



# Full wwPDB X-ray Structure Validation Report ⓘ

May 26, 2020 – 08:34 pm BST

PDB ID : 2XCQ  
Title : The 2.98Å crystal structure of the catalytic core (B'A' region) of Staphylococcus aureus DNA Gyrase  
Authors : Bax, B.D.; Chan, P.F.; Eggleston, D.S.; Fosberry, A.; Gentry, D.R.; Gorrec, F.; Giordano, I.; Hann, M.M.; Hennessy, A.; Hibbs, M.; Huang, J.; Jones, E.; Jones, J.; Brown, K.K.; Lewis, C.J.; May, E.W.; Singh, O.; Spitzfaden, C.; Shen, C.; Shillings, A.; Theobald, A.F.; Wohlkonig, A.; Pearson, N.D.; Gwynn, M.N.  
Deposited on : 2010-04-24  
Resolution : 2.98 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.

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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
Xtriage (Phenix)	:	1.13
EDS	:	2.11
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)	:	2.11

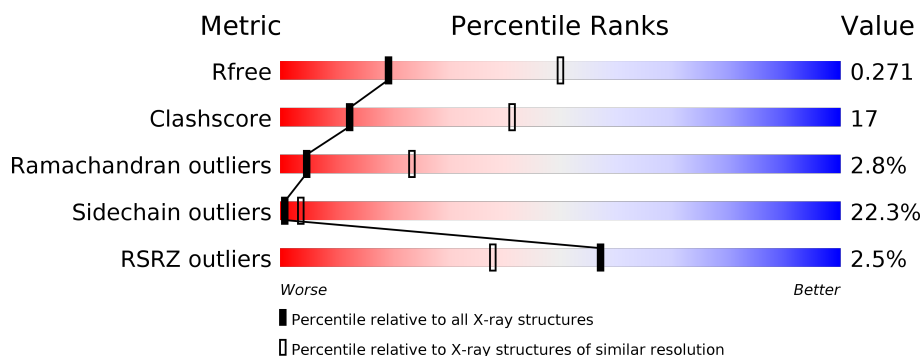
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.98 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	2754 (3.00-2.96)
Clashscore	141614	3103 (3.00-2.96)
Ramachandran outliers	138981	2993 (3.00-2.96)
Sidechain outliers	138945	2996 (3.00-2.96)
RSRZ outliers	127900	2644 (3.00-2.96)

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 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	726	<div> <div>2%</div> <div>47%</div> <div>34%</div> <div>8%</div> <div>10%</div> </div>

## 2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 5153 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 DNA GYRASE SUBUNIT B, DNA GYRASE SUBUNIT A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	653	Total	C	N	O	S	0	0	1
			5152	3223	927	981	21			

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	409	MET	-	expression tag	UNP P66937

