Full wwPDB X-ray Structure Validation Report ⓘ

Dec 3, 2020 – 09:06 AM GMT

PDB ID	:	6YT0
Title	:	Magnesium chelatase H subunit (ChlH) E660D variant from Synechocystis sp.PCC6803
Authors	:	Bisson, C.; Hunter, C.N.
Deposited on	:	2020-04-23
Resolution	:	2.85 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:

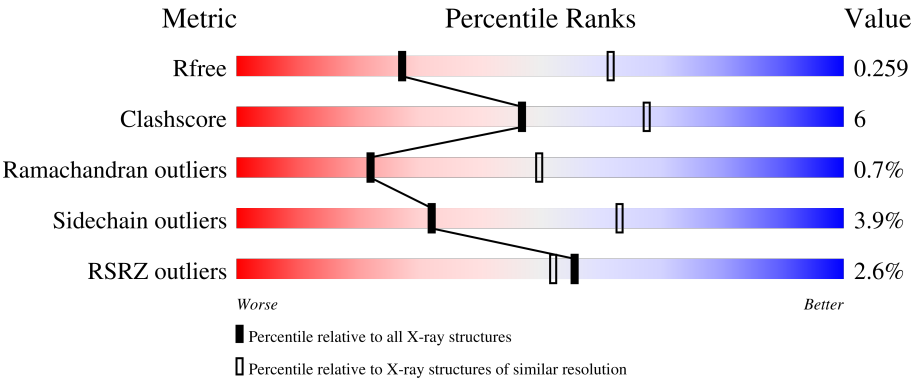
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.14.6
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.14.6

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

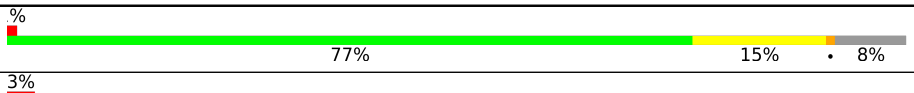
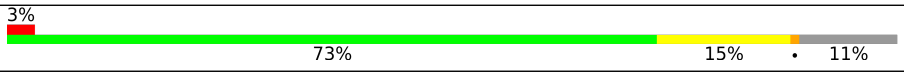
The reported resolution of this entry is 2.85 Å.

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	3168 (2.90-2.82)
Clashscore	141614	3438 (2.90-2.82)
Ramachandran outliers	138981	3348 (2.90-2.82)
Sidechain outliers	138945	3351 (2.90-2.82)
RSRZ outliers	127900	3103 (2.90-2.82)

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 >=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	1351	
1	B	1351	

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 19365 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 Mg-chelatase subunit ChlH.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	B	1207	Total	C	N	O	S	0	1	0
			9511	6023	1610	1831	47			
1	A	1248	Total	C	N	O	S	0	0	0
			9822	6221	1670	1882	49			

There are 42 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-19	MET	-	initiating methionine	UNP P73020
B	-18	GLY	-	expression tag	UNP P73020
B	-17	SER	-	expression tag	UNP P73020
B	-16	SER	-	expression tag	UNP P73020
B	-15	HIS	-	expression tag	UNP P73020
B	-14	HIS	-	expression tag	UNP P73020
B	-13	HIS	-	expression tag	UNP P73020
B	-12	HIS	-	expression tag	UNP P73020
B	-11	HIS	-	expression tag	UNP P73020
B	-10	HIS	-	expression tag	UNP P73020
B	-9	SER	-	expression tag	UNP P73020
B	-8	SER	-	expression tag	UNP P73020
B	-7	GLY	-	expression tag	UNP P73020
B	-6	LEU	-	expression tag	UNP P73020
B	-5	VAL	-	expression tag	UNP P73020
B	-4	PRO	-	expression tag	UNP P73020
B	-3	ARG	-	expression tag	UNP P73020
B	-2	GLY	-	expression tag	UNP P73020
B	-1	SER	-	expression tag	UNP P73020
B	0	HIS	-	expression tag	UNP P73020
B	660	ASP	GLU	engineered mutation	UNP P73020
A	-19	MET	-	initiating methionine	UNP P73020
A	-18	GLY	-	expression tag	UNP P73020
A	-17	SER	-	expression tag	UNP P73020
A	-16	SER	-	expression tag	UNP P73020

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-15	HIS	-	expression tag	UNP P73020
A	-14	HIS	-	expression tag	UNP P73020
A	-13	HIS	-	expression tag	UNP P73020
A	-12	HIS	-	expression tag	UNP P73020
A	-11	HIS	-	expression tag	UNP P73020
A	-10	HIS	-	expression tag	UNP P73020
A	-9	SER	-	expression tag	UNP P73020
A	-8	SER	-	expression tag	UNP P73020
A	-7	GLY	-	expression tag	UNP P73020
A	-6	LEU	-	expression tag	UNP P73020
A	-5	VAL	-	expression tag	UNP P73020
A	-4	PRO	-	expression tag	UNP P73020
A	-3	ARG	-	expression tag	UNP P73020
A	-2	GLY	-	expression tag	UNP P73020
A	-1	SER	-	expression tag	UNP P73020
A	0	HIS	-	expression tag	UNP P73020
A	660	ASP	GLU	engineered mutation	UNP P73020

- Molecule 2 is water.

