



# Full wwPDB X-ray Structure Validation Report ⓘ

Jun 16, 2024 – 09:21 PM EDT

PDB ID : 5PGX  
Title : CRYSTAL STRUCTURE OF 11BETA-HSD1 DOUBLE MUTANT (L262R, F278E) COMPLEXED WITH 2-(2-BENZYL-6-HYDROXYADAMANTAN-2-YL)-1-(3-HYDROXYAZETIDIN-1-YL)ETHAN-1-ONE  
Authors : Sheriff, S.  
Deposited on : 2017-02-06  
Resolution : 2.50 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](mailto: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)  
Xtrriage (Phenix) : 1.13  
EDS : 2.37.1  
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) : 2.37.1

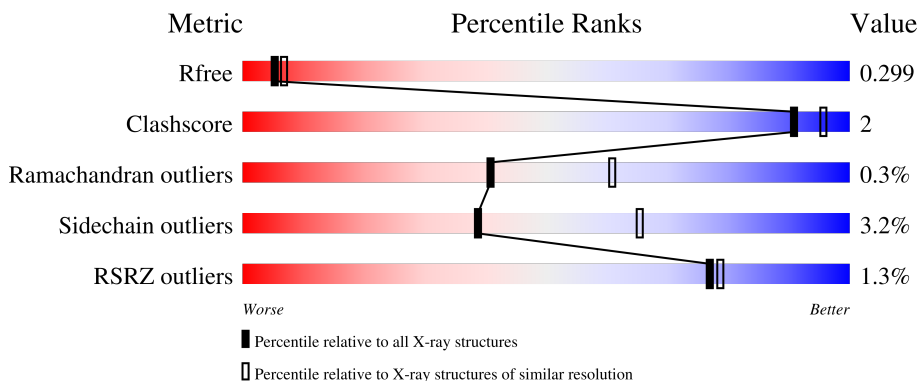
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.50 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))
$R_{free}$	130704	4661 (2.50-2.50)
Clashscore	141614	5346 (2.50-2.50)
Ramachandran outliers	138981	5231 (2.50-2.50)
Sidechain outliers	138945	5233 (2.50-2.50)
RSRZ outliers	127900	4559 (2.50-2.50)

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  $\geq 3$ , 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	286	 85% 6% 8%
1	B	286	 92% 5% ..
1	D	286	 89% 7% .
1	E	286	 85% 7% 8%

## 2 Entry composition i

There are 4 unique types of molecules in this entry. The entry contains 8690 atoms, of which 228 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 Corticosteroid 11-beta-dehydrogenase isozyme 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	262	Total 1983	C 1258	N 337	O 371	S 17	0	0	0
1	B	280	Total 2104	C 1329	N 361	O 395	S 19	0	0	0
1	D	274	Total 2049	C 1298	N 352	O 382	S 17	0	0	0
1	E	263	Total 1991	C 1264	N 335	O 376	S 16	0	0	0

There are 76 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	7	GLY	-	expression tag	UNP P28845
A	8	SER	-	expression tag	UNP P28845
A	9	HIS	-	expression tag	UNP P28845
A	10	MET	-	expression tag	UNP P28845
A	11	ALA	-	expression tag	UNP P28845
A	12	SER	-	expression tag	UNP P28845
A	13	MET	-	expression tag	UNP P28845
A	14	THR	-	expression tag	UNP P28845
A	15	GLY	-	expression tag	UNP P28845
A	16	GLY	-	expression tag	UNP P28845
A	17	GLN	-	expression tag	UNP P28845
A	18	GLN	-	expression tag	UNP P28845
A	19	MET	-	expression tag	UNP P28845
A	20	GLY	-	expression tag	UNP P28845
A	21	ARG	-	expression tag	UNP P28845
A	22	GLY	-	expression tag	UNP P28845
A	23	SER	-	expression tag	UNP P28845
A	262	ARG	LEU	engineered mutation	UNP P28845
A	278	GLU	PHE	engineered mutation	UNP P28845
B	7	GLY	-	expression tag	UNP P28845
B	8	SER	-	expression tag	UNP P28845

*Continued on next page...*

*Continued from previous page...*

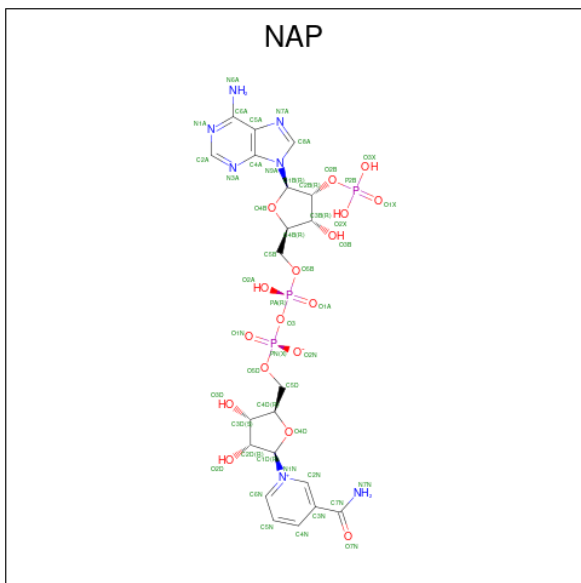
Chain	Residue	Modelled	Actual	Comment	Reference
B	9	HIS	-	expression tag	UNP P28845
B	10	MET	-	expression tag	UNP P28845
B	11	ALA	-	expression tag	UNP P28845
B	12	SER	-	expression tag	UNP P28845
B	13	MET	-	expression tag	UNP P28845
B	14	THR	-	expression tag	UNP P28845
B	15	GLY	-	expression tag	UNP P28845
B	16	GLY	-	expression tag	UNP P28845
B	17	GLN	-	expression tag	UNP P28845
B	18	GLN	-	expression tag	UNP P28845
B	19	MET	-	expression tag	UNP P28845
B	20	GLY	-	expression tag	UNP P28845
B	21	ARG	-	expression tag	UNP P28845
B	22	GLY	-	expression tag	UNP P28845
B	23	SER	-	expression tag	UNP P28845
B	262	ARG	LEU	engineered mutation	UNP P28845
B	278	GLU	PHE	engineered mutation	UNP P28845
D	7	GLY	-	expression tag	UNP P28845
D	8	SER	-	expression tag	UNP P28845
D	9	HIS	-	expression tag	UNP P28845
D	10	MET	-	expression tag	UNP P28845
D	11	ALA	-	expression tag	UNP P28845
D	12	SER	-	expression tag	UNP P28845
D	13	MET	-	expression tag	UNP P28845
D	14	THR	-	expression tag	UNP P28845
D	15	GLY	-	expression tag	UNP P28845
D	16	GLY	-	expression tag	UNP P28845
D	17	GLN	-	expression tag	UNP P28845
D	18	GLN	-	expression tag	UNP P28845
D	19	MET	-	expression tag	UNP P28845
D	20	GLY	-	expression tag	UNP P28845
D	21	ARG	-	expression tag	UNP P28845
D	22	GLY	-	expression tag	UNP P28845
D	23	SER	-	expression tag	UNP P28845
D	262	ARG	LEU	engineered mutation	UNP P28845
D	278	GLU	PHE	engineered mutation	UNP P28845
E	7	GLY	-	expression tag	UNP P28845
E	8	SER	-	expression tag	UNP P28845
E	9	HIS	-	expression tag	UNP P28845
E	10	MET	-	expression tag	UNP P28845
E	11	ALA	-	expression tag	UNP P28845
E	12	SER	-	expression tag	UNP P28845

*Continued on next page...*

Continued from previous page...

