Full wwPDB X-ray Structure Validation Report (i)

Sep 30, 2024 – 10:25 AM EDT

PDB ID	:	8V5T
Title	:	Crystal structure of Alzheimers disease phospholipase D3
Authors	:	Ishii, K.; Hermans, S.J.; Nero, T.L.; Gorman, M.A.; Parker, M.W.
Deposited on	:	2023-12-01
Resolution	:	2.30 Å(reported)

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

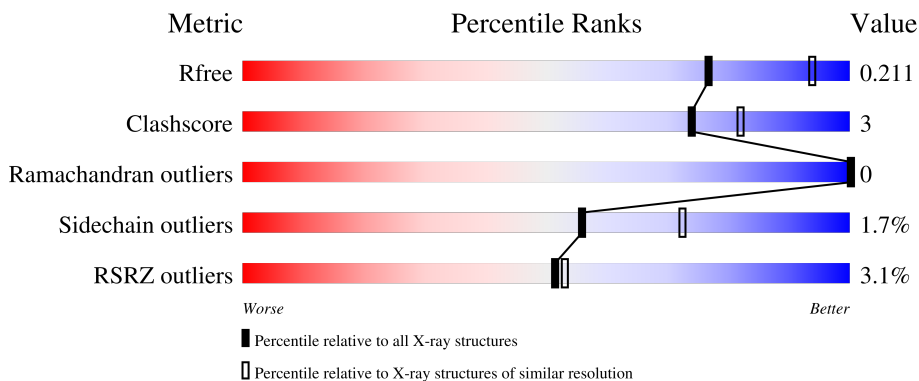|		
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

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 2.30 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		0.211
Clashscore		3
Ramachandran outliers		0
Sidechain outliers		1.7%
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}	164625	5963 (2.30-2.30)
Clashscore	180529	6698 (2.30-2.30)
Ramachandran outliers	177936	6640 (2.30-2.30)
Sidechain outliers	177891	6640 (2.30-2.30)
RSRZ outliers	164620	5963 (2.30-2.30)

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	490	3% — 77% / 8% / 15%
1	B	490	3% — 80% / 5% / 15%
2	C	2	50% / 50%
2	D	2	50% / 50%
2	E	2	100%

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Mol	Chain	Length	Quality of chain
2	F	2	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
3	SO4	A	505	-	X	-	-

2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 7097 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 5'-3' exonuclease PLD3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	416	Total	C	N	O	S	0	0	0
			3265	2066	572	611	16			
1	B	416	Total	C	N	O	S	0	0	0
			3265	2066	572	611	16			

- 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	C	2	Total	C	N	O	0	0	0
			28	16	2	10			
2	D	2	Total	C	N	O	0	0	0
			28	16	2	10			
2	E	2	Total	C	N	O	0	0	0
			28	16	2	10			
2	F	2	Total	C	N	O	0	0	0
			28	16	2	10			

- Molecule 3 is SULFATE ION (three-letter code: SO4) (formula: O_4S).

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total 5	O 4	S 1	0	0
3	A	1	Total 5	O 4	S 1	0	0
3	A	1	Total 5	O 4	S 1	0	0
3	A	1	Total 5	O 4	S 1	0	0
3	A	1	Total 5	O 4	S 1	0	0
3	A	1	Total 5	O 4	S 1	0	0
3	B	1	Total 5	O 4	S 1	0	0
3	B	1	Total 5	O 4	S 1	0	0
3	B	1	Total 5	O 4	S 1	0	0
3	B	1	Total 5	O 4	S 1	0	0

- Molecule 4 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).

GOL

| Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total 6	C 3	O 3	0	0
4	A	1	Total 6	C 3	O 3	0	0
4	A	1	Total 6	C 3	O 3	0	0

• Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	235	Total 235	O 235	0	0
5	B	152	Total 152	O 152	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: 5'-3' exonuclease PLD3
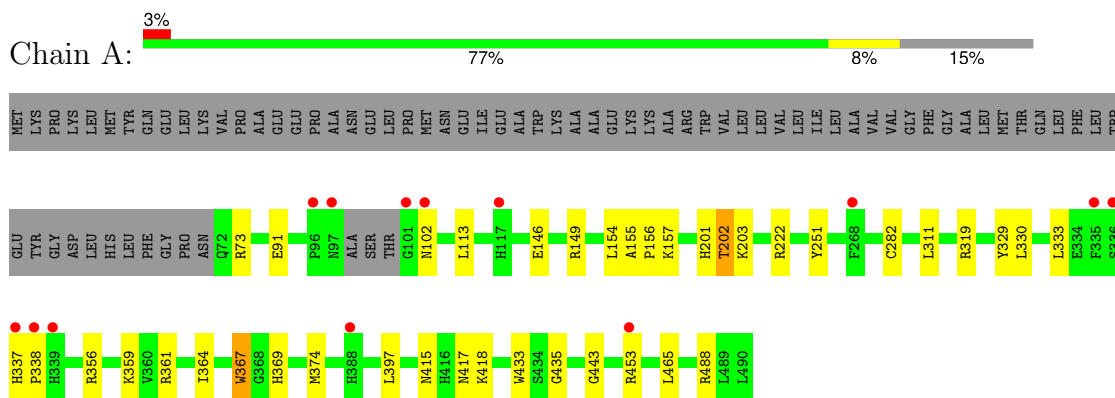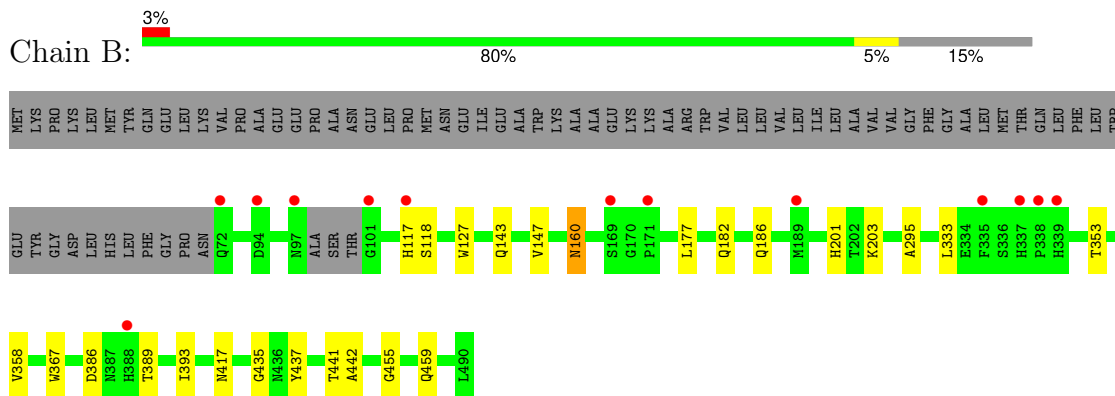
Chain A:

