



# Full wwPDB X-ray Structure Validation Report ⓘ

Apr 29, 2019 – 03:14 PM EDT

PDB ID : 2C4B  
Title : Inhibitor cystine knot protein McoEeTI fused to the catalytically inactive barnase mutant H102A  
Authors : Niemann, H.H.; Schmoldt, H.U.; Wentzel, A.; Kolmar, H.; Heinz, D.W.  
Deposited on : 2005-10-18  
Resolution : 1.30 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 : 1.8.0 (224370), CSD as540be (2019)  
Xtriage (Phenix) : 1.13  
EDS : rb-20031633  
Percentile statistics : 20171227.v01 (using entries in the PDB archive December 27th 2017)  
Refmac : 5.8.0158  
CCP4 : 7.0 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : rb-20031633

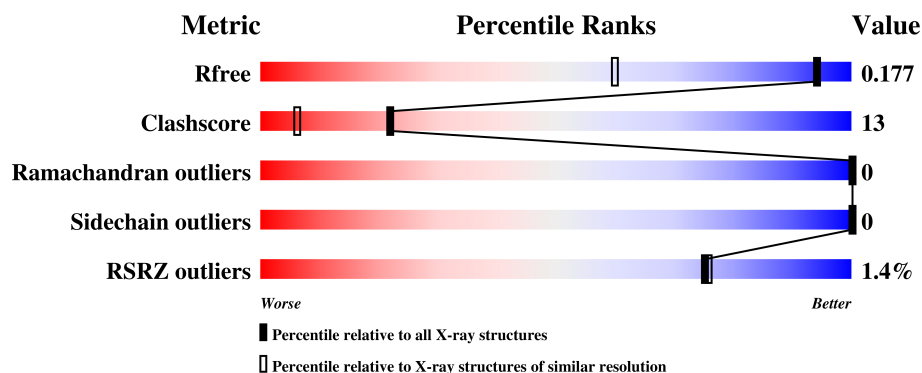
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.30 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))
$R_{free}$	111664	1286 (1.32-1.28)
Clashscore	122126	1332 (1.32-1.28)
Ramachandran outliers	120053	1282 (1.32-1.28)
Sidechain outliers	120020	1282 (1.32-1.28)
RSRZ outliers	108989	1250 (1.32-1.28)

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	143	
1	B	143	

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
3	GOL	A	1148	-	-	X	-
6	SO4	B	1155	-	-	X	-
6	SO4	B	1166	-	-	X	-
6	SO4	B	1169	-	-	X	-
6	SO4	B	1171	-	-	X	-
6	SO4	B	1172	-	-	X	-
6	SO4	B	1173	-	-	-	X
7	UNX	A	1500	-	-	X	-
7	UNX	A	1502	-	-	X	-
7	UNX	A	1503	-	-	X	-
7	UNX	A	1506	-	-	X	-
7	UNX	A	1507	-	-	X	-
7	UNX	A	1508	-	-	X	-
7	UNX	A	1511	-	-	X	-

## 2 Entry composition

There are 9 unique types of molecules in this entry. The entry contains 3057 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.

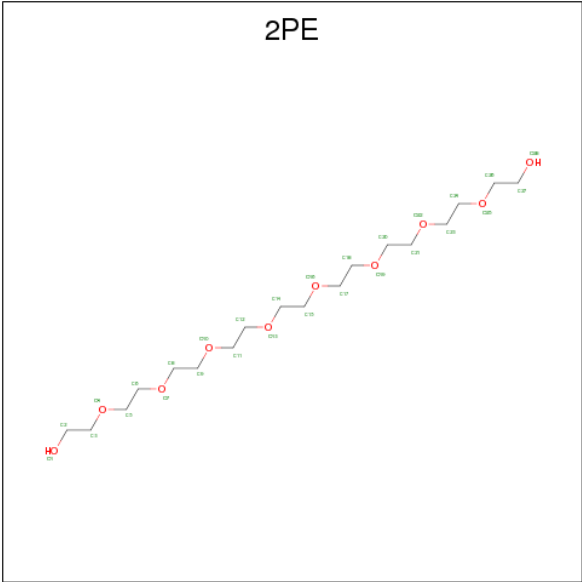
- Molecule 1 is a protein called BARNASE MCOEETI FUSION.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	142	Total	C	N	O	S	0	6	0
			1133	713	194	219	7			
1	B	142	Total	C	N	O	S	0	14	0
			1178	739	208	224	7			

There are 10 discrepancies between the modelled and reference sequences:

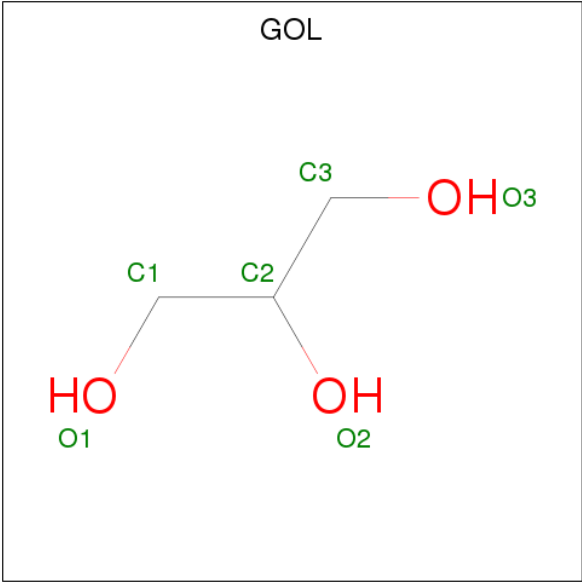
Chain	Residue	Modelled	Actual	Comment	Reference
A	111	SER	-	linker	UNP P00648
A	112	SER	-	linker	UNP P00648
A	113	SER	-	linker	UNP P00648
A	114	MET	-	linker	UNP P00648
A	102	ALA	HIS	engineered mutation	UNP P00648
B	111	SER	-	linker	UNP P00648
B	112	SER	-	linker	UNP P00648
B	113	SER	-	linker	UNP P00648
B	114	MET	-	linker	UNP P00648
B	102	ALA	HIS	engineered mutation	UNP P00648

- Molecule 2 is NONAETHYLENE GLYCOL (three-letter code: 2PE) (formula: C<sub>18</sub>H<sub>38</sub>O<sub>10</sub>).



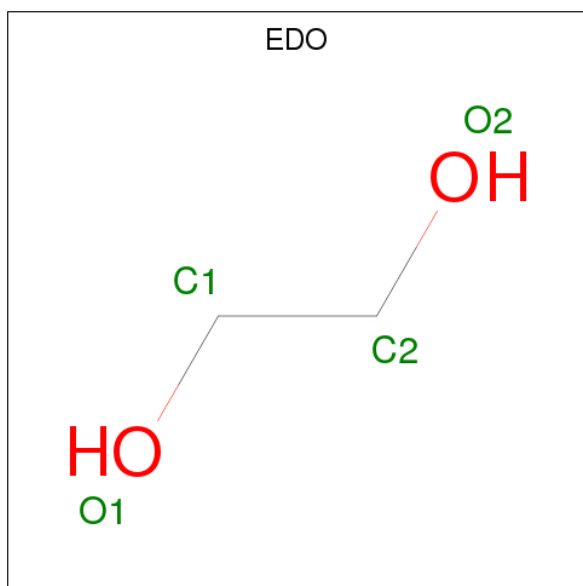
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			21	14	7		
2	A	1	Total	C	O	0	0
			7	4	3		
2	B	1	Total	C	O	0	1
			20	12	8		
2	B	1	Total	C	O	0	1
			12	7	5		

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



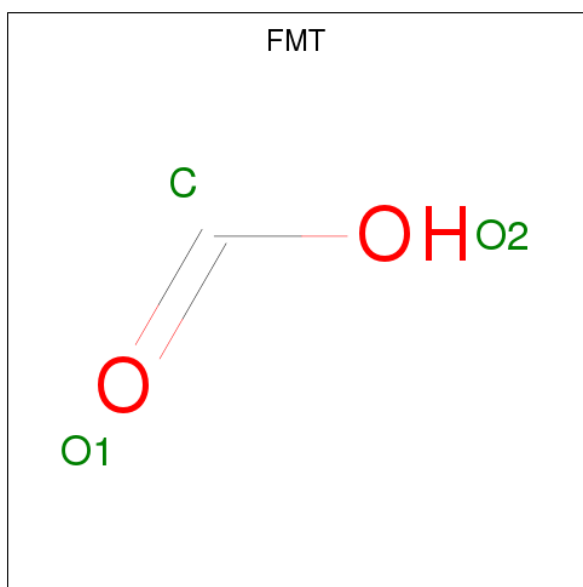
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			6	3	3		

- Molecule 4 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula:  $C_2H_6O_2$ ).



