



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 13, 2017 – 07:16 pm GMT

PDB ID : 4BFW  
Title : Crystal structure of Mycobacterium tuberculosis PanK in complex with a triazole inhibitory compound (1e) and phosphate  
Authors : Bjorkelid, C.; Bergfors, T.; Jones, T.A.  
Deposited on : 2013-03-22  
Resolution : 2.27 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

<http://wwpdb.org/validation/2016/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	:	1.7.2 (RC1), CSD as538be (2017)
Xtriage (Phenix)	:	1.9-1692
EDS	:	trunk28620
Percentile statistics	:	20161228.v01 (using entries in the PDB archive December 28th 2016)
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)	:	recalc28949

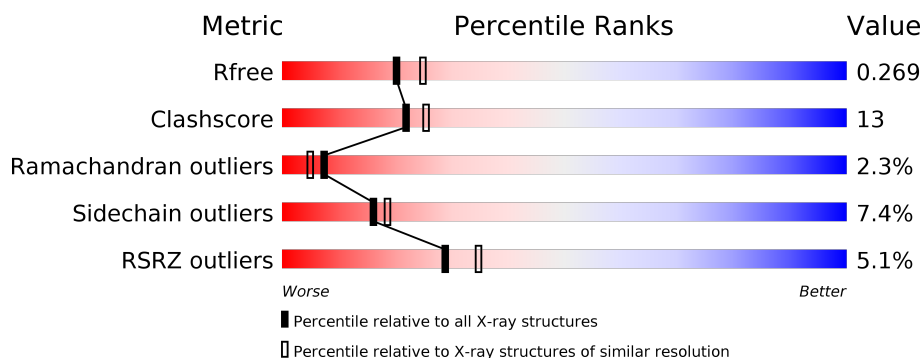
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.27 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))
$R_{free}$	100719	5609 (2.30-2.26)
Clashscore	112137	6364 (2.30-2.26)
Ramachandran outliers	110173	6281 (2.30-2.26)
Sidechain outliers	110143	6281 (2.30-2.26)
RSRZ outliers	101464	5639 (2.30-2.26)

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	318	<div> <div>5%</div> <div> <div></div> <div>68%</div> <div>24%</div> <div>5%</div> <div>.</div> </div> </div>
1	B	318	<div> <div>5%</div> <div> <div></div> <div>68%</div> <div>24%</div> <div>.</div> <div>.</div> </div> </div>

## 2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 5164 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 PANTOTHENATE KINASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	306	Total	C	N	O	S	0	0	0
			2471	1573	451	441	6			
1	B	306	Total	C	N	O	S	0	0	0
			2471	1573	451	441	6			

There are 12 discrepancies between the modelled and reference sequences:

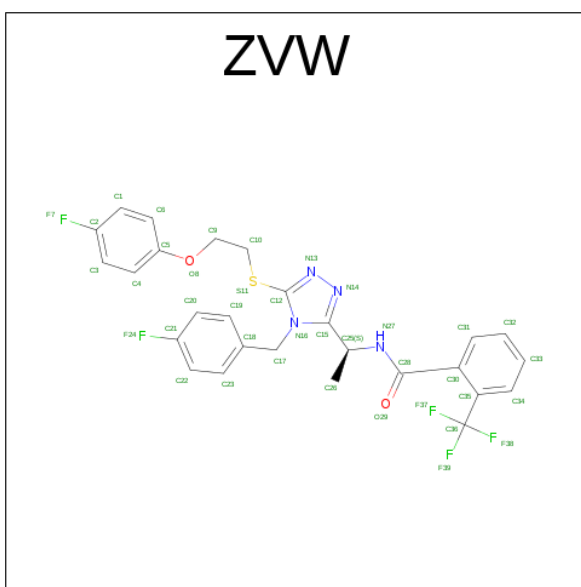
Chain	Residue	Modelled	Actual	Comment	Reference
A	-5	HIS	-	EXPRESSION TAG	UNP P63810
A	-4	HIS	-	EXPRESSION TAG	UNP P63810
A	-3	HIS	-	EXPRESSION TAG	UNP P63810
A	-2	HIS	-	EXPRESSION TAG	UNP P63810
A	-1	HIS	-	EXPRESSION TAG	UNP P63810
A	0	HIS	-	EXPRESSION TAG	UNP P63810
B	-5	HIS	-	EXPRESSION TAG	UNP P63810
B	-4	HIS	-	EXPRESSION TAG	UNP P63810
B	-3	HIS	-	EXPRESSION TAG	UNP P63810
B	-2	HIS	-	EXPRESSION TAG	UNP P63810
B	-1	HIS	-	EXPRESSION TAG	UNP P63810
B	0	HIS	-	EXPRESSION TAG	UNP P63810

