



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 05:39 PM UTC

PDB ID : 5J3H / pdb_00005j3h
Title : Human insulin receptor domains L1-CR in complex with peptide S519C16 and 83-7 Fv
Authors : Lawrence, M.; Menting, J.; Lawrence, C.
Deposited on : 2016-03-30
Resolution : 3.27 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:

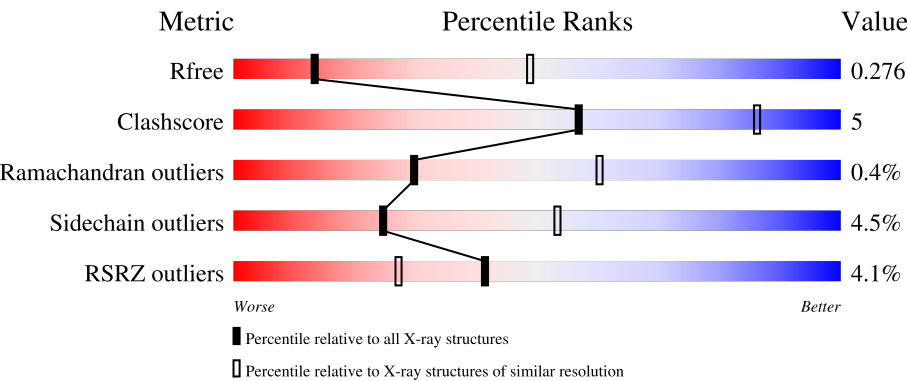
MolProbity : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 3.27 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R _{free}	180053	1303 (3.30-3.26)
Clashscore	190562	1354 (3.30-3.26)
Ramachandran outliers	187476	1334 (3.30-3.26)
Sidechain outliers	187428	1333 (3.30-3.26)
RSRZ outliers	180081	1303 (3.30-3.26)

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	B	16	
2	C	123	
3	D	118	
4	E	317	
5	A	3	

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Mol	Chain	Length	Quality of chain
6	F	2	50% 50%
7	G	7	14% 71% 14%

2 Entry composition

There are 8 unique types of molecules in this entry. The entry contains 4253 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 Peptide S519C16.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
1	B	14	Total	C	N	O	0	0	0
			130	85	19	26			

- Molecule 2 is a protein called mAb 83-7 Fab heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	116	Total	C	N	O	S	0	0	0
			892	562	151	174	5			

- Molecule 3 is a protein called mAb 83-7 Fab light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	D	112	Total	C	N	O	S	0	0	0
			875	556	144	171	4			

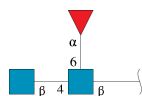
- Molecule 4 is a protein called Insulin receptor.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	E	271	Total	C	N	O	S	0	0	0
			2177	1377	374	396	30			

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	144	HIS	TYR	conflict	UNP P06213
E	311	SER	-	expression tag	UNP P06213
E	312	SER	-	expression tag	UNP P06213
E	313	SER	-	expression tag	UNP P06213
E	314	LEU	-	expression tag	UNP P06213
E	315	VAL	-	expression tag	UNP P06213
E	316	PRO	-	expression tag	UNP P06213
E	317	ARG	-	expression tag	UNP P06213

- Molecule 5 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose.



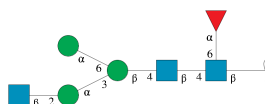
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
5	A	3	Total	C	N	O	0	0	0
			38	22	2	14			

- Molecule 6 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
6	F	2	Total	C	N	O	0	0	0
			28	16	2	10			

- Molecule 7 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
7	G	7	Total	C	N	O	0	0	0
			85	48	3	34			

- Molecule 8 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: C₈H₁₅NO₆).



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

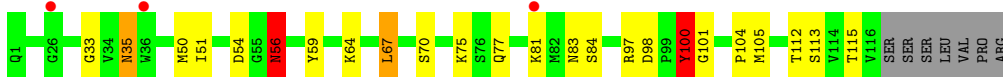
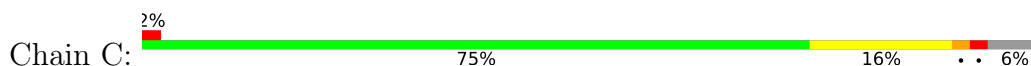
3 Residue-property plots [i](#)

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.

