Full wwPDB X-ray Structure Validation Report (i)

May 29, 2024 – 10:41 AM EDT

PDB ID	:	1LTG
Title	:	THE ARG7LYS MUTANT OF HEAT-LABILE ENTEROTOXIN EXHIBITS GREAT FLEXIBILITY OF ACTIVE SITE LOOP 47-56 OF THE A SUB-UNIT
Authors	:	Van Den Akker, F.; Hol, W.G.J.
Deposited on	:	1995-06-13
Resolution	:	2.40 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:

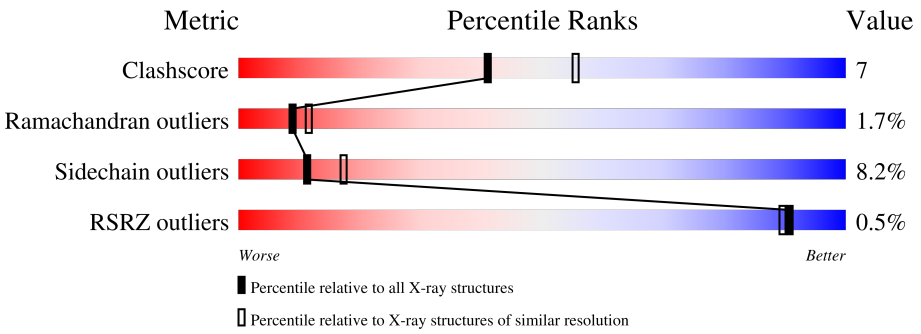
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.36.2
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36.2

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 2.40 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))
Clashscore	141614	4398 (2.40-2.40)
Ramachandran outliers	138981	4318 (2.40-2.40)
Sidechain outliers	138945	4319 (2.40-2.40)
RSRZ outliers	127900	3811 (2.40-2.40)

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	D	103	72% 25% •
1	E	103	81% 16% • •
1	F	103	% 69% 25% 6%
1	G	103	77% 17% 6%
1	H	103	71% 25% •
2	A	191	% 60% 25% 5% • 8%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
3	C	49	2% 61% 20% • 16%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 5967 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 HEAT-LABILE ENTEROTOXIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	D	103	824	516	139	163	6	0	0	0
1	E	103	824	516	139	163	6	0	0	0
1	F	103	824	516	139	163	6	0	0	0
1	G	103	824	516	139	163	6	0	0	0
1	H	103	824	516	139	163	6	0	0	0

- Molecule 2 is a protein called HEAT-LABILE ENTEROTOXIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	A	175	1429	903	260	262	4	0	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	7	LYS	ARG	conflict	UNP P06717

- Molecule 3 is a protein called HEAT-LABILE ENTEROTOXIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	41	347	214	59	73	1	0	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
4	D	18	18	18	0	0
			Total	O		
4	E	16	16	16	0	0
			Total	O		
4	F	11	11	11	0	0
			Total	O		
4	G	8	8	8	0	0
			Total	O		
4	H	7	7	7	0	0
			Total	O		
4	A	5	5	5	0	0
			Total	O		
4	C	6	6	6	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: HEAT-LABILE ENTEROTOXIN

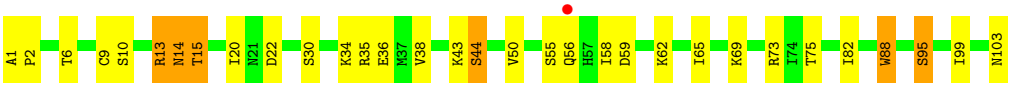
Chain D:

• Molecule 1: HEAT-LABILE ENTEROTOXIN

Chain E:

• Molecule 1: HEAT-LABILE ENTEROTOXIN

Chain F:

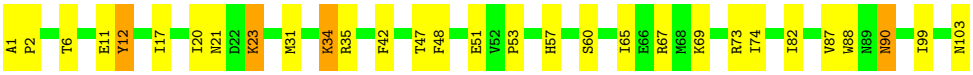


• Molecule 1: HEAT-LABILE ENTEROTOXIN

Chain G:

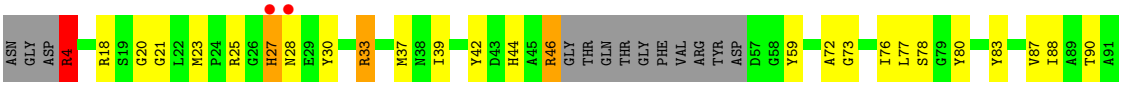
• Molecule 1: HEAT-LABILE ENTEROTOXIN

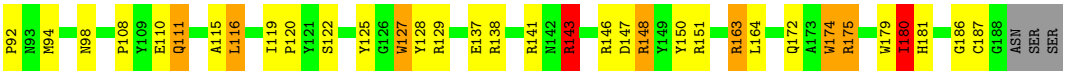
Chain H:



• Molecule 2: HEAT-LABILE ENTEROTOXIN

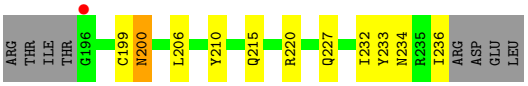
Chain A:





- Molecule 3: HEAT-LABILE ENTEROTOXIN

Chain C:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	119.70Å 98.50Å 65.50Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	10.00 – 2.40 32.89 – 2.28	Depositor EDS
% Data completeness (in resolution range)	(Not available) (10.00-2.40) 70.4 (32.89-2.28)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.29 (at 2.29Å)	Xtriage
Refinement program	X-PLOR	Depositor
R, R_{free}	0.178 , (Not available) 0.174 , (Not available)	Depositor DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å^2)	26.7	Xtriage
Anisotropy	0.212	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.28 , 90.9	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	5967	wwPDB-VP
Average B, all atoms (Å^2)	29.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.40% 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	D	0.82	0/835	1.49	8/1124 (0.7%)
1	E	0.82	0/835	1.56	9/1124 (0.8%)
1	F	0.79	0/835	1.59	11/1124 (1.0%)
1	G	0.80	0/835	1.50	11/1124 (1.0%)
1	H	0.84	0/835	1.54	10/1124 (0.9%)
2	A	0.84	0/1474	1.63	33/2003 (1.6%)
3	C	0.78	0/351	1.58	3/472 (0.6%)
All	All	0.82	0/6000	1.56	85/8095 (1.1%)

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	E	0	1

There are no bond length outliers.

All (85) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	H	73	ARG	NE-CZ-NH1	11.82	126.21	120.30
1	F	88	TRP	CD1-CG-CD2	9.32	113.75	106.30
2	A	148	ARG	NE-CZ-NH1	9.31	124.96	120.30
1	G	88	TRP	CD1-CG-CD2	8.93	113.45	106.30
1	H	88	TRP	CD1-CG-CD2	8.79	113.33	106.30
2	A	127	TRP	CD1-CG-CD2	8.75	113.30	106.30
2	A	174	TRP	CD1-CG-CD2	8.68	113.24	106.30
1	G	88	TRP	CE2-CD2-CG	-8.39	100.59	107.30
3	C	210	TYR	CB-CG-CD2	-8.30	116.02	121.00
1	F	88	TRP	CE2-CD2-CG	-8.30	100.66	107.30
1	D	88	TRP	CD1-CG-CD2	8.26	112.90	106.30

