Full wwPDB X-ray Structure Validation Report ⓘ

Aug 21, 2023 – 06:07 PM JST

PDB ID	:	8HKG
Title	:	Crystal structure of glycosidic hydrolase family 10 (GH10) xylanase XynA contains an additional proline-rich sequence in the C-terminus
Authors	:	Dong, R.Y.; Tu, T.
Deposited on	:	2022-11-26
Resolution	:	2.56 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:

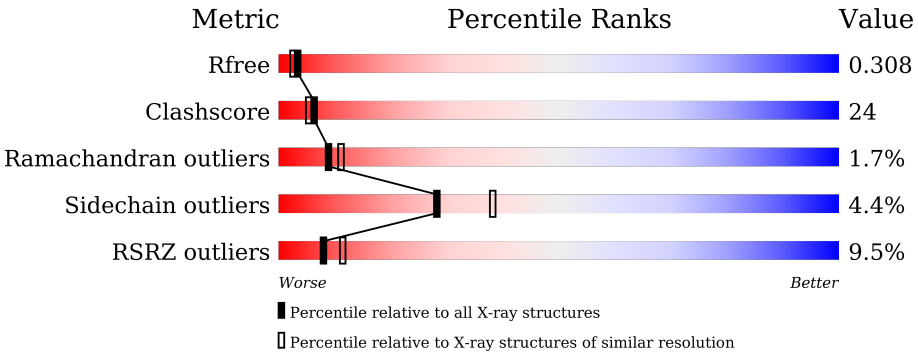
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.35
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35

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 2.56 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	1279 (2.58-2.54)
Clashscore	141614	1327 (2.58-2.54)
Ramachandran outliers	138981	1312 (2.58-2.54)
Sidechain outliers	138945	1312 (2.58-2.54)
RSRZ outliers	127900	1269 (2.58-2.54)

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	383	5% 41% 35% · 21%
1	B	383	10% 39% 37% · 21%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 4974 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 xylanase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	301	Total	C	N	O	S	0	0	0
			2461	1566	425	456	14			
1	B	302	Total	C	N	O	S	0	0	0
			2472	1576	427	455	14			

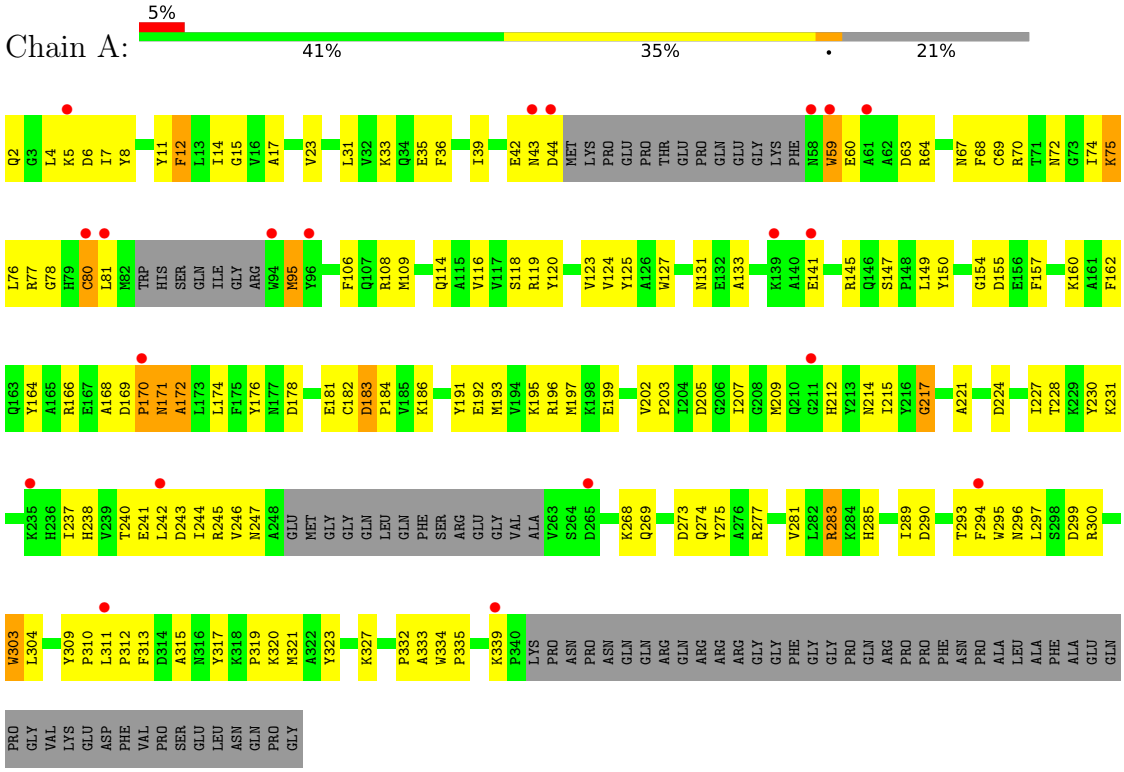
- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	24	Total	O	0	0
			24	24		
2	B	17	Total	O	0	0
			17	17		

