Full wwPDB X-ray Structure Validation Report ⓘ

Aug 27, 2023 – 10:51 PM EDT

PDB ID	:	3KL3
Title	:	Crystal structure of Ligand bound XynC
Authors	:	St John, F.J.; Hurlbert, J.C.; Pozharski, E.
Deposited on	:	2009-11-06
Resolution	:	2.33 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:

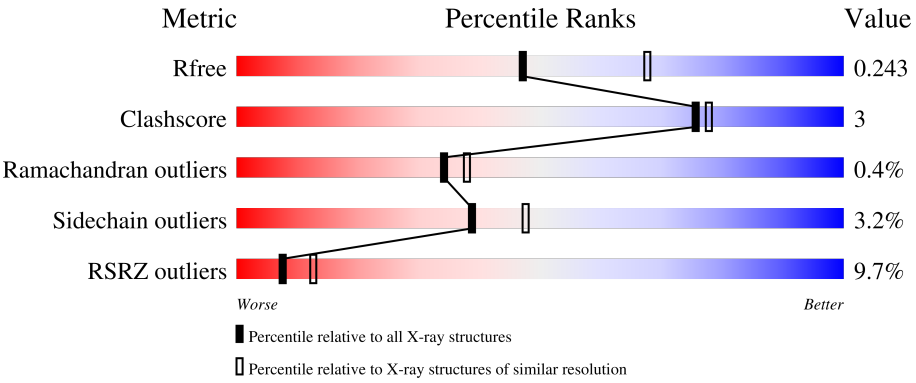
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, 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 2.33 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	2096 (2.36-2.32)
Clashscore	141614	2193 (2.36-2.32)
Ramachandran outliers	138981	2159 (2.36-2.32)
Sidechain outliers	138945	2160 (2.36-2.32)
RSRZ outliers	127900	2067 (2.36-2.32)

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	401	2% 90% 6%
1	B	401	90% 7%
1	C	401	2% 89% 7%
1	D	401	33% 77% 13% 8%

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 12822 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 Glucuronoxylanase xynC.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	389	Total	C	N	O	S	0	0	0
			3095	1959	547	580	9			
1	B	390	Total	C	N	O	S	0	1	0
			3112	1970	551	582	9			
1	C	390	Total	C	N	O	S	0	4	0
			3133	1983	556	585	9			
1	D	368	Total	C	N	O	S	0	0	0
			2940	1869	514	548	9			

There are 44 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MET	-	expression tag	UNP Q45070
A	392	LEU	-	expression tag	UNP Q45070
A	393	GLU	-	expression tag	UNP Q45070
A	394	HIS	-	expression tag	UNP Q45070
A	395	HIS	-	expression tag	UNP Q45070
A	396	HIS	-	expression tag	UNP Q45070
A	397	HIS	-	expression tag	UNP Q45070
A	398	HIS	-	expression tag	UNP Q45070
A	399	HIS	-	expression tag	UNP Q45070
A	400	HIS	-	expression tag	UNP Q45070
A	401	HIS	-	expression tag	UNP Q45070
B	1	MET	-	expression tag	UNP Q45070
B	392	LEU	-	expression tag	UNP Q45070
B	393	GLU	-	expression tag	UNP Q45070
B	394	HIS	-	expression tag	UNP Q45070
B	395	HIS	-	expression tag	UNP Q45070
B	396	HIS	-	expression tag	UNP Q45070
B	397	HIS	-	expression tag	UNP Q45070
B	398	HIS	-	expression tag	UNP Q45070
B	399	HIS	-	expression tag	UNP Q45070
B	400	HIS	-	expression tag	UNP Q45070

