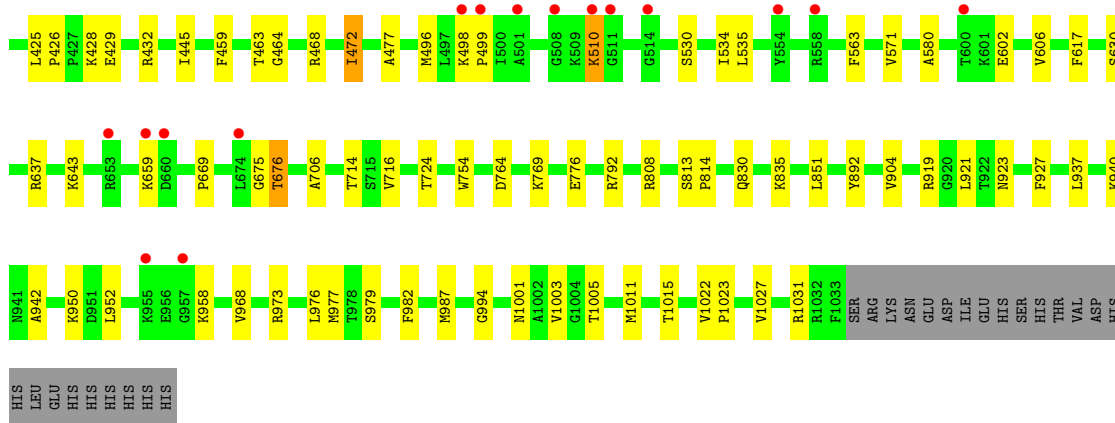
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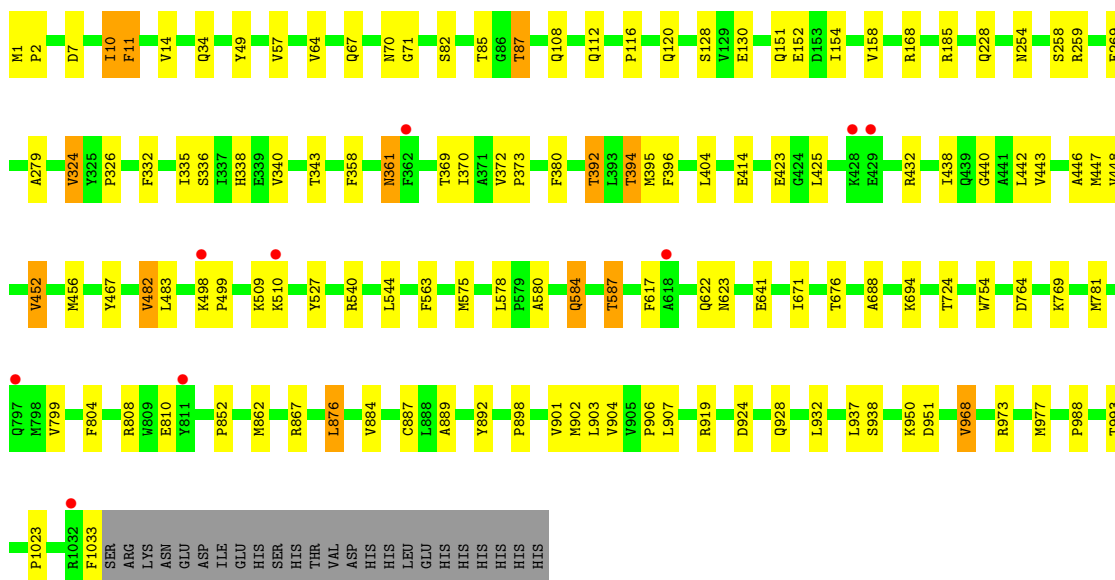
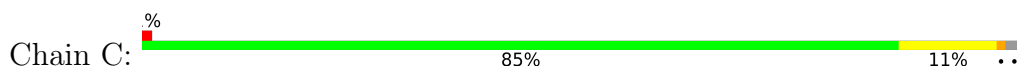
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	C	1	Total	C	O	0	0
			35	24	11		
3	C	1	Total	C	O	0	0
			35	24	11		

- Molecule 4 is water.

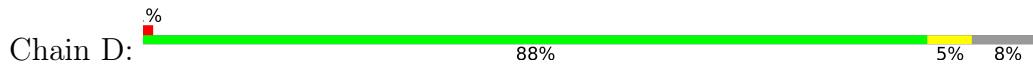
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	710	Total	O	0	0
			710	710		
4	B	668	Total	O	0	0
			668	668		
4	C	785	Total	O	0	0
			785	785		
4	D	111	Total	O	0	0
			111	111		
4	E	94	Total	O	0	0
			94	94		



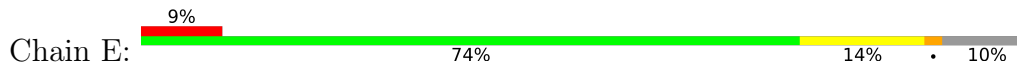
• Molecule 1: Multidrug efflux pump subunit AcrB



• Molecule 2: DARPin



• Molecule 2: DARPin





4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	145.79Å 160.77Å 246.45Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.90 – 2.20 49.14 – 2.20	Depositor EDS
% Data completeness (in resolution range)	99.3 (48.90-2.20) 99.3 (49.14-2.20)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.49 (at 2.20Å)	Xtrriage
Refinement program	PHENIX (phenix.refine: 1.9_1692)	Depositor
R, R_{free}	0.196 , 0.246 0.198 , 0.246	Depositor DCC
R_{free} test set	14506 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	28.8	Xtrriage
Anisotropy	0.274	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 52.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.45$, $\langle L^2 \rangle = 0.27$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	28556	wwPDB-VP
Average B, all atoms (Å ²)	42.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 1.96% 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:
LMT

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	0.42	0/8089	0.58	2/10984 (0.0%)
1	B	0.40	0/7993	0.55	0/10856
1	C	0.45	0/7993	0.58	0/10856
2	D	0.36	0/1196	0.51	0/1626
2	E	0.32	0/1170	0.50	0/1591
All	All	0.42	0/26441	0.56	2/35913 (0.0%)

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	2
1	C	0	1
All	All	0	3

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	88	VAL	CB-CA-C	-5.39	101.15	111.40
1	A	185	ARG	NE-CZ-NH2	-5.15	117.72	120.30

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	1040	ILE	Peptide

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Mol	Chain	Res	Type	Group
1	A	969	ARG	Peptide
1	C	509	LYS	Peptide

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	7937	0	8076	163	0
1	B	7843	0	7993	104	0
1	C	7843	0	7993	96	0
2	D	1177	0	1159	4	0
2	E	1151	0	1136	18	0
3	A	97	0	119	10	0
3	B	70	0	92	3	0
3	C	70	0	92	3	0
4	A	710	0	0	9	0
4	B	668	0	0	19	0
4	C	785	0	0	16	0
4	D	111	0	0	2	0
4	E	94	0	0	5	0
All	All	28556	0	26660	369	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 7.

All (369) 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:B:405:LEU:HD21	1:B:477:ALA:HB1	1.53	0.91
1:A:968:VAL:O	1:A:969:ARG:NH1	2.07	0.88
1:A:945:ILE:HG12	1:A:969:ARG:HH12	1.41	0.85
1:B:108:GLN:HG3	1:C:112:GLN:HG3	1.57	0.85
1:C:575:MET:HE1	1:C:617:PHE:H	1.44	0.82
1:A:641:GLU:O	1:A:650:ARG:NH2	2.12	0.82
1:A:276:ASP:OD2	1:A:620:ARG:NH1	2.13	0.81
1:A:527:TYR:OH	1:A:1019:ILE:O	1.99	0.80

