



# wwPDB X-ray Structure Validation Summary Report i

Feb 27, 2014 – 07:48 PM GMT

PDB ID : 3KML  
Title : Circular Permutant of the Tobacco Mosaic Virus  
Authors : Duderstadt, K.E.; Dedeo, M.T.; Francis, M.B.; Berger, J.M.  
Deposited on : 2009-11-10  
Resolution : 3.01 Å(reported)

This is a wwPDB validation summary 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/ValidationPDFNotes.html>

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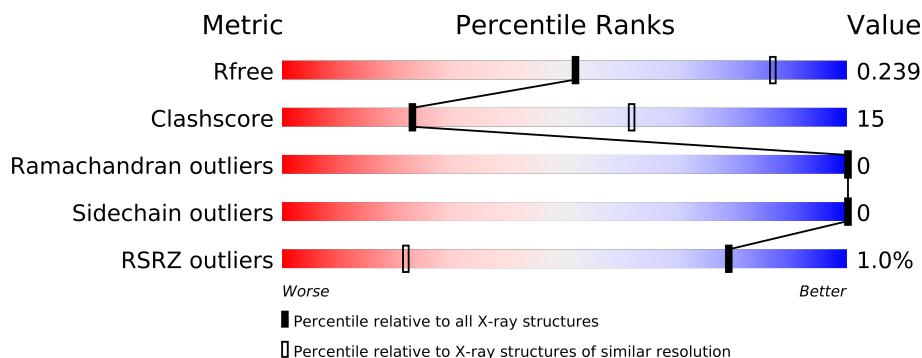
The following versions of software and data (see [references](#)) were used in the production of this report:

MolProbity	:	4.02b-467
Mogul	:	1.15 2013
Xtriage (Phenix)	:	dev-1323
EDS	:	stable22639
Percentile statistics	:	21963
Refmac	:	5.8.0049
CCP4	:	6.3.0 (Settle)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et. al. (1996)
Validation Pipeline (wwPDB-VP)	:	stable22683

# 1 Overall quality at a glance

The reported resolution of this entry is 3.01 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))
$R_{free}$	66092	1332 (3.04-3.00)
Clashscore	79885	1732 (3.04-3.00)
Ramachandran outliers	78287	1669 (3.04-3.00)
Sidechain outliers	78261	1672 (3.04-3.00)
RSRZ outliers	66119	1333 (3.04-3.00)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density.

Mol	Chain	Length	Quality of chain
1	A	161	
1	B	161	
1	C	161	
1	D	161	
1	E	161	
1	F	161	
1	G	161	
1	H	161	
1	I	161	
1	J	161	
1	K	161	
1	L	161	
1	M	161	
1	N	161	

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Mol	Chain	Length	Quality of chain
1	O	161	
1	P	161	
1	Q	161	

## 2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 18700 atoms, of which 0 are hydrogen and 0 are deuterium.

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	141	Total	C	N	O	S	0	0	0
			1100	694	192	212	2			
1	B	141	Total	C	N	O	S	0	0	0
			1100	694	192	212	2			
1	C	141	Total	C	N	O	S	0	0	0
			1100	694	192	212	2			
1	D	141	Total	C	N	O	S	0	0	0
			1100	694	192	212	2			
1	E	141	Total	C	N	O	S	0	0	0
			1100	694	192	212	2			
1	F	141	Total	C	N	O	S	0	0	0
			1100	694	192	212	2			
1	G	141	Total	C	N	O	S	0	0	0
			1100	694	192	212	2			
1	H	141	Total	C	N	O	S	0	0	0
			1100	694	192	212	2			
1	I	141	Total	C	N	O	S	0	0	0
			1100	694	192	212	2			
1	J	141	Total	C	N	O	S	0	0	0
			1100	694	192	212	2			
1	K	141	Total	C	N	O	S	0	0	0
			1100	694	192	212	2			
1	L	141	Total	C	N	O	S	0	0	0
			1100	694	192	212	2			
1	M	141	Total	C	N	O	S	0	0	0
			1100	694	192	212	2			
1	N	141	Total	C	N	O	S	0	0	0
			1100	694	192	212	2			
1	O	141	Total	C	N	O	S	0	0	0
			1100	694	192	212	2			
1	P	141	Total	C	N	O	S	0	0	0
			1100	694	192	212	2			

