wwPDB X-ray Structure Validation Summary Report (i)

Nov 12, 2024 – 05:40 PM EST

PDB ID	:	3TRH
Title	:	Structure of a phosphoribosylaminoimidazole carboxylase catalytic subunit (purE) from Coxiella burnetii
Authors	:	Cheung, J.; Franklin, M.C.; Rudolph, M.; Cassidy, M.; Gary, E.; Burshteyn, F.; Love, J.
Deposited on	:	2011-09-09
Resolution	:	2.20 Å(reported)

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

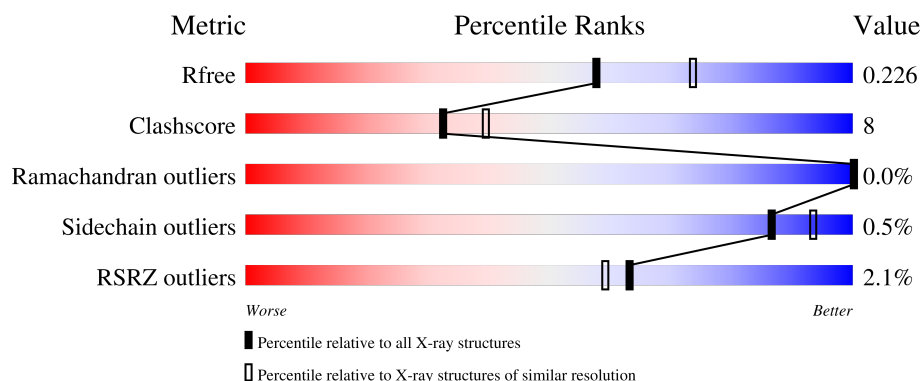|		
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (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 2.20 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		0.226
Clashscore		8
Ramachandran outliers		0.0%
Sidechain outliers		0.5%
RSRZ outliers		2.1%

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	5791 (2.20-2.20)
Clashscore	180529	6634 (2.20-2.20)
Ramachandran outliers	177936	6560 (2.20-2.20)
Sidechain outliers	177891	6561 (2.20-2.20)
RSRZ outliers	164620	5791 (2.20-2.20)

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	169	85% 12% •
1	B	169	% 85% 12% •
1	C	169	83% 13% •
1	D	169	82% 15% •
1	E	169	2% 79% 18% •

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Mol	Chain	Length	Quality of chain
1	F	169	77% 20% ·
1	G	169	87% 11% ·
1	H	169	2% 83% 13% ·
1	I	169	4% 78% 20% ·
1	J	169	80% 17% ·
1	K	169	2% 79% 18% ·
1	L	169	5% 80% 17% ·
1	M	169	80% 17% ·
1	N	169	4% 73% 24% ·
1	O	169	2% 76% 21% ·
1	P	169	7% 75% 22% ·

2　Entry composition ⓘ

There are 2 unique types of molecules in this entry. The entry contains 19690 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 Phosphoribosylaminoimidazole carboxylase carboxyltransferase subunit.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	164	Total	C	N	O	S	Se	0	0	0
			1187	749	207	225	2	4			
1	B	164	Total	C	N	O	S	Se	0	0	0
			1187	749	207	225	2	4			
1	C	163	Total	C	N	O	S	Se	0	0	0
			1178	743	205	224	2	4			
1	D	164	Total	C	N	O	S	Se	0	0	0
			1187	749	207	225	2	4			
1	E	164	Total	C	N	O	S	Se	0	0	0
			1187	749	207	225	2	4			
1	F	163	Total	C	N	O	S	Se	0	0	0
			1178	743	205	224	2	4			
1	G	166	Total	C	N	O	S	Se	0	0	0
			1203	758	210	228	2	5			
1	H	163	Total	C	N	O	S	Se	0	0	0
			1178	743	205	224	2	4			
1	I	165	Total	C	N	O	S	Se	0	0	0
			1195	753	209	227	2	4			
1	J	164	Total	C	N	O	S	Se	0	0	0
			1187	749	207	225	2	4			
1	K	164	Total	C	N	O	S	Se	0	0	0
			1187	749	207	225	2	4			
1	L	163	Total	C	N	O	S	Se	0	0	0
			1178	743	205	224	2	4			
1	M	164	Total	C	N	O	S	Se	0	0	0
			1187	749	207	225	2	4			
1	N	164	Total	C	N	O	S	Se	0	0	0
			1187	749	207	225	2	4			
1	O	164	Total	C	N	O	S	Se	0	0	0
			1187	749	207	225	2	4			
1	P	164	Total	C	N	O	S	Se	0	0	0
			1187	749	207	225	2	4			

