Full wwPDB X-ray Structure Validation Report (i)

Aug 16, 2023 – 02:00 PM EDT

PDB ID	:	2AHB
Title	:	X-ray crystal structure of R46A,R161A mutant of Mycobacterium tuberculosis FabH
Authors	:	Brown, A.K.; Sridharan, S.; Kremer, L.; Lindenberg, S.; Dover, L.G.; Sacchettini, J.C.; Besra, G.S.
Deposited on	:	2005-07-27
Resolution	:	2.00 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 (1)) were used in the production of this report:

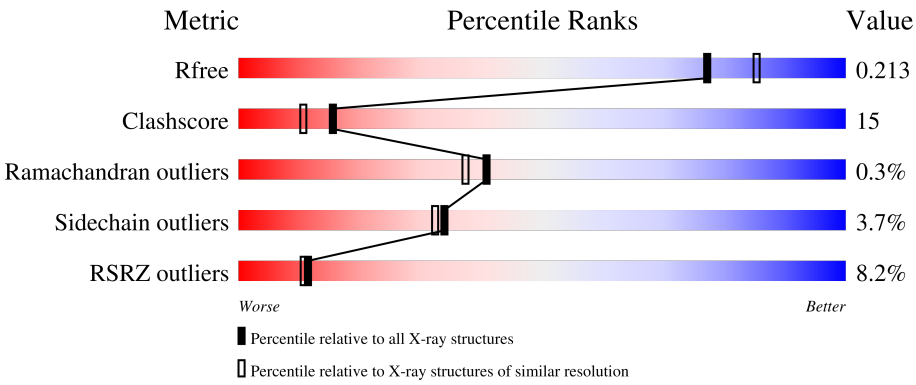
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.35
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35

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 2.00 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	8085 (2.00-2.00)
Clashscore	141614	9178 (2.00-2.00)
Ramachandran outliers	138981	9054 (2.00-2.00)
Sidechain outliers	138945	9053 (2.00-2.00)
RSRZ outliers	127900	7900 (2.00-2.00)

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	356	8% 72% 19% • 6%
1	B	356	7% 68% 24% • 6%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 5097 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 Beta- ketoacyl-ACP synthase III.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	334	2430	1518	426	472	14	0	0	0
1	B	334	2430	1518	426	472	14	0	0	0

There are 46 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-20	MET	-	cloning artifact	UNP P0A574
A	-19	GLY	-	cloning artifact	UNP P0A574
A	-18	SER	-	cloning artifact	UNP P0A574
A	-17	SER	-	cloning artifact	UNP P0A574
A	-16	HIS	-	expression tag	UNP P0A574
A	-15	HIS	-	expression tag	UNP P0A574
A	-14	HIS	-	expression tag	UNP P0A574
A	-13	HIS	-	expression tag	UNP P0A574
A	-12	HIS	-	expression tag	UNP P0A574
A	-11	HIS	-	expression tag	UNP P0A574
A	-10	SER	-	cloning artifact	UNP P0A574
A	-9	SER	-	cloning artifact	UNP P0A574
A	-8	GLY	-	cloning artifact	UNP P0A574
A	-7	LEU	-	cloning artifact	UNP P0A574
A	-6	VAL	-	cloning artifact	UNP P0A574
A	-5	PRO	-	cloning artifact	UNP P0A574
A	-4	ARG	-	cloning artifact	UNP P0A574
A	-3	GLY	-	cloning artifact	UNP P0A574
A	-2	SER	-	cloning artifact	UNP P0A574
A	-1	VAL	-	cloning artifact	UNP P0A574
A	0	CYS	-	cloning artifact	UNP P0A574
A	46	ALA	ARG	engineered mutation	UNP P0A574
A	161	ALA	ARG	engineered mutation	UNP P0A574
B	-20	MET	-	cloning artifact	UNP P0A574
B	-19	GLY	-	cloning artifact	UNP P0A574

