



# wwPDB X-ray Structure Validation Summary Report ⓘ

Jan 31, 2016 – 10:34 PM GMT

PDB ID : 1U5W  
Title : Crystal structure of hypothetical protein yjjX from Escherichia coli  
Authors : Zheng, J.; Singh, V.K.; Jia, Z.; Montreal-Kingston Bacterial Structural Genomics Initiative (BSGI)  
Deposited on : 2004-07-28  
Resolution : 2.30 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  
Mogul : 1.7 (RC4), CSD as536be (2015)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20026688  
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)  
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) : trunk26865

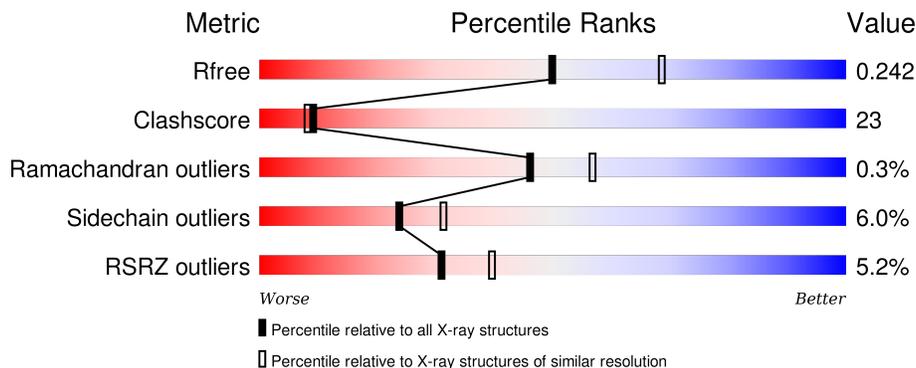
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.30 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))
$R_{free}$	91344	3852 (2.30-2.30)
Clashscore	102246	4452 (2.30-2.30)
Ramachandran outliers	100387	4410 (2.30-2.30)
Sidechain outliers	100360	4409 (2.30-2.30)
RSRZ outliers	91569	3857 (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 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	184	
1	B	184	
1	C	184	
1	D	184	
1	E	184	

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Mol	Chain	Length	Quality of chain
1	F	184	
1	G	184	
1	H	184	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	SO4	E	4408	-	-	-	X

## 2 Entry composition i

There are 3 unique types of molecules in this entry. The entry contains 11017 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 Hypothetical UPF0244 protein yjjX.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	162	1219	768	218	229	4	0	0	0
1	B	172	1297	817	232	244	4	0	0	0
1	C	174	1309	825	234	246	4	0	0	0
1	D	172	1297	817	232	244	4	0	0	0
1	E	172	1297	817	232	244	4	0	0	0
1	F	172	1293	813	232	244	4	0	0	0
1	G	168	1265	800	225	236	4	0	0	0
1	H	170	1283	808	230	241	4	0	0	0

There are 112 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MET	-	cloning artifact	UNP P39411
A	2	LEU	-	cloning artifact	UNP P39411
A	3	ILE	-	cloning artifact	UNP P39411
A	174	SER	-	cloning artifact	UNP P39411
A	175	GLY	-	cloning artifact	UNP P39411
A	176	ARG	-	cloning artifact	UNP P39411
A	177	VAL	-	cloning artifact	UNP P39411
A	178	GLU	-	cloning artifact	UNP P39411
A	179	HIS	-	EXPRESSION TAG	UNP P39411
A	180	HIS	-	EXPRESSION TAG	UNP P39411
A	181	HIS	-	EXPRESSION TAG	UNP P39411
A	182	HIS	-	EXPRESSION TAG	UNP P39411
A	183	HIS	-	EXPRESSION TAG	UNP P39411

