



# Full wwPDB X-ray Structure Validation Report ⓘ

Nov 14, 2023 – 06:51 PM JST

PDB ID : 6A09  
Title : Salmonella Typhi YfdX in the P222 space group  
Authors : Ku, B.; Lee, H.S.; Kim, S.J.  
Deposited on : 2018-06-05  
Resolution : 2.29 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  
Xtriage (Phenix) : 1.13  
EDS : 2.36  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.36

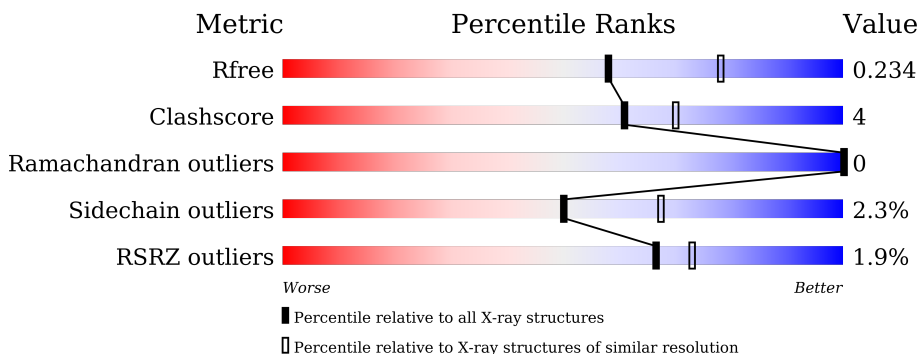
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.29 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.



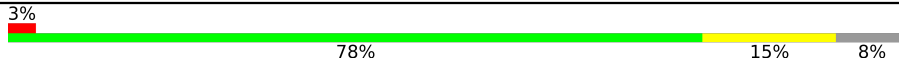

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	5042 (2.30-2.30)
Clashscore	141614	5643 (2.30-2.30)
Ramachandran outliers	138981	5575 (2.30-2.30)
Sidechain outliers	138945	5575 (2.30-2.30)
RSRZ outliers	127900	4938 (2.30-2.30)

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	185	 2% 85% 9% 4%
1	B	185	 2% 85% 8% 7%
1	C	185	 84% 8% 8%
1	D	185	 2% 83% 10% 7%
1	E	185	 81% 12% 7%
1	F	185	 4% 78% 15% 7%

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Mol	Chain	Length	Quality of chain
1	G	185	 3% 78% 15% 8%
1	H	185	 3% 81% 10% 8%

## 2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 11255 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 YfdX protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	174	Total 1352	C 837	N 235	O 275	S 5	0	0	0
1	B	172	Total 1335	C 827	N 233	O 271	S 4	0	0	0
1	C	171	Total 1328	C 823	N 232	O 269	S 4	0	0	0
1	D	172	Total 1335	C 827	N 233	O 271	S 4	0	0	0
1	E	172	Total 1335	C 827	N 233	O 271	S 4	0	0	0
1	F	172	Total 1335	C 827	N 233	O 271	S 4	0	0	0
1	G	171	Total 1328	C 823	N 232	O 269	S 4	0	0	0
1	H	170	Total 1320	C 819	N 231	O 266	S 4	0	0	0

There are 64 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	187	LEU	-	expression tag	UNP A0A0F7DJF1
A	188	GLU	-	expression tag	UNP A0A0F7DJF1
A	189	HIS	-	expression tag	UNP A0A0F7DJF1
A	190	HIS	-	expression tag	UNP A0A0F7DJF1
A	191	HIS	-	expression tag	UNP A0A0F7DJF1
A	192	HIS	-	expression tag	UNP A0A0F7DJF1
A	193	HIS	-	expression tag	UNP A0A0F7DJF1
A	194	HIS	-	expression tag	UNP A0A0F7DJF1
B	187	LEU	-	expression tag	UNP A0A0F7DJF1
B	188	GLU	-	expression tag	UNP A0A0F7DJF1
B	189	HIS	-	expression tag	UNP A0A0F7DJF1
B	190	HIS	-	expression tag	UNP A0A0F7DJF1
B	191	HIS	-	expression tag	UNP A0A0F7DJF1

