Full wwPDB X-ray Structure Validation Report (i)

Dec 16, 2023 – 11:01 AM EST

PDB ID	:	2NYX
Title	:	Crystal structure of RV1404 from Mycobacterium tuberculosis
Authors	:	Yu, M.; Bursey, E.H.; Radhakannan, R.; Kim, C.-Y.; Kaviratne, T.; Woodruff, T.; Segelke, B.W.; Lekin, T.; Toppani, D.; Terwilliger, T.C.; Hung, L.-W.; TB Structural Genomics Consortium (TBSGC); Integrated Center for Structure and Function Innovation (ISFI)
Deposited on	:	2006-11-21
Resolution	:	2.30 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 (i) 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 (i)) were used in the production of this report:

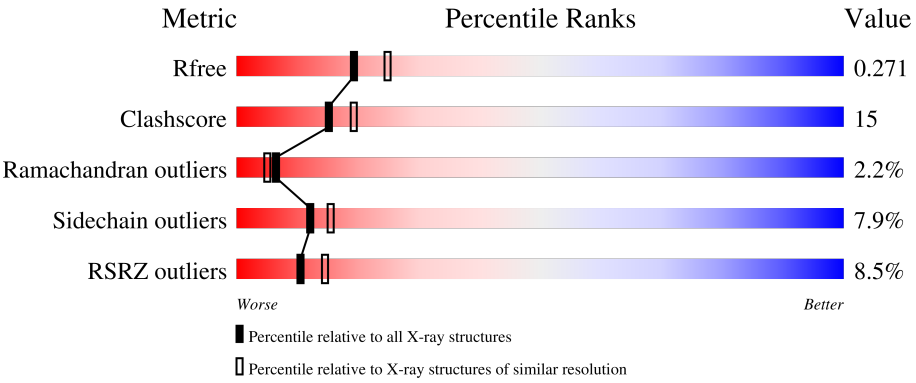
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.30 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	5042 (2.30-2.30)
Clashscore	141614	5643 (2.30-2.30)
Ramachandran outliers	138981	5575 (2.30-2.30)
Sidechain outliers	138945	5575 (2.30-2.30)
RSRZ outliers	127900	4938 (2.30-2.30)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=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	168	8% 71% 12% • 13%
1	B	168	5% 65% 15% 7% • 12%
1	C	168	7% 67% 17% •• 13%
1	D	168	10% 62% 21% • 12%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 4602 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 Probable transcriptional regulatory protein, Rv1404.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	146	Total	C	N	O	Se	0	0	0
			1109	688	210	209	2			
1	B	147	Total	C	N	O	Se	0	0	0
			1121	694	214	211	2			
1	C	146	Total	C	N	O	Se	0	0	0
			1109	688	210	209	2			
1	D	147	Total	C	N	O	Se	0	0	0
			1121	694	214	211	2			

There are 48 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MSE	-	modified residue	UNP P71672
A	2	MSE	-	modified residue	UNP P71672
A	79	MSE	MET	modified residue	UNP P71672
A	131	MSE	MET	modified residue	UNP P71672
A	161	ARG	-	cloning artifact	UNP P71672
A	162	SER	-	cloning artifact	UNP P71672
A	163	HIS	-	expression tag	UNP P71672
A	164	HIS	-	expression tag	UNP P71672
A	165	HIS	-	expression tag	UNP P71672
A	166	HIS	-	expression tag	UNP P71672
A	167	HIS	-	expression tag	UNP P71672
A	168	HIS	-	expression tag	UNP P71672
B	1	MSE	-	modified residue	UNP P71672
B	2	MSE	-	modified residue	UNP P71672
B	79	MSE	MET	modified residue	UNP P71672
B	131	MSE	MET	modified residue	UNP P71672
B	161	ARG	-	cloning artifact	UNP P71672
B	162	SER	-	cloning artifact	UNP P71672
B	163	HIS	-	expression tag	UNP P71672
B	164	HIS	-	expression tag	UNP P71672
B	165	HIS	-	expression tag	UNP P71672

