Full wwPDB X-ray Structure Validation Report (i)

Nov 6, 2023 – 04:16 AM EST

PDB ID	:	5BSA
Title	:	Structure of histone H3/H4 in complex with Spt2
Authors	:	Chen, S.; Patel, D.J.
Deposited on	:	2015-06-01
Resolution	:	4.61 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:

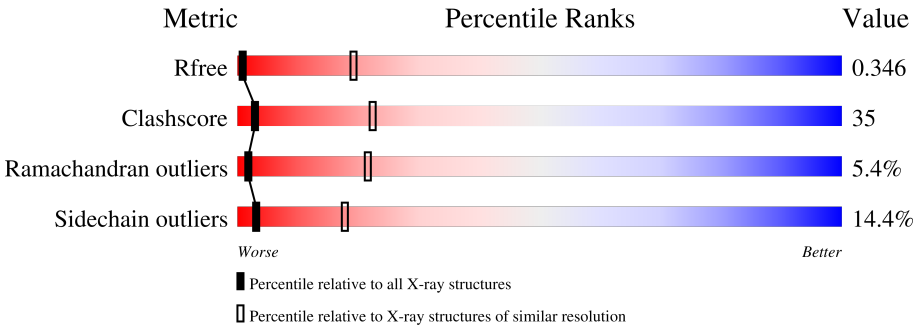
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA,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

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 4.61 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	1062 (5.40-3.80)
Clashscore	141614	1130 (5.40-3.80)
Ramachandran outliers	138981	1074 (5.40-3.80)
Sidechain outliers	138945	1055 (5.40-3.80)

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%

Mol	Chain	Length	Quality of chain
1	A	110	34% 28% 6% 32%
1	B	110	31% 35% • • 31%
2	C	102	28% 34% 5% 32%
2	D	102	22% 40% 5% 33%
3	E	115	24% 23% 10% • 40%
3	F	115	10% 10% 80%

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 2733 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 Histone H3.2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	75	Total	C	N	O	S	0	0	0
			528	337	96	92	3			
1	B	76	Total	C	N	O	S	0	0	0
			510	317	95	95	3			

- Molecule 2 is a protein called Histone H4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	69	Total	C	N	O	S	0	0	0
			520	329	100	90	1			
2	D	68	Total	C	N	O	S	0	0	0
			525	335	98	91	1			

- Molecule 3 is a protein called Protein SPT2 homolog.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	E	69	Total	C	N	O	Se	0	0	0
			500	304	80	111	5			
3	F	23	Total	C	N	O	Se	0	0	0
			150	95	25	29	1			

There are 2 discrepancies between the modelled and reference sequences:

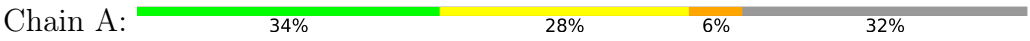
Chain	Residue	Modelled	Actual	Comment	Reference
E	615	MSE	ILE	conflict	UNP Q68D10
F	615	MSE	ILE	conflict	UNP Q68D10

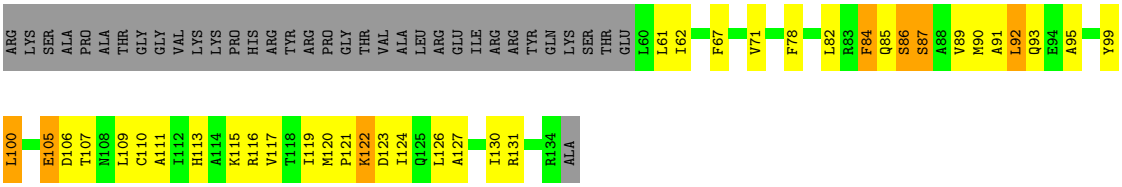
3 Residue-property plots (i)

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. 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. 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: Histone H3.2

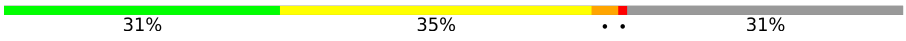
Chain A:

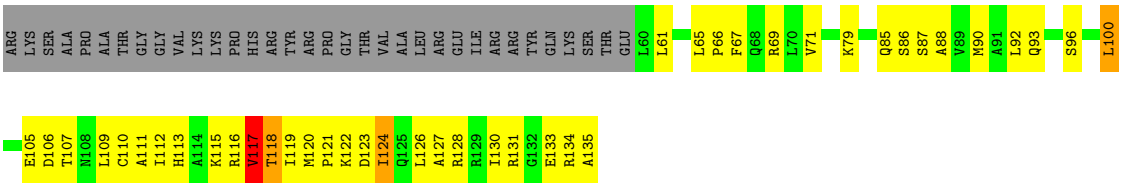




- Molecule 1: Histone H3.2

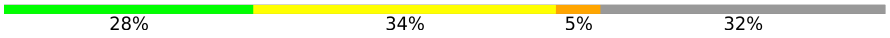
Chain B:

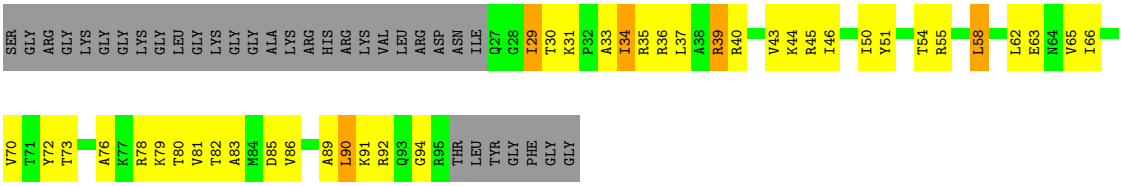




- Molecule 2: Histone H4

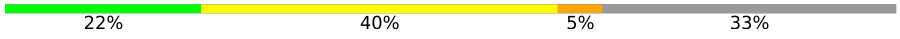
Chain C:

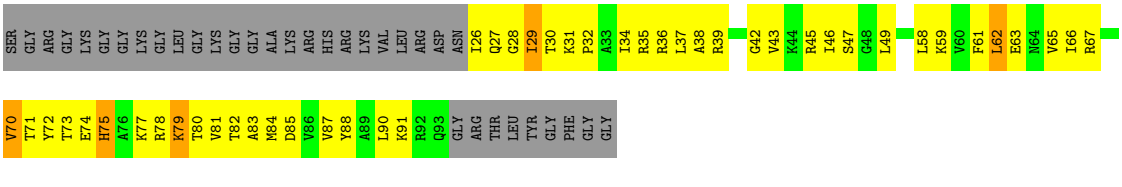




- Molecule 2: Histone H4

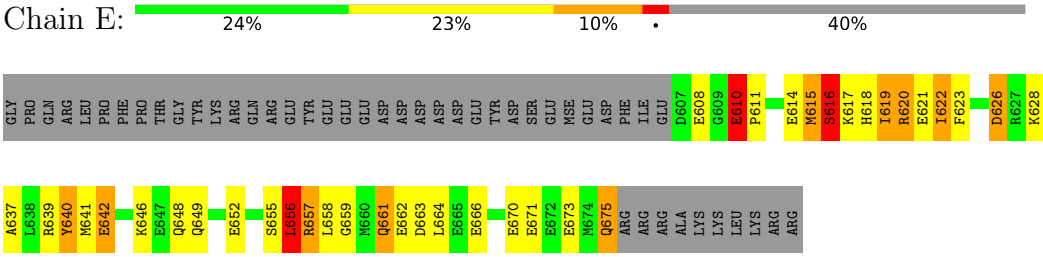
Chain D:





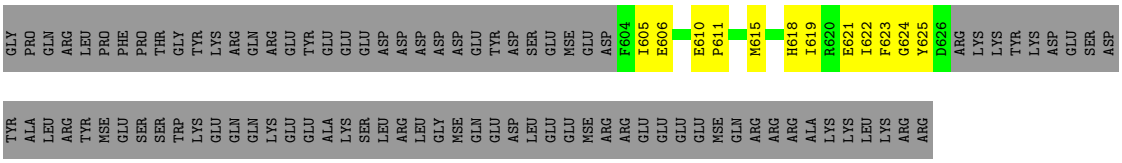
• Molecule 3: Protein SPT2 homolog

Chain E:



• Molecule 3: Protein SPT2 homolog

Chain F:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 43 2 2	Depositor
Cell constants a, b, c, α, β, γ	128.35Å 128.35Å 116.81Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.12 – 4.61 49.12 – 4.61	Depositor EDS
% Data completeness (in resolution range)	77.7 (49.12-4.61) 79.6 (49.12-4.61)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	4.81 (at 4.64Å)	Xtriage
Refinement program	PHENIX 1.8.4_1496	Depositor
R, R_{free}	0.239 , 0.329 0.277 , 0.346	Depositor DCC
R_{free} test set	210 reflections (4.58%)	wwPDB-VP
Wilson B-factor (Å^2)	64.3	Xtriage
Anisotropy	0.678	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.19 , 64.9	EDS
L-test for twinning[2]	$< \|L\| > = 0.46$, $< L^2 > = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.82	EDS
Total number of atoms	2733	wwPDB-VP
Average B, all atoms (Å^2)	68.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.67% 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	0.64	0/534	1.03	4/724 (0.6%)
1	B	0.57	0/514	0.92	2/700 (0.3%)
2	C	0.65	0/525	0.91	2/706 (0.3%)
2	D	0.66	0/530	0.98	1/713 (0.1%)
3	E	0.70	0/500	1.10	5/664 (0.8%)
3	F	0.62	0/152	0.87	0/205
All	All	0.64	0/2755	0.98	14/3712 (0.4%)

There are no bond length outliers.

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	E	610	GLU	N-CA-CB	-9.40	93.68	110.60
1	A	84	PHE	N-CA-C	7.72	131.86	111.00
3	E	616	SER	N-CA-CB	-7.19	99.71	110.50
1	B	65	LEU	C-N-CD	7.18	143.47	128.40
1	A	92	LEU	CA-CB-CG	-6.93	99.37	115.30
2	C	90	LEU	CA-CB-CG	-6.65	100.00	115.30
3	E	656	LEU	CA-CB-CG	-6.40	100.59	115.30
2	D	62	LEU	CA-CB-CG	-6.26	100.90	115.30
3	E	610	GLU	N-CA-C	6.26	127.90	111.00
2	C	58	LEU	CB-CG-CD2	-5.53	101.61	111.00
1	B	61	LEU	N-CA-C	5.43	125.66	111.00
1	A	84	PHE	N-CA-CB	-5.20	101.23	110.60
1	A	61	LEU	CA-CB-CG	5.19	127.23	115.30
3	E	673	GLU	N-CA-C	5.11	124.79	111.00

There are no chirality outliers.

There are no planarity outliers.

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	528	0	496	32	0
1	B	510	0	443	35	0
2	C	520	0	525	41	0
2	D	525	0	558	40	0
3	E	500	0	397	52	0
3	F	150	0	105	5	0
All	All	2733	0	2524	184	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 35.

All (184) 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:39:ARG:CD	3:E:641:MSE:HE1	1.79	1.11
3:E:610:GLU:CB	3:E:611:PRO:HD3	1.85	1.06
3:E:615:MSE:HA	3:E:615:MSE:HE2	1.37	1.06
2:C:39:ARG:HD3	3:E:641:MSE:CE	1.87	1.05
3:E:610:GLU:CB	3:E:611:PRO:CD	2.36	1.04
2:C:39:ARG:HD3	3:E:641:MSE:HE1	1.02	1.01
2:D:79:LYS:HD2	2:D:80:THR:H	1.23	1.00
3:E:615:MSE:O	3:E:617:LYS:N	1.97	0.98
2:C:34:ILE:HA	2:C:37:LEU:HD12	1.50	0.94
3:E:637:ALA:HA	3:E:641:MSE:HE2	1.55	0.88
1:A:121:PRO:HA	1:A:124:ILE:HD12	1.58	0.86
3:E:675:GLN:O	3:E:675:GLN:NE2	2.10	0.85
1:B:122:LYS:NZ	3:E:662:GLU:OE2	2.09	0.85
3:E:615:MSE:HA	3:E:615:MSE:CE	2.02	0.84
1:B:107:THR:HG21	1:B:124:ILE:HD13	1.66	0.76
2:C:63:GLU:HA	2:C:66:ILE:HD11	1.67	0.74
2:D:73:THR:HG22	2:D:78:ARG:HD3	1.67	0.74
2:D:34:ILE:HA	2:D:37:LEU:HD12	1.69	0.74
3:E:615:MSE:HE2	3:E:615:MSE:CA	2.16	0.72
1:A:67:PHE:HZ	1:A:92:LEU:HB3	1.53	0.72
3:E:635:ASP:N	3:E:635:ASP:OD1	2.21	0.72

