



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 09:26 PM UTC

PDB ID : 3G2F / pdb_00003g2f
Title : Crystal structure of the kinase domain of bone morphogenetic protein receptor type II (BMPRII) at 2.35 Å resolution
Authors : Chaikuad, A.; Thangaratnarajah, C.; Roos, A.K.; Filippakopoulos, P.; Salah, E.; Phillips, C.; Keates, T.; Fedorov, O.; Chalk, R.; Petrie, K.; Pike, A.C.W.; von Delft, F.; Arrowsmith, C.H.; Edwards, A.M.; Weigelt, J.; Bountra, C.; Knapp, S.; Bullock, A.; Structural Genomics Consortium (SGC)
Deposited on : 2009-01-31
Resolution : 2.35 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ 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)

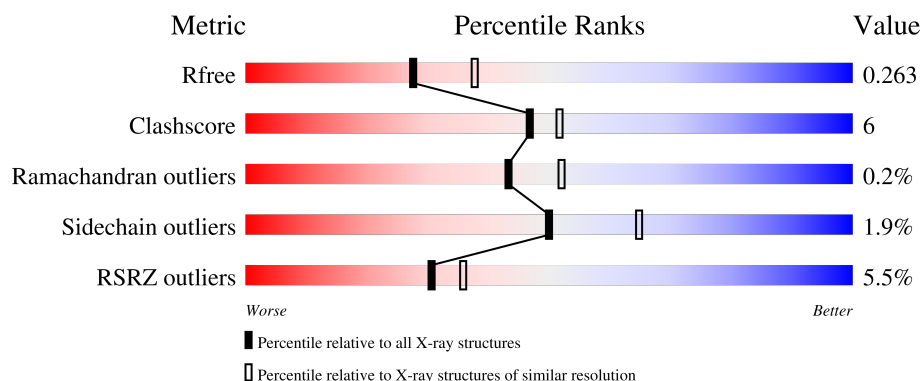
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

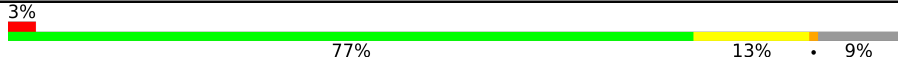
The reported resolution of this entry is 2.35 Å.

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	1596 (2.36-2.36)
Clashscore	190562	1663 (2.36-2.36)
Ramachandran outliers	187476	1646 (2.36-2.36)
Sidechain outliers	187428	1646 (2.36-2.36)
RSRZ outliers	180081	1598 (2.36-2.36)

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	336	
1	B	336	

Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 5138 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.

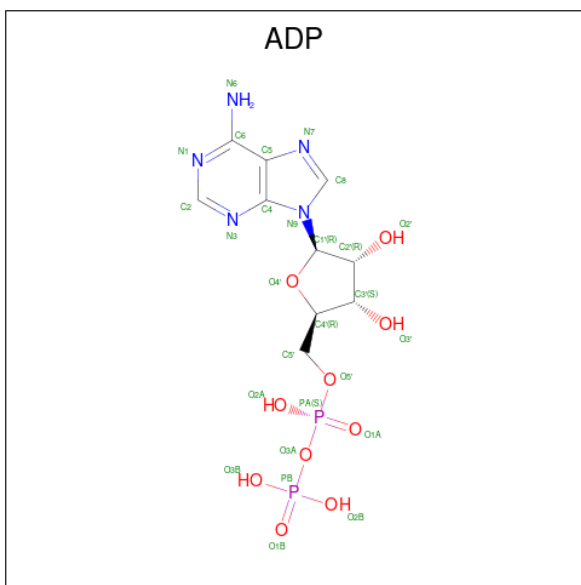
- Molecule 1 is a protein called Bone morphogenetic protein receptor type-2.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	305	Total	As	C	N	O	S	0	2	0
			2480	3	1564	433	461	19			
1	B	303	Total	As	C	N	O	S	0	1	0
			2454	2	1543	430	460	19			

There are 14 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	518	ALA	-	expression tag	UNP Q13873
A	519	HIS	-	expression tag	UNP Q13873
A	520	HIS	-	expression tag	UNP Q13873
A	521	HIS	-	expression tag	UNP Q13873
A	522	HIS	-	expression tag	UNP Q13873
A	523	HIS	-	expression tag	UNP Q13873
A	524	HIS	-	expression tag	UNP Q13873
B	518	ALA	-	expression tag	UNP Q13873
B	519	HIS	-	expression tag	UNP Q13873
B	520	HIS	-	expression tag	UNP Q13873
B	521	HIS	-	expression tag	UNP Q13873
B	522	HIS	-	expression tag	UNP Q13873
B	523	HIS	-	expression tag	UNP Q13873
B	524	HIS	-	expression tag	UNP Q13873