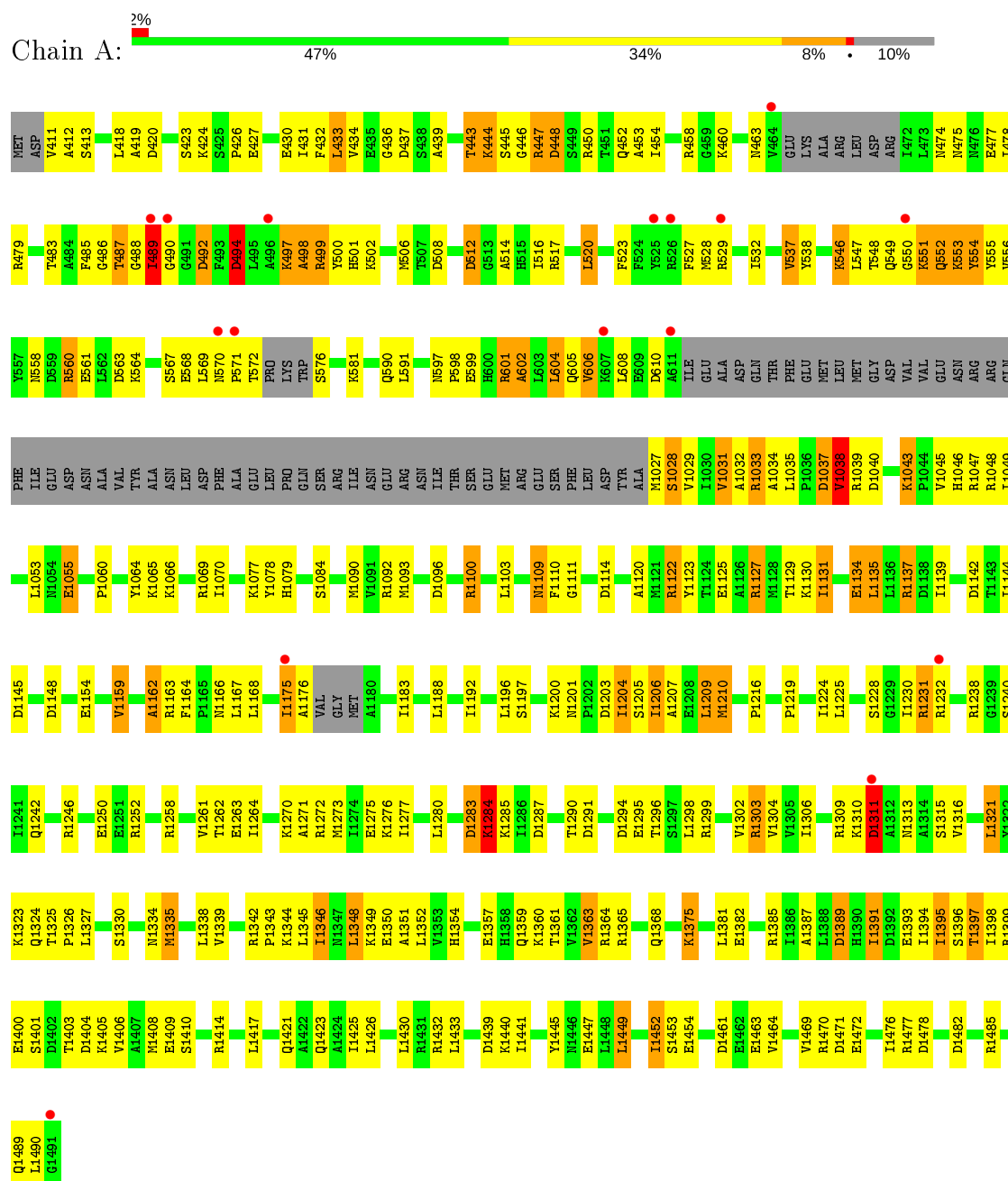
- Molecule 2 is water.

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

### 3 Residue-property plots

These plots are drawn for all protein, RNA and DNA 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 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: DNA GYRASE SUBUNIT B, DNA GYRASE SUBUNIT A



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 61 2 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	90.12Å 90.12Å 416.14Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	13.99 – 2.98 13.99 – 2.98	Depositor EDS
% Data completeness (in resolution range)	96.1 (13.99-2.98) 96.1 (13.99-2.98)	Depositor EDS
$R_{merge}$	0.07	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.83 (at 3.00Å)	Xtriage
Refinement program	REFMAC 5.1.24	Depositor
R, $R_{free}$	0.205 , 0.286 0.201 , 0.271	Depositor DCC
$R_{free}$ test set	1076 reflections (5.25%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	82.5	Xtriage
Anisotropy	0.100	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.29 , 67.1	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.47$ , $\langle L^2 \rangle = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	5153	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	19.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.56% 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

### 5.1 Standard geometry

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	0.68	0/5222	0.95	24/7033 (0.3%)

There are no bond length outliers.