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:876:LEU:HD21	1:C:932:LEU:HD11	1.63	0.80
1:A:675:GLY:O	1:A:677:ALA:N	2.16	0.79
1:C:904:VAL:HG13	1:C:938:SER:HB3	1.62	0.79
1:B:414:GLU:HG3	1:B:977:MET:HE1	1.66	0.78
1:B:904:VAL:HG11	1:B:942:ALA:HB2	1.63	0.78
1:A:447:MET:SD	4:A:1777:HOH:O	2.41	0.78
1:A:423:GLU:HG3	1:A:424:GLY:H	1.47	0.78
1:A:890:ALA:HB2	1:C:14:VAL:HG21	1.66	0.77
2:E:15:GLY:N	4:E:254:HOH:O	2.18	0.75
1:B:714:THR:HG23	1:B:830:GLN:HG3	1.69	0.75
1:B:968:VAL:HG11	1:B:1023:PRO:HG3	1.67	0.74
3:B:1101:LMT:H5B	3:B:1101:LMT:H6E	1.71	0.73
1:C:578:LEU:HD22	1:C:587:THR:HG22	1.70	0.72
1:A:513:PHE:O	1:A:517:ASN:ND2	2.23	0.72
1:A:969:ARG:HB3	1:A:972:LEU:HB2	1.69	0.72
1:A:568:ASP:OD2	1:A:637:ARG:NH2	2.23	0.70
1:A:429:GLU:HG3	1:A:432:ARG:HH21	1.57	0.68
1:B:919:ARG:NH1	4:B:1543:HOH:O	2.26	0.68
1:C:950:LYS:NZ	4:C:1520:HOH:O	2.27	0.68
1:A:785:ASP:OD1	4:A:1201:HOH:O	2.12	0.67
1:A:456:MET:HB2	1:A:459:PHE:HE2	1.59	0.67
1:B:168:ARG:NH1	4:B:1588:HOH:O	2.20	0.67
1:C:688:ALA:O	4:C:1363:HOH:O	2.13	0.67
1:C:867:ARG:NH1	4:C:1386:HOH:O	2.28	0.67
1:A:49:TYR:HE2	1:A:60:THR:HG21	1.58	0.67
1:B:1001:ASN:O	1:B:1005:THR:HG23	1.94	0.66
1:B:463:THR:HG22	1:B:563:PHE:HE1	1.61	0.66
1:B:919:ARG:NE	4:B:1495:HOH:O	2.29	0.66
1:A:935:ILE:HG21	3:A:1102:LMT:H111	1.78	0.66
1:A:531:VAL:HA	1:A:534:ILE:HG12	1.78	0.65
1:A:958:LYS:HE3	1:A:962:GLU:OE2	1.97	0.65
1:A:202:ASP:OD2	1:A:792:ARG:NH2	2.29	0.64
1:A:673:GLU:OE1	4:A:1407:HOH:O	2.14	0.64
1:C:587:THR:HG21	1:C:623:ASN:HA	1.79	0.64
1:C:404:LEU:HD21	1:C:937:LEU:HD21	1.79	0.64
1:A:502:LYS:O	1:A:504:ASP:N	2.31	0.64
1:A:456:MET:HB2	1:A:459:PHE:CE2	2.33	0.64
1:A:453:PHE:O	1:A:456:MET:HG2	1.98	0.64
1:A:343:THR:HB	1:A:988:PRO:HB2	1.80	0.63
1:B:396:PHE:CZ	1:B:1003:VAL:HG11	2.33	0.63
1:C:1033:PHE:O	4:C:1855:HOH:O	2.15	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:867:ARG:NH2	4:C:1424:HOH:O	2.32	0.63
1:A:554:TYR:OH	1:A:558:ARG:NH1	2.31	0.62
1:B:293:LEU:HD22	1:B:297:ALA:HB3	1.82	0.62
1:B:580:ALA:HB1	1:B:724:THR:HG22	1.81	0.62
1:A:964:THR:O	1:A:968:VAL:N	2.28	0.62
3:A:1103:LMT:H2B	3:A:1103:LMT:H6D	1.81	0.61
1:A:456:MET:SD	1:A:932:LEU:HD13	2.40	0.61
1:A:351:VAL:O	1:A:355:MET:HG2	2.01	0.61
2:E:127:GLU:HG2	4:E:212:HOH:O	2.01	0.60
1:B:363:ARG:NH1	1:B:496:MET:O	2.35	0.60
1:C:343:THR:HG23	1:C:988:PRO:HB2	1.82	0.60
1:A:969:ARG:HB3	1:A:972:LEU:CB	2.31	0.60
1:A:468:ARG:O	1:A:472:ILE:HG12	2.02	0.60
1:A:328:ASP:OD1	1:A:330:THR:HB	2.02	0.60
1:C:575:MET:SD	4:C:1618:HOH:O	2.57	0.60
1:C:901:VAL:O	1:C:904:VAL:HG12	2.02	0.60
1:A:418:ARG:HA	1:A:421:ALA:HB3	1.83	0.59
1:A:405:LEU:HD22	1:A:481:SER:HB2	1.85	0.59
1:A:764:ASP:HB3	1:A:769:LYS:HD2	1.84	0.59
1:B:248:LYS:NZ	4:B:1414:HOH:O	2.35	0.59
1:B:669:PRO:HB3	1:B:676:THR:H	1.67	0.58
1:A:559:LEU:HD23	1:A:923:ASN:HB2	1.85	0.58
1:A:671:ILE:HG22	1:A:672:VAL:O	2.04	0.58
1:B:247:GLY:HA2	1:B:268:ILE:HD13	1.85	0.58
1:B:416:VAL:O	1:B:420:MET:HG3	2.04	0.58
1:C:34:GLN:O	1:C:392:THR:HB	2.04	0.58
1:C:168:ARG:HD2	4:C:1388:HOH:O	2.04	0.57
1:C:498:LYS:HG3	1:C:499:PRO:HD2	1.85	0.57
1:A:877:TYR:CZ	3:A:1102:LMT:H41	2.38	0.57
1:A:1027:VAL:O	1:A:1031:ARG:HG3	2.04	0.57
2:E:21:ALA:HA	2:E:26:ARG:HD2	1.86	0.57
1:A:527:TYR:HE2	1:A:969:ARG:CG	2.17	0.57
1:C:151:GLN:NE2	1:C:279:ALA:O	2.38	0.57
1:A:49:TYR:CE2	1:A:60:THR:HG21	2.39	0.56
1:C:671:ILE:H	1:C:862:MET:HE1	1.69	0.56
1:A:415:ASN:HB3	1:A:434:SER:OG	2.05	0.56
1:B:414:GLU:HG3	1:B:977:MET:CE	2.35	0.56
1:A:946:VAL:HG13	1:A:1026:PHE:CE2	2.41	0.56
1:A:969:ARG:CB	1:A:972:LEU:HB2	2.36	0.56
1:A:41:PRO:HB3	1:A:295:THR:HG21	1.87	0.55
1:A:57:VAL:HG13	1:A:88:VAL:HG22	1.88	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:990:VAL:HG23	1:A:991:ILE:HG23	1.89	0.55
1:B:267:LYS:NZ	4:B:1635:HOH:O	2.40	0.55
1:C:527:TYR:CE2	1:C:968:VAL:HG13	2.41	0.55
1:C:563:PHE:O	1:C:924:ASP:HB2	2.06	0.55
1:B:940:LYS:NZ	4:B:1565:HOH:O	2.40	0.55
1:A:343:THR:HG21	1:A:1000:GLN:OE1	2.06	0.55
1:C:867:ARG:NE	4:C:1424:HOH:O	2.40	0.55
1:B:335:ILE:O	1:B:339:GLU:HG2	2.06	0.55
1:A:941:ASN:HB3	1:A:975:ILE:HD13	1.90	0.54
1:A:340:VAL:HG11	1:A:395:MET:HB3	1.88	0.54
1:C:369:THR:O	1:C:372:VAL:HG13	2.07	0.54
1:A:537:SER:OG	1:A:538:THR:N	2.39	0.54
1:B:259:ARG:NH2	4:B:1421:HOH:O	2.38	0.54
1:C:764:ASP:HB3	1:C:769:LYS:HD2	1.88	0.54
1:A:30:LEU:HD21	1:A:384:ALA:HA	1.89	0.54
1:C:151:GLN:HG2	4:C:1553:HOH:O	2.08	0.54
1:C:808:ARG:NH1	1:C:810:GLU:OE2	2.42	0.53
1:C:336:SER:O	1:C:340:VAL:HG23	2.09	0.53
1:A:32:VAL:HG21	3:A:1101:LMT:H11	1.91	0.53
1:C:64:VAL:O	1:C:67:GLN:HG2	2.08	0.53
1:A:1001:ASN:O	1:A:1005:THR:HG23	2.08	0.53
1:A:416:VAL:HG22	1:A:431:THR:HA	1.90	0.53
1:B:571:VAL:HG12	1:B:630:SER:HA	1.91	0.53
1:A:419:VAL:O	1:A:423:GLU:HG2	2.08	0.53
1:A:969:ARG:CG	1:A:972:LEU:HB2	2.39	0.53
1:B:835:LYS:O	4:B:1530:HOH:O	2.19	0.52
1:B:420:MET:HE1	1:B:499:PRO:HA	1.90	0.52
1:B:706:ALA:HB1	1:B:716:VAL:HG11	1.90	0.52
1:B:892:TYR:O	1:B:950:LYS:HE3	2.09	0.52
2:D:94:GLU:HG2	4:D:263:HOH:O	2.08	0.52
1:A:202:ASP:CG	1:A:792:ARG:HH22	2.13	0.52
1:A:356:TYR:HA	1:A:365:THR:HG21	1.91	0.52
1:C:440:GLY:HA2	3:C:1102:LMT:O2'	2.10	0.52
2:E:92:HIS:O	2:E:96:VAL:HG23	2.09	0.52
1:A:946:VAL:HG13	1:A:1026:PHE:HE2	1.75	0.52
1:B:459:PHE:O	1:B:464:GLY:HA3	2.09	0.52
1:B:510:LYS:H	1:B:510:LYS:HD2	1.74	0.52
1:C:799:VAL:HG23	1:C:804:PHE:HE2	1.75	0.52
1:A:527:TYR:CE2	1:A:969:ARG:CG	2.92	0.52
1:A:1038:GLU:HG2	1:A:1039:ASP:H	1.74	0.52
1:A:57:VAL:CG1	1:A:88:VAL:HG22	2.40	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:968:VAL:C	1:A:969:ARG:HD2	2.31	0.51
1:C:259:ARG:NH1	2:E:155:ASN:OD1	2.43	0.51
1:C:254:ASN:HB2	1:C:258:SER:HB3	1.93	0.51
1:B:388:PHE:CE1	1:B:472:ILE:HD12	2.46	0.51
1:B:979:SER:OG	1:B:1015:THR:HG21	2.11	0.51
1:C:10:ILE:HG13	1:C:11:PHE:N	2.26	0.51
1:A:863:SER:O	1:A:867:ARG:HG3	2.12	0.51
1:A:423:GLU:HG3	1:A:424:GLY:N	2.22	0.50
1:A:568:ASP:CG	1:A:637:ARG:HH22	2.13	0.50
1:A:968:VAL:HG13	1:A:969:ARG:HD2	1.93	0.50
1:B:764:ASP:HB3	1:B:769:LYS:HD2	1.92	0.50
1:B:445:ILE:HD13	1:B:940:LYS:HG3	1.92	0.50
1:B:219:LEU:HD23	1:C:754:TRP:CZ3	2.45	0.50
1:C:57:VAL:HG13	1:C:82:SER:HB3	1.94	0.50
1:C:580:ALA:HB1	1:C:724:THR:HG22	1.93	0.50
1:A:524:THR:O	1:A:528:THR:HG23	2.12	0.50
1:B:64:VAL:HG11	1:B:117:LEU:HB2	1.94	0.50
1:B:428:LYS:HE2	1:B:429:GLU:OE2	2.11	0.49
1:A:877:TYR:CD1	3:A:1102:LMT:H81	2.47	0.49
1:A:431:THR:HG21	1:A:494:ALA:HB2	1.94	0.49
2:E:28:ASP:O	2:E:32:ILE:HG12	2.12	0.49
1:A:38:ILE:HD11	1:A:671:ILE:HD13	1.94	0.49
1:A:307:ARG:NE	4:A:1398:HOH:O	2.42	0.49
1:B:979:SER:HA	1:B:1011:MET:HE1	1.94	0.49
2:D:163:GLU:OE2	4:D:244:HOH:O	2.20	0.49
1:A:514:GLY:HA2	1:A:517:ASN:HD22	1.78	0.48
1:A:527:TYR:CE2	1:A:969:ARG:HG3	2.48	0.48
1:A:604:ASN:OD1	4:A:1202:HOH:O	2.20	0.48
1:C:361:ASN:OD1	1:C:361:ASN:C	2.50	0.48
1:B:346:GLU:HA	1:B:349:ILE:HD12	1.95	0.48
1:A:575:MET:HG3	1:A:617:PHE:HD2	1.79	0.48
1:A:672:VAL:O	1:A:673:GLU:HB2	2.13	0.48
1:A:1038:GLU:HG2	1:A:1039:ASP:N	2.28	0.48
1:B:1011:MET:O	1:B:1015:THR:HG23	2.13	0.48
1:C:394:THR:HG22	1:C:395:MET:HE3	1.94	0.48
1:B:370:ILE:O	1:B:373:PRO:HD2	2.13	0.48
1:B:375:VAL:HG11	1:B:405:LEU:HD22	1.96	0.48
1:C:85:THR:OG1	1:C:87:THR:HG22	2.14	0.48
2:E:34:MET:CE	2:E:40:VAL:HG12	2.42	0.48
2:E:98:VAL:O	2:E:102:ASN:ND2	2.42	0.48
1:A:889:ALA:O	1:C:10:ILE:HD11	2.12	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:97:GLU:N	4:E:243:HOH:O	2.46	0.48
1:C:370:ILE:O	1:C:373:PRO:HD2	2.13	0.48
1:C:903:LEU:O	1:C:906:PRO:HD2	2.13	0.48
1:A:801:PHE:HA	1:A:804:PHE:CZ	2.49	0.48
1:C:447:MET:SD	1:C:887:CYS:HB3	2.53	0.48
1:A:359:LEU:HB2	1:A:365:THR:HG22	1.96	0.48
1:A:716:VAL:HA	1:A:828:LEU:O	2.13	0.48
1:A:403:GLY:HA3	1:A:937:LEU:HD11	1.96	0.48
1:A:401:ALA:O	1:A:405:LEU:HG	2.13	0.47
1:A:1013:THR:O	1:A:1017:LEU:HB2	2.14	0.47
1:B:982:PHE:CD2	1:B:1011:MET:HG3	2.49	0.47
1:C:671:ILE:N	1:C:862:MET:HE1	2.28	0.47
1:C:898:PRO:O	1:C:902:MET:HG2	2.13	0.47
1:B:418:ARG:HD3	4:B:1329:HOH:O	2.13	0.47
1:C:456:MET:HG3	1:C:467:TYR:HB3	1.97	0.47
1:C:919:ARG:NH2	4:C:1754:HOH:O	2.47	0.47
2:E:73:VAL:HG13	2:E:74:ASN:OD1	2.15	0.47
1:A:341:VAL:HG21	3:A:1101:LMT:H41	1.97	0.47
1:A:540:ARG:HA	1:A:543:VAL:HG23	1.96	0.47
1:C:968:VAL:HG21	1:C:1023:PRO:HG3	1.96	0.47