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

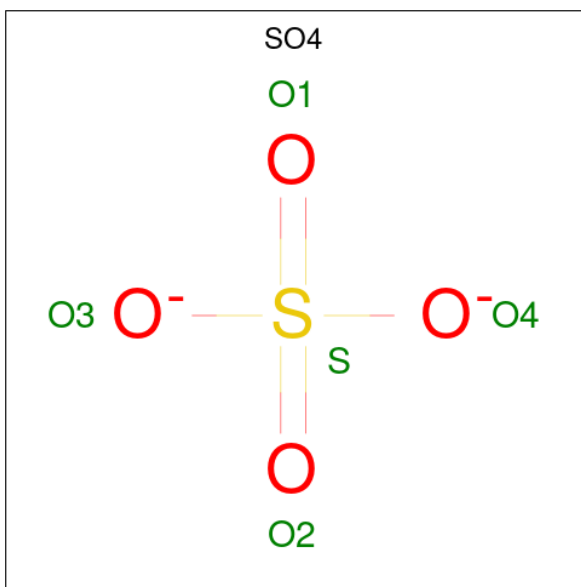


Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total 27	C 10	N 5	O 10	P 2	0	0
2	B	1	Total 27	C 10	N 5	O 10	P 2	0	0

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

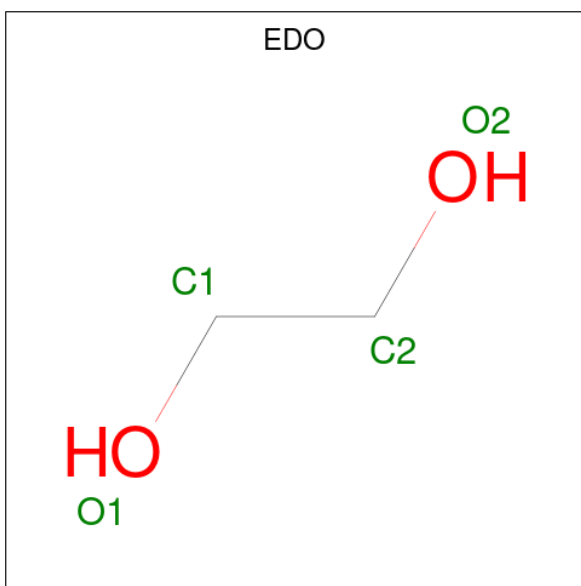
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total Mg 1 1	0	0
3	B	1	Total Mg 1 1	0	0

- Molecule 4 is SULFATE ION (CCD ID: SO4) (formula: O_4S).



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

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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		

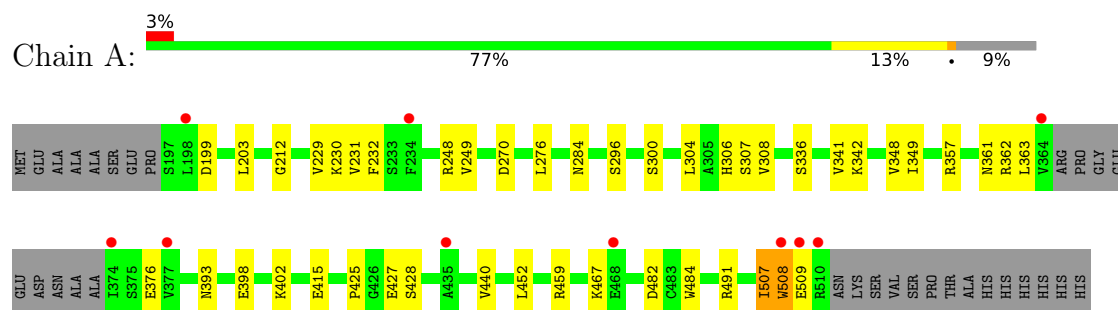
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	107	Total	O	0	0
			107	107		
6	B	15	Total	O	0	0
			15	15		

