



## Full wwPDB EM Validation Report ⓘ

Nov 20, 2022 – 06:57 AM EST

PDB ID : 7M6F  
EMDB ID : EMD-23694  
Title : Structure of the SARS-CoV-2 S 6P trimer in complex with the human neutralizing antibody Fab fragment, BG1-22  
Authors : Barnes, C.O.; Bjorkman, P.J.  
Deposited on : 2021-03-25  
Resolution : 3.90 Å (reported)  
Based on initial model : 6XKL

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto: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>.

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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  
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) : 2.31.2

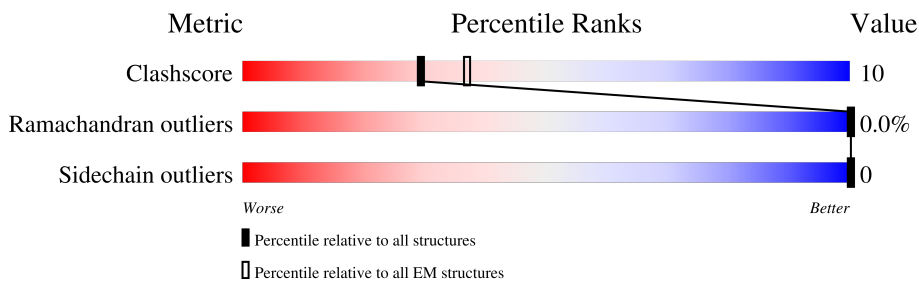
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.90 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.




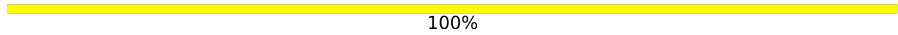


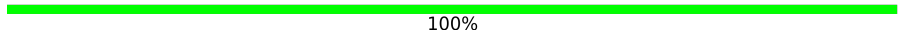
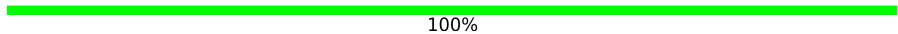
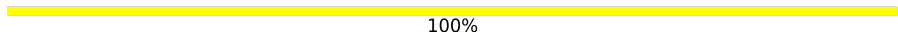

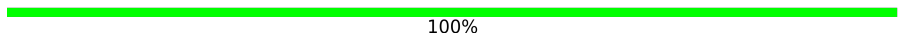
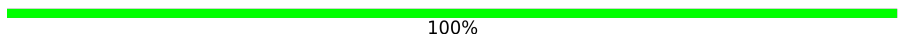
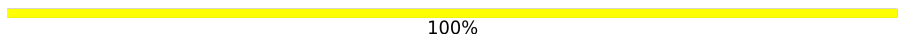

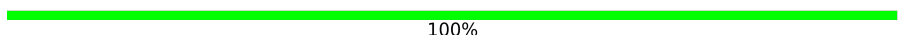
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion  $< 40\%$ ). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	1288	
1	B	1288	
1	E	1288	
2	C	233	
2	H	233	
3	D	217	
3	L	217	
4	F	2	

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Mol	Chain	Length	Quality of chain
4	G	2	 50% 50%
4	I	2	 50% 50%
4	K	2	 100%
4	M	2	 50% 50%
4	N	2	 50% 100%
4	O	2	 100%
4	P	2	 100%
4	Q	2	 100%
4	R	2	 50% 100%
4	S	2	 100%
4	T	2	 100%
4	V	2	 100%
4	W	2	 50% 50%
4	X	2	 100%

## 2 Entry composition i

There are 5 unique types of molecules in this entry. The entry contains 24304 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
			Total	C	N	O	S		
1	A	998	7064	4529	1209	1292	34	0	0
1	B	998	7026	4501	1207	1284	34	0	0
1	E	998	7064	4529	1209	1292	34	0	0

There are 267 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	682	GLY	ARG	engineered mutation	UNP P0DTC2
A	683	SER	ARG	engineered mutation	UNP P0DTC2
A	685	SER	ARG	engineered mutation	UNP P0DTC2
A	817	PRO	PHE	engineered mutation	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	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

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Chain	Residue	Modelled	Actual	Comment	Reference
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
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

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Chain	Residue	Modelled	Actual	Comment	Reference
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
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	engineered mutation	UNP P0DTC2
B	683	SER	ARG	engineered mutation	UNP P0DTC2
B	685	SER	ARG	engineered mutation	UNP P0DTC2
B	817	PRO	PHE	engineered mutation	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	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

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Chain	Residue	Modelled	Actual	Comment	Reference
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
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

