WORLDWIDE wwPDB PROTEIN DATA BANK

wwPDB X-ray Structure Validation Summary Report (i)

Nov 11, 2024 – 12:33 pm GMT

PDB ID	:	9FBG
Title	:	SARS-CoV-2 Nucleocapsid N-terminal domain (NTD) mutant P151S
Authors	:	Dhamotharan, K.; Schlundt, A.
Deposited on	:	2024-05-13
Resolution	:	2.54 Å(reported)

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

|		
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

1 Overall quality at a glance ⓘ

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

The reported resolution of this entry is 2.54 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		0.251
Clashscore		2
Ramachandran outliers		0.3%
Sidechain outliers		2.2%
RSRZ outliers		3.2%

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution
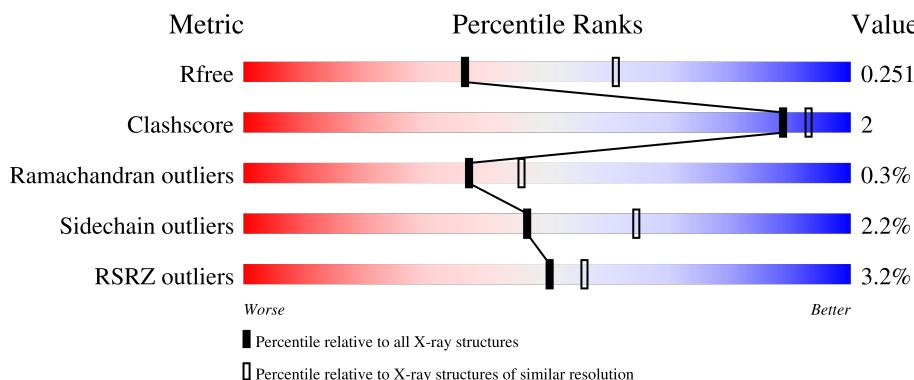
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	1004 (2.54-2.54)
Clashscore	180529	1055 (2.54-2.54)
Ramachandran outliers	177936	1048 (2.54-2.54)
Sidechain outliers	177891	1048 (2.54-2.54)
RSRZ outliers	164620	1004 (2.54-2.54)

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	136	4% / 91% ...
1	B	136	4% / 93% ..
1	C	136	4% / 90% 6% ..
1	D	136	6% / 91% ...
1	E	136	2% / 92% ..

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Mol	Chain	Length	Quality of chain
1	F	136	4% 93% 5%
1	G	136	2% 91% 6%
1	H	136	% 89% 8%
1	I	136	3% 90% 9%
1	J	136	% 88% 9%
1	K	136	% 91% 7%
1	L	136	4% 88% 9%
1	M	136	% 89% 6% 5%
1	N	136	3% 92%
1	O	136	2% 90% 9%
1	P	136	4% 94%
1	Q	136	4% 92%
1	R	136	4% 93%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 19632 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 Nucleoprotein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	131	Total	C	N	O	S	0	0	0
			1020	645	184	190	1			
1	B	133	Total	C	N	O	S	0	0	0
			1032	651	186	194	1			
1	C	132	Total	C	N	O	S	0	0	0
			1028	649	188	190	1			
1	D	131	Total	C	N	O	S	0	0	0
			1016	640	187	188	1			
1	E	130	Total	C	N	O	S	0	0	0
			1005	634	183	187	1			
1	F	134	Total	C	N	O	S	0	0	0
			1043	657	190	195	1			
1	G	132	Total	C	N	O	S	0	0	0
			1028	649	188	190	1			
1	H	134	Total	C	N	O	S	0	0	0
			1043	657	190	195	1			
1	I	134	Total	C	N	O	S	0	0	0
			1043	657	190	195	1			
1	J	132	Total	C	N	O	S	0	0	0
			1028	649	188	190	1			
1	K	134	Total	C	N	O	S	0	0	0
			1043	657	190	195	1			
1	L	133	Total	C	N	O	S	0	0	0
			1032	651	186	194	1			
1	M	129	Total	C	N	O	S	0	0	0
			1007	637	181	188	1			
1	N	131	Total	C	N	O	S	0	0	0
			1017	643	184	189	1			
1	O	134	Total	C	N	O	S	0	0	0
			1043	657	190	195	1			
1	P	134	Total	C	N	O	S	0	0	0
			1043	657	190	195	1			

