



# Full wwPDB X-ray Structure Validation Report ⓘ

Aug 22, 2020 – 04:20 PM BST

PDB ID : 4FC6  
Title : Studies on DCR shed new light on peroxisomal beta-oxidation: Crystal structure of the ternary complex of pDCR  
Authors : Hua, T.; Wu, D.; Wang, J.; Shaw, N.; Liu, Z.-J.  
Deposited on : 2012-05-24  
Resolution : 2.10 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.

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

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.13.1  
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) : 2.13.1

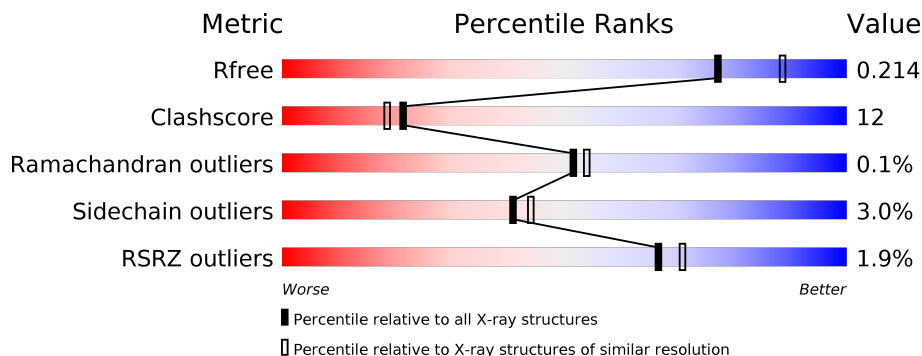
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.10 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	5197 (2.10-2.10)
Clashscore	141614	5710 (2.10-2.10)
Ramachandran outliers	138981	5647 (2.10-2.10)
Sidechain outliers	138945	5648 (2.10-2.10)
RSRZ outliers	127900	5083 (2.10-2.10)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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	277	 2% 81% 17%
1	B	277	 3% 82% 17%
1	C	277	 2% 87% 12%
1	D	277	 0% 82% 15%

## 2 Entry composition [i](#)

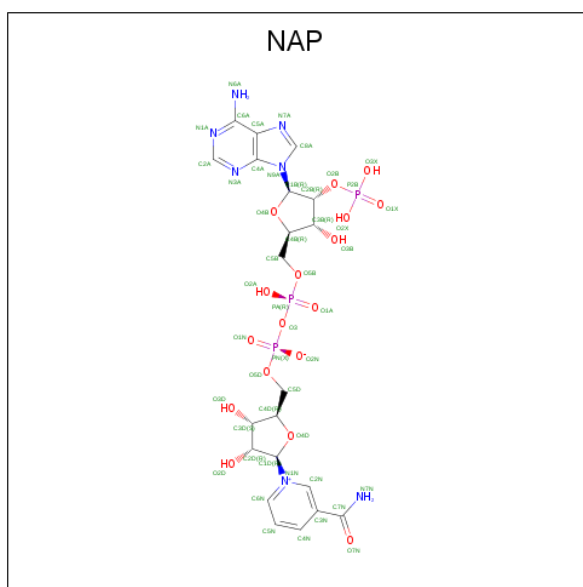
There are 4 unique types of molecules in this entry. The entry contains 9358 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Peroxisomal 2,4-dienoyl-CoA reductase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	274	Total	C	N	O	S	0	2	0
			2043	1294	371	366	12			
1	B	276	Total	C	N	O	S	0	1	0
			2051	1296	374	369	12			
1	C	276	Total	C	N	O	S	0	1	0
			2052	1297	374	369	12			
1	D	272	Total	C	N	O	S	0	1	0
			2021	1276	369	364	12			

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



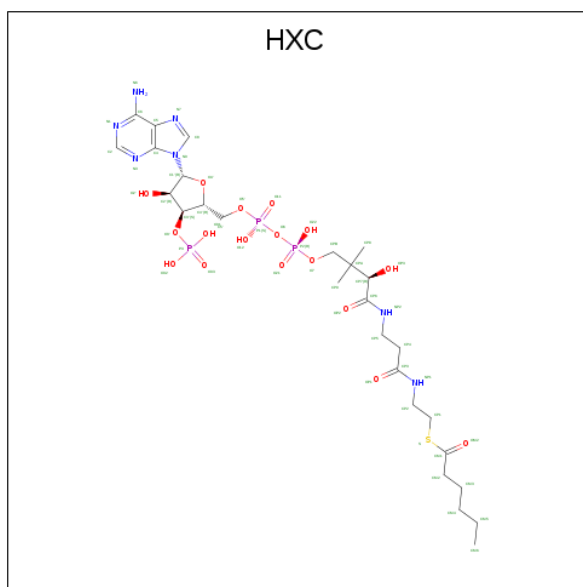
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
			Total	C	N	O			P
2	A	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
2	B	1	Total	C	N	O	P	0	0
			48	21	7	17	3		

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

- Molecule 3 is HEXANOYL-COENZYME A (three-letter code: HXC) (formula:  $C_{27}H_{46}N_7O_{17}P_3S$ ).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
			Total	C	N	O	P	S		
3	A	1	Total	C	N	O	P	S	0	0
			55	27	7	17	3	1		
3	B	1	Total	C	N	O	P	S	0	0
			55	27	7	17	3	1		
3	C	1	Total	C	N	O	P	S	0	0
			55	27	7	17	3	1		
3	D	1	Total	C	N	O	P	S	0	0
			55	27	7	17	3	1		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	225	Total	O	0	0
			225	225		
4	B	170	Total	O	0	0
			170	170		
4	C	200	Total	O	0	0
			200	200		

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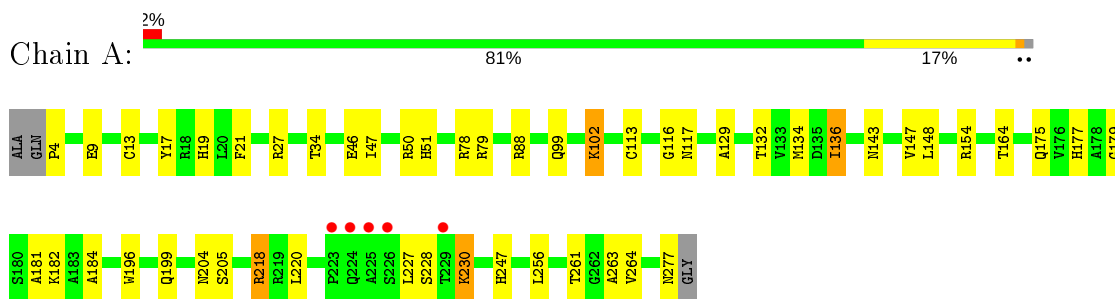
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<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>ZeroOcc</b>	<b>AltConf</b>
4	D	184	Total 184	O 184	0	0

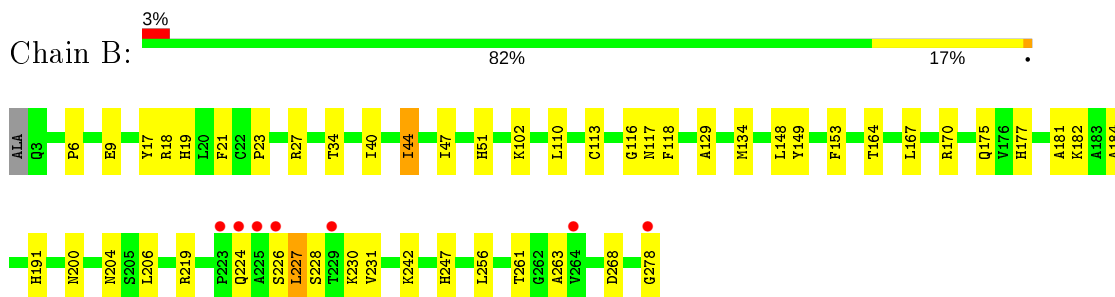
### 3 Residue-property plots [i](#)

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.

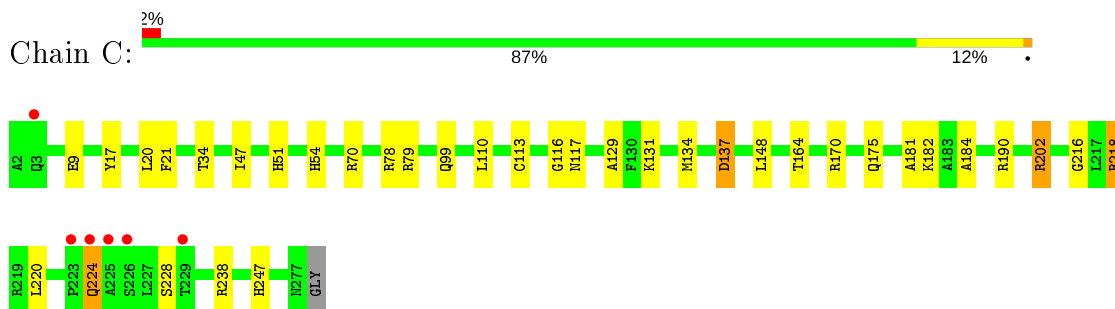
- Molecule 1: Peroxisomal 2,4-dienoyl-CoA reductase



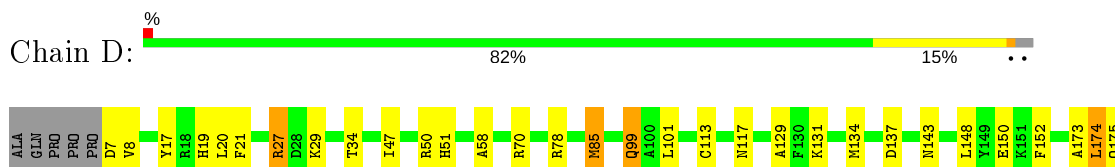
- Molecule 1: Peroxisomal 2,4-dienoyl-CoA reductase

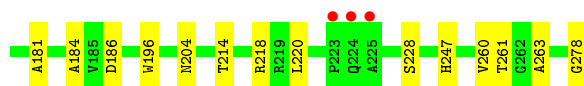


- Molecule 1: Peroxisomal 2,4-dienoyl-CoA reductase



- Molecule 1: Peroxisomal 2,4-dienoyl-CoA reductase





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	88.04Å 95.11Å 133.41Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	41.80 – 2.10 41.80 – 2.10	Depositor EDS
% Data completeness (in resolution range)	95.9 (41.80-2.10) 95.9 (41.80-2.10)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	8.28 (at 2.10Å)	Xtrriage
Refinement program	REFMAC 5.6.0117	Depositor
R, $R_{free}$	0.156 , 0.215 0.156 , 0.214	Depositor DCC
$R_{free}$ test set	3196 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	19.2	Xtrriage
Anisotropy	0.033	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.35 , 51.8	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	9358	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	19.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.26% 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: HXC, NAP

