



# Full wwPDB X-ray Structure Validation Report ⓘ

Aug 13, 2017 – 10:12 AM EDT

PDB ID : 5AKM  
Title : THE CRYSTAL STRUCTURE OF I-DMOI G20S IN COMPLEX WITH ITS  
TARGET DNA IN THE PRESENCE OF 2MM MG  
Authors : Molina, R.; Marcaida, M.J.; Redondo, P.; Marenchino, M.; D'Abramo, M.;  
Montoya, G.; Prieto, J.  
Deposited on : unknown  
Resolution : 2.40 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

<http://wwpdb.org/validation/2016/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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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  
Mogul : 1.7.2 (RC1), CSD as538be (2017)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20029824  
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)  
Refmac : 5.8.0135  
CCP4 : 6.5.0  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : rb-20029824

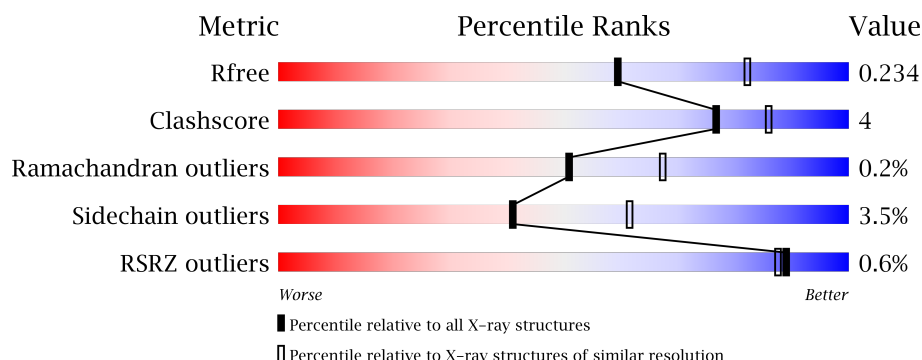
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.40 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	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	100719	3166 (2.40-2.40)
Clashscore	112137	3674 (2.40-2.40)
Ramachandran outliers	110173	3616 (2.40-2.40)
Sidechain outliers	110143	3617 (2.40-2.40)
RSRZ outliers	101464	3195 (2.40-2.40)

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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. 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	199	<div> <div style="width: 100%; height: 10px; background-color: red;"></div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 80%; height: 10px; background-color: green;"></div> <div style="width: 11%; height: 10px; background-color: yellow;"></div> <div style="width: 8%; height: 10px; background-color: orange;"></div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <span>80%</span> <span>11%</span> <span>8%</span> </div> </div>
1	F	199	<div> <div style="width: 100%; height: 10px; background-color: red;"></div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 73%; height: 10px; background-color: green;"></div> <div style="width: 14%; height: 10px; background-color: yellow;"></div> <div style="width: 13%; height: 10px; background-color: orange;"></div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <span>73%</span> <span>14%</span> <span>13%</span> </div> </div>
1	K	199	<div> <div style="width: 100%; height: 10px; background-color: green;"></div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 82%; height: 10px; background-color: green;"></div> <div style="width: 7%; height: 10px; background-color: yellow;"></div> <div style="width: 11%; height: 10px; background-color: orange;"></div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <span>82%</span> <span>7%</span> <span>11%</span> </div> </div>
2	B	14	<div> <div style="width: 100%; height: 10px; background-color: green;"></div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 79%; height: 10px; background-color: green;"></div> <div style="width: 14%; height: 10px; background-color: yellow;"></div> <div style="width: 7%; height: 10px; background-color: orange;"></div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <span>79%</span> <span>14%</span> <span>7%</span> </div> </div>
2	G	14	<div> <div style="width: 100%; height: 10px; background-color: green;"></div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 93%; height: 10px; background-color: green;"></div> <div style="width: 7%; height: 10px; background-color: yellow;"></div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <span>93%</span> <span>7%</span> </div> </div>

