Full wwPDB X-ray Structure Validation Report (i)

Aug 7, 2020 – 06:04 PM BST

PDB ID	:	6U3O
Title	:	JR51 DQ2-p.aeru-alpha2a complex
Authors	:	Petersen, J.; Rossjohn, J.
Deposited on	:	2019-08-22
Resolution	:	2.74 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 (i) symbol.

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

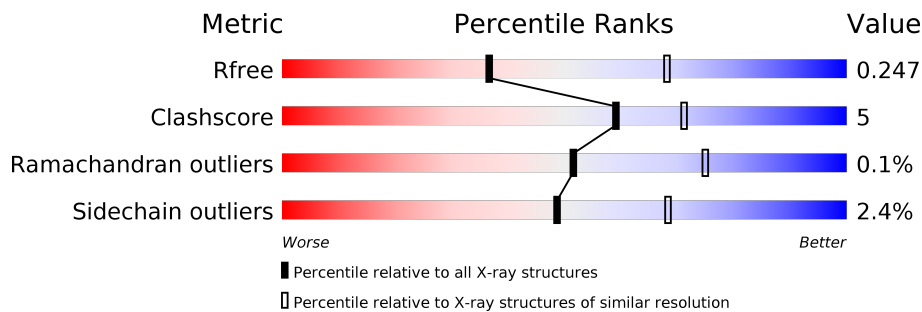|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.13.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.13.1

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.74 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	Percentile Ranks	Value
Rfree		0.247
Clashscore		5
Ramachandran outliers		0.1%
Sidechain outliers		2.4%

Worse — *Better*

▌ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1271 (2.76-2.72)
Clashscore	141614	1322 (2.76-2.72)
Ramachandran outliers	138981	1297 (2.76-2.72)
Sidechain outliers	138945	1298 (2.76-2.72)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for >=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 <=5%

Mol	Chain	Length	Quality of chain
1	A	202	81% 14% • •
1	G	202	81% 15% •
2	B	244	89% 10% • •
2	H	244	90% 9% •
3	C	191	85% 10% 5%
3	E	191	82% 12% • 5%
4	D	206	73% 14% • 12%

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Mol	Chain	Length	Quality of chain
4	F	206	69% 18% · 12%
5	I	20	45% 20% 35%
5	J	20	55% 10% 35%
6	K	2	100%
6	L	2	100%

2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 12888 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 T-CELL RECEPTOR, JR5.1 alpha.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	G	194	Total	C	N	O	S	0	0	0
			1480	924	254	292	10			
1	A	194	Total	C	N	O	S	0	0	0
			1490	931	254	295	10			

- Molecule 2 is a protein called T-CELL RECEPTOR, JR5.1 beta.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	H	242	Total	C	N	O	S	0	0	0
			1877	1182	328	362	5			
2	B	242	Total	C	N	O	S	0	0	0
			1877	1182	328	362	5			

- Molecule 3 is a protein called MHC class II HLA-DQ-alpha chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	181	Total	C	N	O	S	0	0	0
			1445	931	236	276	2			
3	E	181	Total	C	N	O	S	0	0	0
			1445	931	236	276	2			

There are 18 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	44	SER	CYS	conflict	UNP O19705
C	182	THR	-	expression tag	UNP O19705
C	183	SER	-	expression tag	UNP O19705
C	184	GLY	-	expression tag	UNP O19705
C	185	ASP	-	expression tag	UNP O19705
C	186	ASP	-	expression tag	UNP O19705
C	187	ASP	-	expression tag	UNP O19705
C	188	ASP	-	expression tag	UNP O19705

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Chain	Residue	Modelled	Actual	Comment	Reference
C	189	LYS	-	expression tag	UNP O19705
E	44	SER	CYS	conflict	UNP O19705
E	182	THR	-	expression tag	UNP O19705
E	183	SER	-	expression tag	UNP O19705
E	184	GLY	-	expression tag	UNP O19705
E	185	ASP	-	expression tag	UNP O19705
E	186	ASP	-	expression tag	UNP O19705
E	187	ASP	-	expression tag	UNP O19705
E	188	ASP	-	expression tag	UNP O19705
E	189	LYS	-	expression tag	UNP O19705

- Molecule 4 is a protein called MHC class II HLA-DQ-beta-1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	D	181	Total	C	N	O	S	0	0	0
			1480	935	264	274	7			
4	F	181	Total	C	N	O	S	0	0	0
			1480	935	264	274	7			

There are 28 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	-5	GLY	-	expression tag	UNP O19712
D	-4	GLY	-	expression tag	UNP O19712
D	-3	SER	-	expression tag	UNP O19712
D	-2	GLY	-	expression tag	UNP O19712
D	-1	ALA	-	expression tag	UNP O19712
D	0	SER	-	expression tag	UNP O19712
D	193	THR	-	expression tag	UNP O19712
D	194	GLY	-	expression tag	UNP O19712
D	195	GLY	-	expression tag	UNP O19712
D	196	ASP	-	expression tag	UNP O19712
D	197	ASP	-	expression tag	UNP O19712
D	198	ASP	-	expression tag	UNP O19712
D	199	ASP	-	expression tag	UNP O19712
D	200	LYS	-	expression tag	UNP O19712
F	-5	GLY	-	expression tag	UNP O19712
F	-4	GLY	-	expression tag	UNP O19712
F	-3	SER	-	expression tag	UNP O19712
F	-2	GLY	-	expression tag	UNP O19712
F	-1	ALA	-	expression tag	UNP O19712
F	0	SER	-	expression tag	UNP O19712

