



# Full wwPDB X-ray Structure Validation Report ⓘ

Jun 7, 2020 – 02:05 am BST

PDB ID : 6HB8  
Title : Crystal structure of OXA-517 beta-lactamase  
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Deposited on : 2018-08-09  
Resolution : 1.86 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.

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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)  
Xtriage (Phenix) : 1.13  
EDS : 2.11  
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) : 2.11

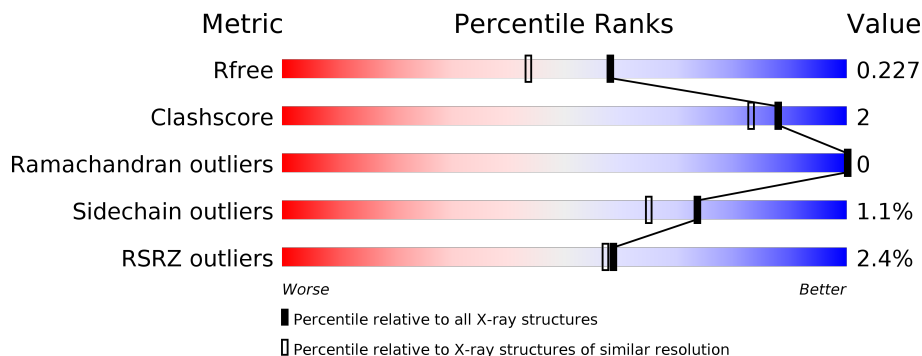
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.86 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	2469 (1.86-1.86)
Clashscore	141614	2625 (1.86-1.86)
Ramachandran outliers	138981	2592 (1.86-1.86)
Sidechain outliers	138945	2592 (1.86-1.86)
RSRZ outliers	127900	2436 (1.86-1.86)

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 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	 4% 90% 6%
1	B	254	 2% 91% 5%
1	C	254	 2% 89% 7%
1	D	254	 2% 89% 6% 5%

## 2 Entry composition i

There are 7 unique types of molecules in this entry. The entry contains 8981 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 Beta-lactamase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	244	Total 2012	C 1289	N 350	O 365	S 8	0	4	0
1	B	243	Total 2041	C 1307	N 360	O 366	S 8	0	9	0
1	C	244	Total 2043	C 1309	N 359	O 367	S 8	0	8	0
1	D	241	Total 2010	C 1287	N 351	O 364	S 8	0	7	0

There are 44 discrepancies between the modelled and reference sequences:

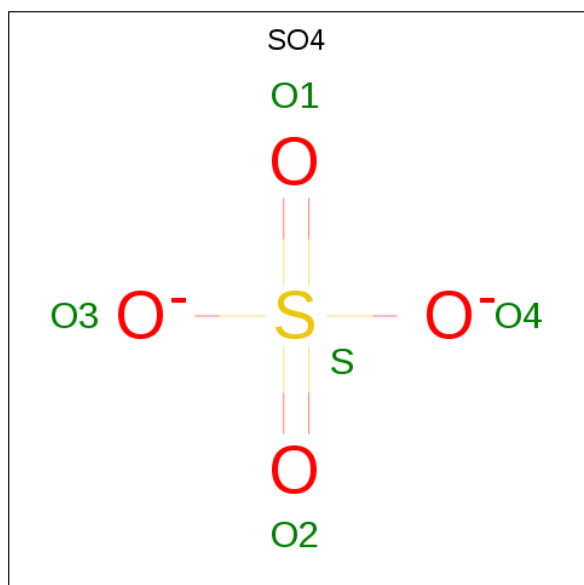
Chain	Residue	Modelled	Actual	Comment	Reference
A	20	MET	-	initiating methionine	UNP A0A1U8YI81
A	266	PHE	-	expression tag	UNP A0A1U8YI81
A	267	GLU	-	expression tag	UNP A0A1U8YI81
A	268	HIS	-	expression tag	UNP A0A1U8YI81
A	269	HIS	-	expression tag	UNP A0A1U8YI81
A	270	HIS	-	expression tag	UNP A0A1U8YI81
A	271	HIS	-	expression tag	UNP A0A1U8YI81
A	272	HIS	-	expression tag	UNP A0A1U8YI81
A	273	HIS	-	expression tag	UNP A0A1U8YI81
A	274	HIS	-	expression tag	UNP A0A1U8YI81
A	275	HIS	-	expression tag	UNP A0A1U8YI81
B	20	MET	-	initiating methionine	UNP A0A1U8YI81
B	266	PHE	-	expression tag	UNP A0A1U8YI81
B	267	GLU	-	expression tag	UNP A0A1U8YI81
B	268	HIS	-	expression tag	UNP A0A1U8YI81
B	269	HIS	-	expression tag	UNP A0A1U8YI81
B	270	HIS	-	expression tag	UNP A0A1U8YI81
B	271	HIS	-	expression tag	UNP A0A1U8YI81
B	272	HIS	-	expression tag	UNP A0A1U8YI81
B	273	HIS	-	expression tag	UNP A0A1U8YI81
B	274	HIS	-	expression tag	UNP A0A1U8YI81

