Full wwPDB X-ray Structure Validation Report (i)

May 15, 2020 – 07:55 pm BST

PDB ID	:	5MLN
Title	:	The crystal structure of alcohol dehydrogenase 10 from Candida magnoliae
Authors	:	Castellanos, J.R.G.; Mattevi, A.
Deposited on	:	2016-12-07
Resolution	:	1.60 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 (i) symbol.

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

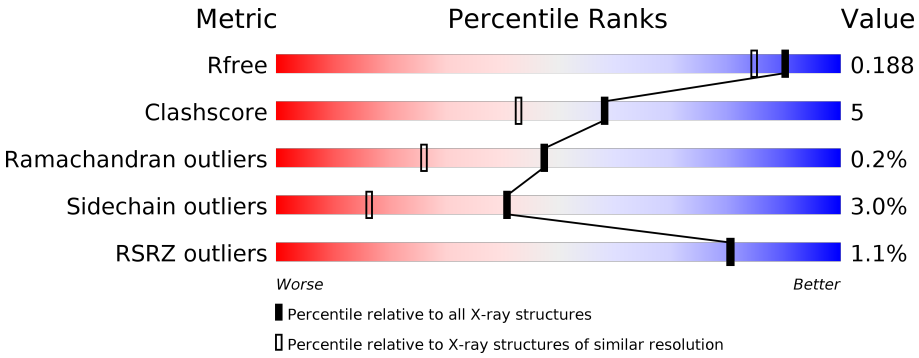
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.11
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.11

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 1.60 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	3398 (1.60-1.60)
Clashscore	141614	3665 (1.60-1.60)
Ramachandran outliers	138981	3564 (1.60-1.60)
Sidechain outliers	138945	3563 (1.60-1.60)
RSRZ outliers	127900	3321 (1.60-1.60)

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 on 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	241	2% 86% 11%
1	B	241	88% 10%

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

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	PEG	A	303	-	-	X	-

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 4033 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.

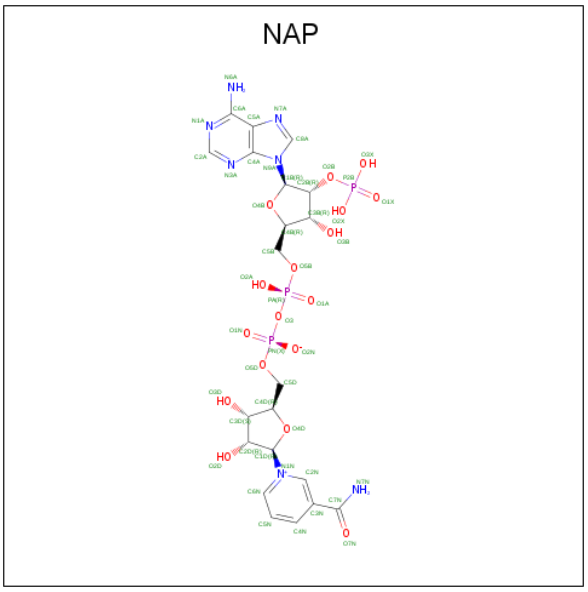
- Molecule 1 is a protein called Alcohol dehydrogenase 3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	237	Total	C	N	O	S	0	2	0
			1766	1122	300	342	2			
1	B	238	Total	C	N	O	S	0	0	0
			1762	1119	300	341	2			

There are 8 discrepancies between the modelled and reference sequences:

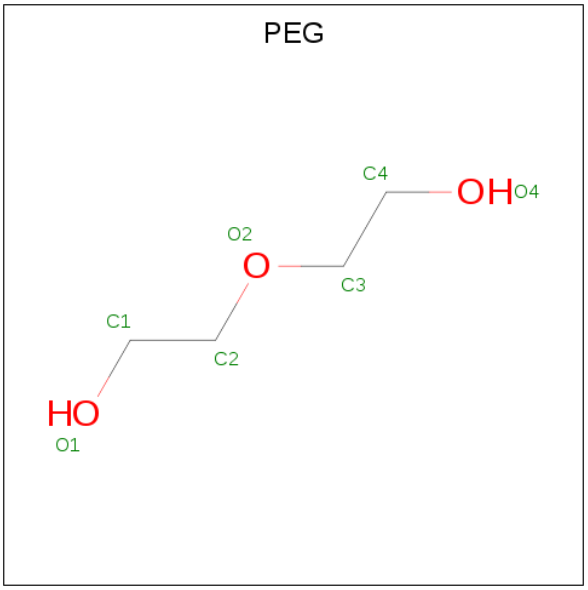
Chain	Residue	Modelled	Actual	Comment	Reference
A	30	ASN	SER	conflict	UNP B8K244
A	81	ARG	SER	conflict	UNP B8K244
A	133	VAL	ALA	conflict	UNP B8K244
A	135	LYS	ASN	conflict	UNP B8K244
B	30	ASN	SER	conflict	UNP B8K244
B	81	ARG	SER	conflict	UNP B8K244
B	133	VAL	ALA	conflict	UNP B8K244
B	135	LYS	ASN	conflict	UNP B8K244