- Molecule 2 is PHOSPHATE ION (three-letter code: PO4) (formula: O<sub>4</sub>P).



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

- Molecule 3 is N-[1-(5-{[2-(4-FLUOROPHENOXY)ETHYL]SULFANYL}-4-[(4-FLUOROPHENYL)METHYL]-4H-1,2,4-TRIAZOL-3-YL)ETHYL)-2-(TRIFLUOROMETHYL)BENZAMIDE (three-letter code: ZVW) (formula: C<sub>27</sub>H<sub>23</sub>F<sub>5</sub>N<sub>4</sub>O<sub>2</sub>S).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
3	A	1	Total	C	F	N	O	S	0	0
			39	27	5	4	2	1		

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Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
3	B	1	Total	C	F	N	O	S	0	0
			39	27	5	4	2	1		

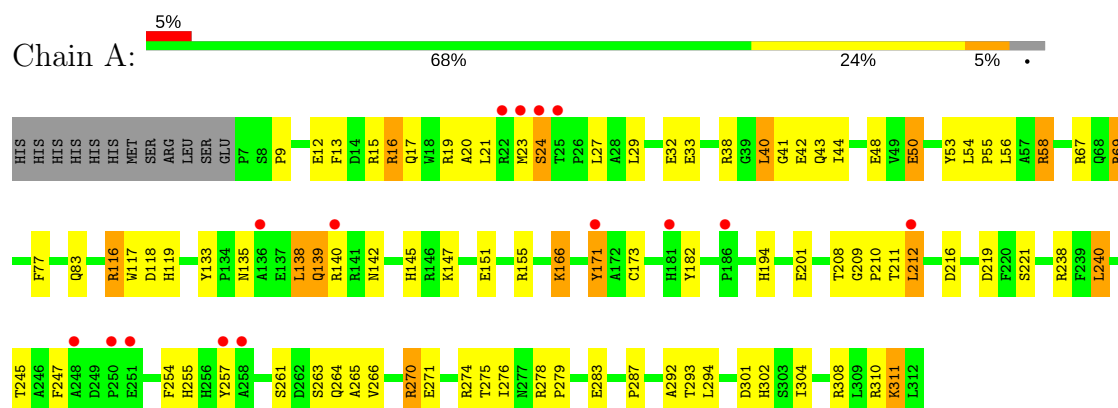
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	77	Total	O	0	0
			77	77		
4	B	57	Total	O	0	0
			57	57		

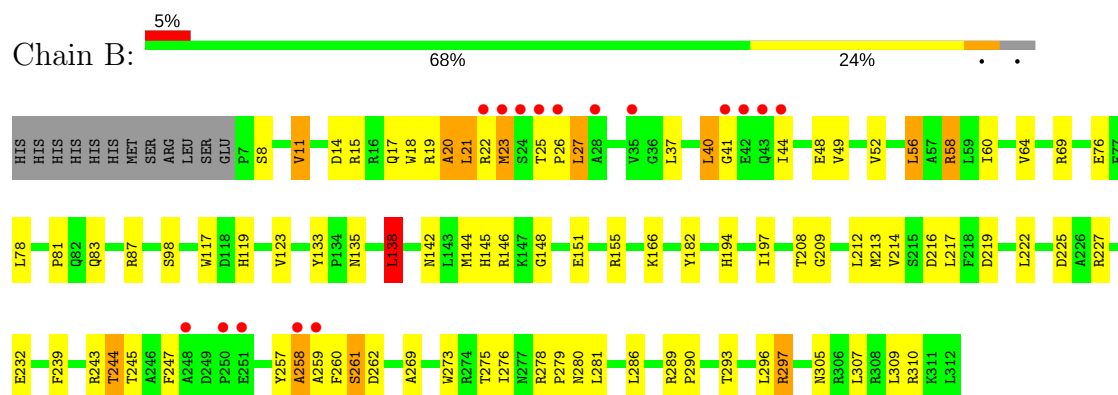
### 3 Residue-property plots [i](#)

