WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Oct 10, 2023 – 10:01 AM EDT

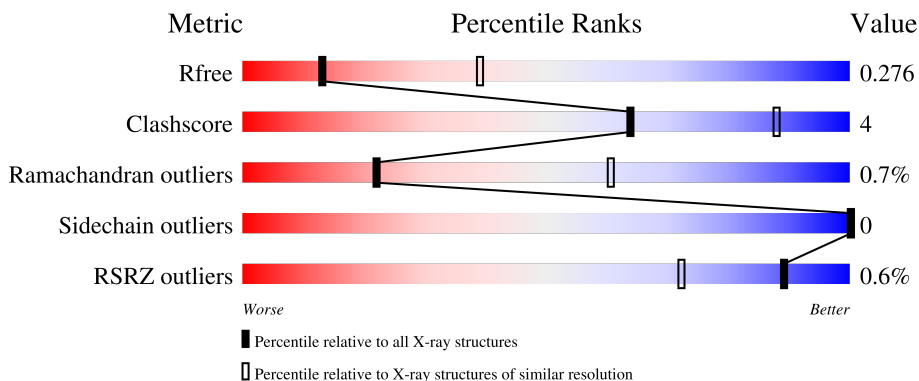|		
PDB ID	:	6X0R
Title	:	A Circular Permutant of the Tobacco Mosaic Virus (TMV) mutant Q101H
Authors	:	Dai, J.; Knott, G.J.; Francis, M.B.
Deposited on	:	2020-05-17
Resolution	:	3.00 Å(reported)

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 3.00 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	Percentile Ranks	Value
Rfree		0.276
Clashscore		4
Ramachandran outliers		0.7%
Sidechain outliers		0
RSRZ outliers		0.6%

Worse　　　　　　　　　　　　　*Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution
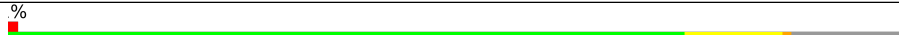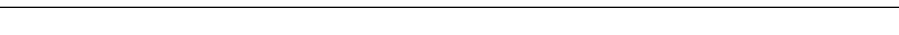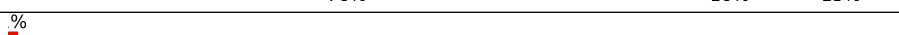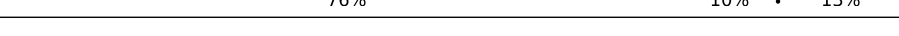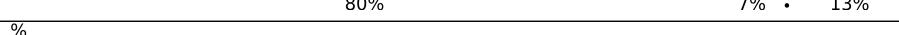
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R$_{free}$	130704	2092 (3.00-3.00)
Clashscore	141614	2416 (3.00-3.00)
Ramachandran outliers	138981	2333 (3.00-3.00)
Sidechain outliers	138945	2336 (3.00-3.00)
RSRZ outliers	127900	1990 (3.00-3.00)

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 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	161	76% 11% • 13%
1	B	161	75% 12% • 13%
1	C	161	77% 9% • 13%
1	D	161	76% 10% • 13%
1	E	161	76% 10% • 13%

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Mol	Chain	Length	Quality of chain
1	F	161	73% 13% · 13%
1	G	161	% 76% 10% · 13%
1	H	161	78% 8% · 13%
1	I	161	% 78% 8% · 13%
1	J	161	% 75% 11% · 13%
1	K	161	% 79% 7% · 13%
1	L	161	% 76% 11% · 13%
1	M	161	76% 10% · 13%
1	N	161	% 76% 10% · 13%
1	O	161	80% 7% · 13%
1	P	161	% 73% 13% · 13%
1	Q	161	2% 76% 10% · 13%

2 Entry composition ⓘ

There is only 1 type of molecule in this entry. The entry contains 18581 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 Capsid protein Circular Permutant.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	140	Total	C	N	O	S	0	0	0
			1093	691	191	210	1			
1	B	140	Total	C	N	O	S	0	0	0
			1093	691	191	210	1			
1	C	140	Total	C	N	O	S	0	0	0
			1093	691	191	210	1			
1	D	140	Total	C	N	O	S	0	0	0
			1093	691	191	210	1			
1	E	140	Total	C	N	O	S	0	0	0
			1093	691	191	210	1			
1	F	140	Total	C	N	O	S	0	0	0
			1093	691	191	210	1			
1	G	140	Total	C	N	O	S	0	0	0
			1093	691	191	210	1			
1	H	140	Total	C	N	O	S	0	0	0
			1093	691	191	210	1			
1	I	140	Total	C	N	O	S	0	0	0
			1093	691	191	210	1			
1	J	140	Total	C	N	O	S	0	0	0
			1093	691	191	210	1			
1	K	140	Total	C	N	O	S	0	0	0
			1093	691	191	210	1			
1	L	140	Total	C	N	O	S	0	0	0
			1093	691	191	210	1			
1	M	140	Total	C	N	O	S	0	0	0
			1093	691	191	210	1			
1	N	140	Total	C	N	O	S	0	0	0
			1093	691	191	210	1			
1	O	140	Total	C	N	O	S	0	0	0
			1093	691	191	210	1			
1	P	140	Total	C	N	O	S	0	0	0
			1093	691	191	210	1			

