



# wwPDB X-ray Structure Validation Summary Report ⓘ

May 11, 2021 – 09:17 am BST

PDB ID : 6ZOA  
Title : Partially induced AcrB T protomer and DDM binding to the TM8/PC2 pathway of AcrB L2 protomer  
Authors : Tam, H.K.; Foong, W.E.; Pos, K.M.  
Deposited on : 2020-07-07  
Resolution : 3.05 Å(reported)

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

We welcome your comments at [validation@mail.wwpdb.org](mailto: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.

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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 : 2.18  
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) : 2.18

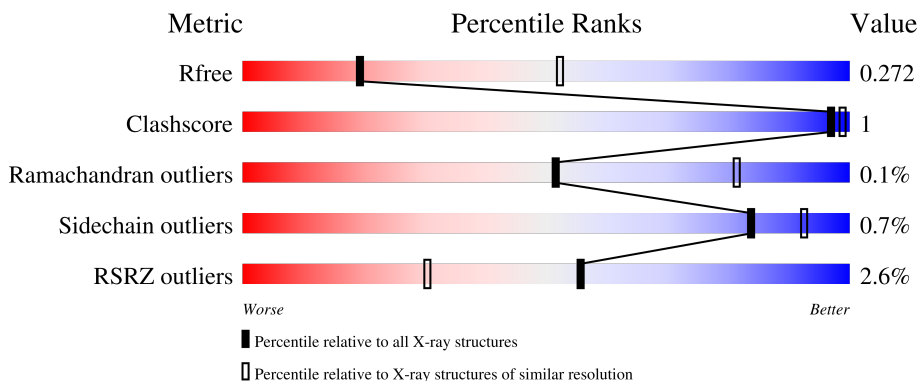
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.05 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	1754 (3.10-3.02)
Clashscore	141614	1864 (3.10-3.02)
Ramachandran outliers	138981	1794 (3.10-3.02)
Sidechain outliers	138945	1793 (3.10-3.02)
RSRZ outliers	127900	1713 (3.10-3.02)

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  $\geq 3$ , 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	 3% 94% 5%
1	B	1057	 2% 94%
1	C	1057	 % 95%
2	D	169	 6% 92% 8%
2	E	169	 9% 91% 9%

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:

<b>Mol</b>	<b>Type</b>	<b>Chain</b>	<b>Res</b>	<b>Chirality</b>	<b>Geometry</b>	<b>Clashes</b>	<b>Electron density</b>
11	OCT	B	1108	-	-	-	X
3	LMT	A	1104	-	-	-	X

## 2 Entry composition i

There are 15 unique types of molecules in this entry. The entry contains 26771 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	1042	7932	5099	1314	1475	44	0	1	0
1	B	1024	7800	5024	1286	1446	44	0	0	0
1	C	1035	7866	5061	1300	1461	44	0	0	0

There are 24 discrepancies between the modelled and reference sequences:

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

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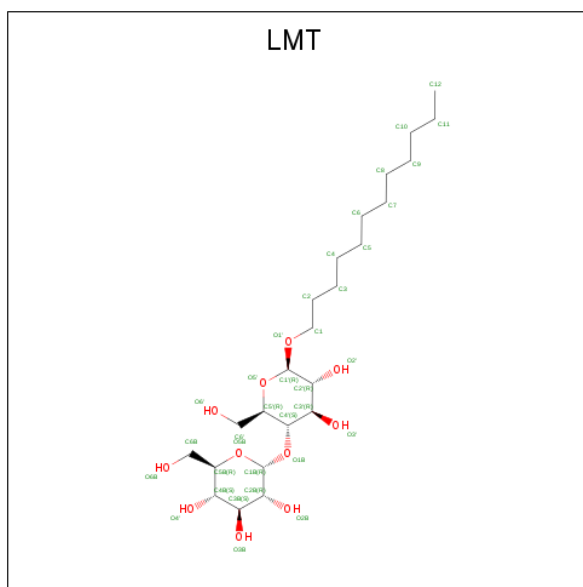
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Chain	Residue	Modelled	Actual	Comment	Reference
C	1057	HIS	-	expression tag	UNP P31224

- Molecule 2 is a protein called DARPIN.

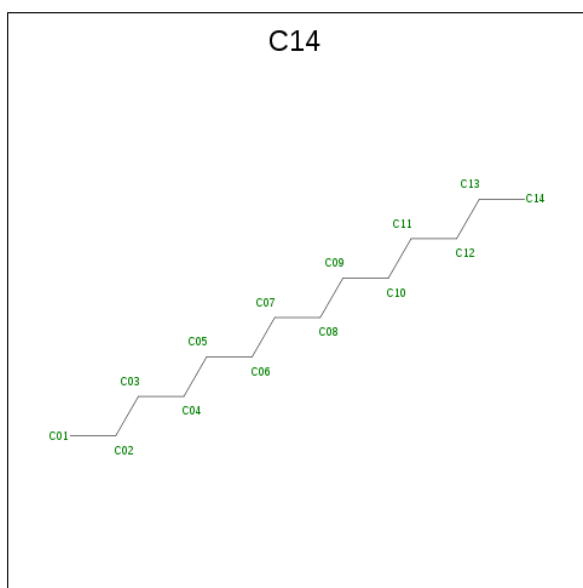
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	D	156	1177	741	206	229	1	0	0	0
2	E	154	1167	736	204	226	1	0	0	0

- Molecule 3 is DODECYL-BETA-D-MALTOSE (three-letter code: LMT) (formula:  $C_{24}H_{46}O_{11}$ ) (labeled as "Ligand of Interest" by depositor).



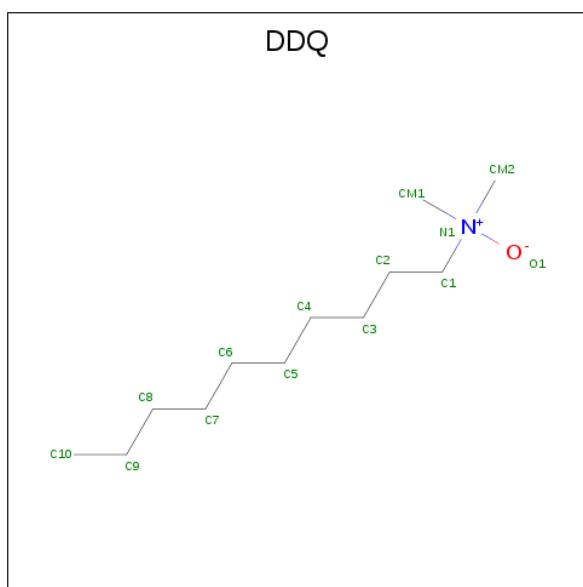
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
3	A	1	35	24	11	0	0
3	A	1	35	24	11	0	0
3	A	1	35	24	11	0	0
3	A	1	35	24	11	0	0
3	B	1	35	24	11	0	0
3	C	1	35	24	11	0	0

- Molecule 4 is TETRADECANE (three-letter code: C14) (formula:  $C_{14}H_{30}$ ).



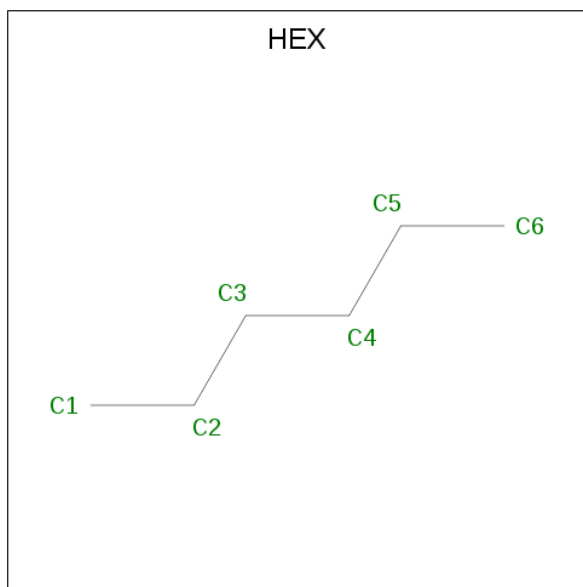
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C 14 14	0	0
4	B	1	Total C 14 14	0	0
4	B	1	Total C 14 14	0	0
4	B	1	Total C 14 14	0	0

- Molecule 5 is DECYLAMINE-N,N-DIMETHYL-N-OXIDE (three-letter code: DDQ) (formula:  $C_{12}H_{27}NO$ ).



