wwPDB X-ray Structure Validation Summary Report (i)

Oct 18, 2023 – 09:22 AM EDT

PDB ID	:	1T0L
Title	:	Crystal structure of human cytosolic NADP(+)-dependent isocitrate dehydrogenase in complex with NADP, isocitrate, and calcium(2+)
Authors	:	Xu, X.; Zhao, J.; Peng, B.; Huang, Q.; Arnold, E.; Ding, J.
Deposited on	:	2004-04-10
Resolution	:	2.41 Å(reported)

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

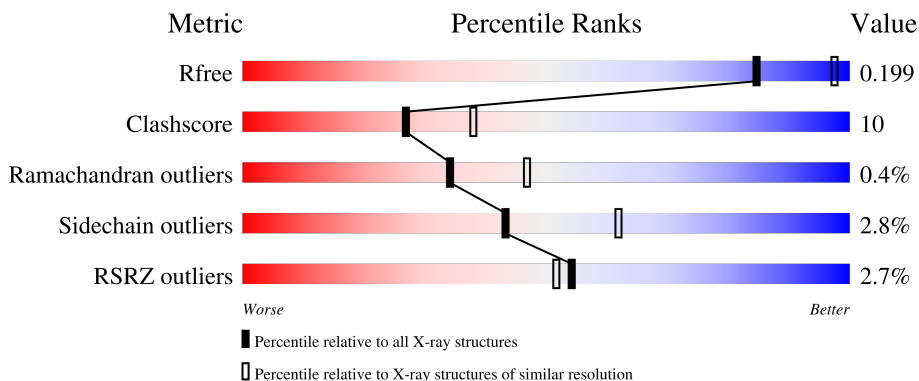|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance ⓘ

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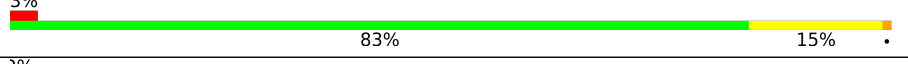*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.41 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		0.199
Clashscore		10
Ramachandran outliers		0.4%
Sidechain outliers		2.8%
RSRZ outliers		2.7%

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	4647 (2.44-2.40)
Clashscore	141614	5161 (2.44-2.40)
Ramachandran outliers	138981	5073 (2.44-2.40)
Sidechain outliers	138945	5074 (2.44-2.40)
RSRZ outliers	127900	4543 (2.44-2.40)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=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	414	2% / 84% / 15% / ·
1	B	414	3% / 83% / 15% / ·
1	C	414	2% / 84% / 15% / ·
1	D	414	3% / 83% / 14% / ·

2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 14286 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 Isocitrate dehydrogenase [NADP] cytoplasmic.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	414	Total 3281	C 2085	N 556	O 621	S 19	0	0	0
1	B	414	Total 3281	C 2085	N 556	O 621	S 19	0	0	0
1	C	414	Total 3281	C 2085	N 556	O 621	S 19	0	0	0
1	D	414	Total 3281	C 2085	N 556	O 621	S 19	0	0	0

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

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

- Molecule 3 is NADP NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (three-letter code: NAP) (formula: $C_{21}H_{28}N_7O_{17}P_3$).

NAP

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
3	B	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
3	C	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
3	D	1	Total	C	N	O	P	0	0
			48	21	7	17	3		

- Molecule 4 is ISOCITRIC ACID (three-letter code: ICT) (formula: $C_6H_8O_7$).

ICT
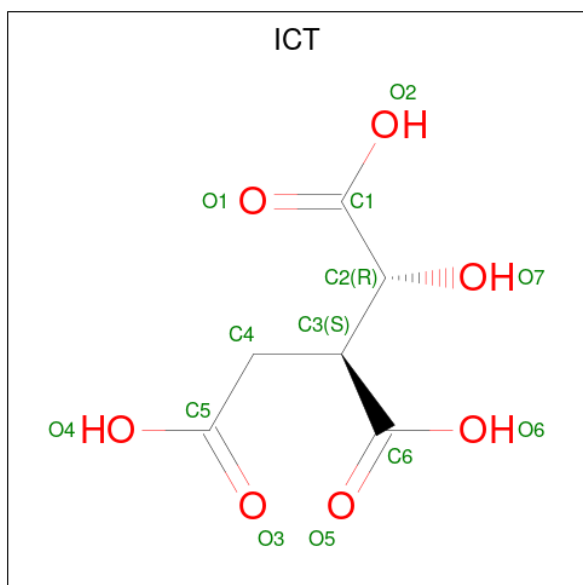
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			13	6	7		
4	B	1	Total	C	O	0	0
			13	6	7		
4	C	1	Total	C	O	0	0
			13	6	7		
4	D	1	Total	C	O	0	0
			13	6	7		

- Molecule 5 is water.

