



wwPDB X-ray Structure Validation Summary Report ⓘ

Apr 1, 2026 – 08:08 AM EDT

PDB ID : 9ZLL / pdb_00009zll
Title : Complex of N-terminal BrxC walker B, BrxB, and N-terminal PglZ from the Acinetobacter BREX system
Authors : Doyle, L.A.; Stoddard, B.L.; Kaiser, B.; Kaiser, A.
Deposited on : 2025-12-08
Resolution : 2.74 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 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 : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtrriage (Phenix) : 2.0
EDS : 3.0
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.48.1

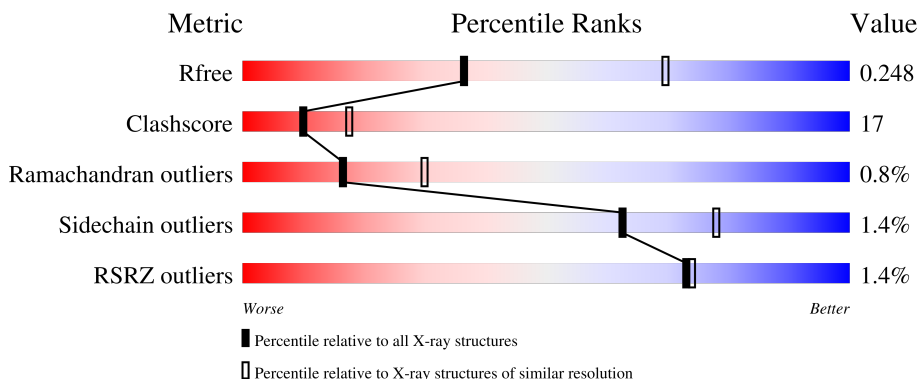
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.74 Å.

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



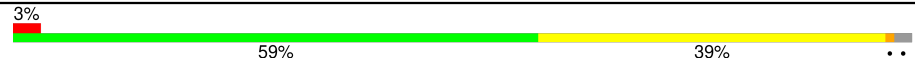


Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	1649 (2.76-2.72)
Clashscore	180529	1744 (2.76-2.72)
Ramachandran outliers	177936	1710 (2.76-2.72)
Sidechain outliers	177891	1711 (2.76-2.72)
RSRZ outliers	164620	1649 (2.76-2.72)

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	561	 71% 25%
1	B	561	 68% 24% 7%
1	C	561	 65% 30% 5%
1	D	561	 67% 28%
2	E	192	 71% 28%

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Mol	Chain	Length	Quality of chain
2	G	192	
3	F	105	
3	H	105	

2 Entry composition [i](#)

There are 8 unique types of molecules in this entry. The entry contains 21160 atoms, of which 48 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 Putative conjugative transfer protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	540	4153	2644	694	805	10	0	0	0
1	B	521	3851	2455	643	743	10	0	0	0
1	C	533	4138	2626	705	796	11	0	0	0
1	D	548	4192	2644	717	821	10	0	0	0

There are 44 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	0	MET	-	cloning artifact	UNP A0A1J0HS39
A	1	GLY	-	expression tag	UNP A0A1J0HS39
A	269	GLN	GLU	engineered mutation	UNP A0A1J0HS39
A	553	HIS	-	cloning artifact	UNP A0A1J0HS39
A	554	MET	-	cloning artifact	UNP A0A1J0HS39
A	555	GLU	-	expression tag	UNP A0A1J0HS39
A	556	ASN	-	expression tag	UNP A0A1J0HS39
A	557	LEU	-	expression tag	UNP A0A1J0HS39
A	558	TYR	-	expression tag	UNP A0A1J0HS39
A	559	PHE	-	expression tag	UNP A0A1J0HS39
A	560	GLN	-	expression tag	UNP A0A1J0HS39
B	0	MET	-	cloning artifact	UNP A0A1J0HS39
B	1	GLY	-	expression tag	UNP A0A1J0HS39
B	269	GLN	GLU	engineered mutation	UNP A0A1J0HS39
B	553	HIS	-	cloning artifact	UNP A0A1J0HS39
B	554	MET	-	cloning artifact	UNP A0A1J0HS39
B	555	GLU	-	expression tag	UNP A0A1J0HS39
B	556	ASN	-	expression tag	UNP A0A1J0HS39
B	557	LEU	-	expression tag	UNP A0A1J0HS39
B	558	TYR	-	expression tag	UNP A0A1J0HS39
B	559	PHE	-	expression tag	UNP A0A1J0HS39

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Chain	Residue	Modelled	Actual	Comment	Reference
B	560	GLN	-	expression tag	UNP A0A1J0HS39
C	0	MET	-	cloning artifact	UNP A0A1J0HS39
C	1	GLY	-	expression tag	UNP A0A1J0HS39
C	269	GLN	GLU	engineered mutation	UNP A0A1J0HS39
C	553	HIS	-	cloning artifact	UNP A0A1J0HS39
C	554	MET	-	cloning artifact	UNP A0A1J0HS39
C	555	GLU	-	expression tag	UNP A0A1J0HS39
C	556	ASN	-	expression tag	UNP A0A1J0HS39
C	557	LEU	-	expression tag	UNP A0A1J0HS39
C	558	TYR	-	expression tag	UNP A0A1J0HS39
C	559	PHE	-	expression tag	UNP A0A1J0HS39
C	560	GLN	-	expression tag	UNP A0A1J0HS39
D	0	MET	-	cloning artifact	UNP A0A1J0HS39
D	1	GLY	-	expression tag	UNP A0A1J0HS39
D	269	GLN	GLU	engineered mutation	UNP A0A1J0HS39
D	553	HIS	-	cloning artifact	UNP A0A1J0HS39
D	554	MET	-	cloning artifact	UNP A0A1J0HS39
D	555	GLU	-	expression tag	UNP A0A1J0HS39
D	556	ASN	-	expression tag	UNP A0A1J0HS39
D	557	LEU	-	expression tag	UNP A0A1J0HS39
D	558	TYR	-	expression tag	UNP A0A1J0HS39
D	559	PHE	-	expression tag	UNP A0A1J0HS39
D	560	GLN	-	expression tag	UNP A0A1J0HS39

- Molecule 2 is a protein called DUF1788 domain-containing protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	E	190	Total	C	N	O	S	0	0	0
			1493	972	253	263	5			
2	G	189	Total	C	N	O	S	0	0	0
			1443	941	245	253	4			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	0	MET	-	initiating methionine	UNP A0A1L6KSM0
E	1	GLY	-	expression tag	UNP A0A1L6KSM0
G	0	MET	-	initiating methionine	UNP A0A1L6KSM0
G	1	GLY	-	expression tag	UNP A0A1L6KSM0