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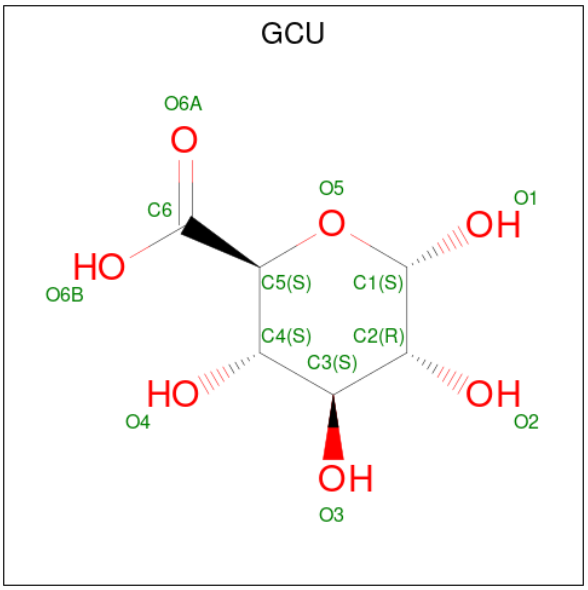
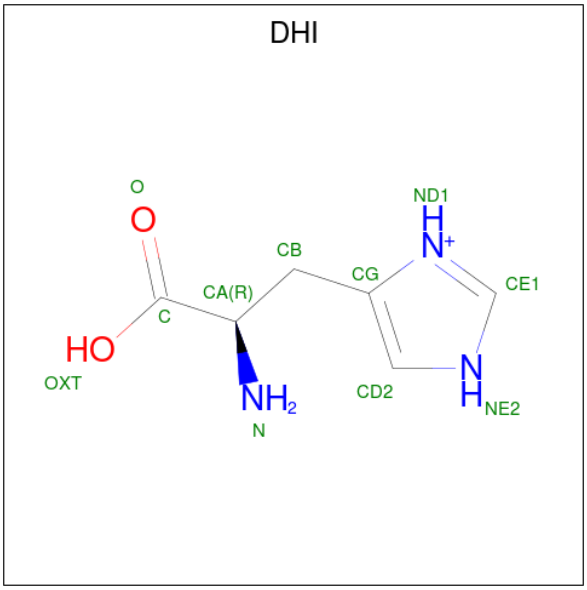
Chain	Residue	Modelled	Actual	Comment	Reference
B	401	HIS	-	expression tag	UNP Q45070
C	1	MET	-	expression tag	UNP Q45070
C	392	LEU	-	expression tag	UNP Q45070
C	393	GLU	-	expression tag	UNP Q45070
C	394	HIS	-	expression tag	UNP Q45070
C	395	HIS	-	expression tag	UNP Q45070
C	396	HIS	-	expression tag	UNP Q45070
C	397	HIS	-	expression tag	UNP Q45070
C	398	HIS	-	expression tag	UNP Q45070
C	399	HIS	-	expression tag	UNP Q45070
C	400	HIS	-	expression tag	UNP Q45070
C	401	HIS	-	expression tag	UNP Q45070
D	1	MET	-	expression tag	UNP Q45070
D	392	LEU	-	expression tag	UNP Q45070
D	393	GLU	-	expression tag	UNP Q45070
D	394	HIS	-	expression tag	UNP Q45070
D	395	HIS	-	expression tag	UNP Q45070
D	396	HIS	-	expression tag	UNP Q45070
D	397	HIS	-	expression tag	UNP Q45070
D	398	HIS	-	expression tag	UNP Q45070
D	399	HIS	-	expression tag	UNP Q45070
D	400	HIS	-	expression tag	UNP Q45070
D	401	HIS	-	expression tag	UNP Q45070

- Molecule 2 is alpha-D-glucopyranuronic acid (three-letter code: GCU) (formula: $C_6H_{10}O_7$).



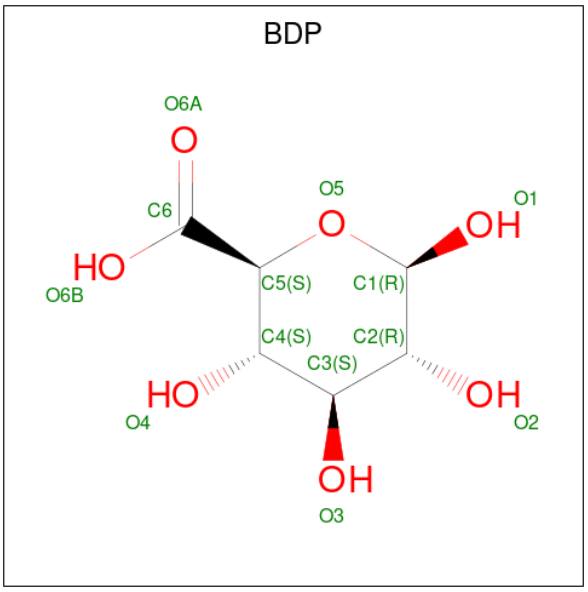
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C O 13 6 7	0	0
2	B	1	Total C O 13 6 7	0	0

- Molecule 3 is D-HISTIDINE (three-letter code: DHI) (formula: $C_6H_{10}N_3O_2$).



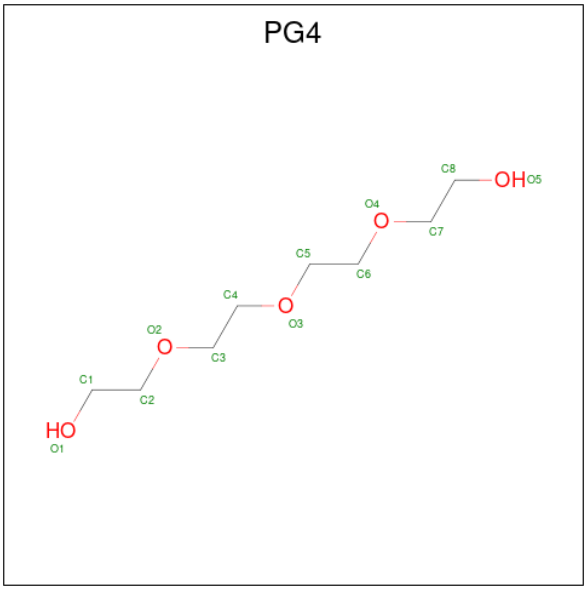
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C N O 11 6 3 2	0	0
3	B	1	Total C N O 11 6 3 2	0	0