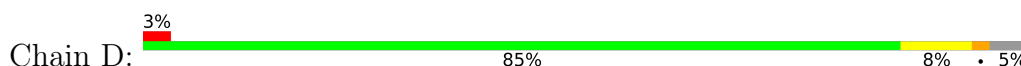
- Molecule 1: Peptide S519C16



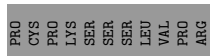
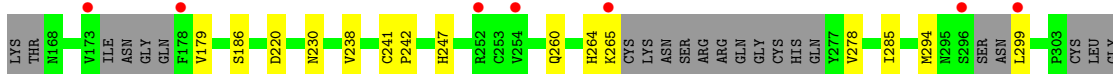
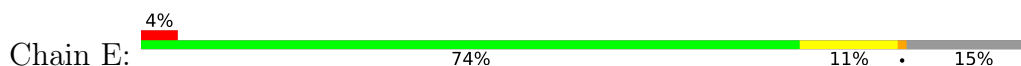
- Molecule 2: mAb 83-7 Fab heavy chain



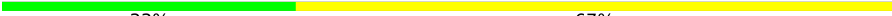
- Molecule 3: mAb 83-7 Fab light chain



- Molecule 4: Insulin receptor



- Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose

Chain A:  33% 67%

MAG1
MAG2
FUC3

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

Chain F:  50% 50%

MAG1
MAG2

- Molecule 7: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose

Chain G:  14% 71% 14%

MAG1
MAG2
BMA3
MAN4
MAG5
MAN6
FUC7

4 Data and refinement statistics

Property	Value	Source
Space group	P 41 21 2	Depositor
Cell constants a, b, c, α , β , γ	176.78Å 176.78Å 86.19Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	34.79 – 3.27 34.79 – 3.27	Depositor EDS
% Data completeness (in resolution range)	99.2 (34.79-3.27) 99.4 (34.79-3.27)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.12 (at 3.25Å)	Xtriage
Refinement program	BUSTER 2.10.2	Depositor
R, R_{free}	0.226 , 0.248 0.248 , 0.276	Depositor DCC
R_{free} test set	1033 reflections (4.81%)	wwPDB-VP
Wilson B-factor (Å ²)	87.1	Xtriage
Anisotropy	0.742	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 95.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.45$, $\langle L^2 \rangle = 0.28$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	4253	wwPDB-VP
Average B, all atoms (Å ²)	122.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.14% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: NAG, FUC, BMA, MAN

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	B	0.93	0/134	1.39	1/180 (0.6%)
2	C	0.88	0/914	1.19	6/1242 (0.5%)
3	D	0.69	0/894	1.04	1/1207 (0.1%)
4	E	0.82	1/2226 (0.0%)	1.15	8/3012 (0.3%)
All	All	0.81	1/4168 (0.0%)	1.15	16/5641 (0.3%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	E	230	ASN	CA-C	8.22	1.57	1.52

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	E	16	ASN	CA-CB-CG	10.18	122.78	112.60
4	E	123	ASN	N-CA-C	-7.80	97.36	109.76
2	C	83	ASN	CA-CB-CG	7.03	119.62	112.60
2	C	67	LEU	N-CA-C	6.16	119.74	109.95
4	E	264	HIS	CA-C-N	6.13	132.73	121.70
4	E	264	HIS	C-N-CA	6.13	132.73	121.70
4	E	124	GLU	N-CA-CB	5.91	120.48	110.49
2	C	100	TYR	N-CA-C	5.59	117.84	111.02
1	B	25	GLU	N-CA-C	-5.54	104.93	110.97
2	C	112	THR	CA-C-N	5.52	129.19	121.02
2	C	112	THR	C-N-CA	5.52	129.19	121.02
4	E	285	ILE	N-CA-C	5.51	115.06	108.45
2	C	56	ASN	CA-CB-CG	5.45	118.05	112.60
4	E	15	ASN	CA-CB-CG	5.32	117.92	112.60
3	D	1	ASP	CA-CB-CG	5.05	117.65	112.60
4	E	220	ASP	CA-CB-CG	5.02	117.62	112.60