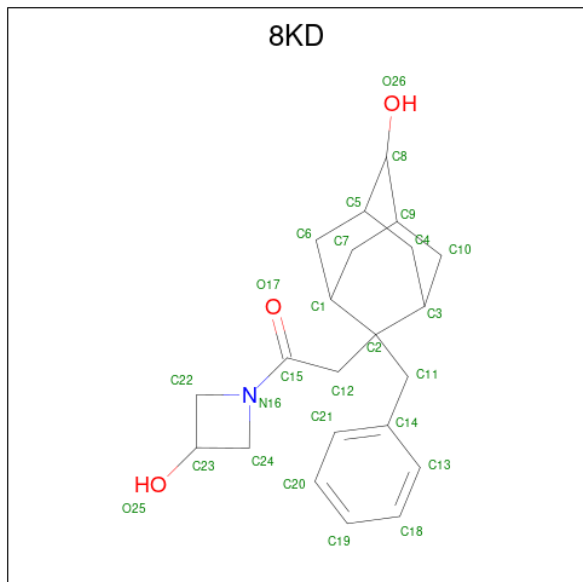
Chain	Residue	Modelled	Actual	Comment	Reference
E	13	MET	-	expression tag	UNP P28845
E	14	THR	-	expression tag	UNP P28845
E	15	GLY	-	expression tag	UNP P28845
E	16	GLY	-	expression tag	UNP P28845
E	17	GLN	-	expression tag	UNP P28845
E	18	GLN	-	expression tag	UNP P28845
E	19	MET	-	expression tag	UNP P28845
E	20	GLY	-	expression tag	UNP P28845
E	21	ARG	-	expression tag	UNP P28845
E	22	GLY	-	expression tag	UNP P28845
E	23	SER	-	expression tag	UNP P28845
E	262	ARG	LEU	engineered mutation	UNP P28845
E	278	GLU	PHE	engineered mutation	UNP P28845

- Molecule 2 is NADP NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (three-letter code: NAP) (formula: C<sub>21</sub>H<sub>28</sub>N<sub>7</sub>O<sub>17</sub>P<sub>3</sub>).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
			Total	C	H	N	O			P
2	A	1	Total	C	H	N	O	P	28	0
			76	21	28	7	17	3		
2	B	1	Total	C	H	N	O	P	28	0
			76	21	28	7	17	3		
2	D	1	Total	C	H	N	O	P	28	0
			76	21	28	7	17	3		
2	E	1	Total	C	H	N	O	P	28	0
			76	21	28	7	17	3		

- Molecule 3 is 2-(2-BENZYL-6-HYDROXYADAMANTAN-2-YL)-1-(3-HYDROXYAZETIDIN-1-YL)ETHAN-1-ONE (three-letter code: 8KD) (formula: C<sub>22</sub>H<sub>29</sub>NO<sub>3</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
			Total	C	H	N			O
3	A	1	Total	C	H	N	O	29	0
			55	22	29	1	3		
3	B	1	Total	C	H	N	O	29	0
			55	22	29	1	3		
3	D	1	Total	C	H	N	O	29	0
			55	22	29	1	3		
3	E	1	Total	C	H	N	O	29	0
			55	22	29	1	3		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	6	Total	O	0	0
			6	6		
4	B	11	Total	O	0	0
			11	11		
4	D	15	Total	O	0	0
			15	15		
4	E	7	Total	O	0	0
			7	7		



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	74.60Å 93.30Å 168.50Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	25.56 – 2.50 25.56 – 2.50	Depositor EDS
% Data completeness (in resolution range)	73.0 (25.56-2.50) 72.9 (25.56-2.50)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.13	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.46 (at 2.50Å)	Xtrriage
Refinement program	BUSTER 2.11.7	Depositor
R, $R_{free}$	0.227 , 0.271 0.244 , 0.299	Depositor DCC
$R_{free}$ test set	1040 reflections (3.44%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	37.0	Xtrriage
Anisotropy	0.590	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.27 , 43.4	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.42$ , $\langle L^2 \rangle = 0.25$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.91	EDS
Total number of atoms	8690	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	42.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.31% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: NAP, 8KD

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	0.45	0/2014	0.65	0/2719
1	B	0.45	0/2136	0.65	0/2881
1	D	0.47	0/2080	0.65	0/2808
1	E	0.46	0/2023	0.64	0/2735
All	All	0.46	0/8253	0.65	0/11143

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	1983	0	2009	7	0
1	B	2104	0	2121	8	0
1	D	2049	0	2049	10	0
1	E	1991	0	2001	10	0
2	A	48	28	25	0	0
2	B	48	28	25	2	0
2	D	48	28	25	0	0
2	E	48	28	25	1	0
3	A	26	29	0	0	0

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	26	29	0	0	0
3	D	26	29	0	0	0
3	E	26	29	0	0	0
4	A	6	0	0	0	0
4	B	11	0	0	0	0
4	D	15	0	0	1	0
4	E	7	0	0	0	0
All	All	8462	228	8280	29	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 2.

All (29) 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:211:THR:HG21	1:E:249:GLY:HA2	1.73	0.70
1:A:248:GLY:HA3	1:A:256:VAL:HG21	1.79	0.64
1:B:227:VAL:HB	1:B:231:VAL:HG12	1.90	0.54
1:D:144:PHE:O	1:D:147:TYR:HB2	2.09	0.53
1:E:248:GLY:HA3	1:E:256:VAL:HG21	1.92	0.52
1:E:141:GLU:HA	1:E:145:LEU:HB2	1.91	0.51
1:B:124:THR:HG22	1:B:135:HIS:HE1	1.76	0.51
1:A:43:SER:HB2	1:A:70:THR:HG23	1.93	0.51
1:D:185:ALA:HB2	1:E:193:PHE:HB2	1.92	0.50
1:A:141:GLU:HA	1:A:145:LEU:HB2	1.93	0.50
1:B:66:ARG:HD3	2:B:301:NAP:C6A	2.43	0.48
1:D:193:PHE:HB2	1:E:185:ALA:HB2	1.97	0.47
1:A:126:LEU:HD23	1:A:180:VAL:HG13	1.96	0.47
1:D:140:MET:HE3	1:E:144:PHE:CE2	2.49	0.47
1:D:164:SER:HB3	4:D:401:HOH:O	2.14	0.47
1:D:267:LEU:O	1:E:272:CYS:HB3	2.15	0.47
1:B:36:LYS:HG2	1:B:110:MET:HB3	1.98	0.45
1:A:193:PHE:HB2	1:B:185:ALA:HB2	1.98	0.44
1:B:66:ARG:HE	1:B:66:ARG:HB2	1.62	0.43
1:E:248:GLY:HA3	1:E:256:VAL:CG2	2.48	0.43
1:E:121:ILE:HG12	2:E:301:NAP:H3D	2.00	0.43
1:A:248:GLY:HA3	1:A:256:VAL:CG2	2.48	0.42
1:D:231:VAL:HG22	1:D:233:MET:HG2	2.01	0.42
1:D:248:GLY:HA3	1:D:256:VAL:HG21	2.02	0.42
1:B:169:SER:O	2:B:301:NAP:H6N	2.20	0.41
1:E:180:VAL:O	1:E:184:SER:HB2	2.20	0.41

*Continued on next page...*

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:144:PHE:O	1:B:147:TYR:HB2	2.21	0.41
1:D:144:PHE:HD1	1:D:190:LEU:HD23	1.84	0.41
1:A:278:GLU:HG2	1:D:266:LEU:HD21	2.03	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	260/286 (91%)	246 (95%)	12 (5%)	2 (1%)	19	35
1	B	278/286 (97%)	265 (95%)	13 (5%)	0	100	100
1	D	270/286 (94%)	257 (95%)	12 (4%)	1 (0%)	34	54
1	E	261/286 (91%)	249 (95%)	12 (5%)	0	100	100
All	All	1069/1144 (93%)	1017 (95%)	49 (5%)	3 (0%)	41	61

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	230	ILE
1	A	69	GLU
1	D	65	ALA

### 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	213/237 (90%)	205 (96%)	8 (4%)	33	58
1	B	224/237 (94%)	217 (97%)	7 (3%)	40	67
1	D	214/237 (90%)	209 (98%)	5 (2%)	50	76
1	E	213/237 (90%)	205 (96%)	8 (4%)	33	58
All	All	864/948 (91%)	836 (97%)	28 (3%)	39	65

All (28) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	44	LYS
1	A	77	HIS
1	A	108	LYS
1	A	124	THR
1	A	145	LEU
1	A	199	LYS
1	A	228	SER
1	A	287	ASP
1	B	36	LYS
1	B	66	ARG
1	B	145	LEU
1	B	199	LYS
1	B	262	ARG
1	B	285	ASN
1	B	288	ARG
1	D	145	LEU
1	D	199	LYS
1	D	228	SER
1	D	262	ARG
1	D	286	MET
1	E	25	GLU
1	E	105	GLN
1	E	145	LEU
1	E	199	LYS
1	E	228	SER
1	E	232	HIS
1	E	233	MET
1	E	253	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	127	ASN
1	B	135	HIS
1	B	285	ASN

