



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 12, 2024 – 09:18 PM EDT

PDB ID : 1G3X
Title : INTERCALATION OF AN 9ACRIDINE-PEPTIDE DRUG IN A DNA DO-DECAMER
Authors : Malinina, L.; Soler-Lopez, M.; Aymami, J.; Subirana, J.A.
Deposited on : 2000-10-25
Resolution : 2.70 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 types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36.2

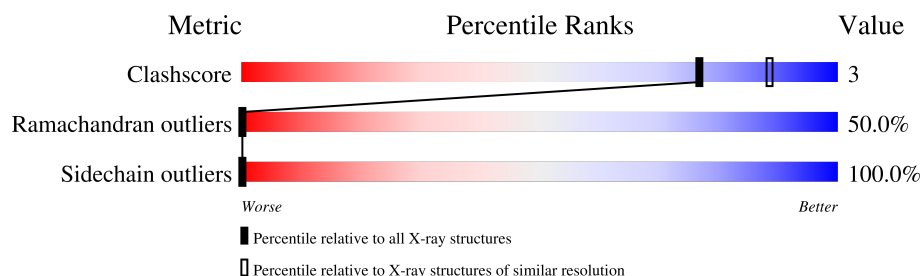
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.70 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	3122 (2.70-2.70)
Ramachandran outliers	138981	3069 (2.70-2.70)
Sidechain outliers	138945	3069 (2.70-2.70)


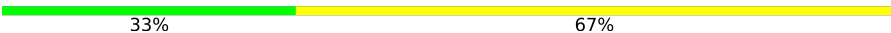
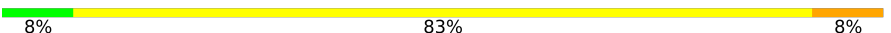


The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. 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 $\leq 5\%$.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	12	<div> <div style="width: 33%; background-color: green;"></div> <div style="width: 67%; background-color: yellow;"></div> </div> <div>33% 67%</div>
1	B	12	<div> <div style="width: 67%; background-color: yellow;"></div> <div style="width: 33%; background-color: orange;"></div> </div> <div>67% 33%</div>
1	C	12	<div> <div style="width: 25%; background-color: green;"></div> <div style="width: 58%; background-color: yellow;"></div> <div style="width: 17%; background-color: orange;"></div> </div> <div>25% 58% 17%</div>
1	D	12	<div> <div style="width: 25%; background-color: green;"></div> <div style="width: 75%; background-color: yellow;"></div> </div> <div>25% 75%</div>
1	E	12	<div> <div style="width: 25%; background-color: green;"></div> <div style="width: 58%; background-color: yellow;"></div> <div style="width: 17%; background-color: orange;"></div> </div> <div>25% 58% 17%</div>
1	F	12	<div> <div style="width: 25%; background-color: green;"></div> <div style="width: 75%; background-color: yellow;"></div> </div> <div>25% 75%</div>
1	G	12	<div> <div style="width: 25%; background-color: green;"></div> <div style="width: 58%; background-color: yellow;"></div> <div style="width: 8%; background-color: orange;"></div> <div style="width: 8%; background-color: grey;"></div> </div> <div>25% 58% 8% 8%</div>
1	H	12	<div> <div style="width: 33%; background-color: green;"></div> <div style="width: 58%; background-color: yellow;"></div> <div style="width: 8%; background-color: orange;"></div> </div> <div>33% 58% 8%</div>

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Mol	Chain	Length	Quality of chain
1	I	12	
1	J	12	
1	K	12	
1	L	12	
2	M	5	