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:39:ARG:CG	3:E:641:MSE:HE1	2.18	0.72
3:E:666:GLU:O	3:E:670:GLU:HB2	1.89	0.71
1:A:126:LEU:O	1:A:130:ILE:HG13	1.92	0.70
2:C:40:ARG:NH1	3:E:626:ASP:O	2.26	0.69
2:C:58:LEU:HG	2:C:62:LEU:HD11	1.75	0.69
2:D:85:ASP:HA	2:D:88:TYR:HD2	1.59	0.67
1:B:109:LEU:O	1:B:112:ILE:HG12	1.95	0.67
1:A:123:ASP:O	1:A:126:LEU:HB3	1.95	0.66
2:C:34:ILE:HD11	2:C:51:TYR:HD1	1.60	0.66
3:E:637:ALA:CA	3:E:641:MSE:HE2	2.25	0.66
3:E:658:LEU:HD12	3:E:661:GLN:HE21	1.62	0.65
1:A:111:ALA:CB	1:A:119:ILE:HG22	2.27	0.64
2:C:83:ALA:O	2:C:86:VAL:HG13	1.98	0.63
1:A:110:CYS:O	1:A:113:HIS:N	2.32	0.63
2:C:39:ARG:HG2	3:E:637:ALA:HB2	1.80	0.62
2:C:90:LEU:O	2:C:92:ARG:N	2.30	0.61
3:E:619:ILE:O	3:E:622:ILE:N	2.34	0.61
1:A:126:LEU:HD22	1:B:113:HIS:ND1	2.16	0.61
2:C:46:ILE:HG12	3:E:641:MSE:HG3	1.83	0.60
3:E:616:SER:HA	3:E:619:ILE:HD12	1.82	0.60
1:A:111:ALA:HB2	1:A:119:ILE:HG22	1.84	0.59
2:D:26:ILE:O	2:D:28:GLY:N	2.35	0.59
2:D:73:THR:HG21	2:D:81:VAL:HG13	1.83	0.59
2:C:51:TYR:OH	3:E:642:GLU:OE1	2.18	0.59
2:D:29:ILE:H	2:D:29:ILE:HD12	1.67	0.59
1:A:113:HIS:CD2	1:B:126:LEU:HD22	2.38	0.59
2:C:72:TYR:HB3	2:C:85:ASP:HB2	1.83	0.59
1:B:106:ASP:HA	1:B:109:LEU:HD13	1.85	0.58
3:E:637:ALA:CB	3:E:641:MSE:HE2	2.34	0.58
2:D:82:THR:OG1	2:D:83:ALA:N	2.36	0.58
2:D:59:LYS:O	2:D:63:GLU:HG2	2.05	0.57
2:D:35:ARG:O	2:D:39:ARG:HG2	2.05	0.56
1:A:62:ILE:O	1:A:93:GLN:NE2	2.39	0.56
1:B:116:ARG:HD3	3:E:662:GLU:OE1	2.06	0.56
1:B:85:GLN:HB2	2:D:80:THR:HG23	1.87	0.56
1:A:67:PHE:CZ	1:A:92:LEU:HB3	2.36	0.56
1:B:87:SER:HA	1:B:90:MET:HB2	1.87	0.56
2:D:71:THR:O	2:D:75:HIS:N	2.31	0.56
2:D:38:ALA:HB1	2:D:43:VAL:HB	1.87	0.56
1:B:107:THR:HG21	1:B:124:ILE:CD1	2.35	0.55
1:A:91:ALA:O	1:A:95:ALA:N	2.32	0.55

