



# Full wwPDB X-ray Structure Validation Report ⓘ

Jan 31, 2016 – 09:09 PM GMT

PDB ID : 1NP2  
Title : Crystal structure of thermostable beta-glycosidase from thermophilic eubacterium *Thermus nonproteolyticus* HG102  
Authors : Liang, D.C.; Chang, W.R.; Wang, X.Q.; He, X.Y.  
Deposited on : 2003-01-16  
Resolution : 2.40 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

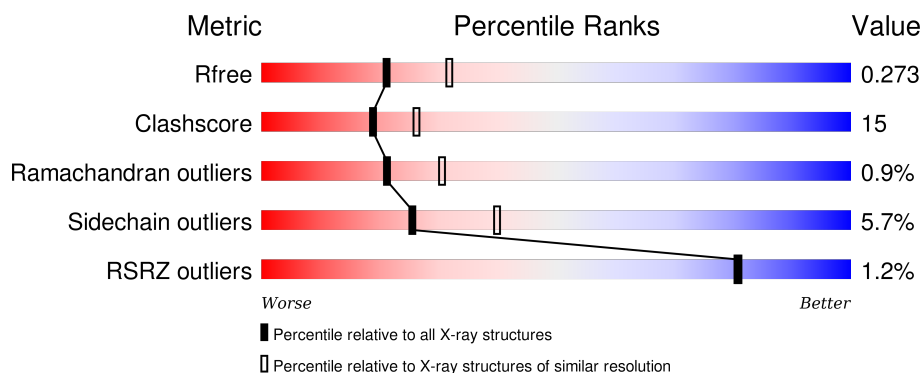
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*



The reported resolution of this entry is 2.40 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	2919 (2.40-2.40)
Clashscore	102246	3407 (2.40-2.40)
Ramachandran outliers	100387	3351 (2.40-2.40)
Sidechain outliers	100360	3352 (2.40-2.40)
RSRZ outliers	91569	2928 (2.40-2.40)

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	436	 68% 28% . .
1	B	436	 2% 68% 26% . .

## 2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 7156 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 beta-glycosidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	426	Total	C	N	O	S	0	0	0
			3411	2199	606	601	5			
1	B	426	Total	C	N	O	S	0	0	0
			3411	2199	606	601	5			

- Molecule 2 is water.

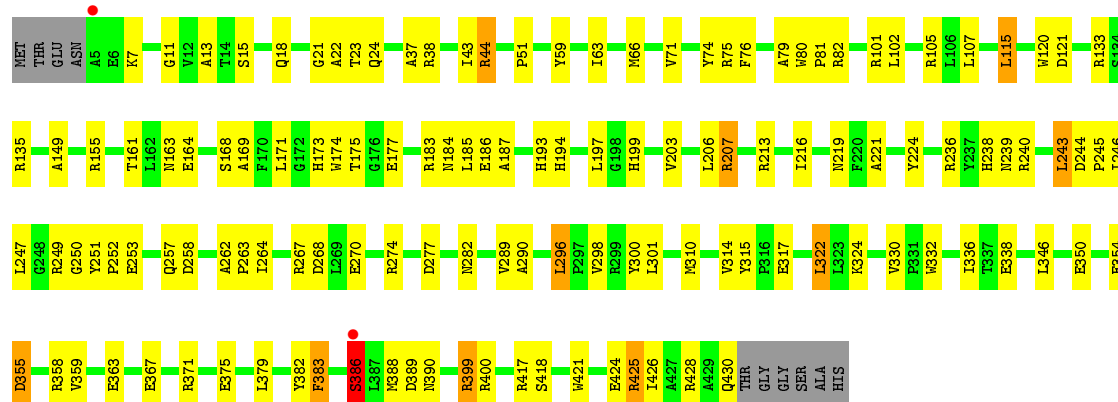
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	154	Total	O	0	0
			154	154		
2	B	180	Total	O	0	0
			180	180		