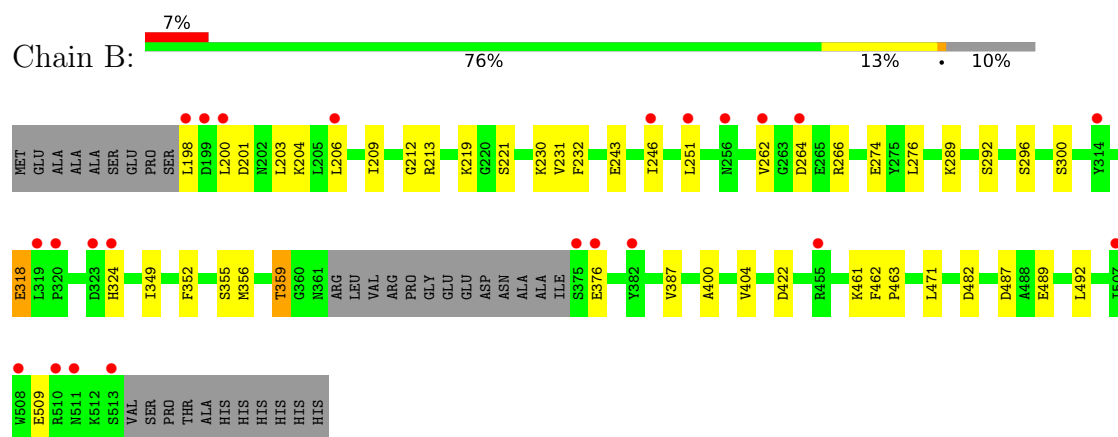
3 Residue-property plots [i](#)

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 2 ₁ 2 ₁ 2	Depositor
Cell constants a, b, c, α , β , γ	94.54Å 218.79Å 44.19Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	47.35 – 2.35 47.35 – 2.35	Depositor EDS
% Data completeness (in resolution range)	99.9 (47.35-2.35) 99.9 (47.35-2.35)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.01 (at 2.34Å)	Xtriage
Refinement program	REFMAC 5.5.0055	Depositor
R, R_{free}	0.208 , 0.246 0.225 , 0.263	Depositor DCC
R_{free} test set	1975 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å ²)	42.9	Xtriage
Anisotropy	0.703	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 53.7	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	0.93	EDS
Total number of atoms	5138	wwPDB-VP
Average B, all atoms (Å ²)	24.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 12.07% 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: SO4, ADP, MG, EDO, 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	0.70	0/2510	0.87	2/3386 (0.1%)
1	B	0.53	0/2481	0.82	0/3346
All	All	0.62	0/4991	0.85	2/6732 (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	A	361	ASN	N-CA-C	6.05	119.13	111.69
1	A	363	LEU	N-CA-C	5.12	117.19	109.41

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	2480	0	2436	28	0
1	B	2454	0	2402	28	0
2	A	27	0	12	1	0
2	B	27	0	12	3	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	A	5	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	B	5	0	0	0	0
5	A	12	0	18	4	0
5	B	4	0	6	2	0
6	A	107	0	0	4	0
6	B	15	0	0	2	0
All	All	5138	0	4886	56	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.

