Full wwPDB EM Validation Report ⓘ

Nov 29, 2022 – 11:47 PM JST

PDB ID	:	7XCO
EMDB ID	:	EMD-33124
Title	:	Cryo-EM structure of SARS-CoV-2 Omicron spike protein (S-6P-RRAR) in complex with S309 fab
Authors	:	Gao, G.F.; Qi, J.X.; Zhao, Z.N.; Liu, S.; Xie, Y.F.
Deposited on	:	2022-03-24
Resolution	:	2.50 Å(reported)

This is a Full wwPDB EM 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/EMValidationReportHelp
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:

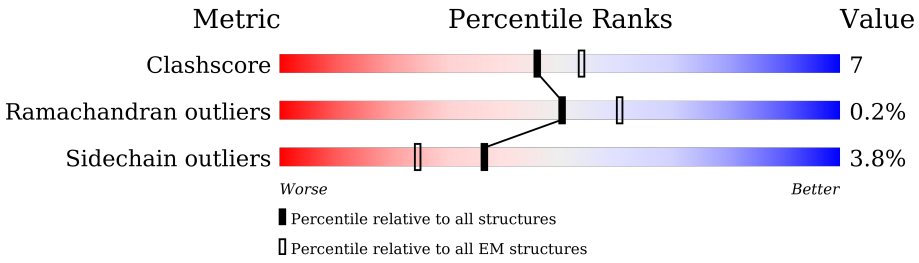
EMDB validation analysis	:	0.0.1.dev43
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.3

1 Overall quality at a glance

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 2.50 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)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the 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 EM map (all-atom inclusion < 40%). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	1240	71% 14% 14%
1	B	1240	72% 12% 14%
1	C	1240	12% 71% 14% 14%
2	H	230	32% 72% 24%
2	M	230	43% 73% 23%
2	O	230	72% 67% 29%
3	L	214	44% 74% 25%
3	N	214	50% 73% 25%

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Mol	Chain	Length	Quality of chain
3	P	214	83% 82% 17%
4	D	2	50% 50% 50%
4	E	2	100%
4	F	2	50% 50% 50%
4	G	2	100%
4	I	2	100%
4	J	2	50% 50%
4	K	2	100%
4	Q	2	100%
4	R	2	100%
4	S	2	100%
4	T	2	100%
4	U	2	100%
4	V	2	100%
4	W	2	100%
4	X	2	100%
4	Y	2	100%
4	Z	2	50% 50%
4	a	2	100%
4	b	2	100%

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 35802 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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 Spike glycoprotein.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	1062	Total	C	N	O	S	0	0
			8330	5333	1389	1570	38		
1	B	1065	Total	C	N	O	S	0	0
			8351	5345	1395	1573	38		
1	C	1062	Total	C	N	O	S	0	0
			8330	5333	1389	1570	38		

There are 276 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	67	VAL	ALA	variant	UNP P0DTC2
A	?	-	HIS	deletion	UNP P0DTC2
A	?	-	VAL	deletion	UNP P0DTC2
A	95	ILE	THR	variant	UNP P0DTC2
A	142	ASP	GLY	conflict	UNP P0DTC2
A	?	-	VAL	deletion	UNP P0DTC2
A	?	-	TYR	deletion	UNP P0DTC2
A	?	-	ASN	deletion	UNP P0DTC2
A	210A	ILE	LEU	variant	UNP P0DTC2
A	210D	GLU	-	insertion	UNP P0DTC2
A	210E	PRO	-	insertion	UNP P0DTC2
A	210F	GLU	-	insertion	UNP P0DTC2
A	339	ASP	GLY	variant	UNP P0DTC2
A	371	LEU	SER	variant	UNP P0DTC2
A	373	PRO	SER	variant	UNP P0DTC2
A	375	PHE	SER	variant	UNP P0DTC2
A	417	ASN	LYS	variant	UNP P0DTC2
A	440	LYS	ASN	variant	UNP P0DTC2
A	446	SER	GLY	variant	UNP P0DTC2
A	477	ASN	SER	variant	UNP P0DTC2
A	478	LYS	THR	variant	UNP P0DTC2
A	484	ALA	GLU	variant	UNP P0DTC2
A	493	ARG	GLN	variant	UNP P0DTC2
A	496	SER	GLY	variant	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
A	498	ARG	GLN	variant	UNP P0DTC2
A	501	TYR	ASN	variant	UNP P0DTC2
A	505	HIS	TYR	variant	UNP P0DTC2
A	547	LYS	THR	variant	UNP P0DTC2
A	614	GLY	ASP	variant	UNP P0DTC2
A	655	TYR	HIS	variant	UNP P0DTC2
A	679	LYS	ASN	variant	UNP P0DTC2
A	681	HIS	PRO	variant	UNP P0DTC2
A	764	LYS	ASN	variant	UNP P0DTC2
A	796	TYR	ASP	variant	UNP P0DTC2
A	817	PRO	PHE	variant	UNP P0DTC2
A	856	LYS	ASN	variant	UNP P0DTC2
A	892	PRO	ALA	engineered mutation	UNP P0DTC2
A	899	PRO	ALA	engineered mutation	UNP P0DTC2
A	942	PRO	ALA	engineered mutation	UNP P0DTC2
A	954	HIS	GLN	variant	UNP P0DTC2
A	969	LYS	ASN	variant	UNP P0DTC2
A	981	PHE	LEU	variant	UNP P0DTC2
A	986	PRO	LYS	engineered mutation	UNP P0DTC2
A	987	PRO	VAL	engineered mutation	UNP P0DTC2
A	1209	GLY	-	expression tag	UNP P0DTC2
A	1210	SER	-	expression tag	UNP P0DTC2
A	1211	GLY	-	expression tag	UNP P0DTC2
A	1212	TYR	-	expression tag	UNP P0DTC2
A	1213	ILE	-	expression tag	UNP P0DTC2
A	1214	PRO	-	expression tag	UNP P0DTC2
A	1215	GLU	-	expression tag	UNP P0DTC2
A	1216	ALA	-	expression tag	UNP P0DTC2
A	1217	PRO	-	expression tag	UNP P0DTC2
A	1218	ARG	-	expression tag	UNP P0DTC2
A	1219	ASP	-	expression tag	UNP P0DTC2
A	1220	GLY	-	expression tag	UNP P0DTC2
A	1221	GLN	-	expression tag	UNP P0DTC2
A	1222	ALA	-	expression tag	UNP P0DTC2
A	1223	TYR	-	expression tag	UNP P0DTC2
A	1224	VAL	-	expression tag	UNP P0DTC2
A	1225	ARG	-	expression tag	UNP P0DTC2
A	1226	LYS	-	expression tag	UNP P0DTC2
A	1227	ASP	-	expression tag	UNP P0DTC2
A	1228	GLY	-	expression tag	UNP P0DTC2
A	1229	GLU	-	expression tag	UNP P0DTC2
A	1230	TRP	-	expression tag	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
A	1231	VAL	-	expression tag	UNP P0DTC2
A	1232	LEU	-	expression tag	UNP P0DTC2
A	1233	LEU	-	expression tag	UNP P0DTC2
A	1234	SER	-	expression tag	UNP P0DTC2
A	1235	THR	-	expression tag	UNP P0DTC2
A	1236	PHE	-	expression tag	UNP P0DTC2
A	1237	LEU	-	expression tag	UNP P0DTC2
A	1238	GLY	-	expression tag	UNP P0DTC2
A	1239	SER	-	expression tag	UNP P0DTC2
A	1240	ALA	-	expression tag	UNP P0DTC2
A	1241	TRP	-	expression tag	UNP P0DTC2
A	1242	SER	-	expression tag	UNP P0DTC2
A	1243	HIS	-	expression tag	UNP P0DTC2
A	1244	PRO	-	expression tag	UNP P0DTC2
A	1245	GLN	-	expression tag	UNP P0DTC2
A	1246	PHE	-	expression tag	UNP P0DTC2
A	1247	GLU	-	expression tag	UNP P0DTC2
A	1248	LYS	-	expression tag	UNP P0DTC2
A	1249	HIS	-	expression tag	UNP P0DTC2
A	1250	HIS	-	expression tag	UNP P0DTC2
A	1251	HIS	-	expression tag	UNP P0DTC2
A	1252	HIS	-	expression tag	UNP P0DTC2
A	1253	HIS	-	expression tag	UNP P0DTC2
A	1254	HIS	-	expression tag	UNP P0DTC2
A	1255	HIS	-	expression tag	UNP P0DTC2
A	1256	HIS	-	expression tag	UNP P0DTC2
B	67	VAL	ALA	variant	UNP P0DTC2
B	?	-	HIS	deletion	UNP P0DTC2
B	?	-	VAL	deletion	UNP P0DTC2
B	95	ILE	THR	variant	UNP P0DTC2
B	142	ASP	GLY	conflict	UNP P0DTC2
B	?	-	VAL	deletion	UNP P0DTC2
B	?	-	TYR	deletion	UNP P0DTC2
B	?	-	ASN	deletion	UNP P0DTC2
B	210A	ILE	LEU	variant	UNP P0DTC2
B	210D	GLU	-	insertion	UNP P0DTC2
B	210E	PRO	-	insertion	UNP P0DTC2
B	210F	GLU	-	insertion	UNP P0DTC2
B	339	ASP	GLY	variant	UNP P0DTC2
B	371	LEU	SER	variant	UNP P0DTC2
B	373	PRO	SER	variant	UNP P0DTC2
B	375	PHE	SER	variant	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
B	417	ASN	LYS	variant	UNP P0DTC2
B	440	LYS	ASN	variant	UNP P0DTC2
B	446	SER	GLY	variant	UNP P0DTC2
B	477	ASN	SER	variant	UNP P0DTC2
B	478	LYS	THR	variant	UNP P0DTC2
B	484	ALA	GLU	variant	UNP P0DTC2
B	493	ARG	GLN	variant	UNP P0DTC2
B	496	SER	GLY	variant	UNP P0DTC2
B	498	ARG	GLN	variant	UNP P0DTC2
B	501	TYR	ASN	variant	UNP P0DTC2
B	505	HIS	TYR	variant	UNP P0DTC2
B	547	LYS	THR	variant	UNP P0DTC2
B	614	GLY	ASP	variant	UNP P0DTC2
B	655	TYR	HIS	variant	UNP P0DTC2
B	679	LYS	ASN	variant	UNP P0DTC2
B	681	HIS	PRO	variant	UNP P0DTC2
B	764	LYS	ASN	variant	UNP P0DTC2
B	796	TYR	ASP	variant	UNP P0DTC2
B	817	PRO	PHE	variant	UNP P0DTC2
B	856	LYS	ASN	variant	UNP P0DTC2
B	892	PRO	ALA	engineered mutation	UNP P0DTC2
B	899	PRO	ALA	engineered mutation	UNP P0DTC2
B	942	PRO	ALA	engineered mutation	UNP P0DTC2
B	954	HIS	GLN	variant	UNP P0DTC2
B	969	LYS	ASN	variant	UNP P0DTC2
B	981	PHE	LEU	variant	UNP P0DTC2
B	986	PRO	LYS	engineered mutation	UNP P0DTC2
B	987	PRO	VAL	engineered mutation	UNP P0DTC2
B	1209	GLY	-	expression tag	UNP P0DTC2
B	1210	SER	-	expression tag	UNP P0DTC2
B	1211	GLY	-	expression tag	UNP P0DTC2
B	1212	TYR	-	expression tag	UNP P0DTC2
B	1213	ILE	-	expression tag	UNP P0DTC2
B	1214	PRO	-	expression tag	UNP P0DTC2
B	1215	GLU	-	expression tag	UNP P0DTC2
B	1216	ALA	-	expression tag	UNP P0DTC2
B	1217	PRO	-	expression tag	UNP P0DTC2
B	1218	ARG	-	expression tag	UNP P0DTC2
B	1219	ASP	-	expression tag	UNP P0DTC2
B	1220	GLY	-	expression tag	UNP P0DTC2
B	1221	GLN	-	expression tag	UNP P0DTC2
B	1222	ALA	-	expression tag	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
B	1223	TYR	-	expression tag	UNP P0DTC2
B	1224	VAL	-	expression tag	UNP P0DTC2
B	1225	ARG	-	expression tag	UNP P0DTC2
B	1226	LYS	-	expression tag	UNP P0DTC2
B	1227	ASP	-	expression tag	UNP P0DTC2
B	1228	GLY	-	expression tag	UNP P0DTC2
B	1229	GLU	-	expression tag	UNP P0DTC2
B	1230	TRP	-	expression tag	UNP P0DTC2
B	1231	VAL	-	expression tag	UNP P0DTC2
B	1232	LEU	-	expression tag	UNP P0DTC2
B	1233	LEU	-	expression tag	UNP P0DTC2
B	1234	SER	-	expression tag	UNP P0DTC2
B	1235	THR	-	expression tag	UNP P0DTC2
B	1236	PHE	-	expression tag	UNP P0DTC2
B	1237	LEU	-	expression tag	UNP P0DTC2
B	1238	GLY	-	expression tag	UNP P0DTC2
B	1239	SER	-	expression tag	UNP P0DTC2
B	1240	ALA	-	expression tag	UNP P0DTC2
B	1241	TRP	-	expression tag	UNP P0DTC2
B	1242	SER	-	expression tag	UNP P0DTC2
B	1243	HIS	-	expression tag	UNP P0DTC2
B	1244	PRO	-	expression tag	UNP P0DTC2
B	1245	GLN	-	expression tag	UNP P0DTC2
B	1246	PHE	-	expression tag	UNP P0DTC2
B	1247	GLU	-	expression tag	UNP P0DTC2
B	1248	LYS	-	expression tag	UNP P0DTC2
B	1249	HIS	-	expression tag	UNP P0DTC2
B	1250	HIS	-	expression tag	UNP P0DTC2
B	1251	HIS	-	expression tag	UNP P0DTC2
B	1252	HIS	-	expression tag	UNP P0DTC2
B	1253	HIS	-	expression tag	UNP P0DTC2
B	1254	HIS	-	expression tag	UNP P0DTC2
B	1255	HIS	-	expression tag	UNP P0DTC2
B	1256	HIS	-	expression tag	UNP P0DTC2
C	67	VAL	ALA	variant	UNP P0DTC2
C	?	-	HIS	deletion	UNP P0DTC2
C	?	-	VAL	deletion	UNP P0DTC2
C	95	ILE	THR	variant	UNP P0DTC2
C	142	ASP	GLY	conflict	UNP P0DTC2
C	?	-	VAL	deletion	UNP P0DTC2
C	?	-	TYR	deletion	UNP P0DTC2
C	?	-	ASN	deletion	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
C	210A	ILE	LEU	variant	UNP P0DTC2
C	210D	GLU	-	insertion	UNP P0DTC2
C	210E	PRO	-	insertion	UNP P0DTC2
C	210F	GLU	-	insertion	UNP P0DTC2
C	339	ASP	GLY	variant	UNP P0DTC2
C	371	LEU	SER	variant	UNP P0DTC2
C	373	PRO	SER	variant	UNP P0DTC2
C	375	PHE	SER	variant	UNP P0DTC2
C	417	ASN	LYS	variant	UNP P0DTC2
C	440	LYS	ASN	variant	UNP P0DTC2
C	446	SER	GLY	variant	UNP P0DTC2
C	477	ASN	SER	variant	UNP P0DTC2
C	478	LYS	THR	variant	UNP P0DTC2
C	484	ALA	GLU	variant	UNP P0DTC2
C	493	ARG	GLN	variant	UNP P0DTC2
C	496	SER	GLY	variant	UNP P0DTC2
C	498	ARG	GLN	variant	UNP P0DTC2
C	501	TYR	ASN	variant	UNP P0DTC2
C	505	HIS	TYR	variant	UNP P0DTC2
C	547	LYS	THR	variant	UNP P0DTC2
C	614	GLY	ASP	variant	UNP P0DTC2
C	655	TYR	HIS	variant	UNP P0DTC2
C	679	LYS	ASN	variant	UNP P0DTC2
C	681	HIS	PRO	variant	UNP P0DTC2
C	764	LYS	ASN	variant	UNP P0DTC2
C	796	TYR	ASP	variant	UNP P0DTC2
C	817	PRO	PHE	variant	UNP P0DTC2
C	856	LYS	ASN	variant	UNP P0DTC2
C	892	PRO	ALA	engineered mutation	UNP P0DTC2
C	899	PRO	ALA	engineered mutation	UNP P0DTC2
C	942	PRO	ALA	engineered mutation	UNP P0DTC2
C	954	HIS	GLN	variant	UNP P0DTC2
C	969	LYS	ASN	variant	UNP P0DTC2
C	981	PHE	LEU	variant	UNP P0DTC2
C	986	PRO	LYS	engineered mutation	UNP P0DTC2
C	987	PRO	VAL	engineered mutation	UNP P0DTC2
C	1209	GLY	-	expression tag	UNP P0DTC2
C	1210	SER	-	expression tag	UNP P0DTC2
C	1211	GLY	-	expression tag	UNP P0DTC2
C	1212	TYR	-	expression tag	UNP P0DTC2
C	1213	ILE	-	expression tag	UNP P0DTC2
C	1214	PRO	-	expression tag	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
C	1215	GLU	-	expression tag	UNP P0DTC2
C	1216	ALA	-	expression tag	UNP P0DTC2
C	1217	PRO	-	expression tag	UNP P0DTC2
C	1218	ARG	-	expression tag	UNP P0DTC2
C	1219	ASP	-	expression tag	UNP P0DTC2
C	1220	GLY	-	expression tag	UNP P0DTC2
C	1221	GLN	-	expression tag	UNP P0DTC2
C	1222	ALA	-	expression tag	UNP P0DTC2
C	1223	TYR	-	expression tag	UNP P0DTC2
C	1224	VAL	-	expression tag	UNP P0DTC2
C	1225	ARG	-	expression tag	UNP P0DTC2
C	1226	LYS	-	expression tag	UNP P0DTC2
C	1227	ASP	-	expression tag	UNP P0DTC2
C	1228	GLY	-	expression tag	UNP P0DTC2
C	1229	GLU	-	expression tag	UNP P0DTC2
C	1230	TRP	-	expression tag	UNP P0DTC2
C	1231	VAL	-	expression tag	UNP P0DTC2
C	1232	LEU	-	expression tag	UNP P0DTC2
C	1233	LEU	-	expression tag	UNP P0DTC2
C	1234	SER	-	expression tag	UNP P0DTC2
C	1235	THR	-	expression tag	UNP P0DTC2
C	1236	PHE	-	expression tag	UNP P0DTC2
C	1237	LEU	-	expression tag	UNP P0DTC2
C	1238	GLY	-	expression tag	UNP P0DTC2
C	1239	SER	-	expression tag	UNP P0DTC2
C	1240	ALA	-	expression tag	UNP P0DTC2
C	1241	TRP	-	expression tag	UNP P0DTC2
C	1242	SER	-	expression tag	UNP P0DTC2
C	1243	HIS	-	expression tag	UNP P0DTC2
C	1244	PRO	-	expression tag	UNP P0DTC2
C	1245	GLN	-	expression tag	UNP P0DTC2
C	1246	PHE	-	expression tag	UNP P0DTC2
C	1247	GLU	-	expression tag	UNP P0DTC2
C	1248	LYS	-	expression tag	UNP P0DTC2
C	1249	HIS	-	expression tag	UNP P0DTC2
C	1250	HIS	-	expression tag	UNP P0DTC2
C	1251	HIS	-	expression tag	UNP P0DTC2
C	1252	HIS	-	expression tag	UNP P0DTC2
C	1253	HIS	-	expression tag	UNP P0DTC2
C	1254	HIS	-	expression tag	UNP P0DTC2
C	1255	HIS	-	expression tag	UNP P0DTC2
C	1256	HIS	-	expression tag	UNP P0DTC2

- Molecule 2 is a protein called S309 Fab heavy chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	H	223	Total	C	N	O	S	0	0
			1688	1067	285	329	7		
2	M	223	Total	C	N	O	S	0	0
			1688	1067	285	329	7		
2	O	223	Total	C	N	O	S	0	0
			1688	1067	285	329	7		

- Molecule 3 is a protein called S309 fab light chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	L	212	Total	C	N	O	S	0	0
			1615	1006	276	329	4		
3	N	212	Total	C	N	O	S	0	0
			1615	1006	276	329	4		
3	P	212	Total	C	N	O	S	0	0
			1615	1006	276	329	4		

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

Mol	Chain	Residues	Atoms				AltConf	Trace
4	D	2	Total	C	N	O	0	0
			28	16	2	10		
4	E	2	Total	C	N	O	0	0
			28	16	2	10		
4	F	2	Total	C	N	O	0	0
			28	16	2	10		
4	G	2	Total	C	N	O	0	0
			28	16	2	10		
4	I	2	Total	C	N	O	0	0
			28	16	2	10		
4	J	2	Total	C	N	O	0	0
			28	16	2	10		
4	K	2	Total	C	N	O	0	0
			28	16	2	10		
4	Q	2	Total	C	N	O	0	0
			28	16	2	10		

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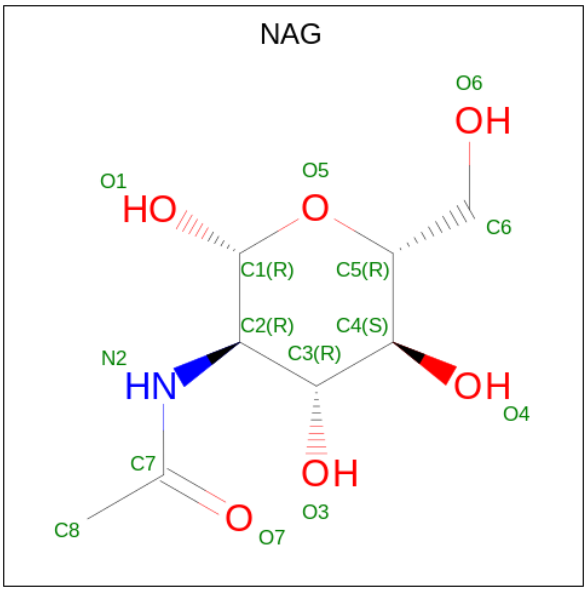
Mol	Chain	Residues	Atoms				AltConf	Trace
4	R	2	Total	C	N	O	0	0
			28	16	2	10		
4	S	2	Total	C	N	O	0	0
			28	16	2	10		
4	T	2	Total	C	N	O	0	0
			28	16	2	10		
4	U	2	Total	C	N	O	0	0
			28	16	2	10		
4	V	2	Total	C	N	O	0	0
			28	16	2	10		
4	W	2	Total	C	N	O	0	0
			28	16	2	10		
4	X	2	Total	C	N	O	0	0
			28	16	2	10		
4	Y	2	Total	C	N	O	0	0
			28	16	2	10		
4	Z	2	Total	C	N	O	0	0
			28	16	2	10		
4	a	2	Total	C	N	O	0	0
			28	16	2	10		
4	b	2	Total	C	N	O	0	0
			28	16	2	10		

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				AltConf
5	A	1	Total	C	N	O	0
			112	64	8	40	
5	A	1	Total	C	N	O	0
			112	64	8	40	
5	A	1	Total	C	N	O	0
			112	64	8	40	
5	A	1	Total	C	N	O	0
			112	64	8	40	
5	A	1	Total	C	N	O	0
			112	64	8	40	
5	A	1	Total	C	N	O	0
			112	64	8	40	
5	A	1	Total	C	N	O	0
			112	64	8	40	
5	A	1	Total	C	N	O	0
			112	64	8	40	
5	B	1	Total	C	N	O	0
			126	72	9	45	
5	B	1	Total	C	N	O	0
			126	72	9	45	
5	B	1	Total	C	N	O	0
			126	72	9	45	
5	B	1	Total	C	N	O	0
			126	72	9	45	
5	B	1	Total	C	N	O	0
			126	72	9	45	
5	B	1	Total	C	N	O	0
			126	72	9	45	
5	B	1	Total	C	N	O	0
			126	72	9	45	
5	B	1	Total	C	N	O	0
			126	72	9	45	
5	B	1	Total	C	N	O	0
			126	72	9	45	
5	C	1	Total	C	N	O	0
			112	64	8	40	
5	C	1	Total	C	N	O	0
			112	64	8	40	
5	C	1	Total	C	N	O	0
			112	64	8	40	
5	C	1	Total	C	N	O	0
			112	64	8	40	
5	C	1	Total	C	N	O	0
			112	64	8	40	

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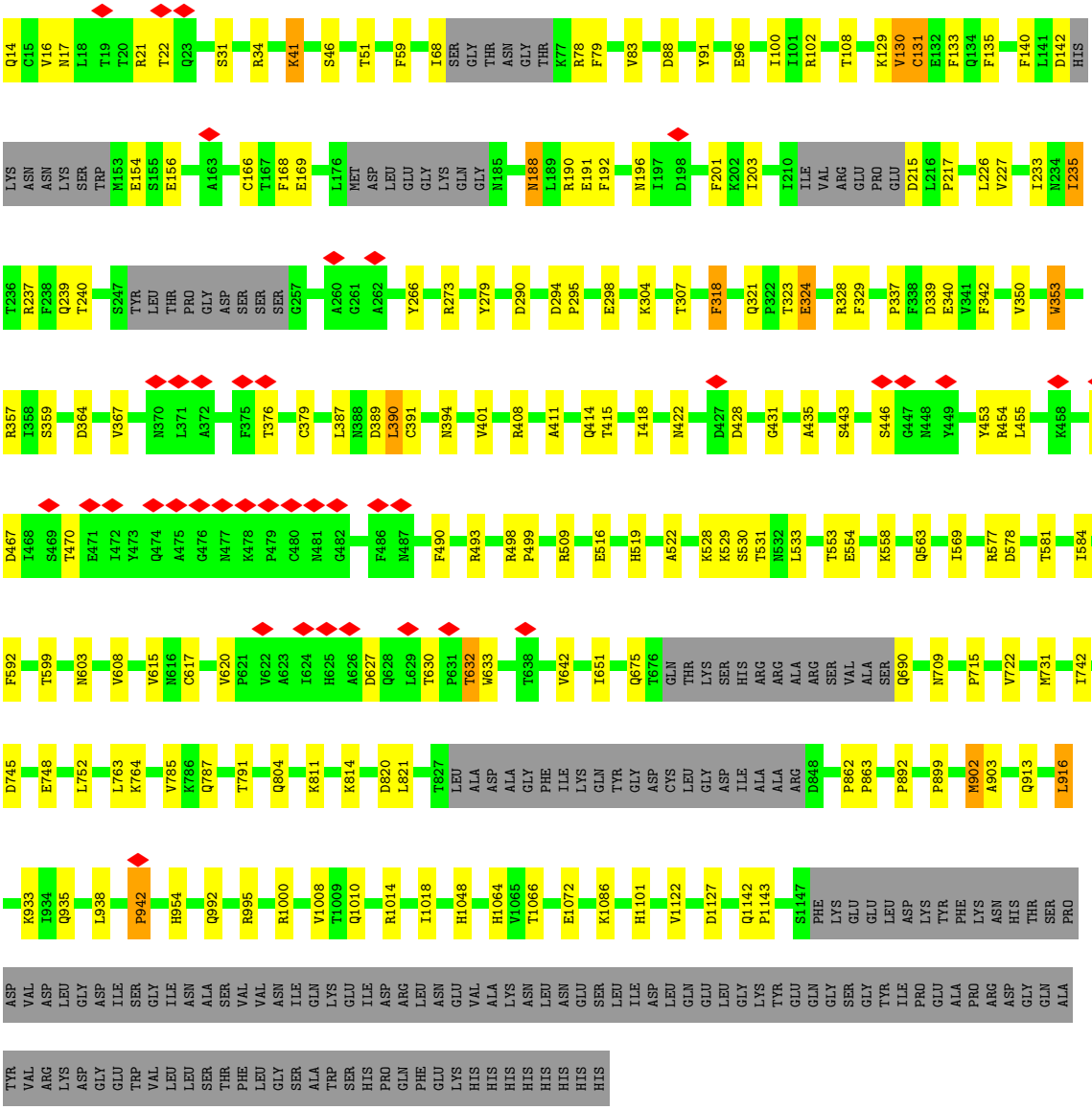
Mol	Chain	Residues	Atoms				AltConf
5	C	1	Total	C	N	O	0
			112	64	8	40	
5	C	1	Total	C	N	O	0
			112	64	8	40	
5	C	1	Total	C	N	O	0
			112	64	8	40	

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 atom inclusion in map 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 diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). 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.

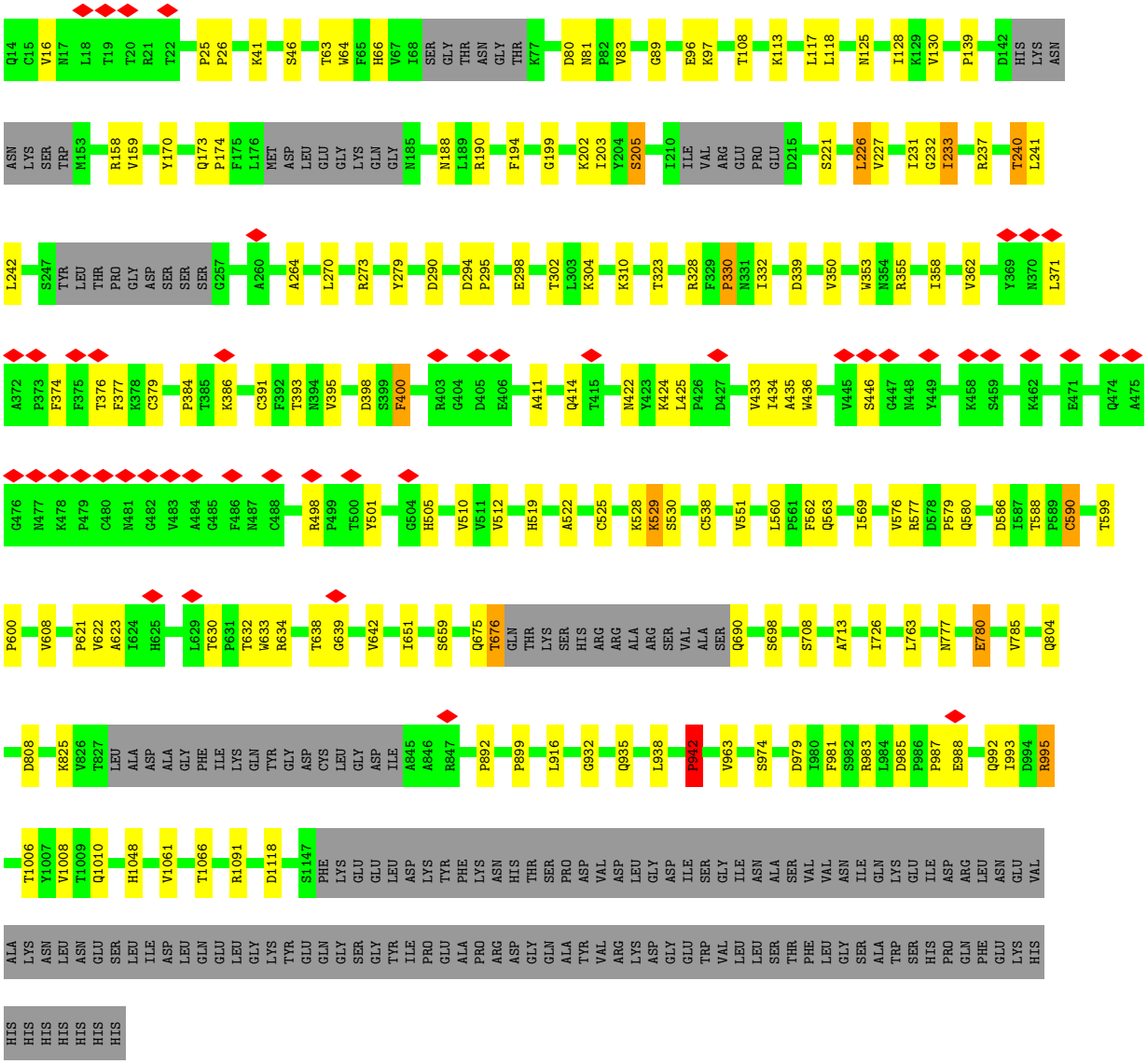
- Molecule 1: Spike glycoprotein

Chain A:



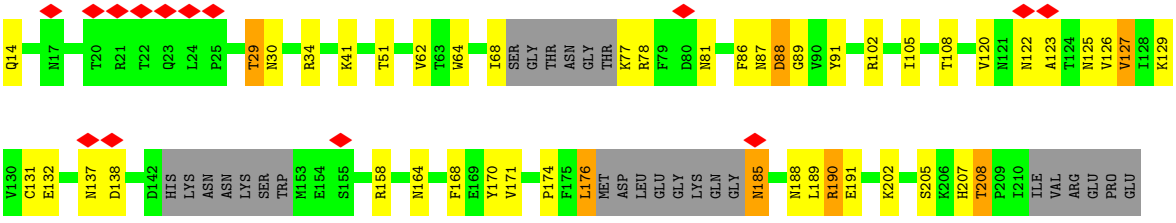
• Molecule 1: Spike glycoprotein

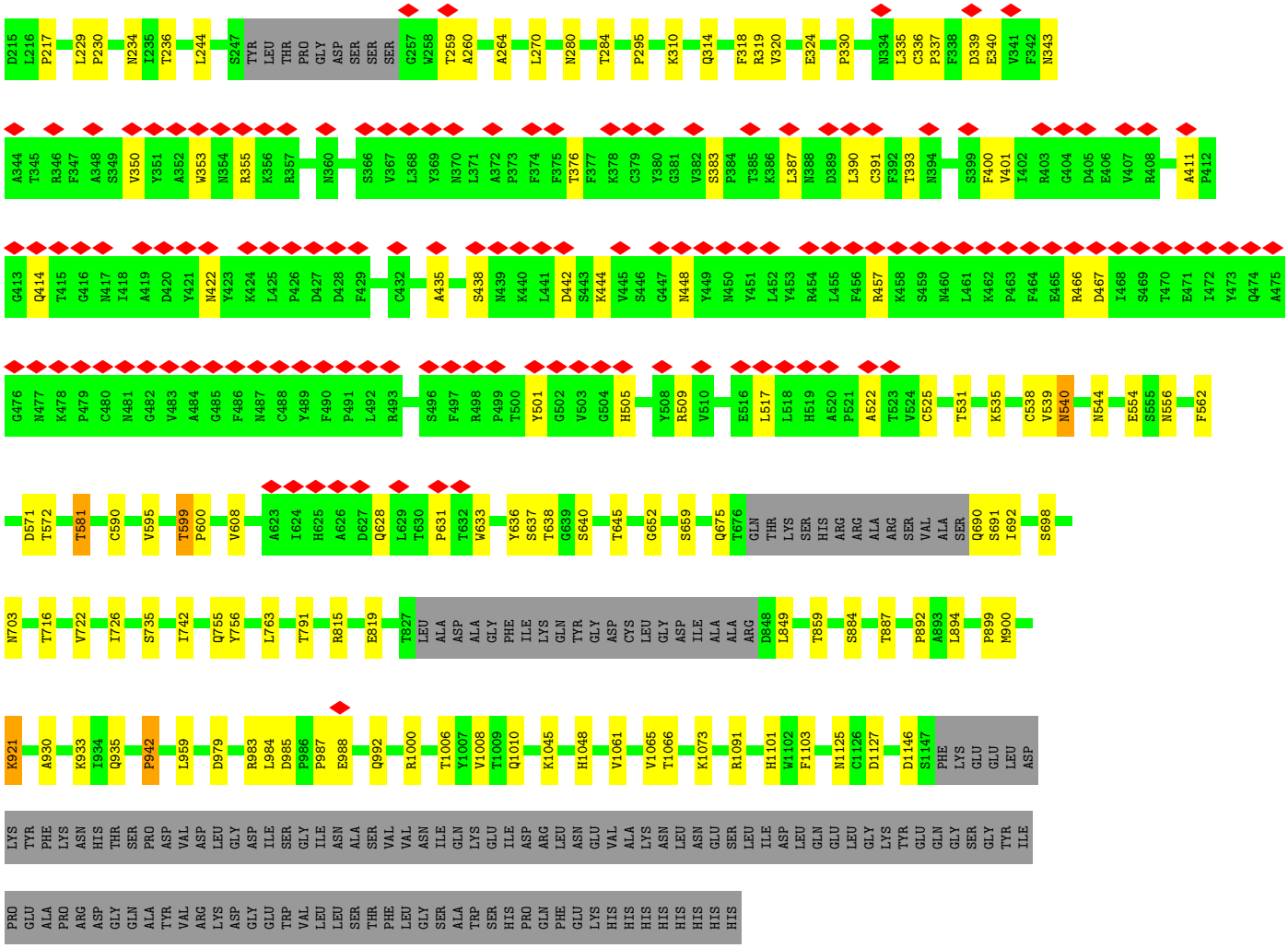
Chain B:



• Molecule 1: Spike glycoprotein

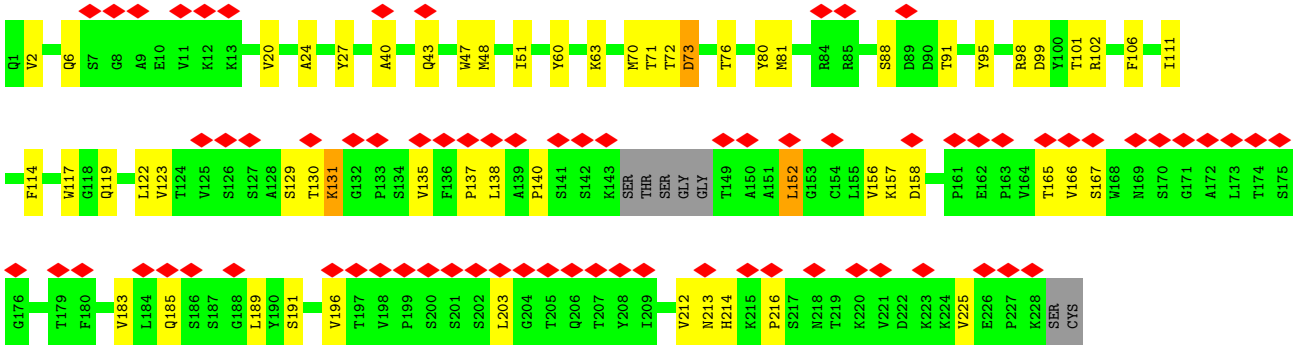
Chain C:





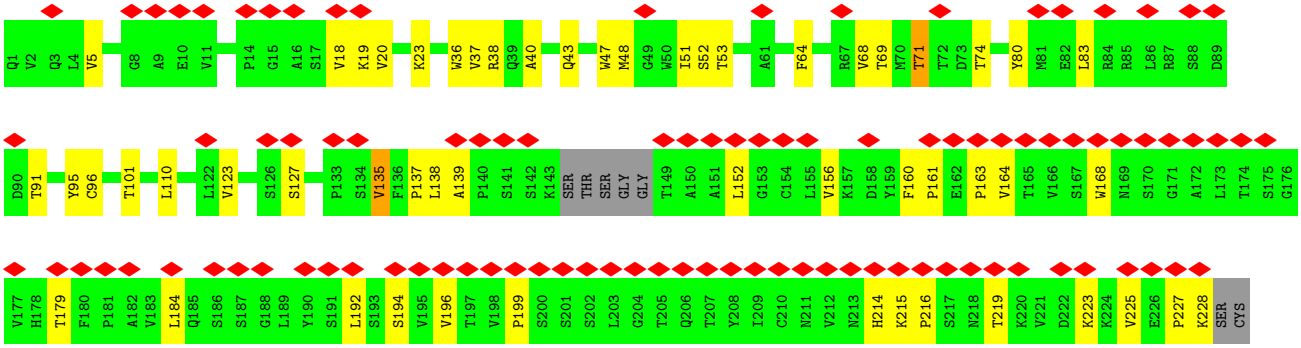
• Molecule 2: S309 Fab heavy chain

Chain H:



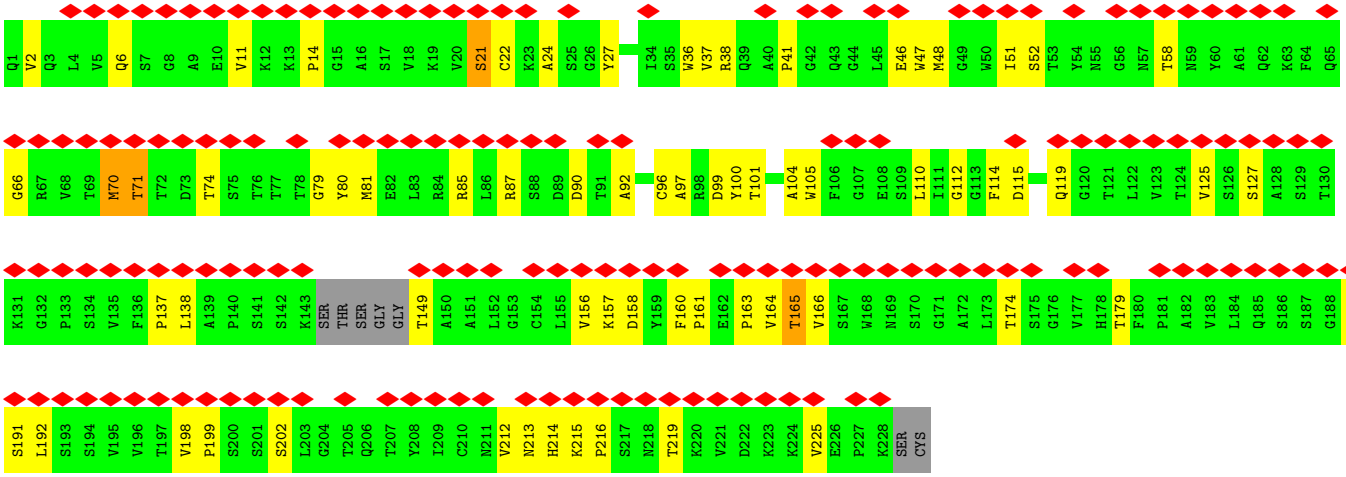
• Molecule 2: S309 Fab heavy chain

Chain M:



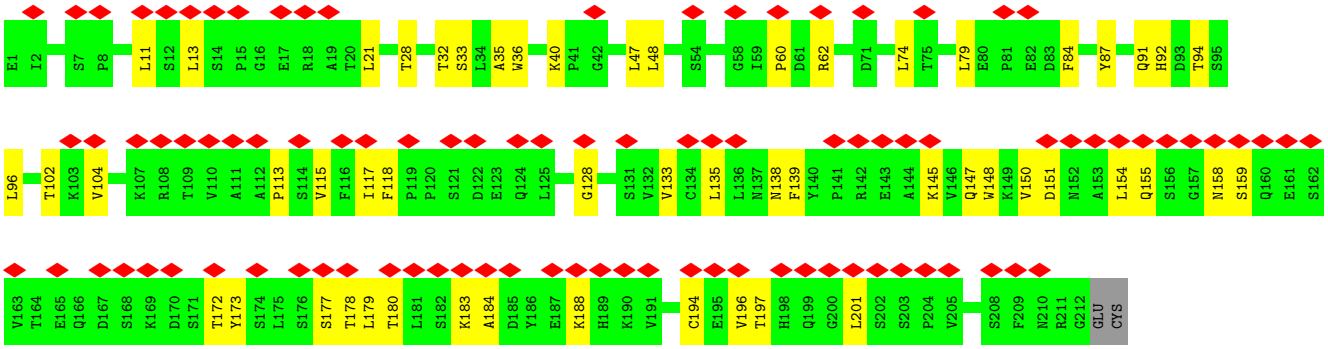
• Molecule 2: S309 Fab heavy chain

Chain O:



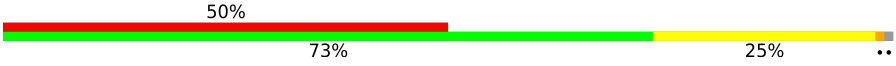
• Molecule 3: S309 fab light chain

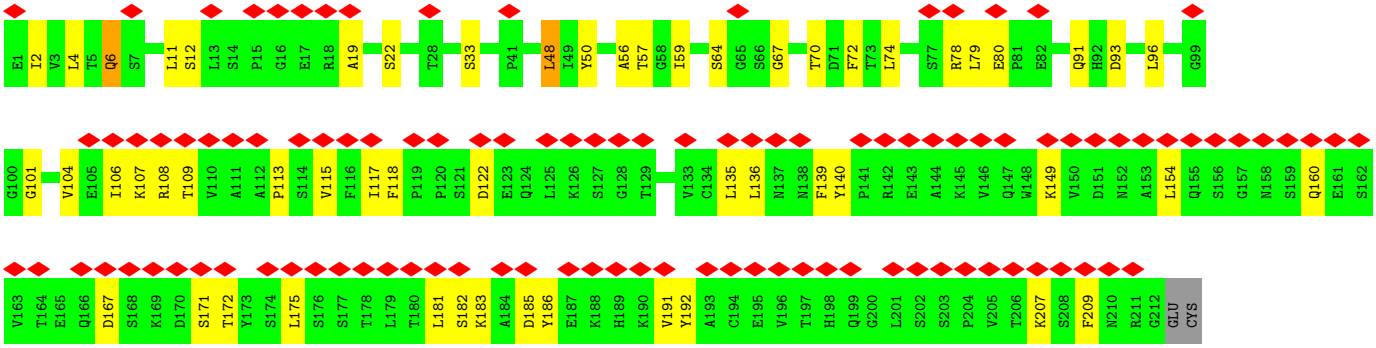
Chain L:



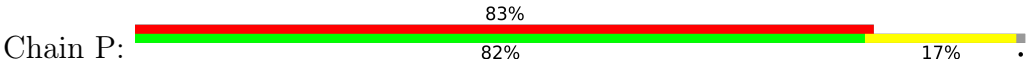
• Molecule 3: S309 fab light chain

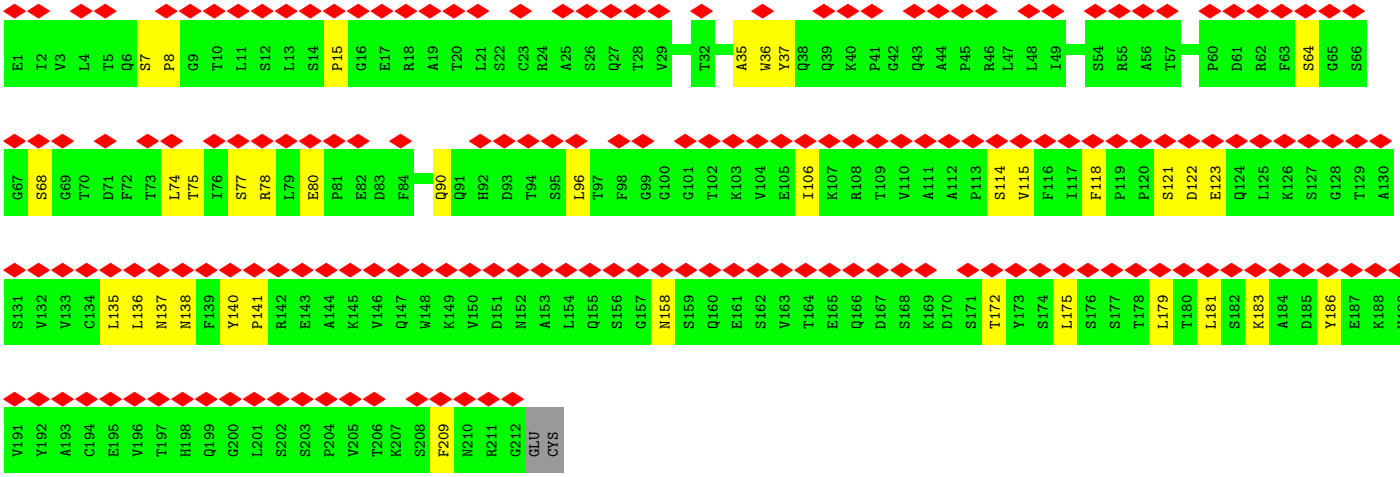
Chain N:





• Molecule 3: S309 fab light chain





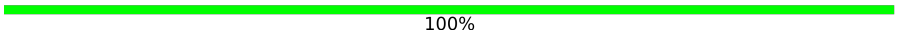
• Molecule 4: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

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

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

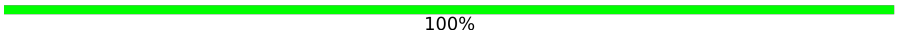
• Molecule 4: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain G:



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

Chain I:

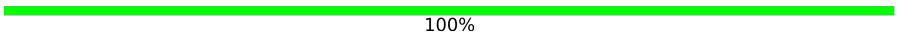


• Molecule 4: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain J:

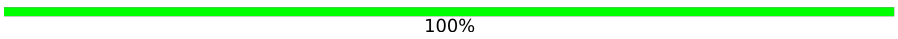
• Molecule 4: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain K:



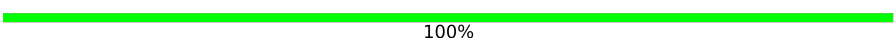
• Molecule 4: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain Q:



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

Chain R:



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

Chain S: 100%

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

Chain T: 100%

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

Chain U: 100%

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

Chain V: 100%

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

Chain W: 100%

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

Chain X: 100%

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

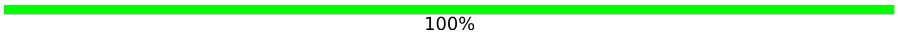
Chain Y: 100%

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

Chain Z:

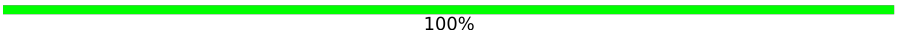
• Molecule 4: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain a:



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

Chain b:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	517940	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	1.39	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	5000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	2.448	Depositor
Minimum map value	-1.165	Depositor
Average map value	-0.001	Depositor
Map value standard deviation	0.052	Depositor
Recommended contour level	0.15	Depositor
Map size (Å)	343.04, 343.04, 343.04	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.67, 0.67, 0.67	Depositor

5 Model quality

5.1 Standard geometry

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	0.26	0/8526	0.49	3/11602 (0.0%)
1	B	0.26	0/8547	0.49	3/11630 (0.0%)
1	C	0.26	0/8526	0.50	3/11602 (0.0%)
2	H	0.25	0/1730	0.48	0/2356
2	M	0.25	0/1730	0.50	0/2356
2	O	0.25	0/1730	0.49	0/2356
3	L	0.25	0/1648	0.50	0/2238
3	N	0.25	0/1648	0.51	0/2238
3	P	0.25	0/1648	0.49	0/2238
All	All	0.26	0/35733	0.49	9/48616 (0.0%)

There are no bond length outliers.

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	892	PRO	N-CA-CB	5.88	110.35	103.30
1	B	892	PRO	N-CA-CB	5.86	110.33	103.30
1	A	892	PRO	N-CA-CB	5.86	110.33	103.30
1	A	942	PRO	N-CA-CB	5.77	110.22	103.30
1	C	942	PRO	N-CA-CB	5.71	110.16	103.30
1	B	942	PRO	N-CA-CB	5.70	110.14	103.30
1	A	899	PRO	N-CA-CB	5.60	110.02	103.30
1	C	899	PRO	N-CA-CB	5.58	109.99	103.30
1	B	899	PRO	N-CA-CB	5.56	109.97	103.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	8330	0	8135	99	0
1	B	8351	0	8158	89	0
1	C	8330	0	8136	104	0
2	H	1688	0	1649	34	0
2	M	1688	0	1649	32	0
2	O	1688	0	1649	45	0
3	L	1615	0	1576	36	0
3	N	1615	0	1576	31	0
3	P	1615	0	1576	19	0
4	D	28	0	25	1	0
4	E	28	0	25	0	0
4	F	28	0	25	0	0
4	G	28	0	25	0	0
4	I	28	0	25	0	0
4	J	28	0	25	1	0
4	K	28	0	25	0	0
4	Q	28	0	25	0	0
4	R	28	0	25	0	0
4	S	28	0	25	0	0
4	T	28	0	25	0	0
4	U	28	0	25	0	0
4	V	28	0	25	0	0
4	W	28	0	25	0	0
4	X	28	0	25	0	0
4	Y	28	0	25	0	0
4	Z	28	0	25	3	0
4	a	28	0	25	0	0
4	b	28	0	25	0	0
5	A	112	0	104	2	0
5	B	126	0	117	3	0
5	C	112	0	104	1	0
All	All	35802	0	34904	466	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 7.

All (466) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:640:SER:HB3	1:C:652:GLY:HA2	1.58	0.85
3:P:115:VAL:HA	3:P:135:LEU:O	1.80	0.81
1:B:676:THR:HA	1:B:690:GLN:N	1.95	0.81
1:B:391:CYS:HA	1:B:525:CYS:HB3	1.61	0.81
1:B:433:VAL:HG22	1:B:512:VAL:HG22	1.65	0.77
1:B:763:LEU:HG	1:B:1008:VAL:HG21	1.70	0.74
1:B:231:ILE:HD12	1:B:233:ILE:H	1.53	0.73
3:P:115:VAL:HG22	3:P:136:LEU:HG	1.71	0.72
2:M:91:THR:HA	2:M:123:VAL:O	1.90	0.71
2:O:165:THR:HG23	2:O:213:ASN:HB3	1.72	0.71
1:C:985:ASP:HB3	1:C:987:PRO:HD2	1.73	0.71
1:B:96:GLU:O	1:B:188:ASN:HB2	1.91	0.71
1:C:126:VAL:HG23	1:C:174:PRO:HA	1.73	0.69
2:M:71:THR:HG23	2:M:80:TYR:HB2	1.74	0.69
3:P:158:ASN:HD22	3:P:181:LEU:HD21	1.57	0.68
1:A:203:ILE:HB	1:A:227:VAL:HB	1.77	0.67
2:O:179:THR:HG23	2:O:192:LEU:HD21	1.76	0.67
2:M:18:VAL:HG22	2:M:83:LEU:HB3	1.76	0.67
3:N:115:VAL:HG22	3:N:136:LEU:HG	1.76	0.67
1:C:631:PRO:HG2	1:C:633:TRP:HE1	1.59	0.66
2:M:5:VAL:HG12	2:M:23:LYS:HB3	1.78	0.65
2:O:24:ALA:HB1	2:O:27:TYR:HE1	1.62	0.65
1:A:804:GLN:NE2	1:A:935:GLN:OE1	2.30	0.64
2:H:40:ALA:HB3	2:H:43:GLN:HB2	1.80	0.64
1:A:490:PHE:O	1:A:493:ARG:NH1	2.30	0.64
1:C:29:THR:HG23	1:C:62:VAL:HG23	1.79	0.64
1:C:984:LEU:HD21	1:C:988:GLU:HB2	1.79	0.64
1:A:731:MET:HE3	1:A:1018:ILE:HG13	1.80	0.64
2:O:97:ALA:HB1	2:O:114:PHE:HB3	1.80	0.63
1:A:328:ARG:NH1	1:A:578:ASP:OD2	2.31	0.63
1:A:903:ALA:HB1	1:A:913:GLN:HG2	1.79	0.63
2:O:66:GLY:O	2:O:85:ARG:NH2	2.32	0.62
1:A:21:ARG:HG2	1:A:79:PHE:HB3	1.80	0.62
1:C:411:ALA:HB3	1:C:414:GLN:HG3	1.81	0.62
1:A:129:LYS:HG3	1:A:169:GLU:HG3	1.81	0.62
1:A:83:VAL:HG11	1:A:237:ARG:HH22	1.64	0.62
1:C:376:THR:HB	1:C:435:ALA:HB3	1.80	0.62
2:O:158:ASP:HA	2:O:189:LEU:HB3	1.82	0.61
1:B:985:ASP:HB2	1:B:987:PRO:HD2	1.82	0.61
1:C:535:LYS:NZ	1:C:554:GLU:OE2	2.33	0.61
2:O:114:PHE:N	3:P:37:TYR:OH	2.34	0.61
3:N:108:ARG:HH21	3:N:109:THR:HG1	1.49	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:519:HIS:CD2	1:B:519:HIS:H	2.18	0.61
1:C:127:VAL:HG12	1:C:171:VAL:HG22	1.83	0.60
3:N:181:LEU:HD21	3:N:185:ASP:HB2	1.84	0.60
3:L:21:LEU:HD13	3:L:74:LEU:HD23	1.83	0.60
1:A:131:CYS:HB3	1:A:166:CYS:HA	1.83	0.60
1:C:310:LYS:HG3	1:C:600:PRO:HA	1.83	0.60
1:A:742:ILE:O	1:A:1000:ARG:NH1	2.32	0.59
1:A:787:GLN:HG2	1:C:703:ASN:HD22	1.67	0.59
2:O:14:PRO:HD2	2:O:127:SER:HB3	1.85	0.59
3:L:115:VAL:HA	3:L:135:LEU:O	2.03	0.59
1:C:185:ASN:N	1:C:185:ASN:HD22	1.99	0.59
1:A:1048:HIS:HA	1:A:1066:THR:HG22	1.85	0.58
1:C:68:ILE:H	1:C:78:ARG:HB2	1.68	0.58
1:A:96:GLU:O	1:A:188:ASN:HB2	2.01	0.58
1:C:540:ASN:OD1	1:C:540:ASN:N	2.30	0.58
1:A:389:ASP:OD1	1:A:389:ASP:N	2.34	0.58
2:O:156:VAL:HG11	2:O:212:VAL:HG11	1.85	0.58
1:A:96:GLU:OE2	1:A:100:ILE:N	2.36	0.57
1:B:414:GLN:O	1:B:424:LYS:NZ	2.37	0.57
1:B:330:PRO:HG3	1:B:579:PRO:HB2	1.85	0.57
2:M:101:THR:O	2:M:110:LEU:N	2.36	0.57
3:L:13:LEU:HD23	3:L:79:LEU:HD12	1.86	0.57
3:L:11:LEU:HD13	3:L:104:VAL:HG22	1.87	0.57
3:L:147:GLN:HG2	3:L:154:LEU:HD22	1.86	0.57
1:B:80:ASP:C	1:B:81:ASN:HD22	2.07	0.57
1:C:189:LEU:HB3	1:C:208:THR:HG23	1.86	0.57
2:O:38:ARG:O	2:O:46:GLU:N	2.37	0.57
1:A:298:GLU:OE1	1:A:633:TRP:NE1	2.38	0.56
2:O:213:ASN:HA	2:O:219:THR:O	2.06	0.56
2:M:135:VAL:HB	2:M:223:LYS:HD2	1.86	0.56
1:C:188:ASN:OD1	1:C:207:HIS:NE2	2.39	0.56
2:O:161:PRO:HG2	2:O:163:PRO:HD2	1.87	0.56
1:B:675:GLN:O	1:B:676:THR:C	2.44	0.56
1:B:1091:ARG:NH1	1:B:1118:ASP:O	2.38	0.56
3:N:48:LEU:HA	3:N:59:ILE:HG13	1.86	0.56
1:A:83:VAL:HG23	1:A:239:GLN:HG2	1.89	0.55
4:D:1:NAG:H83	4:D:1:NAG:H3	1.88	0.55
1:A:715:PRO:HA	1:A:1072:GLU:HA	1.87	0.55
3:N:115:VAL:HA	3:N:135:LEU:O	2.07	0.55
1:C:190:ARG:HD3	1:C:207:HIS:HD2	1.71	0.55
1:C:164:ASN:ND2	5:C:1304:NAG:O7	2.38	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:L:79:LEU:HD13	3:L:84:PHE:HE1	1.71	0.55
1:B:519:HIS:CE1	1:C:41:LYS:H	2.25	0.55
3:P:78:ARG:NH1	3:P:80:GLU:OE2	2.40	0.54
2:M:160:PHE:O	2:M:214:HIS:NE2	2.39	0.54
1:C:88:ASP:N	1:C:88:ASP:OD1	2.35	0.54
2:O:22:CYS:HB2	2:O:36:TRP:HZ2	1.72	0.54
1:B:638:THR:OG1	1:B:639:GLY:N	2.38	0.54
3:N:78:ARG:NH1	3:N:80:GLU:OE2	2.40	0.54
1:B:226:LEU:HD23	1:B:227:VAL:HB	1.88	0.54
2:O:71:THR:HG23	2:O:80:TYR:HB2	1.90	0.54
1:A:359:SER:OG	1:A:394:ASN:OD1	2.25	0.54
1:B:125:ASN:HA	1:B:174:PRO:HD3	1.88	0.54
1:C:108:THR:OG1	1:C:234:ASN:O	2.26	0.54
1:C:763:LEU:HD22	1:C:1008:VAL:HG21	1.89	0.54
2:O:52:SER:OG	2:O:104:ALA:O	2.19	0.54
1:A:233:ILE:HG13	1:A:235:ILE:HG13	1.89	0.53
2:M:37:VAL:HG13	2:M:95:TYR:HB2	1.90	0.53
2:M:137:PRO:HB3	2:M:225:VAL:HG13	1.90	0.53
2:M:168:TRP:NE1	2:M:194:SER:OG	2.40	0.53
3:P:35:ALA:HB3	3:P:90:GLN:NE2	2.23	0.53
1:A:46:SER:HA	1:A:279:TYR:O	2.08	0.53
2:O:6:GLN:O	2:O:119:GLN:NE2	2.41	0.53
1:C:884:SER:OG	1:C:887:THR:OG1	2.26	0.53
3:N:6:GLN:OE1	3:N:101:GLY:N	2.40	0.53
1:C:391:CYS:HA	1:C:525:CYS:HA	1.91	0.53
2:M:152:LEU:HG	2:M:196:VAL:HG23	1.90	0.53
1:B:376:THR:HB	1:B:435:ALA:HB3	1.90	0.53
1:C:401:VAL:HG22	1:C:509:ARG:HG2	1.90	0.53
3:P:64:SER:OG	3:P:75:THR:OG1	2.27	0.53
1:B:83:VAL:HG11	1:B:237:ARG:HE	1.74	0.53
1:B:350:VAL:HG22	1:B:422:ASN:HB3	1.91	0.53
1:A:401:VAL:HG22	1:A:509:ARG:HG2	1.91	0.53
2:H:137:PRO:HB3	2:H:225:VAL:HG22	1.91	0.52
2:M:19:LYS:NZ	2:M:20:VAL:O	2.41	0.52
1:B:529:LYS:HE2	1:B:530:SER:H	1.75	0.52
2:H:135:VAL:HG22	2:H:156:VAL:HG22	1.92	0.52
1:C:1125:ASN:ND2	1:C:1127:ASP:OD1	2.43	0.52
3:P:158:ASN:OD1	3:P:158:ASN:N	2.37	0.52
1:A:453:TYR:HE2	1:A:455:LEU:HD13	1.75	0.52
1:C:77:LYS:HE2	1:C:259:THR:HG23	1.91	0.52
1:A:350:VAL:HG21	1:A:418:ILE:HD12	1.90	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:L:115:VAL:HG21	3:L:196:VAL:HG21	1.91	0.52
1:B:80:ASP:OD1	1:B:80:ASP:N	2.42	0.52
1:C:659:SER:HB3	1:C:698:SER:HB3	1.91	0.52
1:B:108:THR:HB	5:B:1309:NAG:H62	1.91	0.52
1:C:319:ARG:O	1:C:628:GLN:NE2	2.43	0.52
2:H:156:VAL:HG21	2:H:212:VAL:HG21	1.91	0.52
3:L:145:LYS:HB3	3:L:197:THR:HG22	1.91	0.52
1:A:273:ARG:NH1	1:A:290:ASP:OD2	2.43	0.52
3:N:183:LYS:HA	3:N:186:TYR:HB3	1.91	0.52
1:C:438:SER:OG	1:C:442:ASP:OD2	2.20	0.52
1:C:1103:PHE:HZ	4:Z:1:NAG:H62	1.75	0.52
3:N:117:ILE:HG22	3:N:207:LYS:HE2	1.91	0.52
1:A:811:LYS:O	1:A:814:LYS:NZ	2.39	0.52
1:C:599:THR:HB	1:C:608:VAL:HG12	1.92	0.52
3:N:91:GLN:HE21	3:N:93:ASP:HB3	1.75	0.52
1:C:339:ASP:OD1	1:C:343:ASN:ND2	2.44	0.51
1:C:350:VAL:HA	1:C:400:PHE:HB2	1.91	0.51
2:O:137:PRO:HB3	2:O:225:VAL:HG22	1.92	0.51
1:A:226:LEU:HG	1:A:227:VAL:HG23	1.91	0.51
3:L:128:GLY:HA2	3:L:183:LYS:HD3	1.92	0.51
2:M:228:LYS:NZ	3:N:122:ASP:OD1	2.33	0.51
2:H:158:ASP:HA	2:H:189:LEU:HB3	1.91	0.51
2:M:139:ALA:HB1	2:M:227:PRO:HA	1.92	0.51
2:M:214:HIS:CE1	2:M:216:PRO:HD2	2.45	0.51
1:A:68:ILE:HG22	1:A:78:ARG:HB2	1.92	0.51
1:A:323:THR:O	1:A:324:GLU:HG2	2.10	0.51
3:L:118:PHE:HB2	3:L:133:VAL:HG22	1.92	0.51
1:C:735:SER:HG	1:C:859:THR:HG1	1.59	0.51
2:H:24:ALA:HB1	2:H:27:TYR:HE1	1.74	0.50
3:N:106:ILE:O	3:N:140:TYR:OH	2.18	0.50
1:A:599:THR:HB	1:A:608:VAL:HG12	1.94	0.50
1:C:742:ILE:O	1:C:1000:ARG:NH1	2.40	0.50
1:A:519:HIS:HB2	1:B:41:LYS:HD3	1.93	0.50
1:A:563:GLN:O	1:A:577:ARG:NH1	2.44	0.50
2:M:138:LEU:HD22	3:N:118:PHE:HB3	1.93	0.50
1:B:139:PRO:HB3	1:B:159:VAL:HA	1.93	0.50
1:B:621:PRO:O	1:B:623:ALA:N	2.44	0.50
1:C:631:PRO:HG2	1:C:633:TRP:NE1	2.27	0.50
1:C:921:LYS:CD	1:C:921:LYS:H	2.23	0.50
2:O:87:ARG:N	2:O:90:ASP:OD2	2.37	0.50
2:O:70:MET:HG3	2:O:81:MET:HG2	1.94	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:599:THR:HB	1:B:608:VAL:HG12	1.94	0.50
1:A:428:ASP:OD1	1:A:428:ASP:N	2.41	0.50
2:H:138:LEU:HD21	3:L:133:VAL:HG21	1.93	0.50
1:A:462:LYS:HD2	5:B:1309:NAG:H82	1.93	0.49
1:B:205:SER:HB3	1:B:226:LEU:HD13	1.95	0.49
2:H:91:THR:HA	2:H:123:VAL:O	2.12	0.49
2:O:214:HIS:CE1	2:O:216:PRO:HD2	2.47	0.49
1:C:132:GLU:HB2	1:C:164:ASN:HB2	1.93	0.49
2:H:157:LYS:HG3	2:H:191:SER:HB2	1.94	0.49
1:A:748:GLU:O	1:A:752:LEU:HG	2.12	0.49
1:B:501:TYR:HB3	1:B:505:HIS:HB2	1.94	0.49
2:M:37:VAL:HG23	2:M:47:TRP:HA	1.95	0.49
3:N:67:GLY:HA3	3:N:72:PHE:HA	1.94	0.49
1:C:1048:HIS:HA	1:C:1066:THR:HG22	1.94	0.49
1:C:86:PHE:N	1:C:236:THR:O	2.45	0.49
3:N:19:ALA:HB2	3:N:79:LEU:HD11	1.95	0.49
2:H:166:VAL:HG23	2:H:212:VAL:HG22	1.94	0.49
1:A:821:LEU:HD22	1:A:938:LEU:HB3	1.93	0.49
1:B:332:ILE:HG13	1:B:362:VAL:HG22	1.94	0.49
1:B:988:GLU:O	1:B:992:GLN:HG2	2.13	0.49
1:C:185:ASN:N	1:C:185:ASN:ND2	2.61	0.49
1:A:454:ARG:NH2	1:A:467:ASP:O	2.46	0.48
1:C:921:LYS:H	1:C:921:LYS:HD3	1.79	0.48
3:L:113:PRO:HD2	3:L:201:LEU:HD13	1.95	0.48
1:A:129:LYS:HD2	1:A:133:PHE:HZ	1.78	0.48
1:A:342:PHE:HB2	5:A:1305:NAG:H82	1.95	0.48
1:B:562:PHE:HD2	1:C:41:LYS:HD3	1.78	0.48
1:B:659:SER:HB3	1:B:698:SER:HB3	1.95	0.48
3:N:33:SER:O	3:N:33:SER:OG	2.27	0.48
1:B:328:ARG:HH12	1:B:580:GLN:HB2	1.78	0.48
3:N:48:LEU:HD11	3:N:74:LEU:HD11	1.95	0.48
2:H:47:TRP:CE2	3:L:96:LEU:HD12	2.49	0.48
1:C:129:LYS:NZ	1:C:131:CYS:HB2	2.29	0.48
2:M:161:PRO:HD2	2:M:214:HIS:HE1	1.78	0.48
1:C:930:ALA:HA	1:C:933:LYS:HE3	1.96	0.48
2:M:51:ILE:HD12	2:M:52:SER:H	1.79	0.48
1:A:22:THR:O	1:A:78:ARG:NH1	2.46	0.48
1:C:581:THR:O	1:C:581:THR:OG1	2.32	0.48
2:O:100:TYR:HD2	2:O:112:GLY:HA3	1.78	0.48
2:O:115:ASP:OD1	2:O:115:ASP:N	2.38	0.48
2:O:160:PHE:O	2:O:214:HIS:NE2	2.42	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:979:ASP:O	1:B:983:ARG:HB2	2.13	0.47
3:L:91:GLN:NE2	3:L:94:THR:O	2.47	0.47
3:N:149:LYS:HG2	3:N:154:LEU:HD23	1.96	0.47
1:B:117:LEU:HD23	1:B:118:LEU:N	2.29	0.47
1:C:87:ASN:O	1:C:89:GLY:N	2.47	0.47
3:L:35:ALA:HB1	3:L:47:LEU:HD11	1.96	0.47
2:M:40:ALA:HB3	2:M:43:GLN:HB2	1.96	0.47
2:O:90:ASP:HB2	2:O:125:VAL:HG21	1.96	0.47
1:A:443:SER:HB3	1:A:499:PRO:HD3	1.95	0.47
1:C:138:ASP:N	1:C:138:ASP:OD1	2.47	0.47
1:C:168:PHE:CZ	1:C:170:TYR:HB2	2.49	0.47
1:C:637:SER:HB3	1:C:638:THR:HG23	1.96	0.47
1:A:411:ALA:HB3	1:A:414:GLN:HG3	1.97	0.47
1:B:411:ALA:HB3	1:B:414:GLN:HG3	1.95	0.47
1:A:130:VAL:CG1	1:A:168:PHE:HB3	2.45	0.47
1:A:391:CYS:HB3	1:A:522:ALA:HB1	1.96	0.47
1:A:1142:GLN:HG3	1:A:1143:PRO:HD3	1.95	0.47
3:L:158:ASN:OD1	3:L:158:ASN:N	2.47	0.47
2:M:161:PRO:HG2	2:M:163:PRO:HD2	1.95	0.47
1:B:932:GLY:O	1:B:935:GLN:HB3	2.14	0.47
3:L:113:PRO:HB3	3:L:139:PHE:HB3	1.97	0.47
2:O:2:VAL:HG22	2:O:27:TYR:HB3	1.97	0.47
1:C:91:TYR:OH	1:C:191:GLU:OE1	2.24	0.47
1:C:383:SER:HB2	1:C:387:LEU:HD22	1.96	0.47
1:A:615:VAL:HG12	1:A:617:CYS:H	1.80	0.47
1:B:273:ARG:NH1	1:B:290:ASP:OD2	2.46	0.47
1:B:310:LYS:HG3	1:B:600:PRO:HA	1.96	0.46
2:M:38:ARG:HB3	2:M:48:MET:CE	2.45	0.46
2:O:36:TRP:CZ2	2:O:96:CYS:HB2	2.49	0.46
1:B:393:THR:HA	1:B:522:ALA:HA	1.97	0.46
2:H:111:ILE:HG12	3:L:32:THR:HB	1.95	0.46
2:H:157:LYS:HD2	2:H:185:GLN:HE22	1.80	0.46
3:P:15:PRO:HD3	3:P:106:ILE:HG23	1.98	0.46
2:H:95:TYR:HD2	2:H:117:TRP:CE3	2.33	0.46
2:M:38:ARG:HB3	2:M:48:MET:HE1	1.97	0.46
1:A:321:GLN:HB2	1:A:627:ASP:HA	1.96	0.46
1:B:64:TRP:HE1	1:B:264:ALA:HB1	1.80	0.46
1:B:992:GLN:O	1:B:995:ARG:HG2	2.16	0.46
1:C:295:PRO:HG3	1:C:633:TRP:CE3	2.51	0.46
1:C:393:THR:HA	1:C:522:ALA:HA	1.98	0.46
2:H:60:TYR:HE1	2:H:70:MET:HG3	1.80	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:642:VAL:HG22	1:A:651:ILE:HG12	1.97	0.46
1:B:139:PRO:HA	1:B:158:ARG:O	2.15	0.46
2:O:41:PRO:HD3	2:O:92:ALA:HA	1.97	0.46
3:P:35:ALA:HB3	3:P:90:GLN:HE22	1.79	0.46
1:A:578:ASP:HB3	1:A:581:THR:O	2.15	0.46
1:A:91:TYR:OH	1:A:191:GLU:OE2	2.27	0.46
1:C:722:VAL:HG22	1:C:1065:VAL:HG22	1.98	0.46
1:B:128:ILE:HB	1:B:170:TYR:HB3	1.97	0.46
1:C:202:LYS:HE2	1:C:202:LYS:HB3	1.77	0.46
3:L:148:TRP:HE1	3:L:177:SER:HG	1.64	0.46
1:B:199:GLY:HA2	1:B:232:GLY:HA2	1.98	0.46
1:B:569:ILE:HD12	1:C:849:LEU:HD13	1.97	0.46
1:A:108:THR:O	1:A:237:ARG:HD3	2.16	0.45
1:B:377:PHE:HD1	1:B:434:ILE:HG23	1.80	0.45
1:B:1048:HIS:HA	1:B:1066:THR:HG22	1.96	0.45
3:L:33:SER:HA	3:L:92:HIS:CE1	2.51	0.45
3:P:183:LYS:HA	3:P:186:TYR:HB3	1.98	0.45
1:A:814:LYS:HA	1:A:814:LYS:HD3	1.70	0.45
1:A:577:ARG:HG3	1:A:584:ILE:HD13	1.97	0.45
1:C:691:SER:OG	1:C:692:ILE:N	2.49	0.45
3:L:79:LEU:HD23	3:L:79:LEU:HA	1.86	0.45
2:M:184:LEU:O	3:N:160:GLN:NE2	2.50	0.45
3:P:114:SER:HB2	3:P:137:ASN:HB2	1.97	0.45
1:C:501:TYR:HB3	1:C:505:HIS:HB2	1.97	0.45
1:C:1125:ASN:OD1	1:C:1125:ASN:N	2.47	0.45
2:H:152:LEU:HD12	2:H:225:VAL:HB	1.97	0.45
1:B:194:PHE:HD1	1:B:203:ILE:HG12	1.81	0.45
1:C:89:GLY:HA3	1:C:270:LEU:HD12	1.98	0.45
2:H:129:SER:OG	2:H:130:THR:N	2.50	0.45
3:N:167:ASP:HB2	3:N:172:THR:H	1.80	0.45
3:P:138:ASN:HB3	3:P:172:THR:HG21	1.98	0.45
1:A:329:PHE:HB2	1:A:530:SER:HB2	1.99	0.45
3:L:40:LYS:HB2	3:L:40:LYS:HE2	1.73	0.45
2:M:215:LYS:HB2	2:M:216:PRO:HD3	1.98	0.45
3:N:192:TYR:HB2	3:N:209:PHE:CE1	2.51	0.45
1:A:16:VAL:HG23	1:A:140:PHE:HZ	1.82	0.45
1:A:387:LEU:HB3	1:A:390:LEU:HD21	1.99	0.45
1:A:1086:LYS:HD2	1:A:1122:VAL:HG11	1.99	0.45
2:H:99:ASP:OD1	2:H:101:THR:OG1	2.31	0.45
2:O:215:LYS:HB2	2:O:216:PRO:HD3	1.99	0.45
1:A:215:ASP:N	1:A:215:ASP:OD1	2.49	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:446:SER:O	1:A:498:ARG:NH2	2.49	0.45
1:B:676:THR:CA	1:B:690:GLN:N	2.74	0.45
1:C:457:ARG:NH2	1:C:467:ASP:OD2	2.41	0.45
2:H:71:THR:HG23	2:H:80:TYR:HB2	1.98	0.45
1:A:376:THR:HB	1:A:435:ALA:HB3	1.97	0.45
1:C:34:ARG:NH1	1:C:217:PRO:O	2.50	0.45
1:C:64:TRP:HE1	1:C:264:ALA:HB1	1.82	0.45
1:C:517:LEU:HD12	1:C:517:LEU:HA	1.86	0.45
1:C:595:VAL:HG11	1:C:633:TRP:HH2	1.81	0.45
2:H:73:ASP:OD2	2:H:76:THR:OG1	2.29	0.45
2:O:14:PRO:HG3	2:O:125:VAL:HG12	2.00	0.45
2:O:22:CYS:HB2	2:O:36:TRP:CZ2	2.51	0.45
2:O:138:LEU:HB3	3:P:118:PHE:CD2	2.52	0.45
3:P:136:LEU:HB2	3:P:175:LEU:HB3	1.97	0.45
1:A:142:ASP:HB2	1:A:156:GLU:HB2	1.98	0.44
1:A:764:LYS:HB3	1:A:764:LYS:HE2	1.67	0.44
1:A:992:GLN:HE22	1:A:995:ARG:HH21	1.65	0.44
3:P:7:SER:HA	3:P:8:PRO:HA	1.80	0.44
1:B:16:VAL:HG13	1:B:158:ARG:NE	2.32	0.44
1:B:96:GLU:OE1	1:B:190:ARG:NH1	2.46	0.44
1:C:14:GLN:OE1	1:C:158:ARG:NE	2.41	0.44
2:O:37:VAL:HG13	2:O:47:TRP:HA	1.99	0.44
2:O:157:LYS:HG3	2:O:191:SER:HB2	1.98	0.44
1:A:196:ASN:OD1	1:A:201:PHE:HD1	2.00	0.44
1:A:933:LYS:HB2	1:A:933:LYS:HE2	1.78	0.44
1:B:538:CYS:HB2	1:B:590:CYS:HB3	1.58	0.44
1:B:632:THR:HA	1:B:634:ARG:NH1	2.32	0.44
3:L:172:THR:OG1	3:L:173:TYR:N	2.51	0.44
1:A:1101:HIS:ND1	4:J:1:NAG:H5	2.33	0.44
1:B:1006:THR:O	1:B:1010:GLN:HG2	2.18	0.44
1:C:137:ASN:OD1	1:C:137:ASN:N	2.48	0.44
2:H:51:ILE:HD13	2:H:72:THR:HG23	2.00	0.44
3:P:121:SER:OG	3:P:123:GLU:OE1	2.36	0.44
2:O:161:PRO:HD2	2:O:216:PRO:HG2	2.00	0.44
1:A:34:ARG:NH1	1:A:217:PRO:O	2.50	0.44
1:A:394:ASN:ND2	1:A:516:GLU:OE1	2.37	0.44
1:C:353:TRP:HZ3	1:C:355:ARG:HB2	1.83	0.44
1:C:716:THR:HG21	1:C:1073:LYS:HD2	2.00	0.44
3:L:138:ASN:HB3	3:L:172:THR:HG21	2.00	0.44
2:M:156:VAL:HG22	2:M:192:LEU:HB3	1.98	0.44
1:C:350:VAL:HG22	1:C:422:ASN:HB3	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:95:TYR:HD2	2:H:117:TRP:HE3	1.64	0.44
2:M:179:THR:HG23	2:M:192:LEU:HD21	2.00	0.44
2:O:149:THR:OG1	2:O:198:VAL:O	2.34	0.44
3:P:36:TRP:CD1	3:P:74:LEU:HD13	2.52	0.44
1:A:129:LYS:HD3	1:A:166:CYS:SG	2.58	0.43
1:C:1127:ASP:OD1	1:C:1127:ASP:N	2.51	0.43
2:H:20:VAL:HG12	2:H:81:MET:HB3	2.00	0.43
1:B:630:THR:O	1:B:632:THR:N	2.47	0.43
1:C:29:THR:OG1	1:C:30:ASN:N	2.51	0.43
2:H:165:THR:OG1	2:H:213:ASN:HB3	2.19	0.43
1:A:294:ASP:OD1	1:A:294:ASP:N	2.52	0.43
1:B:97:LYS:HB3	1:B:97:LYS:HE2	1.85	0.43
1:C:988:GLU:O	1:C:992:GLN:HG2	2.18	0.43
3:N:12:SER:HB3	3:N:107:LYS:HB2	2.01	0.43
1:A:188:ASN:OD1	1:A:190:ARG:NH2	2.51	0.43
1:B:713:ALA:HB3	1:C:894:LEU:HB3	2.00	0.43
1:B:726:ILE:HG13	1:B:1061:VAL:HG22	2.01	0.43
1:B:777:ASN:O	1:B:780:GLU:HG3	2.19	0.43
2:H:2:VAL:HG21	2:H:98:ARG:HH21	1.83	0.43
3:N:181:LEU:HD23	3:N:182:SER:O	2.18	0.43
2:O:24:ALA:HB1	2:O:27:TYR:CE1	2.49	0.43
1:A:675:GLN:O	1:A:690:GLN:HA	2.19	0.43
1:B:298:GLU:O	1:B:302:THR:OG1	2.26	0.43
1:C:330:PRO:HD3	1:C:544:ASN:HD21	1.83	0.43
2:M:64:PHE:O	2:M:68:VAL:HG12	2.19	0.43
1:B:400:PHE:CE1	1:B:510:VAL:HB	2.54	0.43
1:A:17:ASN:HB3	5:A:1301:NAG:HN2	1.83	0.43
1:A:529:LYS:HB2	1:A:529:LYS:HE2	1.69	0.43
1:B:25:PRO:HA	1:B:26:PRO:HD3	1.94	0.43
1:C:280:ASN:OD1	1:C:284:THR:OG1	2.27	0.43
2:H:129:SER:H	2:H:131:LYS:HZ2	1.67	0.43
3:L:36:TRP:HD1	3:L:48:LEU:HD12	1.84	0.43
3:L:184:ALA:O	3:L:188:LYS:HG3	2.19	0.43
2:O:21:SER:HA	2:O:79:GLY:O	2.19	0.43
1:A:102:ARG:NH2	1:A:154:GLU:OE1	2.52	0.42
1:A:722:VAL:HA	1:A:1064:HIS:O	2.19	0.42
1:C:815:ARG:HD2	1:C:819:GLU:HB3	2.01	0.42
1:A:367:VAL:O	1:A:367:VAL:HG23	2.18	0.42
1:B:89:GLY:HA3	1:B:270:LEU:HD12	2.00	0.42
2:O:6:GLN:HE21	2:O:6:GLN:HB3	1.69	0.42
2:O:36:TRP:NE1	2:O:96:CYS:SG	2.92	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:129:LYS:HD2	1:A:133:PHE:CZ	2.54	0.42
1:A:938:LEU:HD23	1:A:938:LEU:HA	1.91	0.42
1:B:81:ASN:HD21	1:B:242:LEU:HD11	1.83	0.42
1:B:642:VAL:HG22	1:B:651:ILE:HG12	2.00	0.42
1:B:825:LYS:NZ	1:B:942:PRO:HA	2.34	0.42
1:C:229:LEU:HA	1:C:230:PRO:HD3	1.92	0.42
1:C:324:GLU:O	1:C:539:VAL:HG23	2.19	0.42
2:H:114:PHE:HB2	2:H:117:TRP:HE1	1.84	0.42
3:L:159:SER:HA	3:L:178:THR:O	2.20	0.42
1:A:295:PRO:HG3	1:A:633:TRP:CE3	2.55	0.42
1:C:1103:PHE:CZ	4:Z:1:NAG:H62	2.54	0.42
2:H:214:HIS:ND1	2:H:216:PRO:HD2	2.34	0.42
1:C:335:LEU:HD23	1:C:336:CYS:H	1.85	0.42
3:L:148:TRP:CE2	3:L:179:LEU:HB2	2.54	0.42
3:L:148:TRP:CD1	3:L:179:LEU:HD13	2.54	0.42
3:N:113:PRO:HB3	3:N:139:PHE:HB3	2.01	0.42
1:B:46:SER:HA	1:B:279:TYR:O	2.19	0.42
1:B:339:ASP:OD1	1:B:339:ASP:N	2.50	0.42
1:B:938:LEU:HD23	1:B:938:LEU:HA	1.84	0.42
1:C:337:PRO:HB3	2:O:105:TRP:CG	2.54	0.42
1:C:979:ASP:O	1:C:983:ARG:HB2	2.19	0.42
1:A:318:PHE:O	1:A:592:PHE:HA	2.18	0.42
1:A:350:VAL:O	1:A:353:TRP:HD1	2.01	0.42
1:A:415:THR:HG21	1:B:386:LYS:HD2	2.02	0.42
2:H:152:LEU:HD23	2:H:196:VAL:HG23	2.02	0.42
3:N:136:LEU:HB2	3:N:175:LEU:HB3	2.00	0.42
3:N:171:SER:O	3:N:171:SER:OG	2.35	0.42
1:B:358:ILE:HB	1:B:395:VAL:HB	2.02	0.42
3:L:87:TYR:HB2	3:L:102:THR:HB	2.02	0.42
1:A:31:SER:O	1:A:59:PHE:HA	2.20	0.42
1:A:190:ARG:HB3	1:A:192:PHE:CE1	2.55	0.42
1:B:804:GLN:NE2	1:B:935:GLN:OE1	2.42	0.42
1:C:123:ALA:HA	1:C:176:LEU:HD21	2.02	0.42
1:C:244:LEU:HD12	1:C:260:ALA:HB2	2.01	0.42
1:C:340:GLU:HA	2:O:110:LEU:HD21	2.01	0.42
1:C:1006:THR:O	1:C:1010:GLN:HG2	2.19	0.42
2:H:140:PRO:HA	3:L:118:PHE:HE2	1.84	0.42
1:A:418:ILE:HA	1:A:422:ASN:HB2	2.02	0.42
1:B:294:ASP:OD1	1:B:294:ASP:N	2.51	0.42
1:C:102:ARG:HD2	1:C:122:ASN:HA	2.02	0.41
1:C:355:ARG:H	1:C:466:ARG:HH22	1.69	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:446:SER:O	1:B:498:ARG:NH2	2.53	0.41
1:B:569:ILE:H	1:B:569:ILE:HG12	1.72	0.41
1:C:538:CYS:HB2	1:C:590:CYS:HB3	1.64	0.41
2:O:51:ILE:HB	2:O:58:THR:HG23	2.01	0.41
1:B:379:CYS:SG	1:B:384:PRO:HG3	2.60	0.41
1:B:563:GLN:O	1:B:577:ARG:NH1	2.53	0.41
2:H:138:LEU:HD12	2:H:138:LEU:HA	1.89	0.41
3:N:11:LEU:HB2	3:N:104:VAL:HG22	2.02	0.41
1:C:444:LYS:HB2	1:C:448:ASN:HB2	2.02	0.41
1:C:726:ILE:HG13	1:C:1061:VAL:HG22	2.03	0.41
3:L:117:ILE:HD12	3:L:194:CYS:HB2	2.01	0.41
2:O:99:ASP:OD1	2:O:101:THR:OG1	2.36	0.41
1:B:295:PRO:HG3	1:B:633:TRP:CE3	2.55	0.41
1:A:902:MET:HB3	1:A:916:LEU:HD11	2.03	0.41
1:C:125:ASN:OD1	1:C:125:ASN:N	2.54	0.41
1:C:190:ARG:HD3	1:C:207:HIS:CD2	2.53	0.41
3:N:2:ILE:HD12	3:N:91:GLN:NE2	2.36	0.41
1:A:41:LYS:HG3	1:C:562:PHE:HD2	1.85	0.41
1:C:755:GLN:HG2	1:C:755:GLN:O	2.21	0.41
1:A:41:LYS:HG3	1:C:562:PHE:CD2	2.55	0.41
1:A:133:PHE:HB2	1:A:135:PHE:CE2	2.56	0.41
1:A:201:PHE:HE2	1:A:203:ILE:HD11	1.85	0.41
1:A:379:CYS:SG	1:A:431:GLY:O	2.79	0.41
1:A:630:THR:O	1:A:632:THR:N	2.40	0.41
1:B:355:ARG:NH2	1:B:398:ASP:OD2	2.48	0.41
1:B:528:LYS:HB2	1:B:528:LYS:HE3	1.81	0.41
2:H:6:GLN:O	2:H:119:GLN:NE2	2.54	0.41
2:H:6:GLN:H	2:H:119:GLN:HG2	1.86	0.41
2:H:106:PHE:CD1	2:H:106:PHE:N	2.87	0.41
3:L:11:LEU:HB2	3:L:104:VAL:HG13	2.03	0.41
2:M:47:TRP:CE3	3:N:96:LEU:HB3	2.55	0.41
2:O:199:PRO:HG2	2:O:202:SER:HB2	2.03	0.41
3:L:150:VAL:HG12	3:L:155:GLN:OE1	2.21	0.41
2:M:51:ILE:HD12	2:M:52:SER:N	2.36	0.41
3:P:140:TYR:CG	3:P:141:PRO:HA	2.56	0.41
1:C:120:VAL:HB	1:C:127:VAL:HG23	2.03	0.40
3:L:60:PRO:HB2	3:L:62:ARG:HG2	2.02	0.40
1:A:862:PRO:HA	1:A:863:PRO:HD3	2.00	0.40
1:B:425:LEU:HD23	1:B:425:LEU:HA	1.90	0.40
1:C:1101:HIS:ND1	4:Z:1:NAG:H5	2.37	0.40
3:L:36:TRP:NE1	3:L:74:LEU:HD22	2.36	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:M:36:TRP:CH2	2:M:96:CYS:HB2	2.56	0.40
2:M:139:ALA:HB3	2:M:228:LYS:HG2	2.02	0.40
1:B:240:THR:OG1	1:B:241:LEU:N	2.55	0.40
1:B:353:TRP:HB3	1:B:400:PHE:HB3	2.03	0.40
1:C:340:GLU:OE2	2:O:105:TRP:N	2.34	0.40
1:A:569:ILE:HD13	1:B:963:VAL:HG11	2.04	0.40
1:B:371:LEU:HD21	5:B:1307:NAG:HN2	1.86	0.40
1:B:981:PHE:CZ	1:B:993:ILE:HG13	2.56	0.40
1:C:959:LEU:HD23	1:C:959:LEU:HA	1.90	0.40
3:N:50:TYR:HE1	3:N:56:ALA:HA	1.86	0.40
1:A:339:ASP:OD1	1:A:340:GLU:N	2.54	0.40
1:A:470:THR:H	1:B:113:LYS:NZ	2.19	0.40
1:A:763:LEU:HD22	1:A:1008:VAL:HG21	2.03	0.40
3:N:4:LEU:HD23	3:N:4:LEU:HA	1.95	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 PDB entries followed by that with respect to all EM entries.