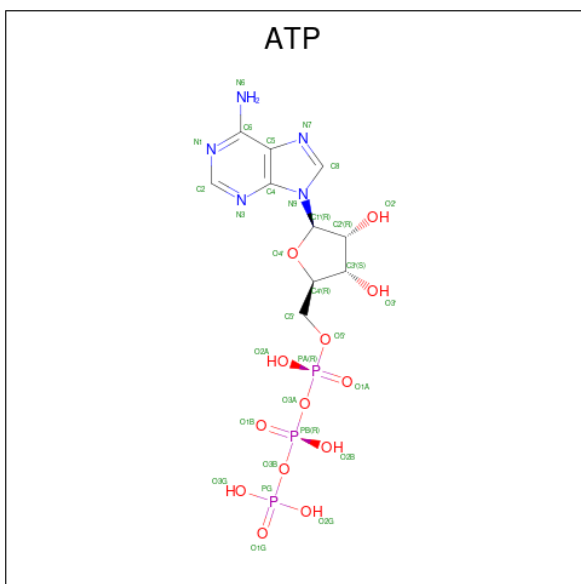
- Molecule 3 is a protein called BREX-1 system phosphatase PglZ type A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	F	96	Total	C	N	O	S	0	0	0
			772	503	123	145	1			
3	H	86	Total	C	N	O	S	0	0	0
			603	382	103	117	1			

There are 14 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	0	MET	-	initiating methionine	UNP A0A558EY06
F	1	GLY	-	expression tag	UNP A0A558EY06
F	100	LEU	-	expression tag	UNP A0A558EY06
F	101	VAL	-	expression tag	UNP A0A558EY06
F	102	GLY	-	expression tag	UNP A0A558EY06
F	103	PRO	-	expression tag	UNP A0A558EY06
F	104	ARG	-	expression tag	UNP A0A558EY06
H	0	MET	-	initiating methionine	UNP A0A558EY06
H	1	GLY	-	expression tag	UNP A0A558EY06
H	100	LEU	-	expression tag	UNP A0A558EY06
H	101	VAL	-	expression tag	UNP A0A558EY06
H	102	GLY	-	expression tag	UNP A0A558EY06
H	103	PRO	-	expression tag	UNP A0A558EY06
H	104	ARG	-	expression tag	UNP A0A558EY06

- Molecule 4 is ADENOSINE-5'-TRIPHOSPHATE (CCD ID: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
4	A	1	Total	C	H	N	O	P	0	0
			43	10	12	5	13	3		
4	B	1	Total	C	H	N	O	P	0	0
			43	10	12	5	13	3		
4	C	1	Total	C	H	N	O	P	0	0
			43	10	12	5	13	3		
4	D	1	Total	C	H	N	O	P	0	0
			43	10	12	5	13	3		

- Molecule 5 is CALCIUM ION (CCD ID: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	3	Total	Ca	0	0
			3	3		
5	B	1	Total	Ca	0	0
			1	1		
5	C	1	Total	Ca	0	0
			1	1		
5	E	1	Total	Ca	0	0
			1	1		

- Molecule 6 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	1	Total	Cl	0	0
			1	1		

- Molecule 7 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	D	1	Total	Mg	0	0
			1	1		
7	E	1	Total	Mg	0	0
			1	1		

- Molecule 8 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	72	Total	O	0	0
			72	72		
8	B	43	Total	O	0	0
			43	43		

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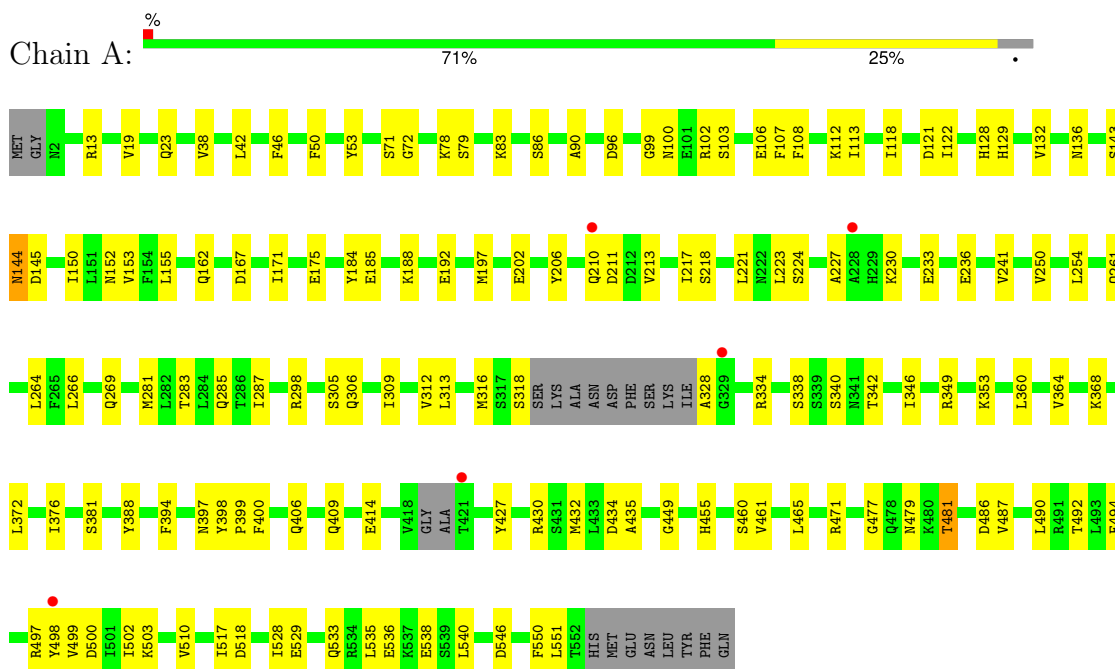
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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	C	79	Total O 79 79	0	0
8	D	63	Total O 63 63	0	0
8	E	43	Total O 43 43	0	0
8	F	22	Total O 22 22	0	0
8	G	11	Total O 11 11	0	0
8	H	1	Total O 1 1	0	0