### 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 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.

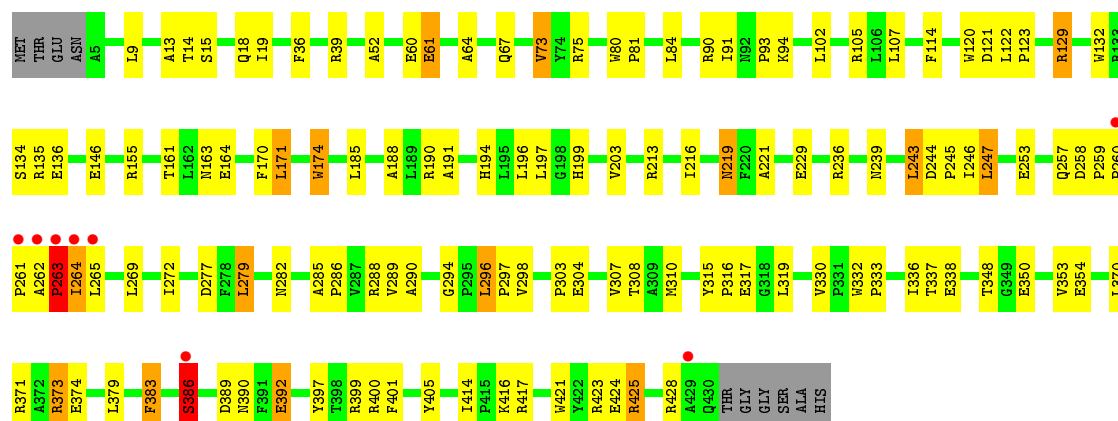
- Molecule 1: beta-glycosidase

Chain A: 



- Molecule 1: beta-glycosidase

Chain B: 



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	66.70 Å 94.75 Å 176.72 Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 2.40 83.51 – 2.40	Depositor EDS
% Data completeness (in resolution range)	94.0 (50.00-2.40) 94.0 (83.51-2.40)	Depositor EDS
$R_{merge}$	0.18	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.77 (at 2.40 Å)	Xtriage
Refinement program	CNS 1.0	Depositor
R, $R_{free}$	0.230 , 0.272 0.230 , 0.273	Depositor DCC
$R_{free}$ test set	2101 reflections (5.01%)	DCC
Wilson B-factor (Å <sup>2</sup> )	24.7	Xtriage
Anisotropy	1.182	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.34 , 44.4	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtriage
Outliers	1 of 41963 reflections (0.002%)	Xtriage
$F_o, F_c$ correlation	0.93	EDS
Total number of atoms	7156	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	29.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.79% 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](#)

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	0.38	0/3525	0.62	1/4814 (0.0%)
1	B	0.37	0/3525	0.64	0/4814
All	All	0.37	0/7050	0.63	1/9628 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	115	LEU	CA-CB-CG	6.67	130.63	115.30

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	3411	0	3282	105	0
1	B	3411	0	3282	103	0
2	A	154	0	0	7	0
2	B	180	0	0	10	0
All	All	7156	0	6564	205	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 15.

