



# wwPDB X-ray Structure Validation Summary Report ⓘ

Aug 7, 2020 – 10:33 AM BST

PDB ID : 3T6Z  
Title : Crystal Structure of *Steccherinum ochraceum* Laccase obtained by multi-crystals composite data collection technique (60% dose)  
Authors : Ferraroni, M.; Briganti, F.; Matera, I.; Kolomytseva, M.; Golovleva, L.; Scozzafava, A.; Chernykh, A.M.  
Deposited on : 2011-07-29  
Resolution : 2.15 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.

---

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	:	2.13.1
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)	:	2.13.1

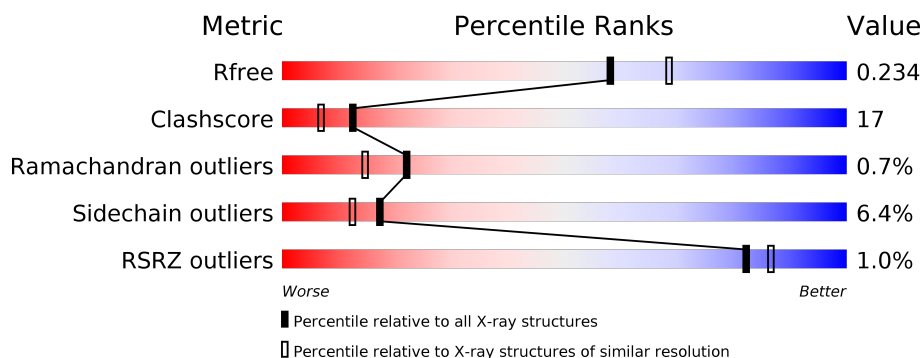
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.15 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	1479 (2.16-2.16)
Clashscore	141614	1585 (2.16-2.16)
Ramachandran outliers	138981	1560 (2.16-2.16)
Sidechain outliers	138945	1559 (2.16-2.16)
RSRZ outliers	127900	1456 (2.16-2.16)

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 on 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  $\leq 5\%$ . 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	495	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, red, orange, yellow, green);"></div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>77%</span> <span>20%</span> </div> </div>
1	B	495	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, red, orange, yellow, green);"></div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>76%</span> <span>22%</span> </div> </div>
1	C	495	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, red, orange, yellow, green);"></div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>76%</span> <span>20%</span> </div> </div>
2	D	2	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, orange, yellow, green);"></div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>50%</span> <span>50%</span> </div> </div>
2	E	2	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, orange, yellow, green);"></div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>100%</span> </div> </div>
2	F	2	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, orange, yellow, green);"></div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>100%</span> </div> </div>

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Length	Quality of chain
2	G	2	 100%
2	H	2	 50%50%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	SO4	B	506	-	-	X	-
5	GOL	B	508	-	-	X	-

## 2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 12857 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 Laccase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	495	Total	C	N	O	S	0	5	0
			3736	2361	626	730	19			
1	B	495	Total	C	N	O	S	0	5	0
			3727	2356	628	725	18			
1	C	495	Total	C	N	O	S	0	4	0
			3733	2358	629	729	17			

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



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

- Molecule 3 is COPPER (II) ION (three-letter code: CU) (formula: Cu).

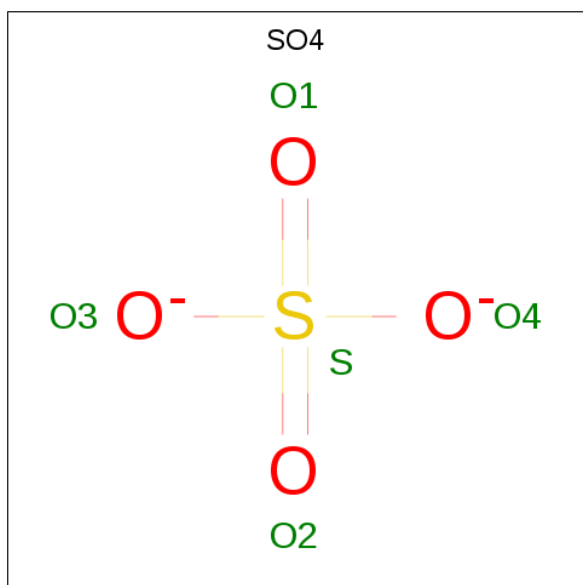
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	4	Total	Cu	0	0
			4	4		

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	4	Total	Cu	0	0
			4	4		
3	C	4	Total	Cu	0	0
			4	4		

- Molecule 4 is SULFATE ION (three-letter code: SO4) (formula: O<sub>4</sub>S).



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

- Molecule 5 is GLYCEROL (three-letter code: GOL) (formula: C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>).



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

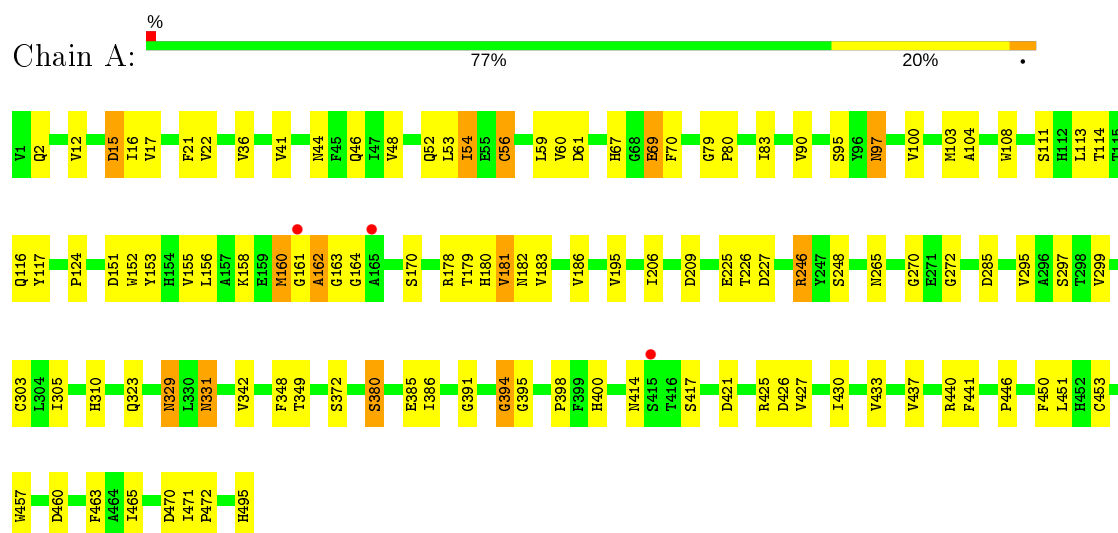
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	503	Total	O	0	0
			503	503		
6	B	453	Total	O	0	0
			453	453		
6	C	464	Total	O	0	0
			464	464		

