Full wwPDB EM Validation Report ⓘ

Oct 6, 2024 – 04:17 am BST

PDB ID	:	7A29
EMDB ID	:	EMD-11617
Title	:	Cryo-EM structure of the SARS-CoV-2 spike protein bound to neutralizing sybodies (Sb23) 2-up conformation
Authors	:	Hallberg, B.M.; Das, H.
Deposited on	:	2020-08-16
Resolution	:	2.94 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:

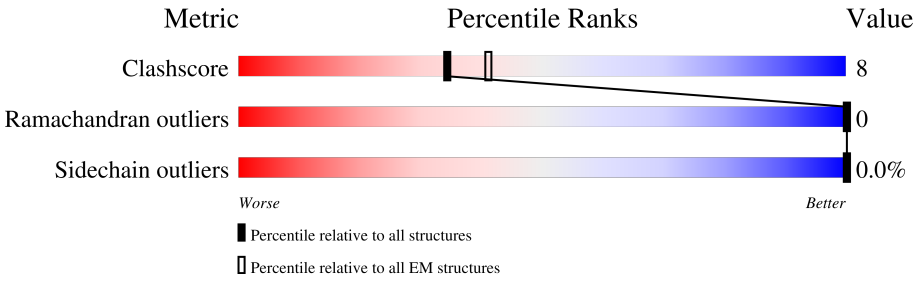
EMDB validation analysis	:	FAILED
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	FAILED
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

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 2.94 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	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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%

Mol	Chain	Length	Quality of chain
1	A	1288	68% 15% 18%
1	B	1288	65% 17% 18%
1	C	1288	66% 16% 18%
2	D	114	77% 23%
2	E	114	73% 27%
2	F	114	75% 25%
3	G	2	50% 50%
3	H	2	100%
3	I	2	100%

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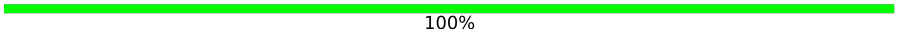
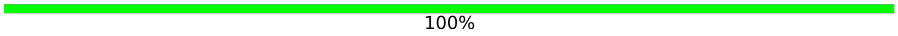
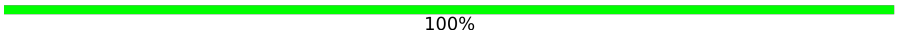
Mol	Chain	Length	Quality of chain
3	J	2	
3	K	2	
3	L	2	
3	M	2	
3	N	2	

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 28286 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	1058	Total	C	N	O	S	0	0
			8278	5284	1380	1576	38		
1	B	1058	Total	C	N	O	S	0	0
			8278	5284	1380	1576	38		
1	C	1052	Total	C	N	O	S	0	0
			8230	5255	1373	1564	38		

There are 255 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	682	GLY	ARG	conflict	UNP P0DTC2
A	683	SER	ARG	conflict	UNP P0DTC2
A	685	SER	ARG	conflict	UNP P0DTC2
A	986	PRO	LYS	conflict	UNP P0DTC2
A	987	PRO	VAL	conflict	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

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Chain	Residue	Modelled	Actual	Comment	Reference
A	1228	GLY	-	expression tag	UNP P0DTC2
A	1229	GLU	-	expression tag	UNP P0DTC2
A	1230	TRP	-	expression tag	UNP P0DTC2
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	ARG	-	expression tag	UNP P0DTC2
A	1240	SER	-	expression tag	UNP P0DTC2
A	1241	LEU	-	expression tag	UNP P0DTC2
A	1242	GLU	-	expression tag	UNP P0DTC2
A	1243	VAL	-	expression tag	UNP P0DTC2
A	1244	LEU	-	expression tag	UNP P0DTC2
A	1245	PHE	-	expression tag	UNP P0DTC2
A	1246	GLN	-	expression tag	UNP P0DTC2
A	1247	GLY	-	expression tag	UNP P0DTC2
A	1248	PRO	-	expression tag	UNP P0DTC2
A	1249	GLY	-	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
A	1257	HIS	-	expression tag	UNP P0DTC2
A	1258	SER	-	expression tag	UNP P0DTC2
A	1259	ALA	-	expression tag	UNP P0DTC2
A	1260	TRP	-	expression tag	UNP P0DTC2
A	1261	SER	-	expression tag	UNP P0DTC2
A	1262	HIS	-	expression tag	UNP P0DTC2
A	1263	PRO	-	expression tag	UNP P0DTC2
A	1264	GLN	-	expression tag	UNP P0DTC2
A	1265	PHE	-	expression tag	UNP P0DTC2
A	1266	GLU	-	expression tag	UNP P0DTC2
A	1267	LYS	-	expression tag	UNP P0DTC2
A	1268	GLY	-	expression tag	UNP P0DTC2
A	1269	GLY	-	expression tag	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
A	1270	GLY	-	expression tag	UNP P0DTC2
A	1271	SER	-	expression tag	UNP P0DTC2
A	1272	GLY	-	expression tag	UNP P0DTC2
A	1273	GLY	-	expression tag	UNP P0DTC2
A	1274	GLY	-	expression tag	UNP P0DTC2
A	1275	GLY	-	expression tag	UNP P0DTC2
A	1276	SER	-	expression tag	UNP P0DTC2
A	1277	GLY	-	expression tag	UNP P0DTC2
A	1278	GLY	-	expression tag	UNP P0DTC2
A	1279	SER	-	expression tag	UNP P0DTC2
A	1280	ALA	-	expression tag	UNP P0DTC2
A	1281	TRP	-	expression tag	UNP P0DTC2
A	1282	SER	-	expression tag	UNP P0DTC2
A	1283	HIS	-	expression tag	UNP P0DTC2
A	1284	PRO	-	expression tag	UNP P0DTC2
A	1285	GLN	-	expression tag	UNP P0DTC2
A	1286	PHE	-	expression tag	UNP P0DTC2
A	1287	GLU	-	expression tag	UNP P0DTC2
A	1288	LYS	-	expression tag	UNP P0DTC2
B	682	GLY	ARG	conflict	UNP P0DTC2
B	683	SER	ARG	conflict	UNP P0DTC2
B	685	SER	ARG	conflict	UNP P0DTC2
B	986	PRO	LYS	conflict	UNP P0DTC2
B	987	PRO	VAL	conflict	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
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

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Chain	Residue	Modelled	Actual	Comment	Reference
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	ARG	-	expression tag	UNP P0DTC2
B	1240	SER	-	expression tag	UNP P0DTC2
B	1241	LEU	-	expression tag	UNP P0DTC2
B	1242	GLU	-	expression tag	UNP P0DTC2
B	1243	VAL	-	expression tag	UNP P0DTC2
B	1244	LEU	-	expression tag	UNP P0DTC2
B	1245	PHE	-	expression tag	UNP P0DTC2
B	1246	GLN	-	expression tag	UNP P0DTC2
B	1247	GLY	-	expression tag	UNP P0DTC2
B	1248	PRO	-	expression tag	UNP P0DTC2
B	1249	GLY	-	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
B	1257	HIS	-	expression tag	UNP P0DTC2
B	1258	SER	-	expression tag	UNP P0DTC2
B	1259	ALA	-	expression tag	UNP P0DTC2
B	1260	TRP	-	expression tag	UNP P0DTC2
B	1261	SER	-	expression tag	UNP P0DTC2
B	1262	HIS	-	expression tag	UNP P0DTC2
B	1263	PRO	-	expression tag	UNP P0DTC2
B	1264	GLN	-	expression tag	UNP P0DTC2
B	1265	PHE	-	expression tag	UNP P0DTC2
B	1266	GLU	-	expression tag	UNP P0DTC2
B	1267	LYS	-	expression tag	UNP P0DTC2
B	1268	GLY	-	expression tag	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
B	1269	GLY	-	expression tag	UNP P0DTC2
B	1270	GLY	-	expression tag	UNP P0DTC2
B	1271	SER	-	expression tag	UNP P0DTC2
B	1272	GLY	-	expression tag	UNP P0DTC2
B	1273	GLY	-	expression tag	UNP P0DTC2
B	1274	GLY	-	expression tag	UNP P0DTC2
B	1275	GLY	-	expression tag	UNP P0DTC2
B	1276	SER	-	expression tag	UNP P0DTC2
B	1277	GLY	-	expression tag	UNP P0DTC2
B	1278	GLY	-	expression tag	UNP P0DTC2
B	1279	SER	-	expression tag	UNP P0DTC2
B	1280	ALA	-	expression tag	UNP P0DTC2
B	1281	TRP	-	expression tag	UNP P0DTC2
B	1282	SER	-	expression tag	UNP P0DTC2
B	1283	HIS	-	expression tag	UNP P0DTC2
B	1284	PRO	-	expression tag	UNP P0DTC2
B	1285	GLN	-	expression tag	UNP P0DTC2
B	1286	PHE	-	expression tag	UNP P0DTC2
B	1287	GLU	-	expression tag	UNP P0DTC2
B	1288	LYS	-	expression tag	UNP P0DTC2
C	682	GLY	ARG	conflict	UNP P0DTC2
C	683	SER	ARG	conflict	UNP P0DTC2
C	685	SER	ARG	conflict	UNP P0DTC2
C	986	PRO	LYS	conflict	UNP P0DTC2
C	987	PRO	VAL	conflict	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
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

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Chain	Residue	Modelled	Actual	Comment	Reference
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	ARG	-	expression tag	UNP P0DTC2
C	1240	SER	-	expression tag	UNP P0DTC2
C	1241	LEU	-	expression tag	UNP P0DTC2
C	1242	GLU	-	expression tag	UNP P0DTC2
C	1243	VAL	-	expression tag	UNP P0DTC2
C	1244	LEU	-	expression tag	UNP P0DTC2
C	1245	PHE	-	expression tag	UNP P0DTC2
C	1246	GLN	-	expression tag	UNP P0DTC2
C	1247	GLY	-	expression tag	UNP P0DTC2
C	1248	PRO	-	expression tag	UNP P0DTC2
C	1249	GLY	-	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
C	1257	HIS	-	expression tag	UNP P0DTC2
C	1258	SER	-	expression tag	UNP P0DTC2
C	1259	ALA	-	expression tag	UNP P0DTC2
C	1260	TRP	-	expression tag	UNP P0DTC2
C	1261	SER	-	expression tag	UNP P0DTC2
C	1262	HIS	-	expression tag	UNP P0DTC2
C	1263	PRO	-	expression tag	UNP P0DTC2
C	1264	GLN	-	expression tag	UNP P0DTC2
C	1265	PHE	-	expression tag	UNP P0DTC2
C	1266	GLU	-	expression tag	UNP P0DTC2
C	1267	LYS	-	expression tag	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
C	1268	GLY	-	expression tag	UNP P0DTC2
C	1269	GLY	-	expression tag	UNP P0DTC2
C	1270	GLY	-	expression tag	UNP P0DTC2
C	1271	SER	-	expression tag	UNP P0DTC2
C	1272	GLY	-	expression tag	UNP P0DTC2
C	1273	GLY	-	expression tag	UNP P0DTC2
C	1274	GLY	-	expression tag	UNP P0DTC2
C	1275	GLY	-	expression tag	UNP P0DTC2
C	1276	SER	-	expression tag	UNP P0DTC2
C	1277	GLY	-	expression tag	UNP P0DTC2
C	1278	GLY	-	expression tag	UNP P0DTC2
C	1279	SER	-	expression tag	UNP P0DTC2
C	1280	ALA	-	expression tag	UNP P0DTC2
C	1281	TRP	-	expression tag	UNP P0DTC2
C	1282	SER	-	expression tag	UNP P0DTC2
C	1283	HIS	-	expression tag	UNP P0DTC2
C	1284	PRO	-	expression tag	UNP P0DTC2
C	1285	GLN	-	expression tag	UNP P0DTC2
C	1286	PHE	-	expression tag	UNP P0DTC2
C	1287	GLU	-	expression tag	UNP P0DTC2
C	1288	LYS	-	expression tag	UNP P0DTC2

- Molecule 2 is a protein called Neutralising sybody (Sb23).

Mol	Chain	Residues	Atoms					AltConf	Trace
2	D	114	Total	C	N	O	S	0	0
			882	556	151	171	4		
2	E	114	Total	C	N	O	S	0	0
			882	556	151	171	4		
2	F	114	Total	C	N	O	S	0	0
			882	556	151	171	4		

- Molecule 3 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
3	G	2	Total	C	N	O	0	0
			28	16	2	10		

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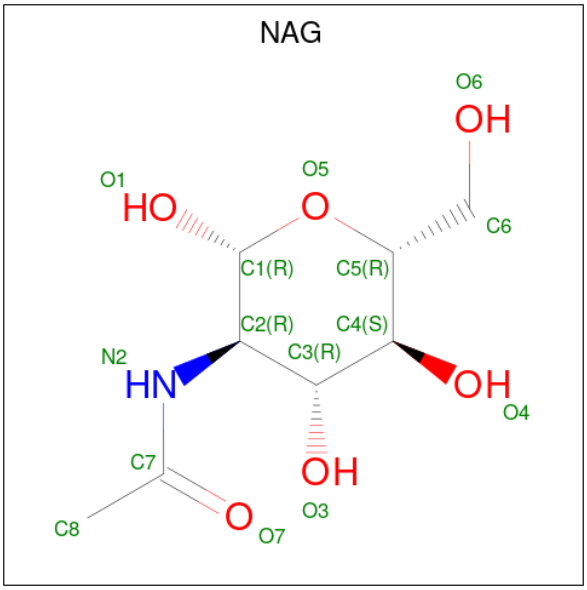
Mol	Chain	Residues	Atoms				AltConf	Trace
3	H	2	Total	C	N	O	0	0
			28	16	2	10		
3	I	2	Total	C	N	O	0	0
			28	16	2	10		
3	J	2	Total	C	N	O	0	0
			28	16	2	10		
3	K	2	Total	C	N	O	0	0
			28	16	2	10		
3	L	2	Total	C	N	O	0	0
			28	16	2	10		
3	M	2	Total	C	N	O	0	0
			28	16	2	10		
3	N	2	Total	C	N	O	0	0
			28	16	2	10		

- Molecule 4 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms				AltConf
4	A	1	Total	C	N	O	0
			14	8	1	5	
4	A	1	Total	C	N	O	0
			14	8	1	5	
4	A	1	Total	C	N	O	0
			14	8	1	5	
4	A	1	Total	C	N	O	0
			14	8	1	5	

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Mol	Chain	Residues	Atoms				AltConf
4	A	1	Total 14	C 8	N 1	O 5	0
4	A	1	Total 14	C 8	N 1	O 5	0
4	A	1	Total 14	C 8	N 1	O 5	0
4	A	1	Total 14	C 8	N 1	O 5	0
4	A	1	Total 14	C 8	N 1	O 5	0
4	A	1	Total 14	C 8	N 1	O 5	0
4	A	1	Total 14	C 8	N 1	O 5	0
4	A	1	Total 14	C 8	N 1	O 5	0
4	A	1	Total 14	C 8	N 1	O 5	0
4	A	1	Total 14	C 8	N 1	O 5	0
4	B	1	Total 14	C 8	N 1	O 5	0
4	B	1	Total 14	C 8	N 1	O 5	0
4	B	1	Total 14	C 8	N 1	O 5	0
4	B	1	Total 14	C 8	N 1	O 5	0
4	B	1	Total 14	C 8	N 1	O 5	0
4	B	1	Total 14	C 8	N 1	O 5	0
4	B	1	Total 14	C 8	N 1	O 5	0
4	B	1	Total 14	C 8	N 1	O 5	0
4	B	1	Total 14	C 8	N 1	O 5	0
4	B	1	Total 14	C 8	N 1	O 5	0
4	B	1	Total 14	C 8	N 1	O 5	0

