wwPDB X-ray Structure Validation Summary Report (i)

Sep 12, 2023 – 06:57 PM EDT

PDB ID	:	4OQ9
Title	:	Satellite Tobacco Mosaic Virus Refined to 1.4 A Resolution using non-crystallographic symmetry restraints
Authors	:	Larson, S.B.; Day, J.S.; McPherson, A.
Deposited on	:	2014-02-07
Resolution	:	1.45 Å(reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references (1)) were used in the production of this report:

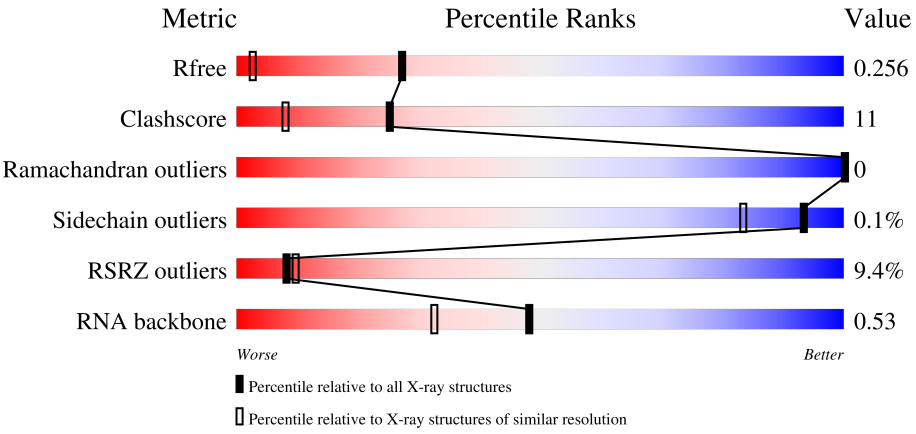
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35.1

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 1.45 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	1156 (1.46-1.46)
Clashscore	141614	1202 (1.46-1.46)
Ramachandran outliers	138981	1178 (1.46-1.46)
Sidechain outliers	138945	1178 (1.46-1.46)
RSRZ outliers	127900	1139 (1.46-1.46)
RNA backbone	3102	1000 (2.34-0.62)

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 <=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	159	80% 11% 9%
1	B	159	87% 9%
1	C	159	87% 9%
1	D	159	81% 9% 9%

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Mol	Chain	Length	Quality of chain
1	E	159	85% 6% 9%
1	F	159	81% 10% 9%
1	G	159	87% 9%
1	H	159	84% 6% 9%
1	I	159	84% 6% 9%
1	J	159	85% 6% 9%
1	K	159	84% 6% 9%
1	L	159	79% 12% 9%
1	M	159	84% 7% 9%
1	N	159	84% 6% 9%
1	O	159	79% 12% 9%
2	P	10	90% 80% 20%
2	Q	10	60% 80% 20%
2	R	10	60% 80% 20%
2	S	10	50% 50% 50%
2	T	10	60% 80% 20%
2	U	10	60% 70% 30%
2	V	10	60% 80% 20%
2	W	10	60% 80% 20%
2	X	10	80% 80% 20%
2	Y	10	60% 80% 20%
2	Z	10	70% 70% 30%
2	a	10	70% 100%
2	b	10	100% 100%
2	c	10	60% 100%

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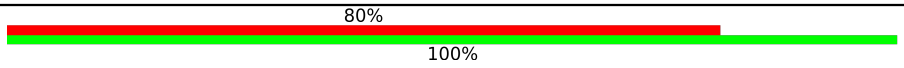
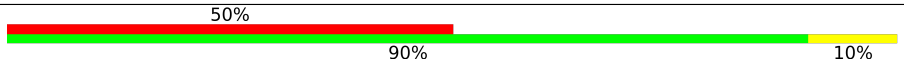
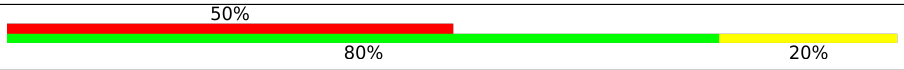
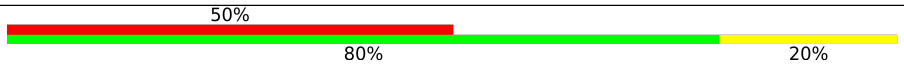
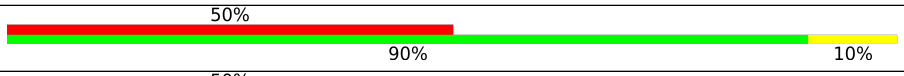
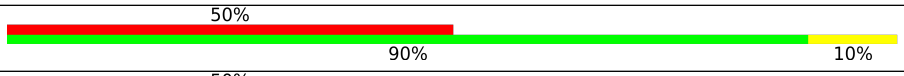
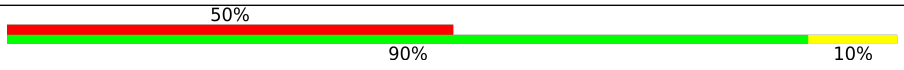
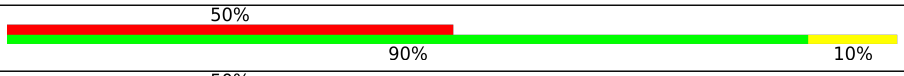
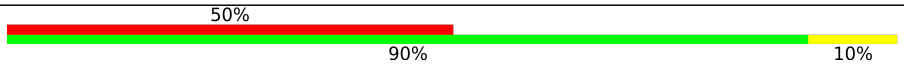
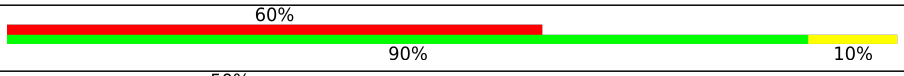
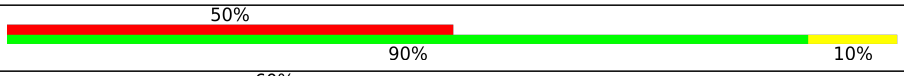
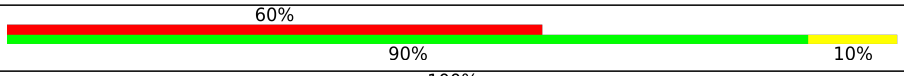
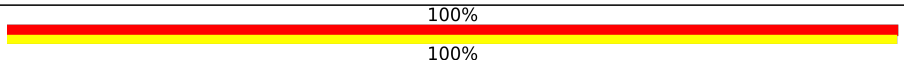
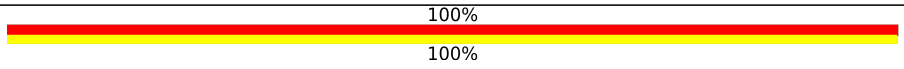
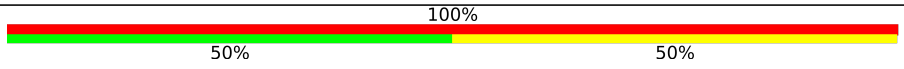
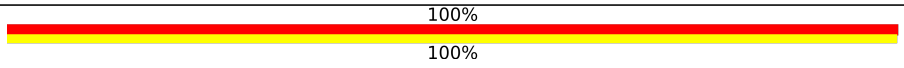
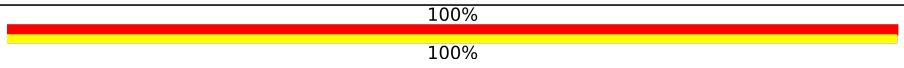
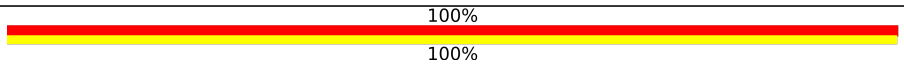
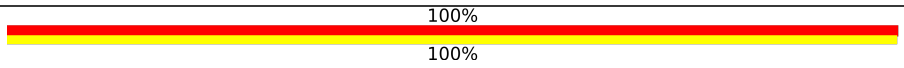
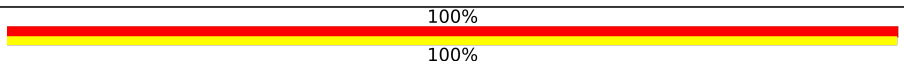
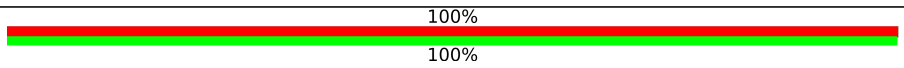
Mol	Chain	Length	Quality of chain
2	d	10	
3	e	10	
3	f	10	
3	g	10	
3	h	10	
3	i	10	
3	j	10	
3	k	10	
3	l	10	
3	m	10	
3	n	10	
3	o	10	
3	p	10	
3	q	10	
3	r	10	
3	s	10	
4	1	2	
4	2	2	
4	3	2	
4	4	2	
4	5	2	
4	6	2	
4	7	2	
4	8	2	
4	t	2	

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Mol	Chain	Length	Quality of chain
4	u	2	100% 100%
4	v	2	100% 100%
4	w	2	100% 100%
4	x	2	100% 100%
4	y	2	100% 100%
4	z	2	100% 100%

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	SO4	M	201[A]	-	-	-	X
6	SO4	M	201[B]	-	-	-	X
6	SO4	M	201[C]	-	-	-	X
6	SO4	M	201[D]	-	-	-	X
6	SO4	M	201[E]	-	-	-	X
7	NA	B	202	-	-	-	X
7	NA	N	203[A]	-	-	-	X

