



# wwPDB X-ray Structure Validation Summary Report ⓘ

Oct 2, 2021 – 08:52 PM EDT

PDB ID : 3GVK  
Title : Crystal structure of endo-neuraminidase NF mutant  
Authors : Schulz, E.C.; Dickmanns, A.; Ficner, R.  
Deposited on : 2009-03-31  
Resolution : 1.84 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](mailto: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.

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

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.23.2  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.23.2

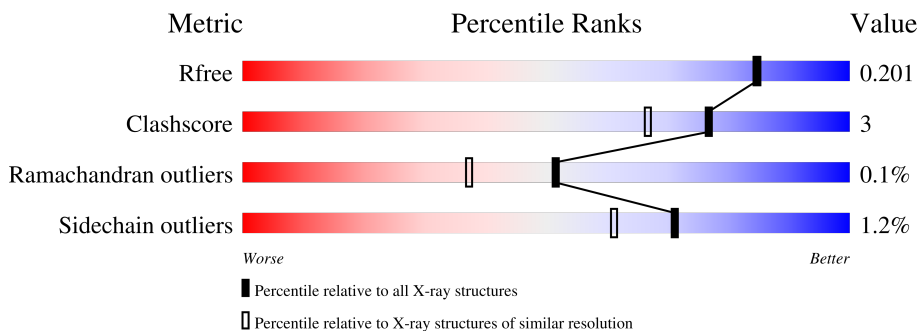
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.84 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))
$R_{free}$	130704	4003 (1.86-1.82)
Clashscore	141614	4233 (1.86-1.82)
Ramachandran outliers	138981	4185 (1.86-1.82)
Sidechain outliers	138945	4186 (1.86-1.82)

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  $\geq 3$ , 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  $\leq 5\%$

Mol	Chain	Length	Quality of chain
1	A	670	89% (green), 6% (yellow), 5% (grey)
1	B	670	93% (green), 6% (yellow), 1% (grey)
1	C	670	94% (green), 6% (yellow), 1% (grey)
2	D	3	67% (yellow), 33% (orange)
2	E	3	100% (yellow)
2	G	3	67% (yellow), 33% (orange)
2	H	3	100% (yellow)

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Mol	Chain	Length	Quality of chain
2	J	3	 33% 67%
2	K	3	 67% 33%
3	F	2	 50% 50%
3	I	2	 50% 50%
3	L	2	 100%

## 2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 18367 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.

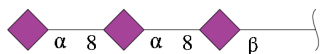
- Molecule 1 is a protein called Endo-N-acetylneuraminidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	644	Total 5163	C 3266	N 892	O 985	S 20	0	17	0
1	B	666	Total 5295	C 3341	N 911	O 1023	S 20	0	14	0
1	C	666	Total 5287	C 3335	N 916	O 1016	S 20	0	12	0

There are 18 discrepancies between the modelled and reference sequences:

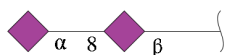
Chain	Residue	Modelled	Actual	Comment	Reference
A	241	VAL	-	expression tag	UNP Q858B1
A	242	PRO	-	expression tag	UNP Q858B1
A	243	ARG	-	expression tag	UNP Q858B1
A	244	GLY	-	expression tag	UNP Q858B1
A	245	SER	-	expression tag	UNP Q858B1
A	350	ALA	HIS	engineered mutation	UNP Q858B1
B	241	VAL	-	expression tag	UNP Q858B1
B	242	PRO	-	expression tag	UNP Q858B1
B	243	ARG	-	expression tag	UNP Q858B1
B	244	GLY	-	expression tag	UNP Q858B1
B	245	SER	-	expression tag	UNP Q858B1
B	350	ALA	HIS	engineered mutation	UNP Q858B1
C	241	VAL	-	expression tag	UNP Q858B1
C	242	PRO	-	expression tag	UNP Q858B1
C	243	ARG	-	expression tag	UNP Q858B1
C	244	GLY	-	expression tag	UNP Q858B1
C	245	SER	-	expression tag	UNP Q858B1
C	350	ALA	HIS	engineered mutation	UNP Q858B1

- Molecule 2 is an oligosaccharide called N-acetyl-alpha-neuraminic acid-(2-8)-N-acetyl-alpha-neuraminic acid-(2-8)-N-acetyl-beta-neuraminic acid.



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	D	3	Total	C	N	O	0	0	0
			61	33	3	25			
2	E	3	Total	C	N	O	0	0	0
			61	33	3	25			
2	G	3	Total	C	N	O	0	0	0
			61	33	3	25			
2	H	3	Total	C	N	O	0	0	0
			61	33	3	25			
2	J	3	Total	C	N	O	0	0	0
			61	33	3	25			
2	K	3	Total	C	N	O	0	0	0
			61	33	3	25			

- Molecule 3 is an oligosaccharide called N-acetyl-alpha-neuraminic acid-(2-8)-N-acetyl-beta-neuraminic acid.



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	F	2	Total	C	N	O	0	0	0
			41	22	2	17			
3	I	2	Total	C	N	O	0	0	0
			41	22	2	17			
3	L	2	Total	C	N	O	0	0	0
			41	22	2	17			

- Molecule 4 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total	Na	0	0
			1	1		
4	B	1	Total	Na	0	0
			1	1		
4	C	1	Total	Na	0	0
			1	1		

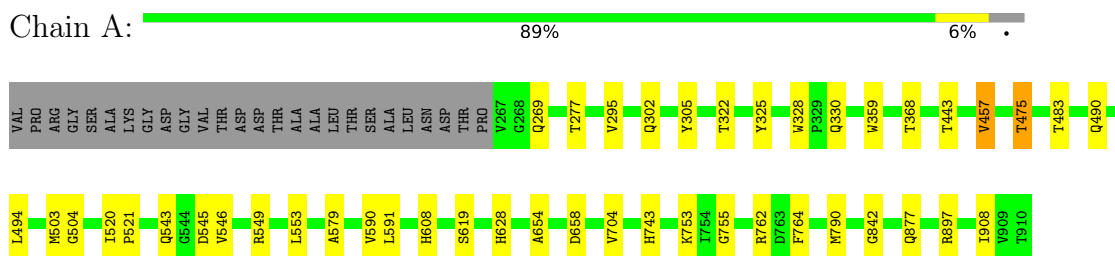
- Molecule 5 is water.

<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>ZeroOcc</b>	<b>AltConf</b>
5	A	625	Total 625	O 625	0	0
5	B	767	Total 767	O 767	0	0
5	C	738	Total 738	O 738	0	0

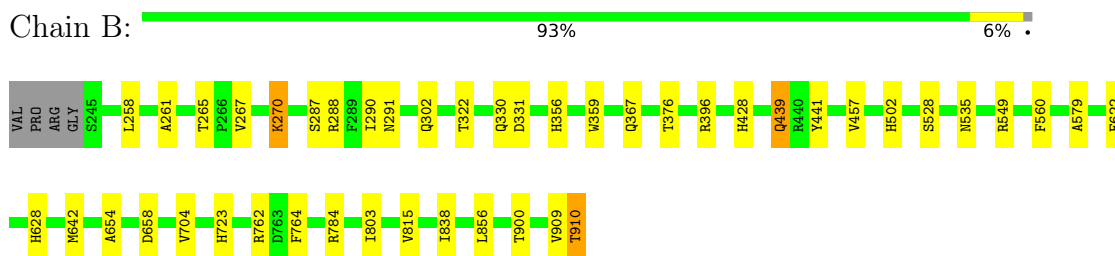
### 3 Residue-property plots [i](#)

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. 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. 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.

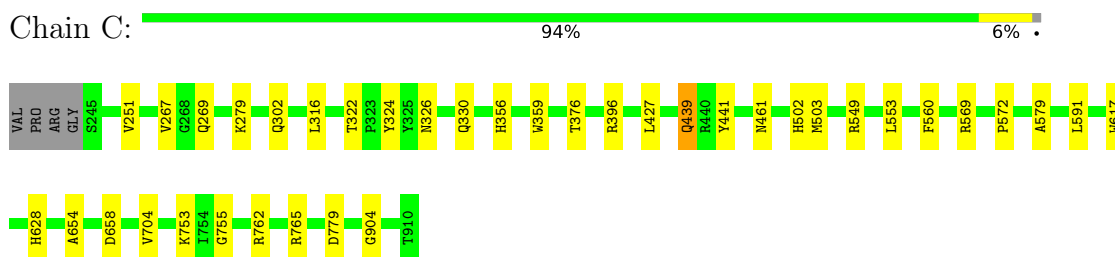
- Molecule 1: Endo-N-acetylneuraminidase



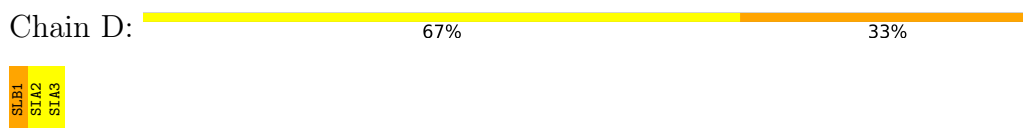
- Molecule 1: Endo-N-acetylneuraminidase



- Molecule 1: Endo-N-acetylneuraminidase



- Molecule 2: N-acetyl-alpha-neuraminic acid-(2-8)-N-acetyl-alpha-neuraminic acid-(2-8)-N-acetyl-beta-neuraminic acid

