



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 07:02 AM UTC

PDB ID : 2CML / pdb\_00002cml  
Title : Structure of Neuraminidase from English Duck Subtype N6 Complexed with 30 MM ZANAMIVIR, Crystal Soaked for 3 Hours at 291 K.  
Authors : Rudino-Pinera, E.; Tunnah, P.; Lukacik, P.; Crennell, S.J.; Webster, R.G.; Laver, W.G.; Garman, E.F.  
Deposited on : 2006-05-10  
Resolution : 2.15 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](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 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)  
Xtrriage (Phenix) : 2.0  
EDS : 3.0  
Buster-report : wwPDB partial adaption of 1.1.7 (2018)  
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

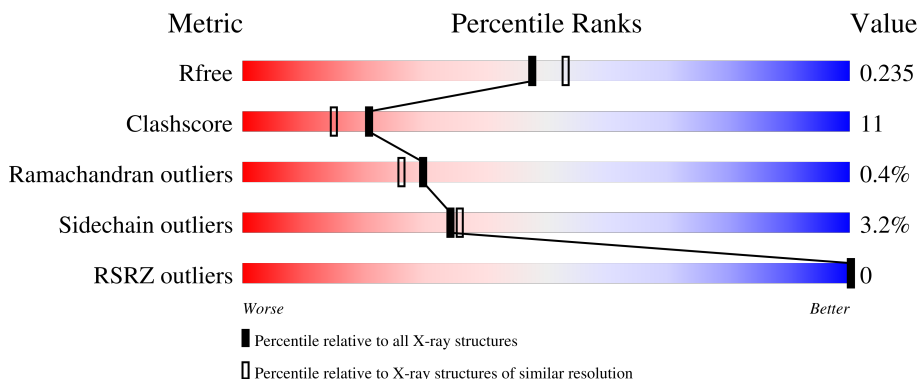
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.15 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))
$R_{free}$	180053	2057 (2.16-2.16)
Clashscore	190562	2159 (2.16-2.16)
Ramachandran outliers	187476	2134 (2.16-2.16)
Sidechain outliers	187428	2133 (2.16-2.16)
RSRZ outliers	180081	2059 (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 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  $\leq 5\%$ . 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	389	80% 18% ..
1	B	389	81% 15% ..
1	C	389	82% 16% .
1	D	389	83% 14% .

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Length	Quality of chain
2	E	2	 50% 50%
2	H	2	 100%
2	I	2	 100%
3	F	3	 100%
4	G	5	 100%

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
2	NAG	E	1	X	-	-	-
2	NAG	E	2	X	-	-	-
2	NAG	H	1	X	-	-	-
2	NAG	H	2	X	-	-	-
2	NAG	I	1	X	-	-	-
2	NAG	I	2	X	-	-	-
4	NAG	G	1	X	-	-	-
4	NAG	G	2	X	-	-	-
5	ZMR	A	1477	X	-	-	-
5	ZMR	A	1478	X	-	-	-
5	ZMR	B	2477	X	-	-	-
5	ZMR	B	2478	X	-	-	-
5	ZMR	C	3477	X	-	-	-
5	ZMR	C	3478	X	-	-	-
5	ZMR	D	4477	X	-	-	-
5	ZMR	D	4478	X	-	-	-
7	NAG	A	1482	X	-	-	-
7	NAG	A	1483	X	-	-	-
7	NAG	B	2480	X	-	-	-
7	NAG	B	2481	X	-	-	-
7	NAG	B	2482	X	-	-	-
7	NAG	B	2483	X	-	-	-
7	NAG	C	3486	X	-	-	-
7	NAG	C	3487	X	-	-	-
7	NAG	C	3488	X	-	-	-
7	NAG	D	4482	X	-	X	-
7	NAG	D	4483	X	-	-	-
9	MAN	B	2484	-	-	X	-

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Type</b>	<b>Chain</b>	<b>Res</b>	<b>Chirality</b>	<b>Geometry</b>	<b>Clashes</b>	<b>Electron density</b>
9	MAN	C	3490	-	-	X	-

## 2 Entry composition [i](#)

There are 10 unique types of molecules in this entry. The entry contains 13060 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 NEURAMINIDASE.

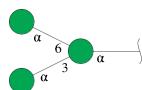
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	389	Total 3008	C 1875	N 535	O 571	S 27	0	0	0
1	B	389	Total 3008	C 1875	N 535	O 571	S 27	0	0	0
1	C	389	Total 3008	C 1875	N 535	O 571	S 27	0	0	0
1	D	389	Total 3009	C 1875	N 535	O 572	S 27	0	0	0

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



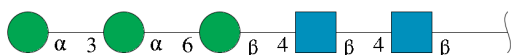
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
2	E	2	Total 28	C 16	N 2	O 10	0	0	0
2	H	2	Total 28	C 16	N 2	O 10	0	0	0
2	I	2	Total 28	C 16	N 2	O 10	0	0	0

- Molecule 3 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose.



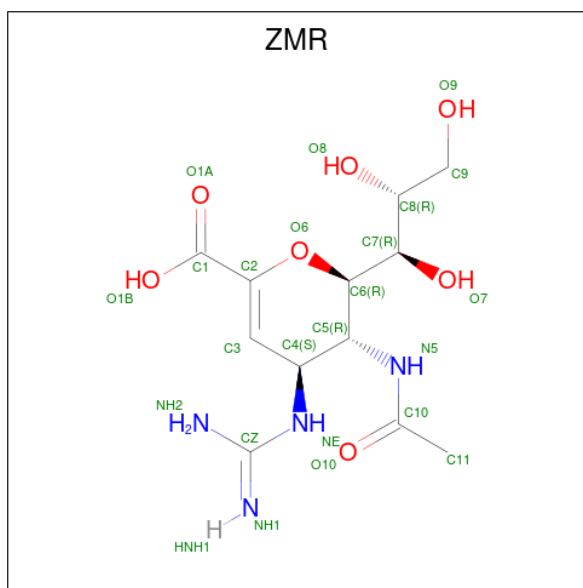
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	Trace
3	F	3	Total	C	O	0	0	0
			33	18	15			

- Molecule 4 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-alpha-D-mannopyranose-(1-6)-beta-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	G	5	Total	C	N	O	0	0	0
			61	34	2	25			

- Molecule 5 is ZANAMIVIR (CCD ID: ZMR) (formula:  $C_{12}H_{20}N_4O_7$ ).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total	C	N	O	0	0
			23	12	4	7		
5	A	1	Total	C	N	O	0	0
			23	12	4	7		
5	B	1	Total	C	N	O	0	0
			23	12	4	7		
5	B	1	Total	C	N	O	0	0
			23	12	4	7		

*Continued on next page...*

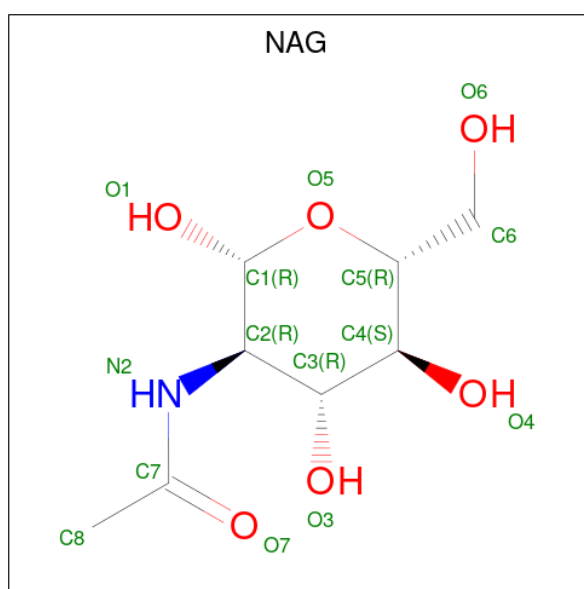
Continued from previous page...

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	C	1	Total	C	N	O	0	0
			23	12	4	7		
5	C	1	Total	C	N	O	0	0
			23	12	4	7		
5	D	1	Total	C	N	O	0	0
			23	12	4	7		
5	D	1	Total	C	N	O	0	0
			23	12	4	7		

- Molecule 6 is CALCIUM ION (CCD ID: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	1	Total	Ca	0	0
			1	1		
6	B	1	Total	Ca	0	0
			1	1		
6	C	1	Total	Ca	0	0
			1	1		
6	D	1	Total	Ca	0	0
			1	1		

- Molecule 7 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: C<sub>8</sub>H<sub>15</sub>NO<sub>6</sub>).



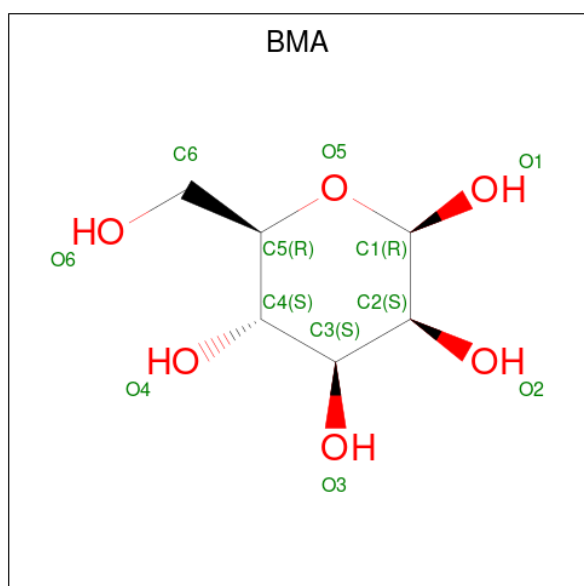
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
7	A	1	Total	C	N	O	0	0
			14	8	1	5		

Continued on next page...

Continued from previous page...

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

- Molecule 8 is beta-D-mannopyranose (CCD ID: BMA) (formula: C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>).



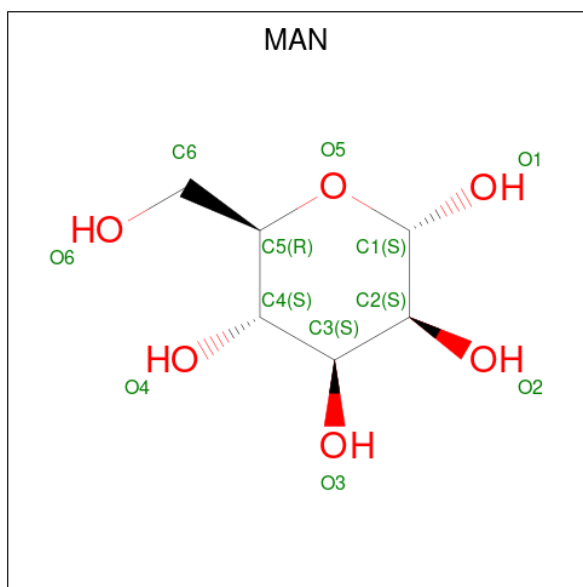
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
8	A	1	Total	C	O	0	0
			11	6	5		

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	C	1	Total C O 11 6 5	0	0
8	D	1	Total C O 11 6 5	0	0

- Molecule 9 is alpha-D-mannopyranose (CCD ID: MAN) (formula: C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	B	1	Total C O 11 6 5	0	0
9	B	1	Total C O 11 6 5	0	0
9	B	1	Total C O 11 6 5	0	0
9	C	1	Total C O 11 6 5	0	0
9	C	1	Total C O 11 6 5	0	0
9	C	1	Total C O 11 6 5	0	0
9	D	1	Total C O 11 6 5	0	0
9	D	1	Total C O 11 6 5	0	0


- Molecule 10 is water.

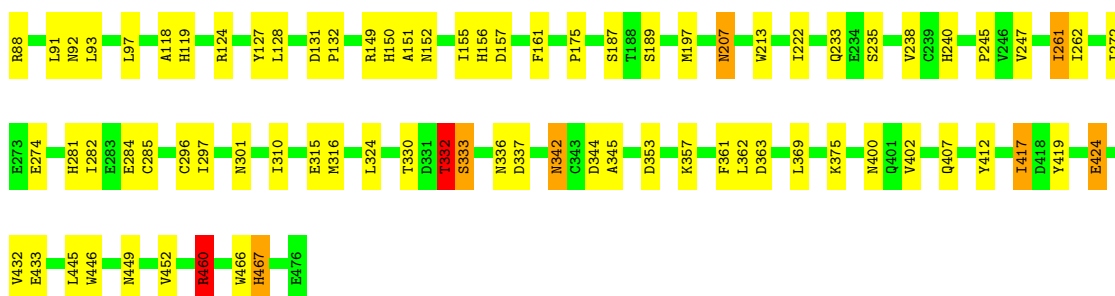
<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>ZeroOcc</b>	<b>AltConf</b>
10	A	103	Total 103	O 103	0	0
10	B	109	Total 109	O 109	0	0
10	C	96	Total 96	O 96	0	0
10	D	78	Total 78	O 78	0	0

### 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 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.

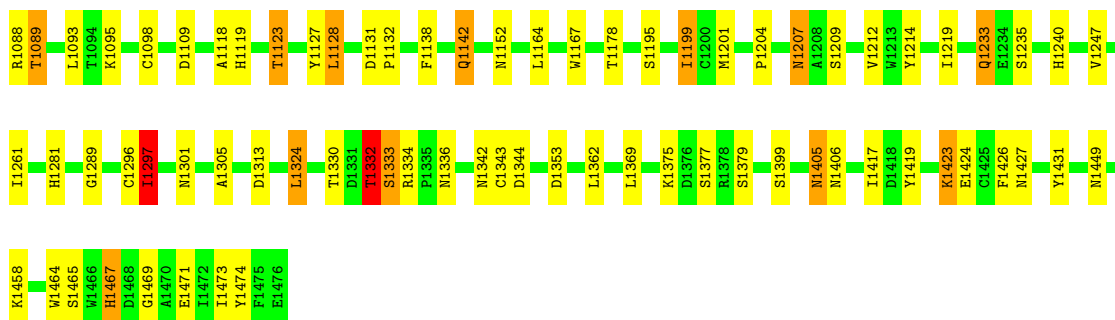
#### • Molecule 1: NEURAMINIDASE

Chain A: 




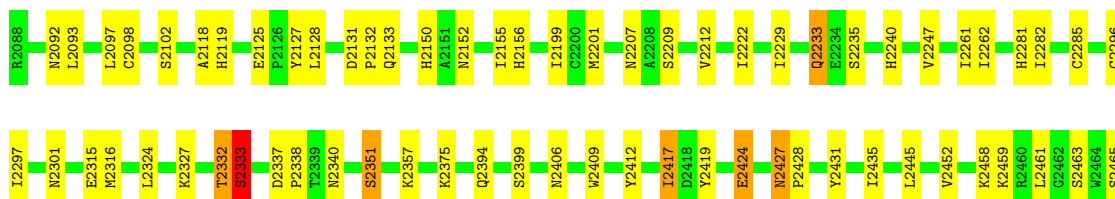
#### • Molecule 1: NEURAMINIDASE

Chain B: 



#### • Molecule 1: NEURAMINIDASE

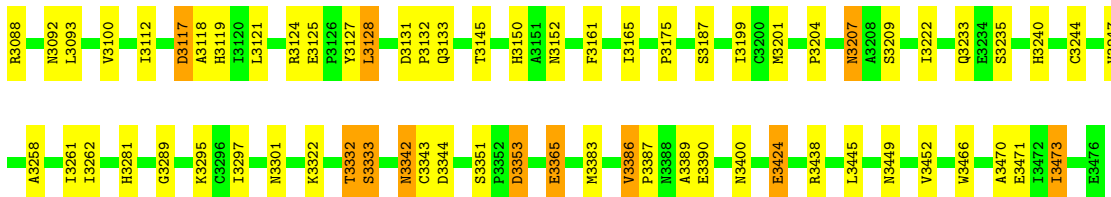
Chain C: 





- Molecule 1: NEURAMINIDASE

Chain D: 83% 14%



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

Chain E: 50% 50%



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

Chain H: 100%



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

Chain I: 100%



- Molecule 3: alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose

Chain F: 100%



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

Chain G: 100%

MAC1  
MAC2  
BMA3  
MAN4  
MAN5

## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	106.24Å 73.69Å 106.68Å 90.00° 90.29° 90.00°	Depositor
Resolution (Å)	30.70 – 2.15 30.70 – 2.15	Depositor EDS
% Data completeness (in resolution range)	90.3 (30.70-2.15) 90.2 (30.70-2.15)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.52 (at 2.16Å)	Xtrriage
Refinement program	REFMAC 5.2.0005	Depositor
R, $R_{free}$	0.180 , 0.232 0.186 , 0.235	Depositor DCC
$R_{free}$ test set	4038 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	15.1	Xtrriage
Anisotropy	0.217	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.40 , 34.5	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	0.017 for l,k,-h 0.025 for h,-k,-l 0.021 for l,-k,h	Xtrriage
$F_o, F_c$ correlation	0.93	EDS
Total number of atoms	13060	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	13.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.45% 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: ZMR, NAG, MAN, CA, BMA

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	1.24	5/3083 (0.2%)	1.17	12/4185 (0.3%)
1	B	1.24	3/3083 (0.1%)	1.16	12/4185 (0.3%)
1	C	1.27	5/3083 (0.2%)	1.14	8/4185 (0.2%)
1	D	1.29	8/3084 (0.3%)	1.20	9/4185 (0.2%)
All	All	1.26	21/12333 (0.2%)	1.17	41/16740 (0.2%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	B	0	1
1	C	0	1
1	D	0	1
All	All	0	4

All (21) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	3222	ILE	CA-CB	9.25	1.61	1.54
1	C	2222	ILE	CA-CB	8.78	1.60	1.54
1	D	3125	GLU	CA-C	8.19	1.58	1.53
1	D	3258	ALA	CA-CB	7.02	1.62	1.53
1	B	1123	THR	CA-CB	6.70	1.64	1.53
1	D	3125	GLU	C-O	6.66	1.26	1.23
1	A	261	ILE	CA-CB	6.17	1.61	1.54
1	B	1297	ILE	CA-CB	6.00	1.61	1.54
1	C	2452	VAL	CA-CB	5.94	1.63	1.54
1	A	432	VAL	CA-CB	5.91	1.62	1.54

*Continued on next page...*

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	3117	ASP	CA-C	5.88	1.59	1.52
1	A	297	ILE	CA-CB	5.63	1.61	1.54
1	D	3100	VAL	CA-CB	5.57	1.61	1.54
1	B	1199	ILE	CA-CB	5.55	1.61	1.54
1	D	3165	ILE	CA-CB	5.55	1.62	1.54
1	A	417	ILE	CA-CB	5.55	1.62	1.54
1	D	3297	ILE	CA-CB	5.35	1.60	1.54
1	C	2417	ILE	CA-CB	5.24	1.62	1.54
1	C	2435	ILE	CA-CB	5.11	1.60	1.54
1	A	222	ILE	CA-CB	5.06	1.60	1.54
1	C	2282	ILE	CA-CB	5.01	1.60	1.54

All (41) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	2118	ALA	N-CA-C	-8.13	98.49	110.52
1	C	2233	GLN	N-CA-C	7.73	120.79	111.82
1	D	3118	ALA	CA-C-N	-7.38	112.01	122.41
1	D	3118	ALA	C-N-CA	-7.38	112.01	122.41
1	A	118	ALA	CA-C-N	-7.19	111.94	123.23
1	A	118	ALA	C-N-CA	-7.19	111.94	123.23
1	D	3244	CYS	CA-C-N	-6.79	112.94	120.14
1	D	3244	CYS	C-N-CA	-6.79	112.94	120.14
1	A	157	ASP	N-CA-C	6.57	119.44	111.82
1	B	1313	ASP	CA-C-N	6.48	127.04	120.04
1	B	1313	ASP	C-N-CA	6.48	127.04	120.04
1	B	1118	ALA	CA-C-N	-6.48	113.18	122.77
1	B	1118	ALA	C-N-CA	-6.48	113.18	122.77
1	A	332	THR	CA-C-N	6.30	133.57	121.54
1	A	332	THR	C-N-CA	6.30	133.57	121.54
1	B	1305	ALA	N-CA-C	-6.10	105.84	113.28
1	D	3438	ARG	N-CA-C	6.04	118.24	109.84
1	B	1118	ALA	N-CA-C	-6.03	102.03	110.35
1	C	2427	ASN	N-CA-C	5.95	117.52	109.24
1	B	1089	THR	N-CA-C	5.74	118.12	109.23
1	A	361	PHE	N-CA-C	-5.72	99.86	109.07
1	A	187	SER	N-CA-C	5.47	117.11	108.96
1	B	1109	ASP	N-CA-C	5.42	119.95	113.23
1	A	156	HIS	CB-CA-C	5.41	118.33	109.90
1	D	3353	ASP	CA-C-N	5.37	124.98	119.56
1	D	3353	ASP	C-N-CA	5.37	124.98	119.56
1	A	460	ARG	CB-CA-C	5.35	120.02	111.73

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	1332	THR	CA-C-N	5.34	131.74	121.54
1	B	1332	THR	C-N-CA	5.34	131.74	121.54
1	A	345	ALA	CA-C-N	5.33	125.09	119.76
1	A	345	ALA	C-N-CA	5.33	125.09	119.76
1	C	2333	SER	N-CA-C	5.30	122.10	110.80
1	B	1333	SER	CB-CA-C	5.28	120.93	110.42
1	C	2155	ILE	CA-C-N	5.26	128.24	120.82
1	C	2155	ILE	C-N-CA	5.26	128.24	120.82
1	A	316	MET	N-CA-C	-5.19	106.91	113.18
1	D	3112	ILE	N-CA-C	5.15	115.37	110.53
1	C	2125	GLU	CA-C-N	5.14	125.61	120.52
1	C	2125	GLU	C-N-CA	5.14	125.61	120.52
1	D	3128	LEU	CA-CB-CG	5.05	133.99	116.30
1	B	1233	GLN	N-CA-C	5.04	116.86	111.36

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	332	THR	Peptide
1	B	1332	THR	Peptide
1	C	2332	THR	Peptide
1	D	3332	THR	Peptide

## 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	3008	0	2888	58	0
1	B	3008	0	2888	63	0
1	C	3008	0	2888	66	0
1	D	3009	0	2888	55	0
2	E	28	0	22	6	0
2	H	28	0	22	7	0
2	I	28	0	22	8	0
3	F	33	0	30	8	0
4	G	61	0	51	14	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	A	46	0	30	1	0
5	B	46	0	30	0	0
5	C	46	0	30	3	0
5	D	46	0	30	0	0
6	A	1	0	0	0	0
6	B	1	0	0	0	0
6	C	1	0	0	0	0
6	D	1	0	0	0	0
7	A	28	0	22	5	0
7	B	56	0	44	12	0
7	C	42	0	33	11	0
7	D	28	0	22	9	0
8	A	11	0	10	3	0
8	C	11	0	10	2	0
8	D	11	0	10	4	0
9	B	33	0	30	7	0
9	C	33	0	30	8	0
9	D	22	0	20	1	0
10	A	103	0	0	0	0
10	B	109	0	0	1	0
10	C	96	0	0	2	0
10	D	78	0	0	1	0
All	All	13060	0	12050	259	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 11.

