



# Full wwPDB X-ray Structure Validation Report ⓘ

Jan 31, 2016 – 10:03 PM GMT

PDB ID : 1RUN  
Title : CATABOLITE GENE ACTIVATOR PROTEIN (CAP)/DNA COMPLEX +  
ADENOSINE-3',5'-CYCLIC-MONOPHOSPHATE  
Authors : Parkinson, G.N.; Gunasekera, A.; Vojtechovsky, J.; Zhang, X.; Kunkel, T.A.;  
Berman, H.M.; Ebright, R.H.  
Deposited on : 1996-05-26  
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](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 (RC4), CSD as536be (2015)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20026688  
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)  
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) : trunk26865

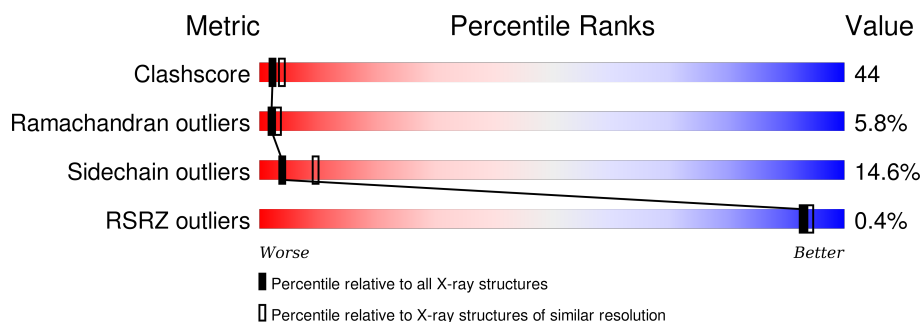
# 1 Overall quality at a glance

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	102246	2422 (2.70-2.70)
Ramachandran outliers	100387	2382 (2.70-2.70)
Sidechain outliers	100360	2382 (2.70-2.70)
RSRZ outliers	91569	2107 (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 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	C	14	<div> <div>21%</div> <div>79%</div> </div>
1	E	14	<div> <div>21%</div> <div>79%</div> </div>
2	D	17	<div> <div>6%</div> <div>47%</div> <div>47%</div> </div>
2	F	17	<div> <div>41%</div> <div>41%</div> <div>18%</div> </div>
3	A	209	<div> <div>39%</div> <div>41%</div> <div>13%</div> <div>• •</div> </div>
3	B	209	<div> <div>%</div> <div>39%</div> <div>44%</div> <div>11%</div> <div>• 6%</div> </div>

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
4	CMP	A	679	-	-	X	-

## 2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 4654 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 DNA (5'-D(\*GP\*CP\*GP\*AP\*AP\*AP\*AP\*AP\*TP\*GP\*TP\*GP\*AP\*T)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	C	14	Total	C	N	O	P	0	0	0
			290	139	59	79	13			
1	E	14	Total	C	N	O	P	0	0	0
			290	139	59	79	13			

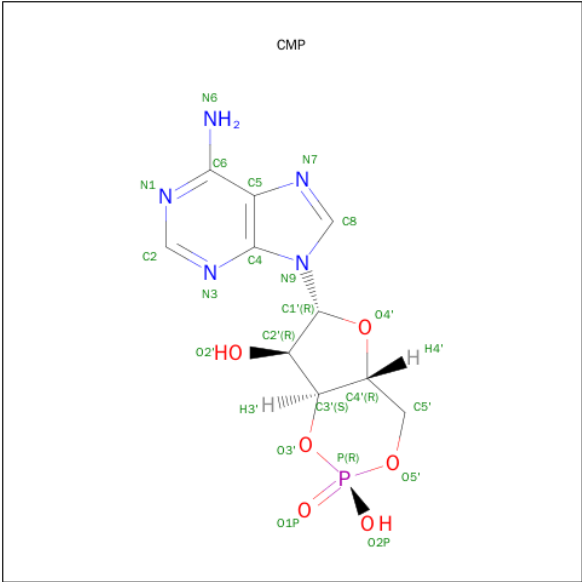
- Molecule 2 is a DNA chain called DNA (5'-D(\*CP\*TP\*AP\*GP\*AP\*TP\*CP\*AP\*CP\*AP\*TP\*TP\*TP\*TP\*TP\*CP\*G)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	D	17	Total	C	N	O	P	0	0	0
			341	166	56	103	16			
2	F	17	Total	C	N	O	P	0	0	0
			341	166	56	103	16			

- Molecule 3 is a protein called PROTEIN (CATABOLITE GENE ACTIVATOR PROTEIN (CAP)).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	A	201	Total	C	N	O	S	0	0	0
			1591	1007	280	295	9			
3	B	197	Total	C	N	O	S	0	0	0
			1556	986	273	288	9			

- Molecule 4 is ADENOSINE-3',5'-CYCLIC-MONOPHOSPHATE (three-letter code: CMP) (formula: C<sub>10</sub>H<sub>12</sub>N<sub>5</sub>O<sub>6</sub>P).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	B	1	Total	C	N	O	P	0	0
			22	10	5	6	1		
4	A	1	Total	C	N	O	P	0	0
			22	10	5	6	1		

- Molecule 5 is water.

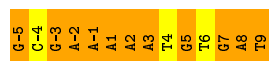
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	58	Total	O	0	0
			58	58		
5	B	62	Total	O	0	0
			62	62		
5	C	28	Total	O	0	0
			28	28		
5	D	14	Total	O	0	0
			14	14		
5	E	20	Total	O	0	0
			20	20		
5	F	19	Total	O	0	0
			19	19		

### 3 Residue-property plots

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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: DNA (5'-D(\*GP\*CP\*GP\*AP\*AP\*AP\*AP\*AP\*TP\*GP\*TP\*GP\*AP\*T)-3')

Chain C: 



- Molecule 1: DNA (5'-D(\*GP\*CP\*GP\*AP\*AP\*AP\*AP\*AP\*TP\*GP\*TP\*GP\*AP\*T)-3')

Chain E: 



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

Chain D: 



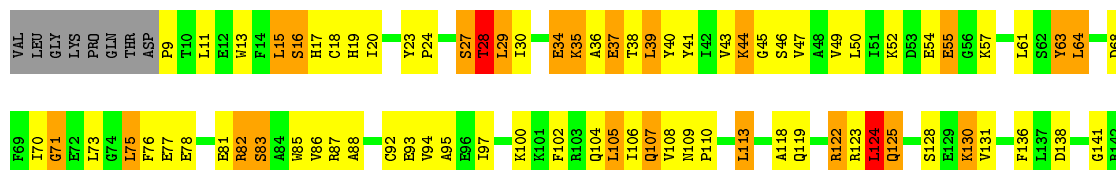
- Molecule 2: DNA (5'-D(\*CP\*TP\*AP\*GP\*AP\*TP\*CP\*AP\*CP\*AP\*TP\*TP\*TP\*TP\*TP\*CP\*G)-3')

