Full wwPDB X-ray Structure Validation Report (i)

Apr 9, 2025 – 06:14 PM JST

PDB ID	:	8ZN7 / pdb_00008zn7
Title	:	Crystal Structure of Designed Clock Protein KaiC
Authors	:	Furuike, Y.; Akiyama, S.
Deposited on	:	2024-05-26
Resolution	:	2.54 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 (i) 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 (i)) were used in the production of this report:

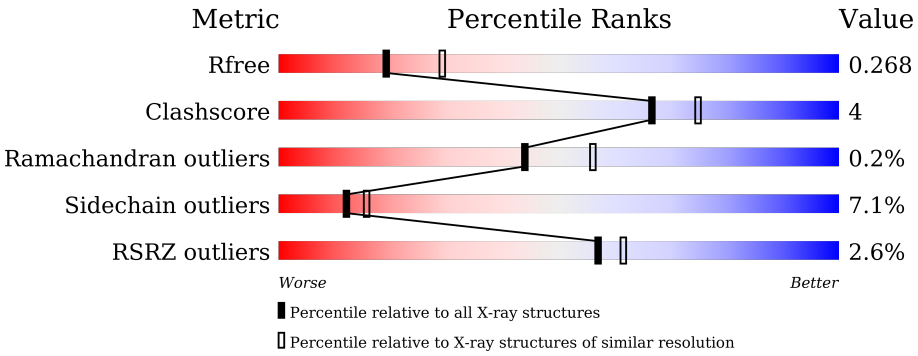
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.006 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.42

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 2.54 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	1004 (2.54-2.54)
Clashscore	180529	1055 (2.54-2.54)
Ramachandran outliers	177936	1048 (2.54-2.54)
Sidechain outliers	177891	1048 (2.54-2.54)
RSRZ outliers	164620	1004 (2.54-2.54)

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	512	2% 78% 10% • 10%
1	B	512	2% 78% 13% • 8%
1	C	512	2% 79% 12% • 8%
1	D	512	3% 83% 7% 9%
1	E	512	3% 81% 8% • 9%
1	F	512	3% 78% 11% • 10%

2 Entry composition

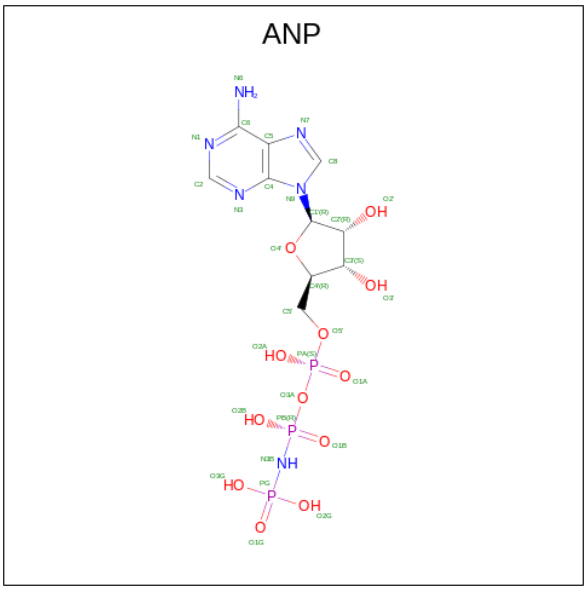
There are 4 unique types of molecules in this entry. The entry contains 20931 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 KaiC.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	D	464	Total	C	N	O	P	S	0	0	0
			3344	2120	587	624	1	12			
1	E	466	Total	C	N	O	P	S	0	0	0
			3339	2122	577	626	1	13			
1	B	471	Total	C	N	O	P	S	0	0	0
			3552	2255	627	654	1	15			
1	C	470	Total	C	N	O	P	S	0	0	0
			3494	2218	603	658	1	14			
1	F	460	Total	C	N	O	P	S	0	0	0
			3298	2096	571	616	1	14			
1	A	460	Total	C	N	O	P	S	0	0	0
			3416	2179	593	629	1	14			

- Molecule 2 is PHOSPHOAMINOPHOSPHONIC ACID-ADENYLATE ESTER (CCD ID: ANP) (formula: $C_{10}H_{17}N_6O_{12}P_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	D	1	Total	C	N	O	P	0	0
			31	10	6	12	3		
2	D	1	Total	C	N	O	P	0	0
			31	10	6	12	3		
2	E	1	Total	C	N	O	P	0	0
			31	10	6	12	3		
2	E	1	Total	C	N	O	P	0	0
			31	10	6	12	3		
2	B	1	Total	C	N	O	P	0	0
			31	10	6	12	3		
2	B	1	Total	C	N	O	P	0	0
			31	10	6	12	3		
2	C	1	Total	C	N	O	P	0	0
			31	10	6	12	3		
2	C	1	Total	C	N	O	P	0	0
			31	10	6	12	3		
2	F	1	Total	C	N	O	P	0	0
			31	10	6	12	3		
2	F	1	Total	C	N	O	P	0	0
			31	10	6	12	3		
2	A	1	Total	C	N	O	P	0	0
			31	10	6	12	3		
2	A	1	Total	C	N	O	P	0	0
			31	10	6	12	3		

- Molecule 3 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	D	2	Total	Mg	0	0
			2	2		
3	E	2	Total	Mg	0	0
			2	2		
3	B	2	Total	Mg	0	0
			2	2		
3	C	2	Total	Mg	0	0
			2	2		
3	F	2	Total	Mg	0	0
			2	2		
3	A	2	Total	Mg	0	0
			2	2		

- Molecule 4 is water.

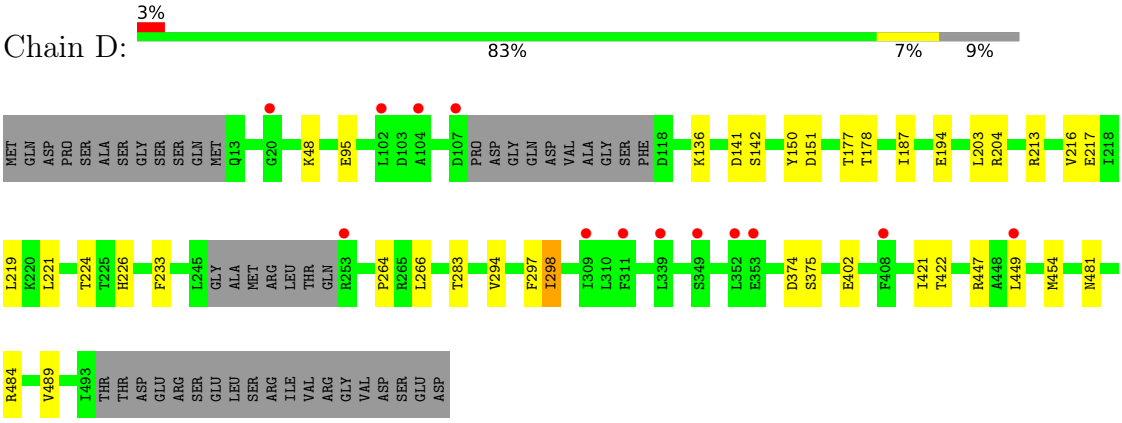
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	D	11	Total O 11 11	0	0
4	E	13	Total O 13 13	0	0
4	B	20	Total O 20 20	0	0
4	C	15	Total O 15 15	0	0
4	F	22	Total O 22 22	0	0
4	A	23	Total O 23 23	0	0

3 Residue-property plots

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

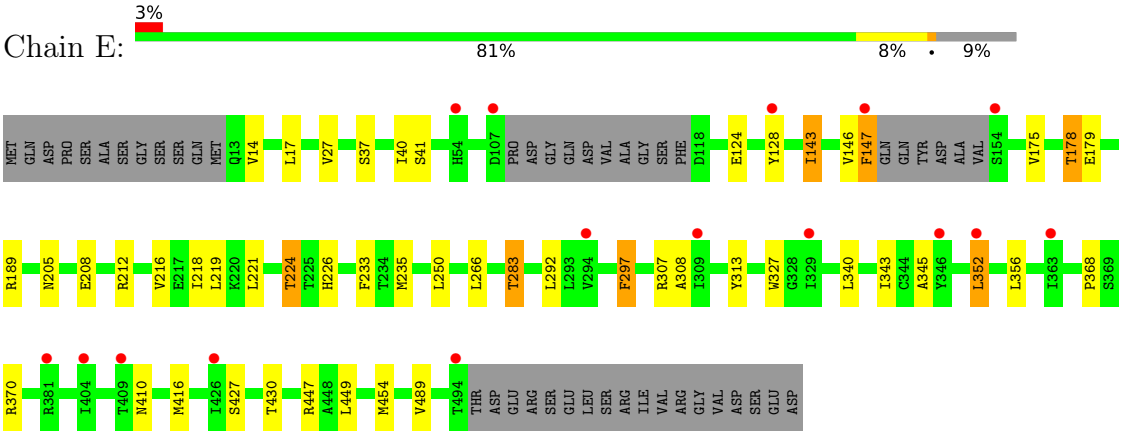
• Molecule 1: KaiC

Chain D:



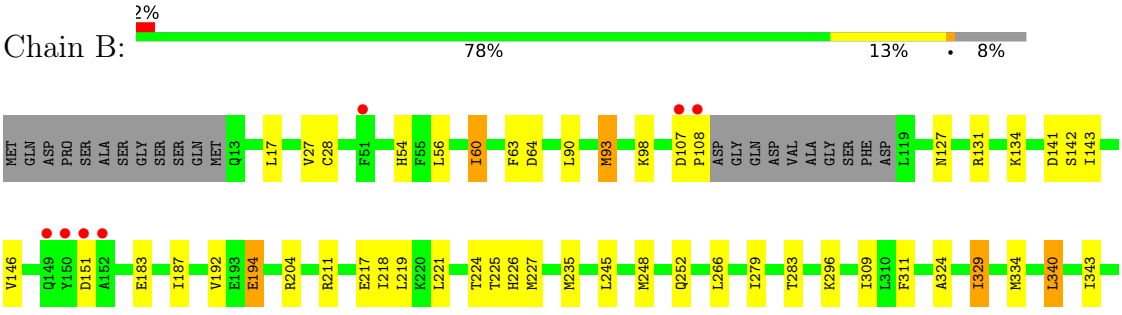
• Molecule 1: KaiC

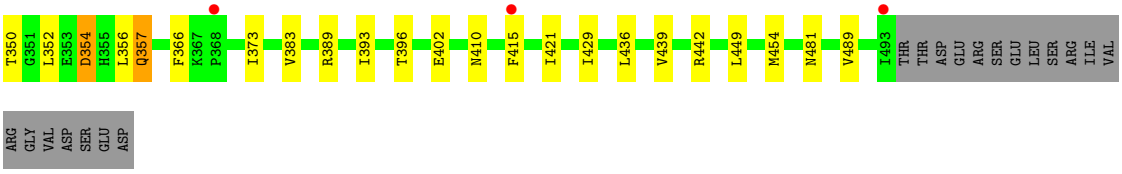
Chain E:



• Molecule 1: KaiC

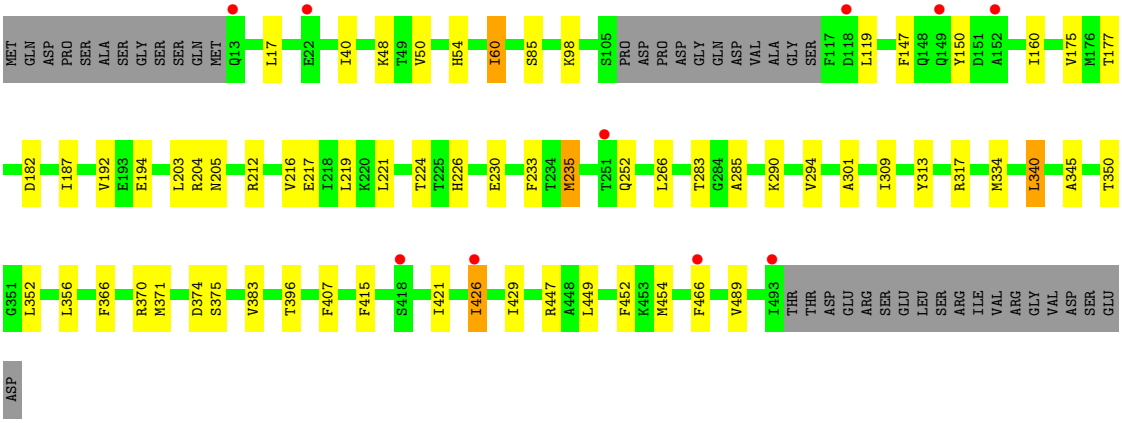
Chain B:





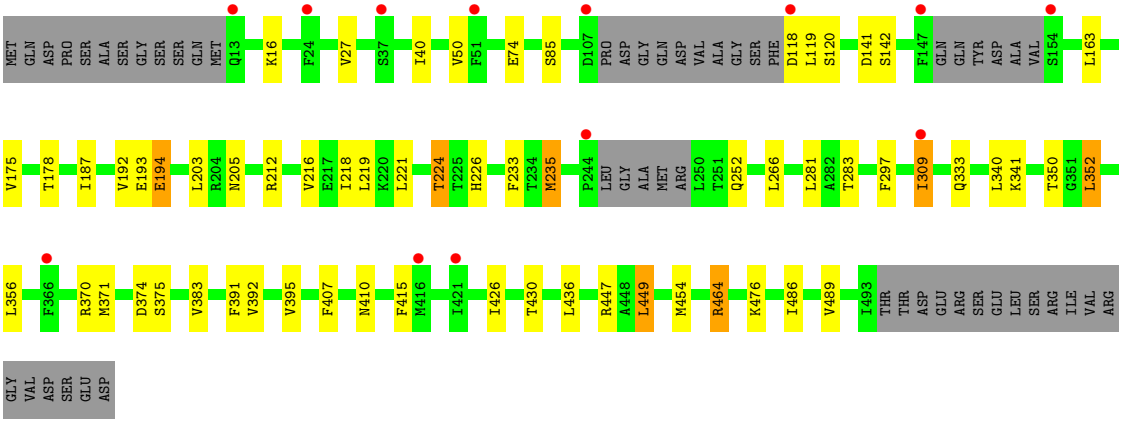
• Molecule 1: KaiC

Chain C:



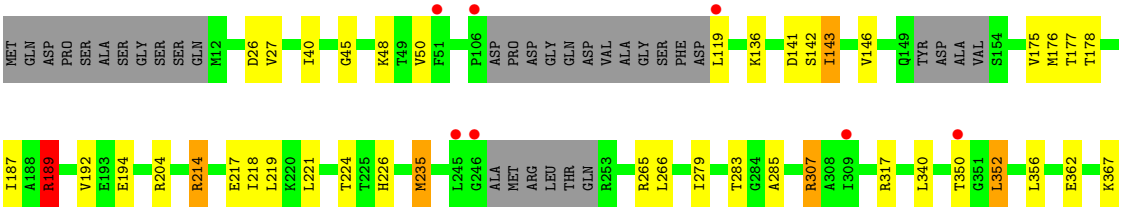
• Molecule 1: KaiC

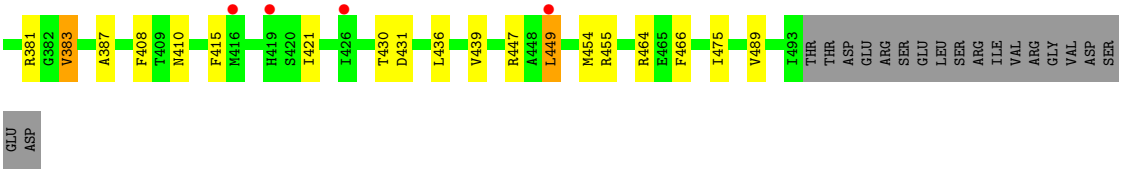
Chain F:



• Molecule 1: KaiC

Chain A:




R381
G382
V383
A387
F408
T409
N410
F415
M416
H419
S420
I421
I426
T430
D431
L436
V439
R447
A448
L449
M454
R455
R464
E465
F466
I475
V489
I493
THR
THR
ASP
GLU
ARG
SER
GLU
LEU
SER
ARG
ILE
VAL
ARG
GLY
VAL
ASP
SER
GLU
ASP

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	91.98Å 175.18Å 94.77Å 90.00° 96.93° 90.00°	Depositor
Resolution (Å)	49.19 – 2.54 49.19 – 2.54	Depositor EDS
% Data completeness (in resolution range)	99.7 (49.19-2.54) 99.9 (49.19-2.54)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.45 (at 2.54Å)	Xtriage
Refinement program	REFMAC 5.8.0415	Depositor
R, R_{free}	0.225 , 0.272 0.223 , 0.268	Depositor DCC
R_{free} test set	4893 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	62.5	Xtriage
Anisotropy	0.016	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 57.8	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.015 for l,-k,h	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	20931	wwPDB-VP
Average B, all atoms (Å^2)	66.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.92% of the height of the origin peak. No significant pseudotranslation is detected.*

[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: SEP, ANP, MG

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|$ >5	RMSZ	#$\|Z\|$ >5
1	A	0.27	0/3466	0.47	0/4687
1	B	0.26	0/3606	0.48	0/4875
1	C	0.27	0/3545	0.46	0/4801
1	D	0.27	0/3393	0.46	0/4607
1	E	0.27	0/3386	0.46	0/4597
1	F	0.27	0/3345	0.46	0/4543
All	All	0.27	0/20741	0.47	0/28110

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	4
1	F	0	1
All	All	0	5

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	189	ARG	Sidechain
1	A	214	ARG	Sidechain
1	A	317	ARG	Sidechain
1	A	464	ARG	Sidechain
1	F	464	ARG	Sidechain

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	3416	0	3282	30	0
1	B	3552	0	3459	31	0
1	C	3494	0	3339	26	0
1	D	3344	0	3091	14	0
1	E	3339	0	3098	19	0
1	F	3298	0	3055	30	0
2	A	62	0	26	2	0
2	B	62	0	26	0	0
2	C	62	0	26	1	0
2	D	62	0	26	1	0
2	E	62	0	26	1	0
2	F	62	0	26	1	0
3	A	2	0	0	0	0
3	B	2	0	0	0	0
3	C	2	0	0	0	0
3	D	2	0	0	0	0
3	E	2	0	0	0	0
3	F	2	0	0	0	0
4	A	23	0	0	0	0
4	B	20	0	0	0	0
4	C	15	0	0	0	0
4	D	11	0	0	0	0
4	E	13	0	0	0	0
4	F	22	0	0	1	0
All	All	20931	0	19480	145	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 4.

All (145) 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:B:27:VAL:HG12	1:B:218:ILE:HD12	1.61	0.81
1:A:307:ARG:HB2	1:A:307:ARG:HH21	1.46	0.79
1:A:40:ILE:HD13	1:A:175:VAL:HG13	1.65	0.79

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:436:LEU:HD22	1:F:449:LEU:HD22	1.65	0.78
1:F:85:SER:OG	2:F:601:ANP:N6	2.20	0.75
1:F:216:VAL:HG23	1:F:233:PHE:CD2	2.24	0.73
1:C:85:SER:OG	2:C:601:ANP:N6	2.20	0.72
1:A:436:LEU:HD22	1:A:449:LEU:HD22	1.71	0.70
1:A:283:THR:HG23	1:A:410:ASN:HD22	1.57	0.70
1:C:396:THR:HG21	1:C:429:ILE:HG22	1.76	0.68
1:C:60:ILE:HG21	1:C:98:LYS:HB3	1.75	0.68
1:C:216:VAL:HG23	1:C:233:PHE:CD2	2.29	0.67
1:B:283:THR:HG21	1:B:421:ILE:O	1.96	0.66
1:A:189:ARG:HH21	1:A:189:ARG:HG3	1.61	0.66
1:E:179:GLU:OE1	1:E:189:ARG:NH2	2.30	0.64
1:C:40:ILE:HD13	1:C:175:VAL:HG13	1.79	0.64
1:D:216:VAL:HG23	1:D:233:PHE:CD2	2.34	0.63
1:C:50:VAL:HG21	1:C:235:MET:HE1	1.81	0.63
1:D:187:ILE:HB	1:D:194:GLU:HG2	1.81	0.63
1:D:297:PHE:O	1:D:298:ILE:HB	1.98	0.63
1:B:283:THR:HG23	1:B:410:ASN:HD22	1.64	0.63
1:A:352:LEU:HD22	1:A:383:VAL:HG11	1.80	0.62
1:F:40:ILE:HD13	1:F:175:VAL:HG13	1.81	0.62
1:D:48:LYS:HD2	1:D:177:THR:HG23	1.82	0.60
1:E:216:VAL:HG23	1:E:233:PHE:CD2	2.37	0.60
1:E:40:ILE:HD13	1:E:175:VAL:HG13	1.83	0.60
1:F:187:ILE:HB	1:F:194:GLU:HG2	1.83	0.59
1:E:221:LEU:HD12	1:E:226:HIS:HB3	1.84	0.59
1:B:221:LEU:HD12	1:B:226:HIS:HB3	1.85	0.58
1:B:187:ILE:HB	1:B:194:GLU:HG2	1.85	0.57
1:F:50:VAL:HG21	1:F:235:MET:HE1	1.87	0.56
1:D:447:ARG:NH2	2:D:602:ANP:O2'	2.39	0.56
1:A:307:ARG:HH21	1:A:307:ARG:CB	2.17	0.55
1:B:245:LEU:HD21	1:B:393:ILE:HB	1.89	0.55
1:C:334:MET:HB3	1:C:340:LEU:HB2	1.91	0.53
1:E:283:THR:HG22	1:E:410:ASN:HD22	1.73	0.53
1:B:396:THR:HG21	1:B:429:ILE:CG2	2.39	0.53
1:F:221:LEU:HD12	1:F:226:HIS:HB3	1.90	0.53
1:B:436:LEU:HG	1:B:449:LEU:HD23	1.91	0.53
1:F:309:ILE:HD12	1:F:341:LYS:CB	2.39	0.53
1:F:392:VAL:HG11	1:F:426:ILE:HG23	1.91	0.53
1:F:464:ARG:NH1	1:F:476:LYS:O	2.41	0.52
1:A:431:ASP:HA	1:A:455:ARG:HD2	1.90	0.52
1:B:60:ILE:HG21	1:B:98:LYS:HB3	1.91	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:41:SER:CB	1:E:178:THR:HG23	2.40	0.52
1:F:415:PHE:HB3	1:A:421:ILE:HD11	1.92	0.52
1:B:309:ILE:HD11	1:B:366:PHE:HB3	1.92	0.52
1:A:45:GLY:O	1:A:214:ARG:NH2	2.42	0.52
1:D:203:LEU:CD2	1:D:216:VAL:HG22	2.39	0.51
1:E:447:ARG:NH2	2:E:602:ANP:O2'	2.43	0.51
1:D:297:PHE:O	1:D:298:ILE:CB	2.59	0.51
1:A:447:ARG:NH2	2:A:602:ANP:O2'	2.43	0.51
1:C:48:LYS:HD2	1:C:177:THR:HG23	1.93	0.51
1:C:309:ILE:HD11	1:C:366:PHE:HB3	1.91	0.51
1:B:127:ASN:O	1:B:131:ARG:HG2	2.10	0.51
1:D:221:LEU:HD12	1:D:226:HIS:HB3	1.93	0.50
1:B:279:ILE:HG13	1:B:396:THR:HG23	1.93	0.50
1:C:187:ILE:HB	1:C:194:GLU:HG2	1.94	0.50
1:F:436:LEU:HD23	1:F:436:LEU:N	2.26	0.50
1:F:352:LEU:HD22	1:F:383:VAL:HG11	1.93	0.50
1:B:211:ARG:NH2	1:C:230:GLU:O	2.44	0.50
1:C:352:LEU:HD22	1:C:383:VAL:HG11	1.92	0.50
1:D:204:ARG:NH2	1:D:217:GLU:OE2	2.45	0.49
1:A:48:LYS:HD2	1:A:177:THR:HG23	1.94	0.49
1:C:426:ILE:HG13	1:C:429:ILE:HD12	1.94	0.49
1:F:203:LEU:HD22	1:F:216:VAL:HG22	1.94	0.49
1:A:383:VAL:HG12	1:A:387:ALA:HB3	1.94	0.49
1:C:204:ARG:NH2	1:C:217:GLU:OE2	2.45	0.49
1:C:294:VAL:HG12	1:C:407:PHE:CE1	2.48	0.49
1:E:297:PHE:CZ	1:E:370:ARG:HB3	2.48	0.49
1:E:416:MET:HE2	1:F:486:ILE:HG21	1.95	0.49
1:F:283:THR:HG22	1:F:410:ASN:HB3	1.94	0.48
1:A:27:VAL:HG12	1:A:218:ILE:HG12	1.93	0.48
1:A:436:LEU:HD23	1:A:436:LEU:N	2.28	0.48
1:B:107:ASP:N	1:B:108:PRO:HD2	2.29	0.48
1:C:205:ASN:O	1:C:212:ARG:NH1	2.47	0.47
1:B:183:GLU:O	1:B:204:ARG:HD3	2.14	0.47
1:F:74:GLU:OE2	4:F:701:HOH:O	2.21	0.47
1:F:436:LEU:HD22	1:F:449:LEU:CD2	2.42	0.46
1:F:141:ASP:HA	1:F:142:SER:HA	1.75	0.46
1:B:141:ASP:HA	1:B:142:SER:HA	1.78	0.45
1:B:352:LEU:HD22	1:B:383:VAL:HG11	1.98	0.45
1:A:307:ARG:NH2	1:A:367:LYS:O	2.49	0.45
1:B:56:LEU:O	1:B:60:ILE:HG12	2.16	0.45
1:B:90:LEU:HA	1:B:93:MET:HG3	1.97	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:193:GLU:OE2	1:F:193:GLU:N	2.46	0.45
1:C:313:TYR:HA	1:C:345:ALA:O	2.17	0.45
1:F:374:ASP:HA	1:F:375:SER:HA	1.78	0.45
1:A:265:ARG:HG2	1:A:475:ILE:HB	1.98	0.45
1:B:311:PHE:HB2	1:B:373:ILE:HD13	1.99	0.45
1:A:204:ARG:NH2	1:A:217:GLU:OE2	2.50	0.45
1:E:205:ASN:O	1:E:212:ARG:NH1	2.49	0.44
1:F:391:PHE:O	1:F:395:VAL:HG23	2.18	0.44
1:B:204:ARG:NH2	1:B:217:GLU:OE2	2.48	0.44
1:D:141:ASP:OD2	1:D:177:THR:HG21	2.17	0.44
1:E:308:ALA:HA	1:E:370:ARG:O	2.17	0.44
1:F:297:PHE:CZ	1:F:370:ARG:HD3	2.53	0.44
1:A:187:ILE:HB	1:A:194:GLU:HG2	2.00	0.44
1:C:283:THR:HG21	1:C:421:ILE:HG23	1.99	0.44
1:E:27:VAL:HG12	1:E:218:ILE:HG12	2.00	0.44
1:A:285:ALA:HB2	1:A:415:PHE:HA	2.00	0.44
1:A:50:VAL:HG21	1:A:235:MET:HE1	2.00	0.43
1:B:27:VAL:HG13	1:B:227:MET:HB2	1.99	0.43
1:D:421:ILE:HG22	1:D:422:THR:HG23	2.00	0.43
1:E:313:TYR:HA	1:E:345:ALA:O	2.18	0.43
1:C:60:ILE:CG2	1:C:98:LYS:HB3	2.45	0.43
1:E:14:VAL:HB	1:E:224:THR:HG23	1.99	0.43
1:B:334:MET:HB3	1:B:340:LEU:HB2	2.00	0.43
1:F:27:VAL:HG12	1:F:218:ILE:HG13	2.01	0.43
1:A:283:THR:HG21	1:A:421:ILE:O	2.19	0.43
1:A:221:LEU:HD12	1:A:226:HIS:HB3	2.00	0.43
1:F:118:ASP:O	1:F:120:SER:N	2.52	0.43
1:B:28:CYS:SG	1:B:218:ILE:HD13	2.60	0.42
1:B:415:PHE:HB2	1:C:452:PHE:HZ	1.85	0.42
1:F:205:ASN:O	1:F:212:ARG:NH1	2.50	0.42
1:B:350:THR:HB	1:B:354:ASP:HB2	2.02	0.42
1:C:203:LEU:CD2	1:C:216:VAL:HG22	2.49	0.42
1:C:374:ASP:HA	1:C:375:SER:HA	1.86	0.42
1:F:426:ILE:HG22	1:F:426:ILE:O	2.19	0.42
1:B:357:GLN:HE21	1:B:357:GLN:HA	1.85	0.42
1:C:301:ALA:HB2	1:C:370:ARG:HD2	2.02	0.42
1:A:141:ASP:HA	1:A:142:SER:HA	1.82	0.42
1:E:292:LEU:HD13	1:E:327:TRP:CD2	2.55	0.42
1:B:389:ARG:O	1:B:393:ILE:HG12	2.20	0.41
1:B:225:THR:HG22	2:A:601:ANP:C2	2.50	0.41
1:D:374:ASP:HA	1:D:375:SER:HA	1.83	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:27:VAL:HG12	1:F:218:ILE:CG1	2.50	0.41
1:A:436:LEU:HD22	1:A:449:LEU:CD2	2.44	0.41
1:F:16:LYS:HE3	1:F:224:THR:HG21	2.01	0.41
1:A:279:ILE:HG23	1:A:408:PHE:CE1	2.56	0.41
1:B:324:ALA:HB1	1:B:329:ILE:HB	2.02	0.41
1:A:307:ARG:HH21	1:A:307:ARG:CG	2.34	0.41
1:E:143:ILE:HG22	1:E:147:PHE:CE2	2.56	0.41
1:E:427:SEP:O	1:E:430:THR:HG22	2.21	0.41
1:A:143:ILE:HG21	1:A:176:MET:HE3	2.02	0.41
1:D:203:LEU:HD22	1:D:216:VAL:HG22	2.02	0.40
1:E:27:VAL:HG12	1:E:218:ILE:CG1	2.51	0.40
1:E:352:LEU:HD12	1:E:352:LEU:HA	1.87	0.40
1:A:27:VAL:HG12	1:A:218:ILE:CG1	2.52	0.40
1:D:141:ASP:HA	1:D:142:SER:HA	1.72	0.40
1:B:389:ARG:NH2	1:A:381:ARG:HD2	2.37	0.40
1:C:147:PHE:CZ	1:C:160:ILE:HG12	2.56	0.40
1:C:221:LEU:HD12	1:C:226:HIS:HB3	2.03	0.40
1:C:285:ALA:HB2	1:C:415:PHE:HA	2.04	0.40
1:F:281:LEU:HB2	1:F:430:THR:HG21	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	451/512 (88%)	436 (97%)	15 (3%)	0	100	100
1	B	466/512 (91%)	446 (96%)	20 (4%)	0	100	100
1	C	465/512 (91%)	448 (96%)	16 (3%)	1 (0%)	44	56
1	D	457/512 (89%)	430 (94%)	24 (5%)	3 (1%)	19	26
1	E	459/512 (90%)	441 (96%)	18 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	F	451/512 (88%)	439 (97%)	11 (2%)	1 (0%)	44 56
All	All	2749/3072 (90%)	2640 (96%)	104 (4%)	5 (0%)	44 56

