Full wwPDB X-ray Structure Validation Report ⓘ

Mar 10, 2025 – 02:31 PM JST

PDB ID	:	8YPZ
Title	:	Crystal strcture of human phosphoribosyl pyrophosphate synthetase 1 (PRPS1) in complex with GDP
Authors	:	Zhang, L.; Zhang, L.
Deposited on	:	2024-03-18
Resolution	:	3.00 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

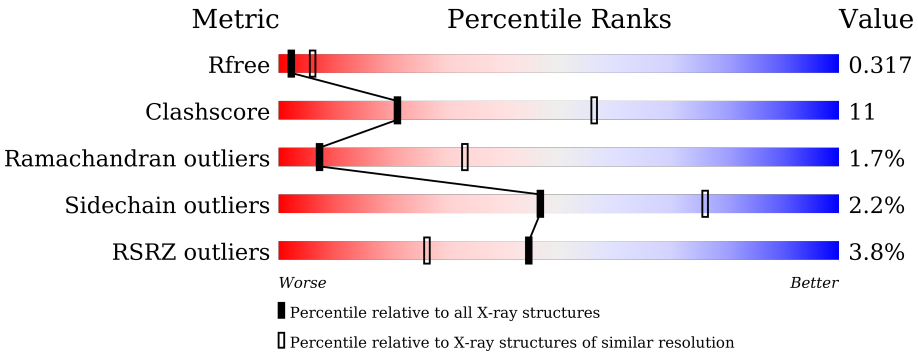
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.21
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.004 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.41.2

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.00 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}	164625	2511 (3.00-3.00)
Clashscore	180529	2866 (3.00-3.00)
Ramachandran outliers	177936	2778 (3.00-3.00)
Sidechain outliers	177891	2781 (3.00-3.00)
RSRZ outliers	164620	2523 (3.00-3.00)

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	318	2% 74% 21%
1	B	318	3% 72% 24%
1	C	318	4% 77% 19%
1	D	318	4% 68% 23% 8%
1	E	318	5% 66% 29%
1	F	318	4% 67% 28%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
5	PO4	D	1002	-	X	X	-

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 14526 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.

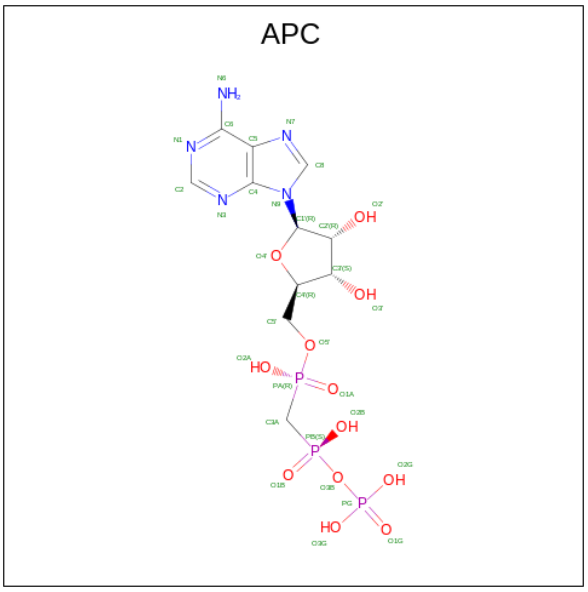
- Molecule 1 is a protein called Ribose-phosphate pyrophosphokinase 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	309	Total	C	N	O	S	0	0	0
			2360	1481	415	447	17			
1	B	309	Total	C	N	O	S	0	0	0
			2362	1484	415	446	17			
1	C	309	Total	C	N	O	S	0	0	0
			2362	1484	415	446	17			
1	D	294	Total	C	N	O	S	0	0	0
			2245	1407	398	423	17			
1	E	306	Total	C	N	O	S	0	0	0
			2334	1467	409	441	17			
1	F	308	Total	C	N	O	S	0	0	0
			2350	1476	413	444	17			

There are 6 discrepancies between the modelled and reference sequences:

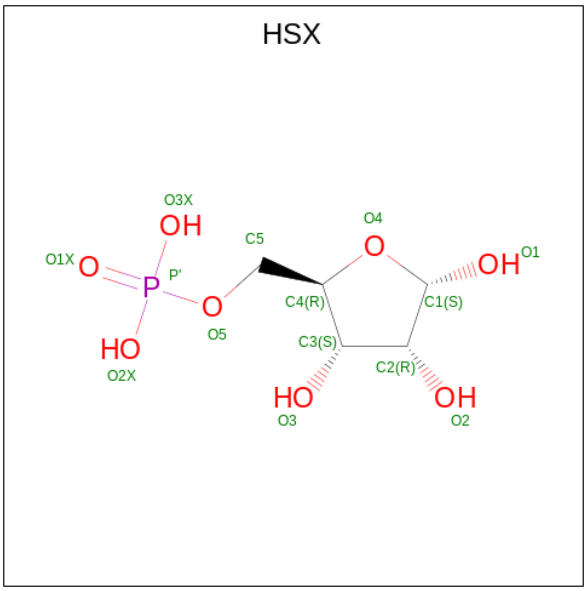
Chain	Residue	Modelled	Actual	Comment	Reference
A	1	SER	-	expression tag	UNP P60891
B	1	SER	-	expression tag	UNP P60891
C	1	SER	-	expression tag	UNP P60891
D	1	SER	-	expression tag	UNP P60891
E	1	SER	-	expression tag	UNP P60891
F	1	SER	-	expression tag	UNP P60891

- Molecule 2 is DIPHOSPHOMETHYLPHOSPHONIC ACID ADENOSYL ESTER (three-letter code: APC) (formula: $C_{11}H_{18}N_5O_{12}P_3$).



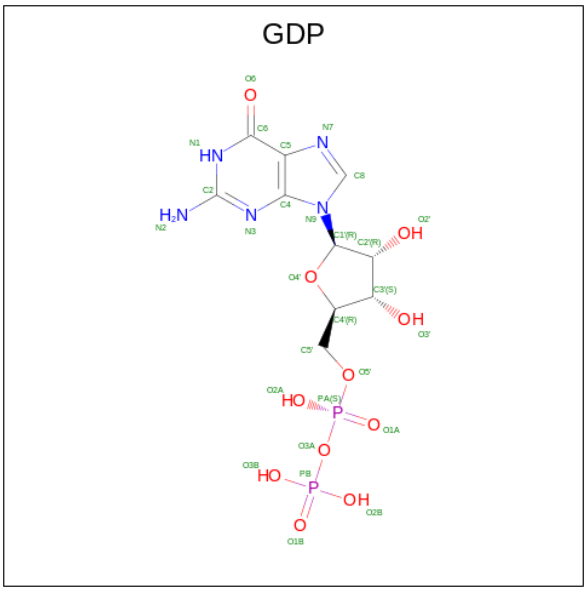
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			31	11	5	12	3		
2	A	1	Total	C	N	O	P	0	0
			31	11	5	12	3		
2	B	1	Total	C	N	O	P	0	0
			31	11	5	12	3		
2	C	1	Total	C	N	O	P	0	0
			31	11	5	12	3		
2	D	1	Total	C	N	O	P	0	0
			31	11	5	12	3		
2	E	1	Total	C	N	O	P	0	0
			31	11	5	12	3		

- Molecule 3 is 5-O-phosphono-alpha-D-ribofuranose (three-letter code: HSX) (formula: $C_5H_{11}O_8P$).



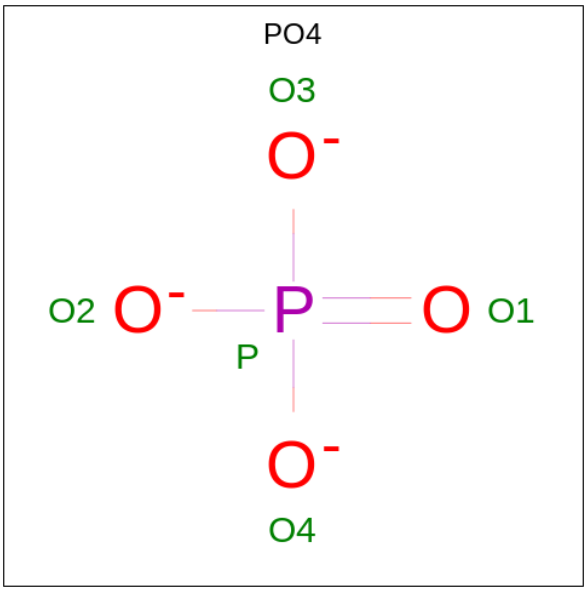
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O P 14 5 8 1	0	0
3	B	1	Total C O P 14 5 8 1	0	0
3	C	1	Total C O P 14 5 8 1	0	0
3	E	1	Total C O P 14 5 8 1	0	0
3	F	1	Total C O P 14 5 8 1	0	0

- Molecule 4 is GUANOSINE-5'-DIPHOSPHATE (three-letter code: GDP) (formula: $C_{10}H_{15}N_5O_{11}P_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	N	O	P	0	0
			28	10	5	11	2		
4	A	1	Total	C	N	O	P	0	0
			28	10	5	11	2		
4	C	1	Total	C	N	O	P	0	0
			24	10	5	8	1		
4	C	1	Total	C	N	O	P	0	0
			28	10	5	11	2		
4	E	1	Total	C	N	O	P	0	0
			28	10	5	11	2		
4	F	1	Total	C	N	O	P	0	0
			28	10	5	11	2		

- Molecule 5 is PHOSPHATE ION (three-letter code: PO4) (formula: O_4P).



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

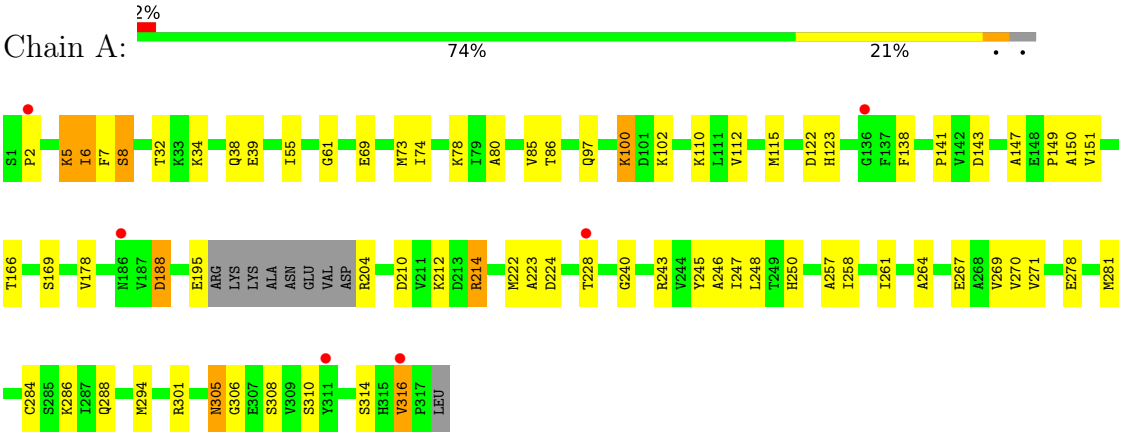
- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	15	Total O 15 15	0	0
6	B	11	Total O 11 11	0	0
6	C	12	Total O 12 12	0	0
6	D	6	Total O 6 6	0	0
6	E	7	Total O 7 7	0	0
6	F	12	Total O 12 12	0	0

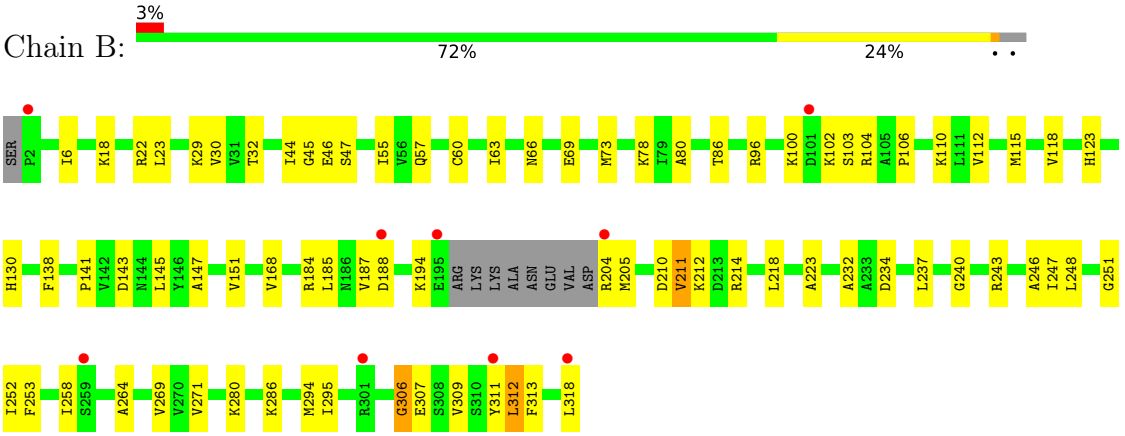
3 Residue-property plots (i)

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.

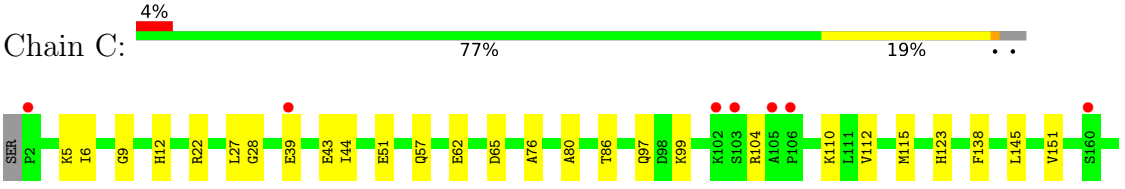
• Molecule 1: Ribose-phosphate pyrophosphokinase 1

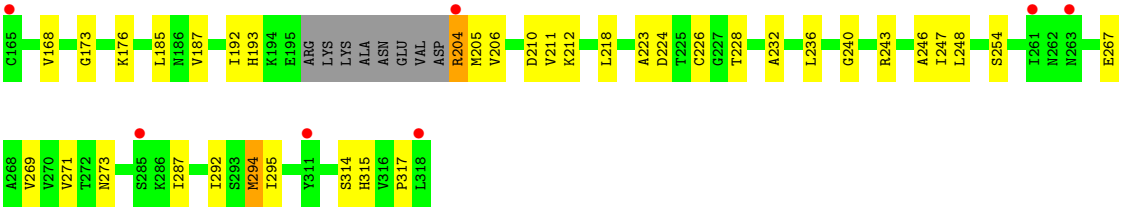


• Molecule 1: Ribose-phosphate pyrophosphokinase 1

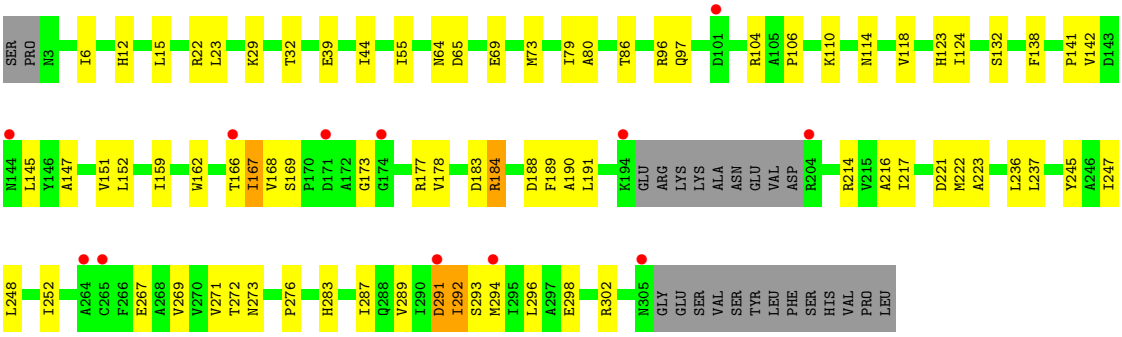


• Molecule 1: Ribose-phosphate pyrophosphokinase 1

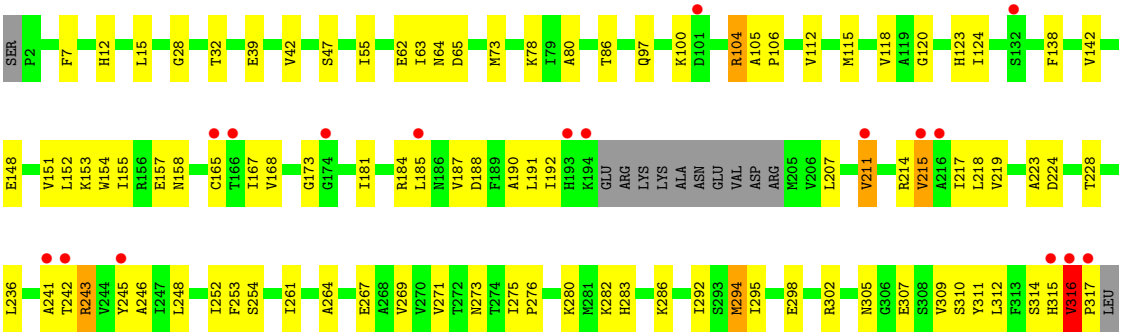




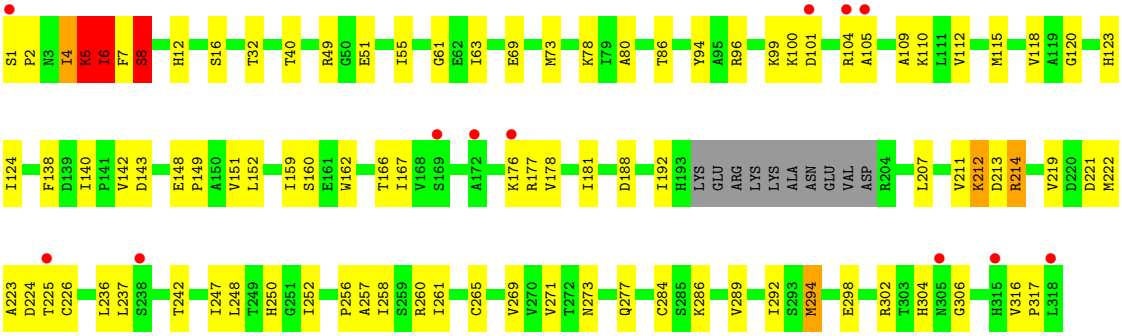
• Molecule 1: Ribose-phosphate pyrophosphokinase 1



