



Full wwPDB X-ray Structure Validation Report ⓘ

Aug 14, 2023 – 02:25 PM EDT

PDB ID : 1S7G
Title : Structural Basis for the Mechanism and Regulation of Sir2 Enzymes
Authors : Avalos, J.L.; Boeke, J.D.; Wolberger, C.
Deposited on : 2004-01-29
Resolution : 2.30 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 : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.35
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) : 2.35

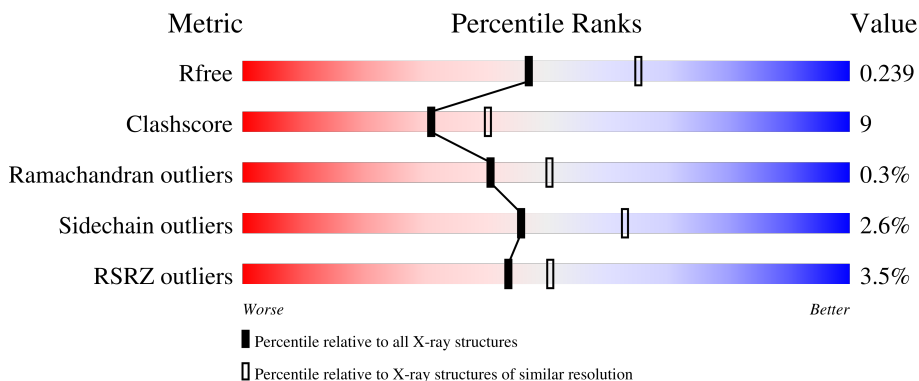
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.30 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	5042 (2.30-2.30)
Clashscore	141614	5643 (2.30-2.30)
Ramachandran outliers	138981	5575 (2.30-2.30)
Sidechain outliers	138945	5575 (2.30-2.30)
RSRZ outliers	127900	4938 (2.30-2.30)

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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	253	<div style="display: flex; align-items: center;"> <div style="width: 4%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 78%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 21%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 40px;">4% 78% 21% •</p>
1	B	253	<div style="display: flex; align-items: center;"> <div style="width: 0%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 87%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 13%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 0%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 0%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 40px;">% 87% 13%</p>
1	C	253	<div style="display: flex; align-items: center;"> <div style="width: 0%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 80%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 19%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 0%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 40px;">% 80% 19% •</p>
1	D	253	<div style="display: flex; align-items: center;"> <div style="width: 4%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 79%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 14%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 5%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 0%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 40px;">4% 79% 14% • 5%</p>
1	E	253	<div style="display: flex; align-items: center;"> <div style="width: 8%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 74%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 23%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 0%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 0%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 40px;">8% 74% 23% ••</p>

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
10	APR	E	704	X	-	-	-
3	SO4	B	410	-	-	-	X

2 Entry composition

There are 11 unique types of molecules in this entry. The entry contains 10187 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 NAD-dependent deacetylase 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	252	1930	1233	328	355	14	0	0	0
1	B	252	1975	1262	339	360	14	0	0	0
1	C	252	1947	1248	333	352	14	0	0	0
1	D	240	1854	1188	318	336	12	0	0	0
1	E	248	1830	1174	306	336	14	0	0	0

- Molecule 2 is ZINC ION (three-letter code: ZN) (formula: Zn).

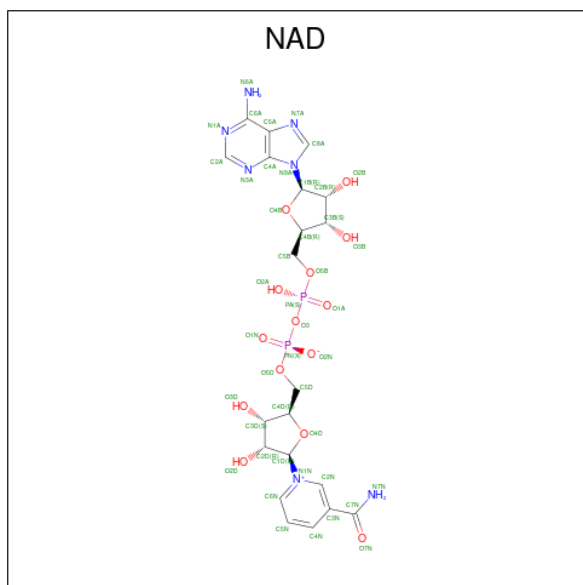
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	2	Total 2	Zn 2	0	0
2	B	2	Total 2	Zn 2	0	0
2	C	2	Total 2	Zn 2	0	0
2	D	2	Total 2	Zn 2	0	0
2	E	1	Total 1	Zn 1	0	0

- Molecule 3 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



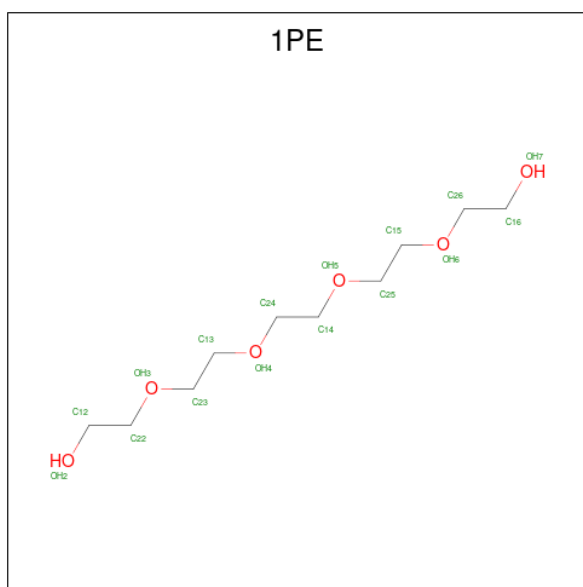
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	O	S	0	0
			5	4	1		
3	A	1	Total	O	S	0	0
			5	4	1		
3	A	1	Total	O	S	0	0
			5	4	1		
3	A	1	Total	O	S	0	0
			5	4	1		
3	B	1	Total	O	S	0	0
			5	4	1		
3	B	1	Total	O	S	0	0
			5	4	1		
3	B	1	Total	O	S	0	0
			5	4	1		
3	B	1	Total	O	S	0	0
			5	4	1		
3	C	1	Total	O	S	0	0
			5	4	1		
3	C	1	Total	O	S	0	0
			5	4	1		
3	D	1	Total	O	S	0	0
			5	4	1		
3	D	1	Total	O	S	0	0
			5	4	1		

- Molecule 4 is NICOTINAMIDE-ADENINE-DINUCLEOTIDE (three-letter code: NAD) (formula: C₂₁H₂₇N₇O₁₄P₂).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
			Total	C	N	O			P
4	A	1	44	21	7	14	2	0	0
4	B	1	44	21	7	14	2	0	0
4	C	1	44	21	7	14	2	0	0

- Molecule 5 is PENTAETHYLENE GLYCOL (three-letter code: 1PE) (formula: $C_{10}H_{22}O_6$).



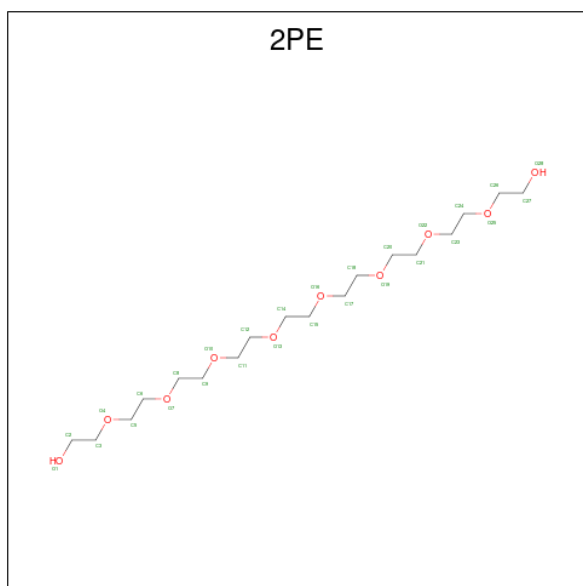
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
5	A	1	16	10	6	0	0

- Molecule 6 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).



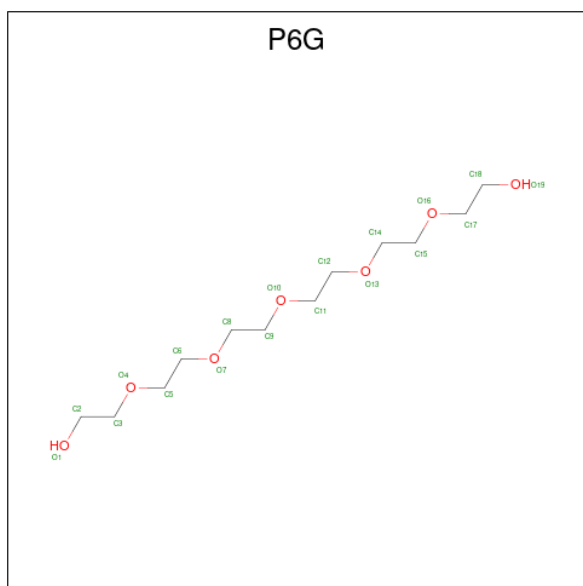
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total C O 4 2 2	0	0
6	B	1	Total C O 4 2 2	0	0
6	B	1	Total C O 4 2 2	0	0

- Molecule 7 is NONAETHYLENE GLYCOL (three-letter code: 2PE) (formula: $C_{18}H_{38}O_{10}$).



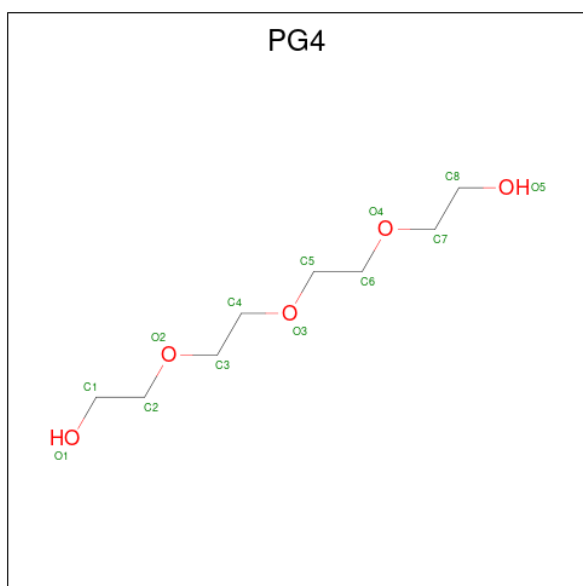
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	B	1	Total	C O	0	0
			28	18 10		

- Molecule 8 is HEXAETHYLENE GLYCOL (three-letter code: P6G) (formula: $C_{12}H_{26}O_7$).