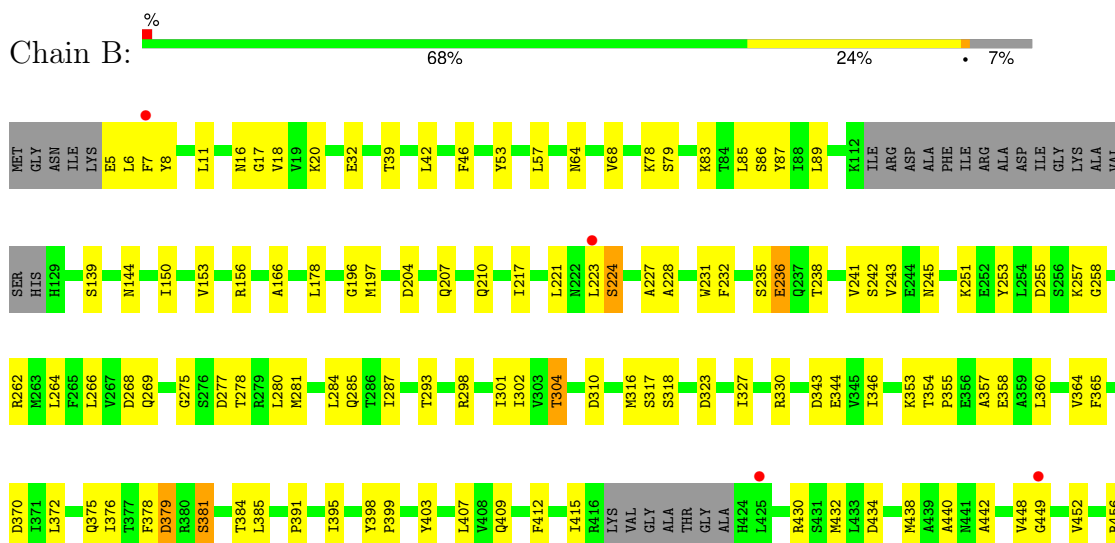
3 Residue-property plots [i](#)

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.

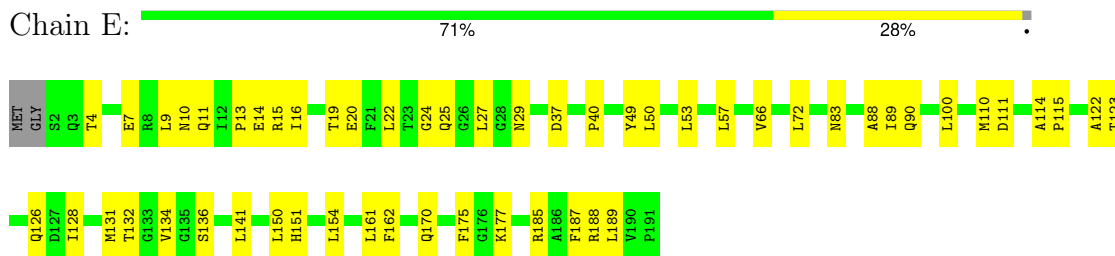
- Molecule 1: Putative conjugative transfer protein



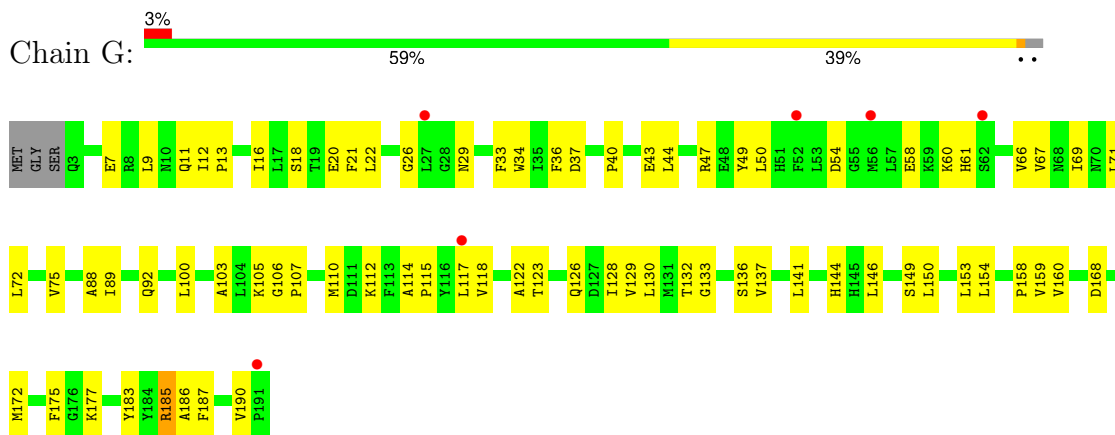
- Molecule 1: Putative conjugative transfer protein



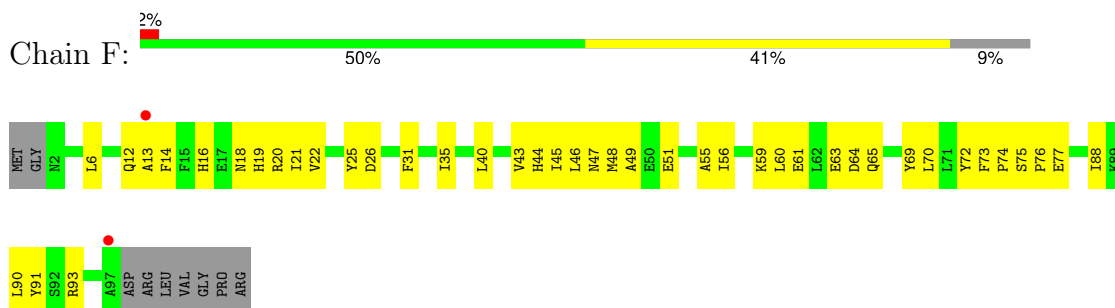
- Molecule 2: DUF1788 domain-containing protein



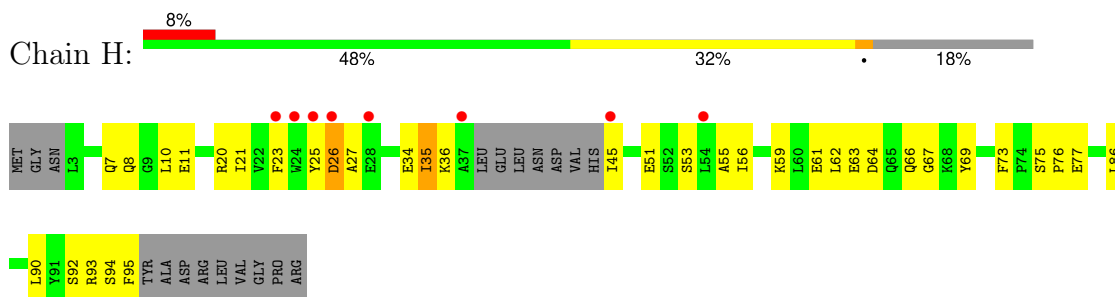
- Molecule 2: DUF1788 domain-containing protein



