Full wwPDB X-ray Structure Validation Report ⓘ

Nov 6, 2023 – 12:51 PM JST

PDB ID	:	8JFJ
Title	:	Crystal structure of enoyl-ACP reductase FabI from Helicobacter pylori
Authors	:	Song, W.Y.; Zhang, L.
Deposited on	:	2023-05-18
Resolution	:	1.80 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ 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 ⓘ) were used in the production of this report:

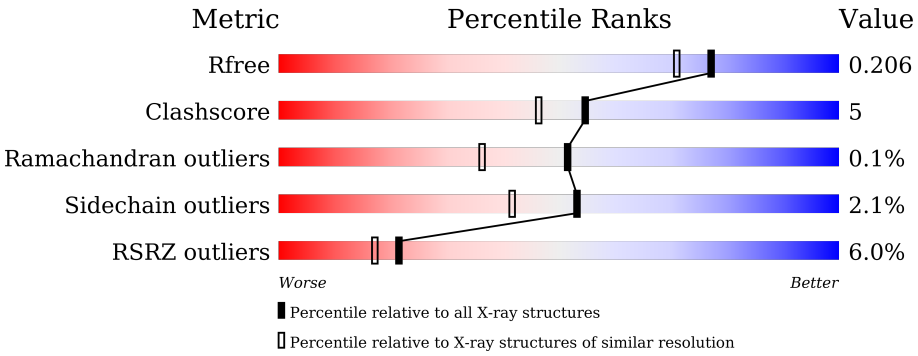
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation 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 1.80 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	5950 (1.80-1.80)
Clashscore	141614	6793 (1.80-1.80)
Ramachandran outliers	138981	6697 (1.80-1.80)
Sidechain outliers	138945	6696 (1.80-1.80)
RSRZ outliers	127900	5850 (1.80-1.80)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments 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	275	4% 85% 11%
1	B	275	4% 84% 11% 5%
1	C	275	7% 85% 10%
1	D	275	7% 83% 10% 6%
1	E	275	5% 83% 12%
1	F	275	7% 79% 13%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 13195 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 Enoyl-[acyl-carrier-protein] reductase [NADH].

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	273	Total	C	N	O	S	0	0	0
			2090	1336	350	395	9			
1	B	262	Total	C	N	O	S	0	1	0
			2018	1293	336	380	9			
1	C	272	Total	C	N	O	S	0	0	0
			2081	1330	348	394	9			
1	D	258	Total	C	N	O	S	0	0	0
			1983	1272	332	370	9			
1	E	263	Total	C	N	O	S	0	0	0
			2018	1294	336	380	8			
1	F	265	Total	C	N	O	S	0	0	0
			2036	1304	340	383	9			

- Molecule 2 is water.

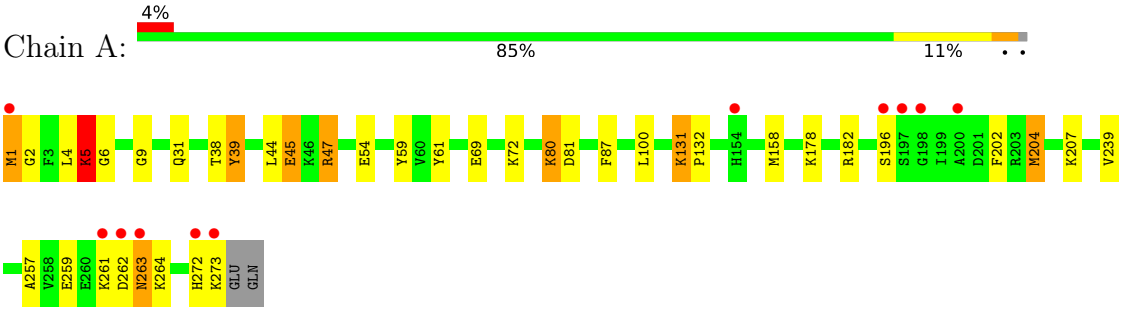
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	169	Total	O	0	0
			169	169		
2	B	172	Total	O	0	0
			172	172		
2	C	153	Total	O	0	0
			153	153		
2	D	172	Total	O	0	0
			172	172		
2	E	165	Total	O	0	0
			165	165		
2	F	138	Total	O	0	0
			138	138		

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.

