



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 1, 2026 – 02:22 AM UTC

PDB ID : 3SX2 / pdb_00003sx2
Title : Crystal structure of a putative 3-ketoacyl-(acyl-carrier-protein) reductase from Mycobacterium paratuberculosis in complex with NAD
Authors : Seattle Structural Genomics Center for Infectious Disease (SSGCID)
Deposited on : 2011-07-14
Resolution : 1.50 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	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

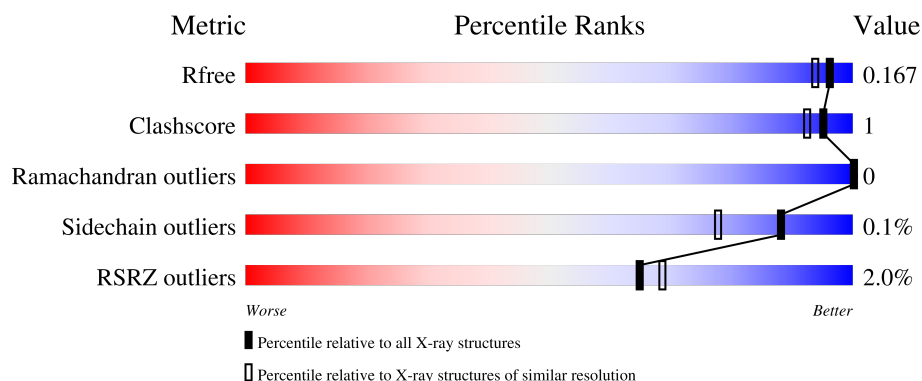
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.50 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}	180053	4037 (1.50-1.50)
Clashscore	190562	4235 (1.50-1.50)
Ramachandran outliers	187476	4153 (1.50-1.50)
Sidechain outliers	187428	4150 (1.50-1.50)
RSRZ outliers	180081	4039 (1.50-1.50)

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	278	2% 94% • •
1	B	278	3% 90% • 8%
1	C	278	% 91% • 8%
1	D	278	% 94% • •
1	E	278	3% 89% • 8%

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Mol	Chain	Length	Quality of chain
1	F	278	
1	G	278	
1	H	278	

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	MPD	B	301	X	-	-	-
3	MPD	E	302	X	-	-	-

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 17297 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 Putative 3-ketoacyl-(acyl-carrier-protein) reductase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	268	Total	C	N	O	S	0	8	0
			1971	1244	344	375	8			
1	B	257	Total	C	N	O	S	0	7	0
			1872	1183	329	354	6			
1	C	257	Total	C	N	O	S	0	8	0
			1885	1192	328	359	6			
1	D	269	Total	C	N	O	S	0	11	0
			1981	1253	344	376	8			
1	E	256	Total	C	N	O	S	0	5	0
			1838	1157	324	351	6			
1	F	274	Total	C	N	O	S	0	11	0
			2018	1274	349	387	8			
1	G	267	Total	C	N	O	S	0	8	0
			1953	1231	340	374	8			
1	H	249	Total	C	N	O	S	0	6	0
			1824	1151	320	348	5			

There are 16 discrepancies between the modelled and reference sequences:

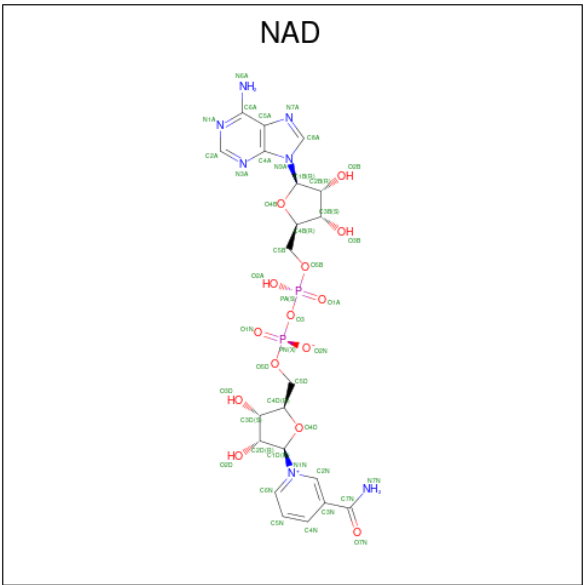
Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	expression tag	UNP Q73W00
A	0	SER	-	expression tag	UNP Q73W00
B	-1	GLY	-	expression tag	UNP Q73W00
B	0	SER	-	expression tag	UNP Q73W00
C	-1	GLY	-	expression tag	UNP Q73W00
C	0	SER	-	expression tag	UNP Q73W00
D	-1	GLY	-	expression tag	UNP Q73W00
D	0	SER	-	expression tag	UNP Q73W00
E	-1	GLY	-	expression tag	UNP Q73W00
E	0	SER	-	expression tag	UNP Q73W00
F	-1	GLY	-	expression tag	UNP Q73W00
F	0	SER	-	expression tag	UNP Q73W00
G	-1	GLY	-	expression tag	UNP Q73W00

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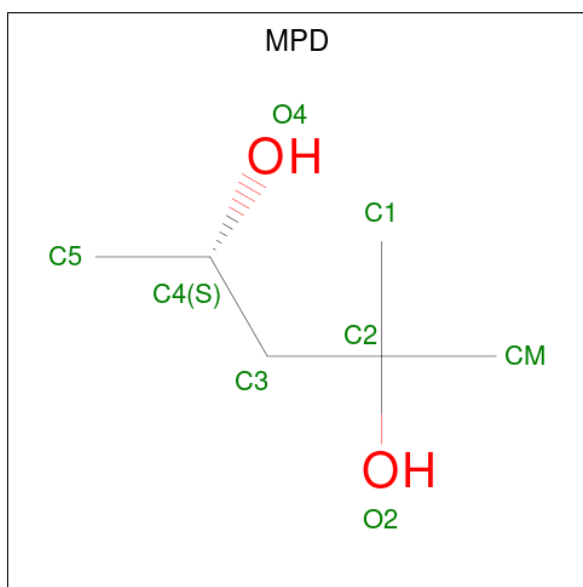
Chain	Residue	Modelled	Actual	Comment	Reference
G	0	SER	-	expression tag	UNP Q73W00
H	-1	GLY	-	expression tag	UNP Q73W00
H	0	SER	-	expression tag	UNP Q73W00

- Molecule 2 is NICOTINAMIDE-ADENINE-DINUCLEOTIDE (CCD ID: NAD) (formula: $C_{21}H_{27}N_7O_{14}P_2$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
2	B	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
2	C	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
2	D	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
2	E	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
2	F	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
2	G	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
2	H	1	Total	C	N	O	P	0	0
			44	21	7	14	2		

- Molecule 3 is (4S)-2-METHYL-2,4-PENTANEDIOL (CCD ID: MPD) (formula: $C_6H_{14}O_2$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	B	1	Total C O 8 6 2	0	0
3	D	1	Total C O 8 6 2	0	0
3	E	1	Total C O 8 6 2	0	0
3	F	1	Total C O 8 6 2	0	0
3	H	1	Total C O 8 6 2	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	234	Total O 234 234	0	0
4	B	188	Total O 188 188	0	0
4	C	188	Total O 188 188	0	0
4	D	179	Total O 179 179	0	0
4	E	145	Total O 145 145	0	0
4	F	216	Total O 216 216	0	0
4	G	245	Total O 245 245	0	0

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	H	168	Total 168	O 168	0	0

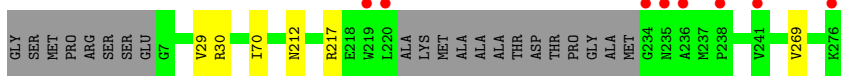
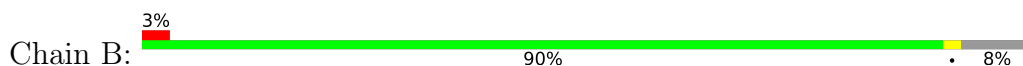
3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

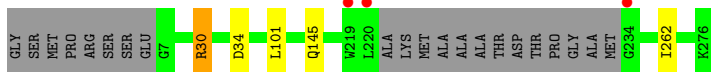
- Molecule 1: Putative 3-ketoacyl-(acyl-carrier-protein) reductase



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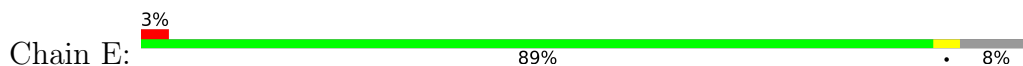
- Molecule 1: Putative 3-ketoacyl-(acyl-carrier-protein) reductase



- Molecule 1: Putative 3-ketoacyl-(acyl-carrier-protein) reductase

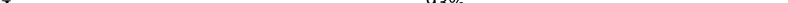


- Molecule 1: Putative 3-ketoacyl-(acyl-carrier-protein) reductase

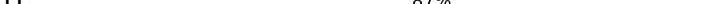


- Molecule 1: Putative 3-ketoacyl-(acyl-carrier-protein) reductase

Category	Count
GLY	1
SER	1
MET	1
PRO	1
R3	1
S4	1
R30	1
D34	1
D125	1
P203	1
A226	1
T227	1
D228	1
T229	1
P230	1
G231	1
A250	1
W253	1
I262	1
V269	1
K276	1

- Chain G:  3% 93%

Amino Acid	Number of mutations
GLY	1
SER	1
MET	1
PRO	1
ARG	1
SER	1
SER	1
SER	1
GLU	1
P8	1
P112	1
M113	1
S155	1
S170	1
K177	1
P203	1
F215	1
W219	1
A226	1
T227	1
ASP	1
THR	1
PRO	1
G231	1
A232	1
W253	1
V269	1
K276	1

- Chain H:  87% • 10%

GLY	SER	MET	PRO	ARG	SER	SER	GLU	G7		R30	D34	S204	W219	LEU	LYS	MET	ALA	ALA	ALA	THR	ASP	THR	PRO	GLY	ALA	MET	MET	GLY	ASN	ALA	MET	PRO	VAL	E240	V241	L242	W253	N275
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4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	64.46Å 70.76Å 125.68Å 97.01° 93.92° 86.91°	Depositor
Resolution (Å)	20.00 – 1.50 20.00 – 1.50	Depositor EDS
% Data completeness (in resolution range)	94.8 (20.00-1.50) 94.8 (20.00-1.50)	Depositor EDS
R_{merge}	0.04	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.54 (at 1.50Å)	Xtriage
Refinement program	REFMAC 5.5.0110	Depositor
R, R_{free}	0.140 , 0.159 0.149 , 0.167	Depositor DCC
R_{free} test set	16842 reflections (4.79%)	wwPDB-VP
Wilson B-factor (Å ²)	13.2	Xtriage
Anisotropy	0.059	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.39 , 47.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	17297	wwPDB-VP
Average B, all atoms (Å ²)	15.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.94% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: NAD, MPD

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	0.89	1/2023 (0.0%)	0.86	0/2759
1	B	0.81	0/1919	0.85	0/2622
1	C	0.86	0/1937	0.86	1/2648 (0.0%)
1	D	0.82	0/2039	0.85	1/2783 (0.0%)
1	E	0.78	0/1877	0.82	0/2565
1	F	0.84	0/2082	0.88	2/2843 (0.1%)
1	G	0.87	0/2004	0.87	0/2736
1	H	0.80	0/1867	0.80	2/2550 (0.1%)
All	All	0.84	1/15748 (0.0%)	0.85	6/21506 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	215	PHE	N-CA	-5.04	1.40	1.46

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	F	30	ARG	NE-CZ-NH2	6.34	124.91	119.20
1	H	7	GLY	CA-C-N	5.13	125.42	119.47
1	H	7	GLY	C-N-CA	5.13	125.42	119.47
1	D	30	ARG	NE-CZ-NH2	5.11	123.80	119.20
1	F	30	ARG	NE-CZ-NH1	-5.10	116.40	121.50
1	C	30	ARG	NE-CZ-NH2	5.03	123.73	119.20

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1971	0	2000	5	0
1	B	1872	0	1897	5	0
1	C	1885	0	1895	4	0
1	D	1981	0	2005	5	0
1	E	1838	0	1846	7	0
1	F	2018	0	2032	7	0
1	G	1953	0	1972	7	0
1	H	1824	0	1846	6	0
2	A	44	0	26	0	0
2	B	44	0	26	0	0
2	C	44	0	26	0	0
2	D	44	0	26	0	0
2	E	44	0	26	0	0
2	F	44	0	26	0	0
2	G	44	0	26	0	0
2	H	44	0	26	1	0
3	B	8	0	14	0	0
3	D	8	0	14	0	0
3	E	8	0	14	0	0
3	F	8	0	14	0	0
3	H	8	0	14	0	0
4	A	234	0	0	1	0
4	B	188	0	0	1	0
4	C	188	0	0	1	0
4	D	179	0	0	1	0
4	E	145	0	0	1	0
4	F	216	0	0	2	0
4	G	245	0	0	1	0
4	H	168	0	0	1	0
All	All	17297	0	15771	39	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 1.