All (259) 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:D:3152:ASN:HD21	7:D:4483:NAG:C1	1.01	1.60
1:A:152:ASN:HD21	7:A:1482:NAG:C1	0.98	1.59
1:C:2152:ASN:HD21	7:C:3487:NAG:C1	1.15	1.59
1:A:207:ASN:HD21	4:G:1:NAG:C1	0.97	1.57
1:A:92:ASN:HD21	2:E:1:NAG:C1	1.10	1.56
1:B:1152:ASN:HD21	7:B:2480:NAG:C1	0.88	1.50
1:D:3207:ASN:HD21	2:I:1:NAG:C1	1.25	1.45
1:D:3092:ASN:ND2	7:D:4482:NAG:H2	1.17	1.41
1:C:2207:ASN:HD22	2:H:1:NAG:C1	1.46	1.20
1:D:3207:ASN:ND2	2:I:1:NAG:C1	2.09	1.14
1:D:3092:ASN:ND2	7:D:4482:NAG:C2	2.13	1.10

Continued on next page...

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1207:ASN:HD21	7:B:2482:NAG:C2	1.73	1.02
8:A:1709:BMA:O6	3:F:1:MAN:C1	2.07	1.01
1:D:3092:ASN:HD22	7:D:4482:NAG:C2	1.73	1.01
7:B:2482:NAG:O4	7:B:2483:NAG:C1	2.09	1.00
9:C:3490:MAN:C1	4:G:3:BMA:O3	2.10	0.99
1:B:1093:LEU:H	1:B:1240:HIS:HD2	0.97	0.96
8:A:1709:BMA:C1	7:B:2483:NAG:O4	2.14	0.96
9:C:3484:MAN:C1	4:G:4:MAN:O6	2.13	0.95
8:C:3493:BMA:C1	2:H:2:NAG:O4	2.15	0.93
1:B:1207:ASN:HD21	7:B:2482:NAG:H2	1.33	0.92
1:C:2150:HIS:HE1	1:D:3471:GLU:H	1.13	0.92
1:D:3092:ASN:HD21	7:D:4482:NAG:H2	1.09	0.92
1:C:2092:ASN:HD21	7:C:3486:NAG:C1	1.83	0.92
1:C:2207:ASN:HD21	2:H:1:NAG:C1	1.76	0.91
1:B:1471:GLU:H	1:D:3150:HIS:HE1	1.07	0.91
1:D:3333:SER:HB2	1:D:3353:ASP:O	1.70	0.91
1:B:1093:LEU:H	1:B:1240:HIS:CD2	1.88	0.89
1:D:3233:GLN:HE21	1:D:3247:VAL:H	1.22	0.88
1:C:2093:LEU:H	1:C:2240:HIS:HD2	1.20	0.88
3:F:1:MAN:HO6	3:F:3:MAN:C1	1.82	0.86
1:D:3295:LYS:NZ	1:D:3390:GLU:OE2	2.08	0.85
1:D:3092:ASN:HD22	7:D:4482:NAG:H2	1.02	0.84
1:B:1333:SER:HB2	1:B:1353:ASP:O	1.78	0.83
1:A:152:ASN:HD21	7:A:1482:NAG:C2	1.89	0.82
1:A:92:ASN:CG	2:E:1:NAG:C1	2.53	0.82
1:A:150:HIS:HE1	1:C:2471:GLU:H	1.25	0.82
1:D:3093:LEU:H	1:D:3240:HIS:HD2	1.27	0.81
8:D:4486:BMA:C1	2:I:2:NAG:O4	2.27	0.81
1:C:2152:ASN:HD21	7:C:3487:NAG:C2	1.92	0.81
7:A:1482:NAG:O4	7:A:1483:NAG:C1	2.28	0.81
1:B:1233:GLN:HE21	1:B:1247:VAL:H	1.29	0.80
9:B:2484:MAN:O6	9:B:2485:MAN:C1	2.30	0.79
9:B:2484:MAN:O3	9:B:2486:MAN:H2	1.83	0.79
8:D:4486:BMA:O5	2:I:2:NAG:O4	2.01	0.78
1:C:2207:ASN:ND2	2:H:1:NAG:N2	2.31	0.78
1:C:2233:GLN:HE21	1:C:2247:VAL:H	1.30	0.78
1:A:93:LEU:H	1:A:240:HIS:HD2	1.30	0.78
1:A:333:SER:HB2	1:A:353:ASP:O	1.85	0.77
1:D:3386:VAL:HG22	1:D:3389:ALA:HB2	1.66	0.77
1:C:2207:ASN:ND2	2:H:1:NAG:C2	2.47	0.77
1:B:1207:ASN:ND2	7:B:2482:NAG:H2	2.01	0.76

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1471:GLU:H	1:D:3150:HIS:CE1	1.98	0.75
1:B:1207:ASN:HD21	7:B:2482:NAG:C1	1.98	0.75
9:C:3490:MAN:O2	9:C:3492:MAN:H3	1.86	0.75
1:C:2092:ASN:ND2	7:C:3486:NAG:C1	2.51	0.74
1:B:1405:ASN:C	1:B:1405:ASN:HD22	1.97	0.73
1:C:2102:SER:HB2	1:C:2459:LYS:O	1.90	0.72
1:B:1333:SER:CB	1:B:1353:ASP:O	2.38	0.71
1:A:152:ASN:CG	7:A:1482:NAG:C1	2.63	0.71
1:A:240:HIS:HE1	1:A:315:GLU:OE2	1.75	0.68
1:B:1471:GLU:N	1:D:3150:HIS:HE1	1.87	0.67
1:B:1281:HIS:HD2	1:B:1301:ASN:H	1.42	0.66
1:D:3093:LEU:H	1:D:3240:HIS:CD2	2.12	0.66
1:A:92:ASN:HD21	2:E:1:NAG:C2	2.03	0.66
1:A:233:GLN:HE21	1:A:247:VAL:H	1.41	0.66
1:C:2465:SER:OG	1:C:2467:HIS:HD2	1.79	0.66
4:G:4:MAN:C3	4:G:5:MAN:C1	2.74	0.65
4:G:3:BMA:C6	4:G:4:MAN:C1	2.74	0.65
1:A:342:ASN:HD22	1:A:344:ASP:H	1.44	0.65
9:B:2484:MAN:O6	9:B:2485:MAN:H2	1.96	0.64
1:C:2092:ASN:HD21	7:C:3486:NAG:C2	2.10	0.64
1:C:2399:SER:HB2	4:G:2:NAG:O3	1.97	0.64
8:C:3493:BMA:O6	9:D:4480:MAN:C1	2.47	0.63
1:D:3471:GLU:HG3	1:D:3473:ILE:HG22	1.79	0.63
1:C:2150:HIS:CE1	1:D:3471:GLU:H	2.05	0.63
7:B:2480:NAG:O4	7:B:2481:NAG:C1	2.47	0.62
1:B:1093:LEU:N	1:B:1240:HIS:HD2	1.83	0.62
1:C:2281:HIS:HD2	1:C:2301:ASN:H	1.46	0.62
1:D:3424:GLU:H	1:D:3424:GLU:CD	2.08	0.62
1:A:92:ASN:ND2	2:E:1:NAG:C2	2.61	0.62
9:B:2484:MAN:O6	9:B:2485:MAN:C2	2.46	0.62
1:A:467:HIS:CD2	1:A:467:HIS:H	2.16	0.61
1:C:2207:ASN:HD21	2:H:1:NAG:C2	2.12	0.61
2:I:1:NAG:C4	2:I:2:NAG:C1	2.78	0.61
1:C:2461:LEU:O	4:G:1:NAG:H61	2.01	0.61
9:C:3490:MAN:C2	4:G:3:BMA:O3	2.50	0.60
1:D:3342:ASN:HD22	1:D:3344:ASP:H	1.50	0.60
1:A:93:LEU:H	1:A:240:HIS:CD2	2.16	0.60
1:A:412:TYR:HB2	1:A:433:GLU:OE2	2.02	0.59
1:A:235:SER:HB3	1:A:357:LYS:HE2	1.84	0.59
1:C:2131:ASP:HB2	1:C:2132:PRO:HD2	1.83	0.59
1:C:2152:ASN:CG	7:C:3487:NAG:C1	2.73	0.59

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:207:ASN:CG	4:G:1:NAG:C1	2.72	0.59
1:B:1465:SER:OG	1:B:1467:HIS:HD2	1.85	0.58
1:C:2424:GLU:CD	1:C:2424:GLU:H	2.11	0.58
9:B:2484:MAN:O5	8:D:4486:BMA:O6	2.22	0.57
1:A:284:GLU:OE2	1:A:412:TYR:OH	2.20	0.57
1:D:3365:GLU:HA	1:D:3387:PRO:HB3	1.86	0.57
4:G:1:NAG:O4	4:G:2:NAG:O5	2.22	0.57
1:C:2119:HIS:HD2	1:D:3117:ASP:OD1	1.88	0.57
9:B:2484:MAN:C6	9:B:2485:MAN:C1	2.83	0.57
1:D:3281:HIS:CD2	1:D:3301:ASN:H	2.23	0.56
9:C:3490:MAN:C1	9:C:3492:MAN:H5	2.35	0.56
1:C:2093:LEU:H	1:C:2240:HIS:CD2	2.12	0.56
1:B:1142:GLN:NE2	10:B:2017:HOH:O	2.38	0.56
1:C:2333:SER:HB3	1:C:2351:SER:N	2.20	0.56
9:C:3490:MAN:C1	4:G:3:BMA:C3	2.83	0.56
1:A:262:ILE:HG12	1:A:272:ILE:HG12	1.87	0.56
1:D:3152:ASN:ND2	7:D:4483:NAG:C2	2.68	0.55
1:C:2092:ASN:OD1	7:C:3486:NAG:C1	2.54	0.55
1:D:3131:ASP:HB2	1:D:3132:PRO:HD2	1.88	0.55
1:C:2097:LEU:HD22	1:C:2428:PRO:HG3	1.88	0.55
1:A:92:ASN:ND2	2:E:1:NAG:O5	2.19	0.55
4:G:4:MAN:O3	4:G:5:MAN:C2	2.54	0.55
1:B:1342:ASN:ND2	1:B:1344:ASP:H	2.05	0.55
1:B:1207:ASN:ND2	7:B:2482:NAG:C2	2.56	0.54
1:B:1281:HIS:CD2	1:B:1301:ASN:H	2.24	0.54
1:A:119:HIS:CE1	1:B:1119:HIS:CE1	2.96	0.54
3:F:1:MAN:C3	3:F:2:MAN:C1	2.84	0.54
1:A:91:LEU:HD11	1:A:419:TYR:HB3	1.89	0.54
1:A:281:HIS:HD2	1:A:301:ASN:H	1.55	0.54
1:C:2417:ILE:HB	1:C:2419:TYR:CZ	2.43	0.54
7:B:2480:NAG:O4	7:B:2481:NAG:O5	2.25	0.54
1:C:2152:ASN:ND2	7:C:3487:NAG:C2	2.59	0.54
1:C:2233:GLN:HB3	1:C:2285:CYS:O	2.08	0.53
1:D:3332:THR:HG22	1:D:3333:SER:H	1.72	0.53
1:C:2233:GLN:NE2	1:C:2247:VAL:H	2.03	0.53
1:D:3088:ARG:NH2	1:D:3133:GLN:OE1	2.36	0.53
1:B:1098:CYS:HB2	1:B:1427:ASN:HD22	1.73	0.53
1:D:3233:GLN:NE2	1:D:3247:VAL:H	1.98	0.53
1:A:285:CYS:HB3	1:A:296:CYS:HB3	1.89	0.53
1:A:400:ASN:HB2	3:F:2:MAN:O6	2.08	0.53
1:B:1379:SER:OG	1:B:1406:ASN:ND2	2.42	0.53

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1131:ASP:HB2	1:B:1132:PRO:CD	2.38	0.53
1:B:1336:ASN:OD1	1:B:1375:LYS:HE3	2.09	0.52
1:D:3207:ASN:HD21	2:I:1:NAG:C2	2.13	0.52
1:D:3281:HIS:HD2	1:D:3301:ASN:H	1.57	0.52
1:D:3201:MET:HA	1:D:3209:SER:O	2.10	0.52
1:D:3093:LEU:HD13	1:D:3289:GLY:HA3	1.92	0.51
1:D:3322:LYS:HB2	1:D:3343:CYS:O	2.10	0.51
1:B:1342:ASN:HD22	1:B:1344:ASP:H	1.56	0.51
1:D:3092:ASN:HD21	7:D:4482:NAG:C2	1.99	0.51
1:B:1195:SER:HB2	1:B:1214:TYR:CZ	2.46	0.50
1:B:1123:THR:OG1	1:B:1449:ASN:ND2	2.43	0.50
1:C:2156:HIS:CE1	10:C:4020:HOH:O	2.64	0.50
7:C:3487:NAG:O4	7:C:3488:NAG:C1	2.59	0.50
1:A:119:HIS:HE1	1:B:1119:HIS:HE1	1.59	0.50
1:B:1199:ILE:HG12	1:B:1212:VAL:HG13	1.93	0.50
1:A:342:ASN:ND2	1:A:344:ASP:H	2.09	0.50
1:C:2131:ASP:HB2	1:C:2132:PRO:CD	2.40	0.50
1:D:3332:THR:CG2	1:D:3333:SER:H	2.25	0.50
1:A:119:HIS:CE1	1:B:1119:HIS:HE1	2.29	0.50
1:C:2152:ASN:ND2	7:C:3487:NAG:O5	2.36	0.50
8:A:1709:BMA:C6	3:F:1:MAN:C1	2.88	0.50
1:A:460:ARG:O	1:A:460:ARG:HG3	2.12	0.49
1:C:2406:ASN:O	5:C:3478:ZMR:H4	2.13	0.49
3:F:1:MAN:O6	3:F:3:MAN:O5	2.29	0.49
1:A:332:THR:HG22	1:A:333:SER:H	1.75	0.49
9:B:2484:MAN:O3	9:B:2486:MAN:C2	2.58	0.49
1:B:1399:SER:HA	8:D:4486:BMA:H62	1.94	0.49
1:A:238:VAL:O	1:A:245:PRO:HD2	2.13	0.49
1:A:150:HIS:CE1	1:C:2471:GLU:H	2.17	0.49
1:A:337:ASP:OD1	3:F:3:MAN:O2	2.30	0.49
1:A:92:ASN:OD1	2:E:1:NAG:C1	2.61	0.48
1:A:417:ILE:HB	1:A:419:TYR:CZ	2.48	0.48
2:H:1:NAG:C4	2:H:2:NAG:C1	2.85	0.48
1:A:332:THR:CG2	1:A:333:SER:H	2.26	0.48
1:B:1332:THR:CG2	1:B:1333:SER:H	2.25	0.48
1:A:282:ILE:HD12	1:A:310:ILE:HD11	1.95	0.48
1:C:2409:TRP:CD2	5:C:3478:ZMR:H112	2.48	0.48
1:A:152:ASN:ND2	7:A:1482:NAG:C2	2.63	0.48
1:C:2092:ASN:CG	7:C:3486:NAG:C1	2.87	0.48
1:D:3187:SER:HA	1:D:3199:ILE:O	2.13	0.48
1:A:407:GLN:C	5:A:1478:ZMR:H113	2.39	0.48

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:2127:TYR:CG	1:C:2235:SER:HA	2.49	0.48
1:B:1471:GLU:HB2	1:B:1474:TYR:CD1	2.49	0.48
1:D:3127:TYR:CG	1:D:3235:SER:HA	2.49	0.48
1:A:281:HIS:CD2	1:A:301:ASN:H	2.32	0.48
1:B:1330:THR:HG21	1:B:1369:LEU:HB3	1.96	0.48
1:B:1127:TYR:CG	1:B:1235:SER:HA	2.49	0.47
1:C:2119:HIS:CE1	1:D:3119:HIS:CE1	3.01	0.47
1:D:3092:ASN:HD22	7:D:4482:NAG:C7	2.26	0.47
1:A:151:ALA:HB1	1:A:446:TRP:HB3	1.96	0.47
1:B:1088:ARG:HE	1:B:1088:ARG:HA	1.78	0.47
1:C:2240:HIS:HE1	1:C:2315:GLU:OE1	1.98	0.47
1:B:1417:ILE:HG21	1:B:1426:PHE:HB3	1.97	0.47
1:B:1464:TRP:HB3	1:D:3204:PRO:HD3	1.96	0.47
1:B:1334:ARG:HG3	1:B:1375:LYS:HB2	1.97	0.47
1:B:1095:LYS:NZ	1:B:1423:LYS:O	2.44	0.47
1:C:2399:SER:CB	4:G:2:NAG:O3	2.63	0.47
1:C:2119:HIS:HE1	1:D:3119:HIS:CE1	2.33	0.46
1:D:3342:ASN:ND2	1:D:3344:ASP:H	2.13	0.46
1:C:2102:SER:CB	1:C:2459:LYS:O	2.61	0.46
1:D:3207:ASN:CG	2:I:1:NAG:C1	2.83	0.46
1:A:324:LEU:HD21	1:A:362:LEU:HD21	1.98	0.46
1:C:2150:HIS:HD2	10:D:2009:HOH:O	1.99	0.46
1:A:127:TYR:CG	1:A:235:SER:HA	2.51	0.46
1:A:119:HIS:O	1:A:175:PRO:HD3	2.15	0.45
1:B:1152:ASN:CG	7:B:2480:NAG:C1	2.72	0.45
1:D:3332:THR:CG2	1:D:3333:SER:N	2.79	0.45
1:C:2199:ILE:HG12	1:C:2212:VAL:HG13	1.98	0.45
1:A:149:ARG:NH1	1:C:2474:TYR:O	2.49	0.45
1:A:330:THR:HG21	1:A:369:LEU:HB3	1.97	0.45
1:B:1138:PHE:HB3	1:B:1164:LEU:HD11	1.98	0.45
1:B:1204:PRO:HG2	1:B:1207:ASN:HB2	1.99	0.45
2:I:1:NAG:O4	2:I:2:NAG:O5	2.34	0.45
1:A:452:VAL:HG21	1:A:466:TRP:HB3	2.00	0.44
1:C:2412:TYR:OH	5:C:3477:ZMR:C2	2.65	0.44
1:C:2285:CYS:HB3	1:C:2296:CYS:HB3	1.99	0.44
1:B:1093:LEU:HD13	1:B:1289:GLY:HA3	1.98	0.44
1:B:1342:ASN:HD22	1:B:1343:CYS:N	2.15	0.44
1:B:1405:ASN:C	1:B:1405:ASN:ND2	2.72	0.44
1:A:424:GLU:CD	1:A:424:GLU:H	2.25	0.44
1:B:1333:SER:HB3	1:B:1353:ASP:O	2.18	0.44
1:B:1088:ARG:HA	1:B:1088:ARG:NE	2.31	0.44