All (56) 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:A:507:ILE:HD13	1:B:471:LEU:HD23	1.70	0.74
1:A:342:LYS:HD2	1:A:348:VAL:HG13	1.68	0.73
1:A:393:ASN:HB3	5:A:5:EDO:H21	1.71	0.73
1:B:198:LEU:HA	1:B:262:VAL:HG21	1.73	0.68
1:B:296:SER:HB3	1:B:300:SER:HB2	1.80	0.63
1:B:422:ASP:HB3	1:B:509:GLU:HG3	1.83	0.60
1:B:461:LYS:HA	5:B:6:EDO:H22	1.85	0.58
1:A:296:SER:HB3	1:A:300:SER:HB2	1.88	0.56
1:B:212:GLY:HA3	2:B:900:ADP:O2B	2.06	0.55
1:B:289:LYS:O	1:B:292:SER:HB3	2.06	0.55
1:A:357:ARG:HD3	6:A:98:HOH:O	2.07	0.54
1:A:307:SER:HB3	5:A:4:EDO:H12	1.89	0.54
1:A:306:HIS:ND1	5:A:4:EDO:H11	2.24	0.53
1:A:459:ARG:O	5:A:3:EDO:H12	2.09	0.53
1:B:230:LYS:HE2	1:B:232:PHE:CZ	2.44	0.53
5:B:6:EDO:H21	6:B:116:HOH:O	2.10	0.51
1:A:270:ASP:HB2	6:A:117:HOH:O	2.11	0.51
1:A:230:LYS:HE2	1:A:232:PHE:CZ	2.46	0.50
1:A:212:GLY:HA3	2:A:900:ADP:O2B	2.11	0.50
1:A:427:GLU:HG2	1:A:428:SER:N	2.27	0.50
1:B:482:ASP:HB3	1:B:492:LEU:HG	1.94	0.50
1:B:318:GLU:OE1	1:B:359:THR:HB	2.12	0.49
1:B:487:ASP:OD1	1:B:487:ASP:C	2.56	0.49
1:B:231:VAL:HG22	1:B:276:LEU:HD22	1.96	0.48
1:B:243:GLU:HG3	1:B:352:PHE:HB2	1.95	0.48
1:A:398:GLU:HG2	1:A:402:LYS:HE3	1.97	0.47
1:B:400:ALA:O	1:B:404:VAL:HG23	2.15	0.47
1:A:248:ARG:HH11	1:A:248:ARG:HG2	1.80	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:251:LEU:HD11	1:B:324:HIS:HB3	1.97	0.46
1:B:209:ILE:HD12	2:B:900:ADP:C2	2.51	0.46
1:A:231:VAL:HG22	1:A:276:LEU:HD22	1.98	0.46
1:B:213:ARG:O	1:B:213:ARG:HG2	2.15	0.46
1:A:199:ASP:HB3	6:A:92:HOH:O	2.16	0.45
1:A:357:ARG:NH2	1:A:362:ARG:O	2.50	0.44
1:B:201:ASP:C	1:B:203:LEU:H	2.25	0.44
1:A:342:LYS:HD2	1:A:348:VAL:CG1	2.43	0.44
1:A:484:TRP:C	1:A:484:TRP:CD1	2.96	0.44
1:B:246:ILE:HG13	1:B:355:SER:HB2	2.00	0.44
1:B:206:LEU:HD12	1:B:219:LYS:HE3	1.99	0.43
1:B:230:LYS:HE3	2:B:900:ADP:O3A	2.18	0.43
1:B:274:GLU:HG3	6:B:36:HOH:O	2.18	0.42
1:B:204:LYS:HA	1:B:204:LYS:HD2	1.79	0.42
1:A:336:SER:OG	1:A:415:GLU:OE1	2.33	0.42
1:B:203:LEU:HA	1:B:221:SER:O	2.20	0.42
1:A:248:ARG:HG2	1:A:248:ARG:NH1	2.34	0.41
1:A:482:ASP:O	1:A:491:ARG:HA	2.19	0.41
1:A:304:LEU:O	1:A:308:VAL:HG12	2.20	0.41
1:A:508:TRP:O	1:A:509:GLU:HB2	2.20	0.41
1:A:425:PRO:HD2	6:A:120:HOH:O	2.19	0.41
1:A:203:LEU:HD11	1:A:229:VAL:HG21	2.02	0.41
1:A:440:VAL:HG13	1:A:452:LEU:HD22	2.03	0.41
1:B:376:GLU:OE1	1:B:387:VAL:HG13	2.21	0.41
1:B:462:PHE:HA	1:B:463:PRO:HD3	1.94	0.41
1:A:284:ASN:HB2	1:A:341:VAL:O	2.21	0.41
1:B:200:LEU:HD11	1:B:264:ASP:HB3	2.03	0.40
1:B:356:MET:HE3	1:B:356:MET:HB2	1.92	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	300/336 (89%)	285 (95%)	14 (5%)	1 (0%)	36	43
1	B	297/336 (88%)	281 (95%)	16 (5%)	0	100	100
All	All	597/672 (89%)	566 (95%)	30 (5%)	1 (0%)	43	52

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	376	GLU

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	267/289 (92%)	262 (98%)	5 (2%)	50	65
1	B	264/289 (91%)	259 (98%)	5 (2%)	50	65
All	All	531/578 (92%)	521 (98%)	10 (2%)	50	65

All (10) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	249	VAL
1	A	349	ILE
1	A	467	LYS
1	A	507	ILE
1	A	508	TRP
1	B	266	ARG
1	B	318	GLU
1	B	349	ILE
1	B	359	THR
1	B	489	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	239	ASN
1	B	294	HIS

