Full wwPDB X-ray Structure Validation Report (i)

Feb 7, 2022 – 03:20 pm GMT

PDB ID	:	7Q27
Title	:	Crystal structure of Angiotensin-1 converting enzyme C-domain in complex with dual ACE/NEP inhibitor AD011
Authors	:	Cozier, G.E.; Acharya, K.R.
Deposited on	:	2021-10-23
Resolution	:	1.50 Å(reported)

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

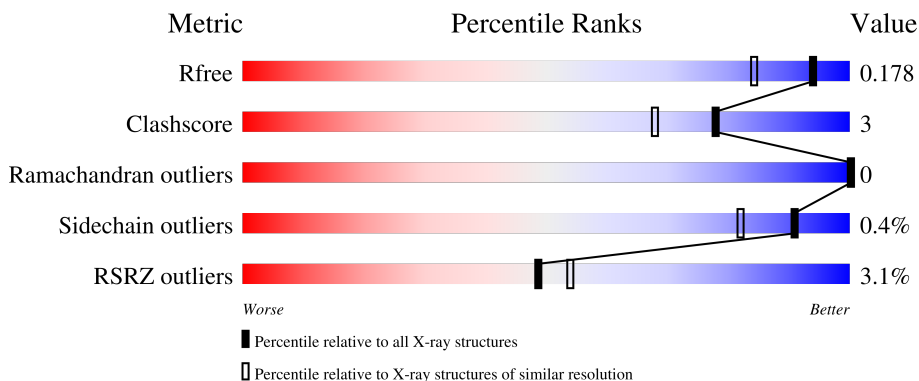|		
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.26
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0267
CCP4	:	7.1.010 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.26

1 Overall quality at a glance ⓘ

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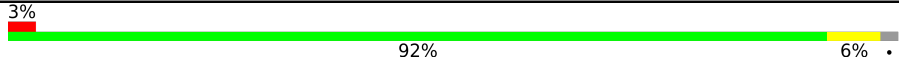*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.50 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	Percentile Ranks	Value
Rfree		0.178
Clashscore		3
Ramachandran outliers		0
Sidechain outliers		0.4%
RSRZ outliers		3.1%

Worse   *Better*

▊ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	2936 (1.50-1.50)
Clashscore	141614	3144 (1.50-1.50)
Ramachandran outliers	138981	3066 (1.50-1.50)
Sidechain outliers	138945	3064 (1.50-1.50)
RSRZ outliers	127900	2884 (1.50-1.50)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments 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	597	3% 92% 6% ·
2	B	4	50% 50%

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
9	BO3	A	711[A]	-	-	X	-

2 Entry composition ⓘ

There are 12 unique types of molecules in this entry. The entry contains 10818 atoms, of which 4975 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.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	H	N	O	S			
1	A	586	9796	3179	4817	853	920	27	0	29	0

There are 5 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	64	GLY	GLU	engineered mutation	UNP P12821
A	90	GLN	ASN	engineered mutation	UNP P12821
A	155	GLN	ASN	engineered mutation	UNP P12821
A	337	GLN	ASN	engineered mutation	UNP P12821
A	586	GLN	ASN	engineered mutation	UNP P12821

- Molecule 2 is an oligosaccharide called beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose.
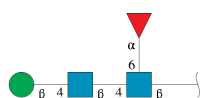
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	H	N	O			
2	B	4	93	28	44	2	19	0	0	0

- Molecule 3 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).

NAG

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	H	N	O	0	0
			28	8	14	1	5		

- Molecule 4 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).

EDO

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	H	O	0	1
			20	4	12	4		
4	A	1	Total	C	H	O	0	0
			10	2	6	2		
4	A	1	Total	C	H	O	0	0
			10	2	6	2		

- Molecule 5 is ACETATE ION (three-letter code: ACT) (formula: $C_2H_3O_2$).
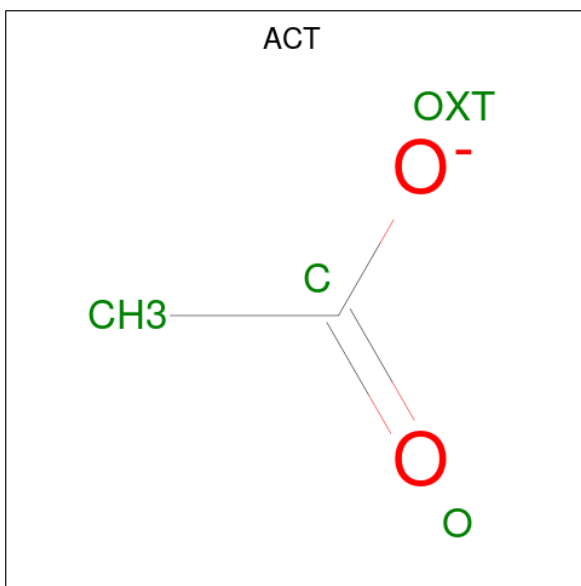
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
5	A	1	7	2	3	2	0	0

- Molecule 6 is ZINC ION (three-letter code: ZN) (formula: Zn).