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:2296:CYS:C	1:C:2297:ILE:HD12	2.43	0.44
1:B:1247:VAL:HG22	1:B:1261:ILE:HD12	2.00	0.44
1:B:1167:TRP:HB3	1:B:1178:THR:HG22	1.99	0.43
1:A:124:ARG:HA	1:A:449:ASN:ND2	2.34	0.43
1:C:2333:SER:HA	1:C:2375:LYS:O	2.18	0.43
1:D:3119:HIS:O	1:D:3175:PRO:HD3	2.18	0.43
1:B:1119:HIS:CE1	1:D:3119:HIS:CE1	3.07	0.43
1:B:1214:TYR:HB3	1:B:1219:ILE:HG13	1.99	0.43
1:C:2098:CYS:HB2	1:C:2427:ASN:HD22	1.83	0.43
1:C:2327:LYS:O	1:C:2338:PRO:HD2	2.18	0.43
1:A:161:PHE:CE2	1:C:2469:GLY:HA3	2.53	0.43
1:C:2150:HIS:HE1	1:D:3471:GLU:N	1.96	0.43
1:C:2340:ASN:ND2	1:C:2394:GLN:HG2	2.34	0.43
1:B:1417:ILE:HB	1:B:1419:TYR:CZ	2.54	0.43
1:C:2431:TYR:CD2	1:C:2431:TYR:C	2.96	0.43
1:B:1128:LEU:HD23	1:B:1431:TYR:HB3	2.01	0.42
1:D:3121:LEU:HA	1:D:3145:THR:HA	2.01	0.42
1:B:1324:LEU:HD21	1:B:1362:LEU:HD21	2.01	0.42
1:B:1152:ASN:ND2	7:B:2480:NAG:O5	2.40	0.42
1:B:1342:ASN:HD22	1:B:1342:ASN:C	2.27	0.42
9:C:3490:MAN:O2	9:C:3492:MAN:C3	2.64	0.42
1:B:1296:CYS:C	1:B:1297:ILE:HD12	2.44	0.42
1:B:1332:THR:CG2	1:B:1333:SER:N	2.82	0.42
1:A:97:LEU:HD12	1:A:363:ASP:HB2	2.02	0.42
1:B:1201:MET:HA	1:B:1209:SER:O	2.19	0.42
4:G:4:MAN:H2	4:G:5:MAN:O5	2.20	0.42
1:C:2332:THR:HG22	1:C:2333:SER:N	2.34	0.42
1:C:2229:ILE:O	1:C:2229:ILE:HG22	2.19	0.41
1:C:2337:ASP:OD1	9:C:3484:MAN:O2	2.35	0.41
1:D:3383:MET:O	1:D:3400:ASN:HA	2.21	0.41
1:C:2332:THR:HG22	1:C:2333:SER:H	1.85	0.41
1:C:2150:HIS:CE1	1:D:3470:ALA:HA	2.55	0.41
1:D:3124:ARG:HA	1:D:3449:ASN:ND2	2.36	0.41
1:C:2357:LYS:HB3	1:C:2412:TYR:CG	2.55	0.41
1:C:2201:MET:HA	1:C:2209:SER:O	2.21	0.41
1:C:2463:SER:HB2	10:C:4073:HOH:O	2.20	0.41
1:A:131:ASP:HB2	1:A:132:PRO:CD	2.51	0.41
1:A:189:SER:HA	1:A:197:MET:O	2.21	0.40
1:A:336:ASN:OD1	1:A:375:LYS:NZ	2.26	0.40
1:D:3452:VAL:HG21	1:D:3466:TRP:HB3	2.03	0.40
1:A:197:MET:HA	1:A:213:TRP:O	2.21	0.40

*Continued on next page...*

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1469:GLY:HA3	1:D:3161:PHE:CE2	2.56	0.40
1:A:402:VAL:HG23	3:F:2:MAN:H61	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	A	387/389 (100%)	365 (94%)	20 (5%)	2 (0%)	24	20
1	B	387/389 (100%)	368 (95%)	18 (5%)	1 (0%)	36	34
1	C	387/389 (100%)	370 (96%)	16 (4%)	1 (0%)	36	34
1	D	387/389 (100%)	373 (96%)	12 (3%)	2 (0%)	24	20
All	All	1548/1556 (100%)	1476 (95%)	66 (4%)	6 (0%)	30	26

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	333	SER
1	C	2333	SER
1	D	3333	SER
1	A	207	ASN
1	D	3207	ASN
1	B	1207	ASN

### 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	331/331 (100%)	321 (97%)	10 (3%)	36	38
1	B	331/331 (100%)	319 (96%)	12 (4%)	31	31
1	C	331/331 (100%)	321 (97%)	10 (3%)	36	38
1	D	331/331 (100%)	321 (97%)	10 (3%)	36	38
All	All	1324/1324 (100%)	1282 (97%)	42 (3%)	34	36

All (42) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	88	ARG
1	A	128	LEU
1	A	155	ILE
1	A	261	ILE
1	A	274	GLU
1	A	342	ASN
1	A	424	GLU
1	A	445	LEU
1	A	460	ARG
1	A	467	HIS
1	B	1089	THR
1	B	1128	LEU
1	B	1142	GLN
1	B	1297	ILE
1	B	1324	LEU
1	B	1377	SER
1	B	1405	ASN
1	B	1423	LYS
1	B	1424	GLU
1	B	1458	LYS
1	B	1467	HIS
1	B	1473	ILE
1	C	2128	LEU
1	C	2133	GLN
1	C	2261	ILE
1	C	2262	ILE
1	C	2316	MET
1	C	2324	LEU
1	C	2351	SER
1	C	2424	GLU

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
1	C	2445	LEU
1	C	2458	LYS
1	D	3128	LEU
1	D	3261	ILE
1	D	3262	ILE
1	D	3342	ASN
1	D	3351	SER
1	D	3365	GLU
1	D	3386	VAL
1	D	3424	GLU
1	D	3445	LEU
1	D	3473	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (57) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	92	ASN
1	A	119	HIS
1	A	142	GLN
1	A	150	HIS
1	A	152	ASN
1	A	207	ASN
1	A	233	GLN
1	A	240	HIS
1	A	270	GLN
1	A	281	HIS
1	A	342	ASN
1	A	400	ASN
1	A	422	ASN
1	A	427	ASN
1	A	449	ASN
1	A	467	HIS
1	B	1119	HIS
1	B	1142	GLN
1	B	1152	ASN
1	B	1171	GLN
1	B	1207	ASN
1	B	1233	GLN
1	B	1240	HIS
1	B	1270	GLN
1	B	1281	HIS
1	B	1340	ASN

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
1	B	1342	ASN
1	B	1388	ASN
1	B	1406	ASN
1	B	1427	ASN
1	B	1449	ASN
1	B	1467	HIS
1	C	2092	ASN
1	C	2119	HIS
1	C	2150	HIS
1	C	2152	ASN
1	C	2207	ASN
1	C	2233	GLN
1	C	2240	HIS
1	C	2270	GLN
1	C	2281	HIS
1	C	2340	ASN
1	C	2422	ASN
1	C	2427	ASN
1	C	2449	ASN
1	C	2467	HIS
1	D	3119	HIS
1	D	3150	HIS
1	D	3152	ASN
1	D	3207	ASN
1	D	3233	GLN
1	D	3240	HIS
1	D	3281	HIS
1	D	3342	ASN
1	D	3422	ASN
1	D	3427	ASN
1	D	3449	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

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
2	NAG	E	1	2,1	14,14,15	2.32	1 (7%)	17,19,21	2.64	7 (41%)
2	NAG	E	2	2	14,14,15	2.12	1 (7%)	17,19,21	2.35	6 (35%)
3	MAN	F	1	3	11,11,12	0.77	0	15,15,17	1.83	6 (40%)
3	MAN	F	2	3	11,11,12	0.66	0	15,15,17	1.75	2 (13%)
3	MAN	F	3	3	11,11,12	0.78	0	15,15,17	1.59	4 (26%)
4	NAG	G	1	4,1	14,14,15	2.38	1 (7%)	17,19,21	3.26	9 (52%)
4	NAG	G	2	4	14,14,15	2.57	1 (7%)	17,19,21	2.87	9 (52%)
4	BMA	G	3	4	11,11,12	0.57	0	15,15,17	1.43	2 (13%)
4	MAN	G	4	4	11,11,12	0.49	0	15,15,17	1.74	2 (13%)
4	MAN	G	5	4	11,11,12	1.08	1 (9%)	15,15,17	2.09	5 (33%)
2	NAG	H	1	2,1	14,14,15	2.58	2 (14%)	17,19,21	3.12	4 (23%)
2	NAG	H	2	2	14,14,15	2.22	1 (7%)	17,19,21	2.46	6 (35%)
2	NAG	I	1	2	14,14,15	2.28	1 (7%)	17,19,21	3.77	9 (52%)
2	NAG	I	2	2	14,14,15	2.09	1 (7%)	17,19,21	2.68	7 (41%)

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	E	1	2,1	1/1/5/7	0/6/23/26	0/1/1/1
2	NAG	E	2	2	1/1/5/7	0/6/23/26	0/1/1/1
3	MAN	F	1	3	-	0/2/19/22	0/1/1/1
3	MAN	F	2	3	-	0/2/19/22	0/1/1/1
3	MAN	F	3	3	-	2/2/19/22	0/1/1/1
4	NAG	G	1	4,1	1/1/5/7	2/6/23/26	0/1/1/1
4	NAG	G	2	4	1/1/5/7	1/6/23/26	0/1/1/1

*Continued on next page...*

Continued from previous page...

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

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	G	2	NAG	O4-C4	-9.33	1.19	1.43
2	H	1	NAG	O4-C4	-9.17	1.20	1.43
4	G	1	NAG	O4-C4	-8.75	1.21	1.43
2	E	1	NAG	O4-C4	-8.42	1.22	1.43
2	H	2	NAG	O4-C4	-8.13	1.22	1.43
2	I	1	NAG	O4-C4	-7.96	1.23	1.43
2	E	2	NAG	O4-C4	-7.79	1.23	1.43
2	I	2	NAG	O4-C4	-7.62	1.24	1.43
4	G	5	MAN	C2-C3	2.44	1.56	1.52
2	H	1	NAG	C1-C2	2.20	1.55	1.52

All (78) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	I	1	NAG	C1-O5-C5	-9.27	99.76	112.19
4	G	1	NAG	C1-O5-C5	-8.11	101.31	112.19
2	H	1	NAG	C3-C4-C5	8.00	124.74	110.23
2	H	1	NAG	C2-N2-C7	-7.56	112.76	122.90
4	G	2	NAG	C3-C4-C5	7.48	123.79	110.23
2	I	1	NAG	C3-C4-C5	7.25	123.39	110.23
4	G	1	NAG	C3-C4-C5	6.66	122.31	110.23
2	I	2	NAG	C3-C4-C5	6.56	122.12	110.23
2	I	1	NAG	C2-N2-C7	-6.28	114.48	122.90
2	E	1	NAG	C3-C4-C5	5.77	120.69	110.23
4	G	5	MAN	C1-O5-C5	5.71	119.84	112.19
3	F	2	MAN	C1-O5-C5	5.52	119.59	112.19
4	G	2	NAG	C1-C2-N2	-5.18	102.27	110.43
4	G	4	MAN	C1-O5-C5	5.17	119.12	112.19
2	H	2	NAG	C3-C4-C5	5.00	119.29	110.23
2	E	2	NAG	O4-C4-C5	4.71	120.93	109.32

Continued on next page...

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	2	NAG	O4-C4-C3	4.71	121.47	110.38
2	I	2	NAG	O4-C4-C3	4.69	121.42	110.38
2	E	1	NAG	C1-O5-C5	-4.60	106.03	112.19
2	H	1	NAG	O4-C4-C5	4.51	120.44	109.32
2	E	1	NAG	O4-C4-C5	4.47	120.34	109.32
2	H	2	NAG	O4-C4-C3	4.39	120.72	110.38
2	H	2	NAG	O4-C4-C5	4.32	119.97	109.32
2	H	2	NAG	C2-N2-C7	4.17	128.49	122.90
2	E	2	NAG	C3-C4-C5	4.06	117.59	110.23
2	I	1	NAG	O4-C4-C5	4.03	119.25	109.32
2	I	2	NAG	C1-C2-N2	-3.99	104.14	110.43
4	G	1	NAG	O4-C4-C3	3.97	119.74	110.38
4	G	1	NAG	C1-C2-N2	-3.95	104.21	110.43
2	I	2	NAG	C2-N2-C7	3.94	128.18	122.90
4	G	2	NAG	O4-C4-C3	3.89	119.55	110.38
2	E	2	NAG	C1-C2-N2	-3.65	104.68	110.43
2	E	1	NAG	O4-C4-C3	3.63	118.93	110.38
2	I	1	NAG	O5-C1-C2	-3.57	105.78	111.29
4	G	1	NAG	O4-C4-C5	3.49	117.93	109.32
2	H	2	NAG	C1-C2-N2	-3.40	105.07	110.43
3	F	1	MAN	C1-O5-C5	3.26	116.55	112.19
3	F	1	MAN	C3-C4-C5	-3.17	104.49	110.23
2	E	1	NAG	O3-C3-C4	3.05	117.57	110.38
4	G	4	MAN	O2-C2-C3	3.05	116.46	110.15
3	F	3	MAN	C1-O5-C5	3.02	116.24	112.19
2	I	1	NAG	C6-C5-C4	3.02	120.43	113.02
2	I	1	NAG	O4-C4-C3	2.93	117.29	110.38
4	G	2	NAG	O4-C4-C5	2.90	116.47	109.32
4	G	1	NAG	O5-C5-C4	-2.90	103.77	110.83
2	I	2	NAG	O4-C4-C5	2.88	116.42	109.32
4	G	3	BMA	C2-C3-C4	2.85	115.88	110.86
3	F	1	MAN	O6-C6-C5	-2.84	101.68	111.33
4	G	3	BMA	C1-C2-C3	-2.82	105.54	109.64
2	H	1	NAG	O7-C7-N2	-2.79	117.05	121.98
2	E	1	NAG	C6-C5-C4	2.73	119.72	113.02
3	F	3	MAN	C3-C4-C5	2.68	115.09	110.23
4	G	5	MAN	O2-C2-C3	2.65	115.63	110.15
2	I	2	NAG	O5-C1-C2	-2.63	107.23	111.29
2	E	2	NAG	C2-N2-C7	2.61	126.40	122.90
3	F	3	MAN	O2-C2-C1	-2.58	103.33	109.22
2	I	1	NAG	O3-C3-C2	-2.53	104.16	109.40
2	E	2	NAG	O5-C1-C2	2.52	115.19	111.29

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	F	3	MAN	O2-C2-C3	2.45	115.22	110.15
3	F	1	MAN	C1-C2-C3	2.38	113.10	109.64
2	I	1	NAG	O5-C5-C6	2.37	112.28	107.66
2	E	1	NAG	O3-C3-C2	-2.31	104.59	109.40
4	G	2	NAG	C1-O5-C5	2.29	115.25	112.19
4	G	2	NAG	C2-N2-C7	2.25	125.92	122.90
4	G	5	MAN	O5-C5-C6	2.23	112.00	107.66
4	G	2	NAG	C8-C7-N2	-2.18	112.50	116.12
3	F	1	MAN	O2-C2-C3	2.17	114.65	110.15
4	G	2	NAG	O6-C6-C5	-2.17	103.94	111.33
4	G	2	NAG	O3-C3-C2	2.17	113.91	109.40
4	G	5	MAN	O4-C4-C3	2.16	115.47	110.38
4	G	1	NAG	O3-C3-C2	-2.15	104.94	109.40
3	F	1	MAN	O4-C4-C3	2.13	115.39	110.38
3	F	2	MAN	O5-C5-C6	2.09	111.72	107.66
2	I	2	NAG	O6-C6-C5	-2.07	104.30	111.33
2	H	2	NAG	O5-C5-C6	2.04	111.64	107.66
4	G	1	NAG	C2-N2-C7	-2.04	120.17	122.90
4	G	5	MAN	O6-C6-C5	-2.01	104.47	111.33
4	G	1	NAG	O5-C5-C6	2.00	111.56	107.66

All (8) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	E	1	NAG	C4
2	E	2	NAG	C4
2	H	1	NAG	C4
2	H	2	NAG	C4
2	I	1	NAG	C4
2	I	2	NAG	C4
4	G	1	NAG	C4
4	G	2	NAG	C4

All (17) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	G	1	NAG	O5-C5-C6-O6
3	F	3	MAN	O5-C5-C6-O6
2	I	2	NAG	C4-C5-C6-O6
4	G	3	BMA	O5-C5-C6-O6
4	G	1	NAG	C4-C5-C6-O6
4	G	3	BMA	C4-C5-C6-O6

*Continued on next page...*

*Continued from previous page...*

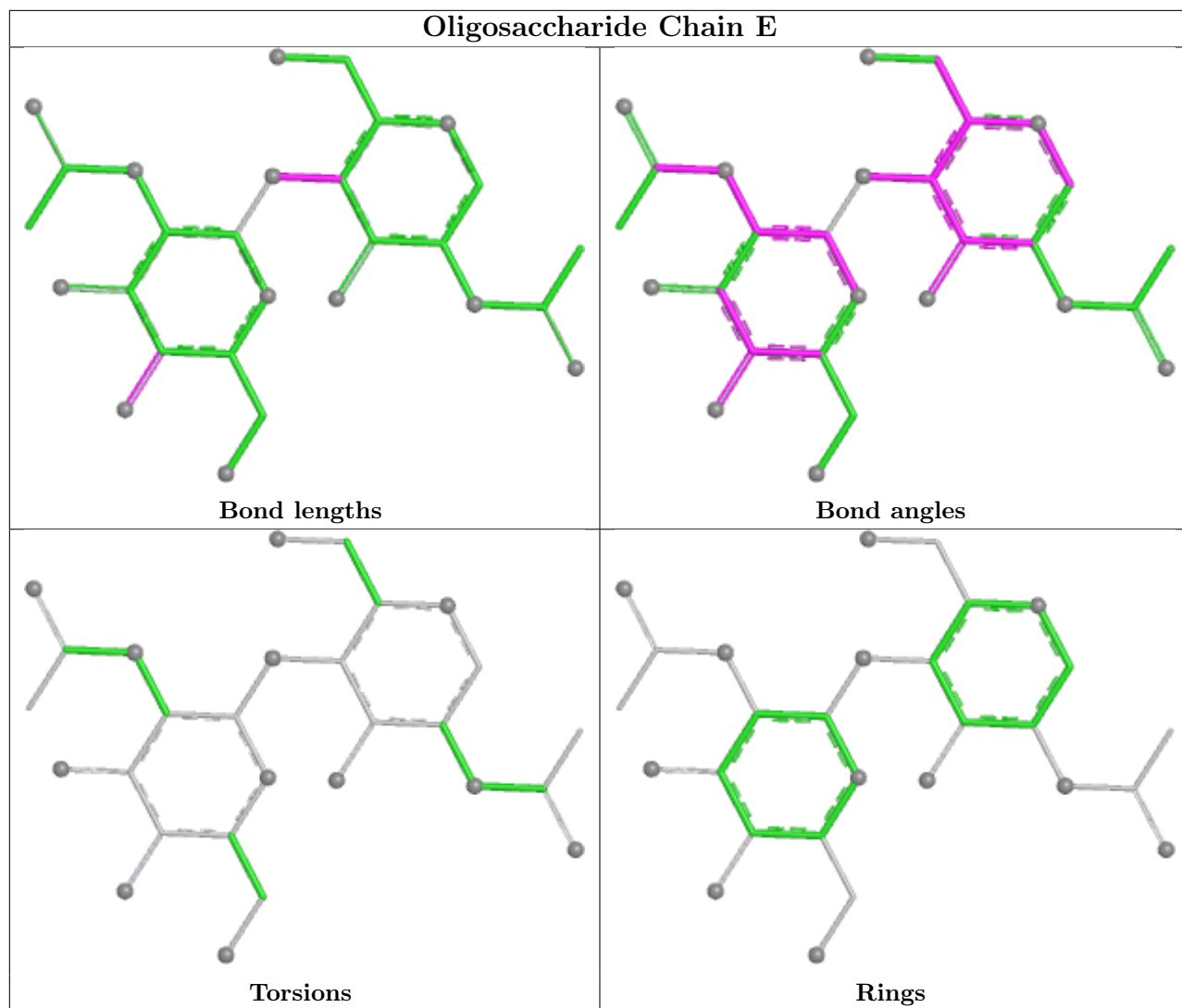
Mol	Chain	Res	Type	Atoms
2	I	2	NAG	C8-C7-N2-C2
2	I	2	NAG	O7-C7-N2-C2
3	F	3	MAN	C4-C5-C6-O6
2	I	1	NAG	C4-C5-C6-O6
2	I	2	NAG	O5-C5-C6-O6
2	H	2	NAG	O5-C5-C6-O6
2	H	2	NAG	C4-C5-C6-O6
2	I	1	NAG	O5-C5-C6-O6
4	G	5	MAN	C4-C5-C6-O6
2	H	1	NAG	C4-C5-C6-O6
4	G	2	NAG	C4-C5-C6-O6

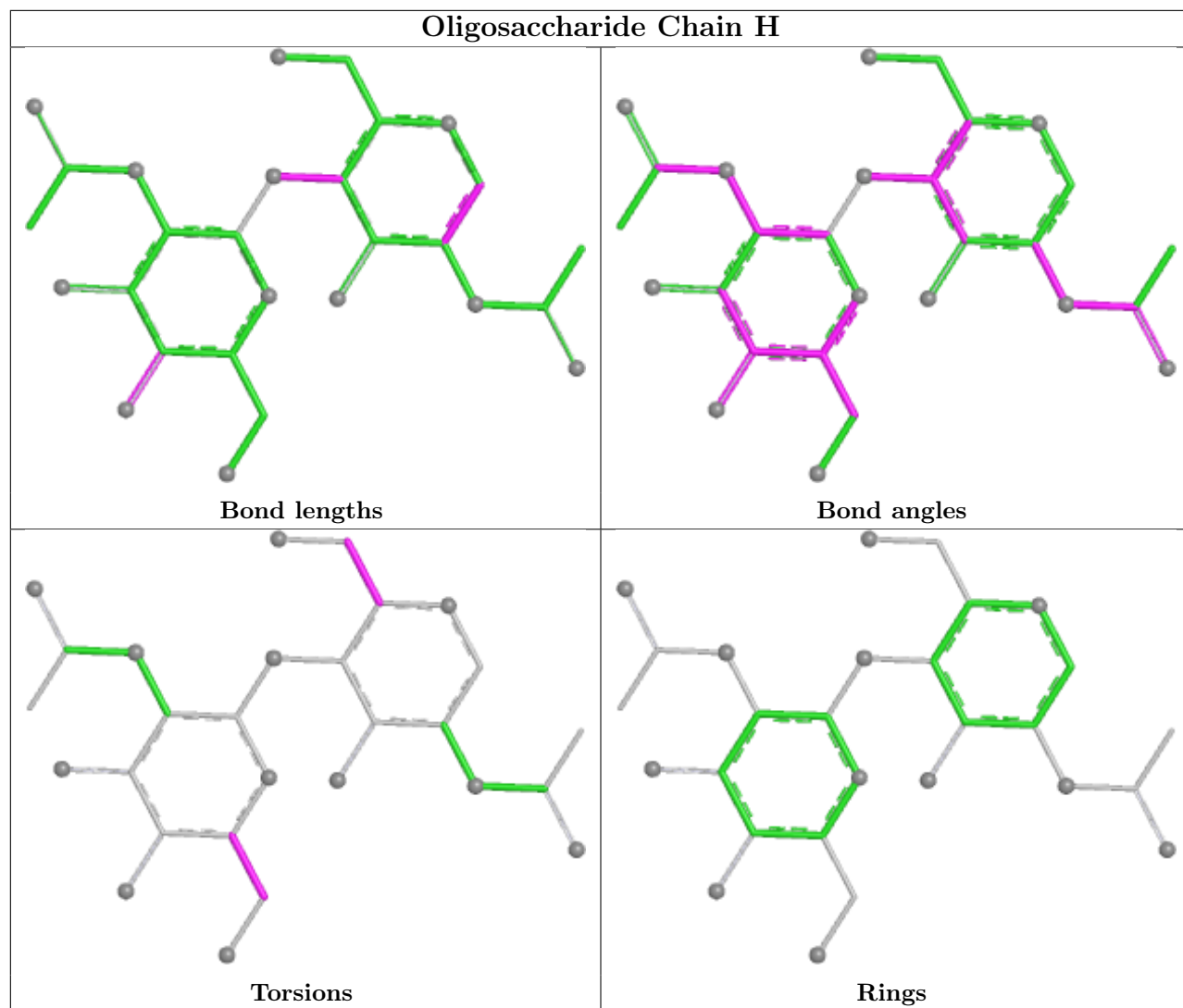
There are no ring outliers.

