



# Full wwPDB X-ray Structure Validation Report ⓘ

Nov 16, 2023 – 08:26 AM JST

PDB ID : 6LER  
Title : 169 bp nucleosome harboring non-identical cohesive DNA termini.  
Authors : Sharma, D.; Adhireksan, Z.; Lee, P.L.; Davey, C.A.  
Deposited on : 2019-11-26  
Resolution : 3.00 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](mailto: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>.

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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

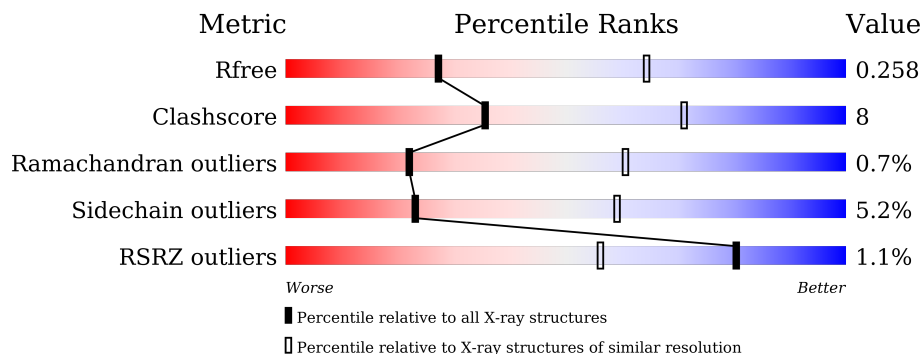
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.00 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	2092 (3.00-3.00)
Clashscore	141614	2416 (3.00-3.00)
Ramachandran outliers	138981	2333 (3.00-3.00)
Sidechain outliers	138945	2336 (3.00-3.00)
RSRZ outliers	127900	1990 (3.00-3.00)

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  $\geq 3$ , 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  $\leq 5\%$ . 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	136	
1	E	136	
1	K	136	
1	O	136	
2	B	103	
2	F	103	

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Mol	Chain	Length	Quality of chain
2	L	103	 63% 14% 23%
2	P	103	 67% 11% 22%
3	C	130	 68% 12% 19%
3	G	130	 70% 8% 19%
3	M	130	 68% 12% 19%
3	Q	130	 65% 15% 19%
4	D	126	 62% 13% 24%
4	H	126	 54% 20% 24%
4	N	126	 67% 8% 24%
4	R	126	 60% 13% 24%
5	J	169	 69% 31%
5	S	169	 62% 37%
6	I	169	 71% 29%
6	T	169	 60% 38%

## 2 Entry composition

There are 9 unique types of molecules in this entry. The entry contains 25911 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 H3.1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	K	98	807	508	156	139	4	0	0	0
1	O	98	807	508	156	139	4	0	0	0
1	A	98	807	508	156	139	4	0	0	0
1	E	98	807	508	156	139	4	0	0	0

- Molecule 2 is a protein called Histone H4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	L	79	627	395	121	110	1	0	0	0
2	P	80	638	401	125	111	1	0	0	0
2	B	79	627	395	121	110	1	0	0	0
2	F	79	627	395	121	110	1	0	0	0

- Molecule 3 is a protein called Histone H2A type 1-B/E.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
3	M	105	810	511	158	141	0	0	0
3	Q	105	810	511	158	141	0	0	0
3	C	105	810	511	158	141	0	0	0
3	G	105	810	511	158	141	0	0	0

- Molecule 4 is a protein called Histone H2B type 1-J.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	N	96	Total	C	N	O	S	0	0	0
			755	474	138	141	2			
4	R	96	Total	C	N	O	S	0	0	0
			755	474	138	141	2			
4	D	96	Total	C	N	O	S	0	0	0
			755	474	138	141	2			
4	H	96	Total	C	N	O	S	0	0	0
			755	474	138	141	2			

- Molecule 5 is a DNA chain called DNA (169-MER).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	S	169	Total	C	N	O	P	0	0	0
			3474	1652	616	1037	169			
5	J	169	Total	C	N	O	P	0	0	0
			3474	1652	616	1037	169			

- Molecule 6 is a DNA chain called DNA (169-MER).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
6	T	169	Total	C	N	O	P	0	0	0
			3457	1639	656	993	169			
6	I	169	Total	C	N	O	P	0	0	0
			3457	1639	656	993	169			

- Molecule 7 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	S	5	Total	Ca	0	0
			5	5		
7	T	3	Total	Ca	0	0
			3	3		
7	I	4	Total	Ca	0	0
			4	4		
7	J	2	Total	Ca	0	0
			2	2		

- Molecule 8 is POTASSIUM ION (three-letter code: K) (formula: K).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	T	1	Total K 1 1	0	0
8	I	1	Total K 1 1	0	0
8	J	1	Total K 1 1	0	0

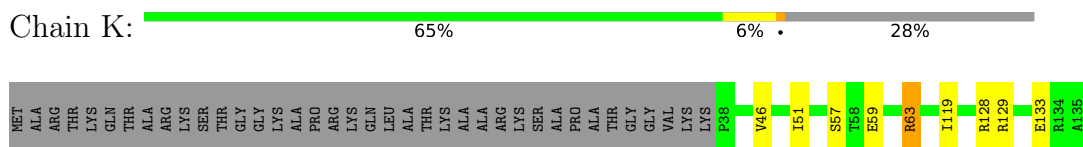
- Molecule 9 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	K	1	Total O 1 1	0	0
9	L	4	Total O 4 4	0	0
9	M	2	Total O 2 2	0	0
9	O	4	Total O 4 4	0	0
9	Q	1	Total O 1 1	0	0
9	R	2	Total O 2 2	0	0
9	S	2	Total O 2 2	0	0
9	A	2	Total O 2 2	0	0
9	C	2	Total O 2 2	0	0
9	D	2	Total O 2 2	0	0
9	E	1	Total O 1 1	0	0
9	F	2	Total O 2 2	0	0

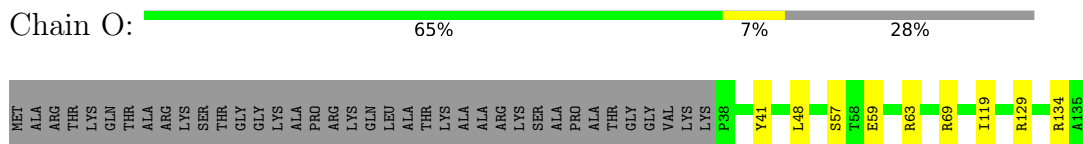
### 3 Residue-property plots [i](#)

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.

