wwPDB X-ray Structure Validation Summary Report (i)

Nov 20, 2023 – 01:42 PM EST

PDB ID	:	3T3M
Title	:	A Novel High Affinity Integrin alphaIIbbeta3 Receptor Antagonist That Unexpectedly Displaces Mg2+ from the beta3 MIDAS
Authors	:	Zhu, J.; Zhu, J.; Springer, T.A.
Deposited on	:	2011-07-25
Resolution	:	2.60 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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 types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

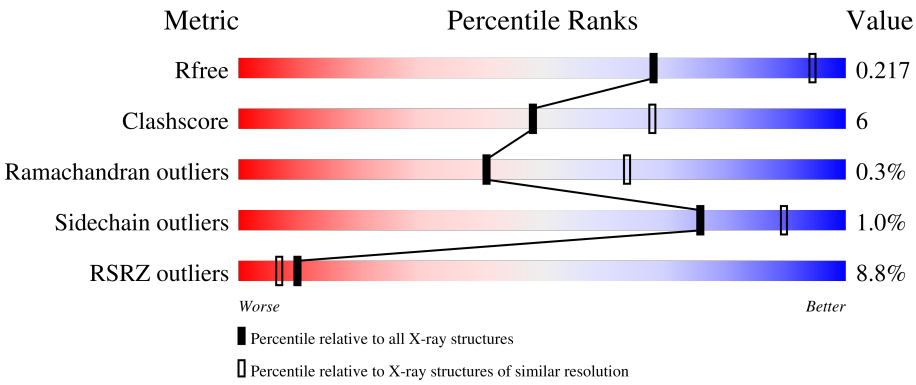
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.60 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	3163 (2.60-2.60)
Clashscore	141614	3518 (2.60-2.60)
Ramachandran outliers	138981	3455 (2.60-2.60)
Sidechain outliers	138945	3455 (2.60-2.60)
RSRZ outliers	127900	3104 (2.60-2.60)

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 <=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	457	90% 9% •
1	C	457	89% 9% ••
2	B	472	8% 85% 13% ••
2	D	472	6% 85% 15%
3	E	221	35% 74% 22% • •

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Mol	Chain	Length	Quality of chain
3	H	221	8% 73% 24%
4	F	214	35% 78% 22%
4	L	214	% 91% 9%
5	G	5	80% 20%
6	I	2	100%
6	K	2	100%
7	J	4	75% 25%

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
10	SO4	A	458	-	-	X	-

2 Entry composition (i)

There are 13 unique types of molecules in this entry. The entry contains 21909 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 Integrin alpha-IIb.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	454	3504	2229	602	665	8	0	5	0
1	C	453	3484	2214	600	662	8	0	2	0

- Molecule 2 is a protein called Integrin beta-3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	466	3601	2243	615	710	33	4	2	0
2	D	471	3634	2265	620	715	34	3	1	0

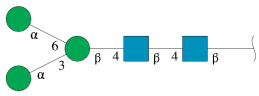
- Molecule 3 is a protein called Monoclonal antibody 10E5 heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	E	214	1631	1035	264	326	6	0	0	0
3	H	216	1642	1041	266	329	6	0	0	0

- Molecule 4 is a protein called Monoclonal antibody 10E5 light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	F	214	1637	1019	268	341	9	0	0	0
4	L	214	1637	1019	268	341	9	0	0	0

- Molecule 5 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
5	G	5	61	34	2	25	0	0	0

- 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
			Total	C	N	O			
6	I	2	28	16	2	10	0	0	0
			Total	C	N	O			
6	K	2	28	16	2	10	0	0	0

- Molecule 7 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-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
			Total	C	N	O			
7	J	4	50	28	2	20	0	0	0

- Molecule 8 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Ca		
8	A	4	4	4	0	0
			Total	Ca		
8	B	2	2	2	0	0
			Total	Ca		
8	C	4	4	4	0	0

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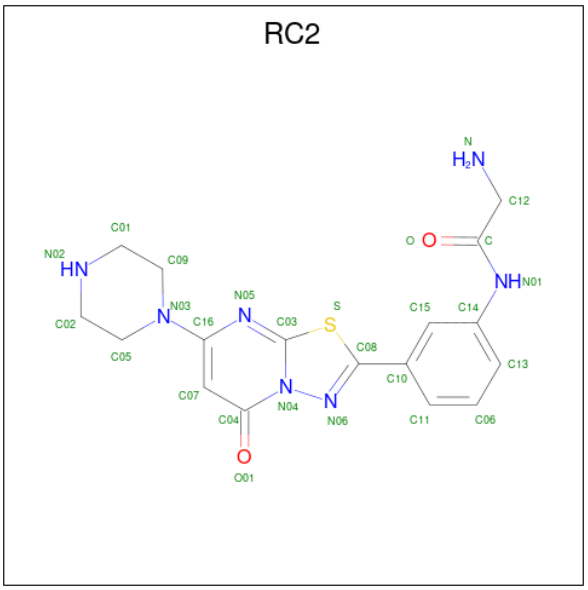
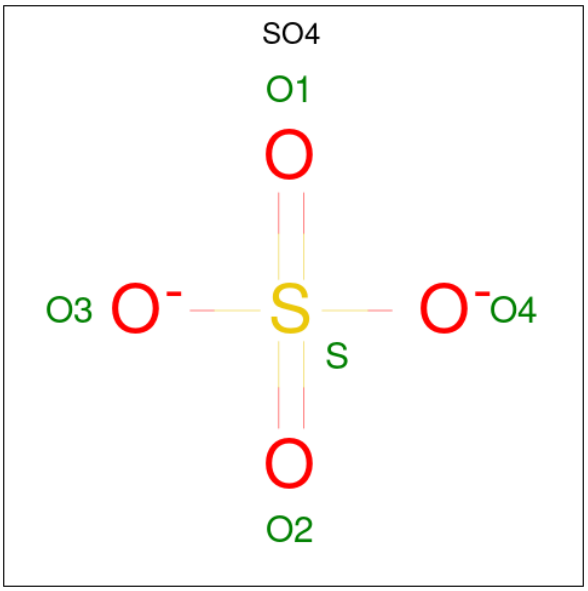
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Ca		
8	D	2	2	2	0	0

- Molecule 9 is N-{3-[5-oxo-7-(piperazin-1-yl)-5H-[1,3,4]thiadiazolo[3,2-a]pyrimidin-2-yl]phenyl}glycinamide (three-letter code: RC2) (formula: $C_{17}H_{19}N_7O_2S$).



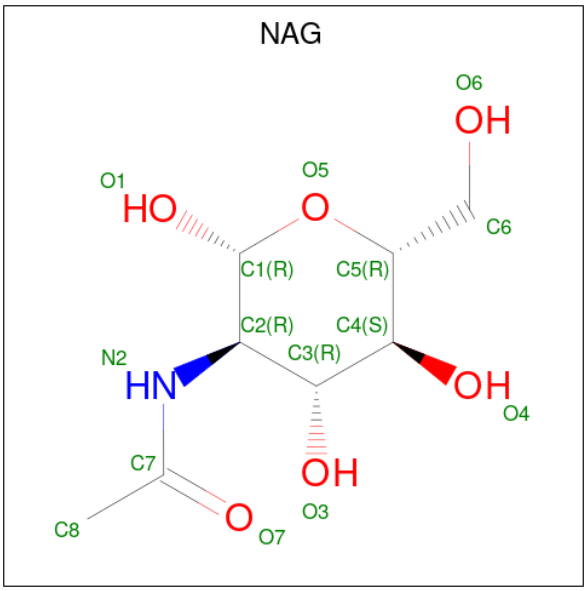
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	S		
9	A	1	27	17	7	2	1	0	0
			Total	C	N	O	S		
9	C	1	27	17	7	2	1	0	0

- Molecule 10 is SULFATE ION (three-letter code: SO4) (formula: O_4S).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
10	A	1	Total O S 5 4 1	0	0
10	A	1	Total O S 5 4 1	0	0
10	A	1	Total O S 5 4 1	0	0
10	L	1	Total O S 5 4 1	0	0

- Molecule 11 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



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

- Molecule 12 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Cl		
12	B	1	1	1	0	0
12	C	1	1	1	0	0
12	D	1	1	1	0	0

- Molecule 13 is water.

