Full wwPDB X-ray Structure Validation Report (i)

Dec 13, 2023 – 11:10 am GMT

PDB ID	:	4CFE
Title	:	Structure of full length human AMPK in complex with a small molecule activator, a benzimidazole derivative (991)
Authors	:	Xiao, B.; Sanders, M.J.; Carmena, D.; Bright, N.J.; Haire, L.F.; Underwood, E.; Patel, B.R.; Heath, R.B.; Walker, P.A.; Hallen, S.; Giordanetto, F.; Martin, S.R.; Carling, D.; Gamblin, S.J.
Deposited on	:	2013-11-14
Resolution	:	3.02 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 (1)) were used in the production of this report:

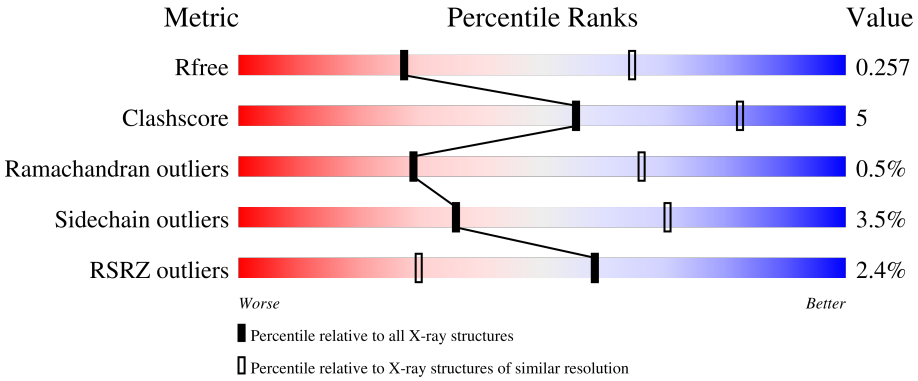
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 3.02 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	2399 (3.04-3.00)
Clashscore	141614	2734 (3.04-3.00)
Ramachandran outliers	138981	2640 (3.04-3.00)
Sidechain outliers	138945	2643 (3.04-3.00)
RSRZ outliers	127900	2287 (3.04-3.00)

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	571	62% 12% • 25%
1	C	571	60% 10% • 29%
2	B	286	49% 9% • 41%
2	D	286	46% 12% 42%
3	E	331	75% 13% • 11%

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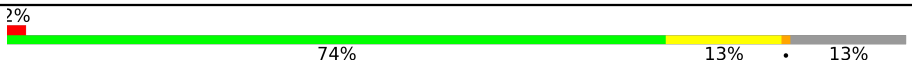
Mol	Chain	Length	Quality of chain
3	F	331	

2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 14322 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 5'-AMP-ACTIVATED PROTEIN KINASE CATALYTIC SUBUNIT ALPHA-2.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	426	Total	C	N	O	P	S	3	0	0
			3411	2191	593	604	1	22			
1	C	404	Total	C	N	O	P	S	7	0	0
			3268	2101	568	576	1	22			

There are 38 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-18	MET	-	expression tag	UNP P54646
A	-17	SER	-	expression tag	UNP P54646
A	-16	HIS	-	expression tag	UNP P54646
A	-15	HIS	-	expression tag	UNP P54646
A	-14	HIS	-	expression tag	UNP P54646
A	-13	HIS	-	expression tag	UNP P54646
A	-12	HIS	-	expression tag	UNP P54646
A	-11	HIS	-	expression tag	UNP P54646
A	-10	SER	-	expression tag	UNP P54646
A	-9	SER	-	expression tag	UNP P54646
A	-8	GLY	-	expression tag	UNP P54646
A	-7	LEU	-	expression tag	UNP P54646
A	-6	GLU	-	expression tag	UNP P54646
A	-5	VAL	-	expression tag	UNP P54646
A	-4	LEU	-	expression tag	UNP P54646
A	-3	PHE	-	expression tag	UNP P54646
A	-2	GLN	-	expression tag	UNP P54646
A	-1	GLY	-	expression tag	UNP P54646
A	0	PRO	-	expression tag	UNP P54646
C	-18	MET	-	expression tag	UNP P54646
C	-17	SER	-	expression tag	UNP P54646
C	-16	HIS	-	expression tag	UNP P54646
C	-15	HIS	-	expression tag	UNP P54646
C	-14	HIS	-	expression tag	UNP P54646

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-13	HIS	-	expression tag	UNP P54646
C	-12	HIS	-	expression tag	UNP P54646
C	-11	HIS	-	expression tag	UNP P54646
C	-10	SER	-	expression tag	UNP P54646
C	-9	SER	-	expression tag	UNP P54646
C	-8	GLY	-	expression tag	UNP P54646
C	-7	LEU	-	expression tag	UNP P54646
C	-6	GLU	-	expression tag	UNP P54646
C	-5	VAL	-	expression tag	UNP P54646
C	-4	LEU	-	expression tag	UNP P54646
C	-3	PHE	-	expression tag	UNP P54646
C	-2	GLN	-	expression tag	UNP P54646
C	-1	GLY	-	expression tag	UNP P54646
C	0	PRO	-	expression tag	UNP P54646

- Molecule 2 is a protein called 5'-AMP-ACTIVATED PROTEIN KINASE SUBUNIT BETA-1.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
2	B	168	Total	C	N	O	P	S	0	0	0
			1336	863	224	243	1	5			
2	D	167	Total	C	N	O	P	S	0	0	0
			1322	855	221	241	1	4			

There are 32 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-15	MET	-	expression tag	UNP Q9Y478
B	-14	GLY	-	expression tag	UNP Q9Y478
B	-13	LEU	-	expression tag	UNP Q9Y478
B	-12	ASN	-	expression tag	UNP Q9Y478
B	-11	ASP	-	expression tag	UNP Q9Y478
B	-10	ILE	-	expression tag	UNP Q9Y478
B	-9	PHE	-	expression tag	UNP Q9Y478
B	-8	GLU	-	expression tag	UNP Q9Y478
B	-7	ALA	-	expression tag	UNP Q9Y478
B	-6	GLN	-	expression tag	UNP Q9Y478
B	-5	LYS	-	expression tag	UNP Q9Y478
B	-4	ILE	-	expression tag	UNP Q9Y478
B	-3	GLU	-	expression tag	UNP Q9Y478
B	-2	TRP	-	expression tag	UNP Q9Y478
B	-1	HIS	-	expression tag	UNP Q9Y478

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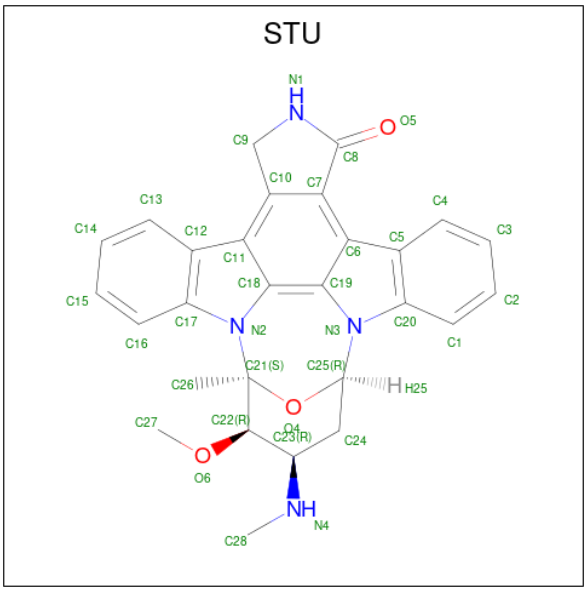
Chain	Residue	Modelled	Actual	Comment	Reference
B	0	GLU	-	expression tag	UNP Q9Y478
D	-15	MET	-	expression tag	UNP Q9Y478
D	-14	GLY	-	expression tag	UNP Q9Y478
D	-13	LEU	-	expression tag	UNP Q9Y478
D	-12	ASN	-	expression tag	UNP Q9Y478
D	-11	ASP	-	expression tag	UNP Q9Y478
D	-10	ILE	-	expression tag	UNP Q9Y478
D	-9	PHE	-	expression tag	UNP Q9Y478
D	-8	GLU	-	expression tag	UNP Q9Y478
D	-7	ALA	-	expression tag	UNP Q9Y478
D	-6	GLN	-	expression tag	UNP Q9Y478
D	-5	LYS	-	expression tag	UNP Q9Y478
D	-4	ILE	-	expression tag	UNP Q9Y478
D	-3	GLU	-	expression tag	UNP Q9Y478
D	-2	TRP	-	expression tag	UNP Q9Y478
D	-1	HIS	-	expression tag	UNP Q9Y478
D	0	GLU	-	expression tag	UNP Q9Y478

- Molecule 3 is a protein called 5'-AMP-ACTIVATED PROTEIN KINASE SUBUNIT GAMMA-1.

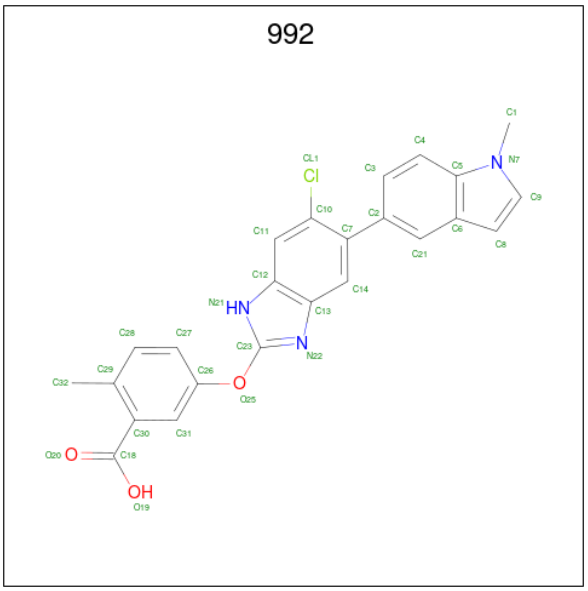
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	E	294	Total	C	N	O	S	8	0	0
			2369	1541	393	428	7			
3	F	288	Total	C	N	O	S	15	0	0
			2315	1504	385	419	7			

- Molecule 4 is STAUROSPORINE (three-letter code: STU) (formula: $C_{28}H_{26}N_4O_3$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	N	O	0	0
			35	28	4	3		
4	C	1	Total	C	N	O	0	0
			35	28	4	3		

- Molecule 5 is 5-[[6-chloranyl-5-(1-methylindol-5-yl)-1H-benzimidazol-2-yl]oxy]-2-methyl-benzoic acid (three-letter code: 992) (formula: $C_{24}H_{18}ClN_3O_3$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	A	1	Total	C	Cl	N	O	0	0
			31	24	1	3	3		

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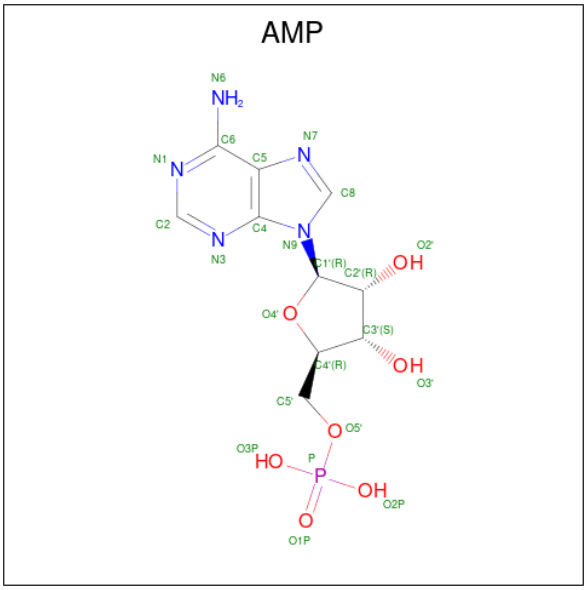
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	C	1	Total	C	Cl	N	O	0	0
			31	24	1	3	3		

- Molecule 6 is ADENOSINE MONOPHOSPHATE (three-letter code: AMP) (formula: $C_{10}H_{14}N_5O_7P$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
6	E	1	Total	C	N	O	P	0	0
			23	10	5	7	1		
6	E	1	Total	C	N	O	P	0	0
			23	10	5	7	1		
6	E	1	Total	C	N	O	P	0	0
			23	10	5	7	1		
6	F	1	Total	C	N	O	P	0	0
			23	10	5	7	1		
6	F	1	Total	C	N	O	P	0	0
			23	10	5	7	1		
6	F	1	Total	C	N	O	P	0	0
			23	10	5	7	1		

- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	13	Total	O	0	0
			13	13		
7	B	6	Total	O	0	0
			6	6		

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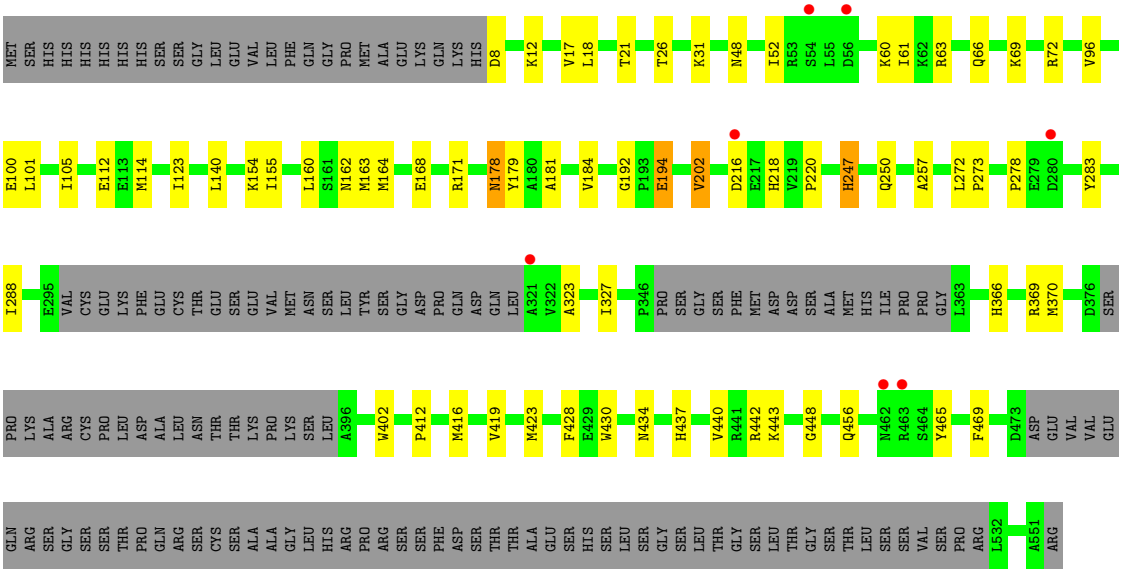
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	C	6	Total O 6 6	0	0
7	D	1	Total O 1 1	0	0
7	E	2	Total O 2 2	0	0
7	F	3	Total O 3 3	0	0

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.