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	1046/1240 (84%)	986 (94%)	57 (5%)	3 (0%)	41	61
1	B	1049/1240 (85%)	1003 (96%)	43 (4%)	3 (0%)	41	61
1	C	1046/1240 (84%)	990 (95%)	55 (5%)	1 (0%)	51	73
2	H	219/230 (95%)	213 (97%)	6 (3%)	0	100	100
2	M	219/230 (95%)	210 (96%)	9 (4%)	0	100	100
2	O	219/230 (95%)	211 (96%)	8 (4%)	0	100	100
3	L	210/214 (98%)	194 (92%)	16 (8%)	0	100	100
3	N	210/214 (98%)	195 (93%)	15 (7%)	0	100	100
3	P	210/214 (98%)	195 (93%)	15 (7%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	4428/5052 (88%)	4197 (95%)	224 (5%)	7 (0%)	50 68

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	330	PRO
1	C	942	PRO
1	A	235	ILE
1	A	942	PRO
1	A	324	GLU
1	B	942	PRO
1	B	622	VAL

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 PDB entries followed by that with respect to all EM entries.

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	930/1084 (86%)	891 (96%)	39 (4%)	30 54
1	B	931/1084 (86%)	901 (97%)	30 (3%)	39 65
1	C	930/1084 (86%)	896 (96%)	34 (4%)	34 60
2	H	187/192 (97%)	176 (94%)	11 (6%)	19 37
2	M	187/192 (97%)	178 (95%)	9 (5%)	25 48
2	O	187/192 (97%)	177 (95%)	10 (5%)	22 43
3	L	183/185 (99%)	180 (98%)	3 (2%)	62 84
3	N	183/185 (99%)	176 (96%)	7 (4%)	33 58
3	P	183/185 (99%)	177 (97%)	6 (3%)	38 64
All	All	3901/4383 (89%)	3752 (96%)	149 (4%)	36 58

All (149) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	14	GLN

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Mol	Chain	Res	Type
1	A	41	LYS
1	A	51	THR
1	A	88	ASP
1	A	130	VAL
1	A	131	CYS
1	A	188	ASN
1	A	240	THR
1	A	266	TYR
1	A	304	LYS
1	A	307	THR
1	A	318	PHE
1	A	337	PRO
1	A	353	TRP
1	A	357	ARG
1	A	364	ASP
1	A	390	LEU
1	A	408	ARG
1	A	528	LYS
1	A	531	THR
1	A	533	LEU
1	A	553	THR
1	A	554	GLU
1	A	558	LYS
1	A	588	THR
1	A	603	ASN
1	A	620	VAL
1	A	632	THR
1	A	709	ASN
1	A	745	ASP
1	A	785	VAL
1	A	791	THR
1	A	820	ASP
1	A	902	MET
1	A	916	LEU
1	A	954	HIS
1	A	1010	GLN
1	A	1014	ARG
1	A	1127	ASP
1	B	63	THR
1	B	66	HIS
1	B	130	VAL
1	B	173	GLN

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Mol	Chain	Res	Type
1	B	202	LYS
1	B	205	SER
1	B	221	SER
1	B	226	LEU
1	B	233	ILE
1	B	240	THR
1	B	304	LYS
1	B	323	THR
1	B	374	PHE
1	B	400	PHE
1	B	436	TRP
1	B	529	LYS
1	B	551	VAL
1	B	560	LEU
1	B	576	VAL
1	B	586	ASP
1	B	588	THR
1	B	590	CYS
1	B	676	THR
1	B	708	SER
1	B	780	GLU
1	B	785	VAL
1	B	808	ASP
1	B	916	LEU
1	B	974	SER
1	B	995	ARG
1	C	29	THR
1	C	51	THR
1	C	81	ASN
1	C	88	ASP
1	C	105	ILE
1	C	127	VAL
1	C	176	LEU
1	C	185	ASN
1	C	190	ARG
1	C	205	SER
1	C	208	THR
1	C	314	GLN
1	C	318	PHE
1	C	320	VAL
1	C	390	LEU
1	C	531	THR

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Mol	Chain	Res	Type
1	C	540	ASN
1	C	556	ASN
1	C	571	ASP
1	C	572	THR
1	C	581	THR
1	C	599	THR
1	C	636	TYR
1	C	645	THR
1	C	675	GLN
1	C	690	GLN
1	C	756	TYR
1	C	791	THR
1	C	900	MET
1	C	921	LYS
1	C	935	GLN
1	C	1045	LYS
1	C	1091	ARG
1	C	1146	ASP
2	H	48	MET
2	H	63	LYS
2	H	73	ASP
2	H	88	SER
2	H	102	ARG
2	H	122	LEU
2	H	131	LYS
2	H	152	LEU
2	H	167	SER
2	H	183	VAL
2	H	203	LEU
3	L	28	THR
3	L	151	ASP
3	L	180	THR
2	M	53	THR
2	M	69	THR
2	M	71	THR
2	M	74	THR
2	M	127	SER
2	M	135	VAL
2	M	164	VAL
2	M	199	PRO
2	M	219	THR
3	N	6	GLN

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Mol	Chain	Res	Type
3	N	22	SER
3	N	48	LEU
3	N	57	THR
3	N	64	SER
3	N	70	THR
3	N	191	VAL
2	O	11	VAL
2	O	21	SER
2	O	48	MET
2	O	70	MET
2	O	71	THR
2	O	74	THR
2	O	164	VAL
2	O	165	THR
2	O	166	VAL
2	O	174	THR
3	P	68	SER
3	P	77	SER
3	P	96	LEU
3	P	122	ASP
3	P	179	LEU
3	P	209	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	81	ASN
1	B	519	HIS
1	C	628	GLN
1	C	675	GLN

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 (i)

38 monosaccharides are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
4	NAG	D	1	1,4	14,14,15	0.35	0	17,19,21	1.28	2 (11%)
4	NAG	D	2	4	14,14,15	0.22	0	17,19,21	0.47	0
4	NAG	E	1	1,4	14,14,15	0.22	0	17,19,21	0.44	0
4	NAG	E	2	4	14,14,15	0.24	0	17,19,21	0.42	0
4	NAG	F	1	1,4	14,14,15	0.56	0	17,19,21	0.72	1 (5%)
4	NAG	F	2	4	14,14,15	0.30	0	17,19,21	0.41	0
4	NAG	G	1	1,4	14,14,15	0.24	0	17,19,21	0.46	0
4	NAG	G	2	4	14,14,15	0.25	0	17,19,21	0.51	0
4	NAG	I	1	1,4	14,14,15	0.28	0	17,19,21	0.45	0
4	NAG	I	2	4	14,14,15	0.24	0	17,19,21	0.40	0
4	NAG	J	1	1,4	14,14,15	0.24	0	17,19,21	0.44	0
4	NAG	J	2	4	14,14,15	0.22	0	17,19,21	0.41	0
4	NAG	K	1	1,4	14,14,15	0.24	0	17,19,21	0.43	0
4	NAG	K	2	4	14,14,15	0.20	0	17,19,21	0.44	0
4	NAG	Q	1	1,4	14,14,15	0.37	0	17,19,21	0.46	0
4	NAG	Q	2	4	14,14,15	0.27	0	17,19,21	0.43	0
4	NAG	R	1	1,4	14,14,15	0.20	0	17,19,21	0.46	0
4	NAG	R	2	4	14,14,15	0.25	0	17,19,21	0.43	0
4	NAG	S	1	1,4	14,14,15	0.28	0	17,19,21	0.62	0
4	NAG	S	2	4	14,14,15	0.23	0	17,19,21	0.42	0
4	NAG	T	1	1,4	14,14,15	0.20	0	17,19,21	0.46	0
4	NAG	T	2	4	14,14,15	0.22	0	17,19,21	0.43	0
4	NAG	U	1	1,4	14,14,15	0.23	0	17,19,21	0.53	0
4	NAG	U	2	4	14,14,15	0.22	0	17,19,21	0.42	0
4	NAG	V	1	1,4	14,14,15	0.20	0	17,19,21	0.42	0
4	NAG	V	2	4	14,14,15	0.23	0	17,19,21	0.39	0
4	NAG	W	1	1,4	14,14,15	0.21	0	17,19,21	0.45	0
4	NAG	W	2	4	14,14,15	0.21	0	17,19,21	0.42	0
4	NAG	X	1	1,4	14,14,15	0.31	0	17,19,21	0.57	0
4	NAG	X	2	4	14,14,15	0.24	0	17,19,21	0.44	0
4	NAG	Y	1	1,4	14,14,15	0.25	0	17,19,21	0.49	0
4	NAG	Y	2	4	14,14,15	0.24	0	17,19,21	0.42	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
4	NAG	Z	1	1,4	14,14,15	0.21	0	17,19,21	0.43	0
4	NAG	Z	2	4	14,14,15	0.25	0	17,19,21	0.39	0
4	NAG	a	1	1,4	14,14,15	0.27	0	17,19,21	0.53	0
4	NAG	a	2	4	14,14,15	0.27	0	17,19,21	0.51	0
4	NAG	b	1	1,4	14,14,15	0.17	0	17,19,21	0.37	0
4	NAG	b	2	4	14,14,15	0.27	0	17,19,21	0.43	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
4	NAG	D	1	1,4	-	5/6/23/26	0/1/1/1
4	NAG	D	2	4	-	0/6/23/26	0/1/1/1
4	NAG	E	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	E	2	4	-	2/6/23/26	0/1/1/1
4	NAG	F	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	F	2	4	-	1/6/23/26	0/1/1/1
4	NAG	G	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	G	2	4	-	1/6/23/26	0/1/1/1
4	NAG	I	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	I	2	4	-	2/6/23/26	0/1/1/1
4	NAG	J	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	J	2	4	-	2/6/23/26	0/1/1/1
4	NAG	K	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	K	2	4	-	2/6/23/26	0/1/1/1
4	NAG	Q	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	Q	2	4	-	1/6/23/26	0/1/1/1
4	NAG	R	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	R	2	4	-	2/6/23/26	0/1/1/1
4	NAG	S	1	1,4	-	1/6/23/26	0/1/1/1
4	NAG	S	2	4	-	0/6/23/26	0/1/1/1
4	NAG	T	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	T	2	4	-	2/6/23/26	0/1/1/1
4	NAG	U	1	1,4	-	1/6/23/26	0/1/1/1
4	NAG	U	2	4	-	2/6/23/26	0/1/1/1
4	NAG	V	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	V	2	4	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	NAG	W	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	W	2	4	-	0/6/23/26	0/1/1/1
4	NAG	X	1	1,4	-	3/6/23/26	0/1/1/1
4	NAG	X	2	4	-	2/6/23/26	0/1/1/1
4	NAG	Y	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	Y	2	4	-	2/6/23/26	0/1/1/1
4	NAG	Z	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	Z	2	4	-	1/6/23/26	0/1/1/1
4	NAG	a	1	1,4	-	1/6/23/26	0/1/1/1
4	NAG	a	2	4	-	3/6/23/26	0/1/1/1
4	NAG	b	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	b	2	4	-	1/6/23/26	0/1/1/1

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	D	1	NAG	C2-N2-C7	4.40	129.17	122.90
4	F	1	NAG	C1-O5-C5	2.53	115.62	112.19
4	D	1	NAG	C1-C2-N2	2.06	114.00	110.49

There are no chirality outliers.

All (55) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	D	1	NAG	O5-C5-C6-O6
4	K	1	NAG	O5-C5-C6-O6
4	a	2	NAG	O5-C5-C6-O6
4	T	2	NAG	C4-C5-C6-O6
4	U	2	NAG	C4-C5-C6-O6
4	R	2	NAG	O5-C5-C6-O6
4	V	1	NAG	O5-C5-C6-O6
4	E	2	NAG	O5-C5-C6-O6
4	J	1	NAG	O5-C5-C6-O6
4	K	2	NAG	O5-C5-C6-O6
4	D	1	NAG	C4-C5-C6-O6
4	K	1	NAG	C4-C5-C6-O6
4	I	2	NAG	O5-C5-C6-O6
4	T	2	NAG	O5-C5-C6-O6
4	J	2	NAG	C4-C5-C6-O6

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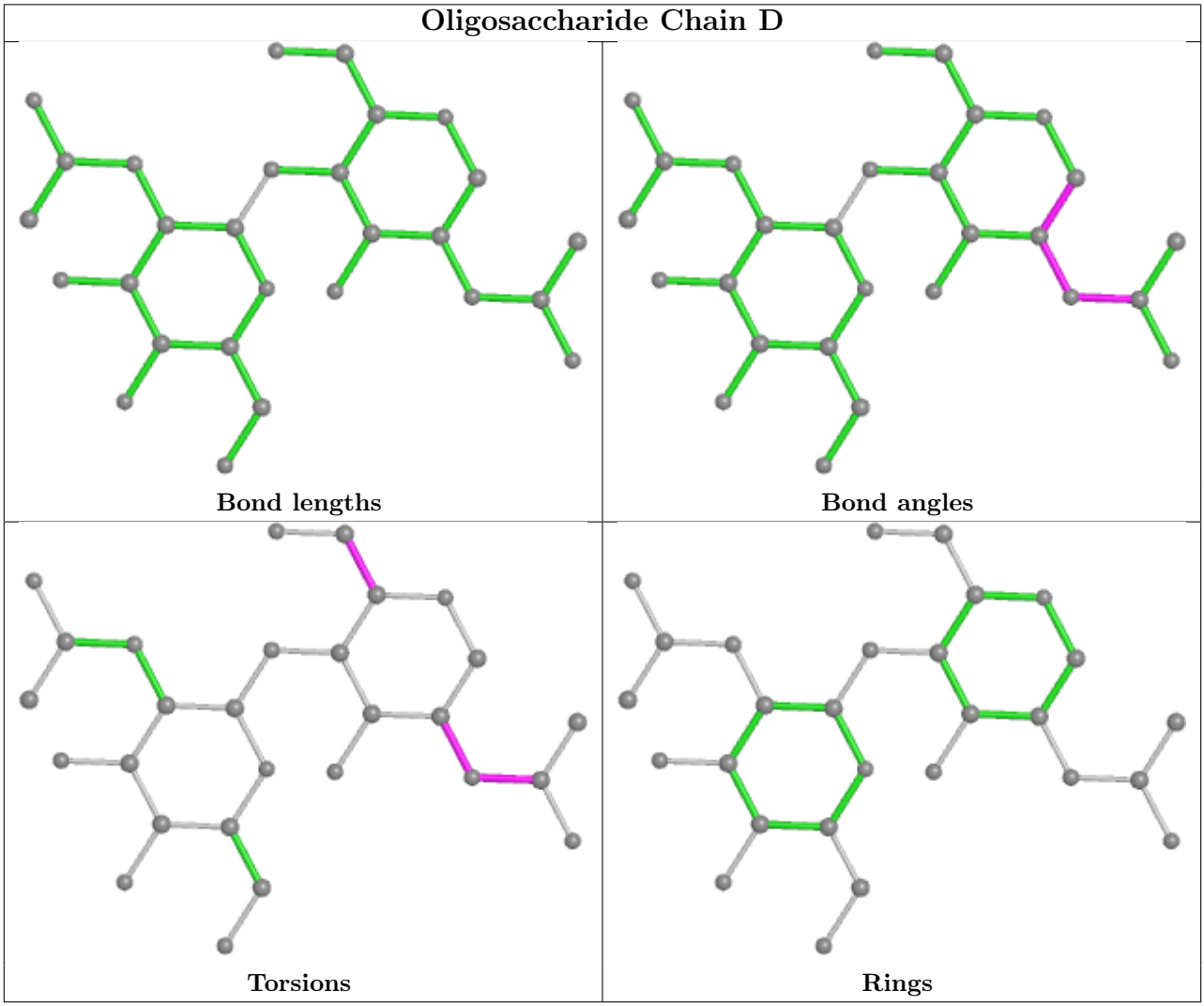
Mol	Chain	Res	Type	Atoms
4	V	2	NAG	O5-C5-C6-O6
4	V	1	NAG	C4-C5-C6-O6
4	R	2	NAG	C4-C5-C6-O6
4	V	2	NAG	C4-C5-C6-O6
4	J	1	NAG	C4-C5-C6-O6
4	D	1	NAG	C8-C7-N2-C2
4	D	1	NAG	O7-C7-N2-C2
4	E	1	NAG	C8-C7-N2-C2
4	E	1	NAG	O7-C7-N2-C2
4	b	1	NAG	C8-C7-N2-C2
4	b	1	NAG	O7-C7-N2-C2
4	J	2	NAG	O5-C5-C6-O6
4	X	2	NAG	C4-C5-C6-O6
4	Y	2	NAG	C4-C5-C6-O6
4	I	2	NAG	C4-C5-C6-O6
4	Z	2	NAG	O5-C5-C6-O6
4	U	2	NAG	O5-C5-C6-O6
4	I	1	NAG	C4-C5-C6-O6
4	Q	1	NAG	O5-C5-C6-O6
4	a	2	NAG	C4-C5-C6-O6
4	F	2	NAG	O5-C5-C6-O6
4	X	2	NAG	O5-C5-C6-O6
4	Y	2	NAG	O5-C5-C6-O6
4	K	2	NAG	C4-C5-C6-O6
4	I	1	NAG	O5-C5-C6-O6
4	W	1	NAG	O5-C5-C6-O6
4	Q	2	NAG	O5-C5-C6-O6
4	b	2	NAG	O5-C5-C6-O6
4	E	2	NAG	C4-C5-C6-O6
4	G	2	NAG	C3-C2-N2-C7
4	S	1	NAG	C3-C2-N2-C7
4	U	1	NAG	C3-C2-N2-C7
4	X	1	NAG	C3-C2-N2-C7
4	a	1	NAG	C3-C2-N2-C7
4	a	2	NAG	C3-C2-N2-C7
4	Q	1	NAG	C4-C5-C6-O6
4	X	1	NAG	C4-C5-C6-O6
4	D	1	NAG	C3-C2-N2-C7
4	W	1	NAG	C4-C5-C6-O6
4	X	1	NAG	O5-C5-C6-O6

There are no ring outliers.

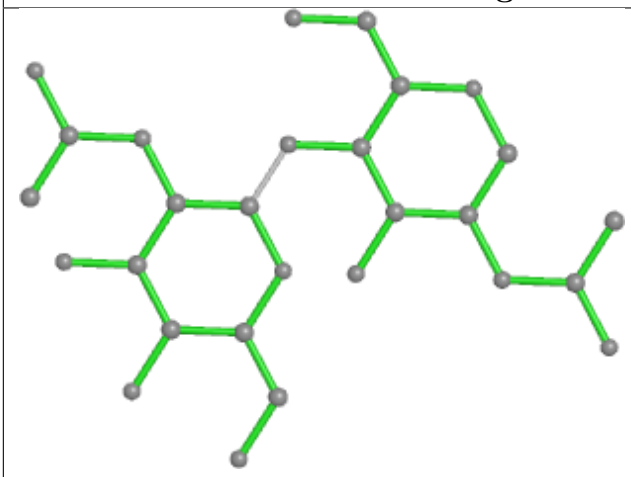
3 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	D	1	NAG	1	0
4	Z	1	NAG	3	0
4	J	1	NAG	1	0

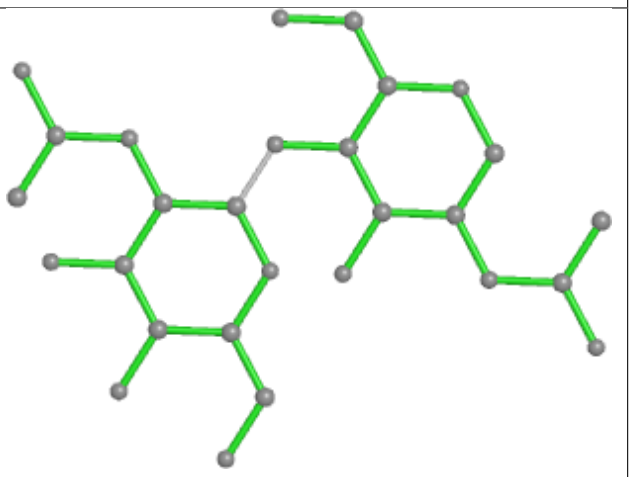
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.



