



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 17, 2026 – 03:48 PM UTC

PDB ID : 4TQT / pdb_00004tqt
Title : Crystal structure of Dihydropyrimidinase from Brucella suis
Authors : Seattle Structural Genomics Center for Infectious Disease (SSGCID)
Deposited on : 2014-06-12
Resolution : 2.15 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	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.48.1

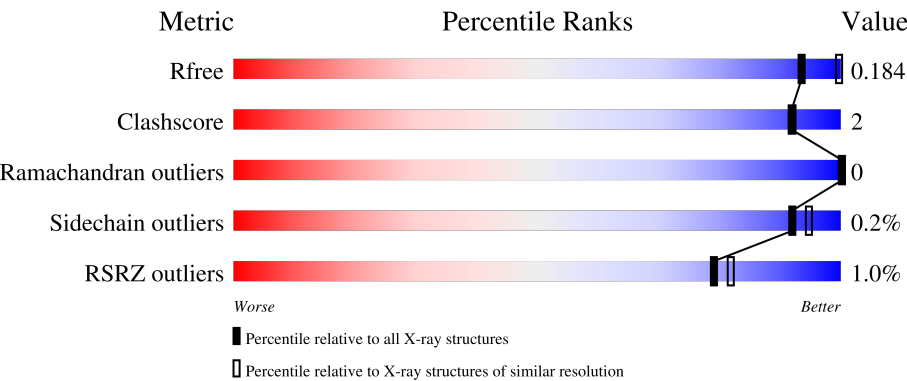
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.15 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}	164625	1881 (2.16-2.16)
Clashscore	180529	2047 (2.16-2.16)
Ramachandran outliers	177936	2027 (2.16-2.16)
Sidechain outliers	177891	2026 (2.16-2.16)
RSRZ outliers	164620	1882 (2.16-2.16)

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 $\leq 5\%$. 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	497	% 92%
1	B	497	% 93%
1	C	497	% 91%
1	D	497	% 93%
1	E	497	% 92%

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Mol	Chain	Length	Quality of chain
1	F	497	% 94%

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 23274 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 D-hydantoinase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	477	Total	C	N	O	S	0	0	0
			3633	2274	643	696	20			
1	B	477	Total	C	N	O	S	0	4	0
			3674	2305	649	700	20			
1	C	476	Total	C	N	O	S	0	2	0
			3628	2275	638	695	20			
1	D	481	Total	C	N	O	S	0	4	0
			3689	2314	650	705	20			
1	E	477	Total	C	N	O	S	0	4	0
			3665	2301	645	699	20			
1	F	481	Total	C	N	O	S	0	3	0
			3639	2283	637	698	21			

There are 48 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-7	MET	-	expression tag	UNP Q8G2P0
A	-6	ALA	-	expression tag	UNP Q8G2P0
A	-5	HIS	-	expression tag	UNP Q8G2P0
A	-4	HIS	-	expression tag	UNP Q8G2P0
A	-3	HIS	-	expression tag	UNP Q8G2P0
A	-2	HIS	-	expression tag	UNP Q8G2P0
A	-1	HIS	-	expression tag	UNP Q8G2P0
A	0	HIS	-	expression tag	UNP Q8G2P0
B	-7	MET	-	expression tag	UNP Q8G2P0
B	-6	ALA	-	expression tag	UNP Q8G2P0
B	-5	HIS	-	expression tag	UNP Q8G2P0
B	-4	HIS	-	expression tag	UNP Q8G2P0
B	-3	HIS	-	expression tag	UNP Q8G2P0
B	-2	HIS	-	expression tag	UNP Q8G2P0
B	-1	HIS	-	expression tag	UNP Q8G2P0
B	0	HIS	-	expression tag	UNP Q8G2P0
C	-7	MET	-	expression tag	UNP Q8G2P0