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	130	0	109	6	0
2	C	892	0	869	14	0
3	D	875	0	864	9	0
4	E	2177	0	2086	15	0
5	A	38	0	34	0	0
6	F	28	0	25	1	0
7	G	85	0	73	1	0
8	E	28	0	26	0	0
All	All	4253	0	4086	38	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 (38) 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:C:104:PRO:HG3	3:D:40:ALA:HB2	1.60	0.81
4:E:278:VAL:HG12	4:E:294:MET:SD	2.34	0.67
4:E:56:MET:HG3	4:E:81:VAL:HB	1.77	0.67
4:E:241:CYS:H	4:E:247:HIS:CE1	2.20	0.58
2:C:35:ASN:HD21	2:C:98:ASP:HB2	1.70	0.56
1:B:22:SER:HB3	1:B:25:GLU:HB2	1.88	0.55
2:C:59:TYR:HB2	2:C:64:LYS:HG3	1.90	0.54
3:D:97:TYR:HB2	3:D:101:ARG:HH11	1.74	0.53
2:C:104:PRO:HG3	3:D:40:ALA:CB	2.36	0.53
4:E:241:CYS:H	4:E:247:HIS:HE1	1.56	0.51
2:C:75:LYS:O	2:C:77:GLN:HG3	2.10	0.51
1:B:24:ASP:O	1:B:28:TYR:CD2	2.64	0.51
4:E:12:ASP:OD1	4:E:32:HIS:HE1	1.93	0.50
2:C:35:ASN:ND2	2:C:98:ASP:HB2	2.26	0.50
2:C:50:MET:HG2	2:C:51:ILE:N	2.25	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:105:MET:HE1	3:D:103:PHE:HZ	1.77	0.50
1:B:34:GLN:C	1:B:35:LEU:HG	2.38	0.49
2:C:100:TYR:HB2	4:E:242:PRO:HG3	1.95	0.48
2:C:54:ASP:OD1	2:C:56:ASN:HB2	2.15	0.47
2:C:33:GLY:HA3	2:C:50:MET:HE3	1.97	0.47
3:D:38:PHE:CD2	3:D:97:TYR:CD2	3.04	0.46
4:E:260:GLN:HA	4:E:299:LEU:HD21	1.97	0.45
3:D:39:LEU:HG	3:D:40:ALA:N	2.32	0.45
3:D:13:VAL:HG11	3:D:19:VAL:HG21	1.99	0.45
1:B:34:GLN:O	1:B:35:LEU:HG	2.17	0.44
2:C:97:ARG:O	2:C:105:MET:HA	2.18	0.44
4:E:66:VAL:HB	4:E:98:MET:HE1	2.00	0.44
2:C:104:PRO:HB3	3:D:97:TYR:CD1	2.53	0.43
4:E:19:ARG:O	4:E:22:GLU:HB2	2.19	0.42
3:D:11:LEU:HD11	3:D:19:VAL:HG13	2.00	0.42
1:B:26:SER:HB3	4:E:89:PHE:CE1	2.56	0.41
4:E:11:MET:HE1	4:E:22:GLU:HB3	2.03	0.41
1:B:24:ASP:O	1:B:28:TYR:HD2	2.02	0.40
2:C:101:GLY:HA3	4:E:238:VAL:HB	2.02	0.40
4:E:135:ARG:C	6:F:1:NAG:H81	2.45	0.40
7:G:3:BMA:H61	7:G:6:MAN:H2	1.80	0.40
4:E:63:LEU:HD12	4:E:95:ILE:CD1	2.51	0.40
4:E:118:ARG:HD2	4:E:144:HIS:HB3	2.02	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	B	12/16 (75%)	9 (75%)	3 (25%)	0	100	100
2	C	114/123 (93%)	106 (93%)	7 (6%)	1 (1%)	14	43

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	D	110/118 (93%)	103 (94%)	7 (6%)	0	100	100
4	E	259/317 (82%)	251 (97%)	7 (3%)	1 (0%)	30	60
All	All	495/574 (86%)	469 (95%)	24 (5%)	2 (0%)	30	60

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	C	84	SER
4	E	124	GLU

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	B	14/14 (100%)	12 (86%)	2 (14%)	3	15
2	C	99/106 (93%)	91 (92%)	8 (8%)	11	36
3	D	99/105 (94%)	95 (96%)	4 (4%)	28	55
4	E	253/293 (86%)	246 (97%)	7 (3%)	38	62
All	All	465/518 (90%)	444 (96%)	21 (4%)	24	53

All (21) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	32	GLU
1	B	35	LEU
2	C	35	ASN
2	C	56	ASN
2	C	67	LEU
2	C	70	SER
2	C	81	LYS
2	C	100	TYR
2	C	113	SER
2	C	115	THR

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Mol	Chain	Res	Type
3	D	1	ASP
3	D	20	THR
3	D	60	ARG
3	D	101	ARG
4	E	22	GLU
4	E	27	SER
4	E	42	ARG
4	E	154	GLU
4	E	179	VAL
4	E	186	SER
4	E	265	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
2	C	3	GLN
2	C	56	ASN
3	D	95	GLN
4	E	108	ASN
4	E	280	HIS

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 ⓘ

12 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
5	NAG	A	1	4,5	14,14,15	0.40	0	17,19,21	1.16	1 (5%)
5	NAG	A	2	5	14,14,15	0.34	0	17,19,21	0.67	0
5	FUC	A	3	5	10,10,11	0.56	0	14,14,16	0.98	1 (7%)
6	NAG	F	1	4,6	14,14,15	0.39	0	17,19,21	1.04	1 (5%)
6	NAG	F	2	6	14,14,15	0.59	0	17,19,21	1.87	1 (5%)
7	NAG	G	1	7,4	14,14,15	0.28	0	17,19,21	1.60	2 (11%)
7	NAG	G	2	7	14,14,15	0.29	0	17,19,21	0.69	0
7	BMA	G	3	7	11,11,12	0.36	0	15,15,17	0.82	0
7	MAN	G	4	7	11,11,12	0.45	0	15,15,17	1.17	1 (6%)
7	NAG	G	5	7	14,14,15	0.42	0	17,19,21	0.92	1 (5%)
7	MAN	G	6	7	11,11,12	0.64	0	15,15,17	1.25	2 (13%)
7	FUC	G	7	7	10,10,11	0.60	0	14,14,16	0.98	1 (7%)

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

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

There are no bond length outliers.

