



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 12:06 PM UTC

PDB ID : 6EQ0 / pdb_00006eq0
Title : Structure of the periplasmic binding protein (PBP) MelB (atu4661) in complex with galactose from agrobacterium tumefaciens C58
Authors : Vigouroux, A.; Morera, S.
Deposited on : 2017-10-12
Resolution : 2.45 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	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
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)	:	2.49

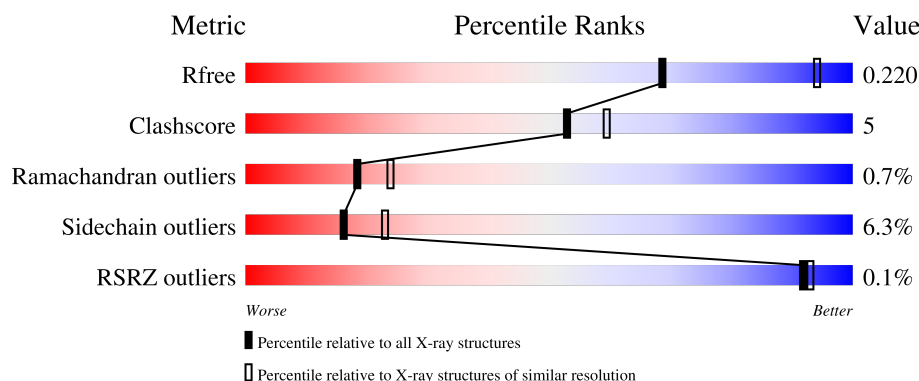
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.45 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}	180053	1190 (2.46-2.46)
Clashscore	190562	1229 (2.46-2.46)
Ramachandran outliers	187476	1218 (2.46-2.46)
Sidechain outliers	187428	1218 (2.46-2.46)
RSRZ outliers	180081	1190 (2.46-2.46)

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	683	 79% 18% ..
1	B	683	 78% 18% ..

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	PEG	A	703	-	-	X	-

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 10998 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.

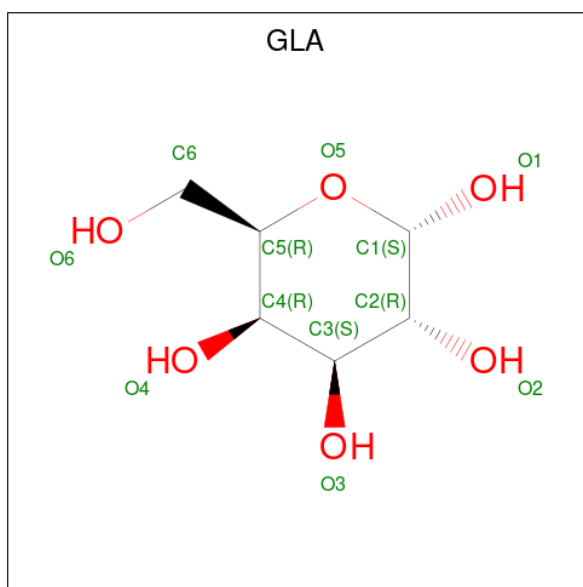
- Molecule 1 is a protein called Periplasmic alpha-galactoside-binding protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	671	Total	C	N	O	S	0	0	0
			5295	3380	899	1000	16			
1	B	671	Total	C	N	O	S	0	0	0
			5295	3380	899	1000	16			

There are 12 discrepancies between the modelled and reference sequences:

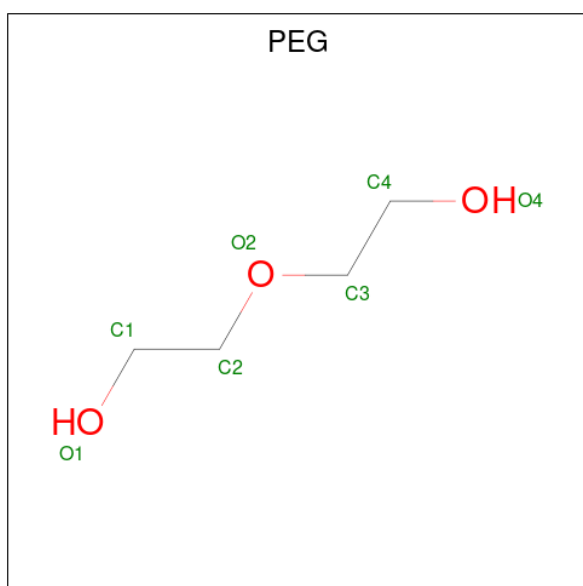
Chain	Residue	Modelled	Actual	Comment	Reference
A	678	HIS	-	expression tag	UNP A0A083ZM57
A	679	HIS	-	expression tag	UNP A0A083ZM57
A	680	HIS	-	expression tag	UNP A0A083ZM57
A	681	HIS	-	expression tag	UNP A0A083ZM57
A	682	HIS	-	expression tag	UNP A0A083ZM57
A	683	HIS	-	expression tag	UNP A0A083ZM57
B	678	HIS	-	expression tag	UNP A0A083ZM57
B	679	HIS	-	expression tag	UNP A0A083ZM57
B	680	HIS	-	expression tag	UNP A0A083ZM57
B	681	HIS	-	expression tag	UNP A0A083ZM57
B	682	HIS	-	expression tag	UNP A0A083ZM57
B	683	HIS	-	expression tag	UNP A0A083ZM57