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	Q	140	1093	691	191	210	1	0	0	0

There are 85 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	GLY	-	expression tag	UNP P69687
A	60	GLY	-	linker	UNP P69687
A	61	GLU	-	linker	UNP P69687
A	62	GLY	-	linker	UNP P69687
A	101	HIS	GLN	engineered mutation	UNP P69687
B	1	GLY	-	expression tag	UNP P69687
B	60	GLY	-	linker	UNP P69687
B	61	GLU	-	linker	UNP P69687
B	62	GLY	-	linker	UNP P69687
B	101	HIS	GLN	engineered mutation	UNP P69687
C	1	GLY	-	expression tag	UNP P69687
C	60	GLY	-	linker	UNP P69687
C	61	GLU	-	linker	UNP P69687
C	62	GLY	-	linker	UNP P69687
C	101	HIS	GLN	engineered mutation	UNP P69687
D	1	GLY	-	expression tag	UNP P69687
D	60	GLY	-	linker	UNP P69687
D	61	GLU	-	linker	UNP P69687
D	62	GLY	-	linker	UNP P69687
D	101	HIS	GLN	engineered mutation	UNP P69687
E	1	GLY	-	expression tag	UNP P69687
E	60	GLY	-	linker	UNP P69687
E	61	GLU	-	linker	UNP P69687
E	62	GLY	-	linker	UNP P69687
E	101	HIS	GLN	engineered mutation	UNP P69687
F	1	GLY	-	expression tag	UNP P69687
F	60	GLY	-	linker	UNP P69687
F	61	GLU	-	linker	UNP P69687
F	62	GLY	-	linker	UNP P69687
F	101	HIS	GLN	engineered mutation	UNP P69687
G	1	GLY	-	expression tag	UNP P69687
G	60	GLY	-	linker	UNP P69687
G	61	GLU	-	linker	UNP P69687
G	62	GLY	-	linker	UNP P69687
G	101	HIS	GLN	engineered mutation	UNP P69687
H	1	GLY	-	expression tag	UNP P69687

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Chain	Residue	Modelled	Actual	Comment	Reference
H	60	GLY	-	linker	UNP P69687
H	61	GLU	-	linker	UNP P69687
H	62	GLY	-	linker	UNP P69687
H	101	HIS	GLN	engineered mutation	UNP P69687
I	1	GLY	-	expression tag	UNP P69687
I	60	GLY	-	linker	UNP P69687
I	61	GLU	-	linker	UNP P69687
I	62	GLY	-	linker	UNP P69687
I	101	HIS	GLN	engineered mutation	UNP P69687
J	1	GLY	-	expression tag	UNP P69687
J	60	GLY	-	linker	UNP P69687
J	61	GLU	-	linker	UNP P69687
J	62	GLY	-	linker	UNP P69687
J	101	HIS	GLN	engineered mutation	UNP P69687
K	1	GLY	-	expression tag	UNP P69687
K	60	GLY	-	linker	UNP P69687
K	61	GLU	-	linker	UNP P69687
K	62	GLY	-	linker	UNP P69687
K	101	HIS	GLN	engineered mutation	UNP P69687
L	1	GLY	-	expression tag	UNP P69687
L	60	GLY	-	linker	UNP P69687
L	61	GLU	-	linker	UNP P69687
L	62	GLY	-	linker	UNP P69687
L	101	HIS	GLN	engineered mutation	UNP P69687
M	1	GLY	-	expression tag	UNP P69687
M	60	GLY	-	linker	UNP P69687
M	61	GLU	-	linker	UNP P69687
M	62	GLY	-	linker	UNP P69687
M	101	HIS	GLN	engineered mutation	UNP P69687
N	1	GLY	-	expression tag	UNP P69687
N	60	GLY	-	linker	UNP P69687
N	61	GLU	-	linker	UNP P69687
N	62	GLY	-	linker	UNP P69687
N	101	HIS	GLN	engineered mutation	UNP P69687
O	1	GLY	-	expression tag	UNP P69687
O	60	GLY	-	linker	UNP P69687
O	61	GLU	-	linker	UNP P69687
O	62	GLY	-	linker	UNP P69687
O	101	HIS	GLN	engineered mutation	UNP P69687
P	1	GLY	-	expression tag	UNP P69687
P	60	GLY	-	linker	UNP P69687
P	61	GLU	-	linker	UNP P69687

