



# Full wwPDB X-ray Structure Validation Report ⓘ

Jun 17, 2024 – 09:25 PM EDT

PDB ID : 5WQF  
Title : Structure of fungal meroterpenoid isomerase Trt14  
Authors : Mori, T.; Iwabuchi, T.; Matsuda, Y.; Abe, I.  
Deposited on : 2016-11-26  
Resolution : 2.00 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 : 1.8.5 (274361), CSD as541be (2020)  
Xtrriage (Phenix) : 1.13  
EDS : 2.37.1  
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) : 2.37.1

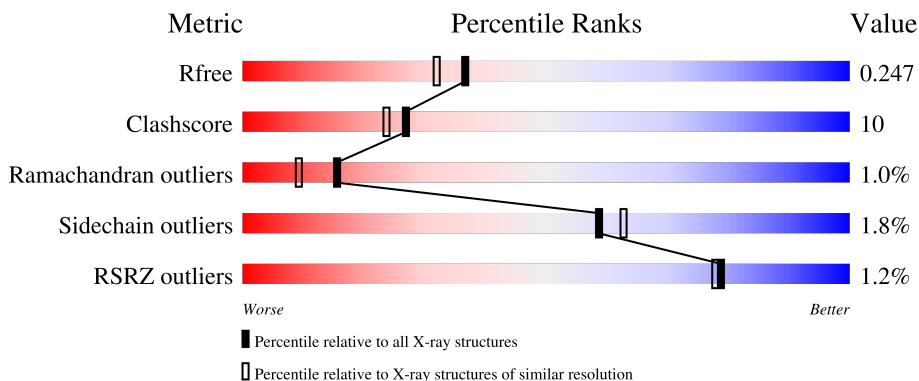
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.00 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.



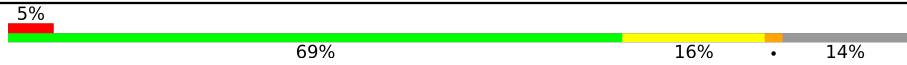
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	8085 (2.00-2.00)
Clashscore	141614	9178 (2.00-2.00)
Ramachandran outliers	138981	9054 (2.00-2.00)
Sidechain outliers	138945	9053 (2.00-2.00)
RSRZ outliers	127900	7900 (2.00-2.00)

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	162	
1	B	162	
1	C	162	
1	D	162	
1	E	162	

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Mol	Chain	Length	Quality of chain
1	F	162	 <p>A horizontal bar chart representing the quality of chain. The bar is divided into four segments: a small red segment at the beginning labeled '5%', a large green segment labeled '69%', a yellow segment labeled '16%', and a grey segment at the end labeled '14%'. A small black dot is visible on the grey segment.</p>

## 2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 6996 atoms, of which 24 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 Isomerase trt14.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	138	1101	694	186	216	5	0	0	0
1	B	139	1108	701	184	218	5	0	0	0
1	C	139	1108	698	187	218	5	0	0	0
1	D	139	1108	698	187	218	5	0	0	0
1	E	138	1101	694	186	216	5	0	0	0
1	F	140	1119	707	188	219	5	0	0	0

There are 120 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-19	MET	-	expression tag	UNP Q0C8A2
A	-18	GLY	-	expression tag	UNP Q0C8A2
A	-17	SER	-	expression tag	UNP Q0C8A2
A	-16	SER	-	expression tag	UNP Q0C8A2
A	-15	HIS	-	expression tag	UNP Q0C8A2
A	-14	HIS	-	expression tag	UNP Q0C8A2
A	-13	HIS	-	expression tag	UNP Q0C8A2
A	-12	HIS	-	expression tag	UNP Q0C8A2
A	-11	HIS	-	expression tag	UNP Q0C8A2
A	-10	HIS	-	expression tag	UNP Q0C8A2
A	-9	SER	-	expression tag	UNP Q0C8A2
A	-8	SER	-	expression tag	UNP Q0C8A2
A	-7	GLY	-	expression tag	UNP Q0C8A2
A	-6	LEU	-	expression tag	UNP Q0C8A2
A	-5	VAL	-	expression tag	UNP Q0C8A2
A	-4	PRO	-	expression tag	UNP Q0C8A2
A	-3	ARG	-	expression tag	UNP Q0C8A2

