



# Full wwPDB X-ray Structure Validation Report ⓘ

Jan 31, 2016 – 08:59 PM GMT

PDB ID : 1N1D  
Title : Glycerol-3-phosphate cytidylyltransferase complexed with CDP-glycerol  
Authors : Pattridge, K.A.; Weber, C.H.; Friesen, J.A.; Sankar, S.; Kent, C.; Ludwig, M.L.  
Deposited on : 2002-10-17  
Resolution : 2.00 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  
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>  
with specific help available everywhere you see the ⓘ symbol.

---

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

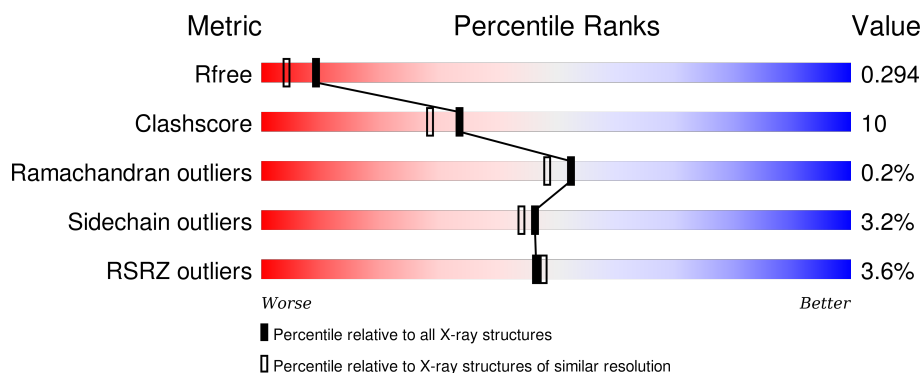
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.00 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	6249 (2.00-2.00)
Clashscore	102246	7340 (2.00-2.00)
Ramachandran outliers	100387	7248 (2.00-2.00)
Sidechain outliers	100360	7247 (2.00-2.00)
RSRZ outliers	91569	6262 (2.00-2.00)

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	129	<div> <div></div> <div>76% 20% ..</div> </div>
1	B	129	<div> <div></div> <div>81% 16% ..</div> </div>
1	C	129	<div> <div>10%</div> <div>69% 27% ..</div> </div>
1	D	129	<div> <div>3%</div> <div>71% 22% 5% .</div> </div>

## 2 Entry composition [i](#)

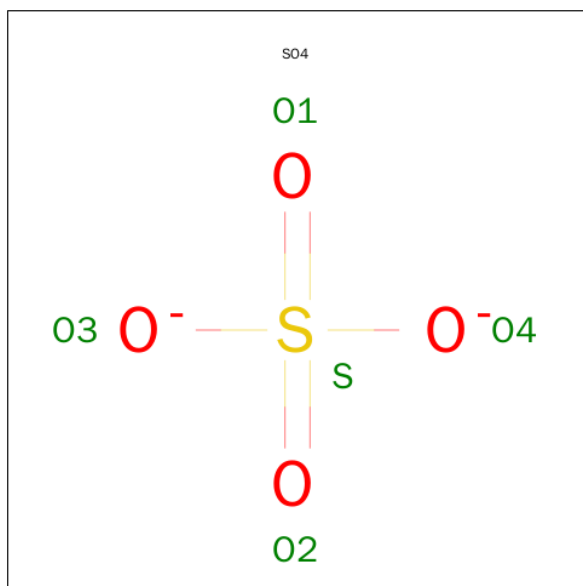
There are 4 unique types of molecules in this entry. The entry contains 4548 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 glycerol-3-phosphate cytidyltransferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	126	Total	C	N	O	S	0	0	0
			1061	686	175	197	3			
1	B	126	Total	C	N	O	S	0	0	0
			1061	686	175	197	3			
1	C	126	Total	C	N	O	S	0	0	0
			1061	686	175	197	3			
1	D	126	Total	C	N	O	S	0	0	0
			1061	686	175	197	3			