• Molecule 1: Ribose-phosphate pyrophosphokinase 1



• Molecule 1: Ribose-phosphate pyrophosphokinase 1



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 65	Depositor
Cell constants a, b, c, α, β, γ	186.88Å 186.88Å 160.64Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	48.70 – 3.00 48.70 – 3.00	Depositor EDS
% Data completeness (in resolution range)	100.0 (48.70-3.00) 97.9 (48.70-3.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	5.44 (at 3.01Å)	Xtriage
Refinement program	PHENIX 1.17.1-3660	Depositor
R, R_{free}	0.260 , 0.310 0.283 , 0.317	Depositor DCC
R_{free} test set	3184 reflections (4.98%)	wwPDB-VP
Wilson B-factor (Å^2)	57.4	Xtriage
Anisotropy	0.070	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 40.5	EDS
L-test for twinning[2]	$< \|L\| > = 0.46$, $< L^2 > = 0.29$	Xtriage
Estimated twinning fraction	0.047 for h,-h-k,-l	Xtriage
F_o,F_c correlation	0.83	EDS
Total number of atoms	14526	wwPDB-VP
Average B, all atoms (Å^2)	42.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 20.55 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 8.4739e-03. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

[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: HSX, PO4, GDP, APC

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	0.52	6/2395 (0.3%)	0.56	1/3240 (0.0%)
1	B	0.27	0/2397	0.54	1/3242 (0.0%)
1	C	0.27	0/2397	0.52	0/3242
1	D	0.27	0/2275	0.53	0/3075
1	E	0.28	0/2369	0.55	1/3205 (0.0%)
1	F	0.58	6/2385 (0.3%)	0.58	1/3228 (0.0%)
All	All	0.39	12/14218 (0.1%)	0.55	4/19232 (0.0%)

All (12) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	F	7	PHE	C-O	-9.02	1.06	1.23
1	F	5	LYS	C-O	-8.37	1.07	1.23
1	A	8	SER	C-O	-8.26	1.07	1.23
1	A	5	LYS	C-O	-7.31	1.09	1.23
1	F	8	SER	C-O	-7.13	1.09	1.23
1	F	4	ILE	C-O	-6.65	1.10	1.23
1	F	6	ILE	C-O	-6.04	1.11	1.23
1	A	7	PHE	CG-CD1	-5.98	1.29	1.38
1	A	6	ILE	C-O	-5.87	1.12	1.23
1	A	7	PHE	C-O	-5.82	1.12	1.23
1	A	8	SER	CA-CB	-5.54	1.44	1.52
1	F	6	ILE	CB-CG1	-5.47	1.38	1.54

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	F	4	ILE	CG1-CB-CG2	-5.88	98.46	111.40
1	E	316	VAL	C-N-CD	5.44	139.83	128.40
1	B	188	ASP	CB-CG-OD2	5.22	123.00	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	188	ASP	CB-CG-OD2	5.18	122.96	118.30

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	2360	0	2399	48	0
1	B	2362	0	2403	50	0
1	C	2362	0	2403	41	0
1	D	2245	0	2293	55	0
1	E	2334	0	2373	73	0
1	F	2350	0	2391	63	0
2	A	62	0	28	2	0
2	B	31	0	14	1	0
2	C	31	0	14	3	0
2	D	31	0	14	3	0
2	E	31	0	14	1	0
3	A	14	0	0	1	0
3	B	14	0	0	0	0
3	C	14	0	0	5	0
3	E	14	0	0	1	0
3	F	14	0	0	1	0
4	A	56	0	24	10	0
4	C	52	0	24	3	0
4	E	28	0	12	6	0
4	F	28	0	12	5	0
5	A	5	0	0	0	0
5	B	5	0	0	1	0
5	C	5	0	0	0	0
5	D	10	0	0	3	0
5	F	5	0	0	1	0
6	A	15	0	0	1	0
6	B	11	0	0	1	0
6	C	12	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	D	6	0	0	0	0
6	E	7	0	0	0	0
6	F	12	0	0	0	0
All	All	14526	0	14418	313	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 11.