- Molecule 1: 5'-3' exonuclease PLD3

Chain B:

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

Chain C:

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

Chain D:

NAG1 NAG2

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

Chain E:

100%

NAG1 NAG2

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

Chain F:

50%   50%

NAG1 NAG2

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	205.14Å 60.57Å 111.50Å 90.00° 98.72° 90.00°	Depositor
Resolution (Å)	48.96 – 2.30 48.96 – 2.30	Depositor EDS
% Data completeness (in resolution range)	95.4 (48.96-2.30) 99.0 (48.96-2.30)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.84 (at 2.29Å)	Xtriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, R_{free}	0.185 , 0.209 0.184 , 0.211	Depositor DCC
R_{free} test set	2968 reflections (4.88%)	wwPDB-VP
Wilson B-factor (Å^2)	49.2	Xtriage
Anisotropy	0.309	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 40.1	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	0.96	EDS
Total number of atoms	7097	wwPDB-VP
Average B, all atoms (Å^2)	58.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.80% 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: NAG, SO4, GOL

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	0.44	0/3352	0.67	0/4574
1	B	0.39	0/3352	0.62	0/4574
All	All	0.42	0/6704	0.64	0/9148

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	3265	0	3167	24	0
1	B	3265	0	3167	15	0
2	C	28	0	25	1	0
2	D	28	0	25	0	0
2	E	28	0	25	0	0
2	F	28	0	25	0	0
3	A	30	0	0	2	0
3	B	20	0	0	1	0
4	A	18	0	24	1	0
5	A	235	0	0	4	0
5	B	152	0	0	0	0
All	All	7097	0	6458	40	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 (40) 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:282:CYS:SG	5:A:796:HOH:O	2.46	0.73
1:A:202:THR:HG21	1:A:251:TYR:OH	1.93	0.69
1:B:160:ASN:HD21	1:B:186:GLN:HE21	1.46	0.63
2:C:2:NAG:H3	2:C:2:NAG:H83	1.86	0.57
1:A:102:ASN:ND2	5:A:602:HOH:O	2.37	0.56
1:A:222:ARG:HH22	4:A:509:GOL:H11	1.69	0.56
1:B:353:THR:HG21	1:B:393:ILE:HG12	1.86	0.56
1:B:333:LEU:HD23	1:B:435:GLY:HA3	1.89	0.55
1:B:182:GLN:HA	1:B:182:GLN:OE1	2.07	0.55
1:B:353:THR:HG22	1:B:358:VAL:O	2.07	0.54
1:B:143:GLN:O	1:B:147:VAL:HG23	2.07	0.53
1:B:353:THR:HG21	1:B:393:ILE:CG1	2.39	0.51
1:A:333:LEU:HD23	1:A:435:GLY:HA3	1.91	0.51
1:A:415:ASN:HD21	1:A:417:ASN:ND2	2.09	0.51
1:A:337:HIS:HB2	1:A:338:PRO:HD3	1.94	0.50
1:B:127:TRP:CD1	1:B:177:LEU:HD21	2.48	0.47
1:A:146:GLU:OE1	1:A:149:ARG:NH2	2.46	0.47
1:B:455:GLY:O	1:B:459:GLN:HG3	2.15	0.46
1:A:453:ARG:HH11	1:A:453:ARG:HG2	1.82	0.45
1:A:311:LEU:HD11	1:A:433:TRP:CE2	2.51	0.45
1:A:73:ARG:HD3	5:A:791:HOH:O	2.17	0.44
1:A:201:HIS:NE2	3:A:501:SO4:O3	2.51	0.44
1:B:201:HIS:NE2	3:B:501:SO4:O1	2.50	0.44
1:B:160:ASN:HD21	1:B:186:GLN:NE2	2.14	0.44
1:A:329:TYR:O	1:A:374:MET:HG2	2.17	0.43
1:A:330:LEU:HD13	1:A:374:MET:HG3	2.00	0.43
1:B:386:ASP:OD2	1:B:389:THR:HG23	2.18	0.43
1:A:356:ARG:HD3	5:A:651:HOH:O	2.19	0.43
1:A:113:LEU:HD22	1:A:154:LEU:HD11	2.00	0.42
1:A:367:TRP:CE2	1:A:369:HIS:HB2	2.54	0.42
1:A:453:ARG:HG2	1:A:453:ARG:NH1	2.35	0.42
1:A:91:GLU:O	1:A:91:GLU:HG3	2.19	0.42
1:A:361:ARG:NE	3:A:504:SO4:O2	2.51	0.42
1:A:155:ALA:HB3	1:A:156:PRO:HD3	2.02	0.41
1:A:202:THR:HG22	1:A:443:GLY:HA2	2.03	0.41
1:B:437:TYR:HA	1:B:441:THR:HB	2.03	0.41
1:A:364:ILE:O	1:A:397:LEU:HA	2.22	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:465:LEU:HD23	1:A:465:LEU:HA	1.95	0.40
1:B:117:HIS:CE1	1:B:118:SER:HB3	2.56	0.40
1:B:295:ALA:O	1:B:442:ALA:HA	2.22	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	412/490 (84%)	398 (97%)	14 (3%)	0	100	100
1	B	412/490 (84%)	394 (96%)	18 (4%)	0	100	100
All	All	824/980 (84%)	792 (96%)	32 (4%)	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	354/415 (85%)	346 (98%)	8 (2%)	45	63
1	B	354/415 (85%)	350 (99%)	4 (1%)	70	83
All	All	708/830 (85%)	696 (98%)	12 (2%)	56	72