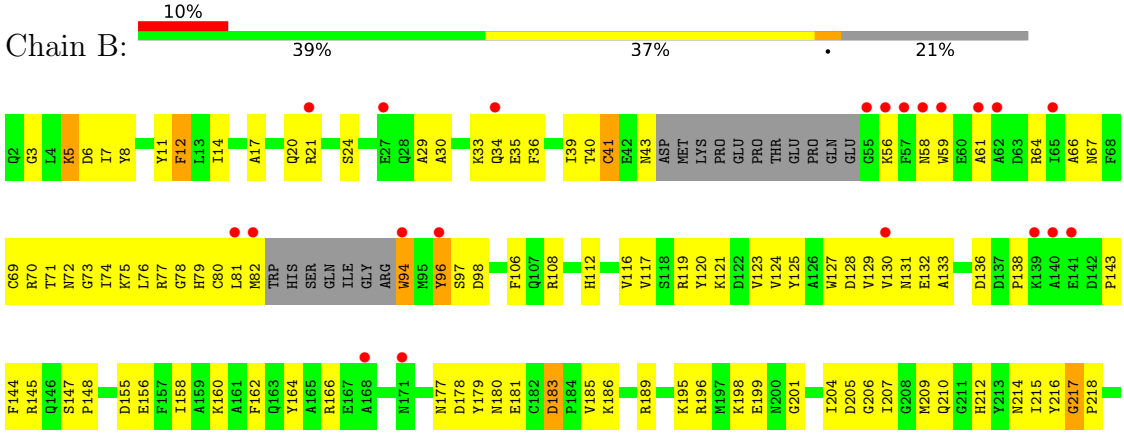
3 Residue-property plots (i)

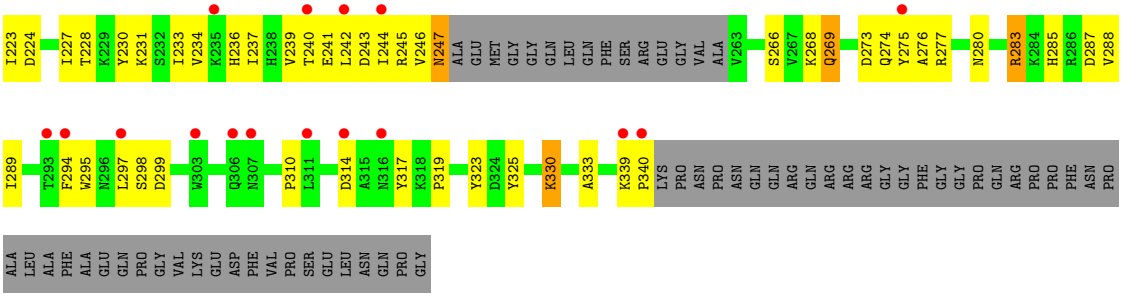
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density.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



• Molecule 1: xylanase




I223 D224 I227 T228 K229 Y230 K231 S232 I233 V234 K235 H236 I237 H238 V239 T240 E241 L242 D243 I244 R245 V246 N247 ALA GLU MET GLY GLY GLN LEU GLN PHE SER ARG GLU GLY VAL ALA V263 S266 V267 K268 Q269 D273 Q274 Y275 A276 R277 N280 R283 K284 H285 R286 D287 V288
I289 T293 F294 W295 N296 L297 S298 D299 W303 Q306 N307 P310 L311 D314 A315 N316 Y317 K318 P319 Y323 D324 Y325 K330 A333 K339 P340 LYS PRO ASN PRO ASN GLN GLN ARG GLN ARG ARG ARG GLY GLY PHE GLY GLY PRO GLN ARG PRO PRO PHE ASN PRO
ALA LEU ALA PHE ALA GLU GLN PRO GLY VAL LYS GLU ASP PHE VAL PRO SER GLU LEU ASN GLN PRO GLY

