wwPDB X-ray Structure Validation Summary Report (i)

Jan 16, 2025 – 06:32 am GMT

PDB ID	:	9GBP
Title	:	Human Angiotensin-1 converting enzyme N-domain in complex with a diprolyl inhibitor- SG3
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Deposited on	:	2024-07-31
Resolution	:	2.00 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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 (i) 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 (i)) were used in the production of this report:

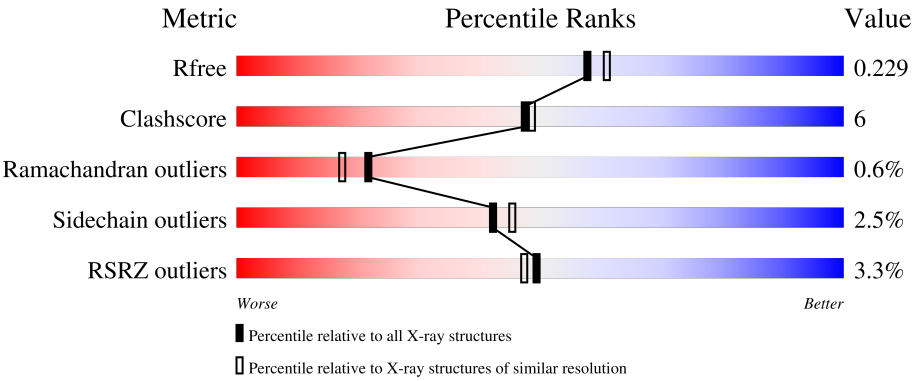
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.40

1 Overall quality at a glance (i)

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

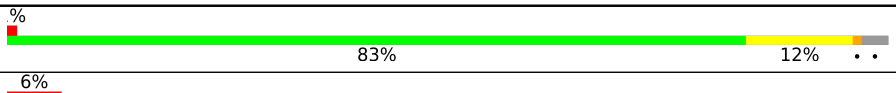
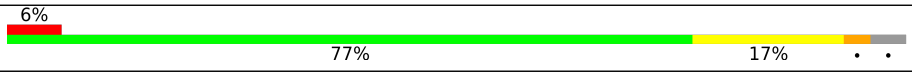
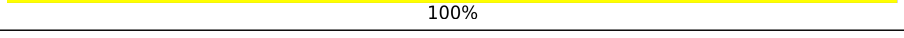
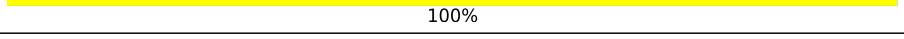
The reported resolution of this entry is 2.00 Å.

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	9409 (2.00-2.00)
Clashscore	180529	10737 (2.00-2.00)
Ramachandran outliers	177936	10628 (2.00-2.00)
Sidechain outliers	177891	10627 (2.00-2.00)
RSRZ outliers	164620	9409 (2.00-2.00)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	628	
1	B	628	
2	E	2	
3	C	3	

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
7	PEG	A	704	-	-	X	-
8	EDO	B	709	-	-	X	-

2 Entry composition (i)

There are 13 unique types of molecules in this entry. The entry contains 11143 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 Angiotensin-converting enzyme, soluble form.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	609	Total	C	N	O	S	0	5	0
			5011	3218	858	915	20			
1	B	604	Total	C	N	O	S	0	3	0
			4948	3175	848	906	19			

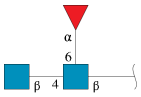
There are 16 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	9	GLN	ASN	engineered mutation	UNP P12821
A	25	GLN	ASN	engineered mutation	UNP P12821
A	82	GLN	ASN	engineered mutation	UNP P12821
A	117	GLN	ASN	engineered mutation	UNP P12821
A	131	GLN	ASN	engineered mutation	UNP P12821
A	289	GLN	ASN	engineered mutation	UNP P12821
A	545	ARG	GLN	engineered mutation	UNP P12821
A	576	LEU	PRO	engineered mutation	UNP P12821
B	9	GLN	ASN	engineered mutation	UNP P12821
B	25	GLN	ASN	engineered mutation	UNP P12821
B	82	GLN	ASN	engineered mutation	UNP P12821
B	117	GLN	ASN	engineered mutation	UNP P12821
B	131	GLN	ASN	engineered mutation	UNP P12821
B	289	GLN	ASN	engineered mutation	UNP P12821
B	545	ARG	GLN	engineered mutation	UNP P12821
B	576	LEU	PRO	engineered mutation	UNP P12821

- Molecule 2 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.

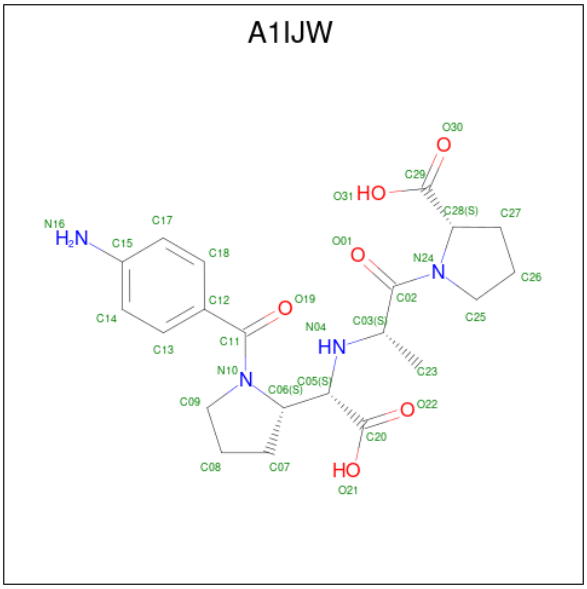
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf	Trace
2	E	2	Total C N O 28 16 2 10	0	0	0

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



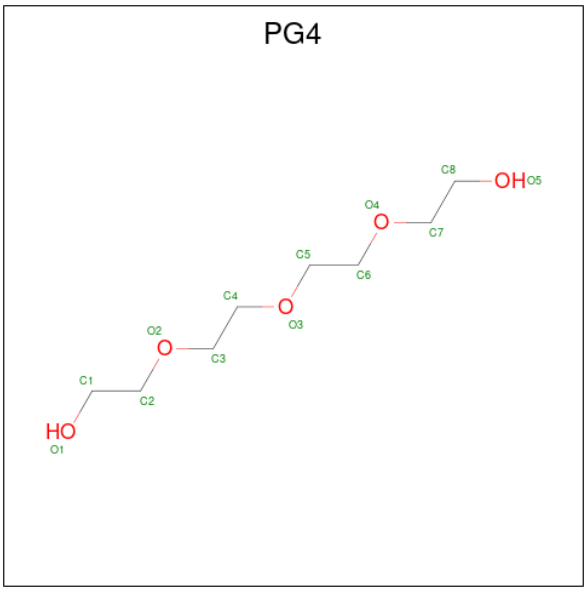
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf	Trace
3	C	3	Total C N O 38 22 2 14	0	0	0

- Molecule 4 is (2S)-1-[(2S)-2-[[(1S)-1-[(2S)-1-(4-aminophenyl)carbonylpyrrolidin-2-yl]-2-oxidanyl-2-oxidanylidene-ethyl]amino]propanoyl]pyrrolidine-2-carboxylic acid (three-letter code: A1IJW) (formula: $C_{21}H_{28}N_4O_6$) (labeled as "Ligand of Interest" by depositor).