### 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](#)

8 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	NAP	D	301	-	45,52,52	0.66	1 (2%)	56,80,80	0.92	2 (3%)
3	8KD	E	302	-	28,30,30	0.30	0	34,46,46	0.65	0
2	NAP	E	301	-	45,52,52	0.96	1 (2%)	56,80,80	0.93	2 (3%)
3	8KD	A	302	-	28,30,30	0.28	0	34,46,46	0.66	0
2	NAP	B	301	-	45,52,52	0.88	1 (2%)	56,80,80	0.83	2 (3%)
2	NAP	A	301	-	45,52,52	0.89	1 (2%)	56,80,80	0.89	2 (3%)
3	8KD	D	302	-	28,30,30	0.32	0	34,46,46	0.78	1 (2%)
3	8KD	B	302	-	28,30,30	0.22	0	34,46,46	0.68	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NAP	D	301	-	-	3/31/67/67	0/5/5/5
3	8KD	E	302	-	-	3/12/58/58	0/6/5/5
2	NAP	E	301	-	-	5/31/67/67	0/5/5/5
3	8KD	A	302	-	-	4/12/58/58	0/6/5/5
2	NAP	B	301	-	-	4/31/67/67	0/5/5/5
2	NAP	A	301	-	-	1/31/67/67	0/5/5/5
3	8KD	D	302	-	-	3/12/58/58	0/6/5/5
3	8KD	B	302	-	-	2/12/58/58	0/6/5/5

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	301	NAP	C2N-N1N	4.91	1.40	1.35
2	A	301	NAP	C2N-N1N	4.31	1.40	1.35
2	B	301	NAP	C2N-N1N	4.07	1.39	1.35
2	D	301	NAP	C2N-N1N	2.84	1.38	1.35

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	301	NAP	O4D-C1D-C2D	-4.42	100.47	106.93
2	D	301	NAP	O4D-C1D-C2D	-4.29	100.65	106.93
2	E	301	NAP	O4D-C1D-C2D	-3.85	101.30	106.93
2	B	301	NAP	O4D-C1D-C2D	-3.02	102.51	106.93
2	D	301	NAP	C5A-C6A-N6A	2.53	124.20	120.35
2	E	301	NAP	C5A-C6A-N6A	2.47	124.11	120.35
2	A	301	NAP	C5A-C6A-N6A	2.43	124.04	120.35
2	B	301	NAP	C5A-C6A-N6A	2.23	123.74	120.35
3	D	302	8KD	C2-C11-C14	2.05	119.25	116.23

There are no chirality outliers.

All (25) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	302	8KD	C14-C11-C2-C3
3	B	302	8KD	C14-C11-C2-C3
3	D	302	8KD	C14-C11-C2-C12

*Continued on next page...*

*Continued from previous page...*

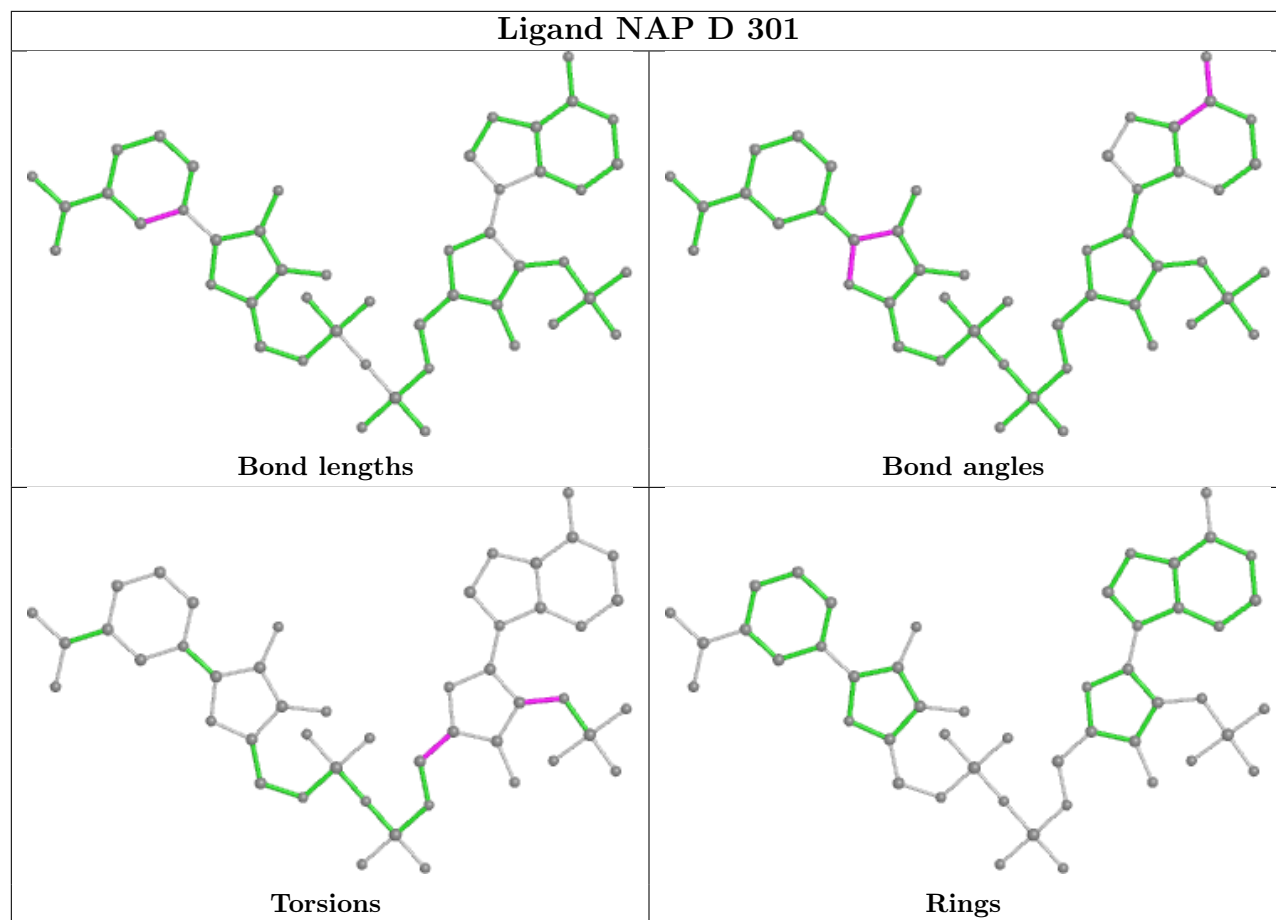
Mol	Chain	Res	Type	Atoms
3	D	302	8KD	C14-C11-C2-C3
3	E	302	8KD	C14-C11-C2-C12
3	E	302	8KD	C14-C11-C2-C3
2	E	301	NAP	C1B-C2B-O2B-P2B
2	E	301	NAP	C3B-C2B-O2B-P2B
3	A	302	8KD	C14-C11-C2-C12
3	B	302	8KD	C14-C11-C2-C12
3	D	302	8KD	C14-C11-C2-C1
3	E	302	8KD	C14-C11-C2-C1
2	E	301	NAP	PN-O3-PA-O1A
2	D	301	NAP	C3B-C2B-O2B-P2B
2	D	301	NAP	C1B-C2B-O2B-P2B
3	A	302	8KD	C14-C11-C2-C1
2	B	301	NAP	PN-O3-PA-O1A
2	B	301	NAP	O4B-C4B-C5B-O5B
2	B	301	NAP	C1B-C2B-O2B-P2B
2	B	301	NAP	C2B-O2B-P2B-O3X
2	A	301	NAP	O4B-C4B-C5B-O5B
2	E	301	NAP	C5B-O5B-PA-O1A
2	D	301	NAP	O4B-C4B-C5B-O5B
2	E	301	NAP	O4B-C4B-C5B-O5B
3	A	302	8KD	C2-C11-C14-C21

There are no ring outliers.