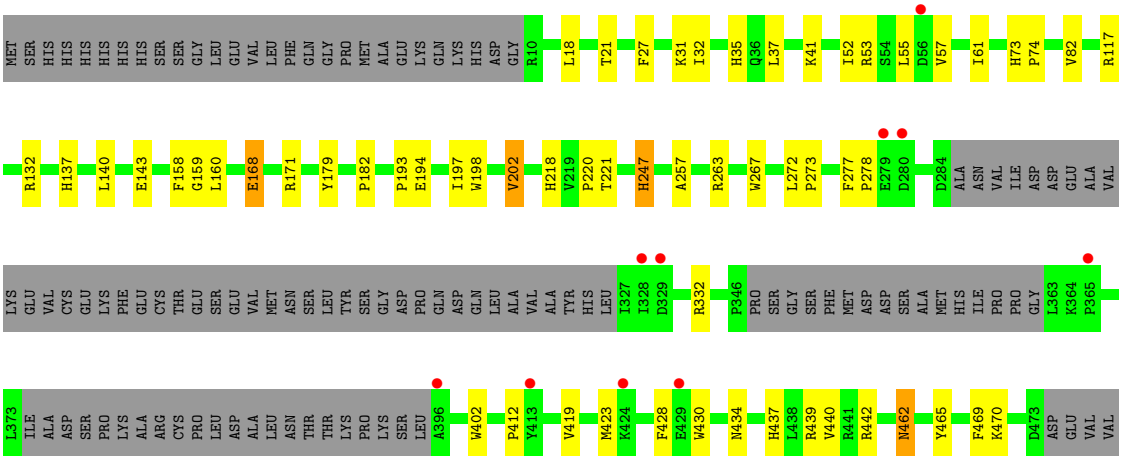
• Molecule 1: 5'-AMP-ACTIVATED PROTEIN KINASE CATALYTIC SUBUNIT ALPHA-2

Chain A:



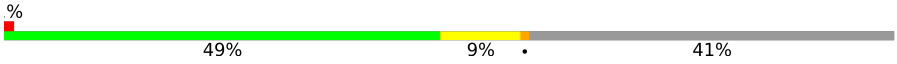
• Molecule 1: 5'-AMP-ACTIVATED PROTEIN KINASE CATALYTIC SUBUNIT ALPHA-2

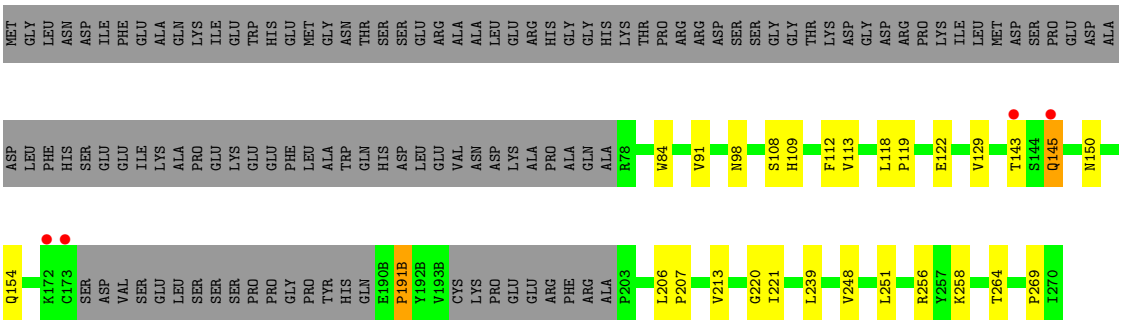
Chain C:



• Molecule 2: 5'-AMP-ACTIVATED PROTEIN KINASE SUBUNIT BETA-1

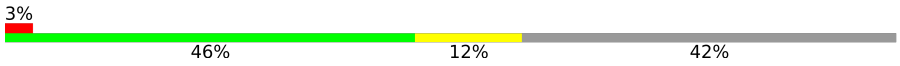
Chain B:

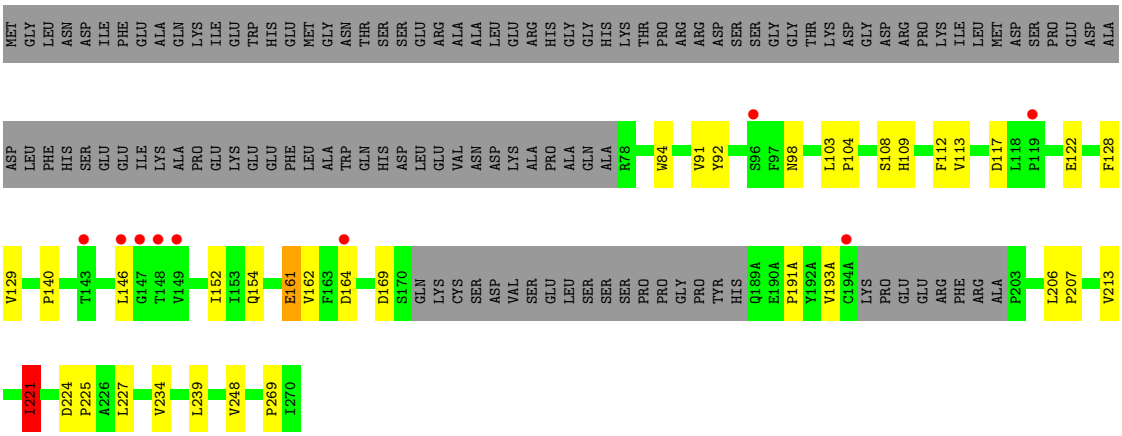




• Molecule 2: 5'-AMP-ACTIVATED PROTEIN KINASE SUBUNIT BETA-1

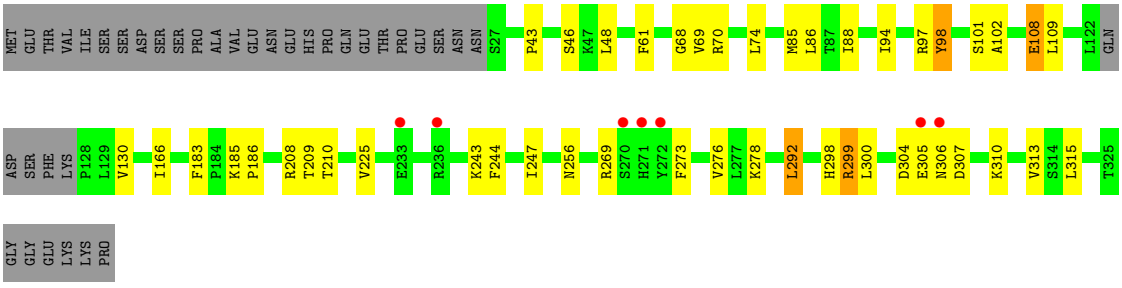
Chain D:





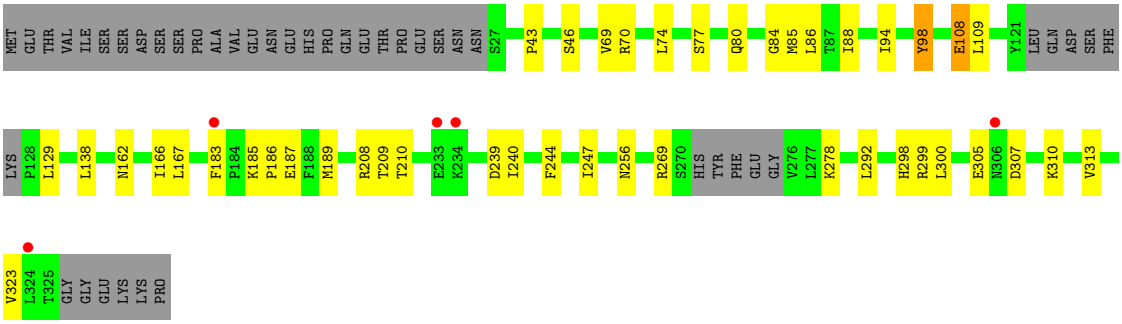
• Molecule 3: 5'-AMP-ACTIVATED PROTEIN KINASE SUBUNIT GAMMA-1

Chain E:



• Molecule 3: 5'-AMP-ACTIVATED PROTEIN KINASE SUBUNIT GAMMA-1

Chain F:


MET GLU THR VAL ILE SER SER ASP SER SER PRO ALA VAL GLU ASN GLU HIS PRO GLN GLU THR PRO GLU SER ASN ASN S27 P43 S46 V69 R70 L74 S77 Q80 G84 M85 L86 T87 I88 I94 Y98 E108 L109 Y121 LEU GLN ASP SER PHE
LYS P128 L129 L138 N162 I166 L167 F183 P184 K185 P186 E187 F188 M189 R208 T209 T210 E233 K234 D239 I240 F244 I247 N256 R269 S270 HIS TYR PHE GLU GLY V276 L277 K278 L292 H298 R299 L300 E305 N306 D307 K310 V313
V323 L324 T325 GLY GLY GLU LYS LYS PRO

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	76.03Å 134.14Å 140.56Å 90.00° 92.42° 90.00°	Depositor
Resolution (Å)	19.91 – 3.02 19.91 – 3.02	Depositor EDS
% Data completeness (in resolution range)	92.0 (19.91-3.02) 92.0 (19.91-3.02)	Depositor EDS
R_{merge}	0.04	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.21 (at 3.04Å)	Xtriage
Refinement program	PHENIX (PHENIX.REFINE)	Depositor
R, R_{free}	0.218 , 0.253 0.224 , 0.257	Depositor DCC
R_{free} test set	2550 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å^2)	97.0	Xtriage
Anisotropy	0.303	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 67.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	0.027 for h,-k,-l	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	14322	wwPDB-VP
Average B, all atoms (Å^2)	78.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.38% 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: STU, SEP, TPO, AMP, 992

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	0.21	0/3478	0.36	0/4698
1	C	0.22	0/3333	0.37	0/4497
2	B	0.22	0/1361	0.43	1/1851 (0.1%)
2	D	0.23	0/1347	0.45	1/1834 (0.1%)
3	E	0.21	0/2418	0.40	0/3282
3	F	0.22	0/2360	0.39	0/3202
All	All	0.22	0/14297	0.39	2/19364 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	D	191(A)	PRO	N-CA-CB	6.22	110.77	103.30
2	B	191(B)	PRO	N-CA-CB	5.89	110.37	103.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3411	0	3398	43	0
1	C	3268	0	3277	35	0
2	B	1336	0	1322	15	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	D	1322	0	1300	17	0
3	E	2369	0	2444	25	0
3	F	2315	0	2398	19	0
4	A	35	0	26	2	0
4	C	35	0	26	1	0
5	A	31	0	17	2	0
5	C	31	0	17	2	0
6	E	69	0	36	2	0
6	F	69	0	36	0	0
7	A	13	0	0	0	0
7	B	6	0	0	0	0
7	C	6	0	0	1	0
7	D	1	0	0	0	0
7	E	2	0	0	0	0
7	F	3	0	0	0	0
All	All	14322	0	14297	146	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 5.

