



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 07:17 AM GMT

PDB ID : 3A7H
Title : Human MST3 kinase in complex with ATP
Authors : Ko, T.P.; Jeng, W.Y.; Liu, C.I.; Lai, M.D.; Wang, A.H.J.
Deposited on : 2009-09-26
Resolution : 1.96 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
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.7 (RC4), CSD as536be (2015)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20026688
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : trunk26865

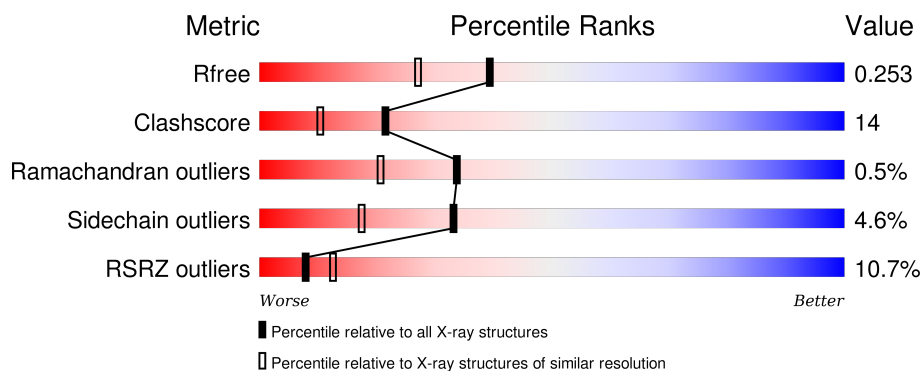
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.96 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}	91344	1833 (1.96-1.96)
Clashscore	102246	1953 (1.96-1.96)
Ramachandran outliers	100387	1936 (1.96-1.96)
Sidechain outliers	100360	1936 (1.96-1.96)
RSRZ outliers	91569	1835 (1.96-1.96)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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	303	<div> <div>11%</div> <div>68%</div> <div>25%</div> <div>• •</div> </div>
1	B	303	<div> <div>10%</div> <div>76%</div> <div>17%</div> <div>• •</div> </div>

2 Entry composition [i](#)

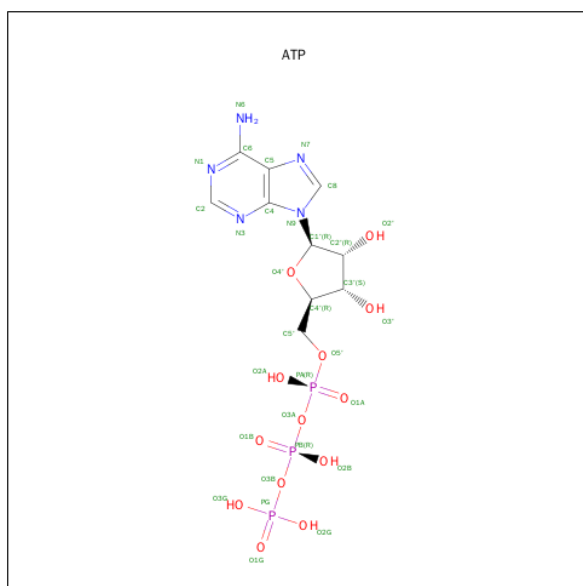
There are 3 unique types of molecules in this entry. The entry contains 5174 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Serine/threonine kinase 24 (STE20 homolog, yeast).

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	290	Total	C	N	O	P	S	0	0	0
			2319	1490	382	440	1	6			
1	B	291	Total	C	N	O	P	S	0	0	0
			2325	1493	383	442	1	6			

- Molecule 2 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$).