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

- Molecule 7 is (2 {S})-2-[[(2 {S})-1-[[(2 {S})-3-(1 {H}-indol-3-yl)-1-oxidanyl-1-oxidanylidene -propan-2-yl]amino]-1-oxidanylidene-hexan-2-yl]amino]-4-phenyl-butanoic acid (three-letter code: 8KC) (formula: $C_{27}H_{33}N_3O_5$) (labeled as "Ligand of Interest" by depositor).

8KC
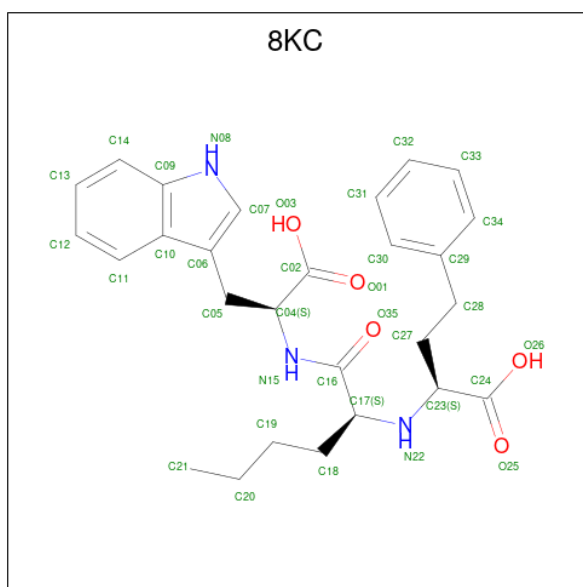
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
7	A	1	Total	C	H	N	O	0	0
			66	27	31	3	5		

- Molecule 8 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	2	Total	Cl	0	0
			2	2		

- Molecule 9 is BORIC ACID (three-letter code: BO3) (formula: BH_3O_3).

BO3
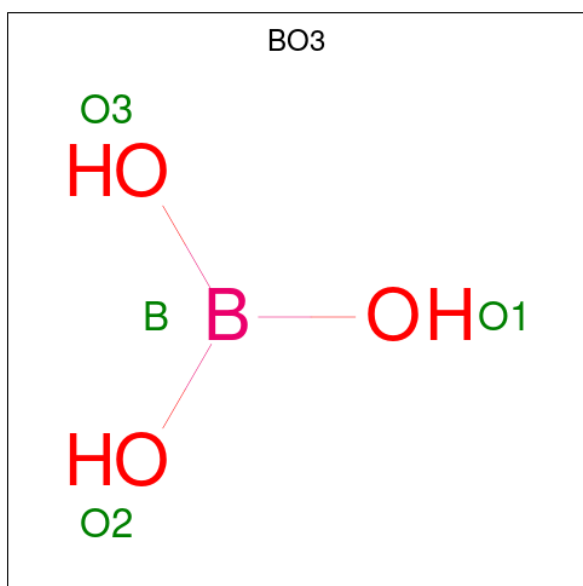
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
9	A	1	Total 7	B 1	H 3	O 3	0	0
9	A	1	Total 7	B 1	H 3	O 3	0	1
9	A	1	Total 7	B 1	H 3	O 3	0	0
9	A	1	Total 7	B 1	H 3	O 3	0	0
9	A	1	Total 7	B 1	H 3	O 3	0	0

- Molecule 10 is PENTAETHYLENE GLYCOL (three-letter code: 1PE) (formula: $C_{10}H_{22}O_6$).
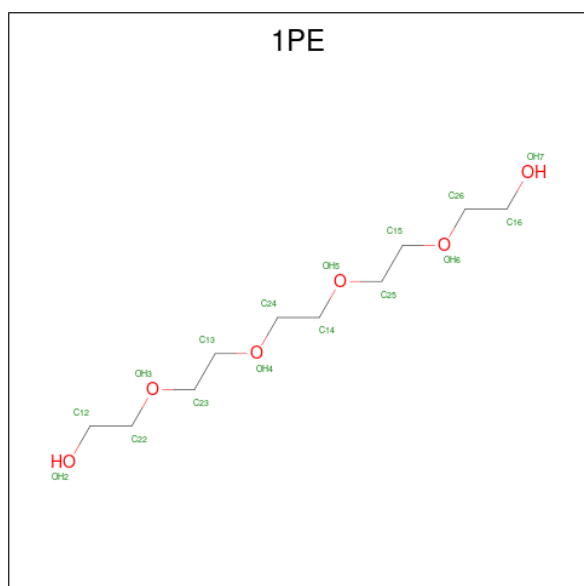
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
10	A	1	Total 38	C 10	H 22	O 6	0	0

