Full wwPDB X-ray Structure Validation Report ⓘ

May 6, 2025 – 01:11 pm BST

PDB ID	:	9QA4 / pdb_00009qa4
Title	:	Drosophila melanogaster angiotensin converting enzyme homologue, AnCE in complex with WR dipeptide
Authors	:	Zukowska, J.; Gregory, K.S.; Acharya, K.R.
Deposited on	:	2025-02-27
Resolution	:	1.85 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The 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:

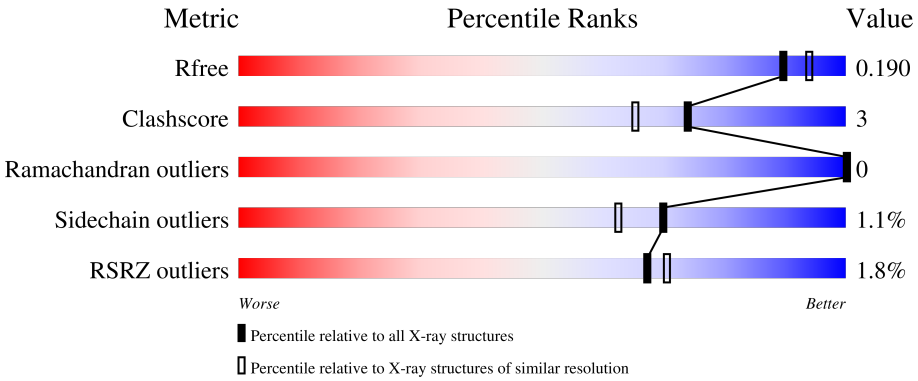
MolProbity	:	4-5-2 with Phenix2.0rc1
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.43.1

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 1.85 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	3097 (1.86-1.86)
Clashscore	180529	3359 (1.86-1.86)
Ramachandran outliers	177936	3335 (1.86-1.86)
Sidechain outliers	177891	3335 (1.86-1.86)
RSRZ outliers	164620	3097 (1.86-1.86)

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	B	2	100%
1	C	2	50% 50% 50%
2	A	598	2% 92% 7% .
3	D	6	67% 33%

2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 5843 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 TRP-ARG dipeptide.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
1	B	2	Total	C	N	O	0	2	0
			52	34	12	6			
1	C	2	Total	C	N	O	0	0	0
			26	17	6	3			

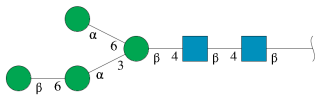
- Molecule 2 is a protein called Angiotensin-converting enzyme.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	A	598	Total	C	N	O	S	0	0	0
			4878	3123	805	930	20			

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	346	ILE	THR	conflict	UNP Q10714

- Molecule 3 is an oligosaccharide called beta-D-mannopyranose-(1-6)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.

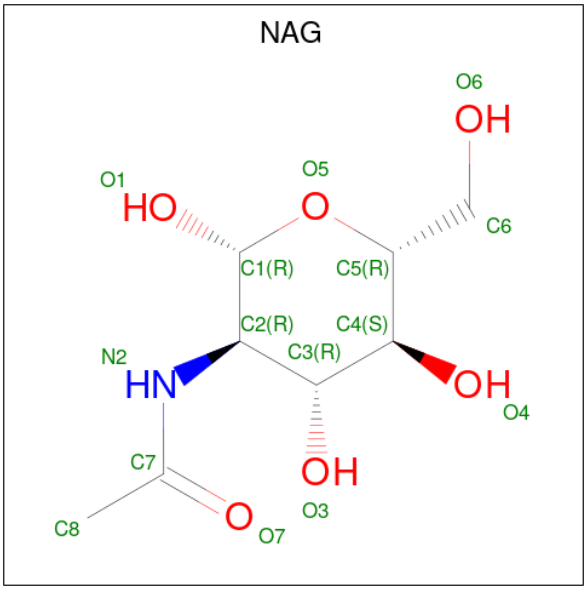


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	D	6	Total	C	N	O	0	0	0
			72	40	2	30			

- Molecule 4 is ZINC ION (CCD ID: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

