WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Dec 17, 2023 – 03:15 AM EST

PDB ID	:	3F0D
Title	:	High resolution crystal structure of 2C-methyl-D-erythritol 2,4-cyclodiphosph atase synthase from Burkholderia pseudomallei
Authors	:	Seattle Structural Genomics Center for Infectious Disease (SSGCID)
Deposited on	:	2008-10-24
Resolution	:	1.20 Å(reported)

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

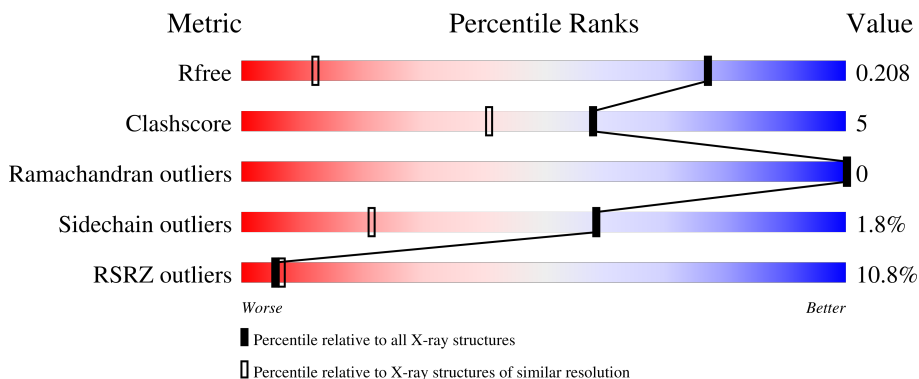|		
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 1.20 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		0.208
Clashscore		5
Ramachandran outliers		0
Sidechain outliers		1.8%
RSRZ outliers		10.8%

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	1223 (1.22-1.18)
Clashscore	141614	1286 (1.22-1.18)
Ramachandran outliers	138981	1240 (1.22-1.18)
Sidechain outliers	138945	1239 (1.22-1.18)
RSRZ outliers	127900	1200 (1.22-1.18)

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	183	9% 78% 6% · 15%
1	B	183	15% 69% 9% · 21%
1	C	183	9% 74% 6% ·· 19%
1	D	183	5% 79% 5% · 14%
1	E	183	8% 73% 6% · 21%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
1	F	183	

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 7315 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 2-C-methyl-D-erythritol 2,4-cyclodiphosphate synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	155	Total 1184	C 752	N 215	O 214	S 3	0	5	0
1	B	144	Total 1089	C 692	N 196	O 198	S 3	0	4	0
1	C	148	Total 1118	C 706	N 207	O 202	S 3	0	2	0
1	D	157	Total 1201	C 761	N 220	O 217	S 3	0	5	0
1	E	145	Total 1095	C 694	N 199	O 199	S 3	0	4	0
1	F	148	Total 1118	C 706	N 207	O 202	S 3	5	2	0

There are 126 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-20	MET	-	expression tag	UNP Q63T71
A	-19	ALA	-	expression tag	UNP Q63T71
A	-18	HIS	-	expression tag	UNP Q63T71
A	-17	HIS	-	expression tag	UNP Q63T71
A	-16	HIS	-	expression tag	UNP Q63T71
A	-15	HIS	-	expression tag	UNP Q63T71
A	-14	HIS	-	expression tag	UNP Q63T71
A	-13	HIS	-	expression tag	UNP Q63T71
A	-12	MET	-	expression tag	UNP Q63T71
A	-11	GLY	-	expression tag	UNP Q63T71
A	-10	THR	-	expression tag	UNP Q63T71
A	-9	LEU	-	expression tag	UNP Q63T71
A	-8	GLU	-	expression tag	UNP Q63T71
A	-7	ALA	-	expression tag	UNP Q63T71
A	-6	GLN	-	expression tag	UNP Q63T71
A	-5	THR	-	expression tag	UNP Q63T71
A	-4	GLN	-	expression tag	UNP Q63T71