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

6 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	496	1	5,8,9	0.50	0	1,9,11	1.36	0
1	CAS	B	288	1	3,6,9	0.58	0	2,6,11	0.36	0
1	CAS	B	397	1	4,5,9	0.90	0	1,5,11	0.81	0
1	CAS	A	288	1	3,6,9	0.51	0	2,6,11	0.72	0
1	CAS	A	397	1	3,6,9	0.64	0	2,6,11	0.53	0
1	CAS	B	496	1	5,8,9	0.70	0	1,9,11	0.49	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	496	1	-	0/0/7/9	-
1	CAS	B	288	1	-	0/0/5/9	-
1	CAS	B	397	1	-	1/1/4/9	-
1	CAS	A	288	1	-	0/0/5/9	-
1	CAS	A	397	1	-	0/0/5/9	-
1	CAS	B	496	1	-	0/0/7/9	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	B	397	CAS	N-CA-CB-SG

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 10 ligands modelled in this entry, 2 are monoatomic - leaving 8 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	900	3	28,29,29	1.40	4 (14%)	43,45,45	1.83	10 (23%)
5	EDO	B	6	-	3,3,3	0.52	0	2,2,2	0.27	0
2	ADP	A	900	3	28,29,29	1.35	5 (17%)	43,45,45	1.93	10 (23%)
5	EDO	A	3	-	3,3,3	0.46	0	2,2,2	0.37	0
5	EDO	A	4	-	3,3,3	0.37	0	2,2,2	0.44	0
4	SO4	B	1	-	4,4,4	0.30	0	6,6,6	0.88	0
4	SO4	A	2	-	4,4,4	0.32	0	6,6,6	0.58	0
5	EDO	A	5	-	3,3,3	0.46	0	2,2,2	0.20	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	ADP	B	900	3	-	2/16/32/32	0/3/3/3
5	EDO	B	6	-	-	1/1/1/1	-
2	ADP	A	900	3	-	2/16/32/32	0/3/3/3
5	EDO	A	3	-	-	1/1/1/1	-
5	EDO	A	4	-	-	0/1/1/1	-
5	EDO	A	5	-	-	0/1/1/1	-

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	900	ADP	C5-C4	4.46	1.47	1.39
2	A	900	ADP	C5-C4	3.82	1.45	1.39
2	B	900	ADP	C8-N7	3.50	1.38	1.31
2	A	900	ADP	C8-N7	3.23	1.37	1.31
2	A	900	ADP	C5-C6	2.58	1.48	1.41
2	A	900	ADP	PA-O3A	2.32	1.62	1.59
2	B	900	ADP	C5-C6	2.06	1.46	1.41
2	A	900	ADP	C5-N7	-2.05	1.35	1.39
2	B	900	ADP	C5-N7	-2.04	1.35	1.39

All (20) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	900	ADP	C5-C4-N3	-5.97	118.50	126.72
2	B	900	ADP	C5-C4-N3	-5.55	119.08	126.72
2	A	900	ADP	N3-C2-N1	-4.70	121.47	128.58
2	A	900	ADP	C2-N3-C4	4.64	123.17	111.83
2	A	900	ADP	N3-C4-N9	4.53	134.88	127.17
2	B	900	ADP	N3-C4-N9	4.15	134.22	127.17
2	B	900	ADP	C2-N3-C4	3.61	120.65	111.83
2	B	900	ADP	N3-C2-N1	-3.58	123.16	128.58
2	B	900	ADP	C4-C5-N7	-3.45	106.64	110.58
2	B	900	ADP	C4-N9-C8	3.20	109.10	105.74
2	B	900	ADP	N9-C8-N7	-3.15	109.46	113.94
2	B	900	ADP	C5-N7-C8	2.95	108.08	103.45
2	A	900	ADP	C4-N9-C8	2.74	108.61	105.74
2	A	900	ADP	C4-C5-N7	-2.69	107.50	110.58
2	A	900	ADP	N9-C8-N7	-2.67	110.15	113.94
2	A	900	ADP	O3B-PB-O2B	2.52	117.24	107.80
2	A	900	ADP	C5-N7-C8	2.32	107.10	103.45
2	A	900	ADP	O2A-PA-O3A	2.30	113.48	107.27
2	B	900	ADP	C6-C5-N7	2.13	136.19	132.09
2	B	900	ADP	O3B-PB-O2B	2.09	115.65	107.80

There are no chirality outliers.