All (39) 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:F:125[B]:ASP:OD1	4:F:1308:HOH:O	1.88	0.90
1:A:125[B]:ASP:OD2	4:A:1393:HOH:O	2.03	0.77
1:H:30:ARG:HD3	4:H:526:HOH:O	1.89	0.71
1:A:113:MET:HE1	1:A:170:SER:HB2	1.80	0.64
1:C:101:LEU:H	1:C:145:GLN:HE22	1.44	0.64
1:A:112:PRO:O	1:A:113:MET:HE2	1.99	0.61
1:F:30:ARG:HD3	4:F:434:HOH:O	2.06	0.55
1:G:112:PRO:O	1:G:113:MET:HE2	2.07	0.55
1:C:30:ARG:HH12	1:C:34:ASP:CG	2.15	0.53
1:D:163[B]:VAL:O	1:D:163[B]:VAL:HG23	2.07	0.53
1:G:113:MET:HE1	1:G:170:SER:HB2	1.91	0.52
1:F:30:ARG:HH12	1:F:34:ASP:CG	2.17	0.52
1:G:8:PRO:HB2	4:G:910:HOH:O	2.11	0.50
1:E:30:ARG:HH12	1:E:34:ASP:CG	2.19	0.49
1:F:253[B]:TRP:CH2	1:F:262[B]:ILE:CD1	2.96	0.48
1:E:73:ARG:NH2	4:E:1547:HOH:O	2.47	0.48
1:B:30:ARG:HD3	4:B:493:HOH:O	2.13	0.48
1:D:30:ARG:HD3	4:D:709:HOH:O	2.14	0.46
1:A:30:ARG:HH12	1:A:34:ASP:CG	2.23	0.45
1:A:253[B]:TRP:CZ2	1:D:250:ALA:HA	2.50	0.45
1:B:30:ARG:HH11	1:B:30:ARG:HG3	1.82	0.44
1:C:30:ARG:HD3	4:C:1103:HOH:O	2.16	0.44
1:G:155:SER:HA	1:G:177:LYS:HD2	2.00	0.44
1:G:203:PRO:HA	1:G:269:VAL:O	2.18	0.44
1:H:30:ARG:HH12	1:H:34:ASP:CG	2.25	0.44
1:E:260:ARG:NE	1:E:261:TYR:CE2	2.86	0.44
1:E:261:TYR:CD2	1:H:242:LEU:HD22	2.53	0.44
1:F:203:PRO:HA	1:F:269:VAL:O	2.18	0.43
1:F:250:ALA:HA	1:G:253[B]:TRP:CZ2	2.54	0.43
1:E:250:ALA:HA	1:H:253[B]:TRP:CZ2	2.55	0.42
1:D:203:PRO:HA	1:D:269:VAL:O	2.19	0.42
1:F:262[A]:ILE:HD11	1:G:269:VAL:HG13	2.01	0.42
1:E:258:GLN:NE2	1:H:30:ARG:HH21	2.17	0.42
1:B:212:ASN:OD1	1:B:217:ARG:NH1	2.50	0.42
1:H:204[A]:SER:O	2:H:300:NAD:H4N	2.20	0.42
1:E:155:SER:HA	1:E:177:LYS:HD2	2.02	0.42
1:B:29[A]:VAL:HG13	1:B:70:ILE:HD11	2.03	0.41
1:B:269:VAL:HG13	1:C:262[A]:ILE:HD11	2.02	0.41
1:D:30:ARG:HH12	1:D:34:ASP:CG	2.30	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	272/278 (98%)	266 (98%)	6 (2%)	0	100	100
1	B	260/278 (94%)	253 (97%)	7 (3%)	0	100	100
1	C	261/278 (94%)	252 (97%)	9 (3%)	0	100	100
1	D	276/278 (99%)	268 (97%)	8 (3%)	0	100	100
1	E	257/278 (92%)	249 (97%)	8 (3%)	0	100	100
1	F	283/278 (102%)	275 (97%)	8 (3%)	0	100	100
1	G	271/278 (98%)	265 (98%)	6 (2%)	0	100	100
1	H	251/278 (90%)	244 (97%)	7 (3%)	0	100	100
All	All	2131/2224 (96%)	2072 (97%)	59 (3%)	0	100	100

There are no Ramachandran outliers to report.

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	202/206 (98%)	202 (100%)	0	100	100
1	B	192/206 (93%)	192 (100%)	0	100	100
1	C	193/206 (94%)	193 (100%)	0	100	100
1	D	202/206 (98%)	201 (100%)	1 (0%)	81	66
1	E	186/206 (90%)	186 (100%)	0	100	100
1	F	207/206 (100%)	207 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	G	199/206 (97%)	199 (100%)	0	100	100
1	H	188/206 (91%)	188 (100%)	0	100	100
All	All	1569/1648 (95%)	1568 (100%)	1 (0%)	88	78

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	113	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	23	GLN
1	B	23	GLN
1	C	23	GLN
1	C	145	GLN
1	C	258	GLN
1	D	23	GLN
1	E	23	GLN
1	E	212	ASN
1	F	23	GLN
1	F	194	GLN
1	G	23	GLN
1	H	23	GLN

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 oligosaccharides in this entry.

5.6 Ligand geometry

13 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	NAD	D	300	-	46,48,48	2.24	15 (32%)	64,73,73	1.88	13 (20%)
3	MPD	B	301	-	7,7,7	0.39	0	9,10,10	0.97	1 (11%)
2	NAD	H	300	-	46,48,48	2.38	13 (28%)	64,73,73	1.89	16 (25%)
2	NAD	F	300	-	46,48,48	2.18	13 (28%)	64,73,73	1.52	11 (17%)
2	NAD	B	300	-	46,48,48	2.42	13 (28%)	64,73,73	1.78	12 (18%)
2	NAD	A	300	-	46,48,48	2.17	14 (30%)	64,73,73	1.53	10 (15%)
3	MPD	E	302	-	7,7,7	0.35	0	9,10,10	0.69	0
2	NAD	G	300	-	46,48,48	2.22	13 (28%)	64,73,73	1.79	15 (23%)
3	MPD	D	302	-	7,7,7	0.38	0	9,10,10	0.59	0
2	NAD	C	300	-	46,48,48	2.38	17 (36%)	64,73,73	1.81	16 (25%)
3	MPD	F	302	-	7,7,7	0.38	0	9,10,10	0.69	0
2	NAD	E	300	-	46,48,48	2.62	14 (30%)	64,73,73	1.82	19 (29%)
3	MPD	H	301	-	7,7,7	0.41	0	9,10,10	0.93	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	NAD	D	300	-	-	7/30/62/62	0/5/5/5
3	MPD	B	301	-	1/1/2/2	3/5/5/5	-
2	NAD	H	300	-	-	8/30/62/62	0/5/5/5
2	NAD	F	300	-	-	8/30/62/62	0/5/5/5
2	NAD	B	300	-	-	7/30/62/62	0/5/5/5
2	NAD	A	300	-	-	8/30/62/62	0/5/5/5
3	MPD	E	302	-	1/1/2/2	1/5/5/5	-
2	NAD	G	300	-	-	8/30/62/62	0/5/5/5

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	MPD	D	302	-	-	0/5/5/5	-
2	NAD	C	300	-	-	7/30/62/62	0/5/5/5
3	MPD	F	302	-	-	0/5/5/5	-
2	NAD	E	300	-	-	8/30/62/62	0/5/5/5
3	MPD	H	301	-	-	1/5/5/5	-