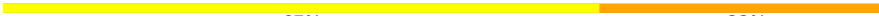


- Molecule 2: N-acetyl-alpha-neuraminic acid-(2-8)-N-acetyl-alpha-neuraminic acid-(2-8)-N-acetyl-beta-neuraminic acid

Chain E:  100%


SLB1  
SLA2  
SLA3

- Molecule 2: N-acetyl-alpha-neuraminic acid-(2-8)-N-acetyl-alpha-neuraminic acid-(2-8)-N-acetyl-beta-neuraminic acid

Chain G:  67% 33%

SLB1  
SLA2  
SLA3

- Molecule 2: N-acetyl-alpha-neuraminic acid-(2-8)-N-acetyl-alpha-neuraminic acid-(2-8)-N-acetyl-beta-neuraminic acid

Chain H:  100%

SLB1  
SLA2  
SLA3

- Molecule 2: N-acetyl-alpha-neuraminic acid-(2-8)-N-acetyl-alpha-neuraminic acid-(2-8)-N-acetyl-beta-neuraminic acid

Chain J:  33% 67%

SLB1  
SLA2  
SLA3

- Molecule 2: N-acetyl-alpha-neuraminic acid-(2-8)-N-acetyl-alpha-neuraminic acid-(2-8)-N-acetyl-beta-neuraminic acid

Chain K:  67% 33%


SLB1  
SLA2  
SLA3

- Molecule 3: N-acetyl-alpha-neuraminic acid-(2-8)-N-acetyl-beta-neuraminic acid

Chain F:  50% 50%

SLB1  
SLA2

- Molecule 3: N-acetyl-alpha-neuraminic acid-(2-8)-N-acetyl-beta-neuraminic acid

Chain I:  50% 50%

SLB1  
SLA2



- Molecule 3: N-acetyl-alpha-neuraminic acid-(2-8)-N-acetyl-beta-neuraminic acid

Chain L:  100%

SLB1  
SLA2

## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	90.40Å 153.70Å 157.80Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	15.00 – 1.84 19.81 – 1.84	Depositor EDS
% Data completeness (in resolution range)	100.0 (15.00-1.84) 99.9 (19.81-1.84)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	5.08 (at 1.84Å)	Xtrriage
Refinement program	REFMAC 5.5.0039	Depositor
R, $R_{free}$	0.265 , 0.282 0.171 , 0.201	Depositor DCC
$R_{free}$ test set	9498 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	19.0	Xtrriage
Anisotropy	0.423	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.33 , 49.0	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.45$ , $\langle L^2 \rangle = 0.28$	Xtrriage
Estimated twinning fraction	0.023 for -h,l,k	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	18367	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	22.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.02% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: SLB, NA, SIA

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	0.37	0/5360	0.53	0/7301
1	B	0.38	0/5479	0.54	0/7463
1	C	0.37	0/5469	0.53	0/7450
All	All	0.37	0/16308	0.54	0/22214

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	A	5163	0	4929	31	0
1	B	5295	0	5039	38	0
1	C	5287	0	5040	27	0
2	D	61	0	48	3	0
2	E	61	0	50	0	0
2	G	61	0	50	2	0
2	H	61	0	50	0	0
2	J	61	0	49	3	0
2	K	61	0	50	1	0
3	F	41	0	34	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	I	41	0	34	1	0
3	L	41	0	34	0	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
5	A	625	0	0	3	0
5	B	767	0	0	5	0
5	C	738	0	0	3	0
All	All	18367	0	15407	94	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.

The worst 5 of 94 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:543:GLN:HE22	1:A:546:VAL:H	1.23	0.86
1:B:302:GLN:HE22	1:B:654:ALA:H	1.26	0.83
1:C:302:GLN:HE22	1:C:654:ALA:H	1.29	0.80
3:F:1:SLB:O6	3:F:1:SLB:H92	1.84	0.78
1:B:367:GLN:HE22	1:B:764:PHE:H	1.33	0.76

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	659/670 (98%)	633 (96%)	26 (4%)	0	100 100
1	B	677/670 (101%)	654 (97%)	23 (3%)	0	100 100
1	C	676/670 (101%)	650 (96%)	25 (4%)	1 (0%)	51 37

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
All	All	2012/2010 (100%)	1937 (96%)	74 (4%)	1 (0%)	51	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	267	VAL

### 5.3.2 Protein sidechains [i](#)

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	564/566 (100%)	557 (99%)	7 (1%)	71	61
1	B	577/566 (102%)	566 (98%)	11 (2%)	57	42
1	C	575/566 (102%)	571 (99%)	4 (1%)	84	78
All	All	1716/1698 (101%)	1694 (99%)	22 (1%)	71	58

5 of 22 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	457	VAL
1	B	910[B]	THR
1	B	910[A]	THR
1	C	269	GLN
1	A	762	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 48 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	502	HIS
1	C	269	GLN
1	B	535	ASN
1	B	676	ASN
1	C	338	ASN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

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
2	SLB	D	1	2	18,21,21	1.05	2 (11%)	21,31,31	4.39	6 (28%)
2	SIA	D	2	2,1	17,20,21	0.49	0	21,28,31	1.33	4 (19%)
2	SIA	D	3	2	17,20,21	0.43	0	21,28,31	1.18	3 (14%)
2	SLB	E	1	2	18,21,21	0.93	1 (5%)	21,31,31	4.47	5 (23%)
2	SIA	E	2	2	17,20,21	0.35	0	21,28,31	1.34	3 (14%)
2	SIA	E	3	2	17,20,21	0.36	0	21,28,31	1.24	3 (14%)
3	SLB	F	1	3	18,21,21	0.80	1 (5%)	21,31,31	4.35	2 (9%)
3	SIA	F	2	3	17,20,21	0.45	0	21,28,31	1.10	1 (4%)
2	SLB	G	1	2	18,21,21	1.66	3 (16%)	21,31,31	4.22	5 (23%)
2	SIA	G	2	2	17,20,21	0.39	0	21,28,31	1.19	3 (14%)
2	SIA	G	3	2	17,20,21	0.27	0	21,28,31	1.12	3 (14%)
2	SLB	H	1	2	18,21,21	0.87	1 (5%)	21,31,31	4.34	5 (23%)
2	SIA	H	2	2	17,20,21	0.35	0	21,28,31	1.30	3 (14%)
2	SIA	H	3	2	17,20,21	0.39	0	21,28,31	1.12	3 (14%)
3	SLB	I	1	3	18,21,21	0.98	1 (5%)	21,31,31	4.52	4 (19%)
3	SIA	I	2	3	17,20,21	0.39	0	21,28,31	1.20	3 (14%)
2	SLB	J	1	2	18,21,21	1.54	3 (16%)	21,31,31	6.92	12 (57%)
2	SIA	J	2	2	17,20,21	0.43	0	21,28,31	1.16	3 (14%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	SIA	J	3	2	17,20,21	0.32	0	21,28,31	1.21	4 (19%)
2	SLB	K	1	2	18,21,21	1.04	2 (11%)	21,31,31	4.26	3 (14%)
2	SIA	K	2	2	17,20,21	0.39	0	21,28,31	1.18	3 (14%)
2	SIA	K	3	2	17,20,21	0.40	0	21,28,31	1.24	4 (19%)
3	SLB	L	1	3	18,21,21	1.08	2 (11%)	21,31,31	4.37	3 (14%)
3	SIA	L	2	3	17,20,21	0.39	0	21,28,31	1.13	3 (14%)

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	SLB	D	1	2	-	7/14/38/38	0/1/1/1
2	SIA	D	2	2,1	-	7/14/34/38	0/1/1/1
2	SIA	D	3	2	-	2/14/34/38	0/1/1/1
2	SLB	E	1	2	-	4/14/38/38	0/1/1/1
2	SIA	E	2	2	-	0/14/34/38	0/1/1/1
2	SIA	E	3	2	-	0/14/34/38	0/1/1/1
3	SLB	F	1	3	-	0/14/38/38	0/1/1/1
3	SIA	F	2	3	-	5/14/34/38	0/1/1/1
2	SLB	G	1	2	-	4/14/38/38	0/1/1/1
2	SIA	G	2	2	-	1/14/34/38	0/1/1/1
2	SIA	G	3	2	-	0/14/34/38	0/1/1/1
2	SLB	H	1	2	-	1/14/38/38	0/1/1/1
2	SIA	H	2	2	-	1/14/34/38	0/1/1/1
2	SIA	H	3	2	-	4/14/34/38	0/1/1/1
3	SLB	I	1	3	-	4/14/38/38	0/1/1/1
3	SIA	I	2	3	-	6/14/34/38	0/1/1/1
2	SLB	J	1	2	-	5/14/38/38	0/1/1/1
2	SIA	J	2	2	-	5/14/34/38	0/1/1/1
2	SIA	J	3	2	-	0/14/34/38	0/1/1/1
2	SLB	K	1	2	-	0/14/38/38	0/1/1/1
2	SIA	K	2	2	-	0/14/34/38	0/1/1/1
2	SIA	K	3	2	-	2/14/34/38	0/1/1/1
3	SLB	L	1	3	-	2/14/38/38	0/1/1/1
3	SIA	L	2	3	-	0/14/34/38	0/1/1/1

The worst 5 of 16 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	G	1	SLB	O6-C2	-4.92	1.38	1.43
2	K	1	SLB	O2-C2	3.61	1.44	1.39
2	J	1	SLB	O2-C2	3.50	1.44	1.39
3	L	1	SLB	O2-C2	3.45	1.44	1.39
2	J	1	SLB	O6-C6	-3.38	1.38	1.44

The worst 5 of 91 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	J	1	SLB	O2-C2-C3	-20.98	80.04	109.35
3	I	1	SLB	O2-C2-C3	-17.00	85.59	109.35
3	F	1	SLB	O2-C2-C3	-16.76	85.93	109.35
2	D	1	SLB	O2-C2-C3	-16.72	85.99	109.35
2	E	1	SLB	O2-C2-C3	-16.21	86.70	109.35

There are no chirality outliers.