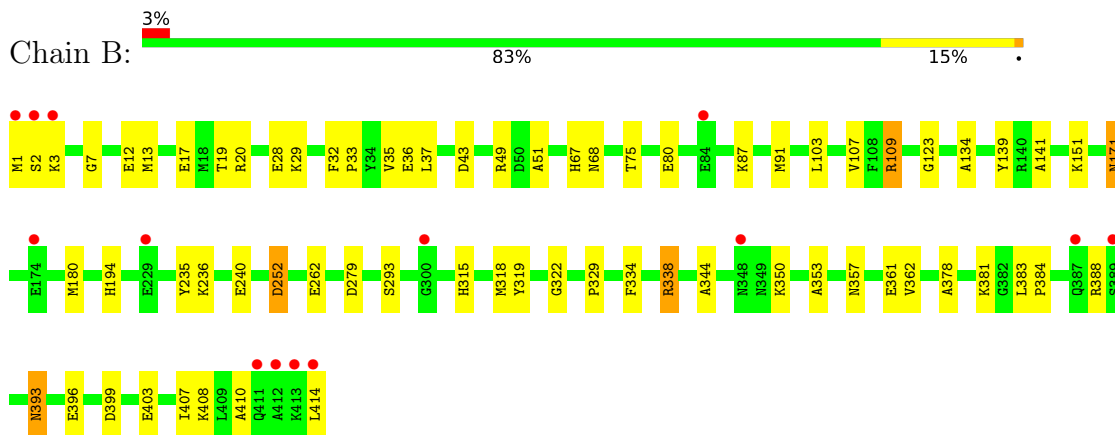| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	227	Total	O	0	0
			227	227		
5	B	221	Total	O	0	0
			221	221		
5	C	226	Total	O	0	0
			226	226		
5	D	240	Total	O	0	0
			240	240		

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.
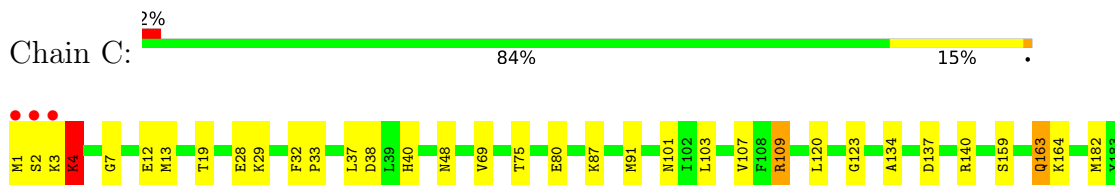
- Molecule 1: Isocitrate dehydrogenase [NADP] cytoplasmic

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N184 Q185 H194 E229 Q234 Y235 K236 S237 E240 D252 E262 D279 T292 S293 E306 A307 A308 R314 H315 M318 G322 F334 T337 R338 R343 N357 E360 E361 A378 K381 G382 L383 P384 N393 T394 F395 E396 D399

A412 K413 L414

• Molecule 1: Isocitrate dehydrogenase [NADP] cytoplasmic

Chain D:

3%

83%   14%

M1 S2 K3 G7 E12 M13 T19 R20 E28 K29 L37 D38 L39 H40 S41 Y42 D43 V69 T75 E80 E84 M91 N101 I102 L103 V107 F108 R109 G123 A134 D137 R140 A141 T142 P149 Y156 T157 P158 Q163 M182

Y183 N184 K187 H194 Y235 K236 E240 D252 M259 E262 Y272 D275 T292 S293 V294 V303 H315 M318 P329 R343 N348 N357 E361 A378 K381 G382 L383 P384 R388 N393 E396 D399 N404 L405 K406

I407 K408 L409 A410 Q411 A412 K413 L414

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	103.30Å 86.74Å 115.77Å 90.00° 107.15° 90.00°	Depositor
Resolution (Å)	12.00 – 2.41 11.99 – 2.41	Depositor EDS
% Data completeness (in resolution range)	94.2 (12.00-2.41) 94.3 (11.99-2.41)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.91 (at 2.40Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.214 , 0.253 0.202 , 0.199	Depositor DCC
R_{free} test set	3562 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å^2)	21.9	Xtriage
Anisotropy	0.390	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.42 , 68.1	EDS
L-test for twinning[2]	$< |L| > = 0.51, < L^2 > = 0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	14286	wwPDB-VP
Average B, all atoms (Å^2)	23.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 8.22% 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: NAP, CA, ICT

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	0.35	0/3349	0.62	0/4513
1	B	0.34	0/3349	0.61	0/4513
1	C	0.35	0/3349	0.62	0/4513
1	D	0.35	0/3349	0.62	0/4513
All	All	0.35	0/13396	0.62	0/18052

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	D	0	1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	D	183	TYR	Sidechain

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.

WORLDWIDE
wwPDB
PROTEIN DATA BANK

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3281	0	3256	59	0
1	B	3281	0	3256	57	0
1	C	3281	0	3256	63	0
1	D	3281	0	3256	94	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	0	0
3	A	48	0	25	3	0
3	B	48	0	25	4	0
3	C	48	0	25	5	0
3	D	48	0	25	4	0
4	A	13	0	5	3	0
4	B	13	0	5	2	0
4	C	13	0	5	3	0
4	D	13	0	5	2	0
5	A	227	0	0	3	0
5	B	221	0	0	4	0
5	C	226	0	0	4	0
5	D	240	0	0	4	0
All	All	14286	0	13144	270	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 10.