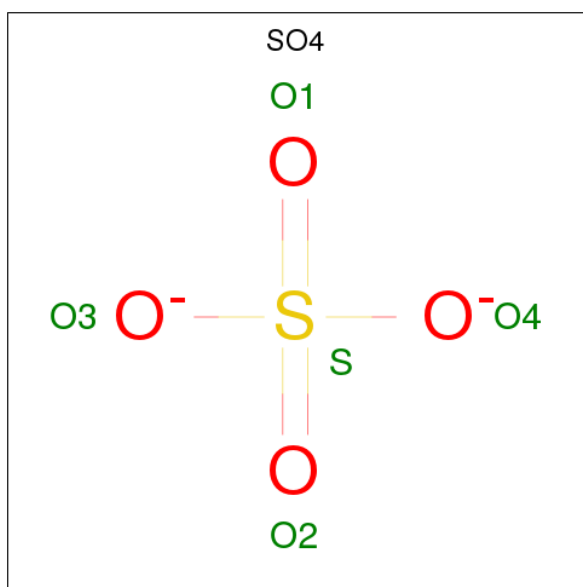
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			4	2	2		
4	A	1	Total	C	O	0	1
			8	4	4		
4	A	1	Total	C	O	0	1
			5	2	3		
4	A	1	Total	C	O	0	0
			4	2	2		
4	B	1	Total	C	O	0	0
			4	2	2		
4	B	1	Total	C	O	0	0
			4	2	2		
4	B	1	Total	C	O	0	0
			4	2	2		
4	B	1	Total	C	O	0	1
			8	4	4		
4	B	1	Total	C	O	0	0
			4	2	2		

- Molecule 5 is FORMIC ACID (three-letter code: FMT) (formula:  $CH_2O_2$ ).



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

- Molecule 6 is SULFATE ION (three-letter code: SO4) (formula: O<sub>4</sub>S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total	O	S	0	0
			5	4	1		

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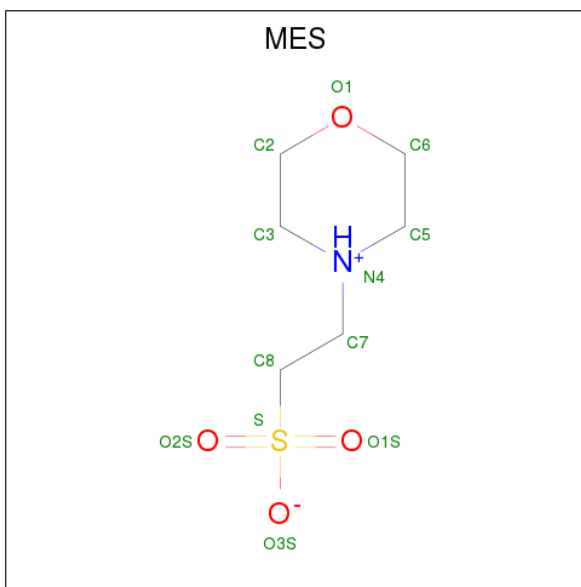
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total	O	S	0	0
			5	4	1		
6	A	1	Total	O	S	0	0
			5	4	1		
6	A	1	Total	O	S	0	0
			5	4	1		
6	A	1	Total	O	S	0	0
			5	4	1		
6	A	1	Total	O	S	0	0
			5	4	1		
6	B	1	Total	O	S	0	0
			5	4	1		
6	B	1	Total	O	S	0	0
			5	4	1		
6	B	1	Total	O	S	0	0
			5	4	1		
6	B	1	Total	O	S	0	0
			5	4	1		
6	B	1	Total	O	S	0	0
			5	4	1		
6	B	1	Total	O	S	0	0
			5	4	1		
6	B	1	Total	O	S	0	0
			5	4	1		
6	B	1	Total	O	S	0	0
			5	4	1		

- Molecule 7 is UNKNOWN ATOM OR ION (three-letter code: UNX) (formula: X).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	15	Total	X	0	0
			15	15		

- Molecule 8 is 2-(N-MORPHOLINO)-ETHANESULFONIC ACID (three-letter code: MES) (formula: C<sub>6</sub>H<sub>13</sub>NO<sub>4</sub>S).





Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
8	B	1	Total	C	N	O	S	0	0
			12	6	1	4	1		

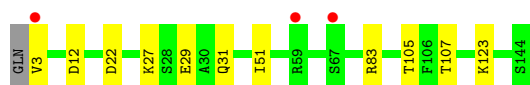
- Molecule 9 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	257	Total	O	0	0
			257	257		
9	B	252	Total	O	0	0
			252	252		

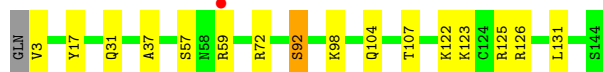
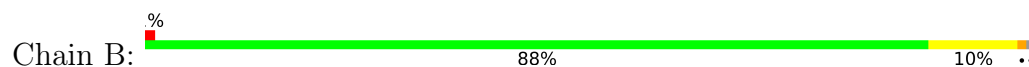
### 3 Residue-property plots [i](#)

