



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 7, 2026 – 04:17 AM UTC

PDB ID : 6UNP / pdb_00006unp
Title : Crystal structure of the kinase domain of BMPR2-D485G
Authors : Agnew, C.; Jura, N.
Deposited on : 2019-10-13
Resolution : 2.30 Å(reported)

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

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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)
Xtriage (Phenix) : 2.0
EDS : 3.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
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) : 2.49

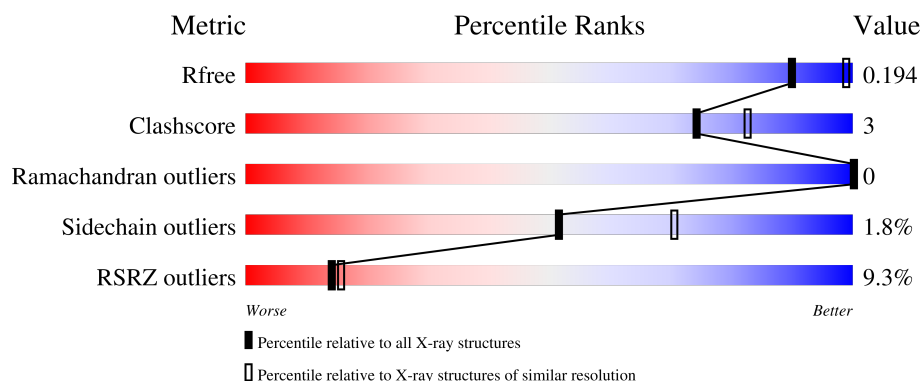
1 Overall quality at a glance

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}	180053	6319 (2.30-2.30)
Clashscore	190562	6919 (2.30-2.30)
Ramachandran outliers	187476	6854 (2.30-2.30)
Sidechain outliers	187428	6854 (2.30-2.30)
RSRZ outliers	180081	6325 (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	363	
1	B	363	

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 4994 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 Bone morphogenetic protein receptor type-2.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	302	Total	As	C	N	O	S	0	2	0
			2367	3	1501	407	436	20			
1	B	303	Total	As	C	N	O	S	0	1	0
			2397	4	1513	416	445	19			

There are 44 discrepancies between the modelled and reference sequences:

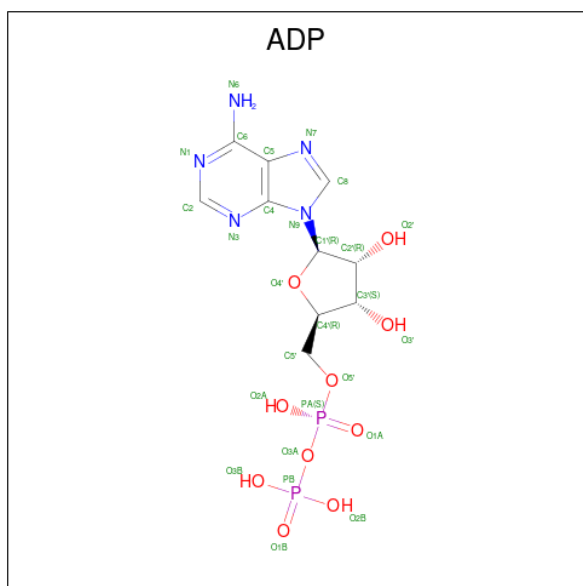
Chain	Residue	Modelled	Actual	Comment	Reference
A	167	MET	-	initiating methionine	UNP Q13873
A	168	GLY	-	expression tag	UNP Q13873
A	169	SER	-	expression tag	UNP Q13873
A	170	SER	-	expression tag	UNP Q13873
A	171	HIS	-	expression tag	UNP Q13873
A	172	HIS	-	expression tag	UNP Q13873
A	173	HIS	-	expression tag	UNP Q13873
A	174	HIS	-	expression tag	UNP Q13873
A	175	HIS	-	expression tag	UNP Q13873
A	176	HIS	-	expression tag	UNP Q13873
A	177	SER	-	expression tag	UNP Q13873
A	178	SER	-	expression tag	UNP Q13873
A	179	GLY	-	expression tag	UNP Q13873
A	180	GLU	-	expression tag	UNP Q13873
A	181	ASN	-	expression tag	UNP Q13873
A	182	LEU	-	expression tag	UNP Q13873
A	183	TYR	-	expression tag	UNP Q13873
A	184	PHE	-	expression tag	UNP Q13873
A	185	GLN	-	expression tag	UNP Q13873
A	186	GLY	-	expression tag	UNP Q13873
A	187	HIS	-	expression tag	UNP Q13873
A	485	GLY	ASP	engineered mutation	UNP Q13873
B	167	MET	-	initiating methionine	UNP Q13873
B	168	GLY	-	expression tag	UNP Q13873
B	169	SER	-	expression tag	UNP Q13873

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Chain	Residue	Modelled	Actual	Comment	Reference
B	170	SER	-	expression tag	UNP Q13873
B	171	HIS	-	expression tag	UNP Q13873
B	172	HIS	-	expression tag	UNP Q13873
B	173	HIS	-	expression tag	UNP Q13873
B	174	HIS	-	expression tag	UNP Q13873
B	175	HIS	-	expression tag	UNP Q13873
B	176	HIS	-	expression tag	UNP Q13873
B	177	SER	-	expression tag	UNP Q13873
B	178	SER	-	expression tag	UNP Q13873
B	179	GLY	-	expression tag	UNP Q13873
B	180	GLU	-	expression tag	UNP Q13873
B	181	ASN	-	expression tag	UNP Q13873
B	182	LEU	-	expression tag	UNP Q13873
B	183	TYR	-	expression tag	UNP Q13873
B	184	PHE	-	expression tag	UNP Q13873
B	185	GLN	-	expression tag	UNP Q13873
B	186	GLY	-	expression tag	UNP Q13873
B	187	HIS	-	expression tag	UNP Q13873
B	485	GLY	ASP	engineered mutation	UNP Q13873

- Molecule 2 is ADENOSINE-5'-DIPHOSPHATE (CCD ID: ADP) (formula: $C_{10}H_{15}N_5O_{10}P_2$).