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Chain	Residue	Modelled	Actual	Comment	Reference
A	184	HIS	-	EXPRESSION TAG	UNP P39411
B	1	MET	-	cloning artifact	UNP P39411
B	2	LEU	-	cloning artifact	UNP P39411
B	3	ILE	-	cloning artifact	UNP P39411
B	174	SER	-	cloning artifact	UNP P39411
B	175	GLY	-	cloning artifact	UNP P39411
B	176	ARG	-	cloning artifact	UNP P39411
B	177	VAL	-	cloning artifact	UNP P39411
B	178	GLU	-	cloning artifact	UNP P39411
B	179	HIS	-	EXPRESSION TAG	UNP P39411
B	180	HIS	-	EXPRESSION TAG	UNP P39411
B	181	HIS	-	EXPRESSION TAG	UNP P39411
B	182	HIS	-	EXPRESSION TAG	UNP P39411
B	183	HIS	-	EXPRESSION TAG	UNP P39411
B	184	HIS	-	EXPRESSION TAG	UNP P39411
C	1	MET	-	cloning artifact	UNP P39411
C	2	LEU	-	cloning artifact	UNP P39411
C	3	ILE	-	cloning artifact	UNP P39411
C	174	SER	-	cloning artifact	UNP P39411
C	175	GLY	-	cloning artifact	UNP P39411
C	176	ARG	-	cloning artifact	UNP P39411
C	177	VAL	-	cloning artifact	UNP P39411
C	178	GLU	-	cloning artifact	UNP P39411
C	179	HIS	-	EXPRESSION TAG	UNP P39411
C	180	HIS	-	EXPRESSION TAG	UNP P39411
C	181	HIS	-	EXPRESSION TAG	UNP P39411
C	182	HIS	-	EXPRESSION TAG	UNP P39411
C	183	HIS	-	EXPRESSION TAG	UNP P39411
C	184	HIS	-	EXPRESSION TAG	UNP P39411
D	1	MET	-	cloning artifact	UNP P39411
D	2	LEU	-	cloning artifact	UNP P39411
D	3	ILE	-	cloning artifact	UNP P39411
D	174	SER	-	cloning artifact	UNP P39411
D	175	GLY	-	cloning artifact	UNP P39411
D	176	ARG	-	cloning artifact	UNP P39411
D	177	VAL	-	cloning artifact	UNP P39411
D	178	GLU	-	cloning artifact	UNP P39411
D	179	HIS	-	EXPRESSION TAG	UNP P39411
D	180	HIS	-	EXPRESSION TAG	UNP P39411
D	181	HIS	-	EXPRESSION TAG	UNP P39411
D	182	HIS	-	EXPRESSION TAG	UNP P39411
D	183	HIS	-	EXPRESSION TAG	UNP P39411

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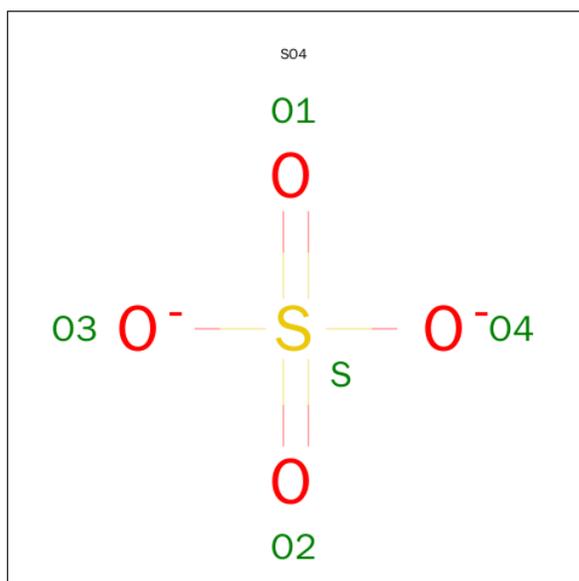
Chain	Residue	Modelled	Actual	Comment	Reference
D	184	HIS	-	EXPRESSION TAG	UNP P39411
E	1	MET	-	cloning artifact	UNP P39411
E	2	LEU	-	cloning artifact	UNP P39411
E	3	ILE	-	cloning artifact	UNP P39411
E	174	SER	-	cloning artifact	UNP P39411
E	175	GLY	-	cloning artifact	UNP P39411
E	176	ARG	-	cloning artifact	UNP P39411
E	177	VAL	-	cloning artifact	UNP P39411
E	178	GLU	-	cloning artifact	UNP P39411
E	179	HIS	-	EXPRESSION TAG	UNP P39411
E	180	HIS	-	EXPRESSION TAG	UNP P39411
E	181	HIS	-	EXPRESSION TAG	UNP P39411
E	182	HIS	-	EXPRESSION TAG	UNP P39411
E	183	HIS	-	EXPRESSION TAG	UNP P39411
E	184	HIS	-	EXPRESSION TAG	UNP P39411
F	1	MET	-	cloning artifact	UNP P39411
F	2	LEU	-	cloning artifact	UNP P39411
F	3	ILE	-	cloning artifact	UNP P39411
F	174	SER	-	cloning artifact	UNP P39411
F	175	GLY	-	cloning artifact	UNP P39411
F	176	ARG	-	cloning artifact	UNP P39411
F	177	VAL	-	cloning artifact	UNP P39411
F	178	GLU	-	cloning artifact	UNP P39411
F	179	HIS	-	EXPRESSION TAG	UNP P39411
F	180	HIS	-	EXPRESSION TAG	UNP P39411
F	181	HIS	-	EXPRESSION TAG	UNP P39411
F	182	HIS	-	EXPRESSION TAG	UNP P39411
F	183	HIS	-	EXPRESSION TAG	UNP P39411
F	184	HIS	-	EXPRESSION TAG	UNP P39411
G	1	MET	-	cloning artifact	UNP P39411
G	2	LEU	-	cloning artifact	UNP P39411
G	3	ILE	-	cloning artifact	UNP P39411
G	174	SER	-	cloning artifact	UNP P39411
G	175	GLY	-	cloning artifact	UNP P39411
G	176	ARG	-	cloning artifact	UNP P39411
G	177	VAL	-	cloning artifact	UNP P39411
G	178	GLU	-	cloning artifact	UNP P39411
G	179	HIS	-	EXPRESSION TAG	UNP P39411
G	180	HIS	-	EXPRESSION TAG	UNP P39411
G	181	HIS	-	EXPRESSION TAG	UNP P39411
G	182	HIS	-	EXPRESSION TAG	UNP P39411
G	183	HIS	-	EXPRESSION TAG	UNP P39411