There are 48 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-2	SER	-	expression tag	UNP Q83AA3
A	-1	ASN	-	expression tag	UNP Q83AA3
A	0	ALA	-	expression tag	UNP Q83AA3
B	-2	SER	-	expression tag	UNP Q83AA3
B	-1	ASN	-	expression tag	UNP Q83AA3
B	0	ALA	-	expression tag	UNP Q83AA3
C	-2	SER	-	expression tag	UNP Q83AA3
C	-1	ASN	-	expression tag	UNP Q83AA3
C	0	ALA	-	expression tag	UNP Q83AA3
D	-2	SER	-	expression tag	UNP Q83AA3
D	-1	ASN	-	expression tag	UNP Q83AA3
D	0	ALA	-	expression tag	UNP Q83AA3
E	-2	SER	-	expression tag	UNP Q83AA3
E	-1	ASN	-	expression tag	UNP Q83AA3
E	0	ALA	-	expression tag	UNP Q83AA3
F	-2	SER	-	expression tag	UNP Q83AA3
F	-1	ASN	-	expression tag	UNP Q83AA3
F	0	ALA	-	expression tag	UNP Q83AA3
G	-2	SER	-	expression tag	UNP Q83AA3
G	-1	ASN	-	expression tag	UNP Q83AA3
G	0	ALA	-	expression tag	UNP Q83AA3
H	-2	SER	-	expression tag	UNP Q83AA3
H	-1	ASN	-	expression tag	UNP Q83AA3
H	0	ALA	-	expression tag	UNP Q83AA3
I	-2	SER	-	expression tag	UNP Q83AA3
I	-1	ASN	-	expression tag	UNP Q83AA3
I	0	ALA	-	expression tag	UNP Q83AA3
J	-2	SER	-	expression tag	UNP Q83AA3
J	-1	ASN	-	expression tag	UNP Q83AA3
J	0	ALA	-	expression tag	UNP Q83AA3
K	-2	SER	-	expression tag	UNP Q83AA3
K	-1	ASN	-	expression tag	UNP Q83AA3
K	0	ALA	-	expression tag	UNP Q83AA3
L	-2	SER	-	expression tag	UNP Q83AA3
L	-1	ASN	-	expression tag	UNP Q83AA3
L	0	ALA	-	expression tag	UNP Q83AA3
M	-2	SER	-	expression tag	UNP Q83AA3
M	-1	ASN	-	expression tag	UNP Q83AA3
M	0	ALA	-	expression tag	UNP Q83AA3
N	-2	SER	-	expression tag	UNP Q83AA3
N	-1	ASN	-	expression tag	UNP Q83AA3
N	0	ALA	-	expression tag	UNP Q83AA3

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Chain	Residue	Modelled	Actual	Comment	Reference
O	-2	SER	-	expression tag	UNP Q83AA3
O	-1	ASN	-	expression tag	UNP Q83AA3
O	0	ALA	-	expression tag	UNP Q83AA3
P	-2	SER	-	expression tag	UNP Q83AA3
P	-1	ASN	-	expression tag	UNP Q83AA3
P	0	ALA	-	expression tag	UNP Q83AA3

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	57	Total 57	O 57	0	0
2	B	66	Total 66	O 66	0	0
2	C	72	Total 72	O 72	0	0
2	D	67	Total 67	O 67	0	0
2	E	44	Total 44	O 44	0	0
2	F	57	Total 57	O 57	0	0
2	G	53	Total 53	O 53	0	0
2	H	43	Total 43	O 43	0	0
2	I	59	Total 59	O 59	0	0
2	J	49	Total 49	O 49	0	0
2	K	40	Total 40	O 40	0	0
2	L	28	Total 28	O 28	0	0
2	M	21	Total 21	O 21	0	0
2	N	22	Total 22	O 22	0	0
2	O	17	Total 17	O 17	0	0
2	P	15	Total 15	O 15	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: Phosphoribosylaminoimidazole carboxylase carboxyltransferase subunit

