



# Full wwPDB X-ray Structure Validation Report ⓘ

Dec 20, 2023 – 08:19 AM EST

PDB ID : 1B6R  
Title : N5-CARBOXYAMINOIMIDAZOLE RIBONUCLEOTIDE SYNTHETASE  
FROM E. COLI  
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Deposited on : 1999-01-17  
Resolution : 2.10 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.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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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)  
Xtrriage (Phenix) : **NOT EXECUTED**  
EDS : **NOT EXECUTED**  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.36

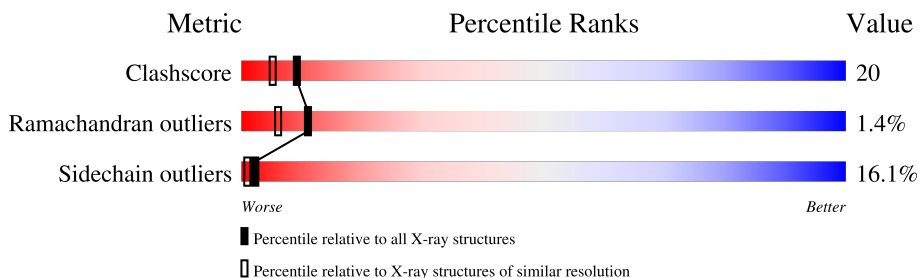
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.10 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))
Clashscore	141614	5710 (2.10-2.10)
Ramachandran outliers	138981	5647 (2.10-2.10)
Sidechain outliers	138945	5648 (2.10-2.10)

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 of 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  $\leq 5\%$

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	355	

## 2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 2834 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 PROTEIN (N5-CARBOXYAMINOIMIDAZOLE RIBONUCLEOTIDE SYNTHETASE).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	349	2737	1742	486	498	11	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	61	GLN	GLU	conflict	UNP P09029
A	205	ARG	GLN	conflict	UNP P09029

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



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

- Molecule 3 is water.

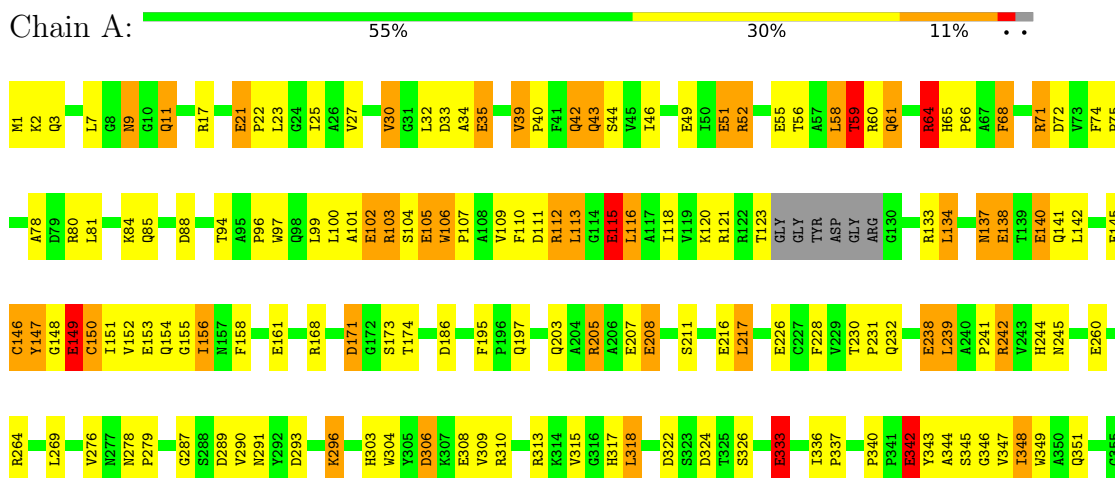
<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>ZeroOcc</b>	<b>AltConf</b>
3	A	92	Total	O	0	0
			92	92		

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

These plots are drawn for all protein, RNA, DNA and oligosaccharide 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. 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. 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.

Note EDS was not executed.