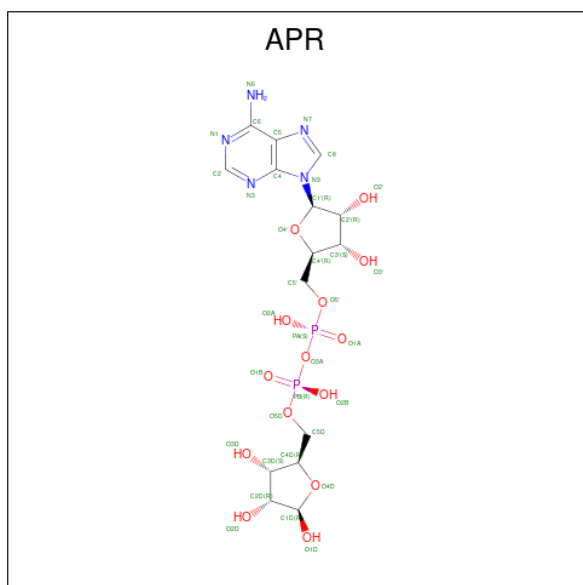
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	C	1	Total	C O	0	0
			19	12 7		

- Molecule 9 is TETRAETHYLENE GLYCOL (three-letter code: PG4) (formula: $C_8H_{18}O_5$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
9	C	1	Total	C	O	0	0
			13	8	5		
9	D	1	Total	C	O	0	0
			13	8	5		

- Molecule 10 is ADENOSINE-5-DIPHOSPHORIBOSE (three-letter code: APR) (formula: $C_{15}H_{23}N_5O_{14}P_2$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
10	E	1	Total	C	N	O	P	0	0
			36	15	5	14	2		

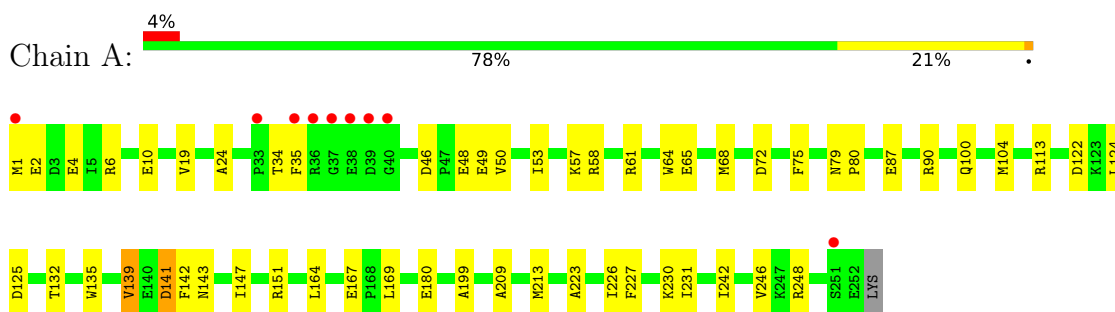
- Molecule 11 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
11	A	67	Total	O	0	0
			67	67		
11	B	96	Total	O	0	0
			96	96		
11	C	50	Total	O	0	0
			50	50		
11	D	77	Total	O	0	0
			77	77		
11	E	23	Total	O	0	0
			23	23		

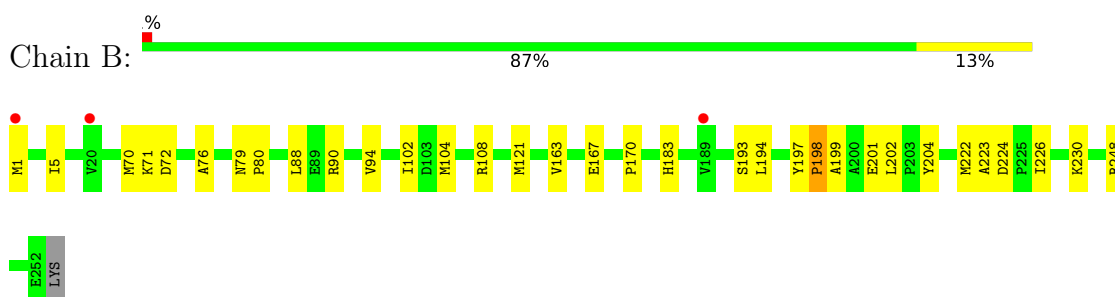
3 Residue-property plots

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.

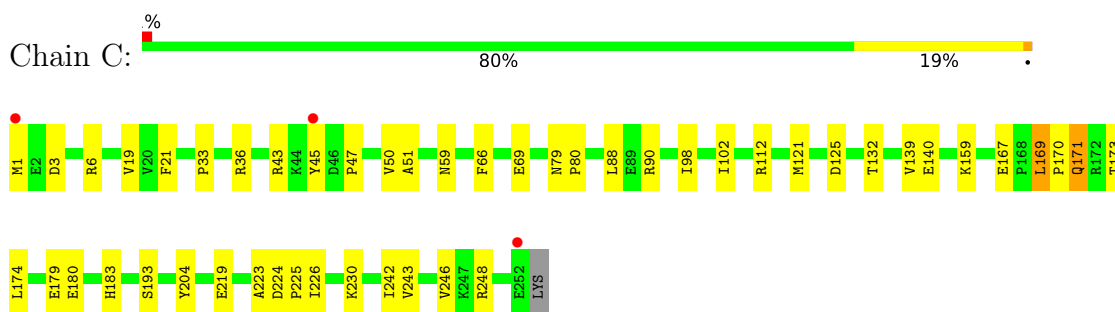
- Molecule 1: NAD-dependent deacetylase 2



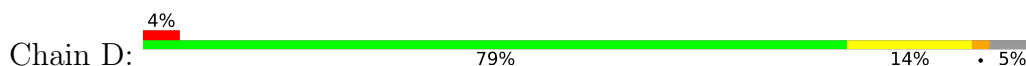
- Molecule 1: NAD-dependent deacetylase 2

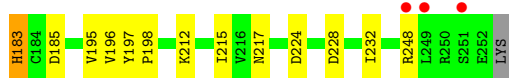
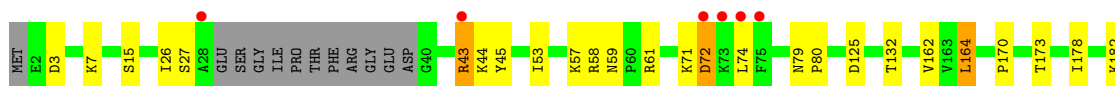


- Molecule 1: NAD-dependent deacetylase 2

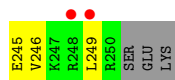
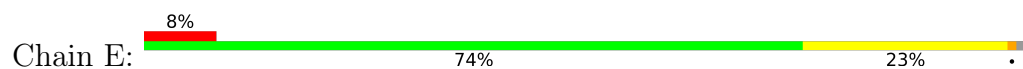


- Molecule 1: NAD-dependent deacetylase 2





● Molecule 1: NAD-dependent deacetylase 2



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	104.85Å 181.57Å 78.92Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.78 – 2.30 29.78 – 2.30	Depositor EDS
% Data completeness (in resolution range)	99.5 (29.78-2.30) 99.7 (29.78-2.30)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	0.11	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.23 (at 2.31Å)	Xtrriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.207 , 0.249 0.198 , 0.239	Depositor DCC
R_{free} test set	3420 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å ²)	36.3	Xtrriage
Anisotropy	0.284	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 39.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	10187	wwPDB-VP
Average B, all atoms (Å ²)	41.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.75% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: APR, EDO, PG4, NAD, 2PE, P6G, ZN, 1PE, SO4

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	0.34	0/1973	0.56	0/2672
1	B	0.34	0/2019	0.58	0/2724
1	C	0.32	0/1991	0.56	0/2690
1	D	0.33	0/1895	0.56	0/2563
1	E	0.30	0/1872	0.51	0/2546
All	All	0.33	0/9750	0.55	0/13195

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1930	0	1879	44	0
1	B	1975	0	1970	26	0
1	C	1947	0	1932	34	0
1	D	1854	0	1824	25	0
1	E	1830	0	1724	52	0
2	A	2	0	0	0	0
2	B	2	0	0	0	0
2	C	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	D	2	0	0	0	0
2	E	1	0	0	0	0
3	A	20	0	0	0	0
3	B	20	0	0	0	0
3	C	10	0	0	0	0
3	D	10	0	0	0	0
4	A	44	0	26	0	0
4	B	44	0	25	2	0
4	C	44	0	26	2	0
5	A	16	0	22	0	0
6	A	4	0	6	0	0
6	B	8	0	12	2	0
7	B	28	0	38	0	0
8	C	19	0	26	1	0
9	C	13	0	18	0	0
9	D	13	0	18	0	0
10	E	36	0	21	1	0
11	A	67	0	0	3	0
11	B	96	0	0	1	0
11	C	50	0	0	1	0
11	D	77	0	0	1	0
11	E	23	0	0	0	0
All	All	10187	0	9567	177	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 9.