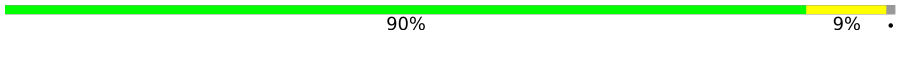
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
13	A	310	310	310	0	0
13	B	174	174	174	0	0
13	C	188	188	188	0	0
13	D	110	110	110	0	0
13	E	8	8	8	0	0
13	F	8	8	8	0	0
13	H	29	29	29	0	0
13	L	28	28	28	0	0

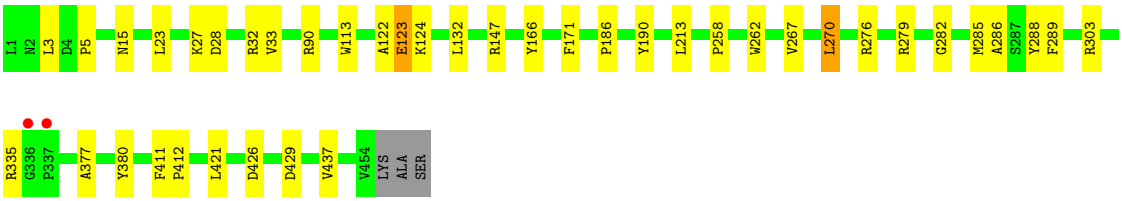
3 Residue-property plots (i)

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: Integrin alpha-IIb

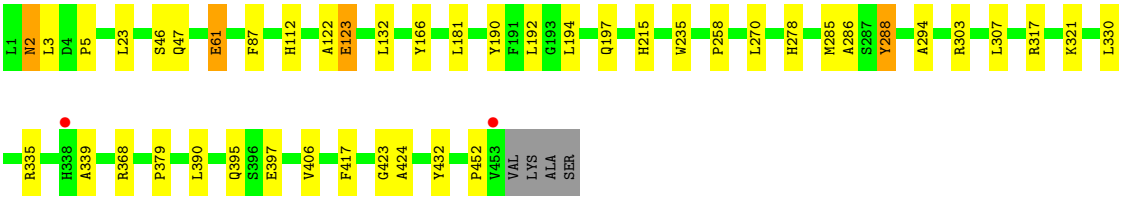
Chain A:





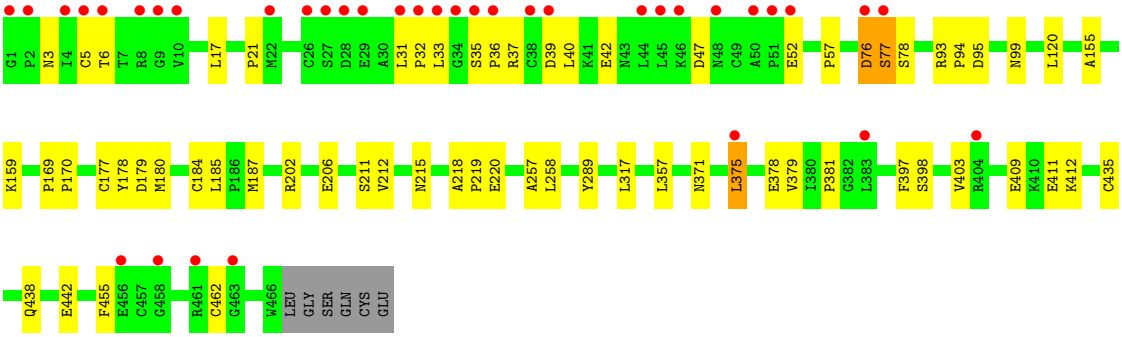
• Molecule 1: Integrin alpha-IIb

Chain C:



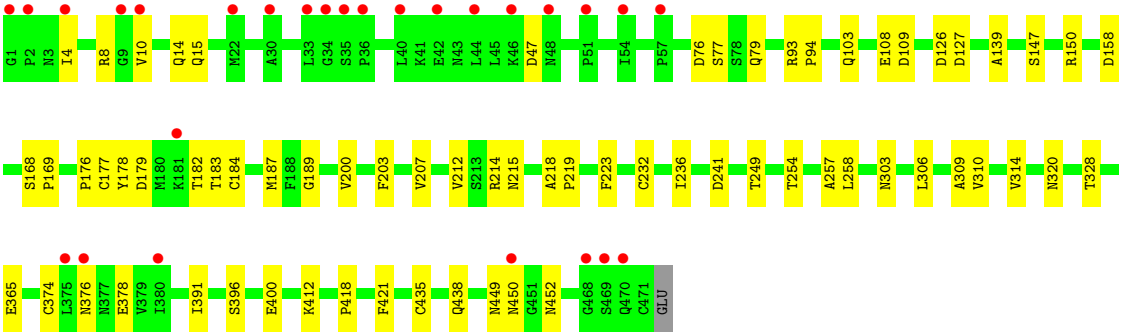
• Molecule 2: Integrin beta-3

Chain B:



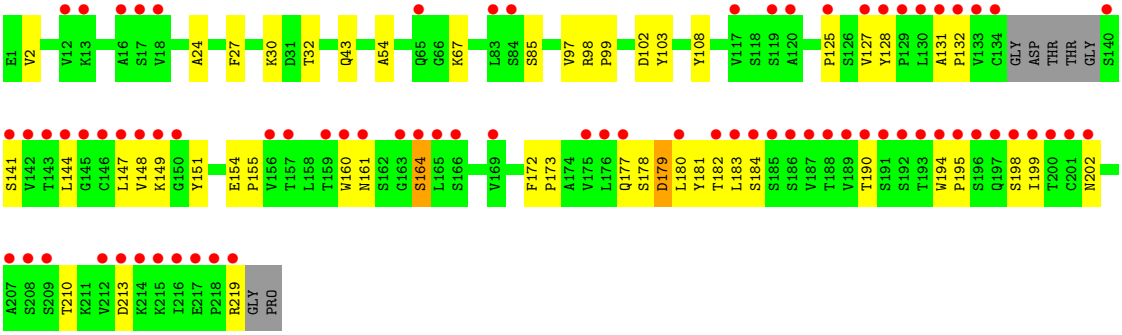
• Molecule 2: Integrin beta-3

Chain D:



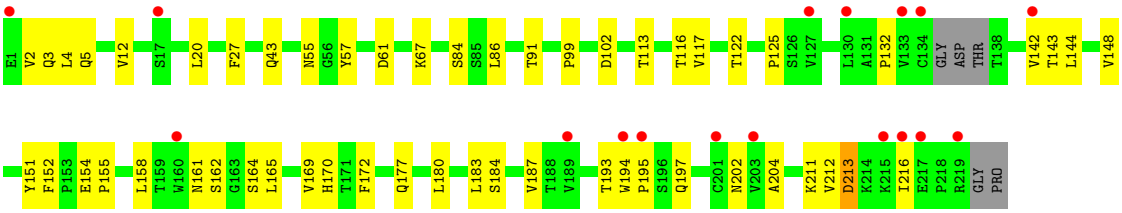
- Molecule 3: Monoclonal antibody 10E5 heavy chain

Chain E:



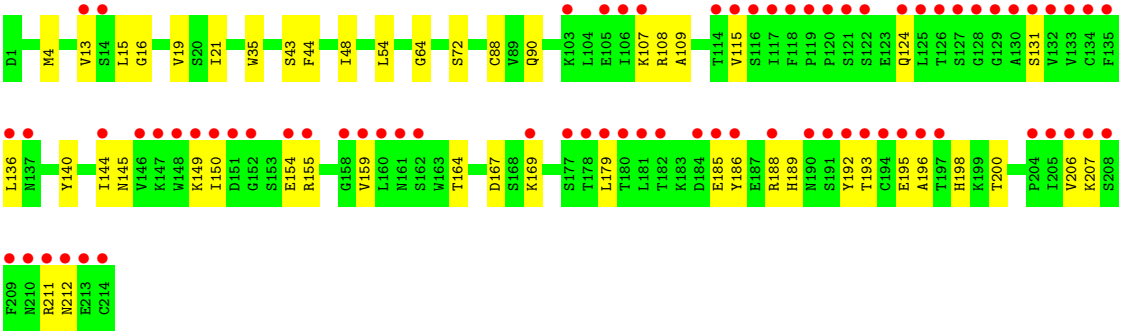
- Molecule 3: Monoclonal antibody 10E5 heavy chain