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	0.95	2/2092 (0.1%)	0.89	5/2842 (0.2%)
1	B	0.89	0/2097	0.86	2/2849 (0.1%)
1	C	0.90	0/2098	0.93	5/2851 (0.2%)
1	D	0.93	1/2064 (0.0%)	0.89	2/2801 (0.1%)
All	All	0.92	3/8351 (0.0%)	0.89	14/11343 (0.1%)

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	196	TRP	CD2-CE2	5.89	1.48	1.41
1	A	196	TRP	CG-CD1	5.61	1.44	1.36
1	D	196	TRP	CD2-CE2	5.56	1.48	1.41

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed( $^{\circ}$ )	Ideal( $^{\circ}$ )
1	C	202	ARG	NE-CZ-NH1	-7.49	116.56	120.30
1	A	79	ARG	NE-CZ-NH2	-6.34	117.13	120.30
1	A	79	ARG	NE-CZ-NH1	6.12	123.36	120.30
1	C	238	ARG	NE-CZ-NH2	-5.77	117.41	120.30
1	C	137	ASP	CB-CG-OD1	5.65	123.39	118.30
1	A	154	ARG	NE-CZ-NH2	-5.59	117.50	120.30
1	D	85	MET	CG-SD-CE	-5.57	91.29	100.20
1	C	190	ARG	NE-CZ-NH1	-5.55	117.52	120.30
1	B	219	ARG	NE-CZ-NH2	-5.52	117.54	120.30
1	D	186	ASP	CB-CG-OD1	5.40	123.16	118.30
1	B	268	ASP	CB-CG-OD1	5.33	123.09	118.30
1	A	27	ARG	NE-CZ-NH1	5.29	122.94	120.30
1	C	190	ARG	NE-CZ-NH2	5.16	122.88	120.30
1	A	218	ARG	NE-CZ-NH1	5.07	122.83	120.30

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	2043	0	2082	53	0
1	B	2051	0	2081	41	0
1	C	2052	0	2083	54	0
1	D	2021	0	2052	46	0
2	A	48	0	25	2	0
2	B	48	0	25	5	0
2	C	48	0	25	1	0
2	D	48	0	25	1	0
3	A	55	0	42	7	0
3	B	55	0	42	16	0
3	C	55	0	42	18	0
3	D	55	0	42	11	0
4	A	225	0	0	17	0
4	B	170	0	0	8	0
4	C	200	0	0	12	0
4	D	184	0	0	10	0
All	All	9358	0	8566	205	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 12.

All (205) 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:C:218:ARG:HH11	1:C:218:ARG:HG2	1.11	1.12
2:B:401:NAP:H2D	3:B:402:HXC:HP12	1.34	1.08
1:A:99:GLN:HG3	4:A:684:HOH:O	1.53	1.07
1:D:117:ASN:HD22	3:D:402:HXC:HM32	1.12	1.05
1:D:143:ASN:HB3	4:D:684:HOH:O	1.55	1.03
1:D:117:ASN:ND2	3:D:402:HXC:HM32	1.76	0.98
4:A:716:HOH:O	1:D:278:GLY:HA3	1.62	0.98