The worst 5 of 270 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:D:407:ILE:HA	1:D:413:LYS:HB2	1.36	1.07
1:B:51:ALA:HB1	1:C:87:LYS:HG3	1.35	1.06
1:D:404:ASN:O	1:D:407:ILE:HB	1.55	1.05
1:C:393:ASN:ND2	1:C:396:GLU:H	1.66	0.94
1:D:412:ALA:O	1:D:413:LYS:HG3	1.68	0.93

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	412/414 (100%)	392 (95%)	19 (5%)	1 (0%)	47	61
1	B	412/414 (100%)	396 (96%)	15 (4%)	1 (0%)	47	61
1	C	412/414 (100%)	390 (95%)	21 (5%)	1 (0%)	47	61
1	D	412/414 (100%)	388 (94%)	20 (5%)	4 (1%)	15	22
All	All	1648/1656 (100%)	1566 (95%)	75 (5%)	7 (0%)	34	47

5 of 7 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	411	GLN
1	D	413	LYS
1	C	4	LYS
1	D	407	ILE
1	D	412	ALA

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	350/350 (100%)	343 (98%)	7 (2%)	55	72
1	B	350/350 (100%)	340 (97%)	10 (3%)	42	61
1	C	350/350 (100%)	339 (97%)	11 (3%)	40	58
1	D	350/350 (100%)	339 (97%)	11 (3%)	40	58
All	All	1400/1400 (100%)	1361 (97%)	39 (3%)	43	62

5 of 39 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	19	THR
1	D	329	PRO
1	D	28	GLU
1	D	140	ARG
1	D	393	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 49 such sidechains are listed below:

Mol	Chain	Res	Type
1	C	198	GLN
1	C	411	GLN
1	C	228	GLN
1	C	348	ASN
1	D	90	GLN

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 ⓘ

Of 12 ligands modelled in this entry, 4 are monoatomic - leaving 8 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
3	NAP	C	1517	-	45,52,52	2.84	13 (28%)	56,80,80	2.02	13 (23%)
3	NAP	D	1518	-	45,52,52	2.85	12 (26%)	56,80,80	1.97	15 (26%)
3	NAP	A	1515	-	45,52,52	2.73	12 (26%)	56,80,80	2.01	14 (25%)
4	ICT	C	1618	2	12,12,12	3.01	6 (50%)	13,16,16	2.28	4 (30%)
3	NAP	B	1516	-	45,52,52	2.80	14 (31%)	56,80,80	1.99	14 (25%)
4	ICT	A	1616	2	12,12,12	2.95	6 (50%)	13,16,16	2.27	4 (30%)
4	ICT	B	1617	2	12,12,12	2.98	7 (58%)	13,16,16	2.18	4 (30%)
4	ICT	D	1619	2	12,12,12	3.13	7 (58%)	13,16,16	2.13	4 (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
3	NAP	C	1517	-	-	7/31/67/67	0/5/5/5
3	NAP	D	1518	-	-	8/31/67/67	0/5/5/5
3	NAP	A	1515	-	-	6/31/67/67	0/5/5/5
4	ICT	C	1618	2	-	4/16/16/16	-
3	NAP	B	1516	-	-	8/31/67/67	0/5/5/5
4	ICT	A	1616	2	-	4/16/16/16	-
4	ICT	B	1617	2	-	4/16/16/16	-
4	ICT	D	1619	2	-	1/16/16/16	-

The worst 5 of 77 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	1518	NAP	C2N-N1N	11.58	1.49	1.35
3	B	1516	NAP	C2N-N1N	11.01	1.48	1.35
3	C	1517	NAP	C2N-N1N	10.88	1.48	1.35
3	A	1515	NAP	C2N-N1N	10.34	1.47	1.35
3	C	1517	NAP	C3N-C7N	7.73	1.62	1.50

The worst 5 of 72 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	1515	NAP	C2N-C3N-C4N	5.44	124.42	118.26
3	C	1517	NAP	C2N-C3N-C4N	5.23	124.19	118.26
3	A	1515	NAP	C5N-C4N-C3N	-5.15	114.25	120.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	1515	NAP	PN-O3-PA	5.15	150.50	132.83
3	D	1518	NAP	C2N-C3N-C4N	5.15	124.09	118.26

