



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 9, 2026 – 12:27 PM UTC

PDB ID : 1I1A / pdb_00001i1a
Title : CRYSTAL STRUCTURE OF THE NEONATAL FC RECEPTOR COM-
PLEXED WITH A HETERODIMERIC FC
Authors : Martin, W.L.; West Jr., A.P.; Gan, L.; Bjorkman, P.J.
Deposited on : 2001-01-31
Resolution : 2.80 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ 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	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

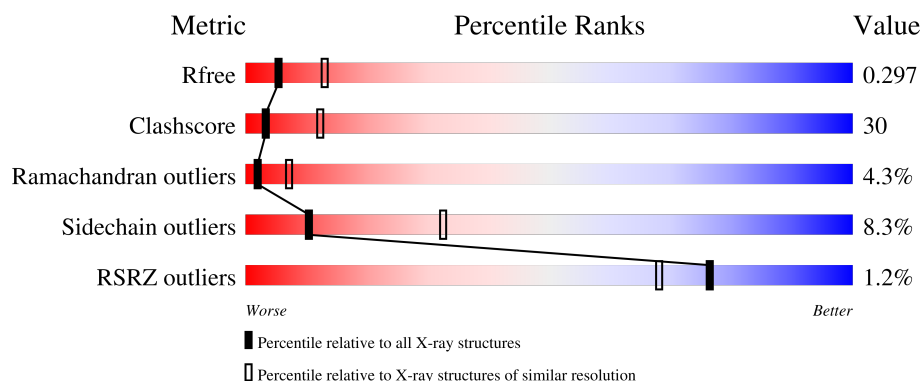
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

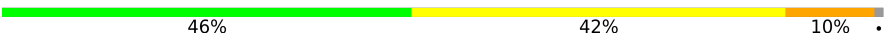
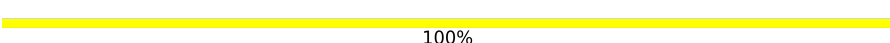
The reported resolution of this entry is 2.80 Å.

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	3866 (2.80-2.80)
Clashscore	190562	4276 (2.80-2.80)
Ramachandran outliers	187476	4196 (2.80-2.80)
Sidechain outliers	187428	4198 (2.80-2.80)
RSRZ outliers	180081	3869 (2.80-2.80)

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	A	269	
2	B	99	
3	C	225	
4	D	239	
5	E	2	

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Mol	Chain	Length	Quality of chain
6	F	6	 50% 50%
7	G	8	 38% 50% 12%
8	H	8	 38% 50% 12%

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
5	NAG	E	1	X	-	-	-
5	FUC	E	2	X	-	-	-
6	NAG	F	1	X	-	-	-
6	FUC	F	6	X	-	-	-
8	FUC	H	8	X	-	-	-
9	NAG	A	601	X	-	-	-

2 Entry composition

There are 11 unique types of molecules in this entry. The entry contains 6526 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 NEONATAL FC RECEPTOR A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	265	Total	C	N	O	S	0	0	0
			2106	1335	363	398	10			

- Molecule 2 is a protein called BETA-2-MICROGLOBULIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	99	Total	C	N	O	S	0	0	0
			821	528	137	152	4			

- Molecule 3 is a protein called IG GAMMA-2A CHAIN C REGION.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	205	Total	C	N	O	S	2	0	0
			1634	1038	274	313	9			

- Molecule 4 is a protein called IG GAMMA-2A CHAIN C REGION.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	D	205	Total	C	N	O	S	0	0	0
			1621	1027	268	317	9			

There are 20 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	252	GLY	THR	engineered mutation	UNP P20760
D	253	GLY	ILE	engineered mutation	UNP P20760
D	254	GLY	THR	engineered mutation	UNP P20760
D	310	GLU	HIS	engineered mutation	UNP P20760
D	433	GLU	HIS	engineered mutation	UNP P20760
D	435	GLU	HIS	engineered mutation	UNP P20760
D	448	GLY	-	cloning artifact	UNP P20760
D	449	ILE	-	cloning artifact	UNP P20760

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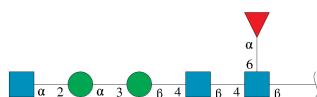
Chain	Residue	Modelled	Actual	Comment	Reference
D	450	GLU	-	cloning artifact	UNP P20760
D	451	GLY	-	cloning artifact	UNP P20760
D	452	ARG	-	cloning artifact	UNP P20760
D	453	GLY	-	cloning artifact	UNP P20760
D	454	SER	-	cloning artifact	UNP P20760
D	455	SER	-	cloning artifact	UNP P20760
D	456	HIS	-	cloning artifact	UNP P20760
D	457	HIS	-	cloning artifact	UNP P20760
D	458	HIS	-	cloning artifact	UNP P20760
D	459	HIS	-	cloning artifact	UNP P20760
D	460	HIS	-	cloning artifact	UNP P20760
D	461	HIS	-	cloning artifact	UNP P20760

- Molecule 5 is an oligosaccharide called alpha-L-fucopyranose-(1-6)-2-acetamido-2-deoxy-beta-D-glucopyranose.



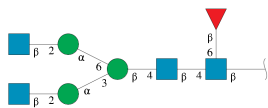
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
5	E	2	Total	C	N	O	0	0	0
			24	14	1	9			

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



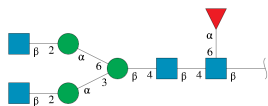
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
6	F	6	Total	C	N	O	0	0	0
			74	42	3	29			

- Molecule 7 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[beta-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose.



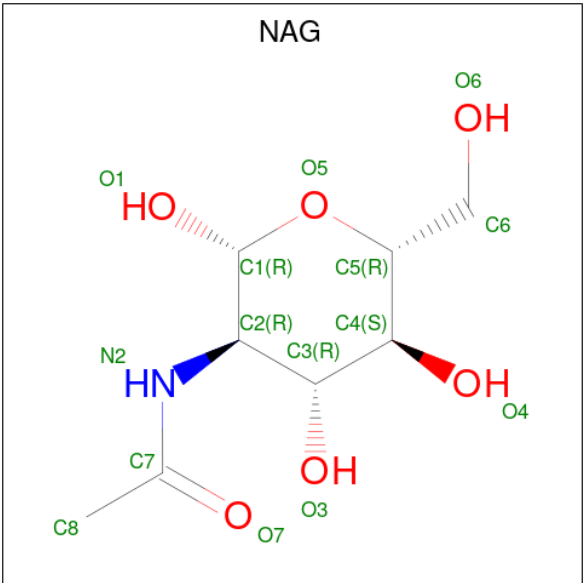
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
7	G	8	Total	C	N	O	0	0	0
			99	56	4	39			

- Molecule 8 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-6)]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
8	H	8	Total	C	N	O	0	0	0
			99	56	4	39			

- Molecule 9 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: C₈H₁₅NO₆).