Chain H:

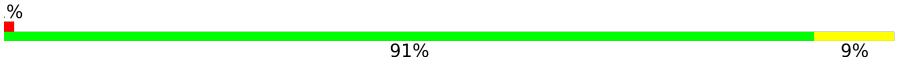


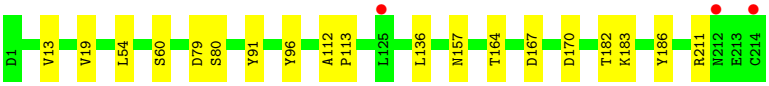
- Molecule 4: Monoclonal antibody 10E5 light chain

Chain F:



• Molecule 4: Monoclonal antibody 10E5 light chain

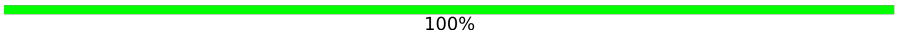
Chain L: 



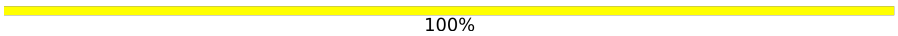
• Molecule 5: alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain G:

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

Chain I: 

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

Chain K: 

• Molecule 7: alpha-D-mannopyranose-(1-3)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain J:

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α, β, γ	261.15Å 145.33Å 104.68Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	59.69 – 2.60 59.69 – 2.60	Depositor EDS
% Data completeness (in resolution range)	96.5 (59.69-2.60) 96.5 (59.69-2.60)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.26 (at 2.61Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.7.1_743)	Depositor
R, R_{free}	0.179 , 0.222 0.172 , 0.217	Depositor DCC
R_{free} test set	1022 reflections (0.86%)	wwPDB-VP
Wilson B-factor (Å^2)	34.5	Xtriage
Anisotropy	0.000	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 61.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	21909	wwPDB-VP
Average B, all atoms (Å^2)	64.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.20% of the height of the origin peak. No significant pseudotranslation is detected.*

[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: RC2, BMA, CL, SO4, NAG, CA, 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	A	0.28	0/3616	0.45	0/4929
1	C	0.25	0/3587	0.42	0/4888
2	B	0.26	0/3674	0.43	0/4982
2	D	0.24	0/3706	0.40	0/5026
3	E	0.21	0/1673	0.39	0/2290
3	H	0.23	0/1684	0.41	0/2305
4	F	0.22	0/1673	0.38	0/2269
4	L	0.23	0/1673	0.41	0/2269
All	All	0.25	0/21286	0.42	0/28958

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	3504	0	3351	25	0
1	C	3484	0	3320	30	0
2	B	3601	0	3525	38	0
2	D	3634	0	3551	39	0
3	E	1631	0	1590	36	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	H	1642	0	1600	38	0
4	F	1637	0	1553	31	0
4	L	1637	0	1553	12	0
5	G	61	0	52	0	0
6	I	28	0	25	0	0
6	K	28	0	25	2	0
7	J	50	0	43	0	0
8	A	4	0	0	0	0
8	B	2	0	0	0	0
8	C	4	0	0	0	0
8	D	2	0	0	0	0
9	A	27	0	19	3	0
9	C	27	0	19	3	0
10	A	15	0	0	3	0
10	L	5	0	0	1	0
11	B	14	0	13	1	0
11	D	14	0	13	0	0
12	B	1	0	0	1	0
12	C	1	0	0	0	0
12	D	1	0	0	1	0
13	A	310	0	0	7	0
13	B	174	0	0	0	0
13	C	188	0	0	0	0
13	D	110	0	0	3	0
13	E	8	0	0	0	0
13	F	8	0	0	1	0
13	H	29	0	0	1	0
13	L	28	0	0	0	0
All	All	21909	0	20252	248	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 6.

The worst 5 of 248 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)
9:C:5000:RC2:H12	12:D:473:CL:CL	2.25	0.73
3:H:193:THR:O	3:H:197:GLN:HG2	1.96	0.65
3:H:12:VAL:HG21	3:H:86:LEU:HD13	1.78	0.65
3:H:194:TRP:CG	3:H:195:PRO:HA	2.34	0.62
2:B:42:GLU:N	2:B:42:GLU:OE1	2.32	0.61

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	457/457 (100%)	441 (96%)	15 (3%)	1 (0%)	47	71
1	C	453/457 (99%)	432 (95%)	20 (4%)	1 (0%)	47	71
2	B	466/472 (99%)	434 (93%)	30 (6%)	2 (0%)	34	57
2	D	470/472 (100%)	448 (95%)	21 (4%)	1 (0%)	47	71
3	E	210/221 (95%)	183 (87%)	26 (12%)	1 (0%)	29	52
3	H	212/221 (96%)	198 (93%)	14 (7%)	0	100	100
4	F	212/214 (99%)	190 (90%)	21 (10%)	1 (0%)	29	52
4	L	212/214 (99%)	200 (94%)	12 (6%)	0	100	100
All	All	2692/2728 (99%)	2526 (94%)	159 (6%)	7 (0%)	41	64

5 of 7 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	33	LEU
1	C	123	GLU
2	D	374	CYS
3	E	164	SER
1	A	123	GLU

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	367/364 (101%)	361 (98%)	6 (2%)	62	82
1	C	363/364 (100%)	357 (98%)	6 (2%)	60	81
2	B	414/417 (99%)	409 (99%)	5 (1%)	71	87
2	D	417/417 (100%)	414 (99%)	3 (1%)	84	94
3	E	186/190 (98%)	185 (100%)	1 (0%)	88	96
3	H	187/190 (98%)	186 (100%)	1 (0%)	88	96
4	F	188/188 (100%)	188 (100%)	0	100	100
4	L	188/188 (100%)	188 (100%)	0	100	100
All	All	2310/2318 (100%)	2288 (99%)	22 (1%)	76	90

5 of 22 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	166	TYR
2	D	47	ASP
1	C	288	TYR
2	D	127	ASP
2	B	47	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 6 such sidechains are listed below:

Mol	Chain	Res	Type
2	D	342	GLN
2	D	438	GLN
3	E	202	ASN
2	D	15	GLN
1	A	338	HIS

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)

13 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	G	1	2,5	14,14,15	0.55	0	17,19,21	0.70	0
5	NAG	G	2	5	14,14,15	0.66	0	17,19,21	0.81	0
5	BMA	G	3	5	11,11,12	0.69	0	15,15,17	0.67	0
5	MAN	G	4	5	11,11,12	0.61	0	15,15,17	0.91	0
5	MAN	G	5	5	11,11,12	0.55	0	15,15,17	0.89	1 (6%)
6	NAG	I	1	2,6	14,14,15	0.59	0	17,19,21	0.72	0
6	NAG	I	2	6	14,14,15	0.56	0	17,19,21	0.65	0
7	NAG	J	1	2,7	14,14,15	0.54	0	17,19,21	0.68	0
7	NAG	J	2	7	14,14,15	0.61	0	17,19,21	0.79	0
7	BMA	J	3	7	11,11,12	0.71	0	15,15,17	1.21	1 (6%)
7	MAN	J	4	7	11,11,12	0.64	0	15,15,17	0.82	0
6	NAG	K	1	2,6	14,14,15	0.62	0	17,19,21	0.98	0
6	NAG	K	2	6	14,14,15	0.53	0	17,19,21	0.65	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
5	NAG	G	1	2,5	-	0/6/23/26	0/1/1/1
5	NAG	G	2	5	-	0/6/23/26	0/1/1/1
5	BMA	G	3	5	-	0/2/19/22	0/1/1/1
5	MAN	G	4	5	-	0/2/19/22	0/1/1/1
5	MAN	G	5	5	-	2/2/19/22	0/1/1/1
6	NAG	I	1	2,6	-	0/6/23/26	0/1/1/1
6	NAG	I	2	6	-	1/6/23/26	0/1/1/1
7	NAG	J	1	2,7	-	2/6/23/26	0/1/1/1
7	NAG	J	2	7	-	2/6/23/26	0/1/1/1
7	BMA	J	3	7	-	0/2/19/22	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
7	MAN	J	4	7	-	0/2/19/22	0/1/1/1
6	NAG	K	1	2,6	-	0/6/23/26	0/1/1/1
6	NAG	K	2	6	-	0/6/23/26	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(^{o})	Ideal(^{o})
7	J	3	BMA	C1-C2-C3	3.58	114.07	109.67
5	G	5	MAN	C1-O5-C5	2.44	115.50	112.19

There are no chirality outliers.

