



Full wwPDB X-ray Structure Validation Report ⓘ

Jul 15, 2026 – 03:18 PM JST

PDB ID : 9VXH / pdb_00009vxh
Title : SFTSV-Gn/N2C1 complex
Authors : Wan, F.; Shu, B.; Wang, X.
Deposited on : 2025-07-18
Resolution : 2.50 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4-5-2 with Phenix2.0
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 2.0
EDS : 3.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.015 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.50

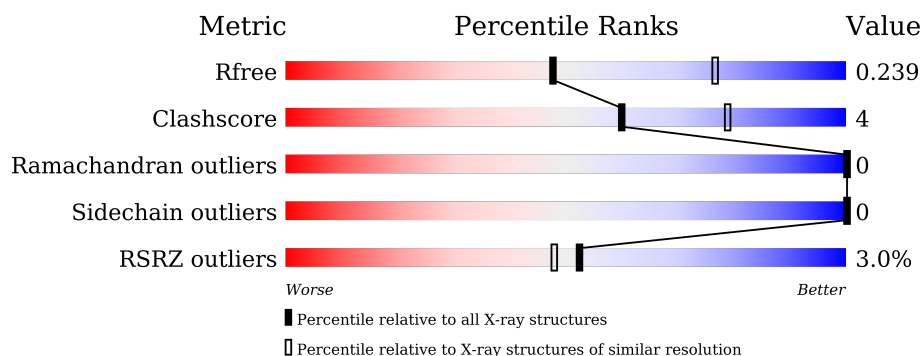
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 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.



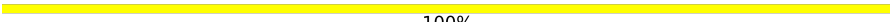
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	5829 (2.50-2.50)
Clashscore	190562	6492 (2.50-2.50)
Ramachandran outliers	187476	6378 (2.50-2.50)
Sidechain outliers	187428	6380 (2.50-2.50)
RSRZ outliers	180081	5833 (2.50-2.50)

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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	B	140	
1	D	140	
2	A	346	
2	C	346	
3	E	5	
4	J	7	

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Mol	Chain	Length	Quality of chain
5	H	2	 100%

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 6619 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 nanobody N2C1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	B	122	Total	C	N	O	S	0	0	0
			885	558	158	164	5			
1	D	122	Total	C	N	O	S	0	0	0
			879	555	155	164	5			

- Molecule 2 is a protein called Envelopment polyprotein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	312	Total	C	N	O	S	0	0	0
			2287	1444	395	423	25			
2	A	312	Total	C	N	O	S	0	0	0
			2277	1436	392	424	25			

There are 50 discrepancies between the modelled and reference sequences:

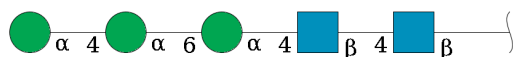
Chain	Residue	Modelled	Actual	Comment	Reference
C	341	GLU	-	expression tag	UNP A0A1S6XXK1
C	342	ALA	-	expression tag	UNP A0A1S6XXK1
C	343	ALA	-	expression tag	UNP A0A1S6XXK1
C	344	ALA	-	expression tag	UNP A0A1S6XXK1
C	345	LYS	-	expression tag	UNP A0A1S6XXK1
C	346	GLU	-	expression tag	UNP A0A1S6XXK1
C	347	ALA	-	expression tag	UNP A0A1S6XXK1
C	348	ALA	-	expression tag	UNP A0A1S6XXK1
C	349	ALA	-	expression tag	UNP A0A1S6XXK1
C	350	LYS	-	expression tag	UNP A0A1S6XXK1
C	351	GLU	-	expression tag	UNP A0A1S6XXK1
C	352	ALA	-	expression tag	UNP A0A1S6XXK1
C	353	ALA	-	expression tag	UNP A0A1S6XXK1
C	354	ALA	-	expression tag	UNP A0A1S6XXK1
C	355	LYS	-	expression tag	UNP A0A1S6XXK1
C	356	HIS	-	expression tag	UNP A0A1S6XXK1

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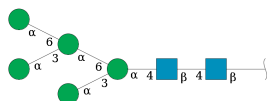
Chain	Residue	Modelled	Actual	Comment	Reference
C	357	HIS	-	expression tag	UNP A0A1S6XXK1
C	358	HIS	-	expression tag	UNP A0A1S6XXK1
C	359	HIS	-	expression tag	UNP A0A1S6XXK1
C	360	HIS	-	expression tag	UNP A0A1S6XXK1
C	361	HIS	-	expression tag	UNP A0A1S6XXK1
C	362	HIS	-	expression tag	UNP A0A1S6XXK1
C	363	HIS	-	expression tag	UNP A0A1S6XXK1
C	364	HIS	-	expression tag	UNP A0A1S6XXK1
C	365	HIS	-	expression tag	UNP A0A1S6XXK1
A	341	GLU	-	expression tag	UNP A0A1S6XXK1
A	342	ALA	-	expression tag	UNP A0A1S6XXK1
A	343	ALA	-	expression tag	UNP A0A1S6XXK1
A	344	ALA	-	expression tag	UNP A0A1S6XXK1
A	345	LYS	-	expression tag	UNP A0A1S6XXK1
A	346	GLU	-	expression tag	UNP A0A1S6XXK1
A	347	ALA	-	expression tag	UNP A0A1S6XXK1
A	348	ALA	-	expression tag	UNP A0A1S6XXK1
A	349	ALA	-	expression tag	UNP A0A1S6XXK1
A	350	LYS	-	expression tag	UNP A0A1S6XXK1
A	351	GLU	-	expression tag	UNP A0A1S6XXK1
A	352	ALA	-	expression tag	UNP A0A1S6XXK1
A	353	ALA	-	expression tag	UNP A0A1S6XXK1
A	354	ALA	-	expression tag	UNP A0A1S6XXK1
A	355	LYS	-	expression tag	UNP A0A1S6XXK1
A	356	HIS	-	expression tag	UNP A0A1S6XXK1
A	357	HIS	-	expression tag	UNP A0A1S6XXK1
A	358	HIS	-	expression tag	UNP A0A1S6XXK1
A	359	HIS	-	expression tag	UNP A0A1S6XXK1
A	360	HIS	-	expression tag	UNP A0A1S6XXK1
A	361	HIS	-	expression tag	UNP A0A1S6XXK1
A	362	HIS	-	expression tag	UNP A0A1S6XXK1
A	363	HIS	-	expression tag	UNP A0A1S6XXK1
A	364	HIS	-	expression tag	UNP A0A1S6XXK1
A	365	HIS	-	expression tag	UNP A0A1S6XXK1

