



# wwPDB X-ray Structure Validation Summary Report ⓘ

Oct 10, 2017 – 04:11 PM EDT

PDB ID : 2GLV  
Title : Crystal structure of (3R)-Hydroxyacyl-Acyl Carrier Protein Dehydratase(FabZ) mutant(Y100A) from Helicobacter pylori  
Authors : Zhang, L.; Liu, W.; Shen, X.; Jiang, H.  
Deposited on : unknown  
Resolution : 2.50 Å(reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<http://wwpdb.org/validation/2016/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.9-1692
EDS	:	rb-20030345
Percentile statistics	:	20161228.v01 (using entries in the PDB archive December 28th 2016)
Refmac	:	5.8.0135
CCP4	:	6.5.0
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	rb-20030345



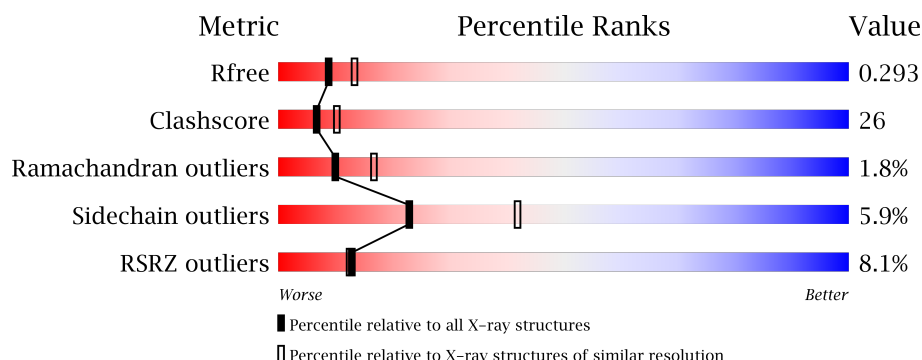
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.50 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	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	100719	3846 (2.50-2.50)
Clashscore	112137	4554 (2.50-2.50)
Ramachandran outliers	110173	4463 (2.50-2.50)
Sidechain outliers	110143	4465 (2.50-2.50)
RSRZ outliers	101464	3876 (2.50-2.50)

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 on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. 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  $\leq 5\%$ . 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	171	<div> <div>10%</div> <div> <div>49%</div> <div>37%</div> <div>•</div> <div>11%</div> </div> </div>
1	B	171	<div> <div>16%</div> <div> <div>39%</div> <div>41%</div> <div>8%</div> <div>12%</div> </div> </div>
1	C	171	<div> <div>9%</div> <div> <div>53%</div> <div>33%</div> <div>• •</div> <div>11%</div> </div> </div>
1	D	171	<div> <div>7%</div> <div> <div>50%</div> <div>35%</div> <div>•</div> <div>12%</div> </div> </div>
1	E	171	<div> <div>7%</div> <div> <div>56%</div> <div>30%</div> <div>• •</div> <div>12%</div> </div> </div>

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Mol	Chain	Length	Quality of chain
1	F	171	<div><div></div><div>3%</div><div>59%</div><div>27%</div><div>•</div><div>11%</div></div>
1	G	171	<div><div></div><div>3%</div><div>50%</div><div>32%</div><div>•</div><div>•</div><div>12%</div></div>
1	H	171	<div><div></div><div>11%</div><div>41%</div><div>39%</div><div>6%</div><div>13%</div></div>
1	I	171	<div><div></div><div>13%</div><div>46%</div><div>40%</div><div>•</div><div>11%</div></div>
1	J	171	<div><div></div><div>4%</div><div>45%</div><div>39%</div><div>5%</div><div>11%</div></div>
1	K	171	<div><div></div><div>2%</div><div>63%</div><div>24%</div><div>•</div><div>11%</div></div>
1	L	171	<div><div></div><div>2%</div><div>61%</div><div>24%</div><div>•</div><div>12%</div></div>



## 2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 14745 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 (3R)-hydroxymyristoyl-acyl carrier protein dehydratase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	152	Total	C	N	O	S	0	0	0
			1218	797	203	213	5			
1	B	150	Total	C	N	O	S	0	0	0
			1197	786	198	208	5			
1	C	152	Total	C	N	O	S	0	0	0
			1218	797	203	213	5			
1	D	151	Total	C	N	O	S	0	0	0
			1210	791	202	212	5			
1	E	151	Total	C	N	O	S	0	0	0
			1210	791	202	212	5			
1	F	152	Total	C	N	O	S	0	0	0
			1218	797	203	213	5			
1	G	150	Total	C	N	O	S	0	0	0
			1200	786	201	208	5			
1	H	148	Total	C	N	O	S	0	0	0
			1180	775	195	205	5			
1	I	152	Total	C	N	O	S	0	0	0
			1218	797	203	213	5			
1	J	152	Total	C	N	O	S	0	0	0
			1218	797	203	213	5			
1	K	152	Total	C	N	O	S	0	0	0
			1218	797	203	213	5			
1	L	151	Total	C	N	O	S	0	0	0
			1210	791	202	212	5			

There are 156 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-11	MET	-	EXPRESSION TAG	UNP Q5G940
A	-10	ARG	-	EXPRESSION TAG	UNP Q5G940
A	-9	GLY	-	EXPRESSION TAG	UNP Q5G940
A	-8	SER	-	EXPRESSION TAG	UNP Q5G940
A	-7	HIS	-	EXPRESSION TAG	UNP Q5G940

