



wwPDB X-ray Structure Validation Summary Report ⓘ

May 15, 2020 – 01:15 am BST

PDB ID : 6LUF
Title : Trans-acting mutant Y290A of the central AAA+ domain of the flagellar regulatory protein FlrC
Authors : Dasgupta, J.; Chakraborty, S.
Deposited on : 2020-01-27
Resolution : 3.45 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.11
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) : 2.11

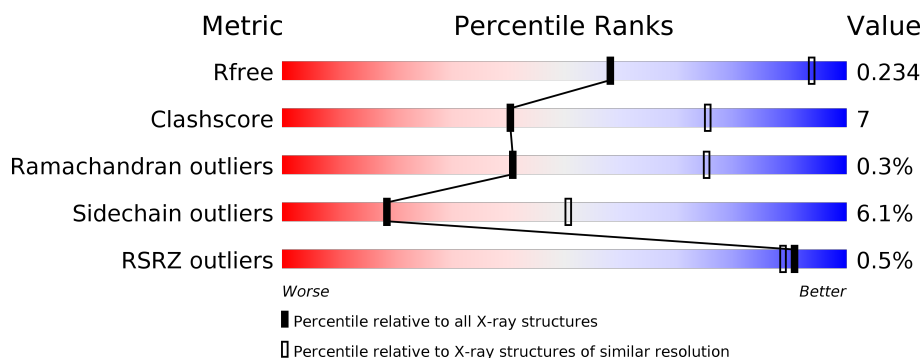
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.45 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	1291 (3.52-3.40)
Clashscore	141614	1372 (3.52-3.40)
Ramachandran outliers	138981	1337 (3.52-3.40)
Sidechain outliers	138945	1338 (3.52-3.40)
RSRZ outliers	127900	1205 (3.52-3.40)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for ≥ 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	271	<div> <div>71%</div> <div>17%</div> <div>•</div> <div>9%</div> </div>
1	B	271	<div> <div>71%</div> <div>16%</div> <div>•</div> <div>9%</div> </div>
1	C	271	<div> <div>%</div> <div>77%</div> <div>13%</div> <div>•</div> <div>9%</div> </div>
1	D	271	<div> <div>73%</div> <div>15%</div> <div>•</div> <div>9%</div> </div>
1	E	271	<div> <div>70%</div> <div>19%</div> <div>•</div> <div>9%</div> </div>
1	F	271	<div> <div>%</div> <div>70%</div> <div>20%</div> <div>•</div> <div>9%</div> </div>

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Mol	Chain	Length	Quality of chain
1	G	271	<div>69% 20% 9%</div>

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

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	ADP	D	401	-	-	-	X
2	ADP	F	401	-	-	-	X

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 13613 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 Flagellar regulatory protein C.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	247	Total	C	N	O	S	0	0	0
			1923	1217	343	354	9			
1	B	247	Total	C	N	O	S	0	0	0
			1923	1217	343	354	9			
1	C	246	Total	C	N	O	S	0	1	0
			1921	1216	343	353	9			
1	D	246	Total	C	N	O	S	0	0	0
			1913	1211	340	353	9			
1	E	246	Total	C	N	O	S	0	0	0
			1913	1211	340	353	9			
1	F	247	Total	C	N	O	S	0	0	0
			1918	1214	341	354	9			
1	G	246	Total	C	N	O	S	0	0	0
			1913	1211	340	353	9			

There are 154 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	111	MET	-	initiating methionine	UNP A0A0H3AHP1
A	112	GLY	-	expression tag	UNP A0A0H3AHP1
A	113	SER	-	expression tag	UNP A0A0H3AHP1
A	114	SER	-	expression tag	UNP A0A0H3AHP1
A	115	HIS	-	expression tag	UNP A0A0H3AHP1
A	116	HIS	-	expression tag	UNP A0A0H3AHP1
A	117	HIS	-	expression tag	UNP A0A0H3AHP1
A	118	HIS	-	expression tag	UNP A0A0H3AHP1
A	119	HIS	-	expression tag	UNP A0A0H3AHP1
A	120	HIS	-	expression tag	UNP A0A0H3AHP1
A	121	SER	-	expression tag	UNP A0A0H3AHP1
A	122	SER	-	expression tag	UNP A0A0H3AHP1
A	123	GLY	-	expression tag	UNP A0A0H3AHP1
A	124	LEU	-	expression tag	UNP A0A0H3AHP1
A	125	VAL	-	expression tag	UNP A0A0H3AHP1

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Chain	Residue	Modelled	Actual	Comment	Reference
A	126	PRO	-	expression tag	UNP A0A0H3AHP1
A	127	ARG	-	expression tag	UNP A0A0H3AHP1
A	128	GLY	-	expression tag	UNP A0A0H3AHP1
A	129	SER	-	expression tag	UNP A0A0H3AHP1
A	130	HIS	-	expression tag	UNP A0A0H3AHP1
A	131	MET	-	expression tag	UNP A0A0H3AHP1
A	290	ALA	TYR	engineered mutation	UNP A0A0H3AHP1
B	111	MET	-	initiating methionine	UNP A0A0H3AHP1
B	112	GLY	-	expression tag	UNP A0A0H3AHP1
B	113	SER	-	expression tag	UNP A0A0H3AHP1
B	114	SER	-	expression tag	UNP A0A0H3AHP1
B	115	HIS	-	expression tag	UNP A0A0H3AHP1
B	116	HIS	-	expression tag	UNP A0A0H3AHP1
B	117	HIS	-	expression tag	UNP A0A0H3AHP1
B	118	HIS	-	expression tag	UNP A0A0H3AHP1
B	119	HIS	-	expression tag	UNP A0A0H3AHP1
B	120	HIS	-	expression tag	UNP A0A0H3AHP1
B	121	SER	-	expression tag	UNP A0A0H3AHP1
B	122	SER	-	expression tag	UNP A0A0H3AHP1
B	123	GLY	-	expression tag	UNP A0A0H3AHP1
B	124	LEU	-	expression tag	UNP A0A0H3AHP1
B	125	VAL	-	expression tag	UNP A0A0H3AHP1
B	126	PRO	-	expression tag	UNP A0A0H3AHP1
B	127	ARG	-	expression tag	UNP A0A0H3AHP1
B	128	GLY	-	expression tag	UNP A0A0H3AHP1
B	129	SER	-	expression tag	UNP A0A0H3AHP1
B	130	HIS	-	expression tag	UNP A0A0H3AHP1
B	131	MET	-	expression tag	UNP A0A0H3AHP1
B	290	ALA	TYR	engineered mutation	UNP A0A0H3AHP1
C	111	MET	-	initiating methionine	UNP A0A0H3AHP1
C	112	GLY	-	expression tag	UNP A0A0H3AHP1
C	113	SER	-	expression tag	UNP A0A0H3AHP1
C	114	SER	-	expression tag	UNP A0A0H3AHP1
C	115	HIS	-	expression tag	UNP A0A0H3AHP1
C	116	HIS	-	expression tag	UNP A0A0H3AHP1
C	117	HIS	-	expression tag	UNP A0A0H3AHP1
C	118	HIS	-	expression tag	UNP A0A0H3AHP1
C	119	HIS	-	expression tag	UNP A0A0H3AHP1
C	120	HIS	-	expression tag	UNP A0A0H3AHP1
C	121	SER	-	expression tag	UNP A0A0H3AHP1
C	122	SER	-	expression tag	UNP A0A0H3AHP1
C	123	GLY	-	expression tag	UNP A0A0H3AHP1