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:70:ARG:HD3	4:C:470:HOH:O	1.68	0.92
3:D:402:HXC:OP2	3:D:402:HXC:HPB2	1.68	0.91
1:D:99:GLN:HG3	4:D:604:HOH:O	1.71	0.88
1:C:218:ARG:HH11	1:C:218:ARG:CG	1.88	0.87
1:A:9:GLU:HB3	4:A:627:HOH:O	1.75	0.87
1:C:117:ASN:H	3:C:301:HXC:HP41	1.36	0.87
3:B:402:HXC:HPB2	3:B:402:HXC:OP2	1.74	0.87
2:D:401:NAP:O2D	3:D:402:HXC:HM21	1.74	0.87
1:A:4:PRO:HD2	4:A:629:HOH:O	1.75	0.86
2:B:401:NAP:C5N	3:B:402:HXC:HM22	2.06	0.86
1:C:116:GLY:HA2	3:C:301:HXC:HP52	1.57	0.84
1:C:116:GLY:HA2	3:C:301:HXC:CP5	2.08	0.83
1:B:117:ASN:HD21	1:B:175:GLN:HE22	1.27	0.82
1:B:167:LEU:HD11	3:B:402:HXC:HM32	1.60	0.82
1:A:88:ARG:HD3	1:A:136[A]:ILE:HD12	1.60	0.82
1:A:204:ASN:HD22	1:A:263:ALA:H	1.29	0.81
1:A:88:ARG:NH1	1:A:136[A]:ILE:HD11	1.94	0.81
1:C:220:LEU:CD1	3:C:301:HXC:HM31	2.10	0.81
1:A:132:THR:O	1:A:136[A]:ILE:HD13	1.81	0.81
1:C:99:GLN:HG3	4:C:501:HOH:O	1.82	0.79
1:C:117:ASN:HD21	1:C:175:GLN:HE22	1.29	0.79
1:A:19:HIS:HD2	4:A:589:HOH:O	1.64	0.79
1:B:17:TYR:OH	1:B:247:HIS:HE1	1.64	0.79
1:C:9:GLU:HG3	4:C:426:HOH:O	1.82	0.78
1:B:117:ASN:H	3:B:402:HXC:HP41	1.47	0.77
1:A:220:LEU:HD11	3:A:402:HXC:HM21	1.67	0.77
1:C:117:ASN:H	3:C:301:HXC:CP4	1.98	0.76
1:D:17:TYR:OH	1:D:247:HIS:HE1	1.69	0.75
1:C:131:LYS:CE	4:C:565:HOH:O	2.36	0.74
3:C:301:HXC:OP2	3:C:301:HXC:HP81	1.87	0.74
1:B:278:GLY:C	4:B:637:HOH:O	2.27	0.73
1:C:117:ASN:N	3:C:301:HXC:HP41	2.02	0.73
3:B:402:HXC:HM61	4:B:625:HOH:O	1.88	0.73
1:C:116:GLY:CA	3:C:301:HXC:HP52	2.19	0.73
1:C:224:GLN:HA	1:C:224:GLN:HE21	1.54	0.72
1:A:17:TYR:OH	1:A:247:HIS:HE1	1.73	0.71
1:D:143:ASN:CB	4:D:684:HOH:O	2.23	0.71
1:D:220:LEU:CD1	3:D:402:HXC:HM51	2.21	0.71
1:A:117:ASN:HD21	1:A:175:GLN:HE22	1.39	0.70
1:C:131:LYS:HE2	4:C:565:HOH:O	1.91	0.69
1:A:9:GLU:CB	4:A:627:HOH:O	2.35	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:54:HIS:HD2	1:C:79:ARG:H	1.38	0.68
1:C:9:GLU:CG	4:C:426:HOH:O	2.39	0.68
1:B:47:ILE:O	1:B:51:HIS:HD2	1.76	0.68
1:C:47:ILE:O	1:C:51:HIS:HD2	1.76	0.68
1:C:218:ARG:HG2	1:C:218:ARG:NH1	1.91	0.67
1:A:177:HIS:CD2	1:A:177:HIS:H	2.11	0.67
1:D:117:ASN:HD21	1:D:175:GLN:HE22	1.39	0.67
1:D:47:ILE:O	1:D:51:HIS:HD2	1.77	0.67
4:A:716:HOH:O	1:D:278:GLY:CA	2.33	0.67
1:A:88:ARG:HD3	1:A:136[A]:ILE:CD1	2.25	0.66
3:D:402:HXC:CM5	3:D:402:HXC:OM2	2.44	0.66
1:A:218:ARG:NH1	4:A:642:HOH:O	2.19	0.65
1:C:220:LEU:HD11	3:C:301:HXC:HM31	1.79	0.65
1:C:218:ARG:NE	4:C:520:HOH:O	2.24	0.65
3:B:402:HXC:HM51	4:B:520:HOH:O	1.97	0.65
1:A:116:GLY:HA3	3:A:402:HXC:HP92	1.79	0.64
1:D:117:ASN:HD22	3:D:402:HXC:CM3	2.01	0.63
1:A:47:ILE:O	1:A:51:HIS:HD2	1.82	0.63
2:A:401:NAP:C5N	3:A:402:HXC:HM51	2.29	0.63
3:C:301:HXC:OP2	3:C:301:HXC:CP8	2.46	0.62
1:A:204:ASN:ND2	1:A:263:ALA:H	1.96	0.62
1:B:110:LEU:HD22	1:B:148:LEU:HD12	1.81	0.62
1:D:7:ASP:N	4:D:667:HOH:O	2.32	0.62
1:A:4:PRO:HD3	4:A:615:HOH:O	1.99	0.61
1:D:204:ASN:HD22	1:D:263:ALA:H	1.49	0.61
1:B:17:TYR:OH	1:B:247:HIS:CE1	2.51	0.60
1:B:117:ASN:N	3:B:402:HXC:HP41	2.16	0.60
1:A:19:HIS:HE1	1:A:50:ARG:O	1.83	0.60
1:A:256:LEU:HD21	1:C:20:LEU:HB2	1.84	0.60
1:B:110:LEU:HB2	1:B:148:LEU:CD1	2.32	0.60
1:B:40:ILE:O	1:B:44:ILE:HD13	2.02	0.60
1:D:27:ARG:HD2	4:D:541:HOH:O	2.01	0.59
1:C:110:LEU:HB2	1:C:148:LEU:CD1	2.31	0.59
1:A:247:HIS:HD2	4:C:441:HOH:O	1.84	0.59
1:B:177:HIS:CD2	1:B:177:HIS:H	2.21	0.57
1:C:117:ASN:ND2	1:C:175:GLN:HE22	2.01	0.57
1:B:167:LEU:CD1	3:B:402:HXC:HM32	2.34	0.57
1:B:116:GLY:HA2	3:B:402:HXC:HP41	1.87	0.56
3:C:301:HXC:HM52	4:C:451:HOH:O	2.05	0.56
3:D:402:HXC:HM22	4:D:511:HOH:O	2.05	0.56
3:D:402:HXC:OM2	3:D:402:HXC:HM52	2.06	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:117:ASN:HB3	3:A:402:HXC:HP11	1.87	0.55
1:D:117:ASN:ND2	1:D:175:GLN:HE22	2.05	0.55
1:C:17:TYR:OH	1:C:247:HIS:HE1	1.90	0.55
1:A:164:THR:HA	1:A:182:LYS:HD2	1.89	0.54
1:B:40:ILE:HD13	1:B:242:LYS:HG2	1.88	0.54
1:C:117:ASN:HD21	1:C:175:GLN:NE2	2.03	0.54
1:A:179:GLY:HA3	1:B:191:HIS:NE2	2.23	0.54
1:A:19:HIS:CD2	4:A:589:HOH:O	2.48	0.53
1:C:116:GLY:HA3	3:C:301:HXC:HP92	1.90	0.53
1:A:88:ARG:CZ	1:A:136[A]:ILE:HD11	2.38	0.53
1:B:117:ASN:ND2	1:B:175:GLN:HE22	2.01	0.53
2:B:401:NAP:C6N	3:B:402:HXC:HM22	2.39	0.53
1:C:70:ARG:NH1	1:C:70:ARG:HB2	2.24	0.52
1:A:34:THR:O	1:A:113:CYS:HB3	2.09	0.52
1:A:277:ASN:C	4:A:682:HOH:O	2.47	0.52
1:B:51:HIS:HE1	4:B:511:HOH:O	1.93	0.52
1:D:17:TYR:OH	1:D:247:HIS:CE1	2.58	0.52
1:B:27:ARG:HG3	4:B:666:HOH:O	2.10	0.51
1:A:9:GLU:CD	1:A:9:GLU:H	2.12	0.51
2:B:401:NAP:C4N	3:B:402:HXC:HM22	2.40	0.51
1:C:224:GLN:CA	1:C:224:GLN:HE21	2.18	0.51
1:A:4:PRO:CD	4:A:629:HOH:O	2.45	0.51
1:C:216:GLY:HA2	3:C:301:HXC:HP22	1.93	0.50
1:D:134[B]:MET:CE	1:D:181:ALA:HB2	2.41	0.50
1:B:170:ARG:HD2	1:C:170:ARG:HD2	1.93	0.50
3:B:402:HXC:CM5	4:B:520:HOH:O	2.57	0.50
1:D:117:ASN:HD21	1:D:175:GLN:NE2	2.08	0.50
1:B:227:LEU:HD22	1:B:231:VAL:HG23	1.93	0.50
1:C:70:ARG:HB2	1:C:70:ARG:CZ	2.41	0.50
1:B:134[B]:MET:HE3	1:B:177:HIS:O	2.12	0.50
1:C:220:LEU:CD1	3:C:301:HXC:CM3	2.85	0.50
1:A:17:TYR:OH	1:A:247:HIS:CE1	2.60	0.49
1:B:224:GLN:OE1	1:B:224:GLN:HA	2.11	0.49
4:A:537:HOH:O	1:C:247:HIS:HD2	1.94	0.49
1:B:204:ASN:HD22	1:B:263:ALA:H	1.60	0.49
1:C:116:GLY:HA2	3:C:301:HXC:HP51	1.92	0.49
1:A:204:ASN:HD21	1:A:261:THR:HA	1.78	0.49
1:A:129:ALA:HB2	3:A:402:HXC:H1'	1.94	0.49
1:C:131:LYS:HZ3	1:D:131:LYS:HZ3	1.61	0.48
4:C:471:HOH:O	1:D:134[B]:MET:HG3	2.13	0.48
1:D:134[B]:MET:HE2	1:D:181:ALA:HB2	1.95	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:131:LYS:NZ	1:D:131:LYS:NZ	2.62	0.47
2:A:401:NAP:HO2N	3:A:402:HXC:CM1	2.27	0.47
1:C:164:THR:HA	1:C:182:LYS:HD2	1.96	0.47
1:C:110:LEU:HB2	1:C:148:LEU:HD12	1.97	0.47
1:D:204:ASN:ND2	1:D:263:ALA:H	2.10	0.47
1:C:134[A]:MET:HE2	1:C:181:ALA:HB2	1.97	0.47
1:A:184:ALA:HB2	1:B:184:ALA:HB2	1.96	0.47
1:B:21:PHE:HB2	1:B:51:HIS:CE1	2.50	0.46
1:B:227:LEU:O	1:B:230:LYS:HG2	2.15	0.46
1:A:21:PHE:HB2	1:A:51:HIS:CE1	2.50	0.46
1:C:21:PHE:HB2	1:C:51:HIS:CE1	2.50	0.46
1:B:117:ASN:HD21	1:B:175:GLN:NE2	2.04	0.46
1:C:134[A]:MET:CE	1:C:181:ALA:HB2	2.46	0.46
1:D:143:ASN:CG	4:D:684:HOH:O	2.45	0.46
1:B:19:HIS:CE1	1:B:23:PRO:HB3	2.51	0.46
1:B:118:PHE:O	1:B:177:HIS:HE1	1.99	0.46
3:C:301:HXC:HM41	2:C:302:NAP:C5N	2.46	0.46
1:B:117:ASN:H	3:B:402:HXC:CP4	2.23	0.45
2:B:401:NAP:C2D	3:B:402:HXC:HP12	2.25	0.45
1:A:13:CYS:HA	1:A:46:GLU:OE1	2.17	0.45
1:B:226:SER:HA	4:B:616:HOH:O	2.16	0.45
1:C:129:ALA:HB2	3:C:301:HXC:H1'	1.99	0.45
1:A:88:ARG:CD	1:A:136[A]:ILE:HD12	2.40	0.45
1:A:102:LYS:HD2	4:A:657:HOH:O	2.17	0.45
1:A:134[A]:MET:CE	1:A:181:ALA:HB2	2.48	0.44
1:D:8:VAL:HG13	4:D:596:HOH:O	2.16	0.44
1:A:134[A]:MET:HE1	1:A:181:ALA:N	2.32	0.44
1:D:58:ALA:HB1	1:D:85:MET:HG2	1.98	0.44
1:A:204:ASN:HD21	1:A:261:THR:CA	2.30	0.44
1:B:134[B]:MET:HE1	1:B:181:ALA:HB2	2.00	0.44
1:B:34:THR:O	1:B:113:CYS:HB3	2.17	0.44
1:C:51:HIS:HE1	4:C:411:HOH:O	2.00	0.44
1:D:129:ALA:HB2	3:D:402:HXC:H1'	2.00	0.44
1:D:204:ASN:HD21	1:D:261:THR:HA	1.82	0.44
1:C:110:LEU:HD22	1:C:148:LEU:HD12	2.00	0.44
1:B:129:ALA:HB2	3:B:402:HXC:H1'	1.98	0.44
1:D:29:LYS:HA	1:D:29:LYS:HD3	1.62	0.43
1:B:206:LEU:HD13	1:B:206:LEU:C	2.38	0.43
1:D:8:VAL:CG1	4:D:596:HOH:O	2.65	0.43
1:C:131:LYS:HZ3	1:D:131:LYS:NZ	2.15	0.43
1:C:220:LEU:HD13	3:C:301:HXC:HM31	1.97	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:117:ASN:ND2	1:A:175:GLN:HE22	2.12	0.43
1:A:205:SER:HB2	1:A:264:VAL:HG22	2.01	0.43
1:C:34:THR:O	1:C:113:CYS:HB3	2.18	0.43
1:A:175:GLN:NE2	4:A:654:HOH:O	2.52	0.42
1:A:227:LEU:O	1:A:230:LYS:HG2	2.19	0.42
1:C:137:ASP:HB2	1:C:181:ALA:HB1	2.01	0.42
1:C:218:ARG:NH1	1:C:218:ARG:CG	2.59	0.42
1:B:256:LEU:HD21	1:D:20:LEU:HB2	2.01	0.42
1:B:204:ASN:HD21	1:B:261:THR:HA	1.83	0.42
4:B:568:HOH:O	1:D:247:HIS:HD2	2.03	0.42
1:B:164:THR:HA	1:B:182:LYS:HD2	2.02	0.42
1:D:117:ASN:HB2	3:D:402:HXC:HM22	2.00	0.42
1:D:70:ARG:HD3	4:D:530:HOH:O	2.20	0.42
1:C:202:ARG:HH11	1:C:202:ARG:HD3	1.67	0.42
1:A:220:LEU:CD1	3:A:402:HXC:HM21	2.44	0.41
1:D:21:PHE:HB2	1:D:51:HIS:CE1	2.55	0.41
1:D:204:ASN:ND2	1:D:260:VAL:HG12	2.36	0.41
1:A:117:ASN:HD21	1:A:175:GLN:NE2	2.14	0.41
1:C:78:ARG:NH1	4:C:594:HOH:O	2.52	0.41
1:D:214:THR:O	1:D:218:ARG:HG3	2.19	0.41
1:B:204:ASN:ND2	1:B:263:ALA:H	2.18	0.41
1:D:101:LEU:HD23	1:D:101:LEU:HA	1.80	0.41
1:D:19:HIS:HE1	1:D:50:ARG:O	2.03	0.41
1:C:184:ALA:HB2	1:D:184:ALA:HB2	2.01	0.41
1:D:34:THR:O	1:D:113:CYS:HB3	2.21	0.41
1:A:143:ASN:O	1:A:147:VAL:HG23	2.21	0.41
1:D:173:ALA:O	1:D:174:LEU:HB2	2.20	0.40
1:D:85:MET:O	1:D:85:MET:HG3	2.20	0.40
1:A:134[A]:MET:HE1	1:A:177:HIS:O	2.22	0.40
1:A:4:PRO:HD3	4:A:578:HOH:O	2.21	0.40
1:A:51:HIS:HE1	4:A:512:HOH:O	2.03	0.40
1:B:149:TYR:HA	1:B:153:PHE:HB2	2.02	0.40
1:D:137:ASP:HB2	1:D:181:ALA:HB1	2.04	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	274/277 (99%)	267 (97%)	7 (3%)	0	100	100
1	B	275/277 (99%)	268 (98%)	7 (2%)	0	100	100
1	C	275/277 (99%)	269 (98%)	6 (2%)	0	100	100
1	D	271/277 (98%)	267 (98%)	3 (1%)	1 (0%)	34	32
All	All	1095/1108 (99%)	1071 (98%)	23 (2%)	1 (0%)	51	54

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	152	PHE

### 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	213/212 (100%)	205 (96%)	8 (4%)	33	34
1	B	213/212 (100%)	205 (96%)	8 (4%)	33	34
1	C	213/212 (100%)	210 (99%)	3 (1%)	67	73
1	D	209/212 (99%)	202 (97%)	7 (3%)	38	40
All	All	848/848 (100%)	822 (97%)	26 (3%)	41	43

All (26) residues with a non-rotameric sidechain are listed below:



Mol	Chain	Res	Type
1	A	78	ARG
1	A	102	LYS
1	A	136[A]	ILE
1	A	136[B]	ILE
1	A	148	LEU
1	A	199	GLN
1	A	228	SER
1	A	230	LYS
1	B	6	PRO
1	B	9	GLU
1	B	18	ARG
1	B	44	ILE
1	B	102	LYS
1	B	200	ASN
1	B	227	LEU
1	B	228	SER
1	C	218	ARG
1	C	224	GLN
1	C	228	SER
1	D	27	ARG
1	D	78	ARG
1	D	99	GLN
1	D	148	LEU
1	D	150	GLU
1	D	174	LEU
1	D	228	SER

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (33) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	19	HIS
1	A	51	HIS
1	A	99	GLN
1	A	112	ASN
1	A	175	GLN
1	A	177	HIS
1	A	199	GLN
1	A	204	ASN
1	A	247	HIS
1	B	3	GLN
1	B	19	HIS
1	B	51	HIS
1	B	99	GLN

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Mol	Chain	Res	Type
1	B	112	ASN
1	B	175	GLN
1	B	177	HIS
1	B	200	ASN
1	B	204	ASN
1	B	247	HIS
1	C	19	HIS
1	C	51	HIS
1	C	54	HIS
1	C	156	HIS
1	C	175	GLN
1	C	224	GLN
1	C	247	HIS
1	D	19	HIS
1	D	51	HIS
1	D	112	ASN
1	D	175	GLN
1	D	204	ASN
1	D	224	GLN
1	D	247	HIS

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

### 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

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	A	401	-	45,52,52	1.36	6 (13%)	56,80,80	1.37	6 (10%)
3	HXC	D	402	-	49,57,57	1.50	5 (10%)	60,83,83	2.95	21 (35%)
2	NAP	C	302	-	45,52,52	1.19	3 (6%)	56,80,80	1.39	10 (17%)
3	HXC	A	402	-	49,57,57	1.68	6 (12%)	60,83,83	3.17	20 (33%)
3	HXC	B	402	-	49,57,57	1.76	10 (20%)	60,83,83	3.50	29 (48%)
2	NAP	B	401	-	45,52,52	1.05	1 (2%)	56,80,80	1.31	6 (10%)
3	HXC	C	301	-	49,57,57	2.02	7 (14%)	60,83,83	5.08	20 (33%)
2	NAP	D	401	-	45,52,52	1.17	4 (8%)	56,80,80	1.37	9 (16%)

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	A	401	-	-	6/31/67/67	0/5/5/5
3	HXC	D	402	-	-	6/52/72/72	0/3/3/3
2	NAP	C	302	-	-	5/31/67/67	0/5/5/5
3	HXC	A	402	-	-	7/52/72/72	0/3/3/3
3	HXC	B	402	-	-	18/52/72/72	0/3/3/3
2	NAP	B	401	-	-	7/31/67/67	0/5/5/5
3	HXC	C	301	-	-	14/52/72/72	0/3/3/3
2	NAP	D	401	-	-	5/31/67/67	0/5/5/5

All (42) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	301	HXC	CM2-CM1	9.77	1.60	1.50
3	B	402	HXC	CM2-CM1	6.83	1.57	1.50
3	A	402	HXC	CM2-CM1	6.63	1.57	1.50
3	D	402	HXC	CM2-CM1	6.60	1.57	1.50
3	C	301	HXC	CM1-S	5.29	1.89	1.76
3	A	402	HXC	OM2-CM1	4.54	1.28	1.21
3	C	301	HXC	P3-O3'	4.47	1.67	1.59
3	A	402	HXC	CM1-S	3.98	1.85	1.76

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	302	NAP	P2B-O2B	3.78	1.66	1.59
2	A	401	NAP	O4D-C1D	3.76	1.46	1.41
2	B	401	NAP	P2B-O2B	3.46	1.65	1.59
3	D	402	HXC	OM2-CM1	3.32	1.26	1.21
2	A	401	NAP	C5N-C4N	3.31	1.45	1.38
3	B	402	HXC	CP5-NP2	3.26	1.53	1.46
2	D	401	NAP	P2B-O2B	3.22	1.65	1.59
3	B	402	HXC	OM2-CM1	3.17	1.26	1.21
2	A	401	NAP	C2N-N1N	3.16	1.38	1.35
3	B	402	HXC	P3-O3'	3.04	1.65	1.59
3	C	301	HXC	OM2-CM1	2.99	1.25	1.21
3	A	402	HXC	C5-C4	2.99	1.48	1.40
3	A	402	HXC	P3-O3'	2.91	1.64	1.59
3	C	301	HXC	C2-N3	2.71	1.36	1.32
2	D	401	NAP	C5A-C4A	2.67	1.48	1.40
2	C	302	NAP	C5A-C4A	2.66	1.48	1.40
3	C	301	HXC	C5-C4	2.57	1.47	1.40
3	B	402	HXC	OP2-CP6	2.54	1.28	1.23
3	B	402	HXC	C5-C4	2.51	1.47	1.40
2	D	401	NAP	O4B-C1B	-2.48	1.37	1.41
2	A	401	NAP	C4N-C3N	2.42	1.43	1.39
2	D	401	NAP	O4D-C1D	2.41	1.44	1.41
3	D	402	HXC	C2-N3	2.37	1.35	1.32
3	B	402	HXC	OP1-CP3	-2.35	1.18	1.23
2	A	401	NAP	C7N-N7N	2.31	1.37	1.33
2	A	401	NAP	P2B-O2B	2.15	1.63	1.59
2	C	302	NAP	C2N-N1N	2.13	1.37	1.35
3	D	402	HXC	P2-O21	-2.12	1.43	1.50
3	B	402	HXC	C2-N3	2.08	1.35	1.32
3	C	301	HXC	CP4-CP3	-2.05	1.47	1.51
3	B	402	HXC	CM1-S	-2.04	1.71	1.76
3	D	402	HXC	P1-O12	-2.02	1.45	1.55
3	A	402	HXC	C2-N3	2.02	1.35	1.32
3	B	402	HXC	CP6-NP2	2.02	1.38	1.33

All (121) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	301	HXC	OM2-CM1-CM2	-22.14	97.85	123.99
3	C	301	HXC	CM2-CM1-S	21.91	138.97	113.46
3	A	402	HXC	OM2-CM1-CM2	-15.59	105.59	123.99
3	A	402	HXC	CM2-CM1-S	11.92	127.33	113.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	402	HXC	CP5-NP2-CP6	11.61	143.30	122.59
3	D	402	HXC	CM2-CM1-S	10.78	126.00	113.46
3	D	402	HXC	CP9-CPA-CPB	9.94	124.44	108.23
3	C	301	HXC	CM3-CM2-CM1	9.43	133.24	112.33
3	C	301	HXC	OP3-CP7-CPA	7.97	129.01	110.25
3	B	402	HXC	CP4-CP3-NP1	7.85	129.63	116.42
3	D	402	HXC	OM2-CM1-CM2	-7.62	114.99	123.99
3	C	301	HXC	OP2-CP6-NP2	7.51	139.13	122.99
3	C	301	HXC	CP5-CP4-CP3	-7.41	100.01	112.36
3	B	402	HXC	CP9-CPA-CPB	7.38	120.26	108.23
3	B	402	HXC	CM3-CM2-CM1	7.17	128.24	112.33
3	D	402	HXC	O7-CPB-CPA	7.05	121.88	110.55
3	C	301	HXC	O4'-C1'-C2'	-6.81	96.98	106.93
3	C	301	HXC	CP7-CP6-NP2	-6.70	103.24	116.58
3	C	301	HXC	CP8-CPA-CP7	6.67	120.39	108.82
3	B	402	HXC	CP7-CP6-NP2	6.32	129.16	116.58
3	B	402	HXC	CP1-S-CM1	6.29	121.47	101.87
3	B	402	HXC	O4'-C1'-C2'	-6.25	97.79	106.93
3	B	402	HXC	OM2-CM1-S	-6.20	114.56	122.61
3	B	402	HXC	OP1-CP3-CP4	-6.19	110.69	122.02
3	C	301	HXC	OP1-CP3-CP4	-5.96	111.12	122.02
3	B	402	HXC	O7-CPB-CPA	5.04	118.65	110.55
3	A	402	HXC	O4'-C1'-C2'	-4.66	100.11	106.93
3	A	402	HXC	CP2-NP1-CP3	4.46	131.12	122.84
2	A	401	NAP	O7N-C7N-C3N	-4.39	114.38	119.63
2	A	401	NAP	N3A-C2A-N1A	-4.21	122.10	128.68
2	A	401	NAP	C3N-C7N-N7N	4.18	122.76	117.75
3	B	402	HXC	CP9-CPA-CP7	4.17	116.04	108.82
3	B	402	HXC	CP8-CPA-CP7	4.17	116.04	108.82
3	C	301	HXC	CP4-CP3-NP1	4.14	123.39	116.42
3	A	402	HXC	CP7-CP6-NP2	4.13	124.81	116.58
3	C	301	HXC	N3-C2-N1	-4.12	122.25	128.68
3	D	402	HXC	CP1-S-CM1	-4.03	89.32	101.87
3	B	402	HXC	OM2-CM1-CM2	4.02	128.74	123.99
3	A	402	HXC	CP1-S-CM1	-3.91	89.69	101.87
2	C	302	NAP	N3A-C2A-N1A	-3.88	122.62	128.68
3	B	402	HXC	OP2-CP6-CP7	-3.86	109.29	121.06
2	B	401	NAP	N3A-C2A-N1A	-3.67	122.94	128.68
2	D	401	NAP	N3A-C2A-N1A	-3.65	122.97	128.68
3	D	402	HXC	O7-P2-O21	3.62	123.21	109.07
3	D	402	HXC	CP5-NP2-CP6	3.61	129.02	122.59
3	D	402	HXC	CP8-CPA-CP7	3.59	115.05	108.82

