wwPDB X-ray Structure Validation Summary Report (i)

Nov 19, 2024 – 04:16 PM EST

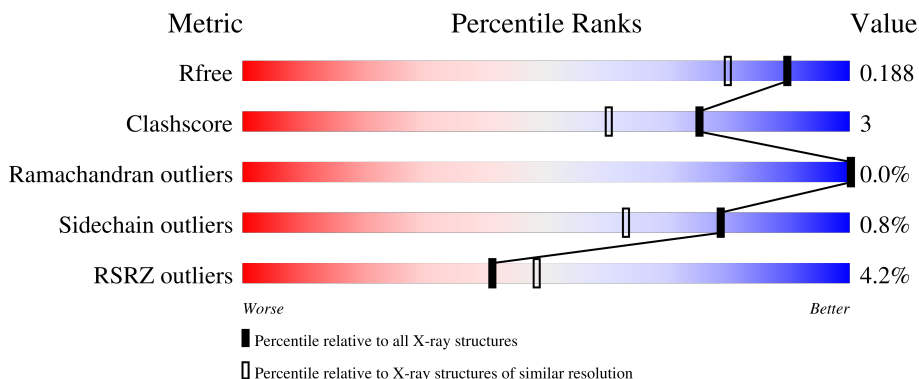|		
PDB ID	:	9DL2
Title	:	Structure of proline utilization A complexed with 2,3-dihydro-1,4-benzodioxine-5-carboxylic acid
Authors	:	Tanner, J.J.; Meeks, K.R.
Deposited on	:	2024-09-10
Resolution	:	1.55 Å(reported)

1 Overall quality at a glance ⓘ

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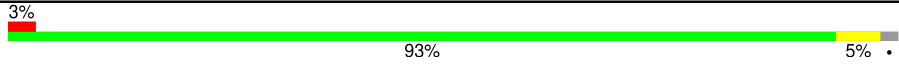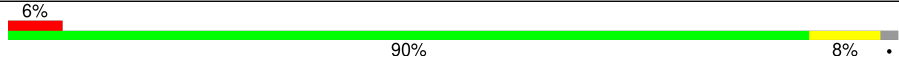*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.55 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.

Metric	Percentile Ranks	Value
Rfree		0.188
Clashscore		3
Ramachandran outliers		0.0%
Sidechain outliers		0.8%
RSRZ outliers		4.2%

Worse · *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	1935 (1.56-1.56)
Clashscore	180529	2073 (1.56-1.56)
Ramachandran outliers	177936	2037 (1.56-1.56)
Sidechain outliers	177891	2034 (1.56-1.56)
RSRZ outliers	164620	1935 (1.56-1.56)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	1235	3% / 93% / 5% ·
1	B	1235	6% / 90% / 8% ·

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2 Entry composition ⓘ

There are 11 unique types of molecules in this entry. The entry contains 20771 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 Bifunctional protein PutA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	1216	Total	C	N	O	S	0	25	0
			9102	5750	1615	1701	36			
1	B	1208	Total	C	N	O	S	0	16	0
			8918	5630	1595	1659	34			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	SER	-	expression tag	UNP F7X6I3
A	0	MET	-	expression tag	UNP F7X6I3
B	-1	SER	-	expression tag	UNP F7X6I3
B	0	MET	-	expression tag	UNP F7X6I3

- Molecule 2 is FLAVIN-ADENINE DINUCLEOTIDE (three-letter code: FAD) (formula: $C_{27}H_{33}N_9O_{15}P_2$) (labeled as "Ligand of Interest" by depositor).
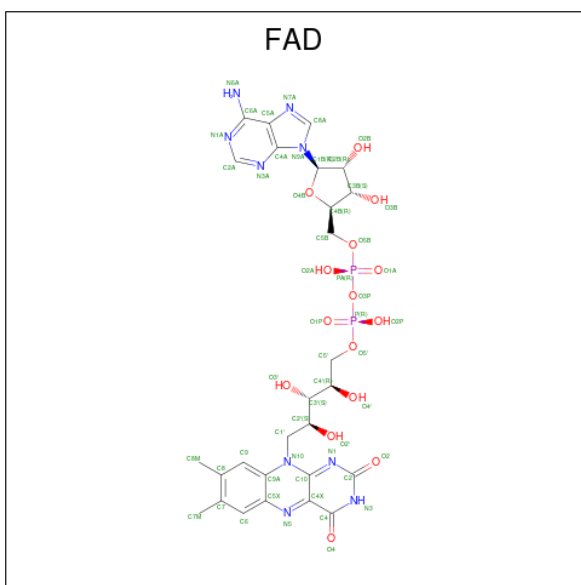
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total 106	C 54	N 18	O 30	P 4	0	1
2	B	1	Total 106	C 54	N 18	O 30	P 4	0	1

- Molecule 3 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: $C_4H_{10}O_3$).
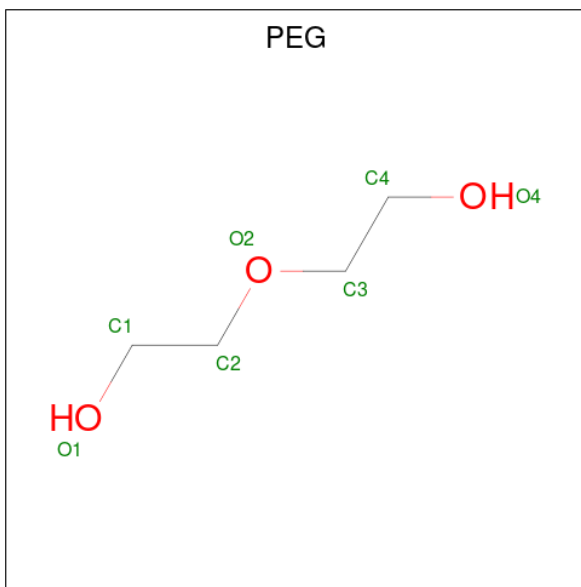
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total 7	C 4	O 3	0	0
3	A	1	Total 7	C 4	O 3	0	0
3	A	1	Total 7	C 4	O 3	0	0
3	B	1	Total 7	C 4	O 3	0	0
3	B	1	Total 7	C 4	O 3	0	0
3	B	1	Total 7	C 4	O 3	0	0

- Molecule 4 is 2,3-dihydro-1,4-benzodioxine-5-carboxylic acid (three-letter code: 53E) (formula: $C_9H_8O_4$) (labeled as "Ligand of Interest" by depositor).

53E

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total 13	C 9	O 4	0	0
4	B	1	Total 13	C 9	O 4	0	0

- Molecule 5 is FORMIC ACID (three-letter code: FMT) (formula: CH_2O_2).

FMT
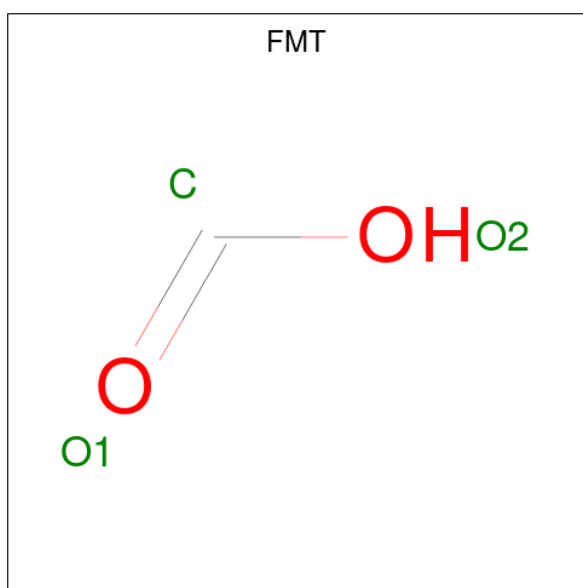
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total 3	C 1	O 2	0	0
5	A	1	Total 3	C 1	O 2	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	B	1	Total C O			0	0
			3 1	2			
5	B	1	Total C O			0	0
			3 1	2			