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-6	ALA	-	expression tag	UNP Q8G2P0
C	-5	HIS	-	expression tag	UNP Q8G2P0
C	-4	HIS	-	expression tag	UNP Q8G2P0
C	-3	HIS	-	expression tag	UNP Q8G2P0
C	-2	HIS	-	expression tag	UNP Q8G2P0
C	-1	HIS	-	expression tag	UNP Q8G2P0
C	0	HIS	-	expression tag	UNP Q8G2P0
D	-7	MET	-	expression tag	UNP Q8G2P0
D	-6	ALA	-	expression tag	UNP Q8G2P0
D	-5	HIS	-	expression tag	UNP Q8G2P0
D	-4	HIS	-	expression tag	UNP Q8G2P0
D	-3	HIS	-	expression tag	UNP Q8G2P0
D	-2	HIS	-	expression tag	UNP Q8G2P0
D	-1	HIS	-	expression tag	UNP Q8G2P0
D	0	HIS	-	expression tag	UNP Q8G2P0
E	-7	MET	-	expression tag	UNP Q8G2P0
E	-6	ALA	-	expression tag	UNP Q8G2P0
E	-5	HIS	-	expression tag	UNP Q8G2P0
E	-4	HIS	-	expression tag	UNP Q8G2P0
E	-3	HIS	-	expression tag	UNP Q8G2P0
E	-2	HIS	-	expression tag	UNP Q8G2P0
E	-1	HIS	-	expression tag	UNP Q8G2P0
E	0	HIS	-	expression tag	UNP Q8G2P0
F	-7	MET	-	expression tag	UNP Q8G2P0
F	-6	ALA	-	expression tag	UNP Q8G2P0
F	-5	HIS	-	expression tag	UNP Q8G2P0
F	-4	HIS	-	expression tag	UNP Q8G2P0
F	-3	HIS	-	expression tag	UNP Q8G2P0
F	-2	HIS	-	expression tag	UNP Q8G2P0
F	-1	HIS	-	expression tag	UNP Q8G2P0
F	0	HIS	-	expression tag	UNP Q8G2P0

- Molecule 2 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	2	Total Zn 2 2	0	0
2	B	2	Total Zn 2 2	0	0
2	C	2	Total Zn 2 2	0	0
2	D	2	Total Zn 2 2	0	0

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	E	2	Total	Zn	0	0
			2	2		
2	F	2	Total	Zn	0	0
			2	2		

- Molecule 3 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: C₂H₆O₂).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			4	2	2		
3	A	1	Total	C	O	0	0
			4	2	2		
3	A	1	Total	C	O	0	0
			4	2	2		
3	A	1	Total	C	O	0	0
			4	2	2		
3	B	1	Total	C	O	0	0
			4	2	2		
3	B	1	Total	C	O	0	0
			4	2	2		
3	B	1	Total	C	O	0	0
			4	2	2		
3	C	1	Total	C	O	0	0
			4	2	2		

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	C	1	Total C O 4 2 2	0	0
3	C	1	Total C O 4 2 2	0	0
3	C	1	Total C O 4 2 2	0	0
3	D	1	Total C O 4 2 2	0	0
3	D	1	Total C O 4 2 2	0	0
3	D	1	Total C O 4 2 2	0	0
3	D	1	Total C O 4 2 2	0	0
3	E	1	Total C O 4 2 2	0	0
3	E	1	Total C O 4 2 2	0	0
3	E	1	Total C O 4 2 2	0	0
3	E	1	Total C O 4 2 2	0	0
3	F	1	Total C O 4 2 2	0	0
3	F	1	Total C O 4 2 2	0	0
3	F	1	Total C O 4 2 2	0	0
3	F	1	Total C O 4 2 2	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	198	Total O 198 198	0	0
4	B	244	Total O 244 244	0	0
4	C	195	Total O 195 195	0	0
4	D	208	Total O 208 208	0	0

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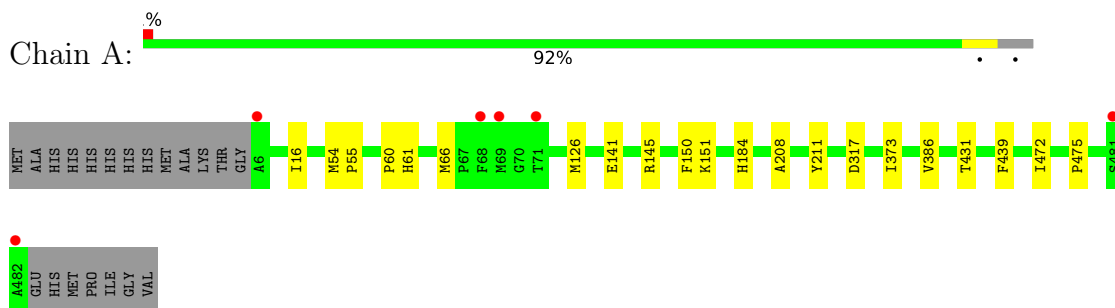
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	E	220	Total 220	O 220	0	0
4	F	173	Total 173	O 173	0	0

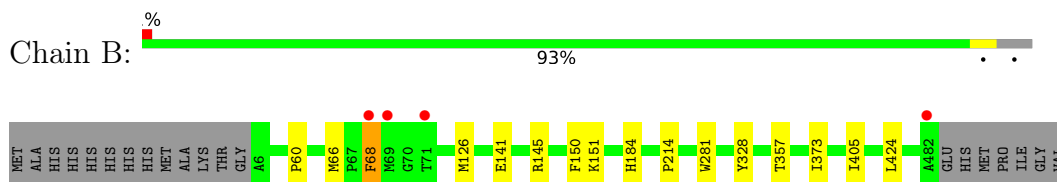
3 Residue-property plots [i](#)

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.

