



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 19, 2022 – 01:20 am BST

PDB ID : 6T4H
Title : Crystal structure of the accessory translocation ATPase, SecA2, from *Clostridium difficile*, in complex with adenosine-5'-(gamma-thio)-triphosphate
Authors : Lindic, N.; Loboda, J.; Usenik, A.; Turk, D.
Deposited on : 2019-10-14
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

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>.

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

MolProbity : 4.02b-467
Mogul : **FAILED**
Xtriage (Phenix) : 1.13
EDS : 2.31.2
buster-report : **FAILED**
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0267
CCP4 : 7.1.010 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.2

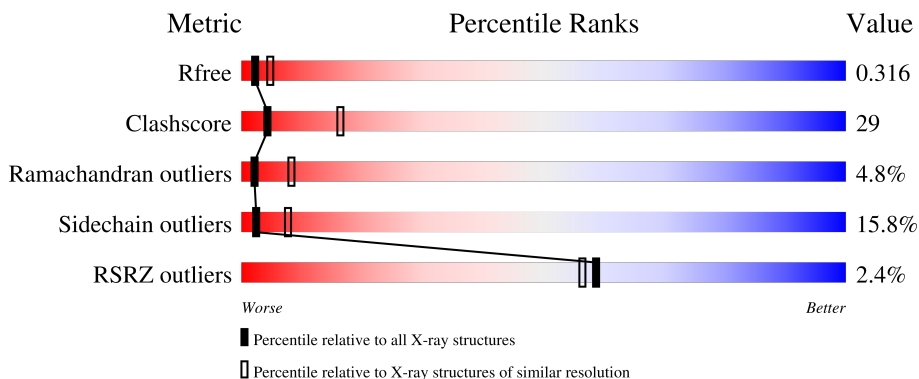
1 Overall quality at a glance i

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 ≥ 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	781	

2 Entry composition [i](#)

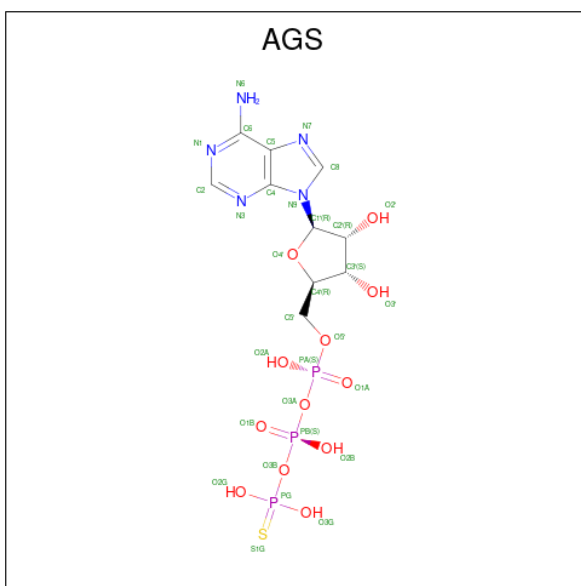
There are 3 unique types of molecules in this entry. The entry contains 7720 atoms, of which 1488 are hydrogens and 0 are deuteriums.

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 translocase subunit SecA 2.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	H	N	O	S			
1	A	771	7635	3901	1448	1055	1209	22	1652	0	0

- Molecule 2 is PHOSPHOTHIOPHOSPHORIC ACID-ADENYLATE ESTER (three-letter code: AGS) (formula: C₁₀H₁₆N₅O₁₂P₃S) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms							ZeroOcc	AltConf
			Total	C	H	N	O	P	S		
2	A	1	43	10	12	5	12	3	1	12	0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			H	O		
3	A	14	28	14	28	0



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	82.94Å 96.84Å 114.68Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.34 – 2.90 49.34 – 2.60	Depositor EDS
% Data completeness (in resolution range)	100.0 (49.34-2.90) 99.5 (49.34-2.60)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.76 (at 2.61Å)	Xtriage
Refinement program	MAIN	Depositor
R, R_{free}	0.335 , 0.380 0.316 , 0.316	Depositor DCC
R_{free} test set	1502 reflections (5.17%)	wwPDB-VP
Wilson B-factor (Å ²)	48.0	Xtriage
Anisotropy	0.954	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	(Not available) , (Not available)	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.87	EDS
Total number of atoms	7720	wwPDB-VP
Average B, all atoms (Å ²)	38.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.18% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical 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: AGS

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	0.55	0/6271	0.75	0/8423

There are no bond length outliers.

There are no bond angle outliers.

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	6187	1448	6268	352	10
2	A	31	12	12	2	0
3	A	14	28	0	1	0
All	All	6232	1488	6280	352	10

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 29.

