



wwPDB X-ray Structure Validation Summary Report ⓘ

Jun 13, 2024 – 01:33 AM EDT

PDB ID : 3DLS
Title : Crystal structure of human PAS kinase bound to ADP
Authors : Antonysamy, S.; Bonanno, J.B.; Romero, R.; Russell, M.; Iizuka, M.; Gheyi, T.; Wasserman, S.R.; Rutter, J.; Sauder, J.M.; Burley, S.K.; New York SGX Research Center for Structural Genomics (NYSGXRC)
Deposited on : 2008-06-29
Resolution : 2.30 Å(reported)

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We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4.02b-467
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 1.20.1
EDS : 2.36.2
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) : 2.36.2

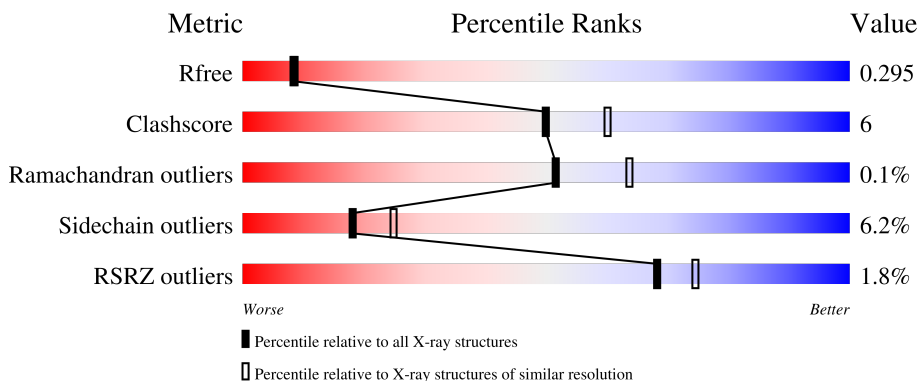
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.30 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	5042 (2.30-2.30)
Clashscore	141614	5643 (2.30-2.30)
Ramachandran outliers	138981	5575 (2.30-2.30)
Sidechain outliers	138945	5575 (2.30-2.30)
RSRZ outliers	127900	4938 (2.30-2.30)

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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	335	 73% 11% 15% 2%
1	B	335	 68% 14% 16% 2%
1	C	335	 69% 13% 16% 2%
1	D	335	 67% 16% 15% 2%

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Mol	Chain	Length	Quality of chain
1	E	335	 <p>% 68% 15% 16%</p>
1	F	335	 <p>3% 71% 12% 16%</p>

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 13724 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 PAS domain-containing serine/threonine-protein kinase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	285	2236	1465	350	411	10	0	0	0
1	B	280	2200	1435	353	403	9	0	0	0
1	C	281	2217	1447	355	407	8	0	0	0
1	D	284	2220	1453	351	406	10	0	0	0
1	E	282	2216	1449	353	405	9	0	0	0
1	F	281	2174	1420	345	400	9	0	0	0

There are 66 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	974	MET	-	expression tag	UNP Q96RG2
A	975	ALA	-	expression tag	UNP Q96RG2
A	976	LEU	-	expression tag	UNP Q96RG2
A	1301	GLU	-	expression tag	UNP Q96RG2
A	1302	GLY	-	expression tag	UNP Q96RG2
A	1303	HIS	-	expression tag	UNP Q96RG2
A	1304	HIS	-	expression tag	UNP Q96RG2
A	1305	HIS	-	expression tag	UNP Q96RG2
A	1306	HIS	-	expression tag	UNP Q96RG2
A	1307	HIS	-	expression tag	UNP Q96RG2
A	1308	HIS	-	expression tag	UNP Q96RG2
B	974	MET	-	expression tag	UNP Q96RG2
B	975	ALA	-	expression tag	UNP Q96RG2
B	976	LEU	-	expression tag	UNP Q96RG2
B	1301	GLU	-	expression tag	UNP Q96RG2
B	1302	GLY	-	expression tag	UNP Q96RG2
B	1303	HIS	-	expression tag	UNP Q96RG2

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Chain	Residue	Modelled	Actual	Comment	Reference
B	1304	HIS	-	expression tag	UNP Q96RG2
B	1305	HIS	-	expression tag	UNP Q96RG2
B	1306	HIS	-	expression tag	UNP Q96RG2
B	1307	HIS	-	expression tag	UNP Q96RG2
B	1308	HIS	-	expression tag	UNP Q96RG2
C	974	MET	-	expression tag	UNP Q96RG2
C	975	ALA	-	expression tag	UNP Q96RG2
C	976	LEU	-	expression tag	UNP Q96RG2
C	1301	GLU	-	expression tag	UNP Q96RG2
C	1302	GLY	-	expression tag	UNP Q96RG2
C	1303	HIS	-	expression tag	UNP Q96RG2
C	1304	HIS	-	expression tag	UNP Q96RG2
C	1305	HIS	-	expression tag	UNP Q96RG2
C	1306	HIS	-	expression tag	UNP Q96RG2
C	1307	HIS	-	expression tag	UNP Q96RG2
C	1308	HIS	-	expression tag	UNP Q96RG2
D	974	MET	-	expression tag	UNP Q96RG2
D	975	ALA	-	expression tag	UNP Q96RG2
D	976	LEU	-	expression tag	UNP Q96RG2
D	1301	GLU	-	expression tag	UNP Q96RG2
D	1302	GLY	-	expression tag	UNP Q96RG2
D	1303	HIS	-	expression tag	UNP Q96RG2
D	1304	HIS	-	expression tag	UNP Q96RG2
D	1305	HIS	-	expression tag	UNP Q96RG2
D	1306	HIS	-	expression tag	UNP Q96RG2
D	1307	HIS	-	expression tag	UNP Q96RG2
D	1308	HIS	-	expression tag	UNP Q96RG2
E	974	MET	-	expression tag	UNP Q96RG2
E	975	ALA	-	expression tag	UNP Q96RG2
E	976	LEU	-	expression tag	UNP Q96RG2
E	1301	GLU	-	expression tag	UNP Q96RG2
E	1302	GLY	-	expression tag	UNP Q96RG2
E	1303	HIS	-	expression tag	UNP Q96RG2
E	1304	HIS	-	expression tag	UNP Q96RG2
E	1305	HIS	-	expression tag	UNP Q96RG2
E	1306	HIS	-	expression tag	UNP Q96RG2
E	1307	HIS	-	expression tag	UNP Q96RG2
E	1308	HIS	-	expression tag	UNP Q96RG2
F	974	MET	-	expression tag	UNP Q96RG2
F	975	ALA	-	expression tag	UNP Q96RG2
F	976	LEU	-	expression tag	UNP Q96RG2
F	1301	GLU	-	expression tag	UNP Q96RG2

