



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 14, 2018 – 02:07 pm GMT

PDB ID : 2QB5  
Title : Crystal Structure of Human Inositol 1,3,4-Trisphosphate 5/6-Kinase (ITPK1)  
in Complex with ADP and Mn<sup>2+</sup>  
Authors : Chamberlain, P.P.; Lesley, S.A.; Spraggon, G.  
Deposited on : 2007-06-15  
Resolution : 1.80 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](mailto: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.

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

MolProbity : 4.02b-467  
Mogul : 1.7.3 (157068), CSD as539be (2018)  
Xtriage (Phenix) : 1.13  
EDS : trunk31020  
Percentile statistics : 20171227.v01 (using entries in the PDB archive December 27th 2017)  
Refmac : 5.8.0158  
CCP4 : 7.0 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : trunk31020

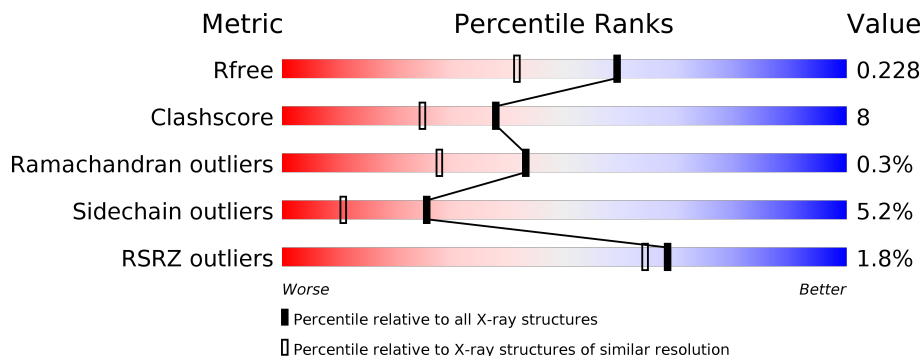
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*



The reported resolution of this entry is 1.80 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))
$R_{free}$	111664	5253 (1.80-1.80)
Clashscore	122126	6077 (1.80-1.80)
Ramachandran outliers	120053	6011 (1.80-1.80)
Sidechain outliers	120020	6010 (1.80-1.80)
RSRZ outliers	108989	5157 (1.80-1.80)

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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. 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	347	 82% 15%
1	B	347	 75% 18%

## 2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 6053 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 Inositol-tetrakisphosphate 1-kinase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	338	2717	1722	474	509	12	0	4	0
1	B	336	2691	1713	465	500	13	0	6	0

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-11	MET	-	EXPRESSION TAG	UNP Q13572
A	-10	GLY	-	EXPRESSION TAG	UNP Q13572
A	-9	SER	-	EXPRESSION TAG	UNP Q13572
A	-8	ASP	-	EXPRESSION TAG	UNP Q13572
A	-7	LYS	-	EXPRESSION TAG	UNP Q13572
A	-6	ILE	-	EXPRESSION TAG	UNP Q13572
A	-5	HIS	-	EXPRESSION TAG	UNP Q13572
A	-4	HIS	-	EXPRESSION TAG	UNP Q13572
A	-3	HIS	-	EXPRESSION TAG	UNP Q13572
A	-2	HIS	-	EXPRESSION TAG	UNP Q13572
A	-1	HIS	-	EXPRESSION TAG	UNP Q13572
A	0	HIS	-	EXPRESSION TAG	UNP Q13572
B	-11	MET	-	EXPRESSION TAG	UNP Q13572
B	-10	GLY	-	EXPRESSION TAG	UNP Q13572
B	-9	SER	-	EXPRESSION TAG	UNP Q13572
B	-8	ASP	-	EXPRESSION TAG	UNP Q13572
B	-7	LYS	-	EXPRESSION TAG	UNP Q13572
B	-6	ILE	-	EXPRESSION TAG	UNP Q13572
B	-5	HIS	-	EXPRESSION TAG	UNP Q13572
B	-4	HIS	-	EXPRESSION TAG	UNP Q13572
B	-3	HIS	-	EXPRESSION TAG	UNP Q13572
B	-2	HIS	-	EXPRESSION TAG	UNP Q13572
B	-1	HIS	-	EXPRESSION TAG	UNP Q13572
B	0	HIS	-	EXPRESSION TAG	UNP Q13572

- Molecule 2 is SULFATE ION (three-letter code: SO4) (formula: O<sub>4</sub>S).