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	33.92Å 99.46Å 87.83Å 90.00° 100.91° 90.00°	Depositor
Resolution (Å)	24.24 – 2.56 25.22 – 2.56	Depositor EDS
% Data completeness (in resolution range)	99.0 (24.24-2.56) 99.0 (25.22-2.56)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.33 (at 2.57Å)	Xtriage
Refinement program	PHENIX 1.14_3260	Depositor
R, R_{free}	0.215 , 0.308 0.215 , 0.308	Depositor DCC
R_{free} test set	920 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å^2)	48.0	Xtriage
Anisotropy	0.209	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 51.3	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	0.000 for h,-k,-h-l	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	4974	wwPDB-VP
Average B, all atoms (Å^2)	55.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 54.95 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 3.3936e-05. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

[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	0.54	0/2521	0.66	0/3413
1	B	0.49	0/2533	0.61	0/3427
All	All	0.52	0/5054	0.64	0/6840

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	2

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	170	PRO	Peptide
1	A	171	ASN	Peptide

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	2461	0	2378	114	0
1	B	2472	0	2394	122	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	A	24	0	0	4	0
2	B	17	0	0	8	0
All	All	4974	0	4772	235	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 24.

All (235) 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:114:GLN:HG2	1:A:168:ALA:HB2	1.54	0.88
1:A:268:LYS:HZ2	1:A:321:MET:H	1.21	0.86
1:B:268:LYS:O	2:B:401:HOH:O	2.01	0.77
1:B:269:GLN:OE1	1:B:325:TYR:OH	2.02	0.74
1:A:169:ASP:OD1	1:A:171:ASN:HB2	1.90	0.71
1:A:268:LYS:NZ	1:A:321:MET:H	1.89	0.71
1:B:96:TYR:HA	1:B:108:ARG:HH21	1.56	0.70
1:A:42:GLU:OE2	1:A:296:ASN:ND2	2.25	0.69
1:A:174:LEU:H	1:A:205:ASP:HB2	1.57	0.69
1:B:162:PHE:O	1:B:166:ARG:N	2.26	0.67
1:A:162:PHE:HB3	1:A:203:PRO:HG2	1.77	0.67
1:A:303:TRP:CD1	1:A:304:LEU:HG	2.29	0.67
1:A:242:LEU:HB3	1:A:294:PHE:HA	1.77	0.67
1:B:94:TRP:O	2:B:402:HOH:O	2.13	0.67
1:A:42:GLU:O	1:A:44:ASP:N	2.28	0.66
1:A:192:GLU:O	1:A:196:ARG:HG2	1.94	0.66
1:B:124:VAL:HG21	1:B:127:TRP:CZ2	2.31	0.66
1:A:114:GLN:O	1:A:118:SER:OG	2.13	0.66
1:A:155:ASP:OD2	1:A:196:ARG:NH2	2.29	0.65