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Mol	Chain	Length	Quality of chain
2	L	14	 64%36%
3	C	11	 55%45%
3	H	11	 55%45%
3	M	11	 55%36%9%
4	D	15	 87%13%
4	I	15	 67%27%7%
4	N	15	 7%33%67%
5	E	10	 70%20%10%
5	J	10	 90%10%
5	O	10	 90%10%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
6	ACT	A	1188	-	-	-	X
6	ACT	A	1189	-	-	-	X

## 2 Entry composition

There are 8 unique types of molecules in this entry. The entry contains 7591 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 HOMING ENDONUCLEASE I-DMOI.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	183	Total	C	N	O	S	0	0	0
			1512	976	273	260	3			
1	F	174	Total	C	N	O	S	0	2	0
			1454	941	263	247	3			
1	K	178	Total	C	N	O	S	0	1	0
			1482	954	270	255	3			

There are 39 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	ALA	-	expression tag	UNP P21505
A	20	SER	GLY	engineered mutation	UNP P21505
A	189	ALA	-	expression tag	UNP P21505
A	190	ALA	-	expression tag	UNP P21505
A	191	ALA	-	expression tag	UNP P21505
A	192	LEU	-	expression tag	UNP P21505
A	193	GLU	-	expression tag	UNP P21505
A	194	HIS	-	expression tag	UNP P21505
A	195	HIS	-	expression tag	UNP P21505
A	196	HIS	-	expression tag	UNP P21505
A	197	HIS	-	expression tag	UNP P21505
A	198	HIS	-	expression tag	UNP P21505
A	199	HIS	-	expression tag	UNP P21505
F	1	ALA	-	expression tag	UNP P21505
F	20	SER	GLY	engineered mutation	UNP P21505
F	189	ALA	-	expression tag	UNP P21505
F	190	ALA	-	expression tag	UNP P21505
F	191	ALA	-	expression tag	UNP P21505
F	192	LEU	-	expression tag	UNP P21505
F	193	GLU	-	expression tag	UNP P21505
F	194	HIS	-	expression tag	UNP P21505
F	195	HIS	-	expression tag	UNP P21505
F	196	HIS	-	expression tag	UNP P21505

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Chain	Residue	Modelled	Actual	Comment	Reference
F	197	HIS	-	expression tag	UNP P21505
F	198	HIS	-	expression tag	UNP P21505
F	199	HIS	-	expression tag	UNP P21505
K	1	ALA	-	expression tag	UNP P21505
K	20	SER	GLY	engineered mutation	UNP P21505
K	189	ALA	-	expression tag	UNP P21505
K	190	ALA	-	expression tag	UNP P21505
K	191	ALA	-	expression tag	UNP P21505
K	192	LEU	-	expression tag	UNP P21505
K	193	GLU	-	expression tag	UNP P21505
K	194	HIS	-	expression tag	UNP P21505
K	195	HIS	-	expression tag	UNP P21505
K	196	HIS	-	expression tag	UNP P21505
K	197	HIS	-	expression tag	UNP P21505
K	198	HIS	-	expression tag	UNP P21505
K	199	HIS	-	expression tag	UNP P21505

- Molecule 2 is a DNA chain called 5'-D(\*GP\*CP\*CP\*TP\*TP\*GP\*CP\*CP\*GP\*GP\*GP\*T  
P\*AP\*AP)-3'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	14	Total	C	N	O	P	0	0	0
			285	136	53	83	13			
2	G	14	Total	C	N	O	P	0	0	0
			285	136	53	83	13			
2	L	14	Total	C	N	O	P	0	0	0
			285	136	53	83	13			

- Molecule 3 is a DNA chain called 5'-D(\*GP\*TP\*TP\*CP\*CP\*GP\*GP\*CP\*GP\*CP\*GP)-3'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	11	Total	C	N	O	P	0	0	0
			227	106	41	69	11			
3	H	11	Total	C	N	O	P	0	0	0
			227	106	41	69	11			
3	M	11	Total	C	N	O	P	0	0	0
			227	106	41	69	11			