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

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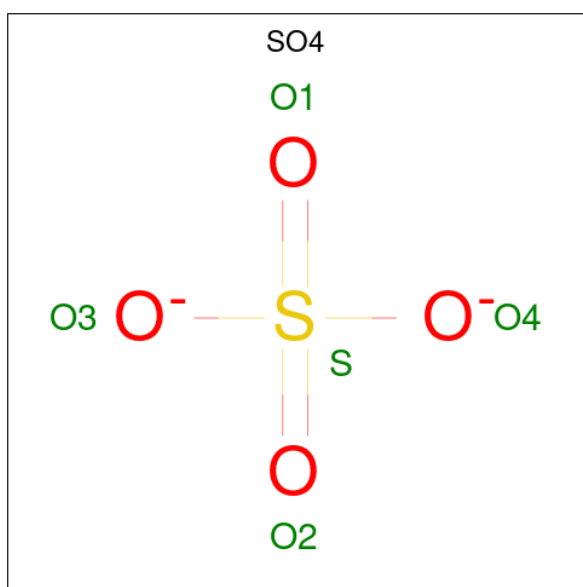
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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	B	1	Total	C	N	O	P	0	0
			27	10	5	10	2		

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

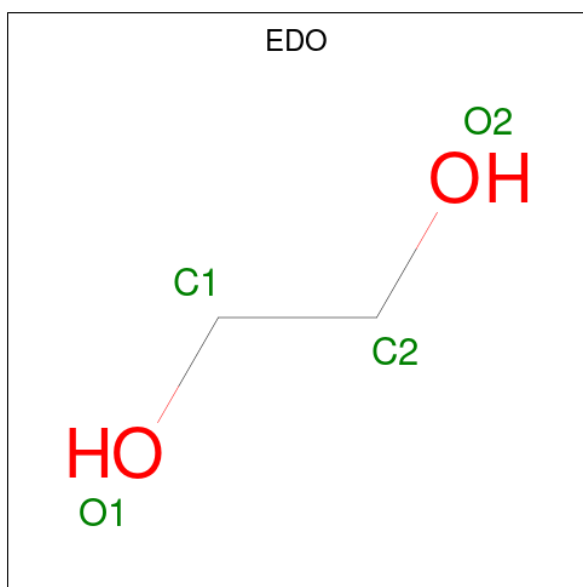
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	7	Total	Mg	0	0
			7	7		
3	B	11	Total	Mg	0	0
			11	11		

- Molecule 4 is SULFATE ION (CCD ID: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	O	S	0	0
			5	4	1		
4	A	1	Total	O	S	0	0
			5	4	1		
4	A	1	Total	O	S	0	0
			5	4	1		
4	B	1	Total	O	S	0	0
			5	4	1		
4	B	1	Total	O	S	0	0
			5	4	1		

- Molecule 5 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: C₂H₆O₂).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	C	O	0	0
			4	2	2		
5	B	1	Total	C	O	0	0
			4	2	2		
5	B	1	Total	C	O	0	0
			4	2	2		

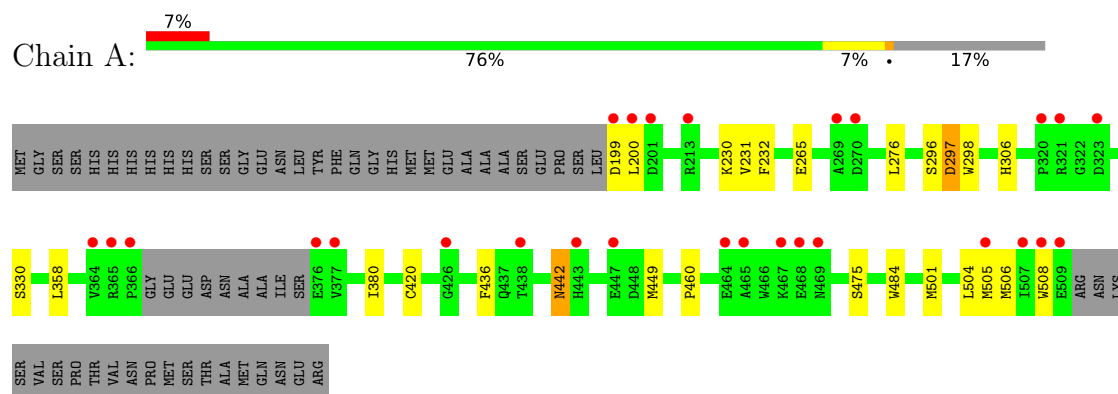
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	37	Total	O	0	0
			37	37		
6	B	57	Total	O	0	0
			57	57		

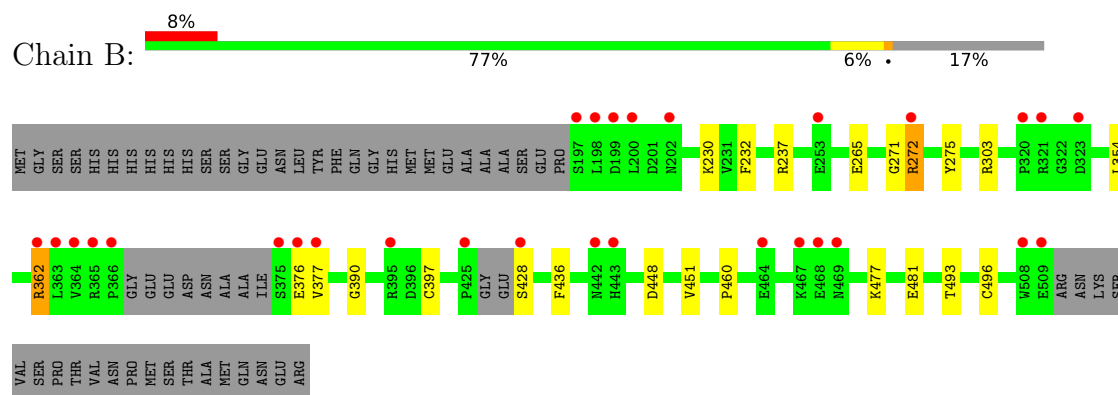
3 Residue-property plots [i](#)

