



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 16, 2024 – 01:15 AM EDT

PDB ID : 1SL6
Title : Crystal Structure of a fragment of DC-SIGNR (containing the carbohydrate recognition domain and two repeats of the neck) complexed with Lewis-x.
Authors : Guo, Y.; Feinberg, H.; Conroy, E.; Mitchell, D.A.; Alvarez, R.; Blixt, O.; Taylor, M.E.; Weis, W.I.; Drickamer, K.
Deposited on : 2004-03-05
Resolution : 2.25 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

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	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	2.37.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

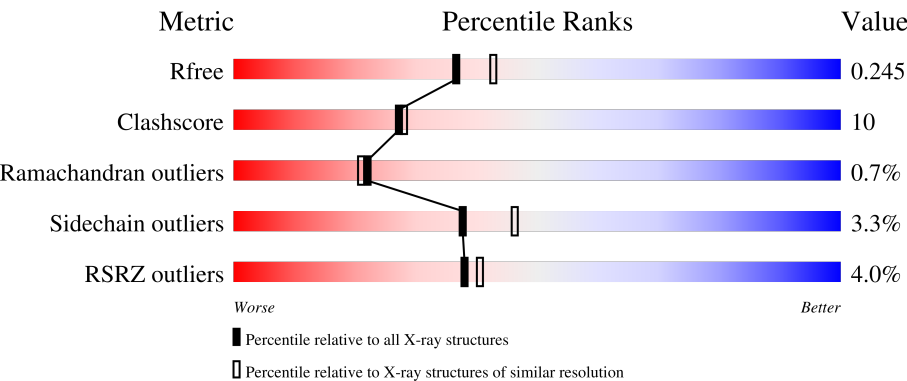
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.25 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	1377 (2.26-2.26)
Clashscore	141614	1487 (2.26-2.26)
Ramachandran outliers	138981	1449 (2.26-2.26)
Sidechain outliers	138945	1450 (2.26-2.26)
RSRZ outliers	127900	1356 (2.26-2.26)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	184	<div><div>3%</div><div><div></div><div>71%</div><div>18%</div><div>•</div><div>9%</div></div></div>
1	B	184	<div><div>4%</div><div><div></div><div>72%</div><div>18%</div><div>•</div><div>9%</div></div></div>
1	C	184	<div><div>4%</div><div><div></div><div>70%</div><div>19%</div><div>•</div><div>9%</div></div></div>
1	D	184	<div><div>4%</div><div><div></div><div>67%</div><div>23%</div><div>•</div><div>9%</div></div></div>
1	E	184	<div><div>4%</div><div><div></div><div>70%</div><div>20%</div><div>•</div><div>9%</div></div></div>

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Mol	Chain	Length	Quality of chain
1	F	184	
2	G	3	
2	H	3	
2	I	3	
2	J	3	
2	K	3	
2	L	3	

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	GAL	H	3	-	-	-	X

2 Entry composition [i](#)

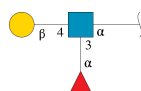
There are 4 unique types of molecules in this entry. The entry contains 8732 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 C-type lectin DC-SIGNR.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	168	Total	C	N	O	S	0	0	0
			1374	857	240	267	10			
1	B	168	Total	C	N	O	S	0	0	0
			1380	860	243	267	10			
1	C	168	Total	C	N	O	S	0	0	0
			1380	860	243	267	10			
1	D	168	Total	C	N	O	S	0	0	0
			1374	858	240	266	10			
1	E	168	Total	C	N	O	S	0	0	0
			1374	858	240	266	10			
1	F	168	Total	C	N	O	S	0	0	0
			1374	858	240	266	10			

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



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	G	3	Total	C	N	O	0	0	0
			36	20	1	15			
2	H	3	Total	C	N	O	0	0	0
			36	20	1	15			
2	I	3	Total	C	N	O	0	0	0
			36	20	1	15			
2	J	3	Total	C	N	O	0	0	0
			36	20	1	15			
2	K	3	Total	C	N	O	0	0	0
			36	20	1	15			
2	L	3	Total	C	N	O	0	0	0
			36	20	1	15			

- Molecule 3 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	4	Total 4	Ca 4	0	0
3	B	4	Total 4	Ca 4	0	0
3	C	4	Total 4	Ca 4	0	0
3	D	4	Total 4	Ca 4	0	0
3	E	4	Total 4	Ca 4	0	0
3	F	4	Total 4	Ca 4	0	0

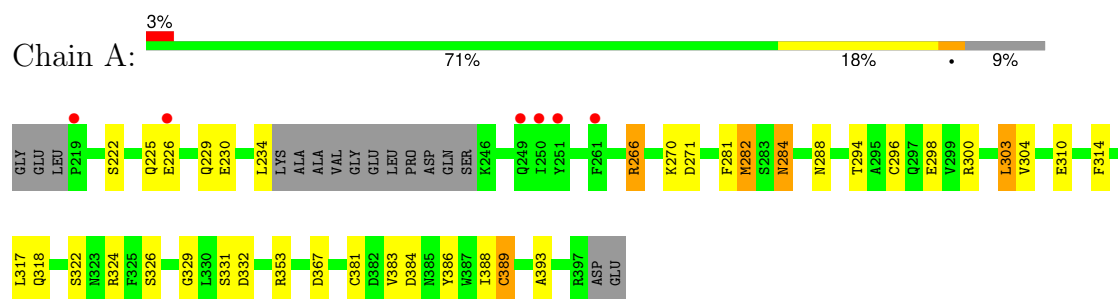
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	42	Total 42	O 42	0	0
4	B	34	Total 34	O 34	0	0
4	C	28	Total 28	O 28	0	0
4	D	37	Total 37	O 37	0	0
4	E	49	Total 49	O 49	0	0
4	F	46	Total 46	O 46	0	0

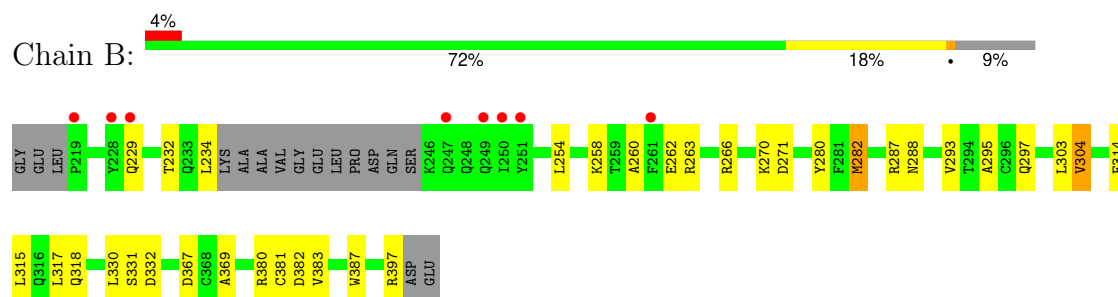
3 Residue-property plots [i](#)

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.

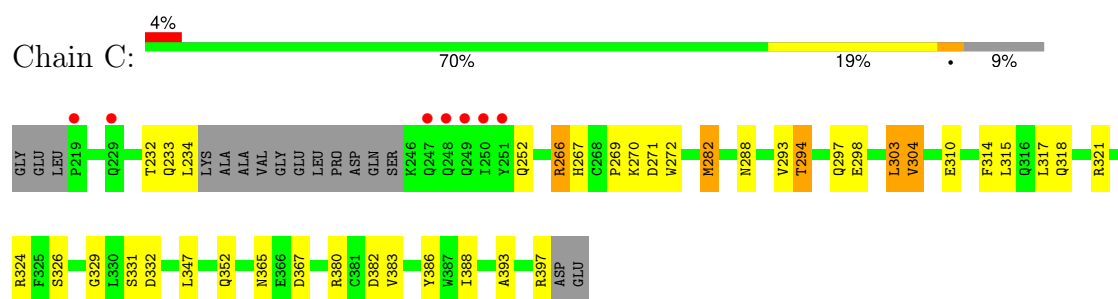
- Molecule 1: C-type lectin DC-SIGNR



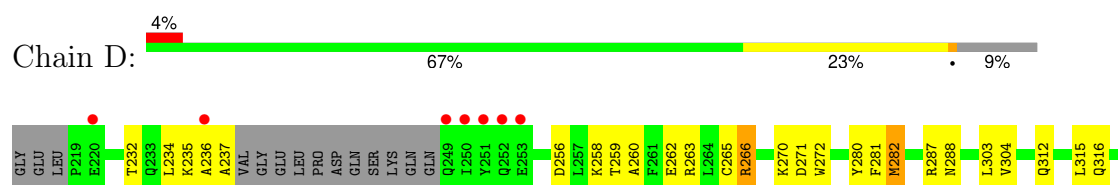
- Molecule 1: C-type lectin DC-SIGNR



- Molecule 1: C-type lectin DC-SIGNR

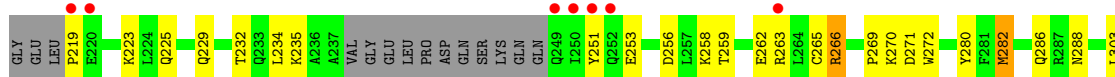


- Molecule 1: C-type lectin DC-SIGNR





- Molecule 1: C-type lectin DC-SIGNR



- Molecule 1: C-type lectin DC-SIGNR



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



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



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



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

Chain J:  100%

HDG1
FUC2
GAL3

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

Chain K:  67% 33%

HDG1
FUC2
GAL3

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

Chain L:  67% 33%

HDG1
FUC2
GAL3

4 Data and refinement statistics

Property	Value	Source
Space group	P 32 2 1	Depositor
Cell constants a, b, c, α , β , γ	153.75Å 153.75Å 128.70Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	41.96 – 2.25 41.96 – 2.25	Depositor EDS
% Data completeness (in resolution range)	87.6 (41.96-2.25) 87.7 (41.96-2.25)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.05	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.74 (at 2.24Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.219 , 0.256 0.211 , 0.245	Depositor DCC
R_{free} test set	6701 reflections (8.35%)	wwPDB-VP
Wilson B-factor (Å ²)	37.0	Xtriage
Anisotropy	0.798	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 43.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.022 for -h,-k,l	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	8732	wwPDB-VP
Average B, all atoms (Å ²)	54.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.30% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: NDG, CA, FUC, GAL