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	401	NAP	O4B-C1B-C2B	-3.56	100.42	106.59
3	B	402	HXC	N6-C6-N1	3.52	125.89	118.57
3	C	301	HXC	O7-CPB-CPA	-3.51	104.90	110.55
3	A	402	HXC	C2-N1-C6	3.45	124.65	118.75
3	D	402	HXC	CM3-CM2-CM1	3.45	119.97	112.33
3	A	402	HXC	OM2-CM1-S	3.43	127.07	122.61
2	C	302	NAP	O4D-C1D-C2D	-3.33	102.05	106.93
3	B	402	HXC	O12-P1-O11	3.16	127.86	112.24
3	C	301	HXC	CP9-CPA-CPB	3.15	113.37	108.23
3	A	402	HXC	N6-C6-N1	3.14	125.09	118.57
3	D	402	HXC	CP8-CPA-CPB	-3.13	103.13	108.23
3	B	402	HXC	O32-P3-O31	3.08	119.39	107.64
3	A	402	HXC	OP1-CP3-CP4	-3.07	116.41	122.02
3	B	402	HXC	O22-P2-O21	3.04	127.25	112.24
3	B	402	HXC	CP8-CPA-CP9	-3.00	103.05	109.17
2	C	302	NAP	C4A-C5A-N7A	-2.99	106.28	109.40
3	B	402	HXC	CP8-CPA-CPB	-2.99	103.36	108.23
3	C	301	HXC	C2-N1-C6	2.93	123.77	118.75
3	D	402	HXC	O4'-C1'-C2'	-2.85	102.77	106.93
3	D	402	HXC	C4-C5-N7	-2.84	106.44	109.40
3	C	301	HXC	CP4-CP5-NP2	2.82	117.59	111.90
3	A	402	HXC	CP9-CPA-CP7	2.81	113.70	108.82
2	C	302	NAP	O2N-PN-O1N	2.81	126.13	112.24
3	D	402	HXC	CP1-CP2-NP1	-2.79	106.55	112.42
3	D	402	HXC	OM2-CM1-S	-2.79	118.99	122.61
2	B	401	NAP	O2N-PN-O1N	2.77	125.95	112.24
3	C	301	HXC	CP8-CPA-CPB	-2.77	103.71	108.23
3	B	402	HXC	CM2-CM1-S	2.75	116.65	113.46
3	D	402	HXC	OP1-CP3-NP1	2.70	128.12	123.01
3	B	402	HXC	OP3-CP7-CP6	2.69	122.38	109.42
2	B	401	NAP	N6A-C6A-N1A	2.67	124.12	118.57
3	A	402	HXC	C5-C6-N1	-2.64	114.36	120.35
2	B	401	NAP	C5A-C6A-N6A	-2.63	116.35	120.35
3	B	402	HXC	CP4-CP5-NP2	2.61	117.16	111.90
2	B	401	NAP	O4B-C1B-C2B	-2.61	102.07	106.59
3	C	301	HXC	C3'-C2'-C1'	2.59	105.63	99.89
3	A	402	HXC	O3'-P3-O33	-2.57	99.48	109.39
3	A	402	HXC	CP8-CPA-CP9	-2.56	103.95	109.17
3	A	402	HXC	OP2-CP6-CP7	-2.55	113.28	121.06
3	D	402	HXC	CP9-CPA-CP7	2.53	113.20	108.82
2	D	401	NAP	C6N-N1N-C2N	-2.53	119.67	121.97
3	D	402	HXC	O32-P3-O33	2.52	120.56	110.68

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	402	HXC	CP1-CP2-NP1	2.52	117.72	112.42
2	D	401	NAP	O3X-P2B-O1X	2.52	120.56	110.68
3	B	402	HXC	O31-P3-O3'	-2.52	94.71	105.99
3	A	402	HXC	O31-P3-O33	2.48	120.40	110.68
2	D	401	NAP	O2A-PA-O1A	2.46	124.38	112.24
2	C	302	NAP	C2A-N1A-C6A	2.43	122.91	118.75
2	A	401	NAP	O2B-P2B-O1X	-2.41	100.11	109.39
3	A	402	HXC	CM4-CM3-CM2	2.37	121.72	113.19
3	B	402	HXC	C3'-C2'-C1'	2.36	105.12	99.89
3	A	402	HXC	N3-C2-N1	-2.36	125.00	128.68
2	D	401	NAP	O2N-PN-O1N	2.33	123.76	112.24
3	D	402	HXC	O12-P1-O5'	-2.33	96.93	107.75
3	A	402	HXC	CP5-NP2-CP6	2.31	126.72	122.59
2	C	302	NAP	C2B-C3B-C4B	2.30	106.99	101.99
3	B	402	HXC	N3-C2-N1	-2.29	125.10	128.68
2	C	302	NAP	O3X-P2B-O1X	2.26	119.54	110.68
3	C	301	HXC	N6-C6-N1	2.26	123.27	118.57
3	A	402	HXC	OP1-CP3-NP1	2.26	127.28	123.01
3	B	402	HXC	C2-N1-C6	2.22	122.55	118.75
2	C	302	NAP	O3X-P2B-O2X	2.22	116.11	107.64
3	B	402	HXC	C5-C6-N1	-2.17	115.44	120.35
2	C	302	NAP	C3B-C2B-C1B	-2.17	98.82	102.89
3	C	301	HXC	O12-P1-O11	2.15	122.85	112.24
2	D	401	NAP	C4A-C5A-N7A	-2.14	107.17	109.40
2	A	401	NAP	O3B-C3B-C4B	-2.14	104.86	111.05
3	D	402	HXC	CP7-CP6-NP2	2.11	120.79	116.58
3	D	402	HXC	O12-P1-O11	2.11	122.66	112.24
2	D	401	NAP	O3B-C3B-C4B	-2.10	104.97	111.05
2	B	401	NAP	PN-O3-PA	-2.10	125.63	132.83
2	D	401	NAP	C2A-N1A-C6A	2.08	122.30	118.75
2	A	401	NAP	C4A-C5A-N7A	-2.05	107.26	109.40
2	C	302	NAP	O2B-P2B-O1X	-2.05	101.50	109.39
3	D	402	HXC	CP4-CP3-NP1	-2.04	112.99	116.42

There are no chirality outliers.

All (68) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	C	302	NAP	C5D-O5D-PN-O2N
3	A	402	HXC	CP2-CP1-S-CM1
3	A	402	HXC	CM2-CM1-S-CP1
3	A	402	HXC	OM2-CM1-S-CP1

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Mol	Chain	Res	Type	Atoms
3	A	402	HXC	CM1-CM2-CM3-CM4
3	B	402	HXC	C3'-O3'-P3-O31
3	B	402	HXC	CP7-CPA-CPB-O7
3	B	402	HXC	OP3-CP7-CPA-CPB
3	B	402	HXC	CP7-CP6-NP2-CP5
3	B	402	HXC	OP2-CP6-NP2-CP5
3	B	402	HXC	CP4-CP3-NP1-CP2
3	B	402	HXC	OP1-CP3-NP1-CP2
3	B	402	HXC	CP2-CP1-S-CM1
3	B	402	HXC	CM2-CM1-S-CP1
3	B	402	HXC	OM2-CM1-S-CP1
3	B	402	HXC	CM1-CM2-CM3-CM4
2	B	401	NAP	C5B-O5B-PA-O1A
2	B	401	NAP	C5D-O5D-PN-O2N
3	C	301	HXC	OP2-CP6-CP7-OP3
3	C	301	HXC	NP2-CP6-CP7-OP3
3	C	301	HXC	CP7-CP6-NP2-CP5
3	C	301	HXC	OP2-CP6-NP2-CP5
3	C	301	HXC	CM2-CM1-S-CP1
3	C	301	HXC	OM2-CM1-S-CP1
3	C	301	HXC	CM1-CM2-CM3-CM4
2	D	401	NAP	C5B-O5B-PA-O1A
3	C	301	HXC	CP4-CP3-NP1-CP2
3	C	301	HXC	OP1-CP3-NP1-CP2
3	B	402	HXC	CP9-CPA-CPB-O7
2	D	401	NAP	PA-O3-PN-O1N
3	B	402	HXC	CM2-CM3-CM4-CM5
3	C	301	HXC	OP2-CP6-CP7-CPA
3	D	402	HXC	CM3-CM4-CM5-CM6
3	D	402	HXC	CM1-CM2-CM3-CM4
2	A	401	NAP	C5D-O5D-PN-O3
2	C	302	NAP	C2B-O2B-P2B-O3X
3	B	402	HXC	C3'-O3'-P3-O32
2	B	401	NAP	C5D-O5D-PN-O3
3	A	402	HXC	CM3-CM4-CM5-CM6
2	C	302	NAP	C5D-O5D-PN-O1N
2	B	401	NAP	C5B-O5B-PA-O2A
2	B	401	NAP	C5D-O5D-PN-O1N
3	D	402	HXC	CP8-CPA-CPB-O7
3	B	402	HXC	CP8-CPA-CPB-O7
2	A	401	NAP	PA-O3-PN-O2N
2	D	401	NAP	PA-O3-PN-O2N

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Mol	Chain	Res	Type	Atoms
3	A	402	HXC	OP1-CP3-NP1-CP2
3	B	402	HXC	CP3-CP4-CP5-NP2
3	C	301	HXC	CP3-CP4-CP5-NP2
3	D	402	HXC	CP9-CPA-CPB-O7
3	C	301	HXC	NP2-CP6-CP7-CPA
3	D	402	HXC	CM2-CM3-CM4-CM5
3	D	402	HXC	CP2-CP1-S-CM1
3	C	301	HXC	CP2-CP1-S-CM1
2	A	401	NAP	PA-O3-PN-O1N
3	B	402	HXC	S-CP1-CP2-NP1
2	C	302	NAP	O4B-C4B-C5B-O5B
2	C	302	NAP	C5D-O5D-PN-O3
3	B	402	HXC	OP3-CP7-CPA-CP9
2	B	401	NAP	C5B-O5B-PA-O3
2	D	401	NAP	C5B-O5B-PA-O3
2	B	401	NAP	O4B-C4B-C5B-O5B
2	D	401	NAP	O4B-C4B-C5B-O5B
2	A	401	NAP	C5B-O5B-PA-O2A
2	A	401	NAP	C5D-O5D-PN-O1N
2	A	401	NAP	O4B-C4B-C5B-O5B
3	C	301	HXC	S-CP1-CP2-NP1
3	A	402	HXC	CP1-CP2-NP1-CP3