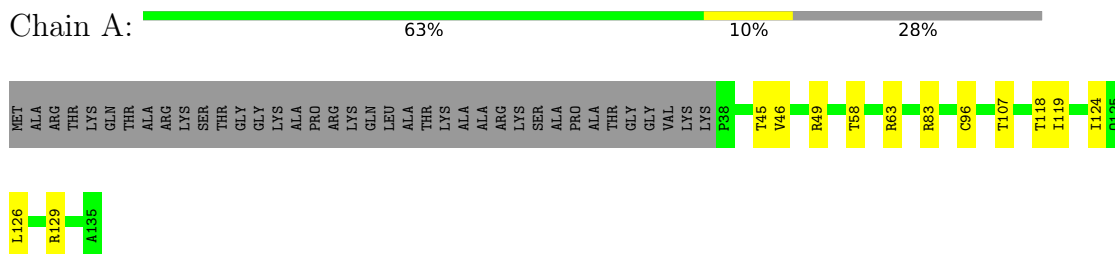
- Molecule 1: Histone H3.1



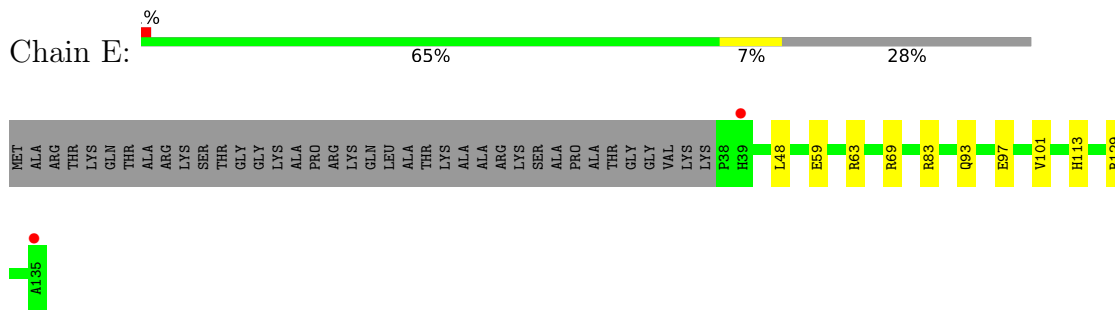
- Molecule 1: Histone H3.1



- Molecule 1: Histone H3.1

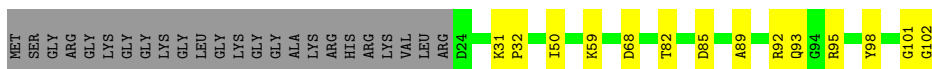


- Molecule 1: Histone H3.1



- Molecule 2: Histone H4





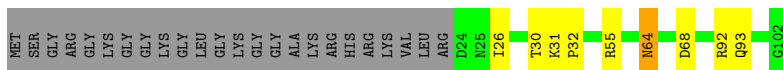
- Molecule 2: Histone H4



- Molecule 2: Histone H4



- Molecule 2: Histone H4



- Molecule 3: Histone H2A type 1-B/E



- Molecule 3: Histone H2A type 1-B/E



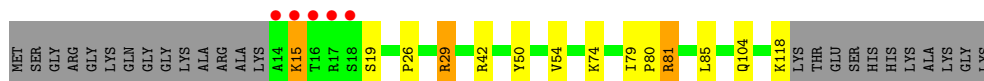
LYS

- Molecule 3: Histone H2A type 1-B/E

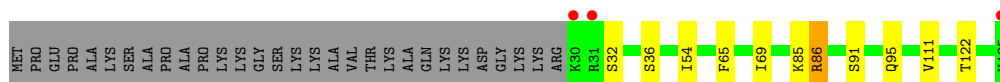


- Molecule 3: Histone H2A type 1-B/E

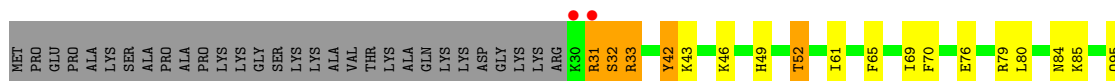




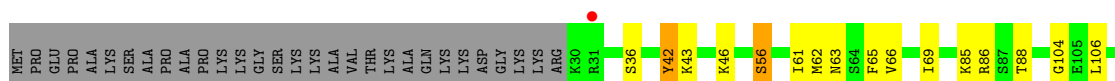
• Molecule 4: Histone H2B type 1-J



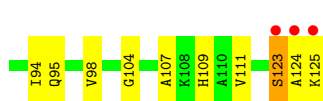
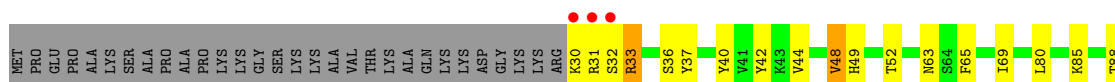
• Molecule 4: Histone H2B type 1-J



• Molecule 4: Histone H2B type 1-J

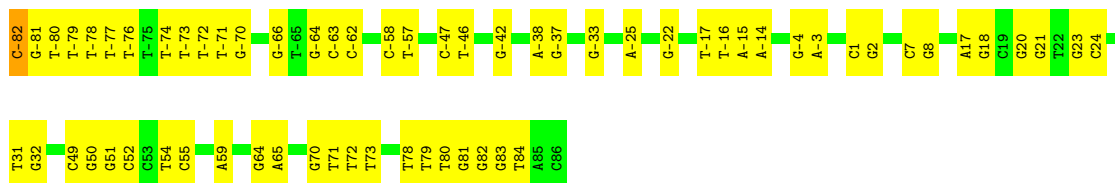


• Molecule 4: Histone H2B type 1-J

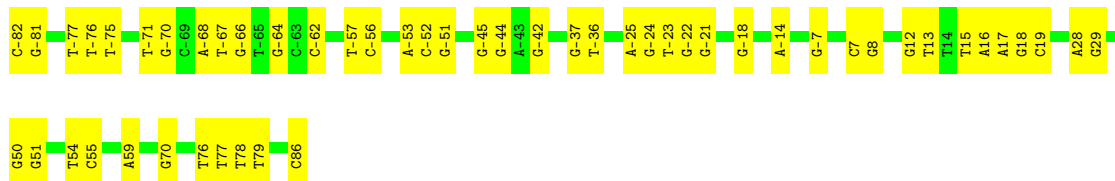


• Molecule 5: DNA (169-MER)

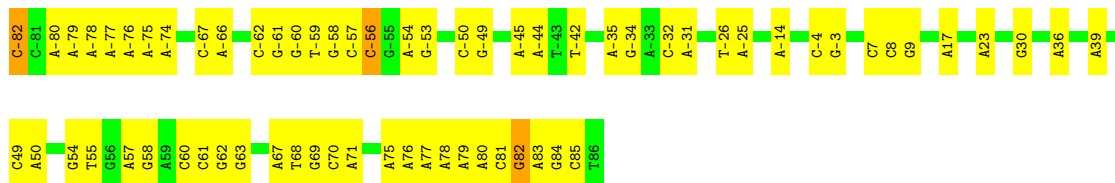




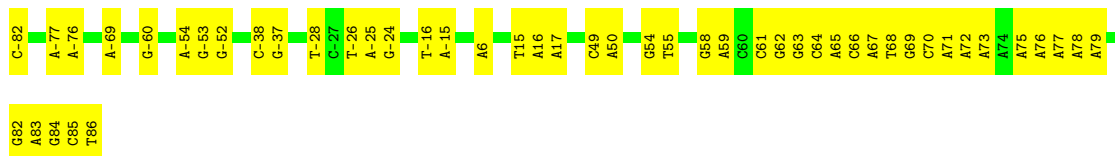
- Molecule 5: DNA (169-MER)



- Molecule 6: DNA (169-MER)



- Molecule 6: DNA (169-MER)



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	107.34Å 116.55Å 117.90Å 61.50° 82.77° 64.23°	Depositor
Resolution (Å)	48.12 – 3.00 48.07 – 3.00	Depositor EDS
% Data completeness (in resolution range)	98.6 (48.12-3.00) 98.6 (48.07-3.00)	Depositor EDS
$R_{merge}$	0.06	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.49 (at 3.01Å)	Xtrriage
Refinement program	REFMAC 5.8.0232	Depositor
R, $R_{free}$	0.208 , 0.261 0.211 , 0.258	Depositor DCC
$R_{free}$ test set	1778 reflections (2.00%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	96.8	Xtrriage
Anisotropy	0.039	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.27 , 64.7	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	25911	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	128.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.66% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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.

