Full wwPDB X-ray Structure Validation Report ⓘ

Oct 17, 2021 – 02:42 AM EDT

PDB ID	:	1M9E
Title	:	X-ray crystal structure of Cyclophilin A/HIV-1 CA N-terminal domain (1-146) M-type H87A Complex.
Authors	:	Howard, B.R.; Vajdos, F.F.; Li, S.; Sundquist, W.I.; Hill, C.P.
Deposited on	:	2002-07-28
Resolution	:	1.72 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 following versions of software and data (see references ⓘ) were used in the production of this report:

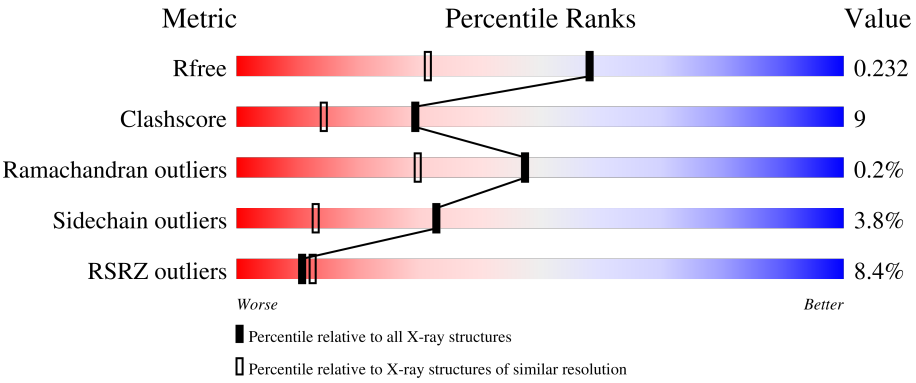
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.23.2
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.23.2

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 1.72 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	5722 (1.74-1.70)
Clashscore	141614	6152 (1.74-1.70)
Ramachandran outliers	138981	6051 (1.74-1.70)
Sidechain outliers	138945	6051 (1.74-1.70)
RSRZ outliers	127900	5629 (1.74-1.70)

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	164	3% 87% 12%
1	B	164	4% 79% 18%
2	C	146	8% 73% 25%
2	D	146	20% 58% 29% 5% 8%

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 5057 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 Cyclophilin A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	164	Total	C	N	O	S	0	0	0
			1257	797	217	234	9			
1	B	162	Total	C	N	O	S	0	0	0
			1242	787	215	232	8			

- Molecule 2 is a protein called HIV-1 Capsid.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	146	Total	C	N	O	S	0	0	0
			1131	715	198	210	8			
2	D	135	Total	C	N	O	S	0	0	0
			1047	662	183	195	7			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	87	ALA	HIS	engineered mutation	UNP Q72497
C	120	HIS	ASN	SEE REMARK 999	UNP Q72497
D	87	ALA	HIS	engineered mutation	UNP Q72497
D	120	HIS	ASN	SEE REMARK 999	UNP Q72497

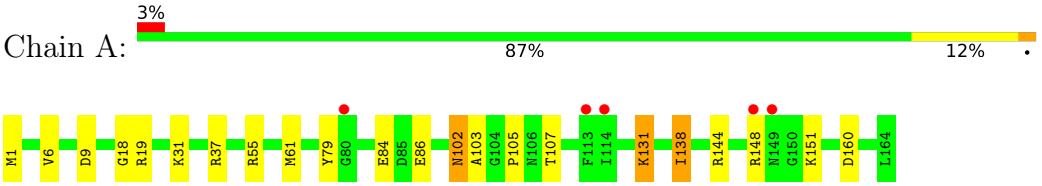
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	138	Total	O	0	0
			138	138		
3	B	95	Total	O	0	0
			95	95		
3	C	101	Total	O	0	0
			101	101		
3	D	46	Total	O	0	0
			46	46		