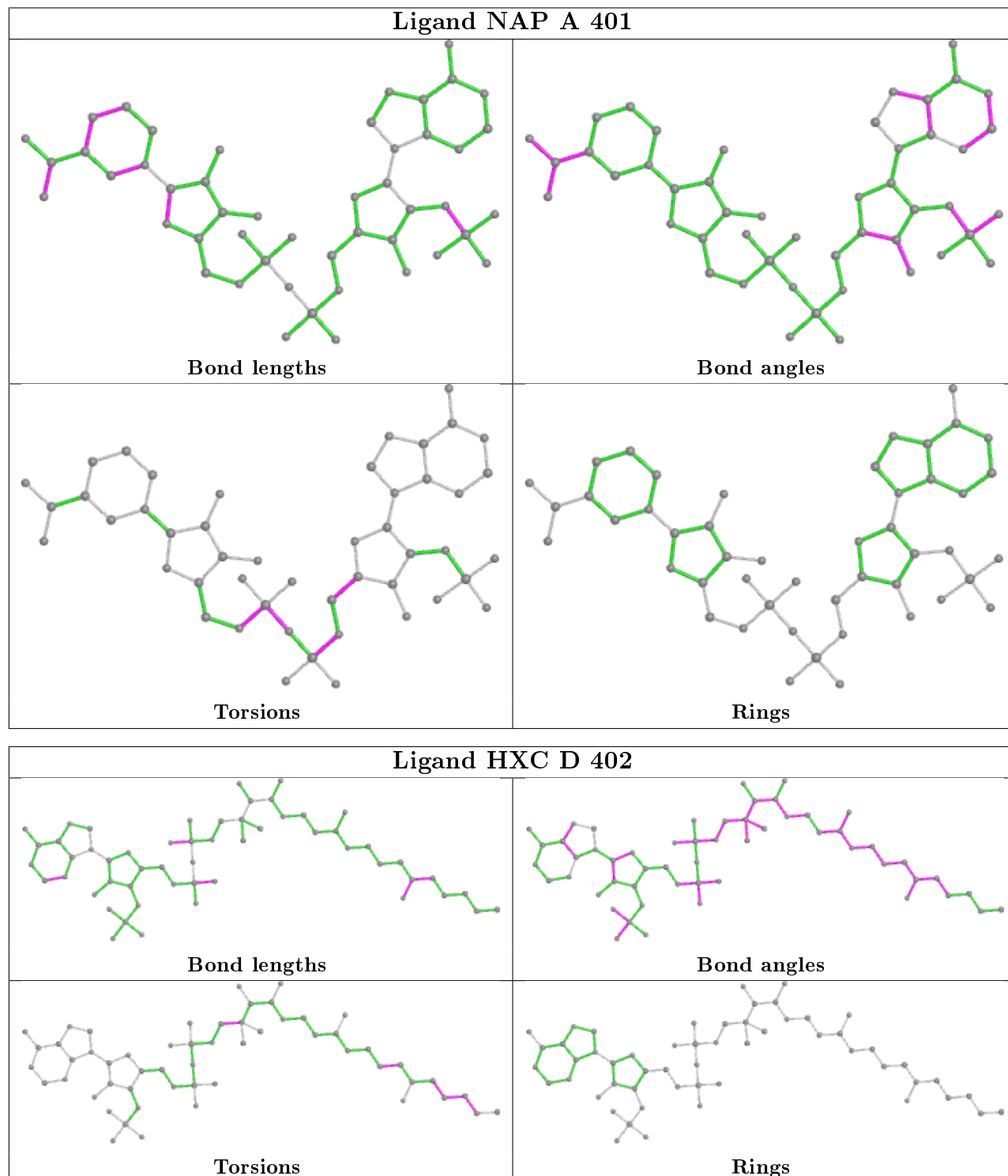
There are no ring outliers.

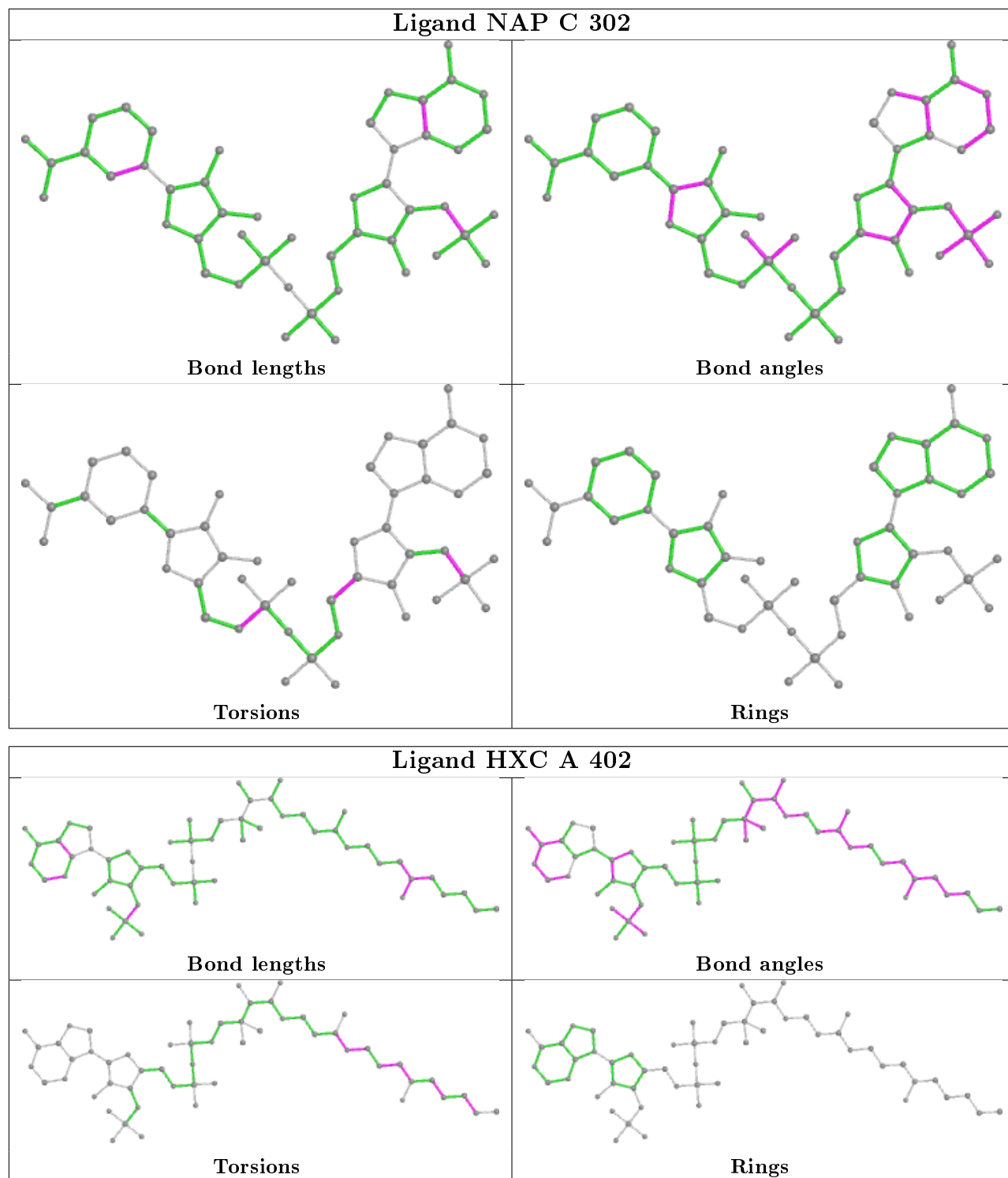
8 monomers are involved in 52 short contacts:

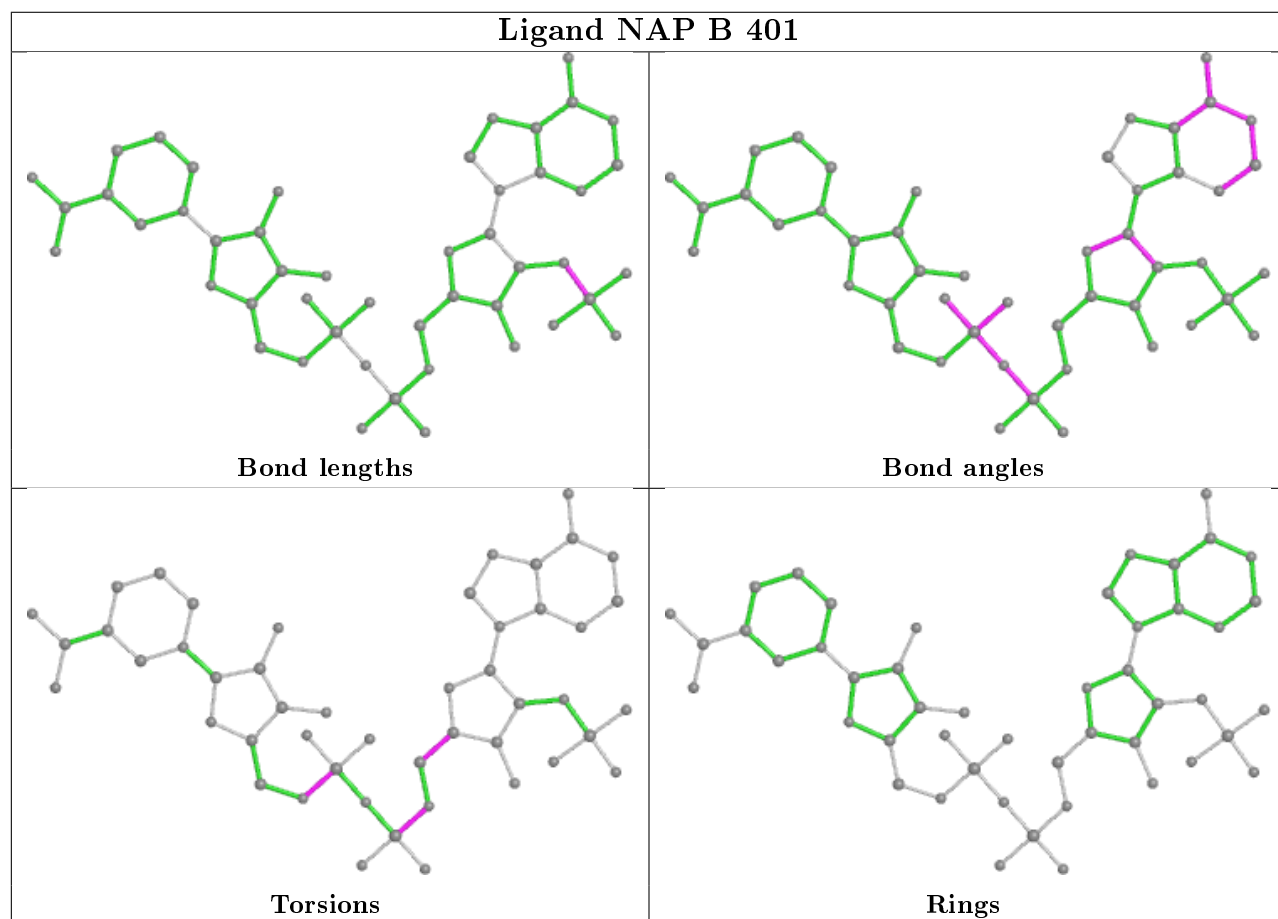
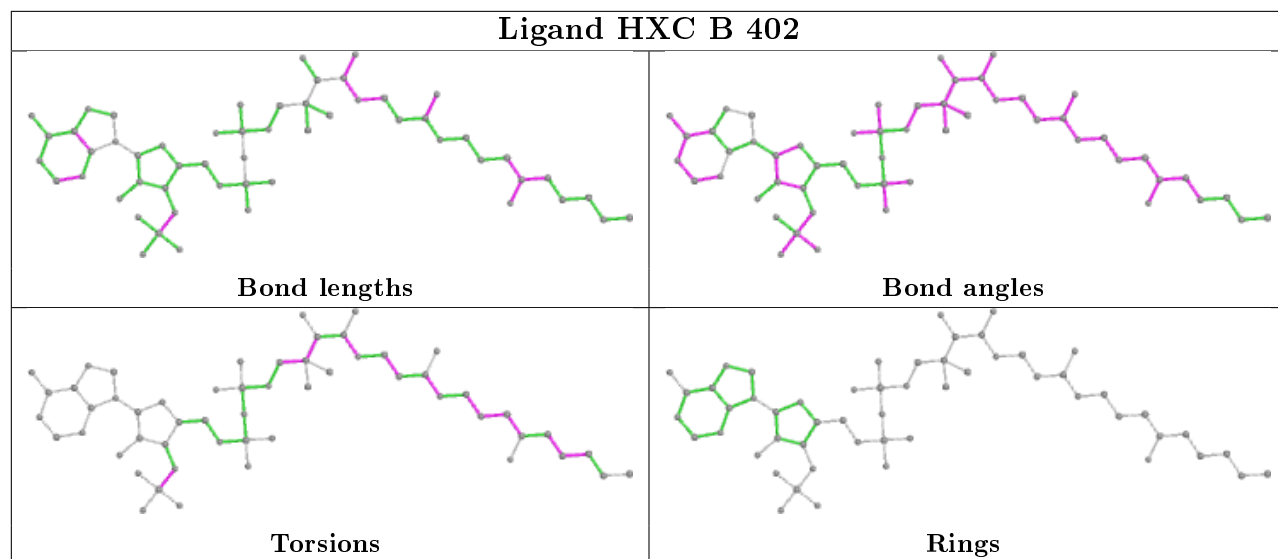
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	401	NAP	2	0
3	D	402	HXC	11	0
2	C	302	NAP	1	0
3	A	402	HXC	7	0
3	B	402	HXC	16	0
2	B	401	NAP	5	0
3	C	301	HXC	18	0
2	D	401	NAP	1	0