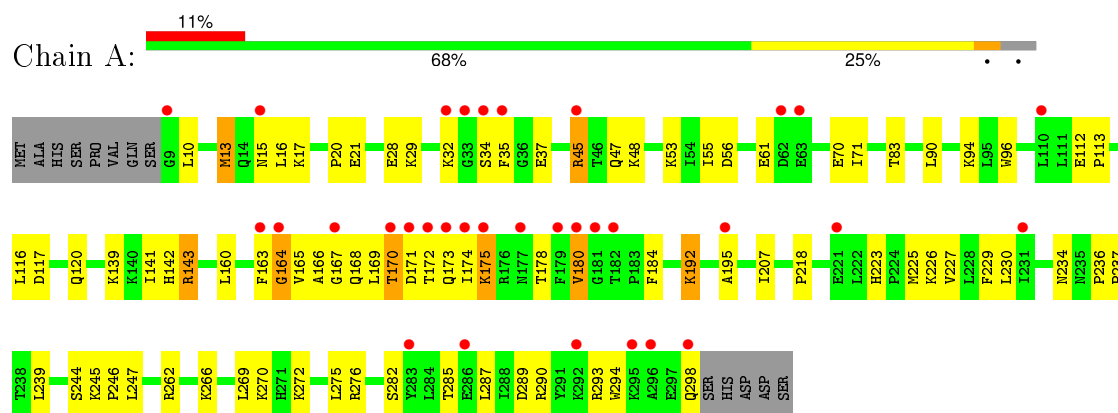


Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	247	Total 247	O 247	0	0
3	B	229	Total 229	O 229	0	0

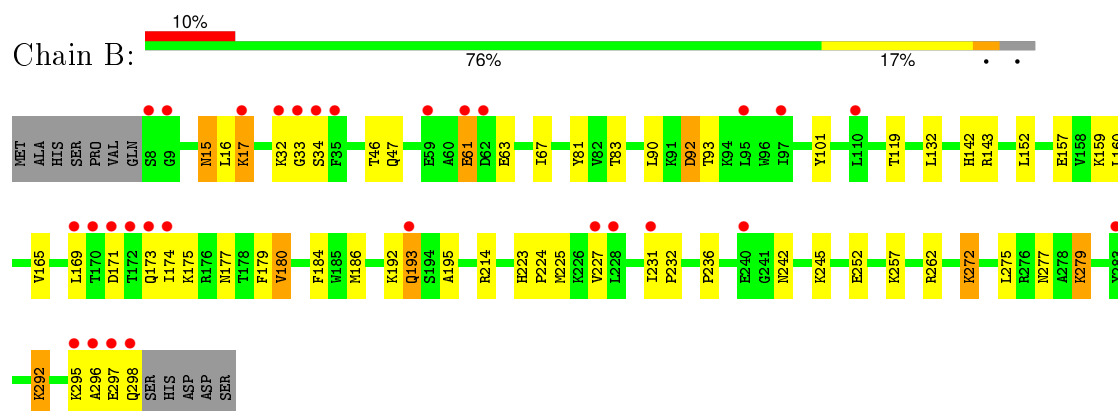
3 Residue-property plots

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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 ($\text{RSRZ} > 2$). 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: Serine/threonine kinase 24 (STE20 homolog, yeast)



- Molecule 1: Serine/threonine kinase 24 (STE20 homolog, yeast)



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	55.68Å 95.19Å 61.48Å 90.00° 93.45° 90.00°	Depositor
Resolution (Å)	20.00 – 1.96 19.58 – 1.96	Depositor EDS
% Data completeness (in resolution range)	95.7 (20.00-1.96) 96.1 (19.58-1.96)	Depositor EDS
R_{merge}	0.04	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	5.00 (at 1.96Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.204 , 0.252 0.204 , 0.253	Depositor DCC
R_{free} test set	2198 reflections (5.00%)	DCC
Wilson B-factor (Å ²)	32.7	Xtriage
Anisotropy	0.514	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.40 , 61.1	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Outliers	0 of 43940 reflections	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	5174	wwPDB-VP
Average B, all atoms (Å ²)	44.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.08% 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, 0.375 respectively for untwinned datasets, and 0.333, 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: TPO, ATP

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	0.88	0/2356	0.90	2/3181 (0.1%)
1	B	0.91	0/2362	0.88	1/3189 (0.0%)
All	All	0.90	0/4718	0.89	3/6370 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	B	0	1

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
1	A	143	ARG	NE-CZ-NH1	-6.64	116.98	120.30
1	A	262	ARG	NE-CZ-NH2	-5.20	117.70	120.30
1	B	262	ARG	NE-CZ-NH1	5.01	122.80	120.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	81	TYR	Sidechain

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	2319	0	2355	71	0
1	B	2325	0	2360	62	0
2	A	27	0	12	0	0
2	B	27	0	12	3	0
3	A	247	0	0	7	0
3	B	229	0	0	10	0
All	All	5174	0	4739	133	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 14.