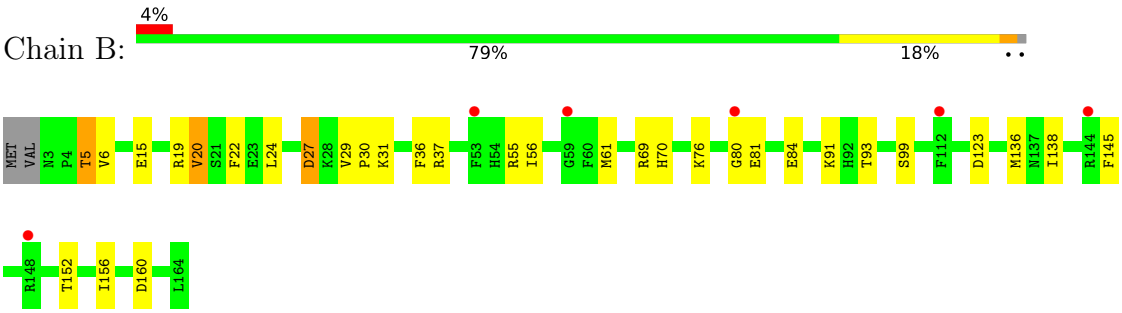
3 Residue-property plots (i)

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.

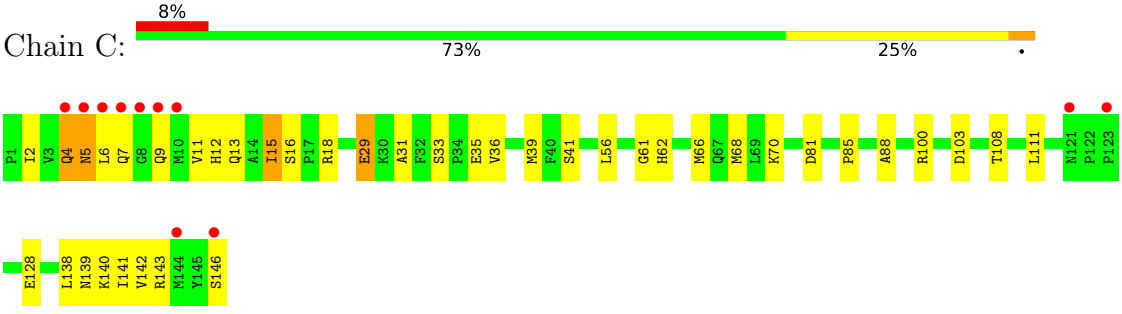
• Molecule 1: Cyclophilin A



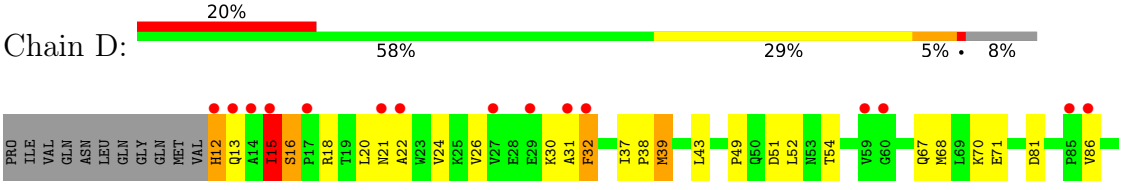
• Molecule 1: Cyclophilin A

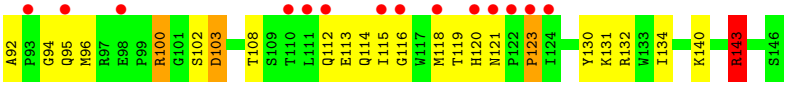


• Molecule 2: HIV-1 Capsid



• Molecule 2: HIV-1 Capsid




A92
P93
G94
Q95
M96
R97
E98
P99
R100
G101
S102
D103
T108
S109
T110
L111
Q112
E113
Q114
I115
G116
W117
M118
T119
H120
N121
P122
P123
I124
Y130
K131
R132
W133
I134
K140
R143
S146