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-6	HIS	-	EXPRESSION TAG	UNP Q5G940
A	-5	HIS	-	EXPRESSION TAG	UNP Q5G940
A	-4	HIS	-	EXPRESSION TAG	UNP Q5G940
A	-3	HIS	-	EXPRESSION TAG	UNP Q5G940
A	-2	HIS	-	EXPRESSION TAG	UNP Q5G940
A	-1	GLY	-	EXPRESSION TAG	UNP Q5G940
A	0	SER	-	EXPRESSION TAG	UNP Q5G940
A	100	ALA	TYR	ENGINEERED	GB 56684725
B	-11	MET	-	EXPRESSION TAG	UNP Q5G940
B	-10	ARG	-	EXPRESSION TAG	UNP Q5G940
B	-9	GLY	-	EXPRESSION TAG	UNP Q5G940
B	-8	SER	-	EXPRESSION TAG	UNP Q5G940
B	-7	HIS	-	EXPRESSION TAG	UNP Q5G940
B	-6	HIS	-	EXPRESSION TAG	UNP Q5G940
B	-5	HIS	-	EXPRESSION TAG	UNP Q5G940
B	-4	HIS	-	EXPRESSION TAG	UNP Q5G940
B	-3	HIS	-	EXPRESSION TAG	UNP Q5G940
B	-2	HIS	-	EXPRESSION TAG	UNP Q5G940
B	-1	GLY	-	EXPRESSION TAG	UNP Q5G940
B	0	SER	-	EXPRESSION TAG	UNP Q5G940
B	100	ALA	TYR	ENGINEERED	GB 56684725
C	-11	MET	-	EXPRESSION TAG	UNP Q5G940
C	-10	ARG	-	EXPRESSION TAG	UNP Q5G940
C	-9	GLY	-	EXPRESSION TAG	UNP Q5G940
C	-8	SER	-	EXPRESSION TAG	UNP Q5G940
C	-7	HIS	-	EXPRESSION TAG	UNP Q5G940
C	-6	HIS	-	EXPRESSION TAG	UNP Q5G940
C	-5	HIS	-	EXPRESSION TAG	UNP Q5G940
C	-4	HIS	-	EXPRESSION TAG	UNP Q5G940
C	-3	HIS	-	EXPRESSION TAG	UNP Q5G940
C	-2	HIS	-	EXPRESSION TAG	UNP Q5G940
C	-1	GLY	-	EXPRESSION TAG	UNP Q5G940
C	0	SER	-	EXPRESSION TAG	UNP Q5G940
C	100	ALA	TYR	ENGINEERED	GB 56684725
D	-11	MET	-	EXPRESSION TAG	UNP Q5G940
D	-10	ARG	-	EXPRESSION TAG	UNP Q5G940
D	-9	GLY	-	EXPRESSION TAG	UNP Q5G940
D	-8	SER	-	EXPRESSION TAG	UNP Q5G940
D	-7	HIS	-	EXPRESSION TAG	UNP Q5G940
D	-6	HIS	-	EXPRESSION TAG	UNP Q5G940
D	-5	HIS	-	EXPRESSION TAG	UNP Q5G940
D	-4	HIS	-	EXPRESSION TAG	UNP Q5G940

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-3	HIS	-	EXPRESSION TAG	UNP Q5G940
D	-2	HIS	-	EXPRESSION TAG	UNP Q5G940
D	-1	GLY	-	EXPRESSION TAG	UNP Q5G940
D	0	SER	-	EXPRESSION TAG	UNP Q5G940
D	100	ALA	TYR	ENGINEERED	GB 56684725
E	-11	MET	-	EXPRESSION TAG	UNP Q5G940
E	-10	ARG	-	EXPRESSION TAG	UNP Q5G940
E	-9	GLY	-	EXPRESSION TAG	UNP Q5G940
E	-8	SER	-	EXPRESSION TAG	UNP Q5G940
E	-7	HIS	-	EXPRESSION TAG	UNP Q5G940
E	-6	HIS	-	EXPRESSION TAG	UNP Q5G940
E	-5	HIS	-	EXPRESSION TAG	UNP Q5G940
E	-4	HIS	-	EXPRESSION TAG	UNP Q5G940
E	-3	HIS	-	EXPRESSION TAG	UNP Q5G940
E	-2	HIS	-	EXPRESSION TAG	UNP Q5G940
E	-1	GLY	-	EXPRESSION TAG	UNP Q5G940
E	0	SER	-	EXPRESSION TAG	UNP Q5G940
E	100	ALA	TYR	ENGINEERED	GB 56684725
F	-11	MET	-	EXPRESSION TAG	UNP Q5G940
F	-10	ARG	-	EXPRESSION TAG	UNP Q5G940
F	-9	GLY	-	EXPRESSION TAG	UNP Q5G940
F	-8	SER	-	EXPRESSION TAG	UNP Q5G940
F	-7	HIS	-	EXPRESSION TAG	UNP Q5G940
F	-6	HIS	-	EXPRESSION TAG	UNP Q5G940
F	-5	HIS	-	EXPRESSION TAG	UNP Q5G940
F	-4	HIS	-	EXPRESSION TAG	UNP Q5G940
F	-3	HIS	-	EXPRESSION TAG	UNP Q5G940
F	-2	HIS	-	EXPRESSION TAG	UNP Q5G940
F	-1	GLY	-	EXPRESSION TAG	UNP Q5G940
F	0	SER	-	EXPRESSION TAG	UNP Q5G940
F	100	ALA	TYR	ENGINEERED	GB 56684725
G	-11	MET	-	EXPRESSION TAG	UNP Q5G940
G	-10	ARG	-	EXPRESSION TAG	UNP Q5G940
G	-9	GLY	-	EXPRESSION TAG	UNP Q5G940
G	-8	SER	-	EXPRESSION TAG	UNP Q5G940
G	-7	HIS	-	EXPRESSION TAG	UNP Q5G940
G	-6	HIS	-	EXPRESSION TAG	UNP Q5G940
G	-5	HIS	-	EXPRESSION TAG	UNP Q5G940
G	-4	HIS	-	EXPRESSION TAG	UNP Q5G940
G	-3	HIS	-	EXPRESSION TAG	UNP Q5G940
G	-2	HIS	-	EXPRESSION TAG	UNP Q5G940
G	-1	GLY	-	EXPRESSION TAG	UNP Q5G940