- Molecule 2 is alpha-D-galactopyranose (CCD ID: GLA) (formula: C₆H₁₂O₆).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			12	6	6		
2	B	1	Total	C	O	0	0
			12	6	6		

- Molecule 3 is DI(HYDROXYETHYL)ETHER (CCD ID: PEG) (formula: $C_4H_{10}O_3$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			7	4	3		
3	A	1	Total	C	O	0	0
			7	4	3		

- Molecule 4 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: $C_2H_6O_2$).



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

Continued on next page...

Continued from previous page...

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

- Molecule 5 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	9	Total Cl 9 9	0	0
5	B	7	Total Cl 7 7	0	0

- Molecule 6 is CALCIUM ION (CCD ID: CA) (formula: Ca).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	12	Total Ca 12 12	0	0
6	B	5	Total Ca 5 5	0	0

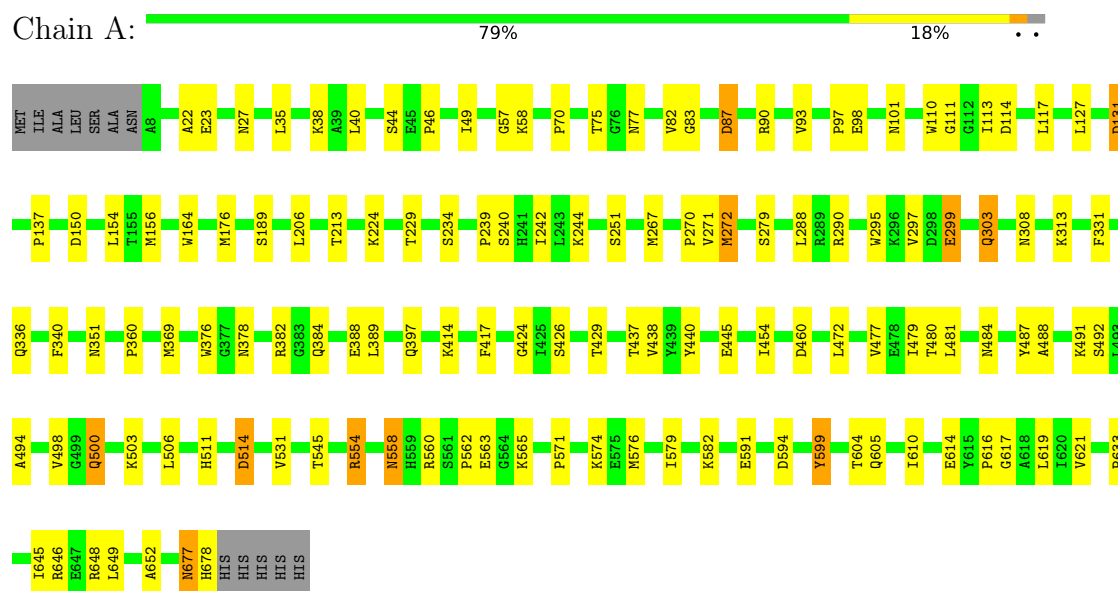
- Molecule 7 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	143	Total O 143 143	0	0
7	B	110	Total O 110 110	0	0