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



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	E	5	Total	C	N	O	0	0	0
			61	34	2	25			

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



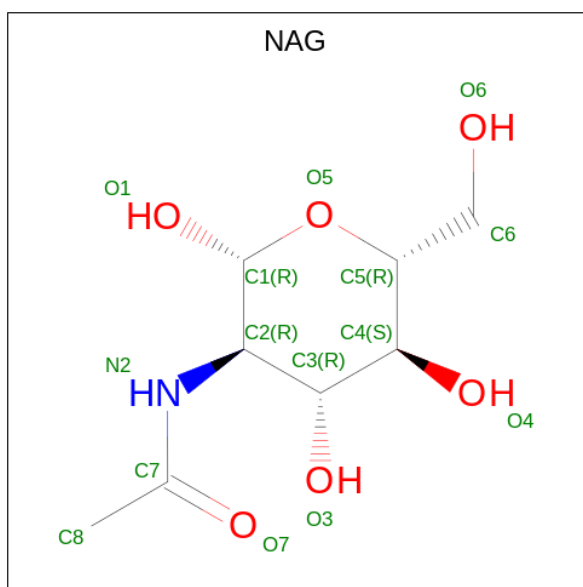
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
4	J	7	Total	C	N	O	0	0	0
			83	46	2	35			

- Molecule 5 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
5	H	2	Total	C	N	O	0	0	0
			28	16	2	10			

- Molecule 6 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: C₈H₁₅NO₆).



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

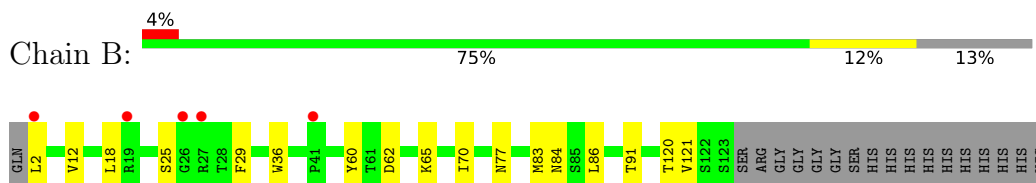
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	B	7	Total	O	0	0
			7	7		
7	C	43	Total	O	0	0
			43	43		
7	D	18	Total	O	0	0
			18	18		
7	A	37	Total	O	0	0
			37	37		

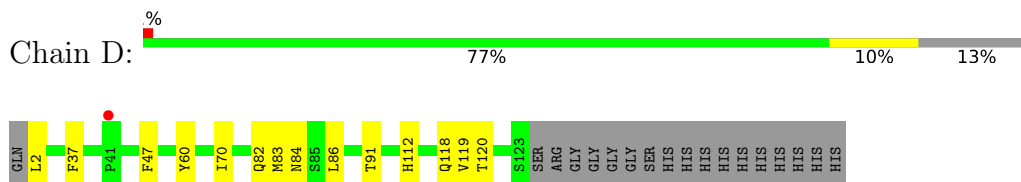
3 Residue-property plots

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.