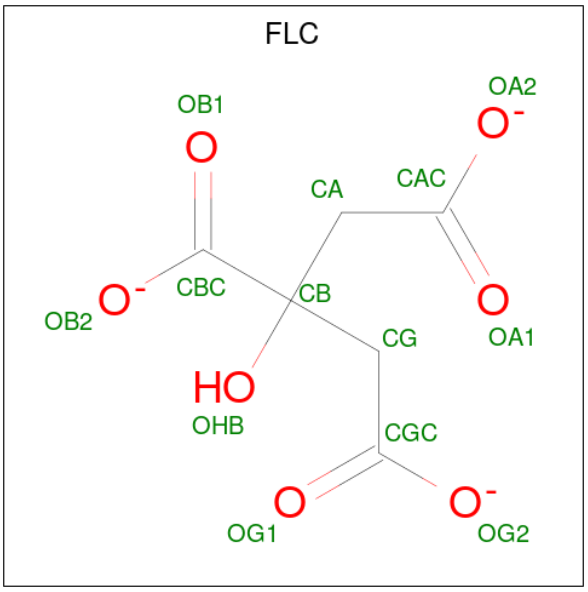
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total Zn 1 1	0	0

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C N O 14 8 1 5	0	0
5	A	1	Total C N O 14 8 1 5	0	0

- Molecule 6 is CITRATE ANION (CCD ID: FLC) (formula: $C_6H_5O_7$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total C O 13 6 7	0	0
6	A	1	Total C O 13 6 7	0	0

- Molecule 7 is water.

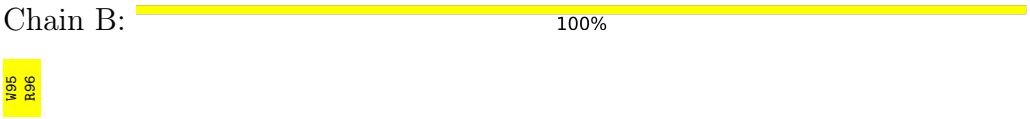
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	B	8	Total O 8 8	0	0
7	C	2	Total O 2 2	0	0
7	A	750	Total O 750 750	0	0

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.

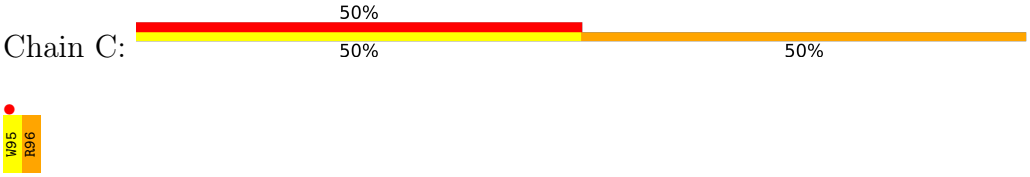
• Molecule 1: TRP-ARG dipeptide

Chain B:



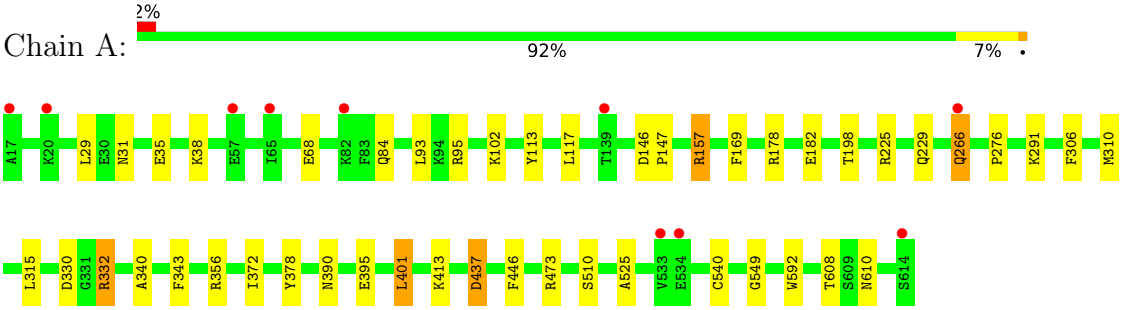
• Molecule 1: TRP-ARG dipeptide

Chain C:



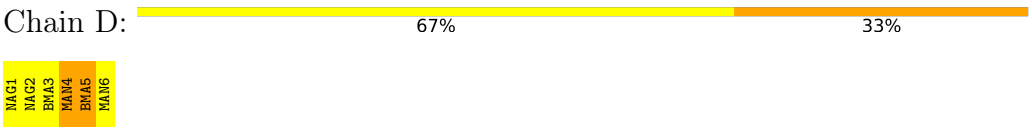
• Molecule 2: Angiotensin-converting enzyme