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Chain	Residue	Modelled	Actual	Comment	Reference
C	124	LEU	-	expression tag	UNP A0A0H3AHP1
C	125	VAL	-	expression tag	UNP A0A0H3AHP1
C	126	PRO	-	expression tag	UNP A0A0H3AHP1
C	127	ARG	-	expression tag	UNP A0A0H3AHP1
C	128	GLY	-	expression tag	UNP A0A0H3AHP1
C	129	SER	-	expression tag	UNP A0A0H3AHP1
C	130	HIS	-	expression tag	UNP A0A0H3AHP1
C	131	MET	-	expression tag	UNP A0A0H3AHP1
C	290	ALA	TYR	engineered mutation	UNP A0A0H3AHP1
D	111	MET	-	initiating methionine	UNP A0A0H3AHP1
D	112	GLY	-	expression tag	UNP A0A0H3AHP1
D	113	SER	-	expression tag	UNP A0A0H3AHP1
D	114	SER	-	expression tag	UNP A0A0H3AHP1
D	115	HIS	-	expression tag	UNP A0A0H3AHP1
D	116	HIS	-	expression tag	UNP A0A0H3AHP1
D	117	HIS	-	expression tag	UNP A0A0H3AHP1
D	118	HIS	-	expression tag	UNP A0A0H3AHP1
D	119	HIS	-	expression tag	UNP A0A0H3AHP1
D	120	HIS	-	expression tag	UNP A0A0H3AHP1
D	121	SER	-	expression tag	UNP A0A0H3AHP1
D	122	SER	-	expression tag	UNP A0A0H3AHP1
D	123	GLY	-	expression tag	UNP A0A0H3AHP1
D	124	LEU	-	expression tag	UNP A0A0H3AHP1
D	125	VAL	-	expression tag	UNP A0A0H3AHP1
D	126	PRO	-	expression tag	UNP A0A0H3AHP1
D	127	ARG	-	expression tag	UNP A0A0H3AHP1
D	128	GLY	-	expression tag	UNP A0A0H3AHP1
D	129	SER	-	expression tag	UNP A0A0H3AHP1
D	130	HIS	-	expression tag	UNP A0A0H3AHP1
D	131	MET	-	expression tag	UNP A0A0H3AHP1
D	290	ALA	TYR	engineered mutation	UNP A0A0H3AHP1
E	111	MET	-	initiating methionine	UNP A0A0H3AHP1
E	112	GLY	-	expression tag	UNP A0A0H3AHP1
E	113	SER	-	expression tag	UNP A0A0H3AHP1
E	114	SER	-	expression tag	UNP A0A0H3AHP1
E	115	HIS	-	expression tag	UNP A0A0H3AHP1
E	116	HIS	-	expression tag	UNP A0A0H3AHP1
E	117	HIS	-	expression tag	UNP A0A0H3AHP1
E	118	HIS	-	expression tag	UNP A0A0H3AHP1
E	119	HIS	-	expression tag	UNP A0A0H3AHP1
E	120	HIS	-	expression tag	UNP A0A0H3AHP1
E	121	SER	-	expression tag	UNP A0A0H3AHP1

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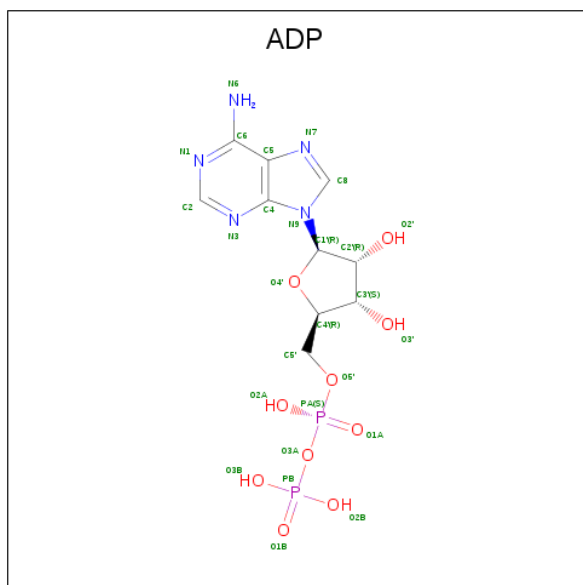
Chain	Residue	Modelled	Actual	Comment	Reference
E	122	SER	-	expression tag	UNP A0A0H3AHP1
E	123	GLY	-	expression tag	UNP A0A0H3AHP1
E	124	LEU	-	expression tag	UNP A0A0H3AHP1
E	125	VAL	-	expression tag	UNP A0A0H3AHP1
E	126	PRO	-	expression tag	UNP A0A0H3AHP1
E	127	ARG	-	expression tag	UNP A0A0H3AHP1
E	128	GLY	-	expression tag	UNP A0A0H3AHP1
E	129	SER	-	expression tag	UNP A0A0H3AHP1
E	130	HIS	-	expression tag	UNP A0A0H3AHP1
E	131	MET	-	expression tag	UNP A0A0H3AHP1
E	290	ALA	TYR	engineered mutation	UNP A0A0H3AHP1
F	111	MET	-	initiating methionine	UNP A0A0H3AHP1
F	112	GLY	-	expression tag	UNP A0A0H3AHP1
F	113	SER	-	expression tag	UNP A0A0H3AHP1
F	114	SER	-	expression tag	UNP A0A0H3AHP1
F	115	HIS	-	expression tag	UNP A0A0H3AHP1
F	116	HIS	-	expression tag	UNP A0A0H3AHP1
F	117	HIS	-	expression tag	UNP A0A0H3AHP1
F	118	HIS	-	expression tag	UNP A0A0H3AHP1
F	119	HIS	-	expression tag	UNP A0A0H3AHP1
F	120	HIS	-	expression tag	UNP A0A0H3AHP1
F	121	SER	-	expression tag	UNP A0A0H3AHP1
F	122	SER	-	expression tag	UNP A0A0H3AHP1
F	123	GLY	-	expression tag	UNP A0A0H3AHP1
F	124	LEU	-	expression tag	UNP A0A0H3AHP1
F	125	VAL	-	expression tag	UNP A0A0H3AHP1
F	126	PRO	-	expression tag	UNP A0A0H3AHP1
F	127	ARG	-	expression tag	UNP A0A0H3AHP1
F	128	GLY	-	expression tag	UNP A0A0H3AHP1
F	129	SER	-	expression tag	UNP A0A0H3AHP1
F	130	HIS	-	expression tag	UNP A0A0H3AHP1
F	131	MET	-	expression tag	UNP A0A0H3AHP1
F	290	ALA	TYR	engineered mutation	UNP A0A0H3AHP1
G	111	MET	-	initiating methionine	UNP A0A0H3AHP1
G	112	GLY	-	expression tag	UNP A0A0H3AHP1
G	113	SER	-	expression tag	UNP A0A0H3AHP1
G	114	SER	-	expression tag	UNP A0A0H3AHP1
G	115	HIS	-	expression tag	UNP A0A0H3AHP1
G	116	HIS	-	expression tag	UNP A0A0H3AHP1
G	117	HIS	-	expression tag	UNP A0A0H3AHP1
G	118	HIS	-	expression tag	UNP A0A0H3AHP1
G	119	HIS	-	expression tag	UNP A0A0H3AHP1

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Chain	Residue	Modelled	Actual	Comment	Reference
G	120	HIS	-	expression tag	UNP A0A0H3AHP1
G	121	SER	-	expression tag	UNP A0A0H3AHP1
G	122	SER	-	expression tag	UNP A0A0H3AHP1
G	123	GLY	-	expression tag	UNP A0A0H3AHP1
G	124	LEU	-	expression tag	UNP A0A0H3AHP1
G	125	VAL	-	expression tag	UNP A0A0H3AHP1
G	126	PRO	-	expression tag	UNP A0A0H3AHP1
G	127	ARG	-	expression tag	UNP A0A0H3AHP1
G	128	GLY	-	expression tag	UNP A0A0H3AHP1
G	129	SER	-	expression tag	UNP A0A0H3AHP1
G	130	HIS	-	expression tag	UNP A0A0H3AHP1
G	131	MET	-	expression tag	UNP A0A0H3AHP1
G	290	ALA	TYR	engineered mutation	UNP A0A0H3AHP1

- Molecule 2 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: $C_{10}H_{15}N_5O_{10}P_2$) (labeled as "Ligand of Interest" by author).