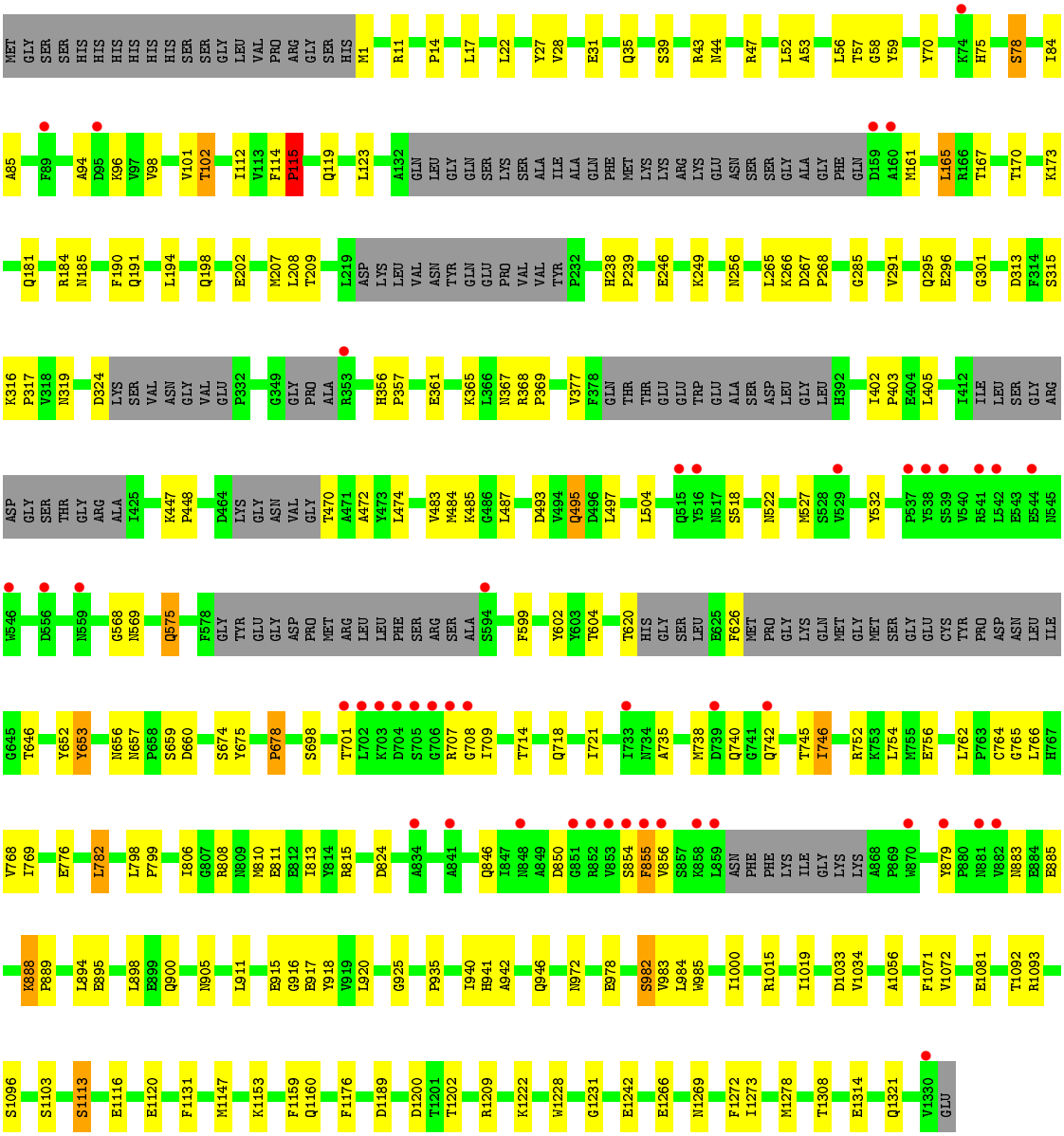
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	B	8	Total O 8 8	0	0
2	A	24	Total O 24 24	0	0

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.