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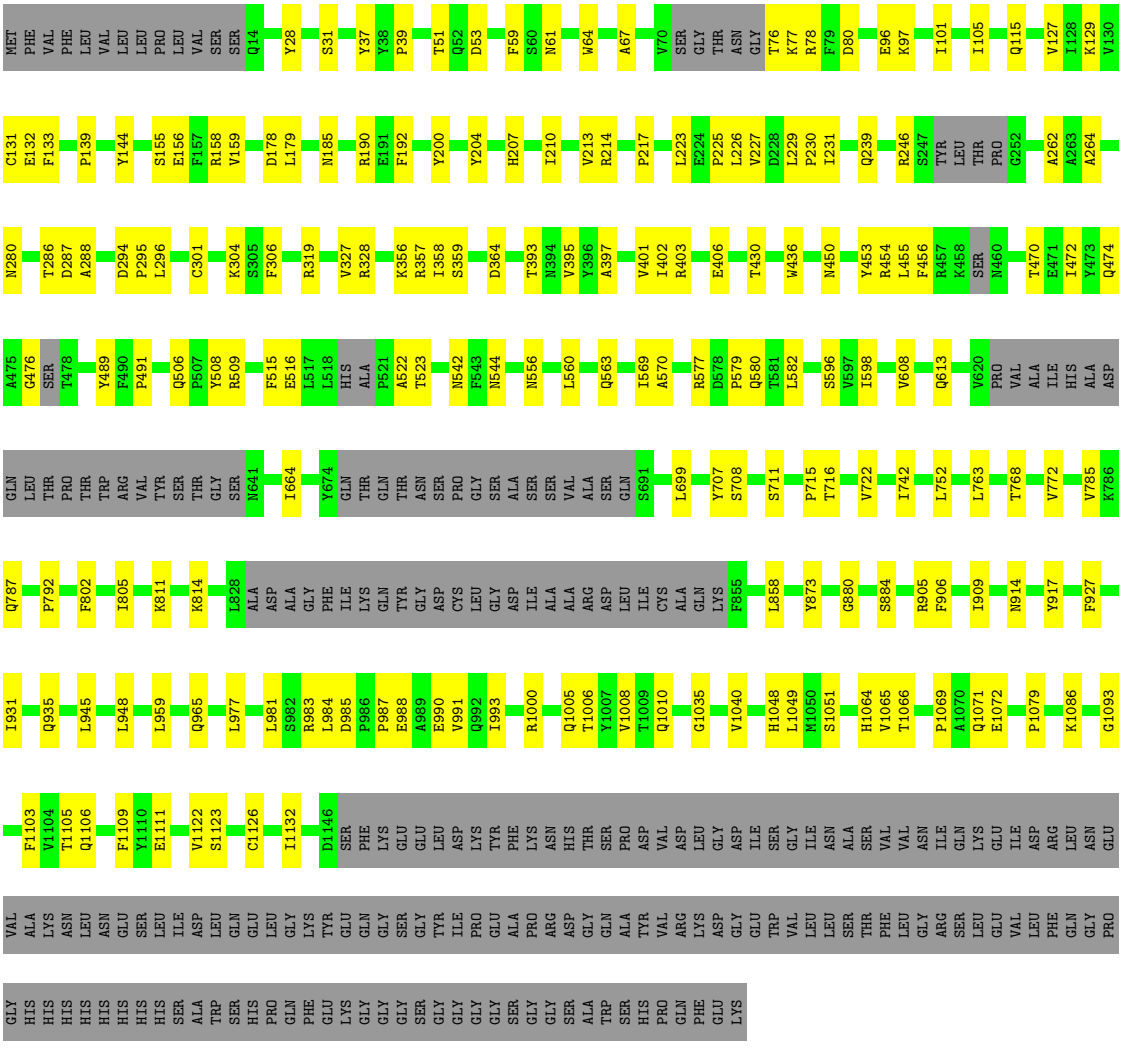
Mol	Chain	Residues	Atoms	AltConf
4	B	1	Total C N O 14 8 1 5	0
4	B	1	Total C N O 14 8 1 5	0
4	B	1	Total C N O 14 8 1 5	0
4	B	1	Total C N O 14 8 1 5	0
4	C	1	Total C N O 14 8 1 5	0
4	C	1	Total C N O 14 8 1 5	0
4	C	1	Total C N O 14 8 1 5	0
4	C	1	Total C N O 14 8 1 5	0
4	C	1	Total C N O 14 8 1 5	0
4	C	1	Total C N O 14 8 1 5	0
4	C	1	Total C N O 14 8 1 5	0
4	C	1	Total C N O 14 8 1 5	0
4	C	1	Total C N O 14 8 1 5	0
4	C	1	Total C N O 14 8 1 5	0
4	C	1	Total C N O 14 8 1 5	0
4	C	1	Total C N O 14 8 1 5	0
4	C	1	Total C N O 14 8 1 5	0
4	C	1	Total C N O 14 8 1 5	0
4	C	1	Total C N O 14 8 1 5	0
4	C	1	Total C N O 14 8 1 5	0

3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

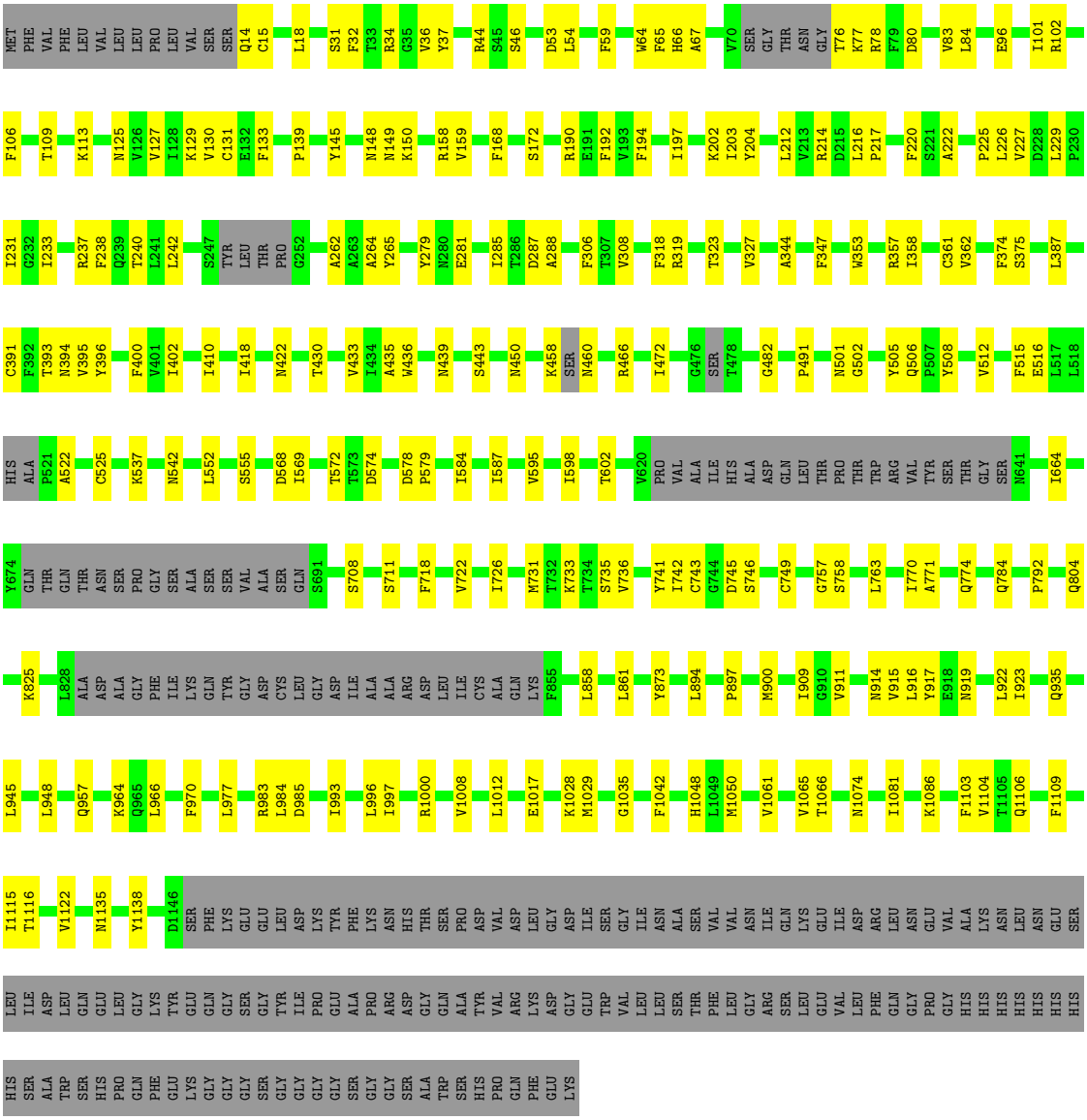
• Molecule 1: Spike glycoprotein

Chain A:



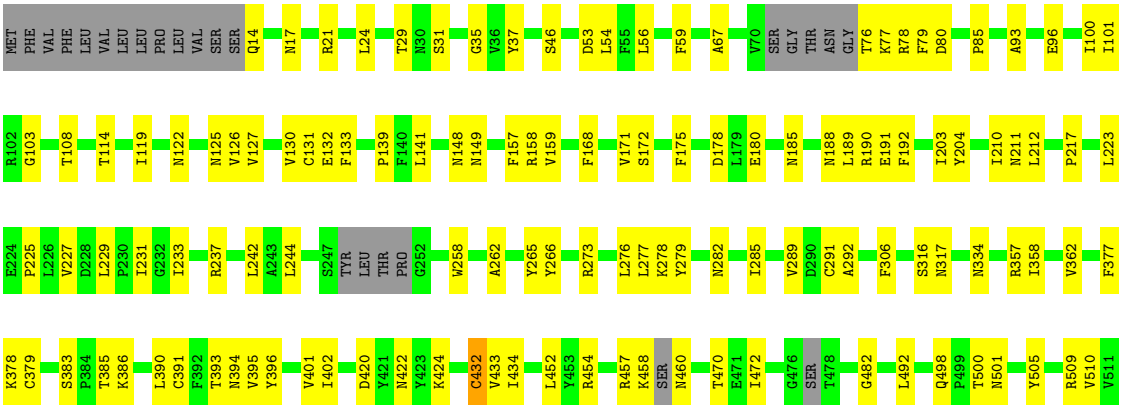
• Molecule 1: Spike glycoprotein

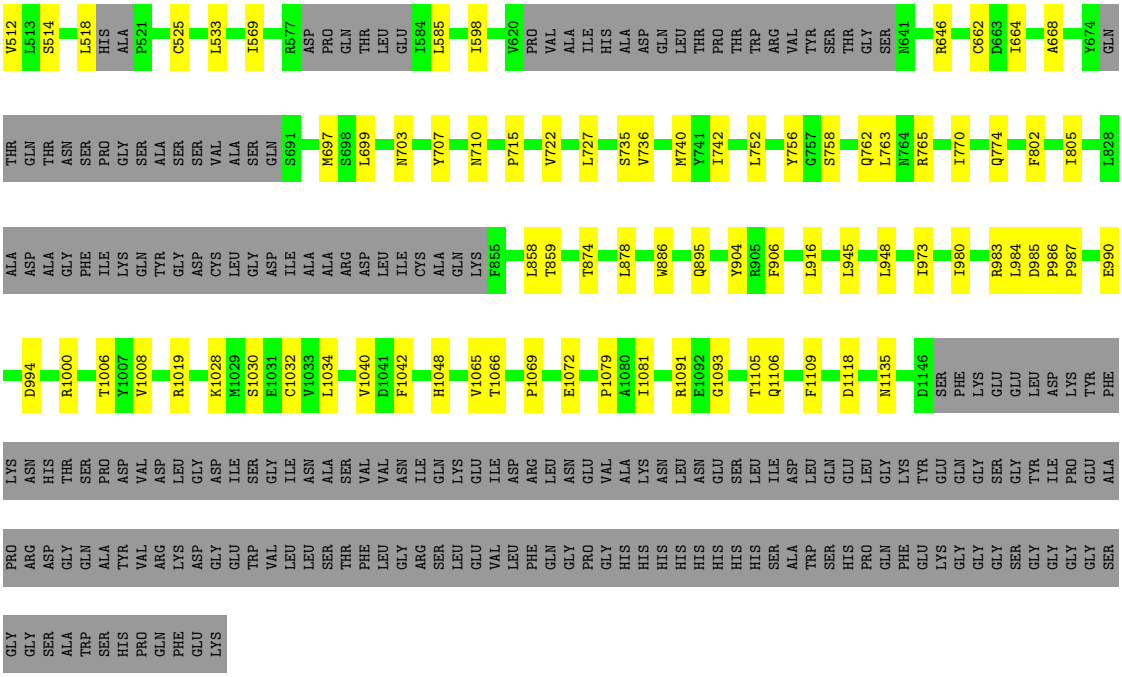
Chain B:



• Molecule 1: Spike glycoprotein

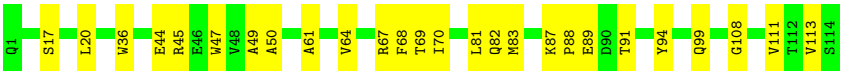
Chain C:





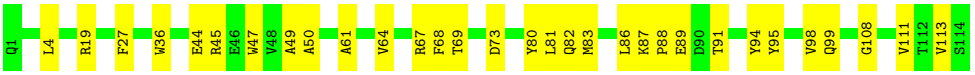
• Molecule 2: Neutralising sybody (Sb23)

Chain D:



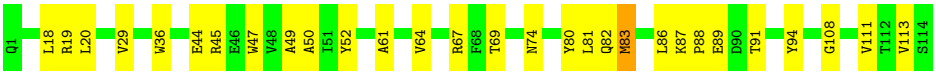
• Molecule 2: Neutralising sybody (Sb23)

Chain E:



• Molecule 2: Neutralising sybody (Sb23)

Chain F:

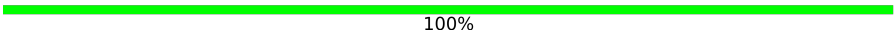


• Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain G:

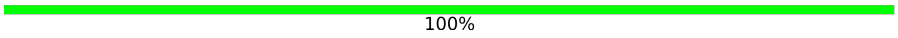
• Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain H:



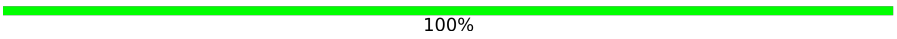
• Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain I:



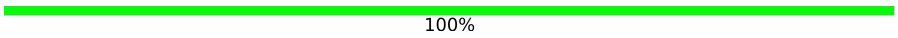
• Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain J:



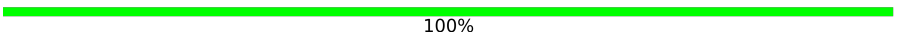
• Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain K:



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

Chain L:



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

Chain M:

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

Chain N:


NAG1
NAG2

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	69567	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	50	Depositor
Minimum defocus (nm)	300	Depositor
Maximum defocus (nm)	1100	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	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	0.25	0/8466	0.44	1/11515 (0.0%)
1	B	0.25	0/8466	0.44	0/11515
1	C	0.25	0/8416	0.47	2/11444 (0.0%)
2	D	0.24	0/903	0.45	0/1227
2	E	0.24	0/903	0.45	0/1227
2	F	0.24	0/903	0.47	1/1227 (0.1%)
All	All	0.25	0/28057	0.45	4/38155 (0.0%)

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	432	CYS	CA-CB-SG	12.50	136.50	114.00
1	C	379	CYS	CA-CB-SG	11.18	134.12	114.00
1	A	582	LEU	CA-CB-CG	5.80	128.64	115.30
2	F	83	MET	CA-CB-CG	5.05	121.89	113.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	8278	0	8058	130	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	8278	0	8061	153	0
1	C	8230	0	8016	127	0
2	D	882	0	840	17	0
2	E	882	0	840	21	0
2	F	882	0	840	20	0
3	G	28	0	25	0	0
3	H	28	0	25	0	0
3	I	28	0	25	0	0
3	J	28	0	25	0	0
3	K	28	0	25	0	0
3	L	28	0	25	0	0
3	M	28	0	25	1	0
3	N	28	0	25	1	0
4	A	196	0	182	1	0
4	B	210	0	195	6	0
4	C	224	0	208	4	0
All	All	28286	0	27440	442	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 8.