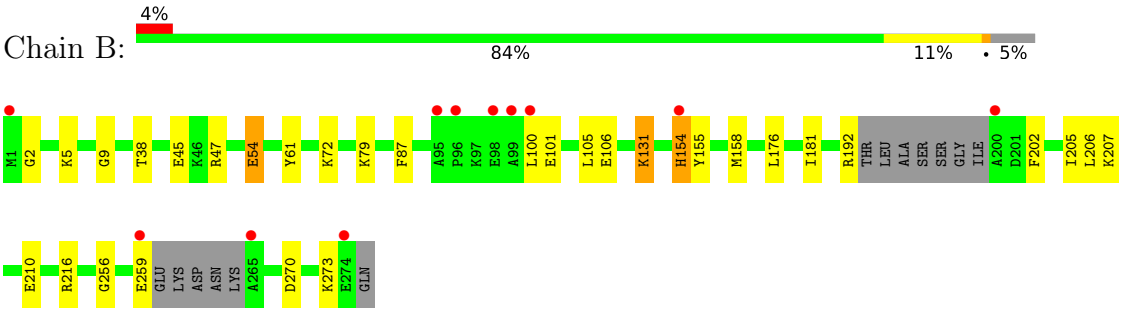
• Molecule 1: Enoyl-[acyl-carrier-protein] reductase [NADH]

Chain A:



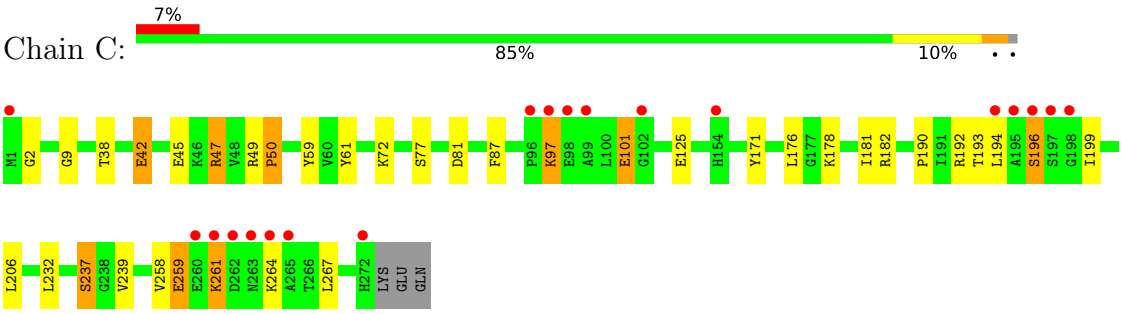
• Molecule 1: Enoyl-[acyl-carrier-protein] reductase [NADH]

Chain B:



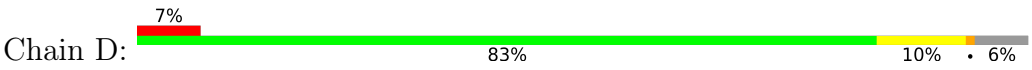
• Molecule 1: Enoyl-[acyl-carrier-protein] reductase [NADH]

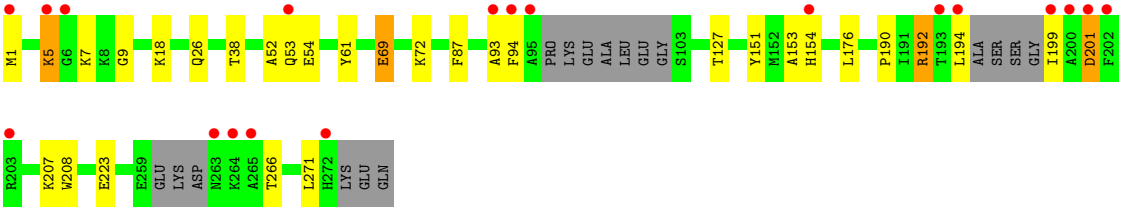
Chain C:



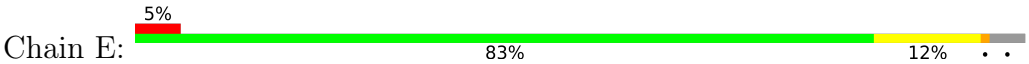
• Molecule 1: Enoyl-[acyl-carrier-protein] reductase [NADH]

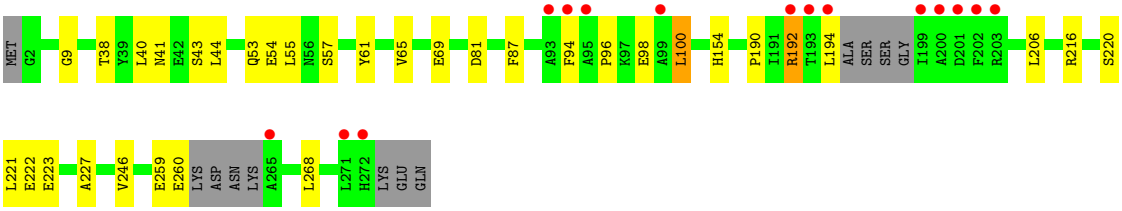
Chain D:



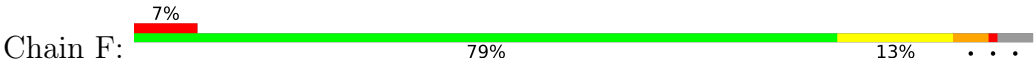


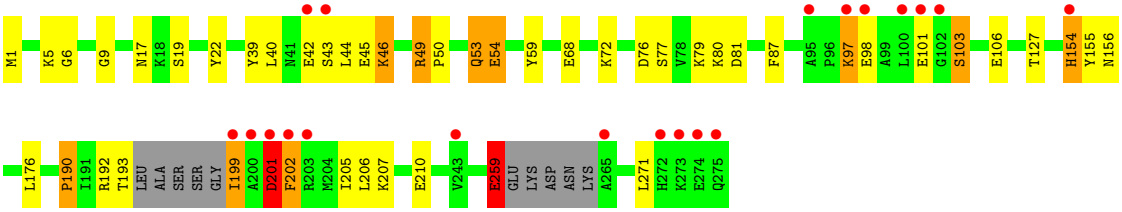
• Molecule 1: Enoyl-[acyl-carrier-protein] reductase [NADH]





• Molecule 1: Enoyl-[acyl-carrier-protein] reductase [NADH]





4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	265.76Å 68.34Å 88.16Å 90.00° 108.59° 90.00°	Depositor
Resolution (Å)	41.43 – 1.80 41.43 – 1.80	Depositor EDS
% Data completeness (in resolution range)	97.3 (41.43-1.80) 97.3 (41.43-1.80)	Depositor EDS
R_{merge}	0.19	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.80 (at 1.79Å)	Xtriage
Refinement program	PHENIX (1.18.2_3874: ???)	Depositor
R, R_{free}	0.192 , 0.206 0.192 , 0.206	Depositor DCC
R_{free} test set	6731 reflections (4.97%)	wwPDB-VP
Wilson B-factor (Å^2)	18.9	Xtriage
Anisotropy	0.081	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 48.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.011 for -h-2*l,-k,l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	13195	wwPDB-VP
Average B, all atoms (Å^2)	23.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 11.94% 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	0.93	11/2128 (0.5%)	0.86	9/2876 (0.3%)
1	B	0.86	11/2057 (0.5%)	0.82	7/2778 (0.3%)
1	C	0.74	6/2119 (0.3%)	0.80	10/2865 (0.3%)
1	D	0.90	8/2017 (0.4%)	0.90	9/2724 (0.3%)
1	E	0.87	14/2054 (0.7%)	0.78	6/2777 (0.2%)
1	F	1.01	15/2072 (0.7%)	1.17	17/2799 (0.6%)
All	All	0.89	65/12447 (0.5%)	0.90	58/16819 (0.3%)

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
1	C	0	1
1	F	0	3
All	All	0	5

All (65) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	69	GLU	CD-OE1	-14.91	1.09	1.25
1	F	68	GLU	CG-CD	-12.30	1.33	1.51
1	E	223	GLU	CD-OE1	-11.89	1.12	1.25
1	F	210	GLU	CD-OE2	-11.69	1.12	1.25
1	F	68	GLU	CB-CG	-11.56	1.30	1.52
1	F	190	PRO	N-CA	11.11	1.66	1.47
1	B	45	GLU	CD-OE1	-10.83	1.13	1.25
1	E	223	GLU	CD-OE2	-10.57	1.14	1.25
1	A	45	GLU	CD-OE2	-10.19	1.14	1.25
1	B	45	GLU	CD-OE2	-8.75	1.16	1.25
1	F	210	GLU	CD-OE1	-8.66	1.16	1.25