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	298	ILE
1	C	150	TYR
1	D	150	TYR
1	F	119	LEU
1	D	151	ASP

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	336/435 (77%)	311 (93%)	25 (7%)	11 15
1	B	359/435 (82%)	328 (91%)	31 (9%)	8 10
1	C	348/435 (80%)	325 (93%)	23 (7%)	14 18
1	D	312/435 (72%)	296 (95%)	16 (5%)	20 28
1	E	313/435 (72%)	288 (92%)	25 (8%)	10 12
1	F	309/435 (71%)	288 (93%)	21 (7%)	13 17
All	All	1977/2610 (76%)	1836 (93%)	141 (7%)	12 16

All (141) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	95	GLU
1	D	136	LYS
1	D	178	THR
1	D	213	ARG
1	D	219	LEU
1	D	224	THR

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Mol	Chain	Res	Type
1	D	264	PRO
1	D	266	LEU
1	D	283	THR
1	D	294	VAL
1	D	402	GLU
1	D	449	LEU
1	D	454	MET
1	D	481	ASN
1	D	484	ARG
1	D	489	VAL
1	E	17	LEU
1	E	37	SER
1	E	124	GLU
1	E	128	TYR
1	E	143	ILE
1	E	146	VAL
1	E	147	PHE
1	E	178	THR
1	E	208	GLU
1	E	219	LEU
1	E	224	THR
1	E	235	MET
1	E	250	LEU
1	E	266	LEU
1	E	283	THR
1	E	297	PHE
1	E	307	ARG
1	E	340	LEU
1	E	343	ILE
1	E	352	LEU
1	E	356	LEU
1	E	368	PRO
1	E	449	LEU
1	E	454	MET
1	E	489	VAL
1	B	17	LEU
1	B	54	HIS
1	B	60	ILE
1	B	63	PHE
1	B	64	ASP
1	B	93	MET
1	B	134	LYS

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Mol	Chain	Res	Type
1	B	143	ILE
1	B	146	VAL
1	B	151	ASP
1	B	192	VAL
1	B	194	GLU
1	B	219	LEU
1	B	224	THR
1	B	235	MET
1	B	248	MET
1	B	252	GLN
1	B	266	LEU
1	B	296	LYS
1	B	329	ILE
1	B	340	LEU
1	B	343	ILE
1	B	354	ASP
1	B	356	LEU
1	B	357	GLN
1	B	402	GLU
1	B	439	VAL
1	B	442	ARG
1	B	454	MET
1	B	481	ASN
1	B	489	VAL
1	C	17	LEU
1	C	54	HIS
1	C	60	ILE
1	C	119	LEU
1	C	182	ASP
1	C	192	VAL
1	C	219	LEU
1	C	224	THR
1	C	235	MET
1	C	252	GLN
1	C	266	LEU
1	C	290	LYS
1	C	317	ARG
1	C	340	LEU
1	C	350	THR
1	C	356	LEU
1	C	371	MET
1	C	426	ILE

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Mol	Chain	Res	Type
1	C	447	ARG
1	C	449	LEU
1	C	454	MET
1	C	466	PHE
1	C	489	VAL
1	F	163	LEU
1	F	178	THR
1	F	192	VAL
1	F	194	GLU
1	F	219	LEU
1	F	224	THR
1	F	235	MET
1	F	252	GLN
1	F	266	LEU
1	F	309	ILE
1	F	333	GLN
1	F	340	LEU
1	F	350	THR
1	F	352	LEU
1	F	356	LEU
1	F	371	MET
1	F	407	PHE
1	F	447	ARG
1	F	449	LEU
1	F	454	MET
1	F	489	VAL
1	A	26	ASP
1	A	119	LEU
1	A	136	LYS
1	A	143	ILE
1	A	146	VAL
1	A	178	THR
1	A	189	ARG
1	A	192	VAL
1	A	219	LEU
1	A	224	THR
1	A	235	MET
1	A	266	LEU
1	A	307	ARG
1	A	340	LEU
1	A	350	THR
1	A	352	LEU

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Mol	Chain	Res	Type
1	A	356	LEU
1	A	362	GLU
1	A	383	VAL
1	A	430	THR
1	A	439	VAL
1	A	449	LEU
1	A	454	MET
1	A	466	PHE
1	A	489	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (21) such sidechains are listed below:

Mol	Chain	Res	Type
1	D	29	HIS
1	E	29	HIS
1	E	205	ASN
1	E	410	ASN
1	E	450	ASN
1	B	29	HIS
1	B	410	ASN
1	B	450	ASN
1	C	29	HIS
1	C	319	GLN
1	C	450	ASN
1	C	491	HIS
1	F	29	HIS
1	F	54	HIS
1	F	252	GLN
1	F	410	ASN
1	F	450	ASN
1	A	29	HIS
1	A	148	GLN
1	A	304	ASN
1	A	410	ASN

5.3.3 RNA

There are no RNA molecules in this entry.

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

6 non-standard protein/DNA/RNA residues 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	$\#\|Z\| > 2$
1	SEP	B	427	1	8,9,10	0.62	0	8,12,14	0.67	0
1	SEP	A	427	1	8,9,10	0.57	0	8,12,14	0.74	0
1	SEP	F	427	1	8,9,10	0.61	0	8,12,14	0.64	0
1	SEP	C	427	1	8,9,10	0.61	0	8,12,14	0.68	0
1	SEP	D	427	1	8,9,10	0.59	0	8,12,14	0.64	0
1	SEP	E	427	1	8,9,10	0.58	0	8,12,14	0.61	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	SEP	B	427	1	-	1/5/8/10	-
1	SEP	A	427	1	-	1/5/8/10	-
1	SEP	F	427	1	-	0/5/8/10	-
1	SEP	C	427	1	-	1/5/8/10	-
1	SEP	D	427	1	-	0/5/8/10	-
1	SEP	E	427	1	-	0/5/8/10	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	B	427	SEP	N-CA-CB-OG
1	C	427	SEP	N-CA-CB-OG
1	A	427	SEP	N-CA-CB-OG

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	E	427	SEP	1	0

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 24 ligands modelled in this entry, 12 are monoatomic - leaving 12 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
2	ANP	D	601	3	29,33,33	1.19	5 (17%)	31,52,52	1.21	3 (9%)
2	ANP	F	602	3	29,33,33	1.21	5 (17%)	31,52,52	1.14	3 (9%)
2	ANP	A	602	3	29,33,33	1.21	5 (17%)	31,52,52	1.13	2 (6%)
2	ANP	F	601	3	29,33,33	1.21	5 (17%)	31,52,52	1.20	1 (3%)
2	ANP	A	601	3	29,33,33	1.15	4 (13%)	31,52,52	1.27	4 (12%)
2	ANP	E	602	3	29,33,33	1.21	4 (13%)	31,52,52	1.13	2 (6%)
2	ANP	C	601	3	29,33,33	1.22	4 (13%)	31,52,52	1.32	4 (12%)
2	ANP	E	601	3	29,33,33	1.19	5 (17%)	31,52,52	1.35	4 (12%)
2	ANP	C	602	3	29,33,33	1.22	5 (17%)	31,52,52	1.19	2 (6%)
2	ANP	B	601	3	29,33,33	1.15	3 (10%)	31,52,52	1.28	4 (12%)
2	ANP	B	602	3	29,33,33	1.20	5 (17%)	31,52,52	1.14	2 (6%)
2	ANP	D	602	3	29,33,33	1.20	4 (13%)	31,52,52	1.17	2 (6%)

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	ANP	D	601	3	-	6/14/38/38	0/3/3/3
2	ANP	F	602	3	-	4/14/38/38	0/3/3/3
2	ANP	A	602	3	-	4/14/38/38	0/3/3/3
2	ANP	F	601	3	-	7/14/38/38	0/3/3/3
2	ANP	A	601	3	-	4/14/38/38	0/3/3/3
2	ANP	E	602	3	-	1/14/38/38	0/3/3/3
2	ANP	C	601	3	-	7/14/38/38	0/3/3/3
2	ANP	E	601	3	-	4/14/38/38	0/3/3/3
2	ANP	C	602	3	-	6/14/38/38	0/3/3/3
2	ANP	B	601	3	-	6/14/38/38	0/3/3/3
2	ANP	B	602	3	-	7/14/38/38	0/3/3/3
2	ANP	D	602	3	-	5/14/38/38	0/3/3/3

All (54) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	602	ANP	PG-O1G	3.46	1.51	1.46
2	E	602	ANP	PG-O1G	3.43	1.51	1.46
2	C	601	ANP	PG-O1G	3.43	1.51	1.46
2	F	602	ANP	PG-O1G	3.37	1.51	1.46
2	B	602	ANP	PG-O1G	3.36	1.51	1.46
2	A	602	ANP	PG-O1G	3.16	1.51	1.46
2	E	601	ANP	PG-O1G	3.15	1.51	1.46
2	D	602	ANP	PG-O1G	3.13	1.51	1.46
2	F	601	ANP	PG-O1G	3.08	1.51	1.46
2	F	601	ANP	PB-O1B	3.03	1.51	1.46
2	B	601	ANP	PG-O1G	3.01	1.50	1.46
2	D	601	ANP	PG-O1G	2.98	1.50	1.46
2	B	601	ANP	PB-O1B	2.95	1.50	1.46
2	D	601	ANP	PB-O1B	2.95	1.50	1.46
2	C	601	ANP	PB-O1B	2.89	1.50	1.46
2	A	602	ANP	PB-O1B	2.89	1.50	1.46
2	B	602	ANP	PB-O1B	2.88	1.50	1.46
2	C	602	ANP	PB-O1B	2.88	1.50	1.46
2	E	601	ANP	PB-O1B	2.86	1.50	1.46
2	D	602	ANP	PB-O1B	2.84	1.50	1.46
2	E	602	ANP	PB-O1B	2.82	1.50	1.46
2	A	601	ANP	PB-O1B	2.82	1.50	1.46
2	A	601	ANP	PG-O1G	2.77	1.50	1.46
2	F	602	ANP	PB-O1B	2.74	1.50	1.46
2	D	601	ANP	PB-O2B	-2.36	1.50	1.56

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	601	ANP	PG-O2G	-2.34	1.50	1.56
2	D	601	ANP	PG-O2G	-2.31	1.50	1.56
2	F	602	ANP	PB-O2B	-2.31	1.50	1.56
2	C	601	ANP	PB-O2B	-2.28	1.50	1.56
2	D	602	ANP	PB-O2B	-2.28	1.50	1.56
2	B	602	ANP	PB-O2B	-2.28	1.50	1.56
2	A	601	ANP	PB-O2B	-2.27	1.50	1.56
2	E	602	ANP	PB-O2B	-2.27	1.50	1.56
2	B	601	ANP	PB-O2B	-2.27	1.50	1.56
2	A	602	ANP	PB-O2B	-2.27	1.50	1.56
2	A	601	ANP	PG-O2G	-2.26	1.50	1.56
2	E	601	ANP	PB-O2B	-2.25	1.50	1.56
2	F	601	ANP	PB-O2B	-2.24	1.50	1.56
2	C	601	ANP	PG-O2G	-2.20	1.50	1.56
2	C	602	ANP	PB-O2B	-2.20	1.50	1.56
2	F	601	ANP	PG-O2G	-2.19	1.50	1.56
2	A	602	ANP	PG-O2G	-2.18	1.50	1.56
2	F	602	ANP	PG-O2G	-2.17	1.50	1.56
2	D	601	ANP	PG-O3G	-2.13	1.51	1.56
2	C	602	ANP	PG-O2G	-2.12	1.51	1.56
2	E	601	ANP	PG-O3G	-2.10	1.51	1.56
2	C	602	ANP	PG-O3G	-2.08	1.51	1.56
2	F	602	ANP	PG-O3G	-2.06	1.51	1.56
2	B	602	ANP	PG-O3G	-2.06	1.51	1.56
2	A	602	ANP	PG-O3G	-2.06	1.51	1.56
2	F	601	ANP	PG-O3G	-2.05	1.51	1.56
2	D	602	ANP	PG-O2G	-2.05	1.51	1.56
2	B	602	ANP	PG-O2G	-2.01	1.51	1.56
2	E	602	ANP	PG-O3G	-2.00	1.51	1.56