Chain A:



• Molecule 3: beta-D-mannopyranose-(1-6)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain D:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	H 3	Depositor
Cell constants a, b, c, α, β, γ	172.95Å 172.95Å 103.01Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	86.47 – 1.85 86.47 – 1.85	Depositor EDS
% Data completeness (in resolution range)	100.0 (86.47-1.85) 100.0 (86.47-1.85)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.65 (at 1.84Å)	Xtriage
Refinement program	REFMAC 5.8.0430 (refmacat 0.4.100)	Depositor
R, R_{free}	0.154 , 0.185 0.164 , 0.190	Depositor DCC
R_{free} test set	5129 reflections (5.23%)	wwPDB-VP
Wilson B-factor (Å^2)	27.3	Xtriage
Anisotropy	0.768	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.38 , 46.2	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.34$	Xtriage
Estimated twinning fraction	0.000 for -2/3*h-1/3*k-4/3*l,-1/3*h-2/3*k+4/3*l,-1/3*h+1/3*k+1/3*l 0.000 for -h,1/3*h-1/3*k-4/3*l,-1/3*h-2/3*k+1/3*l 0.000 for -1/3*h+1/3*k+4/3*l,-k,2/3*h+1/3*k+1/3*l 0.000 for -h,2/3*h+1/3*k+4/3*l,1/3*h+2/3*k-1/3*l 0.007 for -1/3*h-2/3*k+4/3*l,-2/3*h-1/3*k-4/3*l,1/3*h-1/3*k-1/3*l 0.000 for 1/3*h+2/3*k-4/3*l,-k,-2/3*h-1/3*k-1/3*l 0.008 for h,-h-k,-l	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	5843	wwPDB-VP
Average B, all atoms (Å^2)	32.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.28% 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 (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: BMA, NAG, ZN, MAN, FLC

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	B	0.40	0/54	0.41	0/68
1	C	1.15	0/27	1.21	0/34
2	A	0.73	0/5004	1.12	15/6779 (0.2%)
All	All	0.73	0/5085	1.12	15/6881 (0.2%)

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	C	0	1
2	A	0	2
All	All	0	3

There are no bond length outliers.

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	413	LYS	CB-CA-C	8.96	125.92	110.68
2	A	157	ARG	NE-CZ-NH2	-8.89	111.20	119.20
2	A	437	ASP	CA-CB-CG	8.38	120.98	112.60
2	A	413	LYS	N-CA-CB	-6.91	99.69	110.06
2	A	198	THR	CA-CB-OG1	-6.07	100.49	109.60
2	A	343	PHE	CA-CB-CG	-5.86	107.94	113.80
2	A	68	GLU	CB-CA-C	5.54	120.84	110.70
2	A	390	ASN	CB-CA-C	5.52	118.52	109.97
2	A	169	PHE	CA-CB-CG	-5.40	108.40	113.80
2	A	95	ARG	CD-NE-CZ	5.39	131.95	124.40
2	A	38	LYS	CB-CA-C	-5.39	102.38	110.90

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	84	GLN	CB-CA-C	-5.25	103.93	111.91
2	A	332	ARG	CB-CG-CD	-5.25	99.23	111.30
2	A	608	THR	CA-CB-OG1	-5.20	101.80	109.60
2	A	35	GLU	N-CA-CB	-5.20	102.48	110.12

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	A	157	ARG	Sidechain
2	A	473	ARG	Sidechain
1	C	96	ARG	Sidechain

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	B	52	0	44	6	0
1	C	26	0	22	1	0
2	A	4878	0	4680	22	0
3	D	72	0	61	2	0
4	A	1	0	0	0	0
5	A	28	0	26	0	0
6	A	26	0	10	1	0
7	A	750	0	0	8	0
7	B	8	0	0	1	0
7	C	2	0	0	0	0
All	All	5843	0	4843	30	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 3.