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	Q	131	1017	643	184	189	1	0	0	0
1	R	132	Total	C	N	O	S	0	0	0
			1028	649	188	190	1			

There are 54 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	39	GLY	-	expression tag	UNP P0DTC9
A	40	SER	-	expression tag	UNP P0DTC9
A	151	SER	PRO	variant	UNP P0DTC9
B	39	GLY	-	expression tag	UNP P0DTC9
B	40	SER	-	expression tag	UNP P0DTC9
B	151	SER	PRO	variant	UNP P0DTC9
C	39	GLY	-	expression tag	UNP P0DTC9
C	40	SER	-	expression tag	UNP P0DTC9
C	151	SER	PRO	variant	UNP P0DTC9
D	39	GLY	-	expression tag	UNP P0DTC9
D	40	SER	-	expression tag	UNP P0DTC9
D	151	SER	PRO	variant	UNP P0DTC9
E	39	GLY	-	expression tag	UNP P0DTC9
E	40	SER	-	expression tag	UNP P0DTC9
E	151	SER	PRO	variant	UNP P0DTC9
F	39	GLY	-	expression tag	UNP P0DTC9
F	40	SER	-	expression tag	UNP P0DTC9
F	151	SER	PRO	variant	UNP P0DTC9
G	39	GLY	-	expression tag	UNP P0DTC9
G	40	SER	-	expression tag	UNP P0DTC9
G	151	SER	PRO	variant	UNP P0DTC9
H	39	GLY	-	expression tag	UNP P0DTC9
H	40	SER	-	expression tag	UNP P0DTC9
H	151	SER	PRO	variant	UNP P0DTC9
I	39	GLY	-	expression tag	UNP P0DTC9
I	40	SER	-	expression tag	UNP P0DTC9
I	151	SER	PRO	variant	UNP P0DTC9
J	39	GLY	-	expression tag	UNP P0DTC9
J	40	SER	-	expression tag	UNP P0DTC9
J	151	SER	PRO	variant	UNP P0DTC9
K	39	GLY	-	expression tag	UNP P0DTC9
K	40	SER	-	expression tag	UNP P0DTC9
K	151	SER	PRO	variant	UNP P0DTC9
L	39	GLY	-	expression tag	UNP P0DTC9

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Chain	Residue	Modelled	Actual	Comment	Reference
L	40	SER	-	expression tag	UNP P0DTC9
L	151	SER	PRO	variant	UNP P0DTC9
M	39	GLY	-	expression tag	UNP P0DTC9
M	40	SER	-	expression tag	UNP P0DTC9
M	151	SER	PRO	variant	UNP P0DTC9
N	39	GLY	-	expression tag	UNP P0DTC9
N	40	SER	-	expression tag	UNP P0DTC9
N	151	SER	PRO	variant	UNP P0DTC9
O	39	GLY	-	expression tag	UNP P0DTC9
O	40	SER	-	expression tag	UNP P0DTC9
O	151	SER	PRO	variant	UNP P0DTC9
P	39	GLY	-	expression tag	UNP P0DTC9
P	40	SER	-	expression tag	UNP P0DTC9
P	151	SER	PRO	variant	UNP P0DTC9
Q	39	GLY	-	expression tag	UNP P0DTC9
Q	40	SER	-	expression tag	UNP P0DTC9
Q	151	SER	PRO	variant	UNP P0DTC9
R	39	GLY	-	expression tag	UNP P0DTC9
R	40	SER	-	expression tag	UNP P0DTC9
R	151	SER	PRO	variant	UNP P0DTC9

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	58	Total 58	O 58	0	0
2	B	87	Total 87	O 87	0	0
2	C	56	Total 56	O 56	0	0
2	D	41	Total 41	O 41	0	0
2	E	64	Total 64	O 64	0	0
2	F	69	Total 69	O 69	0	0
2	G	82	Total 82	O 82	0	0
2	H	71	Total 71	O 71	0	0
2	I	66	Total 66	O 66	0	0

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	J	61	Total 61	O 61	0	0
2	K	81	Total 81	O 81	0	0
2	L	48	Total 48	O 48	0	0
2	M	50	Total 50	O 50	0	0
2	N	60	Total 60	O 60	0	0
2	O	70	Total 70	O 70	0	0
2	P	46	Total 46	O 46	0	0
2	Q	49	Total 49	O 49	0	0
2	R	57	Total 57	O 57	0	0

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: Nucleoprotein

Chain A:

- Molecule 1: Nucleoprotein

Chain B:

- Molecule 1: Nucleoprotein

Chain C:

- Molecule 1: Nucleoprotein

Chain D:

- Molecule 1: Nucleoprotein

Chain E:

- Molecule 1: Nucleoprotein

Chain F:

4%

93%   5%

```
GLY SER R41  T49 A50 S51  Q58  R89  R93  G96 G97 D98 G99  K100  P106  N126  E174
```

• Molecule 1: Nucleoprotein

Chain G:

2%

91%   6%

```
GLY SER R41  P42  T49 A50 S51  Y86  G96  M101  W132  I157  Y172  ALA GLU
```

• Molecule 1: Nucleoprotein

Chain H:

%

89%   8%

```
GLY SER R41 P42  T49 A50 S51  A55  Y86  R92 R93 I94  K102  R107 W108 Y109  W132  I157  E174
```

• Molecule 1: Nucleoprotein

Chain I:

3%

90%   9%

```
GLY SER R41  T49 A50 S51  A55  R68  I94 R95 G96 G97 D98 G99  K100 M101 K102  Y109  E174
```

• Molecule 1: Nucleoprotein

Chain J:

%

88%   9%

```
GLY SER R41 P42  T49 A50 S51  A55  R92 R93 I94 R95 G96 G97  M101  Y109  E136  K169  Y172  ALA GLU
```

• Molecule 1: Nucleoprotein

Chain K:

%

91%   7%

```
GLY SER R41  T49 A50 S51  K61 E62  Y86  G97  D98  M101  W132  E136  K169  A173 E174
```

• Molecule 1: Nucleoprotein

Chain L:

4%

88%   9%

```
GLY SER ARG P42  T49 A50 S51  Q58  R92 R93 I94 R95 G96 G97 D98 G99 K100 M101  L104 S105 P106 R107  E136  L161  T165  E174
```

• Molecule 1: Nucleoprotein

Chain M:

• Molecule 1: Nucleoprotein

Chain N:

• Molecule 1: Nucleoprotein

Chain O:

• Molecule 1: Nucleoprotein

Chain P:

• Molecule 1: Nucleoprotein

Chain Q:

• Molecule 1: Nucleoprotein

Chain R:
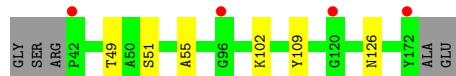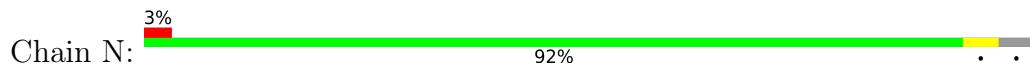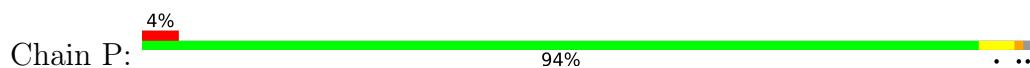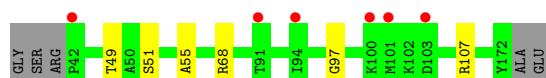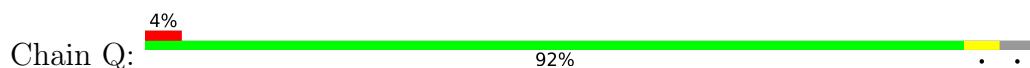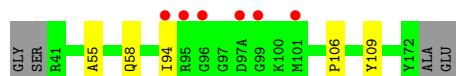
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	188.11Å 108.88Å 146.27Å 90.00° 100.79° 90.00°	Depositor
Resolution (Å)	47.75 – 2.54 47.75 – 2.54	Depositor EDS
% Data completeness (in resolution range)	99.8 (47.75-2.54) 99.8 (47.75-2.54)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$<I/\sigma(I)>$ [1]	1.82 (at 2.54Å)	Xtriage
Refinement program	BUSTER 2.10.4, REFMAC 5.8.0425, PDB-REDO 8.06	Depositor
R, R_{free}	0.221 , 0.261 0.209 , 0.251	Depositor DCC
R_{free} test set	4743 reflections (4.97%)	wwPDB-VP
Wilson B-factor (Å^2)	50.7	Xtriage
Anisotropy	0.602	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 65.6	EDS
L-test for twinning[2]	$<\|L\|> = 0.52, <L^2> = 0.35$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	19632	wwPDB-VP
Average B, all atoms (Å^2)	60.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.47% 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 RMSZ	Bond lengths #$|Z|$>5	Bond angles RMSZ	Bond angles #$|Z|$>5
1	A	0.33	0/1048	0.48	0/1422
1	B	0.37	0/1061	0.51	0/1441
1	C	0.31	0/1057	0.50	0/1437
1	D	0.31	0/1044	0.50	0/1419
1	E	0.34	0/1033	0.50	0/1404
1	F	0.34	0/1072	0.50	0/1456
1	G	0.35	0/1057	0.50	0/1437
1	H	0.35	0/1072	0.51	0/1456
1	I	0.36	0/1072	0.50	0/1456
1	J	0.33	0/1057	0.50	0/1437
1	K	0.36	0/1072	0.50	0/1456
1	L	0.31	0/1061	0.48	0/1441
1	M	0.35	0/1035	0.52	0/1406
1	N	0.34	0/1046	0.50	0/1422
1	O	0.35	0/1072	0.51	0/1456
1	P	0.32	0/1072	0.48	0/1456
1	Q	0.32	0/1046	0.49	0/1422
1	R	0.32	0/1057	0.48	0/1437
All	All	0.34	0/19034	0.50	0/25861

