

wwPDB X-ray Structure Validation Summary Report (i)

May 17, 2020 - 05:54 pm BST

PDB ID	:	5NL0
Title	:	Crystal structure of a 197-bp palindromic 601L nucleosome in complex with
		linker histone H1
Authors	:	Garcia-Saez, I.; Petosa, C.; Dimitrov, S.
Deposited on	:	2017-04-03
Resolution	:	5.40 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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 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	:	2.11
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)	:	2.11

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 5.40 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	$egin{array}{c} { m Whole \ archive} \ (\#{ m Entries}) \end{array}$	${f Similar\ resolution}\ (\#{ m Entries}, { m resolution\ range}({ m \AA}))$			
Clashscore	141614	$1016 \ (6.92-3.86)$			
Ramachandran outliers	138981	1210(7.00-3.80)			
Sidechain outliers	138945	1181 (7.00-3.80)			

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 on 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 ch	ain	
1	А	135	64%	8%	27%
1	Е	135	56%	16%	28%
1	K	135	63%	10%	27%
2	В	102	72%	10%	19%
2	F	102	72%	10%	19%
2	L	102	75%	7%	19%
3	С	129	66%	15%	19%
3	G	129	64%	15% •	20%
3	М	129	68%	12% •	19%



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Mol	Chain	Length	Quality of chain							
4	D	122	61%	16% ·	22%					
4	Н	122	65%	11% •	21%					
4	N	122	64%	11% •	22%					
5	Ι	197	60%	32%	6% •					
5	S	197	32% 15% ·	51%						
6	J	197	67%	28%	••					
6	Т	197	34% 14% •	51%						
7	Z	196	28% 10%	63%						



2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 21492 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.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	1 A	0.8	Total	С	Ν	Ο	\mathbf{S}	0	0	0
1		90	808	509	156	140	3	0	0	
1	1 E	07	Total	С	Ν	Ο	S	0	0	0
		91	802	506	155	138	3			
1	1 IZ	0.0	Total	С	Ν	Ο	S	0	0	0
	90	808	509	156	140	3	0	0	0	

• Molecule 1 is a protein called Histone H3.2.

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
А	102	ALA	GLY	engineered mutation	UNP P84233
Е	102	ALA	GLY	engineered mutation	UNP P84233
K	102	ALA	GLY	engineered mutation	UNP P84233

• Molecule 2 is a protein called Histone H4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	2 B	83	Total	С	Ν	Ο	\mathbf{S}	0	0	0
		0.0	662	418	129	114	1	0	0	
0	2 F	83	Total	С	Ν	Ο	S	0	0	0
			662	418	129	114	1			
0	<u>о</u> т	0.0	Total	С	Ν	Ο	S	0	0	0
	00	662	418	129	114	1	0		U	

• Molecule 3 is a protein called Histone H2A type 1.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3 C	105	Total	С	Ν	Ο	0	0		
		105	809	510	158	141	0	0	0
2	2 0	103	Total	С	Ν	Ο	0	0	0
D G	G		795	501	155	139	0	0	0



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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	М	105	Total 809	C 510	N 158	O 141	0	0	0

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
С	99	ARG	GLY	$\operatorname{conflict}$	UNP P06897
С	123	SER	ALA	conflict	UNP P06897
G	99	ARG	GLY	conflict	UNP P06897
G	123	SER	ALA	$\operatorname{conflict}$	UNP P06897
М	99	ARG	GLY	conflict	UNP P06897
М	123	SER	ALA	conflict	UNP P06897

• Molecule 4 is a protein called Histone H2B 1.1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	4 D	95	Total	С	Ν	Ο	S	0	0	0
4			746	469	136	139	2	0	0	
4	TT	06	Total	С	Ν	Ο	S	0	0	0
4 H	90	756	475	138	141	2	0	0	0	
4	4 N	05	Total	С	Ν	Ο	S	0	0	0
4 IN	90	746	469	136	139	2	0		0	

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	29	THR	SER	engineered mutation	UNP P02281
Н	29	THR	SER	engineered mutation	UNP P02281
N	29	THR	SER	engineered mutation	UNP P02281

• Molecule 5 is a DNA chain called DNA (197-MER).

Mol	Chain	Residues		Atoms				ZeroOcc	AltConf	Trace
5	Ι	193	Total 3957	C 1879	N 728	0 1157	Р 193	0	0	0
5	S	96	Tota 1966	l C 933	N 366	O 571	Р 96	0	0	0

• Molecule 6 is a DNA chain called DNA (197-MER).