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Chain	Residue	Modelled	Actual	Comment	Reference
F	193	THR	-	expression tag	UNP O19712
F	194	GLY	-	expression tag	UNP O19712
F	195	GLY	-	expression tag	UNP O19712
F	196	ASP	-	expression tag	UNP O19712
F	197	ASP	-	expression tag	UNP O19712
F	198	ASP	-	expression tag	UNP O19712
F	199	ASP	-	expression tag	UNP O19712
F	200	LYS	-	expression tag	UNP O19712

- Molecule 5 is a protein called Peptide.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
5	I	13	Total	C	N	O	0	0	0
			96	61	14	21			
5	J	13	Total	C	N	O	0	0	0
			96	61	14	21			

- Molecule 6 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-a cetamido-2-deoxy-beta-D-glucopyranose.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
6	K	2	Total	C	N	O	0	0	0
			28	16	2	10			
6	L	2	Total	C	N	O	0	0	0
			28	16	2	10			

- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	G	9	Total	O	0	0
			9	9		
7	H	6	Total	O	0	0
			6	6		
7	A	12	Total	O	0	0
			12	12		
7	B	2	Total	O	0	0
			2	2		

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| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	C	10	Total 10	O 10	0	0
7	D	9	Total 9	O 9	0	0
7	E	11	Total 11	O 11	0	0
7	F	6	Total 6	O 6	0	0
7	I	1	Total 1	O 1	0	0

3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. 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. 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.
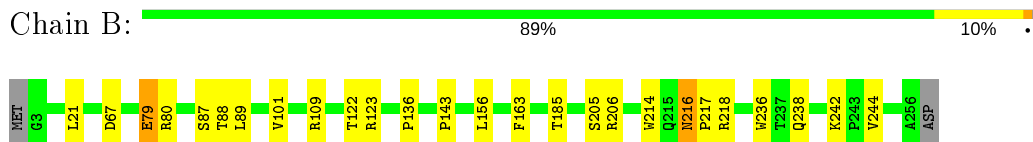
• Molecule 1: T-CELL RECEPTOR, JR5.1 alpha
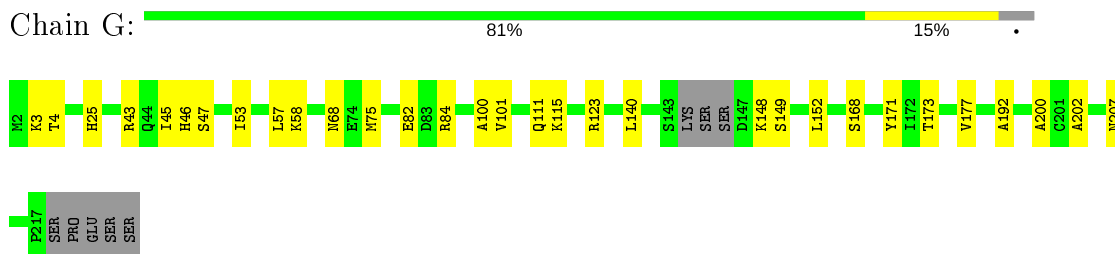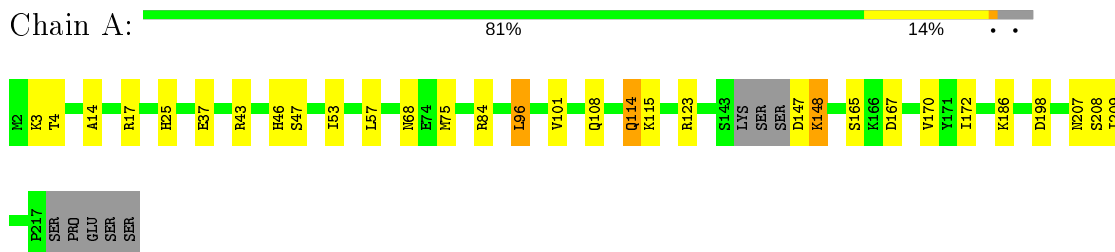
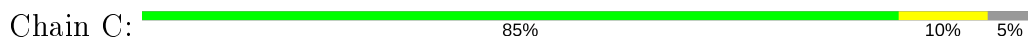Chain G:

• Molecule 1: T-CELL RECEPTOR, JR5.1 alpha

Chain A:

• Molecule 2: T-CELL RECEPTOR, JR5.1 beta
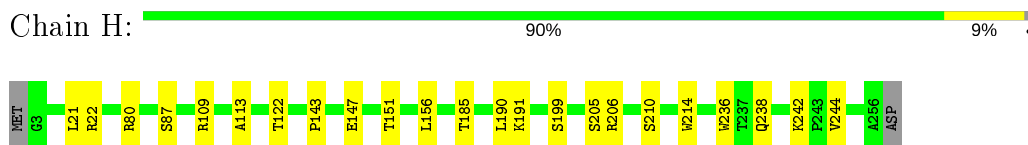
Chain H:

• Molecule 2: T-CELL RECEPTOR, JR5.1 beta

Chain B:

• Molecule 3: MHC class II HLA-DQ-alpha chain

Chain C:

GLU ASP I1 V2 E30 N62 L70 P96 L105 N118 L122 L138 L153 S156 D162 C163 K164 V165 E166 L170 D171 L174 P180 E181 THR SER GLY ASP ASP ASP LYS

• Molecule 3: MHC class II HLA-DQ-alpha chain

Chain E:

82%   12%   5%

GLU ASP I1 V2 N11 K39 D55 F58 A59 L60 T61 N62 I63 L70 T90 P96 L105 N118 V132 L153 E159 E166 L170 D171 L174 E179 P180 E181 THR SER GLY ASP ASP ASP LYS

• Molecule 4: MHC class II HLA-DQ-beta-1

Chain D:

73%   14%   12%

GLY GLY SER ALA SER ARG ASP S3 Y9 Q10 T18 T21 E22 R23 V27 I31 I37 V38 R39 F40 D41 V44 G45 E46 F47 R48 T51 L52 L53 L68 R77 N82 E86 S104 ARG THR GLU ALA LEU ASN HIS H112 V116 C117 S118

V119 T120 A125 R130 R133 L147 M160 D169 E176 A190 GLN SER THR GLY GLY ASP ASP ASP LYS

• Molecule 4: MHC class II HLA-DQ-beta-1

Chain F:

69%   18%   12%

GLY GLY SER ALA SER ARG ASP S3 Y9 Q10 F11 T18 N19 G20 T21 E22 R23 I31 I37 V38 D41 S42 D43 V44 G45 E46 F47 R48 T51 L52 L53 A57 R70 R77 N82 E86 S104 ARG THR GLU ALA LEU ASN HIS H112 L115

V116 C117 T120 A125 K128 V129 R130 W131 F132 R133 V143 L147 M160 L161 Q166 E176 L180 I184 A190 GLN SER THR GLY GLY ASP ASP ASP LYS
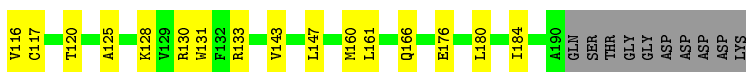
• Molecule 5: Peptide

Chain I:

45%   20%   35%

A1 S5 E6 L7 P8 E11 G12 S13 GLY GLY SER ILE GLU GLY ARG

• Molecule 5: Peptide

Chain J:

55%   10%   35%
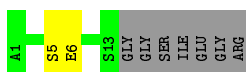
A1 S5 E6 S13 GLY GLY SER ILE GLU GLY ARG

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

Chain K:

100%

NAG1
NAG2

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

Chain L:

100%

NAG1
NAG2

4   Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	69.06Å 157.65Å 106.10Å 90.00° 96.53° 90.00°	Depositor
Resolution (Å)	47.03 – 2.74 48.12 – 2.74	Depositor EDS
% Data completeness (in resolution range)	99.3 (47.03-2.74) 99.3 (48.12-2.74)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$<I/\sigma(I)>$ [1]	1.57 (at 2.73Å)	Xtriage
Refinement program	PHENIX	Depositor
R, R_{free}	(Not available) , (Not available) 0.214 , 0.247	Depositor DCC
R_{free} test set	2000 reflections (3.42%)	wwPDB-VP
Wilson B-factor (Å^2)	61.6	Xtriage
Anisotropy	0.648	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.29 , 52.2	EDS
L-test for twinning[2]	$<|L|> = 0.49, <L^2> = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	12888	wwPDB-VP
Average B, all atoms (Å^2)	84.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.13% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.

[2]Theoretical values of $<|L|>$, $<L^2>$ 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: 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	A	0.25	0/1523	0.47	0/2074
1	G	0.25	0/1512	0.49	0/2060
2	B	0.25	0/1926	0.46	0/2624
2	H	0.25	0/1926	0.45	0/2624
3	C	0.25	0/1487	0.44	0/2031
3	E	0.25	0/1487	0.44	0/2031
4	D	0.23	0/1513	0.43	0/2056
4	F	0.24	0/1513	0.43	0/2056
5	I	0.22	0/98	0.37	0/134
5	J	0.24	0/98	0.39	0/134
All	All	0.25	0/13083	0.45	0/17824

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	1490	0	1381	18	0
1	G	1480	0	1369	14	0
2	B	1877	0	1776	17	1

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	H	1877	0	1776	12	2
3	C	1445	0	1397	13	0
3	E	1445	0	1397	12	1
4	D	1480	0	1443	18	0
4	F	1480	0	1443	24	0
5	I	96	0	92	3	0
5	J	96	0	92	1	0
6	K	28	0	25	0	0
6	L	28	0	25	0	0
7	A	12	0	0	0	0
7	B	2	0	0	0	0
7	C	10	0	0	0	0
7	D	9	0	0	0	0
7	E	11	0	0	0	0
7	F	6	0	0	0	0
7	G	9	0	0	0	0
7	H	6	0	0	0	0
7	I	1	0	0	0	0
All	All	12888	0	12216	117	2