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



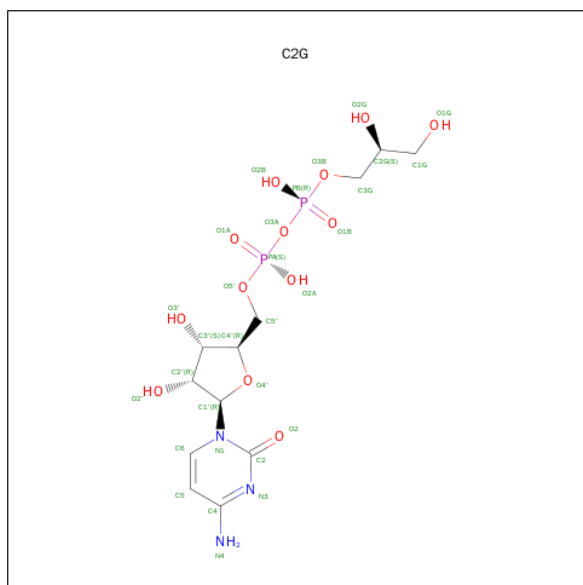
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	O	S	0	0
			5	4	1		
2	D	1	Total	O	S	0	0
			5	4	1		

*Continued on next page...*

Continued from previous page...

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

- Molecule 3 is [CYTIDINE-5'-PHOSPHATE] GLYCERYLPHOSPHORIC ACID ESTER (three-letter code: C2G) (formula: C<sub>12</sub>H<sub>21</sub>N<sub>3</sub>O<sub>13</sub>P<sub>2</sub>).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	0	0
			30	12	3	13	2		
3	B	1	Total	C	N	O	P	0	0
			30	12	3	13	2		
3	C	1	Total	C	N	O	P	0	0
			30	12	3	13	2		
3	D	1	Total	C	N	O	P	0	0
			30	12	3	13	2		

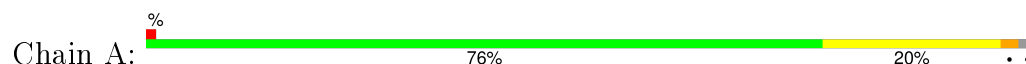
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	52	Total	O	0	0
			52	52		
4	B	41	Total	O	0	0
			41	41		
4	C	25	Total	O	0	0
			25	25		
4	D	51	Total	O	0	0
			51	51		

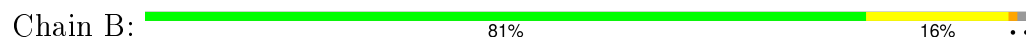
### 3 Residue-property plots [i](#)

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.

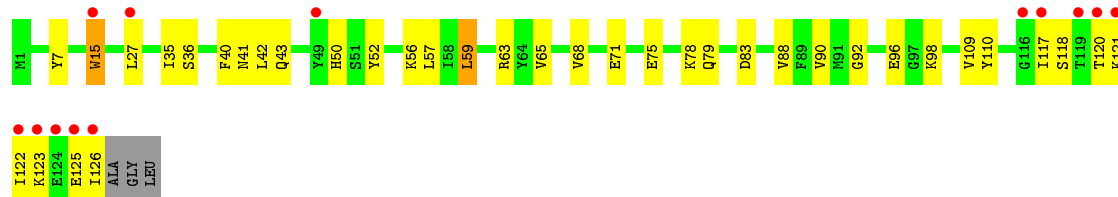
- Molecule 1: glycerol-3-phosphate cytidylyltransferase



- Molecule 1: glycerol-3-phosphate cytidylyltransferase



- Molecule 1: glycerol-3-phosphate cytidylyltransferase



- Molecule 1: glycerol-3-phosphate cytidylyltransferase



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	37.80Å 55.93Å 63.70Å 88.99° 75.03° 82.54°	Depositor
Resolution (Å)	15.00 – 2.00 41.54 – 1.80	Depositor EDS
% Data completeness (in resolution range)	89.6 (15.00-2.00) 87.3 (41.54-1.80)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.05	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	4.76 (at 1.79Å)	Xtriage
Refinement program	CNS	Depositor
R, $R_{free}$	0.241 , 0.294 0.241 , 0.294	Depositor DCC
$R_{free}$ test set	3031 reflections (10.05%)	DCC
Wilson B-factor (Å <sup>2</sup> )	14.0	Xtriage
Anisotropy	0.048	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.41 , 56.6	EDS
Estimated twinning fraction	0.012 for -h,-k,-h+l	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.33$	Xtriage
Outliers	0 of 40624 reflections	Xtriage
$F_o, F_c$ correlation	0.88	EDS
Total number of atoms	4548	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	12.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.86% 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, C2G