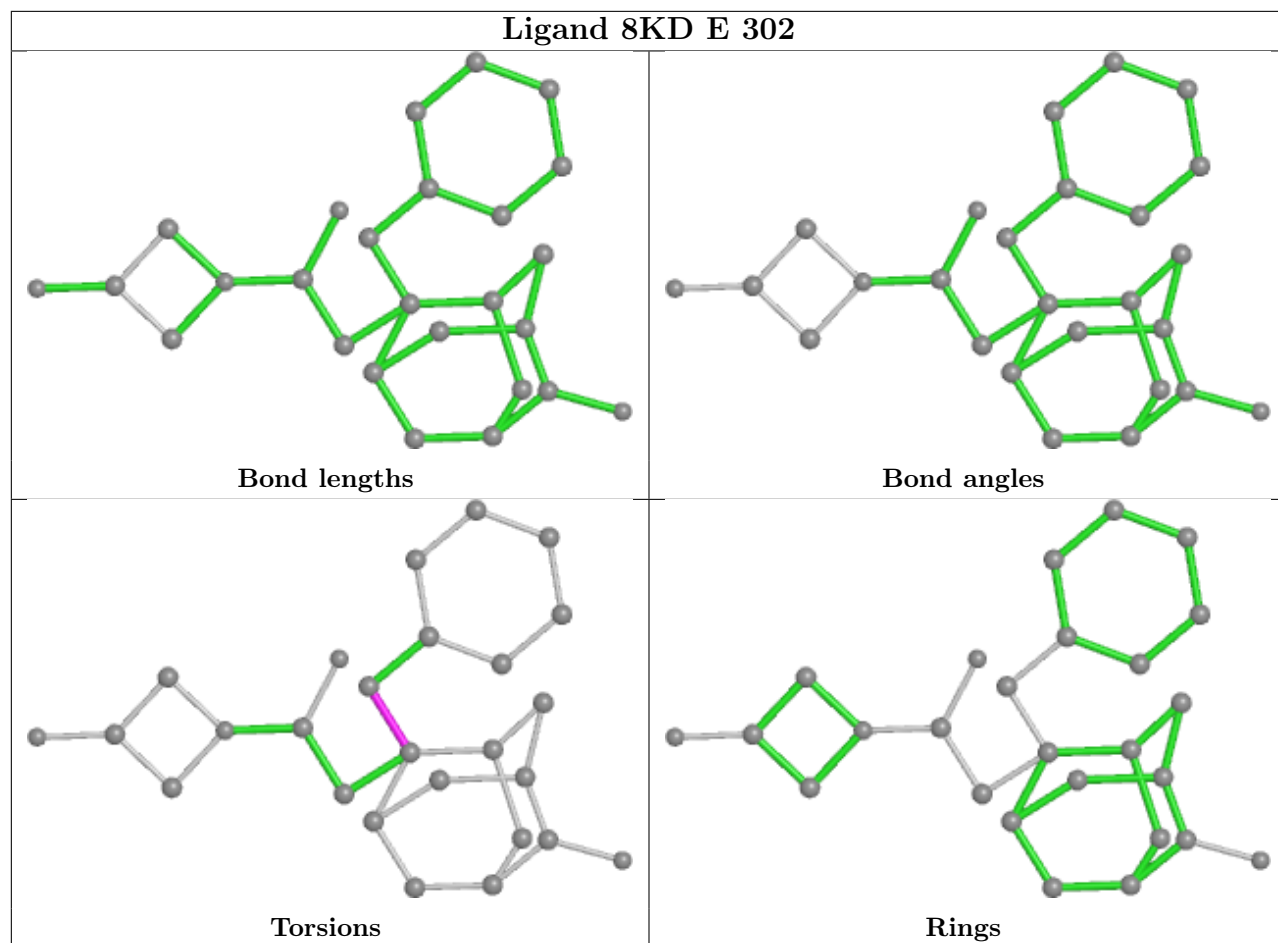
2 monomers are involved in 3 short contacts:

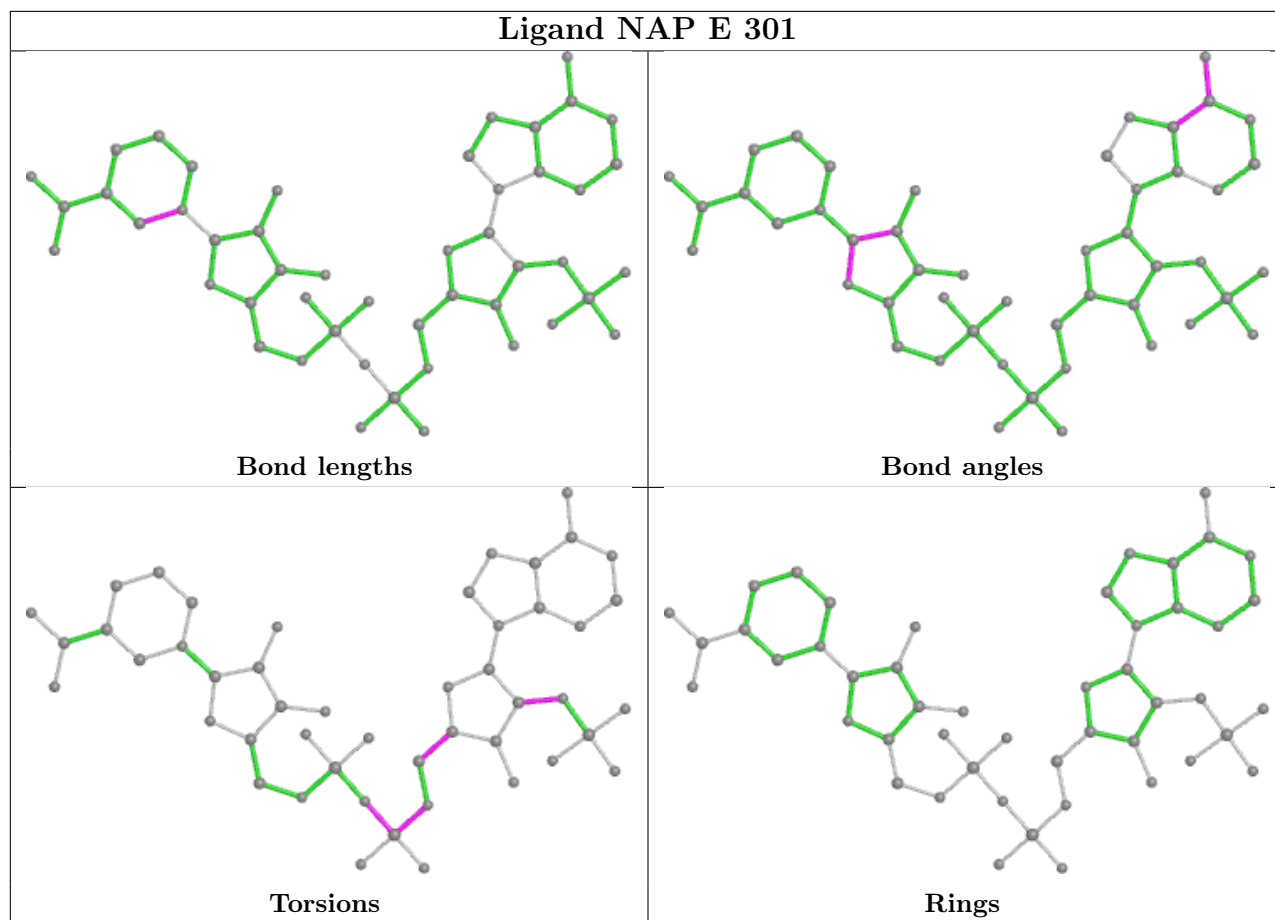
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	E	301	NAP	1	0
2	B	301	NAP	2	0

