



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 27, 2014 – 01:15 AM GMT

PDB ID : 1XA3  
Title : Crystal structure of CaiB, a type III CoA transferase in carnitine metabolism  
Authors : Stenmark, P.; Gurmu, D.; Nordlund, P.; Structural Proteomics in Europe (SPINE)  
Deposited on : 2004-08-25  
Resolution : 1.85 Å(reported)

This is a full wwPDB 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 <http://wwpdb.org/ValidationPDFNotes.html>

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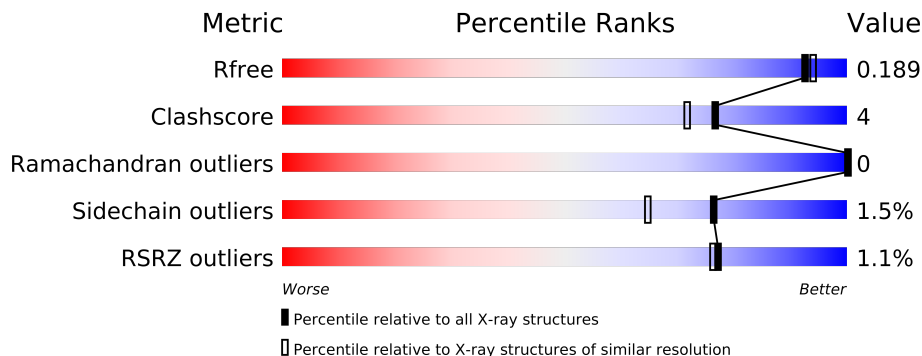
The following versions of software and data (see [references](#)) were used in the production of this report:

MolProbity : 4.02b-467  
Mogul : 1.15 2013  
Xtriage (Phenix) : dev-1323  
EDS : stable22639  
Percentile statistics : 21963  
Refmac : 5.8.0049  
CCP4 : 6.3.0 (Settle)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et. al. (1996)  
Validation Pipeline (wwPDB-VP) : stable22683

# 1 Overall quality at a glance

The reported resolution of this entry is 1.85 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))
$R_{free}$	66092	1269 (1.86-1.86)
Clashscore	79885	1470 (1.86-1.86)
Ramachandran outliers	78287	1451 (1.86-1.86)
Sidechain outliers	78261	1451 (1.86-1.86)
RSRZ outliers	66119	1269 (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. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density.

Mol	Chain	Length	Quality of chain
1	A	437	
1	B	437	

The following table lists non-polymeric compounds that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Geometry	Electron density
2	SO4	B	1502	-	X
3	BTB	B	1602	-	X

## 2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 6932 atoms, of which 0 are hydrogen and 0 are deuterium.

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 Crotonobetainyl-CoA:carnitineCoA-transferase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	400	Total	C	N	O	S	Se	0	0	0
			3127	2005	520	579	7	16			
1	B	400	Total	C	N	O	S	Se	0	0	0
			3127	2005	520	579	7	16			

There are 98 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-23	MSE	-	EXPRESSION TAG	UNP P31572
A	-22	HIS	-	EXPRESSION TAG	UNP P31572
A	-21	HIS	-	EXPRESSION TAG	UNP P31572
A	-20	HIS	-	EXPRESSION TAG	UNP P31572
A	-19	HIS	-	EXPRESSION TAG	UNP P31572
A	-18	HIS	-	EXPRESSION TAG	UNP P31572
A	-17	HIS	-	EXPRESSION TAG	UNP P31572
A	-16	GLY	-	EXPRESSION TAG	UNP P31572
A	-15	SER	-	EXPRESSION TAG	UNP P31572
A	-14	THR	-	EXPRESSION TAG	UNP P31572
A	-13	SER	-	EXPRESSION TAG	UNP P31572
A	-12	LEU	-	EXPRESSION TAG	UNP P31572
A	-11	TYR	-	EXPRESSION TAG	UNP P31572
A	-10	LYS	-	EXPRESSION TAG	UNP P31572
A	-9	LYS	-	EXPRESSION TAG	UNP P31572
A	-8	ALA	-	EXPRESSION TAG	UNP P31572
A	-7	GLY	-	EXPRESSION TAG	UNP P31572
A	-6	SER	-	EXPRESSION TAG	UNP P31572
A	-5	GLU	-	EXPRESSION TAG	UNP P31572
A	-4	THR	-	EXPRESSION TAG	UNP P31572
A	-3	LEU	-	EXPRESSION TAG	UNP P31572
A	-2	TYR	-	EXPRESSION TAG	UNP P31572
A	-1	ILE	-	EXPRESSION TAG	UNP P31572
A	0	GLN	-	EXPRESSION TAG	UNP P31572
A	1	GLY	-	EXPRESSION TAG	UNP P31572