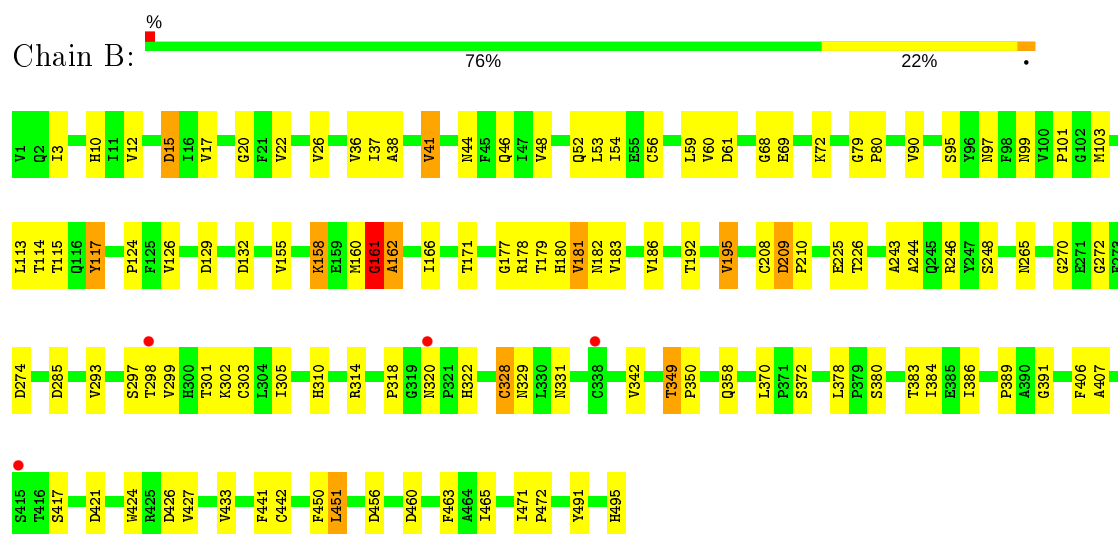
### 3 Residue-property plots

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: Laccase

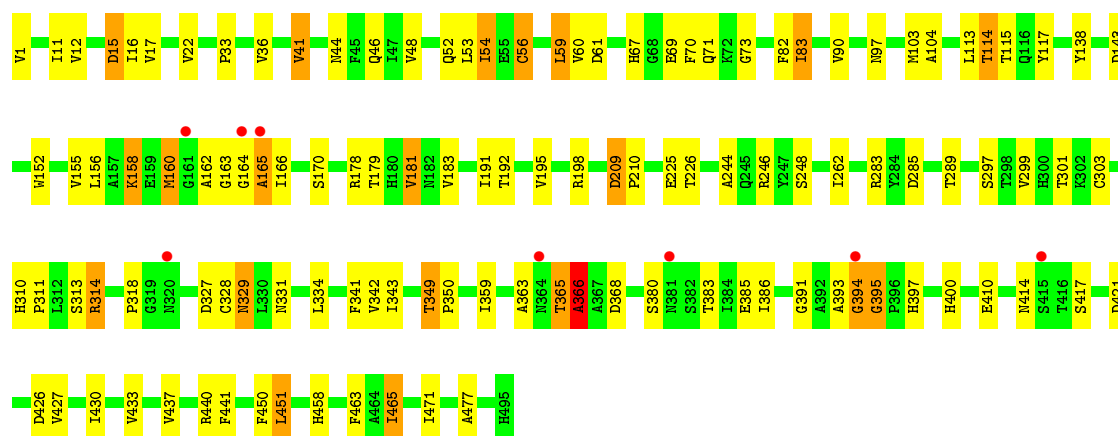


#### • Molecule 1: Laccase



#### • Molecule 1: Laccase





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

Chain D: 50%

MAG1  
MAG2

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

Chain E: 100%

MAG1  
MAG2

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

Chain F: 100%

MAG1  
MAG2

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

Chain G: 100%

MAG1  
MAG2

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

Chain H: 50%





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	73.51Å 140.04Å 172.98Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	19.80 – 2.15 19.80 – 2.15	Depositor EDS
% Data completeness (in resolution range)	90.5 (19.80-2.15) 90.6 (19.80-2.15)	Depositor EDS
$R_{merge}$	0.12	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.91 (at 2.15Å)	Xtriage
Refinement program	REFMAC	Depositor
R, $R_{free}$	0.174 , 0.232 0.177 , 0.234	Depositor DCC
$R_{free}$ test set	4418 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	19.6	Xtriage
Anisotropy	0.681	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 53.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.45$ , $\langle L^2 \rangle = 0.28$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	12857	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	22.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.42% 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

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, NAG, CU, SO4

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	0.63	2/3859 (0.1%)	0.70	1/5299 (0.0%)
1	B	0.62	1/3850 (0.0%)	0.69	1/5287 (0.0%)
1	C	0.62	2/3855 (0.1%)	0.71	4/5294 (0.1%)
All	All	0.62	5/11564 (0.0%)	0.70	6/15880 (0.0%)

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	442	CYS	CB-SG	-5.51	1.72	1.81
1	A	56[A]	CYS	CB-SG	-5.20	1.73	1.81
1	A	56[B]	CYS	CB-SG	-5.20	1.73	1.81
1	C	56[A]	CYS	CB-SG	-5.10	1.73	1.81
1	C	56[B]	CYS	CB-SG	-5.10	1.73	1.81

The worst 5 of 6 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	161	GLY	N-CA-C	-5.93	98.28	113.10
1	C	395	GLY	N-CA-C	-5.68	98.89	113.10
1	A	246	ARG	NE-CZ-NH2	-5.63	117.49	120.30
1	C	366	ALA	N-CA-C	-5.36	96.54	111.00
1	C	365	THR	N-CA-C	-5.27	96.76	111.00

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	3736	0	3510	116	0
1	B	3727	0	3498	124	0
1	C	3733	0	3510	124	0
2	D	28	0	25	2	0
2	E	28	0	25	3	0
2	F	28	0	25	0	0
2	G	28	0	25	9	0
2	H	28	0	25	2	0
3	A	4	0	0	0	0
3	B	4	0	0	0	0
3	C	4	0	0	0	0
4	A	15	0	0	0	0
4	B	15	0	0	6	0
4	C	5	0	0	0	0
5	A	12	0	16	3	0
5	B	36	0	48	15	0
5	C	6	0	8	1	0
6	A	503	0	0	40	0
6	B	453	0	0	32	0
6	C	464	0	0	33	0
All	All	12857	0	10715	372	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 17.

The worst 5 of 372 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:414:ASN:ND2	2:D:1:NAG:C1	1.68	1.53
1:C:414:ASN:HD21	2:H:1:NAG:C1	1.18	1.50
1:C:365:THR:HB	1:C:366:ALA:CB	1.52	1.37
1:C:365:THR:CB	1:C:366:ALA:HB3	1.65	1.25
1:C:414:ASN:ND2	2:H:1:NAG:C1	2.02	1.20

There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	498/495 (101%)	476 (96%)	19 (4%)	3 (1%)	25	18
1	B	497/495 (100%)	471 (95%)	23 (5%)	3 (1%)	25	18
1	C	497/495 (100%)	468 (94%)	25 (5%)	4 (1%)	19	12
All	All	1492/1485 (100%)	1415 (95%)	67 (4%)	10 (1%)	22	15

5 of 10 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	162	ALA
1	B	162	ALA
1	C	366	ALA
1	A	209	ASP
1	A	394	GLY

### 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	409/406 (101%)	386 (94%)	23 (6%)	21	16
1	B	406/406 (100%)	381 (94%)	25 (6%)	18	14
1	C	408/406 (100%)	376 (92%)	32 (8%)	12	7
All	All	1223/1218 (100%)	1143 (94%)	80 (6%)	17	12