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: PANTOTHENATE KINASE



#### • Molecule 1: PANTOTHENATE KINASE



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	89.03Å 150.71Å 60.50Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	47.54 – 2.27 47.49 – 2.27	Depositor EDS
% Data completeness (in resolution range)	99.5 (47.54-2.27) 99.5 (47.49-2.27)	Depositor EDS
$R_{merge}$	0.10	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.51 (at 2.27Å)	Xtriage
Refinement program	REFMAC 5.7.0032	Depositor
R, $R_{free}$	0.213 , 0.273 0.210 , 0.269	Depositor DCC
$R_{free}$ test set	1911 reflections (5.26%)	DCC
Wilson B-factor (Å <sup>2</sup> )	35.2	Xtriage
Anisotropy	0.929	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 48.5	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	5164	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	44.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 50.53 % of the origin peak, indicating pseudo translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo translational symmetry is equal to 6.3841e-05. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

<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

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: PO4, ZVW

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	0.63	0/2531	0.78	2/3442 (0.1%)
1	B	0.60	0/2531	0.81	3/3442 (0.1%)
All	All	0.62	0/5062	0.80	5/6884 (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	212	LEU	CA-CB-CG	6.33	129.85	115.30
1	B	219	ASP	CB-CG-OD2	5.64	123.38	118.30
1	B	138	LEU	CA-CB-CG	5.19	127.24	115.30
1	B	225	ASP	CB-CG-OD1	5.12	122.91	118.30
1	A	138	LEU	CA-CB-CG	5.12	127.07	115.30

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	2471	0	2473	72	0
1	B	2471	0	2473	71	0
2	A	5	0	0	0	0
2	B	5	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	39	0	23	1	0
3	B	39	0	23	2	0
4	A	77	0	0	3	0
4	B	57	0	0	6	0
All	All	5164	0	4992	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 13.