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Chain	Residue	Modelled	Actual	Comment	Reference
P	62	GLY	-	linker	UNP P69687
P	101	HIS	GLN	engineered mutation	UNP P69687
Q	1	GLY	-	expression tag	UNP P69687
Q	60	GLY	-	linker	UNP P69687
Q	61	GLU	-	linker	UNP P69687
Q	62	GLY	-	linker	UNP P69687
Q	101	HIS	GLN	engineered mutation	UNP P69687

3 Residue-property plots ⓘ

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: Capsid protein Circular Permutant
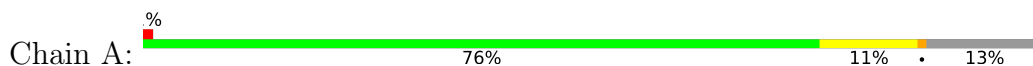
Chain A:

- Molecule 1: Capsid protein Circular Permutant

Chain B:

- Molecule 1: Capsid protein Circular Permutant
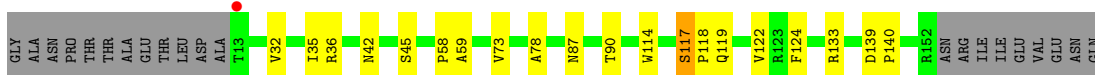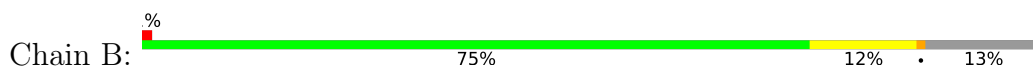
Chain C:
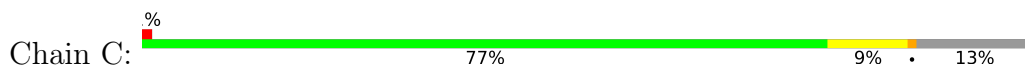
- Molecule 1: Capsid protein Circular Permutant
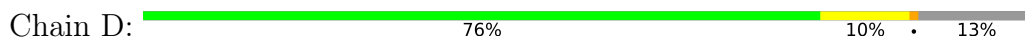
Chain D:

- Molecule 1: Capsid protein Circular Permutant

Chain E:

- Molecule 1: Capsid protein Circular Permutant

Chain F: 73% 13% • 13%

GLY ALA ASN PRO THR THR ALA GLU THR LEU ASP ALA **T13** T20 R24 I35 N42 S45 P58 A59 V73 A78 N87 T90 Q100 H101 A102 R103 V106 W114 S117 P118 F124 R133 D139 P140 **R152** ASN ARG ILE ILE GLU

VAL GLU ASN GLN
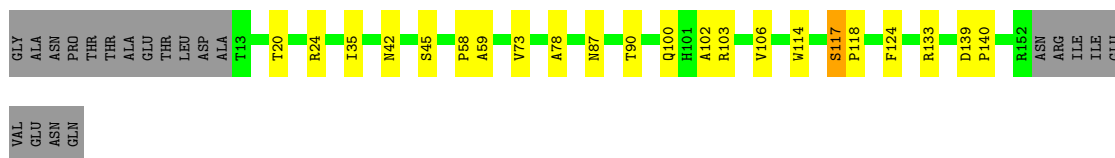
• Molecule 1: Capsid protein Circular Permutant

Chain G: 76% 10% • 13%

GLY ALA ASN PRO THR THR ALA GLU THR LEU ASP ALA **T13** I31 I35 P58 A59 Q71 F72 V73 A78 N87 L88 C89 T90 Q100 R103 W114 S117 P118 Q119 V122 R133 **R152** ASN ARG ILE ILE GLU VAL GLU ASN GLN
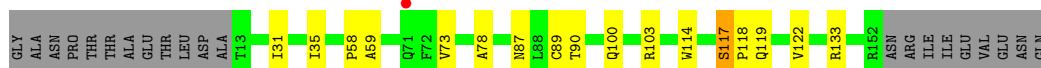
• Molecule 1: Capsid protein Circular Permutant

Chain H: 78% 8% • 13%

GLY ALA ASN PRO THR THR ALA GLU THR LEU ASP ALA **T13** I35 N42 S45 P58 A59 V73 A78 N87 T90 Q100 R103 S117 P118 R133 **R152** ASN ARG ILE ILE GLU VAL GLU ASN GLN

• Molecule 1: Capsid protein Circular Permutant

Chain I: 78% 8% • 13%

GLY ALA ASN PRO THR THR ALA GLU THR LEU ASP ALA **T13** I35 P58 A59 V73 A78 N87 T90 Q100 R103 S117 P118 R133 D139 P140 **R152** ASN ARG ILE ILE GLU VAL GLU ASN GLN

• Molecule 1: Capsid protein Circular Permutant

Chain J: 75% 11% • 13%

GLY ALA ASN PRO THR THR ALA GLU THR LEU ASP ALA **T13** I35 N42 S45 P58 A59 V73 A78 N87 T90 Q100 R103 W114 S117 P118 Q119 V122 R133 D139 P140 **R152** ASN ARG ILE ILE GLU VAL GLU ASN GLN