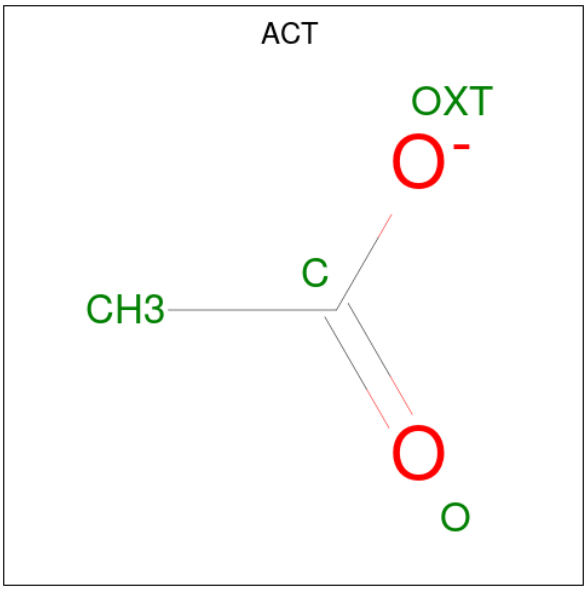
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C N O 31 21 4 6	0	0
4	B	1	Total C N O 31 21 4 6	0	0

- Molecule 5 is TETRAETHYLENE GLYCOL (three-letter code: PG4) (formula: $C_8H_{18}O_5$).



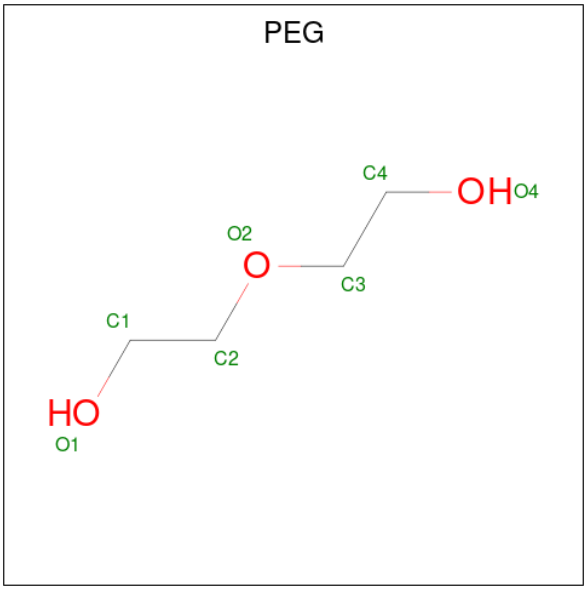
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C O 26 16 10	0	1
5	B	1	Total C O 13 8 5	0	0
5	B	1	Total C O 26 16 10	0	1
5	B	1	Total C O 13 8 5	0	0

- Molecule 6 is ACETATE ION (three-letter code: ACT) (formula: $C_2H_3O_2$).



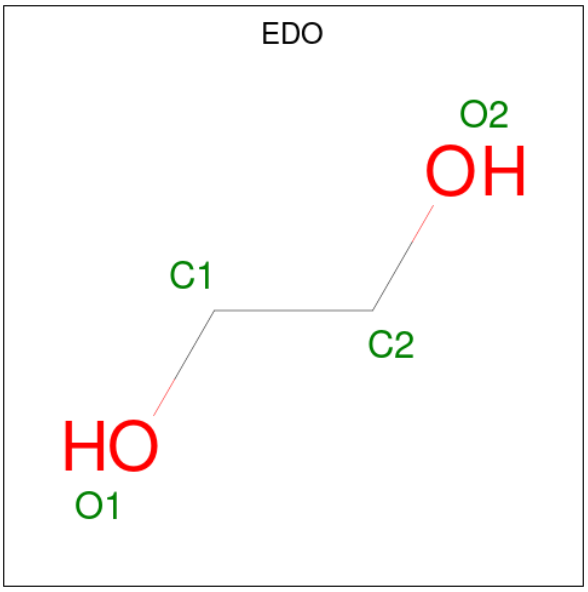
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total C O 4 2 2	0	0
6	B	1	Total C O 4 2 2	0	0

- Molecule 7 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: $C_4H_{10}O_3$).



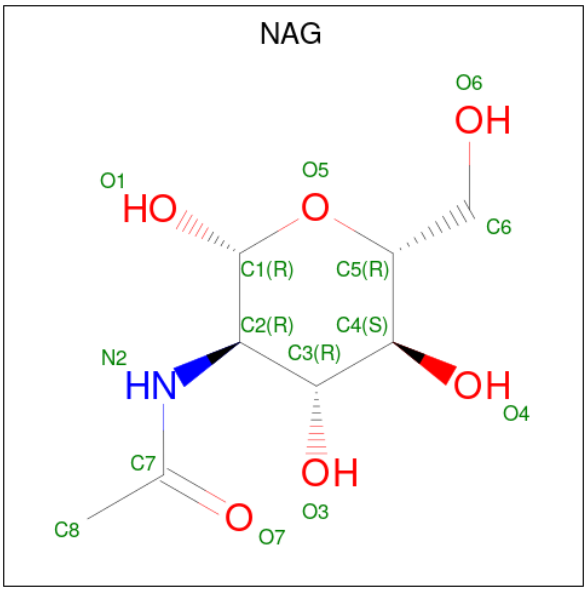
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	1	Total C O 7 4 3	0	0
7	A	1	Total C O 7 4 3	0	0
7	B	1	Total C O 7 4 3	0	0
7	B	1	Total C O 7 4 3	0	0

- Molecule 8 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).



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

- Molecule 9 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



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

- Molecule 10 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
10	A	1	Total Zn 1 1	0	0
10	B	1	Total Zn 1 1	0	0

- Molecule 11 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
11	A	1	Total Cl 1 1	0	0
11	B	1	Total Cl 1 1	0	0

- Molecule 12 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
12	A	1	Total Mg 1 1	0	0
12	B	1	Total Mg 1 1	0	0

- Molecule 13 is water.

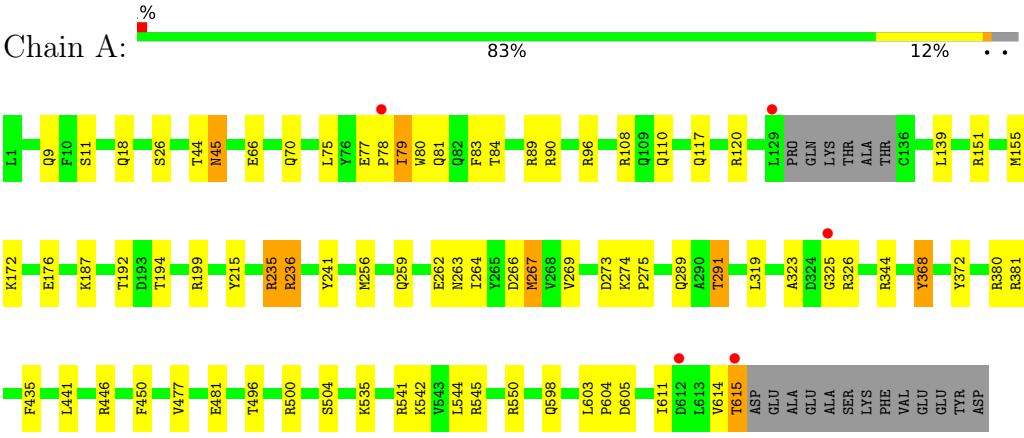
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
13	A	519	Total O 519 519	0	0
13	B	345	Total O 345 345	0	0

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.

