WORLDWIDE PDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Apr 2, 2024 – 01:44 PM JST

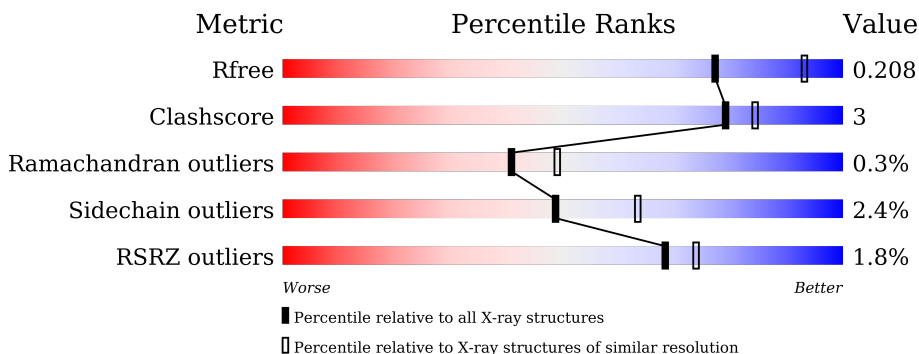|		
PDB ID	:	8K7H
Title	:	Crystal structure of human lysosomal alpha-galactosidase A in complex with (2R,3S,4R)-2-(hydroxymethyl)-1-methylpyrrolidine-3,4-diol
Authors	:	Li, H.Y.; Huang, K.F.; Ko, T.P.; Cheng, W.C.
Deposited on	:	2023-07-26
Resolution	:	2.28 Å(reported)

1   Overall quality at a glance ⓘ

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

The reported resolution of this entry is 2.28 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		0.208
Clashscore		3
Ramachandran outliers		0.3%
Sidechain outliers		2.4%
RSRZ outliers		1.8%

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	6980 (2.30-2.26)
Clashscore	141614	7711 (2.30-2.26)
Ramachandran outliers	138981	7597 (2.30-2.26)
Sidechain outliers	138945	7598 (2.30-2.26)
RSRZ outliers	127900	6849 (2.30-2.26)

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	398	.% 91% 7% ·
1	B	398	3% 87% 11% ·
2	C	2	50% 50%
2	D	2	100%
3	E	4	75% 25%

WORLDWIDE wwPDB PROTEIN DATA BANK

2   Entry composition ⓘ

There are 7 unique types of molecules in this entry. The entry contains 6985 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 Alpha-galactosidase A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	390	Total 3122	C 1988	N 534	O 574	S 26	0	0	0
1	B	393	Total 3145	C 2001	N 538	O 579	S 27	0	0	0

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

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

- Molecule 3 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-beta-D-mannopyranos e-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-gluco pyranose.

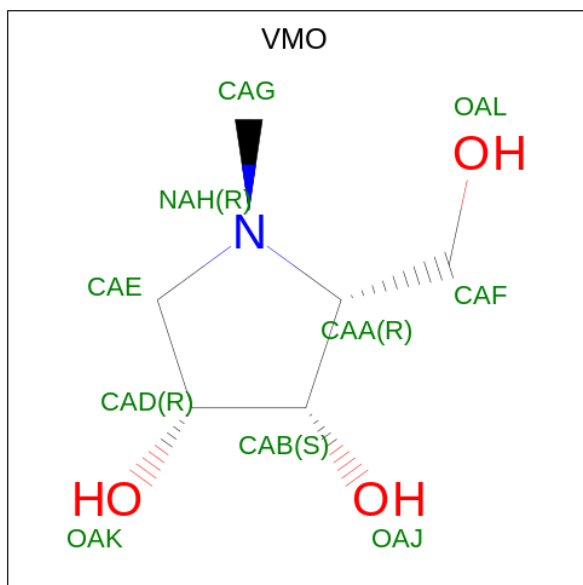| Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	E	4	Total 50	C 28	N 2	O 20	0	0	0

- Molecule 4 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).

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

- Molecule 5 is (2 {R},3 {S},4 {R})-2-(hydroxymethyl)-1-methyl-pyrrolidine-3,4-diol (three-letter code: VMO) (formula: $C_6H_{13}NO_3$) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total 10	C 6	N 1	O 3	0	0
5	B	1	Total 10	C 6	N 1	O 3	0	0

• Molecule 6 is SULFATE ION (three-letter code: SO4) (formula: O_4S).
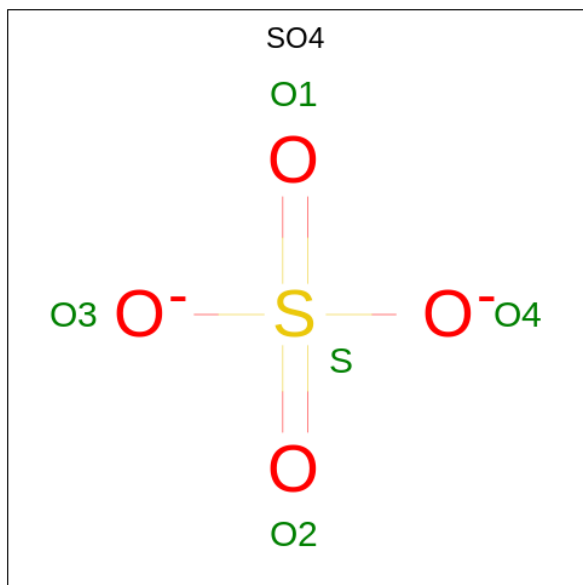
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total 5	O 4	S 1	0	0
6	B	1	Total 5	O 4	S 1	0	0

• Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	307	Total 307	O 307	0	0
7	B	233	Total 233	O 233	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 res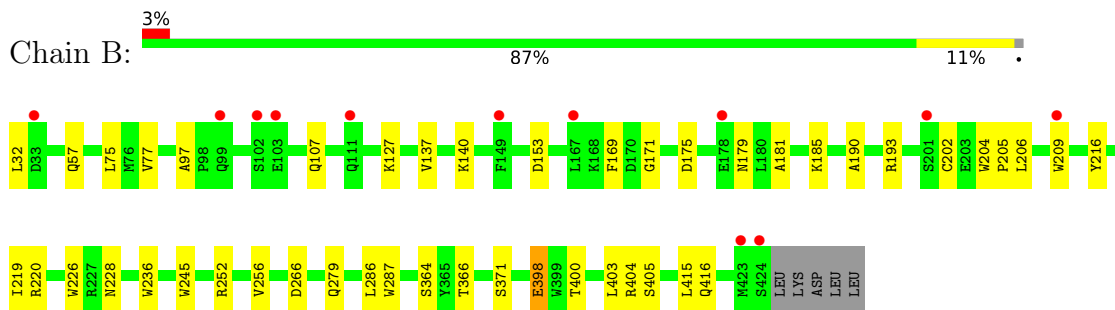idue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