1:A:245:ARG:HE	1:A:304:LEU:HD22	1.60	0.65
1:B:298:SER:OG	1:B:314:ASP:O	2.14	0.65
1:B:198:LYS:NZ	2:B:406:HOH:O	2.31	0.64
1:A:124:VAL:HG11	1:A:127:TRP:CE2	2.34	0.63
1:B:117:VAL:HA	1:B:127:TRP:CZ2	2.33	0.63
1:A:4:LEU:HB2	1:A:35:GLU:HG3	1.81	0.63
1:B:21:ARG:HH11	1:B:21:ARG:HG2	1.64	0.62
1:A:215:ILE:HD13	1:A:246:VAL:HG13	1.81	0.62
1:B:20:GLN:NE2	1:B:61:ALA:HB1	2.14	0.62
1:A:5:LYS:NZ	1:A:6:ASP:OD1	2.29	0.62
1:A:70:ARG:HG3	1:A:123:VAL:CG1	2.30	0.62
1:A:2:GLN:N	2:A:404:HOH:O	2.33	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:77:ARG:CZ	1:A:240:THR:HG22	2.30	0.61
1:B:210:GLN:HB3	1:B:212:HIS:CD2	2.35	0.61
1:A:70:ARG:HG3	1:A:123:VAL:HG11	1.81	0.61
1:B:17:ALA:HB3	1:B:295:TRP:O	2.01	0.60
1:B:181:GLU:HG3	1:B:209:MET:HG2	1.83	0.60
1:A:309:TYR:CZ	1:A:320:LYS:HE3	2.36	0.60
1:B:120:TYR:O	1:B:124:VAL:HG22	2.02	0.59
1:A:221:ALA:HA	1:A:224:ASP:HB3	1.84	0.59
1:A:227:ILE:HD13	1:A:289:ILE:HD11	1.84	0.59
1:B:218:PRO:HB2	1:B:223:ILE:HG13	1.84	0.59
1:A:119:ARG:HD3	1:A:120:TYR:CZ	2.36	0.59
1:A:237:ILE:O	1:A:289:ILE:HA	2.03	0.58
1:A:106:PHE:CE2	1:A:160:LYS:HG3	2.38	0.58
1:B:339:LYS:HG2	1:B:340:PRO:HD2	1.84	0.58
1:A:4:LEU:HB3	1:A:14:ILE:HG21	1.85	0.58
1:A:277:ARG:HG3	1:A:332:PRO:HG3	1.86	0.57
1:B:40:THR:HG22	1:B:77:ARG:HB2	1.86	0.57
1:B:212:HIS:ND1	1:B:243:ASP:OD2	2.37	0.57
1:B:227:ILE:HD13	1:B:289:ILE:HD11	1.85	0.57
1:A:155:ASP:CG	1:A:196:ARG:HH22	2.08	0.57
1:A:238:HIS:HE2	1:A:290:ASP:HB2	1.68	0.57
1:B:144:PHE:CZ	1:B:196:ARG:NH2	2.73	0.57
1:B:76:LEU:O	1:B:124:VAL:HA	2.04	0.57
1:B:30:ALA:O	1:B:34:GLN:HB2	2.04	0.56
1:A:224:ASP:O	1:A:228:THR:OG1	2.18	0.56
1:B:136:ASP:OD2	1:B:179:TYR:OH	2.23	0.55
1:B:106:PHE:CD2	1:B:160:LYS:HD2	2.42	0.55
1:B:130:VAL:HG21	1:B:158:ILE:HG23	1.89	0.55
1:A:69:CYS:HB3	1:A:74:ILE:O	2.07	0.55
1:A:125:TYR:O	1:A:172:ALA:HA	2.07	0.54
1:B:285:HIS:HB2	1:B:289:ILE:HD12	1.88	0.54
1:A:296:ASN:HB2	1:A:311:LEU:HD11	1.90	0.54
1:A:145:ARG:HG2	1:A:147:SER:HB3	1.89	0.54
1:B:207:ILE:HG13	1:B:234:VAL:HG21	1.88	0.54
1:A:75:LYS:HB3	1:A:125:TYR:CD1	2.43	0.54
1:A:214:ASN:OD1	1:A:217:GLY:N	2.40	0.54
1:A:39:ILE:O	1:A:76:LEU:HD12	2.07	0.54
1:B:287:ASP:OD1	1:B:287:ASP:N	2.37	0.54
1:A:78:GLY:HA3	1:A:127:TRP:CE3	2.43	0.54
1:A:217:GLY:HA3	1:A:274:GLN:NE2	2.23	0.54
1:A:309:TYR:CE2	1:A:320:LYS:HE3	2.43	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:297:LEU:HD23	1:B:317:TYR:CE2	2.42	0.54
