



# Full wwPDB X-ray Structure Validation Report ⓘ

Jun 12, 2024 – 07:23 PM EDT

PDB ID : 3ISA  
Title : CRYSTAL STRUCTURE OF putative enoyl-CoA hydratase/isomerase FROM Bordetella parapertussis  
Authors : Patskovsky, Y.; Malashkevich, V.; Toro, R.; Foti, R.; Dickey, M.; Miller, S.; Sauder, J.M.; Burley, S.K.; Almo, S.C.; New York SGX Research Center for Structural Genomics (NYSGXRC)  
Deposited on : 2009-08-25  
Resolution : 1.76 Å(reported)

This is a Full wwPDB X-ray Structure Validation 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

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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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  
Mogul : 2022.3.0, CSD as543be (2022)  
Xtriage (Phenix) : 1.20.1  
EDS : 2.36.2  
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) : 2.36.2

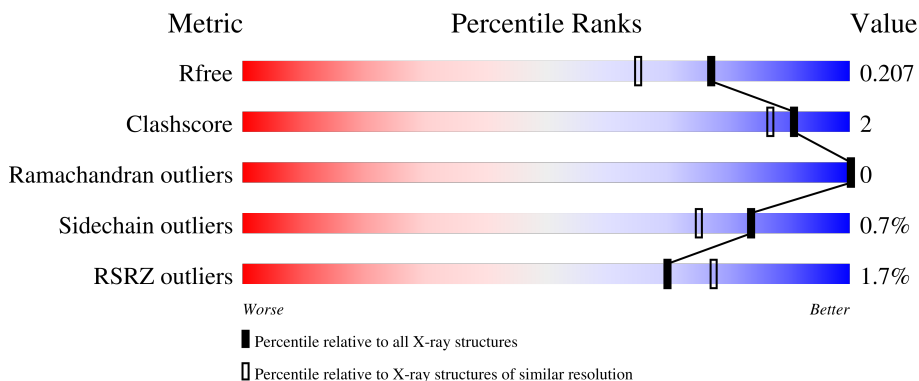
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.76 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.



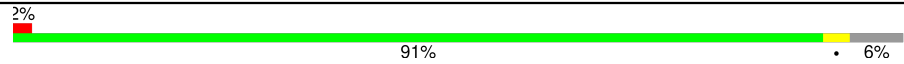
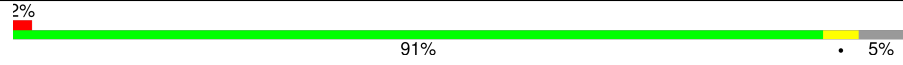
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	2340 (1.76-1.76)
Clashscore	141614	2466 (1.76-1.76)
Ramachandran outliers	138981	2437 (1.76-1.76)
Sidechain outliers	138945	2437 (1.76-1.76)
RSRZ outliers	127900	2298 (1.76-1.76)

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  $\geq 3$ , 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  $\leq 5\%$ . 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	254	 91% 6%
1	B	254	 92% 6%
1	C	254	 91% 6%
1	D	254	 91% 5%

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Mol	Chain	Length	Quality of chain
1	E	254	 2% 91% 6%
1	F	254	 2% 91% 5%

## 2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 13353 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 Putative enoyl-CoA hydratase/isomerase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	240	Total 1914	C 1206	N 360	O 342	S 6	0	13	0
1	B	239	Total 1899	C 1196	N 360	O 337	S 6	0	11	0
1	C	239	Total 1925	C 1215	N 361	O 343	S 6	0	15	0
1	D	242	Total 1937	C 1220	N 365	O 346	S 6	0	15	0
1	E	239	Total 1907	C 1202	N 360	O 339	S 6	0	12	0
1	F	242	Total 1931	C 1217	N 364	O 344	S 6	0	13	0