- Molecule 6 is NICOTINAMIDE-ADENINE-DINUCLEOTIDE (three-letter code: NAD) (formula: $C_{21}H_{27}N_7O_{14}P_2$) (labeled as "Ligand of Interest" by depositor).
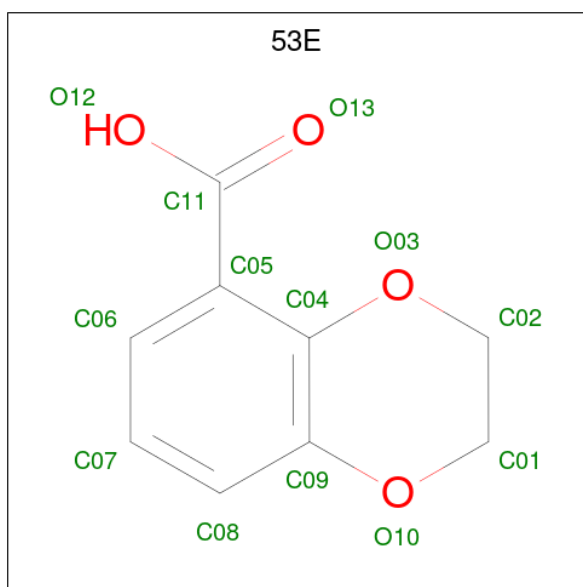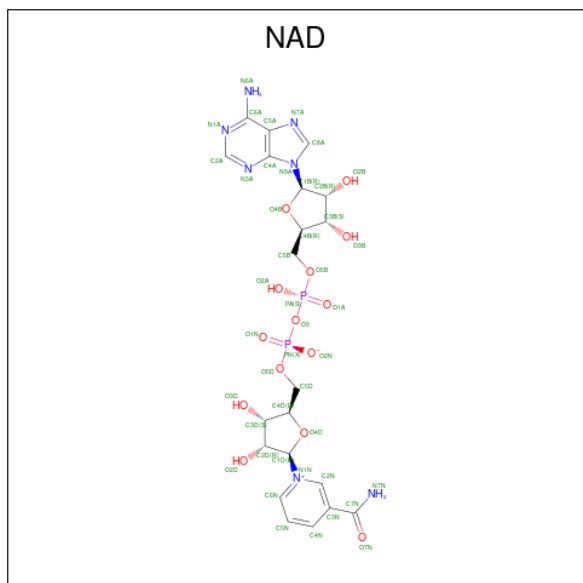

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
6	A	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
6	B	1	Total	C	N	O	P	0	0
			44	21	7	14	2		

- Molecule 7 is SULFATE ION (three-letter code: SO4) (formula: O_4S).

SO4

O1

O3 O⁻ — S — O⁻ O4

S

O2

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	A	1	Total 5	O 4	S 1	0	0
7	A	1	Total 5	O 4	S 1	0	0
7	A	1	Total 5	O 4	S 1	0	0
7	A	1	Total 5	O 4	S 1	0	0
7	A	1	Total 5	O 4	S 1	0	0
7	B	1	Total 5	O 4	S 1	0	0
7	B	1	Total 5	O 4	S 1	0	0

- Molecule 8 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	1	Total 1	Mg 1	0	0
8	B	1	Total 1	Mg 1	0	0

- Molecule 9 is TRIETHYLENE GLYCOL (three-letter code: PGE) (formula: $C_6H_{14}O_4$).

PGE

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
9	B	1	Total 10	C 6	O 4	0	0

- Molecule 10 is TETRAETHYLENE GLYCOL (three-letter code: PG4) (formula: $C_8H_{18}O_5$).

PG4
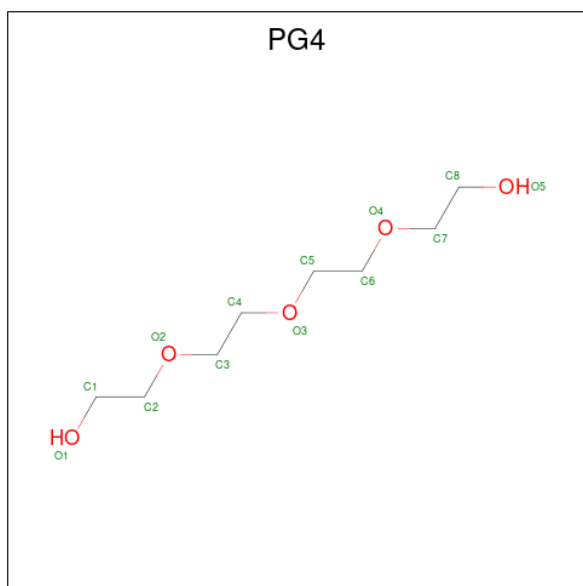
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
10	B	1	Total 13	C 8	O 5	0	0

- Molecule 11 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
11	A	1191	Total 1191	O 1191	0	3
11	B	1120	Total 1120	O 1120	0	3

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: Bifunctional protein PutA

Chain A:

• Molecule 1: Bifunctional protein PutA

Chain B:
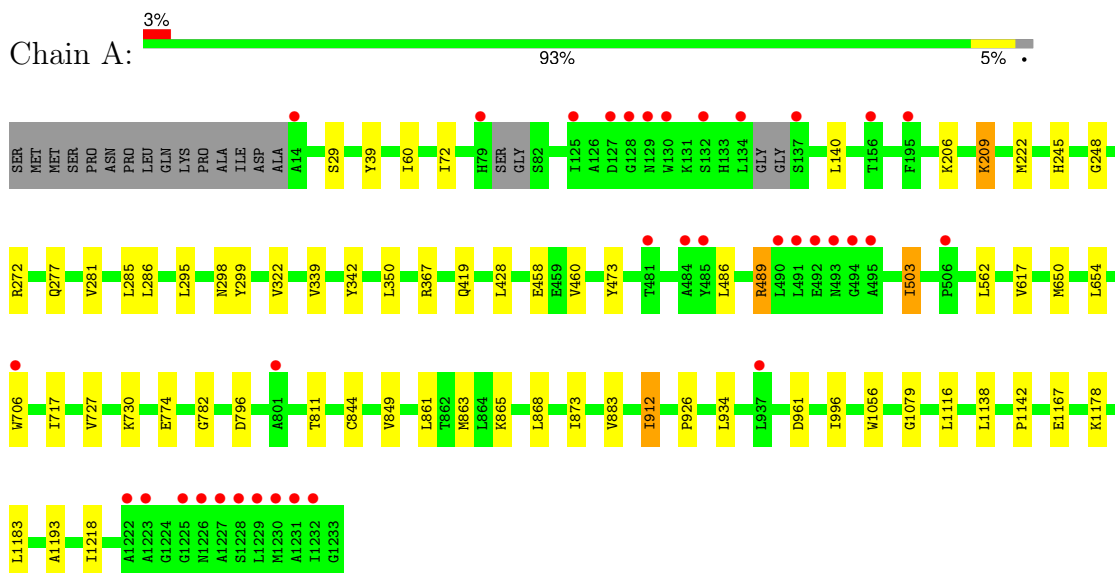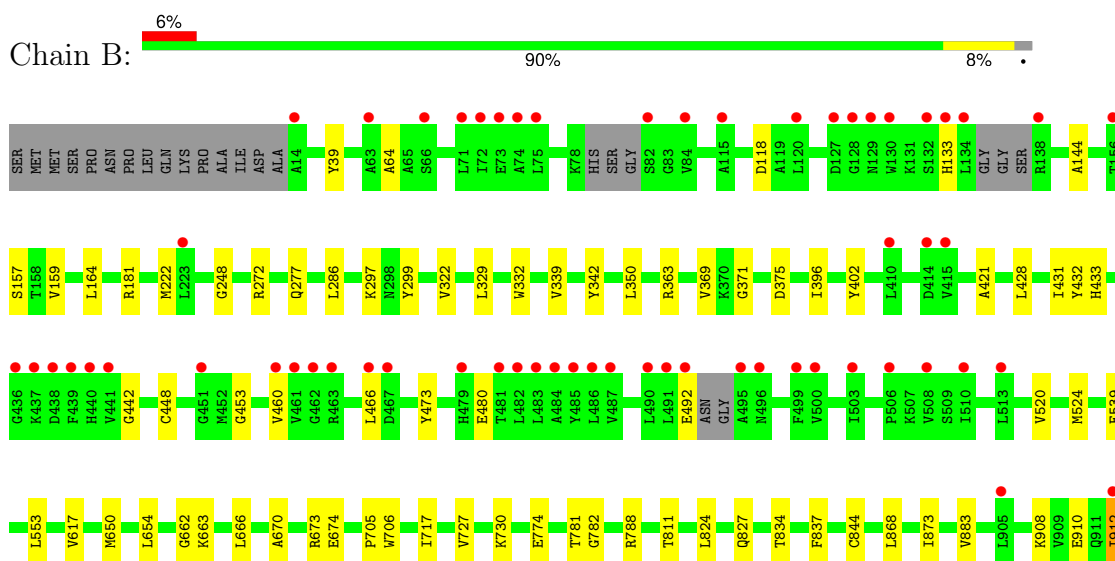
4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	100.40Å 101.72Å 126.29Å 90.00° 106.23° 90.00°	Depositor
Resolution (Å)	46.90 – 1.55	Depositor
	46.90 – 1.55	EDS
% Data completeness	94.5 (46.90-1.55)	Depositor
(in resolution range)	98.2 (46.90-1.55)	EDS
R_{merge}	0.05	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.74 (at 1.55Å)	Xtriage
Refinement program	PHENIX 1.21rc1_5156	Depositor
R, R_{free}	0.167 , 0.190	Depositor
	0.166 , 0.188	DCC
R_{free} test set	17581 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å^2)	21.6	Xtriage
Anisotropy	0.141	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 39.8	EDS
L-test for twinning [2]	$< |L| > = 0.50, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	20771	wwPDB-VP
Average B, all atoms (Å^2)	27.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.63% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5   Model quality ⓘ