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 3055 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 DNA chain called 5'-D(*CP*GP*CP*GP*AP*AP*TP*TP*CP*GP*CP*G)-3'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	12	Total	C	N	O	P	0	0	0
			243	116	46	70	11			
1	B	12	Total	C	N	O	P	0	0	0
			243	116	46	70	11			
1	C	12	Total	C	N	O	P	0	0	0
			243	116	46	70	11			
1	D	12	Total	C	N	O	P	0	0	0
			243	116	46	70	11			
1	E	12	Total	C	N	O	P	0	0	0
			243	116	46	70	11			
1	F	12	Total	C	N	O	P	0	0	0
			243	116	46	70	11			
1	G	11	Total	C	N	O	P	0	0	0
			224	107	43	64	10			
1	H	12	Total	C	N	O	P	0	0	0
			243	116	46	70	11			
1	I	12	Total	C	N	O	P	0	0	0
			243	116	46	70	11			
1	J	12	Total	C	N	O	P	0	0	0
			243	116	46	70	11			
1	K	12	Total	C	N	O	P	0	0	0
			243	116	46	70	11			
1	L	12	Total	C	N	O	P	0	0	0
			243	116	46	70	11			

- Molecule 2 is a protein called N(ALPHA)-(9-ACRIDINOYL)-TETRAARGININE-AMIDE.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	M	5	Total	C	N	O	0	0	0
			48	35	8	5			

- Molecule 3 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total Mg 1 1	0	0
3	B	1	Total Mg 1 1	0	0
3	G	1	Total Mg 1 1	0	0
3	J	1	Total Mg 1 1	0	0
3	K	2	Total Mg 2 2	0	0
3	L	1	Total Mg 1 1	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	11	Total O 11 11	0	0
4	B	16	Total O 16 16	1	0
4	C	3	Total O 3 3	0	0
4	D	5	Total O 5 5	0	0
4	E	8	Total O 8 8	0	0
4	F	3	Total O 3 3	0	0
4	G	9	Total O 9 9	0	0
4	H	2	Total O 2 2	0	0
4	I	7	Total O 7 7	0	0
4	J	10	Total O 10 10	0	0
4	K	11	Total O 11 11	1	0
4	L	17	Total O 17 17	1	0
4	M	1	Total O 1 1	0	0

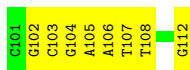
3 Residue-property plots [i](#)

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. 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.

Note EDS was not executed.

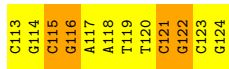
- Molecule 1: 5'-D(*CP*GP*CP*GP*AP*AP*TP*TP*CP*GP*CP*G)-3'

Chain A: 



- Molecule 1: 5'-D(*CP*GP*CP*GP*AP*AP*TP*TP*CP*GP*CP*G)-3'

Chain B: 



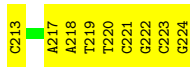
- Molecule 1: 5'-D(*CP*GP*CP*GP*AP*AP*TP*TP*CP*GP*CP*G)-3'

Chain C: 



- Molecule 1: 5'-D(*CP*GP*CP*GP*AP*AP*TP*TP*CP*GP*CP*G)-3'

Chain D: 



- Molecule 1: 5'-D(*CP*GP*CP*GP*AP*AP*TP*TP*CP*GP*CP*G)-3'

Chain E: 



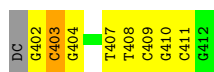
- Molecule 1: 5'-D(*CP*GP*CP*GP*AP*AP*TP*TP*CP*GP*CP*G)-3'

Chain F: 



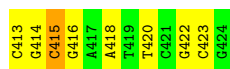
- Molecule 1: 5'-D(*CP*GP*CP*GP*AP*AP*TP*TP*CP*GP*CP*G)-3'

Chain G:



- Molecule 1: 5'-D(*CP*GP*CP*GP*AP*AP*TP*TP*CP*GP*CP*G)-3'

Chain H:



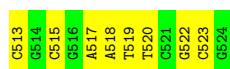
- Molecule 1: 5'-D(*CP*GP*CP*GP*AP*AP*TP*TP*CP*GP*CP*G)-3'

Chain I:



- Molecule 1: 5'-D(*CP*GP*CP*GP*AP*AP*TP*TP*CP*GP*CP*G)-3'

Chain J:



- Molecule 1: 5'-D(*CP*GP*CP*GP*AP*AP*TP*TP*CP*GP*CP*G)-3'

Chain K:



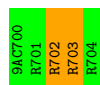
- Molecule 1: 5'-D(*CP*GP*CP*GP*AP*AP*TP*TP*CP*GP*CP*G)-3'

Chain L:



- Molecule 2: N(ALPHA)-(9-ACRIDINOYL)-TETRAARGININE-AMIDE

Chain M:



4 Data and refinement statistics

Xtriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	66.47 Å 68.36 Å 77.36 Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 2.70	Depositor
% Data completeness (in resolution range)	89.0 (20.00-2.70)	Depositor
R_{merge}	0.05	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	REFMAC 5.0	Depositor
R, R_{free}	0.220 , 0.266	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	3055	wwPDB-VP
Average B, all atoms (Å ²)	37.0	wwPDB-VP

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 9AC, MG

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	1.23	0/272	1.89	10/418 (2.4%)
1	B	1.23	0/272	2.29	22/418 (5.3%)
1	C	1.31	0/272	2.09	13/418 (3.1%)
1	D	1.25	0/272	2.01	13/418 (3.1%)
1	E	1.29	0/272	2.10	15/418 (3.6%)
1	F	1.14	0/272	2.05	13/418 (3.1%)
1	G	1.35	2/251 (0.8%)	2.20	14/386 (3.6%)
1	H	1.27	0/272	1.98	12/418 (2.9%)
1	I	1.19	0/272	2.15	21/418 (5.0%)
1	J	1.13	0/272	2.14	13/418 (3.1%)
1	K	1.27	0/272	2.59	25/418 (6.0%)
1	L	1.14	0/272	2.09	11/418 (2.6%)
2	M	0.76	0/31	0.97	0/38
All	All	1.23	2/3274 (0.1%)	2.13	182/5022 (3.6%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	G	403	DC	N1-C6	-5.85	1.33	1.37
1	G	410	DG	C3'-O3'	-5.14	1.37	1.44