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

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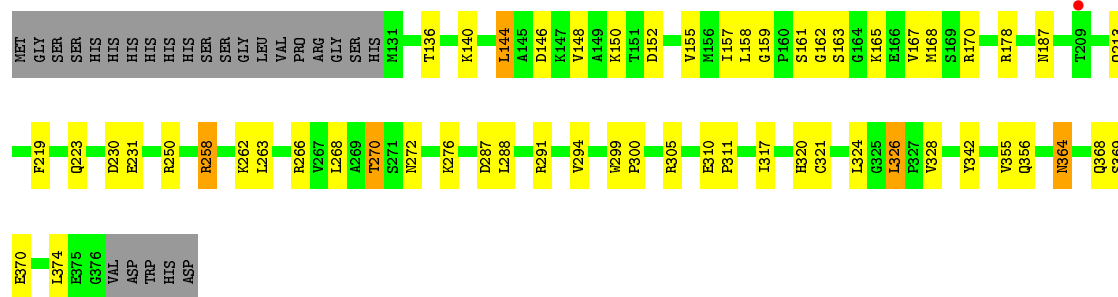
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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	E	1	Total	C	N	O	P	0	0
			27	10	5	10	2		
2	F	1	Total	C	N	O	P	0	0
			27	10	5	10	2		
2	G	1	Total	C	N	O	P	0	0
			27	10	5	10	2		



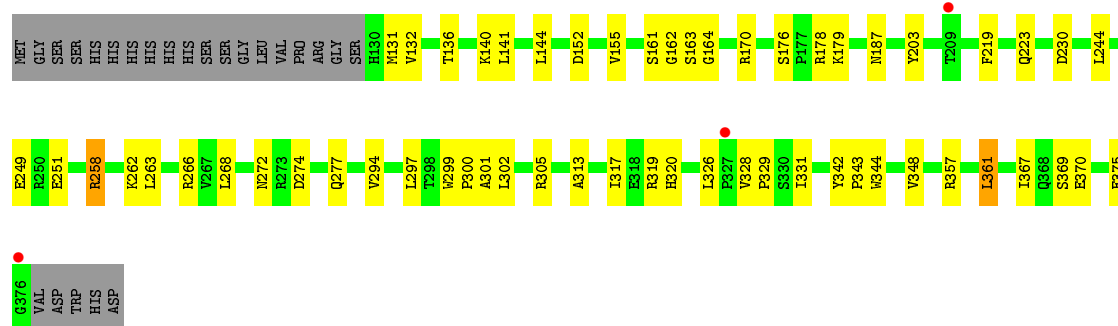
- Molecule 1: Flagellar regulatory protein C

Chain E: 70% 19% 9%



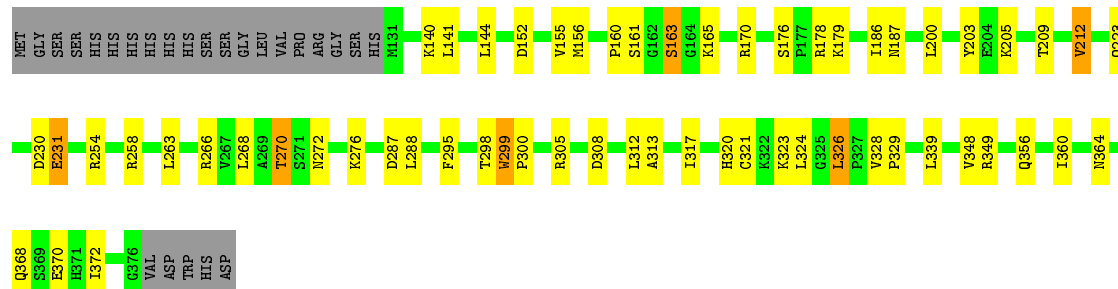
- Molecule 1: Flagellar regulatory protein C

Chain F: 70% 20% 9%



- Molecule 1: Flagellar regulatory protein C

Chain G: 69% 20% 9%



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	80.93Å 154.13Å 194.06Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	46.28 – 3.45 48.01 – 3.45	Depositor EDS
% Data completeness (in resolution range)	99.9 (46.28-3.45) 93.2 (48.01-3.45)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.57 (at 3.48Å)	Xtriage
Refinement program	PHENIX 1.8.4_1496	Depositor
R, R_{free}	0.188 , 0.234 0.192 , 0.234	Depositor DCC
R_{free} test set	1633 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å ²)	57.9	Xtriage
Anisotropy	0.260	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 26.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	13613	wwPDB-VP
Average B, all atoms (Å ²)	56.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.41% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: ADP

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	0.23	0/1957	0.45	0/2648
1	B	0.23	0/1957	0.45	0/2648
1	C	0.23	0/1957	0.43	0/2647
1	D	0.23	0/1946	0.46	0/2633
1	E	0.23	0/1946	0.43	0/2633
1	F	0.23	0/1951	0.43	0/2640
1	G	0.24	0/1946	0.46	0/2633
All	All	0.23	0/13660	0.45	0/18482

There are no bond length outliers.

There are no bond angle outliers.

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	1923	0	1970	31	0
1	B	1923	0	1970	30	0
1	C	1921	0	1976	20	0
1	D	1913	0	1963	32	0
1	E	1913	0	1963	29	0
1	F	1918	0	1965	33	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	G	1913	0	1963	34	0
2	A	27	0	12	4	0
2	B	27	0	12	2	0
2	C	27	0	12	4	0
2	D	27	0	12	2	0
2	E	27	0	12	2	0
2	F	27	0	12	3	0
2	G	27	0	12	1	0
All	All	13613	0	13854	198	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 7.

The worst 5 of 198 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:F:164:GLY:N	2:F:401:ADP:O2A	2.10	0.81
1:B:178:ARG:NH1	1:B:225:GLY:O	2.18	0.76
1:A:258:ARG:NH2	1:G:203:TYR:OH	2.19	0.76
1:A:163:SER:O	1:A:299:TRP:NE1	2.21	0.73
1:F:163:SER:O	1:F:299:TRP:NE1	2.19	0.72

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	245/271 (90%)	233 (95%)	11 (4%)	1 (0%)	34	70
1	B	245/271 (90%)	236 (96%)	9 (4%)	0	100	100
1	C	245/271 (90%)	235 (96%)	9 (4%)	1 (0%)	34	70

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	D	244/271 (90%)	233 (96%)	11 (4%)	0	100	100
1	E	244/271 (90%)	233 (96%)	10 (4%)	1 (0%)	34	70
1	F	245/271 (90%)	235 (96%)	8 (3%)	2 (1%)	19	57
1	G	244/271 (90%)	233 (96%)	11 (4%)	0	100	100
All	All	1712/1897 (90%)	1638 (96%)	69 (4%)	5 (0%)	41	75

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	369	SER
1	F	369	SER
1	A	369	SER
1	E	369	SER
1	F	132	VAL

5.3.2 Protein sidechains ⓘ

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	208/229 (91%)	194 (93%)	14 (7%)	16	48
1	B	208/229 (91%)	190 (91%)	18 (9%)	10	37
1	C	208/229 (91%)	200 (96%)	8 (4%)	33	64
1	D	207/229 (90%)	196 (95%)	11 (5%)	22	54
1	E	207/229 (90%)	194 (94%)	13 (6%)	18	50
1	F	207/229 (90%)	195 (94%)	12 (6%)	20	52
1	G	207/229 (90%)	195 (94%)	12 (6%)	20	52
All	All	1452/1603 (91%)	1364 (94%)	88 (6%)	18	51

5 of 88 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	318	GLU

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Mol	Chain	Res	Type
1	D	361	LEU
1	G	231	GLU
1	D	136	THR
1	D	258	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 10 such sidechains are listed below:

Mol	Chain	Res	Type
1	D	356	GLN
1	E	320	HIS
1	F	174	ASN
1	C	320	HIS
1	E	356	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 carbohydrates in this entry.