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	5	LYS	CB-CG	-8.63	1.29	1.52
1	E	69	GLU	CD-OE2	-7.61	1.17	1.25
1	B	131	LYS	C-N	7.47	1.48	1.34
1	A	131	LYS	C-N	7.14	1.47	1.34
1	A	54	GLU	CD-OE1	-7.12	1.17	1.25
1	C	72	LYS	C-N	6.97	1.47	1.34
1	B	72	LYS	C-N	6.92	1.47	1.34
1	A	72	LYS	C-N	6.81	1.47	1.34
1	A	45	GLU	CD-OE1	-6.73	1.18	1.25
1	D	53	GLN	CB-CG	-6.67	1.34	1.52
1	C	45	GLU	CD-OE1	-6.64	1.18	1.25
1	E	192	ARG	CG-CD	-6.58	1.35	1.51
1	B	2	GLY	C-O	-6.56	1.13	1.23
1	E	57	SER	C-N	6.48	1.46	1.34
1	B	256	GLY	C-O	-6.35	1.13	1.23
1	D	190	PRO	C-O	-6.35	1.10	1.23
1	B	270	ASP	CG-OD2	-6.25	1.10	1.25
1	F	50	PRO	CB-CG	-6.21	1.19	1.50
1	D	208	TRP	CB-CG	6.17	1.61	1.50
1	A	257	ALA	C-O	-6.01	1.11	1.23
1	F	49	ARG	CB-CG	-5.96	1.36	1.52
1	C	2	GLY	C-O	-5.94	1.14	1.23
1	F	19	SER	CA-CB	-5.90	1.44	1.52
1	C	50	PRO	N-CD	-5.88	1.39	1.47
1	A	158	MET	C-O	-5.86	1.12	1.23
1	E	69	GLU	CD-OE1	-5.83	1.19	1.25
1	A	69	GLU	CD-OE2	-5.79	1.19	1.25
1	E	98	GLU	CD-OE1	-5.75	1.19	1.25
1	E	57	SER	CA-CB	-5.74	1.44	1.52
1	A	44	LEU	C-O	-5.70	1.12	1.23
1	E	220	SER	C-O	-5.70	1.12	1.23
1	E	222	GLU	C-O	-5.69	1.12	1.23
1	F	54	GLU	C-O	-5.60	1.12	1.23
1	D	69	GLU	CD-OE2	-5.56	1.19	1.25
1	E	54	GLU	CD-OE1	-5.51	1.19	1.25
1	D	151	TYR	C-O	-5.51	1.12	1.23
1	E	65	VAL	C-O	-5.50	1.12	1.23
1	F	6	GLY	C-O	-5.45	1.15	1.23
1	A	54	GLU	CD-OE2	-5.44	1.19	1.25
1	B	106	GLU	CD-OE1	-5.39	1.19	1.25
1	C	171	TYR	CG-CD1	-5.31	1.32	1.39
1	F	103	SER	CA-CB	-5.29	1.45	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	45	GLU	CD-OE2	-5.29	1.19	1.25
1	B	270	ASP	CG-OD1	-5.28	1.13	1.25
1	F	22	TYR	C-O	-5.28	1.13	1.23
1	A	39	TYR	C-O	-5.27	1.13	1.23
1	B	5	LYS	C-O	-5.20	1.13	1.23
1	F	19	SER	C-O	-5.15	1.13	1.23
1	F	156	ASN	C-O	-5.13	1.13	1.23
1	F	17	ASN	C-O	-5.09	1.13	1.23
1	D	153	ALA	C-O	-5.09	1.13	1.23
1	B	158	MET	C-O	-5.07	1.13	1.23
1	E	55	LEU	C-O	-5.06	1.13	1.23
1	E	221	LEU	C-O	-5.01	1.13	1.23

All (58) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	F	259	GLU	OE1-CD-OE2	-25.95	92.16	123.30
1	F	259	GLU	CG-CD-OE1	16.18	150.65	118.30
1	F	259	GLU	CG-CD-OE2	-15.57	87.15	118.30
1	B	54	GLU	OE1-CD-OE2	-14.77	105.58	123.30
1	E	192	ARG	NE-CZ-NH2	-14.75	112.93	120.30
1	D	72	LYS	CB-CG-CD	-13.07	77.61	111.60
1	D	192	ARG	CG-CD-NE	-11.15	88.38	111.80
1	A	47	ARG	CG-CD-NE	-10.84	89.03	111.80
1	F	49	ARG	NE-CZ-NH2	-10.83	114.89	120.30
1	F	201	ASP	CB-CA-C	10.29	130.98	110.40
1	F	42	GLU	CA-CB-CG	9.43	134.14	113.40
1	C	101	GLU	CB-CA-C	-9.05	92.30	110.40
1	F	49	ARG	NE-CZ-NH1	8.43	124.51	120.30
1	C	259	GLU	OE1-CD-OE2	-8.28	113.36	123.30
1	C	42	GLU	CB-CA-C	8.16	126.71	110.40
1	E	192	ARG	CA-CB-CG	-8.12	95.53	113.40
1	E	192	ARG	CB-CG-CD	8.01	132.41	111.60
1	D	52	ALA	C-N-CA	-7.88	102.01	121.70
1	F	49	ARG	CG-CD-NE	-7.19	96.70	111.80
1	E	100	LEU	CA-CB-CG	7.18	131.81	115.30
1	A	47	ARG	C-N-CA	-7.15	103.81	121.70
1	C	178	LYS	CB-CA-C	7.03	124.46	110.40
1	F	68	GLU	OE1-CD-OE2	6.77	131.43	123.30
1	C	178	LYS	CA-CB-CG	6.72	128.19	113.40
1	B	54	GLU	CG-CD-OE1	6.72	131.74	118.30
1	A	5	LYS	C-N-CA	-6.71	108.21	122.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	F	202	PHE	CB-CA-C	-6.71	96.99	110.40
1	D	93	ALA	N-CA-CB	-6.54	100.95	110.10
1	A	47	ARG	CA-C-O	-6.49	106.47	120.10
1	B	54	GLU	CG-CD-OE2	-6.36	105.58	118.30
1	F	155	TYR	CB-CA-C	6.29	122.99	110.40
1	B	54	GLU	CB-CA-C	-6.21	97.97	110.40
1	E	192	ARG	CD-NE-CZ	6.21	132.29	123.60
1	F	80	LYS	C-N-CA	-6.19	106.23	121.70
1	D	54	GLU	N-CA-CB	5.95	121.31	110.60
1	F	49	ARG	CB-CA-C	-5.93	98.54	110.40
1	A	178	LYS	CB-CA-C	-5.75	98.89	110.40
1	A	259	GLU	CB-CA-C	-5.71	98.98	110.40
1	E	100	LEU	CB-CG-CD2	-5.70	101.31	111.00
1	A	80	LYS	CB-CG-CD	5.67	126.35	111.60
1	F	53	GLN	O-C-N	-5.66	113.64	122.70
1	F	46	LYS	CB-CA-C	5.56	121.51	110.40
1	C	42	GLU	CB-CG-CD	5.50	129.06	114.20
1	B	155	TYR	CB-CA-C	5.49	121.38	110.40
1	D	93	ALA	CA-C-O	-5.44	108.67	120.10
1	B	273	LYS	C-N-CA	5.42	135.24	121.70
1	F	80	LYS	CA-C-O	-5.39	108.79	120.10
1	D	5	LYS	CB-CA-C	-5.36	99.68	110.40
1	C	47	ARG	CB-CG-CD	-5.31	97.80	111.60
1	F	190	PRO	CB-CA-C	5.31	125.27	112.00
1	C	97	LYS	CB-CG-CD	-5.21	98.05	111.60
1	A	262	ASP	CB-CA-C	5.19	120.77	110.40
1	A	100	LEU	CB-CG-CD2	5.17	119.79	111.00
1	B	131	LYS	O-C-N	-5.16	111.30	121.10
1	D	201	ASP	CB-CA-C	5.13	120.65	110.40
1	C	72	LYS	O-C-N	-5.05	111.50	121.10
1	C	259	GLU	CG-CD-OE1	5.03	128.37	118.30
1	D	53	GLN	N-CA-C	-5.01	97.47	111.00