There are 66 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	2	MET	-	expression tag	UNP Q7W3D6
A	3	SER	-	expression tag	UNP Q7W3D6
A	4	LEU	-	expression tag	UNP Q7W3D6
A	248	GLU	-	expression tag	UNP Q7W3D6
A	249	GLY	-	expression tag	UNP Q7W3D6
A	250	HIS	-	expression tag	UNP Q7W3D6
A	251	HIS	-	expression tag	UNP Q7W3D6
A	252	HIS	-	expression tag	UNP Q7W3D6
A	253	HIS	-	expression tag	UNP Q7W3D6
A	254	HIS	-	expression tag	UNP Q7W3D6
A	255	HIS	-	expression tag	UNP Q7W3D6
B	2	MET	-	expression tag	UNP Q7W3D6
B	3	SER	-	expression tag	UNP Q7W3D6
B	4	LEU	-	expression tag	UNP Q7W3D6
B	248	GLU	-	expression tag	UNP Q7W3D6
B	249	GLY	-	expression tag	UNP Q7W3D6
B	250	HIS	-	expression tag	UNP Q7W3D6

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Chain	Residue	Modelled	Actual	Comment	Reference
B	251	HIS	-	expression tag	UNP Q7W3D6
B	252	HIS	-	expression tag	UNP Q7W3D6
B	253	HIS	-	expression tag	UNP Q7W3D6
B	254	HIS	-	expression tag	UNP Q7W3D6
B	255	HIS	-	expression tag	UNP Q7W3D6
C	2	MET	-	expression tag	UNP Q7W3D6
C	3	SER	-	expression tag	UNP Q7W3D6
C	4	LEU	-	expression tag	UNP Q7W3D6
C	248	GLU	-	expression tag	UNP Q7W3D6
C	249	GLY	-	expression tag	UNP Q7W3D6
C	250	HIS	-	expression tag	UNP Q7W3D6
C	251	HIS	-	expression tag	UNP Q7W3D6
C	252	HIS	-	expression tag	UNP Q7W3D6
C	253	HIS	-	expression tag	UNP Q7W3D6
C	254	HIS	-	expression tag	UNP Q7W3D6
C	255	HIS	-	expression tag	UNP Q7W3D6
D	2	MET	-	expression tag	UNP Q7W3D6
D	3	SER	-	expression tag	UNP Q7W3D6
D	4	LEU	-	expression tag	UNP Q7W3D6
D	248	GLU	-	expression tag	UNP Q7W3D6
D	249	GLY	-	expression tag	UNP Q7W3D6
D	250	HIS	-	expression tag	UNP Q7W3D6
D	251	HIS	-	expression tag	UNP Q7W3D6
D	252	HIS	-	expression tag	UNP Q7W3D6
D	253	HIS	-	expression tag	UNP Q7W3D6
D	254	HIS	-	expression tag	UNP Q7W3D6
D	255	HIS	-	expression tag	UNP Q7W3D6
E	2	MET	-	expression tag	UNP Q7W3D6
E	3	SER	-	expression tag	UNP Q7W3D6
E	4	LEU	-	expression tag	UNP Q7W3D6
E	248	GLU	-	expression tag	UNP Q7W3D6
E	249	GLY	-	expression tag	UNP Q7W3D6
E	250	HIS	-	expression tag	UNP Q7W3D6
E	251	HIS	-	expression tag	UNP Q7W3D6
E	252	HIS	-	expression tag	UNP Q7W3D6
E	253	HIS	-	expression tag	UNP Q7W3D6
E	254	HIS	-	expression tag	UNP Q7W3D6
E	255	HIS	-	expression tag	UNP Q7W3D6
F	2	MET	-	expression tag	UNP Q7W3D6
F	3	SER	-	expression tag	UNP Q7W3D6
F	4	LEU	-	expression tag	UNP Q7W3D6
F	248	GLU	-	expression tag	UNP Q7W3D6

