W O R L D W I D E
wwPDB
P R O T E I N   D A T A   B A N K

wwPDB X-ray Structure Validation Summary Report (i)

Jan 23, 2021 – 02:34 PM EST

PDB ID	:	1LW4
Title	:	X-ray structure of L-Threonine Aldolase (low-specificity) in complex with L-allo-threonine
Authors	:	Kielkopf, C.L.; Burley, S.K.; New York SGX Research Center for Structural Genomics (NYSGXRC)
Deposited on	:	2002-05-30
Resolution	:	1.90 Å(reported)

The following versions of software and data (see references (i)) 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	:	2.16
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)	:	2.16

1   Overall quality at a glance ⓘ

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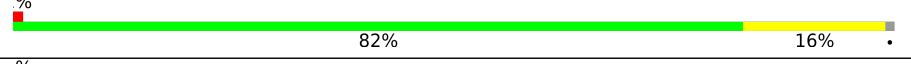*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.90 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.
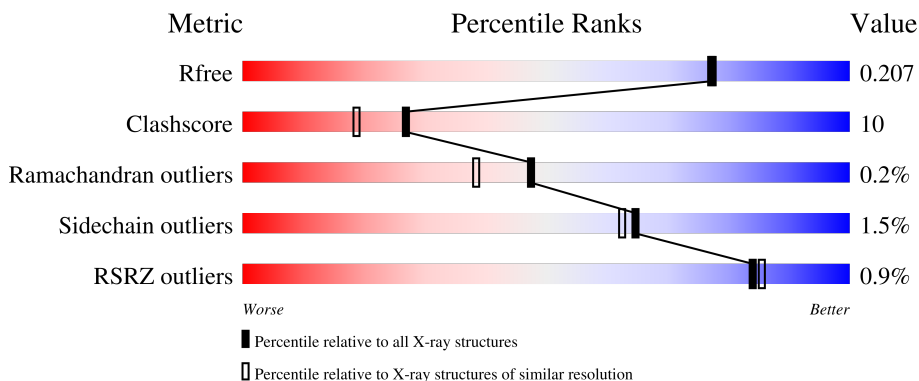
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	6207 (1.90-1.90)
Clashscore	141614	6847 (1.90-1.90)
Ramachandran outliers	138981	6760 (1.90-1.90)
Sidechain outliers	138945	6760 (1.90-1.90)
RSRZ outliers	127900	6082 (1.90-1.90)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% 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	347	
1	B	347	
1	C	347	
1	D	347	

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
5	PLP	B	1053[B]	-	X	-	-

2 Entry composition ⓘ

There are 6 unique types of molecules in this entry. The entry contains 11495 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 L-allo-threonine aldolase.

Mol	Chain	Residues	Atoms							ZeroOcc	AltConf	Trace
1	A	343	Total 2599	C 1626	N 463	O 493	P 1	S 3	Se 13	0	0	0
1	B	343	Total 2587	C 1621	N 461	O 489	S 3	Se 13		0	1	0
1	C	343	Total 2584	C 1618	N 463	O 487	S 3	Se 13		0	0	0
1	D	344	Total 2600	C 1627	N 463	O 493	S 3	Se 14		0	0	0

There are 14 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-3	GLY	-	cloning artifact	UNP Q9X266
A	-2	PRO	-	cloning artifact	UNP Q9X266
A	-1	HIS	-	cloning artifact	UNP Q9X266
A	0	MSE	-	cloning artifact	UNP Q9X266
B	-3	GLY	-	cloning artifact	UNP Q9X266
B	-2	PRO	-	cloning artifact	UNP Q9X266
B	-1	HIS	-	cloning artifact	UNP Q9X266
B	0	MSE	-	cloning artifact	UNP Q9X266
C	-3	GLY	-	cloning artifact	UNP Q9X266
C	-2	PRO	-	cloning artifact	UNP Q9X266
C	-1	HIS	-	cloning artifact	UNP Q9X266
D	-3	GLY	-	cloning artifact	UNP Q9X266
D	-2	PRO	-	cloning artifact	UNP Q9X266
D	-1	HIS	-	cloning artifact	UNP Q9X266

- Molecule 2 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	B	3	Total 3	Ca 3	0	0

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total 1	Ca 1	0	0
2	D	2	Total 2	Ca 2	0	0

- Molecule 3 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	2	Total 2	Cl 2	0	0
3	A	2	Total 2	Cl 2	0	0
3	D	1	Total 1	Cl 1	0	0
3	C	1	Total 1	Cl 1	0	0

