



# Full wwPDB X-ray Structure Validation Report ⓘ

Jan 20, 2024 – 03:12 pm GMT

PDB ID : 7OGZ  
Title : Plant peptide hormone receptor complex H1L3S1  
Authors : Roman, A.O.; Jimenez-Sandoval, P.; Santiago, J.  
Deposited on : 2021-05-07  
Resolution : 2.70 Å(reported)

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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>.

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

MolProbity : 4.02b-467  
Mogul : 1.8.4, CSD as541be (2020)  
Xtrriage (Phenix) : 1.13  
EDS : 2.36  
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) : 2.36

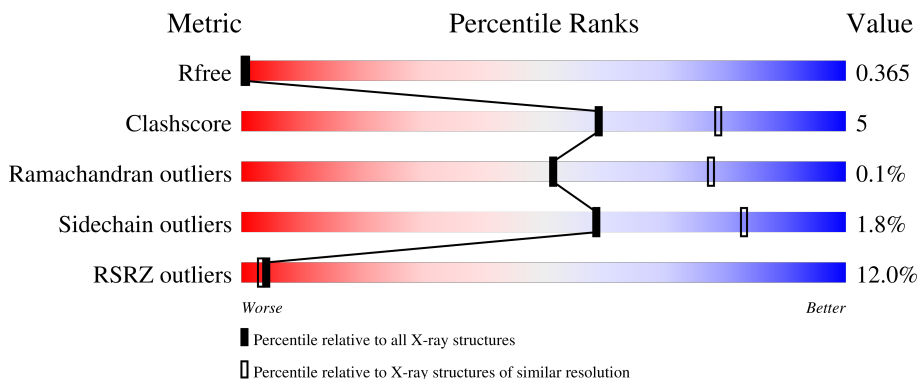
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*


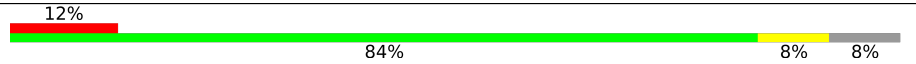
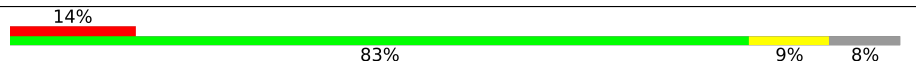

The reported resolution of this entry is 2.70 Å.

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	2808 (2.70-2.70)
Clashscore	141614	3122 (2.70-2.70)
Ramachandran outliers	138981	3069 (2.70-2.70)
Sidechain outliers	138945	3069 (2.70-2.70)
RSRZ outliers	127900	2737 (2.70-2.70)

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	AAA	617	
1	DDD	617	
2	BBB	201	
2	EEE	201	
3	CCC	12	

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Mol	Chain	Length	Quality of chain
3	FFF	12	92% 8%
4	AaA	2	50% 50%
4	AgA	2	100%
4	AiA	2	50% 50%
4	BaB	2	100%
4	DbD	2	50% 50%
4	DcD	2	100%
4	DeD	2	100%
4	DhD	2	100%
4	DkD	2	100%
4	EaE	2	100%
5	AeA	3	100%
5	DaD	3	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
4	NAG	AaA	2	X	-	-	-
4	NAG	AgA	2	X	-	-	-
4	NAG	AiA	2	X	-	-	-
4	NAG	BaB	1	X	-	-	-
4	NAG	DbD	2	X	-	-	-
4	NAG	DcD	2	X	-	-	-
4	NAG	DeD	2	X	-	-	-
4	NAG	DhD	1	-	-	-	X
4	NAG	DhD	2	-	-	-	X
4	NAG	DkD	2	X	-	-	-
4	NAG	EaE	2	X	-	-	-
5	NAG	AeA	2	X	-	-	-
5	BMA	AeA	3	X	-	-	-
5	NAG	DaD	2	X	-	-	-
5	BMA	DaD	3	X	-	-	-

## 2 Entry composition i

There are 7 unique types of molecules in this entry. The entry contains 12054 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 Receptor-like protein kinase HSL1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	AAA	591	4348	2750	714	868	16	0	1	0
1	DDD	589	4350	2756	713	864	17	0	1	0

There are 30 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
AAA	12	GLY	-	expression tag	UNP Q9SGP2
AAA	13	SER	-	expression tag	UNP Q9SGP2
AAA	14	SER	-	expression tag	UNP Q9SGP2
AAA	15	MET	-	expression tag	UNP Q9SGP2
AAA	16	ASP	-	expression tag	UNP Q9SGP2
AAA	619	LEU	-	expression tag	UNP Q9SGP2
AAA	620	GLU	-	expression tag	UNP Q9SGP2
AAA	621	GLY	-	expression tag	UNP Q9SGP2
AAA	622	SER	-	expression tag	UNP Q9SGP2
AAA	623	GLU	-	expression tag	UNP Q9SGP2
AAA	624	ASN	-	expression tag	UNP Q9SGP2
AAA	625	LEU	-	expression tag	UNP Q9SGP2
AAA	626	TYR	-	expression tag	UNP Q9SGP2
AAA	627	PHE	-	expression tag	UNP Q9SGP2
AAA	628	GLN	-	expression tag	UNP Q9SGP2
DDD	12	GLY	-	expression tag	UNP Q9SGP2
DDD	13	SER	-	expression tag	UNP Q9SGP2
DDD	14	SER	-	expression tag	UNP Q9SGP2
DDD	15	MET	-	expression tag	UNP Q9SGP2
DDD	16	ASP	-	expression tag	UNP Q9SGP2
DDD	619	LEU	-	expression tag	UNP Q9SGP2
DDD	620	GLU	-	expression tag	UNP Q9SGP2
DDD	621	GLY	-	expression tag	UNP Q9SGP2
DDD	622	SER	-	expression tag	UNP Q9SGP2
DDD	623	GLU	-	expression tag	UNP Q9SGP2

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Chain	Residue	Modelled	Actual	Comment	Reference
DDD	624	ASN	-	expression tag	UNP Q9SGP2
DDD	625	LEU	-	expression tag	UNP Q9SGP2
DDD	626	TYR	-	expression tag	UNP Q9SGP2
DDD	627	PHE	-	expression tag	UNP Q9SGP2
DDD	628	GLN	-	expression tag	UNP Q9SGP2

- Molecule 2 is a protein called Somatic embryogenesis receptor kinase 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	BBB	185	1362	862	232	263	5	0	0	0
2	EEE	185	1381	871	236	269	5	0	0	0

There are 22 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
BBB	20	GLY	-	expression tag	UNP Q94AG2
BBB	21	SER	-	expression tag	UNP Q94AG2
BBB	22	SER	-	expression tag	UNP Q94AG2
BBB	23	MET	-	expression tag	UNP Q94AG2
BBB	214	LEU	-	expression tag	UNP Q94AG2
BBB	215	GLU	-	expression tag	UNP Q94AG2
BBB	216	ASN	-	expression tag	UNP Q94AG2
BBB	217	LEU	-	expression tag	UNP Q94AG2
BBB	218	TYR	-	expression tag	UNP Q94AG2
BBB	219	PHE	-	expression tag	UNP Q94AG2
BBB	220	GLN	-	expression tag	UNP Q94AG2
EEE	20	GLY	-	expression tag	UNP Q94AG2
EEE	21	SER	-	expression tag	UNP Q94AG2
EEE	22	SER	-	expression tag	UNP Q94AG2
EEE	23	MET	-	expression tag	UNP Q94AG2
EEE	214	LEU	-	expression tag	UNP Q94AG2
EEE	215	GLU	-	expression tag	UNP Q94AG2
EEE	216	ASN	-	expression tag	UNP Q94AG2
EEE	217	LEU	-	expression tag	UNP Q94AG2
EEE	218	TYR	-	expression tag	UNP Q94AG2
EEE	219	PHE	-	expression tag	UNP Q94AG2
EEE	220	GLN	-	expression tag	UNP Q94AG2

- Molecule 3 is a protein called Peptide hormone IDL3.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	CCC	12	Total	C	N	O	0	0	0
			81	48	16	17			
3	FFF	12	Total	C	N	O	0	0	0
			81	48	16	17			

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



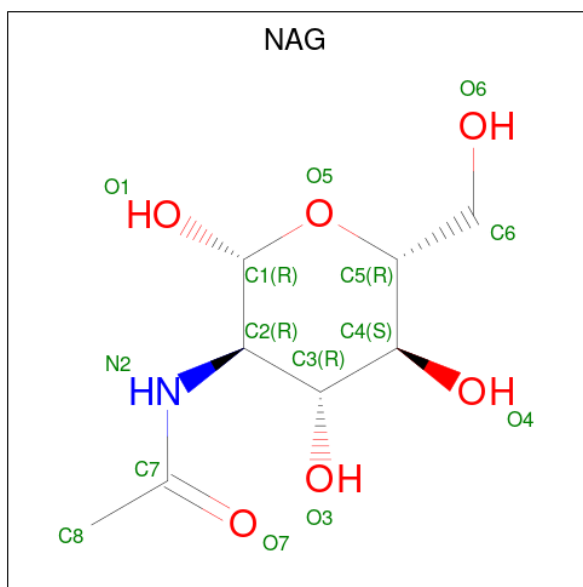
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
4	AaA	2	Total	C	N	O	0	0	0
			28	16	2	10			
4	AgA	2	Total	C	N	O	0	0	0
			28	16	2	10			
4	AiA	2	Total	C	N	O	0	0	0
			28	16	2	10			
4	BaB	2	Total	C	N	O	0	0	0
			28	16	2	10			
4	DbD	2	Total	C	N	O	0	0	0
			28	16	2	10			
4	DcD	2	Total	C	N	O	0	0	0
			28	16	2	10			
4	DeD	2	Total	C	N	O	0	0	0
			28	16	2	10			
4	DhD	2	Total	C	N	O	0	0	0
			28	16	2	10			
4	DkD	2	Total	C	N	O	0	0	0
			28	16	2	10			
4	EaE	2	Total	C	N	O	0	0	0
			28	16	2	10			

- Molecule 5 is an oligosaccharide called 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
5	AeA	3	Total	C	N	O	0	0	0
			39	22	2	15			
5	DaD	3	Total	C	N	O	0	0	0
			39	22	2	15			

- Molecule 6 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula:  $C_8H_{15}NO_6$ ).



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

- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	AAA	10	Total	O	0	0
			10	10		
7	BBB	2	Total	O	0	0
			2	2		

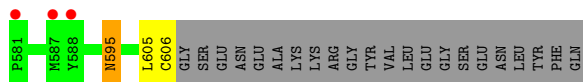
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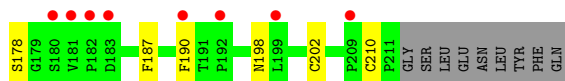
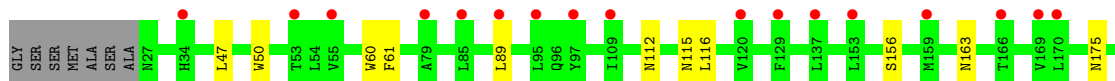
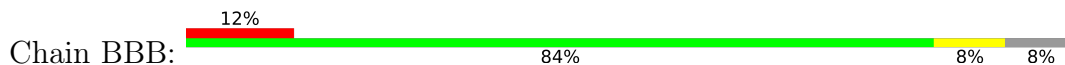
<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>	<b>ZeroOcc</b>	<b>AltConf</b>
7	CCC	1	Total O 1 1	0	0
7	DDD	7	Total O 7 7	0	0
7	EEE	3	Total O 3 3	0	0



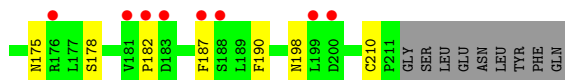
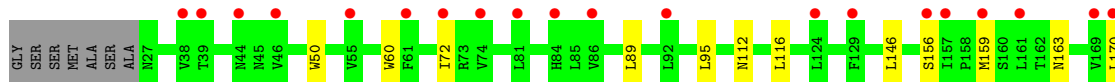
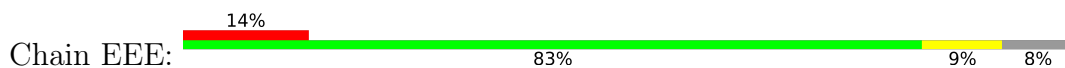




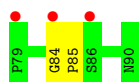
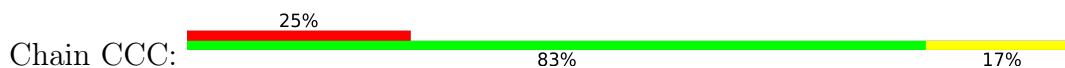
- Molecule 2: Somatic embryogenesis receptor kinase 1



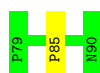
- Molecule 2: Somatic embryogenesis receptor kinase 1



- Molecule 3: Peptide hormone IDL3




- Molecule 3: Peptide hormone IDL3



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



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

Chain AgA:  100%

MAG1  
MAG2

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

Chain AiA:  50% 50%

MAG1  
MAG2

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

Chain BaB:  100%

MAG1  
MAG2

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

Chain DbD:  50% 50%

MAG1  
MAG2

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

Chain DcD:  100%

MAG1  
MAG2

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

Chain DeD:  100%

MAG1  
MAG2

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

Chain DhD:  100%


MAG1  
MAG2

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

Chain DkD:  100%


MAG1  
MAG2

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

Chain EaE:  100%


MAG1  
MAG2

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

Chain AeA:  100%

MAG1  
MAG2  
BMA3

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

Chain DaD:  100%

MAG1  
MAG2  
BMA3

## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	89.84Å 144.50Å 168.43Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	47.66 – 2.70 47.61 – 2.70	Depositor EDS
% Data completeness (in resolution range)	99.8 (47.66-2.70) 99.8 (47.61-2.70)	Depositor EDS
$R_{merge}$	0.32	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.69 (at 2.69Å)	Xtrriage
Refinement program	REFMAC 5.8.0267	Depositor
R, $R_{free}$	0.353 , 0.371 0.347 , 0.365	Depositor DCC
$R_{free}$ test set	3063 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	38.9	Xtrriage
Anisotropy	0.873	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.29 , 38.3	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.46$ , $\langle L^2 \rangle = 0.28$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.87	EDS
Total number of atoms	12054	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	53.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 49.19 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 7.7328e-05. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

<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: HYP, BMA, NAG

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	AAA	0.65	0/4432	0.68	1/6056 (0.0%)
1	DDD	0.65	0/4432	0.68	0/6050
2	BBB	0.64	0/1391	0.72	0/1917
2	EEE	0.63	0/1410	0.72	0/1939
3	CCC	0.68	0/74	0.69	0/96
3	FFF	0.67	0/74	0.72	0/96
All	All	0.65	0/11813	0.69	1/16154 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	AAA	32	ASP	CB-CG-OD2	-5.64	113.22	118.30

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts i

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	AAA	4348	0	4115	47	0
1	DDD	4350	0	4157	46	0
2	BBB	1362	0	1284	10	0
2	EEE	1381	0	1324	9	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	CCC	81	0	66	1	0
3	FFF	81	0	66	0	0
4	AaA	28	0	25	0	0
4	AgA	28	0	25	0	0
4	AiA	28	0	25	0	0
4	BaB	28	0	25	0	0
4	DbD	28	0	25	0	0
4	DcD	28	0	25	0	0
4	DeD	28	0	25	0	0
4	DhD	28	0	25	0	0
4	DkD	28	0	25	0	0
4	EaE	28	0	25	0	0
5	AeA	39	0	34	0	0
5	DaD	39	0	34	0	0
6	AAA	42	0	39	0	0
6	DDD	28	0	26	0	0
7	AAA	10	0	0	0	0
7	BBB	2	0	0	0	0
7	CCC	1	0	0	0	0
7	DDD	7	0	0	0	0
7	EEE	3	0	0	0	0
All	All	12054	0	11395	111	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 5.