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Chain	Residue	Modelled	Actual	Comment	Reference
G	184	HIS	-	EXPRESSION TAG	UNP P39411
H	1	MET	-	cloning artifact	UNP P39411
H	2	LEU	-	cloning artifact	UNP P39411
H	3	ILE	-	cloning artifact	UNP P39411
H	174	SER	-	cloning artifact	UNP P39411
H	175	GLY	-	cloning artifact	UNP P39411
H	176	ARG	-	cloning artifact	UNP P39411
H	177	VAL	-	cloning artifact	UNP P39411
H	178	GLU	-	cloning artifact	UNP P39411
H	179	HIS	-	EXPRESSION TAG	UNP P39411
H	180	HIS	-	EXPRESSION TAG	UNP P39411
H	181	HIS	-	EXPRESSION TAG	UNP P39411
H	182	HIS	-	EXPRESSION TAG	UNP P39411
H	183	HIS	-	EXPRESSION TAG	UNP P39411
H	184	HIS	-	EXPRESSION TAG	UNP P39411

- Molecule 2 is SULFATE ION (three-letter code: SO<sub>4</sub>) (formula: O<sub>4</sub>S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	H	1	Total	O	S	0	0
			5	4	1		
2	H	1	Total	O	S	0	0
			5	4	1		
2	E	1	Total	O	S	0	0
			5	4	1		
2	G	1	Total	O	S	0	0
			5	4	1		

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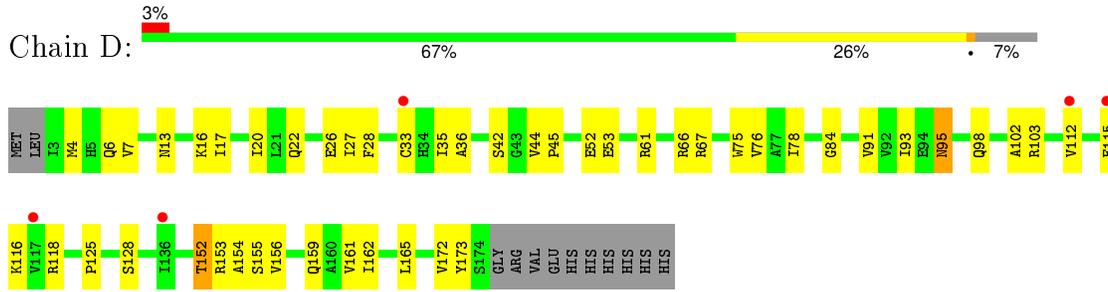
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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	F	1	Total	O	S	0	0
			5	4	1		
2	D	1	Total	O	S	0	0
			5	4	1		
2	D	1	Total	O	S	0	0
			5	4	1		
2	C	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	C	1	Total	O	S	0	0
			5	4	1		
2	E	1	Total	O	S	0	0
			5	4	1		
2	F	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		