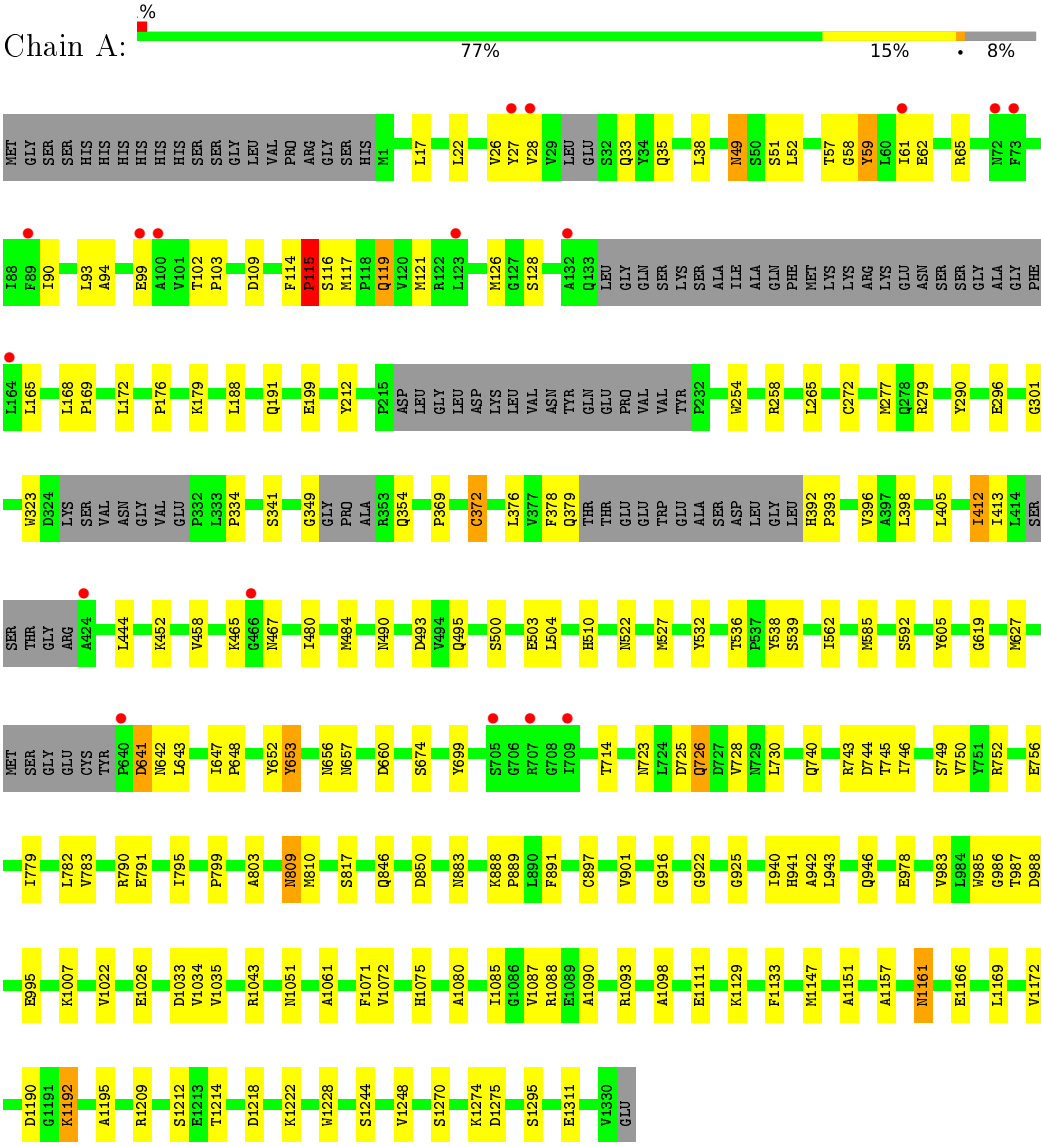
- Molecule 1: Mg-chelatase subunit ChlH

Chain B:



• Molecule 1: Mg-chelatase subunit ChlH

Chain A:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	H 3	Depositor
Cell constants a, b, c, α, β, γ	321.79Å 321.79Å 104.92Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	54.60 – 2.85 54.60 – 2.85	Depositor EDS
% Data completeness (in resolution range)	99.7 (54.60-2.85) 99.7 (54.60-2.85)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.82 (at 2.86Å)	Xtriage
Refinement program	REFMAC 5.8.0258	Depositor
R, R_{free}	0.209 , 0.260 0.213 , 0.259	Depositor DCC
R_{free} test set	4709 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å^2)	53.0	Xtriage
Anisotropy	0.195	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 49.0	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.34$	Xtriage
Estimated twinning fraction	0.010 for h,-h-k,-l	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	19365	wwPDB-VP
Average B, all atoms (Å^2)	64.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.30% 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	0.71	0/10019	0.89	2/13586 (0.0%)
1	B	0.72	0/9700	0.86	0/13157
All	All	0.71	0/19719	0.87	2/26743 (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	A	809	ASN	CB-CA-C	5.25	120.90	110.40
1	A	891	PHE	CB-CA-C	5.03	120.46	110.40

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	9822	0	9695	122	0
1	B	9511	0	9371	117	0
2	A	24	0	0	0	0
2	B	8	0	0	0	0
All	All	19365	0	19066	238	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 6.