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	125	TYR	CB-CG-CD1	-8.11	116.13	121.00
2	A	174	TRP	CE2-CD2-CG	-8.10	100.82	107.30
1	H	73	ARG	NE-CZ-NH2	-8.07	116.26	120.30
2	A	179	TRP	CD1-CG-CD2	7.83	112.57	106.30
2	A	127	TRP	CE2-CD2-CG	-7.80	101.06	107.30
1	H	35	ARG	NE-CZ-NH1	7.77	124.19	120.30
1	H	88	TRP	CE2-CD2-CG	-7.68	101.16	107.30
1	F	88	TRP	CG-CD2-CE3	7.61	140.75	133.90
1	F	88	TRP	CB-CG-CD1	-7.61	117.11	127.00
1	E	88	TRP	CD1-CG-CD2	7.54	112.33	106.30
2	A	179	TRP	CE2-CD2-CG	-7.38	101.39	107.30
1	D	88	TRP	CE2-CD2-CG	-7.26	101.49	107.30
1	D	18	TYR	CB-CG-CD2	-7.14	116.71	121.00
1	E	88	TRP	CE2-CD2-CG	-6.93	101.75	107.30
1	E	27	TYR	CB-CG-CD1	-6.92	116.85	121.00
2	A	148	ARG	NE-CZ-NH2	-6.92	116.84	120.30
2	A	180	ILE	CB-CA-C	-6.88	97.84	111.60
1	F	13	ARG	NE-CZ-NH2	-6.87	116.86	120.30
2	A	175	ARG	NE-CZ-NH2	-6.67	116.96	120.30
1	F	73	ARG	NE-CZ-NH1	6.64	123.62	120.30
1	E	35	ARG	NE-CZ-NH1	6.61	123.60	120.30
2	A	80	TYR	CB-CG-CD2	-6.57	117.06	121.00
1	D	27	TYR	CB-CG-CD2	-6.46	117.13	121.00
1	H	31	MET	CG-SD-CE	-6.45	89.89	100.20
1	G	102	LYS	CA-C-N	-6.43	103.05	117.20
2	A	141	ARG	NE-CZ-NH2	-6.38	117.11	120.30
1	G	13	ARG	NE-CZ-NH2	-6.35	117.12	120.30
2	A	143	ARG	NE-CZ-NH1	6.27	123.43	120.30
2	A	25	ARG	NE-CZ-NH1	6.21	123.40	120.30
1	G	102	LYS	O-C-N	6.12	132.48	122.70
1	G	50	VAL	N-CA-C	-6.10	94.52	111.00
2	A	25	ARG	NE-CZ-NH2	-6.01	117.30	120.30
1	F	88	TRP	CG-CD1-NE1	-5.99	104.11	110.10
1	E	103	ASN	N-CA-C	5.95	127.05	111.00
1	H	12	TYR	CA-C-N	-5.87	104.28	117.20
2	A	175	ARG	NE-CZ-NH1	5.87	123.23	120.30
2	A	4	ARG	NE-CZ-NH1	5.83	123.22	120.30
1	D	73	ARG	NE-CZ-NH2	-5.83	117.39	120.30
2	A	174	TRP	CG-CD1-NE1	-5.80	104.30	110.10
2	A	92	PRO	O-C-N	-5.78	113.45	122.70
2	A	116	LEU	CA-CB-CG	5.72	128.46	115.30
2	A	174	TRP	CB-CG-CD1	-5.72	119.56	127.00

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	50	VAL	N-CA-C	-5.70	95.60	111.00
2	A	174	TRP	CG-CD2-CE3	5.69	139.02	133.90
3	C	200	ASN	CB-CG-ND2	5.67	130.31	116.70
1	E	73	ARG	NE-CZ-NH1	5.59	123.10	120.30
2	A	146	ARG	NE-CZ-NH2	-5.59	117.51	120.30
1	F	50	VAL	CG1-CB-CG2	-5.56	102.00	110.90
1	E	88	TRP	CG-CD2-CE3	5.52	138.87	133.90
2	A	150	TYR	CB-CG-CD1	-5.52	117.69	121.00
2	A	179	TRP	CG-CD2-CE3	5.47	138.82	133.90
1	G	88	TRP	CB-CG-CD1	-5.46	119.90	127.00
1	D	13	ARG	NE-CZ-NH1	5.46	123.03	120.30
3	C	220	ARG	NE-CZ-NH1	5.46	123.03	120.30
2	A	128	TYR	CB-CG-CD1	-5.44	117.74	121.00
1	E	88	TRP	CB-CG-CD1	-5.41	119.97	127.00
1	G	13	ARG	NE-CZ-NH1	5.36	122.98	120.30
2	A	127	TRP	CG-CD1-NE1	-5.36	104.74	110.10
2	A	129	ARG	NE-CZ-NH2	-5.35	117.63	120.30
1	H	88	TRP	CB-CG-CD1	-5.32	120.09	127.00
1	F	34	LYS	CA-CB-CG	5.20	124.84	113.40
2	A	127	TRP	CG-CD2-CE3	5.18	138.56	133.90
1	G	69	LYS	CA-CB-CG	-5.15	102.07	113.40
2	A	83	TYR	CA-CB-CG	5.11	123.11	113.40
1	G	88	TRP	CG-CD2-CE3	5.10	138.49	133.90
1	H	67	ARG	NE-CZ-NH2	-5.09	117.75	120.30
2	A	143	ARG	NE-CZ-NH2	-5.07	117.76	120.30
2	A	46	ARG	NE-CZ-NH2	-5.07	117.77	120.30
1	F	38	VAL	CA-CB-CG2	-5.06	103.31	110.90
1	D	8	LEU	CA-CB-CG	5.04	126.90	115.30
1	H	88	TRP	CG-CD1-NE1	-5.04	105.06	110.10
1	G	88	TRP	CG-CD1-NE1	-5.03	105.07	110.10
1	F	50	VAL	N-CA-C	-5.03	97.42	111.00
1	E	67	ARG	NE-CZ-NH1	5.02	122.81	120.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	E	12	TYR	Sidechain