All (111) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:EEE:89:LEU:O	2:EEE:116:LEU:HD21	2.00	0.61
2:EEE:187:PHE:HA	2:EEE:190:PHE:HD2	1.64	0.60
1:DDD:206:ASN:HA	1:DDD:230:LYS:HD2	1.82	0.60
1:AAA:101:PRO:HB2	1:AAA:103:ASN:OD1	2.04	0.57
1:DDD:101:PRO:HB2	1:DDD:103:ASN:OD1	2.04	0.57
2:BBB:156:SER:HA	2:BBB:178:SER:O	2.06	0.55
1:DDD:69:SER:HA	1:DDD:93:ASN:O	2.06	0.55
1:DDD:384:PHE:HB3	1:DDD:408:PHE:CZ	2.42	0.55
2:EEE:175:ASN:O	2:EEE:198:ASN:HA	2.07	0.55
2:BBB:175:ASN:O	2:BBB:198:ASN:HA	2.07	0.55
2:EEE:156:SER:HA	2:EEE:178:SER:O	2.07	0.54
1:AAA:212:LEU:HB3	1:AAA:217:LEU:HD11	1.88	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:AAA:384:PHE:HB3	1:AAA:408:PHE:CZ	2.43	0.54
1:DDD:61:SER:OG	1:DDD:85:ASN:HB2	2.08	0.54
1:AAA:364:LEU:HD11	1:AAA:379:ILE:HD13	1.90	0.53
1:AAA:423:ASN:HA	1:AAA:446:LEU:HA	1.91	0.53
1:AAA:173:PRO:HB3	1:AAA:175:PHE:CE2	2.44	0.52
1:AAA:471:ASN:HB3	2:BBB:61:PHE:CZ	2.43	0.52
1:DDD:356:SER:HB3	1:DDD:380:ILE:HG12	1.91	0.52
1:AAA:100:LEU:HD12	1:AAA:101:PRO:HD2	1.91	0.52
1:AAA:270:PRO:HG2	1:AAA:273:LEU:HG	1.90	0.52
1:DDD:173:PRO:HB3	1:DDD:175:PHE:CE2	2.45	0.52
1:DDD:573:ASN:HB2	1:DDD:595:ASN:OD1	2.10	0.52
2:BBB:50:TRP:HA	2:BBB:60:TRP:CD2	2.45	0.52
1:AAA:332:PHE:HA	1:AAA:358:ASN:HD21	1.75	0.51
1:AAA:173:PRO:HB2	1:AAA:176:LEU:HG	1.92	0.51
1:AAA:244:HIS:HA	1:AAA:266:THR:O	2.11	0.50
1:AAA:440:ILE:HG13	1:AAA:467:LEU:HD11	1.93	0.50
1:DDD:244:HIS:HA	1:DDD:266:THR:O	2.11	0.50
2:EEE:50:TRP:HA	2:EEE:60:TRP:CD2	2.46	0.50
1:DDD:489:MET:O	1:DDD:514:SER:HB2	2.12	0.49
1:AAA:605:LEU:O	1:AAA:606:CYS:C	2.51	0.49
1:AAA:476:SER:HA	1:AAA:500:HIS:O	2.13	0.49
1:DDD:476:SER:HA	1:DDD:500:HIS:O	2.12	0.48
1:AAA:105:ALA:HB2	1:AAA:127:THR:HB	1.95	0.48
1:DDD:605:LEU:O	1:DDD:606:CYS:C	2.51	0.48
1:DDD:524:ALA:HA	1:DDD:548:SER:O	2.13	0.48
2:BBB:187:PHE:HA	2:BBB:190:PHE:HD2	1.77	0.48
1:AAA:303:GLU:HA	1:AAA:325:ASN:O	2.14	0.48
1:AAA:524:ALA:HA	1:AAA:548:SER:O	2.13	0.48
2:EEE:187:PHE:HA	2:EEE:190:PHE:CD2	2.48	0.48
1:AAA:465:GLY:HA2	1:AAA:491:LEU:HD21	1.95	0.47
1:AAA:489:MET:O	1:AAA:514:SER:HB2	2.13	0.47
1:AAA:351:ARG:HA	1:AAA:374:LEU:HA	1.96	0.47
1:DDD:465:GLY:HA2	1:DDD:491:LEU:HD21	1.96	0.47
2:EEE:146:LEU:HD23	2:EEE:170:LEU:HD12	1.96	0.47
1:DDD:303:GLU:HA	1:DDD:325:ASN:O	2.15	0.47
2:BBB:89:LEU:O	2:BBB:116:LEU:HD21	2.15	0.46
1:AAA:360:PHE:HB3	1:AAA:384:PHE:CZ	2.51	0.46
2:BBB:187:PHE:HA	2:BBB:190:PHE:CD2	2.50	0.46
1:AAA:242:VAL:HG12	1:AAA:264:SER:HB2	1.97	0.46
1:AAA:539:LEU:HD12	1:AAA:542:LEU:HD22	1.97	0.46
1:DDD:457:THR:HG23	1:DDD:479:LYS:HE3	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:DDD:172:ILE:HA	1:DDD:173:PRO:HD3	1.84	0.45
1:AAA:457:THR:HG22	1:AAA:479:LYS:HE3	1.99	0.45
1:AAA:105:ALA:O	1:AAA:108:LYS:HG2	2.17	0.45
2:BBB:47:LEU:HD22	2:BBB:50:TRP:CZ2	2.52	0.45
1:AAA:257:GLN:OE1	3:CCC:84:GLY:HA2	2.17	0.45
1:DDD:364:LEU:HD11	1:DDD:379:ILE:HD13	1.97	0.45
1:DDD:252:LEU:HB3	1:DDD:255:VAL:HB	1.99	0.44
1:DDD:105:ALA:HB2	1:DDD:127:THR:HB	2.00	0.44
1:DDD:483:SER:HA	1:DDD:505:SER:O	2.18	0.44
1:AAA:548:SER:HA	1:AAA:571:SER:O	2.18	0.44
1:DDD:500:HIS:HA	1:DDD:524:ALA:O	2.18	0.44
1:DDD:212:LEU:HB3	1:DDD:217:LEU:HD11	2.00	0.43
1:DDD:384:PHE:HB2	1:DDD:406:ASN:OD1	2.17	0.43
1:AAA:588:TYR:HB3	1:AAA:592:PHE:CE2	2.53	0.43
1:DDD:100:LEU:HD12	1:DDD:101:PRO:HD2	2.00	0.43
1:DDD:301:PRO:HA	1:DDD:323:SER:HB2	2.00	0.43
1:DDD:364:LEU:HD23	1:DDD:364:LEU:HA	1.90	0.43
1:AAA:401:ILE:HD12	1:AAA:425:LEU:HD13	2.00	0.43
1:AAA:588:TYR:HB3	1:AAA:592:PHE:HE2	1.84	0.43
2:EEE:72:ILE:HA	2:EEE:95:LEU:HA	2.01	0.43
1:AAA:142:ASN:O	1:AAA:166:ASN:HA	2.19	0.42
1:DDD:401:ILE:HD12	1:DDD:425:LEU:HD13	2.01	0.42
1:AAA:408:PHE:HB3	1:AAA:432:PHE:CZ	2.54	0.42
1:DDD:376:GLU:HG2	1:DDD:400:ARG:HB3	2.01	0.42
1:AAA:483:SER:HA	1:AAA:505:SER:O	2.20	0.42
2:BBB:112:ASN:HA	2:BBB:115:ASN:HD22	1.84	0.42
1:AAA:531:LYS:HA	1:AAA:553:SER:O	2.19	0.42
1:DDD:242:VAL:HG12	1:DDD:264:SER:HB2	2.00	0.42
1:AAA:408:PHE:HB3	1:AAA:432:PHE:CE1	2.55	0.42
1:AAA:376:GLU:HG2	1:AAA:400:ARG:HB3	2.02	0.42
1:DDD:408:PHE:HB3	1:DDD:432:PHE:CE1	2.55	0.42
1:AAA:406:ASN:HD22	1:AAA:406:ASN:N	2.16	0.42
1:DDD:345:GLY:HA3	1:DDD:368:LEU:HA	2.02	0.41
1:DDD:380:ILE:HA	1:DDD:404:ALA:O	2.20	0.41
1:DDD:408:PHE:HB3	1:DDD:432:PHE:CZ	2.55	0.41
1:AAA:276:LEU:HD12	1:AAA:279:LEU:HD22	2.03	0.41
1:AAA:360:PHE:HB2	1:AAA:382:ASN:OD1	2.21	0.41
1:DDD:105:ALA:O	1:DDD:108:LYS:HG2	2.20	0.41
1:DDD:364:LEU:HG	1:DDD:408:PHE:HZ	1.85	0.41
1:DDD:460:LEU:HD23	1:DDD:460:LEU:HA	1.90	0.41
1:AAA:301:PRO:HA	1:AAA:323:SER:HB2	2.01	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:AAA:443:ALA:O	1:AAA:467:LEU:HD22	2.20	0.41
1:DDD:204:LEU:HB3	1:DDD:207:LEU:HB2	2.03	0.41
1:DDD:266:THR:HG22	1:DDD:288:GLN:HB2	2.03	0.41
2:BBB:202:CYS:HB2	2:BBB:210:CYS:HA	2.03	0.41
1:DDD:380:ILE:CG2	1:DDD:402:ARG:HB3	2.50	0.41
1:AAA:250:GLY:HA2	1:AAA:276:LEU:HD21	2.02	0.41
1:AAA:380:ILE:HA	1:AAA:404:ALA:O	2.21	0.41
1:DDD:350:LEU:HD12	1:DDD:350:LEU:HA	1.85	0.41
1:DDD:85:ASN:HD22	1:DDD:85:ASN:HA	1.72	0.40
1:DDD:304:SER:HB2	1:DDD:328:GLU:HB3	2.03	0.40
1:DDD:54:SER:CB	1:DDD:64:SER:HB2	2.51	0.40
1:DDD:142:ASN:O	1:DDD:166:ASN:HA	2.21	0.40
1:AAA:440:ILE:O	1:AAA:467:LEU:HD21	2.21	0.40
2:EEE:159:MET:SD	2:EEE:182:PRO:HB3	2.62	0.40
1:AAA:428:VAL:HA	1:AAA:452:SER:O	2.22	0.40
1:AAA:537:GLY:HA3	1:AAA:559:SER:HB2	2.03	0.40
1:DDD:548:SER:HA	1:DDD:571:SER:O	2.22	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	AAA	588/617 (95%)	577 (98%)	10 (2%)	1 (0%)	47	73
1	DDD	586/617 (95%)	576 (98%)	9 (2%)	1 (0%)	47	73
2	BBB	183/201 (91%)	180 (98%)	3 (2%)	0	100	100
2	EEE	183/201 (91%)	180 (98%)	3 (2%)	0	100	100
3	CCC	9/12 (75%)	9 (100%)	0	0	100	100
3	FFF	9/12 (75%)	9 (100%)	0	0	100	100
All	All	1558/1660 (94%)	1531 (98%)	25 (2%)	2 (0%)	51	78

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	AAA	98	SER
1	DDD	98	SER

### 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	AAA	469/540 (87%)	457 (97%)	12 (3%)	46	75
1	DDD	473/540 (88%)	466 (98%)	7 (2%)	65	86
2	BBB	150/182 (82%)	149 (99%)	1 (1%)	84	94
2	EEE	157/182 (86%)	154 (98%)	3 (2%)	57	82
3	CCC	7/10 (70%)	7 (100%)	0	100	100
3	FFF	7/10 (70%)	7 (100%)	0	100	100
All	All	1263/1464 (86%)	1240 (98%)	23 (2%)	59	83

All (23) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	AAA	116	SER
1	AAA	143	ASN
1	AAA	165	TYR
1	AAA	223	ASP
1	AAA	255	VAL
1	AAA	373	GLU
1	AAA	394	ASP
1	AAA	406	ASN
1	AAA	489	MET
1	AAA	500	HIS
1	AAA	538	SER
1	AAA	595	ASN
2	BBB	163	ASN
1	DDD	147	ASP
1	DDD	304	SER

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Mol	Chain	Res	Type
1	DDD	351	ARG
1	DDD	406	ASN
1	DDD	457	THR
1	DDD	500	HIS
1	DDD	595	ASN
2	EEE	112	ASN
2	EEE	163	ASN
2	EEE	210	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

2 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
3	HYP	CCC	85	3	6,8,9	0.57	0	5,10,12	1.05	1 (20%)
3	HYP	FFF	85	3	6,8,9	0.53	0	5,10,12	1.12	1 (20%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	HYP	CCC	85	3	-	0/0/11/13	0/1/1/1
3	HYP	FFF	85	3	-	0/0/11/13	0/1/1/1

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	FFF	85	HYP	O-C-CA	-2.14	119.18	124.78
3	CCC	85	HYP	O-C-CA	-2.07	119.34	124.78

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 5.5 Carbohydrates [i](#)

