Full wwPDB X-ray Structure Validation Report ⓘ

Apr 27, 2024 – 11:17 am BST

PDB ID	:	1OKC
Title	:	structure of mitochondrial ADP/ATP carrier in complex with carboxyatractyloside
Authors	:	Pebay-Peyroula, E.; Dahout-Gonzalez, C.; Kahn, R.; Trezeguet, V.; Lauquin, G.J.-M.; Brandolin, G.
Deposited on	:	2003-07-21
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:

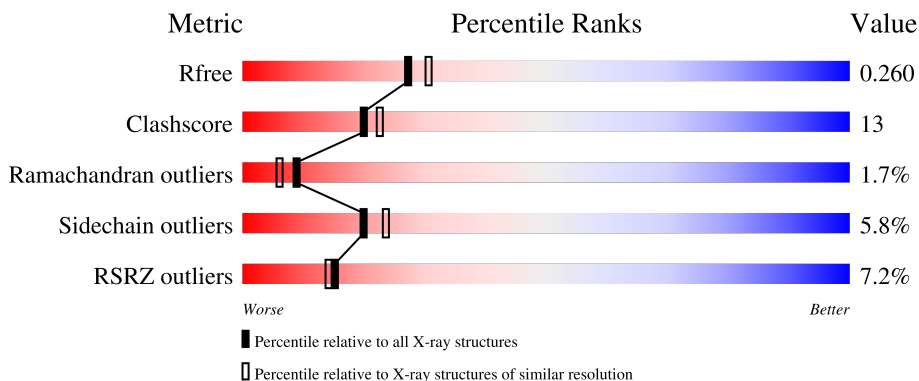|		
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36.2
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36.2

1 Overall quality at a glance ⓘ

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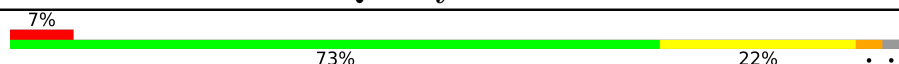*X-RAY DIFFRACTION*

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	Percentile Ranks	Value
Rfree		0.260
Clashscore		13
Ramachandran outliers		1.7%
Sidechain outliers		5.8%
RSRZ outliers		7.2%

Worse   *Better*

▌ Percentile relative to all X-ray structures
▯ Percentile relative to X-ray structures of similar resolution

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 <=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	297	7% — 73% — 22% · ·

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

| Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	CXT	A	401	X	-	-	-

2   Entry composition ⓘ

There are 6 unique types of molecules in this entry. The entry contains 2686 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 ADP, ATP CARRIER PROTEIN HEART ISOFORM T1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	292	Total 2254	C 1460	N 392	O 391	S 11	0	0	0

- Molecule 2 is Carboxyatractyloside (three-letter code: CXT) (formula: $C_{31}H_{46}O_{18}S_2$).
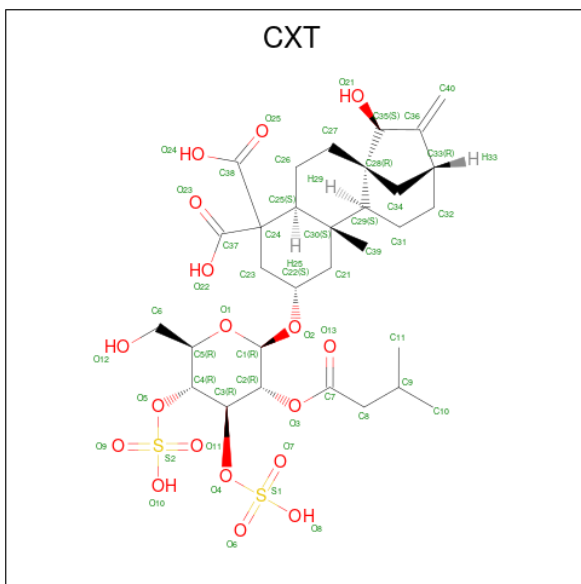
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total 51	C 31	O 18	S 2	0	0

- Molecule 3 is CARDIOLIPIN (three-letter code: CDL) (formula: $C_{81}H_{156}O_{17}P_2$).
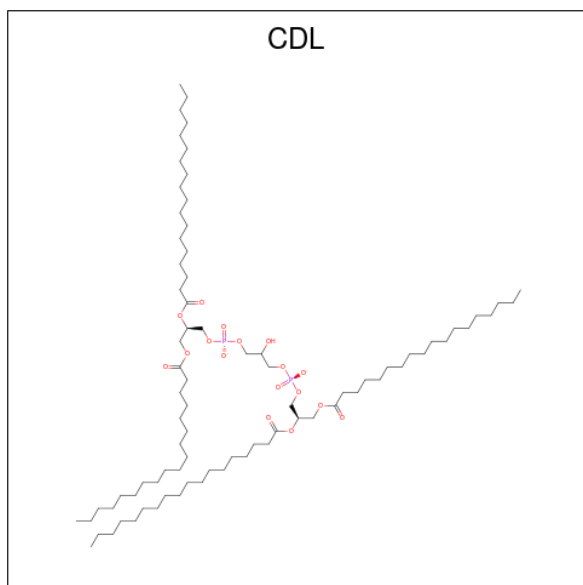
CDL

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total 57	C 38	O 17	P 2	0	0
3	A	1	Total 49	C 30	O 17	P 2	0	0
3	A	1	Total 36	C 32	O 4		0	0

- Molecule 4 is 3-LAURYLAMIDO-N,N'-DIMETHYLPROPYLAMINOXYDE (three-letter code: LDM) (formula: $C_{17}H_{36}N_2O_2$).

LDM
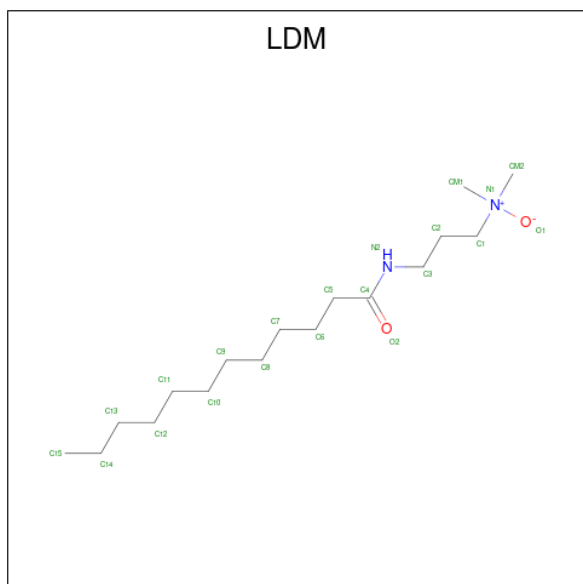
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	N	O	0	0
			18	14	2	2		
4	A	1	Total	C	N	O	0	0
			21	17	2	2		