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: K, CA

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	0.65	0/819	0.78	0/1097
1	E	0.63	0/819	0.79	0/1097
1	K	0.63	0/819	0.81	0/1097
1	O	0.61	0/819	0.76	0/1097
2	B	0.66	0/634	0.79	0/848
2	F	0.66	0/634	0.80	0/848
2	L	0.63	0/634	0.81	0/848
2	P	0.65	0/645	0.79	0/862
3	C	0.65	0/820	0.77	0/1107
3	G	0.66	0/820	0.79	0/1107
3	M	0.65	0/820	0.79	0/1107
3	Q	0.64	0/820	0.79	0/1107
4	D	0.66	0/766	0.77	0/1026
4	H	0.68	0/766	0.82	0/1026
4	N	0.66	0/766	0.75	0/1026
4	R	0.65	0/766	0.78	0/1026
5	J	0.37	1/3891 (0.0%)	0.78	0/6008
5	S	0.41	2/3891 (0.1%)	0.81	1/6008 (0.0%)
6	I	0.35	1/3883 (0.0%)	0.80	0/5983
6	T	0.43	2/3883 (0.1%)	0.82	1/5983 (0.0%)
All	All	0.52	6/27715 (0.0%)	0.80	2/40308 (0.0%)

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	S	-82	DC	OP3-P	-10.18	1.49	1.61
6	T	-82	DC	OP3-P	-10.13	1.49	1.61
6	I	-82	DC	OP3-P	-10.05	1.49	1.61
5	J	-82	DC	OP3-P	-10.05	1.49	1.61
6	T	-56	DC	O3'-P	-5.56	1.54	1.61
5	S	-25	DA	O3'-P	-5.10	1.55	1.61

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	T	82	DG	C1'-O4'-C4'	-5.98	104.12	110.10
5	S	82	DG	C1'-O4'-C4'	-5.17	104.93	110.10

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	807	0	844	10	0
1	E	807	0	844	7	0
1	K	807	0	844	12	0
1	O	807	0	844	5	0
2	B	627	0	663	9	0
2	F	627	0	663	5	0
2	L	627	0	663	7	0
2	P	638	0	676	5	0
3	C	810	0	866	11	0
3	G	810	0	866	13	0
3	M	810	0	866	8	0
3	Q	810	0	866	14	0
4	D	755	0	784	12	0
4	H	755	0	784	19	0
4	N	755	0	784	6	0
4	R	755	0	784	20	0
5	J	3474	0	1911	39	0
5	S	3474	0	1911	88	0
6	I	3457	0	1889	54	0
6	T	3457	0	1889	91	0
7	I	4	0	0	0	0
7	J	2	0	0	0	0
7	S	5	0	0	0	0
7	T	3	0	0	0	0
8	I	1	0	0	0	0
8	J	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
8	T	1	0	0	0	0
9	A	2	0	0	0	0
9	C	2	0	0	1	0
9	D	2	0	0	0	0
9	E	1	0	0	1	0
9	F	2	0	0	0	0
9	K	1	0	0	0	0
9	L	4	0	0	0	0
9	M	2	0	0	0	0
9	O	4	0	0	0	0
9	Q	1	0	0	0	0
9	R	2	0	0	1	0
9	S	2	0	0	0	0
All	All	25911	0	20241	347	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 8.