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:A:171:TYR:HE1	1:A:173:CYS:SG	1.82	1.02
1:A:56:LEU:HD11	1:A:294:LEU:HD21	1.42	1.00
1:A:171:TYR:HE1	1:A:173:CYS:HG	1.09	0.94
1:A:33:GLU:OE2	1:A:116:ARG:HD2	1.69	0.92
1:A:16:ARG:HH11	1:A:16:ARG:CG	1.85	0.90
1:B:243:ARG:NH2	1:B:262:ASP:OD1	2.08	0.87
1:A:208:THR:HG21	1:B:209:GLY:O	1.75	0.86
1:B:260:PHE:O	1:B:261:SER:HB3	1.73	0.85
1:A:209:GLY:O	1:B:208:THR:HG21	1.81	0.80
1:A:142:ASN:HB2	4:A:2036:HOH:O	1.84	0.77
1:B:286:LEU:HD11	1:B:289:ARG:HH21	1.50	0.76
1:B:286:LEU:HD11	1:B:289:ARG:NH2	2.02	0.74
1:B:142:ASN:HB2	4:B:2032:HOH:O	1.87	0.74
1:A:19:ARG:O	1:A:21:LEU:N	2.20	0.73
1:A:135:ASN:O	1:A:139:GLN:HG2	1.91	0.70
1:A:16:ARG:HH11	1:A:16:ARG:HG2	1.55	0.70
1:A:171:TYR:CE1	1:A:173:CYS:SG	2.74	0.69
1:A:54:LEU:HB3	1:A:55:PRO:HD3	1.73	0.69
1:A:29:LEU:HD12	1:A:50:GLU:HB2	1.76	0.68
1:A:69:ARG:HH22	1:B:69:ARG:HD2	1.59	0.68
1:B:21:LEU:HA	1:B:23:MET:SD	2.34	0.68
1:A:261:SER:OG	1:A:264:GLN:HG3	1.95	0.67
1:A:16:ARG:HG3	1:A:16:ARG:HH11	1.58	0.67
1:A:40:LEU:HD12	1:A:44:ILE:HD11	1.77	0.67
1:B:15:ARG:HH12	1:B:52:VAL:HG21	1.61	0.65
1:B:148:GLY:O	1:B:280:ASN:ND2	2.28	0.65
1:B:19:ARG:O	1:B:21:LEU:N	2.28	0.65
1:B:69:ARG:NH1	4:B:2010:HOH:O	2.24	0.65
1:B:194:HIS:HE1	4:B:2015:HOH:O	1.78	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:145:HIS:H	1:B:145:HIS:CD2	2.14	0.64
1:A:145:HIS:CD2	1:A:145:HIS:H	2.15	0.63
1:B:21:LEU:HD21	1:B:27:LEU:HB2	1.79	0.63
1:B:25:THR:O	1:B:27:LEU:N	2.33	0.61
1:A:21:LEU:HD11	1:A:27:LEU:HB2	1.82	0.61
1:B:133:TYR:HB2	1:B:138:LEU:HD13	1.83	0.61
1:A:21:LEU:HD21	1:A:27:LEU:H	1.67	0.59
1:B:14:ASP:OD1	1:B:17:GLN:HG3	2.02	0.59
1:A:15:ARG:NH1	1:A:48:GLU:OE2	2.36	0.59
1:B:145:HIS:HD2	4:B:2033:HOH:O	1.88	0.56
1:B:135:ASN:HA	1:B:144:MET:HE1	1.86	0.56
1:A:209:GLY:O	1:B:208:THR:CG2	2.53	0.56
1:A:41:GLY:O	1:A:43:GLN:N	2.37	0.56
1:B:243:ARG:HD2	1:B:259:ALA:HA	1.86	0.56
1:B:78:LEU:O	1:B:81:PRO:HD3	2.06	0.55
1:B:290:PRO:O	1:B:310:ARG:NH2	2.40	0.55
1:B:58:ARG:HH11	1:B:58:ARG:HG2	1.71	0.55
1:A:212:LEU:HD12	1:A:216:ASP:OD2	2.07	0.55
1:B:81:PRO:HB2	1:B:83:GLN:OE1	2.07	0.55
1:B:60:ILE:O	1:B:64:VAL:HG23	2.06	0.54
1:A:254:PHE:HB3	1:A:257:TYR:CD2	2.43	0.54
1:B:297:ARG:NH1	1:B:305:ASN:HD21	2.05	0.54
1:A:9:PRO:O	1:A:311:LYS:HG2	2.08	0.54
1:B:243:ARG:HH11	1:B:260:PHE:H	1.55	0.54
1:A:58:ARG:HH11	1:A:58:ARG:HG2	1.72	0.53
1:B:182:TYR:CE1	3:B:501:ZVW:H171	2.43	0.53
1:B:297:ARG:NH1	1:B:305:ASN:ND2	2.56	0.53
1:A:266:VAL:O	1:A:270:ARG:HB2	2.09	0.53
1:B:98:SER:HB2	1:B:281:LEU:HD13	1.90	0.53
1:A:133:TYR:HB2	1:A:138:LEU:HD13	1.90	0.52
1:A:40:LEU:HD12	1:A:44:ILE:CD1	2.39	0.52
1:A:271:GLU:O	1:A:275:THR:HB	2.09	0.52
1:B:58:ARG:CG	1:B:58:ARG:HH11	2.23	0.52
1:B:20:ALA:O	1:B:22:ARG:N	2.40	0.52
1:A:12:GLU:HG3	1:A:308:ARG:HG2	1.92	0.51
1:B:145:HIS:CD2	4:B:2033:HOH:O	2.63	0.51
1:A:166:LYS:NZ	1:A:219:ASP:OD2	2.37	0.51
1:A:41:GLY:C	1:A:43:GLN:N	2.63	0.51
1:B:58:ARG:HD2	1:B:117:TRP:HZ2	1.76	0.51
1:A:58:ARG:HD2	1:A:117:TRP:HZ2	1.77	0.50