1:B:225:VAL:HG13	1:C:781:MET:HG3	1.97	0.47
1:A:339:GLU:O	1:A:343:THR:HG23	2.15	0.47
1:C:1:MET:HB3	1:C:2:PRO:HD3	1.96	0.47
1:C:120:GLN:HG2	4:C:1715:HOH:O	2.15	0.47
1:C:128:SER:HB2	1:C:130:GLU:OE1	2.13	0.47
1:A:575:MET:HG3	1:A:617:PHE:CD2	2.50	0.47
1:A:84:SER:HB2	4:A:1537:HOH:O	2.13	0.47
1:A:973:ARG:HB3	1:A:974:PRO:HD3	1.97	0.47
1:B:396:PHE:HZ	1:B:1003:VAL:HG11	1.79	0.47
1:A:255:GLN:CD	1:A:255:GLN:H	2.19	0.46
1:B:115:MET:HB2	1:B:116:PRO:HD3	1.97	0.46
1:B:342:LYS:O	1:B:346:GLU:HG2	2.16	0.46
1:A:1039:ASP:O	1:A:1040:ILE:HB	2.15	0.46
1:B:1:MET:HB3	1:B:2:PRO:HD3	1.97	0.46
1:B:937:LEU:HD23	1:B:937:LEU:HA	1.76	0.46
2:E:105:ASP:HB3	2:E:108:ALA:HB2	1.97	0.46
1:A:255:GLN:HG2	1:A:256:ASP:H	1.80	0.46
1:C:372:VAL:HG22	1:C:373:PRO:HD3	1.98	0.46
1:A:969:ARG:HH21	1:A:972:LEU:HA	1.80	0.46
1:A:969:ARG:HE	1:A:972:LEU:CA	2.28	0.46
1:A:617:PHE:CZ	1:A:666:PHE:HZ	2.33	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:75:ALA:O	2:E:83:PRO:HD3	2.14	0.46
1:B:126:GLY:HA3	1:C:116:PRO:HB3	1.96	0.46
1:C:7:ASP:OD1	1:C:432:ARG:NH2	2.47	0.46
1:A:357:LEU:HD12	1:A:513:PHE:HE1	1.79	0.46
1:A:515:TRP:HD1	1:A:518:ARG:NH2	2.13	0.46
1:C:452:VAL:HG13	1:C:884:VAL:HG21	1.96	0.46
2:E:34:MET:HE2	2:E:40:VAL:HG12	1.96	0.46
2:E:40:VAL:HG13	4:E:277:HOH:O	2.16	0.46
1:B:464:GLY:O	1:B:468:ARG:HB2	2.15	0.46
2:D:100:LEU:HD11	2:D:132:LEU:HD23	1.98	0.46
1:A:987:MET:O	1:A:991:ILE:HG12	2.16	0.46
1:A:1034:SER:HB3	1:A:1036:LYS:HE3	1.98	0.45
1:C:70:ASN:HB3	4:C:1933:HOH:O	2.15	0.45
1:A:427:PRO:O	1:A:431:THR:HG22	2.15	0.45
1:B:174:ASP:HA	1:C:70:ASN:ND2	2.31	0.45
1:A:537:SER:O	1:A:539:GLY:N	2.42	0.45
1:B:108:GLN:HE22	1:C:108:GLN:HE21	1.62	0.45
1:A:358:PHE:CG	1:A:977:MET:HG2	2.51	0.45
1:C:414:GLU:OE1	1:C:973:ARG:HD3	2.15	0.45
1:C:392:THR:HG23	1:C:396:PHE:CE2	2.52	0.45
1:C:904:VAL:HG23	1:C:907:LEU:HD12	1.99	0.45
1:A:27:ILE:HD13	3:A:1101:LMT:H72	1.99	0.45
1:C:185:ARG:HB2	1:C:269:GLU:O	2.16	0.45
1:A:521:GLU:O	1:A:524:THR:HB	2.16	0.45
1:A:687:GLN:NE2	4:A:1727:HOH:O	2.50	0.45
1:A:563:PHE:O	1:A:924:ASP:HB2	2.16	0.45
1:A:578:LEU:HD11	1:A:590:VAL:HG21	1.99	0.45
1:B:420:MET:CE	1:B:499:PRO:HA	2.46	0.45
1:A:151:GLN:HE21	1:A:278:ILE:HA	1.81	0.45
1:A:969:ARG:HE	1:A:972:LEU:HB2	1.80	0.44
1:B:219:LEU:HD23	1:C:754:TRP:HZ3	1.82	0.44
1:C:852:PRO:HG2	4:C:1370:HOH:O	2.18	0.44
1:C:185:ARG:HA	1:C:185:ARG:HD3	1.75	0.44
1:C:332:PHE:HA	1:C:335:ILE:HG22	2.00	0.44
1:A:361:ASN:O	1:A:365:THR:HG23	2.17	0.44
1:A:905:VAL:O	1:A:909:VAL:HG23	2.17	0.44
1:C:254:ASN:N	1:C:258:SER:O	2.45	0.44
1:C:467:TYR:OH	1:C:928:GLN:OE1	2.33	0.44
1:A:948:PHE:CE2	1:A:971:ALA:HB2	2.53	0.44
1:B:401:ALA:O	1:B:405:LEU:HG	2.18	0.44
1:B:904:VAL:HG11	1:B:942:ALA:CB	2.43	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:380:PHE:CE1	1:C:395:MET:HE1	2.53	0.44
1:A:556:PHE:CZ	3:A:1102:LMT:H21	2.53	0.43
1:B:1022:VAL:HG22	1:B:1023:PRO:HD3	1.99	0.43
1:C:358:PHE:CG	1:C:977:MET:HG2	2.53	0.43
1:A:604:ASN:O	1:A:632:LYS:HD2	2.18	0.43
1:A:859:TRP:HB2	1:A:867:ARG:CZ	2.48	0.43
1:B:173:GLY:HA2	1:C:71:GLY:HA3	2.00	0.43
1:A:443:VAL:HG12	4:A:1777:HOH:O	2.18	0.43
1:B:1:MET:N	4:B:1818:HOH:O	2.38	0.43
1:B:429:GLU:H	1:B:429:GLU:CD	2.21	0.43
1:A:586:ARG:HB3	4:A:1870:HOH:O	2.16	0.43
1:A:905:VAL:HB	1:A:906:PRO:HD3	1.99	0.43
1:A:919:ARG:HD2	1:A:1005:THR:HG21	2.00	0.43
1:B:181:GLN:HG3	1:B:769:LYS:HG2	2.00	0.43
1:B:420:MET:HE2	4:B:1335:HOH:O	2.18	0.43
1:C:338:HIS:ND1	4:C:1940:HOH:O	2.36	0.43
2:D:46:VAL:O	2:D:77:ASP:HB2	2.18	0.43
1:A:168:ARG:HG2	1:B:69:MET:O	2.19	0.43
1:A:676:THR:O	1:A:677:ALA:HB3	2.19	0.43
1:A:83:ASP:OD1	1:A:85:THR:HB	2.19	0.43
1:A:453:PHE:O	1:A:471:SER:OG	2.35	0.43
1:B:534:ILE:HD11	3:B:1101:LMT:H12	2.01	0.43
1:A:40:PRO:HA	1:A:41:PRO:HD3	1.84	0.43
1:B:637:ARG:O	1:B:643:LYS:HE3	2.19	0.43
1:B:197:GLN:NE2	4:B:1742:HOH:O	2.51	0.43
1:B:167:SER:HB3	1:C:70:ASN:HB3	2.00	0.43
1:B:187:TRP:HB3	1:B:776:GLU:HG2	2.01	0.43
1:B:228:GLN:OE1	1:C:781:MET:HB3	2.19	0.43
1:A:76:MET:HE2	1:A:93:THR:HG22	2.00	0.42
1:A:556:PHE:HZ	3:A:1102:LMT:H21	1.84	0.42
1:A:702:LEU:HD13	1:A:851:LEU:HD11	2.01	0.42
1:B:498:LYS:HG2	4:B:1277:HOH:O	2.19	0.42
1:C:423:GLU:HB3	1:C:425:LEU:HD13	2.01	0.42
1:C:892:TYR:HD1	3:C:1102:LMT:H6'2	1.84	0.42
1:A:517:ASN:O	1:A:521:GLU:HG2	2.19	0.42
1:B:126:GLY:HA3	1:C:116:PRO:CB	2.49	0.42
1:C:443:VAL:HG12	1:C:447:MET:HE3	2.00	0.42
1:C:694:LYS:HD3	1:C:694:LYS:HA	1.87	0.42
1:C:950:LYS:HE2	1:C:951:ASP:OD1	2.19	0.42
1:A:393:LEU:HD11	1:A:466:ILE:HG13	2.00	0.42
1:A:492:LEU:O	1:A:496:MET:HB2	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:877:TYR:CE1	3:A:1102:LMT:H41	2.55	0.42
1:B:851:LEU:HD23	1:B:851:LEU:HA	1.74	0.42
1:B:940:LYS:HB3	1:B:940:LYS:HE2	1.83	0.42
1:C:867:ARG:CZ	4:C:1424:HOH:O	2.66	0.42
1:B:463:THR:HG22	1:B:563:PHE:CE1	2.47	0.42
1:B:281:PHE:CE2	1:B:324:VAL:HG11	2.55	0.42
2:E:94:GLU:O	4:E:243:HOH:O	2.22	0.42
1:A:196:PHE:O	1:A:198:LEU:HG	2.19	0.42
1:A:459:PHE:CD2	1:A:467:TYR:HB2	2.55	0.42
1:B:174:ASP:HA	1:C:70:ASN:HD21	1.84	0.42
1:A:155:SER:HB3	1:A:180:SER:H	1.85	0.42
1:A:355:MET:HB3	1:A:365:THR:HB	2.01	0.42
1:A:367:ILE:HB	1:A:368:PRO:HD3	2.02	0.42
1:B:1031:ARG:NH2	4:B:1202:HOH:O	2.53	0.42
1:A:706:ALA:HB1	1:A:716:VAL:HG11	2.02	0.42
1:A:781:MET:HB3	1:C:228:GLN:OE1	2.19	0.42
1:A:931:LEU:HD23	1:A:931:LEU:HA	1.67	0.42
1:A:969:ARG:HE	1:A:972:LEU:CB	2.33	0.42
1:B:808:ARG:NH1	4:B:1279:HOH:O	2.51	0.42
1:B:813:SER:HA	1:B:814:PRO:HD3	1.82	0.42
1:A:944:LEU:HA	1:A:944:LEU:HD12	1.84	0.41
1:A:498:LYS:HA	1:A:499:PRO:HD3	1.91	0.41
1:A:969:ARG:NH2	1:A:975:ILE:HD12	2.35	0.41
1:B:149:MET:O	4:B:1736:HOH:O	2.21	0.41
1:B:202:ASP:OD2	1:B:792:ARG:NH2	2.54	0.41
1:B:309:GLU:OE1	4:B:1822:HOH:O	2.21	0.41
1:B:973:ARG:HG2	1:B:977:MET:CE	2.50	0.41
1:B:919:ARG:HH11	1:B:921:LEU:HD11	1.85	0.41
1:A:859:TRP:CD1	1:A:867:ARG:HD3	2.55	0.41
1:B:287:SER:OG	1:B:288:GLY:N	2.52	0.41
1:B:185:ARG:HD3	1:B:185:ARG:HA	1.93	0.41
1:C:937:LEU:HD23	1:C:937:LEU:HA	1.90	0.41
1:A:185:ARG:HA	1:A:185:ARG:HD3	1.69	0.41
1:A:300:LEU:HD23	1:A:330:THR:HG23	2.03	0.41
1:A:400:LEU:HA	1:A:400:LEU:HD23	1.79	0.41
1:C:587:THR:HG21	1:C:622:GLN:O	2.20	0.41
1:A:223:PRO:HA	1:A:224:PRO:HD3	1.84	0.41
1:B:159:ALA:HB2	1:B:177:LEU:HD22	2.02	0.41
1:C:324:VAL:HG13	1:C:326:PRO:HD3	2.03	0.41
1:A:713:LEU:HG	1:A:843:LEU:HD23	2.03	0.41
1:A:1026:PHE:O	1:A:1030:ARG:HG2	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:103:ALA:O	1:B:107:VAL:HG23	2.20	0.41
1:B:617:PHE:N	4:B:1285:HOH:O	2.53	0.41
1:C:584:GLN:HG2	4:C:1460:HOH:O	2.20	0.41
1:A:25:LEU:HD23	3:B:1102:LMT:H21	2.03	0.41
1:A:277:ILE:HA	1:A:613:ASN:O	2.21	0.41
1:B:395:MET:O	1:B:399:VAL:HG13	2.21	0.41
1:B:535:LEU:HD22	1:B:1027:VAL:HG21	2.03	0.41
1:B:952:LEU:HD22	1:B:958:LYS:HD2	2.02	0.41
1:C:446:ALA:HB2	1:C:482:VAL:HG13	2.03	0.41
1:C:889:ALA:HA	1:C:898:PRO:HG2	2.02	0.41
1:C:950:LYS:CE	3:C:1102:LMT:H6'1	2.51	0.41
1:A:1043:SER:O	1:A:1044:HIS:CB	2.69	0.41
1:B:185:ARG:HD2	4:B:1232:HOH:O	2.21	0.41
1:B:602:GLU:HB3	1:B:606:VAL:HG23	2.02	0.41
1:C:438:ILE:O	1:C:442:LEU:HG	2.21	0.41
2:E:89:HIS:HE1	2:E:123:ARG:CZ	2.34	0.41
2:E:127:GLU:HG2	2:E:127:GLU:H	1.64	0.41
1:A:456:MET:CE	1:A:467:TYR:HB3	2.51	0.40
1:A:564:LEU:HA	1:A:565:PRO:HD3	1.88	0.40
1:A:843:LEU:O	1:A:847:LEU:HG	2.20	0.40
1:A:967:ALA:O	1:A:968:VAL:C	2.60	0.40
1:B:11:PHE:HD2	1:B:11:PHE:O	2.02	0.40
1:B:923:ASN:OD1	1:B:927:PHE:HD2	2.05	0.40
1:A:219:LEU:HD23	1:B:754:TRP:CZ3	2.56	0.40
1:B:428:LYS:HE3	1:B:432:ARG:HH22	1.86	0.40
1:C:154:ILE:O	1:C:158:VAL:HG13	2.21	0.40
1:A:509:LYS:O	1:A:509:LYS:NZ	2.42	0.40
1:B:400:LEU:HD11	1:B:1003:VAL:HG21	2.02	0.40
1:B:425:LEU:HA	1:B:426:PRO:HD3	1.93	0.40
1:B:669:PRO:CB	1:B:676:THR:H	2.33	0.40
1:A:968:VAL:HG13	1:A:969:ARG:CD	2.51	0.40
1:C:544:LEU:HD13	1:C:544:LEU:HA	1.86	0.40
2:E:91:GLY:HA2	2:E:128:ILE:HD12	2.03	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	1042/1057 (99%)	984 (94%)	39 (4%)	19 (2%)	8	5
1	B	1031/1057 (98%)	1001 (97%)	26 (2%)	4 (0%)	34	37
1	C	1031/1057 (98%)	1000 (97%)	31 (3%)	0	100	100
2	D	154/169 (91%)	151 (98%)	3 (2%)	0	100	100
2	E	150/169 (89%)	147 (98%)	1 (1%)	2 (1%)	12	9
All	All	3408/3509 (97%)	3283 (96%)	100 (3%)	25 (1%)	22	22