All (347) 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)
6:T:77:DA:H2''	6:T:78:DA:O5'	1.51	1.05
5:S:-81:DG:O3'	5:S:-80:DT:H3'	1.59	1.03
3:Q:15:LYS:HD2	6:T:-42:DT:OP1	1.64	0.98
4:R:42:TYR:OH	6:T:-53:DG:OP2	1.83	0.94
1:K:63:ARG:HD3	6:T:17:DA:H4'	1.52	0.92
1:K:63:ARG:NH2	5:S:-14:DA:H4'	1.84	0.92
6:T:82:DG:H1'	6:T:83:DA:C8	2.07	0.89
5:S:-82:DC:H2'	5:S:-81:DG:C8	2.08	0.88
5:S:-81:DG:N3	5:S:-80:DT:O4'	2.07	0.87
5:S:-80:DT:O4	6:T:80:DA:N6	2.09	0.85
1:A:45:THR:HG21	6:I:70:DC:OP1	1.79	0.82
6:I:62:DG:O6	5:J:-62:DC:N4	2.19	0.76
6:T:82:DG:C2	6:T:83:DA:C2	2.75	0.75
6:T:-57:DC:H2''	6:T:-56:DC:OP2	1.86	0.75
5:S:-81:DG:H1'	5:S:-80:DT:H5'	1.69	0.74
4:R:49:HIS:HB3	4:R:52:THR:HG23	1.68	0.74
1:K:63:ARG:NH2	5:S:-14:DA:C4'	2.52	0.72
5:S:-81:DG:C2	6:T:82:DG:N2	2.57	0.72
6:T:80:DA:C5	6:T:81:DC:C4	2.77	0.71
4:D:65:PHE:CE1	4:D:69:ILE:CD1	2.74	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:S:-80:DT:H3'	5:S:-80:DT:P	2.33	0.68
5:S:-16:DT:H2''	5:S:-15:DA:C8	2.28	0.68
5:S:-82:DC:C6	6:I:86:DT:H2'	2.29	0.67
6:T:-50:DC:H2''	6:T:-49:DG:C8	2.29	0.67
6:T:77:DA:C2'	6:T:78:DA:O5'	2.37	0.66
6:I:82:DG:H2''	6:I:83:DA:O5'	1.96	0.66
5:S:-81:DG:H2''	5:S:-80:DT:H2'	1.76	0.66
4:D:65:PHE:CE1	4:D:69:ILE:HD11	2.30	0.66
6:T:-80:DA:H2''	6:T:-79:DA:OP2	1.94	0.66
6:I:-16:DT:H2''	6:I:-15:DA:C8	2.32	0.65
4:H:123:SER:O	4:H:125:LYS:N	2.29	0.65
4:N:65:PHE:CE1	4:N:69:ILE:CD1	2.79	0.65
5:S:-81:DG:C1'	5:S:-80:DT:H5'	2.27	0.65
1:E:59:GLU:OE2	9:E:201:HOH:O	2.14	0.65
3:G:29:ARG:NH2	4:H:36:SER:O	2.30	0.65
4:H:107:ALA:O	4:H:111:VAL:HG23	1.97	0.64
5:S:-82:DC:C1'	6:I:86:DT:H2''	2.27	0.64
1:K:63:ARG:CZ	5:S:-14:DA:H4'	2.28	0.64
4:R:32:SER:OG	6:T:30:DG:OP1	2.09	0.64
6:I:69:DG:H4'	6:I:70:DC:OP1	1.98	0.63
4:R:95:GLN:HE21	4:R:111:VAL:HG13	1.63	0.63
5:S:-47:DC:H2''	5:S:-46:DT:C6	2.33	0.63
6:T:80:DA:H2''	6:T:81:DC:OP2	1.98	0.62
5:S:-81:DG:H4'	5:S:-80:DT:OP1	1.99	0.62
6:T:-67:DC:H2'	6:T:-66:DA:O4'	1.99	0.62
1:A:119:ILE:HG13	2:B:50:ILE:HD12	1.81	0.62
1:K:128:ARG:HD2	1:K:133:GLU:OE1	2.00	0.62
6:T:78:DA:H2''	6:T:79:DA:H5''	1.82	0.61
6:T:82:DG:C4	6:T:83:DA:C5	2.88	0.61
6:T:81:DC:C4	6:T:82:DG:C6	2.89	0.61
6:I:67:DA:H4'	6:I:68:DT:OP1	2.00	0.60
1:K:119:ILE:HD12	2:L:50:ILE:HD13	1.84	0.60
6:T:81:DC:H2''	6:T:82:DG:H2'	1.82	0.60
5:S:-81:DG:C4	5:S:-80:DT:C6	2.90	0.59
4:N:65:PHE:CE1	4:N:69:ILE:HD11	2.38	0.59
6:T:79:DA:H4'	6:T:79:DA:OP1	2.02	0.59
5:J:-76:DT:H2''	5:J:-75:DT:OP2	2.02	0.59
5:S:-77:DT:O4	6:T:76:DA:N6	2.36	0.58
5:S:-80:DT:O4	6:T:79:DA:N6	2.37	0.58
6:T:82:DG:N3	6:T:83:DA:C4	2.71	0.58
5:J:54:DT:H4'	5:J:55:DC:OP1	2.02	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:I:-69:DA:C2	5:J:70:DG:N2	2.72	0.58
6:I:83:DA:H2''	6:I:84:DG:C8	2.38	0.58
6:T:81:DC:C4	6:T:82:DG:C5	2.92	0.58
6:T:81:DC:H1'	6:T:82:DG:O4'	2.03	0.58
1:K:63:ARG:CD	6:T:17:DA:H4'	2.30	0.57
4:R:65:PHE:CZ	4:R:69:ILE:HD13	2.39	0.57
4:H:65:PHE:CE1	4:H:69:ILE:CD1	2.88	0.57
5:S:-81:DG:C2	5:S:-80:DT:C2	2.93	0.56
5:J:-57:DT:H2''	5:J:-56:DC:C6	2.38	0.56
6:T:82:DG:N2	6:T:83:DA:C2	2.74	0.56
5:S:-80:DT:H2''	5:S:-79:DT:O4'	2.06	0.56
4:D:65:PHE:CZ	4:D:69:ILE:CD1	2.88	0.56
5:J:-71:DT:H2''	5:J:-70:DG:H5'	1.87	0.56
6:T:-4:DC:H2''	6:T:-3:DG:C8	2.41	0.55
1:A:96:CYS:SG	2:B:62:LEU:HG	2.47	0.55
3:M:81:ARG:NH2	3:M:107:VAL:O	2.40	0.55
4:R:65:PHE:CE1	4:R:69:ILE:CD1	2.89	0.55
5:S:-81:DG:N1	6:T:82:DG:C2	2.74	0.55
2:B:68:ASP:OD2	2:B:92:ARG:NH1	2.40	0.55
6:I:71:DA:C2'	6:I:72:DA:O5'	2.55	0.55
5:J:-77:DT:H4'	5:J:-76:DT:OP1	2.07	0.54
5:J:7:DC:H2''	5:J:8:DG:C8	2.42	0.54
6:I:-77:DA:H2''	6:I:-76:DA:C8	2.43	0.54
6:T:82:DG:C1'	6:T:83:DA:C8	2.86	0.54
6:T:82:DG:O6	6:I:86:DT:O4	2.26	0.53
5:S:-71:DT:H2''	5:S:-70:DG:O5'	2.08	0.53
3:C:84:GLN:NE2	3:C:106:GLY:O	2.39	0.53
4:H:94:ILE:O	4:H:98:VAL:HG23	2.09	0.53
5:S:-4:DG:H2''	5:S:-3:DA:C8	2.44	0.53
6:T:83:DA:H2'	6:T:84:DG:C1'	2.39	0.53
6:T:-79:DA:H2''	6:T:-78:DA:OP2	2.07	0.53
5:S:20:DG:H2''	5:S:21:DG:O5'	2.09	0.53
2:L:68:ASP:OD2	2:L:92:ARG:NH1	2.42	0.52
3:M:85:LEU:O	3:M:89:ASN:HB2	2.09	0.52
6:T:-75:DA:H1'	6:T:-74:DA:O4'	2.08	0.52
6:I:72:DA:C2	6:I:73:DA:C2	2.96	0.52
5:S:-81:DG:H1'	5:S:-80:DT:C5'	2.37	0.52
6:T:60:DC:H2''	6:T:61:DC:C6	2.45	0.52
3:M:29:ARG:NH1	4:N:36:SER:O	2.42	0.52
4:N:65:PHE:CZ	4:N:69:ILE:CD1	2.93	0.52
6:T:-82:DC:C6	5:J:86:DC:H2''	2.45	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:35:ARG:O	2:B:39:ARG:HG2	2.10	0.52
4:H:33:ARG:CG	4:H:33:ARG:O	2.56	0.52
1:K:57:SER:HB2	1:K:59:GLU:OE1	2.10	0.52
5:S:64:DG:H2'	5:S:65:DA:C8	2.44	0.52
5:J:-25:DA:H1'	5:J:-24:DG:C8	2.44	0.52
6:T:-77:DA:C2	6:T:-76:DA:C2	2.98	0.52
2:F:26:ILE:HD11	2:F:55:ARG:HB3	1.92	0.51
6:I:75:DA:H4'	6:I:76:DA:OP1	2.11	0.51
5:S:-81:DG:N1	6:T:82:DG:N2	2.59	0.51
5:S:-77:DT:H2'	5:S:-76:DT:C6	2.45	0.51
6:T:82:DG:P	6:T:82:DG:H3'	2.50	0.51
6:T:83:DA:H2'	6:T:84:DG:O4'	2.10	0.51
5:S:-82:DC:H2'	5:S:-81:DG:N9	2.26	0.51
6:T:67:DA:H1'	6:T:68:DT:O4'	2.11	0.51
6:I:63:DG:H4'	6:I:64:DC:OP1	2.11	0.51
3:G:50:TYR:OH	4:H:95:GLN:NE2	2.32	0.50
6:I:-53:DG:C6	6:I:-52:DG:C6	2.99	0.50
6:I:6:DA:N6	5:J:-7:DG:C6	2.79	0.50
5:S:-37:DG:O6	6:T:36:DA:N6	2.44	0.50