All (177) 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:E:107:GLN:H	1:E:107:GLN:HE21	1.03	1.02
1:A:151:ARG:HG3	1:A:151:ARG:HH11	1.41	0.86
1:E:5:ILE:HD13	1:E:242:ILE:HG12	1.60	0.83
1:E:107:GLN:H	1:E:107:GLN:NE2	1.76	0.82
1:E:79:ASN:HB2	1:E:80:PRO:HD2	1.63	0.81
1:C:1:MET:HG3	1:C:3:ASP:H	1.47	0.78
1:A:6:ARG:O	1:A:10:GLU:HG3	1.82	0.78
1:E:65:GLU:HA	1:E:68:MET:HE3	1.66	0.78
1:A:19:VAL:HG21	1:A:180:GLU:HG3	1.64	0.77
1:A:34:THR:HG22	1:A:35:PHE:H	1.48	0.77
1:E:107:GLN:HE21	1:E:107:GLN:N	1.83	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:46:ASP:HB3	1:A:49:GLU:HG2	1.69	0.74
1:E:159:LYS:HE3	1:E:167:GLU:OE2	1.86	0.74
1:D:79:ASN:HB2	1:D:80:PRO:HD2	1.70	0.72
1:E:5:ILE:CD1	1:E:242:ILE:HG12	2.19	0.71
1:C:66:PHE:O	1:C:69:GLU:HG2	1.91	0.70
1:D:195:VAL:HG23	1:D:196:VAL:HG23	1.75	0.68
1:E:133:TYR:HE2	1:E:151:ARG:HD2	1.61	0.66
1:B:104:MET:HE2	1:B:121:MET:HB2	1.78	0.65
1:B:70:MET:HE1	1:B:76:ALA:HB2	1.78	0.65
1:B:163:VAL:HG22	6:B:508:EDO:H12	1.78	0.65
1:C:79:ASN:HB2	1:C:80:PRO:HD2	1.79	0.65
1:A:125:ASP:OD1	1:A:132:THR:HG22	1.97	0.64
1:E:200:ALA:O	1:E:203:PRO:HD2	1.98	0.64
1:E:242:ILE:O	1:E:246:VAL:HG23	1.98	0.64
1:E:136:SER:O	1:E:139:VAL:HG12	1.98	0.64
1:E:213:MET:HB2	1:E:227:PHE:HA	1.79	0.63
1:E:245:GLU:O	1:E:249:LEU:HD23	1.98	0.62
1:A:151:ARG:HG3	1:A:151:ARG:NH1	2.09	0.62
1:A:164:LEU:O	1:A:167:GLU:HG2	1.99	0.62
1:E:36:ARG:HH22	10:E:704:APR:H5R2	1.65	0.61
1:E:238:VAL:O	1:E:242:ILE:HG13	2.02	0.60
1:B:193:SER:HB3	4:B:701:NAD:O3B	2.01	0.60
1:B:1:MET:HE1	1:B:5:ILE:CG2	2.32	0.59
1:C:223:ALA:O	1:C:226:ILE:HG12	2.02	0.59
1:E:159:LYS:HE3	1:E:167:GLU:CD	2.23	0.59
1:E:131:GLU:HG2	1:E:151:ARG:NH1	2.18	0.59
1:C:45:TYR:CD1	1:C:50:VAL:HG11	2.39	0.58
1:C:6:ARG:HH11	1:C:6:ARG:HG2	1.69	0.58
1:D:15:SER:HB2	1:D:185:ASP:OD1	2.03	0.58
1:D:248:ARG:O	1:D:248:ARG:HD2	2.04	0.58
1:E:239:LEU:N	1:E:240:PRO:HD2	2.19	0.57
1:D:248:ARG:HG3	1:D:248:ARG:HH11	1.69	0.56
1:C:47:PRO:O	1:C:51:ALA:HB3	2.05	0.56
1:E:68:MET:O	1:E:71:LYS:HG3	2.06	0.56
1:C:90:ARG:HH11	1:C:90:ARG:HG2	1.70	0.56
1:D:71:LYS:O	1:D:72:ASP:HB2	2.05	0.55
1:C:19:VAL:HG21	1:C:180:GLU:HG3	1.89	0.55
1:A:87:GLU:OE2	1:A:90:ARG:NH2	2.40	0.55
1:D:212:LYS:HE2	1:D:228:ASP:OD1	2.07	0.54
1:C:102:ILE:H	4:C:702:NAD:H71N	1.55	0.54
1:E:87:GLU:HA	1:E:90:ARG:NH1	2.23	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:79:ASN:HB2	1:A:80:PRO:CD	2.38	0.54
1:B:1:MET:HE1	1:B:5:ILE:HG21	1.88	0.54
1:A:242:ILE:O	1:A:246:VAL:HG23	2.08	0.53
1:A:34:THR:HG22	1:A:35:PHE:N	2.21	0.53
1:E:107:GLN:NE2	1:E:107:GLN:N	2.50	0.53
1:E:5:ILE:O	1:E:5:ILE:HD12	2.08	0.53
1:B:204:TYR:CE1	1:B:226:ILE:HD13	2.43	0.53
1:E:86:ALA:O	1:E:90:ARG:HG3	2.08	0.53
1:E:53:ILE:HD11	1:E:57:LYS:HZ2	1.74	0.52
1:A:135:TRP:NE1	1:A:139:VAL:HG13	2.25	0.52
1:A:4:GLU:HB3	1:A:231:ILE:HG12	1.91	0.52
1:A:209:ALA:HA	1:E:151:ARG:NH2	2.24	0.52
1:C:1:MET:HG3	1:C:3:ASP:N	2.22	0.52
1:C:204:TYR:CE1	1:C:226:ILE:HD13	2.45	0.52
1:B:71:LYS:O	1:B:72:ASP:HB2	2.10	0.52
1:B:102:ILE:H	4:B:701:NAD:H71N	1.55	0.51
1:A:24:ALA:HB3	1:A:34:THR:HG23	1.91	0.51
1:A:53:ILE:HD11	1:A:57:LYS:HE3	1.92	0.51
1:D:44:LYS:HE3	1:D:45:TYR:CE1	2.46	0.51
1:C:102:ILE:HD11	8:C:502:P6G:H81	1.92	0.51
1:E:20:VAL:HG11	1:E:85:ILE:HD12	1.92	0.50
1:D:215:ILE:HD11	1:D:217:ASN:HD22	1.76	0.50
1:A:79:ASN:HB2	1:A:80:PRO:HD2	1.92	0.50
1:C:125:ASP:OD1	1:C:132:THR:HG22	2.11	0.50
1:C:159:LYS:HE3	1:C:167:GLU:OE2	2.12	0.50
1:D:26:ILE:HG23	1:D:27:SER:N	2.27	0.50
1:C:224:ASP:HB2	1:C:225:PRO:HD3	1.94	0.49
1:D:170:PRO:HB2	1:D:173:THR:HB	1.94	0.49
1:E:133:TYR:CE2	1:E:151:ARG:HD2	2.45	0.49
1:D:178:ILE:HG22	1:D:182:LYS:HE2	1.94	0.49
1:B:167:GLU:HB3	6:B:508:EDO:H22	1.94	0.49
1:A:65:GLU:HA	1:A:68:MET:HE3	1.94	0.49
1:B:197:TYR:HA	11:B:767:HOH:O	2.13	0.49
1:E:244:GLU:HG3	1:E:245:GLU:N	2.28	0.49
1:A:248:ARG:HH11	1:A:248:ARG:HG2	1.77	0.48
1:E:125:ASP:OD1	1:E:132:THR:HG22	2.14	0.48
1:A:49:GLU:HG3	1:A:50:VAL:HG13	1.95	0.48
1:C:242:ILE:O	1:C:246:VAL:HG23	2.13	0.48
1:B:70:MET:HE1	1:B:76:ALA:N	2.29	0.48
1:E:42:TRP:CE3	1:E:42:TRP:HA	2.48	0.48
1:B:88:LEU:HB3	1:B:94:VAL:HG23	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:169:LEU:HD22	1:C:169:LEU:N	2.28	0.47
1:D:197:TYR:CG	1:D:198:PRO:HA	2.49	0.47
1:C:36:ARG:HD3	11:C:735:HOH:O	2.15	0.47
1:A:65:GLU:HA	1:A:68:MET:CE	2.44	0.47
1:A:100:GLN:OE1	1:A:199:ALA:HB2	2.14	0.47
1:D:3:ASP:OD1	1:D:7:LYS:HE3	2.14	0.47
1:E:42:TRP:HA	1:E:42:TRP:HE3	1.80	0.47
1:A:68:MET:HG2	1:A:142:PHE:CE2	2.50	0.47
1:B:224:ASP:O	1:B:230:LYS:HD3	2.15	0.47
1:C:230:LYS:N	1:C:230:LYS:HD3	2.30	0.47
1:E:5:ILE:HD11	1:E:242:ILE:HA	1.96	0.47
1:E:41:LEU:C	1:E:43:ARG:H	2.19	0.47
1:D:248:ARG:HG3	1:D:248:ARG:NH1	2.31	0.46
1:E:65:GLU:HG2	1:E:68:MET:HE3	1.97	0.46
1:A:1:MET:SD	1:A:2:GLU:N	2.87	0.46
1:A:151:ARG:NH1	1:A:151:ARG:CG	2.79	0.46
1:A:61:ARG:NH1	1:A:147:ILE:HD12	2.31	0.46
1:E:232:ILE:HG23	1:E:232:ILE:O	2.15	0.46
1:C:90:ARG:HG2	1:C:90:ARG:NH1	2.30	0.46
1:A:75:PHE:HE2	1:D:74:LEU:HD22	1.81	0.46
1:B:76:ALA:O	1:B:108:ARG:NH2	2.44	0.46
1:E:1:MET:O	1:E:5:ILE:HG22	2.15	0.45
1:A:213:MET:HB2	1:A:227:PHE:HA	1.98	0.45
1:C:112:ARG:HG2	1:C:112:ARG:HH11	1.80	0.45
1:E:64:TRP:O	1:E:68:MET:HG3	2.17	0.45
1:E:215:ILE:HB	1:E:227:PHE:CE2	2.52	0.45
1:D:58:ARG:HD3	11:D:637:HOH:O	2.16	0.45
1:B:1:MET:HE3	1:B:1:MET:HA	1.98	0.45
1:B:194:LEU:HD22	1:B:199:ALA:O	2.16	0.45
1:B:70:MET:HE1	1:B:76:ALA:CB	2.47	0.45
1:C:204:TYR:CZ	1:C:226:ILE:HD13	2.51	0.45
1:D:43:ARG:HH21	1:D:43:ARG:HG3	1.82	0.45
1:C:171:GLN:HE21	1:C:171:GLN:N	2.15	0.44
1:E:2:GLU:HA	1:E:5:ILE:HG23	1.99	0.44
1:A:6:ARG:HH21	1:A:6:ARG:HG3	1.83	0.44
1:D:183:HIS:CD2	1:D:183:HIS:C	2.91	0.44
1:E:102:ILE:HG22	1:E:119:GLY:O	2.18	0.44
1:A:223:ALA:O	1:A:226:ILE:HG12	2.17	0.44
1:A:248:ARG:HG2	1:A:248:ARG:NH1	2.33	0.44
1:B:163:VAL:HG21	1:B:170:PRO:HD3	1.99	0.44
1:C:33:PRO:HG2	1:C:43:ARG:NH2	2.32	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:131:GLU:HA	1:E:131:GLU:OE2	2.18	0.44
1:B:204:TYR:CE1	1:B:226:ILE:HG21	2.53	0.43
1:E:215:ILE:O	1:E:215:ILE:HG23	2.18	0.43
1:A:141:ASP:HB2	11:A:734:HOH:O	2.18	0.43
1:C:45:TYR:CD2	1:C:45:TYR:N	2.84	0.43
1:A:19:VAL:CG2	1:A:180:GLU:HG3	2.42	0.43
1:C:171:GLN:HE21	1:C:171:GLN:CA	2.31	0.43
1:D:26:ILE:CG2	1:D:27:SER:N	2.82	0.43
1:D:125:ASP:OD1	1:D:132:THR:HG22	2.18	0.43
1:D:162:VAL:HG23	1:D:164:LEU:HD13	2.01	0.43
1:B:197:TYR:CE1	1:B:198:PRO:HB3	2.54	0.43
1:C:248:ARG:HG2	1:C:248:ARG:HH11	1.84	0.43
1:A:169:LEU:HD11	1:B:222:MET:HE1	2.01	0.43
1:A:230:LYS:HD2	11:A:726:HOH:O	2.19	0.43
1:E:213:MET:HB3	1:E:227:PHE:CD2	2.54	0.43
1:A:104:MET:SD	1:A:122:ASP:HB3	2.59	0.42
1:A:124:LEU:N	1:A:124:LEU:HD12	2.33	0.42
1:B:223:ALA:O	1:B:226:ILE:HG12	2.19	0.42
1:E:201:GLU:O	1:E:205:ILE:HG13	2.18	0.42
1:E:224:ASP:N	1:E:225:PRO:CD	2.83	0.42
1:A:113:ARG:HG3	1:A:113:ARG:HH21	1.83	0.42
1:E:207:LYS:O	1:E:207:LYS:HD3	2.19	0.42
1:E:221:THR:C	1:E:223:ALA:H	2.23	0.42
1:B:90:ARG:HG2	1:B:90:ARG:HH21	1.84	0.42
1:E:12:LEU:HD13	1:E:88:LEU:HD21	2.01	0.42
1:C:21:PHE:HA	1:C:98:ILE:O	2.19	0.42
1:C:219:GLU:HG2	4:C:702:NAD:O2B	2.20	0.42
1:A:135:TRP:O	1:A:139:VAL:HG22	2.20	0.42
1:C:170:PRO:HB2	1:C:173:THR:HB	2.02	0.42
1:B:248:ARG:HH21	1:B:248:ARG:HG2	1.84	0.41
1:A:57:LYS:HZ3	1:C:179:GLU:CD	2.22	0.41
1:A:64:TRP:O	1:A:68:MET:HG3	2.20	0.41
1:D:53:ILE:O	1:D:57:LYS:HG3	2.21	0.41
1:C:88:LEU:HD21	1:C:243:VAL:HG22	2.03	0.41
1:C:139:VAL:HG13	1:C:140:GLU:N	2.36	0.41
1:A:48:GLU:OE1	1:A:58:ARG:NH2	2.52	0.41
1:D:217:ASN:O	1:D:232:ILE:HA	2.20	0.41
1:E:224:ASP:HB2	1:E:225:PRO:HD3	2.03	0.41
1:E:229:VAL:HG13	1:E:229:VAL:O	2.20	0.41
1:A:139:VAL:HG23	11:A:719:HOH:O	2.20	0.41
1:B:79:ASN:HB2	1:B:80:PRO:CD	2.51	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:59:ASN:HD21	1:D:61:ARG:HB2	1.87	0.40
1:E:123:LYS:HB3	1:E:161:ARG:NH2	2.36	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	250/253 (99%)	236 (94%)	13 (5%)	1 (0%)	34	42
1	B	250/253 (99%)	245 (98%)	5 (2%)	0	100	100
1	C	250/253 (99%)	244 (98%)	6 (2%)	0	100	100
1	D	236/253 (93%)	226 (96%)	9 (4%)	1 (0%)	34	42
1	E	244/253 (96%)	232 (95%)	10 (4%)	2 (1%)	19	23
All	All	1230/1265 (97%)	1183 (96%)	43 (4%)	4 (0%)	41	50