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-2	GLY	-	expression tag	UNP Q0C8A2
A	-1	SER	-	expression tag	UNP Q0C8A2
A	0	HIS	-	expression tag	UNP Q0C8A2
B	-19	MET	-	expression tag	UNP Q0C8A2
B	-18	GLY	-	expression tag	UNP Q0C8A2
B	-17	SER	-	expression tag	UNP Q0C8A2
B	-16	SER	-	expression tag	UNP Q0C8A2
B	-15	HIS	-	expression tag	UNP Q0C8A2
B	-14	HIS	-	expression tag	UNP Q0C8A2
B	-13	HIS	-	expression tag	UNP Q0C8A2
B	-12	HIS	-	expression tag	UNP Q0C8A2
B	-11	HIS	-	expression tag	UNP Q0C8A2
B	-10	HIS	-	expression tag	UNP Q0C8A2
B	-9	SER	-	expression tag	UNP Q0C8A2
B	-8	SER	-	expression tag	UNP Q0C8A2
B	-7	GLY	-	expression tag	UNP Q0C8A2
B	-6	LEU	-	expression tag	UNP Q0C8A2
B	-5	VAL	-	expression tag	UNP Q0C8A2
B	-4	PRO	-	expression tag	UNP Q0C8A2
B	-3	ARG	-	expression tag	UNP Q0C8A2
B	-2	GLY	-	expression tag	UNP Q0C8A2
B	-1	SER	-	expression tag	UNP Q0C8A2
B	0	HIS	-	expression tag	UNP Q0C8A2
C	-19	MET	-	expression tag	UNP Q0C8A2
C	-18	GLY	-	expression tag	UNP Q0C8A2
C	-17	SER	-	expression tag	UNP Q0C8A2
C	-16	SER	-	expression tag	UNP Q0C8A2
C	-15	HIS	-	expression tag	UNP Q0C8A2
C	-14	HIS	-	expression tag	UNP Q0C8A2
C	-13	HIS	-	expression tag	UNP Q0C8A2
C	-12	HIS	-	expression tag	UNP Q0C8A2
C	-11	HIS	-	expression tag	UNP Q0C8A2
C	-10	HIS	-	expression tag	UNP Q0C8A2
C	-9	SER	-	expression tag	UNP Q0C8A2
C	-8	SER	-	expression tag	UNP Q0C8A2
C	-7	GLY	-	expression tag	UNP Q0C8A2
C	-6	LEU	-	expression tag	UNP Q0C8A2
C	-5	VAL	-	expression tag	UNP Q0C8A2
C	-4	PRO	-	expression tag	UNP Q0C8A2
C	-3	ARG	-	expression tag	UNP Q0C8A2
C	-2	GLY	-	expression tag	UNP Q0C8A2
C	-1	SER	-	expression tag	UNP Q0C8A2