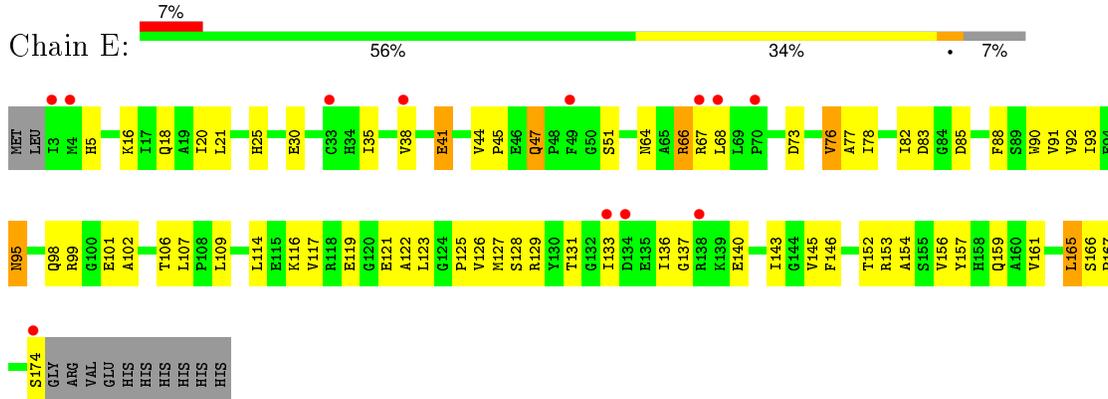
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	73	Total	O	0	0
			73	73		
3	B	106	Total	O	0	0
			106	106		
3	C	92	Total	O	0	0
			92	92		
3	D	110	Total	O	0	0
			110	110		
3	E	68	Total	O	0	0
			68	68		
3	F	92	Total	O	0	0
			92	92		
3	G	69	Total	O	0	0
			69	69		
3	H	72	Total	O	0	0
			72	72		

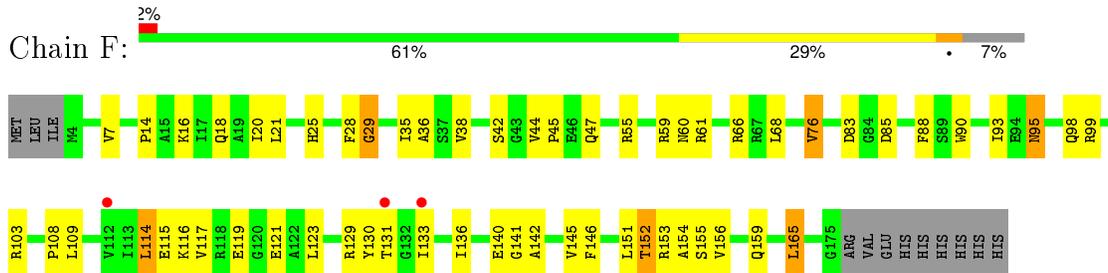




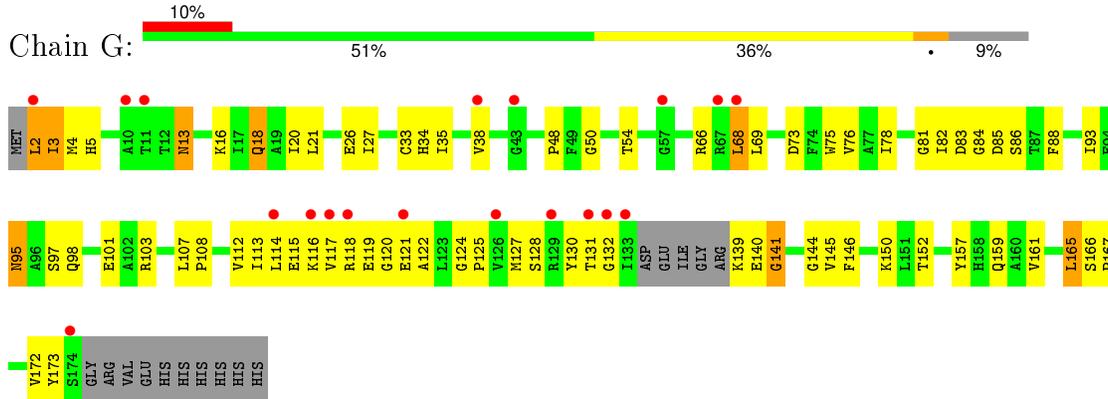
• Molecule 1: Hypothetical UPF0244 protein yjjX