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-18	SER	-	cloning artifact	UNP P0A574
B	-17	SER	-	cloning artifact	UNP P0A574
B	-16	HIS	-	expression tag	UNP P0A574
B	-15	HIS	-	expression tag	UNP P0A574
B	-14	HIS	-	expression tag	UNP P0A574
B	-13	HIS	-	expression tag	UNP P0A574
B	-12	HIS	-	expression tag	UNP P0A574
B	-11	HIS	-	expression tag	UNP P0A574
B	-10	SER	-	cloning artifact	UNP P0A574
B	-9	SER	-	cloning artifact	UNP P0A574
B	-8	GLY	-	cloning artifact	UNP P0A574
B	-7	LEU	-	cloning artifact	UNP P0A574
B	-6	VAL	-	cloning artifact	UNP P0A574
B	-5	PRO	-	cloning artifact	UNP P0A574
B	-4	ARG	-	cloning artifact	UNP P0A574
B	-3	GLY	-	cloning artifact	UNP P0A574
B	-2	SER	-	cloning artifact	UNP P0A574
B	-1	VAL	-	cloning artifact	UNP P0A574
B	0	CYS	-	cloning artifact	UNP P0A574
B	46	ALA	ARG	engineered mutation	UNP P0A574
B	161	ALA	ARG	engineered mutation	UNP P0A574

- Molecule 2 is water.

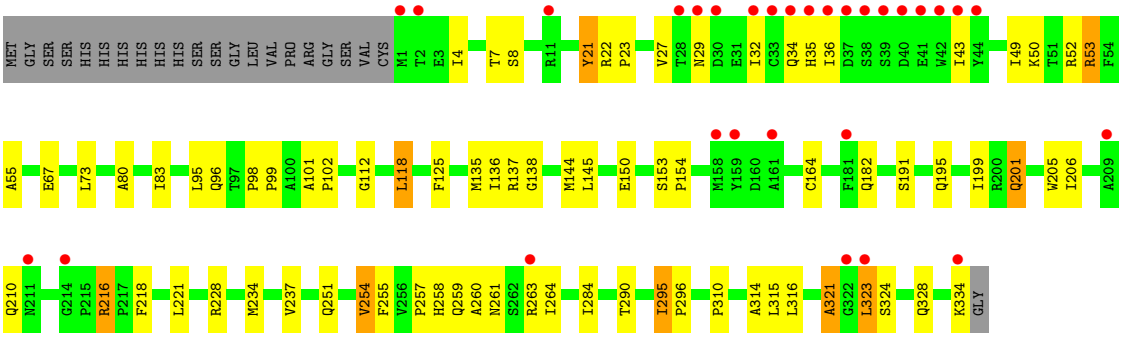
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
2	A	126	126	126	0	0
			Total	O		
2	B	111	111	111	0	0

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.

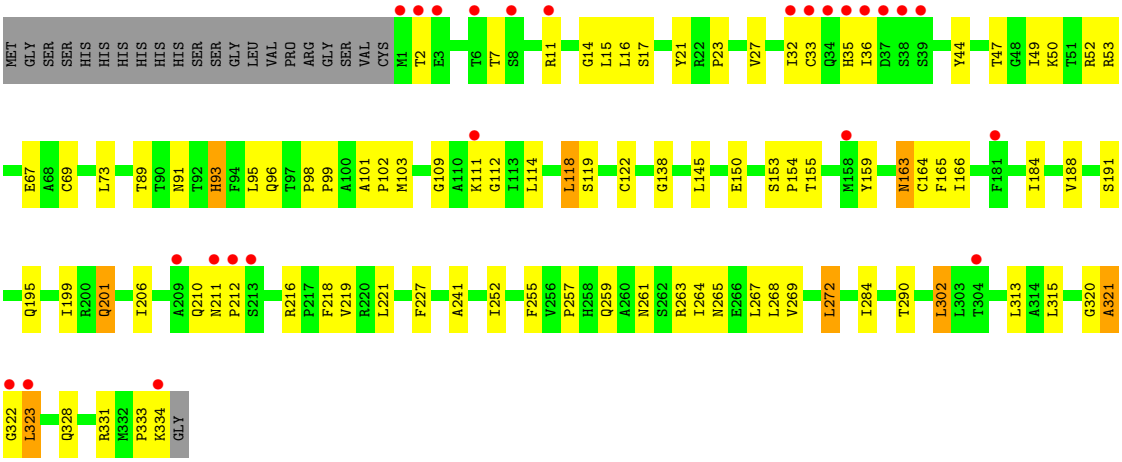
• Molecule 1: Beta- ketoacyl-ACP synthase III

Chain A:



• Molecule 1: Beta- ketoacyl-ACP synthase III

Chain B:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	103.44Å 81.41Å 97.28Å 90.00° 106.91° 90.00°	Depositor
Resolution (Å)	40.00 – 2.00 48.14 – 2.00	Depositor EDS
% Data completeness (in resolution range)	(Not available) (40.00-2.00) 99.4 (48.14-2.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.96 (at 2.00Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.218 , 0.248 0.222 , 0.213	Depositor DCC
R_{free} test set	2586 reflections (4.97%)	wwPDB-VP
Wilson B-factor (Å^2)	31.9	Xtriage
Anisotropy	0.136	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 42.0	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	5097	wwPDB-VP
Average B, all atoms (Å^2)	34.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.84% 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 (i)

5.1 Standard geometry (i)

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	0.32	0/2474	0.64	3/3367 (0.1%)
1	B	0.33	0/2474	0.64	2/3367 (0.1%)
All	All	0.33	0/4948	0.64	5/6734 (0.1%)

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 (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	21	TYR	CB-CA-C	-6.47	97.45	110.40
1	B	201	GLN	N-CA-C	-5.50	96.15	111.00
1	A	201	GLN	N-CA-C	-5.40	96.42	111.00
1	B	93	HIS	N-CA-C	-5.30	96.68	111.00
1	A	118	LEU	CA-CB-CG	5.03	126.86	115.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	323	LEU	Mainchain