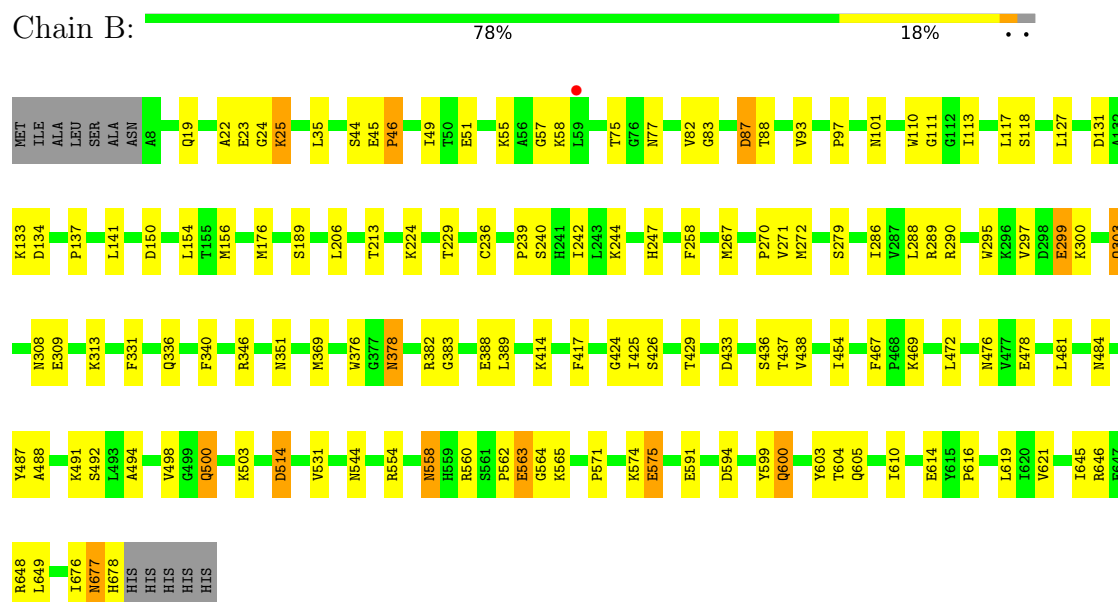
3 Residue-property plots

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: Periplasmic alpha-galactoside-binding protein



- Molecule 1: Periplasmic alpha-galactoside-binding protein



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	107.84Å 73.92Å 171.10Å 90.00° 92.55° 90.00°	Depositor
Resolution (Å)	46.51 – 2.45 46.51 – 2.45	Depositor EDS
% Data completeness (in resolution range)	99.7 (46.51-2.45) 87.8 (46.51-2.45)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.18	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.13 (at 2.45Å)	Xtriage
Refinement program	BUSTER 2.10.2	Depositor
R, R_{free}	0.194 , 0.241 0.199 , 0.220	Depositor DCC
R_{free} test set	2480 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	48.5	Xtriage
Anisotropy	0.217	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 50.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.39$, $\langle L^2 \rangle = 0.22$	Xtriage
Estimated twinning fraction	0.145 for -h,-k,l	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	10998	wwPDB-VP
Average B, all atoms (Å ²)	65.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.42% 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: PEG, CL, EDO, GLA, CA

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	0.90	1/5448 (0.0%)	1.36	32/7413 (0.4%)
1	B	0.87	2/5448 (0.0%)	1.37	40/7413 (0.5%)
All	All	0.89	3/10896 (0.0%)	1.36	72/14826 (0.5%)

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	272	MET	SD-CE	-15.07	1.41	1.79
1	B	378	ASN	CA-C	5.72	1.57	1.53
1	B	677	ASN	CA-C	5.13	1.59	1.52

All (72) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	677	ASN	CA-C-N	10.38	140.38	121.70
1	B	677	ASN	C-N-CA	10.38	140.38	121.70
1	B	22	ALA	CA-C-N	7.81	135.76	121.70
1	B	22	ALA	C-N-CA	7.81	135.76	121.70
1	A	57	GLY	CA-C-N	6.93	134.77	121.54
1	A	57	GLY	C-N-CA	6.93	134.77	121.54
1	A	83	GLY	N-CA-C	6.81	121.90	112.57
1	A	677	ASN	CA-C-N	6.75	133.85	121.70
1	A	677	ASN	C-N-CA	6.75	133.85	121.70
1	B	57	GLY	CA-C-N	6.67	134.29	121.54
1	B	57	GLY	C-N-CA	6.67	134.29	121.54
1	B	134	ASP	CA-CB-CG	6.51	119.11	112.60
1	A	558	ASN	CA-CB-CG	6.45	119.05	112.60
1	B	558	ASN	CA-CB-CG	6.35	118.95	112.60
1	B	476	ASN	CA-CB-CG	6.13	118.73	112.60
1	A	22	ALA	CA-C-N	5.99	130.06	121.98

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	22	ALA	C-N-CA	5.99	130.06	121.98
1	A	87	ASP	CA-CB-CG	5.81	118.41	112.60
1	A	389	LEU	CA-C-N	5.78	128.02	120.28
1	A	389	LEU	C-N-CA	5.78	128.02	120.28
1	B	389	LEU	CA-C-N	5.76	128.00	120.28
1	B	389	LEU	C-N-CA	5.76	128.00	120.28
1	A	514	ASP	CA-CB-CG	5.63	118.23	112.60
1	B	83	GLY	N-CA-C	5.61	120.25	112.57
1	B	575	GLU	CB-CG-CD	5.49	121.94	112.60
1	A	131	ASP	CA-CB-CG	5.48	118.08	112.60
1	B	514	ASP	CA-CB-CG	5.45	118.05	112.60
1	A	234	SER	N-CA-C	5.42	118.11	111.82
1	A	251	SER	N-CA-C	5.41	115.39	108.24
1	B	599	TYR	CA-C-N	5.40	127.45	120.44
1	B	599	TYR	C-N-CA	5.40	127.45	120.44
1	A	340	PHE	CA-CB-CG	5.38	119.18	113.80
1	A	98	GLU	N-CA-C	-5.36	106.42	113.12
1	A	101	ASN	CA-C-N	5.36	127.46	120.28
1	A	101	ASN	C-N-CA	5.36	127.46	120.28
1	B	383	GLY	CA-C-N	5.35	127.71	120.38
1	B	383	GLY	C-N-CA	5.35	127.71	120.38
1	A	591	GLU	CA-C-N	5.33	127.42	120.28
1	A	591	GLU	C-N-CA	5.33	127.42	120.28
1	B	487	TYR	CA-C-N	5.32	127.85	120.29
1	B	487	TYR	C-N-CA	5.32	127.85	120.29
1	A	491	LYS	CA-C-N	5.32	127.35	120.44
1	A	491	LYS	C-N-CA	5.32	127.35	120.44
1	B	491	LYS	CA-C-N	5.32	127.35	120.44
1	B	491	LYS	C-N-CA	5.32	127.35	120.44
1	B	424	GLY	CA-C-N	5.27	127.64	120.63
1	B	424	GLY	C-N-CA	5.27	127.64	120.63
1	B	101	ASN	CA-C-N	5.27	127.34	120.28
1	B	101	ASN	C-N-CA	5.27	127.34	120.28
1	A	27	ASN	CA-CB-CG	5.25	117.85	112.60
1	A	599	TYR	CA-C-N	5.25	127.26	120.44
1	A	599	TYR	C-N-CA	5.25	127.26	120.44
1	B	591	GLU	CA-C-N	5.22	127.28	120.28
1	B	591	GLU	C-N-CA	5.22	127.28	120.28
1	B	484	ASN	CA-C-N	5.19	129.39	120.72
1	B	484	ASN	C-N-CA	5.19	129.39	120.72
1	A	487	TYR	CA-C-N	5.19	127.66	120.29
1	A	487	TYR	C-N-CA	5.19	127.66	120.29