- Molecule 4 is 3-HYDROXY-2-[(3-HYDROXY-2-METHYL-5-PHOSPHONOOXYMETHYL -PYRIDIN-4-YLMETHYL)-AMINO]-BUTYRIC ACID (three-letter code: TLP) (formula: $C_{12}H_{19}N_2O_8P$).
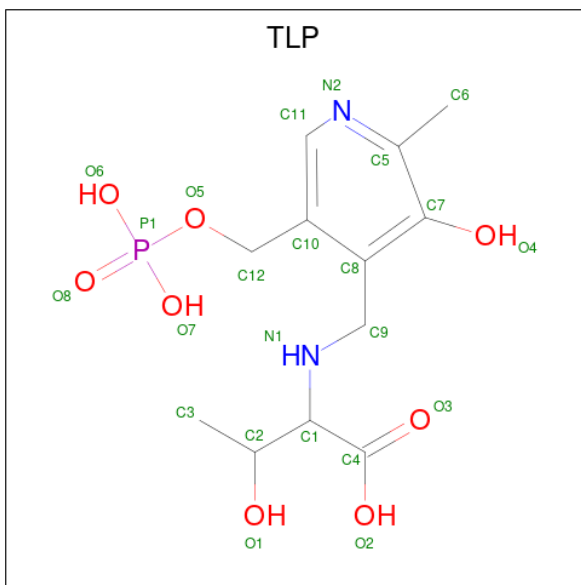
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	B	1	Total 23	C 12	N 2	O 8	P 1	0	1
4	C	1	Total 23	C 12	N 2	O 8	P 1	0	0

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	D	1	Total 23	C 12	N 2	O 8	P 1	0	0

- Molecule 5 is PYRIDOXAL-5'-PHOSPHATE (three-letter code: PLP) (formula: $C_8H_{10}NO_6P$).
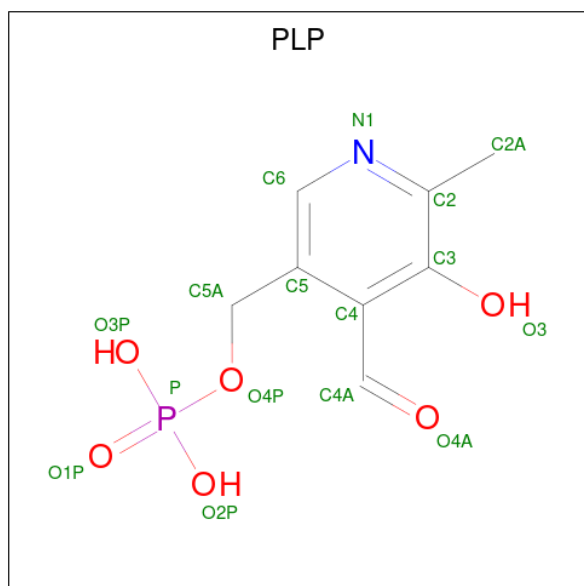
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	B	1	Total 15	C 8	N 1	O 5	P 1	0	1

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	255	Total 255	O 255	0	0
6	B	234	Total 234	O 234	0	0
6	C	266	Total 266	O 266	0	0
6	D	274	Total 274	O 274	0	0

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.
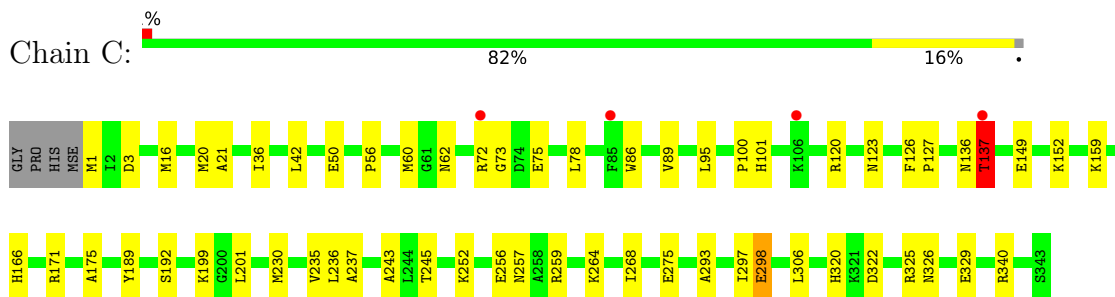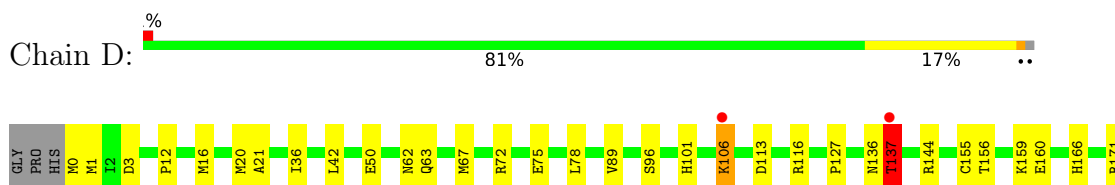
- Molecule 1: L-allo-threonine aldolase
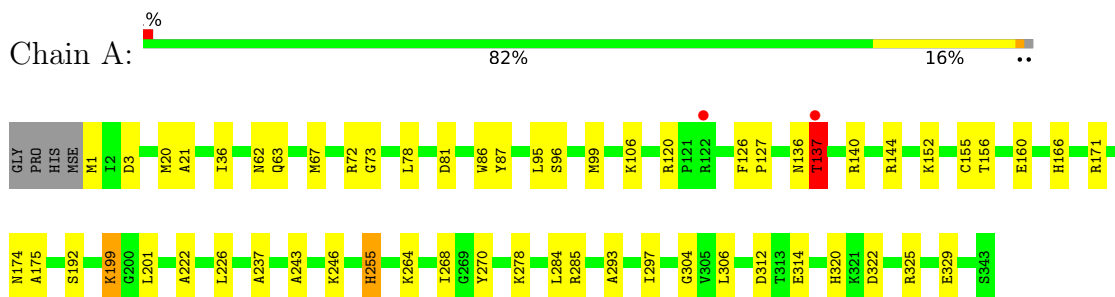
- Molecule 1: L-allo-threonine aldolase
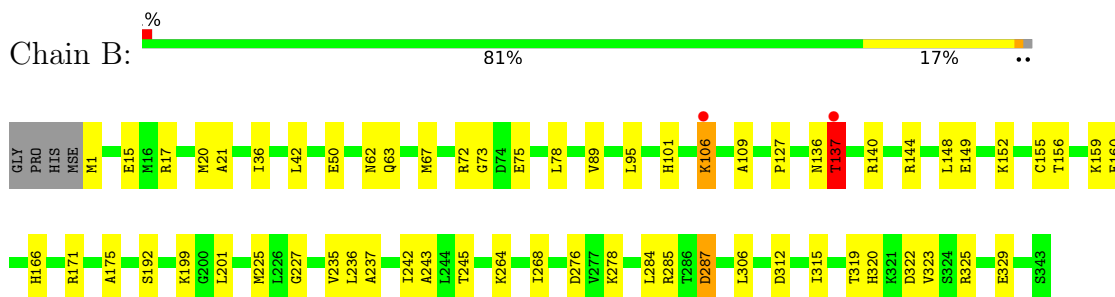
- Molecule 1: L-allo-threonine aldolase