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 (117) 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:B:109:ARG:NH2	3:C:62:ASN:OD1	2.18	0.76
2:H:109:ARG:NH2	3:E:62:ASN:OD1	2.22	0.73
3:E:96:PRO:HD3	4:F:120:THR:HG21	1.74	0.70
4:D:10:GLN:HB2	4:D:31:ILE:HB	1.73	0.69
3:C:96:PRO:HD3	4:D:120:THR:HG21	1.74	0.69
3:E:118:ASN:HB2	3:E:166:GLU:HB2	1.75	0.68
1:G:53:ILE:O	1:G:68:ASN:ND2	2.27	0.68
1:A:101:VAL:HG22	1:A:123:ARG:HD2	1.76	0.67
1:G:57:LEU:O	1:G:84:ARG:NH1	2.27	0.67
1:G:43:ARG:HB3	1:G:53:ILE:HD11	1.80	0.64
1:A:43:ARG:HB3	1:A:53:ILE:HD11	1.82	0.62
2:H:109:ARG:HH21	5:I:8:PRO:HD2	1.65	0.62
3:C:118:ASN:HB2	3:C:166:GLU:HB2	1.81	0.61
1:A:147:ASP:HB3	1:A:148:LYS:HD3	1.81	0.61
3:E:179:GLU:HG3	3:E:180:PRO:HD2	1.81	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:191:LYS:HE2	2:H:199:SER:HB3	1.82	0.60
4:D:130:ARG:NH1	4:D:176:GLU:OE2	2.30	0.60
4:F:51:THR:HG23	4:F:53:LEU:H	1.66	0.60
1:A:53:ILE:O	1:A:68:ASN:ND2	2.35	0.59
1:A:114:GLN:NE2	2:B:67:ASP:OD2	2.35	0.59
4:F:77:ARG:NH2	5:I:5:SER:O	2.36	0.58
1:A:14:ALA:HB3	1:A:17:ARG:HD3	1.86	0.57
4:D:116:VAL:HG22	4:D:160:MET:HG3	1.86	0.57
1:A:57:LEU:O	1:A:84:ARG:NH1	2.36	0.57
3:C:122:LEU:O	3:C:162:ASP:N	2.31	0.56
4:D:51:THR:HG23	4:D:53:LEU:H	1.70	0.56
3:E:70:LEU:HD13	4:F:9:TYR:HB2	1.87	0.56
2:B:80:ARG:HG3	2:B:87:SER:HB2	1.87	0.56
2:B:21:LEU:HD12	2:B:89:LEU:HD23	1.90	0.54
4:D:46:GLU:OE2	4:D:48:ARG:NH1	2.41	0.54
4:D:133:ARG:NH2	4:D:169:ASP:OD2	2.41	0.54
4:F:23:ARG:NH2	4:F:43:ASP:OD2	2.39	0.53
3:C:122:LEU:HB2	3:C:162:ASP:HB2	1.90	0.53
4:F:10:GLN:HB2	4:F:31:ILE:HB	1.90	0.53
2:H:80:ARG:HG3	2:H:87:SER:HB2	1.92	0.52
2:B:21:LEU:HD22	2:B:122:THR:HG21	1.90	0.52
4:F:130:ARG:NH1	4:F:176:GLU:OE2	2.32	0.51
4:F:46:GLU:OE2	4:F:48:ARG:NH1	2.43	0.51
2:B:185:THR:HG23	2:B:205:SER:HB2	1.92	0.51
1:A:4:THR:HG22	1:A:25:HIS:HB3	1.91	0.51
1:A:37:GLU:HG3	1:A:108:GLN:HB3	1.92	0.51
4:D:37:ILE:HG13	4:D:38:VAL:HG12	1.91	0.51
4:D:18:THR:HB	4:D:23:ARG:HB3	1.92	0.51
4:F:133:ARG:NH2	4:F:166:GLN:OE1	2.43	0.51
3:E:39:LYS:HG2	3:E:60:LEU:HD11	1.93	0.50
3:E:105:LEU:HG	3:E:153:LEU:HD22	1.93	0.50
1:A:167:ASP:HB3	1:A:170:VAL:HB	1.94	0.49
4:F:41:ASP:HB3	4:F:44:VAL:HG13	1.92	0.49
3:C:122:LEU:HD11	3:C:164:LYS:HD3	1.93	0.49
1:G:101:VAL:HG22	1:G:123:ARG:HD2	1.94	0.48
3:E:1:ILE:HG23	3:E:2:VAL:HG23	1.96	0.48
4:F:37:ILE:HG13	4:F:38:VAL:HG12	1.95	0.48
2:H:21:LEU:HD22	2:H:122:THR:HG21	1.95	0.48
1:G:46:HIS:HA	1:G:47:SER:HA	1.64	0.48
3:E:170:LEU:HD13	3:E:174:LEU:HB2	1.95	0.48
4:D:125:ALA:HB1	4:D:147:LEU:HD21	1.96	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:77:ARG:NH2	5:J:5:SER:O	2.46	0.48