5 of 7 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	J	2	NAG	O7-C7-N2-C2
7	J	2	NAG	C8-C7-N2-C2
5	G	5	MAN	O5-C5-C6-O6
5	G	5	MAN	C4-C5-C6-O6
7	J	1	NAG	C8-C7-N2-C2

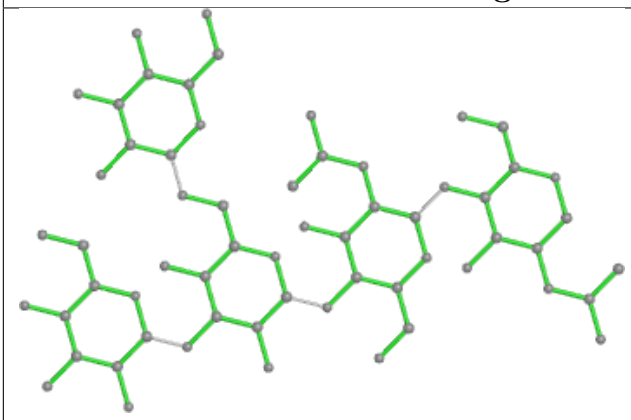
There are no ring outliers.

2 monomers are involved in 2 short contacts:

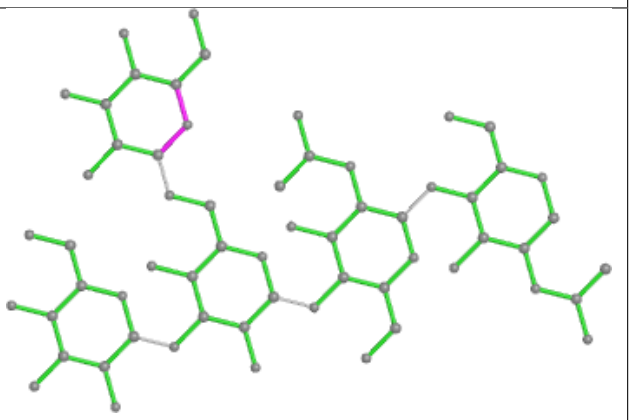
Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	K	2	NAG	1	0
6	K	1	NAG	2	0