All (146) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:430:TRP:HB3	1:C:440:VAL:HA	1.71	0.72
1:C:179:TYR:HA	1:C:202:VAL:HG11	1.77	0.67
1:C:158:PHE:O	1:C:160:LEU:N	2.28	0.66
1:C:423:MET:HB3	1:C:428:PHE:HB2	1.78	0.65
2:D:122:GLU:HG2	2:D:154:GLN:HG2	1.79	0.65
3:F:98:TYR:CG	3:F:108:GLU:HG3	2.31	0.65
1:A:423:MET:HB3	1:A:428:PHE:HB2	1.78	0.64
3:E:278:LYS:NZ	3:E:307:ASP:OD1	2.31	0.64
1:C:402:TRP:HB2	2:D:213:VAL:HG11	1.79	0.64
1:A:63:ARG:HH21	1:A:163:MET:HG2	1.64	0.63
1:C:536:THR:OG1	3:F:162:ASN:ND2	2.32	0.62
1:C:218:HIS:HD1	1:C:221:THR:HG1	1.47	0.62
1:A:179:TYR:HA	1:A:202:VAL:HG11	1.82	0.62
4:A:1552:STU:H261	4:A:1552:STU:H16	1.82	0.61
3:E:98:TYR:CG	3:E:108:GLU:HG3	2.36	0.60
1:C:462:ASN:N	1:C:462:ASN:OD1	2.35	0.60
1:C:132:ARG:HH21	1:C:263:ARG:HH22	1.49	0.59
4:C:1552:STU:H261	4:C:1552:STU:H16	1.83	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:52:ILE:HD12	1:A:61:ILE:HG13	1.85	0.58
2:B:206:LEU:HD12	2:B:207:PRO:HD2	1.87	0.57
3:E:244:PHE:HB3	6:E:1327:AMP:H5'1	1.86	0.56
3:F:70:ARG:HH21	3:F:244:PHE:HB2	1.70	0.56
1:C:469:PHE:HB2	2:D:239:LEU:HB3	1.89	0.55
1:A:370:MET:HG3	3:E:68:GLY:HA2	1.89	0.54
2:D:221:ILE:H	2:D:221:ILE:HD13	1.72	0.54
3:F:209:THR:HG23	3:F:210:THR:HG23	1.89	0.54
2:B:108:SEP:OG	2:B:109:HIS:N	2.37	0.54
3:E:74:LEU:HD21	3:E:86:LEU:HB2	1.89	0.54
3:F:239:ASP:OD1	3:F:240:ILE:N	2.39	0.53
1:C:428:PHE:HE1	1:C:442:ARG:HD3	1.73	0.53
1:A:469:PHE:HB2	2:B:239:LEU:HB3	1.91	0.52
1:A:278:PRO:HA	1:A:283:TYR:CG	2.45	0.52
2:B:256:ARG:NH1	2:B:258:LYS:O	2.38	0.52
3:E:304:ASP:O	3:E:306:ASN:N	2.40	0.52
1:C:55:LEU:HB2	1:C:57:VAL:HG22	1.91	0.52
1:A:402:TRP:HB2	2:B:213:VAL:HG11	1.91	0.51
3:F:74:LEU:HD21	3:F:86:LEU:HB2	1.92	0.51
3:E:70:ARG:HH21	3:E:244:PHE:HB2	1.75	0.51
1:A:178:ASN:OD1	1:A:178:ASN:N	2.43	0.51
1:C:434:ASN:HB3	1:C:437:HIS:HB3	1.93	0.50
2:D:206:LEU:HD12	2:D:207:PRO:HD2	1.93	0.50
3:F:88:ILE:HG23	3:F:247:ILE:HG23	1.93	0.50
1:A:123:ILE:HG23	1:A:155:ILE:HD11	1.93	0.50
3:E:43:PRO:HG2	3:E:46:SER:HB3	1.92	0.50
3:F:77:SER:O	3:F:80:GLN:NE2	2.35	0.50
1:C:52:ILE:HD12	1:C:61:ILE:HG13	1.93	0.50
1:A:366:HIS:HB3	1:A:369:ARG:HG2	1.94	0.50
3:E:70:ARG:NH2	3:E:244:PHE:HB2	2.27	0.50
1:A:369:ARG:NH2	2:B:220:GLY:O	2.45	0.49
1:C:218:HIS:CD2	1:C:220:PRO:HD2	2.47	0.49
1:A:72:ARG:HH22	1:A:288:ILE:HB	1.77	0.49
1:A:26:THR:HG21	1:A:160:LEU:HG	1.94	0.49
3:E:98:TYR:CD1	3:E:108:GLU:HG3	2.48	0.49
1:C:247:HIS:CG	1:C:257:ALA:HB2	2.47	0.49
3:E:85:MET:HE1	3:E:166:ILE:HD13	1.95	0.48
2:D:248:VAL:HA	2:D:269:PRO:HA	1.95	0.48
1:A:18:LEU:HB2	5:A:1553:992:H8	1.94	0.48
1:A:218:HIS:CD2	1:A:220:PRO:HD2	2.48	0.48
3:E:130:VAL:O	6:E:1326:AMP:N6	2.47	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:140:PRO:O	2:D:152:ILE:N	2.43	0.48
1:C:117:ARG:NH1	1:C:267:TRP:O	2.36	0.47
2:B:248:VAL:HA	2:B:269:PRO:HA	1.95	0.47
1:A:443:LYS:NZ	1:A:448:GLY:O	2.47	0.47
1:C:32:ILE:HD11	1:C:41:LYS:HD3	1.96	0.47
3:E:298:HIS:HB3	3:E:299:ARG:NH2	2.30	0.47
3:E:101:SER:OG	3:E:102:ALA:N	2.48	0.47
2:B:264:THR:HG22	3:E:48:LEU:HD23	1.96	0.47
1:A:434:ASN:HB3	1:A:437:HIS:HB3	1.96	0.47
1:C:193:PRO:O	1:C:197:ILE:HG12	2.15	0.47
1:C:35:HIS:CE1	1:C:37:LEU:HB2	2.50	0.46
1:C:18:LEU:CB	5:C:1553:992:H8	2.45	0.46
1:A:272:LEU:HD12	1:A:273:PRO:HD2	1.97	0.46
1:C:82:VAL:HG13	2:D:162:VAL:HG21	1.97	0.46
2:B:122:GLU:HG2	2:B:154:GLN:HG2	1.97	0.46
3:E:88:ILE:HG23	3:E:247:ILE:HG23	1.97	0.46
1:A:18:LEU:CB	5:A:1553:992:H8	2.46	0.46
1:C:132:ARG:NH2	1:C:263:ARG:HH22	2.12	0.46
1:A:430:TRP:HB3	1:A:440:VAL:HA	1.96	0.46
3:E:209:THR:HG23	3:E:210:THR:HG23	1.96	0.46
1:A:60:LYS:HG3	1:A:63:ARG:HH12	1.78	0.46
2:D:224:ASP:HB3	2:D:227:LEU:HG	1.98	0.46
3:F:85:MET:HE1	3:F:166:ILE:HD13	1.98	0.46
2:D:92:TYR:HB2	2:D:128:PHE:HB3	1.97	0.45
3:F:298:HIS:HB3	3:F:299:ARG:NH2	2.31	0.45
1:A:8:ASP:N	1:A:12:LYS:HZ1	2.14	0.45
1:C:439:ARG:NH1	7:C:2005:HOH:O	2.49	0.45
3:F:278:LYS:NZ	3:F:307:ASP:OD1	2.49	0.45
1:A:192:GLY:N	1:A:194:GLU:OE2	2.46	0.45
1:A:247:HIS:CG	1:A:257:ALA:HB2	2.52	0.45
2:B:108:SEP:P	2:B:109:HIS:H	2.40	0.45
2:D:108:SEP:OG	2:D:109:HIS:N	2.43	0.45
1:C:18:LEU:HB3	5:C:1553:992:H8	1.99	0.45
1:A:162:ASN:OD1	1:A:163:MET:N	2.48	0.44
1:A:101:LEU:O	1:A:105:ILE:HG13	2.17	0.44
1:A:437:HIS:ND1	1:A:456:GLN:OE1	2.46	0.44
1:A:112:GLU:HG2	1:A:114:MET:H	1.83	0.44
1:C:419:VAL:O	1:C:423:MET:HG3	2.18	0.44
2:D:84:TRP:HB3	2:D:112:PHE:HB2	1.98	0.44
3:E:315:LEU:HD12	3:E:315:LEU:HA	1.86	0.43
1:C:277:PHE:HA	1:C:278:PRO:HD3	1.89	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:412:PRO:HG3	1:C:465:TYR:CZ	2.54	0.43
3:F:84:GLY:HA2	3:F:129:LEU:HD13	1.99	0.43
3:F:70:ARG:NH2	3:F:244:PHE:HB2	2.34	0.43
1:C:168:GLU:OE2	1:C:470:LYS:NZ	2.51	0.43
2:D:161:GLU:HB3	2:D:164:ASP:HB2	2.01	0.43
1:A:428:PHE:HE1	1:A:442:ARG:HD3	1.84	0.43
1:C:53:ARG:NH2	2:D:169:ASP:OD1	2.51	0.43
2:D:91:VAL:HG22	2:D:129:VAL:HG22	2.01	0.43
3:F:98:TYR:CD2	3:F:108:GLU:HG3	2.54	0.43
2:B:118:LEU:HA	2:B:119:PRO:HD3	1.85	0.42
3:E:310:LYS:HD3	3:E:310:LYS:HA	1.85	0.42
1:A:48:ASN:O	1:A:52:ILE:HG12	2.20	0.42
1:C:143:GLU:OE1	1:C:143:GLU:N	2.45	0.42
3:F:186:PRO:HG2	3:F:189:MET:HG2	2.00	0.42
1:A:100:GLU:OE2	4:A:1552:STU:N4	2.52	0.42
3:F:43:PRO:HG2	3:F:46:SER:HB3	2.01	0.42
3:E:292:LEU:HD13	3:E:292:LEU:HA	1.93	0.42
1:A:31:LYS:HB3	1:A:31:LYS:HE2	1.81	0.42
2:B:91:VAL:HG13	2:B:129:VAL:HG22	2.01	0.42
2:B:143:THR:HG22	2:B:145:GLN:H	1.85	0.42
2:D:224:ASP:HA	2:D:225:PRO:HD3	1.94	0.42
3:E:94:ILE:HG21	3:E:109:LEU:HD13	2.02	0.42
1:A:66:GLN:HA	1:A:69:LYS:HE3	2.02	0.42
1:A:96:VAL:HG11	1:A:154:LYS:HG3	2.02	0.42
3:E:97:ARG:HD2	3:E:98:TYR:CZ	2.55	0.41
3:F:94:ILE:HG21	3:F:109:LEU:HD13	2.00	0.41
1:A:181:ALA:HB3	1:A:184:VAL:HG23	2.01	0.41
2:B:239:LEU:HD11	2:B:251:LEU:HB3	2.02	0.41
1:A:12:LYS:HG2	1:A:17:VAL:HG22	2.03	0.41
1:C:21:THR:HA	1:C:31:LYS:HB3	2.02	0.41
3:F:300:LEU:HB2	3:F:313:VAL:HG13	2.03	0.41
1:A:21:THR:HA	1:A:31:LYS:HB3	2.02	0.41
1:A:164:MET:HB2	1:A:164:MET:HE2	1.92	0.41
1:A:412:PRO:HG3	1:A:465:TYR:CZ	2.55	0.41
1:A:323:ALA:O	1:A:327:ILE:HG12	2.21	0.41
1:A:278:PRO:HA	1:A:283:TYR:CD2	2.56	0.41
2:B:84:TRP:HB3	2:B:112:PHE:HB2	2.03	0.41
3:F:138:LEU:HA	3:F:138:LEU:HD12	1.79	0.41
1:C:182:PRO:HD3	1:C:198:TRP:CE2	2.56	0.41
3:E:61:PHE:HE2	3:E:94:ILE:HD12	1.86	0.41
1:A:416:MET:HA	1:A:419:VAL:HG22	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:272:LEU:HD12	1:C:273:PRO:HD2	2.03	0.40
2:D:103:LEU:HD12	2:D:104:PRO:HD2	2.03	0.40
3:E:300:LEU:HB2	3:E:313:VAL:HG13	2.02	0.40
1:C:73:HIS:CG	1:C:74:PRO:HD2	2.56	0.40
3:E:225:VAL:O	3:E:243:LYS:HE3	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	415/571 (73%)	394 (95%)	21 (5%)	0	100	100
1	C	393/571 (69%)	369 (94%)	23 (6%)	1 (0%)	41	75
2	B	161/286 (56%)	155 (96%)	5 (3%)	1 (1%)	25	62
2	D	160/286 (56%)	150 (94%)	8 (5%)	2 (1%)	12	43
3	E	290/331 (88%)	279 (96%)	7 (2%)	4 (1%)	11	41
3	F	282/331 (85%)	271 (96%)	10 (4%)	1 (0%)	34	71
All	All	1701/2376 (72%)	1618 (95%)	74 (4%)	9 (0%)	29	66

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	159	GLY
2	D	193(A)	VAL
2	B	191(B)	PRO
3	E	185	LYS
2	D	221	ILE
3	E	186	PRO
3	E	305	GLU

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Mol	Chain	Res	Type
3	F	185	LYS
3	E	276	VAL