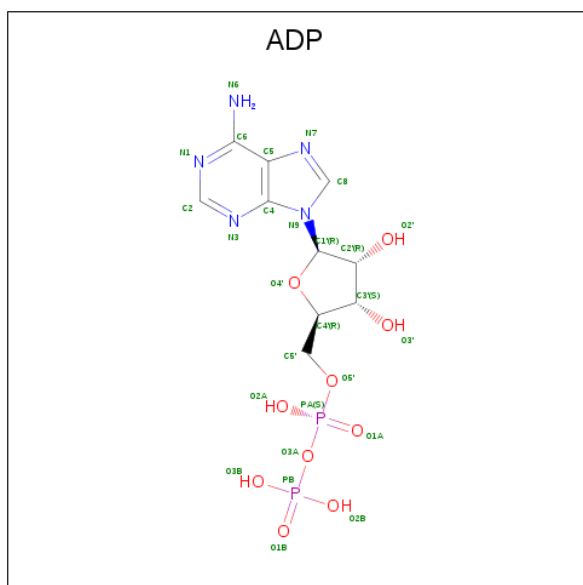


Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total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

- Molecule 3 is MANGANESE (II) ION (three-letter code: MN) (formula: Mn).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	B	2	Total Mn 2 2	0	0
3	A	2	Total Mn 2 2	0	0

- Molecule 4 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula:  $C_{10}H_{15}N_5O_{10}P_2$ ).



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

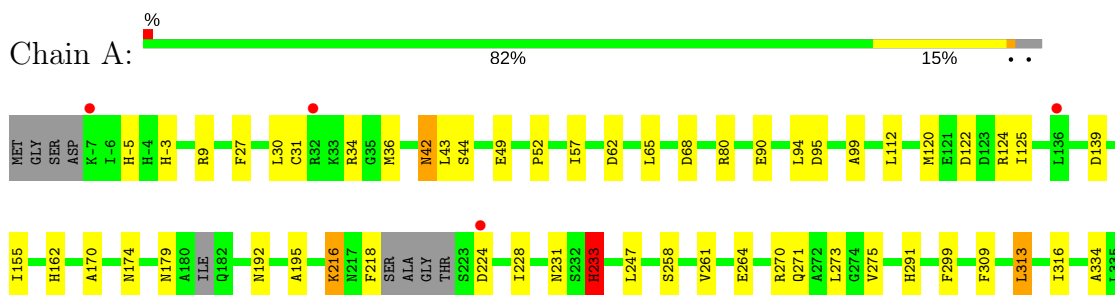
- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	278	Total O 278 278	0	0
5	B	249	Total O 249 249	0	0

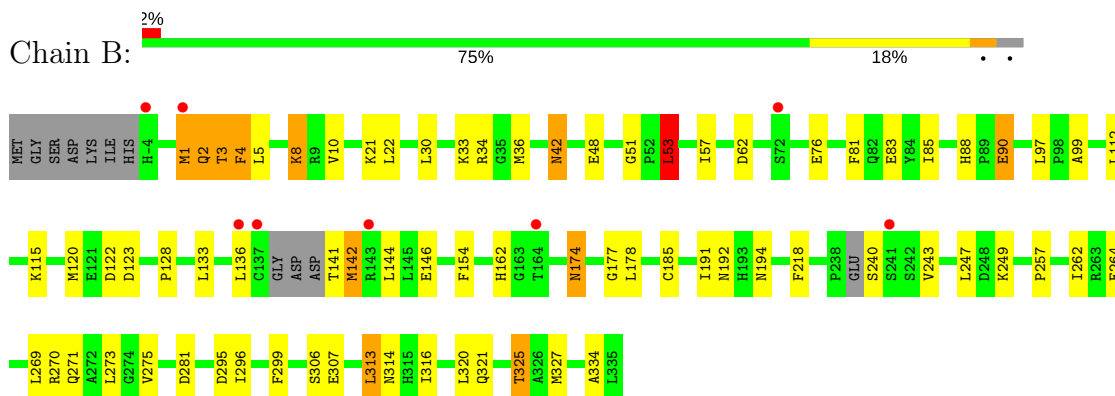
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA 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: Inositol-tetrakisphosphate 1-kinase