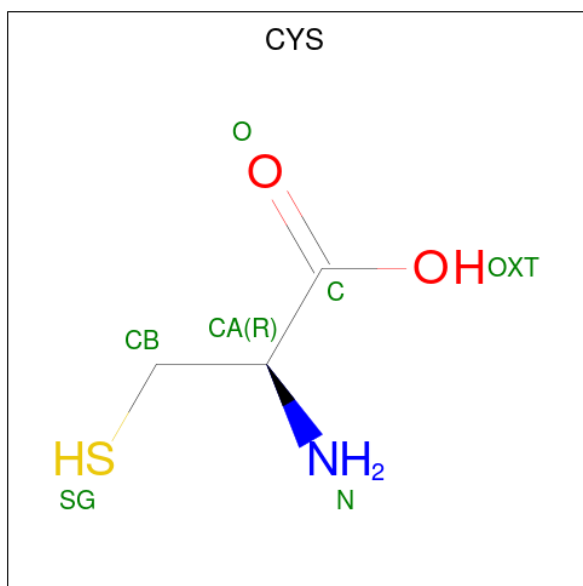
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
9	A	1	Total	C	N	O	0	0
			14	8	1	5		

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

- Molecule 10 is CYSTEINE (CCD ID: CYS) (formula: $C_3H_7NO_2S$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
10	A	1	Total	C	N	O	S	0	0
			7	3	1	2	1		
10	A	1	Total	C	N	O	S	0	0
			7	3	1	2	1		

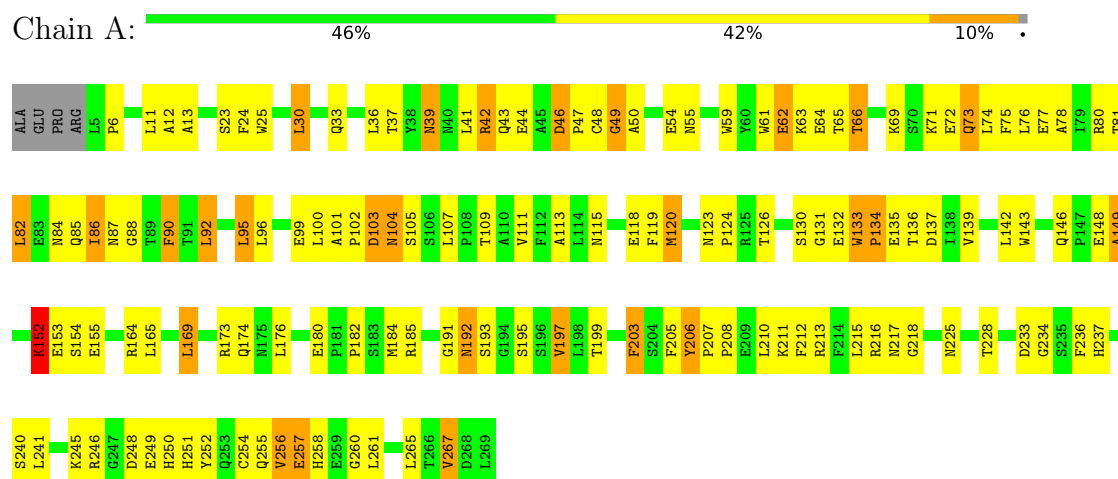
- Molecule 11 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
11	A	3	Total	O	0	0
			3	3		
11	B	2	Total	O	0	0
			2	2		
11	C	1	Total	O	0	0
			1	1		

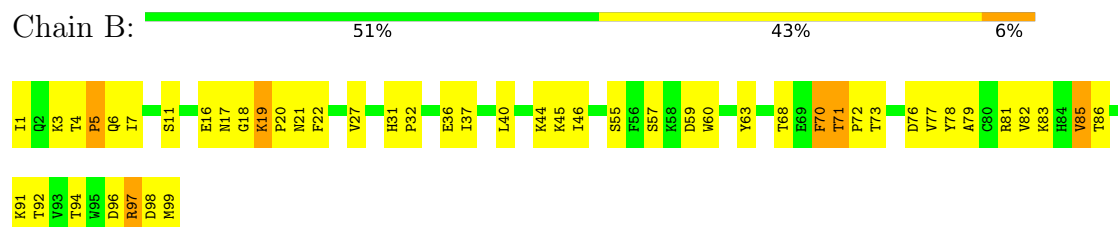
3 Residue-property plots

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.