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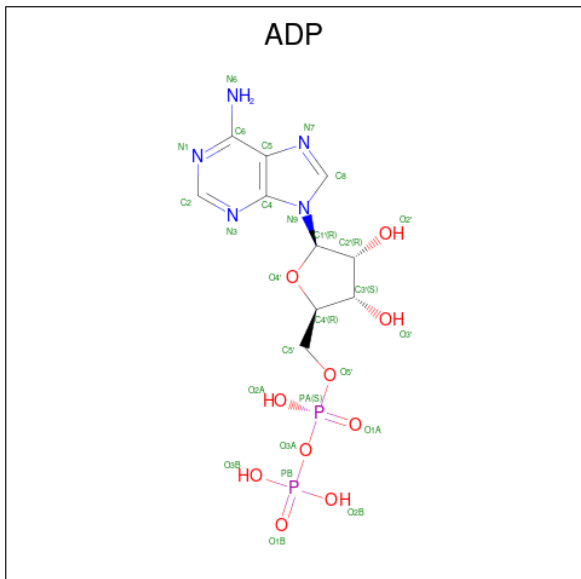
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Chain	Residue	Modelled	Actual	Comment	Reference
F	1302	GLY	-	expression tag	UNP Q96RG2
F	1303	HIS	-	expression tag	UNP Q96RG2
F	1304	HIS	-	expression tag	UNP Q96RG2
F	1305	HIS	-	expression tag	UNP Q96RG2
F	1306	HIS	-	expression tag	UNP Q96RG2
F	1307	HIS	-	expression tag	UNP Q96RG2
F	1308	HIS	-	expression tag	UNP Q96RG2

- Molecule 2 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	4	Total Mg 4 4	0	0
2	B	4	Total Mg 4 4	0	0
2	C	4	Total Mg 4 4	0	0
2	D	3	Total Mg 3 3	0	0
2	E	2	Total Mg 2 2	0	0
2	F	2	Total Mg 2 2	0	0

- Molecule 3 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: $C_{10}H_{15}N_5O_{10}P_2$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	0	0
			27	10	5	10	2		
3	B	1	Total	C	N	O	P	0	0
			27	10	5	10	2		
3	C	1	Total	C	N	O	P	0	0
			27	10	5	10	2		
3	D	1	Total	C	N	O	P	0	0
			27	10	5	10	2		
3	E	1	Total	C	N	O	P	0	0
			27	10	5	10	2		
3	F	1	Total	C	N	O	P	0	0
			27	10	5	10	2		

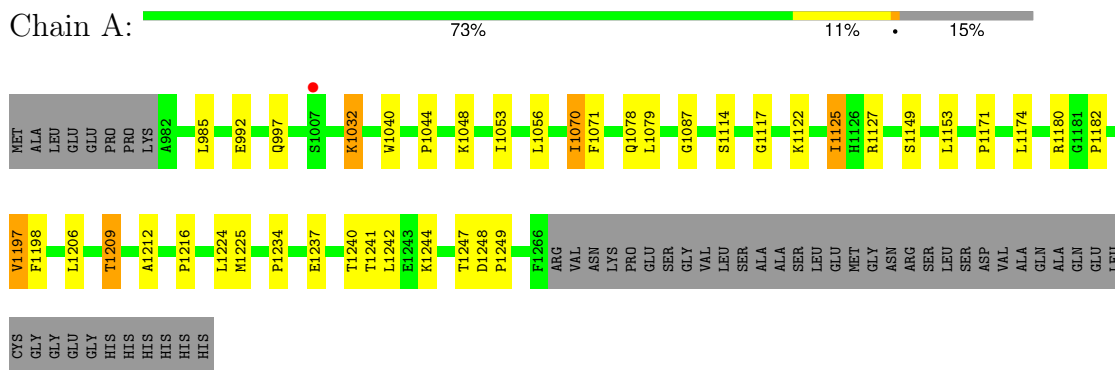
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	55	Total	O	0	0
			55	55		
4	B	57	Total	O	0	0
			57	57		
4	C	47	Total	O	0	0
			47	47		
4	D	48	Total	O	0	0
			48	48		
4	E	39	Total	O	0	0
			39	39		
4	F	34	Total	O	0	0
			34	34		

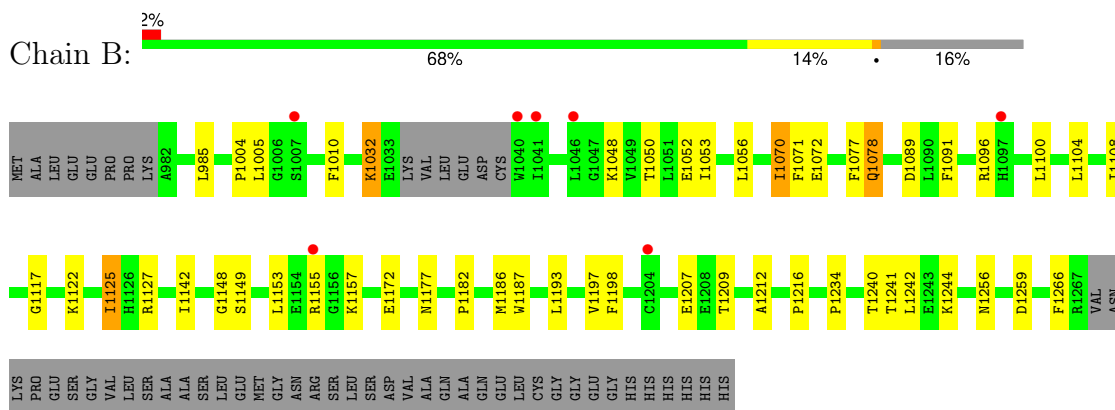
3 Residue-property plots [i](#)

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.

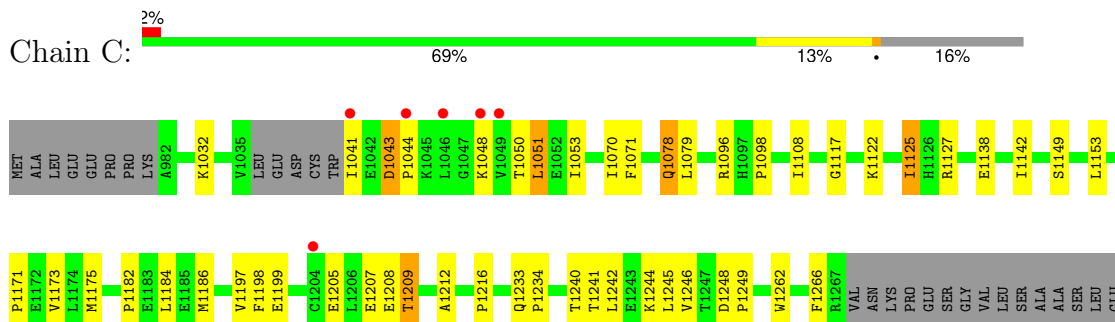
- Molecule 1: PAS domain-containing serine/threonine-protein kinase