- Molecule 1: Inositol-tetrakisphosphate 1-kinase



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	62.70Å 94.31Å 130.24Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 1.80 48.47 – 1.80	Depositor EDS
% Data completeness (in resolution range)	94.4 (50.00-1.80) 94.4 (48.47-1.80)	Depositor EDS
$R_{merge}$	0.06	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.39 (at 1.81Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, $R_{free}$	0.181 , 0.229 0.180 , 0.228	Depositor DCC
$R_{free}$ test set	3416 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	21.1	Xtriage
Anisotropy	0.117	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 46.4	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	6053	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	24.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.92% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: MN, SO4, 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	0.70	0/2776	0.77	2/3752 (0.1%)
1	B	0.72	0/2758	0.79	3/3731 (0.1%)
All	All	0.71	0/5534	0.78	5/7483 (0.1%)

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	270	ARG	NE-CZ-NH2	-5.54	117.53	120.30
1	B	53	LEU	CA-CB-CG	5.20	127.25	115.30
1	B	120	MET	CG-SD-CE	-5.14	91.98	100.20
1	B	136	LEU	CA-CB-CG	5.06	126.94	115.30
1	A	233	HIS	N-CA-CB	5.03	119.66	110.60

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	2717	0	2708	42	0
1	B	2691	0	2709	58	0
2	A	25	0	0	1	0
2	B	35	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	2	0	0	0	0
3	B	2	0	0	0	0
4	A	27	0	12	1	0
4	B	27	0	12	0	0
5	A	278	0	0	3	0
5	B	249	0	0	8	0
All	All	6053	0	5441	91	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 8.