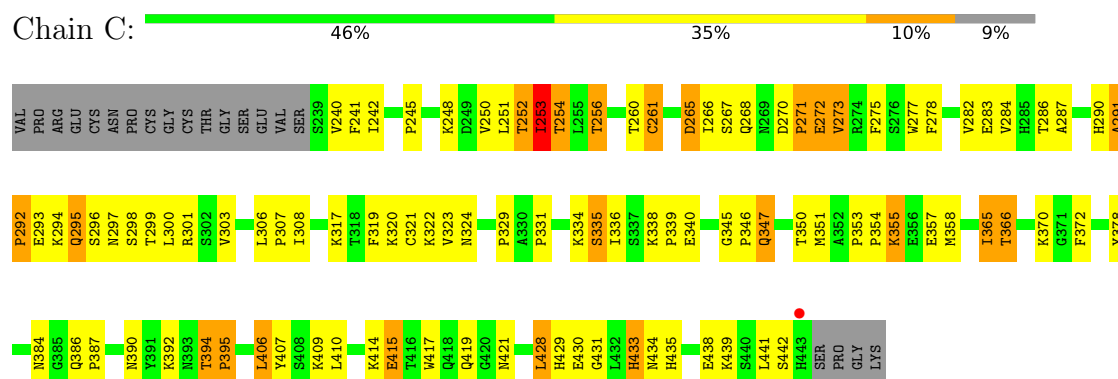
• Molecule 1: NEONATAL FC RECEPTOR A



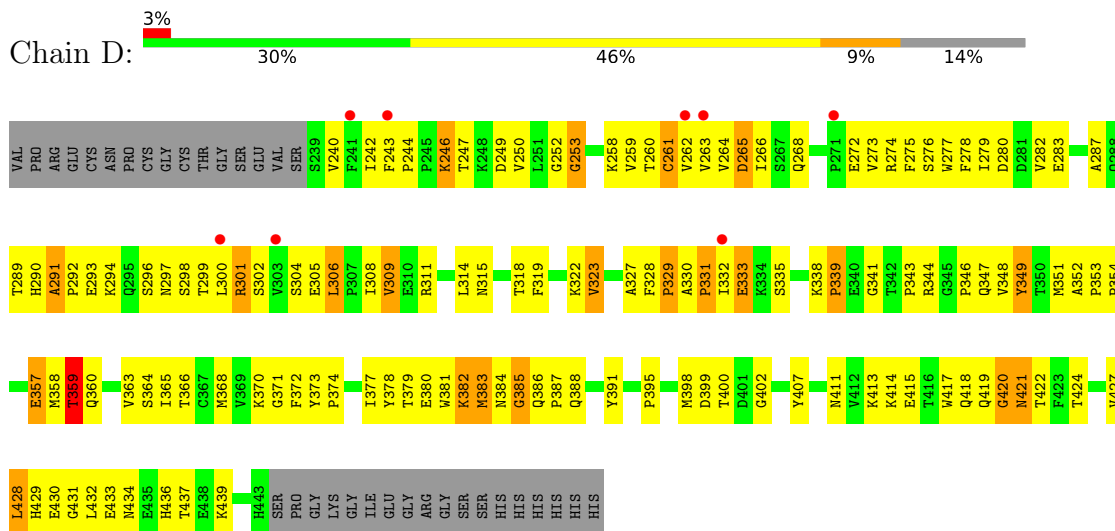
• Molecule 2: BETA-2-MICROGLOBULIN



• Molecule 3: IG GAMMA-2A CHAIN C REGION



- Molecule 4: IG GAMMA-2A CHAIN C REGION



- Molecule 5: alpha-L-fucopyranose-(1-6)-2-acetamido-2-deoxy-beta-D-glucopyranose



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



- Molecule 7: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[beta-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-6)]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



MAG1
MAG2
BMA3
MAN4
NAG5
MAN6
MAG7
FUC8

4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	68.36Å 74.21Å 196.60Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	19.95 – 2.80 19.95 – 2.80	Depositor EDS
% Data completeness (in resolution range)	98.6 (19.95-2.80) 98.4 (19.95-2.80)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	0.10	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.11 (at 2.80Å)	Xtriage
Refinement program	CNS 1.0	Depositor
R, R_{free}	0.222 , 0.292 0.232 , 0.297	Depositor DCC
R_{free} test set	1195 reflections (4.77%)	wwPDB-VP
Wilson B-factor (Å ²)	61.1	Xtriage
Anisotropy	0.135	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.28 , 74.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	6526	wwPDB-VP
Average B, all atoms (Å ²)	78.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.20% 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, FUL, NDG, FUC, BMA, 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	A	0.61	0/2167	1.14	20/2946 (0.7%)
2	B	0.59	0/846	1.11	8/1149 (0.7%)
3	C	0.63	0/1682	1.15	16/2292 (0.7%)
4	D	0.51	0/1666	0.98	5/2267 (0.2%)
All	All	0.59	0/6361	1.10	49/8654 (0.6%)

There are no bond length outliers.

The worst 5 of 49 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	46	ASP	CA-C-N	9.63	129.39	119.76
1	A	46	ASP	C-N-CA	9.63	129.39	119.76
3	C	345	GLY	CA-C-N	7.61	127.53	119.85
3	C	345	GLY	C-N-CA	7.61	127.53	119.85
1	A	234	GLY	N-CA-C	-7.47	104.18	114.64

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	A	2106	0	1993	117	0
2	B	821	0	807	34	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	C	1634	0	1589	79	0
4	D	1621	0	1570	152	0
5	E	24	0	22	1	0
6	F	74	0	63	17	0
7	G	99	0	85	7	0
8	H	99	0	85	8	0
9	A	28	0	26	2	0
10	A	14	0	6	2	0
11	A	3	0	0	0	0
11	B	2	0	0	1	0
11	C	1	0	0	0	0
All	All	6526	0	6246	388	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 30.

The worst 5 of 388 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)
4:D:323:VAL:HG11	4:D:332:ILE:HG13	1.30	1.06
4:D:258:LYS:HD3	4:D:305:GLU:HB3	1.37	1.06
3:C:320:LYS:HG2	3:C:335:SER:HB2	1.39	1.05
3:C:434:ASN:HD21	6:F:6:FUC:H4	1.22	1.04
1:A:131:GLY:HA3	1:A:136:THR:HG21	1.44	0.98

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	263/269 (98%)	228 (87%)	26 (10%)	9 (3%)	3 11

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	B	97/99 (98%)	88 (91%)	8 (8%)	1 (1%)	12	38
3	C	203/225 (90%)	173 (85%)	22 (11%)	8 (4%)	2	8
4	D	203/239 (85%)	144 (71%)	44 (22%)	15 (7%)	1	2
All	All	766/832 (92%)	633 (83%)	100 (13%)	33 (4%)	2	7

5 of 33 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	104	ASN
1	A	149	ALA
1	A	206	TYR
3	C	273	VAL
4	D	291	ALA

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	224/227 (99%)	204 (91%)	20 (9%)	9	29
2	B	95/95 (100%)	91 (96%)	4 (4%)	26	61
3	C	191/208 (92%)	172 (90%)	19 (10%)	7	24
4	D	188/216 (87%)	174 (93%)	14 (7%)	13	37
All	All	698/746 (94%)	641 (92%)	57 (8%)	10	33

5 of 57 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	C	284	VAL
4	D	421	ASN
3	C	365	ILE
4	D	411	ASN
4	D	344	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 32 such sidechains are listed below:

Mol	Chain	Res	Type
4	D	360	GLN
4	D	418	GLN
2	B	29	GLN
2	B	21	ASN
4	D	421	ASN

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 ⓘ

24 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	$\# Z > 2$
5	NAG	E	1	1,5	14,14,15	0.55	0	17,19,21	0.74	0
5	FUC	E	2	5	10,10,11	0.58	0	14,14,16	0.57	0
6	NAG	F	1	1,6	14,14,15	0.83	0	17,19,21	1.00	2 (11%)
6	NAG	F	2	6	14,14,15	0.53	0	17,19,21	0.62	0
6	BMA	F	3	6	11,11,12	0.64	0	15,15,17	0.68	0
6	MAN	F	4	6	11,11,12	0.60	0	15,15,17	0.67	1 (6%)
6	NDG	F	5	6	14,14,15	0.79	1 (7%)	17,19,21	0.86	0
6	FUC	F	6	6	10,10,11	0.60	0	14,14,16	0.66	0
7	NAG	G	1	3,7	14,14,15	0.67	0	17,19,21	0.69	1 (5%)
7	NAG	G	2	7	14,14,15	0.62	0	17,19,21	0.73	1 (5%)
7	BMA	G	3	7	11,11,12	0.57	0	15,15,17	0.42	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
7	MAN	G	4	7	11,11,12	0.47	0	15,15,17	0.59	0
7	NAG	G	5	7	14,14,15	0.60	0	17,19,21	0.62	0
7	MAN	G	6	7	11,11,12	0.40	0	15,15,17	0.59	0
7	NAG	G	7	7	14,14,15	0.55	0	17,19,21	0.69	1 (5%)
7	FUL	G	8	7	10,10,11	0.55	0	14,14,16	0.41	0
8	NAG	H	1	8,4	14,14,15	0.69	0	17,19,21	0.69	0
8	NAG	H	2	8	14,14,15	0.56	0	17,19,21	0.75	1 (5%)
8	BMA	H	3	8	11,11,12	0.53	0	15,15,17	0.40	0
8	MAN	H	4	8	11,11,12	0.51	0	15,15,17	0.61	0
8	NAG	H	5	8	14,14,15	0.58	0	17,19,21	0.62	0
8	MAN	H	6	8	11,11,12	0.49	0	15,15,17	0.60	0
8	NAG	H	7	8	14,14,15	0.52	0	17,19,21	0.69	1 (5%)
8	FUC	H	8	8	10,10,11	0.61	0	14,14,16	0.43	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
5	NAG	E	1	1,5	1/1/5/7	2/6/23/26	0/1/1/1
5	FUC	E	2	5	1/1/4/5	-	0/1/1/1
6	NAG	F	1	1,6	1/1/5/7	0/6/23/26	0/1/1/1
6	NAG	F	2	6	-	5/6/23/26	0/1/1/1
6	BMA	F	3	6	-	0/2/19/22	0/1/1/1
6	MAN	F	4	6	-	2/2/19/22	0/1/1/1
6	NDG	F	5	6	-	4/6/23/26	0/1/1/1
6	FUC	F	6	6	1/1/4/5	-	0/1/1/1
7	NAG	G	1	3,7	-	4/6/23/26	0/1/1/1
7	NAG	G	2	7	-	3/6/23/26	0/1/1/1
7	BMA	G	3	7	-	0/2/19/22	0/1/1/1
7	MAN	G	4	7	-	0/2/19/22	0/1/1/1
7	NAG	G	5	7	-	6/6/23/26	0/1/1/1
7	MAN	G	6	7	-	0/2/19/22	0/1/1/1
7	NAG	G	7	7	-	4/6/23/26	0/1/1/1
7	FUL	G	8	7	-	-	0/1/1/1
8	NAG	H	1	8,4	-	4/6/23/26	0/1/1/1
8	NAG	H	2	8	-	3/6/23/26	0/1/1/1
8	BMA	H	3	8	-	0/2/19/22	0/1/1/1
8	MAN	H	4	8	-	0/2/19/22	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
8	NAG	H	5	8	-	6/6/23/26	0/1/1/1
8	MAN	H	6	8	-	0/2/19/22	0/1/1/1
8	NAG	H	7	8	-	4/6/23/26	0/1/1/1
8	FUC	H	8	8	1/1/4/5	-	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	F	5	NDG	C1-C2	2.40	1.55	1.52

The worst 5 of 8 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	G	2	NAG	C2-N2-C7	-2.35	119.75	122.90
6	F	4	MAN	C1-O5-C5	2.31	115.28	112.19
8	H	2	NAG	C2-N2-C7	-2.30	119.81	122.90
6	F	1	NAG	C2-N2-C7	-2.15	120.02	122.90
6	F	1	NAG	C1-O5-C5	2.11	115.02	112.19

All (5) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
5	E	1	NAG	C1
5	E	2	FUC	C1
6	F	1	NAG	C1
6	F	6	FUC	C1
8	H	8	FUC	C1

5 of 47 torsion outliers are listed below:

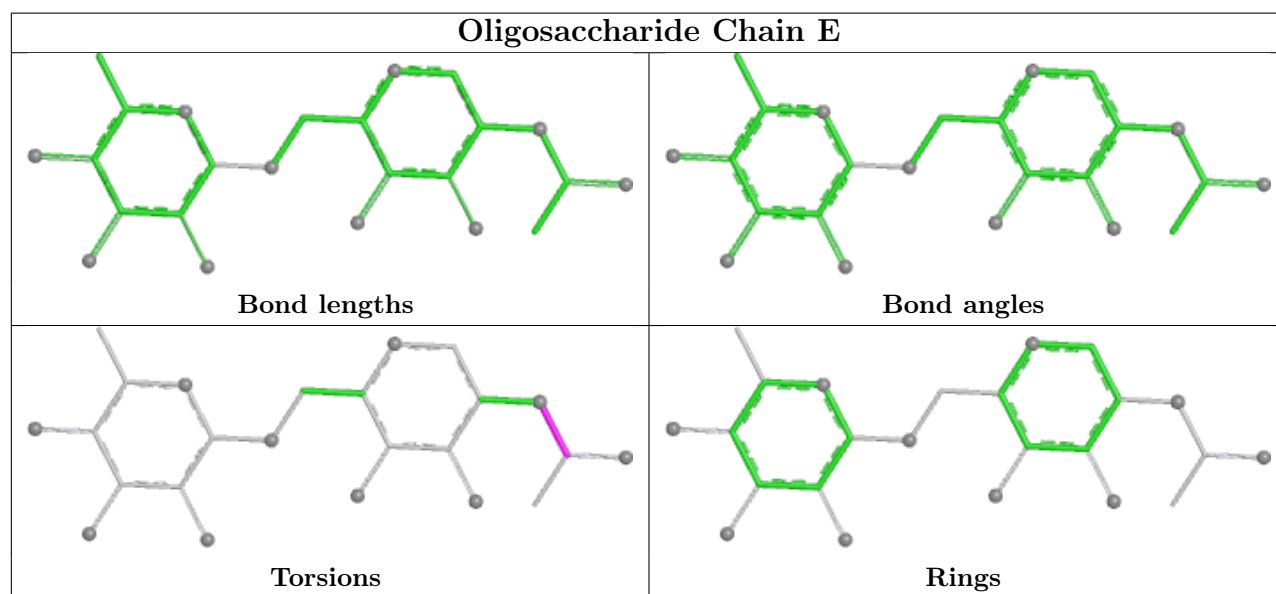
Mol	Chain	Res	Type	Atoms
5	E	1	NAG	C8-C7-N2-C2
5	E	1	NAG	O7-C7-N2-C2
6	F	2	NAG	C8-C7-N2-C2
6	F	2	NAG	O7-C7-N2-C2
6	F	5	NDG	C8-C7-N2-C2