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	72	ASP
1	D	72	ASP
1	E	42	TRP
1	E	222	MET

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	196/212 (92%)	193 (98%)	3 (2%)	65	79
1	B	207/212 (98%)	203 (98%)	4 (2%)	57	73
1	C	201/212 (95%)	194 (96%)	7 (4%)	36	50
1	D	190/212 (90%)	186 (98%)	4 (2%)	53	70
1	E	177/212 (84%)	170 (96%)	7 (4%)	31	44
All	All	971/1060 (92%)	946 (97%)	25 (3%)	46	63

All (25) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	139	VAL
1	A	141	ASP
1	A	143	ASN
1	B	183	HIS
1	B	198	PRO
1	B	201	GLU
1	B	202	LEU
1	C	59	ASN
1	C	121	MET
1	C	169	LEU
1	C	171	GLN
1	C	174	LEU
1	C	183	HIS
1	C	193	SER
1	D	43	ARG
1	D	164	LEU
1	D	183	HIS
1	D	224	ASP
1	E	5	ILE
1	E	29	GLU
1	E	42	TRP
1	E	107	GLN
1	E	151	ARG
1	E	172	ARG
1	E	230	LYS

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

Mol	Chain	Res	Type
1	A	59	ASN
1	A	143	ASN
1	B	100	GLN
1	B	101	ASN
1	C	59	ASN
1	C	100	GLN
1	C	101	ASN
1	C	171	GLN
1	D	59	ASN
1	D	171	GLN
1	E	100	GLN
1	E	107	GLN
1	E	143	ASN
1	E	171	GLN
1	E	183	HIS

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 33 ligands modelled in this entry, 9 are monoatomic - leaving 24 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
6	EDO	B	508	-	3,3,3	0.75	0	2,2,2	0.15	0
3	SO4	C	411	-	4,4,4	0.28	0	6,6,6	0.05	0
8	P6G	C	502	-	18,18,18	0.78	0	17,17,17	0.75	0
3	SO4	D	408	-	4,4,4	0.28	0	6,6,6	0.11	0
3	SO4	B	409	-	4,4,4	0.28	0	6,6,6	0.06	0
3	SO4	B	402	-	4,4,4	0.27	0	6,6,6	0.09	0
3	SO4	B	404	-	4,4,4	0.26	0	6,6,6	0.07	0
3	SO4	A	407	-	4,4,4	0.27	0	6,6,6	0.09	0
10	APR	E	704	-	34,39,39	2.59	8 (23%)	40,60,60	1.87	5 (12%)
6	EDO	B	507	-	3,3,3	0.74	0	2,2,2	0.25	0
4	NAD	C	702	-	42,48,48	3.77	18 (42%)	50,73,73	1.79	9 (18%)
5	1PE	A	504	-	15,15,15	0.64	0	14,14,14	0.44	0
3	SO4	B	410	-	4,4,4	0.28	0	6,6,6	0.05	0
3	SO4	A	412	-	4,4,4	0.28	0	6,6,6	0.09	0
3	SO4	A	401	-	4,4,4	0.30	0	6,6,6	0.15	0
3	SO4	D	403	-	4,4,4	0.28	0	6,6,6	0.07	0
4	NAD	A	703	-	42,48,48	4.63	25 (59%)	50,73,73	1.75	10 (20%)
9	PG4	D	503	-	12,12,12	0.73	0	11,11,11	0.41	0
4	NAD	B	701	-	42,48,48	3.85	22 (52%)	50,73,73	1.99	9 (18%)
3	SO4	C	406	-	4,4,4	0.26	0	6,6,6	0.10	0
9	PG4	C	506	-	12,12,12	0.67	0	11,11,11	0.45	0
7	2PE	B	501	-	27,27,27	0.71	0	26,26,26	0.46	0
3	SO4	A	405	-	4,4,4	0.27	0	6,6,6	0.07	0
6	EDO	A	505	-	3,3,3	0.73	0	2,2,2	0.26	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	EDO	B	508	-	-	1/1/1/1	-
9	PG4	C	506	-	-	3/10/10/10	-
10	APR	E	704	-	1/1/10/10	3/18/54/54	0/4/4/4
6	EDO	B	507	-	-	0/1/1/1	-
8	P6G	C	502	-	-	12/16/16/16	-
4	NAD	A	703	-	-	3/26/62/62	0/5/5/5
7	2PE	B	501	-	-	13/25/25/25	-
4	NAD	C	702	-	-	3/26/62/62	0/5/5/5
5	1PE	A	504	-	-	7/13/13/13	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
9	PG4	D	503	-	-	7/10/10/10	-
4	NAD	B	701	-	-	3/26/62/62	0/5/5/5
6	EDO	A	505	-	-	1/1/1/1	-