All (238) 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:361:GLU:OE1	1:B:365:LYS:NZ	1.70	1.23
1:A:527:MET:CE	1:A:532:TYR:HA	2.13	0.79
1:B:70:TYR:OH	1:B:96:LYS:O	2.01	0.76
1:A:1172:VAL:HG21	1:A:1174:HIS:CE1	2.20	0.76
1:A:392:HIS:O	1:A:396:VAL:HG23	1.85	0.76
1:A:109:ASP:HB3	1:A:212:TYR:O	1.87	0.74
1:A:493:ASP:OD1	1:A:495:GLN:NE2	2.24	0.71
1:B:806:ILE:HG22	1:B:806:ILE:O	1.91	0.70
1:B:256:ASN:O	1:B:266:LYS:HE2	1.91	0.69
1:A:49:ASN:C	1:A:49:ASN:HD22	1.97	0.68
1:A:527:MET:HE1	1:A:532:TYR:HA	1.74	0.68
1:B:756:GLU:OE2	1:B:1209:ARG:NH2	2.27	0.68
1:A:49:ASN:ND2	1:A:52:LEU:H	1.93	0.67
1:B:402:ILE:HB	1:B:403:PRO:HD3	1.79	0.65
1:B:367:ASN:OD1	1:B:917:GLU:HB3	1.97	0.65
1:A:740:GLN:OE1	1:A:743:ARG:NH2	2.31	0.63
1:A:49:ASN:HD21	1:A:52:LEU:H	1.44	0.63
1:A:62:GLU:O	1:A:65:ARG:HG3	1.98	0.63
1:A:176:PRO:HG2	1:A:179:LYS:HD2	1.80	0.63
1:A:27:TYR:CE1	1:A:58:GLY:HA3	2.34	0.62
1:B:313:ASP:OD1	1:B:315:SER:OG	2.13	0.62
1:B:984:LEU:HD21	1:B:1000:ILE:HD12	1.82	0.61
1:B:811:GLU:OE2	1:B:815:ARG:NH1	2.33	0.61
1:B:1153:LYS:NZ	1:B:1189:ASP:OD2	2.34	0.61
1:A:467:ASN:HB2	1:A:1111:GLU:HB2	1.84	0.60
1:B:984:LEU:HD21	1:B:1000:ILE:CD1	2.32	0.60
1:B:98:VAL:O	1:B:102:THR:OG1	2.17	0.59
1:A:756:GLU:OE2	1:A:1209:ARG:NH2	2.33	0.59
1:B:1321:GLN:HE22	1:A:585:MET:HG2	1.68	0.59
1:B:762:LEU:O	1:B:762:LEU:HD12	2.03	0.58
1:B:165:LEU:HD11	1:B:191:GLN:HG2	1.86	0.58
1:B:527:MET:CE	1:B:532:TYR:HA	2.34	0.58
1:A:467:ASN:ND2	1:A:1248:VAL:HG12	2.19	0.57
1:A:117:MET:HB3	1:A:119:GLN:HE22	1.70	0.57
1:A:484:MET:HE1	1:A:504:LEU:HD13	1.86	0.57
1:A:349:GLY:HA3	1:A:354:GLN:HA	1.87	0.57
1:A:723:ASN:O	1:A:726:GLN:NE2	2.37	0.57
1:B:782:LEU:HD11	1:B:898:LEU:HB2	1.85	0.57
1:B:575:GLN:OE1	1:B:602:TYR:HB3	2.07	0.56
1:A:165:LEU:HD11	1:A:191:GLN:CG	2.36	0.55
1:A:444:LEU:O	1:A:452:LYS:HE2	2.06	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:369:PRO:HD3	1:A:916:GLY:O	2.07	0.55
1:B:1116:GLU:HB3	1:B:1120:GLU:OE2	2.07	0.55
1:A:799:PRO:O	1:A:810:MET:CE	2.55	0.55
1:A:341:SER:HB3	1:A:372:CYS:SG	2.47	0.55
1:B:1034:VAL:O	1:B:1093:ARG:HD2	2.07	0.55
1:A:128:SER:HB2	1:A:179:LYS:HG2	1.88	0.54
1:A:897:CYS:O	1:A:901:VAL:HG23	2.08	0.54
1:B:472:ALA:CB	1:B:620:THR:HG22	2.37	0.54
1:B:806:ILE:HD11	1:B:879:TYR:HE1	1.71	0.54
1:A:1157:ALA:HA	1:A:1195:ALA:O	2.08	0.54
1:B:1019:ILE:HD13	1:B:1056:ALA:HB2	1.89	0.54
1:A:762:LEU:HD12	1:A:762:LEU:O	2.08	0.54
1:B:181:GLN:HE21	1:B:185:ASN:HD21	1.55	0.54
1:A:1035:VAL:HG22	1:A:1151:ALA:HB1	1.91	0.53
1:A:1161:ASN:N	1:A:1161:ASN:HD22	2.06	0.53
1:B:27:TYR:CE2	1:B:35:GLN:HG3	2.44	0.53
1:B:44:ASN:HD22	1:B:47:ARG:HH11	1.54	0.53
1:B:806:ILE:HD11	1:B:879:TYR:CE1	2.43	0.53
