Full wwPDB X-ray Structure Validation Report (i)

Feb 1, 2016 – 07:37 AM GMT

PDB ID	:	3BH1
Title	:	Crystal structure of protein DIP2346 from Corynebacterium diphtheriae
Authors	:	Patskovsky, Y.; Sridhar, V.; Bonanno, J.B.; Gilmore, M.; Iizuka, M.; Groshong, C.; Gheyi, T.; Wasserman, S.R.; Sauder, J.M.; Burley, S.K.; Almo, S.C.; New York SGX Research Center for Structural Genomics (NYSGXRC)
Deposited on	:	2007-11-27
Resolution	:	2.51 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
http://wwpdb.org/validation/2016/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The following versions of software and data (see references (1)) were used in the production of this report:

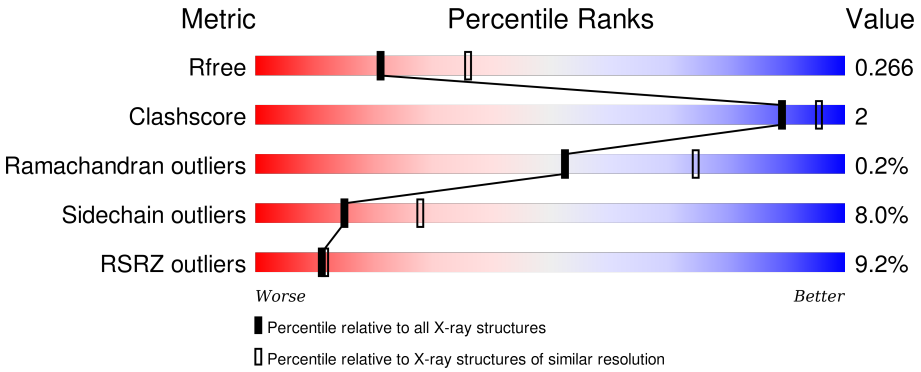
MolProbity	:	4.02b-467
Mogul	:	1.7 (RC4), CSD as536be (2015)
Xtriage (Phenix)	:	1.9-1692
EDS	:	rb-20026688
Percentile statistics	:	20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac	:	5.8.0135
CCP4	:	6.5.0
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	trunk26865

1 Overall quality at a glance (i)

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

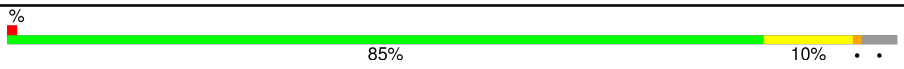
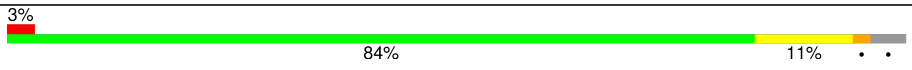
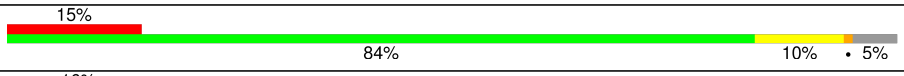
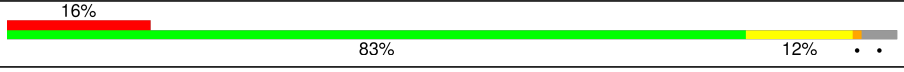
The reported resolution of this entry is 2.51 Å.

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}	91344	3553 (2.50-2.50)
Clashscore	102246	4242 (2.50-2.50)
Ramachandran outliers	100387	4156 (2.50-2.50)
Sidechain outliers	100360	4158 (2.50-2.50)
RSRZ outliers	91569	3562 (2.50-2.50)

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. 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	507	
1	B	507	
1	C	507	
1	D	507	

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 15333 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 UPF0371 protein DIP2346.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	486	Total	C	N	O	S	0	7	0
			3811	2384	677	733	17			
1	B	486	Total	C	N	O	S	0	7	0
			3819	2387	679	736	17			
1	C	483	Total	C	N	O	S	0	3	0
			3771	2359	672	722	18			
1	D	487	Total	C	N	O	S	0	2	0
			3791	2369	674	731	17			

There are 44 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	MET	-	EXPRESSION TAG	UNP Q6NEC9
A	0	SER	-	EXPRESSION TAG	UNP Q6NEC9
A	1	LEU	-	EXPRESSION TAG	UNP Q6NEC9
A	498	GLU	-	EXPRESSION TAG	UNP Q6NEC9
A	499	GLY	-	EXPRESSION TAG	UNP Q6NEC9
A	500	HIS	-	EXPRESSION TAG	UNP Q6NEC9
A	501	HIS	-	EXPRESSION TAG	UNP Q6NEC9
A	502	HIS	-	EXPRESSION TAG	UNP Q6NEC9
A	503	HIS	-	EXPRESSION TAG	UNP Q6NEC9
A	504	HIS	-	EXPRESSION TAG	UNP Q6NEC9
A	505	HIS	-	EXPRESSION TAG	UNP Q6NEC9
B	-1	MET	-	EXPRESSION TAG	UNP Q6NEC9
B	0	SER	-	EXPRESSION TAG	UNP Q6NEC9
B	1	LEU	-	EXPRESSION TAG	UNP Q6NEC9
B	498	GLU	-	EXPRESSION TAG	UNP Q6NEC9
B	499	GLY	-	EXPRESSION TAG	UNP Q6NEC9
B	500	HIS	-	EXPRESSION TAG	UNP Q6NEC9
B	501	HIS	-	EXPRESSION TAG	UNP Q6NEC9
B	502	HIS	-	EXPRESSION TAG	UNP Q6NEC9
B	503	HIS	-	EXPRESSION TAG	UNP Q6NEC9
B	504	HIS	-	EXPRESSION TAG	UNP Q6NEC9