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Chain	Residue	Modelled	Actual	Comment	Reference
C	0	HIS	-	expression tag	UNP Q0C8A2
D	-19	MET	-	expression tag	UNP Q0C8A2
D	-18	GLY	-	expression tag	UNP Q0C8A2
D	-17	SER	-	expression tag	UNP Q0C8A2
D	-16	SER	-	expression tag	UNP Q0C8A2
D	-15	HIS	-	expression tag	UNP Q0C8A2
D	-14	HIS	-	expression tag	UNP Q0C8A2
D	-13	HIS	-	expression tag	UNP Q0C8A2
D	-12	HIS	-	expression tag	UNP Q0C8A2
D	-11	HIS	-	expression tag	UNP Q0C8A2
D	-10	HIS	-	expression tag	UNP Q0C8A2
D	-9	SER	-	expression tag	UNP Q0C8A2
D	-8	SER	-	expression tag	UNP Q0C8A2
D	-7	GLY	-	expression tag	UNP Q0C8A2
D	-6	LEU	-	expression tag	UNP Q0C8A2
D	-5	VAL	-	expression tag	UNP Q0C8A2
D	-4	PRO	-	expression tag	UNP Q0C8A2
D	-3	ARG	-	expression tag	UNP Q0C8A2
D	-2	GLY	-	expression tag	UNP Q0C8A2
D	-1	SER	-	expression tag	UNP Q0C8A2
D	0	HIS	-	expression tag	UNP Q0C8A2
E	-19	MET	-	expression tag	UNP Q0C8A2
E	-18	GLY	-	expression tag	UNP Q0C8A2
E	-17	SER	-	expression tag	UNP Q0C8A2
E	-16	SER	-	expression tag	UNP Q0C8A2
E	-15	HIS	-	expression tag	UNP Q0C8A2
E	-14	HIS	-	expression tag	UNP Q0C8A2
E	-13	HIS	-	expression tag	UNP Q0C8A2
E	-12	HIS	-	expression tag	UNP Q0C8A2
E	-11	HIS	-	expression tag	UNP Q0C8A2
E	-10	HIS	-	expression tag	UNP Q0C8A2
E	-9	SER	-	expression tag	UNP Q0C8A2
E	-8	SER	-	expression tag	UNP Q0C8A2
E	-7	GLY	-	expression tag	UNP Q0C8A2
E	-6	LEU	-	expression tag	UNP Q0C8A2
E	-5	VAL	-	expression tag	UNP Q0C8A2
E	-4	PRO	-	expression tag	UNP Q0C8A2
E	-3	ARG	-	expression tag	UNP Q0C8A2
E	-2	GLY	-	expression tag	UNP Q0C8A2
E	-1	SER	-	expression tag	UNP Q0C8A2
E	0	HIS	-	expression tag	UNP Q0C8A2
F	-19	MET	-	expression tag	UNP Q0C8A2

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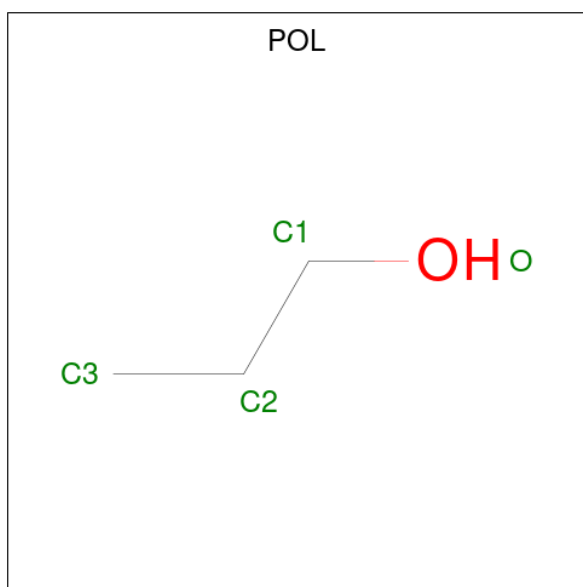
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Chain	Residue	Modelled	Actual	Comment	Reference
F	-18	GLY	-	expression tag	UNP Q0C8A2
F	-17	SER	-	expression tag	UNP Q0C8A2
F	-16	SER	-	expression tag	UNP Q0C8A2
F	-15	HIS	-	expression tag	UNP Q0C8A2
F	-14	HIS	-	expression tag	UNP Q0C8A2
F	-13	HIS	-	expression tag	UNP Q0C8A2
F	-12	HIS	-	expression tag	UNP Q0C8A2
F	-11	HIS	-	expression tag	UNP Q0C8A2
F	-10	HIS	-	expression tag	UNP Q0C8A2
F	-9	SER	-	expression tag	UNP Q0C8A2
F	-8	SER	-	expression tag	UNP Q0C8A2
F	-7	GLY	-	expression tag	UNP Q0C8A2
F	-6	LEU	-	expression tag	UNP Q0C8A2
F	-5	VAL	-	expression tag	UNP Q0C8A2
F	-4	PRO	-	expression tag	UNP Q0C8A2
F	-3	ARG	-	expression tag	UNP Q0C8A2
F	-2	GLY	-	expression tag	UNP Q0C8A2
F	-1	SER	-	expression tag	UNP Q0C8A2
F	0	HIS	-	expression tag	UNP Q0C8A2

- Molecule 2 is CALCIUM ION (three-letter code: CA) (formula: Ca).