- Molecule 2 is NADP NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (three-letter code: NAP) (formula: $C_{21}H_{28}N_7O_{17}P_3$).



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

- Molecule 3 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: $C_4H_{10}O_3$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			7	4	3		
3	A	1	Total	C	O	0	0
			7	4	3		

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O 7 4 3	0	0
3	B	1	Total C O 7 4 3	0	0

- Molecule 4 is water.

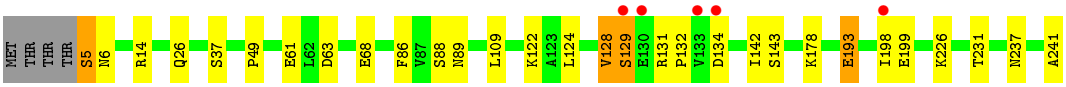
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	178	Total O 178 178	0	0
4	B	203	Total O 203 203	0	0

3 Residue-property plots (i)

These plots are drawn for all protein, RNA and DNA 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: Alcohol dehydrogenase 3

Chain A:



- Molecule 1: Alcohol dehydrogenase 3

Chain B:

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 2 21	Depositor
Cell constants a, b, c, α, β, γ	74.18Å 80.42Å 80.52Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	40.30 – 1.60 40.26 – 1.59	Depositor EDS
% Data completeness (in resolution range)	99.9 (40.30-1.60) 99.9 (40.26-1.59)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.13 (at 1.59Å)	Xtriage
Refinement program	REFMAC 5.8.0158	Depositor
R, R_{free}	0.146 , 0.180 0.160 , 0.188	Depositor DCC
R_{free} test set	3247 reflections (4.98%)	wwPDB-VP
Wilson B-factor (Å^2)	18.7	Xtriage
Anisotropy	0.037	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 61.4	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	0.018 for -h,l,k	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	4033	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 5.49% of the height of the origin peak. No significant pseudotranslation is detected.*

[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, PEG

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	1.21	5/1804 (0.3%)	1.11	5/2455 (0.2%)
1	B	1.25	2/1794 (0.1%)	1.11	7/2442 (0.3%)
All	All	1.23	7/3598 (0.2%)	1.11	12/4897 (0.2%)

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

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

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	241	ALA	C-O	8.34	1.39	1.23
1	B	209	TRP	CG-CD1	6.22	1.45	1.36
1	A	37	SER	CB-OG	5.32	1.49	1.42
1	A	237	ASN	CG-OD1	5.15	1.35	1.24
1	B	89	ASN	N-CA	-5.09	1.36	1.46
1	A	61	GLU	CD-OE2	-5.09	1.20	1.25
1	A	68	GLU	CG-CD	5.08	1.59	1.51

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	63	ASP	CB-CG-OD1	6.31	123.98	118.30
1	B	174	GLU	OE1-CD-OE2	-6.27	115.77	123.30
1	A	241	ALA	CA-C-O	-5.93	107.64	120.10
1	B	145	VAL	CG1-CB-CG2	5.91	120.36	110.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	125	LEU	CB-CG-CD2	5.73	120.74	111.00
1	B	217	ASP	CB-CG-OD2	-5.68	113.19	118.30
1	A	14	ARG	NE-CZ-NH2	-5.63	117.49	120.30
1	A	14	ARG	NE-CZ-NH1	5.53	123.06	120.30
1	A	128	VAL	CG1-CB-CG2	5.50	119.69	110.90
1	B	169	ARG	NE-CZ-NH2	-5.48	117.56	120.30
1	B	81	ARG	NE-CZ-NH1	-5.39	117.60	120.30
1	B	173	ARG	NE-CZ-NH1	5.04	122.82	120.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	199	GLU	Peptide

5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1766	0	1795	23	0
1	B	1762	0	1790	10	0
2	A	48	0	25	1	0
2	B	48	0	25	1	0
3	A	21	0	30	10	0
3	B	7	0	10	0	0
4	A	178	0	0	7	6
4	B	203	0	0	6	7
All	All	4033	0	3675	35	7

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 5.