• Molecule 1: Capsid protein Circular Permutant

Chain K: 79% 7% • 13%

GLY ALA ASN PRO THR THR ALA GLU THR LEU ASP ALA **T13** I35 N42 S45 A78 N87 T90 F97 Q100 R103 S117 P118 R133 D139 P140 **R152** ASN ARG ILE ILE GLU VAL GLU ASN GLN

• Molecule 1: Capsid protein Circular Permutant

Chain L: 76% 11% • 13%

GLY ALA ASN PRO THR THR ALA GLU THR LEU ASP ALA **T13 R14 R15** T20 R24 V32 I35 R36 N42 S45 P58 A59 V73 A78 N87 T90 **S117** P118 Q119 V122 R133 **R152** ASN ARG ILE ILE GLU VAL GLU ASN GLN

• Molecule 1: Capsid protein Circular Permutant

Chain M: 76% 10% 13%

GLY ALA ASN PRO THR THR ALA GLU THR LEU ASP ALA **T13** I35 P58 A59 V73 A78 N87 T90 Q100 **H101** A102 R103 V106 **S117** P118 Q119 **V122** R123 F124 R133 **R152** ASN ARG ILE ILE GLU VAL GLU ASN GLN

• Molecule 1: Capsid protein Circular Permutant

Chain N: % 76% 10% 13%

GLY ALA ASN PRO THR THR ALA GLU THR LEU ASP ALA **T13** T20 R24 I35 F46 **P58** A59 V73 F74 A78 N87 T90 Q100 R103 **S117** P118 F124 R133 **R152** ASN ARG ILE ILE GLU VAL GLU ASN GLN

• Molecule 1: Capsid protein Circular Permutant

Chain O: 80% 7% 13%

GLY ALA ASN PRO THR THR ALA GLU THR LEU ASP ALA **T13** I35 P58 A59 V73 A78 N87 T90 F97 V106 **S117** P118 R133 **R152** ASN ARG ILE ILE GLU VAL GLU ASN GLN

• Molecule 1: Capsid protein Circular Permutant

Chain P: % 73% 13% 13%

GLY ALA ASN PRO THR THR ALA GLU THR LEU ASP ALA **T13** V32 R36 N42 S45 **P58** A59 V73 A78 N87 T90 Q100 **H101** A102 R103 V106 W114 **S117** P118 Q119 V122 R133 D139 P140 **L145 R152** ASN ARG ILE ILE

GLU VAL GLU ASN GLN

• Molecule 1: Capsid protein Circular Permutant

Chain Q: 2% 76% 10% 13%

GLY ALA ASN PRO THR THR ALA GLU THR LEU ASP ALA **T13** I35 N42 S45 P58 A59 V73 A78 N87 T90 Q100 **H101** A102 R103 V106 **F110 S117** P118 F124 **P125 D126** R133 **R152** ASN ARG ILE ILE GLU VAL GLU ASN GLN

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	218.70Å 176.21Å 102.25Å 90.00° 99.16° 90.00°	Depositor
Resolution (Å)	48.97 – 3.00 136.52 – 2.81	Depositor EDS
% Data completeness (in resolution range)	98.5 (48.97-3.00) 96.7 (136.52-2.81)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	(Not available)	Depositor
$<I/\sigma(I)>$ [1]	1.90 (at 2.82Å)	Xtriage
Refinement program	PHENIX 1.15_3459	Depositor
R, R_{free}	0.269 , 0.289 0.260 , 0.276	Depositor DCC
R_{free} test set	2439 reflections (2.71%)	wwPDB-VP
Wilson B-factor (Å^2)	65.0	Xtriage
Anisotropy	0.795	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.26 , 48.5	EDS
L-test for twinning[2]	$<|L|> = 0.48, <L^2> = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	18581	wwPDB-VP
Average B, all atoms (Å^2)	126.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.61% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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 ⓘ

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	0.25	0/1118	0.41	0/1526
1	B	0.24	0/1118	0.41	0/1526
1	C	0.25	0/1118	0.41	0/1526
1	D	0.24	0/1118	0.41	0/1526
1	E	0.25	0/1118	0.40	0/1526
1	F	0.24	0/1118	0.41	0/1526
1	G	0.24	0/1118	0.41	0/1526
1	H	0.25	0/1118	0.41	0/1526
1	I	0.24	0/1118	0.40	0/1526
1	J	0.25	0/1118	0.41	0/1526
1	K	0.25	0/1118	0.42	0/1526
1	L	0.24	0/1118	0.41	0/1526
1	M	0.24	0/1118	0.40	0/1526
1	N	0.24	0/1118	0.41	0/1526
1	O	0.24	0/1118	0.41	0/1526
1	P	0.24	0/1118	0.40	0/1526
1	Q	0.24	0/1118	0.41	0/1526
All	All	0.24	0/19006	0.41	0/25942

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1093	0	1068	11	0
1	B	1093	0	1068	12	0
1	C	1093	0	1068	9	0
1	D	1093	0	1068	10	0
1	E	1093	0	1068	10	0
1	F	1093	0	1068	14	0
1	G	1093	0	1068	10	0
1	H	1093	0	1068	8	0
1	I	1093	0	1068	8	0
1	J	1093	0	1068	11	0
1	K	1093	0	1068	7	0
1	L	1093	0	1068	10	0
1	M	1093	0	1068	10	0
1	N	1093	0	1068	10	0
1	O	1093	0	1068	7	0
1	P	1093	0	1068	12	0
1	Q	1093	0	1068	10	0
All	All	18581	0	18156	153	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 4.