All (352) 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:13:VAL:HA	1:A:16:ILE:HD12	1.29	1.10

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:34:MET:HA	1:A:37:ILE:HG13	1.45	0.99
1:A:421:ILE:HD11	1:A:469:ILE:HG12	1.47	0.97
1:A:87:ILE:HD11	1:A:376:LEU:HD13	1.49	0.94
1:A:424:GLY:HA3	1:A:518:LEU:HD21	1.53	0.91
1:A:60:ARG:HA	1:A:71:GLN:NE2	1.86	0.90
1:A:483:SER:HA	1:A:524:ARG:HH22	1.40	0.87
1:A:512:ARG:HG3	1:A:512:ARG:HH11	1.42	0.85
1:A:98:LEU:HD12	1:A:131:MET:SD	2.18	0.83
1:A:9:LEU:HD22	1:A:77:ILE:HG23	1.60	0.83
1:A:483:SER:HA	1:A:524:ARG:NH2	1.94	0.83
1:A:48:LEU:HD22	1:A:106:LEU:HG	1.60	0.83
1:A:421:ILE:HG22	1:A:502:TYR:HB3	1.58	0.83
1:A:60:ARG:HA	1:A:71:GLN:HE22	1.42	0.81
1:A:425:THR:HG22	1:A:426:VAL:H	1.46	0.78
1:A:153:ILE:HG22	1:A:157:GLN:HE21	1.49	0.78
1:A:613:VAL:HG13	1:A:705:LYS:HB3	1.63	0.77
1:A:231:VAL:HG11	1:A:283:LEU:HA	1.66	0.77
1:A:96:LYS:HA	1:A:99:VAL:HG23	1.66	0.76
1:A:653:LEU:HD23	1:A:653:LEU:N	2.01	0.75
1:A:77:ILE:HB	1:A:381:ILE:HD11	1.69	0.74
1:A:102:ALA:HB3	1:A:103:PRO:HD3	1.69	0.74
1:A:88:ALA:HB3	1:A:359:MET:HG2	1.70	0.74
1:A:396:VAL:HG11	1:A:570:LEU:HD21	1.70	0.73
1:A:168:SER:O	1:A:172:PHE:HB2	1.89	0.73
1:A:727:LYS:O	1:A:730:ILE:HG12	1.88	0.72
1:A:403:LYS:O	1:A:407:VAL:HG23	1.90	0.71
1:A:56:PHE:O	1:A:59:VAL:HG12	1.90	0.70
1:A:180:VAL:HG21	1:A:185:HIS:HB2	1.73	0.70
1:A:422:LEU:HD21	1:A:521:ARG:HD2	1.73	0.70
1:A:13:VAL:HG13	1:A:76:LEU:HD12	1.74	0.70
1:A:656:THR:HG22	1:A:657:PHE:HD2	1.56	0.69
1:A:56:PHE:CD1	1:A:102:ALA:HB1	2.28	0.69
1:A:118:THR:HG21	1:A:123:LEU:HB3	1.73	0.68
1:A:624:GLN:O	1:A:628:LYS:HG3	1.93	0.68
1:A:609:GLU:HA	1:A:612:LYS:HE2	1.74	0.68
1:A:248:ILE:HD11	1:A:283:LEU:HD22	1.75	0.68
1:A:87:ILE:HD12	1:A:199:VAL:HG11	1.74	0.67
1:A:193:PHE:HD1	1:A:355:LYS:HB2	1.60	0.67
1:A:120:ASN:HA	1:A:166:THR:HG23	1.77	0.67
1:A:699:LYS:O	1:A:703:LEU:HB2	1.95	0.67
1:A:512:ARG:HG3	1:A:512:ARG:NH1	2.10	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:524:ARG:HG2	1:A:524:ARG:HH11	1.61	0.66
1:A:100:GLU:O	1:A:103:PRO:HD2	1.95	0.66
1:A:697:ILE:HG23	1:A:698:ASP:N	2.10	0.66
1:A:114:VAL:HG13	1:A:193:PHE:HD2	1.62	0.65
1:A:154:ARG:HH12	1:A:169:GLU:HB3	1.60	0.65
1:A:175:LEU:HD13	1:A:342:ALA:HB1	1.79	0.65
1:A:501:LEU:HD23	1:A:522:SER:HB2	1.78	0.65
1:A:90:MET:HG2	1:A:381:ILE:HG21	1.78	0.65
1:A:61:GLU:HA	1:A:64:LYS:HB3	1.79	0.64
1:A:137:SER:O	1:A:138:LEU:HD23	1.96	0.64
1:A:96:LYS:HD2	2:A:801:AGS:O2B	1.98	0.63
1:A:613:VAL:HG11	1:A:709:LEU:HB2	1.80	0.63
1:A:90:MET:HB2	1:A:96:LYS:HE3	1.80	0.63
1:A:524:ARG:HG2	1:A:524:ARG:NH1	2.13	0.63
1:A:9:LEU:CD2	1:A:77:ILE:HA	2.29	0.63
1:A:61:GLU:HG2	1:A:64:LYS:HD3	1.80	0.63
1:A:424:GLY:HA3	1:A:518:LEU:CD2	2.24	0.63
1:A:448:LEU:HD21	1:A:459:ILE:HG21	1.81	0.62
1:A:623:ILE:HG13	1:A:626:MET:HE2	1.79	0.62
1:A:420:PRO:HG3	1:A:466:LEU:O	1.99	0.62
1:A:413:ARG:HA	1:A:416:LYS:HE2	1.79	0.62
1:A:104:VAL:HG22	1:A:114:VAL:HG11	1.82	0.62
1:A:273:ILE:HD11	1:A:711:VAL:HG12	1.80	0.62
1:A:207:ALA:HB1	1:A:347:GLN:NE2	2.15	0.61
1:A:271:LYS:O	1:A:271:LYS:HG2	1.98	0.61
1:A:59:VAL:HG11	1:A:102:ALA:HB2	1.83	0.61
