WORLDWIDE wwPDB PROTEIN DATA BANK

wwPDB X-ray Structure Validation Summary Report ⓘ

Nov 20, 2023 – 01:48 AM JST

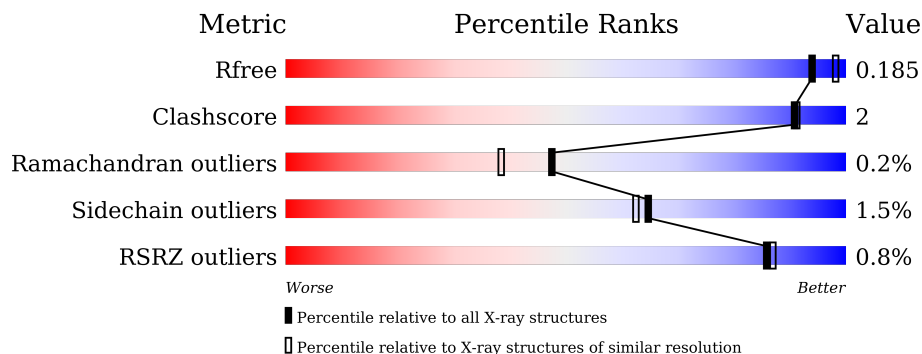|		
PDB ID	:	7CED
Title	:	Apo-methanol dehydrogenase (MDH) from Methylococcus capsulatus (Bath)
Authors	:	Chuankhayan, P.; Chan, S.I.; Nareddy, P.K.R.; Tsai, I.K.; Tsai, Y.F.; Chen, K.H.-C.; Yu, S.S.-F.; Chen, C.J.
Deposited on	:	2020-06-22
Resolution	:	1.90 Å(reported)

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 1.90 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.
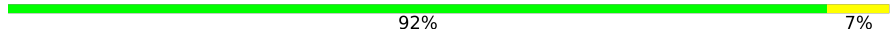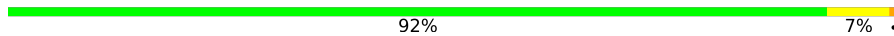
Metric	Percentile Ranks	Value
Rfree		0.185
Clashscore		2
Ramachandran outliers		0.2%
Sidechain outliers		1.5%
RSRZ outliers		0.8%

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	6207 (1.90-1.90)
Clashscore	141614	6847 (1.90-1.90)
Ramachandran outliers	138981	6760 (1.90-1.90)
Sidechain outliers	138945	6760 (1.90-1.90)
RSRZ outliers	127900	6082 (1.90-1.90)

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	573	94% 6% ·
1	B	573	94% 5% ·
1	C	573	93% 6% ·
1	D	573	% 94% 5% ·
1	G	573	94% 6% ·
1	H	573	93% 6% ·

Continued on next page...

WORLDWIDE
ⓦPDB
PROTEIN DATA BANK

Continued from previous page...

Mol	Chain	Length	Quality of chain
1	M	573	92% 7%
1	N	573	92% 7%
2	E	72	.% 90% 8%
2	F	72	4% 85% 14%
2	I	72	7% 88% 11%
2	J	72	3% 92% 6%
2	K	72	4% 90% 8%
2	L	72	3% 90% 7%
2	O	72	11% 94%
2	P	72	7% 90% 7%

2 Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 45177 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 Methanol dehydrogenase protein, large subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	573	Total	C	N	O	S	0	0	0
			4491	2871	765	832	23			
1	B	573	Total	C	N	O	S	0	0	0
			4490	2871	765	831	23			
1	C	573	Total	C	N	O	S	0	0	0
			4491	2871	765	832	23			
1	D	573	Total	C	N	O	S	0	0	0
			4490	2871	765	831	23			
1	G	573	Total	C	N	O	S	0	0	0
			4491	2871	765	832	23			
1	H	573	Total	C	N	O	S	0	0	0
			4490	2871	765	831	23			
1	M	573	Total	C	N	O	S	0	0	0
			4491	2871	765	832	23			
1	N	573	Total	C	N	O	S	0	0	0
			4490	2871	765	831	23			