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

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



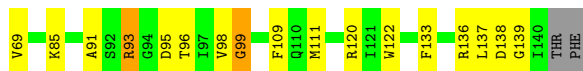
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	H	O	0	0
			12	3	8	1		
3	C	1	Total	C	H	O	0	0
			12	3	8	1		
3	D	1	Total	C	H	O	0	0
			12	3	8	1		

- Molecule 4 is water.

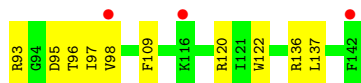
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	82	Total	O	0	0
			82	82		
4	B	89	Total	O	0	0
			89	89		
4	C	54	Total	O	0	0
			54	54		
4	D	26	Total	O	0	0
			26	26		
4	E	34	Total	O	0	0
			34	34		
4	F	21	Total	O	0	0
			21	21		







- Molecule 1: Isomerase trt14



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	100.61Å 47.66Å 121.44Å 90.00° 108.07° 90.00°	Depositor
Resolution (Å)	47.82 – 2.00 47.82 – 2.00	Depositor EDS
% Data completeness (in resolution range)	98.5 (47.82-2.00) 98.5 (47.82-2.00)	Depositor EDS
$R_{merge}$	0.05	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.42 (at 2.00Å)	Xtrriage
Refinement program	PHENIX (1.10.1_2155: ???)	Depositor
R, $R_{free}$	0.214 , 0.247 0.214 , 0.247	Depositor DCC
$R_{free}$ test set	3677 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	34.6	Xtrriage
Anisotropy	0.643	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 44.7	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	6996	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	44.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.44% 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: POL, CA

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	0.45	0/1121	0.57	0/1515
1	B	0.42	0/1128	0.56	0/1524
1	C	0.37	0/1128	0.55	0/1525
1	D	0.35	0/1128	0.51	0/1525
1	E	0.35	0/1121	0.53	0/1515
1	F	0.33	0/1140	0.50	0/1541
All	All	0.38	0/6766	0.54	0/9145

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	1101	0	1078	14	0
1	B	1108	0	1080	7	0
1	C	1108	0	1085	21	0
1	D	1108	0	1085	28	0
1	E	1101	0	1078	36	0
1	F	1119	0	1094	31	0
2	A	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	2	0	0	0	0
2	C	2	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	4	8	8	0	0
3	C	4	8	8	1	0
3	D	4	8	8	3	0
4	A	82	0	0	2	0
4	B	89	0	0	0	0
4	C	54	0	0	1	0
4	D	26	0	0	1	0
4	E	34	0	0	0	0
4	F	21	0	0	1	0
All	All	6972	24	6524	134	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 10.