1:A:203:LEU:O	1:A:207:ALA:HB2	2.01	0.60
1:A:407:VAL:O	1:A:411:ILE:HG13	2.02	0.60
1:A:463:ALA:HB2	1:A:470:THR:HG21	1.81	0.60
1:A:500:GLY:HA3	1:A:528:PRO:O	2.02	0.60
1:A:472:ALA:HB1	1:A:476:ALA:HB3	1.84	0.60
1:A:385:ARG:HD3	1:A:526:GLY:HA3	1.84	0.59
1:A:755:LEU:HA	3:A:908:HOH:O	2.02	0.59
1:A:462:LYS:O	1:A:465:LYS:HG2	2.02	0.59
1:A:623:ILE:O	1:A:627:VAL:HG23	2.03	0.59
1:A:250:LEU:HD11	1:A:254:GLY:HA3	1.85	0.58
1:A:128:LYS:HG3	1:A:129:GLU:N	2.18	0.58
1:A:347:GLN:O	1:A:351:ARG:HG3	2.03	0.58
1:A:104:VAL:HG12	1:A:105:TYR:N	2.18	0.58
1:A:448:LEU:HD21	1:A:459:ILE:CG2	2.34	0.58
1:A:418:ARG:O	1:A:498:LEU:HD13	2.03	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:639:LEU:HD22	1:A:649:TYR:HE2	1.69	0.58
1:A:679:SER:O	1:A:683:ILE:HD13	2.04	0.58
1:A:126:ARG:O	1:A:130:LEU:HG	2.03	0.58
1:A:137:SER:C	1:A:138:LEU:HD23	2.24	0.57
1:A:448:LEU:HD22	1:A:456:GLU:HB2	1.86	0.57
1:A:425:THR:HG22	1:A:426:VAL:N	2.16	0.57
1:A:683:ILE:O	1:A:687:VAL:HG23	2.04	0.57
1:A:199:VAL:HG12	1:A:360:THR:HB	1.87	0.57
1:A:231:VAL:CG1	1:A:283:LEU:HA	2.34	0.57
1:A:89:GLU:HA	1:A:360:THR:O	2.05	0.57
1:A:408:VAL:HG21	1:A:437:MET:HB2	1.86	0.57
1:A:360:THR:HG21	1:A:363:ALA:HB2	1.86	0.57
1:A:4:GLN:HA	1:A:7:LYS:HB2	1.87	0.56
1:A:114:VAL:HG13	1:A:193:PHE:CD2	2.40	0.56
1:A:118:THR:CG2	1:A:123:LEU:HB3	2.35	0.56
1:A:646:TYR:CZ	1:A:668:VAL:HG13	2.41	0.56
1:A:152:ASN:ND2	1:A:153:ILE:HG12	2.20	0.56
1:A:396:VAL:HA	1:A:535:VAL:HG22	1.87	0.56
1:A:623:ILE:HG13	1:A:626:MET:CE	2.36	0.56
1:A:422:LEU:HD23	1:A:503:VAL:HG22	1.88	0.56
1:A:210:PRO:HG3	1:A:345:THR:HG22	1.87	0.56
1:A:606:ILE:O	1:A:610:ARG:HB2	2.05	0.56
1:A:639:LEU:HD22	1:A:649:TYR:CE2	2.41	0.56
1:A:13:VAL:CG1	1:A:76:LEU:HD12	2.36	0.55
1:A:372:SER:O	1:A:373:ILE:HG13	2.07	0.55
1:A:188:GLN:NE2	1:A:191:LEU:HD21	2.21	0.55
1:A:542:ILE:HG21	1:A:574:ILE:HD13	1.87	0.55
1:A:318:TYR:HB3	1:A:322:LEU:HB3	1.87	0.55
1:A:90:MET:SD	1:A:99:VAL:HG21	2.47	0.55
1:A:273:ILE:CD1	1:A:711:VAL:HG12	2.37	0.55
1:A:13:VAL:HG11	1:A:73:ARG:HG3	1.87	0.55
1:A:270:ILE:CG1	1:A:707:VAL:HG12	2.37	0.54
1:A:540:ASP:HA	1:A:543:LYS:HB3	1.89	0.54
1:A:570:LEU:O	1:A:574:ILE:HG12	2.07	0.54
1:A:51:ILE:HG22	1:A:55:ALA:HB2	1.87	0.54
1:A:96:LYS:HA	1:A:99:VAL:CG2	2.37	0.54
1:A:408:VAL:HG21	1:A:437:MET:SD	2.47	0.54
1:A:650:PHE:CD1	1:A:663:LEU:HD13	2.42	0.54
1:A:115:HIS:HD2	1:A:170:PHE:CE1	2.25	0.54
1:A:656:THR:CG2	1:A:657:PHE:HD2	2.21	0.54
1:A:606:ILE:HG13	1:A:716:TRP:CZ3	2.42	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:505:GLY:HA3	1:A:533:PHE:CE2	2.43	0.54
1:A:80:ILE:HG22	1:A:84:GLN:NE2	2.23	0.53
1:A:656:THR:HG23	1:A:761:GLU:HG2	1.88	0.53
1:A:421:ILE:HD13	1:A:421:ILE:N	2.23	0.53
1:A:550:ILE:HD12	1:A:550:ILE:H	1.73	0.53
1:A:9:LEU:HD21	1:A:77:ILE:HA	1.89	0.53
1:A:56:PHE:CG	1:A:102:ALA:HB1	2.43	0.53
1:A:180:VAL:CG2	1:A:185:HIS:HB2	2.38	0.53
1:A:273:ILE:HG23	1:A:274:GLU:N	2.23	0.53
1:A:600:ASN:O	1:A:604:LYS:HB2	2.08	0.53
1:A:389:ARG:HG2	1:A:390:ALA:N	2.23	0.53
1:A:61:GLU:O	1:A:65:ARG:HG3	2.09	0.53
1:A:153:ILE:HG22	1:A:157:GLN:NE2	2.23	0.53
1:A:547:GLY:O	1:A:551:GLU:HG3	2.09	0.53