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	D	824	0	841	11	0
1	E	824	0	841	9	0
1	F	824	0	841	14	0
1	G	824	0	841	16	0
1	H	824	0	841	14	0
2	A	1429	0	1334	26	0
3	C	347	0	327	6	0
4	A	5	0	0	0	0
4	C	6	0	0	1	0
4	D	18	0	0	2	0
4	E	16	0	0	1	0
4	F	11	0	0	1	0
4	G	8	0	0	1	0
4	H	7	0	0	0	0
All	All	5967	0	5866	84	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 7.

All (84) 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:75:THR:HG21	1:F:82:ILE:HD11	1.67	0.76
2:A:175:ARG:HA	2:A:180:ILE:HG23	1.69	0.74
1:F:82:ILE:HD12	1:F:99:ILE:HD11	1.80	0.64
1:F:1:ALA:HB3	1:G:93:PRO:HD2	1.81	0.62
1:D:32:ALA:HB1	1:H:12:TYR:CZ	2.37	0.60
2:A:23:MET:SD	2:A:27:HIS:HD2	2.24	0.60
1:G:20:ILE:HG13	1:G:85:LEU:HD12	1.83	0.60
1:F:30:SER:O	1:F:36:GLU:HA	2.02	0.59
1:E:35:ARG:HG2	1:E:35:ARG:HH11	1.67	0.59
1:D:86:CYS:HB3	1:D:98:ALA:HB3	1.84	0.59
2:A:33:ARG:NH1	3:C:215:GLN:NE2	2.55	0.54
1:G:77:LEU:HA	2:A:148:ARG:NH2	2.22	0.54
2:A:180:ILE:HD13	2:A:181:HIS:CE1	2.42	0.54