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: BARNASE MCOEETI FUSION



#### ● Molecule 1: BARNASE MCOEETI FUSION



## 4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	74.02Å 217.71Å 58.34Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	39.84 – 1.30 39.80 – 1.30	Depositor EDS
% Data completeness (in resolution range)	100.0 (39.84-1.30) 98.7 (39.80-1.30)	Depositor EDS
$R_{merge}$	0.04	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.69 (at 1.30Å)	Xtriage
Refinement program	REFMAC 5.2.0005	Depositor
R, $R_{free}$	0.132 , 0.164 0.146 , 0.177	Depositor DCC
$R_{free}$ test set	2291 reflections (2.00%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	13.7	Xtriage
Anisotropy	0.318	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.37 , 66.7	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.98	EDS
Total number of atoms	3057	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	22.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.29% of the height of the origin peak. No significant pseudotranslation is detected.*

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

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

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, UNX, FMT, EDO, 2PE, SO4, MES

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	0.92	1/1174 (0.1%)	0.97	1/1582 (0.1%)
1	B	0.84	2/1239 (0.2%)	0.90	1/1663 (0.1%)
All	All	0.88	3/2413 (0.1%)	0.94	2/3245 (0.1%)

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	92	SER	CB-OG	-5.63	1.34	1.42
1	A	3	VAL	CB-CG1	-5.21	1.42	1.52
1	B	3	VAL	CB-CG1	-5.05	1.42	1.52

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	72	ARG	NE-CZ-NH1	7.70	124.15	120.30
1	A	12	ASP	CB-CG-OD2	-5.70	113.17	118.30

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	1133	0	1117	12	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	1178	0	1183	22	0
2	A	28	0	36	1	0
2	B	32	0	32	13	0
3	A	6	0	8	4	0
4	A	21	0	30	4	0
4	B	28	0	42	4	0
5	A	6	0	2	0	0
5	B	4	0	2	0	0
6	A	35	0	0	2	0
6	B	50	0	0	13	0
7	A	15	0	0	12	0
8	B	12	0	12	2	0
9	A	257	0	0	3	0
9	B	252	0	0	14	0
All	All	3057	0	2464	64	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 13.