All (35) 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:241:ALA:O	4:B:401:HOH:O	1.99	0.81

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:6:ASN:HD21	3:A:303:PEG:C4	1.94	0.80
1:A:129:SER:OG	4:A:402:HOH:O	2.03	0.76
1:B:189:TYR:HB2	4:B:559:HOH:O	1.87	0.75
1:A:6:ASN:HD21	3:A:303:PEG:H41	1.53	0.72
1:B:128:VAL:HG22	4:B:421:HOH:O	1.90	0.72
1:A:193:GLU:HG2	4:A:406:HOH:O	1.90	0.71
1:B:130:GLU:OE1	4:B:403:HOH:O	2.12	0.67
1:A:26[A]:GLN:CG	1:A:49:PRO:HG2	2.33	0.59
1:A:26[A]:GLN:HG3	1:A:49:PRO:HG2	1.85	0.59
3:A:304:PEG:H21	4:A:452:HOH:O	2.03	0.58
1:A:6:ASN:HD21	3:A:303:PEG:H42	1.72	0.55
1:A:6:ASN:ND2	3:A:303:PEG:H41	2.22	0.55
1:A:5:SER:OG	3:A:303:PEG:C1	2.55	0.54
1:B:101:HIS:HD2	4:B:509:HOH:O	1.92	0.53
1:B:143:SER:O	2:B:301:NAP:H6N	2.09	0.52
1:A:124:LEU:O	1:A:128:VAL:HG13	2.09	0.52
1:B:37:SER:HB3	4:B:407:HOH:O	2.11	0.50
1:A:193:GLU:CG	4:A:406:HOH:O	2.55	0.49
1:A:5:SER:OG	3:A:303:PEG:H11	2.14	0.48
3:A:304:PEG:O2	4:A:403:HOH:O	2.20	0.47
1:A:122:LYS:NZ	4:A:407:HOH:O	2.46	0.46
1:A:5:SER:HG	3:A:303:PEG:C1	2.30	0.45
1:A:131:ARG:HA	1:A:132:PRO:HD2	1.71	0.44
1:B:240:ILE:O	1:B:241:ALA:C	2.56	0.43
1:A:143:SER:O	2:A:301:NAP:H6N	2.19	0.43
1:B:109:LEU:HD23	1:B:109:LEU:C	2.39	0.43
1:B:145:VAL:HG21	1:B:239:LEU:HD23	2.00	0.42
1:A:86:PHE:CZ	1:A:88:SER:HB2	2.55	0.42
1:A:89:ASN:HD22	1:A:142:ILE:HG13	1.84	0.42
1:A:109:LEU:HD23	1:A:109:LEU:C	2.39	0.41
1:A:226:LYS:HD3	1:A:226:LYS:HA	1.99	0.41
1:A:26[A]:GLN:HG2	1:A:49:PRO:HG2	2.03	0.40
1:A:178:LYS:HE2	4:A:565:HOH:O	2.22	0.40
1:A:5:SER:HG	3:A:303:PEG:H11	1.86	0.40

All (7) 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)
4:A:448:HOH:O	4:B:468:HOH:O[2_555]	1.26	0.94

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:A:417:HOH:O	4:B:550:HOH:O[2_555]	1.54	0.66
4:B:520:HOH:O	4:B:520:HOH:O[2_555]	1.70	0.50
4:A:564:HOH:O	4:B:569:HOH:O[1_556]	1.92	0.28
4:A:417:HOH:O	4:B:522:HOH:O[2_555]	1.96	0.24
4:A:555:HOH:O	4:B:566:HOH:O[4_575]	2.08	0.12
4:A:569:HOH:O	4:B:599:HOH:O[2_555]	2.11	0.09