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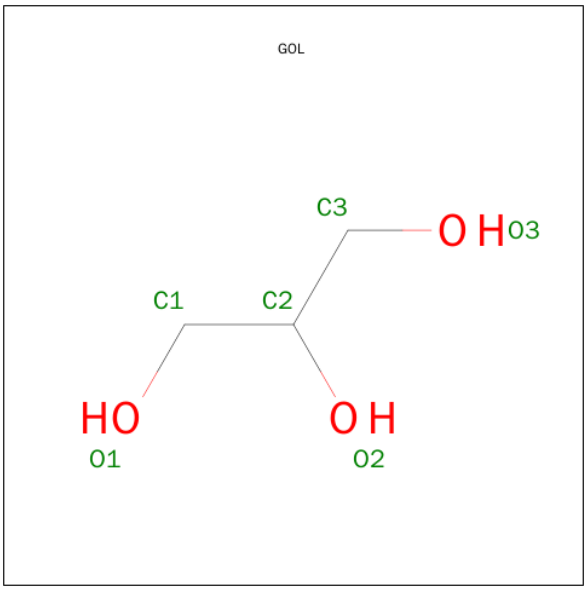
Chain	Residue	Modelled	Actual	Comment	Reference
B	505	HIS	-	EXPRESSION TAG	UNP Q6NEC9
C	-1	MET	-	EXPRESSION TAG	UNP Q6NEC9
C	0	SER	-	EXPRESSION TAG	UNP Q6NEC9
C	1	LEU	-	EXPRESSION TAG	UNP Q6NEC9
C	498	GLU	-	EXPRESSION TAG	UNP Q6NEC9
C	499	GLY	-	EXPRESSION TAG	UNP Q6NEC9
C	500	HIS	-	EXPRESSION TAG	UNP Q6NEC9
C	501	HIS	-	EXPRESSION TAG	UNP Q6NEC9
C	502	HIS	-	EXPRESSION TAG	UNP Q6NEC9
C	503	HIS	-	EXPRESSION TAG	UNP Q6NEC9
C	504	HIS	-	EXPRESSION TAG	UNP Q6NEC9
C	505	HIS	-	EXPRESSION TAG	UNP Q6NEC9
D	-1	MET	-	EXPRESSION TAG	UNP Q6NEC9
D	0	SER	-	EXPRESSION TAG	UNP Q6NEC9
D	1	LEU	-	EXPRESSION TAG	UNP Q6NEC9
D	498	GLU	-	EXPRESSION TAG	UNP Q6NEC9
D	499	GLY	-	EXPRESSION TAG	UNP Q6NEC9
D	500	HIS	-	EXPRESSION TAG	UNP Q6NEC9
D	501	HIS	-	EXPRESSION TAG	UNP Q6NEC9
D	502	HIS	-	EXPRESSION TAG	UNP Q6NEC9
D	503	HIS	-	EXPRESSION TAG	UNP Q6NEC9
D	504	HIS	-	EXPRESSION TAG	UNP Q6NEC9
D	505	HIS	-	EXPRESSION TAG	UNP Q6NEC9

- Molecule 2 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



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

- Molecule 3 is water.

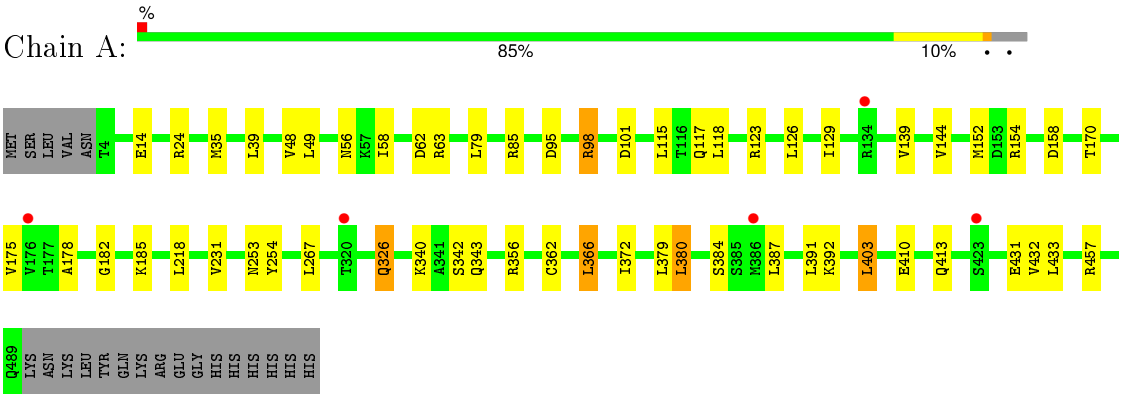
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	47	Total O 47 47	0	0
3	B	35	Total O 35 35	0	0
3	C	29	Total O 29 29	0	0
3	D	6	Total O 6 6	0	0

3 Residue-property plots (i)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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.