- Molecule 1: L-allo-threonine aldolase

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	95.90Å 100.50Å 150.32Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 1.90 29.86 – 1.90	Depositor EDS
% Data completeness (in resolution range)	(Not available) (20.00-1.90) 99.8 (29.86-1.90)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	8.44 (at 1.91Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.183 , 0.206 0.184 , 0.207	Depositor DCC
R_{free} test set	7904 reflections (6.90%)	wwPDB-VP
Wilson B-factor (Å^2)	19.8	Xtriage
Anisotropy	0.064	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 57.7	EDS
L-test for twinning [2]	$< |L| > = 0.51, < L^2 > = 0.34$	Xtriage
Estimated twinning fraction	0.006 for k,h,-l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	11495	wwPDB-VP
Average B, all atoms (Å^2)	22.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 14.31% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5   Model quality ⓘ

5.1   Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: LLP, CA, TLP, PLP, CL

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	0.31	0/2603	0.63	1/3500 (0.0%)
1	B	0.30	0/2597	0.64	1/3493 (0.0%)
1	C	0.39	1/2603 (0.0%)	0.67	4/3500 (0.1%)
1	D	0.40	2/2618 (0.1%)	0.74	4/3517 (0.1%)
All	All	0.35	3/10421 (0.0%)	0.67	10/14010 (0.1%)

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	301	ARG	CZ-NH1	10.15	1.46	1.33
1	C	298	GLU	CB-CG	10.13	1.71	1.52
1	D	301	ARG	CG-CD	6.41	1.68	1.51

The worst 5 of 10 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	301	ARG	NE-CZ-NH1	19.79	130.20	120.30
1	B	137	THR	N-CA-C	-10.13	83.65	111.00
1	A	137	THR	N-CA-C	-9.29	85.93	111.00
1	D	137	THR	N-CA-C	-9.26	86.00	111.00
1	C	137	THR	N-CA-C	-8.72	87.44	111.00

There are no chirality outliers.

There are no planarity outliers.

5.2   Too-close contacts ⓘ

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	2599	0	2576	53	0
1	B	2587	0	2566	64	0
1	C	2584	0	2571	57	0
1	D	2600	0	2586	59	0
2	A	1	0	0	0	0
2	B	3	0	0	0	0
2	D	2	0	0	0	0
3	A	2	0	0	0	0
3	B	2	0	0	0	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
4	B	23	0	15	4	0
4	C	23	0	15	1	0
4	D	23	0	15	2	0
5	B	15	0	6	4	0
6	A	255	0	0	7	0
6	B	234	0	0	6	0
6	C	266	0	0	9	1
6	D	274	0	0	13	1
All	All	11495	0	10350	212	1

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 10.