All (133) 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:177:ASN:O	1:B:193:GLN:HG3	1.56	1.05
1:A:143:ARG:HD3	1:A:165:VAL:O	1.69	0.92
1:B:298:GLN:HA	3:B:411:HOH:O	1.70	0.90
1:B:192:LYS:HE2	3:B:394:HOH:O	1.75	0.86
1:A:223:HIS:HD2	1:A:225:MET:H	1.24	0.85
1:B:33:GLY:HA3	2:B:400:ATP:O1A	1.84	0.77
1:A:16:LEU:HD21	3:A:310:HOH:O	1.86	0.76
1:A:143:ARG:HD2	1:A:167:GLY:N	2.01	0.75
1:B:15:ASN:HD22	1:B:17:LYS:H	1.33	0.75
2:B:400:ATP:H3'	3:B:434:HOH:O	1.87	0.73
1:A:53:LYS:HE2	1:A:55:ILE:HD11	1.69	0.73
1:B:17:LYS:HE3	1:B:17:LYS:HA	1.67	0.73
1:B:184:PHE:CE2	1:B:227:VAL:HG21	2.24	0.73
1:B:16:LEU:HD11	1:B:90:LEU:HB3	1.70	0.73
1:A:35:PHE:HB3	1:A:55:ILE:HD13	1.71	0.72
1:B:295:LYS:HG2	3:B:427:HOH:O	1.89	0.72
1:A:141:ILE:HD11	1:A:169:LEU:HD21	1.73	0.71
1:B:223:HIS:CD2	1:B:225:MET:H	2.10	0.70
1:B:165:VAL:HB	1:B:180:VAL:HG21	1.76	0.68
1:B:296:ALA:O	1:B:297:GLU:HG3	1.94	0.68
1:A:282:SER:O	1:A:285:THR:HG23	1.93	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:223:HIS:CD2	1:A:225:MET:H	2.11	0.68
1:B:184:PHE:CD1	3:B:518:HOH:O	2.47	0.67
1:A:175:LYS:HG3	1:A:195:ALA:HB1	1.75	0.67
1:B:223:HIS:HD2	1:B:225:MET:H	1.42	0.66
1:B:32:LYS:O	1:B:32:LYS:HD3	1.98	0.64
1:B:142:HIS:O	1:B:143:ARG:HB2	1.97	0.64
1:A:270:LYS:HE2	3:A:541:HOH:O	1.97	0.64
1:A:175:LYS:N	1:A:175:LYS:HD3	2.14	0.63
1:B:193:GLN:O	1:B:193:GLN:HG2	2.00	0.62
1:A:21:GLU:HG3	1:A:96:TRP:CZ2	2.35	0.62
1:B:119:THR:HG21	1:B:279:LYS:HD3	1.81	0.62
1:A:163:PHE:HB3	1:A:166:ALA:HB2	1.83	0.61
1:B:15:ASN:ND2	1:B:17:LYS:H	1.96	0.61
1:B:177:ASN:HB3	1:B:193:GLN:CG	2.30	0.61
1:B:17:LYS:CE	1:B:17:LYS:HA	2.30	0.60
1:B:119:THR:CG2	1:B:279:LYS:HD3	2.32	0.60
1:A:172:THR:O	1:A:173:GLN:HG3	2.00	0.60
1:B:143:ARG:HD3	1:B:165:VAL:O	2.03	0.59
1:B:277:ASN:ND2	3:B:338:HOH:O	2.35	0.57
1:A:143:ARG:NH1	1:A:178:TPO:O1P	2.37	0.57
1:A:113:PRO:HB2	1:A:290:ARG:NE	2.19	0.57
1:A:175:LYS:H	1:A:175:LYS:HD3	1.70	0.56
1:A:10:LEU:O	1:A:13:MET:HB2	2.05	0.56
1:A:289:ASP:O	1:A:293:ARG:HG3	2.06	0.56