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	38.29Å 110.99Å 67.69Å 90.00° 101.02° 90.00°	Depositor
Resolution (Å)	25.73 – 1.72 25.72 – 1.72	Depositor EDS
% Data completeness (in resolution range)	77.7 (25.73-1.72) 77.7 (25.72-1.72)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	0.06	Depositor
$< I/\sigma(I) >$ [1]	2.14 (at 1.72Å)	Xtriage
Refinement program	REFMAC 5.0	Depositor
R, R_{free}	0.173 , 0.226 0.185 , 0.232	Depositor DCC
R_{free} test set	4623 reflections (10.12%)	wwPDB-VP
Wilson B-factor (Å^2)	19.9	Xtriage
Anisotropy	0.452	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 46.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	5057	wwPDB-VP
Average B, all atoms (Å^2)	22.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.88% 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	0.82	0/1285	1.65	17/1721 (1.0%)
1	B	0.80	0/1270	1.61	24/1701 (1.4%)
2	C	0.77	0/1158	1.64	17/1575 (1.1%)
2	D	0.70	1/1073 (0.1%)	1.58	13/1460 (0.9%)
All	All	0.78	1/4786 (0.0%)	1.62	71/6457 (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
2	C	0	2
2	D	1	0
All	All	1	2

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	39	MET	SD-CE	-5.04	1.49	1.77