All (6) torsion outliers are listed below:

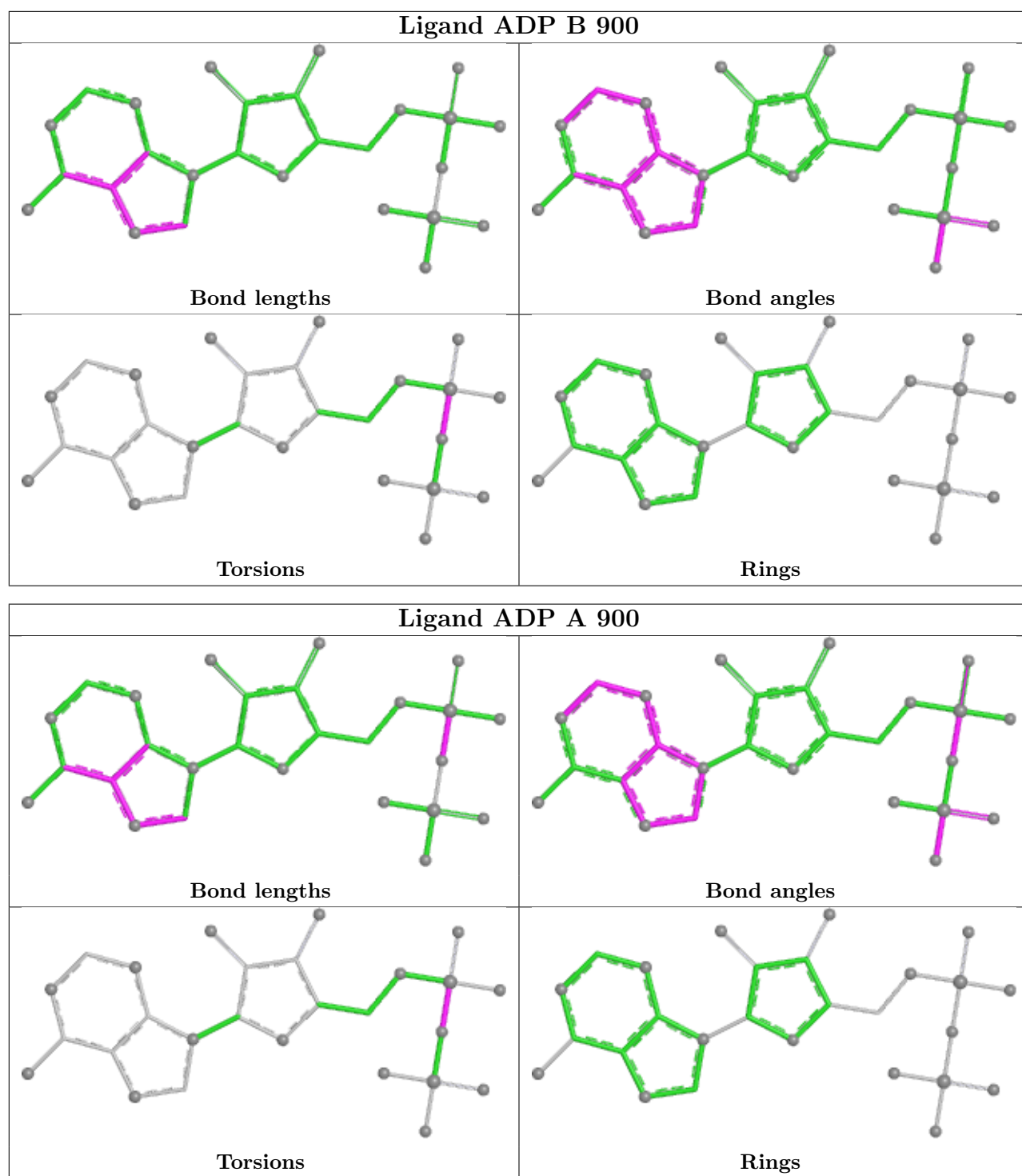
Mol	Chain	Res	Type	Atoms
5	B	6	EDO	O1-C1-C2-O2
2	B	900	ADP	PB-O3A-PA-O2A
2	A	900	ADP	PB-O3A-PA-O1A
5	A	3	EDO	O1-C1-C2-O2
2	A	900	ADP	PB-O3A-PA-O2A
2	B	900	ADP	PB-O3A-PA-O1A

There are no ring outliers.