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
A	-3	GLY	-	expression tag	UNP Q63T71
A	-2	PRO	-	expression tag	UNP Q63T71
A	-1	GLY	-	expression tag	UNP Q63T71
A	0	SER	-	expression tag	UNP Q63T71
B	-20	MET	-	expression tag	UNP Q63T71
B	-19	ALA	-	expression tag	UNP Q63T71
B	-18	HIS	-	expression tag	UNP Q63T71
B	-17	HIS	-	expression tag	UNP Q63T71
B	-16	HIS	-	expression tag	UNP Q63T71
B	-15	HIS	-	expression tag	UNP Q63T71
B	-14	HIS	-	expression tag	UNP Q63T71
B	-13	HIS	-	expression tag	UNP Q63T71
B	-12	MET	-	expression tag	UNP Q63T71
B	-11	GLY	-	expression tag	UNP Q63T71
B	-10	THR	-	expression tag	UNP Q63T71
B	-9	LEU	-	expression tag	UNP Q63T71
B	-8	GLU	-	expression tag	UNP Q63T71
B	-7	ALA	-	expression tag	UNP Q63T71
B	-6	GLN	-	expression tag	UNP Q63T71
B	-5	THR	-	expression tag	UNP Q63T71
B	-4	GLN	-	expression tag	UNP Q63T71
B	-3	GLY	-	expression tag	UNP Q63T71
B	-2	PRO	-	expression tag	UNP Q63T71
B	-1	GLY	-	expression tag	UNP Q63T71
B	0	SER	-	expression tag	UNP Q63T71
C	-20	MET	-	expression tag	UNP Q63T71
C	-19	ALA	-	expression tag	UNP Q63T71
C	-18	HIS	-	expression tag	UNP Q63T71
C	-17	HIS	-	expression tag	UNP Q63T71
C	-16	HIS	-	expression tag	UNP Q63T71
C	-15	HIS	-	expression tag	UNP Q63T71
C	-14	HIS	-	expression tag	UNP Q63T71
C	-13	HIS	-	expression tag	UNP Q63T71
C	-12	MET	-	expression tag	UNP Q63T71
C	-11	GLY	-	expression tag	UNP Q63T71
C	-10	THR	-	expression tag	UNP Q63T71
C	-9	LEU	-	expression tag	UNP Q63T71
C	-8	GLU	-	expression tag	UNP Q63T71
C	-7	ALA	-	expression tag	UNP Q63T71
C	-6	GLN	-	expression tag	UNP Q63T71
C	-5	THR	-	expression tag	UNP Q63T71
C	-4	GLN	-	expression tag	UNP Q63T71

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
C	-3	GLY	-	expression tag	UNP Q63T71
C	-2	PRO	-	expression tag	UNP Q63T71
C	-1	GLY	-	expression tag	UNP Q63T71
C	0	SER	-	expression tag	UNP Q63T71
D	-20	MET	-	expression tag	UNP Q63T71
D	-19	ALA	-	expression tag	UNP Q63T71
D	-18	HIS	-	expression tag	UNP Q63T71
D	-17	HIS	-	expression tag	UNP Q63T71
D	-16	HIS	-	expression tag	UNP Q63T71
D	-15	HIS	-	expression tag	UNP Q63T71
D	-14	HIS	-	expression tag	UNP Q63T71
D	-13	HIS	-	expression tag	UNP Q63T71
D	-12	MET	-	expression tag	UNP Q63T71
D	-11	GLY	-	expression tag	UNP Q63T71
D	-10	THR	-	expression tag	UNP Q63T71
D	-9	LEU	-	expression tag	UNP Q63T71
D	-8	GLU	-	expression tag	UNP Q63T71
D	-7	ALA	-	expression tag	UNP Q63T71
D	-6	GLN	-	expression tag	UNP Q63T71
D	-5	THR	-	expression tag	UNP Q63T71
D	-4	GLN	-	expression tag	UNP Q63T71
D	-3	GLY	-	expression tag	UNP Q63T71
D	-2	PRO	-	expression tag	UNP Q63T71
D	-1	GLY	-	expression tag	UNP Q63T71
D	0	SER	-	expression tag	UNP Q63T71
E	-20	MET	-	expression tag	UNP Q63T71
E	-19	ALA	-	expression tag	UNP Q63T71
E	-18	HIS	-	expression tag	UNP Q63T71
E	-17	HIS	-	expression tag	UNP Q63T71
E	-16	HIS	-	expression tag	UNP Q63T71
E	-15	HIS	-	expression tag	UNP Q63T71
E	-14	HIS	-	expression tag	UNP Q63T71
E	-13	HIS	-	expression tag	UNP Q63T71
E	-12	MET	-	expression tag	UNP Q63T71
E	-11	GLY	-	expression tag	UNP Q63T71
E	-10	THR	-	expression tag	UNP Q63T71
E	-9	LEU	-	expression tag	UNP Q63T71
E	-8	GLU	-	expression tag	UNP Q63T71
E	-7	ALA	-	expression tag	UNP Q63T71
E	-6	GLN	-	expression tag	UNP Q63T71
E	-5	THR	-	expression tag	UNP Q63T71
E	-4	GLN	-	expression tag	UNP Q63T71