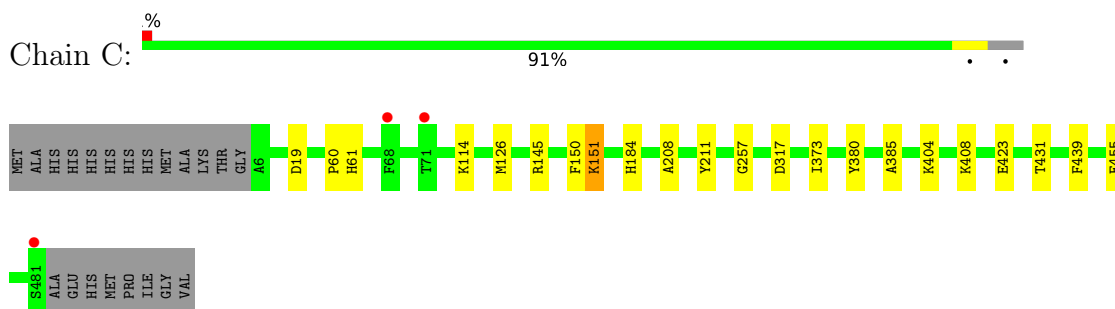
- Molecule 1: D-hydantoinase



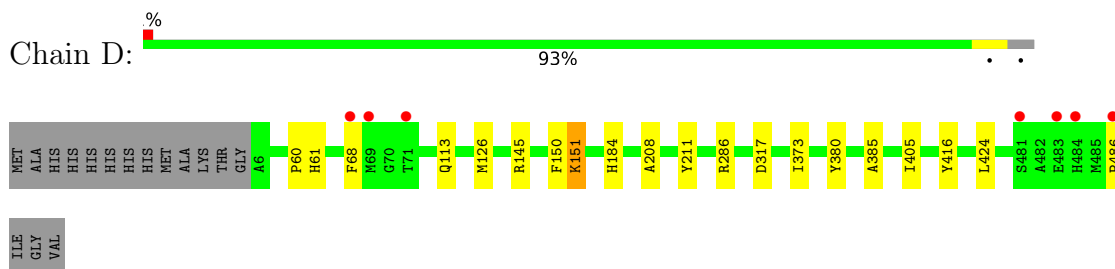
- Molecule 1: D-hydantoinase



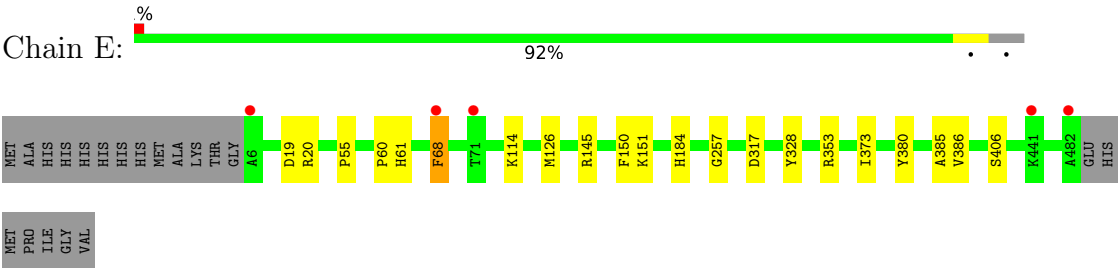
- Molecule 1: D-hydantoinase



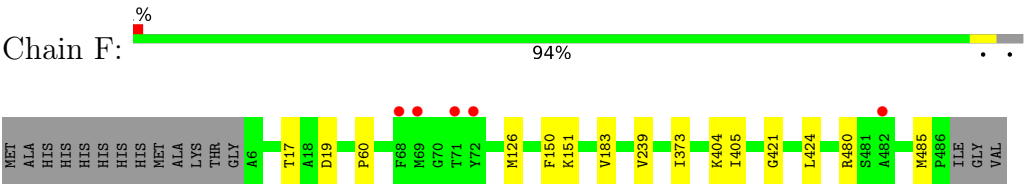
- Molecule 1: D-hydantoinase



● Molecule 1: D-hydantoinase



● Molecule 1: D-hydantoinase



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	156.69Å 88.83Å 221.24Å 90.00° 91.17° 90.00°	Depositor
Resolution (Å)	44.24 – 2.15 44.24 – 2.15	Depositor EDS
% Data completeness (in resolution range)	99.9 (44.24-2.15) 99.9 (44.24-2.15)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.08 (at 2.16Å)	Xtriage
Refinement program	PHENIX (phenix.refine: dev_1702)	Depositor
R, R_{free}	0.135 , 0.182 0.143 , 0.184	Depositor DCC
R_{free} test set	8376 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å ²)	32.1	Xtriage
Anisotropy	0.551	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 44.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.010 for -1/2*h-3/2*k,-1/2*h+1/2*k,-l 0.011 for -1/2*h+3/2*k,1/2*h+1/2*k,-l 0.013 for 1/2*h-3/2*k,-1/2*h-1/2*k,-l 0.016 for 1/2*h+3/2*k,1/2*h-1/2*k,-l 0.012 for -h,-k,l	Xtriage
F_o , F_c correlation	0.97	EDS
Total number of atoms	23274	wwPDB-VP
Average B, all atoms (Å ²)	38.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.68% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ 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: KCX, EDO, ZN

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	0.48	0/3696	0.74	0/5013
1	B	0.51	0/3751	0.76	0/5084
1	C	0.49	0/3697	0.73	0/5013
1	D	0.48	0/3767	0.74	0/5111
1	E	0.49	0/3742	0.75	1/5073 (0.0%)
1	F	0.44	0/3713	0.72	0/5042
All	All	0.48	0/22366	0.74	1/30336 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	20	ARG	N-CA-C	5.07	116.00	108.60