- Molecule 4 is beta-D-glucopyranuronic acid (three-letter code: BDP) (formula: $C_6H_{10}O_7$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	B	1	Total C O 13 6 7	0	0

- Molecule 5 is TETRAETHYLENE GLYCOL (three-letter code: PG4) (formula: $C_8H_{18}O_5$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	B	1	Total C O 13 8 5	0	0
5	C	1	Total C O 10 6 4	0	0

- Molecule 6 is water.

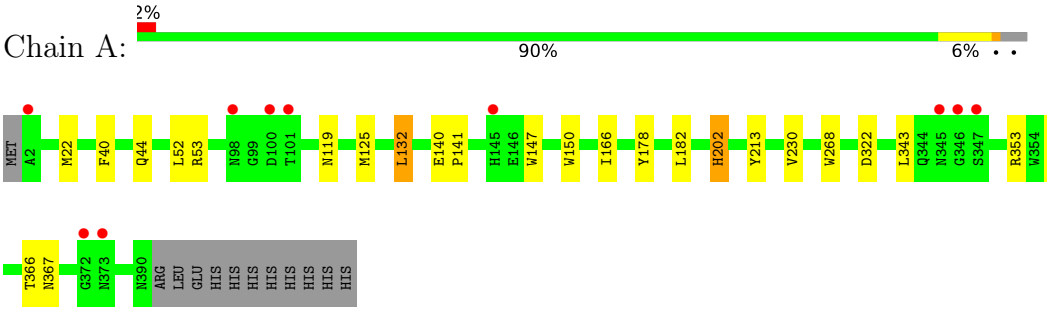
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	112	Total O 112 112	0	0
6	B	189	Total O 189 189	0	0
6	C	156	Total O 157 157	0	1

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.

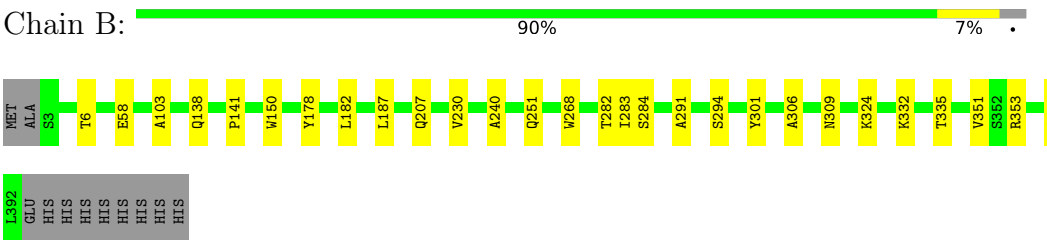
• Molecule 1: Glucuronoxylanase xynC

Chain A:



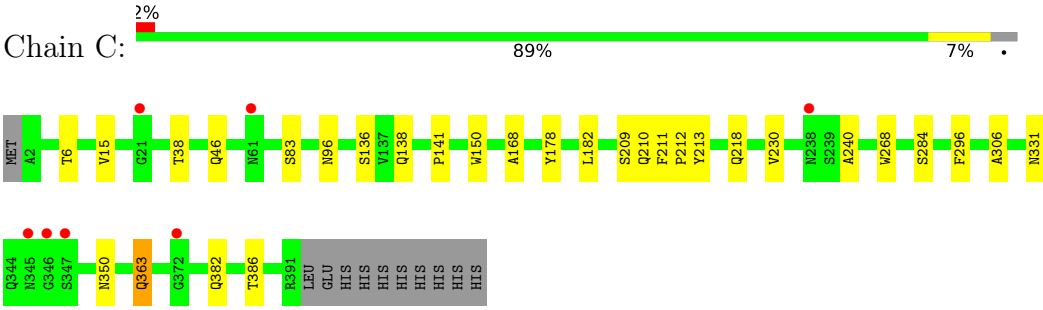
• Molecule 1: Glucuronoxylanase xynC

Chain B:



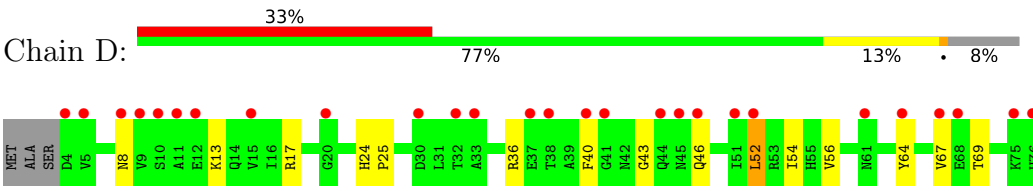
• Molecule 1: Glucuronoxylanase xynC

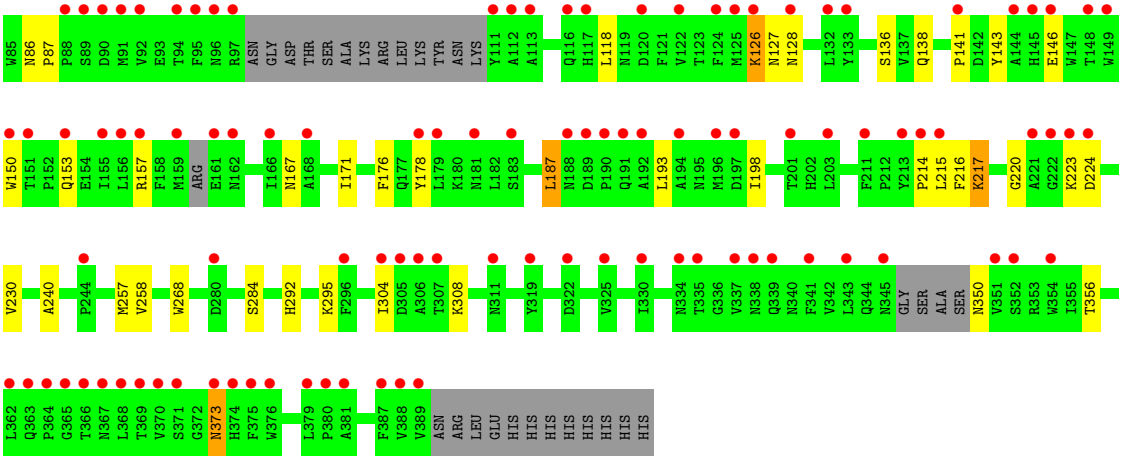
Chain C:



• Molecule 1: Glucuronoxylanase xynC

Chain D:




W85 N86 P87 P88 S89 D90 M91 V92 E93 T94 F95 N96 R97 ASN GLY ASP THR SER ALA LYS ARG LEU LYS TYR ASN LYS Y111 A112 A113 Q116 H117 L118 N119 D120 F121 V122 T123 F124 M125 K126 N127 N128 L132 Y133 S136 V137 Q138 P141 D142 Y143 A144 H145 E146 W147 T148 W149
W150 T151 P152 Q153 E154 I155 L156 R157 F158 M159 ARG E161 N162 I166 N167 A168 I171 F176 Q177 Y178 L179 K180 N181 L182 S183 L187 N188 D189 P190 Q191 A192 L193 A194 N196 M196 D197 I198 T201 H202 L203 F211 P212 Y213 P214 L215 F216 K217 G220 A221 G222 K223 D224
V230 A240 P244 M257 V258 W268 D280 S284 H292 K295 P296 I304 D305 A306 T307 K308 N311 Y319 D322 V325 I330 N334 T335 G336 V337 N338 Q339 N340 F341 V342 L343 Q344 N345 GLY SER ALA SER N350 V351 S352 R353 W354 I355 T356
L362 Q363 P364 G365 T366 N367 L368 T369 V370 S371 G372 N373 H374 F375 W376 L379 P380 A381 F387 V388 V389 ASN ARG LEU GLU HIS HIS HIS HIS HIS HIS HIS HIS

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α, β, γ	137.87Å 192.73Å 65.55Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 2.33 38.20 – 2.33	Depositor EDS
% Data completeness (in resolution range)	99.7 (50.00-2.33) 99.8 (38.20-2.33)	Depositor EDS
R_{merge}	0.14	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.49 (at 2.34Å)	Xtriage
Refinement program	REFMAC 5.5.0102	Depositor
R, R_{free}	0.195 , 0.248 0.193 , 0.243	Depositor DCC
R_{free} test set	3791 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å^2)	36.2	Xtriage
Anisotropy	0.097	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 52.8	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	12822	wwPDB-VP
Average B, all atoms (Å^2)	42.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.98% 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

Bond lengths and bond angles in the following residue types are not validated in this section: BDP, GCU, PG4, DHI

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	0.52	0/3182	0.59	0/4335
1	B	0.57	0/3202	0.64	1/4361 (0.0%)
1	C	0.54	0/3229	0.62	0/4397
1	D	0.40	0/3023	0.51	1/4119 (0.0%)
All	All	0.51	0/12636	0.59	2/17212 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	187	LEU	CA-CB-CG	5.62	128.23	115.30
1	B	368	LEU	CA-CB-CG	5.20	127.27	115.30

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	3095	0	2950	13	0
1	B	3112	0	2974	23	0
1	C	3133	0	2999	17	0
1	D	2940	0	2792	25	0
2	A	13	0	9	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	13	0	9	1	0
3	A	11	0	9	2	0
3	B	11	0	9	0	0
4	B	13	0	9	0	0
5	B	13	0	18	6	0
5	C	10	0	13	1	0
6	A	112	0	0	0	0
6	B	189	0	0	1	0
6	C	157	0	0	0	0
All	All	12822	0	11791	75	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 3.