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Chain	Residue	Modelled	Actual	Comment	Reference
G	0	SER	-	EXPRESSION TAG	UNP Q5G940
G	100	ALA	TYR	ENGINEERED	GB 56684725
H	-11	MET	-	EXPRESSION TAG	UNP Q5G940
H	-10	ARG	-	EXPRESSION TAG	UNP Q5G940
H	-9	GLY	-	EXPRESSION TAG	UNP Q5G940
H	-8	SER	-	EXPRESSION TAG	UNP Q5G940
H	-7	HIS	-	EXPRESSION TAG	UNP Q5G940
H	-6	HIS	-	EXPRESSION TAG	UNP Q5G940
H	-5	HIS	-	EXPRESSION TAG	UNP Q5G940
H	-4	HIS	-	EXPRESSION TAG	UNP Q5G940
H	-3	HIS	-	EXPRESSION TAG	UNP Q5G940
H	-2	HIS	-	EXPRESSION TAG	UNP Q5G940
H	-1	GLY	-	EXPRESSION TAG	UNP Q5G940
H	0	SER	-	EXPRESSION TAG	UNP Q5G940
H	100	ALA	TYR	ENGINEERED	GB 56684725
I	-11	MET	-	EXPRESSION TAG	UNP Q5G940
I	-10	ARG	-	EXPRESSION TAG	UNP Q5G940
I	-9	GLY	-	EXPRESSION TAG	UNP Q5G940
I	-8	SER	-	EXPRESSION TAG	UNP Q5G940
I	-7	HIS	-	EXPRESSION TAG	UNP Q5G940
I	-6	HIS	-	EXPRESSION TAG	UNP Q5G940
I	-5	HIS	-	EXPRESSION TAG	UNP Q5G940
I	-4	HIS	-	EXPRESSION TAG	UNP Q5G940
I	-3	HIS	-	EXPRESSION TAG	UNP Q5G940
I	-2	HIS	-	EXPRESSION TAG	UNP Q5G940
I	-1	GLY	-	EXPRESSION TAG	UNP Q5G940
I	0	SER	-	EXPRESSION TAG	UNP Q5G940
I	100	ALA	TYR	ENGINEERED	GB 56684725
J	-11	MET	-	EXPRESSION TAG	UNP Q5G940
J	-10	ARG	-	EXPRESSION TAG	UNP Q5G940
J	-9	GLY	-	EXPRESSION TAG	UNP Q5G940
J	-8	SER	-	EXPRESSION TAG	UNP Q5G940
J	-7	HIS	-	EXPRESSION TAG	UNP Q5G940
J	-6	HIS	-	EXPRESSION TAG	UNP Q5G940
J	-5	HIS	-	EXPRESSION TAG	UNP Q5G940
J	-4	HIS	-	EXPRESSION TAG	UNP Q5G940
J	-3	HIS	-	EXPRESSION TAG	UNP Q5G940
J	-2	HIS	-	EXPRESSION TAG	UNP Q5G940
J	-1	GLY	-	EXPRESSION TAG	UNP Q5G940
J	0	SER	-	EXPRESSION TAG	UNP Q5G940
J	100	ALA	TYR	ENGINEERED	GB 56684725
K	-11	MET	-	EXPRESSION TAG	UNP Q5G940

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Chain	Residue	Modelled	Actual	Comment	Reference
K	-10	ARG	-	EXPRESSION TAG	UNP Q5G940
K	-9	GLY	-	EXPRESSION TAG	UNP Q5G940
K	-8	SER	-	EXPRESSION TAG	UNP Q5G940
K	-7	HIS	-	EXPRESSION TAG	UNP Q5G940
K	-6	HIS	-	EXPRESSION TAG	UNP Q5G940
K	-5	HIS	-	EXPRESSION TAG	UNP Q5G940
K	-4	HIS	-	EXPRESSION TAG	UNP Q5G940
K	-3	HIS	-	EXPRESSION TAG	UNP Q5G940
K	-2	HIS	-	EXPRESSION TAG	UNP Q5G940
K	-1	GLY	-	EXPRESSION TAG	UNP Q5G940
K	0	SER	-	EXPRESSION TAG	UNP Q5G940
K	100	ALA	TYR	ENGINEERED	GB 56684725
L	-11	MET	-	EXPRESSION TAG	UNP Q5G940
L	-10	ARG	-	EXPRESSION TAG	UNP Q5G940
L	-9	GLY	-	EXPRESSION TAG	UNP Q5G940
L	-8	SER	-	EXPRESSION TAG	UNP Q5G940
L	-7	HIS	-	EXPRESSION TAG	UNP Q5G940
L	-6	HIS	-	EXPRESSION TAG	UNP Q5G940
L	-5	HIS	-	EXPRESSION TAG	UNP Q5G940
L	-4	HIS	-	EXPRESSION TAG	UNP Q5G940
L	-3	HIS	-	EXPRESSION TAG	UNP Q5G940
L	-2	HIS	-	EXPRESSION TAG	UNP Q5G940
L	-1	GLY	-	EXPRESSION TAG	UNP Q5G940
L	0	SER	-	EXPRESSION TAG	UNP Q5G940
L	100	ALA	TYR	ENGINEERED	GB 56684725