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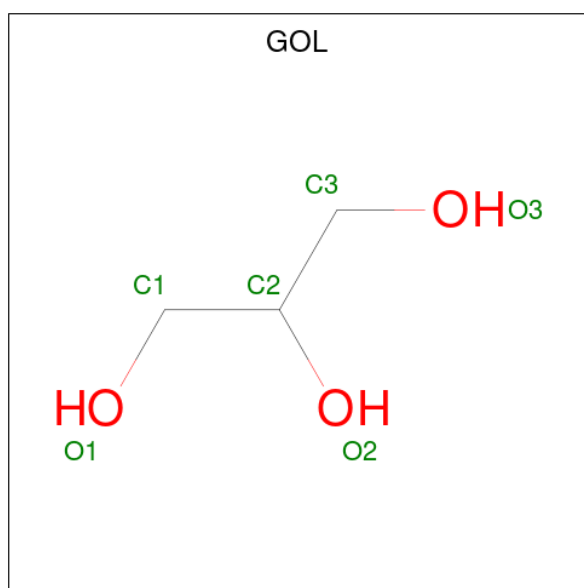
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Chain	Residue	Modelled	Actual	Comment	Reference
F	249	GLY	-	expression tag	UNP Q7W3D6
F	250	HIS	-	expression tag	UNP Q7W3D6
F	251	HIS	-	expression tag	UNP Q7W3D6
F	252	HIS	-	expression tag	UNP Q7W3D6
F	253	HIS	-	expression tag	UNP Q7W3D6
F	254	HIS	-	expression tag	UNP Q7W3D6
F	255	HIS	-	expression tag	UNP Q7W3D6

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

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	8	Total Cl 8 8	0	0
2	B	7	Total Cl 7 7	0	0
2	C	6	Total Cl 6 6	0	0
2	D	9	Total Cl 9 9	0	0
2	E	8	Total Cl 8 8	0	0
2	F	5	Total Cl 5 5	0	0

- Molecule 3 is GLYCEROL (three-letter code: GOL) (formula: C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O 6 3 3	0	0
3	A	1	Total C O 6 3 3	0	0
3	B	1	Total C O 6 3 3	0	0
3	B	1	Total C O 6 3 3	0	0
3	B	1	Total C O 6 3 3	0	0
3	C	1	Total C O 6 3 3	0	0
3	C	1	Total C O 6 3 3	0	0
3	D	1	Total C O 6 3 3	0	0
3	D	1	Total C O 6 3 3	0	0
3	E	1	Total C O 6 3 3	0	0
3	E	1	Total C O 6 3 3	0	0
3	F	1	Total C O 6 3 3	0	0
3	F	1	Total C O 6 3 3	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	297	Total O 298 298	0	1
4	B	282	Total O 282 282	0	0
4	C	271	Total O 271 271	0	0
4	D	292	Total O 292 292	0	0
4	E	243	Total O 243 243	0	0
4	F	333	Total O 333 333	0	0

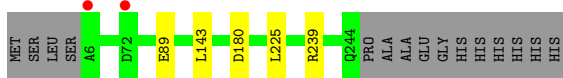
### 3 Residue-property plots

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: Putative enoyl-CoA hydratase/isomerase



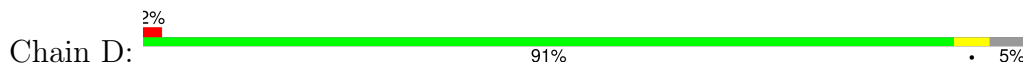
- Molecule 1: Putative enoyl-CoA hydratase/isomerase



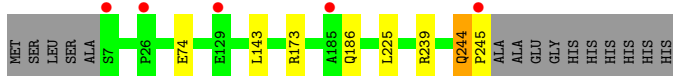
- Molecule 1: Putative enoyl-CoA hydratase/isomerase



- Molecule 1: Putative enoyl-CoA hydratase/isomerase

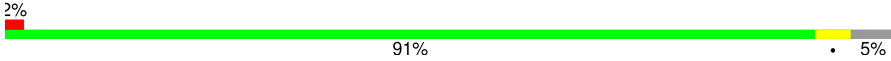


- Molecule 1: Putative enoyl-CoA hydratase/isomerase



- Molecule 1: Putative enoyl-CoA hydratase/isomerase



Chain F:  2% 91% 5%



## 4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	203.84Å 120.83Å 78.58Å 90.00° 110.37° 90.00°	Depositor
Resolution (Å)	20.00 – 1.76 46.71 – 1.76	Depositor EDS
% Data completeness (in resolution range)	98.7 (20.00-1.76) 98.6 (46.71-1.76)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.08	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.36 (at 1.76Å)	Xtrriage
Refinement program	REFMAC 5.3.0034	Depositor
R, $R_{free}$	0.166 , 0.208 0.166 , 0.207	Depositor DCC
$R_{free}$ test set	5225 reflections (3.01%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	24.6	Xtrriage
Anisotropy	0.153	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.35 , 54.7	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.015 for -h-2*1,-k,l	Xtrriage
$F_o, F_c$ correlation	0.97	EDS
Total number of atoms	13353	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	28.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.46% of the height of the origin peak. No significant pseudotranslation is detected.*