All (25) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	503	GLY
1	A	506	GLY
1	A	538	THR
1	A	672	VAL
1	A	676	THR
1	A	1034	SER
1	A	1035	ARG
1	A	1036	LYS
1	A	1039	ASP
1	B	659	LYS
1	B	676	THR
1	A	502	LYS
1	A	869	SER
1	A	509	LYS
1	A	1040	ILE
1	B	675	GLY
2	E	26	ARG
1	A	501	ALA
1	A	677	ALA
2	E	105	ASP
1	A	424	GLY

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Mol	Chain	Res	Type
1	A	620	ARG
1	A	539	GLY
1	A	968	VAL
1	B	994	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	849/862 (98%)	837 (99%)	12 (1%)	67	80
1	B	838/862 (97%)	822 (98%)	16 (2%)	57	71
1	C	838/862 (97%)	816 (97%)	22 (3%)	46	58
2	D	120/132 (91%)	118 (98%)	2 (2%)	60	74
2	E	117/132 (89%)	114 (97%)	3 (3%)	46	58
All	All	2762/2850 (97%)	2707 (98%)	55 (2%)	55	69

All (55) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	11	PHE
1	A	49	TYR
1	A	60	THR
1	A	112	GLN
1	A	330	THR
1	A	415	ASN
1	A	452	VAL
1	A	505	HIS
1	A	672	VAL
1	A	801	PHE
1	A	968	VAL
1	A	1034	SER
1	B	11	PHE
1	B	30	LEU
1	B	48	SER

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Mol	Chain	Res	Type
1	B	49	TYR
1	B	81	ASN
1	B	128	SER
1	B	132	SER
1	B	261	LEU
1	B	293	LEU
1	B	324	VAL
1	B	365	THR
1	B	472	ILE
1	B	510	LYS
1	B	530	SER
1	B	976	LEU
1	B	987	MET
1	C	10	ILE
1	C	11	PHE
1	C	49	TYR
1	C	87	THR
1	C	152	GLU
1	C	324	VAL
1	C	361	ASN
1	C	392	THR
1	C	394	THR
1	C	448	VAL
1	C	452	VAL
1	C	482	VAL
1	C	483	LEU
1	C	510	LYS
1	C	540	ARG
1	C	584	GLN
1	C	587	THR
1	C	641	GLU
1	C	676	THR
1	C	876	LEU
1	C	968	VAL
1	C	993	THR
2	D	45	VAL
2	D	139	VAL
2	E	28	ASP
2	E	45	VAL
2	E	139	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	109	ASN
1	A	112	GLN
1	A	360	GLN
1	A	517	ASN
1	A	726	GLN
1	B	81	ASN
1	B	108	GLN
1	C	124	GLN
1	C	569	GLN
2	E	89	HIS

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](#)