All (24) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	1404	ASP	CB-CG-OD2	8.49	125.94	118.30
1	A	1461	ASP	CB-CG-OD2	8.25	125.73	118.30
1	A	448	ASP	CB-CG-OD2	7.41	124.97	118.30
1	A	1159	VAL	CB-CA-C	-7.09	97.94	111.40
1	A	437	ASP	CB-CG-OD2	6.85	124.46	118.30
1	A	1471	ASP	CB-CG-OD2	6.84	124.45	118.30
1	A	563	ASP	CB-CG-OD2	6.79	124.41	118.30
1	A	1040	ASP	CB-CG-OD2	6.77	124.39	118.30
1	A	1311	ASP	CB-CG-OD2	6.50	124.15	118.30
1	A	512	ASP	CB-CG-OD2	6.11	123.80	118.30
1	A	1148	ASP	CB-CG-OD2	6.00	123.70	118.30
1	A	1037	ASP	CB-CG-OD2	5.99	123.69	118.30
1	A	610	ASP	O-C-N	-5.88	113.29	122.70
1	A	1142	ASP	CB-CG-OD2	5.84	123.55	118.30
1	A	494	ASP	CB-CG-OD2	5.74	123.47	118.30
1	A	1038	VAL	CB-CA-C	-5.72	100.54	111.40
1	A	1287	ASP	CB-CG-OD2	5.67	123.40	118.30
1	A	1439	ASP	CB-CG-OD2	5.59	123.33	118.30
1	A	1145	ASP	CB-CG-OD2	5.38	123.14	118.30
1	A	1389	ASP	CB-CG-OD2	5.32	123.09	118.30
1	A	1291	ASP	CB-CG-OD2	5.30	123.08	118.30
1	A	508	ASP	CB-CG-OD2	5.26	123.04	118.30
1	A	1283	ASP	CB-CG-OD2	5.23	123.00	118.30
1	A	492	ASP	CB-CG-OD2	5.20	122.98	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	5152	0	5221	175	1
2	A	1	0	0	0	0
All	All	5153	0	5221	175	1

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 17.