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:88:ILE:HD13	2:A:119:ILE:HD13	1.90	0.52
1:D:30:SER:O	1:D:36:GLU:HA	2.09	0.52
2:A:23:MET:HE3	2:A:30:TYR:HB2	1.92	0.52
1:F:65:ILE:HG22	1:F:69:LYS:HE2	1.90	0.52
1:G:20:ILE:HG21	1:G:42:PHE:CE1	2.44	0.52
1:G:3:GLN:HG3	1:H:47:THR:HG21	1.92	0.51
1:D:46:GLU:HB3	1:D:48:PHE:CE1	2.44	0.51
1:H:6:THR:HG22	1:H:17:ILE:HD13	1.92	0.51
3:C:232:ILE:O	3:C:236:ILE:HG12	2.11	0.51
1:F:65:ILE:O	1:F:69:LYS:HG3	2.11	0.51
1:D:36:GLU:O	1:D:52:VAL:HG22	2.11	0.50
1:D:55:SER:O	1:D:56:GLN:HG3	2.11	0.50
1:H:82:ILE:HD12	1:H:99:ILE:HD11	1.94	0.50
1:G:14:ASN:HB3	1:G:90:ASN:ND2	2.27	0.50
2:A:98:ASN:OD1	2:A:111:GLN:HA	2.12	0.49
2:A:147:ASP:O	2:A:151:ARG:HB2	2.13	0.49
2:A:163:ARG:HD3	2:A:164:LEU:HG	1.95	0.49
2:A:94:MET:SD	2:A:115:ALA:HB2	2.53	0.48
1:F:13:ARG:O	1:F:14:ASN:HB2	2.13	0.48
1:G:103:ASN:O	1:H:23:LYS:HE3	2.13	0.48
2:A:4:ARG:HG2	2:A:87:VAL:HG12	1.94	0.48
1:H:53:PRO:HG3	1:H:65:ILE:HG21	1.96	0.47
1:G:14:ASN:HB3	1:G:90:ASN:HD22	1.79	0.47
2:A:73:GLY:HA2	2:A:77:LEU:HD12	1.96	0.47
2:A:21:GLY:HA3	2:A:119:ILE:O	2.16	0.46
2:A:163:ARG:HE	3:C:206:LEU:HB3	1.81	0.46
1:G:75:THR:HG21	1:G:82:ILE:HD11	1.98	0.45
2:A:42:TYR:O	2:A:46:ARG:HG3	2.16	0.45
1:H:20:ILE:HG21	1:H:42:PHE:CE1	2.51	0.45
2:A:174:TRP:CD1	2:A:187:CYS:HB3	2.52	0.45
1:E:88:TRP:HE3	1:E:95:SER:HB2	1.82	0.45
1:H:48:PHE:CE1	1:H:87:VAL:HG11	2.52	0.45
2:A:127:TRP:HH2	2:A:143:ARG:HH22	1.65	0.44
1:D:20:ILE:HG13	1:D:85:LEU:HD22	1.99	0.44
2:A:72:ALA:O	2:A:76:ILE:HG12	2.18	0.44
2:A:39:ILE:HG21	2:A:116:LEU:HD13	2.00	0.44
1:F:2:PRO:HD3	1:G:35:ARG:HH21	1.83	0.43
1:F:88:TRP:HE3	1:F:95:SER:HB3	1.83	0.43
1:E:15:THR:HA	1:E:87:VAL:O	2.18	0.43
2:A:186:GLY:O	3:C:199:CYS:HB2	2.18	0.43
1:F:59:ASP:HA	1:F:62:LYS:HD3	2.01	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:49:GLN:HB3	1:G:93:PRO:HG2	2.01	0.43
1:D:48:PHE:CE2	1:D:87:VAL:HG11	2.53	0.43
1:E:63:LYS:HE2	3:C:233:TYR:OH	2.18	0.43
1:F:9:CYS:SG	1:F:15:THR:HB	2.59	0.43
1:G:58:ILE:H	1:G:58:ILE:HG12	1.57	0.43
1:E:41:THR:HG22	1:E:47:THR:OG1	2.19	0.43
4:F:113:HOH:O	3:C:232:ILE:HG13	2.19	0.43
2:A:20:GLY:O	2:A:120:PRO:HA	2.18	0.42
1:F:75:THR:HG21	1:F:82:ILE:CD1	2.45	0.42
2:A:23:MET:SD	2:A:27:HIS:CD2	3.10	0.42
1:D:15:THR:HA	1:D:87:VAL:O	2.20	0.42
1:E:95:SER:HB3	4:E:114:HOH:O	2.18	0.42
1:F:22:ASP:OD2	1:F:43:LYS:HD3	2.19	0.42
2:A:138:ARG:HA	2:A:138:ARG:HD3	1.93	0.42
1:H:74:ILE:HG12	4:C:60:HOH:O	2.20	0.42
1:E:35:ARG:HD2	1:E:37:MET:SD	2.60	0.42
2:A:44:HIS:CG	2:A:59:TYR:HB2	2.54	0.42
2:A:98:ASN:ND2	2:A:108:PRO:HA	2.35	0.41
1:E:8:LEU:HD23	1:E:8:LEU:O	2.21	0.41
1:G:13:ARG:O	1:G:14:ASN:HB2	2.20	0.41
1:H:53:PRO:HA	1:H:57:HIS:ND1	2.35	0.41
1:E:35:ARG:HA	1:E:35:ARG:HD3	1.83	0.41
1:G:68:MET:HB2	4:G:109:HOH:O	2.20	0.41
1:G:58:ILE:HD12	1:H:34:LYS:HE3	2.02	0.41
1:D:24:ILE:HG13	4:D:118:HOH:O	2.19	0.40
1:F:99:ILE:O	1:G:28:THR:HA	2.21	0.40
1:D:75:THR:HG22	4:D:118:HOH:O	2.21	0.40
1:H:65:ILE:O	1:H:69:LYS:HG3	2.21	0.40
1:H:1:ALA:HB1	1:H:2:PRO:HD2	2.03	0.40
1:H:53:PRO:HA	1:H:57:HIS:CE1	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	D	101/103 (98%)	93 (92%)	7 (7%)	1 (1%)	15	23
1	E	101/103 (98%)	94 (93%)	5 (5%)	2 (2%)	7	9
1	F	101/103 (98%)	93 (92%)	5 (5%)	3 (3%)	4	3
1	G	101/103 (98%)	95 (94%)	6 (6%)	0	100	100
1	H	101/103 (98%)	95 (94%)	3 (3%)	3 (3%)	4	3
2	A	171/191 (90%)	161 (94%)	7 (4%)	3 (2%)	8	10
3	C	39/49 (80%)	37 (95%)	2 (5%)	0	100	100
All	All	715/755 (95%)	668 (93%)	35 (5%)	12 (2%)	9	11