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	3633	0	3503	13	0
1	B	3674	0	3564	10	0
1	C	3628	0	3508	15	0
1	D	3689	0	3555	11	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	E	3665	0	3552	13	0
1	F	3639	0	3484	7	0
2	A	2	0	0	0	0
2	B	2	0	0	0	0
2	C	2	0	0	0	0
2	D	2	0	0	0	0
2	E	2	0	0	0	0
2	F	2	0	0	0	0
3	A	20	0	30	0	0
3	B	12	0	18	0	0
3	C	16	0	24	1	0
3	D	16	0	24	1	0
3	E	16	0	24	1	0
3	F	16	0	24	0	0
4	A	198	0	0	1	0
4	B	244	0	0	1	0
4	C	195	0	0	2	0
4	D	208	0	0	1	0
4	E	220	0	0	3	0
4	F	173	0	0	0	0
All	All	23274	0	21310	65	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 (65) 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:F:480:ARG:HB2	1:F:485:MET:HE2	1.66	0.77
1:E:60:PRO:HB3	1:E:373:ILE:HG12	1.74	0.68
1:E:19:ASP:OD2	4:E:815:HOH:O	2.13	0.66
1:D:60:PRO:HB3	1:D:373:ILE:HG12	1.80	0.63
1:C:114:LYS:NZ	4:C:667:HOH:O	2.33	0.60
1:F:60:PRO:HB3	1:F:373:ILE:HG12	1.82	0.60
1:C:404:LYS:NZ	1:C:423:GLU:OE2	2.30	0.59
1:C:60:PRO:HB3	1:C:373:ILE:HG12	1.83	0.59
1:D:113:GLN:NE2	4:D:601:HOH:O	2.35	0.58
1:B:60:PRO:HB3	1:B:373:ILE:HG12	1.84	0.58
1:F:17:THR:OG1	1:F:19[A]:ASP:OD1	2.23	0.57
1:B:68:PHE:HZ	1:B:328:TYR:HD2	1.51	0.57
1:A:60:PRO:HB3	1:A:373:ILE:HG12	1.85	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:281:TRP:HB3	1:D:486:PRO:HD3	1.86	0.56
1:D:380:TYR:CE1	1:D:385:ALA:HB2	2.42	0.55
1:C:257:GLY:O	3:C:505:EDO:H12	2.09	0.53
1:E:114:LYS:NZ	4:E:801:HOH:O	2.41	0.52
1:C:151:KCX:OQ1	1:C:184:HIS:HB2	2.10	0.52
1:E:257:GLY:O	3:E:505:EDO:H12	2.12	0.49
1:A:145:ARG:HD3	4:A:605:HOH:O	2.12	0.49
1:C:380:TYR:CE1	1:C:385:ALA:HB2	2.49	0.48
1:D:405:ILE:HD11	1:D:424:LEU:HD11	1.95	0.48
1:F:405:ILE:HD11	1:F:424:LEU:HD11	1.95	0.48
1:C:257:GLY:HA3	3:D:502:EDO:H22	1.95	0.48
1:B:214:PRO:HB2	4:B:643:HOH:O	2.14	0.48
1:C:455:GLU:OE1	1:E:406:SER:OG	2.26	0.48
1:A:141:GLU:O	1:A:145:ARG:HG3	2.13	0.48
1:D:126:MET:O	1:D:150:PHE:HA	2.14	0.47
1:E:68:PHE:HZ	1:E:328:TYR:HD2	1.62	0.47