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Chain	Residue	Modelled	Actual	Comment	Reference
B	192	HIS	-	expression tag	UNP A0A0F7DJF1
B	193	HIS	-	expression tag	UNP A0A0F7DJF1
B	194	HIS	-	expression tag	UNP A0A0F7DJF1
C	187	LEU	-	expression tag	UNP A0A0F7DJF1
C	188	GLU	-	expression tag	UNP A0A0F7DJF1
C	189	HIS	-	expression tag	UNP A0A0F7DJF1
C	190	HIS	-	expression tag	UNP A0A0F7DJF1
C	191	HIS	-	expression tag	UNP A0A0F7DJF1
C	192	HIS	-	expression tag	UNP A0A0F7DJF1
C	193	HIS	-	expression tag	UNP A0A0F7DJF1
C	194	HIS	-	expression tag	UNP A0A0F7DJF1
D	187	LEU	-	expression tag	UNP A0A0F7DJF1
D	188	GLU	-	expression tag	UNP A0A0F7DJF1
D	189	HIS	-	expression tag	UNP A0A0F7DJF1
D	190	HIS	-	expression tag	UNP A0A0F7DJF1
D	191	HIS	-	expression tag	UNP A0A0F7DJF1
D	192	HIS	-	expression tag	UNP A0A0F7DJF1
D	193	HIS	-	expression tag	UNP A0A0F7DJF1
D	194	HIS	-	expression tag	UNP A0A0F7DJF1
E	187	LEU	-	expression tag	UNP A0A0F7DJF1
E	188	GLU	-	expression tag	UNP A0A0F7DJF1
E	189	HIS	-	expression tag	UNP A0A0F7DJF1
E	190	HIS	-	expression tag	UNP A0A0F7DJF1
E	191	HIS	-	expression tag	UNP A0A0F7DJF1
E	192	HIS	-	expression tag	UNP A0A0F7DJF1
E	193	HIS	-	expression tag	UNP A0A0F7DJF1
E	194	HIS	-	expression tag	UNP A0A0F7DJF1
F	187	LEU	-	expression tag	UNP A0A0F7DJF1
F	188	GLU	-	expression tag	UNP A0A0F7DJF1
F	189	HIS	-	expression tag	UNP A0A0F7DJF1
F	190	HIS	-	expression tag	UNP A0A0F7DJF1
F	191	HIS	-	expression tag	UNP A0A0F7DJF1
F	192	HIS	-	expression tag	UNP A0A0F7DJF1
F	193	HIS	-	expression tag	UNP A0A0F7DJF1
F	194	HIS	-	expression tag	UNP A0A0F7DJF1
G	187	LEU	-	expression tag	UNP A0A0F7DJF1
G	188	GLU	-	expression tag	UNP A0A0F7DJF1
G	189	HIS	-	expression tag	UNP A0A0F7DJF1
G	190	HIS	-	expression tag	UNP A0A0F7DJF1
G	191	HIS	-	expression tag	UNP A0A0F7DJF1
G	192	HIS	-	expression tag	UNP A0A0F7DJF1
G	193	HIS	-	expression tag	UNP A0A0F7DJF1

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Chain	Residue	Modelled	Actual	Comment	Reference
G	194	HIS	-	expression tag	UNP A0A0F7DJF1
H	187	LEU	-	expression tag	UNP A0A0F7DJF1
H	188	GLU	-	expression tag	UNP A0A0F7DJF1
H	189	HIS	-	expression tag	UNP A0A0F7DJF1
H	190	HIS	-	expression tag	UNP A0A0F7DJF1
H	191	HIS	-	expression tag	UNP A0A0F7DJF1
H	192	HIS	-	expression tag	UNP A0A0F7DJF1
H	193	HIS	-	expression tag	UNP A0A0F7DJF1
H	194	HIS	-	expression tag	UNP A0A0F7DJF1

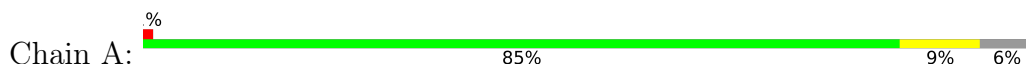
- Molecule 2 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	85	Total O 85 85	0	0
2	B	93	Total O 93 93	0	0
2	C	81	Total O 81 81	0	0
2	D	70	Total O 70 70	0	0
2	E	90	Total O 90 90	0	0
2	F	68	Total O 68 68	0	0
2	G	49	Total O 49 49	0	0
2	H	51	Total O 51 51	0	0

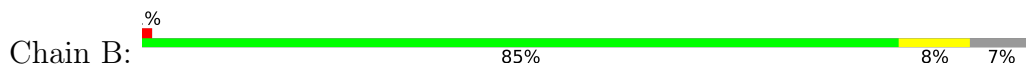
### 3 Residue-property plots [i](#)

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.