All (12) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	157	LYS
1	A	202	THR
1	A	203	LYS
1	A	319	ARG
1	A	359	LYS
1	A	367	TRP
1	A	418	LYS
1	A	488	ARG
1	B	160	ASN
1	B	203	LYS
1	B	367	TRP
1	B	417	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	160	ASN
1	A	193	GLN
1	A	416	HIS
1	A	417	ASN
1	A	451	ASN
1	B	160	ASN
1	B	450	GLN
1	B	474	HIS

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 ⓘ

8 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	C	1	2,1	14,14,15	0.93	1 (7%)	17,19,21	1.09	1 (5%)
2	NAG	C	2	2	14,14,15	0.94	1 (7%)	17,19,21	1.18	1 (5%)
2	NAG	D	1	2,1	14,14,15	0.37	0	17,19,21	0.53	0
2	NAG	D	2	2	14,14,15	0.57	0	17,19,21	0.88	1 (5%)
2	NAG	E	1	2,1	14,14,15	0.63	1 (7%)	17,19,21	0.71	0
2	NAG	E	2	2	14,14,15	1.38	3 (21%)	17,19,21	1.34	3 (17%)
2	NAG	F	1	2,1	14,14,15	0.66	0	17,19,21	0.65	0
2	NAG	F	2	2	14,14,15	0.55	0	17,19,21	0.88	1 (5%)

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	C	1	2,1	-	2/6/23/26	0/1/1/1
2	NAG	C	2	2	-	6/6/23/26	0/1/1/1
2	NAG	D	1	2,1	-	0/6/23/26	0/1/1/1
2	NAG	D	2	2	-	0/6/23/26	0/1/1/1
2	NAG	E	1	2,1	-	2/6/23/26	0/1/1/1
2	NAG	E	2	2	-	0/6/23/26	0/1/1/1
2	NAG	F	1	2,1	-	1/6/23/26	0/1/1/1
2	NAG	F	2	2	-	0/6/23/26	0/1/1/1

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	2	NAG	C1-C2	4.17	1.58	1.52
2	C	2	NAG	C1-C2	3.03	1.56	1.52
2	C	1	NAG	O5-C1	2.62	1.48	1.43
2	E	2	NAG	O5-C1	-2.12	1.40	1.43
2	E	1	NAG	O5-C1	-2.09	1.40	1.43
2	E	2	NAG	C3-C2	2.02	1.56	1.52

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	2	NAG	C2-N2-C7	4.03	128.30	122.90
2	E	2	NAG	C4-C3-C2	3.64	116.35	111.02
2	F	2	NAG	C1-O5-C5	3.17	116.43	112.19
2	C	1	NAG	C1-O5-C5	2.99	116.19	112.19
2	E	2	NAG	C1-O5-C5	-2.63	108.66	112.19
2	D	2	NAG	C1-O5-C5	2.63	115.70	112.19
2	E	2	NAG	O5-C5-C4	-2.38	105.04	110.83

There are no chirality outliers.

All (11) torsion outliers are listed below:

| Mol	Chain	Res	Type	Atoms
2	C	2	NAG	O5-C5-C6-O6
2	C	2	NAG	C8-C7-N2-C2
2	C	2	NAG	O7-C7-N2-C2
2	C	2	NAG	C4-C5-C6-O6
2	C	1	NAG	C1-C2-N2-C7
2	C	2	NAG	C1-C2-N2-C7
2	C	1	NAG	C3-C2-N2-C7
2	E	1	NAG	C3-C2-N2-C7
2	E	1	NAG	C1-C2-N2-C7
2	F	1	NAG	C1-C2-N2-C7
2	C	2	NAG	C3-C2-N2-C7

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	2	NAG	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 oligosaccharide.