All (313) 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)
3:C:1002:HSX:O3	3:C:1002:HSX:O1X	1.78	0.99
1:E:316:VAL:HG22	1:E:317:PRO:CD	1.94	0.97
1:E:214:ARG:O	1:E:215:VAL:HG12	1.65	0.97
1:C:223:ALA:HB2	1:C:248:LEU:HD13	1.48	0.93
1:E:316:VAL:HG22	1:E:317:PRO:HD2	1.51	0.91
1:F:223:ALA:HB2	1:F:248:LEU:HD13	1.56	0.88
1:F:99:LYS:NZ	1:F:101:ASP:OD2	2.10	0.81
1:E:100:LYS:HZ3	4:F:3001:GDP:HN22	1.29	0.81
1:E:155:ILE:HD11	1:E:217:ILE:HD13	1.61	0.80
1:E:294:MET:HG3	1:E:317:PRO:HG3	1.66	0.76
1:E:224:ASP:OD1	1:E:254:SER:OG	2.03	0.76
1:E:253:PHE:HB2	1:E:280:LYS:HE3	1.68	0.76
1:C:243:ARG:HD3	1:C:267:GLU:HG3	1.69	0.74
1:A:39:GLU:HG3	1:F:63:ILE:HD12	1.69	0.73
1:C:110:LYS:NZ	1:D:138:PHE:O	2.20	0.73
5:D:1002:PO4:O1	1:E:39:GLU:OE2	2.08	0.72
1:D:97:GLN:OE1	2:D:1001:APC:O2'	2.07	0.71
1:E:100:LYS:NZ	4:F:3001:GDP:HN22	1.88	0.71
1:B:205:MET:HE1	1:B:232:ALA:HA	1.72	0.71
1:B:130:HIS:NE2	2:B:1001:APC:O1A	2.21	0.70
1:E:305:ASN:ND2	1:E:307:GLU:OE1	2.25	0.69
1:F:8:SER:OG	1:F:16:SER:OG	2.09	0.69
1:E:168:VAL:HG22	1:E:190:ALA:HB3	1.75	0.69
1:F:8:SER:OG	1:F:16:SER:CB	2.41	0.69
1:C:97:GLN:OE1	2:C:1001:APC:O2'	2.09	0.69
1:E:112:VAL:HA	1:E:115:MET:HE2	1.74	0.68
1:D:151:VAL:HG13	1:D:247:ILE:HG21	1.78	0.66
1:A:246:ALA:HB3	1:A:269:VAL:HG22	1.77	0.66
1:A:80:ALA:HA	4:E:1003:GDP:HN21	1.59	0.66
1:F:225:THR:OG1	3:F:3002:HSX:C5	2.43	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:316:VAL:HG22	1:E:317:PRO:HD3	1.78	0.66
1:B:151:VAL:HG13	1:B:247:ILE:HG21	1.78	0.65
1:A:138:PHE:O	1:B:110:LYS:NZ	2.30	0.65
1:D:169:SER:HB3	1:D:191:LEU:HD12	1.78	0.65
1:A:97:GLN:HG2	2:A:1001:APC:H8	1.78	0.64
1:A:195:GLU:N	1:A:204:ARG:O	2.30	0.64
1:A:110:LYS:NZ	1:B:138:PHE:O	2.31	0.63
1:D:96:ARG:NH2	5:D:1002:PO4:O2	2.30	0.63
1:C:224:ASP:OD1	1:C:254:SER:OG	2.13	0.63
1:A:264:ALA:O	1:A:286:LYS:NZ	2.31	0.63
1:D:79:ILE:HG23	1:E:100:LYS:HZ2	1.64	0.62
1:B:102:LYS:NZ	1:C:43:GLU:OE1	2.32	0.62
1:A:97:GLN:OE1	2:A:1001:APC:O2'	2.12	0.62
4:A:1004:GDP:N2	1:C:80:ALA:HA	2.15	0.62
1:C:112:VAL:HA	1:C:115:MET:HE2	1.81	0.62
1:E:315:HIS:O	1:E:316:VAL:HG12	1.99	0.62
1:A:80:ALA:HA	4:E:1003:GDP:N2	2.15	0.62
1:B:251:GLY:O	1:B:253:PHE:N	2.33	0.62
3:C:1002:HSX:O1X	3:C:1002:HSX:C4	2.47	0.62
1:E:223:ALA:HB2	1:E:248:LEU:HG	1.82	0.61
1:E:211:VAL:HG22	1:E:241:ALA:HB2	1.83	0.61
1:F:78:LYS:HG3	1:F:120:GLY:HA3	1.83	0.61
1:A:224:ASP:OD2	6:A:1101:HOH:O	2.16	0.61
1:A:6:ILE:HG23	1:A:6:ILE:O	2.00	0.61
1:B:309:VAL:HG13	1:B:312:LEU:HD23	1.82	0.61
1:B:32:THR:OG1	1:B:69:GLU:OE2	2.11	0.60
1:D:152:LEU:HD11	1:D:184:ARG:HD3	1.82	0.60
1:B:212:LYS:O	1:B:214:ARG:HG3	2.02	0.60
1:D:222:MET:HE2	1:D:252:ILE:HD11	1.82	0.60
1:A:151:VAL:HG13	1:A:247:ILE:HG21	1.85	0.59
1:B:57:GLN:NE2	1:B:69:GLU:OE1	2.35	0.59
1:D:80:ALA:HA	4:F:3001:GDP:N2	2.17	0.59
1:D:298:GLU:O	1:D:302:ARG:HB2	2.03	0.59
1:F:166:THR:HG21	1:F:211:VAL:HG12	1.85	0.59
1:E:78:LYS:HD2	1:E:120:GLY:HA3	1.85	0.58
1:F:248:LEU:O	1:F:271:VAL:HA	2.04	0.58
1:A:301:ARG:O	1:A:305:ASN:ND2	2.36	0.58
1:A:166:THR:HG23	1:A:214:ARG:HD2	1.86	0.58
1:D:12:HIS:NE2	1:D:273:ASN:O	2.37	0.57
1:A:258:ILE:HG23	1:A:284:CYS:HB2	1.86	0.57
1:F:4:ILE:HG23	1:F:4:ILE:O	2.05	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:5:LYS:HD3	1:F:51:GLU:HG2	1.86	0.57
1:C:248:LEU:O	1:C:271:VAL:HA	2.03	0.57
1:D:188:ASP:OD2	1:D:214:ARG:NH2	2.25	0.57
1:F:177:ARG:NH2	1:F:221:ASP:HB3	2.19	0.57
1:E:12:HIS:CE1	1:E:15:LEU:HB2	2.40	0.56
1:A:34:LYS:NZ	1:A:38:GLN:O	2.38	0.56
4:E:1003:GDP:HN22	1:F:100:LYS:CE	2.19	0.56
1:E:261:ILE:HG22	1:E:286:LYS:HD3	1.86	0.56
1:A:123:HIS:CE1	1:A:141:PRO:HB2	2.41	0.56
1:E:148:GLU:HA	1:E:151:VAL:HG22	1.88	0.56
1:E:153:LYS:HD2	1:E:316:VAL:HG11	1.88	0.56
1:D:168:VAL:HG22	1:D:190:ALA:HB3	1.87	0.55
1:D:223:ALA:HB2	1:D:248:LEU:HD22	1.87	0.55
1:C:205:MET:HE1	1:C:232:ALA:HA	1.88	0.55
1:D:177:ARG:CZ	1:D:221:ASP:HB3	2.37	0.55
1:E:12:HIS:NE2	1:E:273:ASN:O	2.40	0.55
1:B:6:ILE:HD11	1:B:23:LEU:HD12	1.88	0.54
1:D:118:VAL:HG11	1:E:118:VAL:HG11	1.89	0.54
1:B:106:PRO:HB3	1:C:76:ALA:HB2	1.89	0.54
1:E:165:CYS:SG	1:E:187:VAL:HG11	2.48	0.54
1:D:159:ILE:HB	1:D:162:TRP:HB3	1.89	0.54
1:F:188:ASP:HB2	1:F:214:ARG:HH22	1.73	0.54
1:E:55:ILE:HD13	1:E:73:MET:HB3	1.90	0.54
1:C:86:THR:HG23	1:C:123:HIS:HB3	1.89	0.54
1:C:151:VAL:HG13	1:C:247:ILE:HG21	1.89	0.53
1:D:79:ILE:HG23	1:E:100:LYS:NZ	2.23	0.53
1:D:39:GLU:OE1	2:E:1001:APC:N6	2.42	0.53
1:D:291:ASP:C	1:D:293:SER:H	2.12	0.53
1:E:152:LEU:HA	1:E:155:ILE:HG22	1.91	0.52
1:D:65:ASP:OD1	1:E:64:ASN:ND2	2.32	0.52
1:E:242:THR:HG22	1:E:243:ARG:HD3	1.92	0.52
1:E:248:LEU:O	1:E:271:VAL:HA	2.09	0.52
1:A:149:PRO:HB2	1:A:316:VAL:HG23	1.90	0.52
1:D:248:LEU:O	1:D:271:VAL:HA	2.08	0.52
1:C:168:VAL:HB	1:C:218:LEU:HD23	1.90	0.52
1:D:44:ILE:HB	1:E:104:ARG:HB3	1.92	0.52
1:A:86:THR:HG23	1:A:123:HIS:HB3	1.92	0.52
1:E:167:ILE:HD11	1:E:185:LEU:HD12	1.92	0.52
1:F:96:ARG:NE	5:F:3003:PO4:O1	2.41	0.52
1:D:114:ASN:O	1:D:118:VAL:HG22	2.10	0.52
1:A:78:LYS:NZ	1:A:122:ASP:OD2	2.42	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:A:1004:GDP:HN22	1:B:100:LYS:NZ	2.08	0.51
1:B:223:ALA:HB2	1:B:248:LEU:HD22	1.91	0.51
1:D:166:THR:O	1:D:189:PHE:HA	2.10	0.51
1:B:60:CYS:O	1:B:66:ASN:ND2	2.44	0.51
1:C:246:ALA:HB3	1:C:269:VAL:HG22	1.92	0.51
1:E:314:SER:O	1:E:315:HIS:ND1	2.43	0.51
1:B:185:LEU:HB2	1:B:187:VAL:HG22	1.93	0.51
1:F:143:ASP:OD1	4:F:3001:GDP:O2'	2.29	0.51
1:B:86:THR:HG23	1:B:123:HIS:HB3	1.91	0.51
4:C:1004:GDP:HN21	1:E:80:ALA:HA	1.76	0.51
1:C:145:LEU:HD13	1:C:295:ILE:HG22	1.93	0.51
3:C:1002:HSX:O1X	3:C:1002:HSX:C3	2.58	0.51
1:D:64:ASN:ND2	1:E:65:ASP:OD1	2.34	0.51
1:E:211:VAL:HG21	1:E:236:LEU:HD22	1.92	0.51
1:C:211:VAL:HG21	1:C:236:LEU:HD22	1.94	0.51
1:B:143:ASP:OD2	6:B:1101:HOH:O	2.19	0.50
1:B:248:LEU:O	1:B:271:VAL:HA	2.11	0.50
1:A:243:ARG:NH2	1:A:245:TYR:OH	2.44	0.50
1:C:97:GLN:HG2	2:C:1001:APC:H8	1.94	0.50
1:E:264:ALA:O	1:E:286:LYS:NZ	2.45	0.50
1:E:292:ILE:HG22	1:E:295:ILE:HD12	1.93	0.50
1:F:181:ILE:HD12	1:F:219:VAL:HG11	1.94	0.50
1:F:207:LEU:HD11	1:F:236:LEU:HD23	1.92	0.50
1:C:99:LYS:HD2	1:D:132:SER:HB2	1.93	0.49
1:F:257:ALA:O	1:F:261:ILE:HG13	2.12	0.49
1:D:12:HIS:CE1	1:D:15:LEU:HB2	2.47	0.49
1:A:166:THR:HG22	1:A:188:ASP:HB2	1.93	0.49
1:F:167:ILE:HG22	1:F:178:VAL:HB	1.95	0.49
1:F:32:THR:HG21	1:F:69:GLU:OE2	2.13	0.49
1:F:237:LEU:HG	1:F:265:CYS:SG	2.52	0.49
1:A:100:LYS:NZ	4:A:1003:GDP:HN22	2.10	0.48
1:B:123:HIS:CE1	1:B:141:PRO:HB2	2.48	0.48
1:A:223:ALA:HB2	1:A:248:LEU:HG	1.94	0.48
1:B:258:ILE:HD11	1:B:280:LYS:HD2	1.95	0.48
1:C:212:LYS:HA	1:C:240:GLY:O	2.13	0.48
1:D:86:THR:HG23	1:D:123:HIS:HB3	1.96	0.48
1:D:123:HIS:CE1	1:D:141:PRO:HB2	2.48	0.48
1:F:149:PRO:HB2	1:F:316:VAL:HG22	1.95	0.48
1:E:228:THR:OG1	3:E:1002:HSX:O2X	2.17	0.48
1:E:273:ASN:OD1	1:E:292:ILE:HG13	2.14	0.48
1:F:212:LYS:HD2	1:F:212:LYS:HA	1.63	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:55:ILE:HD13	1:D:73:MET:HB3	1.96	0.48
1:F:6:ILE:HD13	1:F:6:ILE:HG21	1.57	0.48
1:F:4:ILE:HD13	1:F:4:ILE:HG21	1.65	0.48
1:F:124:ILE:HB	1:F:142:VAL:HG22	1.96	0.48
1:A:278:GLU:HA	1:A:281:MET:HE2	1.95	0.48
1:B:212:LYS:HA	1:B:240:GLY:O	2.14	0.48
1:E:188:ASP:OD2	1:E:214:ARG:NH2	2.47	0.48
1:A:222:MET:HB2	1:A:250:HIS:HB2	1.96	0.47
1:A:248:LEU:O	1:A:271:VAL:HA	2.14	0.47
1:E:310:SER:N	4:E:1003:GDP:H8	2.11	0.47
1:F:176:LYS:HG3	1:F:177:ARG:N	2.28	0.47
1:C:176:LYS:HE2	2:D:1001:APC:H3A1	1.95	0.47
1:A:55:ILE:HD13	1:A:73:MET:HB3	1.97	0.47
1:E:12:HIS:CG	1:E:276:PRO:HD3	2.50	0.47
1:F:225:THR:O	1:F:226:CYS:HB2	2.14	0.47
1:B:309:VAL:HG12	1:B:313:PHE:HE1	1.80	0.47
1:E:86:THR:HG23	1:E:123:HIS:HB3	1.96	0.47
1:C:192:ILE:HA	1:C:206:VAL:O	2.15	0.47
1:C:226:CYS:H	3:C:1002:HSX:C2	2.27	0.47
1:E:154:TRP:O	1:E:158:ASN:ND2	2.44	0.47
1:B:112:VAL:HA	1:B:115:MET:HE2	1.97	0.47
1:A:210:ASP:O	1:A:214:ARG:NH2	2.48	0.47
1:D:271:VAL:O	1:D:289:VAL:HA	2.15	0.47
1:F:8:SER:HG	1:F:16:SER:CB	2.24	0.47
1:E:124:ILE:HB	1:E:142:VAL:HG22	1.97	0.46
4:E:1003:GDP:HN22	1:F:100:LYS:NZ	2.13	0.46
1:F:148:GLU:O	1:F:152:LEU:HD13	2.15	0.46
1:B:29:LYS:O	1:B:45:GLY:N	2.37	0.46
1:D:167:ILE:HG22	1:D:178:VAL:HG13	1.97	0.46
1:F:112:VAL:HA	1:F:115:MET:HE2	1.98	0.46
1:A:143:ASP:OD1	4:A:1004:GDP:O2'	2.34	0.46
1:E:138:PHE:O	1:F:110:LYS:NZ	2.48	0.46
1:C:62:GLU:HG2	1:C:65:ASP:OD2	2.16	0.46
1:D:291:ASP:O	1:D:293:SER:N	2.48	0.46
1:E:181:ILE:HD12	1:E:219:VAL:HG11	1.96	0.46
1:D:272:THR:HB	1:D:292:ILE:HG12	1.97	0.46
1:F:271:VAL:O	1:F:289:VAL:HA	2.16	0.46
1:C:185:LEU:HB2	1:C:187:VAL:HG22	1.98	0.46
1:D:167:ILE:HA	1:D:217:ILE:O	2.15	0.46
1:A:310:SER:N	4:A:1004:GDP:H8	2.14	0.46
1:B:55:ILE:HD13	1:B:73:MET:HB3	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:103:SER:O	1:B:104:ARG:HD3	2.15	0.46
1:D:222:MET:HE1	5:D:1002:PO4:O2	2.15	0.46
1:F:40:THR:HG21	1:F:69:GLU:HA	1.98	0.46
1:D:291:ASP:O	1:D:292:ILE:HG13	2.17	0.45
1:A:100:LYS:HE3	4:A:1003:GDP:HN22	1.81	0.45
1:A:169:SER:HB3	1:A:178:VAL:HG21	1.98	0.45
1:E:97:GLN:NE2	1:E:106:PRO:O	2.49	0.45
3:C:1002:HSX:O3	3:C:1002:HSX:P'	2.74	0.45
1:B:168:VAL:HB	1:B:218:LEU:HD23	1.98	0.45
1:F:256:PRO:HG2	1:F:260:ARG:HH21	1.81	0.45
1:A:147:ALA:O	1:A:151:VAL:HG23	2.17	0.45
1:B:30:VAL:HG23	1:B:44:ILE:HG22	1.98	0.45
1:C:6:ILE:O	1:C:28:GLY:N	2.37	0.45
1:B:18:LYS:O	1:B:22:ARG:HG3	2.17	0.45
1:C:212:LYS:HE2	1:C:212:LYS:HB3	1.74	0.45
1:B:104:ARG:HB3	1:C:44:ILE:HB	1.99	0.45
1:E:315:HIS:O	1:E:316:VAL:CG1	2.65	0.45
1:C:204:ARG:HG3	1:C:205:MET:N	2.32	0.44
4:A:1004:GDP:HN21	1:C:80:ALA:HA	1.82	0.44
2:C:1001:APC:H2'	2:C:1001:APC:H5'1	1.68	0.44
1:F:261:ILE:O	1:F:286:LYS:HE3	2.16	0.44
1:A:212:LYS:HA	1:A:240:GLY:O	2.17	0.44
1:C:22:ARG:NE	1:C:294:MET:HB3	2.32	0.44
1:E:100:LYS:HG3	1:E:105:ALA:HB3	1.98	0.44
1:B:147:ALA:O	1:B:151:VAL:HG23	2.17	0.44
1:D:245:TYR:OH	1:D:267:GLU:HG2	2.18	0.44
4:A:1003:GDP:N2	1:F:80:ALA:HA	2.32	0.44
1:F:261:ILE:HG21	1:F:269:VAL:HG11	2.00	0.44
1:D:32:THR:HG21	1:D:69:GLU:OE1	2.18	0.44
1:E:12:HIS:CD2	1:E:276:PRO:HD3	2.53	0.44
1:F:304:HIS:C	1:F:306:GLY:H	2.21	0.44
1:B:80:ALA:HA	4:C:1003:GDP:N2	2.32	0.44
1:B:306:GLY:O	1:F:49:ARG:HD2	2.18	0.44
1:D:216:ALA:HB1	1:D:236:LEU:HD13	2.00	0.44
1:F:151:VAL:HG13	1:F:247:ILE:HG21	2.00	0.44
1:C:9:GLY:HA3	1:C:57:GLN:NE2	2.33	0.43
1:F:86:THR:HG23	1:F:123:HIS:HB3	1.99	0.43
1:A:257:ALA:O	1:A:261:ILE:HG13	2.17	0.43
1:B:210:ASP:O	1:B:211:VAL:HG22	2.18	0.43
1:B:264:ALA:O	1:B:286:LYS:NZ	2.51	0.43
1:E:191:LEU:HD23	1:E:192:ILE:N	2.32	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:246:ALA:HB3	1:E:269:VAL:HG22	2.01	0.43
1:F:222:MET:HB2	1:F:250:HIS:HB2	2.00	0.43
1:A:112:VAL:HA	1:A:115:MET:HE2	1.99	0.43
1:A:228:THR:N	3:A:1002:HSX:O1X	2.51	0.43
1:E:153:LYS:O	1:E:157:GLU:HB2	2.17	0.43
1:C:269:VAL:O	1:C:287:ILE:HA	2.19	0.43
1:F:294:MET:HG3	1:F:317:PRO:O	2.19	0.43
4:C:1004:GDP:N2	1:E:80:ALA:HA	2.32	0.43
1:A:69:GLU:HG2	1:A:73:MET:HE2	2.00	0.43
1:F:277:GLN:HB2	1:F:289:VAL:HG21	2.01	0.43
1:A:100:LYS:CE	4:A:1003:GDP:HN22	2.32	0.43
1:D:97:GLN:HG2	2:D:1001:APC:H8	2.01	0.43
1:C:193:HIS:HE2	1:D:183:ASP:CG	2.21	0.42
1:D:12:HIS:CD2	1:D:276:PRO:HD3	2.53	0.42
1:E:104:ARG:HD3	4:F:3001:GDP:N1	2.34	0.42
1:A:149:PRO:HB2	1:A:316:VAL:CG2	2.49	0.42
1:A:270:VAL:HA	1:A:288:GLN:O	2.19	0.42
1:C:294:MET:SD	1:C:294:MET:N	2.86	0.42
1:F:192:ILE:HG12	1:F:207:LEU:HG	2.01	0.42
1:B:63:ILE:CD1	1:C:39:GLU:HG3	2.50	0.42
1:D:104:ARG:HD3	1:E:47:SER:HA	2.01	0.42
1:D:147:ALA:O	1:D:151:VAL:HG23	2.19	0.42
1:A:245:TYR:CZ	1:A:267:GLU:HG2	2.54	0.42
1:B:96:ARG:NH1	5:B:1003:PO4:O1	2.51	0.42
1:B:311:TYR:O	1:B:313:PHE:N	2.51	0.42
1:C:314:SER:HB2	1:C:315:HIS:ND1	2.34	0.42
1:F:159:ILE:HB	1:F:162:TRP:HB3	2.00	0.42
1:F:159:ILE:O	1:F:162:TRP:HD1	2.02	0.42
1:B:29:LYS:HG3	1:B:46:GLU:OE2	2.20	0.42
1:B:30:VAL:HG23	1:B:44:ILE:HA	2.02	0.42
1:B:246:ALA:HB3	1:B:269:VAL:HG22	2.01	0.42
1:D:145:LEU:HD12	1:D:296:LEU:HD23	2.01	0.42
1:E:282:LYS:HG3	1:E:283:HIS:ND1	2.35	0.42
1:F:273:ASN:OD1	1:F:292:ILE:HG13	2.20	0.42
1:D:39:GLU:HG3	1:E:63:ILE:HD13	2.02	0.42
1:A:32:THR:HG21	1:A:73:MET:HE1	2.02	0.42
1:A:74:ILE:HG23	1:A:85:VAL:HG11	2.02	0.42
1:B:237:LEU:HD23	1:B:237:LEU:HA	1.78	0.42
1:E:168:VAL:HB	1:E:218:LEU:HD23	2.01	0.42
1:C:5:LYS:HE3	1:C:51:GLU:OE1	2.19	0.41
1:E:298:GLU:O	1:E:302:ARG:HG3	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:102:LYS:HB2	1:A:102:LYS:HE3	1.69	0.41
1:C:273:ASN:OD1	1:C:292:ILE:HG13	2.20	0.41
1:E:7:PHE:CE1	1:E:28:GLY:HA3	2.54	0.41
1:E:245:TYR:CZ	1:E:267:GLU:HG2	2.56	0.41
1:E:32:THR:HG22	1:E:42:VAL:HG22	2.02	0.41
4:A:1004:GDP:C2	1:B:103:SER:O	2.73	0.41
1:F:148:GLU:HB3	1:F:149:PRO:HD3	2.01	0.41
1:A:80:ALA:CA	4:E:1003:GDP:HN21	2.31	0.41
1:D:22:ARG:HD2	1:D:294:MET:SD	2.61	0.41
1:F:55:ILE:HD13	1:F:73:MET:HB3	2.02	0.41
1:F:78:LYS:HE2	1:F:120:GLY:O	2.20	0.41
1:F:138:PHE:HB3	1:F:140:ILE:HG13	2.01	0.41
1:D:237:LEU:HD23	1:D:237:LEU:HA	1.78	0.41
1:E:181:ILE:CD1	1:E:219:VAL:HG11	2.50	0.41
1:E:309:VAL:HG13	1:E:312:LEU:HD23	2.03	0.41
1:F:100:LYS:HG3	1:F:105:ALA:HB3	2.02	0.41
1:B:115:MET:HA	1:B:118:VAL:HG12	2.03	0.41
1:D:124:ILE:HB	1:D:142:VAL:HG22	2.02	0.41
1:E:155:ILE:HD11	1:E:217:ILE:CD1	2.41	0.41
1:E:252:ILE:HD13	1:E:275:ILE:HD13	2.03	0.41
1:F:224:ASP:HA	1:F:252:ILE:HB	2.02	0.41
1:F:258:ILE:HG23	1:F:284:CYS:HB2	2.03	0.41
1:F:298:GLU:OE2	1:F:302:ARG:NH1	2.54	0.41
1:B:311:TYR:C	1:B:313:PHE:H	2.25	0.40
1:E:155:ILE:HD13	1:E:155:ILE:HG21	1.83	0.40
1:F:4:ILE:H	1:F:4:ILE:HG22	1.67	0.40
1:F:5:LYS:HD3	1:F:51:GLU:CG	2.52	0.40
1:B:47:SER:HA	1:C:104:ARG:HD3	2.03	0.40
1:B:294:MET:SD	1:B:294:MET:N	2.90	0.40
1:C:138:PHE:O	1:D:110:LYS:HE2	2.22	0.40
1:D:6:ILE:HD11	1:D:23:LEU:HD12	2.03	0.40
1:D:97:GLN:NE2	1:D:106:PRO:O	2.54	0.40
1:E:138:PHE:CD1	1:E:142:VAL:HG21	2.56	0.40
1:F:94:TYR:O	1:F:109:ALA:HB2	2.21	0.40
1:F:115:MET:HA	1:F:118:VAL:HG12	2.03	0.40
1:B:145:LEU:HD13	1:B:295:ILE:HG22	2.02	0.40
1:D:269:VAL:O	1:D:287:ILE:HA	2.21	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	305/318 (96%)	271 (89%)	27 (9%)	7 (2%)	5	26
1	B	305/318 (96%)	273 (90%)	26 (8%)	6 (2%)	6	29
1	C	305/318 (96%)	273 (90%)	27 (9%)	5 (2%)	8	34
1	D	290/318 (91%)	259 (89%)	26 (9%)	5 (2%)	7	33
1	E	302/318 (95%)	268 (89%)	30 (10%)	4 (1%)	10	39
1	F	304/318 (96%)	274 (90%)	26 (9%)	4 (1%)	10	39
All	All	1811/1908 (95%)	1618 (89%)	162 (9%)	31 (2%)	7	33

All (31) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	2	PRO
1	B	194	LYS
1	B	252	ILE
1	B	307	GLU
1	C	12	HIS
1	C	27	LEU
1	C	173	GLY
1	D	173	GLY
1	D	292	ILE
1	F	212	LYS
1	F	242	THR
1	A	61	GLY
1	A	305	ASN
1	B	211	VAL
1	D	29	LYS
1	D	291	ASP
1	E	173	GLY
1	E	211	VAL
1	E	215	VAL
1	F	2	PRO

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Mol	Chain	Res	Type
1	F	61	GLY
1	A	150	ALA
1	A	306	GLY
1	A	314	SER
1	B	312	LEU
1	C	210	ASP
1	C	317	PRO
1	E	316	VAL
1	D	167	ILE
1	A	316	VAL
1	B	306	GLY

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	262/270 (97%)	256 (98%)	6 (2%)	45	75
1	B	262/270 (97%)	256 (98%)	6 (2%)	45	75
1	C	262/270 (97%)	259 (99%)	3 (1%)	70	87
1	D	248/270 (92%)	246 (99%)	2 (1%)	79	90
1	E	259/270 (96%)	252 (97%)	7 (3%)	40	71
1	F	261/270 (97%)	251 (96%)	10 (4%)	28	62
All	All	1554/1620 (96%)	1520 (98%)	34 (2%)	47	76

All (34) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	5	LYS
1	A	8	SER
1	A	100	LYS
1	A	214	ARG
1	A	294	MET
1	A	308	SER
1	B	78	LYS

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Mol	Chain	Res	Type
1	B	184	ARG
1	B	204	ARG
1	B	234	ASP
1	B	243	ARG
1	B	318	LEU
1	C	204	ARG
1	C	228	THR
1	C	294	MET
1	D	184	ARG
1	D	283	HIS
1	E	62	GLU
1	E	104	ARG
1	E	184	ARG
1	E	207	LEU
1	E	243	ARG
1	E	294	MET
1	E	311	TYR
1	F	1	SER
1	F	5	LYS
1	F	6	ILE
1	F	8	SER
1	F	12	HIS
1	F	104	ARG
1	F	160	SER
1	F	213	ASP
1	F	214	ARG
1	F	294	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	D	263	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 oligosaccharides in this entry.

