Full wwPDB X-ray Structure Validation Report ⓘ

Feb 20, 2021 – 08:07 AM GMT

PDB ID	:	7B1R
Title	:	Crystal structure of B. subtilis glucose-1-phosphate uridylyltransferase YngB
Authors	:	Wu, C.; Morgan, R.M.L.; Freemont, P.; Grundling, A.
Deposited on	:	2020-11-25
Resolution	:	2.80 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 following versions of software and data (see references ⓘ) were used in the production of this report:

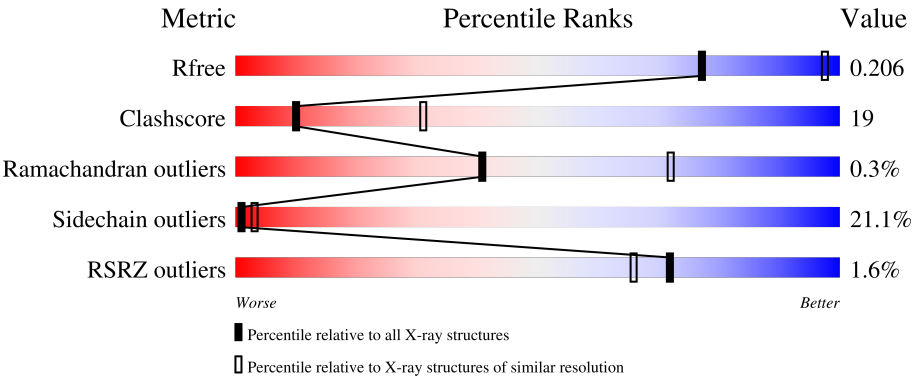
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.17.1.dev1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.17.1.dev1

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 2.80 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	3140 (2.80-2.80)
Clashscore	141614	3569 (2.80-2.80)
Ramachandran outliers	138981	3498 (2.80-2.80)
Sidechain outliers	138945	3500 (2.80-2.80)
RSRZ outliers	127900	3078 (2.80-2.80)

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 <=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	297	61% 29% 8%
1	B	297	56% 30% 10%

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 4432 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 Probable UTP--glucose-1-phosphate uridylyltransferase YngB.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	292	Total	C	N	O	S	Se	0	0	0
			2197	1389	370	427	3	8			
1	B	290	Total	C	N	O	S	Se	0	0	0
			2181	1376	374	420	3	8			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	298	LEU	-	expression tag	UNP O31822
B	298	LEU	-	expression tag	UNP O31822

- Molecule 2 is water.

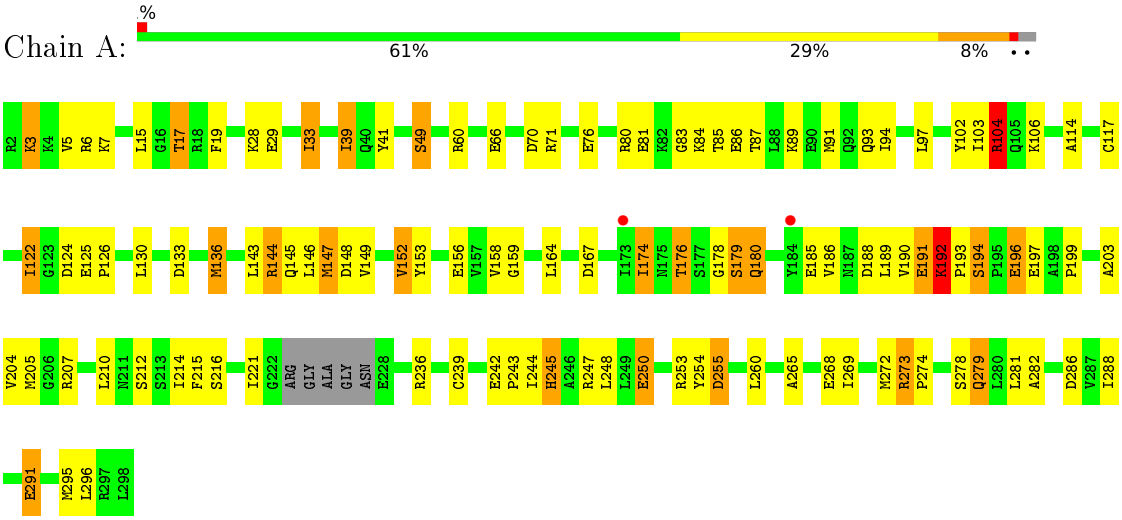
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	29	Total	O	0	0
			29	29		
2	B	25	Total	O	0	0
			25	25		