1:A:208:SER:H	1:A:209:ILE:HA	1.80	0.47
2:B:216:ASN:ND2	2:B:218:ARG:H	2.12	0.47
3:E:11:ASN:HB2	4:F:11:PHE:HB3	1.97	0.47
3:C:105:LEU:HG	3:C:153:LEU:HD22	1.98	0.46
4:F:18:THR:HB	4:F:23:ARG:HB3	1.95	0.46
1:A:3:LYS:HD2	1:A:3:LYS:HA	1.81	0.46
4:F:143:VAL:HG13	4:F:160:MET:HB2	1.97	0.46
2:H:185:THR:HG23	2:H:205:SER:HB2	1.97	0.46
2:H:143:PRO:HD2	2:H:214:TRP:CZ2	2.51	0.46
2:B:216:ASN:C	2:B:216:ASN:HD22	2.19	0.46
4:F:125:ALA:HB1	4:F:147:LEU:HD21	1.98	0.46
1:G:173:THR:HG22	2:H:190:LEU:HD21	1.98	0.46
2:B:143:PRO:HD2	2:B:214:TRP:CZ2	2.51	0.45
2:B:216:ASN:HD21	2:B:218:ARG:CZ	2.30	0.45
1:A:208:SER:N	1:A:209:ILE:HA	2.30	0.45
4:F:82:ASN:O	4:F:86:GLU:HG2	2.17	0.45
1:G:68:ASN:HB3	1:G:75:MET:H	1.82	0.45
1:A:165:SER:HB2	1:A:172:ILE:HG13	1.99	0.44
3:C:30:GLU:HB2	3:C:138:LEU:HD21	1.99	0.44
2:B:236:TRP:CE2	2:B:238:GLN:HB2	2.53	0.44
4:F:116:VAL:HG22	4:F:160:MET:HG3	2.00	0.44
1:G:200:ALA:O	1:G:202:ALA:N	2.45	0.44
3:C:156:SER:O	3:C:180:PRO:HG3	2.17	0.44
1:A:96:LEU:HD21	1:A:186:LYS:HD3	2.00	0.44
4:F:57:ALA:HA	5:I:11:GLU:HG3	1.99	0.44
1:A:68:ASN:HB3	1:A:75:MET:H	1.83	0.43
1:A:46:HIS:HA	1:A:47:SER:HA	1.64	0.43
2:B:216:ASN:HD22	2:B:217:PRO:N	2.16	0.43
2:B:216:ASN:HD21	2:B:218:ARG:NH1	2.15	0.43
3:C:170:LEU:HD13	3:C:174:LEU:HB2	2.00	0.43
3:C:70:LEU:HD13	4:D:9:TYR:HB2	2.00	0.43
4:F:128:LYS:HB3	4:F:176:GLU:HB2	1.99	0.43
2:H:242:LYS:O	2:H:244:VAL:N	2.52	0.43
3:C:1:ILE:HG23	3:C:2:VAL:HG23	2.00	0.43
1:G:58:LYS:HG2	1:G:84:ARG:HD3	2.01	0.43
4:D:82:ASN:O	4:D:86:GLU:HG2	2.18	0.43
4:F:117:CYS:HB2	4:F:131:TRP:CZ2	2.52	0.43
3:C:96:PRO:HG3	4:D:118:SER:CB	2.49	0.43
4:F:128:LYS:HA	4:F:128:LYS:HD2	1.82	0.42
2:H:147:GLU:O	2:H:151:THR:HG22	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:216:ASN:HD22	2:B:218:ARG:H	1.67	0.42
2:H:236:TRP:CE2	2:H:238:GLN:HB2	2.54	0.42
2:H:113:ALA:O	4:F:70:ARG:NH2	2.29	0.42
1:G:140:LEU:O	1:G:149:SER:HA	2.19	0.42
1:A:3:LYS:HE3	1:A:4:THR:H	1.85	0.42
1:G:45:ILE:HG12	1:G:100:ALA:HB2	2.01	0.42
3:E:55:ASP:HB3	3:E:58:PHE:HD2	1.84	0.41
2:B:101:VAL:HG22	2:B:123:ARG:HG3	2.02	0.41
3:E:59:ALA:O	3:E:63:ILE:HG12	2.21	0.41
1:G:4:THR:HG22	1:G:25:HIS:HB3	2.03	0.41
4:D:68:LEU:HA	4:D:68:LEU:HD12	1.92	0.41
4:D:44:VAL:HG22	4:D:46:GLU:H	1.86	0.41
2:B:242:LYS:O	2:B:244:VAL:N	2.54	0.41
4:D:41:ASP:HB3	4:D:44:VAL:HG13	2.02	0.41
2:B:136:PRO:CA	2:B:163:PHE:HB3	2.51	0.41
4:D:27:VAL:HG13	4:D:39:ARG:HD3	2.02	0.41
1:G:3:LYS:HD2	1:G:3:LYS:HA	1.86	0.41
4:F:115:LEU:O	4:F:161:LEU:N	2.54	0.40
4:F:180:LEU:HD13	4:F:184:ILE:HG13	2.03	0.40
1:G:171:TYR:O	1:G:192:ALA:HA	2.21	0.40