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Chain	Residue	Modelled	Actual	Comment	Reference
A	6	MSE	MET	MODIFIED RESIDUE	UNP P31572
A	32	MSE	MET	MODIFIED RESIDUE	UNP P31572
A	86	MSE	MET	MODIFIED RESIDUE	UNP P31572
A	161	MSE	MET	MODIFIED RESIDUE	UNP P31572
A	200	MSE	MET	MODIFIED RESIDUE	UNP P31572
A	204	MSE	MET	MODIFIED RESIDUE	UNP P31572
A	207	MSE	MET	MODIFIED RESIDUE	UNP P31572
A	212	MSE	MET	MODIFIED RESIDUE	UNP P31572
A	213	MSE	MET	MODIFIED RESIDUE	UNP P31572
A	221	MSE	MET	MODIFIED RESIDUE	UNP P31572
A	225	MSE	MET	MODIFIED RESIDUE	UNP P31572
A	248	MSE	MET	MODIFIED RESIDUE	UNP P31572
A	346	MSE	MET	MODIFIED RESIDUE	UNP P31572
A	357	MSE	MET	MODIFIED RESIDUE	UNP P31572
A	371	MSE	MET	MODIFIED RESIDUE	UNP P31572
A	376	MSE	MET	MODIFIED RESIDUE	UNP P31572
A	406	SER	-	EXPRESSION TAG	UNP P31572
A	407	THR	-	EXPRESSION TAG	UNP P31572
A	408	HIS	-	EXPRESSION TAG	UNP P31572
A	409	HIS	-	EXPRESSION TAG	UNP P31572
A	410	HIS	-	EXPRESSION TAG	UNP P31572
A	411	HIS	-	EXPRESSION TAG	UNP P31572
A	412	HIS	-	EXPRESSION TAG	UNP P31572
A	413	HIS	-	EXPRESSION TAG	UNP P31572
B	-23	MSE	-	EXPRESSION TAG	UNP P31572
B	-22	HIS	-	EXPRESSION TAG	UNP P31572
B	-21	HIS	-	EXPRESSION TAG	UNP P31572
B	-20	HIS	-	EXPRESSION TAG	UNP P31572
B	-19	HIS	-	EXPRESSION TAG	UNP P31572
B	-18	HIS	-	EXPRESSION TAG	UNP P31572
B	-17	HIS	-	EXPRESSION TAG	UNP P31572
B	-16	GLY	-	EXPRESSION TAG	UNP P31572
B	-15	SER	-	EXPRESSION TAG	UNP P31572
B	-14	THR	-	EXPRESSION TAG	UNP P31572
B	-13	SER	-	EXPRESSION TAG	UNP P31572
B	-12	LEU	-	EXPRESSION TAG	UNP P31572
B	-11	TYR	-	EXPRESSION TAG	UNP P31572
B	-10	LYS	-	EXPRESSION TAG	UNP P31572
B	-9	LYS	-	EXPRESSION TAG	UNP P31572
B	-8	ALA	-	EXPRESSION TAG	UNP P31572
B	-7	GLY	-	EXPRESSION TAG	UNP P31572
B	-6	SER	-	EXPRESSION TAG	UNP P31572