- Molecule 5 is 1,2-DIACYL-SN-GLYCERO-3-PHOSPHOCHOLINE (three-letter code: PC1) (formula: $C_{44}H_{88}NO_8P$).
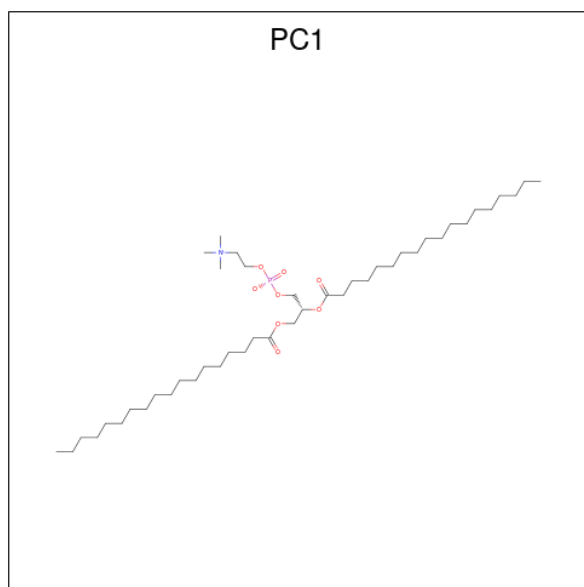
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	A	1	Total	C	N	O	P	0	0
			28	18	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			41	31	1	8	1		
5	A	1	Total	C	N	O	P	0	0
			27	17	1	8	1		
5	A	1	Total	C		O	P	0	0
			21	12		8	1		

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	83	Total	O	0	0
			83	83		

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: ADP, ATP CARRIER PROTEIN HEART ISOFORM T1
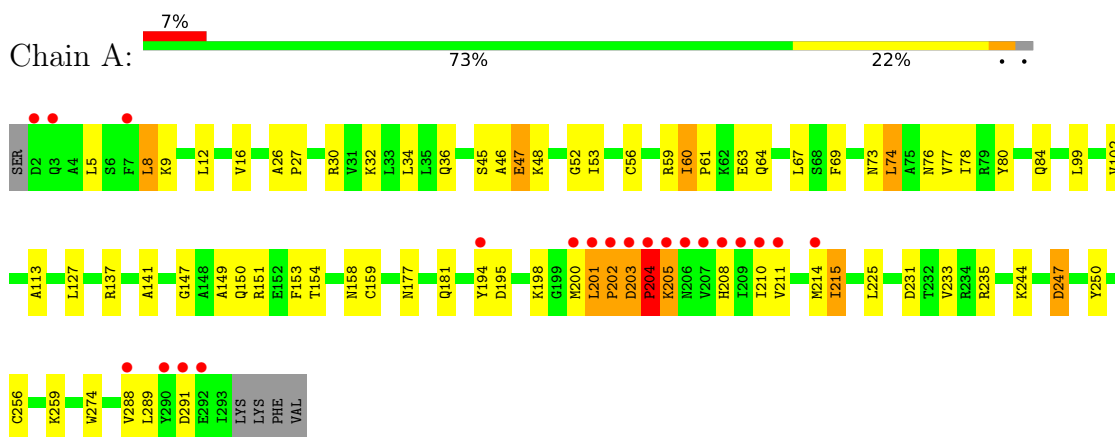
4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α, β, γ	85.44Å 83.46Å 49.92Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	14.99 – 2.20 24.74 – 2.20	Depositor EDS
% Data completeness (in resolution range)	99.2 (14.99-2.20) 99.3 (24.74-2.20)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.81 (at 2.19Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.220 , 0.266 0.211 , 0.260	Depositor DCC
R_{free} test set	899 reflections (4.83%)	wwPDB-VP
Wilson B-factor (Å^2)	30.2	Xtriage
Anisotropy	0.235	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 59.6	EDS
L-test for twinning[2]	$< |L| > = 0.49, < L^2 > = 0.32$	Xtriage
Estimated twinning fraction	0.018 for k,h,-l	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	2686	wwPDB-VP
Average B, all atoms (Å^2)	40.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.43% 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: CDL, PC1, LDM, CXT

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$|Z|$ >5	RMSZ	#$|Z|$ >5
1	A	0.36	0/2306	0.54	0/3113

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 ⓘ

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	2254	0	2258	64	0
2	A	51	0	41	1	0
3	A	142	0	153	8	0
4	A	39	0	63	0	0
5	A	117	0	132	4	0
6	A	83	0	0	0	0
All	All	2686	0	2647	66	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 13.