• Molecule 1: Alpha-galactosidase A
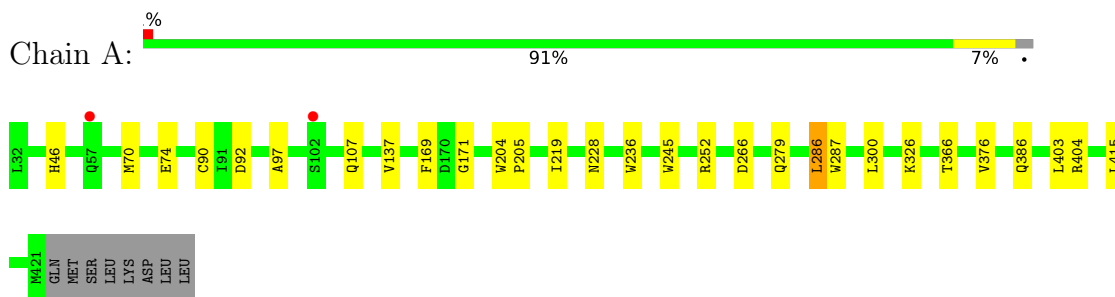
Chain A:

• Molecule 1: Alpha-galactosidase A

Chain B:

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

Chain C:

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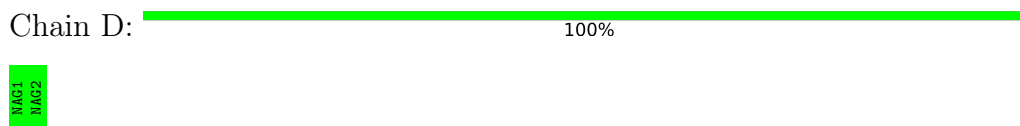
Chain D:

• Molecule 3: alpha-D-mannopyranose-(1-3)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-b eta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain E:

75%   25%

NAG1 NAG2 BMA3 MAN4

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 32 2 1	Depositor
Cell constants a, b, c, α, β, γ	90.51Å　90.51Å　216.35Å 90.00°　90.00°　120.00°	Depositor
Resolution (Å)	29.63　–　2.28 29.63　–　2.28	Depositor EDS
% Data completeness (in resolution range)	94.0 (29.63-2.28) 85.9 (29.63-2.28)	Depositor EDS
R_{merge}	0.16	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.00 (at 2.29Å)	Xtriage
Refinement program	PHENIX 1.19.2_4158	Depositor
R, R_{free}	0.171　,　0.210 0.171　,　0.208	Depositor DCC
R_{free} test set	1911 reflections (4.37%)	wwPDB-VP
Wilson B-factor (Å^2)	28.1	Xtriage
Anisotropy	0.013	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 52.0	EDS
L-test for twinning[2]	$< \lvert L \rvert > = 0.49, < L^2 > = 0.32$	Xtriage
Estimated twinning fraction	0.032 for -h,-k,l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	6985	wwPDB-VP
Average B, all atoms (Å^2)	37.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.49% 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 $< \lvert L \rvert >$, $< L^2 >$ 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: VMO, NAG, SO4, BMA, MAN

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	0.26	0/3209	0.54	1/4358 (0.0%)
1	B	0.27	0/3232	0.53	0/4388
All	All	0.27	0/6441	0.53	1/8746 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	286	LEU	CA-CB-CG	-5.33	103.04	115.30

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	3122	0	2981	14	0
1	B	3145	0	3003	21	0
2	C	28	0	25	0	0
2	D	28	0	25	0	0
3	E	50	0	43	0	0
4	A	14	0	13	0	0
4	B	28	0	26	0	0
5	A	10	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	B	10	0	0	0	0
6	A	5	0	0	0	0
6	B	5	0	0	0	0
7	A	307	0	0	1	1
7	B	233	0	0	1	0
All	All	6985	0	6116	35	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 (35) 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:B:57:GLN:NE2	7:B:601:HOH:O	2.24	0.71
1:B:205:PRO:HG3	1:B:219:ILE:HD13	1.74	0.69
1:A:205:PRO:HG3	1:A:219:ILE:HD13	1.77	0.66
1:B:216:TYR:HB3	1:B:256:VAL:HG11	1.82	0.60
1:A:46:HIS:CD2	1:A:92:ASP:H	2.19	0.60
1:B:228:ASN:HB3	1:B:245:TRP:CH2	2.39	0.57
1:A:137:VAL:HG12	1:A:171:GLY:HA2	1.90	0.53
1:A:228:ASN:HB3	1:A:245:TRP:CH2	2.44	0.53
1:A:403:LEU:HD21	1:A:415:LEU:HD13	1.91	0.53
1:B:77:VAL:HG21	1:B:127:LYS:HB3	1.90	0.53
1:B:137:VAL:HG12	1:B:171:GLY:HA2	1.93	0.51
1:B:153:ASP:OD2	1:B:193:ARG:NH1	2.44	0.51
1:A:204:TRP:HB3	1:A:205:PRO:HD3	1.94	0.50
1:B:204:TRP:HB3	1:B:205:PRO:HD3	1.93	0.49
1:B:97:ALA:HB3	1:B:107:GLN:HG3	1.95	0.49
1:B:32:LEU:N	1:B:220:ARG:O	2.48	0.47
1:A:97:ALA:HB3	1:A:107:GLN:HG3	1.96	0.47
1:B:398:GLU:HG3	1:B:400:THR:H	1.79	0.46
1:B:206:LEU:HA	1:B:209:TRP:CD1	2.50	0.46
1:A:366:THR:HG22	1:A:404:ARG:HG3	1.98	0.45
1:B:190:ALA:HA	1:B:193:ARG:HD2	1.99	0.45
1:B:403:LEU:HD21	1:B:415:LEU:HD13	1.99	0.45
1:A:403:LEU:HD21	1:A:415:LEU:CD1	2.46	0.44
1:B:206:LEU:HA	1:B:209:TRP:HD1	1.82	0.44
1:B:366:THR:HG22	1:B:404:ARG:HG3	1.98	0.44
1:B:181:ALA:O	1:B:185:LYS:HG3	2.17	0.43
1:A:90:CYS:HB3	7:A:716:HOH:O	2.19	0.43
1:A:236:TRP:CE3	1:A:279:GLN:HG2	2.53	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:326:LYS:HB3	1:A:326:LYS:HE3	1.81	0.43
1:A:70:MET:O	1:A:74:GLU:HG3	2.19	0.42
1:A:386:GLN:HA	1:A:415:LEU:HD23	2.02	0.42
1:B:236:TRP:CE3	1:B:279:GLN:HG2	2.55	0.41
1:B:416:GLN:HE21	1:B:416:GLN:HB2	1.64	0.41
1:B:175:ASP:OD1	1:B:179:ASN:ND2	2.45	0.41
1:B:202:CYS:O	1:B:226:TRP:HA	2.21	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)
7:A:824:HOH:O	7:A:875:HOH:O[6_444]	2.15	0.05