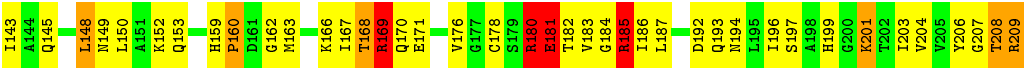
Chain F: 



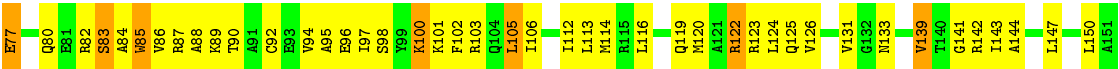
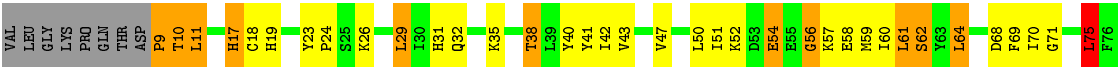
- Molecule 3: PROTEIN (CATABOLITE GENE ACTIVATOR PROTEIN (CAP))

Chain A: 





● Molecule 3: PROTEIN (CATABOLITE GENE ACTIVATOR PROTEIN (CAP))



## 4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	136.93 Å   152.80 Å   76.00 Å 90.00°   90.00°   90.00°	Depositor
Resolution (Å)	10.00 – 2.70 29.83 – 2.50	Depositor EDS
% Data completeness (in resolution range)	75.1 (10.00-2.70) 63.9 (29.83-2.50)	Depositor EDS
$R_{merge}$	0.12	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.29 (at 2.51 Å)	Xtriage
Refinement program	X-PLOR	Depositor
R, $R_{free}$	0.207 , (Not available) 0.214 , (Not available)	Depositor DCC
$R_{free}$ test set	No test flags present.	DCC
Wilson B-factor (Å <sup>2</sup> )	32.8	Xtriage
Anisotropy	0.742	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.38 , 403.8	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.41$ , $\langle L^2 \rangle = 0.23$	Xtriage
Outliers	0 of 17777 reflections	Xtriage
$F_o, F_c$ correlation	0.89	EDS
Total number of atoms	4654	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	28.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.69% 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, 0.375 respectively for untwinned datasets, and 0.333, 0.2 for perfectly twinned datasets.



## 5 Model quality

### 5.1 Standard geometry

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

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	C	2.07	10/327 (3.1%)	1.93	13/504 (2.6%)
1	E	2.07	13/327 (4.0%)	1.93	13/504 (2.6%)
2	D	2.01	12/380 (3.2%)	1.82	8/584 (1.4%)
2	F	1.97	9/380 (2.4%)	2.06	21/584 (3.6%)
3	A	0.98	2/1616 (0.1%)	1.29	17/2174 (0.8%)
3	B	0.93	2/1580 (0.1%)	1.21	6/2127 (0.3%)
All	All	1.38	48/4610 (1.0%)	1.52	78/6477 (1.2%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
2	F	0	4
3	A	0	4
All	All	0	8

All (48) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	1	DA	C5-C6	10.98	1.50	1.41
2	D	25	DC	N1-C2	9.38	1.49	1.40
3	A	169	ARG	CA-CB	-9.33	1.33	1.53
2	D	16	DC	C4-N4	9.28	1.42	1.33
1	E	23	DA	C5-C6	8.94	1.49	1.41
1	E	17	DT	N1-C2	8.91	1.45	1.38
2	D	20	DT	C4-O4	-8.55	1.15	1.23
2	D	18	DC	N1-C2	8.41	1.48	1.40
1	C	-5	DG	C5-C6	8.08	1.50	1.42
2	F	-2	DT	N1-C2	7.74	1.44	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	F	12	DT	C4-C5	7.60	1.51	1.45
2	D	23	DT	C4-C5	7.53	1.51	1.45
1	C	-5	DG	C6-N1	-6.95	1.34	1.39
3	B	9	PRO	N-CD	6.95	1.57	1.47
1	E	18	DG	C6-O6	6.86	1.30	1.24
1	E	23	DA	C2-N3	6.47	1.39	1.33
1	E	14	DT	C4-C5	6.37	1.50	1.45
1	E	25	DG	C2-N3	6.31	1.37	1.32
2	F	8	DT	C4-O4	6.29	1.28	1.23
2	F	12	DT	N1-C2	6.22	1.43	1.38
1	C	7	DG	C2-N2	-6.09	1.28	1.34
1	C	7	DG	N9-C8	-6.06	1.33	1.37
2	D	16	DC	C3'-O3'	-6.03	1.36	1.44
1	E	22	DA	C5-C6	5.86	1.46	1.41
2	D	17	DA	C5-C6	5.81	1.46	1.41
1	E	19	DT	N3-C4	-5.78	1.34	1.38
1	E	24	DA	N9-C4	5.76	1.41	1.37
1	E	21	DA	C5-C6	-5.73	1.35	1.41
1	E	18	DG	N9-C4	5.67	1.42	1.38
1	C	6	DT	C4-C5	5.66	1.50	1.45
1	C	5	DG	O3'-P	-5.64	1.54	1.61
2	D	18	DC	C2'-C1'	5.62	1.57	1.52
2	F	7	DC	N1-C2	5.60	1.45	1.40
2	D	23	DT	N1-C2	5.60	1.42	1.38
3	B	92	CYS	CB-SG	-5.58	1.72	1.81
1	C	-2	DA	C5-C6	-5.49	1.36	1.41
1	E	14	DT	C2-O2	-5.45	1.18	1.22
1	E	23	DA	N1-C2	5.44	1.39	1.34
2	F	-3	DC	N1-C2	5.40	1.45	1.40
3	A	37	GLU	CB-CG	5.39	1.62	1.52
2	D	22	DT	C4-C5	5.25	1.49	1.45
1	C	6	DT	N1-C2	5.22	1.42	1.38
2	F	12	DT	C4-O4	-5.20	1.18	1.23
2	D	22	DT	C4-O4	5.08	1.27	1.23
2	F	-3	DC	C2-O2	5.08	1.29	1.24
2	F	-4	DG	C6-O6	-5.06	1.19	1.24
2	D	20	DT	N3-C4	-5.05	1.34	1.38
1	C	2	DA	C5-C6	5.05	1.45	1.41

All (78) bond angle outliers are listed below:

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	169	ARG	N-CA-CB	11.54	131.37	110.60
1	E	14	DT	O4'-C1'-N1	9.50	114.65	108.00
2	D	12	DA	OP2-P-O3'	9.19	125.42	105.20
1	E	14	DT	O5'-P-OP2	-9.11	97.50	105.70
2	F	8	DT	O4'-C1'-N1	8.81	114.17	108.00
1	E	14	DT	C1'-O4'-C4'	-8.72	101.38	110.10
1	C	7	DG	O4'-C1'-N9	-8.43	102.10	108.00
3	A	9	PRO	CA-N-CD	-8.26	99.93	111.50
3	B	56	GLY	N-CA-C	7.83	132.67	113.10
3	A	181	GLU	N-CA-CB	-7.77	96.61	110.60
3	A	181	GLU	CB-CA-C	7.74	125.88	110.40
2	F	-1	DT	OP2-P-O3'	7.54	121.78	105.20
1	C	7	DG	C5'-C4'-C3'	7.46	127.53	114.10
3	B	9	PRO	CA-N-CD	-7.41	101.12	111.50
3	B	75	LEU	CA-CB-CG	7.37	132.26	115.30
3	A	39	LEU	CA-CB-CG	7.31	132.12	115.30
2	F	13	DC	N1-C2-O2	7.19	123.22	118.90
3	A	185	ARG	NE-CZ-NH1	-7.19	116.71	120.30
1	C	9	DT	C4'-C3'-O3'	7.03	127.28	109.70
2	F	11	DA	N9-C1'-C2'	6.99	125.88	112.60
1	C	3	DA	OP1-P-O3'	-6.75	90.36	105.20
2	D	25	DC	N1-C2-O2	6.73	122.94	118.90
1	C	3	DA	OP2-P-O3'	6.69	119.91	105.20
3	A	148	LEU	CA-CB-CG	6.55	130.37	115.30
2	F	11	DA	O5'-P-OP2	-6.53	99.82	105.70
2	F	12	DT	N1-C1'-C2'	6.51	124.97	112.60
1	C	5	DG	O5'-P-OP1	-6.41	99.93	105.70
3	A	185	ARG	NE-CZ-NH2	6.34	123.47	120.30
2	F	13	DC	N1-C1'-C2'	6.27	124.51	112.60
2	F	-2	DT	N3-C2-O2	-6.22	118.57	122.30
2	D	25	DC	O4'-C1'-N1	6.14	112.30	108.00
2	F	4	DA	O5'-P-OP2	-6.12	100.19	105.70
2	F	1	DT	N1-C1'-C2'	6.04	124.09	112.60
3	B	75	LEU	N-CA-C	6.03	127.28	111.00
2	F	4	DA	OP2-P-O3'	6.00	118.39	105.20
3	B	142	ARG	NE-CZ-NH2	-6.00	117.30	120.30
2	D	24	DT	O4'-C1'-N1	5.99	112.19	108.00
1	C	-3	DG	OP1-P-O3'	5.95	118.28	105.20
3	A	64	LEU	CA-CB-CG	5.94	128.97	115.30
2	F	12	DT	OP1-P-O3'	5.92	118.22	105.20
1	E	14	DT	C3'-C2'-C1'	-5.90	95.42	102.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	169	ARG	CB-CA-C	-5.89	98.62	110.40
1	C	9	DT	C2'-C3'-O3'	-5.88	93.21	112.60
1	C	-2	DA	O4'-C1'-N9	-5.83	103.92	108.00
1	C	8	DA	O5'-P-OP1	-5.78	100.50	105.70
2	F	7	DC	N1-C1'-C2'	5.74	123.50	112.60
2	F	7	DC	O4'-C1'-N1	5.71	112.00	108.00
1	E	20	DA	OP2-P-O3'	5.69	117.72	105.20
2	F	-1	DT	N3-C2-O2	-5.65	118.91	122.30
1	E	14	DT	N1-C1'-C2'	5.54	123.13	112.60
2	D	19	DA	C5'-C4'-C3'	5.50	124.00	114.10
3	A	124	LEU	CB-CG-CD1	-5.48	101.69	111.00
3	A	63	TYR	N-CA-C	-5.48	96.21	111.00
3	A	181	GLU	CA-CB-CG	5.46	125.41	113.40
1	E	15	DA	N9-C1'-C2'	5.45	122.96	112.60
1	E	22	DA	N9-C1'-C2'	5.41	122.87	112.60
2	F	12	DT	N3-C4-O4	-5.38	116.67	119.90
3	B	187	LEU	CA-CB-CG	5.37	127.65	115.30
3	A	75	LEU	N-CA-C	5.37	125.50	111.00
1	E	16	DG	N9-C1'-C2'	5.36	122.78	112.60
3	A	138	ASP	CB-CG-OD1	5.35	123.11	118.30
1	C	7	DG	C5-N7-C8	5.33	106.96	104.30
2	F	1	DT	OP2-P-O3'	5.28	116.82	105.20
2	F	2	DT	N3-C2-O2	-5.25	119.15	122.30
3	A	196	ILE	CB-CA-C	-5.18	101.23	111.60
1	E	19	DT	N3-C2-O2	-5.17	119.20	122.30
3	A	192	ASP	CB-CG-OD2	5.17	122.95	118.30
1	E	15	DA	OP2-P-O3'	5.15	116.52	105.20
2	D	12	DA	OP1-P-O3'	-5.14	93.88	105.20
2	F	5	DC	C1'-O4'-C4'	-5.13	104.97	110.10
1	C	-5	DG	C5-C6-O6	5.12	131.67	128.60
2	D	12	DA	C5'-C4'-O4'	-5.11	99.59	109.30
1	E	18	DG	C5-N7-C8	5.10	106.85	104.30
2	F	-3	DC	N1-C2-O2	5.09	121.95	118.90
1	E	21	DA	N1-C6-N6	5.08	121.64	118.60
2	D	15	DT	C1'-O4'-C4'	-5.06	105.04	110.10
2	F	-2	DT	N1-C2-O2	5.05	127.14	123.10
1	C	-1	DA	N9-C1'-C2'	5.04	122.18	112.60

There are no chirality outliers.

All (8) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	A	136	PHE	Sidechain
3	A	169	ARG	Sidechain
3	A	180	ARG	Sidechain
3	A	41	TYR	Sidechain
2	F	-4	DG	Sidechain
2	F	1	DT	Sidechain
2	F	11	DA	Sidechain
2	F	12	DT	Sidechain

## 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	C	290	0	157	32	0
1	E	290	0	159	40	0
2	D	341	0	196	23	0
2	F	341	0	196	41	0
3	A	1591	0	1632	132	0
3	B	1556	0	1600	130	0
4	A	22	0	11	8	0
4	B	22	0	11	6	0
5	A	58	0	0	34	0
5	B	62	0	0	23	0
5	C	28	0	0	5	0
5	D	14	0	0	0	0
5	E	20	0	0	3	0
5	F	19	0	0	2	0
All	All	4654	0	3962	369	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 44.