Mol	Chain	Residues		Atoms					AltConf	Trace
6	J	193	Total 3956	C 1879	N 725	O 1159	Р 193	0	0	0
6	Т	97	Tota 1990	l C 946	N 359	O 588	Р 97	0	0	0

• Molecule 7 is a protein called Histone H1.0-B.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
7	Z	73	Total 558	${ m C} 347$	N 106	O 104	S 1	0	0	0



3 Residue-property plots (i)

These plots are drawn for all protein, RNA and DNA 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 colorcoded 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.

Chain A:	64%	8%	27%	Ó	
ATA THR THR THR THR THR THR ALA ALA ALA ALA ALA ALA ALA ALA ALA AL	ALA THR LYNS ALA ALA ALA ALA ALA ALA ALA ALA CVAL LYS CIY CLYS CLYS	R42 P43 R63 S86 S86 S86	M90 T107 H113 D123	R128 E133 R134 A135	
• Molecule 1: Histone H3.2	2				
Chain E:	56% 16	%	28%		
ALA THR THR LIYS CLN CLN GLN GLN GLN GLN GLN GLN	ALA THR ITR ITR ITR ITR ALA ALA ALA ALA ALA ALA ALA CLY GLY GLY CLY CLY CLY CLY CLY CLY	H39 741 742 743 743 743 749 749	K64 L65 R69 E73	076 D77 D81 182	
R83 Y99 C110 C110 D123 R134 ALA					
• Molecule 1: Histone H3.2	2				
Chain K:	63%	10%	27%		
ALA THR LYNS LYNS LYNS GLN ALA ALA CLY CLY CLY CLN CLU	MLA THR LTHR LTHR ALA ALA ALA ALA ALA ALA ALA ALA CLY GLY CLY CLY CLY CLY CLY CLY CLY CLY CLY C	R42 P43 R63 F67	100 1107 1107	C110 T118	
D123 L126 A138					
• Molecule 2: Histone H4					
Chain B:	72%	10%	19%	-	
SER ARG GLY GLY GLY CLYS CLY CLYS CLY CLYS GLY CLYS GLY ARG GLY ARG ARG ARG ARG ARG ARG ARG	V21 122 N23 N31 N31 N31 N35 N35 N35 N35 N35 N35 N35 N35 N35 N35	<mark>198</mark> 6102			
• Molecule 2: Histone H4					
Chain F:	72%	10%	19%	-	
SER SER ARG CLY CLY CLY CLY CLY CLY CLY CLY CLY CLY	V21 122 122 N25 N25 N25 N25 N25 N26 N26 N26 N26 N26 N26 N26 N26 N26 N26	<mark>G102</mark>			
	W O R L D W I PROTEIN DATA	D E BANK			

• Molecule 1: Histone H3.2

• Molecule 2: Histone H4			
Chain L:	75%	7%	19%
SER ARG ARC ARC ARC ARC CLY CLY CLY CLY CLY CLY CLY CLY CLY CL	K20 K31 R35 R35 R35 R45 F35 R45 R45 R45 C102		
• Molecule 3: Histone H2.	A type 1		
Chain C:	66%	15% •	19%
SER ARG CLY CLY CLY CLY CLY CLY CLY ARG ARA ARG ARA ARG ARA ARA ARA ARA	R31 R32 R42 F48 F48 F48 F48 F48 F48 F48 F48 F48 F48	090 1102 1102 1102 1102 1102	K118 LYS THR GLU SER SER SER ALA LYS LYS
E SS T			
• Molecule 3: Histone H2.	A type 1		
Chain G:	64%	15% •	20%
SER GLY ARG CLY CLYS CLY CLYS CLY CLYS LYS LYS LYS LYS LYS LYS LYS CLYS C	P26 H31 R32 R32 L33 R36 R36 R36 R36 R36 R36 R36 R42 R42 R42 R48 R42 R48 R42 R42 R48 R42 R176 T76	P80 R81 H82 L93 A102 A103	K118 LYS THR GLU SER SER SER ALA LYS LYS
SER			
• Molecule 3: Histone H2.	A type 1		
Chain M:	68%	12% •	19%
SER ARG CLY ARG CLY CLY CLY CLY CLY ARA ARA ARA ARA ARA ARA ARA ARA ARA AR	022 HB1 FB2 F42 F42 F42 F42 F42 F42 F42 F42 F43 F43 F43 F43 F43 F43 F43 F43 F43 F43	V107 THR GLU SER SER SER SER	ALA LYS SER LYS LYS
• Molecule 4: Histone H2	B 1.1		
Chain D:	61%	16% •	22%
ALA LINS SER SER ALA ALA ALA ALA LINS CLY SER CLY SER LINS THR THR THR THR CLY SER CLY SER CLY SER CLY SER CLY SER CLY SER CLY SER CLY SER SER SER SER SER SER SER SER SER SER	LYNS LLYNS ALNY ALNYS LLYNS LLYNS LLYNS NAS S32 S33 S33 S33 S33 S33 S33 S33 S33 S3	S53 M56 S57 S57 S57 M59 M60 M60 M60 F62	V66 F67 H79 T85 G101 G101 K105
K117 A121 LYS LYS			
• Molecule 4: Histone H2	B 1.1		
Chain H:	65%	11% • 23	1%
ALA LIXS SER SER ALA ALA PRO PRO PRO PRO LIXS SER LIXS LIXS LIXS LIXS THR VAL CIXS CLM CLM	LYS LYS ASP ASP LYS LYS LYS M27 K31 K31 K31 K31 K31 K31 K31 K31 K31 K31	F62 D65 V66 F67 L77 L77 A78 H79	185 193 6101 K122