- Molecule 2 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	G	2	Total Cl 2 2	0	0
2	D	1	Total Cl 1 1	0	0
2	K	2	Total Cl 2 2	0	0
2	E	1	Total Cl 1 1	0	0
2	B	1	Total Cl 1 1	0	0
2	I	2	Total Cl 2 2	0	0
2	C	1	Total Cl 1 1	0	0

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Cl	0	0
			1	1		
2	F	1	Total	Cl	0	0
			1	1		

- Molecule 3 is water.

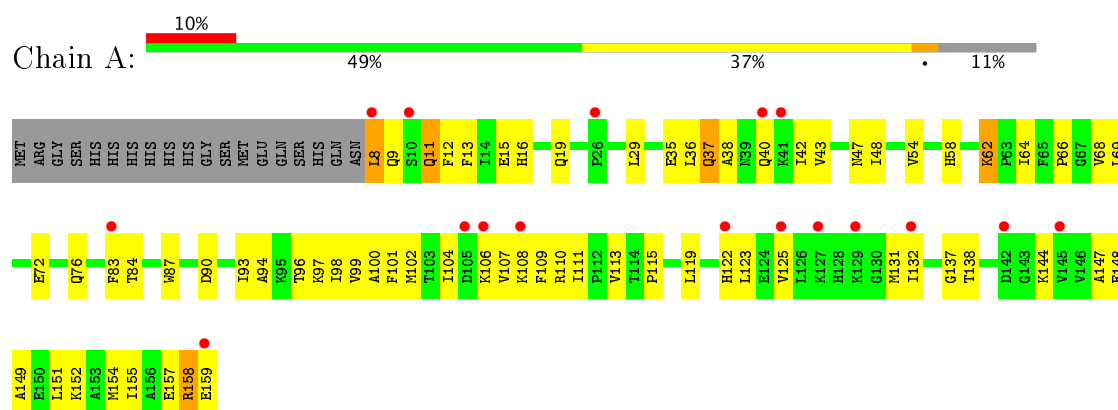
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	14	Total	O	0	0
			14	14		
3	B	17	Total	O	0	0
			17	17		
3	C	16	Total	O	0	0
			16	16		
3	D	15	Total	O	0	0
			15	15		
3	E	20	Total	O	0	0
			20	20		
3	F	21	Total	O	0	0
			21	21		
3	G	17	Total	O	0	0
			17	17		
3	H	14	Total	O	0	0
			14	14		
3	I	17	Total	O	0	0
			17	17		
3	J	19	Total	O	0	0
			19	19		
3	K	23	Total	O	0	0
			23	23		
3	L	25	Total	O	0	0
			25	25		



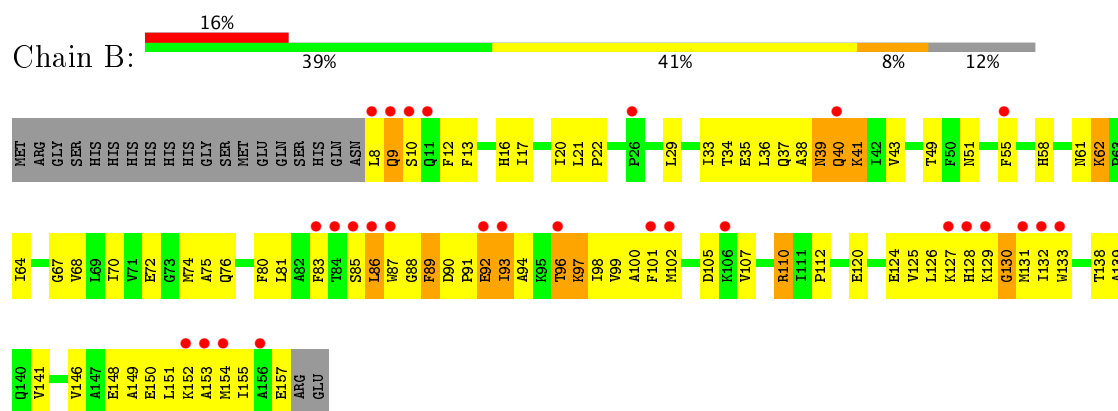
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA 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.