All (66) 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:99:LEU:O	1:A:102:VAL:HG12	1.69	0.93
1:A:60:ILE:HG13	1:A:61:PRO:HD3	1.54	0.89
1:A:30:ARG:O	1:A:34:LEU:HD23	1.79	0.83
1:A:30:ARG:HH22	1:A:64:GLN:HE22	1.29	0.79
1:A:198:LYS:HA	1:A:202:PRO:HG2	1.67	0.75
3:A:802:CDL:H151	3:A:802:CDL:H332	1.71	0.73
1:A:200:MET:O	1:A:202:PRO:HD3	1.90	0.72
1:A:5:LEU:HG	1:A:9:LYS:HE3	1.73	0.71
1:A:200:MET:C	1:A:202:PRO:HD3	2.13	0.67
1:A:60:ILE:HG13	1:A:61:PRO:CD	2.25	0.64
1:A:274:TRP:HB2	3:A:801:CDL:HB61	1.78	0.63
1:A:73:ASN:HD22	1:A:76:ASN:HD22	1.47	0.63
1:A:154:THR:H	1:A:158:ASN:HD22	1.46	0.62
1:A:198:LYS:HA	1:A:202:PRO:CG	2.28	0.61
1:A:67:LEU:HD13	5:A:982:PC1:H31	1.82	0.61
1:A:203:ASP:O	1:A:205:LYS:N	2.35	0.59
1:A:47:GLU:N	1:A:47:GLU:OE1	2.36	0.59
1:A:195:ASP:O	1:A:198:LYS:HG2	2.06	0.56
1:A:45:SER:OG	1:A:48:LYS:HG3	2.07	0.55
1:A:8:LEU:O	1:A:12:LEU:HG	2.08	0.54
1:A:32:LYS:NZ	1:A:36:GLN:HE22	2.06	0.54
1:A:154:THR:H	1:A:158:ASN:ND2	2.04	0.54
1:A:59:ARG:O	1:A:63:GLU:HB2	2.08	0.53
1:A:203:ASP:O	1:A:204:PRO:C	2.47	0.53
1:A:231:ASP:O	1:A:235:ARG:HG2	2.09	0.53
1:A:12:LEU:O	1:A:16:VAL:HG23	2.10	0.52
1:A:177:ASN:OD1	3:A:802:CDL:H311	2.09	0.52
1:A:30:ARG:NH2	1:A:64:GLN:HE22	2.04	0.51
1:A:215:ILE:C	1:A:215:ILE:HD13	2.30	0.51
1:A:73:ASN:ND2	1:A:76:ASN:HD22	2.10	0.50
1:A:147:GLY:O	1:A:151:ARG:HG2	2.12	0.50
1:A:127:LEU:HG	2:A:401:CXT:H11	1.94	0.49
1:A:53:ILE:HG13	3:A:801:CDL:HB21	1.95	0.48
1:A:211:VAL:O	1:A:215:ILE:HG22	2.14	0.47
1:A:250:TYR:CD1	1:A:256:CYS:HA	2.50	0.47
1:A:200:MET:O	1:A:201:LEU:CB	2.62	0.47
1:A:30:ARG:HH22	1:A:64:GLN:NE2	2.06	0.46
1:A:211:VAL:HA	1:A:214:MET:CE	2.46	0.46
1:A:200:MET:O	1:A:201:LEU:HB3	2.16	0.45
1:A:74:LEU:HD22	1:A:78:ILE:CD1	2.47	0.45
1:A:80:TYR:C	1:A:80:TYR:CD1	2.89	0.45
1:A:80:TYR:CZ	1:A:84:GLN:HG3	2.52	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:52:GLY:O	1:A:56:CYS:HB2	2.17	0.45
1:A:113:ALA:HB2	5:A:981:PC1:H362	1.98	0.45
1:A:244:LYS:O	1:A:247:ASP:HB2	2.16	0.45
1:A:34:LEU:HD21	1:A:141:ALA:O	2.15	0.45
1:A:250:TYR:HE1	1:A:259:LYS:HB3	1.82	0.44
1:A:36:GLN:NE2	1:A:235:ARG:HG3	2.33	0.44
1:A:56:CYS:O	1:A:60:ILE:HG23	2.17	0.44
1:A:154:THR:HB	5:A:980:PC1:H132	2.00	0.44
1:A:46:ALA:HB3	1:A:47:GLU:OE1	2.18	0.44
1:A:225:LEU:HB3	3:A:801:CDL:H562	1.99	0.44
3:A:801:CDL:O1	5:A:983:PC1:H12	2.18	0.44
1:A:26:ALA:N	1:A:27:PRO:CD	2.81	0.43
1:A:181:GLN:HG2	3:A:802:CDL:H402	2.00	0.43
1:A:147:GLY:N	1:A:150:GLN:OE1	2.51	0.43
1:A:60:ILE:HG12	1:A:69:PHE:CE1	2.54	0.43
1:A:61:PRO:HG3	1:A:69:PHE:CE2	2.54	0.42
1:A:198:LYS:CA	1:A:202:PRO:HG2	2.44	0.42
1:A:67:LEU:HD12	1:A:67:LEU:HA	1.90	0.42
1:A:211:VAL:HA	1:A:214:MET:HE2	2.02	0.42
1:A:153:PHE:CD1	1:A:159:CYS:HA	2.53	0.42
1:A:288:VAL:HG23	1:A:289:LEU:N	2.35	0.42
1:A:77:VAL:HG11	3:A:800:CDL:H311	2.01	0.41
1:A:149:ALA:HB3	1:A:150:GLN:HE21	1.86	0.41
1:A:200:MET:C	1:A:202:PRO:CD	2.86	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	290/297 (98%)	281 (97%)	4 (1%)	5 (2%)	9	6

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	201	LEU
1	A	202	PRO
1	A	204	PRO
1	A	205	LYS
1	A	210	ILE

5.3.2　Protein sidechains　ⓘ

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	223/234 (95%)	210 (94%)	13 (6%)	20	23

All (13) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	8	LEU
1	A	47	GLU
1	A	60	ILE
1	A	74	LEU
1	A	137	ARG
1	A	194	TYR
1	A	203	ASP
1	A	204	PRO
1	A	208	HIS
1	A	215	ILE
1	A	233	VAL
1	A	247	ASP
1	A	291	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	36	GLN
1	A	64	GLN

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Mol	Chain	Res	Type
1	A	73	ASN
1	A	158	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

10 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	#$\|Z\| > 2$
5	PC1	A	982	-	26,26,53	1.95	2 (7%)	32,34,61	0.94	1 (3%)
3	CDL	A	801	-	48,48,99	0.80	1 (2%)	54,60,111	1.00	6 (11%)
5	PC1	A	980	-	27,27,53	2.22	2 (7%)	33,35,61	1.10	2 (6%)
4	LDM	A	903	-	14,17,20	2.28	1 (7%)	17,20,23	0.92	0
3	CDL	A	800	-	56,56,99	0.65	0	62,68,111	1.03	6 (9%)
5	PC1	A	981	-	40,40,53	1.80	2 (5%)	46,48,61	0.89	1 (2%)
5	PC1	A	983	-	20,20,53	2.31	3 (15%)	24,25,61	1.19	1 (4%)
4	LDM	A	904	-	17,20,20	2.06	1 (5%)	20,23,23	1.02	0
3	CDL	A	802	-	35,35,99	0.77	2 (5%)	37,37,111	1.01	2 (5%)
2	CXT	A	401	-	55,55,55	2.98	21 (38%)	74,89,89	2.92	24 (32%)

W O R L D W I D E
wwPDB
PROTEIN DATA BANK

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
5	PC1	A	982	-	-	8/29/29/57	-
3	CDL	A	801	-	-	21/58/58/110	-
5	PC1	A	980	-	-	17/31/31/57	-
4	LDM	A	903	-	-	3/16/16/19	-
3	CDL	A	800	-	-	24/67/67/110	-
5	PC1	A	981	-	-	17/44/44/57	-
5	PC1	A	983	-	-	9/21/21/57	-
4	LDM	A	904	-	-	3/19/19/19	-
3	CDL	A	802	-	-	11/36/36/110	-
2	CXT	A	401	-	1/1/20/20	10/36/120/120	0/6/5/5

All (35) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	980	PC1	O21-C21	8.48	1.58	1.34
5	A	983	PC1	O21-C21	8.40	1.58	1.34
5	A	981	PC1	O21-C21	8.04	1.57	1.34
5	A	982	PC1	O21-C21	7.96	1.56	1.34
4	A	903	LDM	O1-N1	-7.85	1.23	1.42
2	A	401	CXT	C30-C25	7.80	1.68	1.56
4	A	904	LDM	O1-N1	-7.78	1.24	1.42
5	A	981	PC1	O31-C31	6.57	1.52	1.33
2	A	401	CXT	C31-C29	6.56	1.64	1.53
2	A	401	CXT	C28-C29	6.56	1.68	1.55
2	A	401	CXT	C40-C36	6.45	1.44	1.32
2	A	401	CXT	O3-C7	6.41	1.52	1.34
5	A	980	PC1	O31-C31	6.33	1.51	1.33
2	A	401	CXT	O21-C35	-5.41	1.32	1.42
2	A	401	CXT	C24-C25	5.06	1.68	1.57
2	A	401	CXT	C26-C25	5.05	1.61	1.53
2	A	401	CXT	C39-C30	4.93	1.62	1.54
2	A	401	CXT	O2-C22	4.26	1.50	1.44
5	A	983	PC1	O31-C31	3.96	1.52	1.33
5	A	982	PC1	O31-C31	3.72	1.51	1.33
2	A	401	CXT	O2-C1	-3.71	1.31	1.41
2	A	401	CXT	C24-C37	3.33	1.60	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	401	CXT	C24-C38	3.30	1.60	1.53
2	A	401	CXT	C21-C30	3.21	1.59	1.54
2	A	401	CXT	O13-C7	-3.01	1.13	1.22
2	A	401	CXT	C28-C35	2.96	1.64	1.56
2	A	401	CXT	O4-C3	-2.88	1.40	1.46
2	A	401	CXT	C27-C26	2.86	1.59	1.53
2	A	401	CXT	C23-C22	2.77	1.56	1.51
3	A	801	CDL	CB3-CB4	2.69	1.58	1.50
2	A	401	CXT	O1-C1	2.66	1.48	1.41
5	A	983	PC1	P-O13	2.48	1.64	1.54
2	A	401	CXT	C21-C22	2.38	1.56	1.51
3	A	802	CDL	OA6-CA4	2.27	1.51	1.47
3	A	802	CDL	CA6-CA4	2.13	1.55	1.50