5 of 80 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	297	SER
1	B	451	LEU
1	C	349	THR
1	B	301	THR
1	B	372	SER

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 43 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	116	GLN
1	B	310	HIS
1	C	329	ASN
1	B	180	HIS
1	B	182	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 ⓘ

10 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	D	1	2	14,14,15	1.00	2 (14%)	17,19,21	2.37	2 (11%)
2	NAG	D	2	2	14,14,15	1.47	2 (14%)	17,19,21	2.70	9 (52%)
2	NAG	E	1	2	14,14,15	1.07	0	17,19,21	1.68	5 (29%)
2	NAG	E	2	2	14,14,15	0.60	0	17,19,21	3.32	6 (35%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	NAG	F	1	1,2	14,14,15	0.56	0	17,19,21	2.46	4 (23%)
2	NAG	F	2	2	14,14,15	0.76	0	17,19,21	2.48	6 (35%)
2	NAG	G	1	1,2	14,14,15	1.27	2 (14%)	17,19,21	2.57	6 (35%)
2	NAG	G	2	2	14,14,15	0.79	0	17,19,21	1.99	5 (29%)
2	NAG	H	1	2	14,14,15	2.50	2 (14%)	17,19,21	3.02	9 (52%)
2	NAG	H	2	2	14,14,15	2.61	2 (14%)	17,19,21	3.02	6 (35%)

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	D	1	2	-	2/6/23/26	0/1/1/1
2	NAG	D	2	2	-	0/6/23/26	0/1/1/1
2	NAG	E	1	2	-	2/6/23/26	0/1/1/1
2	NAG	E	2	2	-	5/6/23/26	0/1/1/1
2	NAG	F	1	1,2	-	2/6/23/26	0/1/1/1
2	NAG	F	2	2	-	2/6/23/26	0/1/1/1
2	NAG	G	1	1,2	-	4/6/23/26	0/1/1/1
2	NAG	G	2	2	-	5/6/23/26	0/1/1/1
2	NAG	H	1	2	-	4/6/23/26	0/1/1/1
2	NAG	H	2	2	-	5/6/23/26	0/1/1/1

The worst 5 of 10 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	H	2	NAG	O7-C7	8.90	1.43	1.23
2	H	1	NAG	O7-C7	8.35	1.42	1.23
2	H	1	NAG	C7-N2	3.46	1.46	1.34
2	D	2	NAG	C2-N2	-3.15	1.40	1.46
2	G	1	NAG	C2-N2	-2.91	1.41	1.46

The worst 5 of 58 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	H	2	NAG	O7-C7-N2	-8.16	106.94	121.95
2	D	1	NAG	C1-O5-C5	8.14	123.22	112.19
2	H	1	NAG	O7-C7-C8	-7.95	107.29	122.06

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	F	1	NAG	C1-O5-C5	7.39	122.21	112.19
2	E	2	NAG	C4-C3-C2	-7.13	100.57	111.02

There are no chirality outliers.

5 of 31 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	G	2	NAG	C1-C2-N2-C7
2	H	1	NAG	O7-C7-N2-C2
2	G	1	NAG	C3-C2-N2-C7
2	H	2	NAG	O7-C7-N2-C2
2	F	2	NAG	C4-C5-C6-O6

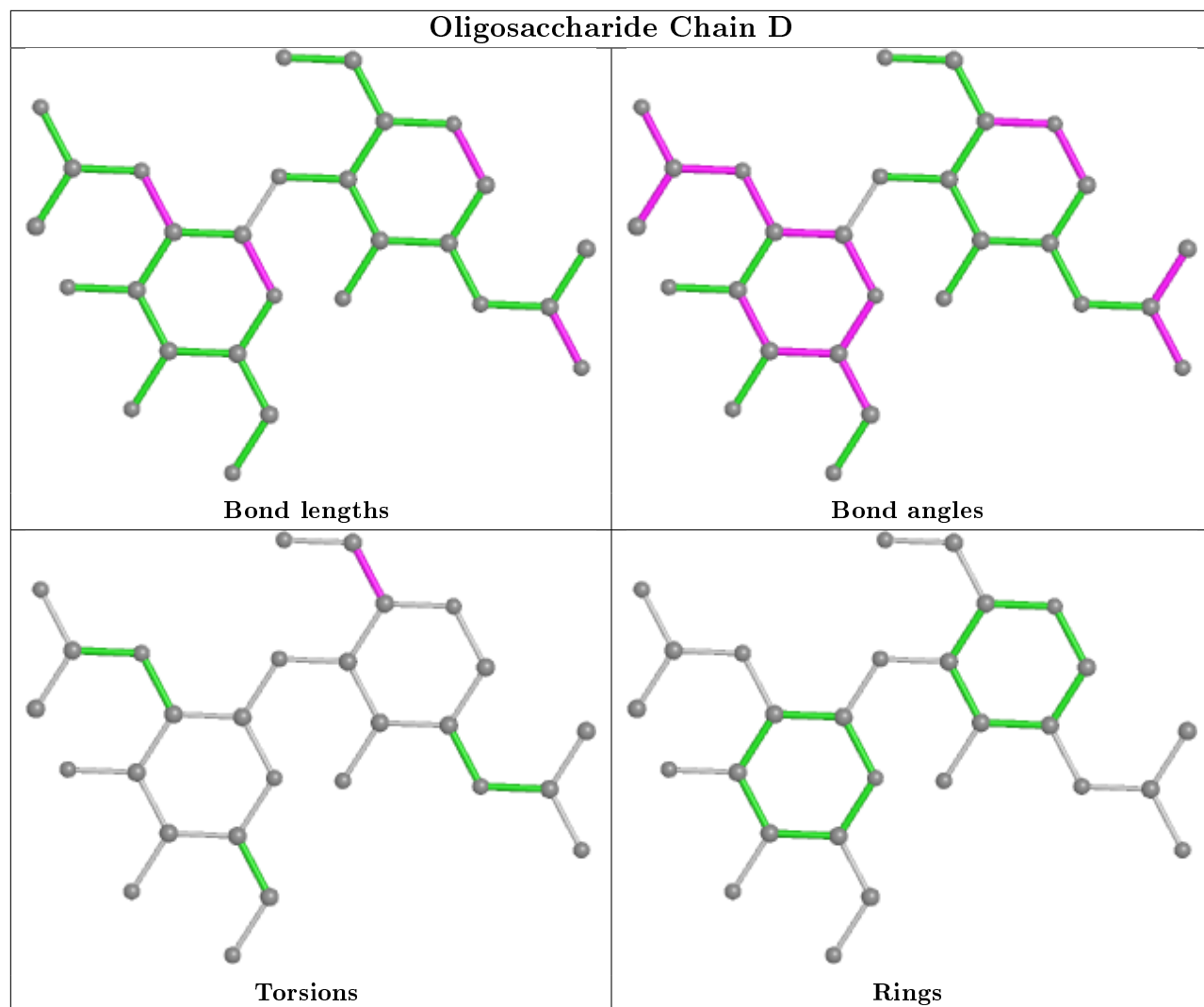
There are no ring outliers.