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: Bone morphogenetic protein receptor type-2



• Molecule 1: Bone morphogenetic protein receptor type-2



4 Data and refinement statistics

Property	Value	Source
Space group	P 32 2 1	Depositor
Cell constants a, b, c, α , β , γ	138.50Å 138.50Å 109.99Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	49.99 – 2.30 49.99 – 2.30	Depositor EDS
% Data completeness (in resolution range)	100.0 (49.99-2.30) 91.8 (49.99-2.30)	Depositor EDS
R_{merge}	0.15	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.16 (at 2.29Å)	Xtriage
Refinement program	PHENIX 1.16_3549, PHENIX 1.16_3549	Depositor
R, R_{free}	0.189 , 0.211 (Not available) , 0.194	Depositor DCC
R_{free} test set	2714 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å ²)	43.9	Xtriage
Anisotropy	0.409	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 43.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.022 for -h,-k,l	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	4994	wwPDB-VP
Average B, all atoms (Å ²)	59.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.29% 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: EDO, ADP, SO4, MG, CAS

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	0.37	0/2399	0.59	0/3249
1	B	0.37	0/2418	0.60	0/3272
All	All	0.37	0/4817	0.59	0/6521

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	2367	0	2280	15	1
1	B	2397	0	2314	15	1
2	A	54	0	24	0	0
2	B	27	0	12	0	0
3	A	7	0	0	0	0
3	B	11	0	0	0	0
4	A	15	0	0	0	0
4	B	10	0	0	0	0
5	A	4	0	6	0	0
5	B	8	0	12	0	0
6	A	37	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	B	57	0	0	0	0
All	All	4994	0	4648	30	1

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 3.

All (30) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:272:ARG:HA	1:B:272:ARG:CZ	1.91	0.99
1:A:199:ASP:HB3	1:A:200:LEU:HD22	1.66	0.78
1:B:272:ARG:HA	1:B:272:ARG:NE	2.13	0.63
1:B:493:THR:H	1:B:496[A]:CAS:AS	2.42	0.62
1:A:231:VAL:HG22	1:A:276:LEU:HD22	1.81	0.62
1:B:362:ARG:HH11	1:B:362:ARG:HG3	1.69	0.58
1:B:271:GLY:O	1:B:272:ARG:NH1	2.38	0.56
1:B:272:ARG:HA	1:B:272:ARG:NH1	2.22	0.53
1:B:376:GLU:OE2	1:B:390:GLY:HA2	2.10	0.51
1:A:505[B]:MET:HE1	1:A:508:TRP:CD1	2.47	0.50
1:A:442:ASN:N	1:A:442:ASN:OD1	2.43	0.50
1:A:297:ASP:CG	1:A:298:TRP:N	2.71	0.49
1:A:306:HIS:HB2	1:A:505[A]:MET:HE1	1.95	0.48
1:B:237:ARG:HD3	1:B:275:TYR:CZ	2.47	0.48
1:A:475:SER:OG	1:A:504:LEU:HD21	2.14	0.48
1:A:504:LEU:HD23	1:A:504:LEU:HA	1.70	0.47
1:A:380:ILE:HG22	1:A:449:MET:HG3	1.96	0.47
1:B:362:ARG:HG3	1:B:362:ARG:NH1	2.30	0.46
1:B:493:THR:HG23	1:B:496[A]:CAS:AS	2.76	0.46
1:B:230:LYS:HE2	1:B:232:PHE:CZ	2.52	0.45
1:A:330:SER:HB2	1:A:358:LEU:HD11	2.00	0.44
1:B:436:PHE:CZ	1:B:460:PRO:HD3	2.54	0.43
1:B:354:LEU:HD13	1:B:377:VAL:HG13	2.01	0.43
1:B:448:ASP:O	1:B:451:VAL:HG22	2.19	0.42
1:A:296:SER:O	1:A:420:CYS:HA	2.20	0.42
1:B:477:LYS:O	1:B:481:GLU:HG3	2.19	0.42
1:A:436:PHE:CZ	1:A:460:PRO:HD3	2.55	0.41
1:A:506:MET:HE2	1:A:506:MET:HB2	1.96	0.41
1:A:230:LYS:HE2	1:A:232:PHE:CZ	2.57	0.40
1:A:484:TRP:CD1	1:A:484:TRP:C	2.99	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the sym-

metry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:297:ASP:OD1	1:B:272:ARG:NH1[5_675]	1.99	0.21

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	4/363 (1%)	4 (100%)	0	0	100	100
1	B	233/363 (64%)	223 (96%)	10 (4%)	0	100	100
All	All	237/726 (33%)	227 (96%)	10 (4%)	0	100	100

There are no Ramachandran outliers to report.