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.36	0/1410	0.56	0/1910
1	B	0.35	0/1416	0.57	0/1917
1	C	0.34	0/1416	0.56	0/1917
1	D	0.35	0/1410	0.58	0/1909
1	E	0.37	0/1410	0.58	0/1909
1	F	0.35	0/1410	0.59	0/1909
All	All	0.35	0/8472	0.57	0/11471

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1374	0	1250	22	0
1	B	1380	0	1257	22	0
1	C	1380	0	1259	34	0
1	D	1374	0	1259	30	0
1	E	1374	0	1259	29	0
1	F	1374	0	1259	35	0
2	G	36	0	28	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	H	36	0	28	0	0
2	I	36	0	28	0	0
2	J	36	0	28	0	0
2	K	36	0	28	0	0
2	L	36	0	28	1	0
3	A	4	0	0	0	0
3	B	4	0	0	0	0
3	C	4	0	0	0	0
3	D	4	0	0	0	0
3	E	4	0	0	0	0
3	F	4	0	0	0	0
4	A	42	0	0	1	0
4	B	34	0	0	0	0
4	C	28	0	0	0	0
4	D	37	0	0	0	0
4	E	49	0	0	1	0
4	F	46	0	0	1	0
All	All	8732	0	7711	163	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 10.

All (163) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:296:CYS:SG	1:A:389:CYS:HB3	2.05	0.95
1:B:397:ARG:HH12	1:E:270:LYS:HG2	1.54	0.73
1:B:397:ARG:NH1	1:E:270:LYS:HG2	2.05	0.71
1:F:380:ARG:HG3	1:F:380:ARG:HH11	1.56	0.71
1:E:282:MET:CE	1:E:388:ILE:HG23	2.23	0.69
1:F:270:LYS:O	1:F:271:ASP:HB2	1.95	0.66
1:B:258:LYS:O	1:B:262:GLU:HG3	1.96	0.66
1:F:282:MET:CE	1:F:388:ILE:HG23	2.26	0.66
1:F:282:MET:HE2	1:F:388:ILE:HG23	1.77	0.65
1:B:270:LYS:O	1:B:271:ASP:HB2	1.96	0.65
1:E:282:MET:HE2	1:E:388:ILE:HG23	1.79	0.64
2:G:2:FUC:H3	2:G:3:GAL:H61	1.79	0.64
1:D:280:TYR:HB3	1:D:282:MET:HE1	1.81	0.62
1:E:331:SER:HB2	1:E:367:ASP:O	2.00	0.61
1:C:282:MET:CE	1:C:388:ILE:HG23	2.30	0.60
1:A:281:PHE:HB3	1:A:389:CYS:SG	2.41	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:265:CYS:HA	1:E:395:CYS:HA	1.84	0.60
1:C:267:HIS:CE1	1:C:397:ARG:HE	2.20	0.59
1:E:380:ARG:HH11	1:E:380:ARG:CB	2.15	0.59
1:F:265:CYS:HA	1:F:395:CYS:HA	1.84	0.59
1:B:380:ARG:HB3	1:B:382:ASP:OD1	2.02	0.58
1:B:293:VAL:O	1:B:297:GLN:HG3	2.02	0.58
1:F:300:ARG:HG2	1:F:300:ARG:HH11	1.67	0.58
1:C:232:THR:C	1:C:234:LEU:H	2.06	0.58
1:C:332:ASP:OD1	1:C:367:ASP:HA	2.04	0.58
1:E:270:LYS:O	1:E:271:ASP:HB2	2.03	0.57
1:E:251:TYR:H	1:E:251:TYR:HD1	1.53	0.57
1:C:282:MET:HE1	1:C:388:ILE:HG23	1.87	0.57
1:C:293:VAL:O	1:C:297:GLN:HG3	2.04	0.56
1:C:266:ARG:HA	1:C:393:ALA:HB1	1.87	0.56
1:A:282:MET:HE2	1:A:388:ILE:HG23	1.88	0.56
1:C:324:ARG:HH12	1:F:323:ASN:ND2	2.04	0.56
1:C:310:GLU:CD	1:D:360:PRO:HG2	2.25	0.55
4:A:428:HOH:O	2:G:3:GAL:H62	2.07	0.55
1:D:260:ALA:HA	1:D:263:ARG:NH1	2.21	0.55
1:B:380:ARG:HB2	1:B:383:VAL:HG23	1.88	0.55
1:C:397:ARG:HH12	1:F:270:LYS:HG2	1.70	0.55
1:C:347:LEU:HD23	1:C:352:GLN:HE22	1.70	0.55
1:E:263:ARG:O	1:E:266:ARG:HD2	2.06	0.55
1:D:282:MET:CE	1:D:388:ILE:HG23	2.36	0.55
1:D:270:LYS:O	1:D:271:ASP:HB2	2.08	0.54
1:F:263:ARG:O	1:F:266:ARG:HD2	2.08	0.54
1:C:380:ARG:HH11	1:C:380:ARG:HG2	1.72	0.53
1:E:314:PHE:O	1:E:318:GLN:HG2	2.08	0.53
1:D:265:CYS:HA	1:D:395:CYS:HA	1.90	0.53
1:B:314:PHE:O	1:B:318:GLN:HG2	2.08	0.53
1:F:290:HIS:HD2	4:F:438:HOH:O	1.92	0.53
1:A:222:SER:O	1:A:225:GLN:HB2	2.09	0.53
1:B:287:ARG:NH1	1:B:295:ALA:HB2	2.23	0.53
1:C:324:ARG:NH1	1:F:323:ASN:ND2	2.56	0.53
1:C:397:ARG:NH1	1:F:270:LYS:HG2	2.24	0.53
1:C:294:THR:O	1:C:298:GLU:HG3	2.09	0.53
1:F:234:LEU:HD23	1:F:234:LEU:O	2.09	0.52
1:A:331:SER:HB2	1:A:367:ASP:O	2.10	0.52
1:B:330:LEU:HB3	1:B:369:ALA:HB3	1.92	0.52
1:A:225:GLN:HB3	1:A:229:GLN:HE21	1.74	0.52
1:A:282:MET:CE	1:A:388:ILE:HG23	2.39	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:258:LYS:HG2	1:D:262:GLU:OE2	2.10	0.52
1:E:258:LYS:HG2	1:E:262:GLU:OE2	2.10	0.52
1:A:284:ASN:ND2	1:D:321:ARG:O	2.43	0.52
1:D:287:ARG:HG3	1:D:387:TRP:CZ3	2.45	0.52
1:F:269:PRO:HB2	1:F:272:TRP:CD1	2.44	0.51
1:C:269:PRO:HB2	1:C:272:TRP:CD1	2.45	0.51
1:F:332:ASP:OD1	1:F:367:ASP:HA	2.09	0.51
1:A:226:GLU:O	1:A:230:GLU:HG2	2.11	0.51
1:B:331:SER:HB2	1:B:367:ASP:O	2.10	0.51
1:D:259:THR:O	1:D:263:ARG:HG3	2.11	0.51
1:F:331:SER:HB2	1:F:367:ASP:O	2.11	0.51
1:C:314:PHE:O	1:C:318:GLN:HG2	2.11	0.51
1:D:280:TYR:HB3	1:D:282:MET:CE	2.40	0.51
1:E:288:ASN:HB2	1:E:381:CYS:O	2.11	0.51
1:F:294:THR:O	1:F:298:GLU:HG3	2.10	0.50
1:A:332:ASP:OD1	1:A:367:ASP:HA	2.11	0.50
1:C:270:LYS:O	1:C:271:ASP:HB2	2.12	0.50
1:E:282:MET:HE1	1:E:388:ILE:HG23	1.92	0.50
1:C:252:GLN:HE22	1:D:353:ARG:NH1	2.11	0.49
1:E:280:TYR:HB3	1:E:282:MET:HE1	1.94	0.49
1:A:314:PHE:O	1:A:318:GLN:HG2	2.12	0.49
1:C:282:MET:HE2	1:C:388:ILE:HG12	1.95	0.49
1:A:270:LYS:O	1:A:271:ASP:HB2	2.13	0.49
1:D:282:MET:HE1	1:D:388:ILE:HG23	1.94	0.48
1:D:331:SER:HB2	1:D:367:ASP:O	2.13	0.48
1:E:234:LEU:HD23	1:E:234:LEU:O	2.14	0.48
1:A:310:GLU:CD	1:E:360:PRO:HG2	2.33	0.48
1:B:229:GLN:O	1:B:232:THR:HB	2.15	0.47
1:B:380:ARG:HH11	1:B:380:ARG:HG2	1.79	0.47
1:C:288:ASN:HA	1:C:383:VAL:O	2.15	0.47
1:C:331:SER:HB2	1:C:367:ASP:O	2.15	0.47
1:C:282:MET:HE2	1:C:282:MET:HA	1.97	0.47