26 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
4	NAG	AaA	1	4,1	14,14,15	0.34	0	17,19,21	1.27	3 (17%)
4	NAG	AaA	2	4	14,14,15	0.32	0	17,19,21	0.75	0
5	NAG	AeA	1	5,1	14,14,15	0.35	0	17,19,21	1.07	2 (11%)
5	NAG	AeA	2	5	14,14,15	0.43	0	17,19,21	0.91	1 (5%)
5	BMA	AeA	3	5	11,11,12	0.33	0	15,15,17	0.78	1 (6%)
4	NAG	AgA	1	4,1	14,14,15	0.28	0	17,19,21	1.00	1 (5%)
4	NAG	AgA	2	4	14,14,15	0.38	0	17,19,21	0.77	1 (5%)
4	NAG	AiA	1	4,1	14,14,15	0.44	0	17,19,21	1.39	2 (11%)
4	NAG	AiA	2	4	14,14,15	0.37	0	17,19,21	0.79	0
4	NAG	BaB	1	2,4	14,14,15	0.40	0	17,19,21	0.57	0
4	NAG	BaB	2	4	14,14,15	0.47	0	17,19,21	0.74	0
5	NAG	DaD	1	5,1	14,14,15	0.33	0	17,19,21	0.96	1 (5%)
5	NAG	DaD	2	5	14,14,15	0.50	0	17,19,21	1.15	1 (5%)
5	BMA	DaD	3	5	11,11,12	0.36	0	15,15,17	0.83	1 (6%)
4	NAG	DbD	1	4,1	14,14,15	0.35	0	17,19,21	1.06	3 (17%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
4	NAG	DbD	2	4	14,14,15	0.36	0	17,19,21	0.68	0
4	NAG	DcD	1	4,1	14,14,15	0.46	0	17,19,21	1.22	1 (5%)
4	NAG	DcD	2	4	14,14,15	0.29	0	17,19,21	0.74	1 (5%)
4	NAG	DeD	1	4,1	14,14,15	0.44	0	17,19,21	0.81	1 (5%)
4	NAG	DeD	2	4	14,14,15	0.32	0	17,19,21	10.12	5 (29%)
4	NAG	DhD	1	4,1	14,14,15	0.37	0	17,19,21	0.97	1 (5%)
4	NAG	DhD	2	4	14,14,15	0.35	0	17,19,21	0.79	1 (5%)
4	NAG	DkD	1	4,1	14,14,15	0.34	0	17,19,21	0.84	0
4	NAG	DkD	2	4	14,14,15	0.27	0	17,19,21	0.55	0
4	NAG	EaE	1	2,4	14,14,15	0.40	0	17,19,21	1.09	2 (11%)
4	NAG	EaE	2	4	14,14,15	0.40	0	17,19,21	0.85	1 (5%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	NAG	AaA	1	4,1	-	0/6/23/26	0/1/1/1
4	NAG	AaA	2	4	1/1/5/7	0/6/23/26	0/1/1/1
5	NAG	AeA	1	5,1	-	2/6/23/26	0/1/1/1
5	NAG	AeA	2	5	1/1/5/7	0/6/23/26	0/1/1/1
5	BMA	AeA	3	5	1/1/4/5	0/2/19/22	0/1/1/1
4	NAG	AgA	1	4,1	-	0/6/23/26	0/1/1/1
4	NAG	AgA	2	4	1/1/5/7	2/6/23/26	0/1/1/1
4	NAG	AiA	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	AiA	2	4	1/1/5/7	1/6/23/26	0/1/1/1
4	NAG	BaB	1	2,4	1/1/5/7	1/6/23/26	0/1/1/1
4	NAG	BaB	2	4	-	1/6/23/26	0/1/1/1
5	NAG	DaD	1	5,1	-	2/6/23/26	0/1/1/1
5	NAG	DaD	2	5	1/1/5/7	0/6/23/26	0/1/1/1
5	BMA	DaD	3	5	1/1/4/5	0/2/19/22	0/1/1/1
4	NAG	DbD	1	4,1	-	0/6/23/26	0/1/1/1
4	NAG	DbD	2	4	1/1/5/7	0/6/23/26	0/1/1/1
4	NAG	DcD	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	DcD	2	4	1/1/5/7	1/6/23/26	0/1/1/1
4	NAG	DeD	1	4,1	-	1/6/23/26	0/1/1/1
4	NAG	DeD	2	4	1/1/5/7	2/6/23/26	0/1/1/1
4	NAG	DhD	1	4,1	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	NAG	DhD	2	4	-	0/6/23/26	0/1/1/1
4	NAG	DkD	1	4,1	-	0/6/23/26	0/1/1/1
4	NAG	DkD	2	4	1/1/5/7	2/6/23/26	0/1/1/1
4	NAG	EaE	1	2,4	-	0/6/23/26	0/1/1/1
4	NAG	EaE	2	4	1/1/5/7	0/6/23/26	0/1/1/1

There are no bond length outliers.

All (30) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	DeD	2	NAG	C8-C7-N2	27.27	162.27	116.10
4	DeD	2	NAG	O7-C7-C8	-22.35	80.54	122.06
4	DeD	2	NAG	O7-C7-N2	-21.87	81.74	121.95
4	AiA	1	NAG	C1-O5-C5	3.84	117.39	112.19
4	AaA	1	NAG	C1-O5-C5	3.20	116.53	112.19
4	DcD	1	NAG	C1-O5-C5	2.99	116.24	112.19
5	AeA	1	NAG	C1-O5-C5	2.97	116.22	112.19
4	AaA	1	NAG	O5-C1-C2	-2.94	106.64	111.29
4	DhD	1	NAG	C1-O5-C5	2.93	116.17	112.19
4	AiA	1	NAG	O5-C1-C2	-2.66	107.09	111.29
4	DeD	2	NAG	O5-C1-C2	-2.61	107.16	111.29
4	AgA	2	NAG	O5-C5-C6	2.55	111.19	107.20
4	DeD	2	NAG	C1-O5-C5	2.53	115.62	112.19
4	DbD	1	NAG	C1-O5-C5	2.52	115.61	112.19
5	DaD	2	NAG	O5-C5-C6	2.42	111.00	107.20
5	AeA	1	NAG	O5-C1-C2	-2.42	107.47	111.29
4	DbD	1	NAG	O5-C1-C2	-2.26	107.72	111.29
5	DaD	3	BMA	C1-O5-C5	2.24	115.22	112.19
4	DhD	2	NAG	O5-C5-C6	2.23	110.71	107.20
4	EaE	1	NAG	O5-C5-C6	2.20	110.65	107.20
5	DaD	1	NAG	C1-O5-C5	2.16	115.12	112.19
5	AeA	2	NAG	C1-O5-C5	2.15	115.11	112.19
5	AeA	3	BMA	C1-O5-C5	2.15	115.11	112.19
4	EaE	2	NAG	C1-O5-C5	2.12	115.07	112.19
4	DcD	2	NAG	C1-O5-C5	2.11	115.05	112.19
4	EaE	1	NAG	C1-O5-C5	2.11	115.05	112.19
4	AgA	1	NAG	C1-O5-C5	2.07	115.00	112.19
4	AaA	1	NAG	C4-C3-C2	-2.03	108.04	111.02
4	DbD	1	NAG	C4-C3-C2	-2.03	108.04	111.02
4	DeD	1	NAG	O5-C1-C2	-2.02	108.10	111.29

All (13) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
4	AaA	2	NAG	C1
4	AgA	2	NAG	C1
4	AiA	2	NAG	C1
4	BaB	1	NAG	C1
4	DbD	2	NAG	C1
4	DcD	2	NAG	C1
4	DeD	2	NAG	C1
4	DkD	2	NAG	C1
4	EaE	2	NAG	C1
5	AeA	2	NAG	C1
5	AeA	3	BMA	C1
5	DaD	2	NAG	C1
5	DaD	3	BMA	C1

All (21) torsion outliers are listed below:

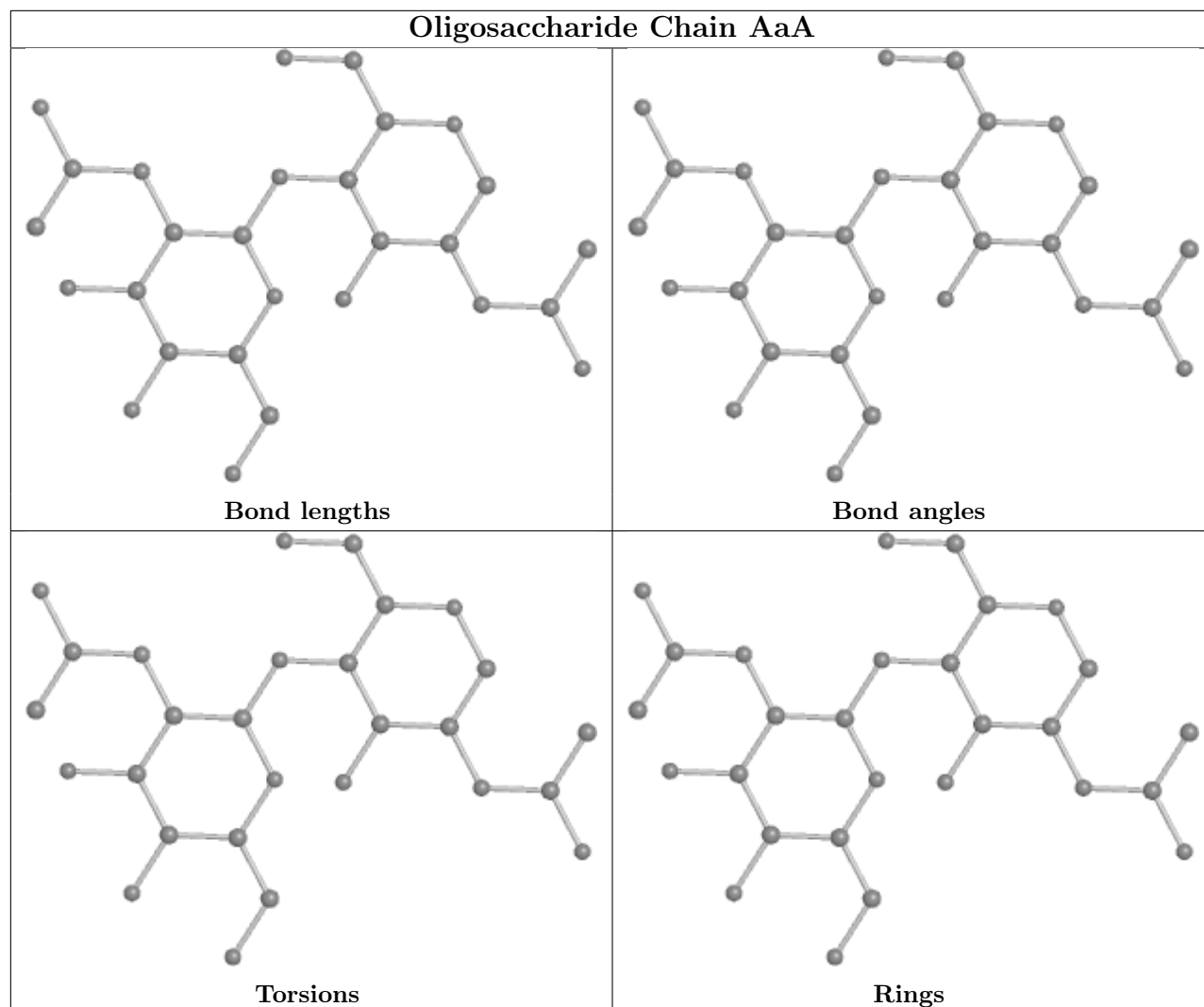
Mol	Chain	Res	Type	Atoms
4	DcD	1	NAG	O5-C5-C6-O6
4	AiA	1	NAG	O5-C5-C6-O6
4	AgA	2	NAG	O5-C5-C6-O6
4	DcD	1	NAG	C4-C5-C6-O6
4	DkD	2	NAG	O5-C5-C6-O6
4	AiA	1	NAG	C4-C5-C6-O6
4	DeD	2	NAG	O7-C7-N2-C2
4	AgA	2	NAG	C4-C5-C6-O6
4	DhD	1	NAG	O5-C5-C6-O6
4	DkD	2	NAG	C4-C5-C6-O6
5	DaD	1	NAG	O5-C5-C6-O6
5	DaD	1	NAG	C4-C5-C6-O6
4	DeD	1	NAG	O5-C5-C6-O6
4	AiA	2	NAG	O5-C5-C6-O6
4	DcD	2	NAG	O5-C5-C6-O6
4	BaB	1	NAG	O5-C5-C6-O6
4	DeD	2	NAG	O5-C5-C6-O6
4	DhD	1	NAG	C4-C5-C6-O6
5	AeA	1	NAG	C4-C5-C6-O6
5	AeA	1	NAG	O5-C5-C6-O6
4	BaB	2	NAG	C1-C2-N2-C7

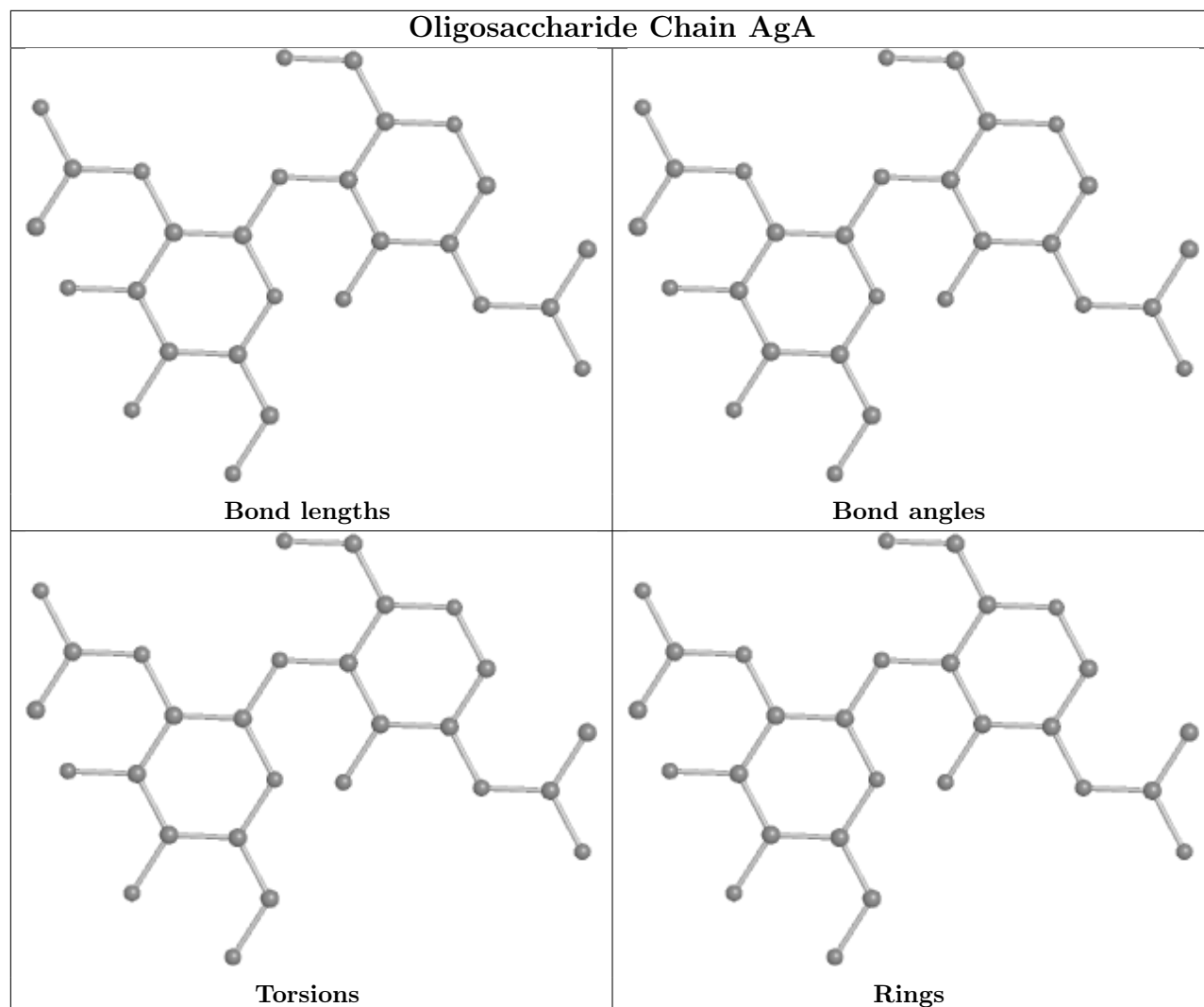
There are no ring outliers.

