Full wwPDB X-ray Structure Validation Report ⓘ

Sep 19, 2023 – 12:29 AM EDT

PDB ID	:	5DXF
Title	:	Structure of Candida albicans trehalose-6-phosphate phosphatase N-terminal domain
Authors	:	Miao, Y.; Brennan, R.G.
Deposited on	:	2015-09-23
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:

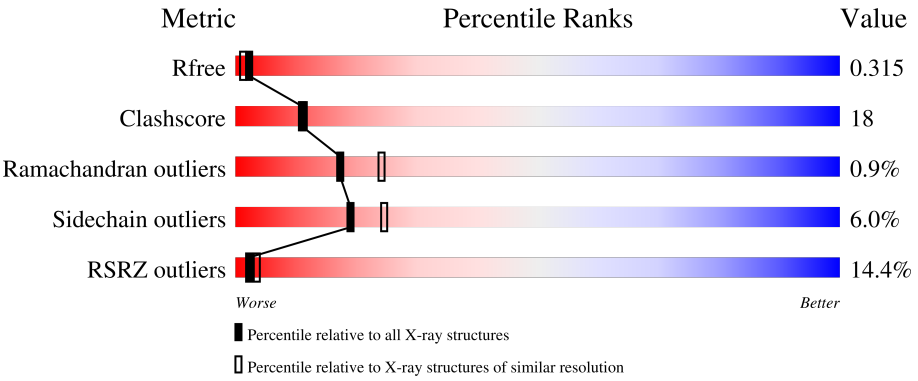
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.35.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35.1

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	534	17% 56% 27% · 14%
1	B	534	8% 65% 19% · 12%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 7549 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 trehalose-6-phosphate phosphatase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	460	Total	C	N	O	S	0	0	0
			3687	2366	620	686	15			
1	B	468	Total	C	N	O	S	0	0	0
			3764	2414	636	699	15			

- Molecule 2 is water.

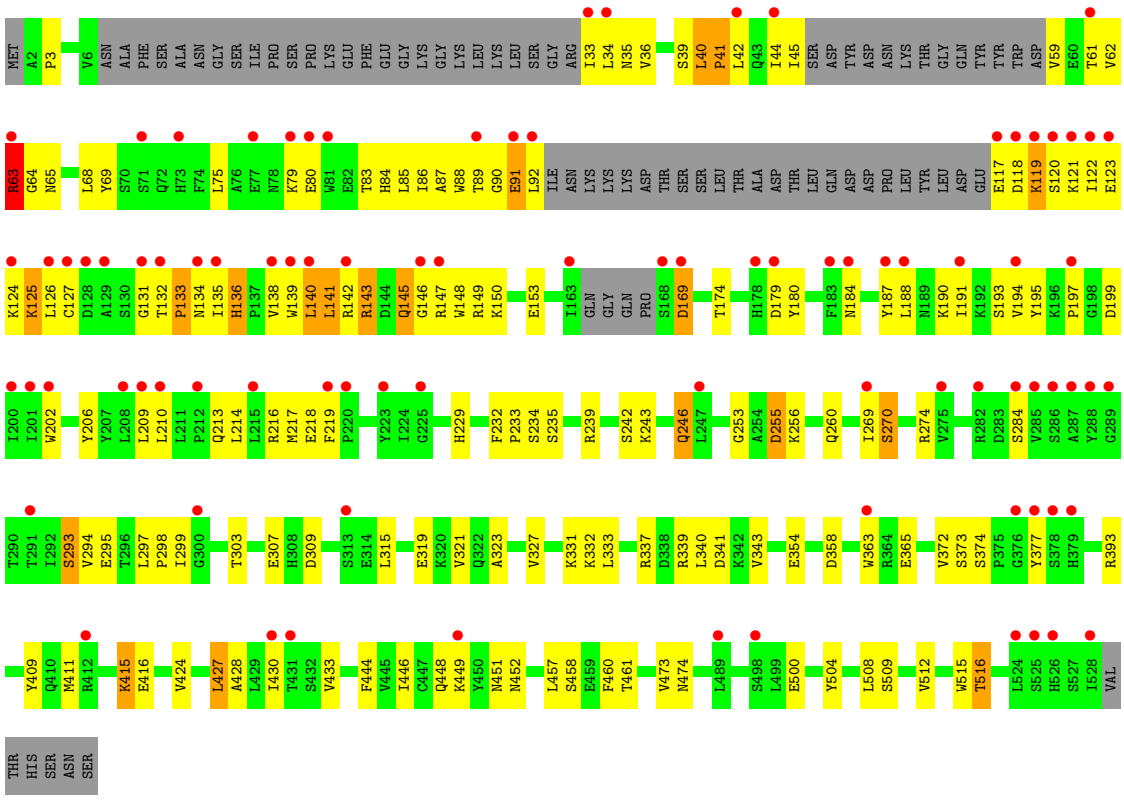
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	27	Total	O	0	0
			27	27		
2	B	71	Total	O	0	0
			71	71		

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.