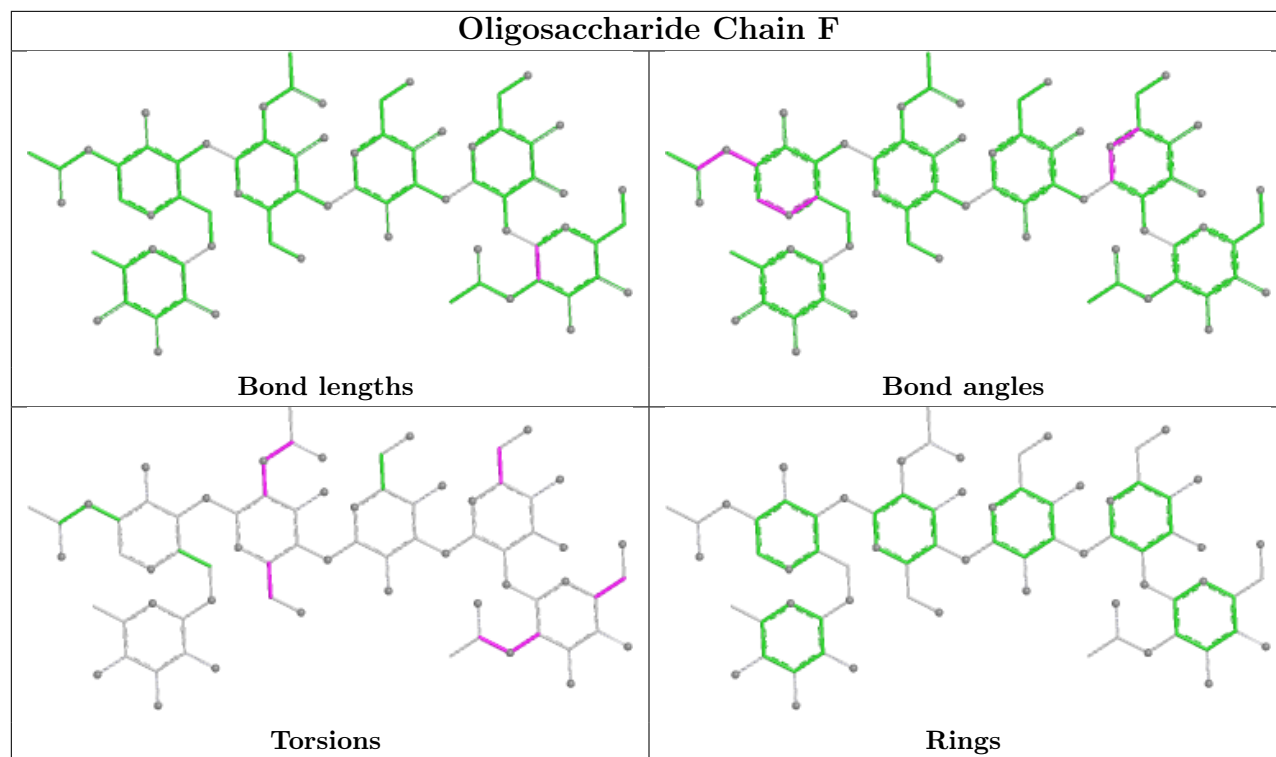
There are no ring outliers.

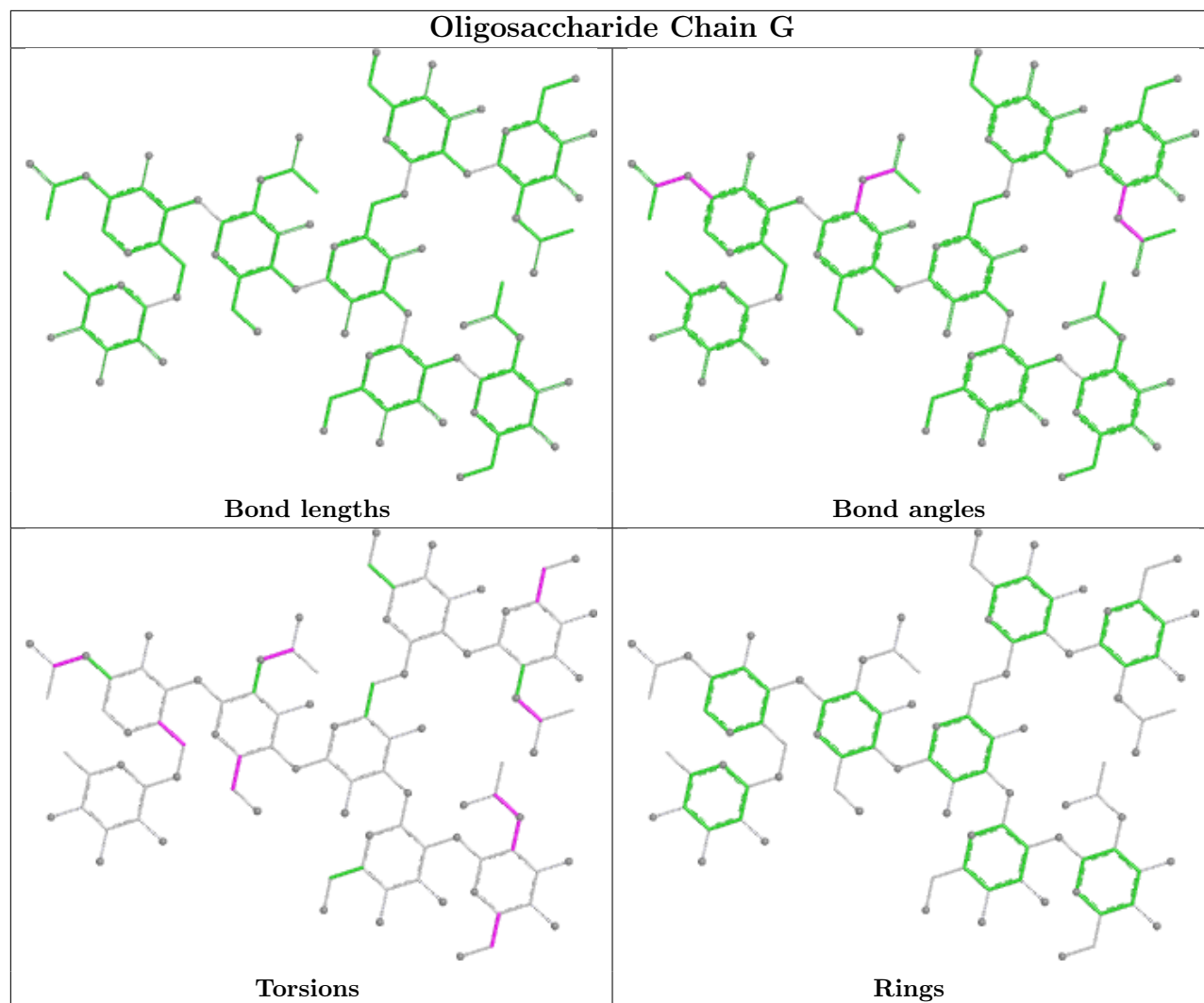
15 monomers are involved in 33 short contacts:

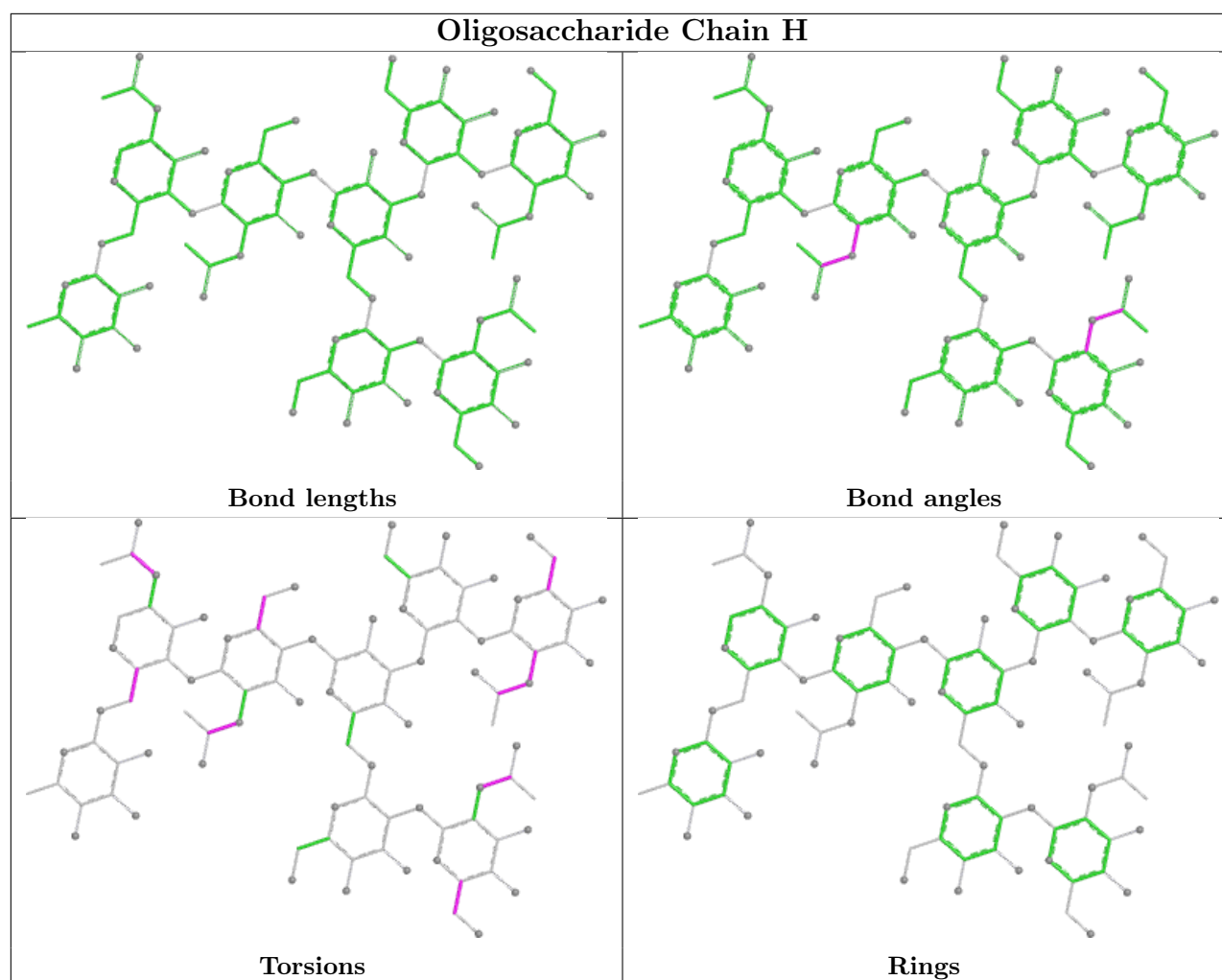
Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	H	2	NAG	4	0
7	G	6	MAN	1	0
8	H	1	NAG	1	0
7	G	5	NAG	1	0
5	E	2	FUC	1	0
6	F	5	NDG	6	0
8	H	6	MAN	3	0
6	F	6	FUC	3	0
6	F	1	NAG	5	0
7	G	2	NAG	6	0
6	F	3	BMA	3	0
8	H	5	NAG	1	0
6	F	2	NAG	5	0
6	F	4	MAN	5	0
5	E	1	NAG	1	0

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](#)

4 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	$\# Z > 2$
10	CYS	A	901	1	5,6,6	1.16	0	3,7,7	1.45	1 (33%)
9	NAG	A	601	1	14,14,15	0.70	0	17,19,21	0.76	1 (5%)
9	NAG	A	751	1	14,14,15	0.69	0	17,19,21	0.70	0
10	CYS	A	951	1	5,6,6	0.90	0	3,7,7	0.37	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
10	CYS	A	901	1	-	3/6/6/6	-
9	NAG	A	601	1	1/1/5/7	4/6/23/26	0/1/1/1
9	NAG	A	751	1	-	4/6/23/26	0/1/1/1
10	CYS	A	951	1	-	6/6/6/6	-

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	A	601	NAG	C2-N2-C7	-2.09	120.10	122.90
10	A	901	CYS	CB-CA-C	-2.09	107.81	109.89

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
9	A	601	NAG	C1

5 of 17 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
9	A	601	NAG	C8-C7-N2-C2
9	A	601	NAG	O7-C7-N2-C2
9	A	751	NAG	C8-C7-N2-C2
9	A	751	NAG	O7-C7-N2-C2
10	A	951	CYS	O-C-CA-N

There are no ring outliers.