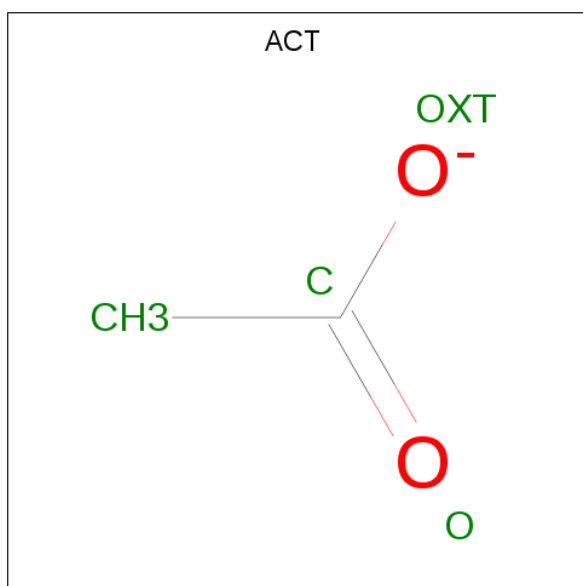
- Molecule 4 is a DNA chain called 5'-D(\*CP\*GP\*CP\*GP\*CP\*CP\*GP\*GP\*AP\*AP\*CP\*T  
P\*TP\*AP\*CP)-3'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	D	15	Total	C	N	O	P	0	0	0
			302	144	57	87	14			
4	I	15	Total	C	N	O	P	0	0	0
			302	144	57	87	14			
4	N	15	Total	C	N	O	P	0	0	0
			302	144	57	87	14			

- Molecule 5 is a DNA chain called 5'-D(\*CP\*CP\*GP\*GP\*CP\*AP\*AP\*GP\*GP\*CP)-3'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	E	10	Total	C	N	O	P	0	0	0
			207	96	42	59	10			
5	J	10	Total	C	N	O	P	0	0	0
			207	96	42	59	10			
5	O	10	Total	C	N	O	P	0	0	0
			207	96	42	59	10			

- Molecule 6 is ACETATE ION (three-letter code: ACT) (formula: C<sub>2</sub>H<sub>3</sub>O<sub>2</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total	C	O	0	0
			4	2	2		
6	A	1	Total	C	O	0	0
			4	2	2		
6	F	1	Total	C	O	0	0
			4	2	2		

- Molecule 7 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	1	Total 1	Mg 1	0	0
7	K	1	Total 1	Mg 1	0	0
7	F	2	Total 2	Mg 2	0	0

- Molecule 8 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	28	Total 28	O 28	0	0
8	B	3	Total 3	O 3	0	0
8	C	4	Total 4	O 4	0	0
8	F	9	Total 9	O 9	0	0
8	G	1	Total 1	O 1	0	0
8	I	1	Total 1	O 1	0	0
8	K	13	Total 13	O 13	0	0
8	L	2	Total 2	O 2	0	0
8	M	2	Total 2	O 2	0	0
8	N	1	Total 1	O 1	0	0

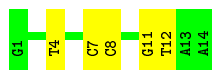






- Molecule 2: 5'-D(\*GP\*CP\*CP\*TP\*TP\*GP\*CP\*CP\*GP\*GP\*GP\*TP\*AP\*AP)-3'

Chain L: 64% 36%



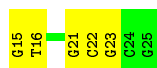
- Molecule 3: 5'-D(\*GP\*TP\*TP\*CP\*CP\*GP\*GP\*CP\*GP\*CP\*GP)-3'

Chain C: 55% 45%



- Molecule 3: 5'-D(\*GP\*TP\*TP\*CP\*CP\*GP\*GP\*CP\*GP\*CP\*GP)-3'

Chain H: 55% 45%



- Molecule 3: 5'-D(\*GP\*TP\*TP\*CP\*CP\*GP\*GP\*CP\*GP\*CP\*GP)-3'