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
E	-3	GLY	-	expression tag	UNP Q63T71
E	-2	PRO	-	expression tag	UNP Q63T71
E	-1	GLY	-	expression tag	UNP Q63T71
E	0	SER	-	expression tag	UNP Q63T71
F	-20	MET	-	expression tag	UNP Q63T71
F	-19	ALA	-	expression tag	UNP Q63T71
F	-18	HIS	-	expression tag	UNP Q63T71
F	-17	HIS	-	expression tag	UNP Q63T71
F	-16	HIS	-	expression tag	UNP Q63T71
F	-15	HIS	-	expression tag	UNP Q63T71
F	-14	HIS	-	expression tag	UNP Q63T71
F	-13	HIS	-	expression tag	UNP Q63T71
F	-12	MET	-	expression tag	UNP Q63T71
F	-11	GLY	-	expression tag	UNP Q63T71
F	-10	THR	-	expression tag	UNP Q63T71
F	-9	LEU	-	expression tag	UNP Q63T71
F	-8	GLU	-	expression tag	UNP Q63T71
F	-7	ALA	-	expression tag	UNP Q63T71
F	-6	GLN	-	expression tag	UNP Q63T71
F	-5	THR	-	expression tag	UNP Q63T71
F	-4	GLN	-	expression tag	UNP Q63T71
F	-3	GLY	-	expression tag	UNP Q63T71
F	-2	PRO	-	expression tag	UNP Q63T71
F	-1	GLY	-	expression tag	UNP Q63T71
F	0	SER	-	expression tag	UNP Q63T71

- Molecule 2 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total 1	Zn 1	0	0
2	B	1	Total 1	Zn 1	0	0
2	C	1	Total 1	Zn 1	0	0
2	D	1	Total 1	Zn 1	0	0
2	E	1	Total 1	Zn 1	0	0
2	F	1	Total 1	Zn 1	0	0

- Molecule 3 is water.

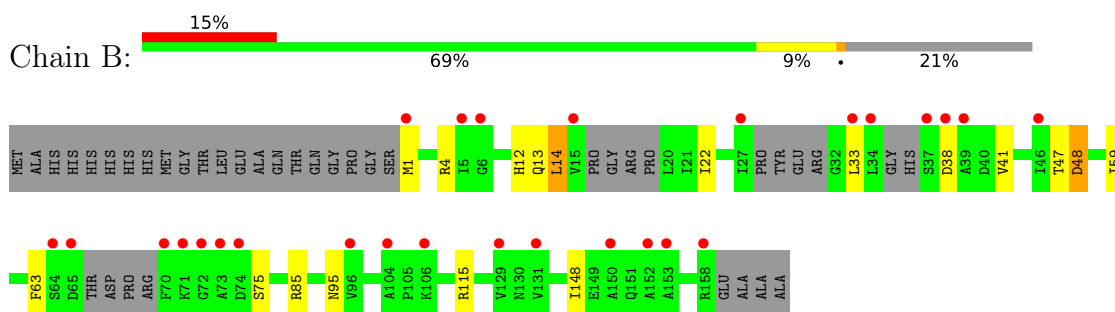| Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	128	Total O 128 128	0	0
3	B	62	Total O 62 62	0	0
3	C	65	Total O 65 65	0	0
3	D	110	Total O 110 110	0	0
3	E	81	Total O 81 81	0	0
3	F	58	Total O 58 58	0	0

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.
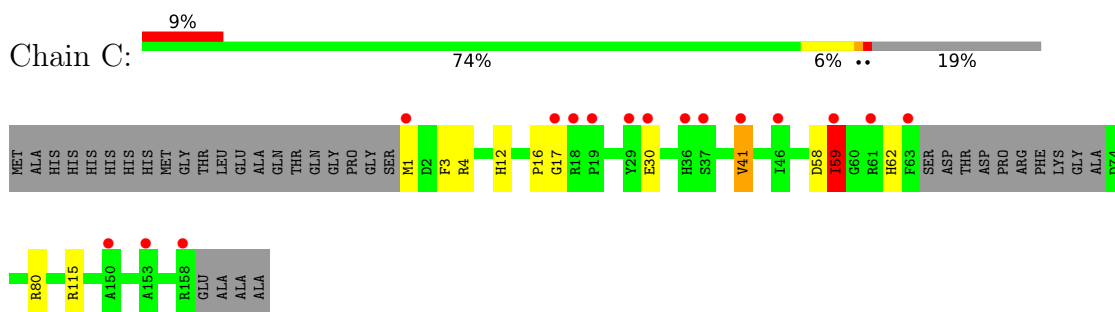
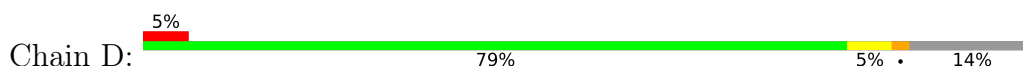• Molecule 1: 2-C-methyl-D-erythritol 2,4-cyclodiphosphate synthase
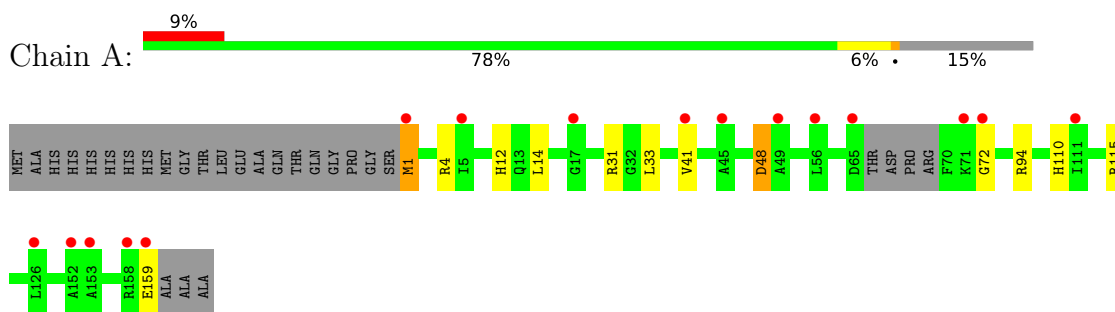
• Molecule 1: 2-C-methyl-D-erythritol 2,4-cyclodiphosphate synthase