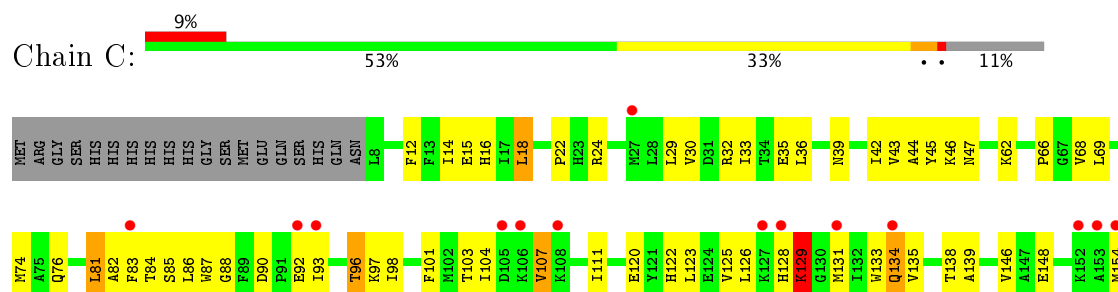
- Molecule 1: (3R)-hydroxymyristoyl-acyl carrier protein dehydratase



- Molecule 1: (3R)-hydroxymyristoyl-acyl carrier protein dehydratase



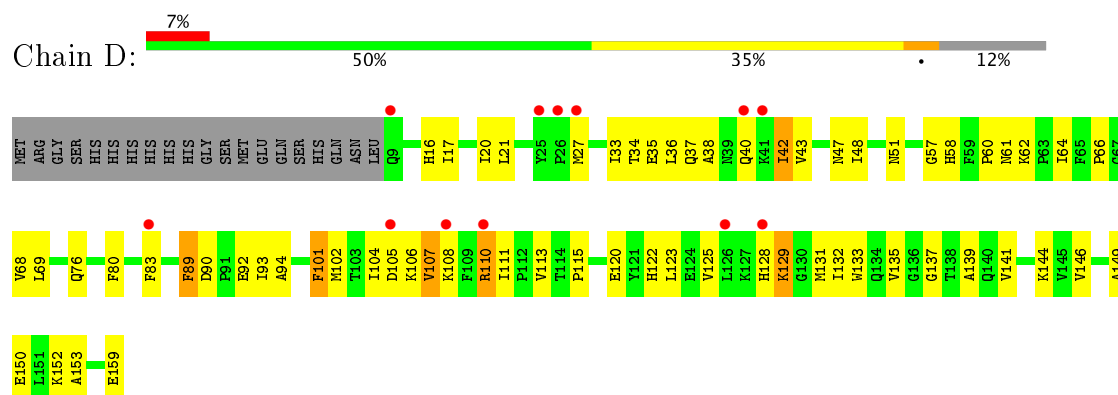
- Molecule 1: (3R)-hydroxymyristoyl-acyl carrier protein dehydratase



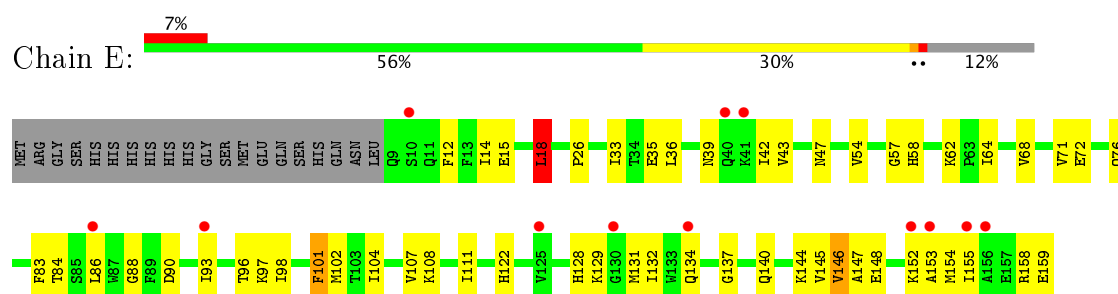




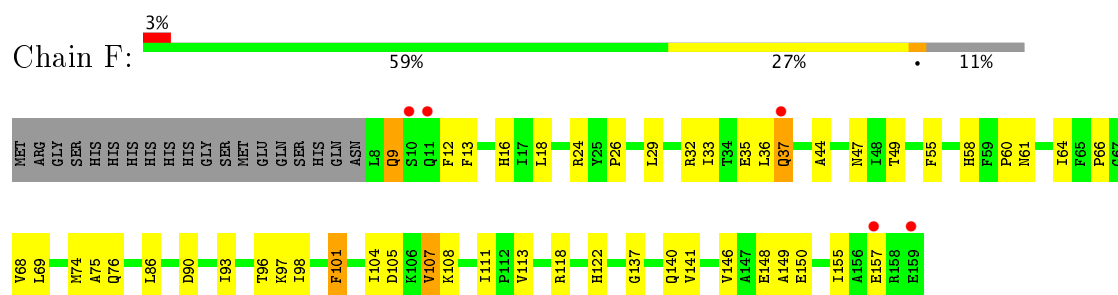
- Molecule 1: (3R)-hydroxymyristoyl-acyl carrier protein dehydratase



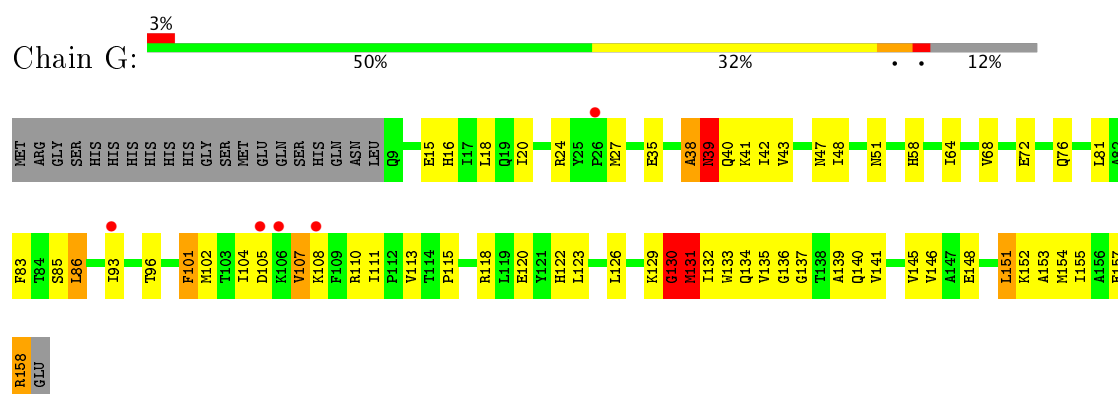
- Molecule 1: (3R)-hydroxymyristoyl-acyl carrier protein dehydratase