• Molecule 4:	Histone H2B 1.	.1				
Chain N:		64%		11% •	22%	
ALA LYS SER ALA PRO PRO LYS CYS GLY	SER LYS LYS LYS ALA VAL THR LYS CLYS CLN SYS CSA	GLY LYS LYS ARG S33 S33	V38 K43 (50 553 S53 S53	158 M59 M60 F67 R83	S84 T85 G101 K105 K113	K117 A121 LYS
• Molecule 5:	DNA (197-ME	R)				
Chain I:	60%	ó		32%	6% •	
DA DC T - 96 T - 89 T - 89 T - 86 T - 86 T - 86 T - 86 T - 86 T - 86	A-77 A-77 A-69 A-66 A-66 A-66 C-64 C-65 C-65 C-65 C-65 C-65 C-65 C-65 C-65	G - 50 G - 56 G - 55 A - 54 G - 55 G - 53	C - 50 C - 50 C - 46 C - 46 C - 46 A - 45 T	G-40 1-38 1	6 - 30 C - 29 G - 24 C - 21 C - 21 G - 19 G - 19 G - 19	G -7 A -5 A -5
C2 C7 C7 C11 C12 C12 C12 C19 C19	62 0 62 1 172 2 772 627 82 7 82 7 82 8 62 9 63 9 63 9 63 4	A39 646 649 650 651 C52	154 154 061 062 177 174 177 775 775	CS CS CS CS CS CS CS CS CS S A S C S S A S CS CS CS CS CS CS CS CS CS CS CS CS C	188 489 190 191 192 892 896	50 TO
• Molecule 5:	DNA (197-ME)	R)				
Chain S:	32%	15% •		51%		
DA DC T-96 1-89 1-89 T-71 T-71	0 0 0 0 0 0 0 0 0 0 0 0 0 0	СС-46 4-46 4-46 4-46 4-46 4-46 4-46 4-46	T T C T T T T T T T T T T T T T T T T T	A 13 A 13 A 13 A 13 A 13 A 13 A 13 A 13	Dr Dr Dr Dr Dr	DC DG DA DC
DG D	828858258888	2242442442	88888888888	*******	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	DG DA DT DT
00 01 02 02 03 04 04 04 05 04 04 04 04 04 04 04 04 04 04 04 04 04	DA DA DA DA DA DA DA DA DA DA DA DA DA D		I			
• Molecule 6:	DNA (197-ME	R)				
Chain J:		67%		28%	•••	
DA DC T -96 C -95 C -95 C -95 T -91 A -91 T -90	A-88 T-87 A-77 G-76 G-76 A-75 A-75 A-66 A-66 A-66	C-64 C-51 C-51 G-50 G-49 A-45	C-38 C-32 A-25 G-24 C-23 C-23 C-21	A-14 A-13 C-12 C-11 C-10 C-8	A-5 6-3 6-3 6-3 71 71 72	A6 C7 G8
115 A16 C19 C21 C21 C21 C23 C23 C23 C29	C30 A42 T44 T44 C49 C49 C49 C50 C51	T54 C55 G57 G57 G57 C72 C79	682 199 199 190	1		
• Molecule 6:	DNA (197-ME	R)				
Chain T:	34%	14%	•	51%		
DA DT DA DT DA DA DT DA	DA 17 70 70 70 70 70 70 70 70	00 04 04 04 04 07 04	DC DA DA DA DC DC DC DC DC DC DC DC	200 200 200 200 200 200 200 200 200 200	DC DC DC DC DA DA	01 00 06 10
00 70 70 70 70 70 70 70 70	F 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	DA DA DC DC DC		C2 66 612 612	T15 A16 C19 G20 G21 T22	623 C30 C30
A42 A43 T44 T45 G46 G49 G50 G51	154 056 057 057 057 057 172 188 188 188 188 190	A96 DG DT				
			WORLDWID PROTEIN DATA BAN	E		