- Molecule 2 is a protein called Methanol dehydrogenase [cytochrome c] subunit 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	E	71	Total	C	N	O	S	0	0	0
			568	356	100	109	3			
2	F	71	Total	C	N	O	S	0	0	0
			568	356	100	109	3			
2	I	71	Total	C	N	O	S	0	0	0
			568	356	100	109	3			
2	J	71	Total	C	N	O	S	0	0	0
			568	356	100	109	3			
2	K	71	Total	C	N	O	S	0	0	0
			568	356	100	109	3			
2	L	71	Total	C	N	O	S	0	0	0
			568	356	100	109	3			

Continued from previous page...

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	O	71	Total	C	N	O	S	0	0	0
			568	356	100	109	3			
2	P	71	Total	C	N	O	S	0	0	0
			568	356	100	109	3			

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	548	Total	O	0	0
			548	548		
3	B	491	Total	O	0	0
			491	491		
3	C	500	Total	O	0	0
			500	500		
3	D	511	Total	O	0	0
			511	511		
3	E	114	Total	O	0	0
			114	114		
3	F	77	Total	O	0	0
			77	77		
3	G	529	Total	O	0	0
			529	529		
3	H	481	Total	O	0	0
			481	481		
3	I	84	Total	O	0	0
			84	84		
3	J	79	Total	O	0	0
			79	79		
3	K	81	Total	O	0	0
			81	81		
3	L	97	Total	O	0	0
			97	97		
3	M	453	Total	O	0	0
			453	453		
3	N	505	Total	O	0	0
			505	505		
3	O	61	Total	O	0	0
			61	61		
3	P	98	Total	O	0	0
			98	98		

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: Methanol dehydrogenase protein, large subunit

Chain A:
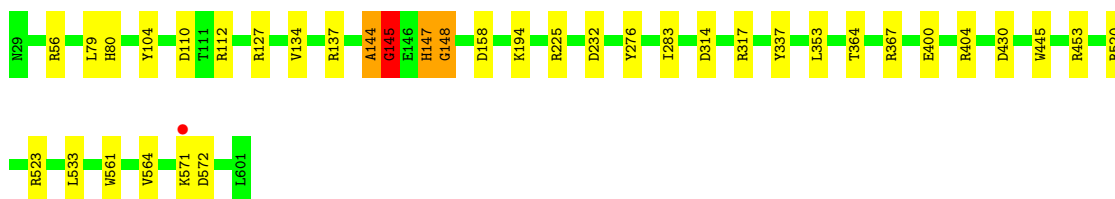
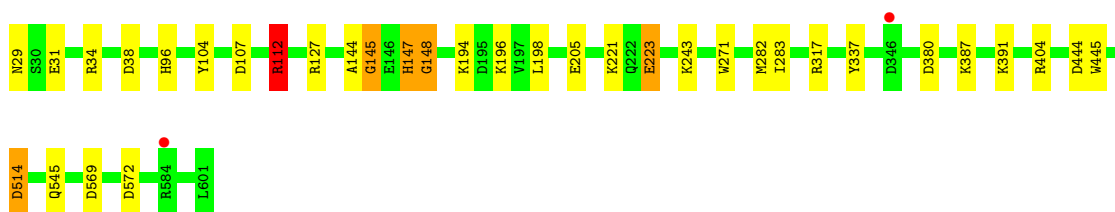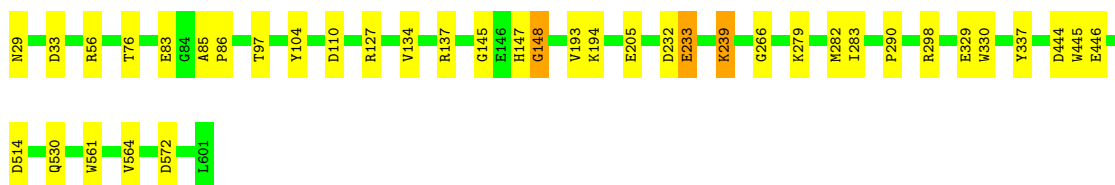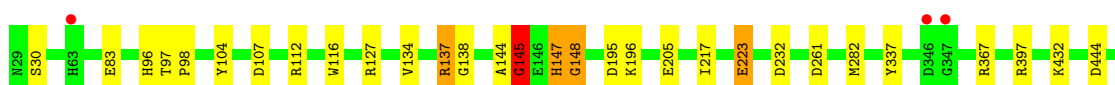• Molecule 1: Methanol dehydrogenase protein, large subunit