Chain M: 55% 36% 9%



- Molecule 4: 5'-D(\*CP\*GP\*CP\*GP\*CP\*CP\*GP\*GP\*AP\*AP\*CP\*TP\*TP\*AP\*CP)-3'

Chain D: 87% 13%



- Molecule 4: 5'-D(\*CP\*GP\*CP\*GP\*CP\*CP\*GP\*GP\*AP\*AP\*CP\*TP\*TP\*AP\*CP)-3'

Chain I: 67% 27% 7%



- Molecule 4: 5'-D(\*CP\*GP\*CP\*GP\*CP\*CP\*GP\*GP\*AP\*AP\*CP\*TP\*TP\*AP\*CP)-3'

Chain N: 7% 33% 67%




- Molecule 5: 5'-D(\*CP\*CP\*GP\*GP\*CP\*AP\*AP\*GP\*GP\*CP)-3'

Chain E:  70% 20% 10%



- Molecule 5: 5'-D(\*CP\*CP\*GP\*GP\*CP\*AP\*AP\*GP\*GP\*CP)-3'

Chain J:  90% 10%



- Molecule 5: 5'-D(\*CP\*CP\*GP\*GP\*CP\*AP\*AP\*GP\*GP\*CP)-3'

Chain O:  90% 10%



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	107.39 Å   68.65 Å   107.34 Å 90.00°   119.94°   90.00°	Depositor
Resolution (Å)	46.53 – 2.40 46.53 – 2.40	Depositor EDS
% Data completeness (in resolution range)	94.0 (46.53-2.40) 95.4 (46.53-2.40)	Depositor EDS
$R_{merge}$	0.06	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.43 (at 2.39 Å)	Xtriage
Refinement program	PHENIX (PHENIX.REFINE)	Depositor
R, $R_{free}$	0.179 , 0.235 0.176 , 0.234	Depositor DCC
$R_{free}$ test set	2542 reflections (5.00%)	DCC
Wilson B-factor (Å <sup>2</sup> )	41.9	Xtriage
Anisotropy	0.453	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.35 , 54.0	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.018 for l,k,-h-l 0.018 for -h-l,k,h 0.017 for -h-l,-k,l 0.024 for h,-k,-h-l 0.018 for l,-k,h	Xtriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	7591	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	58.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.70% 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: MG, ACT

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	0.41	0/1540	0.58	0/2073
1	F	0.36	0/1485	0.52	0/1995
1	K	0.37	0/1511	0.54	0/2030
2	B	0.64	0/319	1.44	5/491 (1.0%)
2	G	0.59	0/319	1.27	0/491
2	L	0.75	0/319	1.36	4/491 (0.8%)
3	C	0.94	1/253 (0.4%)	1.38	2/387 (0.5%)
3	H	1.02	1/253 (0.4%)	1.39	1/387 (0.3%)
3	M	0.92	1/253 (0.4%)	1.54	2/387 (0.5%)
4	D	0.72	0/338	1.39	2/519 (0.4%)
4	I	0.76	0/338	1.55	6/519 (1.2%)
4	N	0.70	0/338	1.38	3/519 (0.6%)
5	E	0.95	1/232 (0.4%)	1.21	2/354 (0.6%)
5	J	0.89	1/232 (0.4%)	1.18	0/354
5	O	0.93	1/232 (0.4%)	1.23	0/354
All	All	0.60	6/7962 (0.1%)	1.02	27/11351 (0.2%)

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	H	15	DG	OP3-P	-11.05	1.47	1.61
3	M	15	DG	OP3-P	-10.86	1.48	1.61
5	E	16	DC	OP3-P	-10.85	1.48	1.61
5	O	16	DC	OP3-P	-10.58	1.48	1.61
5	J	16	DC	OP3-P	-10.24	1.48	1.61
3	C	15	DG	OP3-P	-10.13	1.49	1.61