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	F	2	NAG	C1-O5-C5	6.81	121.31	112.19
7	G	1	NAG	C1-C2-N2	-5.70	101.46	110.43
5	A	1	NAG	C1-O5-C5	4.06	117.62	112.19

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	G	4	MAN	C1-O5-C5	4.01	117.57	112.19
7	G	6	MAN	C1-O5-C5	3.66	117.10	112.19
5	A	3	FUC	C1-C2-C3	2.64	113.48	109.64
7	G	5	NAG	C1-O5-C5	2.42	115.43	112.19
7	G	6	MAN	C1-C2-C3	2.28	112.96	109.64
7	G	7	FUC	C1-C2-C3	2.15	112.77	109.64
6	F	1	NAG	O5-C1-C2	-2.14	107.97	111.29
7	G	1	NAG	O5-C1-C2	2.11	114.55	111.29

There are no chirality outliers.

All (7) torsion outliers are listed below:

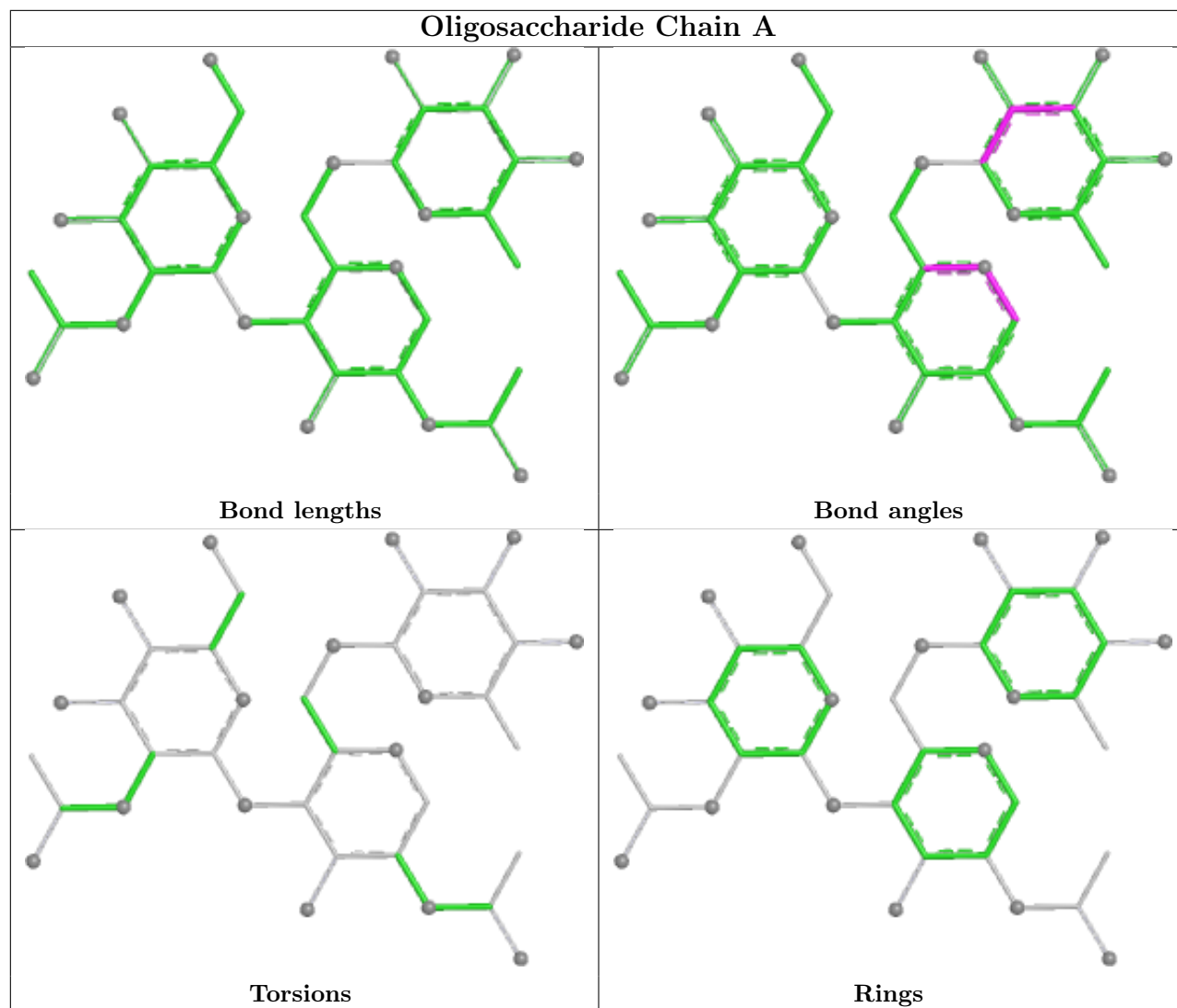
Mol	Chain	Res	Type	Atoms
6	F	1	NAG	C4-C5-C6-O6
6	F	1	NAG	O5-C5-C6-O6
6	F	2	NAG	C4-C5-C6-O6
6	F	2	NAG	O5-C5-C6-O6
7	G	1	NAG	C8-C7-N2-C2
7	G	6	MAN	O5-C5-C6-O6
7	G	1	NAG	O7-C7-N2-C2