There are no chirality outliers.
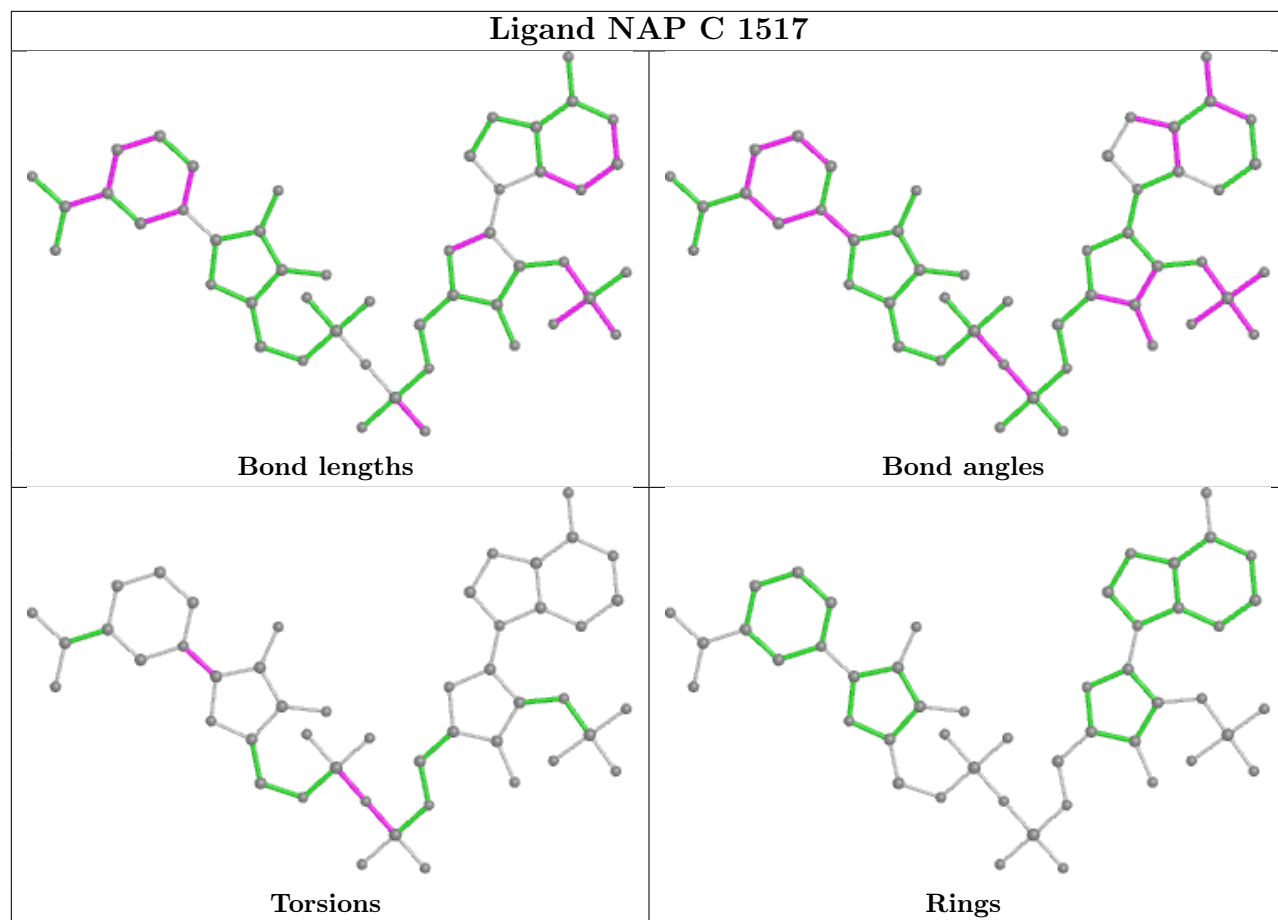
5 of 42 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	1515	NAP	O4D-C1D-N1N-C2N
3	A	1515	NAP	O4D-C1D-N1N-C6N
3	B	1516	NAP	O4D-C1D-N1N-C2N
3	B	1516	NAP	O4D-C1D-N1N-C6N
3	B	1516	NAP	C2D-C1D-N1N-C2N

There are no ring outliers.
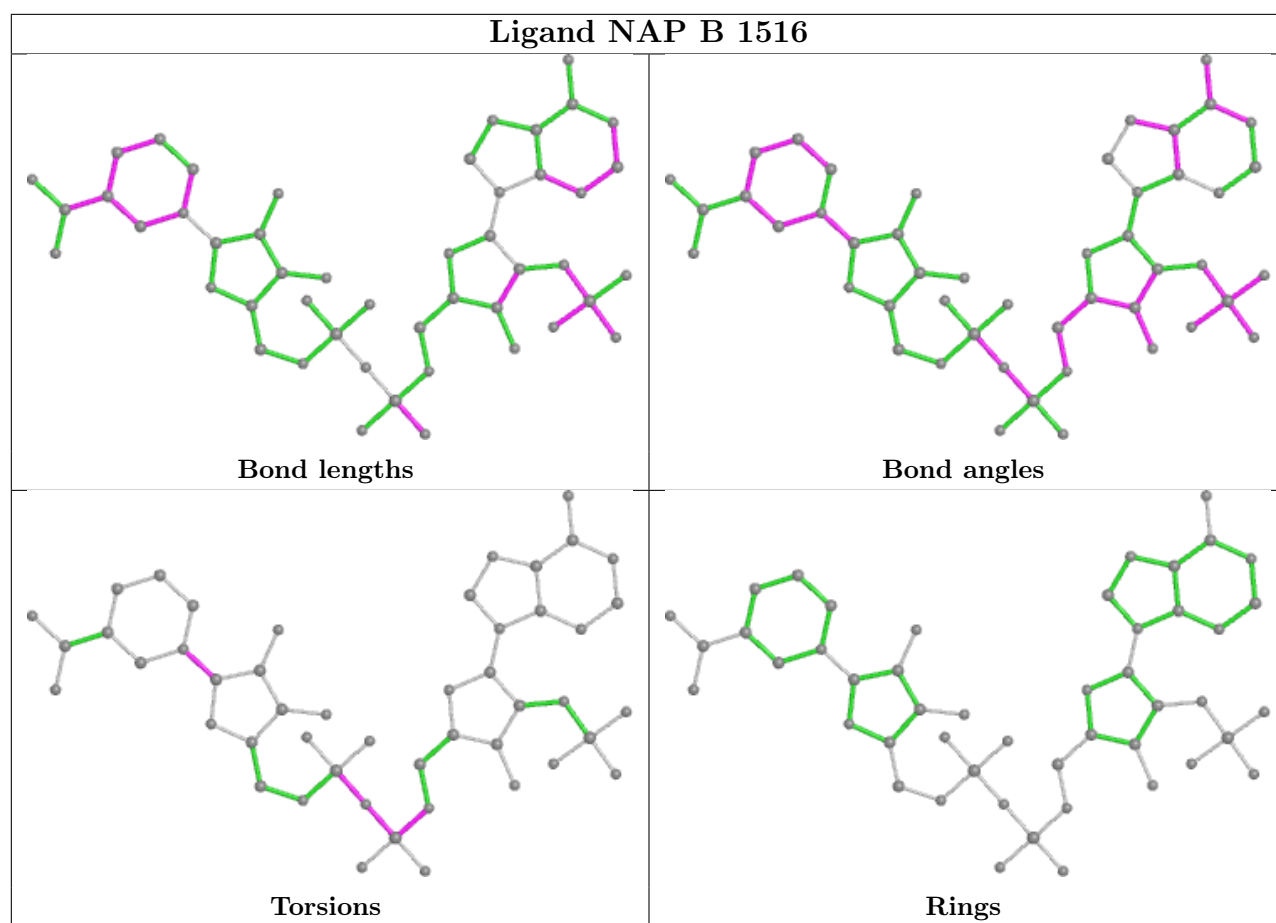
8 monomers are involved in 19 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	1517	NAP	5	0
3	D	1518	NAP	4	0
3	A	1515	NAP	3	0
4	C	1618	ICT	3	0
3	B	1516	NAP	4	0
4	A	1616	ICT	3	0
4	B	1617	ICT	2	0
4	D	1619	ICT	2	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 NAP C 1517