5 of 60 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	D	1	SLB	C6-C5-N5-C10
2	D	1	SLB	O6-C6-C7-O7
2	D	2	SIA	C7-C8-C9-O9
2	D	3	SIA	C7-C8-C9-O9
2	E	1	SLB	C6-C7-C8-C9

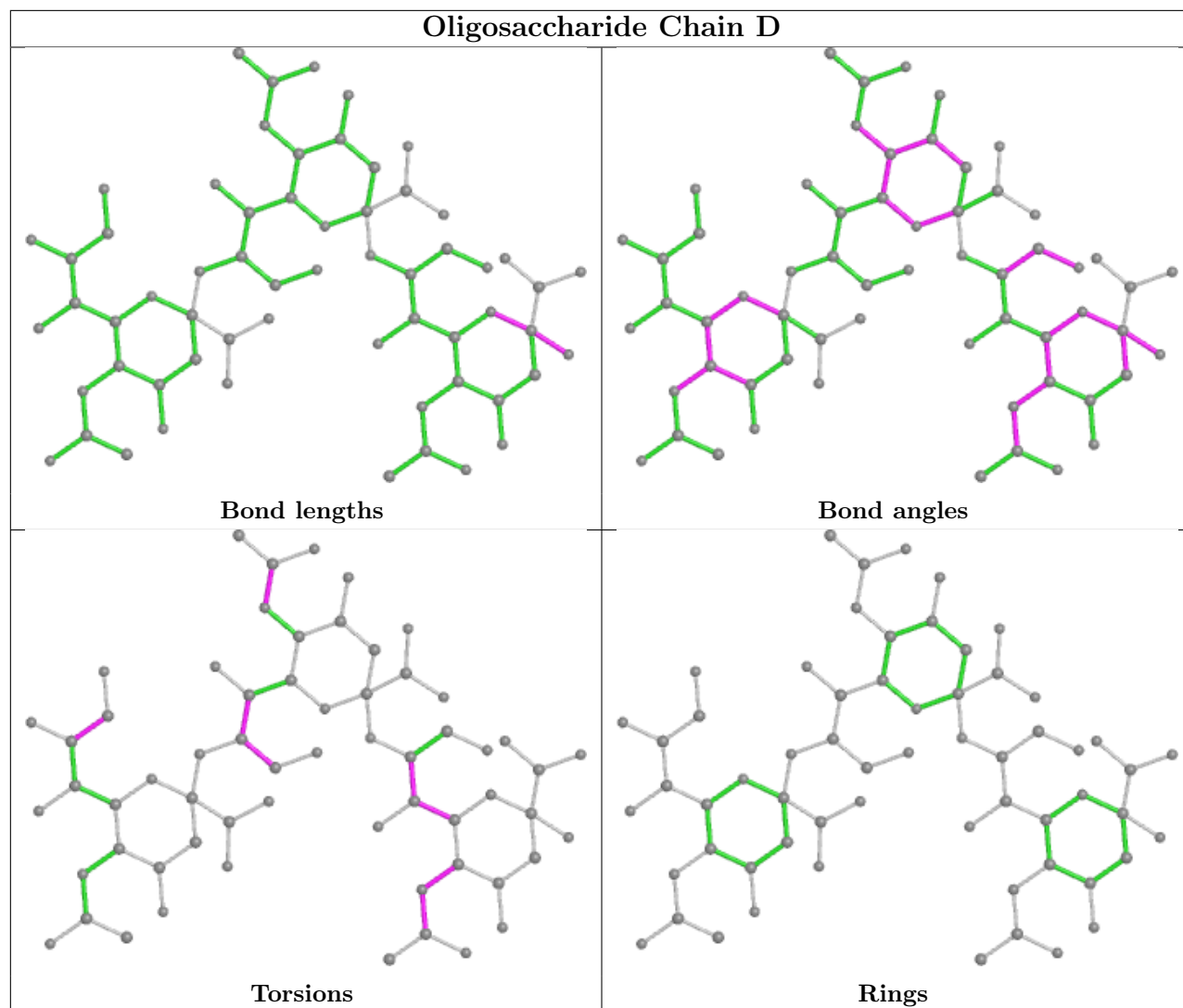
There are no ring outliers.

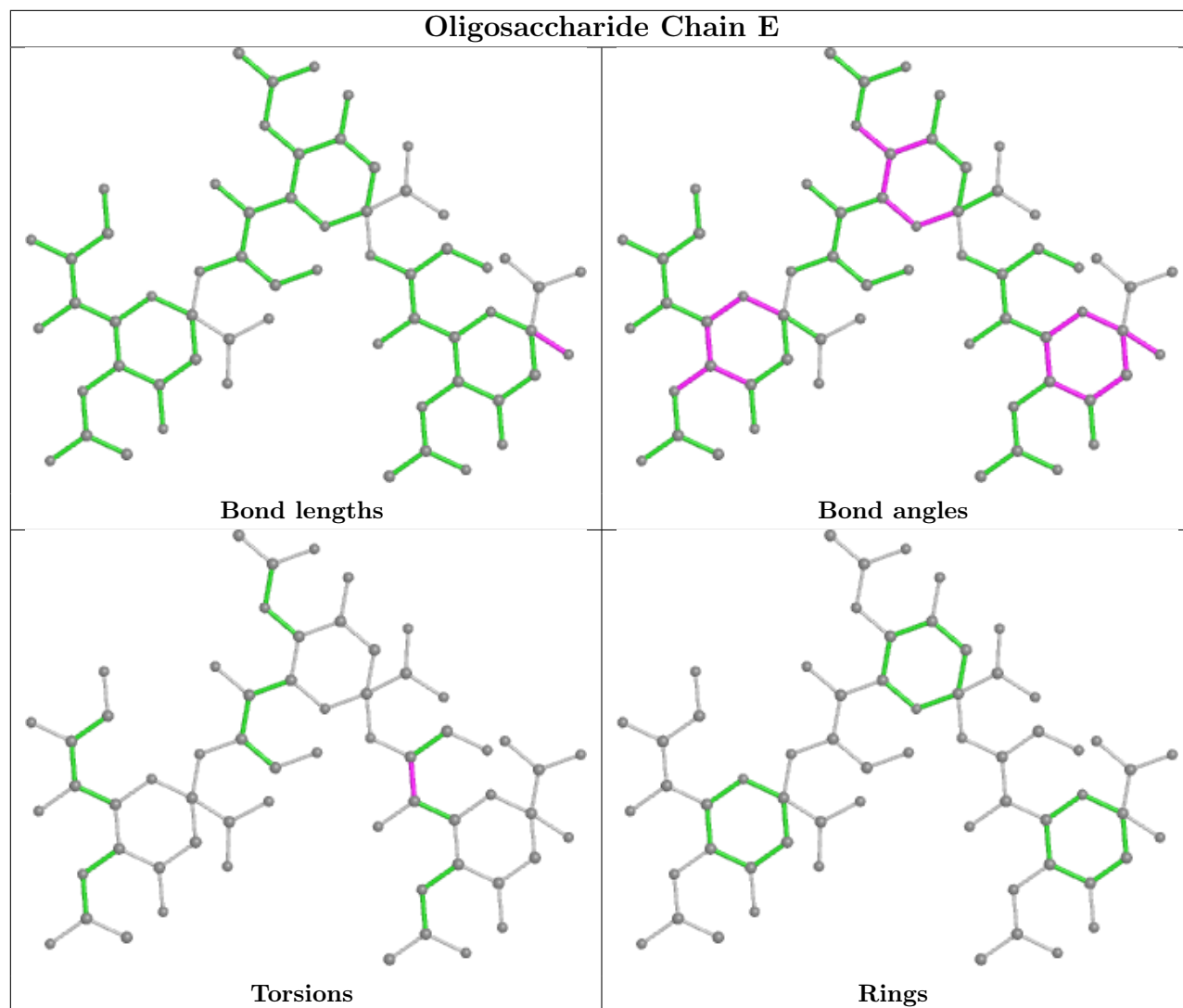
7 monomers are involved in 12 short contacts:

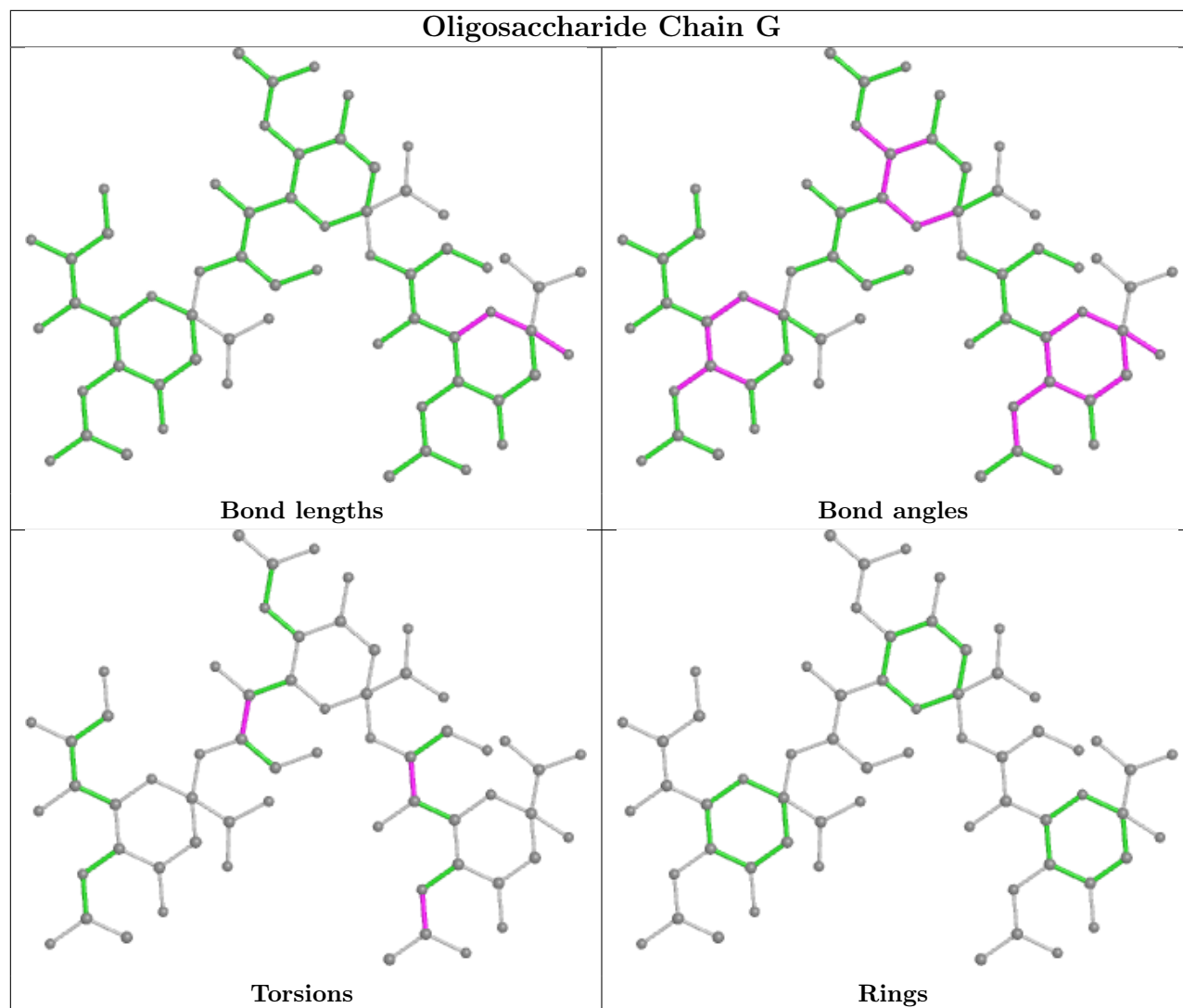
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	J	1	SLB	3	0
3	I	1	SLB	1	0
2	D	1	SLB	3	0
2	K	1	SLB	1	0
2	J	2	SIA	1	0
3	F	1	SLB	2	0
2	G	1	SLB	2	0

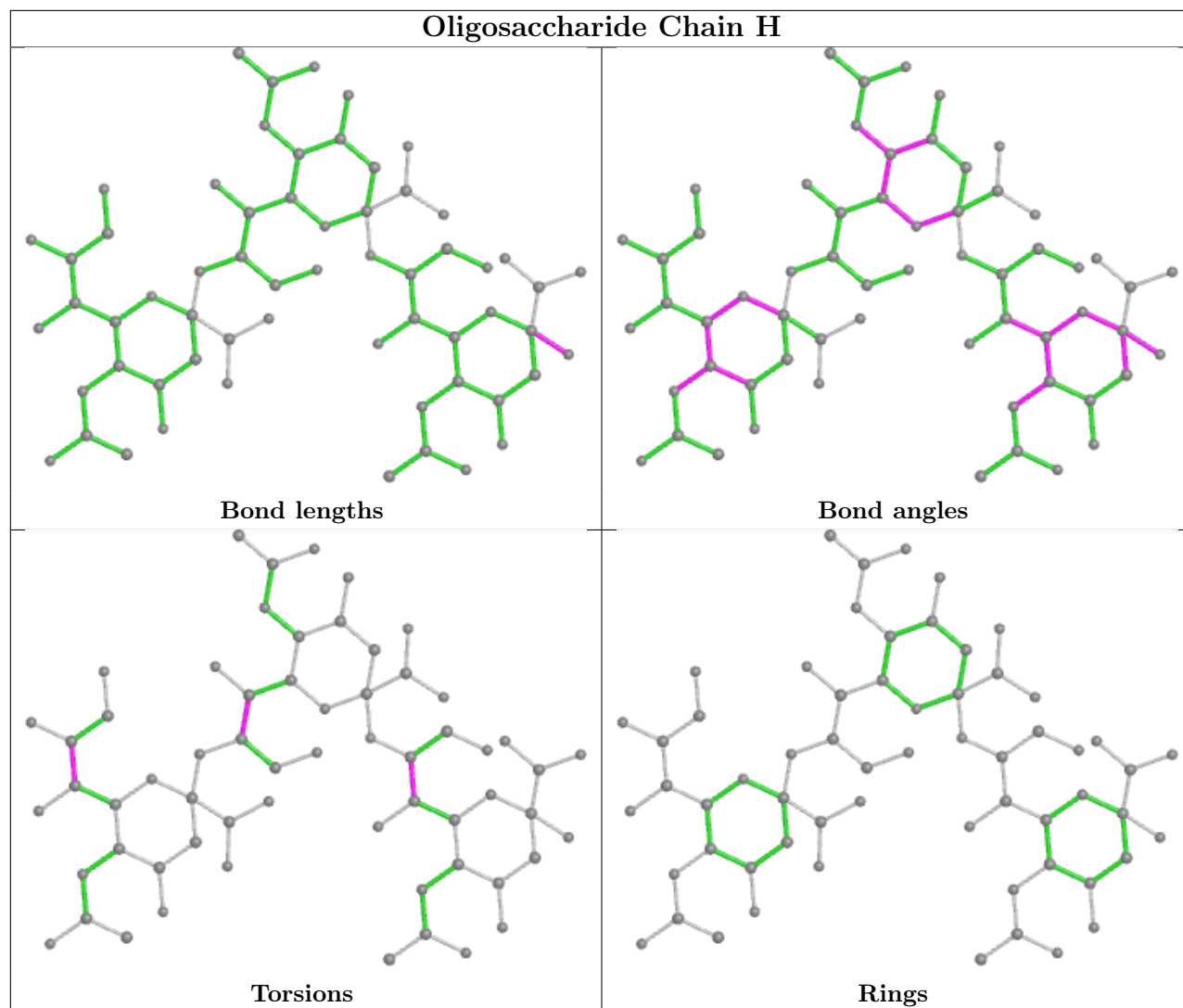
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