- Molecule 1: PAS domain-containing serine/threonine-protein kinase



- Molecule 1: PAS domain-containing serine/threonine-protein kinase



MET
GLY
ASN
GLU
SER
LEU
SER
SER
ASP
VAL
ALA
GLN
ALA
GLN
GLU
LEU
CYS
GLY
GLY
GLY
HIS
HIS
HIS
HIS
HIS

• Molecule 1: PAS domain-containing serine/threonine-protein kinase

Chain D: 

MET
ALA
LEU
GLU
PRO
PRO
LYS
A982
L985
F1010
M1022
I1030
K1031
K1032
E1033
K1034
V1035
G1181
L1036
GLU
D1038
C1039
M1040
I1041
L1046
L1047
K1048
V1049
T1050
L1051
E1052
I1053
I1065
I1070
F1071
E1072
H1073
Q1074
F1077
Q1078
L1079
I1094
D1095
R1096
H1097
P1098
R1099
L1100
I1108

G1117
K1122
H1125
H1126
R1127
I1142
G1148
S1149
L1153
K1157
I1166
P1171
R1180
G1181
P1182
M1186
L1196
V1197
F1198
E1199
F1203
L1206
T1209
V1210
E1211
L1212
L1219
L1231
T1240
L1241
L1242
E1243
K1244
L1245
F1266
VAL
ASN
LYS
PRO
SER

GLY
VAL
LEU
SER
ALA
ALA
SER
LEU
MET
ASN
ARG
SER
LEU
SER
ASP
VAL
GLN
ALA
GLN
GLU
GLU
LEU
CYS
GLY
GLY
GLU
GLY
GLY
HIS
HIS
HIS
HIS
HIS

• Molecule 1: PAS domain-containing serine/threonine-protein kinase

Chain E: 

MET
ALA
LEU
GLU
PRO
LYS
A982
L985
G1006
S1007
G1008
A1009
D1018
M1022
I1030
K1031
K1032
Y1035
LEU
GLU
ASP
CYS
M1040
I1041
E1042
K1048
I1053
H1054
I1055
I1070
F1071
F1077
Q1078
L1079
I1094
D1095
R1096
L1100
I1108
L1112
V1116
G1117

K1122
D1123
I1124
H1125
R1127
I1142
K1143
L1144
S1149
L1153
E1154
R1155
G1156
K1157
I1166
L1174
I1030
K1031
K1032
M1186
L1196
V1197
F1198
E1199
E1200
T1209
I1214
H1215
P1216
P1217
L1218
L1219
E1237
T1241
L1242
E1243
K1244
L1245
V1246
T1247
D1248
P1249
F1266
F1267
VAL
ASN
LYS
PRO

GLU
SER
GLY
VAL
SER
LEU
ALA
ALA
SER
LEU
MET
GLY
ASN
ARG
SER
LEU
SER
ASP
VAL
ALA
GLN
ALA
GLN
GLU
LEU
CYS
GLY
GLY
GLU
GLY
GLY
HIS
HIS
HIS
HIS
HIS

• Molecule 1: PAS domain-containing serine/threonine-protein kinase

Chain F: 

MET
ALA
LEU
GLU
PRO
LYS
A982
L985
A980
G991
Y995
A1009
Y1017
I1030
K1031
K1032
Y1035
LEU
GLU
ASP
CYS
I1041
E1042
K1048
L1051
I1055
D1069
I1070
F1071
E1072
F1077
Q1078
L1079
I1094
L1100
L1121
D1123
I1124
I1125
H1126
R1127

S1149
L1153
I1166
P1171
M1175
P1182
M1186
L1196
F1203
C1204
E1205
L1206
E1207
E1208
T1209
V1210
E1211
A1212
L1219
V1235
T1241
K1244
L1245
L1257
Y1260
F1266
ARG
VAL
ASN
PRO
GLU
SER
GLY
VAL
LEU
SER
ALA
ALA
SER
LEU
GLU
MET
GLY

ASN
ARG
SER
LEU
SER
ASP
VAL
ALA
GLN
GLN
GLU
CYS
GLY
GLY
GLU
GLY
HIS
HIS
HIS
HIS
HIS

4 Data and refinement statistics i

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	85.78Å 85.84Å 94.15Å 77.28° 77.50° 60.09°	Depositor
Resolution (Å)	(Not available) – 2.30 31.20 – 2.30	Depositor EDS
% Data completeness (in resolution range)	(Not available) ((Not available)-2.30) 95.9 (31.20-2.30)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.42 (at 2.29Å)	Xtrriage
Refinement program	REFMAC	Depositor
R, R_{free}	0.241 , 0.297 0.240 , 0.295	Depositor DCC
R_{free} test set	4846 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å ²)	40.0	Xtrriage
Anisotropy	0.092	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 23.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.40$, $\langle L^2 \rangle = 0.22$	Xtrriage
Estimated twinning fraction	0.216 for -k,-h,-l	Xtrriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	13724	wwPDB-VP
Average B, all atoms (Å ²)	37.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 9.46% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: ADP, 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	0.47	0/2291	0.61	0/3118
1	B	0.46	0/2252	0.61	2/3062 (0.1%)
1	C	0.46	0/2269	0.58	0/3083
1	D	0.43	0/2274	0.59	0/3094
1	E	0.42	0/2270	0.57	0/3088
1	F	0.42	0/2226	0.55	0/3033
All	All	0.44	0/13582	0.59	2/18478 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	1005	LEU	O-C-N	6.14	133.64	123.20
1	B	1005	LEU	CA-C-N	-5.30	105.60	116.20

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts i

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2236	0	2198	21	0
1	B	2200	0	2168	27	0
1	C	2217	0	2190	29	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	2220	0	2178	31	0
1	E	2216	0	2178	28	0
1	F	2174	0	2109	18	0
2	A	4	0	0	0	0
2	B	4	0	0	0	0
2	C	4	0	0	0	0
2	D	3	0	0	0	0
2	E	2	0	0	0	0
2	F	2	0	0	0	0
3	A	27	0	12	1	0
3	B	27	0	12	0	0
3	C	27	0	12	0	0
3	D	27	0	12	1	0
3	E	27	0	12	2	0
3	F	27	0	12	0	0
4	A	55	0	0	1	0
4	B	57	0	0	0	0
4	C	47	0	0	2	0
4	D	48	0	0	0	0
4	E	39	0	0	2	0
4	F	34	0	0	0	0
All	All	13724	0	13093	153	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 6.