- Molecule 3: BREX-1 system phosphatase PglZ type A



- Molecule 3: BREX-1 system phosphatase PglZ type A



4 Data and refinement statistics i

Property	Value	Source
Space group	I 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	149.25Å 114.99Å 194.05Å 90.00° 108.03° 90.00°	Depositor
Resolution (Å)	49.68 – 2.74 49.68 – 2.74	Depositor EDS
% Data completeness (in resolution range)	94.9 (49.68-2.74) 94.9 (49.68-2.74)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.71 (at 2.73Å)	Xtrriage
Refinement program	PHENIX 1.21.1_5286+SVN	Depositor
R, R_{free}	0.206 , 0.248 0.206 , 0.248	Depositor DCC
R_{free} test set	1889 reflections (2.30%)	wwPDB-VP
Wilson B-factor (Å ²)	59.3	Xtrriage
Anisotropy	0.222	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 55.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	0.013 for $-1/2^*h+1/2^*k+1/2^*l, 1/2^*h-1/2^*k+1/2^*l, h+k$ 0.019 for $-1/2^*h-1/2^*k+1/2^*l, -1/2^*h-1/2^*k-1/2^*l, h-k$	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	21160	wwPDB-VP
Average B, all atoms (Å ²)	66.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.69% 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: CL, MG, ATP, CA

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	0.15	0/4236	0.41	0/5745
1	B	0.15	0/3932	0.39	0/5349
1	C	0.16	0/4219	0.38	0/5712
1	D	0.18	0/4275	0.43	0/5792
2	E	0.14	0/1532	0.35	0/2084
2	G	0.13	0/1482	0.34	0/2021
3	F	0.15	0/792	0.40	0/1075
3	H	0.18	0/614	0.47	0/840
All	All	0.16	0/21082	0.40	0/28618

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 [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	4153	0	3864	101	1
1	B	3851	0	3403	116	1
1	C	4138	0	3906	149	1
1	D	4192	0	3841	165	0
2	E	1493	0	1462	42	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	G	1443	0	1364	74	0
3	F	772	0	712	31	0
3	H	603	0	484	31	0
4	A	31	12	12	3	0
4	B	31	12	12	1	0
4	C	31	12	12	2	0
4	D	31	12	12	1	0
5	A	3	0	0	0	0
5	B	1	0	0	0	0
5	C	1	0	0	0	0
5	E	1	0	0	0	0
6	A	1	0	0	0	0
7	D	1	0	0	0	0
7	E	1	0	0	0	0
8	A	72	0	0	5	0
8	B	43	0	0	3	0
8	C	79	0	0	6	0
8	D	63	0	0	9	0
8	E	43	0	0	2	0
8	F	22	0	0	2	0
8	G	11	0	0	3	0
8	H	1	0	0	0	0
All	All	21112	48	19084	680	2

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 17.

The worst 5 of 680 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:346:ILE:HD11	1:C:432:MET:HB3	1.42	1.01
1:A:481:THR:HG21	1:B:384:THR:HG21	1.40	0.99
1:A:372:LEU:HD21	1:A:517:ILE:HG12	1.46	0.98
1:D:372:LEU:HD21	1:D:517:ILE:HD13	1.44	0.98
1:C:270:VAL:HG21	1:C:303:VAL:HG22	1.49	0.92

All (2) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:278:THR:OG1	1:C:356:GLU:OE1[4_455]	1.98	0.22
1:A:536:GLU:OE1	1:B:381:SER:OG[2_555]	2.15	0.05

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	534/561 (95%)	511 (96%)	19 (4%)	4 (1%)	19	33
1	B	513/561 (91%)	493 (96%)	18 (4%)	2 (0%)	30	48
1	C	527/561 (94%)	509 (97%)	15 (3%)	3 (1%)	22	37
1	D	544/561 (97%)	517 (95%)	20 (4%)	7 (1%)	10	17
2	E	188/192 (98%)	183 (97%)	5 (3%)	0	100	100
2	G	187/192 (97%)	180 (96%)	5 (3%)	2 (1%)	12	21
3	F	94/105 (90%)	83 (88%)	11 (12%)	0	100	100
3	H	82/105 (78%)	67 (82%)	12 (15%)	3 (4%)	2	4
All	All	2669/2838 (94%)	2543 (95%)	105 (4%)	21 (1%)	16	30

5 of 21 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	144	ASN
1	B	480	LYS
1	D	379	ASP
1	D	398	TYR
2	G	60	LYS

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	418/486 (86%)	413 (99%)	5 (1%)	67	82
1	B	359/486 (74%)	352 (98%)	7 (2%)	52	71
1	C	425/486 (87%)	419 (99%)	6 (1%)	62	78
1	D	415/486 (85%)	406 (98%)	9 (2%)	47	68
2	E	154/165 (93%)	153 (99%)	1 (1%)	84	90
2	G	139/165 (84%)	138 (99%)	1 (1%)	81	89
3	F	77/95 (81%)	77 (100%)	0	100	100
3	H	47/95 (50%)	47 (100%)	0	100	100
All	All	2034/2464 (82%)	2005 (99%)	29 (1%)	62	78

5 of 29 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	276	SER
2	E	19	THR
1	C	481	THR
1	D	472	THR
1	C	377	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 34 such sidechains are listed below:

Mol	Chain	Res	Type
3	F	47	ASN
3	F	66	GLN
2	G	156	HIS
1	C	272	GLN
1	C	248	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 13 ligands modelled in this entry, 9 are monoatomic - leaving 4 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
4	ATP	D	601	-	28,33,33	0.65	0	34,52,52	0.99	3 (8%)
4	ATP	B	601	-	28,33,33	0.65	0	34,52,52	0.93	2 (5%)
4	ATP	A	601	5	28,33,33	0.68	0	34,52,52	0.96	3 (8%)
4	ATP	C	601	-	28,33,33	0.67	0	34,52,52	0.94	2 (5%)

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
4	ATP	D	601	-	-	0/18/38/38	0/3/3/3
4	ATP	B	601	-	-	4/18/38/38	0/3/3/3
4	ATP	A	601	5	-	2/18/38/38	0/3/3/3
4	ATP	C	601	-	-	5/18/38/38	0/3/3/3

There are no bond length outliers.