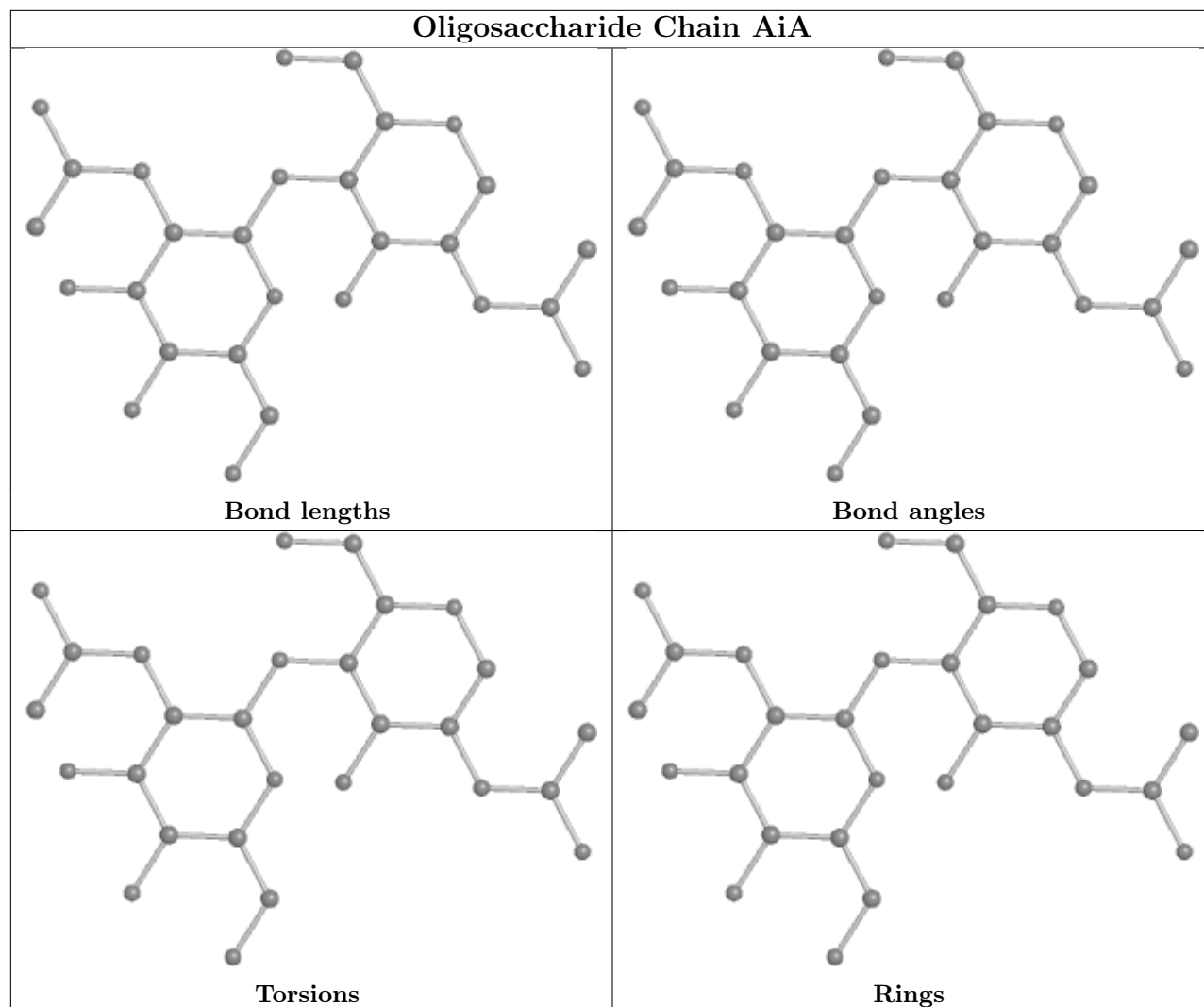
No monomer is involved in short contacts.

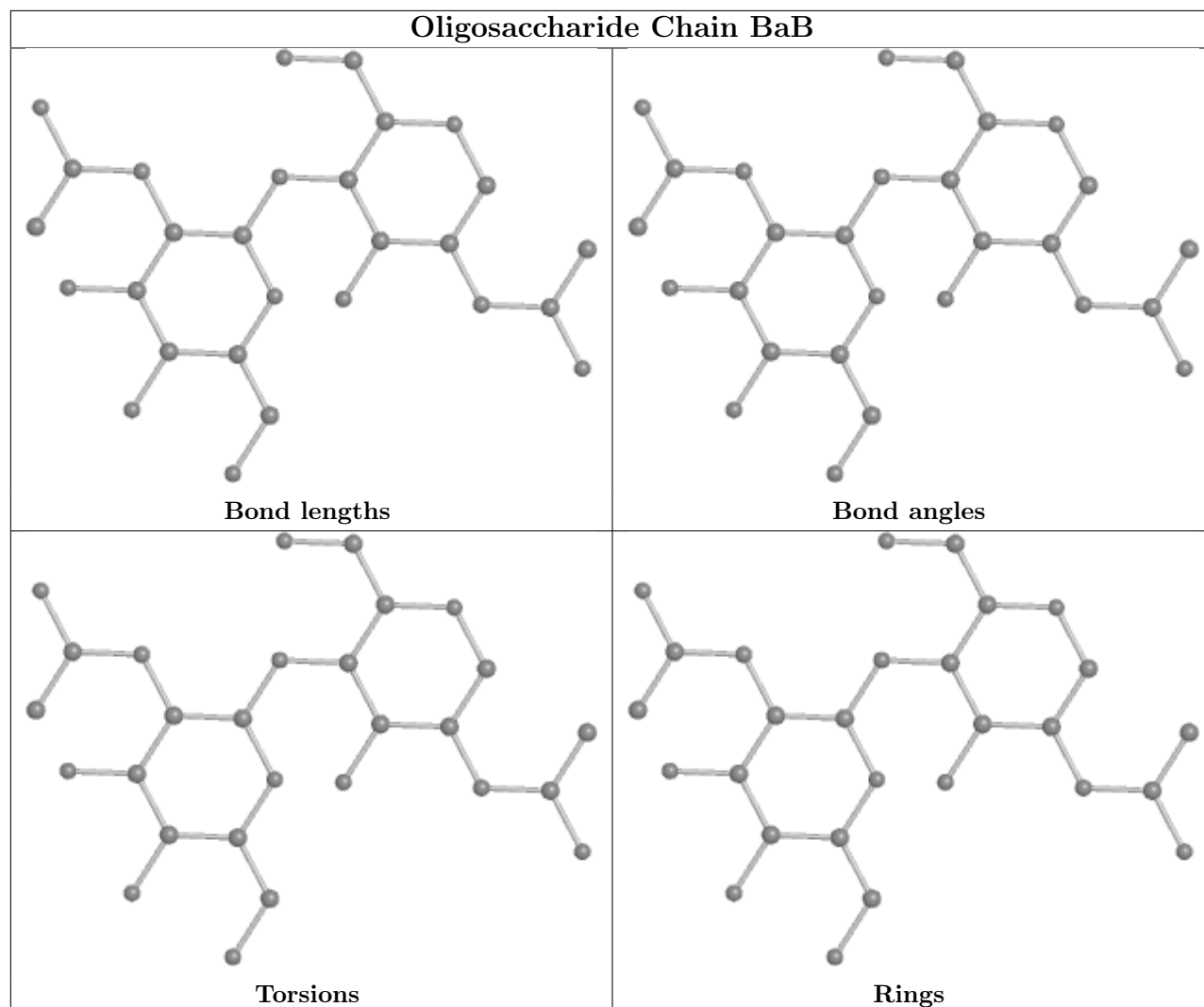
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