All (75) 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:B:103:ALA:HA	2:B:403:GCU:H1	1.42	1.01
1:A:141:PRO:HG2	1:A:182:LEU:HD21	1.71	0.72
1:B:282:THR:HB	5:B:405:PG4:H11	1.71	0.72
1:B:363:GLN:NE2	6:B:481:HOH:O	2.00	0.72
1:B:283:ILE:H	5:B:405:PG4:H32	1.57	0.70
1:C:331:ASN:ND2	1:C:337:VAL:HG12	2.11	0.66
1:C:96:ASN:HD21	5:C:402:PG4:H52	1.59	0.66
1:B:353:ARG:HE	1:B:368:LEU:HD21	1.62	0.65
1:B:335:THR:HG23	1:C:168:ALA:HA	1.81	0.63
1:D:240:ALA:HB1	1:D:284:SER:HB2	1.80	0.62
1:C:363[A]:GLN:HA	1:C:363[A]:GLN:HE21	1.64	0.62
1:D:46:GLN:O	1:D:295:LYS:HE2	2.01	0.61
1:C:240:ALA:HB1	1:C:284:SER:HB2	1.83	0.61
1:D:171:ILE:HG12	1:D:198:ILE:HB	1.82	0.61
1:B:283:ILE:H	5:B:405:PG4:C3	2.12	0.61
1:D:138:GLN:HE21	1:D:150:TRP:HE1	1.49	0.60
1:C:38:THR:HA	1:C:46:GLN:HG2	1.85	0.59
1:C:240:ALA:HB1	1:C:284:SER:CB	2.32	0.59
1:D:258:VAL:HG11	1:D:308:LYS:HG2	1.86	0.58
1:B:141:PRO:HG2	1:B:182:LEU:HD21	1.86	0.58
1:D:8:ASN:O	1:D:304:ILE:HB	2.06	0.56
1:D:138:GLN:HG2	1:D:141:PRO:HB3	1.88	0.55
1:B:282:THR:HB	5:B:405:PG4:C1	2.36	0.55
1:B:324:LYS:HZ2	1:B:324:LYS:HB2	1.70	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:240:ALA:HB1	1:D:284:SER:CB	2.39	0.53
1:A:119:ASN:ND2	1:A:166:ILE:HA	2.24	0.53
1:A:22:MET:SD	1:A:53:ARG:HD3	2.49	0.52
1:A:322:ASP:H	3:A:403:DHI:HB2	1.74	0.52
1:B:207:GLN:HG3	1:C:218[B]:GLN:HA	1.90	0.52
1:B:353:ARG:NE	1:B:368:LEU:HD21	2.24	0.52
1:A:140:GLU:OE2	1:A:202:HIS:HD2	1.93	0.52
1:D:43:GLY:H	1:D:46:GLN:HE21	1.59	0.50
1:D:84:PRO:HG3	1:D:118:LEU:HD21	1.94	0.49
1:D:198:ILE:HG12	1:D:224:ASP:HB2	1.94	0.49
1:D:193:LEU:HD22	1:D:223:LYS:HE3	1.95	0.48
1:A:366:THR:HG22	1:A:367:ASN:O	2.14	0.47
1:B:207:GLN:HG3	1:C:218[A]:GLN:HA	1.94	0.47
1:D:143:TYR:HB2	1:D:176:PHE:CD1	2.50	0.47
1:D:292:HIS:HE1	1:D:356:THR:OG1	1.98	0.47
1:B:351:VAL:HB	1:B:368:LEU:HB2	1.97	0.47
1:A:353:ARG:HD2	1:A:355:ILE:HD11	1.97	0.46
1:B:282:THR:HG22	5:B:405:PG4:H61	1.98	0.46
1:A:40:PHE:HZ	1:A:52:LEU:HD13	1.81	0.46
1:C:83:SER:HA	1:C:136:SER:HB3	1.96	0.46
1:D:214:PRO:O	1:D:217:LYS:HG3	2.16	0.45
1:C:138:GLN:HG2	1:C:150:TRP:CD1	2.52	0.45
1:B:240:ALA:HB1	1:B:284:SER:HB2	1.98	0.45
1:C:141:PRO:HG2	1:C:182:LEU:HD21	1.99	0.45
1:A:322:ASP:HB2	3:A:403:DHI:HD2	1.99	0.45
1:D:126:LYS:HD2	1:D:127:ASN:HD22	1.81	0.44
1:A:119:ASN:HD21	1:A:166:ILE:HA	1.82	0.44
1:C:363[A]:GLN:HA	1:C:363[A]:GLN:NE2	2.31	0.44
1:D:86:ASN:HA	1:D:87:PRO:HD2	1.80	0.44
1:B:240:ALA:HB1	1:B:284:SER:CB	2.48	0.43
1:B:309:ASN:HB3	1:C:15:VAL:HG21	2.00	0.43
1:C:6:THR:O	1:C:306:ALA:HA	2.18	0.43
1:D:373:ASN:HD22	1:D:373:ASN:H	1.67	0.42
1:B:291:ALA:HA	1:B:294:SER:OG	2.19	0.42
1:D:67:VAL:HG21	1:D:128:ASN:HD22	1.84	0.42
1:D:40:PHE:CZ	1:D:52:LEU:HG	2.55	0.42
1:B:332:LYS:HB3	1:B:332:LYS:HE2	1.93	0.41
1:A:141:PRO:HB2	1:A:150:TRP:HB2	2.02	0.41
1:C:211:PHE:N	1:C:212:PRO:CD	2.83	0.41
1:D:83:SER:HA	1:D:136:SER:HB3	2.01	0.41
5:B:405:PG4:H11	5:B:405:PG4:H31	1.78	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:6:THR:O	1:B:306:ALA:HA	2.21	0.41
1:B:301:TYR:OH	1:B:324:LYS:NZ	2.52	0.41
1:C:296:PHE:CG	1:C:386:THR:HG21	2.56	0.41
1:A:125:MET:HB2	1:A:132:LEU:HD22	2.03	0.40
1:D:24:HIS:HA	1:D:25:PRO:HD3	1.92	0.40
1:D:373:ASN:HD22	1:D:373:ASN:N	2.19	0.40
1:A:361:ASN:O	1:A:362:LEU:C	2.58	0.40
1:D:216:PHE:O	1:D:220:GLY:N	2.52	0.40
1:B:138:GLN:HG2	1:B:150:TRP:CD1	2.57	0.40
1:D:36:ARG:HD3	1:D:69:THR:HA	2.02	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	387/401 (96%)	370 (96%)	15 (4%)	2 (0%)	29	31
1	B	389/401 (97%)	377 (97%)	11 (3%)	1 (0%)	41	47
1	C	392/401 (98%)	381 (97%)	10 (3%)	1 (0%)	41	47
1	D	360/401 (90%)	338 (94%)	20 (6%)	2 (1%)	25	26
All	All	1528/1604 (95%)	1466 (96%)	56 (4%)	6 (0%)	34	38