1:A:116:LEU:HD22	1:A:287:LEU:HD21	1.87	0.55
1:B:193:GLN:O	1:B:193:GLN:CG	2.53	0.55
1:A:117:ASP:OD2	1:A:120:GLN:HG3	2.06	0.55
1:B:179:PHE:HE2	1:B:186:MET:HE1	1.71	0.55
3:A:332:HOH:O	1:B:242:ASN:HB2	2.07	0.55
1:A:163:PHE:O	1:A:165:VAL:N	2.31	0.54
1:A:16:LEU:CD2	3:A:310:HOH:O	2.49	0.54
1:B:223:HIS:CD2	1:B:225:MET:HB2	2.42	0.54
1:A:165:VAL:HB	1:A:180:VAL:HG11	1.90	0.54
1:A:175:LYS:CG	1:A:195:ALA:HB1	2.38	0.54
1:B:32:LYS:HD2	3:B:476:HOH:O	2.07	0.54
1:A:16:LEU:HD23	1:A:90:LEU:HB3	1.90	0.54
1:A:230:LEU:HD22	1:A:234:ASN:HD21	1.72	0.54
1:A:32:LYS:HG2	1:A:37:GLU:HG2	1.90	0.53
1:B:227:VAL:HG12	1:B:231:ILE:CD1	2.39	0.53
1:B:177:ASN:HB3	1:B:193:GLN:CD	2.30	0.52
1:B:214:ARG:HG2	1:B:214:ARG:HH11	1.73	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:15:ASN:C	1:B:15:ASN:HD22	2.13	0.52
1:A:143:ARG:HH12	1:A:178:TPO:P	2.33	0.52
1:A:112:GLU:HB2	1:A:113:PRO:HD3	1.92	0.51
1:A:48:LYS:HG3	3:A:330:HOH:O	2.10	0.51
1:A:174:ILE:O	1:A:174:ILE:HG22	2.09	0.51
1:A:163:PHE:HB3	1:A:166:ALA:CB	2.40	0.51
1:A:174:ILE:CG2	1:A:174:ILE:O	2.58	0.51
1:A:272:LYS:HD2	1:A:276:ARG:NH1	2.25	0.51
1:B:165:VAL:HB	1:B:180:VAL:CG2	2.40	0.51
1:A:245:LYS:HB3	1:A:246:PRO:HD3	1.93	0.51
1:B:227:VAL:HG12	1:B:231:ILE:HD11	1.93	0.51
1:A:168:GLN:HG3	1:A:170:THR:HG23	1.92	0.51
1:A:47:GLN:HB3	1:B:245:LYS:HB2	1.93	0.50
1:B:236:PRO:HD3	1:B:257:LYS:HG2	1.93	0.50
1:B:223:HIS:HD2	1:B:225:MET:N	2.09	0.49
1:A:15:ASN:OD1	1:A:17:LYS:HB3	2.12	0.49
1:B:63:GLU:O	1:B:67:ILE:HG13	2.11	0.49
1:A:56:ASP:OD2	1:A:94:LYS:HE3	2.11	0.49
1:A:20:PRO:HB2	1:A:96:TRP:CE3	2.47	0.49
1:A:230:LEU:HD22	1:A:234:ASN:ND2	2.28	0.49
1:A:142:HIS:O	1:A:143:ARG:HB2	2.13	0.49
1:B:83:THR:HG23	1:B:160:LEU:O	2.13	0.49
1:A:143:ARG:HD2	1:A:167:GLY:H	1.76	0.49
1:B:292:LYS:HE2	3:B:428:HOH:O	2.13	0.48
1:A:165:VAL:HB	1:A:180:VAL:CG1	2.44	0.48
1:A:29:LYS:NZ	3:A:317:HOH:O	2.47	0.48
1:B:15:ASN:ND2	1:B:17:LYS:HB2	2.30	0.47
1:B:223:HIS:HD2	1:B:225:MET:HB2	1.79	0.47
1:B:101:TYR:OH	3:B:424:HOH:O	2.20	0.46