• Molecule 7: Histone H1.0-B

Chain Z: 28% 10%

63%

K87 ASP GLU GLU GLU GLU GLU GLU GLU CLUSS CLUSS



4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants	61.73Å 405.74 Å 348.16 Å	Depositor
a, b, c, α , β , γ	90.00° 90.00° 90.00°	Depositor
$\mathbf{B}_{\mathrm{ascolution}}(\mathbf{\hat{A}})$	49.13 - 5.40	Depositor
Resolution (A)	49.13 - 5.40	EDS
% Data completeness	99.2(49.13-5.40)	Depositor
(in resolution range)	99.3(49.13-5.40)	EDS
R_{merge}	0.09	Depositor
R _{sym}	(Not available)	Depositor
$< I/\sigma(I) > 1$	$2.03 (at 5.39 \text{\AA})$	Xtriage
Refinement program	PHENIX (1.10_2155: ???)	Depositor
D D.	0.240 , 0.265	Depositor
n, n_{free}	0.242 , (Not available)	DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å ²)	223.0	Xtriage
Anisotropy	0.349	Xtriage
Bulk solvent $k_{sol}(e/Å^3), B_{sol}(Å^2)$	0.26 , 183.8	EDS
L-test for twinning ²	$ < L >=0.44, < L^2>=0.26$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.90	EDS
Total number of atoms	21492	wwPDB-VP
Average B, all atoms $(Å^2)$	308.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: The largest off-origin peak in the Patterson function is 6.66% of the height of the origin peak. No significant pseudotranslation is detected.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.



¹Intensities estimated from amplitudes.

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).

Mal	Chain	Bo	ond lengths	В	ond angles
	Unam	RMSZ	# Z > 5	RMSZ	# Z > 5
1	А	0.28	0/820	0.43	0/1099
1	Ε	0.52	0/814	0.96	5/1092~(0.5%)
1	Κ	0.38	0/820	0.51	0/1099
2	В	0.36	0/669	0.59	0/894
2	F	0.45	0/669	0.73	0/894
2	L	0.35	0/669	0.60	0/894
3	С	0.41	0/819	0.65	1/1106~(0.1%)
3	G	0.48	0/805	0.86	0/1088
3	М	0.36	0/819	0.60	0/1106
4	D	0.44	0/757	0.61	0/1018
4	Н	0.47	0/767	0.67	1/1029~(0.1%)
4	Ν	0.35	0/757	0.57	0/1018
5	Ι	0.90	16/4439~(0.4%)	1.33	31/6849~(0.5%)
5	S	0.74	0/2206	1.29	10/3401~(0.3%)
6	J	0.86	11/4437~(0.2%)	1.30	29/6846~(0.4%)
6	Т	0.70	0/2230	1.28	13/3441~(0.4%)
7	Ζ	0.38	0/564	0.66	0/750
All	All	0.68	27/23061~(0.1%)	1.10	90/33624~(0.3%)

The worst 5 of 27 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	$\operatorname{Observed}(\operatorname{\AA})$	$\operatorname{Ideal}(\operatorname{\AA})$
6	J	79	DG	C3'-O3'	-7.21	1.34	1.44
5	Ι	88	DT	C3'-O3'	-7.19	1.34	1.44
5	Ι	91	DT	C3'-O3'	-6.82	1.35	1.44
5	Ι	89	DA	C3'-O3'	6.81	1.52	1.44
6	J	-78	DT	C1'-N1	6.23	1.57	1.49

The worst 5 of 90 bond angle outliers are listed below:

Mol	Chain	\mathbf{Res}	Type	Atoms	Z	$Observed(^{o})$	$Ideal(^{o})$
5	Ι	21	DG	O4'-C1'-N9	9.66	114.76	108.00
1	Ε	81	ASP	CB-CG-OD2	8.15	125.64	118.30



		- <u>r</u>	I J													
Mol	Chain	Res	Type	Atoms		$\mathbf{Observed}(^{o})$	$Ideal(^{o})$									
6	J	54	DT	P-O3'-C3'	7.97	129.26	119.70									
6	Т	54	DT	P-O3'-C3'	7.89	129.17	119.70									
1	Ε	81	ASP	CB-CG-OD1	-7.63	111.43	118.30									

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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	А	808	0	846	10	0
1	Ε	802	0	841	23	0
1	Κ	808	0	846	9	0
2	В	662	0	709	6	0
2	F	662	0	709	9	0
2	L	662	0	709	6	0
3	С	809	0	864	16	0
3	G	795	0	846	21	1
3	М	809	0	864	28	0
4	D	746	0	773	16	1
4	Н	756	0	786	15	0
4	Ν	746	0	773	22	1
5	Ι	3957	0	2169	39	0
5	S	1966	0	1077	24	1
6	J	3956	0	2170	28	0
6	Т	1990	0	1094	15	1
7	Ζ	558	0	587	13	0
All	All	21492	0	16663	206	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.