All (112) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	300	NAD	C2N-N1N	9.50	1.45	1.35
2	E	300	NAD	C2N-N1N	9.29	1.45	1.35
2	H	300	NAD	C2N-N1N	9.06	1.44	1.35
2	A	300	NAD	C2N-N1N	8.32	1.44	1.35
2	C	300	NAD	C2N-N1N	8.30	1.44	1.35
2	F	300	NAD	C2N-N1N	7.37	1.43	1.35
2	G	300	NAD	C2N-N1N	6.95	1.42	1.35
2	D	300	NAD	C2N-N1N	6.41	1.42	1.35
2	E	300	NAD	PA-O3	6.15	1.66	1.59
2	E	300	NAD	C7N-N7N	5.90	1.43	1.33
2	C	300	NAD	PA-O3	5.37	1.65	1.59
2	B	300	NAD	PA-O3	5.25	1.65	1.59
2	D	300	NAD	C2A-N1A	5.17	1.43	1.33
2	E	300	NAD	C2A-N1A	5.09	1.43	1.33
2	G	300	NAD	C2A-N1A	5.06	1.42	1.33
2	H	300	NAD	C7N-N7N	5.00	1.42	1.33
2	B	300	NAD	C2A-N1A	4.98	1.42	1.33
2	D	300	NAD	C7N-N7N	4.93	1.42	1.33
2	F	300	NAD	PA-O3	4.79	1.64	1.59
2	G	300	NAD	C7N-N7N	4.76	1.41	1.33
2	F	300	NAD	C4N-C3N	4.71	1.46	1.39
2	C	300	NAD	C7N-N7N	4.44	1.41	1.33
2	H	300	NAD	C2A-N1A	4.43	1.41	1.33
2	F	300	NAD	C2A-N1A	4.42	1.41	1.33
2	G	300	NAD	PA-O3	4.37	1.64	1.59
2	A	300	NAD	C2A-N1A	4.34	1.41	1.33
2	A	300	NAD	C7N-N7N	4.28	1.40	1.33
2	H	300	NAD	PA-O3	4.23	1.64	1.59
2	B	300	NAD	C7N-N7N	4.21	1.40	1.33
2	F	300	NAD	C6A-N6A	4.08	1.44	1.34
2	H	300	NAD	C5N-C4N	4.03	1.45	1.38
2	D	300	NAD	PA-O3	4.01	1.63	1.59
2	E	300	NAD	C6N-C5N	3.80	1.46	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	G	300	NAD	C4N-C3N	3.74	1.45	1.39
2	B	300	NAD	C5N-C4N	3.74	1.45	1.38
2	D	300	NAD	C6A-N6A	3.68	1.43	1.34
2	G	300	NAD	C5N-C4N	3.60	1.45	1.38
2	E	300	NAD	C6A-N6A	3.57	1.43	1.34
2	H	300	NAD	C6N-C5N	3.53	1.46	1.38
2	C	300	NAD	C4N-C3N	3.50	1.44	1.39
2	C	300	NAD	O7N-C7N	-3.50	1.17	1.24
2	C	300	NAD	C8A-N7A	3.49	1.38	1.31
2	B	300	NAD	C6N-C5N	3.49	1.45	1.38
2	E	300	NAD	C8A-N7A	3.44	1.38	1.31
2	C	300	NAD	C2A-N1A	3.33	1.39	1.33
2	A	300	NAD	PA-O3	3.27	1.63	1.59
2	A	300	NAD	O4D-C1D	3.26	1.45	1.40
2	D	300	NAD	C4N-C3N	3.21	1.44	1.39
2	C	300	NAD	C4A-N3A	3.20	1.40	1.34
2	D	300	NAD	C8A-N7A	3.19	1.37	1.31
2	C	300	NAD	C2D-C3D	-3.18	1.44	1.53
2	D	300	NAD	O4B-C1B	3.16	1.49	1.42
2	C	300	NAD	C6N-C5N	3.13	1.45	1.38
2	D	300	NAD	C6N-C5N	3.11	1.45	1.38
2	G	300	NAD	C6N-C5N	3.09	1.45	1.38
2	A	300	NAD	C4N-C3N	3.09	1.44	1.39
2	F	300	NAD	C7N-N7N	3.07	1.38	1.33
2	H	300	NAD	C6A-N6A	3.07	1.42	1.34
2	G	300	NAD	C6A-N6A	3.03	1.42	1.34
2	C	300	NAD	C8A-N9A	2.98	1.42	1.37
2	H	300	NAD	C4N-C3N	2.98	1.43	1.39
2	G	300	NAD	C4A-N3A	2.96	1.39	1.34
2	E	300	NAD	O4B-C1B	2.93	1.48	1.42
2	B	300	NAD	C6A-N6A	2.91	1.41	1.34
2	H	300	NAD	O4B-C1B	2.90	1.48	1.42
2	F	300	NAD	C5N-C4N	2.90	1.43	1.38
2	A	300	NAD	C8A-N7A	2.87	1.37	1.31
2	B	300	NAD	O7N-C7N	-2.85	1.18	1.24
2	D	300	NAD	O4B-C4B	-2.85	1.38	1.45
2	C	300	NAD	C6A-N6A	2.84	1.41	1.34
2	F	300	NAD	C2N-C3N	2.84	1.43	1.39
2	B	300	NAD	C4N-C3N	2.83	1.43	1.39
2	D	300	NAD	O4D-C1D	2.75	1.44	1.40
2	G	300	NAD	O4D-C1D	2.74	1.44	1.40
2	E	300	NAD	C4N-C3N	2.73	1.43	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	H	300	NAD	C2D-C3D	-2.72	1.46	1.53
2	D	300	NAD	C4A-N3A	2.72	1.39	1.34
2	E	300	NAD	C2N-C3N	2.72	1.43	1.39
2	E	300	NAD	C4A-N3A	2.69	1.39	1.34
2	A	300	NAD	PN-O3	2.67	1.62	1.59
2	F	300	NAD	C8A-N7A	2.67	1.36	1.31
2	G	300	NAD	C8A-N7A	2.66	1.36	1.31
2	E	300	NAD	O7N-C7N	-2.65	1.19	1.24
2	B	300	NAD	C8A-N7A	2.62	1.36	1.31
2	C	300	NAD	PN-O3	2.58	1.62	1.59
2	G	300	NAD	C2B-C3B	-2.56	1.46	1.53
2	A	300	NAD	C6A-N6A	2.56	1.40	1.34
2	H	300	NAD	C8A-N7A	2.52	1.36	1.31
2	B	300	NAD	C4A-N3A	2.47	1.39	1.34
2	D	300	NAD	C5N-C4N	2.46	1.43	1.38
2	C	300	NAD	C5N-C4N	2.46	1.43	1.38
2	F	300	NAD	C4A-N3A	2.45	1.39	1.34
2	A	300	NAD	O4B-C1B	2.44	1.47	1.42
2	A	300	NAD	C2D-C3D	-2.41	1.46	1.53
2	C	300	NAD	O4B-C1B	2.40	1.47	1.42
2	B	300	NAD	C2N-C3N	2.35	1.42	1.39
2	G	300	NAD	C2N-C3N	2.35	1.42	1.39
2	E	300	NAD	C5N-C4N	2.33	1.42	1.38
2	F	300	NAD	C6N-C5N	2.29	1.43	1.38
2	A	300	NAD	C4A-N3A	2.28	1.38	1.34
2	E	300	NAD	PN-O3	2.26	1.61	1.59
2	A	300	NAD	C5N-C4N	2.25	1.42	1.38
2	C	300	NAD	C2N-C3N	2.22	1.42	1.39
2	C	300	NAD	C6N-N1N	2.17	1.40	1.35
2	D	300	NAD	C2N-C3N	2.07	1.42	1.39
2	H	300	NAD	O4D-C4D	2.06	1.49	1.45
2	A	300	NAD	C6N-C5N	2.06	1.42	1.38
2	H	300	NAD	C4A-N3A	2.04	1.38	1.34
2	F	300	NAD	C6N-N1N	2.04	1.40	1.35
2	F	300	NAD	O4B-C1B	2.04	1.46	1.42
2	D	300	NAD	C2B-C3B	-2.02	1.47	1.53
2	B	300	NAD	C2A-N3A	2.00	1.37	1.33

All (113) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	300	NAD	C4D-O4D-C1D	-8.75	101.91	109.92

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	G	300	NAD	C4D-O4D-C1D	-7.22	103.32	109.92
2	H	300	NAD	C4D-O4D-C1D	-5.57	104.83	109.92
2	B	300	NAD	C4D-O4D-C1D	-5.54	104.85	109.92
2	C	300	NAD	C5N-C4N-C3N	-5.23	115.22	120.36
2	B	300	NAD	N3A-C2A-N1A	-5.10	120.86	128.58
2	A	300	NAD	C2N-C3N-C4N	5.00	124.08	118.26
2	E	300	NAD	C2B-C1B-N9A	4.77	125.17	113.30
2	H	300	NAD	C5N-C4N-C3N	-4.77	115.68	120.36
2	G	300	NAD	C5N-C4N-C3N	-4.72	115.72	120.36
2	E	300	NAD	N3A-C2A-N1A	-4.68	121.50	128.58
2	A	300	NAD	C5N-C4N-C3N	-4.64	115.81	120.36
2	B	300	NAD	C5N-C4N-C3N	-4.49	115.95	120.36
2	C	300	NAD	C4D-O4D-C1D	-4.46	105.84	109.92
2	C	300	NAD	N3A-C2A-N1A	-4.31	122.06	128.58
2	D	300	NAD	C2B-C1B-N9A	4.30	123.98	113.30
2	F	300	NAD	C4D-O4D-C1D	-4.23	106.05	109.92
2	F	300	NAD	C2B-C1B-N9A	4.16	123.65	113.30
2	H	300	NAD	N3A-C2A-N1A	-4.08	122.40	128.58
2	G	300	NAD	C2B-C1B-N9A	3.99	123.21	113.30
2	C	300	NAD	N9A-C8A-N7A	-3.96	108.31	113.94
2	E	300	NAD	O2B-C2B-C3B	3.94	124.44	111.82
2	H	300	NAD	C2B-C1B-N9A	3.89	122.97	113.30
2	E	300	NAD	N9A-C8A-N7A	-3.87	108.44	113.94
2	C	300	NAD	C2N-C3N-C4N	3.85	122.73	118.26
2	H	300	NAD	O3B-C3B-C4B	3.74	121.82	111.08
2	F	300	NAD	N3A-C2A-N1A	-3.71	122.96	128.58
2	B	300	NAD	C6N-N1N-C2N	-3.70	118.73	121.88
2	C	300	NAD	C6N-N1N-C2N	-3.59	118.82	121.88
2	B	300	NAD	C2N-C3N-C4N	3.51	122.34	118.26
2	H	300	NAD	N9A-C8A-N7A	-3.46	109.03	113.94
2	D	300	NAD	N3A-C2A-N1A	-3.42	123.41	128.58
2	D	300	NAD	C2N-C3N-C4N	3.39	122.20	118.26
2	C	300	NAD	C2B-C1B-N9A	3.28	121.45	113.30
2	G	300	NAD	C2N-C3N-C4N	3.26	122.05	118.26
2	B	300	NAD	C2B-C1B-N9A	3.25	121.37	113.30
2	A	300	NAD	C2B-C1B-N9A	3.20	121.25	113.30
2	G	300	NAD	N3A-C2A-N1A	-3.20	123.74	128.58
2	E	300	NAD	C2N-C3N-C4N	3.15	121.92	118.26
2	A	300	NAD	O2B-C2B-C3B	3.13	121.85	111.82
2	F	300	NAD	C5N-C4N-C3N	-3.06	117.35	120.36
2	E	300	NAD	O2N-PN-O3	3.06	115.55	107.27
2	D	300	NAD	O3B-C3B-C4B	3.02	119.76	111.08

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	H	300	NAD	C2N-C3N-C4N	3.01	121.76	118.26
2	H	300	NAD	C6N-N1N-C2N	-2.93	119.39	121.88
2	B	300	NAD	O2B-C2B-C3B	2.92	121.19	111.82
2	C	300	NAD	C5A-C4A-N3A	-2.92	122.70	126.72
2	D	300	NAD	C5N-C4N-C3N	-2.89	117.53	120.36
2	G	300	NAD	O3B-C3B-C4B	2.88	119.37	111.08
2	E	300	NAD	O3B-C3B-C4B	2.88	119.34	111.08
2	H	300	NAD	O2B-C2B-C3B	2.85	120.95	111.82
2	D	300	NAD	O2B-C2B-C3B	2.75	120.62	111.82
2	H	300	NAD	O2N-PN-O3	2.73	114.67	107.27
2	G	300	NAD	O4B-C1B-C2B	-2.73	100.77	106.62
2	B	300	NAD	O3B-C3B-C4B	2.73	118.92	111.08
2	C	300	NAD	O3B-C3B-C4B	2.68	118.79	111.08
2	D	300	NAD	O4B-C4B-C3B	2.65	110.42	105.15
2	G	300	NAD	O2B-C2B-C3B	2.64	120.27	111.82
2	A	300	NAD	N3A-C2A-N1A	-2.63	124.61	128.58
2	C	300	NAD	O2B-C2B-C3B	2.62	120.22	111.82
2	F	300	NAD	C5A-C4A-N9A	2.60	108.65	105.81
2	B	300	NAD	C5A-C4A-N3A	-2.59	123.16	126.72
2	B	300	NAD	O2N-PN-O3	2.55	114.17	107.27
2	D	300	NAD	N9A-C8A-N7A	-2.55	110.31	113.94
2	A	300	NAD	O3B-C3B-C4B	2.54	118.37	111.08
2	H	300	NAD	C4A-N9A-C8A	2.51	108.37	105.74
2	F	300	NAD	C4A-C5A-N7A	-2.50	107.72	110.58
2	E	300	NAD	C4A-N9A-C8A	2.47	108.33	105.74
2	E	300	NAD	C4D-O4D-C1D	-2.47	107.67	109.92
2	G	300	NAD	C5A-C4A-N3A	-2.46	123.32	126.72
2	F	300	NAD	O2N-PN-O3	2.45	113.89	107.27
2	E	300	NAD	C2N-N1N-C1D	-2.44	113.76	119.13
2	G	300	NAD	C5A-C4A-N9A	2.41	108.44	105.81
2	G	300	NAD	N9A-C8A-N7A	-2.41	110.52	113.94
2	C	300	NAD	O2N-PN-O3	2.38	113.72	107.27
2	E	300	NAD	C5A-N7A-C8A	2.38	107.19	103.45
2	H	300	NAD	C5A-C4A-N3A	-2.37	123.45	126.72
2	C	300	NAD	O3-PA-O1A	-2.33	103.69	110.70
2	C	300	NAD	C5D-C4D-C3D	2.33	123.60	115.21
2	F	300	NAD	O2B-C2B-C3B	2.31	119.21	111.82
2	E	300	NAD	O3-PA-O1A	-2.30	103.78	110.70
2	F	300	NAD	C2N-C3N-C4N	2.27	120.89	118.26
2	H	300	NAD	C5A-N7A-C8A	2.26	107.00	103.45
2	A	300	NAD	C4D-O4D-C1D	-2.26	107.86	109.92
2	D	300	NAD	O2N-PN-O3	2.25	113.36	107.27