All (2) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:210:SER:OG	3:E:159:GLU:OE1[1_556]	2.10	0.10
2:H:22:ARG:NH2	2:B:79:GLU:OE2[2_458]	2.19	0.01

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	190/202 (94%)	177 (93%)	12 (6%)	1 (0%)	29	48
1	G	190/202 (94%)	175 (92%)	15 (8%)	0	100	100
2	B	240/244 (98%)	232 (97%)	8 (3%)	0	100	100
2	H	240/244 (98%)	232 (97%)	8 (3%)	0	100	100
3	C	179/191 (94%)	177 (99%)	2 (1%)	0	100	100
3	E	179/191 (94%)	177 (99%)	2 (1%)	0	100	100
4	D	177/206 (86%)	171 (97%)	6 (3%)	0	100	100
4	F	177/206 (86%)	171 (97%)	6 (3%)	0	100	100
5	I	11/20 (55%)	11 (100%)	0	0	100	100
5	J	11/20 (55%)	11 (100%)	0	0	100	100
All	All	1594/1726 (92%)	1534 (96%)	59 (4%)	1 (0%)	51	75

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	207	ASN

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	162/181 (90%)	157 (97%)	5 (3%)	40	60
1	G	159/181 (88%)	151 (95%)	8 (5%)	24	42
2	B	200/209 (96%)	195 (98%)	5 (2%)	47	67
2	H	200/209 (96%)	198 (99%)	2 (1%)	76	85
3	C	165/174 (95%)	164 (99%)	1 (1%)	86	91
3	E	165/174 (95%)	161 (98%)	4 (2%)	49	68
4	D	164/184 (89%)	161 (98%)	3 (2%)	59	75
4	F	164/184 (89%)	160 (98%)	4 (2%)	49	68
5	I	11/15 (73%)	10 (91%)	1 (9%)	9	17

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
5	J	11/15 (73%)	10 (91%)	1 (9%)	9	17
All	All	1401/1526 (92%)	1367 (98%)	34 (2%)	49	68

All (34) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	G	82	GLU
1	G	111	GLN
1	G	115	LYS
1	G	148	LYS
1	G	152	LEU
1	G	168	SER
1	G	177	VAL
1	G	207	ASN
2	H	156	LEU
2	H	206	ARG
1	A	96	LEU
1	A	114	GLN
1	A	115	LYS
1	A	148	LYS
1	A	198	ASP
2	B	79	GLU
2	B	88	THR
2	B	156	LEU
2	B	206	ARG
2	B	216	ASN
3	C	171	ASP
4	D	21	THR
4	D	48	ARG
4	D	51	THR
3	E	90	THR
3	E	132	VAL
3	E	171	ASP
3	E	179	GLU
4	F	19	ASN
4	F	21	THR
4	F	48	ARG
4	F	51	THR
5	I	6	GLU
5	J	6	GLU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such

sidechains are listed below:

Mol	Chain	Res	Type
2	B	216	ASN

5.3.3   RNA (i)

There are no RNA molecules in this entry.