All (71) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	19	ARG	NE-CZ-NH2	-16.26	112.17	120.30
1	A	55	ARG	NE-CZ-NH2	-13.94	113.33	120.30
1	B	55	ARG	NE-CZ-NH2	-11.66	114.47	120.30
2	D	39	MET	CG-SD-CE	10.18	116.49	100.20
1	A	9	ASP	CB-CG-OD1	9.41	126.77	118.30
1	A	160	ASP	CB-CG-OD1	8.98	126.38	118.30
2	C	143	ARG	NE-CZ-NH2	-8.96	115.82	120.30
1	B	136	MET	CG-SD-CE	-8.71	86.26	100.20
2	D	32	PHE	CB-CA-C	8.68	127.76	110.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	55	ARG	NE-CZ-NH1	8.53	124.56	120.30
2	C	100	ARG	NE-CZ-NH2	8.30	124.45	120.30
1	B	69	ARG	NE-CZ-NH1	8.16	124.38	120.30
2	D	143	ARG	CG-CD-NE	7.93	128.45	111.80
2	C	128	GLU	OE1-CD-OE2	-7.53	114.26	123.30
2	D	12	HIS	N-CA-C	7.49	131.22	111.00
1	B	24	LEU	CB-CG-CD1	-7.42	98.39	111.00
1	B	19	ARG	NE-CZ-NH2	-7.42	116.59	120.30
2	C	85	PRO	N-CD-CG	-7.32	92.22	103.20
1	B	93	THR	OG1-CB-CG2	-7.23	93.37	110.00
2	D	100	ARG	NE-CZ-NH1	7.12	123.86	120.30
2	C	111	LEU	CB-CG-CD2	-7.11	98.92	111.00
1	B	123	ASP	CB-CG-OD1	7.10	124.69	118.30
1	A	6	VAL	CA-CB-CG2	-6.95	100.47	110.90
1	A	160	ASP	CB-CG-OD2	-6.92	112.07	118.30
2	C	18	ARG	NE-CZ-NH2	-6.82	116.89	120.30
2	D	81	ASP	CB-CG-OD2	6.82	124.43	118.30
2	C	143	ARG	NE-CZ-NH1	6.78	123.69	120.30
1	A	131	LYS	CD-CE-NZ	-6.64	96.44	111.70
2	C	146	SER	CA-C-O	-6.54	106.37	120.10
2	C	81	ASP	CB-CG-OD1	6.45	124.11	118.30
1	B	27	ASP	CB-CG-OD2	6.44	124.09	118.30
1	B	37	ARG	NE-CZ-NH2	-6.42	117.09	120.30
2	C	103	ASP	CB-CG-OD1	6.40	124.06	118.30
2	D	32	PHE	N-CA-CB	-6.31	99.24	110.60
1	B	160	ASP	CB-CG-OD1	6.22	123.90	118.30
2	D	15	ILE	CB-CA-C	-6.20	99.20	111.60
1	B	37	ARG	NE-CZ-NH1	6.14	123.37	120.30
2	C	2	ILE	CA-CB-CG1	-6.04	99.53	111.00
1	A	37	ARG	NE-CZ-NH1	6.00	123.30	120.30
1	A	151	LYS	CD-CE-NZ	5.97	125.43	111.70
2	D	131	LYS	CD-CE-NZ	5.95	125.37	111.70
1	B	27	ASP	CB-CG-OD1	5.90	123.61	118.30
1	B	5	THR	CA-CB-CG2	-5.89	104.15	112.40
2	C	103	ASP	CB-CG-OD2	-5.82	113.06	118.30
1	B	27	ASP	OD1-CG-OD2	-5.81	112.27	123.30
1	B	91	LYS	CD-CE-NZ	5.76	124.94	111.70
1	A	6	VAL	CG1-CB-CG2	5.68	119.98	110.90
2	C	108	THR	CA-CB-CG2	-5.67	104.46	112.40
2	C	41	SER	N-CA-CB	-5.66	102.01	110.50
1	A	1	MET	CG-SD-CE	-5.64	91.17	100.20
2	C	18	ARG	NH1-CZ-NH2	5.57	125.52	119.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	18	ARG	NE-CZ-NH1	-5.50	117.55	120.30
1	B	152	THR	CA-CB-CG2	-5.44	104.79	112.40
1	B	15	GLU	OE1-CD-OE2	5.41	129.79	123.30
1	A	86	GLU	OE1-CD-OE2	-5.40	116.82	123.30
1	A	138	ILE	CG1-CB-CG2	5.39	123.26	111.40
2	D	70	LYS	CD-CE-NZ	5.36	124.03	111.70
1	B	76	LYS	CD-CE-NZ	5.35	124.01	111.70
1	B	55	ARG	NE-CZ-NH1	5.35	122.97	120.30
1	A	144	ARG	NE-CZ-NH1	5.34	122.97	120.30
1	B	6	VAL	CA-CB-CG2	-5.33	102.90	110.90
1	B	123	ASP	CB-CG-OD2	-5.31	113.52	118.30
1	B	36	PHE	CB-CG-CD2	5.26	124.48	120.80
2	D	100	ARG	CG-CD-NE	-5.23	100.81	111.80
1	A	144	ARG	CB-CG-CD	5.22	125.18	111.60
2	D	16	SER	CB-CA-C	-5.21	100.20	110.10
2	D	103	ASP	CB-CG-OD2	-5.20	113.62	118.30
1	A	19	ARG	NE-CZ-NH1	5.13	122.87	120.30
1	B	20	VAL	CB-CA-C	-5.12	101.67	111.40
2	C	56	LEU	CB-CG-CD2	5.11	119.69	111.00
1	B	99	SER	N-CA-CB	-5.07	102.90	110.50

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	D	12	HIS	CA

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	C	88	ALA	Mainchain,Peptide

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	1257	0	1231	7	0
1	B	1242	0	1210	10	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	C	1131	0	1133	35	1
2	D	1047	0	1041	41	1
3	A	138	0	0	3	1
3	B	95	0	0	1	0
3	C	101	0	0	4	1
3	D	46	0	0	1	0
All	All	5057	0	4615	88	2

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 9.