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	131	ASP	CA-CB-CG	5.16	117.76	112.60
1	B	603	TYR	CA-C-N	5.15	127.61	120.29
1	B	603	TYR	C-N-CA	5.15	127.61	120.29
1	B	46	PRO	CA-C-N	5.15	127.89	120.38
1	B	46	PRO	C-N-CA	5.15	127.89	120.38
1	A	484	ASN	CA-C-N	5.12	129.28	120.72
1	A	484	ASN	C-N-CA	5.12	129.28	120.72
1	B	87	ASP	CA-CB-CG	5.11	117.71	112.60
1	B	340	PHE	CA-CB-CG	5.08	118.88	113.80
1	B	544	ASN	CA-C-N	5.04	127.74	120.38
1	B	544	ASN	C-N-CA	5.04	127.74	120.38
1	A	424	GLY	CA-C-N	5.04	127.25	120.50
1	A	424	GLY	C-N-CA	5.04	127.25	120.50
1	B	45	GLU	N-CA-C	5.03	112.55	108.07

There are no chirality outliers.

There are no planarity outliers.

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	5295	0	5113	54	0
1	B	5295	0	5114	49	0
2	A	12	0	12	0	0
2	B	12	0	12	0	0
3	A	14	0	20	6	0
4	A	44	0	66	2	0
4	B	40	0	60	0	0
5	A	9	0	0	2	0
5	B	7	0	0	0	0
6	A	12	0	0	0	0
6	B	5	0	0	0	0
7	A	143	0	0	1	0
7	B	110	0	0	1	0
All	All	10998	0	10397	103	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 5.

All (103) 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:633:PRO:HA	3:A:703:PEG:H11	1.32	1.05
1:A:633:PRO:HA	3:A:703:PEG:C1	2.16	0.72
1:A:176:MET:HE1	1:A:206:LEU:HG	1.73	0.70
1:A:579:ILE:HG21	1:A:599:TYR:HB2	1.73	0.70
1:A:617:GLY:H	3:A:703:PEG:H42	1.54	0.70
1:B:176:MET:HE1	1:B:206:LEU:HG	1.73	0.69
1:B:46:PRO:HD2	1:B:49:ILE:HD12	1.77	0.67
1:A:164:TRP:HA	1:A:272:MET:CE	2.27	0.65
1:A:46:PRO:HD2	1:A:49:ILE:HD12	1.78	0.65
1:B:677:ASN:HB3	1:B:678:HIS:C	2.22	0.64
1:B:425:ILE:H	1:B:600:GLN:HE22	1.47	0.60
1:B:295:TRP:H	1:B:295:TRP:CD1	2.19	0.59
1:A:110:TRP:O	1:A:113:ILE:HG22	2.02	0.59
1:A:164:TRP:CD2	1:A:272:MET:HE3	2.37	0.58
1:B:438:VAL:HG21	1:B:605:GLN:HB2	1.85	0.58
1:B:110:TRP:O	1:B:113:ILE:HG22	2.03	0.58
1:A:438:VAL:HG21	1:A:605:GLN:HB2	1.86	0.57
1:A:617:GLY:O	3:A:703:PEG:H21	2.05	0.57
1:A:677:ASN:CG	1:A:678:HIS:HA	2.29	0.56
1:B:240:SER:O	1:B:244:LYS:HB2	2.06	0.56
1:B:242:ILE:HG13	1:B:270:PRO:HG2	1.87	0.56
1:A:295:TRP:H	1:A:295:TRP:CD1	2.22	0.56
1:A:77:ASN:ND2	1:A:648:ARG:HH12	2.04	0.55
1:A:240:SER:O	1:A:244:LYS:HB2	2.06	0.55
1:B:93:VAL:HG12	1:B:111:GLY:HA3	1.87	0.55
1:A:360:PRO:O	3:A:703:PEG:H41	2.07	0.55
1:B:127:LEU:HD11	1:B:137:PRO:HA	1.89	0.55
1:A:242:ILE:HG13	1:A:270:PRO:HG2	1.88	0.54
1:B:51:GLU:HA	1:B:55:LYS:HD2	1.90	0.54
1:A:127:LEU:HD11	1:A:137:PRO:HA	1.88	0.54
1:A:93:VAL:HG12	1:A:111:GLY:HA3	1.88	0.54
1:A:571:PRO:HA	1:A:574:LYS:HD2	1.90	0.54
1:B:77:ASN:ND2	1:B:648:ARG:HH12	2.06	0.53
1:A:500:GLN:HA	1:A:503:LYS:HD2	1.91	0.53
1:B:382:ARG:HA	1:B:472:LEU:HD11	1.92	0.52
1:B:571:PRO:HA	1:B:574:LYS:HD2	1.92	0.52
1:A:480:THR:HB	1:A:511:HIS:ND1	2.25	0.51