5.6 Ligand geometry (i)

23 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	$\#\|Z\| > 2$
4	GDP	E	1003	-	24,30,30	1.11	1 (4%)	30,47,47	1.26	5 (16%)
3	HSX	C	1002	-	14,14,14	2.00	3 (21%)	20,21,21	2.07	3 (15%)
5	PO4	A	1006	-	4,4,4	0.95	0	6,6,6	0.36	0
5	PO4	D	1002	-	4,4,4	2.12	3 (75%)	6,6,6	1.67	2 (33%)
2	APC	C	1001	-	27,33,33	2.20	9 (33%)	31,52,52	2.08	12 (38%)
3	HSX	A	1002	-	14,14,14	1.40	1 (7%)	20,21,21	1.53	3 (15%)
5	PO4	D	1003	-	4,4,4	0.88	0	6,6,6	0.41	0
5	PO4	F	3003	-	4,4,4	0.90	0	6,6,6	0.50	0
2	APC	B	1001	-	27,33,33	2.15	9 (33%)	31,52,52	2.43	13 (41%)
4	GDP	C	1003	-	22,26,30	1.07	1 (4%)	26,40,47	1.29	3 (11%)
4	GDP	C	1004	-	24,30,30	1.00	2 (8%)	30,47,47	1.27	6 (20%)
4	GDP	A	1004	-	24,30,30	1.01	1 (4%)	30,47,47	1.23	4 (13%)
5	PO4	C	1005	-	4,4,4	0.96	0	6,6,6	0.34	0
2	APC	A	1001	-	27,33,33	2.14	9 (33%)	31,52,52	2.20	15 (48%)
2	APC	D	1001	-	27,33,33	2.11	10 (37%)	31,52,52	2.15	13 (41%)
5	PO4	B	1003	-	4,4,4	0.85	0	6,6,6	0.50	0
3	HSX	B	1002	-	14,14,14	1.74	4 (28%)	20,21,21	2.03	7 (35%)
3	HSX	F	3002	-	14,14,14	1.03	0	20,21,21	1.74	5 (25%)
4	GDP	A	1003	-	24,30,30	0.98	1 (4%)	30,47,47	1.27	5 (16%)
4	GDP	F	3001	-	24,30,30	1.02	1 (4%)	30,47,47	1.44	4 (13%)
3	HSX	E	1002	-	14,14,14	1.29	1 (7%)	20,21,21	3.46	8 (40%)
2	APC	A	1005	-	27,33,33	2.23	10 (37%)	31,52,52	2.15	11 (35%)
2	APC	E	1001	-	27,33,33	2.19	9 (33%)	31,52,52	2.18	13 (41%)

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	APC	D	1001	-	-	4/15/38/38	0/3/3/3
4	GDP	C	1004	-	-	5/12/32/32	0/3/3/3
2	APC	C	1001	-	-	3/15/38/38	0/3/3/3
3	HSX	A	1002	-	-	5/6/22/22	0/1/1/1
4	GDP	E	1003	-	-	2/12/32/32	0/3/3/3
3	HSX	C	1002	-	-	3/6/22/22	0/1/1/1
3	HSX	B	1002	-	-	3/6/22/22	0/1/1/1
3	HSX	F	3002	-	-	3/6/22/22	0/1/1/1
2	APC	B	1001	-	-	3/15/38/38	0/3/3/3
4	GDP	A	1004	-	-	4/12/32/32	0/3/3/3
4	GDP	C	1003	-	-	3/6/26/32	0/3/3/3
2	APC	A	1001	-	-	3/15/38/38	0/3/3/3
4	GDP	A	1003	-	-	5/12/32/32	0/3/3/3
4	GDP	F	3001	-	-	6/12/32/32	0/3/3/3
3	HSX	E	1002	-	-	6/6/22/22	0/1/1/1
2	APC	A	1005	-	-	5/15/38/38	0/3/3/3
2	APC	E	1001	-	-	2/15/38/38	0/3/3/3

All (75) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	1001	APC	C2-N3	4.95	1.40	1.32
2	E	1001	APC	C2-N3	4.94	1.40	1.32
2	A	1005	APC	C2-N3	4.88	1.40	1.32
2	C	1001	APC	C2-N3	4.83	1.39	1.32
2	B	1001	APC	C2-N3	4.71	1.39	1.32
2	A	1001	APC	C2-N3	4.58	1.39	1.32
2	C	1001	APC	PB-O3B	4.43	1.63	1.58
3	C	1002	HSX	C1-C2	-4.07	1.48	1.52
3	C	1002	HSX	O4-C1	-4.03	1.38	1.43
2	B	1001	APC	PA-O5'	3.95	1.63	1.57
2	C	1001	APC	PB-O2B	-3.77	1.47	1.56
3	E	1002	HSX	P'-O1X	3.77	1.62	1.50
2	E	1001	APC	PB-O3B	3.72	1.62	1.58
2	A	1005	APC	PB-O3B	3.65	1.62	1.58

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	1001	APC	PB-O2B	-3.61	1.47	1.56
2	A	1001	APC	O4'-C1'	3.58	1.46	1.41
2	A	1005	APC	PA-O2A	-3.58	1.48	1.56
4	E	1003	GDP	C6-N1	-3.56	1.32	1.37
2	B	1001	APC	PB-O3B	3.53	1.62	1.58
2	A	1001	APC	PA-O2A	-3.51	1.48	1.56
2	A	1005	APC	PA-O5'	3.51	1.62	1.57
3	B	1002	HSX	O4-C4	-3.50	1.37	1.45
2	A	1005	APC	PB-O2B	-3.49	1.48	1.56
2	A	1001	APC	PB-O2B	-3.47	1.48	1.56
2	D	1001	APC	PB-O3B	3.47	1.62	1.58
2	E	1001	APC	PA-O2A	-3.47	1.48	1.56
2	D	1001	APC	PA-O2A	-3.46	1.48	1.56
2	B	1001	APC	PA-O2A	-3.46	1.48	1.56
2	D	1001	APC	PB-O2B	-3.45	1.48	1.56
2	E	1001	APC	PB-O2B	-3.37	1.48	1.56
2	C	1001	APC	PA-O2A	-3.36	1.48	1.56
2	E	1001	APC	PA-O5'	3.27	1.62	1.57
2	A	1001	APC	PA-O5'	3.27	1.62	1.57
2	A	1005	APC	C2-N1	3.25	1.40	1.33
2	C	1001	APC	O4'-C1'	3.18	1.45	1.41
4	F	3001	GDP	C6-N1	-3.18	1.33	1.37
2	E	1001	APC	C2-N1	3.12	1.39	1.33
2	D	1001	APC	C2-N1	3.10	1.39	1.33
2	A	1005	APC	O4'-C1'	3.09	1.45	1.41
3	C	1002	HSX	O4-C4	-3.09	1.38	1.45
2	E	1001	APC	O4'-C1'	3.04	1.45	1.41
2	A	1001	APC	PB-O3B	3.04	1.61	1.58
2	C	1001	APC	C2-N1	3.02	1.39	1.33
2	A	1001	APC	C2-N1	3.00	1.39	1.33
2	B	1001	APC	C5-C4	-2.98	1.33	1.40
4	A	1003	GDP	C6-N1	-2.97	1.33	1.37
2	B	1001	APC	C2-N1	2.94	1.39	1.33
4	C	1004	GDP	C6-N1	-2.93	1.33	1.37
5	D	1002	PO4	P-O4	-2.90	1.45	1.54
4	A	1004	GDP	C6-N1	-2.90	1.33	1.37
2	D	1001	APC	PA-O5'	2.87	1.61	1.57
2	C	1001	APC	C5-C4	-2.85	1.33	1.40
3	A	1002	HSX	P'-O3X	-2.81	1.44	1.54
2	A	1005	APC	C5-C4	-2.79	1.33	1.40
2	E	1001	APC	C5-C4	-2.75	1.33	1.40
2	A	1001	APC	C5-C4	-2.74	1.33	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	1001	APC	C6-C5	-2.69	1.33	1.43
2	B	1001	APC	C6-C5	-2.66	1.33	1.43
2	A	1005	APC	C6-C5	-2.66	1.33	1.43
2	C	1001	APC	C6-C5	-2.66	1.33	1.43
4	C	1003	GDP	C6-N1	-2.65	1.33	1.37
2	D	1001	APC	C5-C4	-2.64	1.33	1.40
2	E	1001	APC	C6-C5	-2.61	1.33	1.43
2	A	1001	APC	C6-C5	-2.60	1.33	1.43
3	B	1002	HSX	C3-C4	-2.27	1.47	1.53
3	B	1002	HSX	C5-C4	-2.23	1.44	1.51
2	D	1001	APC	C2'-C1'	-2.21	1.50	1.53
5	D	1002	PO4	P-O2	-2.19	1.48	1.54
2	C	1001	APC	PA-O5'	2.19	1.60	1.57
2	D	1001	APC	O4'-C1'	2.18	1.44	1.41
5	D	1002	PO4	P-O3	-2.17	1.48	1.54
3	B	1002	HSX	P'-O3X	-2.13	1.46	1.54
2	A	1005	APC	C2'-C1'	-2.13	1.50	1.53
2	B	1001	APC	C2'-C1'	-2.09	1.50	1.53
4	C	1004	GDP	O4'-C1'	2.09	1.44	1.41

All (132) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	E	1002	HSX	O5-P'-O1X	-8.72	82.03	106.47
3	E	1002	HSX	O3X-P'-O5	-7.66	86.36	106.73
3	E	1002	HSX	O2X-P'-O5	-6.78	88.68	106.73
2	B	1001	APC	N3-C2-N1	-6.72	118.17	128.68
2	A	1001	APC	N3-C2-N1	-6.62	118.33	128.68
2	E	1001	APC	N3-C2-N1	-6.59	118.37	128.68
2	A	1005	APC	N3-C2-N1	-6.57	118.40	128.68
3	C	1002	HSX	O1-C1-O4	-6.57	102.71	111.13
2	C	1001	APC	N3-C2-N1	-6.47	118.57	128.68
2	D	1001	APC	N3-C2-N1	-6.45	118.59	128.68
2	B	1001	APC	O4'-C1'-C2'	-6.14	97.96	106.93
4	F	3001	GDP	PA-O3A-PB	-5.21	114.94	132.83
2	D	1001	APC	O4'-C1'-C2'	-4.38	100.53	106.93
3	F	3002	HSX	O1-C1-O4	4.15	116.45	111.13
3	E	1002	HSX	O3X-P'-O2X	4.04	123.08	107.64
3	B	1002	HSX	O4-C1-C2	-3.94	99.62	104.46
2	A	1005	APC	C3'-C2'-C1'	-3.91	95.09	100.98
2	E	1001	APC	O4'-C1'-C2'	-3.64	101.60	106.93
3	B	1002	HSX	O1-C1-O4	-3.63	106.49	111.13

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	1001	APC	C3'-C2'-C1'	-3.60	95.56	100.98
3	F	3002	HSX	O4-C4-C3	-3.57	98.04	105.11
3	B	1002	HSX	O4-C4-C3	-3.56	98.08	105.11
3	E	1002	HSX	O4-C1-C2	-3.50	100.16	104.46
4	A	1004	GDP	PA-O3A-PB	-3.47	120.91	132.83
2	C	1001	APC	C2'-C3'-C4'	-3.43	95.97	102.64
2	B	1001	APC	C1'-N9-C4	-3.39	120.68	126.64
2	E	1001	APC	C3'-C2'-C1'	-3.32	95.98	100.98
2	E	1001	APC	PB-O3B-PG	-3.32	120.93	132.62
4	A	1003	GDP	PA-O3A-PB	-3.26	121.63	132.83
3	A	1002	HSX	O5-C5-C4	-3.22	97.91	108.99
2	A	1001	APC	PB-O3B-PG	-3.20	121.34	132.62
2	A	1005	APC	O4'-C1'-C2'	-3.14	102.33	106.93
2	A	1005	APC	PB-O3B-PG	-3.11	121.67	132.62
3	F	3002	HSX	P'-O5-C5	3.05	126.70	118.30
4	C	1003	GDP	C3'-C2'-C1'	3.05	105.57	100.98
2	A	1001	APC	C2'-C3'-C4'	-3.03	96.75	102.64
2	C	1001	APC	PB-O3B-PG	-3.03	121.96	132.62
4	C	1004	GDP	PA-O3A-PB	-2.99	122.57	132.83
2	B	1001	APC	PB-O3B-PG	-2.98	122.12	132.62
3	C	1002	HSX	O3X-P'-O2X	2.98	119.02	107.64
3	B	1002	HSX	P'-O5-C5	2.98	126.49	118.30
2	A	1001	APC	C3'-C2'-C1'	-2.96	96.52	100.98
2	D	1001	APC	C5-C6-N6	-2.92	115.92	120.35
3	C	1002	HSX	O4-C4-C3	-2.91	99.35	105.11
2	E	1001	APC	O2A-PA-O1A	2.89	119.72	110.07
2	C	1001	APC	O2A-PA-O1A	2.87	119.64	110.07
2	C	1001	APC	C5-C6-N6	-2.85	116.01	120.35
3	E	1002	HSX	O1-C1-O4	-2.85	107.48	111.13
5	D	1002	PO4	O2-P-O1	-2.85	100.48	110.89
2	E	1001	APC	O3G-PG-O2G	2.83	118.47	107.64
2	D	1001	APC	O3G-PG-O2G	2.83	118.46	107.64
2	A	1001	APC	O3G-PG-O2G	2.80	118.35	107.64
2	E	1001	APC	O2B-PB-O1B	2.80	119.41	110.07
2	A	1001	APC	O2B-PB-O1B	2.79	119.38	110.07
4	C	1004	GDP	C5-C6-N1	2.78	118.86	113.95
2	A	1001	APC	O4'-C1'-C2'	-2.77	102.88	106.93
2	A	1005	APC	O2A-PA-O1A	2.75	119.26	110.07
2	B	1001	APC	O3G-PG-O2G	2.75	118.14	107.64
2	D	1001	APC	O2A-PA-O1A	2.73	119.20	110.07
4	E	1003	GDP	C3'-C2'-C1'	2.73	105.09	100.98
2	A	1001	APC	O2A-PA-O1A	2.72	119.16	110.07