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	245/312 (78%)	241 (98%)	4 (2%)	55	73
1	B	251/312 (80%)	246 (98%)	5 (2%)	48	67
All	All	496/624 (80%)	487 (98%)	9 (2%)	51	70

All (9) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	265	GLU

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Mol	Chain	Res	Type
1	A	297	ASP
1	A	442	ASN
1	A	501	MET
1	B	265	GLU
1	B	272	ARG
1	B	303	ARG
1	B	362	ARG
1	B	428	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	238	GLN
1	A	393	ASN
1	A	437	GLN
1	A	443	HIS
1	A	486	GLN
1	A	495	GLN
1	B	437	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

7 non-standard protein/DNA/RNA residues are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
1	CAS	A	397	1	3,6,9	1.20	0	2,6,11	1.13	0
1	CAS	B	496[A]	-	3,6,9	0.96	0	2,6,11	0.96	0
1	CAS	B	496[B]	-	3,6,9	0.98	0	2,6,11	0.75	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
1	CAS	B	397	1	3,6,9	1.02	0	2,6,11	1.50	1 (50%)
1	CAS	A	288	1	3,6,9	0.96	0	2,6,11	0.45	0
1	CAS	A	496	1	3,6,9	1.16	0	2,6,11	1.19	0
1	CAS	B	288	1	3,6,9	1.00	0	2,6,11	0.48	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	CAS	A	397	1	-	0/0/5/9	-
1	CAS	B	496[A]	-	-	0/0/5/9	-
1	CAS	B	496[B]	-	-	0/0/5/9	-
1	CAS	B	397	1	-	0/0/5/9	-
1	CAS	A	288	1	-	0/0/5/9	-
1	CAS	A	496	1	-	0/0/5/9	-
1	CAS	B	288	1	-	0/0/5/9	-

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	397	CAS	CA-CB-SG	-2.09	106.04	113.53

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	B	496[A]	CAS	2	0

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 29 ligands modelled in this entry, 18 are monoatomic - leaving 11 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	ADP	B	601	3	28,29,29	1.46	4 (14%)	43,45,45	1.79	9 (20%)
4	SO4	B	614	-	4,4,4	0.27	0	6,6,6	0.16	0
5	EDO	B	616	-	3,3,3	0.42	0	2,2,2	0.55	0
2	ADP	A	602	-	28,29,29	1.50	4 (14%)	43,45,45	1.87	10 (23%)
4	SO4	B	613	-	4,4,4	0.31	0	6,6,6	0.20	0
5	EDO	B	615	-	3,3,3	0.33	0	2,2,2	0.69	0
4	SO4	A	612	-	4,4,4	0.29	0	6,6,6	0.31	0
5	EDO	A	613	-	3,3,3	0.30	0	2,2,2	0.88	0
2	ADP	A	601	3	28,29,29	1.51	5 (17%)	43,45,45	1.88	10 (23%)
4	SO4	A	610	-	4,4,4	0.28	0	6,6,6	0.38	0
4	SO4	A	611	3	4,4,4	0.24	0	6,6,6	0.14	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	EDO	B	616	-	-	0/1/1/1	-
2	ADP	A	602	-	-	7/16/32/32	0/3/3/3
5	EDO	B	615	-	-	0/1/1/1	-
5	EDO	A	613	-	-	1/1/1/1	-
2	ADP	A	601	3	-	0/16/32/32	0/3/3/3
2	ADP	B	601	3	-	0/16/32/32	0/3/3/3

All (13) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	602	ADP	C5-C4	5.10	1.48	1.39
2	B	601	ADP	C5-C4	4.87	1.47	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	601	ADP	C5-C4	4.07	1.46	1.39
2	A	601	ADP	PA-O3A	3.93	1.63	1.59
2	A	602	ADP	C5-C6	3.22	1.50	1.41
2	B	601	ADP	C5-N7	-2.78	1.34	1.39
2	A	602	ADP	C8-N7	2.68	1.36	1.31
2	A	601	ADP	C5-N7	-2.66	1.34	1.39
2	A	601	ADP	C5-C6	2.60	1.48	1.41
2	A	602	ADP	PA-O3A	2.52	1.62	1.59
2	B	601	ADP	C8-N7	2.37	1.36	1.31
2	A	601	ADP	C4-N9	-2.28	1.32	1.37
2	B	601	ADP	PA-O3A	2.25	1.61	1.59

All (29) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	601	ADP	C5-C4-N3	-5.86	118.65	126.72
2	A	602	ADP	C5-C4-N3	-5.70	118.87	126.72
2	A	601	ADP	C5-C4-N3	-5.65	118.94	126.72
2	B	601	ADP	N3-C4-N9	4.86	135.43	127.17
2	A	601	ADP	N3-C4-N9	4.54	134.88	127.17
2	A	602	ADP	N3-C4-N9	4.47	134.77	127.17
2	A	601	ADP	N3-C2-N1	-4.01	122.51	128.58
2	A	602	ADP	C2-N3-C4	3.86	121.27	111.83
2	A	601	ADP	C2-N3-C4	3.83	121.19	111.83
2	A	602	ADP	C4-C5-N7	-3.75	106.29	110.58
2	B	601	ADP	C4-C5-N7	-3.55	106.52	110.58
2	A	601	ADP	C4-C5-N7	-3.43	106.66	110.58
2	A	602	ADP	N3-C2-N1	-3.32	123.56	128.58
2	B	601	ADP	C5-N7-C8	3.13	108.36	103.45
2	A	602	ADP	C4-N9-C8	3.02	108.91	105.74
2	B	601	ADP	C2-N3-C4	2.86	118.81	111.83
2	A	602	ADP	C5-N7-C8	2.74	107.75	103.45
2	A	601	ADP	C4-N9-C8	2.70	108.57	105.74
2	A	601	ADP	C5-N7-C8	2.63	107.58	103.45
2	B	601	ADP	C4-N9-C8	2.61	108.47	105.74
2	A	602	ADP	C6-C5-N7	2.60	137.10	132.09
2	A	601	ADP	C2-N1-C6	2.58	122.96	118.73
2	B	601	ADP	N3-C2-N1	-2.50	124.81	128.58
2	A	602	ADP	O4'-C1'-N9	2.31	112.53	108.09
2	A	602	ADP	N9-C8-N7	-2.28	110.70	113.94
2	B	601	ADP	N9-C8-N7	-2.28	110.70	113.94
2	A	601	ADP	O2A-PA-O1A	2.18	122.60	112.44

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	601	ADP	C2-N1-C6	2.08	122.14	118.73
2	A	601	ADP	N9-C8-N7	-2.06	111.01	113.94

There are no chirality outliers.