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:382:ARG:HA	1:A:472:LEU:HD11	1.92	0.51
1:B:500:GLN:HA	1:B:503:LYS:HD2	1.91	0.51
1:A:633:PRO:CA	3:A:703:PEG:H11	2.22	0.50
1:A:272:MET:HB2	5:A:718:CL:CL	2.49	0.50
1:B:297:VAL:HG12	1:B:303:GLN:HA	1.93	0.50
1:A:164:TRP:HA	1:A:272:MET:HE1	1.93	0.49
1:B:290:ARG:HD2	1:B:308:ASN:HD22	1.77	0.49
1:A:239:PRO:HB3	1:A:270:PRO:HB2	1.95	0.49
1:B:239:PRO:HB3	1:B:270:PRO:HB2	1.94	0.48
1:A:582:LYS:HG3	1:B:571:PRO:HG2	1.95	0.48
1:A:297:VAL:HG12	1:A:303:GLN:HA	1.95	0.48
1:A:369:MET:O	1:A:558:ASN:HB2	2.14	0.48
1:A:646:ARG:HA	1:A:649:LEU:HG	1.95	0.47
1:A:117:LEU:HD22	1:A:271:VAL:HG11	1.96	0.47
1:A:290:ARG:HD2	1:A:308:ASN:HD22	1.80	0.47
1:A:369:MET:HE3	1:A:610:ILE:HD13	1.96	0.47
1:B:417:PHE:O	1:B:616:PRO:HD3	2.15	0.47
1:A:417:PHE:O	1:A:616:PRO:HD3	2.14	0.47
1:A:437:THR:HG23	1:A:604:THR:HG21	1.96	0.47
1:A:494:ALA:O	1:A:498:VAL:HG23	2.14	0.47
1:B:646:ARG:HA	1:B:649:LEU:HG	1.95	0.47
1:A:331:PHE:CE2	1:A:619:LEU:HD11	2.49	0.47
1:B:494:ALA:O	1:B:498:VAL:HG23	2.15	0.47
1:A:652:ALA:HA	4:A:713:EDO:H12	1.96	0.46
1:B:267:MET:HA	1:B:267:MET:HE2	1.98	0.46
1:A:336:GLN:HE22	1:A:488:ALA:H	1.63	0.46
1:B:331:PHE:CE2	1:B:619:LEU:HD11	2.50	0.46
1:B:141:LEU:CD2	1:B:272:MET:HE2	2.46	0.46
1:B:369:MET:O	1:B:558:ASN:HB2	2.15	0.46
1:B:117:LEU:HD22	1:B:271:VAL:HG11	1.98	0.46
1:B:369:MET:HE3	1:B:610:ILE:HD13	1.97	0.46
4:A:704:EDO:H11	4:A:712:EDO:H22	1.98	0.45
1:B:437:THR:HG23	1:B:604:THR:HG21	1.97	0.45
1:B:336:GLN:HE22	1:B:488:ALA:H	1.64	0.45
1:B:478:GLU:HB3	7:B:816:HOH:O	2.17	0.45
1:A:90:ARG:HB3	7:A:884:HOH:O	2.17	0.45
1:A:38:LYS:HE3	1:A:40:LEU:HD21	1.98	0.45
1:A:554:ARG:HH11	1:A:554:ARG:HB2	1.83	0.44
1:A:267:MET:HA	1:A:267:MET:HE2	2.00	0.44
1:A:164:TRP:HA	1:A:272:MET:HE2	1.99	0.44
1:A:481:LEU:HD11	1:A:531:VAL:HG23	2.00	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:376:TRP:CE2	1:B:560:ARG:HB2	2.53	0.43
1:B:24:GLY:HA3	1:B:25:LYS:HA	1.85	0.43
1:B:481:LEU:HD11	1:B:531:VAL:HG23	2.00	0.43
1:A:376:TRP:CE2	1:A:560:ARG:HB2	2.53	0.43
1:A:97:PRO:HD2	5:A:717:CL:CL	2.56	0.43
1:B:562:PRO:HG2	1:B:565:LYS:HD3	2.01	0.43
1:B:467:PHE:CE2	1:B:472:LEU:HD12	2.55	0.42
1:B:571:PRO:O	1:B:575:GLU:HG2	2.20	0.42
1:B:600:GLN:HE21	1:B:600:GLN:HA	1.84	0.42
1:A:426:SER:HA	1:A:614:GLU:OE1	2.19	0.42
1:B:141:LEU:HD21	1:B:272:MET:HE2	2.02	0.42
1:B:289:ARG:HA	1:B:289:ARG:HD2	1.91	0.42
1:A:562:PRO:HG2	1:A:565:LYS:HD3	2.02	0.41
1:B:433:ASP:HB3	1:B:436:SER:HB2	2.02	0.41
1:A:75:THR:HG23	1:A:299:GLU:HB2	2.03	0.41
1:B:88:THR:HA	1:B:309:GLU:O	2.21	0.41
1:A:38:LYS:O	1:A:70:PRO:HD2	2.21	0.41
1:A:397:GLN:HG2	1:A:440:TYR:CE2	2.56	0.41
1:B:247:HIS:HD2	1:B:258:PHE:CZ	2.38	0.41
1:B:563:GLU:HA	1:B:564:GLY:HA2	1.68	0.41
1:A:477:VAL:HG21	1:A:506:LEU:HD23	2.04	0.40
1:B:426:SER:HA	1:B:614:GLU:OE1	2.20	0.40
1:B:75:THR:HG23	1:B:299:GLU:HB2	2.03	0.40
1:B:118:SER:HB3	1:B:236:CYS:HB3	2.04	0.40
1:B:97:PRO:HG3	1:B:286:ILE:HD11	2.02	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	669/683 (98%)	625 (93%)	39 (6%)	5 (1%)	18 24