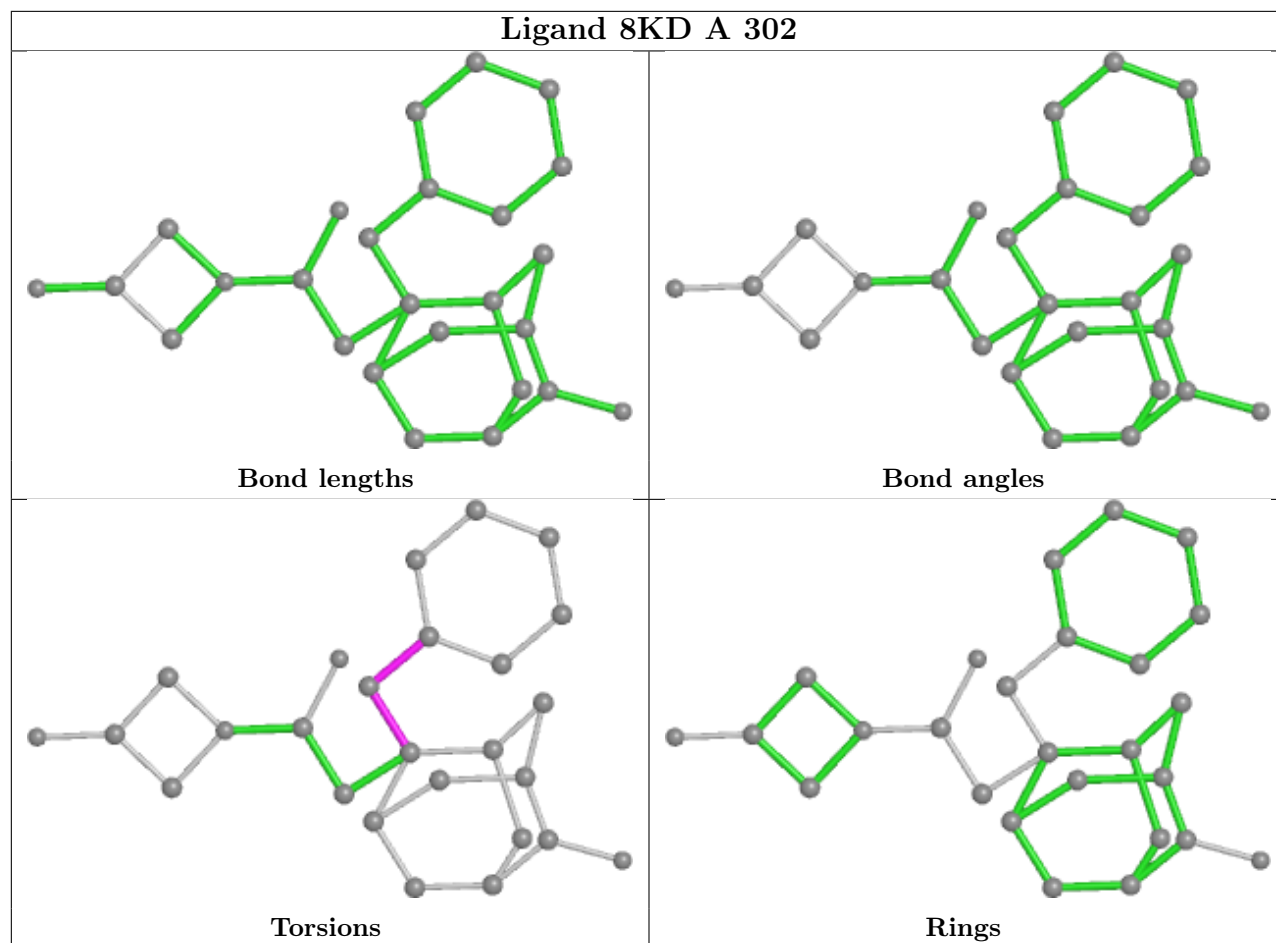
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