All (369) 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)
4:B:678:CMC:C2	4:B:678:CMC:H2	0.97	1.47
4:A:679:CMC:H2	4:A:679:CMC:C2	0.97	1.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:9:DT:H2''	2:D:10:DC:C6	1.65	1.29
3:A:15:LEU:HD21	5:A:645:HOH:O	1.30	1.26
3:B:52:LYS:HE3	5:B:658:HOH:O	1.35	1.21
3:A:35:LYS:HE2	5:A:492:HOH:O	1.40	1.19
3:A:61:LEU:HD21	3:B:131:VAL:HG11	1.27	1.11
2:D:25:DC:H2''	2:D:26:DG:C8	1.87	1.07
3:A:104:GLN:HG2	5:A:648:HOH:O	1.54	1.07
3:B:52:LYS:HB3	5:B:658:HOH:O	1.55	1.04
3:B:163:MET:CE	5:B:643:HOH:O	2.03	1.04
2:F:13:DC:C6	2:F:12:DT:H72	1.98	0.99
1:E:17:DT:H2''	1:E:16:DG:C8	1.97	0.99
3:A:169:ARG:HE	3:A:187:LEU:HD23	1.29	0.97
3:A:124:LEU:HD21	4:B:678:CMP:N6	1.82	0.94
1:E:21:DA:H1'	1:E:20:DA:H5'	1.49	0.94
3:B:114:MET:SD	5:B:504:HOH:O	2.27	0.92
2:F:13:DC:H2'	2:F:12:DT:C6	2.03	0.92
3:A:24:PRO:HG3	5:A:647:HOH:O	1.70	0.92
3:A:83:SER:OG	4:A:679:CMP:O5'	1.89	0.90
2:F:11:DA:H2''	2:F:10:DG:H5'	1.52	0.90
3:A:169:ARG:HE	3:A:187:LEU:CD2	1.84	0.90
3:B:163:MET:HE2	5:B:643:HOH:O	1.64	0.89
2:F:11:DA:H2''	2:F:10:DG:C5'	2.03	0.88
3:B:85:TRP:CH2	5:B:531:HOH:O	2.25	0.88
3:A:124:LEU:CD2	4:B:678:CMP:N6	2.38	0.87
3:B:18:CYS:SG	3:B:97:ILE:HG13	2.15	0.87
3:B:126:VAL:HG11	5:B:632:HOH:O	1.76	0.86
1:E:27:DG:H4'	1:E:26:DC:H5'	1.56	0.86
3:A:166:LYS:CD	5:A:651:HOH:O	2.24	0.84
1:E:14:DT:HO3'	2:F:13:DC:H6	1.24	0.84
3:A:169:ARG:NE	3:A:187:LEU:HD23	1.92	0.84
3:B:85:TRP:CZ2	5:B:531:HOH:O	2.31	0.83
3:A:71:GLY:HA2	4:A:679:CMP:O3'	1.80	0.81
3:A:77:GLU:HB2	5:A:540:HOH:O	1.79	0.81
3:A:18:CYS:SG	3:A:97:ILE:HG23	2.21	0.81
3:A:76:PHE:HE1	5:B:504:HOH:O	1.65	0.80
2:D:25:DC:H2''	2:D:26:DG:H8	1.47	0.80
3:A:108:VAL:HG21	5:A:649:HOH:O	1.82	0.79
2:F:8:DT:H72	3:A:181:GLU:HB2	1.65	0.79
3:B:122:ARG:HD2	5:B:505:HOH:O	1.81	0.79
3:B:178:CYS:SG	3:B:183:VAL:HG23	2.23	0.78
3:B:163:MET:HE1	5:B:643:HOH:O	1.72	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:13:DC:H2'	2:F:12:DT:C7	2.15	0.77
2:D:25:DC:H2''	2:D:26:DG:N7	1.97	0.77
2:D:22:DT:H2''	2:D:23:DT:O5'	1.84	0.76
1:E:25:DG:H2''	1:E:24:DA:C8	2.22	0.75
1:C:-5:DG:H2''	1:C:-4:DC:OP2	1.85	0.75
1:C:4:DT:H73	5:C:660:HOH:O	1.86	0.74
5:A:640:HOH:O	3:B:51:ILE:CD1	2.36	0.74
3:B:196:ILE:HG22	3:B:204:VAL:HA	1.69	0.73
3:B:159:HIS:HB3	3:B:164:GLN:HB2	1.71	0.73
3:B:152:LYS:HG3	5:B:627:HOH:O	1.88	0.72
3:A:201:LYS:HE3	3:A:203:ILE:HD11	1.71	0.72
2:F:13:DC:H2'	2:F:12:DT:C5	2.25	0.72
3:A:35:LYS:CE	5:A:492:HOH:O	2.16	0.71
1:E:18:DG:H1'	5:E:589:HOH:O	1.89	0.71
3:A:166:LYS:HD3	5:A:651:HOH:O	1.87	0.71
3:A:29:LEU:HD23	3:A:88:ALA:HB2	1.72	0.71
3:A:68:ASP:HA	3:A:119:GLN:HE22	1.56	0.71
3:B:197:SER:O	3:B:203:ILE:HG22	1.91	0.70
2:F:8:DT:H72	3:A:181:GLU:CB	2.22	0.70
3:A:122:ARG:HH21	3:A:125:GLN:HG3	1.56	0.70
1:C:9:DT:H2''	2:D:10:DC:C5	2.26	0.70
3:B:199:HIS:HB3	3:B:201:LYS:HE2	1.73	0.70
1:E:27:DG:H4'	1:E:26:DC:C5'	2.22	0.70
2:F:8:DT:C7	3:A:181:GLU:HB2	2.22	0.69
3:B:192:ASP:HB2	5:B:644:HOH:O	1.92	0.69
3:A:15:LEU:CD2	5:A:645:HOH:O	2.07	0.69
3:A:149:ASN:HA	3:A:152:LYS:HE2	1.72	0.69
3:A:30:ILE:HB	3:A:86:VAL:HB	1.74	0.69
1:E:14:DT:H1'	2:F:13:DC:C5	2.28	0.69
1:E:27:DG:H2''	1:E:26:DC:OP2	1.93	0.68
3:A:43:VAL:HG11	5:A:645:HOH:O	1.92	0.68
3:B:18:CYS:HB3	3:B:96:GLU:H	1.58	0.68
5:F:596:HOH:O	3:A:186:ILE:HD11	1.93	0.68
3:B:122:ARG:HH21	3:B:125:GLN:HE22	1.41	0.68
2:F:4:DA:H2'	2:F:3:DT:H71	1.77	0.68
1:E:19:DT:H2''	1:E:18:DG:C8	2.29	0.67
3:A:169:ARG:HB3	3:A:183:VAL:HG11	1.76	0.67
3:A:124:LEU:CD2	4:B:678:CMP:HN61	2.06	0.66
3:B:102:PHE:HA	3:B:105:LEU:HD23	1.78	0.66
3:A:13:TRP:CZ3	3:A:109:ASN:HB3	2.30	0.66
2:D:25:DC:C2'	2:D:26:DG:C8	2.74	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:159:HIS:CE1	3:B:203:ILE:HG12	2.30	0.65
3:A:16:SER:HB3	5:A:558:HOH:O	1.95	0.65
1:C:3:DA:H2''	1:C:4:DT:H5'	1.78	0.65
3:B:18:CYS:SG	3:B:97:ILE:CG1	2.85	0.65
3:A:71:GLY:HA2	4:A:679:CMP:P	2.37	0.65
2:D:20:DT:H2''	2:D:21:DT:O5'	1.96	0.65