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	365/503 (73%)	356 (98%)	9 (2%)	47	78
1	C	355/503 (71%)	345 (97%)	10 (3%)	43	76
2	B	149/253 (59%)	144 (97%)	5 (3%)	37	72
2	D	146/253 (58%)	139 (95%)	7 (5%)	25	60
3	E	270/304 (89%)	260 (96%)	10 (4%)	34	69
3	F	265/304 (87%)	252 (95%)	13 (5%)	25	60
All	All	1550/2120 (73%)	1496 (96%)	54 (4%)	36	70

All (54) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	140	LEU
1	A	168	GLU
1	A	171	ARG
1	A	178	ASN
1	A	194	GLU
1	A	202	VAL
1	A	216	ASP
1	A	247	HIS
1	A	250	GLN
2	B	98	ASN
2	B	113	VAL
2	B	145	GLN
2	B	150	ASN
2	B	221	ILE
1	C	27	PHE
1	C	137	HIS

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Mol	Chain	Res	Type
1	C	140	LEU
1	C	168	GLU
1	C	171	ARG
1	C	194	GLU
1	C	202	VAL
1	C	247	HIS
1	C	332	ARG
1	C	462	ASN
2	D	98	ASN
2	D	113	VAL
2	D	117	ASP
2	D	146	LEU
2	D	161	GLU
2	D	221	ILE
2	D	234	VAL
3	E	69	VAL
3	E	98	TYR
3	E	108	GLU
3	E	183	PHE
3	E	208	ARG
3	E	256	ASN
3	E	269	ARG
3	E	273	PHE
3	E	292	LEU
3	E	299	ARG
3	F	69	VAL
3	F	98	TYR
3	F	108	GLU
3	F	167	LEU
3	F	183	PHE
3	F	187	GLU
3	F	208	ARG
3	F	256	ASN
3	F	269	ARG
3	F	292	LEU
3	F	305	GLU
3	F	310	LYS
3	F	323	VAL

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

Mol	Chain	Res	Type
1	A	48	ASN
2	B	145	GLN
3	F	162	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)

4 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	$\#\|Z\| > 2$
2	SEP	B	108	2	8,9,10	0.91	0	8,12,14	0.98	0
2	SEP	D	108	2	8,9,10	0.90	0	8,12,14	0.84	0
1	TPO	C	172	1	8,10,11	0.79	0	10,14,16	1.02	0
1	TPO	A	172	1	8,10,11	0.76	0	10,14,16	0.95	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	SEP	B	108	2	-	1/5/8/10	-
2	SEP	D	108	2	-	1/5/8/10	-
1	TPO	C	172	1	-	0/9/11/13	-
1	TPO	A	172	1	-	1/9/11/13	-

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	A	172	TPO	CB-OG1-P-O2P
2	B	108	SEP	N-CA-CB-OG
2	D	108	SEP	N-CA-CB-OG

There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	108	SEP	2	0
2	D	108	SEP	1	0

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

10 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	$\#\|Z\| > 2$
6	AMP	F	1327	-	22,25,25	0.89	1 (4%)	25,38,38	1.21	2 (8%)
6	AMP	E	1326	-	22,25,25	0.90	1 (4%)	25,38,38	1.20	2 (8%)
6	AMP	E	1328	-	22,25,25	0.90	1 (4%)	25,38,38	1.22	2 (8%)
6	AMP	F	1328	-	22,25,25	0.89	1 (4%)	25,38,38	1.24	2 (8%)
6	AMP	E	1327	-	22,25,25	0.90	1 (4%)	25,38,38	1.16	2 (8%)
5	992	C	1553	-	34,35,35	1.22	3 (8%)	39,52,52	1.30	3 (7%)
4	STU	C	1552	-	30,42,42	1.01	2 (6%)	31,68,68	2.14	9 (29%)
5	992	A	1553	-	34,35,35	1.23	4 (11%)	39,52,52	1.32	3 (7%)
4	STU	A	1552	-	30,42,42	1.00	2 (6%)	31,68,68	2.11	8 (25%)
6	AMP	F	1326	-	22,25,25	0.88	1 (4%)	25,38,38	1.20	2 (8%)

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
6	AMP	F	1327	-	-	1/6/26/26	0/3/3/3
6	AMP	E	1326	-	-	2/6/26/26	0/3/3/3
6	AMP	E	1328	-	-	4/6/26/26	0/3/3/3
6	AMP	F	1328	-	-	0/6/26/26	0/3/3/3
6	AMP	E	1327	-	-	3/6/26/26	0/3/3/3
5	992	C	1553	-	-	4/10/12/12	0/5/5/5
4	STU	C	1552	-	-	1/4/42/42	-
5	992	A	1553	-	-	4/10/12/12	0/5/5/5
4	STU	A	1552	-	-	1/4/42/42	-
6	AMP	F	1326	-	-	0/6/26/26	0/3/3/3

All (17) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	1553	992	C9-N7	-2.91	1.32	1.37
5	C	1553	992	C9-N7	-2.88	1.32	1.37
5	C	1553	992	C11-C10	2.87	1.41	1.36
5	A	1553	992	C11-C10	2.80	1.41	1.36
5	A	1553	992	O25-C23	2.67	1.41	1.34
5	C	1553	992	O25-C23	2.53	1.40	1.34
6	E	1326	AMP	C5-C4	2.52	1.47	1.40
6	E	1327	AMP	C5-C4	2.51	1.47	1.40
6	F	1328	AMP	C5-C4	2.50	1.47	1.40
6	F	1327	AMP	C5-C4	2.50	1.47	1.40
6	F	1326	AMP	C5-C4	2.50	1.47	1.40
6	E	1328	AMP	C5-C4	2.45	1.47	1.40
4	A	1552	STU	O4-C25	-2.40	1.39	1.43
4	C	1552	STU	C10-C11	-2.31	1.39	1.42
4	A	1552	STU	C10-C11	-2.21	1.39	1.42
4	C	1552	STU	O4-C25	-2.18	1.40	1.43
5	A	1553	992	C30-C29	2.01	1.43	1.40

All (35) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	C	1552	STU	C9-N1-C8	-5.37	108.69	113.85
4	A	1552	STU	C9-N1-C8	-5.35	108.71	113.85

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	A	1552	STU	C10-C9-N1	4.12	105.95	101.76
4	C	1552	STU	C10-C9-N1	4.07	105.90	101.76
4	C	1552	STU	C7-C8-N1	4.01	110.43	106.37
4	A	1552	STU	C7-C8-N1	3.98	110.40	106.37
5	C	1553	992	C4-C5-N7	3.97	135.54	132.14
5	A	1553	992	C4-C5-N7	3.89	135.48	132.14
4	C	1552	STU	C26-C21-C22	-3.73	105.37	112.64
4	A	1552	STU	O5-C8-C7	-3.65	124.98	129.32
4	C	1552	STU	O5-C8-C7	-3.57	125.08	129.32
4	A	1552	STU	C26-C21-C22	-3.47	105.89	112.64
4	C	1552	STU	C27-O6-C22	-3.46	108.47	114.44
4	A	1552	STU	C27-O6-C22	-3.36	108.64	114.44
6	F	1328	AMP	N3-C2-N1	-3.29	123.54	128.68
6	F	1326	AMP	N3-C2-N1	-3.25	123.60	128.68
6	E	1326	AMP	N3-C2-N1	-3.20	123.68	128.68
6	F	1327	AMP	N3-C2-N1	-3.19	123.69	128.68
6	E	1328	AMP	N3-C2-N1	-3.18	123.71	128.68
6	E	1327	AMP	N3-C2-N1	-3.10	123.83	128.68
5	A	1553	992	C11-C10-C7	-3.03	119.77	121.92
5	C	1553	992	C11-C10-C7	-2.88	119.88	121.92
5	A	1553	992	C23-O25-C26	-2.84	111.47	118.78
6	E	1328	AMP	C4-C5-N7	-2.66	106.63	109.40
6	E	1326	AMP	C4-C5-N7	-2.62	106.66	109.40
4	C	1552	STU	C13-C12-C17	2.62	122.70	119.39
6	F	1328	AMP	C4-C5-N7	-2.61	106.68	109.40
5	C	1553	992	C23-O25-C26	-2.60	112.10	118.78
6	F	1326	AMP	C4-C5-N7	-2.60	106.69	109.40
6	F	1327	AMP	C4-C5-N7	-2.55	106.74	109.40
6	E	1327	AMP	C4-C5-N7	-2.40	106.89	109.40
4	A	1552	STU	C13-C12-C17	2.40	122.43	119.39
4	C	1552	STU	C3-C4-C5	-2.33	116.95	120.86
4	A	1552	STU	C3-C4-C5	-2.32	116.97	120.86
4	C	1552	STU	C14-C13-C12	-2.05	117.41	120.86

There are no chirality outliers.

All (20) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	E	1327	AMP	C5'-O5'-P-O1P
6	E	1327	AMP	C5'-O5'-P-O2P
6	E	1327	AMP	C5'-O5'-P-O3P
6	E	1328	AMP	C5'-O5'-P-O2P

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Mol	Chain	Res	Type	Atoms
6	E	1328	AMP	C5'-O5'-P-O3P
6	E	1328	AMP	O4'-C4'-C5'-O5'
6	E	1328	AMP	C3'-C4'-C5'-O5'
6	E	1326	AMP	C5'-O5'-P-O1P
5	A	1553	992	O20-C18-C30-C31
5	C	1553	992	O20-C18-C30-C31
5	A	1553	992	O19-C18-C30-C31
5	C	1553	992	O19-C18-C30-C31
4	A	1552	STU	C24-C23-N4-C28
4	C	1552	STU	C24-C23-N4-C28
5	C	1553	992	O20-C18-C30-C29
5	A	1553	992	O20-C18-C30-C29
6	F	1327	AMP	C5'-O5'-P-O1P
5	A	1553	992	O19-C18-C30-C29
5	C	1553	992	O19-C18-C30-C29
6	E	1326	AMP	C5'-O5'-P-O2P

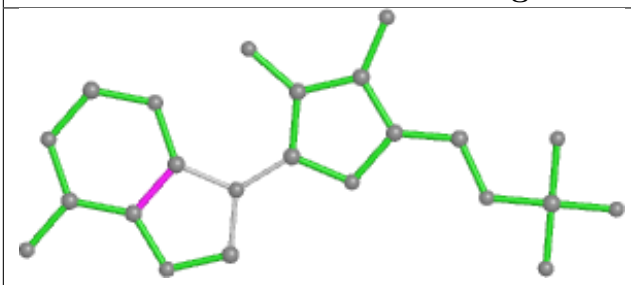
There are no ring outliers.

6 monomers are involved in 9 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	E	1326	AMP	1	0
6	E	1327	AMP	1	0
5	C	1553	992	2	0
4	C	1552	STU	1	0
5	A	1553	992	2	0
4	A	1552	STU	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less 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 AMP F 1327



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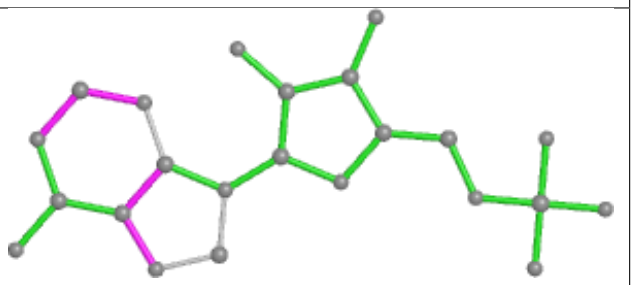
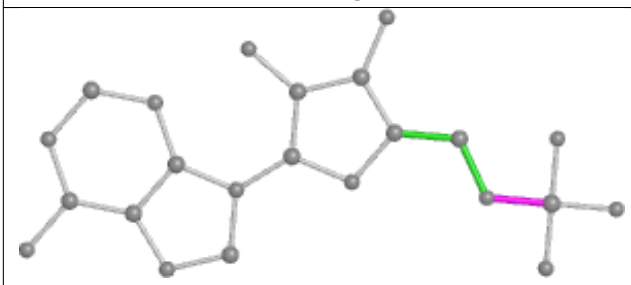
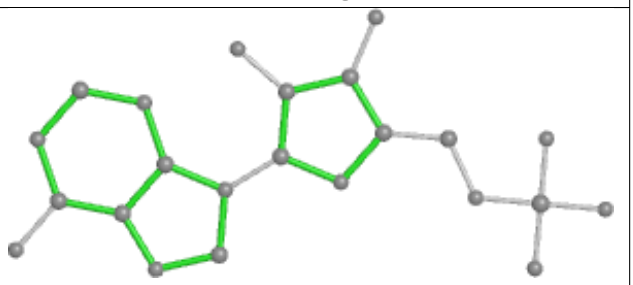