3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry 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.

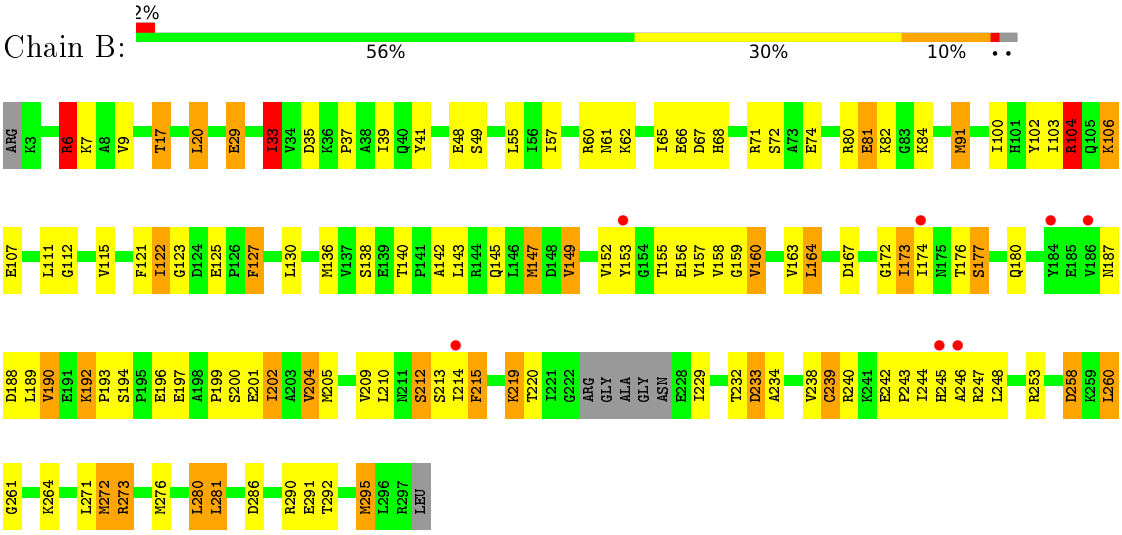
- Molecule 1: Probable UTP--glucose-1-phosphate uridylyltransferase YngB

Chain A:



- Molecule 1: Probable UTP--glucose-1-phosphate uridylyltransferase YngB

Chain B:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	I 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	53.91Å 158.61Å 179.50Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	51.09 – 2.80 55.98 – 2.80	Depositor EDS
% Data completeness (in resolution range)	99.2 (51.09-2.80) 99.5 (55.98-2.80)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.45 (at 2.81Å)	Xtriage
Refinement program	REFMAC 5.8.0258	Depositor
R, R_{free}	0.191 , 0.244 0.201 , 0.206	Depositor DCC
R_{free} test set	976 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å^2)	79.0	Xtriage
Anisotropy	0.576	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 67.9	EDS
L-test for twinning[2]	$< \|L\| > = 0.51$, $< L^2 > = 0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	4432	wwPDB-VP
Average B, all atoms (Å^2)	85.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.67% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ 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	0.48	1/2223 (0.0%)	0.94	6/3004 (0.2%)
1	B	0.43	1/2207 (0.0%)	0.94	10/2981 (0.3%)
All	All	0.45	2/4430 (0.0%)	0.94	16/5985 (0.3%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	192	LYS	C-N	8.95	1.51	1.34
1	B	81	GLU	CD-OE1	5.91	1.32	1.25