1:E:380:TYR:CE1	1:E:385:ALA:HB2	2.49	0.47
1:D:151:KCX:OQ1	1:D:184:HIS:HB2	2.15	0.47
1:B:141:GLU:O	1:B:145[A]:ARG:HG2	2.15	0.47
1:C:19:ASP:OD2	4:C:672:HOH:O	2.21	0.47
1:E:61:HIS:CD2	1:E:317:ASP:HA	2.50	0.47
1:B:405:ILE:HD11	1:B:424:LEU:HD11	1.98	0.46
1:C:208:ALA:HA	1:C:211:TYR:CD2	2.51	0.46
1:E:184:HIS:C	1:E:184:HIS:CD2	2.94	0.46
1:F:404:LYS:HE3	1:F:421:GLY:HA2	1.97	0.45
1:A:431:THR:HB	1:A:439:PHE:HB3	1.98	0.45
1:D:286:ARG:HG2	1:D:416:TYR:CZ	2.52	0.45
1:A:55:PRO:HG3	1:A:386:VAL:HG23	1.99	0.45
1:C:61:HIS:CD2	1:C:317:ASP:HA	2.52	0.45
1:E:126:MET:O	1:E:150:PHE:HA	2.16	0.45
1:D:61:HIS:CD2	1:D:317:ASP:HA	2.51	0.45
1:C:431:THR:HB	1:C:439:PHE:HB3	1.99	0.44
1:A:61:HIS:CD2	1:A:317:ASP:HA	2.53	0.44
1:A:208:ALA:HA	1:A:211:TYR:CD2	2.53	0.44
1:F:126:MET:O	1:F:150:PHE:HA	2.17	0.43
1:E:55:PRO:HG3	1:E:386:VAL:HG23	2.00	0.43
1:B:184:HIS:CD2	1:B:184:HIS:C	2.97	0.43
1:E:145[B]:ARG:NH1	4:E:747:HOH:O	2.43	0.43
1:B:126:MET:O	1:B:150:PHE:HA	2.18	0.43
1:A:126:MET:O	1:A:150:PHE:HA	2.19	0.42
1:A:66:MET:HE2	1:A:66:MET:HB3	1.92	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:475:PRO:HB2	1:C:211:TYR:CD2	2.56	0.41
1:B:66:MET:HE2	1:B:66:MET:HB3	1.98	0.41
1:C:126:MET:O	1:C:150:PHE:HA	2.21	0.40
1:A:472:ILE:CD1	1:B:357:THR:HA	2.51	0.40
1:E:353:ARG:HA	1:E:353:ARG:HD3	1.86	0.40
1:A:184:HIS:CD2	1:A:184:HIS:C	2.99	0.40
1:A:16:ILE:HB	1:A:54:MET:HG2	2.03	0.40
1:D:208:ALA:HA	1:D:211:TYR:CD2	2.57	0.40
1:F:183:VAL:O	1:F:239:VAL:HG22	2.21	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	474/497 (95%)	460 (97%)	14 (3%)	0	100	100
1	B	478/497 (96%)	464 (97%)	14 (3%)	0	100	100
1	C	475/497 (96%)	460 (97%)	15 (3%)	0	100	100
1	D	482/497 (97%)	467 (97%)	15 (3%)	0	100	100
1	E	478/497 (96%)	463 (97%)	15 (3%)	0	100	100
1	F	481/497 (97%)	466 (97%)	15 (3%)	0	100	100
All	All	2868/2982 (96%)	2780 (97%)	88 (3%)	0	100	100

There are no Ramachandran outliers to report.