Bond lengths

Bond angles

Torsions

Rings

Ligand NAP D 1518

Bond lengths

Bond angles

Torsions

Rings

Ligand NAP A 1515

Bond lengths

Bond angles

Torsions

Rings

Ligand NAP B 1516

Bond lengths

Bond angles

Torsions

Rings
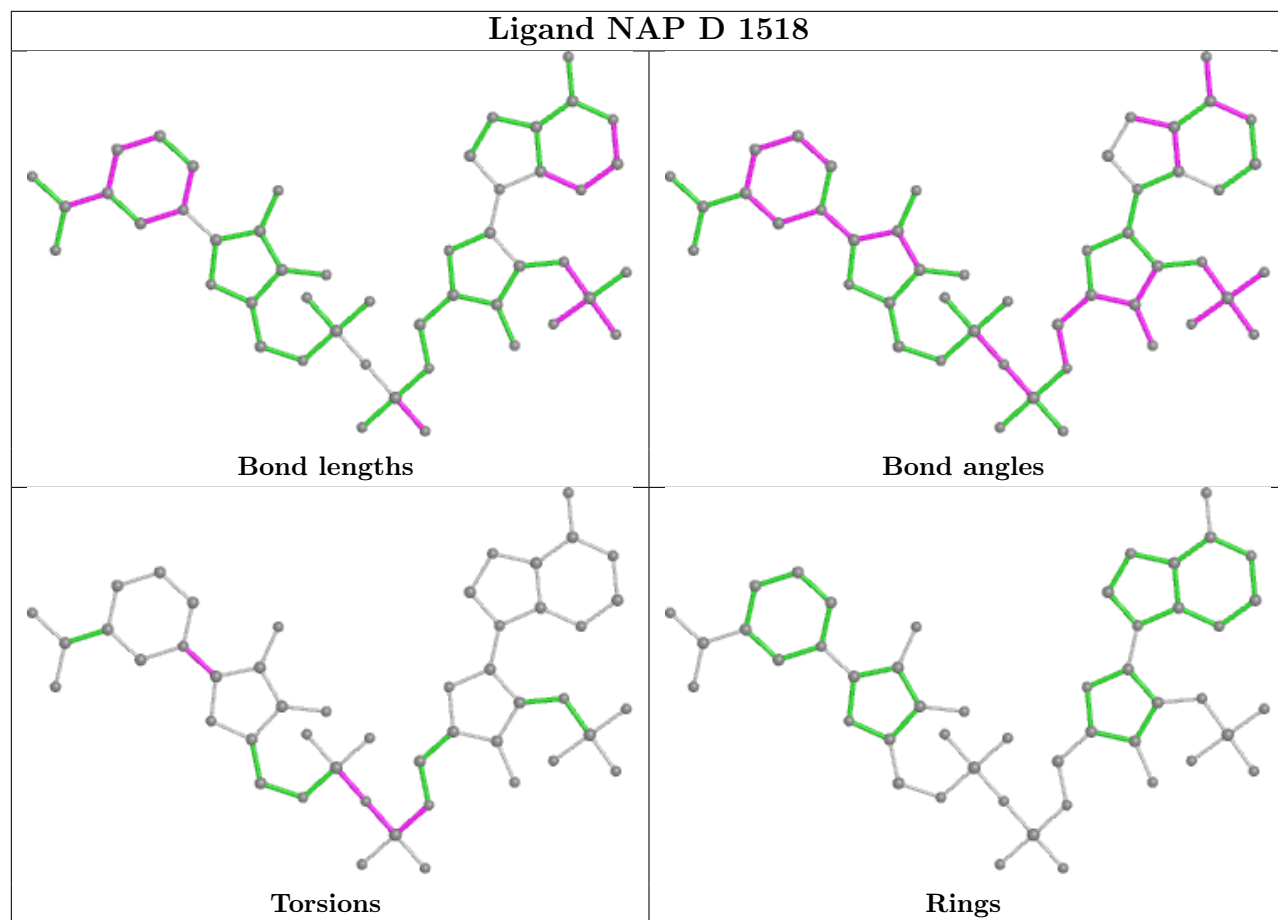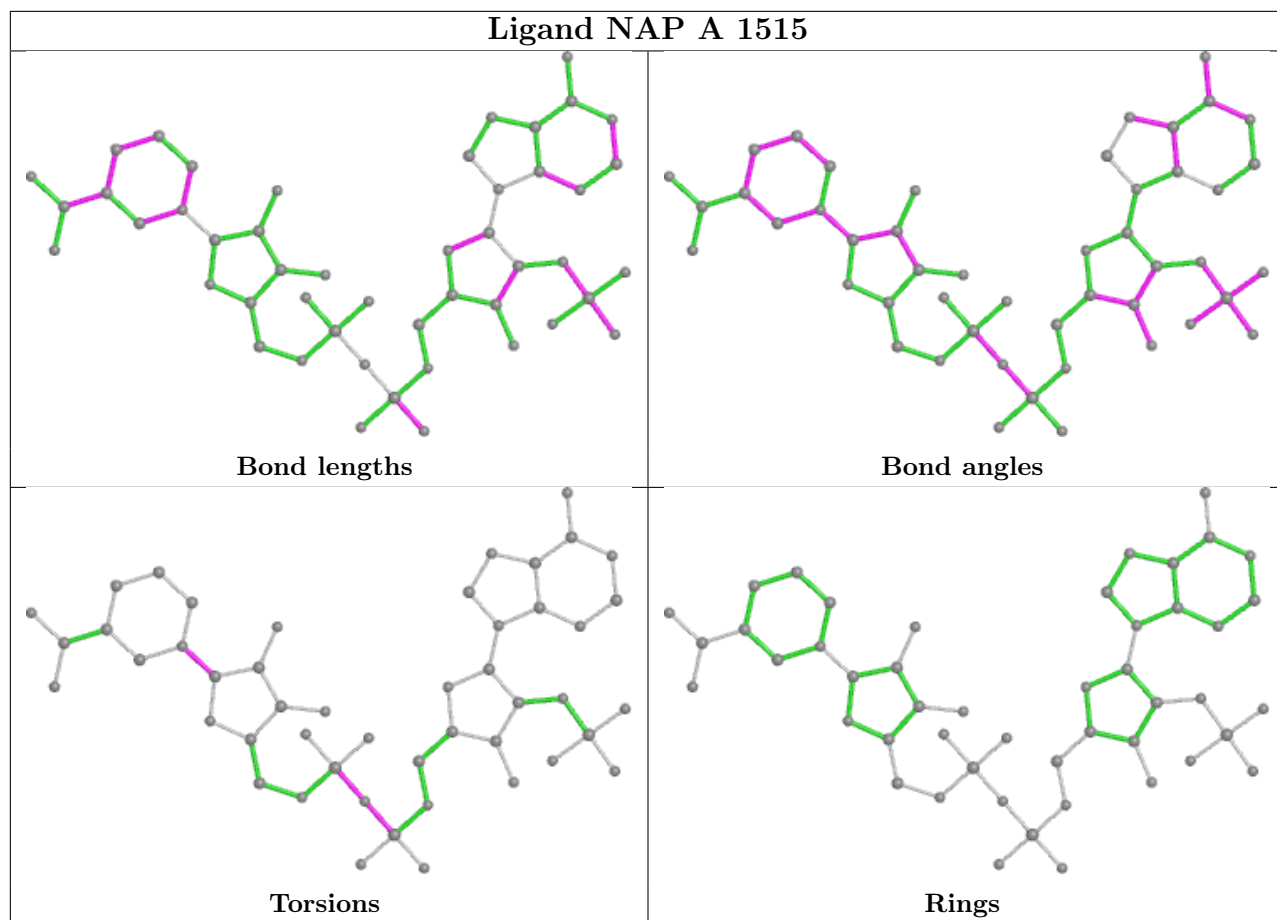
5.7 Other polymers ⓘ