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Chain	Residue	Modelled	Actual	Comment	Reference
B	166	HIS	-	expression tag	UNP P71672
B	167	HIS	-	expression tag	UNP P71672
B	168	HIS	-	expression tag	UNP P71672
C	1	MSE	-	modified residue	UNP P71672
C	2	MSE	-	modified residue	UNP P71672
C	79	MSE	MET	modified residue	UNP P71672
C	131	MSE	MET	modified residue	UNP P71672
C	161	ARG	-	cloning artifact	UNP P71672
C	162	SER	-	cloning artifact	UNP P71672
C	163	HIS	-	expression tag	UNP P71672
C	164	HIS	-	expression tag	UNP P71672
C	165	HIS	-	expression tag	UNP P71672
C	166	HIS	-	expression tag	UNP P71672
C	167	HIS	-	expression tag	UNP P71672
C	168	HIS	-	expression tag	UNP P71672
D	1	MSE	-	modified residue	UNP P71672
D	2	MSE	-	modified residue	UNP P71672
D	79	MSE	MET	modified residue	UNP P71672
D	131	MSE	MET	modified residue	UNP P71672
D	161	ARG	-	cloning artifact	UNP P71672
D	162	SER	-	cloning artifact	UNP P71672
D	163	HIS	-	expression tag	UNP P71672
D	164	HIS	-	expression tag	UNP P71672
D	165	HIS	-	expression tag	UNP P71672
D	166	HIS	-	expression tag	UNP P71672
D	167	HIS	-	expression tag	UNP P71672
D	168	HIS	-	expression tag	UNP P71672

- Molecule 2 is water.

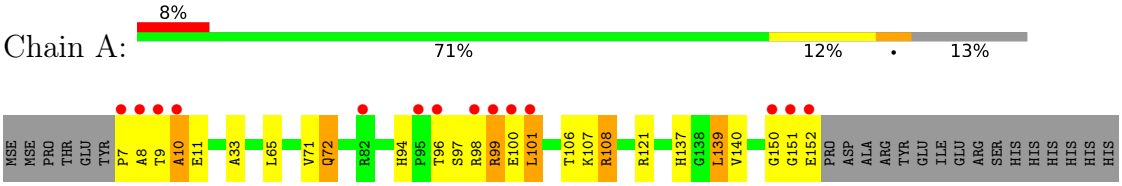
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	35	Total O 35 35	0	0
2	B	38	Total O 38 38	0	0
2	C	39	Total O 39 39	0	0
2	D	30	Total O 30 30	0	0

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.

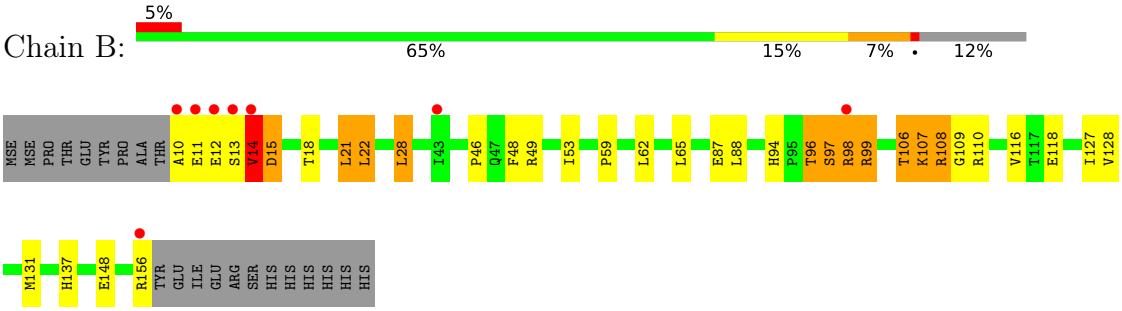
• Molecule 1: Probable transcriptional regulatory protein, Rv1404

Chain A:



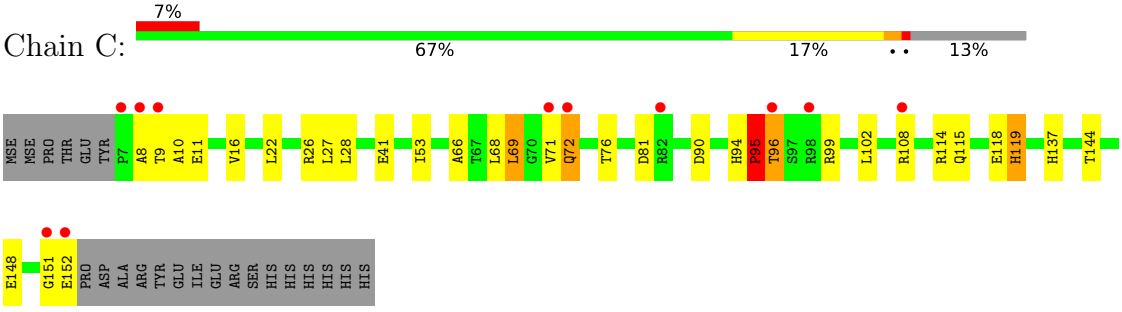
• Molecule 1: Probable transcriptional regulatory protein, Rv1404

Chain B:



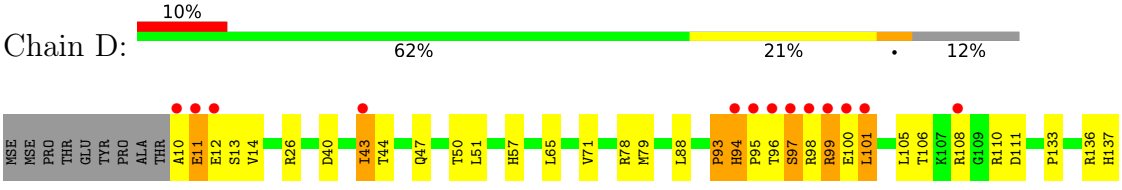
• Molecule 1: Probable transcriptional regulatory protein, Rv1404

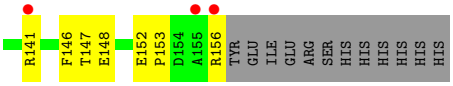
Chain C:



• Molecule 1: Probable transcriptional regulatory protein, Rv1404

Chain D:




R141
F146
T147
E148
E152
P153
D154
A155
R156
TYR
GLU
ILE
GLU
ARG
SER
HIS
HIS
HIS
HIS
HIS

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	51.26Å 54.75Å 227.50Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	19.80 – 2.30 19.80 – 2.30	Depositor EDS
% Data completeness (in resolution range)	100.0 (19.80-2.30) 67.1 (19.80-2.30)	Depositor EDS
R_{merge}	0.15	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	88.23 (at 2.30Å)	Xtriage
Refinement program	REFMAC 5.2.0005	Depositor
R, R_{free}	0.229 , 0.273 0.228 , 0.271	Depositor DCC
R_{free} test set	1179 reflections (5.13%)	wwPDB-VP
Wilson B-factor (Å^2)	21.1	Xtriage
Anisotropy	0.686	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 20.3	EDS
L-test for twinning[2]	$< \|L\| > = 0.45$, $< L^2 > = 0.28$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.91	EDS
Total number of atoms	4602	wwPDB-VP
Average B, all atoms (Å^2)	32.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.23% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ 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

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	0.43	0/1120	0.69	1/1520 (0.1%)
1	B	0.43	0/1132	0.70	1/1536 (0.1%)
1	C	0.42	0/1120	0.70	2/1520 (0.1%)
1	D	0.46	0/1132	0.75	1/1536 (0.1%)
All	All	0.43	0/4504	0.71	5/6112 (0.1%)

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	95	PRO	C-N-CA	6.09	136.92	121.70
1	D	94	HIS	C-N-CD	-5.50	108.50	120.60
1	C	69	LEU	CA-CB-CG	5.20	127.25	115.30
1	A	100	GLU	C-N-CA	5.16	134.59	121.70
1	B	14	VAL	C-N-CA	5.11	134.47	121.70

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	1109	0	1153	32	0
1	B	1121	0	1162	37	0
1	C	1109	0	1153	37	0
1	D	1121	0	1162	45	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	A	35	0	0	1	0
2	B	38	0	0	1	0
2	C	39	0	0	2	0
2	D	30	0	0	2	0
All	All	4602	0	4630	136	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 15.