6:T:81:DC:H2''	6:T:82:DG:C8	2.46	0.50
6:T:61:DC:H1'	6:T:62:DG:H5'	1.94	0.50
5:S:-81:DG:H1'	5:S:-80:DT:C4'	2.41	0.50
6:I:85:DC:H2'	6:I:86:DT:H71	1.93	0.50
6:T:80:DA:C8	6:T:81:DC:C5	3.00	0.50
2:F:31:LYS:N	2:F:32:PRO:HD2	2.25	0.50
1:K:63:ARG:HD3	6:T:17:DA:C4'	2.33	0.50
5:S:-79:DT:H2''	5:S:-78:DT:O4'	2.11	0.50
5:J:-67:DT:H2''	5:J:-66:DG:O5'	2.12	0.50
4:R:42:TYR:OH	6:T:-53:DG:P	2.69	0.50
5:S:-81:DG:H1'	5:S:-80:DT:O4'	2.12	0.49
5:S:-80:DT:C2	5:S:-79:DT:C2	2.99	0.49
3:Q:16:THR:O	3:Q:19:SER:HB3	2.12	0.49
3:G:26:PRO:HD3	4:H:40:TYR:CD1	2.47	0.49
1:A:119:ILE:HD12	2:B:50:ILE:HD13	1.94	0.49
2:L:89:ALA:O	2:L:93:GLN:HG2	2.13	0.49
5:S:-80:DT:H1'	5:S:-79:DT:O4'	2.12	0.49
6:I:54:DG:H4'	6:I:55:DT:OP1	2.13	0.49
3:G:42:ARG:O	4:H:88:THR:HA	2.12	0.49
6:I:15:DT:H2''	6:I:16:DA:C8	2.47	0.49
4:H:30:LYS:NZ	6:I:-28:DT:O2	2.46	0.49
5:S:70:DG:H2''	5:S:71:DT:OP2	2.12	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:S:-81:DG:N9	5:S:-80:DT:C6	2.81	0.48
6:T:-35:DA:C5	6:T:-34:DG:C6	3.01	0.48
4:H:49:HIS:HB3	4:H:52:THR:HG22	1.95	0.48
1:O:57:SER:HB2	1:O:59:GLU:OE1	2.13	0.48
3:M:20:ARG:NH2	5:S:-42:DG:OP1	2.46	0.48
4:R:49:HIS:HB3	4:R:52:THR:CG2	2.40	0.48
5:S:-77:DT:O2	6:T:78:DA:C2	2.66	0.48
6:I:17:DA:N6	5:J:-18:DG:O6	2.46	0.48
2:L:31:LYS:N	2:L:32:PRO:HD2	2.28	0.48
3:C:77:ARG:CZ	6:I:-54:DA:H4'	2.43	0.48
3:G:50:TYR:O	3:G:54:VAL:HG23	2.14	0.48
5:J:-52:DC:H2''	5:J:-51:DG:OP2	2.12	0.48
1:A:58:THR:HG21	3:G:81:ARG:HB2	1.96	0.48
6:I:49:DC:H2'	6:I:50:DA:C8	2.48	0.48
5:S:-82:DC:C2'	5:S:-81:DG:O4'	2.62	0.48
5:S:-38:DA:C2	6:T:39:DA:C2	3.02	0.48
5:S:-81:DG:C4	5:S:-80:DT:N1	2.82	0.48
5:S:-81:DG:C8	5:S:-80:DT:C5	3.02	0.48
3:G:79:ILE:HB	3:G:80:PRO:HD2	1.96	0.47
3:M:47:ALA:HB3	3:M:48:PRO:HD3	1.96	0.47
5:S:-81:DG:C5	5:S:-80:DT:C5	3.02	0.47
1:A:126:LEU:HD22	1:E:113:HIS:CG	2.50	0.47
1:O:69:ARG:NH2	5:S:17:DA:OP2	2.48	0.47
4:R:52:THR:HG22	9:R:201:HOH:O	2.15	0.47
4:R:76:GLU:OE2	4:R:79:ARG:NH1	2.47	0.47
5:S:-81:DG:C5	5:S:-80:DT:C4	3.02	0.47
6:T:54:DG:H2''	6:T:55:DT:C6	2.48	0.47
1:E:63:ARG:NH1	5:J:-14:DA:H4'	2.30	0.47
2:F:68:ASP:OD2	2:F:93:GLN:NE2	2.47	0.47
6:I:85:DC:C2'	6:I:86:DT:H71	2.45	0.47
2:P:89:ALA:O	2:P:93:GLN:HG2	2.15	0.47
6:T:-62:DC:H2'	6:T:-61:DG:C8	2.50	0.47
6:T:81:DC:C2	6:T:82:DG:C4	3.03	0.47
5:J:-22:DG:H2''	5:J:-21:DG:OP2	2.15	0.47
1:O:41:TYR:OH	5:S:-66:DG:H5'	2.15	0.47
6:I:-25:DA:C2	6:I:-24:DG:C6	3.02	0.47
5:S:23:DG:H2''	5:S:24:DC:OP2	2.16	0.46
5:J:28:DA:C6	5:J:29:DG:C6	3.03	0.46
6:T:80:DA:C5	6:T:81:DC:N4	2.83	0.46
3:Q:77:ARG:NE	6:T:-54:DA:H4'	2.31	0.46
3:C:73:ASN:OD1	9:C:201:HOH:O	2.20	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:H:95:GLN:NE2	4:H:111:VAL:HG13	2.31	0.46
2:P:31:LYS:N	2:P:32:PRO:HD2	2.31	0.46
5:S:-78:DT:H2''	5:S:-77:DT:O4'	2.15	0.46
3:G:26:PRO:HG3	4:H:40:TYR:CZ	2.51	0.46
5:S:80:DT:H2''	5:S:81:DG:OP2	2.15	0.45
1:A:119:ILE:HG13	2:B:50:ILE:CD1	2.45	0.45
6:I:-38:DC:H2''	6:I:-37:DG:OP2	2.17	0.45
6:T:-76:DA:H1'	6:T:-75:DA:C8	2.52	0.45
3:C:24:GLN:HG3	4:D:43:LYS:HB3	1.97	0.45
4:H:33:ARG:O	4:H:33:ARG:HG2	2.16	0.45
6:I:-26:DT:C4	6:I:-25:DA:C6	3.04	0.45
5:S:59:DA:C2	6:T:-58:DG:N2	2.85	0.45
6:T:-79:DA:C6	6:T:-78:DA:N6	2.85	0.45
5:J:15:DT:H2''	5:J:16:DA:C8	2.51	0.45
6:T:70:DC:H2''	6:T:71:DA:OP2	2.16	0.45
6:I:63:DG:N2	5:J:-62:DC:C2	2.85	0.45
1:O:63:ARG:NH1	6:T:-14:DA:H4'	2.31	0.45
2:P:75:HIS:HD2	4:R:84:ASN:ND2	2.15	0.45
3:Q:15:LYS:HG2	3:Q:20:ARG:HE	1.81	0.45
3:Q:24:GLN:HG3	4:R:43:LYS:HB3	1.98	0.45
3:Q:50:TYR:OH	4:R:95:GLN:HG3	2.16	0.45
5:S:-47:DC:H2''	5:S:-46:DT:C5	2.51	0.45
6:T:82:DG:C2	6:T:83:DA:N3	2.84	0.45
6:I:-60:DG:O6	5:J:59:DA:N6	2.50	0.45
6:I:78:DA:C2	6:I:79:DA:C4	3.05	0.45
2:L:101:GLY:O	2:L:102:GLY:C	2.55	0.45
3:M:102:ILE:O	3:M:102:ILE:HG22	2.15	0.45
5:S:-64:DG:C2	5:S:-63:DC:N3	2.85	0.45
5:S:54:DT:H2''	5:S:55:DC:C6	2.52	0.45
5:J:76:DT:H1'	5:J:77:DT:C5'	2.47	0.45
6:T:7:DC:H2'	6:T:8:DC:C5	2.52	0.45
6:T:81:DC:H4'	6:T:82:DG:OP1	2.16	0.45
1:E:93:GLN:O	1:E:97:GLU:HG3	2.17	0.45
6:I:-77:DA:C2	6:I:-76:DA:C2	3.05	0.45
5:S:-82:DC:C2'	5:S:-81:DG:C8	2.93	0.45
4:H:42:TYR:OH	5:J:-53:DA:OP2	2.16	0.45
6:I:82:DG:C2	5:J:-81:DG:C2	3.04	0.45
1:A:46:VAL:O	1:A:49:ARG:HB2	2.17	0.44
6:I:75:DA:C2	6:I:76:DA:C4	3.05	0.44
5:S:-70:DG:C2	6:T:71:DA:C2	3.05	0.44
6:T:75:DA:H2''	6:T:76:DA:OP2	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:Q:104:GLN:HA	3:Q:104:GLN:NE2	2.32	0.44
5:S:-73:DT:H4'	5:S:-72:DT:OP1	2.17	0.44
5:J:-37:DG:H2''	5:J:-36:DT:OP2	2.16	0.44
5:S:-17:DT:H2''	5:S:-16:DT:O5'	2.17	0.44
3:Q:80:PRO:HG3	4:R:61:ILE:HD12	1.99	0.44
6:T:81:DC:N4	6:T:82:DG:C6	2.85	0.44
1:E:69:ARG:NH2	6:I:17:DA:OP1	2.49	0.44
1:K:51:ILE:HG21	3:Q:111:ILE:HG12	2.00	0.44
3:Q:62:ILE:HD11	4:R:65:PHE:CE1	2.51	0.44
5:S:83:DG:H4'	5:S:84:DT:OP1	2.17	0.44
6:T:-75:DA:C5	6:T:-74:DA:C5	3.06	0.44
5:S:-74:DT:H2''	5:S:-73:DT:OP2	2.18	0.44
6:T:-35:DA:C6	6:T:-34:DG:C6	3.06	0.44
3:M:84:GLN:NE2	3:M:106:GLY:O	2.48	0.44
5:S:-58:DC:C2'	5:S:-57:DT:H72	2.48	0.44
4:H:49:HIS:HB3	4:H:52:THR:CG2	2.47	0.44
5:J:-45:DG:N2	5:J:-44:DG:C2	2.86	0.44
2:L:98:TYR:CE2	3:Q:100:VAL:HG11	2.52	0.43