• Molecule 1: 2-C-methyl-D-erythritol 2,4-cyclodiphosphate synthase

• Molecule 1: 2-C-methyl-D-erythritol 2,4-cyclodiphosphate synthase

MET ALA HIS HIS HIS HIS HIS MET GLY THR LEU GLU ALA GLN THR GLN GLY PRO GLY SER M1 D2 F3 R4 E30 A45 D48 A49 L56 R61 D65 THR ASP P68 R94 I101 I111 R115 R128 A133 R144 A152 A153 V157

R158 E159 ALA ALA ALA

• Molecule 1: 2-C-methyl-D-erythritol 2,4-cyclodiphosphate synthase

Chain E:

8%

73%   6% •   21%

MET ALA HIS HIS HIS HIS HIS MET GLY THR LEU GLU ALA GLN THR GLN GLY PRO GLY SER M1 I5 H12 I27 E30 R31 H36 S37 D38 V41 I46 T47 D48 L56 I59 G60 ARG HIS PHE SER ASP THR ASP PRO ARG PHE LYS GLY ALA D74

R80 R94 N95 V96 I100 L107 D112 V129 N130 V131 R158 GLU ALA ALA ALA

• Molecule 1: 2-C-methyl-D-erythritol 2,4-cyclodiphosphate synthase

Chain F:

8%

77%   • •   19%

MET ALA HIS HIS HIS HIS HIS MET GLY THR LEU GLU ALA GLN THR GLN GLY PRO GLY SER M1 G8 P16 G17 R18 P19 E30 H36 I46 T47 D48 R61 H62 F63 SER ASP THR ASP PRO ARG PHE LYS GLY ALA D74 R80 V96 K106 P109

H110 I111 R115 L126 A153 R158 GLU ALA ALA ALA
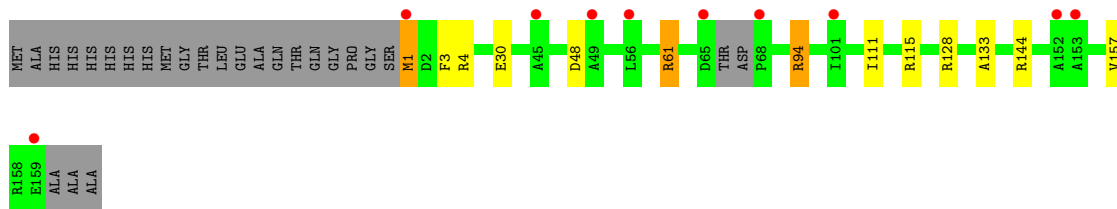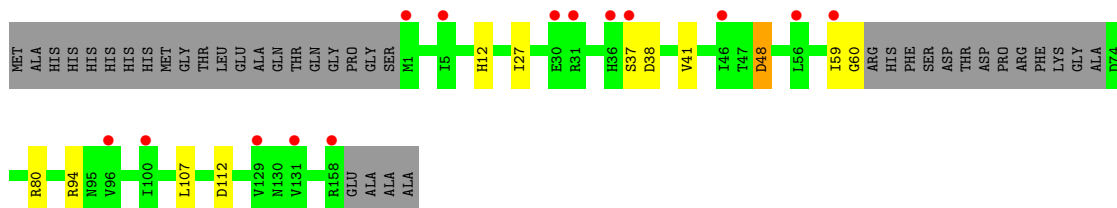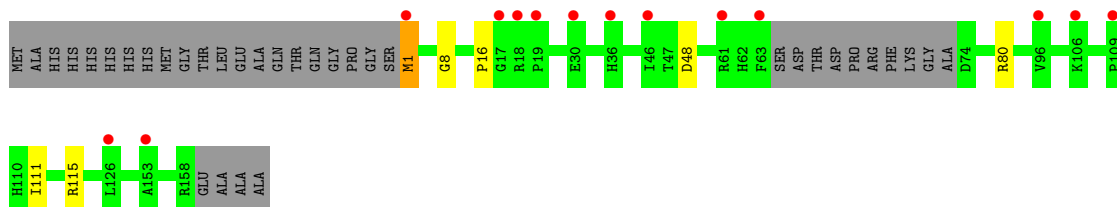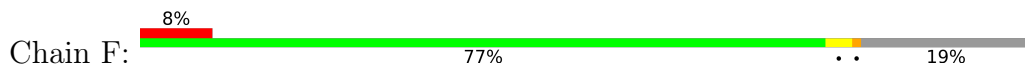
4   Data and refinement statistics   ⓘ