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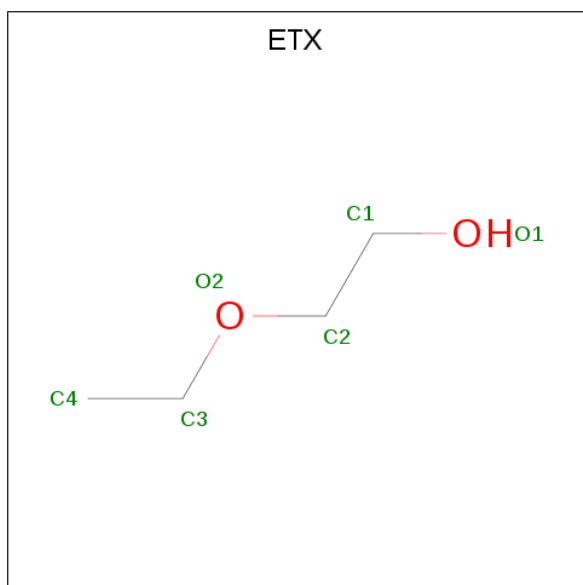
Chain	Residue	Modelled	Actual	Comment	Reference
B	275	HIS	-	expression tag	UNP A0A1U8YI81
C	20	MET	-	initiating methionine	UNP A0A1U8YI81
C	266	PHE	-	expression tag	UNP A0A1U8YI81
C	267	GLU	-	expression tag	UNP A0A1U8YI81
C	268	HIS	-	expression tag	UNP A0A1U8YI81
C	269	HIS	-	expression tag	UNP A0A1U8YI81
C	270	HIS	-	expression tag	UNP A0A1U8YI81
C	271	HIS	-	expression tag	UNP A0A1U8YI81
C	272	HIS	-	expression tag	UNP A0A1U8YI81
C	273	HIS	-	expression tag	UNP A0A1U8YI81
C	274	HIS	-	expression tag	UNP A0A1U8YI81
C	275	HIS	-	expression tag	UNP A0A1U8YI81
D	20	MET	-	initiating methionine	UNP A0A1U8YI81
D	266	PHE	-	expression tag	UNP A0A1U8YI81
D	267	GLU	-	expression tag	UNP A0A1U8YI81
D	268	HIS	-	expression tag	UNP A0A1U8YI81
D	269	HIS	-	expression tag	UNP A0A1U8YI81
D	270	HIS	-	expression tag	UNP A0A1U8YI81
D	271	HIS	-	expression tag	UNP A0A1U8YI81
D	272	HIS	-	expression tag	UNP A0A1U8YI81
D	273	HIS	-	expression tag	UNP A0A1U8YI81
D	274	HIS	-	expression tag	UNP A0A1U8YI81
D	275	HIS	-	expression tag	UNP A0A1U8YI81

- 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	A	1	Total O S 5 4 1	0	0
2	A	1	Total O S 5 4 1	0	0
2	B	1	Total O S 5 4 1	0	0
2	B	1	Total O S 5 4 1	0	1
2	B	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	1
2	C	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	D	1	Total O S 5 4 1	0	0
2	D	1	Total O S 5 4 1	0	1