Oligosaccharide Chain C

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain D

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain E

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain F

Bond lengths   Bond angles

Torsions   Rings
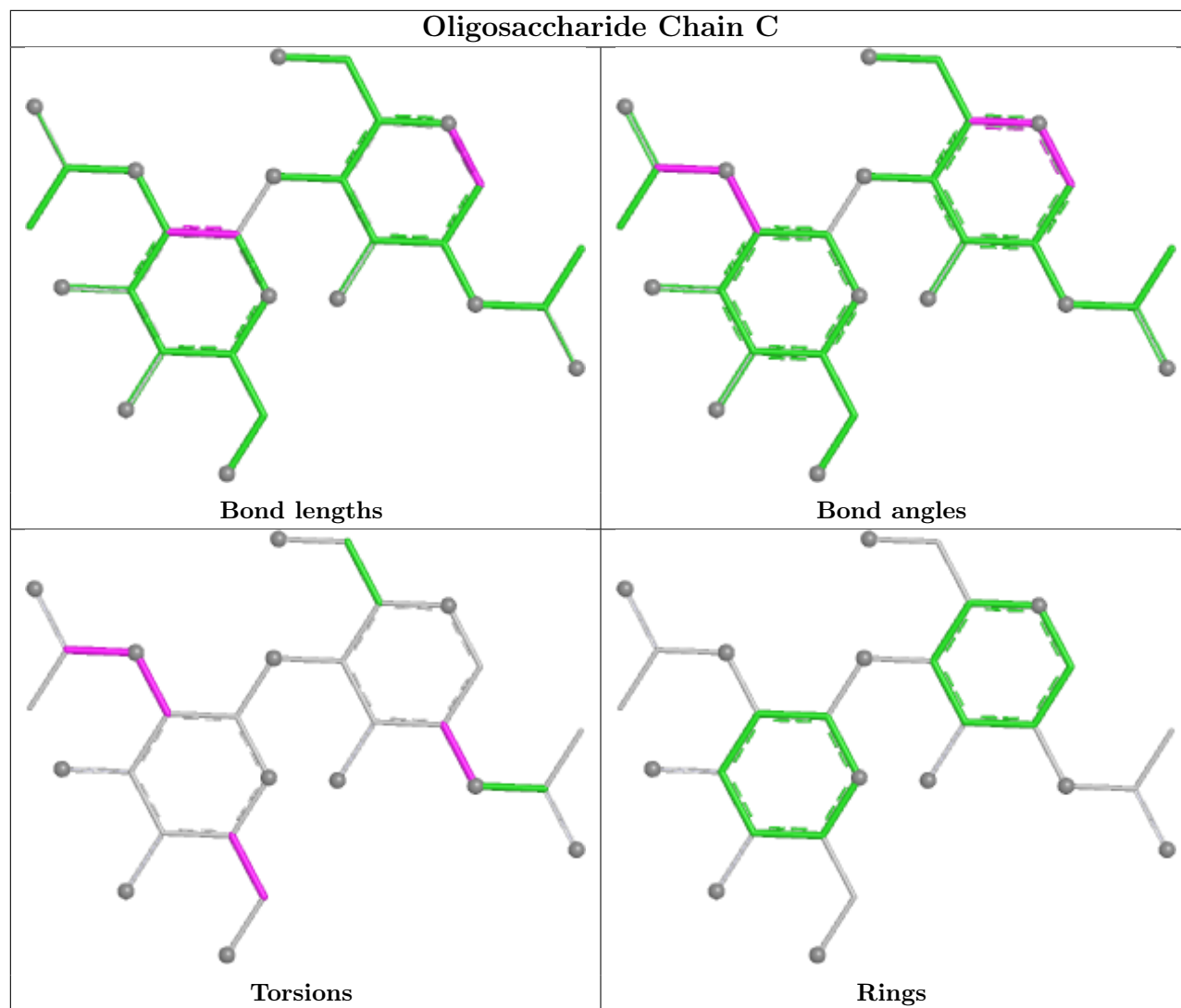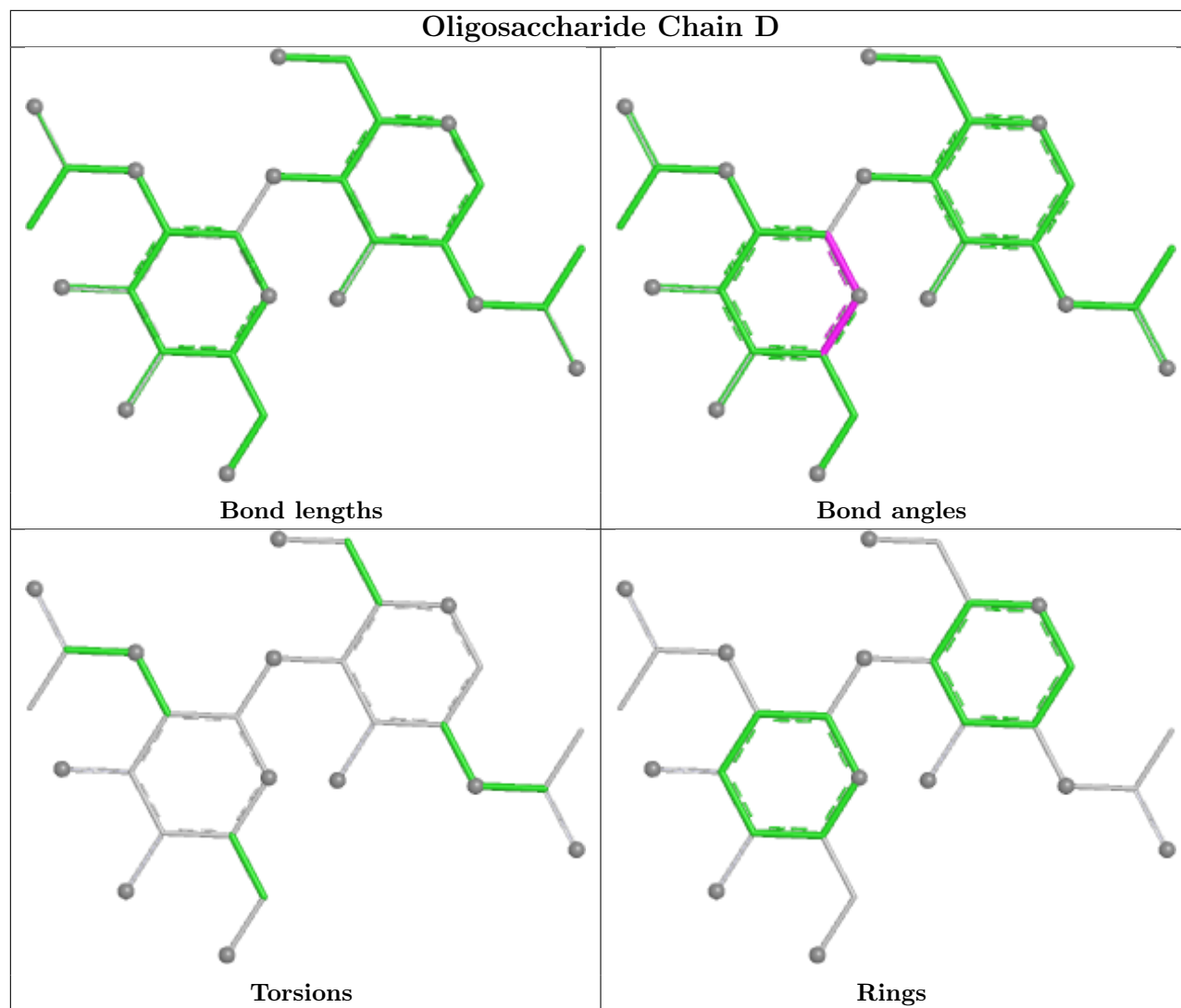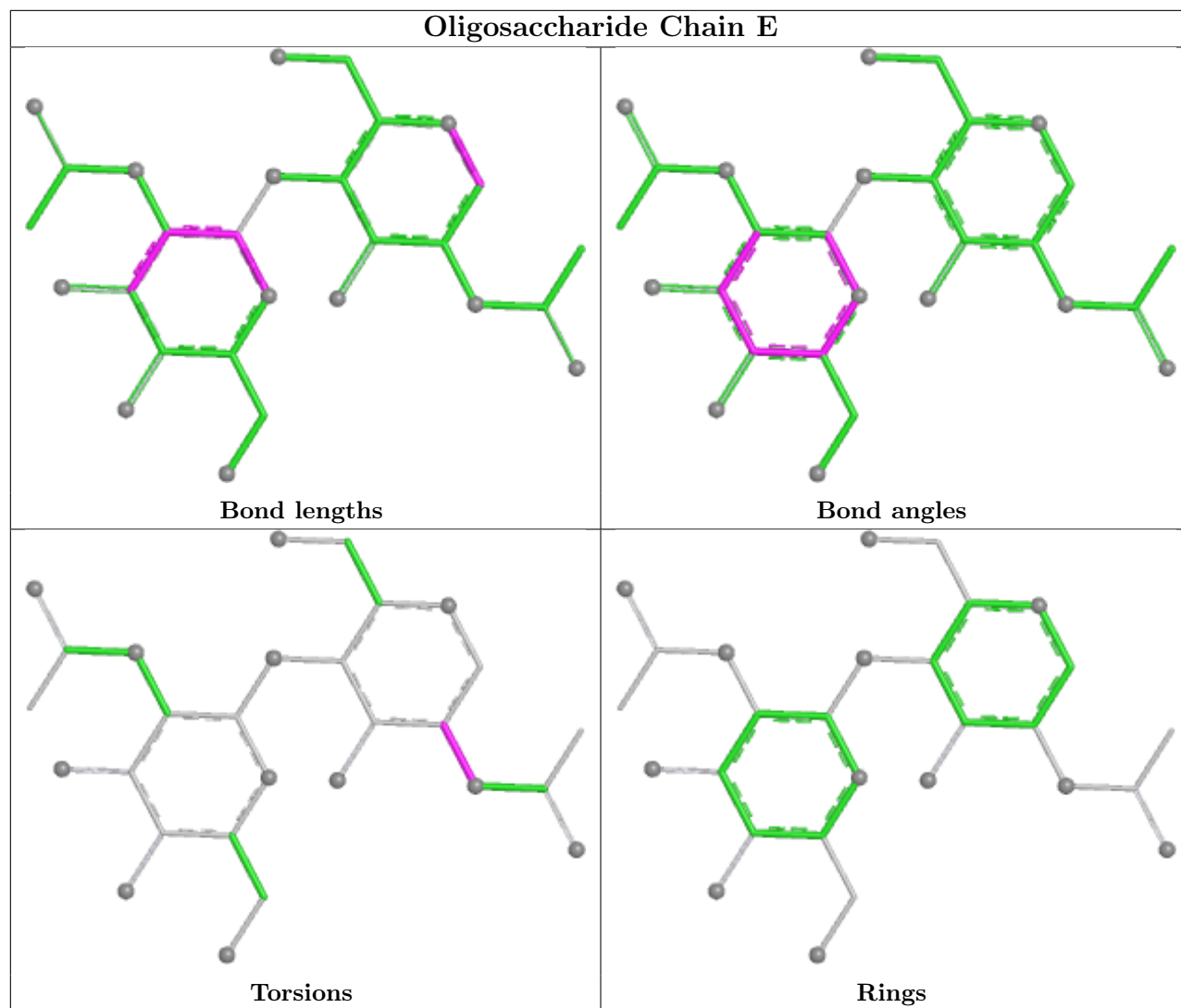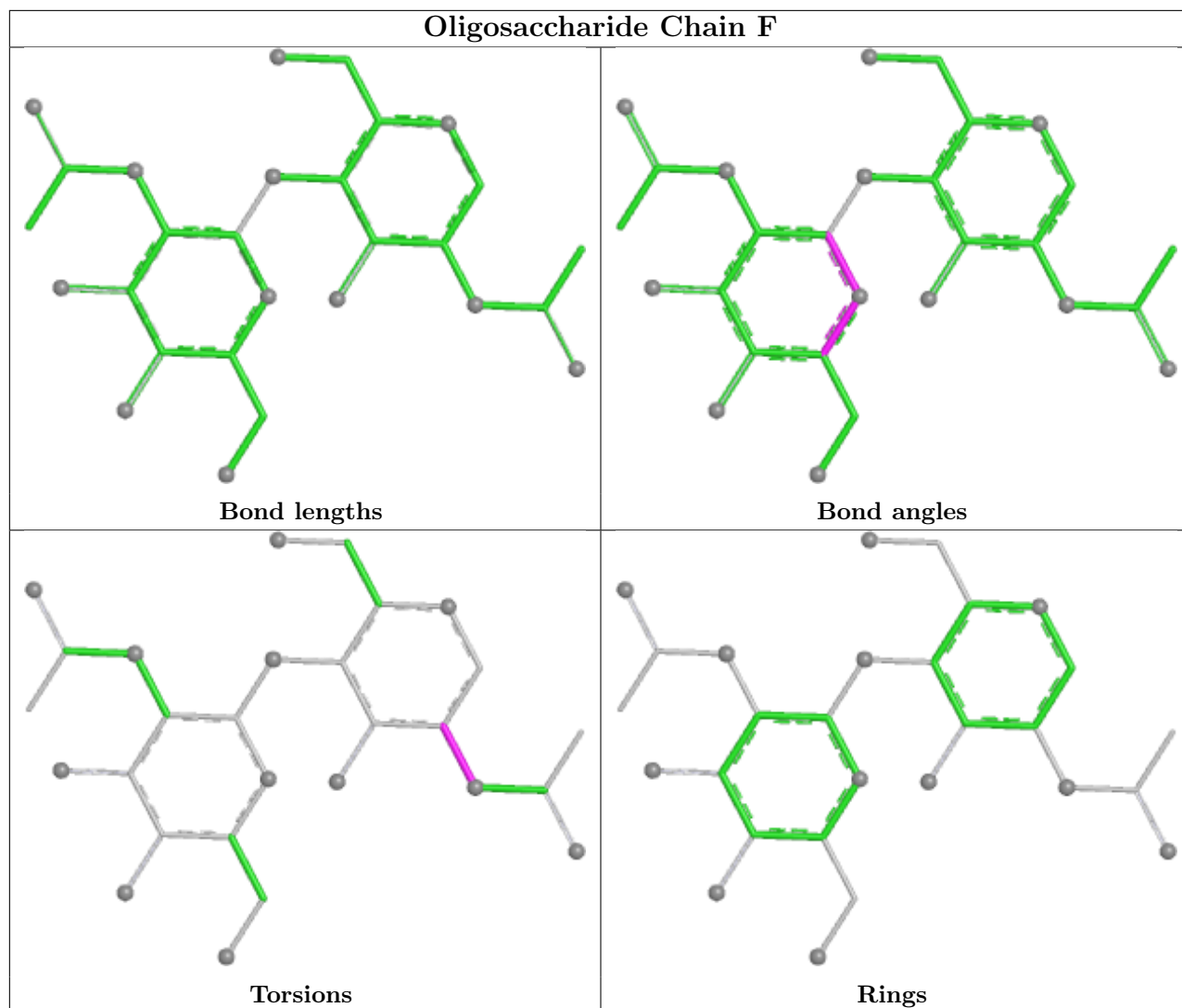
5.6 Ligand geometry ⓘ