All (73) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	703	NAD	C2N-N1N	14.12	1.52	1.35
4	A	703	NAD	C4N-C3N	12.31	1.60	1.39
4	B	701	NAD	C2N-N1N	12.01	1.49	1.35
4	C	702	NAD	C4N-C3N	10.35	1.57	1.39
4	C	702	NAD	C2A-N3A	9.44	1.47	1.32
4	A	703	NAD	C2A-N3A	9.43	1.47	1.32
4	A	703	NAD	C4A-N3A	9.36	1.48	1.35
4	C	702	NAD	C2N-N1N	9.25	1.46	1.35
4	B	701	NAD	C4N-C3N	9.14	1.54	1.39
10	E	704	APR	C2-N3	9.13	1.46	1.32
4	C	702	NAD	C6N-N1N	7.90	1.54	1.35
4	B	701	NAD	C2A-N3A	7.78	1.44	1.32
4	C	702	NAD	C5N-C4N	7.76	1.55	1.38
4	A	703	NAD	C5N-C4N	7.72	1.55	1.38
4	A	703	NAD	C6N-N1N	7.42	1.53	1.35
10	E	704	APR	C4-N3	7.16	1.45	1.35
4	A	703	NAD	O4D-C1D	6.92	1.50	1.41
4	B	701	NAD	O3B-C3B	6.67	1.58	1.43
4	B	701	NAD	C5N-C4N	6.19	1.52	1.38
4	B	701	NAD	C6N-N1N	5.55	1.49	1.35
4	B	701	NAD	C2D-C1D	5.20	1.61	1.53
4	A	703	NAD	C2D-C1D	5.18	1.61	1.53
4	C	702	NAD	C6N-C5N	5.18	1.50	1.38
4	A	703	NAD	C6N-C5N	5.09	1.49	1.38
4	C	702	NAD	C4A-N3A	5.07	1.42	1.35
4	C	702	NAD	C2D-C1D	5.02	1.61	1.53
4	B	701	NAD	O7N-C7N	4.93	1.33	1.24
10	E	704	APR	C1D-C2D	4.92	1.58	1.52
4	A	703	NAD	C2A-N1A	4.58	1.42	1.33
4	C	702	NAD	O7N-C7N	4.54	1.32	1.24
4	B	701	NAD	O4B-C1B	-4.44	1.34	1.41
4	B	701	NAD	C3B-C4B	4.18	1.63	1.53
4	B	701	NAD	C4A-N3A	4.09	1.41	1.35
4	C	702	NAD	C2N-C3N	4.02	1.45	1.39
4	B	701	NAD	PA-O1A	-3.75	1.37	1.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	701	NAD	O5B-C5B	-3.73	1.30	1.44
4	A	703	NAD	O7N-C7N	3.67	1.31	1.24
4	A	703	NAD	C6A-C5A	3.60	1.56	1.43
4	B	701	NAD	O4D-C1D	3.43	1.45	1.41
4	A	703	NAD	C2N-C3N	3.41	1.44	1.39
4	C	702	NAD	O4B-C1B	-3.30	1.36	1.41
4	A	703	NAD	C2D-C3D	3.18	1.62	1.53
4	A	703	NAD	C3B-C4B	2.88	1.60	1.53
4	B	701	NAD	C6A-C5A	2.88	1.54	1.43
4	A	703	NAD	O4D-C4D	2.80	1.51	1.45
10	E	704	APR	C6-C5	2.78	1.53	1.43
4	B	701	NAD	O2B-C2B	-2.67	1.36	1.43
4	C	702	NAD	O5B-C5B	-2.62	1.34	1.44
4	A	703	NAD	PA-O1A	-2.60	1.41	1.50
4	C	702	NAD	C6A-C5A	2.58	1.52	1.43
10	E	704	APR	C2-N1	2.53	1.38	1.33
4	B	701	NAD	C6N-C5N	2.51	1.44	1.38
4	C	702	NAD	C2A-N1A	2.51	1.38	1.33
4	B	701	NAD	C8A-N7A	-2.49	1.30	1.34
4	A	703	NAD	PN-O1N	-2.47	1.42	1.50
4	C	702	NAD	C8A-N7A	-2.47	1.30	1.34
10	E	704	APR	C5D-C4D	-2.42	1.44	1.51
4	A	703	NAD	C7N-N7N	2.41	1.37	1.33
4	B	701	NAD	C5A-N7A	-2.40	1.31	1.39
4	A	703	NAD	C2B-C1B	2.39	1.57	1.53
4	C	702	NAD	C2B-C1B	-2.37	1.50	1.53
10	E	704	APR	PA-O2A	-2.37	1.44	1.55
4	C	702	NAD	O3B-C3B	2.33	1.48	1.43
4	B	701	NAD	PN-O1N	-2.32	1.42	1.50
4	A	703	NAD	PN-O5D	2.26	1.68	1.59
10	E	704	APR	C6-N1	2.22	1.46	1.37
4	C	702	NAD	C5A-N7A	-2.22	1.31	1.39
4	A	703	NAD	C3N-C7N	2.20	1.53	1.50
4	A	703	NAD	PA-O2A	-2.20	1.45	1.55
4	A	703	NAD	O3D-C3D	2.19	1.48	1.43
4	B	701	NAD	C2A-N1A	2.18	1.38	1.33
4	B	701	NAD	PA-O2A	-2.11	1.45	1.55
4	A	703	NAD	C6A-N6A	-2.01	1.26	1.34

All (33) bond angle outliers are listed below:

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	701	NAD	N3A-C2A-N1A	-7.42	117.09	128.68
4	C	702	NAD	N3A-C2A-N1A	-6.96	117.81	128.68
4	A	703	NAD	N3A-C2A-N1A	-6.85	117.97	128.68
10	E	704	APR	N3-C2-N1	-6.74	118.14	128.68
10	E	704	APR	C2-N1-C6	4.65	126.71	118.75
4	B	701	NAD	O4B-C4B-C5B	-4.64	94.12	109.37
4	B	701	NAD	C2A-N1A-C6A	4.51	126.47	118.75
4	A	703	NAD	C2A-N1A-C6A	4.13	125.82	118.75
4	C	702	NAD	C2A-N1A-C6A	3.94	125.50	118.75
4	B	701	NAD	C5B-C4B-C3B	3.80	129.40	115.18
10	E	704	APR	O5D-C5D-C4D	3.74	121.85	108.99
4	A	703	NAD	C1B-N9A-C4A	-3.31	120.82	126.64
10	E	704	APR	O1D-C1D-O4D	-3.28	106.94	111.13
4	B	701	NAD	C2N-N1N-C1D	-3.20	112.02	119.14
4	C	702	NAD	O4B-C4B-C5B	-3.10	99.18	109.37
4	C	702	NAD	C2N-N1N-C1D	-3.10	112.24	119.14
4	C	702	NAD	C5B-C4B-C3B	2.84	125.83	115.18
4	A	703	NAD	C5A-C6A-N6A	2.77	124.56	120.35
4	B	701	NAD	PA-O5B-C5B	2.72	137.62	121.68
4	A	703	NAD	C2B-C3B-C4B	2.65	107.79	102.64
4	A	703	NAD	C4A-C5A-N7A	-2.58	106.71	109.40
4	A	703	NAD	O2B-C2B-C3B	2.54	120.05	111.82
10	E	704	APR	C1'-N9-C4	-2.47	122.30	126.64
4	A	703	NAD	O4B-C1B-C2B	2.43	110.47	106.93
4	B	701	NAD	C3B-C2B-C1B	2.41	104.60	100.98
4	C	702	NAD	O2B-C2B-C3B	2.37	119.48	111.82
4	A	703	NAD	O5D-C5D-C4D	2.35	117.09	108.99
4	B	701	NAD	O5B-C5B-C4B	2.30	116.90	108.99
4	C	702	NAD	O5B-C5B-C4B	2.23	116.66	108.99
4	A	703	NAD	O3B-C3B-C4B	-2.20	104.70	111.05
4	B	701	NAD	C5A-C6A-N6A	2.16	123.63	120.35
4	C	702	NAD	O4B-C4B-C3B	-2.05	101.06	105.11
4	C	702	NAD	O4D-C1D-C2D	-2.04	103.95	106.93

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
10	E	704	APR	C1D

All (56) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	B	701	NAD	PN-O3-PA-O5B
4	C	702	NAD	PN-O3-PA-O5B
10	E	704	APR	O4D-C4D-C5D-O5D
10	E	704	APR	C3D-C4D-C5D-O5D
8	C	502	P6G	O4-C5-C6-O7
7	B	501	2PE	O7-C8-C9-O10
7	B	501	2PE	O19-C20-C21-O22
8	C	502	P6G	O16-C17-C18-O19
9	D	503	PG4	O2-C3-C4-O3
5	A	504	1PE	OH2-C12-C22-OH3
7	B	501	2PE	O25-C26-C27-O28
9	D	503	PG4	O3-C5-C6-O4
7	B	501	2PE	O1-C2-C3-O4
7	B	501	2PE	O10-C11-C12-O13
8	C	502	P6G	O1-C2-C3-O4
9	C	506	PG4	O4-C7-C8-O5
6	A	505	EDO	O1-C1-C2-O2
7	B	501	2PE	O13-C14-C15-O16
5	A	504	1PE	OH5-C14-C24-OH4
7	B	501	2PE	O22-C23-C24-O25
9	D	503	PG4	O1-C1-C2-O2
4	B	701	NAD	C4B-C5B-O5B-PA
4	C	702	NAD	C4B-C5B-O5B-PA
4	A	703	NAD	O4D-C4D-C5D-O5D
7	B	501	2PE	O16-C17-C18-O19
6	B	508	EDO	O1-C1-C2-O2
7	B	501	2PE	C9-C8-O7-C6
5	A	504	1PE	C14-C24-OH4-C13
7	B	501	2PE	C8-C9-O10-C11
9	D	503	PG4	C3-C4-O3-C5
8	C	502	P6G	C9-C8-O7-C6
9	D	503	PG4	C6-C5-O3-C4
9	D	503	PG4	C8-C7-O4-C6
8	C	502	P6G	C12-C11-O10-C9
8	C	502	P6G	C18-C17-O16-C15
7	B	501	2PE	C18-C17-O16-C15
4	A	703	NAD	C3D-C4D-C5D-O5D
8	C	502	P6G	C8-C9-O10-C11
9	C	506	PG4	C5-C6-O4-C7
5	A	504	1PE	C15-C25-OH5-C14
8	C	502	P6G	C2-C3-O4-C5
9	D	503	PG4	C1-C2-O2-C3
8	C	502	P6G	C14-C15-O16-C17