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:34:ILE:O	2:C:37:LEU:HB2	2.07	0.55
2:C:45:ARG:NH1	3:E:640:TYR:O	2.39	0.55
3:E:646:LYS:C	3:E:648:GLN:H	2.10	0.54
3:E:656:LEU:O	3:E:658:LEU:N	2.40	0.54
2:C:76:ALA:HB3	2:C:78:ARG:HD2	1.90	0.54
1:A:67:PHE:O	1:A:71:VAL:HG23	2.08	0.54
2:C:44:LYS:O	2:C:45:ARG:HG2	2.09	0.53
1:B:120:MET:HB3	1:B:121:PRO:HD2	1.89	0.52
1:B:111:ALA:HB2	1:B:119:ILE:HG22	1.92	0.52
3:E:615:MSE:C	3:E:617:LYS:H	2.10	0.52
2:D:72:TYR:CB	2:D:85:ASP:HB2	2.41	0.51
1:A:86:SER:O	1:A:89:VAL:HG12	2.11	0.50
1:A:99:TYR:CD2	1:A:100:LEU:HD23	2.46	0.50
2:C:58:LEU:O	2:C:62:LEU:HG	2.11	0.50
3:F:615:MSE:O	3:F:615:MSE:HG3	2.12	0.50
2:D:47:SER:OG	2:D:49:LEU:HD13	2.12	0.49
3:E:658:LEU:HD12	3:E:661:GLN:NE2	2.27	0.49
1:B:116:ARG:HH22	1:B:123:ASP:CG	2.15	0.49
1:A:106:ASP:O	1:A:109:LEU:HB2	2.12	0.49
1:B:67:PHE:O	1:B:71:VAL:N	2.32	0.49
1:B:116:ARG:NH2	1:B:123:ASP:OD2	2.44	0.49
2:C:30:THR:O	2:C:33:ALA:HB3	2.12	0.49
1:A:84:PHE:C	1:A:86:SER:N	2.66	0.49
3:F:622:ILE:HG13	3:F:623:PHE:CD1	2.48	0.49
2:D:58:LEU:O	2:D:61:PHE:HB3	2.12	0.49
1:B:106:ASP:O	1:B:109:LEU:HB2	2.13	0.48
2:C:66:ILE:O	2:C:70:VAL:HG12	2.14	0.48
3:E:637:ALA:CB	3:E:641:MSE:CE	2.91	0.48
1:B:126:LEU:O	1:B:130:ILE:HG13	2.13	0.48
1:A:99:TYR:HD2	1:A:100:LEU:HD23	1.77	0.48
1:A:123:ASP:HA	1:B:113:HIS:CE1	2.49	0.48
3:E:663:ASP:HB2	3:E:664:LEU:HD12	1.95	0.48
2:C:35:ARG:HD3	2:C:51:TYR:OH	2.14	0.48
2:D:30:THR:HG23	2:D:32:PRO:HD2	1.96	0.48
1:A:120:MET:HB3	1:A:121:PRO:HD2	1.95	0.48
3:E:649:GLN:OE1	3:E:649:GLN:HA	2.14	0.47
1:A:85:GLN:O	1:A:87:SER:N	2.41	0.47
1:B:118:THR:HG23	3:E:663:ASP:OD1	2.15	0.47
1:A:84:PHE:C	1:A:86:SER:H	2.16	0.47
3:E:658:LEU:HA	3:E:661:GLN:HE21	1.79	0.47
2:D:62:LEU:O	2:D:65:VAL:HG12	2.14	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:84:MET:O	2:D:87:VAL:HG13	2.15	0.47
3:E:614:GLU:O	3:E:615:MSE:O	2.32	0.46
2:C:89:ALA:O	2:C:92:ARG:HG2	2.15	0.46
3:E:619:ILE:O	3:E:621:GLU:N	2.49	0.46
2:D:63:GLU:HA	2:D:66:ILE:HG12	1.96	0.46
2:C:30:THR:O	2:C:34:ILE:HG23	2.15	0.46
3:E:636:TYR:HE1	3:E:640:TYR:HB2	1.80	0.46
2:C:55:ARG:O	2:C:58:LEU:HB3	2.15	0.46
2:D:72:TYR:HB2	2:D:85:ASP:HB2	1.98	0.46
1:B:112:ILE:C	1:B:115:LYS:H	2.18	0.46
2:D:71:THR:O	2:D:75:HIS:HB2	2.15	0.46
1:B:66:PRO:HA	1:B:69:ARG:H	1.81	0.45
2:D:87:VAL:HA	2:D:90:LEU:HB2	1.99	0.45
2:D:38:ALA:HB1	2:D:43:VAL:CB	2.46	0.45
2:D:36:ARG:HA	2:D:39:ARG:HE	1.81	0.45
1:A:126:LEU:HD11	1:A:130:ILE:HD11	1.99	0.45
1:B:88:ALA:HA	2:D:83:ALA:HB2	1.99	0.45
2:D:30:THR:OG1	2:D:31:LYS:N	2.50	0.45
1:B:127:ALA:O	1:B:131:ARG:HG3	2.17	0.45
1:B:96:SER:O	1:B:100:LEU:HD12	2.17	0.45
2:C:65:VAL:HG13	2:C:66:ILE:HG23	1.98	0.45
2:C:62:LEU:O	2:C:65:VAL:HG12	2.18	0.45
3:E:636:TYR:O	3:E:639:ARG:N	2.48	0.45
2:C:29:ILE:HG22	2:C:55:ARG:NE	2.32	0.44