5.6 Ligand geometry [i](#)

7 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	ADP	F	401	-	24,29,29	1.03	2 (8%)	29,45,45	1.38	3 (10%)
2	ADP	D	401	-	24,29,29	1.01	2 (8%)	29,45,45	1.25	3 (10%)
2	ADP	B	401	-	24,29,29	1.02	2 (8%)	29,45,45	1.24	2 (6%)
2	ADP	C	401	-	24,29,29	1.00	1 (4%)	29,45,45	1.32	3 (10%)
2	ADP	A	401	-	24,29,29	1.02	3 (12%)	29,45,45	1.30	3 (10%)
2	ADP	G	401	-	24,29,29	1.00	2 (8%)	29,45,45	1.35	4 (13%)
2	ADP	E	401	-	24,29,29	1.00	2 (8%)	29,45,45	1.29	4 (13%)

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	ADP	F	401	-	-	5/12/32/32	0/3/3/3
2	ADP	D	401	-	-	5/12/32/32	0/3/3/3
2	ADP	B	401	-	-	2/12/32/32	0/3/3/3
2	ADP	C	401	-	-	5/12/32/32	0/3/3/3
2	ADP	A	401	-	-	1/12/32/32	0/3/3/3
2	ADP	G	401	-	-	3/12/32/32	0/3/3/3
2	ADP	E	401	-	-	1/12/32/32	0/3/3/3

The worst 5 of 14 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	401	ADP	C5-C4	2.53	1.47	1.40
2	D	401	ADP	C5-C4	2.52	1.47	1.40
2	A	401	ADP	C5-C4	2.52	1.47	1.40
2	F	401	ADP	C5-C4	2.50	1.47	1.40
2	G	401	ADP	C5-C4	2.50	1.47	1.40

The worst 5 of 22 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	F	401	ADP	PA-O3A-PB	-4.11	118.73	132.83
2	D	401	ADP	PA-O3A-PB	-3.33	121.39	132.83
2	G	401	ADP	PA-O3A-PB	-3.29	121.53	132.83
2	C	401	ADP	PA-O3A-PB	-3.24	121.70	132.83
2	A	401	ADP	N3-C2-N1	-3.14	123.78	128.68

There are no chirality outliers.

5 of 22 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	F	401	ADP	C5'-O5'-PA-O3A
2	F	401	ADP	C3'-C4'-C5'-O5'
2	D	401	ADP	C5'-O5'-PA-O2A
2	D	401	ADP	C5'-O5'-PA-O3A
2	C	401	ADP	PA-O3A-PB-O2B

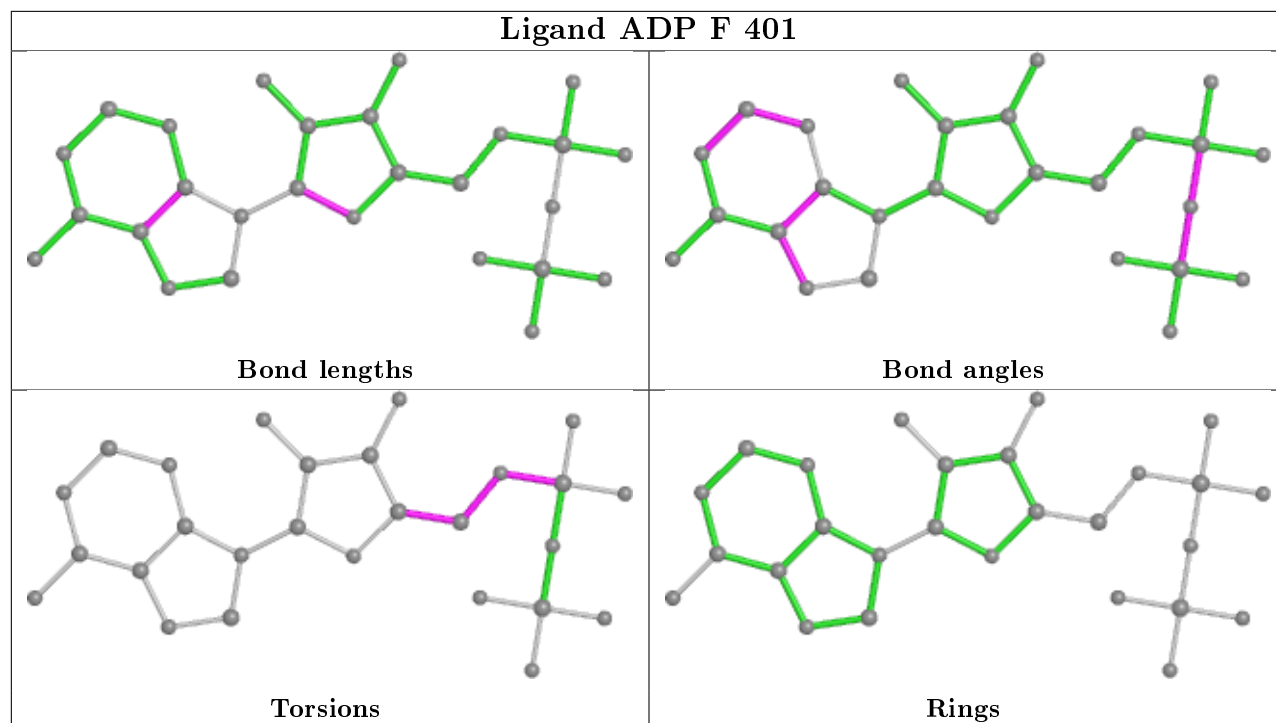
There are no ring outliers.

7 monomers are involved in 18 short contacts:

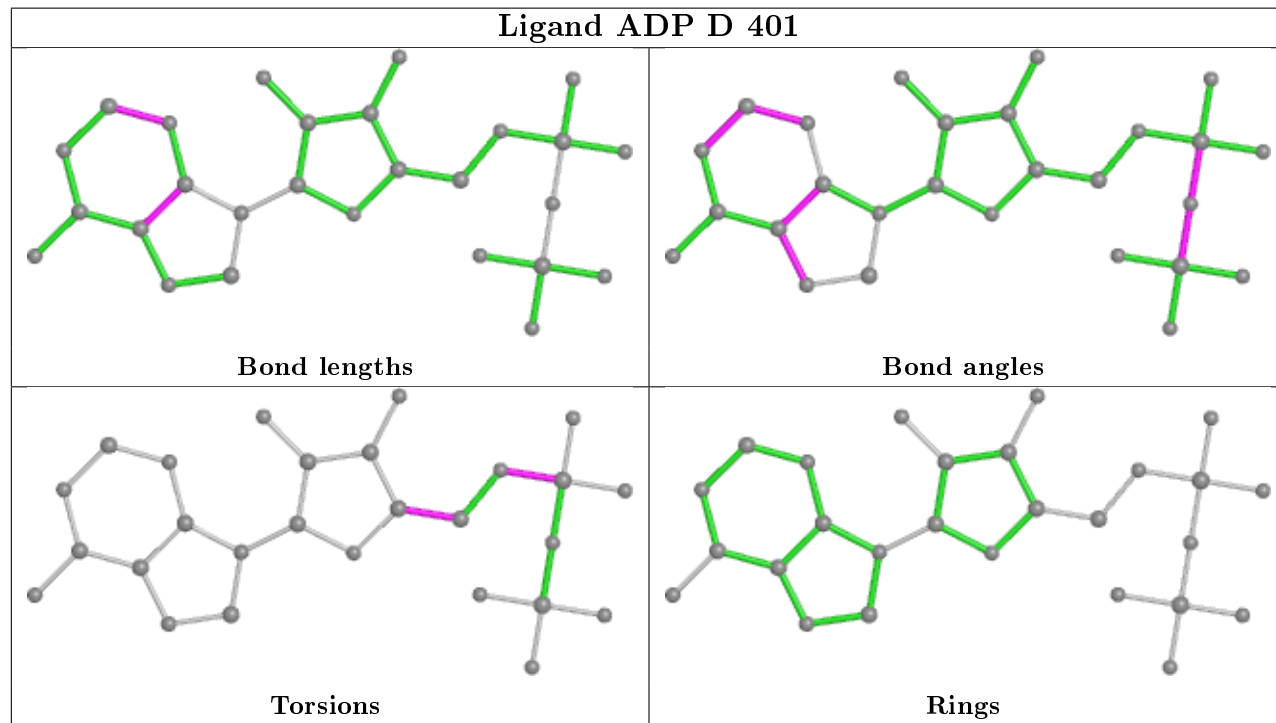
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	F	401	ADP	3	0
2	D	401	ADP	2	0
2	B	401	ADP	2	0
2	C	401	ADP	4	0
2	A	401	ADP	4	0
2	G	401	ADP	1	0
2	E	401	ADP	2	0