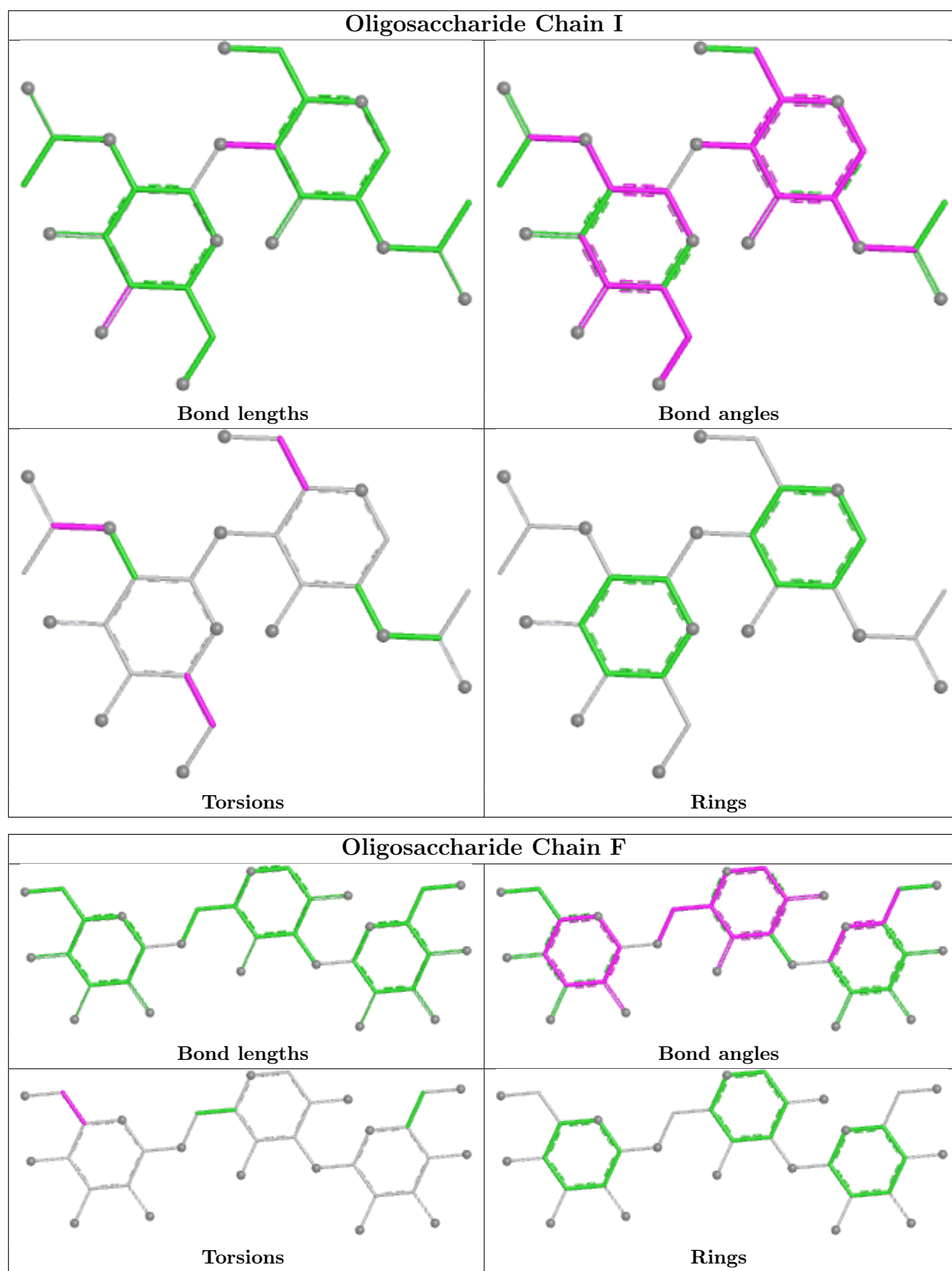
13 monomers are involved in 43 short contacts:

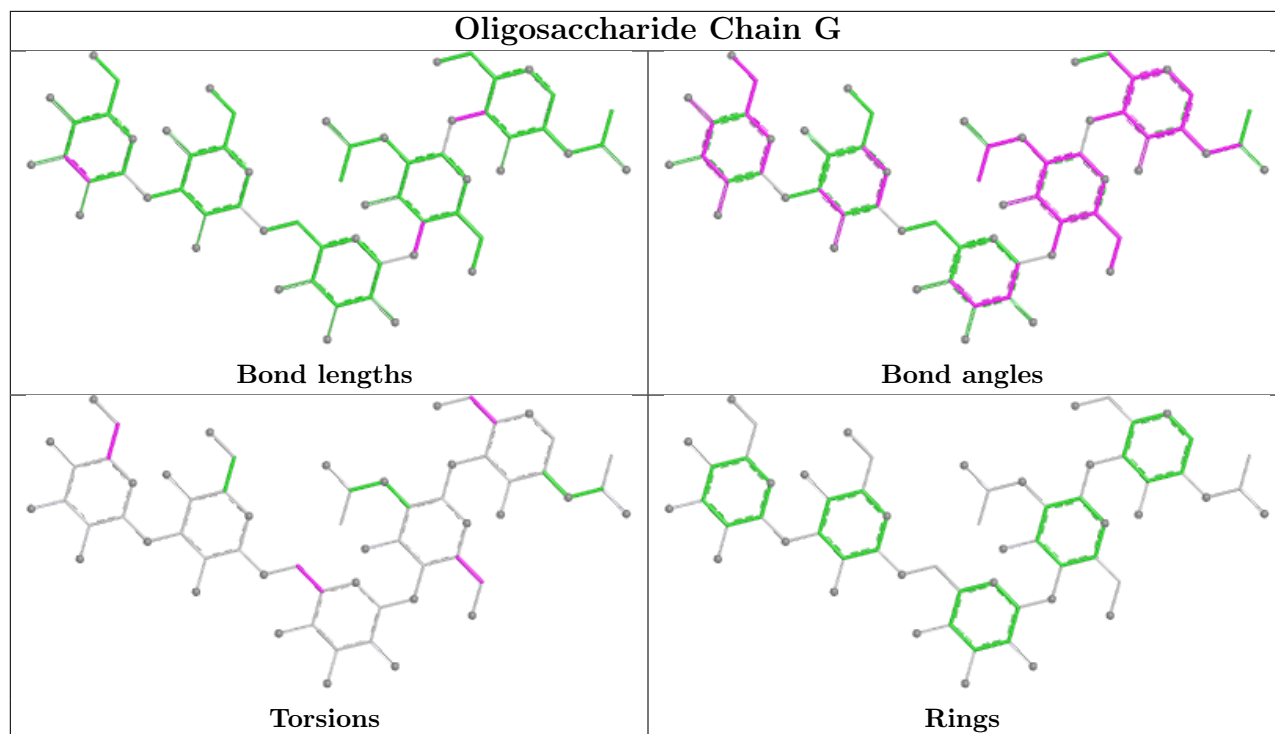
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	E	1	NAG	6	0
4	G	1	NAG	4	0
2	H	1	NAG	6	0
2	I	1	NAG	6	0
4	G	3	BMA	4	0
4	G	2	NAG	3	0
4	G	5	MAN	3	0
2	I	2	NAG	4	0
2	H	2	NAG	2	0
4	G	4	MAN	5	0
3	F	3	MAN	3	0
3	F	2	MAN	3	0
3	F	1	MAN	5	0

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 34 ligands modelled in this entry, 4 are monoatomic - leaving 30 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
7	NAG	B	2481	-	14,14,15	2.23	1 (7%)	17,19,21	2.25	4 (23%)
7	NAG	D	4483	1	14,14,15	1.69	1 (7%)	17,19,21	2.36	4 (23%)
5	ZMR	B	2477	-	22,23,23	2.90	7 (31%)	24,32,32	2.89	8 (33%)
8	BMA	D	4486	-	11,11,12	0.48	0	15,15,17	1.88	4 (26%)
7	NAG	C	3488	-	14,14,15	2.15	1 (7%)	17,19,21	2.39	7 (41%)
7	NAG	B	2480	1	14,14,15	2.20	1 (7%)	17,19,21	2.47	6 (35%)
9	MAN	B	2486	-	11,11,12	0.96	0	15,15,17	1.84	4 (26%)
5	ZMR	A	1478	-	22,23,23	3.13	4 (18%)	24,32,32	3.28	10 (41%)
9	MAN	D	4480	-	11,11,12	1.07	1 (9%)	15,15,17	2.69	9 (60%)
5	ZMR	C	3477	-	22,23,23	3.09	7 (31%)	24,32,32	2.89	11 (45%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
7	NAG	A	1482	1	14,14,15	2.33	1 (7%)	17,19,21	2.22	3 (17%)
9	MAN	B	2484	-	11,11,12	0.78	0	15,15,17	2.13	3 (20%)
7	NAG	B	2482	-	14,14,15	2.36	1 (7%)	17,19,21	2.81	6 (35%)
5	ZMR	B	2478	-	22,23,23	3.16	4 (18%)	24,32,32	3.29	13 (54%)
7	NAG	A	1483	-	14,14,15	2.08	1 (7%)	17,19,21	2.55	7 (41%)
5	ZMR	C	3478	-	22,23,23	3.08	4 (18%)	24,32,32	2.76	10 (41%)
5	ZMR	D	4477	-	22,23,23	3.25	4 (18%)	24,32,32	2.62	8 (33%)
8	BMA	A	1709	-	11,11,12	0.89	0	15,15,17	2.02	5 (33%)
7	NAG	B	2483	-	14,14,15	2.35	1 (7%)	17,19,21	2.55	5 (29%)
9	MAN	C	3492	-	11,11,12	0.76	0	15,15,17	1.58	1 (6%)
7	NAG	C	3486	-	14,14,15	2.05	1 (7%)	17,19,21	2.55	4 (23%)
7	NAG	C	3487	1	14,14,15	2.20	1 (7%)	17,19,21	2.32	6 (35%)
9	MAN	C	3490	-	11,11,12	0.71	0	15,15,17	2.04	3 (20%)
8	BMA	C	3493	-	11,11,12	0.94	0	15,15,17	1.59	3 (20%)
7	NAG	D	4482	-	14,14,15	2.31	2 (14%)	17,19,21	2.60	5 (29%)
9	MAN	B	2485	-	11,11,12	0.90	0	15,15,17	1.82	5 (33%)
9	MAN	C	3484	-	11,11,12	0.64	0	15,15,17	1.82	4 (26%)
5	ZMR	A	1477	-	22,23,23	3.10	4 (18%)	24,32,32	2.72	10 (41%)
5	ZMR	D	4478	-	22,23,23	3.02	4 (18%)	24,32,32	3.04	11 (45%)
9	MAN	D	4481	-	11,11,12	0.84	0	15,15,17	1.42	2 (13%)

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
7	NAG	B	2481	-	1/1/5/7	2/6/23/26	0/1/1/1
7	NAG	D	4483	1	1/1/5/7	2/6/23/26	0/1/1/1
5	ZMR	B	2477	-	2/2/9/12	6/22/38/38	0/1/1/1
8	BMA	D	4486	-	-	2/2/19/22	0/1/1/1
7	NAG	C	3488	-	1/1/5/7	4/6/23/26	0/1/1/1
7	NAG	B	2480	1	1/1/5/7	2/6/23/26	0/1/1/1
9	MAN	B	2486	-	-	0/2/19/22	0/1/1/1
5	ZMR	A	1478	-	2/2/9/12	11/22/38/38	0/1/1/1
9	MAN	D	4480	-	-	1/2/19/22	0/1/1/1

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	ZMR	C	3477	-	2/2/9/12	5/22/38/38	0/1/1/1
7	NAG	A	1482	1	1/1/5/7	2/6/23/26	0/1/1/1
9	MAN	B	2484	-	-	0/2/19/22	0/1/1/1
7	NAG	B	2482	-	1/1/5/7	2/6/23/26	0/1/1/1
5	ZMR	B	2478	-	2/2/9/12	7/22/38/38	0/1/1/1
7	NAG	A	1483	-	1/1/5/7	1/6/23/26	0/1/1/1
5	ZMR	C	3478	-	2/2/9/12	6/22/38/38	0/1/1/1
5	ZMR	D	4477	-	2/2/9/12	5/22/38/38	0/1/1/1
8	BMA	A	1709	-	-	2/2/19/22	0/1/1/1
7	NAG	B	2483	-	1/1/5/7	0/6/23/26	0/1/1/1
9	MAN	C	3492	-	-	2/2/19/22	0/1/1/1
7	NAG	C	3486	-	1/1/5/7	2/6/23/26	0/1/1/1
7	NAG	C	3487	1	1/1/5/7	0/6/23/26	0/1/1/1
9	MAN	C	3490	-	-	2/2/19/22	0/1/1/1
8	BMA	C	3493	-	-	2/2/19/22	0/1/1/1
7	NAG	D	4482	-	1/1/5/7	3/6/23/26	0/1/1/1
9	MAN	B	2485	-	-	2/2/19/22	0/1/1/1
9	MAN	C	3484	-	-	2/2/19/22	0/1/1/1
5	ZMR	A	1477	-	2/2/9/12	5/22/38/38	0/1/1/1
5	ZMR	D	4478	-	2/2/9/12	11/22/38/38	0/1/1/1
9	MAN	D	4481	-	-	2/2/19/22	0/1/1/1

All (51) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	D	4477	ZMR	C8-C7	-11.38	1.33	1.53
5	A	1478	ZMR	C8-C7	-10.63	1.34	1.53
5	B	2478	ZMR	C8-C7	-10.46	1.35	1.53
5	A	1477	ZMR	C8-C7	-10.35	1.35	1.53
5	C	3478	ZMR	C8-C7	-10.21	1.35	1.53
5	D	4478	ZMR	C8-C7	-9.99	1.36	1.53
5	C	3477	ZMR	O7-C7	-8.94	1.20	1.43
5	C	3477	ZMR	C8-C7	-8.85	1.38	1.53
5	B	2477	ZMR	C8-C7	-8.66	1.38	1.53
7	B	2483	NAG	O4-C4	-8.58	1.21	1.43
7	B	2482	NAG	O4-C4	-8.52	1.21	1.43
7	A	1482	NAG	O4-C4	-8.48	1.22	1.43
5	B	2478	ZMR	O7-C7	-8.30	1.22	1.43

Continued on next page...

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	1477	ZMR	O7-C7	-8.18	1.22	1.43
5	D	4478	ZMR	O7-C7	-8.14	1.22	1.43
7	C	3487	NAG	O4-C4	-8.11	1.22	1.43
5	C	3478	ZMR	O7-C7	-8.06	1.23	1.43
7	B	2480	NAG	O4-C4	-8.03	1.23	1.43
7	B	2481	NAG	O4-C4	-8.02	1.23	1.43
7	C	3488	NAG	O4-C4	-7.73	1.23	1.43
5	B	2477	ZMR	O7-C7	-7.67	1.24	1.43
7	A	1483	NAG	O4-C4	-7.65	1.24	1.43
7	D	4482	NAG	O4-C4	-7.63	1.24	1.43
5	A	1478	ZMR	O7-C7	-7.50	1.24	1.43
5	D	4477	ZMR	O7-C7	-7.43	1.24	1.43
7	C	3486	NAG	O4-C4	-7.40	1.24	1.43
7	D	4483	NAG	O4-C4	-5.69	1.28	1.43
5	A	1478	ZMR	O8-C8	-4.73	1.33	1.43
5	C	3478	ZMR	O8-C8	-4.70	1.33	1.43
5	A	1477	ZMR	O8-C8	-4.60	1.33	1.43
5	B	2478	ZMR	O8-C8	-4.54	1.33	1.43
5	D	4477	ZMR	O8-C8	-4.43	1.34	1.43
5	D	4478	ZMR	O8-C8	-4.07	1.34	1.43
5	B	2477	ZMR	O8-C8	-3.65	1.35	1.43
5	C	3477	ZMR	O8-C8	-3.45	1.36	1.43
5	B	2477	ZMR	O6-C6	-3.12	1.40	1.46
5	C	3477	ZMR	C7-C6	-2.88	1.49	1.52
5	C	3477	ZMR	O6-C6	-2.85	1.41	1.46
5	B	2478	ZMR	O6-C2	2.72	1.47	1.37
5	A	1478	ZMR	O6-C2	2.67	1.46	1.37
7	D	4482	NAG	C2-N2	2.56	1.50	1.46
5	D	4478	ZMR	O6-C2	2.42	1.46	1.37
5	B	2477	ZMR	C5-N5	2.42	1.49	1.45
5	C	3477	ZMR	C3-C2	2.39	1.37	1.33
5	C	3477	ZMR	O6-C2	2.25	1.45	1.37
5	D	4477	ZMR	O6-C6	-2.24	1.42	1.46
5	B	2477	ZMR	O1B-C1	-2.20	1.24	1.30
5	A	1477	ZMR	O6-C6	-2.14	1.42	1.46
5	C	3478	ZMR	O6-C2	2.13	1.45	1.37
9	D	4480	MAN	C2-C3	2.08	1.55	1.52
5	B	2477	ZMR	C6-C5	2.07	1.56	1.53

All (181) bond angle outliers are listed below:

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	B	2483	NAG	C3-C4-C5	8.10	124.92	110.23
5	B	2478	ZMR	C8-C7-C6	7.14	126.48	113.05
5	B	2477	ZMR	O6-C6-C7	-7.04	93.60	105.98
7	B	2482	NAG	C1-C2-N2	-6.54	100.12	110.43
5	A	1478	ZMR	O6-C2-C3	-6.48	117.36	124.62
7	D	4483	NAG	O4-C4-C5	6.47	125.25	109.32
5	D	4478	ZMR	C6-C5-N5	-6.41	100.68	110.91
5	A	1478	ZMR	O7-C7-C6	6.37	123.21	109.44
5	C	3477	ZMR	O7-C7-C8	6.34	123.33	108.93
9	D	4480	MAN	C1-O5-C5	6.06	120.31	112.19
5	B	2477	ZMR	O7-C7-C8	5.96	122.46	108.93
5	D	4478	ZMR	O8-C8-C7	5.90	123.07	109.25
5	A	1478	ZMR	C6-C5-N5	-5.82	101.62	110.91
5	B	2478	ZMR	O8-C8-C7	5.80	122.82	109.25
7	C	3486	NAG	C1-C2-N2	-5.78	101.33	110.43
5	B	2477	ZMR	O8-C8-C7	5.76	122.74	109.25
9	B	2484	MAN	C1-O5-C5	5.76	119.90	112.19
5	B	2478	ZMR	C6-C5-N5	-5.73	101.77	110.91
5	A	1477	ZMR	O8-C8-C7	5.59	122.34	109.25
7	B	2482	NAG	C3-C4-C5	5.56	120.31	110.23
5	D	4478	ZMR	C8-C7-C6	5.56	123.50	113.05
7	A	1483	NAG	O4-C4-C5	5.41	122.65	109.32
9	C	3490	MAN	C1-O5-C5	5.40	119.43	112.19
5	C	3477	ZMR	O6-C6-C7	-5.40	96.48	105.98
5	B	2478	ZMR	O6-C2-C3	-5.39	118.59	124.62
5	A	1477	ZMR	O7-C7-C8	5.38	121.16	108.93
5	C	3478	ZMR	C8-C7-C6	5.31	123.03	113.05
7	D	4482	NAG	C3-C4-C5	5.27	119.79	110.23
5	C	3477	ZMR	C9-C8-C7	5.25	122.88	112.17
7	C	3488	NAG	O4-C4-C5	5.19	122.10	109.32
7	B	2480	NAG	O4-C4-C5	5.09	121.86	109.32
7	C	3486	NAG	O4-C4-C5	5.06	121.78	109.32
7	A	1482	NAG	O4-C4-C5	5.04	121.74	109.32
7	A	1483	NAG	C4-C3-C2	-5.04	103.63	111.02
5	D	4477	ZMR	O6-C6-C7	-5.02	97.14	105.98
5	A	1477	ZMR	O7-C7-C6	5.02	120.29	109.44
7	C	3487	NAG	C3-C4-C5	5.01	119.32	110.23
5	C	3478	ZMR	O8-C8-C7	5.00	120.95	109.25
7	B	2481	NAG	O4-C4-C5	5.00	121.63	109.32
5	A	1478	ZMR	O7-C7-C8	4.94	120.16	108.93
5	C	3477	ZMR	O8-C8-C7	4.89	120.69	109.25