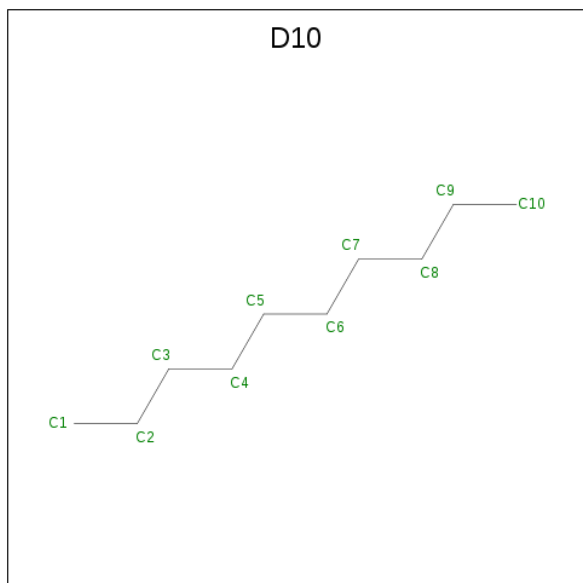
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total	C	N	O	0	0
			14	12	1	1		
5	A	1	Total	C	N	O	0	0
			14	12	1	1		
5	B	1	Total	C	N	O	0	0
			14	12	1	1		
5	B	1	Total	C	N	O	0	0
			14	12	1	1		
5	C	1	Total	C	N	O	0	0
			14	12	1	1		
5	C	1	Total	C	N	O	0	0
			14	12	1	1		

- Molecule 6 is HEXANE (three-letter code: HEX) (formula: C<sub>6</sub>H<sub>14</sub>).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total C 6 6	0	0
6	A	1	Total C 6 6	0	0
6	B	1	Total C 6 6	0	0
6	C	1	Total C 6 6	0	0

- Molecule 7 is DECANE (three-letter code: D10) (formula:  $C_{10}H_{22}$ ).



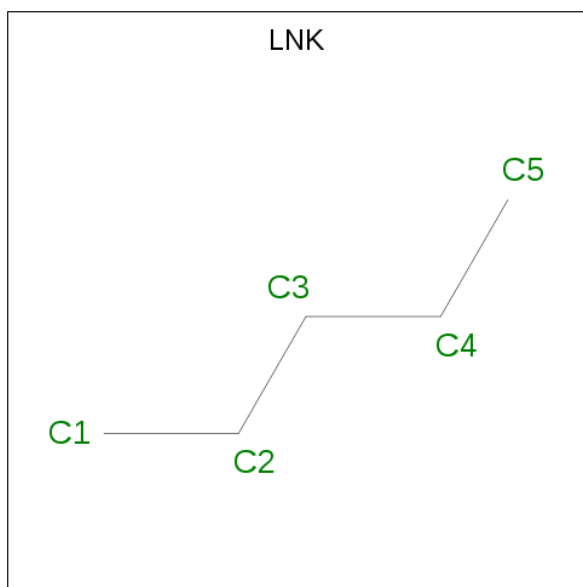


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	1	Total C 10 10	0	0

- Molecule 8 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

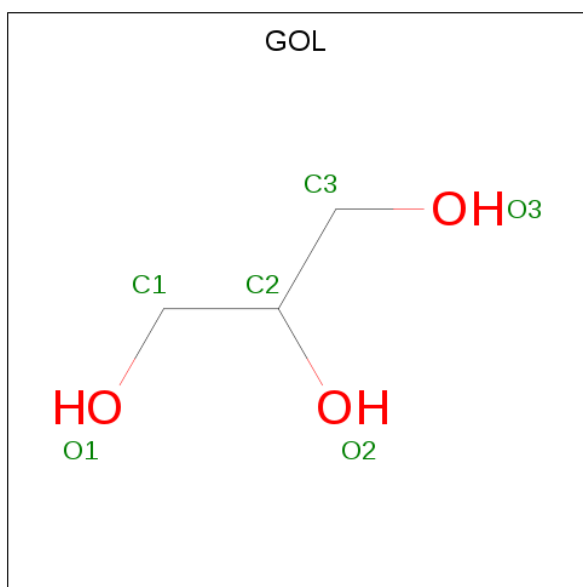
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	A	1	Total Cl 1 1	0	0

- Molecule 9 is PENTANE (three-letter code: LNK) (formula: C<sub>5</sub>H<sub>12</sub>).



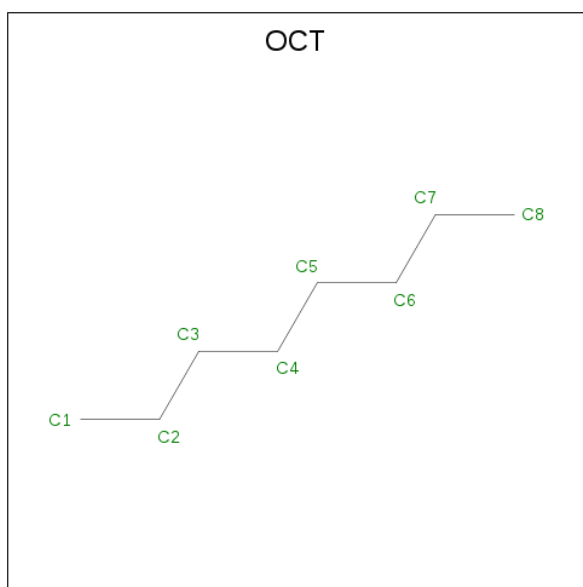
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	A	1	Total C 5 5	0	0

- Molecule 10 is GLYCEROL (three-letter code: GOL) (formula: C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	A	1	Total	C O	0	0
			6	3 3		
10	A	1	Total	C O	0	0
			6	3 3		
10	B	1	Total	C O	0	0
			6	3 3		

- Molecule 11 is N-OCTANE (three-letter code: OCT) (formula: C<sub>8</sub>H<sub>18</sub>).



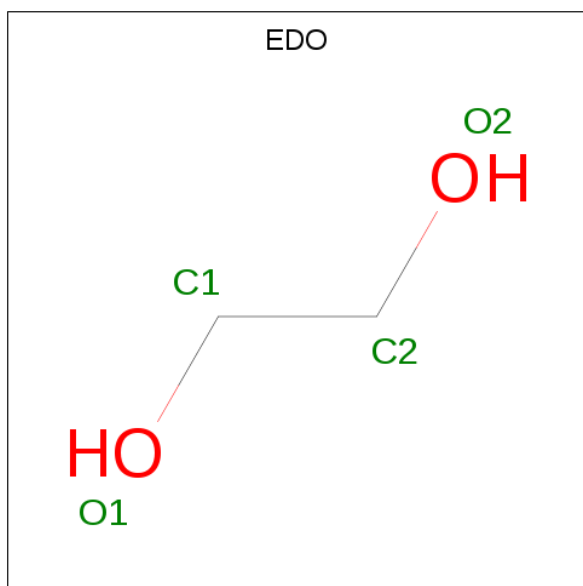
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
11	B	1	Total	C	0	0
			8	8		

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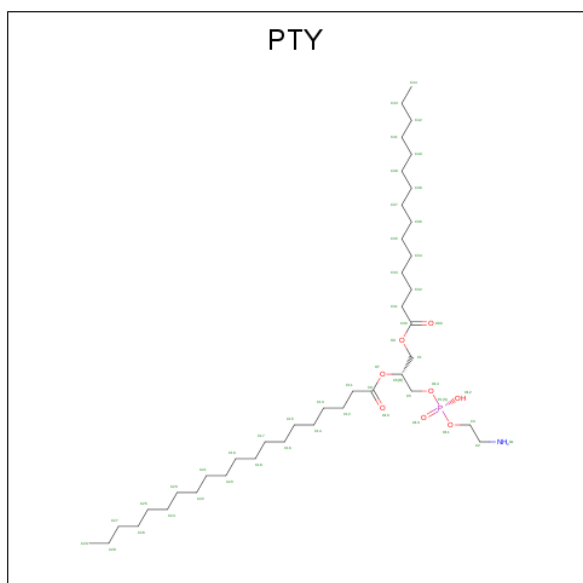
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
11	C	1	Total C 8 8	0	0

- Molecule 12 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C<sub>2</sub>H<sub>6</sub>O<sub>2</sub>).