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	91	MSE	CG-SE-CE	11.13	123.40	98.90
1	B	205	MSE	CG-SE-CE	7.08	114.47	98.90
1	B	295	MSE	CG-SE-CE	6.84	113.94	98.90
1	A	272	MSE	CG-SE-CE	6.04	112.20	98.90
1	B	258	ASP	CB-CA-C	-5.92	98.55	110.40
1	B	33	ILE	C-N-CA	-5.82	107.14	121.70
1	B	286	ASP	CB-CA-C	5.72	121.84	110.40
1	A	147	MSE	CG-SE-CE	5.62	111.25	98.90
1	A	104	ARG	CG-CD-NE	-5.46	100.34	111.80
1	A	295	MSE	CB-CG-SE	-5.33	96.72	112.70
1	A	33	ILE	C-N-CA	-5.31	108.43	121.70
1	B	104	ARG	CB-CG-CD	-5.31	97.80	111.60
1	B	104	ARG	CG-CD-NE	5.26	122.85	111.80
1	A	17	THR	CA-CB-OG1	-5.23	98.03	109.00
1	B	6	ARG	CB-CA-C	5.15	120.69	110.40
1	B	147	MSE	CG-SE-CE	5.11	110.15	98.90

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	2197	0	2141	80	0
1	B	2181	0	2130	89	0
2	A	29	0	0	2	0
2	B	25	0	0	1	0
All	All	4432	0	4271	164	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 19.

All (164) 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:153:TYR:CD2	1:A:245:HIS:CD2	2.38	1.12
1:A:180:GLN:HB3	2:A:326:HOH:O	1.53	1.05
1:B:273:ARG:NH1	2:B:301:HOH:O	2.01	0.90
1:A:153:TYR:CD2	1:A:245:HIS:HD2	1.88	0.88
1:B:242:GLU:HG2	1:B:243:PRO:HD2	1.56	0.86
1:A:122:ILE:HD11	1:A:215:PHE:HZ	1.43	0.83
1:A:49:SER:O	1:A:147:MSE:HE1	1.79	0.82
1:B:130:LEU:HD21	1:B:143:LEU:HD13	1.63	0.80
1:A:94:ILE:O	1:A:97:LEU:HD12	1.85	0.77
1:B:136:MSE:HE2	1:B:253:ARG:HB2	1.69	0.75
1:B:239:CYS:HA	1:B:242:GLU:O	1.87	0.74
1:A:144:ARG:HH11	1:A:144:ARG:HG3	1.53	0.73
1:A:122:ILE:HD11	1:A:215:PHE:CZ	2.24	0.73
1:A:153:TYR:CD2	1:A:245:HIS:NE2	2.57	0.72
1:A:89:LYS:O	1:A:93:GLN:HG3	1.89	0.72
1:B:35:ASP:OD1	1:B:273:ARG:NH2	2.21	0.72
1:A:146:LEU:HD11	1:A:159:GLY:HA3	1.74	0.70
1:B:122:ILE:HD12	1:B:215:PHE:HE2	1.56	0.69
1:A:191:GLU:OE2	1:A:191:GLU:HA	1.91	0.69
1:B:172:GLY:O	1:B:173:ILE:HD12	1.91	0.69
1:A:144:ARG:HG3	1:A:144:ARG:NH1	2.08	0.68
1:B:152:VAL:HG12	1:B:153:TYR:CD1	2.29	0.68
1:B:209:VAL:O	1:B:210:LEU:HD23	1.93	0.68