All (205) 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:221:ALA:H	1:A:239:ASN:HD21	1.08	0.94
1:B:243:LEU:HD22	1:B:247:LEU:HD22	1.55	0.89
1:B:373:ARG:HD3	1:B:379:LEU:O	1.76	0.84
1:A:213:ARG:HH11	1:A:213:ARG:HG3	1.42	0.83
1:B:310:MET:HE1	1:B:401:PHE:HZ	1.45	0.81
1:A:264:ILE:H	1:B:67:GLN:HE22	1.29	0.81
1:B:194:HIS:HD2	1:B:197:LEU:HD12	1.45	0.81
1:B:262:ALA:HB1	1:B:263:PRO:HD2	1.66	0.77
1:B:421:TRP:CZ2	1:B:425:ARG:HG3	2.20	0.75
1:A:13:ALA:O	1:A:386:SER:HA	1.88	0.73
1:A:161:THR:OG1	1:A:199:HIS:HD2	1.73	0.72
1:B:221:ALA:H	1:B:239:ASN:HD21	1.36	0.71
1:A:221:ALA:H	1:A:239:ASN:ND2	1.86	0.71
1:B:75:ARG:HH22	1:B:163:ASN:ND2	1.89	0.70
1:B:107:LEU:HD11	1:B:155:ARG:HB3	1.72	0.69
1:B:310:MET:HE1	1:B:401:PHE:CZ	2.27	0.69
1:B:135:ARG:HD3	2:B:499:HOH:O	1.92	0.68
1:A:310:MET:SD	1:A:399:ARG:HG2	2.33	0.68
1:A:324:LYS:HD3	2:A:530:HOH:O	1.93	0.67
1:B:262:ALA:HB1	1:B:263:PRO:CD	2.24	0.67
1:A:354:GLU:OE1	1:A:417:ARG:HD3	1.95	0.67
1:A:75:ARG:HH22	1:A:163:ASN:ND2	1.94	0.66
1:A:175:THR:OG1	1:A:177:GLU:HG2	1.95	0.65
1:A:213:ARG:NH1	1:A:213:ARG:HG3	2.09	0.65
1:B:421:TRP:CE2	1:B:425:ARG:HG3	2.32	0.64
1:B:296:LEU:HD13	1:B:298:VAL:HB	1.77	0.64
1:A:350:GLU:CD	1:A:350:GLU:H	2.00	0.64
1:B:373:ARG:HG2	1:B:379:LEU:HB3	1.78	0.63
1:B:161:THR:OG1	1:B:199:HIS:HD2	1.81	0.63
1:A:389:ASP:OD1	1:A:400:ARG:HB3	1.99	0.63
1:A:289:VAL:HB	1:A:298:VAL:HG13	1.81	0.63
1:A:382:TYR:C	1:A:383:PHE:HD1	2.02	0.62
1:B:94:LYS:HG3	2:B:519:HOH:O	1.99	0.62
1:A:236:ARG:HD2	1:A:253:GLU:O	1.99	0.61
1:A:107:LEU:HD11	1:A:155:ARG:HB3	1.82	0.61
1:A:18:GLN:O	1:A:390:ASN:HB2	2.00	0.61
1:B:9:LEU:HB3	1:B:73:VAL:CG2	2.31	0.61
1:A:363:GLU:O	1:A:367:GLU:HG3	2.00	0.61
1:B:424:GLU:O	1:B:428:ARG:HG3	2.02	0.59
1:B:94:LYS:HE2	2:B:566:HOH:O	2.02	0.59
1:A:44:ARG:HH11	1:A:44:ARG:HB3	1.67	0.59
1:B:221:ALA:H	1:B:239:ASN:ND2	2.01	0.58

Continued on next page...