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	0.35	0/1084	0.61	0/1460
1	B	0.37	0/1084	0.63	0/1460
1	C	0.36	0/1084	0.62	0/1460
1	D	0.38	0/1084	0.62	0/1460
All	All	0.36	0/4336	0.62	0/5840

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	D	0	1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	D	49	TYR	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	1061	0	1063	21	0
1	B	1061	0	1063	13	0
1	C	1061	0	1063	37	0
1	D	1061	0	1063	24	0
2	A	5	0	0	0	0
2	B	5	0	0	1	0
2	D	5	0	0	0	0
3	A	30	0	19	1	0
3	B	30	0	19	1	0
3	C	30	0	19	2	0
3	D	30	0	19	1	0
4	A	52	0	0	1	0
4	B	41	0	0	2	0
4	C	25	0	0	1	0
4	D	51	0	0	1	0
All	All	4548	0	4328	89	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 10.

All (89) 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:C:78:LYS:HG3	1:C:79:GLN:H	1.21	1.02
1:C:78:LYS:HG3	1:C:79:GLN:N	1.96	0.80
1:A:18:ILE:HG13	1:B:58:ILE:HG12	1.73	0.71
1:C:90:VAL:HG12	1:C:109:VAL:HB	1.72	0.70
1:A:92:GLY:HA3	3:A:130:C2G:O2'	1.90	0.70
1:B:94:ASP:HB3	1:B:113:ARG:HD2	1.75	0.69
1:C:122:ILE:HG23	1:D:49:TYR:CE2	2.29	0.68
1:C:35:ILE:HG23	1:C:52:TYR:HE1	1.59	0.68
1:C:79:GLN:HG3	1:C:83:ASP:OD2	1.94	0.67
1:C:27:LEU:HD23	1:C:90:VAL:HG11	1.78	0.65
1:A:1:MET:HG3	1:A:29:ASP:OD2	1.97	0.64
1:C:117:ILE:HD12	1:C:121:LYS:HD3	1.82	0.62
1:A:70:PRO:HG2	1:A:72:LYS:HE3	1.80	0.61
1:B:22:GLU:O	1:B:26:GLN:HG3	2.01	0.60
1:A:70:PRO:HB2	1:A:72:LYS:HD2	1.84	0.59
1:A:36:SER:HA	1:A:71:GLU:HB3	1.85	0.59
1:C:117:ILE:HD11	1:C:122:ILE:HD11	1.84	0.59
1:C:59:LEU:CD1	1:C:65:VAL:HG21	2.33	0.59
1:C:92:GLY:HA3	3:C:330:C2G:O2'	2.03	0.58