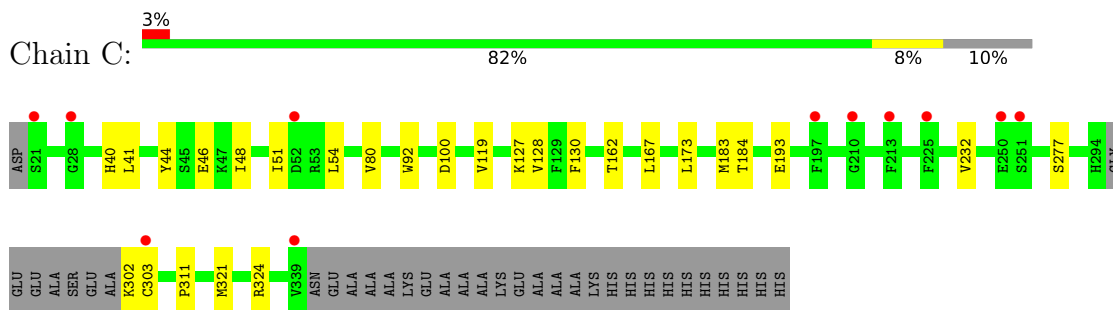
- Molecule 1: nanobody N2C1



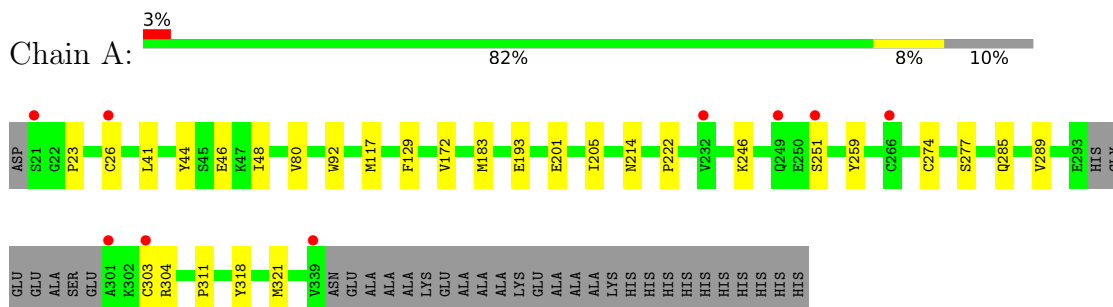
- Molecule 1: nanobody N2C1



- Molecule 2: Envelopment polypeptide



- Molecule 2: Envelopment polyprotein



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

nose

Chain E:  60% 40%

MAG1
MAG2
MAN3
MAN4
MAN5

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

Chain J:  100%

MAG1
MAG2
MAN3
MAN4
MAN5
MAN6
MAN7

- Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain H:  100%

MAG1
MAG2

4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	155.67Å 71.54Å 104.39Å 90.00° 108.69° 90.00°	Depositor
Resolution (Å)	35.77 – 2.50 35.77 – 2.50	Depositor EDS
% Data completeness (in resolution range)	99.9 (35.77-2.50) 99.9 (35.77-2.50)	Depositor EDS
R_{merge}	0.23	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.58 (at 2.51Å)	Xtriage
Refinement program	PHENIX 1.21.1	Depositor
R, R_{free}	0.201 , 0.240 0.200 , 0.239	Depositor DCC
R_{free} test set	1822 reflections (4.81%)	wwPDB-VP
Wilson B-factor (Å ²)	45.6	Xtriage
Anisotropy	0.806	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 51.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	6619	wwPDB-VP
Average B, all atoms (Å ²)	52.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.84% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z > 5$	RMSZ	$\# Z > 5$
1	B	0.50	0/904	0.69	0/1226
1	D	0.41	0/898	0.67	0/1219
2	A	0.38	0/2337	0.60	0/3170
2	C	0.37	0/2347	0.60	0/3181
All	All	0.40	0/6486	0.62	0/8796

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 [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	885	0	842	11	0
1	D	879	0	831	8	0
2	A	2277	0	2073	18	0
2	C	2287	0	2099	19	0
3	E	61	0	52	2	0
4	J	83	0	70	0	0
5	H	28	0	25	0	0
6	C	14	0	13	0	0
7	A	37	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	B	7	0	0	0	0
7	C	43	0	0	1	0
7	D	18	0	0	1	0
All	All	6619	0	6005	54	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 4.

All (54) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:40:HIS:HB2	3:E:2:NAG:H82	1.60	0.83
1:B:83:MET:HE2	1:B:86:LEU:HD21	1.60	0.81
1:D:83:MET:HE2	1:D:86:LEU:HD21	1.63	0.81
2:A:193:GLU:HB3	2:A:321:MET:HE1	1.65	0.76
1:D:91:THR:HG23	1:D:120:THR:HA	1.77	0.65
1:B:91:THR:HG23	1:B:120:THR:HA	1.83	0.60
2:C:41:LEU:HD13	2:C:46:GLU:HB3	1.84	0.59
1:D:2:LEU:HD23	1:D:112:HIS:ND1	2.19	0.58
2:C:277:SER:O	2:A:321:MET:HB3	2.03	0.58
1:D:82:GLN:NE2	7:D:201:HOH:O	2.37	0.58
2:A:274:CYS:SG	2:A:303:CYS:HB3	2.46	0.56
2:A:201:GLU:OE1	2:A:318:TYR:OH	2.22	0.56
2:C:127:LYS:HD2	2:C:173:LEU:HB2	1.87	0.55
2:C:44:TYR:O	2:C:48:ILE:HG12	2.06	0.55
2:A:285:GLN:O	2:A:289:VAL:HG23	2.06	0.54
2:C:193:GLU:HB3	2:C:321:MET:HE1	1.89	0.54
2:C:40:HIS:O	3:E:5:MAN:O6	2.28	0.52
2:C:183:MET:HE1	2:C:232:VAL:C	2.36	0.51
2:C:321:MET:HB3	2:A:277:SER:O	2.12	0.50
2:A:205:ILE:O	2:A:214:ASN:HB2	2.13	0.49
1:B:2:LEU:HD12	1:B:25:SER:O	2.13	0.49
2:A:44:TYR:O	2:A:48:ILE:HG12	2.12	0.49
2:A:117:MET:HE1	2:A:222:PRO:HB3	1.95	0.48
2:C:51:ILE:HD13	2:C:100:ASP:HB3	1.95	0.48
1:B:36:TRP:HD1	1:B:70:ILE:HD12	1.79	0.48
1:B:29:PHE:CD2	1:B:77:ASN:HA	2.50	0.47
1:B:60:TYR:OH	1:B:70:ILE:HG22	2.14	0.46
1:D:83:MET:C	1:D:84:ASN:HD22	2.24	0.46
1:D:118:GLN:HG3	1:D:119:VAL:N	2.30	0.46
2:C:302:LYS:HB3	2:C:303:CYS:H	1.58	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:41:LEU:HD13	2:A:46:GLU:HB3	1.98	0.45
2:A:246:LYS:HE3	2:A:246:LYS:HB2	1.59	0.44
2:A:183:MET:HE2	2:A:183:MET:HB3	1.75	0.44
1:B:62:ASP:HA	1:B:65:LYS:HE3	1.99	0.44
2:A:92:TRP:CD2	2:A:311:PRO:HD3	2.53	0.44
2:C:162:THR:HB	2:C:167:LEU:HD21	2.00	0.43
2:C:119:VAL:HG22	7:C:521:HOH:O	2.18	0.43
1:D:37:PHE:CD2	1:D:47:PHE:HA	2.54	0.42
2:A:23:PRO:HB3	2:A:26:CYS:O	2.19	0.42
2:A:251:SER:O	2:A:289:VAL:HG11	2.19	0.42
2:C:92:TRP:CD2	2:C:311:PRO:HD3	2.55	0.42
2:A:80:VAL:HG23	2:A:172:VAL:HB	2.01	0.41
1:B:18:LEU:HD23	1:B:18:LEU:HA	1.91	0.41
2:C:128:VAL:HG21	2:C:167:LEU:HD23	2.02	0.41
2:A:259:TYR:CE1	2:A:304:ARG:HB2	2.55	0.41
1:D:60:TYR:OH	1:D:70:ILE:HG22	2.20	0.41
2:C:128:VAL:HG21	2:C:167:LEU:CD2	2.51	0.41
2:C:130:PHE:HA	2:C:173:LEU:O	2.21	0.41
2:A:129:PHE:HD2	2:A:172:VAL:HG13	1.85	0.41
1:B:83:MET:C	1:B:84:ASN:HD22	2.28	0.41
1:B:12:VAL:O	1:B:121:VAL:HA	2.21	0.41
2:C:54:LEU:HD11	2:C:80:VAL:HG12	2.01	0.41
2:C:184:THR:HG23	2:C:324:ARG:HD2	2.01	0.41
1:B:12:VAL:HG11	1:B:86:LEU:HD13	2.03	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	B	120/140 (86%)	118 (98%)	2 (2%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	D	120/140 (86%)	120 (100%)	0	0	100	100
2	A	308/346 (89%)	293 (95%)	15 (5%)	0	100	100
2	C	308/346 (89%)	296 (96%)	12 (4%)	0	100	100
All	All	856/972 (88%)	827 (97%)	29 (3%)	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	B	84/107 (78%)	84 (100%)	0	100	100
1	D	83/107 (78%)	83 (100%)	0	100	100
2	A	231/290 (80%)	231 (100%)	0	100	100
2	C	233/290 (80%)	233 (100%)	0	100	100
All	All	631/794 (80%)	631 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	84	ASN
2	C	40	HIS
1	D	84	ASN
1	D	118	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 ⓘ