- Molecule 1: (3R)-hydroxymyristoyl-acyl carrier protein dehydratase

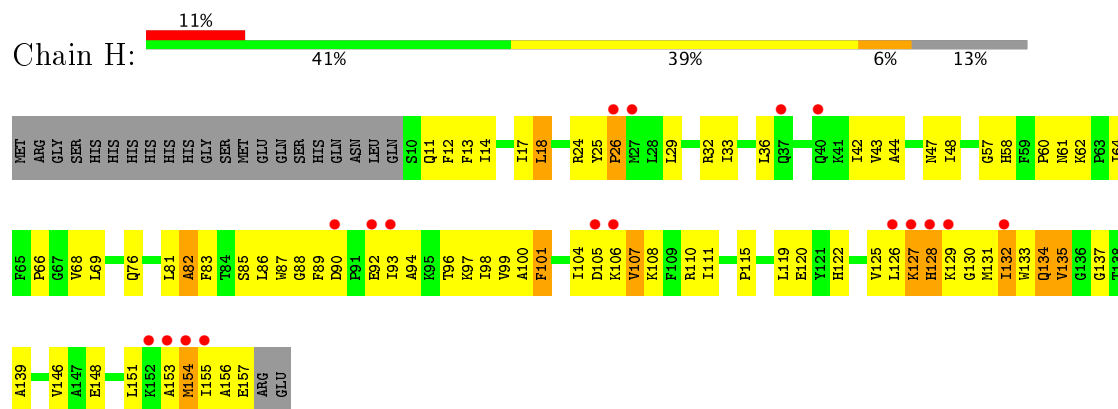


- Molecule 1: (3R)-hydroxymyristoyl-acyl carrier protein dehydratase

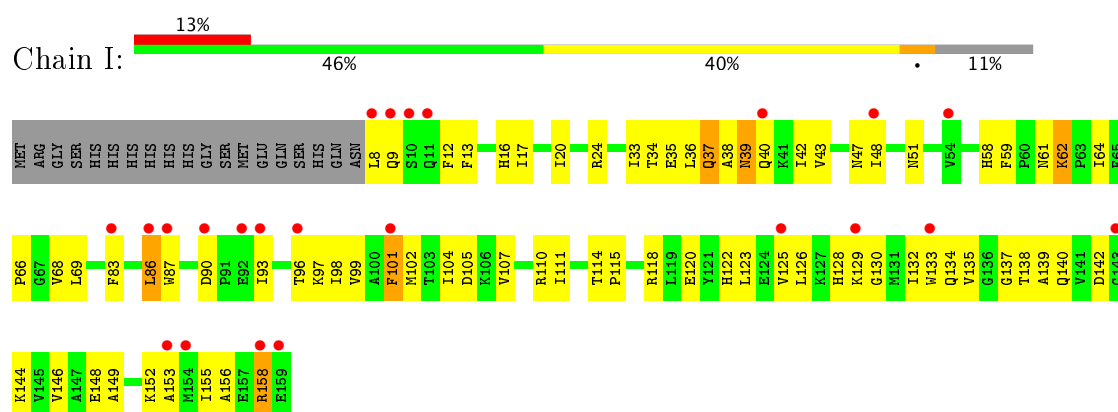




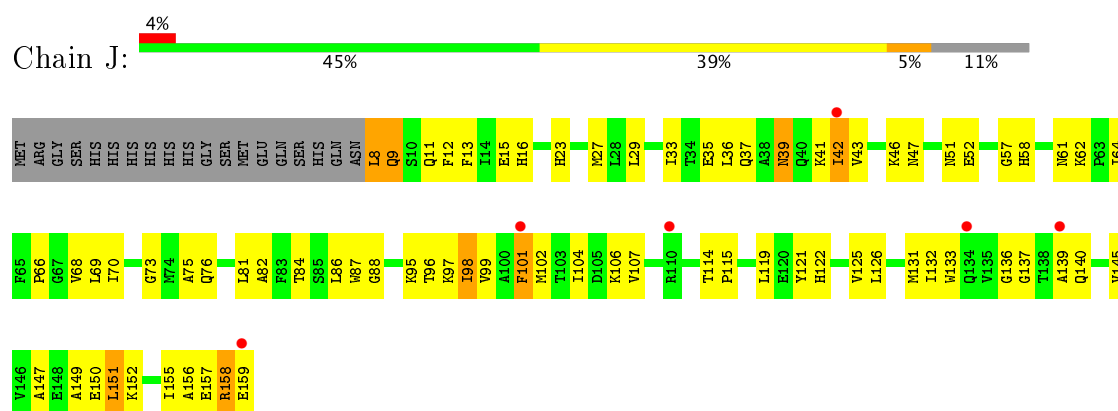
• Molecule 1: (3R)-hydroxymyristoyl-acyl carrier protein dehydratase