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:289:VAL:HB	1:A:298:VAL:CG1	2.33	0.58
1:B:374:GLU:HB3	2:B:506:HOH:O	2.04	0.58
1:B:190:ARG:NH1	2:B:475:HOH:O	2.36	0.58
1:B:282:ASN:CG	1:B:338:GLU:HB2	2.23	0.57
1:A:253:GLU:HG3	1:B:423:ARG:HD3	1.86	0.57
1:B:288:ARG:CZ	1:B:304:GLU:HG3	2.33	0.57
1:A:240:ARG:HB3	1:A:244:ASP:OD2	2.05	0.57
1:A:424:GLU:OE2	1:A:428:ARG:HD3	2.04	0.57
1:B:262:ALA:O	1:B:263:PRO:C	2.42	0.57
1:B:170:PHE:O	1:B:174:TRP:HB3	2.05	0.57
1:A:274:ARG:HE	1:A:274:ARG:HA	1.69	0.57
1:B:244:ASP:HB2	1:B:245:PRO:HD3	1.87	0.56
1:B:199:HIS:O	1:B:203:VAL:HG23	2.06	0.56
1:B:414:ILE:N	1:B:414:ILE:HD12	2.21	0.56
1:A:383:PHE:N	1:A:383:PHE:HD1	2.04	0.56
1:B:75:ARG:NH2	1:B:338:GLU:OE2	2.39	0.56
1:B:91:ILE:O	1:B:93:PRO:HD3	2.05	0.56
1:A:383:PHE:CD1	1:A:383:PHE:N	2.74	0.56
1:B:13:ALA:O	1:B:386:SER:HA	2.06	0.56
1:B:146:GLU:HG3	2:B:487:HOH:O	2.04	0.56
1:B:36:PHE:HA	1:B:39:ARG:HH11	1.71	0.56
1:B:18:GLN:O	1:B:390:ASN:HB2	2.07	0.55
1:B:386:SER:OG	1:B:390:ASN:ND2	2.39	0.55
1:A:330:VAL:HG12	1:A:332:TRP:H	1.72	0.55
1:B:330:VAL:HG12	1:B:332:TRP:H	1.72	0.55
1:B:282:ASN:OD1	1:B:338:GLU:HB2	2.07	0.55
1:A:244:ASP:HB2	1:A:245:PRO:HD3	1.89	0.55
1:A:207:ARG:NH2	1:A:277:ASP:OD2	2.32	0.54
1:A:267:ARG:O	1:A:270:GLU:HG2	2.07	0.54
1:B:163:ASN:OD1	1:B:164:GLU:HG3	2.07	0.54
1:A:371:ARG:O	1:A:375:GLU:HG3	2.08	0.54
1:A:23:THR:HG22	1:A:24:GLN:HG3	1.90	0.53
1:A:11:GLY:HA2	1:A:71:VAL:HG13	1.91	0.53
1:A:80:TRP:N	1:A:81:PRO:HD2	2.24	0.53
1:A:174:TRP:O	1:A:183:ARG:HA	2.09	0.52
1:A:59:TYR:OH	1:A:101:ARG:NE	2.42	0.52
1:A:199:HIS:O	1:A:203:VAL:HG23	2.10	0.52
1:A:133:ARG:HD3	1:A:187:ALA:HB1	1.91	0.52
1:A:389:ASP:CG	1:A:400:ARG:HB3	2.30	0.51
1:A:15:SER:OG	1:A:18:GLN:HG3	2.10	0.51
1:A:193:HIS:O	1:A:197:LEU:HG	2.10	0.51