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	1020	0	992	4	0
1	B	1032	0	1000	3	0
1	C	1028	0	1001	3	0
1	D	1016	0	992	5	0
1	E	1005	0	980	3	0
1	F	1043	0	1012	3	0
1	G	1028	0	1001	4	0
1	H	1043	0	1012	8	0
1	I	1043	0	1012	4	0
1	J	1028	0	1001	4	0
1	K	1043	0	1012	6	0
1	L	1032	0	1000	10	0
1	M	1007	0	976	4	0
1	N	1017	0	989	3	0
1	O	1043	0	1012	3	0
1	P	1043	0	1012	3	0
1	Q	1017	0	989	3	0
1	R	1028	0	1001	2	0
2	A	58	0	0	0	0
2	B	87	0	0	0	0
2	C	56	0	0	0	0
2	D	41	0	0	0	0
2	E	64	0	0	0	0
2	F	69	0	0	0	0
2	G	82	0	0	0	0
2	H	71	0	0	0	0
2	I	66	0	0	0	0
2	J	61	0	0	0	0
2	K	81	0	0	0	0
2	L	48	0	0	0	0
2	M	50	0	0	0	0
2	N	60	0	0	0	0
2	O	70	0	0	0	0
2	P	46	0	0	0	0
2	Q	49	0	0	0	0
2	R	57	0	0	0	0
All	All	19632	0	17994	64	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 2.

The worst 5 of 64 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:I:95:ARG:HA	1:I:100:LYS:HA	1.51	0.91
1:L:95:ARG:HA	1:L:101:MET:HA	1.62	0.82
1:H:94:ILE:HD11	1:H:102:LYS:HE2	1.72	0.72
1:Q:55:ALA:HB3	1:Q:107:ARG:HE	1.55	0.72
1:D:95:ARG:HD2	1:D:95:ARG:H	1.60	0.66

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	127/136 (93%)	124 (98%)	3 (2%)	0	100	100
1	B	131/136 (96%)	127 (97%)	4 (3%)	0	100	100
1	C	130/136 (96%)	126 (97%)	3 (2%)	1 (1%)	16	23
1	D	129/136 (95%)	125 (97%)	4 (3%)	0	100	100
1	E	128/136 (94%)	125 (98%)	3 (2%)	0	100	100
1	F	132/136 (97%)	128 (97%)	4 (3%)	0	100	100
1	G	130/136 (96%)	125 (96%)	5 (4%)	0	100	100
1	H	132/136 (97%)	129 (98%)	3 (2%)	0	100	100
1	I	132/136 (97%)	128 (97%)	3 (2%)	1 (1%)	16	23
1	J	130/136 (96%)	125 (96%)	5 (4%)	0	100	100
1	K	132/136 (97%)	126 (96%)	5 (4%)	1 (1%)	16	23
1	L	131/136 (96%)	128 (98%)	3 (2%)	0	100	100
1	M	125/136 (92%)	121 (97%)	4 (3%)	0	100	100
1	N	129/136 (95%)	124 (96%)	5 (4%)	0	100	100
1	O	132/136 (97%)	125 (95%)	5 (4%)	2 (2%)	8	11
1	P	132/136 (97%)	127 (96%)	4 (3%)	1 (1%)	16	23