1:A:208:THR:CG2	1:B:209:GLY:O	2.52	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:16:ARG:NH1	1:A:16:ARG:CG	2.55	0.50
1:B:212:LEU:HD12	1:B:216:ASP:OD2	2.12	0.49
1:B:25:THR:HB	1:B:27:LEU:HG	1.93	0.49
1:A:283:GLU:O	1:A:287:PRO:HG2	2.12	0.49
1:A:194:HIS:HE1	4:A:2017:HOH:O	1.96	0.49
1:A:221:SER:OG	1:A:292:ALA:HA	2.13	0.49
1:A:58:ARG:CG	1:A:58:ARG:HH11	2.25	0.49
1:A:301:ASP:O	1:A:302:HIS:HB2	2.13	0.48
1:B:209:GLY:H	1:B:213:MET:CE	2.25	0.48
1:B:119:HIS:H	1:B:119:HIS:CD2	2.30	0.48
1:B:232:GLU:HG3	1:B:273:TRP:CD1	2.48	0.48
1:A:17:GLN:NE2	1:B:83:GLN:HE22	2.10	0.48
1:A:240:LEU:HD22	1:A:265:ALA:HB1	1.95	0.48
1:A:38:ARG:O	1:A:41:GLY:N	2.38	0.47
1:A:119:HIS:H	1:A:119:HIS:CD2	2.31	0.47
1:B:182:TYR:OH	3:B:501:ZVW:H19	2.14	0.47
1:A:210:PRO:HA	1:B:208:THR:HG21	1.96	0.47
1:B:194:HIS:CE1	4:B:2015:HOH:O	2.58	0.47
1:B:296:LEU:HD23	1:B:307:LEU:HG	1.96	0.46
1:A:21:LEU:HD23	1:A:21:LEU:O	2.16	0.46
1:A:53:TYR:OH	1:A:304:ILE:HD11	2.15	0.46
1:B:15:ARG:NH1	1:B:52:VAL:HG21	2.27	0.46
1:B:260:PHE:O	1:B:261:SER:CB	2.52	0.46
1:B:37:LEU:HD13	1:B:49:VAL:HG11	1.98	0.46
1:A:15:ARG:HH22	1:A:48:GLU:HG2	1.80	0.45
1:A:247:PHE:O	1:A:255:HIS:HD2	1.99	0.45
1:B:257:TYR:O	1:B:259:ALA:N	2.50	0.45
1:B:239:PHE:CD2	1:B:269:ALA:HB2	2.52	0.45
1:A:139:GLN:O	1:A:140:ARG:C	2.55	0.45
1:B:40:LEU:HB2	1:B:44:ILE:CD1	2.47	0.45
1:B:15:ARG:HH12	1:B:52:VAL:CG2	2.28	0.44
1:A:145:HIS:HD2	1:A:145:HIS:H	1.64	0.44
1:A:311:LYS:HG2	1:A:311:LYS:H	1.60	0.44
1:A:182:TYR:CE1	3:A:501:ZVW:H171	2.52	0.44
1:B:145:HIS:CE1	1:B:146:ARG:HG3	2.53	0.44
1:A:69:ARG:HH22	1:B:69:ARG:CD	2.26	0.44
1:A:13:PHE:HZ	1:B:78:LEU:HD13	1.83	0.44
1:A:276:ILE:C	1:A:279:PRO:HD2	2.38	0.44
1:B:278:ARG:HB3	1:B:279:PRO:HD3	2.00	0.44
1:A:56:LEU:HD11	1:A:294:LEU:CD2	2.29	0.43
1:A:147:LYS:HD2	1:A:182:TYR:CZ	2.52	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:41:GLY:C	1:A:43:GLN:H	2.17	0.43
1:B:244:THR:O	1:B:245:THR:C	2.57	0.43
1:B:15:ARG:NH1	1:B:48:GLU:OE2	2.52	0.42
1:B:166:LYS:HG3	1:B:217:LEU:HB3	2.02	0.42
1:A:16:ARG:H	1:A:16:ARG:HG3	1.63	0.42
1:A:21:LEU:HD21	1:A:27:LEU:N	2.33	0.42
1:A:67:ARG:NH1	1:A:219:ASP:OD1	2.41	0.42
1:A:238:ARG:HB2	4:A:2065:HOH:O	2.18	0.42
1:A:142:ASN:CG	1:A:142:ASN:O	2.58	0.42
1:A:41:GLY:HA2	1:A:44:ILE:HD12	2.02	0.42
1:B:11:VAL:HG23	1:B:309:LEU:O	2.19	0.42
1:A:77:PHE:CE1	1:B:58:ARG:HG2	2.54	0.42
1:B:25:THR:C	1:B:27:LEU:N	2.74	0.41
1:B:243:ARG:NH1	1:B:260:PHE:H	2.18	0.41
1:A:145:HIS:CD2	1:A:145:HIS:N	2.87	0.41
1:A:275:THR:HG22	1:A:276:ILE:HG13	2.02	0.41
1:B:166:LYS:HA	1:B:166:LYS:HD3	1.79	0.41
1:B:247:PHE:HB3	1:B:258:ALA:HA	2.03	0.41
1:A:211:THR:OG1	1:A:212:LEU:N	2.52	0.40
1:B:275:THR:HG22	1:B:276:ILE:HG13	2.03	0.40
1:B:123:VAL:HG13	1:B:197:ILE:HB	2.02	0.40
1:B:18:TRP:CZ2	1:B:56:LEU:HD12	2.57	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	304/318 (96%)	284 (93%)	15 (5%)	5 (2%)	11	9
1	B	304/318 (96%)	279 (92%)	16 (5%)	9 (3%)	5	3
All	All	608/636 (96%)	563 (93%)	31 (5%)	14 (2%)	7	5