2:C:50:ILE:O	2:C:54:THR:OG1	2.36	0.44
2:D:74:GLU:O	2:D:77:LYS:HD3	2.18	0.44
1:A:113:HIS:C	1:A:115:LYS:H	2.21	0.44
2:D:34:ILE:O	2:D:37:LEU:HB2	2.17	0.44
1:A:105:GLU:H	1:A:105:GLU:HG3	1.57	0.44
1:A:107:THR:HG21	1:A:124:ILE:HG12	2.00	0.44
1:A:116:ARG:HH21	1:A:123:ASP:CG	2.20	0.44
3:E:663:ASP:CB	3:E:664:LEU:HD12	2.48	0.44
3:E:656:LEU:HA	3:E:656:LEU:HD13	1.62	0.44
1:B:110:CYS:HB2	1:B:123:ASP:HB3	2.00	0.43
2:C:31:LYS:O	2:C:34:ILE:HG12	2.18	0.43
2:D:62:LEU:O	2:D:65:VAL:N	2.51	0.43
2:D:62:LEU:HA	2:D:65:VAL:HG12	2.00	0.43
2:D:75:HIS:O	2:D:77:LYS:HE3	2.17	0.43
3:E:646:LYS:C	3:E:648:GLN:N	2.72	0.43
1:A:127:ALA:O	1:A:131:ARG:HG3	2.18	0.43
1:B:118:THR:HG22	2:D:45:ARG:HD3	1.99	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:116:ARG:NH2	1:A:123:ASP:OD2	2.48	0.43
1:B:116:ARG:O	1:B:117:VAL:HG13	2.19	0.43
2:C:31:LYS:HB2	2:C:55:ARG:HH22	1.84	0.43
2:D:84:MET:CE	3:F:615:MSE:HE2	2.48	0.43
1:B:128:ARG:HB3	1:B:133:GLU:HB3	2.01	0.43
3:E:636:TYR:CE1	3:E:640:TYR:HB2	2.53	0.43
2:D:82:THR:HG23	2:D:85:ASP:H	1.84	0.42
2:D:87:VAL:O	2:D:91:LYS:N	2.52	0.42
1:B:92:LEU:HD23	1:B:93:GLN:NE2	2.34	0.42
2:C:34:ILE:HD11	2:C:51:TYR:CD1	2.46	0.42
3:E:610:GLU:CB	3:E:611:PRO:HD2	2.43	0.42
2:C:29:ILE:HG13	2:C:30:THR:H	1.84	0.42
2:C:79:LYS:HG3	2:C:80:THR:H	1.85	0.42
3:F:618:HIS:HA	3:F:621:GLU:HG2	2.00	0.42
1:B:134:ARG:HA	1:B:135:ALA:HA	1.77	0.42
3:E:618:HIS:O	3:E:621:GLU:HB3	2.19	0.42
2:D:39:ARG:C	2:D:42:GLY:H	2.22	0.42
3:E:626:ASP:C	3:E:628:LYS:H	2.22	0.42
2:C:29:ILE:HG22	2:C:55:ARG:HG2	2.01	0.42
3:E:658:LEU:HD12	3:E:658:LEU:HA	1.69	0.42
2:C:73:THR:HG21	2:C:81:VAL:HA	2.02	0.42
2:C:33:ALA:O	2:C:36:ARG:HB2	2.20	0.41
3:E:637:ALA:O	3:E:641:MSE:HB2	2.19	0.41
1:A:122:LYS:HE3	1:A:122:LYS:HB2	1.85	0.41
1:B:85:GLN:HG2	1:B:86:SER:O	2.20	0.41
1:B:86:SER:C	1:B:88:ALA:H	2.23	0.41
1:B:105:GLU:O	1:B:109:LEU:HD12	2.20	0.41
3:F:605:ILE:HA	3:F:606:GLU:HA	1.83	0.41
2:C:29:ILE:CG1	2:C:30:THR:H	2.33	0.41
2:C:39:ARG:HD3	3:E:641:MSE:SE	2.70	0.41
2:D:66:ILE:O	2:D:70:VAL:N	2.41	0.41
1:A:123:ASP:HA	1:B:113:HIS:HE1	1.85	0.41
1:B:107:THR:CG2	1:B:124:ILE:HD13	2.44	0.41
2:D:70:VAL:O	2:D:73:THR:OG1	2.31	0.41
3:E:619:ILE:HB	3:E:620:ARG:H	1.70	0.41
2:C:82:THR:HG22	2:C:85:ASP:OD2	2.21	0.40
2:D:39:ARG:O	2:D:42:GLY:N	2.49	0.40
1:A:110:CYS:O	1:A:111:ALA:C	2.60	0.40
3:E:622:ILE:HG22	3:E:623:PHE:CD1	2.57	0.40
3:E:656:LEU:O	3:E:659:GLY:N	2.54	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	73/110 (66%)	62 (85%)	9 (12%)	2 (3%)	5 34
1	B	74/110 (67%)	61 (82%)	10 (14%)	3 (4%)	3 25
2	C	67/102 (66%)	56 (84%)	9 (13%)	2 (3%)	4 31
2	D	66/102 (65%)	61 (92%)	4 (6%)	1 (2%)	10 46
3	E	67/115 (58%)	47 (70%)	12 (18%)	8 (12%)	0 6
3	F	21/115 (18%)	13 (62%)	4 (19%)	4 (19%)	0 2
All	All	368/654 (56%)	300 (82%)	48 (13%)	20 (5%)	2 21