13 ligands 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	SO4	A	501	-	4,4,4	0.32	0	6,6,6	0.29	0
4	GOL	A	509	-	5,5,5	2.17	2 (40%)	5,5,5	1.23	1 (20%)
3	SO4	B	504	-	4,4,4	1.32	0	6,6,6	1.28	1 (16%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
3	SO4	B	501	-	4,4,4	0.22	0	6,6,6	0.42	0
3	SO4	B	502	-	4,4,4	0.29	0	6,6,6	0.28	0
3	SO4	A	502	-	4,4,4	0.31	0	6,6,6	0.09	0
4	GOL	A	507	-	5,5,5	0.68	0	5,5,5	1.81	3 (60%)
4	GOL	A	508	-	5,5,5	1.44	1 (20%)	5,5,5	2.42	3 (60%)
3	SO4	A	503	-	4,4,4	0.24	0	6,6,6	0.16	0
3	SO4	A	505	-	4,4,4	1.41	0	6,6,6	2.56	4 (66%)
3	SO4	A	506	-	4,4,4	1.22	0	6,6,6	1.25	0
3	SO4	B	503	-	4,4,4	0.29	0	6,6,6	0.20	0
3	SO4	A	504	-	4,4,4	0.97	0	6,6,6	1.64	1 (16%)

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	GOL	A	509	-	-	0/4/4/4	-
4	GOL	A	507	-	-	0/4/4/4	-
4	GOL	A	508	-	-	0/4/4/4	-

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	509	GOL	O1-C1	3.19	1.55	1.42
4	A	509	GOL	C1-C2	2.87	1.62	1.51
4	A	508	GOL	C1-C2	2.15	1.60	1.51

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	508	GOL	O1-C1-C2	-4.06	92.09	110.38
3	A	505	SO4	O3-S-O1	-3.73	90.05	109.56
3	A	505	SO4	O2-S-O1	3.16	131.29	109.06
3	A	505	SO4	O4-S-O3	3.00	125.07	108.54
4	A	507	GOL	O1-C1-C2	-2.77	97.92	110.38
3	A	504	SO4	O4-S-O2	-2.73	95.30	109.56
4	A	508	GOL	C3-C2-C1	-2.61	102.22	111.80
3	A	505	SO4	O3-S-O2	-2.50	96.46	109.56
4	A	508	GOL	O2-C2-C3	-2.18	100.14	109.18
4	A	507	GOL	O3-C3-C2	-2.15	100.71	110.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	B	504	SO4	O2-S-O1	-2.12	94.09	109.06
4	A	509	GOL	C3-C2-C1	-2.09	104.13	111.80
4	A	507	GOL	C3-C2-C1	-2.00	104.45	111.80