All (33) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	E	601	ANP	O2B-PB-O1B	4.26	118.86	109.92
2	B	602	ANP	O2B-PB-O1B	4.23	118.78	109.92
2	C	602	ANP	O2B-PB-O1B	4.19	118.70	109.92
2	A	601	ANP	O2B-PB-O1B	4.14	118.60	109.92
2	B	601	ANP	O2B-PB-O1B	4.14	118.59	109.92
2	D	601	ANP	O2B-PB-O1B	4.13	118.58	109.92
2	C	601	ANP	O2B-PB-O1B	4.09	118.50	109.92
2	F	601	ANP	O2B-PB-O1B	4.09	118.49	109.92
2	E	602	ANP	O2B-PB-O1B	4.09	118.49	109.92

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	D	602	ANP	O2B-PB-O1B	4.03	118.37	109.92
2	A	602	ANP	O2B-PB-O1B	3.99	118.29	109.92
2	F	602	ANP	O2B-PB-O1B	3.92	118.15	109.92
2	C	601	ANP	O1B-PB-N3B	2.88	116.00	111.77
2	E	601	ANP	O1B-PB-N3B	2.76	115.83	111.77
2	B	601	ANP	O1G-PG-N3B	-2.67	107.84	111.77
2	A	601	ANP	O1G-PG-N3B	-2.52	108.06	111.77
2	C	601	ANP	O3A-PB-N3B	-2.38	99.99	106.59
2	D	602	ANP	C5-C6-N6	2.36	123.93	120.35
2	C	602	ANP	C5-C6-N6	2.33	123.89	120.35
2	A	601	ANP	C5-C6-N6	2.31	123.86	120.35
2	E	601	ANP	O2G-PG-O1G	-2.24	107.82	113.45
2	A	602	ANP	C5-C6-N6	2.24	123.75	120.35
2	E	601	ANP	C5-C6-N6	2.23	123.74	120.35
2	B	602	ANP	C5-C6-N6	2.20	123.70	120.35
2	E	602	ANP	C5-C6-N6	2.19	123.67	120.35
2	F	602	ANP	C5-C6-N6	2.19	123.67	120.35
2	B	601	ANP	O3A-PB-N3B	-2.16	100.61	106.59
2	D	601	ANP	C5-C6-N6	2.14	123.61	120.35
2	B	601	ANP	C5-C6-N6	2.11	123.55	120.35
2	D	601	ANP	O3G-PG-O1G	-2.06	108.28	113.45
2	C	601	ANP	C5-C6-N6	2.06	123.48	120.35
2	F	602	ANP	O3A-PB-N3B	-2.02	100.98	106.59
2	A	601	ANP	C3'-C2'-C1'	2.01	104.00	100.98

There are no chirality outliers.

All (61) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	D	601	ANP	PB-N3B-PG-O1G
2	D	601	ANP	PG-N3B-PB-O1B
2	D	601	ANP	PA-O3A-PB-O1B
2	D	601	ANP	PA-O3A-PB-O2B
2	D	602	ANP	PB-N3B-PG-O1G
2	D	602	ANP	PG-N3B-PB-O1B
2	D	602	ANP	PA-O3A-PB-O1B
2	D	602	ANP	PA-O3A-PB-O2B
2	E	601	ANP	PB-N3B-PG-O1G
2	E	601	ANP	PG-N3B-PB-O1B
2	E	601	ANP	PA-O3A-PB-O1B
2	E	601	ANP	PA-O3A-PB-O2B
2	E	602	ANP	PB-N3B-PG-O1G

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Mol	Chain	Res	Type	Atoms
2	B	601	ANP	PB-N3B-PG-O1G
2	B	601	ANP	PG-N3B-PB-O1B
2	B	601	ANP	PA-O3A-PB-O1B
2	B	601	ANP	PA-O3A-PB-O2B
2	B	602	ANP	PB-N3B-PG-O1G
2	B	602	ANP	PG-N3B-PB-O1B
2	B	602	ANP	PA-O3A-PB-O1B
2	B	602	ANP	PA-O3A-PB-O2B
2	B	602	ANP	C5'-O5'-PA-O2A
2	C	601	ANP	PB-N3B-PG-O1G
2	C	601	ANP	PG-N3B-PB-O1B
2	C	601	ANP	PG-N3B-PB-O3A
2	C	601	ANP	PA-O3A-PB-O1B
2	C	601	ANP	PA-O3A-PB-O2B
2	C	601	ANP	O4'-C4'-C5'-O5'
2	C	601	ANP	C3'-C4'-C5'-O5'
2	C	602	ANP	PB-N3B-PG-O1G
2	C	602	ANP	PG-N3B-PB-O1B
2	C	602	ANP	C5'-O5'-PA-O2A
2	F	601	ANP	PB-N3B-PG-O1G
2	F	601	ANP	PG-N3B-PB-O1B
2	F	601	ANP	PA-O3A-PB-O1B
2	F	601	ANP	PA-O3A-PB-O2B
2	F	601	ANP	C5'-O5'-PA-O1A
2	F	601	ANP	C5'-O5'-PA-O3A
2	F	602	ANP	PB-N3B-PG-O1G
2	F	602	ANP	PG-N3B-PB-O1B
2	F	602	ANP	PA-O3A-PB-O1B
2	F	602	ANP	PA-O3A-PB-O2B
2	A	601	ANP	PB-N3B-PG-O1G
2	A	601	ANP	PG-N3B-PB-O1B
2	A	601	ANP	PA-O3A-PB-O1B
2	A	601	ANP	PA-O3A-PB-O2B
2	A	602	ANP	PB-N3B-PG-O1G
2	A	602	ANP	PG-N3B-PB-O1B
2	A	602	ANP	PA-O3A-PB-O1B
2	A	602	ANP	PA-O3A-PB-O2B
2	B	601	ANP	C3'-C4'-C5'-O5'
2	D	601	ANP	C3'-C4'-C5'-O5'
2	B	601	ANP	O4'-C4'-C5'-O5'
2	B	602	ANP	C5'-O5'-PA-O3A
2	C	602	ANP	C5'-O5'-PA-O3A

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Mol	Chain	Res	Type	Atoms
2	D	601	ANP	O4'-C4'-C5'-O5'
2	F	601	ANP	C5'-O5'-PA-O2A
2	C	602	ANP	PG-N3B-PB-O3A
2	D	602	ANP	C5'-O5'-PA-O3A
2	B	602	ANP	C5'-O5'-PA-O1A
2	C	602	ANP	C5'-O5'-PA-O1A

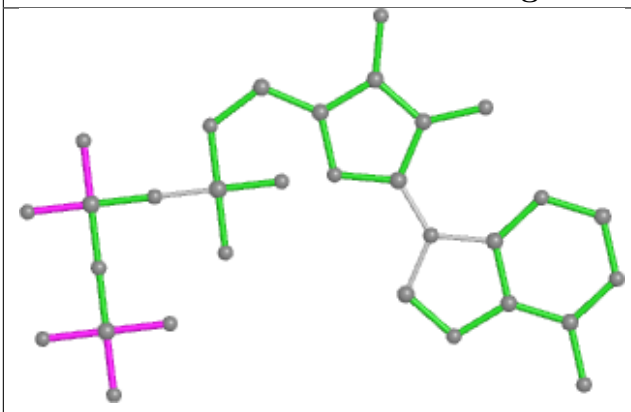
There are no ring outliers.

6 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	602	ANP	1	0
2	F	601	ANP	1	0
2	A	601	ANP	1	0
2	E	602	ANP	1	0
2	C	601	ANP	1	0
2	D	602	ANP	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 ANP D 601



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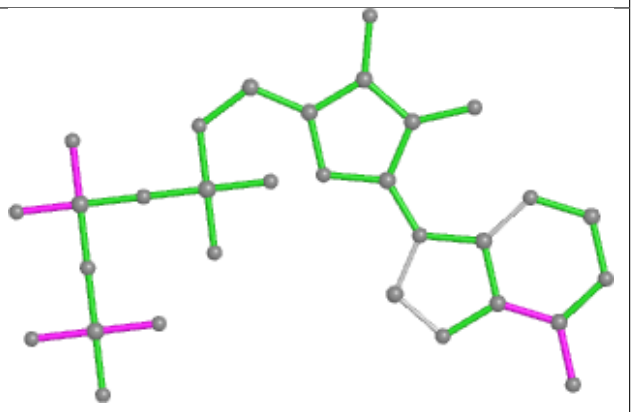
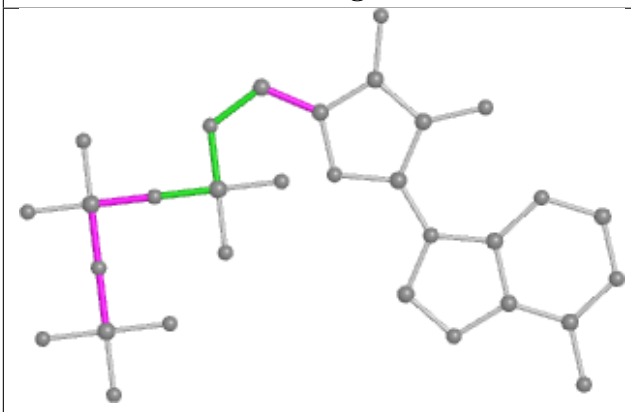
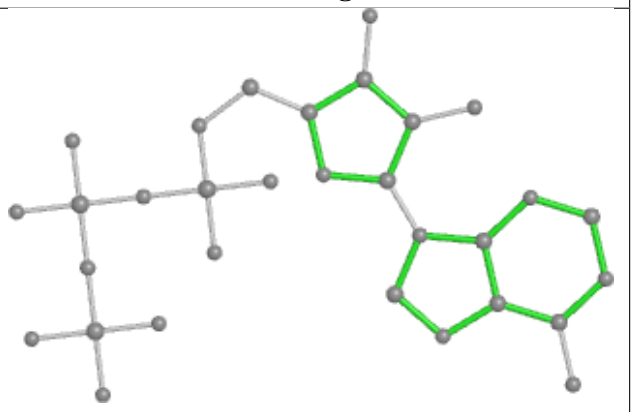


Bond angles

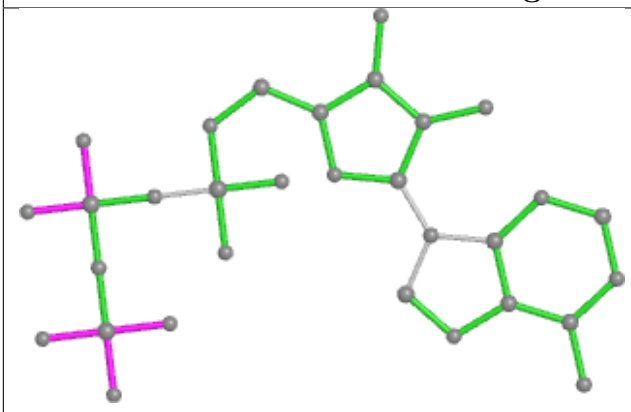


Torsions



Rings

Ligand ANP F 602



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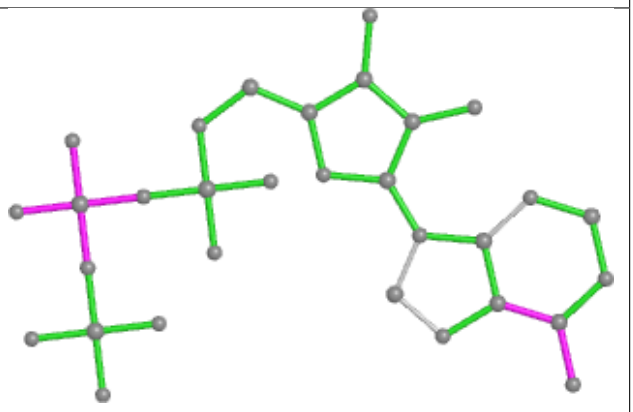

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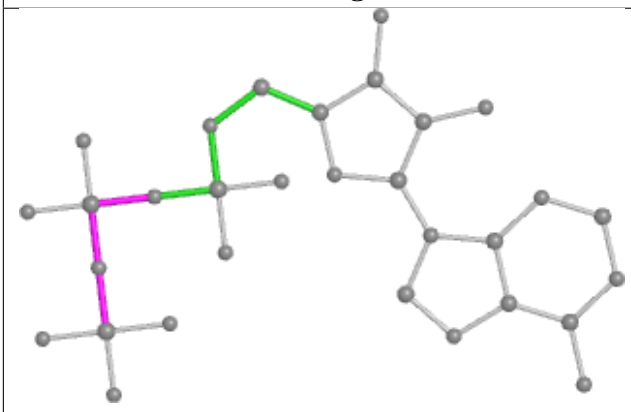

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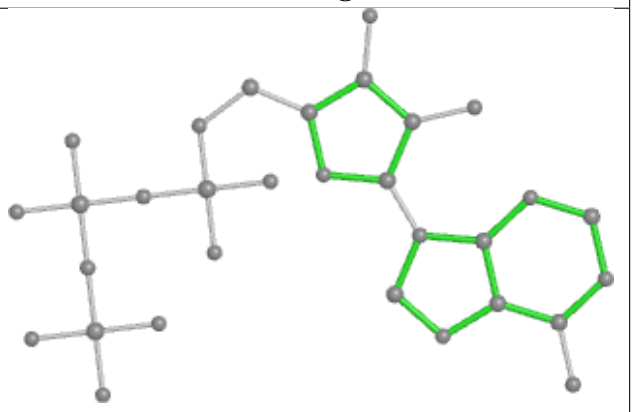
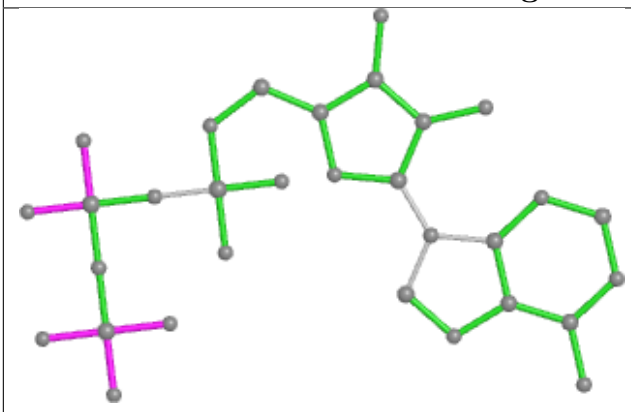


Rings

Ligand ANP A 602



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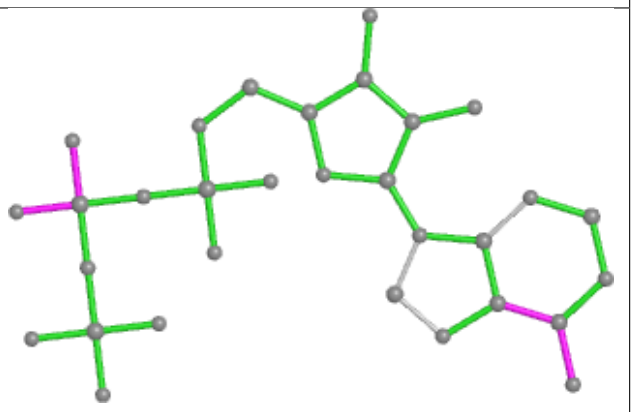