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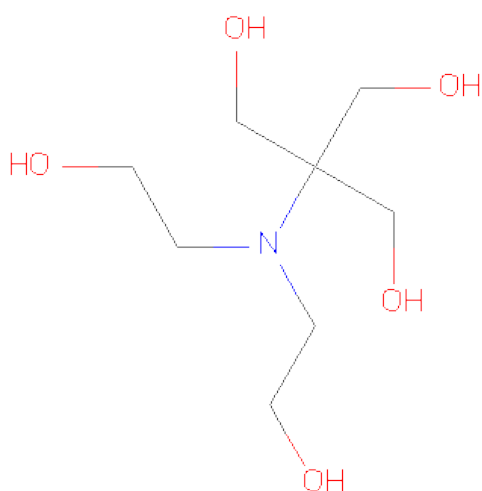
Chain	Residue	Modelled	Actual	Comment	Reference
B	-5	GLU	-	EXPRESSION TAG	UNP P31572
B	-4	THR	-	EXPRESSION TAG	UNP P31572
B	-3	LEU	-	EXPRESSION TAG	UNP P31572
B	-2	TYR	-	EXPRESSION TAG	UNP P31572
B	-1	ILE	-	EXPRESSION TAG	UNP P31572
B	0	GLN	-	EXPRESSION TAG	UNP P31572
B	1	GLY	-	EXPRESSION TAG	UNP P31572
B	6	MSE	MET	MODIFIED RESIDUE	UNP P31572
B	32	MSE	MET	MODIFIED RESIDUE	UNP P31572
B	86	MSE	MET	MODIFIED RESIDUE	UNP P31572
B	161	MSE	MET	MODIFIED RESIDUE	UNP P31572
B	200	MSE	MET	MODIFIED RESIDUE	UNP P31572
B	204	MSE	MET	MODIFIED RESIDUE	UNP P31572
B	207	MSE	MET	MODIFIED RESIDUE	UNP P31572
B	212	MSE	MET	MODIFIED RESIDUE	UNP P31572
B	213	MSE	MET	MODIFIED RESIDUE	UNP P31572
B	221	MSE	MET	MODIFIED RESIDUE	UNP P31572
B	225	MSE	MET	MODIFIED RESIDUE	UNP P31572
B	248	MSE	MET	MODIFIED RESIDUE	UNP P31572
B	346	MSE	MET	MODIFIED RESIDUE	UNP P31572
B	357	MSE	MET	MODIFIED RESIDUE	UNP P31572
B	371	MSE	MET	MODIFIED RESIDUE	UNP P31572
B	376	MSE	MET	MODIFIED RESIDUE	UNP P31572
B	406	SER	-	EXPRESSION TAG	UNP P31572
B	407	THR	-	EXPRESSION TAG	UNP P31572
B	408	HIS	-	EXPRESSION TAG	UNP P31572
B	409	HIS	-	EXPRESSION TAG	UNP P31572
B	410	HIS	-	EXPRESSION TAG	UNP P31572
B	411	HIS	-	EXPRESSION TAG	UNP P31572
B	412	HIS	-	EXPRESSION TAG	UNP P31572
B	413	HIS	-	EXPRESSION TAG	UNP P31572

- Molecule 2 is SULFATE ION (three-letter code: SO4) (formula: O<sub>4</sub>S).



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

- Molecule 3 is 2-[BIS-(2-HYDROXY-ETHYL)-AMINO]-2-HYDROXYMETHYL-PROPAN E-1,3-DIOL (three-letter code: BTB) (formula: C<sub>8</sub>H<sub>19</sub>NO<sub>5</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			14	8	1	5		

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	B	1	Total	C	N	O	0	0
			14	8	1	5		

- Molecule 4 is water.