14 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	E	1	3,2	14,14,15	0.91	1 (7%)	17,19,21	1.11	1 (5%)
3	NAG	E	2	3	14,14,15	0.92	1 (7%)	17,19,21	1.48	3 (17%)
3	MAN	E	3	3	11,11,12	0.71	0	15,15,17	2.11	6 (40%)
3	MAN	E	4	3	11,11,12	0.72	0	15,15,17	1.66	3 (20%)
3	MAN	E	5	3	11,11,12	0.99	1 (9%)	15,15,17	0.79	0
5	NAG	H	1	5,2	14,14,15	0.65	0	17,19,21	2.16	3 (17%)
5	NAG	H	2	5	14,14,15	0.75	0	17,19,21	1.73	5 (29%)
4	NAG	J	1	4,2	14,14,15	1.11	2 (14%)	17,19,21	1.87	3 (17%)
4	NAG	J	2	4	14,14,15	0.85	1 (7%)	17,19,21	1.35	2 (11%)
4	MAN	J	3	4	11,11,12	0.81	0	15,15,17	1.79	4 (26%)
4	MAN	J	4	4	11,11,12	0.82	1 (9%)	15,15,17	1.46	3 (20%)
4	MAN	J	5	4	11,11,12	0.68	0	15,15,17	1.26	1 (6%)
4	MAN	J	6	4	11,11,12	0.64	0	15,15,17	1.97	4 (26%)
4	MAN	J	7	4	11,11,12	0.65	0	15,15,17	2.42	7 (46%)

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

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	MAN	E	3	3	-	2/2/19/22	1/1/1/1
3	MAN	E	4	3	-	1/2/19/22	1/1/1/1
3	MAN	E	5	3	-	2/2/19/22	0/1/1/1
5	NAG	H	1	5,2	-	0/6/23/26	0/1/1/1
5	NAG	H	2	5	-	4/6/23/26	0/1/1/1
4	NAG	J	1	4,2	-	0/6/23/26	0/1/1/1
4	NAG	J	2	4	-	0/6/23/26	0/1/1/1
4	MAN	J	3	4	-	0/2/19/22	0/1/1/1
4	MAN	J	4	4	-	0/2/19/22	0/1/1/1
4	MAN	J	5	4	-	0/2/19/22	0/1/1/1
4	MAN	J	6	4	-	1/2/19/22	0/1/1/1
4	MAN	J	7	4	-	2/2/19/22	1/1/1/1

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	J	1	NAG	C2-N2	-2.70	1.41	1.46
3	E	5	MAN	O5-C1	-2.69	1.39	1.43
3	E	2	NAG	O5-C1	-2.43	1.39	1.43
4	J	2	NAG	O5-C1	-2.30	1.40	1.43
3	E	1	NAG	O5-C1	-2.26	1.40	1.43
4	J	1	NAG	O5-C1	-2.13	1.40	1.43
4	J	4	MAN	O5-C1	-2.06	1.40	1.43

All (45) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	J	7	MAN	C1-O5-C5	6.42	120.89	112.19
5	H	1	NAG	C1-O5-C5	6.15	120.52	112.19
4	J	6	MAN	C1-O5-C5	4.81	118.71	112.19
3	E	3	MAN	O5-C5-C6	4.46	114.20	107.20
3	E	4	MAN	C1-C2-C3	-4.39	104.27	109.67
4	J	1	NAG	C2-N2-C7	4.18	128.86	122.90
4	J	4	MAN	C1-O5-C5	4.02	117.64	112.19
3	E	3	MAN	C1-O5-C5	3.77	117.30	112.19
4	J	3	MAN	C1-C2-C3	3.68	114.19	109.67
5	H	1	NAG	C4-C3-C2	-3.59	105.76	111.02
5	H	2	NAG	C2-N2-C7	3.40	127.74	122.90
4	J	1	NAG	C8-C7-N2	-3.38	110.37	116.10
4	J	7	MAN	O3-C3-C4	3.33	118.05	110.35
3	E	2	NAG	C3-C4-C5	-3.13	104.65	110.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	J	6	MAN	O2-C2-C1	-3.00	103.02	109.15
4	J	3	MAN	C1-O5-C5	2.96	116.20	112.19
5	H	1	NAG	O4-C4-C3	2.94	117.15	110.35
4	J	7	MAN	C1-C2-C3	-2.92	106.07	109.67
3	E	3	MAN	O2-C2-C1	-2.86	103.29	109.15
4	J	1	NAG	C4-C3-C2	-2.81	106.89	111.02
4	J	5	MAN	O4-C4-C3	-2.77	103.95	110.35
3	E	3	MAN	C1-C2-C3	2.72	113.01	109.67
4	J	2	NAG	C2-N2-C7	2.65	126.68	122.90
4	J	7	MAN	O2-C2-C3	2.63	115.41	110.14
3	E	2	NAG	C2-N2-C7	2.61	126.63	122.90
4	J	3	MAN	O2-C2-C1	-2.59	103.86	109.15
4	J	7	MAN	O5-C5-C6	2.54	111.19	107.20
3	E	4	MAN	O4-C4-C5	2.54	115.60	109.30
3	E	1	NAG	O5-C5-C6	-2.49	103.29	107.20
5	H	2	NAG	C1-O5-C5	-2.47	108.85	112.19
4	J	4	MAN	O3-C3-C2	-2.45	105.29	109.99
3	E	2	NAG	C1-O5-C5	2.40	115.45	112.19
5	H	2	NAG	O5-C5-C6	2.40	110.97	107.20
5	H	2	NAG	O5-C1-C2	-2.40	107.51	111.29
4	J	6	MAN	C1-C2-C3	2.35	112.56	109.67
3	E	3	MAN	C3-C4-C5	-2.28	106.17	110.24
5	H	2	NAG	C4-C3-C2	2.26	114.33	111.02
4	J	7	MAN	O3-C3-C2	-2.23	105.72	109.99
4	J	4	MAN	C1-C2-C3	2.19	112.36	109.67
4	J	7	MAN	C2-C3-C4	-2.14	107.19	110.89
3	E	3	MAN	C6-C5-C4	-2.10	108.09	113.00
4	J	6	MAN	O5-C5-C6	2.09	110.49	107.20
4	J	3	MAN	O4-C4-C3	-2.07	105.56	110.35
3	E	4	MAN	O5-C1-C2	-2.01	107.66	110.77
4	J	2	NAG	C1-O5-C5	2.00	114.91	112.19