All (43) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	401	CXT	O2-C22-C21	15.12	152.52	107.83
2	A	401	CXT	C3-O4-S1	7.28	132.95	118.88
2	A	401	CXT	O2-C22-C23	-7.17	86.64	107.83
2	A	401	CXT	O3-C7-C8	-6.72	99.10	111.46
2	A	401	CXT	C26-C25-C30	-4.82	105.91	110.95
5	A	980	PC1	C3-C2-C1	-4.39	101.41	111.79
2	A	401	CXT	C38-C24-C37	-4.37	98.41	107.29
3	A	802	CDL	OA6-CA4-CA3	4.05	117.18	107.93
2	A	401	CXT	O12-C6-C5	4.01	125.03	111.29
5	A	983	PC1	C3-C2-C1	-3.76	102.89	111.79
2	A	401	CXT	C39-C30-C21	-3.68	103.38	108.97
2	A	401	CXT	C1-C2-C3	3.62	117.97	110.75
2	A	401	CXT	C23-C24-C25	-3.44	102.13	110.16
5	A	981	PC1	C3-C2-C1	-3.44	103.66	111.79
3	A	801	CDL	OB8-CB6-CB4	3.26	117.93	108.43
2	A	401	CXT	C23-C24-C38	3.17	116.57	109.92
2	A	401	CXT	O3-C7-O13	3.16	131.33	123.70
3	A	800	CDL	OB8-CB6-CB4	3.01	117.18	108.43
2	A	401	CXT	C1-O1-C5	2.83	119.25	113.69
2	A	401	CXT	O23-C37-C24	2.62	126.52	122.52
5	A	982	PC1	C3-C2-C1	-2.59	105.66	111.79
2	A	401	CXT	C39-C30-C25	2.55	117.64	112.92
2	A	401	CXT	O3-C2-C1	2.53	114.19	108.40
3	A	800	CDL	CB6-CB4-CB3	-2.46	105.98	111.79
3	A	800	CDL	CA6-CA4-CA3	-2.40	106.12	111.79

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	801	CDL	C52-C51-CB5	2.37	122.25	113.62
2	A	401	CXT	O2-C1-C2	2.32	113.81	109.10
5	A	980	PC1	O21-C21-C22	2.32	116.50	111.50
3	A	801	CDL	O1-C1-CA2	-2.29	101.54	109.56
2	A	401	CXT	O2-C1-O1	-2.28	104.30	110.67
2	A	401	CXT	O22-C37-O23	-2.25	116.65	123.82
3	A	802	CDL	OA6-CA4-CA6	2.21	111.24	106.13
2	A	401	CXT	O3-C2-C3	-2.19	103.87	108.25
2	A	401	CXT	O13-C7-C8	2.19	129.57	124.73
2	A	401	CXT	C32-C33-C36	2.11	114.00	110.49
2	A	401	CXT	C25-C24-C38	2.10	118.73	112.09
3	A	800	CDL	OB6-CB5-C51	2.09	116.01	111.50
3	A	800	CDL	O1-C1-CA2	-2.07	102.30	109.56
3	A	801	CDL	CB4-OB6-CB5	2.07	122.88	117.79
3	A	801	CDL	OB6-CB5-C51	2.04	115.91	111.50
2	A	401	CXT	O1-C5-C6	-2.04	101.37	106.44
3	A	800	CDL	OB6-CB5-OB7	-2.02	118.81	123.70
3	A	801	CDL	OB6-CB5-OB7	-2.01	118.85	123.70

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	A	401	CXT	C1

All (123) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	401	CXT	C21-C22-O2-C1
2	A	401	CXT	C25-C24-C37-O22
2	A	401	CXT	C25-C24-C37-O23
3	A	800	CDL	CA3-OA5-PA1-OA2
3	A	800	CDL	CA3-OA5-PA1-OA3
3	A	800	CDL	CA3-OA5-PA1-OA4
3	A	800	CDL	CB2-OB2-PB2-OB5
3	A	801	CDL	O1-C1-CB2-OB2
3	A	801	CDL	CA3-OA5-PA1-OA2
3	A	801	CDL	CA3-OA5-PA1-OA3
3	A	801	CDL	CA3-OA5-PA1-OA4
3	A	801	CDL	CB2-OB2-PB2-OB4
3	A	801	CDL	C51-CB5-OB6-CB4
3	A	801	CDL	OB7-CB5-OB6-CB4
3	A	802	CDL	OA7-CA5-OA6-CA4

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Mol	Chain	Res	Type	Atoms
5	A	980	PC1	C32-C31-O31-C3
5	A	982	PC1	C32-C31-O31-C3
3	A	802	CDL	C11-CA5-OA6-CA4
3	A	802	CDL	CA3-CA4-OA6-CA5
5	A	980	PC1	O32-C31-O31-C3
3	A	801	CDL	CA2-C1-CB2-OB2
5	A	980	PC1	C11-C12-N-C15
5	A	982	PC1	O32-C31-O31-C3
5	A	980	PC1	C11-C12-N-C13
5	A	981	PC1	C31-C32-C33-C34
3	A	801	CDL	CB2-OB2-PB2-OB5
5	A	981	PC1	C34-C35-C36-C37
4	A	903	LDM	C11-C10-C9-C8
5	A	981	PC1	C38-C39-C3A-C3B
5	A	981	PC1	C3B-C3C-C3D-C3E
3	A	802	CDL	C19-C20-C21-C22
3	A	800	CDL	C11-C12-C13-C14
3	A	800	CDL	C39-C40-C41-C42
3	A	801	CDL	C51-C52-C53-C54
5	A	980	PC1	C21-C22-C23-C24
5	A	983	PC1	C21-C22-C23-C24
5	A	982	PC1	C23-C24-C25-C26
3	A	800	CDL	OB7-CB5-OB6-CB4
3	A	800	CDL	C51-CB5-OB6-CB4
5	A	981	PC1	C3A-C3B-C3C-C3D
5	A	982	PC1	C21-C22-C23-C24
5	A	981	PC1	C37-C38-C39-C3A
3	A	800	CDL	C31-C32-C33-C34
3	A	802	CDL	C11-C12-C13-C14
3	A	802	CDL	C31-C32-C33-C34
4	A	904	LDM	C11-C12-C13-C14
3	A	802	CDL	C20-C21-C22-C23
3	A	802	CDL	C33-C34-C35-C36
5	A	980	PC1	C11-C12-N-C14
5	A	981	PC1	C32-C33-C34-C35
2	A	401	CXT	C3-O4-S1-O7
3	A	801	CDL	C11-CA5-OA6-CA4
5	A	980	PC1	C22-C21-O21-C2
3	A	801	CDL	OA7-CA5-OA6-CA4
3	A	800	CDL	CA7-C31-C32-C33
5	A	983	PC1	C22-C21-O21-C2
5	A	980	PC1	O11-C1-C2-C3