All (175) 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:1038:VAL:HG21	1:A:1339:VAL:HG22	1.42	1.02
1:A:1201:ASN:HD22	1:A:1204:ILE:CG1	1.78	0.97
1:A:1201:ASN:ND2	1:A:1204:ILE:HG12	1.80	0.95
1:A:1100:ARG:HG2	1:A:1219:PRO:HD3	1.49	0.92
1:A:1201:ASN:HD22	1:A:1204:ILE:HG12	1.34	0.90
1:A:1283:ASP:O	1:A:1284:LYS:HB3	1.72	0.86
1:A:1201:ASN:ND2	1:A:1204:ILE:CG1	2.40	0.82
1:A:1135:LEU:HD13	1:A:1164:PHE:CE2	2.16	0.81
1:A:1391:ILE:O	1:A:1395:ILE:HG12	1.81	0.80
1:A:1262:THR:O	1:A:1302:VAL:HB	1.82	0.79
1:A:1034:ALA:O	1:A:1043:LYS:HD2	1.82	0.78
1:A:432:PHE:HE1	1:A:452:GLN:HG2	1.49	0.78
1:A:1029:VAL:O	1:A:1033:ARG:CG	2.32	0.78
1:A:1246:ARG:HB3	1:A:1263:GLU:HG2	1.67	0.75
1:A:430:GLU:OE1	1:A:502:LYS:HE3	1.86	0.74
1:A:1029:VAL:O	1:A:1033:ARG:HG2	1.89	0.72
1:A:494:ASP:HB3	1:A:497:LYS:HB2	1.71	0.71
1:A:1163:ARG:NH2	1:A:1472:GLU:OE1	2.24	0.70
1:A:555:TYR:OH	1:A:590:GLN:HG2	1.91	0.70
1:A:1109:ASN:ND2	1:A:1111:GLY:H	1.90	0.69
1:A:1231:ARG:HG2	1:A:1232:ARG:HH21	1.58	0.69
1:A:1137:ARG:HH11	1:A:1476:ILE:HD11	1.58	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1270:LYS:NZ	1:A:1294:ASP:OD2	2.27	0.67
1:A:546:LYS:HA	1:A:554:TYR:O	1.95	0.66
1:A:1100:ARG:HG2	1:A:1219:PRO:CD	2.25	0.66
1:A:1201:ASN:HD22	1:A:1204:ILE:HG13	1.60	0.65
1:A:1205:SER:O	1:A:1207:ALA:N	2.29	0.65
1:A:1284:LYS:O	1:A:1284:LYS:HG2	1.96	0.65
1:A:447:ARG:HD3	1:A:454:ILE:HD13	1.77	0.65
1:A:556:VAL:HG13	1:A:561:GLU:HB3	1.78	0.64
1:A:1029:VAL:O	1:A:1033:ARG:HG3	1.95	0.64
1:A:411:VAL:HG22	1:A:412:ALA:H	1.62	0.64
1:A:1064:TYR:HB3	1:A:1125:GLU:HB3	1.80	0.64
1:A:486:GLY:HA3	1:A:498:ALA:HB3	1.78	0.63
1:A:538:TYR:HA	1:A:604:LEU:O	1.97	0.63
1:A:434:VAL:HG12	1:A:506:MET:HB3	1.81	0.63
1:A:1348:LEU:HD22	1:A:1352:LEU:CD1	2.28	0.63
1:A:434:VAL:HG11	1:A:443:THR:HG21	1.80	0.62
1:A:1038:VAL:CG2	1:A:1339:VAL:HG22	2.24	0.62
1:A:1048:ARG:HD3	1:A:1078:TYR:CB	2.30	0.61
1:A:1048:ARG:HD3	1:A:1078:TYR:HB3	1.82	0.61
1:A:1393:GLU:O	1:A:1397:THR:HG22	2.01	0.61
1:A:1131:ILE:O	1:A:1134:GLU:HB2	2.01	0.60
1:A:1250:GLU:HG3	1:A:1258:ARG:HB3	1.83	0.60
1:A:1375:LYS:HG2	1:A:1452:ILE:HD13	1.82	0.60
1:A:1346:ILE:HB	1:A:1350:GLU:HG2	1.84	0.59
1:A:432:PHE:CE1	1:A:452:GLN:HG2	2.34	0.59
1:A:1144:ILE:O	1:A:1144:ILE:HD12	2.04	0.58
1:A:1064:TYR:O	1:A:1065:LYS:HD3	2.04	0.57
1:A:1109:ASN:C	1:A:1109:ASN:HD22	2.08	0.57
1:A:1035:LEU:CD1	1:A:1343:PRO:HB3	2.35	0.57
1:A:548:THR:HB	1:A:576:SER:HB3	1.88	0.56
1:A:1163:ARG:NH1	1:A:1359:GLN:OE1	2.38	0.56
1:A:1038:VAL:HG23	1:A:1338:LEU:O	2.05	0.56
1:A:558:ASN:OD1	1:A:560:ARG:HG3	2.06	0.56
1:A:1201:ASN:ND2	1:A:1204:ILE:HG13	2.18	0.56
1:A:1348:LEU:HD22	1:A:1352:LEU:HD11	1.86	0.55