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

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	D	601	ATP	O4'-C1'-N9	-2.78	105.05	108.75
4	A	601	ATP	O4'-C1'-N9	-2.73	105.13	108.75
4	C	601	ATP	O4'-C1'-N9	-2.52	105.40	108.75
4	B	601	ATP	O4'-C1'-N9	-2.41	105.55	108.75

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	C	601	ATP	C5-C6-N6	2.18	123.62	120.31

There are no chirality outliers.

5 of 11 torsion outliers are listed below:

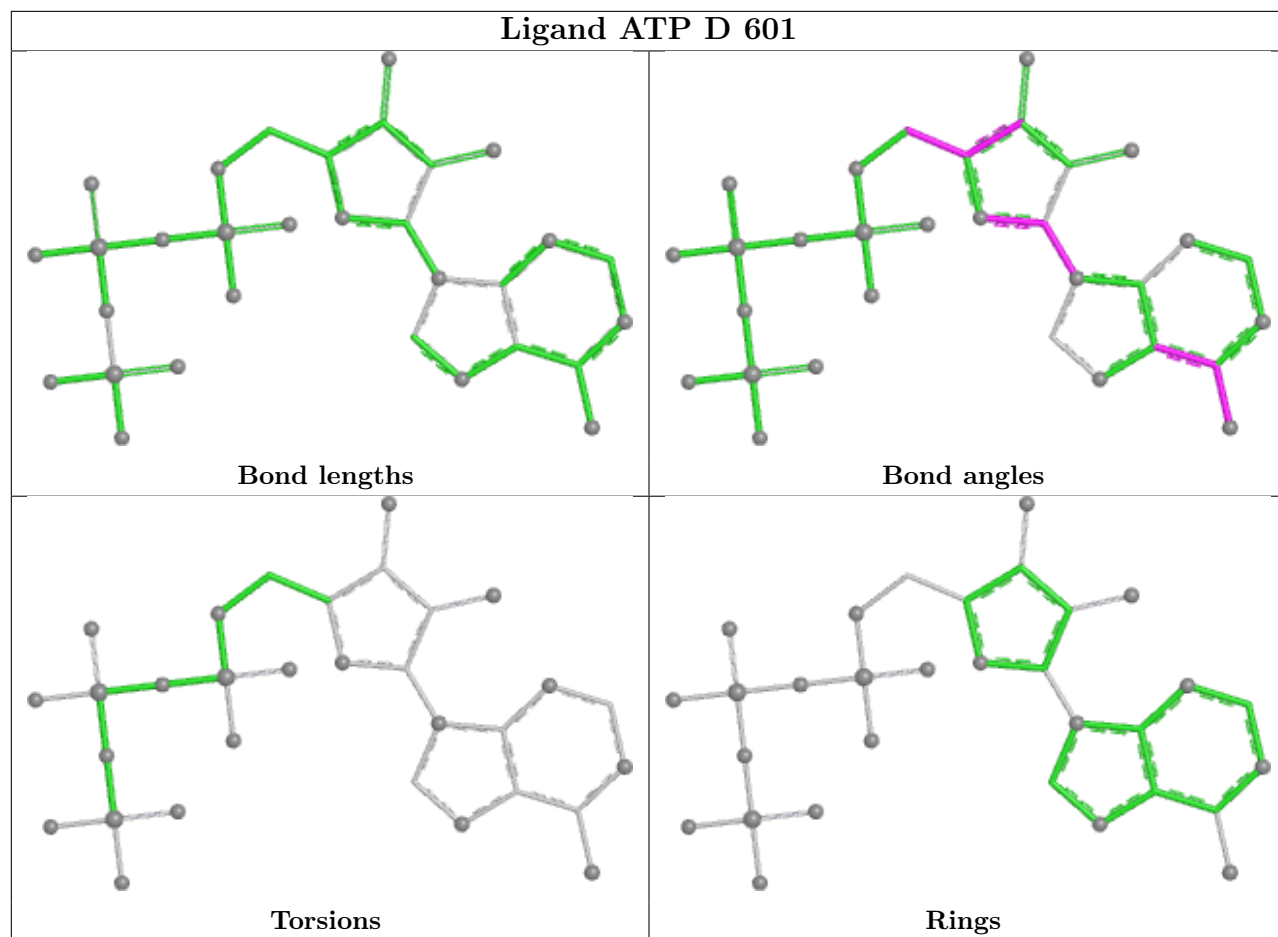
Mol	Chain	Res	Type	Atoms
4	A	601	ATP	PB-O3B-PG-O2G
4	B	601	ATP	PB-O3B-PG-O3G
4	B	601	ATP	O4'-C4'-C5'-O5'
4	C	601	ATP	O4'-C4'-C5'-O5'
4	B	601	ATP	PB-O3B-PG-O2G