*Continued on next page...*



*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:303:PRO:HG3	1:B:307:VAL:HG11	1.93	0.51
1:B:105:ARG:HD2	2:B:551:HOH:O	2.10	0.50
1:B:279:LEU:HD12	1:B:330:VAL:HG21	1.94	0.50
1:A:135:ARG:HD3	2:A:557:HOH:O	2.12	0.50
1:B:185:LEU:O	1:B:188:ALA:HB3	2.12	0.49
1:A:243:LEU:HD22	1:A:247:LEU:CD1	2.41	0.49
1:B:216:ILE:HG21	1:B:246:ILE:HD13	1.93	0.49
1:B:14:THR:HB	1:B:19:ILE:HD13	1.94	0.49
1:B:120:TRP:CD1	1:B:120:TRP:N	2.80	0.49
1:A:251:TYR:CE2	1:A:264:ILE:HD13	2.48	0.49
1:A:169:ALA:O	1:A:173:HIS:HB2	2.12	0.49
1:A:37:ALA:HA	1:A:43:ILE:HD13	1.94	0.49
1:B:9:LEU:HB3	1:B:73:VAL:HG21	1.95	0.49
1:A:300:TYR:CD1	1:A:300:TYR:N	2.81	0.49
1:B:336:ILE:HG13	1:B:379:LEU:HD11	1.95	0.48
1:A:240:ARG:HD3	2:A:547:HOH:O	2.13	0.48
1:A:315:TYR:CZ	1:A:317:GLU:HB3	2.48	0.48
1:B:315:TYR:CE1	1:B:317:GLU:HB3	2.48	0.48
1:B:354:GLU:OE1	1:B:417:ARG:HG3	2.13	0.48
1:A:355:ASP:CG	1:A:358:ARG:HH11	2.15	0.48
1:B:337:THR:O	1:B:338:GLU:HG3	2.14	0.48
1:A:336:ILE:HG13	1:A:379:LEU:HD11	1.96	0.48
1:A:194:HIS:HD2	1:A:197:LEU:HD12	1.79	0.48
1:B:84:LEU:HD23	1:B:90:ARG:O	2.14	0.48
1:B:194:HIS:CD2	1:B:197:LEU:HD12	2.36	0.48
1:A:355:ASP:OD2	1:A:358:ARG:HD2	2.14	0.48
1:A:79:ALA:HA	1:A:121:ASP:OD2	2.14	0.48
1:B:75:ARG:HH22	1:B:163:ASN:HD21	1.61	0.47
1:A:197:LEU:HD21	1:A:268:ASP:OD2	2.14	0.47
1:A:388:MET:HE2	1:A:388:MET:HB3	1.70	0.47
1:B:219:ASN:ND2	2:B:514:HOH:O	2.46	0.47
1:B:132:TRP:O	1:B:191:ALA:HA	2.15	0.47
1:A:199:HIS:HE1	2:A:440:HOH:O	1.98	0.47
1:B:389:ASP:OD1	1:B:400:ARG:HB3	2.15	0.47
1:B:14:THR:CB	1:B:19:ILE:HD13	2.45	0.47
1:A:355:ASP:OD1	1:A:358:ARG:NH1	2.48	0.47
1:B:257:GLN:NE2	1:B:294:GLY:O	2.48	0.47
1:B:243:LEU:HD22	1:B:247:LEU:CD2	2.36	0.47
1:B:52:ALA:HA	1:B:397:TYR:OH	2.15	0.47
1:A:282:ASN:CG	1:A:338:GLU:HB2	2.35	0.47
1:A:426:ILE:O	1:A:430:GLN:HG3	2.15	0.47

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:184:ASN:HD21	1:A:186:GLU:HB3	1.79	0.47
1:B:194:HIS:HD2	1:B:197:LEU:CD1	2.23	0.46
1:A:221:ALA:N	1:A:239:ASN:HD21	1.92	0.46
1:B:196:LEU:HD22	1:B:272:ILE:HG21	1.97	0.46
1:A:238:HIS:HE1	1:A:300:TYR:OH	1.99	0.46
1:A:224:TYR:HH	1:A:315:TYR:HE2	1.62	0.46
1:B:75:ARG:HA	1:B:114:PHE:O	2.16	0.46
1:A:244:ASP:OD1	1:A:249:ARG:HD2	2.15	0.46
1:A:101:ARG:HH21	1:A:105:ARG:HH12	1.64	0.46
1:A:38:ARG:HD2	2:A:507:HOH:O	2.16	0.46
1:B:317:GLU:OE2	1:B:371:ARG:NH1	2.49	0.45
1:A:121:ASP:N	1:A:121:ASP:OD1	2.48	0.45
1:A:44:ARG:HH11	1:A:44:ARG:CB	2.29	0.45
1:B:288:ARG:NE	1:B:304:GLU:HG3	2.32	0.45
1:A:257:GLN:O	1:A:258:ASP:OD1	2.34	0.45
1:A:263:PRO:HD3	1:B:60:GLU:O	2.16	0.45
1:B:405:TYR:N	1:B:414:ILE:O	2.45	0.45
1:B:260:PRO:HA	1:B:261:PRO:HD2	1.88	0.45
1:A:168:SER:O	1:A:173:HIS:CD2	2.69	0.45
1:A:120:TRP:N	1:A:120:TRP:CD1	2.85	0.44
1:B:316:PRO:HG2	2:B:513:HOH:O	2.17	0.44
1:B:236:ARG:NH1	1:B:253:GLU:O	2.44	0.44
1:B:310:MET:HG2	1:B:399:ARG:HE	1.83	0.44
1:A:274:ARG:HA	1:A:274:ARG:NE	2.33	0.44
1:A:63:ILE:HA	1:A:66:MET:CE	2.48	0.44
1:B:265:LEU:O	1:B:269:LEU:HG	2.18	0.43
1:B:290:ALA:HA	2:B:550:HOH:O	2.18	0.43
1:A:386:SER:OG	1:A:390:ASN:ND2	2.51	0.43
1:A:74:TYR:CE2	1:A:76:PHE:HB3	2.52	0.43
1:A:168:SER:O	1:A:173:HIS:HD2	2.01	0.43
1:A:290:ALA:HB2	1:A:301:LEU:HD11	2.01	0.43
1:A:243:LEU:HD22	1:A:247:LEU:HD11	2.01	0.43
1:A:21:GLY:O	1:A:22:ALA:C	2.57	0.43
1:A:428:ARG:C	1:A:430:GLN:H	2.22	0.43
1:B:121:ASP:OD1	1:B:121:ASP:N	2.52	0.43
1:A:75:ARG:HH22	1:A:163:ASN:HD22	1.63	0.43
1:B:370:LEU:O	1:B:374:GLU:HG2	2.19	0.43
1:A:262:ALA:HB1	1:A:263:PRO:HD2	2.01	0.43
1:B:353:VAL:O	1:B:416:LYS:HA	2.19	0.43
1:A:240:ARG:NH1	1:A:252:PRO:HB3	2.34	0.43
1:A:105:ARG:HA	1:A:105:ARG:HD3	1.74	0.43