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:136:MSE:HG3	1:A:207:ARG:NH2	2.09	0.68
1:A:153:TYR:HD2	1:A:245:HIS:NE2	1.91	0.67
1:B:136:MSE:CE	1:B:253:ARG:HB2	2.25	0.66
1:B:290:ARG:NH1	1:B:291:GLU:OE2	2.29	0.66
1:A:254:TYR:CE1	1:A:268:GLU:HG3	2.32	0.65
1:A:86:GLU:HG2	1:A:87:THR:H	1.62	0.64
1:B:202:ILE:N	1:B:202:ILE:HD13	2.13	0.63
1:A:86:GLU:HG2	1:A:87:THR:N	2.13	0.63
1:B:122:ILE:HD13	1:B:123:GLY:N	2.13	0.63
1:A:179:SER:C	1:A:180:GLN:HG3	2.18	0.62
1:B:7:LYS:NZ	1:B:121:PHE:O	2.33	0.62
1:B:153:TYR:CD2	1:B:245:HIS:NE2	2.68	0.62
1:A:33:ILE:HB	1:A:41:TYR:CE2	2.35	0.61
1:A:130:LEU:HD21	1:A:143:LEU:HD22	1.82	0.61
1:B:260:LEU:HD23	1:B:264:LYS:HE3	1.82	0.61
1:A:104:ARG:NH2	1:B:67:ASP:OD1	2.34	0.61
1:A:152:VAL:HG22	1:A:153:TYR:CD1	2.35	0.61
1:B:258:ASP:CB	1:B:261:GLY:H	2.13	0.61
1:A:146:LEU:HD11	1:A:159:GLY:CA	2.32	0.60
1:B:104:ARG:CG	1:B:104:ARG:HH11	2.15	0.59
1:A:153:TYR:CE2	1:A:245:HIS:CD2	2.90	0.59
1:A:174:ILE:HD11	1:A:186:VAL:HG22	1.84	0.58
1:A:83:GLY:O	1:A:85:THR:N	2.37	0.58
1:A:106:LYS:HE2	2:A:320:HOH:O	2.02	0.58
1:A:176:THR:HG22	1:A:178:GLY:H	1.68	0.57
1:A:66:GLU:HA	1:A:102:TYR:OH	2.04	0.57
1:B:136:MSE:HE2	1:B:253:ARG:HD2	1.87	0.56
1:A:153:TYR:HD2	1:A:245:HIS:HE2	1.52	0.56
1:A:244:ILE:C	1:A:245:HIS:ND1	2.59	0.56
1:A:174:ILE:HG12	1:A:186:VAL:HG13	1.88	0.56
1:B:127:PHE:CD1	1:B:127:PHE:N	2.73	0.56
1:A:103:ILE:HD12	1:B:100:ILE:O	2.07	0.55
1:B:258:ASP:HB2	1:B:261:GLY:H	1.72	0.55
1:A:70:ASP:OD1	1:B:106:LYS:HD3	2.07	0.55
1:A:176:THR:CG2	1:A:185:GLU:H	2.19	0.55
1:A:247:ARG:NH1	1:A:248:LEU:O	2.39	0.55
1:A:190:VAL:HG11	1:A:193:PRO:HG3	1.89	0.55
1:A:114:ALA:O	1:A:117:CYS:HB2	2.07	0.54
1:A:158:VAL:HG11	1:A:204:VAL:HG12	1.89	0.54
1:A:176:THR:HG21	1:A:178:GLY:O	2.08	0.54
1:B:156:GLU:O	1:B:244:ILE:HB	2.07	0.54