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	237/241 (98%)	231 (98%)	6 (2%)	0	100 100
1	B	236/241 (98%)	230 (98%)	5 (2%)	1 (0%)	34 15
All	All	473/482 (98%)	461 (98%)	11 (2%)	1 (0%)	47 26

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	129	SER

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	187/189 (99%)	181 (97%)	6 (3%)	39 15

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	B	186/189 (98%)	181 (97%)	5 (3%)	44 20
All	All	373/378 (99%)	362 (97%)	11 (3%)	41 18

All (11) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	5	SER
1	A	129	SER
1	A	134	ASP
1	A	193	GLU
1	A	198	ILE
1	A	231	THR
1	B	52	GLN
1	B	73	PHE
1	B	133	VAL
1	B	193	GLU
1	B	203	ASP

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	6	ASN
1	A	42	ASN
1	A	89	ASN
1	A	149	HIS
1	A	153	GLN
1	A	186	ASN
1	A	232	ASN
1	A	237	ASN
1	B	89	ASN
1	B	101	HIS
1	B	149	HIS
1	B	153	GLN
1	B	186	ASN
1	B	232	ASN
1	B	237	ASN

5.3.3 RNA

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 carbohydrates in this entry.

5.6 Ligand geometry (i)

6 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	$\#\|Z\| > 2$
2	NAP	B	301	-	45,52,52	1.50	4 (8%)	56,80,80	1.60	10 (17%)
3	PEG	B	302	-	6,6,6	0.64	0	5,5,5	0.81	0
2	NAP	A	301	-	45,52,52	1.25	5 (11%)	56,80,80	1.36	8 (14%)
3	PEG	A	304	-	6,6,6	0.44	0	5,5,5	0.80	0
3	PEG	A	302	-	6,6,6	0.53	0	5,5,5	1.00	0
3	PEG	A	303	-	6,6,6	0.62	0	5,5,5	1.05	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
2	NAP	B	301	-	-	8/31/67/67	0/5/5/5
3	PEG	B	302	-	-	2/4/4/4	-
2	NAP	A	301	-	-	6/31/67/67	0/5/5/5
3	PEG	A	304	-	-	3/4/4/4	-
3	PEG	A	302	-	-	3/4/4/4	-
3	PEG	A	303	-	-	3/4/4/4	-

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	301	NAP	P2B-O2B	6.41	1.71	1.59
2	A	301	NAP	P2B-O2B	3.59	1.66	1.59
2	B	301	NAP	C2D-C1D	-3.31	1.48	1.53
2	B	301	NAP	O4B-C1B	2.98	1.45	1.41
2	A	301	NAP	C6N-C5N	-2.61	1.32	1.38
2	A	301	NAP	C2A-N3A	2.41	1.36	1.32
2	B	301	NAP	C4N-C3N	2.23	1.43	1.39
2	A	301	NAP	O4D-C1D	2.17	1.44	1.41
2	A	301	NAP	P2B-O3X	-2.14	1.46	1.54

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	301	NAP	C5N-C4N-C3N	-5.86	113.41	120.34
2	B	301	NAP	N3A-C2A-N1A	-3.81	122.72	128.68
2	A	301	NAP	O4D-C1D-C2D	-3.79	101.39	106.93
2	B	301	NAP	C6N-C5N-C4N	3.09	123.93	119.44
2	A	301	NAP	O2A-PA-O1A	2.81	126.15	112.24
2	A	301	NAP	C3D-C2D-C1D	2.80	105.20	100.98
2	A	301	NAP	C1B-N9A-C4A	-2.57	122.12	126.64
2	B	301	NAP	C1B-N9A-C4A	-2.51	122.24	126.64
2	A	301	NAP	C4A-C5A-N7A	-2.46	106.84	109.40
2	B	301	NAP	C4N-C3N-C7N	-2.40	114.61	121.04
2	B	301	NAP	C2A-N1A-C6A	2.31	122.71	118.75
2	B	301	NAP	C2N-N1N-C1D	2.31	124.28	119.14
2	A	301	NAP	O2X-P2B-O2B	-2.30	95.68	105.99
2	A	301	NAP	C6N-N1N-C2N	-2.26	119.92	121.97
2	B	301	NAP	C2N-C3N-C4N	2.14	120.68	118.26
2	B	301	NAP	O3X-P2B-O2X	2.13	115.80	107.64
2	A	301	NAP	N6A-C6A-N1A	2.10	122.92	118.57
2	B	301	NAP	O2X-P2B-O2B	-2.02	96.94	105.99

There are no chirality outliers.