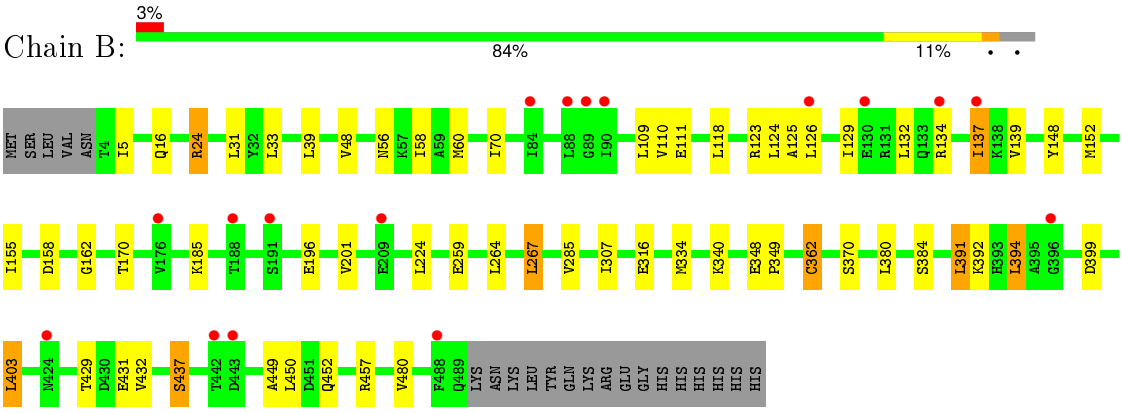
- Molecule 1: UPF0371 protein DIP2346

Chain A:



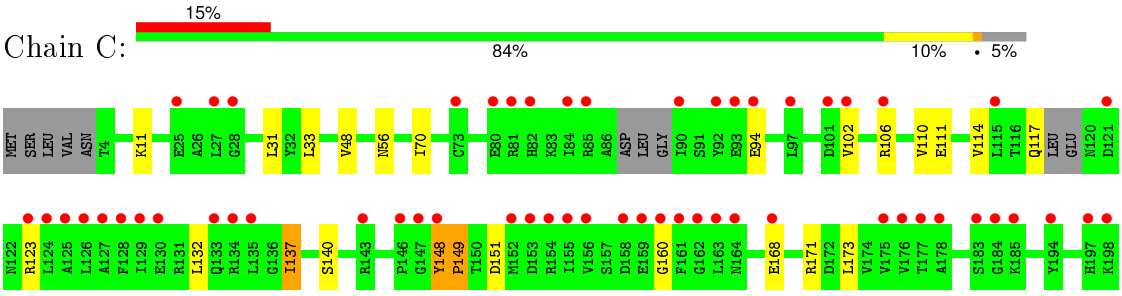
- Molecule 1: UPF0371 protein DIP2346

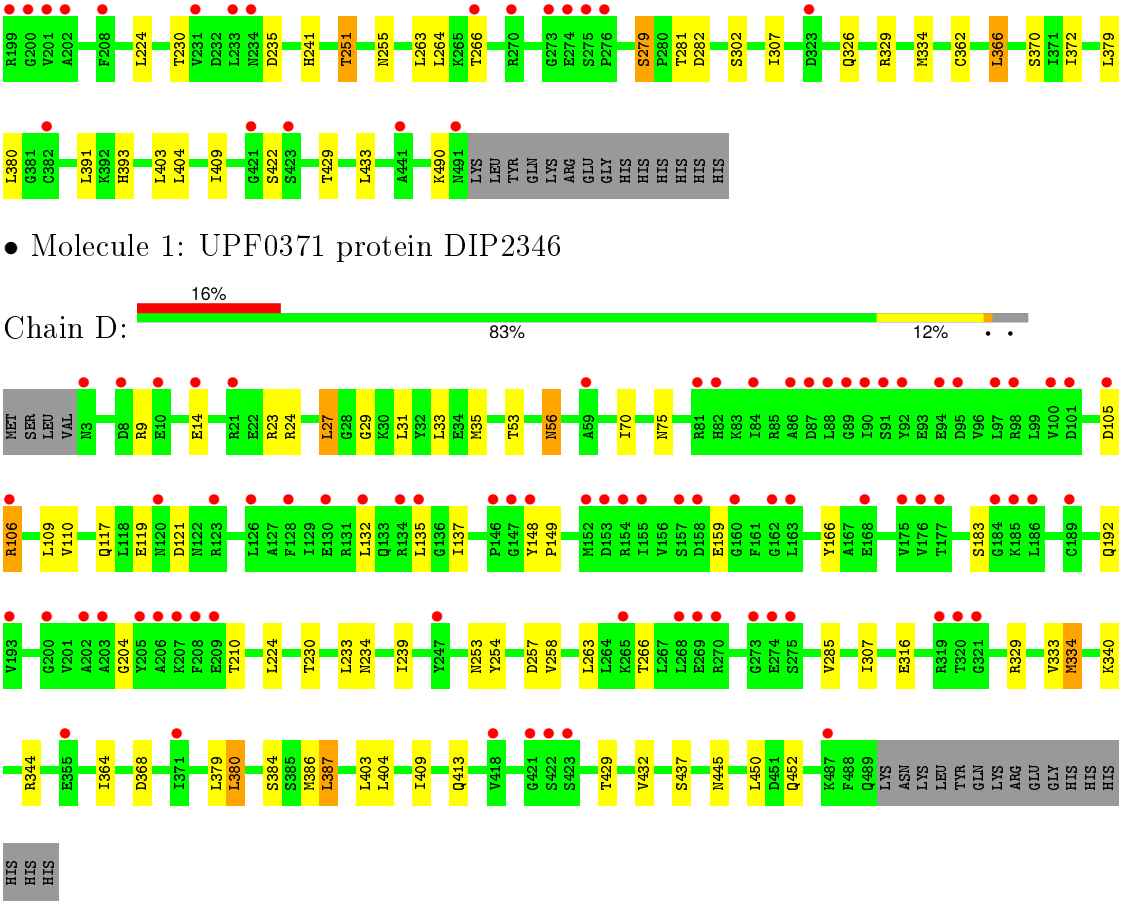
Chain B:



- Molecule 1: UPF0371 protein DIP2346

Chain C:




R199 G200 V201 A202 F208 L224 T230 V231 D232 L233 N234 D235 H241 T251 N255 L263 L264 K265 T266 R270 G273 E274 S275 P276 S279 P280 T281 D282 S302 I307 D323 Q326 R329 M334 C362 L366 S370 I371 I372 L379
L380 G381 C382 L391 K392 H393 L403 L404 I409 G421 S422 S423 T429 L433 A441 K490 N491 LYS LEU TYR GLN LYS ARG GLU GLY HIS HIS HIS HIS HIS HIS HIS HIS
• Molecule 1: UPF0371 protein DIP2346
Chain D:
16%
83%
12%
MET SER LEU VAL N3 D8 R9 E10 E14 R21 E22 R23 R24 L27 G28 G29 K30 L31 Y32 L33 E34 M35 T53 N56 A59 I70 N75 R81 H82 K83 I84 R85 A86 D87 L88 G89 I90 S91 Y92 E93 E94 D95 V96 L97 R98 L99 V100 D101 D105
R106 L109 V110 Q117 L118 E119 N120 D121 N122 R123 L126 A127 F128 I129 E130 R131 L132 Q133 R134 L135 G136 I137 P146 G147 Y148 P149 M152 D153 R154 I155 V156 S157 D158 E159 G160 F161 G162 L163 Y166 A167 E168 V175 V176 T177 S183 G184 K185 L186 C189 Q192
V193 G200 V201 A202 A203 G204 Y205 A206 K207 F208 E209 T210 L224 T230 L233 N234 I239 Y247 N253 Y254 D257 V258 L263 L264 K265 T266 L267 L268 E269 R270 G273 E274 S275 V285 I307 E316 R319 T320 G321 R329 V333 M334 K340
R344 E355 I364 D368 I371 L379 L380 S384 S385 M386 L387 L403 L404 I409 Q413 V418 G421 S422 S423 T429 V432 S437 N445 L450 D451 Q452 K487 F488 Q489 LYS ASN LYS LEU TYR GLN LYS ARG GLU GLY HIS HIS HIS
HIS HIS HIS

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	95.45Å 138.94Å 98.27Å 90.00° 116.49° 90.00°	Depositor
Resolution (Å)	20.00 – 2.51 34.27 – 2.51	Depositor EDS
% Data completeness (in resolution range)	98.7 (20.00-2.51) 98.7 (34.27-2.51)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	0.08	Depositor
$< I/\sigma(I) >$ [1]	1.50 (at 2.51Å)	Xtriage
Refinement program	REFMAC 5.3.0034	Depositor
R, R_{free}	0.211 , 0.271 0.212 , 0.266	Depositor DCC
R_{free} test set	1542 reflections (2.04%)	DCC
Wilson B-factor (Å^2)	55.4	Xtriage
Anisotropy	0.119	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 57.4	EDS
Estimated twinning fraction	0.018 for l,-k,h	Xtriage
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Outliers	1 of 77092 reflections (0.001%)	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	15333	wwPDB-VP
Average B, all atoms (Å^2)	62.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.16% 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, 0.375 respectively for untwinned datasets, and 0.333, 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: GOL

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	0.38	1/3893 (0.0%)	0.58	0/5269
1	B	0.38	1/3898 (0.0%)	0.59	0/5275
1	C	0.37	1/3839 (0.0%)	0.57	0/5191
1	D	0.37	1/3858 (0.0%)	0.54	0/5223
All	All	0.37	4/15488 (0.0%)	0.57	0/20958

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	362	CYS	CB-SG	-5.85	1.72	1.81
1	D	119	GLU	CD-OE2	5.10	1.31	1.25
1	C	362	CYS	CB-SG	-5.07	1.73	1.81
1	A	362	CYS	CB-SG	-5.04	1.73	1.81

There are no bond angle outliers.