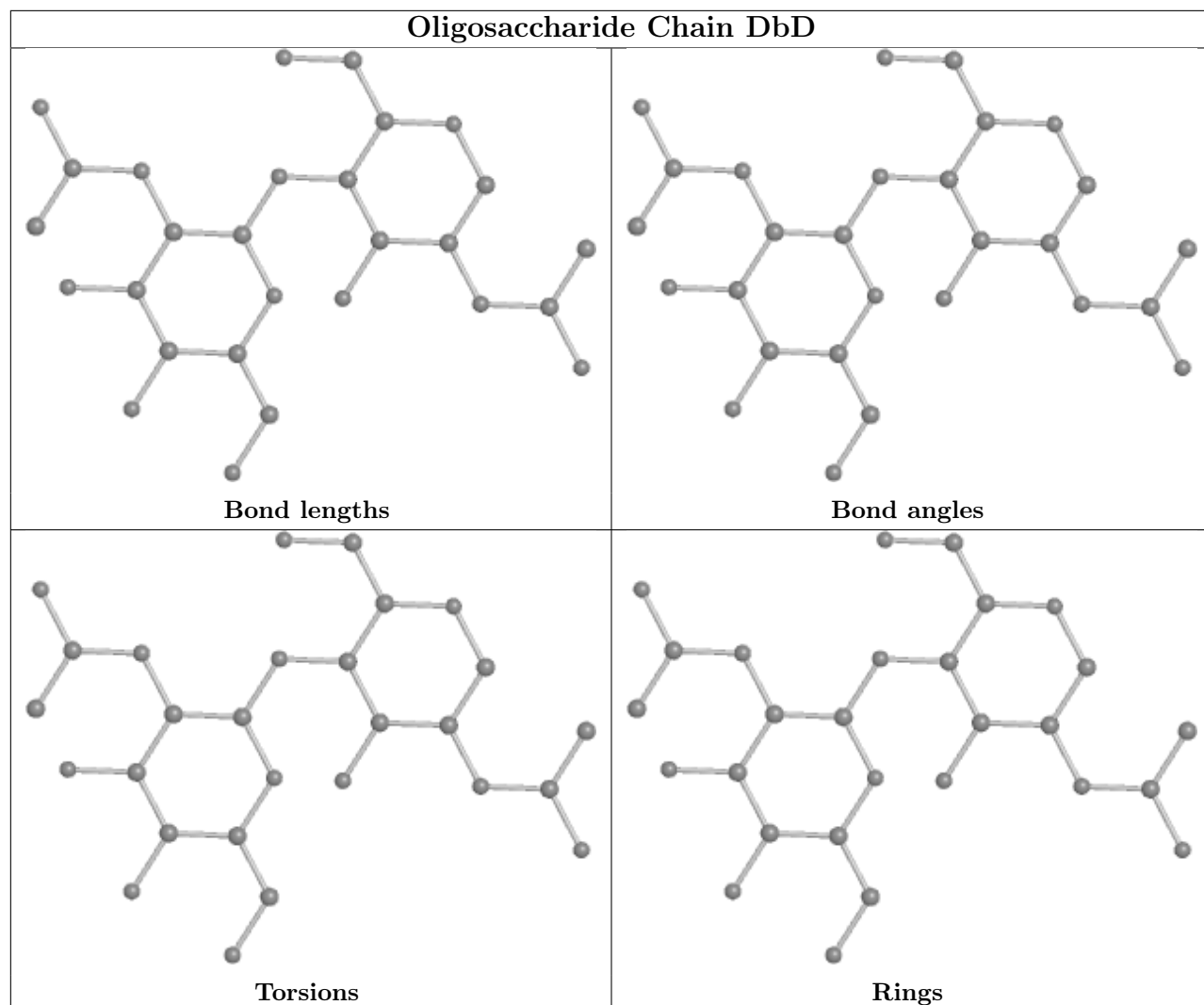


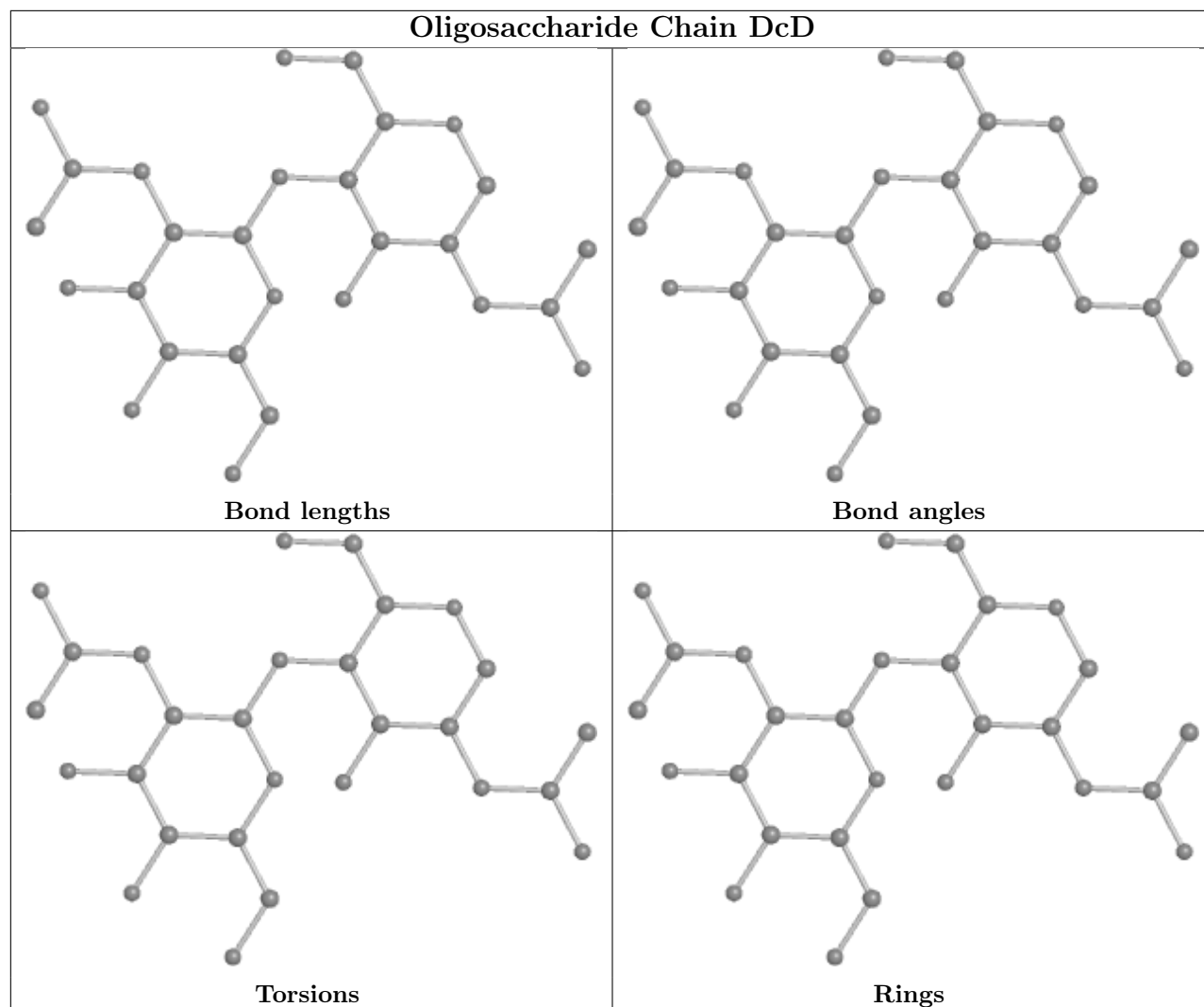


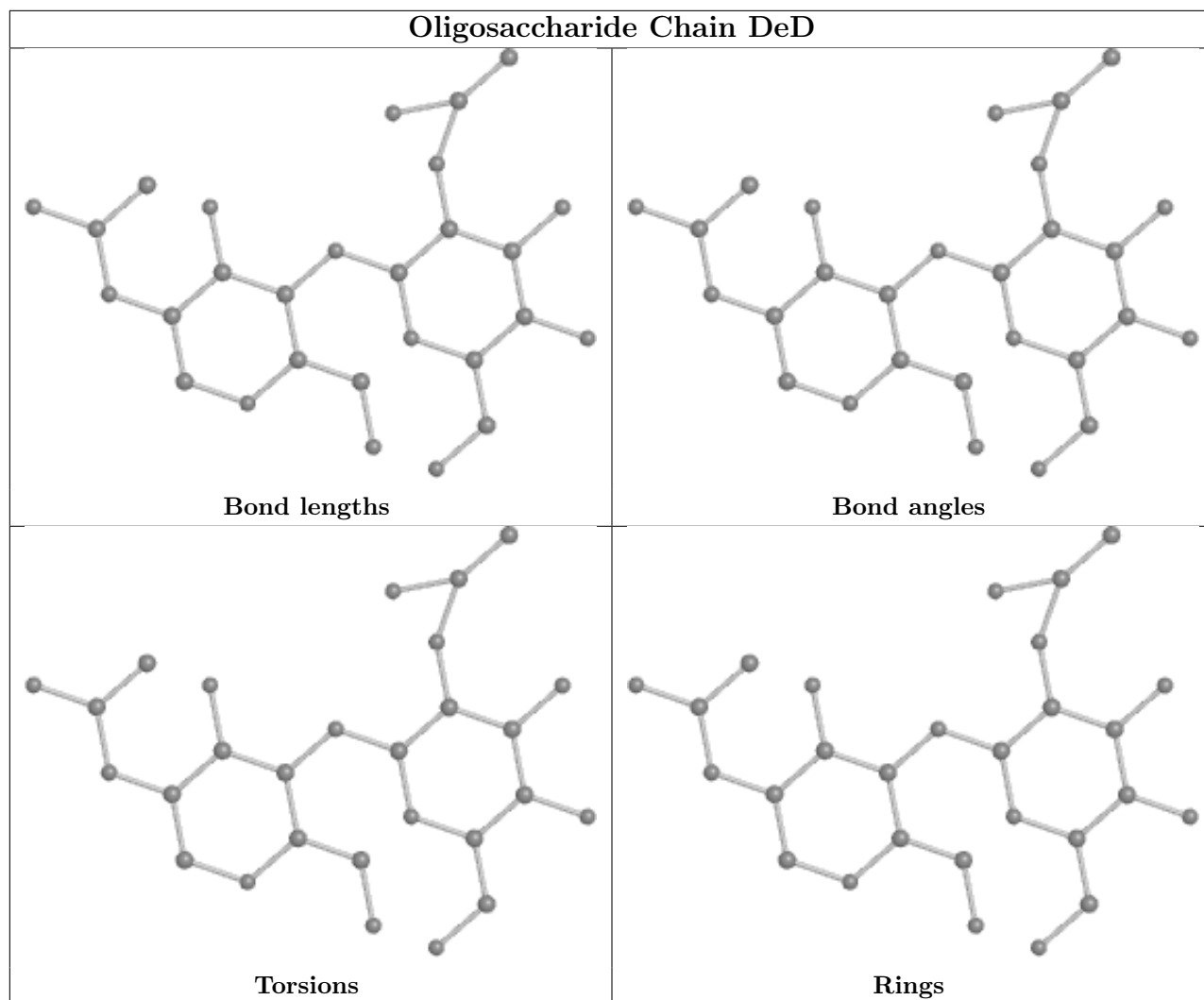


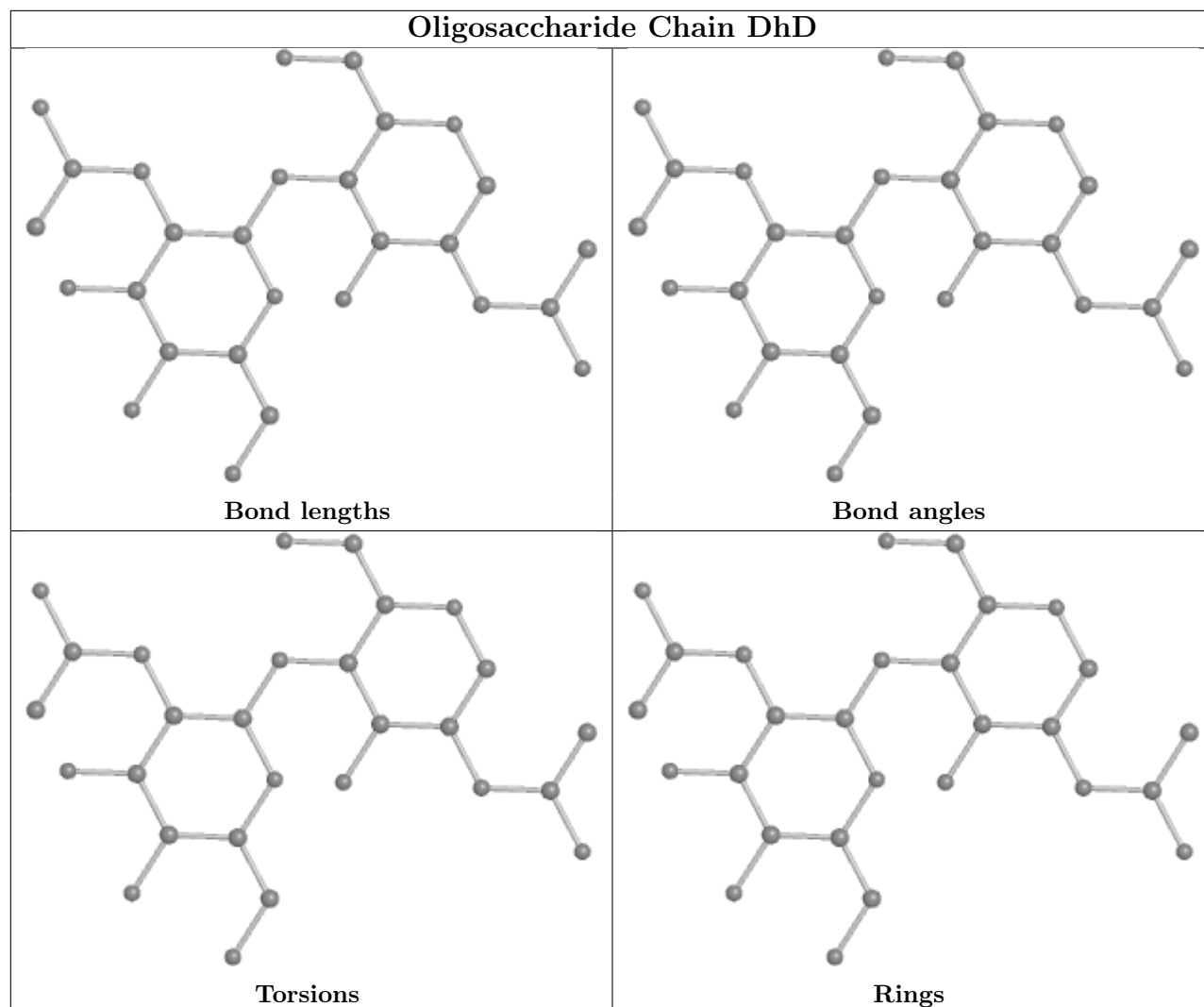




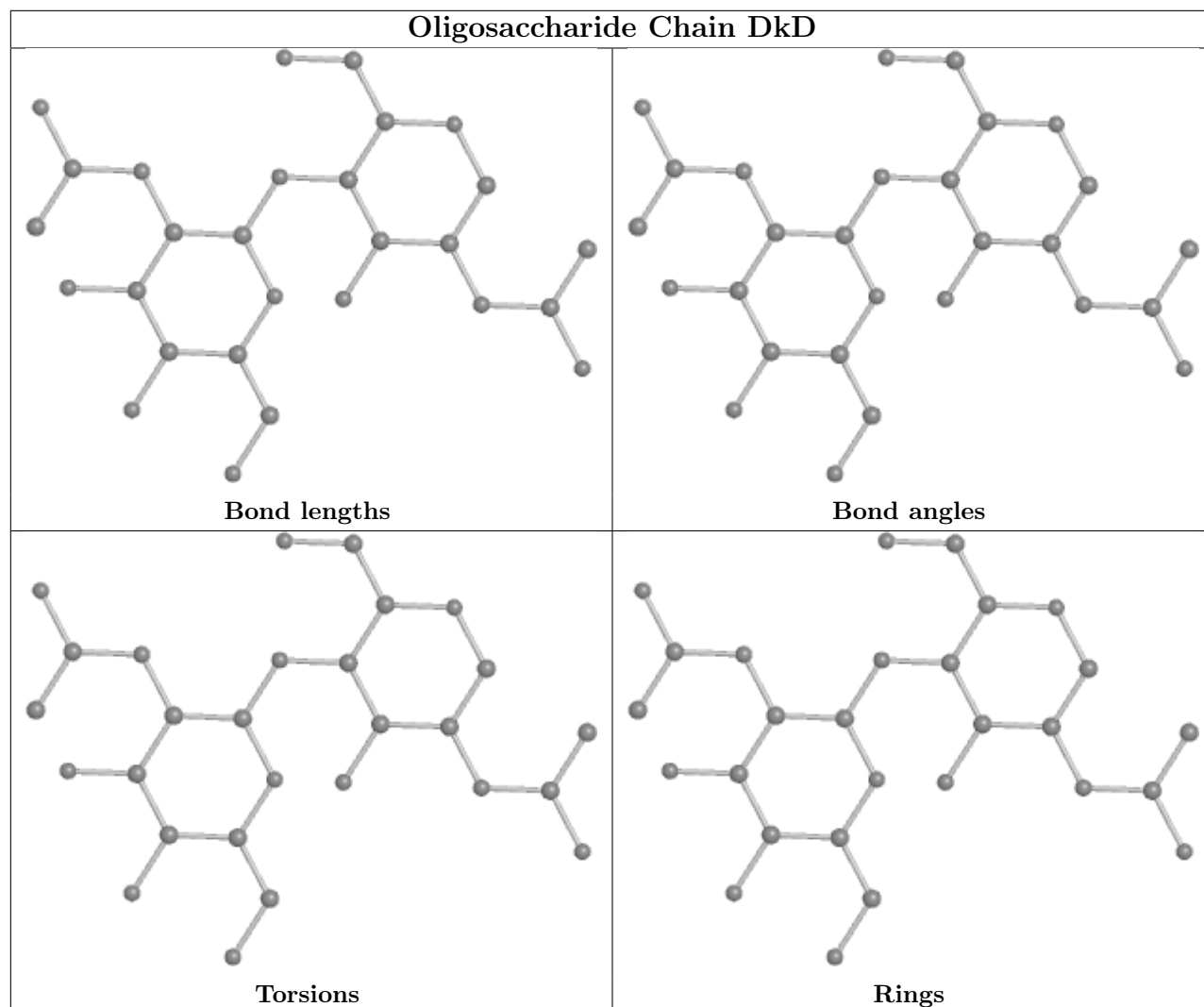


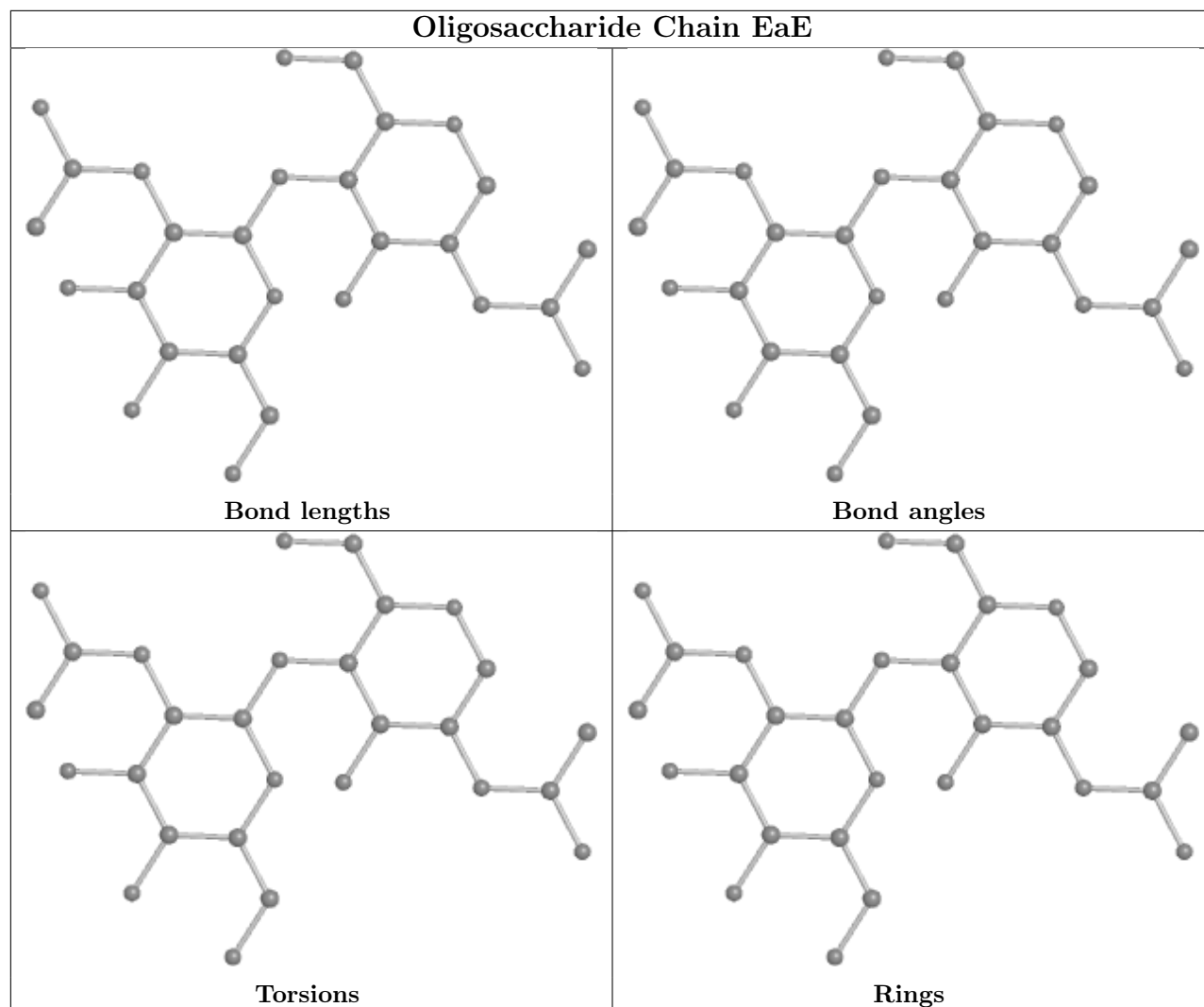


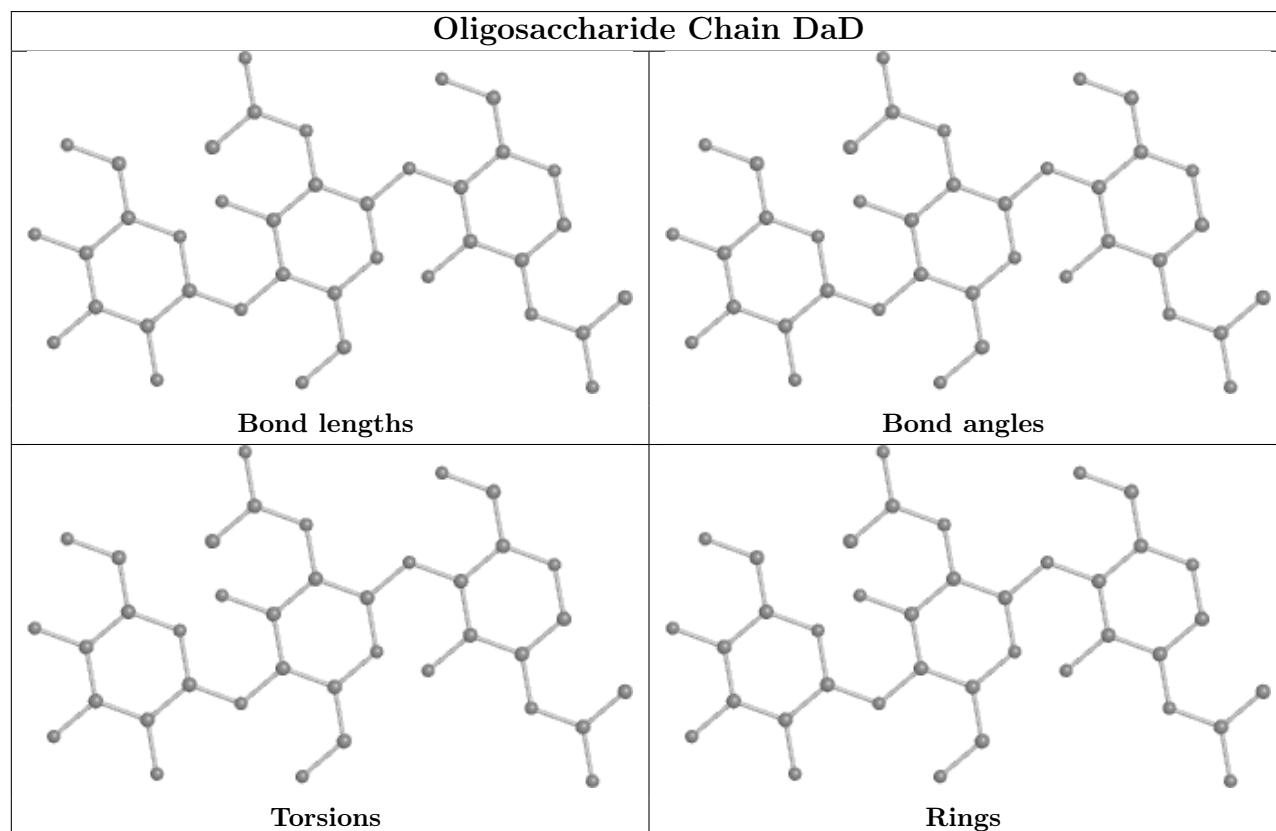
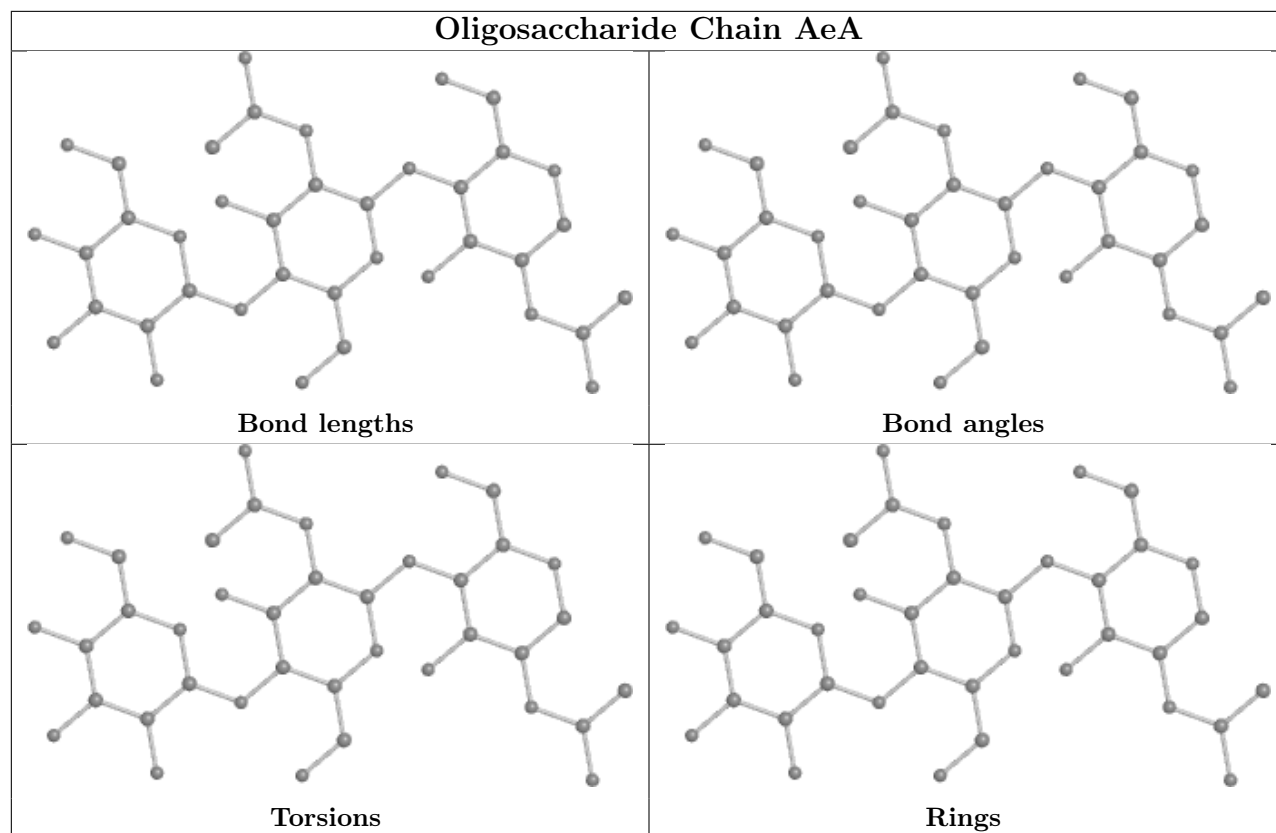












## 5.6 Ligand geometry

5 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
6	NAG	AAA	703	1	14,14,15	0.37	0	17,19,21	0.79	0
6	NAG	AAA	702	1	14,14,15	0.43	0	17,19,21	0.78	0
6	NAG	DDD	701	1	14,14,15	0.34	0	17,19,21	0.93	1 (5%)
6	NAG	DDD	702	1	14,14,15	0.42	0	17,19,21	1.18	2 (11%)
6	NAG	AAA	701	1	14,14,15	0.45	0	17,19,21	1.25	4 (23%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	NAG	AAA	703	1	-	2/6/23/26	0/1/1/1
6	NAG	AAA	702	1	-	2/6/23/26	0/1/1/1
6	NAG	DDD	701	1	-	0/6/23/26	0/1/1/1
6	NAG	DDD	702	1	-	2/6/23/26	0/1/1/1
6	NAG	AAA	701	1	-	0/6/23/26	0/1/1/1

There are no bond length outliers.

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	DDD	702	NAG	O5-C5-C6	3.27	112.33	107.20
6	AAA	701	NAG	C1-O5-C5	2.47	115.53	112.19
6	AAA	701	NAG	O5-C1-C2	-2.17	107.86	111.29
6	AAA	701	NAG	C4-C3-C2	-2.16	107.85	111.02
6	DDD	701	NAG	O5-C5-C6	2.09	110.48	107.20
6	AAA	701	NAG	O5-C5-C6	2.08	110.46	107.20
6	DDD	702	NAG	C2-N2-C7	2.07	125.85	122.90

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	DDD	702	NAG	O5-C5-C6-O6
6	DDD	702	NAG	C4-C5-C6-O6
6	AAA	703	NAG	C4-C5-C6-O6
6	AAA	703	NAG	O5-C5-C6-O6
6	AAA	702	NAG	C4-C5-C6-O6
6	AAA	702	NAG	O5-C5-C6-O6

There are no ring outliers.

No monomer is involved in short contacts.

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data [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	AAA	591/617 (95%)	0.89	62 (10%) 6 4	18, 53, 72, 99	0
1	DDD	589/617 (95%)	1.05	71 (12%) 4 3	16, 55, 79, 106	0
2	BBB	185/201 (92%)	0.91	25 (13%) 3 2	30, 45, 76, 94	0
2	EEE	185/201 (92%)	1.08	28 (15%) 2 1	27, 45, 83, 96	0
3	CCC	11/12 (91%)	1.19	3 (27%) 0 0	32, 48, 63, 72	0
3	FFF	11/12 (91%)	0.76	0 100 100	35, 46, 75, 83	0
All	All	1572/1660 (94%)	0.98	189 (12%) 4 3	16, 53, 78, 106	0

All (189) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	EEE	187	PHE	6.1
1	DDD	427	LEU	4.5
2	EEE	181	VAL	4.4
1	DDD	110	LEU	4.2
1	AAA	158	LEU	4.2
2	EEE	182	PRO	4.2
1	DDD	270	PRO	3.8
2	BBB	85	LEU	3.7
1	DDD	201	PHE	3.6
2	EEE	39	THR	3.6
1	DDD	440	ILE	3.5
2	BBB	170	LEU	3.5
1	DDD	226	GLY	3.4
1	DDD	222	PRO	3.4
2	EEE	38	VAL	3.4
1	DDD	281	LEU	3.4
1	AAA	395	CYS	3.3
1	AAA	273	LEU	3.3
1	AAA	418	GLY	3.3

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	DDD	128	LEU	3.3
2	EEE	183	ASP	3.2
1	AAA	364	LEU	3.2
1	DDD	212	LEU	3.2
1	DDD	314	GLY	3.2
1	DDD	418	GLY	3.2
1	DDD	587	MET	3.2
1	DDD	297	LEU	3.2
1	DDD	258	ILE	3.1
1	DDD	228	LEU	3.1
1	AAA	128	LEU	3.1
1	AAA	311[A]	ASN	3.1
2	BBB	129	PHE	3.1
1	DDD	279	LEU	3.0
2	BBB	89	LEU	3.0
1	DDD	249	LEU	3.0
1	DDD	46	SER	2.9