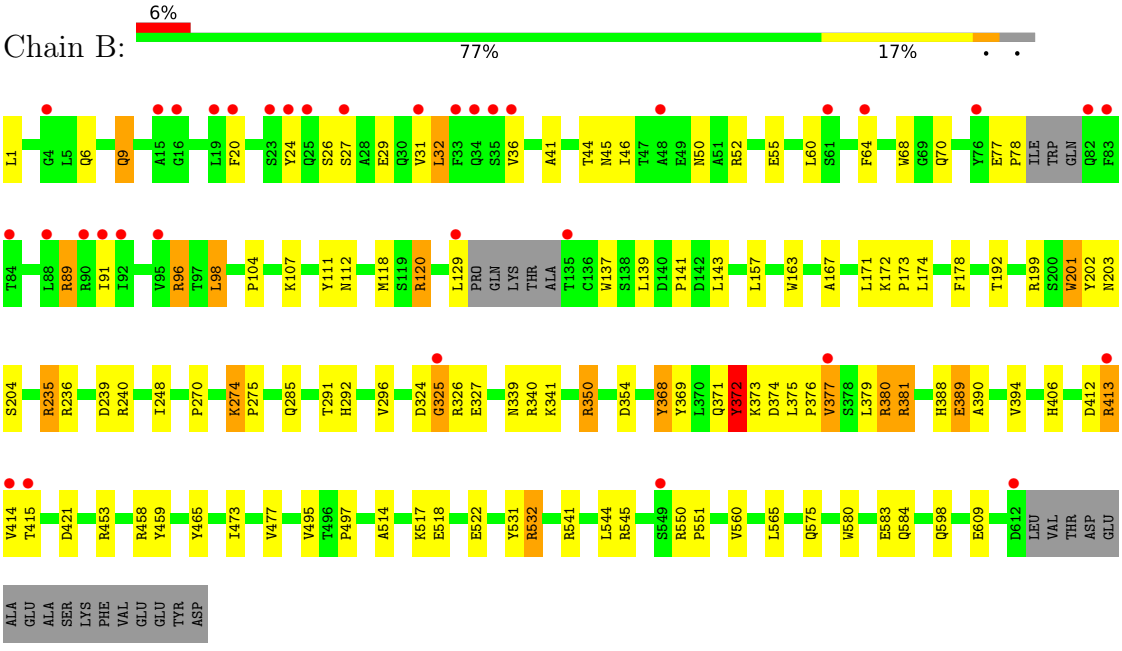
• Molecule 1: Angiotensin-converting enzyme, soluble form

Chain A:



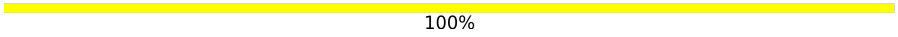
• Molecule 1: Angiotensin-converting enzyme, soluble form

Chain B:



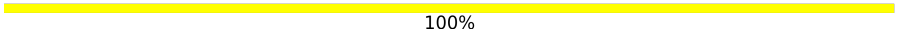
• Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain E:



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

Chain C:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	73.09Å 77.97Å 83.31Å 88.27° 64.11° 74.36°	Depositor
Resolution (Å)	74.70 – 2.00 74.70 – 2.00	Depositor EDS
% Data completeness (in resolution range)	98.0 (74.70-2.00) 96.4 (74.70-2.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.86 (at 2.00Å)	Xtriage
Refinement program	REFMAC 5.8.0425	Depositor
R, R_{free}	0.183 , 0.230 0.183 , 0.229	Depositor DCC
R_{free} test set	5131 reflections (4.89%)	wwPDB-VP
Wilson B-factor (Å^2)	27.2	Xtriage
Anisotropy	0.061	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 40.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.51$, $< L^2 > = 0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	11143	wwPDB-VP
Average B, all atoms (Å^2)	31.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.12% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: NAG, FUC, ACT, PEG, CL, MG, ZN, PG4, A1IJW, EDO

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	0.71	1/5166 (0.0%)	1.26	37/7035 (0.5%)
1	B	0.66	1/5100 (0.0%)	1.25	34/6943 (0.5%)
All	All	0.69	2/10266 (0.0%)	1.25	71/13978 (0.5%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	3
1	B	0	5
All	All	0	8

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	262	GLU	CD-OE1	5.68	1.31	1.25
1	B	389	GLU	CD-OE2	5.43	1.31	1.25

The worst 5 of 71 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	500	ARG	NE-CZ-NH2	-13.63	113.48	120.30
1	A	267	MET	CG-SD-CE	-10.80	82.93	100.20
1	B	44	THR	CA-CB-OG1	-8.84	90.44	109.00
1	A	326	ARG	CB-CA-C	-8.80	92.81	110.40
1	A	263	ASN	CB-CA-C	8.38	127.16	110.40

There are no chirality outliers.

5 of 8 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	235	ARG	Sidechain
1	A	380	ARG	Sidechain
1	A	541	ARG	Sidechain
1	B	120	ARG	Sidechain
1	B	89	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	A	5011	0	4789	33	0
1	B	4948	0	4724	65	0
2	E	28	0	25	0	0
3	C	38	0	34	0	0
4	A	31	0	0	0	0
4	B	31	0	0	1	0
5	A	26	0	36	3	0
5	B	52	0	72	10	0
6	A	4	0	3	1	0
6	B	4	0	3	0	0
7	A	14	0	20	4	0
7	B	14	0	20	1	0
8	A	4	0	6	0	0
8	B	12	0	18	5	0
9	A	14	0	13	0	0
9	B	42	0	39	0	0
10	A	1	0	0	0	0
10	B	1	0	0	0	0
11	A	1	0	0	0	0
11	B	1	0	0	0	0
12	A	1	0	0	0	0
12	B	1	0	0	0	0
13	A	519	0	0	9	0
13	B	345	0	0	9	0
All	All	11143	0	9802	111	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 6.