All (25) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	301	NAP	C5D-O5D-PN-O3
2	B	301	NAP	C5D-O5D-PN-O1N
2	B	301	NAP	C5D-O5D-PN-O2N
2	A	301	NAP	C5D-O5D-PN-O3
3	A	304	PEG	O1-C1-C2-O2

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Mol	Chain	Res	Type	Atoms
3	A	302	PEG	O1-C1-C2-O2
3	A	303	PEG	O1-C1-C2-O2
3	A	304	PEG	O2-C3-C4-O4
3	B	302	PEG	O1-C1-C2-O2
2	B	301	NAP	PN-O3-PA-O5B
3	B	302	PEG	C1-C2-O2-C3
3	A	303	PEG	C4-C3-O2-C2
3	A	302	PEG	C4-C3-O2-C2
2	A	301	NAP	PA-O3-PN-O1N
3	A	304	PEG	C4-C3-O2-C2
2	A	301	NAP	C5D-O5D-PN-O1N
3	A	303	PEG	O2-C3-C4-O4
2	A	301	NAP	PA-O3-PN-O2N
3	A	302	PEG	O2-C3-C4-O4
2	B	301	NAP	PA-O3-PN-O1N
2	B	301	NAP	PA-O3-PN-O2N
2	B	301	NAP	C2B-O2B-P2B-O2X
2	A	301	NAP	C2B-O2B-P2B-O2X
2	A	301	NAP	O4B-C4B-C5B-O5B
2	B	301	NAP	O4B-C4B-C5B-O5B

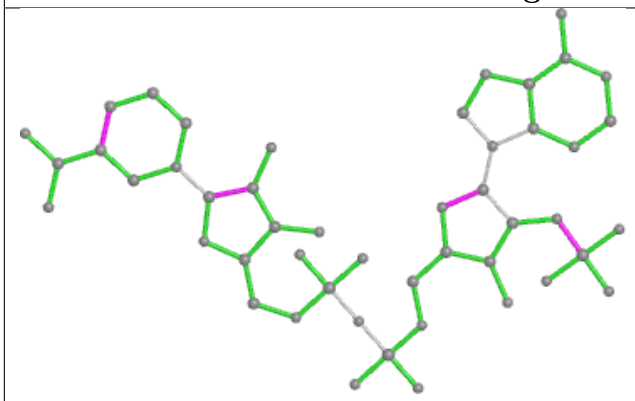
There are no ring outliers.

4 monomers are involved in 12 short contacts:

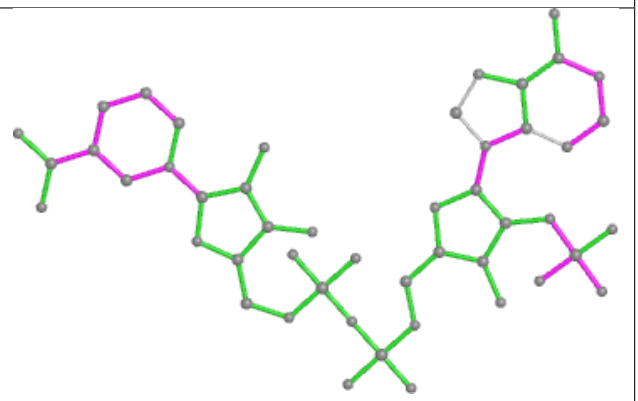
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	301	NAP	1	0
2	A	301	NAP	1	0
3	A	304	PEG	2	0
3	A	303	PEG	8	0

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.