1:C:303:LEU:HD13	1:C:329:GLY:HA2	1.96	0.47
1:B:260:ALA:HA	1:B:263:ARG:NH1	2.30	0.47
1:C:324:ARG:HH12	1:F:323:ASN:HD21	1.62	0.47
1:F:314:PHE:O	1:F:318:GLN:HG2	2.15	0.46
1:D:332:ASP:OD1	1:D:367:ASP:HA	2.16	0.46
1:F:288:ASN:HB2	1:F:381:CYS:O	2.15	0.46
1:E:253:GLU:HA	1:E:256:ASP:HB2	1.98	0.46
1:B:332:ASP:OD1	1:B:367:ASP:HA	2.15	0.46
1:F:355:TRP:CD2	1:F:360:PRO:HD3	2.50	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:232:THR:C	1:B:234:LEU:H	2.19	0.46
1:E:380:ARG:HH11	1:E:380:ARG:HB3	1.80	0.46
1:A:288:ASN:HA	1:A:383:VAL:O	2.15	0.46
1:B:234:LEU:HD22	1:B:254:LEU:HD11	1.98	0.46
1:F:380:ARG:HH11	1:F:380:ARG:CG	2.27	0.46
1:A:326:SER:HA	1:A:386:TYR:O	2.16	0.45
1:D:280:TYR:C	1:D:282:MET:HE3	2.37	0.45
1:A:303:LEU:HD13	1:A:329:GLY:HA2	1.98	0.45
1:F:302:GLN:O	1:F:303:LEU:C	2.55	0.45
1:F:359:GLU:HB3	1:F:360:PRO:HA	1.97	0.45
1:D:282:MET:HE2	1:D:388:ILE:HG23	1.99	0.44
1:F:259:THR:O	1:F:263:ARG:HG3	2.17	0.44
1:A:294:THR:O	1:A:298:GLU:HG3	2.17	0.44
1:A:266:ARG:HA	1:A:393:ALA:HB1	1.99	0.44
1:F:270:LYS:HE3	1:F:270:LYS:HB2	1.84	0.44
1:B:280:TYR:HB3	1:B:282:MET:HE1	2.00	0.44
1:A:322:SER:O	1:A:324:ARG:HG3	2.18	0.44
1:C:304:VAL:HG21	1:C:315:LEU:CD1	2.48	0.44
1:D:259:THR:HG22	1:D:263:ARG:NE	2.33	0.43
1:D:232:THR:O	1:D:235:LYS:HB3	2.18	0.43
1:D:312:GLN:HG2	1:D:354:TYR:CZ	2.52	0.43
1:F:253:GLU:HA	1:F:253:GLU:OE1	2.18	0.43
1:B:287:ARG:HG3	1:B:387:TRP:CZ3	2.54	0.43
1:C:282:MET:HE1	1:C:388:ILE:CG2	2.47	0.43
1:C:326:SER:HA	1:C:386:TYR:O	2.18	0.43
1:B:304:VAL:HG21	1:B:315:LEU:HD11	2.00	0.43
1:D:272:TRP:CE2	1:D:281:PHE:HB2	2.53	0.43
1:E:288:ASN:HA	1:E:383:VAL:O	2.18	0.43
1:A:300:ARG:HG2	1:A:300:ARG:HH11	1.83	0.43
1:C:282:MET:CE	1:C:388:ILE:HG12	2.49	0.43
1:E:219:PRO:O	1:E:223:LYS:HG3	2.19	0.43
1:F:249:GLN:HG3	1:F:250:ILE:N	2.33	0.43
1:A:288:ASN:HB2	1:A:381:CYS:O	2.19	0.42
1:C:380:ARG:HB3	1:C:382:ASP:OD1	2.19	0.42
1:F:288:ASN:HA	1:F:383:VAL:O	2.18	0.42
1:F:300:ARG:HG2	1:F:300:ARG:NH1	2.34	0.42
1:C:347:LEU:HD23	1:C:352:GLN:NE2	2.33	0.42
1:B:234:LEU:C	1:B:234:LEU:HD23	2.40	0.42
1:E:269:PRO:HB2	1:E:272:TRP:CD1	2.55	0.42
1:E:251:TYR:CD1	1:E:251:TYR:N	2.88	0.42
1:D:316:GLN:O	1:D:320:SER:HB2	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:326:SER:O	1:D:370:GLU:HA	2.20	0.42
1:D:235:LYS:C	1:D:237:ALA:H	2.22	0.41
1:D:263:ARG:O	1:D:266:ARG:HD3	2.19	0.41
1:D:288:ASN:HA	1:D:383:VAL:O	2.20	0.41
1:D:304:VAL:HG21	1:D:315:LEU:HD11	2.00	0.41
1:E:232:THR:O	1:E:235:LYS:HB3	2.19	0.41
1:E:359:GLU:HB3	1:E:360:PRO:HA	2.02	0.41
1:E:332:ASP:OD1	1:E:367:ASP:HA	2.21	0.41
1:D:327:TRP:NE1	1:D:385:ASN:HB2	2.36	0.41
1:E:286:GLN:NE2	4:E:442:HOH:O	2.48	0.41
1:C:232:THR:C	1:C:234:LEU:N	2.72	0.41
1:C:234:LEU:HD23	1:C:234:LEU:C	2.41	0.41
1:A:383:VAL:CG1	1:A:384:ASP:N	2.84	0.41
1:C:321:ARG:O	2:L:3:GAL:H3	2.20	0.41
1:D:322:SER:O	1:D:323:ASN:HB2	2.20	0.41
1:E:225:GLN:O	1:E:229:GLN:HB2	2.21	0.41
1:F:312:GLN:HG2	1:F:354:TYR:CE2	2.55	0.41
1:F:316:GLN:O	1:F:320:SER:HB2	2.21	0.41
1:D:235:LYS:O	1:D:237:ALA:N	2.51	0.40
1:F:221:LYS:HG2	1:F:225:GLN:OE1	2.21	0.40
1:F:380:ARG:CG	1:F:380:ARG:NH1	2.85	0.40
1:F:380:ARG:HG3	1:F:380:ARG:NH1	2.30	0.40
1:B:288:ASN:HB2	1:B:381:CYS:O	2.22	0.40
1:E:259:THR:O	1:E:263:ARG:HG3	2.21	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	164/184 (89%)	157 (96%)	6 (4%)	1 (1%)	25 25

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	164/184 (89%)	157 (96%)	6 (4%)	1 (1%)	25	25
1	C	164/184 (89%)	154 (94%)	7 (4%)	3 (2%)	8	4
1	D	164/184 (89%)	155 (94%)	8 (5%)	1 (1%)	25	25
1	E	164/184 (89%)	151 (92%)	12 (7%)	1 (1%)	25	25
1	F	164/184 (89%)	156 (95%)	8 (5%)	0	100	100
All	All	984/1104 (89%)	930 (94%)	47 (5%)	7 (1%)	22	21

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	233	GLN
1	D	236	ALA
1	C	304	VAL
1	C	365	ASN
1	A	304	VAL
1	B	304	VAL
1	E	304	VAL

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	150/165 (91%)	142 (95%)	8 (5%)	22	23
1	B	151/165 (92%)	147 (97%)	4 (3%)	46	55
1	C	151/165 (92%)	146 (97%)	5 (3%)	38	46
1	D	150/165 (91%)	144 (96%)	6 (4%)	31	37
1	E	150/165 (91%)	145 (97%)	5 (3%)	38	46
1	F	150/165 (91%)	148 (99%)	2 (1%)	69	79
All	All	902/990 (91%)	872 (97%)	30 (3%)	38	46

All (30) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	234	LEU
1	A	266	ARG
1	A	282	MET
1	A	284	ASN
1	A	303	LEU
1	A	317	LEU
1	A	353	ARG
1	A	389	CYS
1	B	266	ARG
1	B	282	MET
1	B	303	LEU
1	B	317	LEU
1	C	266	ARG
1	C	282	MET
1	C	294	THR
1	C	303	LEU
1	C	317	LEU
1	D	234	LEU
1	D	256	ASP
1	D	266	ARG
1	D	282	MET
1	D	303	LEU
1	D	380	ARG
1	E	266	ARG
1	E	282	MET
1	E	303	LEU
1	E	317	LEU
1	E	380	ARG
1	F	282	MET
1	F	303	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	229	GLN
1	B	334	ASN
1	B	340	GLN
1	C	252	GLN
1	C	267	HIS
1	C	340	GLN
1	D	286	GLN
1	D	323	ASN
1	F	323	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5 Carbohydrates ⓘ