- Molecule 1: PROTEIN (N5-CARBOXYAMINOIMIDAZOLE RIBONUCLEOTIDE SYNTHETASE)



## 4 Data and refinement statistics

Xtrriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	93.40Å 95.20Å 120.60Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	30.00 – 2.10	Depositor
% Data completeness (in resolution range)	95.6 (30.00-2.10)	Depositor
$R_{merge}$	0.05	Depositor
$R_{sym}$	0.05	Depositor
Refinement program	TNT 5D	Depositor
R, $R_{free}$	0.197 , (Not available)	Depositor
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	2834	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	44.0	wwPDB-VP

## 5 Model quality [i](#)

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

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

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	A	1.05	22/2804 (0.8%)	1.53	37/3822 (1.0%)

All (22) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	260	GLU	CD-OE2	11.15	1.38	1.25
1	A	115	GLU	CD-OE2	9.39	1.35	1.25
1	A	208	GLU	CD-OE1	8.58	1.35	1.25
1	A	145	GLU	CD-OE1	8.01	1.34	1.25
1	A	21	GLU	CD-OE1	7.61	1.34	1.25
1	A	140	GLU	CD-OE1	7.51	1.33	1.25
1	A	260	GLU	CD-OE1	7.32	1.33	1.25
1	A	333	GLU	CD-OE1	7.15	1.33	1.25
1	A	161	GLU	CD-OE2	6.97	1.33	1.25
1	A	149	GLU	CD-OE2	6.90	1.33	1.25
1	A	55	GLU	CD-OE2	6.89	1.33	1.25
1	A	226	GLU	CD-OE2	6.85	1.33	1.25
1	A	308	GLU	CD-OE1	6.74	1.33	1.25
1	A	216	GLU	CD-OE1	6.61	1.32	1.25
1	A	138	GLU	CD-OE2	6.13	1.32	1.25
1	A	49	GLU	CD-OE1	5.96	1.32	1.25
1	A	102	GLU	CD-OE1	5.83	1.32	1.25
1	A	238	GLU	CD-OE1	5.79	1.32	1.25
1	A	342	GLU	CD-OE2	5.78	1.32	1.25
1	A	35	GLU	CD-OE2	5.50	1.31	1.25
1	A	105	GLU	CD-OE1	5.09	1.31	1.25
1	A	51	GLU	CD-OE2	5.06	1.31	1.25

All (37) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	264	ARG	NE-CZ-NH1	17.31	128.95	120.30
1	A	205	ARG	NE-CZ-NH2	15.75	128.18	120.30
1	A	205	ARG	NE-CZ-NH1	-14.18	113.21	120.30
1	A	264	ARG	NE-CZ-NH2	-13.15	113.73	120.30
1	A	205	ARG	CD-NE-CZ	-9.85	109.82	123.60
1	A	260	GLU	OE1-CD-OE2	9.52	134.73	123.30
1	A	260	GLU	CG-CD-OE2	-8.72	100.87	118.30
1	A	242	ARG	NE-CZ-NH1	7.98	124.29	120.30
1	A	171	ASP	CB-CG-OD2	-7.88	111.21	118.30
1	A	171	ASP	CB-CG-OD1	7.56	125.10	118.30
1	A	33	ASP	CB-CG-OD1	7.45	125.00	118.30
1	A	168	ARG	NE-CZ-NH1	7.41	124.00	120.30
1	A	33	ASP	CB-CG-OD2	-7.23	111.80	118.30
1	A	264	ARG	CD-NE-CZ	6.76	133.06	123.60
1	A	239	LEU	CB-CA-C	-6.63	97.60	110.20
1	A	289	ASP	CB-CG-OD1	-6.25	112.67	118.30
1	A	72	ASP	CB-CG-OD2	6.11	123.80	118.30
1	A	322	ASP	CB-CG-OD2	6.08	123.78	118.30
1	A	306	ASP	CB-CG-OD2	-6.02	112.88	118.30
1	A	318	LEU	CB-CA-C	-6.00	98.81	110.20
1	A	186	ASP	CB-CG-OD1	-5.97	112.93	118.30
1	A	276	VAL	CA-CB-CG2	-5.83	102.16	110.90
1	A	88	ASP	CB-CG-OD2	5.60	123.34	118.30
1	A	186	ASP	CB-CG-OD2	5.59	123.33	118.30
1	A	195	PHE	CB-CG-CD1	-5.50	116.95	120.80
1	A	111	ASP	CB-CG-OD1	-5.45	113.39	118.30
1	A	296	LYS	N-CA-CB	5.35	120.24	110.60
1	A	150	CYS	CA-CB-SG	-5.34	104.38	114.00
1	A	64	ARG	CB-CA-C	-5.33	99.74	110.40
1	A	289	ASP	CB-CG-OD2	5.32	123.09	118.30
1	A	52	ARG	NE-CZ-NH1	5.26	122.93	120.30
1	A	9	ASN	N-CA-CB	-5.25	101.14	110.60
1	A	72	ASP	CB-CG-OD1	-5.19	113.63	118.30
1	A	244	HIS	N-CA-CB	-5.08	101.45	110.60
1	A	88	ASP	CB-CG-OD1	-5.07	113.74	118.30
1	A	150	CYS	CB-CA-C	5.05	120.51	110.40
1	A	324	ASP	CB-CG-OD1	-5.02	113.78	118.30