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	E	3	MAN	O5-C5-C6-O6
4	J	7	MAN	O5-C5-C6-O6
5	H	2	NAG	O5-C5-C6-O6
3	E	5	MAN	O5-C5-C6-O6
5	H	2	NAG	C1-C2-N2-C7
3	E	5	MAN	C4-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
3	E	2	NAG	C8-C7-N2-C2
3	E	2	NAG	O7-C7-N2-C2
3	E	3	MAN	C4-C5-C6-O6
5	H	2	NAG	C4-C5-C6-O6
4	J	7	MAN	C4-C5-C6-O6
4	J	6	MAN	O5-C5-C6-O6
3	E	4	MAN	O5-C5-C6-O6
5	H	2	NAG	C3-C2-N2-C7

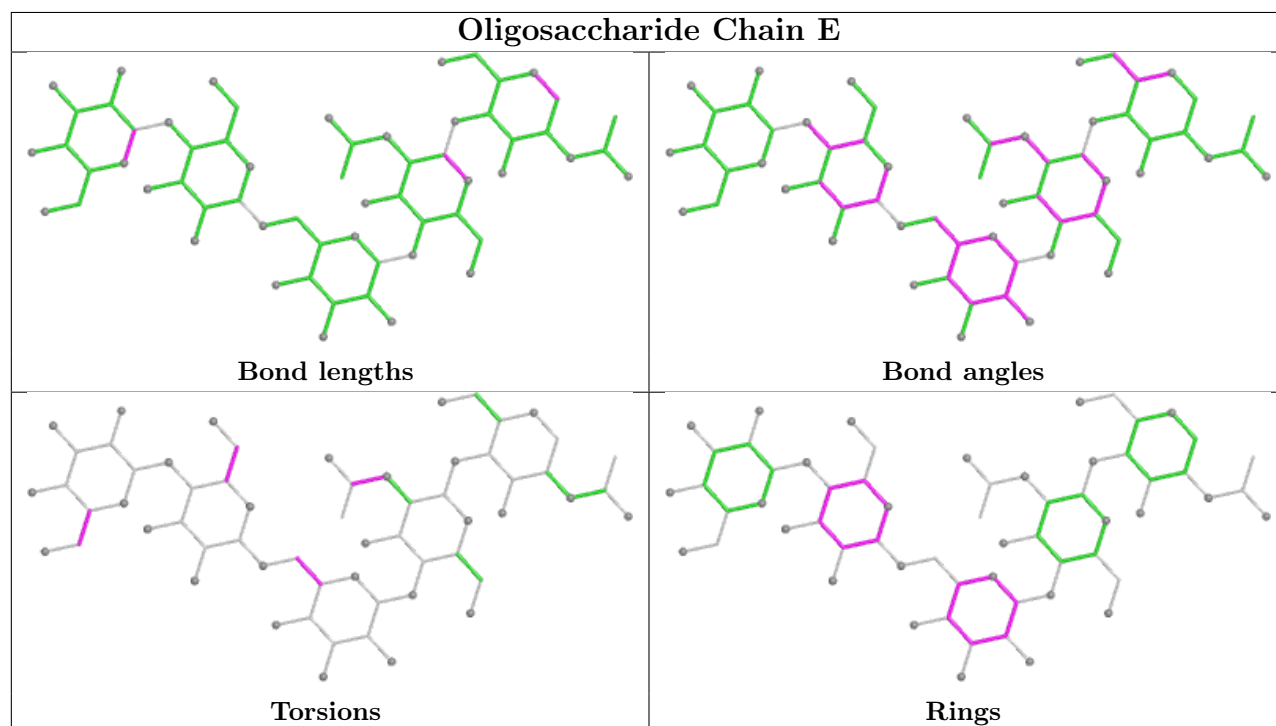
All (3) ring outliers are listed below:

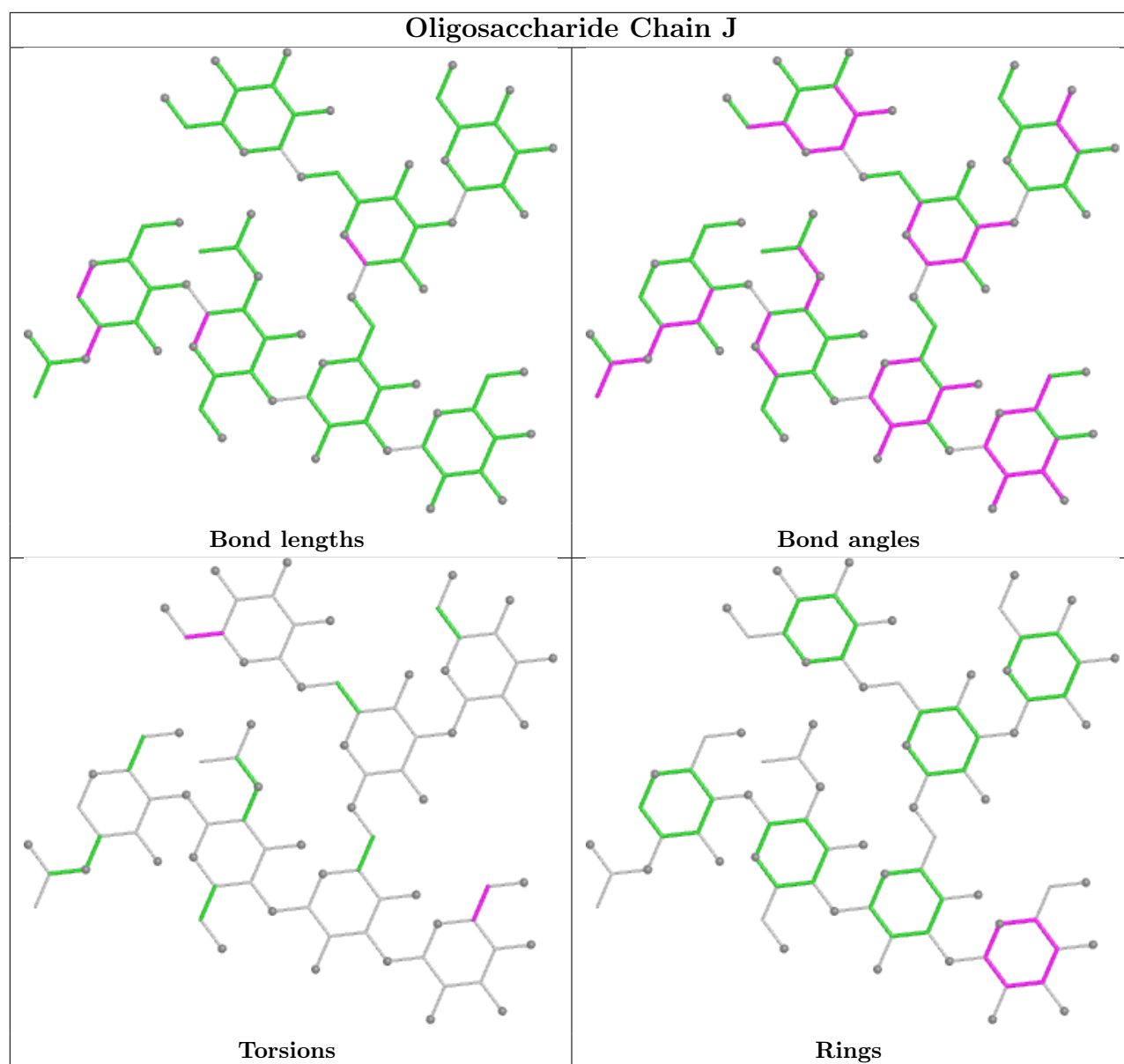
Mol	Chain	Res	Type	Atoms
4	J	7	MAN	C1-C2-C3-C4-C5-O5
3	E	3	MAN	C1-C2-C3-C4-C5-O5
3	E	4	MAN	C1-C2-C3-C4-C5-O5

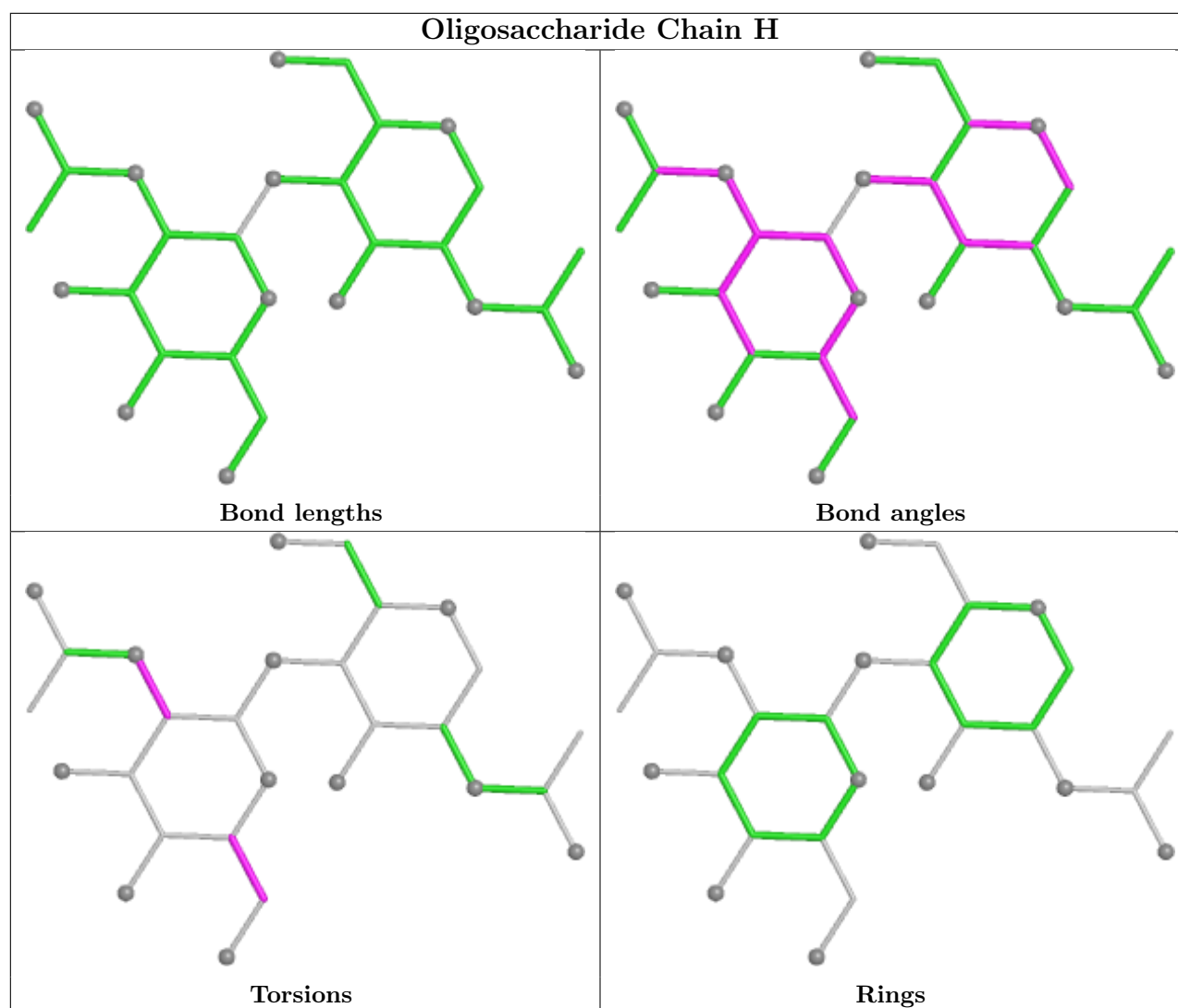
2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	E	5	MAN	1	0
3	E	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.