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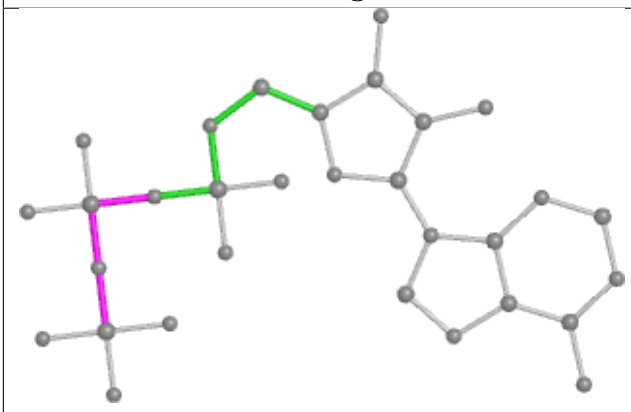

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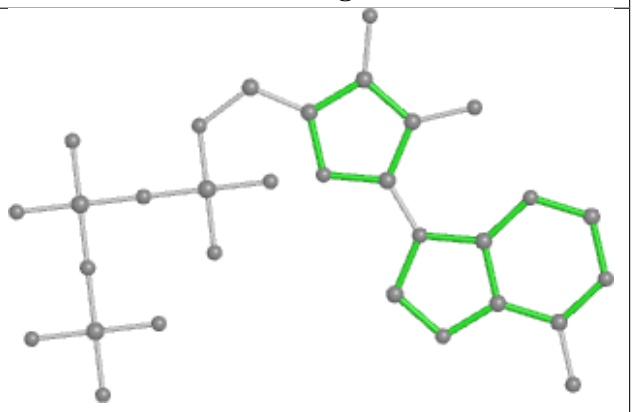
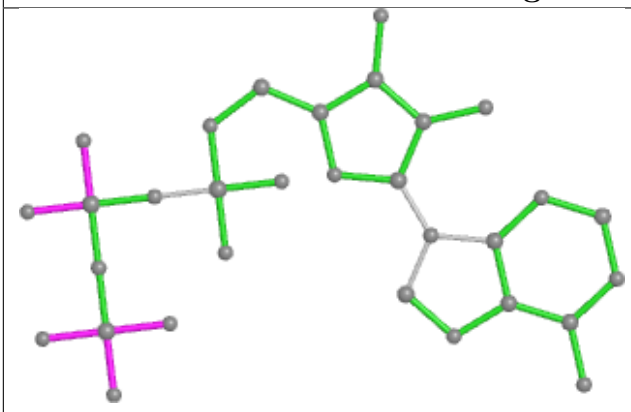


Rings

Ligand ANP F 601



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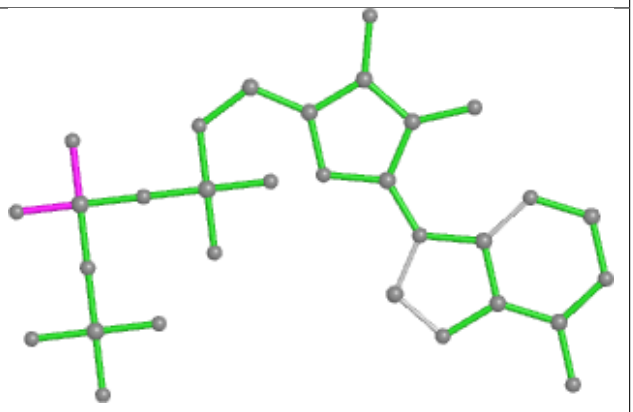

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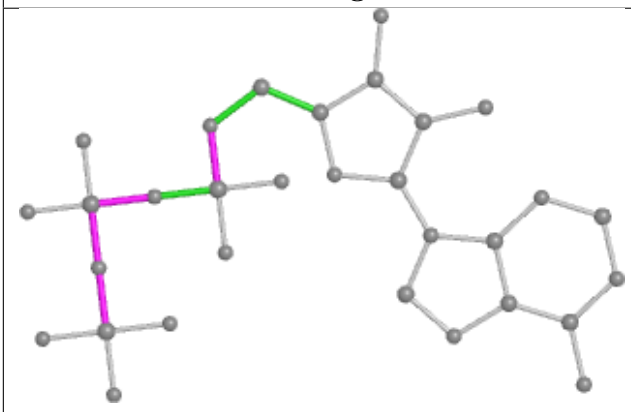

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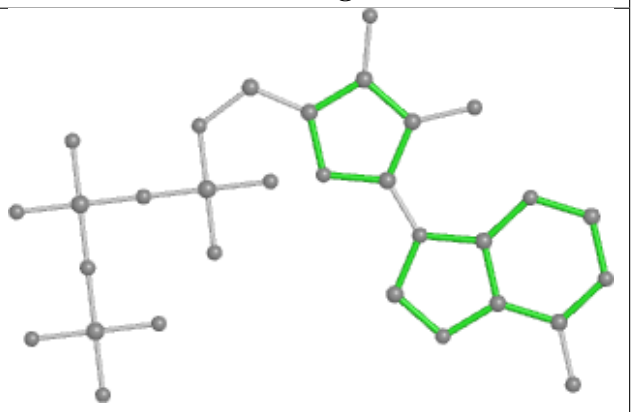
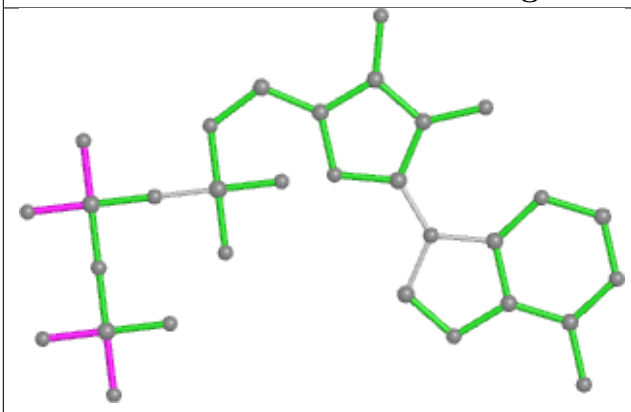


Rings

Ligand ANP A 601



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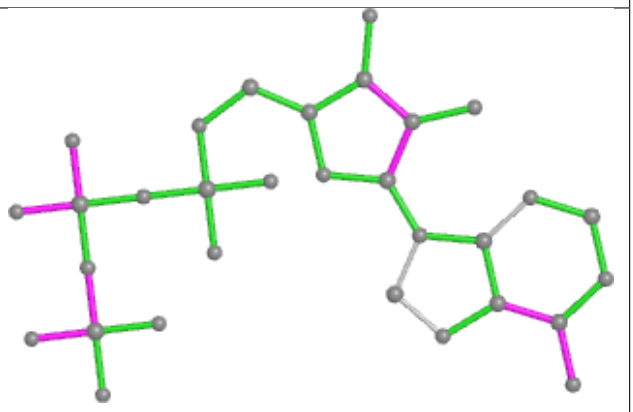

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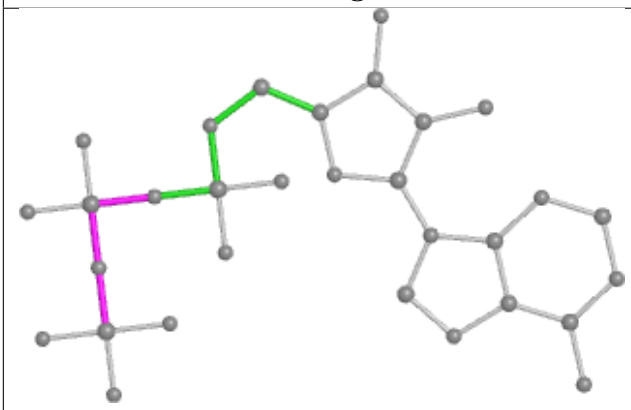

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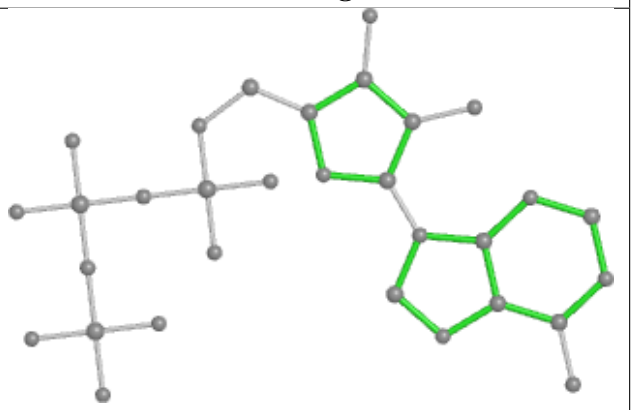

Rings

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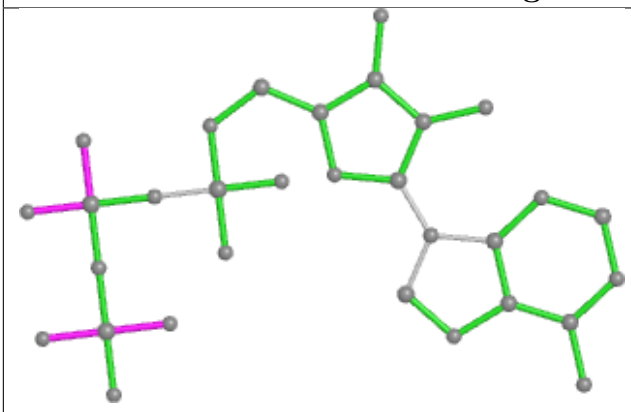

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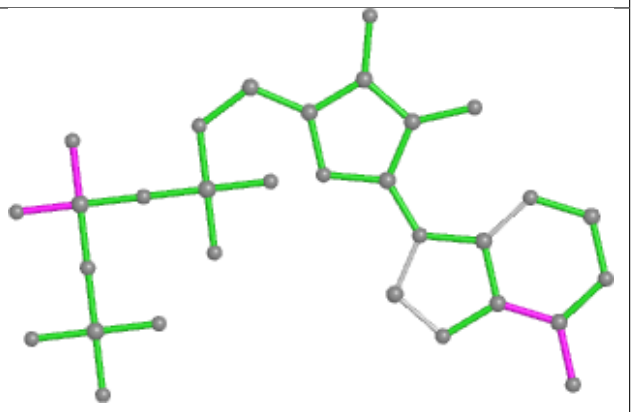

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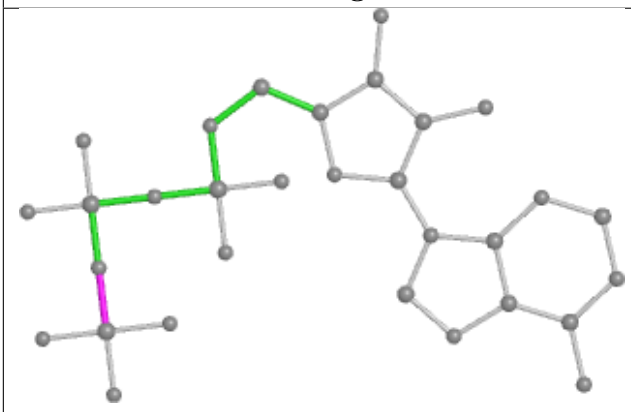

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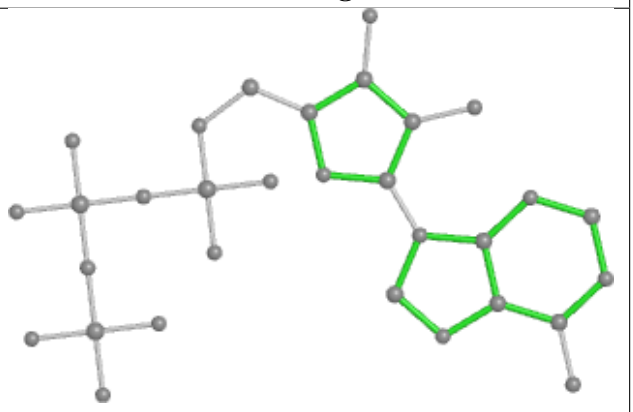
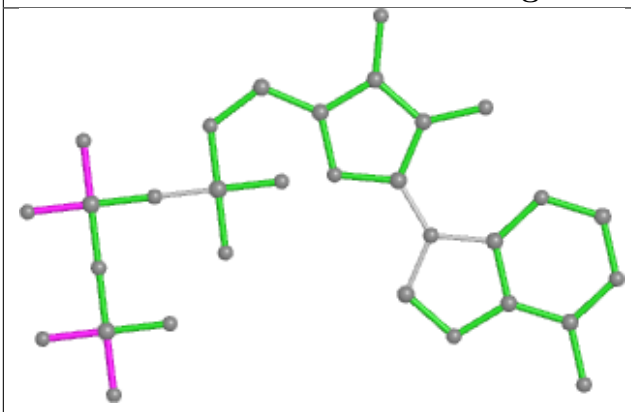


Rings

Ligand ANP C 601



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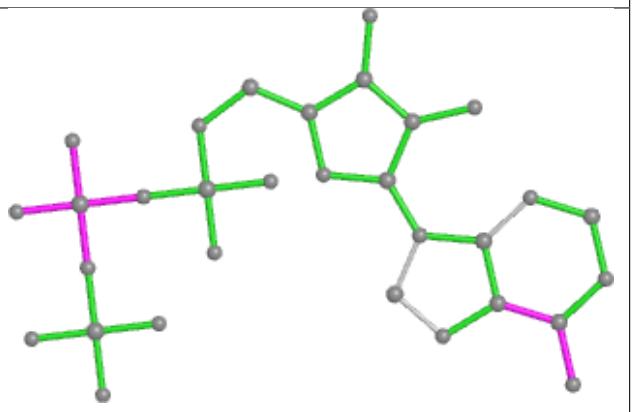

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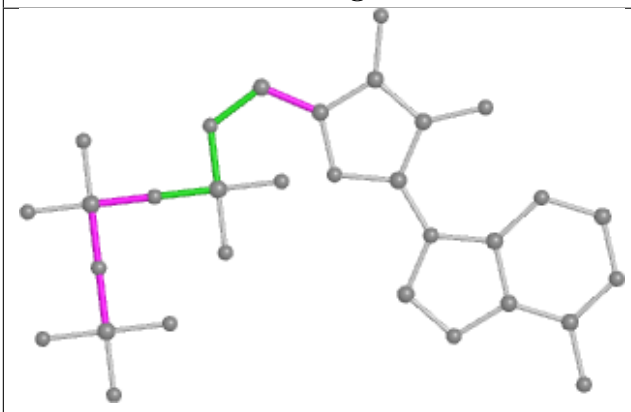