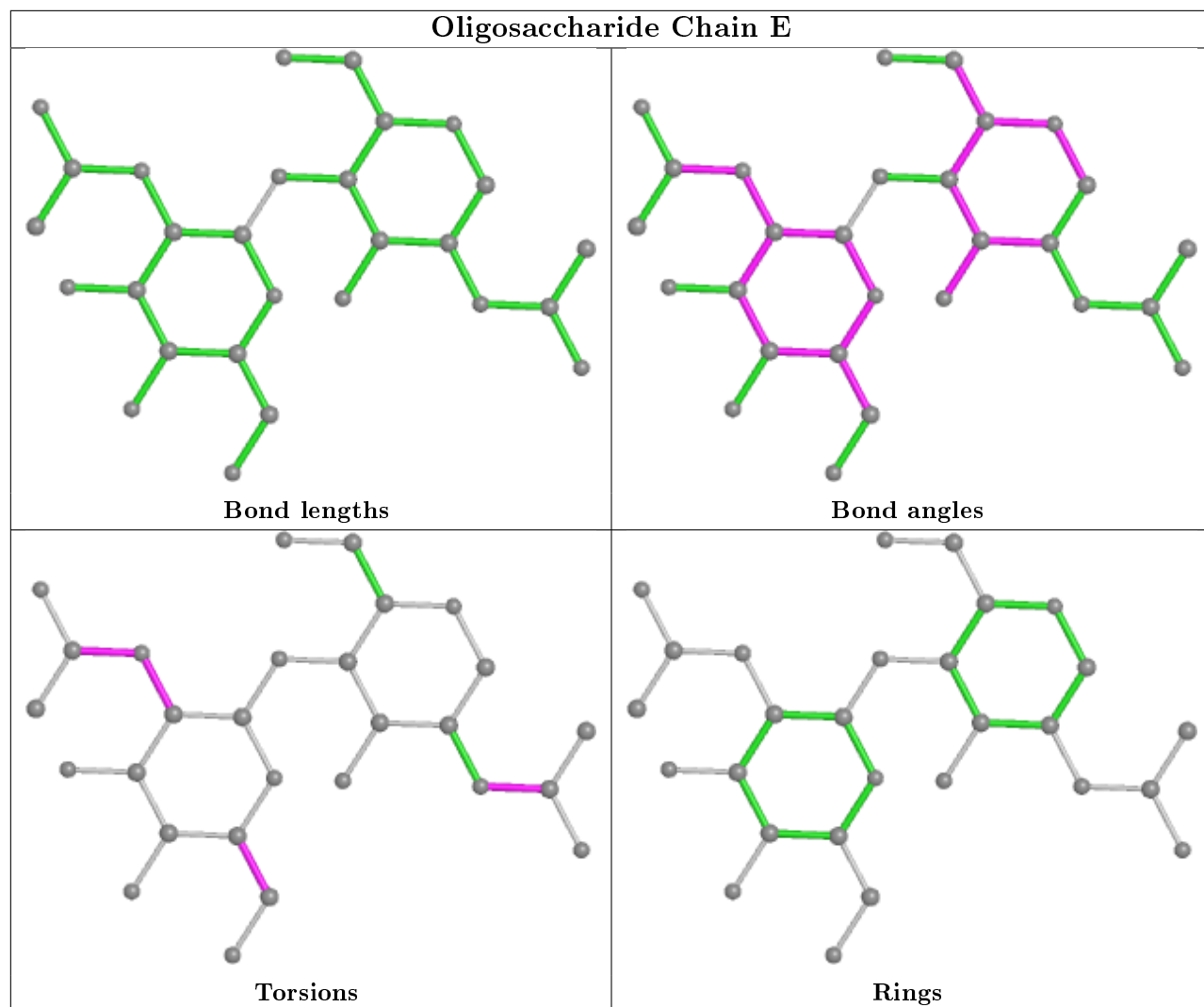
6 monomers are involved in 16 short contacts:

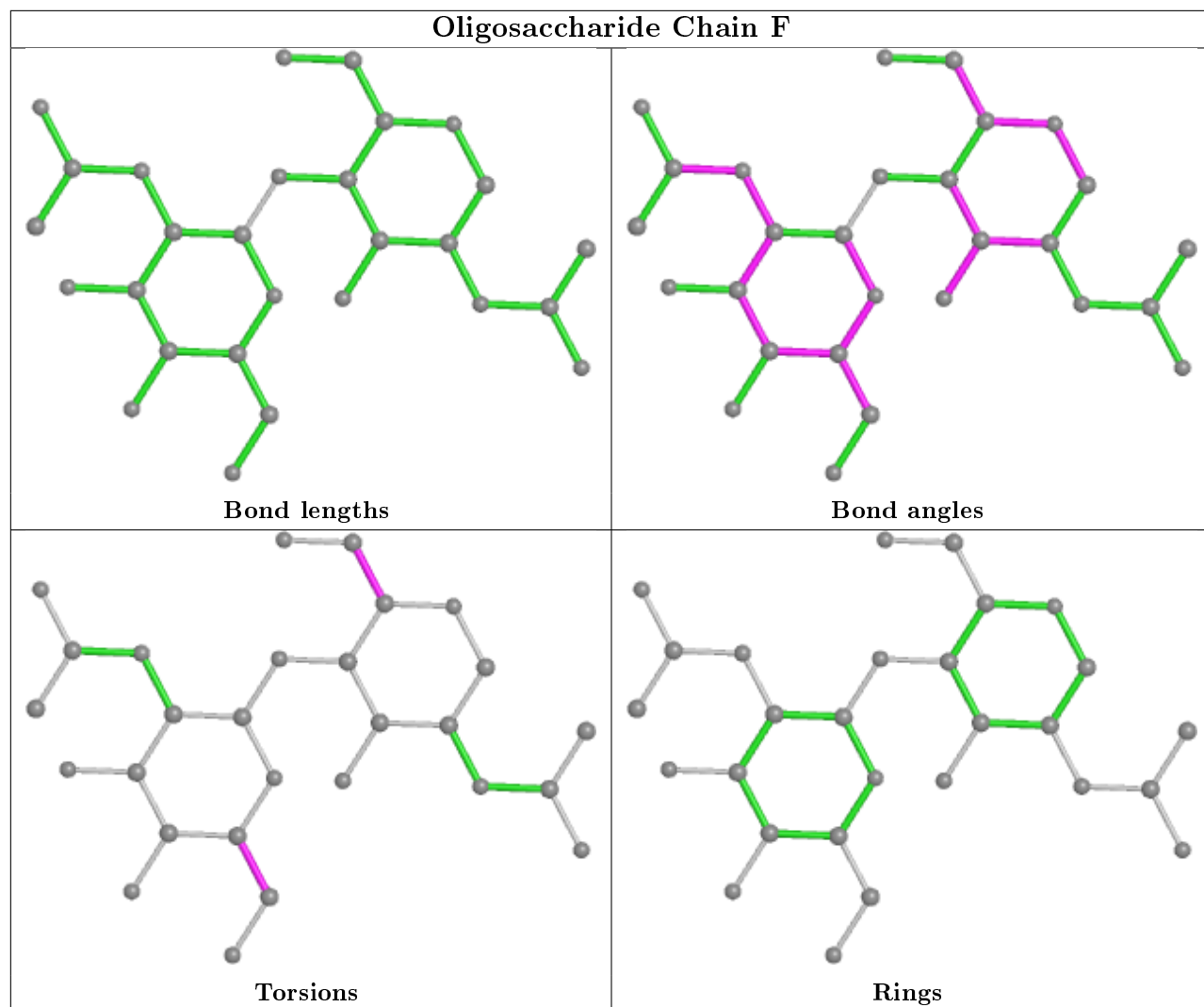
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	G	2	NAG	5	0
2	H	1	NAG	2	0
2	E	1	NAG	1	0
2	G	1	NAG	6	0
2	D	1	NAG	2	0
2	E	2	NAG	3	0