*Continued on next page...*



*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:35:ILE:HG23	1:C:52:TYR:CE1	2.37	0.58
1:A:119:THR:HG21	4:A:747:HOH:O	2.04	0.58
1:C:36:SER:HA	1:C:71:GLU:HB3	1.86	0.57
1:A:12:LEU:HD12	1:A:119:THR:HG23	1.87	0.57
1:D:92:GLY:HA3	3:D:430:C2G:O2'	2.04	0.57
1:C:117:ILE:HG13	1:C:118:SER:N	2.21	0.56
1:C:75:GLU:O	1:C:78:LYS:HG2	2.06	0.54
1:C:126:ILE:HB	1:D:126:ILE:HG21	1.89	0.54
1:D:15:TRP:CH2	1:D:117:ILE:HB	2.43	0.54
1:A:52:TYR:OH	1:A:70:PRO:HB3	2.07	0.54
1:C:15:TRP:CD1	1:C:15:TRP:N	2.74	0.54
1:B:92:GLY:HA3	3:B:230:C2G:O2'	2.08	0.53
1:B:122:ILE:O	1:B:126:ILE:HG12	2.09	0.52
1:A:72:LYS:N	1:A:72:LYS:HD3	2.24	0.52
1:A:118:SER:O	1:A:122:ILE:HG13	2.10	0.52
1:D:118:SER:O	1:D:122:ILE:HG13	2.09	0.52
1:B:77:LYS:HE2	1:B:99:PHE:CE2	2.45	0.51
1:D:78:LYS:HG2	1:D:105:GLN:OE1	2.09	0.51
1:B:36:SER:HA	1:B:71:GLU:HB3	1.93	0.51
1:D:81:ILE:HG23	1:D:86:ILE:HB	1.93	0.51
1:D:15:TRP:CZ2	1:D:117:ILE:HB	2.47	0.49
1:C:78:LYS:HB3	4:C:817:HOH:O	2.12	0.49
1:D:20:LEU:HD13	1:D:20:LEU:C	2.33	0.49
1:D:34:ALA:HA	1:D:69:ILE:O	2.13	0.49
1:A:32:VAL:HG22	1:A:67:GLU:HG2	1.95	0.48
1:C:63:ARG:NH1	1:C:63:ARG:HB3	2.28	0.48
1:D:124:GLU:C	1:D:126:ILE:H	2.17	0.48
1:C:117:ILE:HG13	1:C:118:SER:H	1.79	0.48
1:C:57:LEU:C	1:C:57:LEU:HD13	2.34	0.47
1:A:81:ILE:HG23	1:A:86:ILE:HB	1.97	0.47
1:D:125:GLU:O	1:D:126:ILE:HD13	2.14	0.47
1:C:120:THR:HA	1:C:123:LYS:HE2	1.97	0.47
1:C:7:TYR:HB2	3:C:330:C2G:H1G1	1.97	0.47
1:A:35:ILE:HG23	1:A:52:TYR:HE1	1.80	0.47
1:D:15:TRP:HD1	1:D:19:LYS:HE2	1.78	0.47
1:D:73:ASN:OD1	1:D:75:GLU:HG2	2.14	0.46
1:D:2:LYS:HD2	1:D:28:GLY:HA2	1.97	0.46
1:D:118:SER:HB3	1:D:121:LYS:HB2	1.97	0.46
1:C:27:LEU:CD2	1:C:90:VAL:HG11	2.46	0.46
1:B:23:ARG:HA	1:B:26:GLN:OE1	2.16	0.46
1:C:40:PHE:O	1:C:43:GLN:HB2	2.16	0.46