All (27) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	M	24	DC	O4'-C1'-N1	9.82	114.87	108.00
4	D	6	DC	O4'-C1'-N1	-9.10	101.63	108.00
4	N	9	DA	O4'-C1'-N9	8.31	113.82	108.00
3	H	16	DT	O4'-C1'-N1	-8.23	102.24	108.00
4	I	6	DC	O4'-C1'-N1	-8.16	102.29	108.00
3	M	16	DT	O4'-C1'-N1	-7.54	102.72	108.00
4	I	14	DA	C3'-C2'-C1'	-7.49	93.52	102.50
3	C	16	DT	O4'-C1'-N1	-6.89	103.18	108.00
2	B	12	DT	O4'-C1'-C2'	-6.80	100.46	105.90
2	B	3	DC	O4'-C1'-N1	-6.67	103.33	108.00
2	B	1	DG	O4'-C1'-N9	-6.52	103.44	108.00
4	N	13	DT	C3'-C2'-C1'	-6.21	95.05	102.50
4	I	6	DC	C1'-O4'-C4'	-6.14	103.96	110.10
2	B	12	DT	C1'-O4'-C4'	-5.79	104.31	110.10
2	L	8	DC	O4'-C1'-N1	5.62	111.94	108.00
4	I	14	DA	C1'-O4'-C4'	-5.62	104.48	110.10
4	N	14	DA	C4'-C3'-C2'	5.52	108.07	103.10
4	D	8	DG	C1'-O4'-C4'	-5.52	104.58	110.10
2	L	12	DT	C1'-O4'-C4'	-5.49	104.61	110.10
2	L	4	DT	N3-C4-O4	5.18	123.01	119.90
3	C	17	DT	N3-C4-O4	5.17	123.00	119.90
2	L	7	DC	C1'-O4'-C4'	-5.16	104.94	110.10
4	I	14	DA	O4'-C1'-C2'	-5.14	101.79	105.90
5	E	25	DC	C1'-O4'-C4'	-5.07	105.03	110.10
4	I	9	DA	O4'-C1'-C2'	-5.07	101.85	105.90
2	B	12	DT	O4'-C1'-N1	5.05	111.54	108.00
5	E	18	DG	C1'-O4'-C4'	-5.02	105.08	110.10

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	1512	0	1588	10	0
1	F	1454	0	1539	20	0
1	K	1482	0	1552	7	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	285	0	159	1	0
2	G	285	0	159	1	0
2	L	285	0	159	1	0
3	C	227	0	124	1	0
3	H	227	0	124	2	0
3	M	227	0	124	2	0
4	D	302	0	169	0	0
4	I	302	0	169	3	0
4	N	302	0	169	4	0
5	E	207	0	111	1	0
5	J	207	0	111	2	0
5	O	207	0	111	0	0
6	A	8	0	6	1	0
6	F	4	0	3	0	0
7	A	1	0	0	0	0
7	F	2	0	0	0	0
7	K	1	0	0	0	0
8	A	28	0	0	0	0
8	B	3	0	0	0	0
8	C	4	0	0	0	0
8	F	9	0	0	0	0
8	G	1	0	0	0	0
8	I	1	0	0	0	0
8	K	13	0	0	3	0
8	L	2	0	0	0	0
8	M	2	0	0	0	0
8	N	1	0	0	0	0
All	All	7591	0	6377	47	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 4.