All (134) 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:96:THR:HG22	1:A:98:VAL:H	1.14	1.05
1:F:4:THR:HG23	1:F:7:ASP:H	1.32	0.94
1:A:96:THR:HB	1:A:99:GLY:O	1.67	0.93
1:D:96:THR:HG22	1:D:99:GLY:O	1.68	0.93
1:C:4:THR:HG23	1:C:7:ASP:H	1.34	0.91
1:C:44:ARG:HG3	1:C:130:MET:CE	2.01	0.90
1:D:28:ILE:HD11	1:D:50:ILE:HB	1.53	0.90
1:E:28:ILE:HG21	1:E:50:ILE:HG23	1.55	0.89
1:D:76:ASP:HB3	3:D:202:POL:H33	1.55	0.88
1:E:63:VAL:HG12	1:E:96:THR:HG23	1.59	0.84
1:F:98:VAL:HG11	1:F:136:ARG:HB3	1.62	0.81
1:F:65:LYS:N	1:F:95:ASP:O	2.13	0.80
1:E:96:THR:HG21	1:E:133:PHE:HZ	1.49	0.78
1:E:98:VAL:HG12	1:E:99:GLY:H	1.49	0.76
1:D:6:GLU:HG2	1:F:93:ARG:HG2	1.68	0.76
1:C:44:ARG:HG3	1:C:130:MET:HE1	1.66	0.76
1:E:98:VAL:HG12	1:E:99:GLY:N	2.03	0.74
1:F:18:LYS:HB2	1:F:18:LYS:NZ	2.04	0.73
1:F:98:VAL:CG1	1:F:136:ARG:HB3	2.19	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:96:THR:HG23	1:D:98:VAL:H	1.54	0.71
1:A:96:THR:HG22	1:A:98:VAL:N	1.98	0.71
1:E:96:THR:HG21	1:E:133:PHE:CZ	2.26	0.71
1:E:98:VAL:HG11	1:E:136:ARG:HB3	1.72	0.70
1:C:4:THR:HG22	1:C:7:ASP:OD2	1.92	0.70
1:F:81:GLU:HG3	4:F:314:HOH:O	1.92	0.68
1:E:98:VAL:CG1	1:E:99:GLY:H	2.06	0.67
1:A:132:GLU:OE2	1:A:136:ARG:HD2	1.94	0.67
1:F:98:VAL:HG11	1:F:136:ARG:CB	2.24	0.67
1:D:28:ILE:HD11	1:D:50:ILE:CB	2.24	0.66
1:F:98:VAL:O	1:F:98:VAL:HG12	1.96	0.65
1:E:4:THR:HG22	1:E:7:ASP:OD2	1.97	0.65
1:D:25:GLU:HA	1:D:28:ILE:HG22	1.79	0.65
1:B:36:VAL:CG1	1:B:47:THR:HG23	2.28	0.64
1:C:4:THR:HG22	1:C:7:ASP:CG	2.18	0.63
1:E:28:ILE:CG2	1:E:50:ILE:HG23	2.28	0.63
1:A:96:THR:CG2	1:A:98:VAL:H	2.02	0.63
1:A:96:THR:CG2	1:A:98:VAL:HG22	2.31	0.61
1:F:98:VAL:HG21	1:F:137:LEU:HD23	1.83	0.60
1:C:44:ARG:HG3	1:C:130:MET:HE3	1.82	0.60
1:E:98:VAL:CG1	1:E:99:GLY:N	2.64	0.60
1:D:89:TYR:HB2	3:D:202:POL:H31	1.82	0.60
1:F:4:THR:HG22	1:F:7:ASP:CG	2.22	0.59
1:E:48:ARG:HA	1:E:52:GLU:OE1	2.03	0.59
1:D:28:ILE:CD1	1:D:50:ILE:HB	2.29	0.58
1:E:96:THR:HG22	1:E:98:VAL:H	1.69	0.58
1:D:87:VAL:HG22	1:D:108:ILE:HG12	1.86	0.57
1:E:4:THR:HG22	1:E:7:ASP:CG	2.25	0.57