2 Entry composition (i)

There are 9 unique types of molecules in this entry. The entry contains 29296 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 Coat protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	144	Total	C	N	O	S	0	15	0
			1201	761	213	219	8			
1	B	144	Total	C	N	O	S	0	14	0
			1191	753	210	219	9			
1	C	144	Total	C	N	O	S	0	18	0
			1204	768	210	217	9			
1	D	144	Total	C	N	O	S	0	19	0
			1223	779	215	220	9			
1	E	144	Total	C	N	O	S	0	16	0
			1211	768	214	220	9			
1	F	144	Total	C	N	O	S	0	18	0
			1216	775	214	218	9			
1	G	144	Total	C	N	O	S	0	16	0
			1198	760	210	219	9			
1	H	144	Total	C	N	O	S	0	17	0
			1205	766	210	221	8			
1	I	144	Total	C	N	O	S	0	16	0
			1201	762	210	220	9			
1	J	144	Total	C	N	O	S	0	15	0
			1190	751	210	221	8			
1	K	144	Total	C	N	O	S	0	16	0
			1198	761	209	219	9			
1	L	144	Total	C	N	O	S	0	18	0
			1209	769	212	219	9			
1	M	144	Total	C	N	O	S	0	17	0
			1201	764	210	219	8			
1	N	144	Total	C	N	O	S	0	16	0
			1198	758	211	220	9			
1	O	144	Total	C	N	O	S	0	21	0
			1221	780	212	220	9			

- Molecule 2 is a RNA chain called RNA (5'-R(P*AP*AP*AP*AP*AP*AP*AP*AP*AP*A)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	P	10	Total	C	N	O	P	0	10	0
			221	100	50	61	10			
2	Q	10	Total	C	N	O	P	0	10	0
			221	100	50	61	10			
2	R	10	Total	C	N	O	P	0	10	0
			221	100	50	61	10			
2	S	10	Total	C	N	O	P	0	10	0
			221	100	50	61	10			
2	T	10	Total	C	N	O	P	0	10	0
			221	100	50	61	10			
2	U	10	Total	C	N	O	P	0	10	0
			221	100	50	61	10			
2	V	10	Total	C	N	O	P	0	10	0
			221	100	50	61	10			
2	W	10	Total	C	N	O	P	0	10	0
			221	100	50	61	10			
2	X	10	Total	C	N	O	P	0	10	0
			221	100	50	61	10			
2	Y	10	Total	C	N	O	P	0	10	0
			221	100	50	61	10			
2	Z	10	Total	C	N	O	P	0	10	0
			221	100	50	61	10			
2	a	10	Total	C	N	O	P	0	10	0
			221	100	50	61	10			
2	b	10	Total	C	N	O	P	0	10	0
			221	100	50	61	10			
2	c	10	Total	C	N	O	P	0	10	0
			221	100	50	61	10			
2	d	10	Total	C	N	O	P	0	10	0
			221	100	50	61	10			

- Molecule 3 is a RNA chain called RNA (5'-R(P*UP*UP*UP*UP*UP*UP*UP*UP*UP*U)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	e	10	Total	C	N	O	P	0	10	0
			201	90	20	81	10			
3	f	10	Total	C	N	O	P	0	10	0
			201	90	20	81	10			
3	g	10	Total	C	N	O	P	0	10	0
			201	90	20	81	10			
3	h	10	Total	C	N	O	P	0	10	0
			201	90	20	81	10			

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	i	10	Total	C	N	O	P	0	10	0
			201	90	20	81	10			
3	j	10	Total	C	N	O	P	0	10	0
			201	90	20	81	10			
3	k	10	Total	C	N	O	P	0	10	0
			201	90	20	81	10			
3	l	10	Total	C	N	O	P	0	10	0
			201	90	20	81	10			
3	m	10	Total	C	N	O	P	0	10	0
			201	90	20	81	10			
3	n	10	Total	C	N	O	P	0	10	0
			201	90	20	81	10			
3	o	10	Total	C	N	O	P	0	10	0
			201	90	20	81	10			
3	p	10	Total	C	N	O	P	0	10	0
			201	90	20	81	10			
3	q	10	Total	C	N	O	P	0	10	0
			201	90	20	81	10			
3	r	10	Total	C	N	O	P	0	10	0
			201	90	20	81	10			
3	s	10	Total	C	N	O	P	0	10	0
			201	90	20	81	10			

- Molecule 4 is a RNA chain called RNA (5'-R(P*UP*U)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	t	2	Total	C	N	O	P	0	2	0
			26	10	2	12	2			
4	u	2	Total	C	N	O	P	0	2	0
			26	10	2	12	2			
4	v	2	Total	C	N	O	P	0	2	0
			26	10	2	12	2			
4	w	2	Total	C	N	O	P	0	2	0
			26	10	2	12	2			
4	x	2	Total	C	N	O	P	0	2	0
			26	10	2	12	2			
4	y	2	Total	C	N	O	P	0	2	0
			26	10	2	12	2			
4	z	2	Total	C	N	O	P	0	2	0
			26	10	2	12	2			
4	1	2	Total	C	N	O	P	0	2	0
			26	10	2	12	2			

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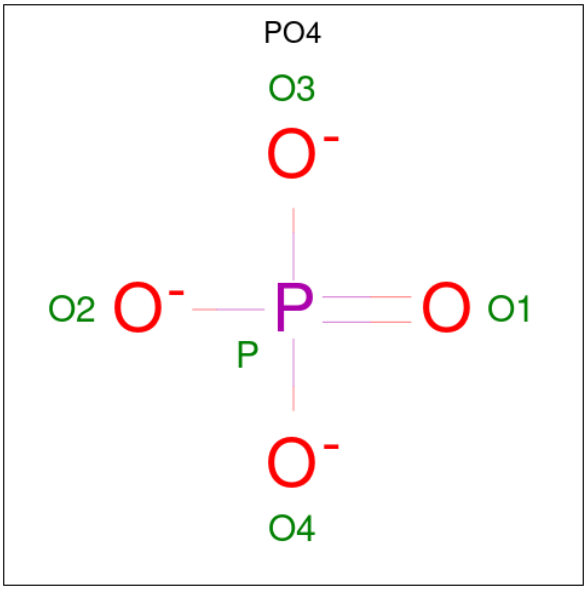
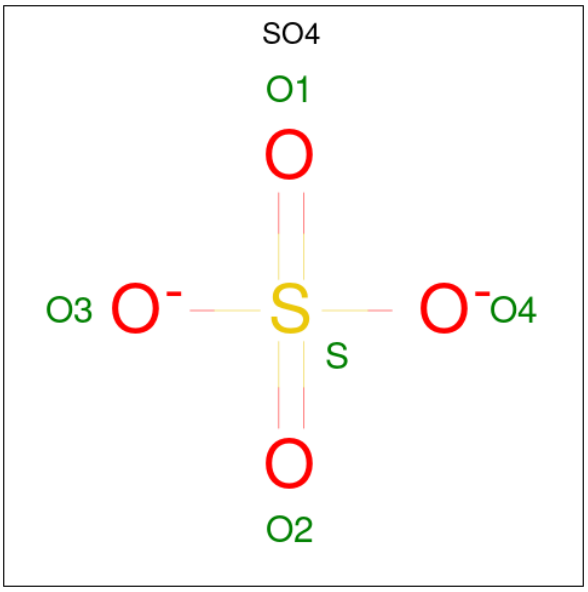
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	2	2	Total	C	N	O	P	0	2	0
			26	10	2	12	2			
4	3	2	Total	C	N	O	P	0	2	0
			26	10	2	12	2			
4	4	2	Total	C	N	O	P	0	2	0
			26	10	2	12	2			
4	5	2	Total	C	N	O	P	0	2	0
			26	10	2	12	2			
4	6	2	Total	C	N	O	P	0	2	0
			26	10	2	12	2			
4	7	2	Total	C	N	O	P	0	2	0
			26	10	2	12	2			
4	8	2	Total	C	N	O	P	0	2	0
			26	10	2	12	2			

- Molecule 5 is PHOSPHATE ION (three-letter code: PO4) (formula: O_4P).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total	O	P		0	1
			21	20	1			
5	H	1	Total	O	P		0	1
			21	20	1			
5	N	1	Total	O	P		0	1
			21	20	1			

- Molecule 6 is SULFATE ION (three-letter code: SO4) (formula: O_4S).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total O S 5 4 1	0	0
6	B	1	Total O S 5 4 1	0	0
6	C	1	Total O S 5 4 1	0	0
6	D	1	Total O S 5 4 1	0	0
6	E	1	Total O S 25 20 5	0	1
6	E	1	Total O S 5 4 1	0	0
6	F	1	Total O S 5 4 1	0	0
6	G	1	Total O S 25 20 5	0	1
6	G	1	Total O S 5 4 1	0	0
6	H	1	Total O S 5 4 1	0	0
6	I	1	Total O S 5 4 1	0	0
6	J	1	Total O S 5 4 1	0	0
6	K	1	Total O S 5 4 1	0	0
6	L	1	Total O S 5 4 1	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	M	1	Total O S 25 20 5	0	1
6	M	1	Total O S 5 4 1	0	0
6	N	1	Total O S 5 4 1	0	0
6	O	1	Total O S 5 4 1	0	0