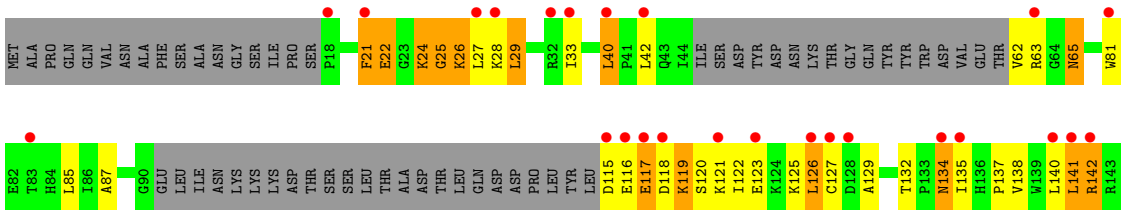
• Molecule 1: trehalose-6-phosphate phosphatase

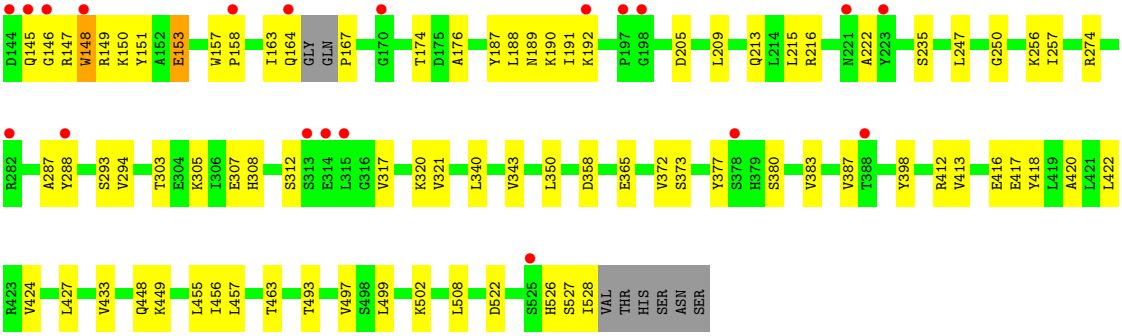
Chain A:



• Molecule 1: trehalose-6-phosphate phosphatase

Chain B:




D144 Q145 G146 R147 W148 R149 K150 Y151 A152 E153 W157 P158 I163 Q164 GLY GLN P167 G170 T174 D175 A176 Y187 L188 N189 K190 I191 K192 P197 G198 D205 L209 Q213 L214 L215 R216 N221 A222 Y223 S235 L247 G250 K256 I257 R274
R282 A287 Y288 S293 V294 T303 E304 K305 I306 E307 H308 S312 S313 E314 L315 G316 V317 K320 V321 L340 V343 L350 D358 E365 V372 S373 Y377 S378 H379 S380 V383 V387 T388 Y398 R412 V413 E416 E417 Y418 L419 A420 L421 L422
R423 V424 L427 V433 Q448 K449 L455 I456 L457 T463 T493 V497 S498 L499 K502 L508 D522 S525 H526 S527 I528 VAL THR HIS SER ASN SER

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 61 2 2	Depositor
Cell constants a, b, c, α, β, γ	98.31Å 98.31Å 452.83Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	48.87 – 2.56 49.16 – 2.56	Depositor EDS
% Data completeness (in resolution range)	97.6 (48.87-2.56) 93.8 (49.16-2.56)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.10 (at 2.58Å)	Xtriage
Refinement program	PHENIX	Depositor
R, R_{free}	0.266 , 0.298 0.292 , 0.315	Depositor DCC
R_{free} test set	2000 reflections (4.76%)	wwPDB-VP
Wilson B-factor (Å^2)	48.5	Xtriage
Anisotropy	0.378	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 55.8	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.89	EDS
Total number of atoms	7549	wwPDB-VP
Average B, all atoms (Å^2)	59.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.54% 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	0.43	3/3766 (0.1%)	0.57	5/5102 (0.1%)
1	B	0.29	0/3847	0.52	2/5204 (0.0%)
All	All	0.37	3/7613 (0.0%)	0.54	7/10306 (0.1%)

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
1	B	0	1
All	All	0	3

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	233	PRO	N-CD	5.33	1.55	1.47
1	A	41	PRO	N-CD	5.13	1.55	1.47
1	A	298	PRO	N-CD	5.08	1.54	1.47

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	25	GLY	N-CA-C	5.96	127.99	113.10
1	A	136	HIS	C-N-CD	5.91	140.80	128.40
1	A	3	PRO	N-CA-CB	5.84	110.31	103.30
1	A	297	LEU	C-N-CD	5.76	140.50	128.40
1	A	40	LEU	C-N-CD	5.56	140.07	128.40
1	A	232	PHE	C-N-CD	5.46	139.87	128.40
1	B	63	ARG	NE-CZ-NH1	5.23	122.92	120.30

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	127	CYS	Peptide
1	A	63	ARG	Peptide
1	B	24	LYS	Peptide

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	3687	0	3675	181	0
1	B	3764	0	3770	88	0
2	A	27	0	0	3	0
2	B	71	0	0	1	0
All	All	7549	0	7445	269	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 18.