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	388/398 (98%)	376 (97%)	11 (3%)	1 (0%)	41	49
1	B	391/398 (98%)	380 (97%)	10 (3%)	1 (0%)	41	49
All	All	779/796 (98%)	756 (97%)	21 (3%)	2 (0%)	41	49

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	266	ASP
1	B	266	ASP

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	331/339 (98%)	325 (98%)	6 (2%)	59	72
1	B	334/339 (98%)	324 (97%)	10 (3%)	41	54
All	All	665/678 (98%)	649 (98%)	16 (2%)	49	63

All (16) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	169	PHE
1	A	252	ARG
1	A	286	LEU
1	A	287	TRP
1	A	300	LEU
1	A	376	VAL
1	B	75	LEU
1	B	140	LYS
1	B	169	PHE
1	B	252	ARG
1	B	286	LEU
1	B	287	TRP
1	B	364	SER
1	B	371	SER
1	B	398	GLU
1	B	405	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	46	HIS
1	A	221	GLN
1	A	416	GLN
1	B	115	HIS
1	B	119	GLN
1	B	212	GLN

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Mol	Chain	Res	Type
1	B	416	GLN

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	1,2	14,14,15	0.52	0	17,19,21	0.42	0
2	NAG	C	2	2	14,14,15	0.29	0	17,19,21	0.66	1 (5%)
2	NAG	D	1	1,2	14,14,15	0.35	0	17,19,21	0.52	0
2	NAG	D	2	2	14,14,15	0.30	0	17,19,21	0.52	0
3	NAG	E	1	1,3	14,14,15	0.23	0	17,19,21	0.48	0
3	NAG	E	2	3	14,14,15	0.56	0	17,19,21	0.42	0
3	BMA	E	3	3	11,11,12	0.50	0	15,15,17	0.65	0
3	MAN	E	4	3	11,11,12	0.72	0	15,15,17	1.01	1 (6%)

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	1,2	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NAG	C	2	2	-	2/6/23/26	0/1/1/1
2	NAG	D	1	1,2	-	2/6/23/26	0/1/1/1
2	NAG	D	2	2	-	1/6/23/26	0/1/1/1
3	NAG	E	1	1,3	-	2/6/23/26	0/1/1/1
3	NAG	E	2	3	-	0/6/23/26	0/1/1/1
3	BMA	E	3	3	-	0/2/19/22	0/1/1/1
3	MAN	E	4	3	-	0/2/19/22	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})
3	E	4	MAN	C1-O5-C5	2.57	115.68	112.19
2	C	2	NAG	C1-O5-C5	2.24	115.23	112.19

There are no chirality outliers.

All (9) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	C	2	NAG	O5-C5-C6-O6
2	C	2	NAG	C4-C5-C6-O6
3	E	1	NAG	O5-C5-C6-O6
2	C	1	NAG	O5-C5-C6-O6
2	C	1	NAG	C4-C5-C6-O6
2	D	1	NAG	C4-C5-C6-O6
3	E	1	NAG	C4-C5-C6-O6
2	D	1	NAG	O5-C5-C6-O6
2	D	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