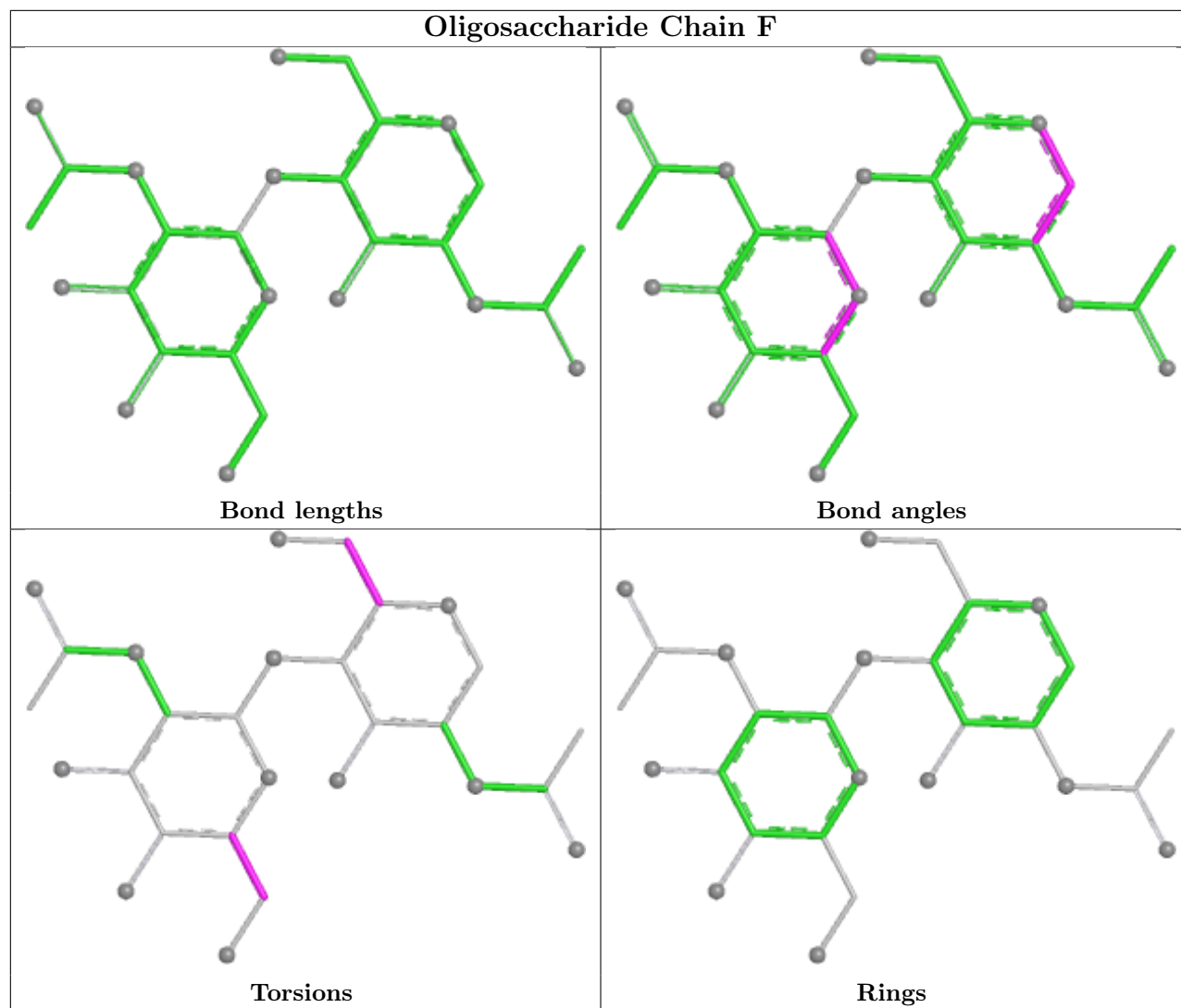
There are no ring outliers.