The worst 5 of 212 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:199[A]:LLP:NZ	4:B:1050[A]:TLP:H13	1.37	1.37
1:A:99:MSE:HE3	1:C:100:PRO:HG3	1.29	1.08
1:C:340:ARG:HG2	6:C:1320:HOH:O	1.53	1.05
1:B:199[A]:LLP:NZ	4:B:1050[A]:TLP:C9	2.20	1.04
1:D:136:ASN:O	1:D:137:THR:HG23	1.58	1.04

All (1) 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)
6:C:1316:HOH:O	6:D:1270:HOH:O[2_665]	2.15	0.05

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	340/347 (98%)	333 (98%)	6 (2%)	1 (0%)	41	31
1	B	340/347 (98%)	331 (97%)	8 (2%)	1 (0%)	41	31
1	C	340/347 (98%)	334 (98%)	5 (2%)	1 (0%)	41	31
1	D	341/347 (98%)	333 (98%)	8 (2%)	0	100	100
All	All	1361/1388 (98%)	1331 (98%)	27 (2%)	3 (0%)	47	38

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	137	THR
1	A	137	THR
1	B	137	THR

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	269/269 (100%)	266 (99%)	3 (1%)	73	73
1	B	268/269 (100%)	263 (98%)	5 (2%)	57	53
1	C	269/269 (100%)	267 (99%)	2 (1%)	84	84
1	D	272/269 (101%)	266 (98%)	6 (2%)	52	47
All	All	1078/1076 (100%)	1062 (98%)	16 (2%)	65	62

5 of 16 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	312	ASP
1	C	137	THR
1	D	106	LYS
1	B	287	ASP
1	D	137	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 29 such sidechains are listed below:

Mol	Chain	Res	Type
1	C	101	HIS
1	C	166	HIS
1	D	308	ASN
1	C	107	ASN
1	C	257	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

5 non-standard protein/DNA/RNA residues 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	$\#|Z| > 2$
1	LLP	B	199[A]	1	7,8,25	0.49	0	3,8,34	0.65	0
1	LLP	D	199	1	7,8,25	0.50	0	3,8,34	0.36	0
1	LLP	B	199[B]	1	7,8,25	0.75	0	3,8,34	1.07	0
1	LLP	A	199	1	23,24,25	3.48	6 (26%)	25,32,34	2.41	10 (40%)
1	LLP	C	199	1	7,8,25	0.48	0	3,8,34	0.53	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
1	LLP	B	199[A]	1	-	1/6/7/19	-
1	LLP	D	199	1	-	1/6/7/19	-
1	LLP	B	199[B]	1	-	1/6/7/19	-
1	LLP	A	199	1	-	8/16/17/19	0/1/1/1
1	LLP	C	199	1	-	1/6/7/19	-

The worst 5 of 6 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	199	LLP	C4-C5	12.34	1.57	1.42
1	A	199	LLP	C3-C2	8.13	1.49	1.40
1	A	199	LLP	C2-N1	3.93	1.41	1.33
1	A	199	LLP	C4'-NZ	3.27	1.38	1.27
1	A	199	LLP	C6-N1	3.26	1.41	1.34

The worst 5 of 10 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	199	LLP	C2'-C2-C3	6.20	128.55	120.89
1	A	199	LLP	CE-NZ-C4'	4.23	131.89	118.90
1	A	199	LLP	C6-N1-C2	4.11	126.78	119.17
1	A	199	LLP	C3-C2-N1	-3.50	116.25	120.77
1	A	199	LLP	C4-C4'-NZ	-3.20	109.60	124.31

There are no chirality outliers.

5 of 12 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	B	199[A]	LLP	O-C-CA-CB
1	D	199	LLP	O-C-CA-CB
1	B	199[B]	LLP	O-C-CA-CB
1	A	199	LLP	C4-C5-C5'-OP4
1	A	199	LLP	C6-C5-C5'-OP4

There are no ring outliers.

5 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	B	199[A]	LLP	4	0
1	D	199	LLP	2	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	B	199[B]	LLP	3	0
1	A	199	LLP	2	0
1	C	199	LLP	1	0

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 16 ligands modelled in this entry, 12 are monoatomic - leaving 4 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	#$|Z| > 2$
4	TLP	D	1052	-	20,23,23	3.74	7 (35%)	26,33,33	3.12	8 (30%)
5	PLP	B	1053[B]	-	15,15,16	4.85	7 (46%)	20,22,23	2.61	8 (40%)
4	TLP	C	1051	-	20,23,23	3.72	8 (40%)	26,33,33	3.08	8 (30%)
4	TLP	B	1050[A]	-	20,23,23	3.86	7 (35%)	26,33,33	3.16	8 (30%)

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
4	TLP	D	1052	-	-	4/15/19/19	0/1/1/1
5	PLP	B	1053[B]	-	-	5/6/6/8	0/1/1/1
4	TLP	C	1051	-	-	3/15/19/19	0/1/1/1
4	TLP	B	1050[A]	-	-	3/15/19/19	0/1/1/1

The worst 5 of 29 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	1053[B]	PLP	C5-C4	15.40	1.57	1.40
4	B	1050[A]	TLP	C10-C8	11.78	1.57	1.40
4	D	1052	TLP	C10-C8	11.65	1.56	1.40
4	C	1051	TLP	C10-C8	11.13	1.56	1.40
4	B	1050[A]	TLP	C7-C5	9.59	1.50	1.40

The worst 5 of 32 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	B	1050[A]	TLP	C9-N1-C1	11.46	129.66	113.78
4	D	1052	TLP	C9-N1-C1	11.25	129.36	113.78
4	C	1051	TLP	C9-N1-C1	10.84	128.80	113.78
4	C	1051	TLP	C6-C5-C7	6.52	128.94	120.89
4	D	1052	TLP	C6-C5-C7	6.40	128.79	120.89

There are no chirality outliers.