- Molecule 11 is IMIDAZOLE (three-letter code: IMD) (formula: $C_3H_5N_2$).
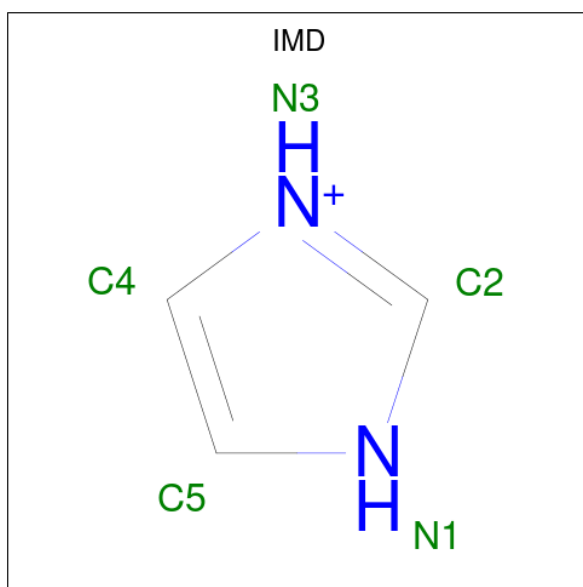
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
11	A	1	Total 10	C 3	H 5	N 2	0	0

- Molecule 12 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
12	A	695	Total 702	O 702	0	17

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: Angiotensin-converting enzyme

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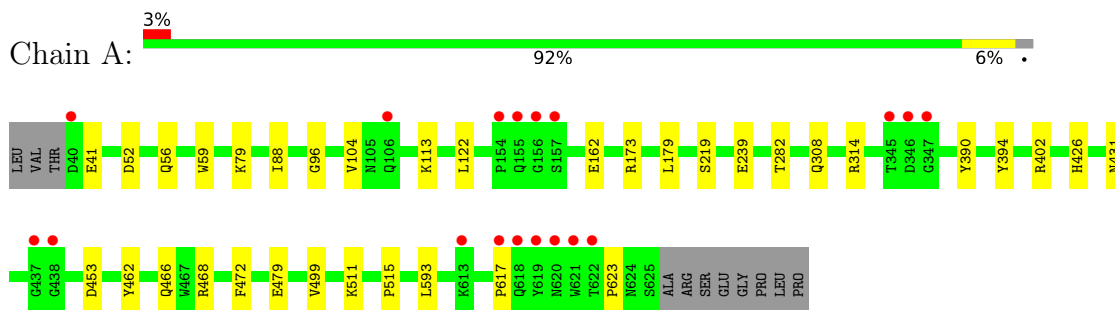
• Molecule 2: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose

Chain B:

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	56.45Å 85.59Å 134.05Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	47.13 – 1.50 52.03 – 1.50	Depositor EDS
% Data completeness (in resolution range)	100.0 (47.13-1.50) 100.0 (52.03-1.50)	Depositor EDS
R_{merge}	0.22	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.91 (at 1.50Å)	Xtriage
Refinement program	PHENIX 1.19.1_4122	Depositor
R, R_{free}	0.148 , 0.178 0.149 , 0.178	Depositor DCC
R_{free} test set	2131 reflections (2.04%)	wwPDB-VP
Wilson B-factor (Å^2)	12.8	Xtriage
Anisotropy	0.195	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	(Not available) , (Not available)	EDS
L-test for twinning[2]	$< |L| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	10818	wwPDB-VP
Average B, all atoms (Å^2)	20.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.90% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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: ACT, IMD, BO3, CL, ZN, BMA, 8KC, 1PE, NAG, EDO, FUC

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	0.53	0/5156	0.69	0/7009

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2   Too-close contacts ⓘ

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	4979	4817	4775	27	1
2	B	49	44	43	0	0
3	A	14	14	13	0	0
4	A	16	24	24	0	0
5	A	4	3	3	1	0
6	A	1	0	0	0	0
7	A	35	31	0	0	0
8	A	2	0	0	0	0
9	A	20	15	15	2	0
10	A	16	22	22	0	0
11	A	5	5	5	1	0
12	A	702	0	0	13	0
All	All	5843	4975	4900	29	1