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

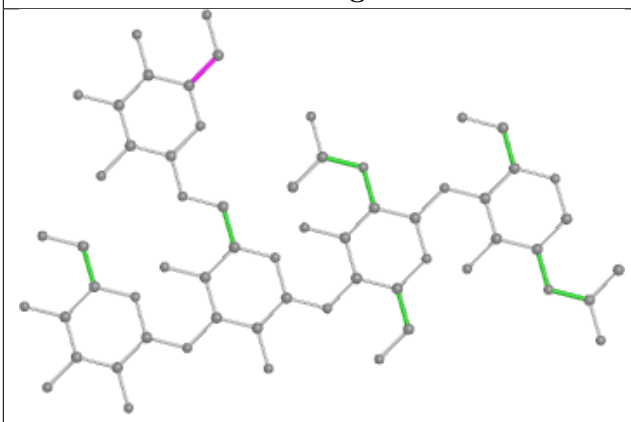
Oligosaccharide Chain G



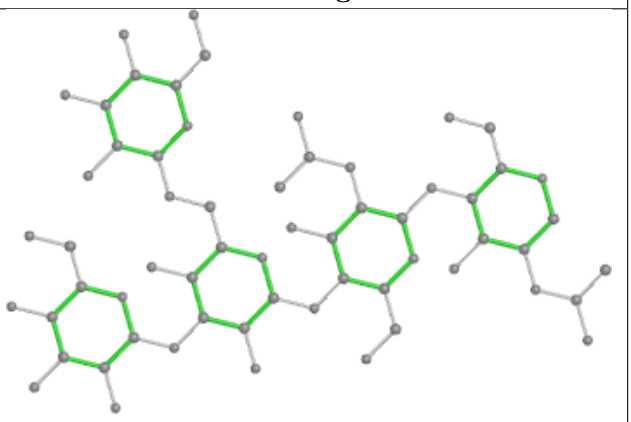
Bond lengths



Bond angles

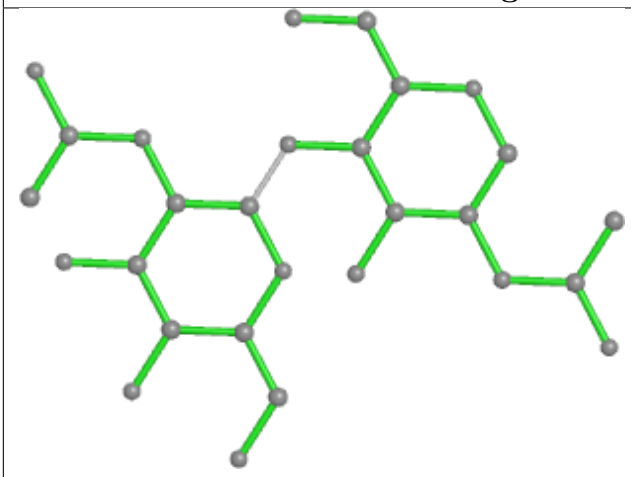


Torsions

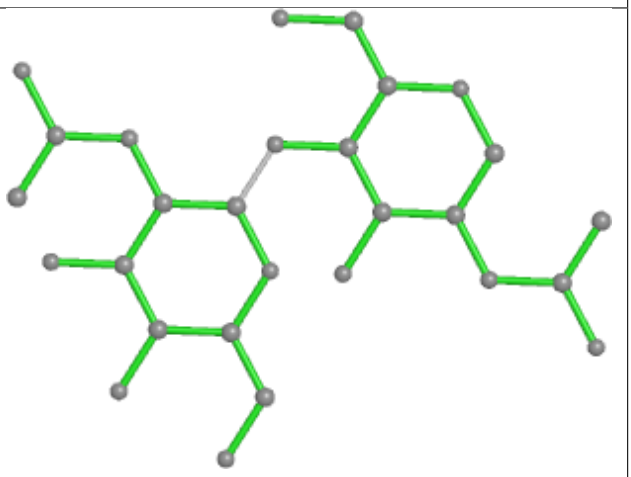


Rings

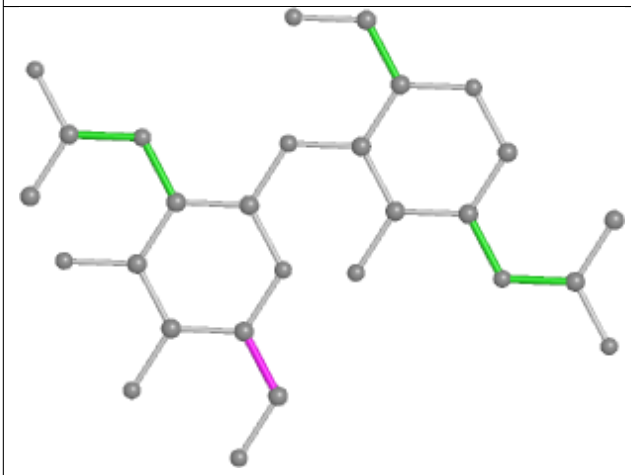
Oligosaccharide Chain I



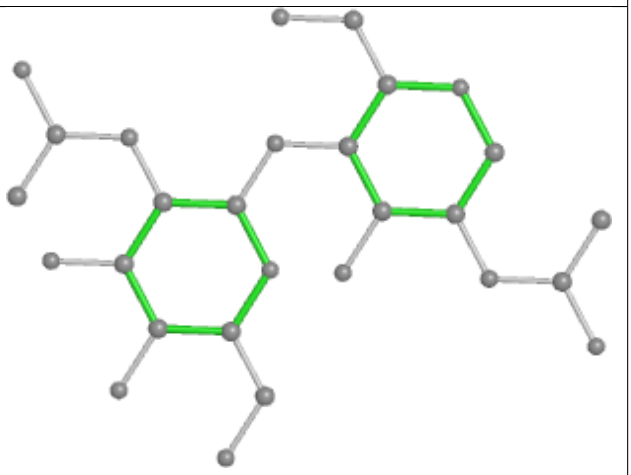
Bond lengths



Bond angles

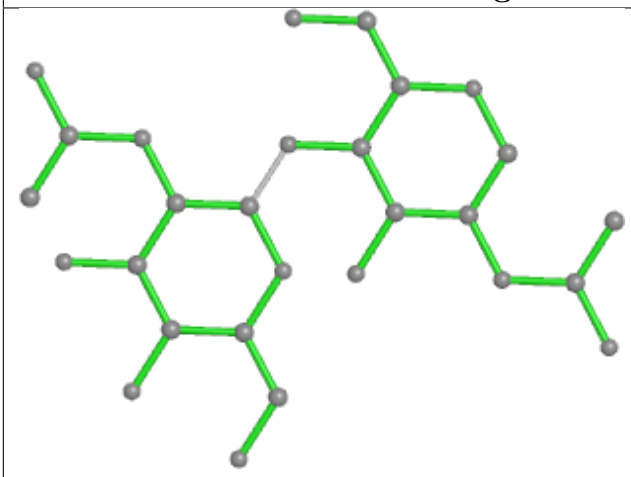


Torsions

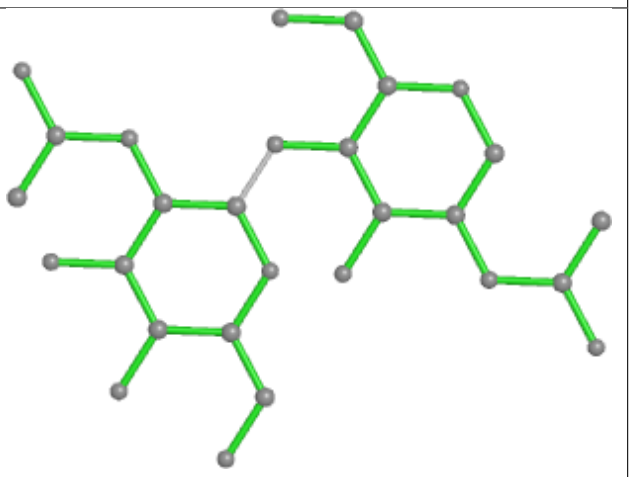


Rings

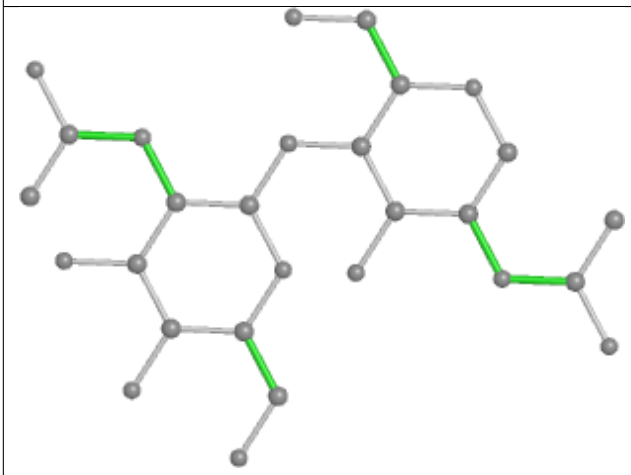
Oligosaccharide Chain K



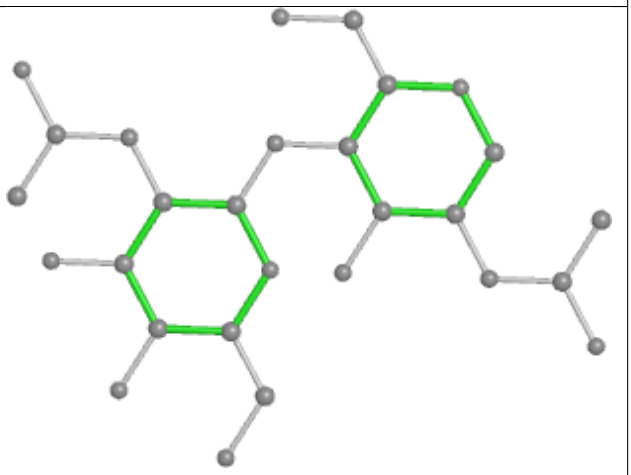
Bond lengths



Bond angles

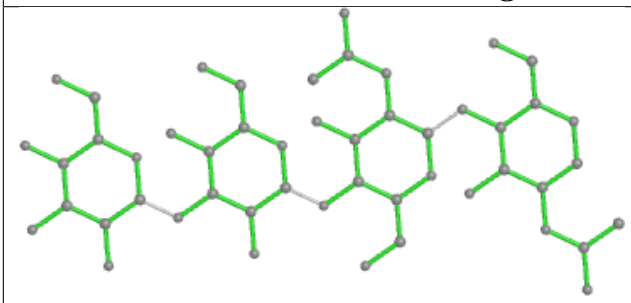


Torsions

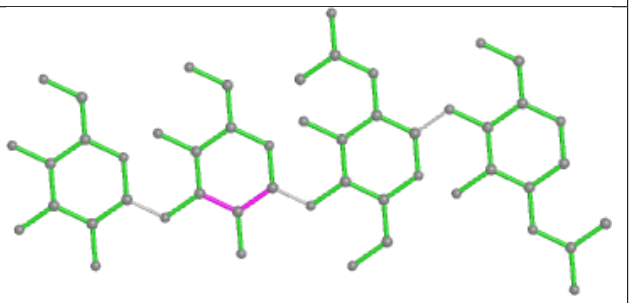


Rings

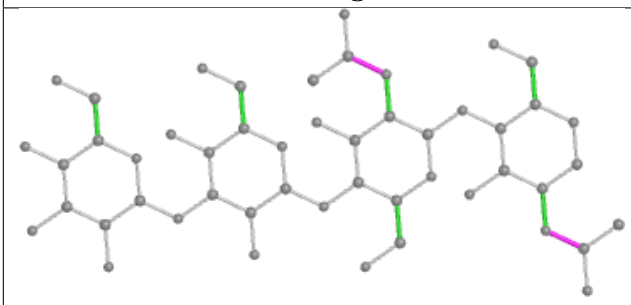
Oligosaccharide Chain J



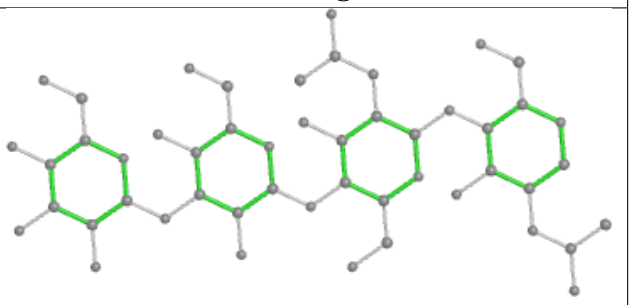
Bond lengths



Bond angles



Torsions



Rings

5.6 Ligand geometry (i)

Of 23 ligands modelled in this entry, 15 are monoatomic - leaving 8 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
10	SO4	L	215	-	4,4,4	0.13	0	6,6,6	0.08	0
11	NAG	B	3099	2	14,14,15	0.54	0	17,19,21	0.82	1 (5%)
10	SO4	A	459	-	4,4,4	0.13	0	6,6,6	0.07	0
10	SO4	A	460	-	4,4,4	0.15	0	6,6,6	0.11	0
9	RC2	C	5000	-	29,30,30	0.77	0	36,42,42	2.84	11 (30%)
11	NAG	D	3099	2	14,14,15	0.52	0	17,19,21	0.58	0
10	SO4	A	458	-	4,4,4	0.14	0	6,6,6	0.08	0
9	RC2	A	5000	-	29,30,30	0.80	0	36,42,42	2.76	11 (30%)

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
9	RC2	C	5000	-	-	0/14/22/22	0/4/4/4
11	NAG	D	3099	2	-	0/6/23/26	0/1/1/1
11	NAG	B	3099	2	-	0/6/23/26	0/1/1/1
9	RC2	A	5000	-	-	0/14/22/22	0/4/4/4

There are no bond length outliers.