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	300	NAD	C4A-N9A-C8A	2.23	108.08	105.74
2	F	300	NAD	C5A-C4A-N3A	-2.23	123.65	126.72
2	E	300	NAD	O3-PN-O1N	-2.22	104.03	110.70
2	E	300	NAD	C5N-C4N-C3N	-2.22	118.19	120.36
2	D	300	NAD	O4B-C1B-C2B	-2.21	101.88	106.62
2	E	300	NAD	C2A-N1A-C6A	2.20	122.35	118.73
2	G	300	NAD	C6N-N1N-C2N	-2.20	120.01	121.88
2	B	300	NAD	C2A-N3A-C4A	2.19	117.19	111.83
2	H	300	NAD	C6N-C5N-C4N	2.19	122.61	119.45
2	H	300	NAD	O3B-C3B-C2B	2.19	118.83	111.82
2	E	300	NAD	N6A-C6A-N1A	2.18	123.23	118.38
2	H	300	NAD	O3-PA-O1A	-2.18	104.15	110.70
2	D	300	NAD	C6N-N1N-C2N	-2.17	120.03	121.88
2	G	300	NAD	O2N-PN-O3	2.15	113.08	107.27
2	E	300	NAD	C6N-N1N-C1D	2.13	123.91	119.73
2	D	300	NAD	O7N-C7N-C3N	2.12	122.19	119.60
2	E	300	NAD	O4B-C1B-N9A	-2.11	104.03	108.09
2	C	300	NAD	C6N-N1N-C1D	2.10	123.84	119.73
2	F	300	NAD	C2A-N1A-C6A	2.09	122.17	118.73
2	G	300	NAD	O3-PN-O1N	-2.09	104.42	110.70
2	A	300	NAD	C5A-C4A-N3A	-2.09	123.84	126.72
2	C	300	NAD	C6N-C5N-C4N	2.07	122.44	119.45
2	E	300	NAD	O4B-C4B-C5B	2.07	115.95	109.33
2	A	300	NAD	N9A-C8A-N7A	-2.06	111.01	113.94
2	B	300	NAD	O4B-C4B-C5B	2.05	115.92	109.33
2	A	300	NAD	O4B-C4B-C3B	2.02	109.16	105.15
3	B	301	MPD	O2-C2-C3	2.02	116.82	109.27
2	G	300	NAD	C3B-C2B-C1B	2.00	105.25	101.46

All (2) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
3	B	301	MPD	C4
3	E	302	MPD	C4

All (66) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	300	NAD	C5D-O5D-PN-O3
2	A	300	NAD	O4D-C1D-N1N-C2N
2	A	300	NAD	O4D-C1D-N1N-C6N
2	B	300	NAD	C5D-O5D-PN-O3

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Mol	Chain	Res	Type	Atoms
2	B	300	NAD	O4D-C1D-N1N-C2N
2	B	300	NAD	O4D-C1D-N1N-C6N
2	C	300	NAD	C5D-O5D-PN-O3
2	C	300	NAD	O4D-C1D-N1N-C2N
2	C	300	NAD	O4D-C1D-N1N-C6N
2	D	300	NAD	C5D-O5D-PN-O3
2	D	300	NAD	O4D-C1D-N1N-C2N
2	D	300	NAD	O4D-C1D-N1N-C6N
2	E	300	NAD	C5D-O5D-PN-O3
2	E	300	NAD	O4D-C1D-N1N-C2N
2	E	300	NAD	O4D-C1D-N1N-C6N
2	F	300	NAD	C5D-O5D-PN-O3
2	F	300	NAD	O4D-C1D-N1N-C2N
2	F	300	NAD	O4D-C1D-N1N-C6N
2	G	300	NAD	C5D-O5D-PN-O3
2	G	300	NAD	O4D-C1D-N1N-C2N
2	G	300	NAD	O4D-C1D-N1N-C6N
2	H	300	NAD	C5D-O5D-PN-O3
2	H	300	NAD	O4D-C1D-N1N-C2N
2	H	300	NAD	O4D-C1D-N1N-C6N
2	A	300	NAD	PA-O3-PN-O1N
2	B	300	NAD	PA-O3-PN-O1N
2	C	300	NAD	PA-O3-PN-O1N
2	D	300	NAD	PA-O3-PN-O1N
2	E	300	NAD	PA-O3-PN-O1N
2	A	300	NAD	PN-O3-PA-O5B
2	B	300	NAD	PN-O3-PA-O5B
2	C	300	NAD	PN-O3-PA-O5B
2	D	300	NAD	PN-O3-PA-O5B
2	E	300	NAD	PN-O3-PA-O5B
2	F	300	NAD	PN-O3-PA-O5B
2	G	300	NAD	PN-O3-PA-O5B
2	H	300	NAD	PN-O3-PA-O5B
2	G	300	NAD	PA-O3-PN-O1N
3	B	301	MPD	C1-C2-C3-C4
3	B	301	MPD	CM-C2-C3-C4
2	A	300	NAD	C5D-O5D-PN-O1N
2	B	300	NAD	C5D-O5D-PN-O1N
2	C	300	NAD	C5D-O5D-PN-O1N
2	D	300	NAD	C5D-O5D-PN-O1N
2	E	300	NAD	C5D-O5D-PN-O1N
2	F	300	NAD	C5D-O5D-PN-O1N

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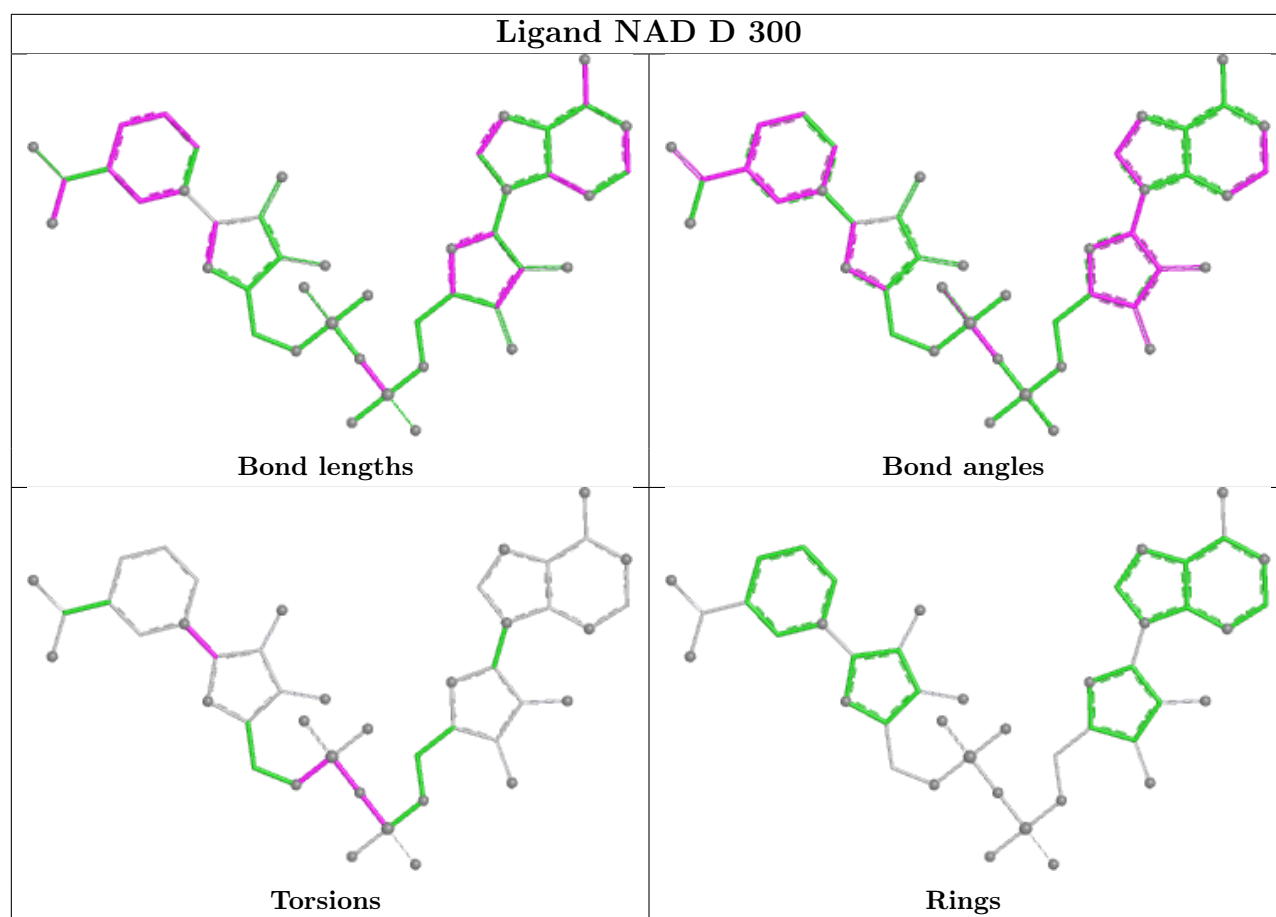
Mol	Chain	Res	Type	Atoms
2	G	300	NAD	C5D-O5D-PN-O1N
2	H	300	NAD	C5D-O5D-PN-O1N
2	F	300	NAD	PA-O3-PN-O1N
2	H	300	NAD	PA-O3-PN-O1N
2	E	300	NAD	C2B-C1B-N9A-C8A
2	E	300	NAD	PA-O3-PN-O2N
2	H	300	NAD	PA-O3-PN-O2N
2	A	300	NAD	PA-O3-PN-O2N
2	B	300	NAD	PA-O3-PN-O2N
2	C	300	NAD	PA-O3-PN-O2N
2	D	300	NAD	PA-O3-PN-O2N
2	G	300	NAD	PA-O3-PN-O2N
2	G	300	NAD	O4B-C4B-C5B-O5B
2	H	300	NAD	O4B-C4B-C5B-O5B
3	B	301	MPD	C2-C3-C4-O4
3	E	302	MPD	CM-C2-C3-C4
3	H	301	MPD	C1-C2-C3-C4
2	F	300	NAD	PA-O3-PN-O2N
2	A	300	NAD	O4B-C4B-C5B-O5B
2	F	300	NAD	O4B-C4B-C5B-O5B