1	DDD	153	GLY	2.9
1	DDD	355	VAL	2.9
1	DDD	187	LEU	2.9
1	DDD	322	LEU	2.9
1	DDD	568	LEU	2.9
2	BBB	209	PRO	2.9
1	DDD	340	LEU	2.9
2	BBB	120	VAL	2.9
1	DDD	168	LEU	2.9
1	DDD	96	ILE	2.9
1	DDD	379	ILE	2.9
1	AAA	417	TRP	2.8
1	AAA	270	PRO	2.8
1	AAA	30	LEU	2.8
1	DDD	158	LEU	2.8
2	BBB	169	VAL	2.8
2	BBB	182	PRO	2.8
2	BBB	137	LEU	2.8
1	AAA	355	VAL	2.8
1	AAA	538	SER	2.8
1	AAA	134	LEU	2.8
1	DDD	144	PHE	2.7
1	AAA	592	PHE	2.7
1	AAA	305	LEU	2.7
1	DDD	588	TYR	2.7

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	DDD	148	ILE	2.7
1	AAA	238	LEU	2.7
2	BBB	53	THR	2.7
1	DDD	364	LEU	2.7
1	DDD	26	VAL	2.7
2	BBB	109	ILE	2.7
1	AAA	427	LEU	2.6
2	BBB	159	MET	2.6
1	DDD	196	ARG	2.6
2	BBB	190	PHE	2.6
1	DDD	255	VAL	2.6
1	DDD	280	ARG	2.6
1	DDD	100	LEU	2.6
1	AAA	80	ILE	2.5
1	AAA	157	ASN	2.5
1	AAA	309	GLU	2.5
1	AAA	120	LEU	2.5
1	AAA	118	ASN	2.5
1	AAA	176	LEU	2.5
2	BBB	181	VAL	2.5
2	EEE	199	LEU	2.5
2	EEE	84	HIS	2.5
1	AAA	133	THR	2.5
1	DDD	357	GLU	2.5
3	CCC	79	PRO	2.5
1	DDD	252	LEU	2.5
2	EEE	81	LEU	2.5
2	EEE	92	LEU	2.5
2	EEE	129	PHE	2.5
2	BBB	183	ASP	2.5
3	CCC	84	GLY	2.4
2	EEE	159	MET	2.4
1	DDD	581	PRO	2.4
1	AAA	392	LEU	2.4
1	DDD	155	PHE	2.4
1	AAA	588	TYR	2.4
2	EEE	44	ASN	2.4
1	DDD	347	ASN	2.4
2	EEE	200	ASP	2.4
1	DDD	30	LEU	2.4
2	EEE	124	LEU	2.4
1	AAA	155	PHE	2.4

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	AAA	211	TRP	2.4
1	AAA	288	GLN	2.4
1	DDD	121	THR	2.4
1	AAA	201	PHE	2.4
1	AAA	110	LEU	2.4
1	DDD	227	GLN	2.3
1	AAA	281	LEU	2.3
1	DDD	283	ASP	2.3
1	AAA	470	LEU	2.3
1	DDD	211	TRP	2.3
2	BBB	192	PRO	2.3
1	AAA	322	LEU	2.3
2	EEE	176	ARG	2.3
1	DDD	475	ALA	2.3
1	AAA	480	PHE	2.3
1	DDD	172	ILE	2.3
1	DDD	343	ASP	2.3
1	DDD	72	LEU	2.3
1	AAA	513	LYS	2.3
1	AAA	582	SER	2.3
1	DDD	425	LEU	2.3
1	AAA	388	ILE	2.2
1	AAA	534	ASP	2.2
2	BBB	55	VAL	2.2
1	AAA	91	LEU	2.2
1	DDD	112	THR	2.2
1	DDD	36	TYR	2.2
1	AAA	167	LEU	2.2
2	BBB	79	ALA	2.2
1	DDD	192	PHE	2.2
1	DDD	143	ASN	2.2
2	BBB	180	SER	2.2
1	AAA	115	LEU	2.2
1	AAA	70	ALA	2.2
1	DDD	152	PHE	2.2
1	AAA	416	PHE	2.2
1	AAA	209	VAL	2.1
1	DDD	16	ASP	2.1
2	EEE	86	VAL	2.1
1	AAA	360	PHE	2.1
1	DDD	62	VAL	2.1
1	AAA	76	PHE	2.1

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	DDD	384	PHE	2.1
1	AAA	226	GLY	2.1
2	BBB	199	LEU	2.1
2	BBB	166	THR	2.1
1	AAA	459	SER	2.1
1	AAA	346	LEU	2.1
1	AAA	491	LEU	2.1
2	BBB	34	HIS	2.1
2	EEE	156	SER	2.1
1	DDD	309	GLU	2.1
2	BBB	153	LEU	2.1
2	EEE	169	VAL	2.1
1	DDD	130	ASP	2.1
2	EEE	157	ILE	2.1
2	BBB	97	TYR	2.1
1	AAA	274	GLY	2.1
1	AAA	494	LEU	2.0
2	BBB	95	LEU	2.0
1	AAA	331	ILE	2.0
1	DDD	247	PRO	2.0
1	AAA	36	TYR	2.0
1	AAA	571	SER	2.0
1	DDD	278	SER	2.0
3	CCC	86	SER	2.0
1	DDD	555	LYS	2.0
2	EEE	61	PHE	2.0
1	AAA	570	LEU	2.0
1	DDD	346	LEU	2.0
1	DDD	467	LEU	2.0
2	EEE	161	LEU	2.0
1	AAA	62	VAL	2.0
2	EEE	46	VAL	2.0
1	AAA	107	CYS	2.0
1	AAA	205	THR	2.0
1	AAA	343	ASP	2.0
2	EEE	188	SER	2.0
1	AAA	204	LEU	2.0
1	DDD	134	LEU	2.0
2	EEE	74	VAL	2.0
2	EEE	72	ILE	2.0
1	DDD	111	GLN	2.0
1	DDD	348	SER	2.0