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	E	1003	GDP	PA-O3A-PB	-2.72	123.50	132.83
2	A	1005	APC	C5-C6-N6	-2.72	116.22	120.35
2	C	1001	APC	O3G-PG-O2G	2.71	117.98	107.64
2	B	1001	APC	O2A-PA-O1A	2.69	119.04	110.07
2	A	1005	APC	O3G-PG-O2G	2.68	117.90	107.64
2	B	1001	APC	C5-C6-N6	-2.68	116.28	120.35
3	B	1002	HSX	O3X-P'-O2X	2.67	117.83	107.64
2	B	1001	APC	O2B-PB-O1B	2.66	118.95	110.07
2	E	1001	APC	C5-C6-N6	-2.63	116.36	120.35
3	B	1002	HSX	O4-C4-C5	-2.62	100.75	109.37
2	C	1001	APC	O3B-PG-O1G	-2.62	96.65	111.19
2	A	1005	APC	O2B-PB-O1B	2.61	118.77	110.07
2	D	1001	APC	O2B-PB-O1B	2.60	118.75	110.07
2	A	1001	APC	O3B-PG-O1G	-2.58	96.88	111.19
2	A	1001	APC	C5-C6-N6	-2.57	116.45	120.35
2	A	1001	APC	C1'-N9-C4	-2.57	122.13	126.64
2	E	1001	APC	O3B-PG-O1G	-2.55	97.07	111.19
2	A	1005	APC	O3G-PG-O3B	-2.53	96.14	104.64
2	D	1001	APC	C3'-C2'-C1'	-2.52	97.19	100.98
2	A	1005	APC	O3B-PG-O1G	-2.52	97.22	111.19
2	C	1001	APC	O2B-PB-O1B	2.49	118.40	110.07
2	D	1001	APC	PB-O3B-PG	-2.49	123.83	132.62
2	B	1001	APC	O3B-PG-O1G	-2.49	97.36	111.19
2	B	1001	APC	O3G-PG-O3B	-2.48	96.31	104.64
4	A	1003	GDP	C5-C6-N1	2.48	118.33	113.95
4	C	1003	GDP	C5-C6-N1	2.47	118.32	113.95
4	F	3001	GDP	C2-N1-C6	-2.41	120.67	125.10
4	E	1003	GDP	C5-C6-N1	2.40	118.19	113.95
4	A	1004	GDP	C2-N1-C6	-2.38	120.72	125.10
2	D	1001	APC	O3B-PG-O1G	-2.37	98.03	111.19
2	D	1001	APC	O2G-PG-O3B	-2.34	96.78	104.64
4	F	3001	GDP	C8-N7-C5	2.33	107.42	102.99
4	C	1004	GDP	C2-N1-C6	-2.32	120.83	125.10
4	E	1003	GDP	C2-N1-C6	-2.28	120.90	125.10
2	D	1001	APC	O3G-PG-O3B	-2.28	97.00	104.64
2	A	1001	APC	O3G-PG-O3B	-2.28	97.00	104.64
3	A	1002	HSX	O3X-P'-O5	-2.27	100.68	106.73
2	E	1001	APC	C2'-C3'-C4'	-2.26	98.25	102.64
4	A	1003	GDP	C2-N1-C6	-2.26	120.94	125.10
2	E	1001	APC	O3G-PG-O3B	-2.25	97.11	104.64
4	F	3001	GDP	C5-C6-N1	2.22	117.87	113.95
4	A	1004	GDP	C5-C6-N1	2.21	117.86	113.95

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	E	1002	HSX	O4-C4-C3	-2.21	100.75	105.11
4	A	1003	GDP	O2B-PB-O3A	2.20	112.02	104.64
3	F	3002	HSX	O2X-P'-O5	-2.20	100.88	106.73
2	A	1001	APC	O2G-PG-O3B	-2.19	97.29	104.64
5	D	1002	PO4	O3-P-O2	2.18	114.97	107.97
2	C	1001	APC	O4'-C1'-C2'	-2.18	103.74	106.93
3	A	1002	HSX	O2-C2-C3	2.17	118.84	111.82
2	B	1001	APC	O3G-PG-O1G	2.16	119.15	110.68
3	E	1002	HSX	O4-C4-C5	2.16	116.49	109.37
4	C	1004	GDP	C3'-C2'-C1'	2.16	104.23	100.98
2	A	1005	APC	O3G-PG-O1G	2.16	119.13	110.68
4	A	1004	GDP	C8-N7-C5	2.16	107.10	102.99
2	D	1001	APC	C2'-C3'-C4'	-2.13	98.49	102.64
4	A	1003	GDP	C8-N7-C5	2.09	106.96	102.99
2	E	1001	APC	O2G-PG-O3B	-2.08	97.65	104.64
2	C	1001	APC	O3G-PG-O1G	2.08	118.83	110.68
4	C	1004	GDP	C8-N7-C5	2.08	106.94	102.99
2	C	1001	APC	O3G-PG-O3B	-2.07	97.69	104.64
4	C	1004	GDP	O6-C6-C5	-2.06	120.36	124.37
2	C	1001	APC	C3'-C2'-C1'	-2.05	97.90	100.98
4	C	1003	GDP	C8-N7-C5	2.04	106.88	102.99
2	A	1001	APC	O3G-PG-O1G	2.04	118.66	110.68
2	B	1001	APC	O2G-PG-O3B	-2.04	97.80	104.64
3	F	3002	HSX	O3X-P'-O1X	2.03	118.64	110.68
4	E	1003	GDP	O3B-PB-O3A	2.03	111.46	104.64
2	D	1001	APC	O3G-PG-O1G	2.03	118.63	110.68
3	B	1002	HSX	O3-C3-C4	-2.02	105.20	111.05
2	E	1001	APC	O3G-PG-O1G	2.01	118.55	110.68
2	A	1001	APC	O2G-PG-O1G	2.01	118.53	110.68

There are no chirality outliers.

All (65) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	1005	APC	PB-C3A-PA-O1A
2	A	1005	APC	PB-C3A-PA-O2A
2	A	1005	APC	PB-C3A-PA-O5'
2	B	1001	APC	C5'-O5'-PA-O1A
2	B	1001	APC	C5'-O5'-PA-C3A
2	D	1001	APC	C5'-O5'-PA-O2A
3	A	1002	HSX	C5-O5-P'-O1X
3	A	1002	HSX	C5-O5-P'-O2X

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Mol	Chain	Res	Type	Atoms
3	A	1002	HSX	C5-O5-P'-O3X
3	B	1002	HSX	C4-C5-O5-P'
3	C	1002	HSX	C4-C5-O5-P'
3	E	1002	HSX	C5-O5-P'-O1X
3	F	3002	HSX	C3-C4-C5-O5
3	F	3002	HSX	C4-C5-O5-P'
4	A	1003	GDP	PA-O3A-PB-O2B
4	A	1003	GDP	C4'-C5'-O5'-PA
4	A	1004	GDP	PA-O3A-PB-O3B
4	C	1003	GDP	C3'-C4'-C5'-O5'
4	C	1004	GDP	C5'-O5'-PA-O3A
4	C	1004	GDP	C3'-C4'-C5'-O5'
4	F	3001	GDP	C5'-O5'-PA-O1A
4	F	3001	GDP	C5'-O5'-PA-O2A
4	F	3001	GDP	C4'-C5'-O5'-PA
2	E	1001	APC	O4'-C4'-C5'-O5'
2	E	1001	APC	C3'-C4'-C5'-O5'
3	C	1002	HSX	O4-C4-C5-O5
3	C	1002	HSX	C3-C4-C5-O5
3	E	1002	HSX	C3-C4-C5-O5
3	F	3002	HSX	O4-C4-C5-O5
4	C	1004	GDP	O4'-C4'-C5'-O5'
2	D	1001	APC	C3'-C4'-C5'-O5'
4	C	1003	GDP	O4'-C4'-C5'-O5'
4	F	3001	GDP	O4'-C4'-C5'-O5'
2	A	1005	APC	C5'-O5'-PA-O1A
2	D	1001	APC	O4'-C4'-C5'-O5'
4	F	3001	GDP	C3'-C4'-C5'-O5'
3	E	1002	HSX	O4-C4-C5-O5
4	E	1003	GDP	PB-O3A-PA-O1A
2	C	1001	APC	C3'-C4'-C5'-O5'
4	A	1004	GDP	C4'-C5'-O5'-PA
3	B	1002	HSX	C5-O5-P'-O2X
3	E	1002	HSX	C5-O5-P'-O3X
3	A	1002	HSX	C4-C5-O5-P'
4	A	1004	GDP	C5'-O5'-PA-O3A
4	F	3001	GDP	C5'-O5'-PA-O3A
4	A	1003	GDP	O4'-C4'-C5'-O5'
4	C	1004	GDP	C5'-O5'-PA-O2A
4	A	1003	GDP	C3'-C4'-C5'-O5'
2	B	1001	APC	PB-C3A-PA-O2A
3	A	1002	HSX	C3-C4-C5-O5

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Mol	Chain	Res	Type	Atoms
3	B	1002	HSX	C5-O5-P'-O1X
2	C	1001	APC	C4'-C5'-O5'-PA
2	C	1001	APC	O4'-C4'-C5'-O5'
3	E	1002	HSX	C4-C5-O5-P'
2	D	1001	APC	PA-C3A-PB-O1B
2	A	1001	APC	C5'-O5'-PA-O2A
2	A	1005	APC	C5'-O5'-PA-O2A
3	E	1002	HSX	C5-O5-P'-O2X
4	C	1003	GDP	C5'-O5'-PA-O2A
4	A	1003	GDP	PA-O3A-PB-O1B
4	A	1004	GDP	C3'-C4'-C5'-O5'
2	A	1001	APC	O4'-C4'-C5'-O5'
4	E	1003	GDP	PB-O3A-PA-O2A
4	C	1004	GDP	C5'-O5'-PA-O1A
2	A	1001	APC	C4'-C5'-O5'-PA

There are no ring outliers.

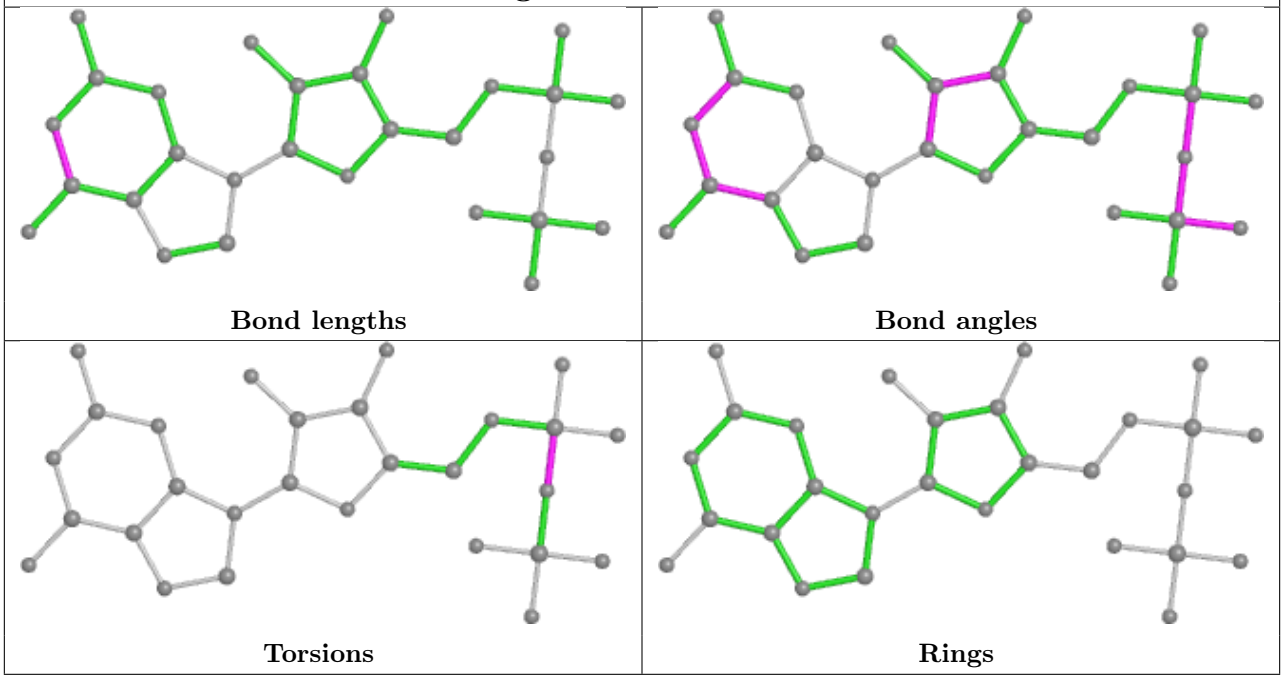
18 monomers are involved in 47 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	E	1003	GDP	6	0
3	C	1002	HSX	5	0
5	D	1002	PO4	3	0
2	C	1001	APC	3	0
3	A	1002	HSX	1	0
5	F	3003	PO4	1	0
2	B	1001	APC	1	0
4	C	1003	GDP	1	0
4	C	1004	GDP	2	0
4	A	1004	GDP	6	0
2	A	1001	APC	2	0
2	D	1001	APC	3	0
5	B	1003	PO4	1	0
3	F	3002	HSX	1	0
4	A	1003	GDP	4	0
4	F	3001	GDP	5	0
3	E	1002	HSX	1	0
2	E	1001	APC	1	0

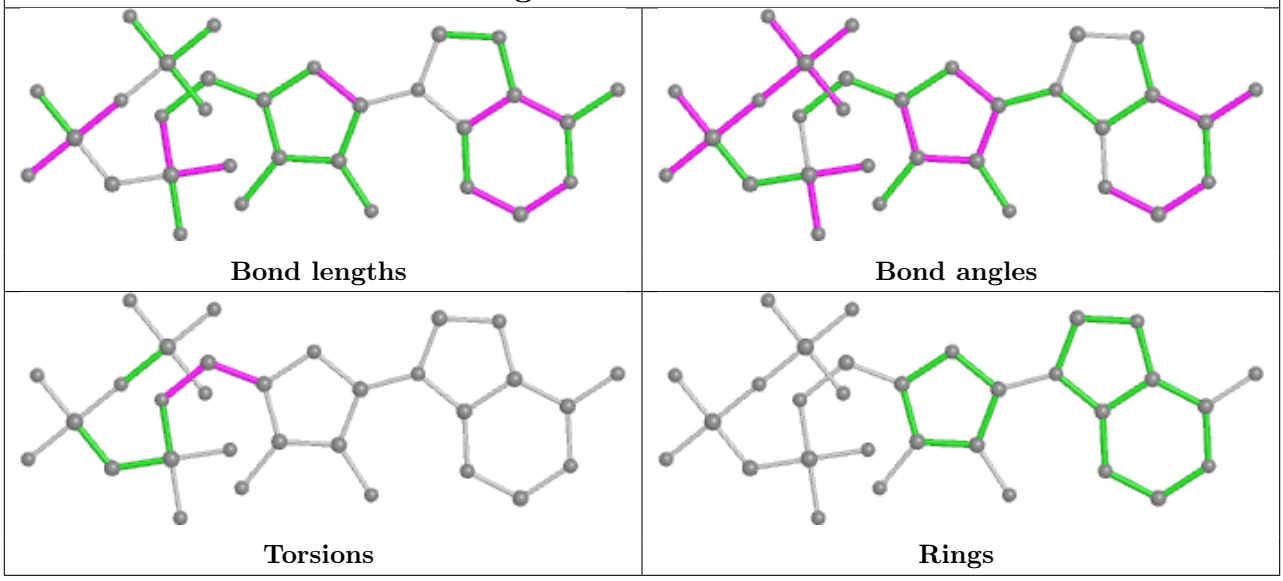
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will

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.