All (269) 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:256:LYS:NZ	1:A:295:GLU:OE2	1.74	1.21
1:A:147:ARG:CG	1:A:179:ASP:OD2	1.88	1.20
1:B:122:ILE:O	1:B:126:LEU:HD21	1.40	1.19
1:A:62:VAL:O	1:A:64:GLY:N	1.82	1.12
1:A:44:ILE:HB	1:A:91:GLU:HG3	1.24	1.07
1:A:40:LEU:HD12	1:A:87:ALA:HB3	1.26	1.07
1:B:126:LEU:HD23	1:B:126:LEU:H	1.19	1.06
1:A:61:THR:CG2	1:A:63:ARG:HB2	1.88	1.04
1:A:147:ARG:HG3	1:A:179:ASP:OD2	1.55	1.02
1:A:134:ASN:O	1:A:136:HIS:CD2	2.15	0.98
1:A:415:LYS:H	1:A:415:LYS:HD2	1.28	0.97
1:B:118:ASP:HA	1:B:121:LYS:HG2	1.48	0.95
1:A:213:GLN:HE21	1:A:217:MET:HG2	1.32	0.94
1:A:142:ARG:HH22	1:A:143:ARG:HH21	1.15	0.93
1:A:85:LEU:HB3	1:A:135:ILE:HG23	1.52	0.92