All (442) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:67:ALA:O	1:A:262:ALA:HA	1.67	0.93
1:C:422:ASN:HD21	1:C:454:ARG:H	1.26	0.82
1:C:433:VAL:HG12	1:C:512:VAL:HG22	1.65	0.79
1:B:130:VAL:HB	1:B:168:PHE:HB3	1.66	0.78
1:B:568:ASP:OD1	1:B:569:ILE:N	2.17	0.77
1:A:1072:GLU:HG2	1:B:894:LEU:HD21	1.68	0.75
1:A:358:ILE:HB	1:A:395:VAL:HB	1.70	0.73
1:C:212:LEU:HD13	1:C:217:PRO:HB3	1.72	0.72
1:A:356:LYS:HB3	1:A:397:ALA:HB3	1.72	0.72
1:B:46:SER:HA	1:B:279:TYR:O	1.90	0.72
1:B:983:ARG:HG3	1:B:984:LEU:HG	1.71	0.72
1:A:1093:GLY:HA3	1:A:1105:THR:O	1.90	0.71
1:B:746:SER:OG	1:B:749:CYS:SG	2.49	0.70
1:B:804:GLN:NE2	1:B:935:GLN:OE1	2.23	0.70
1:C:122:ASN:OD1	1:C:125:ASN:N	2.18	0.70
2:E:69:THR:HB	2:E:82:GLN:HB3	1.73	0.70
2:E:36:TRP:HB2	2:E:49:ALA:HB3	1.73	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:36:TRP:HB2	2:D:49:ALA:HB3	1.74	0.70
1:B:31:SER:O	1:B:59:PHE:HA	1.93	0.68
1:A:983:ARG:HA	1:C:390:LEU:HD11	1.76	0.68
1:B:323:THR:OG1	1:B:537:LYS:NZ	2.27	0.68
2:D:87:LYS:HE3	2:D:89:GLU:HB3	1.76	0.68
1:A:1005:GLN:NE2	1:C:1006:THR:OG1	2.25	0.67
1:B:742:ILE:O	1:B:1000:ARG:NH1	2.27	0.67
1:A:31:SER:O	1:A:59:PHE:HA	1.93	0.67
1:C:139:PRO:HA	1:C:158:ARG:O	1.95	0.67
1:C:1106:GLN:HE21	1:C:1109:PHE:HB3	1.58	0.67
1:A:76:THR:OG1	1:A:77:LYS:N	2.27	0.66
2:F:36:TRP:HB2	2:F:49:ALA:HB3	1.76	0.66
1:A:596:SER:OG	1:A:613:GLN:NE2	2.27	0.66
1:C:139:PRO:HB3	1:C:159:VAL:HA	1.75	0.66
1:A:37:TYR:HB3	1:A:223:LEU:HD23	1.78	0.66
2:F:87:LYS:HE3	2:F:89:GLU:HB3	1.78	0.65
2:E:87:LYS:HE3	2:E:89:GLU:HB3	1.77	0.65
2:F:64:VAL:HG12	2:F:67:ARG:HH21	1.61	0.65
1:A:450:ASN:ND2	2:D:99:GLN:OE1	2.30	0.65
1:C:93:ALA:HB3	1:C:266:TYR:HB2	1.79	0.65
2:D:69:THR:HB	2:D:82:GLN:HB3	1.79	0.65
1:B:64:TRP:HE1	1:B:264:ALA:HB1	1.62	0.65
1:C:742:ILE:O	1:C:1000:ARG:NH1	2.30	0.64
1:C:662:CYS:HB2	1:C:697:MET:HG2	1.78	0.64
1:B:1106:GLN:HE21	1:B:1109:PHE:HB3	1.63	0.64
1:A:707:TYR:HB3	1:B:792:PRO:HG3	1.80	0.64
1:B:708:SER:HB3	1:B:711:SER:HB3	1.79	0.64
1:A:139:PRO:HB3	1:A:159:VAL:HA	1.79	0.63
1:A:981:LEU:HD21	1:A:993:ILE:HD11	1.80	0.63
1:B:53:ASP:OD1	1:B:54:LEU:N	2.31	0.62
1:B:922:LEU:HD11	4:B:1304:NAG:H5	1.81	0.62
1:A:1106:GLN:HE21	1:A:1109:PHE:HB3	1.63	0.62
1:A:144:TYR:HB2	1:A:155:SER:HB3	1.81	0.62
1:C:1028:LYS:NZ	1:C:1042:PHE:O	2.28	0.62
1:C:77:LYS:NZ	1:C:258:TRP:O	2.32	0.62
2:E:64:VAL:HG12	2:E:67:ARG:HH21	1.64	0.62
1:C:148:ASN:ND2	4:C:1310:NAG:O7	2.33	0.62
1:A:811:LYS:HG3	1:A:814:LYS:HE3	1.81	0.61
1:A:1048:HIS:HA	1:A:1066:THR:HG22	1.80	0.61
1:A:792:PRO:HG3	1:C:707:TYR:HB3	1.82	0.61
1:A:456:PHE:HB2	1:A:491:PRO:HA	1.83	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:560:LEU:O	1:A:577:ARG:NH2	2.34	0.61
1:C:96:GLU:O	1:C:188:ASN:HB3	2.00	0.61
1:C:125:ASN:ND2	1:C:172:SER:O	2.29	0.61
2:D:64:VAL:HG12	2:D:67:ARG:HH21	1.66	0.61
1:A:139:PRO:HA	1:A:158:ARG:O	2.01	0.61
1:B:552:LEU:HG	1:B:587:ILE:HG12	1.81	0.61
2:E:47:TRP:HE1	2:E:50:ALA:HB2	1.66	0.61
1:A:742:ILE:O	1:A:1000:ARG:NH1	2.34	0.61
1:C:31:SER:O	1:C:59:PHE:HA	2.01	0.60
1:A:295:PRO:HB2	1:A:608:VAL:HG11	1.83	0.60
1:A:454:ARG:HH12	1:A:470:THR:HA	1.64	0.60
2:F:94:TYR:O	2:F:108:GLY:HA2	2.02	0.60
1:A:229:LEU:HB3	1:A:231:ILE:HG12	1.83	0.60
1:B:76:THR:OG1	1:B:77:LYS:N	2.33	0.60
2:F:69:THR:HB	2:F:82:GLN:HB3	1.83	0.60
1:C:1048:HIS:HA	1:C:1066:THR:HG22	1.83	0.60
2:D:47:TRP:HE1	2:D:50:ALA:HB2	1.66	0.60
1:B:993:ILE:O	1:B:997:ILE:HG12	2.03	0.59
1:B:358:ILE:HB	1:B:395:VAL:HB	1.84	0.59
1:B:226:LEU:HD23	1:B:227:VAL:HB	1.83	0.59
1:C:1093:GLY:HA3	1:C:1105:THR:O	2.03	0.59
1:A:96:GLU:OE1	1:A:190:ARG:NH1	2.36	0.59
1:A:596:SER:HG	1:A:613:GLN:HE21	1.51	0.59
1:B:46:SER:CA	1:B:279:TYR:O	2.51	0.58
2:D:94:TYR:O	2:D:108:GLY:HA2	2.03	0.58
2:F:47:TRP:HE1	2:F:50:ALA:HB2	1.68	0.58
1:B:361:CYS:SG	1:B:362:VAL:N	2.76	0.58
1:B:763:LEU:HD22	1:B:1008:VAL:HG21	1.86	0.58
1:A:200:TYR:OH	1:C:394:ASN:ND2	2.37	0.58
1:B:145:TYR:OH	1:B:150:LYS:NZ	2.36	0.58
1:B:319:ARG:NH1	1:C:740:MET:SD	2.76	0.57
1:C:598:ILE:HG23	1:C:664:ILE:HG21	1.86	0.57
1:B:1104:VAL:HG23	1:B:1115:ILE:HG12	1.86	0.57
1:A:722:VAL:HG22	1:A:1065:VAL:HG22	1.86	0.57
1:B:197:ILE:HG23	1:B:202:LYS:HZ1	1.69	0.57
1:C:76:THR:OG1	1:C:77:LYS:N	2.36	0.57
1:C:457:ARG:HH12	1:C:460:ASN:HA	1.69	0.57
1:B:34:ARG:NH1	1:B:217:PRO:O	2.35	0.56
1:C:378:LYS:O	1:C:432:CYS:HB2	2.04	0.56
1:A:328:ARG:NH2	1:A:580:GLN:OE1	2.39	0.56
1:B:203:ILE:HB	1:B:227:VAL:HG12	1.87	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:498:GLN:HE22	1:C:500:THR:HB	1.71	0.56
1:A:787:GLN:OE1	1:C:703:ASN:ND2	2.38	0.56
1:B:125:ASN:ND2	1:B:172:SER:O	2.35	0.56
1:C:391:CYS:HB3	1:C:525:CYS:HA	1.87	0.56
1:B:237:ARG:HD2	1:B:238:PHE:N	2.21	0.56
1:A:699:LEU:HD22	1:B:873:TYR:CZ	2.41	0.56
1:B:1048:HIS:HA	1:B:1066:THR:HG22	1.87	0.56
1:C:1028:LYS:O	1:C:1032:CYS:HB2	2.06	0.55
1:B:83:VAL:HG12	1:B:237:ARG:HH22	1.71	0.55
1:A:931:ILE:O	1:A:935:GLN:HG2	2.06	0.55
1:B:139:PRO:HA	1:B:158:ARG:O	2.06	0.55
1:B:400:PHE:CE2	1:B:402:ILE:HD11	2.41	0.55
4:C:1307:NAG:H3	4:C:1307:NAG:H83	1.88	0.55
2:F:94:TYR:O	2:F:108:GLY:CA	2.55	0.55
4:B:1301:NAG:H3	4:B:1301:NAG:H83	1.88	0.55
1:B:287:ASP:HB3	1:B:306:PHE:HE1	1.72	0.55
1:A:987:PRO:O	1:A:990:GLU:HG3	2.07	0.55
1:C:334:ASN:O	1:C:362:VAL:N	2.39	0.55
1:C:756:TYR:OH	1:C:994:ASP:OD1	2.16	0.55
2:D:94:TYR:O	2:D:108:GLY:CA	2.55	0.55
1:C:127:VAL:HG21	3:N:1:NAG:H62	1.88	0.54
1:A:988:GLU:HA	1:A:991:VAL:HG12	1.89	0.54
1:C:973:ILE:HD12	1:C:983:ARG:HH21	1.72	0.54
1:B:743:CYS:SG	1:B:746:SER:OG	2.65	0.54
1:A:1123:SER:OG	1:B:914:ASN:ND2	2.40	0.54
1:B:80:ASP:O	1:B:265:TYR:OH	2.24	0.54
1:A:226:LEU:HD23	1:A:227:VAL:HB	1.90	0.54
1:B:1074:ASN:HB3	4:B:1305:NAG:HN2	1.72	0.54
1:B:1116:THR:HG22	1:B:1138:TYR:HB3	1.88	0.54
1:C:185:ASN:ND2	1:C:211:ASN:OD1	2.41	0.54
1:C:67:ALA:O	1:C:262:ALA:HA	2.08	0.53
1:C:14:GLN:O	1:C:158:ARG:NH1	2.40	0.53
2:F:19:ARG:HE	2:F:80:TYR:HB3	1.74	0.53
2:E:94:TYR:O	2:E:108:GLY:CA	2.56	0.53
1:A:763:LEU:HD22	1:A:1008:VAL:HG21	1.89	0.53
1:A:945:LEU:HD23	1:A:948:LEU:HD12	1.91	0.53
1:A:977:LEU:HD11	1:A:993:ILE:HG12	1.91	0.53
1:A:914:ASN:ND2	1:A:1111:GLU:OE2	2.41	0.53
1:B:375:SER:N	1:B:435:ALA:O	2.41	0.53
1:C:273:ARG:HH21	1:C:292:ALA:HB3	1.74	0.53
1:B:109:THR:HB	1:B:113:LYS:HE2	1.91	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:80:ASP:O	1:C:265:TYR:OH	2.23	0.53
1:A:560:LEU:HB2	1:A:563:GLN:HG3	1.90	0.52
1:B:353:TRP:O	1:B:466:ARG:NH1	2.40	0.52
1:C:980:ILE:HG23	1:C:984:LEU:HD12	1.90	0.52
1:C:316:SER:OG	1:C:317:ASN:N	2.42	0.52
1:B:204:TYR:CD1	1:B:225:PRO:HA	2.45	0.52
1:B:458:LYS:O	1:B:460:ASN:N	2.43	0.52
1:B:1074:ASN:OD1	1:C:895:GLN:NE2	2.43	0.52
1:C:758:SER:O	1:C:762:GLN:NE2	2.40	0.52
1:A:357:ARG:NH1	1:A:359:SER:HB3	2.25	0.52
1:C:35:GLY:HA3	1:C:56:LEU:HB3	1.92	0.52
1:A:977:LEU:HG	1:A:981:LEU:HD11	1.91	0.51
1:B:14:GLN:O	1:B:158:ARG:NH1	2.44	0.51
1:B:101:ILE:HD11	1:B:240:THR:OG1	2.11	0.51
1:B:722:VAL:HG22	1:B:1065:VAL:HG22	1.92	0.51
1:C:715:PRO:HA	1:C:1072:GLU:HA	1.92	0.51
1:C:244:LEU:HD13	1:C:258:TRP:HB2	1.93	0.51
1:B:555:SER:HB3	1:B:584:ILE:HG22	1.93	0.51
1:C:37:TYR:OH	1:C:53:ASP:OD2	2.29	0.51
1:B:148:ASN:ND2	4:B:1309:NAG:O7	2.42	0.50
1:C:189:LEU:HD12	1:C:210:ILE:HD12	1.92	0.50
1:C:401:VAL:HG22	1:C:509:ARG:HG2	1.94	0.50
1:C:358:ILE:HB	1:C:395:VAL:HB	1.92	0.50
1:C:420:ASP:OD1	1:C:424:LYS:NZ	2.36	0.50
1:C:763:LEU:HD22	1:C:1008:VAL:HG21	1.93	0.50
1:A:357:ARG:HH12	1:A:359:SER:HB3	1.76	0.50
1:B:1017:GLU:HG3	1:C:1019:ARG:HH22	1.76	0.50
1:C:130:VAL:HB	1:C:168:PHE:HB3	1.93	0.50
1:A:64:TRP:HE1	1:A:264:ALA:HB1	1.76	0.50
1:B:44:ARG:HB2	1:B:279:TYR:CD2	2.47	0.50
1:C:452:LEU:HD21	2:F:52:TYR:CZ	2.47	0.50
2:E:83:MET:HB3	2:E:86:LEU:HD21	1.93	0.50
1:B:598:ILE:HG23	1:B:664:ILE:HG21	1.92	0.50
1:C:131:CYS:SG	1:C:132:GLU:N	2.84	0.50
1:B:393:THR:OG1	1:B:516:GLU:O	2.24	0.50
1:C:203:ILE:HB	1:C:227:VAL:HG12	1.94	0.50
1:A:905:ARG:NH1	1:A:1049:LEU:O	2.44	0.49
1:B:214:ARG:HD2	1:B:214:ARG:O	2.12	0.49
1:B:194:PHE:HD1	1:B:203:ILE:HG12	1.78	0.49
1:B:402:ILE:O	1:B:508:TYR:HB2	2.12	0.49
1:B:131:CYS:HB3	1:B:133:PHE:CZ	2.47	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:456:PHE:HE2	1:A:489:TYR:HB2	1.76	0.49
1:A:28:TYR:HB3	1:A:61:ASN:HD21	1.77	0.49
1:B:229:LEU:HB3	1:B:231:ILE:HG12	1.95	0.49
1:B:915:VAL:O	1:B:919:ASN:ND2	2.44	0.49
1:C:229:LEU:HB3	1:C:231:ILE:HG23	1.93	0.49
1:C:85:PRO:HA	1:C:237:ARG:HA	1.95	0.49
1:C:569:ILE:H	1:C:569:ILE:HD12	1.78	0.49
1:C:17:ASN:H	3:M:1:NAG:H83	1.78	0.49
1:A:185:ASN:HB2	1:A:213:VAL:HA	1.95	0.48
1:A:393:THR:HA	1:A:522:ALA:HA	1.93	0.48
1:A:506:GLN:NE2	1:A:508:TYR:OH	2.47	0.48
1:A:873:TYR:CE1	1:C:699:LEU:HD22	2.48	0.48
1:A:984:LEU:HD21	1:A:988:GLU:HB3	1.94	0.48
1:B:31:SER:HA	1:B:216:LEU:HD23	1.96	0.48
1:C:101:ILE:HA	1:C:242:LEU:HA	1.94	0.48
1:A:287:ASP:HB3	1:A:306:PHE:HE2	1.78	0.48
1:A:715:PRO:HG3	1:A:1069:PRO:HB3	1.95	0.48
1:B:197:ILE:CG2	1:B:202:LYS:HZ1	2.26	0.48
1:B:741:TYR:CE1	1:B:966:LEU:HD12	2.48	0.48
1:B:897:PRO:HB2	1:B:900:MET:HG3	1.95	0.48
1:C:21:ARG:NH1	1:C:79:PHE:O	2.40	0.48
1:A:802:PHE:HD1	1:A:805:ILE:HD11	1.77	0.48
2:E:81:LEU:HG	2:E:83:MET:HE3	1.95	0.48
2:D:61:ALA:HB3	2:D:64:VAL:HG22	1.95	0.48
1:A:1035:GLY:HA3	1:C:1040:VAL:HG21	1.95	0.48
1:B:190:ARG:HB3	1:B:192:PHE:CE2	2.49	0.48
1:B:450:ASN:ND2	2:E:99:GLN:OE1	2.47	0.48
2:E:61:ALA:HB3	2:E:64:VAL:HG22	1.94	0.48
1:A:230:PRO:HB2	1:C:357:ARG:NH1	2.28	0.48
1:A:472:ILE:HD12	1:A:491:PRO:HD3	1.94	0.48
1:A:699:LEU:HD22	1:B:873:TYR:CE1	2.49	0.48
1:B:327:VAL:HG12	1:B:542:ASN:HB3	1.96	0.48
1:B:1081:ILE:HG23	1:B:1135:ASN:HB3	1.96	0.48
1:C:1091:ARG:NE	1:C:1118:ASP:O	2.40	0.48
1:A:156:GLU:OE2	1:A:246:ARG:NH1	2.47	0.48
1:A:715:PRO:HA	1:A:1072:GLU:HA	1.96	0.48
1:B:393:THR:HA	1:B:522:ALA:HA	1.94	0.48
1:B:735:SER:HB2	1:B:861:LEU:HD11	1.94	0.48
1:A:319:ARG:NH2	1:B:745:ASP:HB2	2.29	0.48
1:C:501:ASN:HB3	1:C:505:TYR:HB2	1.96	0.48
1:C:987:PRO:O	1:C:990:GLU:HG3	2.13	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:296:LEU:HB2	1:A:608:VAL:HG21	1.94	0.47
1:B:15:CYS:HA	1:B:158:ARG:HD3	1.96	0.47
1:B:770:ILE:O	1:B:774:GLN:HG2	2.14	0.47