All (88) 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)
2:C:5:ASN:ND2	2:C:7:GLN:OE1	1.93	1.01
2:C:11:VAL:HG22	2:C:12:HIS:N	1.84	0.92
2:C:11:VAL:HG23	3:C:169:HOH:O	1.73	0.88
2:C:11:VAL:HG22	2:C:12:HIS:H	1.42	0.84
2:C:5:ASN:ND2	2:C:7:GLN:H	1.76	0.83
1:A:148:ARG:HG2	3:A:260:HOH:O	1.79	0.82
2:D:37:ILE:HB	2:D:38:PRO:HD3	1.65	0.78
2:D:92:ALA:O	2:D:95:GLN:HB2	1.84	0.77
2:D:115:ILE:HA	2:D:118:MET:CE	2.17	0.73
2:C:9:GLN:HA	2:C:9:GLN:OE1	1.92	0.70
2:D:115:ILE:HA	2:D:118:MET:HE2	1.74	0.69
2:C:11:VAL:CG2	2:C:12:HIS:N	2.58	0.67
2:C:142:VAL:HG21	2:D:143:ARG:HD2	1.78	0.65
2:D:68:MET:HB3	2:D:140:LYS:HE3	1.78	0.64
2:D:100:ARG:O	2:D:103:ASP:HB2	1.98	0.64
2:C:11:VAL:CG2	2:C:12:HIS:H	2.11	0.63
2:C:138:LEU:O	2:C:142:VAL:HG13	1.99	0.63
2:D:49:PRO:HD2	2:D:114:GLN:OE1	1.98	0.62
1:A:103:ALA:HB1	2:D:86:VAL:HG23	1.81	0.62
2:C:5:ASN:HD21	2:C:7:GLN:CD	2.03	0.62
2:C:142:VAL:HG21	2:D:143:ARG:CD	2.30	0.61
2:C:142:VAL:CG2	2:D:143:ARG:HD3	2.30	0.61
2:D:15:ILE:HG13	2:D:20:LEU:HD21	1.81	0.61
2:C:5:ASN:ND2	2:C:7:GLN:CD	2.54	0.60
1:B:20:VAL:HG22	1:B:138:ILE:HB	1.82	0.60
2:D:39:MET:O	2:D:43:LEU:HG	2.01	0.60
1:B:56:ILE:CD1	1:B:156:ILE:HD12	2.32	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:6:LEU:HB2	3:C:246:HOH:O	2.02	0.59
2:C:68:MET:SD	2:C:141:ILE:HG22	2.44	0.58
2:C:142:VAL:CG2	2:D:143:ARG:CD	2.82	0.58
2:C:15:ILE:HD12	2:C:16:SER:N	2.19	0.58
2:C:39:MET:HE3	2:C:39:MET:HA	1.85	0.57
2:D:37:ILE:HB	2:D:38:PRO:CD	2.36	0.53
2:D:15:ILE:O	2:D:15:ILE:HG12	2.06	0.53
2:C:5:ASN:OD1	2:C:9:GLN:N	2.39	0.52
2:D:67:GLN:O	2:D:71:GLU:HG3	2.10	0.52
1:A:131:LYS:NZ	3:A:175:HOH:O	2.43	0.52
1:B:56:ILE:HD12	1:B:156:ILE:HD12	1.91	0.51
2:D:119:THR:O	2:D:120:HIS:C	2.47	0.51
2:C:15:ILE:HD12	2:C:16:SER:H	1.75	0.51
2:D:30:LYS:O	2:D:32:PHE:N	2.45	0.50
2:D:100:ARG:H	2:D:103:ASP:HB2	1.75	0.50
2:D:15:ILE:HD11	2:D:54:THR:HG21	1.93	0.49