7 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	LMT	A	1102	-	36,36,36	0.54	1 (2%)	47,47,47	1.16	5 (10%)
3	LMT	C	1102	-	36,36,36	0.57	1 (2%)	47,47,47	0.95	2 (4%)
3	LMT	A	1101	-	36,36,36	0.37	0	47,47,47	1.06	4 (8%)
3	LMT	A	1103	-	28,28,36	0.51	0	39,39,47	1.36	4 (10%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	LMT	B	1101	-	36,36,36	0.40	0	47,47,47	1.00	2 (4%)
3	LMT	B	1102	-	36,36,36	0.52	0	47,47,47	1.22	4 (8%)
3	LMT	C	1101	-	36,36,36	0.44	0	47,47,47	0.90	1 (2%)

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	LMT	A	1102	-	-	12/21/61/61	0/2/2/2
3	LMT	C	1102	-	-	9/21/61/61	0/2/2/2
3	LMT	A	1101	-	-	8/21/61/61	0/2/2/2
3	LMT	A	1103	-	-	6/13/53/61	0/2/2/2
3	LMT	B	1101	-	-	5/21/61/61	0/2/2/2
3	LMT	B	1102	-	-	5/21/61/61	0/2/2/2
3	LMT	C	1101	-	-	7/21/61/61	0/2/2/2

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	1102	LMT	O1'-C1'	2.26	1.44	1.40
3	A	1102	LMT	O1'-C1'	2.11	1.43	1.40

All (22) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	1102	LMT	O1'-C1'-C2'	5.23	116.47	108.30
3	A	1103	LMT	O1B-C4'-C5'	4.60	122.06	109.45
3	A	1102	LMT	C1B-O5B-C5B	3.43	120.42	113.69
3	C	1102	LMT	O1B-C1B-C2B	2.80	115.36	108.10
3	C	1102	LMT	O1'-C1'-C2'	2.76	112.61	108.30
3	B	1102	LMT	C1'-O5'-C5'	-2.64	108.51	113.69
3	A	1101	LMT	C1B-O1B-C4'	-2.58	111.57	117.96
3	A	1103	LMT	O5'-C5'-C4'	-2.52	104.44	109.75
3	A	1102	LMT	O5'-C5'-C6'	2.48	112.60	106.44
3	A	1101	LMT	C3B-C4B-C5B	2.42	114.55	110.24
3	A	1102	LMT	C1'-C2'-C3'	2.37	114.94	110.00
3	A	1103	LMT	O5'-C1'-O1'	-2.33	104.46	109.97
3	B	1101	LMT	C4B-C3B-C2B	-2.32	106.77	110.82

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	1102	LMT	O5B-C5B-C6B	2.31	112.18	106.44
3	B	1101	LMT	O5B-C5B-C4B	2.30	113.87	109.69
3	A	1101	LMT	O5'-C1'-O1'	-2.30	104.54	109.97
3	B	1102	LMT	O5'-C1'-C2'	-2.24	105.61	110.35
3	A	1103	LMT	C6'-C5'-C4'	2.23	119.82	113.33
3	C	1101	LMT	C1B-O1B-C4'	-2.21	112.50	117.96
3	B	1102	LMT	C1B-C2B-C3B	2.14	114.45	110.00
3	A	1102	LMT	O5B-C5B-C4B	2.09	113.49	109.69
3	A	1101	LMT	O5B-C5B-C4B	2.05	113.42	109.69

There are no chirality outliers.

All (52) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	1101	LMT	C2'-C1'-O1'-C1
3	A	1101	LMT	O5'-C1'-O1'-C1
3	A	1103	LMT	C2'-C1'-O1'-C1
3	A	1103	LMT	O5'-C1'-O1'-C1
3	B	1101	LMT	C2'-C1'-O1'-C1
3	B	1101	LMT	O5'-C1'-O1'-C1
3	C	1101	LMT	C2'-C1'-O1'-C1
3	C	1101	LMT	O5'-C1'-O1'-C1
3	C	1102	LMT	C2B-C1B-O1B-C4'
3	A	1103	LMT	C5'-C4'-O1B-C1B
3	B	1102	LMT	C2'-C1'-O1'-C1
3	C	1102	LMT	C2'-C1'-O1'-C1
3	A	1103	LMT	O5B-C5B-C6B-O6B
3	C	1101	LMT	O1'-C1-C2-C3
3	C	1101	LMT	C3-C4-C5-C6
3	A	1102	LMT	C2-C3-C4-C5
3	A	1101	LMT	C3-C4-C5-C6
3	A	1102	LMT	C1-C2-C3-C4
3	A	1101	LMT	C7-C8-C9-C10
3	A	1102	LMT	O1'-C1-C2-C3
3	A	1102	LMT	C4-C5-C6-C7
3	A	1102	LMT	C5-C6-C7-C8
3	A	1101	LMT	C11-C10-C9-C8
3	B	1102	LMT	C4'-C5'-C6'-O6'
3	C	1101	LMT	C6-C7-C8-C9
3	C	1102	LMT	O5B-C5B-C6B-O6B
3	A	1101	LMT	C2-C3-C4-C5
3	C	1101	LMT	C2-C3-C4-C5

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Mol	Chain	Res	Type	Atoms
3	A	1101	LMT	C6-C7-C8-C9
3	C	1101	LMT	O5B-C5B-C6B-O6B
3	A	1102	LMT	C3-C4-C5-C6
3	C	1102	LMT	O5'-C5'-C6'-O6'
3	C	1102	LMT	C2-C3-C4-C5
3	A	1103	LMT	C1-C2-C3-C4
3	B	1101	LMT	C2-C1-O1'-C1'
3	B	1101	LMT	O1'-C1-C2-C3
3	A	1102	LMT	C9-C10-C11-C12
3	B	1102	LMT	O5'-C5'-C6'-O6'
3	B	1101	LMT	C1-C2-C3-C4
3	A	1102	LMT	C11-C10-C9-C8
3	C	1102	LMT	C5-C6-C7-C8
3	A	1101	LMT	O1'-C1-C2-C3
3	A	1102	LMT	C7-C8-C9-C10
3	C	1102	LMT	C7-C8-C9-C10
3	A	1103	LMT	C4B-C5B-C6B-O6B
3	C	1102	LMT	C4-C5-C6-C7
3	A	1102	LMT	C2-C1-O1'-C1'
3	A	1102	LMT	O5'-C1'-O1'-C1
3	B	1102	LMT	C4B-C5B-C6B-O6B
3	B	1102	LMT	O5B-C5B-C6B-O6B
3	A	1102	LMT	C2'-C1'-O1'-C1
3	C	1102	LMT	C1-C2-C3-C4

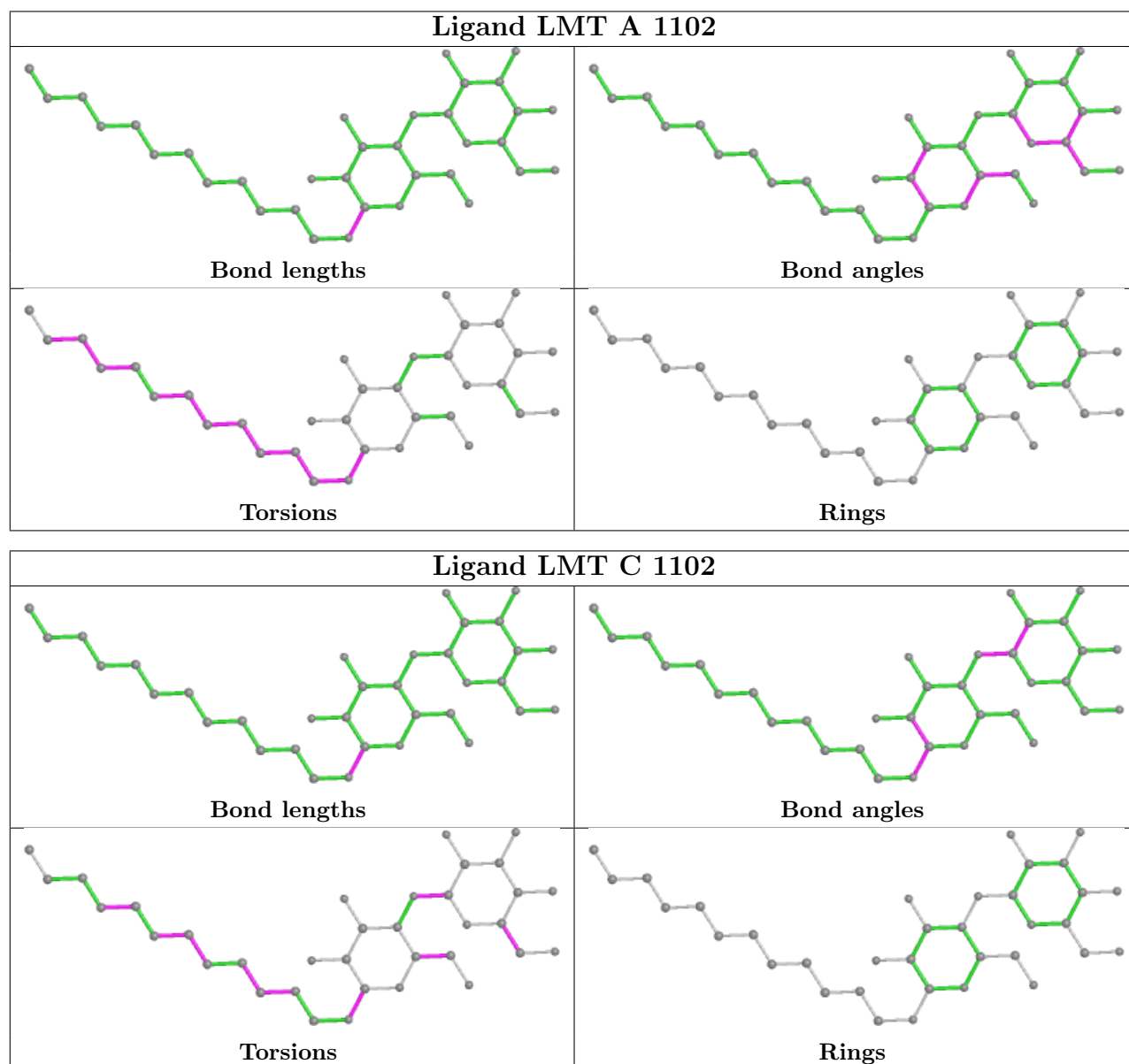
There are no ring outliers.