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 (29) 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:308[A]:GLN:NE2	12:A:801:HOH:O	1.96	0.98
1:A:59:TRP:CE2	1:A:88:ILE:HD11	2.18	0.77
1:A:219[A]:SER:OG	9:A:711[A]:BO3:O3	2.08	0.72
11:A:716:IMD:H4	12:A:844:HOH:O	1.96	0.64
1:A:59:TRP:CD2	1:A:88:ILE:HD11	2.34	0.63
1:A:623:PRO:CD	12:A:1240:HOH:O	2.53	0.56
1:A:219[A]:SER:HG	9:A:711[A]:BO3:HO3	1.38	0.55
1:A:179:LEU:HD11	1:A:499:VAL:HG23	1.88	0.54
1:A:59:TRP:CZ2	1:A:88:ILE:HD11	2.43	0.53
1:A:239:GLU:OE2	12:A:802:HOH:O	2.19	0.52
1:A:617:PRO:HD2	12:A:950:HOH:O	2.10	0.51
1:A:96:GLY:HA3	1:A:122:LEU:CD2	2.42	0.50
1:A:511:LYS:O	1:A:515:PRO:HD2	2.12	0.50
1:A:623:PRO:HD3	12:A:1240:HOH:O	2.12	0.49
1:A:104:VAL:HG13	1:A:113:LYS:HG3	1.93	0.49
1:A:282:THR:HB	1:A:453:ASP:OD1	2.13	0.48
1:A:56[B]:GLN:HE22	1:A:402[B]:ARG:HH22	1.63	0.47
1:A:104:VAL:HG13	1:A:113:LYS:CG	2.46	0.46
1:A:162:GLU:OE2	12:A:803:HOH:O	2.21	0.44
1:A:593:LEU:HD22	12:A:1453:HOH:O	2.17	0.43
1:A:308[A]:GLN:OE1	1:A:431:ASN:HB3	2.18	0.43
1:A:462:TYR:O	1:A:466:GLN:HG2	2.19	0.43
1:A:52[B]:ASP:O	1:A:56[B]:GLN:HG2	2.19	0.43
1:A:41:GLU:HG3	12:A:905:HOH:O	2.20	0.42
1:A:173:ARG:NH1	12:A:840:HOH:O	2.52	0.42
1:A:79:LYS:NZ	12:A:821:HOH:O	2.46	0.41
1:A:468[A]:ARG:HG2	1:A:472:PHE:CE2	2.56	0.40
1:A:314:ARG:NH1	12:A:846:HOH:O	2.54	0.40
5:A:705:ACT:H2	12:A:1228:HOH:O	2.20	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:426:HIS:HD1	1:A:479[A]:GLU:OE2[1_455]	1.56	0.04

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	614/597 (103%)	603 (98%)	11 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	541/520 (104%)	539 (100%)	2 (0%)	91	82

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	390	TYR
1	A	394	TYR

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

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

4 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	#$|Z| > 2$
2	NAG	B	1	1,2	14,14,15	0.48	0	17,19,21	0.44	0
2	NAG	B	2	2	14,14,15	0.46	0	17,19,21	0.43	0
2	BMA	B	3	2	11,11,12	1.13	0	15,15,17	0.99	1 (6%)
2	FUC	B	4	2	10,10,11	0.90	0	14,14,16	0.91	1 (7%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NAG	B	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	B	2	2	-	2/6/23/26	0/1/1/1
2	BMA	B	3	2	-	0/2/19/22	0/1/1/1
2	FUC	B	4	2	-	-	0/1/1/1

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	3	BMA	C1-O5-C5	2.41	115.46	112.19
2	B	4	FUC	O2-C2-C1	2.00	113.25	109.15

There are no chirality outliers.

All (2) torsion outliers are listed below:

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

Bond lengths

Bond angles

Torsions

Rings
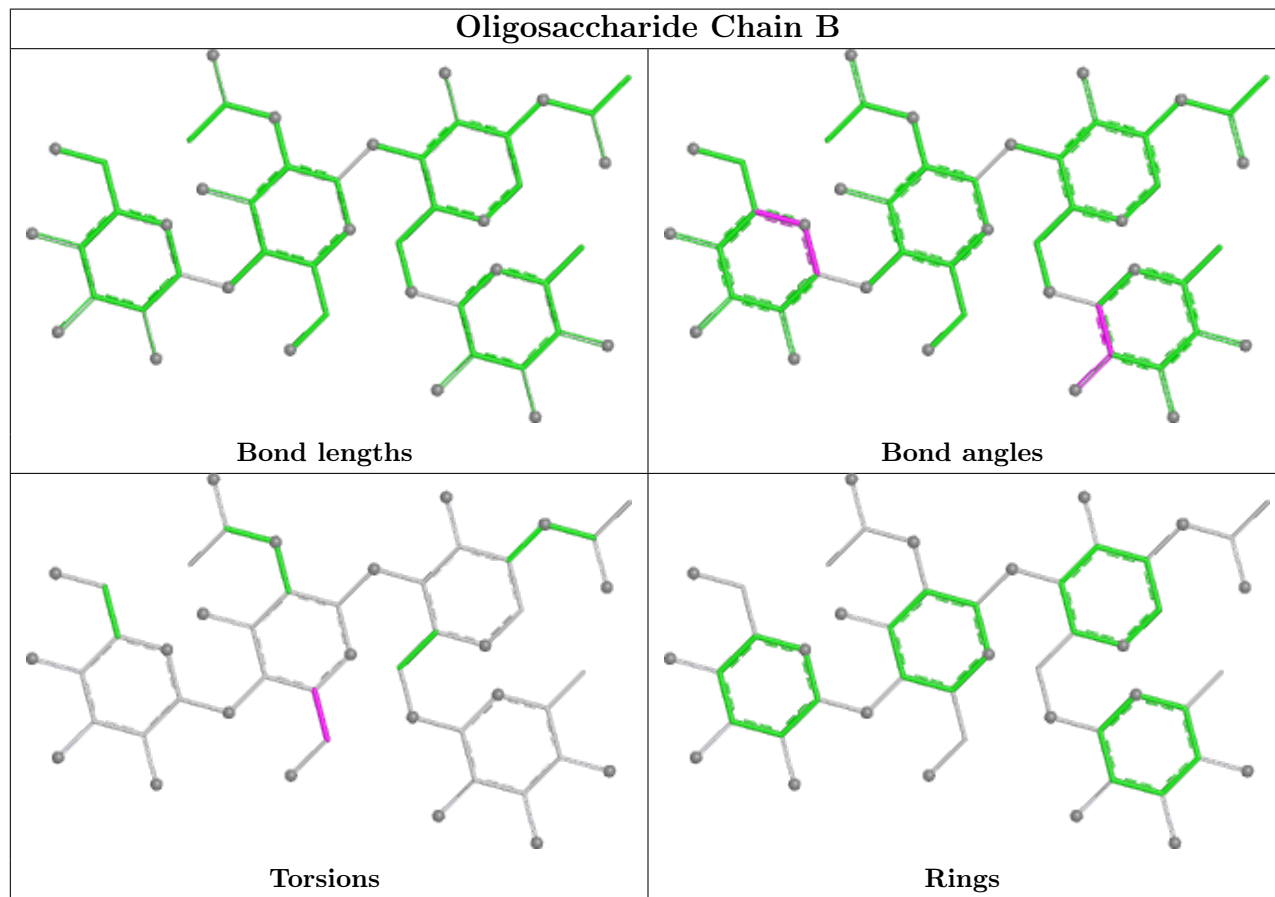
5.6 Ligand geometry ⓘ

Of 17 ligands modelled in this entry, 3 are monoatomic - leaving 14 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
9	BO3	A	711[A]	-	3,3,3	0.69	0	3,3,3	0.69	0
5	ACT	A	705	-	1,3,3	6.99	1 (100%)	0,3,3	-	-
3	NAG	A	701	1	14,14,15	0.33	0	17,19,21	0.50	0
4	EDO	A	703	-	3,3,3	0.46	0	2,2,2	0.27	0
9	BO3	A	710	-	3,3,3	0.65	0	3,3,3	0.55	0
9	BO3	A	713	-	3,3,3	0.29	0	3,3,3	0.13	0
4	EDO	A	704	-	3,3,3	0.54	0	2,2,2	0.81	0
10	1PE	A	715	-	15,15,15	0.48	0	14,14,14	0.52	0
4	EDO	A	702[B]	-	3,3,3	0.37	0	2,2,2	0.53	0
7	8KC	A	707	6	30,37,37	1.22	1 (3%)	34,49,49	1.16	2 (5%)
11	IMD	A	716	-	3,5,5	0.23	0	4,5,5	0.63	0
9	BO3	A	714	-	3,3,3	0.28	0	3,3,3	0.38	0
4	EDO	A	702[A]	-	3,3,3	0.44	0	2,2,2	0.55	0
9	BO3	A	712	-	3,3,3	0.32	0	3,3,3	0.47	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	NAG	A	701	1	-	0/6/23/26	0/1/1/1
4	EDO	A	703	-	-	0/1/1/1	-
4	EDO	A	704	-	-	1/1/1/1	-
10	1PE	A	715	-	-	0/13/13/13	-
4	EDO	A	702[B]	-	-	1/1/1/1	-
7	8KC	A	707	6	-	6/24/42/42	0/3/3/3
11	IMD	A	716	-	-	-	0/1/1/1
4	EDO	A	702[A]	-	-	1/1/1/1	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	705	ACT	CH3-C	6.99	1.57	1.48
7	A	707	8KC	C16-N15	4.12	1.43	1.34

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	A	707	8KC	C04-N15-C16	-3.91	117.33	123.19
7	A	707	8KC	C16-C17-N22	-2.20	105.74	110.51

There are no chirality outliers.