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	54	GLU	Sidechain
1	C	259	GLU	Sidechain
1	F	259	GLU	Sidechain
1	F	53	GLN	Mainchain
1	F	79	LYS	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	2090	0	2122	19	0
1	B	2018	0	2043	12	0
1	C	2081	0	2109	29	0
1	D	1983	0	2014	21	0
1	E	2018	0	2041	27	0
1	F	2036	0	2063	33	0
2	A	169	0	0	3	1
2	B	172	0	0	3	1
2	C	153	0	0	2	0
2	D	172	0	0	3	1
2	E	165	0	0	2	1
2	F	138	0	0	4	1
All	All	13195	0	12392	129	3

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 5.

All (129) 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:F:154:HIS:CD2	1:F:201:ASP:OD2	1.66	1.44
1:F:154:HIS:HD2	1:F:201:ASP:OD2	1.06	1.12
1:F:97:LYS:H	1:F:97:LYS:HD2	1.15	1.08
1:F:154:HIS:HD2	1:F:201:ASP:CG	1.56	1.07
1:C:192:ARG:HD2	1:E:53:GLN:HG2	1.46	0.97
1:C:261:LYS:O	1:C:264:LYS:HG2	1.65	0.95
1:E:259:GLU:OE1	2:E:301:HOH:O	1.83	0.94
1:F:154:HIS:CD2	1:F:201:ASP:CG	2.36	0.90
1:C:192:ARG:CD	1:E:53:GLN:HG2	2.04	0.87
1:A:1:MET:HA	1:A:5:LYS:HG2	1.54	0.87
1:D:154:HIS:CG	1:D:201:ASP:OD2	2.30	0.84
1:F:76:ASP:OD2	2:F:301:HOH:O	1.94	0.83
1:F:98:GLU:OE1	1:F:98:GLU:N	2.12	0.82
1:F:97:LYS:HD2	1:F:97:LYS:N	1.95	0.81
1:C:97:LYS:N	1:C:97:LYS:HD3	1.97	0.80