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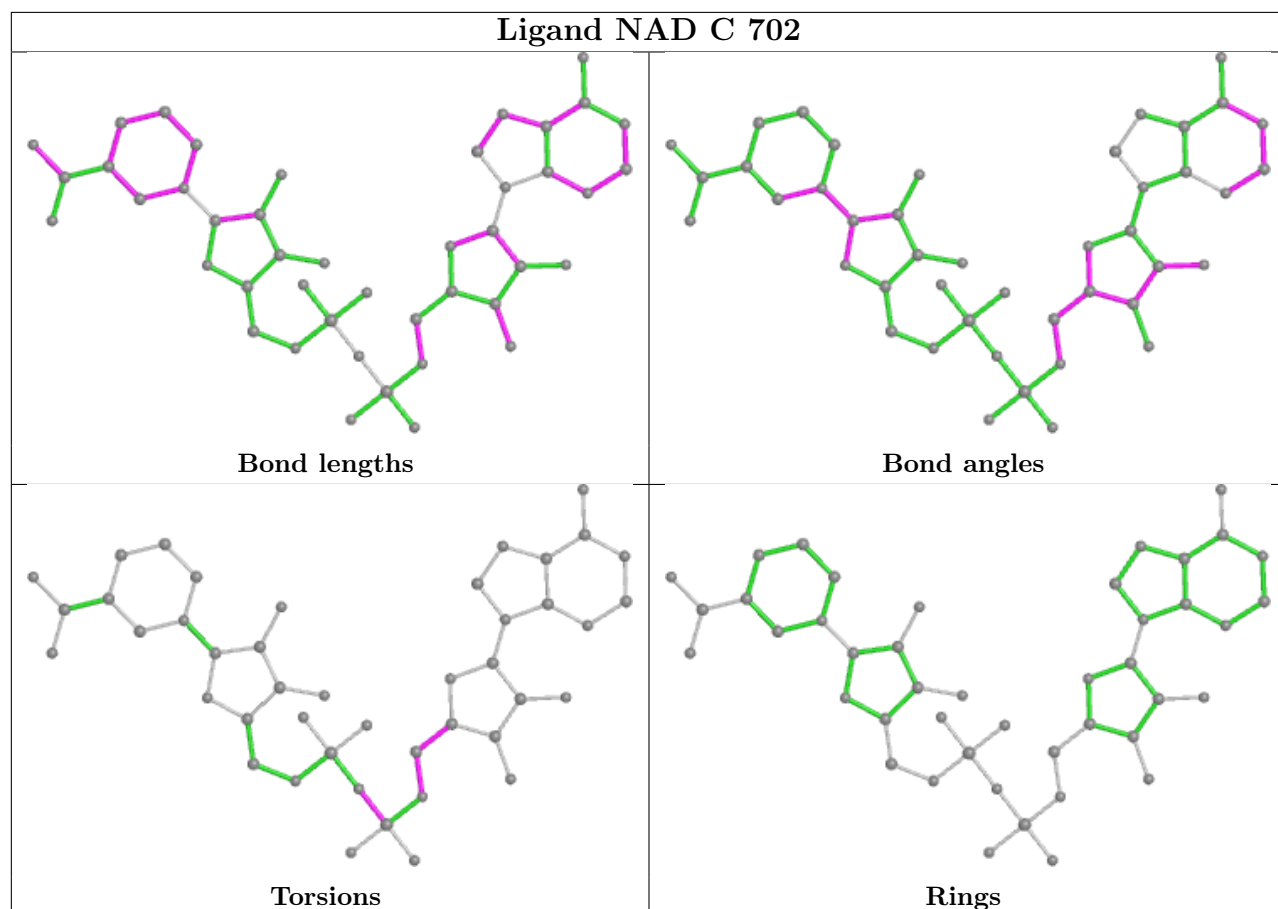
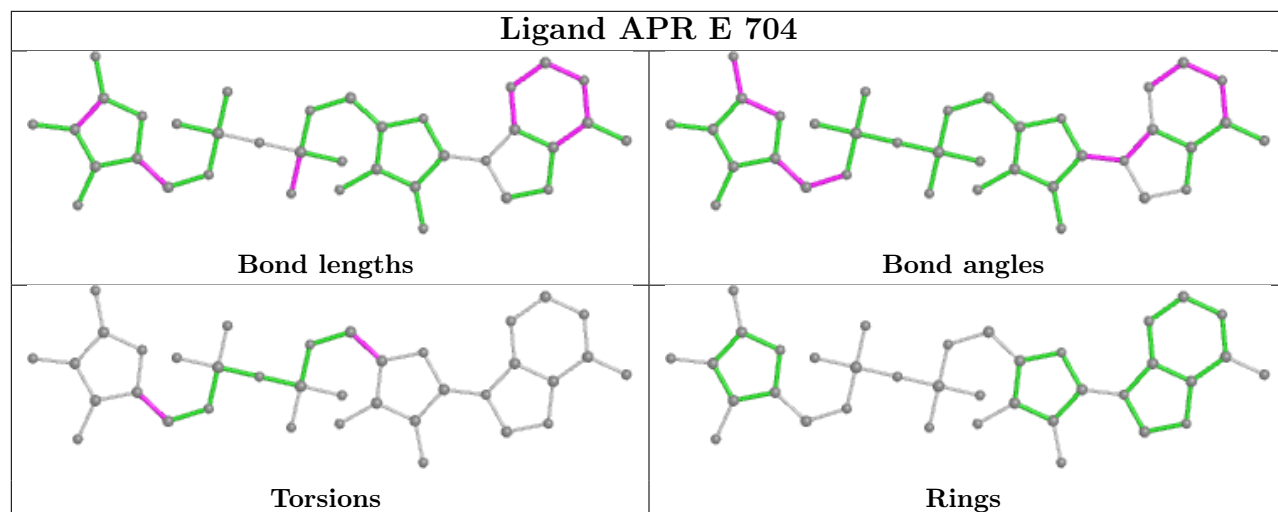
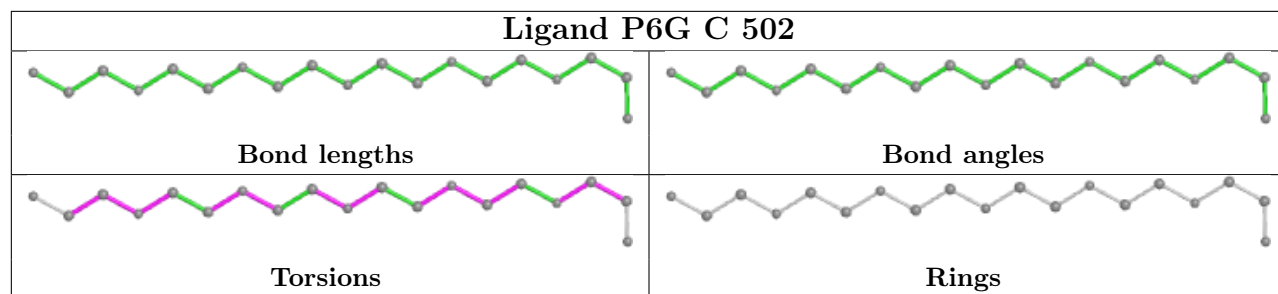
Mol	Chain	Res	Type	Atoms
8	C	502	P6G	C15-C14-O13-C12
5	A	504	1PE	C25-C15-OH6-C26
7	B	501	2PE	C6-C5-O4-C3
5	A	504	1PE	C16-C26-OH6-C15
8	C	502	P6G	C11-C12-O13-C14
7	B	501	2PE	O4-C5-C6-O7
4	A	703	NAD	O4B-C4B-C5B-O5B
9	C	506	PG4	C3-C4-O3-C5
4	C	702	NAD	O4B-C4B-C5B-O5B
4	B	701	NAD	O4B-C4B-C5B-O5B
10	E	704	APR	O4'-C4'-C5'-O5'
5	A	504	1PE	OH7-C16-C26-OH6
8	C	502	P6G	C5-C6-O7-C8

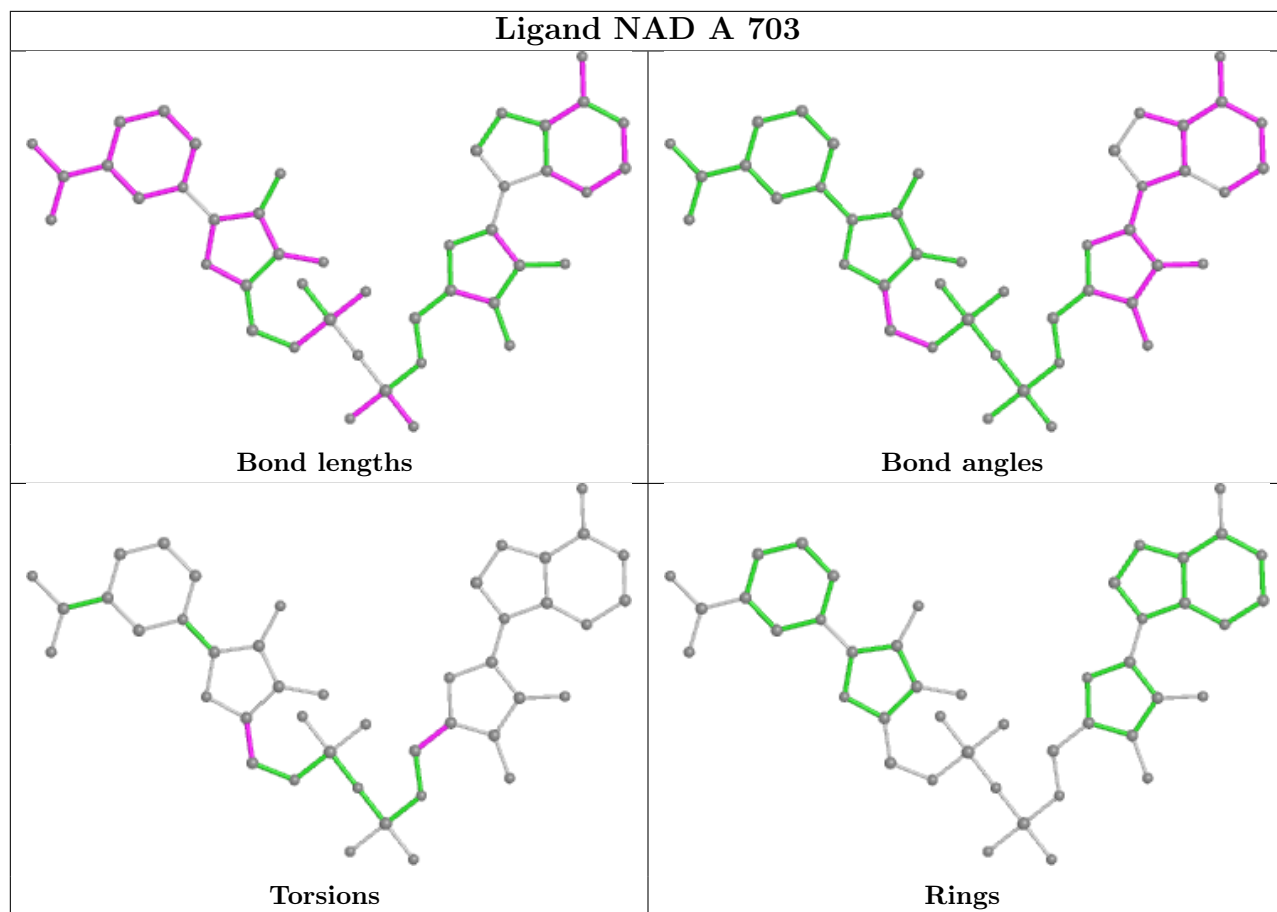
There are no ring outliers.