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	268	TRP
1	D	268	TRP
1	C	268	TRP
1	D	64	TYR
1	A	147	TRP

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Mol	Chain	Res	Type
1	A	268	TRP

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	329/341 (96%)	321 (98%)	8 (2%)	49	59
1	B	332/341 (97%)	326 (98%)	6 (2%)	59	70
1	C	334/341 (98%)	323 (97%)	11 (3%)	38	46
1	D	313/341 (92%)	295 (94%)	18 (6%)	20	23
All	All	1308/1364 (96%)	1265 (97%)	43 (3%)	39	46

All (43) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	44	GLN
1	A	132	LEU
1	A	178	TYR
1	A	202	HIS
1	A	213	TYR
1	A	230	VAL
1	A	343	LEU
1	A	362	LEU
1	B	58	GLU
1	B	178	TYR
1	B	187	LEU
1	B	230	VAL
1	B	251	GLN
1	B	368	LEU
1	C	178	TYR
1	C	209	SER
1	C	210	GLN
1	C	213	TYR
1	C	230	VAL
1	C	337	VAL

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Mol	Chain	Res	Type
1	C	343	LEU
1	C	350	ASN
1	C	363[A]	GLN
1	C	363[B]	GLN
1	C	382	GLN
1	D	13	LYS
1	D	17	ARG
1	D	52	LEU
1	D	54	ILE
1	D	56	VAL
1	D	126	LYS
1	D	146	GLU
1	D	153	GLN
1	D	157	ARG
1	D	167	ASN
1	D	178	TYR
1	D	187	LEU
1	D	215	LEU
1	D	217	LYS
1	D	230	VAL
1	D	257	MET
1	D	350	ASN
1	D	373	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	D	24	HIS
1	D	46	GLN
1	D	55	HIS
1	D	127	ASN
1	D	138	GLN
1	D	167	ASN
1	D	181	ASN
1	D	195	ASN
1	D	251	GLN
1	D	292	HIS
1	D	339	GLN
1	D	373	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 monosaccharides in this entry.