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:15:SER:OG	1:B:18:GLN:HG3	2.18	0.43
1:A:296:LEU:HD22	1:A:298:VAL:HB	2.00	0.42
1:B:383:PHE:N	1:B:383:PHE:CD1	2.86	0.42
1:A:11:GLY:O	1:A:383:PHE:HA	2.19	0.42
1:B:285:ALA:HB1	1:B:286:PRO:HD2	2.01	0.42
1:A:149:ALA:HB2	1:A:206:LEU:HD23	2.00	0.42
1:A:216:ILE:HG21	1:A:246:ILE:HD13	1.99	0.42
1:B:60:GLU:OE1	1:B:105:ARG:NH1	2.52	0.42
1:A:322:LEU:O	1:A:322:LEU:HD22	2.19	0.42
1:B:296:LEU:O	1:B:298:VAL:N	2.47	0.42
1:A:257:GLN:NE2	2:A:473:HOH:O	2.52	0.42
1:B:105:ARG:HG3	1:B:105:ARG:HH11	1.85	0.42
1:B:392:GLU:HA	1:B:392:GLU:OE1	2.19	0.42
1:A:203:VAL:O	1:A:207:ARG:HB2	2.20	0.41
1:A:421:TRP:CZ2	1:A:425:ARG:HG3	2.54	0.41
1:A:177:GLU:H	1:A:177:GLU:HG2	1.64	0.41
1:B:129:ARG:HH11	1:B:129:ARG:HB3	1.84	0.41
1:A:135:ARG:HG2	2:A:508:HOH:O	2.20	0.41
1:A:44:ARG:CG	1:A:44:ARG:HH11	2.34	0.41
1:B:247:LEU:HD12	1:B:247:LEU:HA	1.93	0.41
1:B:332:TRP:HB3	1:B:333:PRO:HD2	2.02	0.41
1:A:164:GLU:HG2	1:A:219:ASN:HB3	2.01	0.41
1:B:213:ARG:HA	1:B:277:ASP:OD2	2.21	0.41
1:B:61:GLU:O	1:B:64:ALA:HB3	2.20	0.41
1:B:263:PRO:O	1:B:264:ILE:HG13	2.21	0.41
1:B:80:TRP:N	1:B:81:PRO:HD2	2.36	0.41
1:B:308:THR:C	1:B:310:MET:H	2.24	0.41
1:A:244:ASP:HB3	1:A:250:GLY:O	2.20	0.41
1:A:101:ARG:NH2	1:A:105:ARG:HH12	2.18	0.41
1:B:317:GLU:CD	1:B:371:ARG:HH12	2.25	0.41
1:B:80:TRP:HB3	1:B:81:PRO:CD	2.51	0.41
1:B:171:LEU:HD12	1:B:171:LEU:HA	1.78	0.41
1:B:288:ARG:NE	1:B:304:GLU:CG	2.84	0.41
1:B:216:ILE:HD13	1:B:246:ILE:CD1	2.50	0.41
1:B:348:THR:OG1	1:B:350:GLU:HG3	2.21	0.40
1:A:251:TYR:HE2	1:A:264:ILE:HD13	1.85	0.40
1:B:134:SER:OG	1:B:136:GLU:HG2	2.21	0.40
1:A:213:ARG:NH1	1:A:213:ARG:CG	2.77	0.40
1:A:359:VAL:HG22	1:A:418:SER:HA	2.04	0.40
1:B:122:LEU:HD12	1:B:123:PRO:HD2	2.03	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	424/436 (97%)	394 (93%)	28 (7%)	2 (0%)	34	48
1	B	424/436 (97%)	393 (93%)	25 (6%)	6 (1%)	14	19
All	All	848/872 (97%)	787 (93%)	53 (6%)	8 (1%)	21	30