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	D	4477	ZMR	O8-C8-C7	4.87	120.65	109.25
5	D	4477	ZMR	O7-C7-C8	4.86	119.97	108.93
7	B	2480	NAG	C3-C4-C5	4.82	118.97	110.23
7	C	3488	NAG	C3-C4-C5	4.80	118.93	110.23
7	C	3486	NAG	C3-C4-C5	4.80	118.93	110.23
9	C	3492	MAN	C1-O5-C5	4.77	118.58	112.19
5	A	1478	ZMR	C9-C8-C7	4.77	121.90	112.17
8	D	4486	BMA	C1-C2-C3	-4.76	102.72	109.64
5	D	4477	ZMR	O8-C8-C9	4.75	119.83	109.03
5	A	1478	ZMR	O6-C2-C1	4.74	121.46	112.02
5	C	3477	ZMR	O9-C9-C8	-4.72	101.24	111.16
7	C	3487	NAG	O4-C4-C5	4.68	120.86	109.32
7	A	1483	NAG	O4-C4-C3	4.64	121.32	110.38
7	D	4482	NAG	O4-C4-C5	4.61	120.68	109.32
5	C	3478	ZMR	O7-C7-C6	4.49	119.16	109.44
7	D	4483	NAG	O4-C4-C3	4.48	120.95	110.38
5	A	1477	ZMR	C9-C8-C7	4.45	121.25	112.17
7	B	2482	NAG	O4-C4-C5	4.42	120.21	109.32
5	A	1478	ZMR	O8-C8-C7	4.41	119.56	109.25
5	B	2478	ZMR	O6-C2-C1	4.40	120.80	112.02
5	D	4478	ZMR	O7-C7-C6	4.38	118.92	109.44
5	C	3478	ZMR	O8-C8-C9	4.37	118.95	109.03
7	A	1482	NAG	C3-C4-C5	4.34	118.10	110.23
9	B	2486	MAN	C1-O5-C5	4.34	118.00	112.19
5	D	4477	ZMR	O7-C7-C6	4.33	118.81	109.44
5	B	2477	ZMR	C8-C7-C6	4.27	121.08	113.05
7	B	2481	NAG	C3-C4-C5	4.26	117.96	110.23
7	B	2481	NAG	O4-C4-C3	4.25	120.40	110.38
5	A	1478	ZMR	O8-C8-C9	4.18	118.54	109.03
7	B	2480	NAG	C1-C2-N2	-4.16	103.88	110.43
5	D	4477	ZMR	C8-C7-C6	4.15	120.86	113.05
8	A	1709	BMA	O3-C3-C4	4.14	120.14	110.38
5	C	3478	ZMR	O6-C2-C3	-4.14	119.99	124.62
7	A	1482	NAG	O4-C4-C3	4.13	120.11	110.38
7	D	4482	NAG	C2-N2-C7	4.05	128.33	122.90
7	B	2481	NAG	C1-C2-N2	-4.03	104.08	110.43
9	B	2485	MAN	C1-O5-C5	4.02	117.58	112.19
7	C	3487	NAG	O4-C4-C3	3.97	119.74	110.38
5	C	3478	ZMR	O7-C7-C8	3.91	117.81	108.93
5	C	3478	ZMR	C9-C8-C7	3.89	120.09	112.17
7	D	4482	NAG	O4-C4-C3	3.88	119.51	110.38
7	B	2482	NAG	O4-C4-C3	3.85	119.46	110.38

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	D	4478	ZMR	O8-C8-C9	3.84	117.75	109.03
5	D	4478	ZMR	O7-C7-C8	3.80	117.57	108.93
5	B	2477	ZMR	O8-C8-C9	3.80	117.66	109.03
5	A	1477	ZMR	O6-C6-C7	-3.77	99.35	105.98
5	B	2478	ZMR	O8-C8-C9	3.76	117.58	109.03
7	C	3486	NAG	O4-C4-C3	3.76	119.23	110.38
7	B	2480	NAG	O4-C4-C3	3.72	119.15	110.38
8	A	1709	BMA	C1-C2-C3	-3.72	104.22	109.64
7	D	4482	NAG	C1-O5-C5	3.68	117.12	112.19
9	D	4480	MAN	O5-C1-C2	3.68	119.57	110.79
5	B	2478	ZMR	C9-C8-C7	3.64	119.60	112.17
7	C	3488	NAG	O4-C4-C3	3.64	118.96	110.38
5	C	3477	ZMR	C8-C7-C6	3.59	119.79	113.05
5	A	1477	ZMR	O6-C2-C3	-3.55	120.64	124.62
9	D	4480	MAN	O5-C5-C4	3.54	119.45	110.83
5	B	2477	ZMR	C9-C8-C7	3.54	119.39	112.17
9	D	4480	MAN	C3-C4-C5	3.52	116.62	110.23
5	B	2478	ZMR	O7-C7-C8	3.50	116.89	108.93
5	D	4478	ZMR	O6-C2-C3	-3.50	120.70	124.62
5	D	4477	ZMR	C9-C8-C7	3.48	119.27	112.17
5	D	4478	ZMR	C9-C8-C7	3.44	119.18	112.17
7	B	2483	NAG	O4-C4-C5	3.43	117.78	109.32
5	A	1478	ZMR	C3-C4-NE	3.40	115.72	110.98
9	C	3490	MAN	C1-C2-C3	3.35	114.52	109.64
5	B	2477	ZMR	O9-C9-C8	-3.34	104.15	111.16
9	C	3484	MAN	C1-O5-C5	3.32	116.63	112.19
5	B	2478	ZMR	O7-C7-C6	3.32	116.62	109.44
9	C	3484	MAN	O2-C2-C3	3.28	116.95	110.15
9	B	2485	MAN	C1-C2-C3	3.28	114.42	109.64
5	B	2478	ZMR	C5-N5-C10	3.26	130.73	123.11
7	C	3488	NAG	C8-C7-N2	3.24	121.49	116.12
8	A	1709	BMA	C3-C4-C5	-3.23	104.37	110.23
5	C	3477	ZMR	O7-C7-C6	3.20	116.37	109.44
7	A	1483	NAG	C3-C4-C5	3.20	116.03	110.23
5	D	4478	ZMR	C3-C4-NE	3.20	115.43	110.98
5	A	1477	ZMR	O8-C8-C9	3.19	116.29	109.03
5	A	1477	ZMR	C6-C5-N5	-3.16	105.86	110.91
9	B	2486	MAN	C3-C4-C5	-3.15	104.52	110.23
5	C	3478	ZMR	O1B-C1-C2	3.15	121.19	114.06
5	B	2477	ZMR	O7-C7-C6	3.13	116.22	109.44
5	C	3477	ZMR	O8-C8-C9	3.10	116.08	109.03
5	C	3478	ZMR	O6-C2-C1	3.02	118.03	112.02

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	B	2478	ZMR	C3-C4-NE	2.97	115.11	110.98
7	B	2483	NAG	O4-C4-C3	2.94	117.30	110.38
7	B	2480	NAG	O5-C5-C6	2.92	113.35	107.66
8	C	3493	BMA	C3-C4-C5	2.90	115.49	110.23
9	B	2486	MAN	O5-C5-C6	2.86	113.22	107.66
7	B	2482	NAG	C4-C3-C2	-2.86	106.83	111.02
9	B	2485	MAN	O5-C1-C2	2.85	117.59	110.79
8	A	1709	BMA	O2-C2-C3	2.84	116.04	110.15
5	D	4478	ZMR	O6-C2-C1	2.84	117.68	112.02
7	C	3487	NAG	C2-N2-C7	-2.83	119.11	122.90
7	D	4483	NAG	O5-C1-C2	-2.81	106.95	111.29
9	C	3484	MAN	O5-C5-C4	-2.79	104.03	110.83
8	C	3493	BMA	O2-C2-C3	2.79	115.93	110.15
9	C	3484	MAN	C2-C3-C4	2.76	115.72	110.86
8	D	4486	BMA	O5-C1-C2	-2.76	104.20	110.79
7	D	4483	NAG	C4-C3-C2	2.75	115.04	111.02
5	C	3477	ZMR	C3-C4-NE	2.74	114.80	110.98
9	D	4480	MAN	O2-C2-C3	2.70	115.75	110.15
5	A	1477	ZMR	C8-C7-C6	2.66	118.05	113.05
7	A	1483	NAG	C1-O5-C5	2.66	115.75	112.19
9	B	2484	MAN	C3-C4-C5	-2.66	105.42	110.23
9	D	4480	MAN	O4-C4-C5	-2.59	102.95	109.32
7	B	2480	NAG	C1-O5-C5	-2.57	108.75	112.19
5	C	3477	ZMR	C6-C5-N5	-2.51	106.90	110.91
7	C	3488	NAG	O7-C7-N2	-2.50	117.57	121.98
8	C	3493	BMA	O5-C5-C6	2.50	112.52	107.66
7	B	2483	NAG	C2-N2-C7	-2.49	119.56	122.90
9	D	4480	MAN	O5-C5-C6	2.48	112.48	107.66
7	C	3487	NAG	C1-C2-N2	-2.46	106.55	110.43
5	D	4478	ZMR	O1B-C1-C2	2.45	119.61	114.06
5	D	4477	ZMR	O6-C2-C3	-2.44	121.89	124.62
9	D	4481	MAN	C3-C4-C5	2.42	114.62	110.23
9	B	2486	MAN	C1-C2-C3	2.42	113.17	109.64
5	C	3478	ZMR	O10-C10-N5	2.40	126.21	121.98
9	B	2484	MAN	O4-C4-C3	2.39	116.01	110.38
9	C	3490	MAN	O5-C1-C2	2.36	116.42	110.79
5	A	1478	ZMR	O9-C9-C8	-2.35	106.21	111.16
7	B	2482	NAG	O5-C5-C4	-2.35	105.12	110.83
7	C	3487	NAG	O5-C5-C6	2.32	112.18	107.66
5	B	2478	ZMR	O1B-C1-C2	2.31	119.30	114.06
9	D	4481	MAN	O5-C5-C6	2.30	112.13	107.66
5	A	1477	ZMR	C3-C2-C1	2.28	128.50	123.56

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	B	2485	MAN	C2-C3-C4	2.28	114.86	110.86
5	B	2478	ZMR	O10-C10-N5	2.27	126.00	121.98
7	C	3488	NAG	O5-C5-C6	2.26	112.07	107.66
7	A	1483	NAG	O3-C3-C2	2.23	114.03	109.40
7	B	2483	NAG	C1-C2-N2	-2.22	106.93	110.43
9	B	2485	MAN	O2-C2-C3	2.20	114.70	110.15
8	D	4486	BMA	O4-C4-C3	2.18	115.52	110.38
9	D	4480	MAN	C6-C5-C4	-2.13	107.79	113.02
7	A	1483	NAG	O5-C1-C2	-2.10	108.04	111.29
8	D	4486	BMA	O3-C3-C4	2.10	115.32	110.38
8	A	1709	BMA	O6-C6-C5	-2.05	104.34	111.33
7	C	3488	NAG	C4-C3-C2	2.05	114.03	111.02
9	D	4480	MAN	O3-C3-C2	2.05	114.24	110.05
5	C	3477	ZMR	O10-C10-N5	-2.02	118.41	121.98

All (27) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
5	A	1477	ZMR	C7
5	A	1477	ZMR	C8
5	A	1478	ZMR	C7
5	A	1478	ZMR	C8
5	B	2477	ZMR	C7
5	B	2477	ZMR	C8
5	B	2478	ZMR	C7
5	B	2478	ZMR	C8
5	C	3477	ZMR	C7
5	C	3477	ZMR	C8
5	C	3478	ZMR	C7
5	C	3478	ZMR	C8
5	D	4477	ZMR	C7
5	D	4477	ZMR	C8
5	D	4478	ZMR	C7
5	D	4478	ZMR	C8
7	A	1482	NAG	C4
7	A	1483	NAG	C4
7	B	2480	NAG	C4
7	B	2481	NAG	C4
7	B	2482	NAG	C4
7	B	2483	NAG	C4
7	C	3486	NAG	C4
7	C	3487	NAG	C4

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atom
7	C	3488	NAG	C4
7	D	4482	NAG	C4
7	D	4483	NAG	C4

All (93) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	1477	ZMR	C6-C7-C8-O8
5	A	1477	ZMR	O7-C7-C8-C9
5	A	1477	ZMR	C7-C8-C9-O9
5	A	1478	ZMR	O1A-C1-C2-C3
5	A	1478	ZMR	O1A-C1-C2-O6
5	A	1478	ZMR	O1B-C1-C2-C3
5	A	1478	ZMR	O1B-C1-C2-O6
5	A	1478	ZMR	C3-C4-NE-CZ
5	A	1478	ZMR	C5-C6-C7-O7
5	A	1478	ZMR	O6-C6-C7-O7
5	A	1478	ZMR	C6-C7-C8-O8
5	A	1478	ZMR	O7-C7-C8-C9
5	A	1478	ZMR	C7-C8-C9-O9
5	B	2477	ZMR	O6-C6-C7-C8
5	B	2477	ZMR	C6-C7-C8-O8
5	B	2477	ZMR	O7-C7-C8-C9
5	B	2478	ZMR	C3-C4-NE-CZ
5	B	2478	ZMR	C5-C6-C7-O7
5	B	2478	ZMR	O6-C6-C7-O7
5	B	2478	ZMR	C6-C7-C8-O8
5	B	2478	ZMR	O7-C7-C8-C9
5	C	3477	ZMR	C6-C7-C8-O8
5	C	3477	ZMR	O7-C7-C8-C9
5	C	3477	ZMR	C7-C8-C9-O9
5	C	3478	ZMR	C5-C6-C7-O7
5	C	3478	ZMR	O6-C6-C7-O7
5	C	3478	ZMR	C6-C7-C8-O8
5	C	3478	ZMR	O7-C7-C8-C9
5	C	3478	ZMR	O8-C8-C9-O9
5	D	4477	ZMR	O6-C6-C7-C8
5	D	4477	ZMR	C6-C7-C8-O8
5	D	4477	ZMR	O7-C7-C8-C9
5	D	4477	ZMR	C7-C8-C9-O9
5	D	4478	ZMR	O1A-C1-C2-C3
5	D	4478	ZMR	O1A-C1-C2-O6

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>Atoms</b>
5	D	4478	ZMR	O1B-C1-C2-C3
5	D	4478	ZMR	O1B-C1-C2-O6
5	D	4478	ZMR	C3-C4-NE-CZ
5	D	4478	ZMR	C5-C6-C7-C8
5	D	4478	ZMR	O6-C6-C7-C8
5	D	4478	ZMR	C6-C7-C8-O8
5	D	4478	ZMR	O7-C7-C8-C9
5	D	4478	ZMR	O8-C8-C9-O9
8	C	3493	BMA	O5-C5-C6-O6
5	B	2478	ZMR	C7-C8-C9-O9
9	D	4481	MAN	O5-C5-C6-O6
7	D	4482	NAG	C4-C5-C6-O6
8	C	3493	BMA	C4-C5-C6-O6
9	B	2485	MAN	O5-C5-C6-O6
7	C	3486	NAG	O5-C5-C6-O6
7	D	4483	NAG	O5-C5-C6-O6
9	D	4481	MAN	C4-C5-C6-O6
7	D	4482	NAG	O5-C5-C6-O6
9	C	3492	MAN	C4-C5-C6-O6
7	D	4483	NAG	C4-C5-C6-O6
7	B	2480	NAG	C4-C5-C6-O6
7	C	3486	NAG	C4-C5-C6-O6
9	B	2485	MAN	C4-C5-C6-O6
9	C	3484	MAN	O5-C5-C6-O6
7	C	3488	NAG	C8-C7-N2-C2
7	C	3488	NAG	O7-C7-N2-C2
7	A	1482	NAG	O5-C5-C6-O6
7	C	3488	NAG	O5-C5-C6-O6
7	B	2480	NAG	O5-C5-C6-O6
5	B	2477	ZMR	C7-C8-C9-O9
7	A	1482	NAG	C4-C5-C6-O6
7	C	3488	NAG	C4-C5-C6-O6
9	C	3490	MAN	O5-C5-C6-O6
8	A	1709	BMA	C4-C5-C6-O6
9	C	3484	MAN	C4-C5-C6-O6
9	C	3492	MAN	O5-C5-C6-O6
7	A	1483	NAG	O5-C5-C6-O6
5	B	2478	ZMR	O8-C8-C9-O9
9	D	4480	MAN	O5-C5-C6-O6
8	A	1709	BMA	O5-C5-C6-O6
8	D	4486	BMA	C4-C5-C6-O6
7	B	2482	NAG	C4-C5-C6-O6

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms
7	B	2481	NAG	C3-C2-N2-C7
8	D	4486	BMA	O5-C5-C6-O6
7	B	2481	NAG	C1-C2-N2-C7
9	C	3490	MAN	C4-C5-C6-O6
5	A	1477	ZMR	C5-C6-C7-C8
5	B	2477	ZMR	C5-C6-C7-C8
5	C	3477	ZMR	C5-C6-C7-C8
5	D	4477	ZMR	C5-C6-C7-C8
5	C	3478	ZMR	C7-C8-C9-O9
5	B	2477	ZMR	O8-C8-C9-O9
7	D	4482	NAG	C3-C2-N2-C7
7	B	2482	NAG	O5-C5-C6-O6
5	A	1477	ZMR	O6-C6-C7-C8
5	A	1478	ZMR	C5-C4-NE-CZ
5	C	3477	ZMR	O6-C6-C7-C8
5	D	4478	ZMR	C5-C4-NE-CZ

There are no ring outliers.

24 monomers are involved in 63 short contacts:

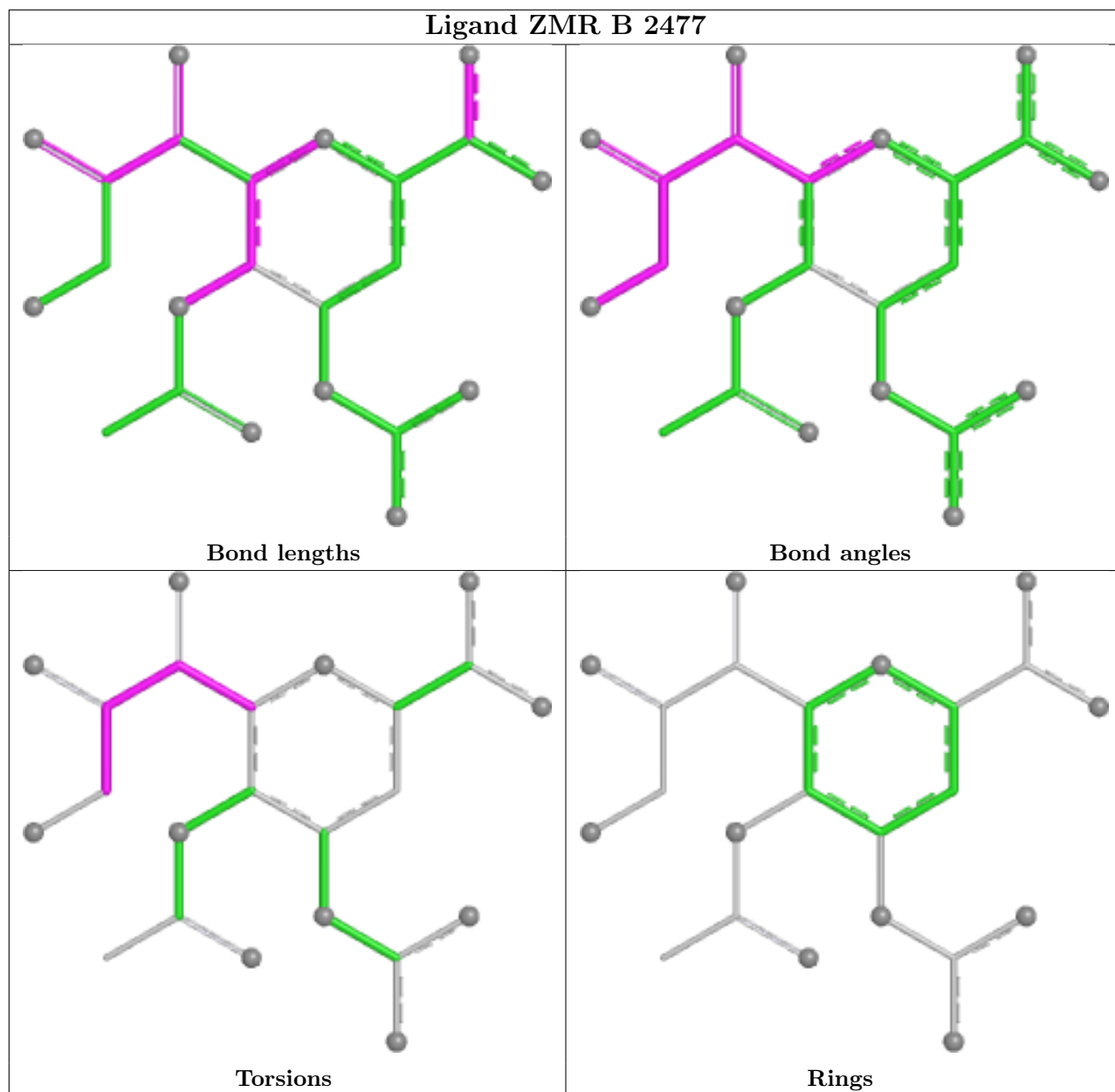
Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	B	2481	NAG	2	0
7	D	4483	NAG	2	0
8	D	4486	BMA	4	0
7	C	3488	NAG	1	0
7	B	2480	NAG	5	0
9	B	2486	MAN	2	0
5	A	1478	ZMR	1	0
9	D	4480	MAN	1	0
5	C	3477	ZMR	1	0
7	A	1482	NAG	5	0
9	B	2484	MAN	7	0
7	B	2482	NAG	6	0
7	A	1483	NAG	1	0
5	C	3478	ZMR	2	0
8	A	1709	BMA	3	0
7	B	2483	NAG	2	0
9	C	3492	MAN	3	0
7	C	3486	NAG	5	0
7	C	3487	NAG	6	0
9	C	3490	MAN	6	0
8	C	3493	BMA	2	0