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain D

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain E

Bond lengths

Bond angles

Torsions

Rings
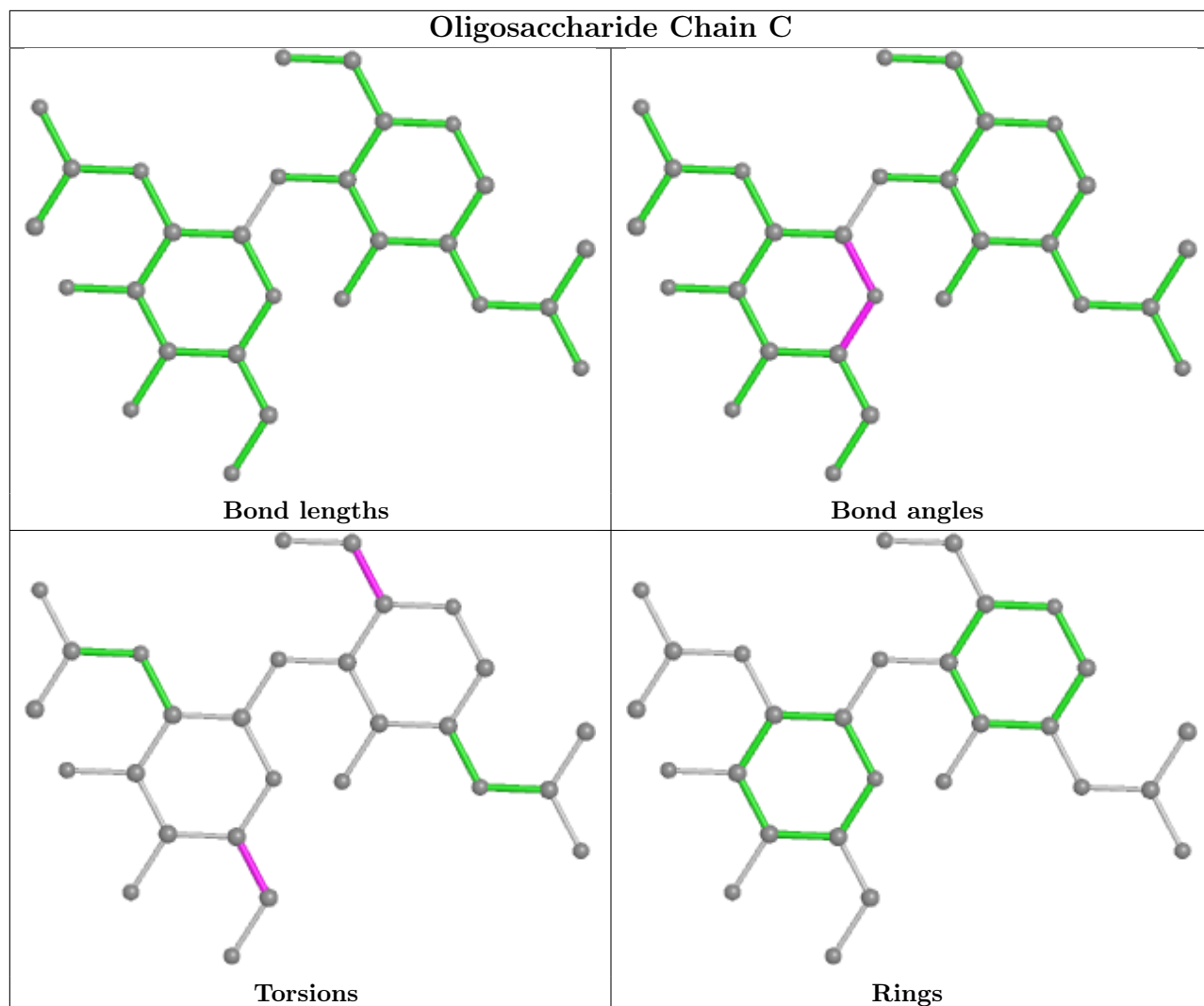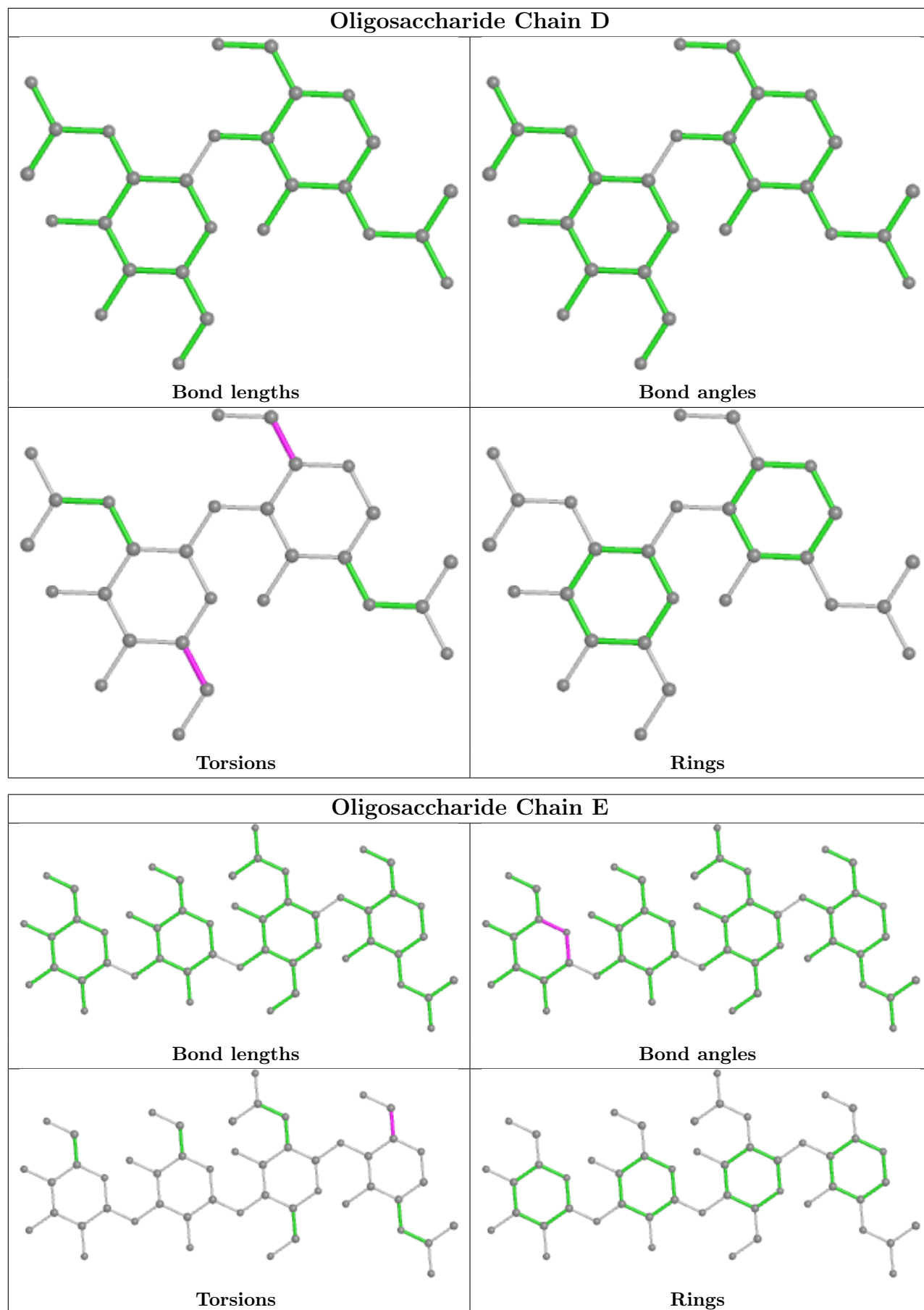
5.6 Ligand geometry ⓘ

7 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
6	SO4	B	504	-	4,4,4	0.14	0	6,6,6	0.05	0
4	NAG	B	502	1	14,14,15	0.21	0	17,19,21	0.57	0
5	VMO	A	502	-	10,10,10	0.89	1 (10%)	10,14,14	1.30	2 (20%)
5	VMO	B	503	-	10,10,10	0.97	1 (10%)	10,14,14	1.41	2 (20%)
4	NAG	A	501	1	14,14,15	0.25	0	17,19,21	0.49	0
6	SO4	A	503	-	4,4,4	0.17	0	6,6,6	0.05	0
4	NAG	B	501	1	14,14,15	0.38	0	17,19,21	0.48	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	NAG	B	502	1	-	0/6/23/26	0/1/1/1
5	VMO	A	502	-	-	0/2/18/18	0/1/1/1
5	VMO	B	503	-	-	0/2/18/18	0/1/1/1
4	NAG	A	501	1	-	2/6/23/26	0/1/1/1
4	NAG	B	501	1	-	0/6/23/26	0/1/1/1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	503	VMO	CAD-CAB	-2.20	1.50	1.53
5	A	502	VMO	CAD-CAB	-2.04	1.50	1.53