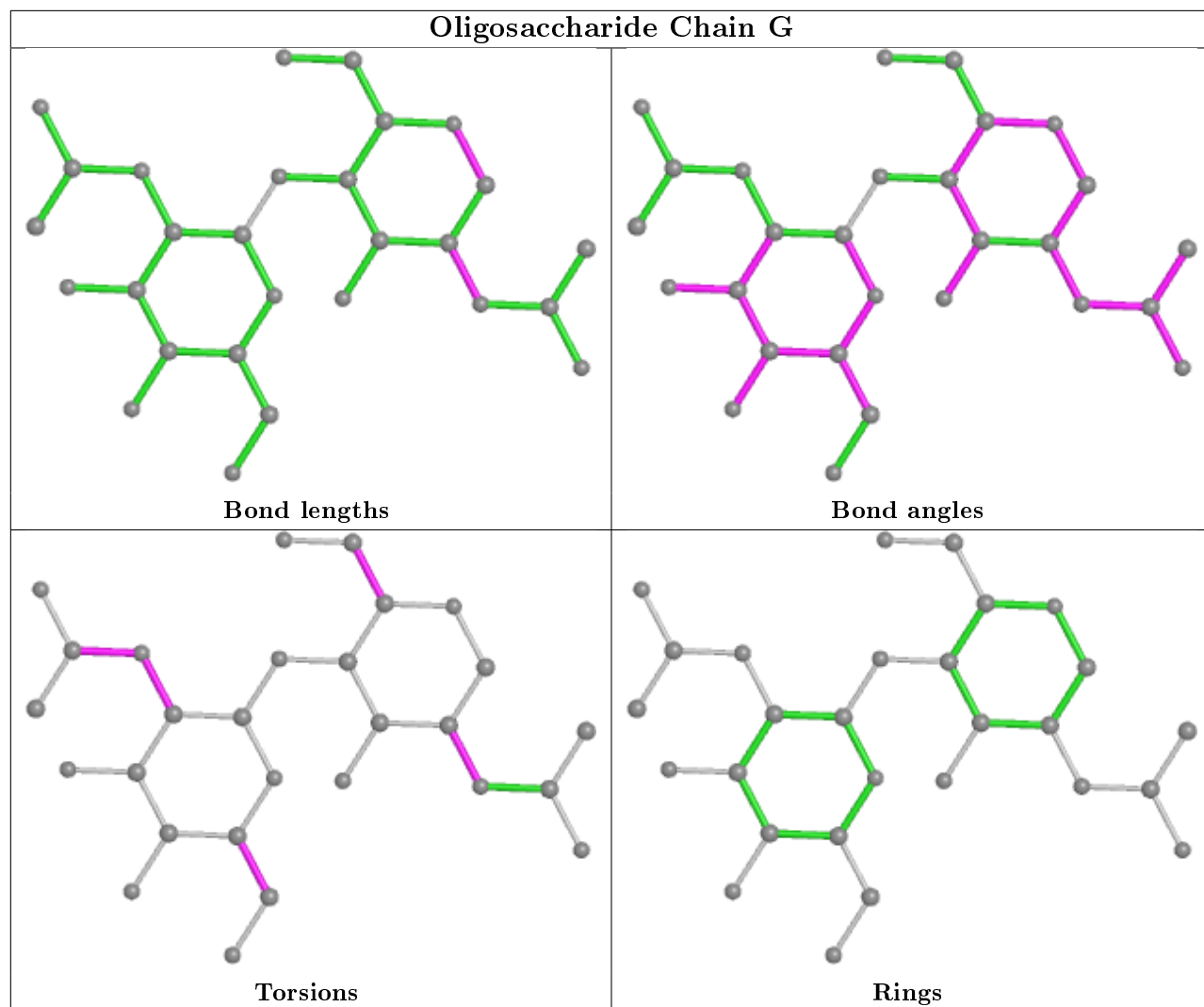
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