The worst 5 of 206 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:E:43:PRO:HG2	6:J:-5:DA:H5'	1.41	0.98
3:C:63:LEU:HD13	4:D:42:LEU:HB2	1.57	0.85
1:E:73:GLU:OE1	2:F:25:ASN:HB2	1.75	0.84
3:M:21:ALA:C	4:N:117:LYS:HE3	1.96	0.84
4:N:27:ARG:HE	6:T:51:DG:H5"	1.46	0.81

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)
5:S:-1:DA:O3'	6:T:0:DT:P[3_554]	1.63	0.57
4:D:117:LYS:NZ	3:G:20:ARG:O[1_455]	2.15	0.05
4:N:117:LYS:NZ	4:N:117:LYS:NZ[3_454]	2.16	0.04

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	Perce	entiles
1	А	96/135~(71%)	93~(97%)	3 (3%)	0	100	100
1	E	95/135~(70%)	91~(96%)	4 (4%)	0	100	100
1	K	96/135~(71%)	91~(95%)	5 (5%)	0	100	100
2	В	81/102 (79%)	79 (98%)	2 (2%)	0	100	100
2	F	81/102 (79%)	79 (98%)	2 (2%)	0	100	100
2	L	81/102 (79%)	81 (100%)	0	0	100	100
3	С	103/129~(80%)	96~(93%)	7 (7%)	0	100	100
3	G	101/129~(78%)	94 (93%)	7 (7%)	0	100	100
3	М	103/129~(80%)	96~(93%)	7 (7%)	0	100	100
4	D	93/122~(76%)	87 (94%)	5 (5%)	1 (1%)	14	52
4	Н	94/122~(77%)	90 (96%)	3 (3%)	1 (1%)	14	52



continued from provide page								
Mol	Chain	Analysed	Favoured	Allowed	Outliers	Perce	ntiles	3
4	Ν	93/122~(76%)	88~(95%)	4 (4%)	1 (1%)	14	52	
7	Z	71/196~(36%)	68~(96%)	3 (4%)	0	100	100	
All	All	1188/1660~(72%)	1133 (95%)	52 (4%)	3 (0%)	41	76	

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All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	D	101	GLY
4	Н	101	GLY
4	Ν	101	GLY

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 Pe		Perce	ntiles
1	А	85/110~(77%)	85~(100%)	0	100	100
1	Е	85/110~(77%)	85~(100%)	0	100	100
1	K	85/110~(77%)	85~(100%)	0	100	100
2	В	68/78~(87%)	67 (98%)	1 (2%)	65	80
2	F	68/78~(87%)	67~(98%)	1 (2%)	65	80
2	L	68/78~(87%)	67~(98%)	1 (2%)	65	80
3	С	83/101~(82%)	81~(98%)	2(2%)	49	69
3	G	82/101 (81%)	80 (98%)	2 (2%)	49	69
3	М	83/101~(82%)	81~(98%)	2(2%)	49	69
4	D	81/102~(79%)	76~(94%)	5(6%)	18	45
4	Н	82/102~(80%)	78~(95%)	4 (5%)	25	51
4	Ν	81/102~(79%)	75~(93%)	6 (7%)	13	40
7	Z	60/158~(38%)	58 (97%)	2(3%)	38	61
All	All	$101\overline{1/1331}$ (76%)	985~(97%)	26 (3%)	46	67

 $5~{\rm of}~26$ residues with a non-rotameric side chain are listed below:



Mol	Chain	Res	Type
4	Н	27	ARG
4	Н	85	THR
7	Ζ	60	VAL
4	Н	28	LYS
4	Н	31	LYS

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

Mol	Chain	Res	Type
4	D	60	ASN
4	Ν	60	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 carbohydrates 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)

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

6.2 Non-standard residues in protein, DNA, RNA chains (i)

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

6.3 Carbohydrates (i)

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

6.4 Ligands (i)

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

6.5 Other polymers (i)

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