All (30) 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)
2:A:31:ASN:HB3	7:A:1326:HOH:O	1.61	0.99

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:610:ASN:HB3	7:A:1348:HOH:O	1.64	0.96
1:B:95[B]:TRP:CD1	1:B:95[B]:TRP:O	2.31	0.84
3:D:4:MAN:H61	3:D:5:BMA:O2	1.79	0.82
1:B:95[B]:TRP:O	1:B:95[B]:TRP:CG	2.32	0.82
1:B:96[B]:ARG:O	7:B:101:HOH:O	2.13	0.67
2:A:306:PHE:CD1	2:A:401:LEU:HD13	2.31	0.64
3:D:4:MAN:C6	3:D:5:BMA:O2	2.50	0.58
2:A:291:LYS:HE2	7:A:1018:HOH:O	2.05	0.56
2:A:178:ARG:NE	2:A:182:GLU:OE2	2.37	0.55
2:A:525:ALA:HA	6:A:705:FLC:OB1	2.08	0.54
2:A:276:PRO:HB3	2:A:592:TRP:CH2	2.45	0.52
2:A:330:ASP:OD1	2:A:332:ARG:HD3	2.12	0.49
2:A:113:TYR:CE2	2:A:117:LEU:HD11	2.47	0.48
2:A:29:LEU:HD12	2:A:93:LEU:HD22	1.96	0.47
2:A:178:ARG:NH2	7:A:805:HOH:O	2.35	0.46
1:B:95[B]:TRP:HA	2:A:340:ALA:O	2.15	0.46
1:B:96[B]:ARG:HE	1:B:96[B]:ARG:CA	2.28	0.46
2:A:225:ARG:O	2:A:229:GLN:HG2	2.19	0.43
2:A:291:LYS:HE2	7:A:976:HOH:O	2.17	0.42
1:C:95:TRP:HA	1:C:95:TRP:CE3	2.54	0.42
2:A:266:GLN:HG3	2:A:437:ASP:OD1	2.20	0.41
2:A:315:LEU:CD2	2:A:372:ILE:HG21	2.50	0.41
2:A:146:ASP:HA	2:A:147:PRO:HA	1.80	0.41
1:B:95[B]:TRP:CD1	1:B:95[B]:TRP:C	2.99	0.41
2:A:291:LYS:CE	7:A:976:HOH:O	2.68	0.41
2:A:356:ARG:HD2	7:A:1161:HOH:O	2.21	0.40
2:A:102:LYS:HD3	7:A:827:HOH:O	2.20	0.40
2:A:310:MET:O	2:A:549:GLY:HA3	2.22	0.40
2:A:395:GLU:HB2	2:A:510:SER:HB2	2.03	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	
2	A	596/598 (100%)	589 (99%)	7 (1%)	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	B	4/2 (200%)	4 (100%)	0	100	100
1	C	2/2 (100%)	1 (50%)	1 (50%)	0	0
2	A	520/520 (100%)	515 (99%)	5 (1%)	73	67
All	All	526/524 (100%)	520 (99%)	6 (1%)	70	62

All (6) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	96	ARG
2	A	266	GLN
2	A	378	TYR
2	A	401	LEU
2	A	446	PHE
2	A	540	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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)

6 monosaccharides 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	$\#\|Z\| > 2$
3	NAG	D	1	3,2	14,14,15	0.44	0	17,19,21	0.87	1 (5%)
3	NAG	D	2	3	14,14,15	0.58	0	17,19,21	1.25	1 (5%)
3	BMA	D	3	3	11,11,12	0.79	0	15,15,17	1.14	1 (6%)
3	MAN	D	4	3	11,11,12	0.89	0	15,15,17	0.89	1 (6%)
3	BMA	D	5	3	11,11,12	1.41	2 (18%)	15,15,17	1.94	5 (33%)
3	MAN	D	6	3	11,11,12	1.27	1 (9%)	15,15,17	1.63	3 (20%)

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	NAG	D	1	3,2	-	0/6/23/26	0/1/1/1
3	NAG	D	2	3	-	0/6/23/26	0/1/1/1
3	BMA	D	3	3	-	0/2/19/22	0/1/1/1
3	MAN	D	4	3	-	0/2/19/22	0/1/1/1
3	BMA	D	5	3	-	2/2/19/22	1/1/1/1
3	MAN	D	6	3	-	2/2/19/22	0/1/1/1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	5	BMA	C2-C3	-3.80	1.46	1.52
3	D	6	MAN	C2-C3	3.17	1.57	1.52
3	D	5	BMA	C4-C5	2.43	1.58	1.53