<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: GOL, 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	0.55	0/1989	0.63	0/2689
1	B	0.54	0/1968	0.61	0/2662
1	C	0.52	0/2007	0.60	0/2714
1	D	0.55	0/2016	0.60	0/2726
1	E	0.49	0/1980	0.61	0/2679
1	F	0.57	0/2007	0.61	0/2715
All	All	0.54	0/11967	0.61	0/16185

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 [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	1914	0	1945	6	0
1	B	1899	0	1928	3	0
1	C	1925	0	1961	6	0
1	D	1937	0	1970	7	0
1	E	1907	0	1936	9	0
1	F	1931	0	1963	7	0
2	A	8	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	7	0	0	0	0
2	C	6	0	0	0	0
2	D	9	0	0	1	0
2	E	8	0	0	0	0
2	F	5	0	0	0	0
3	A	12	0	16	0	0
3	B	18	0	24	0	0
3	C	12	0	16	1	0
3	D	12	0	16	0	0
3	E	12	0	16	0	0
3	F	12	0	16	0	0
4	A	298	0	0	0	0
4	B	282	0	0	1	0
4	C	271	0	0	2	0
4	D	292	0	0	0	0
4	E	243	0	0	2	0
4	F	333	0	0	2	0
All	All	13353	0	11807	39	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.

All (39) 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:E:244:GLN:CG	1:E:245:PRO:HD2	1.98	0.93
1:E:244:GLN:CB	1:E:245:PRO:HD2	2.06	0.85
1:F:143:LEU:HD13	1:F:225[B]:LEU:HD13	1.76	0.66
1:F:107:HIS:HD2	4:F:678:HOH:O	1.79	0.65
1:C:15[B]:ARG:HD2	4:C:859:HOH:O	2.00	0.62
1:A:143:LEU:HD13	1:A:225[B]:LEU:CD1	2.30	0.61
1:D:143:LEU:HD13	1:D:225[B]:LEU:HD13	1.83	0.60
1:E:244:GLN:HG3	1:E:245:PRO:HD2	1.83	0.57
1:D:135:PRO:HA	1:D:164:ALA:HB1	1.86	0.56
1:E:143:LEU:HD13	1:E:225[B]:LEU:HD13	1.88	0.55
1:E:244:GLN:O	1:E:245:PRO:C	2.48	0.51
1:C:15[B]:ARG:HB2	1:C:16:PRO:CD	2.40	0.51
1:F:231:GLN:HB2	1:F:237[A]:ARG:NH2	2.26	0.51
1:E:74[A]:GLU:OE2	1:E:239[A]:ARG:NE	2.43	0.50
1:B:239[A]:ARG:NH2	4:B:1291:HOH:O	2.45	0.50
1:C:15[A]:ARG:HB3	1:C:16:PRO:CD	2.41	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:173:ARG:HD2	4:E:1187:HOH:O	2.12	0.49
2:A:258:CL:CL	1:D:211[A]:ARG:NH2	2.72	0.49
1:D:244:GLN:HA	1:D:245:PRO:HD3	1.45	0.48
1:A:135:PRO:HA	1:A:164:ALA:HB1	1.95	0.48
1:C:89:GLU:HB2	1:C:225[B]:LEU:HD22	1.95	0.47
1:A:89:GLU:HB2	1:A:225[B]:LEU:HD13	1.95	0.47
1:F:231:GLN:HB2	1:F:237[A]:ARG:HH22	1.79	0.46
1:C:135:PRO:HA	1:C:164:ALA:HB1	1.98	0.46
1:B:143:LEU:HD13	1:B:225[B]:LEU:CD1	2.46	0.45
1:E:239[B]:ARG:NH1	4:E:1363:HOH:O	2.49	0.45
3:C:262:GOL:H12	4:C:1823:HOH:O	2.14	0.45
1:D:241:TYR:O	1:D:244:GLN:HB2	2.16	0.45
1:F:156:GLN:NE2	4:F:1753:HOH:O	2.45	0.44
1:C:15[B]:ARG:HB2	1:C:16:PRO:HD3	2.00	0.44
1:A:140:GLY:O	1:A:228:SER:HB2	2.18	0.44
1:F:244:GLN:HA	1:F:245:PRO:HD3	1.92	0.43
1:A:143:LEU:HD13	1:A:225[B]:LEU:HD12	2.01	0.43
1:E:244:GLN:HG2	1:E:245:PRO:HD2	1.91	0.42
1:F:140:GLY:O	1:F:228:SER:HB2	2.21	0.41
1:B:89:GLU:HB2	1:B:225[B]:LEU:HD13	2.02	0.41
1:D:89:GLU:HB2	1:D:225[B]:LEU:HD22	2.03	0.40
1:A:87:ARG:HA	1:A:87:ARG:HD2	1.94	0.40
1:D:78[A]:GLU:HG2	2:D:262:CL:CL	2.58	0.40