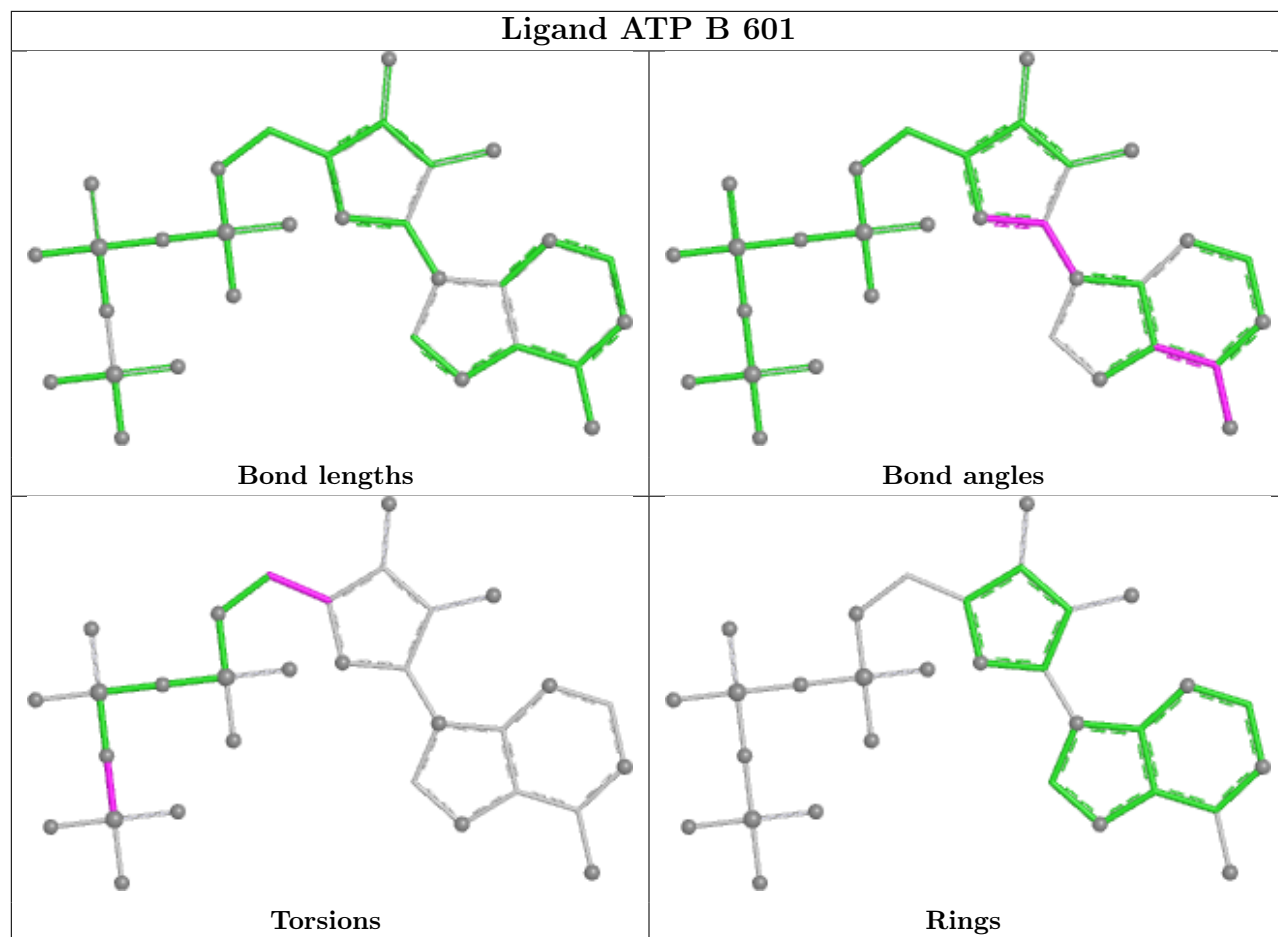
There are no ring outliers.

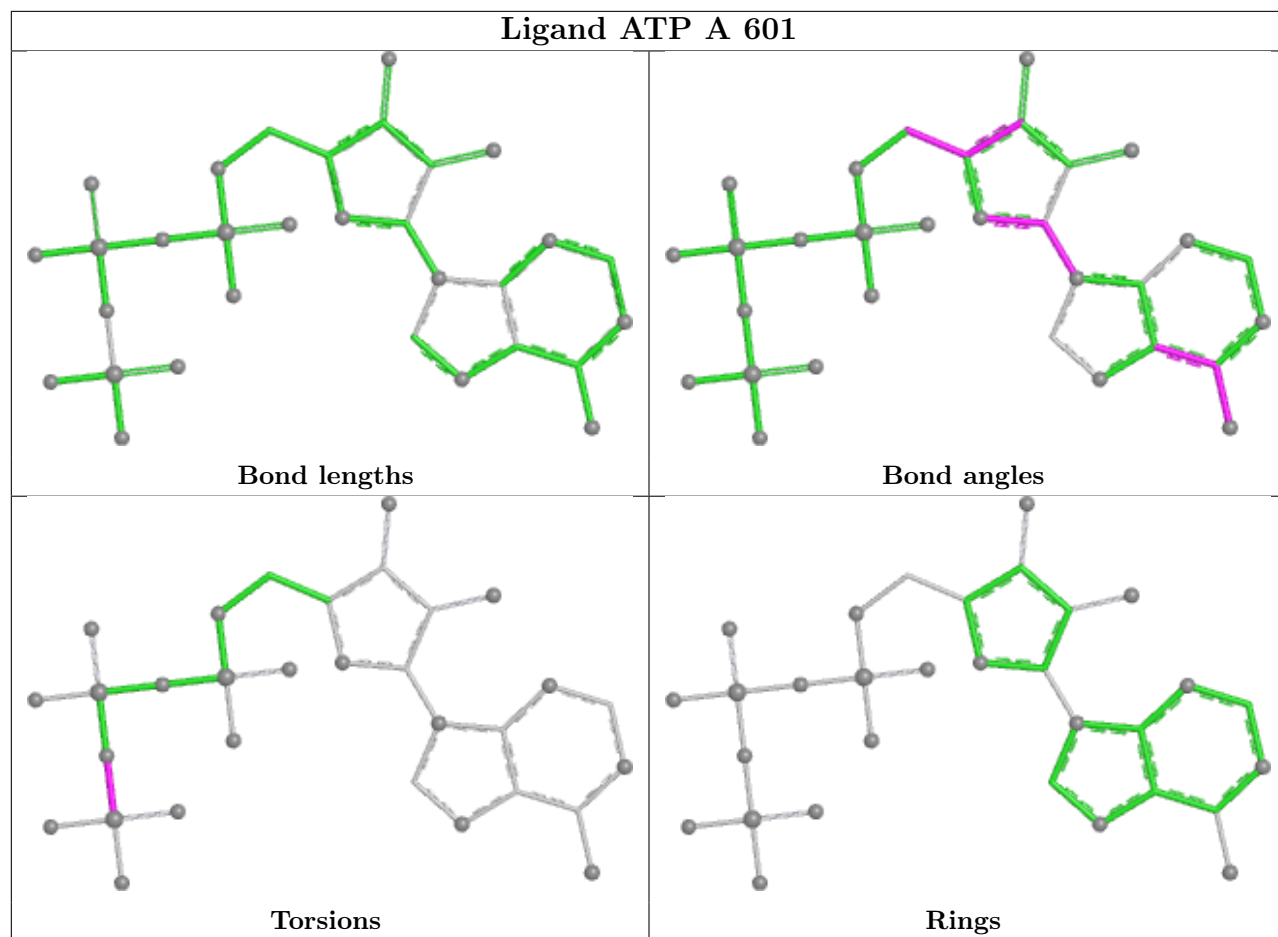
4 monomers are involved in 7 short contacts:

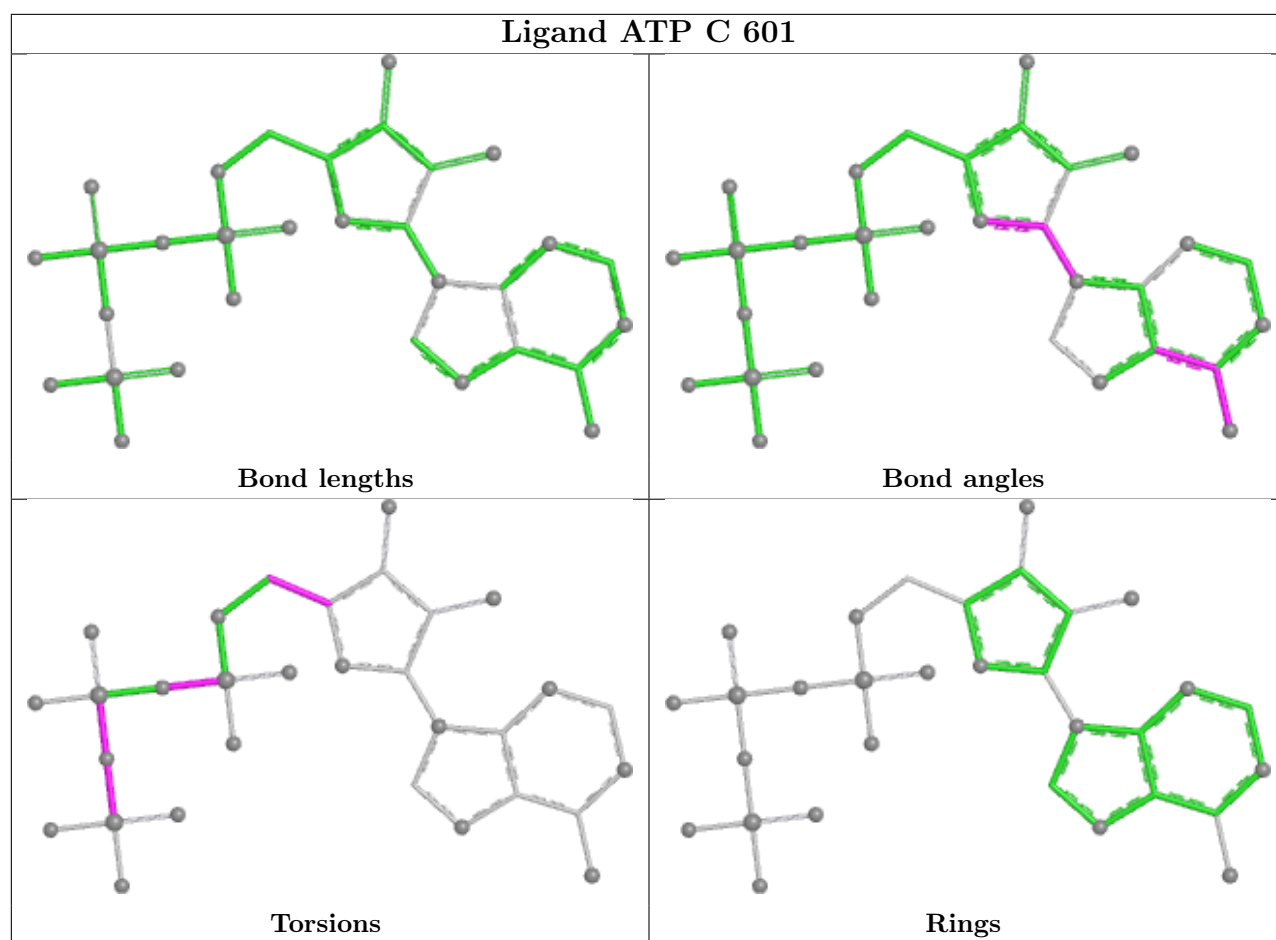
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	D	601	ATP	1	0
4	B	601	ATP	1	0
4	A	601	ATP	3	0
4	C	601	ATP	2	0

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.









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	540/561 (96%)	-0.08	5 (0%) 81 82	41, 64, 95, 109	0
1	B	521/561 (92%)	0.16	6 (1%) 76 78	43, 72, 110, 127	0
1	C	533/561 (95%)	-0.01	3 (0%) 85 87	38, 63, 92, 109	0
1	D	548/561 (97%)	-0.03	7 (1%) 74 76	36, 60, 106, 126	0
2	E	190/192 (98%)	-0.35	0 100 100	33, 47, 76, 96	0
2	G	189/192 (98%)	0.21	6 (3%) 50 51	54, 74, 112, 123	0
3	F	96/105 (91%)	-0.09	2 (2%) 63 63	42, 68, 88, 93	0
3	H	86/105 (81%)	0.72	8 (9%) 16 18	71, 99, 113, 134	0
All	All	2703/2838 (95%)	0.01	37 (1%) 73 74	33, 65, 104, 134	0

The worst 5 of 37 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	328	ALA	3.3
3	H	26	ASP	3.1
1	B	469	VAL	3.0
1	D	111	SER	2.9
1	B	7	PHE	2.9

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 oligosaccharides in this entry.

6.4 Ligands

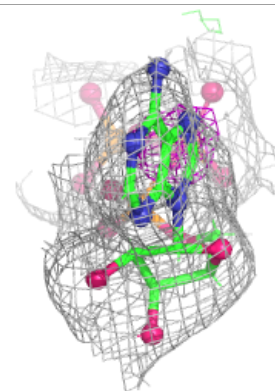
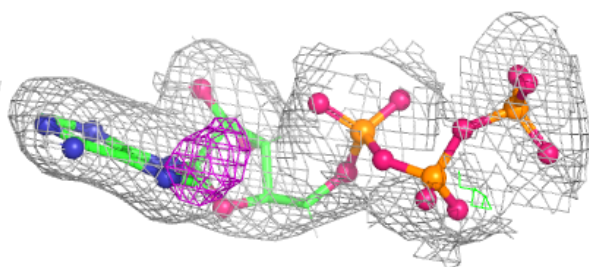
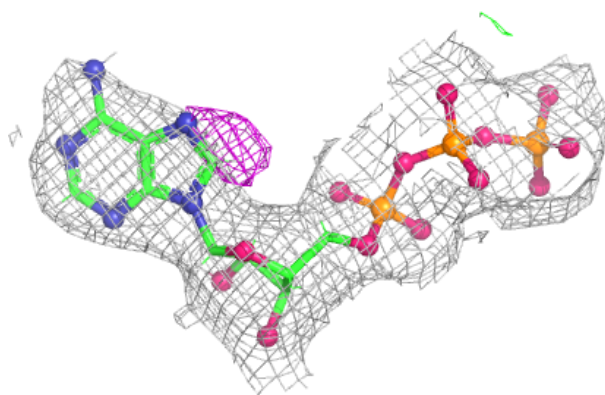
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
5	CA	A	604	1/1	0.72	0.33	156,156,156,156	0
4	ATP	B	601	31/31	0.92	0.09	44,61,74,89	0
6	CL	A	605	1/1	0.93	0.10	67,67,67,67	0
4	ATP	C	601	31/31	0.94	0.08	41,50,62,79	0
4	ATP	D	601	31/31	0.94	0.09	33,48,58,78	0
5	CA	E	202	1/1	0.95	0.06	62,62,62,62	0
7	MG	E	201	1/1	0.95	0.14	35,35,35,35	0
5	CA	C	602	1/1	0.96	0.08	60,60,60,60	0
5	CA	A	602	1/1	0.96	0.07	58,58,58,58	0
4	ATP	A	601	31/31	0.97	0.06	33,45,58,76	0
7	MG	D	602	1/1	0.98	0.04	31,31,31,31	0
5	CA	A	603	1/1	0.98	0.06	54,54,54,54	0
5	CA	B	602	1/1	0.99	0.05	61,61,61,61	0