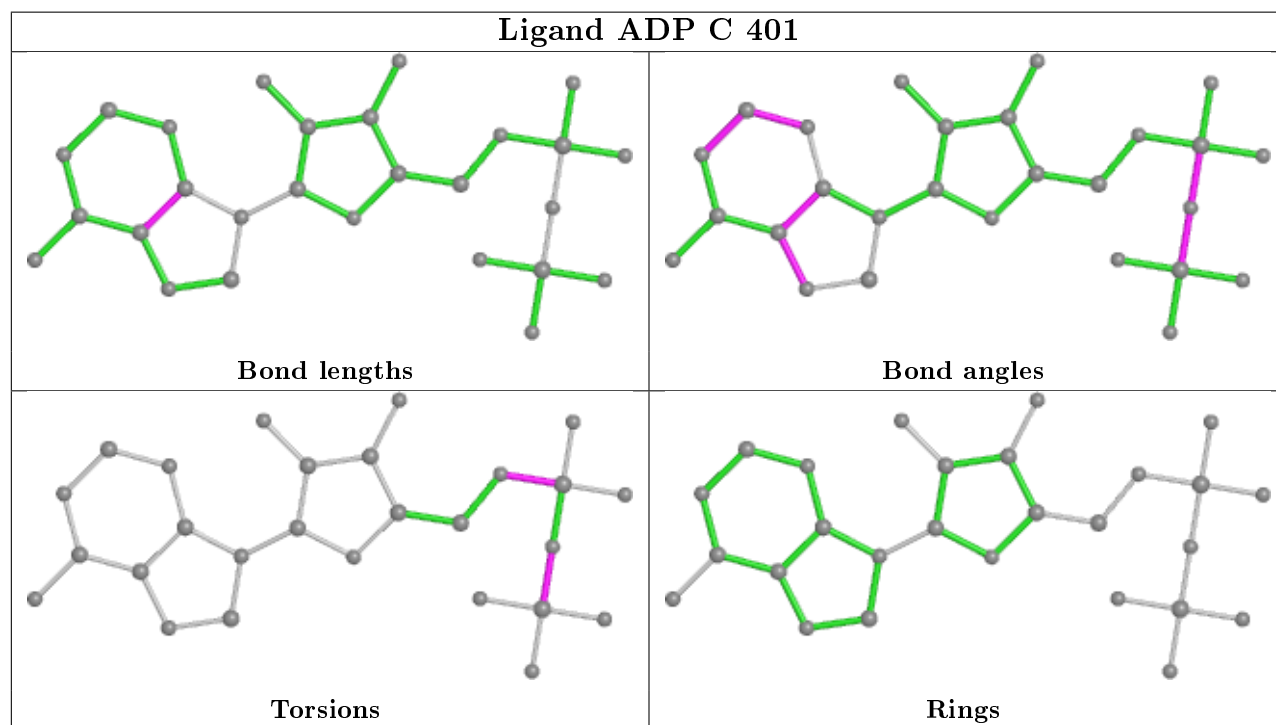
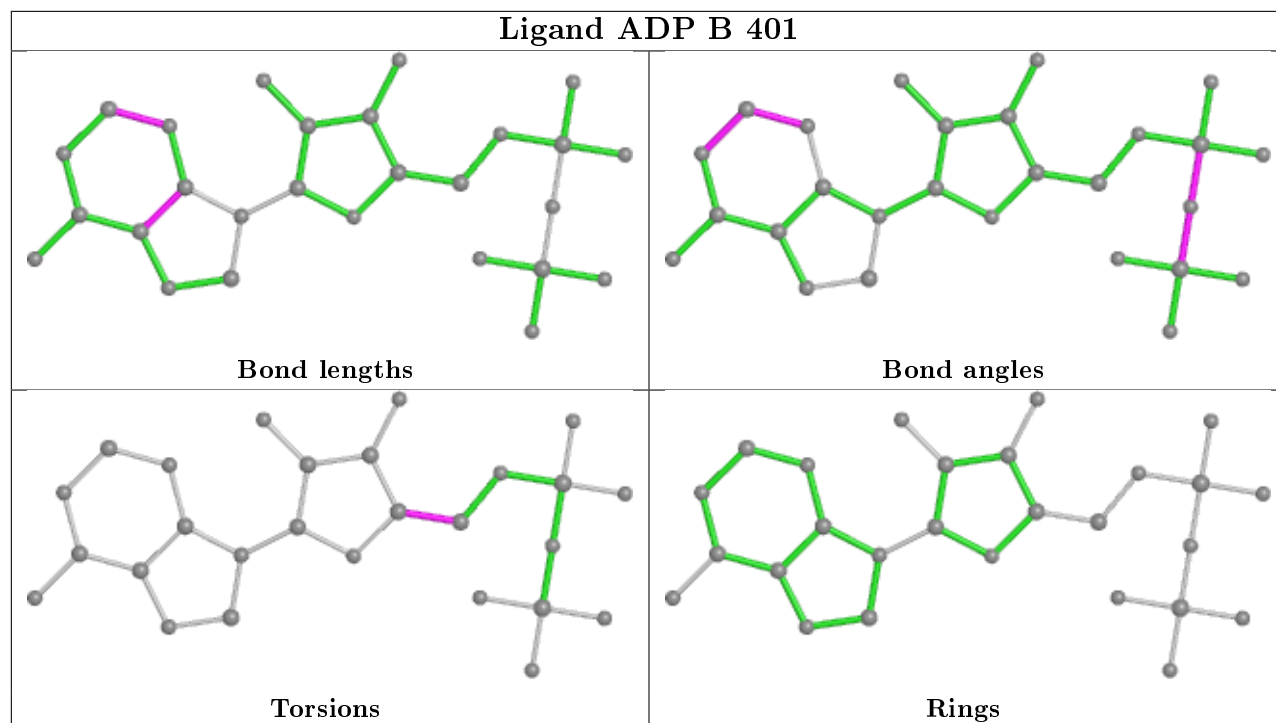
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