The worst 5 of 111 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)
5:A:702[B]:PG4:H51	13:A:845:HOH:O	1.63	0.95
5:B:708[B]:PG4:H51	8:B:709:EDO:H22	1.54	0.89
7:A:704:PEG:H12	13:A:1153:HOH:O	1.83	0.79
7:A:704:PEG:C1	13:A:1153:HOH:O	2.32	0.77
1:B:24:TYR:CE1	1:B:64:PHE:HE1	2.06	0.74

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	610/628 (97%)	598 (98%)	10 (2%)	2 (0%)	37	35
1	B	601/628 (96%)	579 (96%)	17 (3%)	5 (1%)	16	12
All	All	1211/1256 (96%)	1177 (97%)	27 (2%)	7 (1%)	22	17

5 of 7 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	413	ARG
1	B	325	GLY
1	B	201	TRP
1	B	274	LYS
1	B	575	GLN

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	529/540 (98%)	519 (98%)	10 (2%)	52	57
1	B	522/540 (97%)	506 (97%)	16 (3%)	35	36
All	All	1051/1080 (97%)	1025 (98%)	26 (2%)	42	45

5 of 26 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	178	PHE
1	B	368	TYR
1	B	517	LYS
1	B	341	LYS
1	B	372	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 6 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	25	GLN
1	B	30	GLN
1	B	586	GLN
1	A	110	GLN
1	A	18	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)

5 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	C	1	3,1	14,14,15	0.68	0	17,19,21	1.30	2 (11%)
3	NAG	C	2	3	14,14,15	0.44	0	17,19,21	1.30	3 (17%)
3	FUC	C	3	3	10,10,11	0.63	0	14,14,16	1.18	2 (14%)
2	NAG	E	1	2,1	14,14,15	0.43	0	17,19,21	1.46	2 (11%)
2	NAG	E	2	2	14,14,15	0.37	0	17,19,21	1.18	2 (11%)

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	C	1	3,1	-	0/6/23/26	0/1/1/1
3	NAG	C	2	3	-	2/6/23/26	0/1/1/1
3	FUC	C	3	3	-	-	0/1/1/1
2	NAG	E	1	2,1	-	0/6/23/26	0/1/1/1
2	NAG	E	2	2	-	0/6/23/26	0/1/1/1

There are no bond length outliers.

The worst 5 of 11 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	E	1	NAG	C2-N2-C7	-3.73	117.59	122.90
2	E	1	NAG	C1-O5-C5	3.38	116.77	112.19
3	C	2	NAG	C1-C2-N2	3.03	115.66	110.49
3	C	1	NAG	C1-C2-N2	-2.94	105.46	110.49
3	C	3	FUC	O5-C1-C2	-2.84	106.39	110.77

There are no chirality outliers.

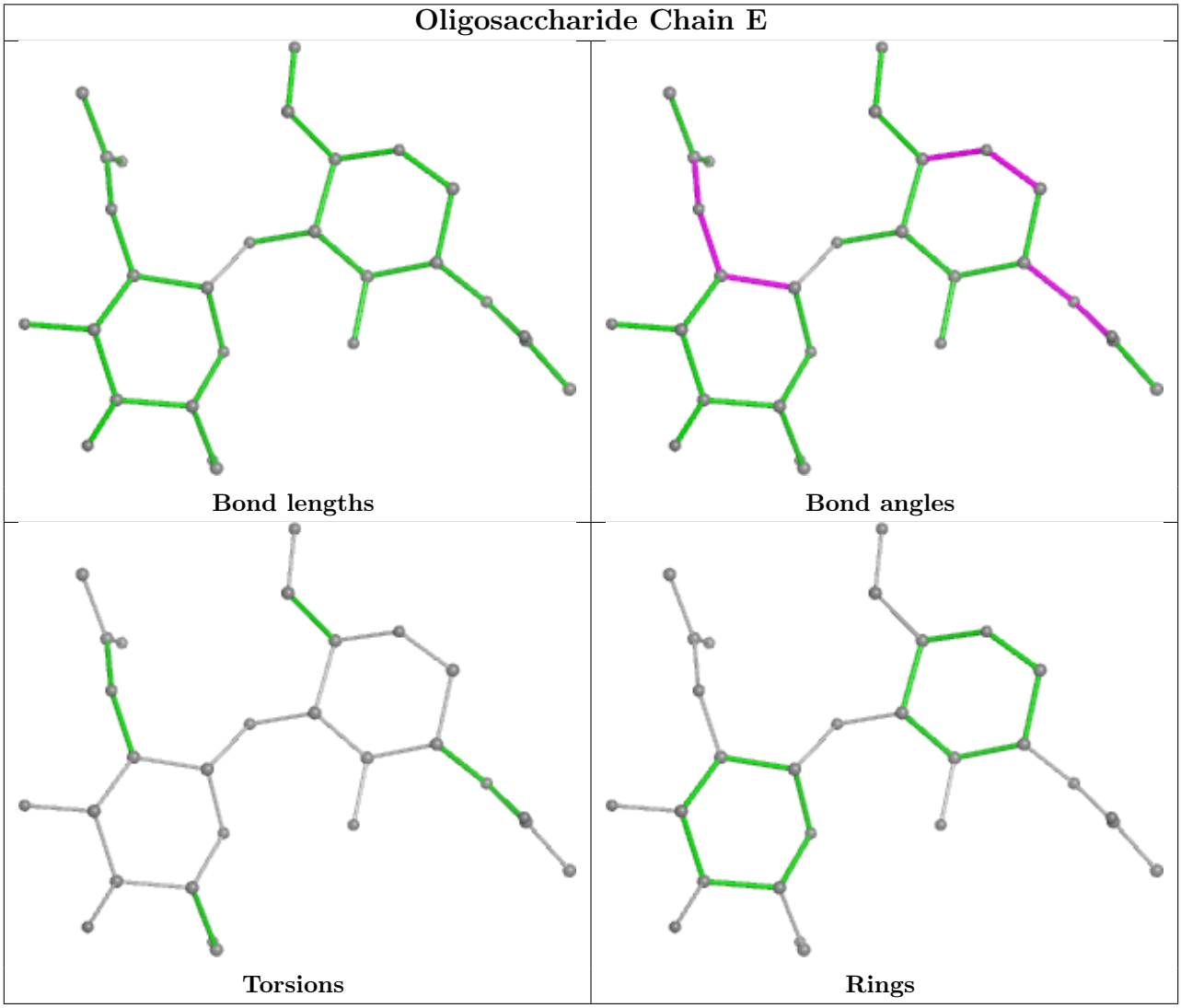
All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	C	2	NAG	O5-C5-C6-O6
3	C	2	NAG	C4-C5-C6-O6