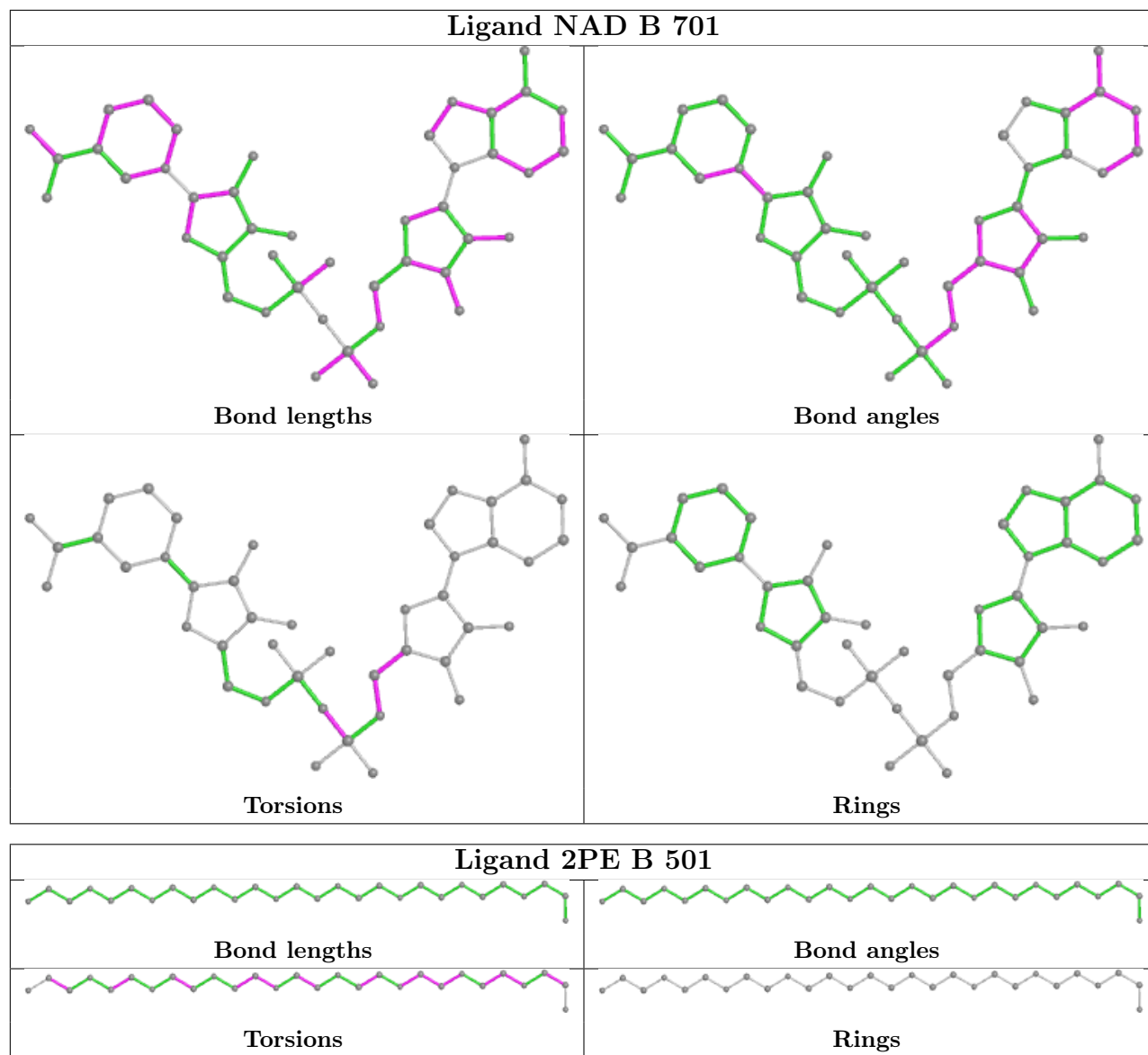
5 monomers are involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	B	508	EDO	2	0
8	C	502	P6G	1	0
10	E	704	APR	1	0
4	C	702	NAD	2	0
4	B	701	NAD	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 than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.







5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

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	252/253 (99%)	-0.02	9 (3%) 42 49	21, 34, 63, 84	0
1	B	252/253 (99%)	-0.23	3 (1%) 79 83	17, 30, 47, 77	0
1	C	252/253 (99%)	-0.08	3 (1%) 79 83	23, 39, 60, 90	0
1	D	240/253 (94%)	-0.28	9 (3%) 40 47	18, 34, 60, 85	0
1	E	248/253 (98%)	0.43	19 (7%) 13 17	31, 54, 82, 98	0
All	All	1244/1265 (98%)	-0.04	43 (3%) 44 51	17, 37, 73, 98	0

All (43) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	1	MET	7.4
1	C	1	MET	6.1
1	A	1	MET	5.2
1	A	35	PHE	5.1
1	D	249	LEU	4.9
1	E	249	LEU	4.9
1	A	37	GLY	4.5
1	D	251	SER	4.3
1	C	252	GLU	3.9
1	E	39	ASP	3.9
1	E	45	TYR	3.8
1	E	242	ILE	3.7
1	D	72	ASP	3.5
1	E	232	ILE	3.4
1	D	28	ALA	3.4
1	E	243	VAL	3.2
1	E	239	LEU	3.2
1	B	1	MET	3.1
1	A	39	ASP	3.1
1	C	45	TYR	3.1

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Mol	Chain	Res	Type	RSRZ
1	E	211	ALA	3.0
1	A	251	SER	2.8
1	D	75	PHE	2.7
1	B	20	VAL	2.7
1	D	248	ARG	2.6
1	D	73	LYS	2.5
1	E	228	ASP	2.5
1	E	139	VAL	2.5
1	E	141	ASP	2.5
1	E	175	PHE	2.4
1	A	38	GLU	2.4
1	A	40	GLY	2.4
1	A	33	PRO	2.4
1	A	36	ARG	2.3
1	E	219	GLU	2.2
1	D	74	LEU	2.2
1	E	37	GLY	2.2
1	E	145	GLY	2.2
1	D	43	ARG	2.1
1	E	31	GLY	2.1
1	E	222	MET	2.1
1	B	189	VAL	2.1
1	E	248	ARG	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

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

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 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.

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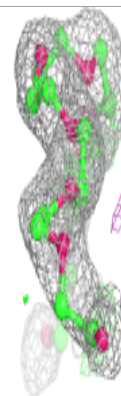
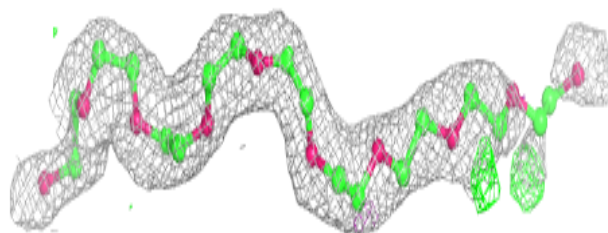
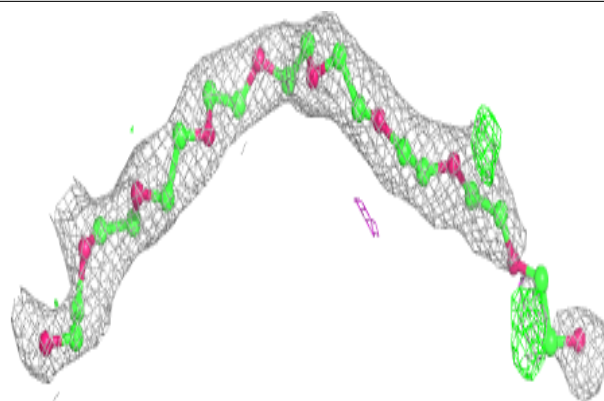
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	SO4	B	410	5/5	0.50	0.44	104,104,105,106	0
9	PG4	C	506	13/13	0.71	0.19	78,81,83,83	0
6	EDO	A	505	4/4	0.73	0.32	59,60,60,61	0
6	EDO	B	508	4/4	0.76	0.30	44,45,45,46	0
3	SO4	C	406	5/5	0.76	0.24	99,100,100,101	0
3	SO4	A	412	5/5	0.80	0.23	104,104,104,105	0
3	SO4	C	411	5/5	0.85	0.40	103,103,104,104	0
3	SO4	A	405	5/5	0.85	0.26	102,102,103,103	0
7	2PE	B	501	28/28	0.86	0.21	39,56,67,69	0
8	P6G	C	502	19/19	0.87	0.23	50,57,68,69	0
6	EDO	B	507	4/4	0.87	0.13	54,54,55,55	0
5	1PE	A	504	16/16	0.88	0.17	61,68,69,69	0
3	SO4	B	409	5/5	0.89	0.57	104,104,104,105	0
9	PG4	D	503	13/13	0.89	0.20	57,59,64,66	0
3	SO4	D	403	5/5	0.90	0.19	86,87,88,88	0
3	SO4	A	407	5/5	0.93	0.09	78,79,79,81	0
10	APR	E	704	36/36	0.93	0.14	46,51,55,56	0
3	SO4	B	404	5/5	0.94	0.17	87,87,88,89	0
3	SO4	A	401	5/5	0.94	0.12	38,44,45,46	0
3	SO4	D	408	5/5	0.94	0.12	64,65,66,66	0
4	NAD	A	703	44/44	0.95	0.13	37,49,68,69	0
4	NAD	C	702	44/44	0.96	0.14	24,30,34,38	0
4	NAD	B	701	44/44	0.97	0.13	18,23,26,31	0
3	SO4	B	402	5/5	0.99	0.11	33,33,33,34	0
2	ZN	A	602	1/1	0.99	0.11	32,32,32,32	0
2	ZN	B	603	1/1	0.99	0.06	32,32,32,32	0
2	ZN	C	606	1/1	0.99	0.10	33,33,33,33	0
2	ZN	D	608	1/1	0.99	0.11	31,31,31,31	0
2	ZN	E	609	1/1	1.00	0.06	31,31,31,31	0
2	ZN	C	605	1/1	1.00	0.06	32,32,32,32	0
2	ZN	A	601	1/1	1.00	0.06	32,32,32,32	0
2	ZN	D	607	1/1	1.00	0.09	27,27,27,27	0
2	ZN	B	604	1/1	1.00	0.10	28,28,28,28	0