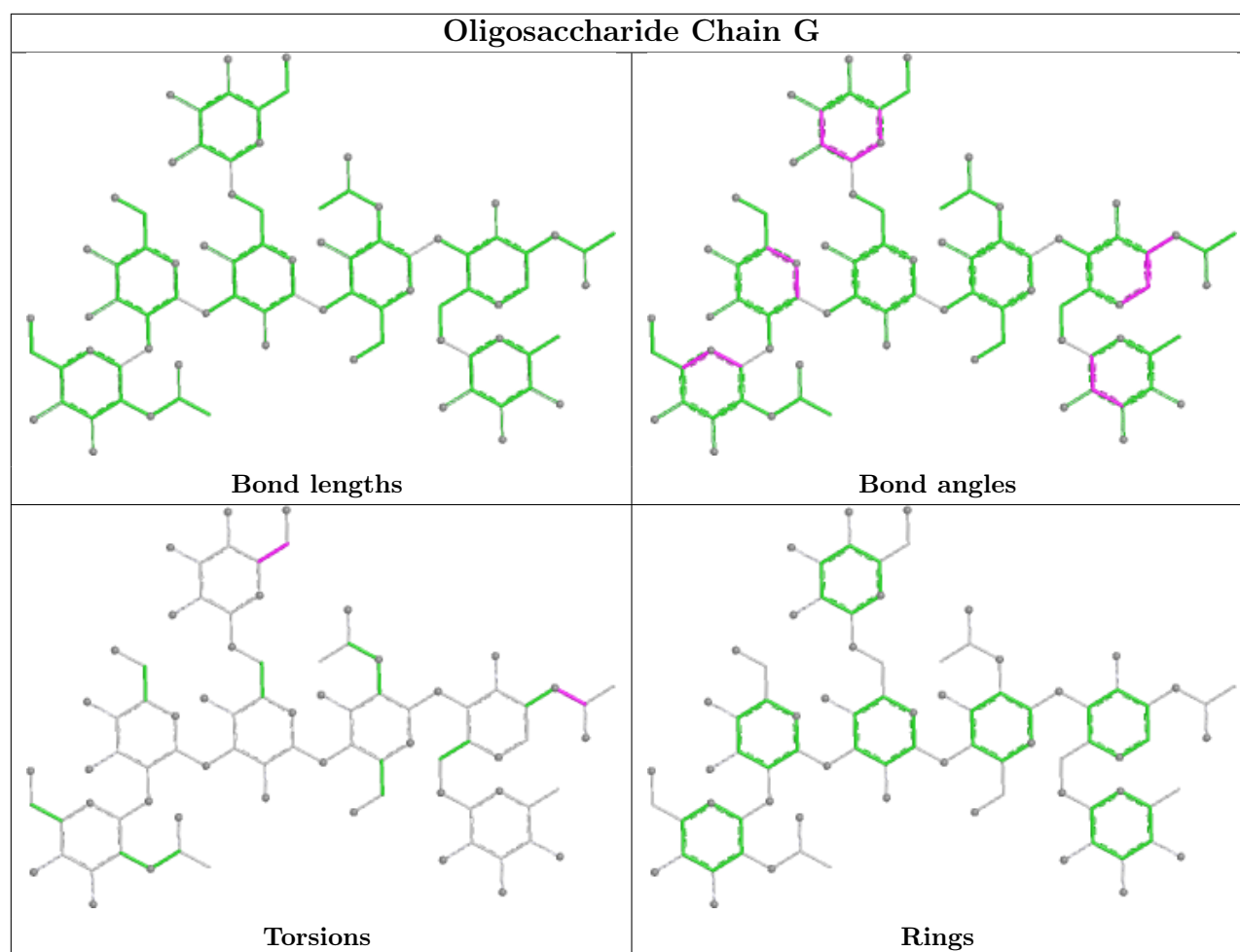
3 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	G	3	BMA	1	0
7	G	6	MAN	1	0
6	F	1	NAG	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](#)

2 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	$\# Z > 2$
8	NAG	E	1107	4	14,14,15	0.39	0	17,19,21	1.53	2 (11%)
8	NAG	E	1101	4	14,14,15	0.44	0	17,19,21	1.25	2 (11%)

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
8	NAG	E	1107	4	-	3/6/23/26	0/1/1/1
8	NAG	E	1101	4	-	0/6/23/26	0/1/1/1

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	E	1107	NAG	C1-C2-N2	-4.70	103.03	110.43
8	E	1101	NAG	O5-C1-C2	3.93	117.38	111.29
8	E	1107	NAG	O5-C1-C2	3.29	116.38	111.29
8	E	1101	NAG	C1-O5-C5	2.15	115.07	112.19

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
8	E	1107	NAG	C8-C7-N2-C2
8	E	1107	NAG	O7-C7-N2-C2
8	E	1107	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 ⓘ

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	B	14/16 (87%)	0.42	1 (7%)	22	16	72, 90, 119, 119	0
2	C	116/123 (94%)	0.10	3 (2%)	57	38	98, 115, 141, 150	0
3	D	112/118 (94%)	0.42	4 (3%)	46	31	88, 130, 160, 180	0
4	E	271/317 (85%)	0.46	13 (4%)	35	24	87, 120, 166, 207	0
All	All	513/574 (89%)	0.37	21 (4%)	41	27	72, 120, 160, 207	0

All (21) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
4	E	296	SER	4.9
4	E	5	GLY	4.8
4	E	299	LEU	4.3
4	E	89	PHE	3.9
2	C	81	LYS	3.9
3	D	112	LYS	3.7
4	E	173	VAL	3.7
4	E	159	CYS	3.5
4	E	150	ASP	3.2
4	E	129	ALA	3.2
4	E	265	LYS	3.1
3	D	110	GLU	2.8
4	E	123	ASN	2.8
2	C	26	GLY	2.3
4	E	254	VAL	2.2
1	B	35	LEU	2.2
2	C	36	TRP	2.1
3	D	20	THR	2.1
4	E	178	PHE	2.0
3	D	3	VAL	2.0
4	E	252	ARG	2.0