1:A:565:ILE:HG22	1:A:566:GLU:N	2.22	0.53
1:A:637:THR:O	1:A:641:GLY:HA3	2.08	0.53
1:A:78:GLY:HA3	1:A:90:MET:CE	2.39	0.53
1:A:203:LEU:HD23	1:A:203:LEU:N	2.24	0.53
1:A:503:VAL:O	1:A:531:SER:HA	2.08	0.52
1:A:347:GLN:HB3	1:A:593:LEU:HD13	1.90	0.52
1:A:89:GLU:O	1:A:381:ILE:HG22	2.09	0.52
1:A:606:ILE:HG13	1:A:716:TRP:CE3	2.44	0.52
1:A:400:GLU:O	1:A:404:TYR:HD2	1.93	0.52
1:A:585:ASN:HA	1:A:588:ILE:HG12	1.92	0.52
1:A:31:LEU:O	1:A:34:MET:HB2	2.10	0.51
1:A:389:ARG:HG2	1:A:390:ALA:H	1.75	0.51
1:A:668:VAL:HG12	1:A:669:ASP:N	2.24	0.51
1:A:630:ILE:HG21	1:A:656:THR:HG21	1.92	0.51
1:A:697:ILE:CG2	1:A:698:ASP:N	2.72	0.51
1:A:59:VAL:HA	1:A:62:VAL:HG12	1.92	0.51
1:A:407:VAL:HG11	1:A:434:LEU:HD11	1.92	0.51
1:A:9:LEU:CD1	1:A:81:VAL:HG23	2.41	0.51
1:A:248:ILE:CD1	1:A:283:LEU:HD22	2.41	0.51
1:A:421:ILE:HD13	1:A:421:ILE:H	1.76	0.50
1:A:524:ARG:HH11	1:A:524:ARG:CG	2.24	0.50
1:A:501:LEU:HD23	1:A:522:SER:CB	2.41	0.50
1:A:182:ASP:OD2	1:A:184:SER:HB2	2.12	0.50
1:A:109:LEU:HD23	1:A:140:MET:CE	2.41	0.50
1:A:68:GLY:O	1:A:70:ARG:N	2.44	0.50
1:A:259:GLU:HA	1:A:264:ILE:O	2.12	0.50
1:A:408:VAL:HG21	1:A:437:MET:CB	2.42	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:445:HIS:HB3	1:A:469:ILE:HB	1.93	0.50
1:A:628:LYS:HE2	1:A:681:TYR:CZ	2.47	0.50
1:A:104:VAL:HG22	1:A:114:VAL:CG1	2.41	0.50
1:A:228:ASN:O	1:A:232:LYS:HB2	2.12	0.50
1:A:9:LEU:HD22	1:A:77:ILE:CG2	2.38	0.49
1:A:88:ALA:H	1:A:359:MET:HA	1.76	0.49
1:A:270:ILE:HG12	1:A:707:VAL:HB	1.93	0.49
1:A:87:ILE:HA	1:A:358:GLY:O	2.12	0.49
1:A:115:HIS:CD2	1:A:170:PHE:CE1	3.01	0.49
1:A:606:ILE:HG21	1:A:716:TRP:CD2	2.47	0.49
1:A:48:LEU:HD11	1:A:107:ASN:HA	1.95	0.49
1:A:97:THR:OG1	2:A:801:AGS:S1G	2.68	0.49
1:A:174:TYR:C	1:A:174:TYR:CD2	2.86	0.49
1:A:228:ASN:OD1	1:A:286:HIS:HE1	1.96	0.49
1:A:238:ASP:O	1:A:250:LEU:HD12	2.13	0.49
1:A:644:ARG:NH2	1:A:646:TYR:OH	2.45	0.49
1:A:682:GLU:O	1:A:686:ARG:HG3	2.13	0.49
1:A:90:MET:HE2	1:A:381:ILE:HD13	1.95	0.48
1:A:667:GLY:O	1:A:669:ASP:N	2.46	0.48
1:A:270:ILE:HG21	1:A:706:THR:CG2	2.43	0.48
1:A:599:ILE:O	1:A:603:ARG:HB2	2.12	0.48
1:A:448:LEU:HD12	1:A:472:ALA:HB2	1.96	0.48
1:A:483:SER:CA	1:A:524:ARG:HH22	2.17	0.48
1:A:463:ALA:HB1	1:A:470:THR:OG1	2.13	0.48
1:A:434:LEU:HD23	1:A:434:LEU:O	2.14	0.48
1:A:59:VAL:HG11	1:A:102:ALA:CB	2.44	0.48
1:A:104:VAL:CG1	1:A:162:ILE:HG12	2.44	0.47
1:A:275:LEU:O	1:A:279:ILE:HG22	2.14	0.47
1:A:318:TYR:HD1	1:A:323:HIS:ND1	2.12	0.47
1:A:650:PHE:CD2	1:A:650:PHE:N	2.82	0.47
1:A:677:ILE:HA	1:A:680:THR:OG1	2.13	0.47
1:A:12:ILE:HD12	1:A:80:ILE:HG21	1.97	0.47
1:A:13:VAL:HG13	1:A:76:LEU:CD1	2.44	0.47
1:A:48:LEU:HD21	1:A:106:LEU:O	2.14	0.47
1:A:206:GLU:O	1:A:208:ARG:N	2.47	0.47
1:A:552:LYS:O	1:A:556:ARG:HG3	2.15	0.47
1:A:549:THR:O	1:A:553:LEU:HG	2.14	0.47
1:A:268:THR:HG23	1:A:770:PHE:CD2	2.49	0.47
1:A:598:THR:O	1:A:602:GLN:HG3	2.13	0.47
1:A:334:ILE:HD12	1:A:334:ILE:H	1.79	0.47
1:A:519:ARG:HH21	1:A:533:PHE:HD1	1.62	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:142:VAL:HG13	1:A:162:ILE:HB	1.96	0.47
1:A:460:ILE:O	1:A:463:ALA:HB3	2.14	0.47
1:A:9:LEU:HD11	1:A:81:VAL:HG23	1.97	0.46