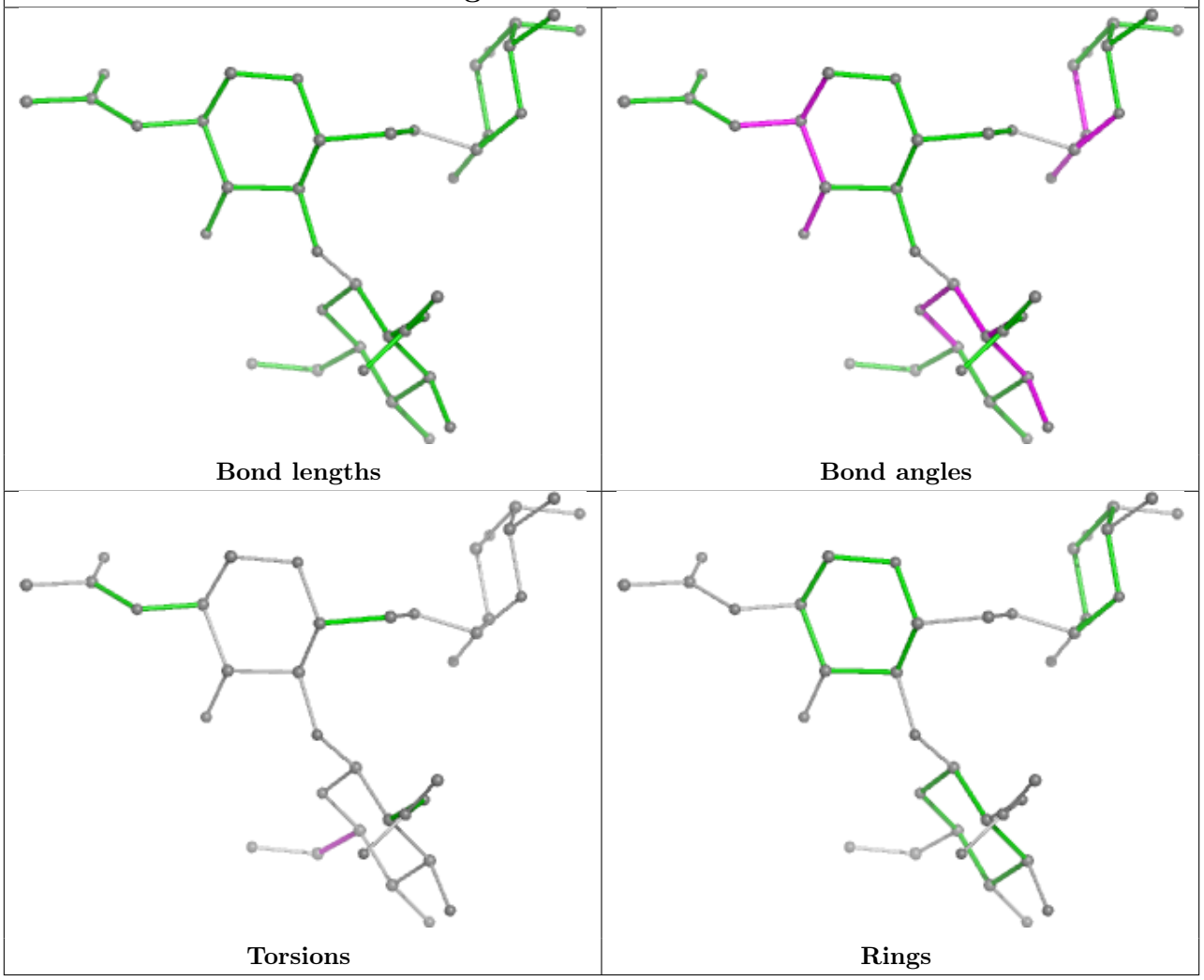
There are no ring outliers.

No monomer is involved in short contacts.

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



Oligosaccharide Chain C



5.6 Ligand geometry (i)

Of 28 ligands modelled in this entry, 6 are monoatomic - leaving 22 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	A1IJW	B	701	10	33,33,33	3.45	14 (42%)	40,47,47	2.36	15 (37%)
6	ACT	A	703	-	3,3,3	1.26	0	3,3,3	0.66	0
9	NAG	B	715	1	14,14,15	0.47	0	17,19,21	1.64	3 (17%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
9	NAG	A	707	1	14,14,15	0.64	0	17,19,21	1.84	2 (11%)
7	PEG	A	706	-	6,6,6	0.28	0	5,5,5	0.24	0
8	EDO	B	706	-	3,3,3	0.18	0	2,2,2	0.26	0
8	EDO	B	709	-	3,3,3	0.06	0	2,2,2	0.37	0
5	PG4	B	708[A]	-	12,12,12	0.15	0	11,11,11	0.30	0
5	PG4	A	702[A]	-	12,12,12	0.31	0	11,11,11	0.21	0
7	PEG	B	702	-	6,6,6	0.28	0	5,5,5	0.40	0
7	PEG	B	703	-	6,6,6	0.30	0	5,5,5	0.19	0
6	ACT	B	707	-	3,3,3	1.02	0	3,3,3	1.20	0
5	PG4	B	708[B]	-	12,12,12	0.18	0	11,11,11	0.34	0
5	PG4	A	702[B]	-	12,12,12	0.23	0	11,11,11	0.37	0
5	PG4	B	704	-	12,12,12	0.44	0	11,11,11	0.31	0
5	PG4	B	710	-	12,12,12	0.43	0	11,11,11	0.35	0
8	EDO	B	705	-	3,3,3	0.70	0	2,2,2	1.11	0
4	A1IJW	A	701	10	33,33,33	2.82	15 (45%)	40,47,47	2.56	17 (42%)
7	PEG	A	704	-	6,6,6	0.46	0	5,5,5	0.38	0
8	EDO	A	705	-	3,3,3	0.71	0	2,2,2	0.94	0
9	NAG	B	714	1	14,14,15	0.61	0	17,19,21	2.46	4 (23%)
9	NAG	B	713	1	14,14,15	0.75	0	17,19,21	3.55	6 (35%)

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	A1IJW	B	701	10	-	3/32/52/52	0/3/3/3
9	NAG	B	715	1	-	2/6/23/26	0/1/1/1
9	NAG	A	707	1	-	3/6/23/26	0/1/1/1
7	PEG	A	706	-	-	3/4/4/4	-
8	EDO	B	706	-	-	1/1/1/1	-
8	EDO	B	709	-	-	1/1/1/1	-
5	PG4	B	708[A]	-	-	5/10/10/10	-
5	PG4	A	702[A]	-	-	3/10/10/10	-
7	PEG	B	702	-	-	3/4/4/4	-
7	PEG	B	703	-	-	4/4/4/4	-
5	PG4	B	708[B]	-	-	8/10/10/10	-
5	PG4	A	702[B]	-	-	7/10/10/10	-
5	PG4	B	704	-	-	5/10/10/10	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	PG4	B	710	-	-	5/10/10/10	-
8	EDO	B	705	-	-	0/1/1/1	-
4	A1IJW	A	701	10	-	5/32/52/52	0/3/3/3
7	PEG	A	704	-	-	2/4/4/4	-
8	EDO	A	705	-	-	0/1/1/1	-
9	NAG	B	714	1	-	4/6/23/26	0/1/1/1
9	NAG	B	713	1	-	2/6/23/26	0/1/1/1

The worst 5 of 29 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	701	A1IJW	C06-N10	-11.84	1.31	1.47
4	A	701	A1IJW	C06-N10	-8.65	1.36	1.47
4	B	701	A1IJW	C09-N10	7.08	1.61	1.47
4	A	701	A1IJW	C02-N24	5.99	1.48	1.34
4	B	701	A1IJW	C11-N10	5.39	1.47	1.34

The worst 5 of 47 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
9	B	713	NAG	C2-N2-C7	-11.43	106.62	122.90
9	B	714	NAG	C1-C2-N2	6.81	122.13	110.49
4	B	701	A1IJW	O21-C20-O22	-5.74	111.06	124.09
4	A	701	A1IJW	O21-C20-O22	-5.70	111.16	124.09
9	B	714	NAG	C2-N2-C7	5.69	131.01	122.90

There are no chirality outliers.