1:C:108:THR:HB	1:C:114:THR:HG21	1.95	0.47
1:B:308:VAL:HG22	1:B:602:THR:HG23	1.96	0.47
1:B:733:LYS:HD2	1:B:771:ALA:HB1	1.96	0.47
1:C:722:VAL:HG22	1:C:1065:VAL:HG22	1.95	0.47
2:F:61:ALA:HB3	2:F:64:VAL:HG22	1.97	0.47
1:A:115:GLN:HA	1:A:132:GLU:HG2	1.96	0.47
1:C:710:ASN:HD22	4:C:1305:NAG:H82	1.79	0.47
1:C:945:LEU:HD23	1:C:948:LEU:HD12	1.96	0.47
1:A:393:THR:O	1:A:523:THR:OG1	2.28	0.47
1:C:289:VAL:HG12	1:C:291:CYS:H	1.80	0.47
1:A:927:PHE:O	1:A:931:ILE:HG12	2.15	0.47
2:D:17:SER:HA	2:D:83:MET:O	2.15	0.47
2:E:91:THR:HA	2:E:111:VAL:O	2.15	0.47
1:A:402:ILE:HD12	1:A:406:GLU:HB3	1.96	0.47
1:A:858:LEU:HD13	1:A:959:LEU:HD11	1.96	0.47
1:A:1086:LYS:HD2	1:A:1122:VAL:HG11	1.97	0.47
1:B:784:GLN:HG3	1:B:1029:MET:HG2	1.96	0.47
1:C:386:LYS:O	1:C:386:LYS:HG2	2.14	0.47
1:C:24:LEU:HB2	1:C:78:ARG:NH1	2.30	0.47
1:C:178:ASP:HB3	1:C:180:GLU:HG3	1.96	0.47
1:C:646:ARG:HH21	1:C:668:ALA:HA	1.79	0.47
2:F:44:GLU:HG3	2:F:45:ARG:H	1.80	0.47
1:A:210:ILE:HG21	1:A:217:PRO:HG3	1.97	0.46
1:B:139:PRO:HB3	1:B:159:VAL:HA	1.96	0.46
2:D:44:GLU:HG3	2:D:45:ARG:H	1.80	0.46
1:A:985:ASP:OD1	1:A:985:ASP:N	2.48	0.46
1:B:375:SER:H	1:B:436:TRP:HA	1.79	0.46
1:C:277:LEU:HD22	1:C:285:ILE:HG21	1.96	0.46
1:A:403:ARG:HG2	1:A:406:GLU:HB2	1.97	0.46
1:A:768:THR:O	1:A:772:VAL:HG23	2.14	0.46
1:C:46:SER:HA	1:C:279:TYR:O	2.16	0.46
2:F:18:LEU:O	2:F:82:GLN:NE2	2.48	0.46
1:A:78:ARG:NH2	1:A:80:ASP:OD1	2.47	0.46
1:B:743:CYS:HB2	1:B:977:LEU:HD13	1.98	0.46
1:C:276:LEU:HB3	1:C:289:VAL:HB	1.97	0.46
2:F:81:LEU:HG	2:F:83:MET:HE3	1.97	0.46
1:A:965:GLN:NE2	1:B:757:GLY:HA3	2.31	0.46
1:B:985:ASP:N	1:B:985:ASP:OD1	2.49	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:105:ILE:HG12	1:A:239:GLN:HB2	1.98	0.46
1:B:46:SER:N	1:B:279:TYR:O	2.49	0.46
1:B:65:PHE:HE2	1:B:84:LEU:HD11	1.81	0.46
1:B:472:ILE:HG21	1:B:482:GLY:HA2	1.97	0.46
1:C:736:VAL:HG22	1:C:858:LEU:HD23	1.97	0.46
1:A:39:PRO:HG3	1:A:51:THR:HG21	1.97	0.46
1:C:273:ARG:NH2	1:C:292:ALA:HB3	2.30	0.46
1:A:204:TYR:CD1	1:A:225:PRO:HA	2.51	0.45
1:B:726:ILE:HG13	1:B:1061:VAL:HG22	1.98	0.45
2:E:44:GLU:HG3	2:E:45:ARG:H	1.81	0.45
1:B:287:ASP:OD2	1:B:288:ALA:N	2.49	0.45
1:C:770:ILE:O	1:C:774:GLN:HG2	2.15	0.45
1:A:1006:THR:O	1:A:1010:GLN:HG2	2.16	0.45
2:F:29:VAL:HG11	2:F:74:ASN:HA	1.98	0.45
1:A:1051:SER:OG	1:A:1064:HIS:ND1	2.41	0.45
1:B:31:SER:O	1:B:59:PHE:CA	2.63	0.45
1:B:501:ASN:HB3	1:B:505:TYR:HB2	1.99	0.45
1:A:37:TYR:OH	1:A:53:ASP:OD2	2.35	0.45
1:A:474:GLN:HG3	1:A:476:GLY:H	1.81	0.45
1:A:716:THR:OG1	1:A:1071:GLN:O	2.23	0.45
1:B:387:LEU:HD23	1:B:387:LEU:H	1.82	0.45
1:A:965:GLN:HE22	1:B:758:SER:H	1.63	0.45
1:B:131:CYS:HB3	1:B:133:PHE:CE1	2.51	0.45
1:B:569:ILE:HD12	1:B:569:ILE:H	1.81	0.45
1:A:1093:GLY:CA	1:A:1105:THR:O	2.63	0.45
1:B:102:ARG:HD3	1:B:102:ARG:HA	1.82	0.45
1:B:279:TYR:CE1	1:B:285:ILE:HG12	2.51	0.45
1:C:103:GLY:HA3	1:C:119:ILE:O	2.16	0.45
1:C:126:VAL:HG23	1:C:175:PHE:HZ	1.81	0.45
2:E:19:ARG:HE	2:E:80:TYR:HB3	1.83	0.45
1:A:294:ASP:OD1	1:A:294:ASP:N	2.48	0.44
1:B:970:PHE:HD1	1:B:996:LEU:HD12	1.82	0.44
1:C:127:VAL:HG22	1:C:171:VAL:HG22	1.99	0.44
1:B:430:THR:OG1	1:B:515:PHE:O	2.23	0.44
1:C:96:GLU:OE1	1:C:100:ILE:N	2.50	0.44
1:A:785:VAL:HG22	1:A:787:GLN:H	1.82	0.44
1:B:222:ALA:HB2	1:B:285:ILE:HB	2.00	0.44
1:B:318:PHE:HB2	1:B:595:VAL:HG23	2.00	0.44
1:C:874:THR:O	1:C:878:LEU:HD23	2.18	0.44
1:B:1103:PHE:HZ	4:B:1306:NAG:H62	1.81	0.44
1:B:472:ILE:HD12	1:B:491:PRO:HD3	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:402:ILE:HD11	1:C:510:VAL:HG21	1.99	0.44
2:E:94:TYR:O	2:E:108:GLY:HA2	2.18	0.44
2:E:94:TYR:O	2:E:108:GLY:HA3	2.18	0.44
2:F:91:THR:HA	2:F:111:VAL:O	2.18	0.44
1:A:752:LEU:HD21	1:A:990:GLU:HB2	2.00	0.43
1:B:66:HIS:HB2	1:B:78:ARG:HG2	2.00	0.43
1:B:718:PHE:HE2	1:B:923:ILE:HG12	1.83	0.43
2:D:49:ALA:HB1	2:D:70:ILE:HD11	1.99	0.43
2:E:88:PRO:HA	2:E:113:VAL:HB	2.00	0.43
2:F:88:PRO:HA	2:F:113:VAL:HB	2.00	0.43
1:A:280:ASN:HB3	1:A:286:THR:HG21	2.01	0.43
1:A:436:TRP:CZ2	1:A:509:ARG:HD3	2.53	0.43
1:B:96:GLU:OE2	1:B:101:ILE:N	2.27	0.43
1:B:106:PHE:HD1	1:B:238:PHE:HB2	1.82	0.43
1:B:957:GLN:OE1	1:C:765:ARG:NE	2.51	0.43
1:C:282:ASN:OD1	4:C:1301:NAG:N2	2.49	0.43
1:C:802:PHE:HD1	1:C:805:ILE:HD11	1.82	0.43
1:B:344:ALA:HB3	1:B:347:PHE:CE1	2.53	0.43
1:C:37:TYR:OH	1:C:54:LEU:O	2.21	0.43
1:A:1040:VAL:HG21	1:B:1035:GLY:HA3	2.00	0.43
1:C:396:TYR:HB2	1:C:514:SER:OG	2.18	0.43
2:D:91:THR:HA	2:D:111:VAL:O	2.19	0.43
1:A:327:VAL:HG23	1:A:542:ASN:HB3	2.01	0.43
1:A:393:THR:OG1	1:A:516:GLU:O	2.33	0.43
1:A:544:ASN:HD21	1:A:579:PRO:HG3	1.82	0.43
1:A:1072:GLU:HG2	1:B:894:LEU:CD2	2.44	0.43
1:B:101:ILE:HD12	1:B:242:LEU:HG	1.99	0.43
2:D:81:LEU:HG	2:D:83:MET:HE2	2.00	0.43
2:E:67:ARG:HG3	2:E:68:PHE:CD1	2.54	0.43
2:E:95:TYR:HD1	2:E:108:GLY:HA3	1.84	0.43
1:B:402:ILE:HG12	1:B:410:ILE:HG13	2.00	0.43
1:B:825:LYS:HD3	1:B:945:LEU:HD23	2.00	0.43
1:C:727:LEU:HD23	1:C:727:LEU:HA	1.88	0.43
1:C:886:TRP:HH2	1:C:904:TYR:HB3	1.84	0.43
2:F:36:TRP:CD2	2:F:81:LEU:HD22	2.54	0.43
1:A:570:ALA:HA	1:B:964:LYS:HD3	2.01	0.43
1:B:568:ASP:HB3	1:B:572:THR:HG23	2.00	0.43
1:C:148:ASN:OD1	1:C:149:ASN:N	2.50	0.43
2:F:81:LEU:HG	2:F:83:MET:CE	2.48	0.43
1:C:906:PHE:CD2	1:C:916:LEU:HB2	2.54	0.43
1:B:433:VAL:HG22	1:B:512:VAL:HG22	1.99	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:141:LEU:HD21	1:C:157:PHE:HD1	1.83	0.43
2:D:88:PRO:HA	2:D:113:VAL:HB	2.01	0.43
1:A:131:CYS:HB3	1:A:133:PHE:CZ	2.53	0.42
1:A:880:GLY:O	1:A:884:SER:OG	2.27	0.42
1:C:472:ILE:HG21	1:C:482:GLY:HA2	2.01	0.42
1:C:752:LEU:HD11	1:C:990:GLU:HB2	2.01	0.42
1:C:715:PRO:HG3	1:C:1069:PRO:HB3	2.01	0.42
1:A:287:ASP:OD1	1:A:288:ALA:N	2.50	0.42
1:C:985:ASP:OD1	1:C:985:ASP:N	2.46	0.42
2:D:67:ARG:HG3	2:D:68:PHE:CD1	2.55	0.42
1:A:28:TYR:HB3	1:A:61:ASN:OD1	2.20	0.42
1:A:598:ILE:HG23	1:A:664:ILE:HG21	2.01	0.42
1:B:1086:LYS:HD2	1:B:1122:VAL:HG11	2.01	0.42
1:A:453:TYR:CE2	1:A:455:LEU:HD12	2.53	0.42
1:C:377:PHE:CE1	1:C:434:ILE:HG12	2.54	0.42
1:B:281:GLU:HG3	4:B:1301:NAG:HN2	1.83	0.42
1:C:393:THR:HG21	1:C:518:LEU:HD12	2.02	0.42
1:A:1079:PRO:HB3	1:B:917:TYR:CE1	2.55	0.42
1:B:568:ASP:HB2	1:B:574:ASP:HB2	2.02	0.42
1:B:916:LEU:HD12	1:B:923:ILE:HD12	2.02	0.42
1:C:190:ARG:HB3	1:C:192:PHE:CE2	2.55	0.42
1:A:190:ARG:HE	1:A:207:HIS:CD2	2.37	0.42
1:B:127:VAL:HG11	1:B:129:LYS:HE3	2.01	0.42
1:B:357:ARG:NH1	1:B:394:ASN:HD22	2.18	0.42
1:B:502:GLY:O	1:B:506:GLN:HG3	2.20	0.42
1:C:231:ILE:HD12	1:C:233:ILE:HG12	2.01	0.42
2:E:4:LEU:HD11	2:E:98:VAL:HG22	2.01	0.42
1:A:802:PHE:CD1	1:A:805:ILE:HD11	2.54	0.42
1:A:917:TYR:CE1	1:C:1079:PRO:HB3	2.55	0.42
1:B:770:ILE:HD11	1:B:1012:LEU:HG	2.01	0.42
1:A:430:THR:OG1	1:A:515:PHE:O	2.30	0.41
1:A:596:SER:HG	1:A:613:GLN:NE2	2.13	0.41
1:B:18:LEU:H	1:B:18:LEU:HD23	1.85	0.41
1:B:36:VAL:HG11	1:B:220:PHE:CZ	2.54	0.41
1:C:141:LEU:HD23	1:C:157:PHE:HA	2.02	0.41
1:A:1126:CYS:HB2	1:A:1132:ILE:HD13	2.01	0.41
1:B:418:ILE:HG23	1:B:422:ASN:HD22	1.85	0.41
1:B:731:MET:HG2	1:B:774:GLN:OE1	2.20	0.41
1:C:533:LEU:HD21	1:C:585:LEU:HD11	2.02	0.41
1:C:646:ARG:HE	1:C:668:ALA:HB2	1.85	0.41
1:C:1081:ILE:HG23	1:C:1135:ASN:HB3	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:73:ASP:HB2	2:E:80:TYR:CE2	2.55	0.41
1:A:190:ARG:HB3	1:A:192:PHE:HE1	1.86	0.41
1:B:578:ASP:HA	1:B:579:PRO:HD3	1.96	0.41
1:C:204:TYR:CD1	1:C:225:PRO:HA	2.55	0.41
1:A:213:VAL:HG13	1:A:214:ARG:H	1.85	0.41
1:B:190:ARG:HB3	1:B:192:PHE:HE2	1.85	0.41
1:B:77:LYS:HA	1:B:77:LYS:HD3	1.94	0.41
1:B:83:VAL:HG12	1:B:237:ARG:NH2	2.34	0.41
1:B:391:CYS:HB3	1:B:525:CYS:HA	2.03	0.41
2:F:83:MET:HB3	2:F:86:LEU:HD21	2.01	0.41
1:A:178:ASP:O	1:A:179:LEU:HB2	2.20	0.41
1:A:301:CYS:O	1:A:304:LYS:HD2	2.21	0.41
1:A:401:VAL:HG22	1:A:509:ARG:HG2	2.02	0.41
1:B:231:ILE:HG22	1:B:233:ILE:HG23	2.02	0.41
1:B:439:ASN:O	1:B:443:SER:HB3	2.21	0.41
1:A:906:PHE:HA	1:A:909:ILE:HG12	2.01	0.41
1:B:192:PHE:HA	1:B:204:TYR:O	2.21	0.41
1:B:1050:MET:HG2	1:B:1065:VAL:HB	2.02	0.41
1:A:364:ASP:OD1	1:A:364:ASP:N	2.47	0.41
1:A:708:SER:HB3	1:A:711:SER:HB3	2.03	0.41
1:B:67:ALA:O	1:B:262:ALA:HA	2.20	0.41
1:B:212:LEU:HD21	1:B:217:PRO:HG3	2.03	0.41
1:B:374:PHE:HA	1:B:436:TRP:HB3	2.03	0.41
1:B:909:ILE:HG13	1:B:911:VAL:HG23	2.03	0.41
1:B:1028:LYS:HG2	1:B:1042:PHE:CZ	2.55	0.41
1:C:29:THR:HG21	1:C:266:TYR:CE1	2.56	0.41
1:C:377:PHE:CD1	1:C:434:ILE:HG12	2.56	0.41
1:C:470:THR:HG21	1:C:492:LEU:HD11	2.03	0.41
1:C:735:SER:HB3	1:C:859:THR:OG1	2.21	0.41
1:A:96:GLU:OE2	1:A:101:ILE:HB	2.21	0.41
1:A:1103:PHE:HZ	4:A:1308:NAG:H62	1.85	0.41
1:B:945:LEU:HD12	1:B:948:LEU:HD12	2.03	0.41
1:B:37:TYR:OH	1:B:54:LEU:O	2.29	0.40
1:B:357:ARG:NH1	1:B:396:TYR:OH	2.55	0.40
1:B:736:VAL:HG22	1:B:858:LEU:HD22	2.02	0.40
1:C:278:LYS:HB2	1:C:306:PHE:CE2	2.56	0.40
1:C:1030:SER:O	1:C:1034:LEU:HB2	2.21	0.40
2:F:20:LEU:HD23	2:F:20:LEU:HA	1.95	0.40
1:A:37:TYR:HA	1:A:223:LEU:HB3	2.03	0.40
1:B:726:ILE:HG12	1:B:945:LEU:HD13	2.02	0.40
1:A:97:LYS:NZ	1:A:262:ALA:HB3	2.35	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:569:ILE:H	1:A:569:ILE:HD12	1.86	0.40
1:A:1105:THR:OG1	1:A:1106:GLN:N	2.55	0.40
1:C:46:SER:CA	1:C:279:TYR:O	2.70	0.40
1:C:457:ARG:NH1	1:C:458:LYS:O	2.51	0.40
1:A:127:VAL:HG12	1:A:129:LYS:HG3	2.03	0.40
1:B:148:ASN:OD1	1:B:149:ASN:N	2.54	0.40
2:E:27:PHE:CZ	2:E:98:VAL:HG21	2.57	0.40
1:A:453:TYR:HE2	1:A:455:LEU:HD12	1.85	0.40
1:A:985:ASP:OD1	1:A:988:GLU:HB2	2.22	0.40
1:B:32:PHE:O	1:B:34:ARG:HG2	2.22	0.40
1:C:131:CYS:HB3	1:C:133:PHE:CZ	2.56	0.40
1:C:191:GLU:HG2	1:C:223:LEU:HD11	2.04	0.40
1:C:383:SER:OG	1:C:385:THR:O	2.37	0.40
1:C:986:PRO:N	1:C:987:PRO:HD2	2.36	0.40
2:D:20:LEU:HD23	2:D:20:LEU:HA	1.98	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	1040/1288 (81%)	1002 (96%)	38 (4%)	0	100	100
1	B	1040/1288 (81%)	997 (96%)	43 (4%)	0	100	100
1	C	1032/1288 (80%)	1000 (97%)	32 (3%)	0	100	100
2	D	112/114 (98%)	107 (96%)	5 (4%)	0	100	100
2	E	112/114 (98%)	107 (96%)	5 (4%)	0	100	100
2	F	112/114 (98%)	107 (96%)	5 (4%)	0	100	100
All	All	3448/4206 (82%)	3320 (96%)	128 (4%)	0	100	100