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:40:LEU:HD12	1:A:87:ALA:CB	1.98	0.92
1:A:142:ARG:HG3	1:A:142:ARG:HH11	1.35	0.90
1:A:44:ILE:CB	1:A:91:GLU:HG3	2.02	0.90
1:B:40:LEU:HD13	1:B:87:ALA:HB3	1.55	0.89
1:A:40:LEU:CD1	1:A:87:ALA:HB3	2.02	0.89
1:B:122:ILE:O	1:B:126:LEU:CD2	2.22	0.88
1:B:42:LEU:HD12	1:B:62:VAL:HG11	1.54	0.88
1:B:116:GLU:HA	1:B:121:LYS:HE2	1.56	0.85
1:A:246:GLN:N	1:A:246:GLN:OE1	2.08	0.85
1:B:21:PHE:HD1	1:B:81:TRP:CD1	1.94	0.84
1:A:86:ILE:HD13	1:A:191:ILE:HG12	1.59	0.83
1:B:120:SER:HA	1:B:123:GLU:HG2	1.60	0.83
1:B:85:LEU:HB3	1:B:135:ILE:HG22	1.61	0.83
1:A:142:ARG:HG2	1:A:143:ARG:N	1.95	0.81
1:A:149:ARG:HH11	1:A:149:ARG:HG3	1.44	0.81
1:A:147:ARG:CD	1:A:179:ASP:OD2	2.28	0.81
1:A:44:ILE:HB	1:A:91:GLU:CG	2.07	0.80
1:A:62:VAL:C	1:A:64:GLY:H	1.86	0.79
1:A:125:LYS:NZ	1:A:125:LYS:HB2	1.98	0.79
1:A:415:LYS:H	1:A:415:LYS:CD	1.94	0.79
1:A:147:ARG:HG2	1:A:179:ASP:OD2	1.83	0.78
1:A:235:SER:OG	1:A:274:ARG:NH1	2.15	0.78
1:A:120:SER:HA	1:A:123:GLU:HG3	1.66	0.78
1:A:136:HIS:HD1	1:A:194:VAL:HG21	1.49	0.78
1:A:61:THR:HG22	1:A:63:ARG:HB2	1.65	0.77
1:A:187:TYR:O	1:A:191:ILE:HG13	1.86	0.76
1:A:512:VAL:O	1:A:516:THR:HG22	1.85	0.76
1:B:146:GLY:O	1:B:150:LYS:N	2.16	0.75
1:A:452:ASN:HA	1:A:500:GLU:HG3	1.67	0.75
1:A:41:PRO:O	1:A:61:THR:HB	1.88	0.74
1:B:21:PHE:CD1	1:B:81:TRP:CD1	2.75	0.74
1:A:141:LEU:N	1:A:141:LEU:HD23	2.03	0.73
1:A:147:ARG:HG3	1:A:179:ASP:CG	2.10	0.72
1:B:358:ASP:OD1	1:B:398:TYR:OH	2.08	0.72
1:A:169:ASP:OD1	1:A:169:ASP:N	2.23	0.71
1:A:141:LEU:HD23	1:A:141:LEU:H	1.53	0.71
1:A:142:ARG:HG3	1:A:142:ARG:NH1	1.97	0.71
1:B:149:ARG:NH1	1:B:377:TYR:OH	2.24	0.71
1:A:33:ILE:C	1:A:34:LEU:HD23	2.12	0.70
1:A:145:GLN:O	1:A:147:ARG:N	2.26	0.69
1:A:142:ARG:HH12	1:A:143:ARG:NH2	1.91	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:40:LEU:HB2	1:A:89:THR:HG22	1.73	0.68
1:A:122:ILE:HA	1:A:125:LYS:HG2	1.74	0.68
1:A:136:HIS:ND1	1:A:194:VAL:HG21	2.09	0.68
1:A:36:VAL:HG23	1:A:202:TRP:O	1.96	0.66
1:B:158:PRO:HB3	1:B:163:ILE:HB	1.78	0.65
1:B:126:LEU:H	1:B:126:LEU:CD2	1.93	0.65
1:A:415:LYS:HD2	1:A:415:LYS:N	2.09	0.65
1:A:339:ARG:HG2	1:A:374:SER:HB2	1.79	0.64
1:A:134:ASN:O	1:A:136:HIS:HD2	1.75	0.64
1:A:218:GLU:C	1:A:219:PHE:HD1	2.01	0.64
1:A:65:ASN:HB2	1:A:69:TYR:CE2	2.33	0.63
1:A:84:HIS:HD2	1:A:136:HIS:NE2	1.97	0.63
1:B:321:VAL:HG13	1:B:424:VAL:HG22	1.81	0.62
1:A:61:THR:HG23	1:A:63:ARG:HB2	1.75	0.62
1:A:147:ARG:HD2	1:A:179:ASP:OD2	1.99	0.62
1:A:303:THR:HG23	1:A:446:ILE:HD11	1.82	0.62
1:B:118:ASP:O	1:B:121:LYS:HB2	1.98	0.62
1:A:40:LEU:HB2	1:A:89:THR:CG2	2.28	0.62
1:A:134:ASN:O	1:A:136:HIS:NE2	2.33	0.62
1:A:512:VAL:O	1:A:516:THR:CG2	2.49	0.61
1:A:195:TYR:CE1	1:A:199:ASP:HB2	2.36	0.61
1:A:303:THR:HG23	1:A:446:ILE:CD1	2.31	0.61
1:A:142:ARG:HH22	1:A:143:ARG:NH2	1.91	0.60
1:A:331:LYS:NZ	1:A:365:GLU:O	2.33	0.60
1:B:118:ASP:HA	1:B:121:LYS:CG	2.28	0.60
1:A:427:LEU:HD22	1:A:428:ALA:N	2.16	0.60
1:A:117:GLU:O	1:A:120:SER:HB2	2.02	0.60
1:A:45:ILE:HG22	1:A:45:ILE:O	2.02	0.59
1:A:122:ILE:HG23	1:A:125:LYS:HG2	1.84	0.59
1:A:243:LYS:HB3	1:A:246:GLN:HG2	1.84	0.59
1:B:320:LYS:HE2	1:B:417:GLU:HG3	1.84	0.59
1:A:44:ILE:HG22	1:A:44:ILE:O	2.02	0.59
1:A:142:ARG:NH2	1:A:143:ARG:HH21	1.94	0.59
1:A:321:VAL:HG13	1:A:424:VAL:HG22	1.85	0.58
1:A:451:ASN:ND2	2:A:607:HOH:O	2.35	0.58
1:A:61:THR:HG22	1:A:63:ARG:H	1.68	0.58
1:A:243:LYS:O	1:A:246:GLN:HG2	2.03	0.58
1:B:65:ASN:OD1	1:B:65:ASN:N	2.37	0.58
1:A:88:TRP:CZ2	1:A:90:GLY:HA3	2.39	0.58
1:B:164:GLN:HG2	1:B:167:PRO:HG3	1.84	0.58
1:A:149:ARG:HH11	1:A:149:ARG:CG	2.15	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:87:ALA:O	1:A:138:VAL:HG23	2.04	0.58
1:A:136:HIS:CD2	1:A:136:HIS:N	2.72	0.58
1:A:34:LEU:HD22	1:A:84:HIS:HB2	1.85	0.57