There are no chirality outliers.

There are no planarity outliers.



## 5.2 Too-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 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	2737	0	2723	109	0
2	A	5	0	0	1	0
3	A	92	0	0	2	0
All	All	2834	0	2723	109	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 20.

All (109) 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:A:278:ASN:HB3	1:A:279:PRO:HD2	1.60	0.83
1:A:230:THR:HB	1:A:231:PRO:HD2	1.66	0.77
1:A:138:GLU:O	1:A:141:GLN:HB2	1.87	0.75
1:A:74:PHE:HB2	1:A:75:PRO:HD3	1.67	0.74
1:A:112:ARG:HG2	1:A:113:LEU:HD13	1.69	0.73
1:A:11:GLN:HE21	1:A:11:GLN:H	1.38	0.71
1:A:121:ARG:HG2	1:A:150:CYS:SG	2.30	0.71
1:A:103:ARG:HA	1:A:106:TRP:CD1	2.26	0.69
1:A:203:GLN:O	1:A:207:GLU:HG3	1.94	0.68
1:A:137:ASN:OD1	1:A:137:ASN:N	2.22	0.67
1:A:61:GLN:O	1:A:64:ARG:HB2	1.95	0.66
1:A:84:LYS:HE2	1:A:153:GLU:OE1	1.95	0.66
1:A:346:GLY:HA3	3:A:456:HOH:O	1.96	0.66
1:A:84:LYS:NZ	1:A:94:THR:OG1	2.28	0.66
1:A:100:LEU:O	1:A:148:GLY:N	2.29	0.65
1:A:242:ARG:NH2	2:A:500:SO4:O3	2.25	0.65
1:A:46:ILE:HD12	1:A:65:HIS:CG	2.32	0.65
1:A:142:LEU:HD11	1:A:146:CYS:SG	2.37	0.65
1:A:65:HIS:O	1:A:71:ARG:NH1	2.30	0.65
1:A:171:ASP:OD1	1:A:173:SER:HB2	1.97	0.64
1:A:336:ILE:N	1:A:337:PRO:HD2	2.15	0.62
1:A:97:TRP:HB3	1:A:153:GLU:HG2	1.80	0.62
1:A:105:GLU:C	1:A:107:PRO:HD2	2.21	0.61
1:A:109:VAL:O	1:A:113:LEU:HB2	2.00	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:103:ARG:HA	1:A:106:TRP:HD1	1.67	0.60
1:A:3:GLN:HB3	1:A:44:SER:HB3	1.86	0.58
1:A:146:CYS:SG	1:A:150:CYS:HB2	2.43	0.58
1:A:146:CYS:SG	1:A:150:CYS:CB	2.93	0.57
1:A:340:PRO:HB2	1:A:342:GLU:OE2	2.06	0.55
1:A:205:ARG:HH11	1:A:205:ARG:CG	2.15	0.55
1:A:278:ASN:HB3	1:A:279:PRO:CD	2.35	0.55
1:A:205:ARG:HH11	1:A:205:ARG:HG2	1.71	0.55
1:A:104:SER:O	1:A:107:PRO:HD2	2.07	0.55
1:A:30:VAL:CG2	1:A:39:VAL:HG11	2.38	0.55
1:A:74:PHE:N	1:A:75:PRO:HD2	2.22	0.54
1:A:290:VAL:HG22	1:A:304:TRP:CZ2	2.44	0.53
1:A:21:GLU:HB3	1:A:22:PRO:HD3	1.90	0.52
1:A:116:LEU:HD23	1:A:133:ARG:HB3	1.92	0.52
1:A:121:ARG:HA	1:A:150:CYS:SG	2.50	0.52
1:A:30:VAL:HG23	1:A:39:VAL:HG11	1.93	0.51
1:A:116:LEU:CD2	1:A:133:ARG:HB3	2.40	0.51
1:A:102:GLU:HG3	1:A:104:SER:H	1.74	0.51
1:A:99:LEU:HD12	1:A:150:CYS:O	2.11	0.51
1:A:344:ALA:O	1:A:348:ILE:HD12	2.11	0.50
1:A:106:TRP:N	1:A:107:PRO:HD2	2.27	0.50
1:A:333:GLU:HA	1:A:336:ILE:HD12	1.93	0.50
1:A:113:LEU:HD12	1:A:154:GLN:HB2	1.92	0.50
1:A:158:PHE:HB3	1:A:228:PHE:HB3	1.93	0.50
1:A:106:TRP:O	1:A:110:PHE:HD2	1.94	0.49
1:A:313:ARG:O	1:A:315:VAL:HG13	2.11	0.49
1:A:147:TYR:N	1:A:147:TYR:CD1	2.81	0.49