The worst 5 of 153 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:1125:ILE:HG23	1:C:1127:ARG:HG3	1.67	0.74
1:D:1032:LYS:HZ1	1:D:1074:GLN:HA	1.51	0.74
1:A:1240:THR:HG23	1:A:1244:LYS:HD2	1.70	0.73
1:A:1125:ILE:HG23	1:A:1127:ARG:HG3	1.72	0.71
1:E:1094:ILE:HD11	1:E:1196:LEU:HA	1.71	0.71

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	283/335 (84%)	272 (96%)	11 (4%)	0	100	100
1	B	276/335 (82%)	264 (96%)	12 (4%)	0	100	100
1	C	277/335 (83%)	260 (94%)	17 (6%)	0	100	100
1	D	280/335 (84%)	271 (97%)	9 (3%)	0	100	100
1	E	278/335 (83%)	268 (96%)	9 (3%)	1 (0%)	34	42
1	F	277/335 (83%)	260 (94%)	17 (6%)	0	100	100
All	All	1671/2010 (83%)	1595 (96%)	75 (4%)	1 (0%)	51	64

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	1009	ALA

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	236/291 (81%)	218 (92%)	18 (8%)	13	16
1	B	233/291 (80%)	223 (96%)	10 (4%)	29	40
1	C	235/291 (81%)	224 (95%)	11 (5%)	26	37
1	D	234/291 (80%)	218 (93%)	16 (7%)	16	21
1	E	234/291 (80%)	217 (93%)	17 (7%)	14	18
1	F	226/291 (78%)	211 (93%)	15 (7%)	16	22

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	1398/1746 (80%)	1311 (94%)	87 (6%)	18 25

5 of 87 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	1042	GLU
1	E	1245	LEU
1	E	1070	ILE
1	E	1155	ARG
1	F	1048	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 9 such sidechains are listed below:

Mol	Chain	Res	Type
1	E	1078	GLN
1	F	1253	GLN
1	B	1078	GLN
1	C	997	GLN
1	C	1078	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 25 ligands modelled in this entry, 19 are monoatomic - leaving 6 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
3	ADP	B	2	2	24,29,29	1.21	3 (12%)	29,45,45	1.23	2 (6%)
3	ADP	E	5	2	24,29,29	1.21	3 (12%)	29,45,45	1.11	1 (3%)
3	ADP	A	1	2	24,29,29	1.14	2 (8%)	29,45,45	1.20	2 (6%)
3	ADP	C	3	2	24,29,29	1.15	2 (8%)	29,45,45	1.16	1 (3%)
3	ADP	F	6	2	24,29,29	1.18	3 (12%)	29,45,45	1.08	2 (6%)
3	ADP	D	4	2	24,29,29	1.12	3 (12%)	29,45,45	1.05	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
3	ADP	B	2	2	-	1/12/32/32	0/3/3/3
3	ADP	E	5	2	-	0/12/32/32	0/3/3/3
3	ADP	A	1	2	-	1/12/32/32	0/3/3/3
3	ADP	C	3	2	-	4/12/32/32	0/3/3/3
3	ADP	F	6	2	-	0/12/32/32	0/3/3/3
3	ADP	D	4	2	-	0/12/32/32	0/3/3/3

The worst 5 of 16 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	E	5	ADP	PA-O3A	3.65	1.63	1.59
3	C	3	ADP	PA-O3A	3.64	1.63	1.59
3	F	6	ADP	PA-O3A	3.54	1.63	1.59
3	A	1	ADP	PA-O3A	3.41	1.63	1.59
3	B	2	ADP	PA-O3A	3.38	1.63	1.59

The worst 5 of 10 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	3	ADP	N3-C2-N1	-4.24	122.92	128.67
3	A	1	ADP	N3-C2-N1	-4.15	123.03	128.67
3	B	2	ADP	N3-C2-N1	-4.09	123.12	128.67
3	E	5	ADP	N3-C2-N1	-3.88	123.41	128.67

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	4	ADP	N3-C2-N1	-3.62	123.76	128.67

There are no chirality outliers.

5 of 6 torsion outliers are listed below:

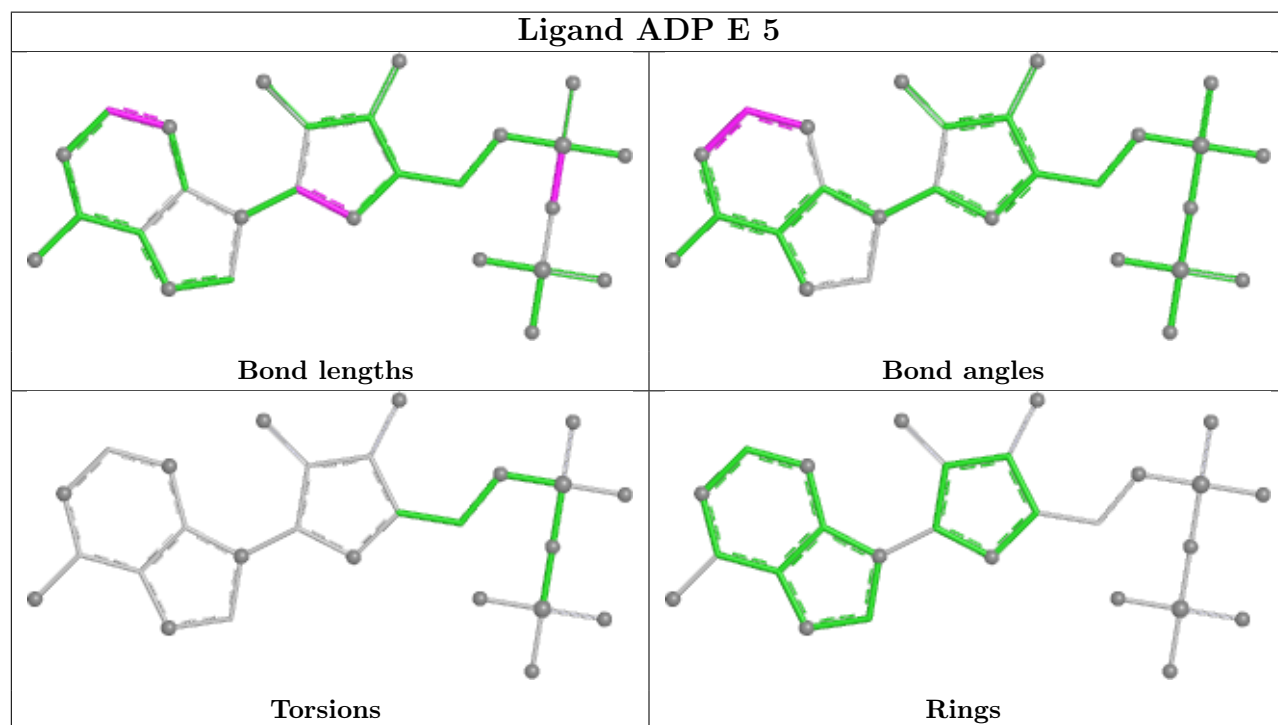
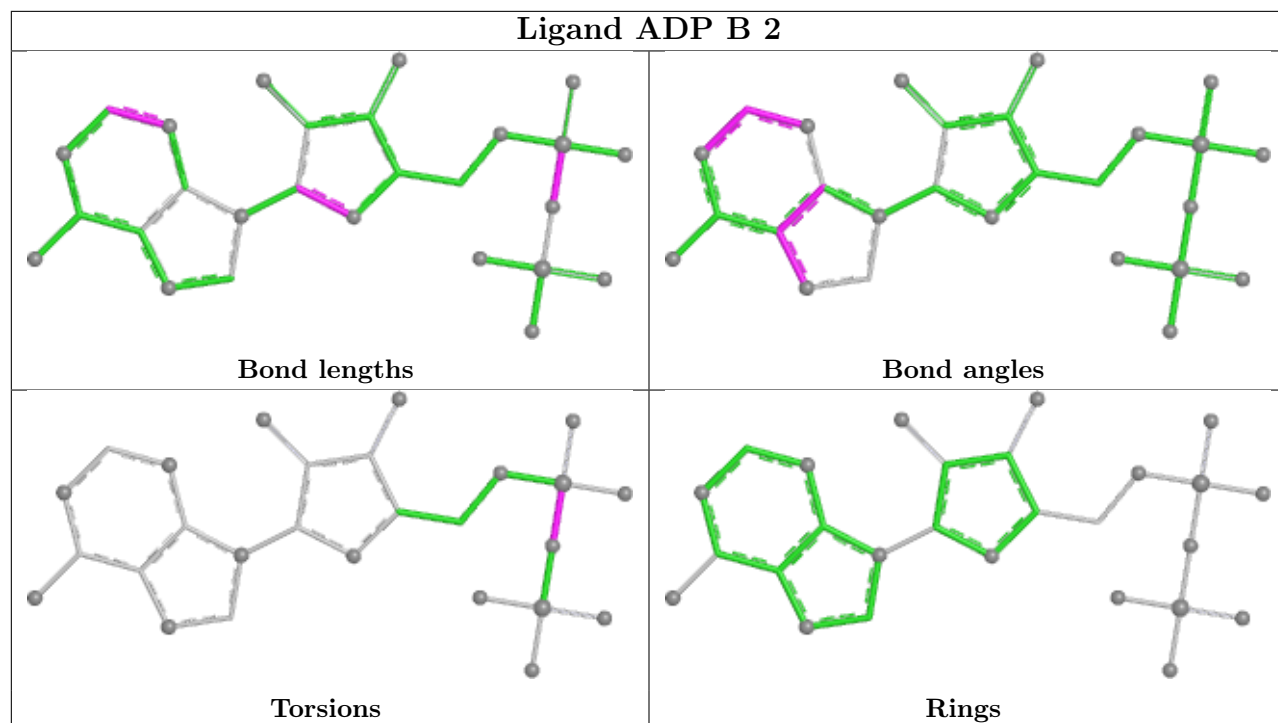
Mol	Chain	Res	Type	Atoms
3	C	3	ADP	PA-O3A-PB-O2B
3	B	2	ADP	PB-O3A-PA-O1A
3	A	1	ADP	PA-O3A-PB-O3B
3	C	3	ADP	PA-O3A-PB-O3B
3	C	3	ADP	PA-O3A-PB-O1B

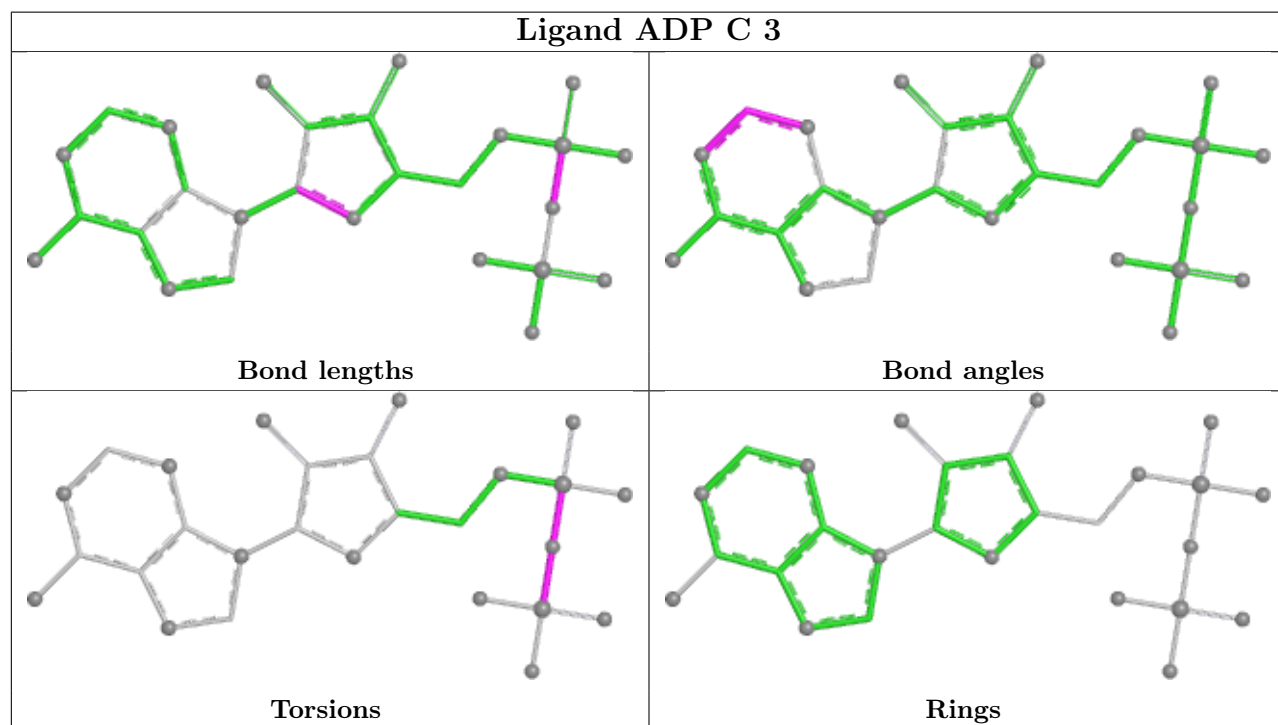
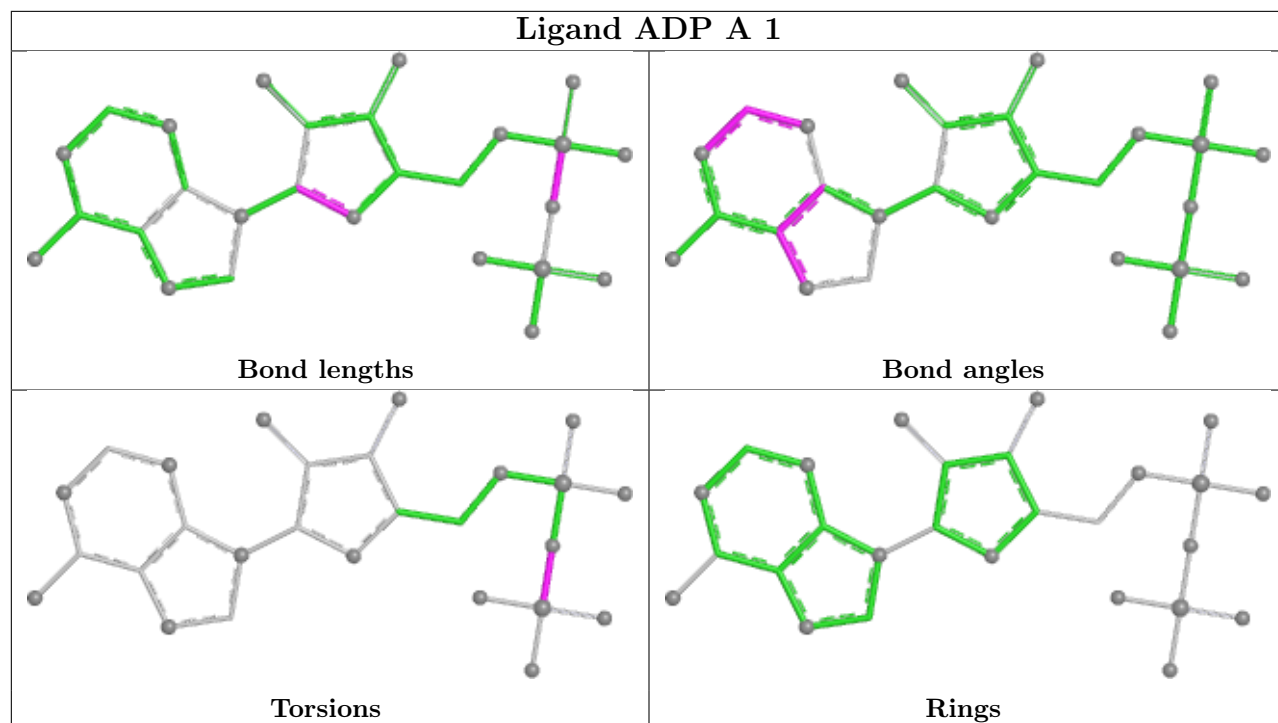
There are no ring outliers.