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	Q	141	Total	C	N	O	S	0	0	0
			1100	694	192	212	2			

There are 85 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	GLY	-	EXPRESSION TAG	UNP P69687
A	25	CYS	SER	ENGINEERED	UNP P69687
A	60	GLY	-	LINKER	UNP P69687
A	61	GLU	-	LINKER	UNP P69687
A	62	GLY	-	LINKER	UNP P69687
B	1	GLY	-	EXPRESSION TAG	UNP P69687
B	25	CYS	SER	ENGINEERED	UNP P69687
B	60	GLY	-	LINKER	UNP P69687
B	61	GLU	-	LINKER	UNP P69687
B	62	GLY	-	LINKER	UNP P69687
C	1	GLY	-	EXPRESSION TAG	UNP P69687
C	25	CYS	SER	ENGINEERED	UNP P69687
C	60	GLY	-	LINKER	UNP P69687
C	61	GLU	-	LINKER	UNP P69687
C	62	GLY	-	LINKER	UNP P69687
D	1	GLY	-	EXPRESSION TAG	UNP P69687
D	25	CYS	SER	ENGINEERED	UNP P69687
D	60	GLY	-	LINKER	UNP P69687
D	61	GLU	-	LINKER	UNP P69687
D	62	GLY	-	LINKER	UNP P69687
E	1	GLY	-	EXPRESSION TAG	UNP P69687
E	25	CYS	SER	ENGINEERED	UNP P69687
E	60	GLY	-	LINKER	UNP P69687
E	61	GLU	-	LINKER	UNP P69687
E	62	GLY	-	LINKER	UNP P69687
F	1	GLY	-	EXPRESSION TAG	UNP P69687
F	25	CYS	SER	ENGINEERED	UNP P69687
F	60	GLY	-	LINKER	UNP P69687
F	61	GLU	-	LINKER	UNP P69687
F	62	GLY	-	LINKER	UNP P69687
G	1	GLY	-	EXPRESSION TAG	UNP P69687
G	25	CYS	SER	ENGINEERED	UNP P69687
G	60	GLY	-	LINKER	UNP P69687
G	61	GLU	-	LINKER	UNP P69687
G	62	GLY	-	LINKER	UNP P69687
H	1	GLY	-	EXPRESSION TAG	UNP P69687

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Chain	Residue	Modelled	Actual	Comment	Reference
H	25	CYS	SER	ENGINEERED	UNP P69687
H	60	GLY	-	LINKER	UNP P69687
H	61	GLU	-	LINKER	UNP P69687
H	62	GLY	-	LINKER	UNP P69687
I	1	GLY	-	EXPRESSION TAG	UNP P69687
I	25	CYS	SER	ENGINEERED	UNP P69687
I	60	GLY	-	LINKER	UNP P69687
I	61	GLU	-	LINKER	UNP P69687
I	62	GLY	-	LINKER	UNP P69687
J	1	GLY	-	EXPRESSION TAG	UNP P69687
J	25	CYS	SER	ENGINEERED	UNP P69687
J	60	GLY	-	LINKER	UNP P69687
J	61	GLU	-	LINKER	UNP P69687
J	62	GLY	-	LINKER	UNP P69687
K	1	GLY	-	EXPRESSION TAG	UNP P69687
K	25	CYS	SER	ENGINEERED	UNP P69687
K	60	GLY	-	LINKER	UNP P69687
K	61	GLU	-	LINKER	UNP P69687
K	62	GLY	-	LINKER	UNP P69687
L	1	GLY	-	EXPRESSION TAG	UNP P69687
L	25	CYS	SER	ENGINEERED	UNP P69687
L	60	GLY	-	LINKER	UNP P69687
L	61	GLU	-	LINKER	UNP P69687
L	62	GLY	-	LINKER	UNP P69687
M	1	GLY	-	EXPRESSION TAG	UNP P69687
M	25	CYS	SER	ENGINEERED	UNP P69687
M	60	GLY	-	LINKER	UNP P69687
M	61	GLU	-	LINKER	UNP P69687
M	62	GLY	-	LINKER	UNP P69687
N	1	GLY	-	EXPRESSION TAG	UNP P69687
N	25	CYS	SER	ENGINEERED	UNP P69687
N	60	GLY	-	LINKER	UNP P69687
N	61	GLU	-	LINKER	UNP P69687
N	62	GLY	-	LINKER	UNP P69687
O	1	GLY	-	EXPRESSION TAG	UNP P69687
O	25	CYS	SER	ENGINEERED	UNP P69687
O	60	GLY	-	LINKER	UNP P69687
O	61	GLU	-	LINKER	UNP P69687
O	62	GLY	-	LINKER	UNP P69687
P	1	GLY	-	EXPRESSION TAG	UNP P69687
P	25	CYS	SER	ENGINEERED	UNP P69687
P	60	GLY	-	LINKER	UNP P69687