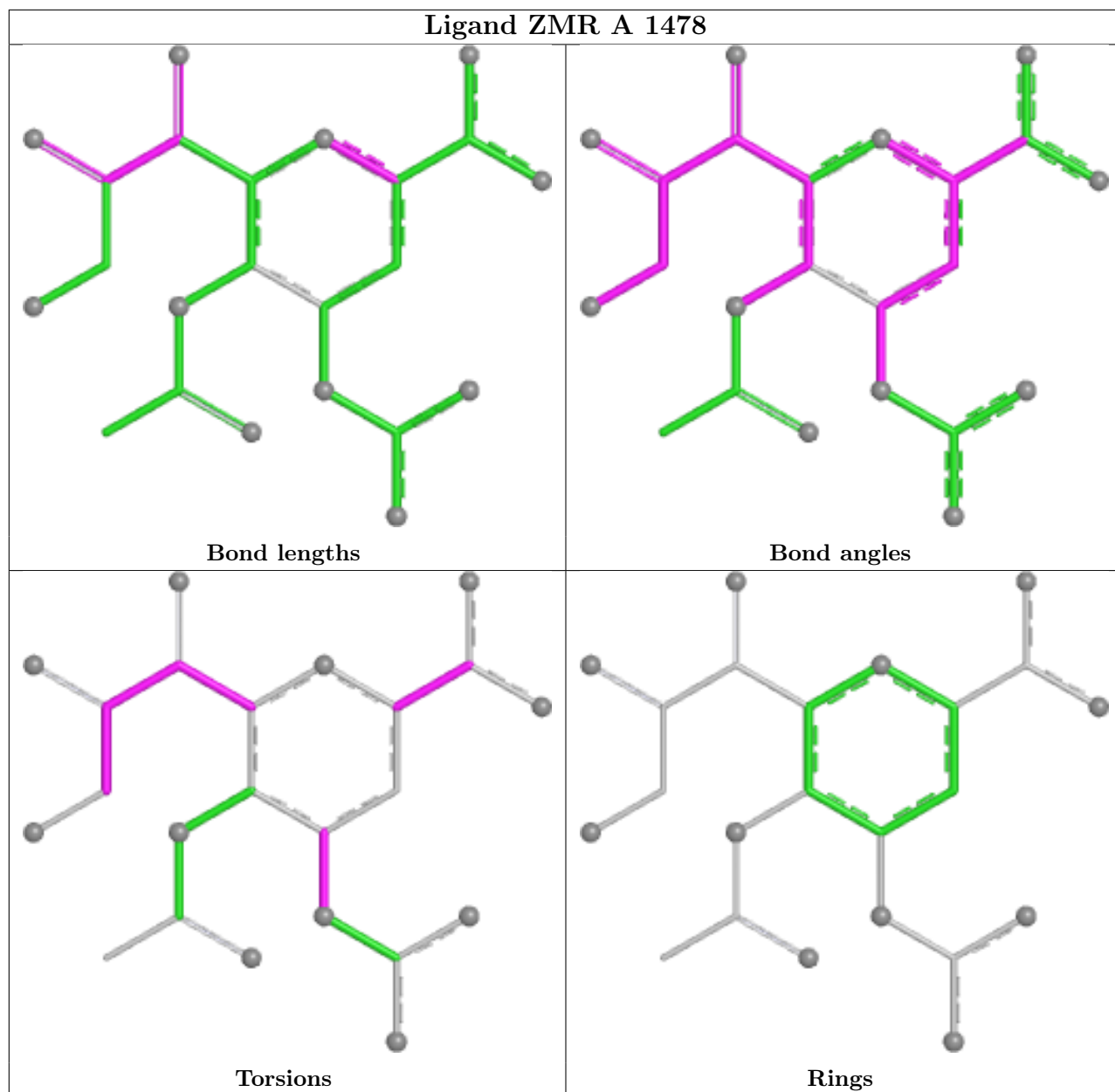
*Continued on next page...*

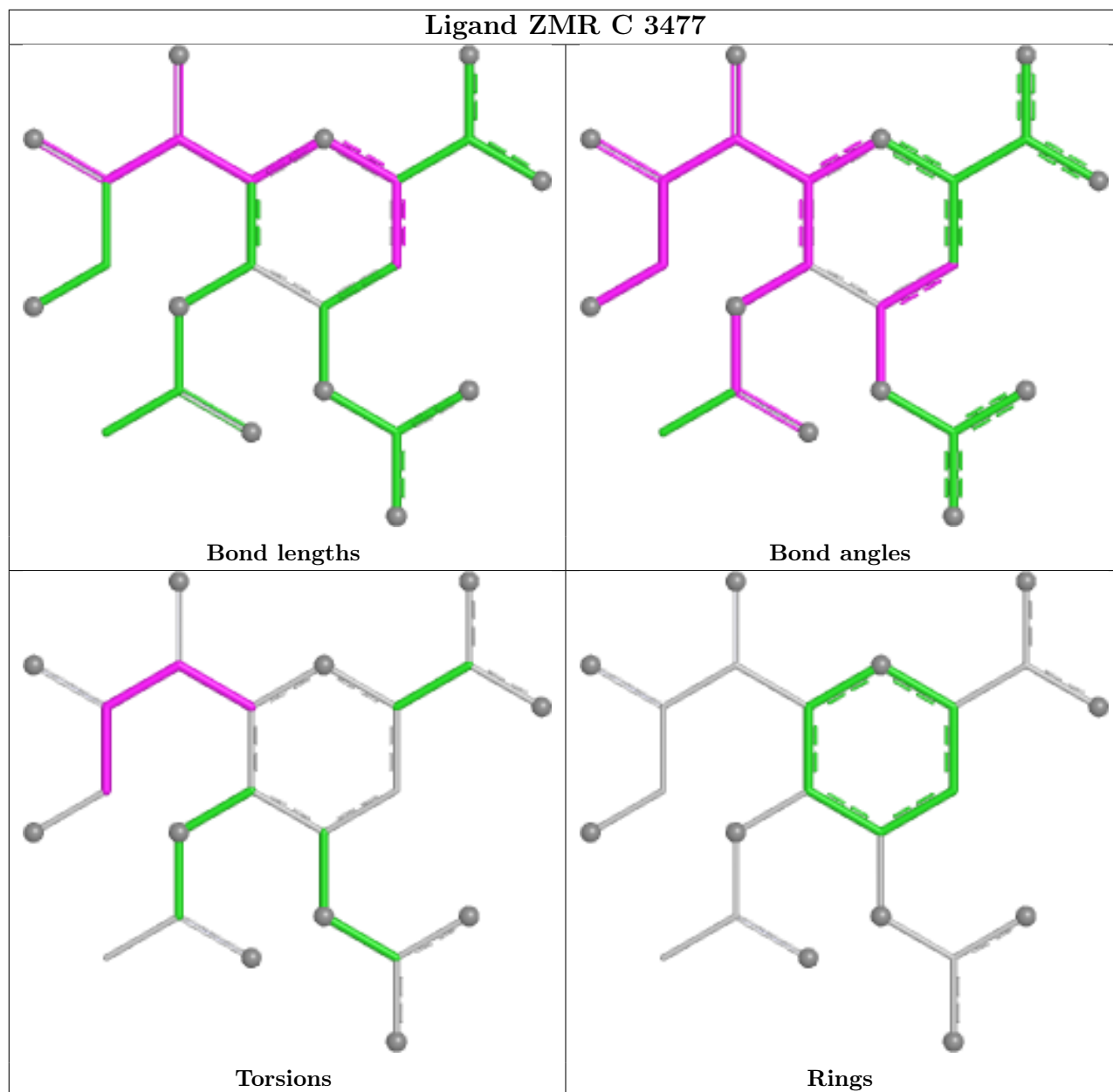
*Continued from previous page...*

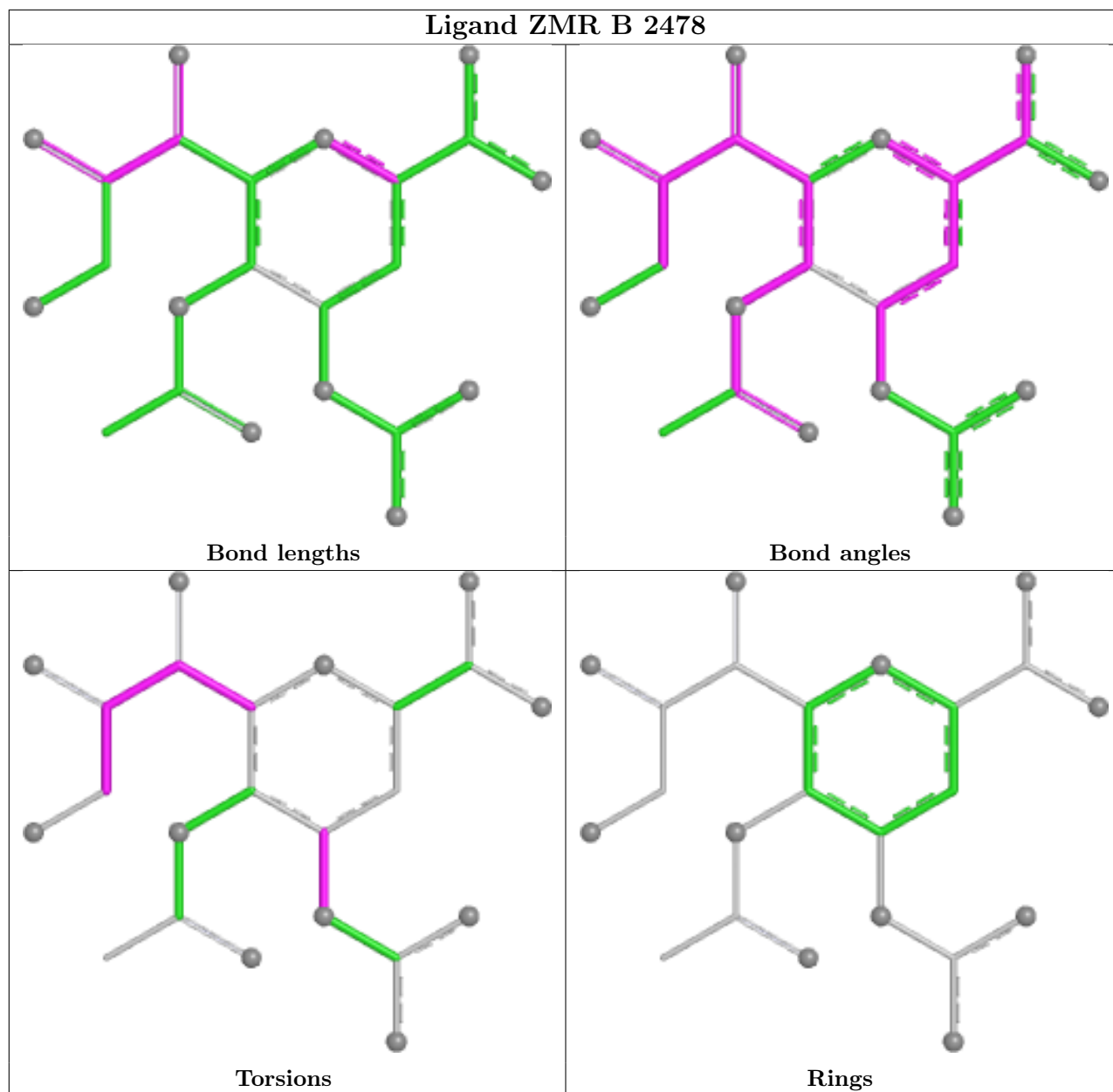
Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	D	4482	NAG	7	0
9	B	2485	MAN	4	0
9	C	3484	MAN	2	0

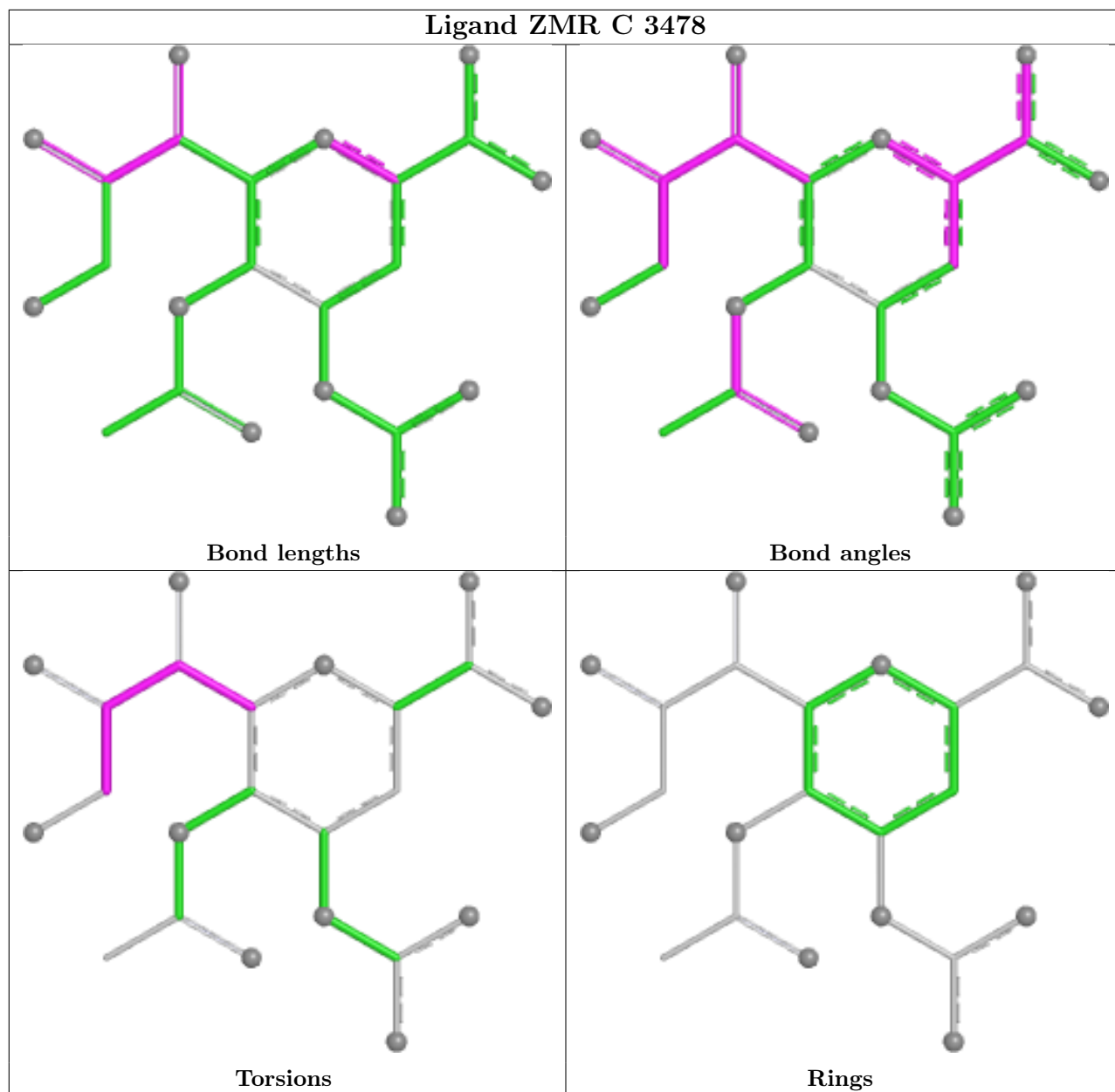
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