Chain A:

- Molecule 1: Phosphoribosylaminoimidazole carboxylase carboxyltransferase subunit

Chain B:

- Molecule 1: Phosphoribosylaminoimidazole carboxylase carboxyltransferase subunit
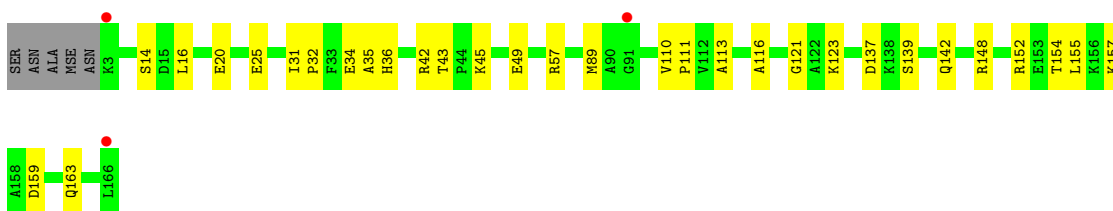
Chain C:

- Molecule 1: Phosphoribosylaminoimidazole carboxylase carboxyltransferase subunit
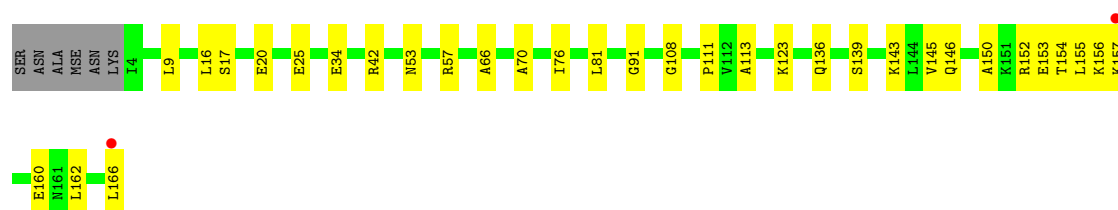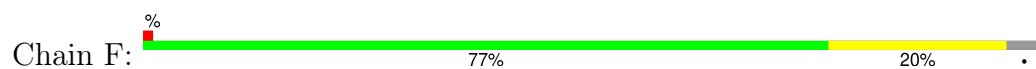
Chain D:

- Molecule 1: Phosphoribosylaminoimidazole carboxylase carboxyltransferase subunit

Chain E:

• Molecule 1: Phosphoribosylaminoimidazole carboxylase carboxyltransferase subunit

Chain F:

• Molecule 1: Phosphoribosylaminoimidazole carboxylase carboxyltransferase subunit
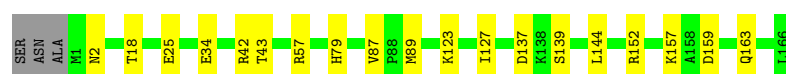
Chain G:

• Molecule 1: Phosphoribosylaminoimidazole carboxylase carboxyltransferase subunit

Chain H:

• Molecule 1: Phosphoribosylaminoimidazole carboxylase carboxyltransferase subunit
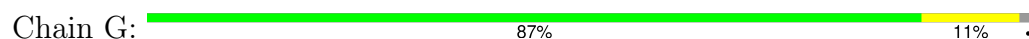
Chain I:

• Molecule 1: Phosphoribosylaminoimidazole carboxylase carboxyltransferase subunit

Chain J:

• Molecule 1: Phosphoribosylaminoimidazole carboxylase carboxyltransferase subunit

Chain K:

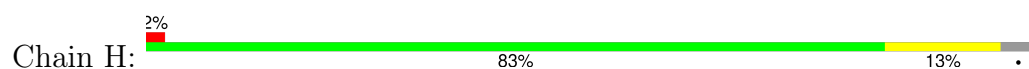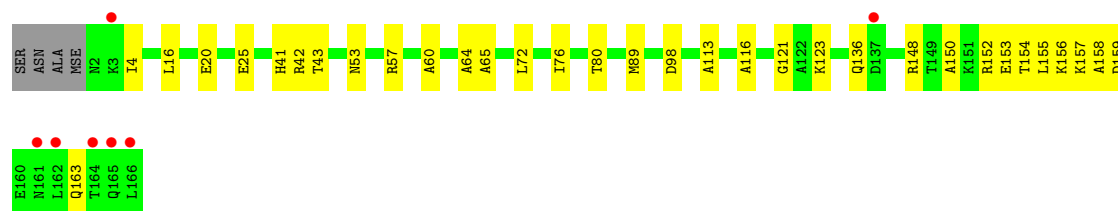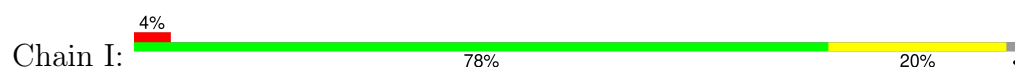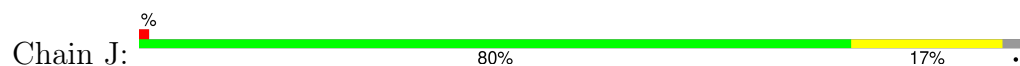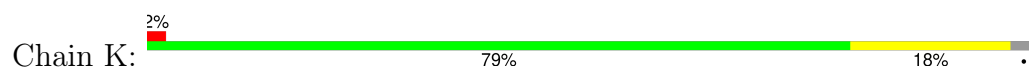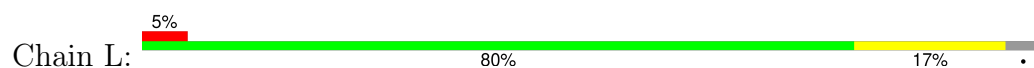K157 L166

- Molecule 1: Phosphoribosylaminoimidazole carboxylase carboxyltransferase subunit

Chain L:

5%
80% 17%

SER ASN ALA MSE ASN LYS I4 M10 L16 M19 E20 E34 R42 T43 P44 K45 E49 R57 A60 A65 L81 A90 D98 V104 G109 V110 P111 I117 Q136 D137 K143 Q146 R152 E153 T154 L155 K156 K157 E160 N161

L162 Q165 L166

- Molecule 1: Phosphoribosylaminoimidazole carboxylase carboxyltransferase subunit

Chain M:

%
80% 17%

SER ASN ALA MSE ASN K3 I4 I8 L9 L16 S17 T18 M19 E20 E25 E34 A35 K45 E46 T47 V48 E49 F50 V51 R57 A60 I76 L81 M89 A90 G91 D98 M106 P111 V112 A113 K123 D137 K138 S139 R152 L155

L166

- Molecule 1: Phosphoribosylaminoimidazole carboxylase carboxyltransferase subunit

Chain N:

4%
73% 24%

SER ASN ALA MSE ASN K3 D13 L16 S17 T18 M19 E20 E25 L29 G30 I31 P32 A35 H41 R42 T43 P44 K45 E46 E49 H71 I76 H79 T80 M89 A90 G91 G92 S93 A116 I117 G121 A122 K123 A130 A134 A135 Q136 D137

A141 V145 A150 K151 R152 E153 T154 L155 K156 K157 A158 D159 L162 Q163 L166

- Molecule 1: Phosphoribosylaminoimidazole carboxylase carboxyltransferase subunit

Chain O:

2%
76% 21%

SER ASN ALA MSE ASN K3 I4 F5 V6 A7 I8 L9 L16 S17 T18 M19 E20 I31 P32 A35 T43 P44 K45 E49 E52 N56 F62 A65 L68 I76 H79 K82 M89 A90 G96 L97 D98 I117 N124 Q136 D137 K138

S139 L144 R148 T149 R152 L162 L166

- Molecule 1: Phosphoribosylaminoimidazole carboxylase carboxyltransferase subunit

Chain P:

7%
75% 22%

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	87.27Å 96.29Å 152.72Å 90.00° 91.95° 90.00°	Depositor
Resolution (Å)	40.80 – 2.20 40.80 – 2.20	Depositor EDS
% Data completeness (in resolution range)	95.7 (40.80-2.20) 95.6 (40.80-2.20)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.16 (at 2.20Å)	Xtriage
Refinement program	PHENIX 1.7_650	Depositor
R, R_{free}	0.191 , 0.231 0.186 , 0.226	Depositor DCC
R_{free} test set	6139 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å^2)	32.3	Xtriage
Anisotropy	0.343	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 40.4	EDS
L-test for twinning[2]	$< |L| > = 0.48, < L^2 > = 0.31$	Xtriage
Estimated twinning fraction	0.026 for h,-k,-l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	19690	wwPDB-VP
Average B, all atoms (Å^2)	39.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.39% 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	0.26	0/1197	0.45	0/1612
1	B	0.26	0/1197	0.46	0/1612
1	C	0.25	0/1188	0.45	0/1601
1	D	0.28	0/1197	0.45	0/1612
1	E	0.25	0/1197	0.43	0/1612
1	F	0.25	0/1188	0.44	0/1601
1	G	0.26	0/1213	0.43	0/1633
1	H	0.25	0/1188	0.43	0/1601
1	I	0.26	0/1205	0.46	0/1623
1	J	0.25	0/1197	0.43	0/1612
1	K	0.25	0/1197	0.44	0/1612
1	L	0.23	0/1188	0.45	0/1601
1	M	0.24	0/1197	0.44	0/1612
1	N	0.24	0/1197	0.44	0/1612
1	O	0.22	0/1197	0.43	0/1612
1	P	0.23	0/1197	0.44	0/1612
All	All	0.25	0/19140	0.44	0/25780

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	1187	0	1241	17	0
1	B	1187	0	1241	17	0
1	C	1178	0	1228	15	0
1	D	1187	0	1241	19	0
1	E	1187	0	1241	24	0
1	F	1178	0	1228	25	0
1	G	1203	0	1259	21	0
1	H	1178	0	1228	16	0
1	I	1195	0	1247	30	0
1	J	1187	0	1241	20	0
1	K	1187	0	1241	26	0
1	L	1178	0	1228	28	0
1	M	1187	0	1241	24	0
1	N	1187	0	1241	32	0
1	O	1187	0	1241	31	0
1	P	1187	0	1241	24	0
2	A	57	0	0	2	0
2	B	66	0	0	5	0
2	C	72	0	0	2	0
2	D	67	0	0	2	0
2	E	44	0	0	4	0
2	F	57	0	0	4	0
2	G	53	0	0	3	0
2	H	43	0	0	0	0
2	I	59	0	0	7	0
2	J	49	0	0	2	0
2	K	40	0	0	1	0
2	L	28	0	0	2	0
2	M	21	0	0	1	0
2	N	22	0	0	2	0
2	O	17	0	0	4	0
2	P	15	0	0	0	0
All	All	19690	0	19828	303	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 8.

The worst 5 of 303 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:L:152:ARG:HG2	1:P:43:THR:HG22	1.45	0.98
1:N:152:ARG:HG2	1:O:43:THR:HG22	1.55	0.88

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:4:ILE:N	2:C:586:HOH:O	2.07	0.87
1:L:155:LEU:HD11	1:P:42:ARG:HD2	1.53	0.87
1:E:45:LYS:O	1:E:49:GLU:HG3	1.75	0.86

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	162/169 (96%)	159 (98%)	3 (2%)	0	100	100
1	B	162/169 (96%)	162 (100%)	0	0	100	100
1	C	161/169 (95%)	157 (98%)	4 (2%)	0	100	100
1	D	162/169 (96%)	159 (98%)	3 (2%)	0	100	100
1	E	162/169 (96%)	159 (98%)	3 (2%)	0	100	100
1	F	161/169 (95%)	161 (100%)	0	0	100	100
1	G	164/169 (97%)	161 (98%)	3 (2%)	0	100	100
1	H	161/169 (95%)	158 (98%)	3 (2%)	0	100	100
1	I	163/169 (96%)	158 (97%)	5 (3%)	0	100	100
1	J	162/169 (96%)	160 (99%)	2 (1%)	0	100	100
1	K	162/169 (96%)	159 (98%)	3 (2%)	0	100	100
1	L	161/169 (95%)	158 (98%)	3 (2%)	0	100	100
1	M	162/169 (96%)	158 (98%)	4 (2%)	0	100	100
1	N	162/169 (96%)	155 (96%)	7 (4%)	0	100	100
1	O	162/169 (96%)	157 (97%)	5 (3%)	0	100	100
1	P	162/169 (96%)	155 (96%)	6 (4%)	1 (1%)	22	23
All	All	2591/2704 (96%)	2536 (98%)	54 (2%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	P	68	LEU