1:E:28:ILE:HG21	1:E:50:ILE:CG2	2.31	0.57
1:F:18:LYS:HB2	1:F:18:LYS:HZ1	1.68	0.57
1:C:36:VAL:CG1	1:C:47:THR:HG23	2.35	0.57
1:D:36:VAL:CG1	1:D:47:THR:HG23	2.35	0.57
1:F:38:HIS:HD1	1:F:47:THR:HG22	1.68	0.57
1:D:96:THR:HG23	1:D:98:VAL:N	2.20	0.57
1:E:4:THR:HG23	1:E:7:ASP:H	1.70	0.56
1:B:36:VAL:HG11	1:B:47:THR:HG23	1.85	0.56
1:E:4:THR:HG23	1:E:6:GLU:N	2.21	0.56
1:F:30:VAL:HG12	1:F:30:VAL:O	2.06	0.56
1:D:6:GLU:CG	1:F:93:ARG:HG2	2.34	0.56
1:D:32:THR:HB	1:D:33:PRO:HD2	1.87	0.55
1:E:28:ILE:HG22	1:E:28:ILE:O	2.06	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:85:LYS:HA	1:D:109:PHE:O	2.07	0.55
1:E:96:THR:O	1:E:98:VAL:O	2.25	0.54
1:C:4:THR:CG2	1:C:7:ASP:H	2.15	0.54
1:C:76:ASP:HB3	3:C:203:POL:H12	1.90	0.54
1:E:5:ARG:HD3	1:F:82:ARG:NH1	2.23	0.54
1:F:98:VAL:HG12	1:F:136:ARG:HD2	1.90	0.54
1:D:57:CYS:O	1:D:61:LYS:HG3	2.08	0.53
1:F:65:LYS:HE2	1:F:97:ILE:HG22	1.89	0.53
1:F:120:ARG:HD2	1:F:122:TRP:CH2	2.43	0.53
1:F:85:LYS:HA	1:F:109:PHE:O	2.09	0.53
1:E:4:THR:HG23	1:E:6:GLU:H	1.73	0.52
1:A:139:GLY:C	1:A:140:ILE:HG13	2.30	0.52
1:F:19:TYR:CE1	1:F:27:ILE:HG13	2.44	0.52
1:F:97:ILE:HG13	1:F:98:VAL:HG23	1.90	0.52
1:D:21:GLU:HB2	1:D:26:SER:HB2	1.90	0.52
1:D:72:ILE:O	1:D:72:ILE:HG13	2.09	0.52
1:E:27:ILE:HD13	1:E:57:CYS:HB2	1.93	0.51
1:B:36:VAL:HG11	1:B:47:THR:CG2	2.40	0.51
1:F:64:PHE:CD1	1:F:96:THR:HG22	2.45	0.51
1:C:39:ARG:HD3	1:C:125:PHE:CE2	2.46	0.50
1:E:85:LYS:HA	1:E:109:PHE:O	2.12	0.50
1:C:28:ILE:HD13	1:C:54:MET:SD	2.53	0.49
1:C:85:LYS:HA	1:C:109:PHE:O	2.12	0.49
1:E:120:ARG:HD3	1:E:122:TRP:CH2	2.47	0.49
1:C:65:LYS:NZ	4:C:303:HOH:O	2.46	0.49
1:D:141:THR:O	1:D:141:THR:HG23	2.13	0.48
1:E:4:THR:CG2	1:E:7:ASP:H	2.26	0.48
1:E:50:ILE:O	1:E:54:MET:HG3	2.14	0.48
1:A:85:LYS:HA	1:A:109:PHE:O	2.14	0.48
1:F:96:THR:C	1:F:98:VAL:H	2.18	0.48
1:E:63:VAL:O	1:E:96:THR:HA	2.14	0.47
1:A:113:GLU:HG3	4:A:322:HOH:O	2.13	0.47
1:E:65:LYS:N	1:E:95:ASP:O	2.44	0.47
1:C:30:VAL:HG12	1:C:30:VAL:O	2.14	0.47
1:F:20:ASN:OD1	1:F:69:VAL:N	2.29	0.47