All (91) 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:65:LEU:HD12	5:A:673:HOH:O	1.40	1.20
1:B:1:MET:CA	1:B:2:GLN:HB2	1.80	1.12
1:B:1:MET:HA	1:B:2:GLN:CB	1.86	1.06
1:A:258:SER:H	1:A:291:HIS:HE1	1.05	0.96
1:B:142:MET:O	1:B:146:GLU:HG3	1.65	0.95
1:A:258:SER:H	1:A:291:HIS:CE1	1.90	0.90
1:A:65:LEU:CD1	5:A:673:HOH:O	2.04	0.89
1:B:141:THR:HG22	1:B:144:LEU:H	1.38	0.85
1:B:1:MET:HA	1:B:2:GLN:HB2	0.90	0.84
1:B:240:SER:N	5:B:589:HOH:O	2.20	0.75
1:A:271:GLN:HE22	1:B:334:ALA:H	1.34	0.75
1:A:334:ALA:H	1:B:271:GLN:HE22	1.35	0.74
1:A:-3:HIS:HE1	1:B:123:ASP:OD1	1.71	0.73
1:A:258:SER:N	1:A:291:HIS:HE1	1.85	0.72
1:B:128:PRO:HG3	1:B:191[A]:ILE:HD11	1.72	0.70
1:A:271:GLN:NE2	1:B:334:ALA:H	1.92	0.68
1:B:4:PHE:CE2	1:B:321:GLN:HG3	2.30	0.66
1:A:-5:HIS:HD2	1:B:123:ASP:OD2	1.78	0.66
1:A:62:ASP:OD2	1:A:162:HIS:ND1	2.27	0.64
5:A:594:HOH:O	1:B:325:THR:HG21	1.96	0.64
1:A:334:ALA:H	1:B:271:GLN:NE2	1.95	0.64
1:A:233:HIS:HE1	2:A:543:SO4:O1	1.83	0.62
1:B:325:THR:CG2	1:B:327:MET:HG2	2.30	0.61
1:B:88:HIS:HA	1:B:90:GLU:OE1	2.00	0.60
1:B:62:ASP:OD1	5:B:701:HOH:O	2.16	0.60
1:B:21:LYS:HB3	5:B:768:HOH:O	2.02	0.60
1:B:327:MET:HA	1:B:327:MET:HE3	1.86	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:85:ILE:CG2	5:B:746:HOH:O	2.52	0.57
1:A:99:ALA:HB1	1:A:275:VAL:HG13	1.87	0.57
1:A:42:ASN:C	1:A:42:ASN:HD22	2.08	0.56
1:B:57:ILE:HD11	1:B:316:ILE:HD11	1.88	0.55
1:B:62:ASP:OD2	1:B:162:HIS:ND1	2.41	0.54
1:B:192:ASN:HD21	1:B:218:PHE:H	1.53	0.54
1:A:-5:HIS:CD2	1:B:123:ASP:OD2	2.61	0.53
1:B:42:ASN:C	1:B:42:ASN:HD22	2.12	0.53
1:A:43:LEU:O	1:A:80:ARG:HD2	2.09	0.53
1:A:99:ALA:HB1	1:A:275:VAL:CG1	2.40	0.52
1:A:122:ASP:OD2	1:A:264:GLU:OE2	2.28	0.52
1:A:42:ASN:ND2	1:A:44:SER:H	2.09	0.51
1:B:51:GLY:HA2	1:B:53:LEU:HD13	1.93	0.50
1:A:120:MET:HE1	1:A:125:ILE:CD1	2.42	0.50
1:B:3:THR:C	1:B:5:LEU:H	2.16	0.49
1:B:3:THR:O	1:B:5:LEU:N	2.46	0.49
1:A:192:ASN:HD21	1:A:218:PHE:H	1.59	0.49
1:B:34:ARG:HG3	1:B:313:LEU:HD11	1.94	0.49
1:B:325:THR:HG22	1:B:327:MET:HG2	1.94	0.49
1:B:10[B]:VAL:HG23	1:B:36:MET:CE	2.43	0.48
1:A:231:ASN:OD1	1:A:233:HIS:ND1	2.46	0.48
1:B:122:ASP:OD2	1:B:264:GLU:OE2	2.32	0.47
1:A:170:ALA:HA	1:A:228:ILE:O	2.14	0.47
1:A:27:PHE:HB2	1:A:309:PHE:CD2	2.49	0.47
1:B:194:ASN:HA	1:B:247:LEU:HD21	1.97	0.47
1:B:306:SER:O	1:B:307:GLU:HB2	2.15	0.46
1:A:112:LEU:HD21	1:A:273:LEU:HG	1.97	0.46
1:A:195:ALA:HB2	1:A:216:LYS:HA	1.97	0.46
1:B:243:VAL:HG22	5:B:773:HOH:O	2.15	0.46
1:A:192:ASN:ND2	1:A:218:PHE:H	2.14	0.46
1:B:85:ILE:HG22	5:B:746:HOH:O	2.15	0.46
1:B:270:ARG:HG2	1:B:275:VAL:O	2.16	0.45
1:B:281:ASP:HB2	1:B:295:ASP:HB3	1.98	0.45
1:A:31:CYS:HB3	1:A:36:MET:HB2	1.99	0.45
1:A:9:ARG:HD3	1:A:52:PRO:O	2.16	0.45
1:A:271:GLN:HE22	1:B:334:ALA:N	2.09	0.45
1:B:128:PRO:HG3	1:B:191[A]:ILE:CD1	2.44	0.45
1:A:27:PHE:HB2	1:A:309:PHE:CE2	2.53	0.44
1:A:334:ALA:N	1:B:271:GLN:HE22	2.11	0.44
1:A:57:ILE:HD11	1:A:316:ILE:HD11	1.99	0.44
1:B:33:LYS:HE2	5:B:636:HOH:O	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:81:PHE:O	1:B:85:ILE:HG13	2.16	0.44
1:A:124:ARG:O	1:A:291:HIS:HD2	2.00	0.44
1:B:99:ALA:HB1	1:B:275:VAL:HG13	2.00	0.44
1:A:34:ARG:HG3	1:A:313:LEU:HD11	2.00	0.43
1:A:94:LEU:HA	1:A:95:ASP:HA	1.84	0.43
1:B:81:PHE:CE2	1:B:85:ILE:HD11	2.54	0.42
1:B:3:THR:C	1:B:5:LEU:N	2.72	0.42
1:A:155:ILE:HD12	4:A:557:ADP:C5	2.55	0.42
1:B:154:PHE:HE2	1:B:178:LEU:HD21	1.84	0.42
1:A:112:LEU:CD2	1:A:273:LEU:HG	2.50	0.42
1:B:2:GLN:NE2	1:B:314:ASN:OD1	2.37	0.42
1:B:10[B]:VAL:HG23	1:B:36:MET:HE2	2.00	0.42
1:B:269:LEU:HD13	1:B:296:ILE:HD12	2.01	0.41
1:B:192:ASN:ND2	1:B:218:PHE:H	2.18	0.41
1:A:261:VAL:O	1:A:264:GLU:HG2	2.21	0.41
1:B:8:LYS:HG2	1:B:320:LEU:HD13	2.02	0.41
1:B:112:LEU:HD21	1:B:273:LEU:HG	2.02	0.41
1:B:257:PRO:HB2	1:B:262:ILE:HD11	2.03	0.41
1:B:115:LYS:HD2	5:B:671:HOH:O	2.20	0.40
1:B:174:ASN:ND2	1:B:177:GLY:H	2.19	0.40
1:A:42:ASN:C	1:A:42:ASN:ND2	2.74	0.40
1:B:133:LEU:HB2	1:B:185:CYS:SG	2.62	0.40
1:A:65:LEU:O	1:A:68:ASP:HB2	2.22	0.40

