



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2024 – 04:39 PM EST

PDB ID : 3CP2  
Title : Crystal structure of GidA from E. coli  
Authors : Scrima, A.; Meyer, S.; Versees, W.; Wittinghofer, A.  
Deposited on : 2008-03-30  
Resolution : 2.90 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)  
Xtriage (Phenix) : 1.13  
EDS : 2.36  
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) : 2.36

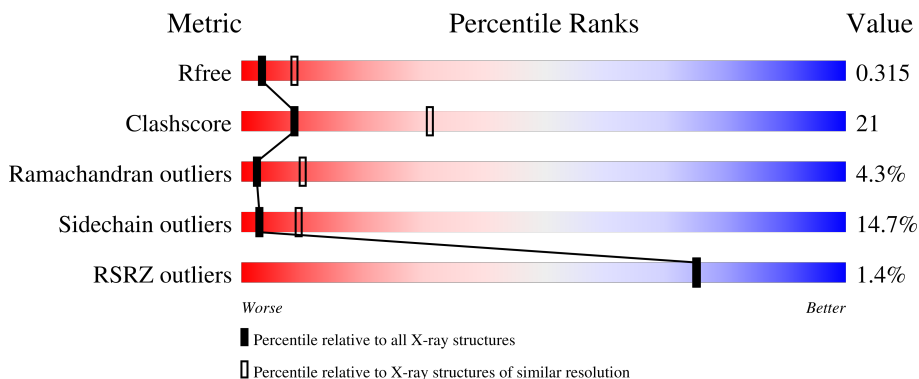
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.90 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	1957 (2.90-2.90)
Clashscore	141614	2172 (2.90-2.90)
Ramachandran outliers	138981	2115 (2.90-2.90)
Sidechain outliers	138945	2117 (2.90-2.90)
RSRZ outliers	127900	1906 (2.90-2.90)

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  $\leq 5\%$ . 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	649	

## 2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 3800 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 tRNA uridine 5-carboxymethylaminomethyl modification enzyme gidA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	491	3790	2381	673	718	18	0	0	0

There are 20 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-19	MET	-	initiating methionine	UNP P0A6U3
A	-18	GLY	-	expression tag	UNP P0A6U3
A	-17	SER	-	expression tag	UNP P0A6U3
A	-16	SER	-	expression tag	UNP P0A6U3
A	-15	HIS	-	expression tag	UNP P0A6U3
A	-14	HIS	-	expression tag	UNP P0A6U3
A	-13	HIS	-	expression tag	UNP P0A6U3
A	-12	HIS	-	expression tag	UNP P0A6U3
A	-11	HIS	-	expression tag	UNP P0A6U3
A	-10	HIS	-	expression tag	UNP P0A6U3
A	-9	SER	-	expression tag	UNP P0A6U3
A	-8	SER	-	expression tag	UNP P0A6U3
A	-7	GLY	-	expression tag	UNP P0A6U3
A	-6	LEU	-	expression tag	UNP P0A6U3
A	-5	VAL	-	expression tag	UNP P0A6U3
A	-4	PRO	-	expression tag	UNP P0A6U3
A	-3	ARG	-	expression tag	UNP P0A6U3
A	-2	GLY	-	expression tag	UNP P0A6U3
A	-1	SER	-	expression tag	UNP P0A6U3
A	0	HIS	-	expression tag	UNP P0A6U3

- 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		

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	5	Total	O	0	0
			5	5		



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 65 2 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	197.60Å 197.60Å 69.16Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	19.96 – 2.90 19.88 – 2.90	Depositor EDS
% Data completeness (in resolution range)	99.8 (19.96-2.90) 99.8 (19.88-2.90)	Depositor EDS
$R_{merge}$	0.05	Depositor
$R_{sym}$	0.04	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	4.34 (at 2.88Å)	Xtrriage
Refinement program	REFMAC 5.2.0019	Depositor
R, $R_{free}$	0.246 , 0.313 0.243 , 0.315	Depositor DCC
$R_{free}$ test set	920 reflections (5.11%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	84.6	Xtrriage
Anisotropy	0.204	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.31 , 61.1	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	3800	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	89.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.70% 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: 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	0.49	0/3858	0.67	0/5227

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

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	A	503	LEU	Peptide

### 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	3790	0	3761	155	0
2	A	5	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	5	0	0	0	0
All	All	3800	0	3761	155	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 21.