3:A:110:PRO:HG2	5:A:567:HOH:O	1.95	0.65
1:E:17:DT:H2''	1:E:16:DG:N7	2.12	0.64
3:A:169:ARG:HB3	3:A:183:VAL:CG1	2.26	0.64
5:A:640:HOH:O	3:B:51:ILE:HD12	1.95	0.64
3:A:130:LYS:HE3	5:A:650:HOH:O	1.97	0.64
2:F:11:DA:H2''	2:F:10:DG:H5''	1.80	0.64
1:C:9:DT:H2''	2:D:10:DC:H6	1.56	0.64
1:E:20:DA:H1'	1:E:19:DT:H5''	1.80	0.64
2:F:6:DA:H1'	2:F:5:DC:C6	2.33	0.64
2:D:16:DC:H6	2:D:16:DC:H5''	1.62	0.64
3:A:49:VAL:HG22	3:A:86:VAL:HG22	1.80	0.64
2:F:13:DC:H2''	2:F:12:DT:O5'	1.98	0.63
3:B:100:LYS:HD3	3:B:103:ARG:NH1	2.13	0.63
2:D:14:DA:H2''	2:D:15:DT:H6	1.63	0.63
2:F:10:DG:H2''	2:F:9:DA:OP2	1.99	0.63
2:F:13:DC:H2'	2:F:12:DT:H6	1.60	0.63
3:A:37:GLU:HG2	3:A:38:THR:H	1.64	0.63
2:F:8:DT:C7	3:A:181:GLU:HG3	2.28	0.63
1:E:15:DA:OP2	1:E:15:DA:H8	1.81	0.62
2:F:13:DC:H2''	2:F:12:DT:C5'	2.28	0.62
1:E:14:DT:O3'	2:F:13:DC:H6	1.80	0.62
2:D:14:DA:H2''	2:D:15:DT:C6	2.34	0.62
3:A:162:GLY:H	3:A:209:ARG:HD2	1.65	0.62
3:A:77:GLU:HG3	3:A:78:GLU:H	1.64	0.62
3:B:203:ILE:HG21	5:B:500:HOH:O	1.99	0.62
3:B:41:TYR:HD2	3:B:69:PHE:CE1	2.17	0.62
2:F:13:DC:N1	2:F:12:DT:H72	2.15	0.61
3:B:31:HIS:CD2	5:B:531:HOH:O	2.53	0.61
3:A:207:GLY:O	3:A:209:ARG:HD3	2.01	0.61
3:A:166:LYS:HD2	5:A:651:HOH:O	1.92	0.61
3:A:100:LYS:HG3	5:A:646:HOH:O	2.00	0.60
1:C:9:DT:C2'	2:D:10:DC:C6	2.61	0.60
5:A:640:HOH:O	3:B:51:ILE:HD13	1.99	0.60
3:A:97:ILE:O	3:A:97:ILE:HD12	2.02	0.60
3:B:203:ILE:O	3:B:203:ILE:HG23	2.02	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:85:TRP:HH2	5:A:487:HOH:O	1.83	0.59
3:A:13:TRP:HH2	3:A:105:LEU:O	1.86	0.59
1:C:3:DA:C4	1:C:4:DT:C5	2.90	0.59
2:D:10:DC:N4	2:F:11:DA:N6	2.51	0.59
3:A:23:TYR:CD2	3:A:29:LEU:HD22	2.37	0.59
3:A:29:LEU:HD11	3:A:94:VAL:HG21	1.85	0.59
2:D:18:DC:H2''	2:D:19:DA:OP2	2.03	0.59
1:C:7:DG:N2	5:C:479:HOH:O	2.36	0.58
2:F:6:DA:P	2:F:6:DA:H3'	2.44	0.58
3:B:98:SER:OG	3:B:101:LYS:HB2	2.04	0.58
3:A:71:GLY:HA2	4:A:679:CMP:O1P	2.04	0.58
1:E:21:DA:C1'	1:E:20:DA:H5'	2.31	0.58
3:A:63:TYR:O	3:A:64:LEU:HD12	2.04	0.58
3:B:150:LEU:HB3	3:B:165:ILE:HD13	1.87	0.56
2:D:25:DC:C2'	2:D:26:DG:N7	2.67	0.56
1:C:3:DA:C2	1:C:4:DT:C2	2.93	0.56
3:B:17:HIS:H	3:B:17:HIS:CD2	2.22	0.56
1:E:20:DA:H1'	1:E:19:DT:C5'	2.35	0.56
1:C:3:DA:C8	1:C:4:DT:H71	2.41	0.56
3:B:188:LYS:NZ	3:B:188:LYS:HB3	2.19	0.56
3:B:102:PHE:CE2	3:B:106:ILE:HD11	2.41	0.56
3:A:106:ILE:HD13	3:A:113:LEU:HD13	1.87	0.56
3:B:10:THR:HG23	3:B:112:ILE:HG23	1.87	0.56
3:B:186:ILE:O	3:B:189:MET:HB3	2.06	0.56
3:A:16:SER:HA	5:A:558:HOH:O	2.05	0.56
1:E:14:DT:H1'	2:F:13:DC:C6	2.42	0.55
3:A:176:VAL:HG12	3:A:178:CYS:SG	2.46	0.55
3:B:19:HIS:O	3:B:96:GLU:HG2	2.06	0.55
2:F:13:DC:C6	2:F:12:DT:C7	2.84	0.55
2:F:13:DC:H2''	2:F:12:DT:H5'	1.88	0.55
5:A:640:HOH:O	3:B:51:ILE:HG21	2.06	0.55
3:B:198:ALA:O	3:B:199:HIS:HB2	2.06	0.55
3:A:141:GLY:O	3:A:145:GLN:HG2	2.06	0.55
2:F:13:DC:C2'	2:F:12:DT:C6	2.85	0.55
2:F:11:DA:H4'	5:F:481:HOH:O	2.05	0.55
3:A:108:VAL:CG2	5:A:649:HOH:O	2.48	0.55
1:E:18:DG:N7	3:B:180:ARG:NH1	2.54	0.55
3:A:40:TYR:HB2	3:A:70:ILE:HB	1.87	0.55
2:D:22:DT:H2''	2:D:23:DT:C5'	2.36	0.55
3:B:143:ILE:HD11	3:B:183:VAL:HG22	1.88	0.55
2:F:8:DT:H71	3:A:181:GLU:HG3	1.88	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:150:LEU:O	3:B:165:ILE:HG21	2.07	0.55
3:A:45:GLY:HA3	3:A:92:CYS:HB3	1.87	0.55
3:B:32:GLN:HG3	3:B:84:ALA:HA	1.88	0.54
2:F:5:DC:H2''	2:F:4:DA:N7	2.22	0.54
3:A:43:VAL:CG1	5:A:645:HOH:O	2.50	0.54
1:C:8:DA:C8	1:C:9:DT:H73	2.42	0.54
2:F:2:DT:C2'	2:F:1:DT:H71	2.38	0.54
3:B:169:ARG:HG2	3:B:183:VAL:HG12	1.90	0.54
3:A:52:LYS:HA	3:A:57:LYS:O	2.08	0.54
3:A:169:ARG:NE	3:A:187:LEU:CD2	2.58	0.54
3:B:9:PRO:HG2	3:B:11:LEU:H	1.73	0.54
1:E:25:DG:H2''	1:E:24:DA:N7	2.23	0.54
3:B:24:PRO:HG2	5:B:528:HOH:O	2.07	0.54
3:A:169:ARG:N	3:A:169:ARG:CD	2.71	0.53
2:F:8:DT:H72	3:A:181:GLU:CG	2.38	0.53
1:C:8:DA:C8	1:C:9:DT:C7	2.92	0.53
3:B:150:LEU:HB3	3:B:165:ILE:CD1	2.39	0.53
3:B:64:LEU:HD21	3:B:123:ARG:NH2	2.23	0.53