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	335/347 (96%)	328 (98%)	7 (2%)	0	100	100
1	B	335/347 (96%)	324 (97%)	9 (3%)	2 (1%)	27	13

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	670/694 (96%)	652 (97%)	16 (2%)	2 (0%)	43 28

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	4	PHE
1	B	2	GLN

### 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	305/308 (99%)	292 (96%)	13 (4%)	32 16
1	B	304/308 (99%)	286 (94%)	18 (6%)	21 8
All	All	609/616 (99%)	578 (95%)	31 (5%)	25 11

All (31) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	30	LEU
1	A	42	ASN
1	A	49	GLU
1	A	90	GLU
1	A	139	ASP
1	A	174	ASN
1	A	179	ASN
1	A	216	LYS
1	A	224	ASP
1	A	233	HIS
1	A	247	LEU
1	A	299	PHE
1	A	313	LEU
1	B	1	MET
1	B	3	THR
1	B	8	LYS

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Mol	Chain	Res	Type
1	B	22	LEU
1	B	30	LEU
1	B	42	ASN
1	B	48	GLU
1	B	53	LEU
1	B	76	GLU
1	B	83	GLU
1	B	90	GLU
1	B	97	LEU
1	B	142	MET
1	B	174	ASN
1	B	249	LYS
1	B	299	PHE
1	B	313	LEU
1	B	325	THR

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (28) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	-5	HIS
1	A	-3	HIS
1	A	23	ASN
1	A	42	ASN
1	A	69	GLN
1	A	174	ASN
1	A	175	GLN
1	A	179	ASN
1	A	192	ASN
1	A	211	GLN
1	A	234	ASN
1	A	271	GLN
1	A	290	GLN
1	A	291	HIS
1	A	314	ASN
1	A	321	GLN
1	B	-2	HIS
1	B	0	HIS
1	B	23	ASN
1	B	25	GLN
1	B	42	ASN
1	B	70	ASN
1	B	73	GLN

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Mol	Chain	Res	Type
1	B	88	HIS
1	B	174	ASN
1	B	192	ASN
1	B	271	GLN
1	B	290	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](#)

Of 18 ligands modelled in this entry, 4 are monoatomic - leaving 14 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	SO4	A	542	-	4,4,4	0.28	0	6,6,6	0.26	0
2	SO4	A	543	-	4,4,4	0.21	0	6,6,6	0.42	0
2	SO4	A	546	-	4,4,4	0.09	0	6,6,6	0.40	0
2	SO4	A	551	-	4,4,4	0.55	0	6,6,6	0.49	0
2	SO4	A	552	3	4,4,4	0.41	0	6,6,6	0.41	0
4	ADP	A	557	3	25,29,29	1.01	1 (4%)	25,45,45	1.78	5 (20%)
2	SO4	B	541	-	4,4,4	0.36	0	6,6,6	0.55	0
2	SO4	B	544	-	4,4,4	0.30	0	6,6,6	1.04	0
2	SO4	B	545	-	4,4,4	0.33	0	6,6,6	0.36	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	SO4	B	547	-	4,4,4	0.27	0	6,6,6	0.76	0
2	SO4	B	548	3	4,4,4	0.46	0	6,6,6	0.60	0
2	SO4	B	549	-	4,4,4	0.29	0	6,6,6	0.28	0
2	SO4	B	550	-	4,4,4	0.18	0	6,6,6	0.34	0
4	ADP	B	558	3	25,29,29	1.13	2 (8%)	25,45,45	1.79	5 (20%)