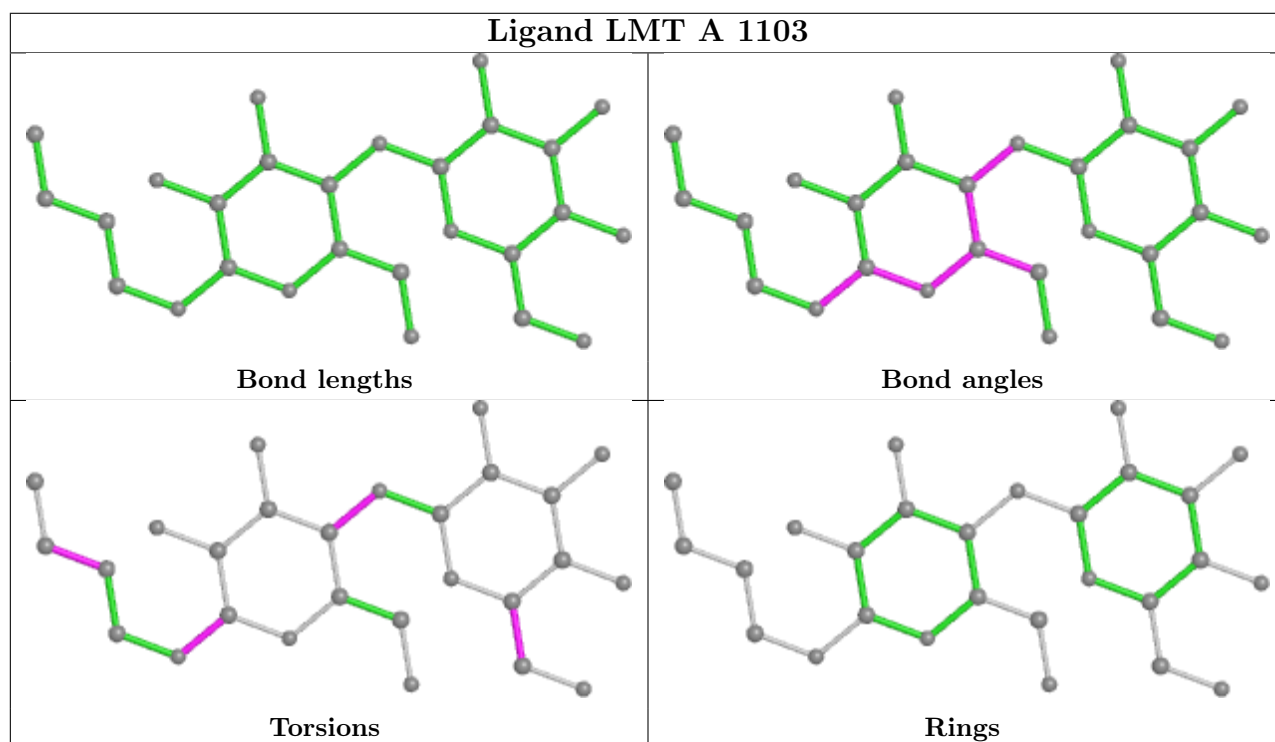
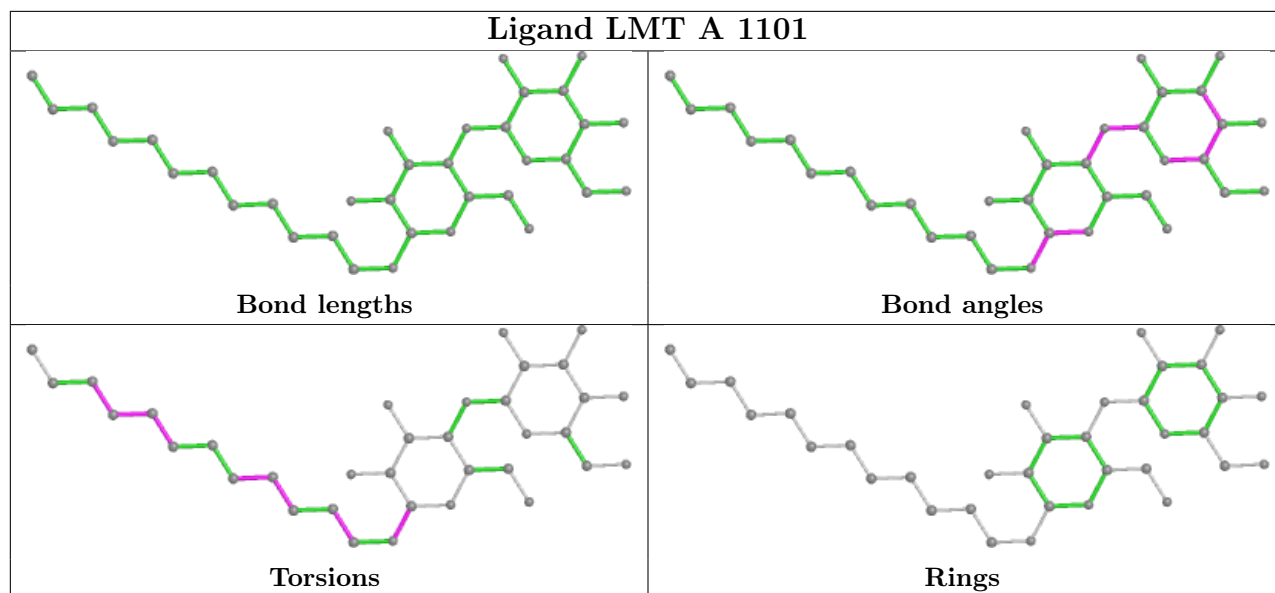
6 monomers are involved in 16 short contacts:

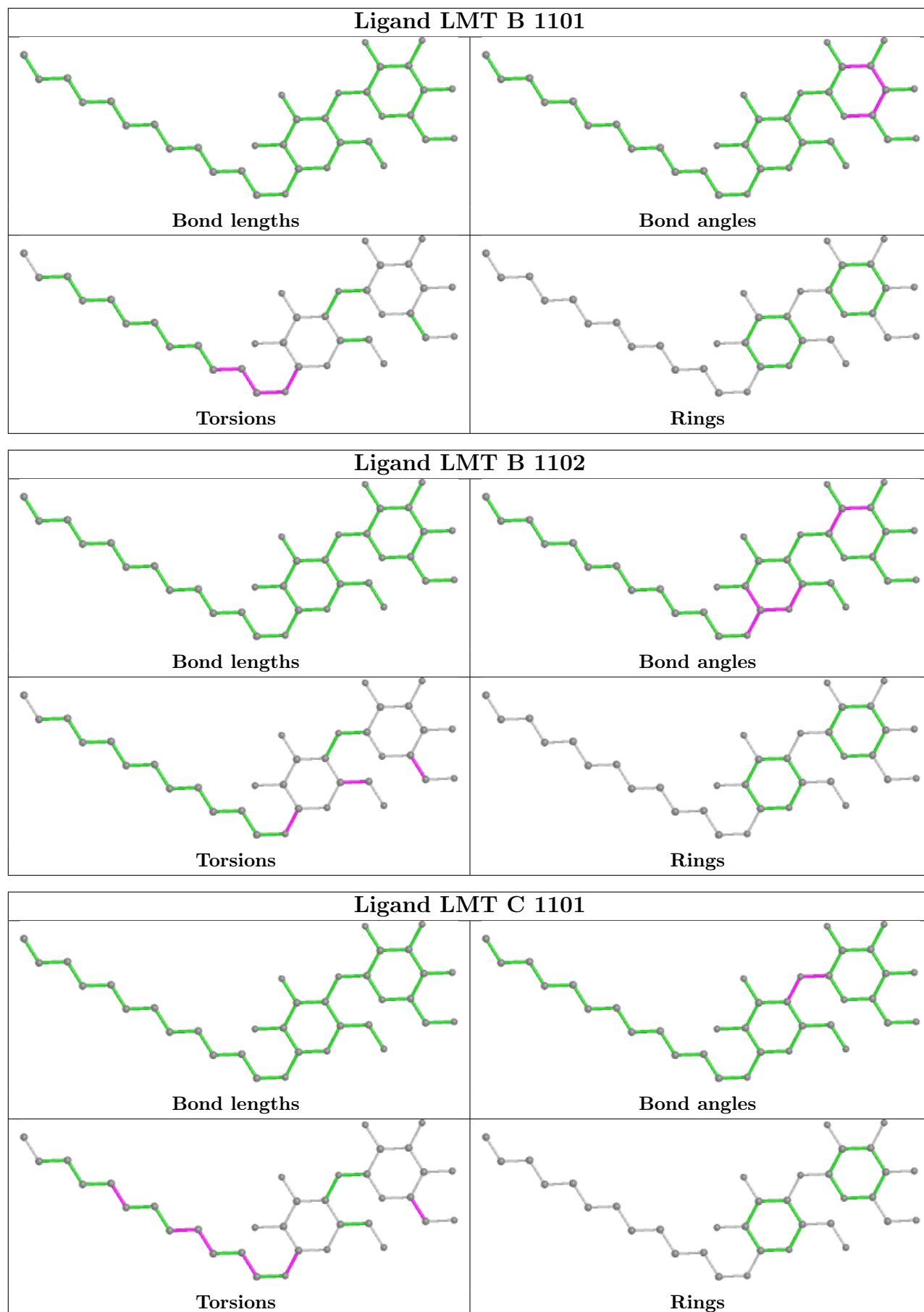
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	1102	LMT	6	0
3	C	1102	LMT	3	0
3	A	1101	LMT	3	0
3	A	1103	LMT	1	0
3	B	1101	LMT	2	0
3	B	1102	LMT	1	0

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 than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be

highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.