- Molecule 3 is 2-ETHOXYETHANOL (three-letter code: ETX) (formula: C<sub>4</sub>H<sub>10</sub>O<sub>2</sub>).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O 6 4 2	0	0

- Molecule 4 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
4	A	1	Total C O 6 3 3	0	0
4	B	1	Total C O 6 3 3	0	0
4	C	1	Total C O 6 3 3	0	0
4	C	1	Total C O 6 3 3	0	0
4	C	1	Total C O 6 3 3	0	0
4	C	1	Total C O 6 3 3	0	0
4	C	1	Total C O 6 3 3	0	0
4	D	1	Total C O 6 3 3	0	0
4	D	1	Total C O 12 6 6	0	1
4	D	1	Total C O 6 3 3	0	0

- Molecule 5 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

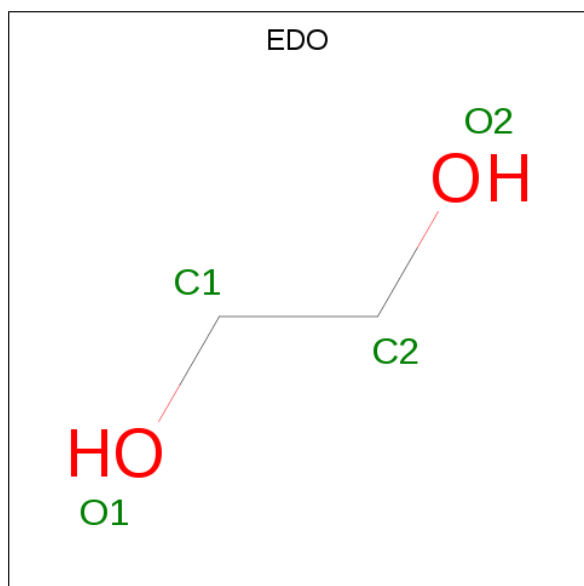
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	B	1	Total Cl 1 1	0	1

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total Cl 1 1	0	1

- Molecule 6 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C<sub>2</sub>H<sub>6</sub>O<sub>2</sub>).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	B	1	Total C O 4 2 2	0	0
6	D	1	Total C O 4 2 2	0	0

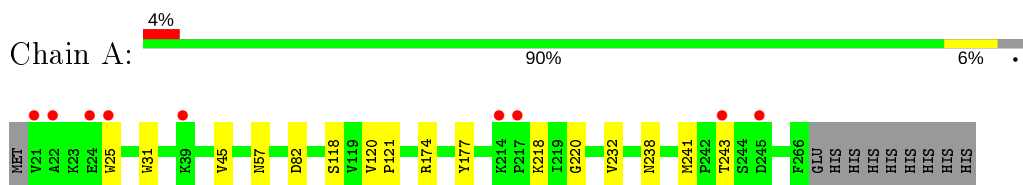
- Molecule 7 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	175	Total O 175 175	0	0
7	B	199	Total O 200 200	0	2
7	C	179	Total O 180 180	0	4
7	D	182	Total O 183 183	0	2

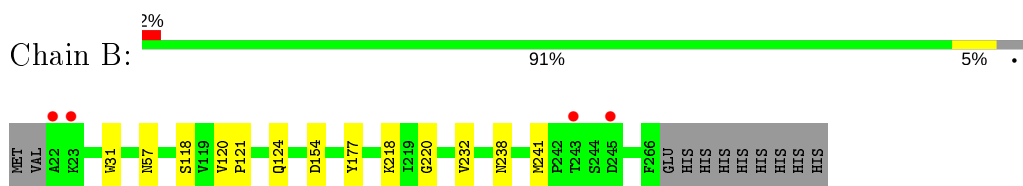
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ( $RSRZ > 2$ ). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