5.1   Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: FMT, 53E, FAD, PG4, SO4, PGE, PEG, NAD, MG

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	0.33	0/9336	0.60	0/12708
1	B	0.33	0/9122	0.61	0/12427
All	All	0.33	0/18458	0.60	0/25135

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2   Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	9102	0	9173	42	0
1	B	8918	0	8901	61	0
2	A	106	0	62	3	0
2	B	106	0	62	6	0
3	A	21	0	30	1	0
3	B	21	0	30	4	0
4	A	13	0	7	1	0
4	B	13	0	7	1	0
5	A	6	0	2	1	0
5	B	6	0	2	0	0
6	A	44	0	26	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	B	44	0	26	2	0
7	A	25	0	0	1	0
7	B	10	0	0	0	0
8	A	1	0	0	0	0
8	B	1	0	0	0	0
9	B	10	0	14	0	0
10	B	13	0	18	0	0
11	A	1191	0	0	7	0
11	B	1120	0	0	12	0
All	All	20771	0	18360	108	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 3.

The worst 5 of 108 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1079:GLY:HA2	3:A:2002:PEG:H22	1.51	0.91
1:B:674:GLU:OE1	11:B:2101:HOH:O	1.98	0.81
1:B:673:ARG:HH11	3:B:2005:PEG:H41	1.46	0.78
1:A:473:TYR:HB2	2:A:2001[A]:FAD:HM72	1.69	0.73
1:B:873:ILE:HG13	1:B:883:VAL:HB	1.71	0.72

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	1235/1235 (100%)	1216 (98%)	19 (2%)	0	100	100
1	B	1216/1235 (98%)	1191 (98%)	24 (2%)	1 (0%)	48	26
All	All	2451/2470 (99%)	2407 (98%)	43 (2%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	133	HIS

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	921/951 (97%)	913 (99%)	8 (1%)	75	58
1	B	882/951 (93%)	876 (99%)	6 (1%)	81	67
All	All	1803/1902 (95%)	1789 (99%)	14 (1%)	79	63

5 of 14 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	912	ILE
1	B	39	TYR
1	B	934	LEU
1	B	730	LYS
1	B	912	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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.

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5.6 Ligand geometry ⓘ

Of 29 ligands modelled in this entry, 2 are monoatomic - leaving 27 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	$\#|Z| > 2$
7	SO4	A	2012	-	4,4,4	0.64	0	6,6,6	0.12	0
7	SO4	A	2010	-	4,4,4	0.66	0	6,6,6	0.29	0
3	PEG	B	2005	-	6,6,6	0.35	0	5,5,5	0.45	0
5	FMT	A	2004	-	2,2,2	0.53	0	1,1,1	0.27	0
3	PEG	B	2007	-	6,6,6	0.24	0	5,5,5	0.22	0
6	NAD	A	2008	8	42,48,48	2.43	11 (26%)	50,73,73	1.72	7 (14%)
3	PEG	B	2003	-	6,6,6	0.24	0	5,5,5	0.28	0
5	FMT	B	2006	-	2,2,2	0.85	0	1,1,1	0.13	0
7	SO4	A	2013	-	4,4,4	0.67	0	6,6,6	0.18	0
7	SO4	B	2012	-	4,4,4	0.69	0	6,6,6	0.14	0
3	PEG	A	2002	-	6,6,6	0.23	0	5,5,5	0.32	0
6	NAD	B	2010	8	42,48,48	2.42	9 (21%)	50,73,73	1.57	6 (12%)
4	53E	B	2004	-	14,14,14	2.02	2 (14%)	18,19,19	0.59	0
2	FAD	A	2001[B]	-	54,58,58	2.30	17 (31%)	71,89,89	1.63	12 (16%)
2	FAD	B	2001[B]	-	54,58,58	2.46	16 (29%)	71,89,89	1.65	15 (21%)
3	PEG	A	2007	-	6,6,6	0.25	0	5,5,5	0.22	0
7	SO4	A	2011	-	4,4,4	0.66	0	6,6,6	0.09	0
5	FMT	B	2008	-	2,2,2	0.65	0	1,1,1	0.17	0
7	SO4	A	2009	-	4,4,4	0.55	0	6,6,6	0.23	0
5	FMT	A	2006	-	2,2,2	0.58	0	1,1,1	0.20	0
2	FAD	A	2001[A]	-	54,58,58	2.27	15 (27%)	71,89,89	1.60	13 (18%)
2	FAD	B	2001[A]	-	54,58,58	2.28	16 (29%)	71,89,89	1.61	14 (19%)
10	PG4	B	2009	-	12,12,12	0.28	0	11,11,11	0.22	0
4	53E	A	2003	-	14,14,14	2.00	2 (14%)	18,19,19	1.00	1 (5%)
9	PGE	B	2002	-	9,9,9	0.33	0	8,8,8	0.40	0
7	SO4	B	2011	-	4,4,4	0.56	0	6,6,6	0.24	0
3	PEG	A	2005	-	6,6,6	0.26	0	5,5,5	0.17	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	FAD	B	2001[A]	-	-	5/30/50/50	0/6/6/6
3	PEG	B	2003	-	-	3/4/4/4	-
2	FAD	B	2001[B]	-	-	9/30/50/50	0/6/6/6
3	PEG	B	2007	-	-	2/4/4/4	-
10	PG4	B	2009	-	-	3/10/10/10	-
3	PEG	B	2005	-	-	3/4/4/4	-
4	53E	A	2003	-	-	4/4/11/11	0/2/2/2
3	PEG	A	2002	-	-	2/4/4/4	-
3	PEG	A	2007	-	-	3/4/4/4	-
6	NAD	B	2010	8	-	2/26/62/62	0/5/5/5
9	PGE	B	2002	-	-	1/7/7/7	-
6	NAD	A	2008	8	-	2/26/62/62	0/5/5/5
4	53E	B	2004	-	-	2/4/11/11	0/2/2/2
2	FAD	A	2001[A]	-	-	7/30/50/50	0/6/6/6
3	PEG	A	2005	-	-	0/4/4/4	-
2	FAD	A	2001[B]	-	-	6/30/50/50	0/6/6/6

The worst 5 of 88 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	2001[B]	FAD	PA-O3P	-10.30	1.48	1.59
6	A	2008	NAD	PA-O3	-9.83	1.48	1.59
6	B	2010	NAD	PA-O3	-9.58	1.49	1.59
2	A	2001[B]	FAD	PA-O3P	-9.20	1.49	1.59
2	B	2001[A]	FAD	PA-O3P	-9.05	1.49	1.59

The worst 5 of 68 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	A	2008	NAD	N3A-C2A-N1A	-6.81	119.43	128.67
6	B	2010	NAD	N3A-C2A-N1A	-6.74	119.52	128.67
2	B	2001[A]	FAD	N3A-C2A-N1A	-6.52	119.83	128.67
2	B	2001[B]	FAD	N3A-C2A-N1A	-6.38	120.01	128.67
2	A	2001[A]	FAD	N3A-C2A-N1A	-6.28	120.15	128.67

There are no chirality outliers.