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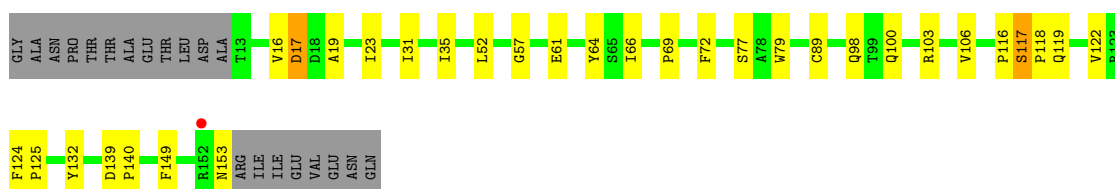
Chain	Residue	Modelled	Actual	Comment	Reference
P	61	GLU	-	LINKER	UNP P69687
P	62	GLY	-	LINKER	UNP P69687
Q	1	GLY	-	EXPRESSION TAG	UNP P69687
Q	25	CYS	SER	ENGINEERED	UNP P69687
Q	60	GLY	-	LINKER	UNP P69687
Q	61	GLU	-	LINKER	UNP P69687
Q	62	GLY	-	LINKER	UNP P69687

### 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: Coat protein

Chain A: 



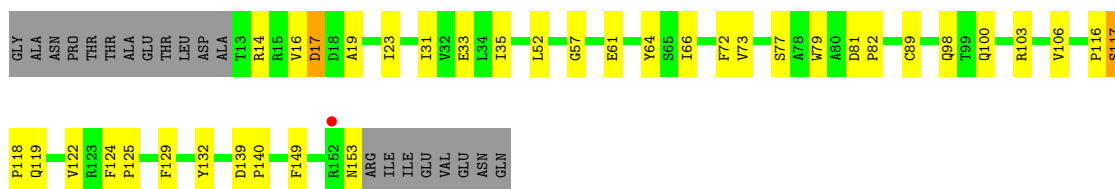
- Molecule 1: Coat protein

Chain B: 



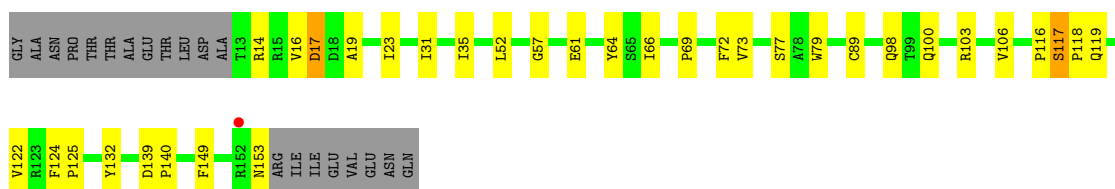
- Molecule 1: Coat protein

Chain C: 



- Molecule 1: Coat protein

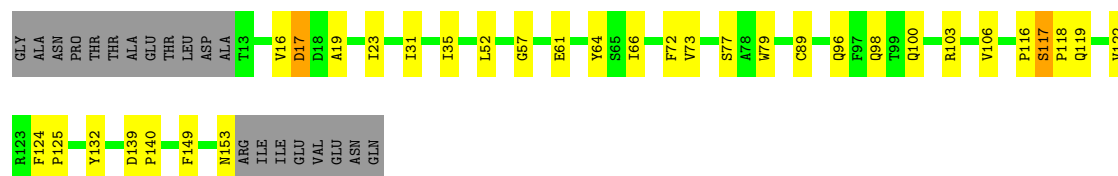
Chain D: 