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:97:LYS:H	1:F:97:LYS:CD	1.95	0.79
1:F:154:HIS:NE2	1:F:201:ASP:OD2	2.15	0.79
1:E:94:PHE:CZ	1:E:96:PRO:HG3	2.18	0.78
1:F:259:GLU:HG2	1:F:271:LEU:HD11	1.66	0.78
1:F:45:GLU:OE2	2:F:302:HOH:O	2.03	0.76
1:F:199:ILE:HG22	1:F:202:PHE:H	1.52	0.74
1:A:80:LYS:HE3	2:A:376:HOH:O	1.88	0.73
1:D:154:HIS:CD2	1:D:201:ASP:OD2	2.40	0.73
1:D:5:LYS:NZ	1:E:192:ARG:HD2	2.04	0.73
1:A:263:ASN:O	1:A:263:ASN:ND2	2.17	0.71
1:E:100:LEU:CD2	1:E:154:HIS:CD2	2.75	0.70
1:A:80:LYS:CE	2:A:376:HOH:O	2.40	0.69
1:B:79:LYS:NZ	2:B:303:HOH:O	2.25	0.69
1:C:49:ARG:HB3	1:C:50:PRO:HD3	1.74	0.69
1:F:49:ARG:NH2	2:F:302:HOH:O	2.15	0.68
1:C:192:ARG:HA	1:C:206:LEU:HD21	1.74	0.68
1:F:49:ARG:NE	2:F:302:HOH:O	2.19	0.67
1:C:237:SER:OG	1:D:223:GLU:OE2	2.10	0.66
1:F:40:LEU:HB3	1:F:44:LEU:HD12	1.77	0.65
1:C:199:ILE:N	1:C:199:ILE:HD13	2.13	0.64
1:F:77:SER:O	1:F:81:ASP:N	2.31	0.64
1:E:41:ASN:OD1	1:E:43:SER:HB3	1.98	0.63
1:F:154:HIS:CD2	1:F:201:ASP:OD1	2.52	0.61
1:E:100:LEU:HD21	1:E:154:HIS:CD2	2.37	0.59
1:A:196:SER:HB3	1:A:202:PHE:CD2	2.38	0.59
1:C:261:LYS:O	1:C:264:LYS:CG	2.45	0.58
1:D:5:LYS:HZ2	1:E:192:ARG:HD2	1.68	0.58
1:D:69:GLU:HG3	2:D:313:HOH:O	2.02	0.58
1:D:18:LYS:NZ	2:D:303:HOH:O	2.37	0.58
1:D:5:LYS:HZ3	1:E:192:ARG:HD2	1.70	0.56
2:C:431:HOH:O	1:E:194:LEU:HD23	2.06	0.54
1:D:5:LYS:NZ	1:E:192:ARG:CD	2.71	0.53
1:F:59:TYR:CE1	1:F:81:ASP:HB3	2.44	0.53
1:C:192:ARG:HD3	1:E:53:GLN:HG2	1.88	0.52
1:D:5:LYS:C	1:D:7:LYS:H	2.13	0.52
1:E:81:ASP:OD2	2:E:302:HOH:O	2.19	0.52
1:C:61:TYR:CE1	1:C:77:SER:HB3	2.45	0.52
1:F:39:TYR:CD1	1:F:45:GLU:HB2	2.45	0.52
1:D:5:LYS:C	1:D:7:LYS:N	2.63	0.52
1:A:263:ASN:HD22	1:A:263:ASN:C	2.12	0.51
1:D:5:LYS:HZ3	1:E:192:ARG:CD	2.23	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:38:THR:HA	1:B:61:TYR:O	2.12	0.49
1:C:125:GLU:OE2	2:C:301:HOH:O	2.19	0.49
1:B:100:LEU:O	1:B:154:HIS:CD2	2.66	0.49
1:D:38:THR:HA	1:D:61:TYR:O	2.13	0.49
1:E:94:PHE:O	1:E:96:PRO:HD3	2.13	0.49
1:F:54:GLU:O	1:F:54:GLU:HG2	2.13	0.48
1:F:72:LYS:HE2	1:F:76:ASP:OD1	2.14	0.48
1:F:103:SER:OG	1:F:106:GLU:HG3	2.13	0.48
1:D:266:THR:HG21	1:D:271:LEU:HD21	1.96	0.47
1:D:5:LYS:HE3	1:D:5:LYS:HB2	1.43	0.47
1:F:154:HIS:ND1	1:F:154:HIS:C	2.68	0.47
1:B:9:GLY:HA3	1:B:87:PHE:CZ	2.49	0.47
1:C:97:LYS:N	1:C:97:LYS:CD	2.74	0.47
1:C:237:SER:HB3	1:D:223:GLU:HG2	1.95	0.46
1:C:192:ARG:HD3	1:E:53:GLN:CG	2.46	0.46
1:A:2:GLY:HA3	1:A:31:GLN:OE1	2.14	0.46
1:F:98:GLU:HA	1:F:101:GLU:HG3	1.98	0.46
1:D:127:THR:HG21	1:D:176:LEU:HD11	1.97	0.46
1:A:38:THR:HA	1:A:61:TYR:O	2.15	0.45
1:C:176:LEU:HB3	1:C:181:ILE:HB	1.97	0.45
1:D:69:GLU:H	1:D:69:GLU:CD	2.19	0.45
1:E:216:ARG:NH2	1:E:268:LEU:HD11	2.30	0.45
1:E:38:THR:HA	1:E:61:TYR:O	2.16	0.45
1:E:190:PRO:HB2	1:E:206:LEU:HD23	1.97	0.45
1:D:9:GLY:HA3	1:D:87:PHE:CZ	2.51	0.45
1:F:192:ARG:HA	1:F:206:LEU:HD21	1.98	0.45
1:E:94:PHE:CE2	1:E:96:PRO:HG3	2.52	0.45
1:F:207:LYS:HD2	1:F:207:LYS:HA	1.77	0.45
1:B:176:LEU:HB3	1:B:181:ILE:HB	1.98	0.45
1:C:38:THR:HA	1:C:61:TYR:O	2.16	0.45
1:F:43:SER:O	1:F:46:LYS:HG2	2.17	0.45
1:E:259:GLU:O	1:E:260:GLU:HB2	2.17	0.44
1:A:131:LYS:HB3	1:A:132:PRO:HD3	2.00	0.44
1:A:59:TYR:CE1	1:A:81:ASP:HB3	2.53	0.44
1:C:47:ARG:HD3	1:C:47:ARG:HA	1.62	0.44
1:B:105:LEU:HD23	1:B:105:LEU:HA	1.81	0.43
1:C:59:TYR:CE1	1:C:81:ASP:HB3	2.52	0.43
1:E:40:LEU:HB3	1:E:44:LEU:HD22	1.99	0.43
1:C:97:LYS:HB2	1:C:97:LYS:HE2	1.78	0.43
1:C:193:THR:HG1	1:C:196:SER:HG	1.58	0.43
1:C:190:PRO:HB2	1:C:206:LEU:HD13	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:9:GLY:HA3	1:A:87:PHE:CZ	2.53	0.43
1:B:216:ARG:NE	2:B:302:HOH:O	2.22	0.43
1:C:9:GLY:HA3	1:C:87:PHE:CZ	2.53	0.43
1:C:182:ARG:HD2	1:C:239:VAL:O	2.18	0.43
1:E:100:LEU:HD21	1:E:154:HIS:HD2	1.84	0.43
1:A:6:GLY:HA2	2:A:322:HOH:O	2.19	0.43
1:B:101:GLU:HB2	2:B:398:HOH:O	2.19	0.43
1:C:258:VAL:HG12	1:C:267:LEU:HD23	2.00	0.43
1:A:272:HIS:O	1:A:273:LYS:HB2	2.19	0.42
1:B:202:PHE:HA	1:B:205:ILE:HG22	2.01	0.42
1:A:207:LYS:HA	1:A:207:LYS:HD3	1.83	0.42
1:C:261:LYS:HE3	1:C:261:LYS:HB2	1.63	0.42
1:F:9:GLY:HA3	1:F:87:PHE:CZ	2.53	0.42
1:D:26:GLN:HG2	2:D:302:HOH:O	2.19	0.42
1:A:182:ARG:HD2	1:A:239:VAL:O	2.19	0.42
1:E:9:GLY:HA3	1:E:87:PHE:CZ	2.54	0.42
1:F:190:PRO:HB2	1:F:206:LEU:HD13	2.02	0.42
1:A:263:ASN:ND2	1:A:263:ASN:C	2.73	0.42
1:F:205:ILE:HD12	1:F:205:ILE:O	2.19	0.41
1:C:9:GLY:HA3	1:C:87:PHE:CE2	2.55	0.41
1:A:39:TYR:CD1	1:A:45:GLU:HB2	2.55	0.41
1:C:87:PHE:HB2	1:C:232:LEU:HD22	2.03	0.41
1:F:127:THR:HG21	1:F:176:LEU:HD11	2.02	0.41
1:C:192:ARG:CD	1:E:53:GLN:CG	2.87	0.41
1:B:47:ARG:HH11	1:B:47:ARG:HD2	1.74	0.40
1:B:192:ARG:HA	1:B:206:LEU:HD11	2.02	0.40
1:E:227:ALA:CB	1:E:246:VAL:HG21	2.51	0.40
1:A:204:MET:HE2	1:A:204:MET:HB3	1.69	0.40
1:D:154:HIS:CB	1:D:201:ASP:OD2	2.70	0.40
1:F:1:MET:O	1:F:1:MET:HG3	2.20	0.40
1:A:4:LEU:HA	1:A:4:LEU:HD23	1.90	0.40
1:B:207:LYS:NZ	1:B:210:GLU:OE2	2.44	0.40