1:A:549:GLN:OE1	1:A:569:LEU:HD13	2.07	0.55
1:A:448:ASP:OD2	1:A:450:ARG:HB2	2.07	0.55
1:A:1365:ARG:HA	1:A:1368:GLN:HG3	1.88	0.54
1:A:550:GLY:C	1:A:552:GLN:H	2.12	0.53
1:A:1192:ILE:HG21	1:A:1477:ARG:HB2	1.90	0.53
1:A:1114:ASP:HB3	1:A:1271:ALA:HB2	1.91	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1357:GLU:HA	1:A:1360:LYS:HD2	1.91	0.52
1:A:1137:ARG:NH1	1:A:1476:ILE:HD11	2.23	0.52
1:A:537:VAL:O	1:A:606:VAL:HG23	2.09	0.52
1:A:1131:ILE:HD13	1:A:1164:PHE:CE2	2.45	0.52
1:A:1417:LEU:HB3	1:A:1421:GLN:HB2	1.92	0.51
1:A:444:LYS:HG3	1:A:454:ILE:HG21	1.92	0.51
1:A:1216:PRO:HD3	1:A:1230:ILE:HG12	1.91	0.51
1:A:1100:ARG:HH11	1:A:1485:ARG:CZ	2.23	0.51
1:A:1321:LEU:HB3	1:A:1327:LEU:HD23	1.92	0.51
1:A:1053:LEU:CD2	1:A:1070:ILE:HG12	2.41	0.51
1:A:523:PHE:CD1	1:A:527:PHE:HD1	2.28	0.51
1:A:1070:ILE:HB	1:A:1090:MET:CE	2.41	0.51
1:A:1445:TYR:CZ	1:A:1449:LEU:HD21	2.46	0.50
1:A:1109:ASN:HD22	1:A:1110:PHE:N	2.09	0.50
1:A:1385:ARG:O	1:A:1389:ASP:OD2	2.30	0.50
1:A:512:ASP:O	1:A:516:ILE:HG12	2.12	0.50
1:A:538:TYR:HE2	1:A:605:GLN:HE21	1.59	0.50
1:A:1238:ARG:HE	1:A:1334:ASN:ND2	2.09	0.50
1:A:1175:ILE:O	1:A:1176:ALA:CB	2.59	0.50
1:A:426:PRO:HG3	1:A:499:ARG:HA	1.94	0.49
1:A:538:TYR:CE2	1:A:605:GLN:HG3	2.46	0.49
1:A:597:ASN:O	1:A:599:GLU:N	2.45	0.49
1:A:1109:ASN:C	1:A:1109:ASN:ND2	2.66	0.48
1:A:1144:ILE:C	1:A:1144:ILE:HD12	2.32	0.48
1:A:439:ALA:O	1:A:443:THR:OG1	2.29	0.48
1:A:1100:ARG:NH2	1:A:1482:ASP:OD1	2.45	0.48
1:A:1387:ALA:HB2	1:A:1425:ILE:CD1	2.42	0.48
1:A:601:ARG:O	1:A:602:ALA:HB3	2.13	0.48
1:A:1295:GLU:HB2	1:A:1303:ARG:HB3	1.96	0.48
1:A:1037:ASP:OD2	1:A:1039:ARG:HB2	2.14	0.48
1:A:423:SER:O	1:A:499:ARG:NH2	2.47	0.48
1:A:1364:ARG:O	1:A:1368:GLN:HG3	2.14	0.47
1:A:458:ARG:HB2	1:A:477:GLU:CD	2.34	0.47
1:A:1055:GLU:HA	1:A:1055:GLU:OE2	2.13	0.47
1:A:1296:THR:HG23	1:A:1302:VAL:HA	1.96	0.47
1:A:431:ILE:HG22	1:A:500:TYR:HB3	1.97	0.47
1:A:1077:LYS:HG2	1:A:1154:GLU:HG3	1.96	0.47
1:A:1313:ASN:HB3	1:A:1316:VAL:CG1	2.43	0.47
1:A:1053:LEU:HD23	1:A:1070:ILE:HG12	1.97	0.47
1:A:1313:ASN:HB3	1:A:1316:VAL:HG12	1.96	0.47
1:A:1100:ARG:NH1	1:A:1485:ARG:NE	2.63	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1395:ILE:HG12	1:A:1395:ILE:H	1.48	0.46
1:A:547:LEU:O	1:A:553:LYS:HA	2.16	0.46
1:A:1348:LEU:CD2	1:A:1352:LEU:HD11	2.44	0.46
1:A:523:PHE:CE1	1:A:527:PHE:CD1	3.04	0.46
1:A:1168:LEU:HD23	1:A:1168:LEU:HA	1.69	0.46
1:A:1477:ARG:NH1	1:A:1478:ASP:OD1	2.43	0.46
1:A:1175:ILE:O	1:A:1176:ALA:HB2	2.16	0.46
1:A:1066:LYS:HD2	1:A:1122:ARG:O	2.15	0.46
1:A:1129:THR:HG22	1:A:1131:ILE:H	1.79	0.46
1:A:1166:ASN:O	1:A:1167:LEU:C	2.54	0.46
1:A:1216:PRO:HD2	1:A:1224:ILE:HD13	1.98	0.46
1:A:1183:ILE:HG12	1:A:1335:MET:HG3	1.97	0.46