- Molecule 7 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	1	Total Na 1 1	0	1
7	B	2	Total Na 2 2	0	0
7	C	1	Total Na 1 1	0	1
7	D	1	Total Na 1 1	0	0
7	E	2	Total Na 2 2	0	0
7	F	1	Total Na 1 1	0	0
7	G	1	Total Na 1 1	0	0
7	H	1	Total Na 1 1	0	0
7	I	1	Total Na 1 1	0	1
7	J	1	Total Na 1 1	0	1
7	K	1	Total Na 1 1	0	1
7	L	1	Total Na 1 1	0	0
7	M	1	Total Na 1 1	0	1
7	N	1	Total Na 1 1	0	1
7	O	1	Total Na 1 1	0	1

- Molecule 8 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	E	1	Total Mg 1 1	0	0
8	F	1	Total Mg 1 1	0	0
8	K	1	Total Mg 1 1	0	0

- Molecule 9 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	A	271	Total O 271 271	0	77
9	B	267	Total O 267 267	0	51
9	C	263	Total O 263 263	0	43
9	D	228	Total O 228 228	0	39
9	E	269	Total O 269 269	0	46
9	F	259	Total O 259 259	0	49
9	G	275	Total O 275 275	0	49
9	H	277	Total O 277 277	0	51
9	I	253	Total O 253 253	0	55
9	J	279	Total O 279 279	0	53
9	K	240	Total O 240 240	0	60
9	L	303	Total O 303 303	0	64
9	M	298	Total O 298 298	0	58
9	N	254	Total O 254 254	0	60
9	O	309	Total O 309 309	0	70
9	P	7	Total O 7 7	0	4

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	Q	7	Total O 7 7	0	2
9	R	6	Total O 6 6	0	1
9	S	8	Total O 8 8	0	3
9	T	5	Total O 5 5	0	1
9	U	7	Total O 7 7	0	2
9	V	7	Total O 7 7	0	0
9	W	6	Total O 6 6	0	1
9	X	4	Total O 4 4	0	2
9	Y	6	Total O 6 6	0	1
9	Z	7	Total O 7 7	0	2
9	a	13	Total O 13 13	0	7
9	b	6	Total O 6 6	0	3
9	c	6	Total O 6 6	0	2
9	d	7	Total O 7 7	0	2
9	e	5	Total O 5 5	0	3
9	f	8	Total O 8 8	0	1
9	g	9	Total O 9 9	0	3
9	h	10	Total O 10 10	0	2
9	i	9	Total O 9 9	0	4
9	j	5	Total O 5 5	0	1
9	k	9	Total O 9 9	0	2

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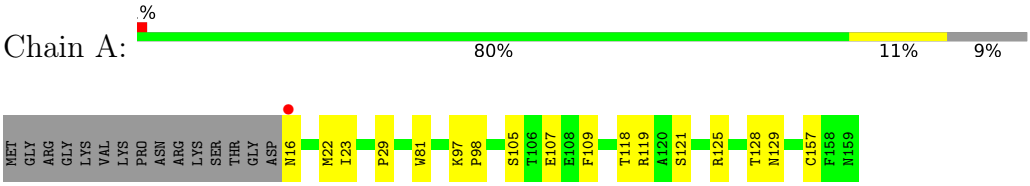
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	l	8	Total O 8 8	0	2
9	m	10	Total O 10 10	0	4
9	n	8	Total O 8 8	0	3
9	o	9	Total O 9 9	0	2
9	p	6	Total O 6 6	0	0
9	q	10	Total O 10 10	0	4
9	r	10	Total O 10 10	0	3
9	s	7	Total O 7 7	0	2
9	t	1	Total O 1 1	0	0
9	x	2	Total O 2 2	0	0
9	4	1	Total O 1 1	0	0
9	6	1	Total O 1 1	0	0
9	8	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 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.

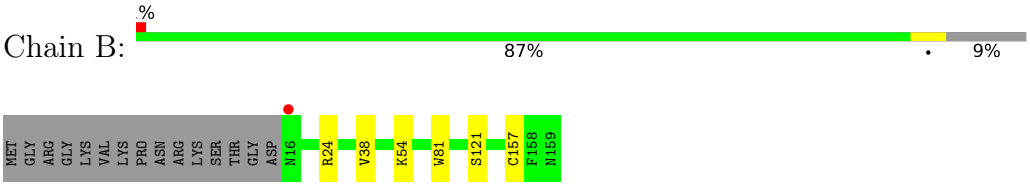
• Molecule 1: Coat protein

Chain A:



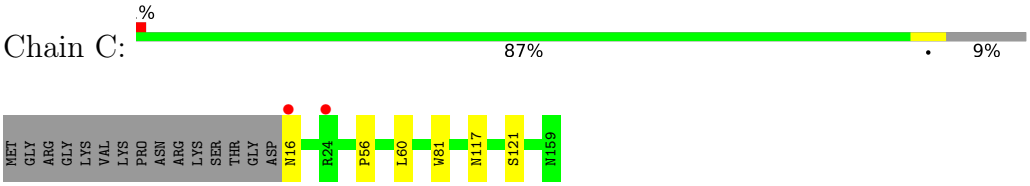
• Molecule 1: Coat protein

Chain B:



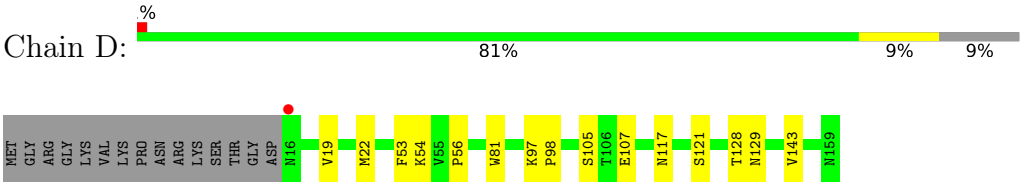
• Molecule 1: Coat protein

Chain C:



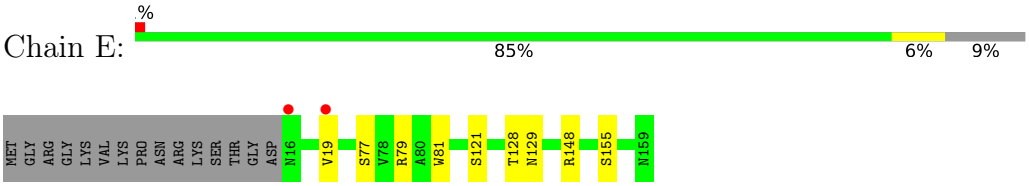
• Molecule 1: Coat protein

Chain D:



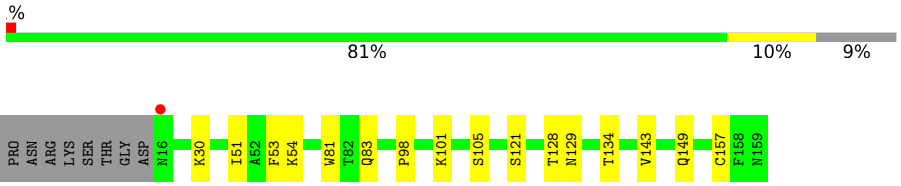
• Molecule 1: Coat protein

Chain E:



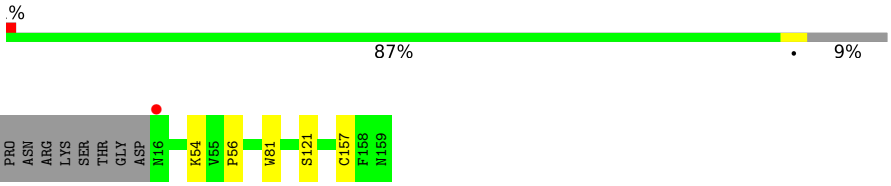
• Molecule 1: Coat protein

Chain F:



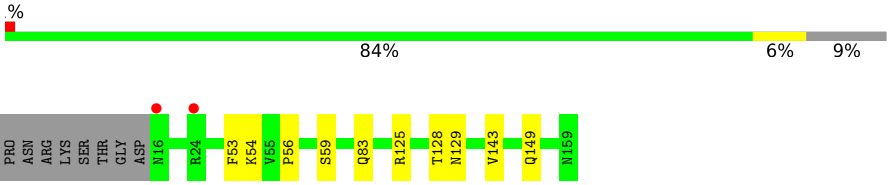
• Molecule 1: Coat protein

Chain G:



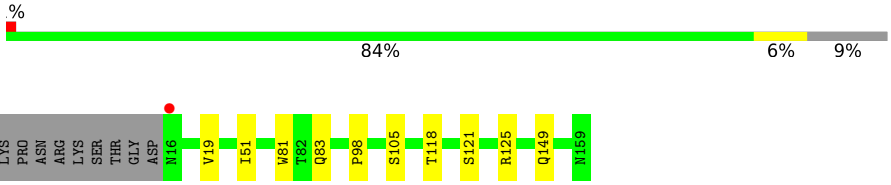
• Molecule 1: Coat protein

Chain H:



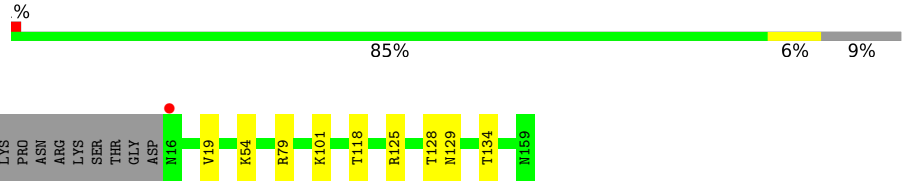
• Molecule 1: Coat protein

Chain I:



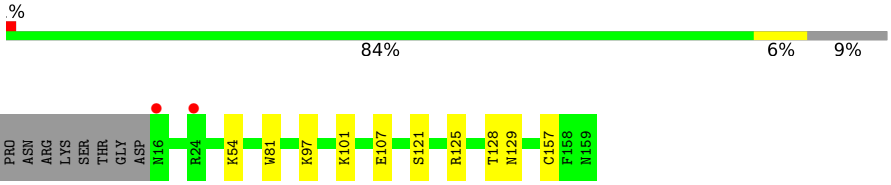
• Molecule 1: Coat protein

Chain J:



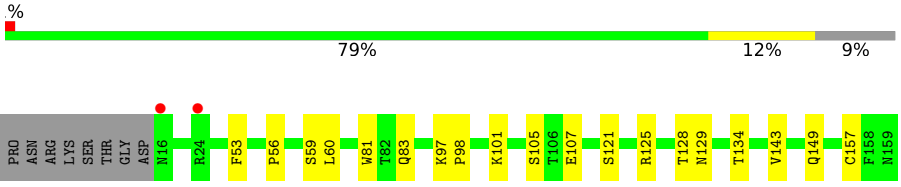
• Molecule 1: Coat protein

Chain K:



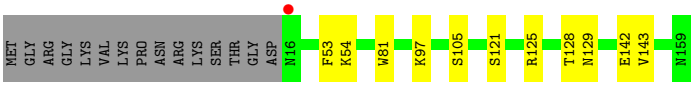
• Molecule 1: Coat protein

Chain L:



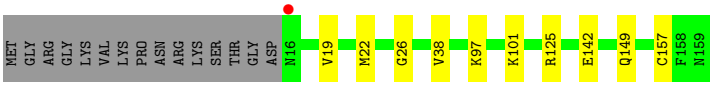
• Molecule 1: Coat protein

Chain M:



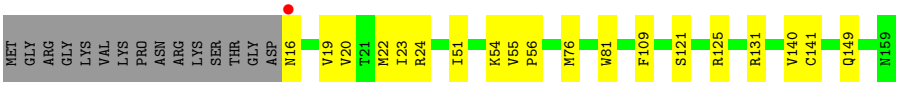
• Molecule 1: Coat protein

Chain N:



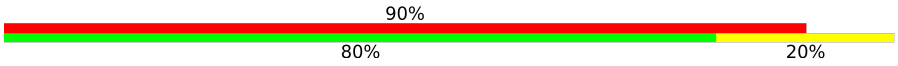
• Molecule 1: Coat protein

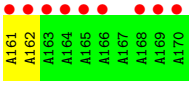
Chain O:



• Molecule 2: RNA (5'-R(P*AP*AP*AP*AP*AP*AP*AP*AP*AP*A)-3')

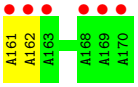
Chain P:





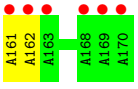
• Molecule 2: RNA (5'-R(P*AP*AP*AP*AP*AP*AP*AP*AP*AP*A)-3')

Chain Q:



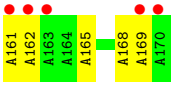
• Molecule 2: RNA (5'-R(P*AP*AP*AP*AP*AP*AP*AP*AP*AP*A)-3')

Chain R:

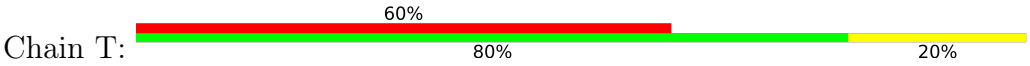


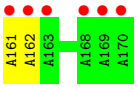
• Molecule 2: RNA (5'-R(P*AP*AP*AP*AP*AP*AP*AP*AP*AP*A)-3')

Chain S:

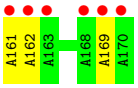


• Molecule 2: RNA (5'-R(P*AP*AP*AP*AP*AP*AP*AP*AP*AP*A)-3')

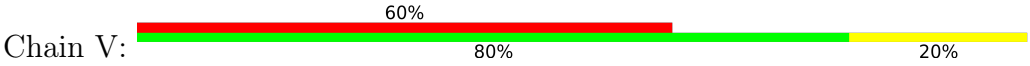


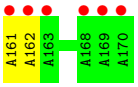


• Molecule 2: RNA (5'-R(P*AP*AP*AP*AP*AP*AP*AP*AP*AP*A)-3')

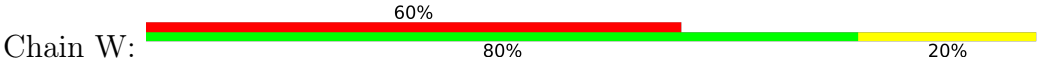


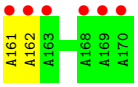
• Molecule 2: RNA (5'-R(P*AP*AP*AP*AP*AP*AP*AP*AP*AP*A)-3')



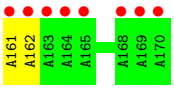


• Molecule 2: RNA (5'-R(P*AP*AP*AP*AP*AP*AP*AP*AP*AP*A)-3')

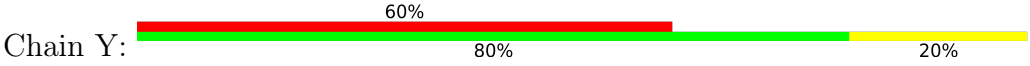


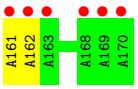


• Molecule 2: RNA (5'-R(P*AP*AP*AP*AP*AP*AP*AP*AP*AP*A)-3')



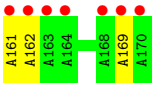
• Molecule 2: RNA (5'-R(P*AP*AP*AP*AP*AP*AP*AP*AP*AP*A)-3')





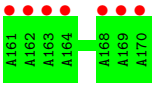
• Molecule 2: RNA (5'-R(P*AP*AP*AP*AP*AP*AP*AP*AP*AP*A)-3')

Chain Z:



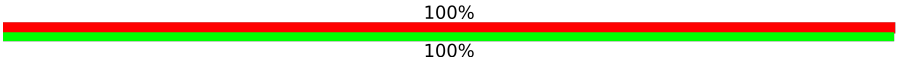
• Molecule 2: RNA (5'-R(P*AP*AP*AP*AP*AP*AP*AP*AP*AP*A)-3')

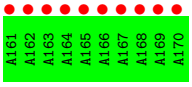
Chain a:



• Molecule 2: RNA (5'-R(P*AP*AP*AP*AP*AP*AP*AP*AP*AP*A)-3')

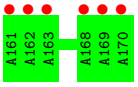
Chain b:





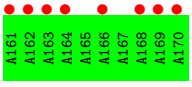
• Molecule 2: RNA (5'-R(P*AP*AP*AP*AP*AP*AP*AP*AP*AP*A)-3')

Chain c:



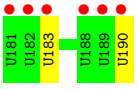
• Molecule 2: RNA (5'-R(P*AP*AP*AP*AP*AP*AP*AP*AP*AP*A)-3')

Chain d:



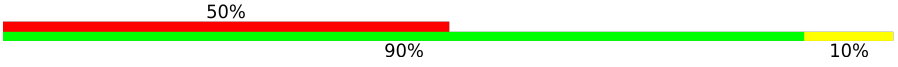
• Molecule 3: RNA (5'-R(P*UP*UP*UP*UP*UP*UP*UP*UP*UP*U)-3')

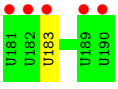
Chain e:



• Molecule 3: RNA (5'-R(P*UP*UP*UP*UP*UP*UP*UP*UP*UP*U)-3')

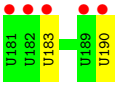
Chain f:





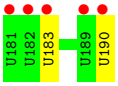
• Molecule 3: RNA (5'-R(P*UP*UP*UP*UP*UP*UP*UP*UP*UP*U)-3')

Chain g:



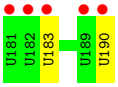
• Molecule 3: RNA (5'-R(P*UP*UP*UP*UP*UP*UP*UP*UP*UP*U)-3')

Chain h:



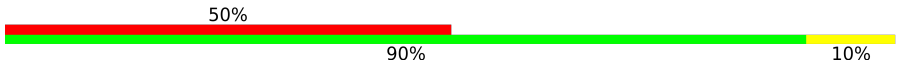
• Molecule 3: RNA (5'-R(P*UP*UP*UP*UP*UP*UP*UP*UP*UP*U)-3')

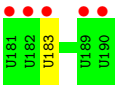
Chain i:



• Molecule 3: RNA (5'-R(P*UP*UP*UP*UP*UP*UP*UP*UP*UP*U)-3')

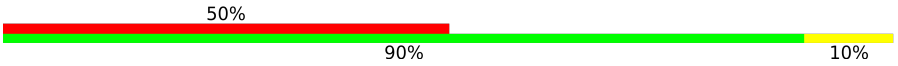
Chain j:

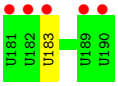




• Molecule 3: RNA (5'-R(P*UP*UP*UP*UP*UP*UP*UP*UP*UP*U)-3')

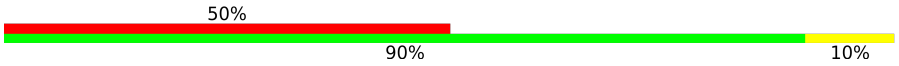
Chain k:

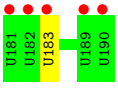




• Molecule 3: RNA (5'-R(P*UP*UP*UP*UP*UP*UP*UP*UP*UP*U)-3')

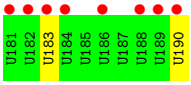
Chain l:





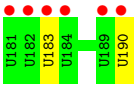
• Molecule 3: RNA (5'-R(P*UP*UP*UP*UP*UP*UP*UP*UP*UP*U)-3')

Chain m:



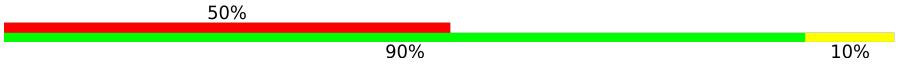
• Molecule 3: RNA (5'-R(P*UP*UP*UP*UP*UP*UP*UP*UP*UP*U)-3')

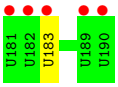
Chain n:



• Molecule 3: RNA (5'-R(P*UP*UP*UP*UP*UP*UP*UP*UP*UP*U)-3')

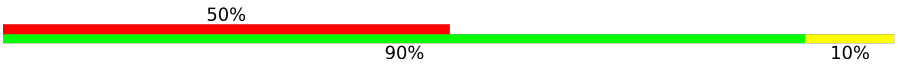
Chain o:

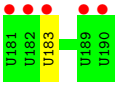




• Molecule 3: RNA (5'-R(P*UP*UP*UP*UP*UP*UP*UP*UP*UP*U)-3')

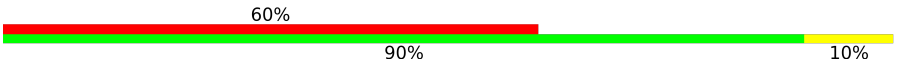
Chain p:

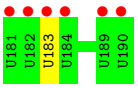




• Molecule 3: RNA (5'-R(P*UP*UP*UP*UP*UP*UP*UP*UP*UP*U)-3')

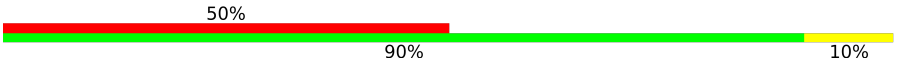
Chain q:

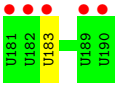




• Molecule 3: RNA (5'-R(P*UP*UP*UP*UP*UP*UP*UP*UP*UP*U)-3')

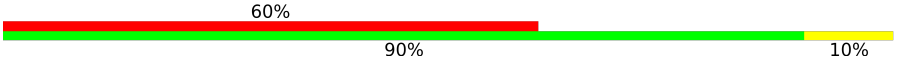
Chain r:

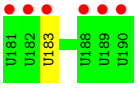




• Molecule 3: RNA (5'-R(P*UP*UP*UP*UP*UP*UP*UP*UP*UP*U)-3')

Chain s:



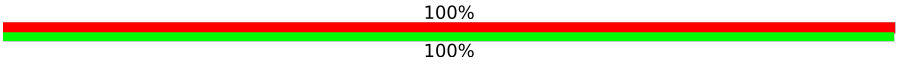


• Molecule 4: RNA (5'-R(P*UP*U)-3')

Chain t:

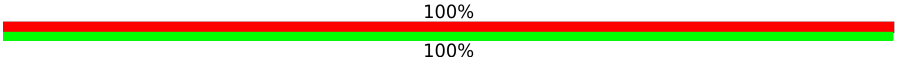
• Molecule 4: RNA (5'-R(P*UP*U)-3')

Chain u:



• Molecule 4: RNA (5'-R(P*UP*U)-3')

Chain v:



• Molecule 4: RNA (5'-R(P*UP*U)-3')

Chain w:

• Molecule 4: RNA (5'-R(P*UP*U)-3')

Chain x:

• Molecule 4: RNA (5'-R(P*UP*U)-3')

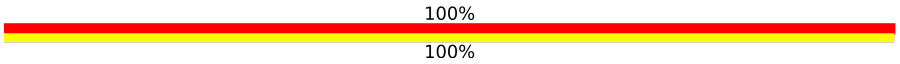
Chain y:

• Molecule 4: RNA (5'-R(P*UP*U)-3')

Chain z:

• Molecule 4: RNA (5'-R(P*UP*U)-3')

Chain 1:



• Molecule 4: RNA (5'-R(P*UP*U)-3')

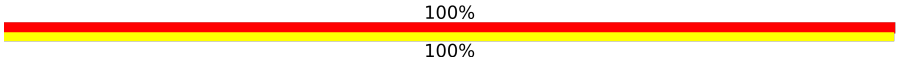
Chain 2:

• Molecule 4: RNA (5'-R(P*UP*U)-3')

Chain 3:

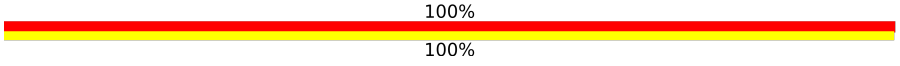
• Molecule 4: RNA (5'-R(P*UP*U)-3')

Chain 4:



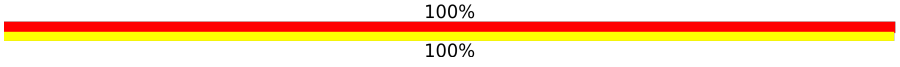
• Molecule 4: RNA (5'-R(P*UP*U)-3')

Chain 5:



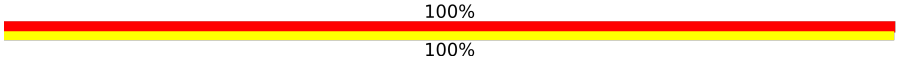
• Molecule 4: RNA (5'-R(P*UP*U)-3')

Chain 6:



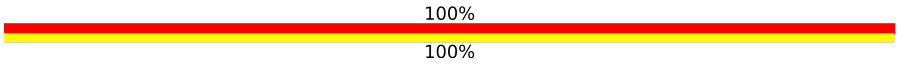
• Molecule 4: RNA (5'-R(P*UP*U)-3')

Chain 7:



• Molecule 4: RNA (5'-R(P*UP*U)-3')

Chain 8:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	I 2 2 2	Depositor
Cell constants a, b, c, α, β, γ	172.69Å 190.30Å 201.69Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.35 – 1.45 47.85 – 1.45	Depositor EDS
% Data completeness (in resolution range)	98.5 (48.35-1.45) 98.5 (47.85-1.45)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.44 (at 1.45Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.217 , 0.250 0.226 , 0.256	Depositor DCC
R_{free} test set	28359 reflections (4.97%)	wwPDB-VP
Wilson B-factor (Å^2)	18.5	Xtriage
Anisotropy	0.235	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 87.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.45$, $< L^2 > = 0.28$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	29296	wwPDB-VP
Average B, all atoms (Å^2)	49.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.17% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ 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: SO4, MG, PO4, NA

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	0.58	0/1271	0.73	1/1727 (0.1%)
1	B	0.54	0/1251	0.70	0/1700
1	C	0.53	0/1284	0.71	0/1743
1	D	0.55	0/1309	0.71	0/1777
1	E	0.54	0/1286	0.70	0/1746
1	F	0.57	0/1303	0.71	0/1767
1	G	0.54	0/1266	0.68	0/1721
1	H	0.55	0/1279	0.68	0/1740
1	I	0.54	0/1272	0.72	0/1728
1	J	0.57	0/1256	0.71	0/1707
1	K	0.55	0/1273	0.72	0/1729
1	L	0.54	0/1292	0.72	0/1753
1	M	0.52	0/1274	0.71	0/1732
1	N	0.55	0/1267	0.71	0/1721
1	O	0.56	0/1306	0.70	0/1775
2	P	0.45	0/250	1.06	0/386
2	Q	0.43	0/250	1.08	0/386
2	R	0.44	0/250	1.06	0/386
2	S	0.57	0/250	1.15	1/386 (0.3%)
2	T	0.45	0/250	1.07	0/386
2	U	0.42	0/250	1.12	0/386
2	V	0.44	0/250	1.06	0/386
2	W	0.40	0/250	1.11	0/386
2	X	0.45	0/250	1.06	0/386
2	Y	0.43	0/250	1.06	0/386
2	Z	0.42	0/250	1.14	0/386
2	a	0.45	0/250	1.06	0/386
2	b	0.46	0/250	1.10	0/386
2	c	0.43	0/250	1.11	0/386
2	d	0.45	0/250	1.13	0/386
3	e	0.54	0/220	1.07	0/336
3	f	0.49	0/220	1.01	0/336