2:D:116:GLY:O	2:D:120:HIS:ND1	2.42	0.49
2:C:68:MET:SD	2:C:140:LYS:HG2	2.52	0.48
2:D:21:ASN:O	2:D:24:VAL:HB	2.14	0.47
2:D:32:PHE:N	2:D:32:PHE:CD1	2.79	0.47
2:D:102:SER:HB2	2:D:108:THR:HG23	1.96	0.47
2:C:5:ASN:CG	2:C:7:GLN:H	2.17	0.47
1:B:80:GLY:O	1:B:81:GLU:C	2.51	0.47
1:B:145:PHE:HB2	1:B:156:ILE:HD11	1.97	0.46
2:D:26:VAL:HG21	2:D:39:MET:HE2	1.96	0.46
1:A:18:GLY:HA3	1:A:138:ILE:HD12	1.98	0.46
2:C:66:MET:O	2:C:70:LYS:HG3	2.16	0.46
2:D:120:HIS:O	2:D:123:PRO:CA	2.64	0.45
1:B:31:LYS:NZ	1:B:84:GLU:OE2	2.38	0.45
2:C:5:ASN:HD21	2:C:7:GLN:CB	2.30	0.45
2:D:22:ALA:O	2:D:26:VAL:HG23	2.17	0.45
1:B:20:VAL:CG2	1:B:138:ILE:HB	2.48	0.44
2:D:12:HIS:O	2:D:13:GLN:NE2	2.50	0.44
1:A:31:LYS:HG3	1:A:79:TYR:CZ	2.53	0.44
2:C:15:ILE:HD12	3:C:176:HOH:O	2.17	0.44
2:D:15:ILE:HG23	2:D:51:ASP:HB3	2.00	0.44
2:D:112:GLN:HG3	2:D:113:GLU:N	2.33	0.44
1:A:84:GLU:HG2	3:A:246:HOH:O	2.18	0.43
2:C:4:GLN:H	2:C:4:GLN:HG3	1.58	0.43
2:C:39:MET:HE3	2:C:39:MET:CA	2.48	0.43
2:D:31:ALA:O	2:D:32:PHE:HB2	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:5:ASN:HD21	2:C:7:GLN:HB2	1.84	0.43
2:C:33:SER:O	2:C:36:VAL:HG22	2.19	0.43
2:D:49:PRO:HA	2:D:52:LEU:HD12	2.01	0.42
2:D:120:HIS:O	2:D:123:PRO:N	2.52	0.42
2:C:31:ALA:O	2:C:36:VAL:HG11	2.20	0.42
1:A:105:PRO:O	1:A:107:THR:HG23	2.18	0.42
2:D:100:ARG:N	2:D:103:ASP:HB2	2.35	0.41
2:D:15:ILE:HD13	2:D:51:ASP:OD1	2.20	0.41
2:D:130:TYR:O	2:D:134:ILE:HG13	2.20	0.41
2:C:61:GLY:O	2:C:62:HIS:C	2.58	0.41
1:B:84:GLU:H	1:B:84:GLU:CD	2.24	0.41
1:B:70:HIS:HD2	3:B:179:HOH:O	2.03	0.41
2:D:132:ARG:NH2	3:D:175:HOH:O	2.54	0.41
2:D:37:ILE:CB	2:D:38:PRO:HD3	2.46	0.41
2:D:94:GLY:O	2:D:95:GLN:NE2	2.53	0.41
2:C:139:ASN:O	2:C:142:VAL:HG22	2.21	0.40
2:C:39:MET:HE2	2:C:39:MET:HB3	1.96	0.40
1:B:5:THR:HA	1:B:22:PHE:O	2.21	0.40
2:C:6:LEU:CB	3:C:246:HOH:O	2.64	0.40
2:D:15:ILE:HD11	2:D:54:THR:CG2	2.50	0.40