3 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
9	A	601	NAG	1	0
9	A	751	NAG	1	0
10	A	951	CYS	2	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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	265/269 (98%)	-0.44	0	100 100	27, 54, 96, 136	0
2	B	99/99 (100%)	-0.53	0	100 100	22, 56, 93, 128	0
3	C	205/225 (91%)	-0.31	1 (0%)	87 82	31, 55, 156, 199	1 (0%)
4	D	205/239 (85%)	0.31	8 (3%)	43 34	35, 92, 194, 202	0
All	All	774/832 (93%)	-0.22	9 (1%)	76 68	22, 61, 168, 202	1 (0%)

The worst 5 of 9 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
4	D	271	PRO	3.2
3	C	443	HIS	2.7
4	D	241	PHE	2.5
4	D	263	VAL	2.2
4	D	243	PHE	2.2

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
8	MAN	H	6	11/12	0.34	0.14	202,202,202,202	0
6	MAN	F	4	11/12	0.39	0.16	189,191,191,191	0

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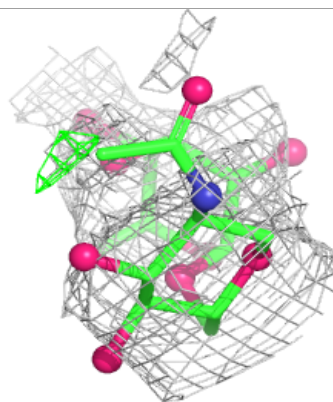
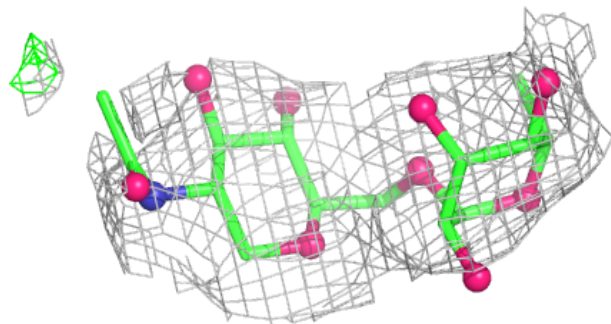
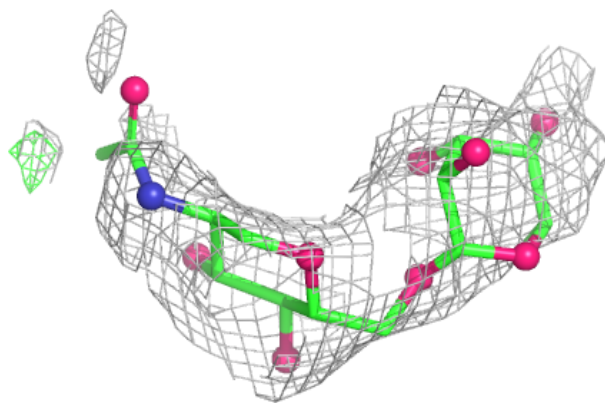
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
8	FUC	H	8	10/11	0.45	0.12	202,202,202,202	0
8	NAG	H	5	14/15	0.49	0.13	188,199,202,202	0
5	FUC	E	2	10/11	0.51	0.11	171,171,171,171	0
8	NAG	H	2	14/15	0.53	0.14	202,202,202,202	0
5	NAG	E	1	14/15	0.54	0.11	144,149,162,170	0
8	BMA	H	3	11/12	0.55	0.12	202,202,202,202	0
7	NAG	G	5	14/15	0.56	0.15	145,150,153,153	0
8	NAG	H	1	14/15	0.57	0.16	202,202,202,202	0
7	FUL	G	8	10/11	0.58	0.12	142,143,146,147	0
7	MAN	G	4	11/12	0.63	0.11	119,127,133,153	0
8	MAN	H	4	11/12	0.66	0.10	191,196,199,202	0
8	NAG	H	7	14/15	0.69	0.14	167,192,202,202	0
6	NAG	F	2	14/15	0.72	0.14	108,123,128,138	0
7	BMA	G	3	11/12	0.75	0.10	88,92,99,105	0
6	BMA	F	3	11/12	0.77	0.10	69,103,111,131	0
6	NDG	F	5	14/15	0.79	0.22	173,179,179,179	0
7	NAG	G	7	14/15	0.81	0.10	76,91,115,116	0
6	NAG	F	1	14/15	0.83	0.10	91,101,104,105	0
7	NAG	G	2	14/15	0.84	0.12	102,112,116,117	0
7	NAG	G	1	14/15	0.85	0.10	128,139,144,145	0
7	MAN	G	6	11/12	0.85	0.07	96,98,102,105	0
6	FUC	F	6	10/11	0.91	0.09	79,88,92,92	0

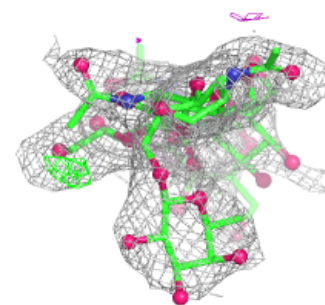
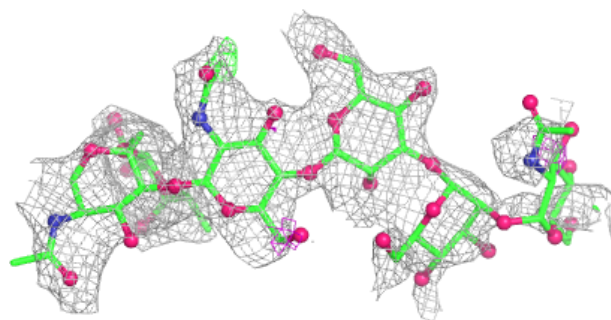
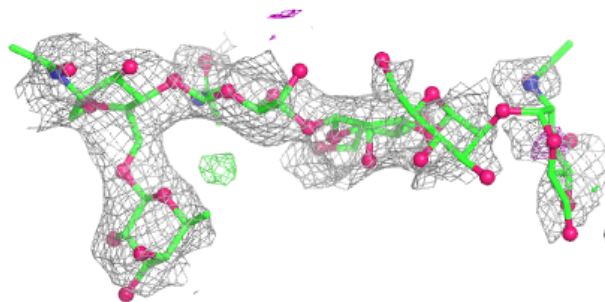
The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.