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Mol	Chain	Res	Type	Atoms
5	A	981	PC1	C21-C22-C23-C24
5	A	981	PC1	C3D-C3E-C3F-C3G
2	A	401	CXT	C23-C24-C37-O22
2	A	401	CXT	C23-C24-C38-O24
5	A	983	PC1	C1-C2-C3-O31
5	A	982	PC1	C24-C25-C26-C27
5	A	983	PC1	C24-C25-C26-C27
2	A	401	CXT	C23-C24-C38-O25
3	A	801	CDL	C13-C14-C15-C16
5	A	980	PC1	O21-C21-C22-C23
5	A	981	PC1	O21-C2-C3-O31
5	A	980	PC1	O22-C21-O21-C2
3	A	800	CDL	C38-C39-C40-C41
5	A	981	PC1	C22-C21-O21-C2
5	A	983	PC1	O22-C21-O21-C2
4	A	904	LDM	C6-C7-C8-C9
3	A	800	CDL	OB5-CB3-CB4-OB6
3	A	801	CDL	OA5-CA3-CA4-OA6
3	A	801	CDL	OB5-CB3-CB4-OB6
5	A	980	PC1	O21-C2-C3-O31
5	A	981	PC1	O22-C21-O21-C2
4	A	904	LDM	C4-C5-C6-C7
3	A	800	CDL	OA5-CA3-CA4-CA6
3	A	800	CDL	OB5-CB3-CB4-CB6
3	A	801	CDL	OB5-CB3-CB4-CB6
5	A	981	PC1	C3E-C3F-C3G-C3H
3	A	800	CDL	C36-C37-C38-C39
3	A	801	CDL	CB2-OB2-PB2-OB3
3	A	801	CDL	OA5-CA3-CA4-CA6
5	A	980	PC1	C23-C24-C25-C26
3	A	800	CDL	OA5-CA3-CA4-OA6
5	A	980	PC1	O13-C11-C12-N
5	A	982	PC1	O13-C11-C12-N
3	A	801	CDL	OA6-CA4-CA6-OA8
5	A	983	PC1	O21-C2-C3-O31
3	A	800	CDL	C13-C14-C15-C16
4	A	903	LDM	C6-C7-C8-C9
5	A	980	PC1	O11-C1-C2-O21
5	A	983	PC1	C32-C31-O31-C3
3	A	802	CDL	C21-C22-C23-C24
3	A	800	CDL	OA6-CA4-CA6-OA8
3	A	802	CDL	C36-C37-C38-C39

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Mol	Chain	Res	Type	Atoms
4	A	903	LDM	C4-C5-C6-C7
5	A	980	PC1	O22-C21-C22-C23
3	A	800	CDL	OA7-CA5-OA6-CA4
2	A	401	CXT	C37-C24-C38-O24
2	A	401	CXT	C23-C24-C37-O23
2	A	401	CXT	C37-C24-C38-O25
3	A	800	CDL	CA3-CA4-CA6-OA8
5	A	980	PC1	C1-C2-C3-O31
5	A	981	PC1	C1-C2-C3-O31
3	A	800	CDL	C51-C52-C53-C54
3	A	802	CDL	CA6-CA4-OA6-CA5
3	A	800	CDL	C11-CA5-OA6-CA4
5	A	981	PC1	O21-C21-C22-C23
3	A	800	CDL	C72-C71-CB7-OB8
5	A	982	PC1	O21-C21-C22-C23
3	A	801	CDL	CA3-CA4-CA6-OA8
3	A	800	CDL	CB2-OB2-PB2-OB4
5	A	981	PC1	O22-C21-C22-C23
5	A	981	PC1	C3C-C3D-C3E-C3F
5	A	980	PC1	C12-C11-O13-P
5	A	982	PC1	O22-C21-C22-C23
5	A	983	PC1	O21-C21-C22-C23
5	A	983	PC1	O32-C31-O31-C3
3	A	801	CDL	C52-C51-CB5-OB6

There are no ring outliers.

8 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	982	PC1	1	0
3	A	801	CDL	4	0
5	A	980	PC1	1	0
3	A	800	CDL	1	0
5	A	981	PC1	1	0
5	A	983	PC1	1	0
3	A	802	CDL	3	0
2	A	401	CXT	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 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 PC1 A 982

Bond lengths

Bond angles

Torsions

Rings

Ligand CDL A 801

Bond lengths

Bond angles

Torsions

Rings

Ligand PC1 A 980

Bond lengths	Bond angles
Torsions	Rings

Ligand LDM A 903

Bond lengths	Bond angles
Torsions	Rings

Ligand CDL A 800

Bond lengths

Bond angles

Torsions

Rings

Ligand PC1 A 981

Bond lengths

Bond angles

Torsions

Rings

Ligand PC1 A 983	
Bond lengths	Bond angles
Torsions	Rings

Ligand LDM A 904	
Bond lengths	Bond angles
Torsions	Rings

Ligand CDL A 802

Bond lengths

Bond angles

Torsions

Rings

Ligand CXT A 401

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	292/297 (98%)	-0.01	21 (7%)	15	14	20, 31, 76, 108	0

All (21) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	201	LEU	6.0
1	A	209	ILE	5.6
1	A	204	PRO	5.5
1	A	210	ILE	5.3
1	A	200	MET	5.2
1	A	208	HIS	3.9
1	A	288	VAL	3.8
1	A	291	ASP	3.7
1	A	203	ASP	3.6
1	A	202	PRO	3.6
1	A	2	ASP	3.6
1	A	194	TYR	3.2
1	A	205	LYS	3.1
1	A	211	VAL	3.0
1	A	206	ASN	2.8
1	A	290	TYR	2.7
1	A	7	PHE	2.6
1	A	207	VAL	2.6
1	A	214	MET	2.6
1	A	292	GLU	2.5
1	A	3	GLN	2.3