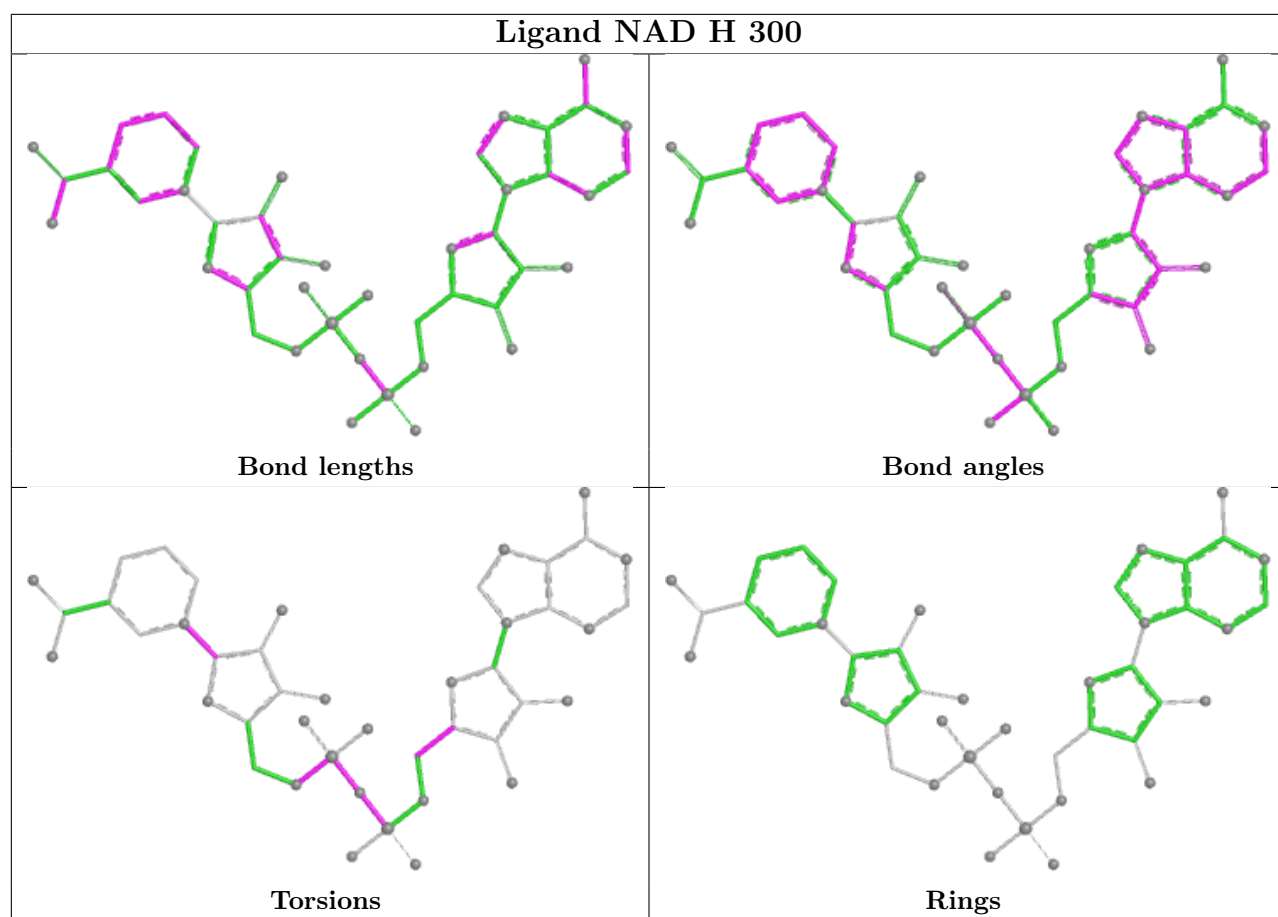
There are no ring outliers.

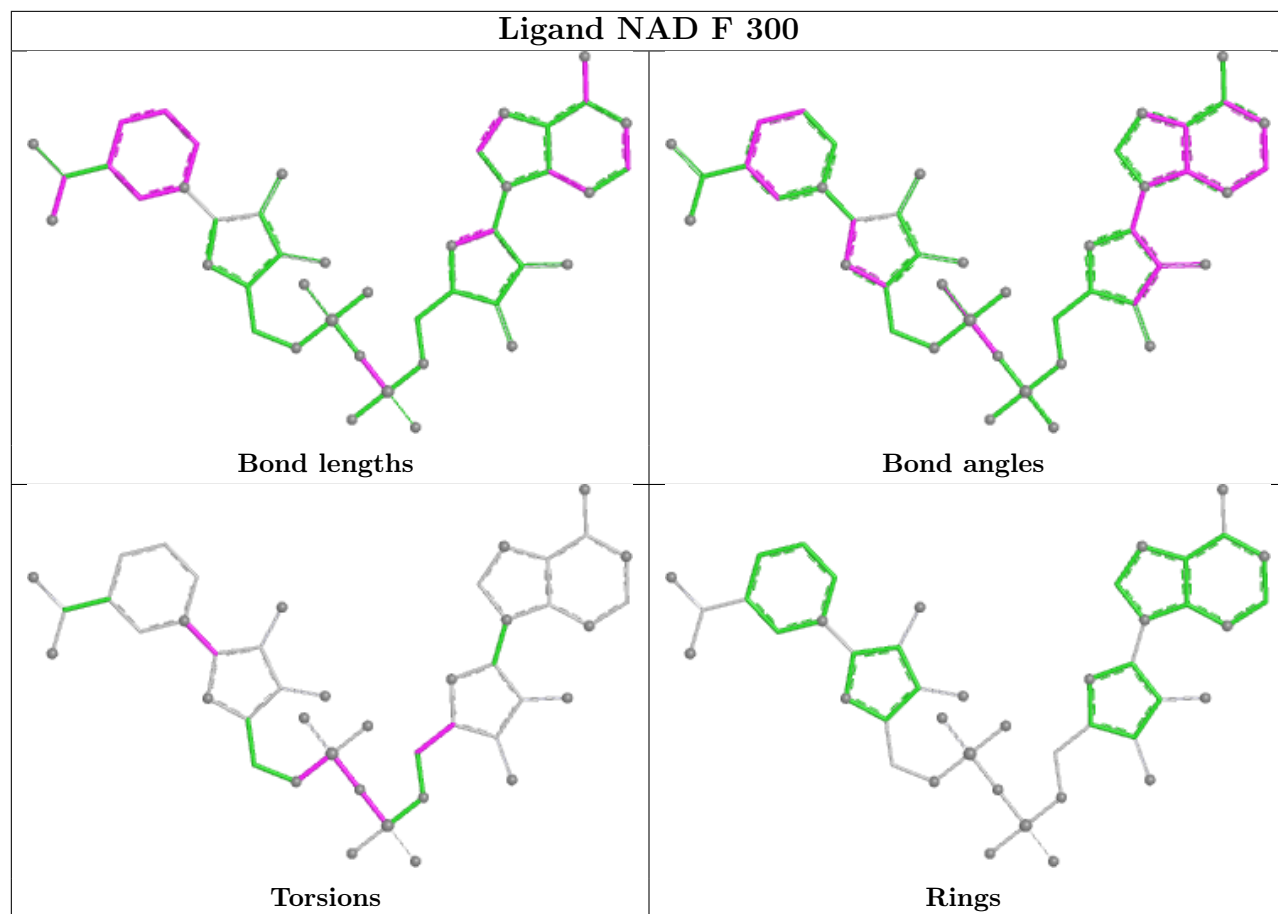
1 monomer is involved in 1 short contact:

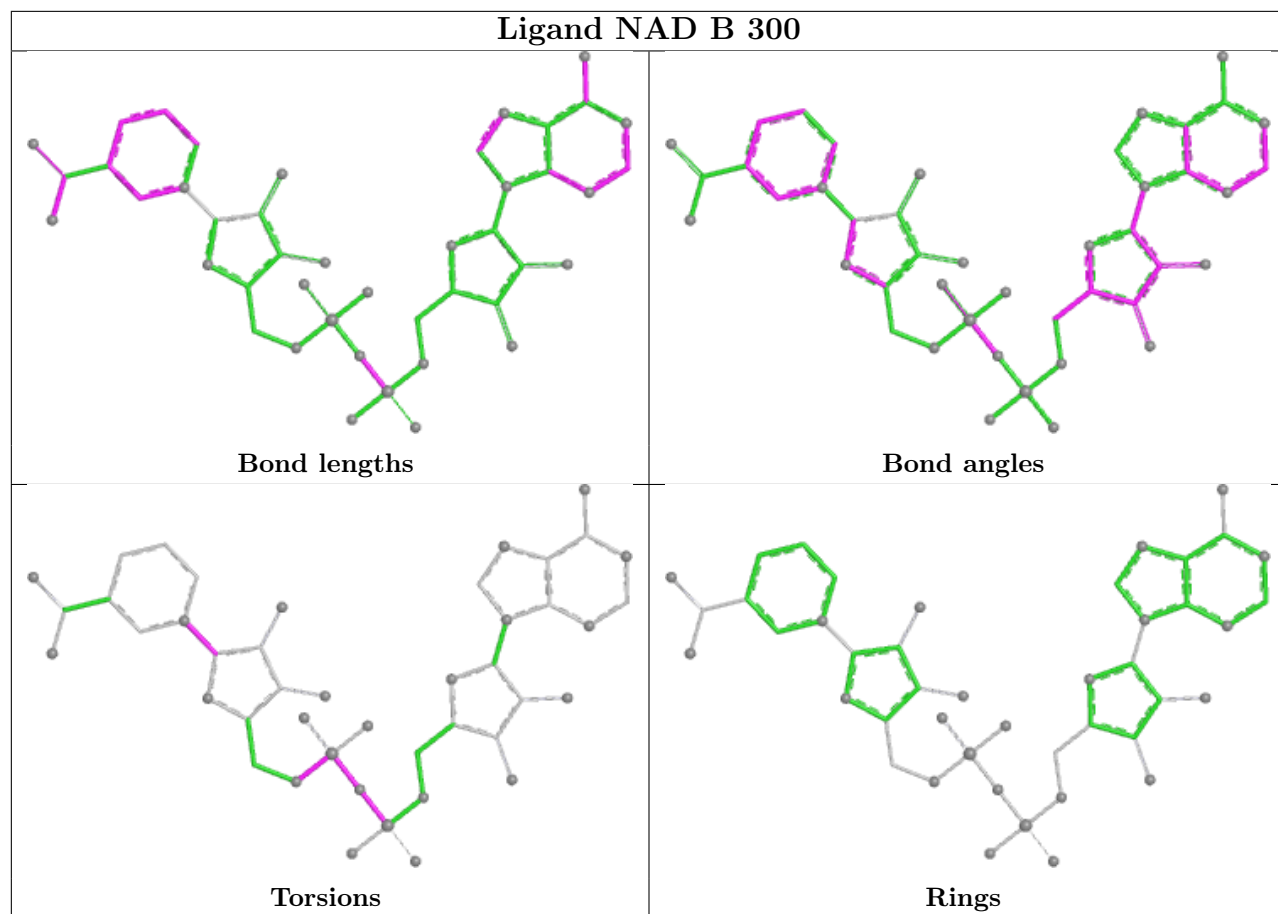
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	H	300	NAD	1	0