18 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	NDG	G	1	2	15,15,15	0.57	0	21,21,21	0.57	0
2	FUC	G	2	2,3	10,10,11	0.47	0	14,14,16	0.43	0
2	GAL	G	3	2	11,11,12	0.48	0	15,15,17	0.32	0
2	NDG	H	1	2	15,15,15	0.40	0	21,21,21	0.63	0
2	FUC	H	2	2,3	10,10,11	0.38	0	14,14,16	0.43	0
2	GAL	H	3	2	11,11,12	0.43	0	15,15,17	0.27	0
2	NDG	I	1	2	15,15,15	0.48	0	21,21,21	0.59	0
2	FUC	I	2	2,3	10,10,11	0.56	0	14,14,16	0.39	0
2	GAL	I	3	2	11,11,12	0.43	0	15,15,17	0.31	0
2	NDG	J	1	2	15,15,15	0.54	0	21,21,21	0.63	0
2	FUC	J	2	2,3	10,10,11	0.44	0	14,14,16	0.47	0
2	GAL	J	3	2	11,11,12	0.46	0	15,15,17	0.31	0
2	NDG	K	1	2	15,15,15	0.50	0	21,21,21	0.91	1 (4%)
2	FUC	K	2	2,3	10,10,11	0.60	0	14,14,16	0.39	0
2	GAL	K	3	2	11,11,12	0.52	0	15,15,17	0.37	0
2	NDG	L	1	2	15,15,15	0.54	0	21,21,21	0.61	0
2	FUC	L	2	2,3	10,10,11	0.58	0	14,14,16	0.49	0
2	GAL	L	3	2	11,11,12	0.49	0	15,15,17	0.32	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns.

'-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NDG	G	1	2	-	0/6/26/26	0/1/1/1
2	FUC	G	2	2,3	-	-	0/1/1/1
2	GAL	G	3	2	-	0/2/19/22	0/1/1/1
2	NDG	H	1	2	-	0/6/26/26	0/1/1/1
2	FUC	H	2	2,3	-	-	0/1/1/1
2	GAL	H	3	2	-	2/2/19/22	0/1/1/1
2	NDG	I	1	2	-	0/6/26/26	0/1/1/1
2	FUC	I	2	2,3	-	-	0/1/1/1
2	GAL	I	3	2	-	2/2/19/22	0/1/1/1
2	NDG	J	1	2	-	4/6/26/26	0/1/1/1
2	FUC	J	2	2,3	-	-	0/1/1/1
2	GAL	J	3	2	-	1/2/19/22	0/1/1/1
2	NDG	K	1	2	-	2/6/26/26	0/1/1/1
2	FUC	K	2	2,3	-	-	0/1/1/1
2	GAL	K	3	2	-	1/2/19/22	0/1/1/1
2	NDG	L	1	2	-	2/6/26/26	0/1/1/1
2	FUC	L	2	2,3	-	-	0/1/1/1
2	GAL	L	3	2	-	1/2/19/22	0/1/1/1

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	K	1	NDG	C4-C3-C2	2.10	113.47	110.40

There are no chirality outliers.

All (15) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	H	3	GAL	C4-C5-C6-O6
2	J	1	NDG	C3-C2-N2-C7
2	J	3	GAL	O5-C5-C6-O6
2	I	3	GAL	O5-C5-C6-O6
2	H	3	GAL	O5-C5-C6-O6
2	L	1	NDG	C4-C5-C6-O6
2	K	3	GAL	O5-C5-C6-O6
2	L	3	GAL	O5-C5-C6-O6
2	L	1	NDG	O5-C5-C6-O6
2	J	1	NDG	C4-C5-C6-O6

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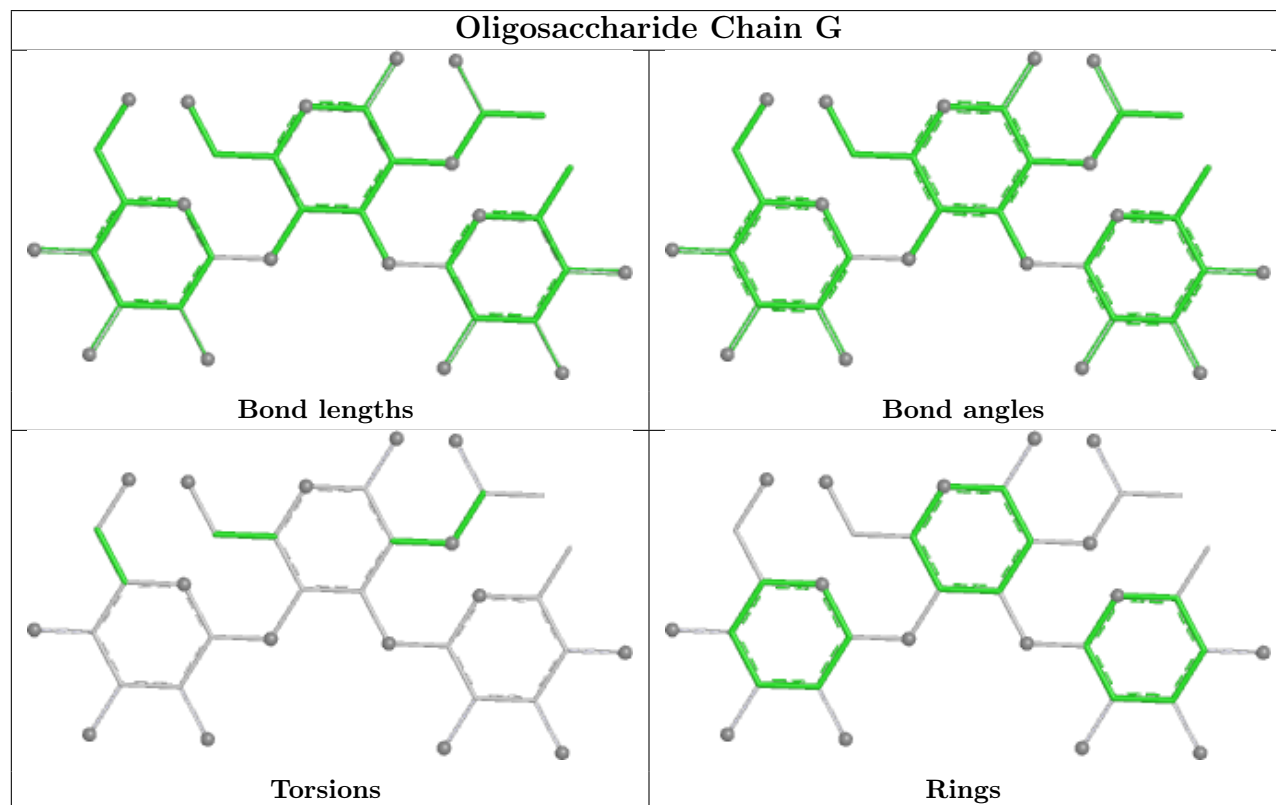
Mol	Chain	Res	Type	Atoms
2	K	1	NDG	C8-C7-N2-C2
2	J	1	NDG	O5-C5-C6-O6
2	J	1	NDG	C1-C2-N2-C7
2	K	1	NDG	O7-C7-N2-C2
2	I	3	GAL	C4-C5-C6-O6