All (182) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	123	DC	O4'-C1'-N1	13.03	117.12	108.00
1	L	617	DA	O4'-C1'-N9	-12.15	99.50	108.00
1	K	603	DC	O4'-C1'-N1	-11.43	100.00	108.00
1	K	606	DA	O4'-C1'-C2'	-10.96	97.13	105.90
1	F	324	DG	O4'-C4'-C3'	-10.27	99.84	106.00
1	K	604	DG	P-O3'-C3'	10.22	131.96	119.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	K	601	DC	O4'-C1'-N1	-10.08	100.95	108.00
1	D	213	DC	O4'-C1'-N1	-9.66	101.24	108.00
1	I	509	DC	P-O3'-C3'	9.04	130.55	119.70
1	B	117	DA	O4'-C1'-N9	-9.03	101.68	108.00
1	J	513	DC	O4'-C1'-N1	8.76	114.13	108.00
1	J	519	DT	O4'-C1'-C2'	-8.71	98.93	105.90
1	B	122	DG	O4'-C1'-N9	8.69	114.08	108.00
1	L	614	DG	P-O3'-C3'	8.65	130.09	119.70
1	D	217	DA	O4'-C1'-N9	-8.28	102.21	108.00
1	C	208	DT	N3-C4-O4	8.23	124.83	119.90
1	C	206	DA	O4'-C1'-N9	-8.20	102.26	108.00
1	L	619	DT	O4'-C4'-C3'	-8.19	101.09	106.00
1	G	402	DG	C3'-C2'-C1'	8.15	112.28	102.50
1	B	124	DG	O4'-C4'-C3'	-8.11	101.14	106.00
1	H	418	DA	O4'-C1'-N9	-8.01	102.39	108.00
1	D	220	DT	P-O3'-C3'	8.00	129.30	119.70
1	J	518	DA	O4'-C1'-N9	-7.96	102.43	108.00
1	K	601	DC	N1-C2-O2	7.96	123.67	118.90
1	C	212	DG	O4'-C1'-N9	7.93	113.55	108.00
1	K	605	DA	P-O3'-C3'	-7.91	110.21	119.70
1	C	208	DT	C5-C4-O4	-7.89	119.38	124.90
1	E	301	DC	O4'-C1'-N1	7.85	113.49	108.00
1	K	606	DA	O4'-C1'-N9	-7.83	102.52	108.00
1	K	602	DG	C5-C6-O6	-7.73	123.96	128.60
1	K	601	DC	N1-C1'-C2'	7.72	127.27	112.60
1	A	102	DG	O4'-C1'-C2'	-7.68	99.76	105.90
1	L	619	DT	C5-C4-O4	-7.66	119.53	124.90
1	F	313	DC	N1-C2-O2	7.64	123.49	118.90
1	J	520	DT	O4'-C1'-N1	-7.64	102.65	108.00
1	B	119	DT	O4'-C1'-C2'	-7.63	99.80	105.90
1	K	601	DC	C2-N1-C1'	7.59	127.15	118.80
1	I	508	DT	N3-C4-O4	7.57	124.44	119.90
1	F	313	DC	C5-C6-N1	7.46	124.73	121.00
1	B	114	DG	P-O3'-C3'	7.39	128.57	119.70
1	L	615	DC	O4'-C1'-C2'	-7.29	100.07	105.90
1	C	203	DC	C1'-O4'-C4'	-7.10	103.00	110.10
1	K	607	DT	O4'-C1'-C2'	-7.09	100.23	105.90
1	E	302	DG	C4'-C3'-C2'	-6.97	96.83	103.10
1	A	107	DT	O4'-C1'-C2'	-6.93	100.35	105.90
1	J	517	DA	O4'-C1'-C2'	-6.88	100.39	105.90
1	A	112	DG	O4'-C1'-N9	6.86	112.80	108.00
1	E	306	DA	O4'-C1'-N9	-6.84	103.21	108.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	J	522	DG	N3-C4-N9	-6.84	121.90	126.00
1	I	502	DG	C3'-C2'-C1'	6.81	110.68	102.50
1	H	418	DA	O4'-C1'-C2'	-6.79	100.47	105.90
1	E	312	DG	N3-C4-N9	-6.70	121.98	126.00
1	H	415	DC	O4'-C4'-C3'	-6.67	101.83	104.50
1	K	603	DC	N3-C2-O2	-6.64	117.25	121.90
1	B	114	DG	O4'-C1'-N9	-6.62	103.36	108.00
1	F	317	DA	O4'-C1'-N9	-6.62	103.36	108.00
1	I	508	DT	C5-C4-O4	-6.58	120.29	124.90
1	I	507	DT	C6-C5-C7	-6.58	118.95	122.90
1	C	212	DG	C3'-C2'-C1'	-6.57	94.61	102.50
1	H	414	DG	O4'-C1'-N9	-6.56	103.41	108.00
1	J	517	DA	C3'-C2'-C1'	-6.54	94.65	102.50
1	E	307	DT	O4'-C1'-C2'	-6.54	100.67	105.90
1	I	501	DC	C4'-C3'-C2'	-6.51	97.24	103.10
1	C	212	DG	O4'-C1'-C2'	-6.51	100.69	105.90
1	H	423	DC	O4'-C1'-N1	6.46	112.52	108.00
1	L	619	DT	N3-C4-O4	6.45	123.77	119.90
1	E	304	DG	P-O3'-C3'	6.36	127.33	119.70
1	B	113	DC	O4'-C1'-N1	-6.36	103.55	108.00
1	K	601	DC	C6-N1-C1'	-6.31	113.22	120.80
1	F	322	DG	O4'-C1'-N9	6.29	112.40	108.00
1	I	504	DG	C5-C6-O6	-6.28	124.83	128.60
1	G	403	DC	C5-C6-N1	6.24	124.12	121.00
1	E	312	DG	N3-C4-C5	6.23	131.71	128.60
1	I	501	DC	O4'-C1'-N1	6.22	112.35	108.00
1	I	503	DC	C2-N1-C1'	6.21	125.63	118.80
1	G	407	DT	P-O3'-C3'	6.15	127.08	119.70
1	K	610	DG	C3'-C2'-C1'	-6.11	95.17	102.50
1	B	123	DC	N1-C1'-C2'	-6.08	101.04	112.60
1	B	121	DC	P-O3'-C3'	-6.08	112.40	119.70
1	B	121	DC	P-O5'-C5'	-6.05	111.22	120.90
1	C	211	DC	O4'-C1'-N1	-6.04	103.77	108.00
1	B	121	DC	O4'-C1'-N1	6.03	112.22	108.00
1	K	612	DG	N3-C4-C5	-6.02	125.59	128.60
1	G	411	DC	O4'-C1'-N1	-6.01	103.79	108.00
1	B	122	DG	C3'-C2'-C1'	-6.00	95.30	102.50
1	A	108	DT	C4-C5-C7	6.00	122.60	119.00