All (153) 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:D:35:ILE:HA	1:Q:73:VAL:HG21	1.73	0.70
1:B:78:ALA:HB1	1:B:133:ARG:HB3	1.74	0.69
1:G:78:ALA:HB1	1:G:133:ARG:HB3	1.76	0.68
1:E:78:ALA:HB1	1:E:133:ARG:HB3	1.77	0.67
1:C:78:ALA:HB1	1:C:133:ARG:HB3	1.78	0.66
1:D:78:ALA:HB1	1:D:133:ARG:HB3	1.78	0.66
1:M:78:ALA:HB1	1:M:133:ARG:HB3	1.76	0.66
1:M:73:VAL:HG21	1:O:35:ILE:HA	1.78	0.65
1:H:78:ALA:HB1	1:H:133:ARG:HB3	1.79	0.65
1:J:117:SER:HB3	1:J:118:PRO:HD3	1.80	0.63
1:F:78:ALA:HB1	1:F:133:ARG:HB3	1.80	0.63
1:A:78:ALA:HB1	1:A:133:ARG:HB3	1.79	0.62
1:Q:78:ALA:HB1	1:Q:133:ARG:HB3	1.81	0.62
1:N:117:SER:HB3	1:N:118:PRO:HD3	1.81	0.62
1:G:117:SER:HB3	1:G:118:PRO:HD3	1.81	0.62
1:M:117:SER:HB3	1:M:118:PRO:HD3	1.82	0.61
1:D:117:SER:HB3	1:D:118:PRO:HD3	1.83	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:P:78:ALA:HB1	1:P:133:ARG:HB3	1.82	0.61
1:C:73:VAL:HG21	1:G:35:ILE:HA	1.81	0.61
1:J:73:VAL:HG21	1:K:35:ILE:HA	1.81	0.61
1:H:117:SER:HB3	1:H:118:PRO:HD3	1.83	0.61
1:I:78:ALA:HB1	1:I:133:ARG:HB3	1.82	0.61
1:E:35:ILE:HA	1:I:73:VAL:HG21	1.81	0.61
1:I:117:SER:HB3	1:I:118:PRO:HD3	1.82	0.61
1:L:78:ALA:HB1	1:L:133:ARG:HB3	1.83	0.60
1:N:78:ALA:HB1	1:N:133:ARG:HB3	1.83	0.60
1:B:117:SER:HB3	1:B:118:PRO:HD3	1.84	0.60
1:P:117:SER:HB3	1:P:118:PRO:HD3	1.84	0.60
1:C:117:SER:HB3	1:C:118:PRO:HD3	1.83	0.59
1:F:117:SER:HB3	1:F:118:PRO:HD3	1.83	0.59
1:L:117:SER:HB3	1:L:118:PRO:HD3	1.83	0.59
1:J:78:ALA:HB1	1:J:133:ARG:HB3	1.83	0.59
1:Q:117:SER:HB3	1:Q:118:PRO:HD3	1.84	0.59
1:O:117:SER:HB3	1:O:118:PRO:HD3	1.82	0.59
1:A:117:SER:HB3	1:A:118:PRO:HD3	1.85	0.58
1:E:117:SER:HB3	1:E:118:PRO:HD3	1.84	0.58
1:K:117:SER:HB3	1:K:118:PRO:HD3	1.86	0.58
1:F:73:VAL:HG21	1:Q:35:ILE:HA	1.84	0.58
1:K:78:ALA:HB1	1:K:133:ARG:HB3	1.86	0.57
1:O:78:ALA:HB1	1:O:133:ARG:HB3	1.87	0.57
1:H:35:ILE:HA	1:O:73:VAL:HG21	1.85	0.56
1:Q:87:ASN:HA	1:Q:90:THR:HG22	1.89	0.55
1:M:87:ASN:HA	1:M:90:THR:HG22	1.89	0.54
1:L:73:VAL:HG21	1:N:35:ILE:HA	1.90	0.54
1:C:35:ILE:HA	1:D:73:VAL:HG21	1.91	0.53
1:A:35:ILE:HA	1:E:73:VAL:HG21	1.90	0.53
1:O:87:ASN:HA	1:O:90:THR:HG22	1.90	0.53
1:G:73:VAL:HG21	1:L:35:ILE:HA	1.91	0.53
1:D:87:ASN:HA	1:D:90:THR:HG22	1.90	0.53
1:N:87:ASN:HA	1:N:90:THR:HG22	1.90	0.53
1:A:87:ASN:HA	1:A:90:THR:HG22	1.90	0.52
1:H:87:ASN:HA	1:H:90:THR:HG22	1.91	0.52
1:E:87:ASN:HA	1:E:90:THR:HG22	1.92	0.52
1:L:87:ASN:HA	1:L:90:THR:HG22	1.91	0.52