1:A:7:LEU:HD11	1:A:32:LEU:HD23	1.95	0.49
1:A:205:ARG:HG2	1:A:205:ARG:NH1	2.28	0.48
1:A:42:GLN:H	1:A:42:GLN:HG3	1.30	0.48
1:A:118:ILE:HD12	1:A:155:GLY:HA2	1.96	0.48
1:A:118:ILE:CD1	1:A:155:GLY:HA2	2.44	0.47
1:A:134:LEU:HD13	1:A:134:LEU:N	2.29	0.47
1:A:11:GLN:H	1:A:11:GLN:NE2	2.09	0.47
1:A:96:PRO:HG2	1:A:154:GLN:OE1	2.15	0.47
1:A:346:GLY:O	1:A:349:TRP:HB3	2.15	0.47
1:A:347:VAL:O	1:A:351:GLN:HB2	2.15	0.47
1:A:102:GLU:O	1:A:105:GLU:HB2	2.15	0.46
1:A:242:ARG:HB3	3:A:483:HOH:O	2.15	0.46
1:A:46:ILE:HD12	1:A:65:HIS:CD2	2.50	0.46
1:A:97:TRP:CD1	1:A:97:TRP:N	2.83	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:309:VAL:O	1:A:310:ARG:HG3	2.15	0.46
1:A:74:PHE:O	1:A:78:ALA:N	2.45	0.46
1:A:154:GLN:CG	1:A:155:GLY:N	2.78	0.46
1:A:17:ARG:HA	1:A:27:VAL:HB	1.97	0.46
1:A:74:PHE:HB2	1:A:75:PRO:CD	2.42	0.46
1:A:74:PHE:CB	1:A:75:PRO:HD3	2.43	0.46
1:A:56:THR:O	1:A:60:ARG:HB2	2.15	0.45
1:A:101:ALA:HB3	1:A:105:GLU:OE2	2.16	0.45
1:A:147:TYR:H	1:A:147:TYR:HD1	1.65	0.45
1:A:46:ILE:CD1	1:A:65:HIS:CD2	3.00	0.45
1:A:106:TRP:HE1	1:A:147:TYR:HH	1.65	0.44
1:A:115:GLU:H	1:A:115:GLU:HG3	1.51	0.44
1:A:290:VAL:HG22	1:A:304:TRP:CH2	2.53	0.44
1:A:134:LEU:N	1:A:134:LEU:CD1	2.79	0.44
1:A:151:ILE:CG2	1:A:152:VAL:N	2.80	0.44
1:A:291:ASN:OD1	1:A:293:ASP:HB2	2.17	0.44
1:A:113:LEU:HD12	1:A:113:LEU:HA	1.86	0.43
1:A:287:GLY:HA2	1:A:310:ARG:O	2.18	0.43
1:A:156:ILE:HA	1:A:156:ILE:HD13	1.59	0.43
1:A:230:THR:HB	1:A:231:PRO:CD	2.42	0.43
1:A:74:PHE:N	1:A:75:PRO:CD	2.80	0.43
1:A:106:TRP:N	1:A:107:PRO:CD	2.82	0.43
1:A:25:ILE:HD13	1:A:25:ILE:HG21	1.80	0.43
1:A:106:TRP:HB2	1:A:107:PRO:HD3	2.00	0.43
1:A:40:PRO:HB3	1:A:43:GLN:NE2	2.33	0.43
1:A:278:ASN:CB	1:A:279:PRO:CD	2.97	0.42
1:A:336:ILE:HB	1:A:337:PRO:HD3	2.00	0.42
1:A:217:LEU:HA	1:A:217:LEU:HD12	1.75	0.42
1:A:120:LYS:HE3	1:A:153:GLU:OE2	2.20	0.42
1:A:65:HIS:HA	1:A:66:PRO:HD2	1.89	0.42
1:A:81:LEU:O	1:A:85:GLN:HG3	2.19	0.42
1:A:241:PRO:O	1:A:242:ARG:HB3	2.19	0.42
1:A:58:LEU:HB3	1:A:59:THR:H	1.69	0.42
1:A:84:LYS:HA	1:A:84:LYS:HD2	1.84	0.41
1:A:81:LEU:HA	1:A:151:ILE:HD11	2.02	0.41
1:A:7:LEU:HD11	1:A:32:LEU:CD2	2.49	0.41
1:A:68:PHE:C	1:A:68:PHE:CD1	2.94	0.41
1:A:74:PHE:CB	1:A:75:PRO:CD	2.98	0.41
1:A:205:ARG:HE	1:A:208:GLU:CD	2.23	0.41
1:A:149:GLU:C	1:A:150:CYS:SG	2.99	0.41
1:A:291:ASN:C	1:A:293:ASP:H	2.24	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:303:HIS:HB2	1:A:317:HIS:CE1	2.56	0.41
1:A:133:ARG:C	1:A:134:LEU:HD13	2.42	0.40
1:A:343:TYR:O	1:A:347:VAL:HG23	2.21	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	345/355 (97%)	326 (94%)	14 (4%)	5 (1%)	<b>11</b>   <b>6</b>