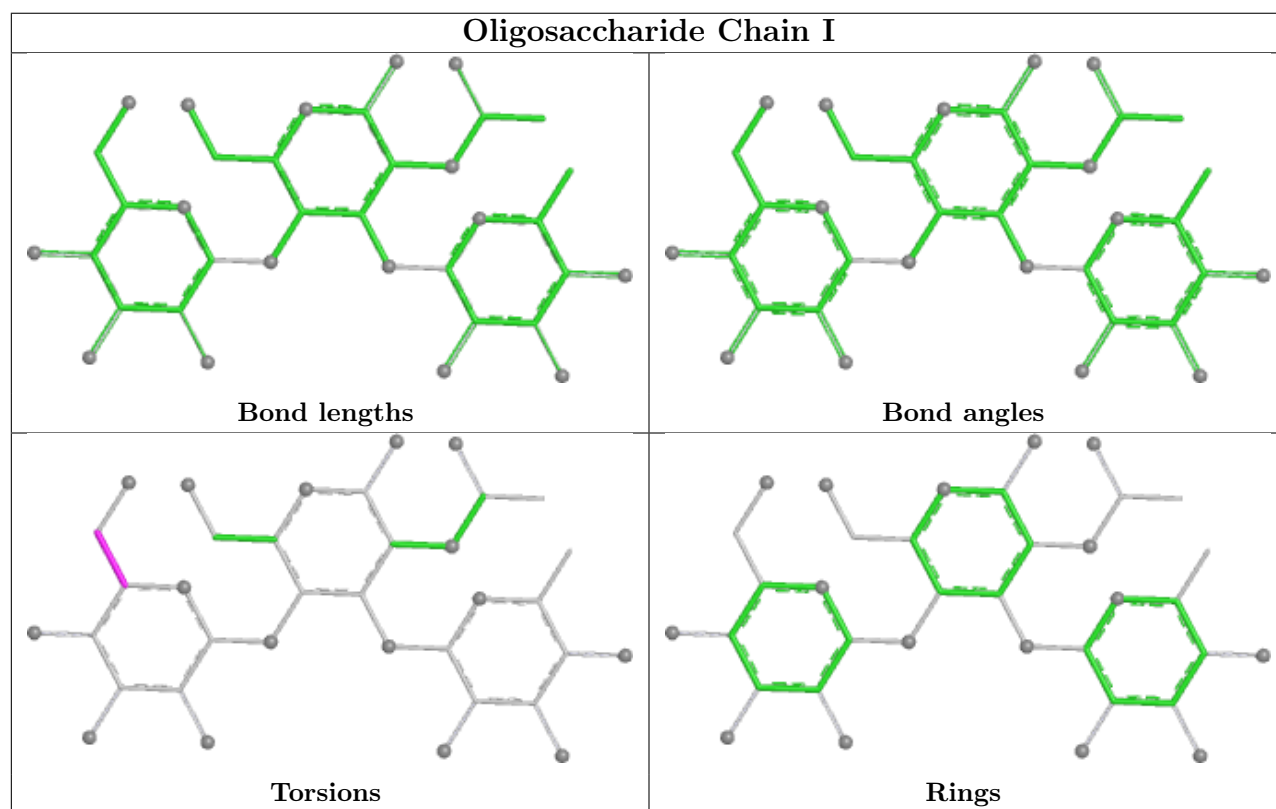
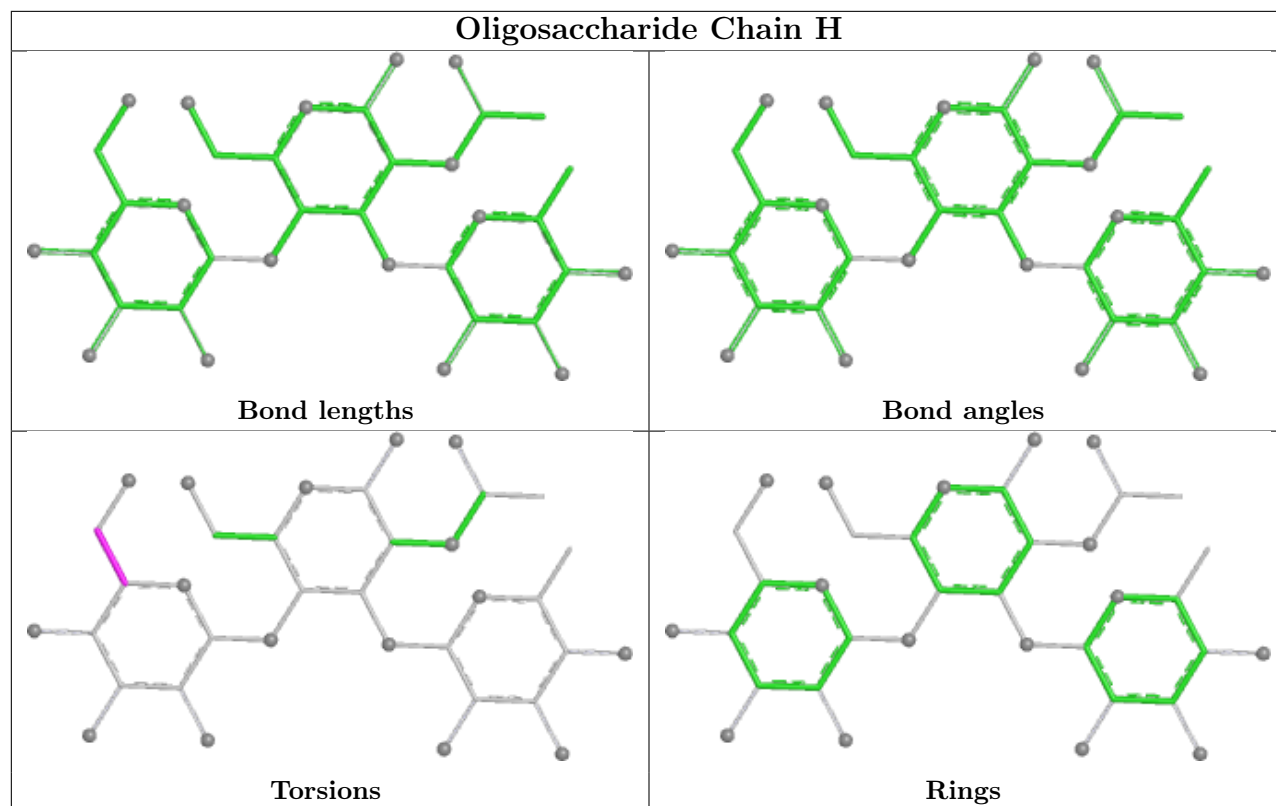
There are no ring outliers.

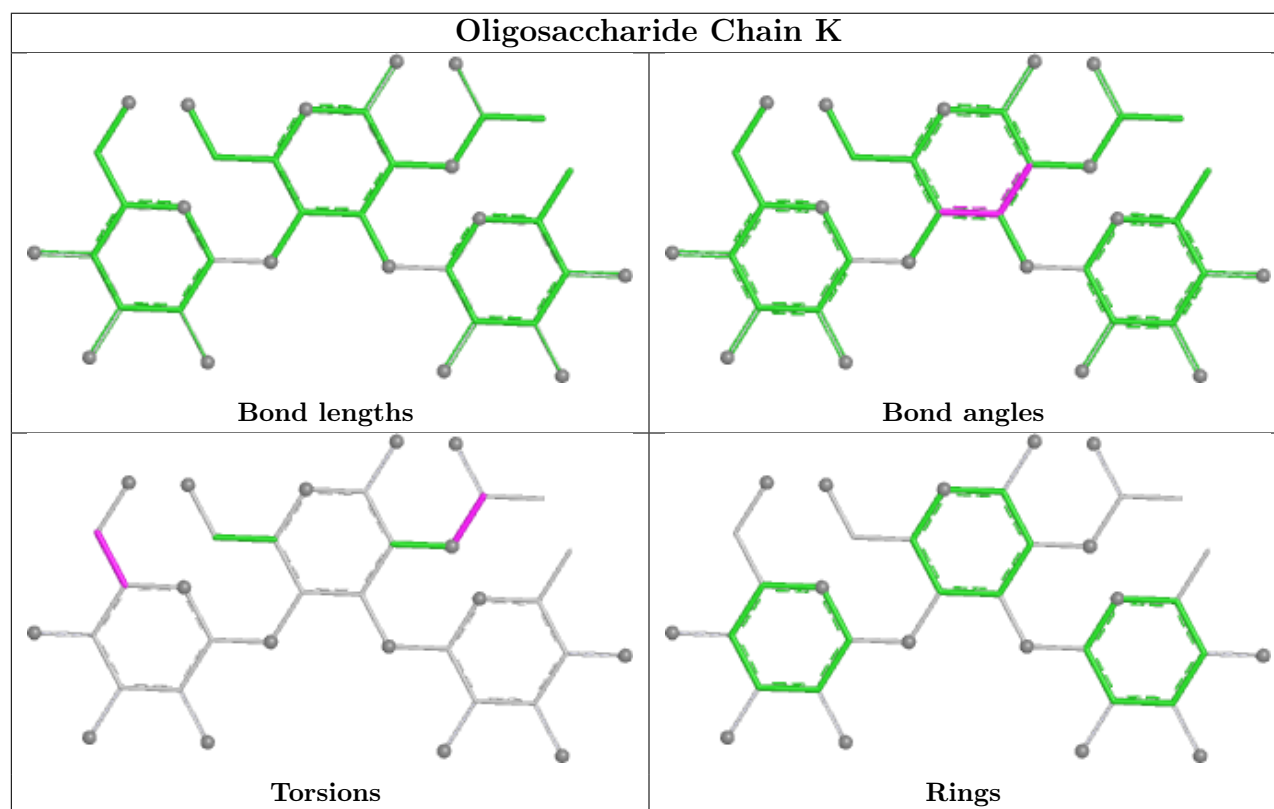
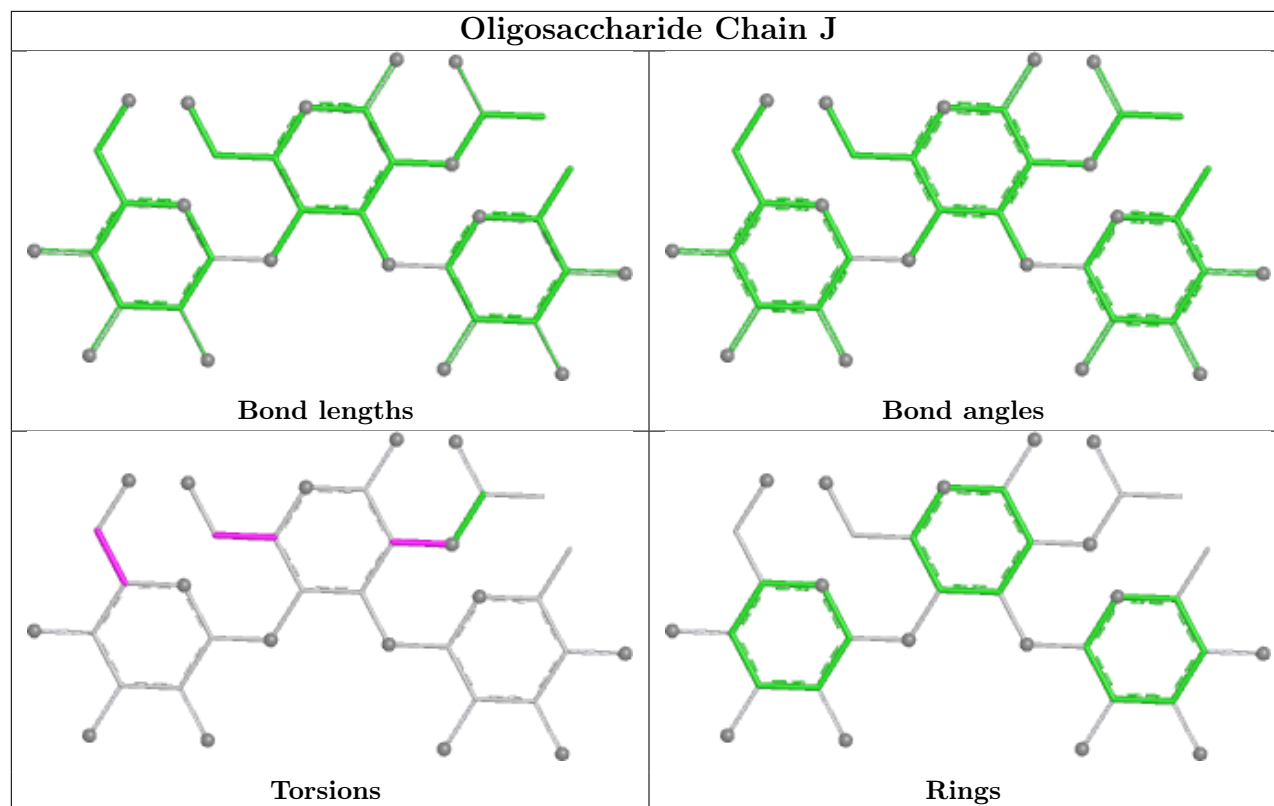
3 monomers are involved in 3 short contacts:

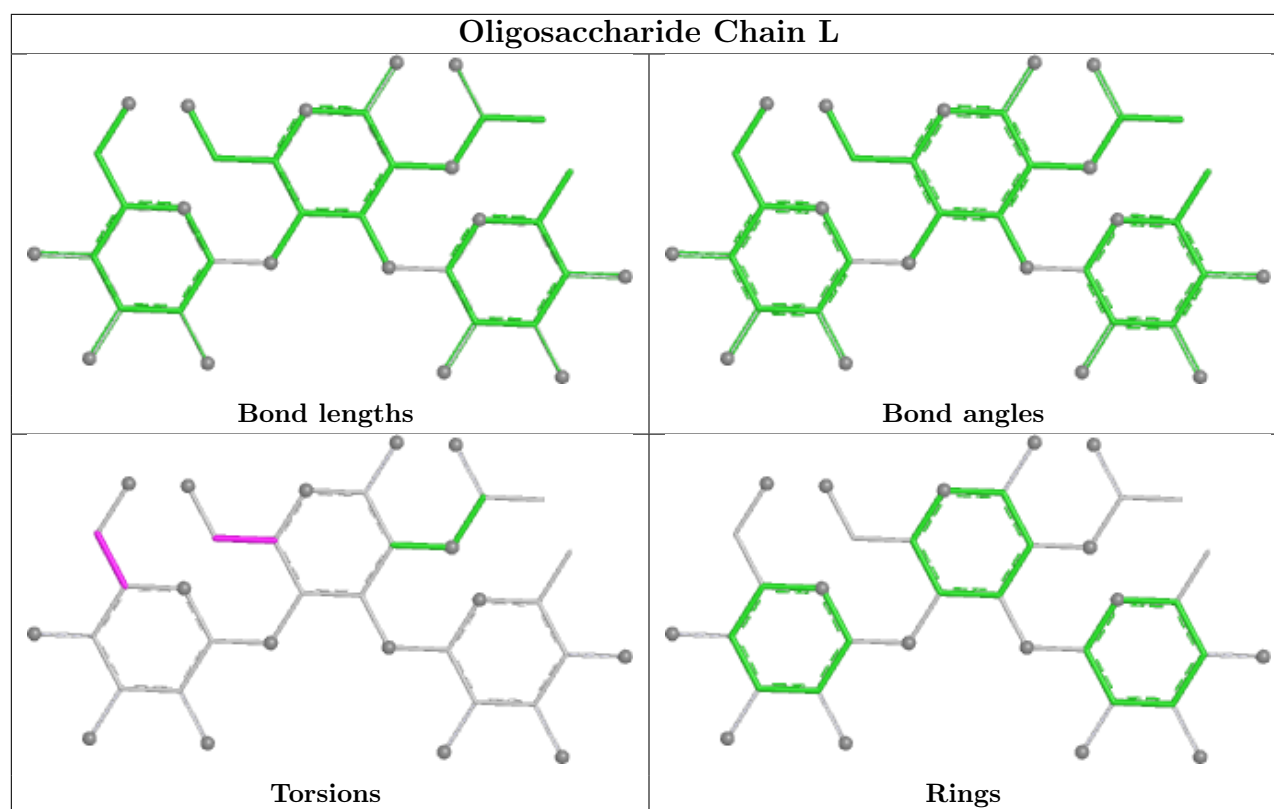
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	G	3	GAL	2	0
2	G	2	FUC	1	0
2	L	3	GAL	1	0

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









5.6 Ligand geometry [i](#)

Of 24 ligands modelled in this entry, 24 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2		OWAB(Å ²)	Q<0.9
1	A	168/184 (91%)	0.16	6 (3%)	42 44	34, 50, 89, 100	0
1	B	168/184 (91%)	0.16	8 (4%)	30 33	33, 48, 90, 100	0
1	C	168/184 (91%)	0.15	7 (4%)	36 38	38, 53, 94, 100	0
1	D	168/184 (91%)	0.05	7 (4%)	36 38	31, 47, 90, 100	0
1	E	168/184 (91%)	0.06	7 (4%)	36 38	30, 43, 93, 100	0
1	F	168/184 (91%)	0.14	5 (2%)	50 53	30, 46, 88, 100	0
All	All	1008/1104 (91%)	0.12	40 (3%)	38 40	30, 48, 93, 100	0

All (40) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	250	ILE	6.1
1	B	251	TYR	5.3
1	D	250	ILE	4.9
1	E	252	GLN	4.7
1	D	251	TYR	4.7
1	D	249	GLN	4.2
1	F	251	TYR	4.1
1	C	251	TYR	4.0
1	C	219	PRO	4.0
1	F	250	ILE	3.8
1	B	249	GLN	3.8
1	E	251	TYR	3.5
1	D	220	GLU	3.5
1	F	220	GLU	3.0
1	B	250	ILE	3.0
1	C	247	GLN	2.8
1	D	252	GLN	2.8
1	A	219	PRO	2.8
1	E	249	GLN	2.7

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Mol	Chain	Res	Type	RSRZ
1	F	252	GLN	2.6
1	D	253	GLU	2.6
1	A	261	PHE	2.6
1	C	250	ILE	2.6
1	E	219	PRO	2.3
1	B	229	GLN	2.3
1	B	228	TYR	2.3
1	B	247	GLN	2.3
1	C	248	GLN	2.2
1	E	220	GLU	2.2
1	F	263	ARG	2.2
1	A	249	GLN	2.2
1	A	251	TYR	2.2
1	B	219	PRO	2.2
1	C	249	GLN	2.1
1	D	236	ALA	2.1
1	B	261	PHE	2.1
1	A	250	ILE	2.1
1	A	226	GLU	2.1
1	C	229	GLN	2.0
1	E	263	ARG	2.0

6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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

6.3 Carbohydrates ⓘ

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	GAL	H	3	11/12	0.56	0.41	73,73,74,75	11
2	NDG	H	1	15/15	0.64	0.37	62,69,70,72	15
2	FUC	H	2	10/11	0.75	0.32	47,52,56,57	10
2	GAL	K	3	11/12	0.79	0.23	75,76,77,77	0
2	NDG	I	1	15/15	0.81	0.39	89,97,97,99	0
2	NDG	G	1	15/15	0.85	0.43	81,90,90,91	0
2	GAL	G	3	11/12	0.87	0.20	89,91,92,92	0