All (155) 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:371:ILE:H	1:A:371:ILE:HD13	1.16	1.09
1:A:432:ARG:HG3	1:A:432:ARG:HH11	1.24	0.99
1:A:371:ILE:H	1:A:371:ILE:CD1	1.84	0.90
1:A:371:ILE:HD13	1:A:371:ILE:N	1.87	0.89
1:A:191:PRO:HD2	1:A:361:PHE:HE1	1.40	0.86
1:A:333:ASN:ND2	1:A:333:ASN:H	1.78	0.82
1:A:500:THR:HG23	1:A:501:ALA:H	1.43	0.82
1:A:522:LYS:O	1:A:525:THR:HG22	1.80	0.82
1:A:130:VAL:HG12	1:A:186:ARG:HH21	1.45	0.81
1:A:524:THR:HG21	1:A:532:ALA:HB2	1.63	0.81
1:A:440:ARG:CZ	1:A:544:ILE:HD11	2.11	0.80
1:A:321:GLN:HE22	1:A:340:GLY:H	1.27	0.80
1:A:130:VAL:HG12	1:A:186:ARG:NH2	1.97	0.79
1:A:14:GLY:HA2	1:A:18:GLY:HA3	1.63	0.78
1:A:333:ASN:H	1:A:333:ASN:HD22	1.32	0.78
1:A:368:ALA:O	1:A:371:ILE:HD11	1.83	0.78
1:A:390:ASN:ND2	1:A:401:TRP:H	1.82	0.77
1:A:39:ILE:HG12	1:A:122:GLN:HE21	1.49	0.76
1:A:193:ARG:HH12	1:A:351:ARG:HB2	1.52	0.74
1:A:203:PRO:HB3	1:A:336:ILE:HD11	1.71	0.73
1:A:310:ASN:HD22	1:A:311:GLY:N	1.88	0.72
1:A:500:THR:HB	1:A:517:GLU:HG2	1.73	0.70
1:A:191:PRO:HD2	1:A:361:PHE:CE1	2.25	0.70
1:A:500:THR:HG23	1:A:501:ALA:N	2.05	0.70
1:A:123:GLN:HG2	1:A:140:THR:HB	1.73	0.70
1:A:130:VAL:CG1	1:A:186:ARG:HH21	2.03	0.70
1:A:48:ASN:HD22	1:A:49:PRO:HD2	1.57	0.69
1:A:81:PHE:HB3	1:A:225:PRO:HG2	1.73	0.69
1:A:479:ARG:O	1:A:483:THR:HG22	1.92	0.69
1:A:477:ARG:HD2	1:A:542:VAL:HG13	1.75	0.68
1:A:500:THR:CG2	1:A:501:ALA:H	2.06	0.67
1:A:7:PHE:O	1:A:148:ALA:HA	1.95	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:432:ARG:HG3	1:A:432:ARG:NH1	2.04	0.66
1:A:10:ILE:HB	1:A:151:VAL:HG23	1.77	0.65
1:A:432:ARG:HH11	1:A:432:ARG:CG	2.03	0.65
1:A:540:GLU:O	1:A:544:ILE:HG23	1.99	0.63
1:A:541:GLN:O	1:A:545:GLN:HB2	1.98	0.63
1:A:9:VAL:HB	1:A:32:THR:HG23	1.81	0.62
1:A:203:PRO:HB3	1:A:321:GLN:NE2	2.16	0.61
1:A:25:ALA:O	1:A:28:MET:HB2	2.01	0.60
1:A:90:PRO:HD3	1:A:93:ARG:NH1	2.17	0.60
1:A:390:ASN:HD21	1:A:401:TRP:H	1.46	0.60
1:A:333:ASN:ND2	1:A:333:ASN:N	2.43	0.58
1:A:316:LEU:HG	1:A:320:VAL:HG13	1.86	0.57
1:A:471:GLU:HA	1:A:471:GLU:OE1	2.04	0.57
1:A:10:ILE:HG13	1:A:148:ALA:HB2	1.86	0.57
1:A:39:ILE:HD13	1:A:122:GLN:HB2	1.85	0.57
1:A:197:LEU:O	1:A:344:GLU:HA	2.04	0.57
1:A:354:LYS:HG3	1:A:355:PRO:HD2	1.86	0.57
1:A:48:ASN:HD22	1:A:49:PRO:CD	2.17	0.57
1:A:524:THR:CG2	1:A:532:ALA:HB2	2.33	0.57