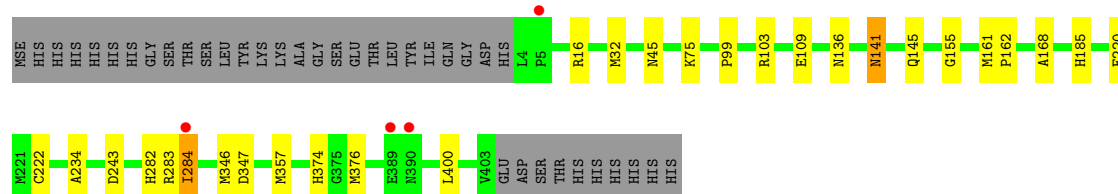
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	313	Total	O	0	0
			313	313		
4	B	327	Total	O	0	0
			327	327		

### 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 errors 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.

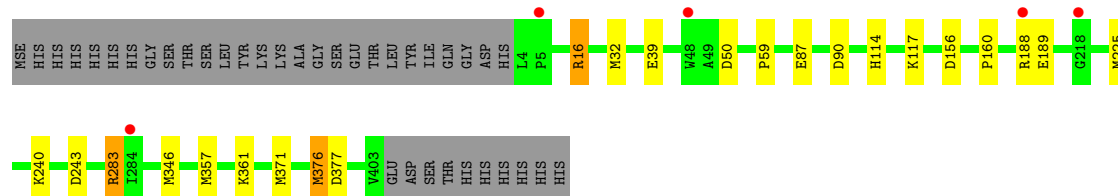
- Molecule 1: Crotonobetainyl-CoA:carnitineCoA-transferase

Chain A: 



- Molecule 1: Crotonobetainyl-CoA:carnitineCoA-transferase

Chain B: 





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	55.58Å 129.80Å 69.79Å 90.00° 109.48° 90.00°	Depositor
Resolution (Å)	30.00 – 1.85 29.63 – 1.85	Depositor EDS
% Data completeness (in resolution range)	96.7 (30.00-1.85) 96.7 (29.63-1.85)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	0.09	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.25 (at 1.85Å)	Xtriage
Refinement program	REFMAC 5.1.24	Depositor
R, $R_{free}$	0.143 , 0.178 0.158 , 0.189	Depositor DCC
$R_{free}$ test set	3866 reflections (5.31%)	DCC
Wilson B-factor (Å <sup>2</sup> )	17.0	Xtriage
Anisotropy	0.293	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.38 , 37.2	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtriage
Outliers	0 of 76709 reflections	Xtriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	6932	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	20.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.11% of the height of the origin peak. No significant pseudotranslation is detected.*

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

## 5 Model quality

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: SO4, BTB

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	0.78	1/3190 (0.0%)	0.78	2/4301 (0.0%)
1	B	0.76	2/3190 (0.1%)	0.80	6/4301 (0.1%)
All	All	0.77	3/6380 (0.0%)	0.79	8/8602 (0.1%)

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	376	MSE	SE-CE	-6.20	1.58	1.95
1	A	222	CYS	CB-SG	-6.06	1.72	1.82
1	B	117	LYS	CD-CE	5.04	1.63	1.51

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	347	ASP	CB-CG-OD2	8.51	125.96	118.30
1	B	243	ASP	CB-CG-OD2	5.56	123.30	118.30
1	B	377	ASP	CB-CG-OD2	5.35	123.11	118.30
1	B	90	ASP	CB-CG-OD2	5.31	123.08	118.30
1	A	243	ASP	CB-CG-OD2	5.23	123.01	118.30
1	B	50	ASP	CB-CG-OD1	5.16	122.94	118.30
1	B	156	ASP	CB-CG-OD2	5.11	122.90	118.30
1	B	16	ARG	NE-CZ-NH1	5.02	122.81	120.30

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Close contacts ⓘ

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 hydrogens added by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, and the number in parentheses is this value normalized per 1000 atoms of the molecule in the chain. The Symm-Clashes column gives symmetry related clashes, in the same way as for the Clashes column.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3127	0	3077	28	0
1	B	3127	0	3077	15	0
2	A	5	0	0	0	0
2	B	5	0	0	0	0
3	A	14	0	19	3	0
3	B	14	0	19	3	0
4	A	313	0	0	15	0
4	B	327	0	0	8	0
All	All	6932	0	6192	48	0

Clashscore is defined as the number of clashes calculated for the entry per 1000 atoms (including hydrogens) of the entry. The overall clashscore for this entry is 4.