1:F:120:ARG:HD2	1:F:122:TRP:CZ2	2.49	0.47
1:E:137:LEU:O	1:E:139:GLY:N	2.49	0.46
1:F:27:ILE:HG22	1:F:28:ILE:HG23	1.97	0.46
1:A:40:LEU:O	1:A:41:PHE:HB2	2.16	0.46
1:A:81:GLU:HG3	4:A:344:HOH:O	2.15	0.45
1:F:28:ILE:C	1:F:28:ILE:HD12	2.37	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:68:THR:HB	1:E:93:ARG:HG3	1.99	0.45
1:B:78:ILE:HB	1:B:87:VAL:HB	1.99	0.45
1:D:21:GLU:HB2	1:D:26:SER:CB	2.47	0.45
1:F:4:THR:OG1	1:F:5:ARG:N	2.49	0.44
1:E:63:VAL:CG1	1:E:96:THR:HG23	2.38	0.44
1:E:133:PHE:HA	1:E:136:ARG:HD3	1.99	0.44
1:D:96:THR:HG21	1:D:133:PHE:CE1	2.53	0.44
1:E:36:VAL:HG23	1:E:38:HIS:NE2	2.33	0.44
1:B:85:LYS:HA	1:B:109:PHE:O	2.18	0.44
1:D:36:VAL:HG13	1:D:47:THR:HG23	1.99	0.44
1:D:96:THR:HG21	1:D:133:PHE:HE1	1.83	0.43
1:A:44:ARG:HA	1:A:44:ARG:HD3	1.72	0.43
1:C:18:LYS:HA	1:C:18:LYS:HD2	1.78	0.43
1:F:98:VAL:CG1	1:F:98:VAL:O	2.65	0.43
1:A:78:ILE:HB	1:A:87:VAL:HB	1.99	0.43
1:C:39:ARG:HD3	1:C:125:PHE:HE2	1.82	0.43
1:B:36:VAL:CG1	1:B:47:THR:CG2	2.94	0.43
1:C:27:ILE:HD13	1:C:57:CYS:HB2	2.01	0.43
1:D:18:LYS:O	1:D:21:GLU:HB2	2.19	0.42
1:D:50:ILE:HG13	1:D:51:GLY:N	2.34	0.42
3:D:202:POL:H32	4:D:301:HOH:O	2.20	0.42
1:D:78:ILE:HB	1:D:87:VAL:HB	2.02	0.42
1:C:78:ILE:HB	1:C:87:VAL:HB	2.02	0.41
1:A:13:LYS:HE2	1:A:71:VAL:HG21	2.02	0.41
1:B:40:LEU:O	1:B:41:PHE:HB2	2.20	0.41
1:C:44:ARG:CG	1:C:130:MET:HE1	2.45	0.41
1:C:69:VAL:HA	1:C:91:ALA:O	2.21	0.41
1:E:12:ALA:HB2	1:E:111:MET:CE	2.51	0.41
1:E:69:VAL:HA	1:E:91:ALA:O	2.20	0.41
1:E:22:PHE:O	1:E:61:LYS:HE3	2.20	0.41
1:C:71:VAL:HA	1:C:90:LEU:HD23	2.03	0.41
1:D:6:GLU:HG2	1:F:93:ARG:CG	2.45	0.40
1:D:28:ILE:HD11	1:D:50:ILE:CG2	2.50	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	136/162 (84%)	134 (98%)	1 (1%)	1 (1%)	22	16
1	B	135/162 (83%)	133 (98%)	1 (1%)	1 (1%)	22	16
1	C	137/162 (85%)	134 (98%)	2 (2%)	1 (1%)	22	16
1	D	137/162 (85%)	131 (96%)	5 (4%)	1 (1%)	22	16
1	E	136/162 (84%)	127 (93%)	6 (4%)	3 (2%)	6	2
1	F	138/162 (85%)	133 (96%)	4 (3%)	1 (1%)	22	16
All	All	819/972 (84%)	792 (97%)	19 (2%)	8 (1%)	15	9