5.6 Ligand geometry

7 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
2	GCU	A	402	-	13,13,13	0.71	0	18,19,19	2.06	3 (16%)
2	GCU	B	403	-	13,13,13	0.83	0	18,19,19	2.02	3 (16%)
3	DHI	B	404	-	6,11,11	1.02	1 (16%)	7,14,14	1.48	2 (28%)
5	PG4	C	402	-	9,9,12	0.46	0	8,8,11	0.37	0
5	PG4	B	405	-	12,12,12	0.49	0	11,11,11	0.38	0
3	DHI	A	403	-	6,11,11	1.01	1 (16%)	7,14,14	1.35	1 (14%)
4	BDP	B	402	-	13,13,13	0.67	0	18,19,19	1.17	1 (5%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	GCU	A	402	-	-	0/4/24/24	0/1/1/1
2	GCU	B	403	-	-	0/4/24/24	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	DHI	B	404	-	-	4/8/8/8	0/1/1/1
5	PG4	C	402	-	-	3/7/7/10	-
5	PG4	B	405	-	-	7/10/10/10	-
3	DHI	A	403	-	-	6/8/8/8	0/1/1/1
4	BDP	B	402	-	-	0/4/24/24	0/1/1/1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	403	DHI	OXT-C	-2.16	1.23	1.30
3	B	404	DHI	OXT-C	-2.06	1.23	1.30

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	402	GCU	C1-O5-C5	6.97	122.47	112.22
2	B	403	GCU	C1-O5-C5	6.01	121.07	112.22
2	B	403	GCU	O5-C1-C2	4.23	117.83	110.28
2	A	402	GCU	O5-C1-C2	3.06	115.75	110.28
3	A	403	DHI	OXT-C-O	-2.87	117.58	124.09
2	B	403	GCU	O5-C5-C4	2.76	114.50	109.57
3	B	404	DHI	OXT-C-O	-2.74	117.87	124.09
4	B	402	BDP	O5-C5-C6	2.35	112.19	105.88
3	B	404	DHI	OXT-C-CA	2.24	121.00	113.38
2	A	402	GCU	O5-C5-C4	2.13	113.38	109.57

There are no chirality outliers.

All (20) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	403	DHI	O-C-CA-N
3	A	403	DHI	N-CA-CB-CG
5	B	405	PG4	O1-C1-C2-O2
5	B	405	PG4	C1-C2-O2-C3
5	B	405	PG4	O2-C3-C4-O3
5	C	402	PG4	O3-C5-C6-O4
3	A	403	DHI	OXT-C-CA-N
5	B	405	PG4	O4-C7-C8-O5
3	B	404	DHI	C-CA-CB-CG
3	B	404	DHI	O-C-CA-N

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Mol	Chain	Res	Type	Atoms
5	C	402	PG4	O2-C3-C4-O3
5	B	405	PG4	C8-C7-O4-C6
5	C	402	PG4	C6-C5-O3-C4
5	B	405	PG4	C3-C4-O3-C5
3	B	404	DHI	N-CA-CB-CG
3	A	403	DHI	C-CA-CB-CG
3	A	403	DHI	O-C-CA-CB
3	A	403	DHI	OXT-C-CA-CB
3	B	404	DHI	OXT-C-CA-N
5	B	405	PG4	O3-C5-C6-O4

There are no ring outliers.

4 monomers are involved in 10 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	403	GCU	1	0
5	C	402	PG4	1	0
5	B	405	PG4	6	0
3	A	403	DHI	2	0

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	389/401 (97%)	0.10	10 (2%) 56 64	20, 36, 54, 72	0
1	B	390/401 (97%)	-0.25	0 100 100	17, 27, 42, 50	0
1	C	390/401 (97%)	-0.15	7 (1%) 68 76	20, 31, 49, 57	1 (0%)
1	D	368/401 (91%)	1.78	132 (35%) 0 0	39, 76, 107, 143	366 (99%)
All	All	1537/1604 (95%)	0.35	149 (9%) 7 12	17, 36, 93, 143	367 (23%)

All (149) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	96	ASN	10.2
1	D	95	PHE	9.7
1	D	64	TYR	7.9
1	D	112	ALA	7.7
1	D	156	LEU	5.7
1	D	369	THR	5.7
1	D	192	ALA	5.7
1	D	341	PHE	5.4
1	D	111	TYR	5.4
1	D	88	PRO	5.4
1	D	145	HIS	5.4
1	D	325	VAL	5.3
1	D	367	ASN	5.3
1	D	183	SER	5.2
1	D	97	ARG	5.0
1	D	120	ASP	4.9
1	D	157	ARG	4.8
1	D	366	THR	4.8
1	D	149	TRP	4.7
1	D	113	ALA	4.7
1	D	351	VAL	4.7