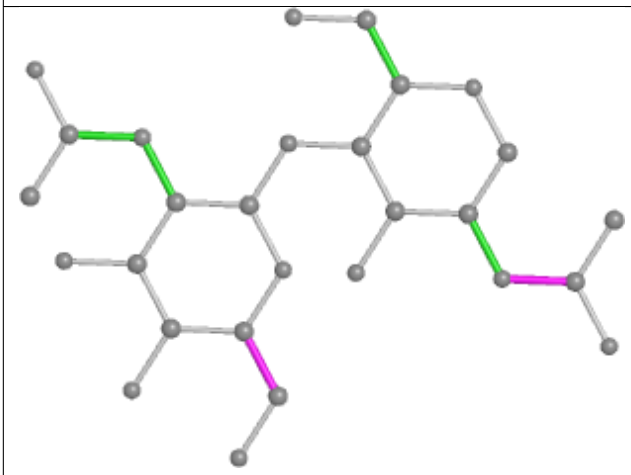
Oligosaccharide Chain E



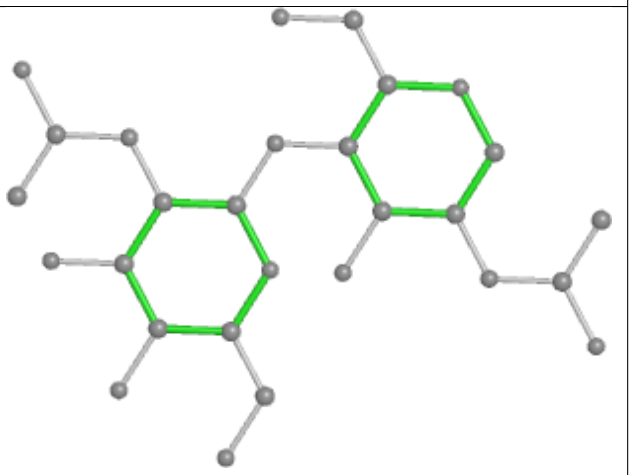
Bond lengths



Bond angles

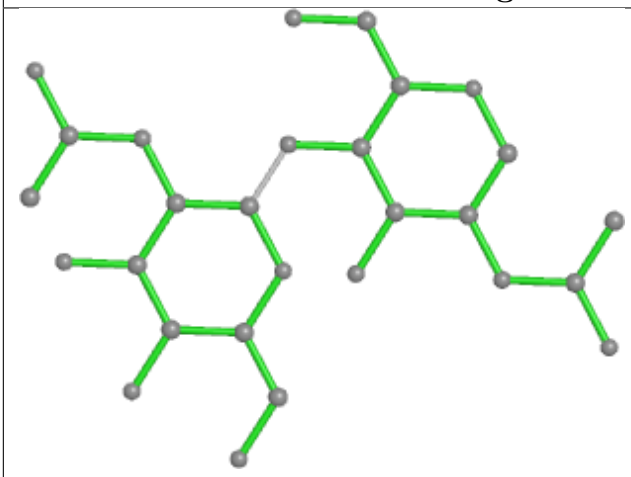


Torsions

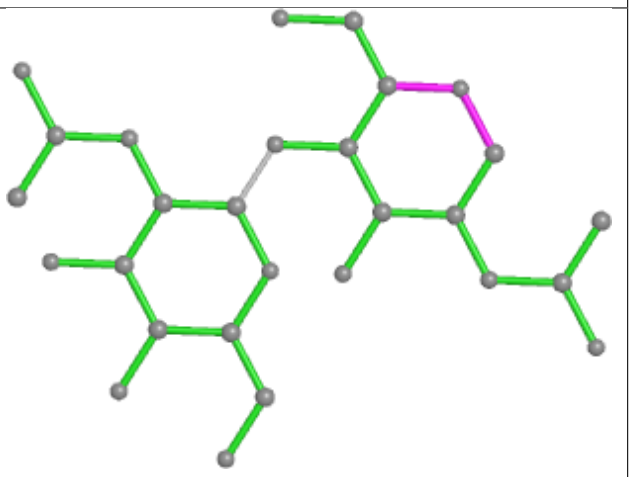


Rings

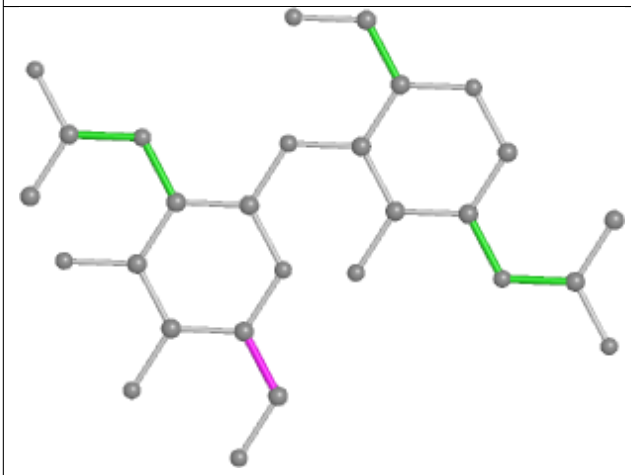
Oligosaccharide Chain F



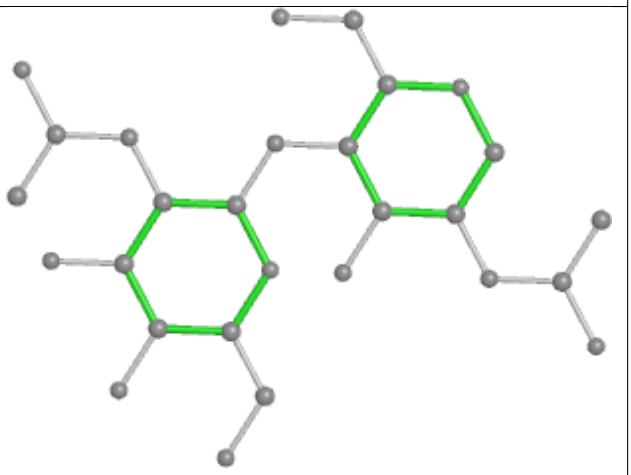
Bond lengths



Bond angles

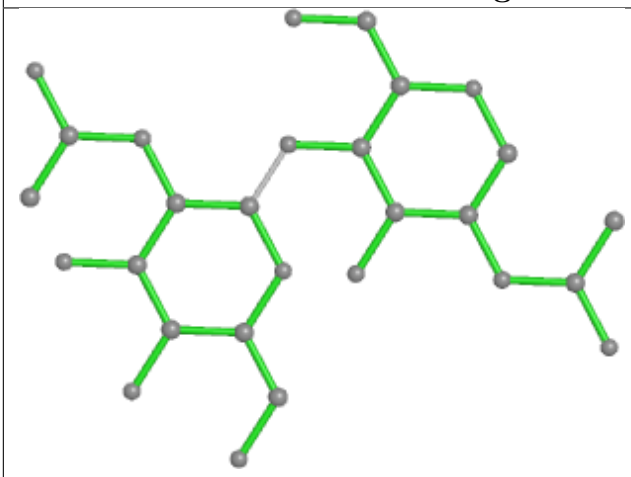


Torsions

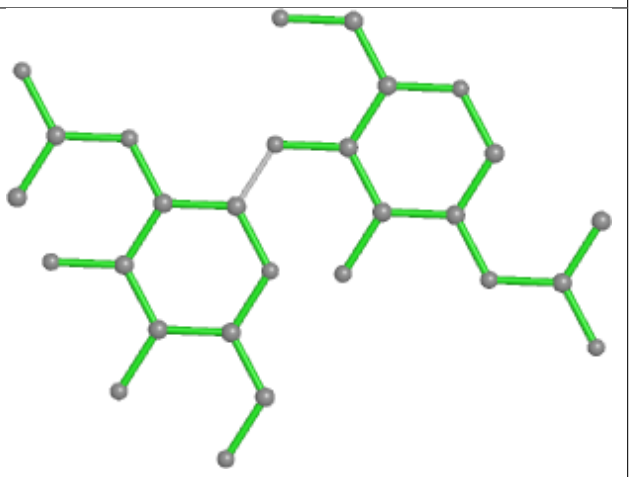


Rings

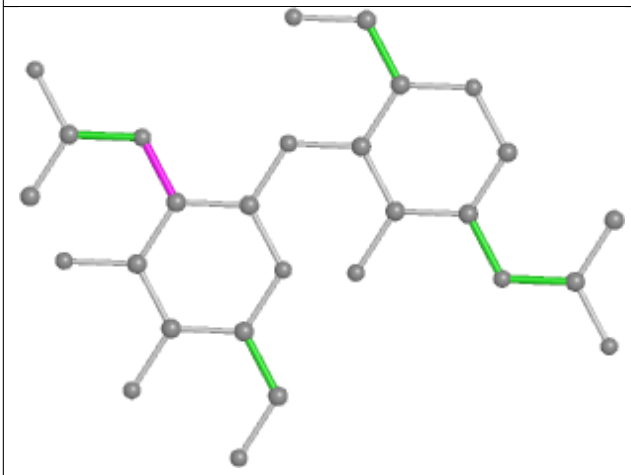
Oligosaccharide Chain G



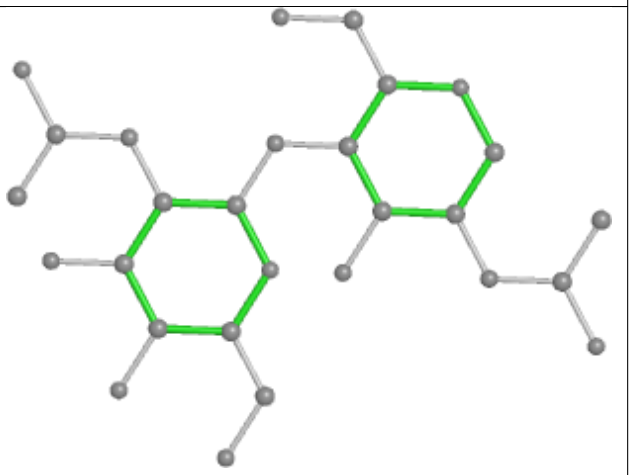
Bond lengths



Bond angles

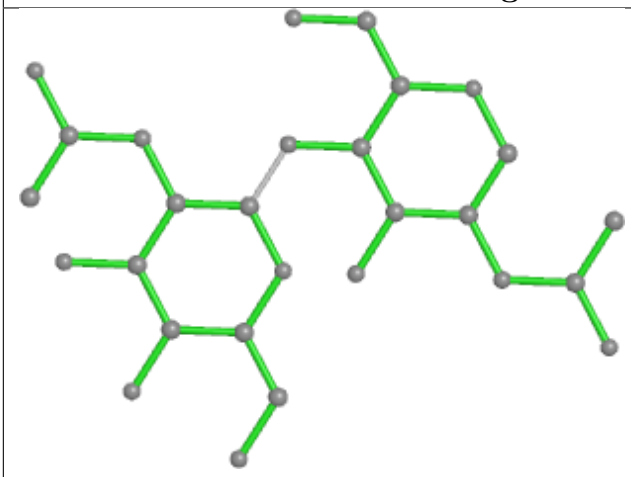


Torsions

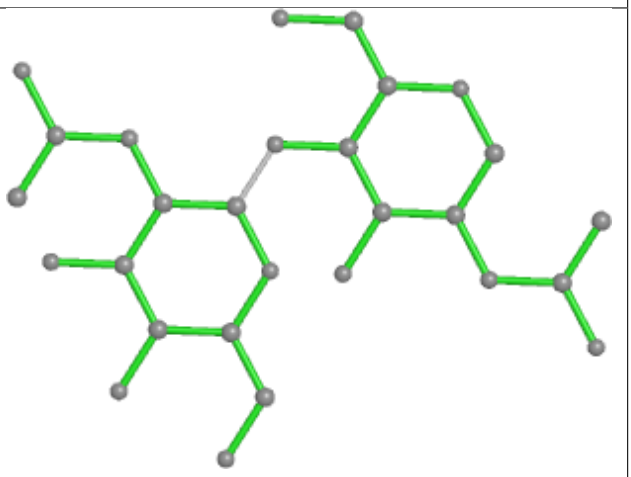


Rings

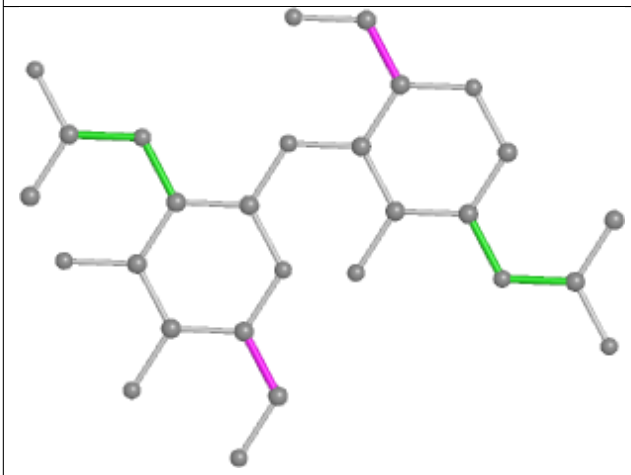
Oligosaccharide Chain I



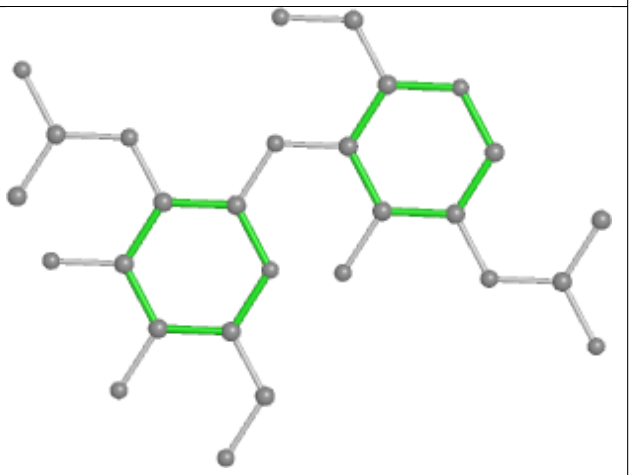
Bond lengths



Bond angles

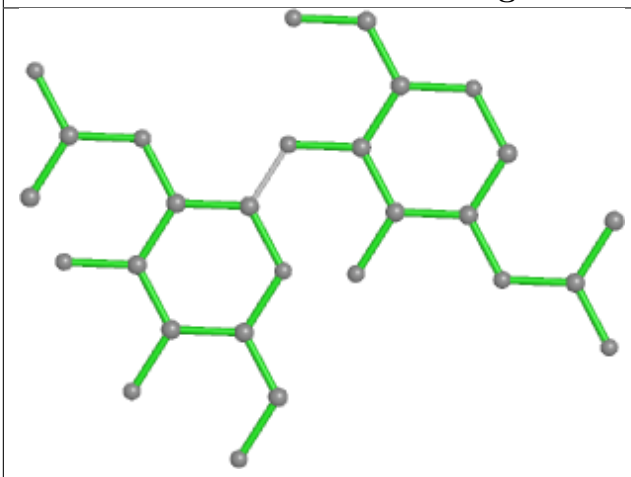


Torsions

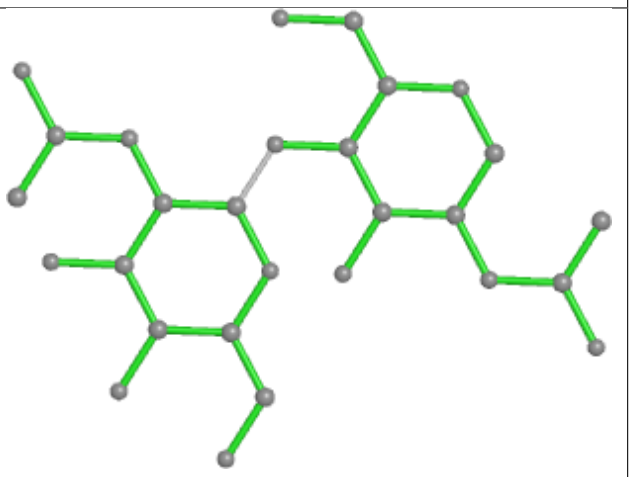


Rings

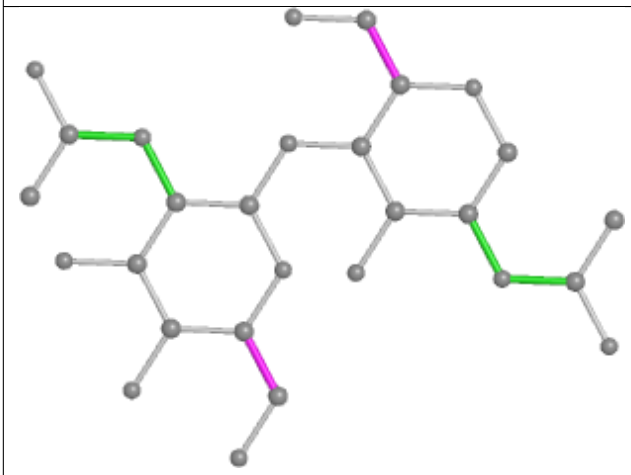
Oligosaccharide Chain J



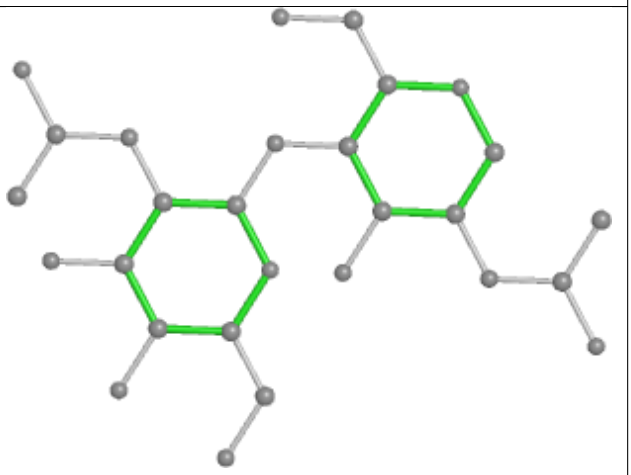
Bond lengths



Bond angles

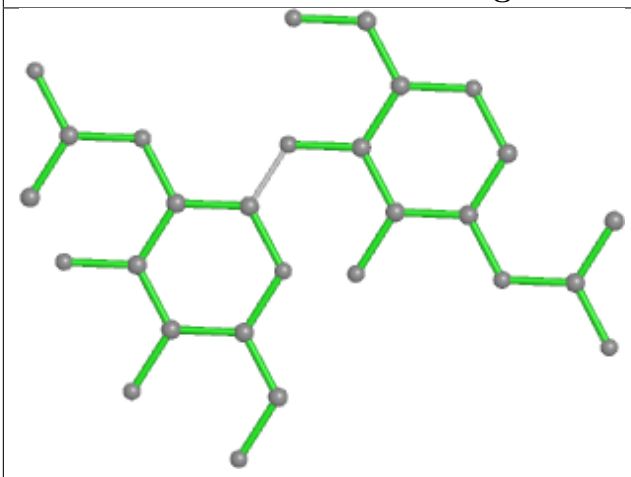


Torsions



Rings

Oligosaccharide Chain K



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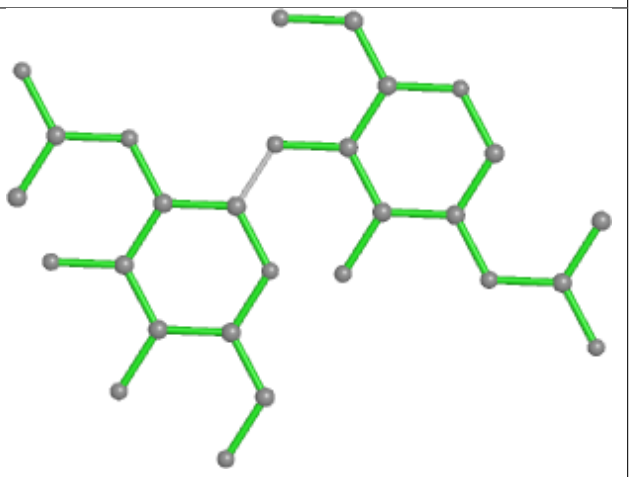

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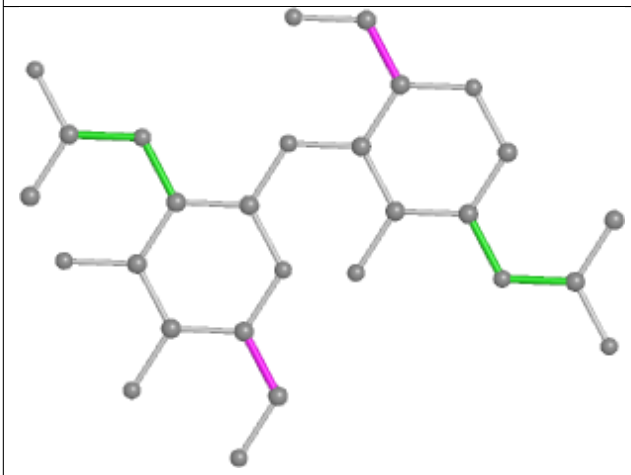

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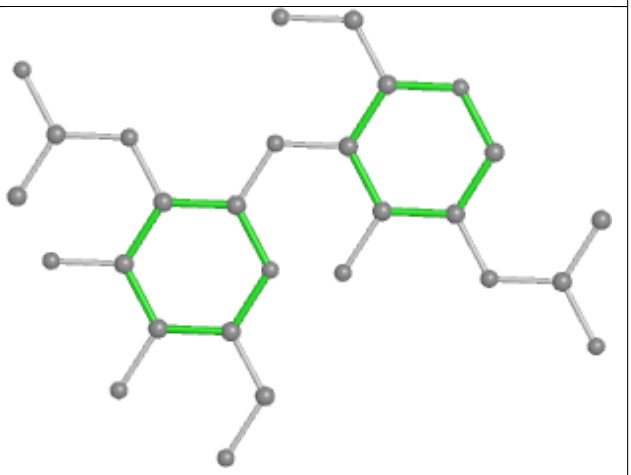
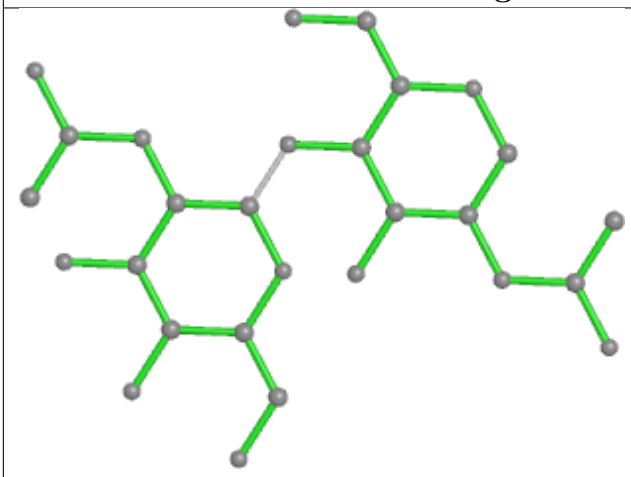


Rings

Oligosaccharide Chain Q



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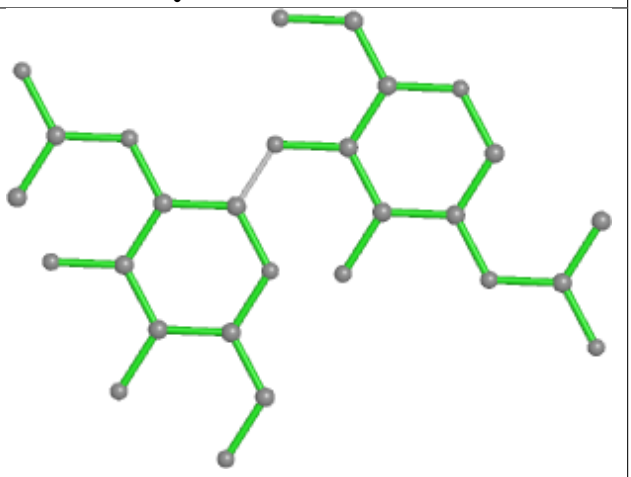

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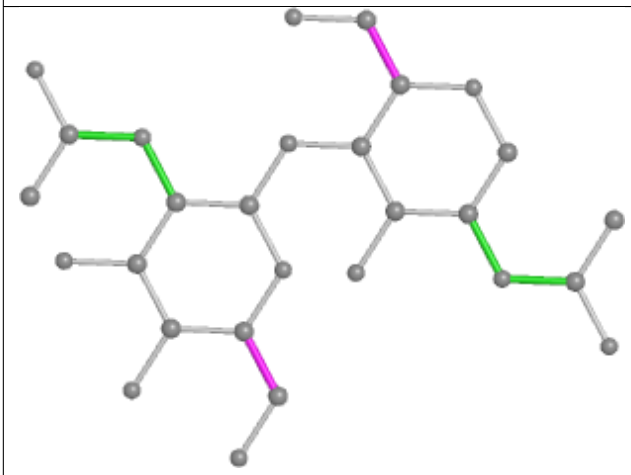

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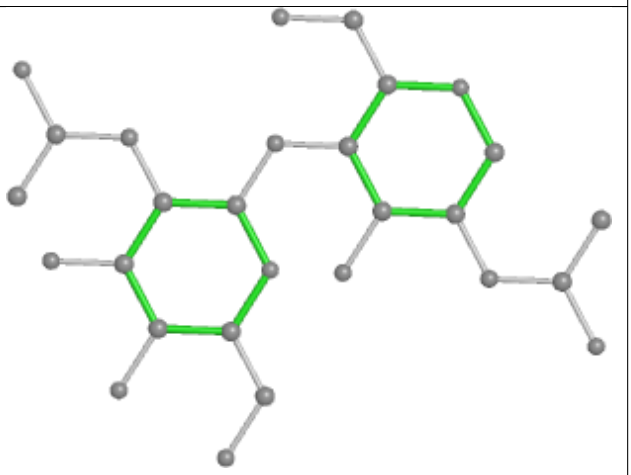
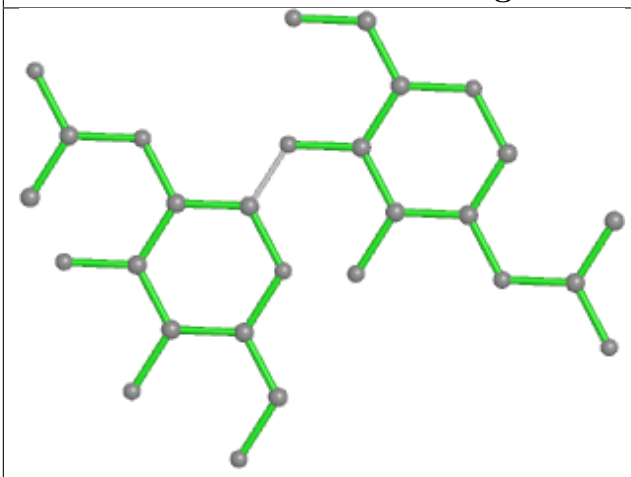


Rings

Oligosaccharide Chain R



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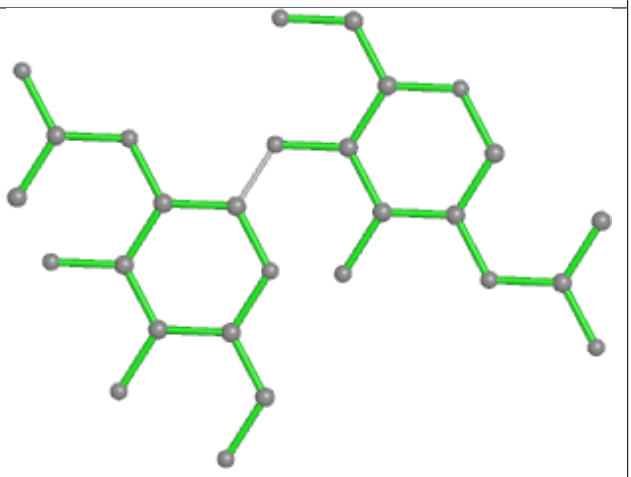
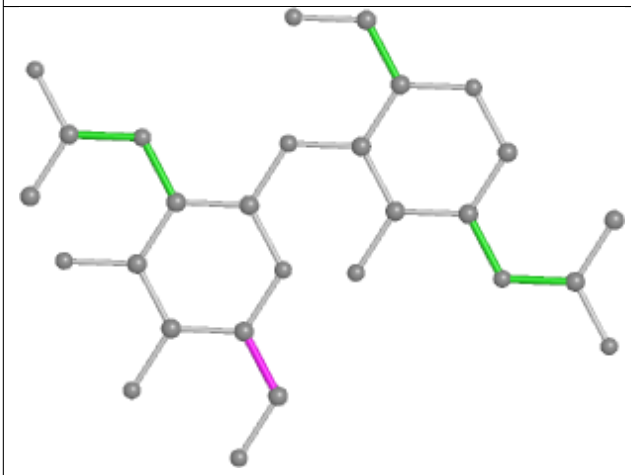


Bond angles



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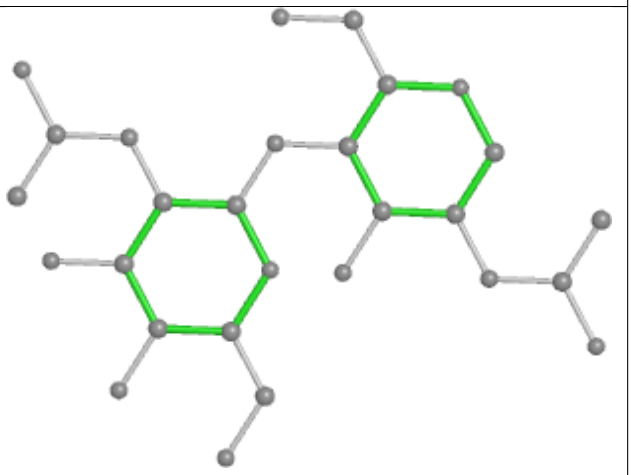
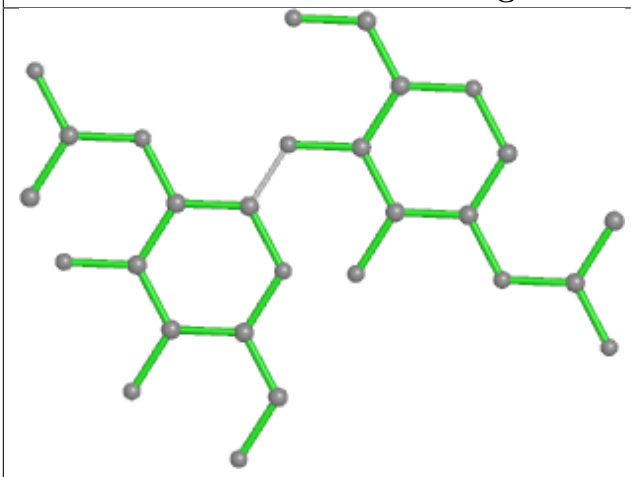


Rings

Oligosaccharide Chain S



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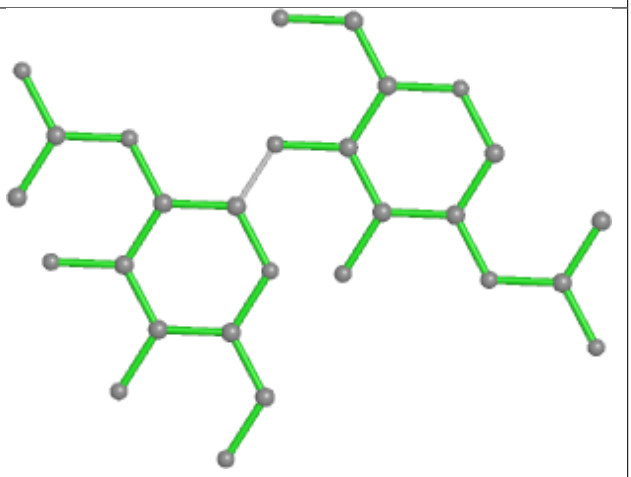
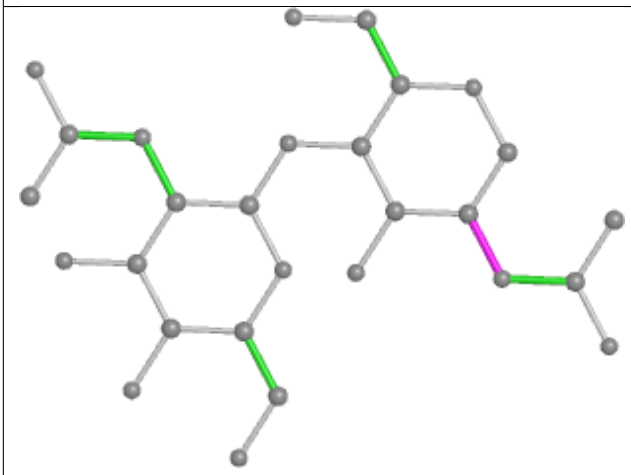


Bond angles



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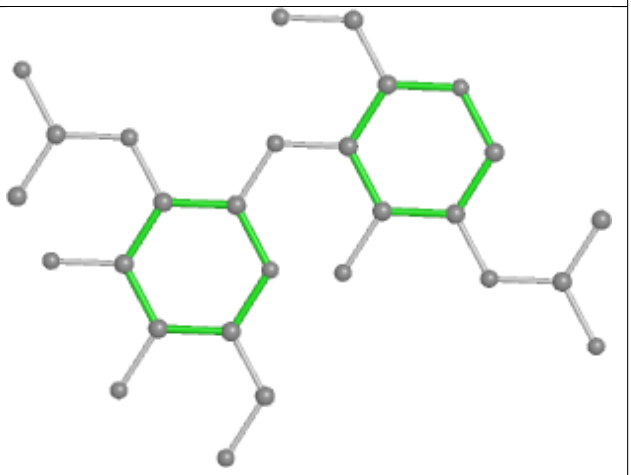
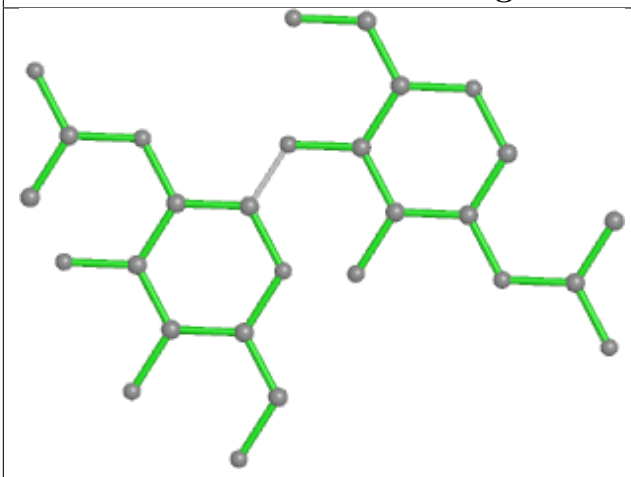


Rings

Oligosaccharide Chain T



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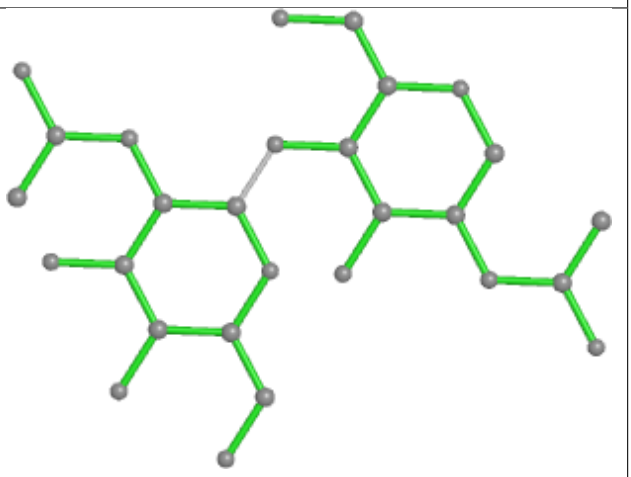
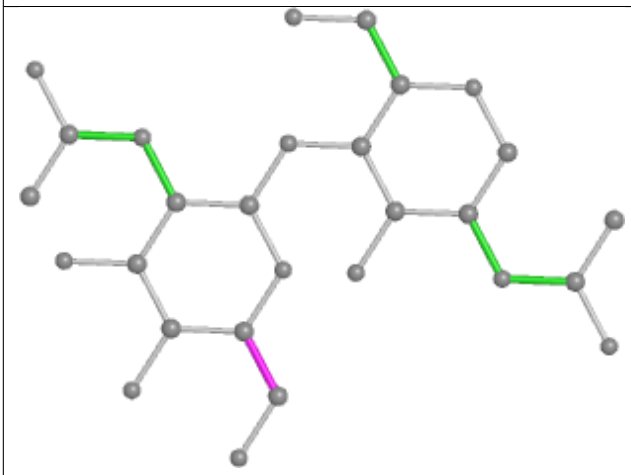


Bond angles



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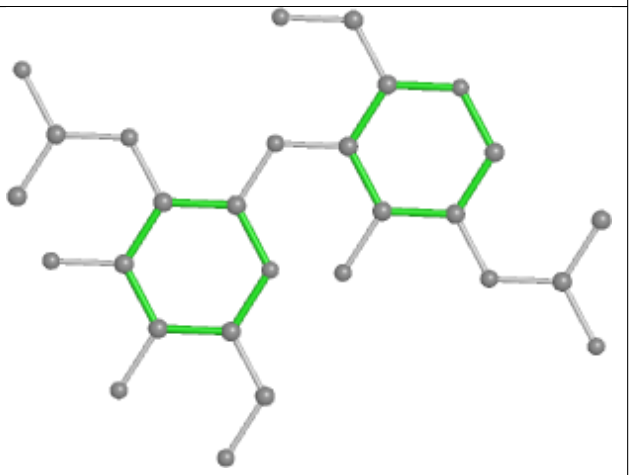
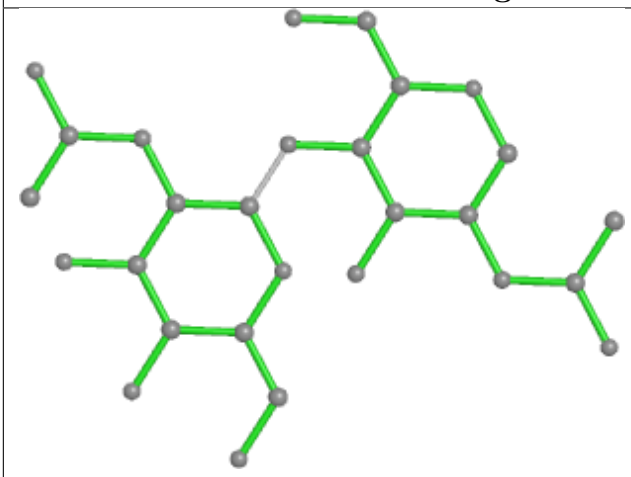
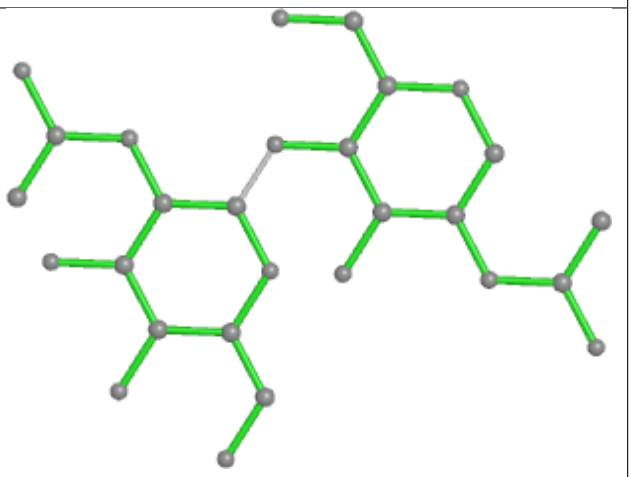