3:B:40:TYR:HB2	3:B:70:ILE:HB	1.91	0.53
3:B:18:CYS:HB3	3:B:95:ALA:HB1	1.90	0.53
3:B:106:ILE:HG23	3:B:113:LEU:HD22	1.89	0.53
3:B:157:MET:SD	3:B:164:GLN:NE2	2.82	0.53
3:A:73:LEU:HD11	3:B:124:LEU:HD13	1.90	0.53
3:B:180:ARG:HG3	3:B:181:GLU:HG2	1.90	0.52
3:B:75:LEU:HD21	3:B:102:PHE:CE2	2.44	0.52
1:E:14:DT:H2'	1:E:14:DT:OP2	2.09	0.52
3:B:18:CYS:CB	3:B:95:ALA:HB1	2.40	0.52
3:A:166:LYS:HG2	3:A:201:LYS:HA	1.91	0.52
3:B:159:HIS:HE1	3:B:204:VAL:O	1.93	0.52
3:A:71:GLY:CA	4:A:679:CMP:O1P	2.58	0.52
3:B:90:THR:HG22	5:B:538:HOH:O	2.09	0.52
1:C:3:DA:C4	1:C:4:DT:C6	2.98	0.52
3:B:139:VAL:CG1	3:B:186:ILE:HD12	2.40	0.52
3:A:73:LEU:HD21	3:B:124:LEU:HB3	1.92	0.52
3:A:203:ILE:N	3:A:203:ILE:HD12	2.25	0.51
3:B:180:ARG:HG3	3:B:181:GLU:H	1.76	0.51
3:A:43:VAL:O	3:A:44:LYS:HB2	2.10	0.51
1:C:7:DG:C4	1:C:8:DA:C6	2.98	0.51
3:B:112:ILE:HD12	3:B:113:LEU:H	1.75	0.51
2:F:8:DT:H72	3:A:181:GLU:HG3	1.92	0.51
3:B:139:VAL:HG11	3:B:186:ILE:HD12	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:169:ARG:N	3:A:169:ARG:HD2	2.26	0.51
3:A:37:GLU:HG2	3:A:38:THR:N	2.26	0.51
2:F:2:DT:H2'	2:F:1:DT:H71	1.93	0.51
3:A:131:VAL:HG12	3:B:59:MET:SD	2.51	0.51
3:A:19:HIS:O	3:A:95:ALA:HA	2.11	0.51
2:F:11:DA:C2'	2:F:10:DG:H5''	2.41	0.50
3:B:75:LEU:HD11	3:B:102:PHE:HD2	1.76	0.50
3:B:181:GLU:O	3:B:185:ARG:HG3	2.11	0.50
3:A:43:VAL:HB	3:A:93:GLU:HG3	1.93	0.50
3:B:143:ILE:HD11	3:B:183:VAL:HA	1.92	0.50
3:B:167:ILE:HB	5:B:547:HOH:O	2.11	0.50
3:A:97:ILE:HD13	3:A:102:PHE:HB2	1.94	0.50
3:A:168:THR:HG22	3:A:171:GLU:HG3	1.93	0.50
3:A:169:ARG:CZ	3:A:187:LEU:HD23	2.40	0.50
3:B:18:CYS:HB3	3:B:96:GLU:N	2.24	0.50
3:B:41:TYR:O	3:B:94:VAL:HA	2.11	0.50
3:A:199:HIS:O	3:A:199:HIS:ND1	2.44	0.50
1:E:24:DA:H2''	1:E:23:DA:C8	2.47	0.49
3:A:77:GLU:HG3	3:A:78:GLU:N	2.28	0.49
3:B:106:ILE:HD12	3:B:113:LEU:HB2	1.93	0.49
3:B:71:GLY:HA2	4:B:678:CMP:O1P	2.13	0.49
1:E:14:DT:C2	2:F:13:DC:C5	3.01	0.49
3:A:184:GLY:O	5:A:653:HOH:O	2.19	0.49
3:B:47:VAL:HG13	3:B:86:VAL:HG13	1.95	0.49
3:B:57:LYS:HG2	3:B:58:GLU:N	2.27	0.49
1:C:3:DA:C8	1:C:4:DT:C7	2.95	0.48
3:B:119:GLN:O	3:B:123:ARG:HG3	2.13	0.48
1:C:3:DA:C2'	1:C:4:DT:H5'	2.44	0.48
1:C:-2:DA:C6	1:C:-1:DA:C6	3.00	0.48
3:A:159:HIS:ND1	3:A:203:ILE:HG12	2.28	0.48
3:A:16:SER:CB	5:A:558:HOH:O	2.57	0.48
2:D:19:DA:H2''	2:D:20:DT:OP2	2.14	0.48
3:B:150:LEU:HD21	3:B:167:ILE:HD13	1.96	0.48
3:B:61:LEU:O	3:B:62:SER:HB2	2.12	0.48
1:E:21:DA:H2''	1:E:20:DA:O5'	2.13	0.48
1:C:3:DA:C6	1:C:4:DT:C4	3.02	0.48
3:A:30:ILE:HG23	3:A:82:ARG:HG2	1.96	0.48
3:A:131:VAL:CG1	3:B:59:MET:SD	3.01	0.48
3:B:60:ILE:HG13	3:B:174:GLN:HB3	1.96	0.48
3:B:116:LEU:O	3:B:119:GLN:HB2	2.14	0.48
1:C:7:DG:H2''	1:C:8:DA:N7	2.28	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:182:THR:HA	3:A:185:ARG:HG3	1.96	0.47
3:A:166:LYS:HB3	5:A:651:HOH:O	2.14	0.47
3:B:17:HIS:N	3:B:17:HIS:CD2	2.81	0.47
2:D:14:DA:C8	2:D:15:DT:H72	2.49	0.47
3:B:41:TYR:HD2	3:B:69:PHE:CD1	2.33	0.47
3:A:24:PRO:HD2	3:A:27:SER:OG	2.15	0.47
1:C:3:DA:C5	1:C:4:DT:C5	3.02	0.47
3:A:181:GLU:HG2	3:A:181:GLU:H	1.38	0.47
2:D:13:DG:OP2	3:B:139:VAL:HB	2.15	0.47
1:C:-3:DG:H5"	5:C:607:HOH:O	2.14	0.47
3:A:107:GLN:HA	3:A:107:GLN:HE21	1.81	0.46
1:E:16:DG:H1'	1:E:15:DA:C8	2.51	0.46
3:A:102:PHE:O	3:A:105:LEU:HB2	2.15	0.46
3:A:38:THR:HG22	3:A:39:LEU:H	1.81	0.46
3:A:166:LYS:CB	5:A:651:HOH:O	2.63	0.46
3:A:201:LYS:CE	3:A:203:ILE:HD11	2.42	0.46
3:A:193:GLN:O	3:A:194:ASN:HB2	2.15	0.46
1:E:18:DG:C6	1:E:17:DT:O4	2.69	0.46
3:A:197:SER:HB2	3:A:203:ILE:HD13	1.97	0.46
3:B:41:TYR:CD2	3:B:69:PHE:CE1	3.02	0.46
3:A:30:ILE:CG2	3:A:82:ARG:HG2	2.46	0.46
3:A:181:GLU:O	3:A:185:ARG:HG2	2.16	0.46
3:B:38:THR:H	3:B:82:ARG:HH22	1.63	0.46
3:A:16:SER:CA	5:A:558:HOH:O	2.61	0.45
3:B:147:LEU:HD22	3:B:202:THR:HG21	1.97	0.45
3:B:106:ILE:CG2	3:B:113:LEU:HD22	2.47	0.45
3:A:54:GLU:O	3:A:55:GLU:HB2	2.17	0.45
1:C:3:DA:H1'	1:C:4:DT:H5'	1.98	0.45
3:A:128:SER:HB3	3:B:61:LEU:HD11	1.99	0.45