The worst 5 of 23 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
9	C	5000	RC2	C07-C16-N05	-10.12	116.25	122.88
9	A	5000	RC2	C07-C16-N05	-9.90	116.40	122.88
9	C	5000	RC2	C10-C08-N06	6.24	131.45	122.28
9	A	5000	RC2	C03-N05-C16	6.10	125.22	114.28
9	C	5000	RC2	C03-N05-C16	6.05	125.14	114.28

There are no chirality outliers.

There are no torsion outliers.

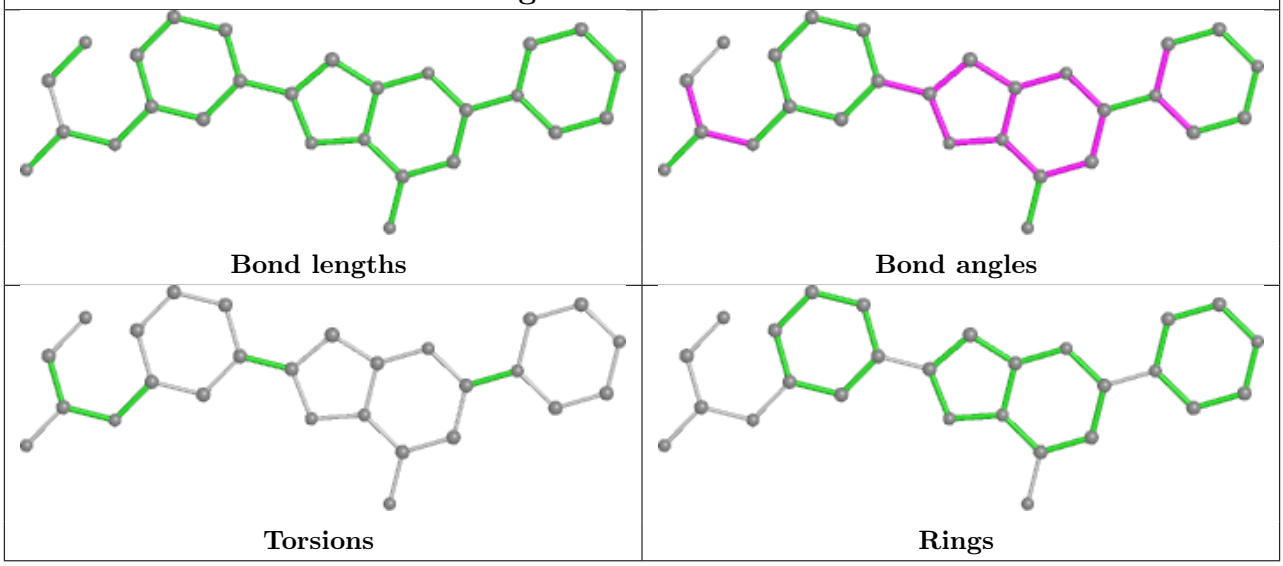
There are no ring outliers.

6 monomers are involved in 11 short contacts:

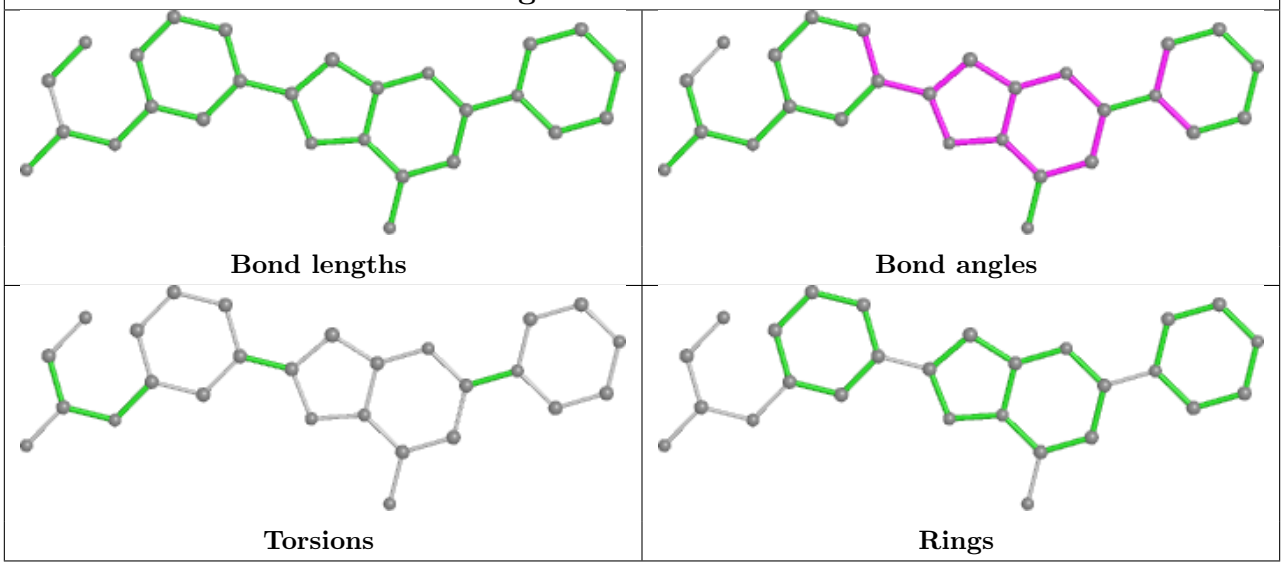
Mol	Chain	Res	Type	Clashes	Symm-Clashes
10	L	215	SO4	1	0
11	B	3099	NAG	1	0
10	A	459	SO4	1	0
9	C	5000	RC2	3	0
10	A	458	SO4	2	0
9	A	5000	RC2	3	0

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

Ligand RC2 C 5000



Ligand RC2 A 5000



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, 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	454/457 (99%)	-0.08	2 (0%)	92	91	12, 29, 56, 122	0
1	C	453/457 (99%)	-0.23	2 (0%)	92	91	23, 44, 75, 107	0
2	B	466/472 (98%)	0.24	37 (7%)	12	9	14, 53, 129, 195	1 (0%)
2	D	471/472 (99%)	0.12	27 (5%)	23	18	27, 59, 115, 165	1 (0%)
3	E	214/221 (96%)	1.82	77 (35%)	0	0	54, 113, 181, 205	0
3	H	216/221 (97%)	0.24	17 (7%)	12	9	31, 82, 140, 152	0
4	F	214/214 (100%)	1.53	74 (34%)	0	0	56, 106, 173, 210	1 (0%)
4	L	214/214 (100%)	0.04	3 (1%)	75	71	39, 70, 101, 163	1 (0%)
All	All	2702/2728 (99%)	0.30	239 (8%)	10	7	12, 57, 145, 210	4 (0%)

The worst 5 of 239 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	E	133	VAL	9.6
3	E	144	LEU	9.2
3	E	128	TYR	9.2
3	E	142	VAL	9.0
4	F	214	CYS	8.7