1:B:946:GLN:OE1	1:B:1015:ARG:HD2	2.08	0.53
1:B:316:LYS:HB2	1:B:317:PRO:HD3	1.89	0.53
1:B:575:GLN:OE1	1:B:599:PHE:HA	2.09	0.53
1:B:766:LEU:HD21	1:B:1242:GLU:HG3	1.90	0.52
1:A:28:VAL:O	1:A:85:ALA:HA	2.10	0.52
1:A:90:ILE:HB	1:A:93:LEU:HD12	1.91	0.52
1:B:483:VAL:O	1:B:487:LEU:HG	2.10	0.52
1:B:1033:ASP:HA	1:B:1072:VAL:HG22	1.91	0.52
1:A:725:ASP:HB3	1:A:730:LEU:HD12	1.92	0.52
1:A:656:ASN:HA	1:A:925:GLY:O	2.10	0.52
1:B:806:ILE:CG2	1:B:806:ILE:O	2.58	0.51
1:A:265:LEU:HD11	1:A:301:GLY:HA2	1.92	0.51
1:A:656:ASN:ND2	1:A:1166:GLU:HG3	2.25	0.51
1:B:527:MET:HE1	1:B:532:TYR:HA	1.93	0.51
1:A:458:VAL:CG2	1:A:480:ILE:HD11	2.40	0.51
1:B:707:ARG:O	1:B:709:ILE:N	2.44	0.51
1:A:444:LEU:HD22	1:A:648:PRO:HG2	1.93	0.50
1:A:117:MET:HB3	1:A:119:GLN:NE2	2.27	0.50
1:A:1022:VAL:HG13	1:A:1026:GLU:HB3	1.94	0.50
1:A:378:PHE:O	1:A:379:GLN:O	2.30	0.50
1:A:799:PRO:O	1:A:810:MET:HE2	2.12	0.50
1:B:656:ASN:HA	1:B:925:GLY:O	2.12	0.50
1:A:538:TYR:OH	1:A:643:LEU:HD12	2.12	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:992:THR:HB	1:A:995:GLU:HG3	1.94	0.50
1:A:27:TYR:OH	1:A:35:GLN:HG2	2.12	0.49
1:B:485:LYS:HG2	1:B:497:LEU:HD21	1.94	0.49
1:A:1275:ASP:C	1:A:1275:ASP:OD1	2.50	0.49
1:B:161:MET:HB3	1:B:194:LEU:HD21	1.94	0.49
1:B:883:ASN:OD1	1:B:883:ASN:C	2.50	0.49
1:B:27:TYR:CE1	1:B:58:GLY:HA3	2.48	0.49
1:B:888:LYS:HB3	1:B:889:PRO:HD3	1.94	0.49
1:A:158:GLN:O	1:A:161:MET:HB2	2.13	0.49
1:B:114:PHE:CD1	1:B:190:PHE:CD1	3.01	0.49
1:A:888:LYS:HB3	1:A:889:PRO:CD	2.42	0.49
1:B:165:LEU:HD11	1:B:191:GLN:CG	2.41	0.49
1:B:674:SER:HB3	1:B:940:ILE:HG23	1.95	0.49
1:A:27:TYR:HA	1:A:84:ILE:O	2.12	0.49
1:B:798:LEU:HB3	1:B:799:PRO:HD3	1.95	0.48
1:A:1190:ASP:OD1	1:A:1192:LYS:HB3	2.13	0.48
1:A:26:VAL:HA	1:A:57:THR:O	2.13	0.48
1:B:28:VAL:O	1:B:85:ALA:HA	2.13	0.48
1:A:510:HIS:CE1	1:A:522:ASN:HD22	2.31	0.48
1:A:883:ASN:C	1:A:883:ASN:OD1	2.52	0.48
1:B:1200:ASP:OD1	1:B:1202:THR:HG23	2.14	0.48
1:B:474:LEU:HD13	1:B:675:TYR:CZ	2.49	0.48
1:A:1090:ALA:HA	1:A:1147:MET:HE1	1.96	0.47
1:A:277:MET:HB2	1:A:290:TYR:CE2	2.49	0.47
1:A:1270:SER:HA	1:A:1274:LYS:HB2	1.96	0.47
1:A:323:TRP:CZ3	1:A:334:PRO:HD3	2.49	0.47
1:B:94:ALA:O	1:B:98:VAL:HG23	2.14	0.47
1:A:728:VAL:HG13	1:A:749:SER:HB3	1.95	0.47
1:A:376:LEU:HD13	1:A:396:VAL:HG22	1.97	0.47
1:A:1033:ASP:HA	1:A:1072:VAL:HG22	1.97	0.47
1:B:493:ASP:HB3	1:B:569:ASN:ND2	2.30	0.47
1:A:126:MET:HG2	1:A:212:TYR:CZ	2.49	0.47
1:B:239:PRO:HB3	1:B:291:VAL:HG22	1.97	0.47
1:B:11:ARG:HA	1:B:56:LEU:O	2.15	0.47
1:B:854:SER:O	1:B:855:PHE:HB2	2.15	0.47
1:A:59:TYR:N	1:A:59:TYR:CD1	2.83	0.46
1:B:484:MET:HE2	1:B:504:LEU:HD22	1.96	0.46
1:B:368:ARG:O	1:B:918:TYR:HB2	2.15	0.46
1:B:173:LYS:NZ	1:B:296:GLU:OE2	2.36	0.46