5 of 54 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	2001[B]	FAD	N10-C1'-C2'-O2'
2	A	2001[B]	FAD	N10-C1'-C2'-C3'
2	A	2001[B]	FAD	C1'-C2'-C3'-C4'
2	A	2001[B]	FAD	C5'-O5'-P-O2P
2	B	2001[A]	FAD	P-O3P-PA-O5B

There are no ring outliers.
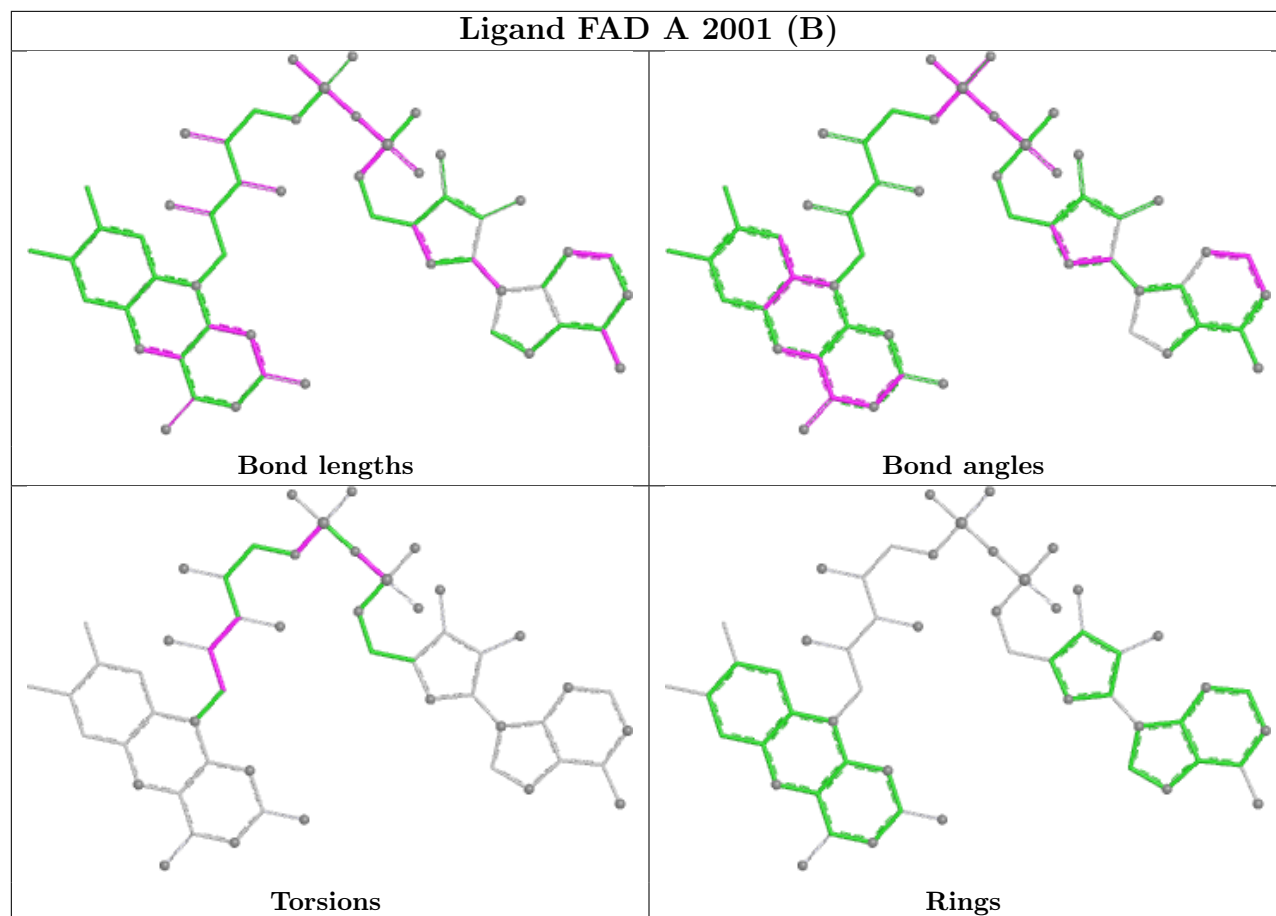
13 monomers are involved in 22 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	A	2012	SO4	1	0
3	B	2005	PEG	2	0