• Molecule 1: Hypothetical UPF0244 protein yjjX

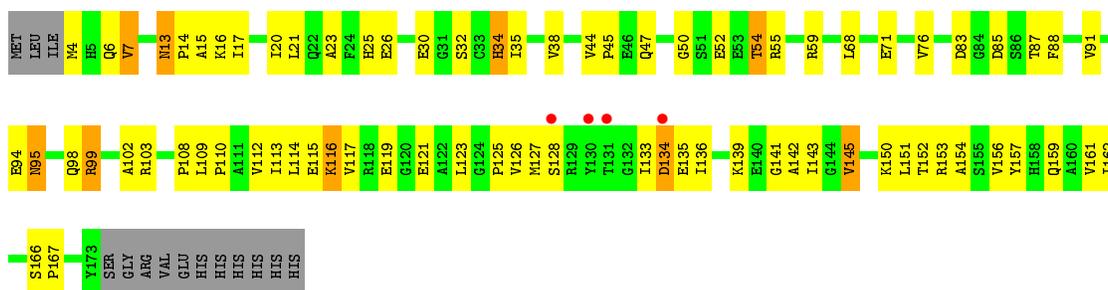


• Molecule 1: Hypothetical UPF0244 protein yjjX



• Molecule 1: Hypothetical UPF0244 protein yjjX





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	71.00Å 129.34Å 85.38Å 90.00° 90.23° 90.00°	Depositor
Resolution (Å)	50.00 – 2.30 29.27 – 2.23	Depositor EDS
% Data completeness (in resolution range)	89.5 (50.00-2.30) 91.0 (29.27-2.23)	Depositor EDS
$R_{merge}$	0.07	Depositor
$R_{sym}$	0.06	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.06 (at 2.24Å)	Xtriage
Refinement program	CNS	Depositor
R, $R_{free}$	0.200 , 0.255 0.244 , 0.242	Depositor DCC
$R_{free}$ test set	3194 reflections (5.32%)	DCC
Wilson B-factor (Å <sup>2</sup> )	29.7	Xtriage
Anisotropy	0.077	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.31 , 17.7	EDS
Estimated twinning fraction	0.120 for h,-k,-l	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.47$ , $\langle L^2 \rangle = 0.30$	Xtriage
Outliers	0 of 68100 reflections	Xtriage
$F_o, F_c$ correlation	0.90	EDS
Total number of atoms	11017	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	31.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.67% 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, 0.375 respectively for untwinned datasets, and 0.333, 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: SO4

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	0.37	0/1243	0.66	1/1688 (0.1%)
1	B	0.35	0/1323	0.59	0/1797
1	C	0.35	0/1335	0.60	0/1813
1	D	0.35	0/1323	0.59	0/1797
1	E	0.34	0/1323	0.56	0/1797
1	F	0.34	0/1319	0.58	0/1791
1	G	0.34	0/1290	0.57	0/1752
1	H	0.34	0/1309	0.56	0/1778
All	All	0.35	0/10465	0.59	1/14213 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	125	PRO	N-CA-CB	5.41	109.79	103.30

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	1219	0	1196	60	0
1	B	1297	0	1285	51	1

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	1309	0	1299	66	0
1	D	1297	0	1285	48	0
1	E	1297	0	1285	69	3
1	F	1293	0	1277	62	0
1	G	1265	0	1258	74	0
1	H	1283	0	1269	68	0
2	A	5	0	0	0	0
2	B	15	0	0	0	0
2	C	10	0	0	1	0
2	D	10	0	0	0	0
2	E	10	0	0	0	0
2	F	10	0	0	0	0
2	G	5	0	0	0	0
2	H	10	0	0	0	0
3	A	73	0	0	6	0
3	B	106	0	0	3	0
3	C	92	0	0	4	0
3	D	110	0	0	3	3
3	E	68	0	0	6	0
3	F	92	0	0	6	0
3	G	69	0	0	3	1
3	H	72	0	0	8	0
All	All	11017	0	10154	472	4

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 23.