1:B:652:TYR:CG	1:B:769:ILE:CD1	2.98	0.46
1:B:114:PHE:O	1:B:115:PRO:C	2.52	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:653:TYR:O	1:B:674:SER:HA	2.15	0.46
1:A:272:CYS:HA	1:A:303:ARG:O	2.16	0.46
1:A:803:ALA:HB2	1:A:810:MET:HE1	1.97	0.46
1:B:856:VAL:N	1:B:895:GLU:OE2	2.49	0.46
1:A:165:LEU:HD11	1:A:191:GLN:HG3	1.98	0.46
1:A:126:MET:HG2	1:A:212:TYR:CE2	2.50	0.46
1:A:484:MET:CE	1:A:504:LEU:HD13	2.46	0.46
1:A:62:GLU:O	1:A:65:ARG:CG	2.64	0.46
1:B:1222:LYS:HA	1:B:1228:TRP:CG	2.51	0.46
1:A:1034:VAL:O	1:A:1093:ARG:HD2	2.15	0.46
1:B:1272:PHE:HA	1:B:1278:MET:HG2	1.97	0.46
1:A:116:SER:O	1:A:121:MET:HG2	2.16	0.46
1:B:17:LEU:HD11	1:B:22:LEU:HB2	1.98	0.45
1:B:911:LEU:O	1:B:915:GLU:HG2	2.16	0.45
1:A:922:GLY:O	1:A:940:ILE:HA	2.15	0.45
1:A:467:ASN:N	1:A:1111:GLU:OE2	2.43	0.45
1:A:17:LEU:HD21	1:A:22:LEU:HB2	1.97	0.45
1:B:447:LYS:HG3	1:B:448:PRO:HD2	1.99	0.45
1:B:740:GLN:HA	1:B:740:GLN:OE1	2.16	0.45
1:B:808:ARG:NH2	1:B:824:ASP:OD1	2.50	0.45
1:A:398:LEU:HD22	1:A:946:GLN:HG3	1.97	0.45
1:A:799:PRO:CB	1:A:810:MET:HE3	2.46	0.45
1:A:277:MET:O	1:A:308:PHE:HA	2.16	0.45
1:B:265:LEU:HD11	1:B:301:GLY:HA2	1.98	0.45
1:B:28:VAL:HA	1:B:59:TYR:O	2.17	0.45
1:A:49:ASN:ND2	1:A:49:ASN:C	2.67	0.45
1:B:484:MET:HE2	1:B:504:LEU:CD2	2.47	0.45
1:B:718:GLN:HA	1:B:718:GLN:OE1	2.16	0.45
1:B:764:CYS:O	1:B:1231:GLY:HA3	2.17	0.45
1:A:699:TYR:OH	1:A:744:ASP:OD1	2.28	0.44
1:A:405:LEU:HA	1:A:941:HIS:CD2	2.52	0.44
1:A:165:LEU:HA	1:A:168:LEU:HD12	1.98	0.44
1:B:356:HIS:N	1:B:357:PRO:CD	2.80	0.44
1:A:254:TRP:CZ3	1:A:258:ARG:HD2	2.52	0.44
1:B:983:VAL:HG11	1:B:985:TRP:CZ2	2.53	0.44
1:B:238:HIS:ND1	1:B:239:PRO:HD2	2.33	0.44
1:A:1090:ALA:HA	1:A:1147:MET:CE	2.48	0.44
1:A:465:LYS:HB3	1:A:1111:GLU:CD	2.37	0.44
1:A:746:ILE:O	1:A:750:VAL:HG23	2.18	0.44
1:A:99:GLU:O	1:A:103:PRO:HD2	2.17	0.44
1:B:11:ARG:HG3	1:B:57:THR:HG22	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:888:LYS:HB3	1:B:889:PRO:CD	2.47	0.44
1:A:27:TYR:OH	1:A:35:GLN:CG	2.66	0.43
1:A:725:ASP:CB	1:A:730:LEU:HD12	2.48	0.43
1:B:161:MET:SD	1:B:190:PHE:HE1	2.40	0.43
1:B:267:ASP:OD1	1:B:268:PRO:HD2	2.18	0.43
1:A:1222:LYS:HA	1:A:1228:TRP:CG	2.54	0.43
1:A:978:GLU:HB3	1:A:1075:HIS:CE1	2.53	0.43
1:B:978:GLU:HA	1:B:1071:PHE:CD2	2.53	0.43
1:B:982:SER:HA	1:B:1159:PHE:O	2.18	0.43
1:B:181:GLN:NE2	1:B:285:GLY:O	2.49	0.43
1:B:983:VAL:HB	1:B:1160:GLN:HG2	2.00	0.43
1:A:392:HIS:N	1:A:393:PRO:CD	2.82	0.43
1:A:484:MET:CE	1:A:504:LEU:CD1	2.96	0.43
1:A:653:TYR:O	1:A:674:SER:HA	2.18	0.43
1:B:184:ARG:O	1:B:184:ARG:HD2	2.19	0.43
1:A:1043:ARG:NH1	1:A:1098:ALA:O	2.52	0.43
1:A:657:ASN:ND2	1:A:660:ASP:HB2	2.34	0.43
1:A:527:MET:CE	1:A:532:TYR:CA	2.90	0.43