All (2) 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:C:29:GLU:OE1	2:D:30:LYS:NZ[1_455]	1.97	0.23
3:A:286:HOH:O	3:C:190:HOH:O[2_756]	2.14	0.06

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	162/164 (99%)	154 (95%)	7 (4%)	1 (1%)	25 10
1	B	160/164 (98%)	156 (98%)	4 (2%)	0	100 100
2	C	144/146 (99%)	140 (97%)	4 (3%)	0	100 100
2	D	133/146 (91%)	127 (96%)	6 (4%)	0	100 100
All	All	599/620 (97%)	577 (96%)	21 (4%)	1 (0%)	47 30

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	102	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	A	132/132 (100%)	130 (98%)	2 (2%)	65 49
1	B	130/132 (98%)	126 (97%)	4 (3%)	40 19
2	C	122/122 (100%)	116 (95%)	6 (5%)	25 8
2	D	112/122 (92%)	105 (94%)	7 (6%)	18 4
All	All	496/508 (98%)	477 (96%)	19 (4%)	33 13

All (19) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	61	MET
1	A	102	ASN
1	B	27	ASP
1	B	29	VAL
1	B	30	PRO
1	B	61	MET
2	C	4	GLN
2	C	5	ASN
2	C	13	GLN
2	C	15	ILE

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Mol	Chain	Res	Type
2	C	29	GLU
2	C	35	GLU
2	D	15	ILE
2	D	16	SER
2	D	18	ARG
2	D	96	MET
2	D	121	ASN
2	D	123	PRO
2	D	143	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	70	HIS
2	C	5	ASN
2	C	50	GLN
2	C	74	ASN
2	D	13	GLN
2	D	95	GLN

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

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	164/164 (100%)	0.26	5 (3%) 50 54	10, 16, 28, 41	0
1	B	162/164 (98%)	0.39	6 (3%) 41 46	11, 20, 33, 48	0
2	C	146/146 (100%)	0.40	11 (7%) 14 16	12, 19, 41, 54	0
2	D	135/146 (92%)	1.01	29 (21%) 0 0	14, 27, 51, 69	0
All	All	607/620 (97%)	0.49	51 (8%) 11 12	10, 20, 42, 69	0

All (51) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	D	31	ALA	7.5
2	C	6	LEU	6.9
2	C	9	GLN	6.7
2	D	32	PHE	6.6
2	D	120	HIS	6.6
2	D	121	ASN	6.0
2	D	112	GLN	4.9
2	C	146	SER	4.5
2	C	8	GLY	4.2
2	D	86	VAL	4.2
2	C	121	ASN	3.9
2	D	122	PRO	3.9
2	C	5	ASN	3.8
1	B	148	ARG	3.8
2	D	12	HIS	3.6
2	D	15	ILE	3.6
1	A	148	ARG	3.5
2	D	115	ILE	3.5
2	D	17	PRO	3.4
2	C	7	GLN	3.4
2	D	95	GLN	3.4

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Mol	Chain	Res	Type	RSRZ
2	D	123	PRO	3.3
1	B	80	GLY	3.0
1	B	112	PHE	3.0
2	D	29	GLU	2.9
2	D	111	LEU	2.8
2	D	60	GLY	2.8
2	C	4	GLN	2.8
2	D	124	ILE	2.7
2	D	85	PRO	2.6
2	D	93	PRO	2.6
2	D	14	ALA	2.6
1	A	114	ILE	2.6
1	B	53	PHE	2.5
2	C	123	PRO	2.5
2	C	10	MET	2.4
1	A	149	ASN	2.4
1	A	80	GLY	2.4
1	B	144	ARG	2.3
2	D	13	GLN	2.3
1	B	59	GLY	2.3
2	D	59	VAL	2.2
1	A	113	PHE	2.2
2	D	98	GLU	2.1
2	D	22	ALA	2.1
2	D	110	THR	2.1
2	D	118	MET	2.1
2	D	27	VAL	2.1
2	D	21	ASN	2.1
2	D	116	GLY	2.0
2	C	144	MET	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

There are no ligands in this entry.

6.5 Other polymers

There are no such residues in this entry.