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	669/683 (98%)	624 (93%)	40 (6%)	5 (1%)	18	24
All	All	1338/1366 (98%)	1249 (93%)	79 (6%)	10 (1%)	18	24

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	58	LYS
1	A	131	ASP
1	B	58	LYS
1	B	87	ASP
1	A	87	ASP
1	B	23	GLU
1	B	224	LYS
1	A	224	LYS
1	A	645	ILE
1	B	645	ILE

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	558/568 (98%)	523 (94%)	35 (6%)	16	23
1	B	558/568 (98%)	523 (94%)	35 (6%)	16	23
All	All	1116/1136 (98%)	1046 (94%)	70 (6%)	16	23

All (70) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	23	GLU
1	A	35	LEU
1	A	44	SER
1	A	82	VAL
1	A	114	ASP
1	A	150	ASP

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	154	LEU
1	A	156	MET
1	A	189	SER
1	A	213	THR
1	A	229	THR
1	A	279	SER
1	A	288	LEU
1	A	299	GLU
1	A	303	GLN
1	A	313	LYS
1	A	351	ASN
1	A	378	ASN
1	A	384	GLN
1	A	388	GLU
1	A	414	LYS
1	A	429	THR
1	A	445	GLU
1	A	454	ILE
1	A	460	ASP
1	A	479	ILE
1	A	492	SER
1	A	500	GLN
1	A	514	ASP
1	A	545	THR
1	A	554	ARG
1	A	563	GLU
1	A	576	MET
1	A	594	ASP
1	A	621	VAL
1	B	19	GLN
1	B	25	LYS
1	B	35	LEU
1	B	44	SER
1	B	82	VAL
1	B	133	LYS
1	B	150	ASP
1	B	154	LEU
1	B	156	MET
1	B	189	SER
1	B	213	THR
1	B	229	THR
1	B	279	SER