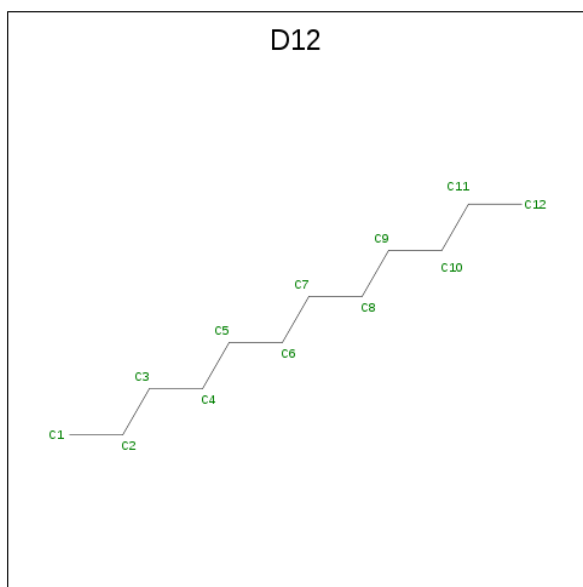
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
12	B	1	Total C O 4 2 2	0	0

- Molecule 13 is PHOSPHATIDYLETHANOLAMINE (three-letter code: PTY) (formula: C<sub>40</sub>H<sub>80</sub>NO<sub>8</sub>P).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
13	C	1	Total	C	N	O	P	0	0
			50	40	1	8	1		
13	C	1	Total	C	N	O	P	0	0
			50	40	1	8	1		

- Molecule 14 is DODECANE (three-letter code: D12) (formula:  $C_{12}H_{26}$ ).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
14	C	1	Total	C	0	0
			12	12		

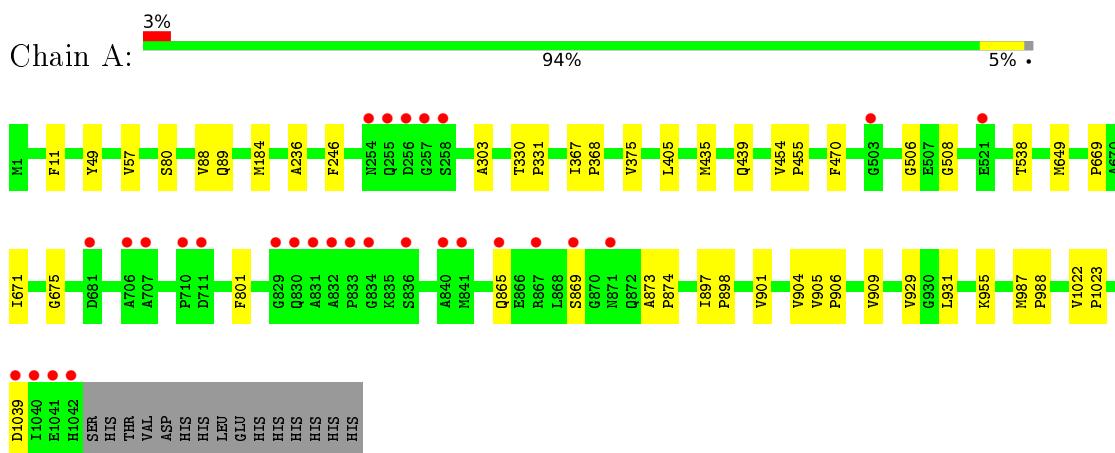
- Molecule 15 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
15	A	86	Total	O	0	0
			86	86		
15	B	83	Total	O	0	0
			83	83		
15	C	86	Total	O	0	0
			86	86		
15	D	15	Total	O	0	0
			15	15		
15	E	5	Total	O	0	0
			5	5		

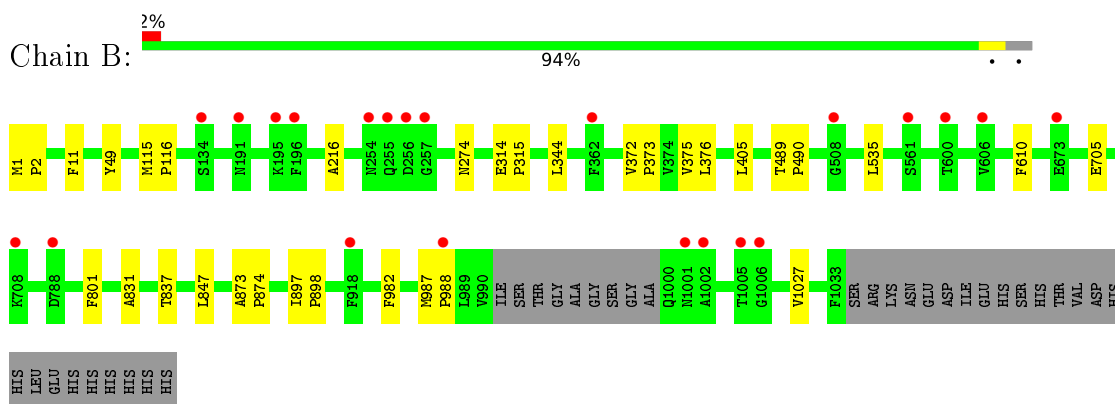
### 3 Residue-property plots [i](#)

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

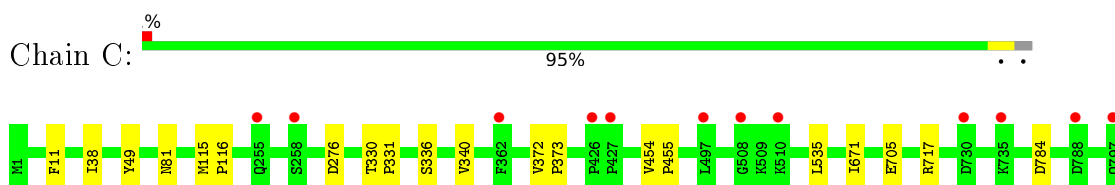
- Molecule 1: Multidrug efflux pump subunit AcrB

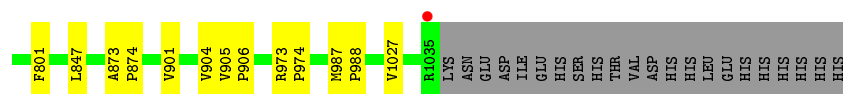


- Molecule 1: Multidrug efflux pump subunit AcrB

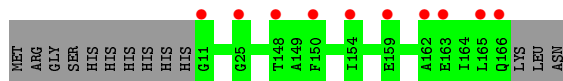


- Molecule 1: Multidrug efflux pump subunit AcrB

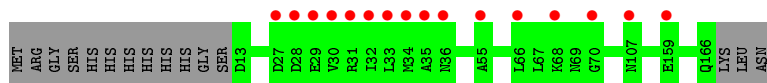
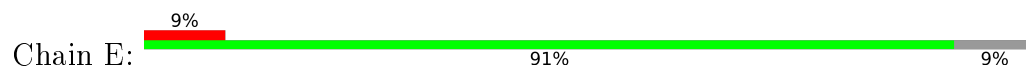




- Molecule 2: DARPIN



- Molecule 2: DARPIN



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	145.60Å 162.99Å 246.38Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.68 – 3.05 49.68 – 3.05	Depositor EDS
% Data completeness (in resolution range)	99.7 (49.68-3.05) 99.7 (49.68-3.05)	Depositor EDS
$R_{merge}$	0.29	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.50 (at 3.07Å)	Xtrriage
Refinement program	REFMAC 5.8.0238	Depositor
R, $R_{free}$	0.240 , 0.272 0.243 , 0.272	Depositor DCC
$R_{free}$ test set	5610 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	56.9	Xtrriage
Anisotropy	0.751	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.32 , 51.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.47$ , $\langle L^2 \rangle = 0.30$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.89	EDS
Total number of atoms	26771	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	63.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 1.97% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: CL, HEX, D10, LMT, DDQ, PTY, GOL, LNK, D12, C14, EDO, OCT

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	A	0.67	0/8086	0.70	0/10978
1	B	0.67	0/7949	0.70	0/10794
1	C	0.67	0/8016	0.70	0/10885
2	D	0.68	0/1196	0.71	0/1626
2	E	0.68	0/1186	0.70	0/1613
All	All	0.67	0/26433	0.70	0/35896

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 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	7932	0	8076	20	0
1	B	7800	0	7953	14	0
1	C	7866	0	8019	13	0
2	D	1177	0	1159	0	0
2	E	1167	0	1151	0	0
3	A	140	0	184	0	0
3	B	35	0	46	0	0
3	C	35	0	46	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	A	14	0	30	0	0
4	B	42	0	90	0	0
5	A	28	0	54	0	0
5	B	28	0	54	0	0
5	C	42	0	81	0	0
6	A	12	0	28	0	0
6	B	6	0	14	0	0
6	C	6	0	14	0	0
7	A	10	0	22	0	0
8	A	1	0	0	0	0
9	A	5	0	12	0	0
10	A	12	0	16	0	0
10	B	6	0	8	0	0
11	B	8	0	18	0	0
11	C	8	0	18	0	0
12	B	4	0	6	0	0
13	C	100	0	158	0	0
14	C	12	0	26	0	0
15	A	86	0	0	0	0
15	B	83	0	0	0	0
15	C	86	0	0	0	0
15	D	15	0	0	0	0
15	E	5	0	0	0	0
All	All	26771	0	27283	47	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 1.