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	251/254 (99%)	248 (99%)	3 (1%)	0	100 100
1	B	248/254 (98%)	245 (99%)	3 (1%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	C	252/254 (99%)	248 (98%)	4 (2%)	0	100	100
1	D	254/254 (100%)	251 (99%)	3 (1%)	0	100	100
1	E	249/254 (98%)	246 (99%)	3 (1%)	0	100	100
1	F	253/254 (100%)	249 (98%)	4 (2%)	0	100	100
All	All	1507/1524 (99%)	1487 (99%)	20 (1%)	0	100	100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains [i](#)

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	191/189 (101%)	191 (100%)	0	100	100
1	B	188/189 (100%)	187 (100%)	1 (0%)	88	83
1	C	193/189 (102%)	189 (98%)	4 (2%)	53	31
1	D	194/189 (103%)	193 (100%)	1 (0%)	88	83
1	E	190/189 (100%)	188 (99%)	2 (1%)	73	60
1	F	193/189 (102%)	191 (99%)	2 (1%)	76	63
All	All	1149/1134 (101%)	1139 (99%)	10 (1%)	84	67

All (10) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	180	ASP
1	C	78[A]	GLU
1	C	78[B]	GLU
1	C	155	ASP
1	C	170	ASP
1	D	244	GLN
1	E	186	GLN
1	E	244	GLN
1	F	211[A]	ARG

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Mol	Chain	Res	Type
1	F	211[B]	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	186	GLN
1	B	156	GLN
1	D	156	GLN
1	F	107	HIS
1	F	156	GLN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 56 ligands modelled in this entry, 43 are monoatomic - leaving 13 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
3	GOL	F	260	-	5,5,5	0.30	0	5,5,5	0.49	0
3	GOL	C	1	-	5,5,5	0.34	0	5,5,5	0.40	0
3	GOL	B	264	-	5,5,5	0.38	0	5,5,5	0.29	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
3	GOL	A	264	-	5,5,5	0.30	0	5,5,5	0.42	0
3	GOL	E	262	-	5,5,5	0.39	0	5,5,5	0.30	0
3	GOL	B	263	-	5,5,5	0.38	0	5,5,5	0.19	0
3	GOL	B	1	-	5,5,5	0.41	0	5,5,5	0.44	0
3	GOL	E	1	-	5,5,5	0.40	0	5,5,5	0.42	0
3	GOL	A	1	-	5,5,5	0.30	0	5,5,5	0.41	0
3	GOL	F	258	-	5,5,5	0.32	0	5,5,5	0.33	0
3	GOL	C	262	-	5,5,5	0.37	0	5,5,5	0.25	0
3	GOL	D	263	-	5,5,5	0.36	0	5,5,5	0.41	0
3	GOL	D	1	-	5,5,5	0.32	0	5,5,5	0.42	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	GOL	F	260	-	-	3/4/4/4	-
3	GOL	C	1	-	-	3/4/4/4	-
3	GOL	B	264	-	-	4/4/4/4	-
3	GOL	A	264	-	-	4/4/4/4	-
3	GOL	E	262	-	-	2/4/4/4	-
3	GOL	B	263	-	-	1/4/4/4	-
3	GOL	B	1	-	-	3/4/4/4	-
3	GOL	E	1	-	-	0/4/4/4	-
3	GOL	A	1	-	-	2/4/4/4	-
3	GOL	F	258	-	-	2/4/4/4	-
3	GOL	C	262	-	-	2/4/4/4	-
3	GOL	D	263	-	-	4/4/4/4	-
3	GOL	D	1	-	-	2/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (32) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	264	GOL	O1-C1-C2-O2