1:A:181:GLU:HG3	1:A:209:MET:HB3	1.90	0.53
1:B:29:ALA:O	1:B:33:LYS:HD3	2.07	0.53
1:A:12:PHE:CE1	1:A:14:ILE:HD11	2.43	0.53
1:A:59:TRP:HE3	1:A:81:LEU:HD13	1.73	0.53
1:B:58:ASN:O	2:B:404:HOH:O	2.19	0.53
1:B:76:LEU:HG	1:B:124:VAL:HG12	1.91	0.53
1:A:243:ASP:OD2	1:A:303:TRP:NE1	2.42	0.52
1:B:67:ASN:O	1:B:71:THR:HG22	2.09	0.52
1:B:59:TRP:CH2	1:B:116:VAL:HG12	2.45	0.52
1:B:66:ALA:O	1:B:70:ARG:HD2	2.09	0.52
1:B:40:THR:HG21	2:B:405:HOH:O	2.08	0.52
1:B:297:LEU:HD23	1:B:317:TYR:HE2	1.74	0.52
1:A:60:GLU:HB3	1:A:64:ARG:NH1	2.25	0.52
1:B:5:LYS:HG3	1:B:6:ASP:H	1.74	0.52
1:B:147:SER:HB2	1:B:148:PRO:HD2	1.90	0.52
1:A:268:LYS:HD3	1:A:309:TYR:OH	2.10	0.52
1:B:59:TRP:HH2	1:B:116:VAL:HG12	1.75	0.52
1:B:183:ASP:OD1	1:B:186:LYS:HB3	2.11	0.51
1:A:183:ASP:OD1	1:A:186:LYS:HB3	2.09	0.51
1:B:96:TYR:HB3	1:B:108:ARG:HE	1.74	0.51
1:A:23:VAL:HB	1:A:68:PHE:CD1	2.45	0.51
1:B:3:GLY:O	1:B:7:ILE:HG12	2.11	0.51
1:B:69:CYS:O	1:B:73:GLY:N	2.43	0.51
1:B:124:VAL:HG21	1:B:127:TRP:CE2	2.46	0.51
1:A:12:PHE:HE1	1:A:14:ILE:HD11	1.74	0.51
1:B:280:ASN:OD1	2:B:403:HOH:O	2.18	0.50
1:A:149:LEU:HD12	1:A:149:LEU:H	1.77	0.50
1:B:39:ILE:O	1:B:76:LEU:HA	2.11	0.50
1:A:67:ASN:OD1	1:A:70:ARG:NH1	2.40	0.50
1:B:214:ASN:OD1	1:B:217:GLY:N	2.40	0.50
1:B:180:ASN:HB2	1:B:186:LYS:HD3	1.94	0.50
1:A:242:LEU:O	1:A:295:TRP:N	2.31	0.49
1:B:132:GLU:HA	1:B:178:ASP:OD1	2.12	0.49
1:B:276:ALA:HB1	1:B:330:LYS:O	2.11	0.49
1:A:8:TYR:OH	1:A:283:ARG:NH1	2.45	0.49
1:B:237:ILE:HG13	1:B:288:VAL:HG22	1.95	0.49
1:B:17:ALA:HA	1:B:40:THR:O	2.13	0.49
1:A:160:LYS:HB3	1:A:164:TYR:CE2	2.47	0.48
1:A:169:ASP:O	1:A:171:ASN:N	2.45	0.48
1:A:197:MET:HE2	1:A:202:VAL:HG21	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:5:LYS:HG3	1:B:6:ASP:N	2.28	0.48
1:B:131:ASN:OD1	1:B:177:ASN:ND2	2.46	0.48
1:A:238:HIS:NE2	1:A:290:ASP:HB2	2.28	0.48
1:B:69:CYS:HB3	1:B:74:ILE:O	2.13	0.48
1:A:181:GLU:HG3	1:A:209:MET:HG2	1.95	0.48
1:A:35:GLU:HB3	1:A:36:PHE:CE2	2.48	0.48
1:A:150:TYR:CE1	1:A:154:GLY:HA2	2.49	0.48
1:A:182:CYS:HB2	2:A:415:HOH:O	2.12	0.48
1:B:212:HIS:NE2	1:B:241:GLU:OE1	2.39	0.48
1:B:245:ARG:HG2	1:B:247:ASN:HB3	1.95	0.48
1:B:78:GLY:HA3	1:B:127:TRP:CE3	2.49	0.47
1:B:224:ASP:O	1:B:228:THR:HG23	2.13	0.47
1:B:20:GLN:HG2	1:B:64:ARG:NH1	2.30	0.47
1:B:195:LYS:HB2	1:B:233:ILE:HG21	1.95	0.47
1:A:184:PRO:HG3	1:B:24:SER:HB2	1.97	0.47
1:B:158:ILE:O	1:B:162:PHE:HD2	1.98	0.47