1	J	523	DC	O4'-C4'-C3'	-6.00	102.10	104.50
1	A	108	DT	O4'-C1'-C2'	-5.99	101.11	105.90
1	I	503	DC	N1-C2-O2	5.95	122.47	118.90
1	A	107	DT	N3-C4-O4	5.91	123.45	119.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	108	DT	C1'-O4'-C4'	-5.91	104.19	110.10
1	K	608	DT	N3-C4-O4	5.89	123.43	119.90
1	D	224	DG	O4'-C1'-N9	5.87	112.11	108.00
1	G	407	DT	C5-C4-O4	-5.86	120.80	124.90
1	H	414	DG	C5-C6-O6	-5.82	125.11	128.60
1	G	403	DC	C6-N1-C2	-5.79	117.98	120.30
1	D	219	DT	O4'-C4'-C3'	5.75	109.45	106.00
1	E	308	DT	N3-C4-O4	5.74	123.35	119.90
1	I	504	DG	C6-C5-N7	-5.73	126.96	130.40
1	G	410	DG	O4'-C1'-N9	-5.73	103.99	108.00
1	B	120	DT	P-O3'-C3'	5.70	126.54	119.70
1	K	602	DG	C3'-C2'-C1'	5.70	109.33	102.50
1	H	413	DC	O4'-C4'-C3'	5.69	109.41	106.00
1	L	620	DT	N3-C4-O4	5.67	123.30	119.90
1	L	615	DC	P-O3'-C3'	5.66	126.50	119.70
1	G	408	DT	P-O3'-C3'	5.65	126.48	119.70
1	F	315	DC	O4'-C4'-C3'	-5.65	102.24	104.50
1	F	317	DA	O4'-C1'-C2'	-5.64	101.39	105.90
1	C	212	DG	C1'-O4'-C4'	-5.63	104.47	110.10
1	G	403	DC	N1-C1'-C2'	5.61	123.26	112.60
1	G	402	DG	O4'-C4'-C3'	5.61	109.36	106.00
1	E	308	DT	O4'-C1'-N1	-5.59	104.09	108.00
1	D	224	DG	C1'-O4'-C4'	-5.56	104.54	110.10
1	B	115	DC	O4'-C4'-C3'	-5.54	102.28	104.50
1	H	423	DC	O4'-C1'-C2'	-5.54	101.47	105.90
1	H	420	DT	O4'-C1'-N1	-5.54	104.12	108.00
1	I	502	DG	O4'-C1'-N9	5.50	111.85	108.00
1	D	218	DA	O4'-C1'-C2'	-5.50	101.50	105.90
1	D	223	DC	C6-N1-C2	5.50	122.50	120.30
1	F	320	DT	N3-C4-O4	5.48	123.19	119.90
1	K	605	DA	O4'-C1'-N9	5.48	111.84	108.00
1	L	613	DC	O4'-C1'-N1	-5.48	104.17	108.00
1	J	515	DC	O4'-C1'-C2'	-5.45	101.54	105.90
1	I	502	DG	N9-C1'-C2'	-5.45	102.25	112.60
1	D	221	DC	O3'-P-O5'	-5.44	93.66	104.00
1	K	606	DA	O5'-P-OP2	-5.44	100.81	105.70
1	E	310	DG	C3'-C2'-C1'	-5.43	95.98	102.50
1	K	602	DG	C5-C6-N1	5.42	114.21	111.50
1	K	601	DC	O4'-C1'-C2'	-5.42	101.56	105.90
1	K	608	DT	C5-C4-O4	-5.42	121.11	124.90
1	A	112	DG	C5-C6-O6	-5.41	125.35	128.60
1	A	108	DT	C6-C5-C7	-5.38	119.67	122.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	I	510	DG	C3'-C2'-C1'	-5.34	96.09	102.50
1	E	302	DG	O4'-C1'-C2'	-5.34	101.63	105.90
1	J	515	DC	P-O3'-C3'	5.34	126.11	119.70
1	H	415	DC	O4'-C1'-N1	-5.32	104.27	108.00
1	E	303	DC	O4'-C1'-N1	5.32	111.72	108.00
1	I	503	DC	N3-C4-C5	-5.31	119.77	121.90
1	I	503	DC	C5-C6-N1	5.31	123.65	121.00
1	C	203	DC	O4'-C4'-C3'	-5.31	102.38	104.50
1	D	223	DC	O4'-C1'-C2'	5.29	110.13	105.90
1	D	222	DG	C3'-C2'-C1'	-5.27	96.18	102.50
1	L	623	DC	C5-C4-N4	-5.26	116.52	120.20
1	B	116	DG	C5-C6-O6	5.25	131.75	128.60
1	D	222	DG	O4'-C1'-N9	-5.25	104.32	108.00
1	K	603	DC	C2-N3-C4	-5.25	117.28	119.90
1	J	522	DG	C8-N9-C1'	5.23	133.80	127.00
1	B	123	DC	C3'-C2'-C1'	5.22	108.77	102.50
1	I	502	DG	O4'-C4'-C3'	5.22	109.13	106.00
1	C	208	DT	C3'-C2'-C1'	-5.21	96.24	102.50
1	E	308	DT	C5-C4-O4	-5.21	121.25	124.90
1	C	210	DG	O4'-C1'-C2'	-5.21	101.74	105.90
1	H	414	DG	C6-N1-C2	-5.20	121.98	125.10
1	B	118	DA	O4'-C1'-C2'	-5.20	101.74	105.90
1	F	323	DC	P-O3'-C3'	5.18	125.92	119.70
1	B	120	DT	P-O5'-C5'	-5.17	112.62	120.90
1	G	409	DC	C6-N1-C2	5.17	122.37	120.30
1	I	505	DA	O4'-C1'-N9	5.16	111.61	108.00
1	B	121	DC	C3'-C2'-C1'	-5.14	96.33	102.50
1	D	220	DT	N3-C4-O4	5.14	122.99	119.90
1	C	204	DG	C5-C6-O6	-5.14	125.52	128.60
1	I	503	DC	C2-N3-C4	5.14	122.47	119.90
1	F	313	DC	C2-N3-C4	5.14	122.47	119.90
1	I	512	DG	C8-N9-C4	-5.14	104.34	106.40
1	F	319	DT	N3-C4-O4	5.13	122.98	119.90
1	H	422	DG	P-O3'-C3'	5.13	125.86	119.70
1	J	522	DG	C4-N9-C1'	-5.12	119.84	126.50
1	B	119	DT	O4'-C1'-N1	-5.08	104.44	108.00
1	E	310	DG	C1'-O4'-C4'	-5.08	105.02	110.10
1	K	608	DT	P-O3'-C3'	5.07	125.78	119.70
1	F	313	DC	C6-N1-C2	-5.05	118.28	120.30
1	F	316	DG	O4'-C1'-N9	5.05	111.53	108.00
1	G	409	DC	N3-C2-O2	5.05	125.43	121.90
1	A	107	DT	C1'-O4'-C4'	-5.05	105.05	110.10