6 monomers are involved in 10 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	900	ADP	3	0
5	B	6	EDO	2	0
2	A	900	ADP	1	0
5	A	3	EDO	1	0
5	A	4	EDO	2	0
5	A	5	EDO	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 ⓘ

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

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	302/336 (89%)	0.03	10 (3%) 49 56	4, 23, 41, 76	4 (1%)
1	B	300/336 (89%)	0.48	23 (7%) 19 22	3, 22, 44, 74	3 (1%)
All	All	602/672 (89%)	0.25	33 (5%) 30 36	3, 23, 43, 76	7 (1%)

All (33) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	198	LEU	5.2
1	A	374	ILE	5.2
1	A	198	LEU	4.5
1	A	508	TRP	3.8
1	B	246	ILE	3.8
1	A	364	VAL	3.8
1	B	323	ASP	3.5
1	B	375	SER	3.5
1	B	324	HIS	3.3
1	A	377	VAL	3.2
1	B	256	ASN	3.2
1	B	200	LEU	3.2
1	B	511	ASN	3.0
1	B	508	TRP	2.9
1	A	509	GLU	2.8
1	B	513	SER	2.7
1	B	251	LEU	2.7
1	B	206	LEU	2.6
1	A	234[A]	PHE	2.5
1	A	510	ARG	2.5
1	B	320	PRO	2.5
1	B	264	ASP	2.4
1	B	314	TYR	2.3
1	B	319	LEU	2.2

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Mol	Chain	Res	Type	RSRZ
1	B	510	ARG	2.2
1	B	382	TYR	2.1
1	B	507	ILE	2.1
1	B	199	ASP	2.1
1	A	435	ALA	2.1
1	A	468	GLU	2.1
1	B	455	ARG	2.1
1	B	376	GLU	2.0
1	B	262	VAL	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	397	7/10	0.60	0.20	6,7,14,43	1
1	CAS	B	496	9/10	0.60	0.31	20,21,47,48	2
1	CAS	B	288	7/10	0.64	0.17	22,23,25,50	2
1	CAS	B	397	6/10	0.80	0.11	17,17,17,18	0
1	CAS	A	496	9/10	0.80	0.19	25,26,44,45	2
1	CAS	A	288	7/10	0.88	0.12	23,24,26,42	2

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.

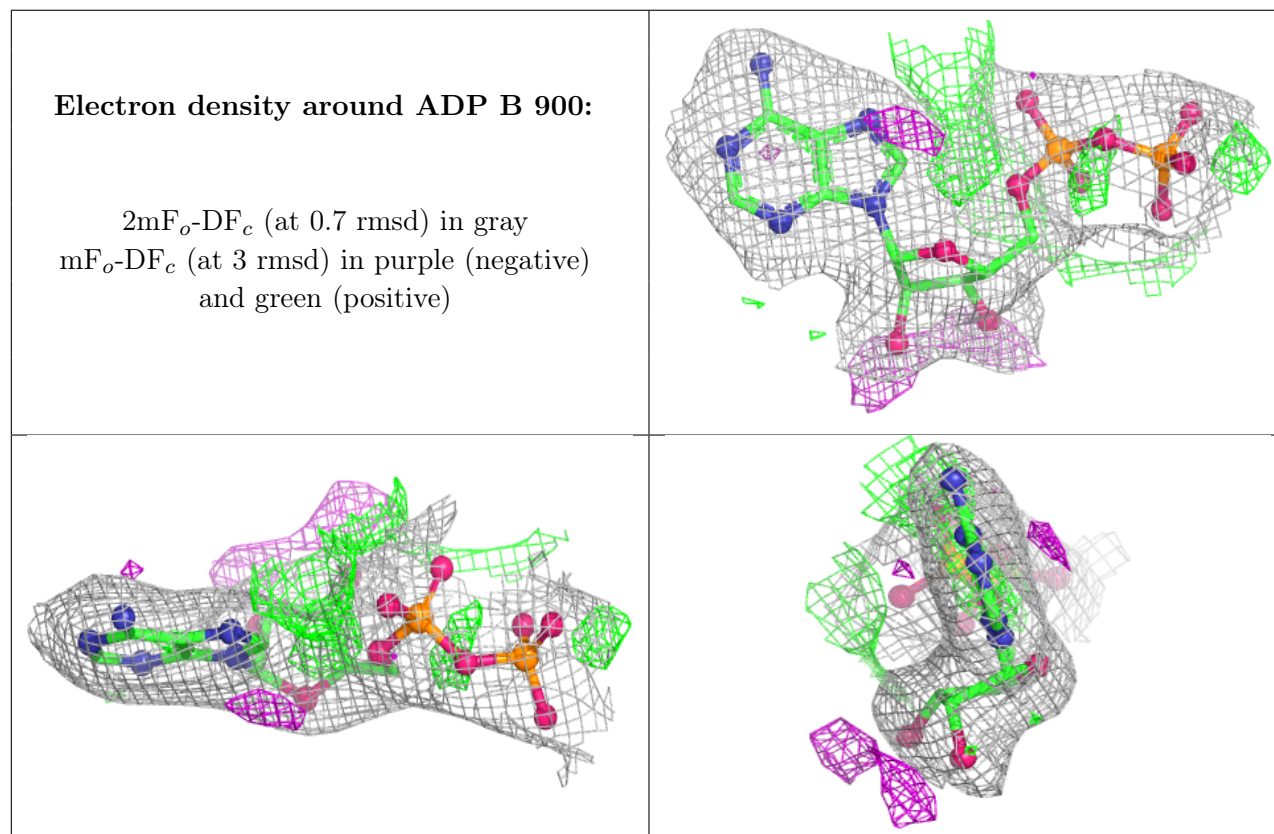
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
5	EDO	A	3	4/4	0.79	0.24	56,59,59,60	0
3	MG	B	901	1/1	0.82	0.10	47,47,47,47	0
5	EDO	B	6	4/4	0.84	0.20	63,63,64,64	0