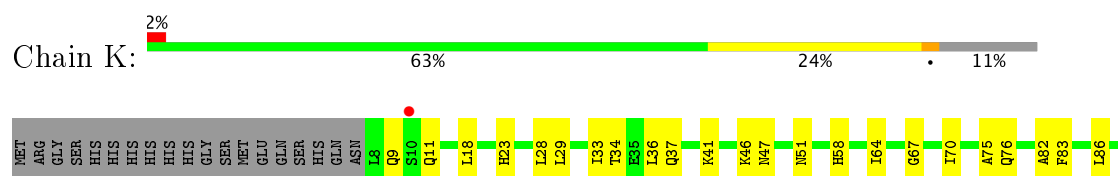
• Molecule 1: (3R)-hydroxymyristoyl-acyl carrier protein dehydratase



• Molecule 1: (3R)-hydroxymyristoyl-acyl carrier protein dehydratase



• Molecule 1: (3R)-hydroxymyristoyl-acyl carrier protein dehydratase







● Molecule 1: (3R)-hydroxymyristoyl-acyl carrier protein dehydratase





## 4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	266.52Å 76.91Å 113.19Å 90.00° 102.25° 90.00°	Depositor
Resolution (Å)	50.00 – 2.50 48.36 – 2.49	Depositor EDS
% Data completeness (in resolution range)	97.8 (50.00-2.50) 91.4 (48.36-2.49)	Depositor EDS
$R_{merge}$	0.07	Depositor
$R_{sym}$	0.07	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.36 (at 2.48Å)	Xtriage
Refinement program	CNS	Depositor
R, $R_{free}$	0.240 , 0.293 0.241 , 0.293	Depositor DCC
$R_{free}$ test set	3607 reflections (5.05%)	DCC
Wilson B-factor (Å <sup>2</sup> )	43.1	Xtriage
Anisotropy	0.529	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.39 , 54.1	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.51$ , $\langle L^2 \rangle = 0.35$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	14745	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	46.0	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 73.19 % 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 1.9244e-06. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

<sup>1</sup> Intensities estimated from amplitudes.

<sup>2</sup> Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.



## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

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

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	0.46	0/1248	0.68	0/1687
1	B	0.47	0/1227	0.69	0/1661
1	C	0.49	0/1248	0.68	0/1687
1	D	0.45	0/1240	0.69	0/1676
1	E	0.46	0/1240	0.69	1/1676 (0.1%)
1	F	0.45	0/1248	0.65	0/1687
1	G	0.60	3/1230 (0.2%)	0.81	3/1664 (0.2%)
1	H	0.47	0/1210	0.74	0/1638
1	I	0.46	0/1248	0.67	0/1687
1	J	0.44	0/1248	0.70	0/1687
1	K	0.45	0/1248	0.68	0/1687
1	L	0.45	0/1240	0.69	0/1676
All	All	0.47	3/14875 (0.0%)	0.70	4/20113 (0.0%)

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	G	0	2

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	G	130	GLY	C-N	-11.97	1.06	1.34
1	G	38	ALA	C-N	-5.81	1.20	1.34
1	G	39	ASN	C-N	5.29	1.46	1.34

All (4) bond angle outliers are listed below:



Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	G	130	GLY	C-N-CA	10.39	147.68	121.70
1	G	130	GLY	O-C-N	-8.16	109.65	122.70
1	E	18	LEU	CA-CB-CG	5.56	128.09	115.30
1	G	130	GLY	CA-C-N	5.53	129.36	117.20

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	G	131	MET	Mainchain
1	G	39	ASN	Mainchain

## 5.2 Too-close contacts [i](#)

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	1218	0	1239	65	0
1	B	1197	0	1220	97	0
1	C	1218	0	1239	65	0
1	D	1210	0	1228	68	0
1	E	1210	0	1228	65	0
1	F	1218	0	1239	50	0
1	G	1200	0	1220	73	0
1	H	1180	0	1201	102	0
1	I	1218	0	1239	79	0
1	J	1218	0	1239	71	0
1	K	1218	0	1239	42	0
1	L	1210	0	1228	49	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	1	0
2	F	1	0	0	1	0
2	G	2	0	0	1	0
2	I	2	0	0	0	0
2	K	2	0	0	0	0
3	A	14	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	17	0	0	3	0
3	C	16	0	0	1	0
3	D	15	0	0	0	0
3	E	20	0	0	1	0
3	F	21	0	0	1	0
3	G	17	0	0	0	0
3	H	14	0	0	1	0
3	I	17	0	0	1	0
3	J	19	0	0	3	0
3	K	23	0	0	2	0
3	L	25	0	0	1	0
All	All	14745	0	14759	762	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 26.