5 of 66 torsion outliers are listed below:

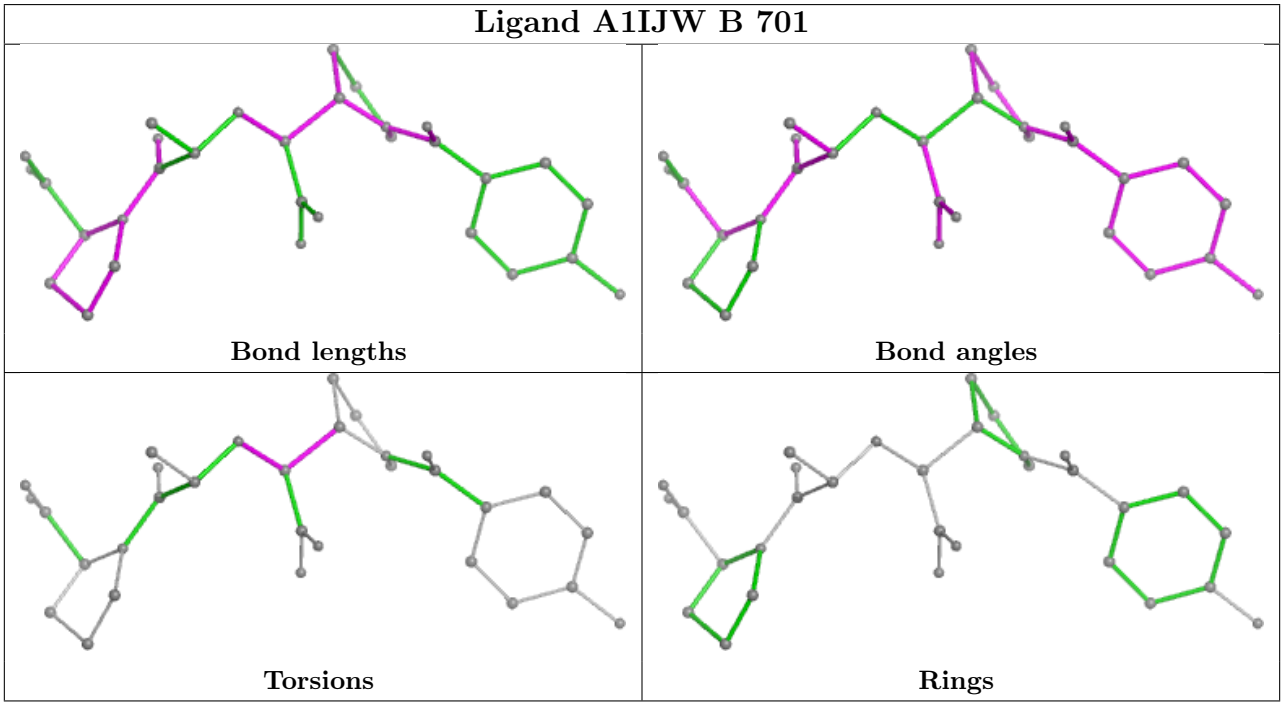
Mol	Chain	Res	Type	Atoms
9	B	714	NAG	C1-C2-N2-C7
9	B	714	NAG	C8-C7-N2-C2
9	B	714	NAG	O7-C7-N2-C2
5	B	704	PG4	C8-C7-O4-C6
5	B	708[A]	PG4	C8-C7-O4-C6

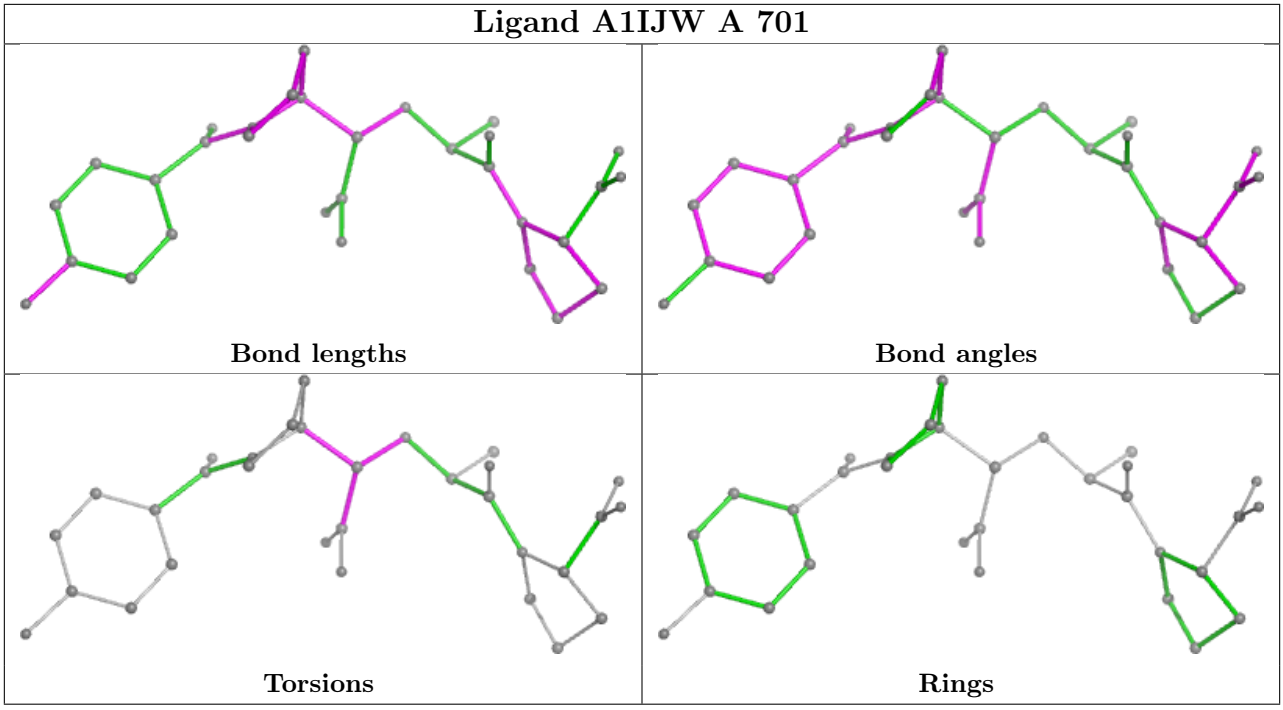
There are no ring outliers.