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	34	ALA
1	A	147	TYR
1	A	59	THR
1	A	58	LEU
1	A	106	TRP

#### 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	292/296 (99%)	245 (84%)	47 (16%)	<b>2</b>   <b>1</b>

All (47) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1	MET
1	A	2	LYS
1	A	9	ASN
1	A	11	GLN
1	A	23	LEU
1	A	30	VAL
1	A	35	GLU
1	A	39	VAL
1	A	42	GLN
1	A	43	GLN
1	A	51	GLU
1	A	52	ARG
1	A	59	THR
1	A	61	GLN
1	A	64	ARG
1	A	68	PHE
1	A	71	ARG
1	A	80	ARG
1	A	103	ARG
1	A	112	ARG
1	A	113	LEU
1	A	115	GLU
1	A	116	LEU
1	A	123	THR
1	A	134	LEU
1	A	137	ASN
1	A	140	GLU
1	A	146	CYS
1	A	149	GLU
1	A	156	ILE
1	A	174	THR
1	A	197	GLN
1	A	211	SER
1	A	217	LEU
1	A	232	GLN
1	A	238	GLU
1	A	239	LEU
1	A	245	ASN
1	A	269	LEU
1	A	296	LYS
1	A	306	ASP
1	A	318	LEU

*Continued on next page...*

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Mol	Chain	Res	Type
1	A	326	SER
1	A	333	GLU
1	A	342	GLU
1	A	345	SER
1	A	348	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	3	GLN
1	A	9	ASN
1	A	11	GLN
1	A	42	GLN
1	A	43	GLN
1	A	182	ASN
1	A	215	GLN
1	A	237	ASN

### 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 monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

1 ligand is 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	500	-	4,4,4	0.33	0	6,6,6	0.65	0

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.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	500	SO4	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 [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

EDS was not executed - this section is therefore empty.

### 6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

EDS was not executed - this section is therefore empty.

### 6.3 Carbohydrates [i](#)

EDS was not executed - this section is therefore empty.

### 6.4 Ligands [i](#)

EDS was not executed - this section is therefore empty.

### 6.5 Other polymers [i](#)

EDS was not executed - this section is therefore empty.