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	122/121 (101%)	122 (100%)	0	100	100
1	B	122/121 (101%)	121 (99%)	1 (1%)	79	88
1	C	121/121 (100%)	120 (99%)	1 (1%)	79	88
1	D	122/121 (101%)	120 (98%)	2 (2%)	58	73
1	E	122/121 (101%)	121 (99%)	1 (1%)	79	88
1	F	121/121 (100%)	121 (100%)	0	100	100
1	G	124/121 (102%)	124 (100%)	0	100	100
1	H	121/121 (100%)	120 (99%)	1 (1%)	79	88
1	I	123/121 (102%)	123 (100%)	0	100	100
1	J	122/121 (101%)	121 (99%)	1 (1%)	79	88
1	K	122/121 (101%)	121 (99%)	1 (1%)	79	88
1	L	121/121 (100%)	120 (99%)	1 (1%)	79	88
1	M	122/121 (101%)	122 (100%)	0	100	100
1	N	122/121 (101%)	122 (100%)	0	100	100
1	O	122/121 (101%)	121 (99%)	1 (1%)	79	88
1	P	122/121 (101%)	122 (100%)	0	100	100
All	All	1951/1936 (101%)	1941 (100%)	10 (0%)	86	93

5 of 10 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	K	139	SER
1	L	104	VAL
1	O	4	ILE

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Mol	Chain	Res	Type
1	D	139	SER
1	E	14	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 13 such sidechains are listed below:

Mol	Chain	Res	Type
1	G	147	GLN
1	I	71	HIS
1	N	71	HIS
1	K	147	GLN
1	L	36	HIS

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(Å^2)	Q<0.9
1	A	160/169 (94%)	-0.29	0	100	100	16, 29, 45, 71	0
1	B	160/169 (94%)	-0.37	1 (0%)	85	83	17, 28, 46, 66	0
1	C	159/169 (94%)	-0.36	0	100	100	17, 30, 44, 55	0
1	D	160/169 (94%)	-0.43	0	100	100	15, 26, 43, 61	0
1	E	160/169 (94%)	-0.12	3 (1%)	66	62	20, 35, 51, 70	0
1	F	159/169 (94%)	-0.21	2 (1%)	74	71	19, 32, 54, 71	0
1	G	161/169 (95%)	-0.21	0	100	100	20, 33, 49, 57	0
1	H	159/169 (94%)	-0.04	4 (2%)	58	55	23, 34, 61, 73	0
1	I	161/169 (95%)	-0.04	7 (4%)	40	36	20, 30, 62, 76	0
1	J	160/169 (94%)	-0.15	2 (1%)	74	71	20, 33, 52, 68	0
1	K	160/169 (94%)	0.02	3 (1%)	66	62	24, 37, 55, 76	0
1	L	159/169 (94%)	0.27	8 (5%)	35	32	27, 41, 72, 87	0
1	M	160/169 (94%)	0.09	2 (1%)	74	71	26, 41, 58, 73	0
1	N	160/169 (94%)	0.54	7 (4%)	39	36	32, 49, 69, 80	0
1	O	160/169 (94%)	0.33	3 (1%)	66	62	33, 50, 66, 77	0
1	P	160/169 (94%)	0.85	12 (7%)	22	19	37, 53, 70, 81	0
All	All	2558/2704 (94%)	-0.01	54 (2%)	63	59	15, 36, 63, 87	0

The worst 5 of 54 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	I	164	THR	4.1
1	N	91	GLY	3.9
1	H	91	GLY	3.6
1	I	162	LEU	3.5
1	H	153	GLU	3.5

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.