5 of 15 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	B	1053[B]	PLP	C4-C5-C5A-O4P
5	B	1053[B]	PLP	C6-C5-C5A-O4P
5	B	1053[B]	PLP	C5A-O4P-P-O2P
5	B	1053[B]	PLP	C5A-O4P-P-O3P
4	B	1050[A]	TLP	C4-C1-N1-C9

There are no ring outliers.
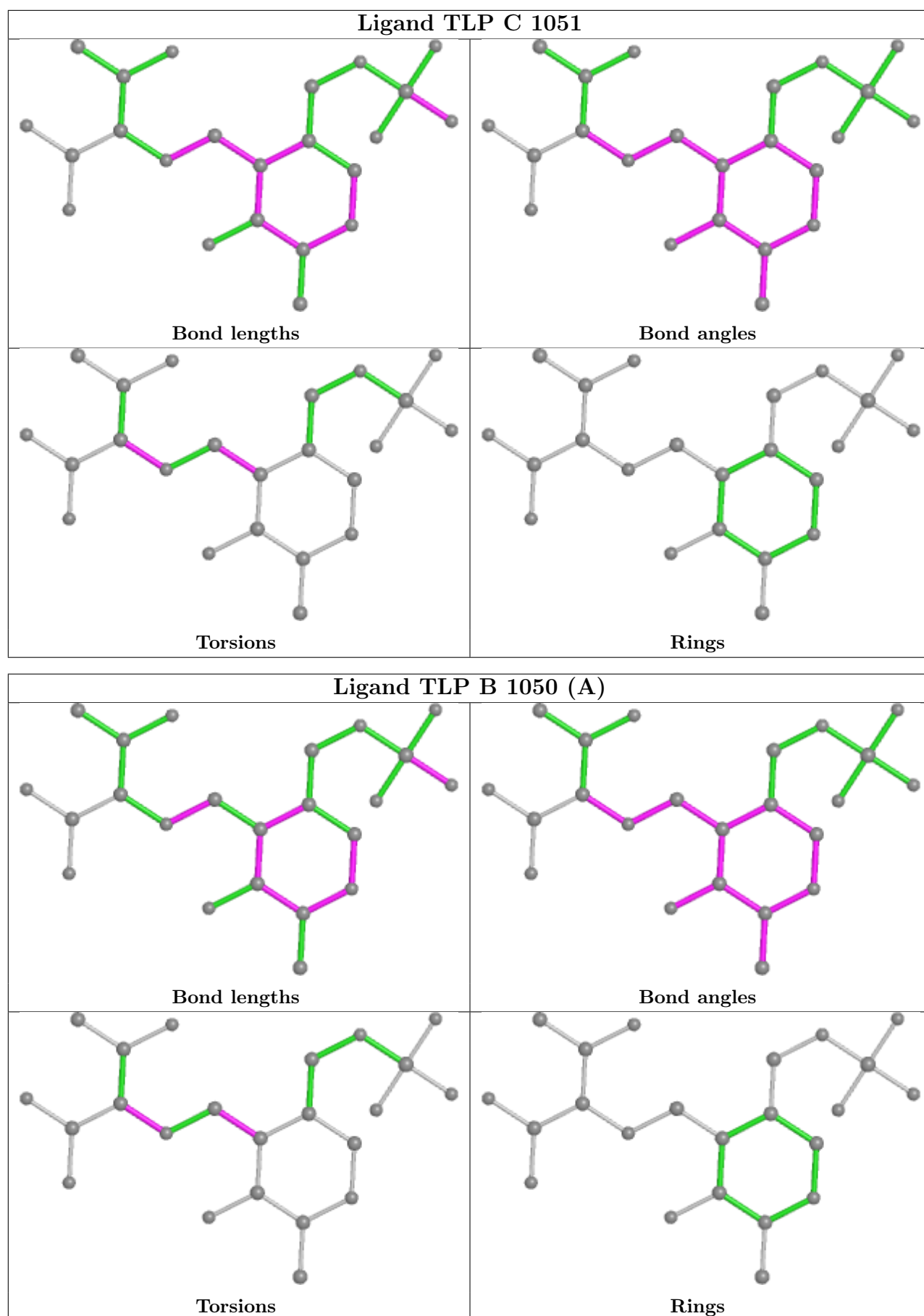
4 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	D	1052	TLP	2	0
5	B	1053[B]	PLP	4	0
4	C	1051	TLP	1	0
4	B	1050[A]	TLP	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 then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and

any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand TLP D 1052

Bond lengths

Bond angles

Torsions

Rings

Ligand TLP C 1051

Bond lengths

Bond angles

Torsions

Rings

Ligand TLP B 1050 (A)