3	B	2007	PEG	2	0
6	A	2008	NAD	2	0
3	A	2002	PEG	1	0
6	B	2010	NAD	2	0
4	B	2004	53E	1	0
2	A	2001[B]	FAD	2	0
2	B	2001[B]	FAD	2	0
5	A	2006	FMT	1	0
2	A	2001[A]	FAD	1	0
2	B	2001[A]	FAD	4	0
4	A	2003	53E	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.
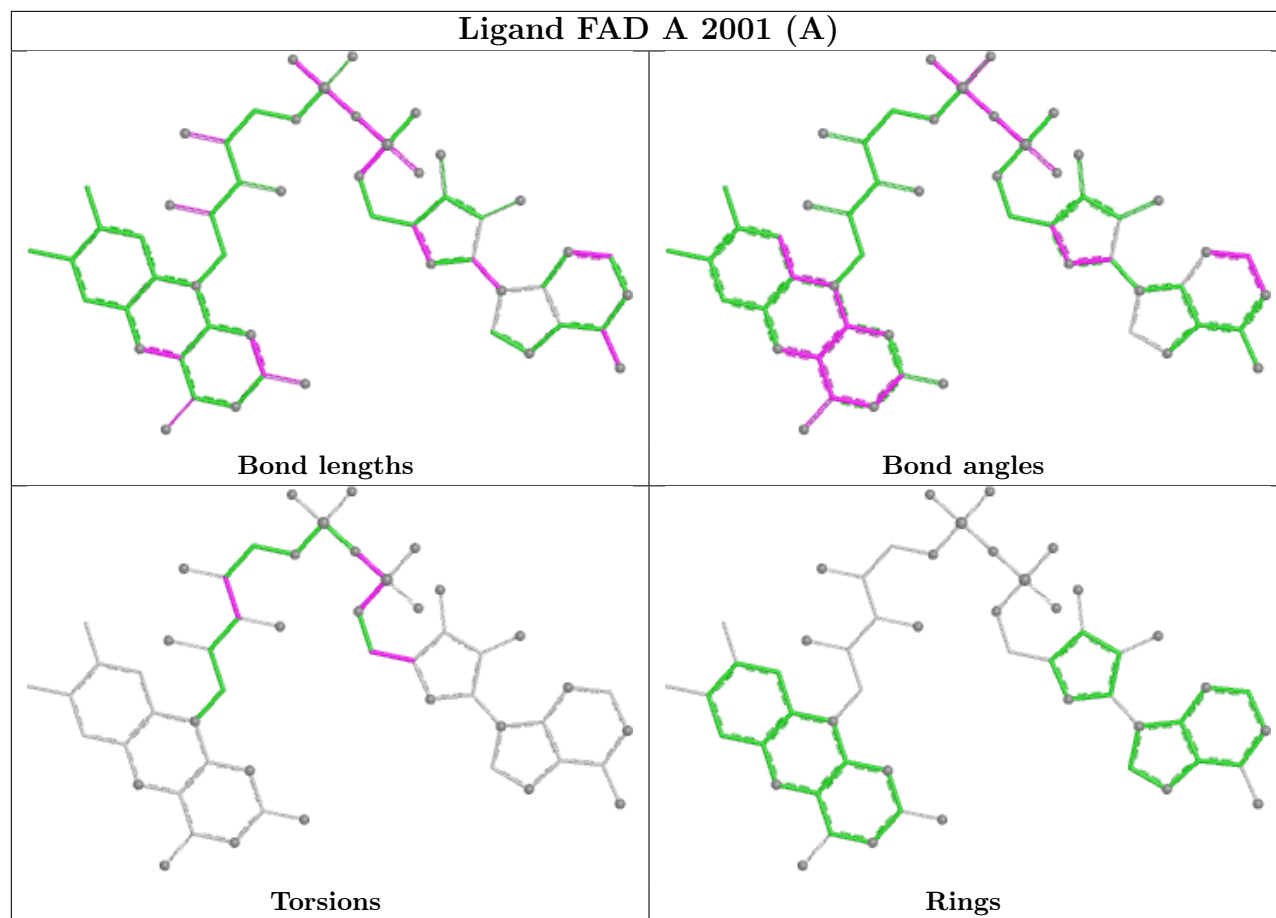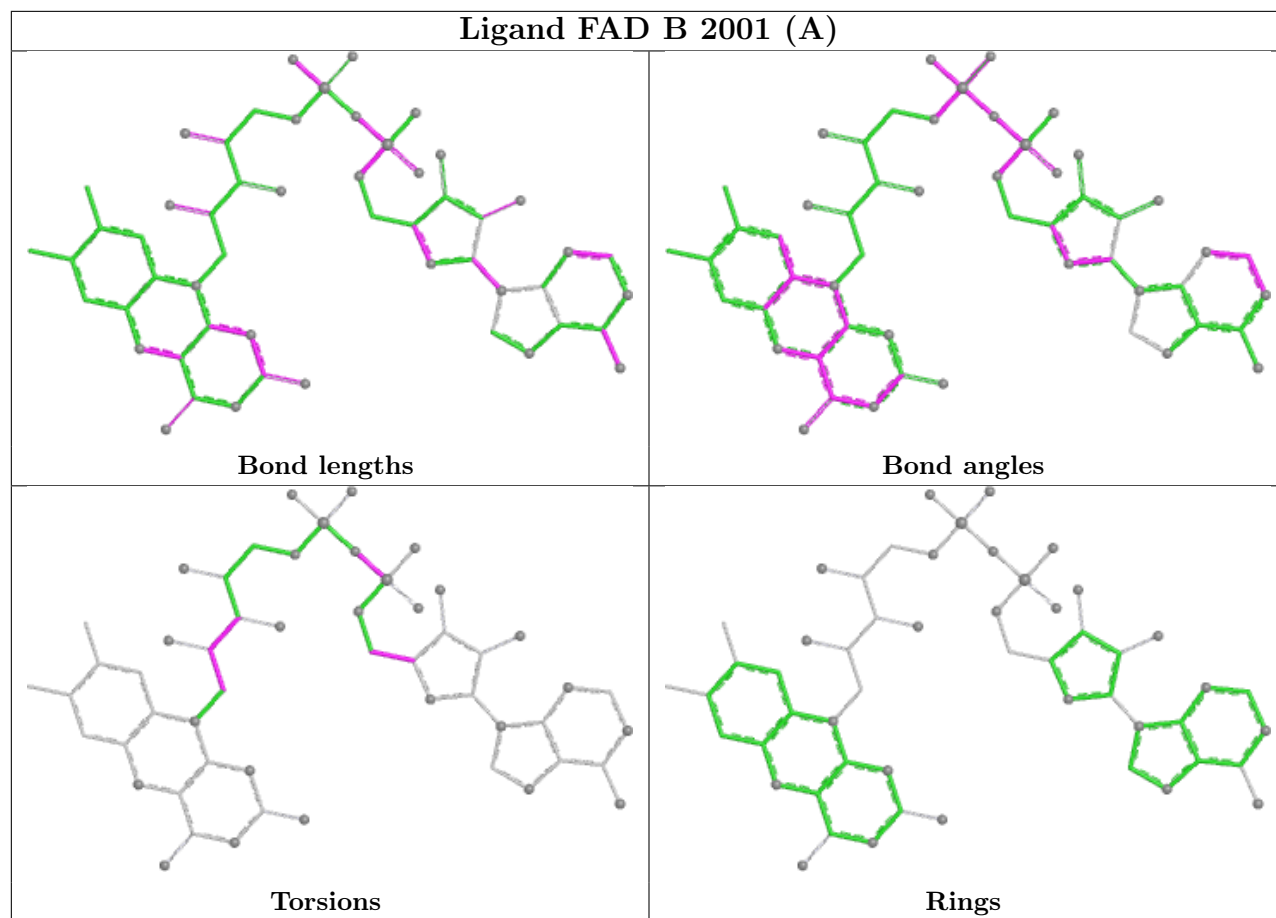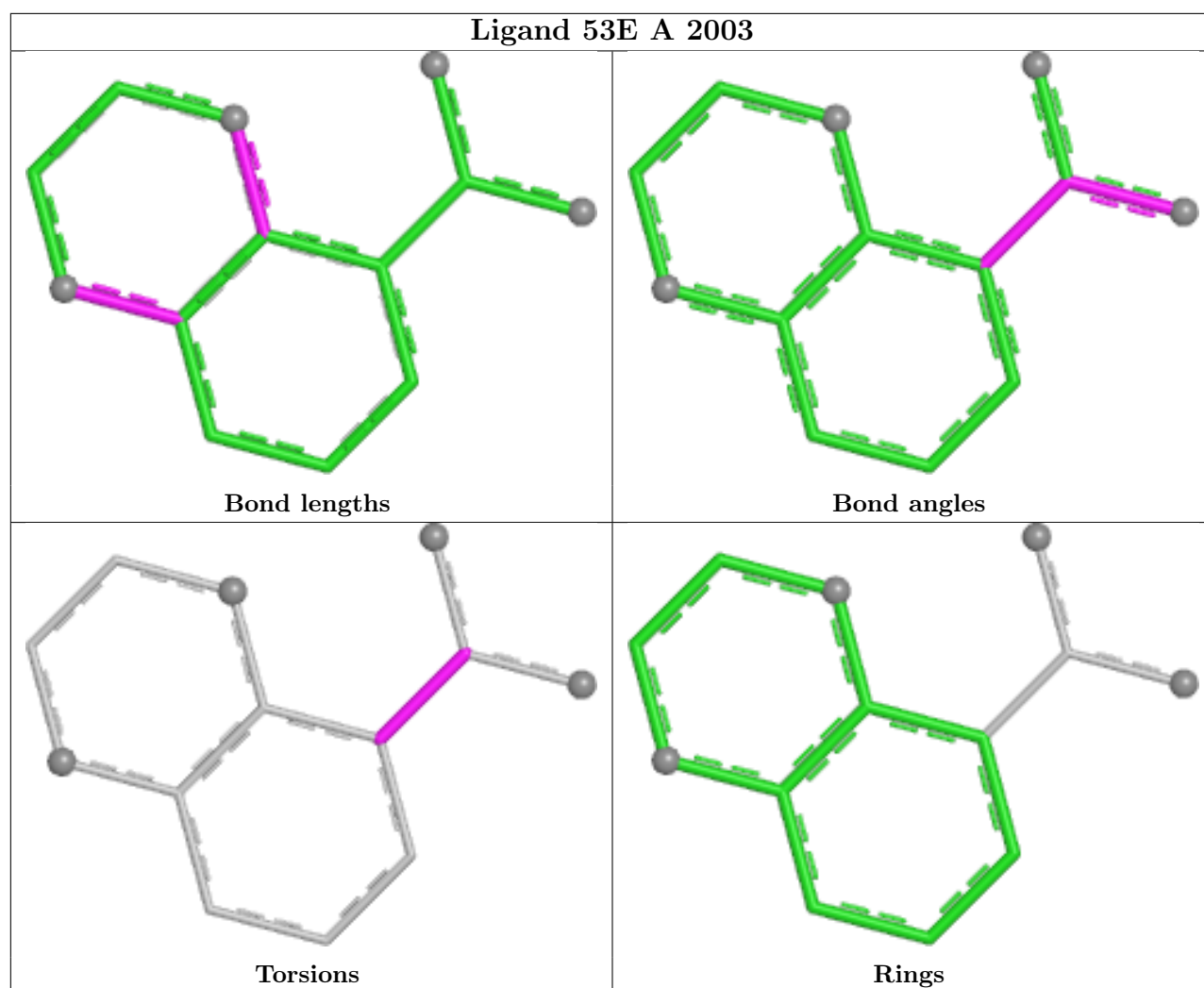
Ligand NAD A 2008