1:A:180:TYR:OH	1:A:206:TYR:O	2.20	0.57
1:A:39:SER:HA	1:A:88:TRP:O	2.04	0.57
1:B:151:TYR:HB2	1:B:176:ALA:HB1	1.87	0.56
1:A:68:LEU:HD13	1:A:229:HIS:CE1	2.40	0.56
1:B:26:LYS:HG2	1:B:27:LEU:HG	1.86	0.56
1:B:380:SER:O	1:B:383:VAL:HB	2.06	0.56
1:A:255:ASP:OD2	1:A:255:ASP:N	2.38	0.56
1:A:140:LEU:HD23	1:A:148:TRP:CD2	2.41	0.56
1:A:147:ARG:HA	1:A:150:LYS:HG3	1.88	0.56
1:B:21:PHE:HD1	1:B:81:TRP:HD1	1.51	0.56
1:B:132:THR:HG21	1:B:135:ILE:HG23	1.87	0.56
1:A:132:THR:N	1:A:133:PRO:HA	2.21	0.55
1:A:332:LYS:HG3	1:A:363:TRP:HZ3	1.71	0.55
1:B:141:LEU:O	1:B:142:ARG:CB	2.54	0.55
1:A:142:ARG:NH2	1:A:143:ARG:HE	2.04	0.55
1:A:92:LEU:HD23	1:A:92:LEU:C	2.26	0.55
1:A:216:ARG:O	1:A:219:PHE:O	2.25	0.55
1:A:145:GLN:C	1:A:147:ARG:H	2.09	0.55
1:A:125:LYS:HB2	1:A:125:LYS:HZ2	1.70	0.55
1:A:44:ILE:CG2	1:A:91:GLU:HG3	2.37	0.54
1:A:354:GLU:OE1	1:A:393:ARG:NH1	2.41	0.54
1:B:502:LYS:NZ	2:B:605:HOH:O	2.41	0.54
1:B:120:SER:HA	1:B:123:GLU:CG	2.36	0.54
1:A:117:GLU:O	1:A:120:SER:N	2.37	0.54
1:B:40:LEU:CD1	1:B:87:ALA:HB3	2.34	0.54
1:A:44:ILE:HA	1:A:45:ILE:HD12	1.89	0.54
1:A:149:ARG:HG3	1:A:149:ARG:NH1	2.19	0.54
1:B:457:LEU:HD21	1:B:463:THR:HG23	1.89	0.54
1:B:412:ARG:NH1	1:B:413:VAL:O	2.42	0.53
1:A:218:GLU:HG3	1:A:219:PHE:CE1	2.43	0.53
1:B:256:LYS:HE2	1:B:522:ASP:HB3	1.90	0.53
1:B:118:ASP:O	1:B:122:ILE:HD12	2.07	0.53
1:A:140:LEU:HB3	1:A:148:TRP:CZ2	2.44	0.53
1:B:21:PHE:CD1	1:B:81:TRP:HD1	2.24	0.52
1:B:216:ARG:NH2	1:B:222:ALA:O	2.43	0.52
1:B:141:LEU:O	1:B:142:ARG:HB3	2.10	0.52
1:A:147:ARG:CG	1:A:179:ASP:CG	2.72	0.52
1:A:427:LEU:CD2	1:A:428:ALA:N	2.73	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:219:PHE:N	1:A:219:PHE:CD1	2.77	0.52
1:B:213:GLN:HB2	1:B:250:GLY:HA2	1.91	0.51
1:A:75:LEU:HB3	1:A:83:THR:OG1	2.11	0.51
1:A:141:LEU:H	1:A:141:LEU:CD2	2.16	0.51
1:B:188:LEU:HD12	1:B:215:LEU:HD23	1.92	0.51
1:A:343:VAL:O	1:A:433:VAL:N	2.42	0.51
1:A:430:ILE:HB	1:A:457:LEU:HD12	1.93	0.51
1:A:145:GLN:C	1:A:147:ARG:N	2.62	0.51
1:B:140:LEU:HB3	1:B:148:TRP:CZ2	2.45	0.51
1:A:33:ILE:O	1:A:34:LEU:HD23	2.11	0.50
1:A:34:LEU:HD23	1:A:34:LEU:N	2.26	0.50
1:A:123:GLU:O	1:A:126:LEU:HB3	2.11	0.50
1:A:427:LEU:CD2	1:A:428:ALA:H	2.25	0.50
1:A:149:ARG:CG	1:A:149:ARG:NH1	2.74	0.50
1:B:129:ALA:HB1	1:B:134:ASN:OD1	2.11	0.50
1:B:125:LYS:HD3	1:B:137:PRO:HD2	1.94	0.50
1:B:153:GLU:O	1:B:157:TRP:HB3	2.12	0.49
1:B:493:THR:O	1:B:497:VAL:HG12	2.12	0.49
1:A:88:TRP:CZ2	1:A:90:GLY:CA	2.96	0.49
1:A:218:GLU:O	1:A:219:PHE:HD1	1.94	0.49
1:B:21:PHE:CD2	1:B:21:PHE:N	2.73	0.49
1:B:117:GLU:N	1:B:117:GLU:OE1	2.46	0.48
1:B:420:ALA:O	1:B:424:VAL:HG23	2.13	0.48
1:B:116:GLU:HG2	1:B:141:LEU:HD11	1.95	0.48
1:A:120:SER:HA	1:A:123:GLU:CG	2.40	0.48
1:A:337:ARG:NH2	2:A:610:HOH:O	2.47	0.48
1:A:119:LYS:HD3	1:A:122:ILE:HD12	1.94	0.48
1:A:142:ARG:NH1	1:A:143:ARG:NH2	2.60	0.48
1:A:256:LYS:HD3	1:A:293:SER:HB3	1.96	0.48
1:A:427:LEU:HD22	1:A:428:ALA:O	2.13	0.48
1:A:65:ASN:HB2	1:A:69:TYR:CZ	2.49	0.48
1:A:309:ASP:HA	1:A:315:LEU:HD12	1.96	0.48
1:B:427:LEU:HD11	1:B:456:ILE:HG13	1.96	0.48
1:A:125:LYS:NZ	1:A:125:LYS:CB	2.73	0.47
1:B:307:GLU:OE1	1:B:449:LYS:NZ	2.42	0.47
1:A:218:GLU:OE2	1:A:218:GLU:HA	2.13	0.47
1:B:189:ASN:HA	1:B:192:LYS:HE2	1.96	0.47
1:B:209:LEU:HD12	1:B:247:LEU:HD22	1.96	0.47
1:B:138:VAL:HG22	1:B:190:LYS:HG3	1.97	0.47
1:B:422:LEU:O	1:B:448:GLN:NE2	2.48	0.47
1:A:139:TRP:C	1:A:140:LEU:HD13	2.35	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:229:HIS:HA	1:A:260:GLN:HE21	1.80	0.47
1:B:257:ILE:HB	1:B:294:VAL:HG12	1.96	0.47
1:B:122:ILE:O	1:B:122:ILE:HG22	2.16	0.46
1:A:142:ARG:HH11	1:A:142:ARG:CG	2.15	0.46
1:A:184:ASN:OD1	1:A:210:LEU:HB2	2.15	0.46
1:A:142:ARG:CG	1:A:143:ARG:N	2.73	0.46
1:B:118:ASP:CA	1:B:121:LYS:HG2	2.32	0.46
1:A:119:LYS:O	1:A:122:ILE:HB	2.16	0.46