All (14) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	20	ALA
1	A	23	MET
1	B	20	ALA
1	B	21	LEU
1	B	23	MET
1	B	41	GLY
1	B	258	ALA
1	A	42	GLU
1	A	24	SER
1	B	27	LEU
1	B	261	SER
1	B	244	THR
1	A	245	THR
1	B	26	PRO

### 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	264/276 (96%)	240 (91%)	24 (9%)	11	12
1	B	264/276 (96%)	249 (94%)	15 (6%)	24	30
All	All	528/552 (96%)	489 (93%)	39 (7%)	16	19

All (39) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	16	ARG
1	A	24	SER
1	A	32	GLU
1	A	40	LEU
1	A	50	GLU
1	A	58	ARG
1	A	69	ARG
1	A	83	GLN
1	A	116	ARG

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Mol	Chain	Res	Type
1	A	118	ASP
1	A	139	GLN
1	A	151	GLU
1	A	155	ARG
1	A	166	LYS
1	A	171	TYR
1	A	201	GLU
1	A	240	LEU
1	A	263	SER
1	A	270	ARG
1	A	274	ARG
1	A	278	ARG
1	A	293	THR
1	A	310	ARG
1	A	311	LYS
1	B	8	SER
1	B	11	VAL
1	B	40	LEU
1	B	56	LEU
1	B	58	ARG
1	B	76	GLU
1	B	87	ARG
1	B	138	LEU
1	B	151	GLU
1	B	155	ARG
1	B	214	VAL
1	B	222	LEU
1	B	227	ARG
1	B	293	THR
1	B	297	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	17	GLN
1	A	83	GLN
1	A	119	HIS
1	A	145	HIS
1	A	181	HIS
1	A	255	HIS
1	B	119	HIS
1	B	145	HIS

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Mol	Chain	Res	Type
1	B	255	HIS