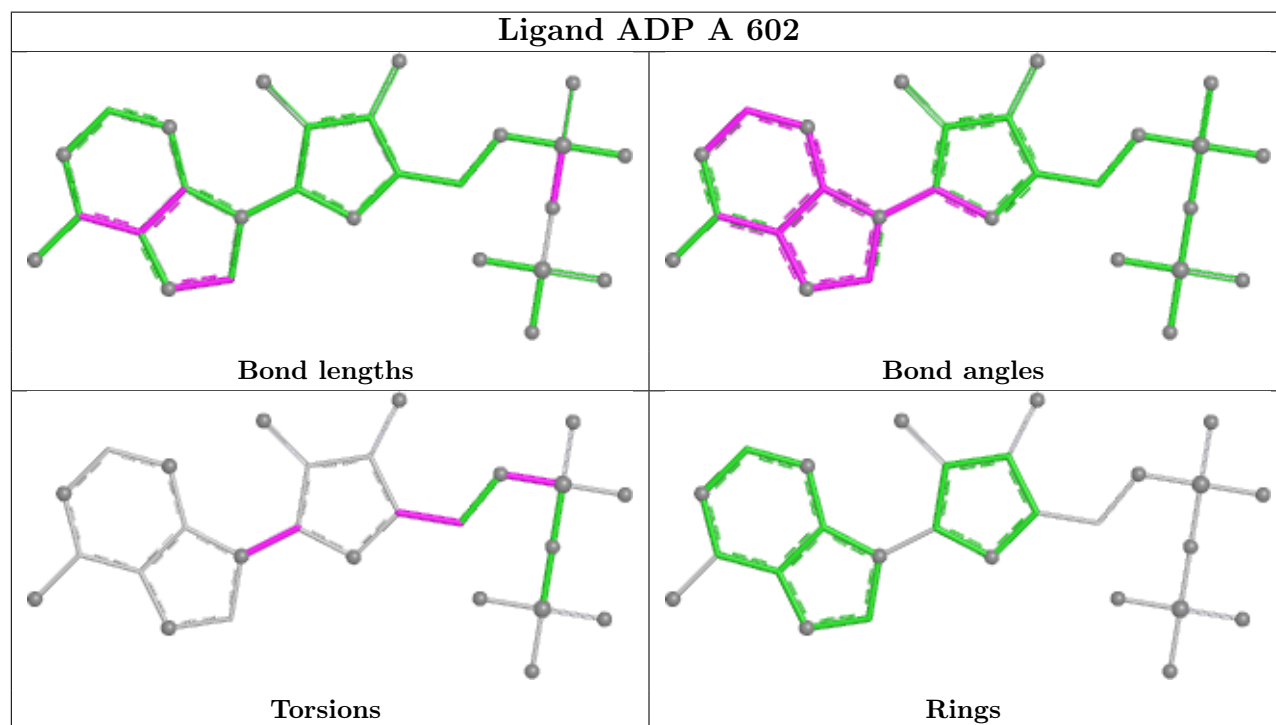
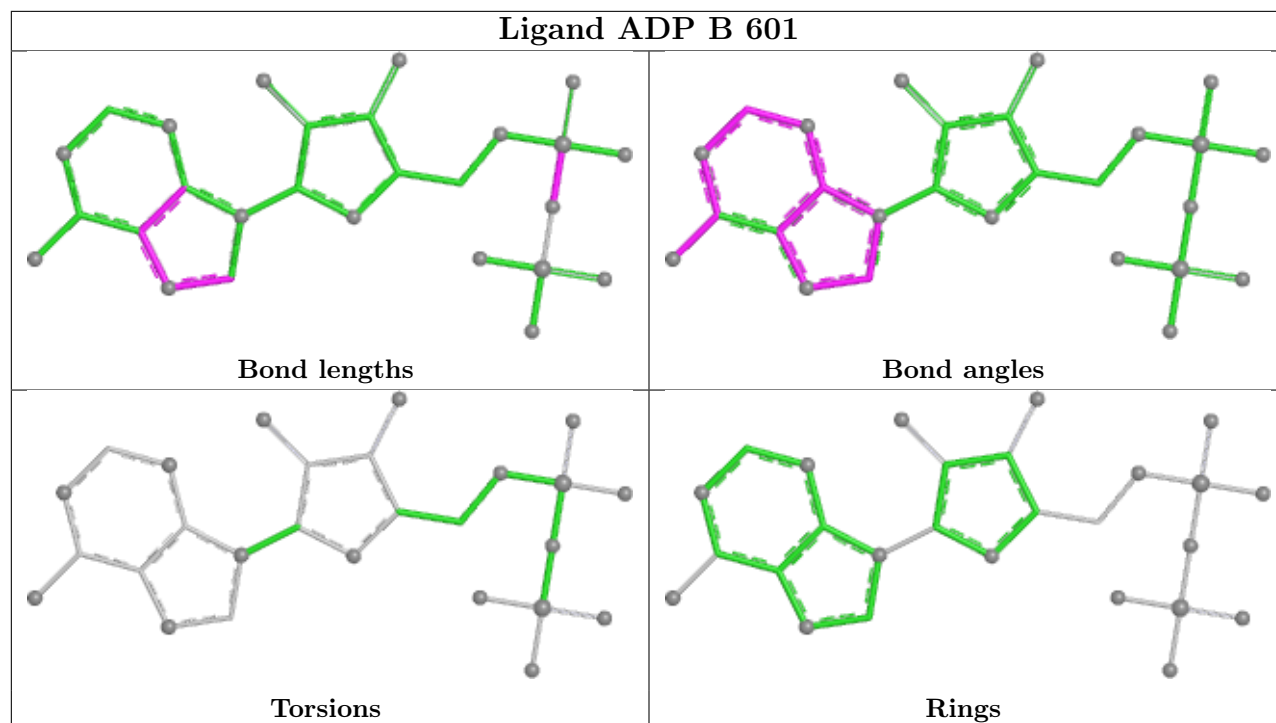
All (8) torsion outliers are listed below:

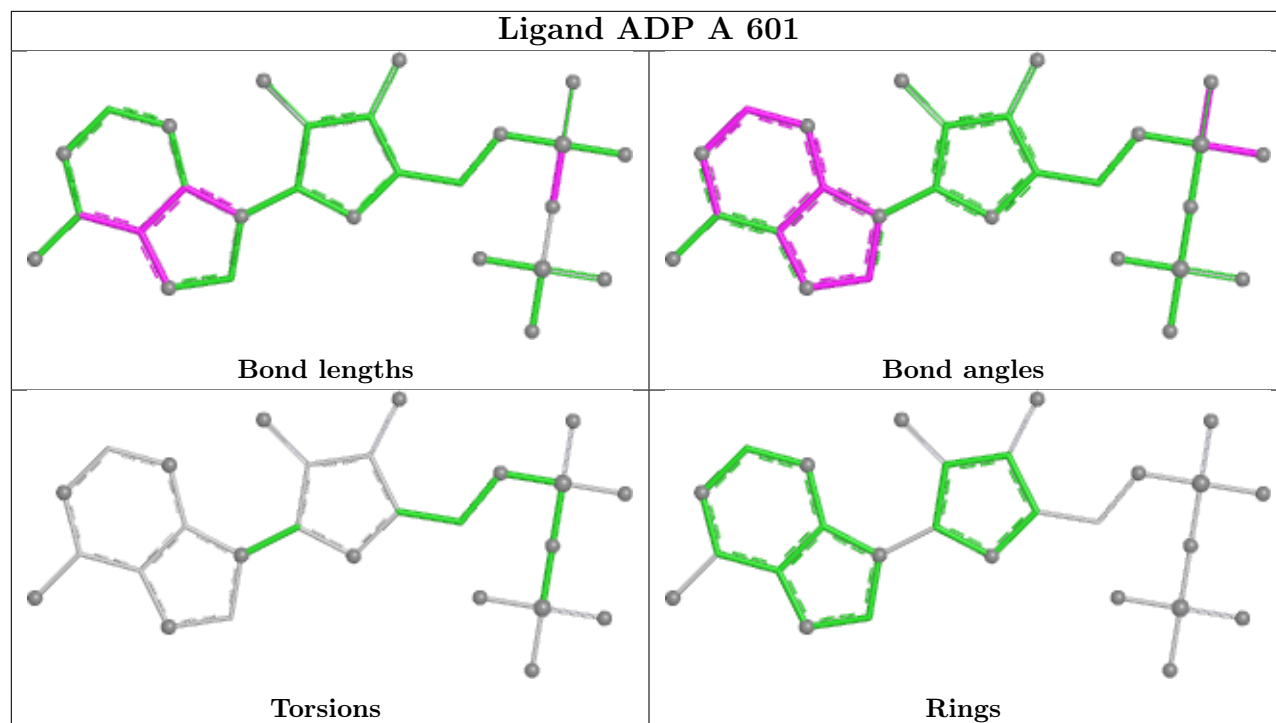
Mol	Chain	Res	Type	Atoms
2	A	602	ADP	C5'-O5'-PA-O2A
2	A	602	ADP	C2'-C1'-N9-C8
2	A	602	ADP	C3'-C4'-C5'-O5'
2	A	602	ADP	C2'-C1'-N9-C4
2	A	602	ADP	O4'-C4'-C5'-O5'
2	A	602	ADP	C5'-O5'-PA-O1A
2	A	602	ADP	C5'-O5'-PA-O3A
5	A	613	EDO	O1-C1-C2-O2

There are no ring outliers.

No monomer is involved in short contacts.

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

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	299/363 (82%)	0.30	27 (9%) 15 16	30, 52, 89, 133	2 (0%)
1	B	300/363 (82%)	0.39	29 (9%) 13 15	37, 55, 97, 127	0
All	All	599/726 (82%)	0.35	56 (9%) 14 16	30, 54, 95, 133	2 (0%)

All (56) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	509	GLU	8.1
1	B	364	VAL	7.4
1	A	365	ARG	7.2
1	A	508	TRP	6.0
1	B	365	ARG	5.8
1	A	509	GLU	5.7
1	B	425	PRO	4.6
1	B	508	TRP	4.5
1	B	198	LEU	4.5
1	B	375	SER	4.5
1	B	363	LEU	4.3
1	A	364	VAL	4.2
1	B	377	VAL	4.1
1	A	323	ASP	4.0
1	A	467	LYS	3.9
1	B	366	PRO	3.9
1	A	377	VAL	3.9
1	A	376	GLU	3.9
1	A	321	ARG	3.8
1	B	428	SER	3.7
1	B	362	ARG	3.6
1	B	272	ARG	3.6
1	B	197	SER	3.4
1	B	199	ASP	3.3

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Mol	Chain	Res	Type	RSRZ
1	A	199	ASP	3.3
1	B	468	GLU	3.1
1	A	269	ALA	3.1
1	A	366	PRO	3.1
1	B	321	ARG	3.0
1	A	426	GLY	3.0
1	B	443	HIS	3.0
1	B	323	ASP	2.9
1	B	469	ASN	2.9
1	A	201	ASP	2.9
1	A	320	PRO	2.7
1	A	464	GLU	2.7
1	A	443	HIS	2.6
1	B	464	GLU	2.6
1	B	202	ASN	2.6
1	A	507	ILE	2.6
1	B	442	ASN	2.5
1	A	505[A]	MET	2.5
1	A	469	ASN	2.4
1	A	213	ARG	2.4
1	A	270	ASP	2.4
1	B	376	GLU	2.4
1	A	447	GLU	2.4
1	B	395	ARG	2.4
1	B	320	PRO	2.3
1	A	200	LEU	2.3
1	A	468	GLU	2.3
1	B	467	LYS	2.3
1	A	438	THR	2.2
1	B	200	LEU	2.2
1	B	253	GLU	2.1
1	A	465	ALA	2.0

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

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 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
1	CAS	A	496	7/10	0.86	0.15	59,63,79,138	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
1	CAS	B	496[A]	7/10	0.92	0.10	61,65,71,76	4
1	CAS	B	496[B]	7/10	0.92	0.10	61,65,71,116	4
1	CAS	B	397	7/10	0.93	0.13	79,85,98,106	0
1	CAS	A	397	7/10	0.95	0.12	67,78,92,93	0
1	CAS	B	288	7/10	0.98	0.06	50,51,56,72	0
1	CAS	A	288	7/10	0.98	0.07	43,46,51,65	0

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 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.