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	138	ASP
1	B	41	PHE
1	F	41	PHE
1	A	41	PHE
1	C	41	PHE
1	D	41	PHE
1	E	41	PHE
1	E	99	GLY

### 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.

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	122/143 (85%)	121 (99%)	1 (1%)	81	86
1	B	123/143 (86%)	121 (98%)	2 (2%)	62	67
1	C	123/143 (86%)	121 (98%)	2 (2%)	62	67
1	D	123/143 (86%)	122 (99%)	1 (1%)	81	86
1	E	122/143 (85%)	119 (98%)	3 (2%)	47	49
1	F	124/143 (87%)	120 (97%)	4 (3%)	39	38
All	All	737/858 (86%)	724 (98%)	13 (2%)	59	63

All (13) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	93	ARG
1	B	106	ILE
1	B	130	MET
1	C	50	ILE
1	C	111	MET
1	D	72	ILE
1	E	25	GLU
1	E	61	LYS
1	E	93	ARG
1	F	4	THR
1	F	18	LYS
1	F	27	ILE
1	F	39	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

### 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 12 ligands modelled in this entry, 9 are monoatomic - leaving 3 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	POL	A	203	-	3,3,3	0.35	0	2,2,2	0.38	0
3	POL	C	203	-	3,3,3	0.39	0	2,2,2	0.20	0
3	POL	D	202	-	3,3,3	0.38	0	2,2,2	0.28	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	POL	A	203	-	-	0/1/1/1	-
3	POL	C	203	-	-	1/1/1/1	-
3	POL	D	202	-	-	1/1/1/1	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	C	203	POL	O-C1-C2-C3
3	D	202	POL	O-C1-C2-C3

There are no ring outliers.

2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	203	POL	1	0
3	D	202	POL	3	0

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

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	138/162 (85%)	-0.02	0 <span style="border: 1px solid blue; padding: 2px;">100</span> <span style="border: 1px solid blue; padding: 2px;">100</span>	26, 35, 50, 64	0
1	B	139/162 (85%)	0.09	1 (0%) <span style="border: 1px solid blue; padding: 2px;">87</span> <span style="border: 1px solid blue; padding: 2px;">87</span>	24, 36, 53, 75	0
1	C	139/162 (85%)	-0.27	0 <span style="border: 1px solid blue; padding: 2px;">100</span> <span style="border: 1px solid blue; padding: 2px;">100</span>	29, 42, 57, 66	0
1	D	139/162 (85%)	0.16	1 (0%) <span style="border: 1px solid blue; padding: 2px;">87</span> <span style="border: 1px solid blue; padding: 2px;">87</span>	32, 51, 65, 80	2 (1%)
1	E	138/162 (85%)	-0.13	0 <span style="border: 1px solid blue; padding: 2px;">100</span> <span style="border: 1px solid blue; padding: 2px;">100</span>	34, 47, 60, 72	0
1	F	140/162 (86%)	0.46	8 (5%) <span style="border: 1px solid red; padding: 2px;">23</span> <span style="border: 1px solid red; padding: 2px;">23</span>	36, 54, 71, 84	1 (0%)
All	All	833/972 (85%)	0.05	10 (1%) <span style="border: 1px solid blue; padding: 2px;">79</span> <span style="border: 1px solid blue; padding: 2px;">78</span>	24, 44, 64, 84	3 (0%)

All (10) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	50	ILE	3.9
1	F	22	PHE	3.4
1	B	43	THR	3.2
1	D	141	THR	3.2
1	F	17	ALA	3.0
1	F	66	SER	2.9
1	F	65	LYS	2.6
1	F	142	PHE	2.6
1	F	116	LYS	2.1
1	F	98	VAL	2.1

### 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	CA	C	202	1/1	0.65	0.07	84,84,84,84	0
2	CA	B	201	1/1	0.67	0.10	78,78,78,78	0
2	CA	F	201	1/1	0.78	0.07	77,77,77,77	0
2	CA	D	201	1/1	0.82	0.07	75,75,75,75	0
3	POL	D	202	4/4	0.86	0.17	40,48,53,53	0
2	CA	E	201	1/1	0.90	0.09	76,76,76,76	0
3	POL	C	203	4/4	0.92	0.09	35,42,54,54	0
3	POL	A	203	4/4	0.92	0.10	38,46,54,54	0
2	CA	A	202	1/1	0.94	0.14	55,55,55,55	0
2	CA	C	201	1/1	0.95	0.06	58,58,58,58	0
2	CA	A	201	1/1	0.97	0.09	47,47,47,47	0
2	CA	B	202	1/1	0.98	0.05	69,69,69,69	0

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

There are no such residues in this entry.