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:153:TYR:CD2	1:B:245:HIS:CD2	2.96	0.54
1:B:240:ARG:HH11	1:B:240:ARG:HB2	1.72	0.54
1:A:239:CYS:SG	1:A:244:ILE:HD12	2.48	0.54
1:B:212:SER:O	1:B:215:PHE:HB2	2.06	0.54
1:B:49:SER:O	1:B:147:MSE:HE1	2.09	0.53
1:B:273:ARG:HB3	1:B:276:MSE:HG3	1.89	0.53
1:A:176:THR:CG2	1:A:178:GLY:O	2.57	0.52
1:B:153:TYR:CE2	1:B:245:HIS:CD2	2.97	0.52
1:B:66:GLU:HA	1:B:102:TYR:OH	2.09	0.51
1:A:5:VAL:HG22	1:A:126:PRO:HB2	1.93	0.51
1:A:188:ASP:CG	1:A:189:LEU:H	2.14	0.51
1:A:156:GLU:O	1:A:244:ILE:HG23	2.10	0.51
1:B:160:VAL:HG23	1:B:247:ARG:O	2.10	0.51
1:A:190:VAL:HG21	1:A:193:PRO:HB3	1.92	0.50
1:B:9:VAL:HG13	1:B:57:ILE:CD1	2.41	0.50
1:A:158:VAL:CG1	1:A:204:VAL:HG12	2.42	0.49
1:A:125:GLU:HB3	1:A:126:PRO:HD2	1.94	0.49
1:B:258:ASP:HB3	1:B:261:GLY:H	1.77	0.49
1:A:245:HIS:ND1	1:A:245:HIS:N	2.61	0.49
1:B:292:THR:HA	1:B:295:MSE:HG2	1.94	0.49
1:B:233:ASP:OD1	1:B:233:ASP:N	2.45	0.48
1:B:55:LEU:HB2	1:B:121:PHE:CD2	2.48	0.48
1:A:29:GLU:HB2	1:A:39:ILE:HB	1.95	0.48
1:A:148:ASP:O	1:A:152:VAL:HG12	2.13	0.48
1:B:66:GLU:HG2	1:B:102:TYR:CE2	2.49	0.48
1:A:149:VAL:HG11	1:A:247:ARG:HB2	1.95	0.48
1:B:55:LEU:HB2	1:B:121:PHE:CE2	2.47	0.48
1:A:253:ARG:NH2	1:A:255:ASP:HB2	2.29	0.48
1:B:149:VAL:HG11	1:B:247:ARG:HB2	1.94	0.48
1:A:17:THR:C	1:A:19:PHE:H	2.16	0.47
1:B:192:LYS:N	1:B:193:PRO:HD3	2.29	0.47
1:A:236:ARG:O	1:A:239:CYS:HB2	2.14	0.47
1:B:115:VAL:O	1:B:215:PHE:HE1	1.98	0.47
1:B:276:MSE:O	1:B:280:LEU:HB2	2.14	0.47
1:B:62:LYS:HB3	1:B:65:ILE:HD12	1.97	0.46
1:A:153:TYR:CE2	1:A:245:HIS:HD2	2.29	0.46
1:A:174:ILE:HA	1:A:189:LEU:CD1	2.45	0.46
1:B:80:ARG:C	1:B:82:LYS:H	2.19	0.46
1:A:3:LYS:HB2	1:A:3:LYS:HE2	1.64	0.46
1:B:247:ARG:HG3	1:B:248:LEU:O	2.16	0.46
1:A:192:LYS:O	1:A:192:LYS:HD2	2.16	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:164:LEU:O	1:B:167:ASP:HB2	2.16	0.46
1:B:173:ILE:O	1:B:173:ILE:CG2	2.63	0.45
1:B:33:ILE:HD13	1:B:33:ILE:HA	1.62	0.45
1:A:265:ALA:O	1:A:269:ILE:HG12	2.16	0.45
1:B:234:ALA:O	1:B:238:VAL:HG23	2.16	0.45
1:B:160:VAL:CG2	1:B:247:ARG:O	2.65	0.45
1:B:112:GLY:HA3	1:B:229:ILE:O	2.17	0.45
1:B:194:SER:O	1:B:197:GLU:N	2.50	0.45
1:B:177:SER:HB2	1:B:187:ASN:OD1	2.17	0.45
1:B:272:MSE:HE2	1:B:272:MSE:HB3	1.88	0.45
1:B:173:ILE:HA	1:B:202:ILE:O	2.18	0.44
1:A:136:MSE:HB3	1:A:136:MSE:HE2	1.58	0.44