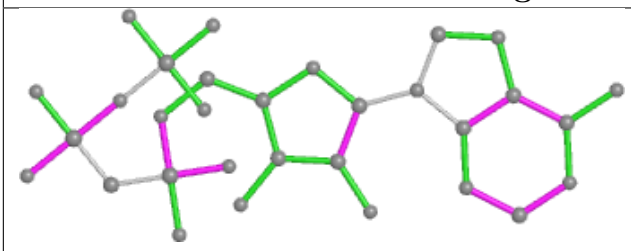
Ligand GDP E 1003



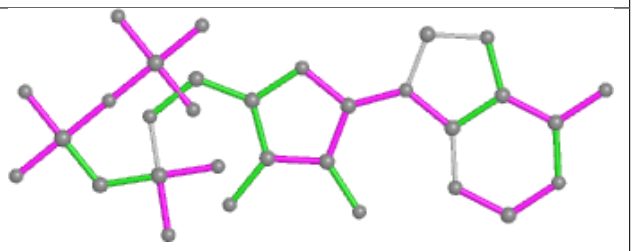
Ligand APC C 1001



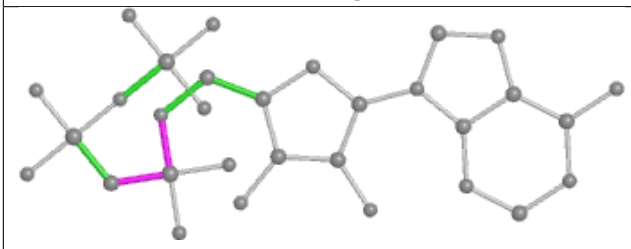
Ligand APC B 1001



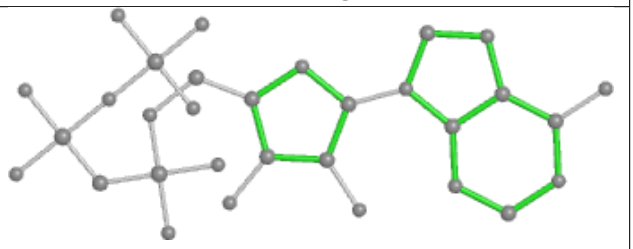
Bond lengths



Bond angles

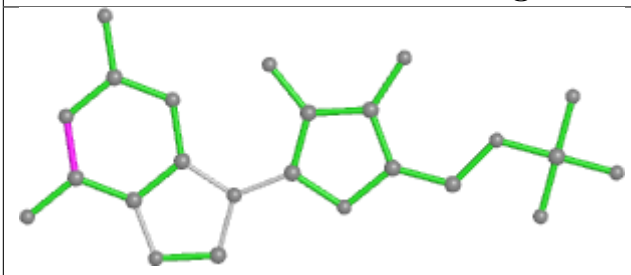


Torsions

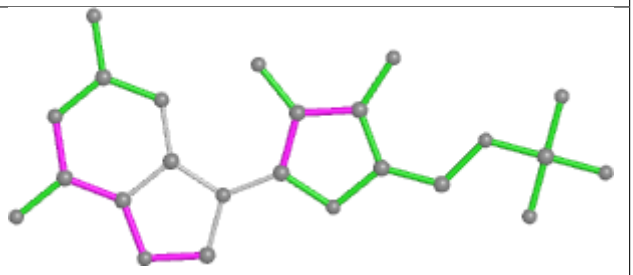


Rings

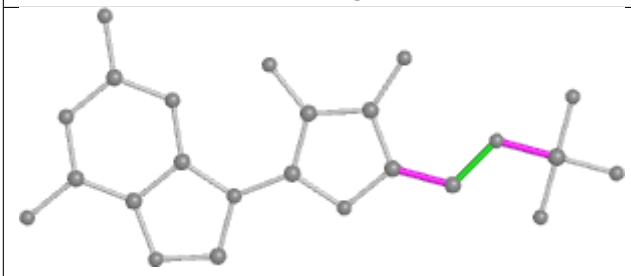
Ligand GDP C 1003



Bond lengths



Bond angles



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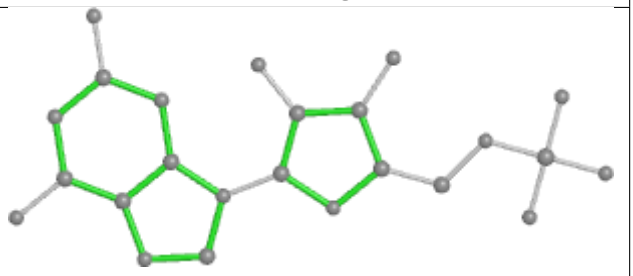
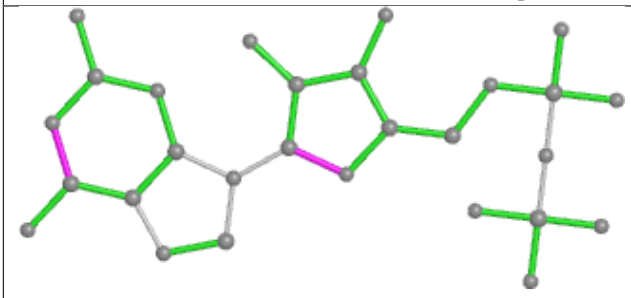
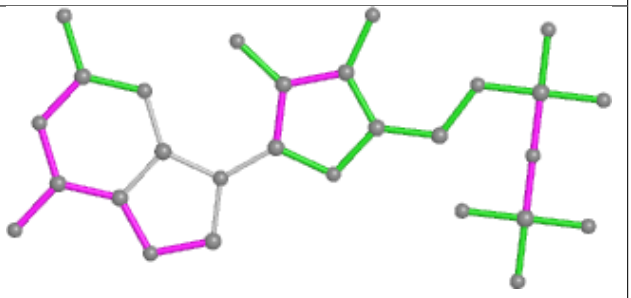