1:B:214:ASN:O	1:B:274:GLN:HG2	2.15	0.47
1:A:35:GLU:OE1	1:A:323:TYR:OH	2.32	0.47
1:B:138:PRO:HB3	1:B:185:VAL:HG21	1.96	0.47
1:B:12:PHE:HB3	1:B:289:ILE:O	2.15	0.46
1:B:43:ASN:ND2	1:B:80:CYS:O	2.48	0.46
1:A:313:PHE:HB3	1:A:317:TYR:HA	1.96	0.46
1:B:35:GLU:HB3	1:B:36:PHE:CE2	2.50	0.46
1:B:212:HIS:NE2	1:B:241:GLU:HB2	2.30	0.46
1:A:95:MET:HA	1:A:108:ARG:HH21	1.79	0.46
1:A:191:TYR:O	1:A:195:LYS:N	2.41	0.46
1:B:210:GLN:HB3	1:B:212:HIS:HD2	1.78	0.46
1:A:196:ARG:HA	1:A:199:GLU:HB2	1.96	0.46
1:A:319:PRO:HB3	1:A:323:TYR:CG	2.51	0.46
1:B:273:ASP:HB3	1:B:277:ARG:NH2	2.31	0.46
1:A:269:GLN:O	1:A:273:ASP:N	2.45	0.46
1:B:144:PHE:CE2	1:B:196:ARG:NH2	2.83	0.46
1:B:198:LYS:HD2	1:B:204:ILE:O	2.15	0.46
1:A:7:ILE:HG13	1:A:327:LYS:HG3	1.98	0.46
1:A:181:GLU:HG3	1:A:209:MET:CB	2.45	0.46
1:A:311:LEU:O	1:A:320:LYS:NZ	2.34	0.46
1:B:21:ARG:HG2	1:B:21:ARG:NH1	2.31	0.46
1:B:196:ARG:HA	1:B:199:GLU:HG2	1.98	0.46
1:B:206:GLY:HA3	1:B:236:HIS:HB2	1.96	0.46
1:A:334:TRP:HB3	1:A:335:PRO:HD2	1.97	0.45
1:B:166:ARG:HH22	1:B:205:ASP:CG	2.19	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:299:ASP:OD1	1:A:310:PRO:HD2	2.16	0.45
1:B:116:VAL:O	1:B:120:TYR:HD2	1.99	0.45
1:A:231:LYS:HE3	1:A:285:HIS:HD2	1.81	0.45
1:B:8:TYR:OH	1:B:283:ARG:NH1	2.49	0.45
1:B:67:ASN:HA	1:B:70:ARG:HB2	1.99	0.45
1:A:275:TYR:OH	1:A:312:PRO:HD3	2.17	0.45
1:B:210:GLN:HG2	1:B:241:GLU:HG3	1.99	0.45
1:B:273:ASP:OD1	1:B:333:ALA:N	2.39	0.45
1:A:17:ALA:HB3	1:A:295:TRP:O	2.17	0.45
1:A:141:GLU:H	1:A:141:GLU:CD	2.20	0.45
1:A:212:HIS:NE2	1:A:241:GLU:OE2	2.43	0.45
1:A:242:LEU:HD23	1:A:294:PHE:CE2	2.52	0.45
1:B:35:GLU:HB3	1:B:36:PHE:CD2	2.52	0.45
1:B:81:LEU:O	1:B:82:MET:HG2	2.17	0.45
1:B:97:SER:HB2	2:B:402:HOH:O	2.16	0.45
1:A:67:ASN:HA	1:A:70:ARG:HB2	1.98	0.45
1:A:277:ARG:O	1:A:281:VAL:HG23	2.17	0.45
1:B:119:ARG:HD3	1:B:120:TYR:CZ	2.52	0.45
1:A:166:ARG:NH2	1:A:205:ASP:OD1	2.34	0.44
1:A:193:MET:O	1:A:197:MET:HG3	2.17	0.44
1:A:176:TYR:OH	1:A:178:ASP:OD2	2.18	0.44
1:B:75:LYS:HB3	1:B:125:TYR:CD1	2.52	0.44
1:A:95:MET:HG3	1:A:108:ARG:HB3	2.00	0.44
1:A:15:GLY:O	1:A:293:THR:HA	2.18	0.44
1:A:230:TYR:HB2	1:A:237:ILE:HD11	1.99	0.44
1:A:133:ALA:O	1:A:145:ARG:N	2.40	0.44
1:A:116:VAL:O	1:A:120:TYR:HD2	2.01	0.44
1:A:245:ARG:HB3	1:A:304:LEU:HD13	1.99	0.44
1:B:166:ARG:NH2	1:B:205:ASP:OD1	2.50	0.43
1:B:242:LEU:HD23	1:B:294:PHE:CE2	2.53	0.43