The worst 5 of 472 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:D:152:THR:HG22	1:D:155:SER:H	1.29	0.96
1:B:44:VAL:HG22	1:B:45:PRO:HD2	1.46	0.96
1:G:3:ILE:H	1:G:3:ILE:HD13	1.31	0.94
1:F:152:THR:HG22	1:F:155:SER:H	1.31	0.93
1:A:95:ASN:HD21	1:A:98:GLN:H	1.09	0.93

All (4) 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)
1:E:73:ASP:OD1	3:D:4457:HOH:O[1_455]	1.87	0.33
1:E:95:ASN:OD1	3:D:4409:HOH:O[1_455]	2.10	0.10
1:E:73:ASP:OD2	3:D:4444:HOH:O[1_455]	2.14	0.06
1:B:129:ARG:O	3:G:4452:HOH:O[1_656]	2.14	0.06

### 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	158/184 (86%)	151 (96%)	7 (4%)	0	100	100
1	B	170/184 (92%)	166 (98%)	4 (2%)	0	100	100
1	C	172/184 (94%)	164 (95%)	8 (5%)	0	100	100
1	D	170/184 (92%)	165 (97%)	5 (3%)	0	100	100
1	E	170/184 (92%)	159 (94%)	11 (6%)	0	100	100
1	F	170/184 (92%)	160 (94%)	8 (5%)	2 (1%)	16	16
1	G	164/184 (89%)	155 (94%)	8 (5%)	1 (1%)	30	36
1	H	168/184 (91%)	161 (96%)	6 (4%)	1 (1%)	30	36
All	All	1342/1472 (91%)	1281 (96%)	57 (4%)	4 (0%)	46	57

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	H	134	ASP
1	F	29	GLY
1	G	141	GLY
1	F	130	TYR

#### 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	124/144 (86%)	115 (93%)	9 (7%)	17	22
1	B	133/144 (92%)	126 (95%)	7 (5%)	28	37
1	C	134/144 (93%)	126 (94%)	8 (6%)	24	31
1	D	133/144 (92%)	128 (96%)	5 (4%)	40	54
1	E	133/144 (92%)	126 (95%)	7 (5%)	28	37
1	F	132/144 (92%)	124 (94%)	8 (6%)	23	30
1	G	130/144 (90%)	123 (95%)	7 (5%)	27	36
1	H	131/144 (91%)	119 (91%)	12 (9%)	11	13
All	All	1050/1152 (91%)	987 (94%)	63 (6%)	24	31

5 of 63 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	153	ARG
1	E	165	LEU
1	H	99	ARG
1	E	21	LEU
1	E	47	GLN

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 49 such sidechains are listed below:

Mol	Chain	Res	Type
1	E	64	ASN
1	F	22	GLN
1	H	34	HIS
1	E	159	GLN
1	F	47	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 carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

15 ligands are modelled in this entry.

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	$\# Z  > 2$
2	SO4	A	4404	-	4,4,4	3.32	2 (50%)	6,6,6	0.92	0
2	SO4	B	4405	-	4,4,4	3.33	2 (50%)	6,6,6	0.94	0
2	SO4	B	4406	-	4,4,4	3.22	2 (50%)	6,6,6	0.98	0
2	SO4	B	4410	-	4,4,4	3.16	2 (50%)	6,6,6	0.98	0
2	SO4	C	4403	-	4,4,4	3.24	2 (50%)	6,6,6	0.96	0
2	SO4	C	4407	-	4,4,4	3.28	2 (50%)	6,6,6	0.93	0
2	SO4	D	4401	-	4,4,4	3.32	2 (50%)	6,6,6	1.00	0
2	SO4	D	4402	-	4,4,4	3.23	2 (50%)	6,6,6	0.97	0
2	SO4	E	4398	-	4,4,4	3.23	2 (50%)	6,6,6	1.01	0
2	SO4	E	4408	-	4,4,4	3.27	2 (50%)	6,6,6	0.97	0
2	SO4	F	4400	-	4,4,4	3.29	2 (50%)	6,6,6	0.96	0
2	SO4	F	4409	-	4,4,4	3.23	2 (50%)	6,6,6	0.98	0
2	SO4	G	4399	-	4,4,4	3.20	2 (50%)	6,6,6	1.00	0
2	SO4	H	4396	-	4,4,4	3.25	2 (50%)	6,6,6	0.97	0
2	SO4	H	4397	-	4,4,4	3.28	2 (50%)	6,6,6	1.00	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
2	SO4	A	4404	-	-	0/0/0/0	0/0/0/0
2	SO4	B	4405	-	-	0/0/0/0	0/0/0/0
2	SO4	B	4406	-	-	0/0/0/0	0/0/0/0
2	SO4	B	4410	-	-	0/0/0/0	0/0/0/0
2	SO4	C	4403	-	-	0/0/0/0	0/0/0/0
2	SO4	C	4407	-	-	0/0/0/0	0/0/0/0
2	SO4	D	4401	-	-	0/0/0/0	0/0/0/0
2	SO4	D	4402	-	-	0/0/0/0	0/0/0/0
2	SO4	E	4398	-	-	0/0/0/0	0/0/0/0
2	SO4	E	4408	-	-	0/0/0/0	0/0/0/0
2	SO4	F	4400	-	-	0/0/0/0	0/0/0/0
2	SO4	F	4409	-	-	0/0/0/0	0/0/0/0
2	SO4	G	4399	-	-	0/0/0/0	0/0/0/0
2	SO4	H	4396	-	-	0/0/0/0	0/0/0/0
2	SO4	H	4397	-	-	0/0/0/0	0/0/0/0