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	157.89Å 69.04Å 116.58Å 90.00° 130.15° 90.00°	Depositor
Resolution (Å)	50.00 – 1.20 42.94 – 1.20	Depositor EDS
% Data completeness (in resolution range)	91.2 (50.00-1.20) 91.2 (42.94-1.20)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.67 (at 1.20Å)	Xtriage
Refinement program	REFMAC 5.5.0035	Depositor
R, R_{free}	0.185 , 0.209 0.186 , 0.208	Depositor DCC
R_{free} test set	13745 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å^2)	14.7	Xtriage
Anisotropy	0.503	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.44 , 53.5	EDS
L-test for twinning[2]	$< |L| > = 0.49, < L^2 > = 0.32$	Xtriage
Estimated twinning fraction	0.000 for h,-k,-h-l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	7315	wwPDB-VP
Average B, all atoms (Å^2)	20.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 39.32 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 3.2291e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

---

[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 ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section:
ZN

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	0.86	1/1216 (0.1%)	0.96	4/1645 (0.2%)
1	B	0.80	0/1110	0.87	3/1495 (0.2%)
1	C	0.82	0/1140	0.94	6/1543 (0.4%)
1	D	0.94	0/1234	0.95	7/1668 (0.4%)
1	E	0.78	0/1121	0.91	4/1519 (0.3%)
1	F	0.83	1/1140 (0.1%)	0.94	3/1543 (0.2%)
All	All	0.84	2/6961 (0.0%)	0.93	27/9413 (0.3%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if
the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected
by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a
sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	C	0	1
1	F	0	1
All	All	0	2

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	31	ARG	CZ-NH2	-5.35	1.26	1.33
1	F	8	GLY	C-O	-5.26	1.15	1.23

All (27) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	F	80	ARG	NE-CZ-NH1	11.53	126.07	120.30
1	F	48	ASP	CB-CG-OD1	8.85	126.26	118.30
1	F	80	ARG	NE-CZ-NH2	-8.16	116.22	120.30

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	80	ARG	NE-CZ-NH1	7.67	124.13	120.30
1	D	61	ARG	NE-CZ-NH1	7.48	124.04	120.30
1	D	61	ARG	NE-CZ-NH2	-7.41	116.59	120.30
1	A	14[A]	LEU	CA-CB-CG	6.44	130.12	115.30
1	A	14[B]	LEU	CA-CB-CG	6.44	130.12	115.30
1	C	4	ARG	NE-CZ-NH2	-6.39	117.10	120.30
1	D	94	ARG	NE-CZ-NH1	6.18	123.39	120.30
1	D	48	ASP	CB-CG-OD1	5.95	123.65	118.30
1	A	48	ASP	CB-CG-OD1	5.78	123.51	118.30
1	C	58	ASP	CB-CG-OD1	-5.58	113.28	118.30
1	B	48	ASP	CB-CG-OD1	5.57	123.31	118.30
1	E	80	ARG	NE-CZ-NH1	5.54	123.07	120.30
1	C	59	ILE	CG1-CB-CG2	5.53	123.57	111.40
1	D	128	ARG	NE-CZ-NH1	5.45	123.03	120.30
1	E	94	ARG	NE-CZ-NH1	5.43	123.02	120.30
1	E	48	ASP	CB-CG-OD1	5.35	123.12	118.30
1	B	85	ARG	NE-CZ-NH2	-5.34	117.63	120.30
1	D	144	ARG	NE-CZ-NH1	5.29	122.95	120.30
1	C	58	ASP	CB-CG-OD2	5.26	123.04	118.30
1	C	17	GLY	N-CA-C	-5.25	99.99	113.10
1	A	4	ARG	NE-CZ-NH1	-5.24	117.68	120.30
1	B	4	ARG	NE-CZ-NH1	5.23	122.92	120.30
1	E	94	ARG	NE-CZ-NH2	-5.23	117.69	120.30
1	D	4	ARG	NE-CZ-NH2	-5.07	117.77	120.30