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

4 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	501	SO4	1	0
4	A	509	GOL	1	0
3	B	501	SO4	1	0
3	A	504	SO4	1	0

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	416/490 (84%)	-0.09	13 (3%)	51	53	34, 48, 86, 146	0
1	B	416/490 (84%)	0.27	13 (3%)	51	53	41, 59, 96, 127	0
All	All	832/980 (84%)	0.09	26 (3%)	51	53	34, 53, 93, 146	0

All (26) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	101	GLY	5.1
1	A	335	PHE	5.0
1	B	335	PHE	4.5
1	A	338	PRO	4.3
1	B	338	PRO	3.6
1	B	339	HIS	3.2
1	A	96	PRO	3.2
1	B	169	SER	3.0
1	B	117	HIS	2.9
1	A	102	ASN	2.9
1	B	72	GLN	2.8
1	A	339	HIS	2.8
1	B	97	ASN	2.8
1	A	101	GLY	2.8
1	B	337	HIS	2.8
1	A	337	HIS	2.7
1	A	97	ASN	2.6
1	A	388	HIS	2.6
1	A	268	PHE	2.5
1	B	388	HIS	2.4
1	B	94	ASP	2.4
1	B	171	PRO	2.4
1	A	336	SER	2.2
1	A	453	ARG	2.2

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Mol	Chain	Res	Type	RSRZ
1	B	189	MET	2.1
1	A	117	HIS	2.0

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

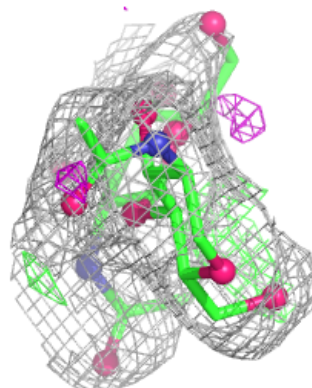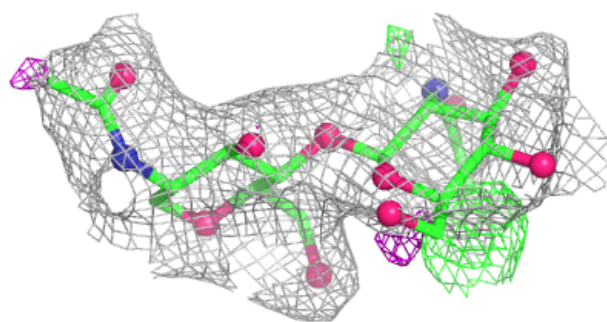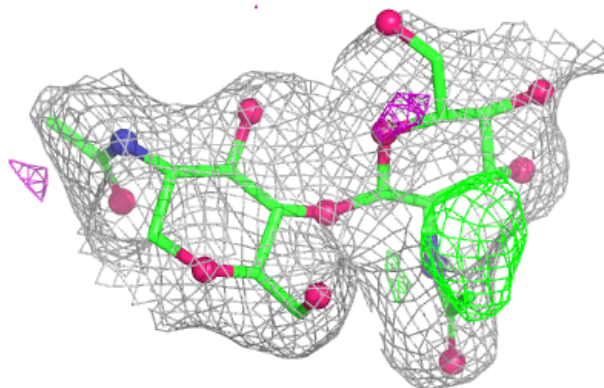There are no non-standard protein/DNA/RNA residues in this entry.

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, 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	NAG	C	2	14/15	0.60	0.15	98,105,110,111	0
2	NAG	E	2	14/15	0.74	0.14	90,120,129,131	0
2	NAG	D	2	14/15	0.83	0.13	65,79,93,96	0
2	NAG	E	1	14/15	0.86	0.14	72,85,96,101	0
2	NAG	F	2	14/15	0.86	0.13	84,95,105,107	0
2	NAG	C	1	14/15	0.94	0.08	56,69,81,89	0
2	NAG	F	1	14/15	0.95	0.09	71,77,82,85	0
2	NAG	D	1	14/15	0.95	0.08	58,67,73,75	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 C:

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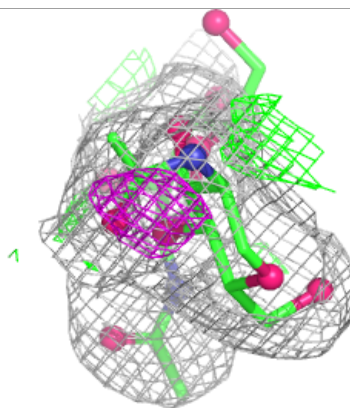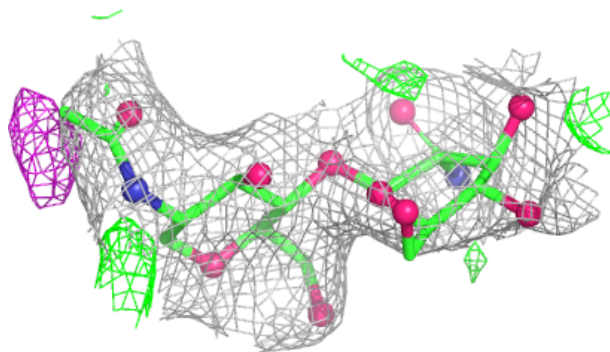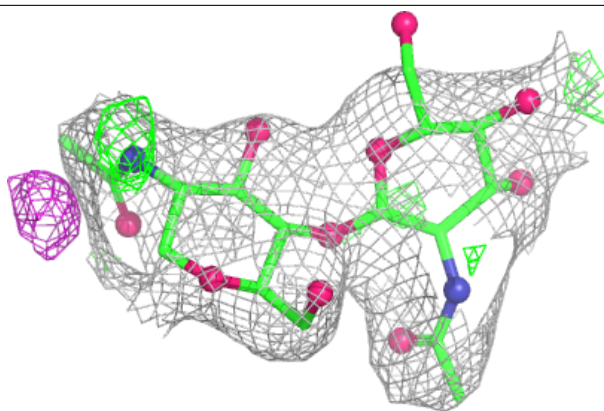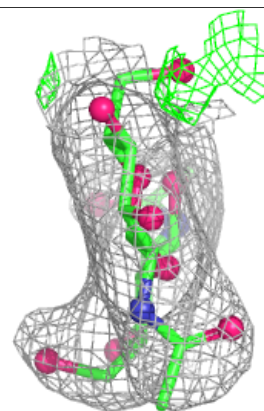and green (positive)