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Mol	Chain	Res	Type	Atoms
3	A	264	GOL	O1-C1-C2-C3
3	B	1	GOL	O1-C1-C2-C3
3	B	264	GOL	C1-C2-C3-O3
3	C	1	GOL	O1-C1-C2-C3
3	C	262	GOL	O1-C1-C2-C3
3	D	263	GOL	O1-C1-C2-C3
3	D	263	GOL	C1-C2-C3-O3
3	E	262	GOL	O1-C1-C2-C3
3	F	258	GOL	C1-C2-C3-O3
3	C	1	GOL	O1-C1-C2-O2
3	C	262	GOL	O1-C1-C2-O2
3	D	263	GOL	O1-C1-C2-O2
3	A	1	GOL	C1-C2-C3-O3
3	A	264	GOL	C1-C2-C3-O3
3	B	263	GOL	C1-C2-C3-O3
3	B	264	GOL	O1-C1-C2-C3
3	D	1	GOL	O1-C1-C2-C3
3	F	260	GOL	O1-C1-C2-C3
3	B	1	GOL	O1-C1-C2-O2
3	B	264	GOL	O1-C1-C2-O2
3	B	264	GOL	O2-C2-C3-O3
3	D	263	GOL	O2-C2-C3-O3
3	E	262	GOL	O1-C1-C2-O2
3	D	1	GOL	O1-C1-C2-O2
3	F	258	GOL	O2-C2-C3-O3
3	A	1	GOL	O2-C2-C3-O3
3	A	264	GOL	O2-C2-C3-O3
3	C	1	GOL	O2-C2-C3-O3
3	F	260	GOL	O1-C1-C2-O2
3	B	1	GOL	O2-C2-C3-O3
3	F	260	GOL	O2-C2-C3-O3

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	262	GOL	1	0

## 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 [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	240/254 (94%)	-0.46	3 (1%) 77 83	15, 22, 38, 79	0
1	B	239/254 (94%)	-0.61	2 (0%) 86 90	15, 23, 44, 72	0
1	C	239/254 (94%)	-0.41	6 (2%) 57 63	17, 25, 46, 95	0
1	D	242/254 (95%)	-0.31	4 (1%) 70 77	15, 23, 41, 101	0
1	E	239/254 (94%)	-0.28	5 (2%) 63 71	16, 29, 50, 89	0
1	F	242/254 (95%)	-0.65	4 (1%) 70 77	14, 20, 35, 89	0
All	All	1441/1524 (94%)	-0.45	24 (1%) 70 77	14, 24, 45, 101	0

All (24) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	245	PRO	6.7
1	D	246	ALA	6.5
1	D	245	PRO	6.3
1	E	245	PRO	5.0
1	E	7	SER	4.1
1	C	7	SER	4.1
1	B	6	ALA	3.9
1	C	8	LEU	3.6
1	C	244	GLN	3.6
1	C	243	ALA	3.6
1	D	244	GLN	2.9
1	F	244	GLN	2.9
1	A	243	ALA	2.8
1	D	62[A]	ARG	2.8
1	A	244	GLN	2.8
1	A	5	SER	2.6
1	E	26	PRO	2.4
1	C	72	ASP	2.3
1	C	245	PRO	2.3

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Mol	Chain	Res	Type	RSRZ
1	B	72	ASP	2.1
1	E	185	ALA	2.1
1	F	72	ASP	2.0
1	F	4	LEU	2.0
1	E	129[A]	GLU	2.0