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	16	PRO	Peptide
1	F	16	PRO	Peptide

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	1184	0	1227	13	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	1089	0	1134	19	0
1	C	1118	0	1151	14	0
1	D	1201	0	1244	18	1
1	E	1095	0	1142	4	1
1	F	1118	0	1151	9	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	0	0
2	E	1	0	0	0	0
2	F	1	0	0	0	0
3	A	128	0	0	3	1
3	B	62	0	0	1	0
3	C	65	0	0	4	0
3	D	110	0	0	2	1
3	E	81	0	0	0	0
3	F	58	0	0	1	0
All	All	7315	0	7049	67	2

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 5.

All (67) 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:C:59:ILE:HG22	3:C:367:HOH:O	1.11	1.24
1:A:12:HIS:HD2	1:A:41[A]:VAL:HG12	1.03	1.11
1:A:33:LEU:HD13	1:A:41[B]:VAL:HG23	1.33	1.07
1:B:47:THR:HG21	1:B:59[A]:ILE:HD13	1.35	1.07
1:D:1:MET:SD	1:D:1:MET:N	2.29	1.06
1:F:115:ARG:HD2	3:F:353:HOH:O	1.54	1.04
1:A:12:HIS:CD2	1:A:41[A]:VAL:HG12	1.92	1.04
1:B:47:THR:CG2	1:B:59[A]:ILE:HD13	1.88	1.03
1:A:33:LEU:HD13	1:A:41[B]:VAL:CG2	1.89	1.02
1:D:3:PHE:CD1	1:D:157[B]:VAL:CG1	2.52	0.93
1:D:3:PHE:CD1	1:D:157[B]:VAL:HG12	2.03	0.92
1:B:47:THR:HG21	1:B:59[A]:ILE:CD1	2.06	0.84
1:A:33:LEU:CD1	1:A:41[B]:VAL:HG23	2.08	0.83
1:D:3:PHE:CE1	1:D:157[B]:VAL:CG1	2.68	0.77
1:D:3:PHE:CE1	1:D:157[B]:VAL:HG11	2.21	0.75
1:D:1:MET:SD	1:F:1:MET:CE	2.76	0.73