Rings

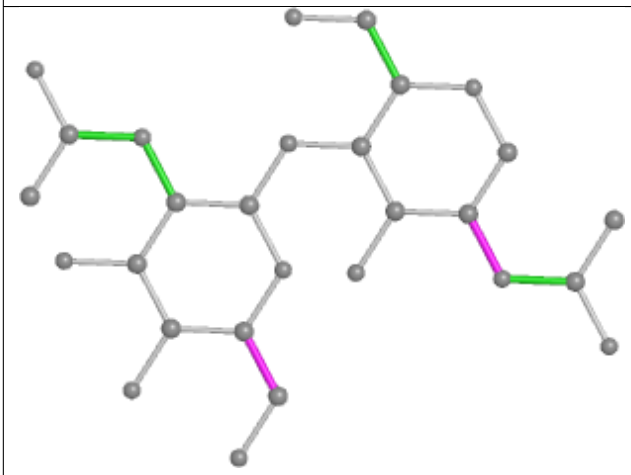
Oligosaccharide Chain U



Bond lengths



Bond angles



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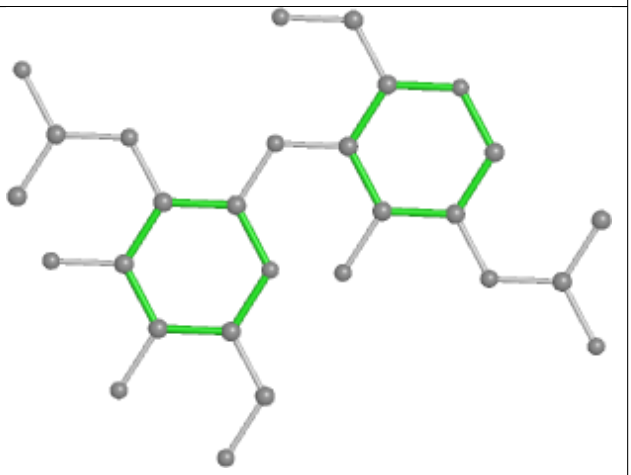
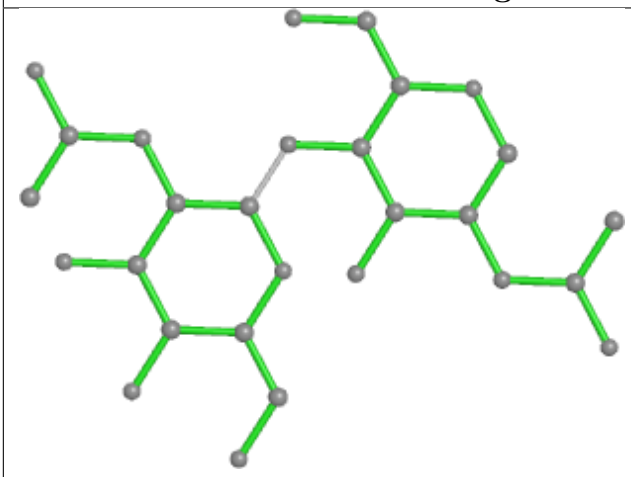


Rings

Oligosaccharide Chain V



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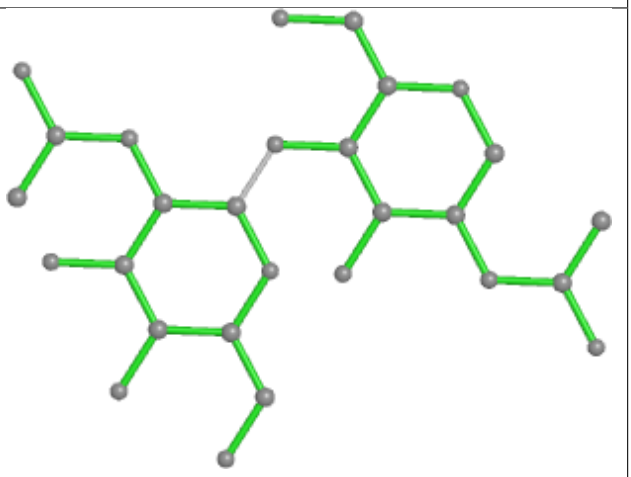
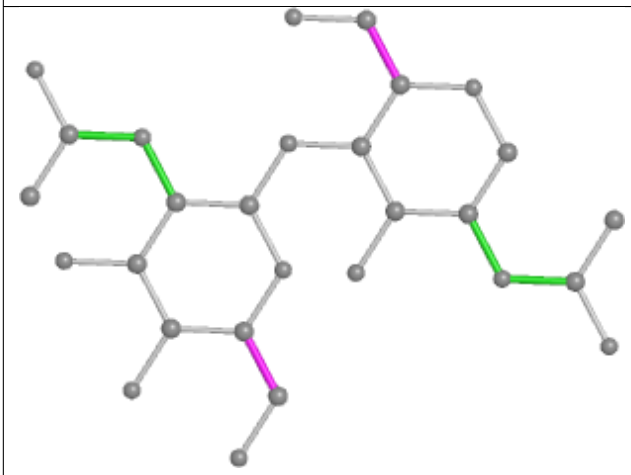


Bond angles



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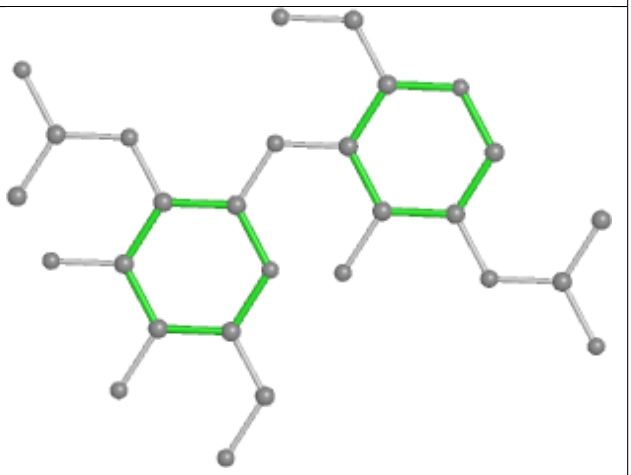
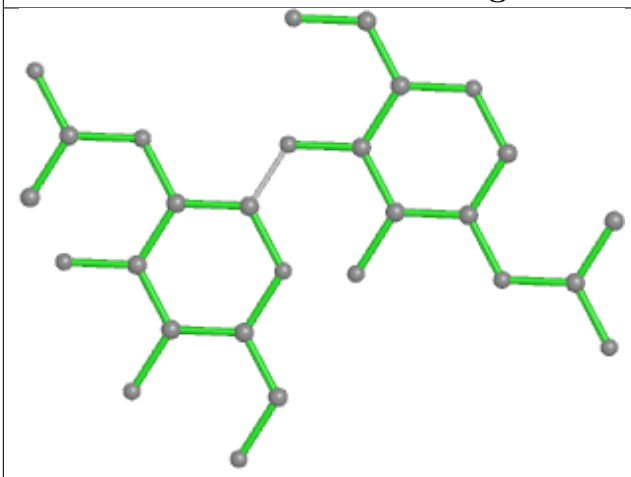


Rings

Oligosaccharide Chain W



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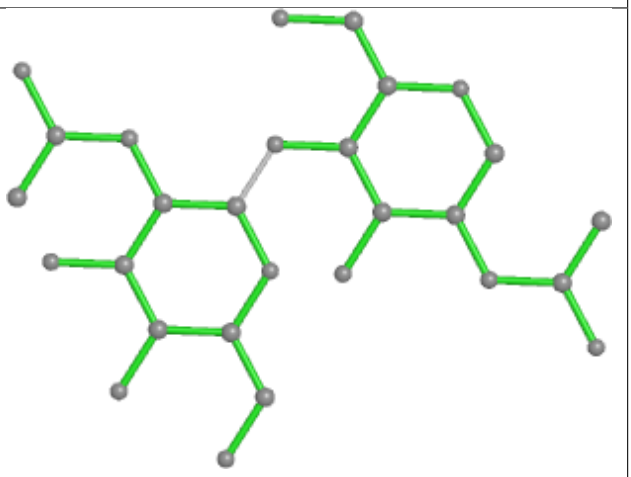
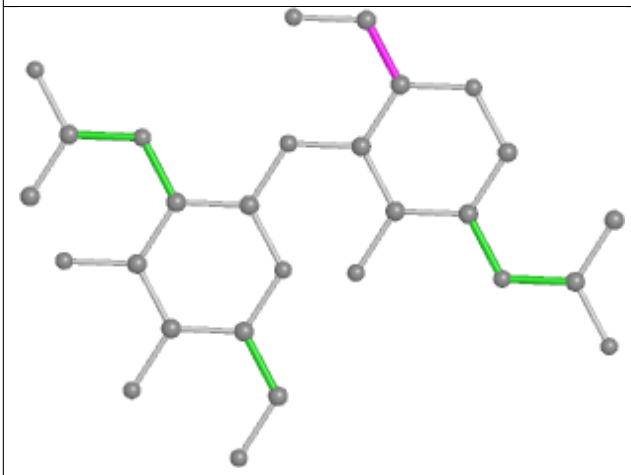


Bond angles



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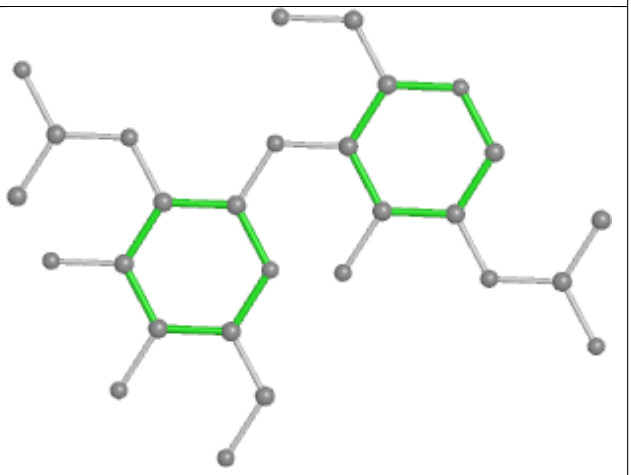
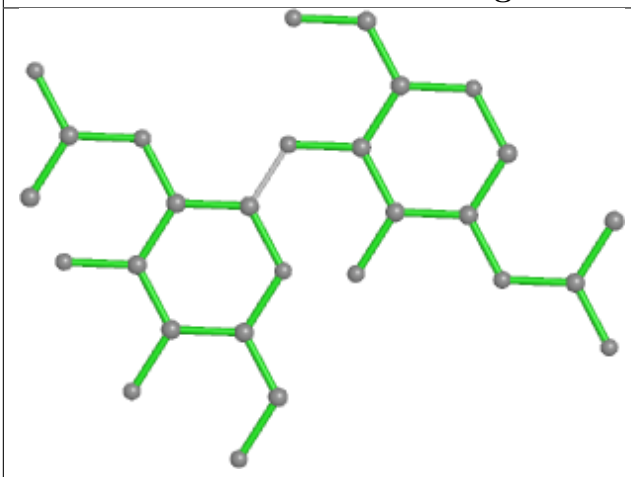
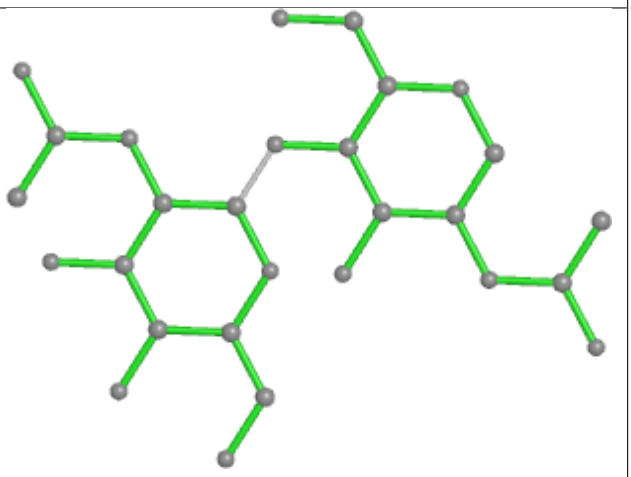


Rings

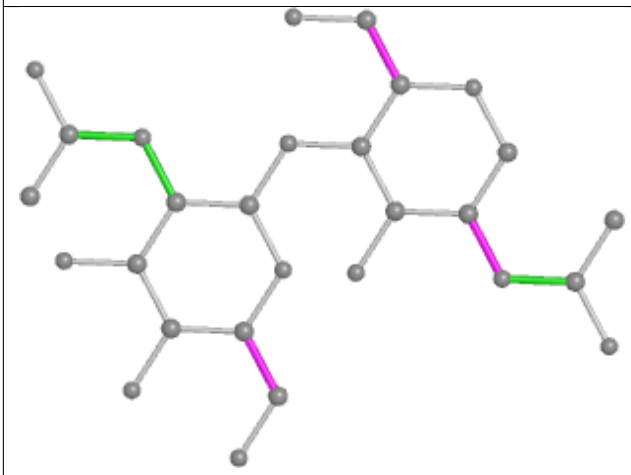
Oligosaccharide Chain X



Bond lengths



Bond angles



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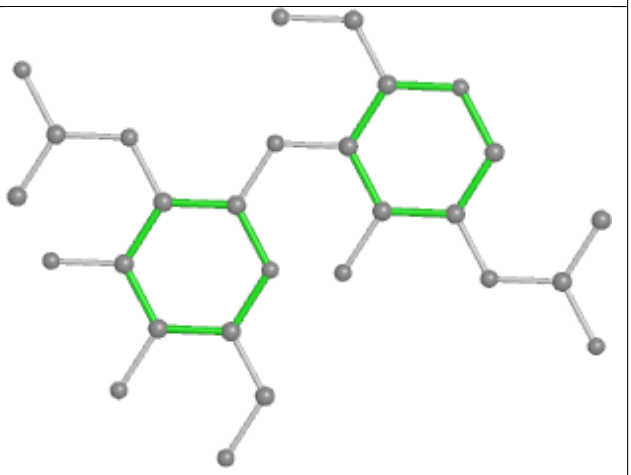
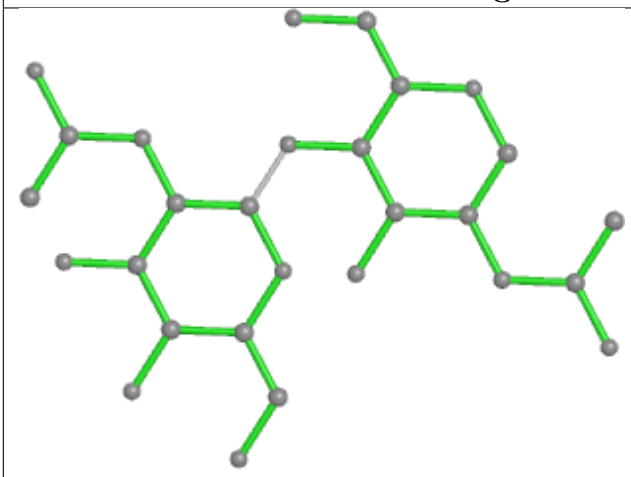


Rings

Oligosaccharide Chain Y



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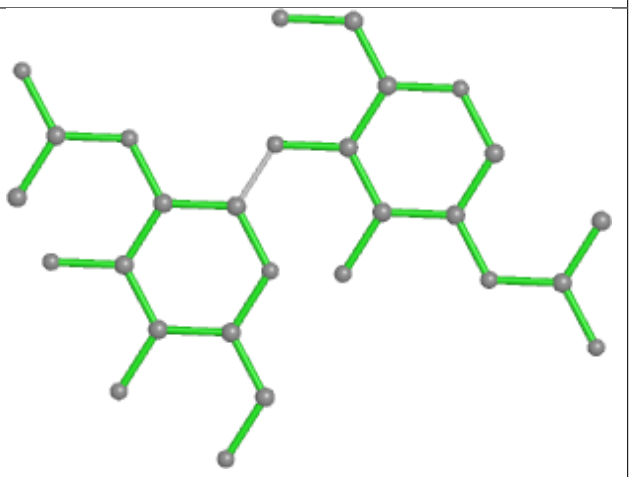
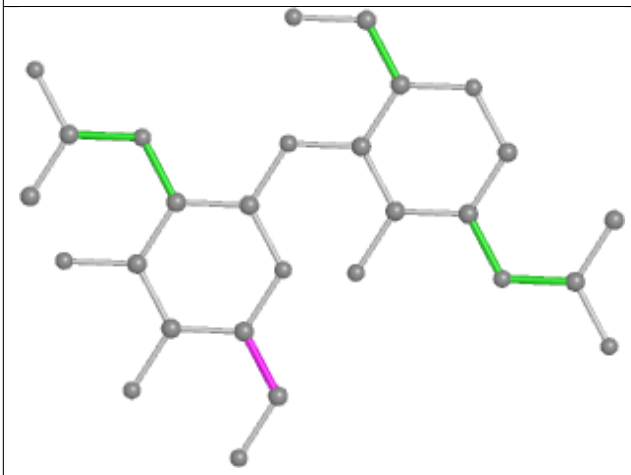


Bond angles



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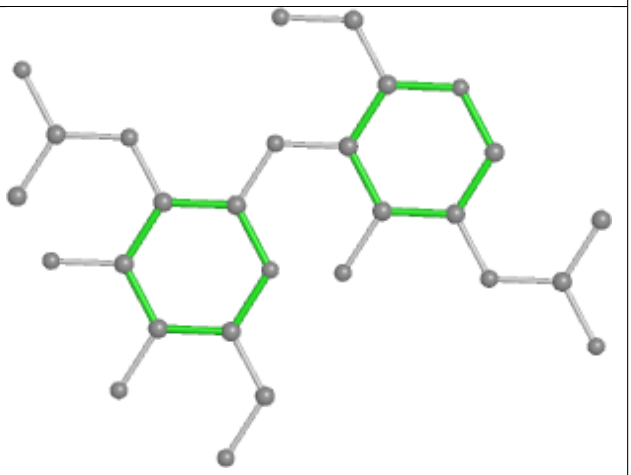
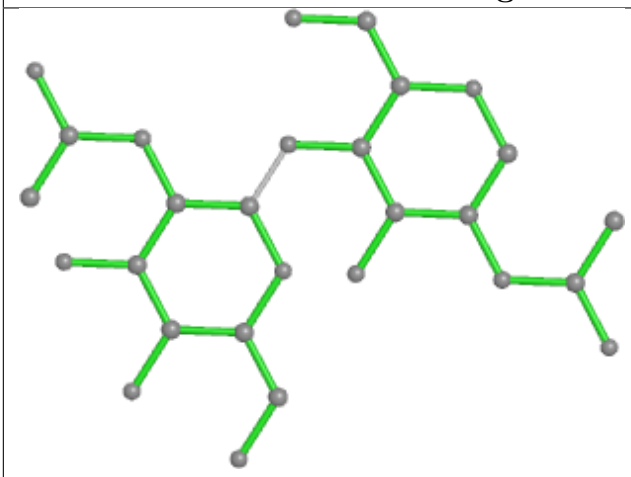


Rings

Oligosaccharide Chain Z



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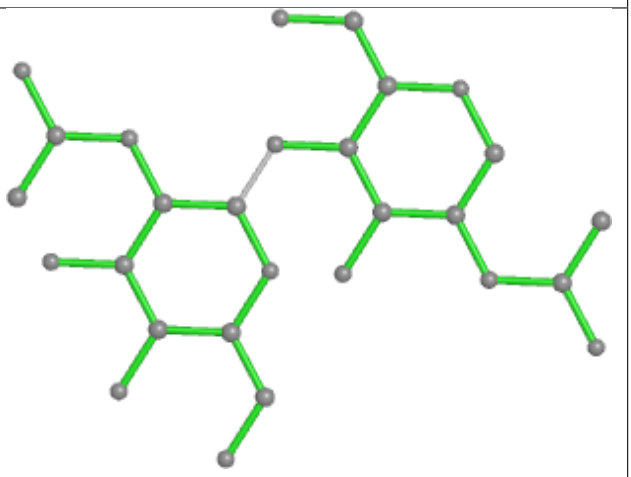
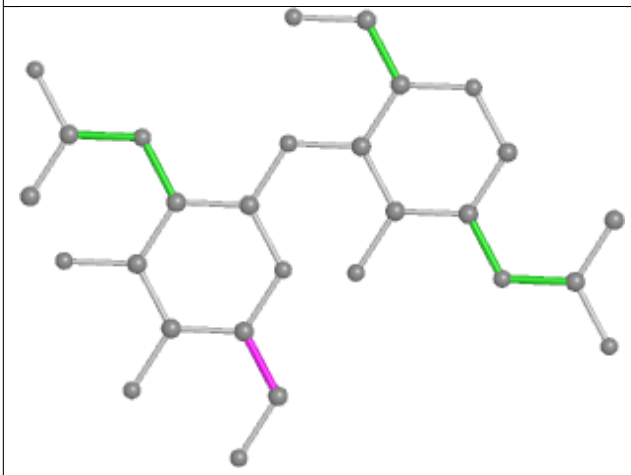


Bond angles



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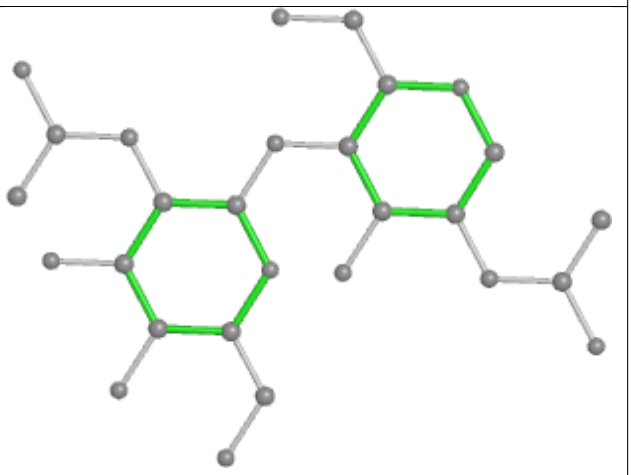
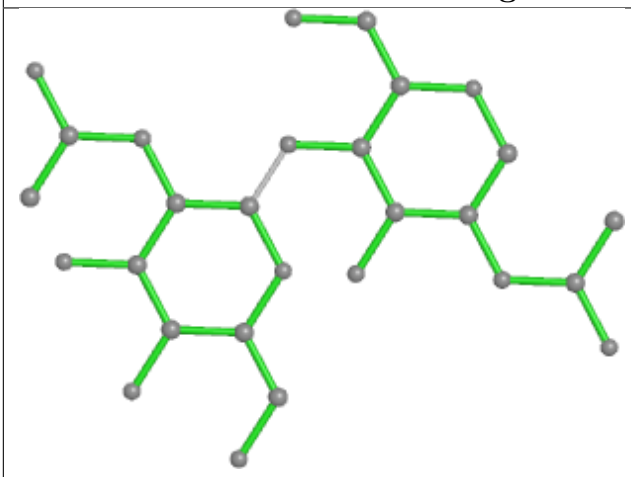
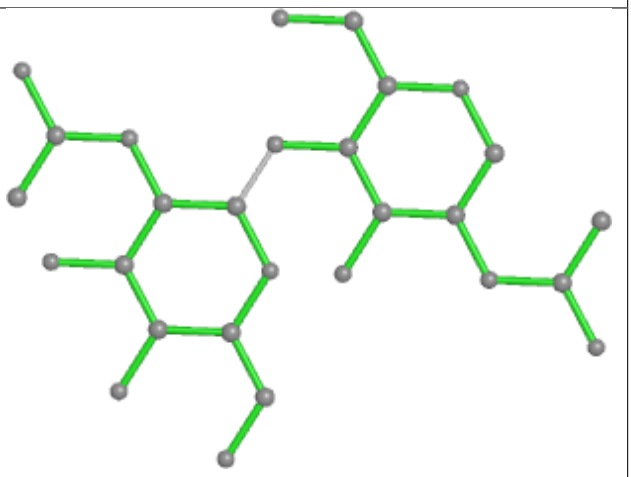


Rings

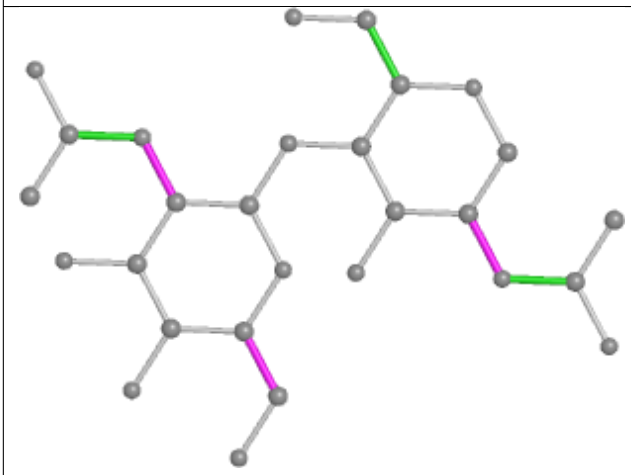
Oligosaccharide Chain a



Bond lengths



Bond angles



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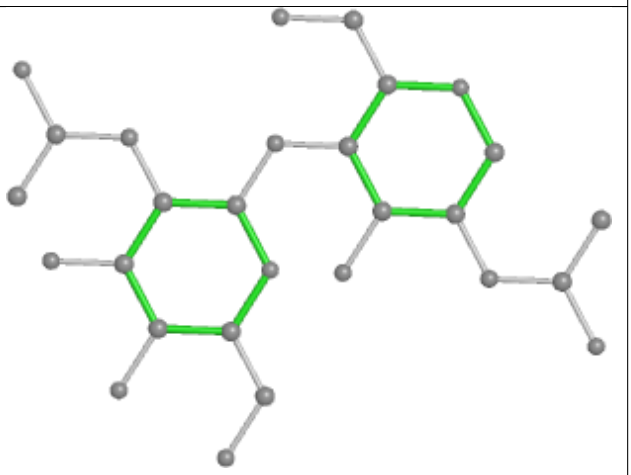
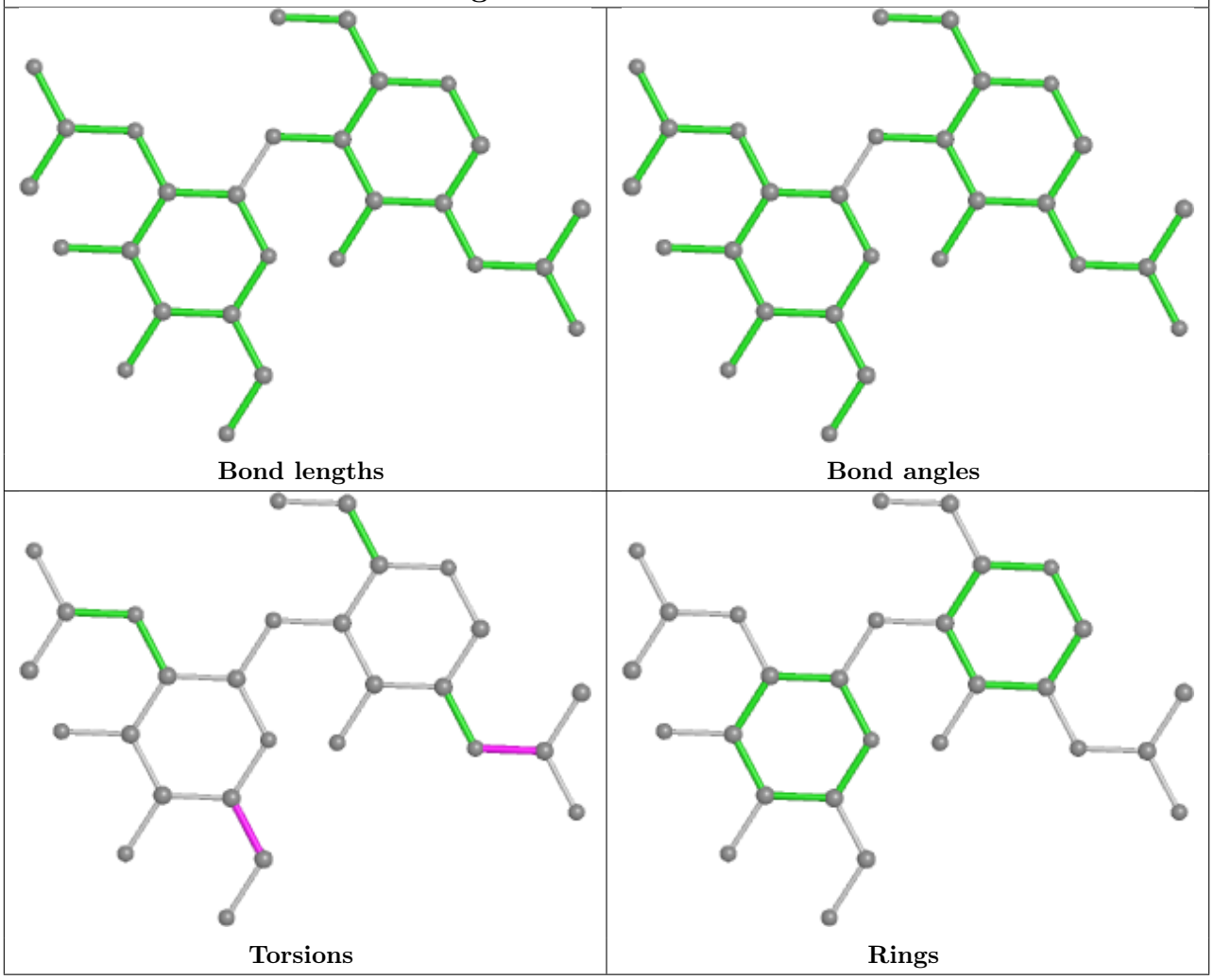


Rings

Oligosaccharide Chain b



5.6 Ligand geometry (i)

25 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	$\#\|Z\| > 2$
5	NAG	C	1307	1	14,14,15	0.20	0	17,19,21	0.37	0
5	NAG	C	1305	1	14,14,15	0.21	0	17,19,21	0.44	0
5	NAG	A	1307	1	14,14,15	0.21	0	17,19,21	0.42	0
5	NAG	A	1305	1	14,14,15	0.23	0	17,19,21	0.42	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
5	NAG	B	1307	1	14,14,15	0.24	0	17,19,21	0.45	0
5	NAG	C	1308	1	14,14,15	0.20	0	17,19,21	0.44	0
5	NAG	B	1304	1	14,14,15	0.22	0	17,19,21	0.44	0
5	NAG	C	1301	1	14,14,15	0.47	0	17,19,21	0.66	1 (5%)
5	NAG	B	1301	1	14,14,15	0.43	0	17,19,21	0.65	1 (5%)
5	NAG	A	1301	1	14,14,15	0.27	0	17,19,21	0.39	0
5	NAG	B	1302	1	14,14,15	0.27	0	17,19,21	0.52	0
5	NAG	C	1303	1	14,14,15	0.33	0	17,19,21	0.39	0
5	NAG	A	1306	1	14,14,15	0.26	0	17,19,21	0.46	0
5	NAG	B	1308	1	14,14,15	0.22	0	17,19,21	0.43	0
5	NAG	B	1303	1	14,14,15	0.22	0	17,19,21	0.36	0
5	NAG	C	1302	1	14,14,15	0.28	0	17,19,21	0.42	0
5	NAG	C	1306	1	14,14,15	0.28	0	17,19,21	0.51	0
5	NAG	A	1302	1	14,14,15	0.24	0	17,19,21	0.45	0
5	NAG	A	1308	1	14,14,15	0.29	0	17,19,21	0.54	0
5	NAG	B	1309	1	14,14,15	0.23	0	17,19,21	0.48	0
5	NAG	A	1303	1	14,14,15	0.27	0	17,19,21	0.42	0
5	NAG	B	1305	1	14,14,15	0.25	0	17,19,21	0.53	0
5	NAG	B	1306	1	14,14,15	0.19	0	17,19,21	0.37	0
5	NAG	C	1304	1	14,14,15	0.31	0	17,19,21	0.46	0
5	NAG	A	1304	1	14,14,15	0.25	0	17,19,21	0.49	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	C	1307	1	-	1/6/23/26	0/1/1/1
5	NAG	C	1305	1	-	2/6/23/26	0/1/1/1
5	NAG	A	1307	1	-	0/6/23/26	0/1/1/1
5	NAG	A	1305	1	-	1/6/23/26	0/1/1/1
5	NAG	B	1307	1	-	4/6/23/26	0/1/1/1
5	NAG	C	1308	1	-	2/6/23/26	0/1/1/1
5	NAG	B	1304	1	-	2/6/23/26	0/1/1/1
5	NAG	C	1301	1	-	3/6/23/26	0/1/1/1
5	NAG	B	1301	1	-	3/6/23/26	0/1/1/1
5	NAG	A	1301	1	-	0/6/23/26	0/1/1/1
5	NAG	B	1302	1	-	3/6/23/26	0/1/1/1
5	NAG	C	1303	1	-	0/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	NAG	A	1306	1	-	2/6/23/26	0/1/1/1
5	NAG	B	1308	1	-	4/6/23/26	0/1/1/1
5	NAG	B	1303	1	-	2/6/23/26	0/1/1/1
5	NAG	C	1302	1	-	2/6/23/26	0/1/1/1
5	NAG	C	1306	1	-	2/6/23/26	0/1/1/1
5	NAG	A	1302	1	-	1/6/23/26	0/1/1/1
5	NAG	A	1308	1	-	1/6/23/26	0/1/1/1
5	NAG	B	1309	1	-	0/6/23/26	0/1/1/1
5	NAG	A	1303	1	-	1/6/23/26	0/1/1/1
5	NAG	B	1305	1	-	3/6/23/26	0/1/1/1
5	NAG	B	1306	1	-	2/6/23/26	0/1/1/1
5	NAG	C	1304	1	-	1/6/23/26	0/1/1/1
5	NAG	A	1304	1	-	2/6/23/26	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})
5	C	1301	NAG	C1-O5-C5	2.00	114.91	112.19
5	B	1301	NAG	C1-O5-C5	2.00	114.90	112.19

There are no chirality outliers.

All (44) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	B	1308	NAG	O5-C5-C6-O6
5	A	1306	NAG	O5-C5-C6-O6
5	B	1301	NAG	O5-C5-C6-O6
5	C	1301	NAG	C4-C5-C6-O6
5	B	1305	NAG	O5-C5-C6-O6
5	B	1307	NAG	C4-C5-C6-O6
5	C	1302	NAG	O5-C5-C6-O6
5	B	1301	NAG	C4-C5-C6-O6
5	B	1303	NAG	O5-C5-C6-O6
5	B	1304	NAG	O5-C5-C6-O6
5	B	1302	NAG	O5-C5-C6-O6
5	B	1303	NAG	C4-C5-C6-O6
5	B	1305	NAG	C4-C5-C6-O6
5	B	1307	NAG	O5-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
5	B	1308	NAG	C4-C5-C6-O6
5	C	1301	NAG	O5-C5-C6-O6
5	A	1306	NAG	C4-C5-C6-O6
5	B	1304	NAG	C4-C5-C6-O6
5	B	1302	NAG	C4-C5-C6-O6
5	C	1305	NAG	O5-C5-C6-O6
5	A	1304	NAG	C8-C7-N2-C2
5	A	1304	NAG	O7-C7-N2-C2
5	B	1307	NAG	C8-C7-N2-C2
5	B	1307	NAG	O7-C7-N2-C2
5	B	1308	NAG	C8-C7-N2-C2
5	B	1308	NAG	O7-C7-N2-C2
5	C	1302	NAG	C4-C5-C6-O6
5	B	1306	NAG	O5-C5-C6-O6
5	A	1302	NAG	O5-C5-C6-O6
5	A	1305	NAG	O5-C5-C6-O6
5	C	1306	NAG	O5-C5-C6-O6
5	C	1307	NAG	O5-C5-C6-O6
5	C	1308	NAG	C4-C5-C6-O6
5	A	1303	NAG	C4-C5-C6-O6
5	A	1308	NAG	C3-C2-N2-C7
5	B	1301	NAG	C3-C2-N2-C7
5	B	1302	NAG	C3-C2-N2-C7
5	B	1305	NAG	C3-C2-N2-C7
5	C	1301	NAG	C3-C2-N2-C7
5	C	1306	NAG	C3-C2-N2-C7
5	C	1308	NAG	O5-C5-C6-O6
5	C	1305	NAG	C4-C5-C6-O6
5	C	1304	NAG	O5-C5-C6-O6
5	B	1306	NAG	C4-C5-C6-O6

There are no ring outliers.

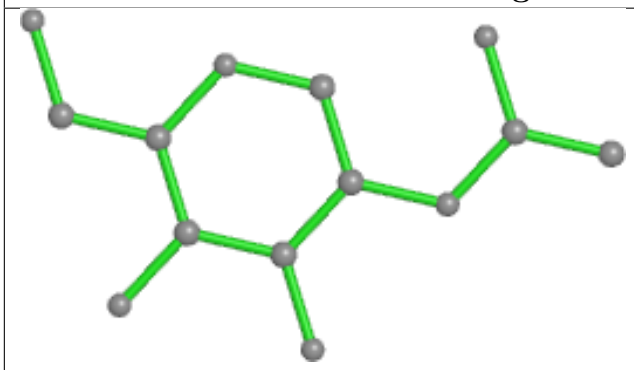
5 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	1305	NAG	1	0
5	B	1307	NAG	1	0
5	A	1301	NAG	1	0
5	B	1309	NAG	2	0
5	C	1304	NAG	1	0

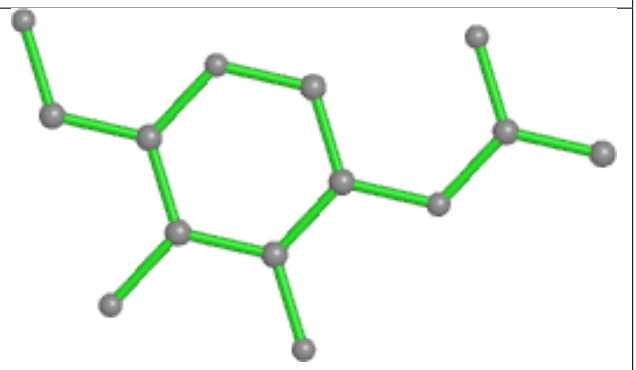
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths,

bond angles, torsion angles, and ring geometry for 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.