1:B:119:LYS:HA	1:B:119:LYS:HD3	1.56	0.46
1:B:343:VAL:O	1:B:433:VAL:N	2.42	0.46
1:B:365:GLU:OE1	1:B:365:GLU:N	2.48	0.46
1:A:88:TRP:CG	1:A:89:THR:N	2.84	0.46
1:A:139:TRP:CD1	1:A:139:TRP:N	2.85	0.46
1:A:188:LEU:HD22	1:A:214:LEU:HB3	1.98	0.45
1:A:61:THR:HG22	1:A:63:ARG:CB	2.41	0.45
1:A:145:GLN:H	1:A:145:GLN:HG2	1.46	0.45
1:B:340:LEU:HG	1:B:373:SER:HB3	1.97	0.45
1:A:428:ALA:HB2	1:A:444:PHE:CE1	2.50	0.45
1:A:235:SER:O	1:A:239:ARG:HG3	2.17	0.45
1:A:340:LEU:HG	1:A:373:SER:HB2	1.98	0.45
1:A:142:ARG:NH2	1:A:143:ARG:NH2	2.60	0.45
1:A:218:GLU:C	1:A:219:PHE:CD1	2.85	0.45
1:B:416:GLU:CD	1:B:416:GLU:H	2.20	0.45
1:A:92:LEU:C	1:A:92:LEU:CD2	2.86	0.45
1:B:146:GLY:O	1:B:149:ARG:HB2	2.17	0.45
1:A:125:LYS:HB2	1:A:125:LYS:HZ3	1.75	0.45
1:A:140:LEU:HD13	1:A:140:LEU:N	2.33	0.45
1:A:269:ILE:HD11	1:A:294:VAL:HG21	1.99	0.44
1:B:412:ARG:CZ	1:B:413:VAL:O	2.65	0.44
1:A:458:SER:O	1:A:461:THR:HG22	2.16	0.44
1:B:418:TYR:CZ	1:B:422:LEU:HD11	2.52	0.44
1:A:307:GLU:OE1	1:A:449:LYS:NZ	2.35	0.44
1:A:195:TYR:CE2	1:A:197:PRO:HA	2.52	0.44
1:B:126:LEU:HG	1:B:127:CYS:H	1.82	0.44
1:A:504:TYR:CZ	1:A:508:LEU:HD11	2.53	0.44
1:B:235:SER:OG	1:B:274:ARG:NH1	2.49	0.44
1:A:299:ILE:HA	1:A:515:TRP:CD1	2.53	0.44
1:B:287:ALA:O	1:B:288:TYR:HB2	2.18	0.44
1:B:455:LEU:HD21	1:B:457:LEU:HD13	1.99	0.44
1:A:246:GLN:H	1:A:246:GLN:CD	2.06	0.43
1:A:323:ALA:O	1:A:327:VAL:HG23	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:118:ASP:O	1:A:121:LYS:HE2	2.18	0.43
1:A:140:LEU:N	1:A:140:LEU:CD1	2.82	0.43
1:A:120:SER:O	1:A:123:GLU:HB2	2.18	0.43
1:B:527:SER:O	1:B:528:ILE:HG13	2.18	0.43
1:A:409:TYR:OH	2:A:601:HOH:O	2.20	0.43
1:A:125:LYS:HG3	1:A:126:LEU:N	2.32	0.43
1:A:416:GLU:CD	1:A:416:GLU:H	2.22	0.43
1:A:190:LYS:O	1:A:193:SER:HB3	2.19	0.43
1:A:214:LEU:HD23	1:A:214:LEU:HA	1.77	0.42
1:B:157:TRP:HB3	1:B:158:PRO:HD3	2.00	0.42
1:B:29:LEU:HD12	1:B:29:LEU:HA	1.83	0.42
1:B:308:HIS:O	1:B:312:SER:HB2	2.19	0.42
1:A:216:ARG:NE	1:A:253:GLY:O	2.46	0.42
1:B:119:LYS:HD3	1:B:122:ILE:HD13	2.02	0.42
1:B:187:TYR:O	1:B:191:ILE:HG12	2.20	0.42
1:A:62:VAL:C	1:A:64:GLY:N	2.51	0.42
1:A:65:ASN:O	1:A:69:TYR:N	2.43	0.42
1:B:350:LEU:HD11	1:B:387:VAL:HG13	2.02	0.42
1:A:61:THR:HG22	1:A:63:ARG:N	2.34	0.42
1:A:139:TRP:O	1:A:140:LEU:HD12	2.20	0.41
1:A:206:TYR:HA	1:A:209:LEU:HG	2.01	0.41
1:A:216:ARG:HA	1:A:219:PHE:O	2.20	0.41
1:B:33:ILE:HG13	1:B:81:TRP:HB3	2.02	0.41
1:A:340:LEU:HD23	1:A:340:LEU:HA	1.80	0.41
1:B:293:SER:HB2	1:B:526:HIS:CD2	2.56	0.41
1:A:256:LYS:NZ	1:A:295:GLU:CD	2.63	0.41
1:A:448:GLN:OE1	1:A:451:ASN:HB3	2.20	0.41
1:B:116:GLU:HA	1:B:121:LYS:CE	2.39	0.41
1:B:150:LYS:HA	1:B:150:LYS:HD3	1.84	0.41
1:A:35:ASN:O	1:A:85:LEU:HD12	2.20	0.41
1:B:22:GLU:OE1	1:B:24:LYS:NZ	2.51	0.41
1:B:115:ASP:O	1:B:116:GLU:HB2	2.21	0.41
1:B:303:THR:HG21	1:B:508:LEU:HG	2.02	0.41
1:A:270:SER:O	1:A:274:ARG:HG3	2.21	0.41
1:A:86:ILE:HA	1:A:136:HIS:O	2.21	0.41
1:A:88:TRP:CH2	1:A:90:GLY:HA3	2.55	0.41
1:B:118:ASP:O	1:B:121:LYS:CB	2.68	0.41
1:A:139:TRP:C	1:A:140:LEU:CD1	2.89	0.40
1:A:142:ARG:NH1	1:A:143:ARG:CZ	2.83	0.40
1:A:142:ARG:NH2	1:A:143:ARG:NE	2.69	0.40
1:A:44:ILE:O	1:A:45:ILE:C	2.59	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:124:LYS:HD3	1:A:124:LYS:HA	1.73	0.40
1:A:415:LYS:CD	1:A:415:LYS:N	2.73	0.40
1:A:460:PHE:HE2	1:A:474:ASN:OD1	2.04	0.40
1:A:149:ARG:O	1:A:153:GLU:HG2	2.21	0.40
1:A:149:ARG:HD3	1:A:377:TYR:HE2	1.86	0.40
1:B:499:LEU:HA	1:B:502:LYS:HE2	2.02	0.40
1:B:163:ILE:HD11	1:B:343:VAL:HG13	2.03	0.40
1:B:305:LYS:HB3	1:B:305:LYS:HE3	1.63	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	450/534 (84%)	427 (95%)	19 (4%)	4 (1%)	17	24
1	B	460/534 (86%)	434 (94%)	22 (5%)	4 (1%)	17	24
All	All	910/1068 (85%)	861 (95%)	41 (4%)	8 (1%)	17	24