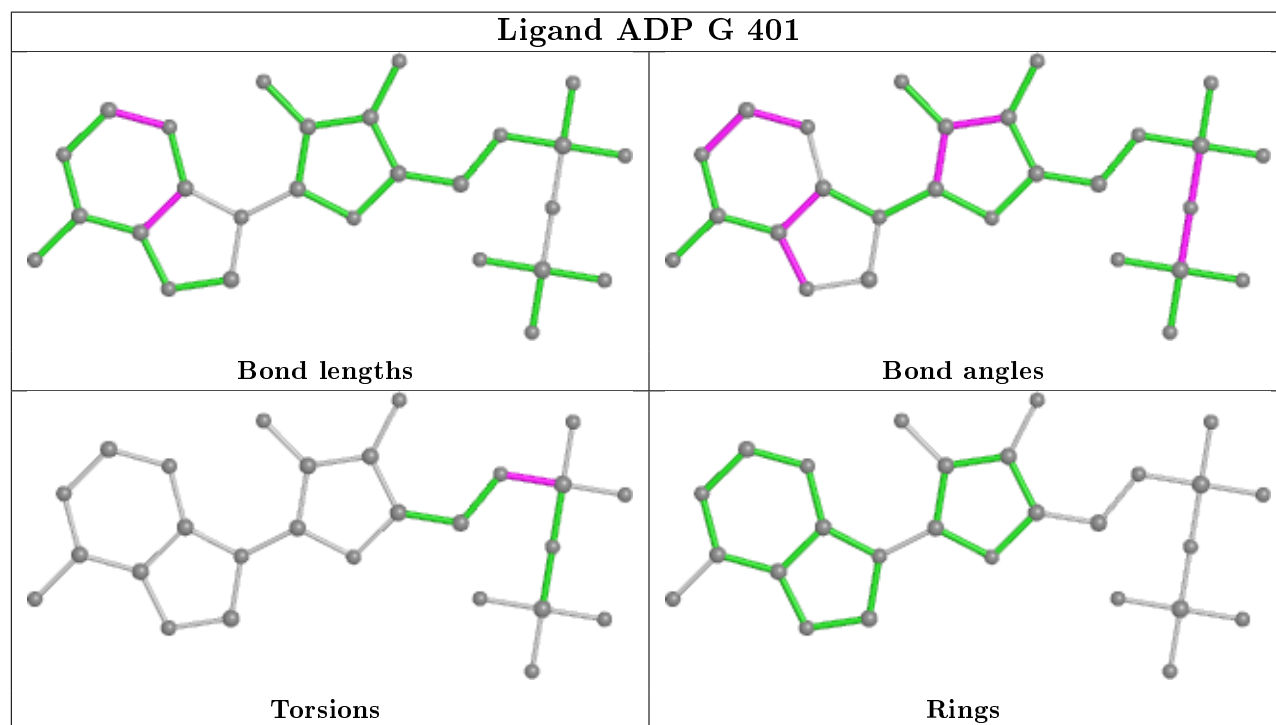
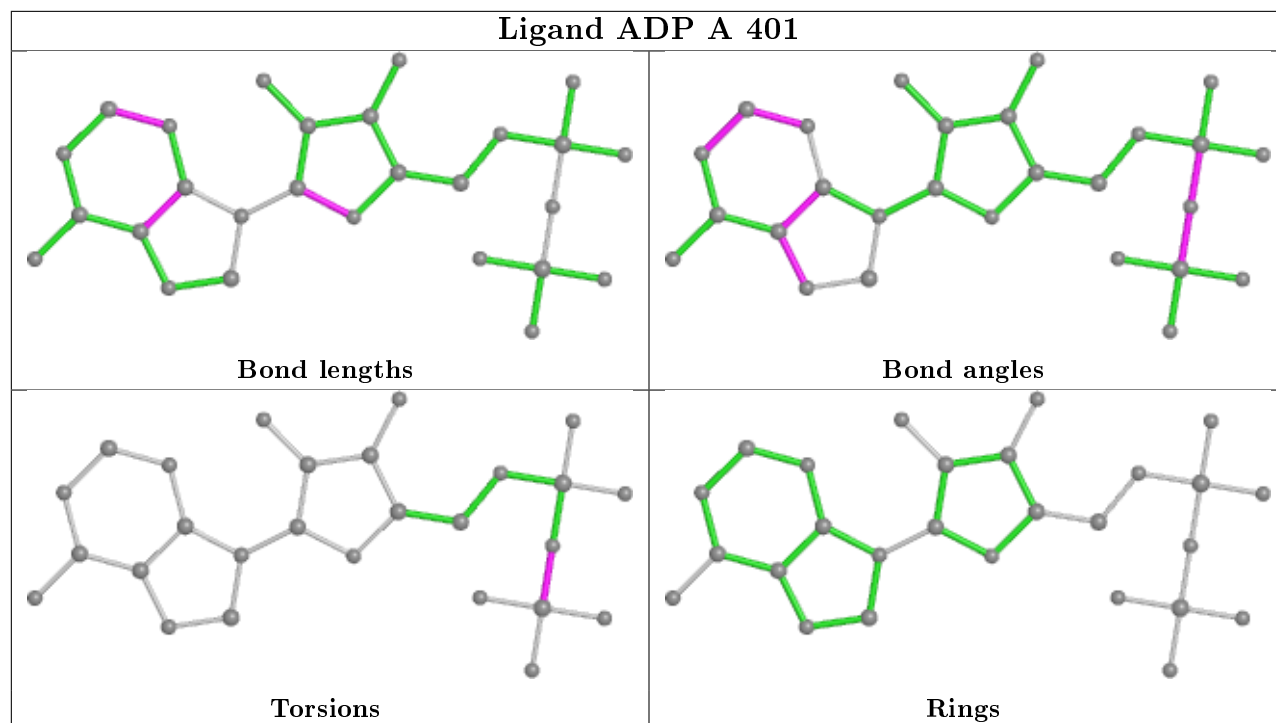
Ligand ADP F 401

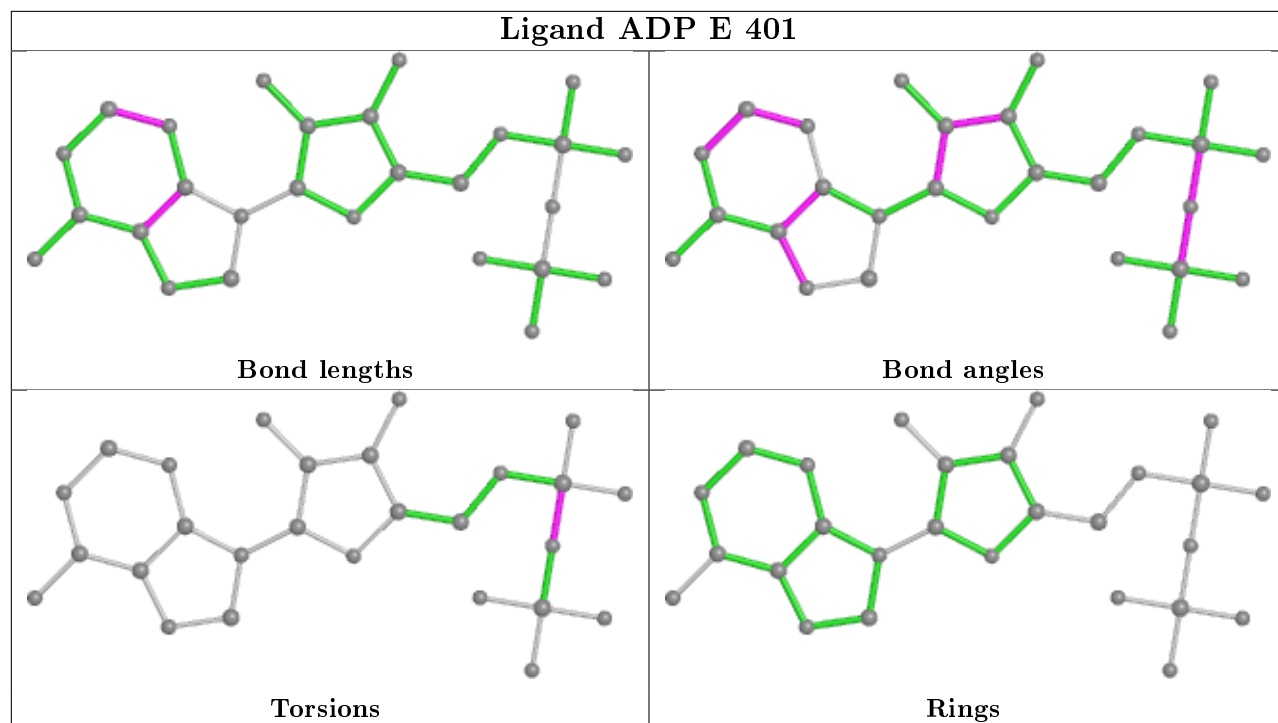


Ligand ADP D 401









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 [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	247/271 (91%)	-0.03	0	100	100	28, 54, 88, 100	0
1	B	247/271 (91%)	-0.09	0	100	100	33, 52, 81, 103	0
1	C	246/271 (90%)	-0.04	3 (1%)	79	75	31, 54, 84, 93	0
1	D	246/271 (90%)	-0.07	1 (0%)	92	90	33, 53, 80, 105	0
1	E	246/271 (90%)	-0.13	1 (0%)	92	90	30, 50, 79, 109	0
1	F	247/271 (91%)	0.01	3 (1%)	79	75	34, 55, 88, 122	0
1	G	246/271 (90%)	-0.16	0	100	100	32, 51, 77, 105	0
All	All	1725/1897 (90%)	-0.07	8 (0%)	91	89	28, 53, 84, 122	0

The worst 5 of 8 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	376	GLY	2.9
1	D	256	GLY	2.6
1	E	209	THR	2.4
1	F	327	PRO	2.3
1	C	376	GLY	2.2

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](#)