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Mol	Chain	Res	Type	RSRZ
2	EEE	170	LEU	2.0
2	EEE	55	VAL	2.0

## 6.2 Non-standard residues in protein, DNA, RNA chains [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
3	HYP	CCC	85	8/9	0.86	0.23	47,48,49,53	0
3	HYP	FFF	85	8/9	0.89	0.19	45,46,46,47	0

## 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.

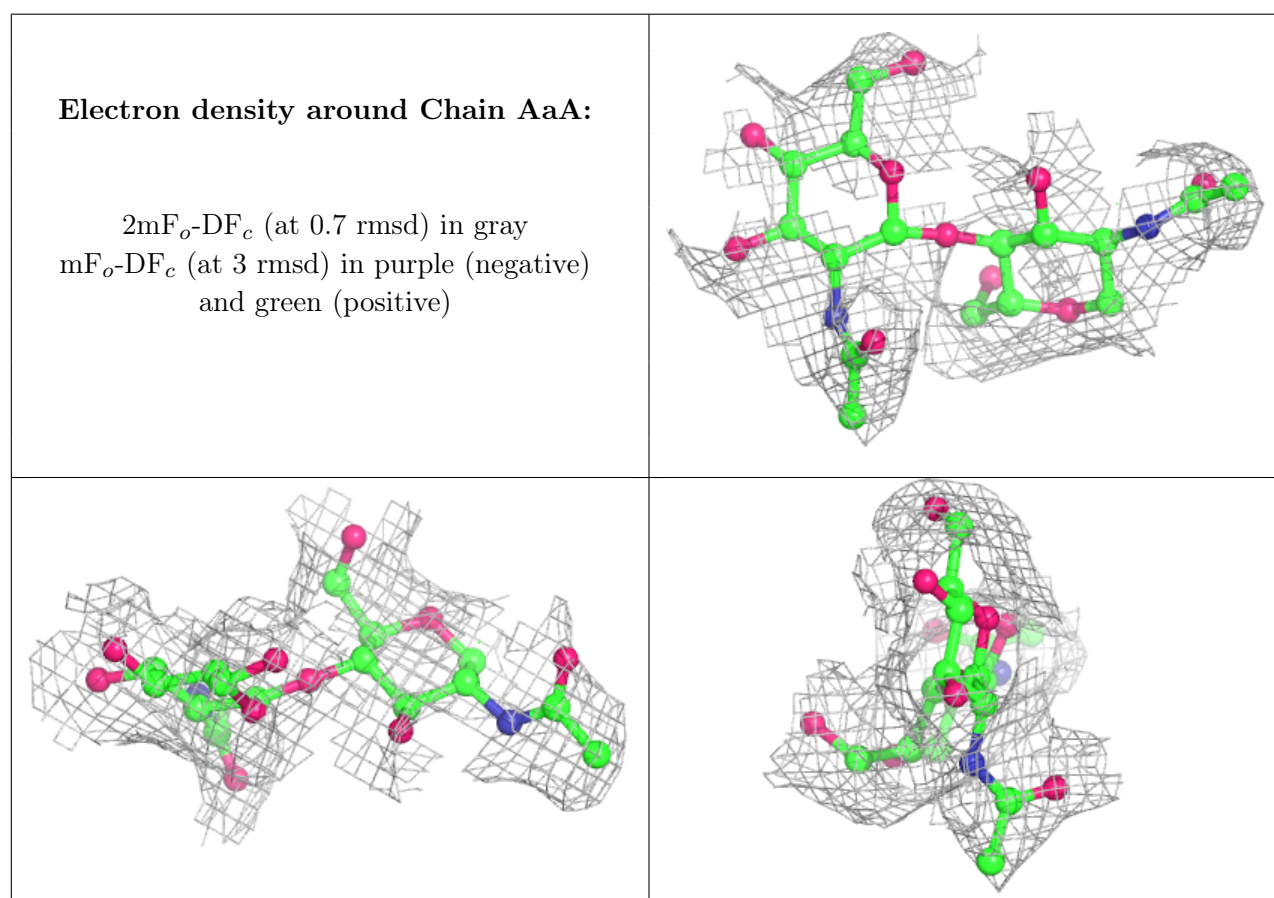
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
4	NAG	DhD	2	14/15	0.32	0.65	103,116,120,121	0
4	NAG	DhD	1	14/15	0.48	0.43	83,95,101,105	0
4	NAG	BaB	2	14/15	0.52	0.22	83,105,109,109	0
4	NAG	DeD	2	14/15	0.60	0.39	110,115,120,122	0
5	BMA	DaD	3	11/12	0.61	0.24	93,97,99,100	0
4	NAG	DkD	2	14/15	0.66	0.35	106,108,111,113	0
5	BMA	AeA	3	11/12	0.67	0.27	99,106,107,108	0
4	NAG	DkD	1	14/15	0.69	0.36	90,94,101,107	0
4	NAG	DbD	2	14/15	0.71	0.20	83,87,88,88	0
4	NAG	EaE	1	14/15	0.72	0.25	99,104,118,119	0
4	NAG	AgA	2	14/15	0.72	0.31	90,94,98,100	0
4	NAG	AgA	1	14/15	0.72	0.34	82,89,92,95	0
4	NAG	AaA	1	14/15	0.74	0.19	62,64,66,67	0
4	NAG	BaB	1	14/15	0.74	0.35	110,118,126,133	0
5	NAG	AeA	2	14/15	0.76	0.24	89,97,100,104	0
4	NAG	AaA	2	14/15	0.78	0.17	74,77,78,80	0
4	NAG	DbD	1	14/15	0.78	0.22	59,63,67,70	0
5	NAG	DaD	1	14/15	0.80	0.21	48,49,55,61	0
5	NAG	DaD	2	14/15	0.80	0.22	78,86,89,91	0

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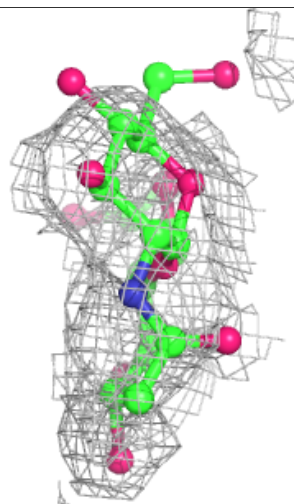
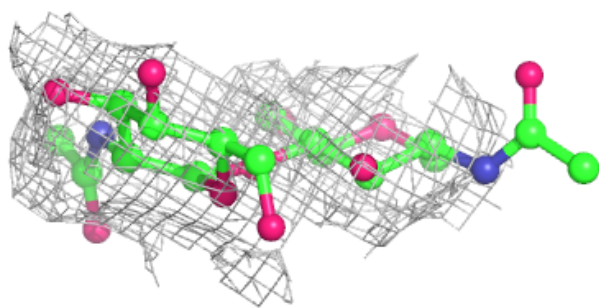
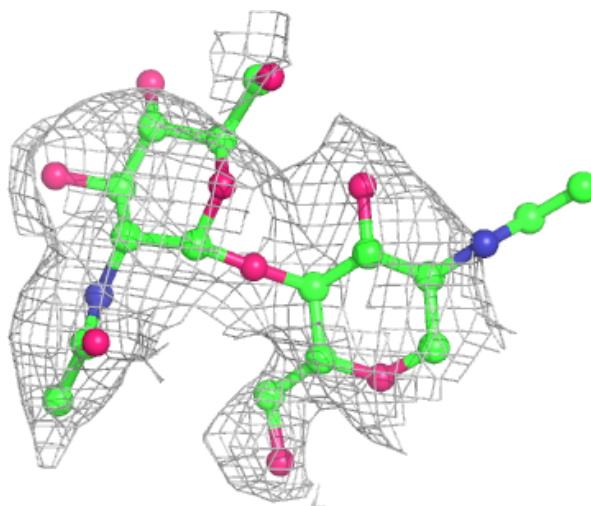
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
4	NAG	DcD	2	14/15	0.80	0.20	65,67,68,68	0
4	NAG	AiA	2	14/15	0.81	0.18	60,67,69,70	0
4	NAG	EaE	2	14/15	0.82	0.20	99,106,108,109	0
4	NAG	DcD	1	14/15	0.82	0.26	46,50,56,61	0
4	NAG	DeD	1	14/15	0.82	0.28	74,78,86,92	0
5	NAG	AeA	1	14/15	0.84	0.17	53,58,62,67	0
4	NAG	AiA	1	14/15	0.87	0.26	53,55,62,65	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.



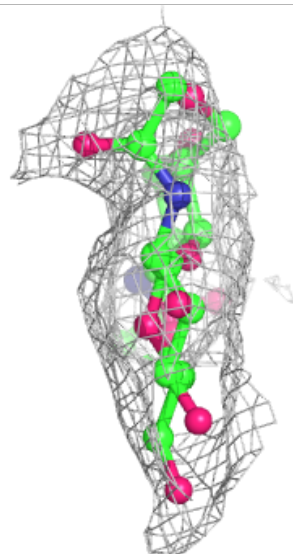
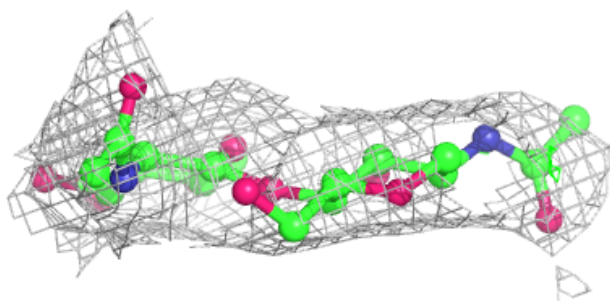
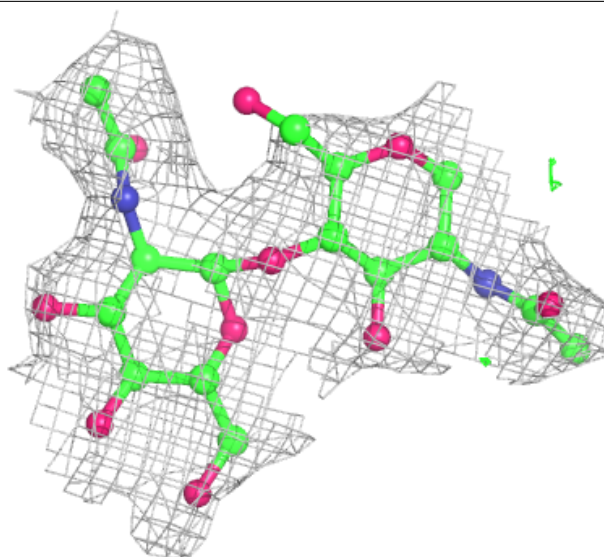
**Electron density around Chain AgA:**

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



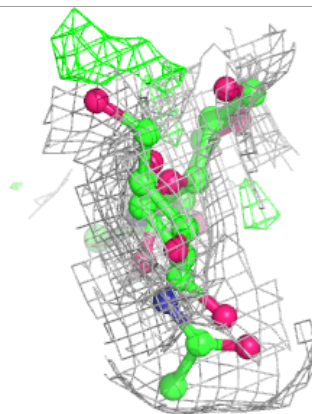
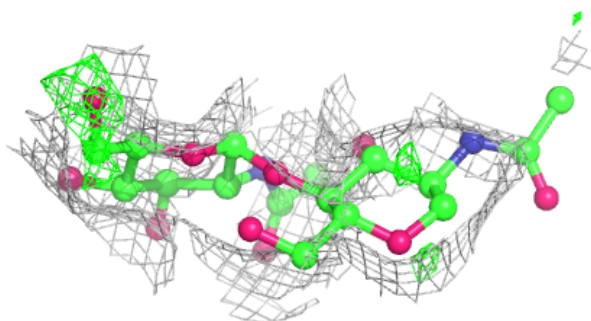
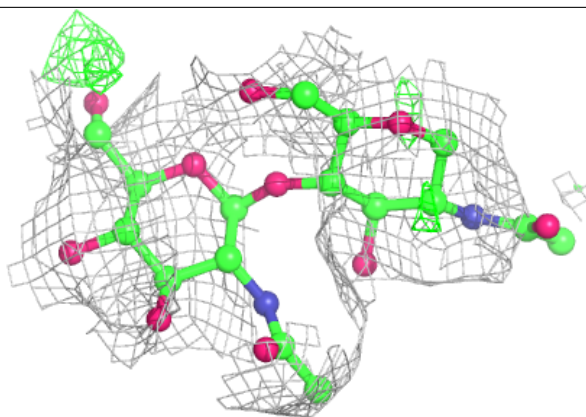
**Electron density around Chain AiA:**

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



**Electron density around Chain BaB:**

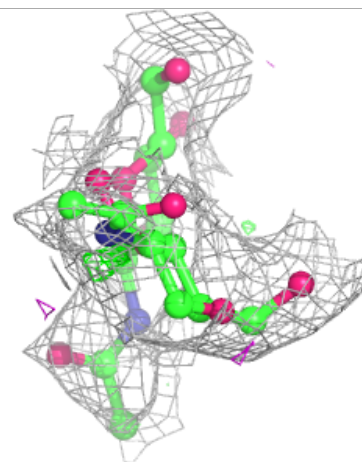
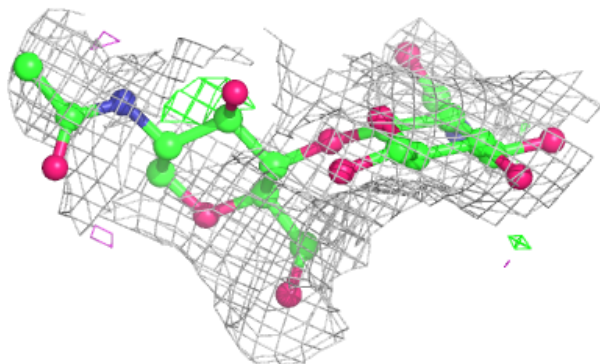
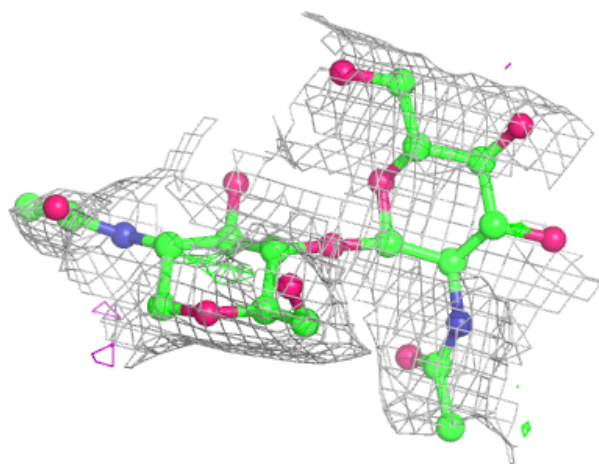
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