5:S:-82:DC:O4'	6:I:86:DT:H2''	2.17	0.43
6:I:58:DG:H2''	6:I:59:DA:C8	2.53	0.43
5:S:-73:DT:H2''	5:S:-72:DT:O5'	2.18	0.43
5:S:20:DG:C2'	5:S:21:DG:O5'	2.66	0.43
5:J:50:DG:C6	5:J:51:DG:C6	3.06	0.43
4:R:106:LEU:HD12	4:R:106:LEU:HA	1.90	0.43
5:S:-62:DC:N3	6:T:63:DG:N2	2.66	0.43
3:C:42:ARG:O	4:D:88:THR:HA	2.18	0.43
1:E:83:ARG:HG2	5:J:-23:DT:H5''	2.01	0.43
3:G:26:PRO:HD3	4:H:40:TYR:CG	2.53	0.43
6:T:-77:DA:C6	6:T:-76:DA:C6	3.06	0.43
3:C:18:SER:OG	3:C:27:VAL:HG23	2.19	0.43
5:S:-81:DG:C4'	5:S:-80:DT:OP1	2.66	0.43
5:S:-81:DG:OP2	5:S:-81:DG:H2'	2.19	0.43
6:T:54:DG:H4'	6:T:55:DT:OP1	2.17	0.43
5:S:78:DT:H4'	5:S:79:DT:OP1	2.18	0.43
6:T:49:DC:H2'	6:T:50:DA:C8	2.54	0.43
6:T:80:DA:C4	6:T:81:DC:C4	3.06	0.43
6:I:67:DA:N6	5:J:-68:DA:N6	2.66	0.43
6:I:71:DA:H2'	6:I:72:DA:O5'	2.17	0.43
5:S:-73:DT:H2'	5:S:-72:DT:C6	2.54	0.43
5:S:72:DT:H1'	5:S:73:DT:H5'	2.01	0.43
5:J:78:DT:H2''	5:J:79:DT:OP2	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:K:46:VAL:HG21	6:T:9:DG:H3'	2.00	0.43
3:C:80:PRO:HG3	4:D:61:ILE:HD12	2.01	0.43
5:S:1:DC:H2''	5:S:2:DG:OP2	2.19	0.42
3:C:79:ILE:HG12	3:C:82:HIS:CE1	2.54	0.42
6:I:65:DA:C2	5:J:-64:DG:N2	2.86	0.42
1:K:63:ARG:HH22	5:S:-14:DA:C4'	2.32	0.42
3:Q:88:ARG:HD3	3:Q:88:ARG:HA	1.65	0.42
5:S:-82:DC:H1'	6:I:86:DT:H2''	1.98	0.42
6:T:81:DC:C6	6:T:82:DG:C8	3.07	0.42
6:I:82:DG:C2'	6:I:83:DA:O5'	2.65	0.42
4:R:70:PHE:CD1	4:R:70:PHE:C	2.93	0.42
5:S:-81:DG:N7	5:S:-80:DT:C5	2.87	0.42
5:J:-57:DT:H2''	5:J:-56:DC:C5	2.55	0.42
5:J:12:DG:H2''	5:J:13:DT:OP2	2.20	0.42
5:S:83:DG:C2	5:S:84:DT:C2	3.07	0.42
6:I:66:DC:H1'	6:I:67:DA:C8	2.55	0.42
4:R:31:ARG:O	4:R:33:ARG:N	2.52	0.42
6:T:57:DA:H2''	6:T:58:DG:C8	2.54	0.42
6:T:68:DT:H1'	6:T:69:DG:H5'	2.01	0.42
3:G:79:ILE:HB	3:G:80:PRO:CD	2.49	0.42
5:J:16:DA:H1'	5:J:17:DA:C8	2.54	0.42
2:B:59:LYS:HD2	2:B:63:GLU:OE2	2.20	0.42
6:I:67:DA:C2	5:J:-66:DG:C2	3.08	0.42
1:O:119:ILE:O	1:O:119:ILE:HG13	2.20	0.42
5:S:31:DT:H2''	5:S:32:DG:C8	2.55	0.42
6:T:-67:DC:H2''	6:T:-66:DA:H5'	2.02	0.42
5:J:18:DG:C5	5:J:19:DC:C4	3.06	0.42
5:S:-81:DG:C8	5:S:-80:DT:C6	3.08	0.42
3:C:62:ILE:HD11	4:D:65:PHE:CZ	2.55	0.42
5:S:-22:DG:C2	6:T:23:DA:C2	3.08	0.41
6:T:-60:DG:H2''	6:T:-59:DT:OP2	2.20	0.41
2:L:82:THR:O	2:L:85:ASP:HB2	2.19	0.41
4:N:95:GLN:NE2	4:N:111:VAL:HG13	2.35	0.41
5:S:17:DA:C6	5:S:18:DG:C6	3.07	0.41
6:I:70:DC:H2''	6:I:71:DA:C8	2.55	0.41
3:M:57:TYR:O	3:M:60:ALA:HB3	2.20	0.41
5:S:7:DC:H2''	5:S:8:DG:C8	2.54	0.41
6:T:79:DA:OP1	6:T:79:DA:C4'	2.68	0.41
2:F:30:THR:HB	2:F:32:PRO:HD2	2.02	0.41
3:G:15:LYS:HE3	5:J:-42:DG:OP1	2.20	0.41
5:J:-67:DT:H2''	5:J:-66:DG:OP2	2.15	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:R:33:ARG:HG2	4:R:33:ARG:O	2.20	0.41
5:S:51:DG:H2''	5:S:52:DC:OP2	2.20	0.41
5:S:49:DC:H2'	5:S:50:DG:C8	2.56	0.41
6:I:62:DG:O6	5:J:-62:DC:C4	2.73	0.41
5:S:-58:DC:C2	5:S:-57:DT:C4	3.07	0.41
6:T:-75:DA:C6	6:T:-74:DA:C6	3.08	0.41
6:T:85:DC:OP2	6:T:85:DC:H6	2.04	0.41
4:H:37:TYR:HB2	4:H:63:ASN:OD1	2.20	0.41
6:I:-77:DA:C2'	6:I:-76:DA:C8	3.03	0.41
6:I:61:DC:H2''	6:I:62:DG:O5'	2.20	0.41
6:I:72:DA:H2''	6:I:73:DA:C8	2.55	0.41
3:C:29:ARG:NH1	4:D:36:SER:O	2.53	0.41
3:G:81:ARG:O	3:G:85:LEU:HG	2.21	0.41
5:S:72:DT:H2''	5:S:73:DT:OP2	2.20	0.41
4:D:42:TYR:O	4:D:46:LYS:HG2	2.20	0.41
2:F:64:ASN:N	2:F:64:ASN:HD22	2.18	0.41
4:N:86:ARG:NH2	5:S:-33:DG:OP2	2.54	0.41
3:Q:47:ALA:HB3	3:Q:48:PRO:HD3	2.02	0.41
4:H:44:VAL:O	4:H:48:VAL:HG22	2.21	0.41
2:P:68:ASP:OD2	2:P:92:ARG:NH1	2.53	0.41
2:P:69:ALA:O	2:P:72:TYR:HB2	2.21	0.41
6:T:-45:DA:C2	6:T:-44:DA:C2	3.09	0.41
1:A:83:ARG:O	2:B:80:THR:HA	2.21	0.41
6:I:-69:DA:C2	5:J:70:DG:C2	3.09	0.41
6:T:-58:DG:H2''	6:T:-57:DC:OP2	2.21	0.40
6:T:-26:DT:C4	6:T:-25:DA:C6	3.09	0.40
4:D:56:SER:HB2	6:I:-54:DA:OP2	2.21	0.40
4:D:62:MET:O	4:D:66:VAL:HG23	2.20	0.40
6:T:81:DC:C5	6:T:82:DG:N7	2.89	0.40
6:T:84:DG:H2''	6:T:85:DC:H5'	2.04	0.40
2:B:31:LYS:N	2:B:32:PRO:HD2	2.36	0.40
3:Q:62:ILE:HD11	4:R:65:PHE:CZ	2.56	0.40
4:D:106:LEU:HD12	4:D:106:LEU:HA	1.96	0.40
3:G:80:PRO:HB2	3:G:104:GLN:O	2.21	0.40
6:I:62:DG:H2'	6:I:63:DG:C8	2.56	0.40
5:S:78:DT:O2	6:T:-78:DA:C2	2.74	0.40
6:T:-32:DC:H2''	6:T:-31:DA:OP2	2.22	0.40
1:A:107:THR:HG21	1:A:124:ILE:HG13	2.03	0.40
3:C:107:VAL:HG11	1:E:101:VAL:HG11	2.02	0.40
6:I:76:DA:H1'	6:I:77:DA:C8	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	A	96/136 (71%)	88 (92%)	8 (8%)	0	100	100
1	E	96/136 (71%)	92 (96%)	4 (4%)	0	100	100
1	K	96/136 (71%)	91 (95%)	5 (5%)	0	100	100
1	O	96/136 (71%)	90 (94%)	6 (6%)	0	100	100
2	B	77/103 (75%)	69 (90%)	8 (10%)	0	100	100
2	F	77/103 (75%)	71 (92%)	6 (8%)	0	100	100
2	L	77/103 (75%)	73 (95%)	4 (5%)	0	100	100
2	P	78/103 (76%)	75 (96%)	3 (4%)	0	100	100
3	C	103/130 (79%)	96 (93%)	7 (7%)	0	100	100
3	G	103/130 (79%)	93 (90%)	10 (10%)	0	100	100
3	M	103/130 (79%)	95 (92%)	7 (7%)	1 (1%)	15	53
3	Q	103/130 (79%)	96 (93%)	7 (7%)	0	100	100
4	D	94/126 (75%)	86 (92%)	7 (7%)	1 (1%)	14	50
4	H	94/126 (75%)	84 (89%)	6 (6%)	4 (4%)	2	15
4	N	94/126 (75%)	81 (86%)	12 (13%)	1 (1%)	14	50
4	R	94/126 (75%)	83 (88%)	8 (8%)	3 (3%)	4	22
All	All	1481/1980 (75%)	1363 (92%)	108 (7%)	10 (1%)	22	60