Chain B:

• Molecule 1: Methanol dehydrogenase protein, large subunit

Chain C:

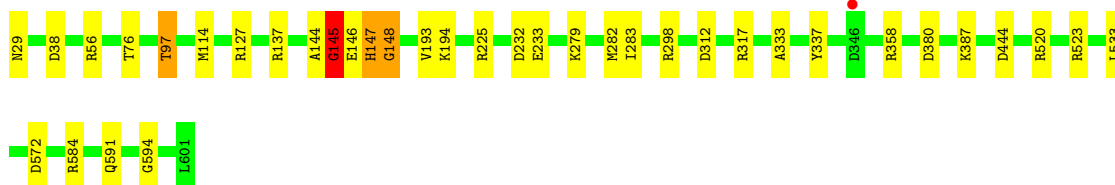• Molecule 1: Methanol dehydrogenase protein, large subunit

Chain D:

P447 A461 D514 I538 G557 R584 L601

- Molecule 1: Methanol dehydrogenase protein, large subunit

Chain G:
94%
6%

N29 D38 R56 T76 T97 M114 R127 R137 A144 G145 E146 H147 G148 V193 K194 R225 D232 E233 K279 M282 I283 R298 D312 R317 A333 Y337 D346 R358 D380 K387 D444 R520 R523 L533

D572 R584 Q591 G594 L601

- Molecule 1: Methanol dehydrogenase protein, large subunit

Chain H:
93%
6%

N29 S30 E31 R34 D38 T76 H96 T97 P98 D110 T111 R112 K113 M114 R127 R137 A144 G145 E146 H147 G148 D179 K194 L198 R209 I217 R225 K279 M282 Y337 G347 L353 T364 D380 D444 R453

M472 R520 K528 G557 K571 D572 G594 L601

- Molecule 1: Methanol dehydrogenase protein, large subunit

Chain M:
92%
7%

N29 S30 E31 R34 K37 R56 L74 H96 V106 M114 R127 V134 R137 A144 G145 E146 H147 G148 E170 V193 K194 R225 D232 Y276 I283 D314 Y337 L353 T364 D380 E400 R404 K410 D444

P447 M472 Q511 V537 W561 V564 D572 R584 Q591 L601

- Molecule 1: Methanol dehydrogenase protein, large subunit

Chain N:
92%
7%

N29 S30 E31 R34 R40 W72 T76 D90 T97 P98 D110 M114 Q117 Y118 K119 R127 R137 A144 G145 E146 H147 G148 K196 V197 L198 V208 R209 D219 D232 E233 W271 I283 K303 W304 D314 R317 Y337

D346 G347 R367 K391 K432 D444 M472 D514 R520 D521 T522 R523 Q530 D572 R584 H588 G594 V598 L601

- Molecule 2: Methanol dehydrogenase [cytochrome c] subunit 2

Chain E:
%
90%
8%

• Molecule 2: Methanol dehydrogenase [cytochrome c] subunit 2

Chain F:

• Molecule 2: Methanol dehydrogenase [cytochrome c] subunit 2

Chain I:

• Molecule 2: Methanol dehydrogenase [cytochrome c] subunit 2

Chain J:

• Molecule 2: Methanol dehydrogenase [cytochrome c] subunit 2

Chain K:

• Molecule 2: Methanol dehydrogenase [cytochrome c] subunit 2

Chain L:

• Molecule 2: Methanol dehydrogenase [cytochrome c] subunit 2
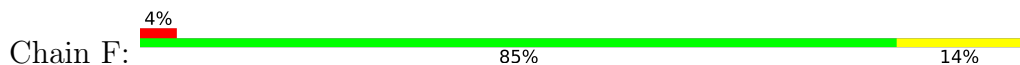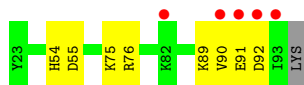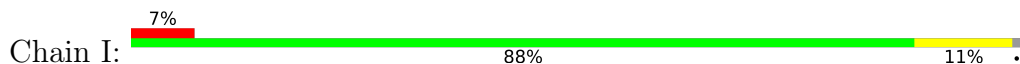
Chain O:

• Molecule 2: Methanol dehydrogenase [cytochrome c] subunit 2
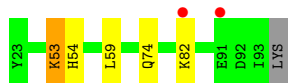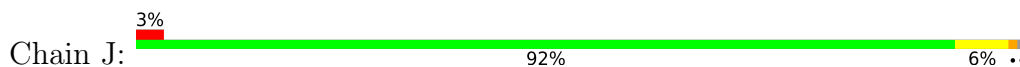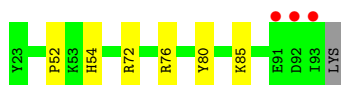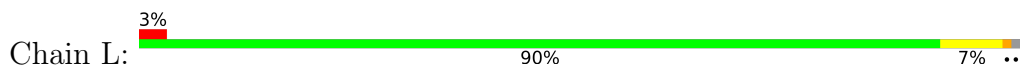
Chain P:

7%

90%

7%

Y23 D24 G25 T26 H54 L59 Q62 A81 K82 K85 K89 V90 E91 D92 I93 LYS
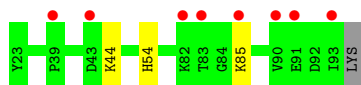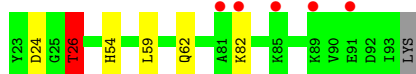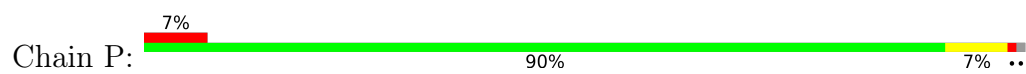
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	128.70Å 211.85Å 223.69Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	153.00 – 1.90 29.88 – 1.90	Depositor EDS
% Data completeness (in resolution range)	99.8 (153.00-1.90) 99.9 (29.88-1.90)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.29 (at 1.89Å)	Xtriage
Refinement program	REFMAC 5.8.0135	Depositor
R, R_{free}	0.140 , 0.180 0.146 , 0.185	Depositor DCC
R_{free} test set	24064 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å^2)	18.8	Xtriage
Anisotropy	0.039	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 43.0	EDS
L-test for twinning[2]	$< |L| > = 0.49, < L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	45177	wwPDB-VP
Average B, all atoms (Å^2)	21.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 1.74% of the height of the origin peak. No significant pseudotranslation is detected.*

---

[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	0.95	4/4622 (0.1%)	1.01	22/6281 (0.4%)
1	B	1.01	10/4621 (0.2%)	1.10	23/6281 (0.4%)
1	C	0.97	6/4622 (0.1%)	0.98	15/6281 (0.2%)
1	D	0.97	7/4621 (0.2%)	1.02	20/6281 (0.3%)
1	G	0.97	4/4622 (0.1%)	1.03	28/6281 (0.4%)
1	H	0.93	3/4621 (0.1%)	1.05	28/6281 (0.4%)
1	M	0.95	4/4622 (0.1%)	0.98	17/6281 (0.3%)
1	N	1.00	6/4621 (0.1%)	1.07	30/6281 (0.5%)
2	E	0.95	0/583	0.91	2/785 (0.3%)
2	F	0.89	0/583	0.96	2/785 (0.3%)
2	I	0.92	0/583	0.98	3/785 (0.4%)
2	J	0.88	0/583	0.85	0/785
2	K	1.01	1/583 (0.2%)	0.95	4/785 (0.5%)
2	L	1.03	1/583 (0.2%)	1.01	3/785 (0.4%)
2	O	0.83	0/583	0.86	0/785
2	P	0.95	0/583	0.99	2/785 (0.3%)
All	All	0.96	46/41636 (0.1%)	1.02	199/56528 (0.4%)