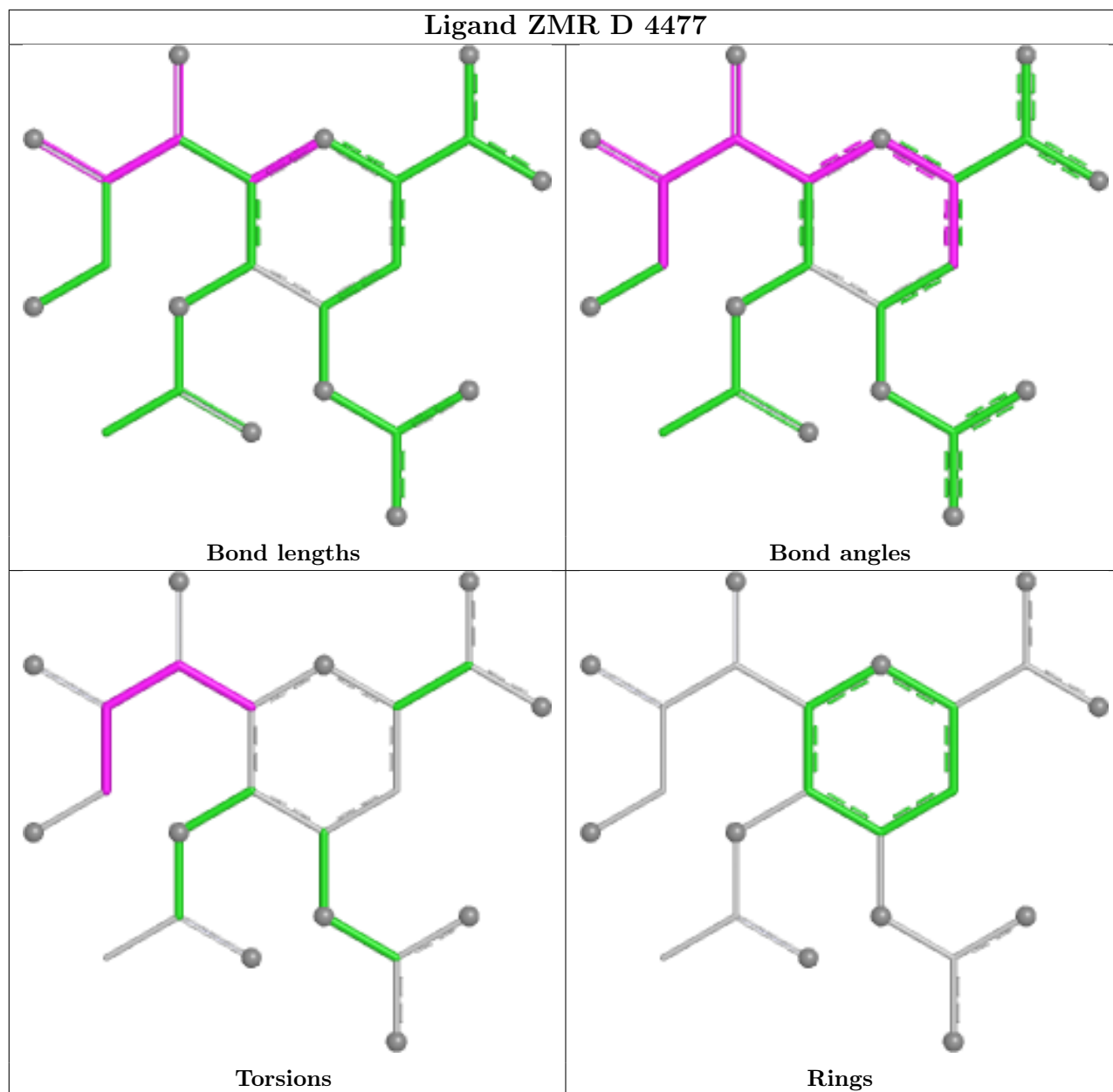


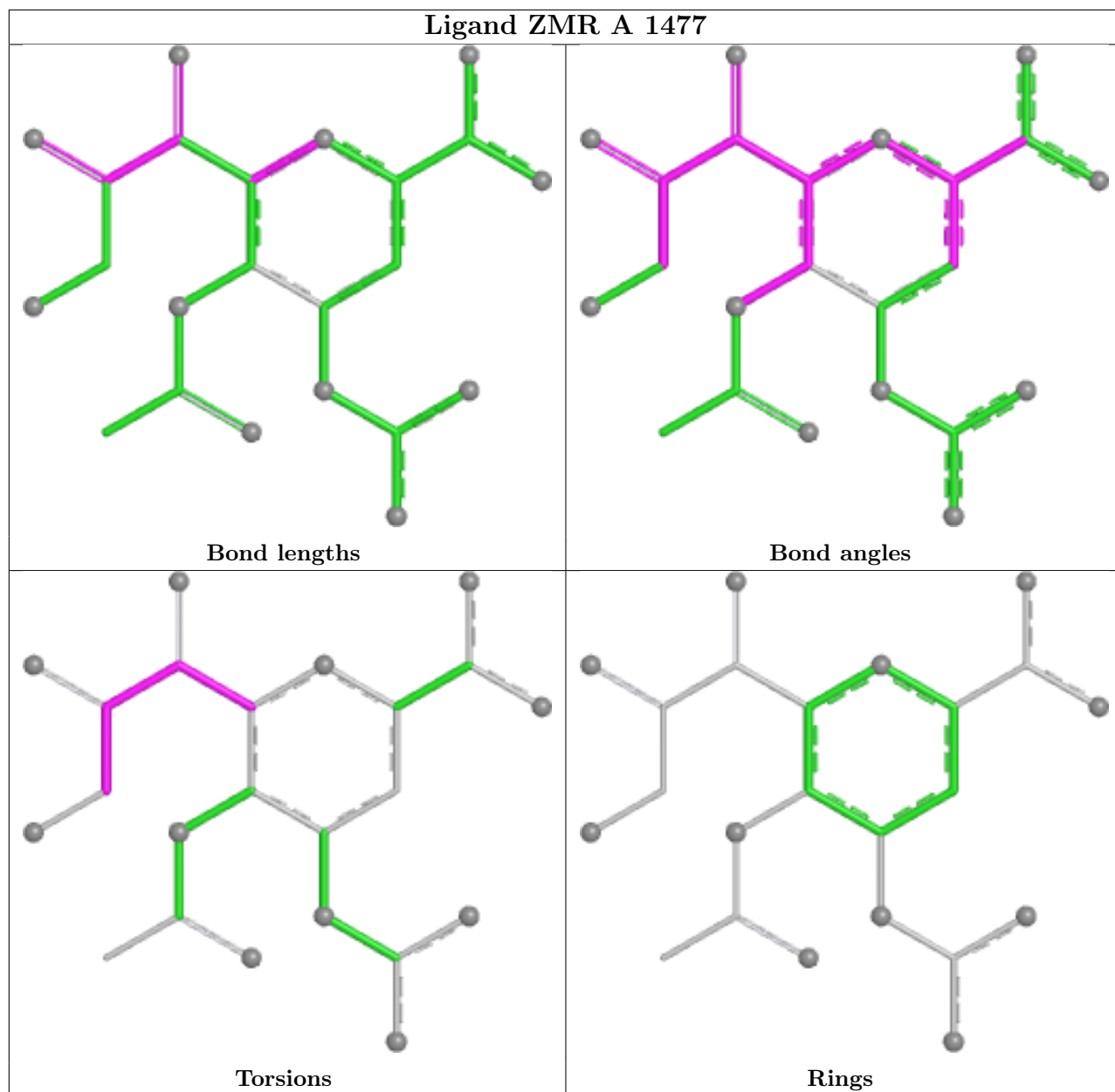


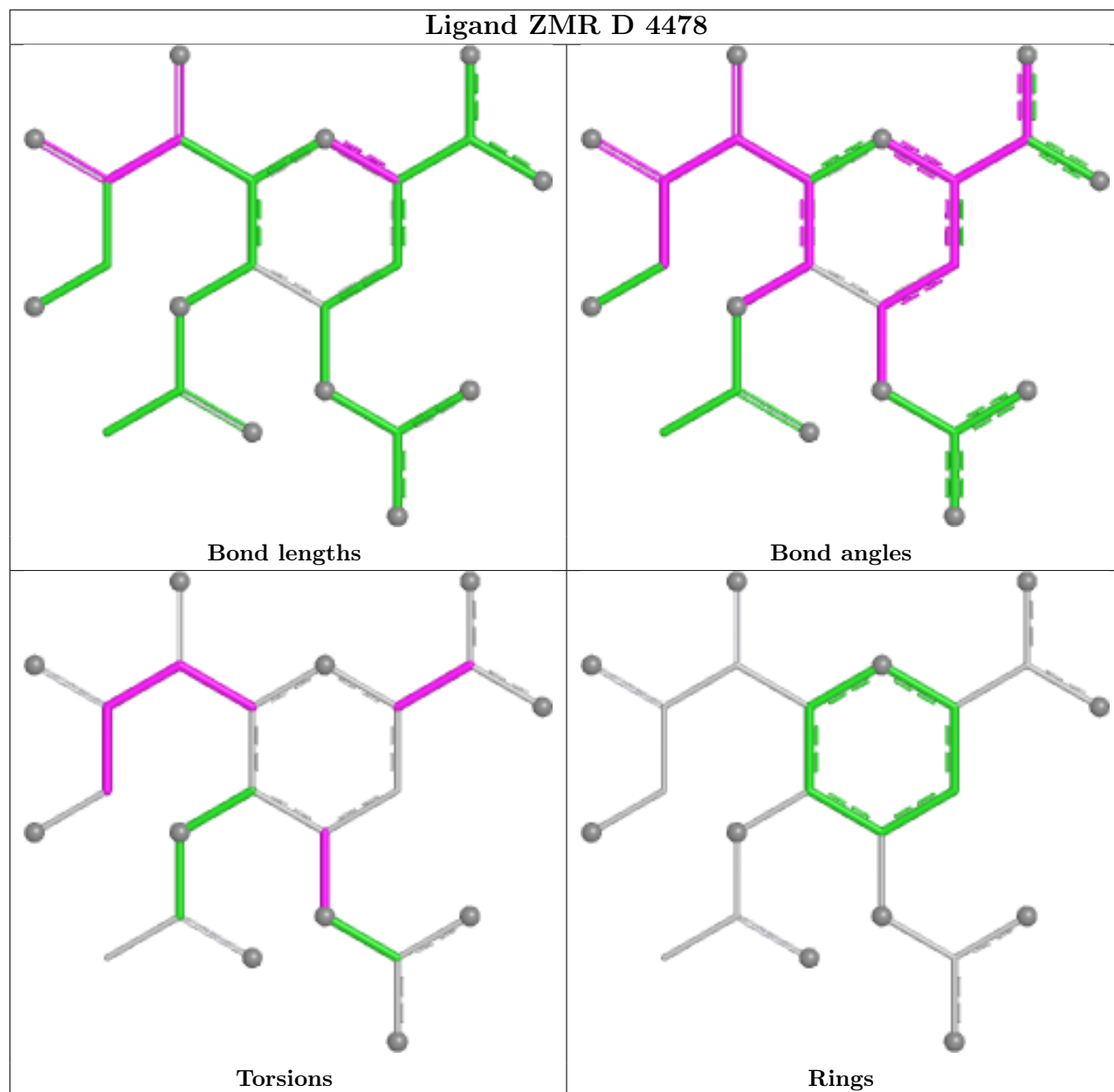












## 5.7 Other polymers [i](#)

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	389/389 (100%)	-0.59	0 100 100	5, 11, 18, 30	0
1	B	389/389 (100%)	-0.56	0 100 100	5, 12, 20, 36	0
1	C	389/389 (100%)	-0.56	0 100 100	5, 12, 20, 37	0
1	D	389/389 (100%)	-0.55	0 100 100	5, 12, 19, 31	0
All	All	1556/1556 (100%)	-0.56	0 100 100	5, 12, 20, 37	0

There are no RSRZ outliers to report.

### 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.

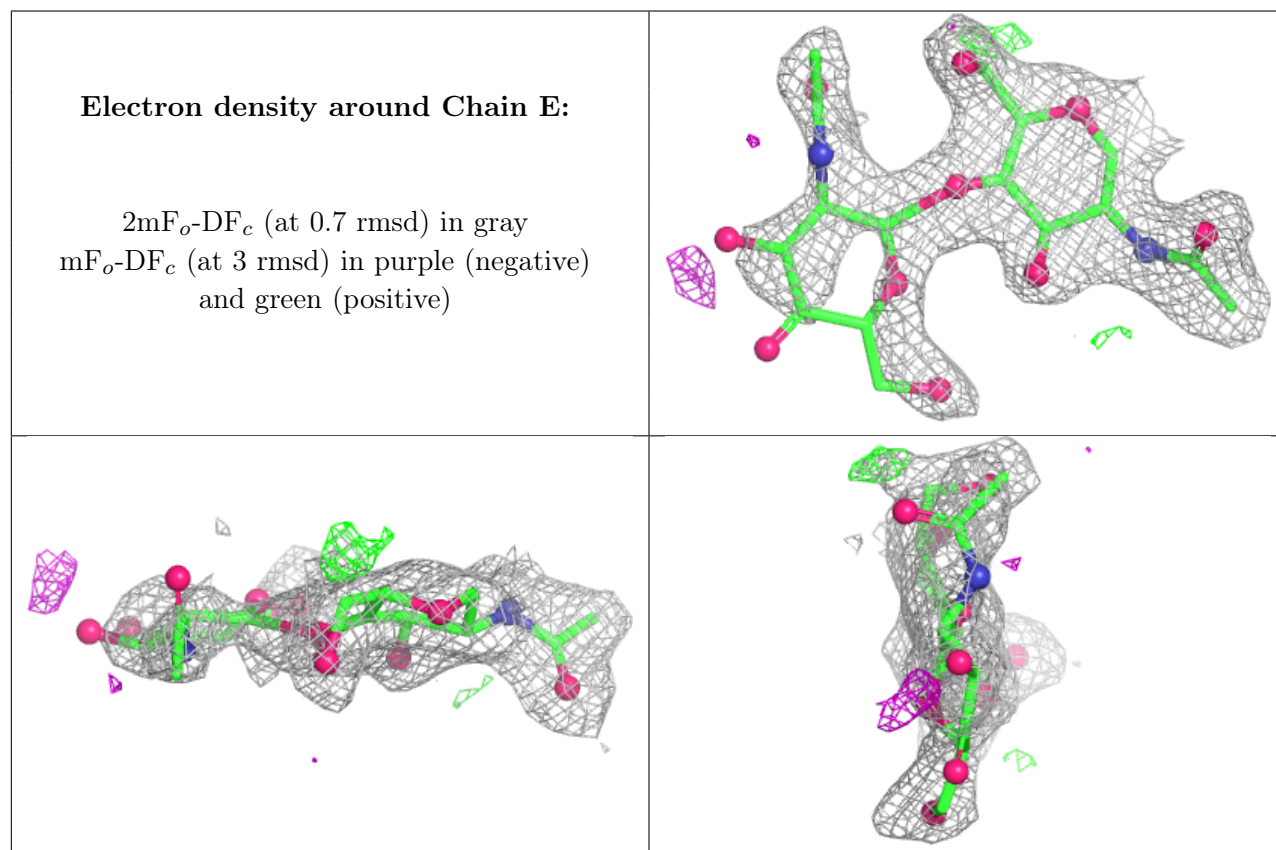
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
2	NAG	E	2	14/15	0.65	0.22	71,74,75,75	0
4	NAG	G	1	14/15	0.78	0.15	33,41,46,47	0
2	NAG	H	1	14/15	0.80	0.13	34,41,44,44	0
2	NAG	I	2	14/15	0.82	0.12	21,30,36,36	0
3	MAN	F	3	11/12	0.83	0.13	32,36,41,46	0
2	NAG	I	1	14/15	0.87	0.10	24,30,31,32	0
4	NAG	G	2	14/15	0.87	0.10	21,25,27,29	0
3	MAN	F	2	11/12	0.89	0.10	21,31,32,33	0
2	NAG	H	2	14/15	0.91	0.08	21,28,31,31	0

*Continued on next page...*

Continued from previous page...

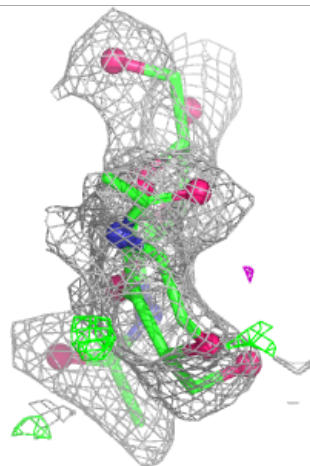
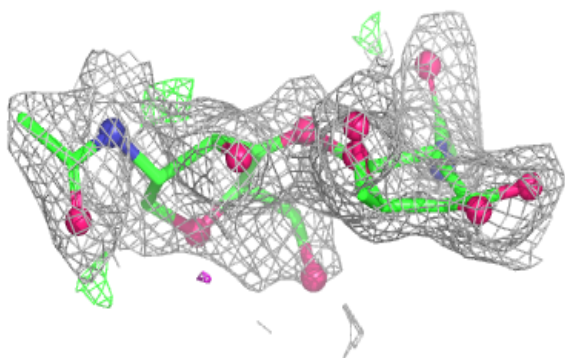
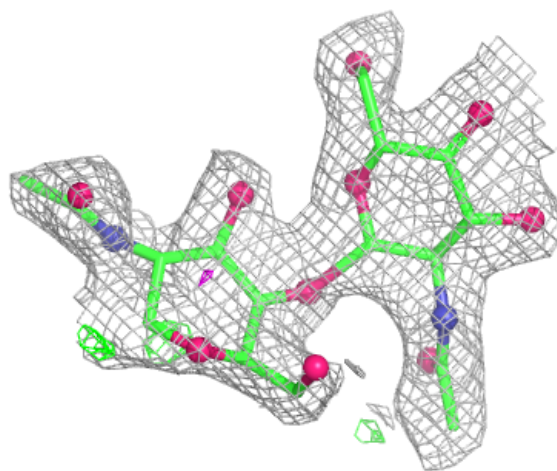
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
3	MAN	F	1	11/12	0.91	0.12	31,35,40,40	0
4	MAN	G	4	11/12	0.91	0.09	24,27,30,30	0
4	MAN	G	5	11/12	0.91	0.08	19,25,28,30	0
2	NAG	E	1	14/15	0.92	0.07	16,25,27,27	0
4	BMA	G	3	11/12	0.92	0.08	26,31,32,33	0

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.



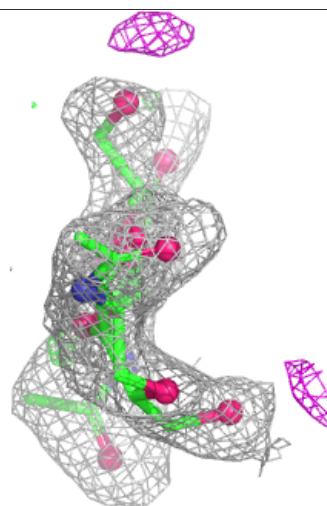
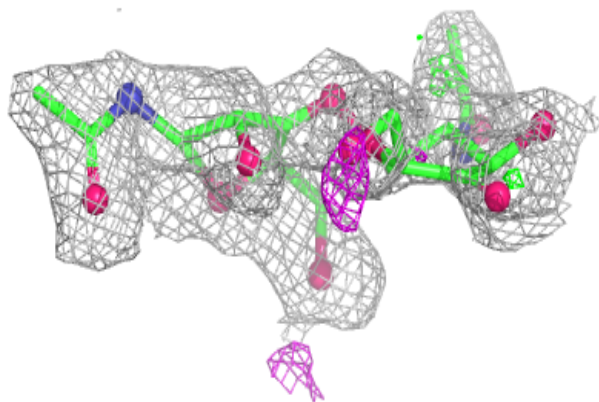
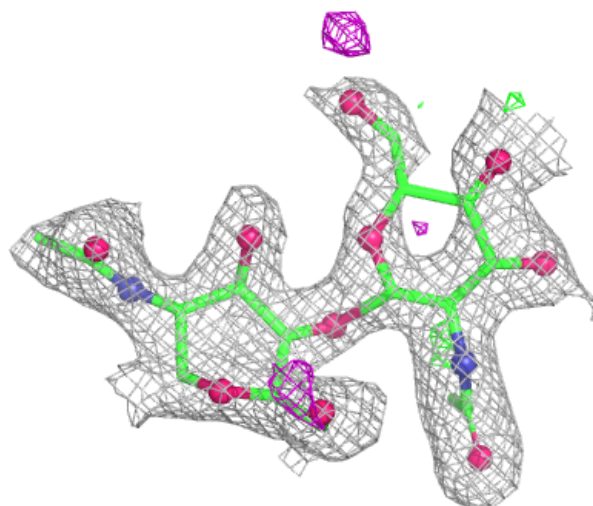
**Electron density around Chain H:**

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



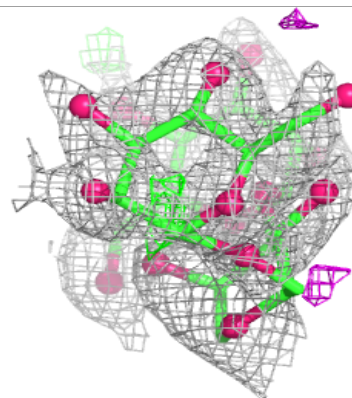
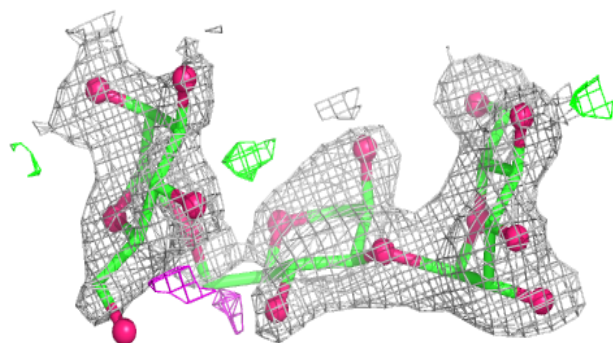
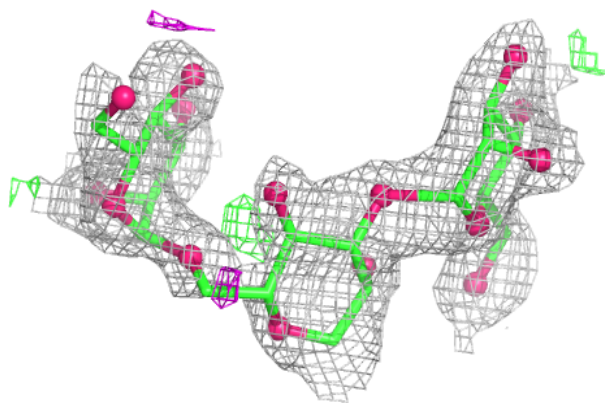
**Electron density around Chain I:**

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

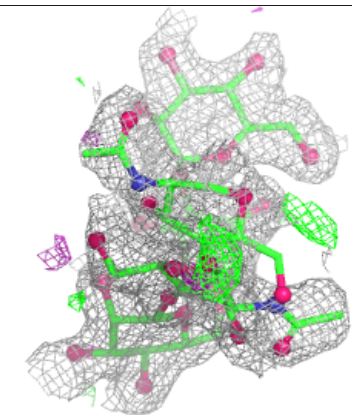
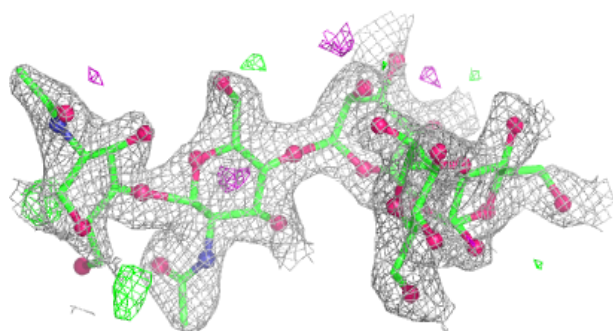
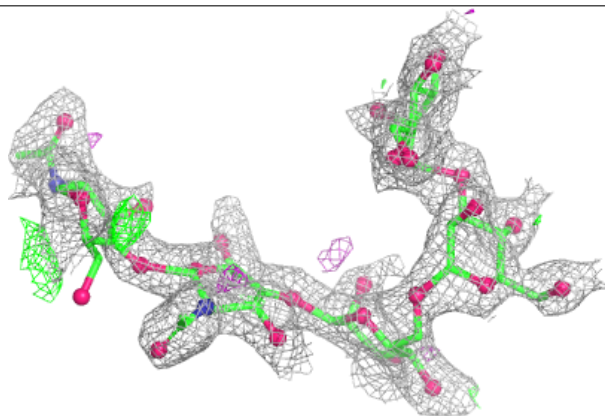


**Electron density around Chain F:**

$2mF_o-DF_c$  (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, 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.