There are no Ramachandran outliers to report.

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	925/1113 (83%)	924 (100%)	1 (0%)	92 96
1	B	925/1113 (83%)	925 (100%)	0	100 100
1	C	919/1113 (83%)	919 (100%)	0	100 100
2	D	91/91 (100%)	91 (100%)	0	100 100
2	E	91/91 (100%)	91 (100%)	0	100 100
2	F	91/91 (100%)	91 (100%)	0	100 100
All	All	3042/3612 (84%)	3041 (100%)	1 (0%)	100 100

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	556	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	613	GLN
1	A	755	GLN
1	A	901	GLN
1	A	965	GLN
1	A	1005	GLN
1	B	804	GLN
1	B	1106	GLN
1	C	394	ASN
1	C	422	ASN
1	C	1002	GLN
1	C	1106	GLN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

16 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	$\#\|Z\| > 2$
3	NAG	G	1	1,3	14,14,15	0.85	1 (7%)	17,19,21	0.96	1 (5%)
3	NAG	G	2	3	14,14,15	0.30	0	17,19,21	0.36	0
3	NAG	H	1	1,3	14,14,15	0.19	0	17,19,21	0.40	0
3	NAG	H	2	3	14,14,15	0.25	0	17,19,21	0.43	0
3	NAG	I	1	1,3	14,14,15	0.24	0	17,19,21	0.48	0
3	NAG	I	2	3	14,14,15	0.24	0	17,19,21	0.40	0
3	NAG	J	1	1,3	14,14,15	0.23	0	17,19,21	0.45	0
3	NAG	J	2	3	14,14,15	0.24	0	17,19,21	0.42	0
3	NAG	K	1	1,3	14,14,15	0.20	0	17,19,21	0.42	0
3	NAG	K	2	3	14,14,15	0.22	0	17,19,21	0.43	0
3	NAG	L	1	1,3	14,14,15	0.23	0	17,19,21	0.44	0
3	NAG	L	2	3	14,14,15	0.23	0	17,19,21	0.40	0
3	NAG	M	1	1,3	14,14,15	0.50	0	17,19,21	0.66	0
3	NAG	M	2	3	14,14,15	0.22	0	17,19,21	0.44	0
3	NAG	N	1	1,3	14,14,15	0.43	0	17,19,21	0.58	0
3	NAG	N	2	3	14,14,15	0.23	0	17,19,21	0.46	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
3	NAG	G	1	1,3	-	3/6/23/26	0/1/1/1
3	NAG	G	2	3	-	0/6/23/26	0/1/1/1
3	NAG	H	1	1,3	-	4/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAG	H	2	3	-	2/6/23/26	0/1/1/1
3	NAG	I	1	1,3	-	0/6/23/26	0/1/1/1
3	NAG	I	2	3	-	4/6/23/26	0/1/1/1
3	NAG	J	1	1,3	-	2/6/23/26	0/1/1/1
3	NAG	J	2	3	-	0/6/23/26	0/1/1/1
3	NAG	K	1	1,3	-	4/6/23/26	0/1/1/1
3	NAG	K	2	3	-	2/6/23/26	0/1/1/1
3	NAG	L	1	1,3	-	0/6/23/26	0/1/1/1
3	NAG	L	2	3	-	2/6/23/26	0/1/1/1
3	NAG	M	1	1,3	-	4/6/23/26	0/1/1/1
3	NAG	M	2	3	-	2/6/23/26	0/1/1/1
3	NAG	N	1	1,3	-	2/6/23/26	0/1/1/1
3	NAG	N	2	3	-	2/6/23/26	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	G	1	NAG	O5-C1	-2.98	1.39	1.43

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	G	1	NAG	C3-C4-C5	2.19	114.14	110.24

There are no chirality outliers.