1:B:244:ILE:HD12	1:B:275:TYR:CG	2.53	0.43
1:B:181:GLU:HG3	1:B:209:MET:CG	2.48	0.43
1:B:11:TYR:CD2	1:B:283:ARG:HB2	2.53	0.43
1:B:71:THR:HG23	1:B:72:ASN:ND2	2.33	0.43
1:A:11:TYR:CD2	1:A:283:ARG:HB2	2.54	0.43
1:A:207:ILE:O	1:A:237:ILE:HA	2.17	0.43
1:B:70:ARG:HG3	1:B:123:VAL:CG1	2.49	0.43
1:B:215:ILE:HD13	1:B:246:VAL:HG13	2.01	0.43
1:A:35:GLU:HB3	1:A:36:PHE:CD2	2.54	0.42
1:A:59:TRP:HB2	1:A:81:LEU:HD11	2.00	0.42
1:B:41:CYS:HB3	1:B:76:LEU:HD11	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:144:PHE:HZ	1:B:196:ARG:NH2	2.15	0.42
1:A:182:CYS:O	2:A:401:HOH:O	2.21	0.42
1:B:117:VAL:O	1:B:121:LYS:N	2.52	0.42
1:B:133:ALA:O	1:B:145:ARG:N	2.46	0.42
1:A:150:TYR:CD1	1:A:154:GLY:HA2	2.55	0.42
1:A:31:LEU:HD23	1:A:297:LEU:HD11	2.01	0.42
1:A:300:ARG:HD3	1:A:315:ALA:O	2.20	0.42
1:B:77:ARG:NH1	1:B:77:ARG:HB3	2.34	0.42
1:A:59:TRP:HE3	1:A:81:LEU:CD1	2.32	0.41
1:B:209:MET:O	1:B:239:VAL:HA	2.20	0.41
1:B:268:LYS:HE3	1:B:268:LYS:HB3	1.94	0.41
1:A:170:PRO:HD2	1:A:171:ASN:HD22	1.84	0.41
1:B:79:HIS:HD2	1:B:128:ASP:HB2	1.85	0.41
1:B:106:PHE:HZ	1:B:156:GLU:HG3	1.85	0.41
1:B:143:PRO:HB2	1:B:189:ARG:HG3	2.03	0.41
1:B:230:TYR:HB2	1:B:237:ILE:HD11	2.01	0.41
1:B:212:HIS:CE1	1:B:243:ASP:OD2	2.73	0.41
1:B:240:THR:O	2:B:405:HOH:O	2.22	0.41
1:A:59:TRP:CZ2	1:A:119:ARG:HD2	2.55	0.41
1:B:276:ALA:O	1:B:280:ASN:HB2	2.20	0.41
1:A:169:ASP:HA	1:A:170:PRO:HD3	1.92	0.41
1:A:228:THR:HG23	1:A:285:HIS:NE2	2.35	0.41
1:A:244:ILE:O	1:A:310:PRO:HA	2.20	0.41
1:B:319:PRO:HB3	1:B:323:TYR:CD2	2.56	0.41
1:A:33:LYS:HE3	1:A:72:ASN:OD1	2.21	0.41
1:A:131:ASN:O	2:A:402:HOH:O	2.22	0.41
1:A:243:ASP:OD1	1:A:295:TRP:HB3	2.21	0.41
1:B:112:HIS:O	1:B:116:VAL:HG13	2.21	0.41
1:B:299:ASP:CG	1:B:310:PRO:HD2	2.42	0.41
1:A:60:GLU:O	1:A:63:ASP:HB2	2.21	0.41
1:A:296:ASN:O	1:A:311:LEU:HD13	2.21	0.40
1:B:98:ASP:N	1:B:98:ASP:OD1	2.54	0.40
1:B:160:LYS:HD3	1:B:164:TYR:OH	2.22	0.40
1:B:210:GLN:HE21	1:B:212:HIS:CD2	2.39	0.40
1:B:129:VAL:HG11	1:B:162:PHE:HA	2.03	0.40
1:B:339:LYS:HG2	1:B:340:PRO:CD	2.51	0.40
1:A:181:GLU:H	1:A:181:GLU:CD	2.22	0.40
1:B:12:PHE:HE1	1:B:14:ILE:HD11	1.86	0.40
1:B:227:ILE:O	1:B:231:LYS:HB2	2.22	0.40
1:B:237:ILE:O	1:B:289:ILE:HA	2.22	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	293/383 (76%)	262 (89%)	24 (8%)	7 (2%)	6 6
1	B	294/383 (77%)	269 (92%)	22 (8%)	3 (1%)	15 21
All	All	587/766 (77%)	531 (90%)	46 (8%)	10 (2%)	9 11