1:A:273:ARG:HA	1:A:274:PRO:HD2	1.69	0.44
1:A:210:LEU:HD13	1:A:214:ILE:HG12	2.00	0.44
1:B:160:VAL:HG11	1:B:174:ILE:HD11	1.99	0.44
1:B:111:LEU:O	1:B:115:VAL:HG23	2.17	0.44
1:B:194:SER:O	1:B:196:GLU:N	2.51	0.44
1:B:281:LEU:HD12	1:B:281:LEU:HA	1.68	0.44
1:B:142:ALA:O	1:B:145:GLN:HB2	2.18	0.44
1:B:106:LYS:HD3	1:B:106:LYS:HA	1.78	0.43
1:B:201:GLU:H	1:B:202:ILE:HD13	1.83	0.43
1:A:194:SER:HB2	1:A:196:GLU:OE1	2.17	0.43
1:B:104:ARG:HH11	1:B:104:ARG:HG2	1.82	0.43
1:B:173:ILE:HG21	1:B:199:PRO:HD2	2.00	0.43
1:B:271:LEU:HD21	1:B:281:LEU:HD13	2.00	0.43
1:A:70:ASP:CG	1:B:104:ARG:HD2	2.39	0.43
1:B:200:SER:HB2	1:B:202:ILE:HG12	2.00	0.43
1:A:33:ILE:HB	1:A:41:TYR:HE2	1.82	0.43
1:A:145:GLN:HE22	1:A:250:GLU:HB3	1.84	0.43
1:B:212:SER:O	1:B:215:PHE:N	2.49	0.42
1:A:156:GLU:HG3	1:A:210:LEU:HA	2.01	0.42
1:B:6:ARG:NH1	1:B:125:GLU:OE2	2.52	0.42
1:B:160:VAL:HG11	1:B:174:ILE:HG12	2.01	0.42
1:A:291:GLU:HA	1:A:291:GLU:OE2	2.18	0.42
1:B:122:ILE:HD13	1:B:122:ILE:C	2.40	0.42
1:B:33:ILE:HB	1:B:41:TYR:CE2	2.55	0.42
1:B:127:PHE:N	1:B:127:PHE:HD1	2.18	0.42
1:B:160:VAL:HG11	1:B:174:ILE:CG1	2.50	0.42
1:A:70:ASP:OD2	1:B:104:ARG:HD2	2.19	0.42
1:B:239:CYS:SG	1:B:244:ILE:HG12	2.59	0.42
1:B:71:ARG:HG3	1:B:71:ARG:HH11	1.84	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:219:LYS:HZ2	1:B:219:LYS:HG3	1.75	0.42
1:A:260:LEU:HD12	1:A:260:LEU:HA	1.84	0.42
1:B:29:GLU:N	1:B:29:GLU:OE2	2.53	0.42
1:A:214:ILE:HD12	1:A:214:ILE:HA	1.88	0.41
1:B:71:ARG:HG3	1:B:71:ARG:NH1	2.35	0.41
1:B:173:ILE:O	1:B:173:ILE:HG22	2.21	0.41
1:A:203:ALA:HB3	1:A:205:MSE:HE2	2.01	0.41
1:B:159:GLY:O	1:B:204:VAL:HA	2.20	0.41
1:A:176:THR:HG23	1:A:185:GLU:H	1.83	0.41
1:A:196:GLU:OE1	1:A:197:GLU:N	2.45	0.41
1:B:37:PRO:HG2	1:B:68:HIS:CE1	2.55	0.41
1:B:190:VAL:HB	1:B:193:PRO:HG3	2.02	0.41
1:B:160:VAL:HG21	1:B:246:ALA:HB1	2.01	0.41
1:A:33:ILE:HD13	1:A:33:ILE:HA	1.77	0.41
1:A:279:GLN:O	1:A:282:ALA:HB3	2.21	0.41
1:B:17:THR:HG22	1:B:20:LEU:HD21	2.03	0.40
1:A:7:LYS:HD3	1:A:122:ILE:HG22	2.04	0.40
1:A:242:GLU:HG2	1:A:243:PRO:HD2	2.04	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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	288/297 (97%)	253 (88%)	34 (12%)	1 (0%)	41	72
1	B	286/297 (96%)	256 (90%)	29 (10%)	1 (0%)	41	72
All	All	574/594 (97%)	509 (89%)	63 (11%)	2 (0%)	41	72