All (48) close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:32:MSE:HG2	4:A:1892:HOH:O	1.24	1.26
1:B:32:MSE:HG2	4:B:1875:HOH:O	1.17	1.25
1:A:16:ARG:HG3	4:A:1688:HOH:O	1.52	1.10
1:B:361:LYS:HE2	4:B:1890:HOH:O	1.71	0.90
3:B:1602:BTB:H62	3:B:1602:BTB:H81	1.63	0.81
3:A:1601:BTB:H62	3:A:1601:BTB:H81	1.64	0.80
1:A:103:ARG:HH12	1:A:136:ASN:ND2	1.87	0.72
1:A:141:ASN:HD21	1:A:145:GLN:HE21	1.38	0.71
1:A:283:ARG:O	4:A:1893:HOH:O	2.10	0.69
1:B:346:MSE:HG2	1:B:376:MSE:HE1	1.77	0.65
1:A:32:MSE:CG	4:A:1892:HOH:O	2.05	0.65
1:A:103:ARG:NH1	1:A:136:ASN:ND2	2.49	0.61
1:B:32:MSE:CG	4:B:1875:HOH:O	2.00	0.57
1:B:16:ARG:HD2	1:B:39:GLU:OE2	2.06	0.56
1:B:59:PRO:HB2	1:B:371:MSE:SE	2.55	0.56
1:A:284:ILE:HD13	4:A:1791:HOH:O	2.04	0.56
1:A:32:MSE:CE	4:A:1891:HOH:O	2.56	0.54
1:B:283:ARG:CD	4:B:1775:HOH:O	2.59	0.50
1:A:374:HIS:HD2	4:A:1838:HOH:O	1.95	0.49

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
4:A:1781:HOH:O	1:B:361:LYS:HD2	2.12	0.49
3:B:1602:BTB:C6	3:B:1602:BTB:H81	2.39	0.48
1:A:141:ASN:HD22	1:A:168:ALA:H	1.60	0.48
1:A:141:ASN:ND2	1:A:168:ALA:H	2.12	0.47
1:A:141:ASN:ND2	1:A:145:GLN:HE21	2.07	0.47
1:A:185:HIS:HE1	4:B:1693:HOH:O	1.98	0.47
1:A:284:ILE:H	1:A:284:ILE:HD12	1.80	0.47
1:A:234:ALA:HB2	1:A:283:ARG:HG3	1.97	0.47
1:A:109:GLU:HG3	4:A:1880:HOH:O	2.16	0.46
3:A:1601:BTB:H31	3:A:1601:BTB:H51	1.78	0.45
1:A:45:ASN:O	1:A:374:HIS:HE1	1.99	0.45
1:A:32:MSE:HE3	4:A:1892:HOH:O	2.16	0.44
1:B:283:ARG:HD2	4:B:1775:HOH:O	2.17	0.44
1:A:282:HIS:HD2	4:A:1787:HOH:O	1.99	0.44
1:B:346:MSE:HE2	1:B:346:MSE:HB2	1.85	0.43
1:B:16:ARG:HG3	4:B:1825:HOH:O	2.18	0.43
1:B:283:ARG:HD3	4:B:1775:HOH:O	2.17	0.43
1:A:99:PRO:HD2	1:A:136:ASN:ND2	2.34	0.43
1:A:162:PRO:O	1:B:225:MSE:HE1	2.19	0.43
4:A:1781:HOH:O	1:B:361:LYS:CD	2.66	0.42
1:A:75:LYS:HD3	1:A:400:LEU:HD21	2.02	0.42
3:B:1602:BTB:H31	3:B:1602:BTB:H51	1.95	0.41
1:B:87:GLU:HG2	1:B:114:HIS:O	2.20	0.41
1:A:155:GLY:CA	1:A:161:MSE:HG2	2.51	0.41
1:A:220:GLU:HA	4:A:1850:HOH:O	2.19	0.41
1:A:376:MSE:HE3	4:A:1906:HOH:O	2.21	0.41
1:A:284:ILE:N	1:A:284:ILE:HD12	2.36	0.40
1:A:282:HIS:HE1	4:A:1887:HOH:O	2.05	0.40
3:A:1601:BTB:C6	3:A:1601:BTB:H81	2.41	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone ⓘ