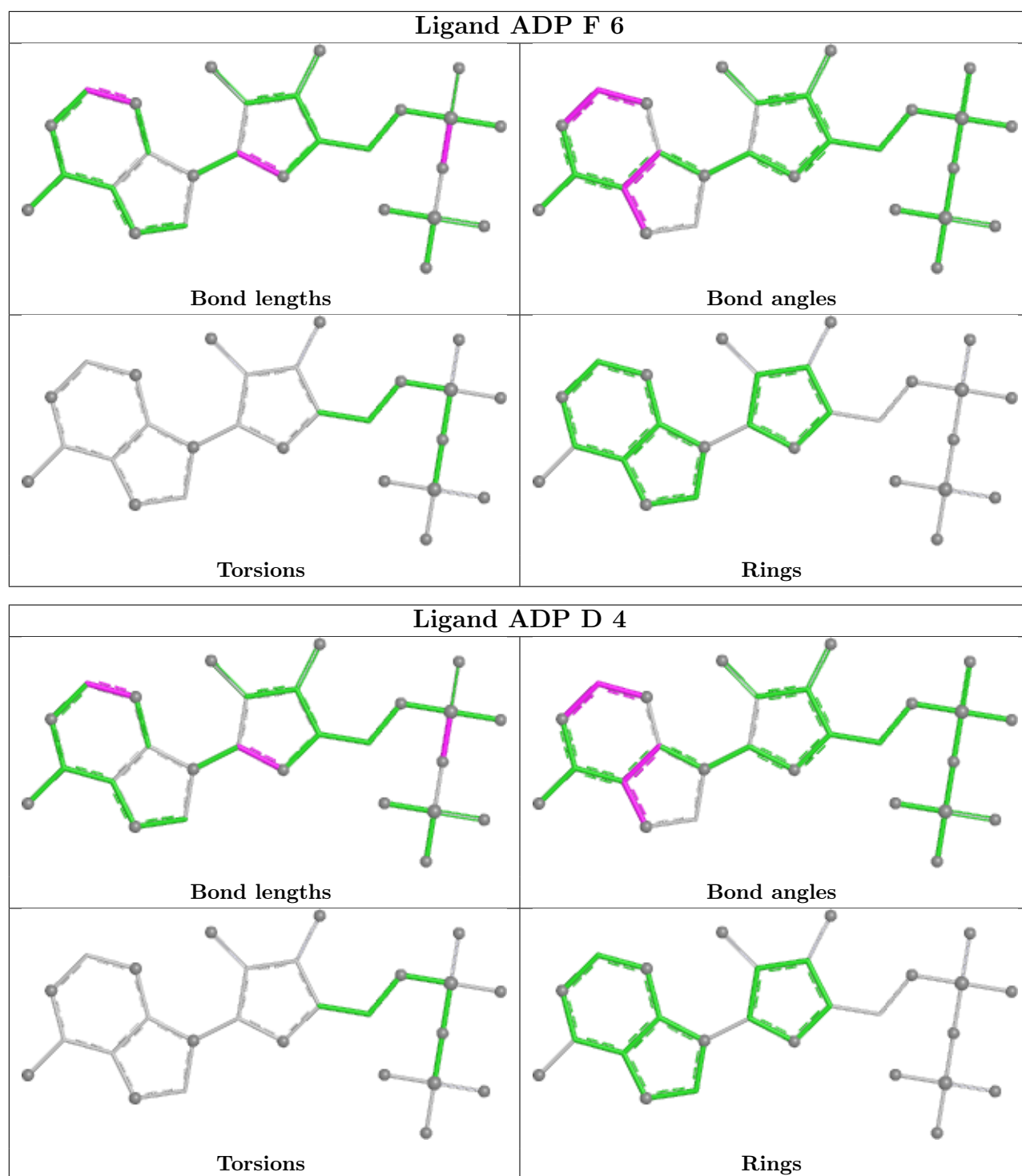
3 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	E	5	ADP	2	0
3	A	1	ADP	1	0
3	D	4	ADP	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.