Bond lengths

Bond angles

Torsions

Rings

Ligand NAD B 2010

Bond lengths

Bond angles

Torsions

Rings

Ligand 53E B 2004

Bond lengths

Bond angles

Torsions

Rings

Ligand FAD A 2001 (B)

Bond lengths

Bond angles

Torsions

Rings

Ligand FAD B 2001 (B)

Bond lengths

Bond angles

Torsions

Rings

Ligand FAD A 2001 (A)

Bond lengths

Bond angles

Torsions

Rings

Ligand FAD B 2001 (A)

Bond lengths

Bond angles

Torsions

Rings

Ligand 53E A 2003

Bond lengths

Bond angles

Torsions

Rings

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	1216/1235 (98%)	0.02	35 (2%)	54	61	10, 24, 41, 67	25 (2%)
1	B	1208/1235 (97%)	0.18	68 (5%)	31	37	11, 25, 48, 68	16 (1%)
All	All	2424/2470 (98%)	0.10	103 (4%)	41	48	10, 24, 45, 68	41 (1%)

The worst 5 of 103 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	508	VAL	5.8
1	B	500	VAL	5.4
1	B	491	LEU	5.3
1	B	912	ILE	4.9
1	B	439	PHE	4.7

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 monosaccharides in this entry.

6.4 Ligands ⓘ

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

WORLDWIDE
wwPDB
PROTEIN DATA BANK

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	PEG	A	2007	7/7	0.78	0.15	44,48,55,60	0
3	PEG	A	2005	7/7	0.80	0.14	34,37,41,49	0
3	PEG	B	2007	7/7	0.83	0.15	37,46,52,54	0
7	SO4	A	2013	5/5	0.83	0.13	41,43,52,67	5
7	SO4	B	2012	5/5	0.85	0.12	29,29,39,49	5
3	PEG	B	2003	7/7	0.86	0.12	33,39,46,50	0
3	PEG	A	2002	7/7	0.87	0.12	26,34,43,45	0
6	NAD	A	2008	44/44	0.87	0.13	21,29,35,36	44
3	PEG	B	2005	7/7	0.88	0.12	28,35,41,45	0
7	SO4	A	2011	5/5	0.88	0.09	51,52,53,61	5
5	FMT	B	2008	3/3	0.89	0.11	32,32,33,36	0
4	53E	A	2003	13/13	0.90	0.12	21,29,37,38	13