5.6 Ligand geometry [i](#)

1 ligand is 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	NAG	C	401	2	14,14,15	0.51	0	17,19,21	1.80	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
6	NAG	C	401	2	-	2/6/23/26	0/1/1/1

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	C	401	NAG	C1-O5-C5	6.51	121.02	112.19

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	C	401	NAG	C4-C5-C6-O6
6	C	401	NAG	O5-C5-C6-O6

There are no ring outliers.

No monomer is involved in short contacts.

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	B	122/140 (87%)	0.86	5 (4%) 41 37	44, 62, 80, 90	0
1	D	122/140 (87%)	0.36	1 (0%) 82 80	33, 46, 58, 73	0
2	A	312/346 (90%)	0.50	9 (2%) 53 49	38, 52, 72, 91	0
2	C	312/346 (90%)	0.48	11 (3%) 47 42	35, 48, 65, 87	0
All	All	868/972 (89%)	0.52	26 (2%) 52 48	33, 51, 74, 91	0

All (26) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	C	28	GLY	3.9
1	B	2	LEU	3.7
2	C	21	SER	3.5
2	A	249	GLN	3.4
2	A	21	SER	3.3
1	B	27	ARG	3.2
2	C	225	PHE	3.1
2	A	301	ALA	3.0
2	C	339	VAL	3.0
1	D	41	PRO	2.8
2	C	52	ASP	2.8
2	A	339	VAL	2.7
2	C	251	SER	2.7
2	C	210	GLY	2.6
2	A	266	CYS	2.5
1	B	41	PRO	2.3
2	C	213	PHE	2.3
2	A	232	VAL	2.3
2	C	250	GLU	2.3
2	A	251	SER	2.2
2	A	26	CYS	2.1

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Mol	Chain	Res	Type	RSRZ
1	B	19	ARG	2.1
1	B	26	GLY	2.1
2	C	303	CYS	2.1
2	A	303	CYS	2.1
2	C	197	PHE	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

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

6.3 Carbohydrates [i](#)

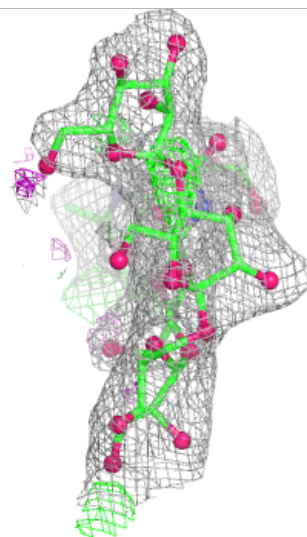
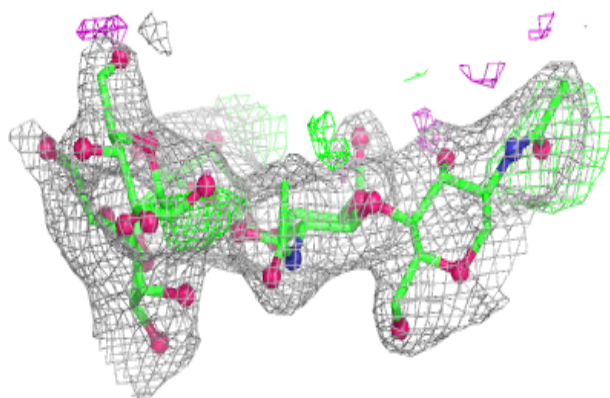
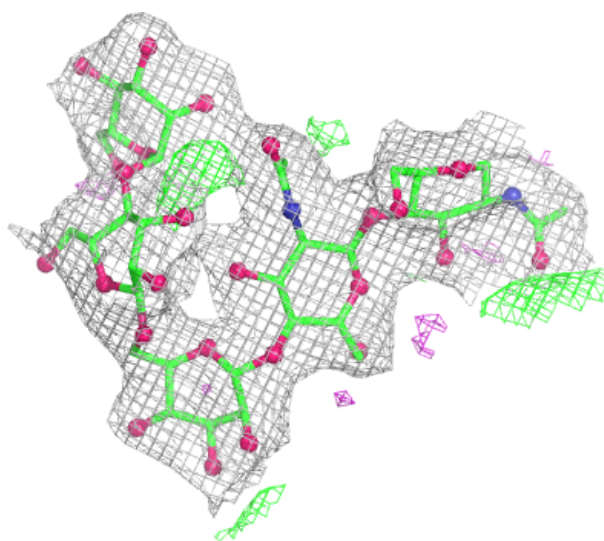
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists 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	MAN	E	4	11/12	0.78	0.13	58,65,70,79	0
3	MAN	E	5	11/12	0.78	0.13	57,59,63,70	0
3	MAN	E	3	11/12	0.83	0.12	59,62,70,73	0
3	NAG	E	1	14/15	0.87	0.10	34,49,55,57	0
3	NAG	E	2	14/15	0.90	0.10	47,56,62,69	0
4	NAG	J	1	14/15	-	-	39,47,52,58	0
4	NAG	J	2	14/15	-	-	42,44,49,51	0
4	MAN	J	3	11/12	-	-	44,48,62,68	0
4	MAN	J	4	11/12	-	-	44,47,52,53	0
4	MAN	J	5	11/12	-	-	43,45,49,49	0
4	MAN	J	6	11/12	-	-	40,44,48,49	0
4	MAN	J	7	11/12	-	-	58,67,75,75	0
5	NAG	H	1	14/15	-	-	56,67,77,80	0
5	NAG	H	2	14/15	-	-	72,82,91,91	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.