All (33) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	H	2	NAG	O5-C5-C6-O6
3	J	1	NAG	O5-C5-C6-O6
3	I	2	NAG	C4-C5-C6-O6
3	K	1	NAG	O5-C5-C6-O6
3	K	2	NAG	O5-C5-C6-O6
3	J	1	NAG	C4-C5-C6-O6
3	G	1	NAG	O5-C5-C6-O6
3	H	2	NAG	C4-C5-C6-O6
3	M	1	NAG	O5-C5-C6-O6
3	G	1	NAG	C4-C5-C6-O6
3	H	1	NAG	C8-C7-N2-C2

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Mol	Chain	Res	Type	Atoms
3	H	1	NAG	O7-C7-N2-C2
3	I	2	NAG	C8-C7-N2-C2
3	I	2	NAG	O7-C7-N2-C2
3	K	1	NAG	C8-C7-N2-C2
3	K	1	NAG	O7-C7-N2-C2
3	L	2	NAG	C8-C7-N2-C2
3	L	2	NAG	O7-C7-N2-C2
3	M	1	NAG	C8-C7-N2-C2
3	M	1	NAG	O7-C7-N2-C2
3	N	2	NAG	C8-C7-N2-C2
3	N	2	NAG	O7-C7-N2-C2
3	M	1	NAG	C4-C5-C6-O6
3	H	1	NAG	O5-C5-C6-O6
3	I	2	NAG	O5-C5-C6-O6
3	K	1	NAG	C4-C5-C6-O6
3	K	2	NAG	C4-C5-C6-O6
3	M	2	NAG	C4-C5-C6-O6
3	H	1	NAG	C4-C5-C6-O6
3	M	2	NAG	O5-C5-C6-O6
3	N	1	NAG	C4-C5-C6-O6
3	N	1	NAG	O5-C5-C6-O6
3	G	1	NAG	C3-C2-N2-C7

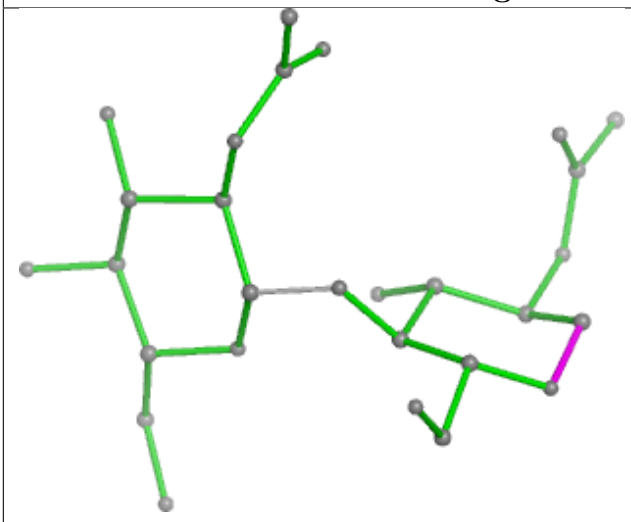
There are no ring outliers.

2 monomers are involved in 2 short contacts:

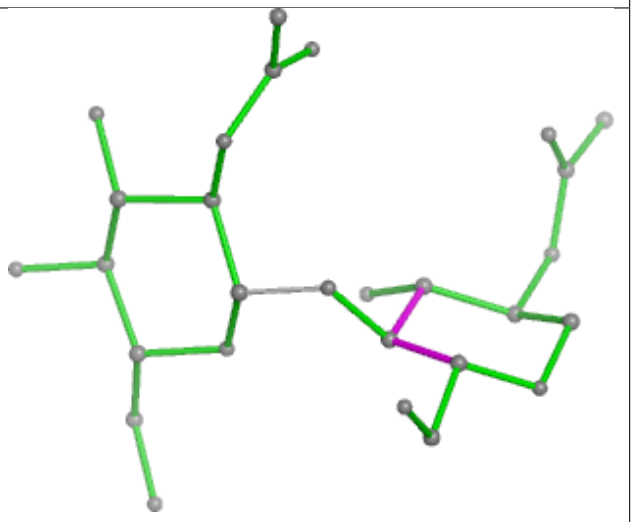
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	M	1	NAG	1	0
3	N	1	NAG	1	0