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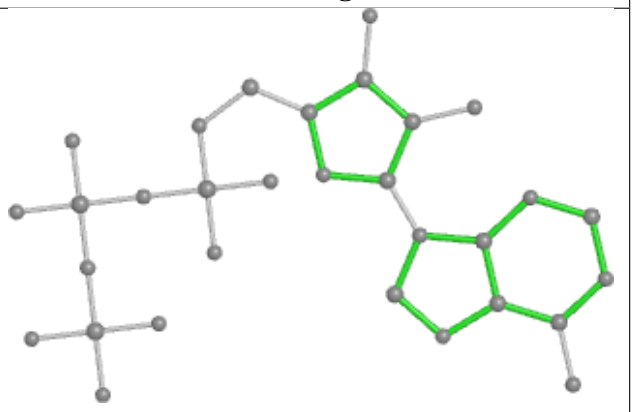

Rings

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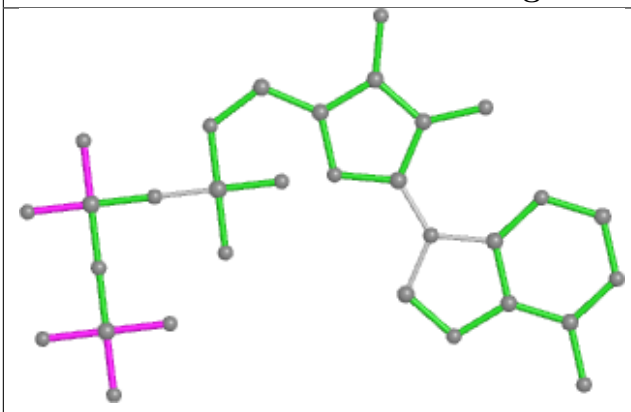

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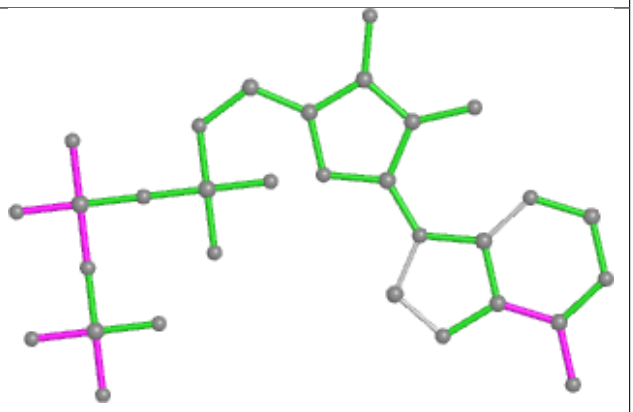

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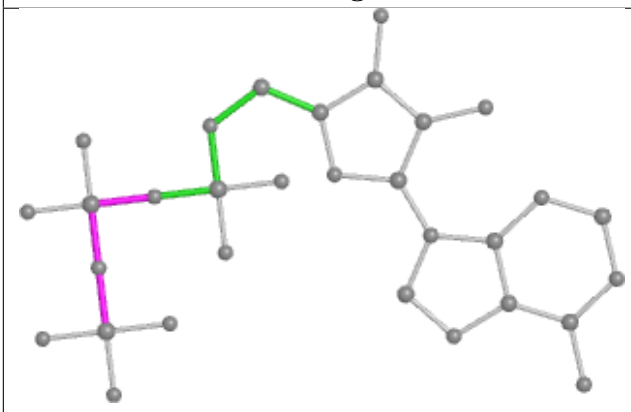

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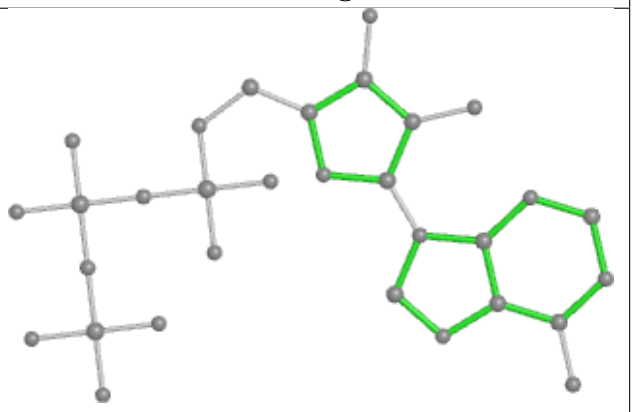
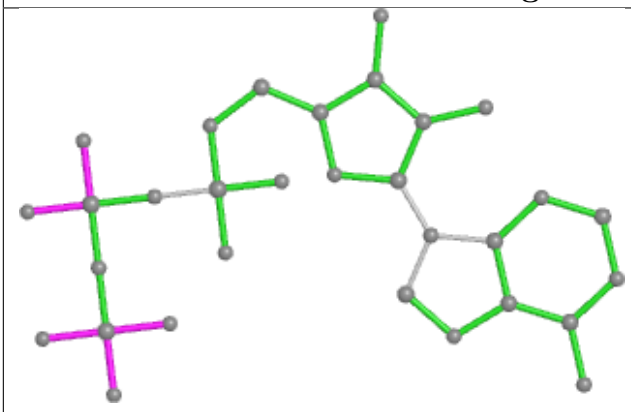


Rings

Ligand ANP C 602



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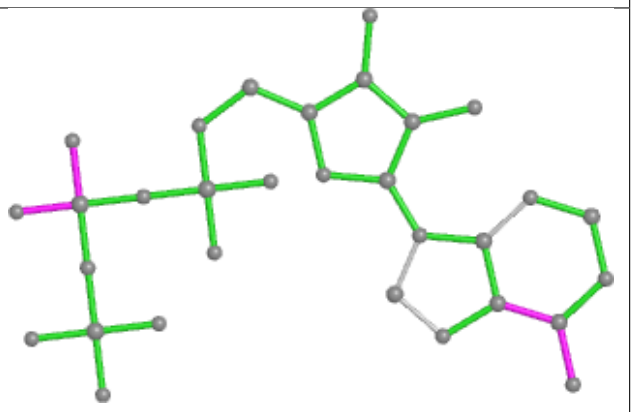
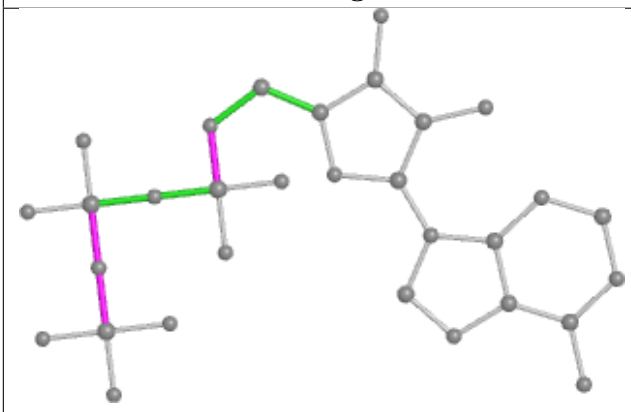


Bond angles



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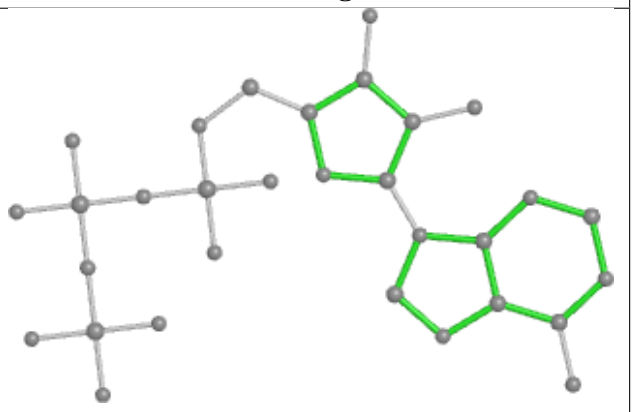
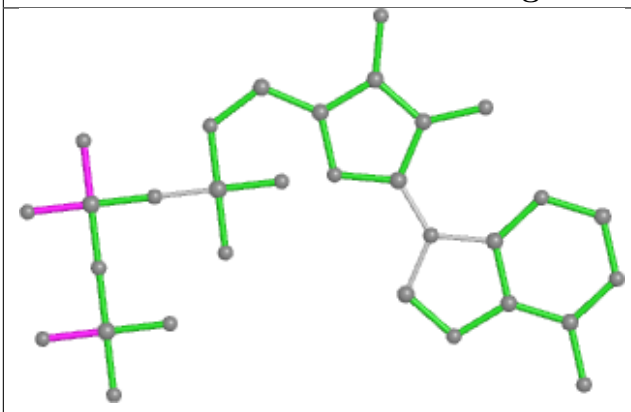
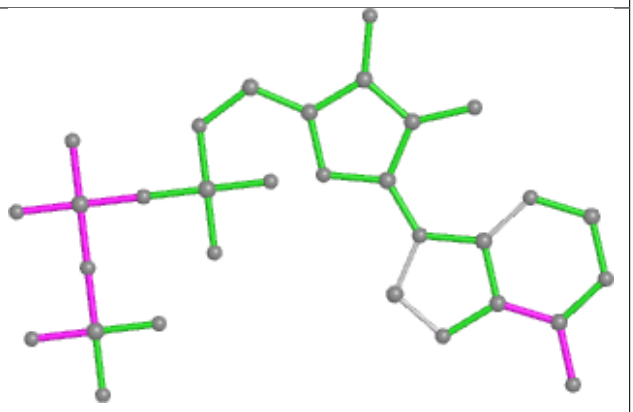