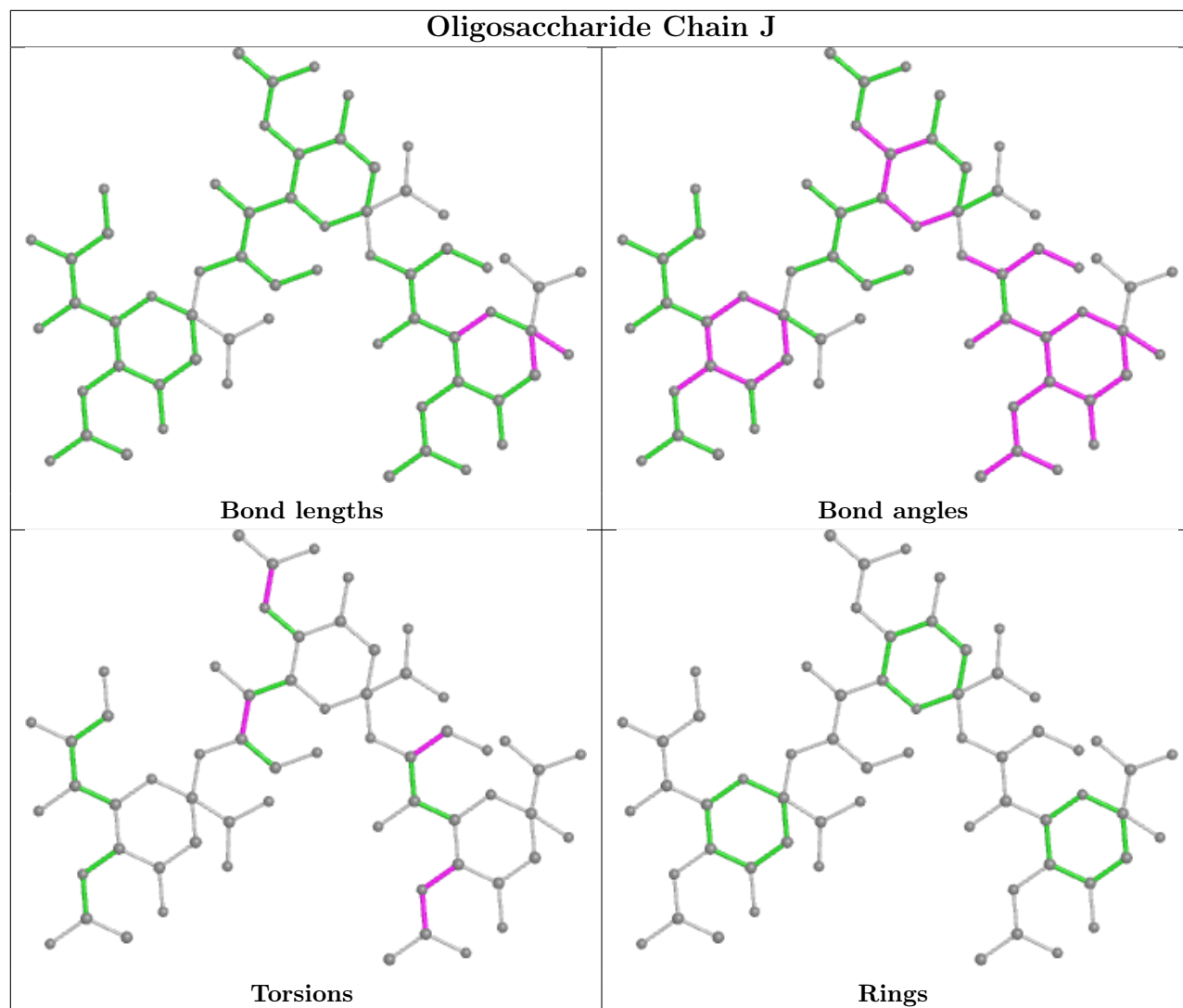


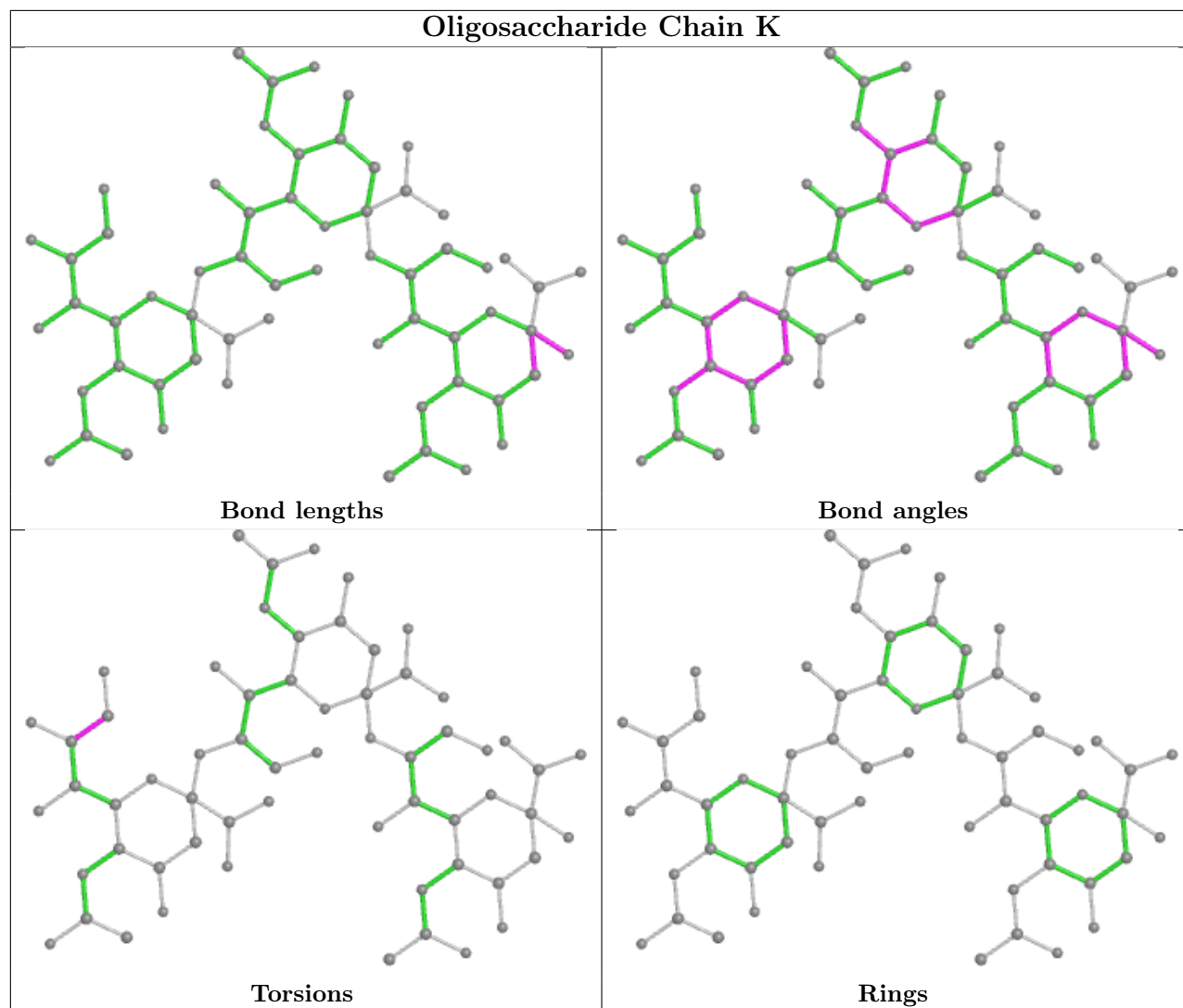


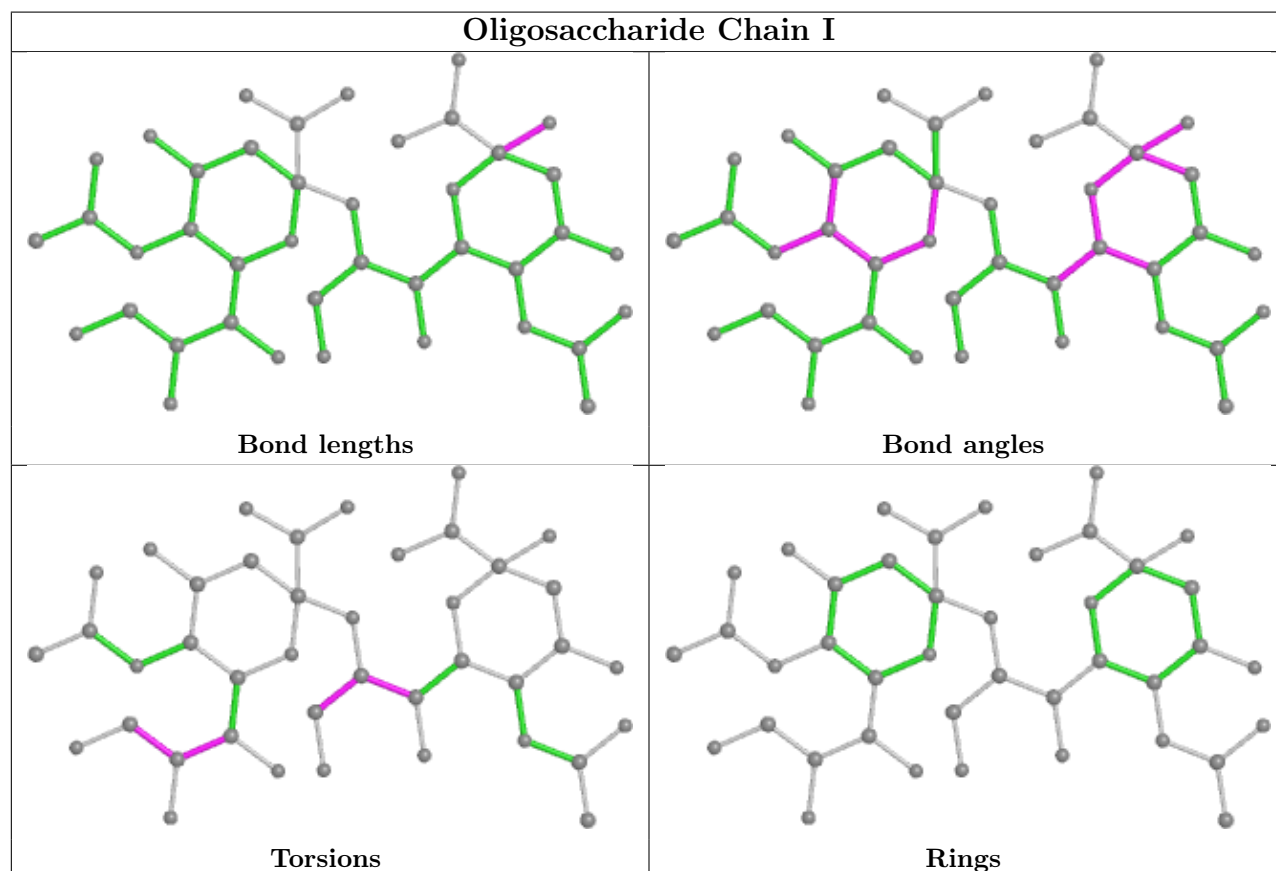
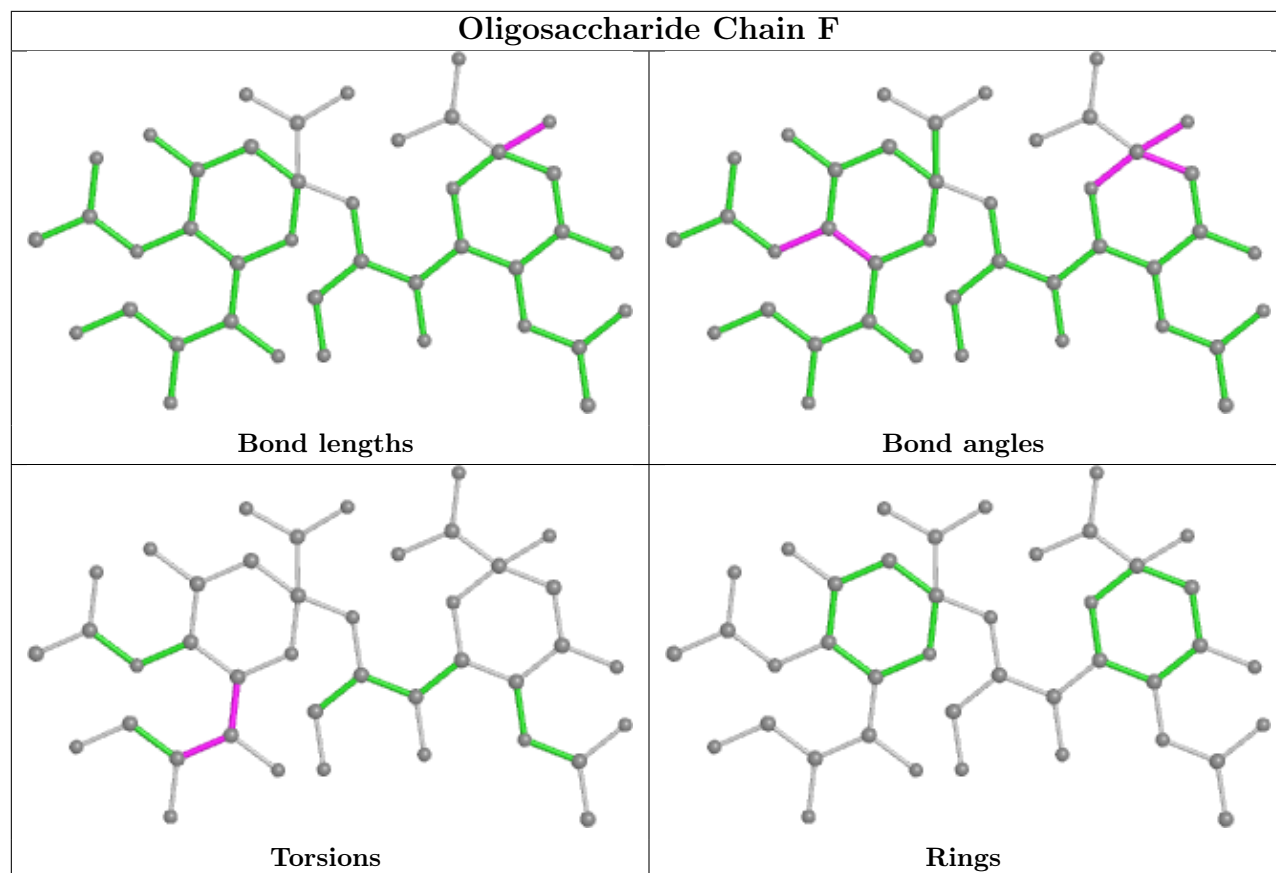