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	259	PRO
1	A	7	LYS
1	A	386	SER
1	B	264	ILE
1	B	263	PRO
1	B	258	ASP
1	B	386	SER
1	B	297	PRO

### 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	333/340 (98%)	315 (95%)	18 (5%)	27	43
1	B	333/340 (98%)	313 (94%)	20 (6%)	24	37
All	All	666/680 (98%)	628 (94%)	38 (6%)	25	40

All (38) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	44	ARG
1	A	51	PRO
1	A	82	ARG
1	A	102	LEU
1	A	115	LEU
1	A	171	LEU
1	A	185	LEU
1	A	207	ARG
1	A	243	LEU
1	A	296	LEU
1	A	314	VAL
1	A	322	LEU
1	A	346	LEU
1	A	355	ASP
1	A	383	PHE
1	A	386	SER
1	A	399	ARG
1	A	425	ARG
1	B	61	GLU
1	B	73	VAL
1	B	102	LEU
1	B	129	ARG
1	B	171	LEU
1	B	174	TRP
1	B	219	ASN
1	B	229	GLU
1	B	243	LEU
1	B	247	LEU
1	B	263	PRO
1	B	279	LEU
1	B	289	VAL
1	B	296	LEU
1	B	319	LEU
1	B	373	ARG
1	B	383	PHE
1	B	386	SER
1	B	392	GLU
1	B	425	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (26) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	18	GLN

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
1	A	119	HIS
1	A	124	GLN
1	A	163	ASN
1	A	173	HIS
1	A	184	ASN
1	A	194	HIS
1	A	199	HIS
1	A	238	HIS
1	A	239	ASN
1	A	257	GLN
1	A	321	HIS
1	A	390	ASN
1	B	18	GLN
1	B	67	GLN
1	B	92	ASN
1	B	119	HIS
1	B	124	GLN
1	B	163	ASN
1	B	173	HIS
1	B	194	HIS
1	B	199	HIS
1	B	219	ASN
1	B	238	HIS
1	B	239	ASN
1	B	390	ASN

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

### 5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

There are no non-standard protein/DNA/RNA residues in this entry.

### 5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

## 5.6 Ligand geometry

There are no ligands in this entry.

## 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	426/436 (97%)	-0.19	2 (0%) 91 91	17, 29, 44, 69	1 (0%)
1	B	426/436 (97%)	-0.11	8 (1%) 70 69	18, 27, 45, 90	1 (0%)
All	All	852/872 (97%)	-0.15	10 (1%) 81 81	17, 28, 45, 90	2 (0%)

All (10) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	262	ALA	6.7
1	B	263	PRO	6.4
1	B	261	PRO	5.5
1	B	264	ILE	5.3
1	B	260	PRO	5.3
1	B	429	ALA	3.7
1	A	5	ALA	3.2
1	B	265	LEU	2.2
1	B	386	SER	2.1
1	A	386	SER	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 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.