## 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 monosaccharides 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. 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	B-factors(Å <sup>2</sup> )	Q<0.9
2	CL	E	264	1/1	0.87	0.06	65,65,65,65	0
3	GOL	B	1	6/6	0.88	0.12	30,51,60,63	0
3	GOL	B	264	6/6	0.88	0.16	38,49,56,67	0
3	GOL	C	262	6/6	0.88	0.12	55,62,62,66	0
3	GOL	F	260	6/6	0.90	0.14	34,47,49,59	0
2	CL	E	258	1/1	0.91	0.09	47,47,47,47	0
3	GOL	A	264	6/6	0.91	0.15	42,46,47,53	0
3	GOL	F	258	6/6	0.92	0.14	30,34,42,45	0
2	CL	B	259	1/1	0.93	0.05	42,42,42,42	0
3	GOL	D	263	6/6	0.94	0.12	46,49,53,56	0
3	GOL	E	1	6/6	0.94	0.15	36,55,62,63	0
3	GOL	E	262	6/6	0.94	0.09	53,60,62,64	0
2	CL	C	260	1/1	0.94	0.07	40,40,40,40	0
2	CL	D	265	1/1	0.94	0.09	51,51,51,51	0
3	GOL	B	263	6/6	0.95	0.09	41,48,50,51	0
2	CL	D	258	1/1	0.95	0.04	42,42,42,42	0
2	CL	D	262	1/1	0.95	0.14	50,50,50,50	0
2	CL	E	263	1/1	0.95	0.13	49,49,49,49	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
3	GOL	A	1	6/6	0.96	0.13	30,43,47,47	0
3	GOL	C	1	6/6	0.96	0.09	32,51,55,60	0
3	GOL	D	1	6/6	0.97	0.11	29,42,45,47	0
2	CL	C	261	1/1	0.97	0.09	40,40,40,40	0
2	CL	A	261	1/1	0.97	0.03	32,32,32,32	0
2	CL	F	257	1/1	0.97	0.04	35,35,35,35	0
2	CL	D	261	1/1	0.97	0.07	37,37,37,37	0
2	CL	E	261	1/1	0.97	0.04	39,39,39,39	0
2	CL	A	258	1/1	0.98	0.07	31,31,31,31	0
2	CL	A	263	1/1	0.98	0.02	35,35,35,35	0
2	CL	B	258	1/1	0.98	0.04	30,30,30,30	0
2	CL	A	260	1/1	0.98	0.04	39,39,39,39	0
2	CL	C	256	1/1	0.98	0.06	32,32,32,32	0
2	CL	C	257	1/1	0.98	0.04	35,35,35,35	0
2	CL	F	1	1/1	0.99	0.04	25,25,25,25	0
2	CL	D	257	1/1	0.99	0.04	28,28,28,28	0
2	CL	F	259	1/1	0.99	0.04	28,28,28,28	0
2	CL	B	261	1/1	0.99	0.03	32,32,32,32	0
2	CL	D	260	1/1	0.99	0.03	31,31,31,31	0
2	CL	B	262	1/1	0.99	0.03	34,34,34,34	0
2	CL	A	259	1/1	0.99	0.04	29,29,29,29	0
2	CL	A	257	1/1	0.99	0.03	27,27,27,27	0
2	CL	E	256	1/1	0.99	0.04	34,34,34,34	0
2	CL	E	257	1/1	0.99	0.05	38,38,38,38	0
2	CL	C	258	1/1	0.99	0.05	26,26,26,26	0
2	CL	E	259	1/1	0.99	0.03	31,31,31,31	0
2	CL	E	260	1/1	0.99	0.03	31,31,31,31	0
2	CL	A	256	1/1	0.99	0.04	30,30,30,30	0
2	CL	B	260	1/1	0.99	0.03	30,30,30,30	0
2	CL	D	256	1/1	0.99	0.03	28,28,28,28	0
2	CL	C	259	1/1	1.00	0.03	34,34,34,34	0
2	CL	D	264	1/1	1.00	0.03	28,28,28,28	0
2	CL	F	261	1/1	1.00	0.04	29,29,29,29	0
2	CL	B	257	1/1	1.00	0.05	28,28,28,28	0
2	CL	D	259	1/1	1.00	0.02	28,28,28,28	0
2	CL	A	262	1/1	1.00	0.03	30,30,30,30	0
2	CL	B	256	1/1	1.00	0.03	27,27,27,27	0
2	CL	F	256	1/1	1.00	0.04	24,24,24,24	0

## 6.5 Other polymers

There are no such residues in this entry.