10	PG4	B	2009	13/13	0.91	0.11	35,42,48,48	0
6	NAD	B	2010	44/44	0.92	0.10	19,22,25,34	44
5	FMT	A	2006	3/3	0.92	0.08	36,36,46,51	0
8	MG	A	2014	1/1	0.92	0.17	45,45,45,45	0
7	SO4	A	2012	5/5	0.92	0.11	36,39,49,52	5
2	FAD	B	2001[A]	53/53	0.94	0.08	18,22,27,30	53
4	53E	B	2004	13/13	0.94	0.09	20,24,28,34	13
9	PGE	B	2002	10/10	0.94	0.08	32,38,43,44	0
2	FAD	B	2001[B]	53/53	0.94	0.08	18,22,28,29	53
2	FAD	A	2001[A]	53/53	0.95	0.07	16,21,25,26	53
5	FMT	B	2006	3/3	0.95	0.14	15,15,34,38	0
8	MG	B	2013	1/1	0.95	0.12	38,38,38,38	0
2	FAD	A	2001[B]	53/53	0.95	0.07	16,21,25,27	53
5	FMT	A	2004	3/3	0.95	0.10	24,24,32,34	0
7	SO4	A	2010	5/5	0.97	0.08	25,30,37,40	5
7	SO4	B	2011	5/5	0.99	0.04	18,18,22,22	0
7	SO4	A	2009	5/5	0.99	0.04	20,20,23,25	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.
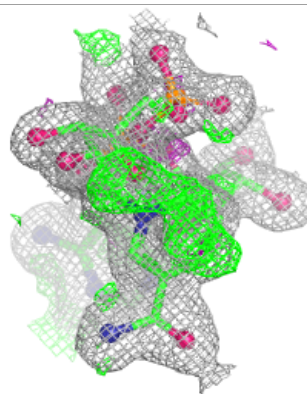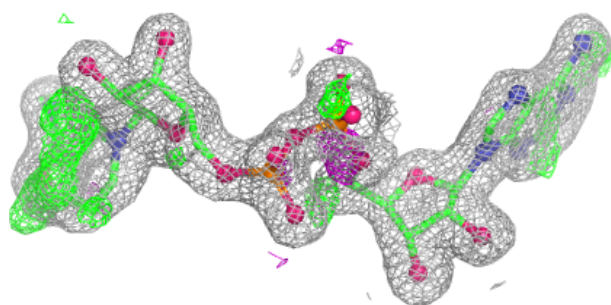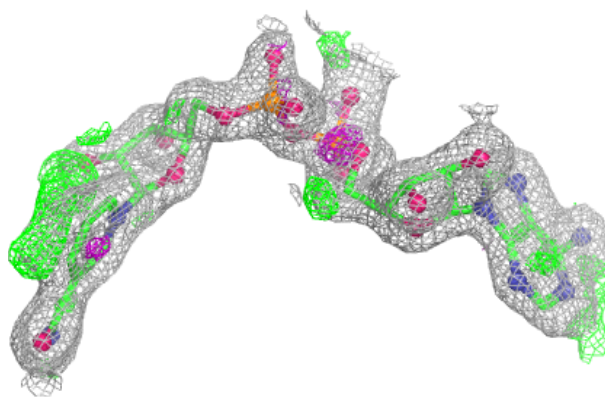
Electron density around NAD A 2008:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
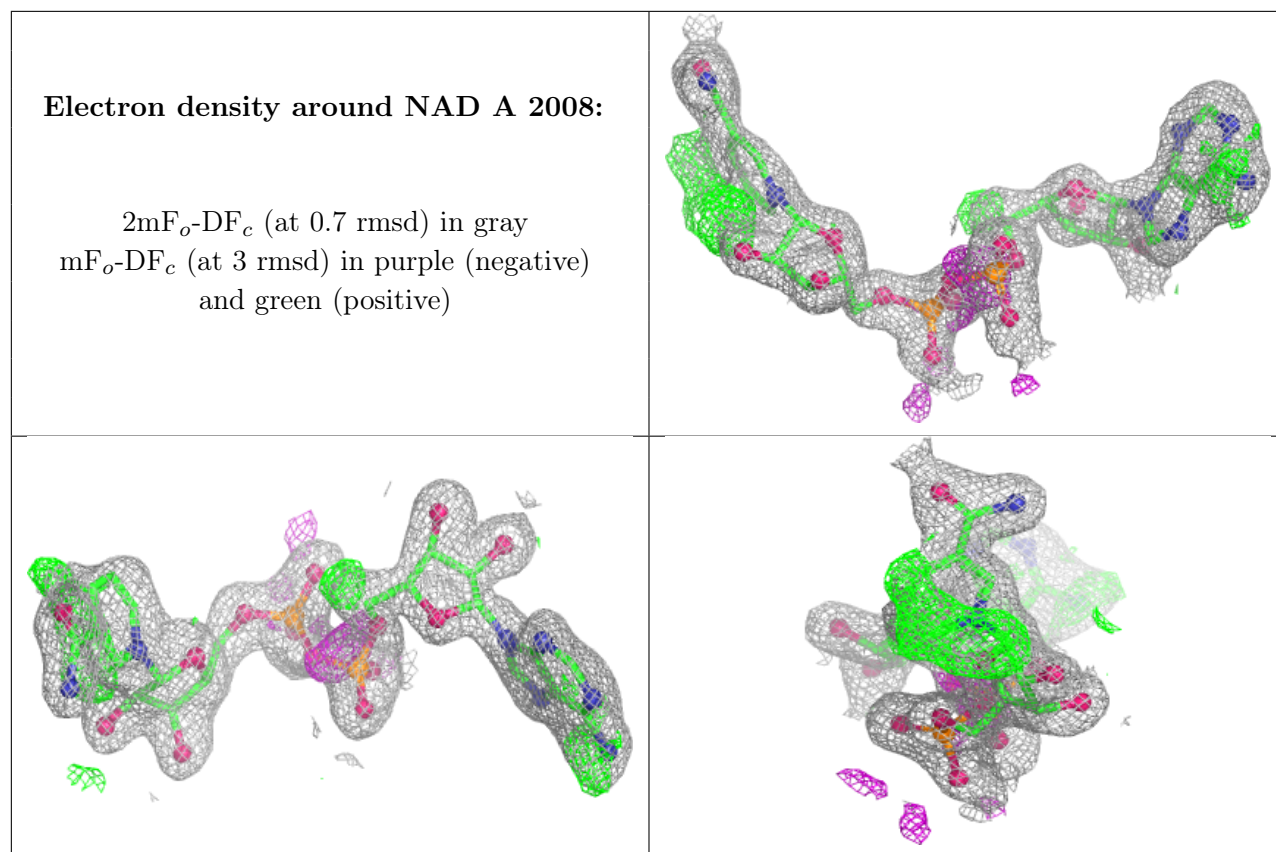
Electron density around 53E A 2003:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
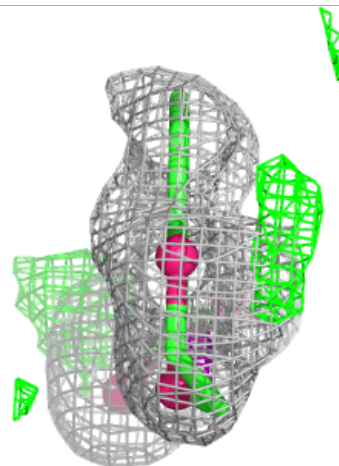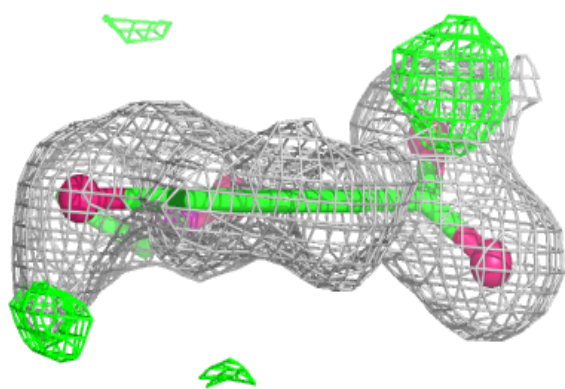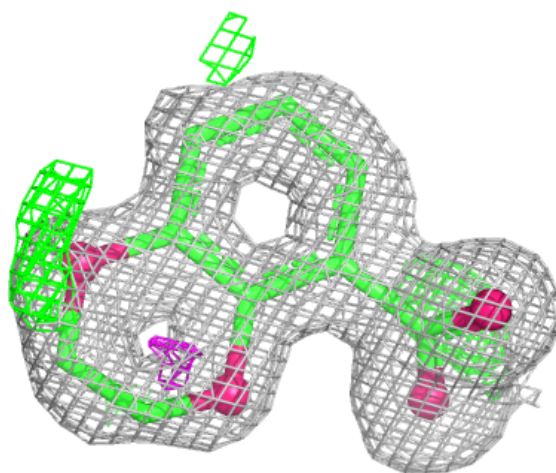
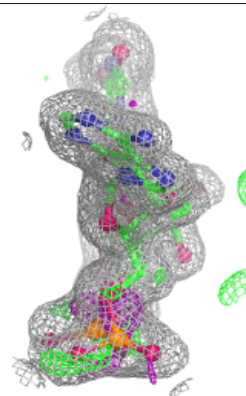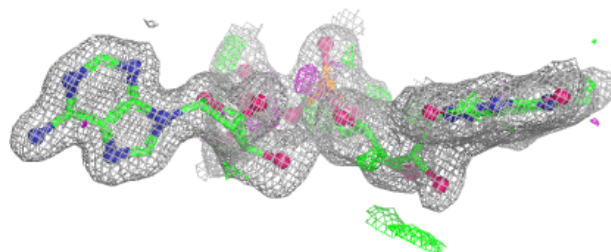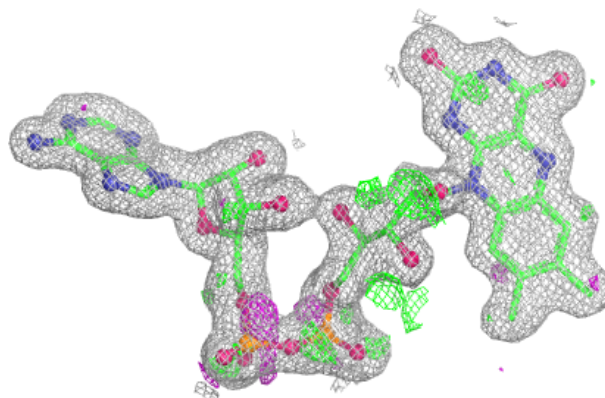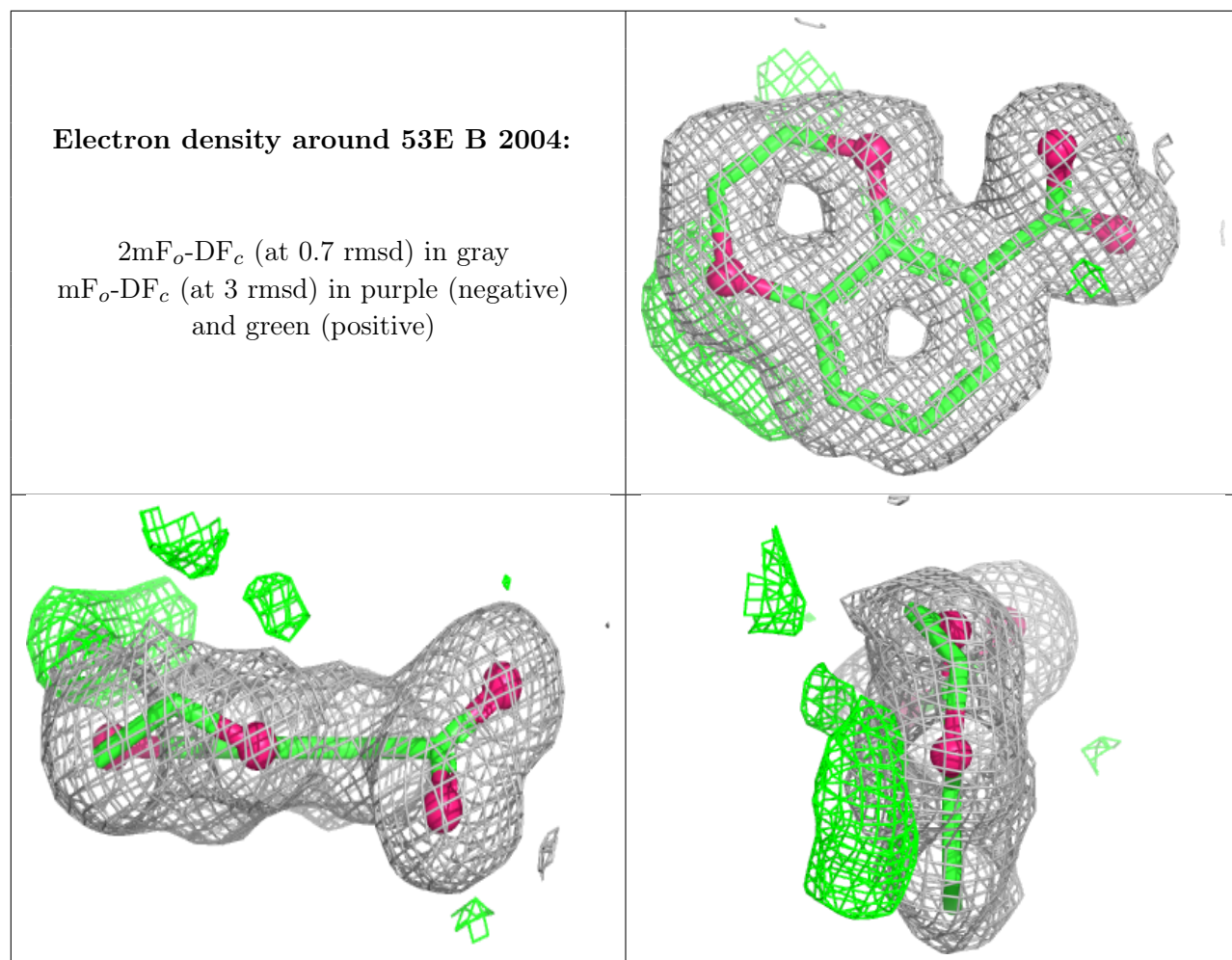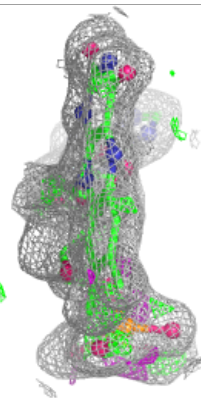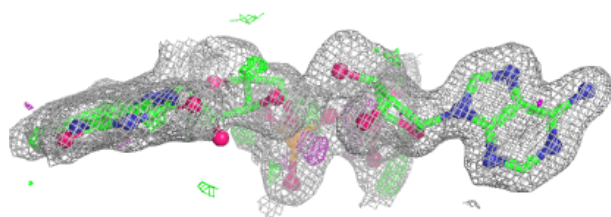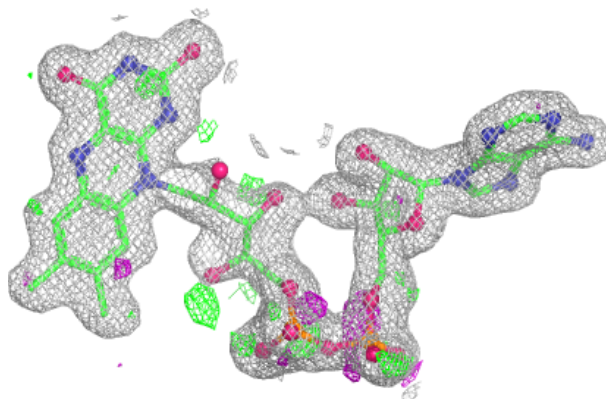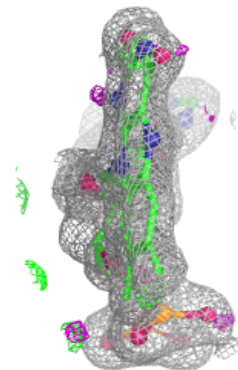**Electron density around NAD B 2010:**