3:A:20:ILE:HG13	3:A:95:ALA:HB2	1.97	0.45
3:A:13:TRP:O	3:A:17:HIS:ND1	2.50	0.45
3:A:45:GLY:HA3	3:A:92:CYS:CB	2.47	0.45
3:B:42:ILE:CG1	3:B:70:ILE:HD11	2.47	0.45
3:A:68:ASP:HB3	3:A:123:ARG:NH2	2.31	0.45
3:A:150:LEU:HA	3:A:153:GLN:HB2	1.98	0.45
3:A:83:SER:OG	4:A:679:CMP:P	2.75	0.45
1:C:8:DA:H2'	1:C:9:DT:H71	1.99	0.45
3:B:180:ARG:HG3	3:B:181:GLU:N	2.32	0.45
3:A:106:ILE:HG12	3:A:113:LEU:HB2	1.99	0.45
3:B:102:PHE:HA	3:B:105:LEU:CD2	2.46	0.44
3:B:17:HIS:H	3:B:17:HIS:HD2	1.63	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:26:DG:C6	1:E:27:DG:N2	2.85	0.44
3:A:201:LYS:HE2	5:A:652:HOH:O	2.17	0.44
3:A:68:ASP:HA	3:A:119:GLN:NE2	2.27	0.44
3:B:83:SER:OG	4:B:678:CMP:H5'1	2.18	0.44
3:B:42:ILE:HG13	3:B:70:ILE:HD11	2.00	0.44
3:A:184:GLY:HA2	5:A:653:HOH:O	2.17	0.44
3:B:26:LYS:HB2	3:B:26:LYS:NZ	2.33	0.44
1:E:17:DT:C2'	1:E:16:DG:C8	2.86	0.44
1:C:5:DG:N7	3:A:180:ARG:NH1	2.66	0.44
3:B:87:ARG:HG2	3:B:88:ALA:H	1.82	0.44
1:E:14:DT:H3'	5:E:670:HOH:O	2.18	0.44
3:B:54:GLU:H	3:B:54:GLU:CD	2.20	0.44
1:E:23:DA:H5''	5:E:581:HOH:O	2.18	0.43
1:E:19:DT:H2'	3:B:180:ARG:HH11	1.83	0.43
3:B:184:GLY:HA2	3:B:187:LEU:HD22	2.00	0.43
1:E:16:DG:H2''	1:E:15:DA:C8	2.53	0.43
3:A:11:LEU:HG	5:A:508:HOH:O	2.16	0.43
2:D:16:DC:H5''	2:D:16:DC:C6	2.49	0.43
3:B:122:ARG:O	3:B:126:VAL:HG13	2.19	0.43
3:B:38:THR:H	3:B:82:ARG:NH2	2.16	0.43
1:E:16:DG:H1'	1:E:15:DA:N7	2.33	0.43
3:A:160:PRO:HA	3:A:209:ARG:NH1	2.33	0.43
1:E:18:DG:C4	1:E:17:DT:C4	3.07	0.43
1:C:-1:DA:H2''	1:C:1:DA:OP2	2.18	0.43
3:B:147:LEU:HD23	3:B:147:LEU:HA	1.69	0.43
1:E:15:DA:H2''	1:E:14:DT:C6	2.54	0.43
3:B:50:LEU:O	3:B:84:ALA:HB1	2.19	0.43
1:C:2:DA:H5'	5:C:604:HOH:O	2.19	0.43
3:B:178:CYS:SG	3:B:179:SER:N	2.92	0.43
3:B:203:ILE:CG2	5:B:500:HOH:O	2.62	0.43
3:A:100:LYS:HE3	5:A:646:HOH:O	2.18	0.43
3:B:23:TYR:CG	3:B:29:LEU:HD22	2.54	0.43
3:B:90:THR:HG22	5:B:488:HOH:O	2.18	0.43
3:B:43:VAL:HG12	3:B:43:VAL:O	2.19	0.43
1:E:14:DT:C2	2:F:13:DC:C4	3.07	0.42
3:B:122:ARG:HH21	3:B:125:GLN:NE2	2.13	0.42
3:B:90:THR:HA	5:B:488:HOH:O	2.18	0.42
3:A:118:ALA:HB2	5:A:641:HOH:O	2.19	0.42
3:B:97:ILE:HG22	3:B:98:SER:O	2.19	0.42
3:A:208:THR:O	3:A:209:ARG:HB2	2.20	0.42
1:C:3:DA:N3	1:C:4:DT:C6	2.86	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:13:DC:C1'	2:F:12:DT:H72	2.50	0.42
3:B:153:GLN:HA	3:B:154:PRO:HD2	1.94	0.42
3:A:113:LEU:HD21	3:B:113:LEU:HD23	2.02	0.42
3:B:18:CYS:HA	3:B:96:GLU:O	2.20	0.42
3:A:61:LEU:HD23	3:A:61:LEU:HA	1.79	0.42
2:D:16:DC:H6	2:D:16:DC:C5'	2.31	0.42
2:F:13:DC:C2'	2:F:12:DT:C7	2.95	0.42
3:B:188:LYS:HZ2	3:B:188:LYS:HB3	1.83	0.42
1:C:-3:DG:H1'	1:C:-2:DA:C8	2.55	0.42
3:A:28:THR:HG23	3:A:87:ARG:CZ	2.50	0.41
1:E:17:DT:H2''	1:E:16:DG:H8	1.73	0.41
3:B:11:LEU:HB3	5:B:636:HOH:O	2.18	0.41
3:B:11:LEU:HA	3:B:11:LEU:HD22	1.84	0.41
3:B:120:MET:O	3:B:123:ARG:N	2.52	0.41
1:E:20:DA:H2''	1:E:19:DT:H5'	2.01	0.41
2:F:7:DC:H2''	2:F:6:DA:OP2	2.19	0.41
3:A:167:ILE:HG23	3:A:168:THR:N	2.35	0.41
3:B:180:ARG:O	3:B:183:VAL:HB	2.20	0.41
3:B:126:VAL:CG1	5:B:632:HOH:O	2.52	0.41
3:A:18:CYS:SG	3:A:97:ILE:CG2	3.02	0.41
3:A:185:ARG:H	3:A:185:ARG:HG2	1.65	0.41
3:A:38:THR:HB	3:A:40:TYR:CE1	2.55	0.41
3:A:34:GLU:O	3:A:81:GLU:HA	2.21	0.41
3:B:141:GLY:O	3:B:144:ALA:HB3	2.20	0.41
3:A:83:SER:OG	4:A:679:CMP:C5'	2.69	0.41
3:B:57:LYS:HG2	3:B:58:GLU:H	1.85	0.41
3:B:181:GLU:H	3:B:181:GLU:HG2	1.40	0.41
3:B:75:LEU:HD21	3:B:102:PHE:HE2	1.86	0.41
3:A:43:VAL:O	3:A:43:VAL:HG12	2.21	0.41
1:C:-2:DA:H3'	5:C:611:HOH:O	2.20	0.41
1:E:24:DA:H8	1:E:24:DA:OP2	2.04	0.40
1:E:19:DT:C6	3:B:180:ARG:NH1	2.89	0.40
3:A:143:ILE:HG12	3:A:176:VAL:HG21	2.02	0.40
3:B:64:LEU:HD23	3:B:68:ASP:HB3	2.04	0.40
1:C:-3:DG:H1'	1:C:-2:DA:N7	2.35	0.40
1:E:26:DC:C4	1:E:25:DG:O6	2.74	0.40
3:B:77:GLU:O	3:B:80:GLN:HG3	2.21	0.40
1:C:-1:DA:H1'	1:C:1:DA:C8	2.56	0.40
2:F:11:DA:C2'	2:F:10:DG:C5'	2.87	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone

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	
3	A	199/209 (95%)	161 (81%)	25 (13%)	13 (6%)	1	2
3	B	195/209 (93%)	156 (80%)	29 (15%)	10 (5%)	2	4
All	All	394/418 (94%)	317 (80%)	54 (14%)	23 (6%)	2	3

All (23) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	A	16	SER
3	A	28	THR
3	A	55	GLU
3	A	75	LEU
3	A	208	THR
3	B	56	GLY
3	B	75	LEU
3	B	83	SER
3	B	155	ASP
3	B	194	ASN
3	B	199	HIS
3	A	34	GLU
3	A	36	ALA
3	A	29	LEU
3	A	44	LYS
3	A	160	PRO
3	B	62	SER
3	A	71	GLY
3	B	158	THR
3	A	27	SER
3	A	180	ARG
3	B	160	PRO
3	B	167	ILE

### 5.3.2 Protein sidechains ⓘ

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	
3	A	173/180 (96%)	146 (84%)	27 (16%)	3	8
3	B	170/180 (94%)	147 (86%)	23 (14%)	5	11
All	All	343/360 (95%)	293 (85%)	50 (15%)	4	9

All (50) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	A	15	LEU
3	A	28	THR
3	A	35	LYS
3	A	46	SER
3	A	47	VAL
3	A	50	LEU
3	A	82	ARG
3	A	83	SER
3	A	105	LEU
3	A	107	GLN
3	A	113	LEU
3	A	122	ARG
3	A	124	LEU
3	A	125	GLN
3	A	130	LYS
3	A	148	LEU
3	A	163	MET
3	A	168	THR
3	A	169	ARG
3	A	170	GLN
3	A	180	ARG
3	A	181	GLU
3	A	185	ARG
3	A	201	LYS
3	A	204	VAL
3	A	206	TYR
3	A	209	ARG

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Mol	Chain	Res	Type
3	B	10	THR
3	B	11	LEU
3	B	17	HIS
3	B	29	LEU
3	B	35	LYS
3	B	38	THR
3	B	54	GLU
3	B	61	LEU
3	B	64	LEU
3	B	77	GLU
3	B	85	TRP
3	B	89	LYS
3	B	100	LYS
3	B	105	LEU
3	B	122	ARG
3	B	133	ASN
3	B	139	VAL
3	B	171	GLU
3	B	178	CYS
3	B	181	GLU
3	B	187	LEU
3	B	188	LYS
3	B	195	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
3	A	21	HIS
3	A	31	HIS
3	A	80	GLN
3	A	107	GLN
3	A	170	GLN
3	B	21	HIS
3	B	31	HIS
3	B	32	GLN
3	B	104	GLN
3	B	125	GLN
3	B	153	GLN
3	B	164	GLN

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

## 5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

## 5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

## 5.6 Ligand geometry ⓘ

2 ligands are modelled in this entry.

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$
4	CMP	A	679	-	19,25,25	0.94	1 (5%)	18,39,39	2.28	3 (16%)
4	CMP	B	678	-	19,25,25	1.39	4 (21%)	18,39,39	2.07	3 (16%)

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
4	CMP	A	679	-	-	0/0/31/31	0/4/4/4
4	CMP	B	678	-	-	0/0/31/31	0/4/4/4

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	678	CMP	O5'-C5'	-2.94	1.41	1.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	678	CMP	C8-N7	-2.28	1.30	1.34
4	A	679	CMP	O3'-C3'	-2.12	1.41	1.44
4	B	678	CMP	C5'-C4'	-2.11	1.48	1.51
4	B	678	CMP	P-O2P	-2.09	1.46	1.54

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	679	CMP	O3'-C3'-C4'	-7.98	104.35	110.72
4	B	678	CMP	O3'-C3'-C4'	-5.40	106.41	110.72
4	B	678	CMP	C2'-C1'-N9	-4.40	107.57	114.29
4	A	679	CMP	C1'-N9-C4	-2.16	123.68	126.94
4	B	678	CMP	O2P-P-O1P	3.31	119.35	108.80
4	A	679	CMP	O2P-P-O1P	3.60	120.27	108.80

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 14 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	679	CMP	8	0
4	B	678	CMP	6	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 [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(Å²)	Q<0.9	
1	C	14/14 (100%)	-0.75	0	100	100	15, 39, 53, 56	0
1	E	14/14 (100%)	-0.20	0	100	100	31, 50, 56, 56	0
2	D	17/17 (100%)	-0.76	0	100	100	33, 44, 53, 54	0
2	F	17/17 (100%)	-0.77	0	100	100	26, 33, 45, 45	0
3	A	201/209 (96%)	-0.95	0	100	100	3, 21, 46, 53	0
3	B	197/209 (94%)	-0.83	2 (1%)	84	85	3, 21, 44, 53	0
All	All	460/480 (95%)	-0.85	2 (0%)	93	94	3, 23, 50, 56	0

All (2) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	B	162	GLY	2.5
3	B	157	MET	2.1

### 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
4	CMP	B	678	22/22	0.98	0.12	0.20	2,10,22,24	0
4	CMP	A	679	22/22	0.98	0.10	-0.48	2,10,22,26	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.