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

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

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
5	PC1	A	983	21/54	0.47	0.35	108,115,121,121	0
4	LDM	A	904	21/21	0.57	0.38	96,98,99,100	0
3	CDL	A	802	36/100	0.57	0.27	62,84,88,89	0
4	LDM	A	903	18/21	0.67	0.29	75,80,82,82	0
5	PC1	A	981	41/54	0.79	0.33	85,89,91,91	0
5	PC1	A	980	28/54	0.80	0.31	99,99,99,99	0
3	CDL	A	801	49/100	0.83	0.23	34,50,71,71	0
5	PC1	A	982	27/54	0.85	0.22	54,59,67,68	0
3	CDL	A	800	57/100	0.86	0.24	34,56,74,75	0
2	CXT	A	401	51/51	0.93	0.14	21,33,45,46	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 PC1 A 983:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
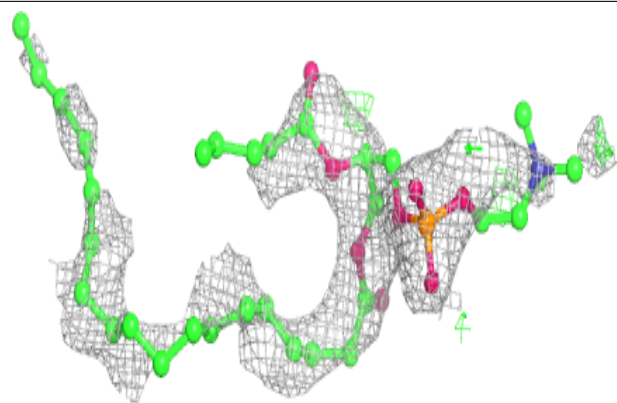and green (positive)
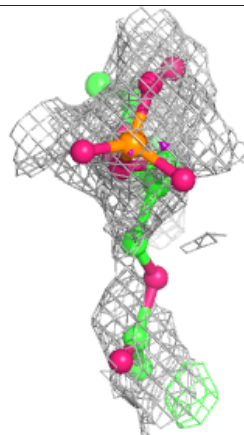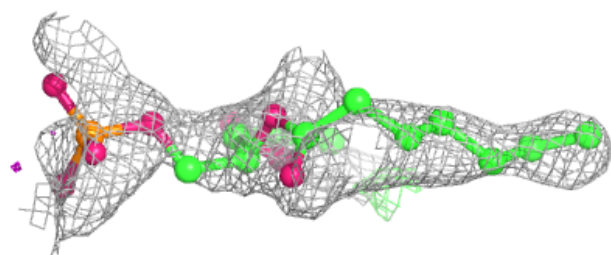
Electron density around LDM A 904:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
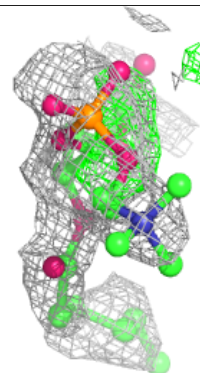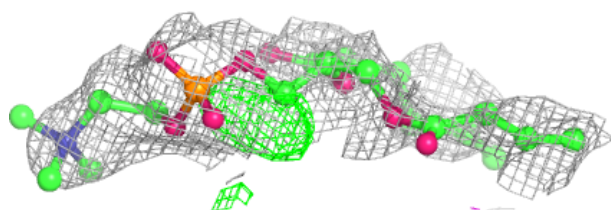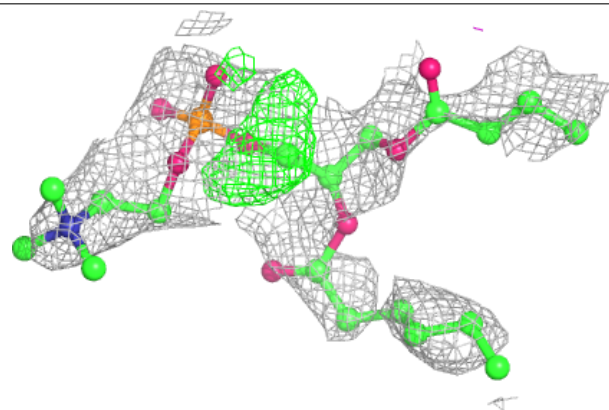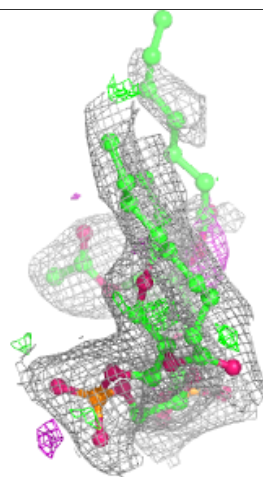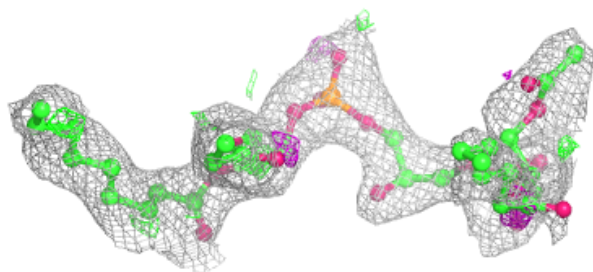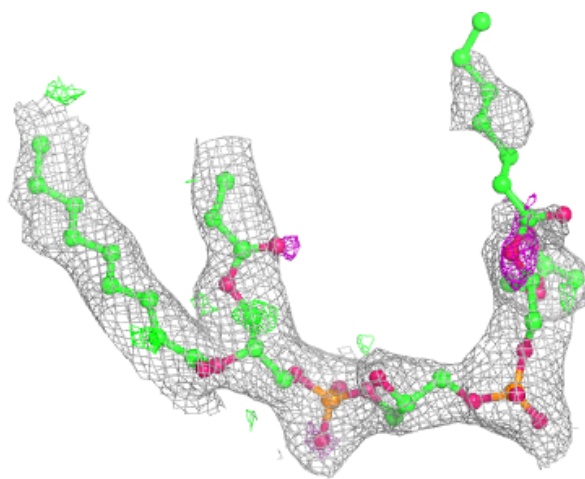$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
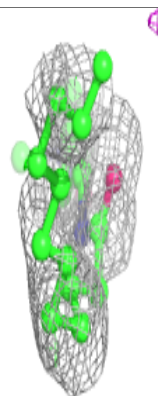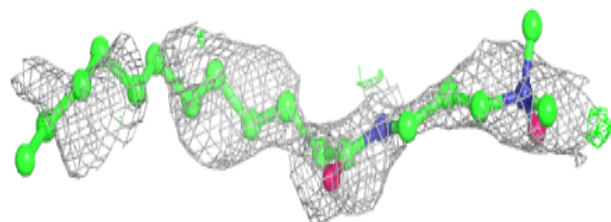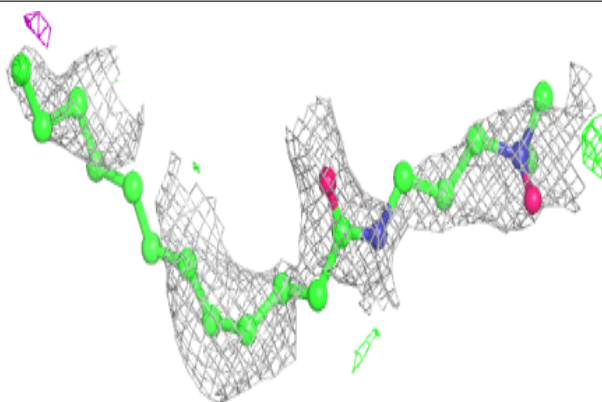
Electron density around CDL A 802:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
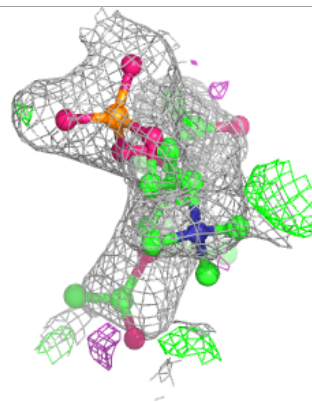$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
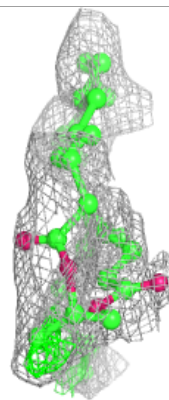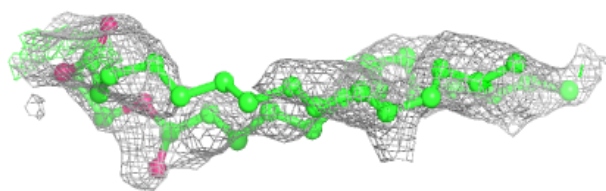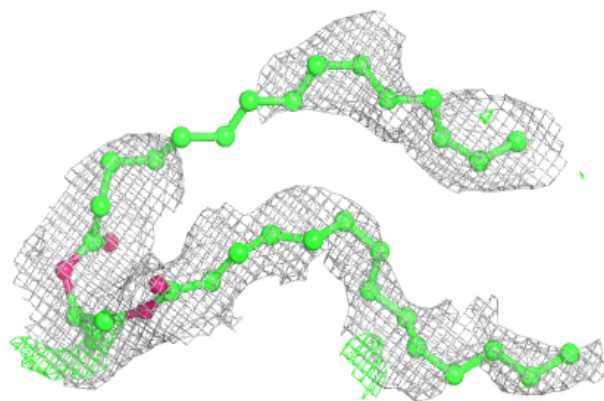
Electron density around LDM A 903:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
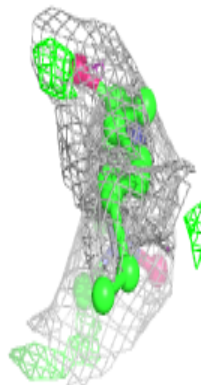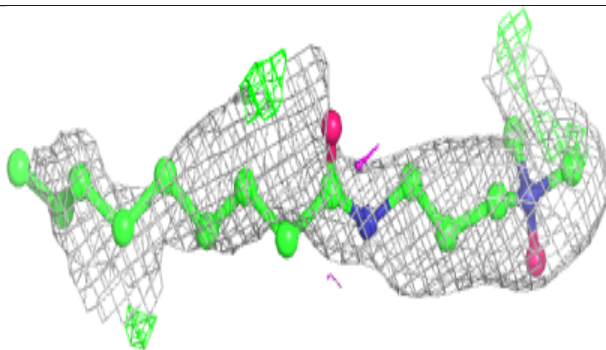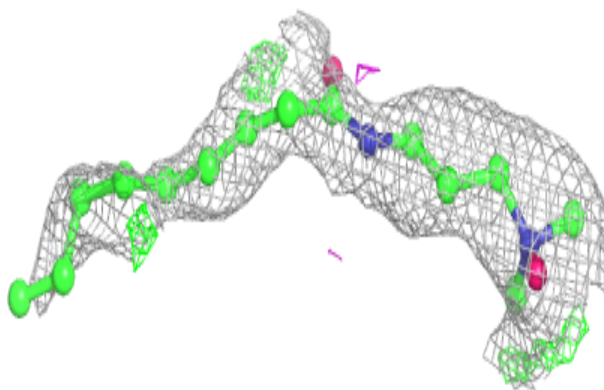
Electron density around PC1 A 981:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
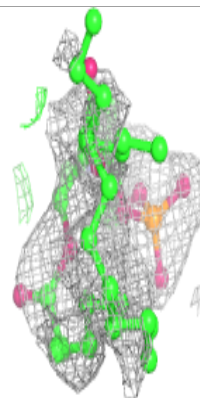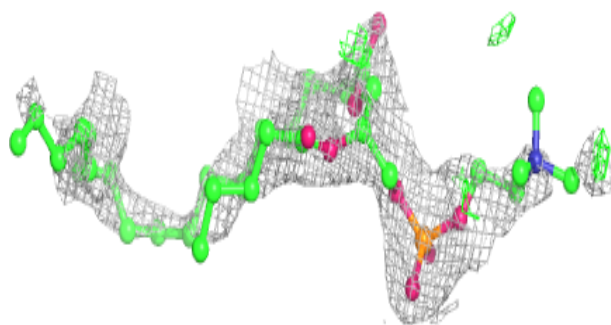
Electron density around PC1 A 980:

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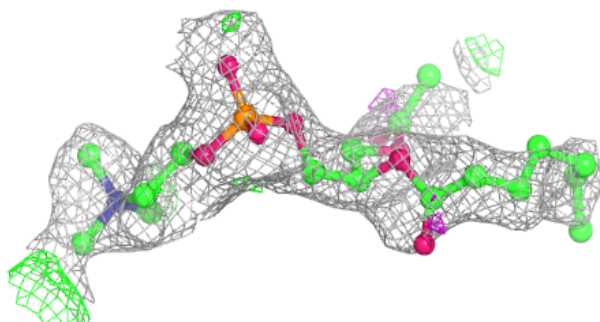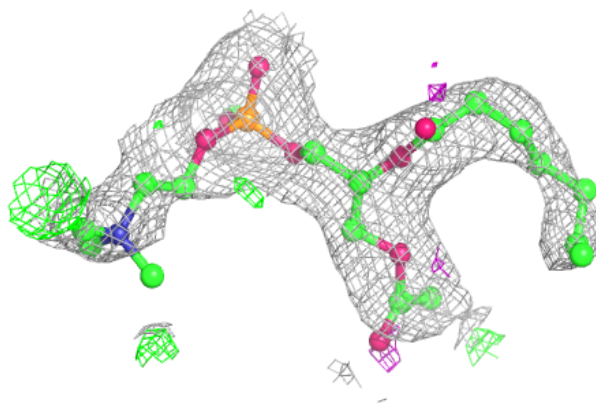$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
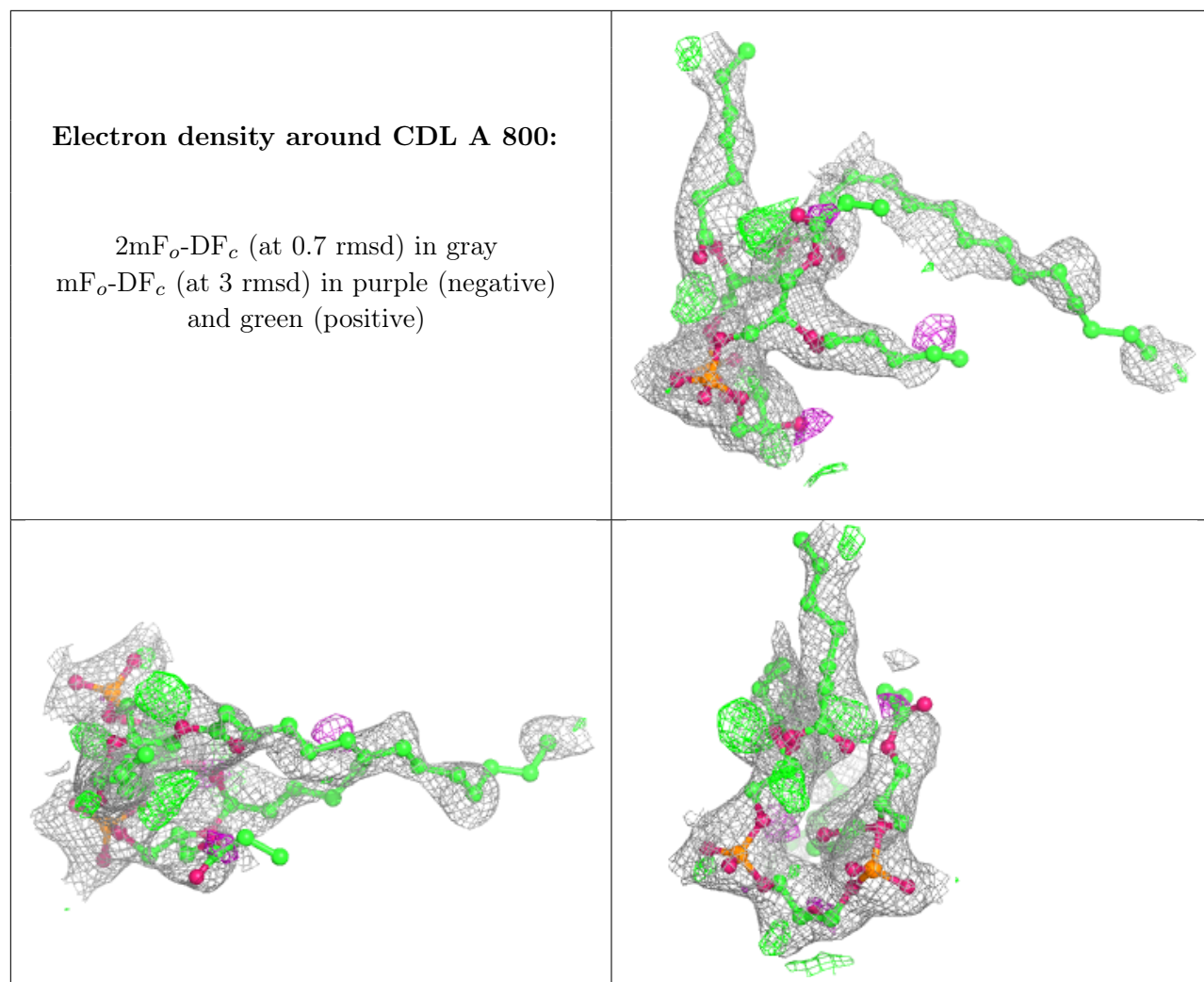and green (positive)