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\| > 5$	RMSZ	$\#\|Z\| > 5$
3	g	0.50	0/220	1.06	0/336
3	h	0.50	0/220	1.05	0/336
3	i	0.51	0/220	1.06	0/336
3	j	0.49	0/220	1.01	0/336
3	k	0.50	0/220	1.02	0/336
3	l	0.50	0/220	1.01	0/336
3	m	0.52	0/220	1.06	0/336
3	n	0.53	0/220	1.10	0/336
3	o	0.49	0/220	1.02	0/336
3	p	0.50	0/220	1.02	0/336
3	q	0.51	0/220	1.02	0/336
3	r	0.49	0/220	1.03	0/336
3	s	0.51	0/220	1.05	0/336
4	1	0.45	0/27	0.92	0/38
4	2	0.55	0/27	1.01	0/38
4	3	0.46	0/27	0.91	0/38
4	4	0.48	0/27	1.00	0/38
4	5	0.47	0/27	0.82	0/38
4	6	0.49	0/27	1.03	0/38
4	7	0.49	0/27	1.03	0/38
4	8	0.48	0/27	0.99	0/38
4	t	0.45	0/27	0.94	0/38
4	u	0.47	0/27	1.00	0/38
4	v	0.46	0/27	0.97	0/38
4	w	0.49	0/27	0.88	0/38
4	x	0.42	0/27	0.90	0/38
4	y	0.49	0/27	0.92	0/38
4	z	0.47	0/27	0.96	0/38
All	All	0.53	0/26644	0.83	2/37466 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	S	165[A]	A	C3'-C2'-C1'	-6.31	96.45	101.50
1	A	119	ARG	NE-CZ-NH2	-5.10	117.75	120.30

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	1201	0	1240	18	0
1	B	1191	0	1224	6	0
1	C	1204	0	1262	5	0
1	D	1223	0	1283	11	0
1	E	1211	0	1260	8	0
1	F	1216	0	1280	16	0
1	G	1198	0	1238	5	0
1	H	1205	0	1250	9	0
1	I	1201	0	1245	12	0
1	J	1190	0	1219	10	0
1	K	1198	0	1247	12	0
1	L	1209	0	1266	16	0
1	M	1201	0	1248	9	0
1	N	1198	0	1236	9	0
1	O	1221	0	1276	34	0
2	P	221	0	93	1	0
2	Q	221	0	111	1	0
2	R	221	0	111	1	0
2	S	221	0	110	2	0
2	T	221	0	96	1	0
2	U	221	0	96	2	0
2	V	221	0	111	1	0
2	W	221	0	111	1	0
2	X	221	0	111	1	0
2	Y	221	0	94	1	0
2	Z	221	0	96	2	0
2	a	221	0	111	0	0
2	b	221	0	111	0	0
2	c	221	0	111	0	0
2	d	221	0	93	0	0
3	e	201	0	83	0	0
3	f	201	0	101	0	0
3	g	201	0	101	0	0
3	h	201	0	100	0	0
3	i	201	0	83	0	0
3	j	201	0	83	0	0
3	k	201	0	101	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	l	201	0	101	0	0
3	m	201	0	101	0	0
3	n	201	0	84	0	0
3	o	201	0	83	0	0
3	p	201	0	101	0	0
3	q	201	0	101	0	0
3	r	201	0	101	0	0
3	s	201	0	82	0	0
4	1	26	0	10	5	0
4	2	26	0	10	5	0
4	3	26	0	10	1	0
4	4	26	0	10	4	0
4	5	26	0	10	5	0
4	6	26	0	10	3	0
4	7	26	0	10	2	0
4	8	26	0	10	6	0
4	t	26	0	10	0	0
4	u	26	0	10	0	0
4	v	26	0	10	0	0
4	w	26	0	10	0	0
4	x	26	0	10	0	0
4	y	26	0	10	0	0
4	z	26	0	10	0	0
5	A	21	0	0	2	0
5	H	21	0	0	0	0
5	N	21	0	0	0	0
6	A	5	0	0	0	0
6	B	5	0	0	0	0
6	C	5	0	0	0	0
6	D	5	0	0	0	0
6	E	30	0	0	0	0
6	F	5	0	0	0	0
6	G	30	0	0	0	0
6	H	5	0	0	0	0
6	I	5	0	0	0	0
6	J	5	0	0	0	0
6	K	5	0	0	0	0
6	L	5	0	0	0	0
6	M	30	0	0	0	0
6	N	5	0	0	0	0
6	O	5	0	0	0	0
7	A	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	B	2	0	0	0	0
7	C	1	0	0	0	0
7	D	1	0	0	0	0
7	E	2	0	0	0	0
7	F	1	0	0	0	0
7	G	1	0	0	0	0
7	H	1	0	0	0	0
7	I	1	0	0	0	0
7	J	1	0	0	0	0
7	K	1	0	0	0	0
7	L	1	0	0	0	0
7	M	1	0	0	0	0
7	N	1	0	0	0	0
7	O	1	0	0	0	0
8	E	1	0	0	0	0
8	F	1	0	0	0	0
8	K	1	0	0	0	0
9	4	1	0	0	0	0
9	6	1	0	0	0	0
9	8	1	0	0	0	0
9	A	271	0	0	7	0
9	B	267	0	0	3	0
9	C	263	0	0	1	0
9	D	228	0	0	0	0
9	E	269	0	0	1	0
9	F	259	0	0	4	0
9	G	275	0	0	1	0
9	H	277	0	0	2	0
9	I	253	0	0	4	0
9	J	279	0	0	3	0
9	K	240	0	0	3	0
9	L	303	0	0	1	0
9	M	298	0	0	2	0
9	N	254	0	0	4	0
9	O	309	0	0	5	0
9	P	7	0	0	0	0
9	Q	7	0	0	0	0
9	R	6	0	0	0	0
9	S	8	0	0	0	0
9	T	5	0	0	0	0
9	U	7	0	0	0	0
9	V	7	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
9	W	6	0	0	0	0
9	X	4	0	0	0	0
9	Y	6	0	0	0	0
9	Z	7	0	0	0	0
9	a	13	0	0	0	0
9	b	6	0	0	0	0
9	c	6	0	0	0	0
9	d	7	0	0	0	0
9	e	5	0	0	0	0
9	f	8	0	0	0	0
9	g	9	0	0	0	0
9	h	10	0	0	0	0
9	i	9	0	0	0	0
9	j	5	0	0	0	0
9	k	9	0	0	0	0
9	l	8	0	0	0	0
9	m	10	0	0	0	0
9	n	8	0	0	0	0
9	o	9	0	0	0	0
9	p	6	0	0	0	0
9	q	10	0	0	0	0
9	r	10	0	0	0	0
9	s	7	0	0	0	0
9	t	1	0	0	0	0
9	x	2	0	0	0	0
All	All	29296	0	21896	179	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 11.

The worst 5 of 179 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:A:157[B]:CYS:SG	1:J:19:VAL:HG11	1.90	1.12
1:E:19:VAL:HG11	1:K:157[B]:CYS:SG	1.99	1.02
1:D:19:VAL:HG11	1:G:157[B]:CYS:SG	2.04	0.96
1:F:51[B]:ILE:HD11	9:F:511:HOH:O	1.68	0.93
9:K:472:HOH:O	4:4:196[A]:U:C5'	2.19	0.89

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	158/159 (99%)	153 (97%)	5 (3%)	0	100	100
1	B	156/159 (98%)	152 (97%)	4 (3%)	0	100	100
1	C	160/159 (101%)	156 (98%)	4 (2%)	0	100	100
1	D	163/159 (102%)	159 (98%)	4 (2%)	0	100	100
1	E	160/159 (101%)	156 (98%)	4 (2%)	0	100	100
1	F	162/159 (102%)	157 (97%)	5 (3%)	0	100	100
1	G	158/159 (99%)	154 (98%)	4 (2%)	0	100	100
1	H	160/159 (101%)	156 (98%)	4 (2%)	0	100	100
1	I	159/159 (100%)	153 (96%)	6 (4%)	0	100	100
1	J	157/159 (99%)	152 (97%)	5 (3%)	0	100	100
1	K	159/159 (100%)	155 (98%)	4 (2%)	0	100	100
1	L	161/159 (101%)	156 (97%)	5 (3%)	0	100	100
1	M	159/159 (100%)	154 (97%)	5 (3%)	0	100	100
1	N	158/159 (99%)	154 (98%)	4 (2%)	0	100	100
1	O	163/159 (102%)	158 (97%)	5 (3%)	0	100	100
All	All	2393/2385 (100%)	2325 (97%)	68 (3%)	0	100	100

There are no Ramachandran outliers to report.

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	144/140 (103%)	144 (100%)	0	100	100
1	B	142/140 (101%)	142 (100%)	0	100	100
1	C	146/140 (104%)	146 (100%)	0	100	100
1	D	149/140 (106%)	149 (100%)	0	100	100
1	E	146/140 (104%)	146 (100%)	0	100	100
1	F	148/140 (106%)	148 (100%)	0	100	100
1	G	144/140 (103%)	144 (100%)	0	100	100
1	H	146/140 (104%)	146 (100%)	0	100	100
1	I	145/140 (104%)	145 (100%)	0	100	100
1	J	143/140 (102%)	143 (100%)	0	100	100
1	K	145/140 (104%)	145 (100%)	0	100	100
1	L	147/140 (105%)	147 (100%)	0	100	100
1	M	145/140 (104%)	143 (99%)	2 (1%)	67	37
1	N	144/140 (103%)	144 (100%)	0	100	100
1	O	149/140 (106%)	149 (100%)	0	100	100
All	All	2183/2100 (104%)	2181 (100%)	2 (0%)	93	83

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	M	105[A]	SER
1	M	105[B]	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	18	ASN
1	F	18	ASN
1	K	18	ASN
1	L	18	ASN
1	M	18	ASN