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

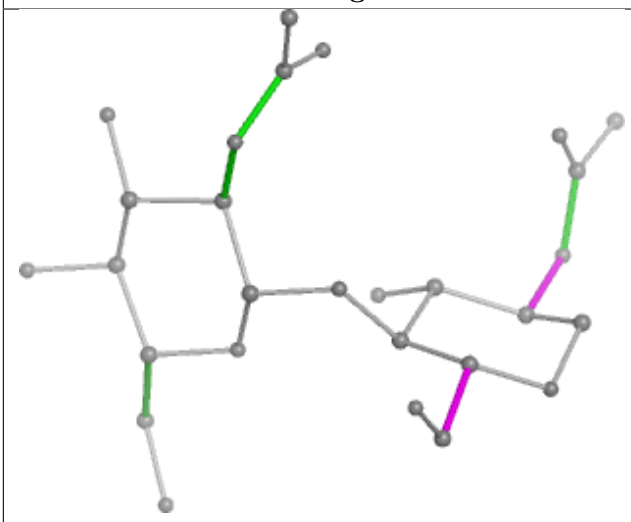
Oligosaccharide Chain G



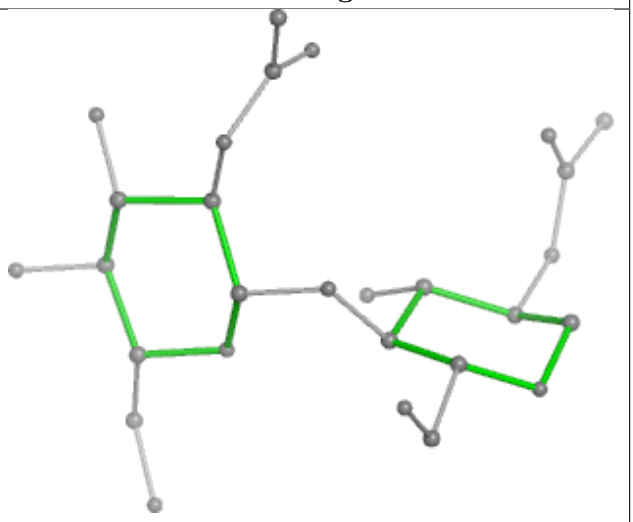
Bond lengths



Bond angles

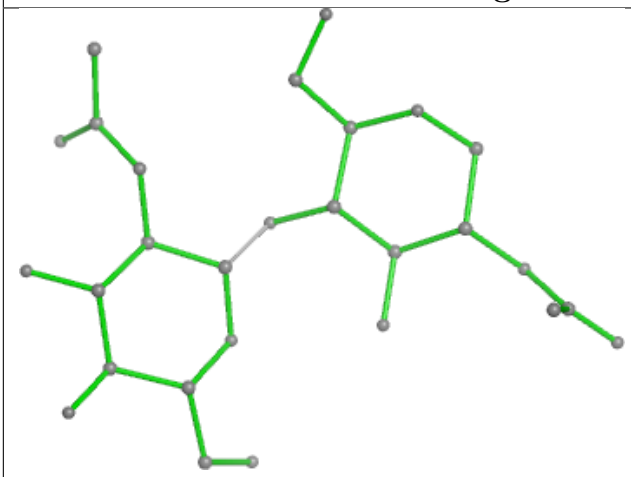


Torsions

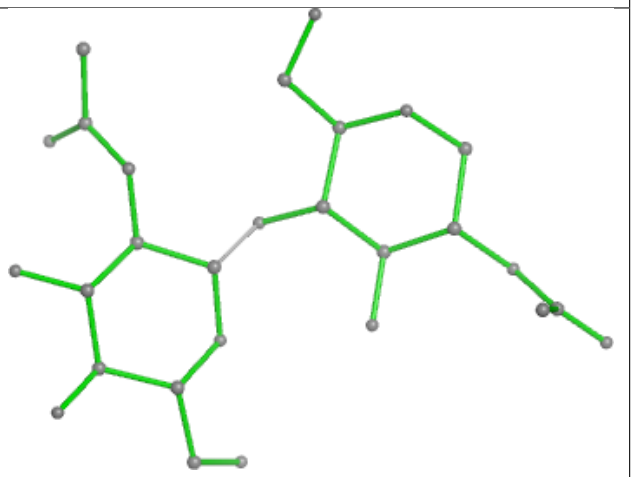


Rings

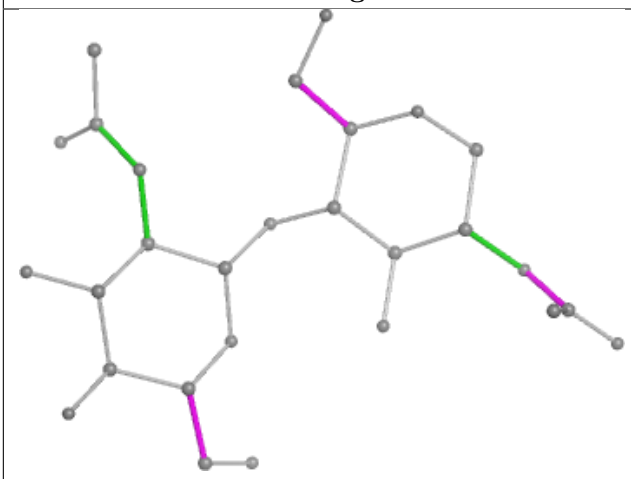
Oligosaccharide Chain H



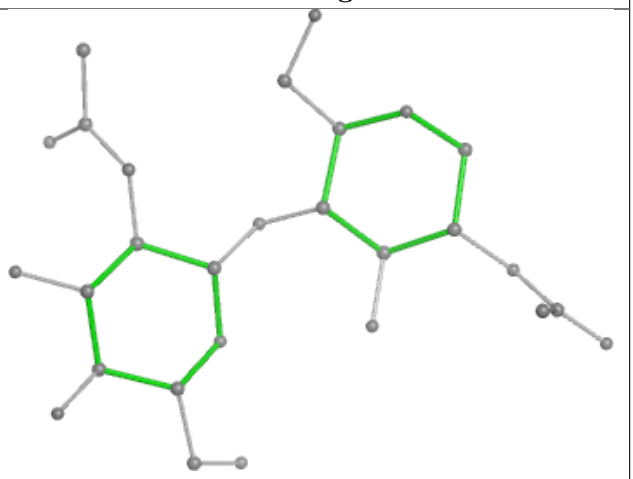
Bond lengths



Bond angles

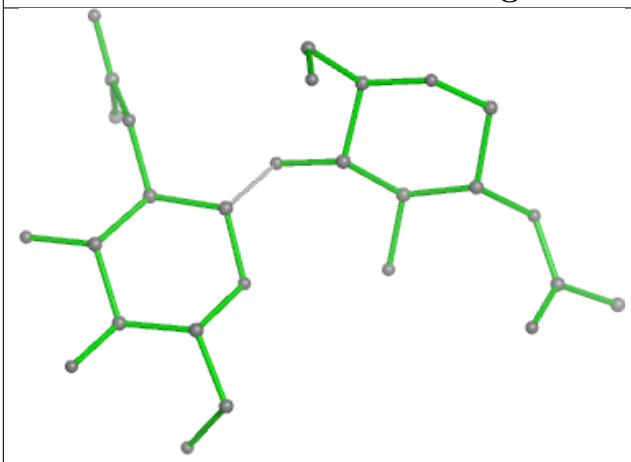


Torsions

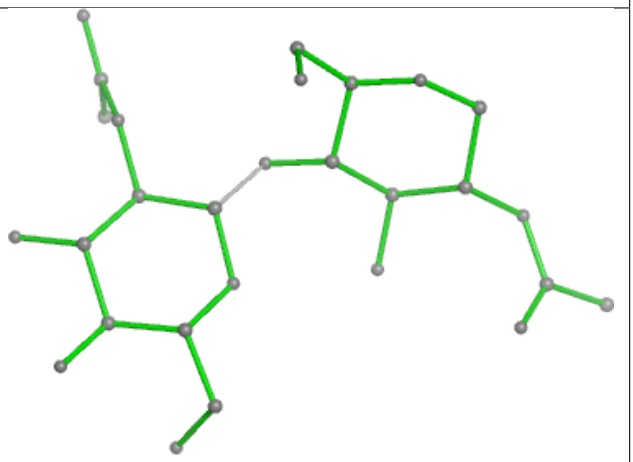


Rings

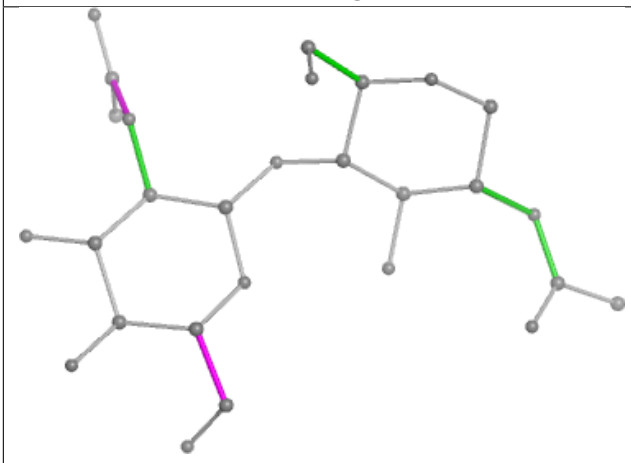
Oligosaccharide Chain I



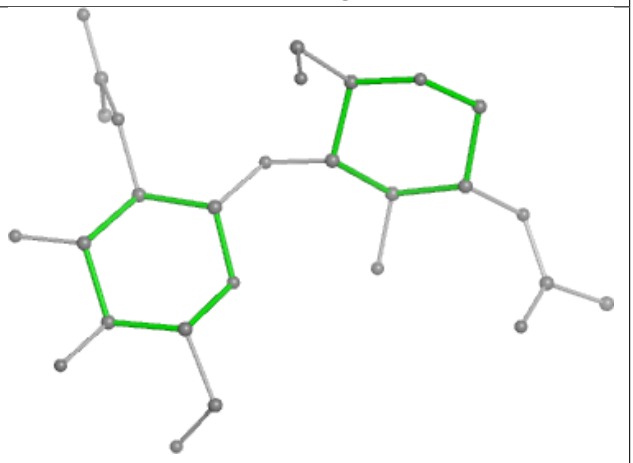
Bond lengths



Bond angles

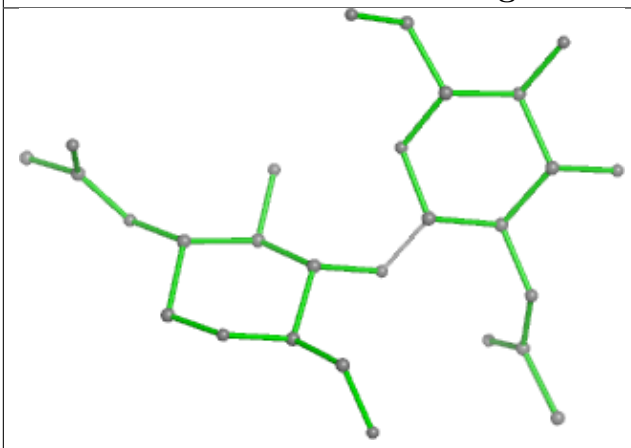


Torsions

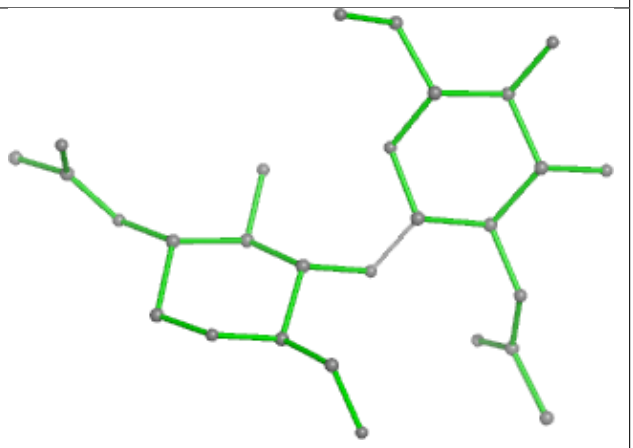


Rings

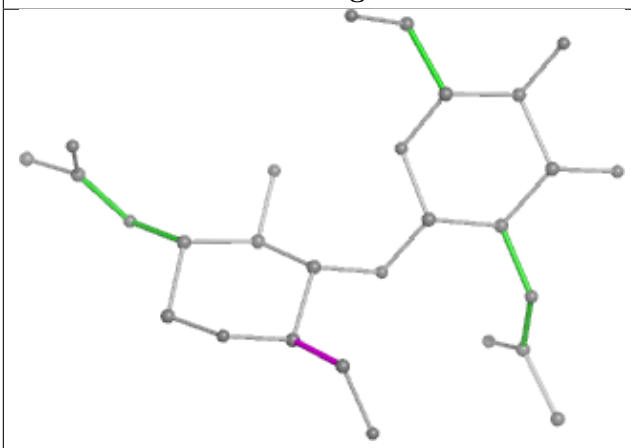
Oligosaccharide Chain J



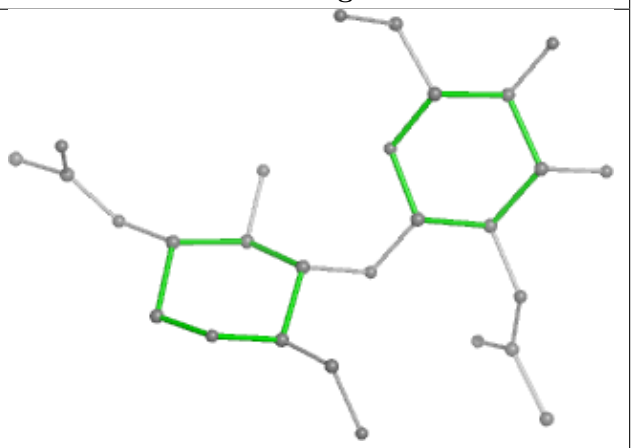
Bond lengths



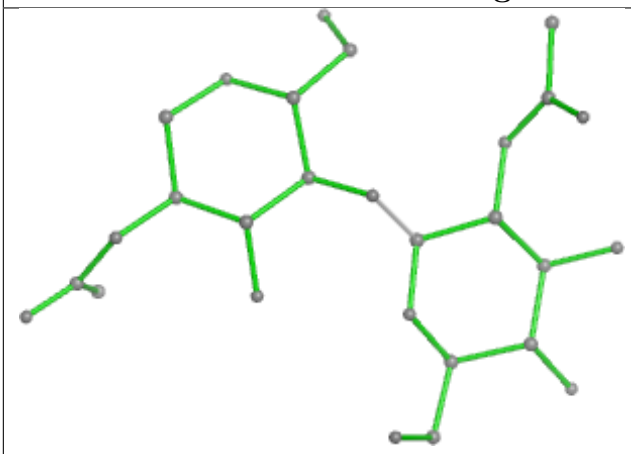
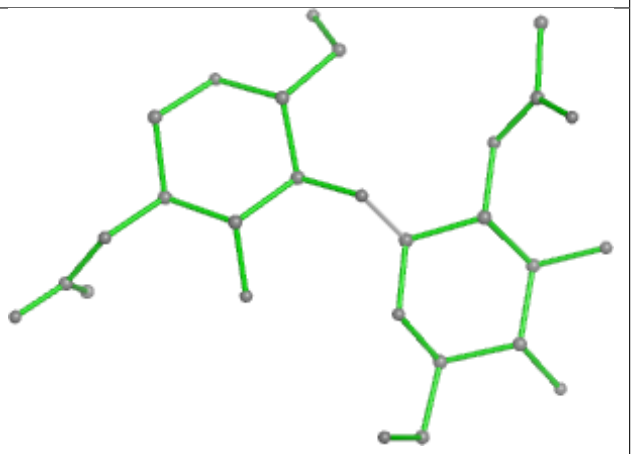
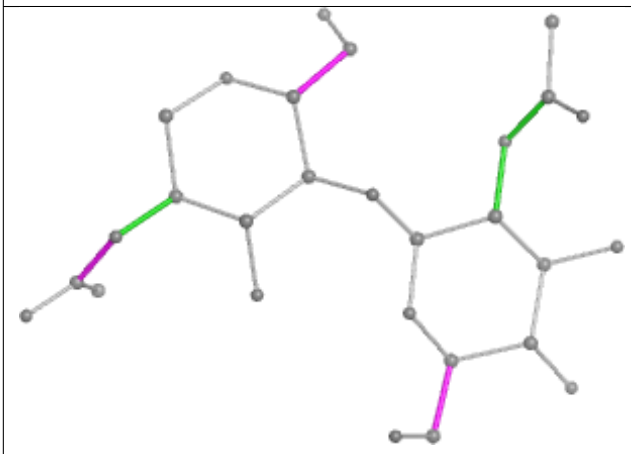
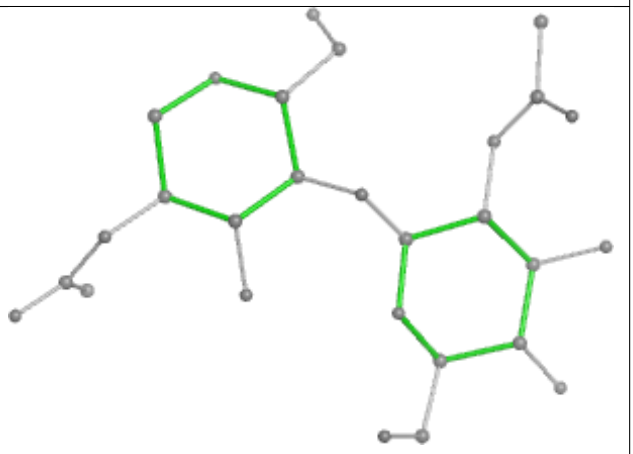
Bond angles