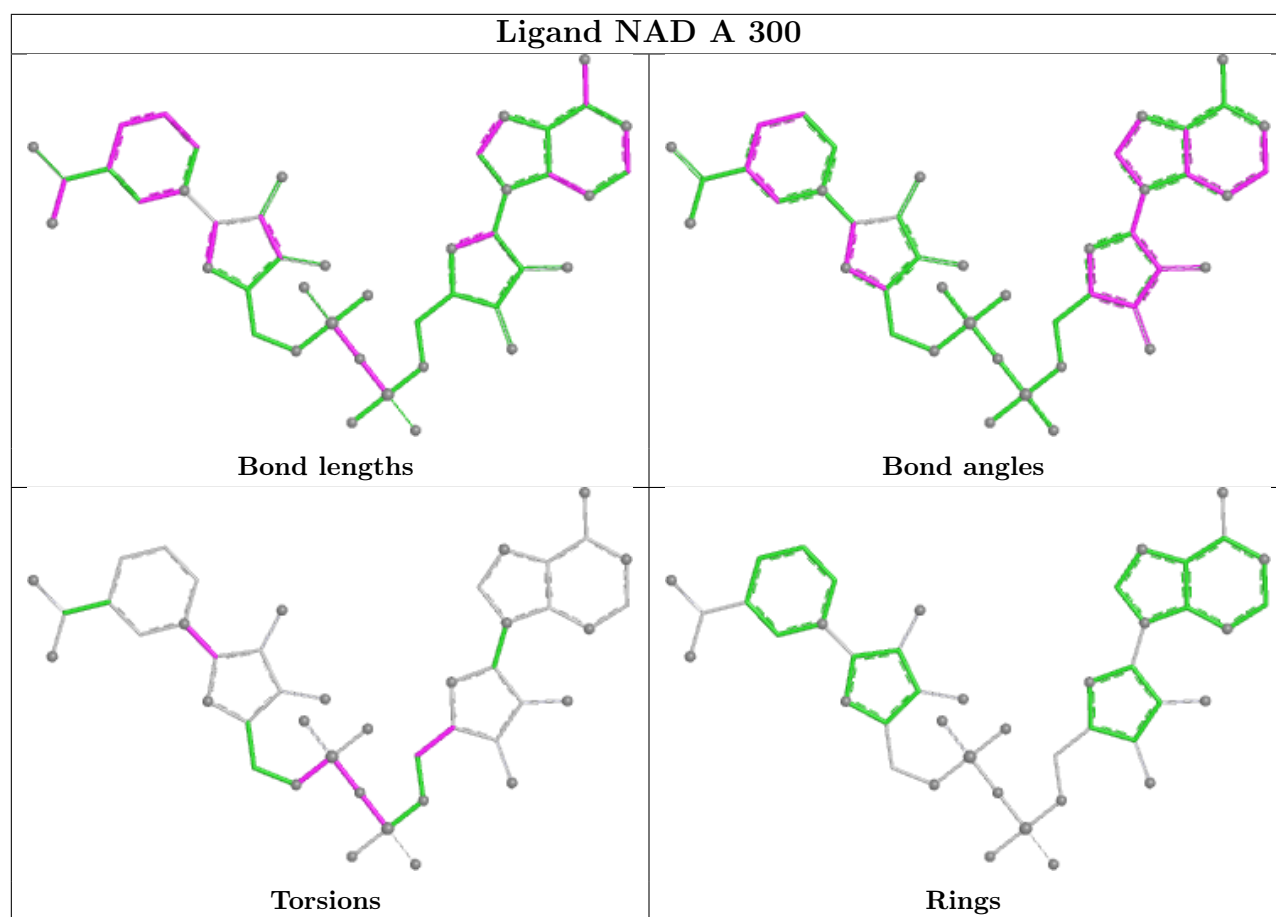
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less 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.