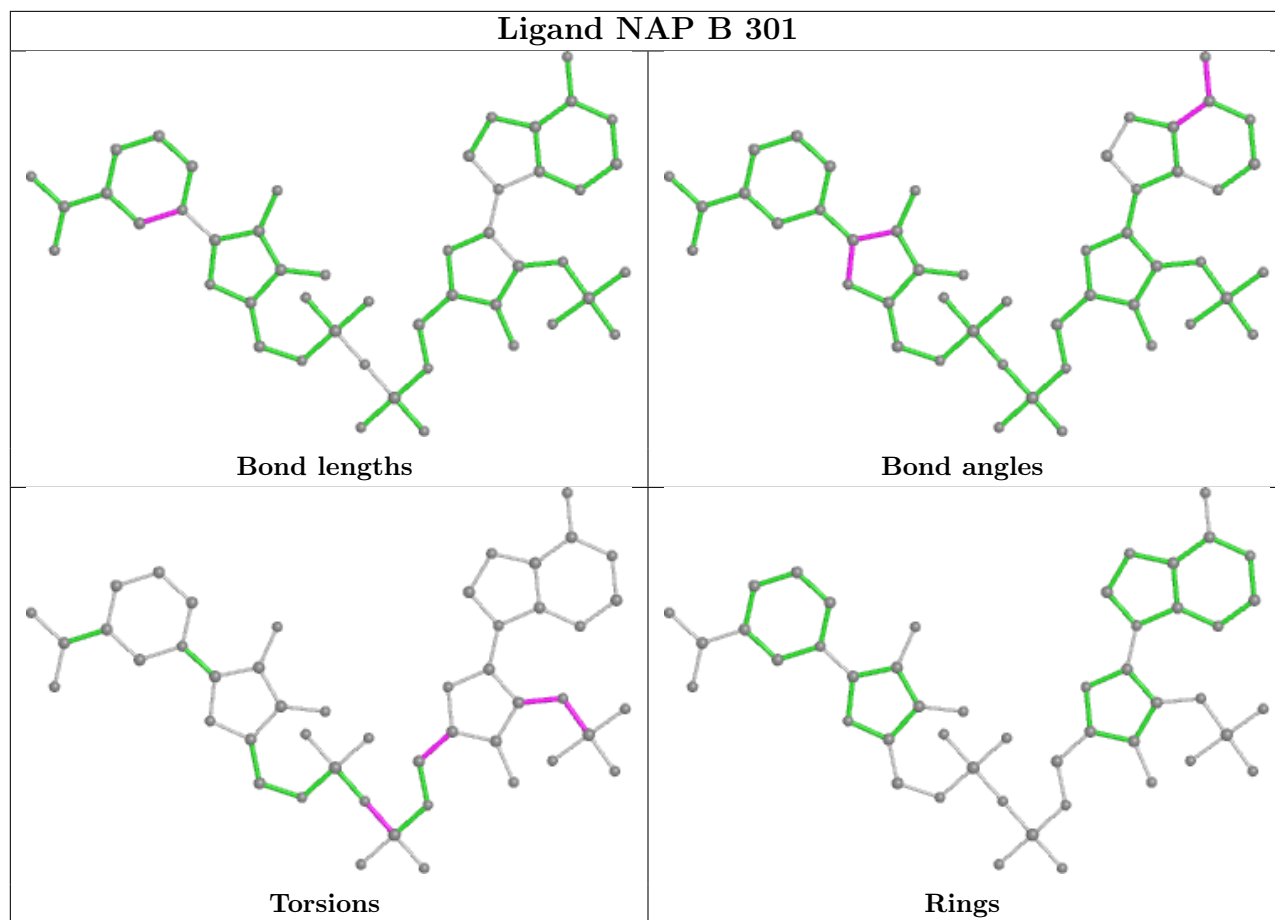


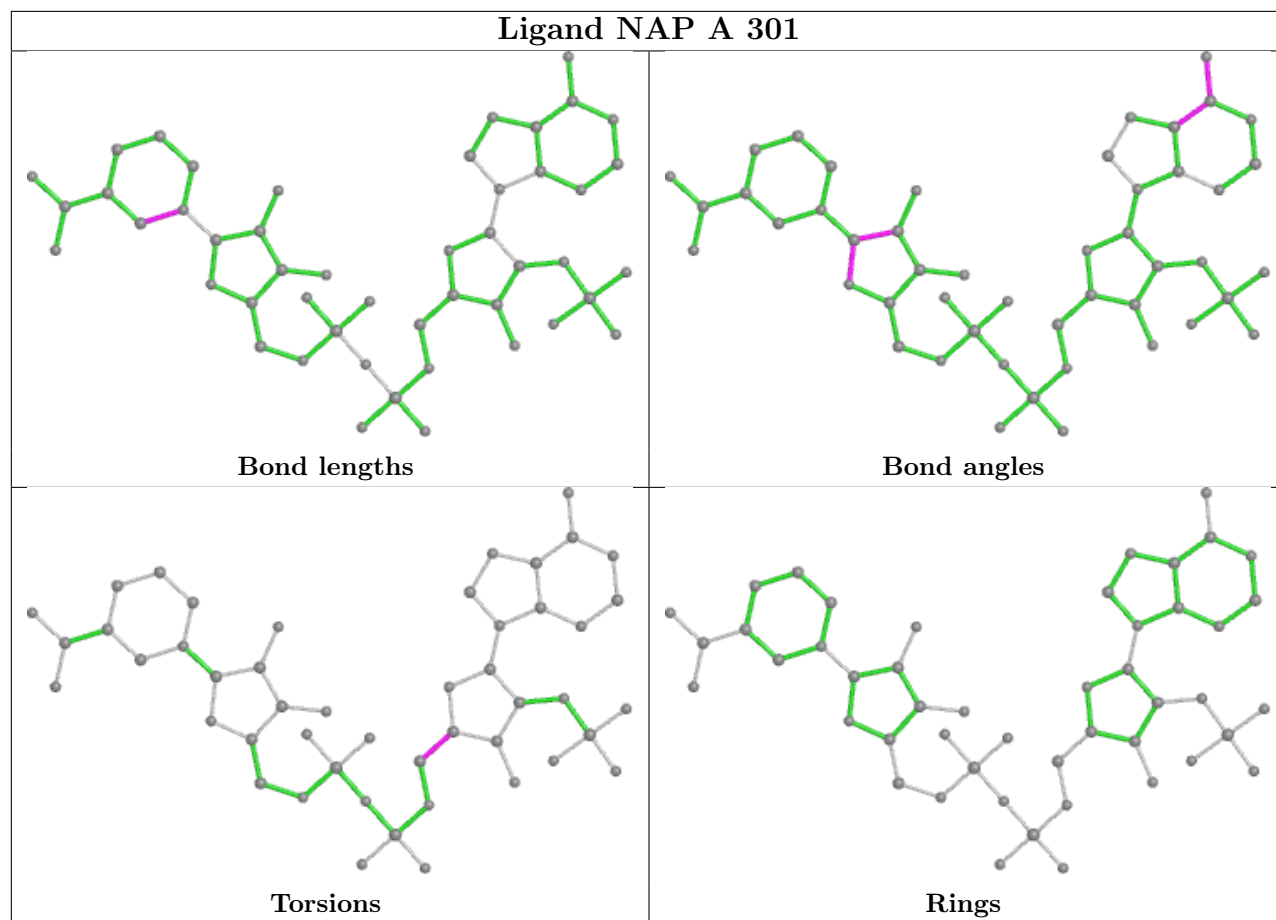


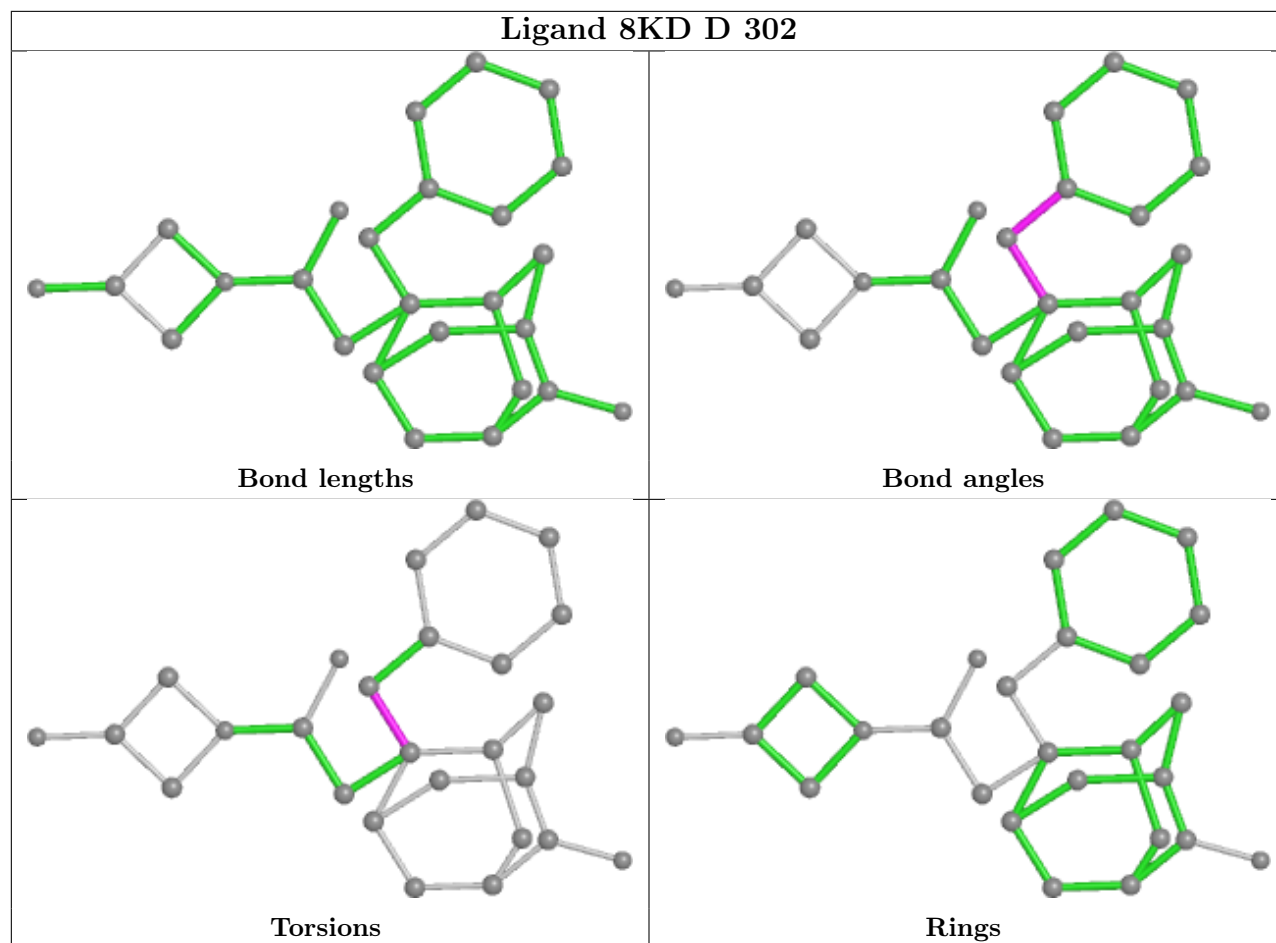


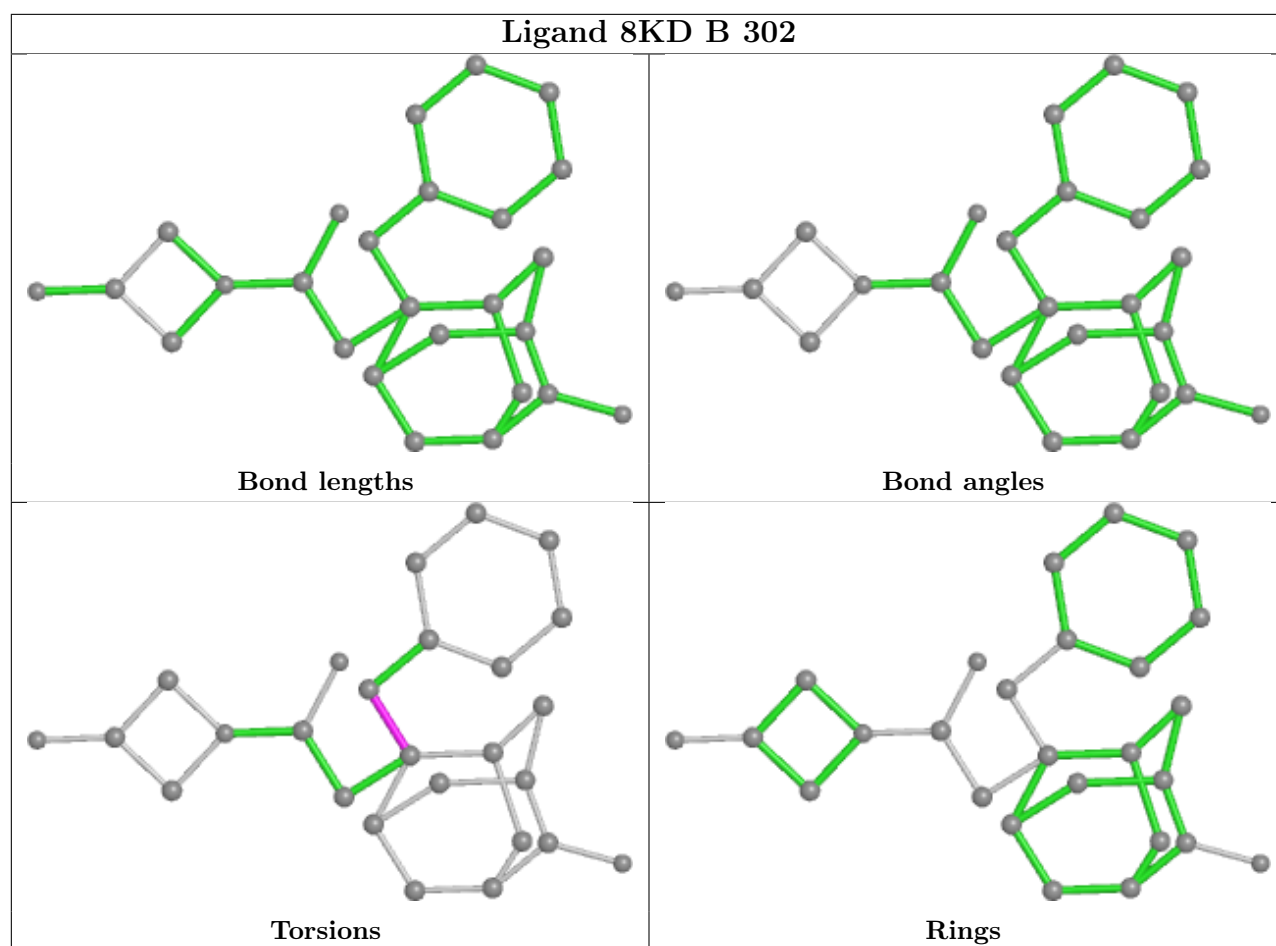












## 5.7 Other polymers [i](#)

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 [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	262/286 (91%)	-0.28	3 (1%) 80 82	26, 41, 66, 93	0
1	B	280/286 (97%)	-0.18	2 (0%) 87 89	24, 45, 69, 84	0
1	D	274/286 (95%)	-0.45	4 (1%) 73 75	16, 34, 63, 103	0
1	E	263/286 (91%)	-0.29	5 (1%) 66 69	22, 42, 65, 126	0
All	All	1079/1144 (94%)	-0.30	14 (1%) 77 79	16, 41, 67, 126	0