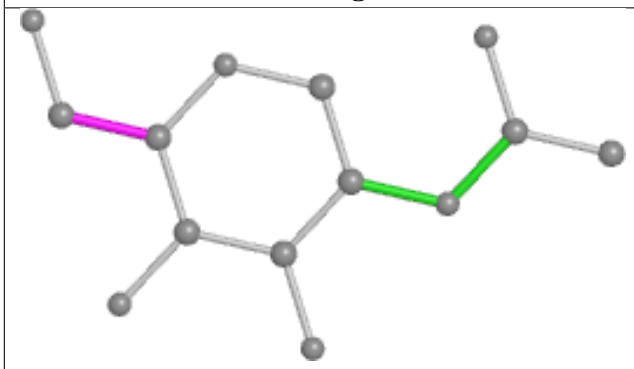
Ligand NAG C 1307



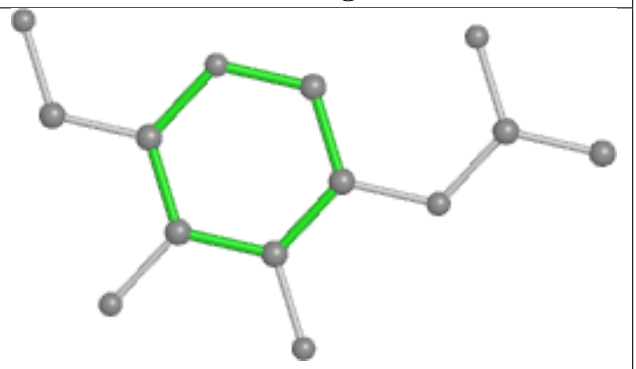
Bond lengths



Bond angles

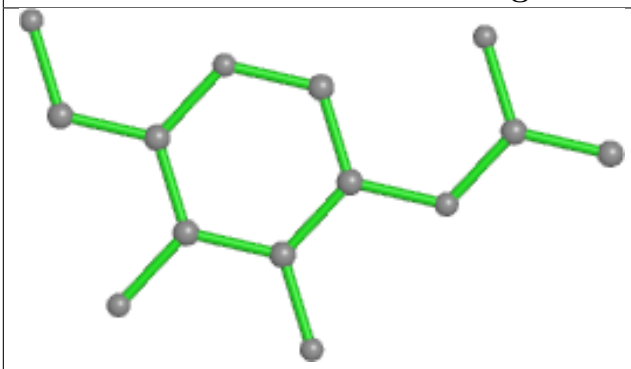


Torsions



Rings

Ligand NAG C 1305



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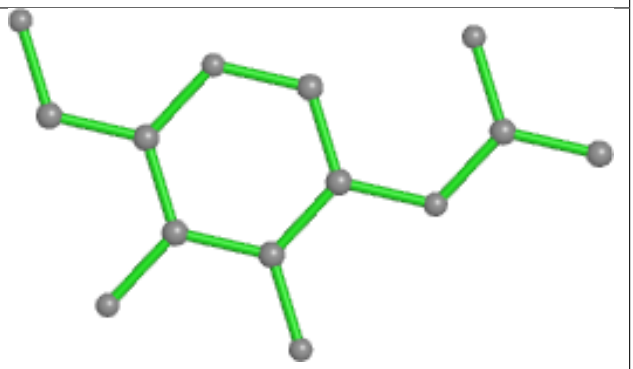

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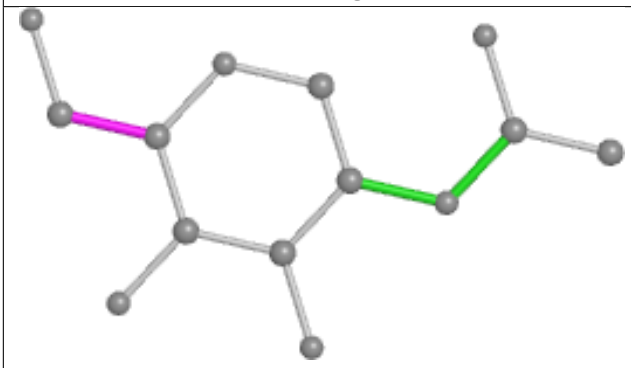

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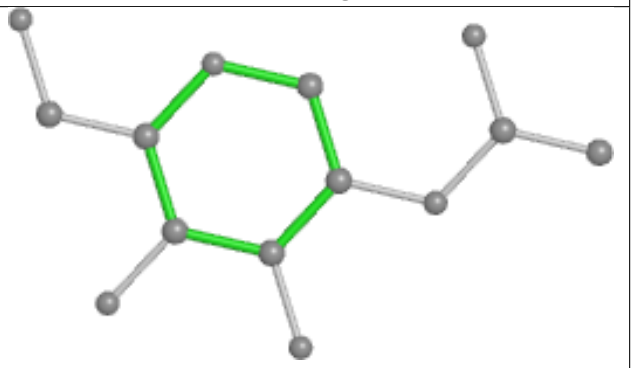
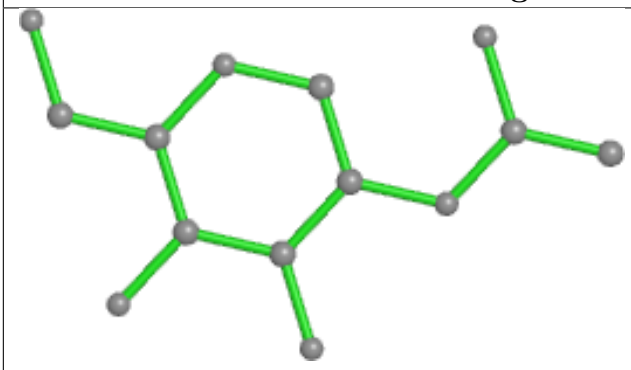


Rings

Ligand NAG A 1307



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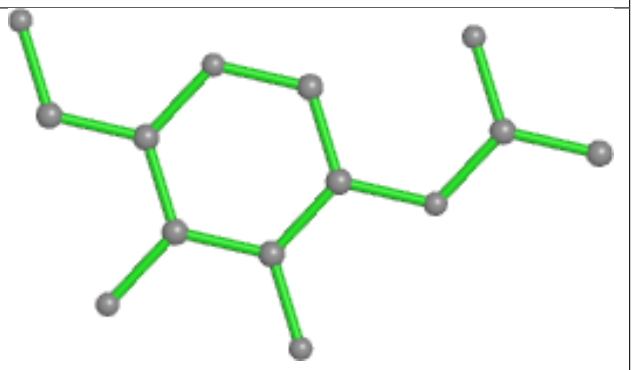
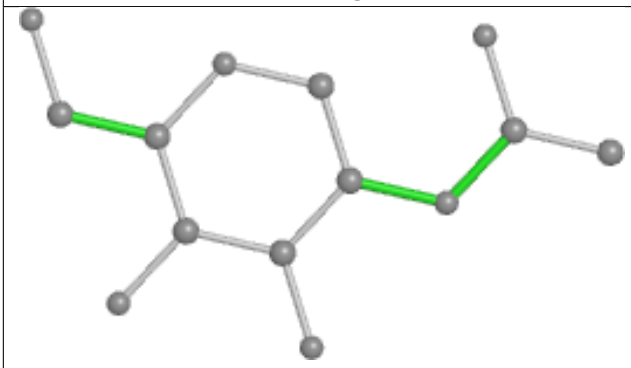


Bond angles



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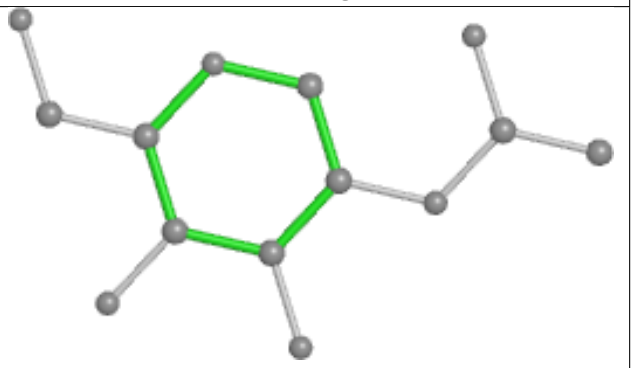
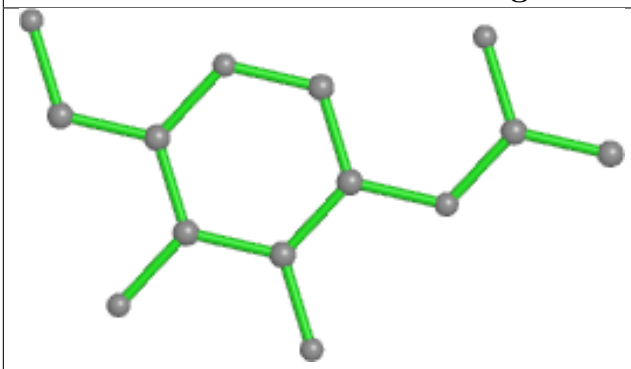


Rings

Ligand NAG A 1305



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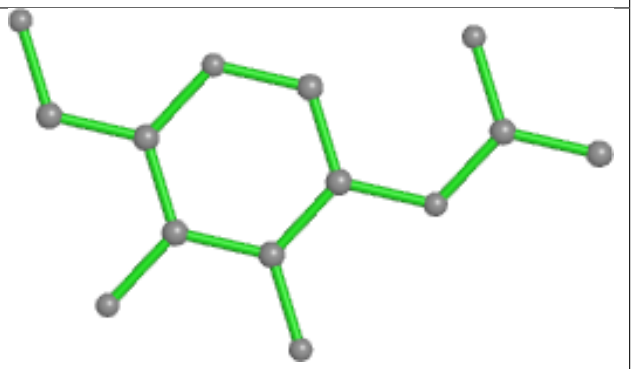
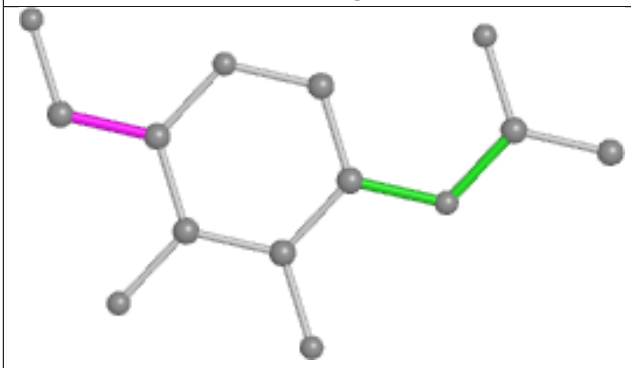
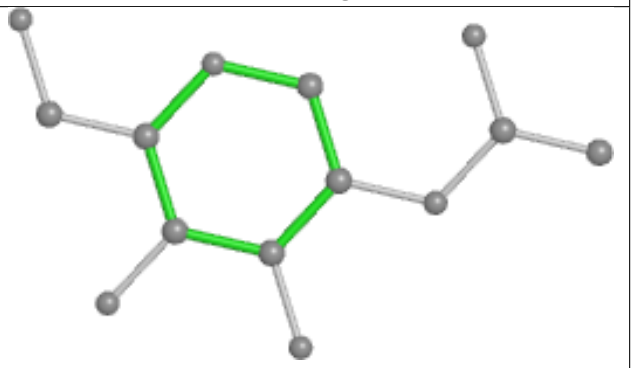


Bond angles

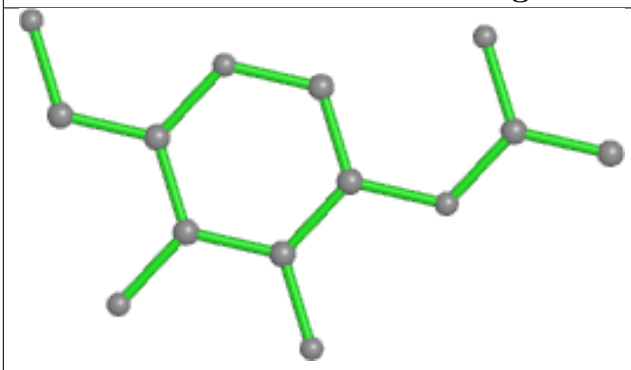


Torsions



Rings

Ligand NAG B 1307



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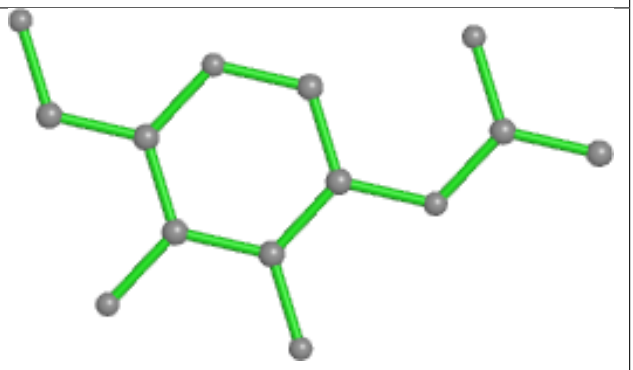

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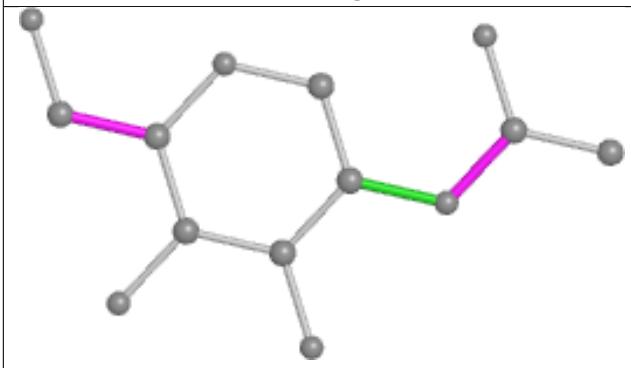

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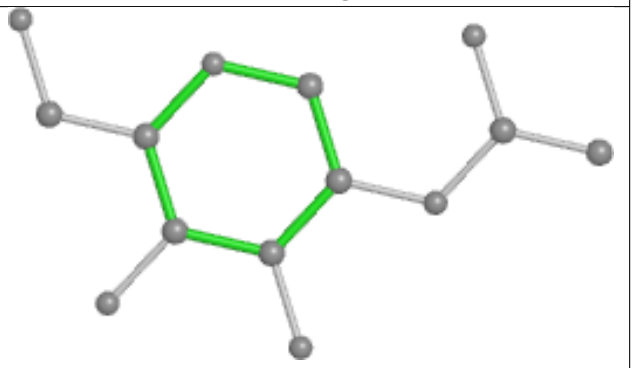
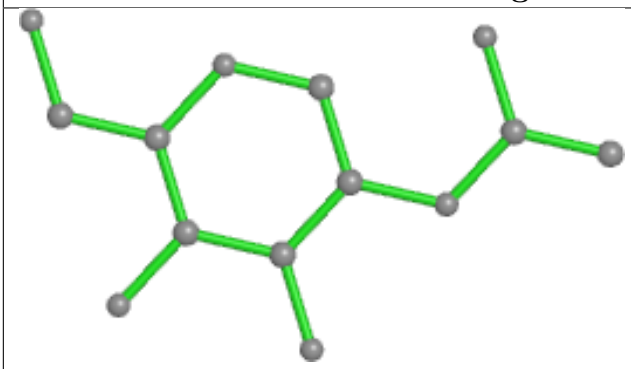


Rings

Ligand NAG C 1308



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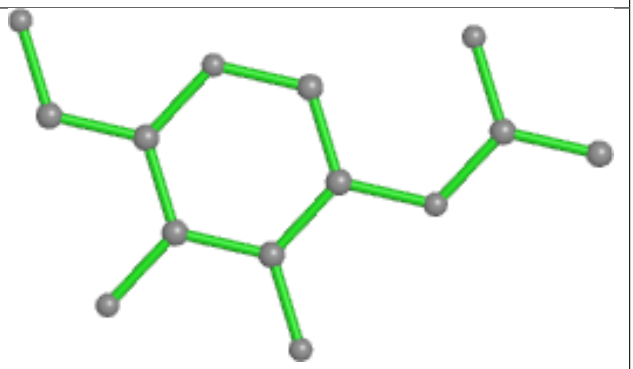

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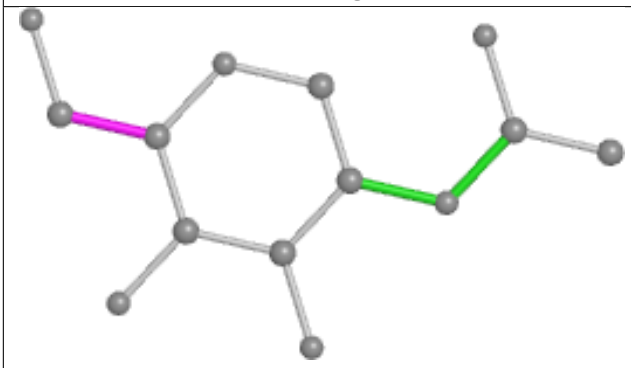

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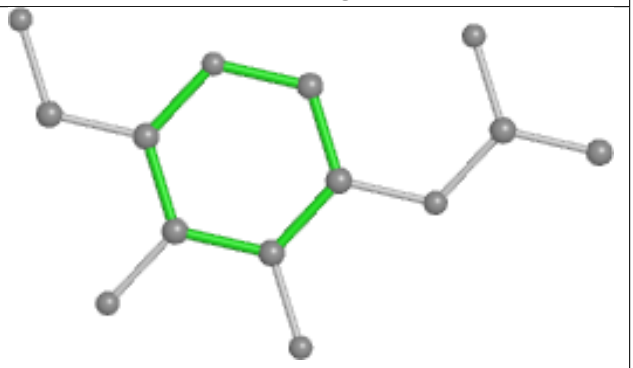
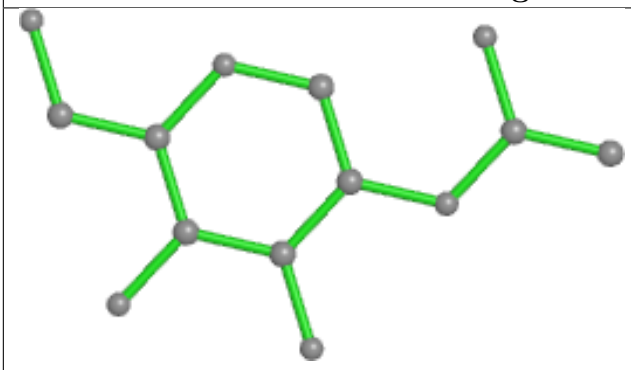


Rings

Ligand NAG B 1304



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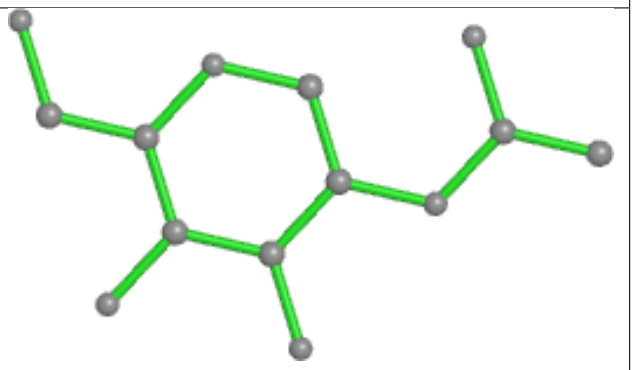

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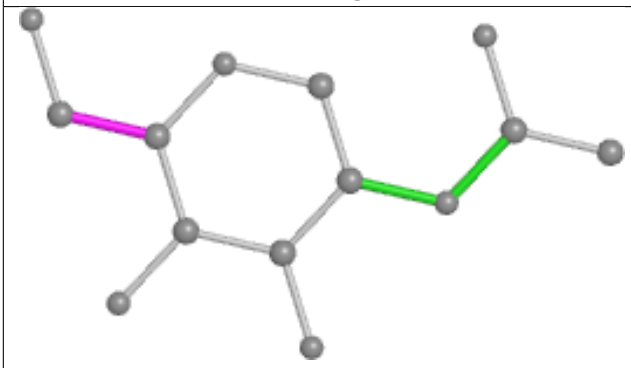

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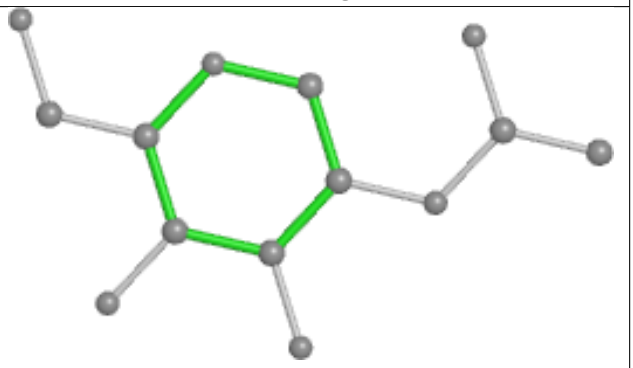
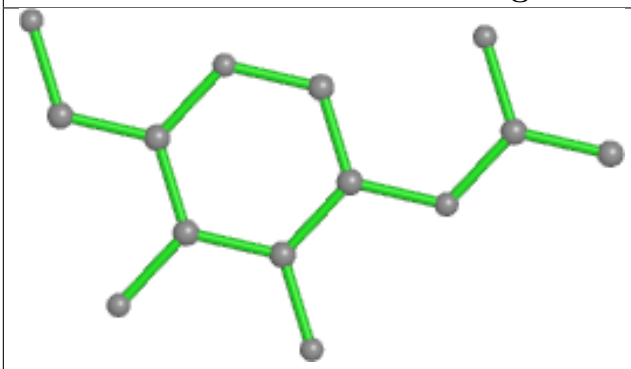
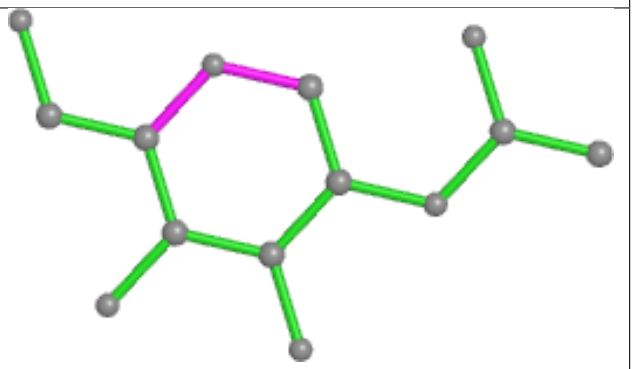
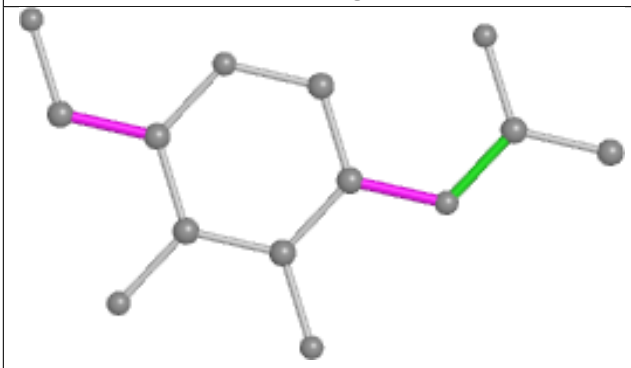
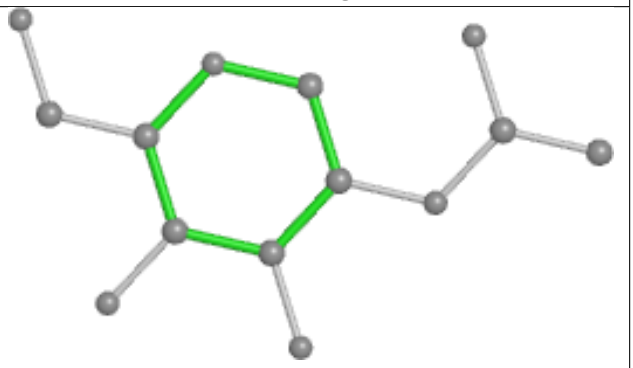
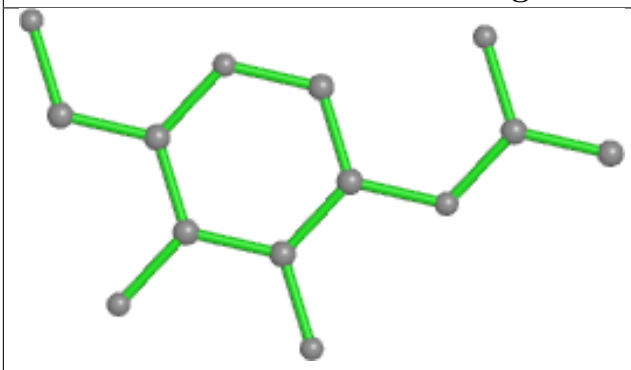
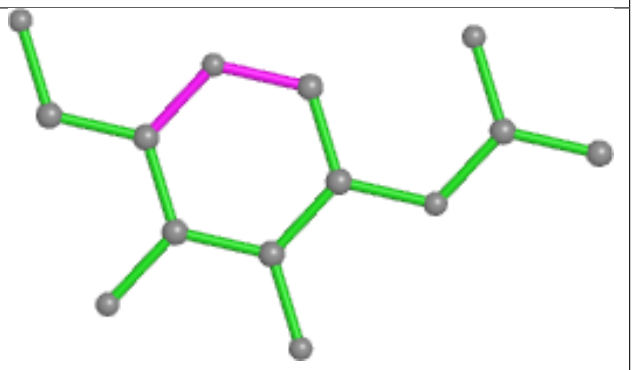
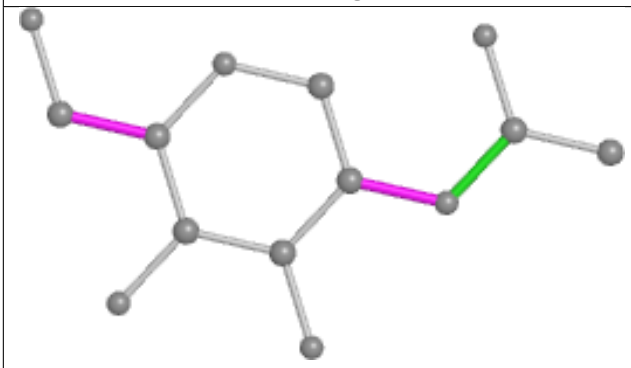
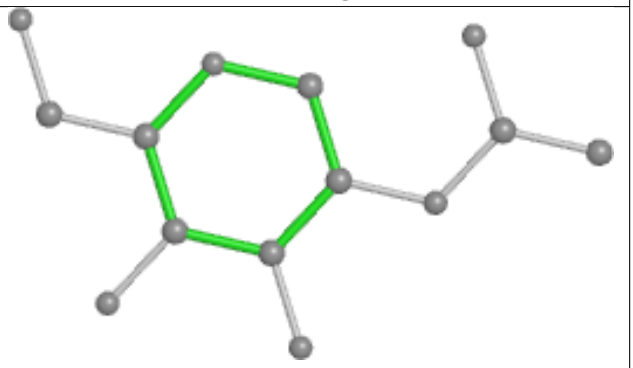
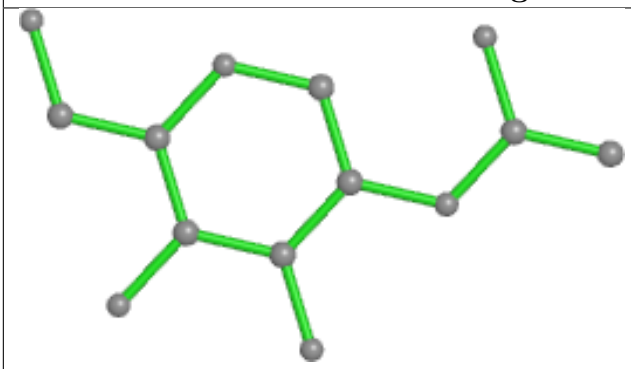


Rings

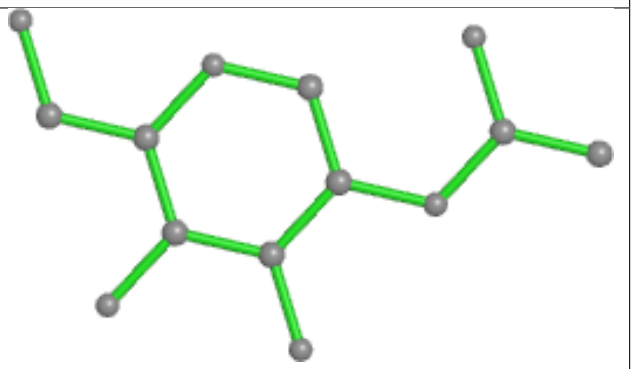
Ligand NAG C 1301	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand NAG B 1301	
 Bond lengths	 Bond angles
 Torsions	 Rings

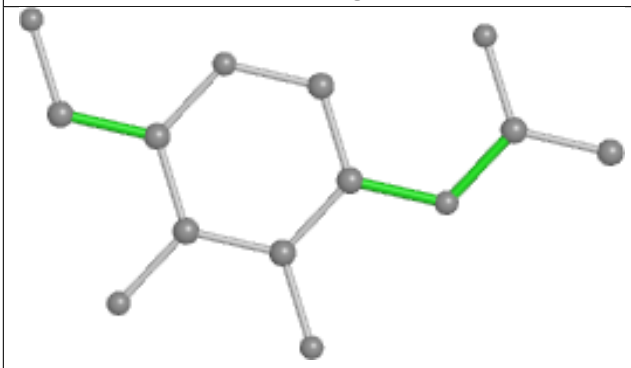
Ligand NAG A 1301



Bond lengths



Bond angles



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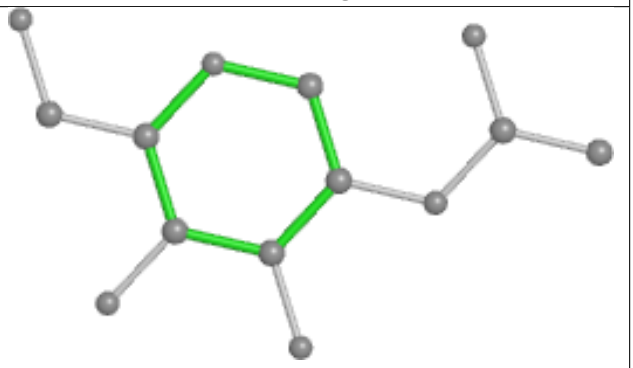
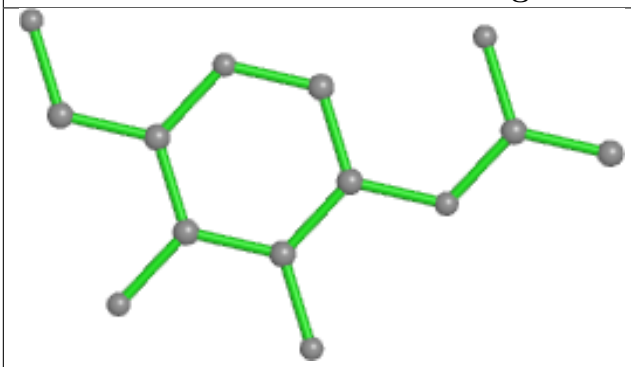


Rings

Ligand NAG B 1302



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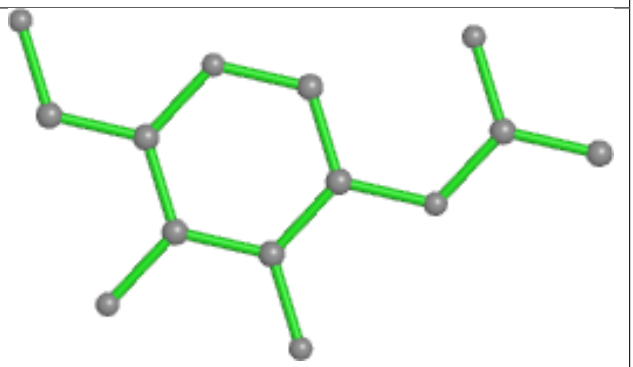

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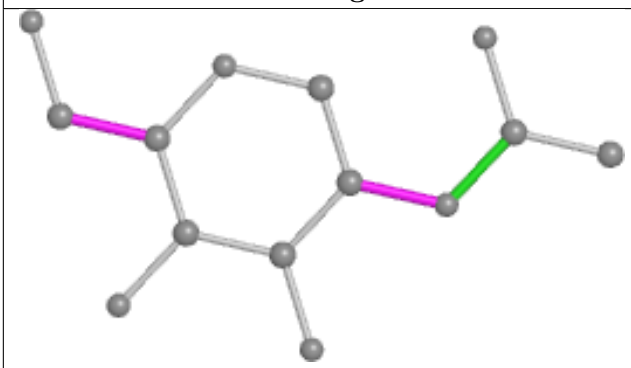

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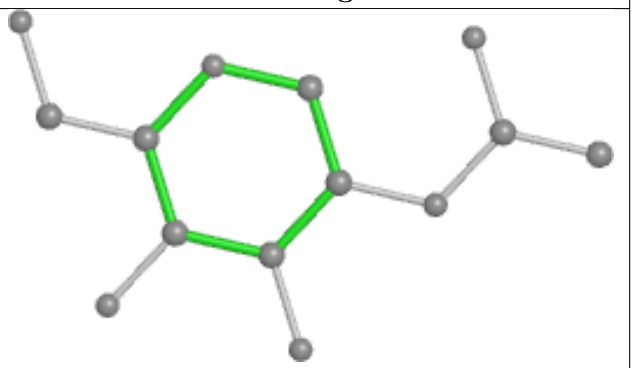
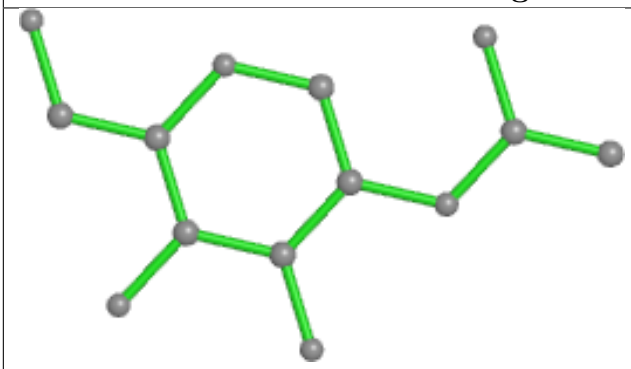
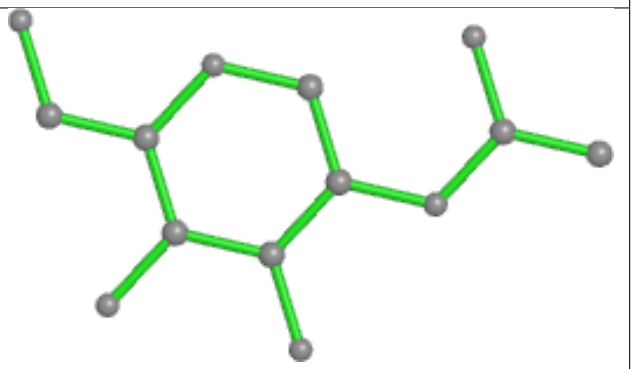
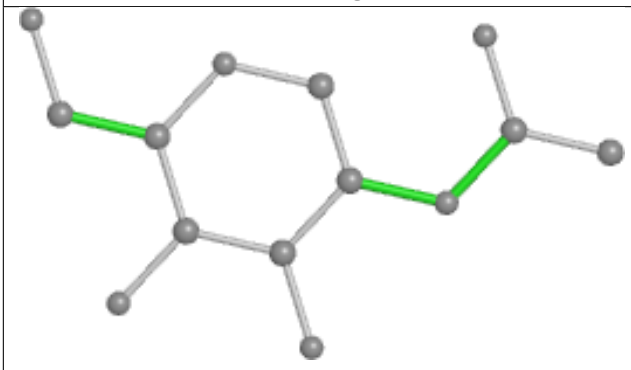
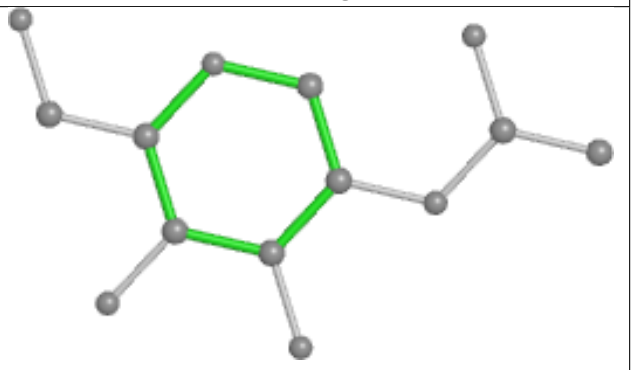
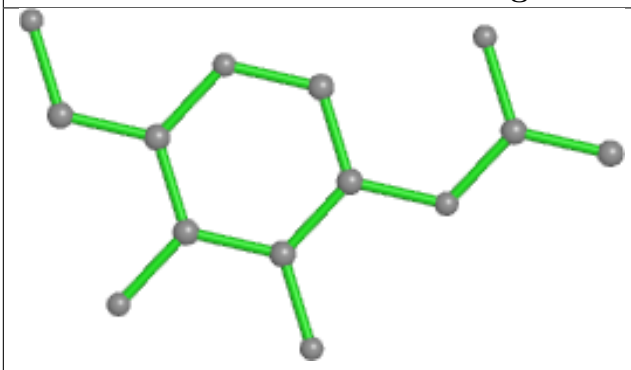
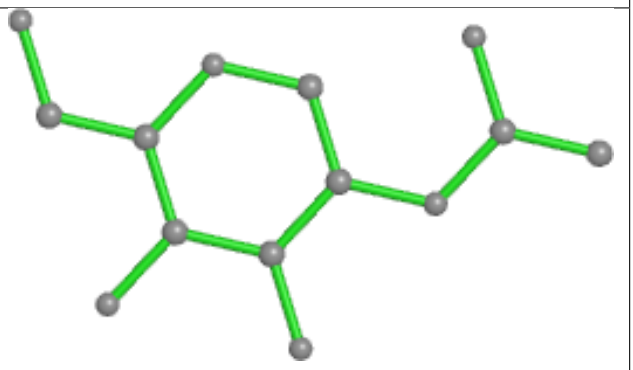
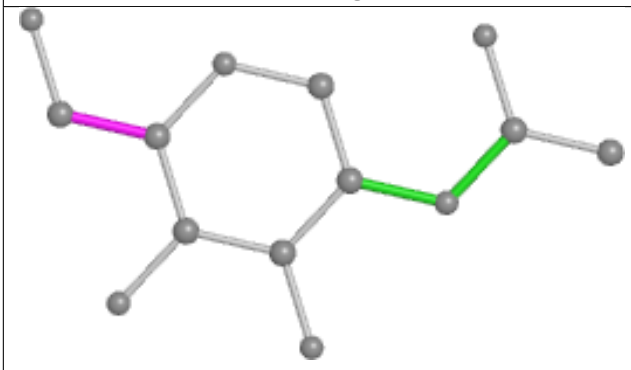
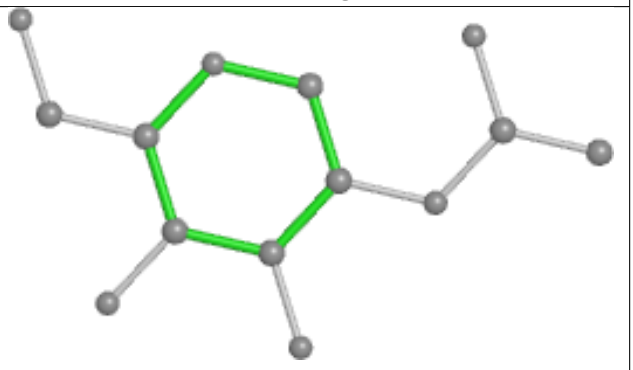
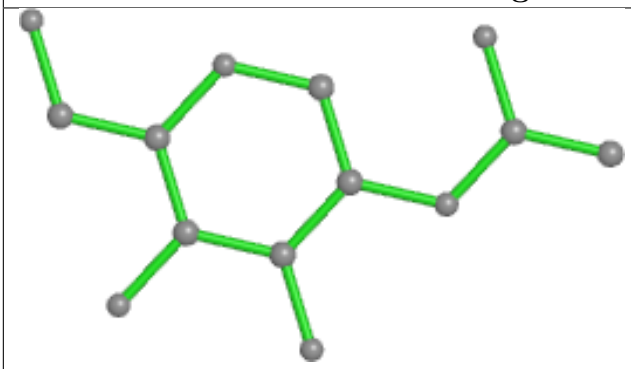