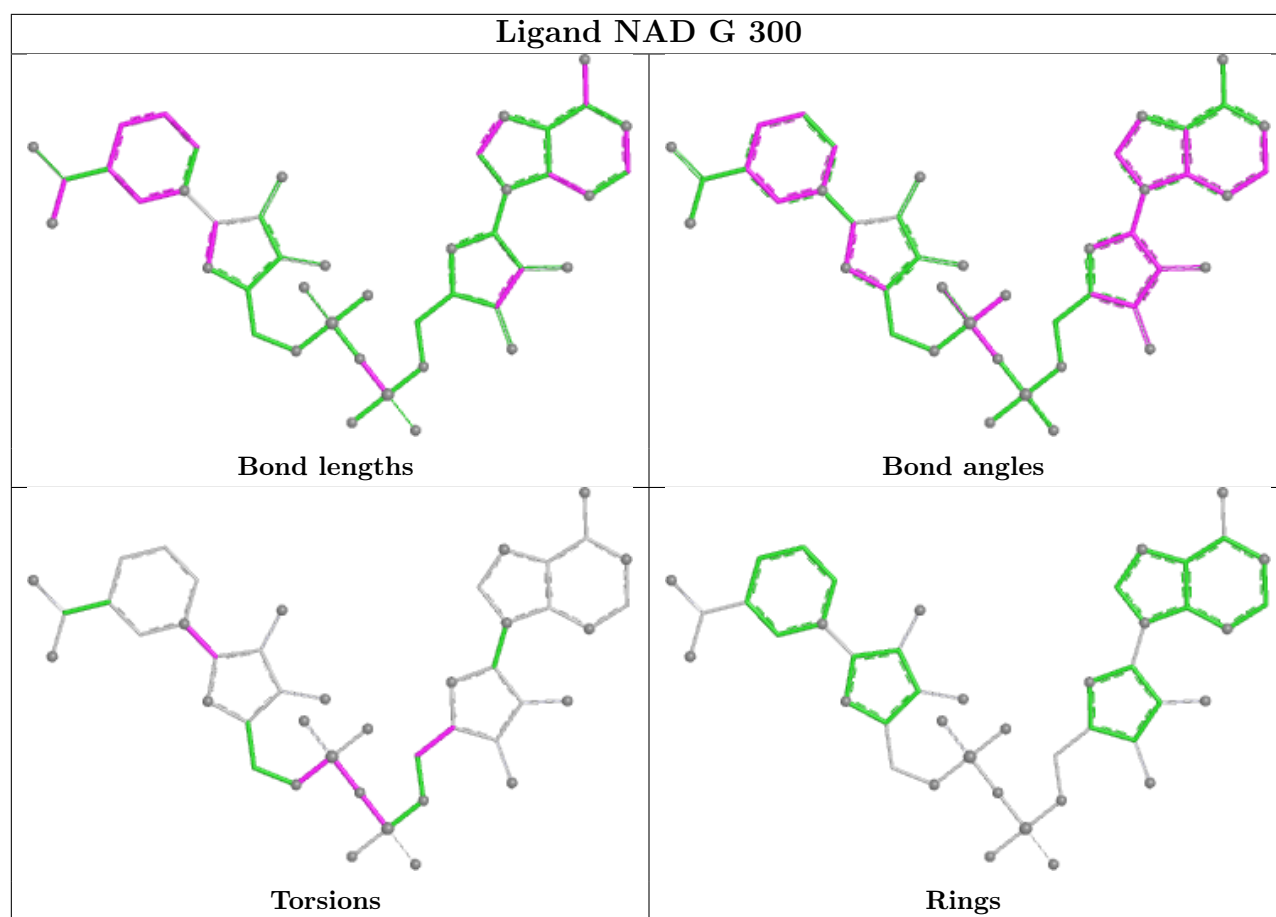


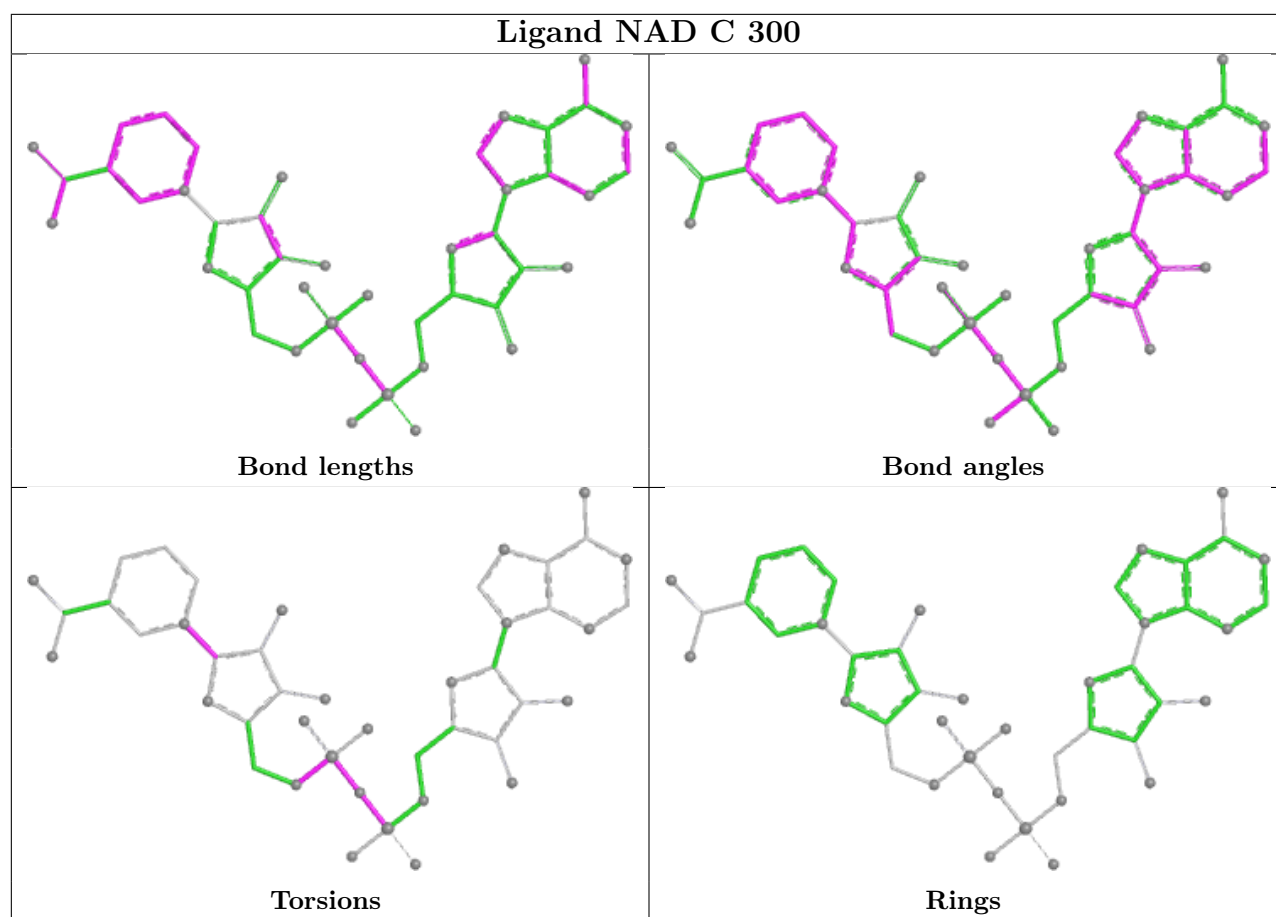


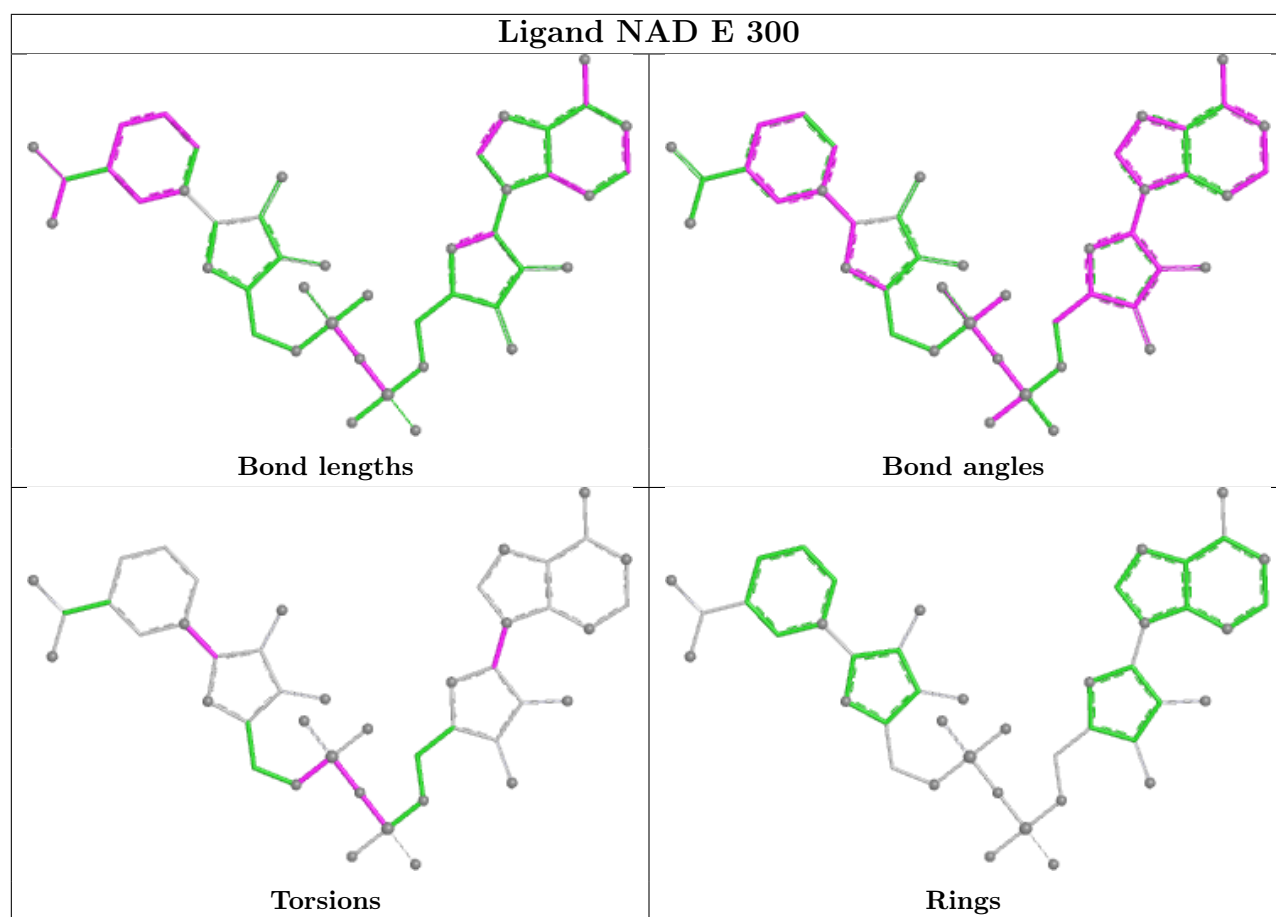












5.7 Other polymers [i](#)

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	268/278 (96%)	-0.46	5 (1%) 66 70	5, 11, 24, 45	8 (2%)
1	B	257/278 (92%)	-0.33	8 (3%) 51 55	5, 14, 27, 48	7 (2%)
1	C	257/278 (92%)	-0.42	3 (1%) 76 80	5, 13, 23, 42	8 (3%)
1	D	269/278 (96%)	-0.44	4 (1%) 72 75	5, 13, 26, 47	11 (4%)
1	E	256/278 (92%)	-0.09	7 (2%) 56 60	5, 18, 32, 46	5 (1%)
1	F	274/278 (98%)	-0.50	7 (2%) 57 61	4, 11, 23, 45	11 (4%)
1	G	267/278 (96%)	-0.50	7 (2%) 57 61	5, 11, 24, 40	8 (2%)
1	H	249/278 (89%)	-0.36	1 (0%) 88 90	6, 15, 25, 41	6 (2%)
All	All	2097/2224 (94%)	-0.39	42 (2%) 65 68	4, 13, 27, 48	64 (3%)

All (42) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	H	219	TRP	9.4
1	E	219	TRP	5.1
1	G	219	TRP	5.0
1	B	220	LEU	4.1
1	B	234	GLY	3.9
1	C	220	LEU	3.7
1	E	236	ALA	3.6
1	F	228	ASP	3.5
1	D	228	ASP	3.4
1	F	229	THR	3.4
1	A	219	TRP	3.4
1	B	276	LYS	3.1
1	C	219	TRP	3.0
1	G	215	PHE	3.0
1	A	228	ASP	2.9
1	G	226	ALA	2.8

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Mol	Chain	Res	Type	RSRZ
1	F	4	SER	2.8
1	F	230	PRO	2.8
1	D	229	THR	2.8
1	G	227	THR	2.6
1	D	231	GLY	2.5
1	B	241	VAL	2.5
1	B	236	ALA	2.5
1	G	232	ALA	2.5
1	A	215	PHE	2.5
1	E	212	ASN	2.5
1	F	3	ARG	2.5
1	C	234	GLY	2.4
1	E	276	LYS	2.4
1	F	226	ALA	2.3
1	A	227	THR	2.3
1	G	8	PRO	2.2
1	G	231	GLY	2.2
1	A	231	GLY	2.2
1	B	219	TRP	2.2
1	F	231	GLY	2.2
1	D	232	ALA	2.1
1	E	238	PRO	2.1
1	E	217	ARG	2.1
1	B	238	PRO	2.1
1	B	235	ASN	2.1
1	E	234	GLY	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](#)

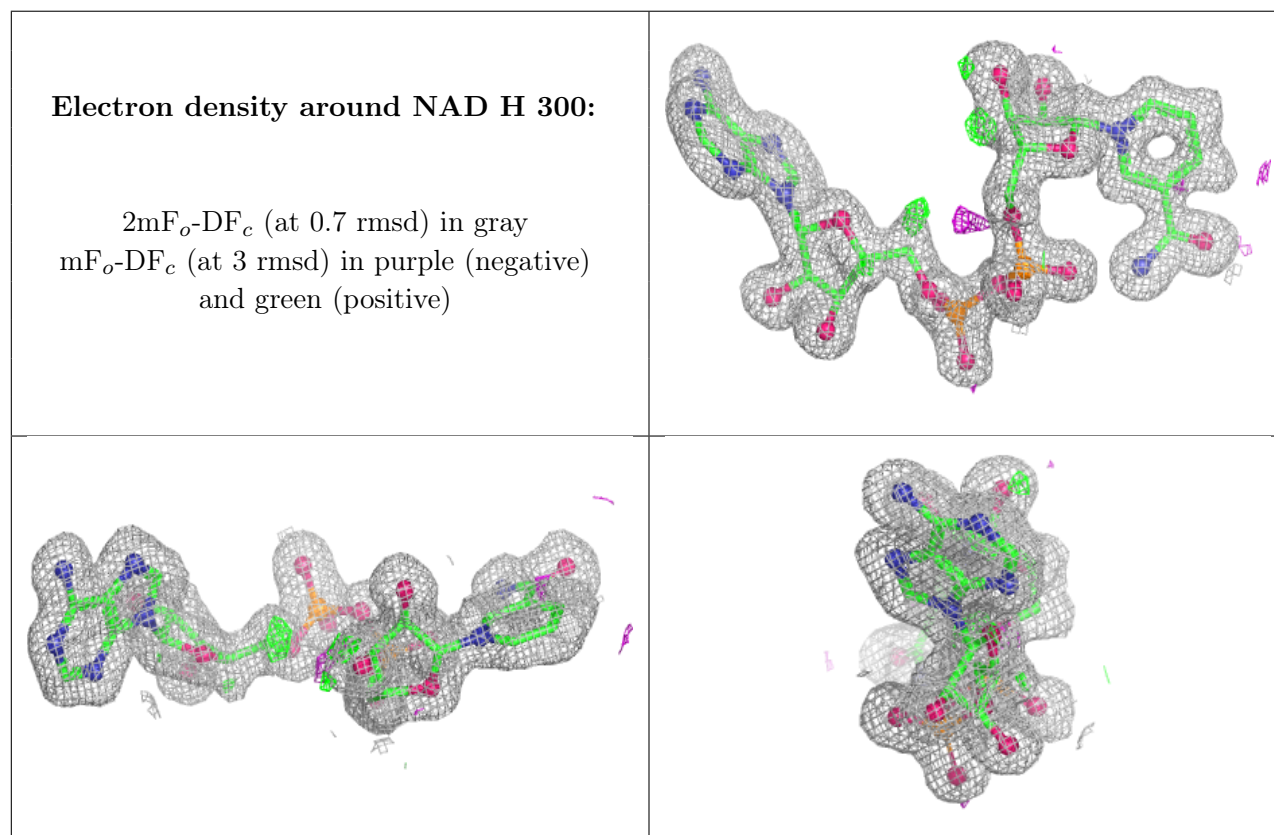
There are no oligosaccharides in this entry.

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.

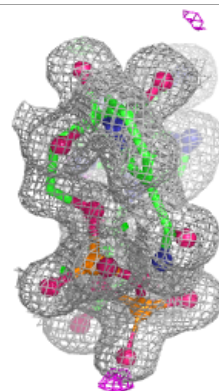
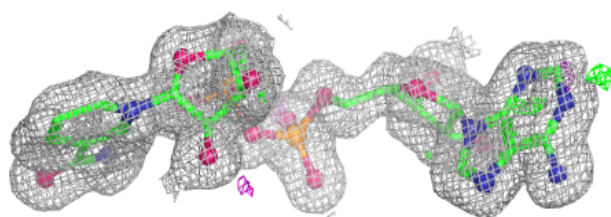
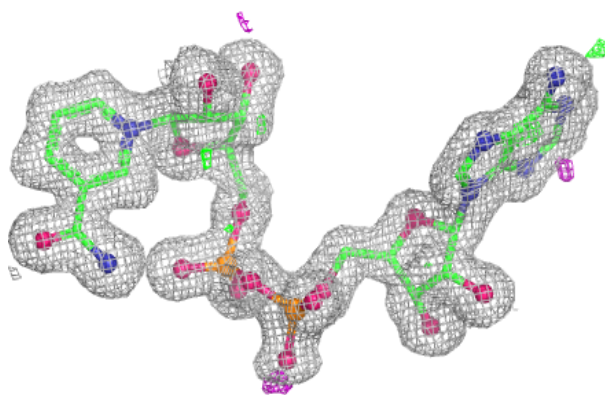
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
3	MPD	B	301	8/8	0.89	0.11	18,24,27,27	0
3	MPD	E	302	8/8	0.90	0.10	15,23,25,27	0
3	MPD	H	301	8/8	0.92	0.11	19,25,26,27	0
3	MPD	D	302	8/8	0.95	0.08	13,16,17,19	0
3	MPD	F	302	8/8	0.96	0.06	14,15,17,19	0
2	NAD	H	300	44/44	0.98	0.04	7,10,12,14	0
2	NAD	B	300	44/44	0.98	0.04	7,10,12,12	0
2	NAD	E	300	44/44	0.98	0.05	12,14,18,20	0
2	NAD	D	300	44/44	0.99	0.04	6,9,11,12	0
2	NAD	A	300	44/44	0.99	0.03	5,7,8,10	0
2	NAD	F	300	44/44	0.99	0.03	5,7,9,9	0
2	NAD	G	300	44/44	0.99	0.03	6,8,9,9	0
2	NAD	C	300	44/44	0.99	0.03	8,9,12,13	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.