1:A:87:ILE:HG23	1:A:199:VAL:HG11	1.97	0.46
1:A:67:LEU:HD11	1:A:134:VAL:HG21	1.98	0.46
1:A:81:VAL:HG22	1:A:379:VAL:HG11	1.96	0.46
1:A:87:ILE:HG13	1:A:378:VAL:HG22	1.96	0.46
1:A:271:LYS:O	1:A:272:ASN:HB2	2.15	0.46
1:A:404:TYR:O	1:A:408:VAL:HG23	2.15	0.46
1:A:72:TYR:O	1:A:75:GLN:N	2.46	0.46
1:A:78:GLY:HA3	1:A:90:MET:HE3	1.96	0.46
1:A:656:THR:HG22	1:A:657:PHE:CD2	2.45	0.46
1:A:4:GLN:O	1:A:8:LYS:HG2	2.15	0.46
1:A:204:ILE:HG12	1:A:370:PHE:CE2	2.50	0.46
1:A:272:ASN:O	1:A:274:GLU:N	2.49	0.46
1:A:239:PHE:HB2	1:A:249:ALA:O	2.16	0.46
1:A:371:GLU:HA	1:A:375:LYS:HA	1.97	0.46
1:A:683:ILE:HG13	1:A:686:ARG:NH1	2.30	0.46
1:A:90:MET:HG2	1:A:381:ILE:CG2	2.45	0.46
1:A:624:GLN:HG3	1:A:681:TYR:OH	2.15	0.46
1:A:720:ILE:HG22	1:A:721:ASP:N	2.31	0.46
1:A:473:THR:HG22	1:A:474:ASN:H	1.81	0.46
1:A:436:LYS:O	1:A:440:LYS:HB2	2.16	0.46
1:A:75:GLN:O	1:A:99:VAL:HG13	2.16	0.46
1:A:503:VAL:HG13	1:A:518:LEU:HG	1.97	0.46
1:A:213:ILE:HB	1:A:342:ALA:HB3	1.97	0.45
1:A:319:THR:HG22	1:A:320:ASP:H	1.81	0.45
1:A:524:ARG:HG3	1:A:524:ARG:O	2.16	0.45
1:A:145:ILE:HG13	1:A:165:GLY:HA3	1.98	0.45
1:A:453:HIS:HA	1:A:456:GLU:HG2	1.98	0.45
1:A:658:MET:HG3	1:A:659:PRO:HD2	1.97	0.45
1:A:453:HIS:O	1:A:457:ALA:HB2	2.17	0.45
1:A:90:MET:HE3	1:A:99:VAL:HG11	1.97	0.45
1:A:200:ASP:HA	1:A:370:PHE:HZ	1.81	0.45
1:A:270:ILE:HG21	1:A:706:THR:HG22	1.99	0.45
1:A:128:LYS:O	1:A:132:SER:HB3	2.17	0.45
1:A:194:ALA:HB2	1:A:353:TYR:CE2	2.51	0.45
1:A:756:ASN:O	1:A:759:ILE:HB	2.17	0.45
1:A:152:ASN:O	1:A:156:GLN:NE2	2.50	0.45
1:A:273:ILE:CG2	1:A:274:GLU:N	2.80	0.45
1:A:362:THR:HB	1:A:513:ARG:HG2	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:425:THR:HG21	1:A:431:SER:N	2.32	0.45
1:A:100:GLU:C	1:A:103:PRO:HD2	2.36	0.45
1:A:409:GLU:O	1:A:412:ILE:HG12	2.17	0.45
1:A:96:LYS:CA	1:A:99:VAL:HG23	2.43	0.44
1:A:267:LEU:O	1:A:268:THR:HB	2.17	0.44
1:A:602:GLN:HB3	1:A:752:PHE:CE1	2.52	0.44
1:A:175:LEU:HD13	1:A:342:ALA:CB	2.46	0.44
1:A:351:ARG:NH1	1:A:373:ILE:O	2.50	0.44
1:A:448:LEU:HB3	1:A:476:ALA:HB1	1.99	0.44
1:A:130:LEU:O	1:A:133:PRO:HD2	2.17	0.44
1:A:239:PHE:HA	1:A:251:THR:HG23	1.99	0.44
1:A:396:VAL:HA	1:A:535:VAL:CG2	2.47	0.44
1:A:152:ASN:HD22	1:A:153:ILE:HG12	1.81	0.44
1:A:343:THR:O	1:A:344:VAL:HB	2.17	0.44
1:A:188:GLN:HE22	1:A:191:LEU:HD21	1.82	0.44
1:A:605:VAL:HG23	1:A:606:ILE:N	2.33	0.44
1:A:650:PHE:N	1:A:650:PHE:HD2	2.16	0.44
1:A:9:LEU:HD22	1:A:77:ILE:HA	1.99	0.44
1:A:188:GLN:HB3	1:A:189:ARG:H	1.67	0.44
1:A:230:PHE:HE1	1:A:279:ILE:HD11	1.83	0.43
1:A:291:LYS:HE3	1:A:297:ILE:HG12	1.99	0.43
1:A:631:ILE:HG22	1:A:677:ILE:HG23	1.99	0.43
1:A:104:VAL:HG11	1:A:162:ILE:HG12	1.99	0.43
1:A:264:ILE:HG12	1:A:272:ASN:ND2	2.33	0.43
1:A:389:ARG:CG	1:A:390:ALA:H	2.30	0.43
1:A:393:HIS:O	1:A:532:ARG:HG2	2.18	0.43
1:A:408:VAL:HG13	1:A:438:LEU:HD23	2.00	0.43
1:A:174:TYR:CD2	1:A:175:LEU:N	2.86	0.43
1:A:347:GLN:CB	1:A:593:LEU:HD13	2.47	0.43
1:A:640:ILE:HD11	1:A:673:VAL:HG21	2.00	0.43
1:A:651:LYS:O	1:A:655:SER:HB2	2.19	0.43
1:A:717:ILE:HG13	1:A:718:ASP:N	2.34	0.43
1:A:117:ILE:HD12	1:A:117:ILE:N	2.34	0.43
1:A:688:TYR:O	1:A:692:LYS:HG3	2.17	0.43