All (9) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	702[A]	EDO	O1-C1-C2-O2
7	A	707	8KC	C05-C04-N15-C16
7	A	707	8KC	O35-C16-C17-N22
7	A	707	8KC	N15-C16-C17-N22
7	A	707	8KC	C02-C04-N15-C16
4	A	702[B]	EDO	O1-C1-C2-O2
4	A	704	EDO	O1-C1-C2-O2
7	A	707	8KC	C27-C28-C29-C34
7	A	707	8KC	C27-C28-C29-C30

There are no ring outliers.

3 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
9	A	711[A]	BO3	2	0
5	A	705	ACT	1	0
11	A	716	IMD	1	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.

Ligand 8KC A 707

Bond lengths

Bond angles

Torsions

Rings
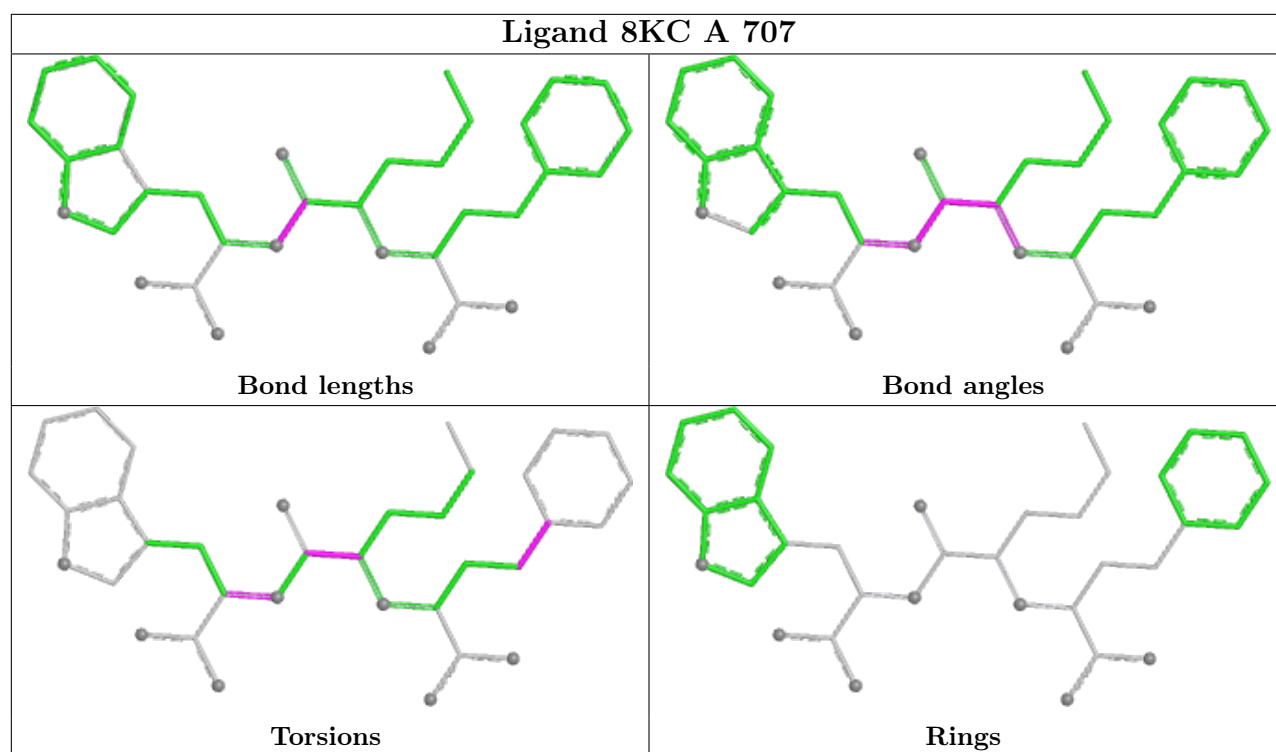
5.7 Other polymers ⓘ

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, 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	586/597 (98%)	-0.20	18 (3%)	49	54	7, 15, 37, 70	0

All (18) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	619	TYR	5.8
1	A	155	GLN	5.3
1	A	620	ASN	4.3
1	A	617	PRO	4.1
1	A	437	GLY	3.8
1	A	621	TRP	3.8
1	A	618	GLN	3.5
1	A	622	THR	3.4
1	A	347	GLY	3.4
1	A	438	GLY	3.3
1	A	345	THR	3.3
1	A	154	PRO	3.1
1	A	106	GLN	2.7
1	A	157	SER	2.6
1	A	613	LYS	2.3
1	A	346	ASP	2.2
1	A	40	ASP	2.1
1	A	156	GLY	2.1