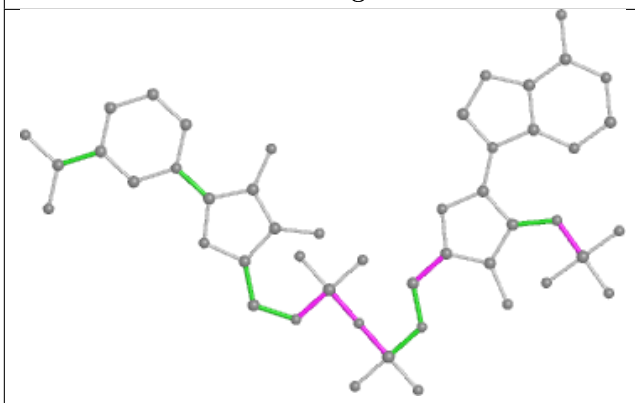
Ligand NAP B 301



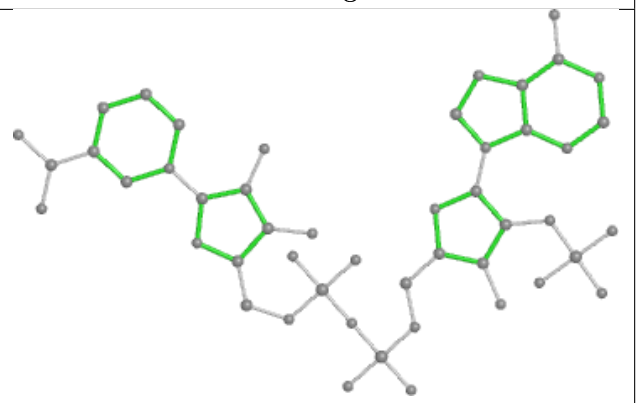
Bond lengths



Bond angles

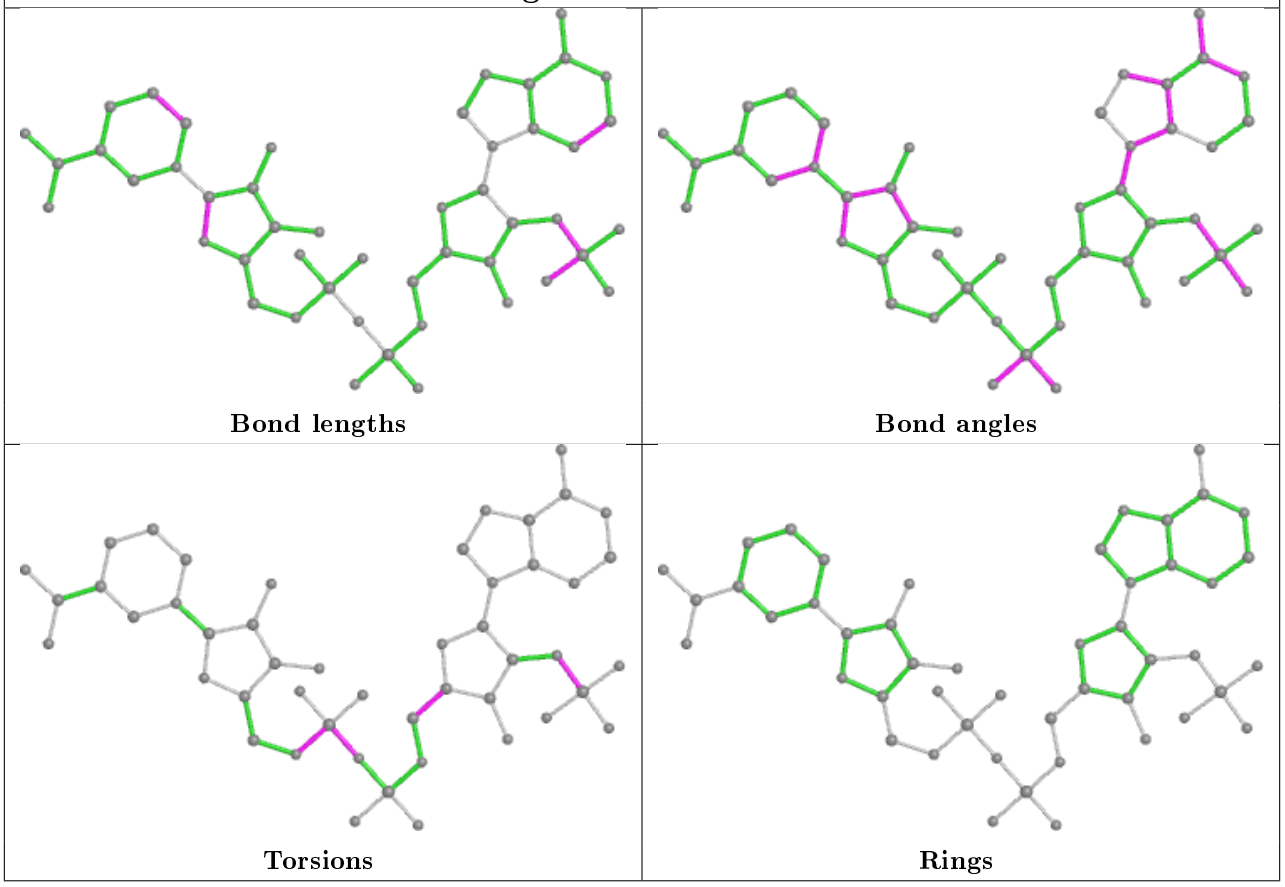


Torsions



Rings

Ligand NAP A 301



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} 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	237/241 (98%)	-0.34	5 (2%) 63 62	12, 19, 38, 73	0
1	B	238/241 (98%)	-0.38	0 100 100	12, 20, 39, 47	0
All	All	475/482 (98%)	-0.36	5 (1%) 80 80	12, 19, 39, 73	0

All (5) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	133	VAL	7.2