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	B	503	VMO	CAG-NAH-CAE	-3.08	108.27	112.45

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	B	503	VMO	CAF-CAA-CAB	-2.71	108.89	113.44
5	A	502	VMO	CAG-NAH-CAE	-2.50	109.06	112.45
5	A	502	VMO	CAF-CAA-CAB	-2.50	109.25	113.44

There are no chirality outliers.
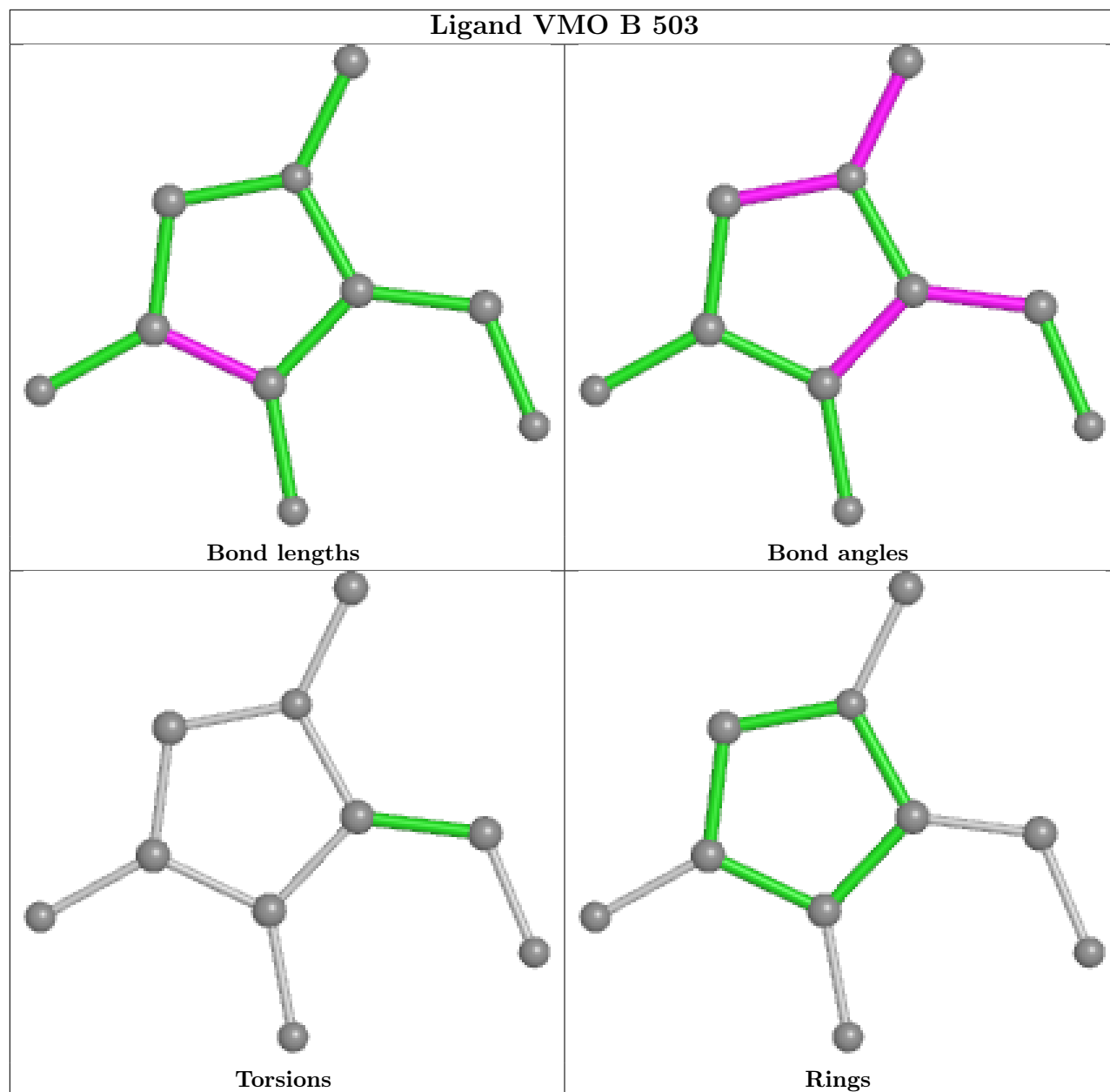
All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	501	NAG	O5-C5-C6-O6
4	A	501	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 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 VMO A 502