5.3.3 RNA (i)

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Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
2	P	9/10 (90%)	0	0
2	Q	9/10 (90%)	0	0
2	R	9/10 (90%)	0	0
2	S	9/10 (90%)	0	0
2	T	9/10 (90%)	0	0
2	U	9/10 (90%)	0	0
2	V	9/10 (90%)	0	0
2	W	9/10 (90%)	0	0
2	X	9/10 (90%)	0	0
2	Y	9/10 (90%)	0	0
2	Z	9/10 (90%)	0	0
2	a	9/10 (90%)	0	0
2	b	9/10 (90%)	0	0
2	c	9/10 (90%)	0	0
2	d	9/10 (90%)	0	0
3	e	9/10 (90%)	2 (22%)	0
3	f	9/10 (90%)	1 (11%)	0
3	g	9/10 (90%)	2 (22%)	0
3	h	9/10 (90%)	2 (22%)	0
3	i	9/10 (90%)	2 (22%)	0
3	j	9/10 (90%)	1 (11%)	0
3	k	9/10 (90%)	1 (11%)	0
3	l	9/10 (90%)	1 (11%)	0
3	m	9/10 (90%)	2 (22%)	0
3	n	9/10 (90%)	2 (22%)	0
3	o	9/10 (90%)	1 (11%)	0
3	p	9/10 (90%)	1 (11%)	0
3	q	9/10 (90%)	1 (11%)	0
3	r	9/10 (90%)	1 (11%)	0
3	s	9/10 (90%)	1 (11%)	0
4	1	0/2	-	-
4	2	0/2	-	-
4	3	0/2	-	-
4	4	0/2	-	-
4	5	0/2	-	-
4	6	0/2	-	-
4	7	0/2	-	-
4	8	0/2	-	-
4	t	0/2	-	-
4	u	0/2	-	-
4	v	0/2	-	-

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Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
4	w	0/2	-	-
4	x	0/2	-	-
4	y	0/2	-	-
4	z	0/2	-	-
All	All	270/330 (81%)	21 (7%)	0

5 of 21 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
3	e	183[A]	U
3	e	190[A]	U
3	f	183[B]	U
3	g	183[A]	U
3	g	190[A]	U

There are no RNA pucker outliers to report.

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 65 ligands modelled in this entry, 20 are monoatomic - leaving 45 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	SO4	J	201	-	4,4,4	0.10	0	6,6,6	0.20	0
6	SO4	N	202	-	4,4,4	0.13	0	6,6,6	0.14	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
6	SO4	E	201[C]	-	4,4,4	0.13	0	6,6,6	0.12	0
6	SO4	E	201[A]	-	4,4,4	0.12	0	6,6,6	0.17	0
6	SO4	O	201	-	4,4,4	0.12	0	6,6,6	0.19	0
6	SO4	C	201	-	4,4,4	0.12	0	6,6,6	0.17	0
6	SO4	E	201[E]	-	4,4,4	0.13	0	6,6,6	0.13	0
6	SO4	E	202	-	4,4,4	0.11	0	6,6,6	0.21	0
6	SO4	E	201[D]	-	4,4,4	0.14	0	6,6,6	0.13	0
6	SO4	A	202	-	4,4,4	0.12	0	6,6,6	0.14	0
5	PO4	N	201[B]	8	4,4,4	0.98	0	6,6,6	0.46	0
6	SO4	I	201	-	4,4,4	0.11	0	6,6,6	0.23	0
6	SO4	M	201[B]	-	4,4,4	0.13	0	6,6,6	0.13	0
5	PO4	N	201[A]	-	4,4,4	1.00	0	6,6,6	0.64	0
5	PO4	N	201[C]	8	4,4,4	0.92	0	6,6,6	0.52	0
6	SO4	K	201	-	4,4,4	0.13	0	6,6,6	0.19	0
6	SO4	M	201[C]	-	4,4,4	0.14	0	6,6,6	0.09	0
6	SO4	M	201[A]	-	4,4,4	0.12	0	6,6,6	0.25	0
5	PO4	N	201[E]	8	4,4,4	1.06	0	6,6,6	0.55	0
5	PO4	N	201[D]	8	4,4,4	0.91	0	6,6,6	0.32	0
6	SO4	M	201[E]	-	4,4,4	0.14	0	6,6,6	0.11	0
5	PO4	H	201[B]	8	4,4,4	0.97	0	6,6,6	0.60	0
6	SO4	L	201	-	4,4,4	0.14	0	6,6,6	0.14	0
6	SO4	M	201[D]	-	4,4,4	0.13	0	6,6,6	0.21	0
5	PO4	A	201[B]	8	4,4,4	0.87	0	6,6,6	0.51	0
6	SO4	G	201[B]	-	4,4,4	0.13	0	6,6,6	0.19	0
6	SO4	G	202	-	4,4,4	0.11	0	6,6,6	0.11	0
5	PO4	H	201[C]	8	4,4,4	0.99	0	6,6,6	0.64	0
5	PO4	H	201[A]	8	4,4,4	1.05	0	6,6,6	0.34	0
6	SO4	M	202	-	4,4,4	0.11	0	6,6,6	0.12	0
5	PO4	A	201[A]	8	4,4,4	0.91	0	6,6,6	0.51	0
5	PO4	H	201[E]	8	4,4,4	1.02	0	6,6,6	0.82	0
6	SO4	F	201	-	4,4,4	0.17	0	6,6,6	0.10	0
6	SO4	B	201	-	4,4,4	0.12	0	6,6,6	0.17	0
5	PO4	A	201[C]	8	4,4,4	0.92	0	6,6,6	0.53	0
6	SO4	G	201[A]	-	4,4,4	0.15	0	6,6,6	0.19	0
5	PO4	H	201[D]	8	4,4,4	1.01	0	6,6,6	0.56	0
5	PO4	A	201[E]	8	4,4,4	1.00	0	6,6,6	0.55	0
6	SO4	G	201[C]	-	4,4,4	0.13	0	6,6,6	0.11	0
5	PO4	A	201[D]	8	4,4,4	0.93	0	6,6,6	0.69	0
6	SO4	H	202	-	4,4,4	0.13	0	6,6,6	0.13	0
6	SO4	G	201[E]	-	4,4,4	0.14	0	6,6,6	0.12	0
6	SO4	G	201[D]	-	4,4,4	0.13	0	6,6,6	0.12	0
6	SO4	E	201[B]	-	4,4,4	0.14	0	6,6,6	0.17	0
6	SO4	D	201	-	4,4,4	0.12	0	6,6,6	0.23	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.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	201[B]	PO4	1	0
5	A	201[C]	PO4	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^{th} 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^2)	Q<0.9
1	A	144/159 (90%)	-0.21	1 (0%)	87	89	22, 26, 33, 62	0
1	B	144/159 (90%)	-0.30	1 (0%)	87	89	22, 26, 33, 62	0
1	C	144/159 (90%)	-0.33	2 (1%)	75	76	22, 26, 32, 62	0
1	D	144/159 (90%)	-0.30	1 (0%)	87	89	22, 26, 33, 62	0
1	E	144/159 (90%)	-0.30	2 (1%)	75	76	22, 26, 33, 62	0
1	F	144/159 (90%)	-0.28	1 (0%)	87	89	22, 26, 33, 62	0
1	G	144/159 (90%)	-0.44	1 (0%)	87	89	22, 26, 33, 62	0
1	H	144/159 (90%)	-0.42	2 (1%)	75	76	22, 26, 33, 62	0
1	I	144/159 (90%)	-0.18	1 (0%)	87	89	22, 26, 33, 62	0
1	J	144/159 (90%)	-0.35	1 (0%)	87	89	22, 26, 33, 62	0
1	K	144/159 (90%)	-0.21	2 (1%)	75	76	22, 26, 33, 62	0
1	L	144/159 (90%)	-0.28	2 (1%)	75	76	22, 26, 33, 62	0
1	M	144/159 (90%)	-0.27	1 (0%)	87	89	22, 26, 33, 62	0
1	N	144/159 (90%)	-0.21	1 (0%)	87	89	22, 26, 33, 62	0
1	O	144/159 (90%)	-0.26	1 (0%)	87	89	22, 26, 33, 62	0
2	P	10/10 (100%)	8.90	9 (90%)	0	0	37, 108, 173, 178	10 (100%)
2	Q	10/10 (100%)	7.16	6 (60%)	0	0	37, 108, 173, 178	10 (100%)
2	R	10/10 (100%)	7.36	6 (60%)	0	0	37, 108, 173, 178	10 (100%)
2	S	10/10 (100%)	7.95	5 (50%)	0	0	25, 106, 185, 187	10 (100%)
2	T	10/10 (100%)	6.22	6 (60%)	0	0	36, 108, 173, 178	10 (100%)
2	U	10/10 (100%)	6.35	6 (60%)	0	0	33, 113, 176, 191	10 (100%)
2	V	10/10 (100%)	8.08	6 (60%)	0	0	36, 108, 173, 178	10 (100%)
2	W	10/10 (100%)	7.45	6 (60%)	0	0	33, 113, 176, 191	10 (100%)
2	X	10/10 (100%)	8.26	8 (80%)	0	0	37, 108, 173, 178	10 (100%)