1:A:48:LYS:CG	3:A:330:HOH:O	2.64	0.46
1:B:175:LYS:CB	1:B:195:ALA:HB1	2.46	0.46
1:A:163:PHE:C	1:A:165:VAL:H	2.18	0.46
1:B:46:THR:O	1:B:47:GLN:HB2	2.16	0.45
1:A:10:LEU:HD11	1:A:71:ILE:HD12	1.96	0.45
1:B:63:GLU:H	1:B:63:GLU:CD	2.17	0.45
1:B:63:GLU:N	1:B:63:GLU:OE2	2.32	0.45
1:A:83:THR:HG23	1:A:160:LEU:O	2.16	0.45
1:A:139:LYS:HA	1:A:139:LYS:HD3	1.80	0.44
1:A:10:LEU:HD11	1:A:71:ILE:HB	1.99	0.44
1:B:231:ILE:HB	1:B:232:PRO:HD3	1.99	0.44
1:A:45:ARG:HG3	1:A:45:ARG:HH11	1.83	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:272:LYS:NZ	3:B:440:HOH:O	2.47	0.44
1:A:192:LYS:HA	1:A:192:LYS:HD2	1.85	0.43
1:A:175:LYS:N	1:A:175:LYS:CD	2.80	0.43
1:B:174:ILE:O	1:B:175:LYS:HG2	2.19	0.43
1:A:207:ILE:HG23	1:A:218:PRO:HD2	2.01	0.43
1:A:163:PHE:CD2	1:A:163:PHE:N	2.86	0.43
1:B:119:THR:HG23	1:B:277:ASN:O	2.19	0.43
1:A:10:LEU:HB3	1:A:13:MET:HG3	2.01	0.43
1:B:15:ASN:HD22	1:B:16:LEU:N	2.17	0.42
1:B:184:PHE:HE2	1:B:227:VAL:HG21	1.79	0.42
1:A:294:TRP:O	1:A:298:GLN:HG2	2.19	0.42
1:B:132:LEU:HD23	1:B:132:LEU:HA	1.76	0.42
1:B:61:GLU:N	1:B:63:GLU:OE2	2.34	0.42
1:A:184:PHE:CE2	1:A:227:VAL:HG21	2.54	0.42
1:A:266:LYS:O	1:A:269:LEU:HB2	2.20	0.42
1:A:245:LYS:N	1:A:246:PRO:CD	2.83	0.42
1:B:275:LEU:HA	1:B:275:LEU:HD23	1.74	0.41
1:A:244:SER:HB2	1:A:246:PRO:HD2	2.02	0.41
1:A:239:LEU:CD2	1:A:247:LEU:HG	2.50	0.41
1:B:92:ASP:HB3	1:B:93:THR:H	1.57	0.41
1:A:112:GLU:CB	1:A:113:PRO:HD3	2.49	0.41
1:A:178:TPO:HG23	1:A:180:VAL:HG23	2.03	0.41
1:B:33:GLY:HA3	2:B:400:ATP:PA	2.61	0.41
1:B:142:HIS:O	1:B:143:ARG:CB	2.63	0.41
1:B:169:LEU:HD22	1:B:174:ILE:O	2.20	0.41
1:B:152:LEU:HA	1:B:157:GLU:O	2.21	0.40
1:A:226:LYS:HA	1:A:229:PHE:CE2	2.56	0.40
1:A:70:GLU:HB2	1:A:164:GLY:HA2	2.04	0.40
1:A:275:LEU:HD23	1:A:275:LEU:HA	1.89	0.40
1:A:236:PRO:HA	1:A:237:PRO:HD3	1.96	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	287/303 (95%)	273 (95%)	13 (4%)	1 (0%)	46	35
1	B	288/303 (95%)	269 (93%)	17 (6%)	2 (1%)	26	14
All	All	575/606 (95%)	542 (94%)	30 (5%)	3 (0%)	34	21