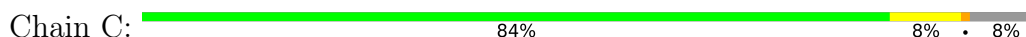
- Molecule 1: YfdX protein



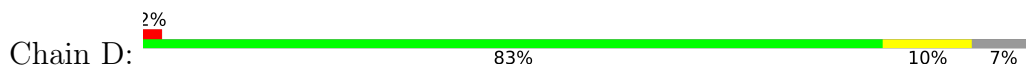
- Molecule 1: YfdX protein



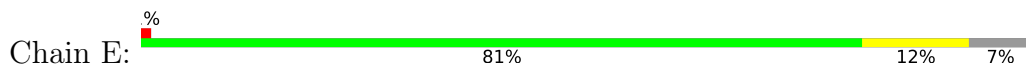
- Molecule 1: YfdX protein




- Molecule 1: YfdX protein

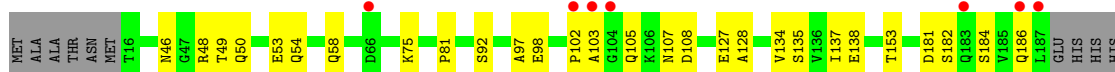


- Molecule 1: YfdX protein




- Molecule 1: YfdX protein

Chain F: 



HIS  
HIS  
HIS


- Molecule 1: YfdX protein

Chain G: 



D181  
Q186  
L187  
GLU  
HIS  
HIS  
HIS  
HIS  
HIS

- Molecule 1: YfdX protein

Chain H: 



HIS  
HIS  
HIS  
HIS



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 2 2 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	72.39Å 127.07Å 170.38Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.50 – 2.29 29.50 – 2.29	Depositor EDS
% Data completeness (in resolution range)	98.5 (29.50-2.29) 98.5 (29.50-2.29)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.64 (at 2.29Å)	Xtrriage
Refinement program	PHENIX (1.10.1_2155: ???)	Depositor
R, $R_{free}$	0.180 , 0.233 0.180 , 0.234	Depositor DCC
$R_{free}$ test set	2000 reflections (2.85%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	31.3	Xtrriage
Anisotropy	0.196	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 45.7	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.47$ , $\langle L^2 \rangle = 0.30$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	11255	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	37.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.49% 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](#)

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	0/1366	0.54	0/1840
1	B	0.42	0/1349	0.59	1/1818 (0.1%)
1	C	0.42	0/1342	0.58	1/1808 (0.1%)
1	D	0.41	0/1349	0.53	0/1818
1	E	0.42	0/1349	0.55	0/1818
1	F	0.40	0/1349	0.52	0/1818
1	G	0.38	0/1342	0.51	0/1808
1	H	0.37	0/1334	0.53	0/1797
All	All	0.41	0/10780	0.54	2/14525 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	170	LEU	CA-CB-CG	-8.24	96.36	115.30
1	B	48	ARG	NE-CZ-NH1	-5.27	117.67	120.30

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	1352	0	1352	11	0
1	B	1335	0	1337	10	0
1	C	1328	0	1330	15	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	1335	0	1337	11	0
1	E	1335	0	1337	12	0
1	F	1335	0	1337	20	0
1	G	1328	0	1330	16	0
1	H	1320	0	1326	12	0
2	A	85	0	0	1	1
2	B	93	0	0	4	1
2	C	81	0	0	3	0
2	D	70	0	0	2	0
2	E	90	0	0	1	1
2	F	68	0	0	2	1
2	G	49	0	0	0	1
2	H	51	0	0	2	0
All	All	11255	0	10686	96	3

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 4.