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	B	288	LEU
1	B	299	GLU
1	B	300	LYS
1	B	303	GLN
1	B	313	LYS
1	B	346	ARG
1	B	351	ASN
1	B	378	ASN
1	B	388	GLU
1	B	414	LYS
1	B	429	THR
1	B	454	ILE
1	B	469	LYS
1	B	492	SER
1	B	500	GLN
1	B	514	ASP
1	B	554	ARG
1	B	563	GLU
1	B	594	ASP
1	B	600	GLN
1	B	621	VAL
1	B	676	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (29) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	77	ASN
1	A	140	ASN
1	A	157	HIS
1	A	302	GLN
1	A	303	GLN
1	A	308	ASN
1	A	323	GLN
1	A	336	GLN
1	A	339	ASN
1	A	443	ASN
1	A	517	GLN
1	A	544	ASN
1	A	622	ASN
1	A	630	GLN
1	B	77	ASN
1	B	140	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	B	157	HIS
1	B	302	GLN
1	B	308	ASN
1	B	323	GLN
1	B	336	GLN
1	B	517	GLN
1	B	543	GLN
1	B	544	ASN
1	B	589	ASN
1	B	598	GLN
1	B	600	GLN
1	B	622	ASN
1	B	630	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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 58 ligands modelled in this entry, 33 are monoatomic - leaving 25 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	$\# Z > 2$
4	EDO	B	708	-	3,3,3	0.56	0	2,2,2	0.31	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	EDO	B	705	-	3,3,3	0.52	0	2,2,2	0.36	0
4	EDO	B	703	-	3,3,3	0.63	0	2,2,2	0.21	0
4	EDO	A	708	-	3,3,3	0.58	0	2,2,2	0.23	0
4	EDO	B	707	-	3,3,3	0.56	0	2,2,2	0.35	0
2	GLA	A	701	6	12,12,12	0.83	0	17,17,17	1.43	3 (17%)
4	EDO	A	705	-	3,3,3	0.52	0	2,2,2	0.46	0
4	EDO	B	706	-	3,3,3	0.71	0	2,2,2	0.30	0
4	EDO	B	709	-	3,3,3	0.56	0	2,2,2	0.35	0
4	EDO	A	710	-	3,3,3	0.65	0	2,2,2	0.15	0
4	EDO	A	707	-	3,3,3	0.64	0	2,2,2	0.09	0
4	EDO	A	709	-	3,3,3	0.69	0	2,2,2	0.30	0
4	EDO	A	713	-	3,3,3	0.46	0	2,2,2	0.28	0
4	EDO	A	704	-	3,3,3	0.57	0	2,2,2	0.23	0
4	EDO	A	714	-	3,3,3	0.51	0	2,2,2	0.37	0
4	EDO	B	702	-	3,3,3	0.56	0	2,2,2	0.29	0
3	PEG	A	702	-	6,6,6	0.14	0	5,5,5	0.13	0
3	PEG	A	703	-	6,6,6	0.36	0	5,5,5	0.41	0
4	EDO	B	710	-	3,3,3	0.50	0	2,2,2	0.46	0
4	EDO	B	711	-	3,3,3	0.67	0	2,2,2	0.28	0
4	EDO	B	704	-	3,3,3	0.56	0	2,2,2	0.28	0
4	EDO	A	712	-	3,3,3	0.53	0	2,2,2	0.32	0
4	EDO	A	711	-	3,3,3	0.65	0	2,2,2	0.27	0
4	EDO	A	706	-	3,3,3	0.67	0	2,2,2	0.33	0
2	GLA	B	701	6	12,12,12	0.25	0	17,17,17	0.54	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
4	EDO	B	708	-	-	0/1/1/1	-
4	EDO	B	705	-	-	0/1/1/1	-
4	EDO	B	703	-	-	1/1/1/1	-
4	EDO	A	708	-	-	0/1/1/1	-
4	EDO	B	707	-	-	0/1/1/1	-
2	GLA	A	701	6	-	0/2/22/22	0/1/1/1
4	EDO	A	705	-	-	1/1/1/1	-
4	EDO	B	706	-	-	0/1/1/1	-
4	EDO	B	709	-	-	0/1/1/1	-
4	EDO	A	710	-	-	0/1/1/1	-
4	EDO	A	707	-	-	0/1/1/1	-

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	EDO	A	709	-	-	1/1/1/1	-
4	EDO	A	713	-	-	0/1/1/1	-
4	EDO	A	704	-	-	0/1/1/1	-
4	EDO	A	714	-	-	0/1/1/1	-
4	EDO	B	702	-	-	0/1/1/1	-
3	PEG	A	702	-	-	2/4/4/4	-
3	PEG	A	703	-	-	2/4/4/4	-
4	EDO	B	710	-	-	0/1/1/1	-
4	EDO	B	711	-	-	1/1/1/1	-
4	EDO	B	704	-	-	0/1/1/1	-
4	EDO	A	712	-	-	0/1/1/1	-
4	EDO	A	711	-	-	0/1/1/1	-
4	EDO	A	706	-	-	0/1/1/1	-
2	GLA	B	701	6	-	0/2/22/22	0/1/1/1

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	701	GLA	C1-O5-C5	2.67	118.82	113.65
2	A	701	GLA	O5-C5-C6	2.27	112.06	106.44
2	A	701	GLA	C3-C4-C5	-2.24	106.17	110.23

There are no chirality outliers.

All (8) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	B	711	EDO	O1-C1-C2-O2
3	A	703	PEG	C4-C3-O2-C2
4	A	709	EDO	O1-C1-C2-O2
3	A	702	PEG	C1-C2-O2-C3
3	A	702	PEG	C4-C3-O2-C2
3	A	703	PEG	C1-C2-O2-C3
4	A	705	EDO	O1-C1-C2-O2
4	B	703	EDO	O1-C1-C2-O2

There are no ring outliers.