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	164	GLY
1	B	61	GLU
1	B	193	GLN

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	252/264 (96%)	242 (96%)	10 (4%)	38	23
1	B	253/264 (96%)	240 (95%)	13 (5%)	29	13
All	All	505/528 (96%)	482 (95%)	23 (5%)	33	17

All (23) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	13	MET
1	A	28	GLU
1	A	34	SER
1	A	45	ARG
1	A	61	GLU
1	A	170	THR
1	A	171	ASP
1	A	175	LYS
1	A	180	VAL
1	A	192	LYS

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Mol	Chain	Res	Type
1	B	15	ASN
1	B	17	LYS
1	B	34	SER
1	B	92	ASP
1	B	159	LYS
1	B	171	ASP
1	B	173	GLN
1	B	180	VAL
1	B	224	PRO
1	B	252	GLU
1	B	272	LYS
1	B	279	LYS
1	B	292	LYS

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

Mol	Chain	Res	Type
1	A	47	GLN
1	A	223	HIS
1	B	14	GLN
1	B	15	ASN
1	B	173	GLN
1	B	223	HIS
1	B	277	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

2 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	TPO	A	178	1	8,10,11	0.92	0	7,14,16	1.29	1 (14%)
1	TPO	B	178	1	8,10,11	0.74	0	7,14,16	1.08	1 (14%)

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	TPO	A	178	1	-	0/8/11/13	0/0/0/0
1	TPO	B	178	1	-	0/8/11/13	0/0/0/0

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
1	B	178	TPO	C-CA-N	2.33	114.70	109.83
1	A	178	TPO	C-CA-N	2.89	115.87	109.83

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	178	TPO	3	0

5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry [i](#)

2 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the chemical component dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length

(or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
2	ATP	A	400	-	22,29,33	1.95	7 (31%)	27,45,52	2.28	9 (33%)
2	ATP	B	400	-	22,29,33	2.03	7 (31%)	27,45,52	2.07	8 (29%)

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	ATP	A	400	-	-	0/12/32/38	0/3/3/3
2	ATP	B	400	-	-	0/12/32/38	0/3/3/3

All (14) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	400	ATP	PB-O2B	-3.04	1.43	1.54
2	B	400	ATP	O4'-C4'	-2.94	1.38	1.45
2	B	400	ATP	PB-O2B	-2.66	1.45	1.54
2	A	400	ATP	C8-N7	-2.32	1.30	1.34
2	A	400	ATP	C3'-C4'	2.08	1.58	1.53
2	B	400	ATP	C2-N3	2.40	1.36	1.32
2	A	400	ATP	C2-N3	2.45	1.36	1.32
2	A	400	ATP	C4-N3	2.72	1.39	1.35
2	B	400	ATP	C4-N3	2.86	1.39	1.35
2	B	400	ATP	C3'-C4'	3.14	1.61	1.53
2	A	400	ATP	PB-O3B	3.58	1.67	1.54
2	B	400	ATP	PB-O3B	4.07	1.69	1.54
2	B	400	ATP	O4'-C1'	4.50	1.46	1.41
2	A	400	ATP	O4'-C1'	5.33	1.47	1.41

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	400	ATP	N3-C2-N1	-5.65	124.56	128.89
2	A	400	ATP	N3-C2-N1	-5.32	124.82	128.89
2	A	400	ATP	C2'-C3'-C4'	-4.17	94.03	102.61
2	A	400	ATP	O3B-PB-O3A	-3.84	87.65	105.09
2	B	400	ATP	C2'-C3'-C4'	-3.07	96.31	102.61