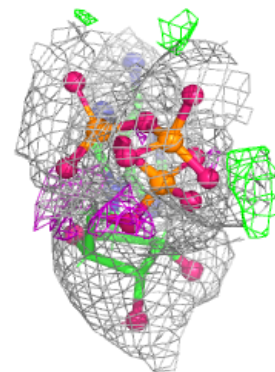
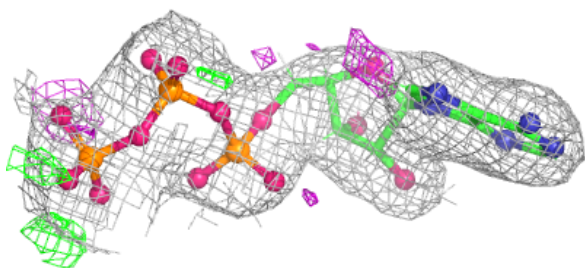
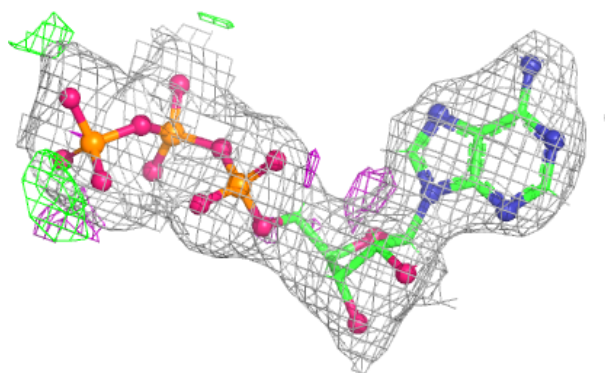
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around ATP B 601:

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

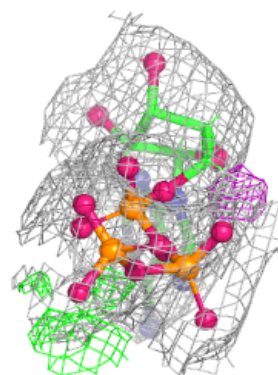
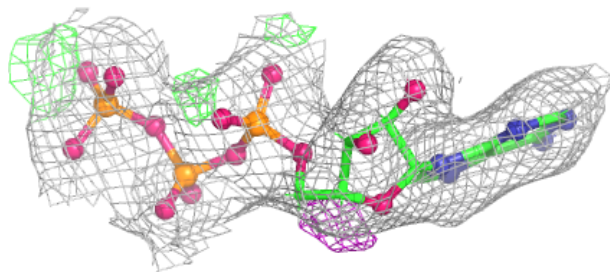
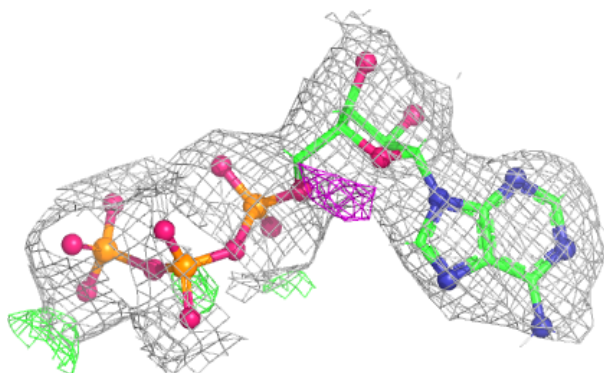
**Electron density around ATP C 601:**

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

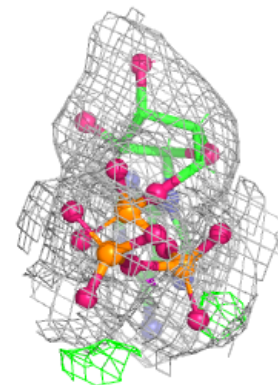
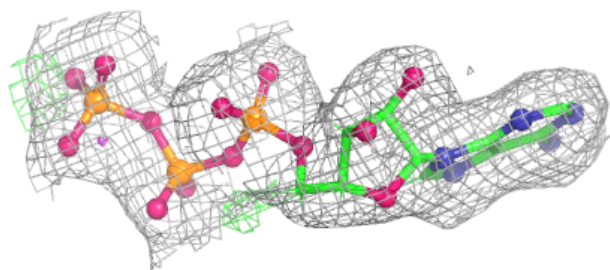
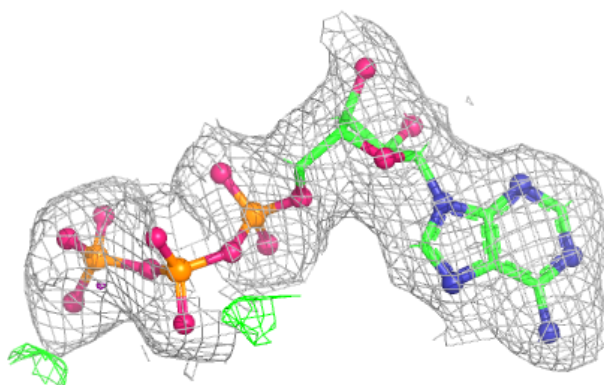


Electron density around ATP D 601:

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

**Electron density around ATP A 601:**

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



6.5 Other polymers [i](#)

There are no such residues in this entry.