All (64) 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:B:104[B]:GLN:NE2	9:B:2164:HOH:O	1.92	1.01
2:B:1156[A]:2PE:H21	9:B:2218:HOH:O	1.59	1.01
6:B:1171:SO4:O1	6:B:1172:SO4:O4	1.78	1.00
6:B:1155:SO4:O1	9:B:2215:HOH:O	1.86	0.92
6:B:1165:SO4:O1	9:B:2230:HOH:O	1.88	0.91
1:B:37:ALA:O	6:B:1169:SO4:O3	1.91	0.88
1:A:27[A]:LYS:HD3	9:A:2126:HOH:O	1.77	0.85
6:B:1171:SO4:S	6:B:1172:SO4:O4	2.35	0.83
6:A:1163:SO4:O3	1:B:125[C]:ARG:NH2	2.13	0.81
8:B:1158:MES:O1S	6:B:1169:SO4:O1	2.01	0.78
3:A:1148:GOL:HO2	4:A:1154[A]:EDO:HO2	1.14	0.75
2:B:1157[B]:2PE:H31	9:B:2222:HOH:O	1.92	0.69
7:A:1500:UNX:UNK	7:A:1514:UNX:UNK	1.37	0.69
1:A:27[A]:LYS:CD	9:A:2126:HOH:O	2.38	0.68
7:A:1508:UNX:UNK	7:A:1509:UNX:UNK	1.37	0.67
1:A:107:THR:HG21	3:A:1148:GOL:O1	1.93	0.67
2:B:1157[A]:2PE:H32	9:B:2222:HOH:O	1.94	0.66
8:B:1158:MES:S	6:B:1169:SO4:O1	2.50	0.65
1:B:104[B]:GLN:OE1	9:B:2166:HOH:O	2.14	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:A:1508:UNX:UNK	7:A:1510:UNX:UNK	1.42	0.63
1:B:131:LEU:HG	2:B:1157[B]:2PE:H22	1.81	0.62
1:B:107:THR:OG1	4:B:1160:EDO:H12	1.99	0.61
1:A:27[A]:LYS:HD2	6:A:1161:SO4:O3	2.02	0.59
7:A:1506:UNX:UNK	7:A:1507:UNX:UNK	1.44	0.59
1:B:123[B]:LYS:HG3	1:B:125[B]:ARG:HH22	1.69	0.58
2:B:1157[B]:2PE:C3	9:B:2222:HOH:O	2.52	0.57
1:A:123:LYS:HB3	2:A:1146:2PE:H51	1.87	0.56
7:A:1502:UNX:UNK	7:A:1503:UNX:UNK	1.49	0.56
7:A:1500:UNX:UNK	7:A:1501:UNX:UNK	1.48	0.56
6:B:1171:SO4:O1	6:B:1172:SO4:S	2.63	0.56
7:A:1503:UNX:UNK	7:A:1504:UNX:UNK	1.48	0.56
1:B:126:ARG:CZ	6:B:1155:SO4:O4	2.55	0.55
1:B:131:LEU:HG	2:B:1157[A]:2PE:H22	1.87	0.55
1:B:57:SER:OG	1:B:59[A]:ARG:HG3	2.06	0.55
6:B:1171:SO4:O3	9:B:2243:HOH:O	2.18	0.54
7:A:1505:UNX:UNK	7:A:1506:UNX:UNK	1.52	0.53
1:B:123[B]:LYS:HG3	1:B:125[B]:ARG:NH2	2.23	0.53
1:B:57:SER:OG	1:B:59[B]:ARG:HG2	2.09	0.52
1:B:123[B]:LYS:HG2	6:B:1166:SO4:O1	2.11	0.51
1:A:51[B]:ILE:HD12	1:A:83:ARG:HD2	1.93	0.51
1:B:123[B]:LYS:HG2	6:B:1166:SO4:S	2.51	0.51
7:A:1500:UNX:UNK	7:A:1502:UNX:UNK	1.55	0.49
1:A:107:THR:CG2	3:A:1148:GOL:O1	2.60	0.48
2:B:1157[B]:2PE:C5	9:B:2222:HOH:O	2.61	0.48
3:A:1148:GOL:O2	4:A:1154[A]:EDO:O2	2.00	0.48
7:A:1507:UNX:UNK	7:A:1508:UNX:UNK	1.58	0.48
4:B:1162:EDO:H22	9:B:2142:HOH:O	2.14	0.47
2:B:1157[B]:2PE:H51	9:B:2222:HOH:O	2.15	0.46
1:B:123[B]:LYS:HE2	6:B:1166:SO4:O1	2.16	0.46
1:A:22[B]:ASP:OD1	1:A:22[B]:ASP:C	2.55	0.45
1:B:31[A]:GLN:HG2	9:B:2072:HOH:O	2.17	0.45
1:B:131:LEU:HD21	2:B:1157[A]:2PE:H51	1.99	0.44
1:B:122:LYS:HG2	2:B:1157[B]:2PE:H21	1.98	0.44
1:B:98:LYS:HG3	4:B:1160:EDO:H11	2.00	0.43
1:B:122:LYS:HG2	2:B:1157[A]:2PE:H21	2.02	0.42
1:A:27[B]:LYS:HE3	1:A:31:GLN:NE2	2.34	0.42
1:A:105:THR:O	4:A:1154[B]:EDO:C1	2.69	0.41
2:B:1156[B]:2PE:H21	9:B:2220:HOH:O	2.19	0.41
1:A:29[C]:GLU:OE2	9:A:2081:HOH:O	2.21	0.41
7:A:1511:UNX:UNK	7:A:1512:UNX:UNK	1.65	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:A:1508:UNX:UNK	7:A:1511:UNX:UNK	1.65	0.41
1:B:17:TYR:HE1	2:B:1157[B]:2PE:H62	1.86	0.41
1:A:105:THR:OG1	4:A:1154[B]:EDO:H11	2.20	0.41
1:B:92:SER:HB3	4:B:1161:EDO:H22	2.04	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	147/143 (103%)	140 (95%)	7 (5%)	0	100	100
1	B	154/143 (108%)	149 (97%)	5 (3%)	0	100	100
All	All	301/286 (105%)	289 (96%)	12 (4%)	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	125/119 (105%)	125 (100%)	0	100	100
1	B	133/119 (112%)	133 (100%)	0	100	100
All	All	258/238 (108%)	258 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