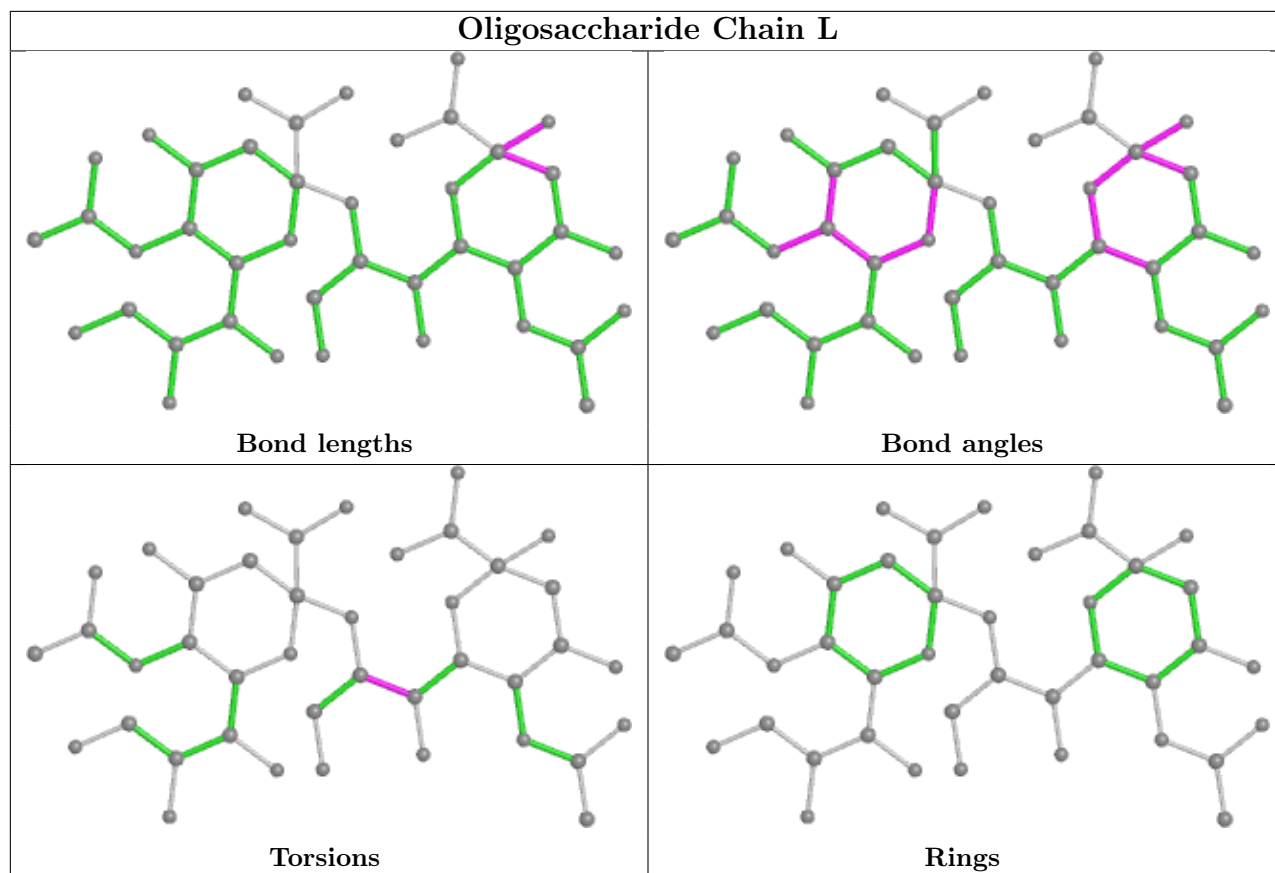












## 5.6 Ligand geometry [i](#)

Of 3 ligands modelled in this entry, 3 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

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 [i](#)

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

Unable to reproduce the depositors R factor - this section is therefore empty.

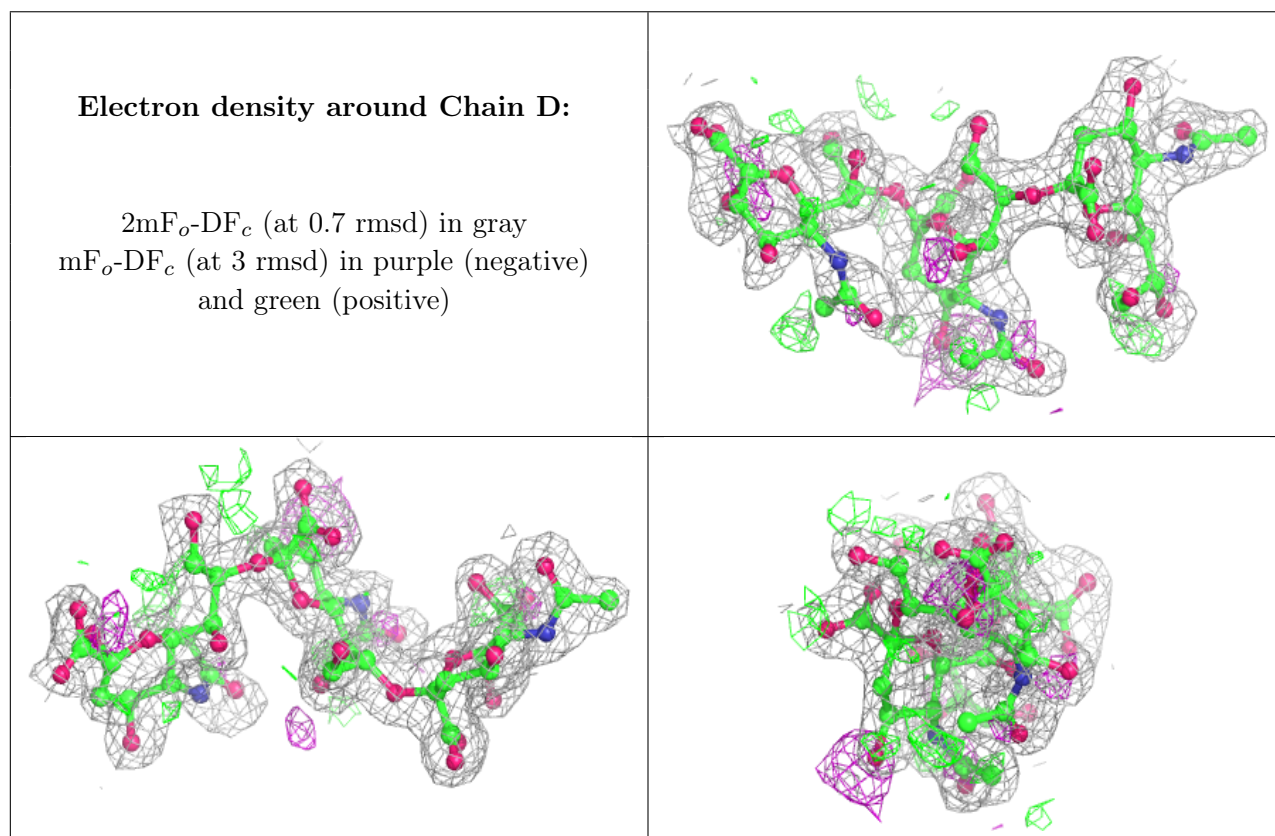
### 6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

Unable to reproduce the depositors R factor - this section is therefore empty.