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	370/398 (93%)	370 (100%)	0	100	100
1	B	377/398 (95%)	376 (100%)	1 (0%)	91	94
1	C	371/398 (93%)	370 (100%)	1 (0%)	91	94
1	D	376/398 (94%)	375 (100%)	1 (0%)	91	94
1	E	376/398 (94%)	375 (100%)	1 (0%)	91	94
1	F	368/398 (92%)	368 (100%)	0	100	100
All	All	2238/2388 (94%)	2234 (100%)	4 (0%)	92	95

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	68	PHE
1	C	408	LYS
1	D	68	PHE
1	E	68	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (17) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	203	ASN
1	A	231	GLN
1	A	468	GLN
1	B	231	GLN
1	B	411	HIS
1	B	463	ASN
1	B	468	GLN
1	C	231	GLN
1	C	338	ASN
1	C	463	ASN
1	D	231	GLN
1	D	277	HIS
1	D	338	ASN
1	D	463	ASN
1	E	411	HIS
1	F	463	ASN
1	F	468	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

6 non-standard protein/DNA/RNA residues 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
1	KCX	B	151	1,2	10,11,12	2.02	3 (30%)	6,12,14	2.00	2 (33%)
1	KCX	E	151	1,2	10,11,12	2.04	2 (20%)	6,12,14	1.50	1 (16%)
1	KCX	F	151	1,2	10,11,12	1.91	2 (20%)	6,12,14	1.86	2 (33%)
1	KCX	D	151	1,2	10,11,12	1.99	2 (20%)	6,12,14	1.83	2 (33%)
1	KCX	A	151	1,2	10,11,12	1.96	3 (30%)	6,12,14	1.42	1 (16%)
1	KCX	C	151	1,2	10,11,12	2.01	2 (20%)	6,12,14	1.81	2 (33%)

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
1	KCX	B	151	1,2	-	2/9/10/12	-
1	KCX	E	151	1,2	-	0/9/10/12	-
1	KCX	F	151	1,2	-	1/9/10/12	-
1	KCX	D	151	1,2	-	0/9/10/12	-
1	KCX	A	151	1,2	-	0/9/10/12	-
1	KCX	C	151	1,2	-	1/9/10/12	-

All (14) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	151	KCX	CX-NZ	5.25	1.44	1.35
1	B	151	KCX	CX-NZ	4.99	1.44	1.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	151	KCX	CX-NZ	4.93	1.44	1.35
1	D	151	KCX	CX-NZ	4.89	1.43	1.35
1	A	151	KCX	CX-NZ	4.86	1.43	1.35
1	F	151	KCX	CX-NZ	4.77	1.43	1.35
1	C	151	KCX	OQ1-CX	2.88	1.27	1.21
1	D	151	KCX	OQ1-CX	2.82	1.26	1.21
1	B	151	KCX	OQ1-CX	2.62	1.26	1.21
1	F	151	KCX	OQ1-CX	2.53	1.26	1.21
1	E	151	KCX	OQ1-CX	2.47	1.26	1.21
1	A	151	KCX	OQ1-CX	2.42	1.26	1.21
1	B	151	KCX	CA-N	-2.10	1.42	1.48
1	A	151	KCX	CA-N	-2.03	1.42	1.48

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	151	KCX	OQ1-CX-NZ	-3.97	118.89	124.92
1	C	151	KCX	OQ1-CX-NZ	-3.29	119.93	124.92
1	D	151	KCX	OQ1-CX-NZ	-3.13	120.16	124.92
1	F	151	KCX	OQ1-CX-NZ	-2.93	120.47	124.92
1	E	151	KCX	OQ1-CX-NZ	-2.53	121.07	124.92
1	F	151	KCX	CE-NZ-CX	-2.50	117.74	121.98
1	A	151	KCX	OQ1-CX-NZ	-2.43	121.23	124.92
1	B	151	KCX	CD-CE-NZ	-2.15	106.17	112.20
1	C	151	KCX	CE-NZ-CX	-2.01	118.56	121.98
1	D	151	KCX	CD-CE-NZ	-2.01	106.57	112.20

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	B	151	KCX	OQ1-CX-NZ-CE
1	B	151	KCX	OQ2-CX-NZ-CE
1	C	151	KCX	C-CA-CB-CG
1	F	151	KCX	C-CA-CB-CG

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	D	151	KCX	1	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	C	151	KCX	1	0

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 36 ligands modelled in this entry, 12 are monoatomic - leaving 24 for Mogul analysis.