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	D	5	BMA	C2-C3-C4	-3.59	104.68	110.89
3	D	5	BMA	O3-C3-C4	3.52	118.48	110.35
3	D	6	MAN	O5-C1-C2	3.27	115.81	110.77
3	D	6	MAN	C1-C2-C3	3.06	113.43	109.67
3	D	5	BMA	C3-C4-C5	-2.96	104.96	110.24
3	D	6	MAN	O3-C3-C2	2.88	115.51	109.99
3	D	1	NAG	C2-N2-C7	2.81	126.91	122.90
3	D	2	NAG	C2-N2-C7	2.74	126.81	122.90
3	D	4	MAN	O2-C2-C3	2.40	114.94	110.14
3	D	5	BMA	O2-C2-C1	2.27	113.80	109.15
3	D	3	BMA	C1-O5-C5	2.19	115.16	112.19
3	D	5	BMA	O2-C2-C3	-2.08	105.98	110.14

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	D	5	BMA	O5-C5-C6-O6
3	D	6	MAN	O5-C5-C6-O6
3	D	6	MAN	C4-C5-C6-O6
3	D	5	BMA	C4-C5-C6-O6

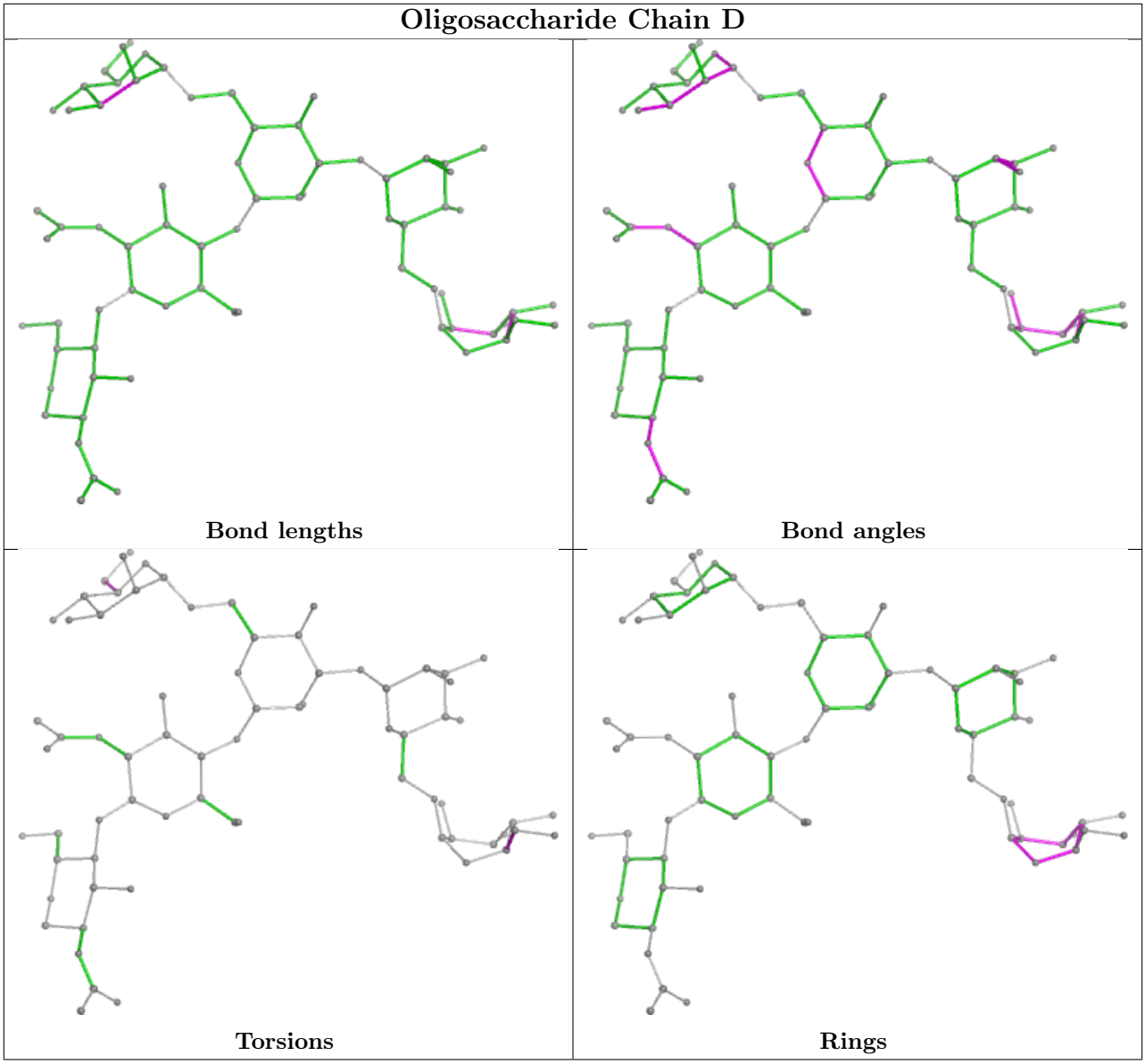
All (1) ring outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	D	5	BMA	C1-C2-C3-C4-C5-O5

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	4	MAN	2	0
3	D	5	BMA	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.