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:12:HIS:HD2	1:A:41[A]:VAL:CG1	1.93	0.72
1:D:1:MET:SD	1:F:1:MET:HE1	2.29	0.72
1:A:12:HIS:CD2	1:A:41[A]:VAL:CG1	2.72	0.70
1:B:1:MET:CE	1:C:1:MET:HG3	2.21	0.70
1:C:12:HIS:HD2	1:C:41[A]:VAL:CG1	2.06	0.69
1:C:59:ILE:CG2	3:C:367:HOH:O	1.89	0.68
1:D:3:PHE:CD1	1:D:157[A]:VAL:HG22	2.29	0.68
1:A:72:GLY:HA2	3:A:449:HOH:O	1.94	0.67
1:B:47:THR:HG22	1:B:59[A]:ILE:HD13	1.75	0.67
1:B:1:MET:HE2	1:C:1:MET:HG3	1.80	0.63
1:D:1:MET:SD	1:F:1:MET:HE3	2.39	0.62
1:D:94:ARG:HH22	1:F:1:MET:HE2	1.66	0.60
1:C:115:ARG:CZ	3:C:257:HOH:O	2.49	0.60
1:D:1:MET:CE	1:F:1:MET:CE	2.78	0.60
1:B:12:HIS:HD2	1:B:41:VAL:HG12	1.66	0.60
1:D:115:ARG:NH2	3:D:419:HOH:O	2.33	0.59
1:A:1:MET:HE3	1:A:94:ARG:HH22	1.68	0.58
1:B:59[A]:ILE:HD11	1:B:63:PHE:HD2	1.69	0.58
1:C:12:HIS:HD2	1:C:41[A]:VAL:HG13	1.69	0.57
1:B:12:HIS:HD2	1:B:41:VAL:CG1	2.17	0.56
1:C:12:HIS:HD2	1:C:41[A]:VAL:HG12	1.70	0.56
1:B:1:MET:HE3	1:C:1:MET:HG3	1.89	0.53
1:B:38:ASP:OD1	1:B:75:SER:OG	2.20	0.53
1:D:94:ARG:HH22	1:F:1:MET:CE	2.22	0.53
1:D:1:MET:N	1:D:3:PHE:CE2	2.77	0.52
1:B:59[A]:ILE:CD1	1:B:63:PHE:HD2	2.23	0.52
1:B:59[A]:ILE:HD11	1:B:63:PHE:CD2	2.46	0.51
1:E:59:ILE:HD12	1:E:60:GLY:N	2.26	0.51
1:B:12:HIS:CD2	1:B:41:VAL:HG12	2.43	0.51
1:A:115:ARG:NH2	3:A:287:HOH:O	2.41	0.50
1:C:1:MET:HB2	1:C:3:PHE:CE2	2.47	0.49
1:F:111:ILE:O	1:F:115:ARG:HG3	2.13	0.49
1:C:62:HIS:HE1	3:C:182:HOH:O	1.97	0.48
1:B:59[A]:ILE:CD1	1:B:63:PHE:CD2	2.98	0.47
1:A:110:HIS:HD2	3:A:197:HOH:O	1.98	0.45
1:D:94:ARG:HG2	1:D:157[A]:VAL:HG23	1.99	0.45
1:B:115:ARG:HD2	3:B:175:HOH:O	2.16	0.45
1:E:37:SER:HB3	1:E:38:ASP:H	1.64	0.44
1:A:33:LEU:HD13	1:A:41[A]:VAL:HG13	1.99	0.43
1:B:22:ILE:HD11	1:B:33:LEU:HD11	2.00	0.43
1:D:30:GLU:HG3	3:D:204:HOH:O	2.17	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:1:MET:CE	1:F:1:MET:HE3	2.49	0.43
1:E:27:ILE:HD13	1:E:107:LEU:HD22	2.02	0.42
1:A:33:LEU:CD1	1:A:41[B]:VAL:CG2	2.76	0.42
1:C:12:HIS:CD2	1:C:41[A]:VAL:HG13	2.52	0.42
1:E:12:HIS:HD2	1:E:41[A]:VAL:HG12	1.85	0.42
1:B:14[A]:LEU:HD13	1:B:33:LEU:HD23	2.02	0.42
1:C:12:HIS:CD2	1:C:41[A]:VAL:CG1	2.95	0.42
1:D:111:ILE:HD11	1:D:133:ALA:HB2	2.02	0.42
1:B:14[B]:LEU:HD11	1:B:148:ILE:HG13	2.03	0.41
1:C:30:GLU:H	1:C:30:GLU:CD	2.23	0.40

All (2) 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	Interatomic distance (Å)	Clash overlap (Å)
3:A:433:HOH:O	3:D:327:HOH:O[4_444]	1.68	0.52
1:D:61:ARG:CD	1:E:112:ASP:OD2[2_555]	1.88	0.32

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	156/183 (85%)	153 (98%)	3 (2%)	0	100	100
1	B	138/183 (75%)	137 (99%)	1 (1%)	0	100	100
1	C	146/183 (80%)	143 (98%)	3 (2%)	0	100	100
1	D	158/183 (86%)	156 (99%)	2 (1%)	0	100	100
1	E	145/183 (79%)	144 (99%)	1 (1%)	0	100	100
1	F	146/183 (80%)	144 (99%)	2 (1%)	0	100	100
All	All	889/1098 (81%)	877 (99%)	12 (1%)	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	120/135 (89%)	117 (98%)	3 (2%)	47	10
1	B	110/135 (82%)	105 (96%)	5 (4%)	27	3
1	C	112/135 (83%)	109 (97%)	3 (3%)	44	9
1	D	122/135 (90%)	121 (99%)	1 (1%)	81	55
1	E	111/135 (82%)	110 (99%)	1 (1%)	78	50
1	F	112/135 (83%)	111 (99%)	1 (1%)	78	50
All	All	687/810 (85%)	673 (98%)	14 (2%)	59	17

All (14) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1	MET
1	A	48	ASP
1	A	159	GLU
1	B	13	GLN
1	B	14[A]	LEU
1	B	14[B]	LEU
1	B	48	ASP
1	B	95	ASN
1	C	41[A]	VAL
1	C	41[B]	VAL
1	C	59	ILE
1	D	1	MET
1	E	48	ASP
1	F	1	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	110	HIS
1	A	136	ASN
1	B	7	GLN
1	B	88	GLN
1	B	110	HIS
1	C	7	GLN
1	C	110	HIS
1	D	7	GLN
1	D	36	HIS
1	D	110	HIS
1	D	136	ASN
1	E	7	GLN
1	E	88	GLN
1	E	110	HIS
1	F	7	GLN