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	84	LYS
1	B	81	GLU

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	228/245 (93%)	184 (81%)	44 (19%)	1 4
1	B	226/245 (92%)	174 (77%)	52 (23%)	1 2
All	All	454/490 (93%)	358 (79%)	96 (21%)	1 3

All (96) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	3	LYS
1	A	6	ARG
1	A	15	LEU
1	A	28	LYS
1	A	39	ILE
1	A	49	SER
1	A	60	ARG
1	A	71	ARG
1	A	76	GLU
1	A	80	ARG
1	A	81	GLU
1	A	91	MSE
1	A	104	ARG
1	A	122	ILE
1	A	124	ASP
1	A	133	ASP
1	A	136	MSE
1	A	144	ARG
1	A	152	VAL
1	A	164	LEU
1	A	167	ASP
1	A	174	ILE

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	176	THR
1	A	179	SER
1	A	180	GLN
1	A	191	GLU
1	A	192	LYS
1	A	194	SER
1	A	196	GLU
1	A	199	PRO
1	A	212	SER
1	A	216	SER
1	A	221	ILE
1	A	245	HIS
1	A	250	GLU
1	A	255	ASP
1	A	273	ARG
1	A	278	SER
1	A	279	GLN
1	A	281	LEU
1	A	286	ASP
1	A	288	ILE
1	A	291	GLU
1	A	296	LEU
1	B	6	ARG
1	B	17	THR
1	B	20	LEU
1	B	29	GLU
1	B	33	ILE
1	B	39	ILE
1	B	48	GLU
1	B	60	ARG
1	B	61	ASN
1	B	72	SER
1	B	74	GLU
1	B	84	LYS
1	B	91	MSE
1	B	103	ILE
1	B	104	ARG
1	B	106	LYS
1	B	107	GLU
1	B	122	ILE
1	B	127	PHE
1	B	138	SER

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	B	140	THR
1	B	149	VAL
1	B	155	THR
1	B	157	VAL
1	B	158	VAL
1	B	160	VAL
1	B	163	VAL
1	B	164	LEU
1	B	173	ILE
1	B	176	THR
1	B	177	SER
1	B	180	GLN
1	B	188	ASP
1	B	189	LEU
1	B	190	VAL
1	B	192	LYS
1	B	202	ILE
1	B	204	VAL
1	B	212	SER
1	B	213	SER
1	B	214	ILE
1	B	215	PHE
1	B	219	LYS
1	B	220	THR
1	B	232	THR
1	B	233	ASP
1	B	239	CYS
1	B	260	LEU
1	B	272	MSE
1	B	273	ARG
1	B	280	LEU
1	B	281	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	180	GLN
1	B	211	ASN
1	B	279	GLN

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 monosaccharides 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

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^{th} 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	284/297 (95%)	-0.02	2 (0%)	87 84	48, 81, 117, 133	0
1	B	282/297 (94%)	0.05	7 (2%)	57 47	49, 85, 135, 168	0
All	All	566/594 (95%)	0.02	9 (1%)	72 66	48, 83, 128, 168	0

All (9) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	184	TYR	4.8
1	B	174	ILE	4.2
1	B	246	ALA	3.5
1	B	186	VAL	2.7
1	B	153	TYR	2.5
1	B	245	HIS	2.4
1	A	173	ILE	2.3
1	B	214	ILE	2.2
1	A	184	TYR	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 monosaccharides in this entry.

6.4 Ligands

There are no ligands in this entry.

6.5 Other polymers (i)

There are no such residues in this entry.