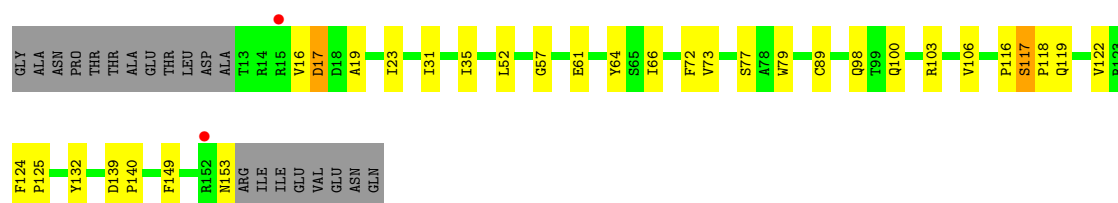
- Molecule 1: Coat protein

Chain E:



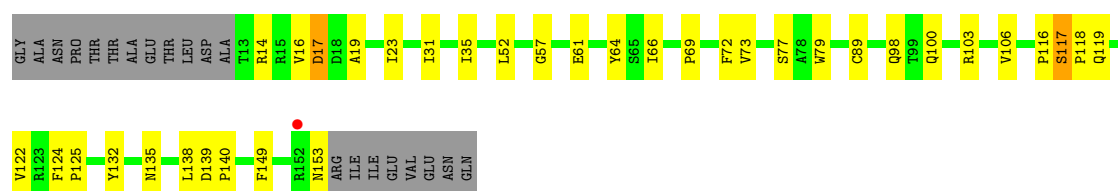
- Molecule 1: Coat protein

Chain F:



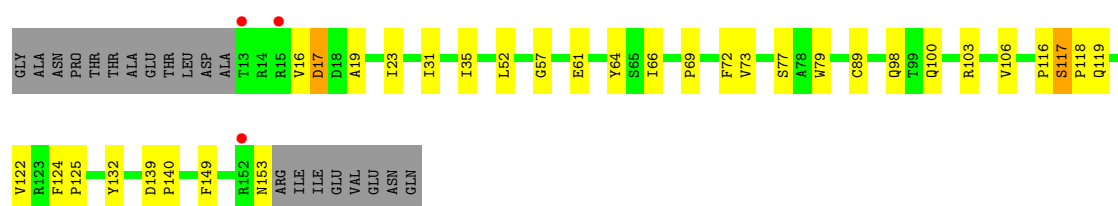
- Molecule 1: Coat protein

Chain G:



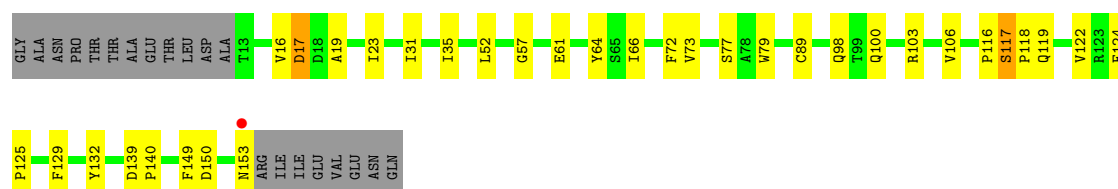
- Molecule 1: Coat protein

Chain H:



- Molecule 1: Coat protein

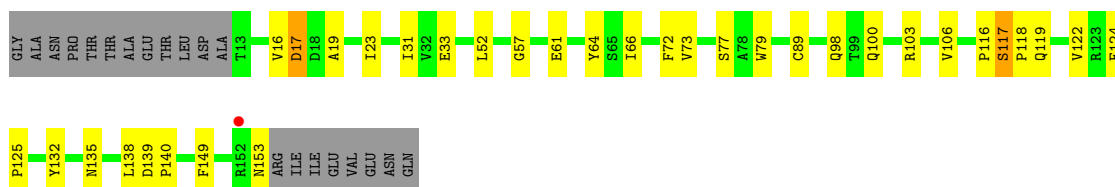
Chain I:



- Molecule 1: Coat protein

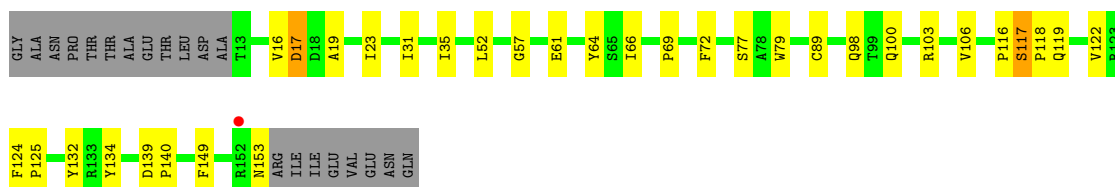
Chain J:





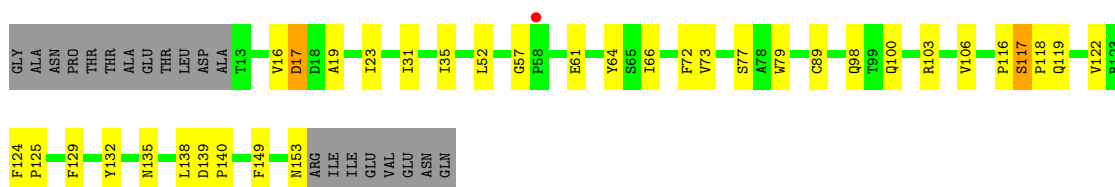
- Molecule 1: Coat protein

Chain K:



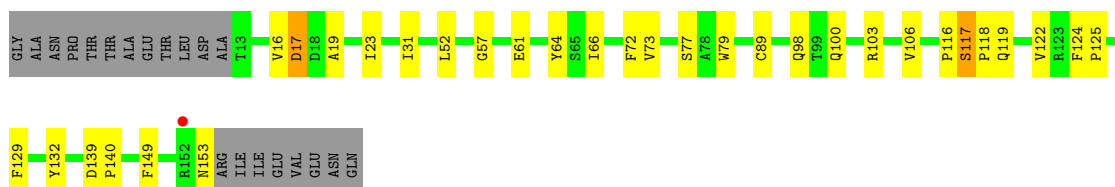
- Molecule 1: Coat protein

Chain L:



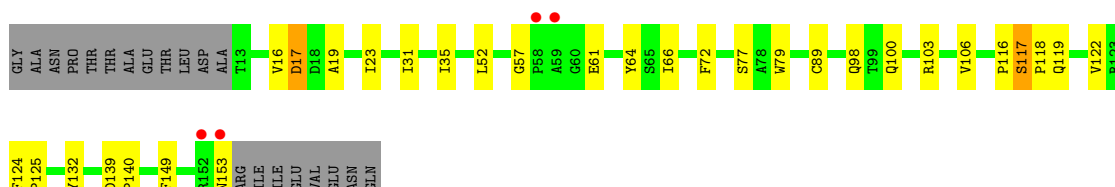
- Molecule 1: Coat protein

Chain M:



- Molecule 1: Coat protein

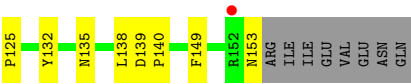
Chain N:



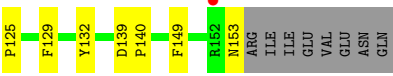
- Molecule 1: Coat protein

Chain O:





● Molecule 1: Coat protein



● Molecule 1: Coat protein



## 4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	220.84Å 177.18Å 102.80Å 90.00° 99.55° 90.00°	Depositor
Resolution (Å)	49.26 – 3.01 49.26 – 3.01	Depositor EDS
% Data completeness (in resolution range)	78.2 (49.26-3.01) 78.2 (49.26-3.01)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.12	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.49 (at 3.01Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.5.2)	Depositor
R, $R_{free}$	0.239 , 0.253 0.228 , 0.239	Depositor DCC
$R_{free}$ test set	1626 reflections (2.70%)	DCC
Wilson B-factor (Å <sup>2</sup> )	29.7	Xtriage
Anisotropy	0.835	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.29 , -4.2	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtriage
Outliers	1 of 73255 reflections (0.001%)	Xtriage
$F_o, F_c$ correlation	0.88	EDS
Total number of atoms	18700	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	42.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.81% of the height of the origin peak. No significant pseudotranslation is detected.*