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	A	0	2
1	B	0	1
1	D	0	1
1	G	0	2
1	H	0	2
1	M	0	2
All	All	0	10

The worst 5 of 46 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	H	112	ARG	CD-NE	-9.96	1.29	1.46
1	B	112	ARG	CD-NE	-9.93	1.29	1.46
1	N	148	GLY	N-CA	-9.61	1.31	1.46
1	D	145	GLY	N-CA	-9.49	1.31	1.46
1	A	148	GLY	N-CA	-9.34	1.32	1.46

The worst 5 of 199 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	112	ARG	NE-CZ-NH2	-24.88	107.86	120.30
1	H	112	ARG	NE-CZ-NH2	-22.07	109.27	120.30
1	B	112	ARG	NE-CZ-NH1	18.30	129.45	120.30
1	H	112	ARG	NE-CZ-NH1	17.21	128.91	120.30
1	N	584	ARG	NE-CZ-NH1	13.27	126.93	120.30

There are no chirality outliers.

5 of 10 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	144	ALA	Peptide
1	A	145	GLY	Peptide
1	B	144	ALA	Peptide
1	D	137	ARG	Sidechain
1	G	97	THR	Mainchain

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	4491	0	4320	10	0
1	B	4490	0	4320	11	0
1	C	4491	0	4320	11	0
1	D	4490	0	4320	17	0
1	G	4491	0	4320	14	0
1	H	4490	0	4320	12	0
1	M	4491	0	4320	13	0
1	N	4490	0	4319	20	0
2	E	568	0	545	3	0

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	F	568	0	545	5	0
2	I	568	0	545	3	0
2	J	568	0	545	6	0
2	K	568	0	545	3	0
2	L	568	0	545	2	0
2	O	568	0	545	3	0
2	P	568	0	545	8	0
3	A	548	0	0	3	0
3	B	491	0	0	2	0
3	C	500	0	0	4	0
3	D	511	0	0	3	0
3	E	114	0	0	1	0
3	F	77	0	0	2	0
3	G	529	0	0	2	0
3	H	481	0	0	3	0
3	I	84	0	0	0	0
3	J	79	0	0	1	0
3	K	81	0	0	0	0
3	L	97	0	0	0	0
3	M	453	0	0	4	0
3	N	505	0	0	6	0
3	O	61	0	0	1	0
3	P	98	0	0	1	0
All	All	45177	0	38919	131	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 131 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)
2:J:74:GLN:HG2	3:J:166:HOH:O	1.64	0.98
1:H:112:ARG:HD3	1:H:112:ARG:O	1.67	0.94
1:B:112:ARG:O	1:B:112:ARG:HD3	1.75	0.87
1:D:196:LYS:HE3	1:D:223:GLU:HG3	1.60	0.83
2:P:26:THR:HG23	3:P:167:HOH:O	1.80	0.79

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	571/573 (100%)	543 (95%)	27 (5%)	1 (0%)	47	38
1	B	571/573 (100%)	542 (95%)	29 (5%)	0	100	100
1	C	571/573 (100%)	544 (95%)	26 (5%)	1 (0%)	47	38
1	D	571/573 (100%)	543 (95%)	25 (4%)	3 (0%)	29	18
1	G	571/573 (100%)	539 (94%)	30 (5%)	2 (0%)	34	24
1	H	571/573 (100%)	539 (94%)	30 (5%)	2 (0%)	34	24
1	M	571/573 (100%)	541 (95%)	29 (5%)	1 (0%)	47	38
1	N	571/573 (100%)	545 (95%)	24 (4%)	2 (0%)	34	24
2	E	69/72 (96%)	69 (100%)	0	0	100	100
2	F	69/72 (96%)	69 (100%)	0	0	100	100
2	I	69/72 (96%)	68 (99%)	1 (1%)	0	100	100
2	J	69/72 (96%)	69 (100%)	0	0	100	100
2	K	69/72 (96%)	69 (100%)	0	0	100	100
2	L	69/72 (96%)	69 (100%)	0	0	100	100
2	O	69/72 (96%)	69 (100%)	0	0	100	100
2	P	69/72 (96%)	69 (100%)	0	0	100	100
All	All	5120/5160 (99%)	4887 (95%)	221 (4%)	12 (0%)	47	38