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(Å²)	Q<0.9
1	A	414/414 (100%)	-0.02	9 (2%)	62	59	9, 20, 41, 103	0
1	B	414/414 (100%)	0.02	14 (3%)	45	43	8, 22, 41, 97	0
1	C	414/414 (100%)	-0.02	9 (2%)	62	59	8, 19, 42, 97	0
1	D	414/414 (100%)	0.05	13 (3%)	49	46	7, 21, 43, 114	0
All	All	1656/1656 (100%)	0.01	45 (2%)	54	52	7, 20, 42, 114	0

The worst 5 of 45 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	1	MET	16.6
1	C	414	LEU	12.0
1	A	414	LEU	10.9
1	D	414	LEU	10.0
1	C	2	SER	9.0

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 ⓘ

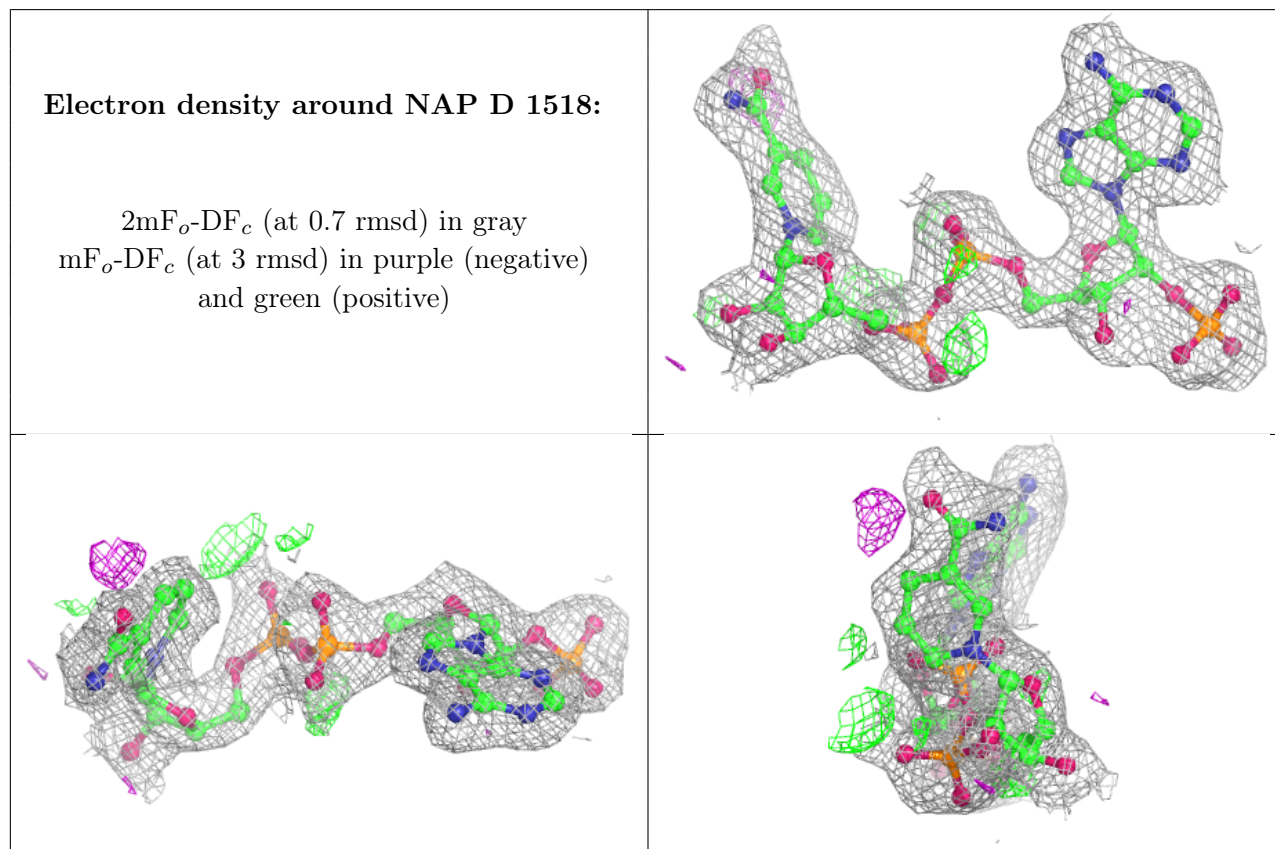There are no monosaccharides in this entry.