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Mol	Chain	Res	Type	RSRZ
1	D	44	GLN	4.6
1	D	188	ASN	4.6
1	D	94	THR	4.6
1	D	89	SER	4.5
1	D	222	GLY	4.5
1	D	33	ALA	4.5
1	D	45	ASN	4.4
1	D	373	ASN	4.4
1	A	98	ASN	4.4
1	C	346	GLY	4.3
1	D	92	VAL	4.3
1	D	12	GLU	4.2
1	D	352	SER	4.1
1	D	307	THR	4.1
1	D	4	ASP	4.1
1	C	347	SER	4.1
1	D	178	TYR	4.0
1	D	133	TYR	4.0
1	D	339	GLN	4.0
1	D	211	PHE	4.0
1	D	10	SER	4.0
1	D	161	GLU	4.0
1	D	368	LEU	3.9
1	D	90	ASP	3.9
1	D	76	HIS	3.9
1	D	61	ASN	3.8
1	D	335	THR	3.8
1	D	190	PRO	3.8
1	D	345	ASN	3.8
1	D	151	THR	3.7
1	D	196	MET	3.7
1	D	117	HIS	3.7
1	D	75	LYS	3.7
1	D	311	ASN	3.7
1	A	345	ASN	3.6
1	D	203	LEU	3.6
1	D	296	PHE	3.5
1	D	148	THR	3.5
1	D	370	VAL	3.4
1	D	11	ALA	3.4
1	D	179	LEU	3.4
1	D	194	ALA	3.4

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Mol	Chain	Res	Type	RSRZ
1	D	387	PHE	3.4
1	A	100	ASP	3.4
1	D	304	ILE	3.3
1	D	116	GLN	3.3
1	D	191	GLN	3.2
1	A	347	SER	3.2
1	D	162	ASN	3.1
1	D	166	ILE	3.1
1	D	375	PHE	3.1
1	D	141	PRO	3.0
1	D	9	VAL	3.0
1	D	337	VAL	3.0
1	D	364	PRO	3.0
1	D	51	ILE	3.0
1	D	91	MET	3.0
1	D	221	ALA	3.0
1	A	346	GLY	3.0
1	D	52	LEU	3.0
1	D	305	ASP	2.9
1	D	354	TRP	2.9
1	C	345	ASN	2.9
1	D	40	PHE	2.9
1	A	101	THR	2.8
1	D	41	GLY	2.8
1	D	37	GLU	2.8
1	A	2	ALA	2.8
1	D	376	TRP	2.8
1	A	145	HIS	2.8
1	D	68	GLU	2.8
1	D	8	ASN	2.8
1	D	343	LEU	2.8
1	D	223	LYS	2.8
1	D	153	GLN	2.7
1	D	322	ASP	2.7
1	D	122	VAL	2.7
1	D	380	PRO	2.7
1	D	181	ASN	2.7
1	D	389	VAL	2.7
1	D	146	GLU	2.6
1	D	381	ALA	2.6
1	D	201	THR	2.6
1	D	371	SER	2.6

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Mol	Chain	Res	Type	RSRZ
1	D	150	TRP	2.6
1	D	189	ASP	2.6
1	D	244	PRO	2.6
1	D	67	VAL	2.5
1	D	197	ASP	2.5
1	D	365	GLY	2.5
1	D	168	ALA	2.4
1	D	132	LEU	2.4
1	D	5	VAL	2.4
1	D	338	ASN	2.3
1	D	213	TYR	2.3
1	D	144	ALA	2.3
1	D	280	ASP	2.3
1	C	372	GLY	2.3
1	D	15	VAL	2.3
1	D	38	THR	2.3
1	D	159	MET	2.3
1	D	32	THR	2.2
1	D	379	LEU	2.2
1	D	126	LYS	2.2
1	D	20	GLY	2.2
1	D	128	ASN	2.2
1	D	334	ASN	2.2
1	D	77	GLY	2.2
1	A	373	ASN	2.2
1	D	215	LEU	2.2
1	D	362	LEU	2.2
1	D	214	PRO	2.2
1	D	30	ASP	2.2
1	D	319	TYR	2.1
1	D	388	VAL	2.1
1	A	372	GLY	2.1
1	D	125	MET	2.1
1	D	124	PHE	2.1
1	D	306	ALA	2.1
1	C	61	ASN	2.1
1	C	238	ASN	2.1
1	D	363	GLN	2.1
1	D	224	ASP	2.1
1	C	21	GLY	2.1
1	D	155	ILE	2.0
1	D	330	ILE	2.0

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Mol	Chain	Res	Type	RSRZ
1	D	374	HIS	2.0
1	D	46	GLN	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, 95^{th} 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(Å^2)	Q<0.9
3	DHI	A	403	11/11	0.70	0.33	88,89,89,89	0
3	DHI	B	404	11/11	0.77	0.23	75,76,77,77	0
2	GCU	B	403	13/13	0.84	0.33	50,54,54,55	0
4	BDP	B	402	13/13	0.87	0.19	58,61,63,64	0
5	PG4	B	405	13/13	0.94	0.19	34,37,46,47	0
2	GCU	A	402	13/13	0.95	0.09	44,47,48,48	0
5	PG4	C	402	10/13	0.97	0.12	36,37,40,41	0

6.5 Other polymers (i)

There are no such residues in this entry.