All (3) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:409:HOH:O	2:F:435:HOH:O[2_555]	1.87	0.33
2:D:450:HOH:O	2:D:450:HOH:O[2_554]	1.97	0.23
2:A:408:HOH:O	2:B:443:HOH:O[4_554]	2.03	0.17

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	271/275 (98%)	262 (97%)	9 (3%)	0	100 100
1	B	257/275 (94%)	253 (98%)	4 (2%)	0	100 100
1	C	270/275 (98%)	264 (98%)	5 (2%)	1 (0%)	34 21
1	D	250/275 (91%)	240 (96%)	10 (4%)	0	100 100
1	E	257/275 (94%)	251 (98%)	6 (2%)	0	100 100
1	F	259/275 (94%)	256 (99%)	3 (1%)	0	100 100
All	All	1564/1650 (95%)	1526 (98%)	37 (2%)	1 (0%)	51 36

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	237	SER

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	225/227 (99%)	218 (97%)	7 (3%)	40 25
1	B	217/227 (96%)	214 (99%)	3 (1%)	67 59
1	C	224/227 (99%)	219 (98%)	5 (2%)	52 39
1	D	214/227 (94%)	208 (97%)	6 (3%)	43 30
1	E	217/227 (96%)	217 (100%)	0	100 100
1	F	219/227 (96%)	213 (97%)	6 (3%)	44 31

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	1316/1362 (97%)	1289 (98%)	27 (2%)	53 42