The worst 5 of 762 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:A:8:LEU:HD13	1:A:9:GLN:H	1.13	1.05
1:H:126:LEU:HB2	1:H:134:GLN:HE22	1.22	1.01
1:H:129:LYS:HG2	1:H:132:ILE:HG23	1.43	1.00
1:B:102:MET:HE1	1:B:132:ILE:HG13	1.44	0.98
1:H:42:ILE:HG22	1:H:81:LEU:HD12	1.46	0.98

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

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	150/171 (88%)	129 (86%)	21 (14%)	0	<b>100</b> <b>100</b>

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	148/171 (86%)	123 (83%)	13 (9%)	12 (8%)	1	1
1	C	150/171 (88%)	134 (89%)	15 (10%)	1 (1%)	25	43
1	D	149/171 (87%)	133 (89%)	13 (9%)	3 (2%)	9	14
1	E	149/171 (87%)	131 (88%)	17 (11%)	1 (1%)	25	43
1	F	150/171 (88%)	138 (92%)	11 (7%)	1 (1%)	25	43
1	G	148/171 (86%)	136 (92%)	10 (7%)	2 (1%)	13	23
1	H	146/171 (85%)	125 (86%)	19 (13%)	2 (1%)	13	23
1	I	150/171 (88%)	130 (87%)	15 (10%)	5 (3%)	4	6
1	J	150/171 (88%)	136 (91%)	11 (7%)	3 (2%)	9	14
1	K	150/171 (88%)	140 (93%)	8 (5%)	2 (1%)	14	25
1	L	149/171 (87%)	138 (93%)	11 (7%)	0	100	100
All	All	1789/2052 (87%)	1593 (89%)	164 (9%)	32 (2%)	10	17

5 of 32 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	39	ASN
1	B	92	GLU
1	B	97	LYS
1	B	127	LYS
1	H	89	PHE

### 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	130/147 (88%)	122 (94%)	8 (6%)	21	39
1	B	128/147 (87%)	123 (96%)	5 (4%)	37	63
1	C	130/147 (88%)	122 (94%)	8 (6%)	21	39
1	D	129/147 (88%)	122 (95%)	7 (5%)	26	47
1	E	129/147 (88%)	123 (95%)	6 (5%)	30	54

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	F	130/147 (88%)	124 (95%)	6 (5%)	31	55
1	G	128/147 (87%)	118 (92%)	10 (8%)	15	28
1	H	126/147 (86%)	114 (90%)	12 (10%)	10	19
1	I	130/147 (88%)	121 (93%)	9 (7%)	18	34
1	J	130/147 (88%)	121 (93%)	9 (7%)	18	34
1	K	130/147 (88%)	125 (96%)	5 (4%)	38	64
1	L	129/147 (88%)	123 (95%)	6 (5%)	30	54
All	All	1549/1764 (88%)	1458 (94%)	91 (6%)	23	42

5 of 91 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	G	41	LYS
1	H	11	GLN
1	K	159	GLU
1	G	86	LEU
1	G	118	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 71 such sidechains are listed below:

Mol	Chain	Res	Type
1	F	134	GLN
1	H	11	GLN
1	L	37	GLN
1	G	9	GLN
1	G	51	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 [i](#)

There are no carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

Of 12 ligands modelled in this entry, 12 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 [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	G	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	G	130:GLY	C	131:MET	N	1.06



## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	152/171 (88%)	0.66	17 (11%) 6 5	29, 50, 69, 89	0
1	B	150/171 (87%)	1.08	28 (18%) 1 1	30, 52, 81, 86	0
1	C	152/171 (88%)	0.76	15 (9%) 8 7	27, 46, 71, 96	0
1	D	151/171 (88%)	0.68	12 (7%) 13 13	27, 44, 62, 81	0
1	E	151/171 (88%)	0.70	12 (7%) 13 13	28, 45, 67, 77	0
1	F	152/171 (88%)	0.38	5 (3%) 47 50	30, 41, 60, 79	0
1	G	150/171 (87%)	0.57	5 (3%) 47 50	26, 41, 57, 68	0
1	H	148/171 (86%)	0.78	18 (12%) 5 4	30, 43, 77, 85	0
1	I	152/171 (88%)	0.82	23 (15%) 3 2	27, 47, 73, 95	0
1	J	152/171 (88%)	0.54	6 (3%) 40 42	28, 43, 64, 82	0
1	K	152/171 (88%)	0.29	3 (1%) 65 67	29, 38, 60, 79	0
1	L	151/171 (88%)	0.45	3 (1%) 65 67	27, 39, 57, 81	0
All	All	1813/2052 (88%)	0.64	147 (8%) 13 12	26, 43, 70, 96	0

The worst 5 of 147 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	8	LEU	6.8
1	E	10	SER	6.1
1	C	93	ILE	5.5
1	G	93	ILE	5.3
1	E	130	GLY	5.0

### 6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.



### 6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

### 6.4 Ligands [i](#)

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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 95<sup>th</sup> 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	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
2	CL	I	1007	1/1	0.36	0.25	1.18	88,88,88,88	0
2	CL	K	1005	1/1	0.95	0.20	0.82	57,57,57,57	0
2	CL	K	1006	1/1	0.95	0.20	0.64	53,53,53,53	0
2	CL	B	1001	1/1	0.95	0.19	0.52	56,56,56,56	0
2	CL	I	1002	1/1	0.85	0.24	0.25	62,62,62,62	0
2	CL	E	1003	1/1	0.94	0.17	-0.09	57,57,57,57	0
2	CL	A	1010	1/1	0.86	0.17	-0.40	72,72,72,72	0
2	CL	C	1011	1/1	0.96	0.16	-0.89	64,64,64,64	0
2	CL	D	1012	1/1	0.92	0.14	-1.14	58,58,58,58	0
2	CL	F	1004	1/1	0.98	0.12	-1.39	48,48,48,48	0
2	CL	G	1009	1/1	0.92	0.13	-1.56	66,66,66,66	0
2	CL	G	1008	1/1	0.92	0.15	-2.29	57,57,57,57	0

### 6.5 Other polymers [i](#)

There are no such residues in this entry.