5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	1044/1057 (98%)	0.11	102 (9%) 7 6	15, 42, 110, 164	0
1	B	1033/1057 (97%)	-0.41	16 (1%) 73 72	16, 37, 59, 92	0
1	C	1033/1057 (97%)	-0.49	9 (0%) 84 83	16, 30, 55, 104	0
2	D	156/169 (92%)	-0.39	2 (1%) 77 75	27, 38, 66, 99	0
2	E	152/169 (89%)	0.26	15 (9%) 7 6	36, 50, 82, 94	0
All	All	3418/3509 (97%)	-0.25	144 (4%) 36 34	15, 37, 82, 164	0

All (144) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	506	GLY	10.0
1	A	509	LYS	9.4
1	A	512	PHE	9.4
1	A	508	GLY	8.8
1	A	505	HIS	8.4
1	A	507	GLU	8.1
1	A	513	PHE	7.8
1	A	540	ARG	7.8
1	A	503	GLY	7.7
1	A	534	ILE	7.0
1	A	501	ALA	6.9
1	A	511	GLY	6.8
1	A	515	TRP	6.8
1	A	543	VAL	6.3
1	A	541	TYR	6.2
1	A	510	LYS	6.1
1	A	1035	ARG	5.9
1	A	421	ALA	5.9
1	A	516	PHE	5.6
1	A	869	SER	5.6

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Mol	Chain	Res	Type	RSRZ
1	A	514	GLY	5.4
2	D	11	GLY	5.3
1	A	529	ASP	5.1
1	A	518	ARG	5.1
1	A	519	MET	5.1
1	A	1029	VAL	5.0
1	A	504	ASP	5.0
1	A	539	GLY	5.0
1	A	870	GLY	4.8
1	A	1037	ASN	4.5
1	A	502	LYS	4.4
1	A	554	TYR	4.3
1	A	433	LYS	4.3
1	A	542	LEU	4.2
1	A	422	GLU	4.2
1	A	678	THR	4.0
1	A	536	ARG	4.0
1	A	500	ILE	4.0
1	A	968	VAL	3.9
1	A	531	VAL	3.9
1	A	517	ASN	3.8
1	A	672	VAL	3.7
1	A	1036	LYS	3.7
1	A	533	GLY	3.7
1	A	619	GLY	3.7
1	A	425	LEU	3.7
1	C	362	PHE	3.7
1	B	498	LYS	3.5
1	B	499	PRO	3.4
1	A	462	SER	3.4
1	A	423	GLU	3.4
1	A	520	PHE	3.4
1	A	617	PHE	3.4
1	A	868	LEU	3.4
1	A	535	LEU	3.3
2	E	68	LYS	3.3
2	E	35	ALA	3.3
1	A	550	VAL	3.3
1	A	1044	HIS	3.1
1	A	4	PHE	3.1
1	A	963	ALA	3.1
1	A	1031	ARG	3.1

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Mol	Chain	Res	Type	RSRZ
1	A	1034	SER	3.1
1	A	965	LEU	3.1
1	A	1038	GLU	3.1
1	A	873	ALA	3.1
1	A	499	PRO	3.0
1	A	833	PRO	3.0
1	B	508	GLY	3.0
1	B	501	ALA	3.0
1	A	918	PHE	3.0
1	A	38	ILE	3.0
1	A	459	PHE	2.9
1	A	1033	PHE	2.9
1	A	558	ARG	2.9
1	A	1042	HIS	2.9
1	A	431	THR	2.9
1	A	952	LEU	2.9
1	A	526	HIS	2.9
1	A	530	SER	2.8
2	E	32	ILE	2.8
1	A	527	TYR	2.8
1	A	834	GLY	2.8
1	B	653	ARG	2.8
1	C	1032	ARG	2.8
1	A	522	LYS	2.8
1	A	832	ALA	2.8
1	A	525	HIS	2.8
1	A	546	LEU	2.7
2	D	12	SER	2.7
2	E	66	LEU	2.7
2	E	166	GLN	2.7
1	A	967	ALA	2.7
1	A	1040	ILE	2.7
1	A	713	LEU	2.6
1	A	1020	PHE	2.6
1	C	510	LYS	2.6
2	E	37	GLY	2.6
2	E	138	ASP	2.6
1	B	514	GLY	2.6
1	A	362	PHE	2.5
1	C	428	LYS	2.5
2	E	31	ARG	2.5
1	B	510	LYS	2.5

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Mol	Chain	Res	Type	RSRZ
1	A	537	SER	2.5
1	B	674	LEU	2.5
1	A	544	LEU	2.5
1	A	1041	GLU	2.4
2	E	165	LEU	2.4
2	E	28	ASP	2.4
1	A	432	ARG	2.4
1	A	426	PRO	2.4
1	A	835	LYS	2.3
1	B	955	LYS	2.3
1	A	956	GLU	2.3
1	C	618	ALA	2.3
1	B	511	GLY	2.3
1	B	659	LYS	2.3
1	A	618	ALA	2.3
1	B	554	TYR	2.2
1	B	660	ASP	2.2
1	A	969	ARG	2.2
1	A	556	PHE	2.2
2	E	139	VAL	2.2
2	E	97	GLU	2.2
1	C	429	GLU	2.2
1	A	707	ALA	2.1
1	B	600	THR	2.1
1	A	521	GLU	2.1
1	A	532	GLY	2.1
2	E	36	ASN	2.1
1	C	811	TYR	2.1
2	E	100	LEU	2.1
1	A	1043	SER	2.1
1	A	674	LEU	2.1
1	B	957	GLY	2.1
1	A	1032	ARG	2.1
1	A	557	VAL	2.1
1	A	547	ILE	2.0
1	B	558	ARG	2.0
1	C	498	LYS	2.0
1	A	357	LEU	2.0
2	E	67	LEU	2.0
1	C	797	GLN	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](#)

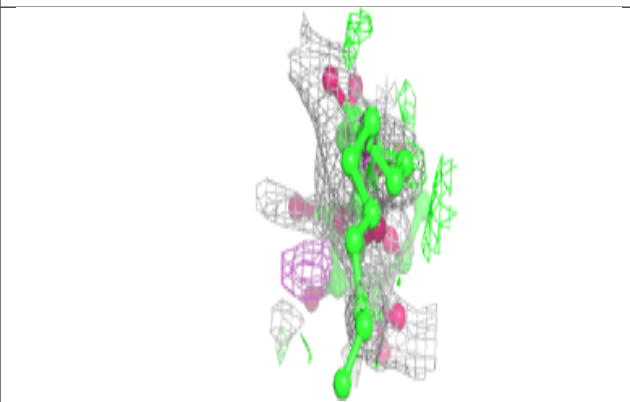
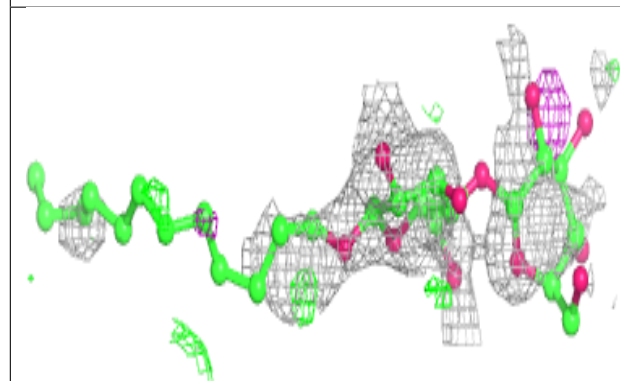
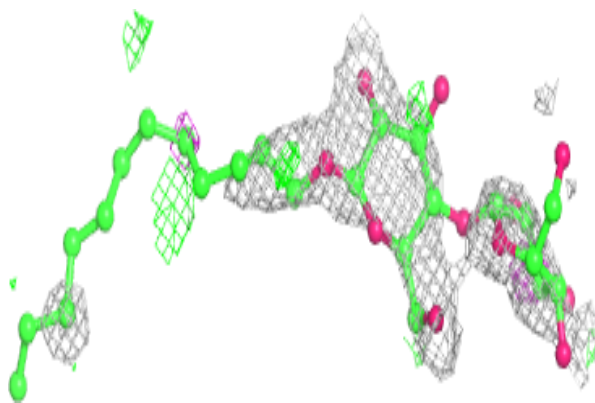
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	LMT	A	1102	35/35	0.62	0.43	100,114,125,127	0
3	LMT	A	1103	27/35	0.85	0.17	69,82,90,92	0
3	LMT	B	1102	35/35	0.86	0.24	40,67,83,88	0
3	LMT	C	1102	35/35	0.86	0.14	37,85,101,111	0
3	LMT	A	1101	35/35	0.91	0.16	27,55,81,90	0
3	LMT	B	1101	35/35	0.92	0.18	48,58,83,86	0
3	LMT	C	1101	35/35	0.94	0.14	38,59,68,75	0

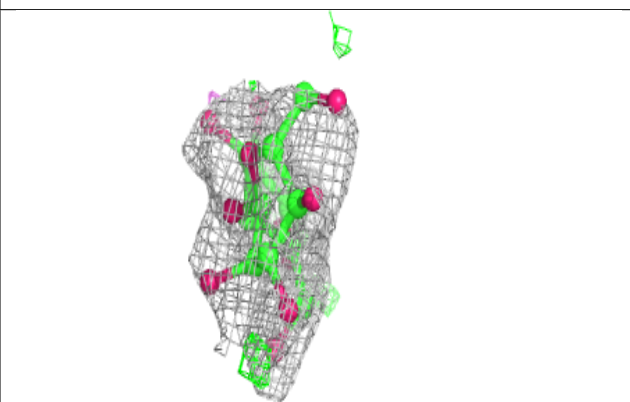
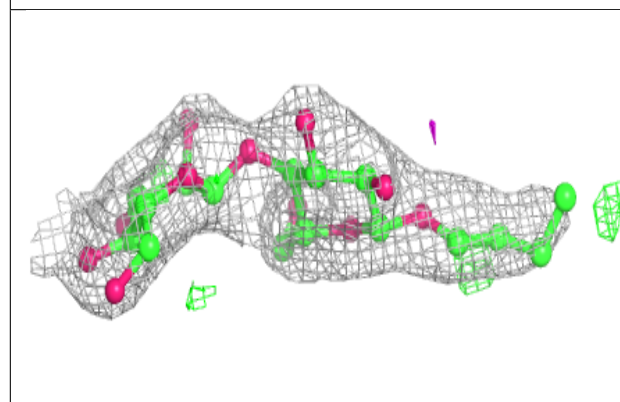
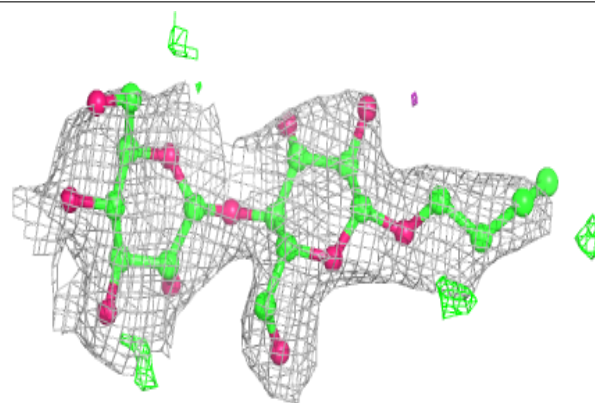
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around LMT A 1102:

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

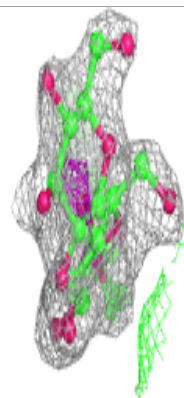
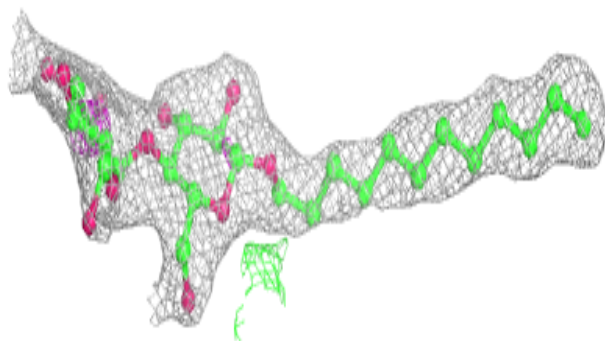
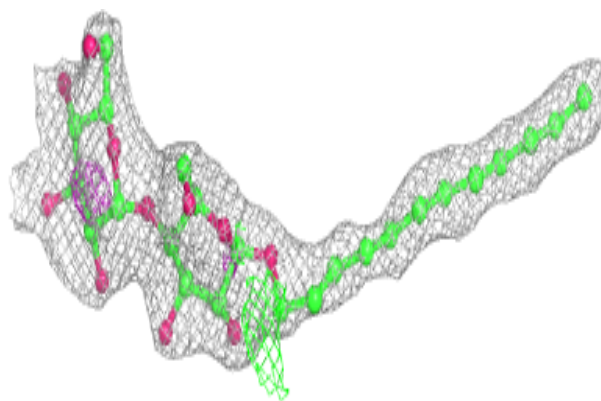
**Electron density around LMT A 1103:**

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

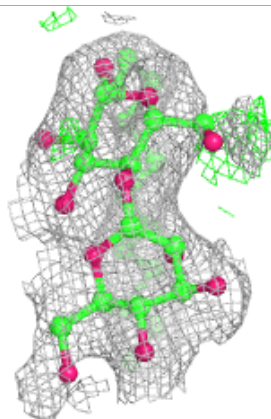
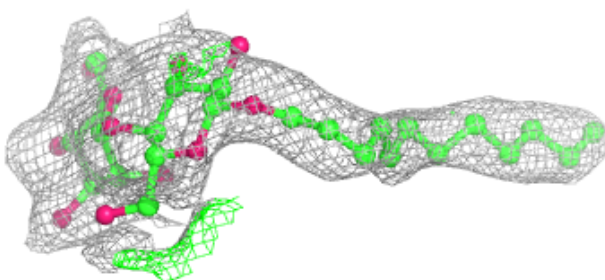
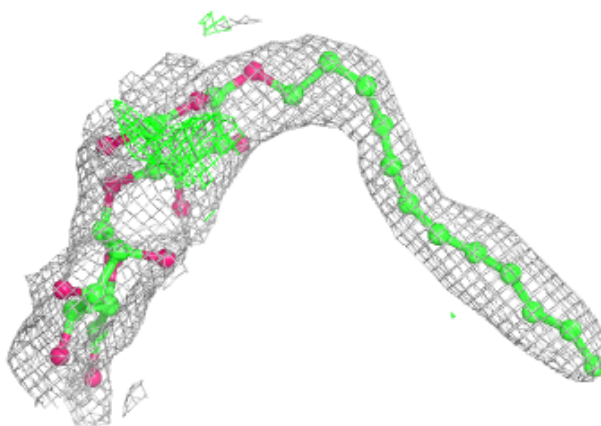


Electron density around LMT B 1102:

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

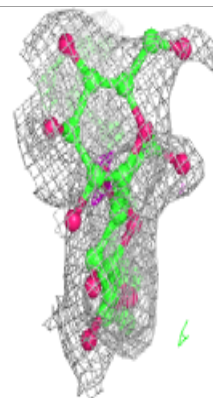
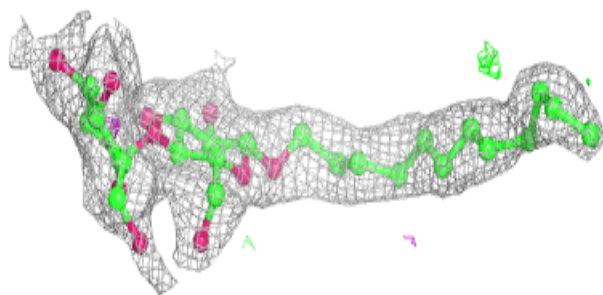
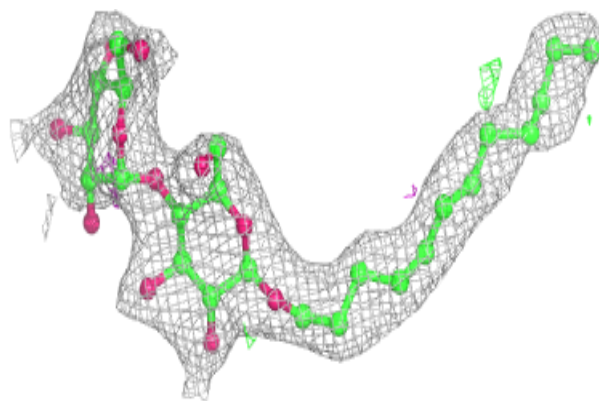
**Electron density around LMT C 1102:**

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

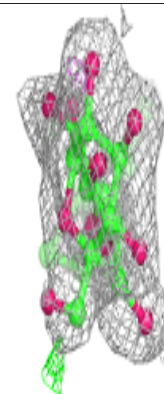
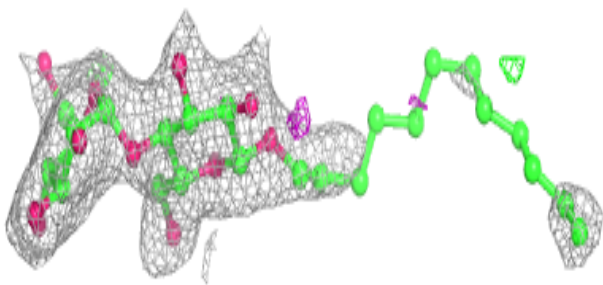
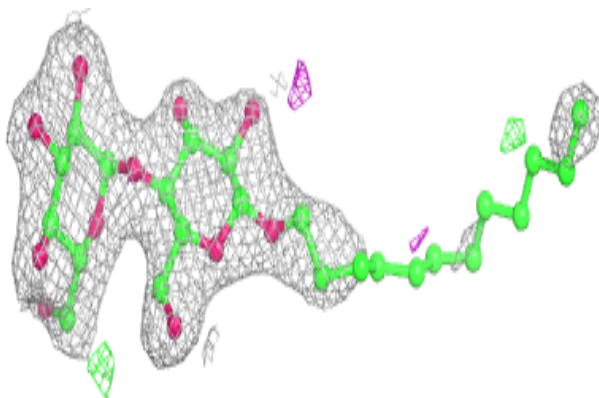


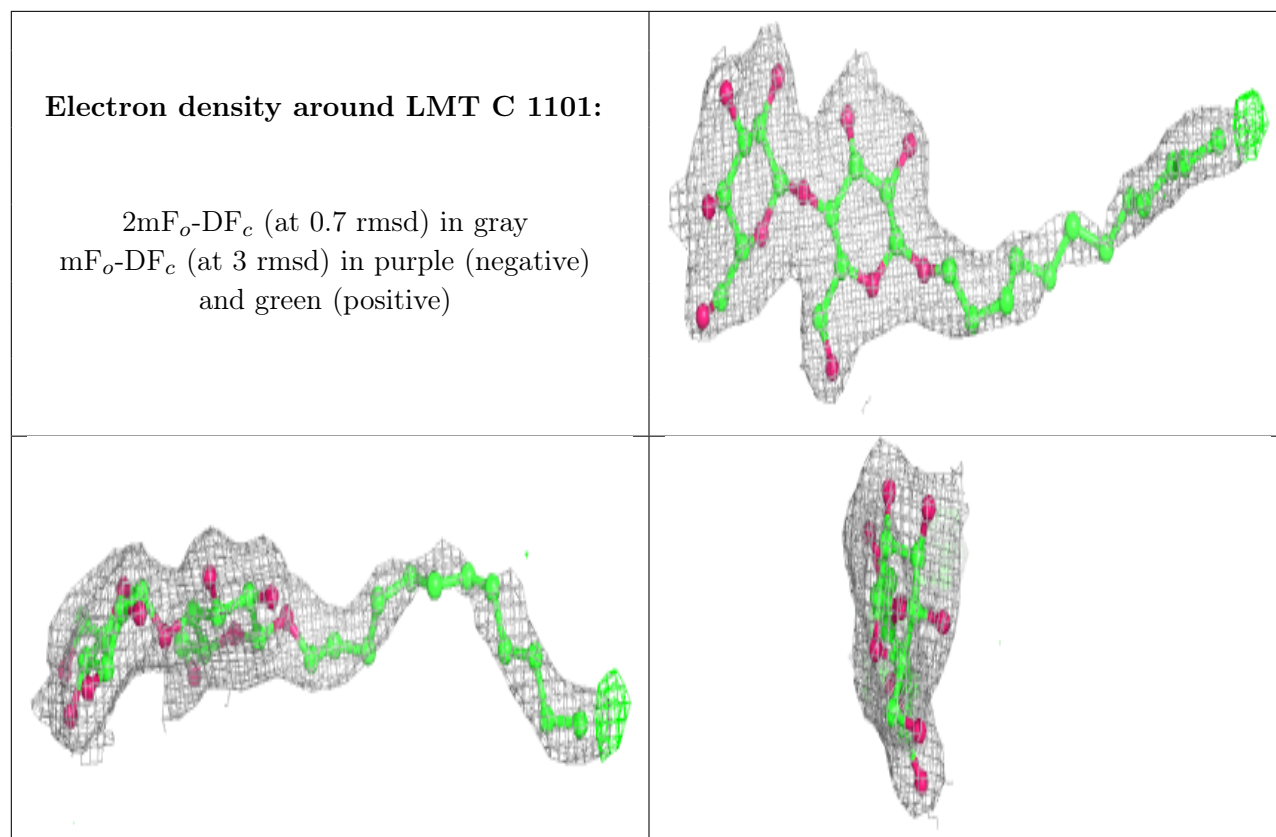
Electron density around LMT A 1101:

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

**Electron density around LMT B 1101:**

$2mF_o-DF_c$ (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.