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	3811	0	3831	18	0
1	B	3819	0	3829	20	0
1	C	3771	0	3787	16	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	3791	0	3794	20	0
2	A	12	0	16	1	0
2	B	12	0	16	1	0
3	A	47	0	0	0	0
3	B	35	0	0	0	0
3	C	29	0	0	1	0
3	D	6	0	0	0	0
All	All	15333	0	15273	73	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 2.

All (73) 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:152:MET:HE1	1:B:267:LEU:HA	1.55	0.87
1:A:253:ASN:HD22	1:A:254:TYR:H	1.34	0.73
1:B:384:SER:HB3	1:B:432:VAL:HG21	1.76	0.67
1:C:307:ILE:HG12	1:C:334:MET:HE2	1.78	0.66
1:A:182:GLY:H	2:A:506:GOL:H32	1.61	0.66
1:A:152:MET:HE1	1:A:267:LEU:HA	1.76	0.65
1:A:379:LEU:HG	1:A:380:LEU:HD13	1.79	0.65
1:A:253:ASN:ND2	1:A:254:TYR:H	1.96	0.63
1:A:384:SER:HB3	1:A:432:VAL:HG21	1.81	0.62
1:A:117:GLN:HG3	1:A:144:VAL:HG22	1.80	0.62
1:B:348:GLU:HG2	1:B:349:PRO:HD3	1.81	0.61
1:C:393:HIS:CD2	3:C:529:HOH:O	2.57	0.56
1:D:24:ARG:HB3	1:D:31:LEU:HB2	1.87	0.56
1:B:39:LEU:HB3	1:B:58:ILE:HD11	1.88	0.55
1:A:340:LYS:HG3	1:A:342:SER:H	1.72	0.55
1:A:129:ILE:HG12	1:A:139:VAL:HG11	1.90	0.53
1:B:132:LEU:HD22	1:B:137:ILE:HD11	1.89	0.53
1:B:307:ILE:HG12	1:B:334:MET:HE3	1.89	0.53
1:B:196:GLU:HG3	1:B:201:VAL:HB	1.90	0.53
1:D:27:LEU:HD12	1:D:204:GLY:HA3	1.92	0.51
1:C:111:GLU:HA	1:C:137:ILE:HG22	1.93	0.50
1:A:35:MET:HG3	1:A:175:VAL:HG13	1.93	0.50
1:B:111:GLU:HA	1:B:137:ILE:HG22	1.94	0.49
1:B:394:LEU:HD13	1:B:452:GLN:HB3	1.95	0.48
1:C:279:SER:HB2	1:C:282:ASP:H	1.77	0.48
1:B:185:LYS:H	2:B:506:GOL:H12	1.79	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:132:LEU:HB3	1:D:137:ILE:HD11	1.96	0.47
1:C:251:THR:HG21	1:C:281:THR:HG21	1.95	0.47
1:D:253:ASN:HD22	1:D:258:VAL:HG23	1.78	0.47
1:A:326[A]:GLN:H	1:A:326[A]:GLN:HE21	1.61	0.47
1:B:125:ALA:O	1:B:129:ILE:HG12	2.14	0.47
1:D:379:LEU:HG	1:D:380:LEU:HD13	1.97	0.47
1:A:48:VAL:HG12	1:A:49:LEU:HG	1.97	0.47
1:D:384:SER:HB3	1:D:432:VAL:HG21	1.97	0.47
1:B:158:ASP:HA	1:B:162:GLY:HA3	1.96	0.47
1:B:70:ILE:HB	1:B:110:VAL:HG22	1.96	0.47
1:D:253:ASN:ND2	1:D:254:TYR:H	2.12	0.47
1:C:132:LEU:HB3	1:C:137:ILE:HG13	1.97	0.46
1:B:392:LYS:HG3	1:B:403:LEU:HD21	1.95	0.46
1:C:366:LEU:HD22	1:C:372:ILE:HD13	1.97	0.46
1:A:39:LEU:HB3	1:A:58:ILE:HD11	1.97	0.46
1:C:379:LEU:HD11	1:C:409:ILE:HG21	1.97	0.46
1:D:166:TYR:HA	1:D:192:GLN:HE22	1.81	0.45
1:A:95:ASP:OD2	1:A:98:ARG:NH1	2.49	0.45
1:C:48:VAL:HG13	1:C:302:SER:HB3	1.98	0.45
1:B:148:TYR:HA	1:B:155:ILE:HD11	1.99	0.45
1:D:70:ILE:HB	1:D:110:VAL:HG22	1.99	0.45
1:C:149:PRO:HB2	1:C:263:LEU:HD13	1.99	0.45
1:C:70:ILE:HB	1:C:110:VAL:HG22	1.98	0.45
1:A:392:LYS:HG3	1:A:403:LEU:HD21	1.98	0.45
1:C:148:TYR:HB2	1:C:149:PRO:HD3	1.99	0.45
1:C:404:LEU:HB3	1:C:409:ILE:HD11	1.99	0.44
1:D:75:ASN:HB2	1:D:183:SER:HA	1.99	0.44
1:A:366:LEU:HD22	1:A:372:ILE:HD13	1.98	0.44
1:D:387:LEU:HA	1:D:387:LEU:HD23	1.83	0.44
1:B:307:ILE:HG12	1:B:334:MET:CE	2.46	0.44
1:C:241:HIS:HB3	1:D:239:ILE:HD11	1.98	0.44
1:D:53:THR:O	1:D:56:ASN:HB2	2.18	0.43
1:D:437:SER:HA	1:D:450:LEU:HD11	2.00	0.43
1:C:114:VAL:HG22	1:C:140:SER:HB2	2.01	0.43
1:B:437:SER:HA	1:B:450:LEU:HD11	2.00	0.43
1:D:148:TYR:HA	1:D:149:PRO:HA	1.87	0.43
1:B:391:LEU:HG	1:B:449:ALA:O	2.19	0.42
1:D:253:ASN:HD21	1:D:257:ASP:HB2	1.84	0.42
1:A:152:MET:HE1	1:A:267:LEU:CA	2.47	0.42
1:D:404:LEU:HB3	1:D:409:ILE:HD11	2.02	0.42
1:B:24:ARG:HB3	1:B:31:LEU:HB2	2.01	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:178:ALA:HB3	1:A:185[A]:LYS:HE2	2.02	0.41
1:D:307:ILE:HA	1:D:334:MET:HE3	2.04	0.40
1:C:31:LEU:HB3	1:C:173:LEU:HD12	2.02	0.40
1:D:364:ILE:HB	1:D:386:MET:SD	2.61	0.40
1:D:106[A]:ARG:H	1:D:106[A]:ARG:HG2	1.66	0.40
1:B:16:GLN:HB3	1:B:60:MET:HG3	2.03	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	491/507 (97%)	477 (97%)	14 (3%)	0	100	100
1	B	491/507 (97%)	479 (98%)	12 (2%)	0	100	100
1	C	480/507 (95%)	461 (96%)	17 (4%)	2 (0%)	39	61
1	D	487/507 (96%)	470 (96%)	16 (3%)	1 (0%)	52	75
All	All	1949/2028 (96%)	1887 (97%)	59 (3%)	3 (0%)	52	75