1:A:204:ARG:HD3	1:A:300:GLU:OE2	2.05	0.56
1:A:321:GLN:O	1:A:325:VAL:HG12	2.06	0.56
1:A:203:PRO:HB3	1:A:321:GLN:HE21	1.70	0.56
1:A:318:PHE:HA	1:A:321:GLN:HB2	1.88	0.56
1:A:78:GLY:HA2	1:A:98:GLN:O	2.05	0.55
1:A:191:PRO:CD	1:A:361:PHE:HE1	2.16	0.55
1:A:440:ARG:NH2	1:A:544:ILE:HD11	2.21	0.55
1:A:128:LEU:HD12	1:A:135:VAL:HG21	1.88	0.54
1:A:513:LEU:HD12	1:A:546:VAL:HB	1.89	0.54
1:A:59:LEU:HD13	1:A:409:TYR:HB3	1.90	0.54
1:A:484:TRP:HA	1:A:508:SER:HA	1.89	0.54
1:A:2:PHE:HD1	1:A:145:LYS:HZ3	1.56	0.54
1:A:96:ARG:NH1	1:A:98:GLN:OE1	2.39	0.53
1:A:199:THR:HG23	1:A:343:ILE:HD12	1.90	0.53
1:A:488:SER:C	1:A:490:GLU:H	2.11	0.53
1:A:2:PHE:CZ	1:A:147:ARG:HB3	2.43	0.53
1:A:500:THR:CG2	1:A:501:ALA:N	2.69	0.52
1:A:130:VAL:HA	1:A:135:VAL:HA	1.92	0.52
1:A:457:LEU:O	1:A:458:VAL:HB	2.09	0.52
1:A:232:ASN:HD21	1:A:234:SER:HB2	1.75	0.52
1:A:386:LEU:HA	1:A:389:LEU:HD23	1.92	0.51
1:A:518:MET:O	1:A:547:LYS:NZ	2.41	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:181:ILE:N	1:A:182:PRO:CD	2.74	0.51
1:A:204:ARG:HD2	1:A:338:ARG:HD2	1.92	0.51
1:A:487:PRO:HG3	1:A:504:SER:OG	2.11	0.51
1:A:292:GLN:HE21	1:A:292:GLN:H	1.58	0.51
1:A:24:ALA:O	1:A:28:MET:HG2	2.11	0.51
1:A:465:ARG:NH2	1:A:469:LYS:HB3	2.26	0.51
1:A:289:ASP:HA	1:A:292:GLN:HE22	1.74	0.50
1:A:200:GLY:HA3	1:A:342:ALA:HA	1.94	0.50
1:A:472:ASN:HB3	1:A:533:LEU:HD11	1.94	0.50
1:A:499:LEU:HD11	1:A:515:ARG:HD3	1.94	0.50
1:A:232:ASN:HD22	1:A:234:SER:H	1.59	0.49
1:A:298:GLU:OE1	1:A:308:TYR:HD2	1.96	0.49
1:A:523:LEU:O	1:A:526:LEU:HB2	2.13	0.48
1:A:542:VAL:O	1:A:546:VAL:HG23	2.13	0.48
1:A:187:LEU:HD13	1:A:348:PHE:CZ	2.48	0.48
1:A:538:ALA:O	1:A:542:VAL:HG23	2.13	0.48
1:A:524:THR:HG21	1:A:532:ALA:CB	2.41	0.48
1:A:188:ARG:C	1:A:190:LEU:H	2.17	0.48
1:A:39:ILE:HG23	1:A:122:GLN:HG3	1.96	0.48
1:A:316:LEU:HD21	1:A:320:VAL:HG22	1.95	0.47
1:A:435:TYR:O	1:A:439:LEU:HB2	2.14	0.47
1:A:62:GLU:CD	1:A:408:ALA:HB1	2.35	0.47
1:A:10:ILE:HG13	1:A:148:ALA:CB	2.45	0.47
1:A:7:PHE:CZ	1:A:33:LEU:HB2	2.50	0.46
1:A:52:GLY:HA3	1:A:96:ARG:HA	1.97	0.46
1:A:75:ASP:OD1	1:A:236:HIS:HE1	1.97	0.46
1:A:219:HIS:CD2	1:A:241:PRO:HB3	2.50	0.46
1:A:128:LEU:HA	1:A:138:ALA:HA	1.97	0.46
1:A:207:ALA:HB2	1:A:307:ILE:HG12	1.96	0.46
1:A:2:PHE:HD1	1:A:145:LYS:NZ	2.13	0.46
1:A:310:ASN:HD22	1:A:310:ASN:C	2.18	0.46