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)

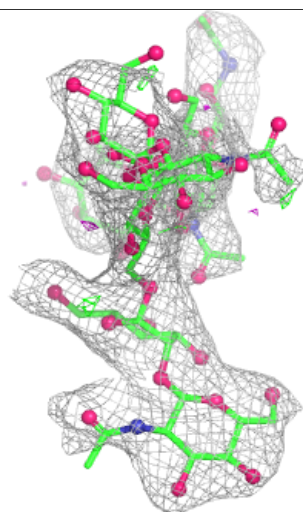
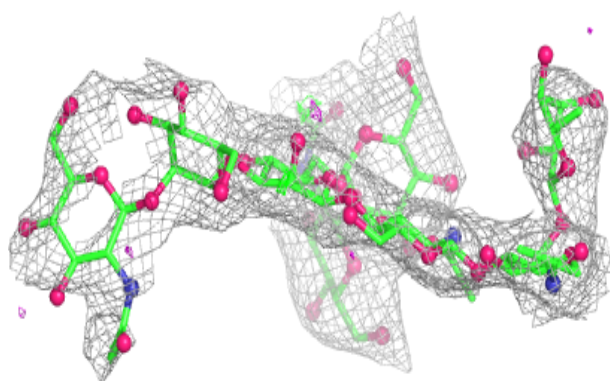
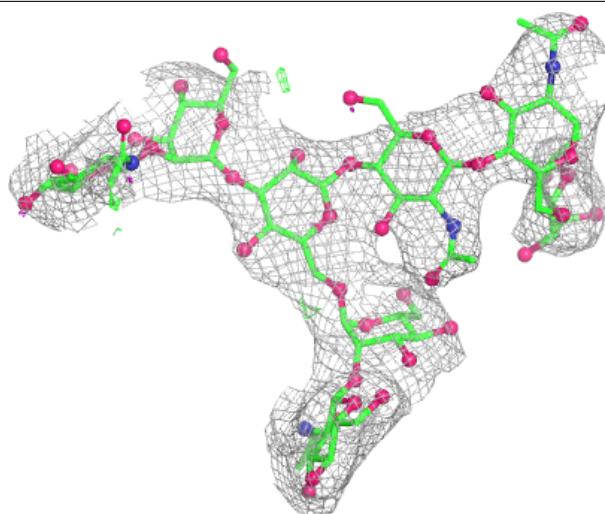
**Electron density around Chain F:**

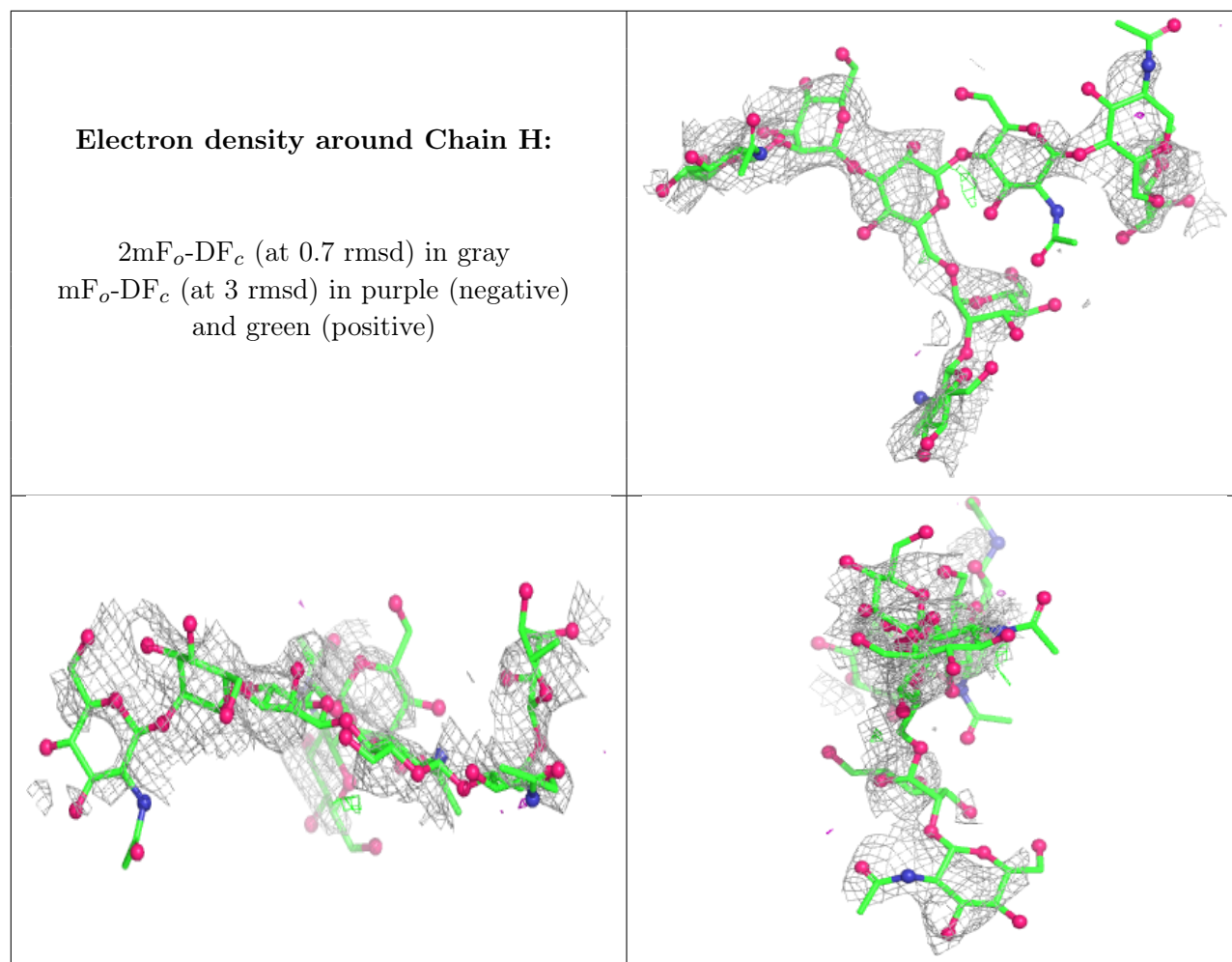
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around Chain G:

$2mF_o-DF_c$ (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($\text{\AA}^2$)	Q<0.9
9	NAG	A	601	14/15	0.07	0.13	201,201,201,201	0
9	NAG	A	751	14/15	0.62	0.11	101,122,128,129	0
10	CYS	A	901	7/7	0.71	0.20	89,99,115,120	0
10	CYS	A	951	7/7	0.73	0.19	89,154,202,202	0

6.5 Other polymers [i](#)

There are no such residues in this entry.