All (12) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	A	172	GLN
1	D	56	GLN
1	F	14	ASN
1	F	44	SER
1	H	51	GLU
1	E	89	ASN
2	A	111	GLN
1	F	10	SER
1	H	11	GLU
2	A	137	GLU
1	E	34	LYS
1	H	90	ASN

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	D	95/95 (100%)	87 (92%)	8 (8%)	11	16
1	E	95/95 (100%)	89 (94%)	6 (6%)	18	28

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	F	95/95 (100%)	85 (90%)	10 (10%)	7	9
1	G	95/95 (100%)	87 (92%)	8 (8%)	11	16
1	H	95/95 (100%)	89 (94%)	6 (6%)	18	28
2	A	147/160 (92%)	134 (91%)	13 (9%)	10	15
3	C	40/48 (83%)	37 (92%)	3 (8%)	13	21
All	All	662/683 (97%)	608 (92%)	54 (8%)	11	17

All (54) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	6	THR
1	D	8	LEU
1	D	23	LYS
1	D	44	SER
1	D	85	LEU
1	D	91	LYS
1	D	101	MET
1	D	103	ASN
1	E	6	THR
1	E	35	ARG
1	E	63	LYS
1	E	90	ASN
1	E	99	ILE
1	E	103	ASN
1	F	6	THR
1	F	15	THR
1	F	20	ILE
1	F	35	ARG
1	F	44	SER
1	F	55	SER
1	F	56	GLN
1	F	58	ILE
1	F	95	SER
1	F	103	ASN
1	G	3	GLN
1	G	11	GLU
1	G	21	ASN
1	G	35	ARG
1	G	58	ILE
1	G	85	LEU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	G	95	SER
1	G	103	ASN
1	H	21	ASN
1	H	23	LYS
1	H	34	LYS
1	H	60	SER
1	H	90	ASN
1	H	103	ASN
2	A	4	ARG
2	A	18	ARG
2	A	27	HIS
2	A	28	ASN
2	A	33	ARG
2	A	37	MET
2	A	78	SER
2	A	90	THR
2	A	110	GLU
2	A	122	SER
2	A	143	ARG
2	A	163	ARG
2	A	180	ILE
3	C	200	ASN
3	C	227	GLN
3	C	234	ASN

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

Mol	Chain	Res	Type
1	D	94	ASN
1	E	103	ASN
1	F	57	HIS
1	G	3	GLN
1	G	90	ASN
1	H	90	ASN
1	H	103	ASN
2	A	27	HIS
2	A	98	ASN
3	C	200	ASN
3	C	215	GLN
3	C	234	ASN

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	D	103/103 (100%)	-1.00	0	100	100	4, 20, 56, 78	0
1	E	103/103 (100%)	-0.93	0	100	100	4, 19, 50, 70	0
1	F	103/103 (100%)	-0.75	1 (0%)	82	80	6, 28, 66, 98	0
1	G	103/103 (100%)	-0.87	0	100	100	7, 28, 54, 70	0
1	H	103/103 (100%)	-0.99	0	100	100	5, 22, 59, 84	0
2	A	175/191 (91%)	-0.75	2 (1%)	80	79	8, 33, 71, 94	0
3	C	41/49 (83%)	-0.68	1 (2%)	59	57	7, 23, 61, 82	0
All	All	731/755 (96%)	-0.86	4 (0%)	91	89	4, 26, 64, 98	0

All (4) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	56	GLN	4.5
2	A	27	HIS	3.1
3	C	196	GLY	2.3
2	A	28	ASN	2.2

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.