1:A:641:ASP:O	1:A:643:LEU:N	2.51	0.43
1:A:779:ILE:O	1:A:783:VAL:HG23	2.18	0.43
1:B:1269:ASN:O	1:B:1273:ILE:HB	2.18	0.43
1:B:470:THR:OG1	1:B:620:THR:HA	2.19	0.43
1:B:75:HIS:O	1:B:78:SER:OG	2.18	0.43
1:B:1266:GLU:OE2	1:B:1308:THR:OG1	2.22	0.42
1:B:207:MET:HE2	1:B:208:LEU:HG	2.00	0.42
1:A:500:SER:OG	1:A:503:GLU:HG3	2.19	0.42
1:B:742:GLN:O	1:B:746:ILE:HG13	2.19	0.42
1:B:810:MET:HA	1:B:813:ILE:HD12	2.01	0.42
1:B:405:LEU:HD23	1:B:941:HIS:ND1	2.34	0.42
1:A:986:GLY:O	1:A:990:ILE:HG13	2.19	0.42
1:B:101:VAL:HG12	1:B:123:LEU:HD22	2.01	0.42
1:B:652:TYR:CD1	1:B:769:ILE:HD13	2.55	0.42
1:A:1080:ALA:HB1	1:A:1085:ILE:O	2.18	0.42
1:B:369:PRO:HD3	1:B:916:GLY:O	2.19	0.42
1:A:1169:LEU:CD1	1:A:1214:THR:HG22	2.50	0.42
1:A:412:ILE:HG23	1:A:413:ILE:O	2.20	0.42
1:A:978:GLU:HA	1:A:1071:PHE:CD2	2.54	0.42
1:B:170:THR:HG22	1:B:295:GLN:OE1	2.20	0.42
1:A:38:LEU:HA	1:A:38:LEU:HD23	1.84	0.42
1:B:315:SER:O	1:B:319:ASN:ND2	2.53	0.42
1:A:114:PHE:O	1:A:115:PRO:C	2.58	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:198:GLN:O	1:B:202:GLU:HG3	2.20	0.42
1:B:39:SER:O	1:B:43:ARG:HG3	2.20	0.42
1:B:14:PRO:HG3	1:B:53:ALA:HB1	2.01	0.42
1:A:647:ILE:O	1:A:648:PRO:C	2.58	0.42
1:A:652:TYR:CD2	1:A:769:ILE:HD13	2.55	0.42
1:B:112:ILE:N	1:B:112:ILE:HD12	2.35	0.41
1:B:167:THR:O	1:B:170:THR:OG1	2.28	0.41
1:A:61:ILE:HG12	1:A:93:LEU:HD13	2.01	0.41
1:A:1061:ALA:HB2	1:A:1072:VAL:HG12	2.02	0.41
1:B:472:ALA:HB2	1:B:620:THR:HG22	2.02	0.41
1:B:678:PRO:HG2	1:B:765:GLY:O	2.20	0.41
1:A:888:LYS:HB3	1:A:889:PRO:HD3	2.03	0.41
1:A:102:THR:N	1:A:103:PRO:HD2	2.35	0.41
1:A:1051:ASN:HA	1:A:1133:PHE:HE2	1.85	0.41
1:A:983:VAL:HG11	1:A:985:TRP:CZ2	2.55	0.41
1:B:698:SER:O	1:B:701:THR:HG22	2.20	0.41
1:B:27:TYR:HA	1:B:84:ILE:O	2.21	0.41
1:A:1244:SER:O	1:A:1248:VAL:HG23	2.20	0.41
1:B:52:LEU:HD22	1:B:209:THR:HG21	2.01	0.41
1:B:495:GLN:HG3	1:B:568:GLY:CA	2.50	0.41
1:B:1092:THR:HB	1:B:1147:MET:HG2	2.02	0.41
1:B:900:GLN:OE1	1:B:935:PRO:HD3	2.20	0.41
1:A:790:ARG:HB2	1:A:795:ILE:HG13	2.03	0.41
1:A:562:ILE:HG21	1:A:605:TYR:CD2	2.56	0.41
1:A:1088:ARG:HG3	1:A:1088:ARG:HH11	1.87	0.40
1:B:1096:SER:O	1:B:1131:PHE:HB2	2.20	0.40
1:A:169:PRO:HA	1:A:172:LEU:HG	2.03	0.40
1:A:987:THR:HG23	1:A:988:ASP:N	2.36	0.40
1:B:735:ALA:HA	1:B:738:MET:CE	2.50	0.40
1:B:885:GLU:O	1:B:889:PRO:HD2	2.21	0.40
1:A:1051:ASN:HA	1:A:1133:PHE:CE2	2.57	0.40
1:B:161:MET:SD	1:B:190:PHE:CE1	3.15	0.40
1:B:754:LEU:HD23	1:B:754:LEU:HA	1.95	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	1230/1351 (91%)	1161 (94%)	62 (5%)	7 (1%)	25	53
1	B	1184/1351 (88%)	1094 (92%)	81 (7%)	9 (1%)	19	46
All	All	2414/2702 (89%)	2255 (93%)	143 (6%)	16 (1%)	22	50