Rings

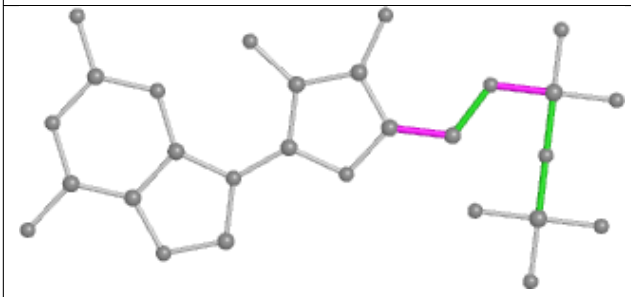
Ligand GDP C 1004



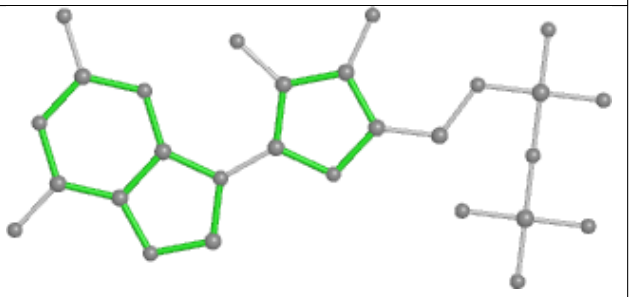
Bond lengths



Bond angles

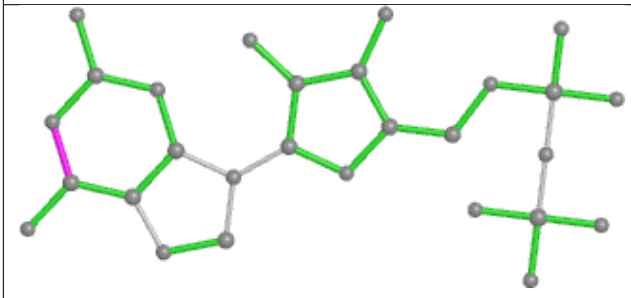


Torsions

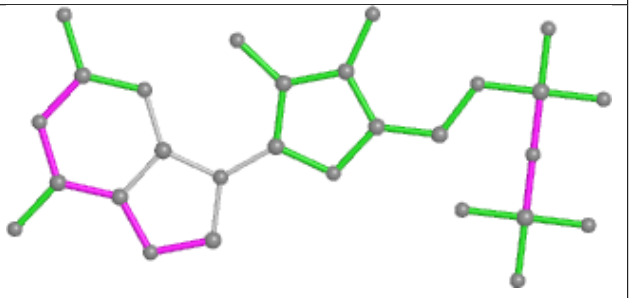


Rings

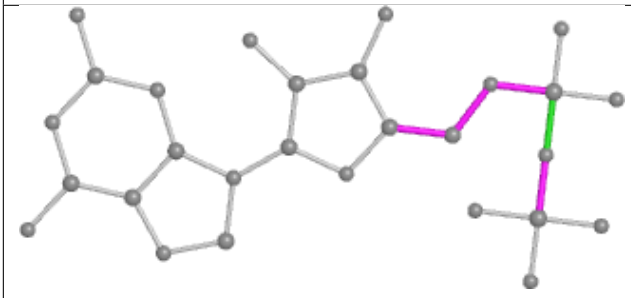
Ligand GDP A 1004



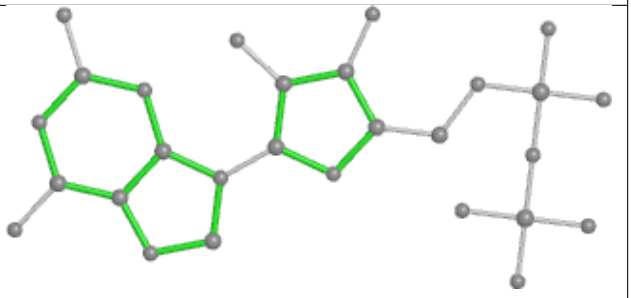
Bond lengths



Bond angles

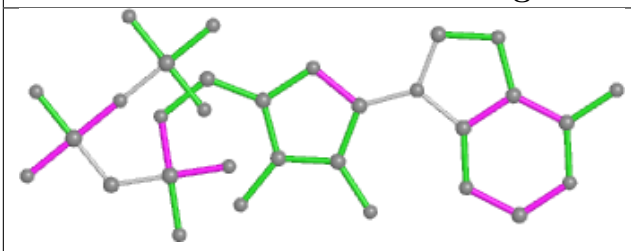


Torsions

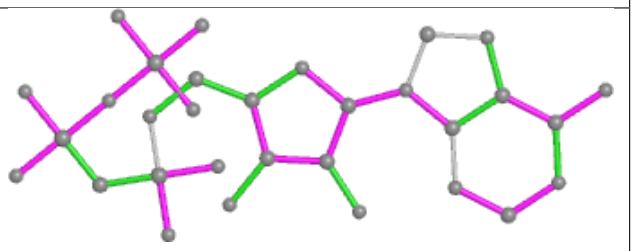


Rings

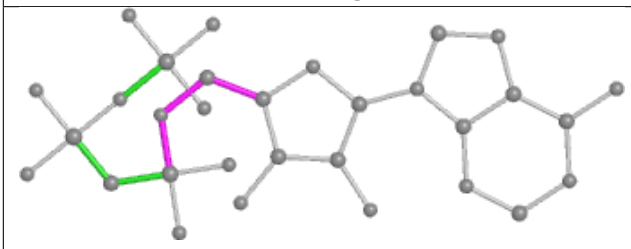
Ligand APC A 1001



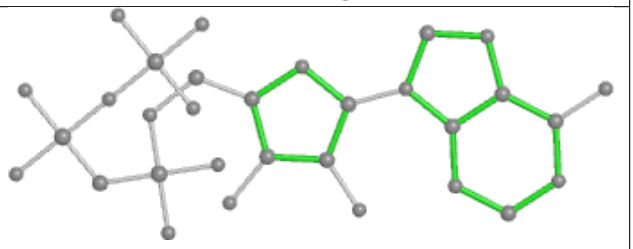
Bond lengths



Bond angles

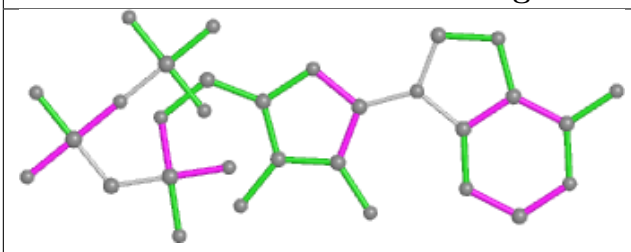


Torsions

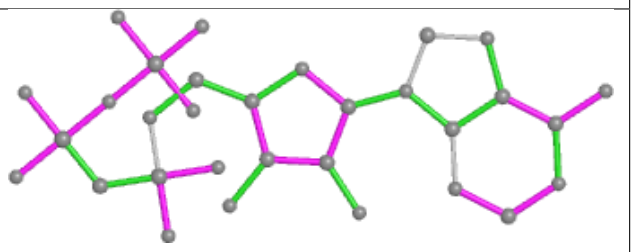


Rings

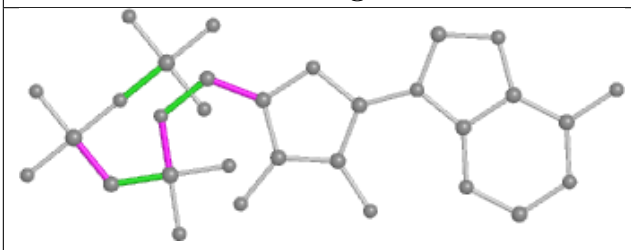
Ligand APC D 1001



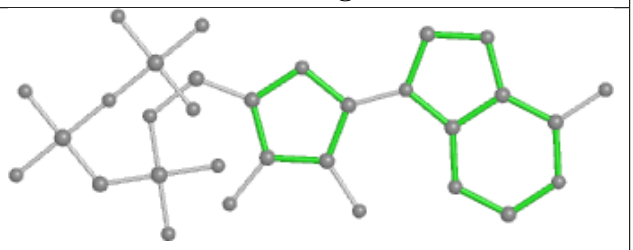
Bond lengths



Bond angles

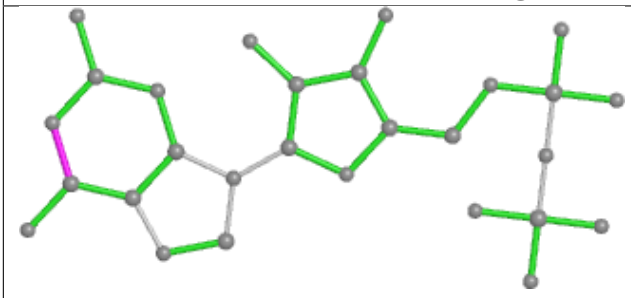


Torsions

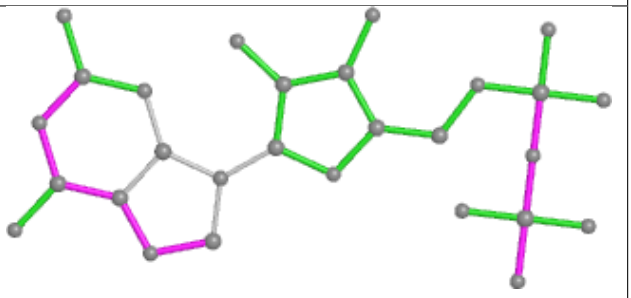


Rings

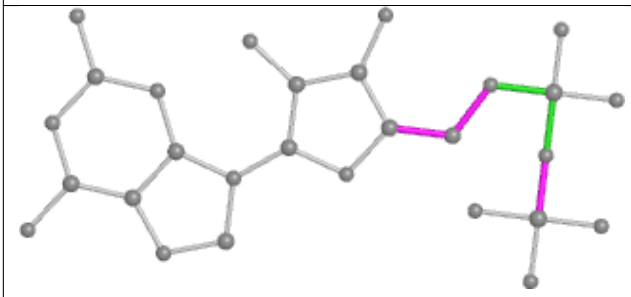
Ligand GDP A 1003



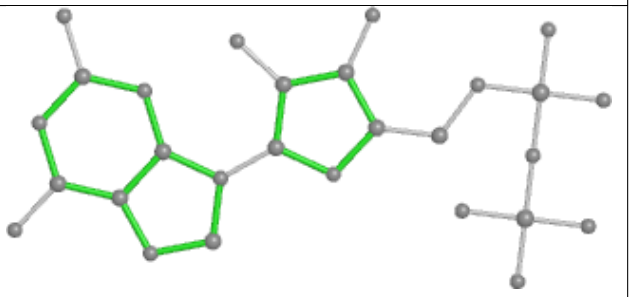
Bond lengths



Bond angles

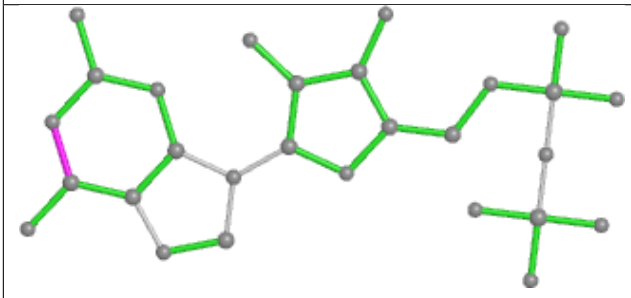


Torsions

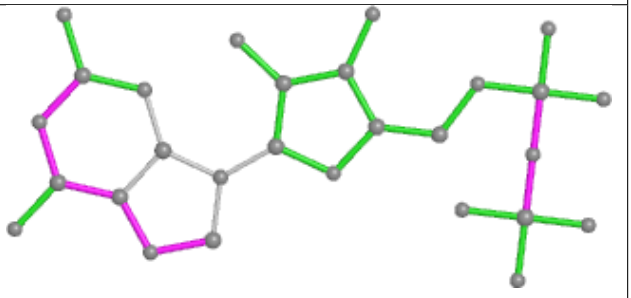


Rings

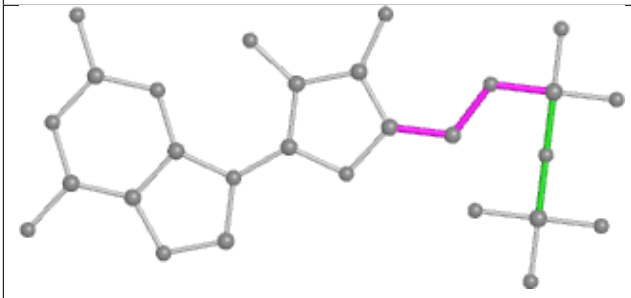
Ligand GDP F 3001



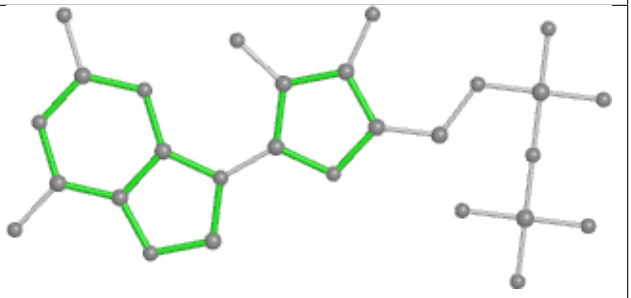
Bond lengths



Bond angles

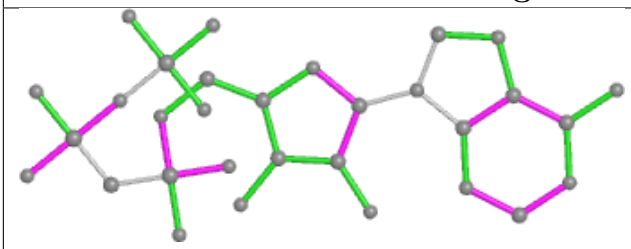


Torsions

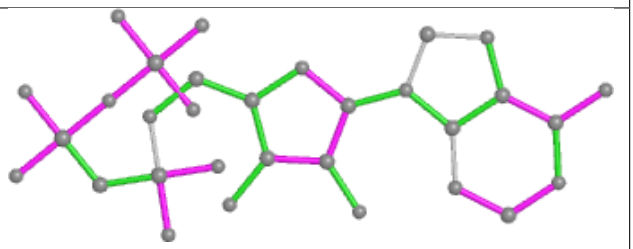


Rings

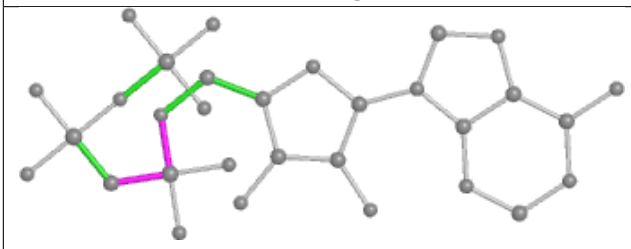
Ligand APC A 1005



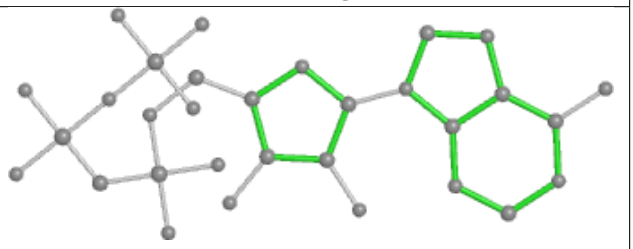
Bond lengths



Bond angles

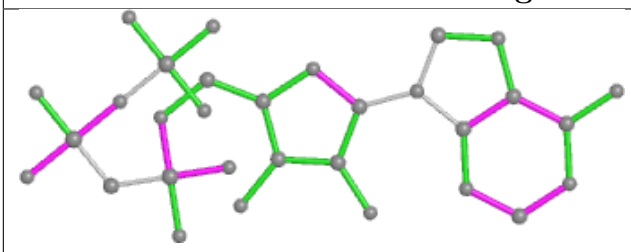


Torsions

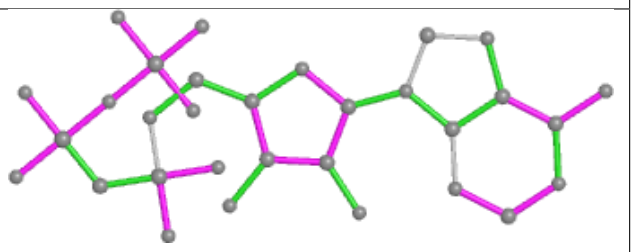


Rings

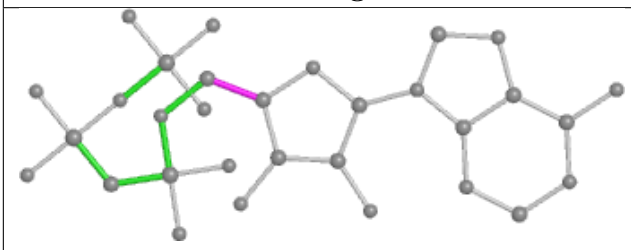
Ligand APC E 1001



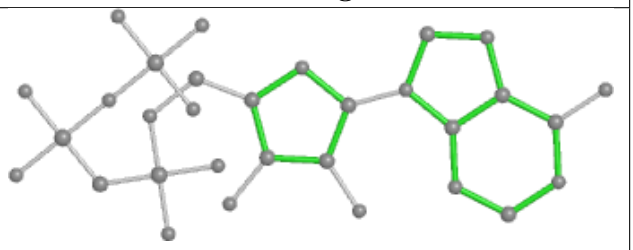
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} 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	309/318 (97%)	0.29	6 (1%)	66	44	22, 40, 62, 97	0
1	B	309/318 (97%)	0.11	9 (2%)	54	32	16, 35, 58, 75	0
1	C	309/318 (97%)	0.33	14 (4%)	39	22	21, 35, 59, 76	0
1	D	294/318 (92%)	0.23	12 (4%)	42	24	19, 40, 60, 75	0
1	E	306/318 (96%)	0.50	17 (5%)	31	18	26, 45, 73, 90	0
1	F	308/318 (96%)	0.45	12 (3%)	44	26	19, 37, 59, 73	0
All	All	1835/1908 (96%)	0.32	70 (3%)	44	26	16, 39, 64, 97	0

All (70) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	318	LEU	4.6
1	F	318	LEU	4.1
1	E	166	THR	4.0
1	A	2	PRO	3.7
1	F	1	SER	3.4
1	A	311	TYR	3.4
1	D	291	ASP	3.4
1	E	317	PRO	3.3
1	B	318	LEU	3.3
1	E	216	ALA	3.3
1	B	259	SER	3.2
1	F	101	ASP	3.2
1	A	186	ASN	3.1
1	D	166	THR	3.1
1	E	194	LYS	3.1
1	B	311	TYR	2.9
1	E	174	GLY	2.9
1	E	241	ALA	2.8
1	C	103	SER	2.7

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Mol	Chain	Res	Type	RSRZ
1	E	211	VAL	2.7
1	E	132	SER	2.7
1	D	144	ASN	2.7
1	E	215	VAL	2.7
1	A	316	VAL	2.6
1	D	174	GLY	2.6
1	E	315	HIS	2.6
1	F	169	SER	2.5
1	C	105	ALA	2.5
1	D	305	ASN	2.5
1	C	102	LYS	2.5
1	B	204	ARG	2.4
1	E	193	HIS	2.4
1	D	171	ASP	2.4
1	C	2	PRO	2.4
1	C	106	PRO	2.4
1	B	195	GLU	2.4
1	F	225	THR	2.4
1	C	204	ARG	2.4
1	C	285	SER	2.3
1	B	188	ASP	2.3
1	C	311	TYR	2.3
1	F	172	ALA	2.3
1	F	176	LYS	2.3
1	E	242	THR	2.3
1	B	101	ASP	2.2
1	F	305	ASN	2.2
1	E	101	ASP	2.2
1	C	165	CYS	2.2
1	D	194	LYS	2.2
1	C	261	ILE	2.2
1	F	238	SER	2.2
1	D	101	ASP	2.2
1	E	245	TYR	2.2
1	A	228	THR	2.2
1	E	316	VAL	2.2
1	F	105	ALA	2.1
1	A	136	GLY	2.1
1	E	165	CYS	2.1
1	F	104	ARG	2.1
1	C	39	GLU	2.1
1	E	185	LEU	2.1

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Mol	Chain	Res	Type	RSRZ
1	D	294	MET	2.1
1	B	2	PRO	2.1
1	F	315	HIS	2.1
1	C	263	ASN	2.0
1	B	301	ARG	2.0
1	D	264	ALA	2.0
1	C	160	SER	2.0
1	D	204	ARG	2.0
1	D	265	CYS	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^{th} 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^2)	Q<0.9
5	PO4	D	1003	5/5	0.57	0.21	64,69,90,114	0
4	GDP	C	1003	24/28	0.63	0.22	55,73,87,91	0
3	HSX	A	1002	14/14	0.65	0.20	65,79,108,132	0
3	HSX	B	1002	14/14	0.68	0.19	57,77,107,107	0
4	GDP	E	1003	28/28	0.70	0.29	36,61,134,140	0
3	HSX	E	1002	14/14	0.70	0.18	77,93,103,119	0
3	HSX	C	1002	14/14	0.73	0.17	59,78,90,97	0
4	GDP	A	1004	28/28	0.76	0.20	32,54,74,115	0
3	HSX	F	3002	14/14	0.77	0.14	48,66,82,97	0
4	GDP	F	3001	28/28	0.80	0.20	33,50,75,156	0
4	GDP	C	1004	28/28	0.80	0.20	27,52,88,96	0
2	APC	B	1001	31/31	0.81	0.16	48,63,89,115	0
2	APC	D	1001	31/31	0.82	0.11	43,53,87,88	0
2	APC	A	1005	31/31	0.82	0.13	33,57,97,122	0

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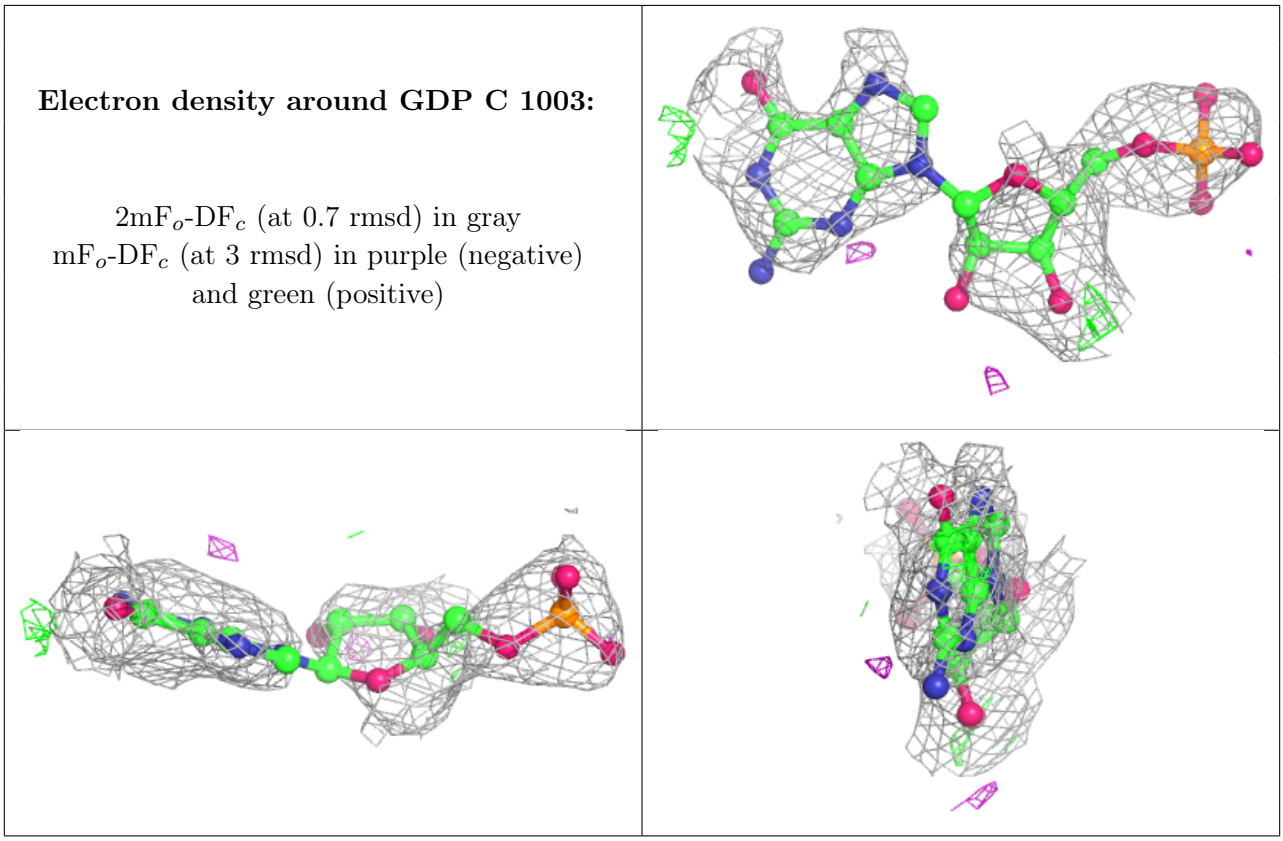
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	APC	E	1001	31/31	0.83	0.11	43,65,92,110	0
5	PO4	D	1002	5/5	0.84	0.15	58,67,84,113	0
2	APC	C	1001	31/31	0.84	0.12	33,61,101,103	0
5	PO4	A	1006	5/5	0.85	0.27	43,54,65,113	0
5	PO4	B	1003	5/5	0.85	0.20	53,54,77,96	0
4	GDP	A	1003	28/28	0.86	0.16	23,45,73,89	0
5	PO4	F	3003	5/5	0.86	0.22	47,57,75,94	0
2	APC	A	1001	31/31	0.88	0.11	31,52,92,103	0
5	PO4	C	1005	5/5	0.90	0.30	46,52,95,101	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.

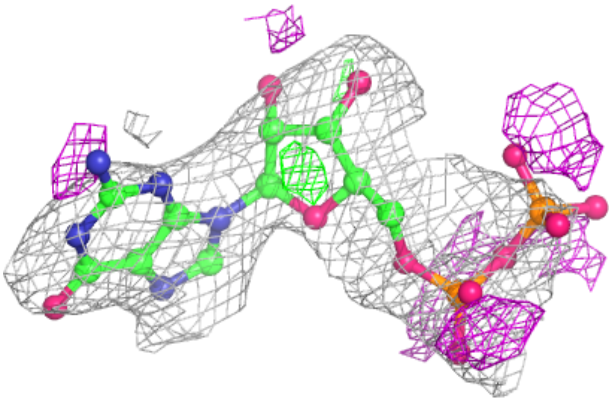
Electron density around GDP C 1003:

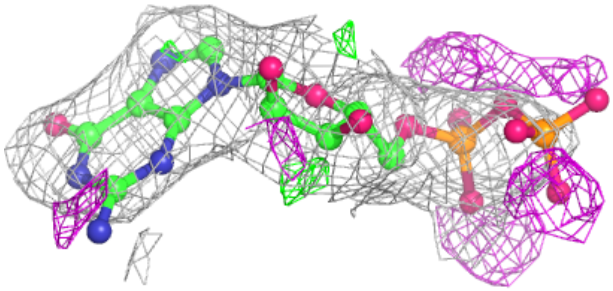
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

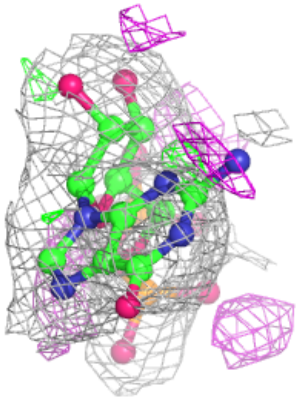


Electron density around GDP E 1003:

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

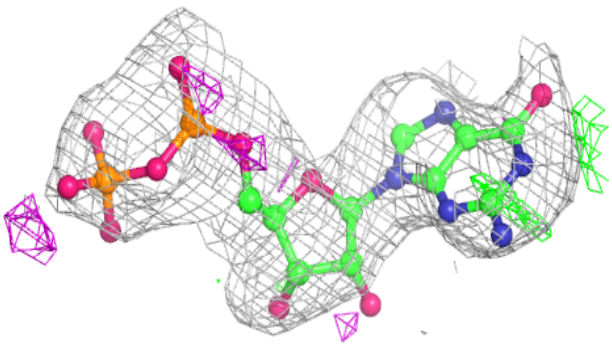


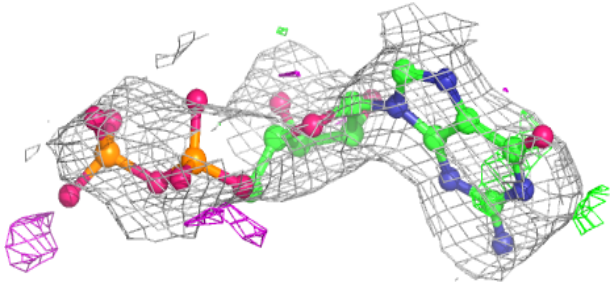


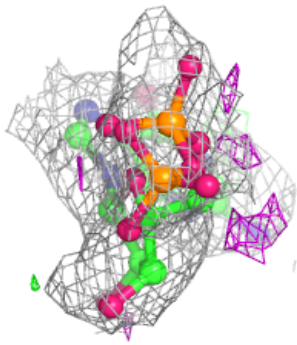


Electron density around GDP A 1004:

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

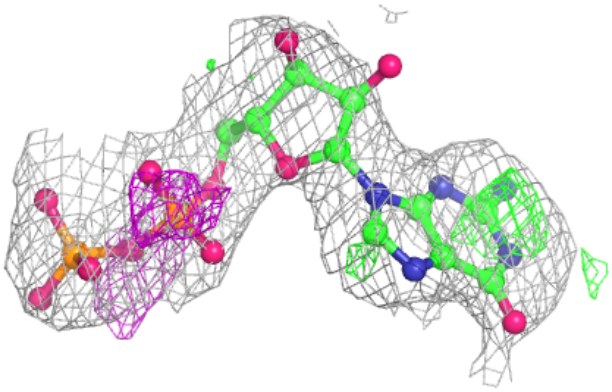


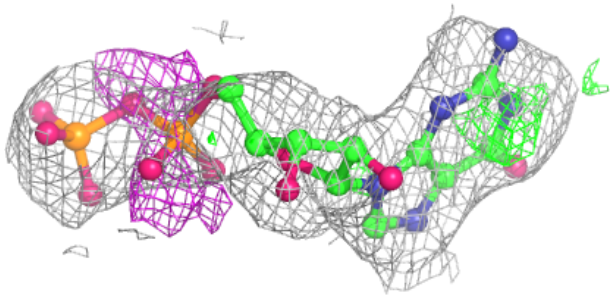


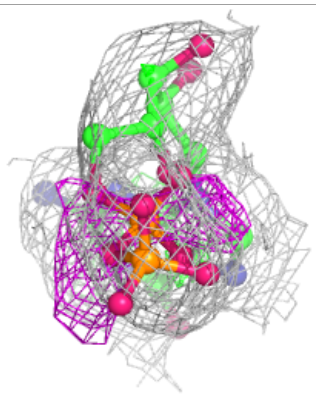


Electron density around GDP F 3001:

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

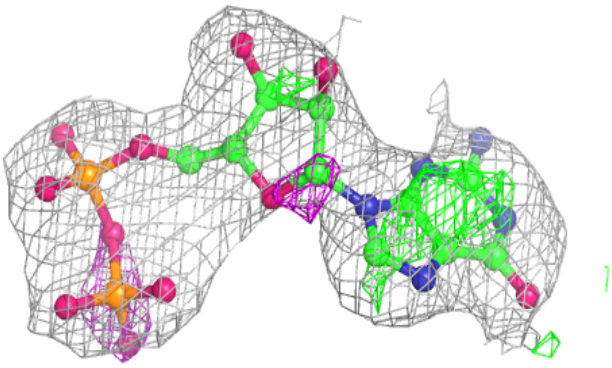


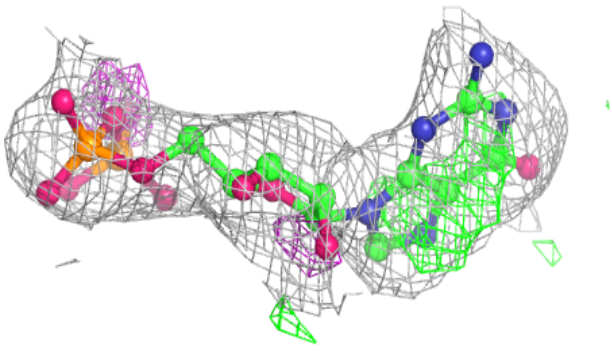


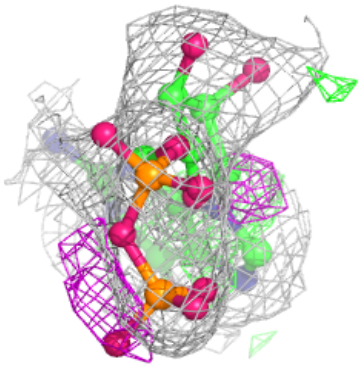


Electron density around GDP C 1004:

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

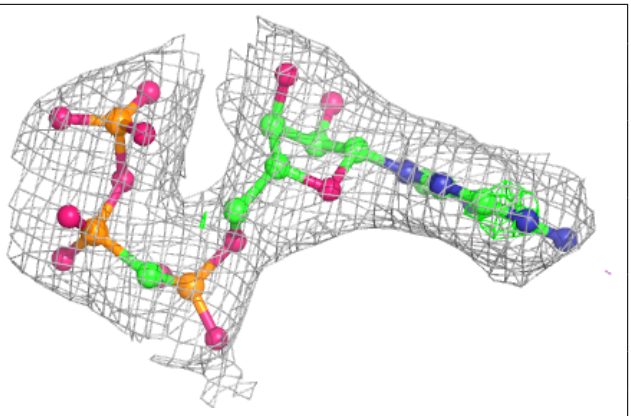


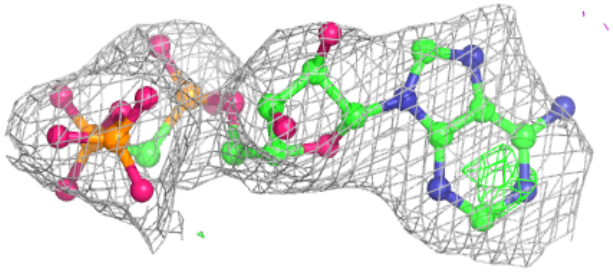


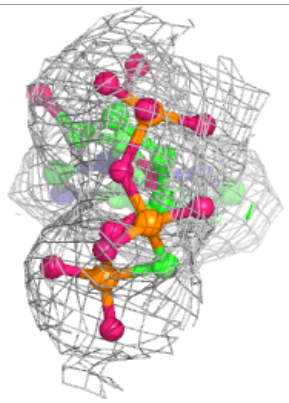


Electron density around APC B 1001:

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

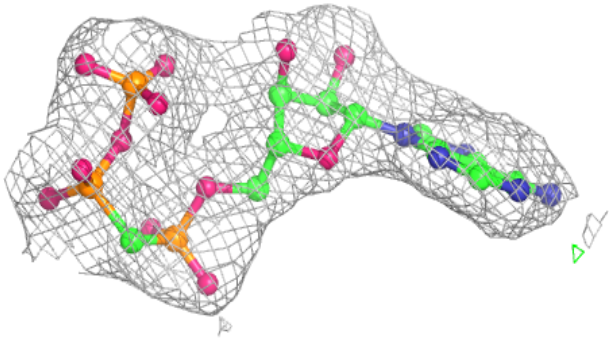


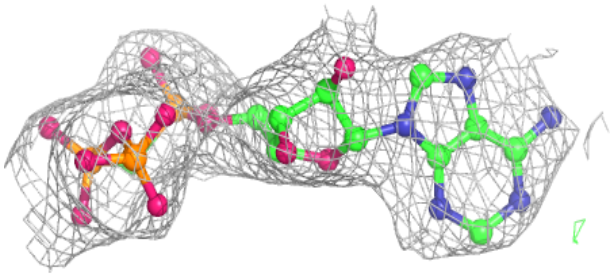


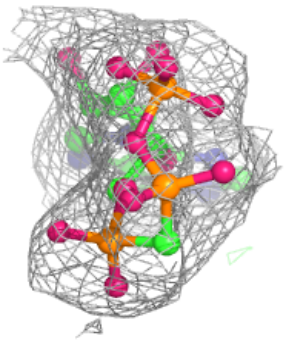


Electron density around APC D 1001:

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

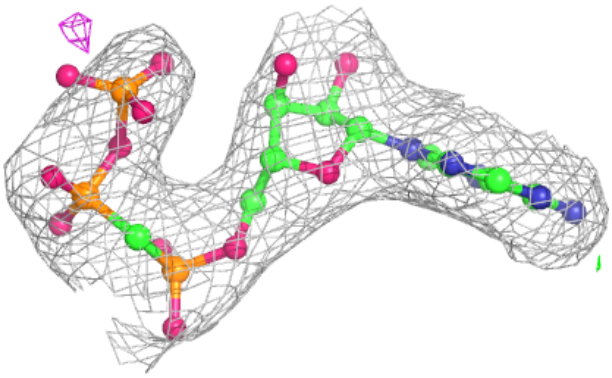


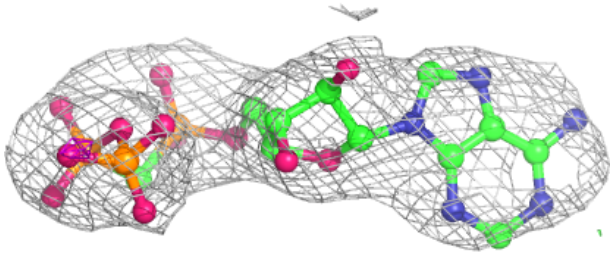


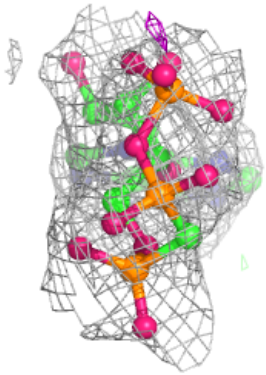


Electron density around APC A 1005:

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

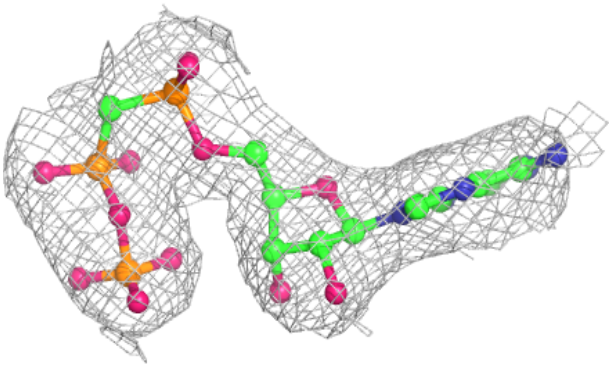


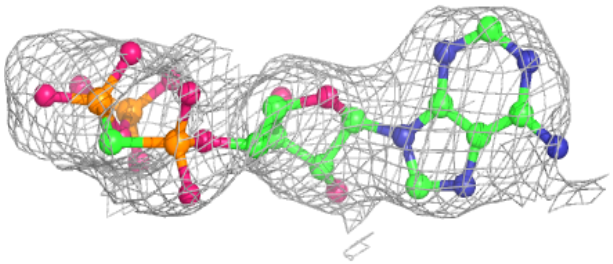


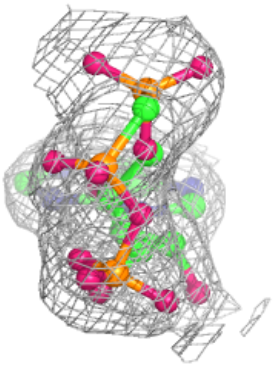


Electron density around APC E 1001:

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

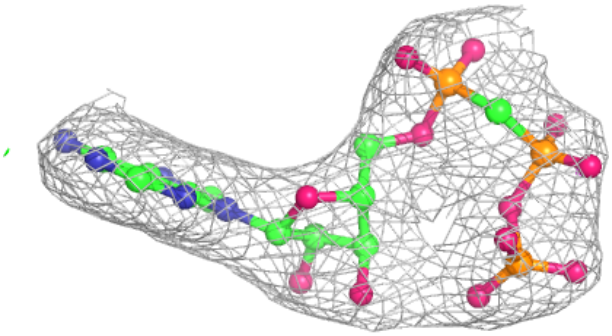


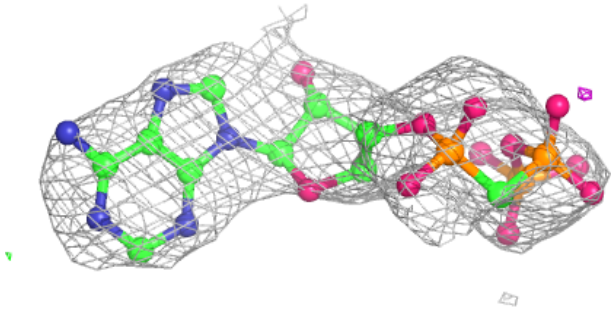


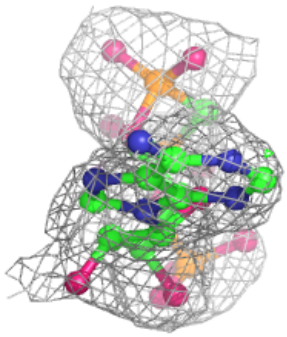


Electron density around APC C 1001:

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

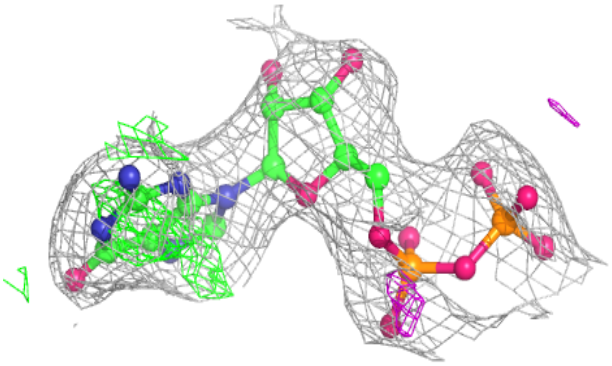


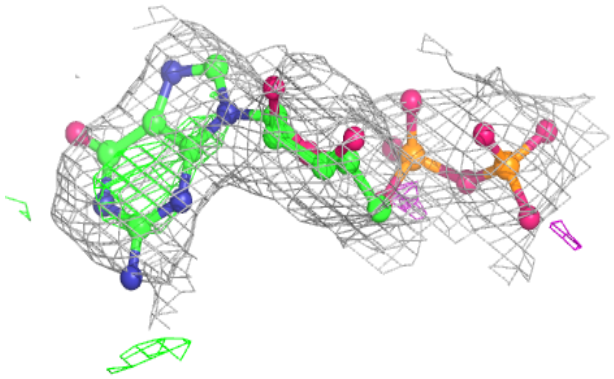


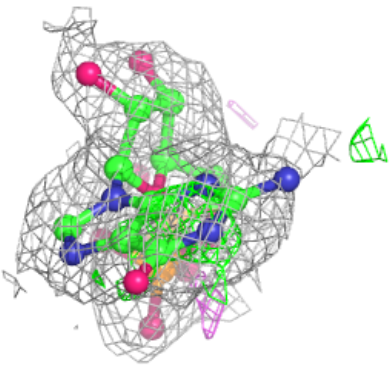


Electron density around GDP A 1003:

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

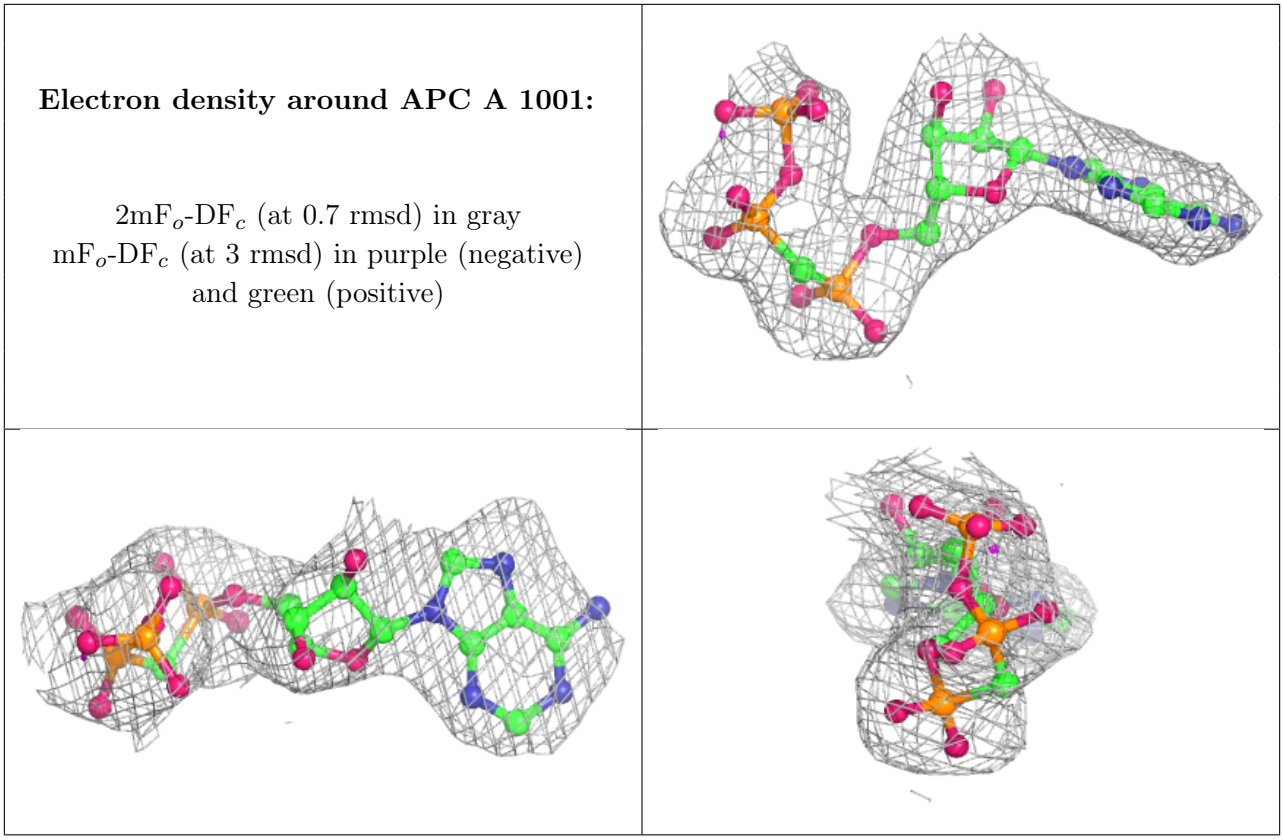






Electron density around APC A 1001:

$2mF_o$-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.