Rings

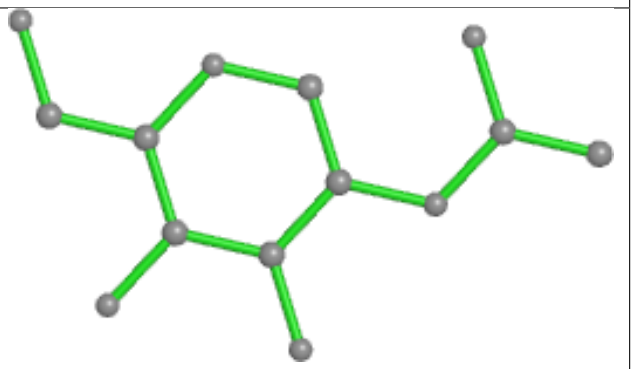
Ligand NAG C 1303	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand NAG A 1306	
 Bond lengths	 Bond angles
 Torsions	 Rings

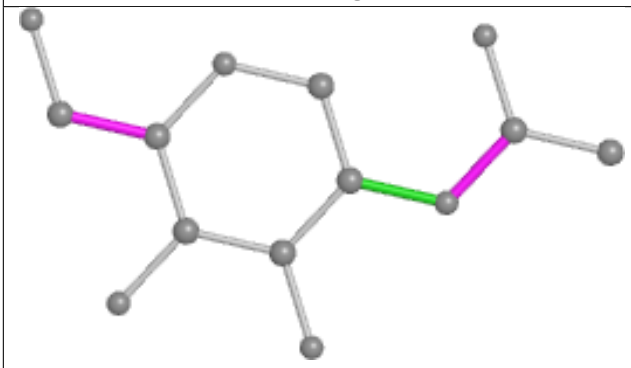
Ligand NAG B 1308



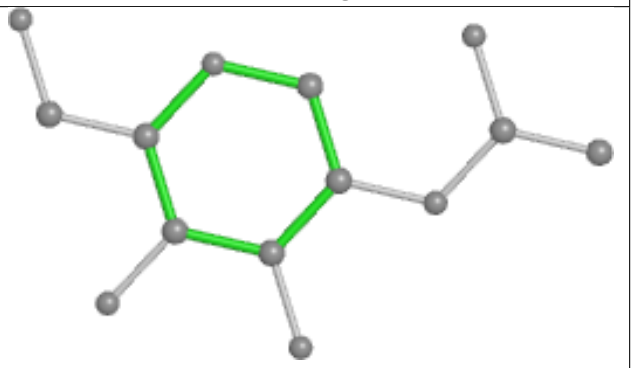
Bond lengths



Bond angles

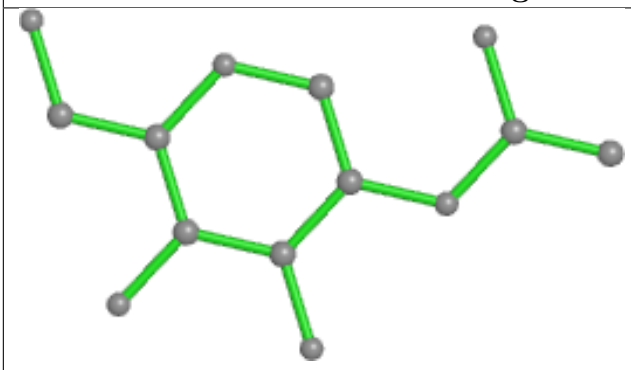


Torsions



Rings

Ligand NAG B 1303



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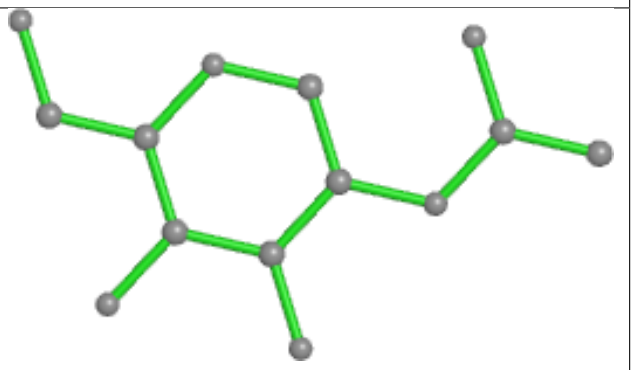
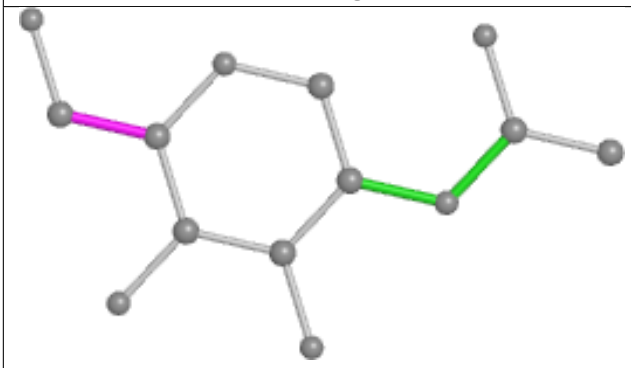


Bond angles



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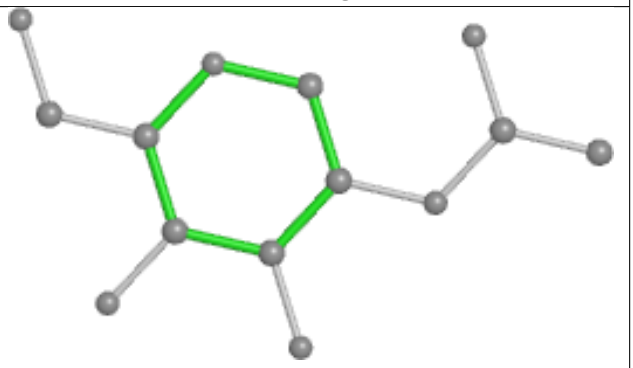
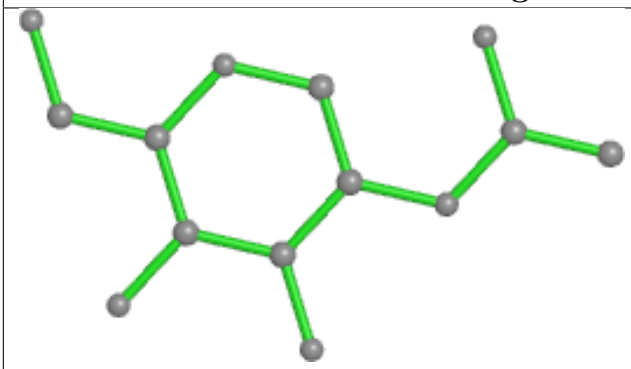


Rings

Ligand NAG C 1302



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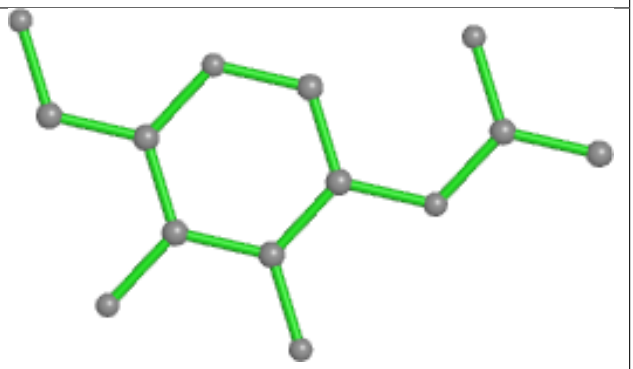
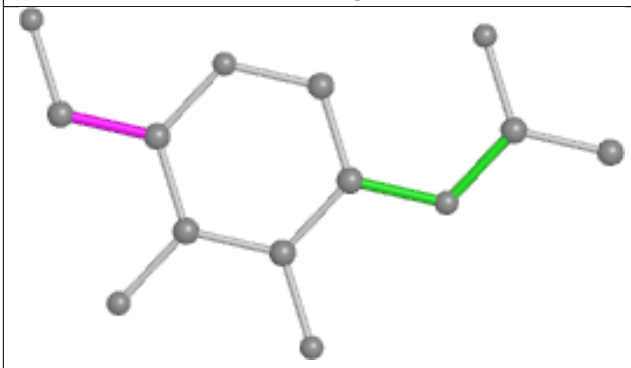


Bond angles



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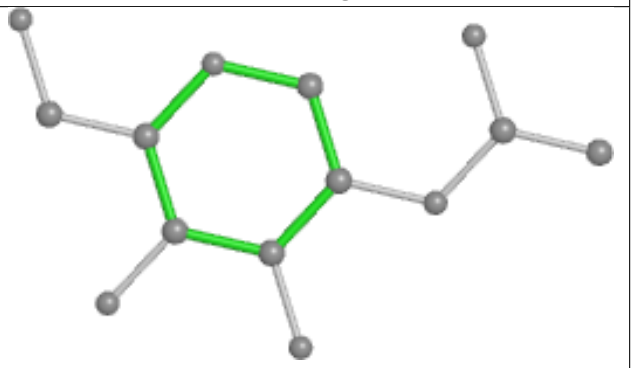
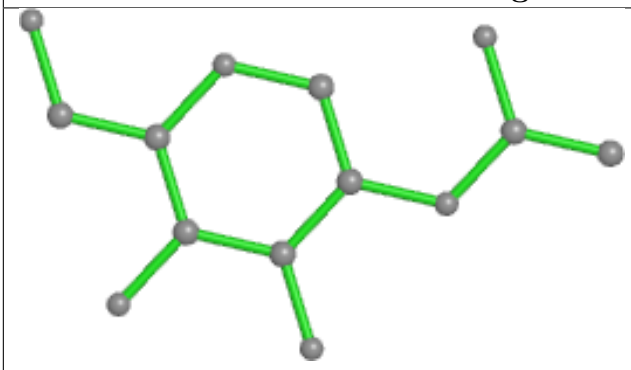
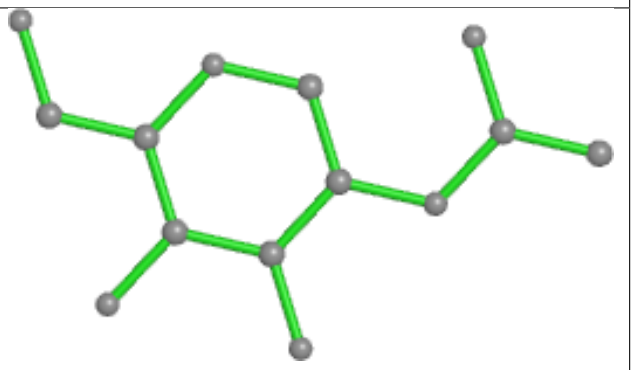


Rings

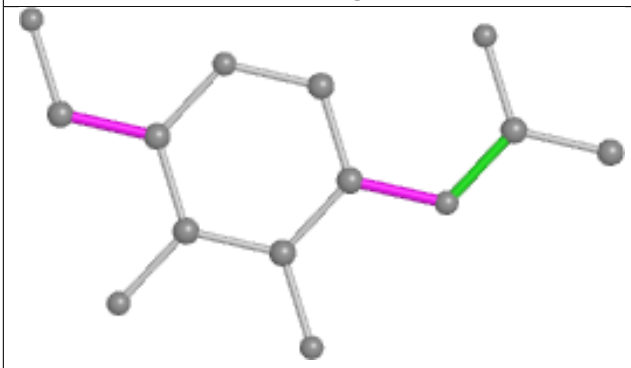
Ligand NAG C 1306



Bond lengths



Bond angles



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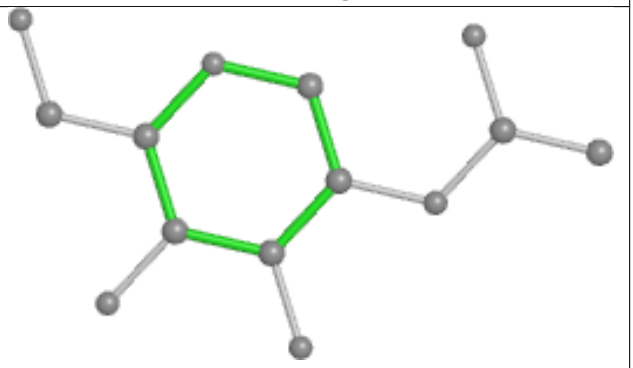
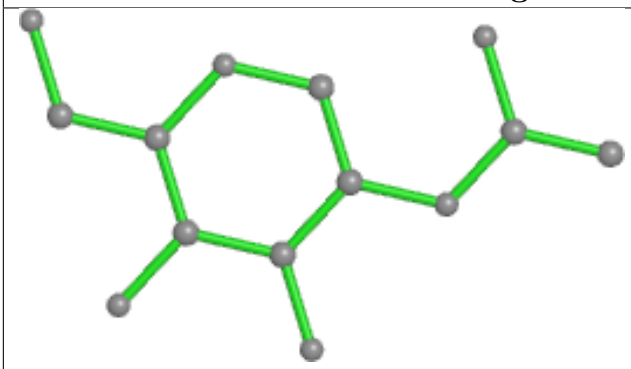
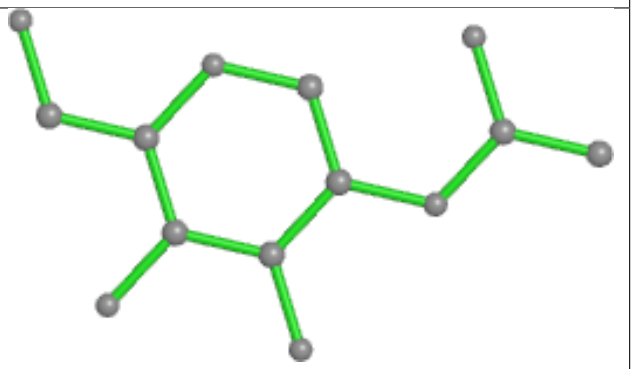


Rings

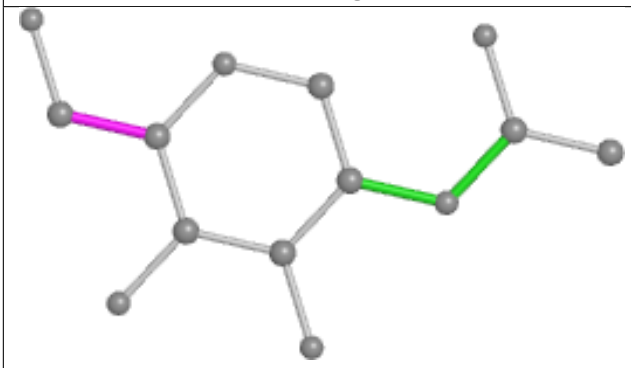
Ligand NAG A 1302



Bond lengths



Bond angles



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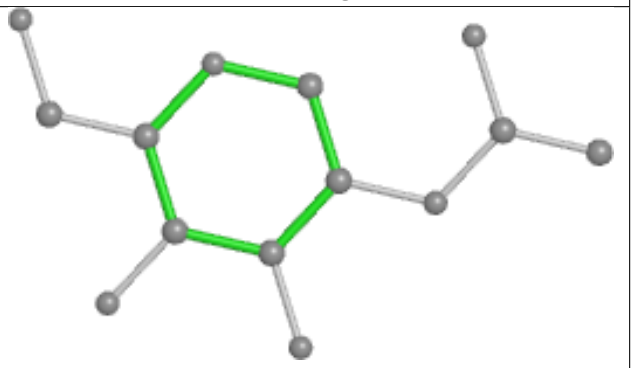
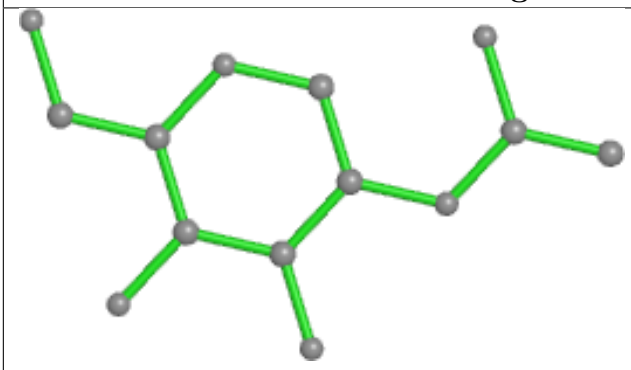


Rings

Ligand NAG A 1308



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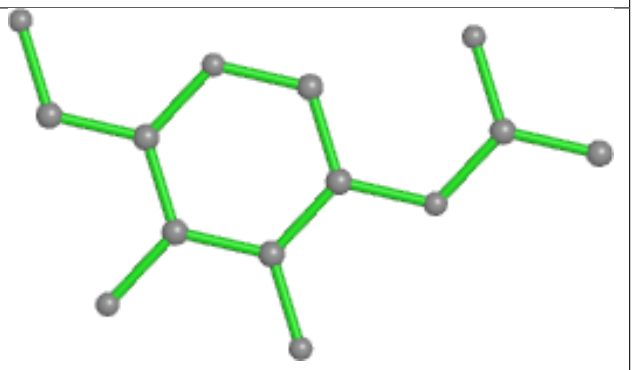
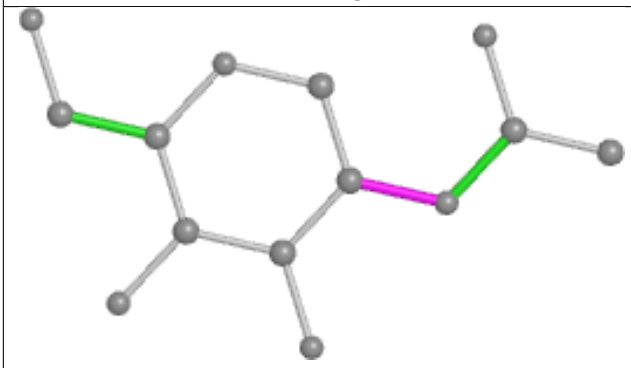


Bond angles



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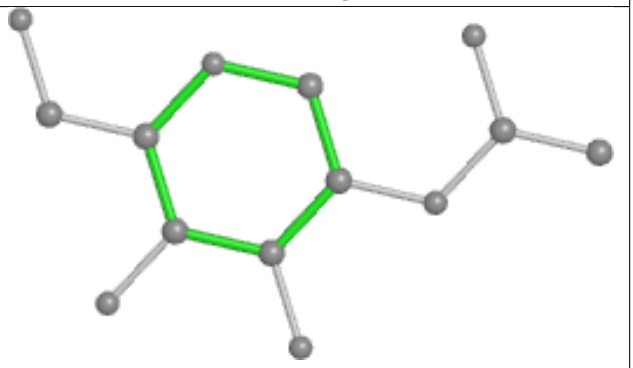
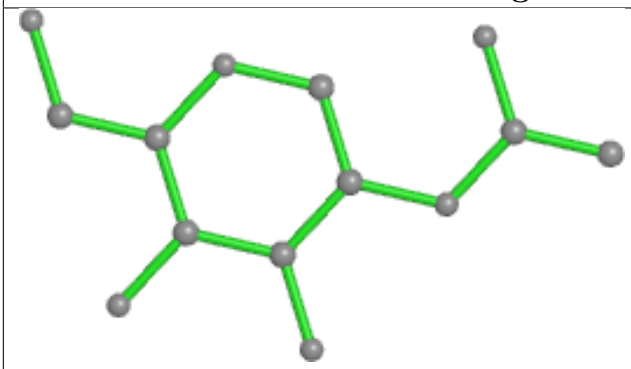
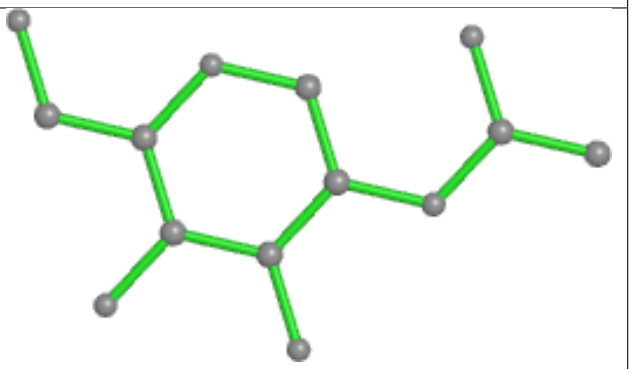
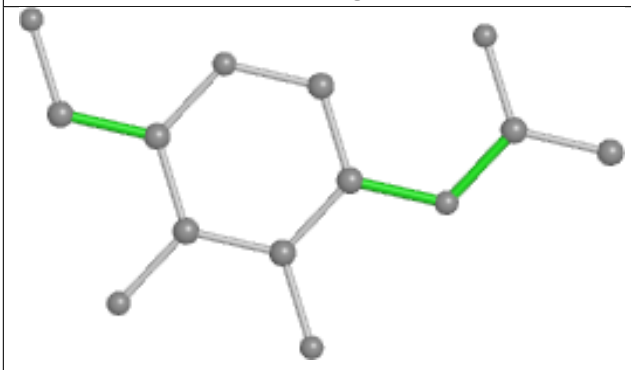
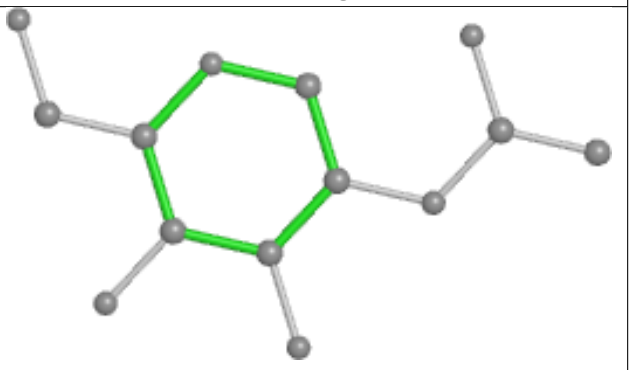
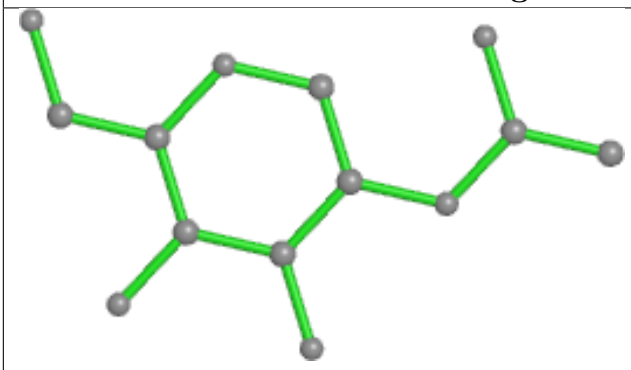
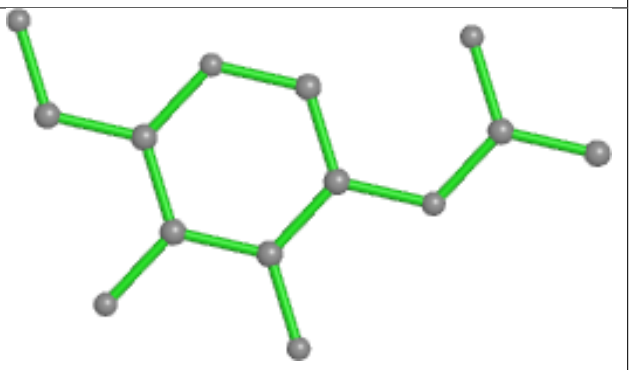
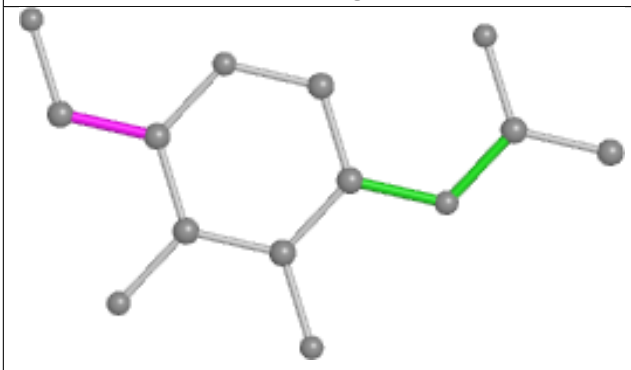
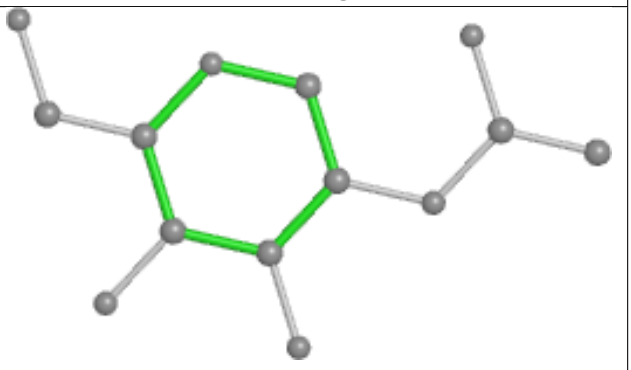
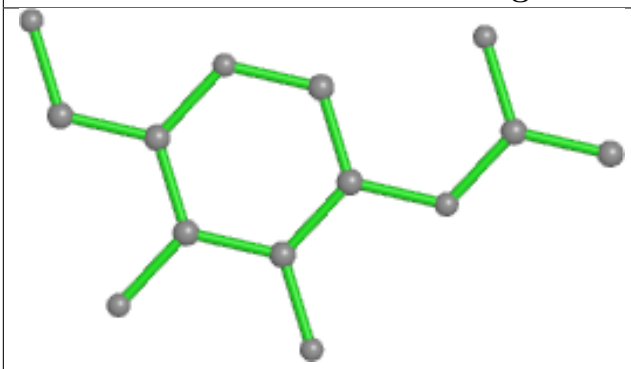


Rings

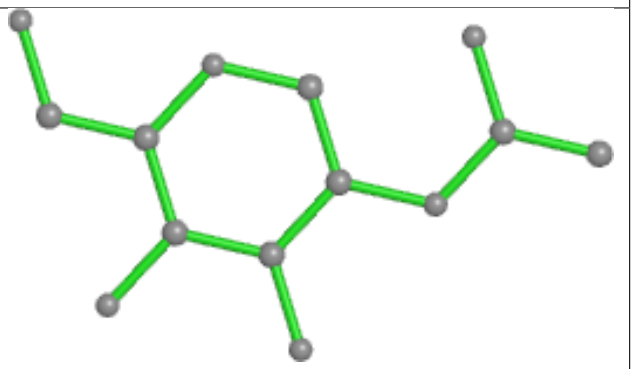
Ligand NAG B 1309	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand NAG A 1303	
 Bond lengths	 Bond angles
 Torsions	 Rings

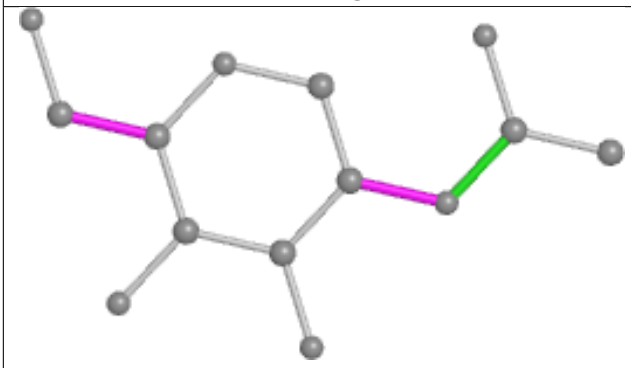
Ligand NAG B 1305



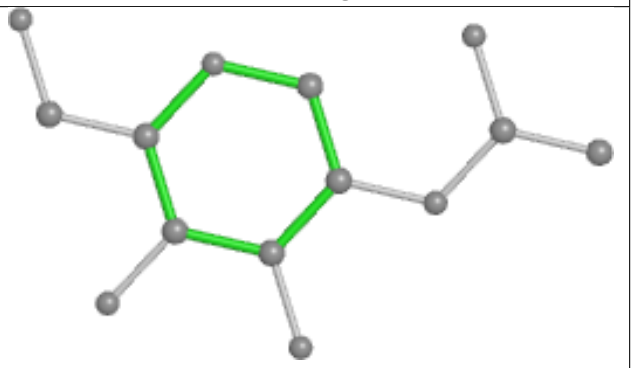
Bond lengths



Bond angles

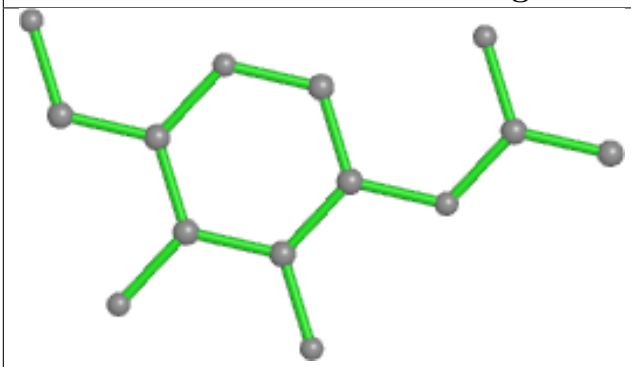


Torsions

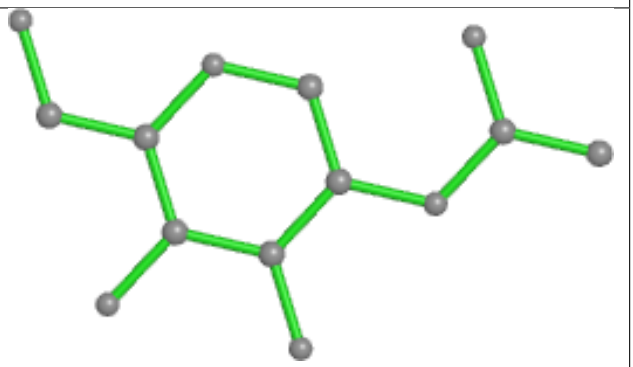


Rings

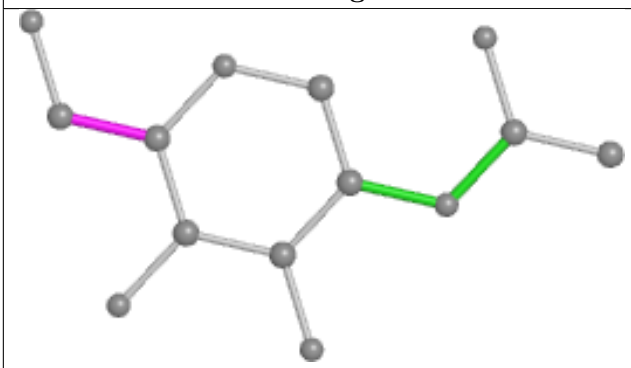
Ligand NAG B 1306



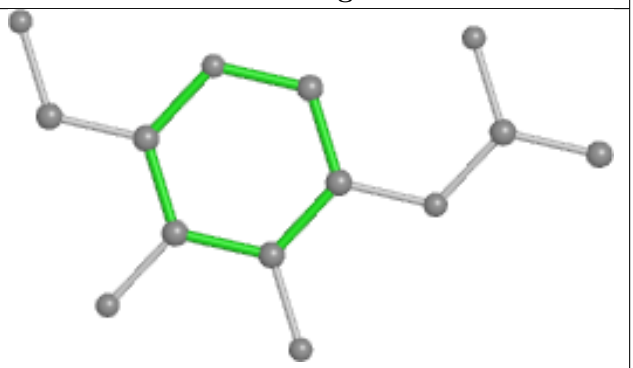
Bond lengths



Bond angles

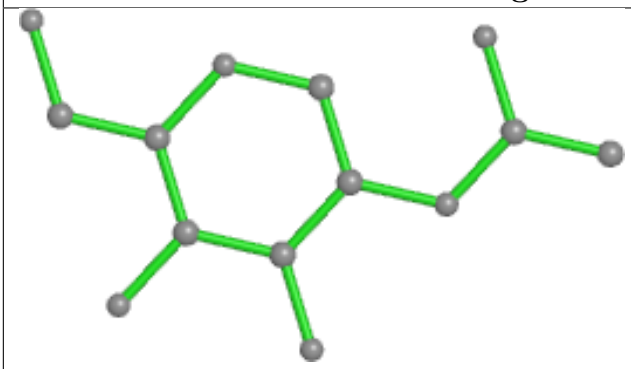


Torsions

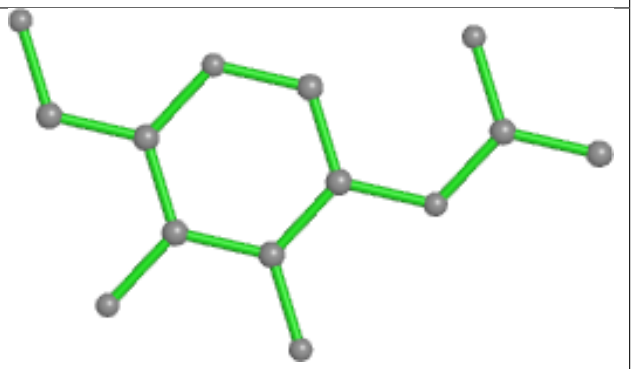


Rings

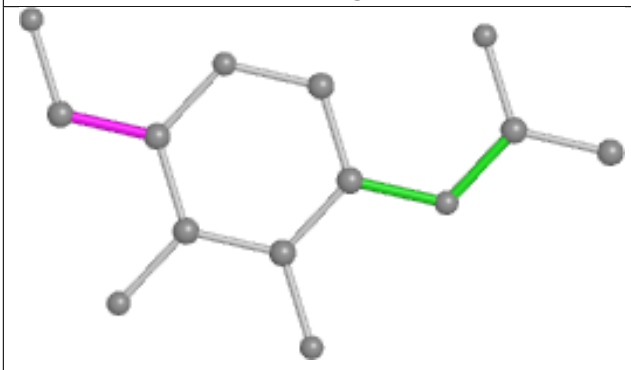
Ligand NAG C 1304



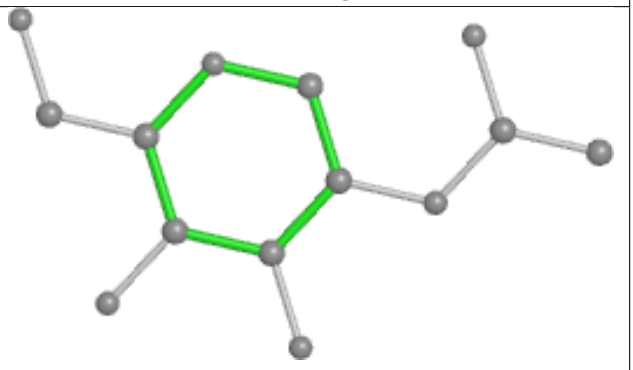
Bond lengths



Bond angles

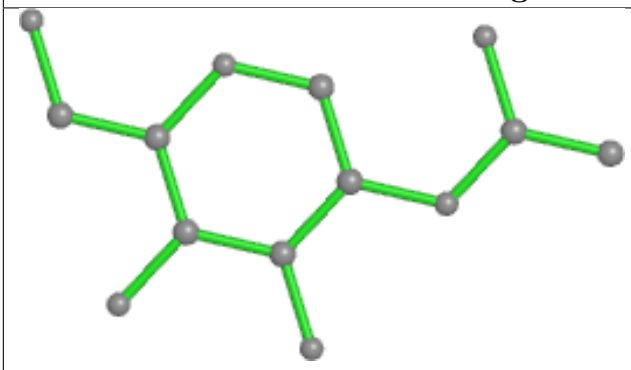


Torsions

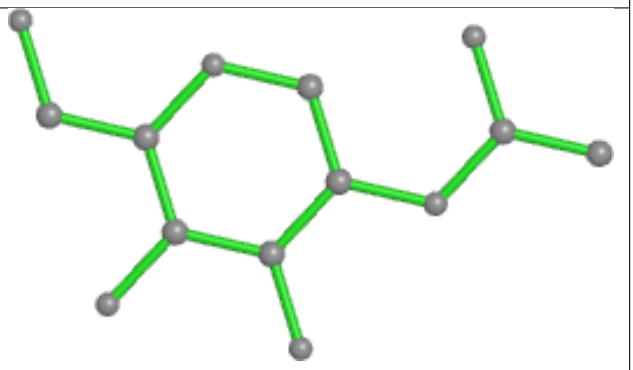


Rings

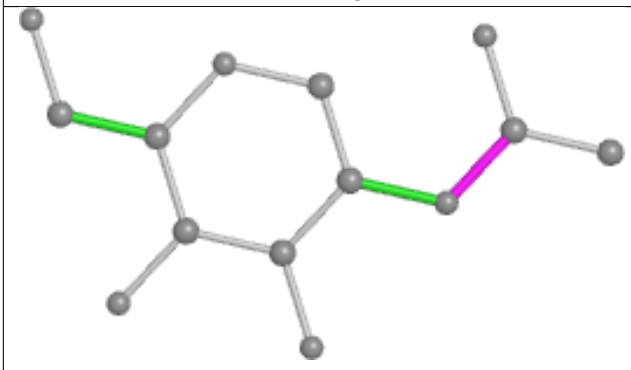
Ligand NAG A 1304



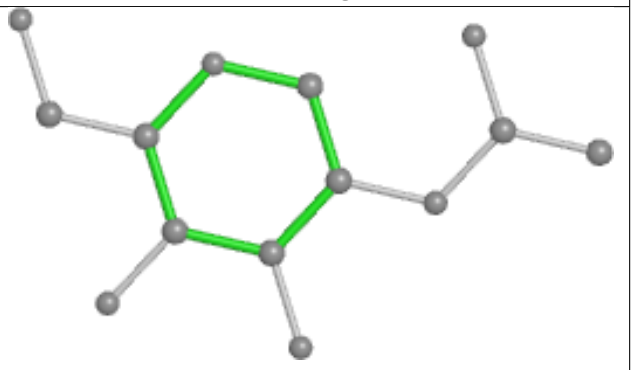
Bond lengths



Bond angles



Torsions



Rings

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.