1:A:82:ILE:HD11	1:A:359:MET:CG	2.49	0.43
1:A:189:ARG:HG2	1:A:190:GLU:H	1.84	0.43
1:A:104:VAL:O	1:A:105:TYR:C	2.58	0.42
1:A:395:LYS:N	1:A:533:PHE:O	2.52	0.42
1:A:466:LEU:HB3	1:A:467:ASP:H	1.58	0.42
1:A:488:ASP:O	1:A:492:GLU:HB2	2.19	0.42
1:A:638:TYR:CE2	1:A:652:HIS:HB2	2.54	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:189:ARG:HG2	1:A:190:GLU:N	2.35	0.42
1:A:524:ARG:O	1:A:526:GLY:N	2.52	0.42
1:A:672:SER:O	1:A:676:ILE:HG13	2.19	0.42
1:A:59:VAL:HG21	1:A:101:VAL:HG12	2.02	0.42
1:A:270:ILE:HG13	1:A:707:VAL:HG12	2.02	0.42
1:A:334:ILE:HD12	1:A:334:ILE:N	2.34	0.42
1:A:81:VAL:CG2	1:A:379:VAL:HG11	2.50	0.42
1:A:101:VAL:HG11	1:A:134:VAL:HG11	2.01	0.42
1:A:693:MET:CE	1:A:694:MET:HG3	2.49	0.42
1:A:123:LEU:HD23	1:A:123:LEU:HA	1.81	0.42
1:A:271:LYS:O	1:A:272:ASN:CB	2.68	0.42
1:A:560:ASN:HB3	1:A:563:THR:HB	2.01	0.42
1:A:609:GLU:HA	1:A:612:LYS:CE	2.46	0.42
1:A:112:LYS:C	1:A:189:ARG:HH21	2.24	0.42
1:A:174:TYR:HD2	1:A:175:LEU:N	2.18	0.42
1:A:426:VAL:HG22	1:A:426:VAL:O	2.20	0.42
1:A:318:TYR:HB2	1:A:323:HIS:HB2	2.01	0.42
1:A:122:TYR:CD1	1:A:453:HIS:HB2	2.55	0.41
1:A:230:PHE:HE2	1:A:257:LYS:HB3	1.84	0.41
1:A:273:ILE:HA	1:A:766:TYR:OH	2.19	0.41
1:A:60:ARG:HG2	1:A:71:GLN:HE21	1.85	0.41
1:A:146:ILE:HG22	1:A:147:SER:N	2.35	0.41
1:A:238:ASP:HA	1:A:253:SER:HB2	2.02	0.41
1:A:371:GLU:O	1:A:375:LYS:HA	2.19	0.41
1:A:7:LYS:O	1:A:10:ASN:HB2	2.20	0.41
1:A:87:ILE:HG22	1:A:88:ALA:N	2.36	0.41
1:A:145:ILE:HD11	1:A:170:PHE:CG	2.55	0.41
1:A:230:PHE:CE1	1:A:279:ILE:HD11	2.56	0.41
1:A:550:ILE:O	1:A:554:MET:HB2	2.20	0.41
1:A:348:ASN:O	1:A:351:ARG:N	2.53	0.41
1:A:363:ALA:HB1	1:A:370:PHE:CE1	2.55	0.41
1:A:389:ARG:CG	1:A:390:ALA:N	2.82	0.41
1:A:484:LEU:O	1:A:492:GLU:HA	2.20	0.41
1:A:82:ILE:HD11	1:A:359:MET:SD	2.61	0.41
1:A:366:GLU:OE2	1:A:513:ARG:HD3	2.20	0.41
1:A:101:VAL:HA	1:A:135:TYR:OH	2.20	0.41
1:A:193:PHE:CD1	1:A:355:LYS:HB2	2.47	0.41
1:A:403:LYS:HE2	1:A:536:SER:HB3	2.03	0.41
1:A:541:VAL:O	1:A:577:ALA:HB1	2.20	0.41
1:A:23:MET:HA	1:A:26:LEU:HG	2.02	0.41
1:A:230:PHE:CE2	1:A:257:LYS:HB3	2.56	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:271:LYS:HG2	1:A:272:ASN:OD1	2.21	0.41
1:A:415:HIS:HD2	1:A:443:ILE:HD11	1.86	0.41
1:A:502:TYR:CE2	1:A:530:THR:HG21	2.56	0.41
1:A:608:ASN:O	1:A:612:LYS:HG3	2.20	0.41
1:A:628:LYS:HG2	1:A:681:TYR:CE1	2.56	0.41
1:A:654:TYR:CZ	1:A:663:LEU:HD11	2.56	0.41
1:A:9:LEU:O	1:A:9:LEU:HD23	2.20	0.40
1:A:230:PHE:O	1:A:233:THR:HG22	2.21	0.40
1:A:489:LYS:HG3	1:A:492:GLU:OE2	2.21	0.40
1:A:492:GLU:O	1:A:496:LYS:HB2	2.20	0.40
1:A:88:ALA:N	1:A:358:GLY:O	2.54	0.40
1:A:183:LEU:HD12	1:A:183:LEU:HA	1.78	0.40
1:A:239:PHE:HA	1:A:251:THR:H	1.86	0.40
1:A:90:MET:CE	1:A:99:VAL:HG11	2.52	0.40
1:A:97:THR:HG22	1:A:131:MET:CE	2.52	0.40
1:A:403:LYS:HB2	1:A:536:SER:HB2	2.02	0.40
1:A:460:ILE:HG12	1:A:482:ILE:HD11	2.02	0.40
1:A:48:LEU:HA	1:A:48:LEU:HD23	1.84	0.40
1:A:111:GLY:O	1:A:189:ARG:NH2	2.54	0.40
1:A:264:ILE:N	1:A:264:ILE:HD12	2.36	0.40
1:A:181:PRO:O	1:A:614:LEU:HD21	2.21	0.40
1:A:585:ASN:O	1:A:588:ILE:HG12	2.22	0.40
1:A:650:PHE:HE1	1:A:663:LEU:O	2.05	0.40