1:A:321:GLN:NE2	1:A:340:GLY:H	2.04	0.46
1:A:382:ALA:HB1	1:A:410:LEU:HD13	1.97	0.46
1:A:445:ASP:OD1	1:A:446:LEU:N	2.48	0.46
1:A:60:VAL:O	1:A:61:LYS:C	2.55	0.45
1:A:130:VAL:HG23	1:A:135:VAL:N	2.32	0.45
1:A:350:PRO:HB2	1:A:417:LEU:O	2.16	0.45
1:A:39:ILE:O	1:A:42:LEU:HD22	2.17	0.45
1:A:48:ASN:ND2	1:A:49:PRO:HD2	2.28	0.44
1:A:364:GLY:HA2	1:A:394:LEU:CD1	2.47	0.44
1:A:432:ARG:NH1	1:A:432:ARG:CG	2.71	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:198:LYS:HA	1:A:344:GLU:HG2	2.00	0.44
1:A:201:THR:OG1	1:A:202:PRO:HD2	2.17	0.44
1:A:379:GLU:OE2	1:A:426:TYR:OH	2.32	0.44
1:A:448:LEU:HD12	1:A:448:LEU:HA	1.82	0.44
1:A:14:GLY:HA3	1:A:34:LEU:HD11	2.00	0.43
1:A:424:GLU:O	1:A:429:PHE:HE1	2.01	0.43
1:A:473:ILE:HG13	1:A:474:GLU:N	2.33	0.43
1:A:473:ILE:HG13	1:A:474:GLU:H	1.83	0.43
1:A:90:PRO:HD3	1:A:93:ARG:HH11	1.83	0.43
1:A:219:HIS:HD2	1:A:241:PRO:HB3	1.84	0.43
1:A:298:GLU:OE1	1:A:308:TYR:CD2	2.72	0.43
1:A:91:ALA:HB2	1:A:437:LEU:HA	2.00	0.43
1:A:295:ILE:HD11	1:A:328:MET:SD	2.58	0.43
1:A:42:LEU:O	1:A:105:ARG:HG2	2.19	0.43
1:A:22:ALA:O	1:A:24:ALA:N	2.52	0.43
1:A:483:THR:O	1:A:529:PHE:HE2	2.02	0.43
1:A:520:TYR:C	1:A:520:TYR:CD2	2.92	0.42
1:A:22:ALA:C	1:A:24:ALA:N	2.72	0.42
1:A:80:GLN:O	1:A:97:ALA:HA	2.19	0.42
1:A:193:ARG:HB2	1:A:349:ASP:HB3	2.02	0.42
1:A:246:HIS:HA	1:A:295:ILE:CD1	2.49	0.42
1:A:380:ALA:O	1:A:381:ALA:C	2.58	0.42
1:A:65:ALA:O	1:A:449:THR:HA	2.19	0.42
1:A:289:ASP:HA	1:A:292:GLN:NE2	2.34	0.42
1:A:386:LEU:HD22	1:A:389:LEU:HD21	2.01	0.42
1:A:39:ILE:HA	1:A:42:LEU:HD22	2.02	0.42
1:A:63:VAL:HG13	1:A:385:LEU:HD23	2.01	0.42
1:A:154:THR:HA	1:A:371:ILE:CD1	2.49	0.42
1:A:343:ILE:H	1:A:343:ILE:HG13	1.77	0.42
1:A:14:GLY:HA2	1:A:18:GLY:CA	2.44	0.42
1:A:300:GLU:HG3	1:A:306:GLU:CB	2.51	0.41
1:A:487:PRO:HD2	1:A:506:GLU:HB2	2.03	0.41
1:A:23:MET:SD	1:A:112:LEU:HD23	2.61	0.41
1:A:203:PRO:CB	1:A:336:ILE:HD11	2.47	0.41
1:A:154:THR:HA	1:A:371:ILE:HD12	2.02	0.41
1:A:482:SER:O	1:A:484:TRP:HD1	2.04	0.41
1:A:64:ASP:HB2	1:A:71:ALA:CB	2.51	0.41
1:A:405:ARG:HD2	1:A:415:ASP:OD2	2.21	0.40
1:A:59:LEU:HD21	1:A:413:LEU:HD22	2.03	0.40
1:A:351:ARG:HA	1:A:418:CYS:O	2.20	0.40
1:A:457:LEU:O	1:A:458:VAL:CB	2.68	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	485/649 (75%)	400 (82%)	64 (13%)	21 (4%)	<b>2</b> <b>10</b>