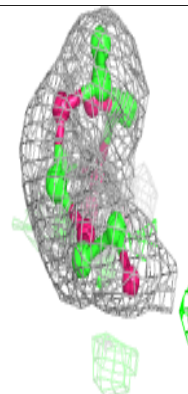
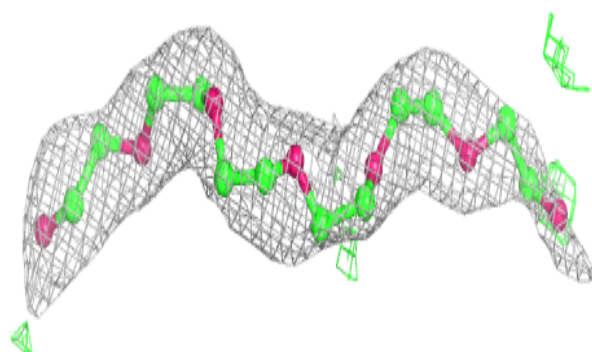
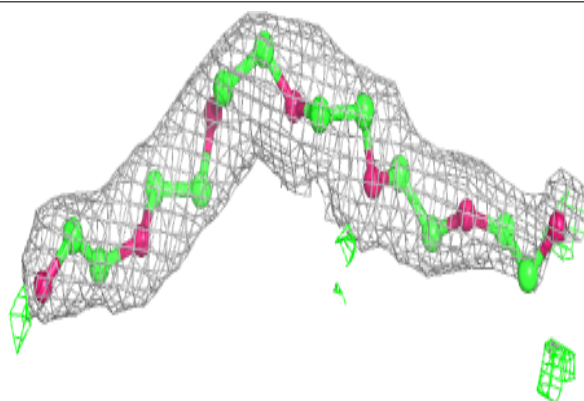
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around 2PE B 501:

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

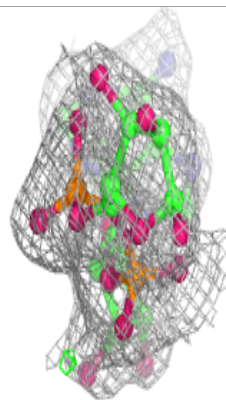
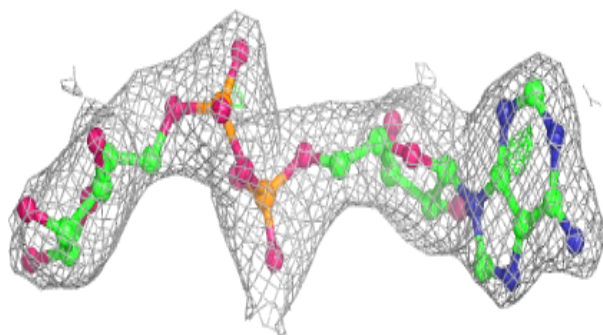
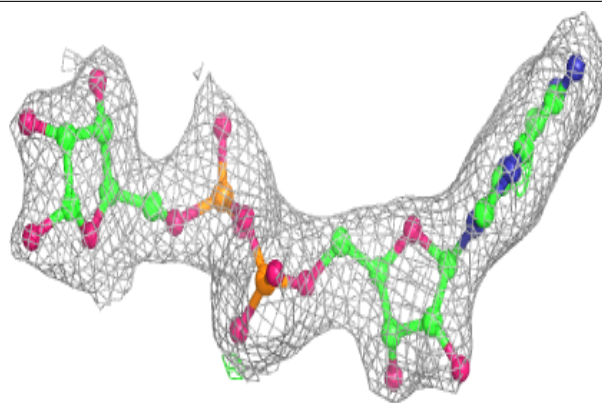
**Electron density around P6G C 502:**

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

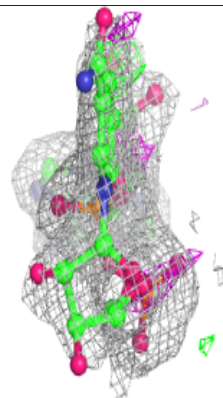
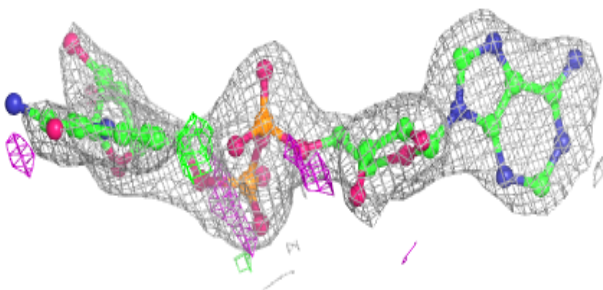
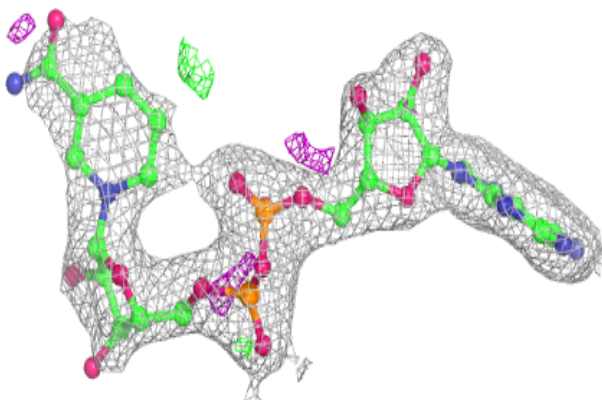


Electron density around APR E 704:

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

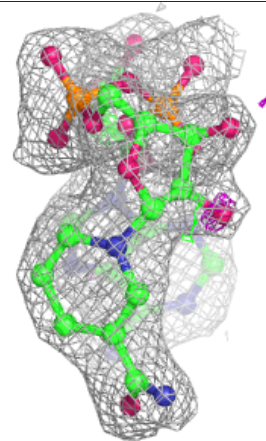
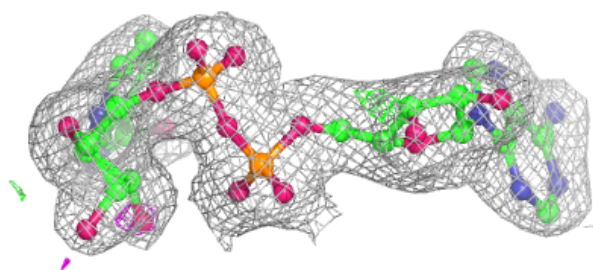
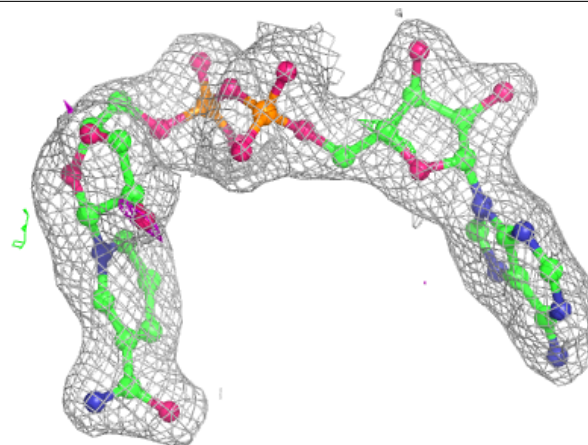
**Electron density around NAD A 703:**

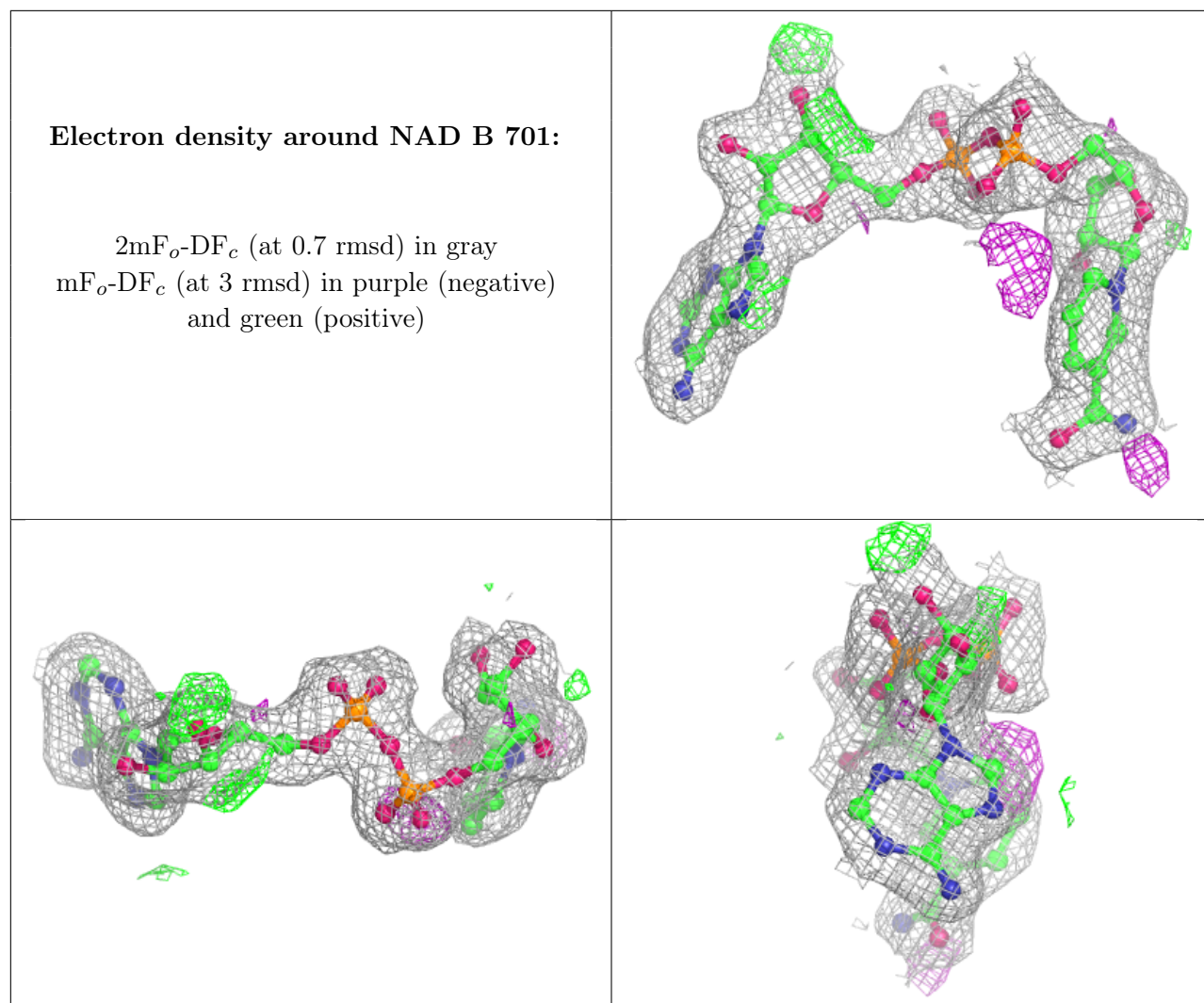
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around NAD C 702:

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





6.5 Other polymers [i](#)

There are no such residues in this entry.