All (96) 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:60:GLU:OE1	2:E:201:HOH:O	1.85	0.92
1:B:81:PRO:HG3	1:C:137:ILE:HD11	1.58	0.85
1:F:103:ALA:O	1:F:107:ASN:ND2	2.10	0.83
1:F:137:ILE:HD11	1:H:81:PRO:HG3	1.64	0.79
1:F:75:LYS:HE2	1:F:181:ASP:OD2	1.82	0.79
1:C:51:LYS:HZ2	1:C:55:LEU:HD21	1.49	0.77
1:F:81:PRO:HG3	1:H:137:ILE:HD11	1.67	0.75
1:F:102:PRO:HD2	1:F:105:GLN:HE21	1.50	0.75
1:A:98:GLU:OE1	1:A:106:LYS:NZ	2.22	0.71
1:E:101:LEU:HD23	1:E:105:GLN:HG2	1.72	0.70
1:F:184:SER:OG	1:F:186:GLN:NE2	2.23	0.69
1:B:77:ASP:OD2	2:B:201:HOH:O	2.15	0.65
1:F:182:SER:O	1:H:78:LYS:NZ	2.29	0.62
1:A:50:GLN:O	1:A:54:GLN:HG3	1.99	0.62
1:H:155:ALA:O	1:H:159:MET:HG3	2.01	0.60
1:G:98:GLU:OE1	1:G:106:LYS:NZ	2.32	0.60
1:A:81:PRO:HG3	1:D:137:ILE:HD11	1.83	0.60
1:F:137:ILE:HD13	1:F:184:SER:HA	1.83	0.59
1:A:51:LYS:HA	1:A:54:GLN:HE21	1.68	0.56
1:F:54:GLN:O	1:F:58:GLN:HG3	2.06	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:49:THR:O	1:F:53:GLU:HG3	2.05	0.55
1:E:99:ASP:OD1	1:E:100:TYR:N	2.39	0.55
1:G:49:THR:O	1:G:53:GLU:HG3	2.07	0.55
1:A:146:GLN:HE22	1:A:149:ARG:HH11	1.55	0.55
1:C:51:LYS:HZ3	1:C:55:LEU:HG	1.71	0.54
1:F:138:GLU:OE1	2:F:201:HOH:O	2.18	0.54
1:C:51:LYS:HZ2	1:C:55:LEU:CD2	2.18	0.53
1:F:102:PRO:CD	1:F:105:GLN:HE21	2.21	0.53
1:G:155:ALA:O	1:G:159:MET:HG3	2.10	0.52
1:C:183:GLN:NE2	2:C:204:HOH:O	2.42	0.51
1:F:46:ASN:ND2	1:F:48:ARG:HD2	2.25	0.51
1:H:60:GLU:OE2	1:H:153:THR:HG22	2.09	0.51
1:D:25:LYS:HG3	1:D:72:LEU:HD13	1.92	0.51
1:C:49:THR:O	1:C:53:GLU:HG3	2.12	0.50
1:B:78:LYS:NZ	1:C:183:GLN:OE1	2.45	0.50
1:B:78:LYS:HG3	1:C:183:GLN:HE22	1.77	0.50
1:H:115:GLN:O	1:H:119:GLU:HG3	2.12	0.49
1:C:89:ARG:HD3	2:C:219:HOH:O	2.13	0.49
1:H:24:ASP:HB3	1:H:89:ARG:CZ	2.43	0.49
1:C:122:LYS:NZ	2:C:205:HOH:O	2.42	0.49
1:D:98:GLU:OE1	1:D:106:LYS:NZ	2.33	0.49
1:C:51:LYS:O	1:C:51:LYS:HD3	2.12	0.49
1:C:51:LYS:NZ	1:C:55:LEU:HG	2.28	0.48
1:D:176:ASP:OD2	2:D:201:HOH:O	2.20	0.48
1:A:102:PRO:HA	2:A:223:HOH:O	2.14	0.48
1:G:69:ASP:HB3	1:G:72:LEU:HD12	1.96	0.47
1:A:98:GLU:HG2	1:A:134:VAL:HG22	1.96	0.47