The worst 5 of 47 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:375:VAL:HG11	1:A:405:LEU:HD22	1.76	0.66
1:C:372:VAL:HB	1:C:373:PRO:HD3	1.86	0.57
1:C:38:ILE:HD11	1:C:671:ILE:HD12	1.89	0.55
1:B:873:ALA:HB3	1:B:874:PRO:HD3	1.88	0.55
1:B:375:VAL:HG11	1:B:405:LEU:HD22	1.90	0.54

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	1041/1057 (98%)	1004 (96%)	34 (3%)	3 (0%)	41	70
1	B	1020/1057 (96%)	987 (97%)	32 (3%)	1 (0%)	51	81
1	C	1033/1057 (98%)	1001 (97%)	32 (3%)	0	100	100
2	D	154/169 (91%)	148 (96%)	6 (4%)	0	100	100
2	E	152/169 (90%)	148 (97%)	4 (3%)	0	100	100
All	All	3400/3509 (97%)	3288 (97%)	108 (3%)	4 (0%)	51	81

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	236	ALA
1	B	216	ALA
1	A	538	THR
1	A	671	ILE

### 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	848/863 (98%)	842 (99%)	6 (1%)	84	92
1	B	835/863 (97%)	829 (99%)	6 (1%)	84	92
1	C	841/863 (98%)	834 (99%)	7 (1%)	81	91
2	D	120/132 (91%)	120 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	E	119/132 (90%)	119 (100%)	0	100	100
All	All	2763/2853 (97%)	2744 (99%)	19 (1%)	84	92

5 of 19 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	81	ASN
1	C	784	ASP
1	C	801	PHE
1	C	717	ARG
1	B	274	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

### 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](#)

Of 33 ligands modelled in this entry, 1 is monoatomic - leaving 32 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
6	HEX	A	1109	-	5,5,5	0.13	0	4,4,4	0.08	0
6	HEX	A	1108	-	5,5,5	0.13	0	4,4,4	0.08	0
13	PTY	C	1102	-	49,49,49	0.26	0	52,54,54	0.36	0
3	LMT	C	1101	-	36,36,36	0.48	1 (2%)	47,47,47	0.62	0
5	DDQ	B	1105	-	10,13,13	2.27	1 (10%)	12,15,15	0.55	0
10	GOL	B	1109	-	5,5,5	0.10	0	5,5,5	0.26	0
4	C14	B	1103	-	13,13,13	0.08	0	12,12,12	0.06	0
6	HEX	C	1107	-	5,5,5	0.13	0	4,4,4	0.08	0
10	GOL	A	1113	-	5,5,5	0.10	0	5,5,5	0.25	0
3	LMT	A	1102	-	36,36,36	0.46	0	47,47,47	0.62	0
12	EDO	B	1110	-	3,3,3	0.07	0	2,2,2	0.18	0
11	OCT	B	1108	-	7,7,7	0.11	0	6,6,6	0.07	0
13	PTY	C	1103	-	49,49,49	0.26	0	52,54,54	0.31	0
3	LMT	B	1101	-	36,36,36	0.53	1 (2%)	47,47,47	1.14	4 (8%)
3	LMT	A	1104	-	36,36,36	0.47	0	47,47,47	0.65	0
11	OCT	C	1108	-	7,7,7	0.11	0	6,6,6	0.07	0
9	LNK	A	1112	-	4,4,4	0.15	0	3,3,3	0.20	0
4	C14	B	1102	-	13,13,13	0.08	0	12,12,12	0.05	0
10	GOL	A	1114	-	5,5,5	0.09	0	5,5,5	0.25	0
14	D12	C	1109	-	11,11,11	0.24	0	10,10,10	0.54	0
4	C14	B	1104	-	13,13,13	0.08	0	12,12,12	0.06	0
7	D10	A	1110	-	9,9,9	0.10	0	8,8,8	0.09	0
5	DDQ	C	1104	-	10,13,13	2.27	1 (10%)	12,15,15	0.51	0
4	C14	A	1105	-	13,13,13	0.08	0	12,12,12	0.08	0
3	LMT	A	1103	-	36,36,36	0.50	0	47,47,47	0.71	0
3	LMT	A	1101	-	36,36,36	0.45	0	47,47,47	0.50	0
5	DDQ	C	1106	-	10,13,13	2.28	1 (10%)	12,15,15	0.53	0
6	HEX	B	1107	-	5,5,5	0.13	0	4,4,4	0.08	0
5	DDQ	C	1105	-	10,13,13	2.27	1 (10%)	12,15,15	0.57	0
5	DDQ	B	1106	-	10,13,13	2.27	1 (10%)	12,15,15	0.50	0
5	DDQ	A	1106	-	10,13,13	2.29	1 (10%)	12,15,15	0.55	0
5	DDQ	A	1107	-	10,13,13	2.27	1 (10%)	12,15,15	0.46	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	HEX	A	1109	-	-	0/3/3/3	-
6	HEX	A	1108	-	-	0/3/3/3	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
13	PTY	C	1102	-	-	30/53/53/53	-
3	LMT	C	1101	-	-	12/21/61/61	0/2/2/2
5	DDQ	B	1105	-	-	3/11/11/11	-
10	GOL	B	1109	-	-	0/4/4/4	-
4	C14	B	1103	-	-	3/11/11/11	-
6	HEX	C	1107	-	-	0/3/3/3	-
10	GOL	A	1113	-	-	2/4/4/4	-
3	LMT	A	1102	-	-	8/21/61/61	0/2/2/2
12	EDO	B	1110	-	-	1/1/1/1	-
11	OCT	B	1108	-	-	0/5/5/5	-
13	PTY	C	1103	-	-	19/53/53/53	-
3	LMT	B	1101	-	-	15/21/61/61	0/2/2/2
3	LMT	A	1104	-	-	4/21/61/61	0/2/2/2
11	OCT	C	1108	-	-	0/5/5/5	-
9	LNK	A	1112	-	-	0/2/2/2	-
4	C14	B	1102	-	-	2/11/11/11	-
10	GOL	A	1114	-	-	0/4/4/4	-
14	D12	C	1109	-	-	1/9/9/9	-
4	C14	B	1104	-	-	6/11/11/11	-
7	D10	A	1110	-	-	2/7/7/7	-
5	DDQ	C	1104	-	-	4/11/11/11	-
4	C14	A	1105	-	-	2/11/11/11	-
3	LMT	A	1103	-	-	11/21/61/61	0/2/2/2
3	LMT	A	1101	-	-	12/21/61/61	0/2/2/2
5	DDQ	C	1106	-	-	3/11/11/11	-
6	HEX	B	1107	-	-	0/3/3/3	-
5	DDQ	C	1105	-	-	2/11/11/11	-
5	DDQ	B	1106	-	-	2/11/11/11	-
5	DDQ	A	1106	-	-	2/11/11/11	-
5	DDQ	A	1107	-	-	3/11/11/11	-

The worst 5 of 9 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	1106	DDQ	O1-N1	-7.21	1.25	1.42
5	C	1106	DDQ	O1-N1	-7.15	1.25	1.42
5	B	1106	DDQ	O1-N1	-7.14	1.25	1.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	C	1105	DDQ	O1-N1	-7.14	1.25	1.42
5	A	1107	DDQ	O1-N1	-7.13	1.25	1.42

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	1101	LMT	C1B-O5B-C5B	3.25	120.06	113.69
3	B	1101	LMT	C1'-C2'-C3'	2.19	114.56	110.00
3	B	1101	LMT	C3B-C4B-C5B	2.17	114.11	110.24
3	B	1101	LMT	O5B-C5B-C6B	2.08	111.60	106.44

There are no chirality outliers.