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	398/437 (91%)	390 (98%)	8 (2%)	0	100	100
1	B	398/437 (91%)	392 (98%)	6 (2%)	0	100	100
All	All	796/874 (91%)	782 (98%)	14 (2%)	0	100	100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains ⓘ

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	327/343 (95%)	323 (99%)	4 (1%)	82	75
1	B	327/343 (95%)	321 (98%)	6 (2%)	71	57
All	All	654/686 (95%)	644 (98%)	10 (2%)	76	65

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

Mol	Chain	Res	Type
1	A	141	ASN
1	A	284	ILE
1	A	346	MSE
1	A	357	MSE
1	B	160	PRO
1	B	188	ARG
1	B	189	GLU
1	B	240	LYS
1	B	283	ARG
1	B	357	MSE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	136	ASN
1	A	141	ASN
1	A	185	HIS
1	A	267	HIS

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Mol	Chain	Res	Type
1	A	279	GLN
1	A	282	HIS
1	A	374	HIS
1	A	390	ASN
1	B	153	GLN

### 5.3.3 RNA ⓘ

There are no RNA chains 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 ⓘ

4 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	1501	-	4,4,4	0.72	0	6,6,6	0.44	0
3	BTB	A	1601	-	13,13,13	0.86	0	16,16,16	1.01	0
2	SO4	B	1502	-	4,4,4	0.15	0	6,6,6	0.29	0
3	BTB	B	1602	-	13,13,13	0.61	0	16,16,16	1.07	1 (6%)

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	1501	-	-	0/0/0/0	0/0/0/0
3	BTB	A	1601	-	-	0/21/21/21	0/0/0/0
2	SO4	B	1502	-	-	0/0/0/0	0/0/0/0
3	BTB	B	1602	-	-	0/21/21/21	0/0/0/0

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed( $^{\circ}$ )	Ideal( $^{\circ}$ )
3	B	1602	BTB	C3-C2-C1	-2.18	106.18	110.04

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

## 5.7 Other polymers ⓘ

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 ⓘ

### 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	400/437 (91%)	-0.44	4 (1%) 79 78	9, 17, 33, 43	0
1	B	400/437 (91%)	-0.33	5 (1%) 74 72	8, 18, 32, 45	0
All	All	800/874 (91%)	-0.38	9 (1%) 77 76	8, 18, 33, 45	0

All (9) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	284	ILE	6.0
1	B	188	ARG	2.7
1	B	5	PRO	2.4
1	A	390	ASN	2.3
1	A	5	PRO	2.2
1	B	218	GLY	2.1
1	B	48	TRP	2.0
1	B	284	ILE	2.0
1	A	389	GLU	2.0

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

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

### 6.3 Carbohydrates ⓘ

There are no carbohydrates in this entry.

### 6.4 Ligands ⓘ

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	RSR	LLDF	B-factors(Å <sup>2</sup> )	Q<0.9
2	SO4	B	1502	5/5	0.29	4.44	73,74,75,75	0
3	BTB	B	1602	14/14	0.12	2.35	23,27,30,34	0
2	SO4	A	1501	5/5	0.13	1.48	21,25,27,28	0
3	BTB	A	1601	14/14	0.09	0.57	16,20,22,26	0

## 6.5 Other polymers ⓘ

There are no such residues in this entry.