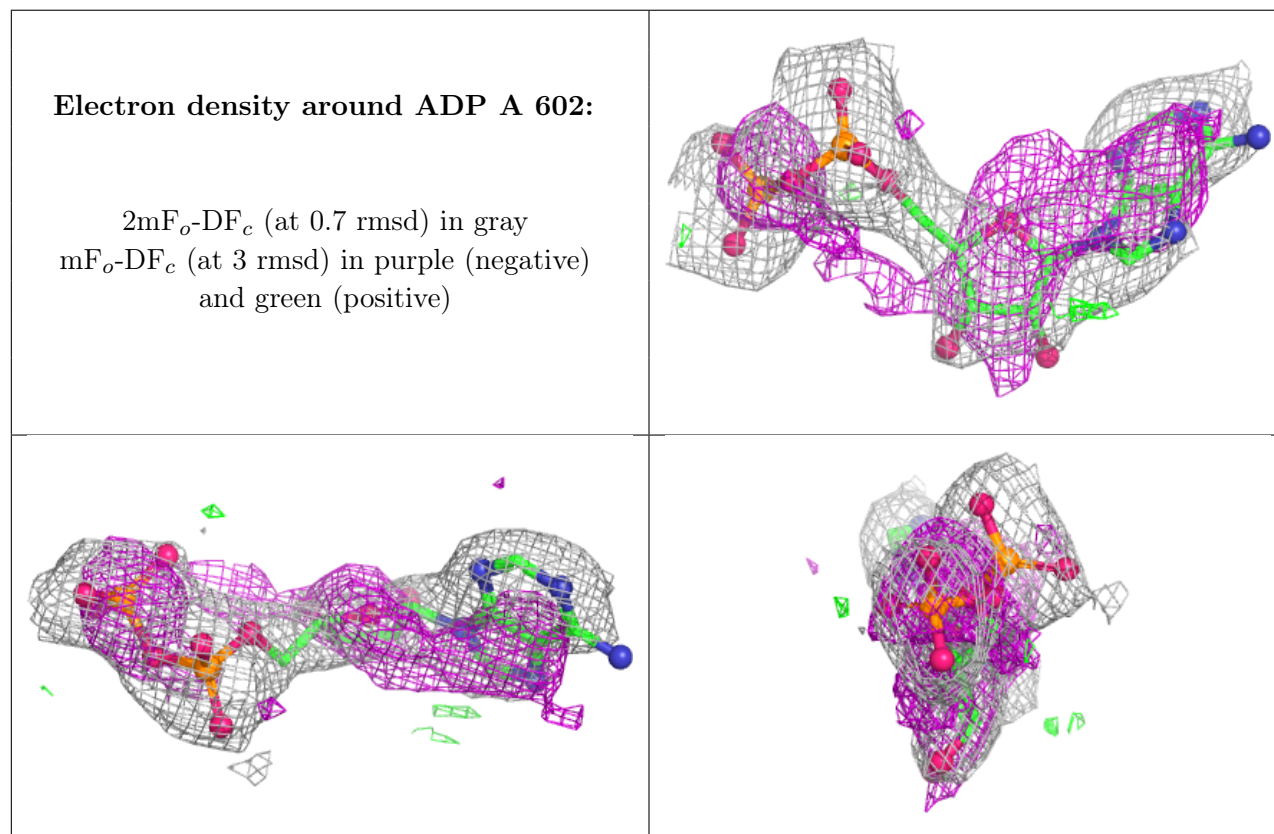
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
4	SO4	A	611	5/5	0.73	0.20	120,124,125,127	0
5	EDO	B	616	4/4	0.79	0.33	78,83,89,91	0
5	EDO	A	613	4/4	0.83	0.29	72,74,75,78	0
2	ADP	A	602	27/27	0.84	0.16	64,84,96,99	0
3	MG	A	605	1/1	0.84	0.30	81,81,81,81	0
3	MG	B	610	1/1	0.84	0.19	82,82,82,82	0
4	SO4	B	613	5/5	0.90	0.11	79,82,89,97	0
4	SO4	A	610	5/5	0.90	0.12	77,86,89,96	0
3	MG	B	606	1/1	0.90	0.30	88,88,88,88	0
5	EDO	B	615	4/4	0.91	0.20	72,72,74,78	0
3	MG	B	612	1/1	0.92	0.18	70,70,70,70	0
3	MG	A	604	1/1	0.92	0.21	98,98,98,98	0
3	MG	B	604	1/1	0.92	0.25	74,74,74,74	0
4	SO4	A	612	5/5	0.92	0.09	81,84,87,94	0
3	MG	A	607	1/1	0.93	0.10	73,73,73,73	0
3	MG	A	608	1/1	0.94	0.17	74,74,74,74	0
3	MG	A	609	1/1	0.94	0.24	69,69,69,69	0
4	SO4	B	614	5/5	0.94	0.10	90,95,96,106	0
3	MG	B	611	1/1	0.95	0.12	75,75,75,75	0
3	MG	B	608	1/1	0.96	0.08	67,67,67,67	0
3	MG	B	609	1/1	0.97	0.34	58,58,58,58	0
3	MG	B	603	1/1	0.97	0.14	60,60,60,60	0