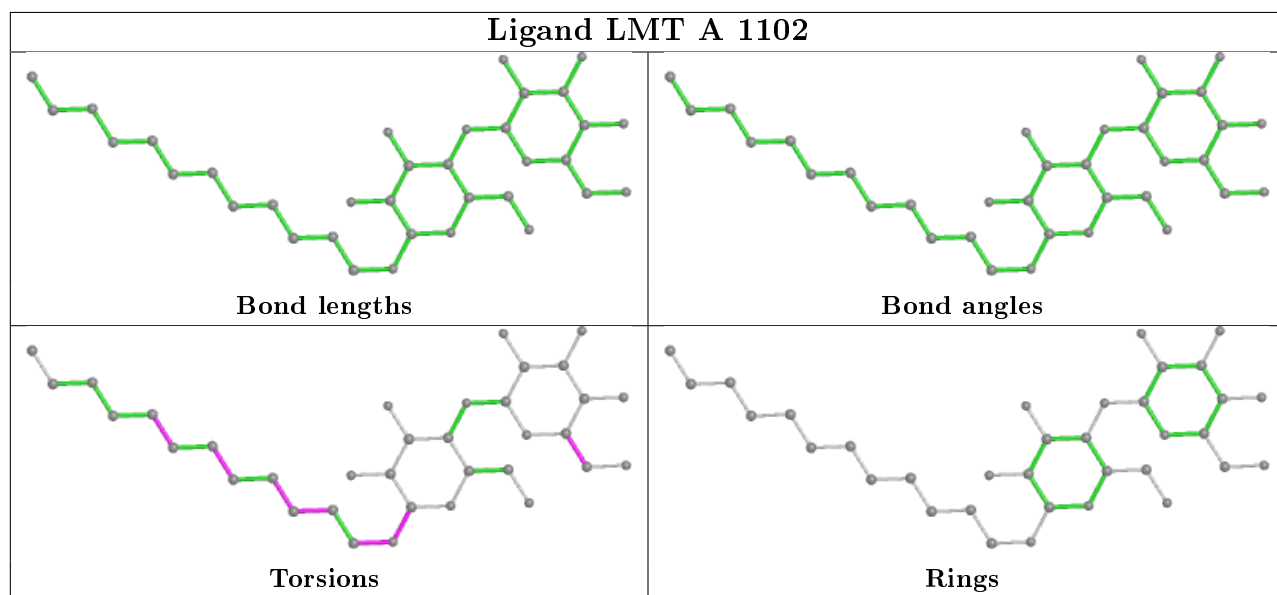
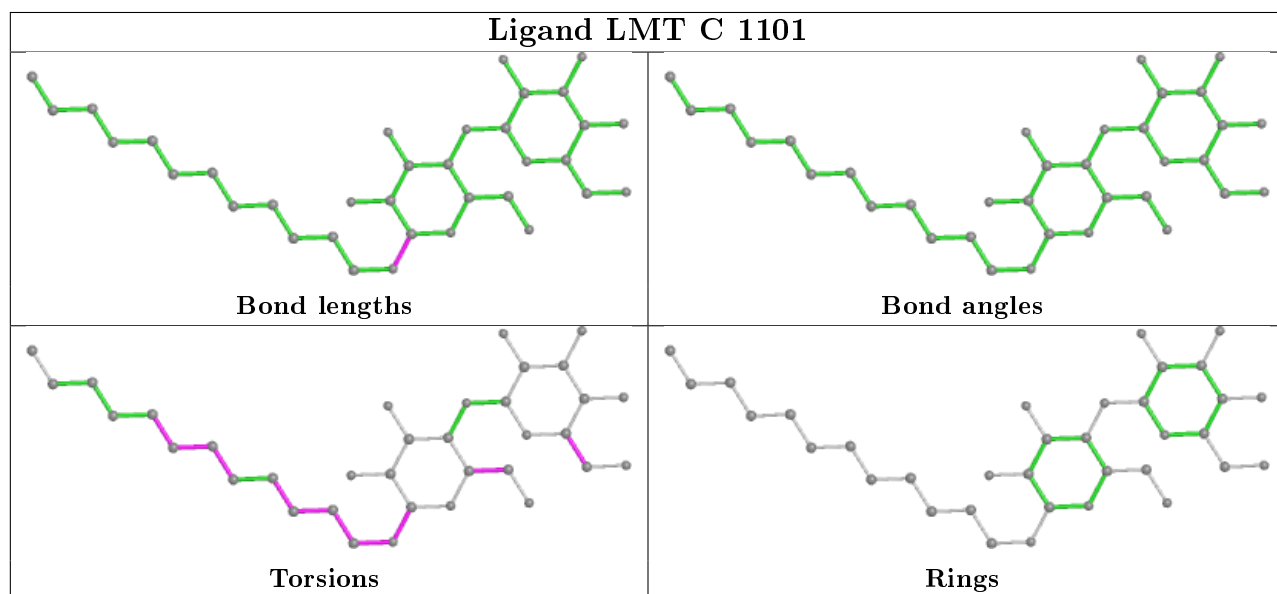
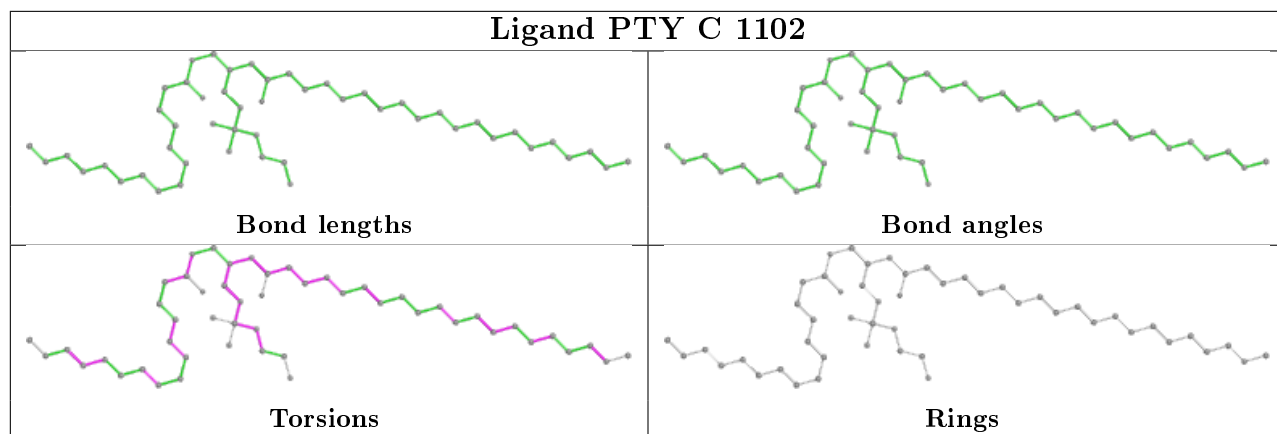
5 of 149 torsion outliers are listed below:

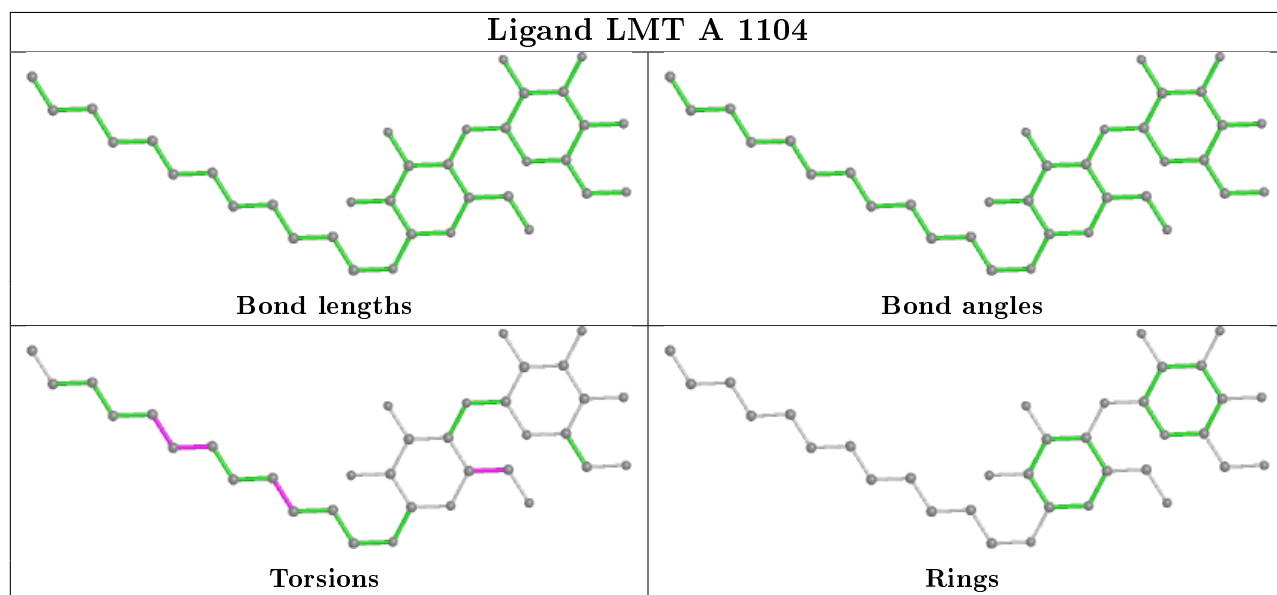
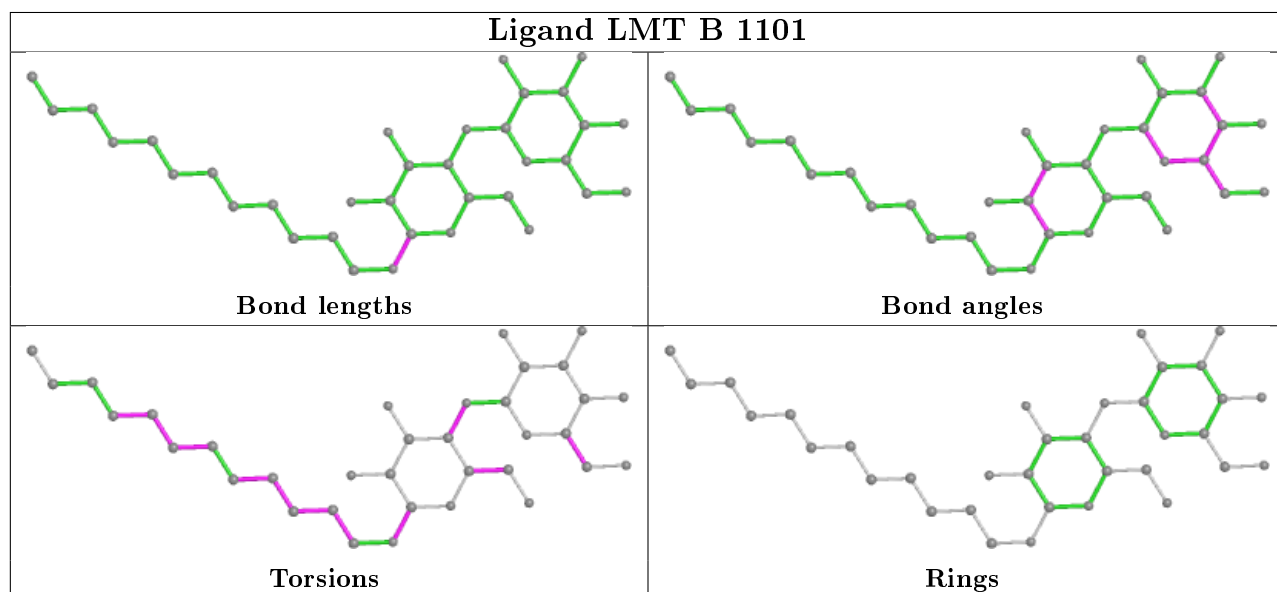
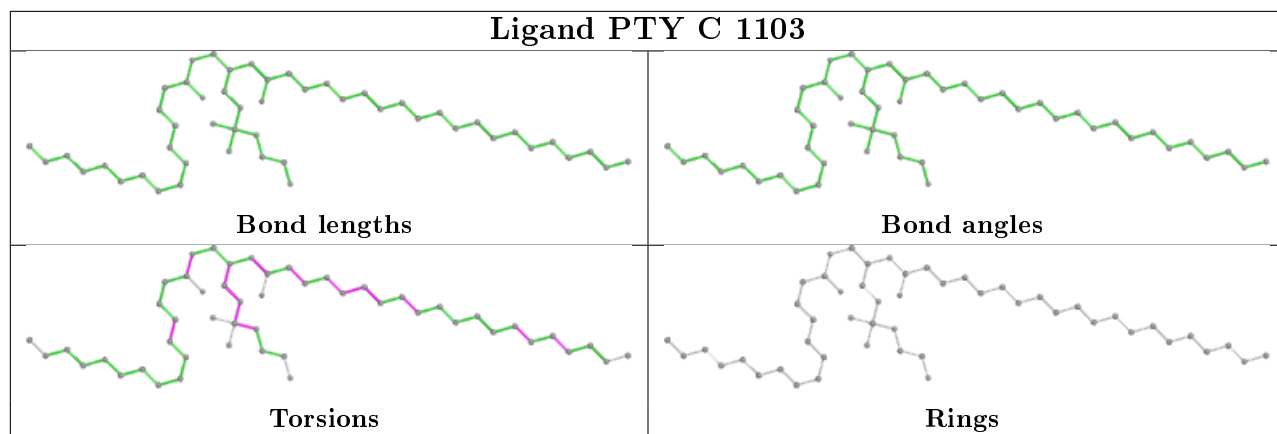
Mol	Chain	Res	Type	Atoms
3	A	1102	LMT	C2'-C1'-O1'-C1
3	A	1102	LMT	O5'-C1'-O1'-C1
3	A	1103	LMT	C2'-C1'-O1'-C1
3	A	1103	LMT	O5'-C1'-O1'-C1
3	B	1101	LMT	O5'-C1'-O1'-C1

There are no ring outliers.

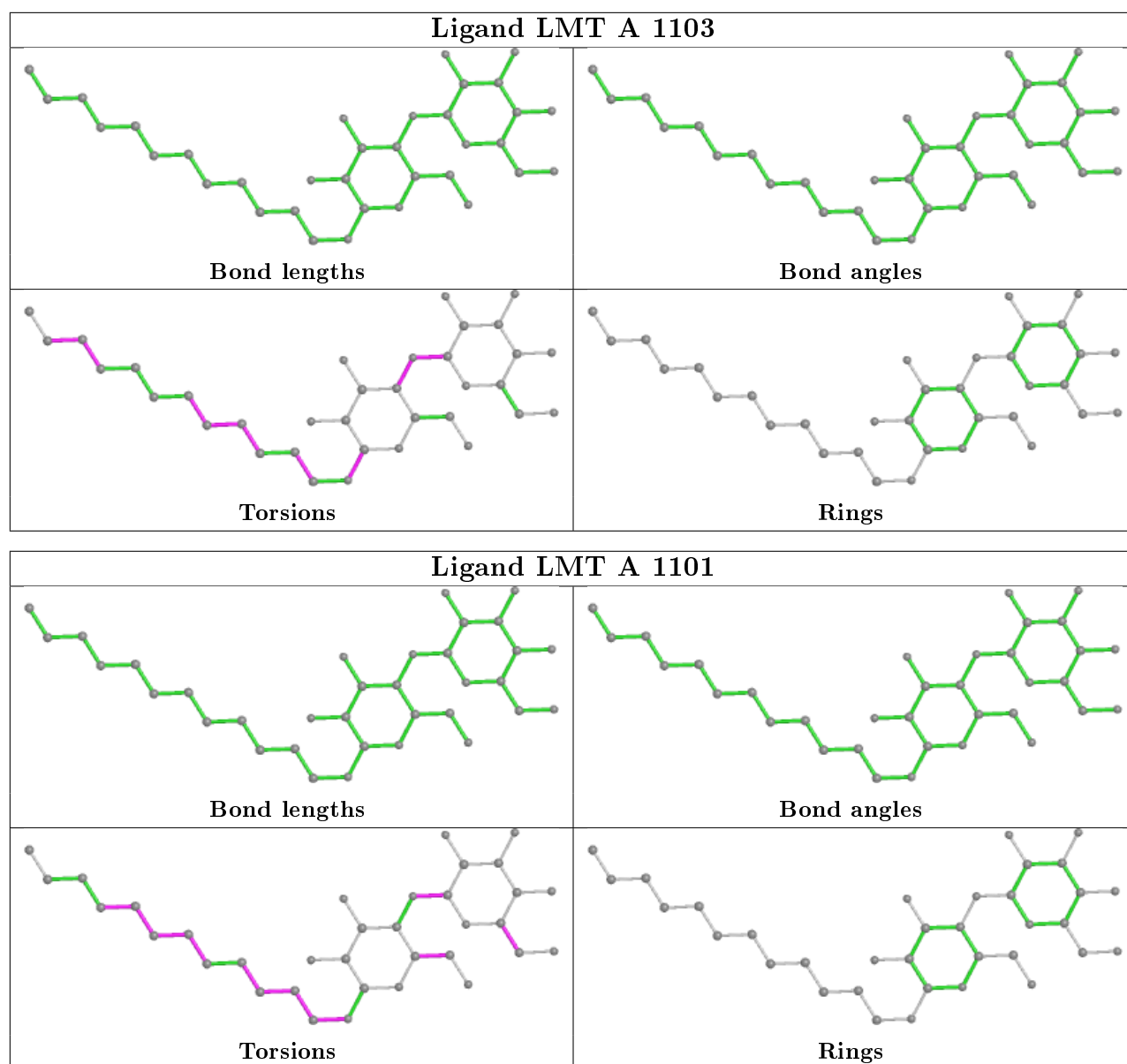
No monomer is involved in short contacts.