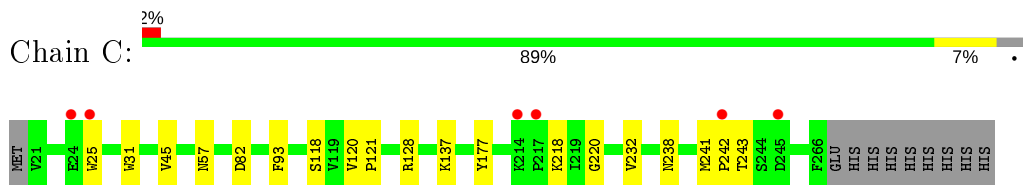
- Molecule 1: Beta-lactamase



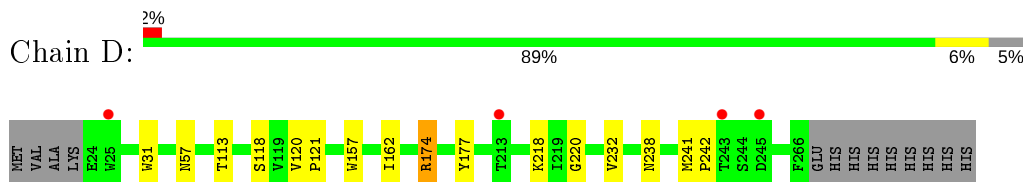
- Molecule 1: Beta-lactamase



- Molecule 1: Beta-lactamase



- Molecule 1: Beta-lactamase





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	49.80Å 125.05Å 82.66Å 90.00° 94.65° 90.00°	Depositor
Resolution (Å)	46.18 – 1.86 46.13 – 1.86	Depositor EDS
% Data completeness (in resolution range)	99.7 (46.18-1.86) 99.6 (46.13-1.86)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.17 (at 1.86Å)	Xtrriage
Refinement program	REFMAC 5.8.0230	Depositor
R, $R_{free}$	0.170 , 0.219 0.181 , 0.227	Depositor DCC
$R_{free}$ test set	4278 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	27.8	Xtrriage
Anisotropy	0.170	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.37 , 45.6	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.51$ , $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.97	EDS
Total number of atoms	8981	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	41.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 63.73 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 9.2488e-06. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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

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

## 5 Model quality

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, CL, ETX, EDO, SO4, KCX

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	0.63	0/2065	0.70	0/2792
1	B	0.64	0/2109	0.69	0/2848
1	C	0.63	0/2107	0.70	0/2846
1	D	0.62	0/2073	0.69	0/2802
All	All	0.63	0/8354	0.70	0/11288

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	D	0	1
All	All	0	2

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	174	ARG	Sidechain
1	D	174	ARG	Sidechain

## 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	2012	0	1971	7	0
1	B	2041	0	2017	6	0
1	C	2043	0	2020	10	0
1	D	2010	0	1969	9	0
2	A	10	0	0	0	0
2	B	15	0	0	0	0
2	C	20	0	0	0	0
2	D	10	0	0	0	0
3	A	6	0	10	0	0
4	A	6	0	8	0	0
4	B	6	0	8	1	0
4	C	30	0	40	0	0
4	D	24	0	32	2	0
5	A	1	0	0	0	0
5	B	1	0	0	0	0
6	B	4	0	6	0	0
6	D	4	0	6	0	0
7	A	175	0	0	0	0
7	B	200	0	0	0	0
7	C	180	0	0	2	0
7	D	183	0	0	1	0
All	All	8981	0	8087	33	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 (33) 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)
4:B:305:GOL:O1	4:B:305:GOL:O3	2.14	0.64
1:C:137:LYS:HG3	7:C:479:HOH:O	1.96	0.64
1:C:218:LYS:HB3	1:C:241:MET:O	2.00	0.61
1:A:218:LYS:HB3	1:A:241:MET:O	2.01	0.59
1:D:218:LYS:HB3	1:D:241:MET:O	2.02	0.59
1:B:218:LYS:HB3	1:B:241:MET:O	2.02	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:177:TYR:CZ	1:D:232[B]:VAL:HG21	2.40	0.56
1:D:113:THR:HG21	4:D:305[A]:GOL:O2	2.06	0.56
1:C:25:TRP:CZ3	1:C:45:VAL:CG1	2.90	0.54
1:D:220:GLY:O	1:D:238:ASN:HA	2.08	0.54
1:D:174:ARG:NH2	4:D:306:GOL:O1	2.32	0.54
1:A:31:TRP:HB2	1:A:57:ASN:HB3	1.90	0.54
1:B:220:GLY:O	1:B:238:ASN:HA	2.08	0.53
1:D:31:TRP:HB2	1:D:57:ASN:HB3	1.91	0.52
1:A:220:GLY:O	1:A:238:ASN:HA	2.10	0.52
1:B:31:TRP:HB2	1:B:57:ASN:HB3	1.91	0.51
1:C:220:GLY:O	1:C:238:ASN:HA	2.10	0.51
1:C:31:TRP:HB2	1:C:57:ASN:HB3	1.93	0.51
1:B:177:TYR:CZ	1:B:232[B]:VAL:HG21	2.48	0.49
1:C:218:LYS:HD2	1:C:242:PRO:HA	1.96	0.48
1:D:242:PRO:HD2	7:D:554:HOH:O	2.14	0.48
1:D:120:VAL:N	1:D:121:PRO:HD2	2.31	0.45
1:A:25:TRP:CZ3	1:A:45:VAL:CG1	3.00	0.45
1:B:120:VAL:N	1:B:121:PRO:HD2	2.32	0.44
1:C:25:TRP:CZ3	1:C:45:VAL:HG13	2.52	0.44
1:C:177:TYR:CZ	1:C:232[B]:VAL:HG21	2.53	0.44
1:A:25:TRP:CZ3	1:A:45:VAL:HG13	2.54	0.43
1:A:177:TYR:CZ	1:A:232[B]:VAL:HG21	2.55	0.41
1:A:120:VAL:N	1:A:121:PRO:HD2	2.36	0.41
1:B:124:GLN:HG2	1:B:154:ASP:O	2.20	0.41
1:C:128[B]:ARG:NH1	7:C:404:HOH:O	2.40	0.41
1:C:120:VAL:N	1:C:121:PRO:HD2	2.35	0.41
1:D:157:TRP:HA	1:D:162:ILE:CG2	2.51	0.41