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	43	ASN
1	A	217	GLY
1	A	247	ASN
1	A	80	CYS
1	B	217	GLY
1	A	109	MET
1	A	172	ALA
1	A	333	ALA
1	B	56	LYS
1	B	201	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	263/330 (80%)	253 (96%)	10 (4%)	33 44
1	B	264/330 (80%)	251 (95%)	13 (5%)	25 34
All	All	527/660 (80%)	504 (96%)	23 (4%)	28 38

All (23) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	12	PHE
1	A	59	TRP
1	A	75	LYS
1	A	80	CYS
1	A	95	MET
1	A	157	PHE
1	A	183	ASP
1	A	283	ARG
1	A	303	TRP
1	A	339	LYS
1	B	5	LYS
1	B	12	PHE
1	B	41	CYS
1	B	94	TRP
1	B	96	TYR
1	B	155	ASP
1	B	183	ASP
1	B	216	TYR
1	B	247	ASN
1	B	266	SER
1	B	269	GLN
1	B	283	ARG
1	B	330	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	171	ASN
1	B	210	GLN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

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 (i)

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	301/383 (78%)	0.53	20 (6%) 18 23	34, 49, 66, 97	0
1	B	302/383 (78%)	0.80	37 (12%) 4 6	37, 60, 78, 103	0
All	All	603/766 (78%)	0.66	57 (9%) 8 11	34, 53, 77, 103	0

All (57) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	94	TRP	10.5
1	B	56	LYS	6.7
1	A	81	LEU	6.5
1	B	57	PHE	6.0
1	A	59	TRP	5.5
1	A	58	ASN	4.7
1	B	316	ASN	4.6
1	B	27	GLU	4.4
1	B	94	TRP	4.3
1	B	311	LEU	4.2
1	A	44	ASP	4.0
1	A	80	CYS	3.8
1	B	96	TYR	3.6
1	A	265	ASP	3.6
1	B	294	PHE	3.4
1	B	171	ASN	3.2
1	A	43	ASN	3.1
1	B	81	LEU	3.1
1	B	293	THR	3.1
1	B	82	MET	3.0
1	B	297	LEU	2.9
1	A	294	PHE	2.8
1	B	141	GLU	2.8
1	B	140	ALA	2.7

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Mol	Chain	Res	Type	RSRZ
1	A	139	LYS	2.7
1	B	61	ALA	2.7
1	B	62	ALA	2.6
1	B	168	ALA	2.6
1	B	240	THR	2.6
1	B	34	GLN	2.6
1	B	303	TRP	2.5
1	B	59	TRP	2.5
1	A	242	LEU	2.5
1	A	339	LYS	2.5
1	B	339	LYS	2.5
1	B	21	ARG	2.4
1	A	141	GLU	2.4
1	B	58	ASN	2.3
1	B	55	GLY	2.3
1	B	275	TYR	2.3
1	B	65	ILE	2.3
1	B	340	PRO	2.3
1	B	314	ASP	2.3
1	B	139	LYS	2.2
1	B	235	LYS	2.2
1	A	96	TYR	2.2
1	A	170	PRO	2.2
1	A	311	LEU	2.2
1	B	244	ILE	2.1
1	A	5	LYS	2.1
1	B	307	ASN	2.1
1	B	242	LEU	2.1
1	B	130	VAL	2.0
1	A	61	ALA	2.0
1	A	235	LYS	2.0
1	B	306	GLN	2.0
1	A	211	GLY	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

There are no ligands in this entry.

6.5 Other polymers

There are no such residues in this entry.