All (136) 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:14:VAL:HB	1:B:15:ASP:HB2	1.22	1.15
1:B:13:SER:HA	1:B:15:ASP:CB	1.81	1.10
1:D:95:PRO:HD2	1:D:96:THR:HB	1.35	1.04
1:B:13:SER:HA	1:B:15:ASP:HB3	1.01	1.01
1:C:151:GLY:HA2	1:C:152:GLU:HB3	1.43	1.01
1:D:98:ARG:HA	1:D:99:ARG:HG3	1.42	0.98
1:C:10:ALA:HB3	1:D:137:HIS:CD2	1.99	0.97
1:C:10:ALA:HB1	1:C:11:GLU:HA	1.48	0.94
1:D:97:SER:HB3	1:D:98:ARG:HB2	1.50	0.93
1:C:9:THR:N	1:C:10:ALA:HB2	1.84	0.93
1:A:8:ALA:H	1:A:9:THR:HA	1.30	0.92
1:B:14:VAL:CB	1:B:15:ASP:HB2	1.99	0.92
1:A:10:ALA:HB1	1:A:11:GLU:HA	1.50	0.92
1:D:97:SER:CB	1:D:98:ARG:HB2	2.01	0.90
1:C:66:ALA:HB1	1:C:72:GLN:HB2	1.52	0.89
1:C:95:PRO:HB2	1:C:96:THR:OG1	1.73	0.88
1:D:100:GLU:CB	1:D:101:LEU:HA	2.04	0.87
1:D:100:GLU:HB3	1:D:101:LEU:HA	1.56	0.87
1:B:13:SER:CA	1:B:15:ASP:HB3	1.98	0.87
1:B:10:ALA:HA	1:B:11:GLU:HB2	1.59	0.85
1:C:71:VAL:H	1:C:72:GLN:HB3	1.41	0.85
1:C:71:VAL:N	1:C:72:GLN:HB3	1.92	0.84
1:C:118:GLU:O	1:C:119:HIS:HB2	1.76	0.83
1:D:12:GLU:N	1:D:13:SER:HB3	1.93	0.83
1:D:110:ARG:HD2	2:D:179:HOH:O	1.81	0.80
1:D:95:PRO:CD	1:D:96:THR:HB	2.10	0.79
1:A:106:THR:HG22	1:A:108:ARG:H	1.48	0.79
1:B:87:GLU:O	1:B:106:THR:HG21	1.82	0.78
1:C:151:GLY:HA2	1:C:152:GLU:CB	2.13	0.78