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	245/254 (96%)	240 (98%)	5 (2%)	0	100	100
1	B	249/254 (98%)	244 (98%)	5 (2%)	0	100	100
1	C	249/254 (98%)	243 (98%)	6 (2%)	0	100	100
1	D	245/254 (96%)	240 (98%)	5 (2%)	0	100	100
All	All	988/1016 (97%)	967 (98%)	21 (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	215/221 (97%)	212 (99%)	3 (1%)	67	55
1	B	219/221 (99%)	218 (100%)	1 (0%)	88	86
1	C	219/221 (99%)	214 (98%)	5 (2%)	50	34
1	D	216/221 (98%)	215 (100%)	1 (0%)	88	86
All	All	869/884 (98%)	859 (99%)	10 (1%)	73	62

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

Mol	Chain	Res	Type
1	A	82	ASP
1	A	118	SER
1	A	243	THR
1	B	118	SER
1	C	82	ASP
1	C	93[A]	PHE
1	C	93[B]	PHE
1	C	118	SER
1	C	243	THR
1	D	118	SER

Some 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](#)

4 non-standard protein/DNA/RNA residues 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
1	KCX	B	73	1	7,11,12	0.45	0	4,12,14	0.30	0
1	KCX	A	73	1	7,11,12	0.62	0	4,12,14	0.36	0
1	KCX	D	73	1	7,11,12	0.43	0	4,12,14	0.27	0
1	KCX	C	73	1	7,11,12	0.52	0	4,12,14	0.52	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
1	KCX	B	73	1	-	0/7/10/12	-
1	KCX	A	73	1	-	0/7/10/12	-
1	KCX	D	73	1	-	0/7/10/12	-
1	KCX	C	73	1	-	0/7/10/12	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