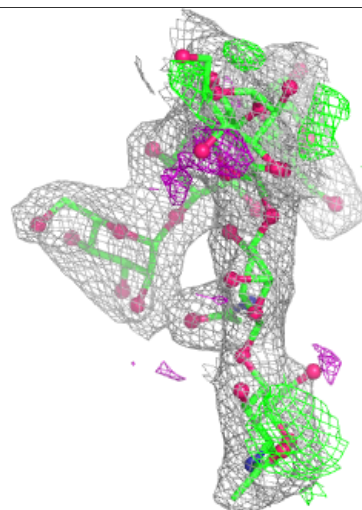
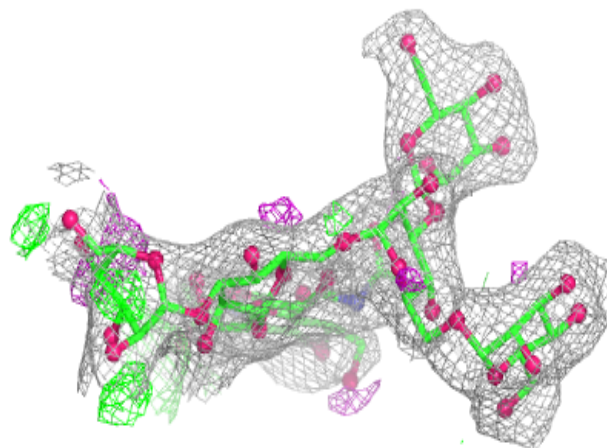
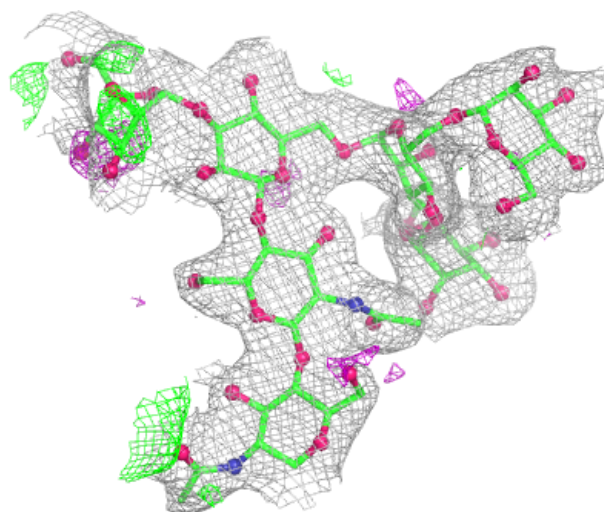
Electron density around Chain E:

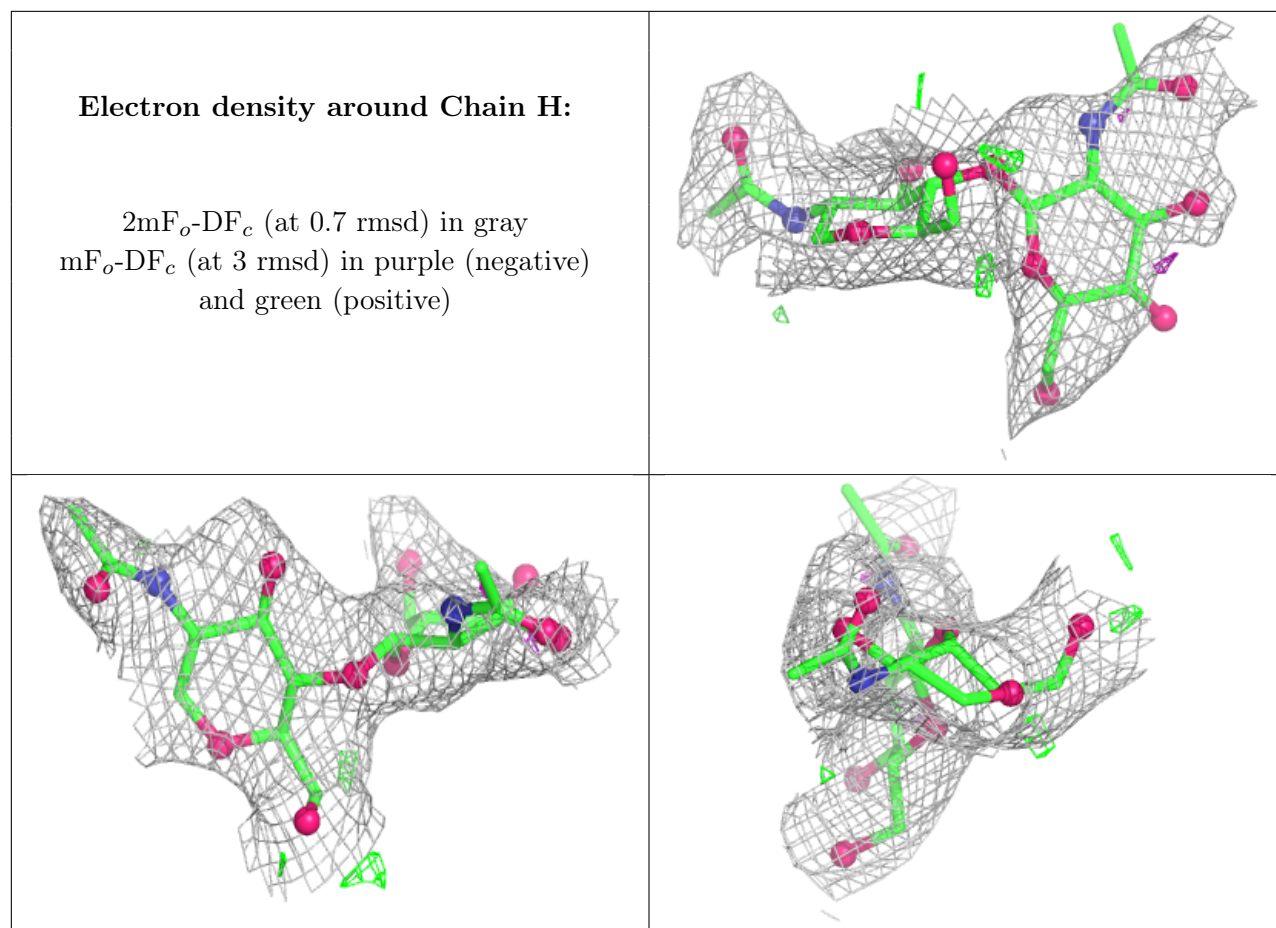
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around Chain J:

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





6.4 Ligands [i](#)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
6	NAG	C	401	14/15	0.73	0.12	51,68,80,80	0

6.5 Other polymers [i](#)

There are no such residues in this entry.