Electron density around Chain D:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
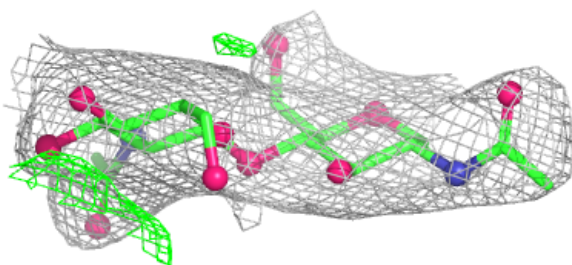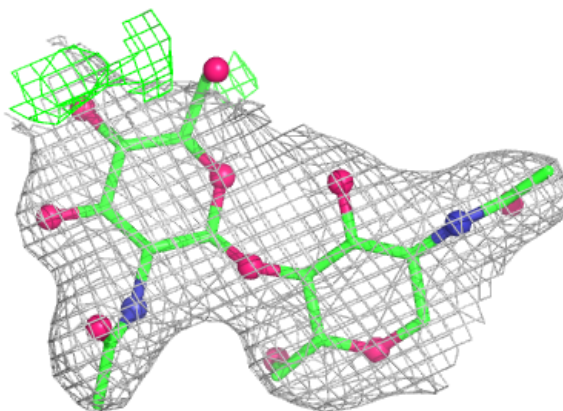and green (positive)
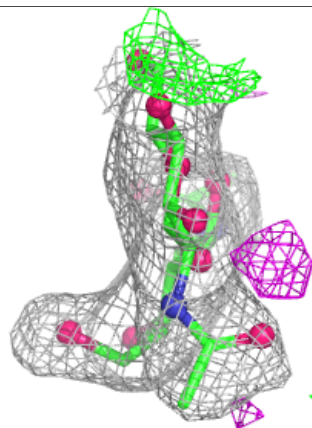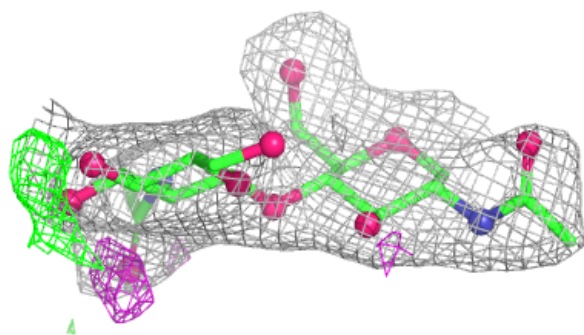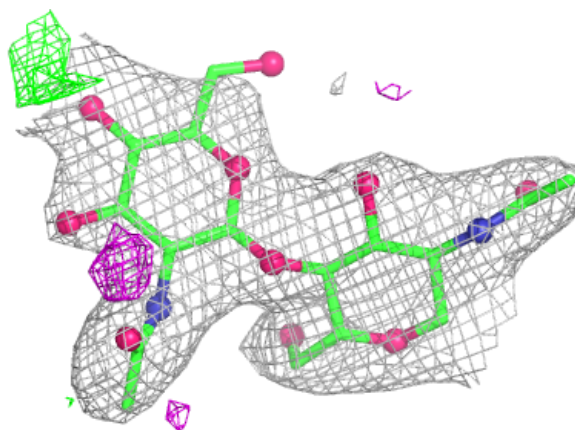
Electron density around Chain E:

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 Chain F:

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
3	SO4	B	504	5/5	0.75	0.14	76,76,79,105	5
3	SO4	A	506	5/5	0.83	0.12	73,73,85,93	5
3	SO4	A	502	5/5	0.84	0.11	79,88,98,99	0
4	GOL	A	508	6/6	0.85	0.14	62,69,71,72	0
4	GOL	A	509	6/6	0.85	0.15	61,63,66,66	0
3	SO4	A	505	5/5	0.86	0.20	62,63,74,85	5
3	SO4	B	501	5/5	0.87	0.11	74,80,86,87	0
3	SO4	A	504	5/5	0.89	0.15	62,67,73,74	5
3	SO4	B	503	5/5	0.90	0.13	70,103,111,115	0
3	SO4	A	503	5/5	0.90	0.14	72,81,114,117	5
3	SO4	B	502	5/5	0.91	0.09	82,83,93,99	0
3	SO4	A	501	5/5	0.94	0.11	67,68,77,82	0
4	GOL	A	507	6/6	0.95	0.11	59,61,66,69	0

6.5 Other polymers ⓘ

There are no such residues in this entry.