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,

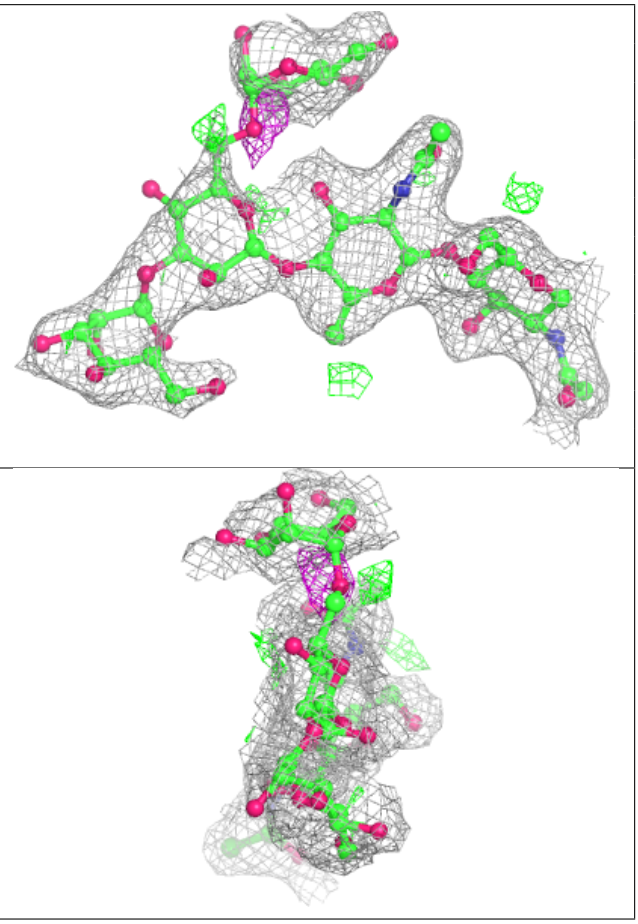
median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
5	MAN	G	5	11/12	0.78	0.22	113,116,119,124	0
7	BMA	J	3	11/12	0.78	0.31	126,132,141,144	0
5	BMA	G	3	11/12	0.80	0.23	96,133,156,157	0
7	MAN	J	4	11/12	0.82	0.33	122,136,141,141	0
6	NAG	K	2	14/15	0.86	0.33	109,137,144,147	0
5	MAN	G	4	11/12	0.86	0.16	98,114,138,141	0
6	NAG	I	2	14/15	0.86	0.25	112,120,132,135	0
7	NAG	J	2	14/15	0.90	0.28	61,93,108,125	0
6	NAG	K	1	14/15	0.91	0.28	71,107,127,130	0
6	NAG	I	1	14/15	0.93	0.22	82,102,113,119	0
5	NAG	G	2	14/15	0.95	0.15	62,79,91,108	0
7	NAG	J	1	14/15	0.97	0.14	35,51,68,72	0
5	NAG	G	1	14/15	0.98	0.15	24,40,58,63	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.

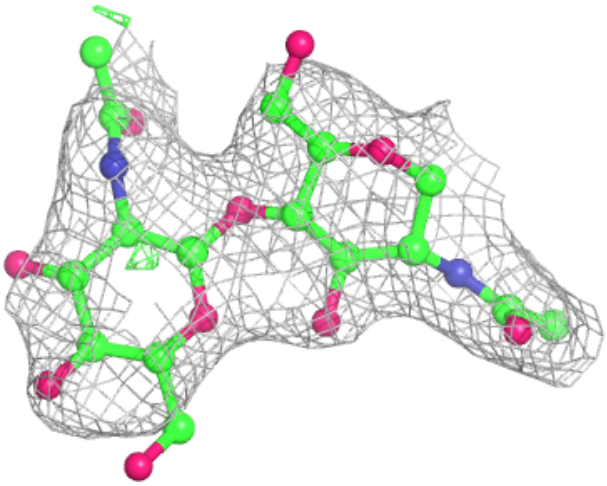
Electron density around Chain G:

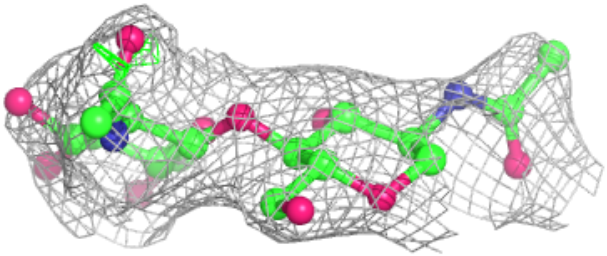
2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative) and green (positive)

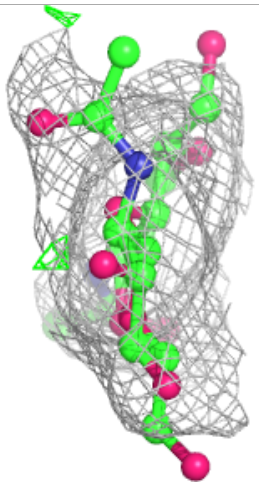


Electron density around Chain I:

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

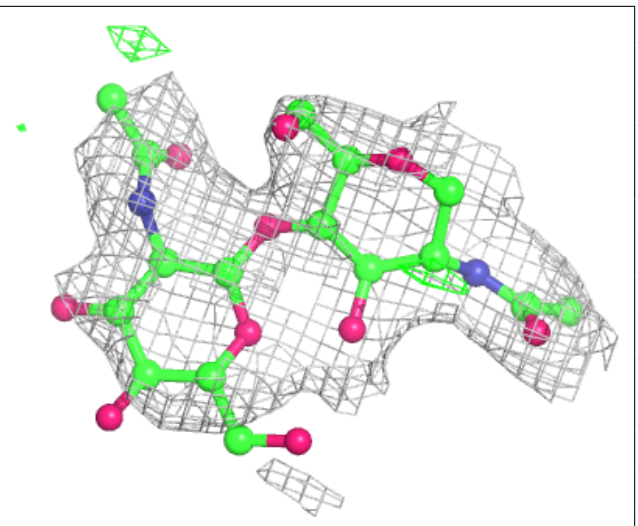


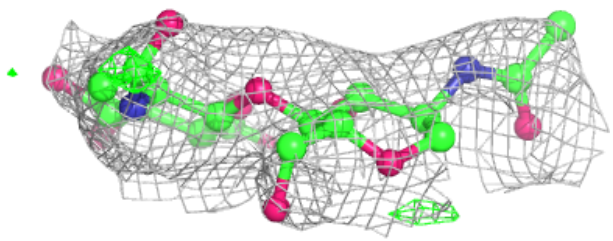


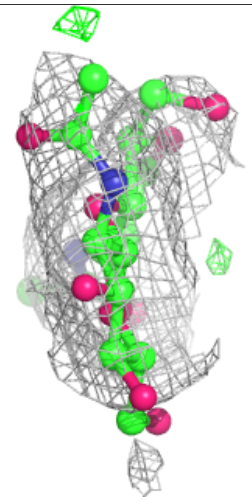


Electron density around Chain K:

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

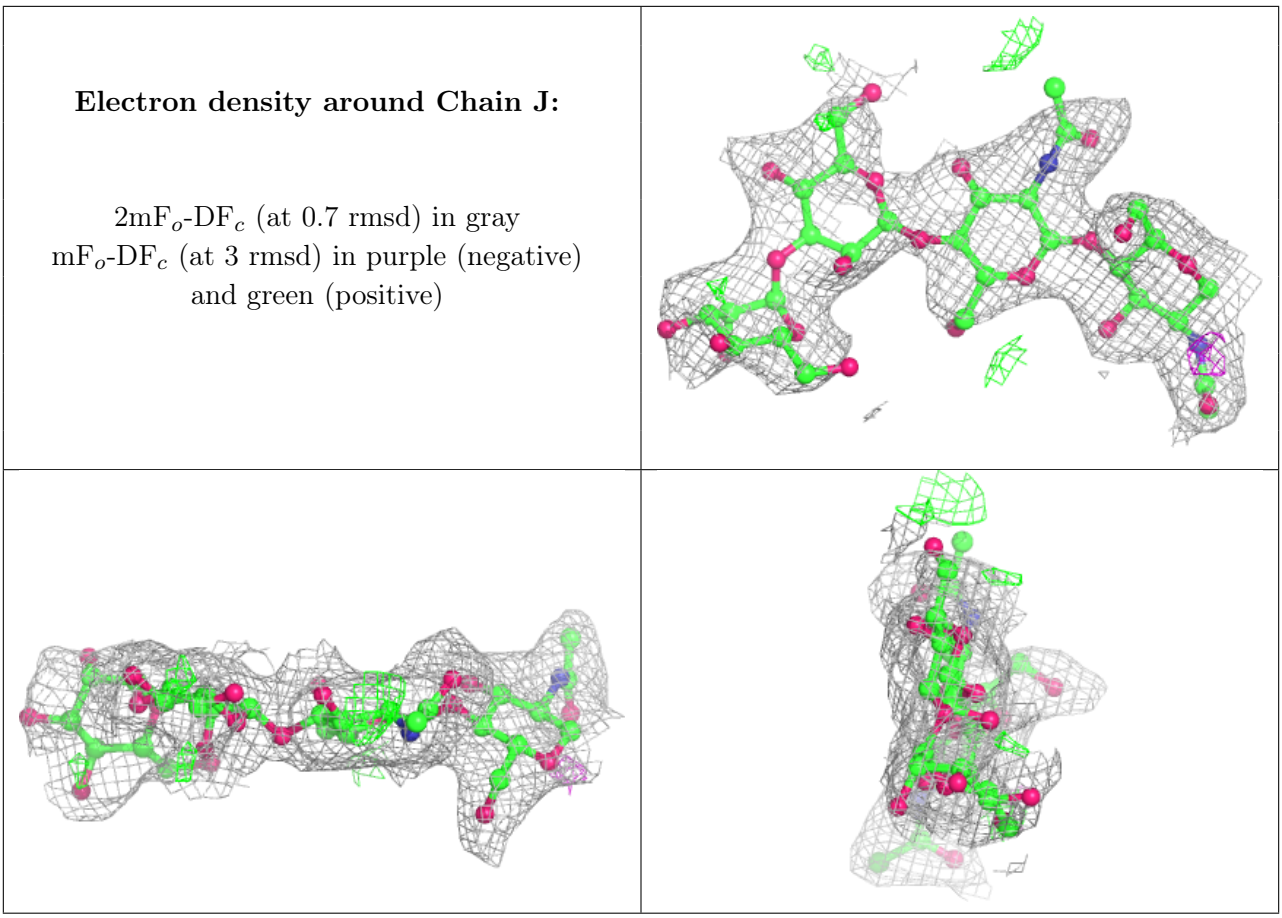






Electron density around Chain J:

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



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(Å^2)	Q<0.9
11	NAG	D	3099	14/15	0.82	0.30	87,100,110,111	0
8	CA	C	2004	1/1	0.85	0.05	67,67,67,67	0
11	NAG	B	3099	14/15	0.88	0.28	96,117,124,132	0
10	SO4	A	458	5/5	0.88	0.26	31,55,67,82	5
10	SO4	L	215	5/5	0.90	0.24	40,62,67,69	5
10	SO4	A	460	5/5	0.95	0.36	37,39,52,65	5
10	SO4	A	459	5/5	0.95	0.15	74,78,85,93	0
12	CL	C	458	1/1	0.95	0.09	74,74,74,74	0
9	RC2	C	5000	27/27	0.96	0.16	26,44,60,61	0
8	CA	C	2006	1/1	0.96	0.10	45,45,45,45	0
8	CA	C	2007	1/1	0.97	0.09	44,44,44,44	0
9	RC2	A	5000	27/27	0.98	0.17	15,34,50,62	0

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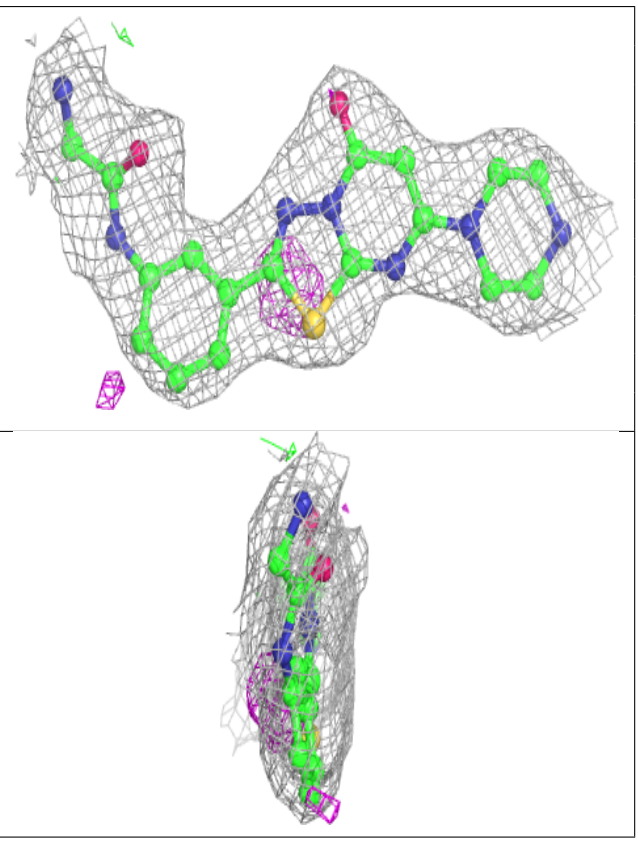
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
8	CA	A	2004	1/1	0.98	0.06	33,33,33,33	0
8	CA	C	2005	1/1	0.98	0.09	48,48,48,48	0
8	CA	A	2007	1/1	0.99	0.14	27,27,27,27	0
8	CA	A	2005	1/1	0.99	0.09	33,33,33,33	0
8	CA	D	2002	1/1	0.99	0.12	42,42,42,42	0
12	CL	B	473	1/1	0.99	0.14	30,30,30,30	0
8	CA	A	2006	1/1	0.99	0.14	24,24,24,24	0
12	CL	D	473	1/1	0.99	0.11	42,42,42,42	0
8	CA	D	2003	1/1	1.00	0.16	33,33,33,33	0
8	CA	B	2003	1/1	1.00	0.21	24,24,24,24	0
8	CA	B	2002	1/1	1.00	0.10	30,30,30,30	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

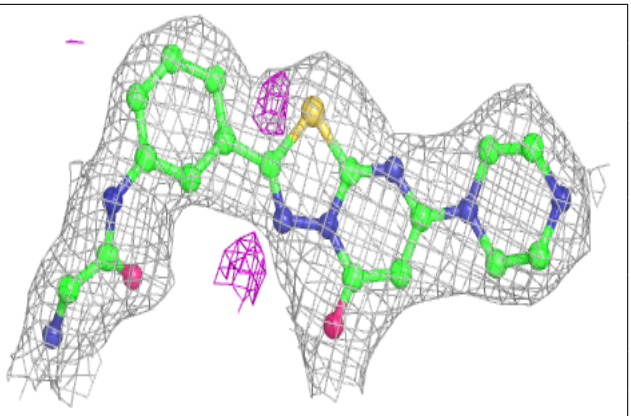
Electron density around RC2 C 5000:

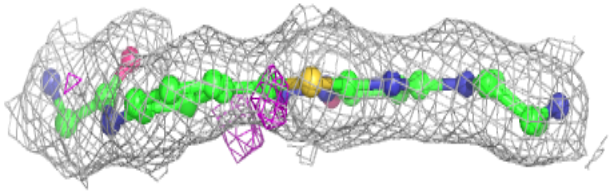
2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative) and green (positive)

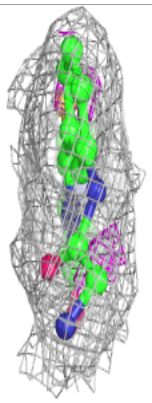


Electron density around RC2 A 5000:

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







6.5 Other polymers (i)

There are no such residues in this entry.