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

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

## 5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

## 5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

## 5.6 Ligand geometry ⓘ

Of 57 ligands modelled in this entry, 15 are unknown - leaving 42 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	$\# Z  > 2$
2	2PE	A	1145	-	20,20,27	0.63	0	19,19,26	0.90	0
2	2PE	A	1146	-	6,6,27	0.57	0	5,5,26	0.65	0
3	GOL	A	1148	-	5,5,5	0.35	0	5,5,5	0.94	0
4	EDO	A	1153	-	3,3,3	0.54	0	2,2,2	0.47	0
4	EDO	A	1154[A]	-	3,3,3	0.63	0	2,2,2	0.25	0
4	EDO	A	1154[B]	-	3,3,3	0.37	0	2,2,2	0.79	0
4	EDO	A	1155[A]	-	3,3,3	1.08	0	2,2,2	1.34	0
4	EDO	A	1155[B]	-	3,3,3	1.05	0	2,2,2	0.93	0
4	EDO	A	1156	-	3,3,3	0.74	0	2,2,2	0.46	0
5	FMT	A	1157	-	0,2,2	0.00	-	0,1,1	0.00	-
5	FMT	A	1158	-	0,2,2	0.00	-	0,1,1	0.00	-
6	SO4	A	1159	-	4,4,4	0.41	0	6,6,6	0.52	0



Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
6	SO4	A	1160	-	4,4,4	0.32	0	6,6,6	1.03	1 (16%)
6	SO4	A	1161	-	4,4,4	0.44	0	6,6,6	0.25	0
6	SO4	A	1162	-	4,4,4	0.24	0	6,6,6	0.28	0
6	SO4	A	1163	-	4,4,4	0.24	0	6,6,6	0.40	0
6	SO4	A	1164	-	4,4,4	0.24	0	6,6,6	0.71	0
6	SO4	A	1165	-	4,4,4	0.24	0	6,6,6	0.73	0
6	SO4	B	1155	-	4,4,4	0.29	0	6,6,6	0.43	0
2	2PE	B	1156[A]	-	15,15,27	0.87	0	14,14,26	0.77	0
2	2PE	B	1156[B]	-	15,15,27	0.70	0	14,14,26	0.75	0
2	2PE	B	1157[A]	-	6,6,27	0.55	0	5,5,26	0.53	0
2	2PE	B	1157[B]	-	6,6,27	0.38	0	5,5,26	0.75	0
8	MES	B	1158	-	12,12,12	2.10	1 (8%)	14,16,16	1.80	3 (21%)
4	EDO	B	1159	-	3,3,3	0.50	0	2,2,2	0.21	0
4	EDO	B	1160	-	3,3,3	1.57	0	2,2,2	2.50	2 (100%)
4	EDO	B	1161	-	3,3,3	0.58	0	2,2,2	0.57	0
4	EDO	B	1162	-	3,3,3	0.46	0	2,2,2	0.37	0
4	EDO	B	1163[A]	-	3,3,3	0.59	0	2,2,2	0.23	0
4	EDO	B	1163[B]	-	3,3,3	0.49	0	2,2,2	0.16	0
4	EDO	B	1164	-	3,3,3	0.55	0	2,2,2	0.34	0
6	SO4	B	1165	-	4,4,4	0.62	0	6,6,6	1.01	1 (16%)
6	SO4	B	1166	-	4,4,4	0.48	0	6,6,6	0.67	0
6	SO4	B	1167	-	4,4,4	0.09	0	6,6,6	0.49	0
6	SO4	B	1168	-	4,4,4	0.21	0	6,6,6	0.21	0
6	SO4	B	1169	-	4,4,4	0.57	0	6,6,6	0.63	0
6	SO4	B	1170	-	4,4,4	0.08	0	6,6,6	0.19	0
6	SO4	B	1171	-	4,4,4	0.24	0	6,6,6	1.13	1 (16%)
6	SO4	B	1172	-	4,4,4	0.25	0	6,6,6	0.66	0
6	SO4	B	1173	-	4,4,4	0.13	0	6,6,6	0.46	0
5	FMT	B	1174[A]	-	0,2,2	0.00	-	0,1,1	0.00	-
5	FMT	B	1174[B]	-	0,2,2	0.00	-	0,1,1	0.00	-

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	2PE	A	1145	-	-	0/18/18/25	0/0/0/0
2	2PE	A	1146	-	-	0/4/4/25	0/0/0/0
3	GOL	A	1148	-	-	0/4/4/4	0/0/0/0
4	EDO	A	1153	-	-	0/1/1/1	0/0/0/0