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	400	ATP	O3B-PB-O3A	-3.01	91.44	105.09
2	A	400	ATP	C2'-C1'-N9	-2.47	110.52	114.29
2	B	400	ATP	O4'-C1'-N9	-2.34	103.19	108.10
2	A	400	ATP	C4'-O4'-C1'	2.27	112.22	109.72
2	B	400	ATP	O4'-C4'-C5'	2.51	118.31	109.32
2	B	400	ATP	C4-C5-N7	2.53	111.80	109.48
2	A	400	ATP	O4'-C4'-C5'	2.67	118.85	109.32
2	A	400	ATP	C4-C5-N7	2.89	112.14	109.48
2	B	400	ATP	O3'-C3'-C2'	2.94	121.38	111.83
2	A	400	ATP	O3'-C3'-C2'	3.38	122.82	111.83
2	B	400	ATP	O2B-PB-O1B	3.50	121.86	110.58
2	A	400	ATP	O2B-PB-O1B	3.82	122.86	110.58

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	400	ATP	3	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 ⓘ

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	289/303 (95%)	0.66	33 (11%) 7 11	23, 40, 73, 97	0
1	B	290/303 (95%)	0.63	29 (10%) 9 15	25, 39, 71, 94	0
All	All	579/606 (95%)	0.64	62 (10%) 8 12	23, 40, 72, 97	0

All (62) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	174	ILE	8.7
1	A	35	PHE	8.7
1	B	172	THR	7.7
1	A	172	THR	7.3
1	B	173	GLN	7.1
1	B	171	ASP	6.3
1	B	9	GLY	6.1
1	B	8	SER	6.1
1	B	35	PHE	5.9
1	A	173	GLN	5.9
1	B	170	THR	5.7
1	B	33	GLY	5.2
1	A	283	TYR	4.9
1	B	34	SER	4.8
1	A	171	ASP	4.6
1	B	193	GLN	4.5
1	A	62	ASP	4.3
1	B	62	ASP	4.2
1	B	17	LYS	4.0
1	B	296	ALA	4.0
1	B	97	ILE	3.9
1	B	298	GLN	3.9
1	B	61	GLU	3.9
1	A	180	VAL	3.8

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Mol	Chain	Res	Type	RSRZ
1	A	182	THR	3.8
1	B	228	LEU	3.7
1	A	177	ASN	3.7
1	A	170	THR	3.6
1	A	34	SER	3.5
1	B	283	TYR	3.5
1	A	32	LYS	3.3
1	A	295	LYS	3.3
1	A	45	ARG	3.3
1	B	174	ILE	3.3
1	B	169	LEU	3.3
1	A	9	GLY	3.2
1	B	59	GLU	3.0
1	B	295	LYS	3.0
1	A	296	ALA	2.9
1	A	195	ALA	2.9
1	A	164	GLY	2.9
1	A	175	LYS	2.8
1	A	167	GLY	2.6
1	A	181	GLY	2.5
1	A	110	LEU	2.5
1	A	163	PHE	2.4
1	A	231	ILE	2.4
1	B	240	GLU	2.3
1	B	110	LEU	2.3
1	A	286	GLU	2.3
1	A	221	GLU	2.3
1	B	95	LEU	2.2
1	B	297	GLU	2.2
1	B	227	VAL	2.2
1	A	298	GLN	2.2
1	B	32	LYS	2.1
1	A	63	GLU	2.1
1	A	33	GLY	2.1
1	A	15	ASN	2.1
1	A	292	LYS	2.1
1	B	231	ILE	2.0
1	A	179	PHE	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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å ²)	Q<0.9
1	TPO	A	178	11/12	0.91	0.29	-	66,73,77,77	0
1	TPO	B	178	11/12	0.90	0.23	-	60,65,67,68	0

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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å ²)	Q<0.9
2	ATP	B	400	27/31	0.84	0.16	-0.03	53,70,83,84	0
2	ATP	A	400	27/31	0.86	0.14	-0.26	46,59,69,70	0

6.5 Other polymers [i](#)

There are no such residues in this entry.