Bond lengths

Bond angles

Torsions

Rings

Ligand VMO B 503

Bond lengths

Bond angles

Torsions

Rings
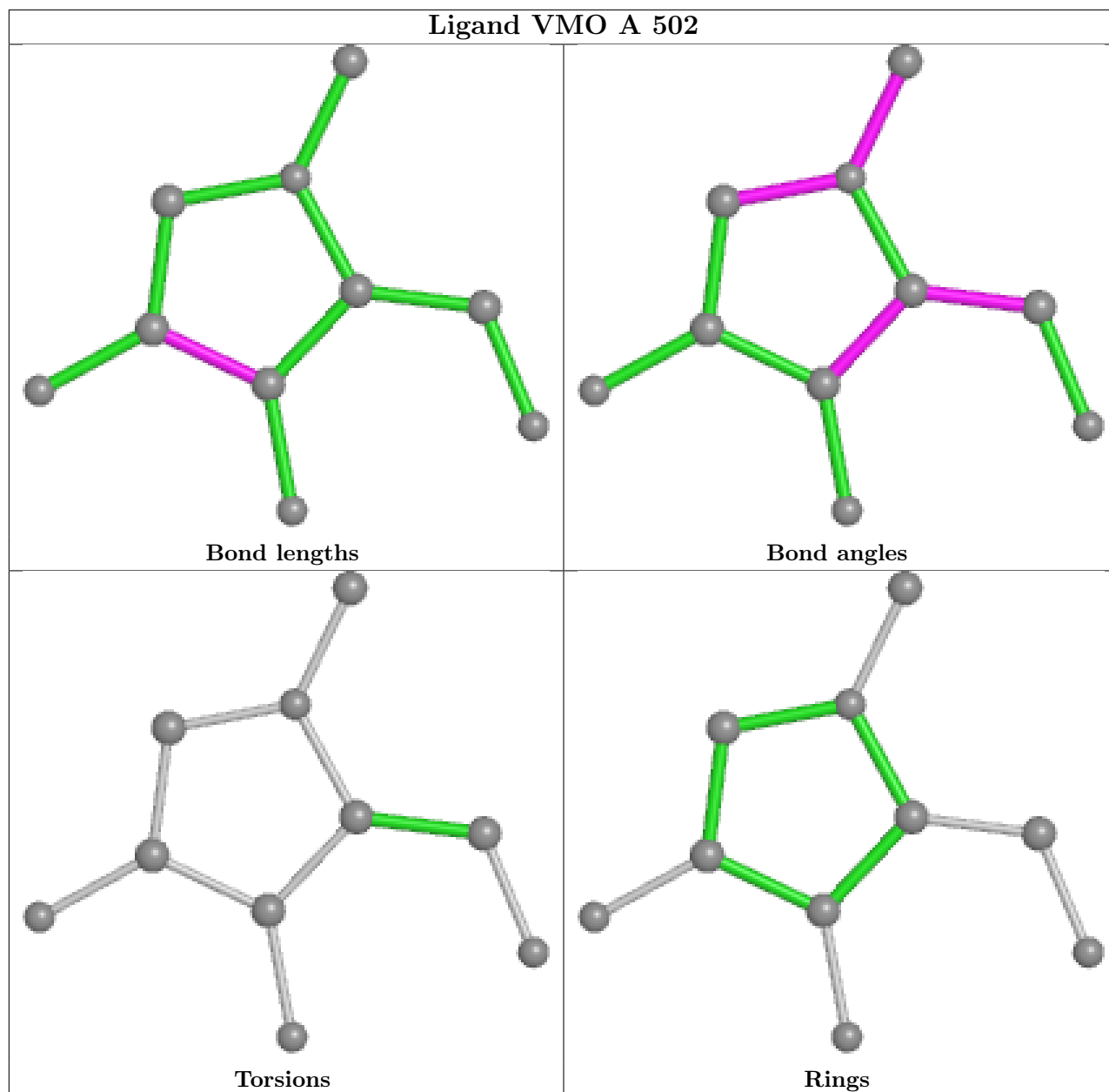
5.7 Other polymers ⓘ

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	390/398 (97%)	-0.48	2 (0%)	91	93	17, 30, 48, 73	0
1	B	393/398 (98%)	-0.20	12 (3%)	49	54	20, 36, 68, 115	0
All	All	783/796 (98%)	-0.34	14 (1%)	68	74	17, 32, 60, 115	0

All (14) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	102	SER	4.1
1	B	424	SER	3.9
1	B	423	MET	3.5
1	B	149	PHE	3.0
1	B	99	GLN	2.9
1	B	103	GLU	2.8
1	B	178	GLU	2.6
1	B	209	TRP	2.5
1	B	167	LEU	2.4
1	A	57	GLN	2.3
1	A	102	SER	2.2
1	B	33	ASP	2.2
1	B	201	SER	2.1
1	B	111	GLN	2.1

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

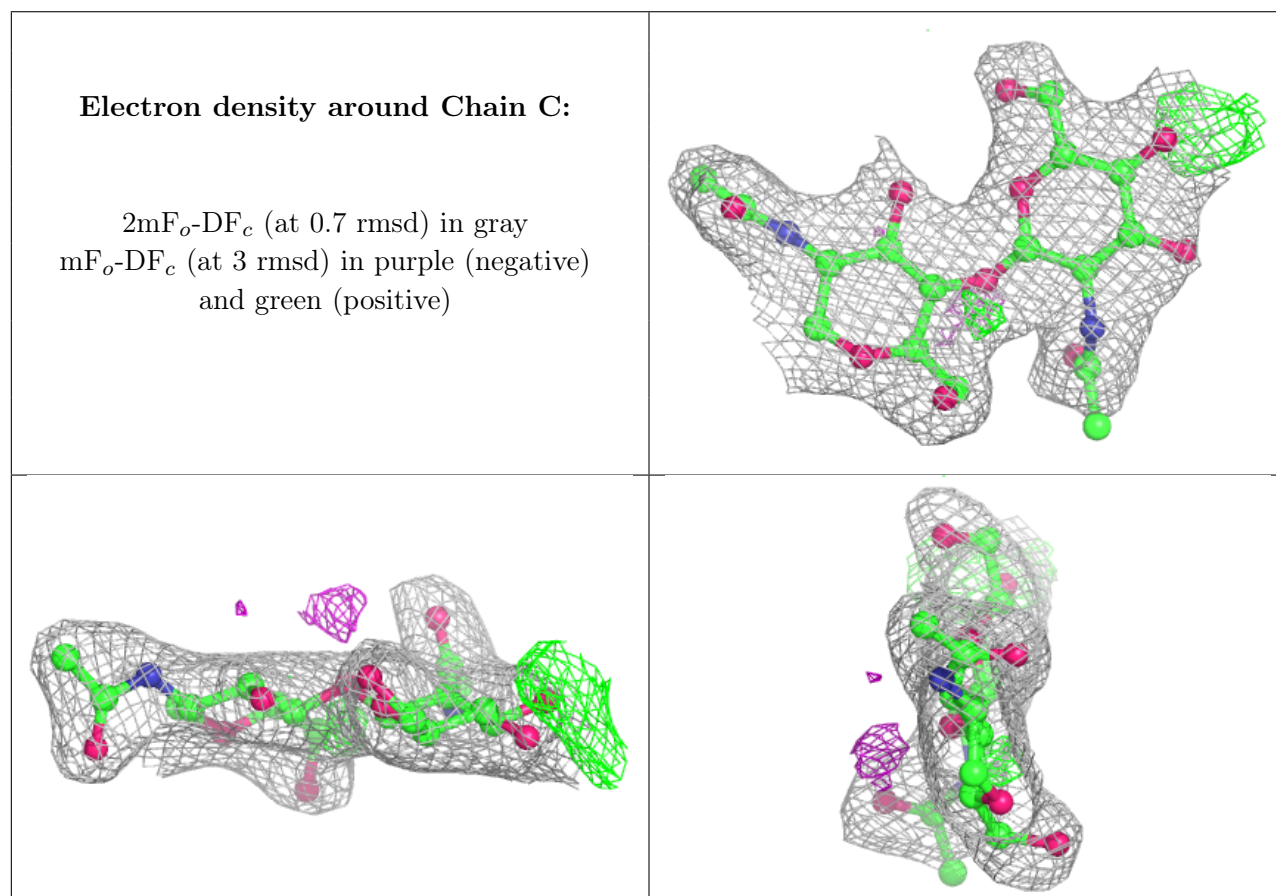There are no non-standard protein/DNA/RNA residues in this entry.