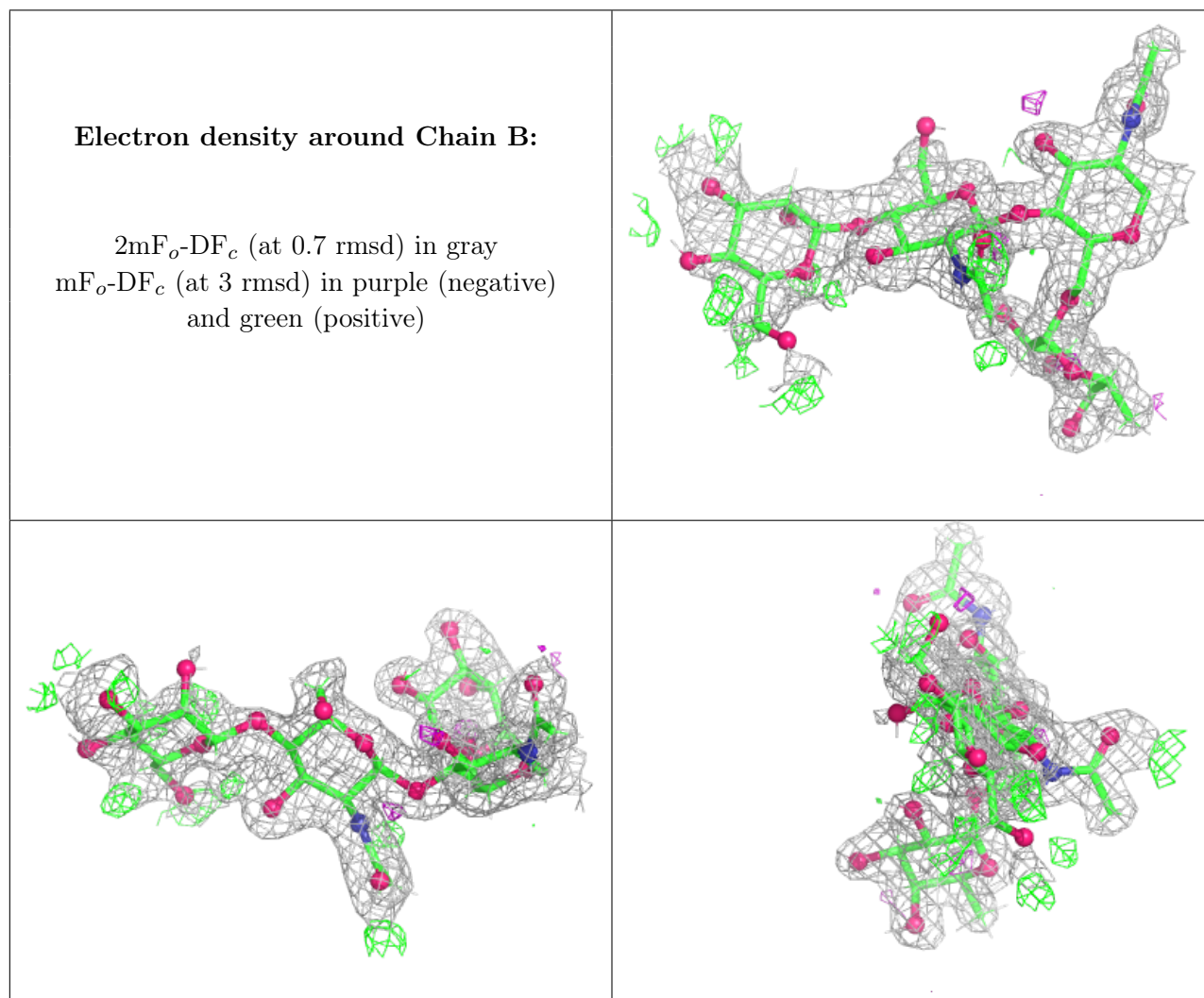## 6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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, 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
2	BMA	B	3	11/12	0.75	0.15	38,75,91,91	0
2	FUC	B	4	10/11	0.87	0.21	30,40,55,62	0
2	NAG	B	2	14/15	0.92	0.13	25,41,59,101	0
2	NAG	B	1	14/15	0.95	0.13	20,34,46,50	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.
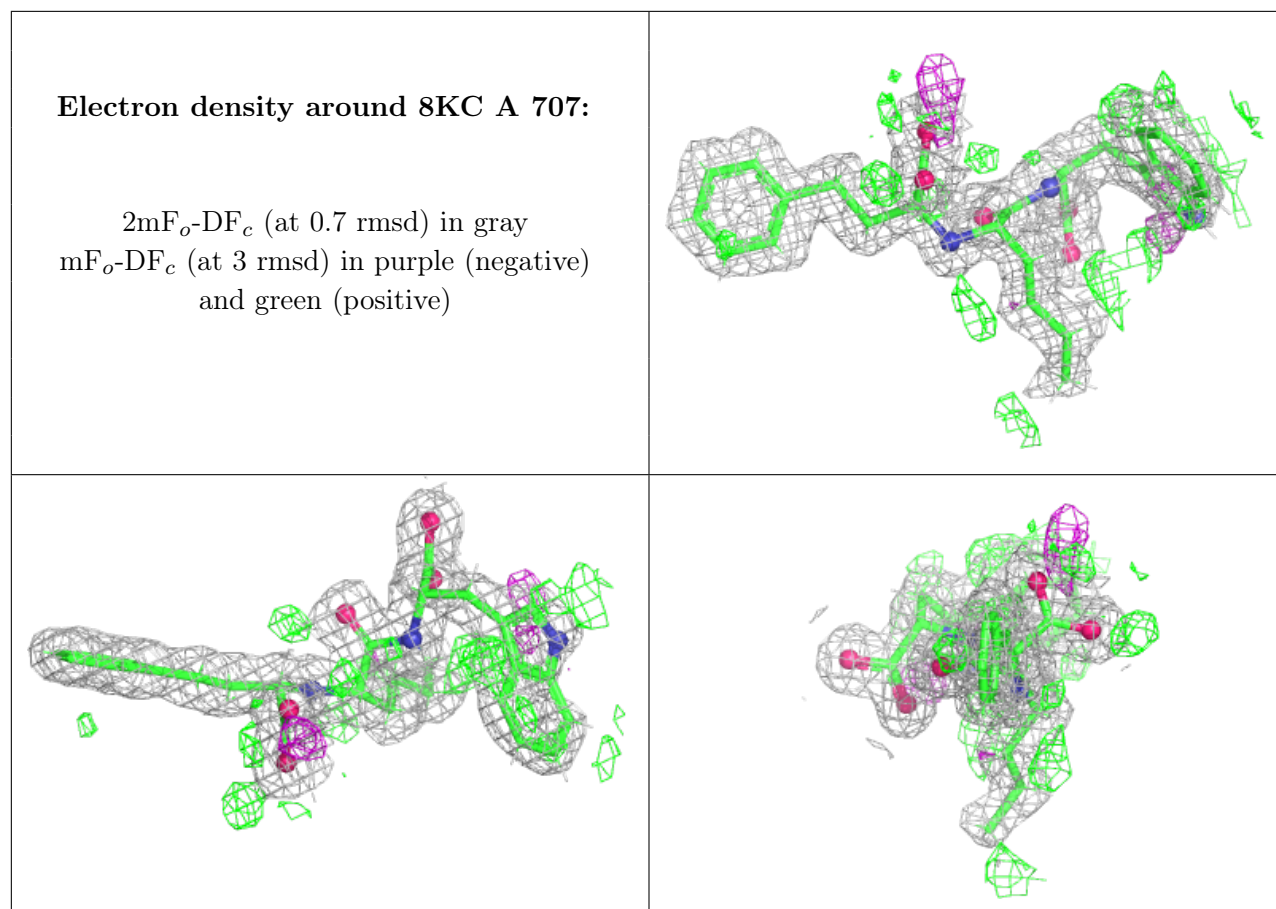
Electron density around Chain B:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)