Bond lengths

Bond angles

Torsions

Rings
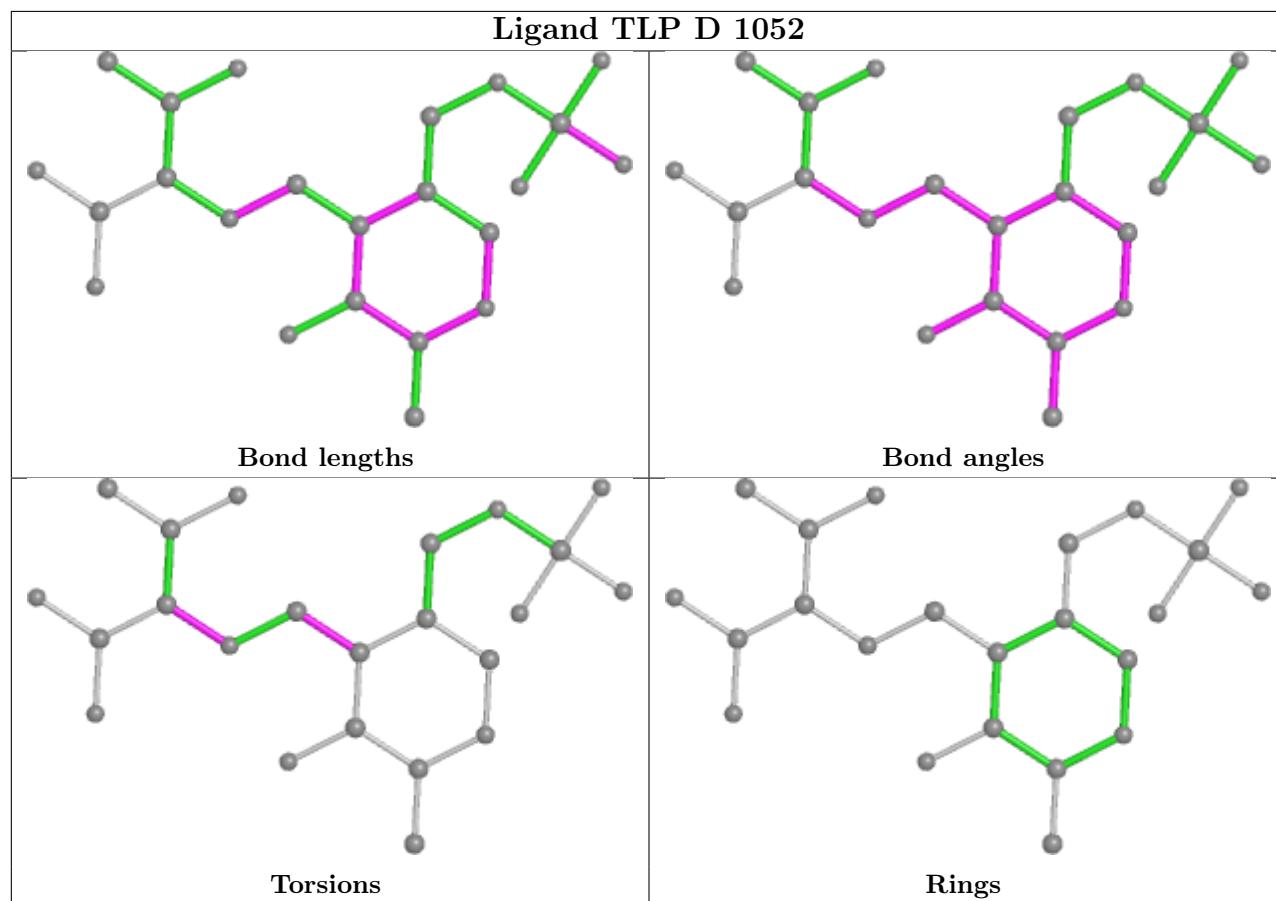
5.7 Other polymers ⓘ

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 ⓘ

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	329/347 (94%)	-0.13	2 (0%)	89	90	13, 20, 30, 41	0
1	B	329/347 (94%)	-0.14	2 (0%)	89	90	11, 18, 32, 41	0
1	C	329/347 (94%)	-0.05	4 (1%)	79	81	10, 21, 33, 42	1 (0%)
1	D	329/347 (94%)	-0.11	4 (1%)	79	81	11, 18, 34, 46	0
All	All	1316/1388 (94%)	-0.11	12 (0%)	84	85	10, 19, 32, 46	1 (0%)

The worst 5 of 12 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	137	THR	5.4
1	B	137	THR	5.2
1	D	137	THR	5.0
1	C	137	THR	4.6
1	C	72	ARG	3.4

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

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
1	LLP	A	199	24/25	0.91	0.18	13,22,27,30	0
1	LLP	B	199[B]	9/25	0.95	0.39	16,17,21,22	9
1	LLP	B	199[A]	9/25	0.95	0.39	13,14,19,23	9
1	LLP	D	199	9/25	0.96	0.14	12,14,23,29	0
1	LLP	C	199	9/25	0.96	0.16	12,14,23,25	0