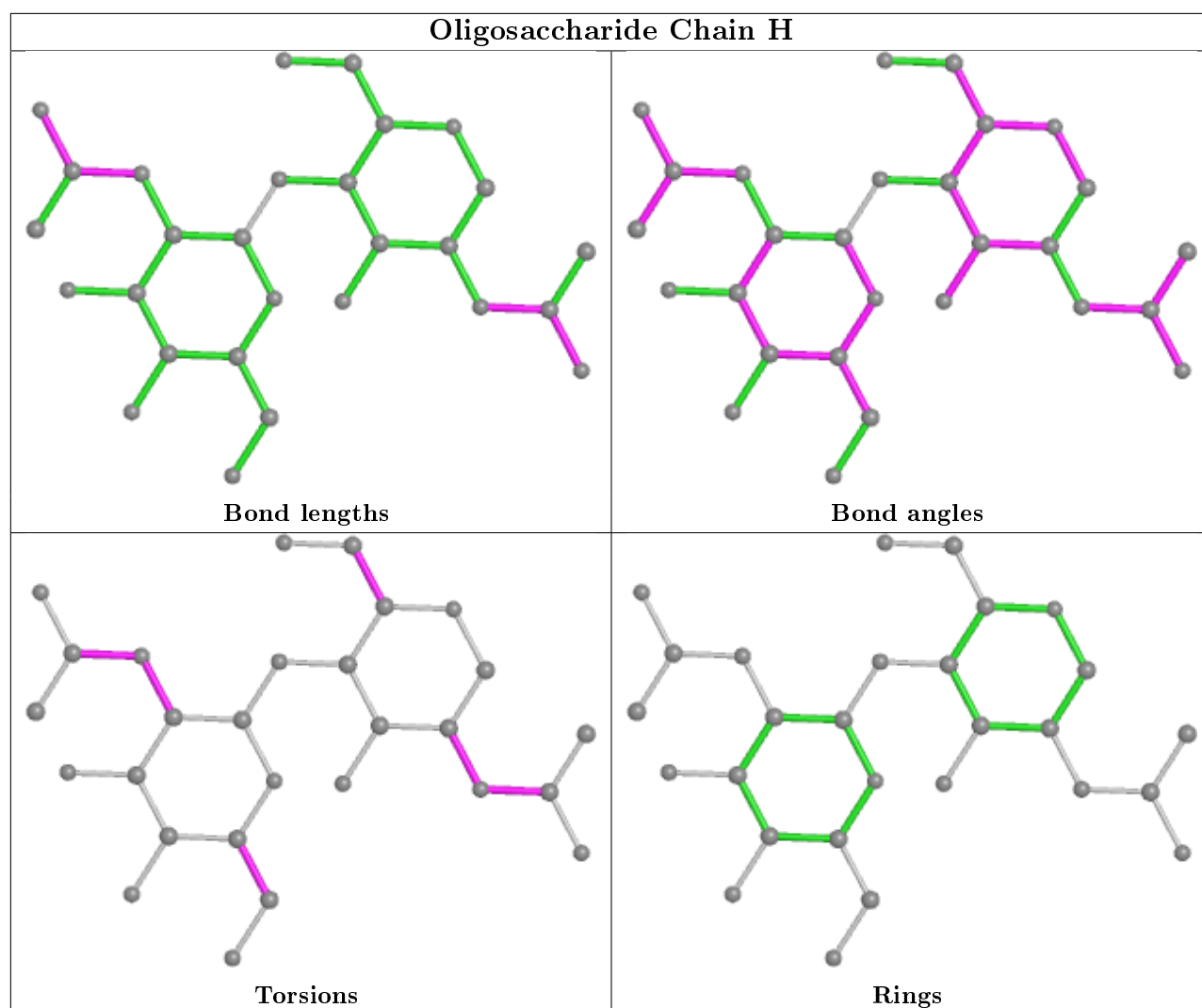












## 5.6 Ligand geometry [i](#)

Of 28 ligands modelled in this entry, 12 are monoatomic - leaving 16 for Mogul analysis.

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	GOL	B	510	-	5,5,5	0.15	0	5,5,5	0.55	0
4	SO4	B	505	-	4,4,4	0.43	0	6,6,6	0.36	0
5	GOL	A	508	-	5,5,5	0.30	0	5,5,5	0.45	0
4	SO4	C	505	-	4,4,4	0.12	0	6,6,6	0.23	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
4	SO4	A	506	-	4,4,4	0.15	0	6,6,6	0.13	0
5	GOL	B	511	-	5,5,5	0.39	0	5,5,5	0.68	0
5	GOL	B	512	-	5,5,5	0.15	0	5,5,5	0.38	0
5	GOL	A	509	-	5,5,5	0.26	0	5,5,5	0.50	0
4	SO4	B	507	-	4,4,4	0.13	0	6,6,6	0.35	0
4	SO4	A	507	-	4,4,4	0.18	0	6,6,6	0.37	0
4	SO4	B	506	-	4,4,4	0.37	0	6,6,6	0.66	0
5	GOL	C	506	-	5,5,5	0.22	0	5,5,5	0.41	0
5	GOL	B	513	-	5,5,5	0.25	0	5,5,5	0.47	0
5	GOL	B	509	-	5,5,5	0.33	0	5,5,5	0.42	0
5	GOL	B	508	-	5,5,5	0.51	0	5,5,5	0.77	0
4	SO4	A	505	-	4,4,4	0.12	0	6,6,6	0.21	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	GOL	B	510	-	-	2/4/4/4	-
5	GOL	A	508	-	-	0/4/4/4	-
5	GOL	B	508	-	-	4/4/4/4	-
5	GOL	B	511	-	-	2/4/4/4	-
5	GOL	B	512	-	-	0/4/4/4	-
5	GOL	A	509	-	-	2/4/4/4	-
5	GOL	C	506	-	-	0/4/4/4	-
5	GOL	B	513	-	-	1/4/4/4	-
5	GOL	B	509	-	-	3/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

5 of 14 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	B	509	GOL	O1-C1-C2-O2
5	B	509	GOL	O1-C1-C2-C3
5	B	511	GOL	O1-C1-C2-C3
5	B	510	GOL	C1-C2-C3-O3
5	B	508	GOL	C1-C2-C3-O3

There are no ring outliers.

10 monomers are involved in 25 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	B	510	GOL	2	0
5	A	508	GOL	1	0
5	B	511	GOL	1	0
5	B	512	GOL	2	0
5	A	509	GOL	2	0
4	B	506	SO4	6	0
5	C	506	GOL	1	0
5	B	513	GOL	2	0
5	B	509	GOL	2	0
5	B	508	GOL	6	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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	495/495 (100%)	-0.56	3 (0%) 89 91	10, 18, 32, 42	0
1	B	495/495 (100%)	-0.44	4 (0%) 86 89	11, 21, 37, 54	0
1	C	495/495 (100%)	-0.44	8 (1%) 72 77	11, 21, 37, 50	0
All	All	1485/1485 (100%)	-0.48	15 (1%) 82 86	10, 20, 36, 54	0

The worst 5 of 15 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	415	SER	4.0
1	B	320	ASN	3.9
1	A	165	ALA	3.3
1	C	381	ASN	2.8
1	C	415	SER	2.7

### 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
2	NAG	F	2	14/15	0.61	0.29	69,71,73,73	0
2	NAG	G	2	14/15	0.62	0.39	73,74,75,76	0
2	NAG	E	2	14/15	0.65	0.30	50,55,56,56	0