5.6 Ligand geometry (i)

Of 5 ligands modelled in this entry, 1 is monoatomic - leaving 4 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	$\#\|Z\|>2$

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
6	FLC	A	704	-	12,12,12	1.37	1 (8%)	17,17,17	1.39	3 (17%)
5	NAG	A	702	2	14,14,15	0.52	0	17,19,21	1.48	1 (5%)
6	FLC	A	705	-	12,12,12	1.20	1 (8%)	17,17,17	1.82	4 (23%)
5	NAG	A	703	2	14,14,15	0.35	0	17,19,21	0.64	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
6	FLC	A	704	-	-	12/16/16/16	-
5	NAG	A	702	2	-	4/6/23/26	0/1/1/1
6	FLC	A	705	-	-	3/16/16/16	-
5	NAG	A	703	2	-	2/6/23/26	0/1/1/1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	A	704	FLC	CB-CBC	2.99	1.56	1.53
6	A	705	FLC	CB-CBC	2.16	1.55	1.53

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	A	702	NAG	C1-C2-N2	-4.97	102.00	110.49
6	A	705	FLC	OB1-CBC-CB	-4.72	115.57	122.25
6	A	704	FLC	OB1-CBC-CB	-3.39	117.45	122.25
6	A	705	FLC	OB2-CBC-CB	3.19	118.59	113.05
6	A	704	FLC	OB2-CBC-CB	3.08	118.39	113.05
6	A	705	FLC	CB-CA-CAC	2.69	120.32	113.81
6	A	705	FLC	OHB-CB-CA	2.35	114.90	109.40
6	A	704	FLC	CB-CG-CGC	2.12	118.94	113.81

There are no chirality outliers.

All (21) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	A	704	FLC	CA-CB-CBC-OB1
6	A	704	FLC	CA-CB-CBC-OB2
6	A	704	FLC	OHB-CB-CBC-OB1
6	A	704	FLC	OHB-CB-CBC-OB2
6	A	704	FLC	CA-CB-CG-CGC
6	A	704	FLC	CBC-CB-CG-CGC
6	A	704	FLC	OHB-CB-CG-CGC
6	A	705	FLC	CA-CB-CG-CGC
6	A	705	FLC	CBC-CB-CG-CGC
6	A	705	FLC	OHB-CB-CG-CGC
5	A	702	NAG	C8-C7-N2-C2
5	A	702	NAG	O7-C7-N2-C2
5	A	703	NAG	C4-C5-C6-O6
5	A	703	NAG	O5-C5-C6-O6
6	A	704	FLC	CG-CB-CBC-OB1
6	A	704	FLC	CAC-CA-CB-OHB
5	A	702	NAG	O5-C5-C6-O6
5	A	702	NAG	C4-C5-C6-O6
6	A	704	FLC	CB-CA-CAC-OA1
6	A	704	FLC	CB-CA-CAC-OA2
6	A	704	FLC	CAC-CA-CB-CBC

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	A	705	FLC	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, 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	B	2/2 (100%)	0.63	0 100 100	15, 15, 15, 30	2 (100%)
1	C	2/2 (100%)	3.18	1 (50%) 0 0	43, 43, 43, 65	0
2	A	598/598 (100%)	-0.18	10 (1%) 69 72	20, 28, 47, 71	0
All	All	602/602 (100%)	-0.17	11 (1%) 67 70	15, 28, 47, 71	2 (0%)

All (11) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	95	TRP	5.1
2	A	17	ALA	4.5
2	A	82	LYS	3.5
2	A	139	THR	3.1
2	A	533	VAL	3.1
2	A	614	SER	3.0
2	A	57	GLU	2.8
2	A	534	GLU	2.8
2	A	20	LYS	2.1
2	A	65	ILE	2.1
2	A	266	GLN	2.0