All (10) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:4:GLN:OE1	1:A:538:GLU:OE1[4_446]	0.90	1.30
1:A:4:GLN:CD	1:A:538:GLU:OE1[4_446]	1.34	0.86
1:A:150:ASP:OD1	1:A:299:ASN:H[3_545]	0.98	0.62
1:A:4:GLN:OE1	1:A:538:GLU:CD[4_446]	1.68	0.52
1:A:150:ASP:OD1	1:A:299:ASN:N[3_545]	1.89	0.31
1:A:307:GLU:OE2	1:A:553:LEU:CD2[2_454]	1.92	0.28
1:A:265:THR:OG1	1:A:621:GLU:OE2[4_545]	2.10	0.10
1:A:4:GLN:OE1	1:A:538:GLU:CB[4_446]	2.11	0.09
1:A:371:GLU:OE2	1:A:440:LYS:CE[4_446]	2.16	0.04
1:A:129:GLU:OE2	1:A:232:LYS:HZ1[3_545]	1.60	0.00

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	769/781 (98%)	644 (84%)	88 (11%)	37 (5%)	2 8

All (37) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	46	GLU
1	A	69	MET
1	A	207	ALA
1	A	320	ASP
1	A	373	ILE
1	A	393	HIS
1	A	450	ALA
1	A	556	ARG
1	A	567	SER
1	A	643	LYS
1	A	644	ARG
1	A	659	PRO
1	A	668	VAL
1	A	181	PRO
1	A	188	GLN
1	A	267	LEU
1	A	272	ASN
1	A	466	LEU
1	A	525	GLN
1	A	641	GLY
1	A	734	SER
1	A	266	ASN
1	A	273	ILE
1	A	338	SER
1	A	399	THR
1	A	509	HIS
1	A	52	LEU
1	A	352	LEU