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	63	ARG
1	A	133	PRO
1	B	147	ARG
1	A	146	GLY
1	B	142	ARG
1	B	153	GLU
1	A	131	GLY
1	B	25	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	409/478 (86%)	377 (92%)	32 (8%)	12 16
1	B	419/478 (88%)	401 (96%)	18 (4%)	29 39
All	All	828/956 (87%)	778 (94%)	50 (6%)	19 24

All (50) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	42	LEU
1	A	59	VAL
1	A	63	ARG
1	A	79	LYS
1	A	80	GLU
1	A	91	GLU
1	A	119	LYS
1	A	125	LYS
1	A	140	LEU
1	A	141	LEU
1	A	143	ARG
1	A	145	GLN
1	A	169	ASP
1	A	174	THR
1	A	234	SER
1	A	242	SER
1	A	246	GLN
1	A	255	ASP
1	A	270	SER
1	A	284	SER
1	A	293	SER
1	A	319	GLU
1	A	333	LEU
1	A	341	ASP
1	A	358	ASP
1	A	372	VAL
1	A	411	MET

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Mol	Chain	Res	Type
1	A	415	LYS
1	A	427	LEU
1	A	473	VAL
1	A	509	SER
1	A	516	THR
1	B	21	PHE
1	B	22	GLU
1	B	26	LYS
1	B	28	LYS
1	B	29	LEU
1	B	40	LEU
1	B	65	ASN
1	B	117	GLU
1	B	119	LYS
1	B	126	LEU
1	B	134	ASN
1	B	141	LEU
1	B	145	GLN
1	B	148	TRP
1	B	174	THR
1	B	205	ASP
1	B	317	VAL
1	B	372	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	84	HIS
1	A	451	ASN
1	A	526	HIS
1	B	213	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	460/534 (86%)	1.18	89 (19%) 1 1	33, 63, 108, 134	0
1	B	468/534 (87%)	0.74	45 (9%) 8 11	24, 43, 98, 130	0
All	All	928/1068 (86%)	0.96	134 (14%) 2 3	24, 56, 105, 134	0