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	SO4	A	542	-	-	0/0/0/0	0/0/0/0
2	SO4	A	543	-	-	0/0/0/0	0/0/0/0
2	SO4	A	546	-	-	0/0/0/0	0/0/0/0
2	SO4	A	551	-	-	0/0/0/0	0/0/0/0
2	SO4	A	552	3	-	0/0/0/0	0/0/0/0
4	ADP	A	557	3	-	0/12/32/32	0/3/3/3
2	SO4	B	541	-	-	0/0/0/0	0/0/0/0
2	SO4	B	544	-	-	0/0/0/0	0/0/0/0
2	SO4	B	545	-	-	0/0/0/0	0/0/0/0
2	SO4	B	547	-	-	0/0/0/0	0/0/0/0
2	SO4	B	548	3	-	0/0/0/0	0/0/0/0
2	SO4	B	549	-	-	0/0/0/0	0/0/0/0
2	SO4	B	550	-	-	0/0/0/0	0/0/0/0
4	ADP	B	558	3	-	0/12/32/32	0/3/3/3

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	558	ADP	C8-N9	-2.92	1.33	1.36
4	A	557	ADP	C5-C4	2.50	1.46	1.40
4	B	558	ADP	C5-C4	3.15	1.47	1.40

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	557	ADP	N3-C2-N1	-6.07	123.67	128.86
4	B	558	ADP	N3-C2-N1	-5.93	123.79	128.86
4	A	557	ADP	C4-C5-N7	-3.53	106.00	109.41
4	A	557	ADP	C1'-N9-C4	-3.02	121.41	126.64
4	B	558	ADP	C4-C5-N7	-2.53	106.97	109.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	557	ADP	O2A-PA-O1A	2.05	122.58	112.14
4	B	558	ADP	O3B-PB-O1B	2.06	118.62	110.60
4	B	558	ADP	O2A-PA-O1A	2.12	122.94	112.14
4	A	557	ADP	O3B-PB-O1B	2.41	120.00	110.60
4	B	558	ADP	N6-C6-N1	2.71	124.19	118.57

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	543	SO4	1	0
4	A	557	ADP	1	0

## 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	338/347 (97%)	-0.23	4 (1%) 79 76	12, 20, 41, 62	1 (0%)
1	B	336/347 (96%)	-0.16	8 (2%) 59 54	12, 21, 41, 58	1 (0%)
All	All	674/694 (97%)	-0.19	12 (1%) 68 64	12, 20, 41, 62	2 (0%)

All (12) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	1	MET	3.5
1	B	137	CYS	3.4
1	B	164	THR	3.1
1	B	136	LEU	2.8
1	A	32	ARG	2.7
1	B	143	ARG	2.7
1	A	136	LEU	2.7
1	A	224	ASP	2.6
1	B	-4	HIS	2.5
1	B	241	SER	2.3
1	B	72	SER	2.1
1	A	-7	LYS	2.0

### 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 [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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
2	SO4	B	549	5/5	0.84	0.14	62,64,67,67	0
2	SO4	B	550	5/5	0.89	0.17	51,58,61,61	0
2	SO4	A	551	5/5	0.90	0.15	30,31,47,50	0
2	SO4	A	546	5/5	0.91	0.22	14,22,27,28	5
2	SO4	B	548	5/5	0.93	0.11	12,15,23,24	5
2	SO4	B	545	5/5	0.94	0.18	35,39,51,51	0
2	SO4	B	547	5/5	0.96	0.10	24,33,46,49	0
2	SO4	A	552	5/5	0.96	0.18	8,10,14,16	5
2	SO4	B	544	5/5	0.97	0.11	21,27,31,35	0
2	SO4	B	541	5/5	0.98	0.08	22,26,30,31	0
4	ADP	A	557	27/27	0.98	0.07	10,14,19,20	0
4	ADP	B	558	27/27	0.98	0.07	10,14,21,25	0
2	SO4	A	543	5/5	0.98	0.09	27,34,40,40	0
2	SO4	A	542	5/5	0.99	0.06	19,20,22,23	0
3	MN	B	556	1/1	0.99	0.04	20,20,20,20	0
3	MN	A	554	1/1	1.00	0.03	15,15,15,15	0
3	MN	B	555	1/1	1.00	0.04	19,19,19,19	0
3	MN	A	553	1/1	1.00	0.02	18,18,18,18	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.