6.2 Non-standard residues in protein, DNA, RNA chains

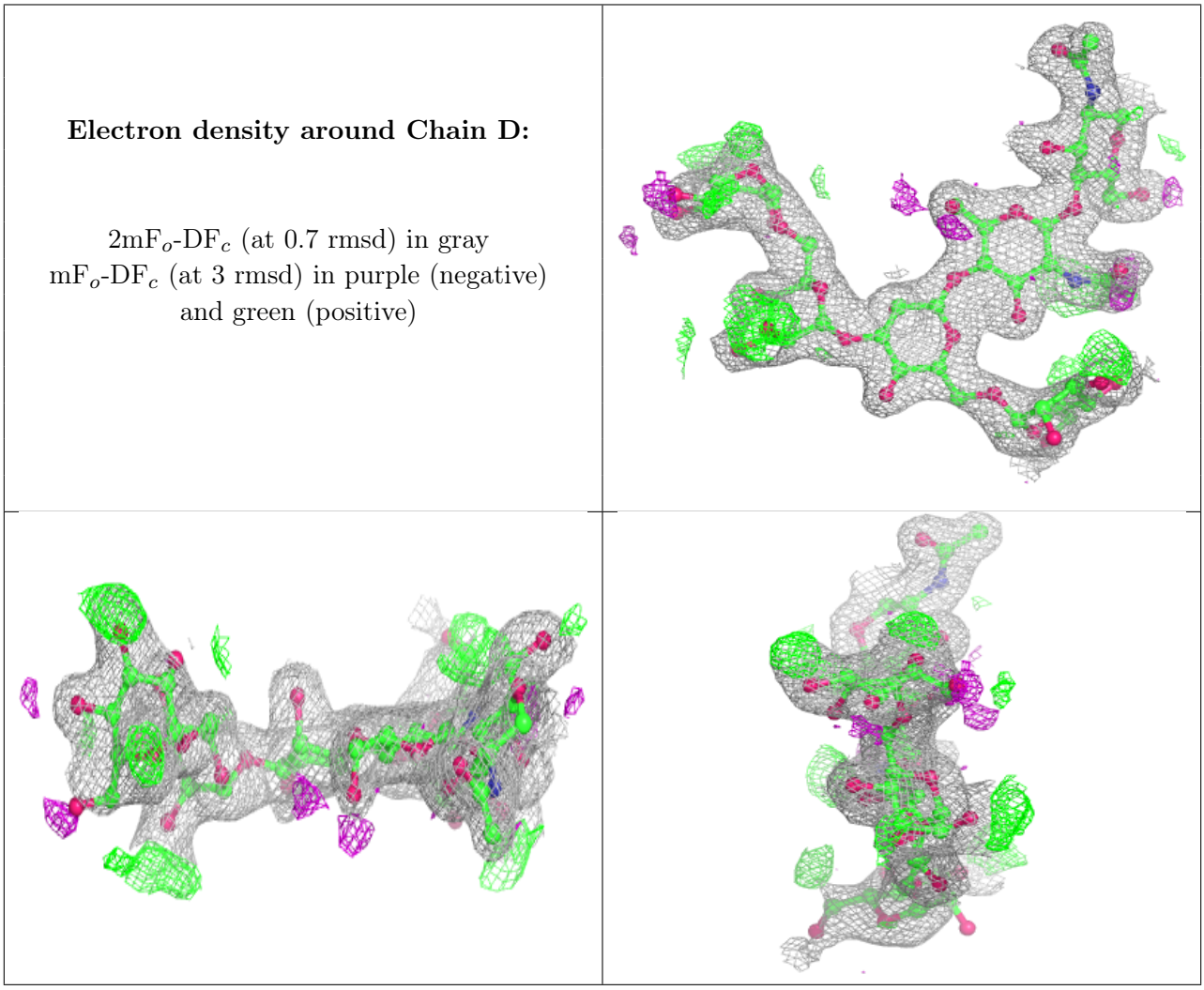
There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates

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, 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	B-factors(Å^2)	Q<0.9
3	MAN	D	6	11/12	0.74	0.18	69,78,86,95	0
3	BMA	D	5	11/12	0.85	0.17	43,53,77,90	0
3	MAN	D	4	11/12	0.90	0.10	41,45,52,57	0
3	BMA	D	3	11/12	0.93	0.09	40,48,60,62	0
3	NAG	D	2	14/15	0.93	0.10	30,34,51,52	0
3	NAG	D	1	14/15	0.97	0.06	25,29,31,35	0

The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.