Of 27 ligands modelled in this entry, 2 are monoatomic - leaving 25 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
4	GOL	A	304	-	5,5,5	0.38	0	5,5,5	0.53	0
4	GOL	D	305[B]	-	5,5,5	0.64	0	5,5,5	0.99	0
2	SO4	D	302	-	4,4,4	0.44	0	6,6,6	0.52	0
3	ETX	A	303	-	5,5,5	0.73	0	4,4,4	0.31	0
2	SO4	C	303	-	4,4,4	0.43	0	6,6,6	0.74	0
4	GOL	C	308	-	5,5,5	0.62	0	5,5,5	0.82	0
2	SO4	C	302[B]	-	4,4,4	0.34	0	6,6,6	0.42	0
4	GOL	D	305[A]	-	5,5,5	0.74	0	5,5,5	0.53	0
2	SO4	C	304	-	4,4,4	0.72	0	6,6,6	0.56	0
2	SO4	C	301	-	4,4,4	0.40	0	6,6,6	0.60	0
4	GOL	C	307	-	5,5,5	0.94	0	5,5,5	1.46	1 (20%)
2	SO4	A	302	-	4,4,4	0.41	0	6,6,6	0.37	0
2	SO4	B	304	-	4,4,4	0.40	0	6,6,6	0.37	0
2	SO4	A	301	-	4,4,4	0.48	0	6,6,6	0.36	0
4	GOL	D	304	-	5,5,5	0.20	0	5,5,5	0.66	0
2	SO4	D	303[B]	-	4,4,4	0.31	0	6,6,6	0.90	0
2	SO4	B	302	-	4,4,4	0.36	0	6,6,6	0.35	0
4	GOL	C	305	-	5,5,5	0.33	0	5,5,5	0.44	0
4	GOL	B	305	-	5,5,5	0.37	0	5,5,5	0.97	0
4	GOL	D	306	-	5,5,5	0.63	0	5,5,5	0.91	0
6	EDO	D	301	-	3,3,3	0.69	0	2,2,2	0.11	0
2	SO4	B	303[B]	-	4,4,4	0.19	0	6,6,6	0.94	0
4	GOL	C	309	-	5,5,5	0.51	0	5,5,5	0.85	0
4	GOL	C	306	-	5,5,5	0.25	0	5,5,5	0.59	0
6	EDO	B	301	-	3,3,3	1.19	0	2,2,2	0.68	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
4	GOL	D	306	-	-	2/4/4/4	-
6	EDO	D	301	-	-	1/1/1/1	-
4	GOL	A	304	-	-	2/4/4/4	-
4	GOL	C	307	-	-	2/4/4/4	-
4	GOL	D	305[B]	-	-	2/4/4/4	-
4	GOL	D	304	-	-	2/4/4/4	-
4	GOL	D	305[A]	-	-	4/4/4/4	-
4	GOL	C	309	-	-	0/4/4/4	-
4	GOL	B	305	-	-	0/4/4/4	-
4	GOL	C	306	-	-	0/4/4/4	-
3	ETX	A	303	-	-	2/3/3/3	-
4	GOL	C	308	-	-	3/4/4/4	-
4	GOL	C	305	-	-	2/4/4/4	-
6	EDO	B	301	-	-	0/1/1/1	-

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	C	307	GOL	C3-C2-C1	2.65	122.01	111.70

There are no chirality outliers.

All (22) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	304	GOL	C1-C2-C3-O3
4	D	305[B]	GOL	O1-C1-C2-C3
4	D	305[A]	GOL	O1-C1-C2-C3
4	D	305[A]	GOL	C1-C2-C3-O3
4	C	305	GOL	O1-C1-C2-O2
4	C	305	GOL	O1-C1-C2-C3
4	C	307	GOL	O1-C1-C2-C3
4	D	304	GOL	C1-C2-C3-O3
4	D	306	GOL	C1-C2-C3-O3
4	A	304	GOL	O2-C2-C3-O3
4	C	307	GOL	O1-C1-C2-O2

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Mol	Chain	Res	Type	Atoms
3	A	303	ETX	O1-C1-C2-O2
6	D	301	EDO	O1-C1-C2-O2
4	D	305[B]	GOL	O1-C1-C2-O2
4	D	305[A]	GOL	O1-C1-C2-O2
4	D	305[A]	GOL	O2-C2-C3-O3
4	D	306	GOL	O2-C2-C3-O3
4	C	308	GOL	O2-C2-C3-O3
3	A	303	ETX	C1-C2-O2-C3
4	D	304	GOL	O2-C2-C3-O3
4	C	308	GOL	O1-C1-C2-C3
4	C	308	GOL	O1-C1-C2-O2

There are no ring outliers.