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	2430	0	2399	78	0
1	B	2430	0	2399	81	0
2	A	126	0	0	1	0
2	B	111	0	0	2	0
All	All	5097	0	4798	143	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 (143) 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:195:GLN:HB2	1:A:323:LEU:HD22	1.38	1.00
1:B:195:GLN:HB2	1:B:323:LEU:HD22	1.54	0.87
1:A:261:ASN:HD21	1:A:263:ARG:HB3	1.38	0.85
1:A:4:ILE:HD11	1:B:313:LEU:HD11	1.57	0.84
1:B:195:GLN:CB	1:B:323:LEU:HD22	2.08	0.84
1:B:261:ASN:HD22	1:B:264:ILE:H	1.24	0.83
1:A:234:MET:HA	1:A:237:VAL:HG12	1.63	0.81
1:A:261:ASN:HD22	1:A:264:ILE:H	1.26	0.80
1:A:135:MET:HB3	1:A:144:MET:HE1	1.67	0.77
1:A:205:TRP:HE1	1:B:96:GLN:HE21	1.33	0.77
1:B:227:PHE:HB3	1:B:264:ILE:HD11	1.68	0.76
1:B:321:ALA:C	1:B:323:LEU:H	1.88	0.75
1:A:80:ALA:HA	1:A:83:ILE:HD12	1.72	0.72
1:A:295:ILE:HD11	1:A:316:LEU:HD13	1.72	0.71
1:B:199:ILE:HG12	1:B:221:LEU:CD2	2.23	0.69
1:B:331:ARG:HG3	1:B:331:ARG:HH11	1.58	0.67
1:A:73:LEU:HD11	1:A:83:ILE:HD11	1.75	0.67
1:A:36:ILE:HG13	1:A:164:CYS:SG	2.35	0.67
1:A:137:ARG:HH21	1:A:182:GLN:NE2	1.93	0.66
1:A:258:HIS:HD2	1:A:260:ALA:HB2	1.61	0.66
1:A:136:ILE:HG13	1:A:144:MET:CE	2.25	0.66
1:A:321:ALA:C	1:A:323:LEU:H	1.97	0.66
1:A:199:ILE:HG12	1:A:221:LEU:HD23	1.78	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:195:GLN:CB	1:A:323:LEU:HD22	2.24	0.64
1:A:23:PRO:HG2	1:A:53:ARG:HB3	1.78	0.64
1:A:254:VAL:HG13	1:A:314:ALA:HB2	1.79	0.64
1:A:153:SER:OG	1:A:154:PRO:HD3	1.99	0.63
1:A:96:GLN:H	1:B:201:GLN:NE2	1.95	0.63
1:B:227:PHE:CB	1:B:264:ILE:HD11	2.28	0.63
1:A:191:SER:O	1:B:112:GLY:HA2	1.99	0.63
1:B:153:SER:OG	1:B:154:PRO:HD3	1.99	0.62
1:A:53:ARG:HG2	1:A:53:ARG:HH21	1.63	0.62
1:B:199:ILE:HG12	1:B:221:LEU:HD22	1.81	0.62
1:B:73:LEU:HD11	1:B:145:LEU:HD11	1.82	0.62
1:A:261:ASN:ND2	1:A:263:ARG:HB3	2.14	0.61
1:B:23:PRO:HG2	1:B:53:ARG:HB3	1.83	0.61
1:A:295:ILE:HG23	2:A:352:HOH:O	2.01	0.60
1:B:331:ARG:HG3	1:B:331:ARG:NH1	2.17	0.60
1:B:7:THR:HG23	1:B:138:GLY:O	2.02	0.59
1:B:21:TYR:CD2	1:B:67:GLU:HG2	2.38	0.59
1:B:261:ASN:HD21	1:B:263:ARG:HB2	1.68	0.59
1:A:201:GLN:NE2	1:B:96:GLN:H	2.01	0.59
1:A:295:ILE:CD1	1:A:316:LEU:HD13	2.33	0.59
1:B:15:LEU:HG	1:B:184:ILE:HD11	1.85	0.59
1:B:47:THR:HG21	1:B:165:PHE:HE2	1.67	0.58
1:B:14:GLY:HA2	1:B:184:ILE:HG12	1.86	0.58
1:B:321:ALA:C	1:B:323:LEU:N	2.57	0.58
1:A:234:MET:HA	1:A:237:VAL:CG1	2.32	0.58
1:B:265:ASN:O	1:B:269:VAL:HG23	2.04	0.57
1:B:35:HIS:HB3	1:B:159:TYR:CE1	2.39	0.57
1:B:195:GLN:HB3	1:B:323:LEU:HD22	1.84	0.57
1:B:69:CYS:O	1:B:73:LEU:HD13	2.06	0.56
1:B:118:LEU:C	1:B:118:LEU:HD12	2.25	0.56
1:B:252:ILE:HD12	1:B:252:ILE:N	2.20	0.56
1:A:101:ALA:HB3	1:A:102:PRO:HD3	1.89	0.55
1:A:4:ILE:HD11	1:B:313:LEU:CD1	2.32	0.55
1:B:261:ASN:ND2	1:B:264:ILE:H	2.01	0.55
1:A:8:SER:HB3	1:B:11:ARG:HH21	1.72	0.55
1:B:191:SER:HB2	1:B:323:LEU:O	2.07	0.55
1:A:234:MET:SD	1:A:237:VAL:HG11	2.47	0.55
1:A:98:PRO:HB2	1:B:322:GLY:HA2	1.89	0.55
1:B:99:PRO:O	1:B:103:MET:HE2	2.07	0.54
1:A:29:ASN:HD21	1:A:50:LYS:HA	1.73	0.54
1:A:136:ILE:HG13	1:A:144:MET:HE3	1.91	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:136:ILE:HG13	1:A:144:MET:HE2	1.90	0.53
1:B:216:ARG:HD3	1:B:218:PHE:CZ	2.44	0.53
1:A:201:GLN:HE22	1:B:96:GLN:HG2	1.74	0.52
1:B:163:ASN:HB2	1:B:166:ILE:HD12	1.91	0.52
1:A:310:PRO:HB3	1:A:334:LYS:HG2	1.90	0.52