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
2	Y	10/10 (100%)	7.00	6 (60%)	0	0	36, 108, 173, 178	10 (100%)
2	Z	10/10 (100%)	8.41	7 (70%)	0	0	33, 113, 176, 191	10 (100%)
2	a	10/10 (100%)	7.97	7 (70%)	0	0	36, 108, 173, 178	10 (100%)
2	b	10/10 (100%)	8.47	10 (100%)	0	0	33, 113, 176, 191	10 (100%)
2	c	10/10 (100%)	7.55	6 (60%)	0	0	33, 113, 176, 191	10 (100%)
2	d	10/10 (100%)	7.64	8 (80%)	0	0	33, 113, 176, 191	10 (100%)
3	e	10/10 (100%)	5.13	6 (60%)	0	0	34, 110, 180, 198	10 (100%)
3	f	10/10 (100%)	4.99	5 (50%)	0	0	35, 109, 189, 200	10 (100%)
3	g	10/10 (100%)	5.01	5 (50%)	0	0	34, 110, 180, 198	10 (100%)
3	h	10/10 (100%)	4.67	5 (50%)	0	0	34, 110, 180, 198	10 (100%)
3	i	10/10 (100%)	4.46	5 (50%)	0	0	34, 110, 180, 198	10 (100%)
3	j	10/10 (100%)	5.05	5 (50%)	0	0	35, 109, 189, 200	10 (100%)
3	k	10/10 (100%)	5.07	5 (50%)	0	0	35, 109, 189, 200	10 (100%)
3	l	10/10 (100%)	5.09	5 (50%)	0	0	35, 109, 189, 200	10 (100%)
3	m	10/10 (100%)	5.74	8 (80%)	0	0	34, 110, 180, 198	10 (100%)
3	n	10/10 (100%)	5.86	6 (60%)	0	0	34, 110, 180, 198	10 (100%)
3	o	10/10 (100%)	4.99	5 (50%)	0	0	35, 109, 189, 200	10 (100%)
3	p	10/10 (100%)	4.67	5 (50%)	0	0	35, 109, 189, 200	10 (100%)
3	q	10/10 (100%)	5.40	6 (60%)	0	0	35, 109, 189, 200	10 (100%)
3	r	10/10 (100%)	4.67	5 (50%)	0	0	35, 109, 189, 200	10 (100%)
3	s	10/10 (100%)	5.56	6 (60%)	0	0	35, 109, 189, 200	10 (100%)
4	1	2/2 (100%)	6.10	2 (100%)	0	0	58, 58, 58, 99	2 (100%)
4	2	2/2 (100%)	6.50	2 (100%)	0	0	51, 51, 51, 100	2 (100%)
4	3	2/2 (100%)	6.38	2 (100%)	0	0	57, 57, 57, 98	2 (100%)
4	4	2/2 (100%)	4.58	2 (100%)	0	0	60, 60, 60, 95	2 (100%)
4	5	2/2 (100%)	6.08	2 (100%)	0	0	62, 62, 62, 101	2 (100%)
4	6	2/2 (100%)	5.42	2 (100%)	0	0	57, 57, 57, 96	2 (100%)
4	7	2/2 (100%)	3.93	2 (100%)	0	0	52, 52, 52, 96	2 (100%)
4	8	2/2 (100%)	5.46	2 (100%)	0	0	54, 54, 54, 98	2 (100%)
4	t	2/2 (100%)	4.69	2 (100%)	0	0	60, 60, 60, 101	2 (100%)
4	u	2/2 (100%)	6.45	2 (100%)	0	0	59, 59, 59, 99	2 (100%)

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
4	v	2/2 (100%)	6.86	2 (100%)	0	0	62, 62, 62, 101	2 (100%)
4	w	2/2 (100%)	5.20	2 (100%)	0	0	70, 70, 70, 99	2 (100%)
4	x	2/2 (100%)	5.88	2 (100%)	0	0	65, 65, 65, 100	2 (100%)
4	y	2/2 (100%)	5.20	2 (100%)	0	0	70, 70, 70, 99	2 (100%)
4	z	2/2 (100%)	6.58	2 (100%)	0	0	60, 60, 60, 103	2 (100%)
All	All	2490/2715 (91%)	0.58	234 (9%)	8	10	22, 27, 130, 200	330 (13%)

The worst 5 of 234 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	Z	170[B]	A	29.4
2	S	170[A]	A	28.2
2	a	170[A]	A	27.9
2	V	161[A]	A	22.4
2	b	161[B]	A	22.2

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, 95th 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(Å^2)	Q<0.9
7	NA	B	202	1/1	0.23	0.46	97,97,97,97	1
7	NA	D	202	1/1	0.64	0.29	103,103,103,103	0
7	NA	N	203[A]	1/1	0.69	0.60	79,79,79,79	1
7	NA	C	202[B]	1/1	0.76	0.22	47,47,47,47	1
7	NA	K	203[B]	1/1	0.77	0.23	43,43,43,43	1
6	SO4	M	201[A]	5/5	0.78	0.76	19,40,44,47	5

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
6	SO4	M	201[B]	5/5	0.78	0.76	72,73,76,76	5
6	SO4	M	201[C]	5/5	0.78	0.76	58,60,61,64	5
6	SO4	M	201[D]	5/5	0.78	0.76	33,40,48,50	5
6	SO4	M	201[E]	5/5	0.78	0.76	71,72,75,76	5
7	NA	E	205	1/1	0.79	0.29	100,100,100,100	0
8	MG	E	203	1/1	0.80	0.10	74,74,74,74	0
6	SO4	B	201	5/5	0.81	0.18	83,99,106,111	0
6	SO4	E	201[A]	5/5	0.81	0.50	33,40,54,55	5
6	SO4	E	201[B]	5/5	0.81	0.50	45,49,51,56	5
6	SO4	E	201[C]	5/5	0.81	0.50	42,45,48,51	5
6	SO4	E	201[D]	5/5	0.81	0.50	48,49,54,54	5
6	SO4	E	201[E]	5/5	0.81	0.50	43,44,54,55	5
6	SO4	G	201[A]	5/5	0.81	0.52	35,39,43,44	5
6	SO4	G	201[B]	5/5	0.81	0.52	48,49,57,57	5
6	SO4	G	201[C]	5/5	0.81	0.52	31,42,53,55	5
6	SO4	G	201[D]	5/5	0.81	0.52	59,60,64,65	5
6	SO4	G	201[E]	5/5	0.81	0.52	54,57,58,62	5
6	SO4	K	201	5/5	0.81	0.19	109,116,122,125	0
7	NA	L	202	1/1	0.84	0.64	80,80,80,80	1
6	SO4	A	202	5/5	0.86	0.16	94,102,108,117	0
6	SO4	M	202	5/5	0.87	0.17	77,92,97,101	0
7	NA	F	203	1/1	0.87	0.11	67,67,67,67	0
6	SO4	I	201	5/5	0.87	0.17	92,103,107,112	0
6	SO4	N	202	5/5	0.88	0.21	119,121,122,130	0
7	NA	G	203	1/1	0.89	0.10	66,66,66,66	0
7	NA	M	203[B]	1/1	0.89	0.13	41,41,41,41	1
7	NA	O	202[B]	1/1	0.90	0.16	47,47,47,47	1
6	SO4	H	202	5/5	0.90	0.17	105,106,111,119	0
6	SO4	G	202	5/5	0.91	0.12	91,100,107,110	0
6	SO4	L	201	5/5	0.92	0.12	87,95,100,107	0
6	SO4	D	201	5/5	0.92	0.12	61,81,90,97	0
6	SO4	J	201	5/5	0.93	0.13	58,80,86,89	0
6	SO4	C	201	5/5	0.94	0.12	75,86,89,98	0
7	NA	B	203	1/1	0.94	0.17	101,101,101,101	0
6	SO4	E	202	5/5	0.94	0.11	77,87,90,101	0
7	NA	I	202[A]	1/1	0.94	0.31	52,52,52,52	1
6	SO4	O	201	5/5	0.94	0.13	56,78,78,89	0
8	MG	F	202	1/1	0.95	0.04	56,56,56,56	0
7	NA	H	203	1/1	0.96	0.21	61,61,61,61	0
7	NA	E	204	1/1	0.96	0.13	64,64,64,64	0
7	NA	A	203[A]	1/1	0.96	0.10	46,46,46,46	1
6	SO4	F	201	5/5	0.97	0.10	58,68,75,85	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
8	MG	K	202	1/1	0.97	0.13	70,70,70,70	0
7	NA	J	202[A]	1/1	0.98	0.18	45,45,45,45	1
5	PO4	H	201[A]	5/5	0.99	0.12	16,26,30,38	4
5	PO4	H	201[B]	5/5	0.99	0.12	19,20,30,30	4
5	PO4	H	201[C]	5/5	0.99	0.12	17,25,30,33	4
5	PO4	H	201[D]	5/5	0.99	0.12	20,23,32,33	4
5	PO4	H	201[E]	5/5	0.99	0.12	19,21,27,29	4
5	PO4	N	201[A]	5/5	0.99	0.13	25,26,30,35	4
5	PO4	N	201[B]	5/5	0.99	0.13	17,22,32,35	4
5	PO4	N	201[C]	5/5	0.99	0.13	25,28,29,31	4
5	PO4	N	201[D]	5/5	0.99	0.13	19,21,32,34	4
5	PO4	N	201[E]	5/5	0.99	0.13	22,25,30,35	4
5	PO4	A	201[A]	5/5	0.99	0.10	22,25,26,32	4
5	PO4	A	201[B]	5/5	0.99	0.10	24,25,29,30	4
5	PO4	A	201[C]	5/5	0.99	0.10	21,26,32,34	4
5	PO4	A	201[D]	5/5	0.99	0.10	26,26,28,35	4
5	PO4	A	201[E]	5/5	0.99	0.10	19,26,31,32	4

6.5 Other polymers (i)

There are no such residues in this entry.