All (20) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	82	LEU
2	C	91	LYS
3	E	610	GLU
3	E	615	MSE
3	E	616	SER
1	A	117	VAL
1	B	117	VAL
2	C	94	GLY
2	D	27	GLN
3	E	619	ILE
3	E	620	ARG
3	E	657	ARG
3	F	624	GLY
1	B	79	LYS
3	F	625	TYR
3	F	610	GLU
3	F	611	PRO
3	E	608	GLU
3	E	629	LYS
1	B	124	ILE

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	44/93 (47%)	37 (84%)	7 (16%)	2 15
1	B	38/93 (41%)	35 (92%)	3 (8%)	12 38
2	C	47/78 (60%)	43 (92%)	4 (8%)	10 36
2	D	53/78 (68%)	47 (89%)	6 (11%)	6 24
3	E	44/101 (44%)	31 (70%)	13 (30%)	0 2
3	F	10/101 (10%)	9 (90%)	1 (10%)	7 28
All	All	236/544 (43%)	202 (86%)	34 (14%)	3 18

All (34) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	78	PHE
1	A	86	SER
1	A	87	SER
1	A	90	MET
1	A	100	LEU
1	A	105	GLU
1	A	122	LYS
1	B	100	LEU
1	B	117	VAL
1	B	118	THR
2	C	29	ILE
2	C	34	ILE
2	C	39	ARG
2	C	43	VAL
2	D	29	ILE
2	D	46	ILE
2	D	67	ARG
2	D	70	VAL
2	D	75	HIS
2	D	79	LYS
3	E	616	SER
3	E	622	ILE

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
3	E	626	ASP
3	E	635	ASP
3	E	640	TYR
3	E	642	GLU
3	E	652	GLU
3	E	655	SER
3	E	656	LEU
3	E	657	ARG
3	E	661	GLN
3	E	671	GLU
3	E	675	GLN
3	F	619	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	93	GLN
3	E	661	GLN

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 (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

Unable to reproduce the depositors R factor - this section is therefore empty.

6.2 Non-standard residues in protein, DNA, RNA chains

Unable to reproduce the depositors R factor - this section is therefore empty.

6.3 Carbohydrates

Unable to reproduce the depositors R factor - this section is therefore empty.

6.4 Ligands

Unable to reproduce the depositors R factor - this section is therefore empty.

6.5 Other polymers

Unable to reproduce the depositors R factor - this section is therefore empty.