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:12:GLU:HA	1:D:14:VAL:H	1.49	0.76
1:A:9:THR:H	1:A:10:ALA:HB2	1.53	0.74
1:A:151:GLY:N	1:A:152:GLU:HA	2.03	0.73
1:B:15:ASP:H	1:B:18:THR:H	1.34	0.73
1:A:94:HIS:O	1:A:96:THR:HA	1.89	0.73
1:C:9:THR:H	1:C:10:ALA:HB2	1.52	0.72
1:B:98:ARG:HA	1:B:99:ARG:CB	2.19	0.72
1:C:10:ALA:HB3	1:D:137:HIS:HD2	1.54	0.71
1:A:8:ALA:N	1:A:9:THR:HA	2.05	0.71
1:C:10:ALA:HB1	1:C:11:GLU:CA	2.21	0.71
1:B:128:VAL:HG22	1:B:131:MSE:HE3	1.71	0.70
1:D:12:GLU:H	1:D:13:SER:HB3	1.55	0.70
1:B:106:THR:HG22	1:B:109:GLY:H	1.57	0.69
1:B:10:ALA:CA	1:B:11:GLU:HB2	2.23	0.69
1:D:98:ARG:HA	1:D:99:ARG:CG	2.21	0.68
1:D:93:PRO:HB2	1:D:94:HIS:CB	2.23	0.68
1:C:137:HIS:HD2	2:C:171:HOH:O	1.75	0.68
1:B:94:HIS:CE1	1:B:98:ARG:HD2	2.29	0.67
1:D:98:ARG:CA	1:D:99:ARG:HG3	2.22	0.66
1:D:100:GLU:HB3	1:D:101:LEU:CA	2.25	0.66
1:C:10:ALA:CB	1:D:137:HIS:CD2	2.78	0.66
1:C:41:GLU:OE1	1:D:78:ARG:NH1	2.30	0.65
1:C:95:PRO:HB2	1:C:96:THR:CB	2.28	0.64
1:D:93:PRO:HB2	1:D:94:HIS:HB3	1.80	0.64
1:C:118:GLU:O	1:C:119:HIS:CB	2.44	0.64
1:B:98:ARG:HA	1:B:99:ARG:HB2	1.79	0.64
1:D:12:GLU:HG3	1:D:14:VAL:HB	1.81	0.62
1:B:10:ALA:HA	1:B:11:GLU:CB	2.29	0.60
1:C:10:ALA:CB	1:C:11:GLU:HA	2.27	0.60
1:A:98:ARG:HB2	1:A:99:ARG:HB3	1.83	0.60
1:D:12:GLU:CA	1:D:13:SER:HB3	2.32	0.59
1:D:97:SER:HB3	1:D:98:ARG:CB	2.28	0.58
1:C:115:GLN:O	1:C:118:GLU:O	2.22	0.58
1:A:10:ALA:CB	1:B:137:HIS:ND1	2.67	0.58
1:D:99:ARG:N	1:D:100:GLU:HB2	2.18	0.58
1:A:139:LEU:HD13	1:B:21:LEU:HD11	1.85	0.57
1:A:9:THR:N	1:A:10:ALA:HB2	2.18	0.57
1:D:100:GLU:CB	1:D:101:LEU:CA	2.81	0.56
1:C:144:THR:O	1:C:148:GLU:HG2	2.05	0.56
1:D:100:GLU:HB2	1:D:101:LEU:HA	1.88	0.54
1:A:10:ALA:HB1	1:A:11:GLU:CA	2.31	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:12:GLU:HA	1:B:13:SER:HB3	1.90	0.54
1:B:97:SER:O	1:B:98:ARG:O	2.25	0.54
1:A:10:ALA:CB	1:A:11:GLU:HA	2.32	0.53
1:C:9:THR:H	1:C:10:ALA:CB	2.21	0.53
1:A:9:THR:HB	1:A:10:ALA:HB2	1.90	0.53
1:A:98:ARG:CB	1:A:99:ARG:HB3	2.39	0.53
1:A:98:ARG:N	1:A:99:ARG:O	2.42	0.52
1:D:93:PRO:HB2	1:D:94:HIS:CA	2.41	0.50
1:C:99:ARG:O	1:C:99:ARG:HG3	2.12	0.50
1:A:150:GLY:H	1:B:127:ILE:HG23	1.77	0.49
2:A:190:HOH:O	1:B:14:VAL:HG11	2.12	0.49
1:C:9:THR:N	1:C:10:ALA:CB	2.68	0.49
1:A:94:HIS:C	1:A:96:THR:HA	2.32	0.48
1:A:106:THR:HG22	1:A:107:LYS:N	2.28	0.48