1:G:100:GLN:OE1	1:G:103:ARG:NH2	2.43	0.51
1:J:87:ASN:HA	1:J:90:THR:HG22	1.93	0.51
1:N:100:GLN:OE1	1:N:103:ARG:NH2	2.43	0.51
1:K:87:ASN:HA	1:K:90:THR:HG22	1.93	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:87:ASN:HA	1:B:90:THR:HG22	1.93	0.51
1:F:87:ASN:HA	1:F:90:THR:HG22	1.91	0.50
1:J:35:ILE:HA	1:N:73:VAL:HG21	1.92	0.50
1:G:87:ASN:HA	1:G:90:THR:HG22	1.94	0.50
1:P:87:ASN:HA	1:P:90:THR:HG22	1.94	0.50
1:I:87:ASN:HA	1:I:90:THR:HG22	1.93	0.50
1:P:100:GLN:OE1	1:P:103:ARG:NH2	2.46	0.49
1:F:100:GLN:OE1	1:F:103:ARG:NH2	2.45	0.49
1:B:32:VAL:O	1:B:36:ARG:HG3	2.12	0.49
1:D:100:GLN:OE1	1:D:103:ARG:NH2	2.45	0.49
1:F:58:PRO:HA	1:F:59:ALA:HA	1.53	0.48
1:E:100:GLN:OE1	1:E:103:ARG:NH2	2.47	0.48
1:C:100:GLN:OE1	1:C:103:ARG:NH2	2.47	0.48
1:J:58:PRO:HA	1:J:59:ALA:HA	1.50	0.48
1:E:58:PRO:HA	1:E:59:ALA:HA	1.51	0.48
1:C:87:ASN:HA	1:C:90:THR:HG22	1.94	0.48
1:N:46:PHE:HE1	1:N:74:PHE:HB3	1.79	0.48
1:O:58:PRO:HA	1:O:59:ALA:HA	1.50	0.47
1:H:73:VAL:HG21	1:I:35:ILE:HA	1.95	0.47
1:I:100:GLN:OE1	1:I:103:ARG:NH2	2.48	0.47
1:H:100:GLN:OE1	1:H:103:ARG:NH2	2.48	0.47
1:D:58:PRO:HA	1:D:59:ALA:HA	1.51	0.46
1:A:58:PRO:HA	1:A:59:ALA:HA	1.51	0.46
1:B:73:VAL:HG21	1:F:35:ILE:HA	1.97	0.46
1:L:58:PRO:HA	1:L:59:ALA:HA	1.50	0.46
1:Q:42:ASN:H	1:Q:45:SER:HG	1.63	0.46
1:L:119:GLN:HB2	1:L:122:VAL:HB	1.98	0.45
1:M:100:GLN:OE1	1:M:103:ARG:NH2	2.50	0.45
1:B:139:ASP:HB3	1:B:140:PRO:HD3	1.99	0.45
1:M:118:PRO:HG3	1:M:124:PHE:CD2	2.52	0.45
1:K:42:ASN:H	1:K:45:SER:HG	1.63	0.45
1:L:32:VAL:O	1:L:36:ARG:HG3	2.17	0.45
1:M:35:ILE:HA	1:P:73:VAL:HG21	1.98	0.44
1:J:119:GLN:HB2	1:J:122:VAL:HB	2.00	0.44
1:P:58:PRO:HA	1:P:59:ALA:HA	1.48	0.44
1:A:119:GLN:HB2	1:A:122:VAL:HB	1.99	0.44
1:G:58:PRO:HA	1:G:59:ALA:HA	1.49	0.44
1:P:42:ASN:H	1:P:45:SER:HG	1.66	0.44
1:H:58:PRO:HA	1:H:59:ALA:HA	1.50	0.43
1:A:42:ASN:H	1:A:45:SER:HG	1.64	0.43
1:P:32:VAL:O	1:P:36:ARG:HG3	2.17	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:42:ASN:H	1:F:45:SER:HG	1.66	0.43
1:Q:58:PRO:HA	1:Q:59:ALA:HA	1.53	0.43
1:N:58:PRO:HA	1:N:59:ALA:HA	1.50	0.43
1:H:42:ASN:H	1:H:45:SER:HG	1.67	0.43
1:B:119:GLN:HB2	1:B:122:VAL:HB	2.00	0.43
1:K:100:GLN:OE1	1:K:103:ARG:NH2	2.52	0.43
1:F:114:TRP:CE3	1:F:133:ARG:HB2	2.54	0.42
1:L:42:ASN:H	1:L:45:SER:HG	1.67	0.42
1:P:139:ASP:HB3	1:P:140:PRO:HD3	2.02	0.42
1:G:119:GLN:HB2	1:G:122:VAL:HB	2.00	0.42
1:K:139:ASP:HB3	1:K:140:PRO:HD3	2.01	0.42