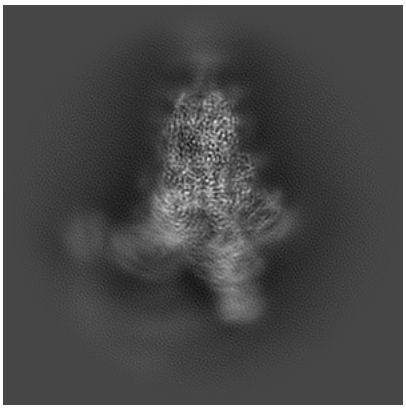
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-33124. These allow visual inspection of the internal detail of the map and identification of artifacts.

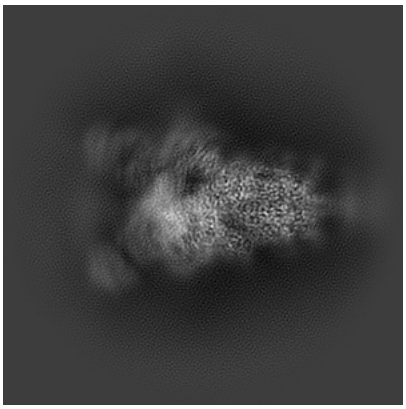
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

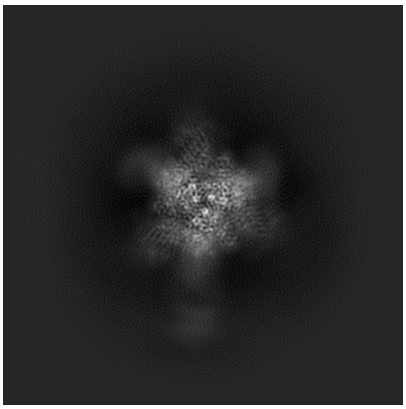
6.1.1 Primary map



X

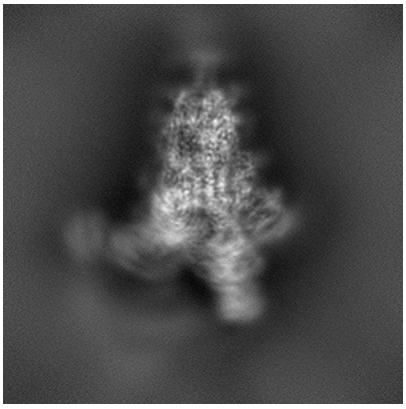


Y

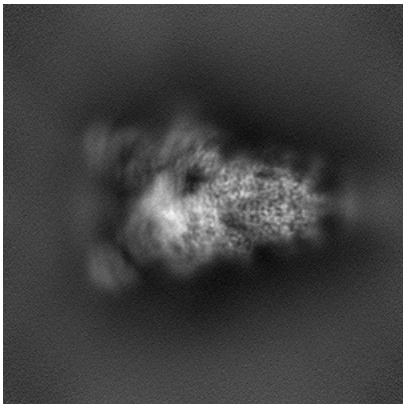


Z

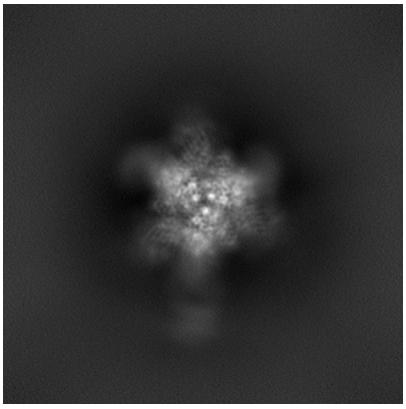
6.1.2 Raw map



X



Y

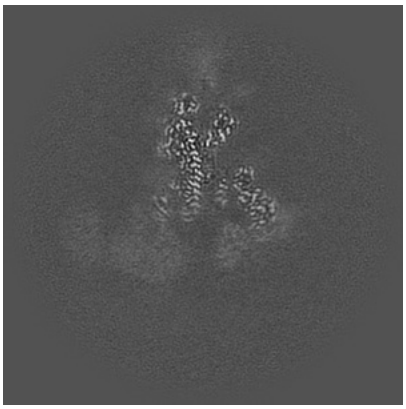


Z

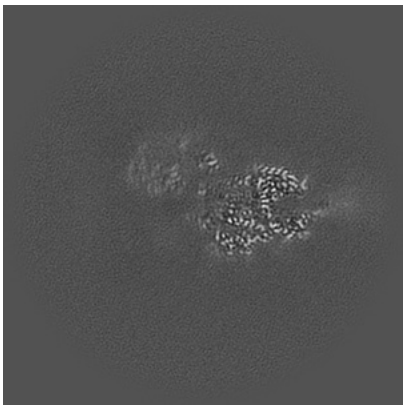
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

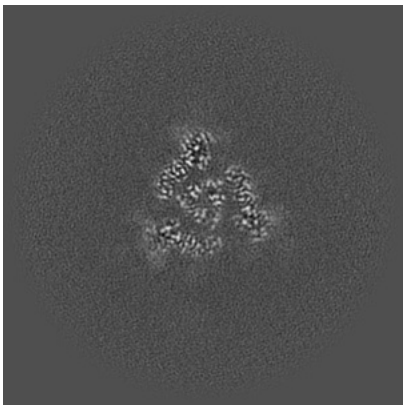
6.2.1 Primary map



X Index: 256

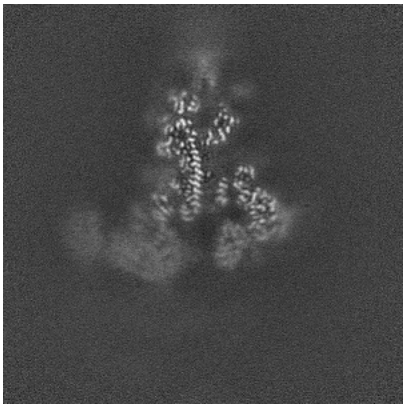


Y Index: 256

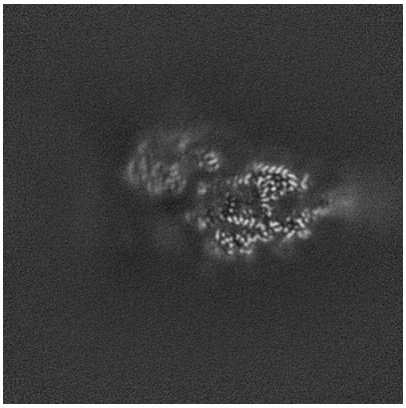


Z Index: 256

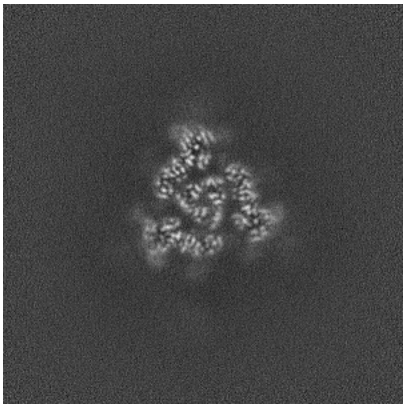
6.2.2 Raw map



X Index: 256



Y Index: 256

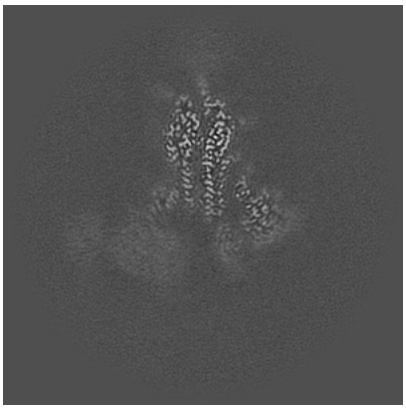


Z Index: 256

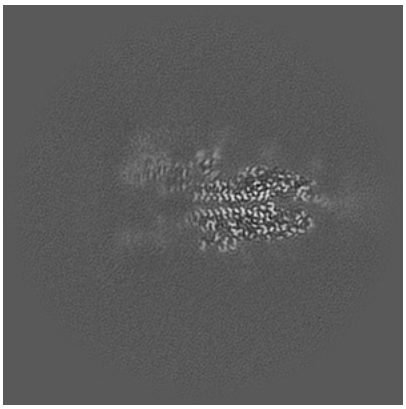
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

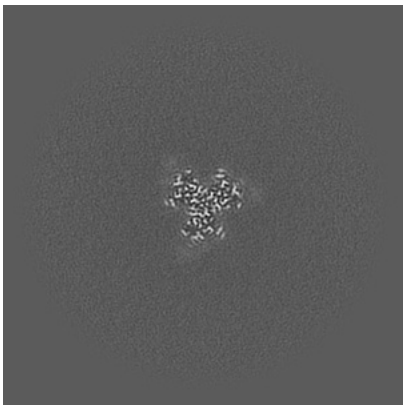
6.3.1 Primary map



X Index: 245

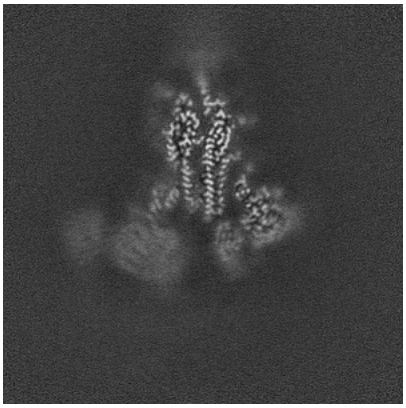


Y Index: 266

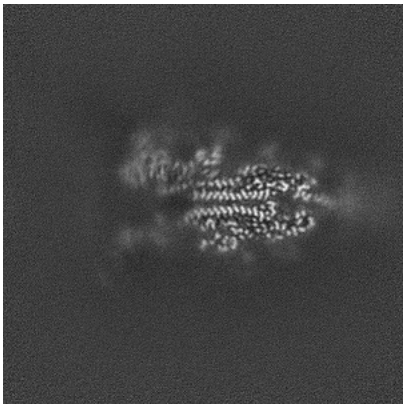


Z Index: 336

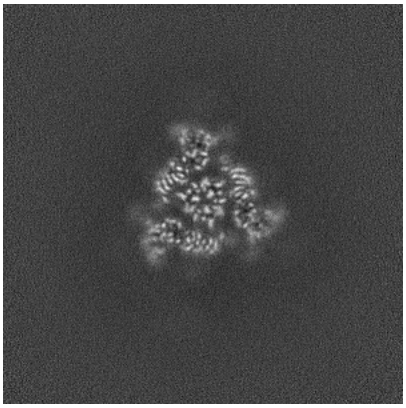
6.3.2 Raw map



X Index: 245



Y Index: 265

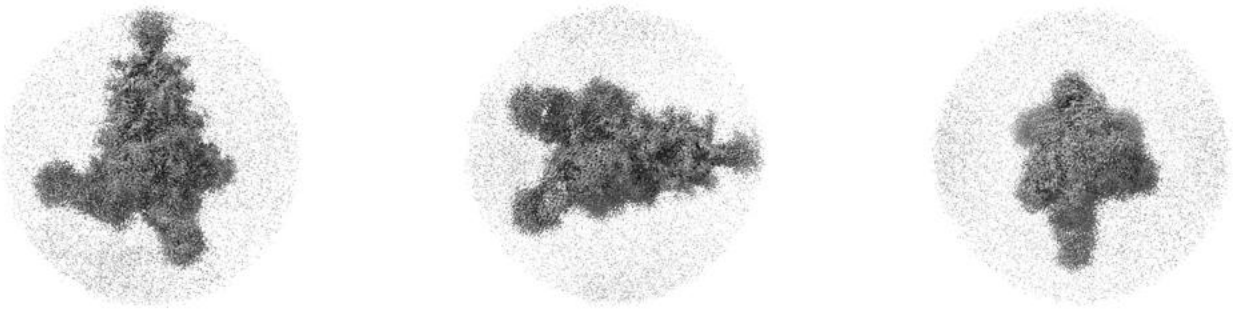


Z Index: 261

The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views (i)

6.4.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.15. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.4.2 Raw map

X Y Z

These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

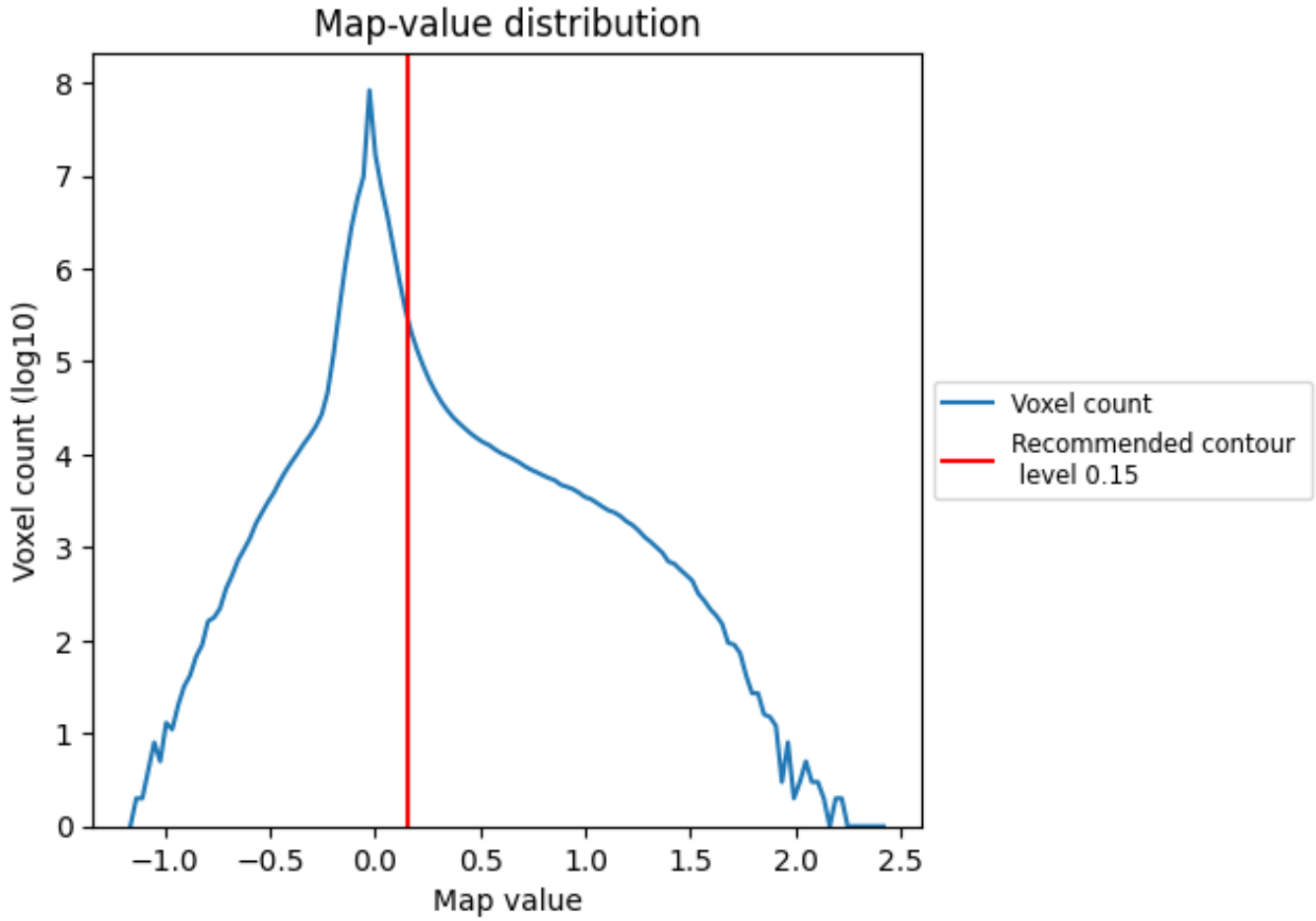
6.5 Mask visualisation (i)

This section was not generated. No masks/segmentation were deposited.

7 Map analysis

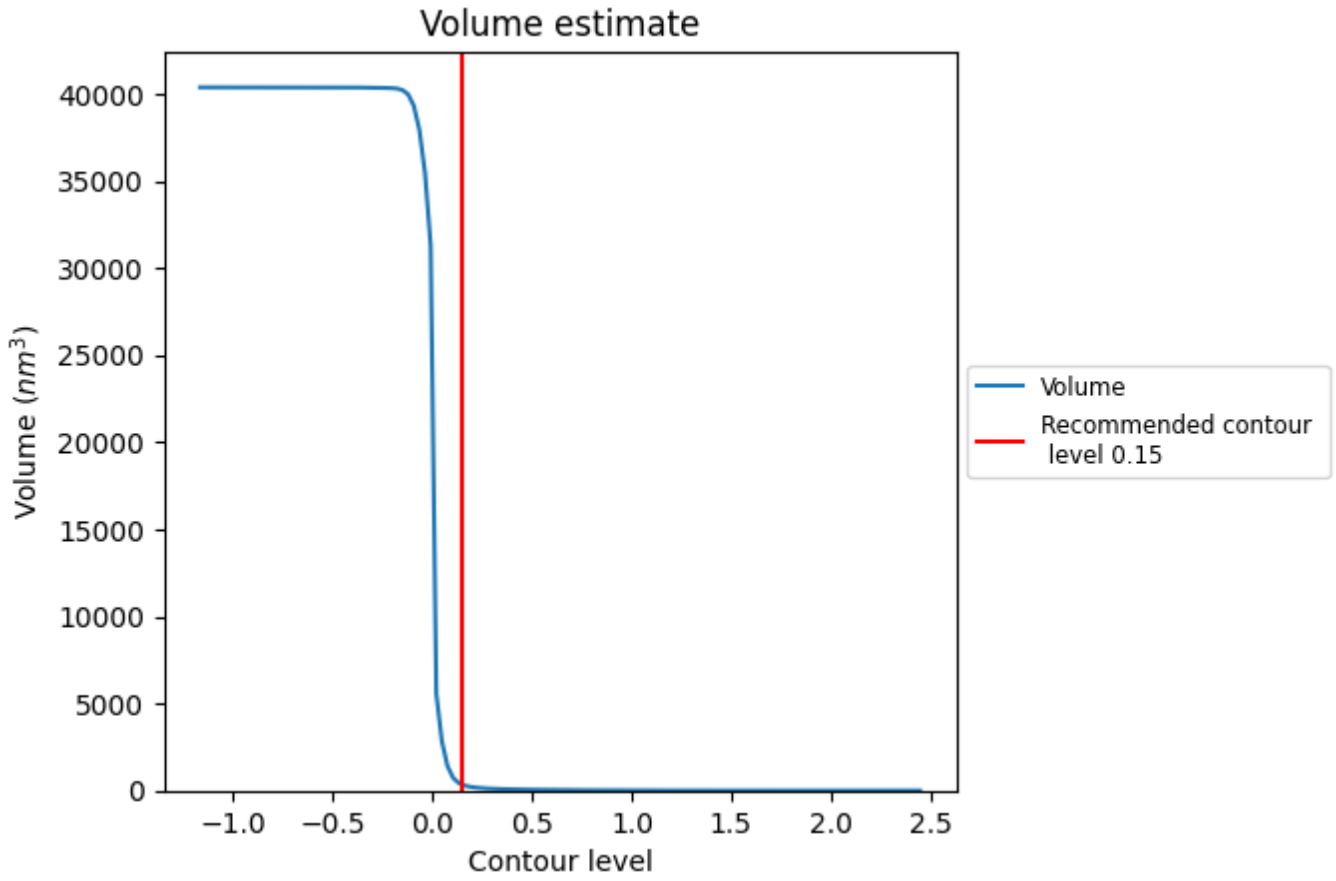
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

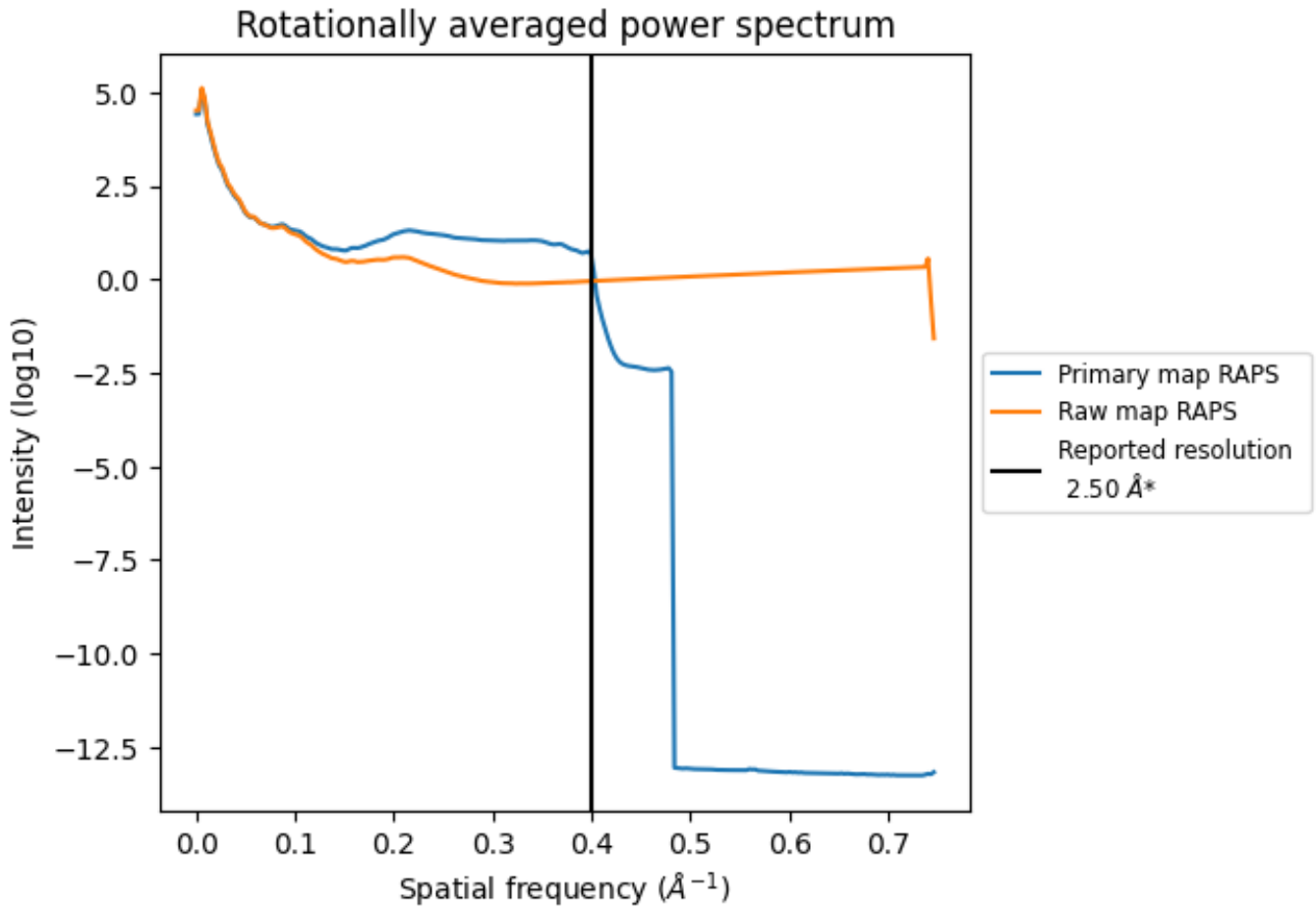
7.2 Volume estimate



The volume at the recommended contour level is 348 nm^3; this corresponds to an approximate mass of 314 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum (i)

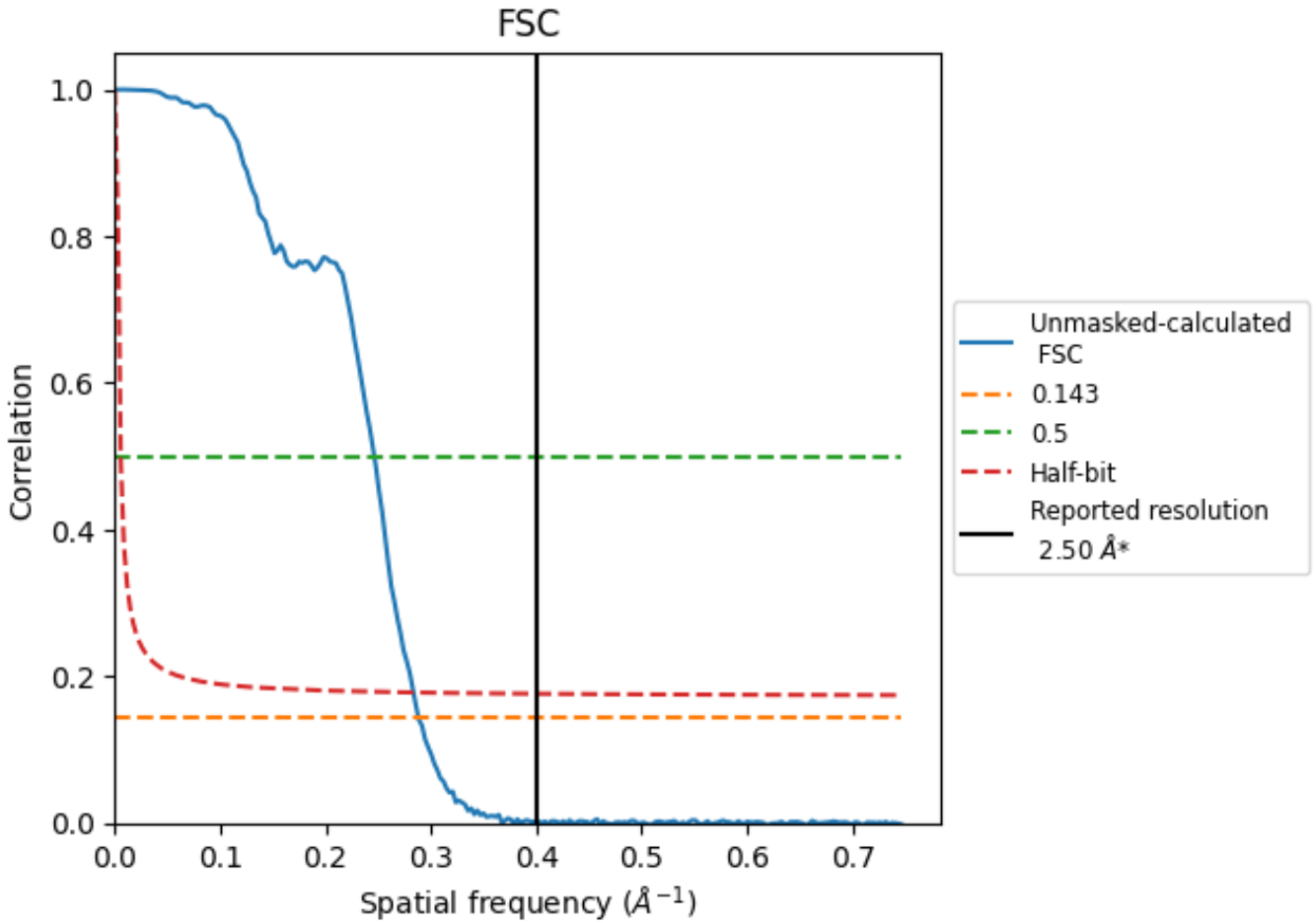


*Reported resolution corresponds to spatial frequency of 0.400 $Å^{-1}$

8 Fourier-Shell correlation

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC



*Reported resolution corresponds to spatial frequency of 0.400 Å^{-1}

8.2 Resolution estimates (i)

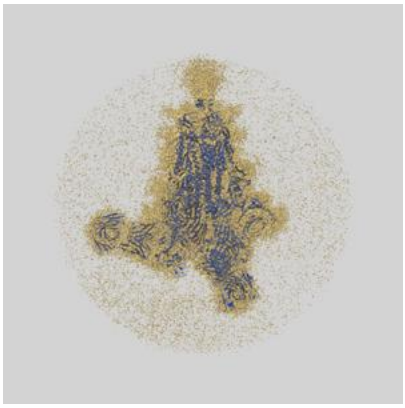
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.50	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.47	4.06	3.53

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.47 differs from the reported value 2.5 by more than 10 %

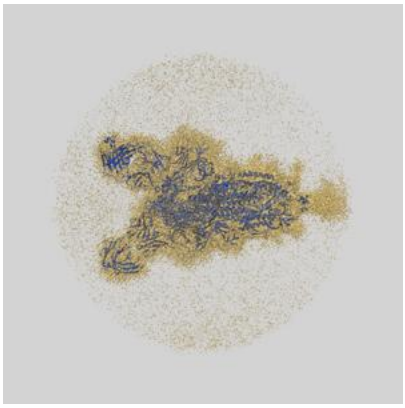
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-33124 and PDB model 7XCO. Per-residue inclusion information can be found in section 3 on page 15.

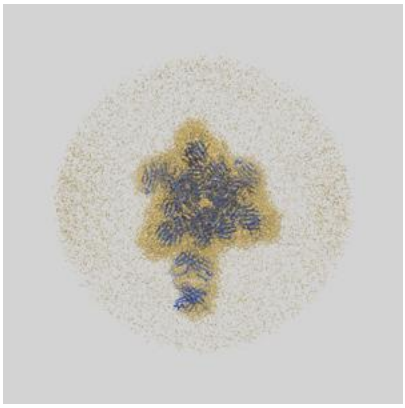
9.1 Map-model overlay



X



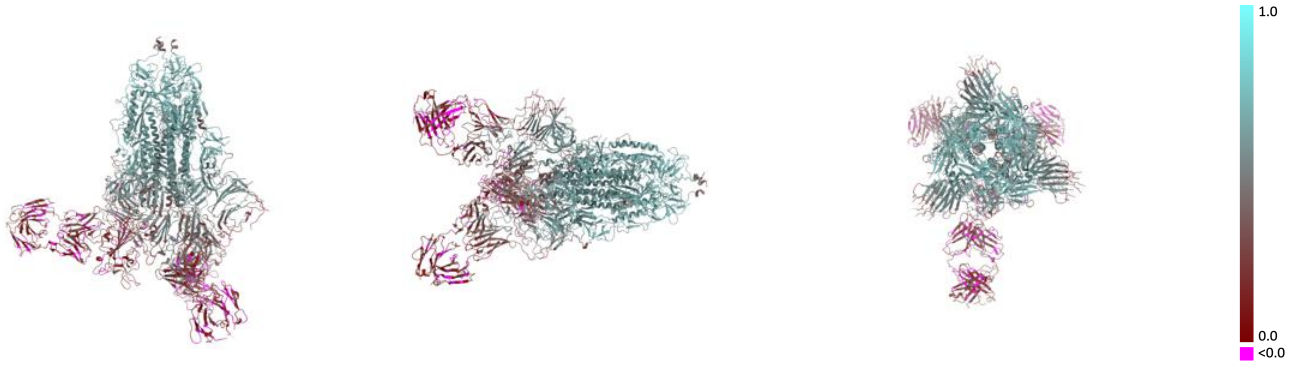
Y



Z

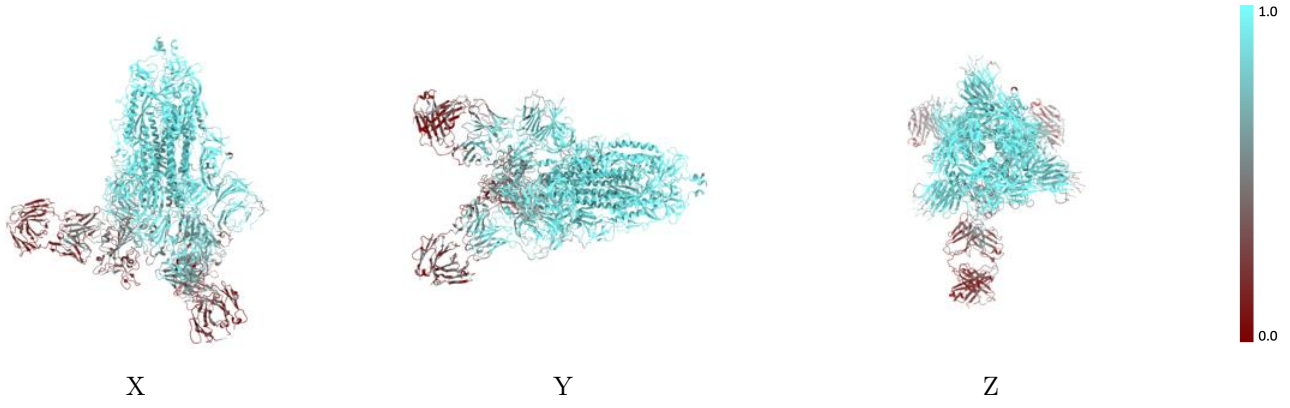
The images above show the 3D surface view of the map at the recommended contour level 0.15 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model



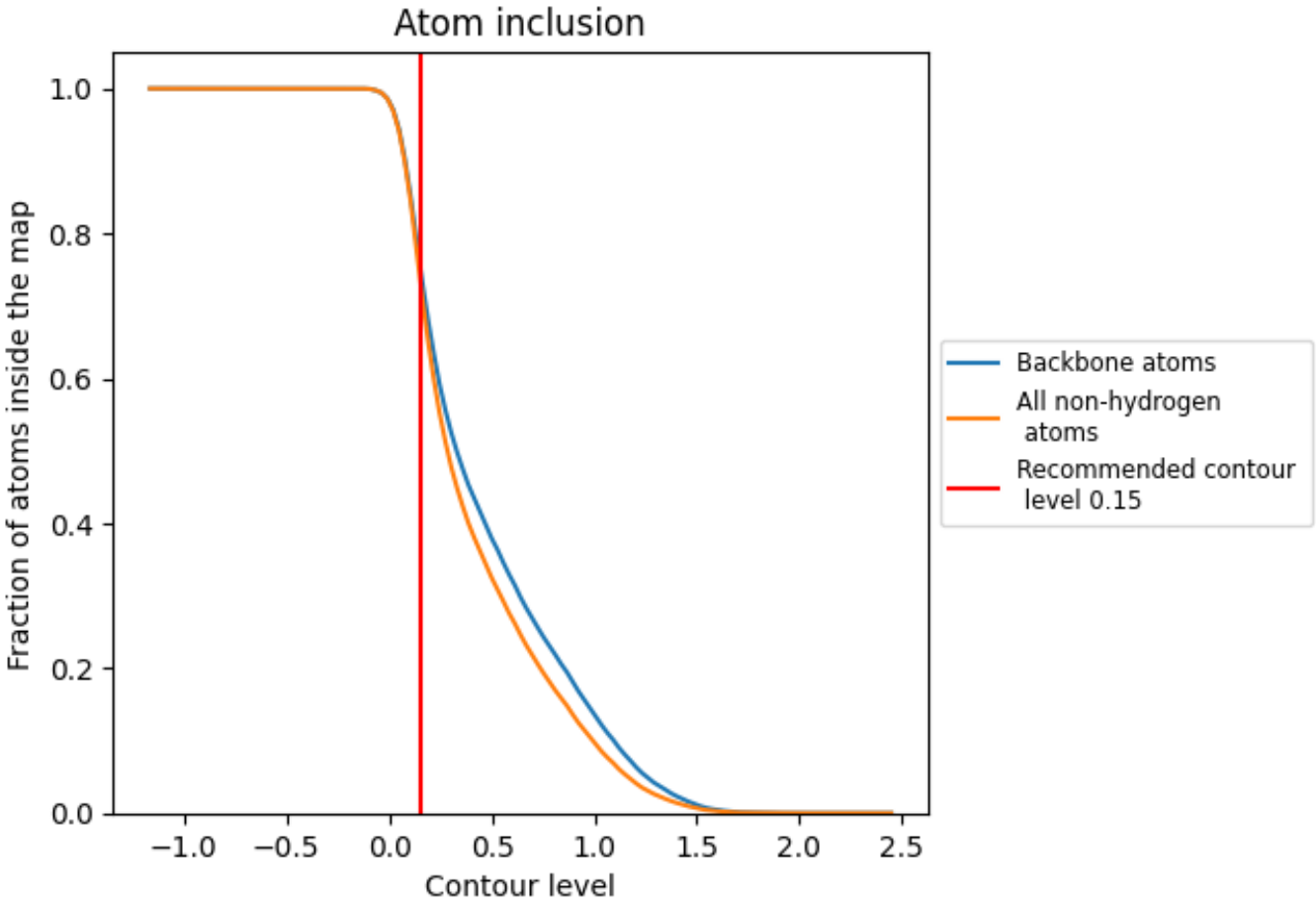
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

9.3 Atom inclusion mapped to coordinate model



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.15).

9.4 Atom inclusion (i)



At the recommended contour level, 76% of all backbone atoms, 74% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.15) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7382	0.4330
A	0.8924	0.5380
B	0.8924	0.5370
C	0.8104	0.4890
D	0.4643	0.2520
E	0.6429	0.3590
F	0.5000	0.1740
G	0.9643	0.5240
H	0.5751	0.2620
I	0.8929	0.4780
J	0.9643	0.5400
K	0.7857	0.4210
L	0.4739	0.2230
M	0.4931	0.2440
N	0.4405	0.2310
O	0.2541	0.1510
P	0.2067	0.1300
Q	0.6786	0.3260
R	0.9286	0.5300
S	0.8929	0.4580
T	0.8929	0.5590
U	0.9286	0.5020
V	0.7857	0.4000
W	1.0000	0.5330
X	1.0000	0.5200
Y	0.7857	0.4840
Z	0.9286	0.4830
a	0.9286	0.4390
b	0.7143	0.4080