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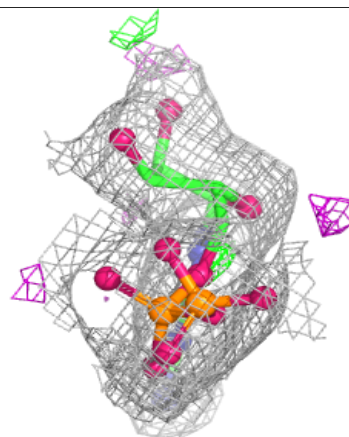
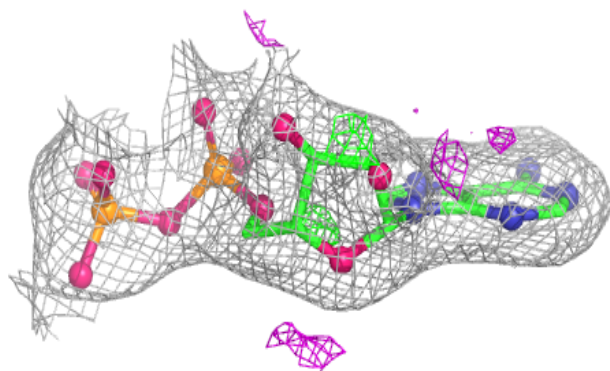
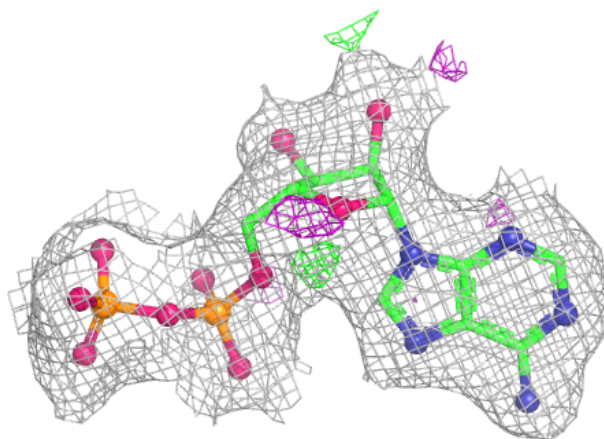
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
4	SO4	B	1	5/5	0.88	0.13	55,56,57,57	0
2	ADP	B	900	27/27	0.90	0.11	37,45,61,63	0
4	SO4	A	2	5/5	0.91	0.13	62,65,65,65	0
5	EDO	A	5	4/4	0.92	0.17	53,55,55,57	0
5	EDO	A	4	4/4	0.92	0.18	50,52,54,55	0
2	ADP	A	900	27/27	0.96	0.07	24,32,49,51	0
3	MG	A	901	1/1	0.98	0.06	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 900:

$2mF_o - DF_c$ (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.