### 6.3 Carbohydrates [i](#)

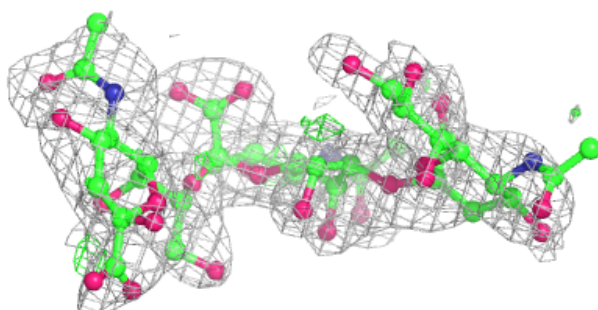
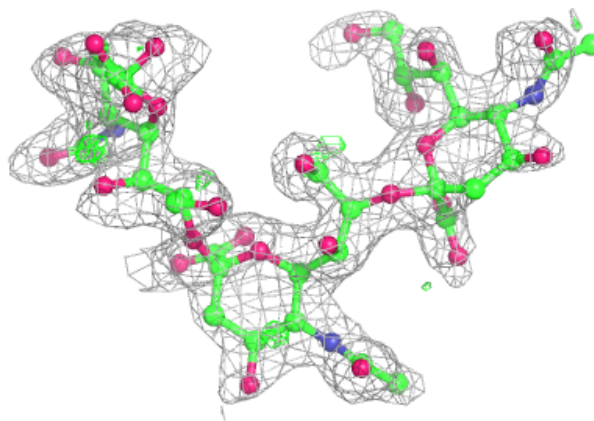
Unable to reproduce the depositors R factor - this section is therefore empty.

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.

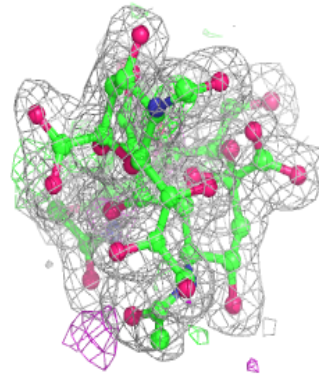
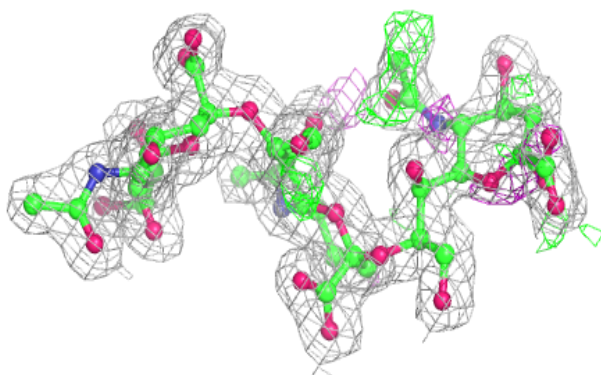
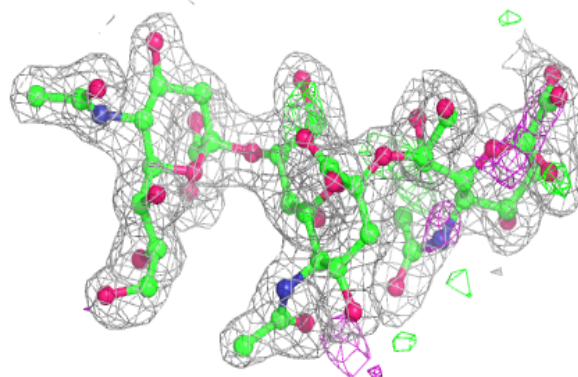


**Electron density around Chain E:**

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

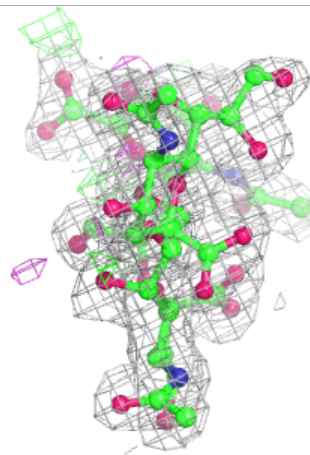
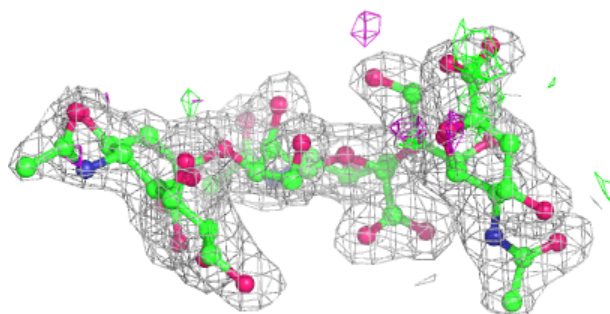
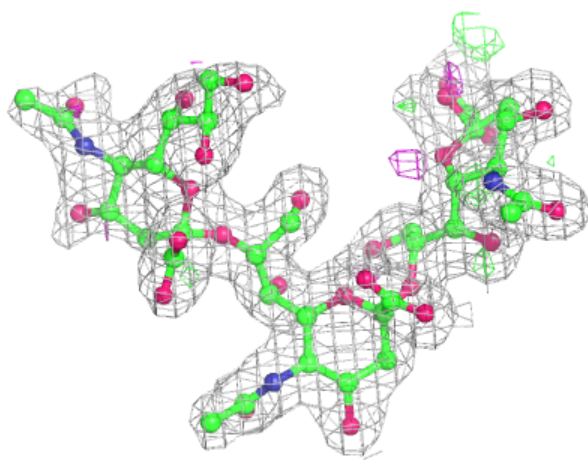
**Electron density around Chain G:**

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



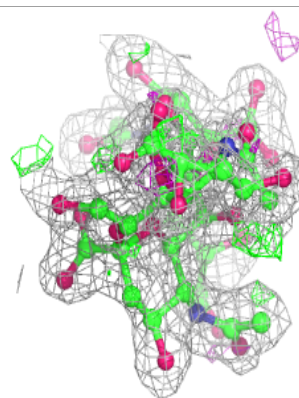
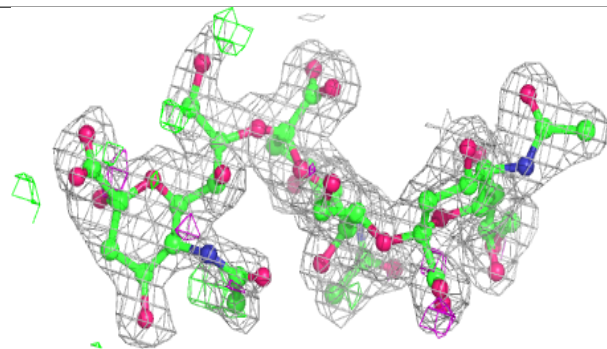
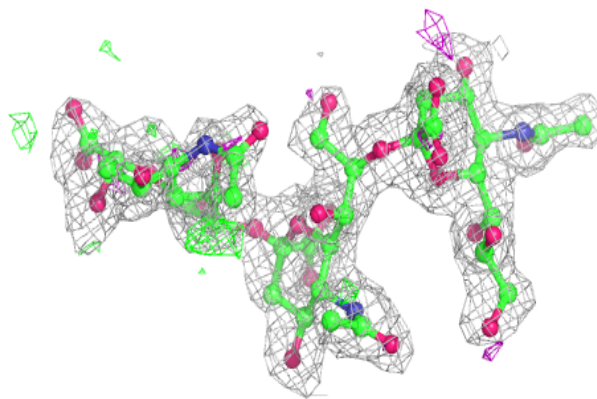
**Electron density around Chain H:**