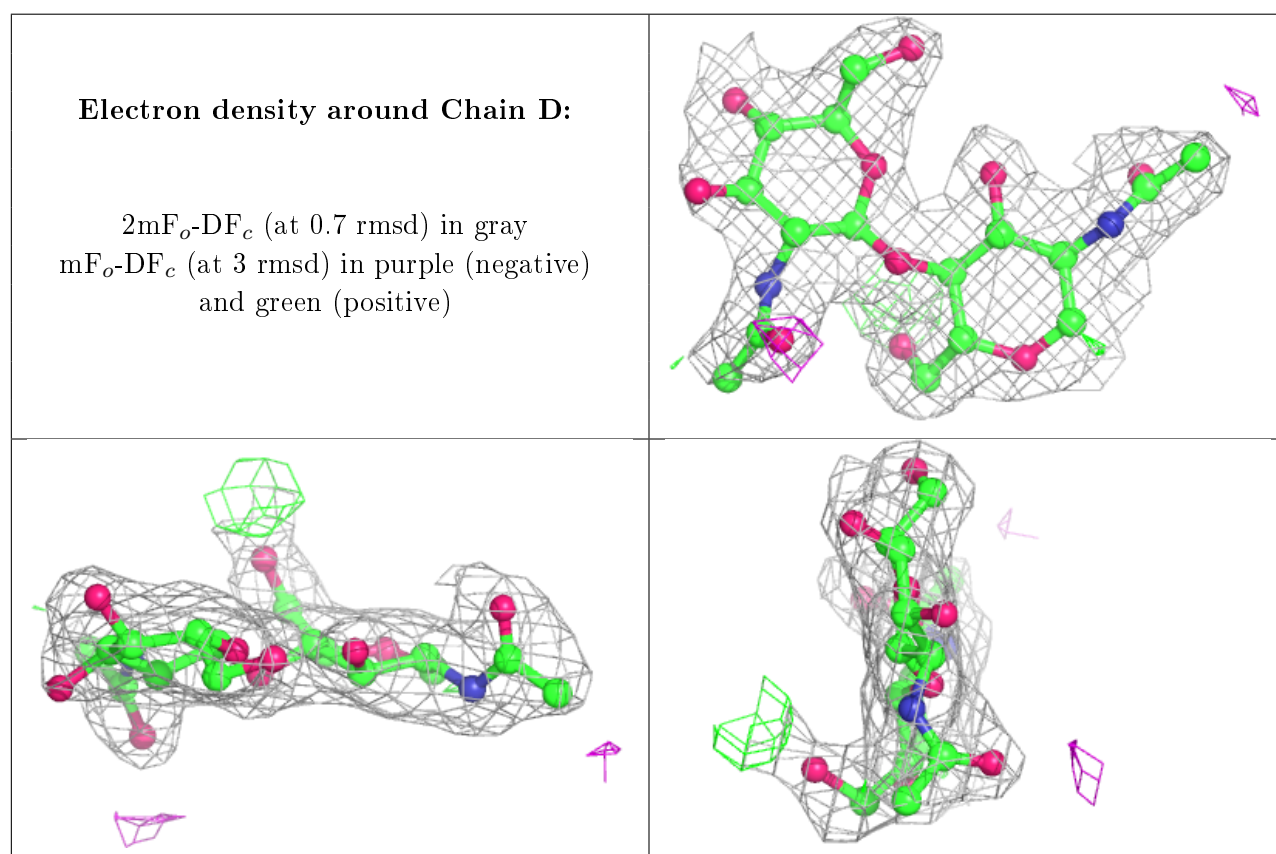
*Continued on next page...*



*Continued from previous page...*

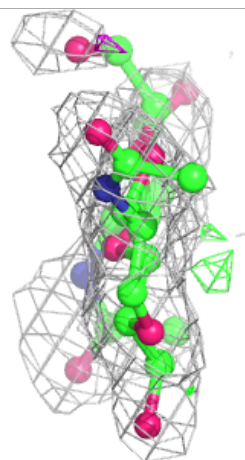
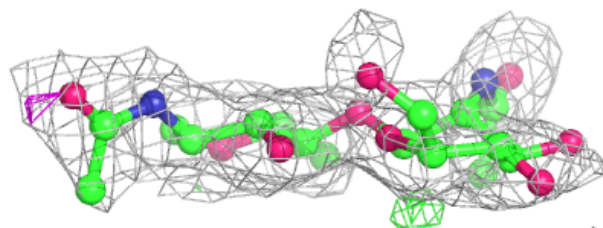
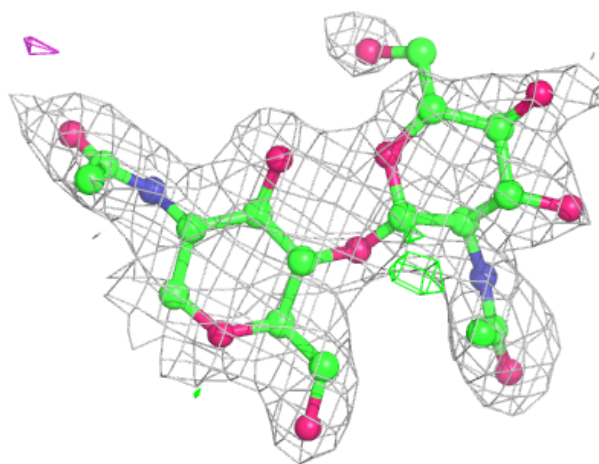
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
2	NAG	H	2	14/15	0.74	0.21	61,64,66,67	0
2	NAG	G	1	14/15	0.80	0.17	62,65,67,70	0
2	NAG	H	1	14/15	0.80	0.19	58,61,62,63	0
2	NAG	F	1	14/15	0.80	0.21	67,69,70,70	0
2	NAG	D	1	14/15	0.86	0.15	35,39,42,44	0
2	NAG	D	2	14/15	0.89	0.23	47,50,51,52	0
2	NAG	E	1	14/15	0.90	0.12	43,44,46,50	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.



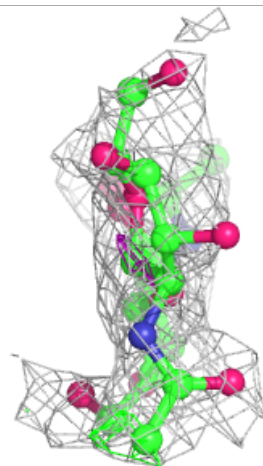
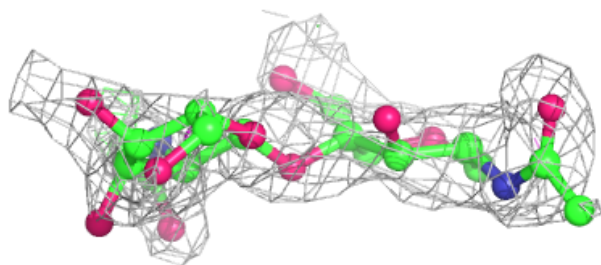
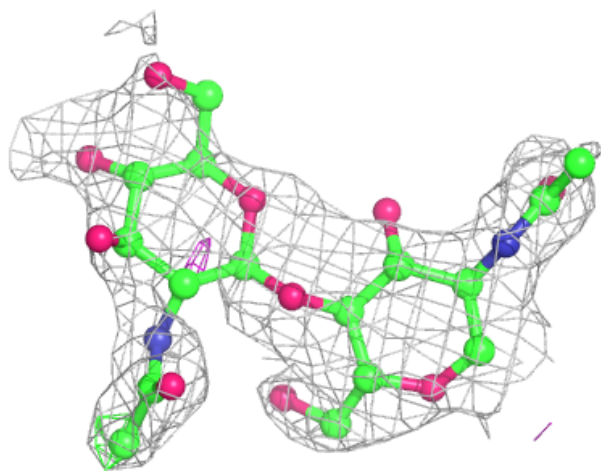
**Electron density around Chain E:**

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



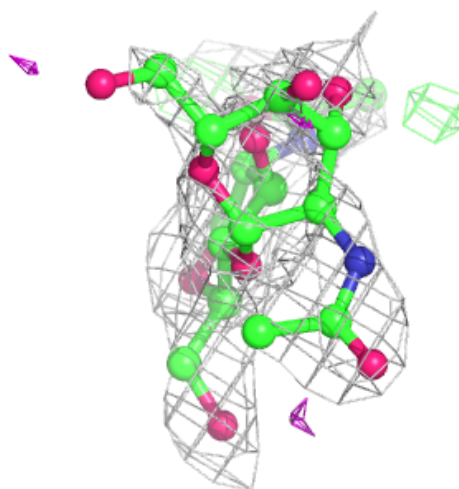
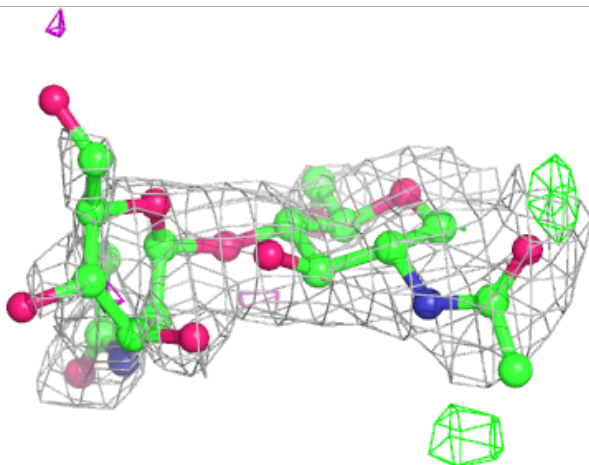
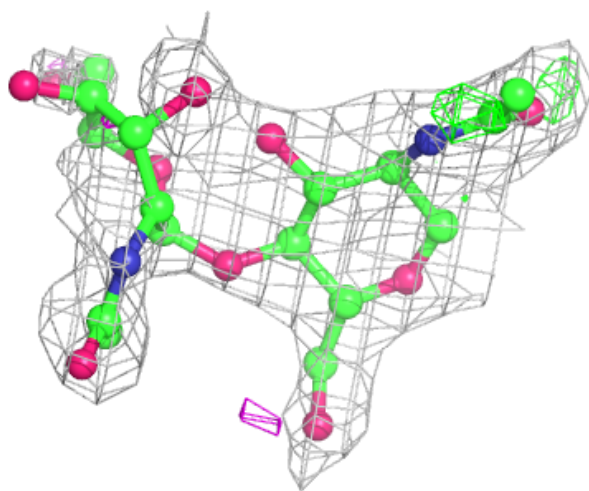
**Electron density around Chain F:**