12 monomers are involved in 20 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	701	A1IJW	1	0
6	A	703	ACT	1	0
8	B	709	EDO	4	0
5	B	708[A]	PG4	3	0
5	A	702[A]	PG4	1	0
7	B	703	PEG	1	0
5	B	708[B]	PG4	3	0
5	A	702[B]	PG4	2	0
5	B	704	PG4	3	0
5	B	710	PG4	1	0
8	B	705	EDO	1	0
7	A	704	PEG	4	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





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	609/628 (96%)	-0.60	5 (0%)	82	82	7, 24, 44, 75	5 (0%)
1	B	604/628 (96%)	0.08	35 (5%)	30	28	9, 33, 62, 99	3 (0%)
All	All	1213/1256 (96%)	-0.26	40 (3%)	49	47	7, 28, 56, 99	8 (0%)

The worst 5 of 40 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	83	PHE	6.2
1	A	129	LEU	5.5
1	B	88	LEU	5.1
1	B	414	VAL	5.1
1	B	91	ILE	4.5

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

SUGAR-RSR INFOmissingINFO

6.4 Ligands

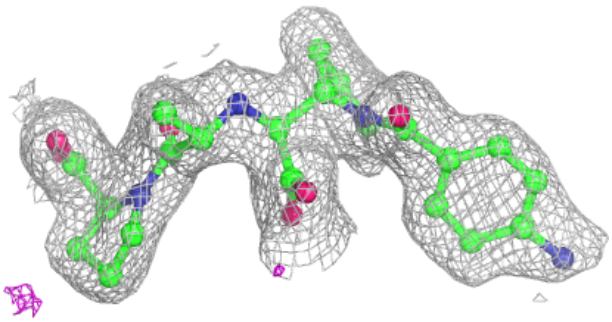
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

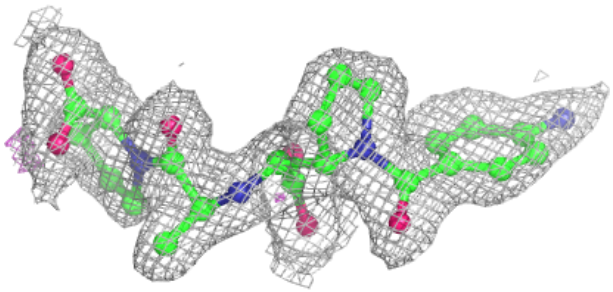
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
8	EDO	B	705	4/4	0.75	0.18	45,45,55,56	0
9	NAG	B	714	14/15	0.76	0.12	59,63,67,67	0
9	NAG	B	715	14/15	0.76	0.17	49,87,103,108	0
8	EDO	B	706	4/4	0.81	0.23	69,71,74,81	0
9	NAG	B	713	14/15	0.82	0.13	30,38,50,53	0
5	PG4	A	702[A]	13/13	0.82	0.19	22,47,52,56	13
5	PG4	A	702[B]	13/13	0.82	0.19	21,26,38,41	13
8	EDO	A	705	4/4	0.84	0.15	46,47,51,52	0
5	PG4	B	704	13/13	0.86	0.13	44,54,66,68	0
5	PG4	B	710	13/13	0.86	0.15	44,58,65,66	0
5	PG4	B	708[B]	13/13	0.87	0.18	23,39,47,49	13
5	PG4	B	708[A]	13/13	0.87	0.18	18,42,48,56	13
7	PEG	A	704	7/7	0.87	0.13	48,55,57,72	0
9	NAG	A	707	14/15	0.89	0.10	31,35,44,55	0
8	EDO	B	709	4/4	0.89	0.14	46,47,56,60	0
7	PEG	B	702	7/7	0.90	0.15	40,46,50,52	0
7	PEG	A	706	7/7	0.91	0.12	47,51,53,56	0
7	PEG	B	703	7/7	0.91	0.11	38,51,58,65	0
6	ACT	A	703	4/4	0.93	0.12	19,31,35,37	0
6	ACT	B	707	4/4	0.95	0.11	29,37,40,44	0
4	A1IJW	B	701	31/31	0.97	0.06	17,21,36,39	0
12	MG	A	710	1/1	0.97	0.05	25,25,25,25	0
10	ZN	A	708	1/1	0.98	0.03	16,16,16,16	0
11	CL	B	712	1/1	0.98	0.04	29,29,29,29	0
4	A1IJW	A	701	31/31	0.98	0.05	15,17,25,32	0
12	MG	B	716	1/1	0.98	0.03	26,26,26,26	0
10	ZN	B	711	1/1	0.99	0.02	20,20,20,20	0
11	CL	A	709	1/1	1.00	0.05	19,19,19,19	0

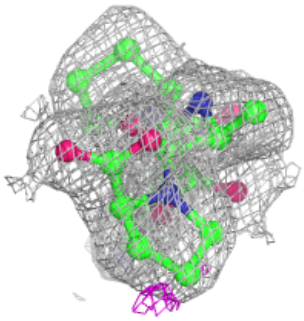
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around A1IJW B 701:

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

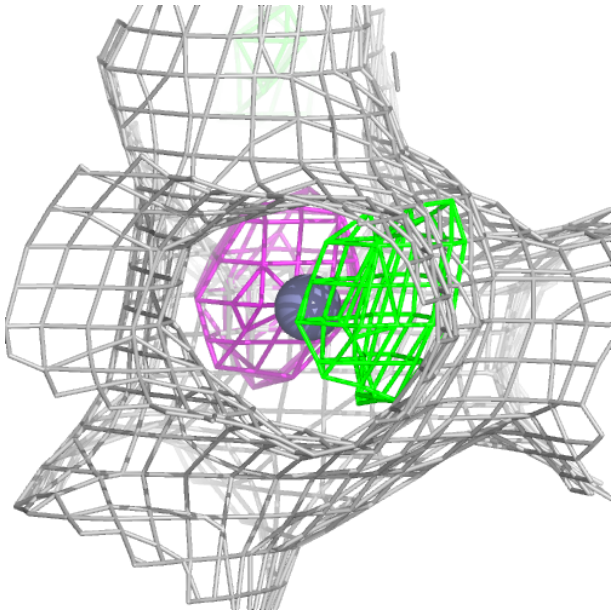


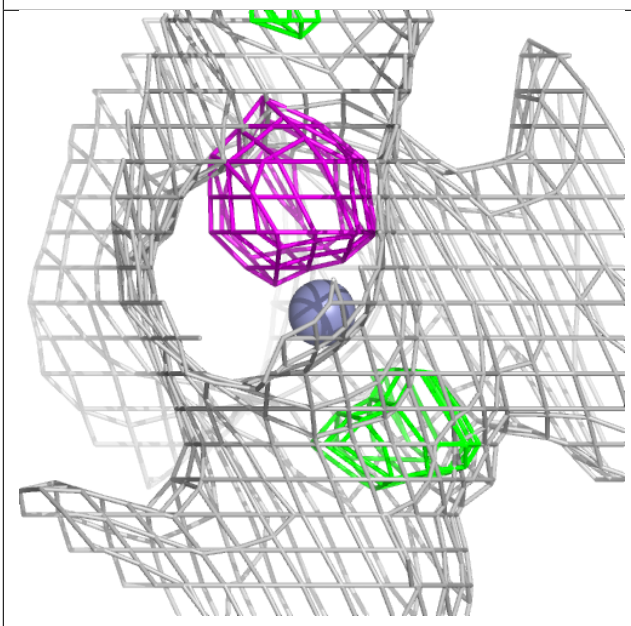


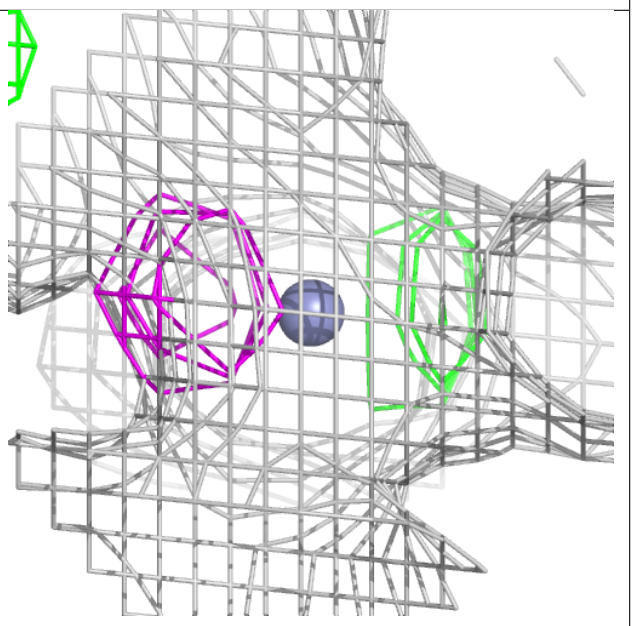


Electron density around ZN A 708:

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

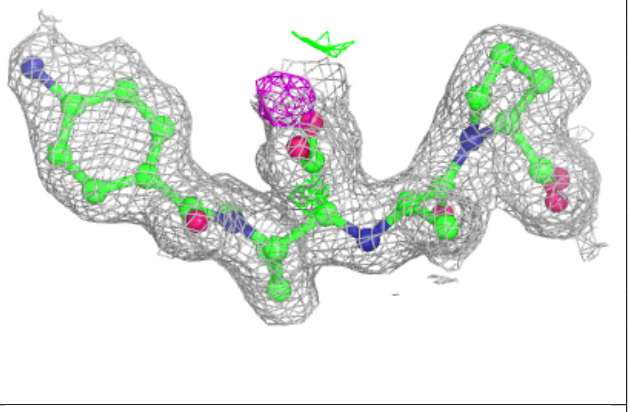


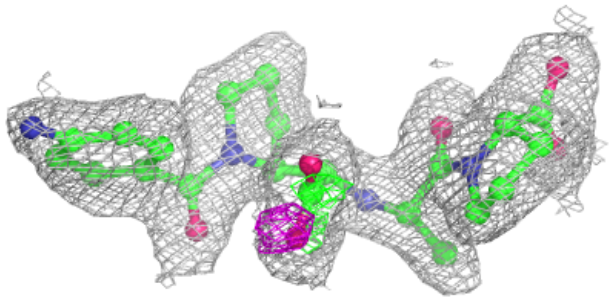


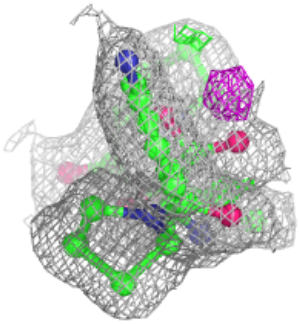


Electron density around A1IJW A 701:

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

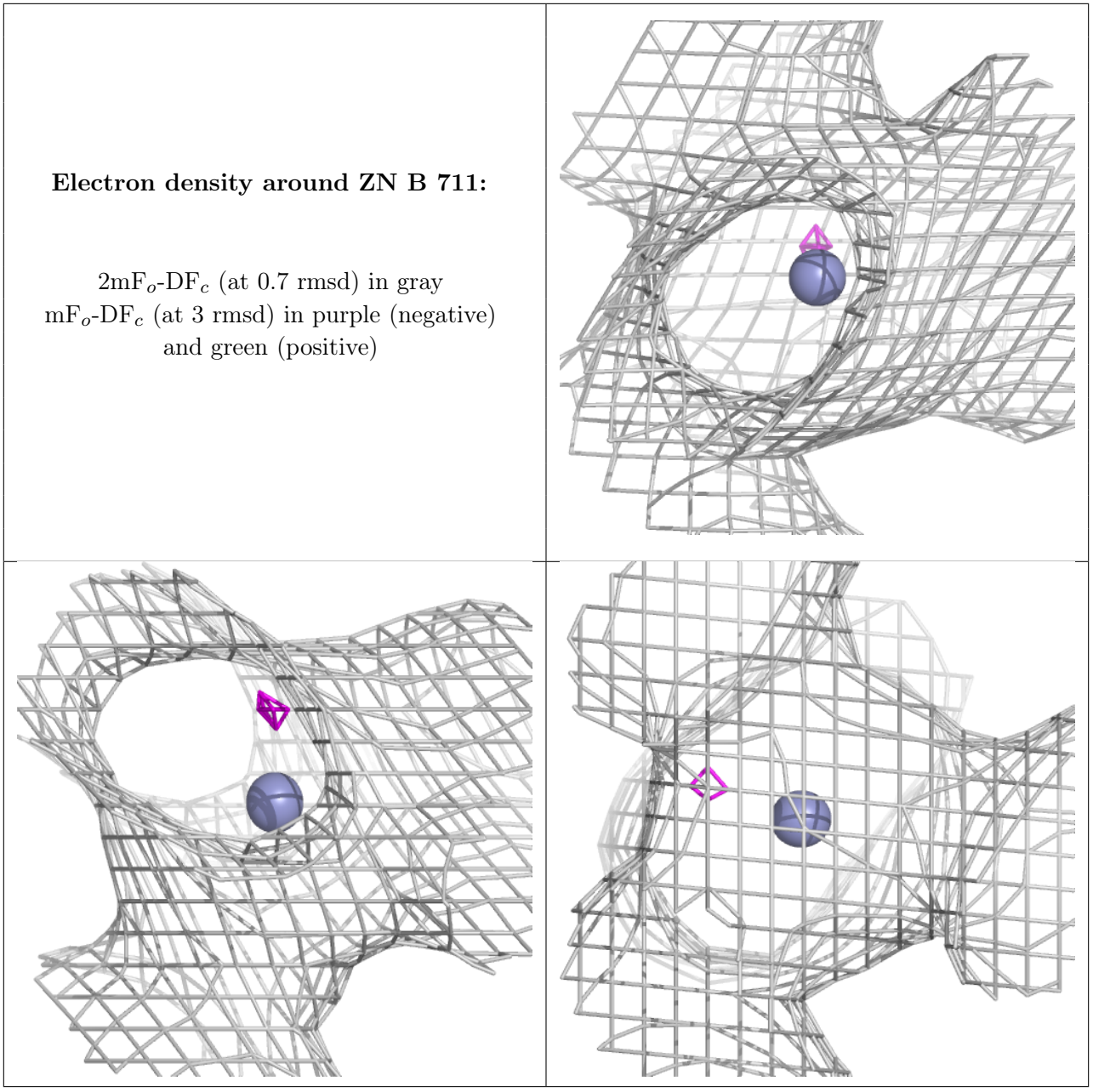






Electron density around ZN B 711:

$2mF_o$-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

There are no such residues in this entry.