1:M:119:GLN:HB2	1:M:122:VAL:HB	2.00	0.42
1:J:42:ASN:H	1:J:45:SER:HG	1.68	0.42
1:E:97:PHE:CE1	1:E:106:VAL:HG21	2.55	0.42
1:J:114:TRP:CE2	1:J:133:ARG:HD3	2.55	0.42
1:M:58:PRO:HA	1:M:59:ALA:HA	1.49	0.42
1:B:58:PRO:HA	1:B:59:ALA:HA	1.51	0.42
1:G:31:ILE:HD11	1:G:89:CYS:HB3	2.02	0.42
1:Q:118:PRO:HG3	1:Q:124:PHE:CD2	2.55	0.42
1:B:114:TRP:CE3	1:B:133:ARG:HB2	2.55	0.41
1:E:42:ASN:H	1:E:45:SER:HG	1.66	0.41
1:G:114:TRP:CE3	1:G:133:ARG:HB2	2.55	0.41
1:D:118:PRO:HG3	1:D:124:PHE:CD2	2.55	0.41
1:P:119:GLN:HB2	1:P:122:VAL:HB	2.01	0.41
1:Q:100:GLN:OE1	1:Q:103:ARG:NH2	2.53	0.41
1:I:58:PRO:HA	1:I:59:ALA:HA	1.51	0.41
1:J:100:GLN:OE1	1:J:103:ARG:NH2	2.53	0.41
1:C:42:ASN:H	1:C:45:SER:HG	1.67	0.41
1:B:42:ASN:H	1:B:45:SER:HG	1.68	0.41
1:C:58:PRO:HA	1:C:59:ALA:HA	1.51	0.41
1:N:118:PRO:HG3	1:N:124:PHE:CD2	2.55	0.41
1:A:93:LEU:HD23	1:A:93:LEU:HA	1.91	0.41
1:D:20:THR:O	1:D:24:ARG:HG3	2.20	0.41
1:N:20:THR:O	1:N:24:ARG:HG3	2.21	0.41
1:F:114:TRP:CE2	1:F:133:ARG:HD3	2.56	0.41
1:F:118:PRO:HG3	1:F:124:PHE:CD2	2.56	0.41
1:M:102:ALA:O	1:M:106:VAL:HG22	2.21	0.41
1:P:114:TRP:CE2	1:P:133:ARG:HD3	2.56	0.41
1:D:42:ASN:H	1:D:45:SER:HG	1.69	0.41
1:L:20:THR:O	1:L:24:ARG:HG3	2.21	0.41
1:A:139:ASP:HB3	1:A:140:PRO:HD3	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:20:THR:O	1:F:24:ARG:HG3	2.21	0.41
1:P:102:ALA:O	1:P:106:VAL:HG22	2.21	0.41
1:A:118:PRO:HG3	1:A:124:PHE:CD2	2.57	0.40
1:C:20:THR:O	1:C:24:ARG:HG3	2.20	0.40
1:J:139:ASP:HB3	1:J:140:PRO:HD3	2.03	0.40
1:O:97:PHE:CE1	1:O:106:VAL:HG21	2.57	0.40
1:B:118:PRO:HG3	1:B:124:PHE:CD2	2.56	0.40
1:F:102:ALA:O	1:F:106:VAL:HG22	2.21	0.40
1:F:139:ASP:HB3	1:F:140:PRO:HD3	2.04	0.40
1:Q:102:ALA:O	1:Q:106:VAL:HG22	2.22	0.40
1:A:73:VAL:HG21	1:B:35:ILE:HA	2.03	0.40
1:E:118:PRO:HG3	1:E:124:PHE:CD2	2.57	0.40
1:I:139:ASP:HB3	1:I:140:PRO:HD3	2.03	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	
1	A	138/161 (86%)	134 (97%)	3 (2%)	1 (1%)	22	60
1	B	138/161 (86%)	134 (97%)	3 (2%)	1 (1%)	22	60
1	C	138/161 (86%)	135 (98%)	2 (1%)	1 (1%)	22	60
1	D	138/161 (86%)	135 (98%)	2 (1%)	1 (1%)	22	60
1	E	138/161 (86%)	134 (97%)	3 (2%)	1 (1%)	22	60
1	F	138/161 (86%)	134 (97%)	3 (2%)	1 (1%)	22	60
1	G	138/161 (86%)	134 (97%)	3 (2%)	1 (1%)	22	60
1	H	138/161 (86%)	135 (98%)	2 (1%)	1 (1%)	22	60
1	I	138/161 (86%)	135 (98%)	2 (1%)	1 (1%)	22	60
1	J	138/161 (86%)	134 (97%)	3 (2%)	1 (1%)	22	60