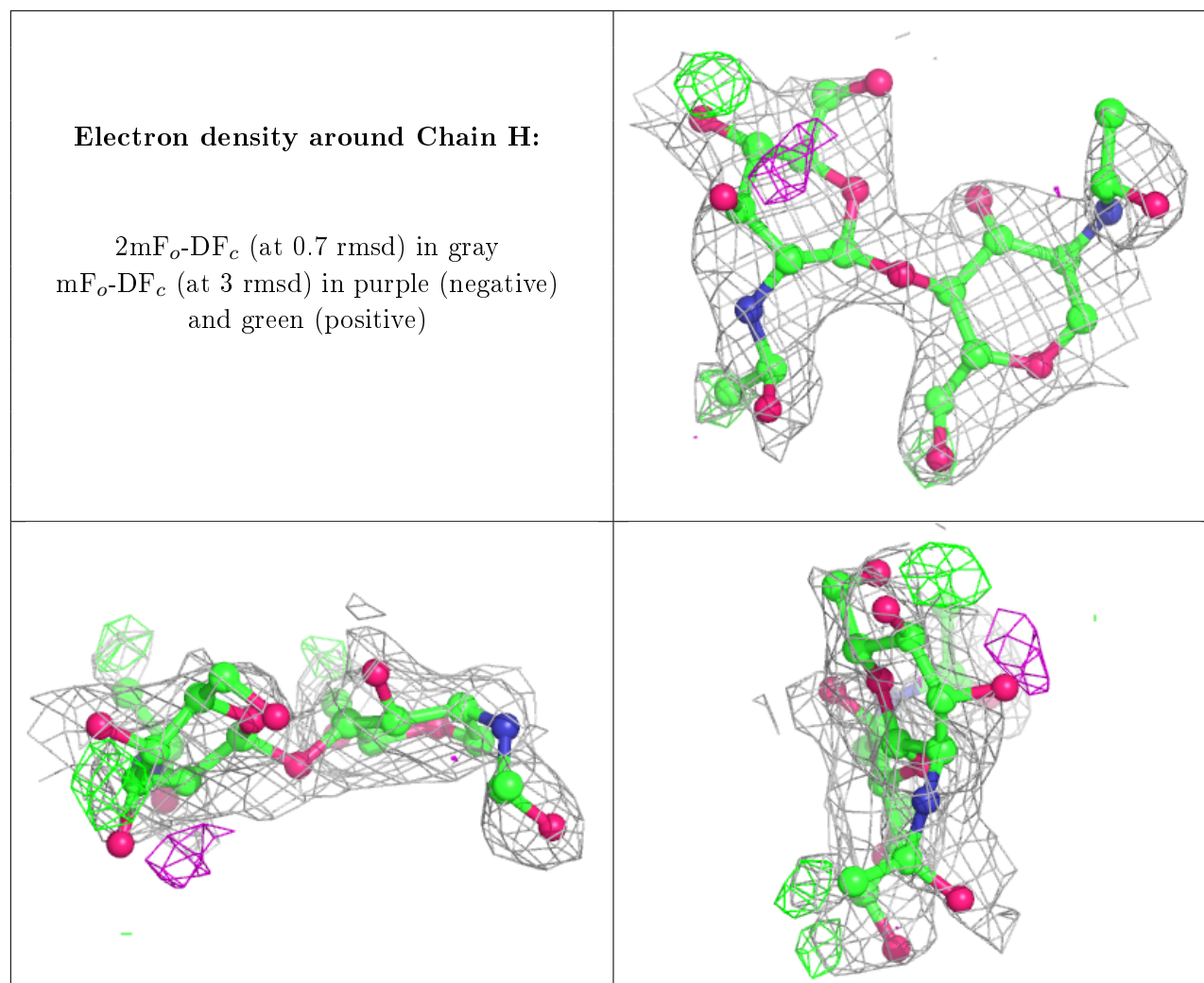
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



**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 ⓘ

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, 95<sup>th</sup> 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
4	SO4	C	505	5/5	0.75	0.32	35,36,37,37	5
5	GOL	A	509	6/6	0.85	0.15	40,45,46,46	0
5	GOL	B	510	6/6	0.87	0.15	39,39,39,41	0
5	GOL	B	513	6/6	0.90	0.21	31,34,36,37	0
5	GOL	B	509	6/6	0.91	0.14	32,34,36,37	0
5	GOL	B	508	6/6	0.93	0.26	32,37,38,39	0
4	SO4	B	507	5/5	0.93	0.14	21,21,22,23	5
5	GOL	C	506	6/6	0.94	0.10	31,32,34,37	0
4	SO4	A	507	5/5	0.95	0.12	15,16,18,18	5

*Continued on next page...*

*Continued from previous page...*

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
5	GOL	B	511	6/6	0.95	0.08	26,29,31,31	0
5	GOL	B	512	6/6	0.95	0.12	23,26,27,28	0
5	GOL	A	508	6/6	0.95	0.09	30,31,32,33	0
4	SO4	A	506	5/5	0.98	0.15	59,59,59,60	0
4	SO4	A	505	5/5	0.98	0.11	45,47,47,48	0
3	CU	B	504	1/1	0.99	0.06	20,20,20,20	0
3	CU	A	503	1/1	0.99	0.04	18,18,18,18	0
3	CU	C	502	1/1	0.99	0.05	17,17,17,17	0
4	SO4	B	505	5/5	0.99	0.06	16,20,23,24	0
4	SO4	B	506	5/5	0.99	0.08	24,27,29,29	0
3	CU	A	502	1/1	1.00	0.03	14,14,14,14	0
3	CU	C	501	1/1	1.00	0.04	20,20,20,20	0
3	CU	A	504	1/1	1.00	0.06	15,15,15,15	0
3	CU	C	503	1/1	1.00	0.05	16,16,16,16	0
3	CU	B	501	1/1	1.00	0.04	19,19,19,19	0
3	CU	B	503	1/1	1.00	0.04	17,17,17,17	0
3	CU	B	502	1/1	1.00	0.03	17,17,17,17	0
3	CU	A	501	1/1	1.00	0.04	18,18,18,18	0
3	CU	C	504	1/1	1.00	0.06	18,18,18,18	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.