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	NAG	D	2	14/15	0.80	0.40	84,96,102,105	0
3	BMA	E	3	11/12	0.84	0.31	86,95,103,104	0
3	MAN	E	4	11/12	0.85	0.28	64,75,93,95	0
2	NAG	D	1	14/15	0.86	0.24	58,71,81,93	0
3	NAG	E	1	14/15	0.92	0.18	46,55,62,76	0
3	NAG	E	2	14/15	0.93	0.26	56,68,73,85	0
2	NAG	C	1	14/15	0.95	0.13	25,37,48,48	0
2	NAG	C	2	14/15	0.95	0.18	35,51,60,62	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.
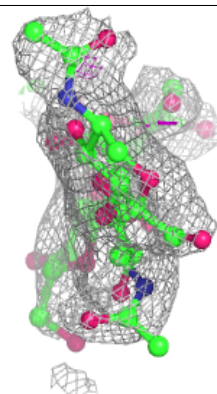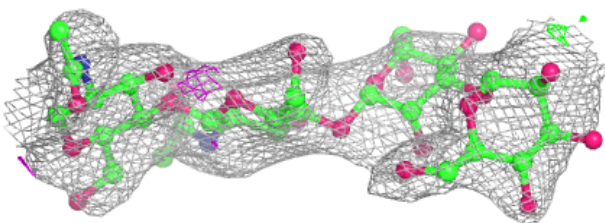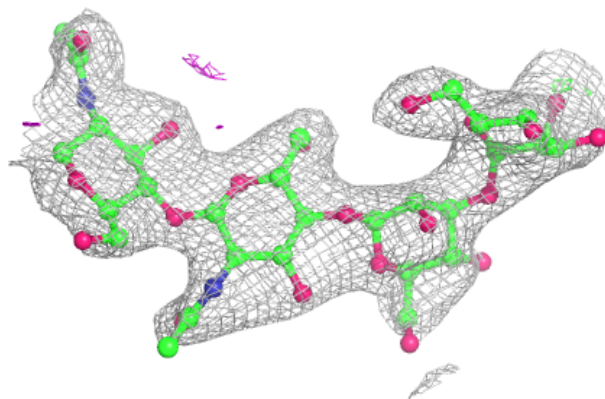

Electron density around Chain C:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (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)
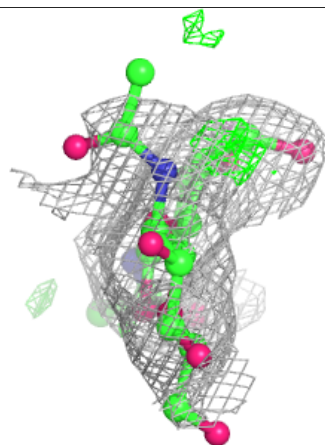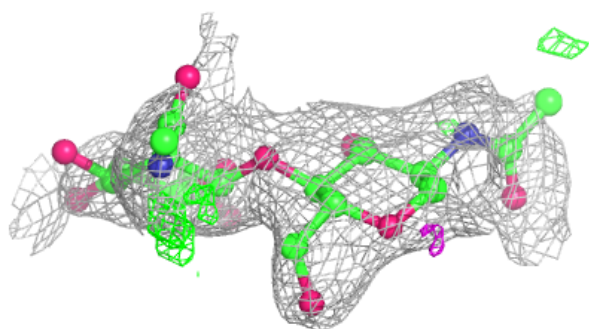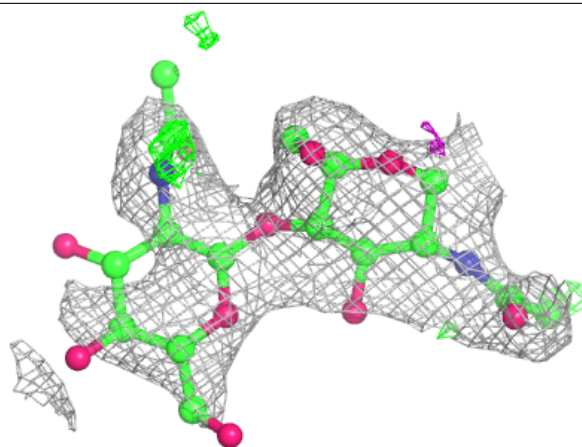
Electron density around Chain E:

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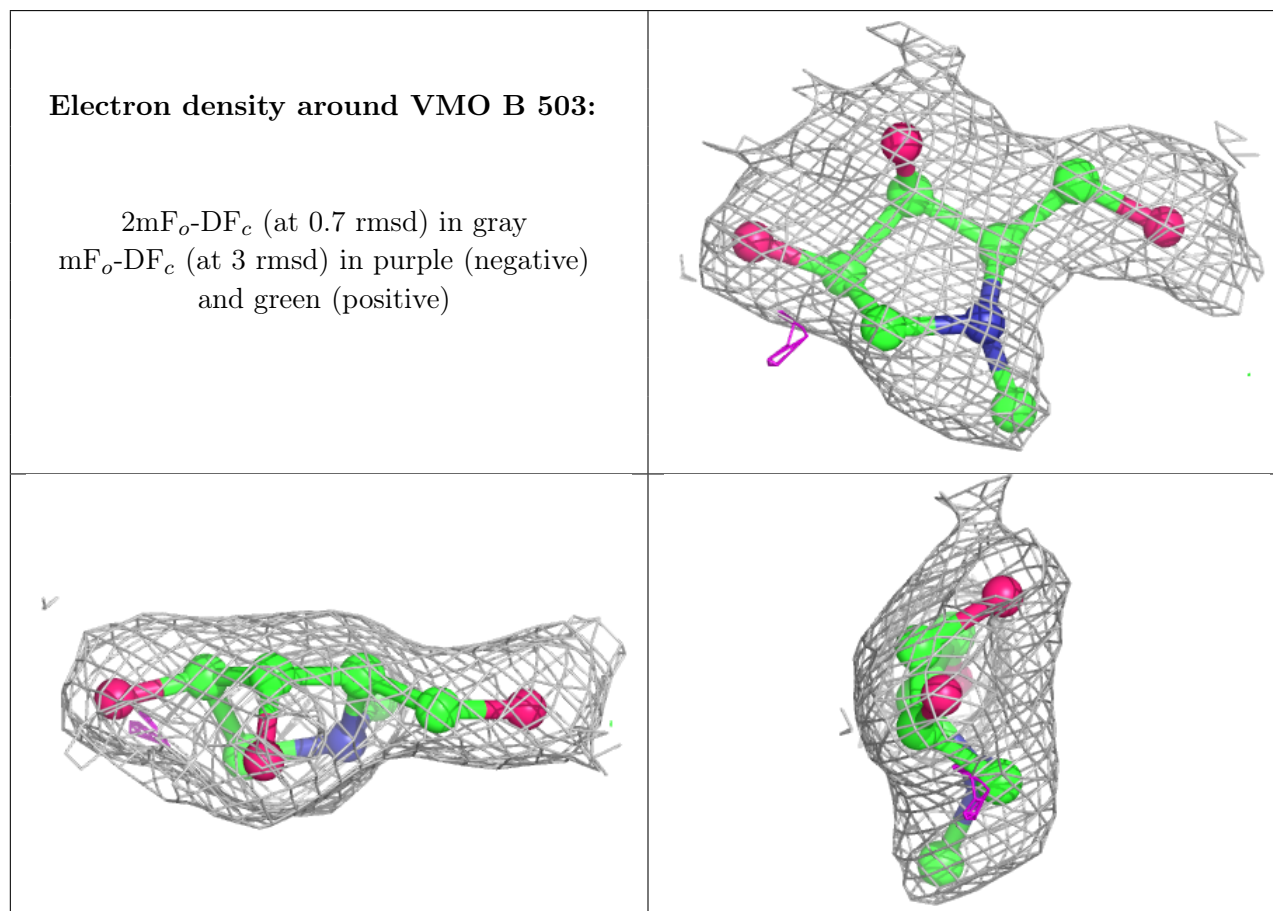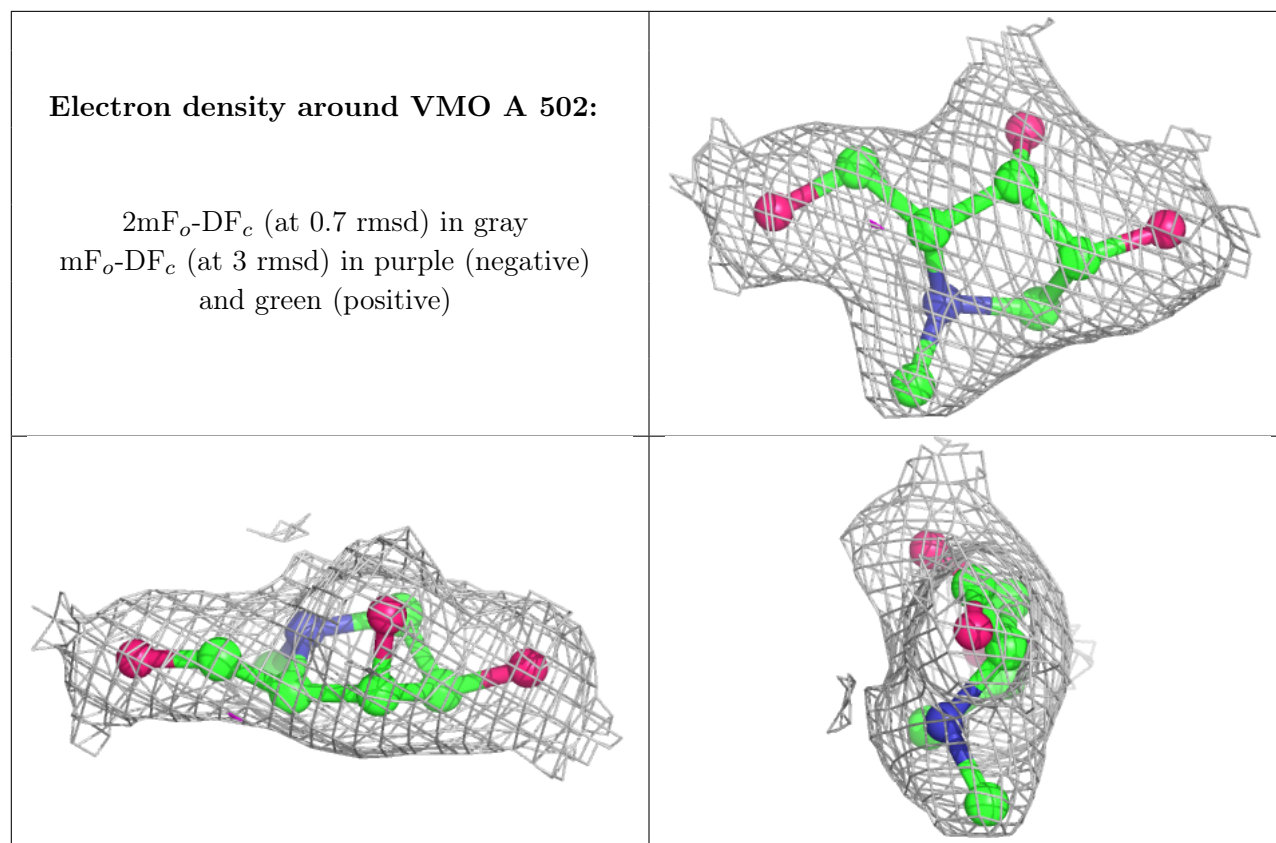and green (positive)

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(Å²)	Q<0.9
4	NAG	B	501	14/15	0.71	0.24	74,94,101,102	0
4	NAG	B	502	14/15	0.72	0.35	89,102,110,113	0
4	NAG	A	501	14/15	0.92	0.17	43,54,60,64	0
5	VMO	B	503	10/10	0.93	0.15	37,40,44,45	0
5	VMO	A	502	10/10	0.95	0.12	29,31,37,41	0
6	SO4	A	503	5/5	0.98	0.08	42,44,50,61	0
6	SO4	B	504	5/5	0.99	0.10	53,56,69,72	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 VMO B 503:

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

Electron density around VMO A 502:

$2mF_o$-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.