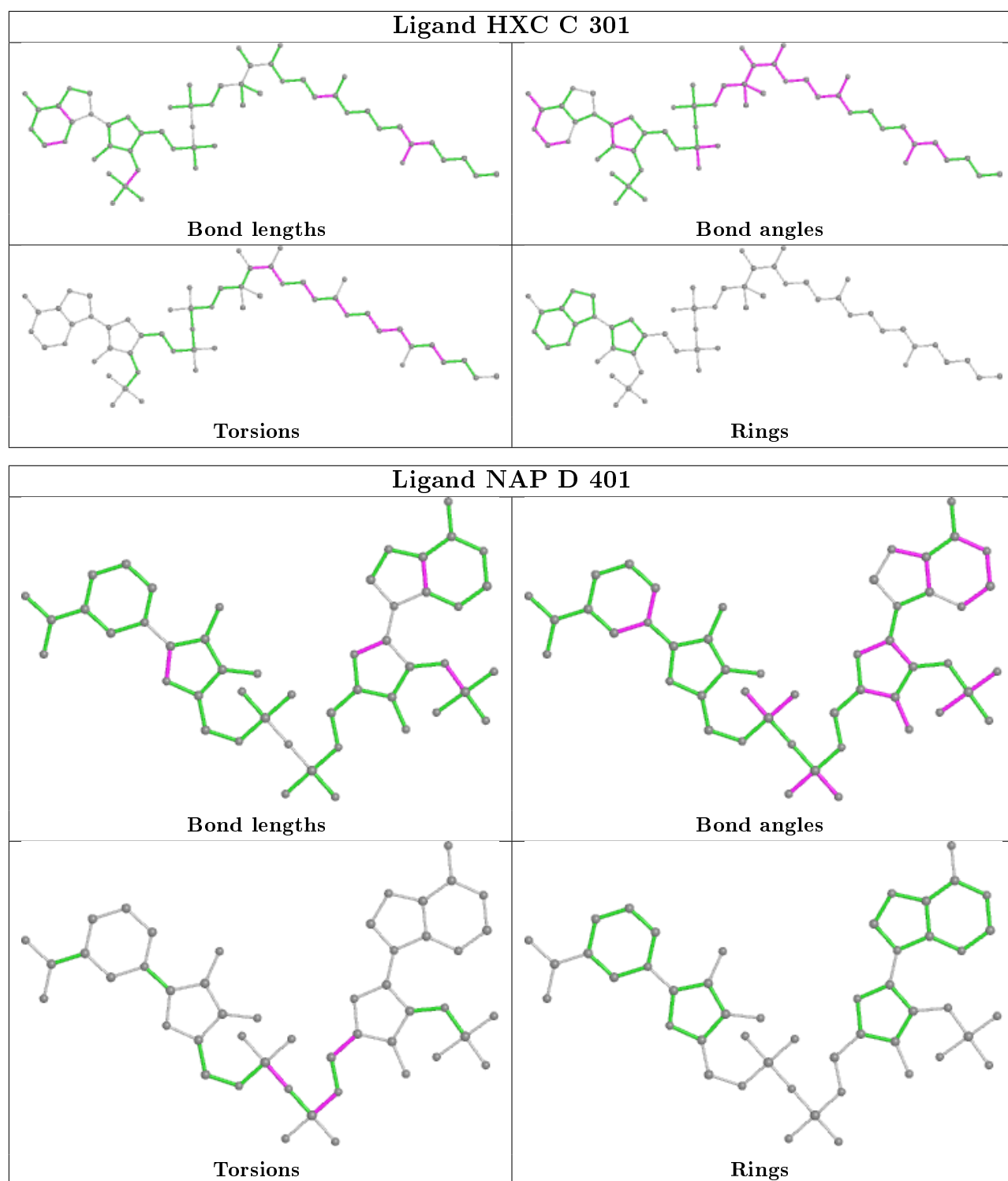
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

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	274/277 (98%)	-0.52	5 (1%) 68 72	9, 15, 28, 54	0
1	B	276/277 (99%)	-0.38	7 (2%) 57 62	10, 18, 36, 61	0
1	C	276/277 (99%)	-0.47	6 (2%) 62 66	10, 16, 32, 56	0
1	D	272/277 (98%)	-0.53	3 (1%) 80 84	10, 16, 30, 50	0
All	All	1098/1108 (99%)	-0.47	21 (1%) 66 71	9, 16, 32, 61	0

All (21) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	225	ALA	5.3
1	B	225	ALA	4.2
1	D	225	ALA	4.0
1	B	223	PRO	3.5
1	C	223	PRO	3.4
1	A	225	ALA	3.3
1	D	223	PRO	3.3
1	C	224	GLN	3.3
1	A	223	PRO	3.2
1	A	224	GLN	3.2
1	D	224	GLN	3.0
1	C	3	GLN	3.0
1	B	224	GLN	3.0
1	C	226	SER	2.9
1	A	229	THR	2.7
1	B	229	THR	2.4
1	B	278	GLY	2.2
1	A	226	SER	2.1
1	B	226	SER	2.1
1	B	264	VAL	2.0
1	C	229	THR	2.0

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

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

## 6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 6.4 Ligands [i](#)

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

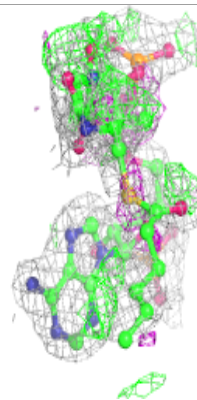
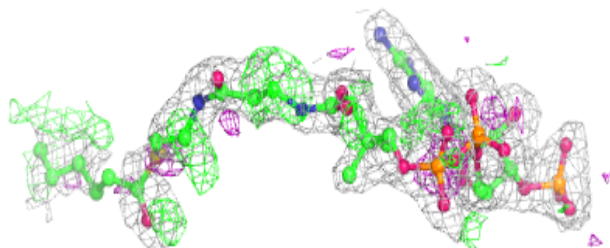
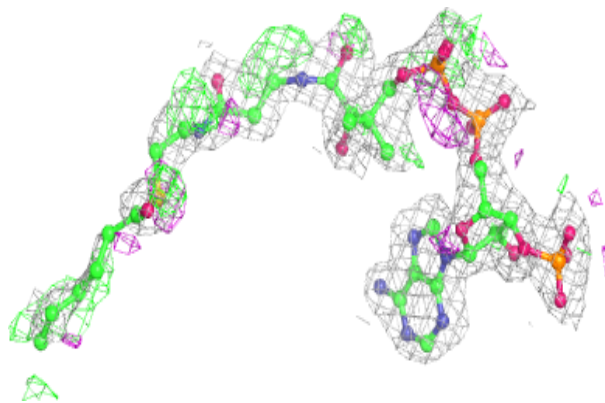
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
3	HXC	B	402	55/55	0.90	0.13	15,25,50,69	0
3	HXC	C	301	55/55	0.92	0.13	16,24,44,52	0
3	HXC	D	402	55/55	0.94	0.12	14,17,37,41	8
3	HXC	A	402	55/55	0.94	0.11	15,21,45,46	0
2	NAP	C	302	48/48	0.98	0.06	13,14,16,17	0
2	NAP	B	401	48/48	0.98	0.07	13,16,20,22	0
2	NAP	A	401	48/48	0.98	0.06	12,14,16,17	0
2	NAP	D	401	48/48	0.98	0.06	11,14,16,18	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.