1	A	129	SER	5.5
1	A	198	ILE	4.6
1	A	134	ASP	4.1
1	A	130	GLU	2.7

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 carbohydrates in this entry.

6.4 Ligands

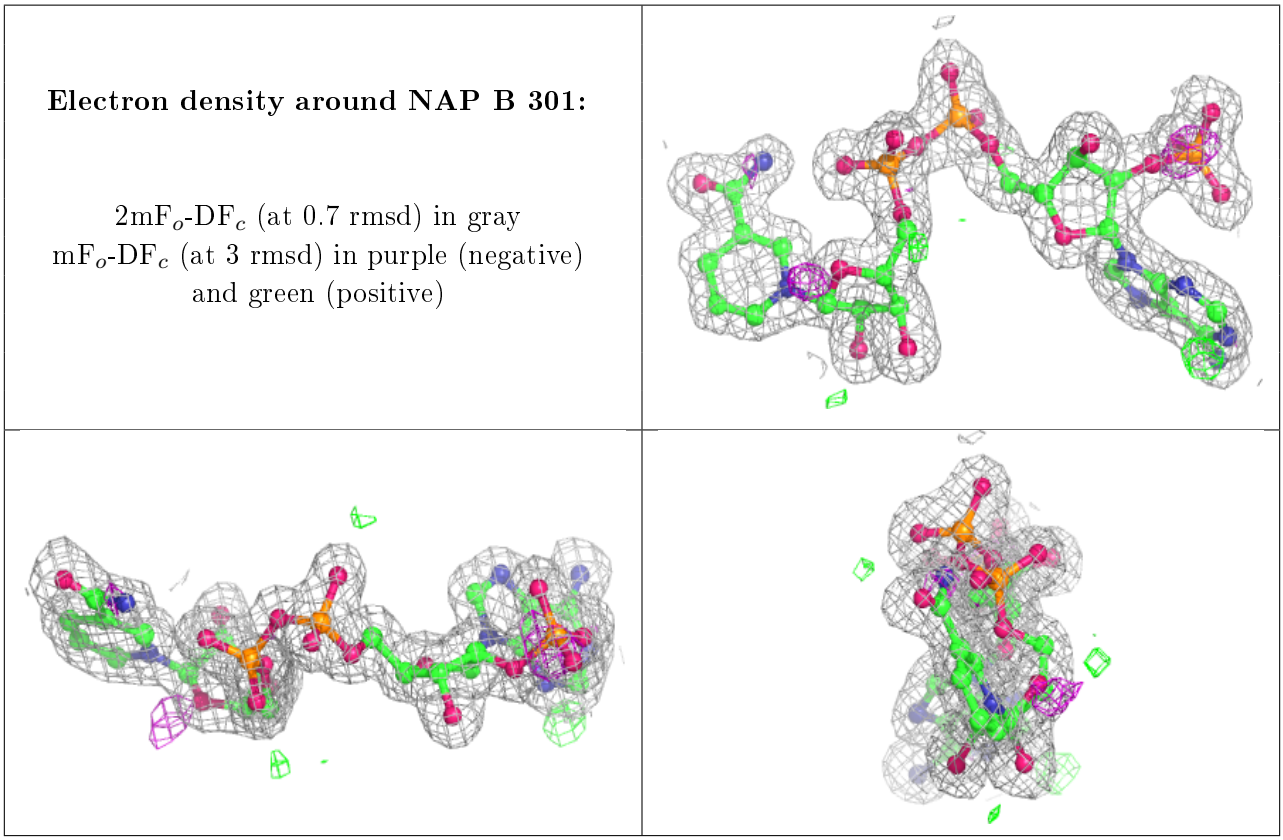
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	PEG	A	303	7/7	0.80	0.29	43,52,59,62	0
3	PEG	A	302	7/7	0.84	0.13	35,38,49,61	0
3	PEG	B	302	7/7	0.84	0.23	38,44,49,55	0
3	PEG	A	304	7/7	0.85	0.28	43,45,50,51	0
2	NAP	B	301	48/48	0.97	0.09	18,21,25,27	0
2	NAP	A	301	48/48	0.98	0.05	14,16,20,22	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.