Electron density around CDL A 801:

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

Electron density around PC1 A 982:

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

Electron density around CDL A 800:

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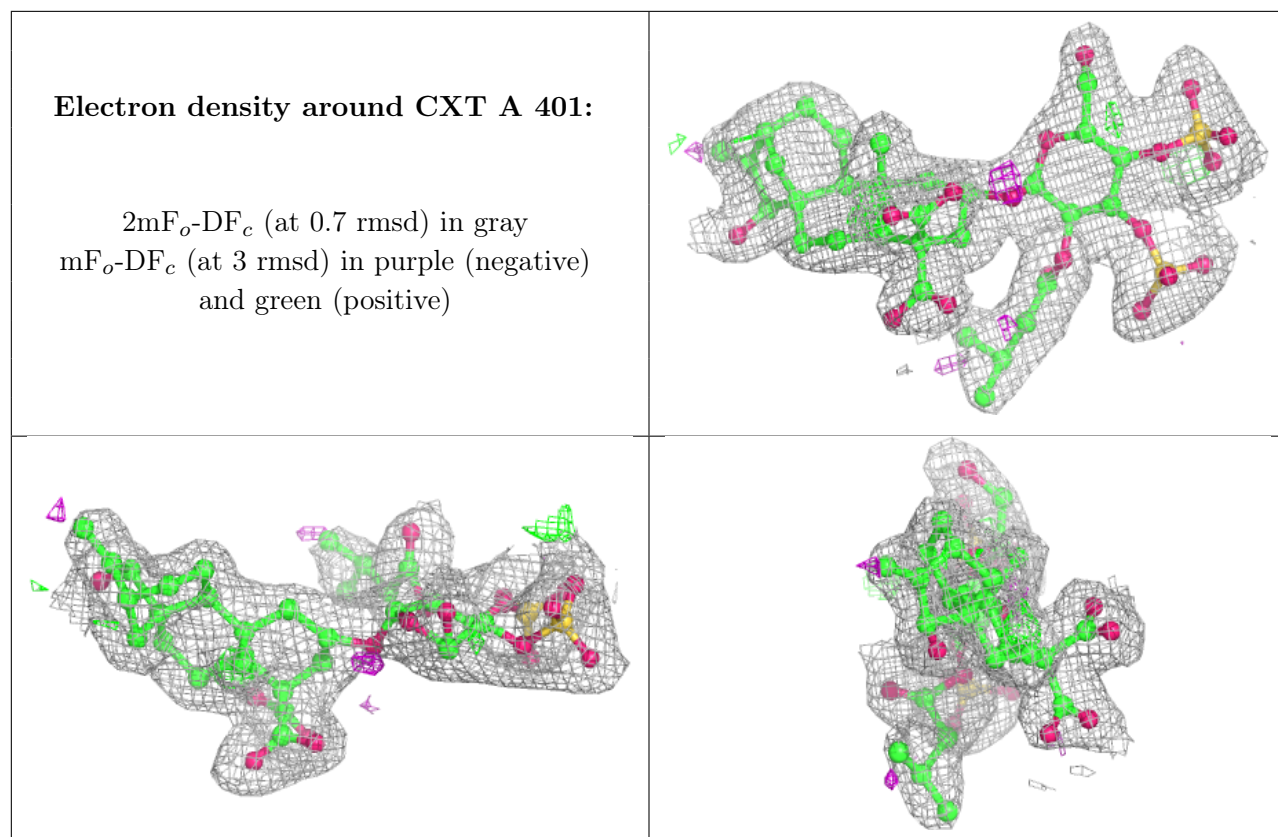mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

Electron density around CXT A 401:

$2mF_o$-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.