Rings

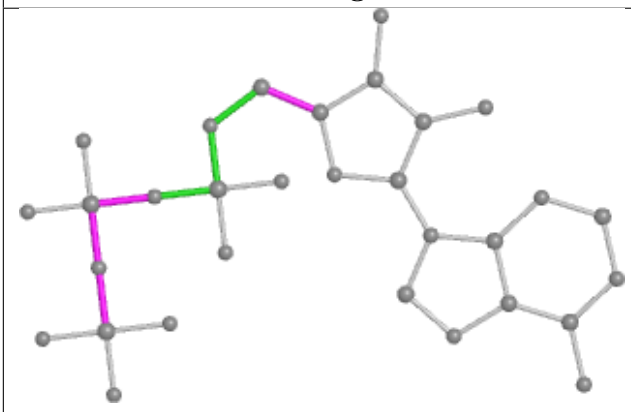
Ligand ANP B 601



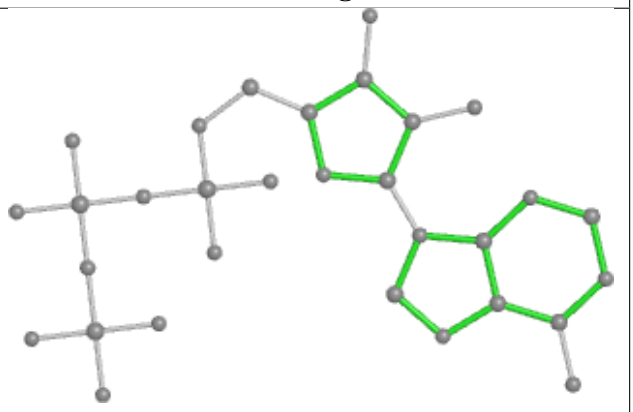
Bond lengths



Bond angles

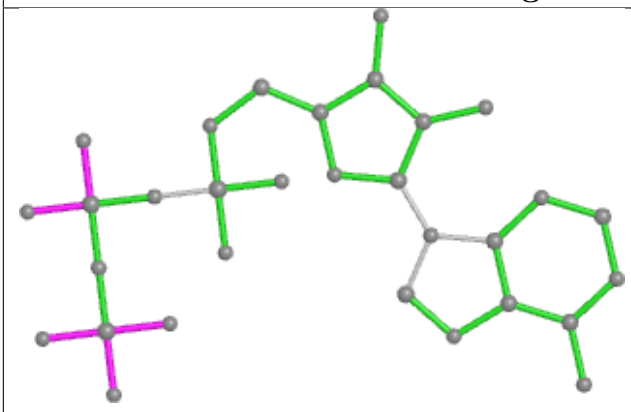


Torsions

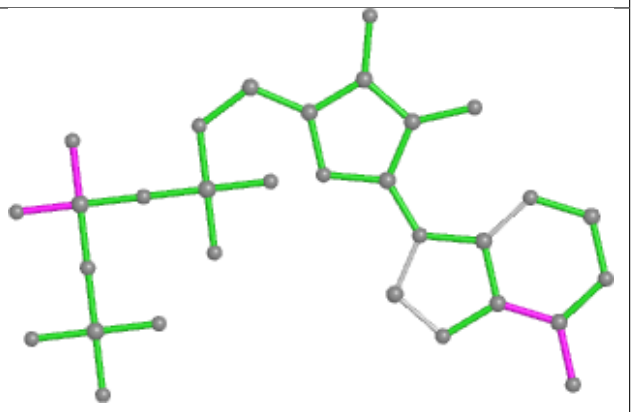


Rings

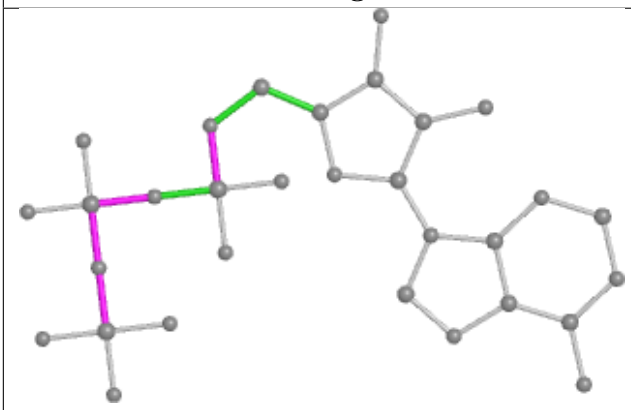
Ligand ANP B 602



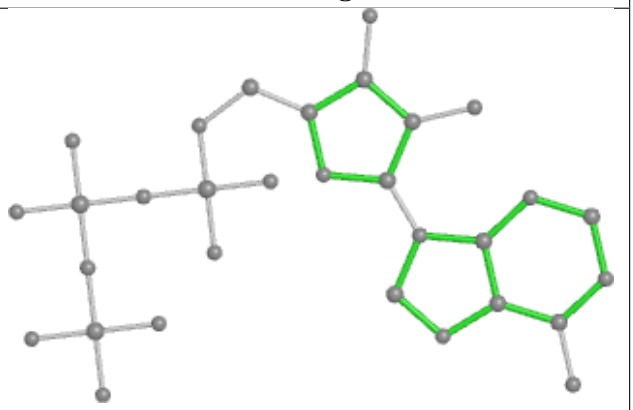
Bond lengths



Bond angles

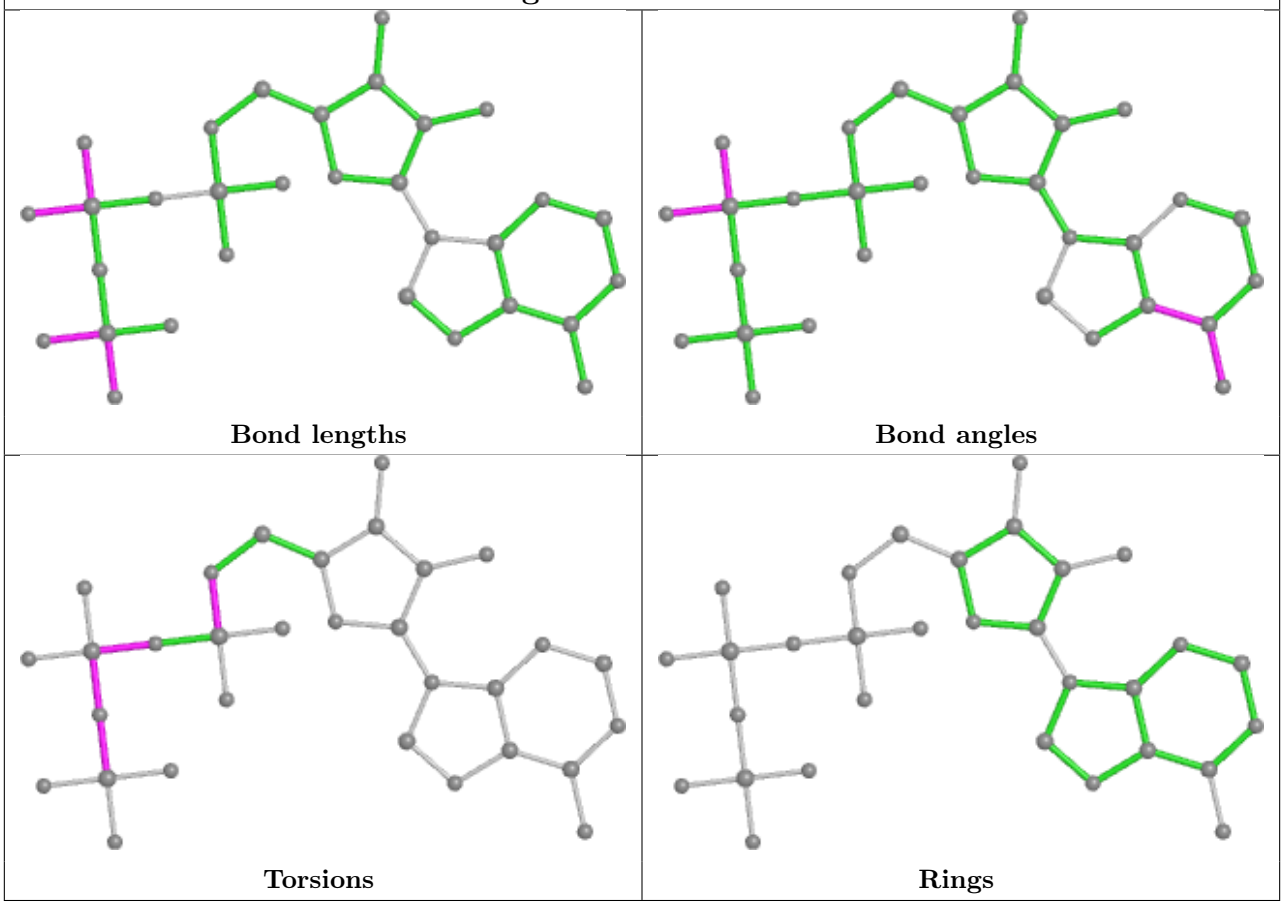


Torsions



Rings

Ligand ANP D 602



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	459/512 (89%)	0.22	11 (2%)	59	64	37, 59, 86, 115	0
1	B	470/512 (91%)	0.23	10 (2%)	63	68	35, 61, 88, 114	0
1	C	469/512 (91%)	0.21	10 (2%)	63	68	38, 60, 87, 130	0
1	D	463/512 (90%)	0.42	13 (2%)	55	59	43, 74, 100, 128	0
1	E	465/512 (90%)	0.51	16 (3%)	48	53	42, 70, 107, 121	0
1	F	459/512 (89%)	0.33	13 (2%)	55	59	39, 67, 94, 112	0
All	All	2785/3072 (90%)	0.32	73 (2%)	57	61	35, 64, 98, 130	0

All (73) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	107	ASP	3.8
1	B	415	PHE	3.5
1	E	426	ILE	3.5
1	A	51	PHE	3.4
1	A	246	GLY	3.3
1	C	426	ILE	3.2
1	E	329	ILE	3.1
1	C	13	GLN	3.1
1	C	152	ALA	3.0
1	B	149	GLN	3.0
1	D	102	LEU	2.9
1	F	51	PHE	2.8
1	F	13	GLN	2.8
1	F	421	ILE	2.8
1	D	353	GLU	2.7
1	A	350	THR	2.7
1	E	346	TYR	2.7
1	D	311	PHE	2.7
1	C	118	ASP	2.6

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Mol	Chain	Res	Type	RSRZ
1	A	426	ILE	2.6
1	D	107	ASP	2.6
1	E	309	ILE	2.6
1	D	20	GLY	2.6
1	C	418	SER	2.5
1	B	493	ILE	2.5
1	B	107	ASP	2.5
1	D	352	LEU	2.5
1	E	404	ILE	2.5
1	E	147	PHE	2.5
1	C	493	ILE	2.4
1	A	309	ILE	2.4
1	F	37	SER	2.4
1	B	151	ASP	2.4
1	F	309	ILE	2.4
1	E	54	HIS	2.4
1	B	150	TYR	2.4
1	D	104	ALA	2.4
1	C	149	GLN	2.4
1	C	251	THR	2.3
1	F	118	ASP	2.3
1	D	253	ARG	2.3
1	C	22	GLU	2.3
1	A	119	LEU	2.3
1	A	416	MET	2.3
1	D	339	LEU	2.3
1	A	449	LEU	2.3
1	B	108	PRO	2.3
1	D	349	SER	2.2
1	E	154	SER	2.2
1	A	245	LEU	2.2
1	B	368	PRO	2.2
1	C	466	PHE	2.2
1	F	147	PHE	2.2
1	E	294	VAL	2.2
1	A	106	PRO	2.2
1	E	363	ILE	2.2
1	E	352	LEU	2.1
1	F	416	MET	2.1
1	E	107	ASP	2.1
1	D	449	LEU	2.1
1	E	494	THR	2.1

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Mol	Chain	Res	Type	RSRZ
1	F	24	PHE	2.1
1	F	244	PRO	2.1
1	B	152	ALA	2.1
1	F	366	PHE	2.1
1	D	309	ILE	2.1
1	A	419	HIS	2.1
1	E	128	TYR	2.0
1	D	408	PHE	2.0
1	E	409	THR	2.0
1	B	51	PHE	2.0
1	E	381	ARG	2.0
1	F	154	SER	2.0

6.2 Non-standard residues in protein, DNA, RNA chains (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
1	SEP	A	427	10/11	0.82	0.17	83,89,102,103	0
1	SEP	F	427	10/11	0.85	0.11	74,90,106,108	0
1	SEP	B	427	10/11	0.85	0.14	72,84,104,106	0
1	SEP	E	427	10/11	0.86	0.13	89,96,106,107	0
1	SEP	D	427	10/11	0.86	0.10	75,91,104,106	0
1	SEP	C	427	10/11	0.88	0.10	81,86,101,103	0

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

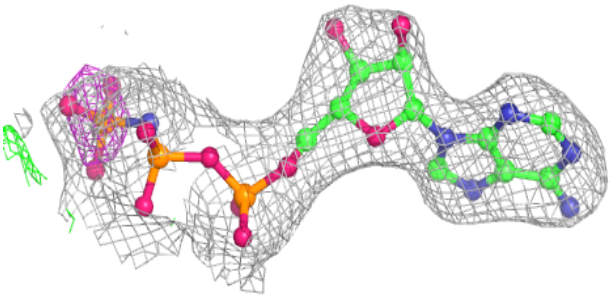
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

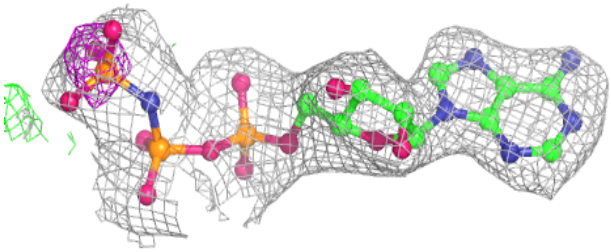
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	MG	D	604	1/1	0.82	0.10	70,70,70,70	0
3	MG	E	604	1/1	0.85	0.08	73,73,73,73	0
3	MG	B	603	1/1	0.88	0.11	51,51,51,51	0
2	ANP	D	602	31/31	0.93	0.08	54,62,91,93	0
2	ANP	E	602	31/31	0.94	0.08	47,59,89,95	0
2	ANP	B	602	31/31	0.94	0.08	46,49,85,85	0
2	ANP	A	602	31/31	0.94	0.08	43,53,81,85	0
3	MG	A	604	1/1	0.94	0.07	56,56,56,56	0
2	ANP	C	602	31/31	0.95	0.07	43,51,78,83	0
2	ANP	F	601	31/31	0.95	0.08	46,53,60,62	0
2	ANP	F	602	31/31	0.95	0.08	42,52,72,75	0
2	ANP	E	601	31/31	0.95	0.08	42,49,63,69	0
2	ANP	D	601	31/31	0.96	0.07	48,58,70,79	0
2	ANP	C	601	31/31	0.96	0.07	48,58,63,64	0
2	ANP	A	601	31/31	0.96	0.07	43,45,50,53	0
2	ANP	B	601	31/31	0.96	0.07	40,50,56,58	0
3	MG	C	604	1/1	0.97	0.03	55,55,55,55	0
3	MG	A	603	1/1	0.98	0.04	45,45,45,45	0
3	MG	E	603	1/1	0.99	0.03	44,44,44,44	0
3	MG	F	603	1/1	0.99	0.06	52,52,52,52	0
3	MG	B	604	1/1	0.99	0.06	51,51,51,51	0
3	MG	C	603	1/1	0.99	0.02	55,55,55,55	0
3	MG	D	603	1/1	1.00	0.07	58,58,58,58	0
3	MG	F	604	1/1	1.00	0.08	47,47,47,47	0

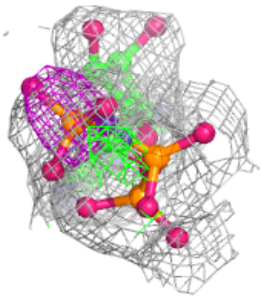
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around ANP D 602:

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

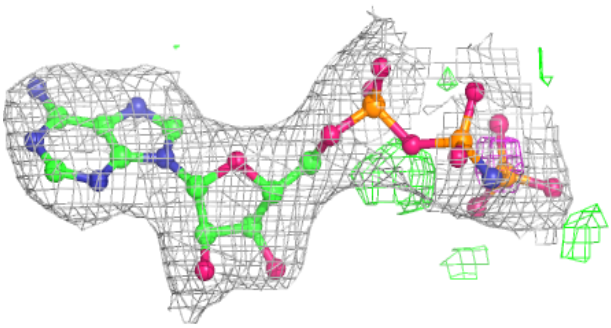


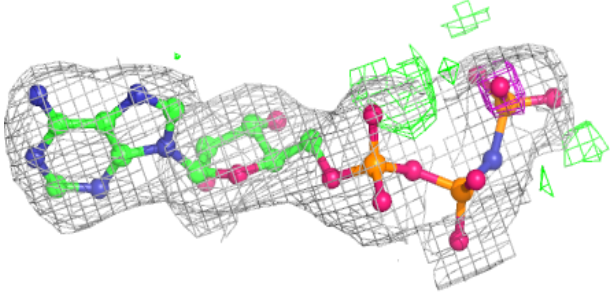


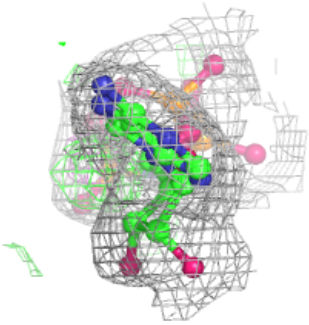


Electron density around ANP E 602:

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

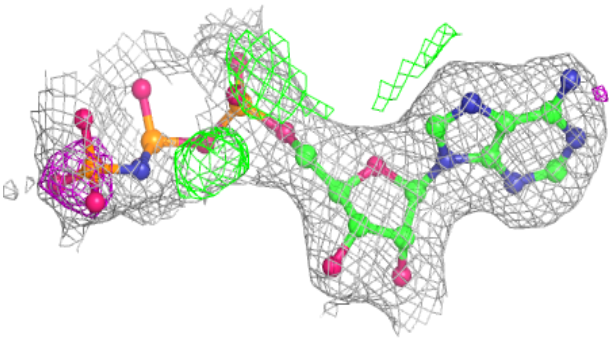


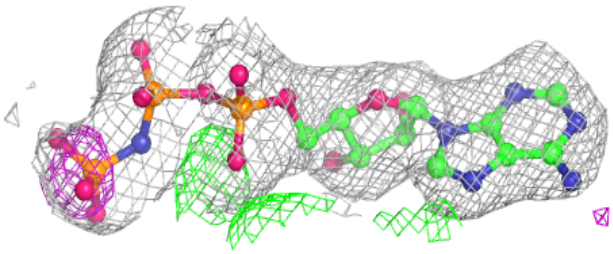


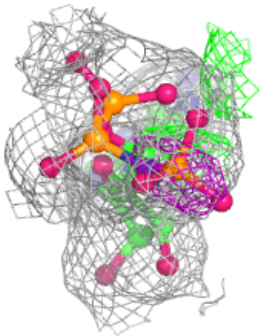


Electron density around ANP B 602:

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







Electron density around ANP A 602:

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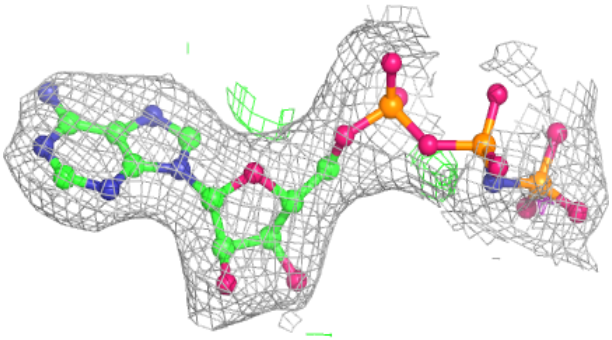
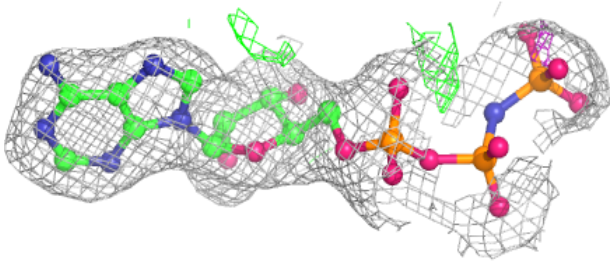
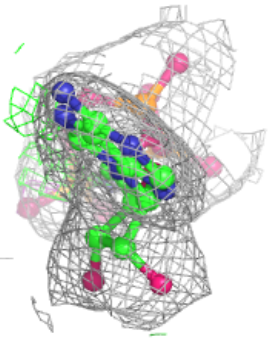
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

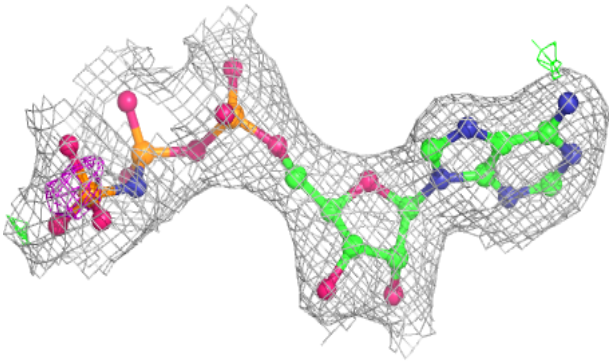


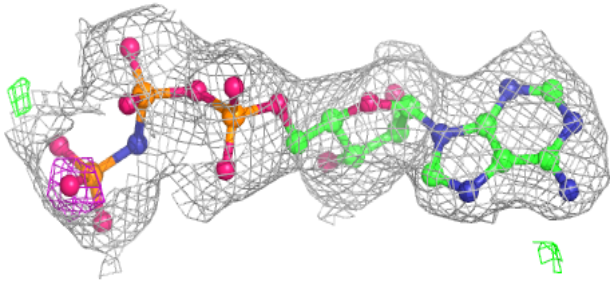


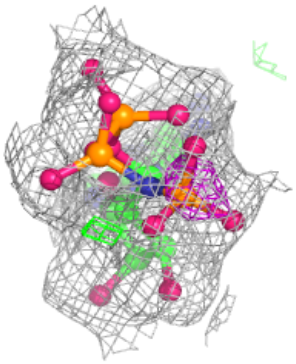


Electron density around ANP C 602:

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

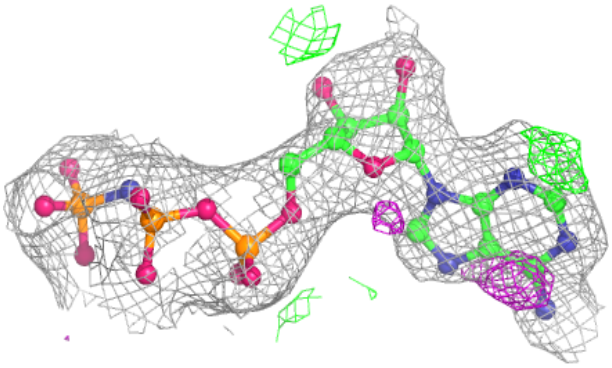


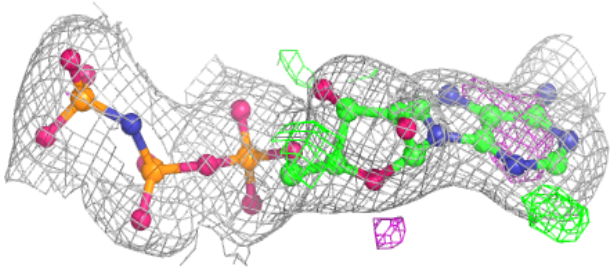


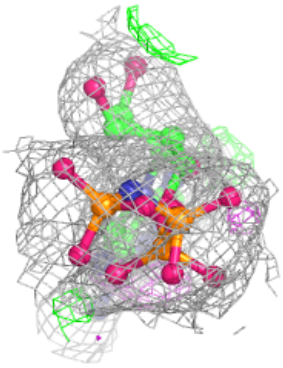


Electron density around ANP F 601:

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

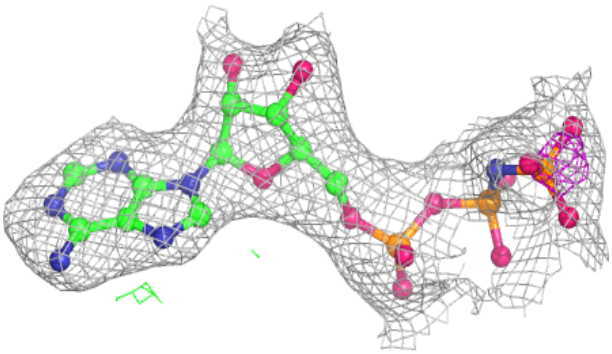


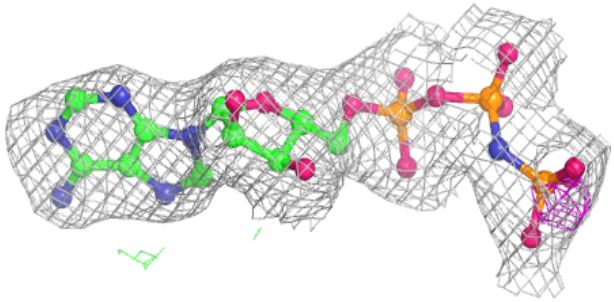


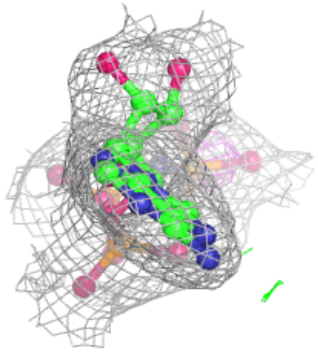


Electron density around ANP F 602:

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

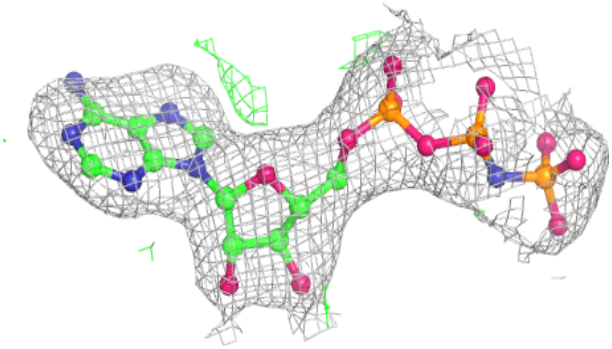


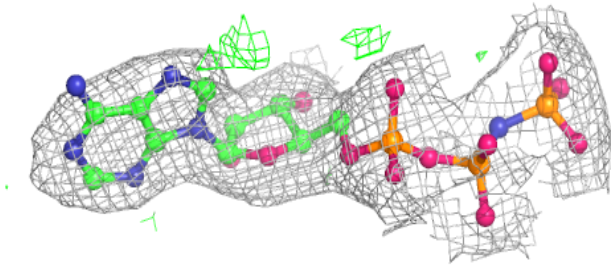


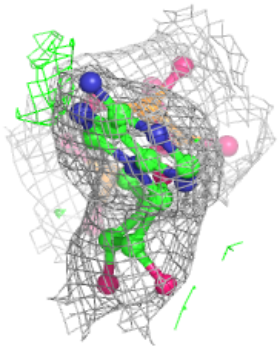


Electron density around ANP E 601:

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

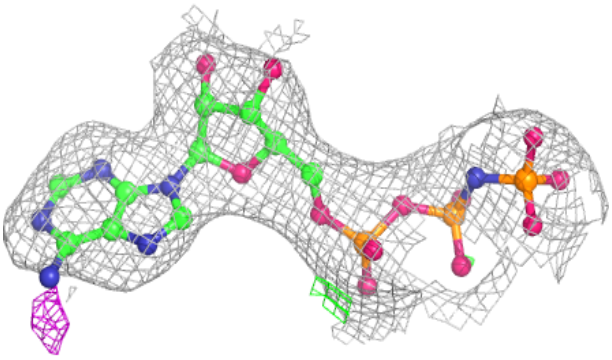


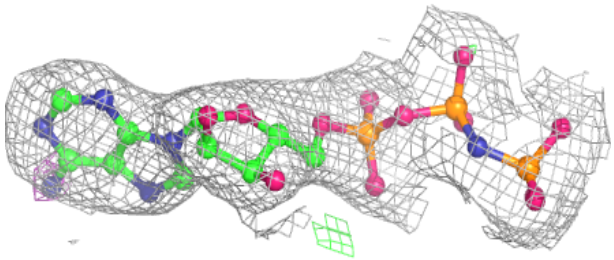


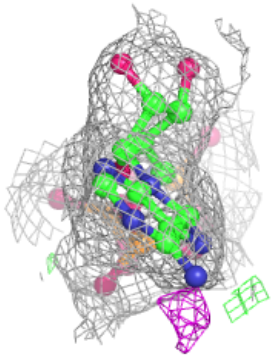


Electron density around ANP D 601:

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

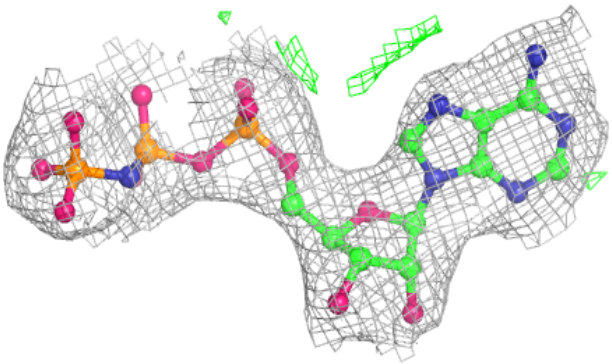


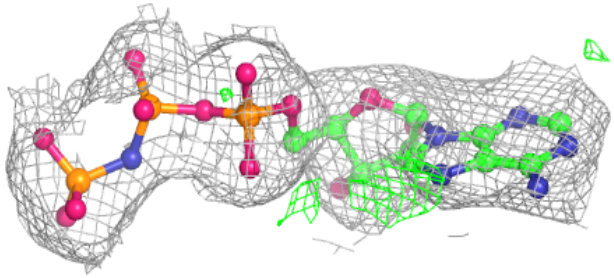


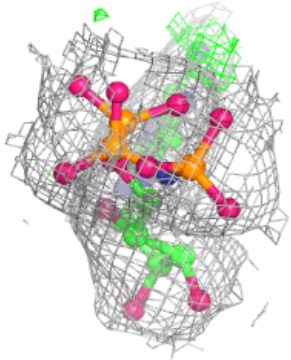


Electron density around ANP C 601:

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

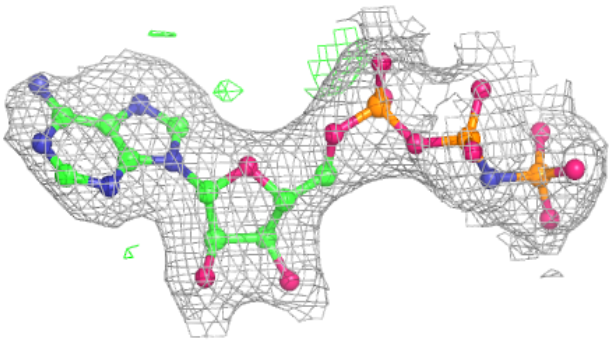


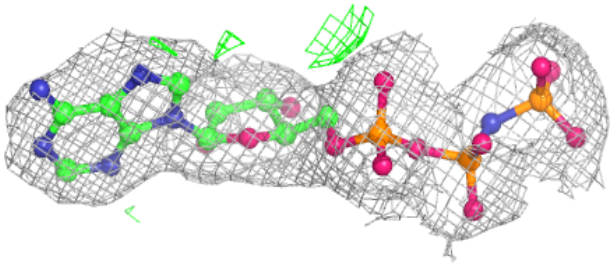


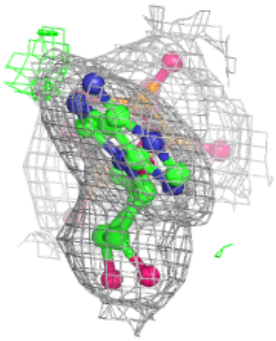


Electron density around ANP A 601:

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

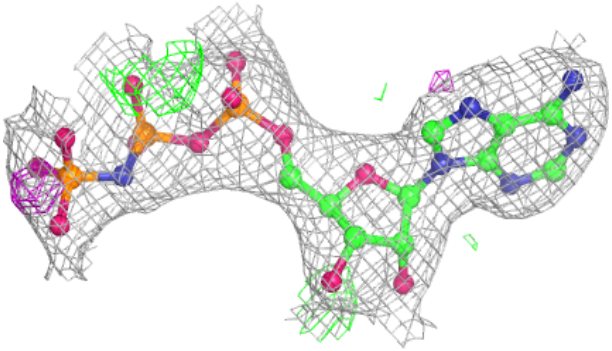


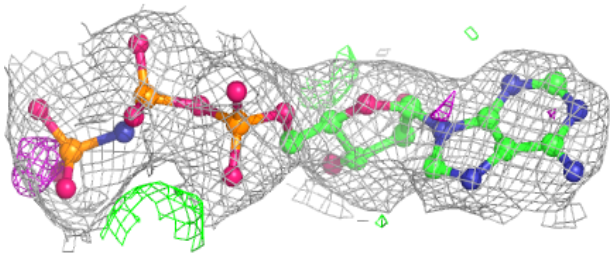


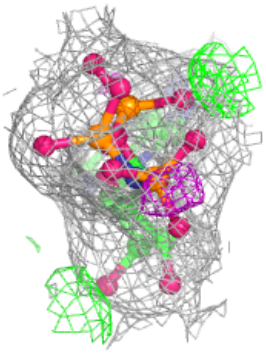


Electron density around ANP B 601:

$2mF_o$-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.