1:D:158:LEU:HD12	1:D:170:LEU:HD12	1.95	0.47
1:F:98:GLU:HG2	1:F:134:VAL:HG22	1.97	0.47
1:D:54:GLN:O	1:D:58:GLN:HG3	2.15	0.46
1:A:186:GLN:HE21	1:D:79:LYS:HG2	1.80	0.46
1:D:154:THR:HB	1:D:170:LEU:HD13	1.98	0.46
1:D:172:LYS:HE2	2:D:225:HOH:O	2.15	0.46
1:G:148:THR:O	1:G:152:VAL:HG23	2.16	0.45
1:H:99:ASP:OD2	2:H:201:HOH:O	2.21	0.45
1:B:17:ASP:OD2	1:B:73:TYR:OH	2.25	0.45
1:B:111:ASN:ND2	2:B:207:HOH:O	2.45	0.45
1:G:121:ASP:OD2	1:G:124:GLY:HA3	2.16	0.45
1:F:127:GLU:HG2	1:F:128:ALA:N	2.32	0.45
1:H:172:LYS:HE3	1:H:176:ASP:OD1	2.17	0.45
1:E:31:TRP:HH2	1:G:31:TRP:CH2	2.35	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:50:GLN:H	1:G:50:GLN:CD	2.20	0.44
1:E:123:LYS:NZ	1:E:127:GLU:HG3	2.32	0.44
1:E:154:THR:HB	1:E:170:LEU:HD22	1.98	0.44
1:A:101:LEU:HD12	1:A:101:LEU:HA	1.82	0.44
1:D:143:ILE:HG22	1:D:178:ILE:HG12	2.00	0.44
1:C:65:ASP:OD1	1:C:66:ASP:N	2.51	0.44
1:F:153:THR:HG22	2:F:215:HOH:O	2.18	0.44
1:H:149:ARG:O	1:H:153:THR:HG23	2.18	0.43
1:E:102:PRO:HG2	1:E:105:GLN:HB3	1.99	0.43
1:E:172:LYS:HA	1:E:172:LYS:HD2	1.76	0.43
1:F:46:ASN:HD22	1:F:48:ARG:HD2	1.83	0.43
1:G:150:LYS:O	1:G:154:THR:OG1	2.35	0.43
1:E:31:TRP:CH2	1:G:31:TRP:HH2	2.37	0.42
1:F:97:ALA:HB3	1:F:135:SER:OG	2.19	0.42
1:F:102:PRO:HG2	1:F:105:GLN:HG2	2.02	0.42
1:A:17:ASP:OD2	1:A:73:TYR:OH	2.32	0.42
1:C:51:LYS:NZ	1:C:55:LEU:HD21	2.27	0.42
1:D:53:GLU:HG2	1:D:159:MET:SD	2.59	0.42
1:B:170:LEU:HD23	1:B:170:LEU:HA	1.96	0.42
1:G:157:SER:O	1:G:161:GLU:HG3	2.19	0.42
1:H:130:LYS:HG3	2:H:215:HOH:O	2.20	0.42
1:G:24:ASP:HB3	1:G:89:ARG:CZ	2.50	0.42
1:G:27:SER:HB2	1:G:73:TYR:CD2	2.55	0.42
1:B:16:THR:HA	2:B:279:HOH:O	2.19	0.41
1:E:31:TRP:HH2	1:G:31:TRP:HH2	1.68	0.41
1:G:170:LEU:HD23	1:G:170:LEU:HA	1.86	0.41
1:A:146:GLN:NE2	1:A:149:ARG:HH11	2.19	0.41
1:H:116:LYS:HA	1:H:116:LYS:HD2	1.79	0.41
1:B:118:LYS:NZ	2:B:208:HOH:O	2.46	0.40
1:C:116:LYS:HD2	1:C:124:GLY:HA3	2.03	0.40
1:E:44:LEU:HD21	1:E:159:MET:CE	2.51	0.40
1:E:129:LEU:HA	1:E:129:LEU:HD23	1.86	0.40
1:G:77:ASP:OD1	1:G:77:ASP:N	2.34	0.40
1:F:50:GLN:O	1:F:54:GLN:HG3	2.21	0.40
1:B:126:ILE:O	1:B:130:LYS:HG2	2.22	0.40