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:122:ILE:O	1:A:126:ILE:HG13	2.15	0.45
1:C:120:THR:HA	1:C:123:LYS:CE	2.46	0.45
1:B:121:LYS:HA	4:B:867:HOH:O	2.17	0.45
1:A:50:HIS:HE1	4:B:777:HOH:O	1.98	0.45
1:C:15:TRP:CD1	1:D:54:HIS:HB3	2.52	0.44
1:C:56:LYS:HG3	1:C:68:VAL:HG11	2.00	0.44
1:D:33:VAL:HG11	1:D:59:LEU:HD11	1.99	0.44
1:C:57:LEU:HD13	1:C:57:LEU:O	2.19	0.43
1:A:20:LEU:HD13	1:A:20:LEU:C	2.39	0.43
1:A:5:ILE:HG22	1:A:86:ILE:HG21	2.01	0.42
1:B:34:ALA:HA	1:B:69:ILE:O	2.18	0.42
1:C:59:LEU:HD12	1:C:65:VAL:HG21	2.01	0.42
1:A:34:ALA:HA	1:A:69:ILE:O	2.19	0.42
1:C:88:VAL:HG12	1:C:90:VAL:HG13	2.01	0.42
1:A:119:THR:HG22	1:A:123:LYS:HE2	2.01	0.42
1:C:96:GLU:HA	1:C:110:TYR:CD2	2.55	0.42
1:D:41:ASN:HD22	1:D:41:ASN:HA	1.63	0.42
1:C:126:ILE:HG21	1:D:123:LYS:HA	2.01	0.41
1:D:17:HIS:O	1:D:21:LEU:HG	2.20	0.41
1:B:118:SER:HA	2:B:705:SO4:O1	2.20	0.41
1:A:3:LYS:HD3	1:A:84:HIS:O	2.21	0.41
1:C:122:ILE:HD12	1:D:49:TYR:HE2	1.85	0.41
1:D:35:ILE:HD13	1:D:52:TYR:CE1	2.55	0.41
1:D:23:ARG:O	1:D:26:GLN:HB3	2.21	0.41
1:B:41:ASN:HD22	1:B:41:ASN:HA	1.68	0.41
1:B:8:GLY:O	1:B:35:ILE:HA	2.21	0.41
1:C:125:GLU:N	1:C:125:GLU:OE2	2.49	0.40
1:C:96:GLU:HA	1:C:110:TYR:CE2	2.57	0.40
1:C:50:HIS:HE1	4:D:841:HOH:O	2.03	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	124/129 (96%)	121 (98%)	3 (2%)	0	100	100
1	B	124/129 (96%)	122 (98%)	2 (2%)	0	100	100
1	C	124/129 (96%)	116 (94%)	8 (6%)	0	100	100
1	D	124/129 (96%)	120 (97%)	3 (2%)	1 (1%)	24	15
All	All	496/516 (96%)	479 (97%)	16 (3%)	1 (0%)	52	48

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	125	GLU

### 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	117/118 (99%)	114 (97%)	3 (3%)	54	54
1	B	117/118 (99%)	115 (98%)	2 (2%)	68	71
1	C	117/118 (99%)	112 (96%)	5 (4%)	35	30
1	D	117/118 (99%)	112 (96%)	5 (4%)	35	30
All	All	468/472 (99%)	453 (97%)	15 (3%)	46	44

All (15) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	29	ASP
1	A	45	GLN
1	A	72	LYS
1	B	41	ASN
1	B	98	LYS
1	C	15	TRP
1	C	41	ASN
1	C	42	LEU
1	C	59	LEU
1	C	98	LYS

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
1	D	35	ILE
1	D	41	ASN
1	D	42	LEU
1	D	59	LEU
1	D	121	LYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	41	ASN
1	A	43	GLN
1	A	50	HIS
1	A	54	HIS
1	B	41	ASN
1	B	43	GLN
1	C	26	GLN
1	C	41	ASN
1	C	50	HIS
1	C	105	GLN
1	D	41	ASN
1	D	43	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](#)

7 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	$\# Z  > 2$
3	C2G	A	130	-	24,31,31	0.82	0	31,46,46	1.83	6 (19%)
2	SO4	A	701	-	4,4,4	0.26	0	6,6,6	0.11	0
3	C2G	B	230	-	24,31,31	0.86	1 (4%)	31,46,46	1.76	6 (19%)
2	SO4	B	705	-	4,4,4	0.33	0	6,6,6	0.08	0
3	C2G	C	330	-	24,31,31	0.86	0	31,46,46	1.91	7 (22%)
3	C2G	D	430	-	24,31,31	0.80	0	31,46,46	1.79	6 (19%)
2	SO4	D	702	-	4,4,4	0.22	0	6,6,6	0.19	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
3	C2G	A	130	-	-	0/20/40/40	0/2/2/2
2	SO4	A	701	-	-	0/0/0/0	0/0/0/0
3	C2G	B	230	-	-	0/20/40/40	0/2/2/2
2	SO4	B	705	-	-	0/0/0/0	0/0/0/0
3	C2G	C	330	-	-	0/20/40/40	0/2/2/2
3	C2G	D	430	-	-	0/20/40/40	0/2/2/2
2	SO4	D	702	-	-	0/0/0/0	0/0/0/0

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	230	C2G	PB-O1B	2.21	1.59	1.51