All (47) 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:B:1:DG:H1	5:E:25:DC:H5	1.15	0.94
2:G:10:DG:H1	5:J:16:DC:H5	1.15	0.88
1:F:120:LYS:NZ	5:J:16:DC:OP3	2.13	0.81
1:A:42:GLN:HG2	1:A:47:LEU:HD23	1.72	0.71
1:F:151:ILE:O	1:F:152[A]:HIS:ND1	2.25	0.70
1:F:33:ARG:NH1	3:H:21:DG:O6	2.23	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:60[B]:ILE:HD11	1:F:87:LEU:HD22	1.77	0.65
1:K:42:GLN:HG3	8:K:2007:HOH:O	1.95	0.65
8:K:2002:HOH:O	3:M:15:DG:OP3	2.15	0.64
1:K:111:LYS:NZ	8:K:2001:HOH:O	2.31	0.63
1:F:73:LYS:HD2	1:F:78:TYR:CZ	2.41	0.56
1:F:130:LYS:NZ	1:F:158:HIS:O	2.35	0.55
4:N:7:DG:H2''	4:N:8:DG:H5''	1.87	0.55
1:A:31:GLY:HA3	1:A:33:ARG:H	1.74	0.53
3:C:19:DC:H2'	3:C:20:DG:C8	2.47	0.49
1:K:29:TYR:HB2	1:K:33:ARG:HB2	1.95	0.49
1:K:41:THR:HB	1:K:77:ARG:HG3	1.94	0.48
4:N:11:DC:H2'	4:N:12:DT:H71	1.95	0.48
1:F:155:ASP:OD2	1:F:157:ARG:NH2	2.41	0.48
1:F:31:GLY:HA2	1:F:32:ASN:HA	1.60	0.47
1:F:41:THR:HB	1:F:77:ARG:HG3	1.97	0.46
1:F:22:GLY:HA3	1:F:39:VAL:O	2.15	0.46
1:F:158:HIS:CD2	4:I:14:DA:H2	2.34	0.46
1:A:106:GLN:O	1:A:110:ILE:HG13	2.16	0.46
1:A:183:ASN:HD21	6:A:1188:ACT:H1	1.81	0.46
1:F:29:TYR:HB2	1:F:33:ARG:HB2	1.98	0.45
1:K:49:LYS:HG2	1:K:71:ILE:HD13	1.99	0.45
1:A:136:GLU:HG2	1:A:136:GLU:H	1.66	0.45
1:F:19:ILE:HD11	1:F:95:LEU:HD22	1.98	0.45
1:F:33:ARG:HD2	4:I:4:DG:O6	2.18	0.44
1:F:16:GLY:O	1:F:20:SER:OG	2.35	0.44
1:A:9:GLY:HA3	1:A:183:ASN:CG	2.38	0.43
3:H:22:DC:H2'	3:H:23:DG:C8	2.54	0.43
1:F:160:VAL:HG21	4:I:15:DC:C5	2.52	0.43
1:F:132:LYS:HE3	1:F:161:TYR:CZ	2.54	0.42
1:A:22:GLY:HA3	1:A:39:VAL:O	2.19	0.42
1:F:60[B]:ILE:HD13	1:F:60[B]:ILE:HA	1.84	0.41
2:L:11:DG:H1	4:N:15:DC:H42	1.68	0.41
1:F:110:ILE:HG22	1:F:177:ILE:HG21	2.03	0.41
1:K:45:GLU:HB2	1:K:78:TYR:CE1	2.55	0.41
4:N:5:DC:H2''	4:N:6:DC:O5'	2.20	0.41
1:A:132:LYS:O	1:A:136:GLU:HG2	2.21	0.41
1:A:136:GLU:O	1:A:140:ARG:HG3	2.21	0.41
1:F:19:ILE:HA	1:F:19:ILE:HD13	1.79	0.41
1:K:102:ASN:O	1:K:106:GLN:HG3	2.20	0.40
1:A:46:ASN:O	1:A:47:LEU:HB3	2.21	0.40
3:M:20:DG:H2''	3:M:21:DG:O5'	2.22	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	181/199 (91%)	171 (94%)	9 (5%)	1 (1%)	28	41
1	F	174/199 (87%)	168 (97%)	6 (3%)	0	100	100
1	K	177/199 (89%)	175 (99%)	2 (1%)	0	100	100
All	All	532/597 (89%)	514 (97%)	17 (3%)	1 (0%)	51	67