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	EDO	A	1154[A]	-	-	0/1/1/1	0/0/0/0
4	EDO	A	1154[B]	-	-	0/1/1/1	0/0/0/0
4	EDO	A	1155[A]	-	-	0/1/1/1	0/0/0/0
4	EDO	A	1155[B]	-	-	0/1/1/1	0/0/0/0
4	EDO	A	1156	-	-	0/1/1/1	0/0/0/0
5	FMT	A	1157	-	-	0/0/0/0	0/0/0/0
5	FMT	A	1158	-	-	0/0/0/0	0/0/0/0
6	SO4	A	1159	-	-	0/0/0/0	0/0/0/0
6	SO4	A	1160	-	-	0/0/0/0	0/0/0/0
6	SO4	A	1161	-	-	0/0/0/0	0/0/0/0
6	SO4	A	1162	-	-	0/0/0/0	0/0/0/0
6	SO4	A	1163	-	-	0/0/0/0	0/0/0/0
6	SO4	A	1164	-	-	0/0/0/0	0/0/0/0
6	SO4	A	1165	-	-	0/0/0/0	0/0/0/0
6	SO4	B	1155	-	-	0/0/0/0	0/0/0/0
2	2PE	B	1156[A]	-	-	0/13/13/25	0/0/0/0
2	2PE	B	1156[B]	-	-	0/13/13/25	0/0/0/0
2	2PE	B	1157[A]	-	-	0/4/4/25	0/0/0/0
2	2PE	B	1157[B]	-	-	0/4/4/25	0/0/0/0
8	MES	B	1158	-	-	0/6/14/14	0/1/1/1
4	EDO	B	1159	-	-	0/1/1/1	0/0/0/0
4	EDO	B	1160	-	-	0/1/1/1	0/0/0/0
4	EDO	B	1161	-	-	0/1/1/1	0/0/0/0
4	EDO	B	1162	-	-	0/1/1/1	0/0/0/0
4	EDO	B	1163[A]	-	-	0/1/1/1	0/0/0/0
4	EDO	B	1163[B]	-	-	0/1/1/1	0/0/0/0
4	EDO	B	1164	-	-	0/1/1/1	0/0/0/0
6	SO4	B	1165	-	-	0/0/0/0	0/0/0/0
6	SO4	B	1166	-	-	0/0/0/0	0/0/0/0
6	SO4	B	1167	-	-	0/0/0/0	0/0/0/0
6	SO4	B	1168	-	-	0/0/0/0	0/0/0/0
6	SO4	B	1169	-	-	0/0/0/0	0/0/0/0
6	SO4	B	1170	-	-	0/0/0/0	0/0/0/0
6	SO4	B	1171	-	-	0/0/0/0	0/0/0/0
6	SO4	B	1172	-	-	0/0/0/0	0/0/0/0
6	SO4	B	1173	-	-	0/0/0/0	0/0/0/0
5	FMT	B	1174[A]	-	-	0/0/0/0	0/0/0/0
5	FMT	B	1174[B]	-	-	0/0/0/0	0/0/0/0

All (1) bond length outliers are listed below:

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
8	B	1158	MES	C8-S	-6.90	1.67	1.77

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	1160	EDO	O1-C1-C2	-2.78	91.73	111.95
6	B	1165	SO4	O4-S-O2	-2.16	97.78	109.37
6	B	1171	SO4	O3-S-O2	-2.14	97.91	109.37
6	A	1160	SO4	O4-S-O2	2.13	120.81	109.37
4	B	1160	EDO	O2-C2-C1	2.19	127.91	111.95
8	B	1158	MES	C5-N4-C3	2.32	113.98	108.86
8	B	1158	MES	C7-N4-C5	3.05	119.04	111.23
8	B	1158	MES	O3S-S-C8	3.23	110.98	105.77

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

20 monomers are involved in 39 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	1146	2PE	1	0
3	A	1148	GOL	4	0
4	A	1154[A]	EDO	2	0
4	A	1154[B]	EDO	2	0
6	A	1161	SO4	1	0
6	A	1163	SO4	1	0
6	B	1155	SO4	2	0
2	B	1156[A]	2PE	1	0
2	B	1156[B]	2PE	1	0
2	B	1157[A]	2PE	4	0
2	B	1157[B]	2PE	7	0
8	B	1158	MES	2	0
4	B	1160	EDO	2	0
4	B	1161	EDO	1	0
4	B	1162	EDO	1	0
6	B	1165	SO4	1	0
6	B	1166	SO4	3	0
6	B	1169	SO4	3	0
6	B	1171	SO4	4	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	B	1172	SO4	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	142/143 (99%)	-0.34	3 (2%) 63 63	11, 17, 30, 49	0
1	B	142/143 (99%)	-0.33	1 (0%) 87 86	12, 18, 29, 44	0
All	All	284/286 (99%)	-0.34	4 (1%) 75 76	11, 17, 30, 49	0

All (4) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	59	ARG	2.6
1	A	3	VAL	2.3
1	B	59[A]	ARG	2.1
1	A	67	SER	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 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
6	SO4	B	1173	5/5	0.72	0.40	31,34,40,60	5