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	K	603	DC	N1-C2-N3	5.05	122.73	119.20
1	G	408	DT	C4-C5-C7	5.04	122.02	119.00
1	I	501	DC	O4'-C1'-C2'	-5.03	101.87	105.90
1	E	301	DC	C4'-C3'-C2'	-5.01	98.59	103.10
1	B	122	DG	C5-C6-O6	-5.01	125.59	128.60
1	G	408	DT	N3-C2-O2	5.01	125.31	122.30
1	L	614	DG	O4'-C1'-C2'	5.00	109.90	105.90
1	J	515	DC	C2-N1-C1'	5.00	124.31	118.80

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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	243	0	136	2	0
1	B	243	0	136	2	0
1	C	243	0	136	2	0
1	D	243	0	136	0	0
1	E	243	0	136	1	0
1	F	243	0	136	0	0
1	G	224	0	125	1	0
1	H	243	0	136	1	0
1	I	243	0	136	3	0
1	J	243	0	136	0	0
1	K	243	0	136	1	0
1	L	243	0	136	0	0
2	M	48	0	38	1	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
3	G	1	0	0	0	0
3	J	1	0	0	0	0
3	K	2	0	0	0	0
3	L	1	0	0	0	0
4	A	11	0	0	0	0
4	B	16	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	C	3	0	0	0	0
4	D	5	0	0	0	0
4	E	8	0	0	0	0
4	F	3	0	0	0	0
4	G	9	0	0	0	0
4	H	2	0	0	0	0
4	I	7	0	0	0	0
4	J	10	0	0	0	0
4	K	11	0	0	0	0
4	L	17	0	0	0	0
4	M	1	0	0	0	0
All	All	3055	0	1659	14	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 3.