All (27) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1	MET
1	A	5	LYS
1	A	47	ARG
1	A	204	MET
1	A	261	LYS
1	A	263	ASN
1	A	264	LYS
1	B	131	LYS
1	B	154	HIS
1	B	259	GLU
1	C	42	GLU
1	C	101	GLU
1	C	194	LEU
1	C	196	SER
1	C	261	LYS
1	D	1	MET
1	D	94	PHE
1	D	192	ARG
1	D	194	LEU
1	D	199	ILE
1	D	207	LYS
1	F	5	LYS
1	F	97	LYS
1	F	154	HIS
1	F	193	THR
1	F	199	ILE
1	F	201	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	136	ASN
1	A	154	HIS
1	B	136	ASN
1	B	272	HIS
1	C	154	HIS

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Mol	Chain	Res	Type
1	D	154	HIS
1	E	154	HIS
1	F	154	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	273/275 (99%)	0.06	11 (4%)	38	32	11, 18, 43, 57	0
1	B	262/275 (95%)	-0.03	11 (4%)	36	30	12, 20, 44, 60	0
1	C	272/275 (98%)	0.14	19 (6%)	16	13	11, 21, 49, 64	0
1	D	258/275 (93%)	0.03	19 (7%)	14	11	10, 17, 41, 67	0
1	E	263/275 (95%)	0.01	15 (5%)	23	19	11, 20, 45, 64	0
1	F	265/275 (96%)	0.18	20 (7%)	14	11	11, 20, 48, 61	0
All	All	1593/1650 (96%)	0.07	95 (5%)	21	17	10, 20, 47, 67	0

All (95) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	199	ILE	7.6
1	F	199	ILE	7.6
1	A	263	ASN	6.8
1	D	194	LEU	6.6
1	C	194	LEU	5.9
1	B	100	LEU	5.9
1	E	194	LEU	5.9
1	C	196	SER	5.8
1	A	1	MET	5.7
1	E	94	PHE	5.3
1	E	200	ALA	5.2
1	C	262	ASP	5.2
1	F	273	LYS	5.2
1	C	261	LYS	5.1
1	D	154	HIS	4.9
1	F	154	HIS	4.8
1	B	154	HIS	4.6
1	F	200	ALA	4.6
1	D	263	ASN	4.6

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Mol	Chain	Res	Type	RSRZ
1	D	272	HIS	4.5
1	F	275	GLN	4.5
1	D	264	LYS	4.5
1	D	199	ILE	4.5
1	A	273	LYS	4.5
1	A	262	ASP	4.4
1	F	101	GLU	4.3
1	B	1	MET	4.3
1	B	200	ALA	4.2
1	E	99	ALA	4.2
1	F	102	GLY	4.1
1	F	201	ASP	3.9
1	A	261	LYS	3.9
1	D	1	MET	3.8
1	D	193	THR	3.8
1	D	200	ALA	3.7
1	E	265	ALA	3.6
1	A	196	SER	3.6
1	E	192	ARG	3.6
1	C	198	GLY	3.6
1	C	264	LYS	3.5
1	C	1	MET	3.5
1	C	272	HIS	3.5
1	D	265	ALA	3.4
1	E	202	PHE	3.4
1	A	197	SER	3.4
1	C	96	PRO	3.3
1	E	193	THR	3.2
1	F	97	LYS	3.2
1	C	263	ASN	3.1
1	E	201	ASP	3.1
1	B	96	PRO	3.1
1	F	202	PHE	3.1
1	F	100	LEU	3.0
1	A	200	ALA	3.0
1	F	274	GLU	3.0
1	C	195	ALA	2.8
1	C	197	SER	2.8
1	B	265	ALA	2.8
1	C	102	GLY	2.8
1	C	154	HIS	2.8
1	B	98	GLU	2.7

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Mol	Chain	Res	Type	RSRZ
1	B	95	ALA	2.7
1	E	95	ALA	2.7
1	C	98	GLU	2.7
1	A	154	HIS	2.6
1	C	99	ALA	2.5
1	F	43	SER	2.5
1	F	272	HIS	2.5
1	D	53	GLN	2.4
1	E	272	HIS	2.4
1	A	272	HIS	2.4
1	F	203	ARG	2.4
1	C	97	LYS	2.4
1	F	98	GLU	2.4
1	E	271	LEU	2.4
1	D	202	PHE	2.3
1	A	198	GLY	2.3
1	C	260	GLU	2.3
1	D	203	ARG	2.3
1	B	274	GLU	2.3
1	D	5	LYS	2.3
1	C	265	ALA	2.2
1	D	95	ALA	2.2
1	F	243	VAL	2.2
1	D	94	PHE	2.2
1	F	95	ALA	2.2
1	E	93	ALA	2.2
1	F	265	ALA	2.2
1	F	42	GLU	2.1
1	D	201	ASP	2.1
1	D	6	GLY	2.1
1	B	99	ALA	2.1
1	D	93	ALA	2.0
1	E	203	ARG	2.0
1	B	259	GLU	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.