1:B:33:CYS:SG	1:B:36:ILE:HB	2.49	0.52
1:B:73:LEU:CD1	1:B:145:LEU:HD21	2.40	0.52
1:B:150:GLU:HG3	1:B:290:THR:O	2.10	0.52
1:A:99:PRO:HD2	1:B:322:GLY:HA3	1.92	0.52
1:A:21:TYR:CD2	1:A:67:GLU:HG2	2.45	0.51
1:A:83:ILE:HD13	1:A:145:LEU:CD1	2.40	0.51
1:A:234:MET:CA	1:A:237:VAL:HG12	2.37	0.51
1:A:112:GLY:HA2	1:B:191:SER:O	2.10	0.51
1:B:32:ILE:HG22	1:B:164:CYS:HB2	1.92	0.51
1:B:32:ILE:HG21	1:B:164:CYS:O	2.10	0.51
1:B:93:HIS:HE1	1:B:98:PRO:O	1.92	0.51
1:A:135:MET:HB3	1:A:144:MET:CE	2.39	0.51
1:B:35:HIS:HB3	1:B:159:TYR:CD1	2.46	0.50
1:A:7:THR:HG23	1:A:138:GLY:O	2.12	0.50
1:A:259:GLN:HB3	1:A:284:ILE:HB	1.94	0.50
1:B:219:VAL:O	1:B:219:VAL:HG13	2.11	0.50
1:A:254:VAL:HG13	1:A:314:ALA:CB	2.41	0.50
1:B:267:LEU:HD23	1:B:267:LEU:C	2.32	0.50
1:B:155:THR:O	1:B:219:VAL:HG12	2.12	0.50
1:B:320:GLY:O	1:B:323:LEU:HA	2.12	0.50
1:A:8:SER:HB3	1:B:11:ARG:NH2	2.26	0.49
1:A:96:GLN:HG2	1:B:201:GLN:HE22	1.77	0.49
1:B:206:ILE:O	1:B:210:GLN:HG3	2.12	0.49
1:B:122:CYS:HB2	1:B:320:GLY:HA3	1.94	0.49
1:B:211:ASN:N	1:B:212:PRO:HD3	2.26	0.49
1:A:49:ILE:HG12	1:A:284:ILE:HG12	1.93	0.49
1:B:27:VAL:HG11	1:B:32:ILE:HD11	1.94	0.49
1:B:111:LYS:HA	2:B:510:HOH:O	2.12	0.49
1:B:101:ALA:HB3	1:B:102:PRO:HD3	1.96	0.48
1:B:188:VAL:HG21	1:B:241:ALA:HA	1.95	0.48
1:A:125:PHE:CD2	1:A:295:ILE:HG12	2.49	0.47
1:A:32:ILE:HD13	1:A:164:CYS:SG	2.55	0.47
1:A:34:GLN:HG3	1:A:35:HIS:CD2	2.50	0.47
1:B:16:LEU:O	1:B:334:LYS:HE2	2.14	0.47
1:B:221:LEU:C	1:B:221:LEU:HD13	2.35	0.47
1:B:259:GLN:HB3	1:B:284:ILE:HB	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:254:VAL:O	1:A:314:ALA:HA	2.15	0.46
1:A:321:ALA:C	1:A:323:LEU:N	2.67	0.46
1:A:29:ASN:HB3	1:A:43:ILE:HD12	1.97	0.46
1:A:206:ILE:O	1:A:210:GLN:HG3	2.15	0.46
1:B:109:GLY:HA2	1:B:111:LYS:HE2	1.98	0.45
1:A:27:VAL:O	1:A:52:ARG:HG2	2.15	0.45
1:A:29:ASN:O	1:A:32:ILE:HG13	2.17	0.45
1:B:118:LEU:HD12	1:B:119:SER:N	2.32	0.45
1:A:23:PRO:HB3	1:A:55:ALA:HA	1.99	0.45
1:B:17:SER:HA	1:B:333:PRO:HB2	1.99	0.44
1:B:44:TYR:CE1	1:B:50:LYS:HE3	2.53	0.44
1:A:295:ILE:HG13	1:A:296:PRO:N	2.32	0.43
1:B:11:ARG:HG2	1:B:11:ARG:HH11	1.82	0.43
1:A:23:PRO:CB	1:A:55:ALA:HA	2.48	0.43
1:A:150:GLU:HG3	1:A:290:THR:O	2.19	0.43
1:A:23:PRO:O	1:A:53:ARG:HG2	2.18	0.43
1:A:251:GLN:NE2	1:B:2:THR:HG22	2.34	0.42
1:B:302:LEU:HD13	2:B:368:HOH:O	2.18	0.42
1:A:96:GLN:HB3	1:B:91:ASN:O	2.19	0.42
1:A:254:VAL:CG1	1:A:314:ALA:HB2	2.48	0.42
1:A:228:ARG:HH11	1:A:228:ARG:HG2	1.85	0.42
1:B:23:PRO:HG2	1:B:53:ARG:CB	2.49	0.42
1:A:261:ASN:ND2	1:A:263:ARG:N	2.68	0.42
1:A:263:ARG:HH11	1:A:263:ARG:HG3	1.86	0.41
1:A:216:ARG:HD2	1:A:218:PHE:CZ	2.54	0.41
1:A:73:LEU:HD11	1:A:83:ILE:CD1	2.49	0.41
1:B:268:LEU:O	1:B:272:LEU:HB2	2.21	0.41
1:B:49:ILE:HG12	1:B:284:ILE:HG12	2.03	0.41
1:B:89:THR:HA	1:B:118:LEU:O	2.21	0.41
1:B:114:LEU:HD12	1:B:114:LEU:C	2.41	0.41
1:A:191:SER:HA	1:A:324:SER:HA	2.02	0.41
1:A:295:ILE:HD13	1:A:316:LEU:HB3	2.03	0.41
1:A:35:HIS:O	1:A:36:ILE:HD13	2.21	0.41
1:A:96:GLN:HG2	1:B:201:GLN:NE2	2.36	0.41
1:B:255:PHE:CZ	1:B:257:PRO:HB3	2.56	0.41
1:A:53:ARG:HG2	1:A:53:ARG:NH2	2.33	0.40
1:A:255:PHE:CZ	1:A:257:PRO:HB3	2.57	0.40
1:B:47:THR:HG21	1:B:165:PHE:CE2	2.52	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	332/356 (93%)	321 (97%)	10 (3%)	1 (0%)	41	37
1	B	332/356 (93%)	321 (97%)	10 (3%)	1 (0%)	41	37
All	All	664/712 (93%)	642 (97%)	20 (3%)	2 (0%)	41	37