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	29	GLY
1	C	149	PRO
1	C	160	GLY

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	418/431 (97%)	386 (92%)	32 (8%)	16	30
1	B	418/431 (97%)	385 (92%)	33 (8%)	15	28
1	C	412/431 (96%)	380 (92%)	32 (8%)	16	29
1	D	414/431 (96%)	377 (91%)	37 (9%)	12	23
All	All	1662/1724 (96%)	1528 (92%)	134 (8%)	15	27

All (134) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	14	GLU
1	A	24	ARG
1	A	56	ASN
1	A	62	ASP
1	A	63	ARG
1	A	79	LEU
1	A	85	ARG
1	A	98	ARG
1	A	101	ASP
1	A	115	LEU
1	A	118	LEU
1	A	123	ARG
1	A	126	LEU
1	A	154	ARG
1	A	158	ASP
1	A	170	THR
1	A	218	LEU
1	A	231	VAL
1	A	326[A]	GLN
1	A	326[B]	GLN
1	A	343	GLN
1	A	356	ARG
1	A	366	LEU
1	A	380	LEU
1	A	387	LEU
1	A	391	LEU
1	A	403	LEU
1	A	410	GLU
1	A	413	GLN
1	A	431	GLU

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Mol	Chain	Res	Type
1	A	433	LEU
1	A	457	ARG
1	B	5	ILE
1	B	24	ARG
1	B	33	LEU
1	B	48	VAL
1	B	56	ASN
1	B	109	LEU
1	B	118	LEU
1	B	123	ARG
1	B	124	LEU
1	B	126	LEU
1	B	134	ARG
1	B	137	ILE
1	B	139	VAL
1	B	170	THR
1	B	224	LEU
1	B	259	GLU
1	B	264	LEU
1	B	267	LEU
1	B	285	VAL
1	B	316	GLU
1	B	340	LYS
1	B	362	CYS
1	B	370	SER
1	B	380	LEU
1	B	391	LEU
1	B	394	LEU
1	B	399	ASP
1	B	403	LEU
1	B	429	THR
1	B	431	GLU
1	B	437	SER
1	B	457	ARG
1	B	480	VAL
1	C	11	LYS
1	C	33	LEU
1	C	56	ASN
1	C	94	GLU
1	C	102	VAL
1	C	106	ARG
1	C	117	GLN