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 [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, 95<sup>th</sup> 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 <sup>2</sup> )	Q < 0.9
1	A	1042/1057 (98%)	0.00	29 (2%) 53 28	48, 64, 98, 112	0
1	B	1024/1057 (96%)	-0.03	22 (2%) 63 39	48, 62, 79, 93	0
1	C	1035/1057 (97%)	-0.17	13 (1%) 77 56	45, 55, 72, 81	0
2	D	156/169 (92%)	0.27	10 (6%) 19 7	52, 63, 76, 87	0
2	E	154/169 (91%)	0.80	16 (10%) 6 2	55, 69, 90, 95	0
All	All	3411/3509 (97%)	-0.01	90 (2%) 56 30	45, 61, 85, 112	0

The worst 5 of 90 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	833	PRO	4.8
2	D	166	GLN	4.5
1	B	255	GLN	4.4
2	E	31	ARG	4.1
2	E	35	ALA	3.9

### 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,

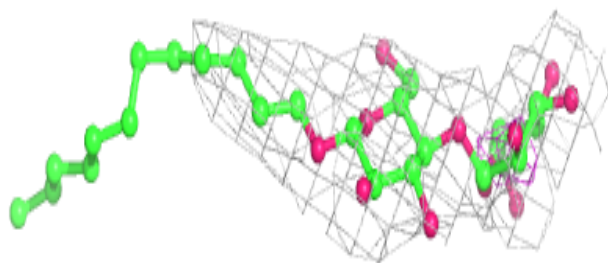
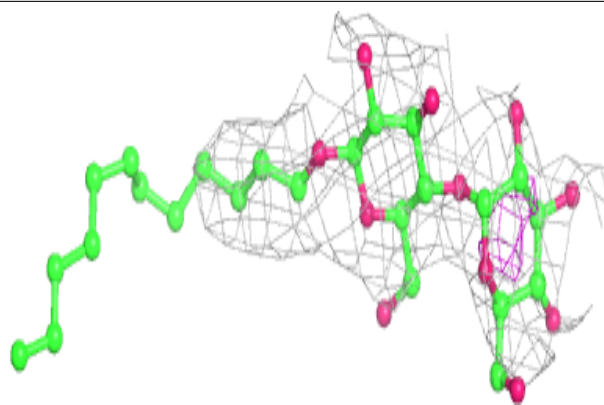
median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
5	DDQ	C	1105	14/14	0.63	0.38	84,86,88,88	0
10	GOL	A	1114	6/6	0.66	0.25	83,83,83,83	0
5	DDQ	B	1106	14/14	0.68	0.33	87,88,90,90	0
9	LNK	A	1112	5/5	0.70	0.38	70,70,71,71	0
3	LMT	A	1104	35/35	0.70	0.41	90,97,102,102	0
5	DDQ	C	1104	14/14	0.71	0.33	82,85,87,88	0
5	DDQ	A	1107	14/14	0.74	0.34	88,89,91,91	0
4	C14	A	1105	14/14	0.77	0.29	79,80,80,80	0
13	PTY	C	1103	50/50	0.78	0.31	75,79,82,82	0
13	PTY	C	1102	50/50	0.79	0.30	82,88,102,102	0
3	LMT	A	1102	35/35	0.79	0.32	72,84,92,93	0
14	D12	C	1109	12/12	0.79	0.25	70,71,72,72	0
3	LMT	C	1101	35/35	0.80	0.37	71,74,81,82	0
8	CL	A	1111	1/1	0.80	0.17	66,66,66,66	0
11	OCT	B	1108	8/8	0.80	0.48	71,72,72,72	0
4	C14	B	1104	14/14	0.81	0.26	78,78,79,79	0
3	LMT	A	1103	35/35	0.81	0.28	83,87,90,91	0
3	LMT	B	1101	35/35	0.81	0.43	88,90,91,92	0
4	C14	B	1103	14/14	0.81	0.31	82,83,83,83	0
5	DDQ	C	1106	14/14	0.82	0.31	84,85,85,86	0
5	DDQ	A	1106	14/14	0.82	0.34	74,75,76,76	0
6	HEX	A	1109	6/6	0.83	0.27	78,78,78,78	0
10	GOL	B	1109	6/6	0.83	0.24	87,87,87,87	0
10	GOL	A	1113	6/6	0.83	0.30	70,70,70,70	0
4	C14	B	1102	14/14	0.84	0.22	76,77,78,78	0
5	DDQ	B	1105	14/14	0.84	0.30	68,72,76,76	0
3	LMT	A	1101	35/35	0.86	0.27	65,71,74,74	35
7	D10	A	1110	10/10	0.86	0.27	70,70,70,70	0
11	OCT	C	1108	8/8	0.86	0.33	73,74,75,75	0
6	HEX	B	1107	6/6	0.87	0.30	67,68,68,68	0
6	HEX	A	1108	6/6	0.88	0.23	74,74,75,75	0
12	EDO	B	1110	4/4	0.92	0.18	72,72,73,73	0
6	HEX	C	1107	6/6	0.94	0.26	71,71,71,71	0

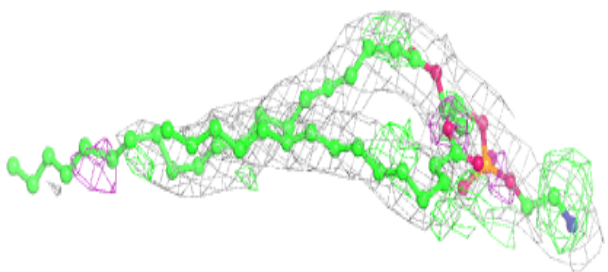
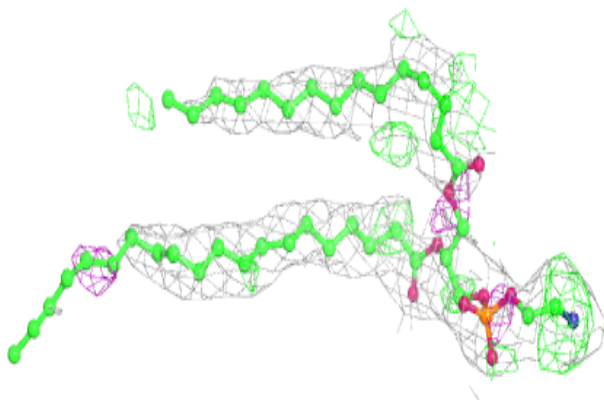
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

**Electron density around LMT A 1104:**

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

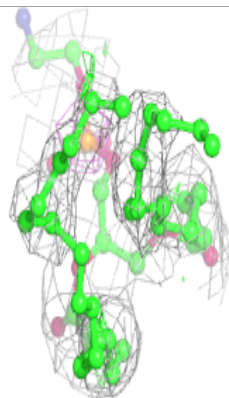
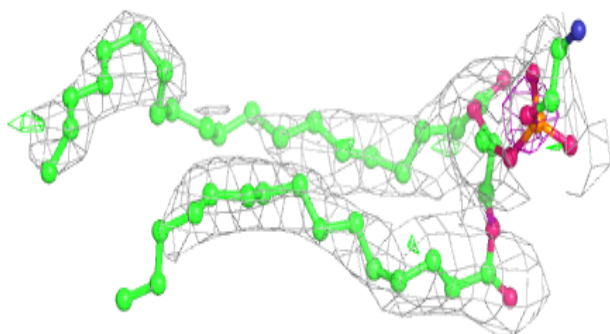
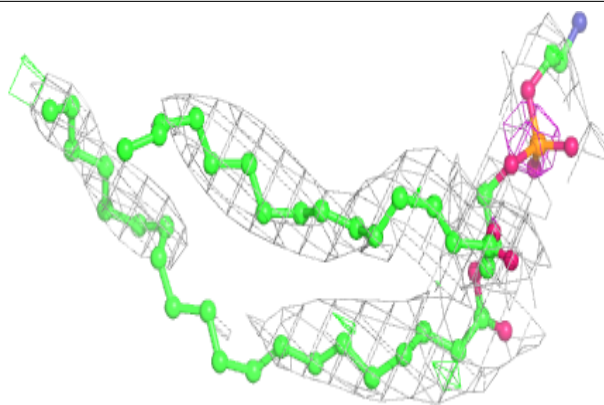
**Electron density around PTY C 1103:**