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

## 5 Model quality

### 5.1 Standard geometry

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	0.27	0/1124	0.50	2/1534 (0.1%)
1	B	0.27	0/1124	0.50	2/1534 (0.1%)
1	C	0.27	0/1124	0.50	2/1534 (0.1%)
1	D	0.27	0/1124	0.49	2/1534 (0.1%)
1	E	0.27	0/1124	0.50	2/1534 (0.1%)
1	F	0.28	0/1124	0.50	2/1534 (0.1%)
1	G	0.27	0/1124	0.50	2/1534 (0.1%)
1	H	0.27	0/1124	0.50	2/1534 (0.1%)
1	I	0.27	0/1124	0.50	2/1534 (0.1%)
1	J	0.27	0/1124	0.50	2/1534 (0.1%)
1	K	0.28	0/1124	0.50	2/1534 (0.1%)
1	L	0.27	0/1124	0.50	2/1534 (0.1%)
1	M	0.27	0/1124	0.50	2/1534 (0.1%)
1	N	0.27	0/1124	0.50	2/1534 (0.1%)
1	O	0.27	0/1124	0.50	2/1534 (0.1%)
1	P	0.27	0/1124	0.50	2/1534 (0.1%)
1	Q	0.27	0/1124	0.50	2/1534 (0.1%)
All	All	0.27	0/19108	0.50	34/26078 (0.1%)

There are no bond length outliers.

The worst 5 of 34 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	P	117	SER	C-N-CD	-6.39	106.54	120.60
1	E	117	SER	C-N-CD	-6.39	106.55	120.60
1	L	117	SER	C-N-CD	-6.39	106.55	120.60
1	G	117	SER	C-N-CD	-6.39	106.55	120.60
1	I	117	SER	C-N-CD	-6.39	106.55	120.60

There are no chirality outliers.

There are no planarity outliers.

## 5.2 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 hydrogens added by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, and the number in parentheses is this value normalized per 1000 atoms of the molecule in the chain. The Symm-Clashes column gives symmetry related clashes, in the same way as for the Clashes column.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1100	0	1075	33	0
1	B	1100	0	1075	32	0
1	C	1100	0	1075	36	1
1	D	1100	0	1075	34	0
1	E	1100	0	1075	33	0
1	F	1100	0	1075	32	0
1	G	1100	0	1075	35	0
1	H	1100	0	1075	33	0
1	I	1100	0	1075	34	0
1	J	1100	0	1075	32	1
1	K	1100	0	1075	33	0
1	L	1100	0	1075	34	0
1	M	1100	0	1075	32	0
1	N	1100	0	1075	31	0
1	O	1100	0	1075	33	0
1	P	1100	0	1075	34	0
1	Q	1100	0	1075	34	0
All	All	18700	0	18275	539	1

Clashscore is defined as the number of clashes calculated for the entry per 1000 atoms (including hydrogens) of the entry. The overall clashscore for this entry is 15.

The worst 5 of 539 close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:B:117:SER:HB3	1:B:118:PRO:HD3	1.27	1.17
1:O:117:SER:HB3	1:O:118:PRO:HD3	1.27	1.16
1:L:117:SER:HB3	1:L:118:PRO:HD3	1.27	1.15
1:F:117:SER:HB3	1:F:118:PRO:HD3	1.27	1.14
1:O:16:VAL:HG21	1:O:153:ASN:O	1.48	1.14

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:C:33:GLU:OE2	1:J:33:GLU:OE2[4.445]	2.16	0.04

## 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	
1	A	139/161 (86%)	130 (94%)	9 (6%)	0	100	100
1	B	139/161 (86%)	131 (94%)	8 (6%)	0	100	100
1	C	139/161 (86%)	131 (94%)	8 (6%)	0	100	100
1	D	139/161 (86%)	130 (94%)	9 (6%)	0	100	100
1	E	139/161 (86%)	130 (94%)	9 (6%)	0	100	100
1	F	139/161 (86%)	130 (94%)	9 (6%)	0	100	100
1	G	139/161 (86%)	130 (94%)	9 (6%)	0	100	100
1	H	139/161 (86%)	131 (94%)	8 (6%)	0	100	100
1	I	139/161 (86%)	131 (94%)	8 (6%)	0	100	100
1	J	139/161 (86%)	130 (94%)	9 (6%)	0	100	100
1	K	139/161 (86%)	130 (94%)	9 (6%)	0	100	100
1	L	139/161 (86%)	130 (94%)	9 (6%)	0	100	100
1	M	139/161 (86%)	131 (94%)	8 (6%)	0	100	100
1	N	139/161 (86%)	131 (94%)	8 (6%)	0	100	100
1	O	139/161 (86%)	130 (94%)	9 (6%)	0	100	100
1	P	139/161 (86%)	131 (94%)	8 (6%)	0	100	100
1	Q	139/161 (86%)	130 (94%)	9 (6%)	0	100	100
All	All	2363/2737 (86%)	2217 (94%)	146 (6%)	0	100	100

There are no Ramachandran outliers to report.