All (16) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	850	ASP
1	B	855	PHE
1	A	115	PRO
1	A	642	ASN
1	B	115	PRO
1	B	708	GLY
1	B	942	ALA
1	A	619	GLY
1	A	850	ASP
1	B	972	ASN
1	A	942	ALA
1	B	1113	SER
1	A	94	ALA
1	A	641	ASP
1	B	377	VAL
1	B	888	LYS

5.3.2 Protein sidechains

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	1064/1147 (93%)	1022 (96%)	42 (4%)	32 63
1	B	1032/1147 (90%)	992 (96%)	40 (4%)	32 63
All	All	2096/2294 (91%)	2014 (96%)	82 (4%)	32 63

All (82) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	1	MET
1	B	31	GLU
1	B	78	SER
1	B	102	THR
1	B	115	PRO
1	B	119	GLN
1	B	165	LEU
1	B	246	GLU
1	B	249	LYS
1	B	324	ASP
1	B	495	GLN
1	B	518	SER
1	B	522	ASN
1	B	575	GLN
1	B	604	THR
1	B	626	PHE
1	B	646	THR
1	B	653	TYR
1	B	657	ASN
1	B	659	SER
1	B	660	ASP
1	B	678	PRO
1	B	714	THR
1	B	721	ILE
1	B	745	THR
1	B	746	ILE
1	B	752	ARG
1	B	768	VAL
1	B	776	GLU
1	B	782	LEU
1	B	846	GLN
1	B	894	LEU
1	B	905	ASN
1	B	920	LEU
1	B	982	SER

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Mol	Chain	Res	Type
1	B	1081	GLU
1	B	1103	SER
1	B	1113	SER
1	B	1176	PHE
1	B	1314	GLU
1	A	33	GLN
1	A	49	ASN
1	A	51	SER
1	A	59	TYR
1	A	87	LEU
1	A	115	PRO
1	A	119	GLN
1	A	158	GLN
1	A	188	LEU
1	A	199	GLU
1	A	279	ARG
1	A	296	GLU
1	A	372	CYS
1	A	412	ILE
1	A	490	ASN
1	A	536	THR
1	A	539	SER
1	A	592	SER
1	A	627	MET
1	A	653	TYR
1	A	714	THR
1	A	726	GLN
1	A	745	THR
1	A	752	ARG
1	A	762	LEU
1	A	769	ILE
1	A	782	LEU
1	A	791	GLU
1	A	809	ASN
1	A	817	SER
1	A	846	GLN
1	A	943	LEU
1	A	1007	LYS
1	A	1087	VAL
1	A	1129	LYS
1	A	1161	ASN
1	A	1176	PHE

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Mol	Chain	Res	Type
1	A	1192	LYS
1	A	1212	SER
1	A	1218	ASP
1	A	1295	SER
1	A	1311	GLU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	44	ASN
1	B	185	ASN
1	B	319	ASN
1	B	657	ASN
1	B	1321	GLN
1	A	49	ASN
1	A	119	GLN
1	A	522	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

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	1248/1351 (92%)	0.02	17 (1%)	75	74	27, 50, 98, 134	36 (2%)
1	B	1207/1351 (89%)	0.21	46 (3%)	40	35	36, 72, 110, 155	36 (2%)
All	All	2455/2702 (90%)	0.11	63 (2%)	56	52	27, 60, 106, 155	72 (2%)

All (63) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	853	VAL	5.5
1	B	541	ARG	5.3
1	B	855	PHE	4.6
1	B	859	LEU	4.4
1	A	132	ALA	4.4
1	B	858	LYS	4.3
1	A	424	ALA	4.2
1	B	852	ARG	4.0
1	B	353	ARG	3.8
1	B	851	GLY	3.8
1	B	704	ASP	3.7
1	B	854	SER	3.6
1	B	1330	VAL	3.5
1	B	705	SER	3.5
1	B	89	PHE	3.4
1	A	99	GLU	3.3
1	A	89	PHE	3.2
1	B	856	VAL	3.2
1	B	529	VAL	3.2
1	B	707	ARG	3.2
1	B	708	GLY	3.1
1	B	544	GLU	3.1
1	B	538	TYR	3.0
1	B	559	ASN	3.0

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Mol	Chain	Res	Type	RSRZ
1	B	95	ASP	3.0
1	A	61	ILE	3.0
1	A	73	PHE	2.9
1	A	100	ALA	2.8
1	B	159	ASP	2.7
1	A	705	SER	2.7
1	B	881	ASN	2.6
1	B	841	ALA	2.6
1	B	160	ALA	2.5
1	B	539	SER	2.5
1	B	515	GLN	2.5
1	B	74	LYS	2.4
1	B	703	LYS	2.4
1	B	706	GLY	2.3
1	B	879	TYR	2.3
1	B	739	ASP	2.3
1	B	702	LEU	2.3
1	B	542	LEU	2.3
1	A	72	ASN	2.3
1	A	640	PRO	2.2
1	B	848	ASN	2.2
1	A	164	LEU	2.2
1	B	742	GLN	2.2
1	B	556	ASP	2.2
1	B	733	ILE	2.2
1	B	882	VAL	2.2
1	A	28	VAL	2.2
1	B	834	ALA	2.2
1	B	870	TRP	2.2
1	B	701	THR	2.2
1	B	537	PRO	2.1
1	A	466	GLY	2.1
1	A	123	LEU	2.1
1	B	546	TRP	2.1
1	A	709	ILE	2.1
1	B	594	SER	2.1
1	A	27	TYR	2.0
1	A	707	ARG	2.0
1	B	516	TYR	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)

There are no ligands in this entry.

6.5 Other polymers (i)

There are no such residues in this entry.