All (14) 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:G:403:DC:H2'	1:G:404:DG:C8	2.27	0.69
1:H:415:DC:H2'	1:H:416:DG:C8	2.35	0.61
1:I:503:DC:H2'	1:I:504:DG:C8	2.43	0.54
1:B:115:DC:H2'	1:B:116:DG:C8	2.43	0.53
1:K:611:DC:H2''	1:K:612:DG:H5''	1.96	0.47
1:C:204:DG:H1'	1:C:205:DA:H5'	1.97	0.45
1:I:501:DC:H2''	1:I:502:DG:C8	2.52	0.44
1:I:511:DC:H2''	1:I:512:DG:H5''	1.99	0.44
1:C:208:DT:H1'	1:C:209:DC:H5'	2.01	0.43
1:A:103:DC:H2'	1:A:104:DG:C8	2.54	0.43
1:B:121:DC:H2''	1:B:122:DG:C8	2.55	0.42
1:E:302:DG:H2'	1:E:303:DC:O4'	2.20	0.42
2:M:702:ARG:HB3	2:M:703:ARG:H	1.63	0.41
1:A:105:DA:H1'	1:A:106:DA:H5'	2.03	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
2	M	2/5 (40%)	0	1 (50%)	1 (50%)	0 0

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	M	702	ARG

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
2	M	1/4 (25%)	0	1 (100%)	0 0

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	M	703	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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 7 ligands modelled in this entry, 7 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

6.1 Protein, DNA and RNA chains

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.