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

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

5.5   Carbohydrates (i)

4 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	$\#|Z| > 2$
6	NAG	K	1	3,6	14,14,15	0.29	0	17,19,21	0.41	0
6	NAG	K	2	6	14,14,15	0.43	0	17,19,21	0.41	0
6	NAG	L	1	3,6	14,14,15	0.33	0	17,19,21	0.39	0
6	NAG	L	2	6	14,14,15	0.41	0	17,19,21	0.44	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
6	NAG	K	1	3,6	-	0/6/23/26	0/1/1/1
6	NAG	K	2	6	-	2/6/23/26	0/1/1/1
6	NAG	L	1	3,6	-	2/6/23/26	0/1/1/1
6	NAG	L	2	6	-	2/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	K	2	NAG	O5-C5-C6-O6
6	L	1	NAG	O5-C5-C6-O6
6	K	2	NAG	C4-C5-C6-O6
6	L	1	NAG	C4-C5-C6-O6
6	L	2	NAG	O5-C5-C6-O6
6	L	2	NAG	C4-C5-C6-O6

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.

Oligosaccharide Chain K

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain L
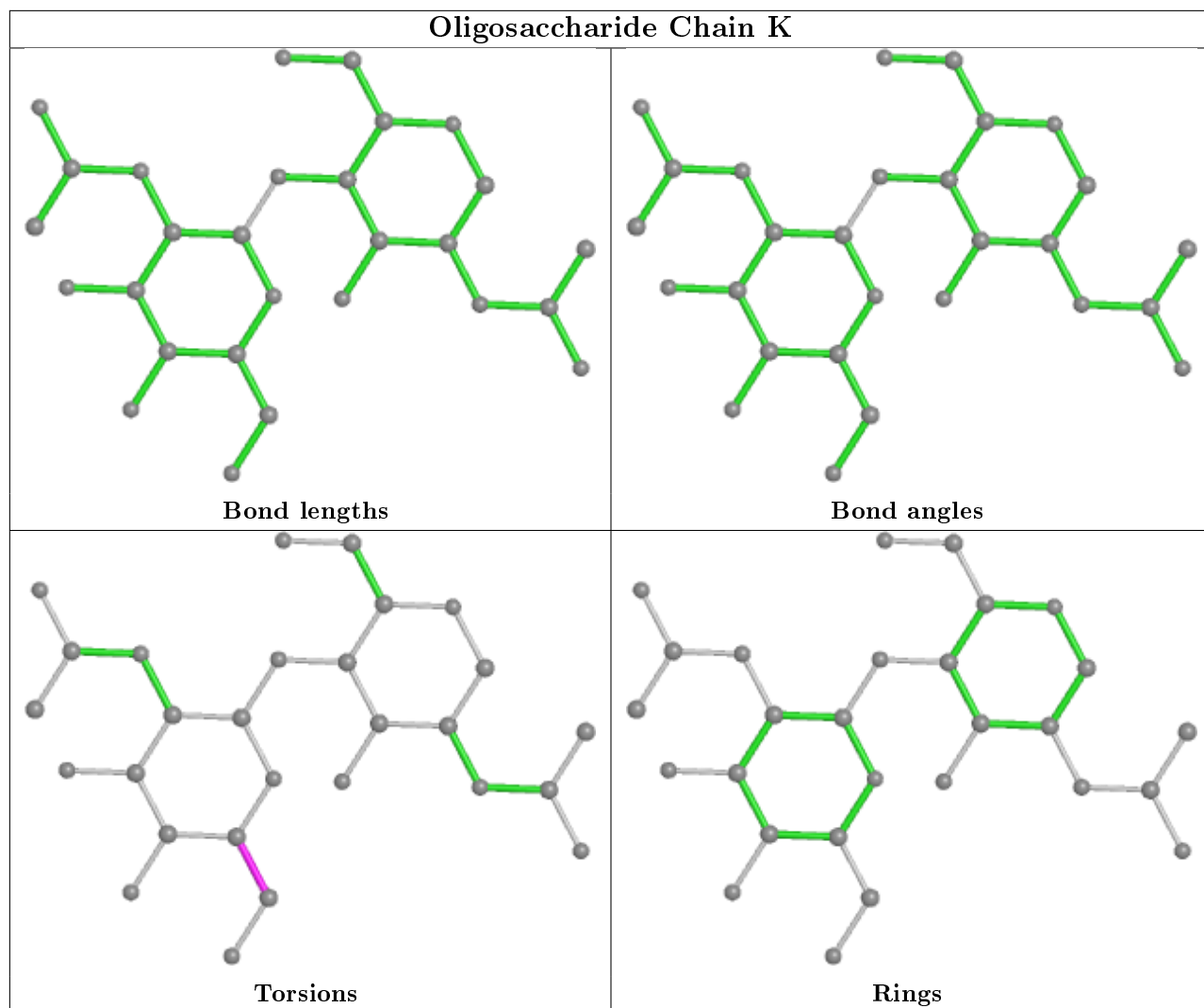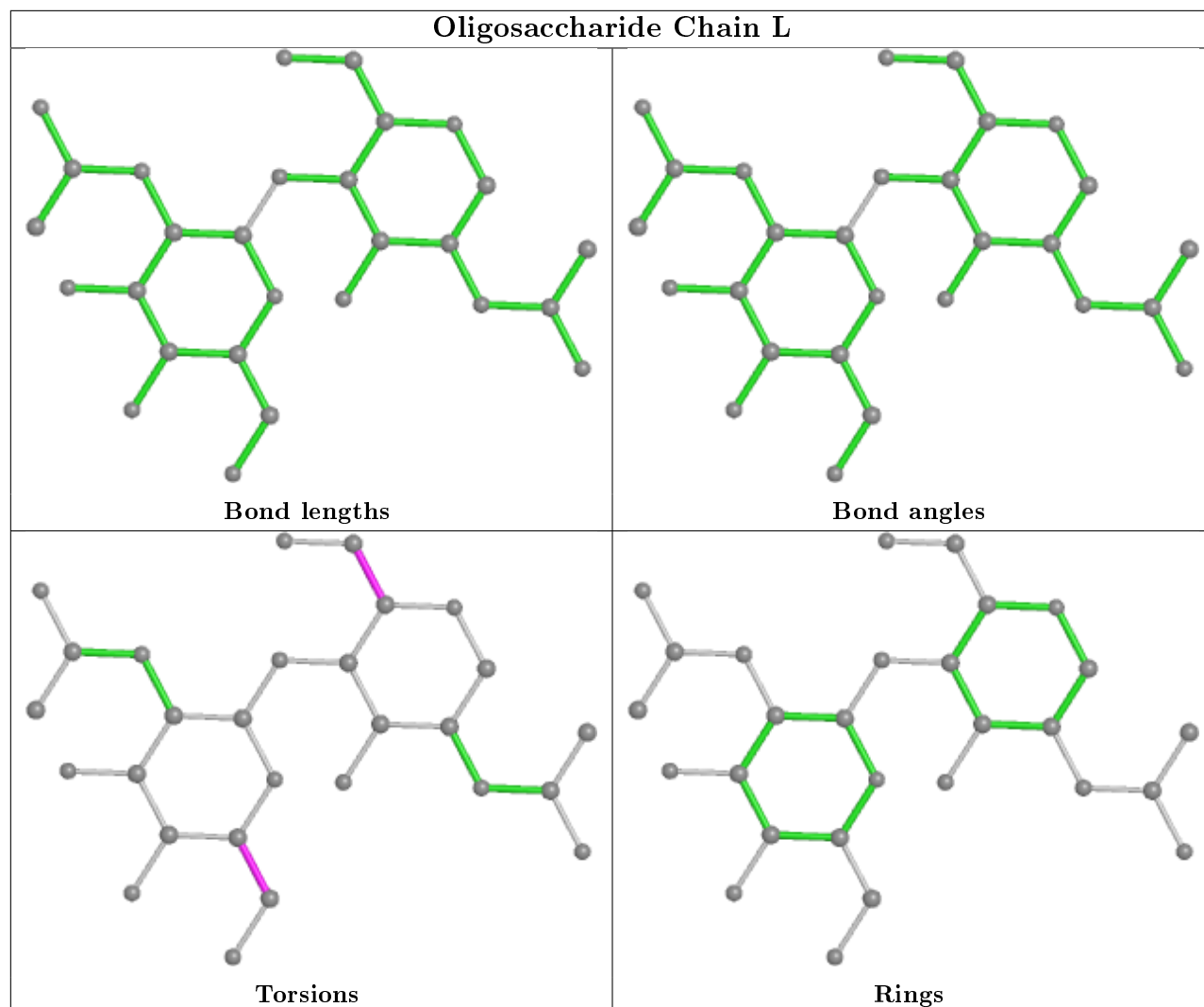
5.6 Ligand geometry (i)