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
4	EDO	A	704	4/4	0.79	0.12	36,46,57,57	0
9	BO3	A	714	4/4	0.81	0.27	35,41,50,60	0
5	ACT	A	705	4/4	0.83	0.22	40,48,57,57	0
9	BO3	A	711[A]	4/4	0.86	0.17	16,17,21,25	7
3	NAG	A	701	14/15	0.86	0.20	36,46,58,73	0
9	BO3	A	713	4/4	0.87	0.18	40,45,48,55	0
4	EDO	A	703	4/4	0.87	0.21	39,47,55,58	0
9	BO3	A	712	4/4	0.92	0.13	19,26,32,38	0
9	BO3	A	710	4/4	0.93	0.10	18,26,32,39	0
4	EDO	A	702[A]	4/4	0.95	0.14	10,21,38,46	10
4	EDO	A	702[B]	4/4	0.95	0.14	10,24,34,41	10
10	1PE	A	715	16/16	0.95	0.09	16,24,56,56	0
7	8KC	A	707	35/35	0.96	0.08	9,16,45,66	0
11	IMD	A	716	5/5	0.97	0.08	15,20,25,26	0
8	CL	A	708	1/1	0.99	0.07	12,12,12,12	0
8	CL	A	709	1/1	1.00	0.07	11,11,11,11	0
6	ZN	A	706	1/1	1.00	0.06	10,10,10,10	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 8KC A 707:

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.