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	R	32	SER
4	R	33	ARG
4	H	33	ARG
4	H	124	ALA
4	H	32	SER
4	H	104	GLY

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Mol	Chain	Res	Type
4	D	104	GLY
4	N	54	ILE
3	M	117	PRO
4	R	104	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	Percentiles
1	A	85/111 (77%)	82 (96%)	3 (4%)	36 71
1	E	85/111 (77%)	83 (98%)	2 (2%)	49 79
1	K	85/111 (77%)	83 (98%)	2 (2%)	49 79
1	O	85/111 (77%)	82 (96%)	3 (4%)	36 71
2	B	64/79 (81%)	61 (95%)	3 (5%)	26 63
2	F	64/79 (81%)	62 (97%)	2 (3%)	40 75
2	L	64/79 (81%)	62 (97%)	2 (3%)	40 75
2	P	65/79 (82%)	63 (97%)	2 (3%)	40 75
3	C	83/100 (83%)	79 (95%)	4 (5%)	25 62
3	G	83/100 (83%)	77 (93%)	6 (7%)	14 45
3	M	83/100 (83%)	79 (95%)	4 (5%)	25 62
3	Q	83/100 (83%)	75 (90%)	8 (10%)	8 32
4	D	82/105 (78%)	75 (92%)	7 (8%)	10 38
4	H	82/105 (78%)	76 (93%)	6 (7%)	14 44
4	N	82/105 (78%)	77 (94%)	5 (6%)	18 53
4	R	82/105 (78%)	76 (93%)	6 (7%)	14 44
All	All	1257/1580 (80%)	1192 (95%)	65 (5%)	23 59