All (25) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	330	C2G	PB-O3A-PA	-6.26	115.15	132.73
3	A	130	C2G	PB-O3A-PA	-5.50	117.28	132.73
3	D	430	C2G	PB-O3A-PA	-4.96	118.81	132.73

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	230	C2G	PB-O3A-PA	-4.70	119.52	132.73
3	A	130	C2G	C5'-C4'-C3'	-3.98	99.40	115.21
3	D	430	C2G	C5'-C4'-C3'	-3.61	100.87	115.21
3	B	230	C2G	C6-N1-C2	-3.51	115.60	121.28
3	B	230	C2G	C5'-C4'-C3'	-3.49	101.37	115.21
3	A	130	C2G	C6-N1-C2	-3.44	115.70	121.28
3	C	330	C2G	C5'-C4'-C3'	-3.38	101.78	115.21
3	D	430	C2G	C6-N1-C2	-3.25	116.01	121.28
3	C	330	C2G	C6-N1-C2	-3.13	116.21	121.28
3	C	330	C2G	O2A-PA-O3A	2.00	114.17	105.09
3	B	230	C2G	O2A-PA-O3A	2.19	115.04	105.09
3	D	430	C2G	O2A-PA-O3A	2.20	115.08	105.09
3	A	130	C2G	O2A-PA-O3A	2.24	115.25	105.09
3	B	230	C2G	C2-N3-C4	2.41	119.01	115.61
3	C	330	C2G	O3A-PB-O3B	2.45	109.42	102.94
3	A	130	C2G	C2-N3-C4	2.71	119.44	115.61
3	A	130	C2G	O3A-PA-O5'	2.93	110.70	102.94
3	D	430	C2G	C2-N3-C4	2.93	119.74	115.61
3	C	330	C2G	C2-N3-C4	3.11	120.00	115.61
3	B	230	C2G	O3A-PA-O5'	3.30	111.70	102.94
3	C	330	C2G	O3A-PA-O5'	3.64	112.60	102.94
3	D	430	C2G	O3A-PA-O5'	3.80	113.01	102.94

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

5 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	130	C2G	1	0
3	B	230	C2G	1	0
2	B	705	SO4	1	0
3	C	330	C2G	2	0
3	D	430	C2G	1	0

## 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	126/129 (97%)	0.30	1 (0%) 87 88	4, 11, 18, 22	0
1	B	126/129 (97%)	0.28	0 100 100	4, 10, 17, 20	0
1	C	126/129 (97%)	0.84	13 (10%) 9 9	5, 13, 47, 53	0
1	D	126/129 (97%)	0.44	4 (3%) 51 52	3, 10, 20, 38	0
All	All	504/516 (97%)	0.46	18 (3%) 46 48	3, 10, 20, 53	0

All (18) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	126	ILE	14.0
1	C	122	ILE	8.0
1	C	117	ILE	5.9
1	D	126	ILE	5.8
1	C	120	THR	5.6
1	C	119	THR	4.6
1	C	124	GLU	4.2
1	C	123	LYS	3.9
1	C	116	GLY	3.9
1	D	49	TYR	3.8
1	C	125	GLU	3.5
1	C	49	TYR	3.4
1	C	121	LYS	3.2
1	D	125	GLU	3.1
1	C	15	TRP	3.0
1	D	15	TRP	2.9
1	A	13	LEU	2.3
1	C	27	LEU	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. 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( $\text{\AA}^2$ )	Q<0.9
2	SO4	B	705	5/5	0.94	0.18	1.91	24,25,25,26	0
3	C2G	D	430	30/30	0.90	0.17	1.27	6,10,13,14	0
3	C2G	B	230	30/30	0.90	0.16	1.01	7,10,14,14	0
3	C2G	A	130	30/30	0.92	0.15	0.54	1,8,10,11	0
3	C2G	C	330	30/30	0.87	0.16	-0.08	6,11,18,20	0
2	SO4	D	702	5/5	0.96	0.11	-1.12	17,18,19,19	0
2	SO4	A	701	5/5	0.93	0.12	-1.86	18,18,20,20	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.