1:A:489:ILE:HB	1:A:490:GLY:H	1.42	0.46
1:A:532:ILE:HG12	1:A:537:VAL:HG21	1.99	0.45
1:A:1273:MET:SD	1:A:1327:LEU:HD13	2.57	0.45
1:A:1070:ILE:HD12	1:A:1070:ILE:N	2.32	0.45
1:A:1100:ARG:NH1	1:A:1485:ARG:CZ	2.80	0.45
1:A:1135:LEU:HA	1:A:1162:ALA:HA	1.98	0.45
1:A:1093:MET:HB3	1:A:1103:LEU:HB2	1.99	0.44
1:A:1188:LEU:HD12	1:A:1188:LEU:HA	1.77	0.44
1:A:1238:ARG:NE	1:A:1334:ASN:ND2	2.65	0.44
1:A:1028:SER:O	1:A:1031:VAL:HG13	2.17	0.44
1:A:1060:PRO:HA	1:A:1127:ARG:HD2	1.99	0.44
1:A:1387:ALA:HA	1:A:1394:ILE:HD11	1.99	0.44
1:A:523:PHE:CE1	1:A:527:PHE:HD1	2.35	0.44
1:A:1321:LEU:HD12	1:A:1321:LEU:HA	1.91	0.44
1:A:1363:VAL:HG11	1:A:1469:VAL:HG23	1.99	0.44
1:A:1043:LYS:NZ	1:A:1046:HIS:HE1	2.16	0.43
1:A:1049:ILE:HG21	1:A:1093:MET:CE	2.48	0.43
1:A:1321:LEU:O	1:A:1325:THR:OG1	2.26	0.43
1:A:601:ARG:CG	1:A:602:ALA:H	2.32	0.43
1:A:1327:LEU:HD12	1:A:1327:LEU:HA	1.79	0.43
1:A:1261:VAL:HB	1:A:1304:VAL:HB	2.01	0.43
1:A:1348:LEU:O	1:A:1352:LEU:HD12	2.18	0.43
1:A:424:LYS:HA	1:A:499:ARG:NH2	2.33	0.43
1:A:1031:VAL:HG22	1:A:1032:ALA:N	2.32	0.42
1:A:411:VAL:HG13	1:A:413:SER:HB3	2.00	0.42
1:A:570:ASN:HB2	1:A:571:PRO:HD3	2.01	0.42
1:A:597:ASN:O	1:A:598:PRO:C	2.57	0.42
1:A:1346:ILE:HG13	1:A:1351:ALA:HB2	2.01	0.42
1:A:419:ALA:HB3	1:A:454:ILE:HB	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1070:ILE:HD12	1:A:1070:ILE:H	1.84	0.42
1:A:1225:LEU:HB2	1:A:1242:GLN:HB2	2.00	0.42
1:A:538:TYR:HE2	1:A:605:GLN:HG3	1.85	0.42
1:A:1120:ALA:HB3	1:A:1123:TYR:CD2	2.53	0.42
1:A:1387:ALA:O	1:A:1394:ILE:HG13	2.19	0.42
1:A:514:ALA:HA	1:A:517:ARG:HB3	2.01	0.42
1:A:1296:THR:OG1	1:A:1302:VAL:HA	2.20	0.42
1:A:1048:ARG:HD3	1:A:1078:TYR:HB2	1.99	0.42
1:A:433:LEU:HD23	1:A:520:LEU:CD2	2.50	0.42
1:A:1210:MET:HB3	1:A:1210:MET:HE3	1.96	0.41
1:A:1463:GLU:OE2	1:A:1470:ARG:NH2	2.53	0.41
1:A:1403:THR:H	1:A:1406:VAL:HG12	1.85	0.41
1:A:1277:ILE:HG13	1:A:1325:THR:HG21	2.01	0.41
1:A:1408:MET:HG2	1:A:1426:LEU:CD1	2.50	0.41
1:A:1037:ASP:HA	1:A:1338:LEU:HB2	2.02	0.41
1:A:1129:THR:HG22	1:A:1130:LYS:N	2.35	0.41
1:A:1381:LEU:HD22	1:A:1441:ILE:HG23	2.03	0.41
1:A:1397:THR:HA	1:A:1400:GLU:OE1	2.20	0.41
1:A:475:ASN:HD21	1:A:477:GLU:HB2	1.85	0.41
1:A:1048:ARG:HH11	1:A:1079:HIS:HD2	1.69	0.41
1:A:1209:LEU:HA	1:A:1209:LEU:HD12	1.97	0.41
1:A:1048:ARG:HD2	1:A:1048:ARG:HH11	1.74	0.41
1:A:1114:ASP:OD1	1:A:1270:LYS:HB3	2.21	0.40
1:A:597:ASN:C	1:A:599:GLU:N	2.74	0.40
1:A:1205:SER:C	1:A:1207:ALA:N	2.75	0.40
1:A:1430:LEU:O	1:A:1433:LEU:HB2	2.20	0.40
1:A:453:ALA:C	1:A:454:ILE:HD12	2.42	0.40
1:A:502:LYS:HG2	1:A:538:TYR:HE1	1.85	0.40
1:A:601:ARG:CG	1:A:602:ALA:N	2.84	0.40
1:A:1280:LEU:HD23	1:A:1285:LYS:HD3	2.04	0.40