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

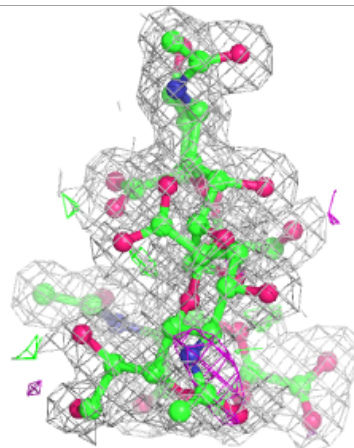
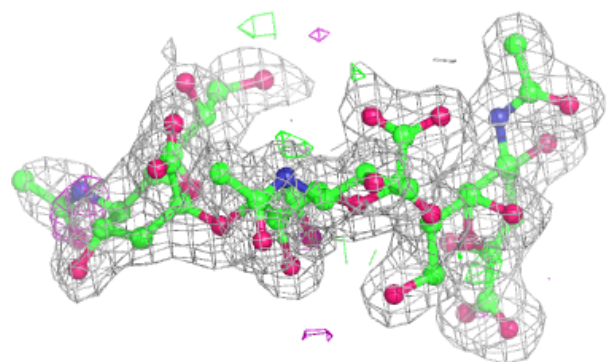
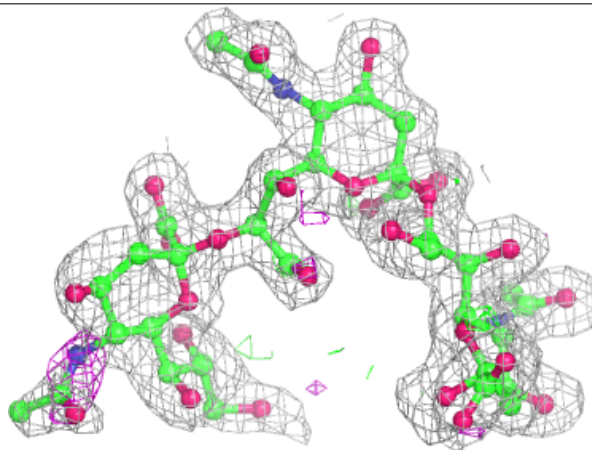


**Electron density around Chain J:**

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

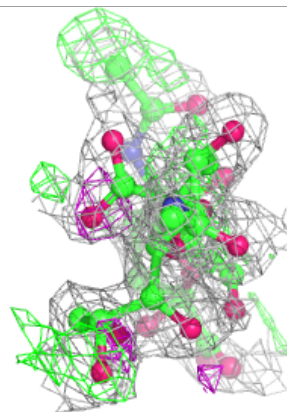
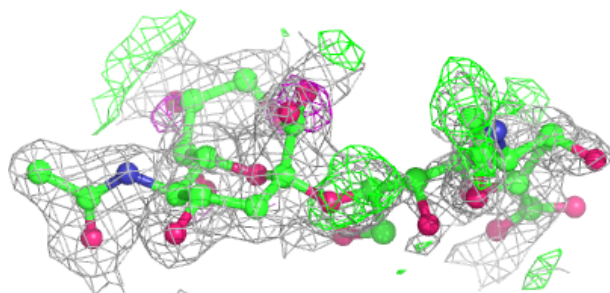
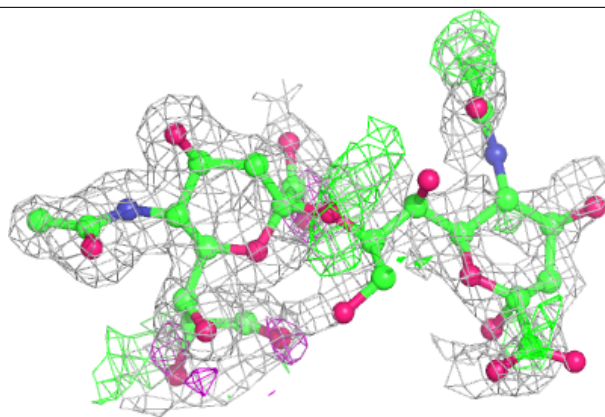
**Electron density around Chain K:**

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

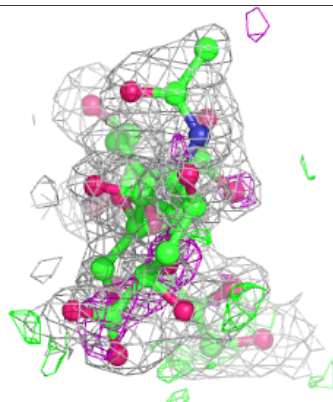
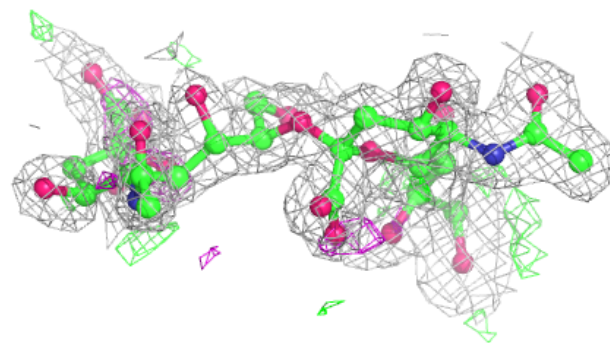
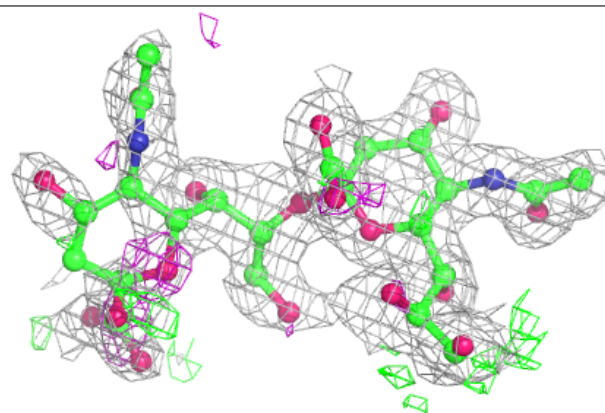


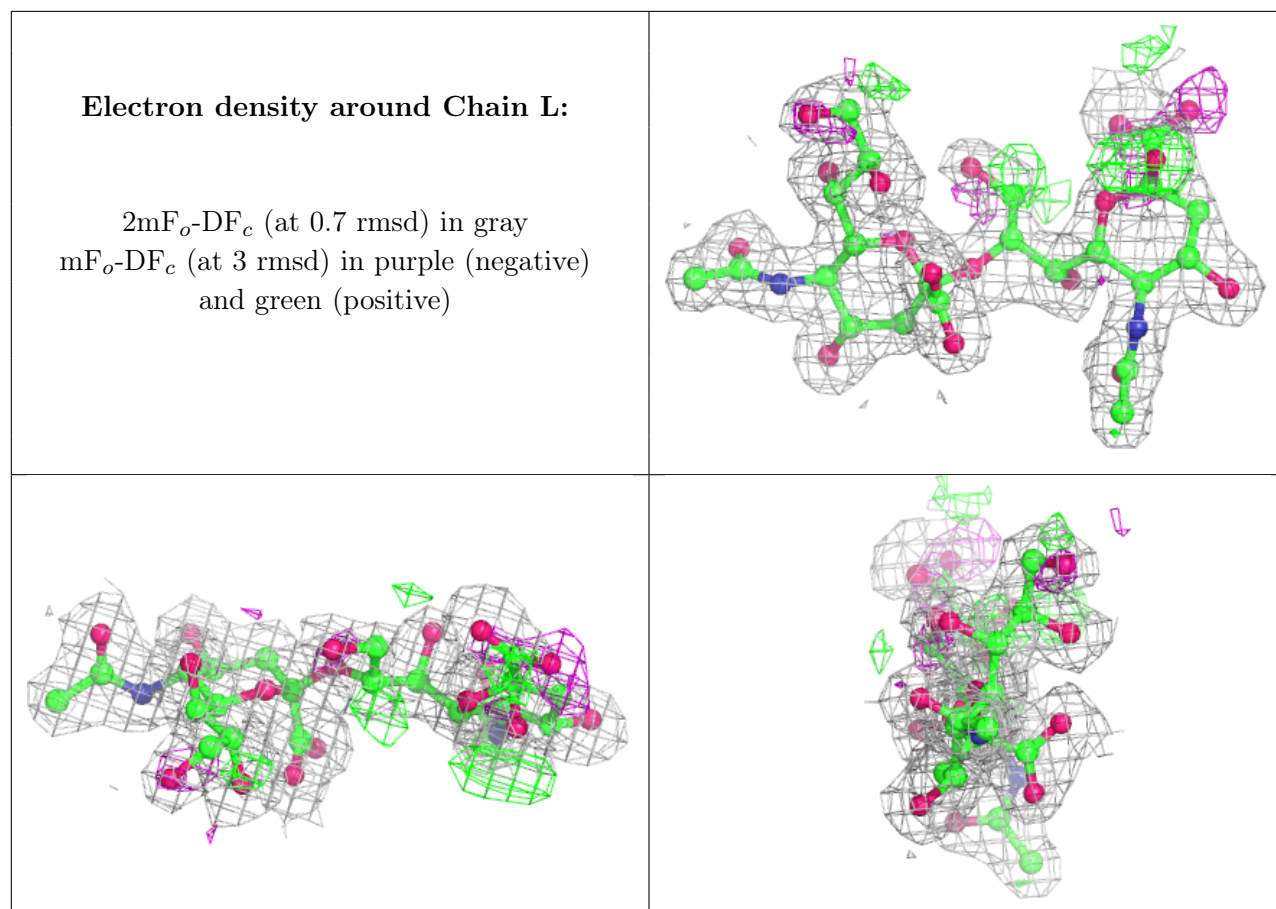
**Electron density around Chain F:**

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

**Electron density around Chain I:**

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





## 6.4 Ligands [i](#)

Unable to reproduce the depositors R factor - this section is therefore empty.

## 6.5 Other polymers [i](#)

Unable to reproduce the depositors R factor - this section is therefore empty.