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	$\# Z > 2$
3	EDO	F	503	-	3,3,3	0.40	0	2,2,2	0.71	0
3	EDO	A	504	-	3,3,3	0.43	0	2,2,2	0.67	0
3	EDO	A	505	-	3,3,3	0.41	0	2,2,2	0.57	0
3	EDO	B	502	-	3,3,3	0.42	0	2,2,2	0.27	0
3	EDO	E	503	-	3,3,3	0.40	0	2,2,2	0.70	0
3	EDO	D	503	-	3,3,3	0.48	0	2,2,2	0.60	0
3	EDO	A	507	-	3,3,3	0.47	0	2,2,2	0.37	0
3	EDO	A	506	-	3,3,3	0.42	0	2,2,2	0.32	0
3	EDO	F	505	-	3,3,3	0.39	0	2,2,2	0.40	0
3	EDO	D	505	-	3,3,3	0.37	0	2,2,2	0.42	0
3	EDO	F	504	-	3,3,3	0.47	0	2,2,2	0.57	0
3	EDO	B	503	-	3,3,3	0.45	0	2,2,2	0.54	0
3	EDO	A	503	-	3,3,3	0.41	0	2,2,2	0.40	0
3	EDO	E	505	-	3,3,3	0.52	0	2,2,2	0.31	0
3	EDO	C	503	-	3,3,3	0.43	0	2,2,2	0.60	0
3	EDO	B	504	-	3,3,3	0.31	0	2,2,2	0.97	0
3	EDO	F	502	-	3,3,3	0.43	0	2,2,2	0.29	0
3	EDO	C	502	-	3,3,3	0.52	0	2,2,2	0.12	0
3	EDO	C	505	-	3,3,3	0.46	0	2,2,2	0.40	0
3	EDO	E	502	-	3,3,3	0.43	0	2,2,2	0.35	0
3	EDO	D	502	-	3,3,3	0.46	0	2,2,2	0.32	0
3	EDO	C	504	-	3,3,3	0.37	0	2,2,2	0.90	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
3	EDO	E	504	-	3,3,3	0.33	0	2,2,2	0.96	0
3	EDO	D	504	-	3,3,3	0.37	0	2,2,2	0.61	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
3	EDO	F	503	-	-	1/1/1/1	-
3	EDO	A	504	-	-	1/1/1/1	-
3	EDO	A	505	-	-	1/1/1/1	-
3	EDO	B	502	-	-	0/1/1/1	-
3	EDO	E	503	-	-	0/1/1/1	-
3	EDO	D	503	-	-	1/1/1/1	-
3	EDO	A	507	-	-	0/1/1/1	-
3	EDO	A	506	-	-	0/1/1/1	-
3	EDO	F	505	-	-	0/1/1/1	-
3	EDO	D	505	-	-	0/1/1/1	-
3	EDO	F	504	-	-	1/1/1/1	-
3	EDO	B	503	-	-	0/1/1/1	-
3	EDO	A	503	-	-	0/1/1/1	-
3	EDO	E	505	-	-	0/1/1/1	-
3	EDO	C	503	-	-	1/1/1/1	-
3	EDO	B	504	-	-	1/1/1/1	-
3	EDO	F	502	-	-	0/1/1/1	-
3	EDO	C	502	-	-	1/1/1/1	-
3	EDO	C	505	-	-	0/1/1/1	-
3	EDO	E	502	-	-	0/1/1/1	-
3	EDO	D	502	-	-	1/1/1/1	-
3	EDO	C	504	-	-	1/1/1/1	-
3	EDO	E	504	-	-	1/1/1/1	-
3	EDO	D	504	-	-	1/1/1/1	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (12) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	C	504	EDO	O1-C1-C2-O2

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Mol	Chain	Res	Type	Atoms
3	C	503	EDO	O1-C1-C2-O2
3	A	504	EDO	O1-C1-C2-O2
3	A	505	EDO	O1-C1-C2-O2
3	B	504	EDO	O1-C1-C2-O2
3	D	503	EDO	O1-C1-C2-O2
3	D	504	EDO	O1-C1-C2-O2
3	E	504	EDO	O1-C1-C2-O2
3	F	503	EDO	O1-C1-C2-O2
3	F	504	EDO	O1-C1-C2-O2
3	C	502	EDO	O1-C1-C2-O2
3	D	502	EDO	O1-C1-C2-O2

There are no ring outliers.

3 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	E	505	EDO	1	0
3	C	505	EDO	1	0
3	D	502	EDO	1	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, 95th 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	476/497 (95%)	-0.68	6 (1%) 74 78	23, 39, 58, 83	0
1	B	476/497 (95%)	-0.77	4 (0%) 82 84	19, 33, 54, 93	4 (0%)
1	C	475/497 (95%)	-0.69	3 (0%) 85 87	22, 38, 58, 91	2 (0%)
1	D	480/497 (96%)	-0.72	7 (1%) 71 75	22, 35, 59, 88	4 (0%)
1	E	476/497 (95%)	-0.73	5 (1%) 77 81	21, 35, 56, 89	4 (0%)
1	F	480/497 (96%)	-0.51	5 (1%) 79 82	24, 43, 66, 102	3 (0%)
All	All	2863/2982 (96%)	-0.68	30 (1%) 79 82	19, 37, 59, 102	17 (0%)