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Mol	Chain	Res	Type
1	C	123	ARG
1	C	137	ILE
1	C	148	TYR
1	C	151	ASP
1	C	168	GLU
1	C	171	ARG
1	C	224	LEU
1	C	230	THR
1	C	235	ASP
1	C	251	THR
1	C	255	ASN
1	C	264	LEU
1	C	266	THR
1	C	279	SER
1	C	326	GLN
1	C	329	ARG
1	C	366	LEU
1	C	370	SER
1	C	380	LEU
1	C	391	LEU
1	C	403	LEU
1	C	422	SER
1	C	429	THR
1	C	433	LEU
1	C	490	LYS
1	D	9	ARG
1	D	14	GLU
1	D	23	ARG
1	D	27	LEU
1	D	33	LEU
1	D	35	MET
1	D	56	ASN
1	D	105	ASP
1	D	106[A]	ARG
1	D	106[B]	ARG
1	D	109	LEU
1	D	117	GLN
1	D	121	ASP
1	D	135	LEU
1	D	159	GLU
1	D	210	THR
1	D	224	LEU

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Mol	Chain	Res	Type
1	D	230	THR
1	D	233	LEU
1	D	234	ASN
1	D	263	LEU
1	D	266	THR
1	D	285	VAL
1	D	316	GLU
1	D	329	ARG
1	D	333	VAL
1	D	334	MET
1	D	340	LYS
1	D	344	ARG
1	D	368	ASP
1	D	380	LEU
1	D	387	LEU
1	D	403	LEU
1	D	413	GLN
1	D	429	THR
1	D	445	ASN
1	D	452	GLN

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	253	ASN
1	A	413	GLN
1	A	445	ASN
1	B	352	GLN
1	C	142	HIS
1	C	253	ASN
1	C	352	GLN
1	C	445	ASN
1	D	253	ASN
1	D	413	GLN

5.3.3 RNA

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 carbohydrates in this entry.

5.6 Ligand geometry (i)

4 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	GOL	A	506	-	5,5,5	0.33	0	5,5,5	0.37	0
2	GOL	A	507	-	5,5,5	0.35	0	5,5,5	0.21	0
2	GOL	B	506	-	5,5,5	0.31	0	5,5,5	0.50	0
2	GOL	B	507	-	5,5,5	0.34	0	5,5,5	0.28	0

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	GOL	A	506	-	-	0/4/4/4	0/0/0/0
2	GOL	A	507	-	-	0/4/4/4	0/0/0/0
2	GOL	B	506	-	-	0/4/4/4	0/0/0/0
2	GOL	B	507	-	-	0/4/4/4	0/0/0/0

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	506	GOL	1	0
2	B	506	GOL	1	0

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	486/507 (95%)	0.15	5 (1%) 84 86	45, 58, 77, 109	0
1	B	486/507 (95%)	0.30	17 (3%) 48 53	40, 58, 85, 104	0
1	C	483/507 (95%)	0.79	77 (15%) 3 2	38, 60, 98, 121	0
1	D	487/507 (96%)	0.79	79 (16%) 3 2	36, 61, 88, 107	0
All	All	1942/2028 (95%)	0.51	178 (9%) 11 12	36, 59, 88, 121	0

All (178) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	124	LEU	6.6
1	C	130	GLU	6.3
1	D	84	ILE	6.2
1	C	128	PHE	6.2
1	C	97	LEU	6.1
1	C	161	PHE	6.0
1	C	234	ASN	5.9
1	C	106	ARG	5.7
1	C	127	ALA	5.7
1	D	185	LYS	5.6
1	C	148	TYR	5.2
1	C	198	LYS	5.1
1	C	147	GLY	5.1
1	C	156	VAL	5.0
1	D	146	PRO	5.0
1	C	273	GLY	5.0
1	C	231	VAL	4.9
1	C	275	SER	4.8
1	C	146	PRO	4.8
1	D	274	GLU	4.7
1	C	90	ILE	4.7

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Mol	Chain	Res	Type	RSRZ
1	C	123	ARG	4.7
1	C	201	VAL	4.6
1	D	273	GLY	4.6
1	C	121	ASP	4.6
1	C	134	ARG	4.6
1	C	233	LEU	4.6
1	C	154	ARG	4.5
1	C	153	ASP	4.5
1	D	90	ILE	4.4
1	D	81	ARG	4.4
1	C	155	ILE	4.3
1	D	147	GLY	4.3
1	C	158	ASP	4.3
1	C	84	ILE	4.3
1	D	88	LEU	4.2
1	C	177	THR	4.1
1	D	123	ARG	4.1
1	D	320	THR	4.1
1	C	82	HIS	4.1
1	B	134	ARG	4.1
1	D	155	ILE	3.9
1	C	491	ASN	3.9
1	C	270	ARG	3.9
1	C	274	GLU	3.9
1	C	125	ALA	3.9
1	D	157	SER	3.8
1	D	92	TYR	3.8
1	D	176	VAL	3.8
1	D	269	GLU	3.7
1	C	28	GLY	3.7
1	D	189	CYS	3.6
1	C	423	SER	3.6
1	D	101	ASP	3.5
1	D	268	LEU	3.5
1	C	135	LEU	3.5
1	D	135	LEU	3.5
1	C	200	GLY	3.5
1	C	202	ALA	3.5
1	D	162	GLY	3.4
1	C	178	ALA	3.4
1	B	84	ILE	3.4
1	C	93	GLU	3.4