Bond angles

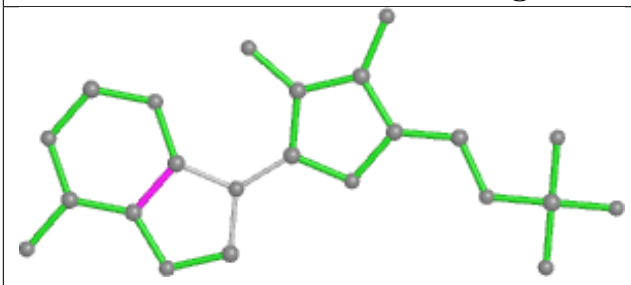


Torsions

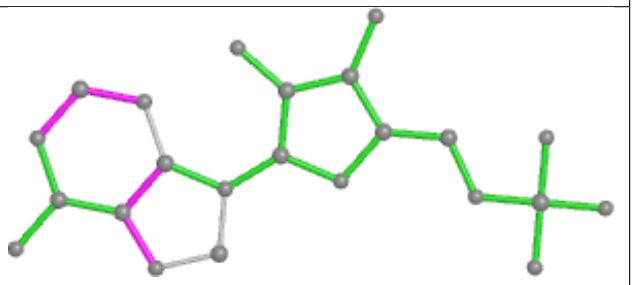


Rings

Ligand AMP E 1326



Bond lengths



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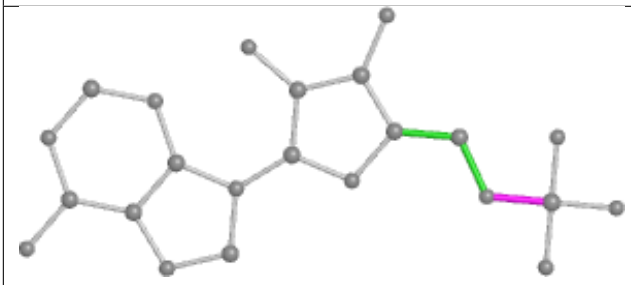

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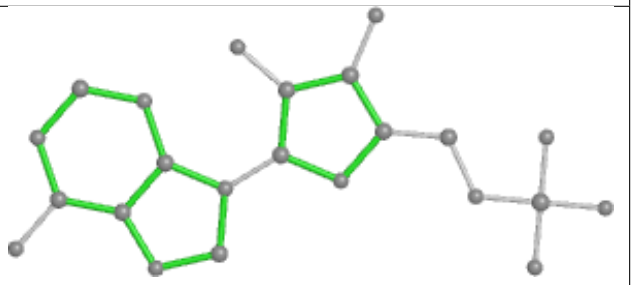
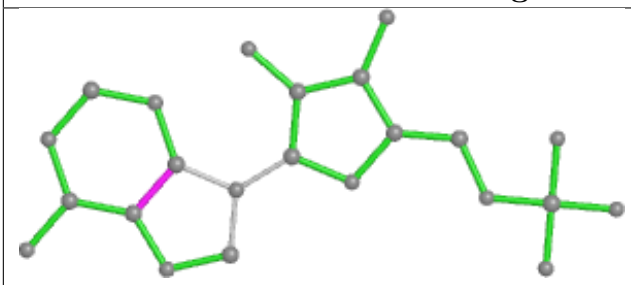


Rings

Ligand AMP E 1328



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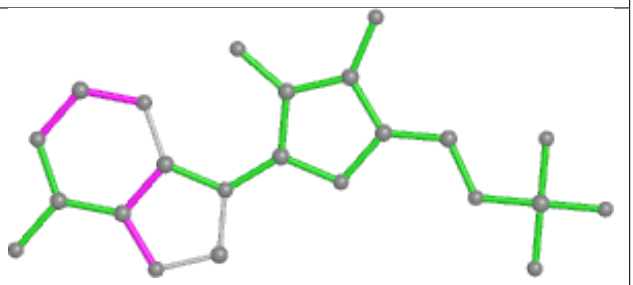

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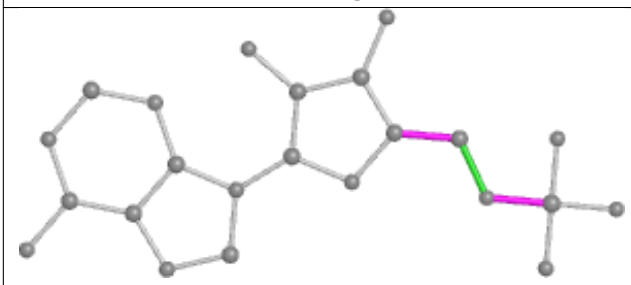

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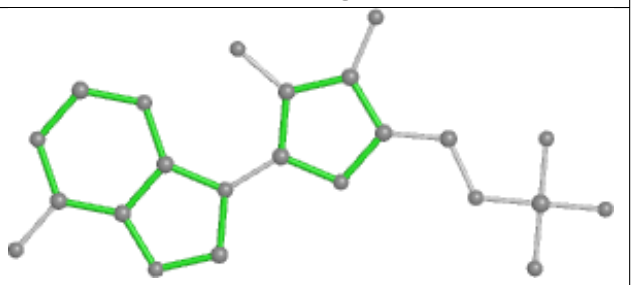
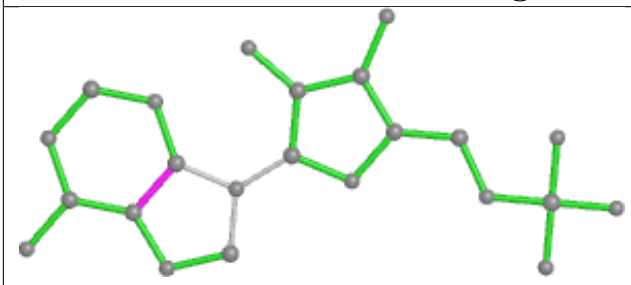


Rings

Ligand AMP F 1328



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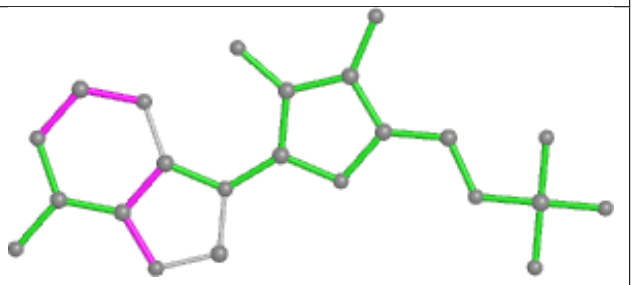

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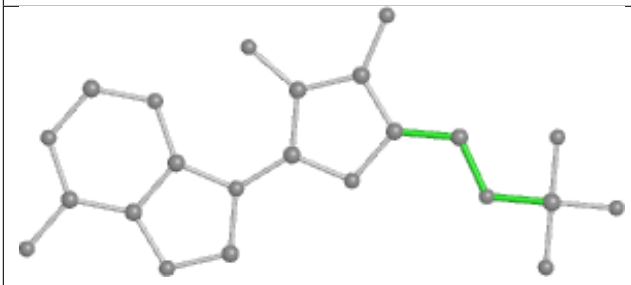

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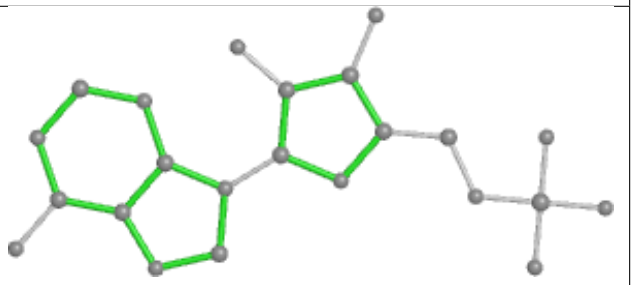
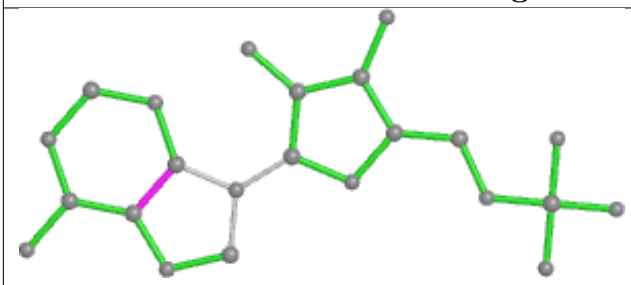


Rings

Ligand AMP E 1327



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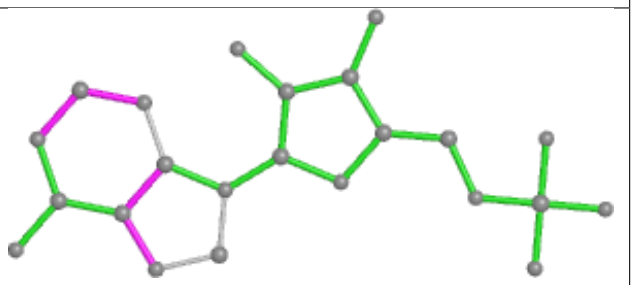

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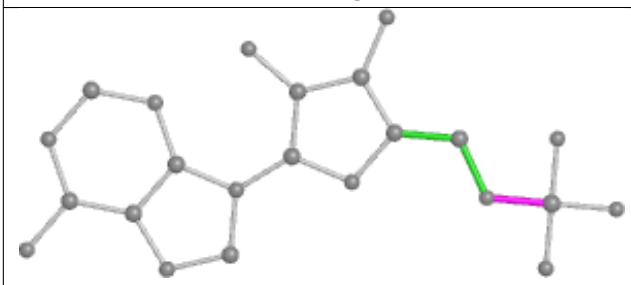

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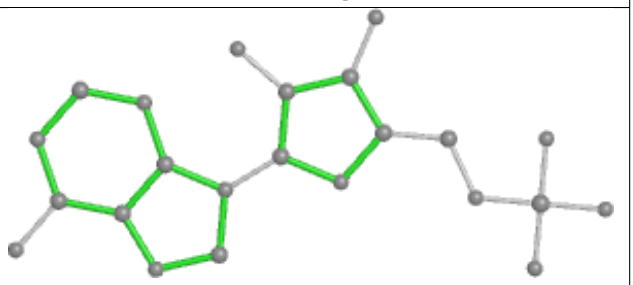
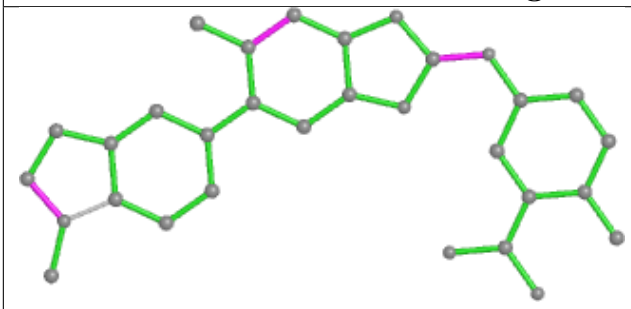


Rings

Ligand 992 C 1553



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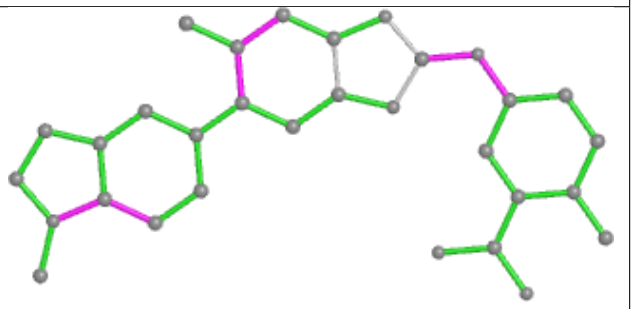

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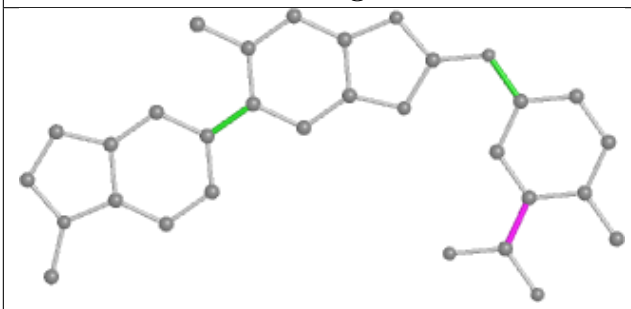

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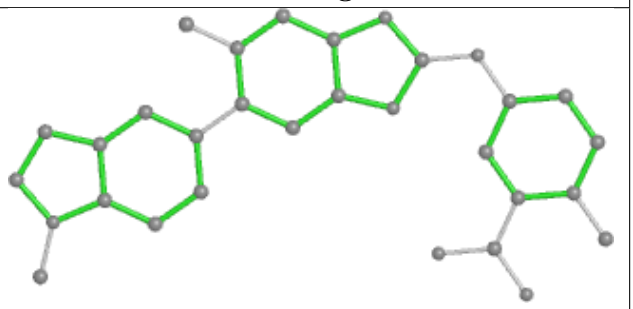
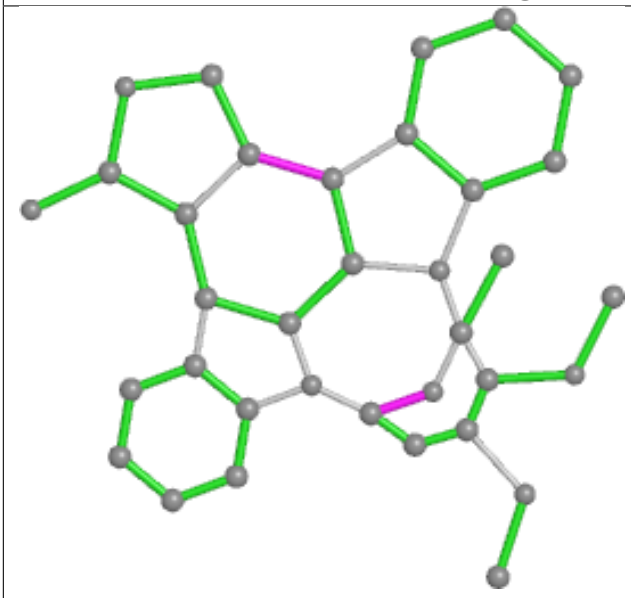