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

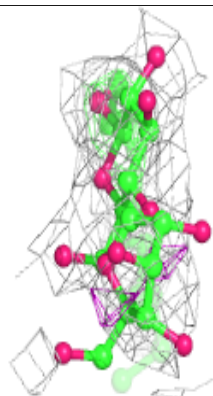
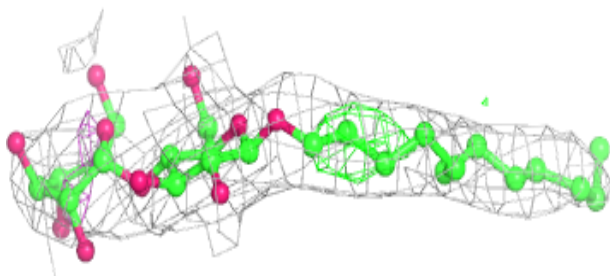
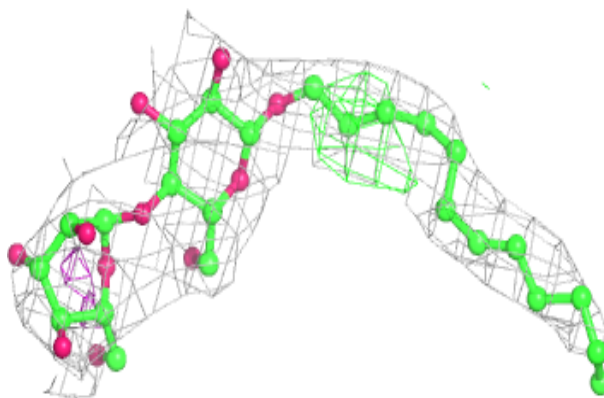


**Electron density around PTY C 1102:**

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

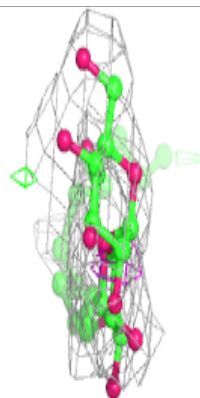
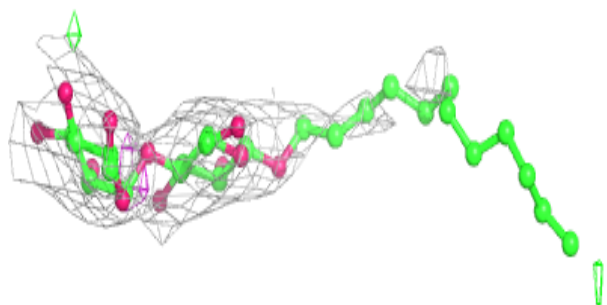
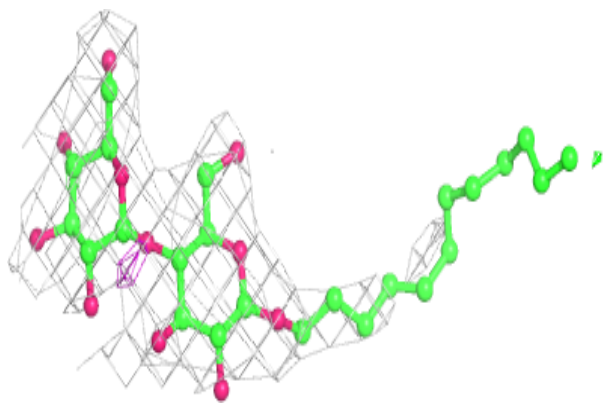
**Electron density around LMT A 1102:**

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

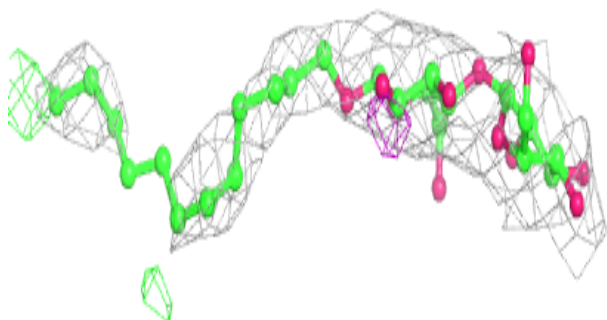
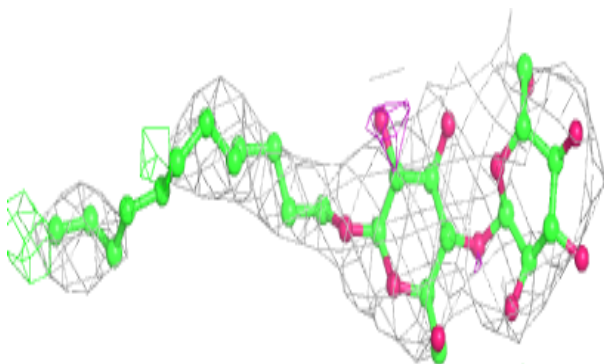


**Electron density around LMT C 1101:**

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

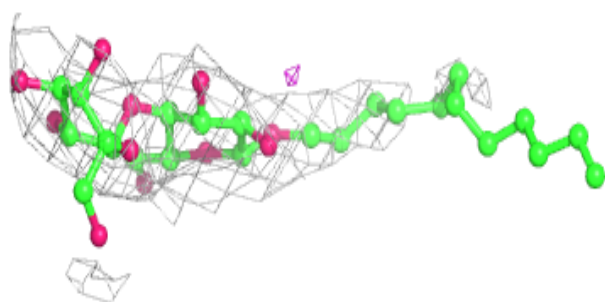
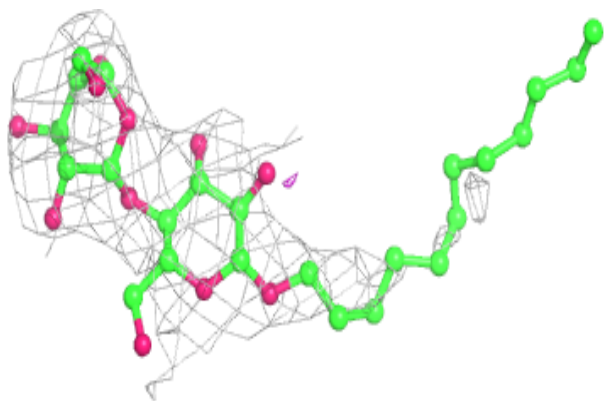
**Electron density around LMT A 1103:**

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

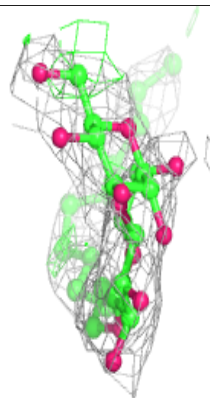
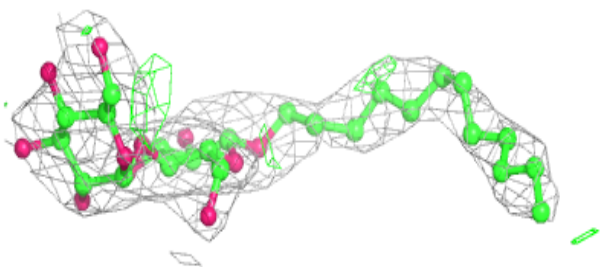
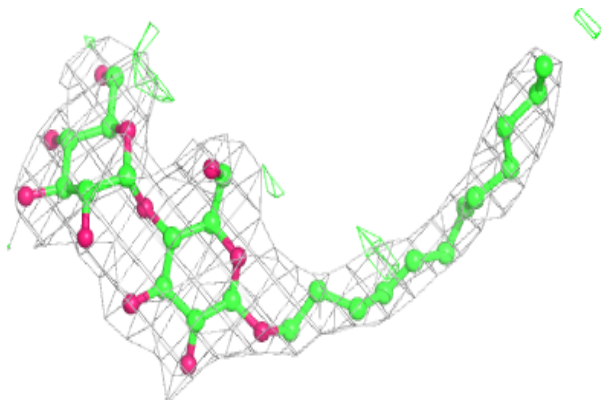


**Electron density around LMT B 1101:**

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

**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)



## 6.5 Other polymers

There are no such residues in this entry.