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Mol	Chain	Res	Type	RSRZ
1	D	423	SER	3.4
1	D	355	GLU	3.4
1	D	87	ASP	3.4
1	B	130	GLU	3.3
1	D	86	ALA	3.3
1	D	128	PHE	3.3
1	C	160	GLY	3.2
1	D	91	SER	3.2
1	C	133	GLN	3.2
1	B	488	PHE	3.2
1	C	168	GLU	3.2
1	C	159	GLU	3.2
1	D	158	ASP	3.2
1	D	126	LEU	3.1
1	D	148	TYR	3.1
1	C	126	LEU	3.1
1	C	81	ARG	3.1
1	B	424	ASN	3.1
1	C	73	CYS	3.0
1	C	129	ILE	3.0
1	D	106[A]	ARG	3.0
1	C	152	MET	3.0
1	D	97	LEU	2.9
1	D	168	GLU	2.9
1	D	319	ARG	2.9
1	D	184	GLY	2.9
1	C	185	LYS	2.9
1	A	423[A]	SER	2.9
1	C	27	LEU	2.9
1	D	120	ASN	2.8
1	D	371	ILE	2.8
1	D	130	GLU	2.8
1	D	82	HIS	2.8
1	D	21	ARG	2.7
1	D	186	LEU	2.7
1	D	203	ALA	2.7
1	B	176	VAL	2.7
1	D	10	GLU	2.6
1	C	115	LEU	2.6
1	B	88	LEU	2.6
1	D	265	LYS	2.6
1	C	162	GLY	2.6

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Mol	Chain	Res	Type	RSRZ
1	B	90	ILE	2.5
1	B	137	ILE	2.5
1	C	176	VAL	2.5
1	D	208	PHE	2.5
1	C	276	PRO	2.5
1	D	89	GLY	2.5
1	D	207	LYS	2.5
1	D	59	ALA	2.5
1	D	98	ARG	2.5
1	C	194	TYR	2.5
1	D	321	GLY	2.5
1	C	102	VAL	2.4
1	D	134	ARG	2.4
1	D	270	ARG	2.4
1	D	275	SER	2.4
1	C	85	ARG	2.4
1	D	418	VAL	2.4
1	C	441	ALA	2.4
1	C	94	GLU	2.4
1	C	163	LEU	2.4
1	D	95	ASP	2.4
1	D	14	GLU	2.4
1	C	382	CYS	2.3
1	C	197	HIS	2.3
1	B	89	GLY	2.3
1	D	206	ALA	2.3
1	D	247	TYR	2.3
1	B	209[A]	GLU	2.3
1	C	80	GLU	2.3
1	B	188	THR	2.3
1	D	177	THR	2.3
1	D	209	GLU	2.3
1	C	184	GLY	2.3
1	A	386	MET	2.3
1	D	163	LEU	2.3
1	D	421	GLY	2.3
1	C	175	VAL	2.3
1	D	200	GLY	2.2
1	B	126	LEU	2.2
1	D	152	MET	2.2
1	D	202	ALA	2.2
1	C	183	SER	2.2

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Mol	Chain	Res	Type	RSRZ
1	D	8	ASP	2.2
1	C	266	THR	2.2
1	C	101	ASP	2.2
1	C	164	ASN	2.2
1	D	100	VAL	2.2
1	B	191	SER	2.1
1	D	94	GLU	2.1
1	D	205	TYR	2.1
1	D	154	ARG	2.1
1	A	320	THR	2.1
1	D	487	LYS	2.1
1	C	92	TYR	2.1
1	C	143	ARG	2.1
1	B	396	GLY	2.1
1	A	134	ARG	2.1
1	C	421	GLY	2.1
1	A	176	VAL	2.1
1	C	25	GLU	2.1
1	B	442	THR	2.1
1	D	153	ASP	2.1
1	D	3	ASN	2.0
1	D	175	VAL	2.0
1	D	193	VAL	2.0
1	D	132	LEU	2.0
1	C	199	ARG	2.0
1	B	443	ASP	2.0
1	C	323	ASP	2.0
1	D	105	ASP	2.0
1	C	208	PHE	2.0
1	D	160	GLY	2.0
1	D	422	SER	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 carbohydrates in this entry.

6.4 Ligands

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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å^2)	Q<0.9
2	GOL	A	506	6/6	0.96	0.23	-0.24	29,63,87,88	0
2	GOL	B	507	6/6	0.93	0.17	-0.26	50,60,83,94	0
2	GOL	B	506	6/6	0.91	0.17	-0.63	26,64,88,90	0
2	GOL	A	507	6/6	0.95	0.16	-0.75	47,61,68,79	0

6.5 Other polymers

There are no such residues in this entry.