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	184	PRO

### 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	167/179 (93%)	156 (93%)	11 (7%)	19	30
1	F	160/179 (89%)	157 (98%)	3 (2%)	62	80
1	K	163/179 (91%)	160 (98%)	3 (2%)	64	81
All	All	490/537 (91%)	473 (96%)	17 (4%)	41	61

All (17) residues with a non-rotameric sidechain are listed below:



Mol	Chain	Res	Type
1	A	19	ILE
1	A	32	ASN
1	A	48	ILE
1	A	77	ARG
1	A	97	ARG
1	A	103	MET
1	A	136	GLU
1	A	167	LEU
1	A	175	HIS
1	A	183	ASN
1	A	185	LEU
1	F	19	ILE
1	F	77	ARG
1	F	122	LEU
1	K	77	ARG
1	K	113	LEU
1	K	178	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	183	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](#)

Of 7 ligands modelled in this entry, 4 are monoatomic - leaving 3 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the chemical component dictionary. The Link column lists molecule types, if any, to which the group is linked. 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  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
6	ACT	A	1188	-	1,3,3	1.26	0	0,3,3	0.00	-
6	ACT	A	1189	-	1,3,3	1.34	0	0,3,3	0.00	-
6	ACT	F	1180	-	1,3,3	1.39	0	0,3,3	0.00	-

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the chemical component dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	ACT	A	1188	-	-	0/0/0/0	0/0/0/0
6	ACT	A	1189	-	-	0/0/0/0	0/0/0/0
6	ACT	F	1180	-	-	0/0/0/0	0/0/0/0

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.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	A	1188	ACT	1	0

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data

### 6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<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	183/199 (91%)	-0.25	2 (1%) 80 79	33, 46, 84, 101	0
1	F	174/199 (87%)	-0.21	1 (0%) 89 87	34, 53, 87, 105	0
1	K	178/199 (89%)	-0.22	0 100 100	32, 48, 75, 115	0
2	B	14/14 (100%)	-0.78	0 100 100	50, 63, 86, 91	0
2	G	14/14 (100%)	-0.02	0 100 100	53, 94, 108, 118	0
2	L	14/14 (100%)	-0.58	0 100 100	51, 59, 70, 88	0
3	C	11/11 (100%)	-0.72	0 100 100	39, 55, 67, 74	0
3	H	11/11 (100%)	-0.69	0 100 100	42, 50, 55, 59	0
3	M	11/11 (100%)	-0.77	0 100 100	44, 53, 64, 66	0
4	D	15/15 (100%)	-0.53	0 100 100	38, 52, 89, 92	0
4	I	15/15 (100%)	-0.73	0 100 100	39, 50, 77, 77	0
4	N	15/15 (100%)	-0.27	1 (6%) 19 17	41, 55, 89, 103	0
5	E	10/10 (100%)	-0.61	0 100 100	52, 67, 76, 82	0
5	J	10/10 (100%)	0.86	0 100 100	84, 99, 111, 113	0
5	O	10/10 (100%)	-0.66	0 100 100	56, 65, 74, 78	0
All	All	685/747 (91%)	-0.28	4 (0%) 89 87	32, 51, 89, 118	0

All (4) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	73	LYS	2.7
1	A	75	ASP	2.3
1	F	152[A]	HIS	2.0
4	N	14	DA	2.0

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

There are no non-standard protein/DNA/RNA residues in this entry.

## 6.3 Carbohydrates [i](#)

There are no carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
6	ACT	A	1189	4/4	0.71	0.32	9.82	47,47,47,47	0
6	ACT	A	1188	4/4	0.94	0.27	3.42	43,43,43,44	0
7	MG	K	1182	1/1	0.94	0.10	-0.96	63,63,63,63	0
7	MG	A	1190	1/1	0.91	0.11	-1.90	63,63,63,63	0
7	MG	F	1181	1/1	0.94	0.05	-3.57	58,58,58,58	0
7	MG	F	1182	1/1	0.90	0.10	-3.67	67,67,67,67	0
6	ACT	F	1180	4/4	0.81	0.62	-	55,56,56,57	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.