5.7 Other polymers [\(i\)](#)

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

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

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th 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	285/335 (85%)	-0.14	1 (0%) 92 95	14, 29, 46, 59	0
1	B	280/335 (83%)	0.01	7 (2%) 57 64	17, 33, 53, 72	0
1	C	281/335 (83%)	-0.05	6 (2%) 63 70	17, 32, 54, 72	0
1	D	284/335 (84%)	-0.01	2 (0%) 87 91	22, 38, 56, 70	0
1	E	282/335 (84%)	0.12	4 (1%) 75 80	22, 42, 58, 73	0
1	F	281/335 (83%)	0.22	10 (3%) 42 49	26, 46, 67, 76	0
All	All	1693/2010 (84%)	0.02	30 (1%) 68 74	14, 37, 59, 76	0

The worst 5 of 30 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	1204	CYS	4.8
1	C	1046	LEU	4.6
1	F	1121	LEU	4.0
1	F	1041	ILE	3.6
1	C	1048	LYS	3.5

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

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

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands

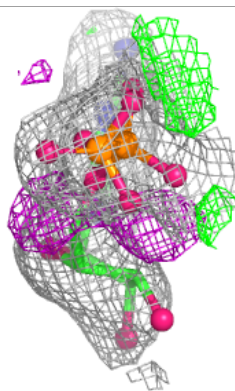
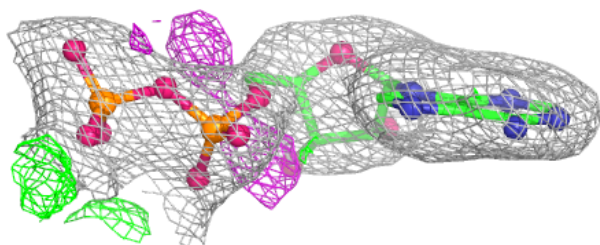
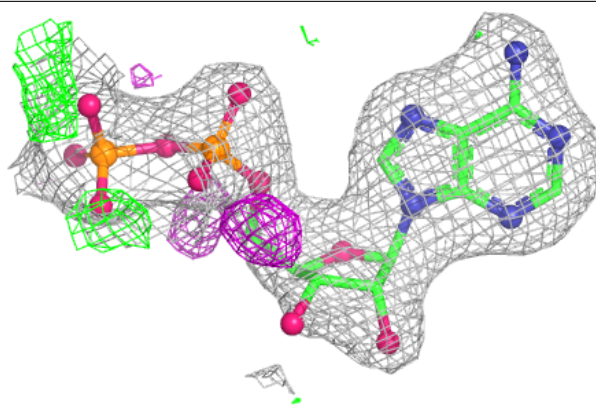
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists 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	MG	A	20	1/1	0.89	0.18	24,24,24,24	0
2	MG	B	19	1/1	0.90	0.20	33,33,33,33	0
2	MG	A	8	1/1	0.93	0.27	28,28,28,28	0
2	MG	C	12	1/1	0.93	0.30	35,35,35,35	0
2	MG	C	22	1/1	0.94	0.09	35,35,35,35	0
2	MG	E	16	1/1	0.94	0.25	36,36,36,36	0
2	MG	F	18	1/1	0.94	0.24	31,31,31,31	0
3	ADP	E	5	27/27	0.94	0.14	27,36,52,53	0
2	MG	B	10	1/1	0.95	0.18	23,23,23,23	0
2	MG	D	14	1/1	0.95	0.29	33,33,33,33	0
2	MG	E	15	1/1	0.95	0.21	24,24,24,24	0
2	MG	A	7	1/1	0.96	0.14	10,10,10,10	0
2	MG	F	17	1/1	0.96	0.24	25,25,25,25	0
2	MG	D	23	1/1	0.96	0.12	31,31,31,31	0
3	ADP	D	4	27/27	0.96	0.13	22,32,37,43	0
2	MG	A	25	1/1	0.96	0.23	22,22,22,22	0
3	ADP	F	6	27/27	0.96	0.10	34,40,45,46	0
3	ADP	B	2	27/27	0.97	0.13	12,23,34,41	0
3	ADP	A	1	27/27	0.98	0.11	13,20,33,36	0
2	MG	B	24	1/1	0.98	0.21	26,26,26,26	0
3	ADP	C	3	27/27	0.98	0.12	17,21,30,36	0
2	MG	D	13	1/1	0.98	0.20	14,14,14,14	0
2	MG	B	9	1/1	0.98	0.16	15,15,15,15	0
2	MG	C	21	1/1	0.98	0.27	30,30,30,30	0
2	MG	C	11	1/1	0.99	0.20	13,13,13,13	0

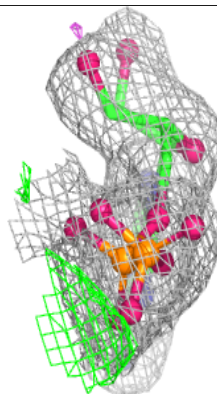
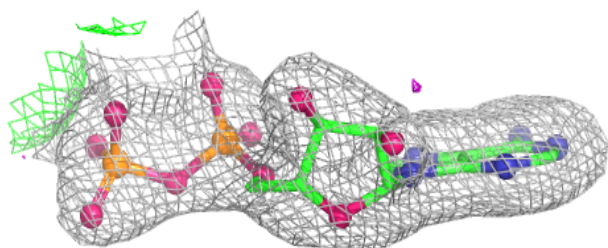
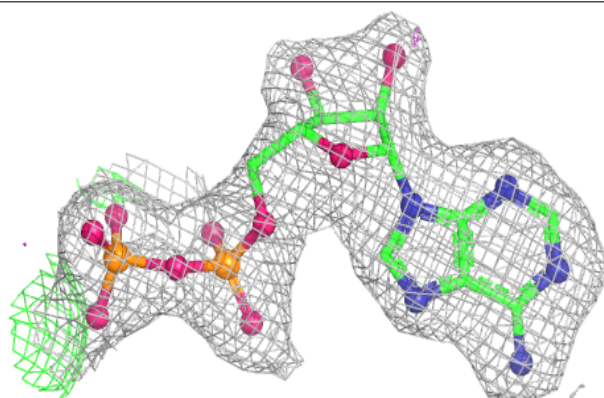
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around ADP E 5:

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

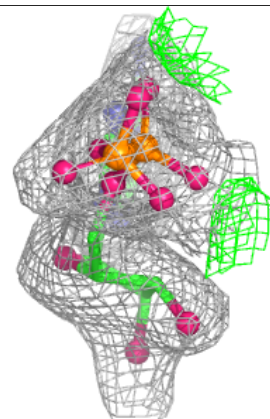
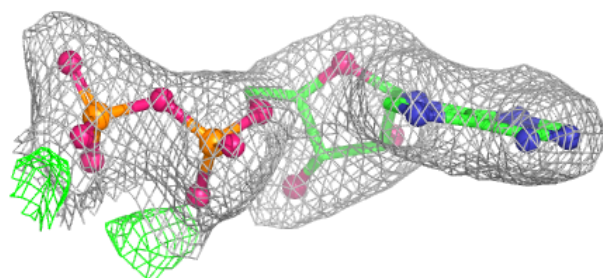
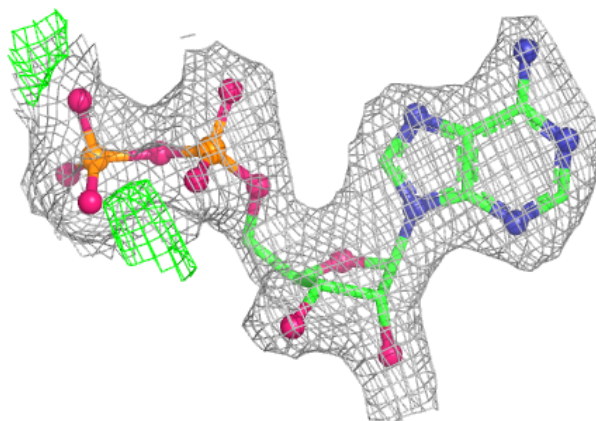
**Electron density around ADP D 4:**

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

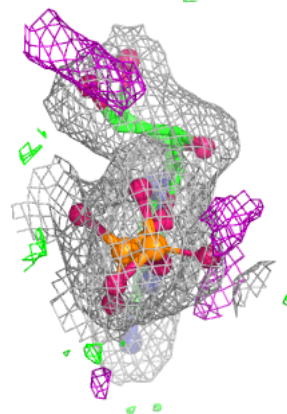
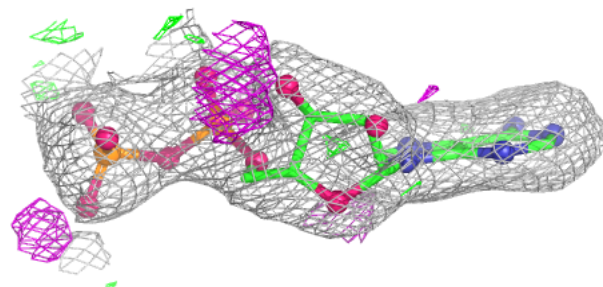
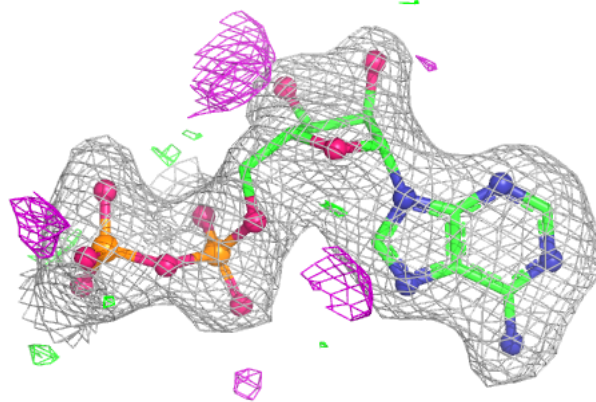


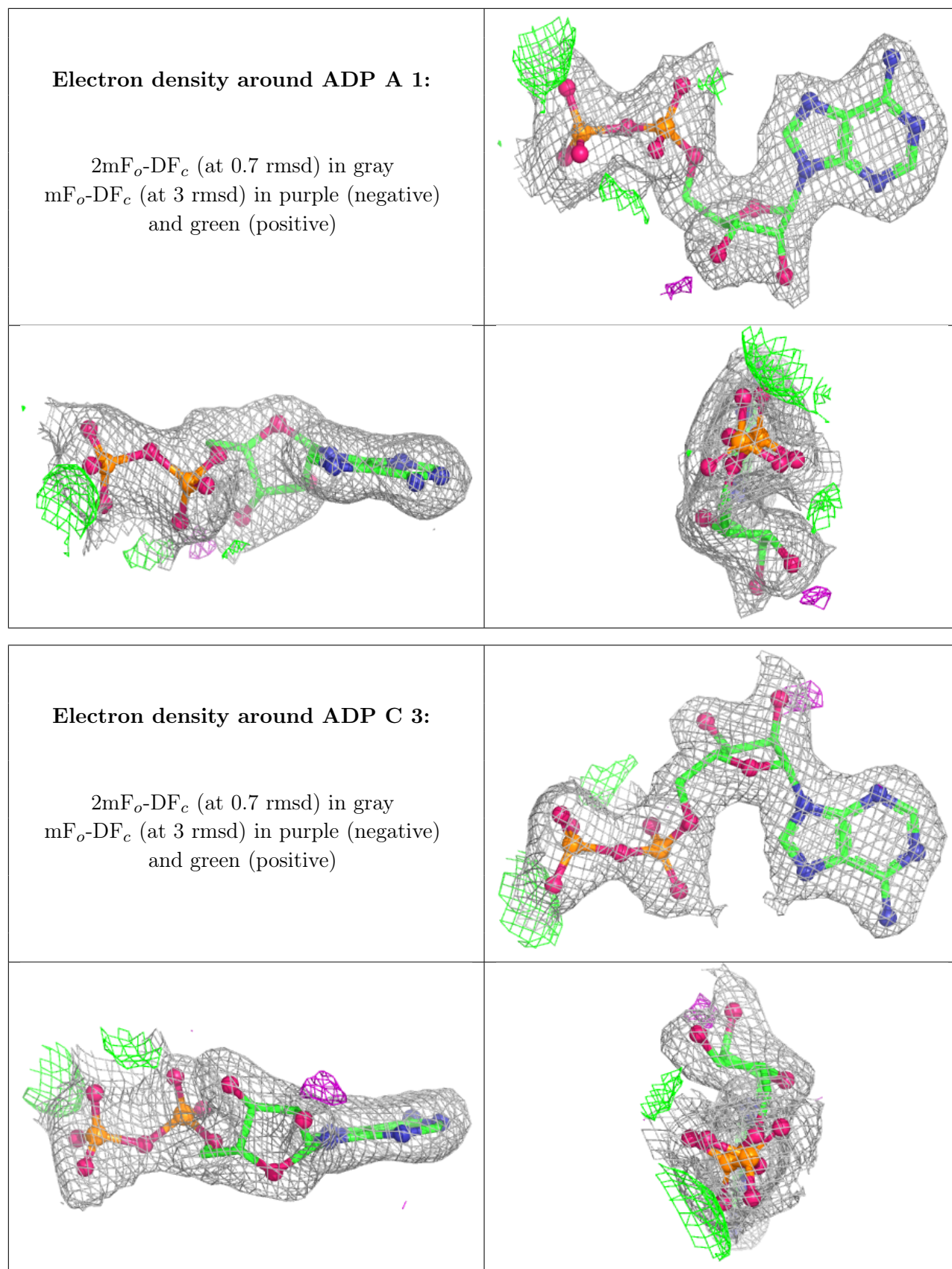
Electron density around ADP F 6:

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

**Electron density around ADP B 2:**

$2mF_o-DF_c$ (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.