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

## 5.6 Ligand geometry ⓘ

4 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	PO4	A	401	-	4,4,4	0.53	0	6,6,6	1.32	0
3	ZVW	A	501	-	38,42,42	1.28	6 (15%)	47,59,59	1.20	4 (8%)
2	PO4	B	401	-	4,4,4	0.76	0	6,6,6	0.50	0
3	ZVW	B	501	-	38,42,42	1.29	4 (10%)	47,59,59	1.31	6 (12%)

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	PO4	A	401	-	-	0/0/0/0	0/0/0/0

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	ZVW	A	501	-	-	0/24/29/29	0/4/4/4
2	PO4	B	401	-	-	0/0/0/0	0/0/0/0
3	ZVW	B	501	-	-	0/24/29/29	0/4/4/4

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	501	ZVW	N14-N13	2.14	1.41	1.37
3	A	501	ZVW	C3-C2	2.22	1.41	1.37
3	B	501	ZVW	C1-C2	2.31	1.41	1.37
3	A	501	ZVW	C20-C21	2.37	1.41	1.37
3	A	501	ZVW	C1-C2	2.39	1.41	1.37
3	B	501	ZVW	N14-N13	2.66	1.42	1.37
3	A	501	ZVW	O8-C5	2.88	1.44	1.37
3	A	501	ZVW	C15-N14	3.20	1.44	1.34
3	B	501	ZVW	O8-C5	3.24	1.45	1.37
3	B	501	ZVW	C15-N14	3.36	1.44	1.34

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	501	ZVW	C6-C1-C2	-4.30	113.82	118.35
3	A	501	ZVW	C6-C1-C2	-3.96	114.18	118.35
3	B	501	ZVW	F38-C36-C35	-2.91	107.46	112.69
3	B	501	ZVW	C22-C21-C20	-2.35	119.59	122.86
3	B	501	ZVW	O29-C28-C30	-2.17	116.88	120.98
3	A	501	ZVW	C25-N27-C28	2.31	127.78	122.72
3	B	501	ZVW	C1-C6-C5	2.74	123.18	119.74
3	A	501	ZVW	C9-O8-C5	2.80	125.31	117.90
3	A	501	ZVW	C1-C6-C5	2.81	123.26	119.74
3	B	501	ZVW	C9-O8-C5	2.87	125.50	117.90

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	501	ZVW	1	0
3	B	501	ZVW	2	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, 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	306/318 (96%)	0.14	15 (4%) 30 36	22, 38, 75, 113	0
1	B	306/318 (96%)	0.32	16 (5%) 28 34	22, 39, 88, 154	0
All	All	612/636 (96%)	0.23	31 (5%) 29 35	22, 39, 83, 154	0

All (31) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	26	PRO	15.7
1	B	24	SER	7.4
1	B	41	GLY	6.6
1	B	259	ALA	5.1
1	A	25	THR	4.9
1	A	22	ARG	4.8
1	A	24	SER	4.8
1	B	258	ALA	4.6
1	B	250	PRO	4.3
1	B	23	MET	4.2
1	A	250	PRO	4.0
1	B	248	ALA	3.9
1	B	28	ALA	3.3
1	A	258	ALA	3.2
1	A	23	MET	3.1
1	B	22	ARG	3.1
1	B	25	THR	3.0
1	B	251	GLU	3.0
1	A	186	PRO	2.7
1	B	42	GLU	2.7
1	A	136	ALA	2.7
1	A	257	TYR	2.4
1	B	35	VAL	2.4
1	A	212	LEU	2.4

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Mol	Chain	Res	Type	RSRZ
1	A	171	TYR	2.2
1	A	140	ARG	2.2
1	B	43	GLN	2.2
1	B	44	ILE	2.1
1	A	248	ALA	2.1
1	A	181	HIS	2.1
1	A	251	GLU	2.1

## 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. 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, 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	LLDF	B-factors(Å <sup>2</sup> )	Q<0.9
3	ZVW	A	501	39/39	0.92	0.17	1.15	37,44,73,76	0
3	ZVW	B	501	39/39	0.91	0.17	0.80	42,51,59,59	0
2	PO4	A	401	5/5	0.98	0.12	-0.62	26,30,30,31	0
2	PO4	B	401	5/5	0.99	0.10	-1.18	29,31,32,33	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.