6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

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
4	TLP	B	1050[A]	23/23	0.92	0.22	14,19,21,22	23
4	TLP	D	1052	23/23	0.92	0.16	13,19,28,32	0
5	PLP	B	1053[B]	15/16	0.94	0.16	18,24,27,27	15
4	TLP	C	1051	23/23	0.96	0.14	15,18,24,28	0
3	CL	D	1062	1/1	0.96	0.06	31,31,31,31	0
2	CA	B	1058	1/1	0.98	0.12	27,27,27,27	0
3	CL	B	1065	1/1	0.98	0.07	28,28,28,28	0
3	CL	B	1063	1/1	0.98	0.04	29,29,29,29	0
2	CA	D	1055	1/1	0.99	0.04	17,17,17,17	0
3	CL	A	1064	1/1	0.99	0.03	31,31,31,31	0
2	CA	D	1059	1/1	0.99	0.03	18,18,18,18	0
3	CL	C	1061	1/1	0.99	0.05	24,24,24,24	0
2	CA	A	1056	1/1	0.99	0.05	19,19,19,19	0
3	CL	A	1060	1/1	1.00	0.03	19,19,19,19	0
2	CA	B	1057	1/1	1.00	0.04	18,18,18,18	0
2	CA	B	1054	1/1	1.00	0.04	17,17,17,17	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.
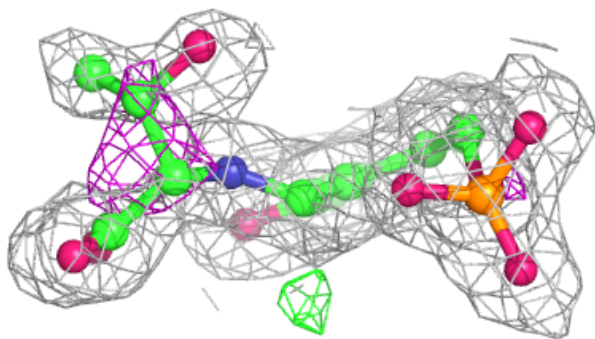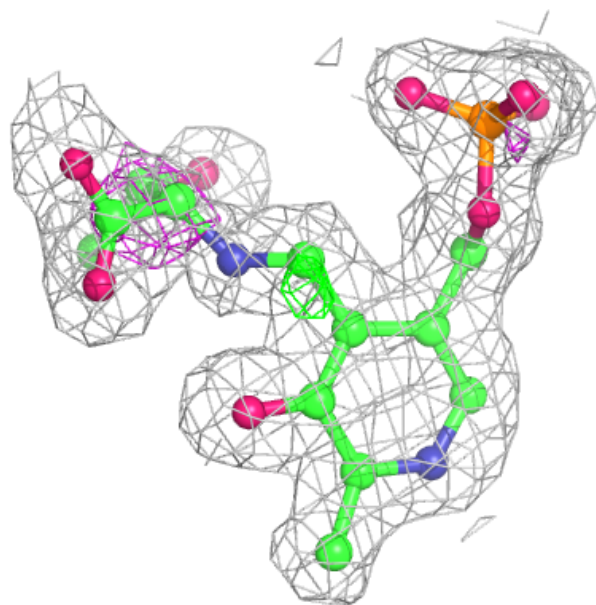
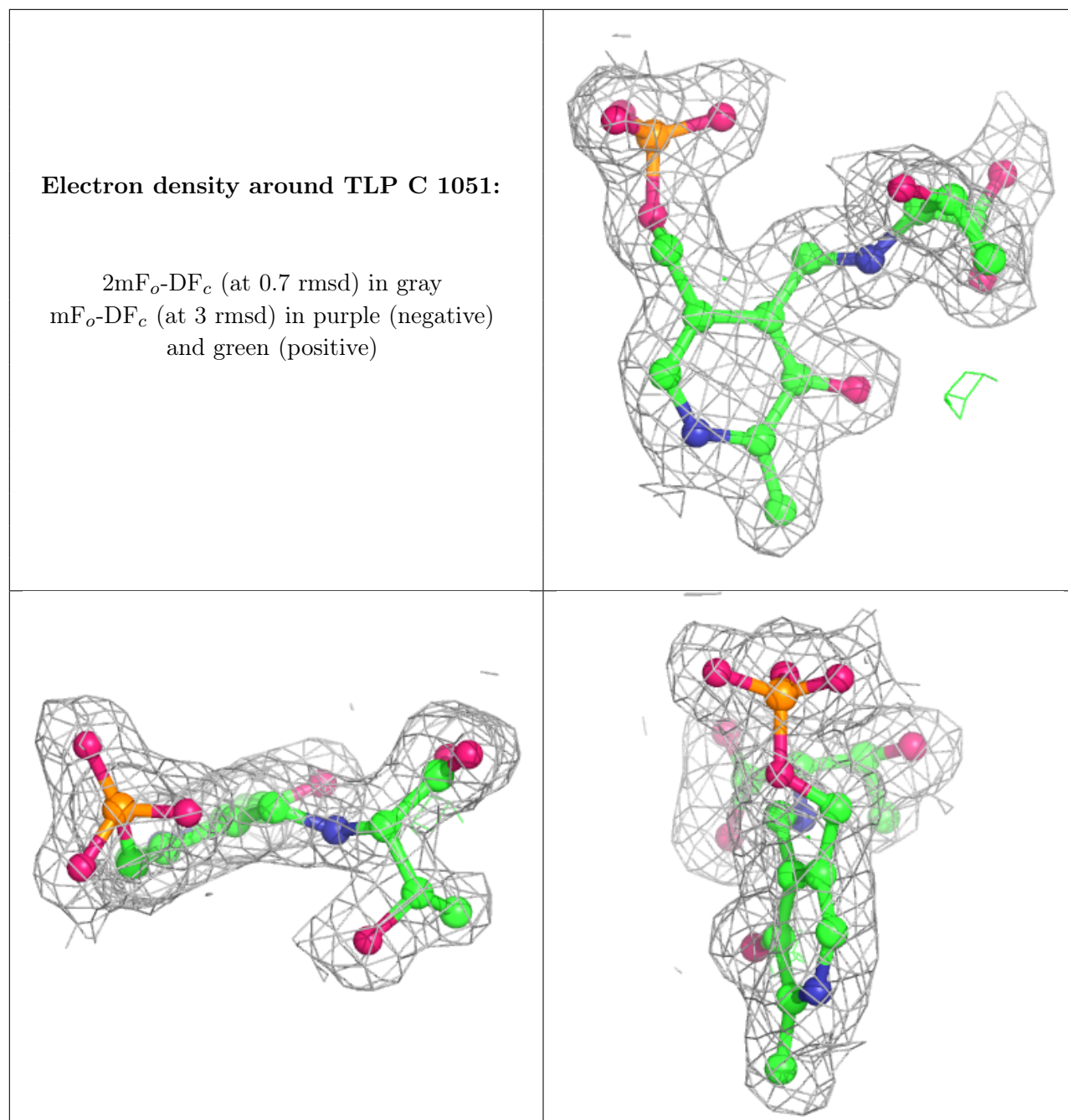**Electron density around TLP B 1050 (A):**