Rings

Ligand STU C 1552



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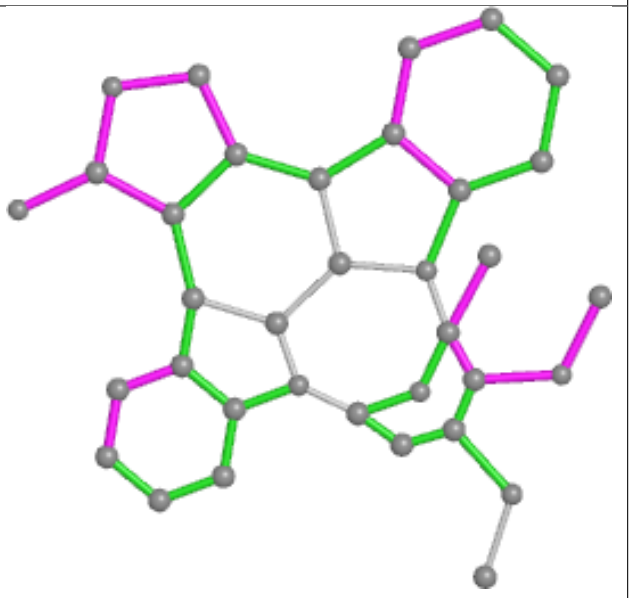

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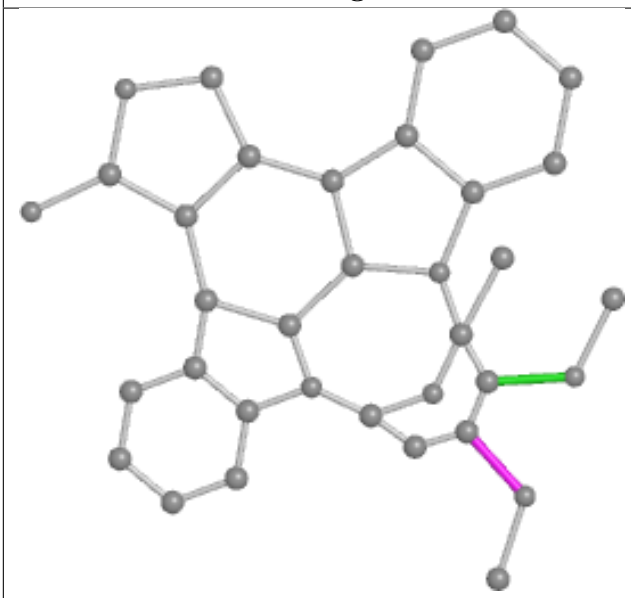

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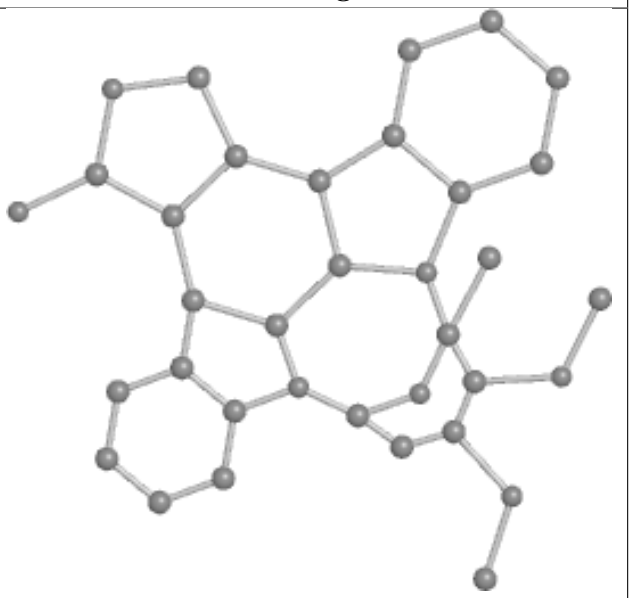
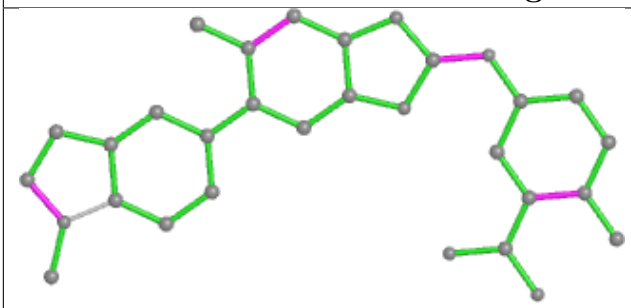


Rings

Ligand 992 A 1553



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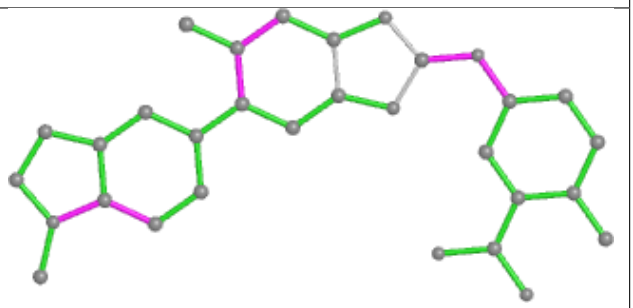

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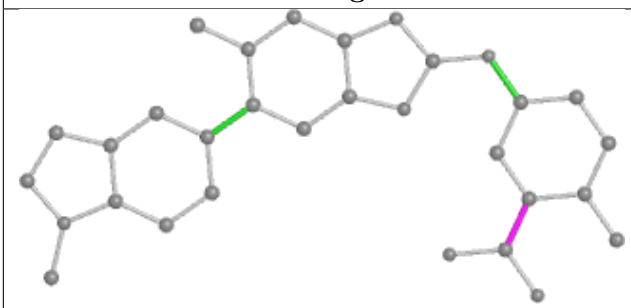

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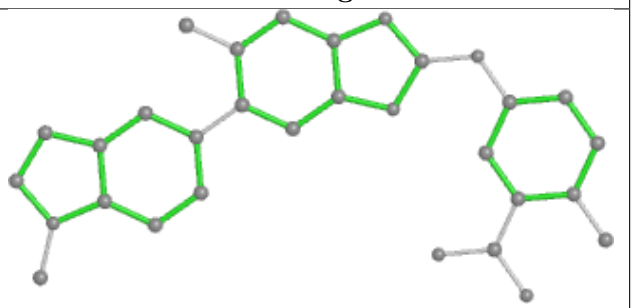
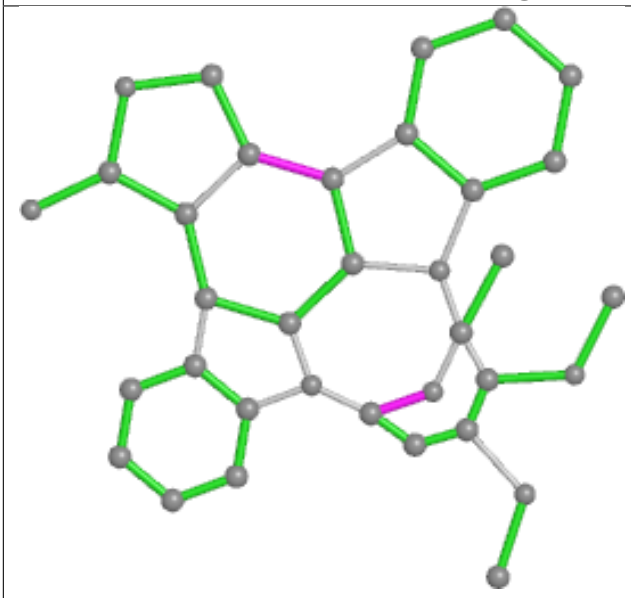


Rings

Ligand STU A 1552



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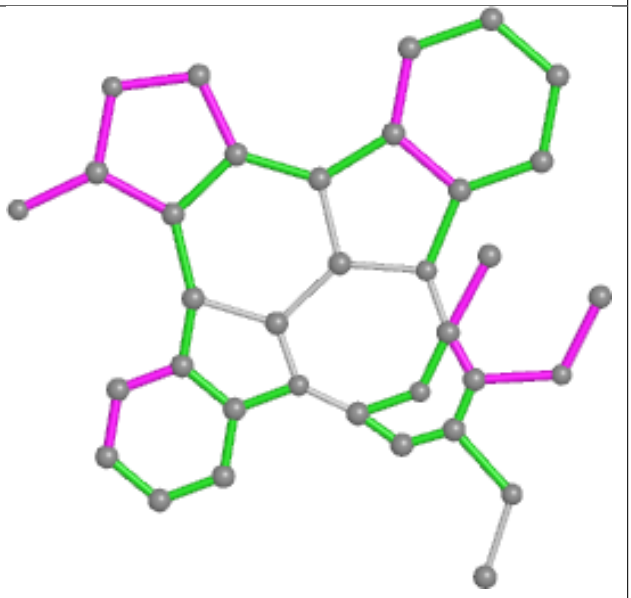

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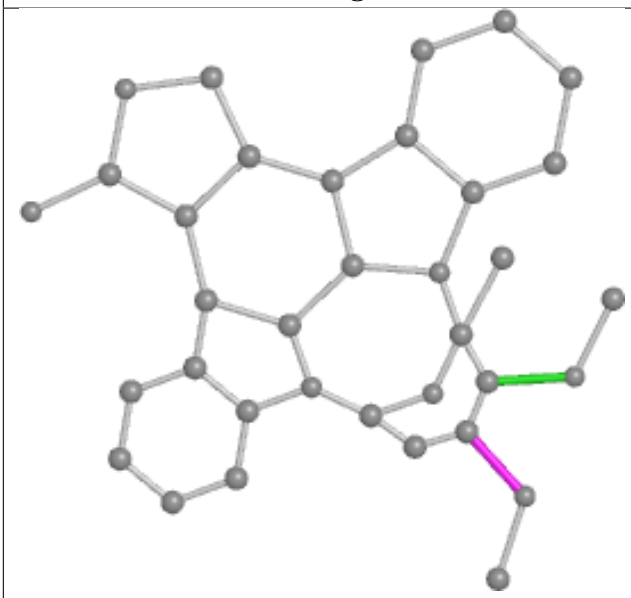

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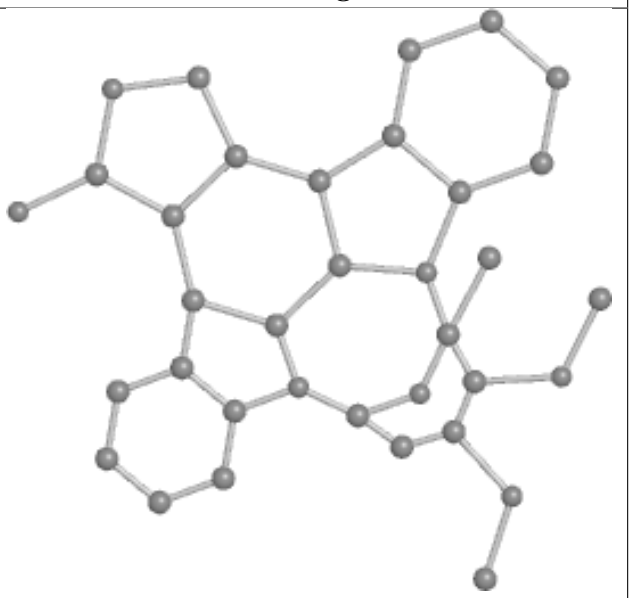
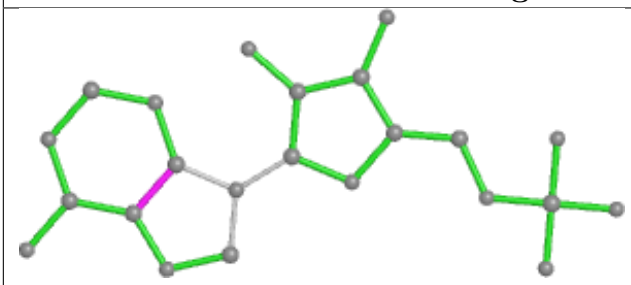