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

Electron density around FAD B 2001 (A):

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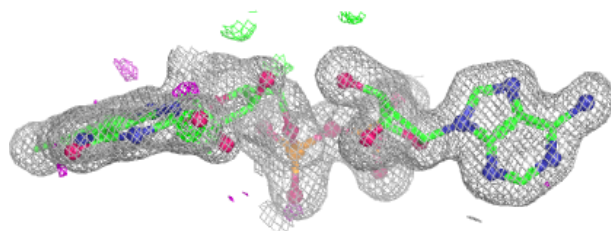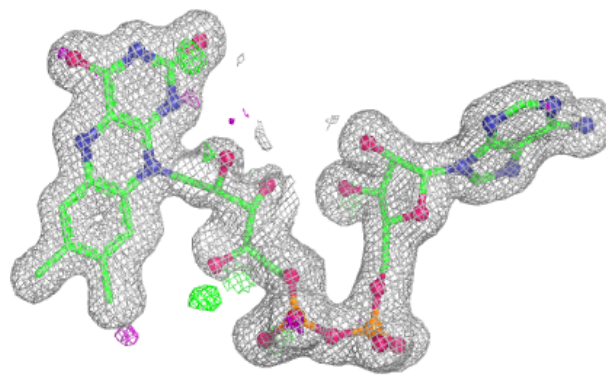and green (positive)

Electron density around 53E B 2004:

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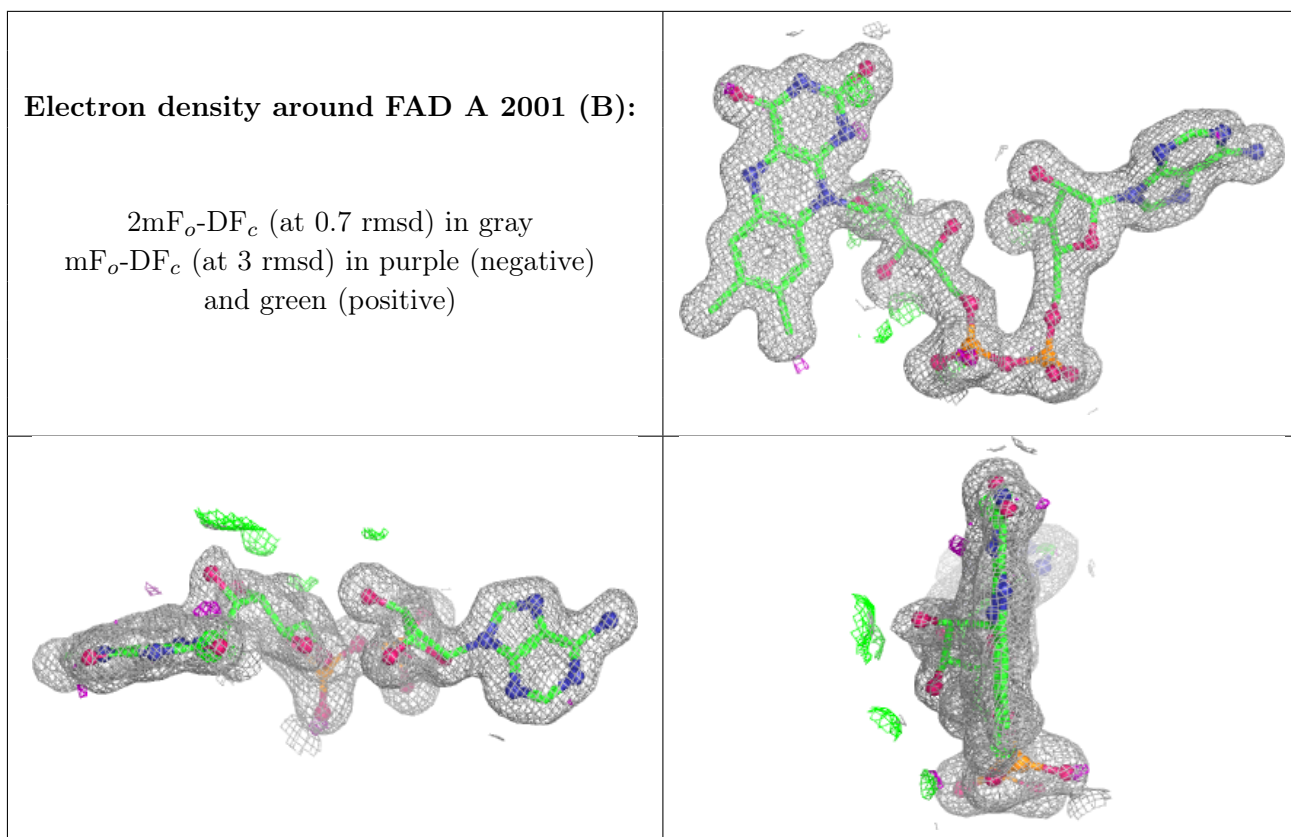mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

Electron density around FAD B 2001 (B):

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

Electron density around FAD A 2001 (A):

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

Electron density around FAD A 2001 (B):

$2mF_o$-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.