4 monomers are involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	713	EDO	1	0
4	A	704	EDO	1	0
3	A	703	PEG	6	0
4	A	712	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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	671/683 (98%)	-0.89	0	100 100	24, 58, 98, 164	0
1	B	671/683 (98%)	-0.75	1 (0%)	92 93	34, 67, 107, 139	0
All	All	1342/1366 (98%)	-0.82	1 (0%)	92 93	24, 63, 104, 164	0

All (1) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	59	LEU	2.1

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 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
6	CA	A	735	1/1	0.83	0.12	171,171,171,171	0
4	EDO	A	708	4/4	0.88	0.10	71,72,74,76	0
4	EDO	B	705	4/4	0.92	0.06	91,92,94,95	0
4	EDO	B	710	4/4	0.92	0.07	60,61,61,62	0

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
4	EDO	B	702	4/4	0.92	0.08	79,79,79,79	0
4	EDO	A	706	4/4	0.93	0.07	49,49,54,55	0
4	EDO	B	711	4/4	0.93	0.07	62,63,63,63	0
4	EDO	B	708	4/4	0.93	0.06	76,77,77,78	0
4	EDO	B	703	4/4	0.94	0.05	70,71,72,72	0
4	EDO	A	710	4/4	0.95	0.07	62,62,64,64	0
4	EDO	B	707	4/4	0.95	0.06	76,78,79,81	0
4	EDO	A	714	4/4	0.96	0.06	51,51,53,53	0
4	EDO	A	709	4/4	0.96	0.06	54,55,59,59	0
5	CL	A	723	1/1	0.96	0.04	65,65,65,65	0
6	CA	A	726	1/1	0.96	0.12	85,85,85,85	0
6	CA	A	733	1/1	0.96	0.05	94,94,94,94	0
4	EDO	A	711	4/4	0.96	0.06	62,63,63,64	0
6	CA	B	721	1/1	0.96	0.05	74,74,74,74	0
5	CL	B	716	1/1	0.97	0.04	80,80,80,80	0
5	CL	B	718	1/1	0.97	0.06	92,92,92,92	0
4	EDO	B	706	4/4	0.97	0.05	42,45,46,47	0
6	CA	A	729	1/1	0.97	0.05	81,81,81,81	0
4	EDO	A	705	4/4	0.97	0.08	56,59,64,66	0
4	EDO	A	712	4/4	0.97	0.06	54,54,54,55	0
5	CL	B	715	1/1	0.97	0.03	79,79,79,79	0
5	CL	B	714	1/1	0.98	0.06	73,73,73,73	0
4	EDO	A	704	4/4	0.98	0.06	64,65,65,65	0
3	PEG	A	702	7/7	0.98	0.06	61,63,64,66	0
5	CL	B	717	1/1	0.98	0.04	77,77,77,77	0
4	EDO	B	709	4/4	0.98	0.05	53,55,55,55	0
4	EDO	B	704	4/4	0.98	0.06	66,67,70,73	0
6	CA	A	727	1/1	0.98	0.06	79,79,79,79	0
6	CA	A	728	1/1	0.98	0.09	91,91,91,91	0
4	EDO	A	713	4/4	0.98	0.11	42,42,43,43	0
6	CA	A	731	1/1	0.98	0.04	86,86,86,86	0
6	CA	A	732	1/1	0.98	0.07	81,81,81,81	0
5	CL	A	721	1/1	0.98	0.05	64,64,64,64	0
3	PEG	A	703	7/7	0.98	0.08	39,42,46,48	0
6	CA	B	720	1/1	0.98	0.06	89,89,89,89	0
5	CL	B	713	1/1	0.98	0.04	97,97,97,97	0
6	CA	B	723	1/1	0.98	0.04	91,91,91,91	0
6	CA	A	724	1/1	0.99	0.08	67,67,67,67	0
6	CA	A	725	1/1	0.99	0.03	82,82,82,82	0
5	CL	A	720	1/1	0.99	0.04	60,60,60,60	0
4	EDO	A	707	4/4	0.99	0.08	41,44,47,48	0
5	CL	A	722	1/1	0.99	0.03	65,65,65,65	0

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	GLA	B	701	12/12	0.99	0.03	35,41,45,45	0
6	CA	A	730	1/1	0.99	0.05	81,81,81,81	0
5	CL	B	712	1/1	0.99	0.06	82,82,82,82	0
2	GLA	A	701	12/12	0.99	0.04	33,39,46,54	0
5	CL	A	715	1/1	0.99	0.04	49,49,49,49	0
6	CA	A	734	1/1	0.99	0.03	68,68,68,68	0
5	CL	A	716	1/1	0.99	0.04	51,51,51,51	0
6	CA	B	719	1/1	0.99	0.02	54,54,54,54	0
5	CL	A	717	1/1	0.99	0.04	60,60,60,60	0
5	CL	A	718	1/1	0.99	0.06	76,76,76,76	0
6	CA	B	722	1/1	0.99	0.07	79,79,79,79	0
5	CL	A	719	1/1	0.99	0.04	68,68,68,68	0

6.5 Other polymers [i](#)

There are no such residues in this entry.