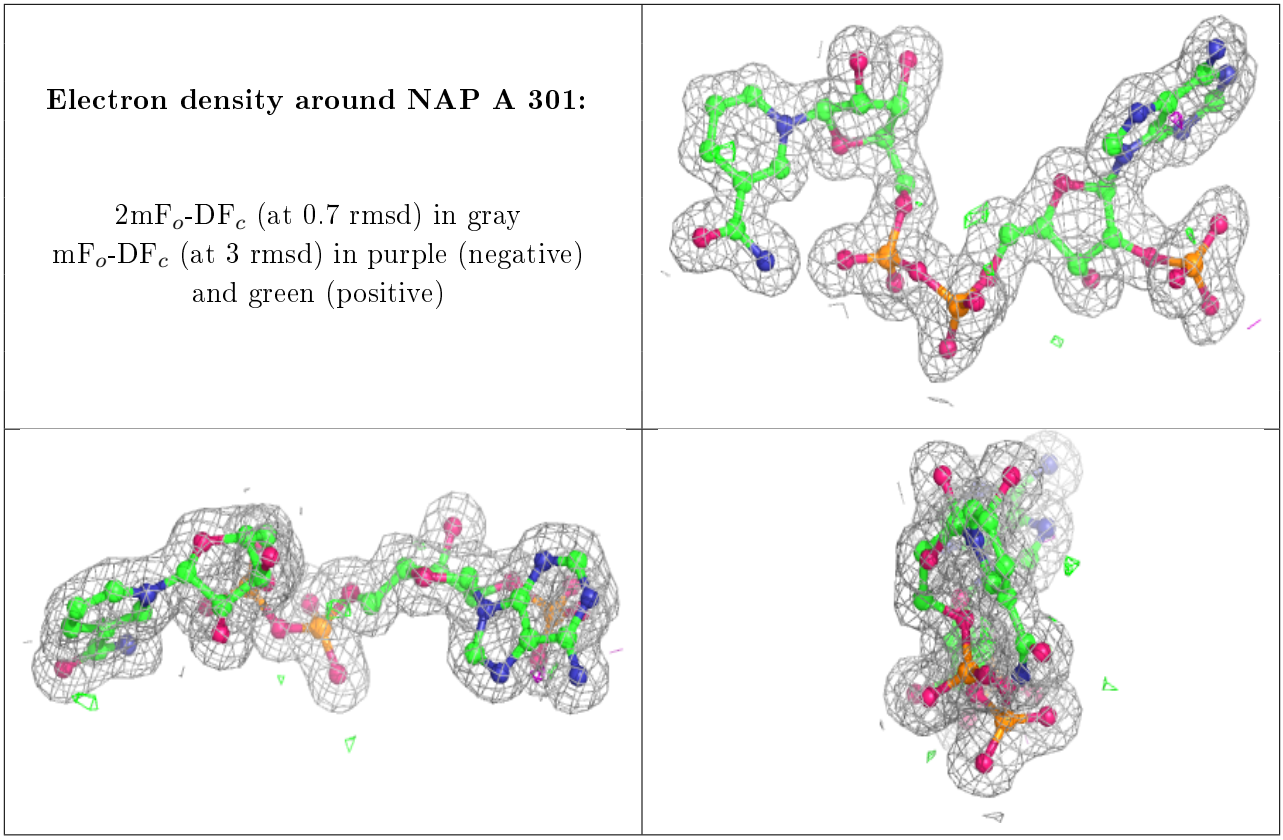
Electron density around NAP B 301:

$2mF_o$-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 301:

$2mF_o$-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.