All (14) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	287	ASP	5.1
1	D	289	PHE	4.4
1	D	282	THR	4.1
1	A	234	GLN	3.5
1	D	284	TYR	3.3
1	D	288	ARG	3.2
1	B	11	ALA	2.9
1	B	23	SER	2.5
1	E	282	THR	2.5
1	E	26	GLU	2.5
1	A	205	ARG	2.4
1	E	25	GLU	2.4
1	E	286	MET	2.3
1	A	230	ILE	2.1

### 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

There are no monosaccharides in this entry.

### 6.4 Ligands

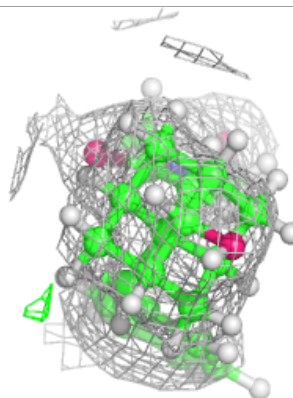
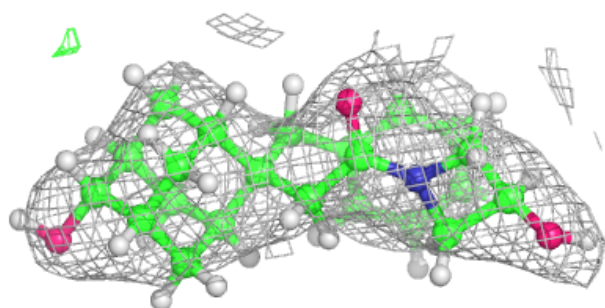
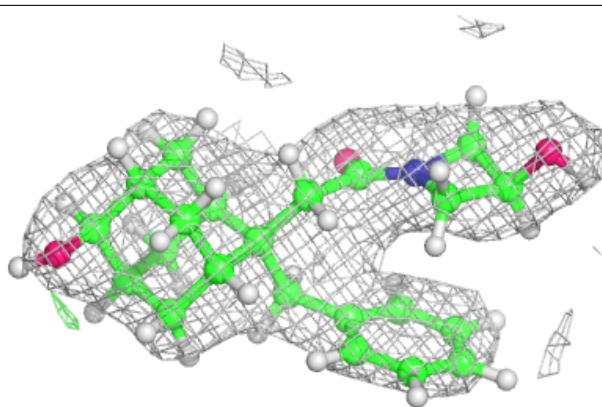
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
3	8KD	A	302	26/26	0.94	0.15	33,41,42,42	29
3	8KD	B	302	26/26	0.95	0.13	26,31,36,44	29
3	8KD	E	302	26/26	0.95	0.14	19,33,38,39	29
3	8KD	D	302	26/26	0.96	0.12	22,29,32,34	29
2	NAP	A	301	48/48	0.97	0.10	21,35,48,52	28
2	NAP	D	301	48/48	0.98	0.09	16,27,34,35	28
2	NAP	E	301	48/48	0.98	0.10	22,32,44,46	28
2	NAP	B	301	48/48	0.98	0.10	20,34,43,44	28

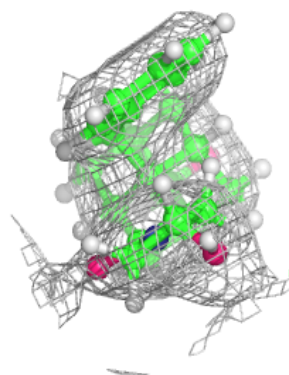
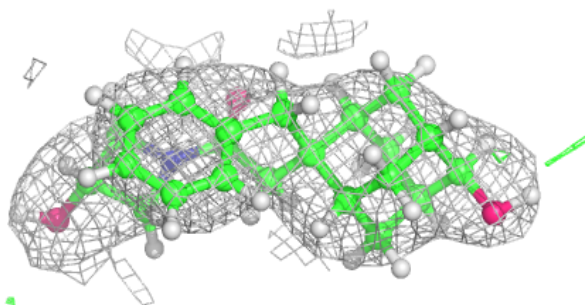
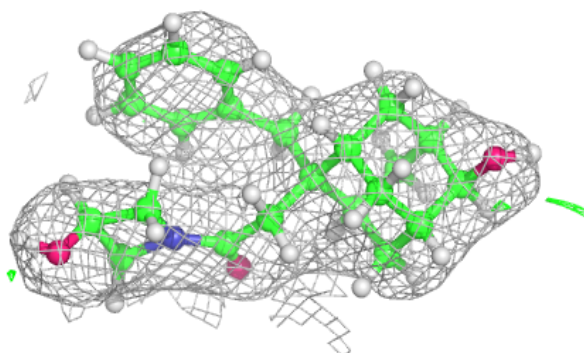
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

**Electron density around 8KD A 302:**

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

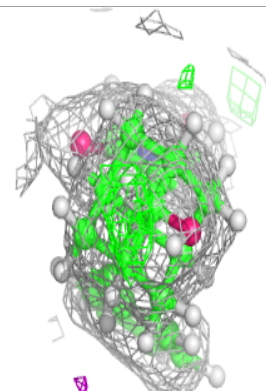
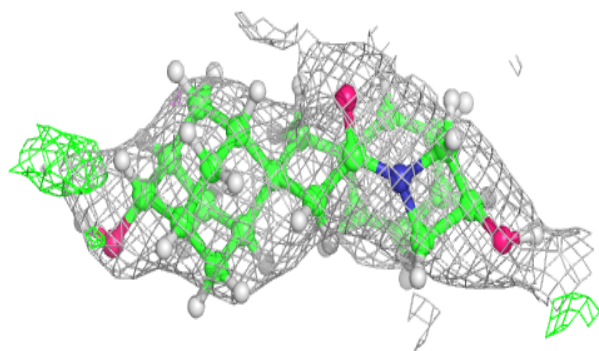
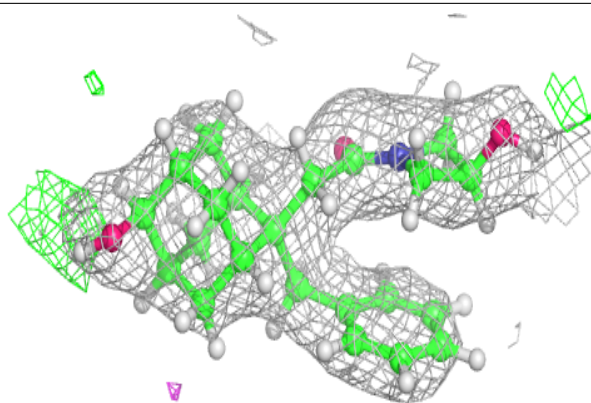
**Electron density around 8KD B 302:**

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

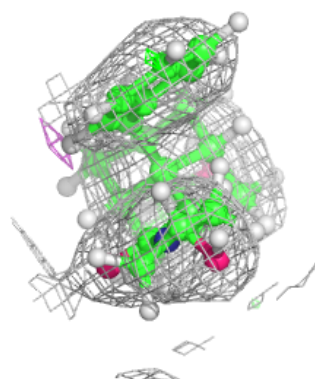
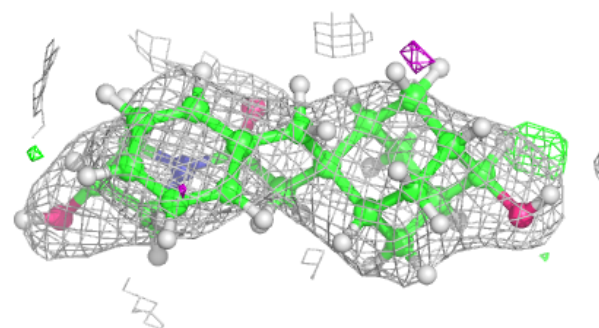
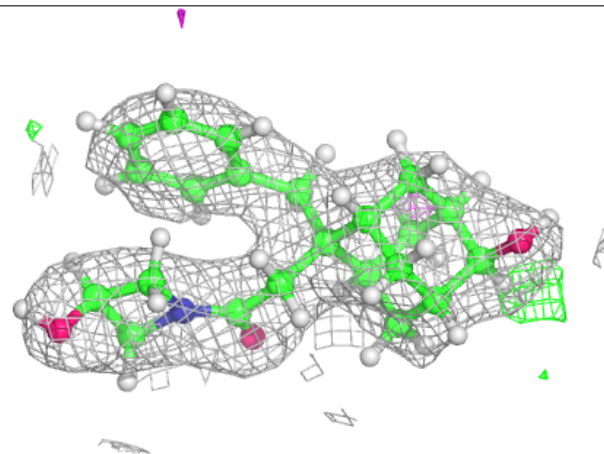