The worst 5 of 30 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	4401	SO4	O3-S	-4.72	1.30	1.47
2	H	4397	SO4	O3-S	-4.68	1.30	1.47
2	B	4406	SO4	O3-S	-4.64	1.30	1.47
2	B	4405	SO4	O3-S	-4.62	1.30	1.47
2	G	4399	SO4	O3-S	-4.60	1.30	1.47

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	4403	SO4	1	0

## 5.7 Other polymers [i](#)

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	162/184 (88%)	0.78	11 (6%) 20 28	17, 30, 63, 82	0
1	B	172/184 (93%)	0.26	4 (2%) 64 72	12, 25, 45, 59	0
1	C	174/184 (94%)	0.65	13 (7%) 17 24	12, 28, 45, 66	0
1	D	172/184 (93%)	0.23	5 (2%) 55 64	14, 25, 44, 54	0
1	E	172/184 (93%)	0.75	12 (6%) 19 27	18, 28, 55, 65	0
1	F	172/184 (93%)	0.07	3 (1%) 73 79	18, 28, 51, 60	0
1	G	168/184 (91%)	0.83	19 (11%) 7 10	16, 29, 64, 73	0
1	H	170/184 (92%)	0.17	4 (2%) 62 71	16, 29, 58, 69	0
All	All	1362/1472 (92%)	0.47	71 (5%) 31 39	12, 28, 55, 82	0

The worst 5 of 71 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	3	ILE	5.5
1	C	29	GLY	4.4
1	A	129	ARG	3.9
1	G	174	SER	3.9
1	G	114	LEU	3.7

### 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(Å <sup>2</sup> )	Q<0.9
2	SO4	E	4408	5/5	0.70	0.23	2.90	97,98,98,99	0
2	SO4	H	4397	5/5	0.94	0.14	1.82	52,52,53,53	0
2	SO4	G	4399	5/5	0.93	0.26	1.69	46,46,48,48	0
2	SO4	B	4406	5/5	0.95	0.16	1.33	37,37,39,40	0
2	SO4	F	4409	5/5	0.85	0.16	1.24	80,81,81,81	0
2	SO4	F	4400	5/5	0.94	0.14	1.13	59,60,61,61	0
2	SO4	D	4402	5/5	0.91	0.15	0.42	47,48,48,49	0
2	SO4	H	4396	5/5	0.91	0.14	0.17	73,73,74,74	0
2	SO4	B	4410	5/5	0.96	0.13	-0.02	18,19,20,21	0
2	SO4	C	4407	5/5	0.90	0.15	-0.26	48,48,51,51	0
2	SO4	D	4401	5/5	0.96	0.13	-0.36	28,29,32,32	0
2	SO4	B	4405	5/5	0.95	0.13	-0.43	43,44,46,46	0
2	SO4	C	4403	5/5	0.95	0.13	-0.67	35,36,36,37	0
2	SO4	A	4404	5/5	0.94	0.11	-1.99	51,52,53,53	0
2	SO4	E	4398	5/5	0.95	0.12	-2.53	35,36,39,40	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.