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Mol	Chain	Res	Type
1	A	453	HIS
1	A	639	LEU
1	A	2	ASP
1	A	203	LEU
1	A	426	VAL
1	A	295	TYR
1	A	299	ASN
1	A	101	VAL
1	A	344	VAL

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	678/688 (98%)	571 (84%)	107 (16%)	2 8

All (107) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	2	ASP
1	A	9	LEU
1	A	14	ASP
1	A	21	ASP
1	A	22	SER
1	A	23	MET
1	A	27	SER
1	A	29	GLU
1	A	37	ILE
1	A	67	LEU
1	A	69	MET
1	A	71	GLN
1	A	72	TYR
1	A	77	ILE
1	A	86	LYS
1	A	100	GLU
1	A	104	VAL

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Mol	Chain	Res	Type
1	A	118	THR
1	A	126	ARG
1	A	128	LYS
1	A	132	SER
1	A	136	GLU
1	A	138	LEU
1	A	152	ASN
1	A	166	THR
1	A	172	PHE
1	A	177	ASP
1	A	200	ASP
1	A	205	ASP
1	A	216	ASP
1	A	222	LYS
1	A	229	SER
1	A	245	ASP
1	A	248	ILE
1	A	253	SER
1	A	256	SER
1	A	270	ILE
1	A	271	LYS
1	A	274	GLU
1	A	275	LEU
1	A	280	ASN
1	A	283	LEU
1	A	292	ASP
1	A	295	TYR
1	A	298	SER
1	A	313	MET
1	A	314	ASP
1	A	319	THR
1	A	330	GLU
1	A	338	SER
1	A	364	LYS
1	A	377	ASN
1	A	384	ASN
1	A	394	ASP
1	A	403	LYS
1	A	405	SER
1	A	409	GLU
1	A	410	GLU
1	A	421	ILE

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Mol	Chain	Res	Type
1	A	429	GLU
1	A	449	ASN
1	A	452	GLN
1	A	458	GLU
1	A	467	ASP
1	A	475	MET
1	A	478	ARG
1	A	483	SER
1	A	490	GLU
1	A	493	GLN
1	A	501	LEU
1	A	507	GLU
1	A	508	ARG
1	A	518	LEU
1	A	524	ARG
1	A	525	GLN
1	A	536	SER
1	A	538	GLU
1	A	542	ILE
1	A	558	SER
1	A	559	SER
1	A	561	GLU
1	A	582	GLU
1	A	587	GLU
1	A	601	GLU
1	A	608	ASN
1	A	610	ARG
1	A	651	LYS
1	A	663	LEU
1	A	669	ASP
1	A	673	VAL
1	A	674	GLN
1	A	682	GLU
1	A	693	MET
1	A	694	MET
1	A	700	VAL
1	A	702	GLU
1	A	703	LEU
1	A	707	VAL
1	A	714	GLN
1	A	718	ASP
1	A	720	ILE

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Mol	Chain	Res	Type
1	A	721	ASP
1	A	728	GLN
1	A	734	SER
1	A	750	ASP
1	A	760	ARG
1	A	770	PHE

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

Mol	Chain	Res	Type
1	A	25	ASN
1	A	71	GLN
1	A	84	GLN
1	A	115	HIS
1	A	149	GLN
1	A	152	ASN
1	A	157	GLN
1	A	188	GLN
1	A	272	ASN
1	A	286	HIS
1	A	384	ASN
1	A	415	HIS
1	A	562	ASN
1	A	608	ASN
1	A	611	ASN
1	A	756	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](#)

Mogul failed to run properly - this section is therefore empty.

5.5 Carbohydrates [i](#)

Mogul failed to run properly - this section is therefore empty.

5.6 Ligand geometry [i](#)

Mogul failed to run properly - this section is therefore empty.

5.7 Other polymers [i](#)

Mogul failed to run properly - this section is therefore empty.

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, 95th 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 ²)	Q<0.9
1	A	760/781 (97%)	0.19	18 (2%) 59 56	10, 43, 101, 156	43 (5%)

All (18) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	363	ALA	3.5
1	A	713	ASP	3.5
1	A	544	LEU	3.1
1	A	288	LEU	2.9
1	A	293	VAL	2.7
1	A	142	VAL	2.5
1	A	218	ASP	2.5
1	A	557	THR	2.5
1	A	318	TYR	2.5
1	A	569	ALA	2.4
1	A	761	GLU	2.3
1	A	555	LYS	2.3
1	A	395	LYS	2.1
1	A	202	ILE	2.1
1	A	356	LEU	2.1
1	A	243	ARG	2.0
1	A	474	ASN	2.0
1	A	195	ILE	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 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, 95th 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(\AA^2)	Q<0.9
2	AGS	A	801	31/31	0.91	0.14	1,18,52,53	12

6.5 Other polymers [i](#)

There are no such residues in this entry.