### 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	
1	A	122/138 (88%)	122 (100%)	0	100	100
1	B	122/138 (88%)	122 (100%)	0	100	100
1	C	122/138 (88%)	122 (100%)	0	100	100
1	D	122/138 (88%)	122 (100%)	0	100	100
1	E	122/138 (88%)	122 (100%)	0	100	100
1	F	122/138 (88%)	122 (100%)	0	100	100
1	G	122/138 (88%)	122 (100%)	0	100	100
1	H	122/138 (88%)	122 (100%)	0	100	100
1	I	122/138 (88%)	122 (100%)	0	100	100
1	J	122/138 (88%)	122 (100%)	0	100	100
1	K	122/138 (88%)	122 (100%)	0	100	100
1	L	122/138 (88%)	122 (100%)	0	100	100
1	M	122/138 (88%)	122 (100%)	0	100	100
1	N	122/138 (88%)	122 (100%)	0	100	100
1	O	122/138 (88%)	122 (100%)	0	100	100
1	P	122/138 (88%)	122 (100%)	0	100	100
1	Q	122/138 (88%)	122 (100%)	0	100	100
All	All	2074/2346 (88%)	2074 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 38 such sidechains are listed below:

Mol	Chain	Res	Type
1	H	28	ASN
1	J	28	ASN
1	Q	28	ASN
1	I	28	ASN
1	J	135	ASN



### 5.3.3 RNA ⓘ

There are no RNA chains 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 ⓘ

There are no ligands in this entry.

### 5.7 Other polymers ⓘ

There are no such residues in this entry.

### 5.8 Polymer linkage issues

There are no chain breaks in this entry.

## 6 Fit of model and data ⓘ

### 6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	141/161 (87%)	-0.17	1 (0%) 84 28	21, 35, 99, 130	0
1	B	141/161 (87%)	-0.14	3 (2%) 60 12	21, 36, 101, 131	0
1	C	141/161 (87%)	-0.17	1 (0%) 84 28	21, 35, 99, 131	0
1	D	141/161 (87%)	-0.13	1 (0%) 84 28	21, 36, 101, 130	0
1	E	141/161 (87%)	-0.22	0 100 100	22, 35, 103, 131	0
1	F	141/161 (87%)	-0.17	2 (1%) 72 17	23, 35, 99, 132	0
1	G	141/161 (87%)	-0.17	1 (0%) 84 28	22, 35, 103, 130	0
1	H	141/161 (87%)	-0.11	3 (2%) 60 12	22, 35, 104, 131	0
1	I	141/161 (87%)	-0.14	1 (0%) 84 28	22, 36, 103, 132	0
1	J	141/161 (87%)	-0.14	1 (0%) 84 28	22, 35, 100, 131	0
1	K	141/161 (87%)	-0.17	1 (0%) 84 28	21, 35, 98, 130	0
1	L	141/161 (87%)	-0.17	1 (0%) 84 28	21, 36, 100, 129	0
1	M	141/161 (87%)	-0.18	1 (0%) 84 28	23, 36, 97, 130	0
1	N	141/161 (87%)	-0.15	4 (2%) 50 9	20, 35, 102, 131	0
1	O	141/161 (87%)	-0.17	1 (0%) 84 28	23, 35, 102, 132	0
1	P	141/161 (87%)	-0.17	1 (0%) 84 28	22, 35, 97, 130	0
1	Q	141/161 (87%)	-0.22	0 100 100	22, 35, 98, 130	0
All	All	2397/2737 (87%)	-0.17	23 (0%) 79 22	20, 36, 103, 132	0

The worst 5 of 23 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	152	ARG	3.8
1	C	152	ARG	3.7
1	F	152	ARG	3.4
1	D	152	ARG	3.3

*Continued on next page...*

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Mol	Chain	Res	Type	RSRZ
1	A	152	ARG	3.2

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

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

## 6.3 Carbohydrates ⓘ

There are no carbohydrates in this entry.

## 6.4 Ligands ⓘ

There are no ligands in this entry.

## 6.5 Other polymers ⓘ

There are no such residues in this entry.