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
2	CA	A	1717	1/1	0.66	0.15	45,45,45,45	0
4	ICT	D	1619	13/13	0.78	0.32	30,36,39,41	0
4	ICT	A	1616	13/13	0.79	0.30	27,36,41,44	0
4	ICT	B	1617	13/13	0.81	0.25	30,36,39,40	0
2	CA	B	1718	1/1	0.81	0.16	38,38,38,38	0
4	ICT	C	1618	13/13	0.82	0.26	28,31,36,38	0
3	NAP	D	1518	48/48	0.94	0.14	9,15,24,25	0
3	NAP	C	1517	48/48	0.95	0.13	8,15,23,24	0
3	NAP	B	1516	48/48	0.95	0.13	8,16,24,25	0
3	NAP	A	1515	48/48	0.96	0.12	10,16,24,28	0
2	CA	C	1719	1/1	0.97	0.07	29,29,29,29	0
2	CA	D	1720	1/1	0.97	0.09	26,26,26,26	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.
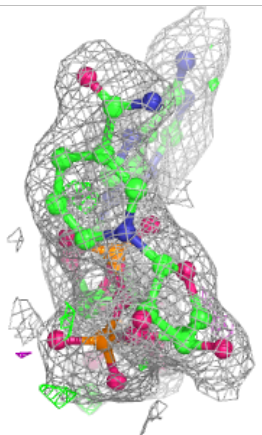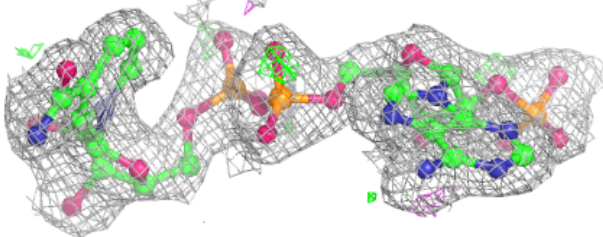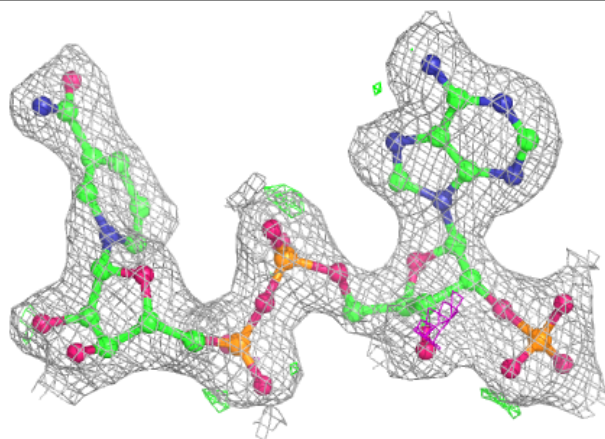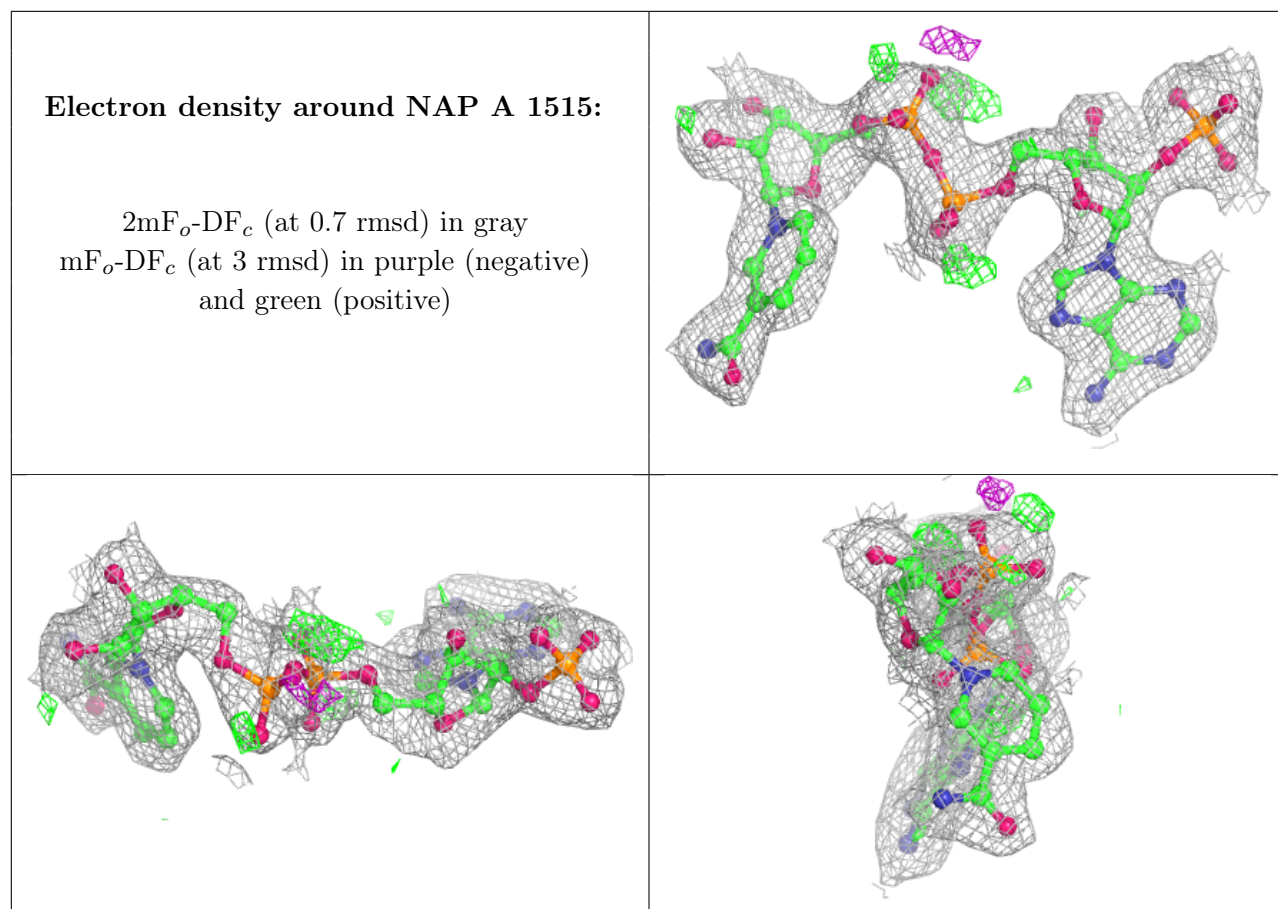

Electron density around NAP D 1518:

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

Electron density around NAP C 1517:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
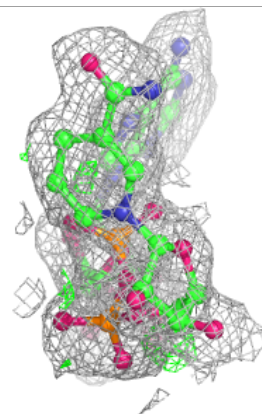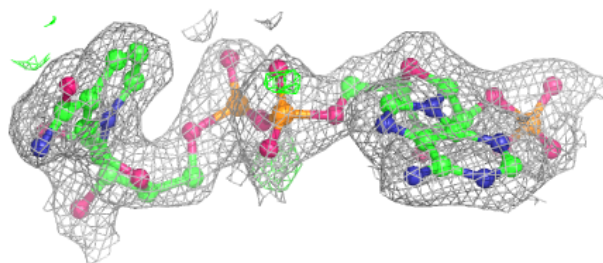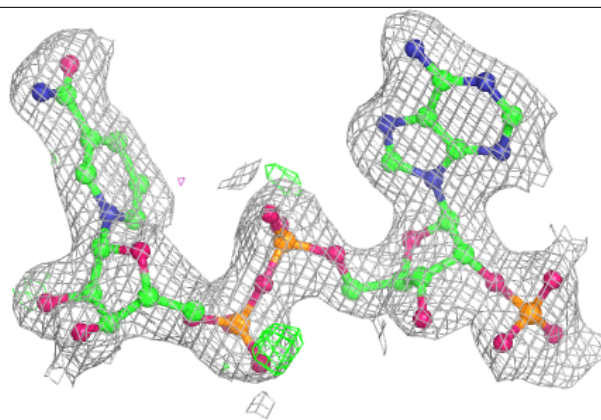
Electron density around NAP B 1516:

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

Electron density around NAP A 1515:

$2mF_o\text{-}DF_c$ (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.