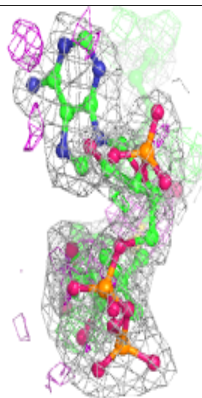
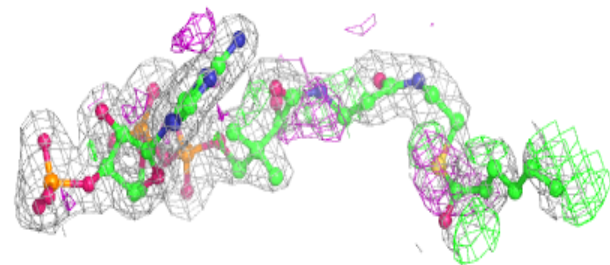
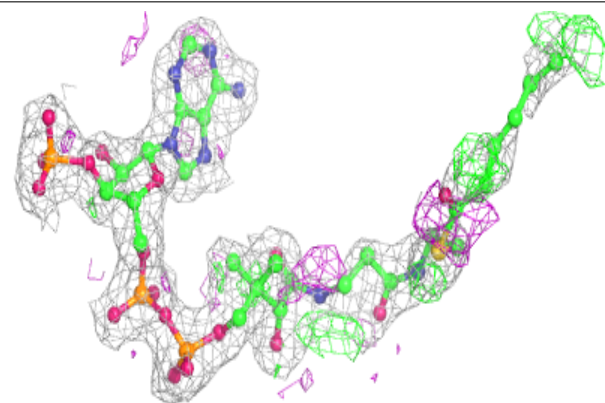


**Electron density around HXC B 402:**

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

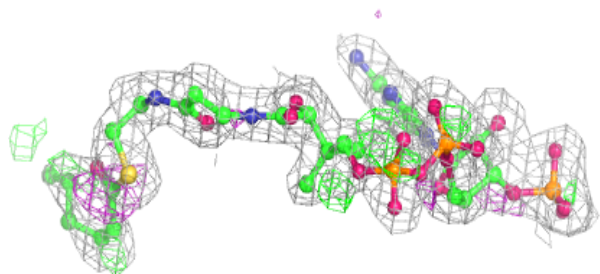
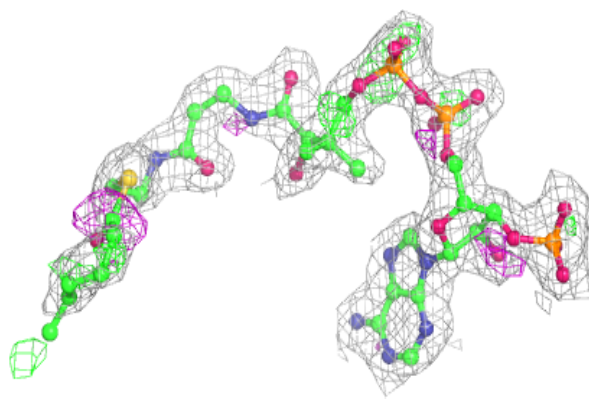
**Electron density around HXC C 301:**

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

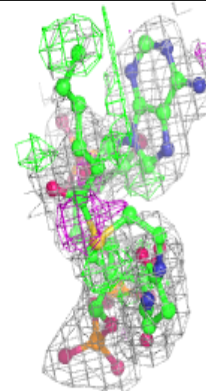
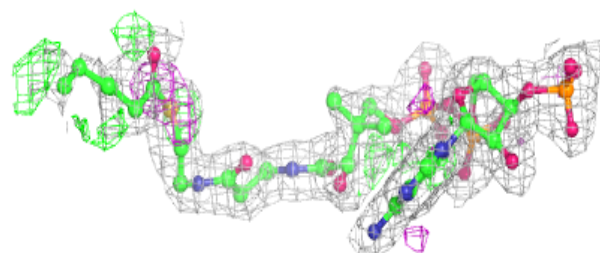
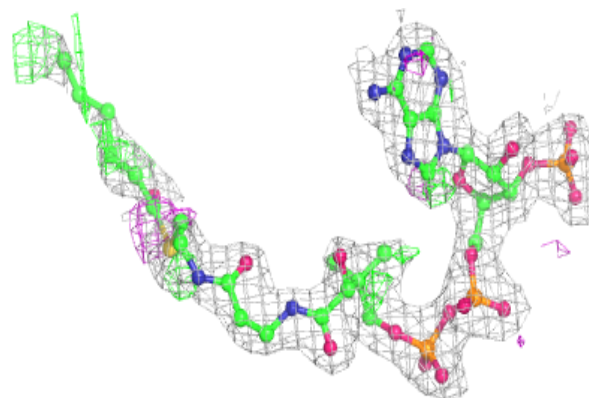


**Electron density around HXC D 402:**

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

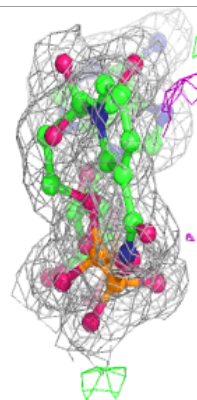
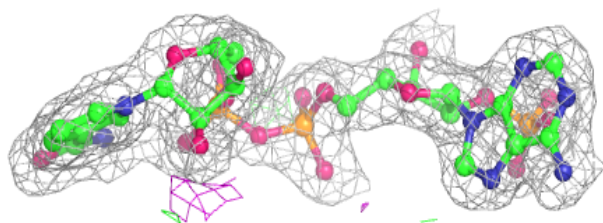
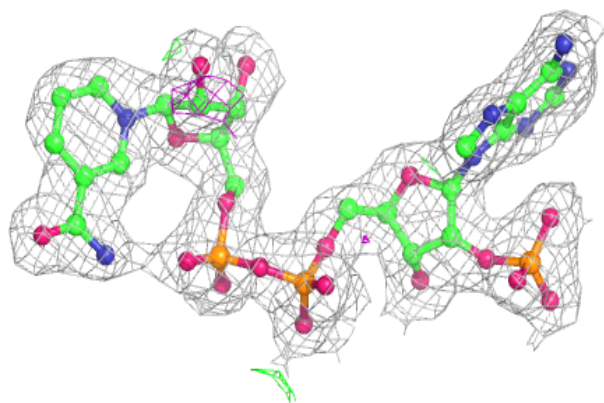
**Electron density around HXC A 402:**

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

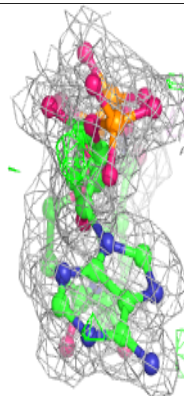
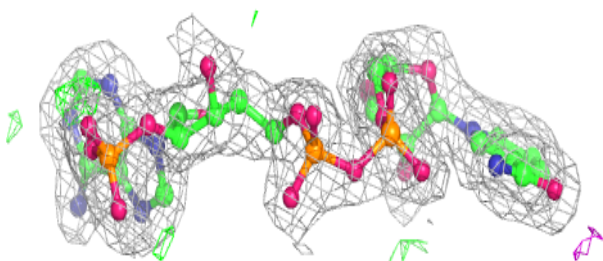
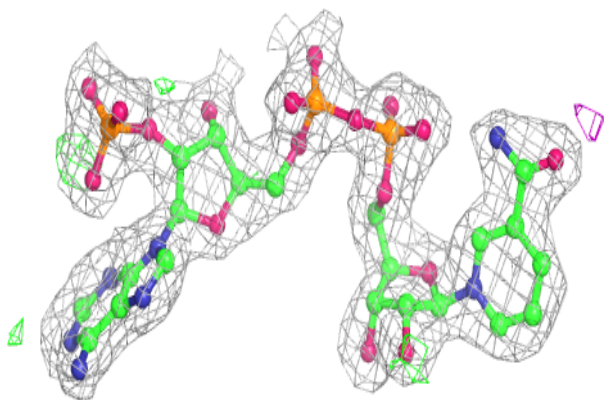


**Electron density around NAP C 302:**

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

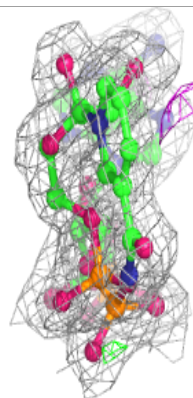
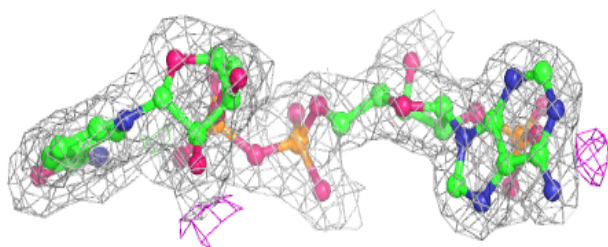
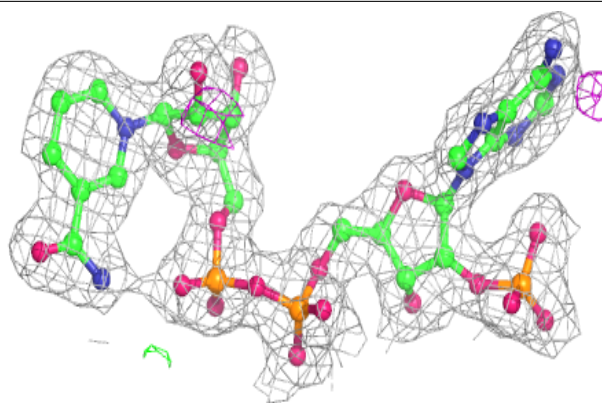
**Electron density around NAP B 401:**

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

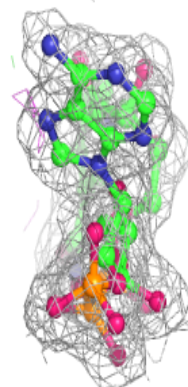
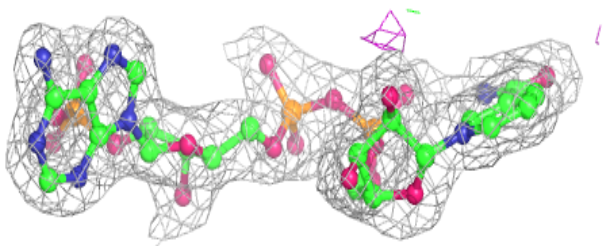
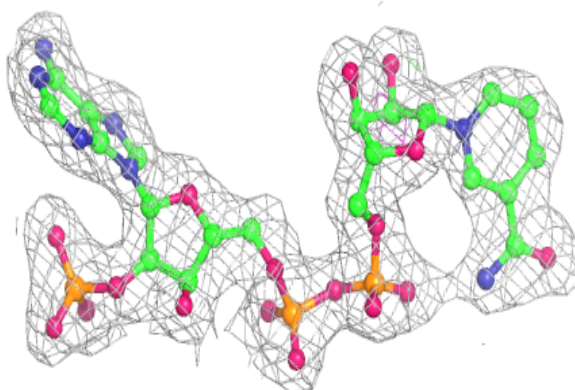


**Electron density around NAP A 401:**

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

**Electron density around NAP D 401:**

$2mF_o-DF_c$  (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.