Rings

Ligand AMP F 1326



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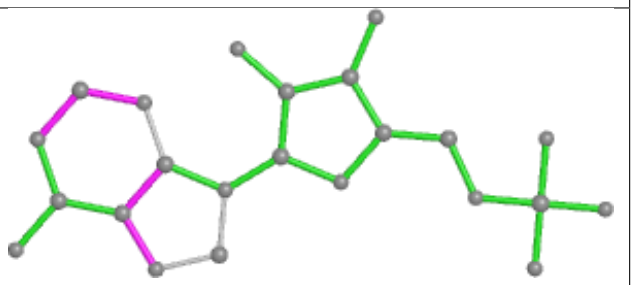

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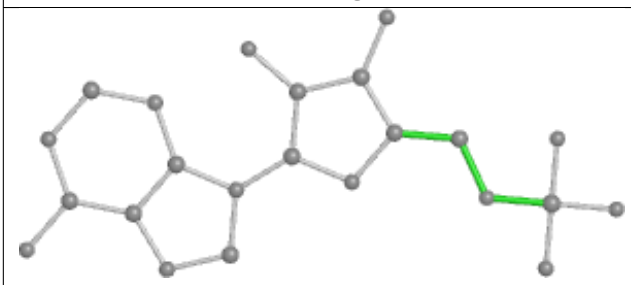

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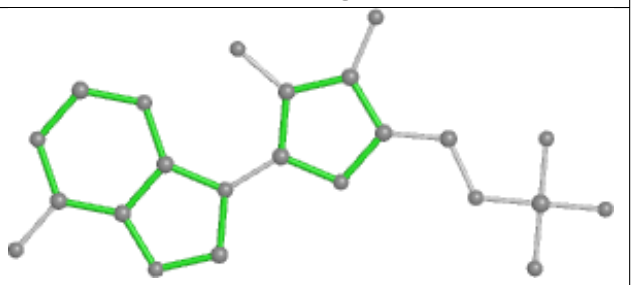

Rings

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	425/571 (74%)	-0.13	7 (1%)	72	43	39, 77, 122, 161	1 (0%)
1	C	403/571 (70%)	-0.01	10 (2%)	57	28	44, 75, 134, 171	2 (0%)
2	B	167/286 (58%)	-0.18	4 (2%)	59	30	50, 71, 122, 146	0
2	D	166/286 (58%)	0.10	9 (5%)	25	9	41, 91, 149, 173	0
3	E	294/331 (88%)	-0.26	7 (2%)	59	30	43, 66, 117, 161	2 (0%)
3	F	288/331 (87%)	-0.26	5 (1%)	70	41	39, 64, 117, 160	3 (1%)
All	All	1743/2376 (73%)	-0.13	42 (2%)	59	30	39, 72, 130, 173	8 (0%)

All (42) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	D	148	THR	5.6
3	E	236	ARG	4.5
2	D	119	PRO	4.4
1	C	396	ALA	4.0
1	C	413	TYR	3.8
3	E	233	GLU	3.7
2	D	147	GLY	3.6
1	C	279	GLU	3.6
1	A	216	ASP	3.6
1	A	463	ARG	3.4
2	D	146	LEU	3.1
3	F	306	ASN	3.1
1	C	429	GLU	3.0
1	C	280	ASP	3.0
2	D	143	THR	2.9
2	B	172	LYS	2.9
3	E	305	GLU	2.8
1	A	56	ASP	2.8
3	F	234	LYS	2.8

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Mol	Chain	Res	Type	RSRZ
3	E	306	ASN	2.8
2	D	149	VAL	2.8
1	A	54	SER	2.7
3	E	271	HIS	2.7
2	B	143	THR	2.6
2	D	164	ASP	2.6
1	A	321	ALA	2.5
1	C	365	PRO	2.5
1	C	424	LYS	2.5
1	A	462	ASN	2.5
2	D	194(A)	CYS	2.4
2	B	145	GLN	2.4
3	E	272	TYR	2.4
3	E	270	SER	2.3
1	C	329	ASP	2.3
2	D	96	SER	2.3
1	C	56	ASP	2.2
3	F	183	PHE	2.2
1	C	328	ILE	2.2
3	F	233	GLU	2.2
3	F	324	LEU	2.1
1	A	280	ASP	2.1
2	B	173	CYS	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
2	SEP	D	108	10/11	0.93	0.19	80,88,111,113	0
2	SEP	B	108	10/11	0.94	0.18	73,84,88,92	0
1	TPO	C	172	11/12	0.97	0.12	55,62,67,68	0
1	TPO	A	172	11/12	0.97	0.10	68,70,72,73	0

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

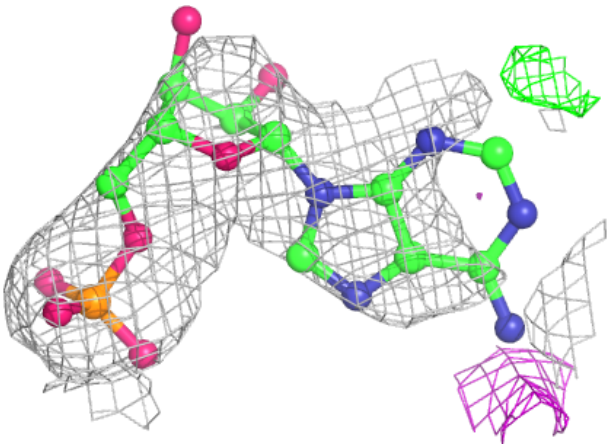
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

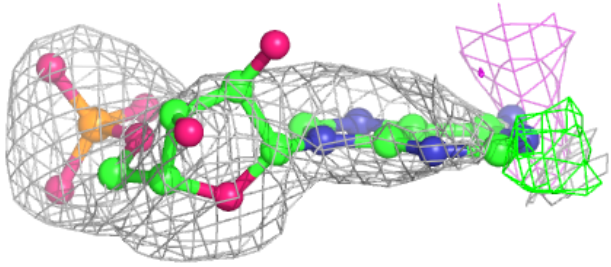
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
6	AMP	E	1326	23/23	0.82	0.29	127,147,161,165	0
5	992	C	1553	31/31	0.91	0.21	73,75,80,82	0
5	992	A	1553	31/31	0.91	0.24	61,67,84,88	0
6	AMP	F	1326	23/23	0.91	0.20	120,134,147,151	0
4	STU	A	1552	35/35	0.96	0.19	37,44,48,87	0
6	AMP	E	1327	23/23	0.96	0.18	49,57,71,79	0
4	STU	C	1552	35/35	0.96	0.18	36,43,51,52	0
6	AMP	F	1328	23/23	0.96	0.16	57,62,67,69	0
6	AMP	F	1327	23/23	0.97	0.14	74,84,90,101	0
6	AMP	E	1328	23/23	0.97	0.14	53,68,75,77	0

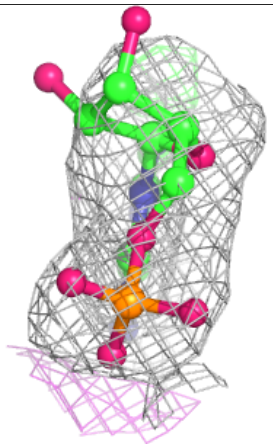
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around AMP E 1326:

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

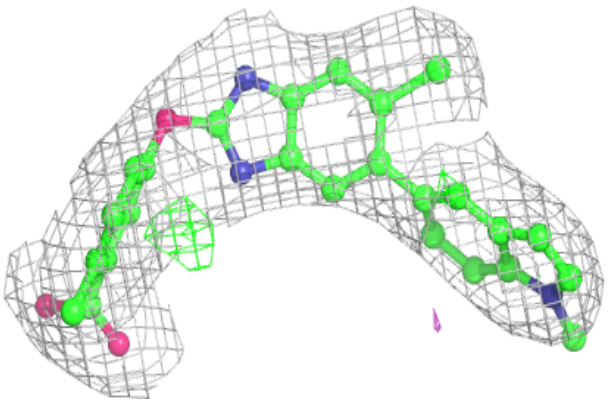


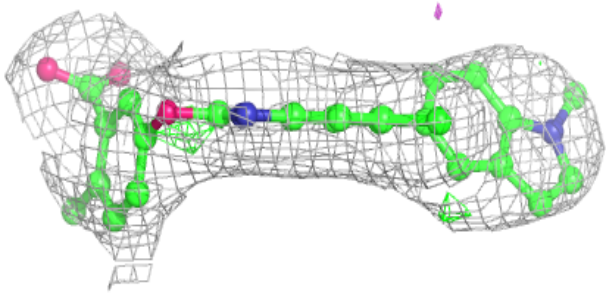


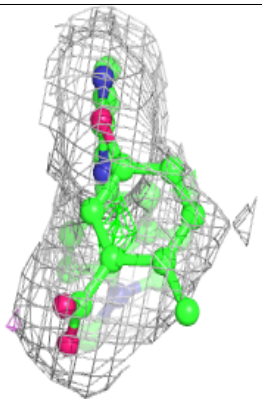


Electron density around 992 C 1553:

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







Electron density around 992 A 1553:

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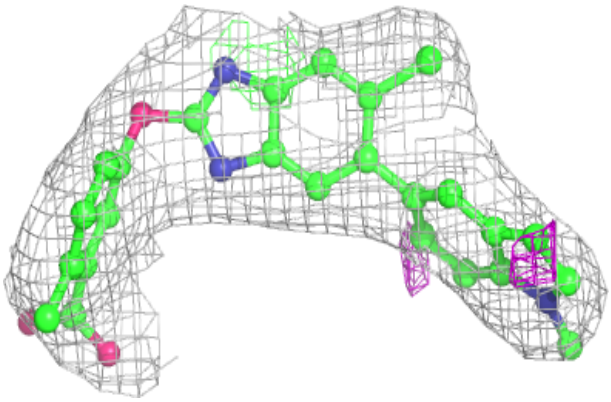
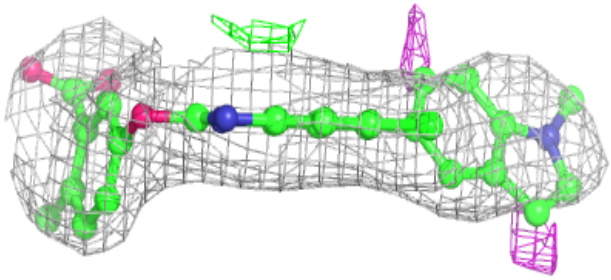
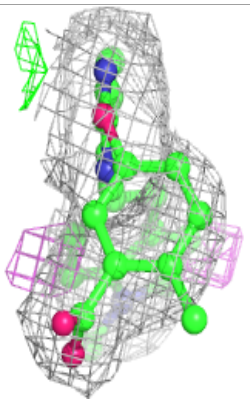
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)







Electron density around AMP F 1326:

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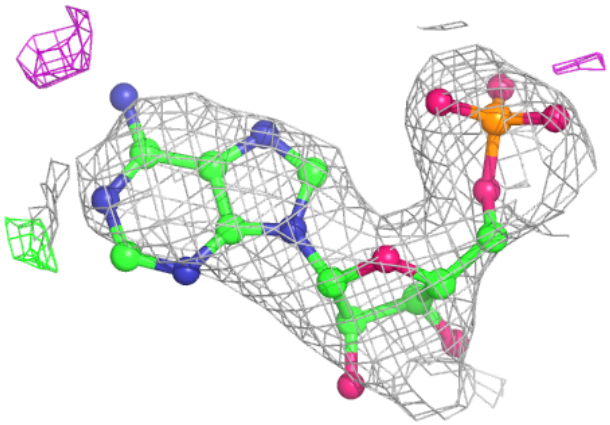

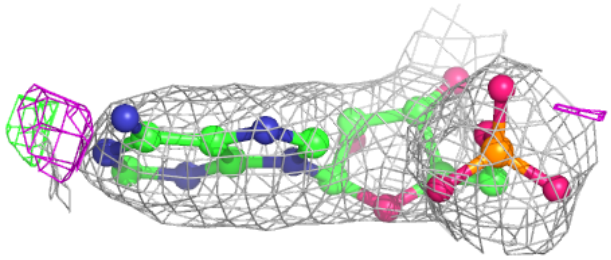

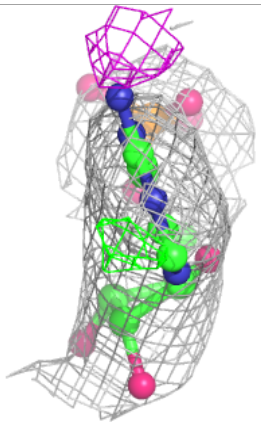

Electron density around STU A 1552:

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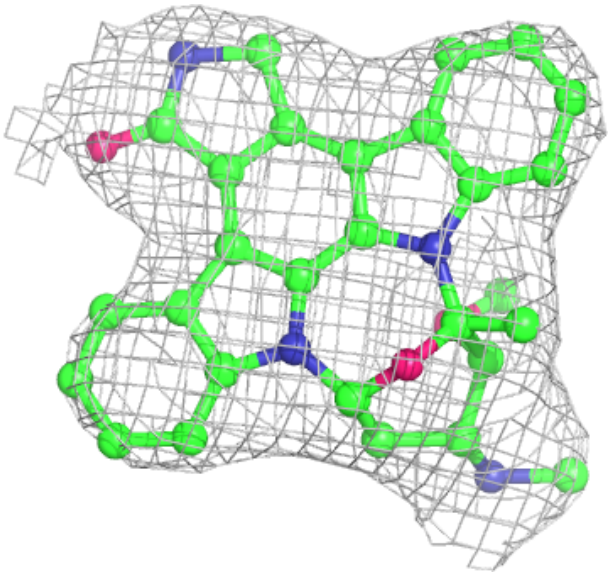