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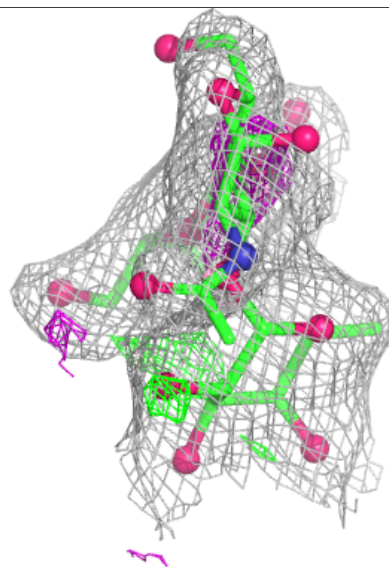
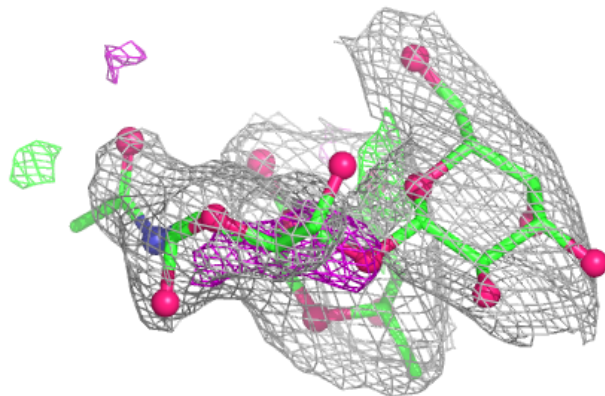
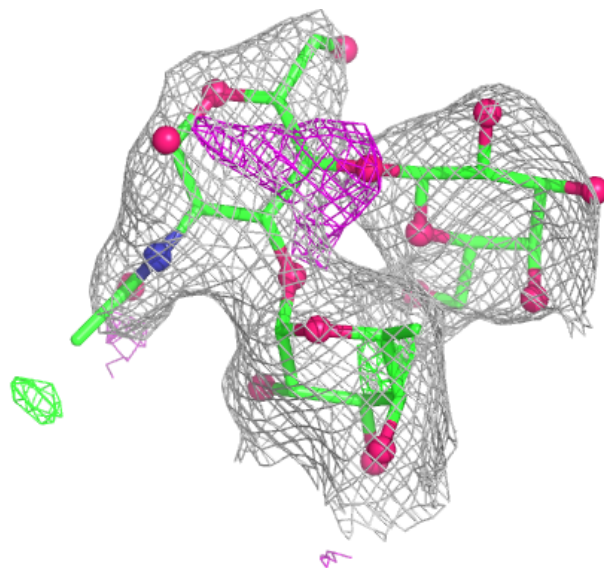
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	NDG	J	1	15/15	0.87	0.20	69,78,82,84	0
2	FUC	G	2	10/11	0.87	0.13	60,68,71,74	0
2	NDG	L	1	15/15	0.87	0.17	65,78,82,82	0
2	GAL	L	3	11/12	0.88	0.20	76,78,79,80	0
2	FUC	I	2	10/11	0.89	0.15	76,80,82,84	0
2	GAL	J	3	11/12	0.89	0.14	75,77,78,80	0
2	NDG	K	1	15/15	0.89	0.15	61,73,78,80	0
2	GAL	I	3	11/12	0.90	0.27	99,99,100,100	0
2	FUC	J	2	10/11	0.94	0.15	53,58,61,64	0
2	FUC	L	2	10/11	0.96	0.14	45,49,53,55	0
2	FUC	K	2	10/11	0.96	0.16	39,46,50,53	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.

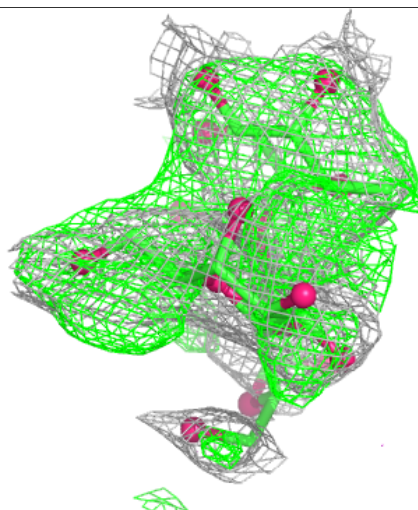
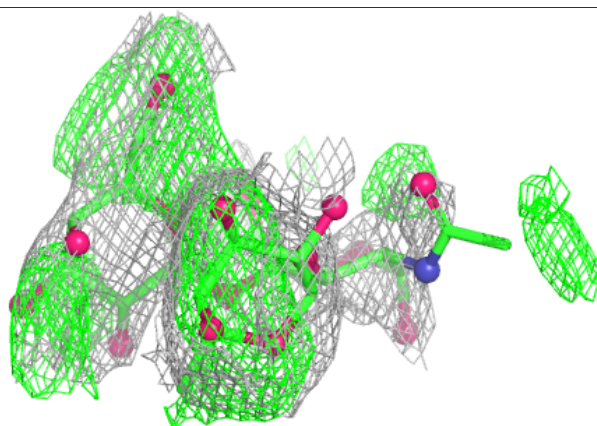
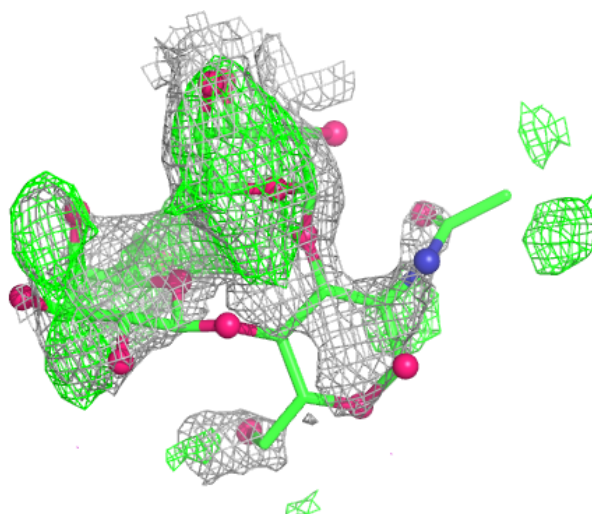
Electron density around Chain G:

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



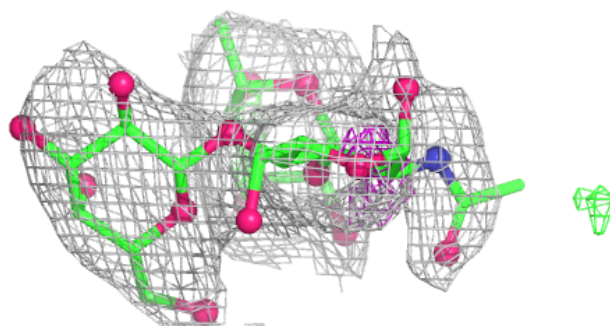
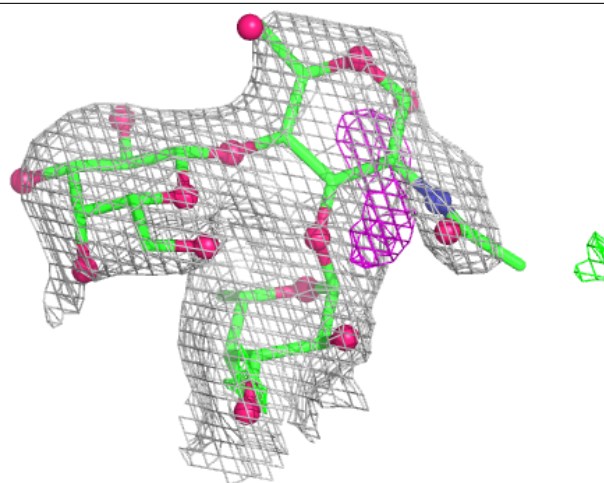
Electron density around Chain H:

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



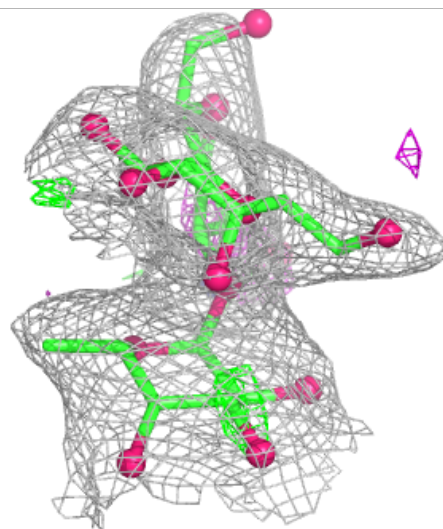
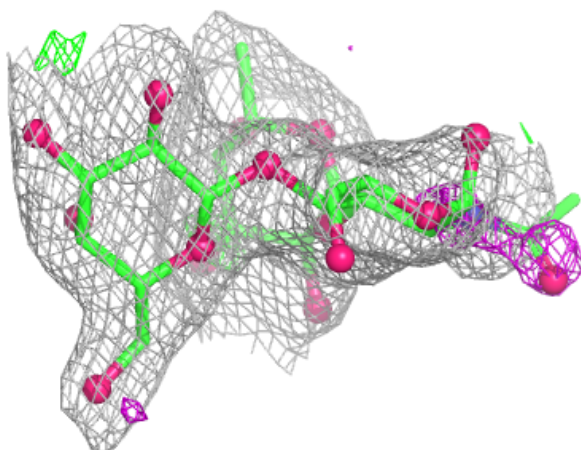
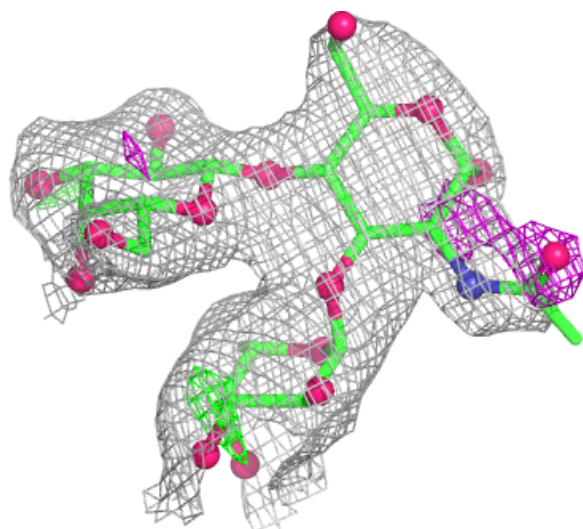
Electron density around Chain I:

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



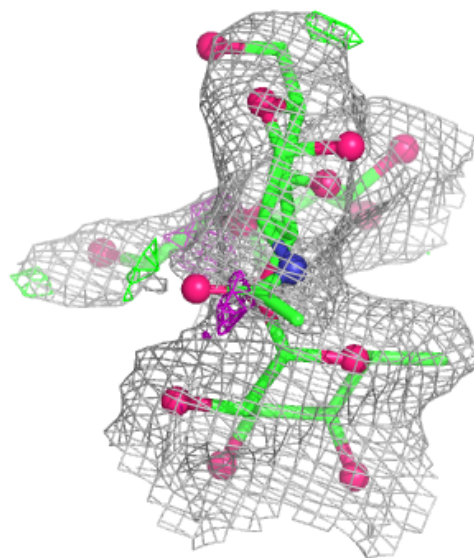
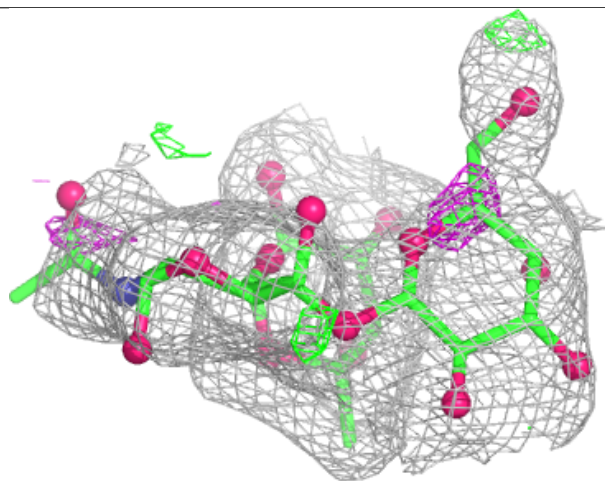
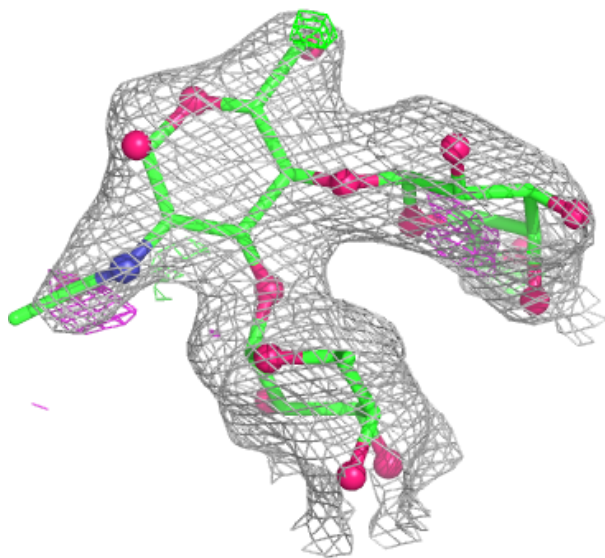
Electron density around Chain J:

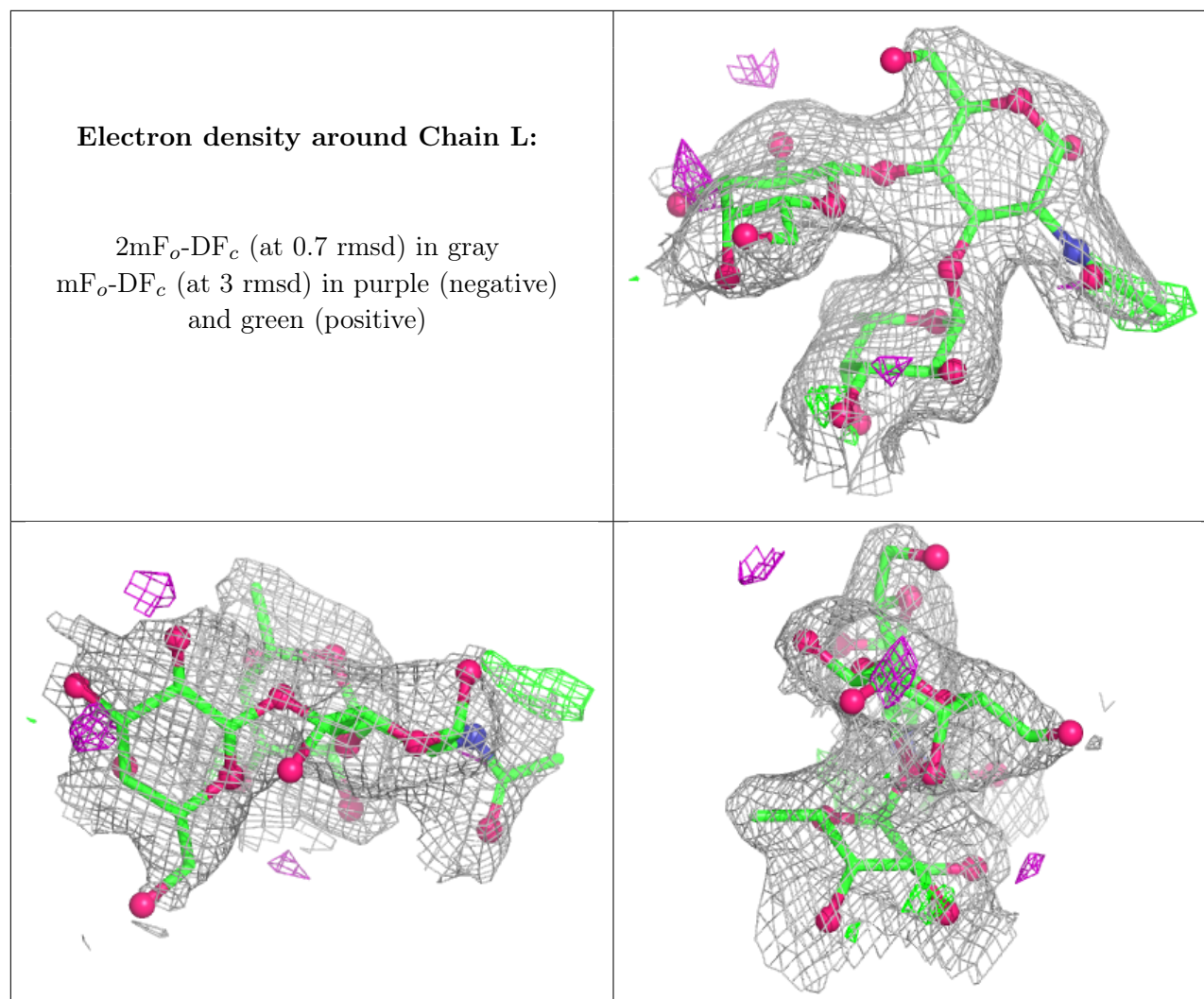
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around Chain K:

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





6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
3	CA	D	4	1/1	0.89	0.12	95,95,95,95	0
3	CA	E	4	1/1	0.93	0.15	100,100,100,100	0
3	CA	F	4	1/1	0.95	0.08	97,97,97,97	0
3	CA	C	4	1/1	0.96	0.08	73,73,73,73	0
3	CA	B	4	1/1	0.97	0.11	76,76,76,76	0
3	CA	B	2	1/1	0.98	0.08	44,44,44,44	0
3	CA	A	3	1/1	0.98	0.08	56,56,56,56	0
3	CA	C	2	1/1	0.98	0.09	47,47,47,47	0
3	CA	C	3	1/1	0.98	0.06	41,41,41,41	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
3	CA	B	1	1/1	0.99	0.06	40,40,40,40	0
3	CA	A	2	1/1	0.99	0.11	48,48,48,48	0
3	CA	D	3	1/1	0.99	0.14	35,35,35,35	0
3	CA	B	3	1/1	0.99	0.08	46,46,46,46	0
3	CA	E	1	1/1	0.99	0.16	32,32,32,32	0
3	CA	E	2	1/1	0.99	0.17	31,31,31,31	0
3	CA	A	1	1/1	0.99	0.08	49,49,49,49	0
3	CA	F	1	1/1	0.99	0.15	35,35,35,35	0
3	CA	A	4	1/1	0.99	0.09	62,62,62,62	0
3	CA	E	3	1/1	1.00	0.10	34,34,34,34	0
3	CA	D	1	1/1	1.00	0.11	36,36,36,36	0
3	CA	D	2	1/1	1.00	0.13	38,38,38,38	0
3	CA	F	2	1/1	1.00	0.15	32,32,32,32	0
3	CA	F	3	1/1	1.00	0.17	33,33,33,33	0
3	CA	C	1	1/1	1.00	0.08	46,46,46,46	0

6.5 Other polymers [i](#)

There are no such residues in this entry.