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
7	UNX	A	1502	1/1	0.77	0.17	39,39,39,39	0
6	SO4	B	1170	5/5	0.82	0.17	28,34,37,42	5
6	SO4	B	1171	5/5	0.82	0.19	22,24,31,33	5
4	EDO	B	1163[A]	4/4	0.83	0.36	24,32,46,55	4
4	EDO	B	1163[B]	4/4	0.83	0.36	24,28,35,38	4
7	UNX	A	1507	1/1	0.84	0.11	22,22,22,22	0
4	EDO	B	1162	4/4	0.84	0.25	50,50,55,61	0
6	SO4	A	1162	5/5	0.86	0.13	38,44,49,50	5
5	FMT	A	1158	3/3	0.87	0.13	44,44,51,52	0
2	2PE	B	1157[B]	7/28	0.88	0.23	15,24,33,35	7
2	2PE	B	1157[A]	7/28	0.88	0.23	15,28,35,45	7
7	UNX	A	1512	1/1	0.89	0.28	27,27,27,27	0
6	SO4	B	1155	5/5	0.89	0.13	17,30,43,62	5
5	FMT	B	1174[B]	3/3	0.89	0.13	38,38,42,46	1
4	EDO	B	1161	4/4	0.89	0.10	35,43,54,74	0
5	FMT	B	1174[A]	3/3	0.89	0.13	38,38,45,46	1
5	FMT	A	1157	3/3	0.90	0.16	40,40,47,54	0
4	EDO	B	1159	4/4	0.90	0.07	43,47,53,54	0
6	SO4	B	1172	5/5	0.90	0.18	22,24,32,36	5
2	2PE	A	1146	7/28	0.90	0.14	29,30,54,69	0
2	2PE	B	1156[B]	16/28	0.91	0.13	15,21,48,52	16
2	2PE	B	1156[A]	16/28	0.91	0.13	16,21,26,27	16
4	EDO	A	1156	4/4	0.91	0.18	28,36,54,55	0
6	SO4	A	1160	5/5	0.92	0.13	23,34,52,55	5
7	UNX	A	1513	1/1	0.92	0.11	32,32,32,32	0
7	UNX	A	1510	1/1	0.93	0.08	24,24,24,24	0
7	UNX	A	1501	1/1	0.93	0.11	30,30,30,30	0
7	UNX	A	1500	1/1	0.93	0.11	14,14,14,14	0
6	SO4	B	1168	5/5	0.93	0.11	36,41,58,58	5
6	SO4	B	1165	5/5	0.94	0.10	34,37,44,56	5
6	SO4	A	1161	5/5	0.94	0.11	32,34,48,58	5
7	UNX	A	1505	1/1	0.95	0.11	17,17,17,17	0
7	UNX	A	1503	1/1	0.95	0.07	13,13,13,13	0
6	SO4	A	1163	5/5	0.95	0.10	33,39,43,49	5
6	SO4	A	1159	5/5	0.95	0.11	31,33,38,42	5
3	GOL	A	1148	6/6	0.95	0.14	18,21,35,61	6
4	EDO	B	1164	4/4	0.96	0.10	17,29,32,34	4
4	EDO	B	1160	4/4	0.96	0.10	18,21,34,42	0
7	UNX	A	1509	1/1	0.96	0.10	30,30,30,30	0
2	2PE	A	1145	21/28	0.96	0.06	18,24,32,63	0
7	UNX	A	1514	1/1	0.96	0.08	33,33,33,33	0
7	UNX	A	1506	1/1	0.96	0.23	18,18,18,18	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
4	EDO	A	1153	4/4	0.96	0.06	34,39,51,51	0
7	UNX	A	1508	1/1	0.96	0.07	12,12,12,12	0
6	SO4	A	1165	5/5	0.97	0.10	21,22,37,42	5
7	UNX	A	1504	1/1	0.97	0.19	16,16,16,16	0
4	EDO	A	1155[B]	4/4	0.97	0.09	16,26,28,31	1
7	UNX	A	1511	1/1	0.97	0.17	23,23,23,23	0
8	MES	B	1158	12/12	0.97	0.09	22,27,37,43	12
4	EDO	A	1155[A]	4/4	0.97	0.09	16,25,28,31	1
6	SO4	B	1167	5/5	0.98	0.09	30,34,41,49	5
6	SO4	B	1166	5/5	0.98	0.15	21,37,39,47	5
6	SO4	B	1169	5/5	0.98	0.10	23,24,28,29	5
4	EDO	A	1154[A]	4/4	0.98	0.10	13,24,25,36	4
4	EDO	A	1154[B]	4/4	0.98	0.10	17,23,24,28	4
6	SO4	A	1164	5/5	0.99	0.11	28,29,45,47	0

## 6.5 Other polymers

There are no such residues in this entry.