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 ⓘ

Of 6 ligands modelled in this entry, 6 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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	155/183 (84%)	0.63	16 (10%)	6	7	12, 16, 25, 36	0
1	B	144/183 (78%)	1.08	27 (18%)	1	1	13, 19, 32, 41	0
1	C	148/183 (80%)	0.77	16 (10%)	5	6	13, 19, 32, 41	0
1	D	157/183 (85%)	0.53	10 (6%)	19	18	11, 17, 26, 34	0
1	E	145/183 (79%)	0.81	14 (9%)	7	8	14, 19, 29, 34	0
1	F	148/183 (80%)	0.74	14 (9%)	8	9	14, 21, 31, 38	0
All	All	897/1098 (81%)	0.75	97 (10%)	5	6	11, 18, 31, 41	0

All (97) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	34	LEU	9.0
1	F	17	GLY	6.9
1	E	59	ILE	6.8
1	B	65	ASP	6.2
1	B	15	VAL	6.0
1	B	37	SER	5.8
1	C	63	PHE	5.7
1	E	1	MET	4.9
1	C	17	GLY	4.9
1	B	1	MET	4.5
1	D	1	MET	4.5
1	B	27	ILE	4.5
1	B	70	PHE	4.3
1	C	36	HIS	4.3
1	B	71	LYS	4.0
1	E	36	HIS	3.8
1	B	72	GLY	3.8
1	F	1	MET	3.7
1	D	159	GLU	3.6

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	D	68	PRO	3.6
1	C	18	ARG	3.3
1	F	36	HIS	3.2
1	B	129	VAL	3.2
1	D	56	LEU	3.2
1	E	158	ARG	3.1
1	A	159	GLU	3.1
1	B	64	SER	3.1
1	B	96[A]	VAL	3.1
1	E	131	VAL	3.1
1	E	129	VAL	3.1
1	D	65	ASP	3.0
1	E	30	GLU	3.0
1	F	46	ILE	3.0
1	A	41[A]	VAL	2.9
1	E	96[A]	VAL	2.9
1	E	37	SER	2.9
1	A	17	GLY	2.9
1	C	61	ARG	2.9
1	B	73	ALA	2.9
1	B	152	ALA	2.9
1	B	46	ILE	2.9
1	C	46	ILE	2.9
1	B	158	ARG	2.9
1	E	100	ILE	2.8
1	C	150	ALA	2.8
1	A	56	LEU	2.7
1	F	30	GLU	2.7
1	D	153	ALA	2.7
1	C	37	SER	2.7
1	A	71	LYS	2.6
1	C	30	GLU	2.6
1	F	96[A]	VAL	2.6
1	B	74	ASP	2.6
1	F	106	LYS	2.6
1	F	109	PRO	2.6
1	A	153	ALA	2.5
1	F	61	ARG	2.5
1	A	49	ALA	2.5
1	C	1	MET	2.5
1	F	153	ALA	2.5
1	C	19	PRO	2.4

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	A	111[A]	ILE	2.4
1	A	45	ALA	2.4
1	D	49	ALA	2.4
1	A	65	ASP	2.4
1	F	63	PHE	2.4
1	C	29	TYR	2.4
1	B	150	ALA	2.3
1	C	153	ALA	2.3
1	A	72	GLY	2.3
1	A	126	LEU	2.3
1	A	1	MET	2.3
1	E	5[A]	ILE	2.3
1	A	152	ALA	2.3
1	B	38	ASP	2.3
1	B	104	ALA	2.3
1	B	106	LYS	2.3
1	C	158	ARG	2.2
1	F	18	ARG	2.2
1	D	152	ALA	2.2
1	B	33	LEU	2.2
1	C	59	ILE	2.2
1	A	158	ARG	2.2
1	B	6	GLY	2.2
1	F	19	PRO	2.2
1	E	56	LEU	2.2
1	E	46	ILE	2.2
1	B	153	ALA	2.2
1	D	45	ALA	2.1
1	B	131	VAL	2.1
1	F	126	LEU	2.1
1	C	41[A]	VAL	2.1
1	E	31	ARG	2.1
1	B	5	ILE	2.1
1	B	39	ALA	2.0
1	A	5	ILE	2.0
1	D	101[A]	ILE	2.0

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 ⓘ

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	ZN	C	163	1/1	0.99	0.15	27,27,27,27	0
2	ZN	B	163	1/1	1.00	0.18	28,28,28,28	0
2	ZN	A	163	1/1	1.00	0.06	17,17,17,17	0
2	ZN	D	163	1/1	1.00	0.05	17,17,17,17	0
2	ZN	E	163	1/1	1.00	0.13	26,26,26,26	0
2	ZN	F	163	1/1	1.00	0.05	23,23,23,23	0

6.5 Other polymers ⓘ

There are no such residues in this entry.