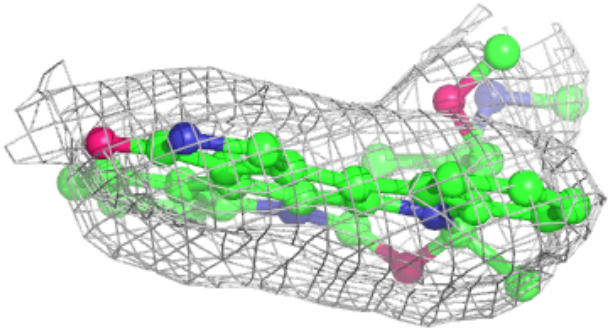

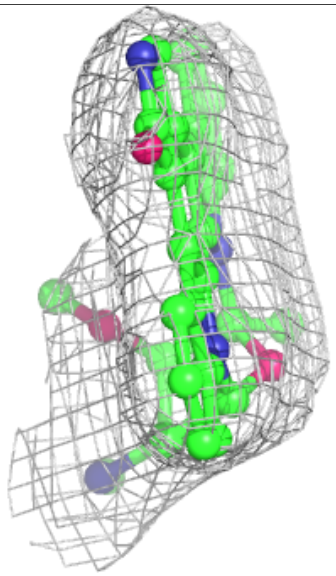

Electron density around AMP E 1327:

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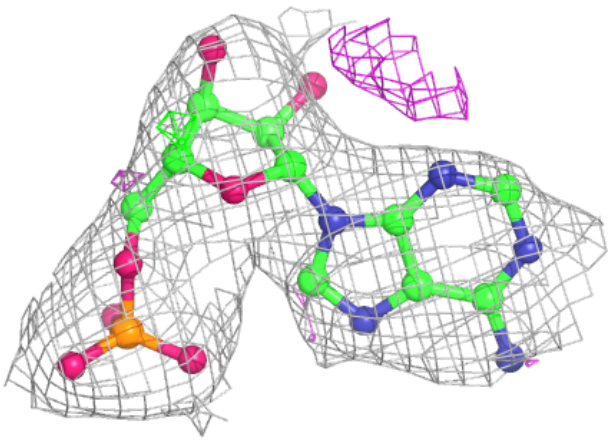
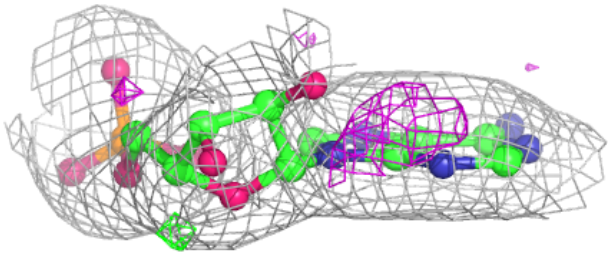
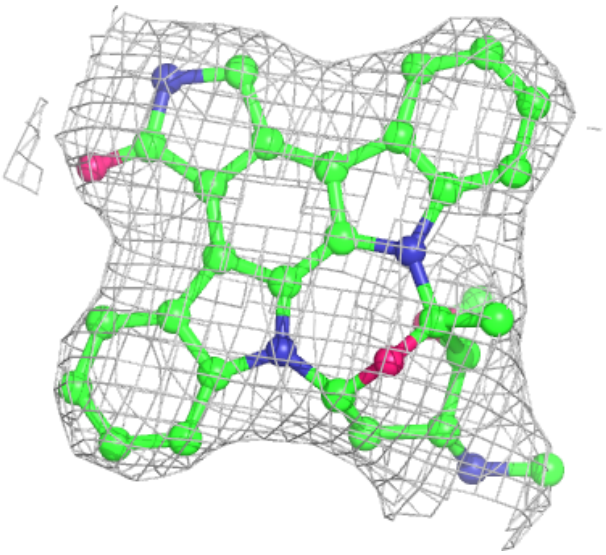
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

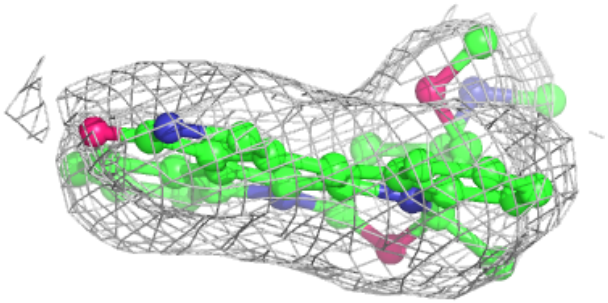


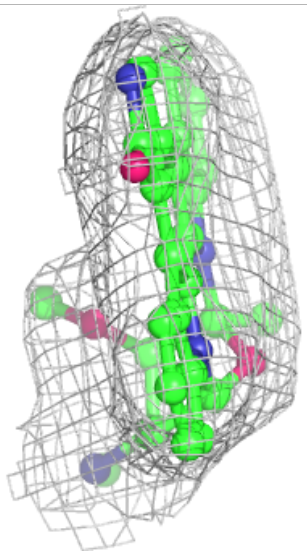


Electron density around STU C 1552:

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







Electron density around AMP F 1328:

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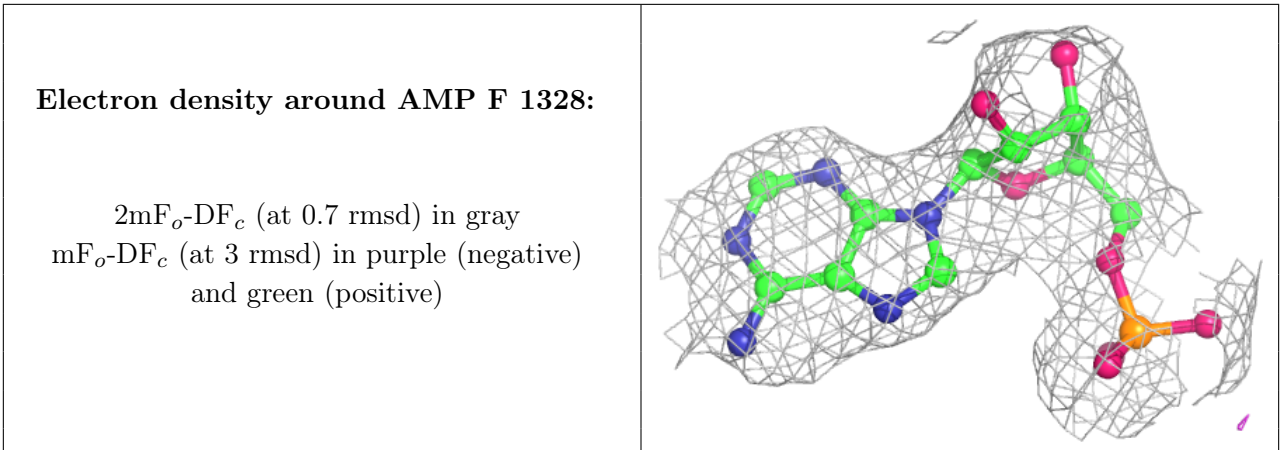
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



Electron density around AMP F 1327:

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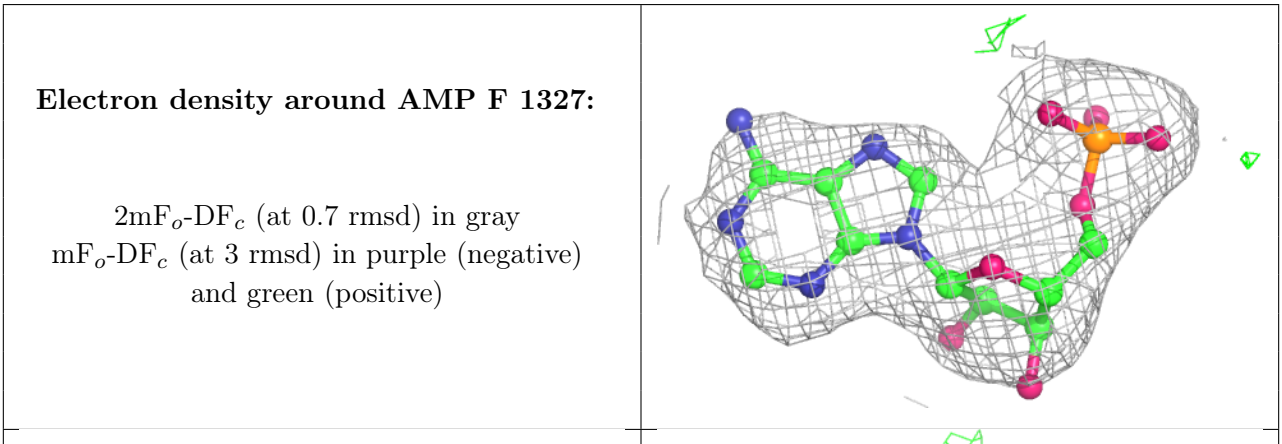
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



Electron density around AMP E 1328:

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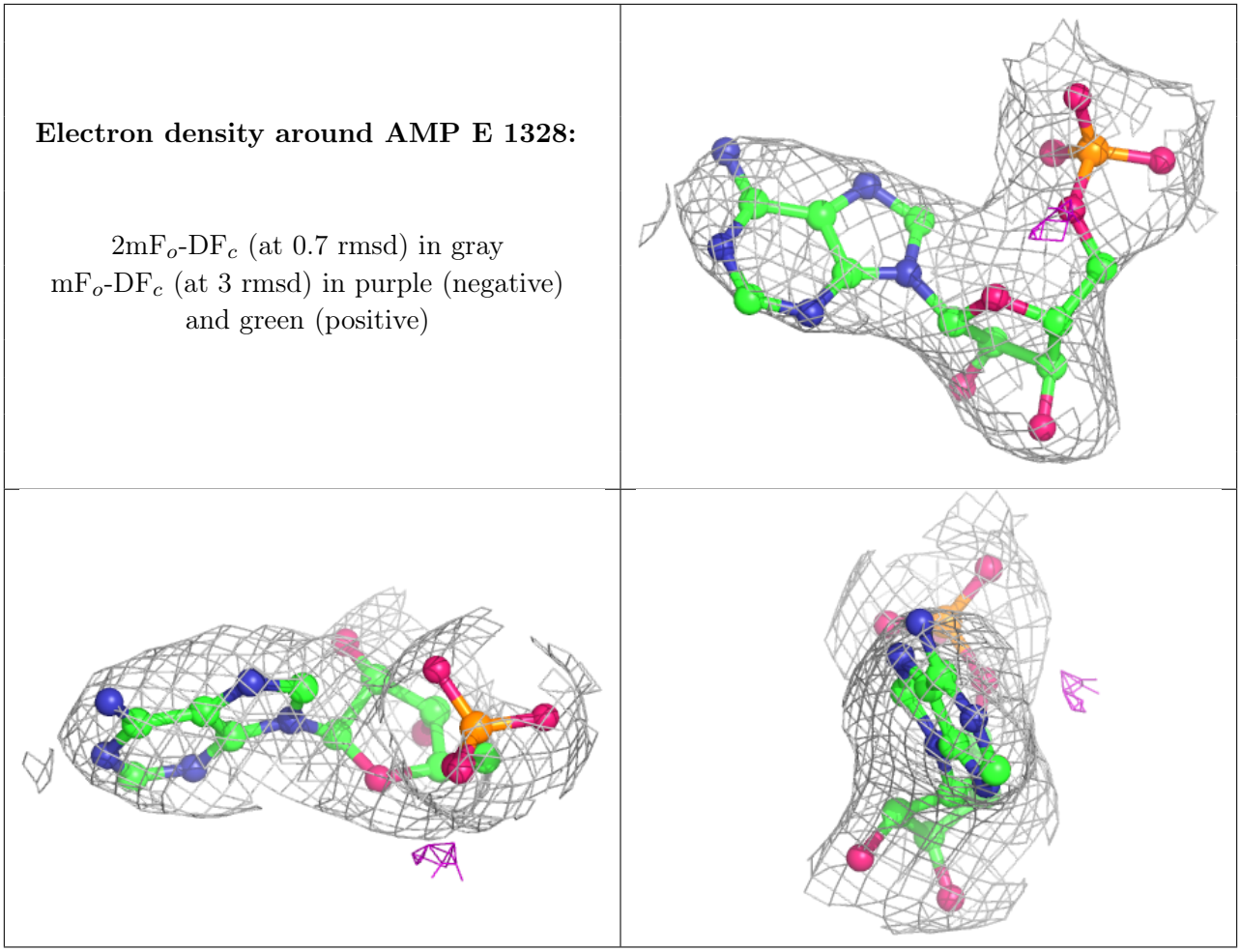
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



6.5 Other polymers (i)

There are no such residues in this entry.