3 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	D	305[A]	GOL	1	0
4	B	305	GOL	1	0
4	D	306	GOL	1	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

### 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	243/254 (95%)	-0.04	9 (3%) 41 39	29, 37, 73, 97	0
1	B	242/254 (95%)	-0.17	4 (1%) 70 70	27, 36, 59, 91	0
1	C	243/254 (95%)	-0.04	6 (2%) 57 56	29, 37, 64, 95	0
1	D	240/254 (94%)	-0.16	4 (1%) 70 70	29, 36, 59, 89	0
All	All	968/1016 (95%)	-0.10	23 (2%) 59 57	27, 37, 64, 97	0

All (23) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	21	VAL	6.2
1	A	22	ALA	5.5
1	D	243	THR	5.0
1	C	245	ASP	5.0
1	B	243	THR	4.7
1	A	245	ASP	3.6
1	A	214	LYS	3.3
1	D	213	THR	2.9
1	C	217	PRO	2.9
1	A	243	THR	2.7
1	B	245	ASP	2.6
1	C	214	LYS	2.5
1	C	24	GLU	2.5
1	A	39	LYS	2.4
1	D	245	ASP	2.4
1	A	25	TRP	2.3
1	D	25	TRP	2.3
1	A	24	GLU	2.3
1	C	25	TRP	2.3
1	A	217	PRO	2.3
1	B	22	ALA	2.3

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Mol	Chain	Res	Type	RSRZ
1	B	23	LYS	2.2
1	C	242	PRO	2.1

## 6.2 Non-standard residues in protein, DNA, RNA chains [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
1	KCX	B	73	12/13	0.93	0.11	28,31,37,37	0
1	KCX	C	73	12/13	0.93	0.11	29,32,44,48	0
1	KCX	D	73	12/13	0.95	0.11	27,30,39,42	0
1	KCX	A	73	12/13	0.96	0.10	27,37,41,43	0

## 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. 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	SO4	B	304	5/5	0.70	0.27	52,58,69,73	5
2	SO4	C	303	5/5	0.74	0.26	39,52,56,62	5
4	GOL	C	306	6/6	0.76	0.23	75,80,82,84	0
2	SO4	C	304	5/5	0.78	0.35	65,77,100,105	0
4	GOL	D	305[B]	6/6	0.81	0.21	53,65,70,70	6
4	GOL	D	305[A]	6/6	0.81	0.21	38,47,50,53	6
2	SO4	A	302	5/5	0.84	0.17	46,48,52,65	5
4	GOL	B	305	6/6	0.87	0.19	58,71,72,81	0
4	GOL	D	306	6/6	0.87	0.36	59,65,67,79	0
6	EDO	D	301	4/4	0.87	0.13	52,57,60,68	0
3	ETX	A	303	6/6	0.88	0.16	60,66,75,76	0
4	GOL	C	305	6/6	0.90	0.15	61,72,77,77	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
4	GOL	C	309	6/6	0.90	0.15	52,58,64,65	0
2	SO4	C	302[B]	5/5	0.90	0.17	50,51,66,66	5
4	GOL	C	308	6/6	0.91	0.14	42,64,69,72	0
4	GOL	D	304	6/6	0.93	0.22	42,58,60,73	0
4	GOL	C	307	6/6	0.93	0.15	35,48,55,56	0
6	EDO	B	301	4/4	0.93	0.15	39,43,52,53	0
4	GOL	A	304	6/6	0.94	0.19	42,64,70,71	0
2	SO4	C	301	5/5	0.94	0.12	55,58,75,77	0
2	SO4	A	301	5/5	0.95	0.13	47,72,78,81	0
2	SO4	D	302	5/5	0.96	0.13	54,57,73,77	0
2	SO4	B	302	5/5	0.96	0.16	59,60,81,81	0
2	SO4	B	303[B]	5/5	0.98	0.11	34,34,39,40	5
2	SO4	D	303[B]	5/5	0.98	0.12	30,33,34,35	5
5	CL	B	306[A]	1/1	0.99	0.07	33,33,33,33	1
5	CL	A	305[A]	1/1	1.00	0.08	37,37,37,37	1

## 6.5 Other polymers [i](#)

There are no such residues in this entry.