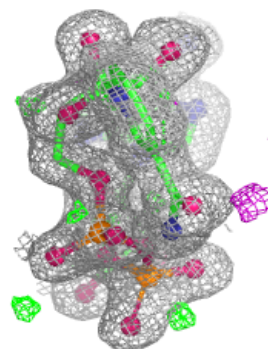
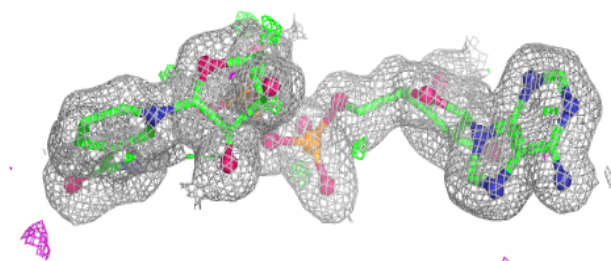
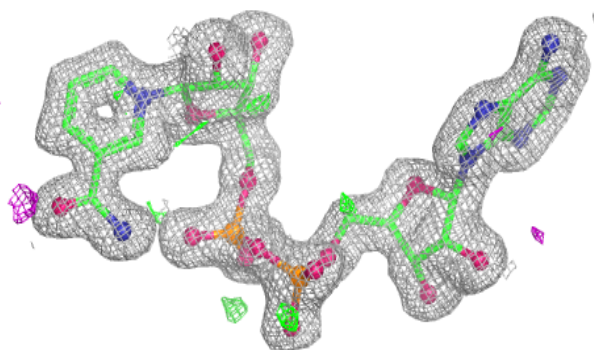


Electron density around NAD B 300:

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

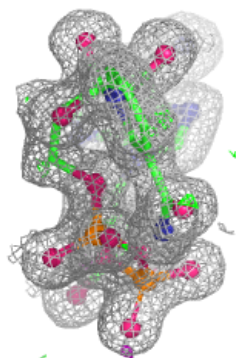
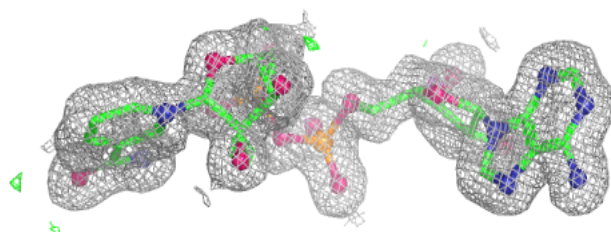
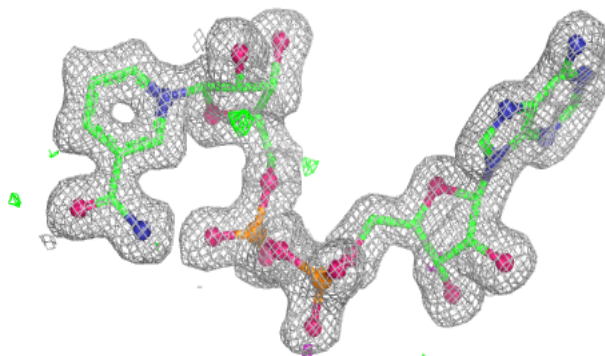
**Electron density around NAD E 300:**

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

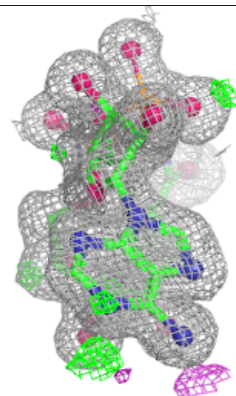
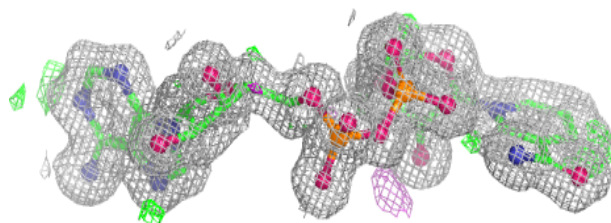
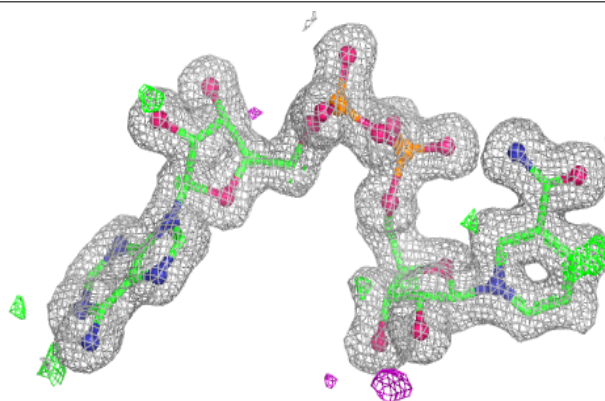


Electron density around NAD D 300:

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

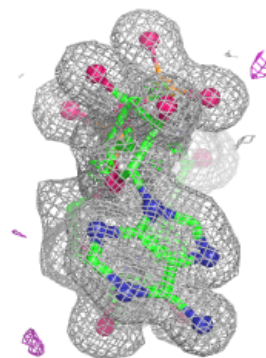
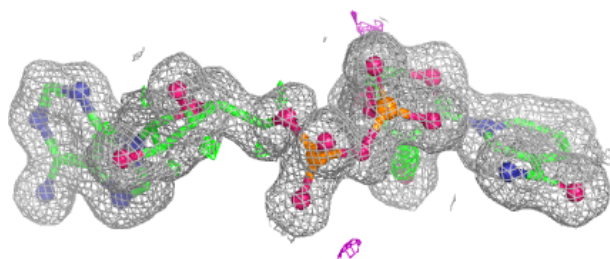
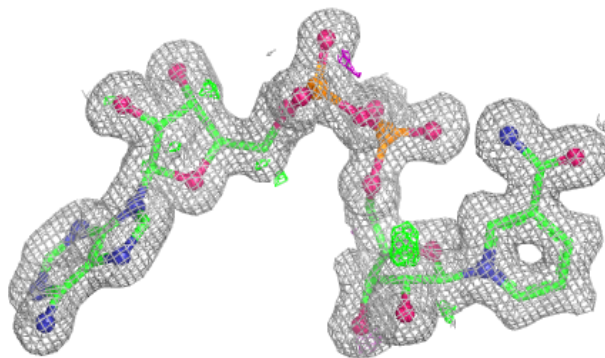
**Electron density around NAD A 300:**

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

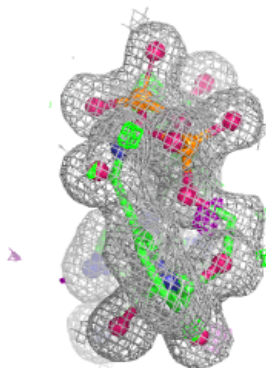
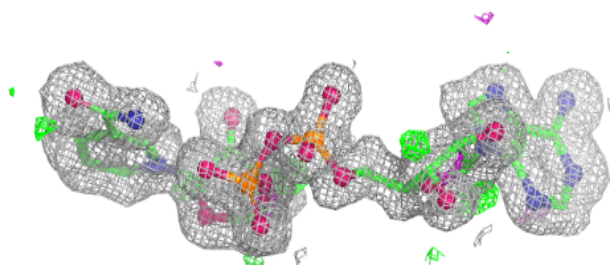
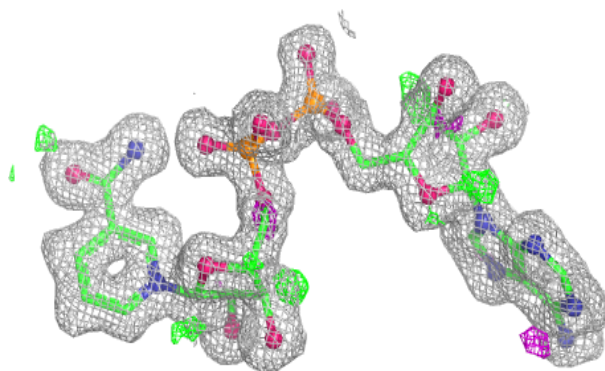


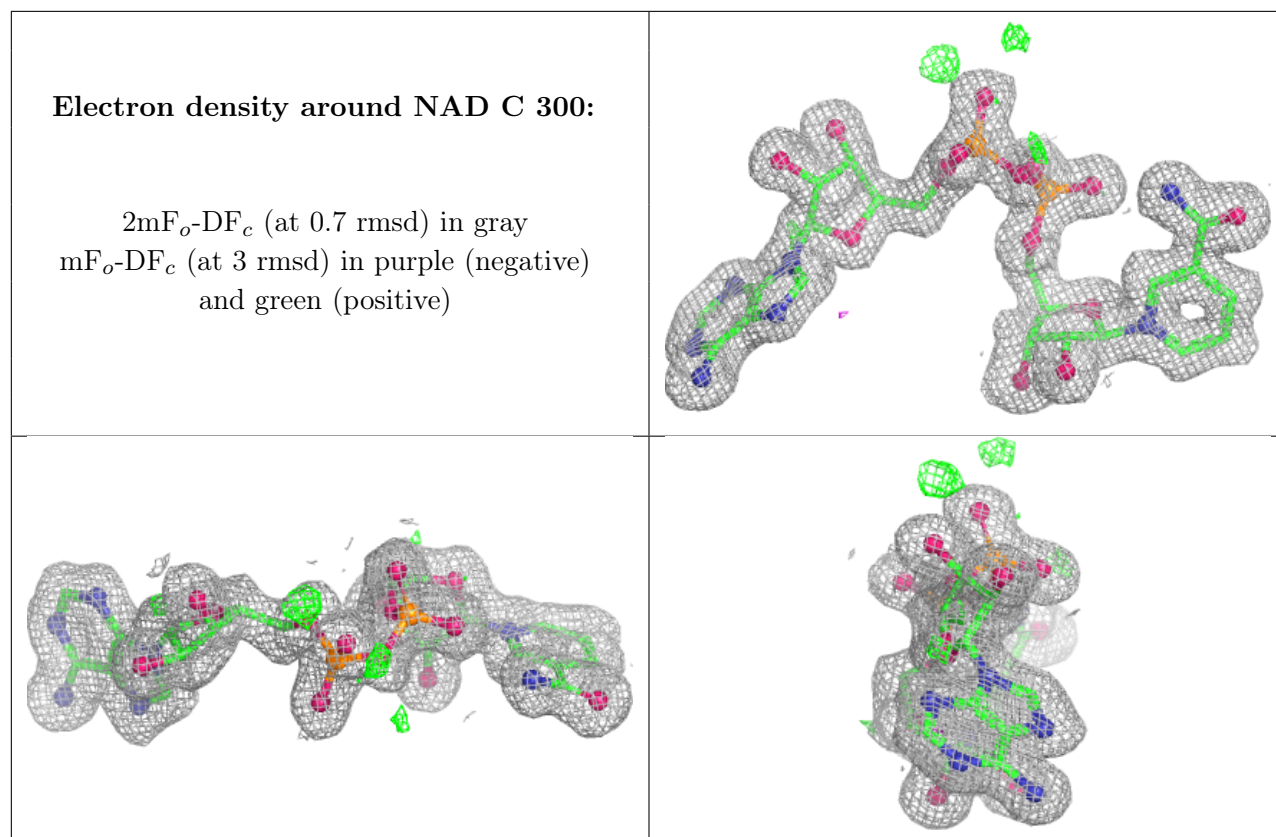
Electron density around NAD F 300:

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

**Electron density around NAD G 300:**

$2mF_o-DF_c$ (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.