All (134) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	132	THR	8.6
1	A	33	ILE	6.7
1	A	288	TYR	6.1
1	A	126	LEU	5.9
1	B	28	LYS	5.5
1	A	121	LYS	5.4
1	B	123	GLU	5.4
1	B	116	GLU	5.3
1	B	21	PHE	5.3
1	A	215	LEU	5.0
1	A	183	PHE	5.0
1	B	192	LYS	5.0
1	A	201	ILE	4.8
1	A	194	VAL	4.8
1	A	168	SER	4.8
1	A	191	ILE	4.7
1	A	289	GLY	4.5
1	A	524	LEU	4.5
1	A	489	LEU	4.4
1	B	42	LEU	4.4
1	B	221	ASN	4.4
1	B	126	LEU	4.3
1	A	147	ARG	4.3
1	A	44	ILE	4.2

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Mol	Chain	Res	Type	RSRZ
1	B	135	ILE	4.2
1	A	200	ILE	4.1
1	B	145	GLN	4.1
1	A	81	TRP	4.1
1	A	118	ASP	3.9
1	B	81	TRP	3.9
1	B	314	GLU	3.9
1	B	146	GLY	3.9
1	B	121	LYS	3.9
1	A	139	TRP	3.9
1	A	127	CYS	3.8
1	A	135	ILE	3.7
1	A	525	SER	3.6
1	A	131	GLY	3.6
1	A	138	VAL	3.6
1	A	120	SER	3.5
1	A	123	GLU	3.5
1	A	89	THR	3.5
1	A	34	LEU	3.4
1	A	223	TYR	3.4
1	A	80	GLU	3.4
1	A	197	PRO	3.4
1	A	528	ILE	3.3
1	B	525	SER	3.3
1	B	144	ASP	3.3
1	A	146	GLY	3.3
1	A	363	TRP	3.3
1	A	124	LYS	3.3
1	A	220	PRO	3.3
1	B	148	TRP	3.3
1	B	141	LEU	3.2
1	A	282	ARG	3.2
1	B	140	LEU	3.2
1	A	378	SER	3.2
1	A	122	ILE	3.2
1	B	83	THR	3.2
1	A	128	ASP	3.1
1	A	313	SER	3.1
1	A	291	THR	3.1
1	A	187	TYR	3.0
1	A	275	VAL	3.0
1	B	127	CYS	3.0

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Mol	Chain	Res	Type	RSRZ
1	A	134	ASN	3.0
1	A	61	THR	2.9
1	A	63	ARG	2.9
1	A	184	ASN	2.9
1	A	202	TRP	2.9
1	A	117	GLU	2.8
1	A	284	SER	2.8
1	A	287	ALA	2.8
1	A	169	ASP	2.8
1	A	42	LEU	2.8
1	B	117	GLU	2.8
1	A	79	LYS	2.8
1	A	188	LEU	2.8
1	B	313	SER	2.8
1	A	77	GLU	2.7
1	A	269	ILE	2.7
1	A	286	SER	2.7
1	A	219	PHE	2.7
1	B	282	ARG	2.7
1	A	225	GLY	2.6
1	B	198	GLY	2.6
1	B	197	PRO	2.6
1	A	376	GLY	2.6
1	A	119	LYS	2.6
1	B	32	ARG	2.6
1	B	388	THR	2.5
1	A	285	VAL	2.5
1	B	27	LEU	2.5
1	A	212	PRO	2.5
1	A	377	TYR	2.4
1	A	209	LEU	2.4
1	B	63	ARG	2.4
1	B	170	GLY	2.4
1	B	115	ASP	2.4
1	A	163	ILE	2.3
1	A	210	LEU	2.3
1	A	178	HIS	2.3
1	B	128	ASP	2.3
1	A	91	GLU	2.3
1	A	449	LYS	2.3
1	A	140	LEU	2.3
1	B	142	ARG	2.3

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Mol	Chain	Res	Type	RSRZ
1	B	33	ILE	2.3
1	A	498	SER	2.2
1	A	129	ALA	2.2
1	A	379	HIS	2.2
1	A	142	ARG	2.2
1	A	92	LEU	2.2
1	B	118	ASP	2.2
1	B	288	TYR	2.2
1	A	526	HIS	2.2
1	A	431	THR	2.2
1	A	208	LEU	2.2
1	A	300	GLY	2.2
1	B	158	PRO	2.1
1	B	134	ASN	2.1
1	A	247	LEU	2.1
1	B	40	LEU	2.1
1	B	315	LEU	2.1
1	A	412	ARG	2.1
1	B	223	TYR	2.1
1	A	73	HIS	2.1
1	B	378	SER	2.1
1	B	164	GLN	2.1
1	A	179	ASP	2.0
1	B	18	PRO	2.0
1	A	71	SER	2.0
1	A	430	ILE	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.