1:B:106:THR:O	1:B:110:ARG:HG3	2.14	0.48
1:B:107:LYS:O	1:B:107:LYS:HD3	2.13	0.47
1:C:71:VAL:HG13	1:C:76:THR:OG1	2.14	0.47
1:A:7:PRO:HA	1:A:8:ALA:HA	1.59	0.47
1:D:12:GLU:HA	1:D:14:VAL:N	2.23	0.47
1:A:140:VAL:HG22	1:B:21:LEU:HD13	1.95	0.47
1:C:53:ILE:HD12	1:C:69:LEU:HD13	1.96	0.47
1:C:71:VAL:HG13	1:C:72:GLN:HA	1.97	0.46
1:A:10:ALA:HB3	1:B:137:HIS:ND1	2.31	0.46
1:B:88:LEU:HD23	1:B:108:ARG:HG2	1.97	0.46
1:A:72:GLN:HE21	1:A:72:GLN:HA	1.81	0.45
1:A:9:THR:CA	1:A:10:ALA:HB2	2.45	0.45
1:C:151:GLY:CA	1:C:152:GLU:CB	2.92	0.45
1:B:11:GLU:HA	1:B:12:GLU:HA	1.67	0.45
1:C:26:ARG:HH12	1:D:156:ARG:HH21	1.65	0.45
1:A:71:VAL:HG12	1:A:72:GLN:O	2.17	0.45
1:D:106:THR:O	1:D:110:ARG:HG3	2.17	0.45
1:C:94:HIS:HD2	1:C:102:LEU:HD21	1.81	0.45
1:B:14:VAL:CA	1:B:15:ASP:HB2	2.47	0.44
1:D:12:GLU:HA	1:D:13:SER:HB3	1.99	0.44
1:A:9:THR:CB	1:A:10:ALA:HB2	2.47	0.44
1:C:8:ALA:HA	1:C:9:THR:HA	1.78	0.44
1:D:57:HIS:HE1	2:D:197:HOH:O	2.00	0.44
1:D:71:VAL:HG11	1:D:79:MSE:HE1	1.99	0.43
1:C:26:ARG:HH22	1:D:156:ARG:HH21	1.65	0.43
1:D:44:THR:H	1:D:47:GLN:NE2	2.16	0.43
1:D:98:ARG:HB3	1:D:100:GLU:HG2	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:137:HIS:CD2	2:C:171:HOH:O	2.58	0.43
1:B:156:ARG:HG3	1:B:156:ARG:HH11	1.84	0.43
1:B:18:THR:O	1:B:22:LEU:HD22	2.19	0.42
1:B:106:THR:HG23	2:B:181:HOH:O	2.19	0.42
1:D:11:GLU:HG3	1:D:12:GLU:CB	2.49	0.42
1:A:94:HIS:CD2	1:A:97:SER:HB2	2.54	0.42
1:B:28:LEU:HD23	1:B:28:LEU:HA	1.93	0.42
1:C:8:ALA:C	1:C:10:ALA:HB2	2.37	0.42
1:D:40:ASP:O	1:D:43:ILE:HG22	2.20	0.42
1:B:49:ARG:O	1:B:53:ILE:HG13	2.20	0.42
1:C:27:LEU:HD23	1:D:146:PHE:CE2	2.55	0.42
1:D:152:GLU:HA	1:D:153:PRO:HD3	1.94	0.41
1:A:150:GLY:N	1:B:127:ILE:HG23	2.35	0.41
1:B:59:PRO:HD3	1:C:81:ASP:CB	2.50	0.41
1:C:95:PRO:HB2	1:C:96:THR:HG1	1.77	0.41
1:D:88:LEU:CD2	1:D:108:ARG:HG2	2.50	0.41
1:A:94:HIS:HB3	1:A:97:SER:H	1.85	0.41
1:D:11:GLU:N	1:D:12:GLU:O	2.54	0.41
1:D:10:ALA:HA	1:D:11:GLU:HA	1.66	0.41
1:D:50:THR:HG23	1:D:65:LEU:HD11	2.02	0.41
1:A:33:ALA:HB1	1:B:46:PRO:HA	2.03	0.41
1:D:133:PRO:HA	1:D:136:ARG:HD2	2.02	0.40
1:A:106:THR:CG2	1:A:107:LYS:N	2.83	0.40
1:A:9:THR:HB	1:A:10:ALA:CA	2.51	0.40
1:B:48:PHE:CZ	1:B:116:VAL:HG11	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	144/168 (86%)	135 (94%)	6 (4%)	3 (2%)	7 5