There are no ligands in this entry.

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)

Unable to reproduce the depositors R factor - this section is therefore empty.
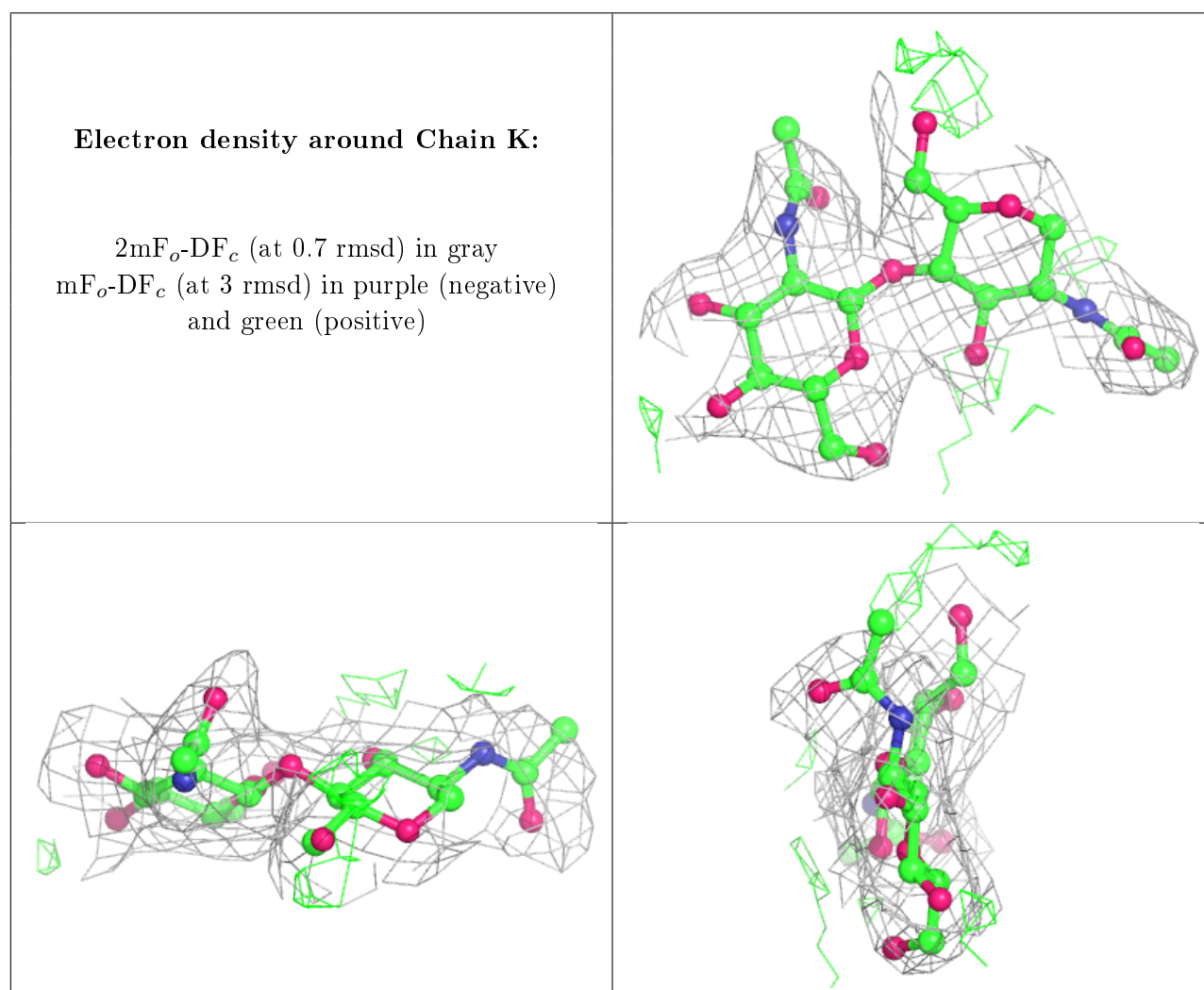
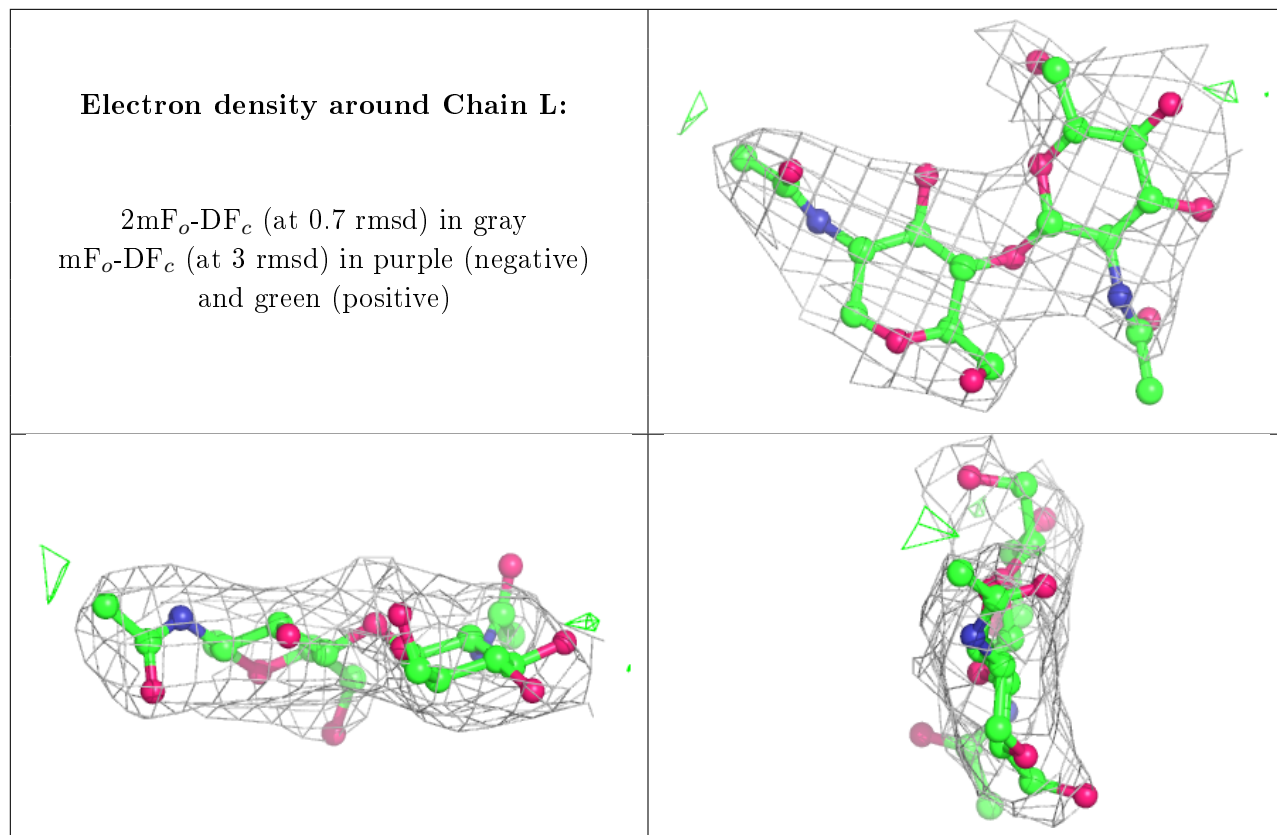## 6.2 Non-standard residues in protein, DNA, RNA chains (i)

Unable to reproduce the depositors R factor - this section is therefore empty.

6.3 Carbohydrates (i)

Unable to reproduce the depositors R factor - this section is therefore empty.

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 K:

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

Electron density around Chain L:

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)

Unable to reproduce the depositors R factor - this section is therefore empty.

6.5 Other polymers (i)

Unable to reproduce the depositors R factor - this section is therefore empty.