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

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

6.3 Carbohydrates [i](#)

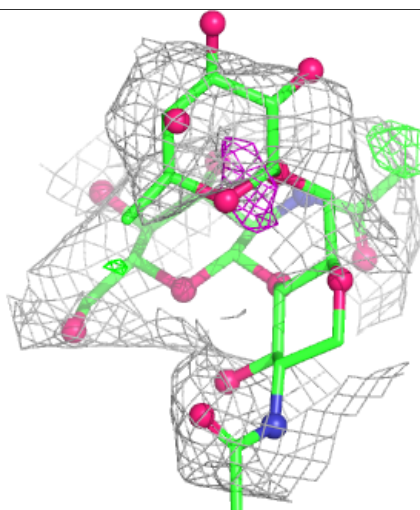
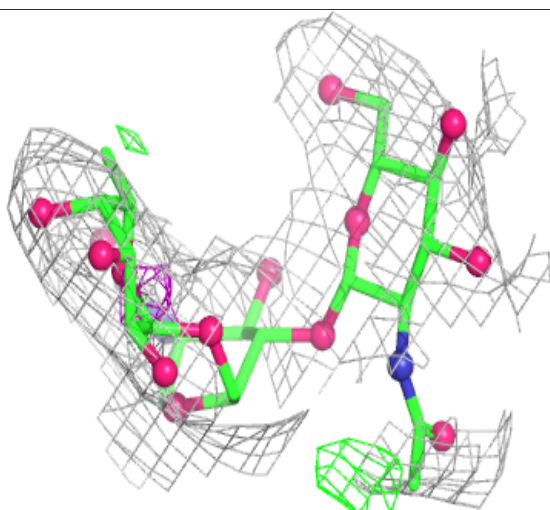
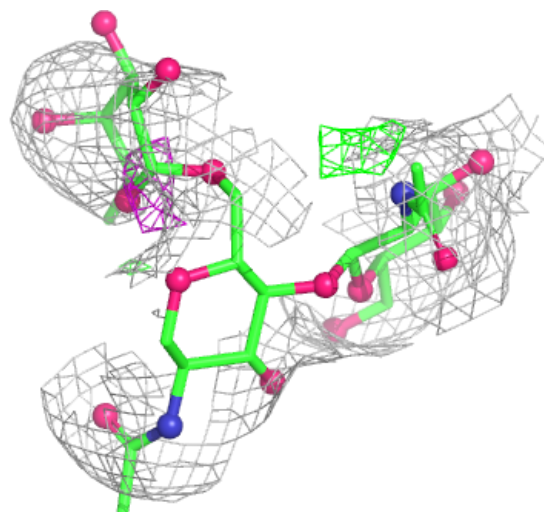
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
5	NAG	A	1	14/15	-	-	155,169,178,183	0
5	NAG	A	2	14/15	-	-	168,174,176,176	0
5	FUC	A	3	10/11	-	-	184,186,187,188	0
7	MAN	G	6	11/12	0.47	0.13	139,141,143,143	0
7	NAG	G	5	14/15	0.65	0.17	135,141,146,147	0
7	BMA	G	3	11/12	0.74	0.13	116,122,128,133	0
6	NAG	F	2	14/15	0.79	0.14	113,119,123,124	0
7	MAN	G	4	11/12	0.79	0.10	107,116,125,134	0
7	NAG	G	1	14/15	0.90	0.13	87,93,101,105	0
7	FUC	G	7	10/11	0.90	0.13	110,113,118,118	0
7	NAG	G	2	14/15	0.91	0.12	92,97,101,108	0
6	NAG	F	1	14/15	0.91	0.10	72,89,95,101	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.

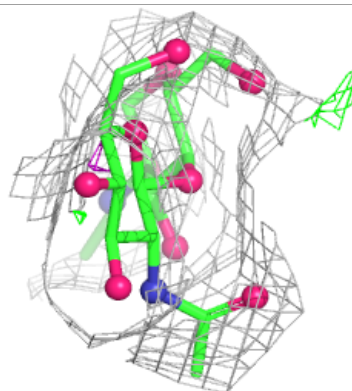
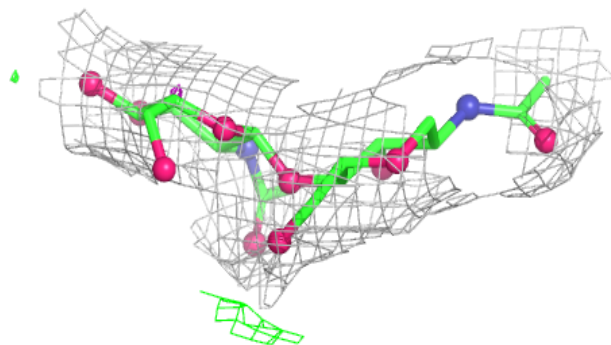
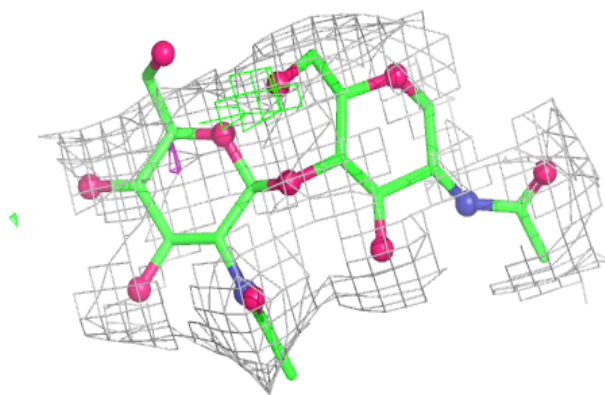
Electron density around Chain A:

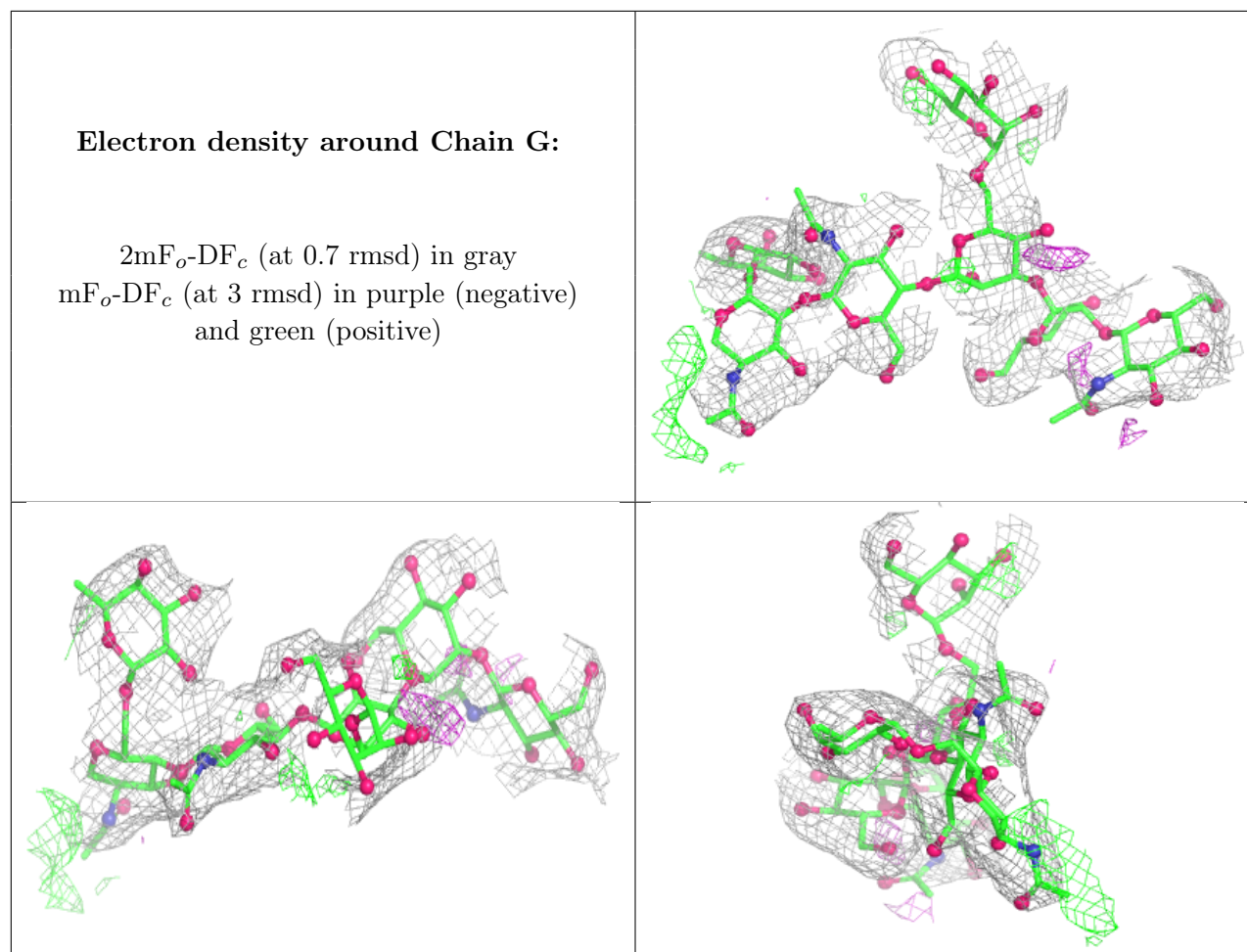
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around Chain F:

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





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($\text{\AA}^2$)	Q<0.9
8	NAG	E	1101	14/15	0.47	0.15	148,151,154,154	0
8	NAG	E	1107	14/15	0.73	0.20	123,125,141,143	0

6.5 Other polymers [i](#)

There are no such residues in this entry.