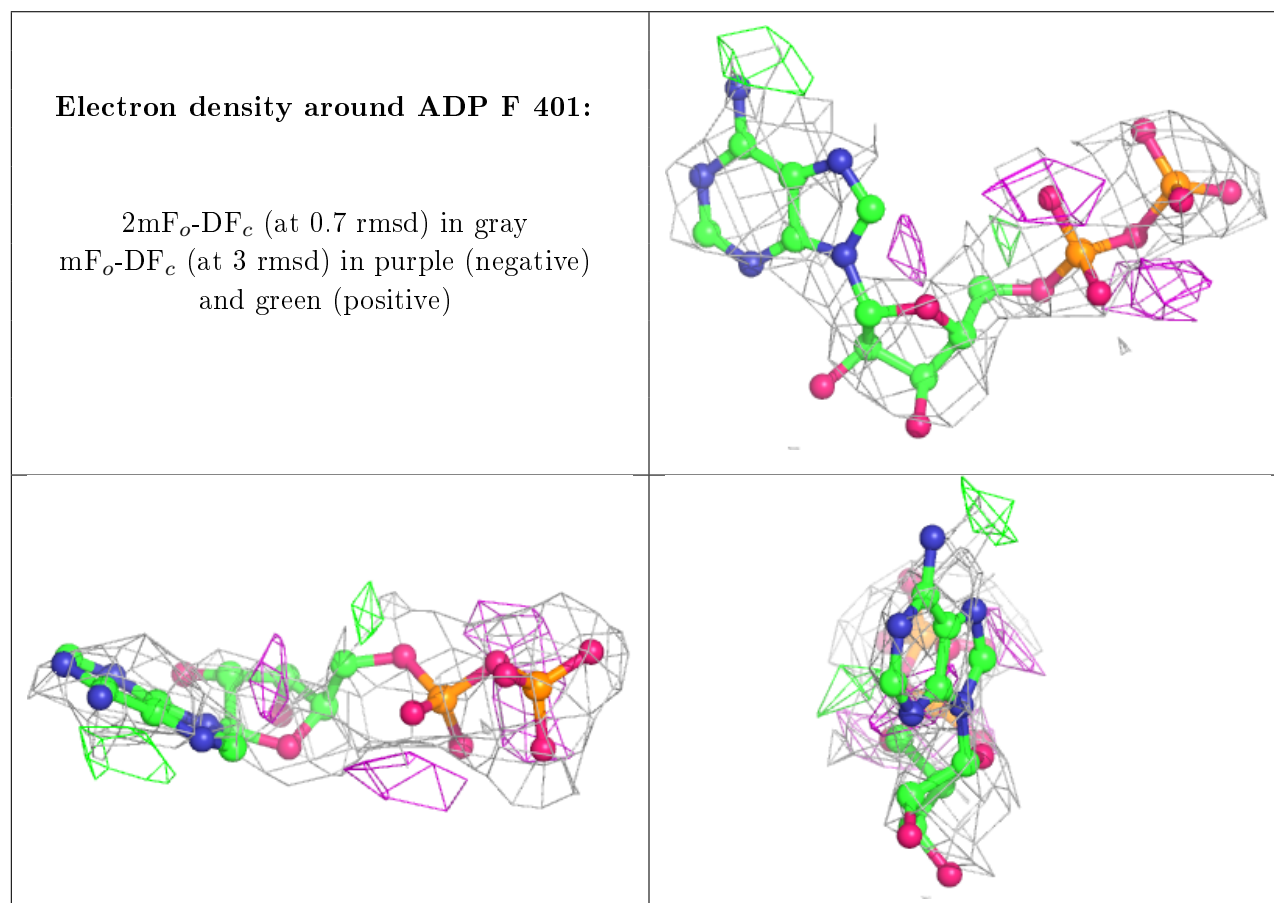
There are no carbohydrates in this entry.

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.

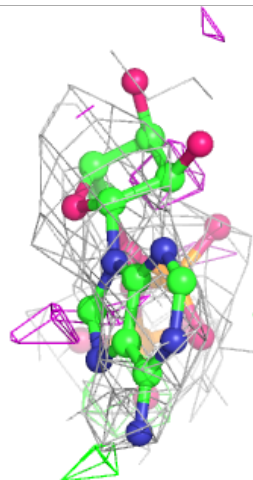
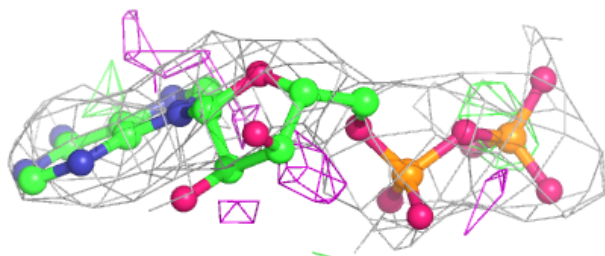
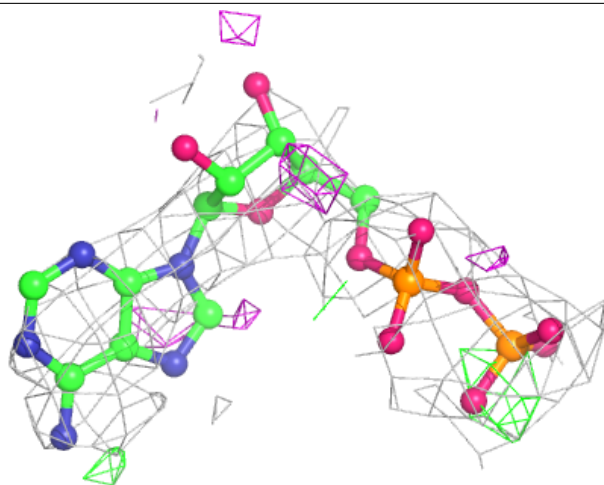
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	ADP	F	401	27/27	0.72	0.45	126,142,172,175	0
2	ADP	B	401	27/27	0.77	0.38	103,110,152,210	0
2	ADP	D	401	27/27	0.78	0.44	100,106,193,219	0
2	ADP	C	401	27/27	0.79	0.37	99,112,143,149	0
2	ADP	A	401	27/27	0.79	0.38	98,109,137,139	0
2	ADP	G	401	27/27	0.85	0.35	91,98,134,139	0
2	ADP	E	401	27/27	0.86	0.33	104,113,132,193	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.



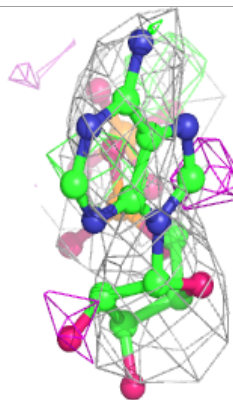
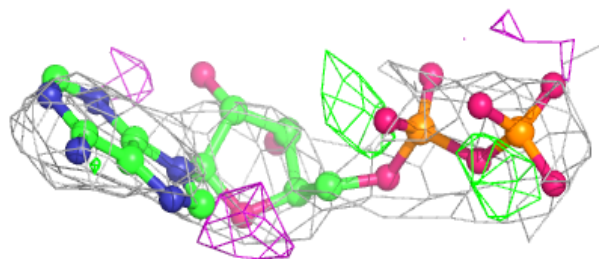
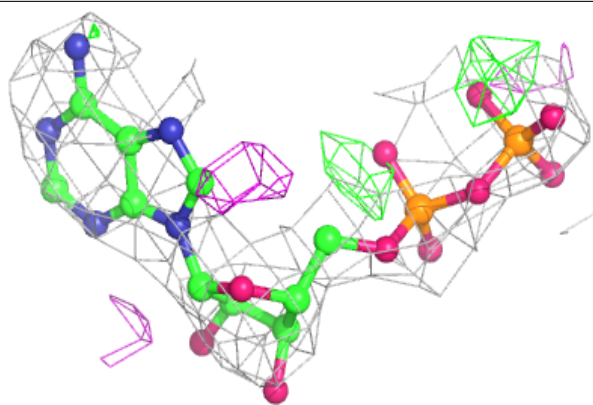
Electron density around ADP B 401:

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

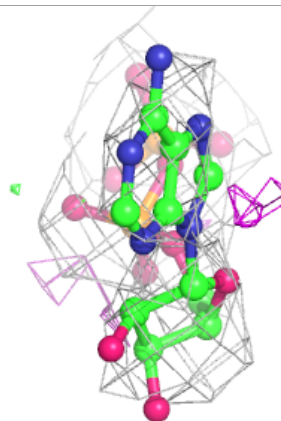
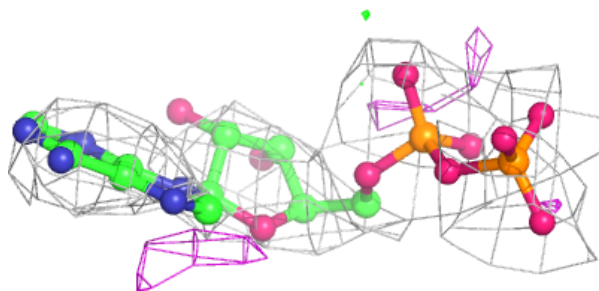
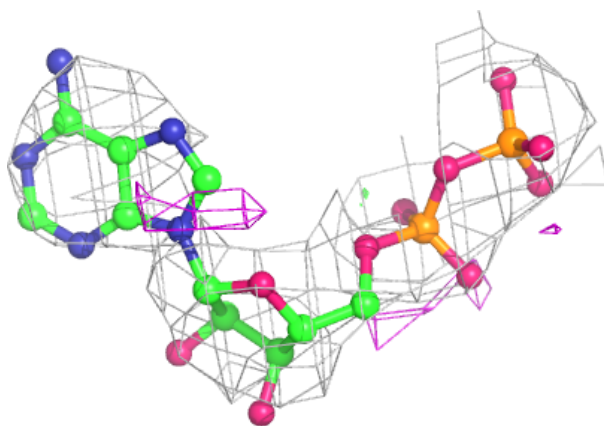


Electron density around ADP D 401:

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

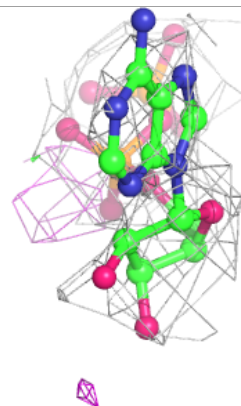
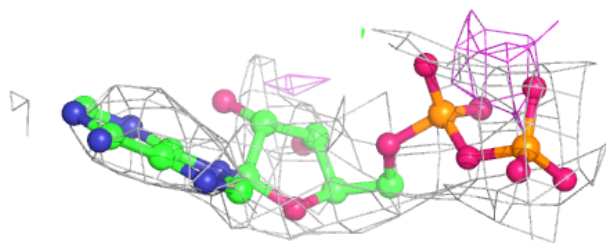
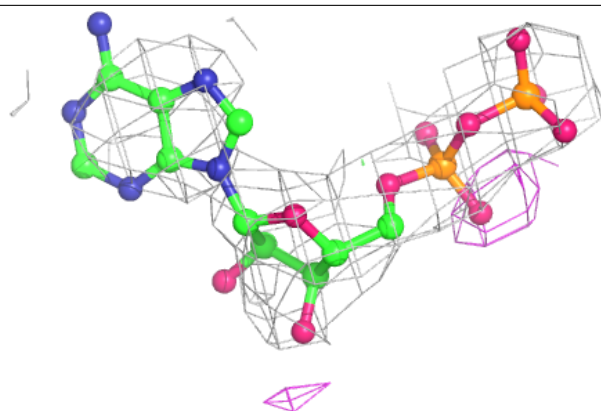
**Electron density around ADP C 401:**

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

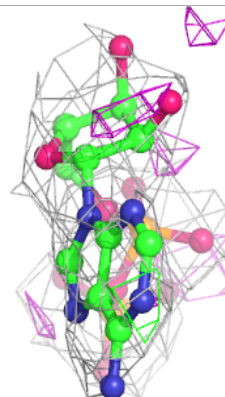
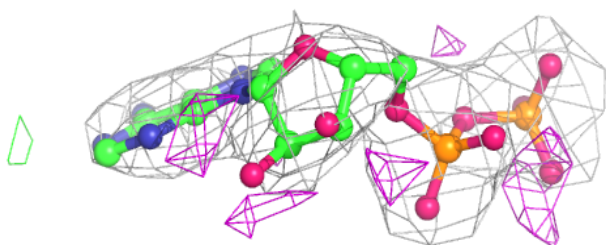
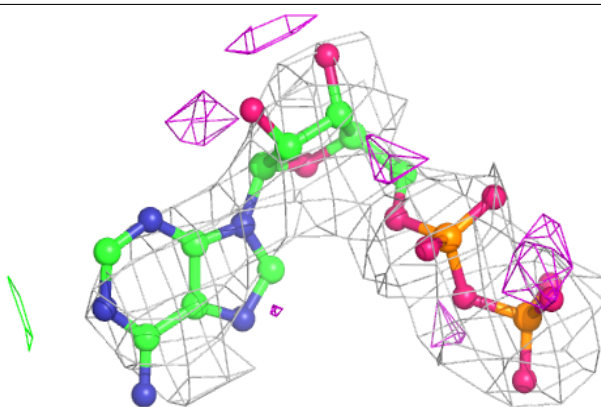


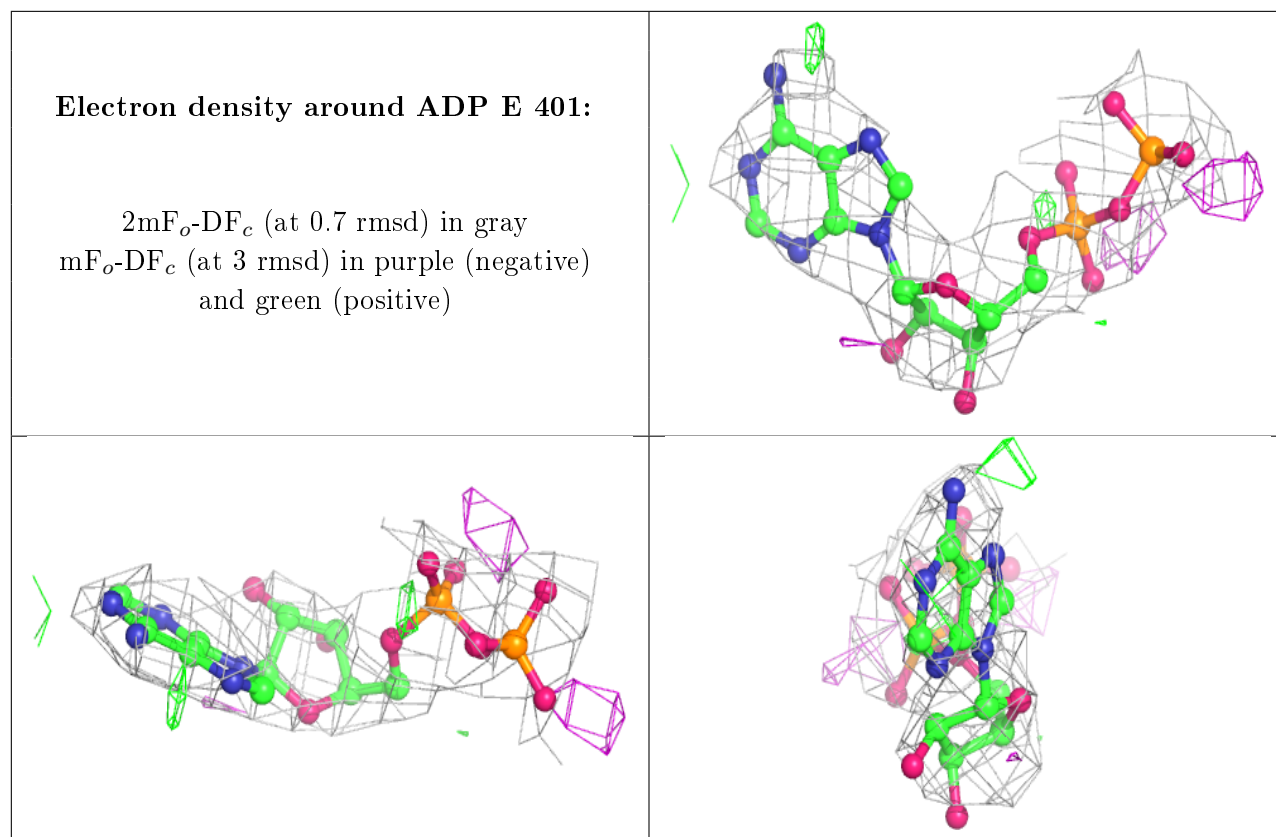
Electron density around ADP A 401:

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

**Electron density around ADP G 401:**

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





6.5 Other polymers [i](#)

There are no such residues in this entry.