5 of 12 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	145	GLY
1	N	145	GLY
1	H	557	GLY
1	A	134	VAL
1	C	134	VAL

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	464/464 (100%)	458 (99%)	6 (1%)	69	68
1	B	464/464 (100%)	456 (98%)	8 (2%)	60	57
1	C	464/464 (100%)	458 (99%)	6 (1%)	69	68
1	D	464/464 (100%)	462 (100%)	2 (0%)	91	91
1	G	464/464 (100%)	460 (99%)	4 (1%)	78	79
1	H	464/464 (100%)	458 (99%)	6 (1%)	69	68
1	M	464/464 (100%)	458 (99%)	6 (1%)	69	68
1	N	464/464 (100%)	459 (99%)	5 (1%)	73	73
2	E	60/61 (98%)	58 (97%)	2 (3%)	38	29
2	F	60/61 (98%)	57 (95%)	3 (5%)	24	15
2	I	60/61 (98%)	57 (95%)	3 (5%)	24	15
2	J	60/61 (98%)	57 (95%)	3 (5%)	24	15
2	K	60/61 (98%)	59 (98%)	1 (2%)	60	57
2	L	60/61 (98%)	57 (95%)	3 (5%)	24	15
2	O	60/61 (98%)	59 (98%)	1 (2%)	60	57
2	P	60/61 (98%)	57 (95%)	3 (5%)	24	15
All	All	4192/4200 (100%)	4130 (98%)	62 (2%)	65	62

5 of 62 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	G	279	LYS
1	N	472	MET
1	H	472	MET
1	N	391	LYS
2	P	26	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 25 such sidechains are listed below:

Mol	Chain	Res	Type
2	J	54	HIS
1	M	591	GLN
2	P	62	GLN
2	L	54	HIS
1	N	117	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 ⓘ

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	573/573 (100%)	-0.50	1 (0%)	95	95	12, 17, 29, 52	0
1	B	573/573 (100%)	-0.48	2 (0%)	94	94	12, 16, 29, 44	0
1	C	573/573 (100%)	-0.53	0	100	100	12, 16, 27, 43	0
1	D	573/573 (100%)	-0.49	3 (0%)	91	92	12, 17, 28, 49	0
1	G	573/573 (100%)	-0.53	1 (0%)	95	95	12, 17, 28, 41	0
1	H	573/573 (100%)	-0.45	1 (0%)	95	95	12, 19, 32, 49	0
1	M	573/573 (100%)	-0.39	0	100	100	13, 20, 34, 58	0
1	N	573/573 (100%)	-0.55	2 (0%)	94	94	12, 16, 28, 41	0
2	E	71/72 (98%)	-0.15	1 (1%)	75	77	17, 24, 41, 54	0
2	F	71/72 (98%)	-0.10	3 (4%)	36	39	14, 21, 46, 86	0
2	I	71/72 (98%)	0.14	5 (7%)	16	18	16, 23, 66, 100	0
2	J	71/72 (98%)	0.32	2 (2%)	53	56	22, 30, 49, 63	0
2	K	71/72 (98%)	-0.20	3 (4%)	36	39	15, 22, 36, 51	0
2	L	71/72 (98%)	-0.18	2 (2%)	53	56	16, 23, 38, 56	0
2	O	71/72 (98%)	0.44	8 (11%)	5	5	24, 34, 55, 64	0
2	P	71/72 (98%)	-0.04	5 (7%)	16	18	16, 21, 43, 60	0
All	All	5152/5160 (99%)	-0.43	39 (0%)	86	87	12, 18, 34, 100	0

The worst 5 of 39 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	I	93	ILE	9.2
2	F	93	ILE	7.0
2	F	92	ASP	5.8
2	I	92	ASP	5.6
2	F	91	GLU	4.5

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.