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
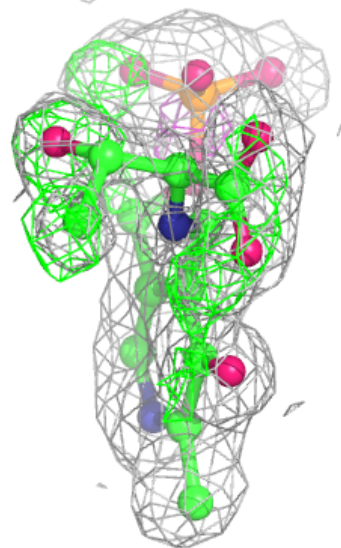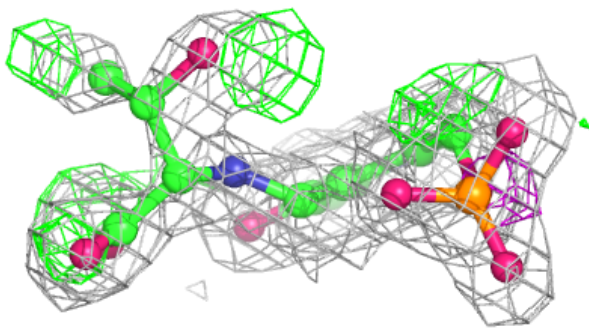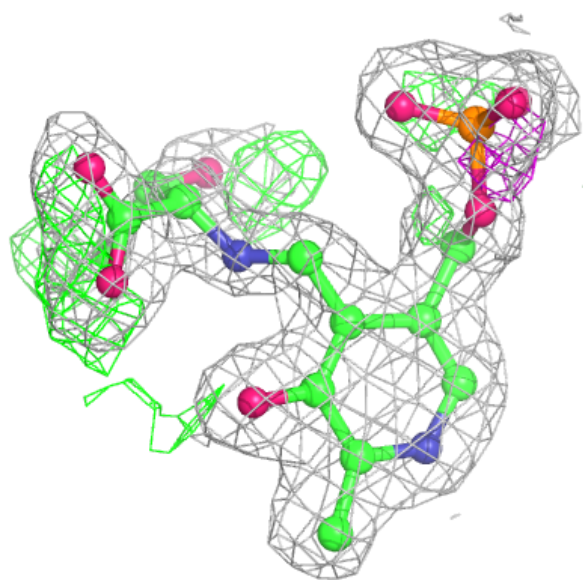
Electron density around TLP D 1052:

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

Electron density around TLP C 1051:

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

6.5 Other polymers ⓘ

There are no such residues in this entry.