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	B	145/168 (86%)	137 (94%)	2 (1%)	6 (4%)	3 1
1	C	144/168 (86%)	138 (96%)	3 (2%)	3 (2%)	7 5
1	D	145/168 (86%)	133 (92%)	11 (8%)	1 (1%)	22 26
All	All	578/672 (86%)	543 (94%)	22 (4%)	13 (2%)	6 5

All (13) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	14	VAL
1	B	15	ASP
1	B	98	ARG
1	C	96	THR
1	C	119	HIS
1	D	93	PRO
1	A	10	ALA
1	A	101	LEU
1	B	97	SER
1	B	99	ARG
1	C	95	PRO
1	A	99	ARG
1	B	96	THR

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	119/136 (88%)	112 (94%)	7 (6%)	19 27
1	B	120/136 (88%)	109 (91%)	11 (9%)	9 11
1	C	119/136 (88%)	111 (93%)	8 (7%)	16 21
1	D	120/136 (88%)	108 (90%)	12 (10%)	7 9
All	All	478/544 (88%)	440 (92%)	38 (8%)	12 15

All (38) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	65	LEU
1	A	72	GLN
1	A	101	LEU
1	A	108	ARG
1	A	121	ARG
1	A	137	HIS
1	A	139	LEU
1	B	21	LEU
1	B	22	LEU
1	B	28	LEU
1	B	62	LEU
1	B	65	LEU
1	B	96	THR
1	B	106	THR
1	B	107	LYS
1	B	108	ARG
1	B	118	GLU
1	B	148	GLU
1	C	16	VAL
1	C	22	LEU
1	C	28	LEU
1	C	68	LEU
1	C	72	GLN
1	C	90	ASP
1	C	108	ARG
1	C	114	ARG
1	D	11	GLU
1	D	26	ARG
1	D	43	ILE
1	D	51	LEU
1	D	97	SER
1	D	99	ARG
1	D	101	LEU
1	D	105	LEU
1	D	111	ASP
1	D	141	ARG
1	D	147	THR
1	D	148	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	42	ASN

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Mol	Chain	Res	Type
1	A	72	GLN
1	A	94	HIS
1	B	42	ASN
1	B	94	HIS
1	C	38	GLN
1	C	72	GLN
1	C	137	HIS
1	D	42	ASN
1	D	47	GLN
1	D	57	HIS
1	D	137	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 monosaccharides in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

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, 95^{th} 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	144/168 (85%)	0.61	14 (9%) 7 10	19, 28, 42, 54	0
1	B	145/168 (86%)	0.54	8 (5%) 25 31	23, 28, 44, 60	0
1	C	144/168 (85%)	0.74	11 (7%) 13 18	23, 34, 48, 57	0
1	D	145/168 (86%)	0.71	16 (11%) 5 7	23, 31, 53, 59	0
All	All	578/672 (86%)	0.65	49 (8%) 10 14	19, 31, 49, 60	0

All (49) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	9	THR	14.9
1	C	8	ALA	10.1
1	B	10	ALA	9.8
1	D	97	SER	7.8
1	A	8	ALA	7.6
1	A	7	PRO	7.1
1	B	11	GLU	6.8
1	D	10	ALA	6.8
1	C	152	GLU	6.2
1	D	96	THR	6.2
1	C	7	PRO	5.9
1	D	98	ARG	5.7
1	A	9	THR	5.6
1	B	14	VAL	5.5
1	C	71	VAL	5.2
1	D	94	HIS	5.1
1	A	10	ALA	5.0
1	D	11	GLU	4.9
1	C	151	GLY	4.6
1	B	12	GLU	4.3
1	B	156	ARG	4.1

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Mol	Chain	Res	Type	RSRZ
1	D	12	GLU	4.0
1	D	99	ARG	4.0
1	D	95	PRO	3.6
1	A	152	GLU	3.5
1	A	151	GLY	3.5
1	A	98	ARG	3.3
1	A	100	GLU	3.2
1	C	98	ARG	3.2
1	D	155	ALA	3.1
1	C	72	GLN	2.9
1	B	13	SER	2.8
1	A	99	ARG	2.8
1	A	82	ARG	2.7
1	D	156	ARG	2.7
1	A	95	PRO	2.6
1	A	150	GLY	2.5
1	B	98	ARG	2.5
1	D	141	ARG	2.4
1	D	43	ILE	2.2
1	A	101	LEU	2.2
1	C	96	THR	2.1
1	A	96	THR	2.1
1	C	108	ARG	2.1
1	D	100	GLU	2.1
1	D	108	ARG	2.0
1	B	43	ILE	2.0
1	D	101	LEU	2.0
1	C	82	ARG	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 monosaccharides in this entry.

6.4 Ligands (i)

There are no ligands in this entry.

6.5 Other polymers (i)

There are no such residues in this entry.