All (1) 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:446:GLY:O	1:A:1299:ARG:NH2[12_575]	2.17	0.03

## 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	643/726 (89%)	562 (87%)	63 (10%)	18 (3%)	5	23

All (18) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	487	THR
1	A	489	ILE
1	A	568	GLU
1	A	1206	ILE
1	A	463	ASN
1	A	494	ASP
1	A	601	ARG
1	A	436	GLY
1	A	492	ASP
1	A	1284	LYS
1	A	1326	PRO
1	A	498	ALA
1	A	602	ALA
1	A	1311	ASP
1	A	485	PHE
1	A	551	LYS
1	A	1162	ALA
1	A	488	GLY

### 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	555/624 (89%)	431 (78%)	124 (22%)	<b>1</b> <b>4</b>

All (124) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	418	LEU
1	A	420	ASP
1	A	427	GLU
1	A	433	LEU
1	A	443	THR
1	A	444	LYS
1	A	445	SER
1	A	447	ARG
1	A	460	LYS
1	A	474	ASN
1	A	478	ILE
1	A	479	ARG
1	A	483	THR
1	A	487	THR
1	A	489	ILE
1	A	494	ASP
1	A	497	LYS
1	A	499	ARG
1	A	501	HIS
1	A	520	LEU
1	A	528	MET
1	A	529	ARG
1	A	537	VAL
1	A	546	LYS
1	A	551	LYS
1	A	552	GLN
1	A	553	LYS
1	A	554	TYR
1	A	560	ARG
1	A	564	LYS
1	A	567	SER
1	A	572	THR
1	A	581	LYS
1	A	591	LEU
1	A	604	LEU
1	A	606	VAL
1	A	608	LEU
1	A	1027	MET