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	321	ALA
1	A	321	ALA

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	244/262 (93%)	234 (96%)	10 (4%)	30	28
1	B	244/262 (93%)	236 (97%)	8 (3%)	38	37
All	All	488/524 (93%)	470 (96%)	18 (4%)	34	32

All (18) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	22	ARG
1	A	53	ARG
1	A	95	LEU
1	A	118	LEU

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Mol	Chain	Res	Type
1	A	216	ARG
1	A	254	VAL
1	A	295	ILE
1	A	315	LEU
1	A	323	LEU
1	A	328	GLN
1	B	52	ARG
1	B	95	LEU
1	B	118	LEU
1	B	163	ASN
1	B	272	LEU
1	B	302	LEU
1	B	315	LEU
1	B	328	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (18) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	35	HIS
1	A	75	ASN
1	A	182	GLN
1	A	201	GLN
1	A	261	ASN
1	A	265	ASN
1	A	286	HIS
1	B	34	GLN
1	B	75	ASN
1	B	93	HIS
1	B	96	GLN
1	B	163	ASN
1	B	201	GLN
1	B	211	ASN
1	B	261	ASN
1	B	265	ASN
1	B	273	GLN
1	B	286	HIS

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 monosaccharides in this entry.

5.6 Ligand geometry (i)

There are no ligands in this entry.

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, 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	334/356 (93%)	0.43	30 (8%)	9	8	16, 31, 59, 84	0
1	B	334/356 (93%)	0.29	25 (7%)	14	13	16, 30, 53, 90	0
All	All	668/712 (93%)	0.36	55 (8%)	11	11	16, 30, 58, 90	0

All (55) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	33	CYS	14.1
1	B	38	SER	9.4
1	A	32	ILE	9.2
1	A	36	ILE	8.2
1	A	38	SER	8.1
1	B	35	HIS	7.3
1	B	1	MET	6.9
1	A	33	CYS	6.9
1	B	34	GLN	6.4
1	A	34	GLN	6.2
1	B	2	THR	6.0
1	A	30	ASP	5.3
1	A	37	ASP	5.1
1	B	36	ILE	5.0
1	A	39	SER	5.0
1	A	1	MET	4.9
1	A	35	HIS	4.9
1	B	32	ILE	4.7
1	A	159	TYR	4.6
1	B	11	ARG	4.0
1	A	41	GLU	4.0
1	B	3	GLU	3.9
1	A	29	ASN	3.9
1	A	323	LEU	3.8

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Mol	Chain	Res	Type	RSRZ
1	A	40	ASP	3.8
1	A	181	PHE	3.8
1	A	322	GLY	3.7
1	A	42	TRP	3.6
1	A	28	THR	3.5
1	B	37	ASP	3.3
1	A	43	ILE	3.3
1	A	11	ARG	3.3
1	B	158	MET	3.2
1	A	2	THR	3.1
1	B	322	GLY	3.0
1	B	209	ALA	3.0
1	B	181	PHE	2.9
1	A	158	MET	2.8
1	B	8	SER	2.8
1	A	334	LYS	2.7
1	B	334	LYS	2.6
1	B	213	SER	2.5
1	A	209	ALA	2.5
1	A	44	TYR	2.4
1	B	304	THR	2.4
1	B	39	SER	2.4
1	B	211	ASN	2.3
1	A	211	ASN	2.2
1	A	161	ALA	2.2
1	B	212	PRO	2.2
1	B	6	THR	2.2
1	B	323	LEU	2.1
1	B	111	LYS	2.1
1	A	263	ARG	2.1
1	A	214	GLY	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.