All (3) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:271:HOH:O	2:G:246:HOH:O[2_865]	2.10	0.10

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:252:HOH:O	2:F:264:HOH:O[3_756]	2.15	0.05
2:A:277:HOH:O	2:B:285:HOH:O[3_855]	2.18	0.02

## 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	172/185 (93%)	169 (98%)	3 (2%)	0	100	100
1	B	170/185 (92%)	169 (99%)	1 (1%)	0	100	100
1	C	169/185 (91%)	163 (96%)	6 (4%)	0	100	100
1	D	170/185 (92%)	166 (98%)	4 (2%)	0	100	100
1	E	170/185 (92%)	169 (99%)	1 (1%)	0	100	100
1	F	170/185 (92%)	167 (98%)	3 (2%)	0	100	100
1	G	169/185 (91%)	165 (98%)	4 (2%)	0	100	100
1	H	168/185 (91%)	165 (98%)	3 (2%)	0	100	100
All	All	1358/1480 (92%)	1333 (98%)	25 (2%)	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	147/156 (94%)	144 (98%)	3 (2%)	55	72

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	B	145/156 (93%)	142 (98%)	3 (2%)	53	70
1	C	144/156 (92%)	140 (97%)	4 (3%)	43	60
1	D	145/156 (93%)	144 (99%)	1 (1%)	84	92
1	E	145/156 (93%)	138 (95%)	7 (5%)	25	36
1	F	145/156 (93%)	143 (99%)	2 (1%)	67	81
1	G	144/156 (92%)	141 (98%)	3 (2%)	53	70
1	H	143/156 (92%)	139 (97%)	4 (3%)	43	60
All	All	1158/1248 (93%)	1131 (98%)	27 (2%)	50	67

All (27) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	58	GLN
1	A	92	SER
1	A	183	GLN
1	B	51	LYS
1	B	92	SER
1	B	181	ASP
1	C	17	ASP
1	C	92	SER
1	C	106	LYS
1	C	170	LEU
1	D	66	ASP
1	E	16	THR
1	E	25	LYS
1	E	66	ASP
1	E	76	SER
1	E	92	SER
1	E	106	LYS
1	E	181	ASP
1	F	92	SER
1	F	108	ASP
1	G	67	SER
1	G	123	LYS
1	G	181	ASP
1	H	66	ASP
1	H	92	SER
1	H	116	LYS
1	H	181	ASP

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	54	GLN
1	B	58	GLN
1	F	105	GLN
1	F	186	GLN
1	G	175	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](#)

There are no ligands in this entry.

### 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

### 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, 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	174/185 (94%)	-0.40	2 (1%) 80 85	19, 28, 53, 67	0
1	B	172/185 (92%)	-0.27	1 (0%) 89 92	20, 31, 53, 64	0
1	C	171/185 (92%)	-0.38	0 100 100	22, 31, 49, 64	0
1	D	172/185 (92%)	-0.26	4 (2%) 60 67	24, 35, 51, 62	0
1	E	172/185 (92%)	-0.29	1 (0%) 89 92	21, 31, 53, 61	0
1	F	172/185 (92%)	-0.12	7 (4%) 37 44	23, 38, 60, 68	0
1	G	171/185 (92%)	-0.08	5 (2%) 51 58	30, 42, 59, 70	0
1	H	170/185 (91%)	-0.02	6 (3%) 44 51	29, 45, 60, 69	0
All	All	1374/1480 (92%)	-0.23	26 (1%) 66 73	19, 35, 57, 70	0

All (26) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	H	50	GLN	3.5
1	H	67	SER	3.4
1	F	104	GLY	3.3
1	A	188	GLU	3.0
1	H	66	ASP	3.0
1	F	186	GLN	3.0
1	G	186	GLN	3.0
1	A	15	MET	2.9
1	H	186	GLN	2.7
1	G	66	ASP	2.5
1	G	72	LEU	2.4
1	G	67	SER	2.4
1	F	66	ASP	2.3
1	F	187	LEU	2.3
1	E	16	THR	2.3
1	D	84	GLY	2.2

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Mol	Chain	Res	Type	RSRZ
1	G	83	GLU	2.2
1	D	16	THR	2.2
1	H	160	ASN	2.1
1	F	103	ALA	2.1
1	F	102	PRO	2.1
1	D	66	ASP	2.1
1	F	183	GLN	2.1
1	B	104	GLY	2.1
1	H	72	LEU	2.0
1	D	186	GLN	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](#)

There are no ligands in this entry.

## 6.5 Other polymers [i](#)

There are no such residues in this entry.