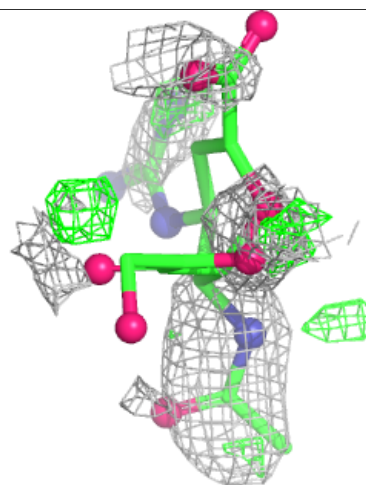
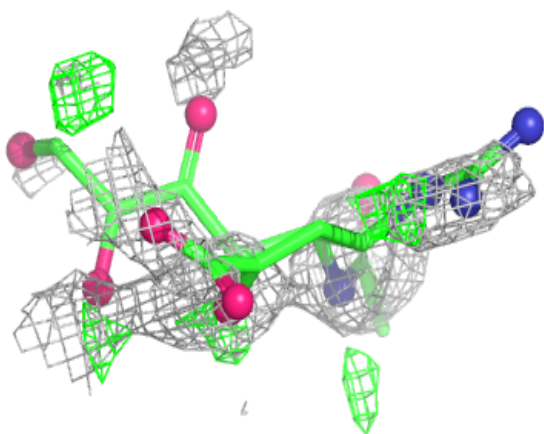
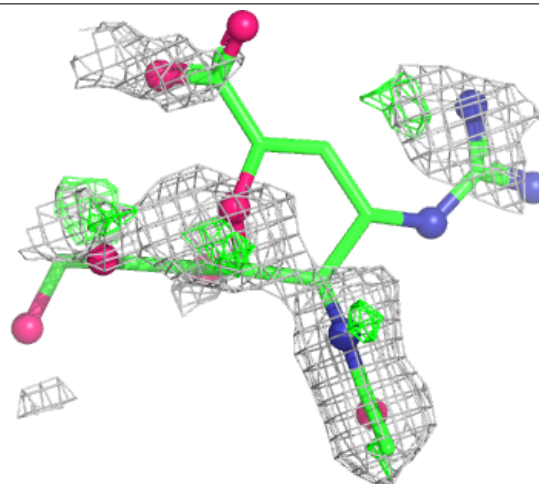
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
7	NAG	D	4482	14/15	0.57	0.29	73,78,79,80	0
7	NAG	B	2481	14/15	0.61	0.22	66,72,74,74	0
5	ZMR	A	1478	23/23	0.64	0.34	36,41,45,47	23
9	MAN	D	4481	11/12	0.64	0.22	65,69,70,70	0
7	NAG	C	3488	14/15	0.67	0.20	63,68,70,70	0
9	MAN	C	3492	11/12	0.70	0.19	60,65,67,67	0
7	NAG	A	1483	14/15	0.71	0.21	71,77,79,80	0
5	ZMR	C	3478	23/23	0.71	0.28	28,35,37,39	23
9	MAN	D	4480	11/12	0.74	0.18	44,49,52,52	0
5	ZMR	D	4478	23/23	0.74	0.31	38,44,48,49	23
7	NAG	B	2483	14/15	0.75	0.13	30,36,37,38	0
7	NAG	B	2482	14/15	0.77	0.17	44,52,53,53	0
5	ZMR	B	2478	23/23	0.80	0.25	35,42,44,45	23
8	BMA	D	4486	11/12	0.82	0.15	41,43,45,46	0
9	MAN	C	3490	11/12	0.83	0.11	29,33,35,36	0
9	MAN	B	2485	11/12	0.83	0.13	42,47,49,49	0
9	MAN	B	2484	11/12	0.84	0.14	41,44,45,46	0
7	NAG	C	3486	14/15	0.85	0.13	42,47,49,49	0
8	BMA	C	3493	11/12	0.86	0.11	33,34,36,37	0
9	MAN	B	2486	11/12	0.86	0.13	48,49,50,50	0
7	NAG	A	1482	14/15	0.87	0.11	23,28,32,34	0
7	NAG	C	3487	14/15	0.90	0.09	19,22,30,31	0
9	MAN	C	3484	11/12	0.90	0.08	29,30,34,37	0
8	BMA	A	1709	11/12	0.90	0.10	31,36,37,37	0
7	NAG	B	2480	14/15	0.91	0.08	14,26,30,30	0
7	NAG	D	4483	14/15	0.92	0.09	16,25,26,27	0
5	ZMR	C	3477	23/23	0.96	0.05	5,11,16,16	0
5	ZMR	B	2477	23/23	0.97	0.04	2,10,13,16	0
6	CA	A	1479	1/1	0.97	0.05	20,20,20,20	0
5	ZMR	A	1477	23/23	0.97	0.05	6,10,13,15	0
5	ZMR	D	4477	23/23	0.97	0.04	5,10,13,16	0
6	CA	C	3479	1/1	0.98	0.05	21,21,21,21	0
6	CA	D	4479	1/1	0.98	0.03	19,19,19,19	0
6	CA	B	2479	1/1	0.98	0.04	25,25,25,25	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers

as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

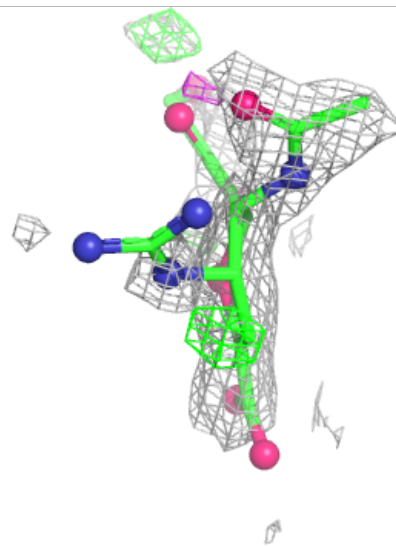
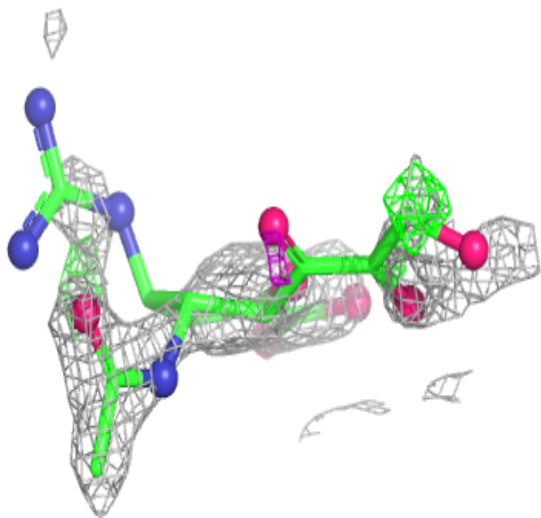
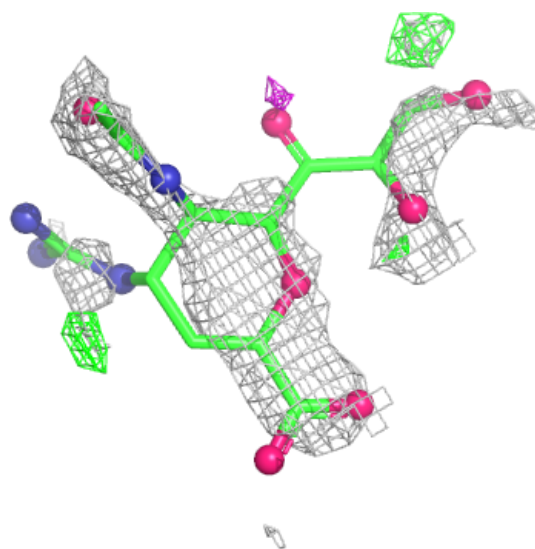
**Electron density around ZMR A 1478:**

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



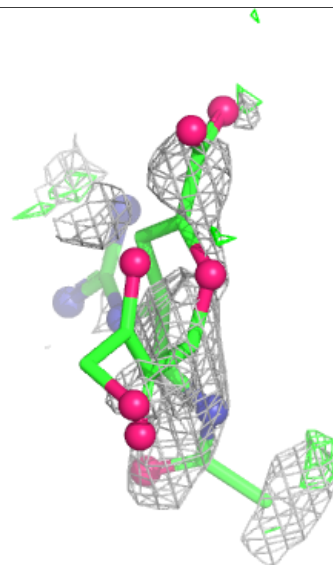
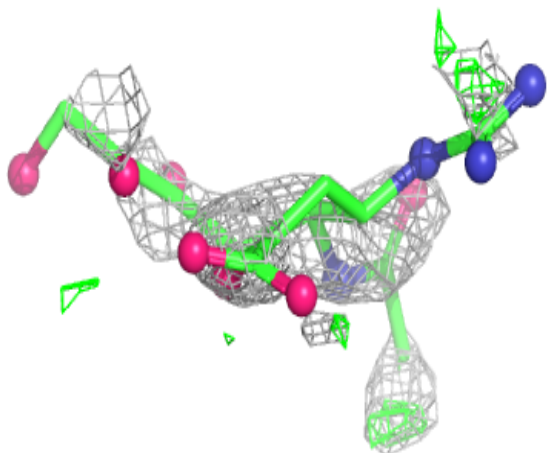
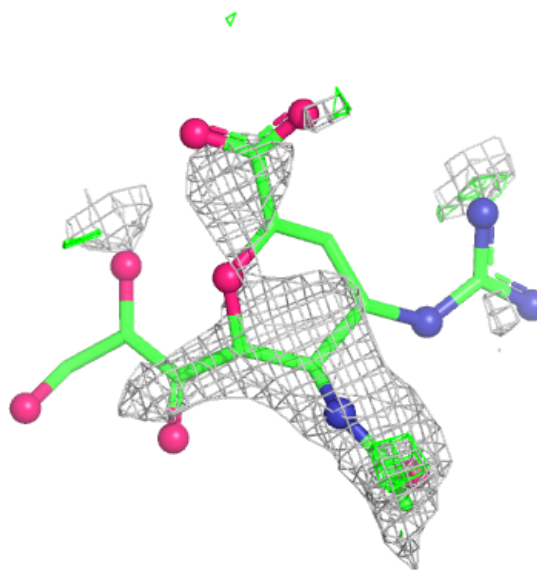
**Electron density around ZMR C 3478:**

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



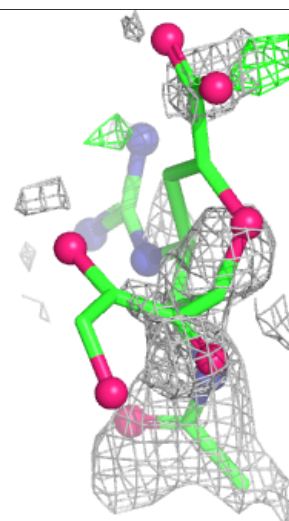
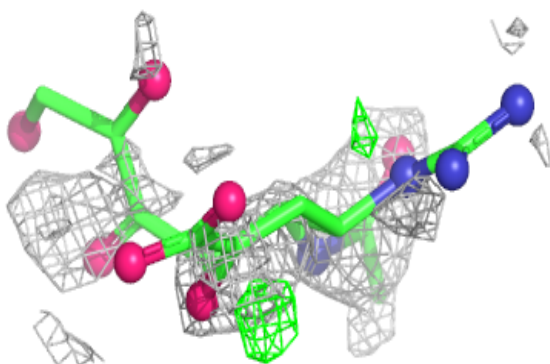
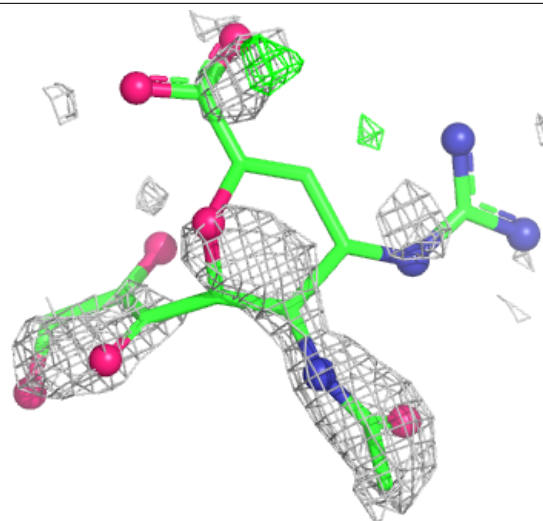
**Electron density around ZMR D 4478:**

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



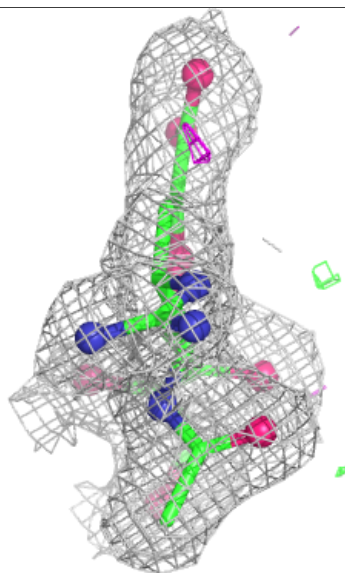
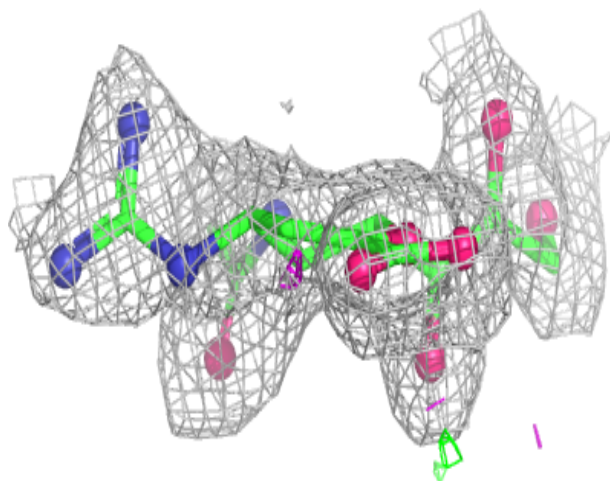
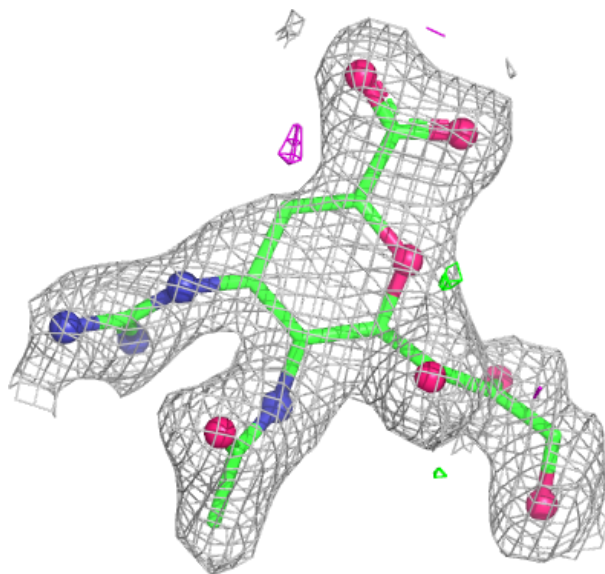
**Electron density around ZMR B 2478:**

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



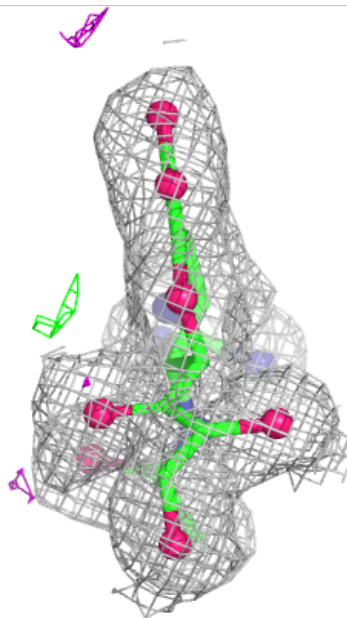
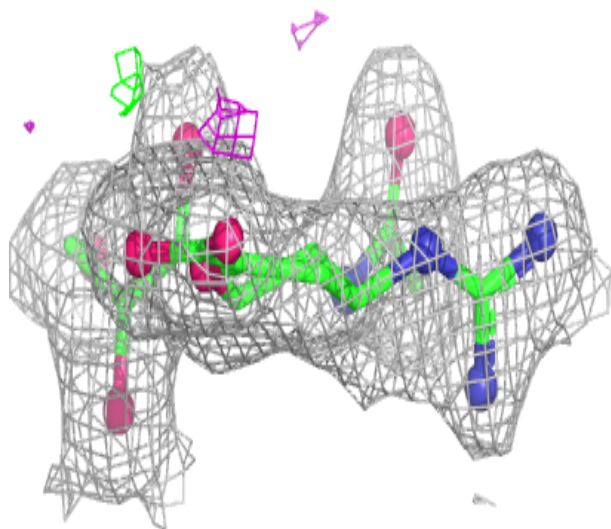
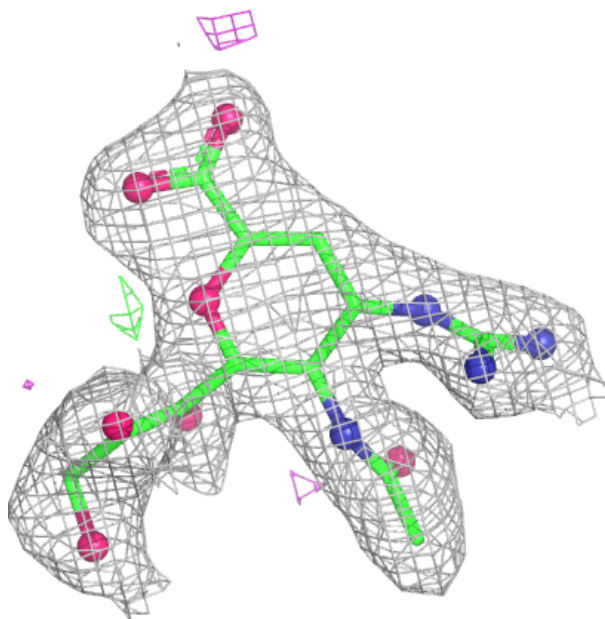
**Electron density around ZMR C 3477:**

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



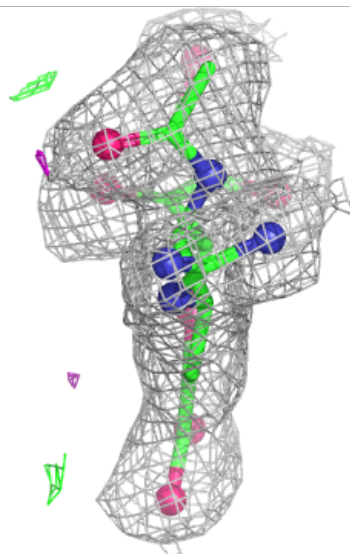
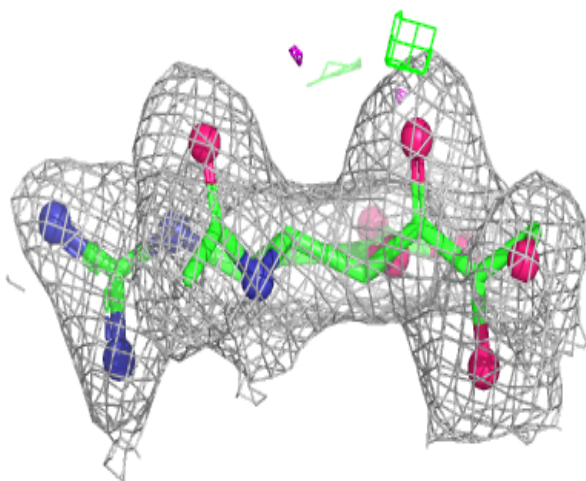
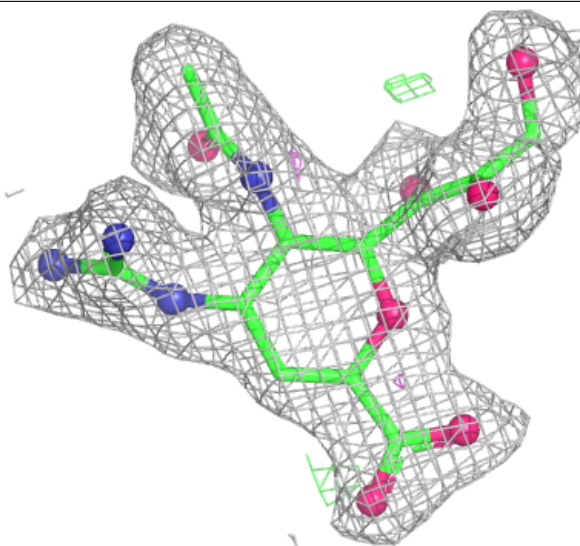
**Electron density around ZMR B 2477:**

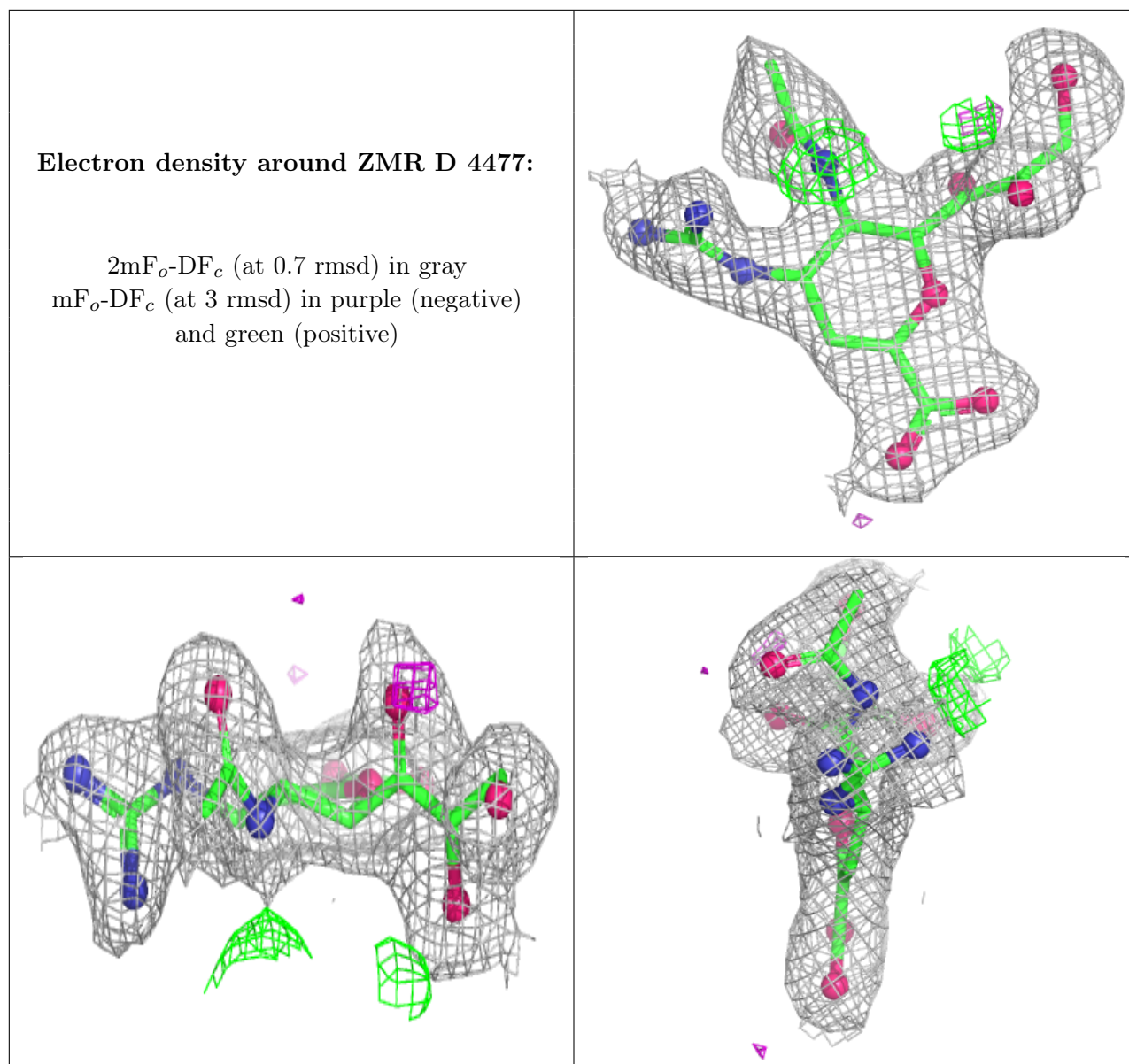
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



**Electron density around ZMR A 1477:**

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





## 6.5 Other polymers [i](#)

There are no such residues in this entry.