**Electron density around 8KD E 302:**

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

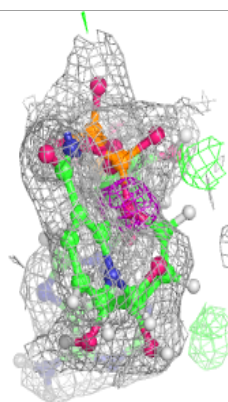
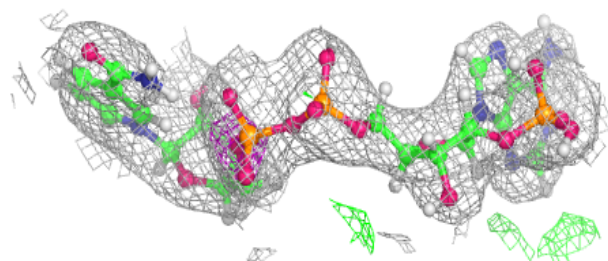
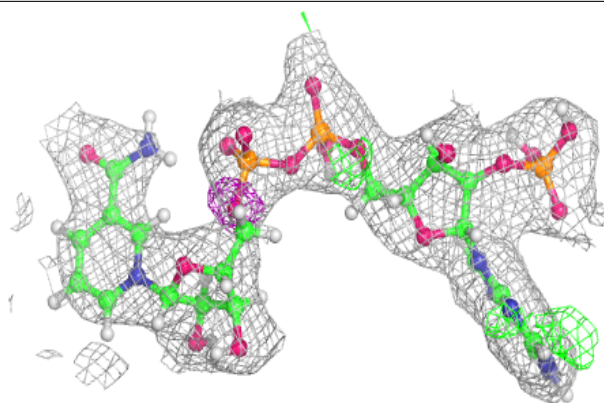
**Electron density around 8KD D 302:**

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

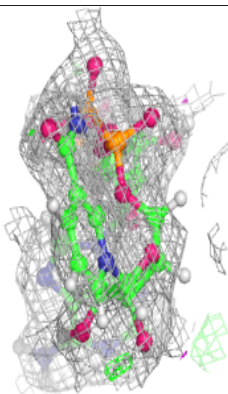
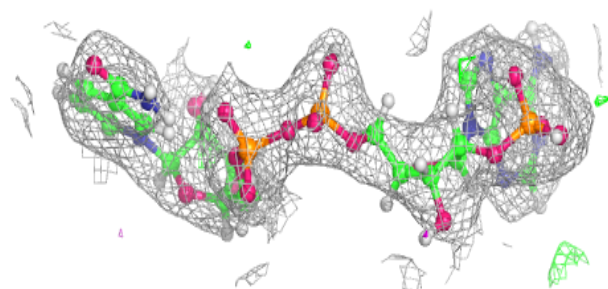
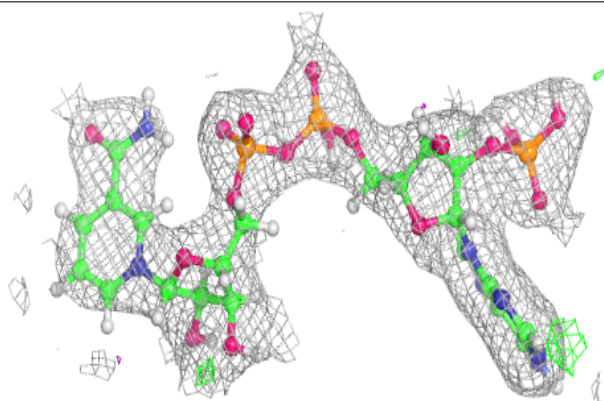


**Electron density around NAP A 301:**

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

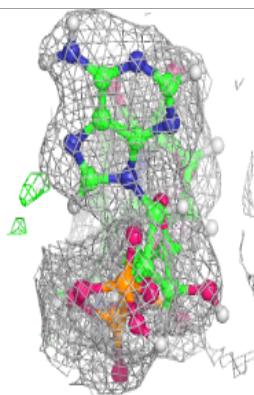
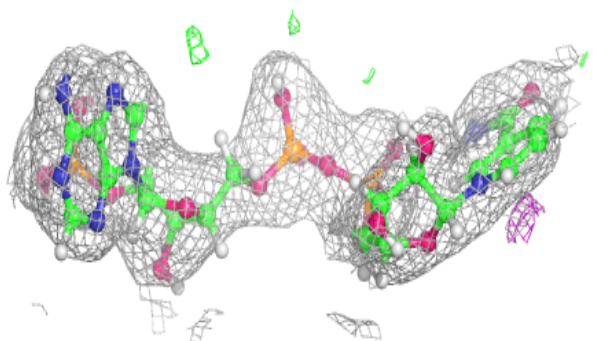
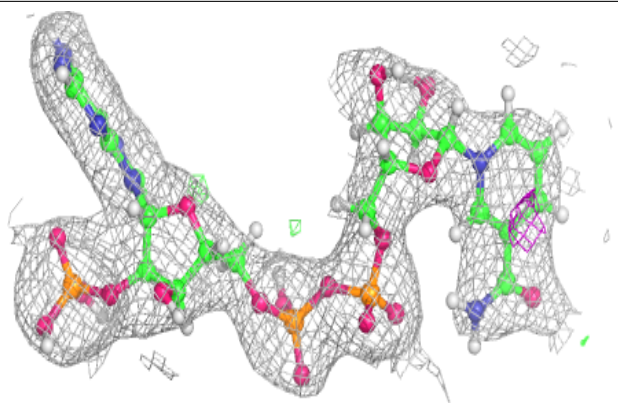
**Electron density around NAP D 301:**

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

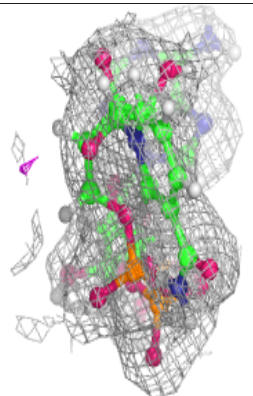
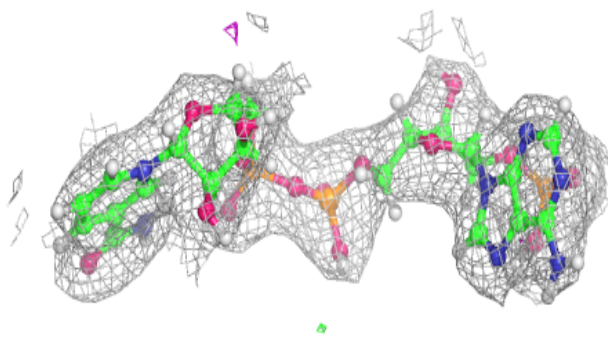
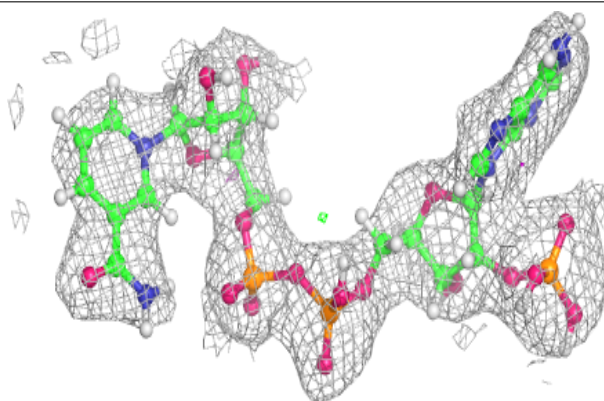


**Electron density around NAP E 301:**

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

**Electron density around NAP B 301:**

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



## 6.5 Other polymers [i](#)

There are no such residues in this entry.