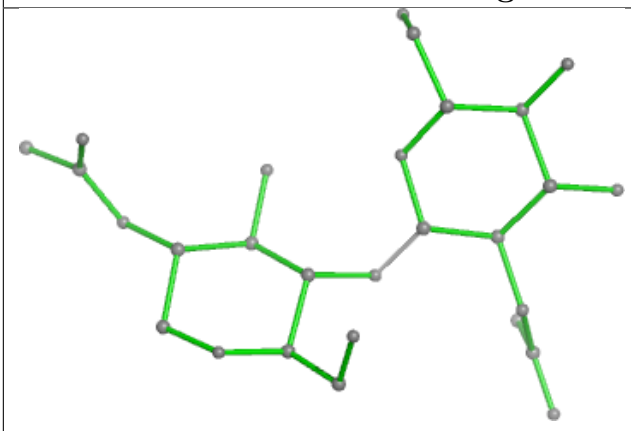
Torsions



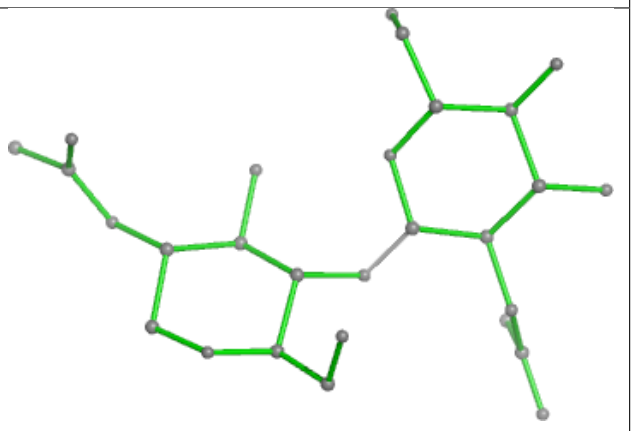
Rings

Oligosaccharide Chain K	
	
Bond lengths	**Bond angles**
	
Torsions	**Rings**

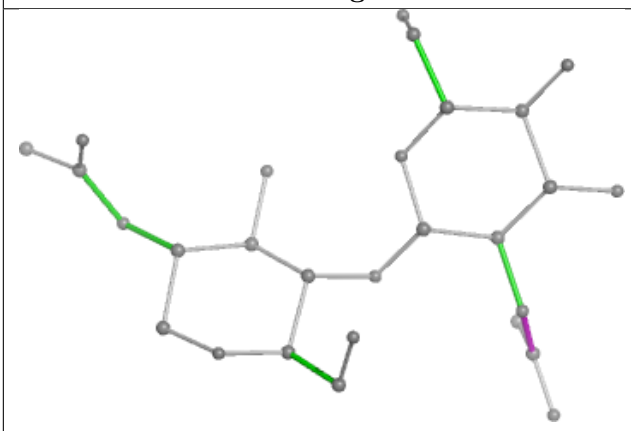
Oligosaccharide Chain L



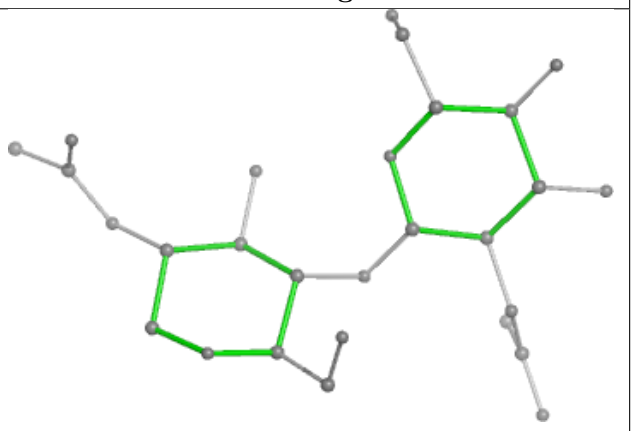
Bond lengths



Bond angles

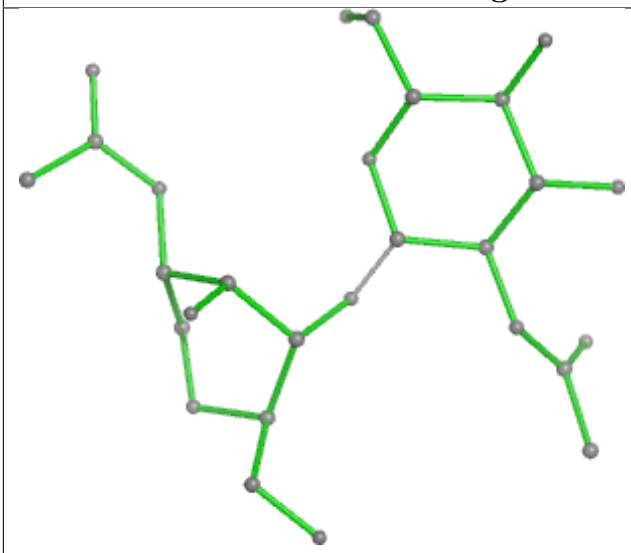


Torsions

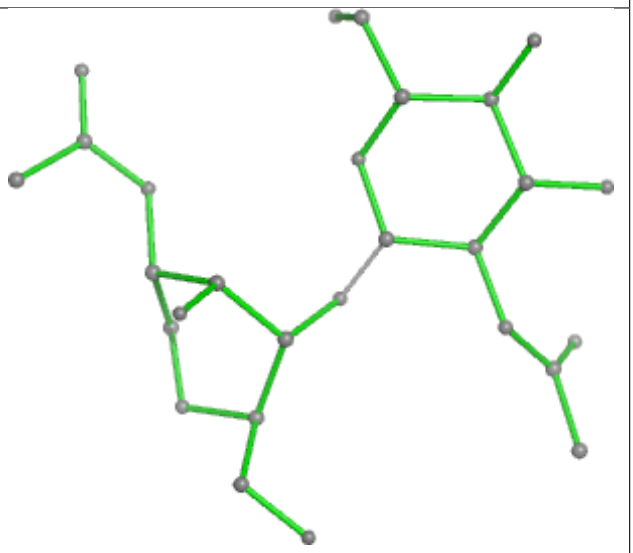


Rings

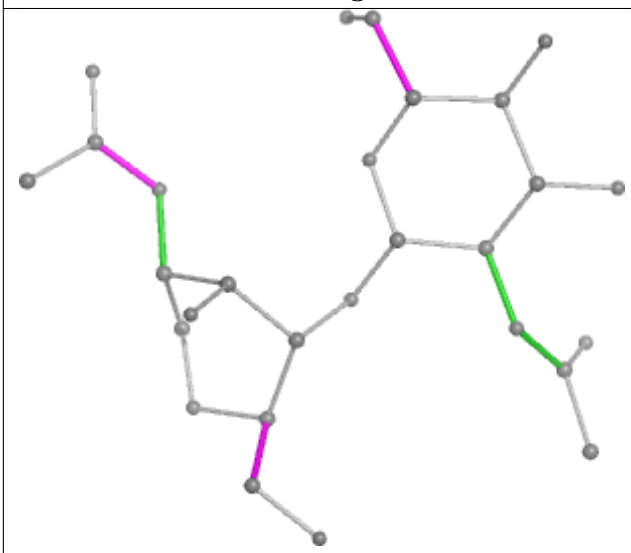
Oligosaccharide Chain M



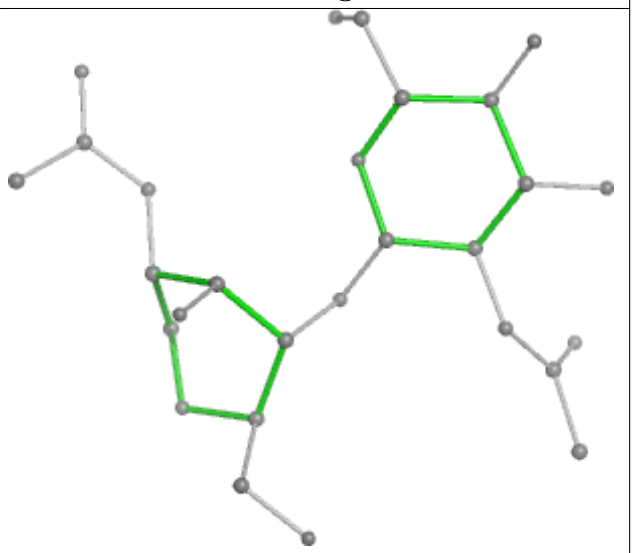
Bond lengths



Bond angles

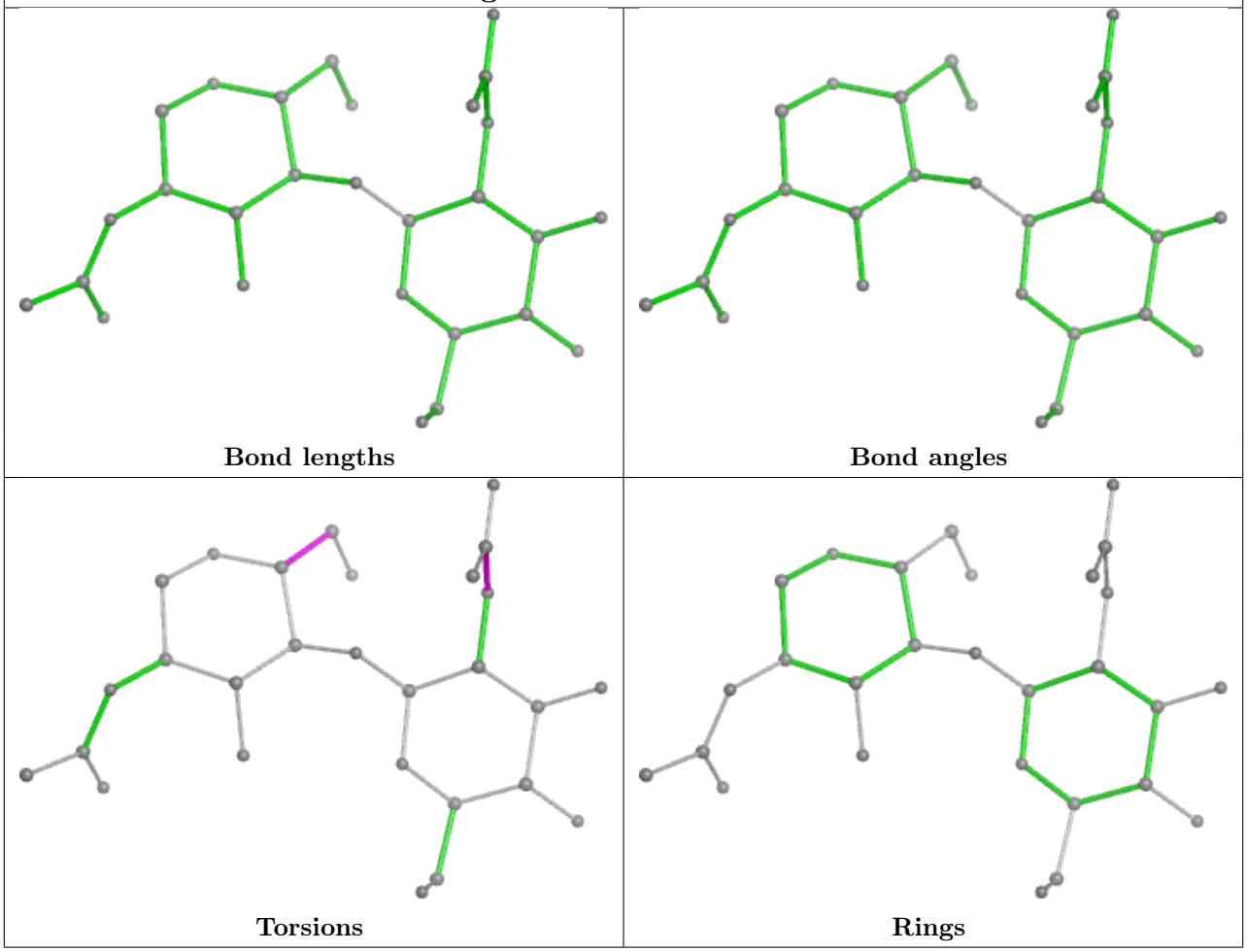


Torsions



Rings

Oligosaccharide Chain N



5.6 Ligand geometry (i)

45 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	$\#\|Z\| > 2$
4	NAG	C	1315	1	14,14,15	0.21	0	17,19,21	0.42	0
4	NAG	C	1309	1	14,14,15	0.22	0	17,19,21	0.43	0
4	NAG	C	1301	1	14,14,15	0.32	0	17,19,21	0.46	0
4	NAG	C	1311	1	14,14,15	0.21	0	17,19,21	0.43	0
4	NAG	B	1314	1	14,14,15	0.22	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	C	1312	1	14,14,15	0.21	0	17,19,21	0.42	0
4	NAG	C	1305	1	14,14,15	0.23	0	17,19,21	0.43	0
4	NAG	B	1311	1	14,14,15	0.22	0	17,19,21	0.41	0
4	NAG	A	1305	1	14,14,15	0.22	0	17,19,21	0.41	0
4	NAG	A	1307	1	14,14,15	0.22	0	17,19,21	0.40	0
4	NAG	B	1310	1	14,14,15	0.21	0	17,19,21	0.42	0
4	NAG	A	1306	1	14,14,15	0.21	0	17,19,21	0.42	0
4	NAG	C	1302	1	14,14,15	0.22	0	17,19,21	0.41	0
4	NAG	C	1304	1	14,14,15	0.86	1 (7%)	17,19,21	1.02	1 (5%)
4	NAG	A	1303	1	14,14,15	0.23	0	17,19,21	0.42	0
4	NAG	B	1309	1	14,14,15	0.23	0	17,19,21	0.38	0
4	NAG	B	1301	1	14,14,15	0.47	0	17,19,21	1.26	1 (5%)
4	NAG	C	1316	1	14,14,15	0.23	0	17,19,21	0.43	0
4	NAG	A	1311	1	14,14,15	0.25	0	17,19,21	0.40	0
4	NAG	B	1303	1	14,14,15	0.22	0	17,19,21	0.42	0
4	NAG	A	1314	1	14,14,15	0.22	0	17,19,21	0.42	0
4	NAG	C	1308	1	14,14,15	0.22	0	17,19,21	0.43	0
4	NAG	B	1312	1	14,14,15	0.26	0	17,19,21	0.54	0
4	NAG	A	1313	1	14,14,15	0.20	0	17,19,21	0.46	0
4	NAG	C	1307	1	14,14,15	0.44	0	17,19,21	1.27	2 (11%)
4	NAG	B	1304	1	14,14,15	0.26	0	17,19,21	0.55	0
4	NAG	B	1306	1	14,14,15	0.24	0	17,19,21	0.53	0
4	NAG	B	1315	1	14,14,15	0.22	0	17,19,21	0.42	0
4	NAG	B	1307	1	14,14,15	0.23	0	17,19,21	0.43	0
4	NAG	A	1309	1	14,14,15	0.22	0	17,19,21	0.43	0
4	NAG	C	1313	1	14,14,15	0.28	0	17,19,21	0.42	0
4	NAG	A	1301	1	14,14,15	0.24	0	17,19,21	0.39	0
4	NAG	B	1302	1	14,14,15	0.23	0	17,19,21	0.45	0
4	NAG	A	1302	1	14,14,15	0.20	0	17,19,21	0.42	0
4	NAG	A	1308	1	14,14,15	0.20	0	17,19,21	0.43	0
4	NAG	A	1312	1	14,14,15	0.49	0	17,19,21	0.45	0
4	NAG	C	1314	1	14,14,15	0.21	0	17,19,21	0.39	0
4	NAG	B	1313	1	14,14,15	0.25	0	17,19,21	0.41	0
4	NAG	C	1303	1	14,14,15	0.22	0	17,19,21	0.42	0
4	NAG	C	1310	1	14,14,15	0.28	0	17,19,21	0.41	0
4	NAG	A	1304	1	14,14,15	0.35	0	17,19,21	0.41	0
4	NAG	C	1306	1	14,14,15	0.21	0	17,19,21	0.43	0
4	NAG	B	1308	1	14,14,15	0.33	0	17,19,21	0.48	0
4	NAG	A	1310	1	14,14,15	0.28	0	17,19,21	0.38	0
4	NAG	B	1305	1	14,14,15	0.41	0	17,19,21	0.58	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	C	1315	1	-	1/6/23/26	0/1/1/1
4	NAG	C	1309	1	-	2/6/23/26	0/1/1/1
4	NAG	C	1301	1	-	2/6/23/26	0/1/1/1
4	NAG	C	1311	1	-	2/6/23/26	0/1/1/1
4	NAG	B	1314	1	-	1/6/23/26	0/1/1/1
4	NAG	C	1312	1	-	2/6/23/26	0/1/1/1
4	NAG	C	1305	1	-	1/6/23/26	0/1/1/1
4	NAG	B	1311	1	-	1/6/23/26	0/1/1/1
4	NAG	A	1305	1	-	0/6/23/26	0/1/1/1
4	NAG	A	1307	1	-	0/6/23/26	0/1/1/1
4	NAG	B	1310	1	-	2/6/23/26	0/1/1/1
4	NAG	A	1306	1	-	1/6/23/26	0/1/1/1
4	NAG	C	1302	1	-	1/6/23/26	0/1/1/1
4	NAG	C	1304	1	-	4/6/23/26	0/1/1/1
4	NAG	A	1303	1	-	2/6/23/26	0/1/1/1
4	NAG	B	1309	1	-	2/6/23/26	0/1/1/1
4	NAG	B	1301	1	-	3/6/23/26	0/1/1/1
4	NAG	C	1316	1	-	2/6/23/26	0/1/1/1
4	NAG	A	1311	1	-	2/6/23/26	0/1/1/1
4	NAG	B	1303	1	-	2/6/23/26	0/1/1/1
4	NAG	A	1314	1	-	2/6/23/26	0/1/1/1
4	NAG	C	1308	1	-	2/6/23/26	0/1/1/1
4	NAG	B	1312	1	-	3/6/23/26	0/1/1/1
4	NAG	A	1313	1	-	2/6/23/26	0/1/1/1
4	NAG	C	1307	1	-	5/6/23/26	0/1/1/1
4	NAG	B	1304	1	-	3/6/23/26	0/1/1/1
4	NAG	B	1306	1	-	1/6/23/26	0/1/1/1
4	NAG	B	1315	1	-	2/6/23/26	0/1/1/1
4	NAG	B	1307	1	-	2/6/23/26	0/1/1/1
4	NAG	A	1309	1	-	2/6/23/26	0/1/1/1
4	NAG	C	1313	1	-	2/6/23/26	0/1/1/1
4	NAG	A	1301	1	-	2/6/23/26	0/1/1/1
4	NAG	B	1302	1	-	4/6/23/26	0/1/1/1
4	NAG	A	1302	1	-	0/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	NAG	A	1308	1	-	0/6/23/26	0/1/1/1
4	NAG	A	1312	1	-	2/6/23/26	0/1/1/1
4	NAG	C	1314	1	-	2/6/23/26	0/1/1/1
4	NAG	B	1313	1	-	2/6/23/26	0/1/1/1
4	NAG	C	1303	1	-	2/6/23/26	0/1/1/1
4	NAG	C	1310	1	-	1/6/23/26	0/1/1/1
4	NAG	A	1304	1	-	0/6/23/26	0/1/1/1
4	NAG	C	1306	1	-	0/6/23/26	0/1/1/1
4	NAG	B	1308	1	-	1/6/23/26	0/1/1/1
4	NAG	A	1310	1	-	0/6/23/26	0/1/1/1
4	NAG	B	1305	1	-	0/6/23/26	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	C	1304	NAG	O5-C1	2.85	1.48	1.43

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	C	1307	NAG	C2-N2-C7	4.31	129.03	122.90
4	B	1301	NAG	C2-N2-C7	4.30	129.02	122.90
4	C	1304	NAG	C1-O5-C5	3.94	117.53	112.19
4	C	1307	NAG	C1-C2-N2	2.00	113.91	110.49

There are no chirality outliers.

All (75) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	B	1304	NAG	O5-C5-C6-O6
4	C	1307	NAG	O5-C5-C6-O6
4	B	1302	NAG	C4-C5-C6-O6
4	C	1308	NAG	O5-C5-C6-O6
4	A	1303	NAG	O5-C5-C6-O6
4	B	1302	NAG	O5-C5-C6-O6
4	B	1312	NAG	C4-C5-C6-O6
4	A	1309	NAG	O5-C5-C6-O6
4	B	1303	NAG	O5-C5-C6-O6
4	C	1301	NAG	O5-C5-C6-O6
4	C	1303	NAG	O5-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
4	C	1309	NAG	O5-C5-C6-O6
4	C	1312	NAG	C4-C5-C6-O6
4	B	1313	NAG	O5-C5-C6-O6
4	A	1309	NAG	C4-C5-C6-O6
4	C	1307	NAG	C4-C5-C6-O6
4	C	1308	NAG	C4-C5-C6-O6
4	C	1309	NAG	C4-C5-C6-O6
4	C	1313	NAG	C4-C5-C6-O6
4	B	1312	NAG	O5-C5-C6-O6
4	C	1304	NAG	C4-C5-C6-O6
4	A	1303	NAG	C4-C5-C6-O6
4	A	1311	NAG	O5-C5-C6-O6
4	A	1312	NAG	O5-C5-C6-O6
4	A	1313	NAG	O5-C5-C6-O6
4	C	1313	NAG	O5-C5-C6-O6
4	C	1314	NAG	O5-C5-C6-O6
4	C	1304	NAG	O5-C5-C6-O6
4	B	1304	NAG	C4-C5-C6-O6
4	B	1303	NAG	C4-C5-C6-O6
4	C	1303	NAG	C4-C5-C6-O6
4	C	1301	NAG	C4-C5-C6-O6
4	C	1314	NAG	C4-C5-C6-O6
4	B	1301	NAG	C8-C7-N2-C2
4	B	1301	NAG	O7-C7-N2-C2
4	B	1302	NAG	C8-C7-N2-C2
4	B	1302	NAG	O7-C7-N2-C2
4	C	1304	NAG	C8-C7-N2-C2
4	C	1304	NAG	O7-C7-N2-C2
4	C	1307	NAG	C8-C7-N2-C2
4	C	1307	NAG	O7-C7-N2-C2
4	C	1311	NAG	C8-C7-N2-C2
4	C	1311	NAG	O7-C7-N2-C2
4	C	1312	NAG	O5-C5-C6-O6
4	A	1311	NAG	C4-C5-C6-O6
4	B	1309	NAG	C4-C5-C6-O6
4	B	1313	NAG	C4-C5-C6-O6
4	A	1312	NAG	C4-C5-C6-O6
4	B	1314	NAG	O5-C5-C6-O6
4	B	1310	NAG	O5-C5-C6-O6
4	B	1310	NAG	C4-C5-C6-O6
4	B	1307	NAG	O5-C5-C6-O6
4	A	1313	NAG	C4-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
4	B	1309	NAG	O5-C5-C6-O6
4	C	1302	NAG	O5-C5-C6-O6
4	A	1314	NAG	O5-C5-C6-O6
4	A	1314	NAG	C4-C5-C6-O6
4	C	1315	NAG	O5-C5-C6-O6
4	C	1316	NAG	C4-C5-C6-O6
4	A	1301	NAG	C4-C5-C6-O6
4	C	1316	NAG	O5-C5-C6-O6
4	B	1311	NAG	O5-C5-C6-O6
4	A	1301	NAG	O5-C5-C6-O6
4	B	1315	NAG	C4-C5-C6-O6
4	A	1306	NAG	O5-C5-C6-O6
4	B	1315	NAG	O5-C5-C6-O6
4	B	1304	NAG	C3-C2-N2-C7
4	B	1306	NAG	C3-C2-N2-C7
4	B	1308	NAG	C3-C2-N2-C7
4	B	1312	NAG	C3-C2-N2-C7
4	C	1310	NAG	C4-C5-C6-O6
4	B	1307	NAG	C4-C5-C6-O6
4	B	1301	NAG	C3-C2-N2-C7
4	C	1307	NAG	C3-C2-N2-C7
4	C	1305	NAG	O5-C5-C6-O6

There are no ring outliers.

10 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	C	1301	NAG	1	0
4	C	1305	NAG	1	0
4	B	1309	NAG	1	0
4	B	1301	NAG	2	0
4	C	1307	NAG	1	0
4	B	1304	NAG	1	0
4	B	1306	NAG	1	0
4	A	1308	NAG	1	0
4	C	1310	NAG	1	0
4	B	1305	NAG	1	0

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.