**Electron density around Chain DbD:**

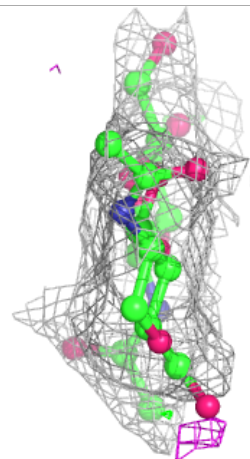
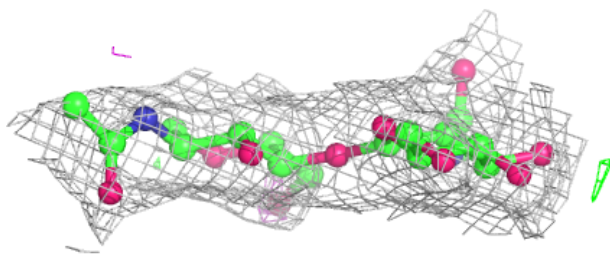
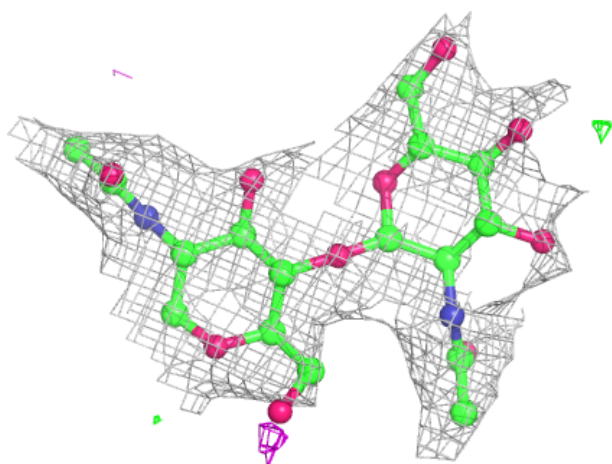
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





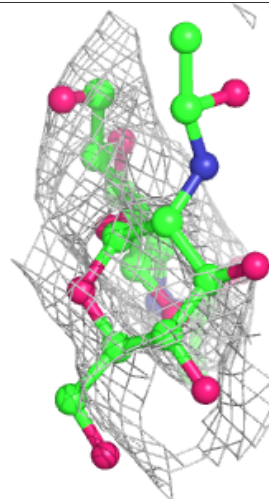
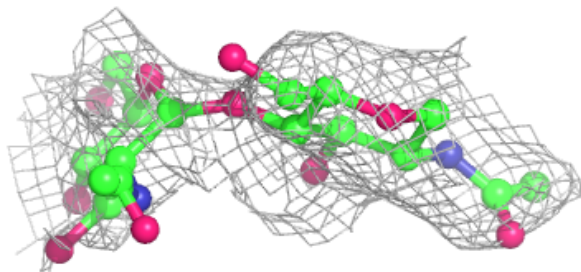
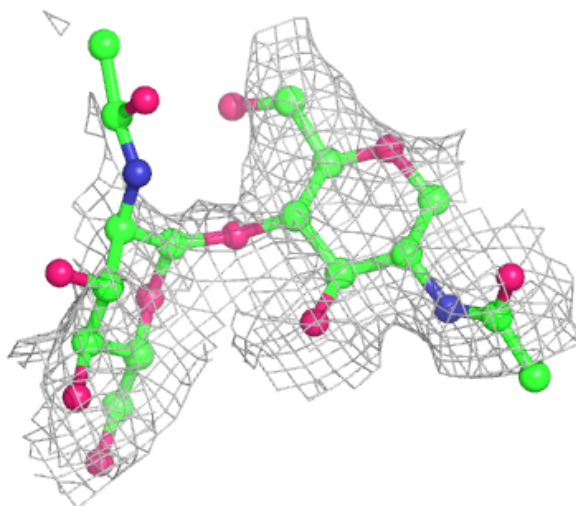
**Electron density around Chain DcD:**

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



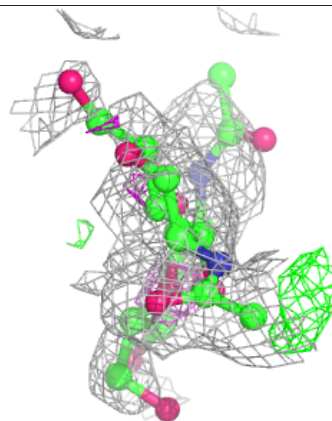
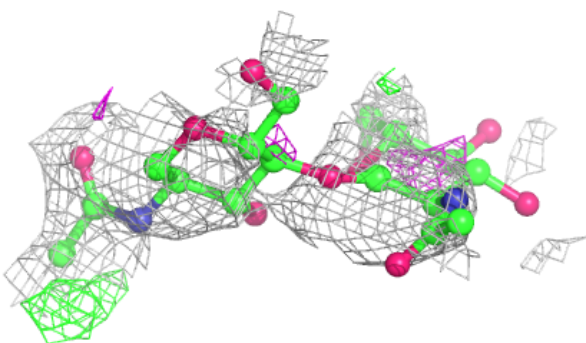
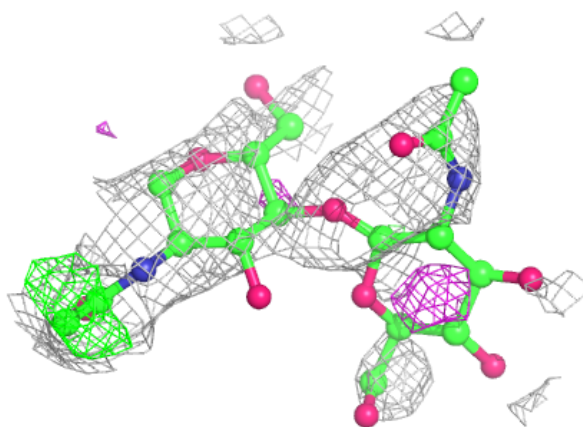
**Electron density around Chain DeD:**

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



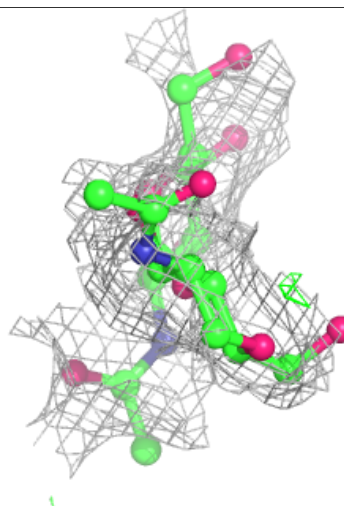
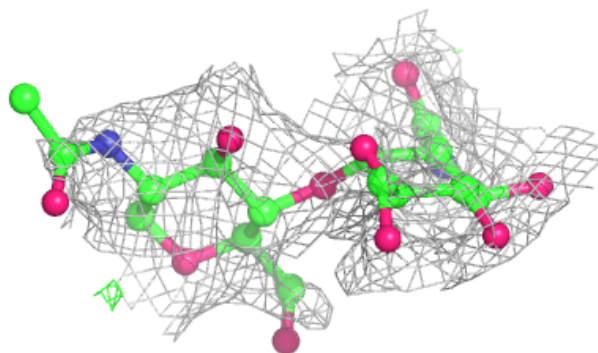
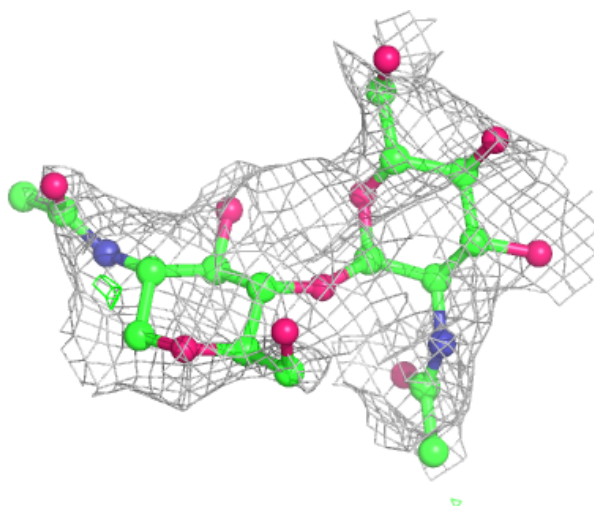
**Electron density around Chain DhD:**

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



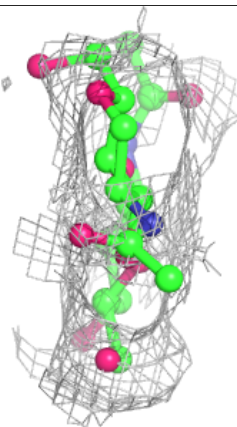
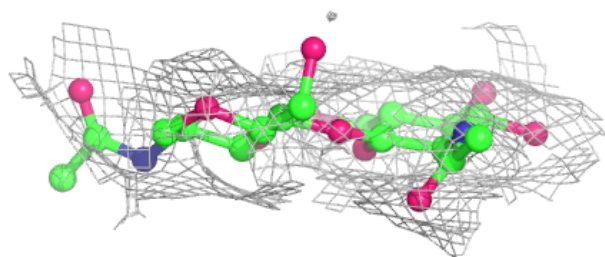
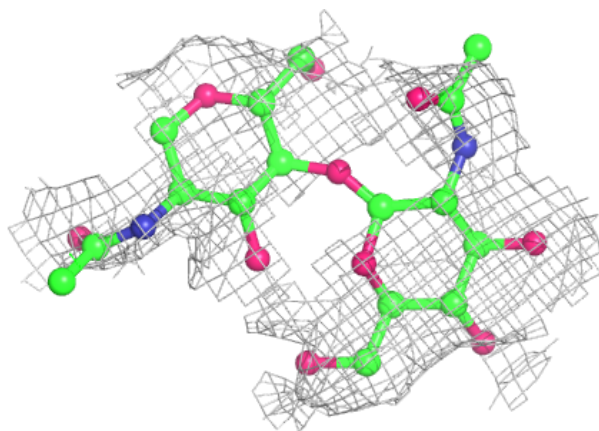
**Electron density around Chain DkD:**

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

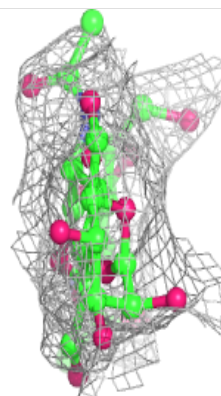
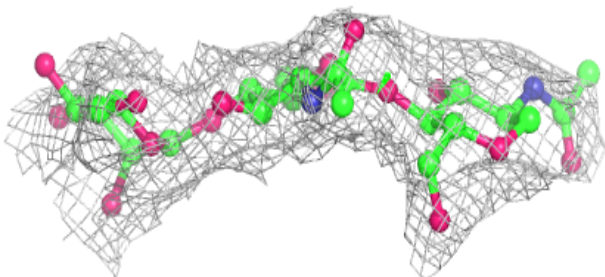
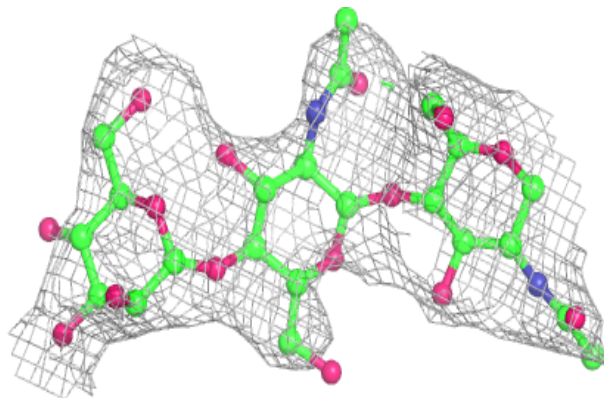


**Electron density around Chain EaE:**

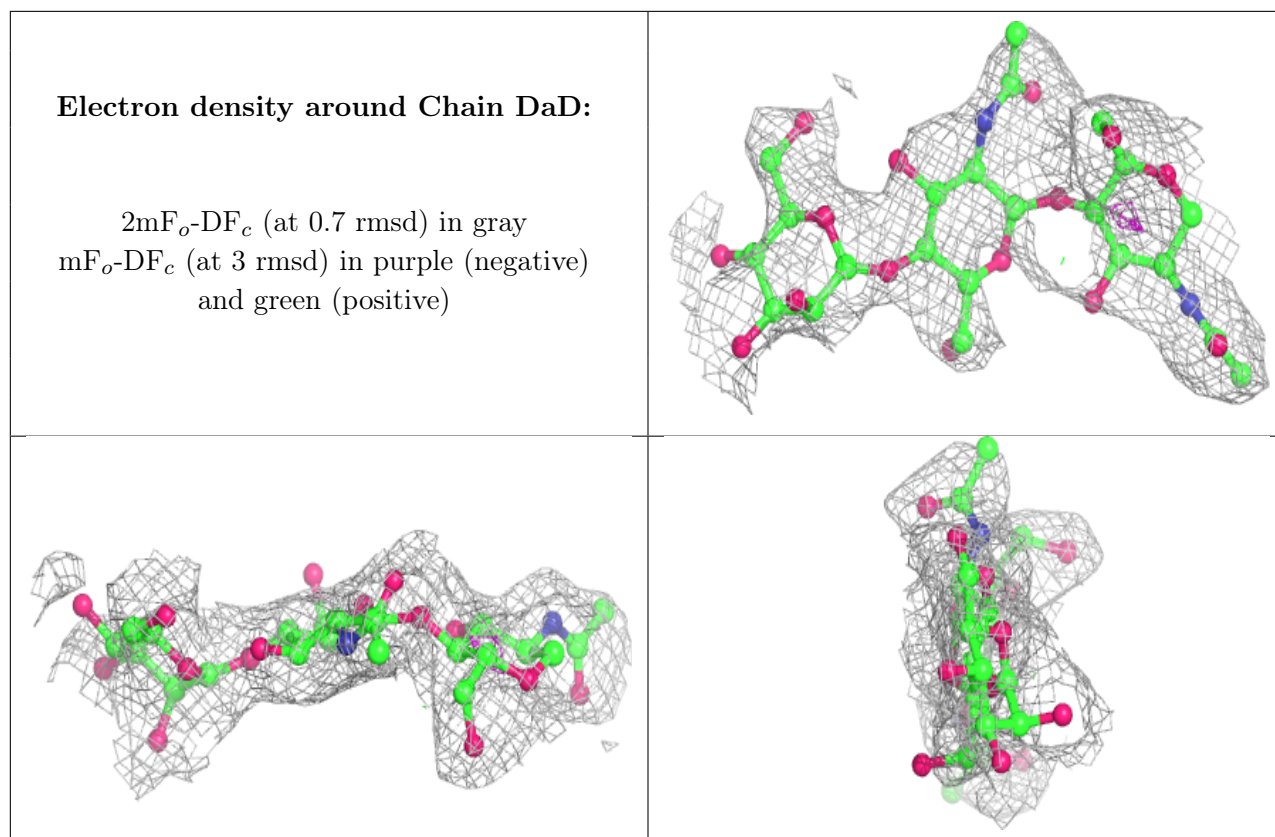
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

**Electron density around Chain AeA:**

$2mF_o-DF_c$  (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
6	NAG	DDD	702	14/15	0.67	0.38	61,67,74,80	0
6	NAG	AAA	702	14/15	0.69	0.25	74,82,85,88	0
6	NAG	DDD	701	14/15	0.73	0.28	82,85,87,88	0
6	NAG	AAA	701	14/15	0.73	0.28	61,64,65,66	0
6	NAG	AAA	703	14/15	0.81	0.27	85,89,92,92	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.