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Mol	Chain	Res	Type
1	A	1028	SER
1	A	1031	VAL
1	A	1033	ARG
1	A	1038	VAL
1	A	1043	LYS
1	A	1045	VAL
1	A	1047	ARG
1	A	1055	GLU
1	A	1069	ARG
1	A	1084	SER
1	A	1092	ARG
1	A	1096	ASP
1	A	1100	ARG
1	A	1109	ASN
1	A	1122	ARG
1	A	1127	ARG
1	A	1131	ILE
1	A	1134	GLU
1	A	1135	LEU
1	A	1137	ARG
1	A	1139	ILE
1	A	1159	VAL
1	A	1175	ILE
1	A	1196	LEU
1	A	1197	SER
1	A	1200	LYS
1	A	1203	ASP
1	A	1204	ILE
1	A	1206	ILE
1	A	1209	LEU
1	A	1210	MET
1	A	1228	SER
1	A	1231	ARG
1	A	1240	SER
1	A	1252	ARG
1	A	1264	ILE
1	A	1272	ARG
1	A	1275	GLU
1	A	1276	LYS
1	A	1284	LYS
1	A	1290	THR
1	A	1298	LEU

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Mol	Chain	Res	Type
1	A	1303	ARG
1	A	1306	ILE
1	A	1309	ARG
1	A	1310	LYS
1	A	1311	ASP
1	A	1315	SER
1	A	1321	LEU
1	A	1323	LYS
1	A	1324	GLN
1	A	1330	SER
1	A	1335	MET
1	A	1342	ARG
1	A	1344	LYS
1	A	1345	LEU
1	A	1346	ILE
1	A	1348	LEU
1	A	1349	LYS
1	A	1354	HIS
1	A	1361	THR
1	A	1363	VAL
1	A	1375	LYS
1	A	1382	GLU
1	A	1391	ILE
1	A	1395	ILE
1	A	1396	SER
1	A	1397	THR
1	A	1398	ILE
1	A	1399	ARG
1	A	1401	SER
1	A	1405	LYS
1	A	1409	GLU
1	A	1410	SER
1	A	1414	ARG
1	A	1423	GLN
1	A	1432	ARG
1	A	1440	LYS
1	A	1447	GLU
1	A	1449	LEU
1	A	1452	ILE
1	A	1453	SER
1	A	1454	GLU
1	A	1464	VAL

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Mol	Chain	Res	Type
1	A	1489	GLN
1	A	1490	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	475	ASN
1	A	480	GLN
1	A	605	GLN
1	A	1046	HIS
1	A	1079	HIS
1	A	1109	ASN
1	A	1201	ASN
1	A	1324	GLN
1	A	1334	ASN
1	A	1358	HIS

### 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](#)

There are no ligands in this entry.

## 5.7 Other polymers [i](#)

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	653/726 (89%)	-0.32	16 (2%) 57 38	11, 19, 25, 40	0

All (16) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	570	ASN	5.9
1	A	1491	GLY	5.2
1	A	464	VAL	3.6
1	A	490	GLY	3.0
1	A	1175	ILE	3.0
1	A	571	PRO	2.8
1	A	611	ALA	2.7
1	A	525	TYR	2.5
1	A	1311	ASP	2.4
1	A	550	GLY	2.4
1	A	529	ARG	2.3
1	A	1232	ARG	2.3
1	A	489	ILE	2.2
1	A	496	ALA	2.2
1	A	526	ARG	2.2
1	A	607	LYS	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 [i](#)

There are no ligands in this entry.

## 6.5 Other polymers [i](#)

There are no such residues in this entry.