All (65) residues with a non-rotameric sidechain are listed below:



Mol	Chain	Res	Type
1	K	63	ARG
1	K	129	ARG
2	L	59	LYS
2	L	95	ARG
3	M	15	LYS
3	M	24	GLN
3	M	81	ARG
3	M	118	LYS
4	N	32	SER
4	N	85	LYS
4	N	86	ARG
4	N	91	SER
4	N	122	THR
1	O	48	LEU
1	O	129	ARG
1	O	134	ARG
2	P	23	ARG
2	P	27	GLN
3	Q	15	LYS
3	Q	24	GLN
3	Q	29	ARG
3	Q	73	ASN
3	Q	74	LYS
3	Q	76	THR
3	Q	81	ARG
3	Q	118	LYS
4	R	31	ARG
4	R	42	TYR
4	R	46	LYS
4	R	52	THR
4	R	80	LEU
4	R	85	LYS
1	A	63	ARG
1	A	118	THR
1	A	129	ARG
2	B	24	ASP
2	B	59	LYS
2	B	95	ARG
3	C	15	LYS
3	C	24	GLN
3	C	36	LYS
3	C	81	ARG
4	D	42	TYR

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
4	D	56	SER
4	D	63	ASN
4	D	85	LYS
4	D	86	ARG
4	D	112	SER
4	D	122	THR
1	E	48	LEU
1	E	129	ARG
2	F	64	ASN
2	F	92	ARG
3	G	15	LYS
3	G	19	SER
3	G	29	ARG
3	G	74	LYS
3	G	81	ARG
3	G	118	LYS
4	H	31	ARG
4	H	48	VAL
4	H	80	LEU
4	H	85	LYS
4	H	109	HIS
4	H	123	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (17) such sidechains are listed below:

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
3	M	24	GLN
4	N	47	GLN
4	N	95	GLN
4	N	109	HIS
1	O	108	ASN
3	Q	24	GLN
3	Q	31	HIS
4	R	47	GLN
4	R	95	GLN
4	D	95	GLN
1	E	76	GLN
2	F	64	ASN
2	F	93	GLN
3	G	31	HIS
3	G	104	GLN
4	H	47	GLN

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Mol	Chain	Res	Type
4	H	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](#)

Of 17 ligands modelled in this entry, 17 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	98/136 (72%)	-0.39	0 <span style="border: 1px solid blue; padding: 2px;">100</span> <span style="border: 1px solid blue; padding: 2px;">100</span>	69, 99, 146, 167	0
1	E	98/136 (72%)	-0.44	2 (2%) <span style="border: 1px solid red; padding: 2px;">65</span> <span style="border: 1px solid red; padding: 2px;">36</span>	57, 81, 138, 155	0
1	K	98/136 (72%)	-0.53	0 <span style="border: 1px solid blue; padding: 2px;">100</span> <span style="border: 1px solid blue; padding: 2px;">100</span>	54, 74, 108, 143	0
1	O	98/136 (72%)	-0.41	0 <span style="border: 1px solid blue; padding: 2px;">100</span> <span style="border: 1px solid blue; padding: 2px;">100</span>	65, 84, 120, 137	0
2	B	79/103 (76%)	-0.34	0 <span style="border: 1px solid blue; padding: 2px;">100</span> <span style="border: 1px solid blue; padding: 2px;">100</span>	71, 92, 123, 151	0
2	F	79/103 (76%)	-0.48	0 <span style="border: 1px solid blue; padding: 2px;">100</span> <span style="border: 1px solid blue; padding: 2px;">100</span>	59, 80, 132, 166	0
2	L	79/103 (76%)	-0.43	0 <span style="border: 1px solid blue; padding: 2px;">100</span> <span style="border: 1px solid blue; padding: 2px;">100</span>	58, 71, 94, 129	0
2	P	80/103 (77%)	-0.29	1 (1%) <span style="border: 1px solid blue; padding: 2px;">77</span> <span style="border: 1px solid blue; padding: 2px;">51</span>	66, 82, 112, 177	0
3	C	105/130 (80%)	-0.41	0 <span style="border: 1px solid blue; padding: 2px;">100</span> <span style="border: 1px solid blue; padding: 2px;">100</span>	58, 80, 132, 177	0
3	G	105/130 (80%)	0.08	5 (4%) <span style="border: 1px solid red; padding: 2px;">30</span> <span style="border: 1px solid red; padding: 2px;">11</span>	80, 107, 151, 212	0
3	M	105/130 (80%)	-0.32	0 <span style="border: 1px solid blue; padding: 2px;">100</span> <span style="border: 1px solid blue; padding: 2px;">100</span>	68, 93, 136, 169	0
3	Q	105/130 (80%)	-0.46	1 (0%) <span style="border: 1px solid blue; padding: 2px;">82</span> <span style="border: 1px solid blue; padding: 2px;">59</span>	56, 81, 122, 166	0
4	D	96/126 (76%)	-0.26	2 (2%) <span style="border: 1px solid blue; padding: 2px;">63</span> <span style="border: 1px solid red; padding: 2px;">34</span>	61, 80, 154, 182	0
4	H	96/126 (76%)	-0.03	6 (6%) <span style="border: 1px solid red; padding: 2px;">20</span> <span style="border: 1px solid red; padding: 2px;">6</span>	74, 108, 169, 199	0
4	N	96/126 (76%)	-0.20	3 (3%) <span style="border: 1px solid blue; padding: 2px;">49</span> <span style="border: 1px solid red; padding: 2px;">21</span>	67, 96, 153, 196	0
4	R	96/126 (76%)	-0.18	4 (4%) <span style="border: 1px solid blue; padding: 2px;">36</span> <span style="border: 1px solid red; padding: 2px;">14</span>	61, 86, 152, 209	0
5	J	169/169 (100%)	-0.56	0 <span style="border: 1px solid blue; padding: 2px;">100</span> <span style="border: 1px solid blue; padding: 2px;">100</span>	104, 167, 227, 291	0
5	S	169/169 (100%)	-0.71	0 <span style="border: 1px solid blue; padding: 2px;">100</span> <span style="border: 1px solid blue; padding: 2px;">100</span>	74, 142, 239, 301	0
6	I	169/169 (100%)	-0.48	0 <span style="border: 1px solid blue; padding: 2px;">100</span> <span style="border: 1px solid blue; padding: 2px;">100</span>	97, 167, 229, 274	0
6	T	169/169 (100%)	-0.82	0 <span style="border: 1px solid blue; padding: 2px;">100</span> <span style="border: 1px solid blue; padding: 2px;">100</span>	76, 143, 226, 277	0
All	All	2189/2656 (82%)	-0.42	24 (1%) <span style="border: 1px solid blue; padding: 2px;">80</span> <span style="border: 1px solid blue; padding: 2px;">56</span>	54, 99, 200, 301	0

All (24) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	G	14	ALA	10.7
3	G	15	LYS	10.3
4	R	125	LYS	7.4
4	R	31	ARG	7.0
4	H	31	ARG	6.6
4	H	125	LYS	6.6
4	R	30	LYS	6.2
4	N	31	ARG	5.0
4	H	32	SER	4.7
4	D	125	LYS	3.9
4	H	30	LYS	3.7
3	G	18	SER	3.6
3	G	17	ARG	3.3
4	N	125	LYS	3.2
4	N	30	LYS	3.1
4	H	124	ALA	3.0
4	R	124	ALA	3.0
1	E	135	ALA	2.8
3	Q	14	ALA	2.7
3	G	16	THR	2.6
1	E	39	HIS	2.5
2	P	24	ASP	2.4
4	D	31	ARG	2.3
4	H	123	SER	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](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
7	CA	T	102	1/1	0.51	0.13	125,125,125,125	0
7	CA	S	105	1/1	0.75	0.21	123,123,123,123	0
8	K	J	103	1/1	0.76	0.27	123,123,123,123	0
7	CA	T	101	1/1	0.80	0.15	134,134,134,134	0
7	CA	I	102	1/1	0.86	0.09	135,135,135,135	0
8	K	I	105	1/1	0.90	0.09	114,114,114,114	0
7	CA	S	101	1/1	0.90	0.07	150,150,150,150	0
8	K	T	104	1/1	0.92	0.04	127,127,127,127	0
7	CA	J	101	1/1	0.92	0.10	129,129,129,129	0
7	CA	J	102	1/1	0.92	0.18	130,130,130,130	0
7	CA	I	103	1/1	0.93	0.07	199,199,199,199	0
7	CA	I	101	1/1	0.93	0.05	129,129,129,129	0
7	CA	S	103	1/1	0.93	0.25	114,114,114,114	0
7	CA	S	104	1/1	0.94	0.05	105,105,105,105	0
7	CA	I	104	1/1	0.95	0.19	124,124,124,124	0
7	CA	T	103	1/1	0.96	0.04	127,127,127,127	0
7	CA	S	102	1/1	0.96	0.24	121,121,121,121	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.