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	K	138/161 (86%)	134 (97%)	3 (2%)	1 (1%)	22	60
1	L	138/161 (86%)	134 (97%)	3 (2%)	1 (1%)	22	60
1	M	138/161 (86%)	134 (97%)	3 (2%)	1 (1%)	22	60
1	N	138/161 (86%)	134 (97%)	3 (2%)	1 (1%)	22	60
1	O	138/161 (86%)	135 (98%)	2 (1%)	1 (1%)	22	60
1	P	138/161 (86%)	134 (97%)	3 (2%)	1 (1%)	22	60
1	Q	138/161 (86%)	134 (97%)	3 (2%)	1 (1%)	22	60
All	All	2346/2737 (86%)	2283 (97%)	46 (2%)	17 (1%)	22	60

All (17) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	117	SER
1	B	117	SER
1	C	117	SER
1	D	117	SER
1	E	117	SER
1	F	117	SER
1	G	117	SER
1	H	117	SER
1	I	117	SER
1	J	117	SER
1	K	117	SER
1	L	117	SER
1	M	117	SER
1	N	117	SER
1	O	117	SER
1	P	117	SER
1	Q	117	SER

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	121/138 (88%)	121 (100%)	0	100	100
1	B	121/138 (88%)	121 (100%)	0	100	100
1	C	121/138 (88%)	121 (100%)	0	100	100
1	D	121/138 (88%)	121 (100%)	0	100	100
1	E	121/138 (88%)	121 (100%)	0	100	100
1	F	121/138 (88%)	121 (100%)	0	100	100
1	G	121/138 (88%)	121 (100%)	0	100	100
1	H	121/138 (88%)	121 (100%)	0	100	100
1	I	121/138 (88%)	121 (100%)	0	100	100
1	J	121/138 (88%)	121 (100%)	0	100	100
1	K	121/138 (88%)	121 (100%)	0	100	100
1	L	121/138 (88%)	121 (100%)	0	100	100
1	M	121/138 (88%)	121 (100%)	0	100	100
1	N	121/138 (88%)	121 (100%)	0	100	100
1	O	121/138 (88%)	121 (100%)	0	100	100
1	P	121/138 (88%)	121 (100%)	0	100	100
1	Q	121/138 (88%)	121 (100%)	0	100	100
All	All	2057/2346 (88%)	2057 (100%)	0	100	100

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

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

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 monosaccharides 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, 95th 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	A	140/161 (86%)	-0.07	1 (0%)	87	69	98, 120, 155, 205	0
1	B	140/161 (86%)	-0.06	1 (0%)	87	69	105, 121, 161, 201	0
1	C	140/161 (86%)	-0.09	1 (0%)	87	69	101, 119, 157, 206	0
1	D	140/161 (86%)	-0.14	0	100	100	101, 122, 159, 203	0
1	E	140/161 (86%)	-0.21	0	100	100	101, 121, 154, 200	0
1	F	140/161 (86%)	-0.11	0	100	100	104, 124, 158, 200	0
1	G	140/161 (86%)	-0.16	1 (0%)	87	69	108, 122, 164, 206	0
1	H	140/161 (86%)	-0.14	0	100	100	100, 118, 158, 203	0
1	I	140/161 (86%)	-0.09	1 (0%)	87	69	105, 121, 155, 203	0
1	J	140/161 (86%)	-0.03	1 (0%)	87	69	102, 119, 158, 196	0
1	K	140/161 (86%)	-0.11	1 (0%)	87	69	110, 122, 158, 199	0
1	L	140/161 (86%)	-0.07	1 (0%)	87	69	109, 123, 163, 200	0
1	M	140/161 (86%)	-0.19	0	100	100	105, 122, 159, 203	0
1	N	140/161 (86%)	-0.15	1 (0%)	87	69	105, 121, 160, 199	0
1	O	140/161 (86%)	-0.02	0	100	100	97, 120, 157, 205	0
1	P	140/161 (86%)	0.08	2 (1%)	75	49	106, 121, 158, 199	0
1	Q	140/161 (86%)	-0.07	3 (2%)	63	34	107, 122, 158, 207	0
All	All	2380/2737 (86%)	-0.10	14 (0%)	89	72	97, 121, 160, 207	0

All (14) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	P	58	PRO	3.6
1	Q	126	ASP	3.5
1	I	58	PRO	3.2
1	B	13	THR	3.1

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Mol	Chain	Res	Type	RSRZ
1	C	152	ARG	3.0
1	L	15	ARG	2.9
1	J	152	ARG	2.8
1	Q	152	ARG	2.7
1	K	97	PHE	2.6
1	P	145	LEU	2.5
1	A	152	ARG	2.2
1	N	58	PRO	2.2
1	G	71	GLN	2.2
1	Q	110	PHE	2.1

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 monosaccharides 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.