All (30) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	482	ALA	4.4
1	F	71	THR	4.1
1	E	68	PHE	3.8
1	D	68	PHE	3.6
1	C	71	THR	3.5
1	E	6	ALA	3.4
1	F	68	PHE	3.3
1	B	68	PHE	3.3
1	A	482	ALA	3.2
1	D	71	THR	3.2
1	D	481	SER	3.1
1	D	484	HIS	3.0
1	C	68	PHE	2.9
1	F	69	MET	2.8
1	A	68	PHE	2.7
1	B	71	THR	2.7
1	D	69	MET	2.7
1	D	483	GLU	2.7
1	A	71	THR	2.7

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Mol	Chain	Res	Type	RSRZ
1	F	72	TYR	2.7
1	E	482	ALA	2.5
1	F	482	ALA	2.5
1	B	69	MET	2.5
1	E	71	THR	2.3
1	A	69	MET	2.2
1	E	441	LYS	2.1
1	A	6	ALA	2.1
1	D	486	PRO	2.1
1	A	481	SER	2.1
1	C	481	SER	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [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, 95th 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
1	KCX	E	151	12/13	0.95	0.07	22,28,33,38	0
1	KCX	F	151	12/13	0.95	0.09	31,35,45,54	0
1	KCX	C	151	12/13	0.97	0.06	29,33,43,48	0
1	KCX	D	151	12/13	0.97	0.06	24,28,40,44	0
1	KCX	A	151	12/13	0.97	0.06	27,33,36,42	0
1	KCX	B	151	12/13	0.97	0.07	25,29,36,42	0

6.3 Carbohydrates [i](#)

There are no oligosaccharides 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, 95th 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	EDO	E	505	4/4	0.86	0.14	36,38,41,50	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
3	EDO	C	505	4/4	0.87	0.14	35,43,45,58	0
3	EDO	A	507	4/4	0.88	0.14	39,46,49,51	0
3	EDO	D	503	4/4	0.89	0.13	42,43,44,45	0
3	EDO	B	503	4/4	0.89	0.11	38,39,45,47	0
3	EDO	F	505	4/4	0.89	0.11	40,45,45,55	0
3	EDO	C	503	4/4	0.90	0.10	35,41,41,41	0
3	EDO	A	504	4/4	0.91	0.10	36,40,41,43	0
3	EDO	F	503	4/4	0.91	0.11	36,41,41,44	0
3	EDO	E	503	4/4	0.91	0.11	40,41,46,46	0
3	EDO	A	506	4/4	0.92	0.11	32,34,40,53	0
3	EDO	D	502	4/4	0.93	0.11	40,46,49,51	0
3	EDO	D	505	4/4	0.93	0.10	44,45,46,53	0
3	EDO	E	502	4/4	0.94	0.10	44,50,50,53	0
3	EDO	F	504	4/4	0.94	0.09	43,49,51,52	0
3	EDO	F	502	4/4	0.94	0.10	43,49,49,49	0
3	EDO	B	502	4/4	0.95	0.08	32,42,47,48	0
3	EDO	A	503	4/4	0.95	0.08	37,44,50,50	0
3	EDO	B	504	4/4	0.95	0.10	39,41,43,46	0
3	EDO	C	504	4/4	0.96	0.11	44,47,47,47	0
3	EDO	C	502	4/4	0.96	0.08	36,44,44,45	0
3	EDO	E	504	4/4	0.97	0.07	42,43,45,51	0
3	EDO	A	505	4/4	0.97	0.07	37,37,39,43	0
2	ZN	C	500	1/1	0.98	0.04	51,51,51,51	0
2	ZN	D	500	1/1	0.98	0.04	46,46,46,46	0
3	EDO	D	504	4/4	0.98	0.06	39,40,44,50	0
2	ZN	A	502	1/1	0.99	0.03	50,50,50,50	0
2	ZN	D	501	1/1	0.99	0.05	50,50,50,50	0
2	ZN	E	500	1/1	0.99	0.03	45,45,45,45	0
2	ZN	E	501	1/1	0.99	0.04	51,51,51,51	0
2	ZN	F	500	1/1	0.99	0.06	53,53,53,53	0
2	ZN	F	501	1/1	0.99	0.06	56,56,56,56	0
2	ZN	B	500	1/1	0.99	0.03	44,44,44,44	0
2	ZN	B	501	1/1	0.99	0.03	48,48,48,48	0
2	ZN	A	501	1/1	0.99	0.03	47,47,47,47	0
2	ZN	C	501	1/1	0.99	0.03	53,53,53,53	0

6.5 Other polymers

There are no such residues in this entry.