6.4 Ligands

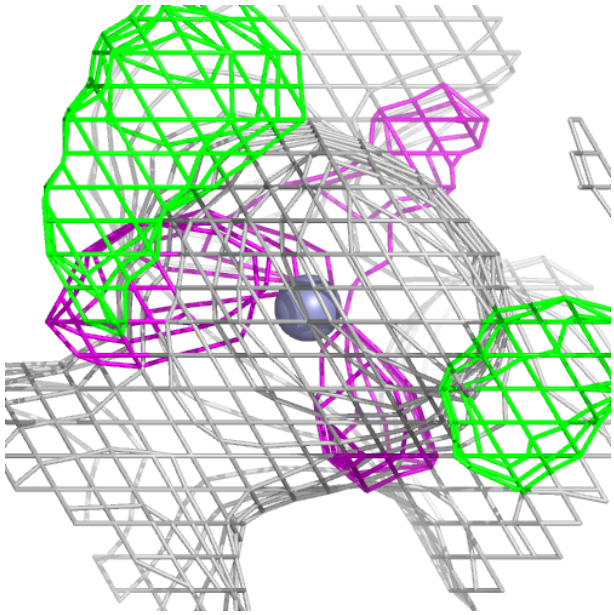
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

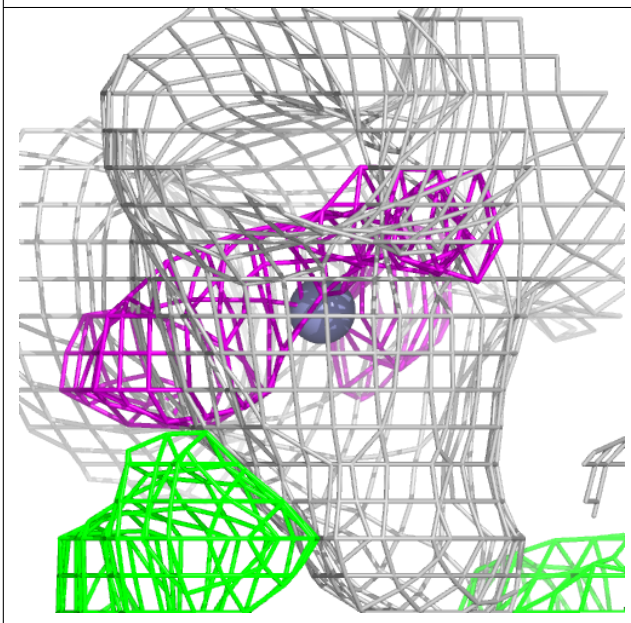
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
6	FLC	A	705	13/13	0.73	0.24	60,95,107,123	0
5	NAG	A	702	14/15	0.74	0.18	54,65,82,83	0
5	NAG	A	703	14/15	0.78	0.15	50,66,82,88	0
6	FLC	A	704	13/13	0.81	0.19	49,84,91,98	0
4	ZN	A	701	1/1	1.00	0.03	25,25,25,25	0

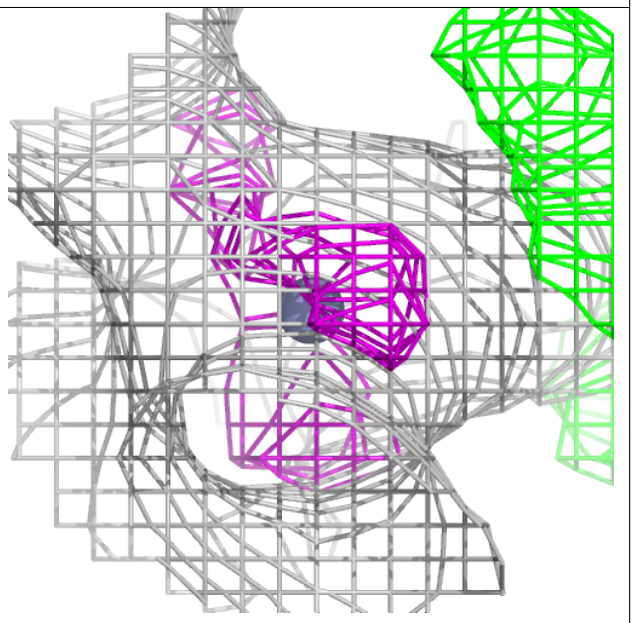
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around ZN A 701:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)







6.5 Other polymers (i)

There are no such residues in this entry.