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	Q	129/136 (95%)	124 (96%)	4 (3%)	1 (1%)	16	23
1	R	130/136 (96%)	126 (97%)	4 (3%)	0	100	100
All	All	2341/2448 (96%)	2263 (97%)	71 (3%)	7 (0%)	37	46

5 of 7 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	Q	97	GLY
1	I	98	ASP
1	O	97	GLY
1	C	98	ASP
1	O	173	ALA

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	104/107 (97%)	102 (98%)	2 (2%)	52	70
1	B	105/107 (98%)	104 (99%)	1 (1%)	73	84
1	C	105/107 (98%)	101 (96%)	4 (4%)	28	41
1	D	104/107 (97%)	101 (97%)	3 (3%)	37	54
1	E	103/107 (96%)	102 (99%)	1 (1%)	73	84
1	F	106/107 (99%)	104 (98%)	2 (2%)	52	70
1	G	105/107 (98%)	103 (98%)	2 (2%)	52	70
1	H	106/107 (99%)	103 (97%)	3 (3%)	38	55
1	I	106/107 (99%)	101 (95%)	5 (5%)	22	32
1	J	105/107 (98%)	100 (95%)	5 (5%)	21	31
1	K	106/107 (99%)	105 (99%)	1 (1%)	75	87
1	L	105/107 (98%)	103 (98%)	2 (2%)	52	70
1	M	103/107 (96%)	101 (98%)	2 (2%)	52	70
1	N	104/107 (97%)	103 (99%)	1 (1%)	73	84

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	O	106/107 (99%)	101 (95%)	5 (5%)	22	32
1	P	106/107 (99%)	104 (98%)	2 (2%)	52	70
1	Q	104/107 (97%)	104 (100%)	0	100	100
1	R	105/107 (98%)	104 (99%)	1 (1%)	73	84
All	All	1888/1926 (98%)	1846 (98%)	42 (2%)	47	65

5 of 42 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	K	136	GLU
1	O	95	ARG
1	L	101	MET
1	M	101	MET
1	O	103	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	126	ASN
1	G	59	HIS
1	M	126	ASN
1	N	126	ASN

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 oligosaccharides 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	131/136 (96%)	0.14	5 (3%)	44	50	42, 58, 95, 116	0
1	B	133/136 (97%)	0.02	5 (3%)	44	50	36, 50, 106, 131	0
1	C	132/136 (97%)	0.19	6 (4%)	39	44	44, 63, 117, 137	0
1	D	131/136 (96%)	0.27	8 (6%)	28	32	45, 61, 112, 138	0
1	E	130/136 (95%)	0.08	3 (2%)	61	65	40, 54, 105, 132	0
1	F	134/136 (98%)	0.05	5 (3%)	45	51	39, 56, 98, 117	0
1	G	132/136 (97%)	-0.01	3 (2%)	61	65	37, 52, 98, 112	0
1	H	134/136 (98%)	-0.11	1 (0%)	84	86	37, 55, 68, 80	0
1	I	134/136 (98%)	0.09	4 (2%)	52	58	38, 53, 103, 119	0
1	J	132/136 (97%)	0.16	2 (1%)	71	75	41, 57, 100, 120	0
1	K	134/136 (98%)	0.10	2 (1%)	71	75	41, 55, 103, 121	0
1	L	133/136 (97%)	0.36	6 (4%)	39	44	49, 64, 112, 130	0
1	M	129/136 (94%)	0.03	2 (1%)	70	74	40, 56, 79, 93	0
1	N	131/136 (96%)	0.10	4 (3%)	51	57	39, 58, 82, 102	0
1	O	134/136 (98%)	0.13	3 (2%)	62	67	42, 60, 102, 129	0
1	P	134/136 (98%)	0.31	5 (3%)	45	51	48, 65, 110, 132	0
1	Q	131/136 (96%)	0.32	6 (4%)	38	43	45, 64, 119, 140	0
1	R	132/136 (97%)	0.32	6 (4%)	39	44	44, 63, 115, 141	0
All	All	2381/2448 (97%)	0.14	76 (3%)	50	56	36, 58, 104, 141	0

The worst 5 of 76 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	I	101	MET	4.6
1	D	101	MET	4.2
1	J	101	MET	3.9

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Mol	Chain	Res	Type	RSRZ
1	D	98	ASP	3.8
1	R	94	ILE	3.8

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.