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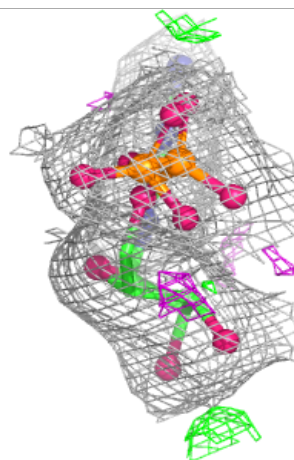
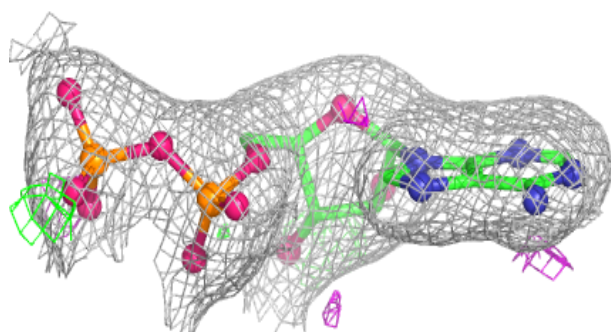
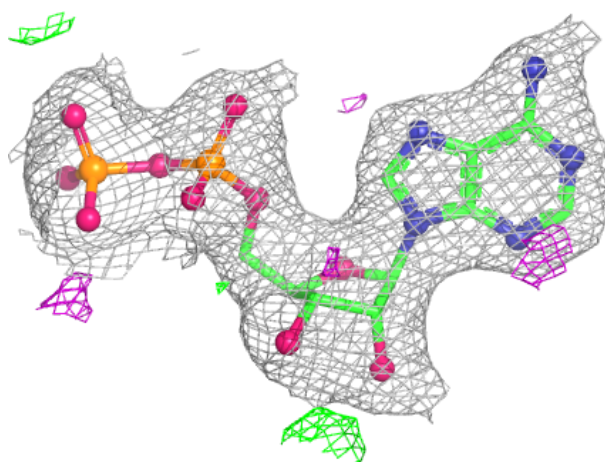
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
3	MG	B	607	1/1	0.97	0.26	64,64,64,64	0
3	MG	A	606	1/1	0.97	0.23	70,70,70,70	0
3	MG	B	605	1/1	0.98	0.28	61,61,61,61	0
2	ADP	A	601	27/27	0.99	0.05	34,39,40,43	0
2	ADP	B	601	27/27	0.99	0.04	33,37,41,43	0
3	MG	A	603	1/1	1.00	0.01	39,39,39,39	0
3	MG	B	602	1/1	1.00	0.03	40,40,40,40	0

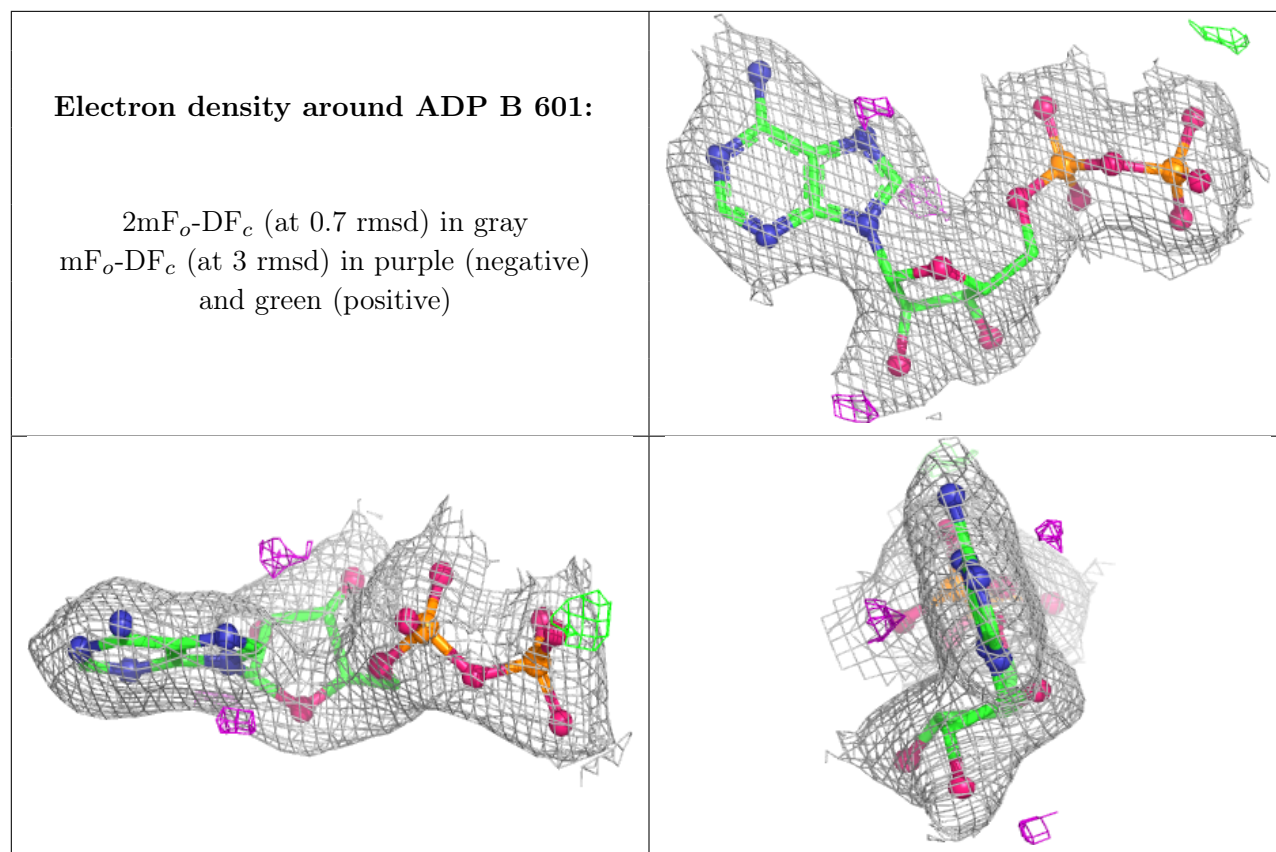
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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



Electron density around ADP 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.