All (21) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	4	PRO
1	A	124	ALA
1	A	490	GLU
1	A	23	MET
1	A	443	ASN
1	A	458	VAL
1	A	488	SER
1	A	505	ARG
1	A	37	HIS
1	A	132	ASN
1	A	247	THR
1	A	203	PRO
1	A	319	ASP
1	A	361	PHE
1	A	500	THR
1	A	26	ALA
1	A	90	PRO
1	A	487	PRO
1	A	191	PRO
1	A	427	ARG
1	A	530	ALA

### 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	394/533 (74%)	336 (85%)	58 (15%)	<b>3</b> <b>9</b>

All (58) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	5	ASP
1	A	19	THR
1	A	32	THR
1	A	37	HIS
1	A	42	LEU
1	A	46	SER
1	A	48	ASN
1	A	59	LEU
1	A	69	LEU
1	A	120	ILE
1	A	128	LEU
1	A	132	ASN
1	A	141	GLN
1	A	144	LEU
1	A	151	VAL
1	A	153	LEU
1	A	155	VAL
1	A	183	LEU
1	A	196	ARG
1	A	201	THR
1	A	204	ARG
1	A	226	VAL
1	A	227	PHE
1	A	240	VAL
1	A	244	ILE
1	A	246	HIS
1	A	292	GLN
1	A	295	ILE
1	A	310	ASN
1	A	312	ILE

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	319	ASP
1	A	320	VAL
1	A	333	ASN
1	A	343	ILE
1	A	354	LYS
1	A	365	LEU
1	A	371	ILE
1	A	375	THR
1	A	385	LEU
1	A	386	LEU
1	A	389	LEU
1	A	394	LEU
1	A	412	VAL
1	A	417	LEU
1	A	423	LYS
1	A	432	ARG
1	A	437	LEU
1	A	451	ILE
1	A	455	LEU
1	A	465	ARG
1	A	470	LEU
1	A	471	GLU
1	A	474	GLU
1	A	498	HIS
1	A	519	THR
1	A	533	LEU
1	A	536	GLU
1	A	544	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (16) such sidechains are listed below:

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	48	ASN
1	A	122	GLN
1	A	123	GLN
1	A	217	GLN
1	A	232	ASN
1	A	236	HIS
1	A	238	GLN
1	A	248	ASN
1	A	292	GLN
1	A	294	GLN

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Mol	Chain	Res	Type
1	A	310	ASN
1	A	321	GLN
1	A	333	ASN
1	A	372	ASN
1	A	390	ASN
1	A	467	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	630	-	4,4,4	0.19	0	6,6,6	0.27	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.

No monomer is involved in short contacts.

## 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 [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	491/649 (75%)	0.02	7 (1%) 75 75	62, 88, 124, 132	0

All (7) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	531	PRO	3.4
1	A	86	ALA	3.1
1	A	497	ALA	2.9
1	A	399	GLU	2.9
1	A	132	ASN	2.4
1	A	158	PHE	2.3
1	A	344	GLU	2.1

### 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 monosaccharides 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	A	630	5/5	0.89	0.20	108,109,110,110	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.