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Chain	Residue	Modelled	Actual	Comment	Reference
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
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
E	682	GLY	ARG	engineered mutation	UNP P0DTC2
E	683	SER	ARG	engineered mutation	UNP P0DTC2
E	685	SER	ARG	engineered mutation	UNP P0DTC2
E	817	PRO	PHE	engineered mutation	UNP P0DTC2
E	892	PRO	ALA	engineered mutation	UNP P0DTC2
E	899	PRO	ALA	engineered mutation	UNP P0DTC2
E	942	PRO	ALA	engineered mutation	UNP P0DTC2
E	986	PRO	LYS	engineered mutation	UNP P0DTC2
E	987	PRO	VAL	engineered mutation	UNP P0DTC2
E	1209	GLY	-	expression tag	UNP P0DTC2
E	1210	SER	-	expression tag	UNP P0DTC2
E	1211	GLY	-	expression tag	UNP P0DTC2
E	1212	TYR	-	expression tag	UNP P0DTC2
E	1213	ILE	-	expression tag	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
E	1214	PRO	-	expression tag	UNP P0DTC2
E	1215	GLU	-	expression tag	UNP P0DTC2
E	1216	ALA	-	expression tag	UNP P0DTC2
E	1217	PRO	-	expression tag	UNP P0DTC2
E	1218	ARG	-	expression tag	UNP P0DTC2
E	1219	ASP	-	expression tag	UNP P0DTC2
E	1220	GLY	-	expression tag	UNP P0DTC2
E	1221	GLN	-	expression tag	UNP P0DTC2
E	1222	ALA	-	expression tag	UNP P0DTC2
E	1223	TYR	-	expression tag	UNP P0DTC2
E	1224	VAL	-	expression tag	UNP P0DTC2
E	1225	ARG	-	expression tag	UNP P0DTC2
E	1226	LYS	-	expression tag	UNP P0DTC2
E	1227	ASP	-	expression tag	UNP P0DTC2
E	1228	GLY	-	expression tag	UNP P0DTC2
E	1229	GLU	-	expression tag	UNP P0DTC2
E	1230	TRP	-	expression tag	UNP P0DTC2
E	1231	VAL	-	expression tag	UNP P0DTC2
E	1232	LEU	-	expression tag	UNP P0DTC2
E	1233	LEU	-	expression tag	UNP P0DTC2
E	1234	SER	-	expression tag	UNP P0DTC2
E	1235	THR	-	expression tag	UNP P0DTC2
E	1236	PHE	-	expression tag	UNP P0DTC2
E	1237	LEU	-	expression tag	UNP P0DTC2
E	1238	GLY	-	expression tag	UNP P0DTC2
E	1239	ARG	-	expression tag	UNP P0DTC2
E	1240	SER	-	expression tag	UNP P0DTC2
E	1241	LEU	-	expression tag	UNP P0DTC2
E	1242	GLU	-	expression tag	UNP P0DTC2
E	1243	VAL	-	expression tag	UNP P0DTC2
E	1244	LEU	-	expression tag	UNP P0DTC2
E	1245	PHE	-	expression tag	UNP P0DTC2
E	1246	GLN	-	expression tag	UNP P0DTC2
E	1247	GLY	-	expression tag	UNP P0DTC2
E	1248	PRO	-	expression tag	UNP P0DTC2
E	1249	GLY	-	expression tag	UNP P0DTC2
E	1250	HIS	-	expression tag	UNP P0DTC2
E	1251	HIS	-	expression tag	UNP P0DTC2
E	1252	HIS	-	expression tag	UNP P0DTC2
E	1253	HIS	-	expression tag	UNP P0DTC2
E	1254	HIS	-	expression tag	UNP P0DTC2
E	1255	HIS	-	expression tag	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
E	1256	HIS	-	expression tag	UNP P0DTC2
E	1257	HIS	-	expression tag	UNP P0DTC2
E	1258	SER	-	expression tag	UNP P0DTC2
E	1259	ALA	-	expression tag	UNP P0DTC2
E	1260	TRP	-	expression tag	UNP P0DTC2
E	1261	SER	-	expression tag	UNP P0DTC2
E	1262	HIS	-	expression tag	UNP P0DTC2
E	1263	PRO	-	expression tag	UNP P0DTC2
E	1264	GLN	-	expression tag	UNP P0DTC2
E	1265	PHE	-	expression tag	UNP P0DTC2
E	1266	GLU	-	expression tag	UNP P0DTC2
E	1267	LYS	-	expression tag	UNP P0DTC2
E	1268	GLY	-	expression tag	UNP P0DTC2
E	1269	GLY	-	expression tag	UNP P0DTC2
E	1270	GLY	-	expression tag	UNP P0DTC2
E	1271	SER	-	expression tag	UNP P0DTC2
E	1272	GLY	-	expression tag	UNP P0DTC2
E	1273	GLY	-	expression tag	UNP P0DTC2
E	1274	GLY	-	expression tag	UNP P0DTC2
E	1275	GLY	-	expression tag	UNP P0DTC2
E	1276	SER	-	expression tag	UNP P0DTC2
E	1277	GLY	-	expression tag	UNP P0DTC2
E	1278	GLY	-	expression tag	UNP P0DTC2
E	1279	SER	-	expression tag	UNP P0DTC2
E	1280	ALA	-	expression tag	UNP P0DTC2
E	1281	TRP	-	expression tag	UNP P0DTC2
E	1282	SER	-	expression tag	UNP P0DTC2
E	1283	HIS	-	expression tag	UNP P0DTC2
E	1284	PRO	-	expression tag	UNP P0DTC2
E	1285	GLN	-	expression tag	UNP P0DTC2
E	1286	PHE	-	expression tag	UNP P0DTC2
E	1287	GLU	-	expression tag	UNP P0DTC2
E	1288	LYS	-	expression tag	UNP P0DTC2

- Molecule 2 is a protein called BG1-22 Fab Heavy Chain.

Mol	Chain	Residues	Atoms				AltConf	Trace	
2	C	118	Total	C	N	O	S	1	0
			596	356	119	119	2		
2	H	118	Total	C	N	O	S	1	0
			596	356	119	119	2		

- Molecule 3 is a protein called BG1-22 Fab Light Chain.

Mol	Chain	Residues	Atoms				AltConf	Trace
3	D	108	Total	C	N	O	3	0
			538	320	109	109		
3	L	108	Total	C	N	O	3	0
			538	320	109	109		

- 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	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	K	2	Total	C	N	O	0	0
			28	16	2	10		
4	M	2	Total	C	N	O	0	0
			28	16	2	10		
4	N	2	Total	C	N	O	0	0
			28	16	2	10		
4	O	2	Total	C	N	O	0	0
			28	16	2	10		
4	P	2	Total	C	N	O	0	0
			28	16	2	10		
4	Q	2	Total	C	N	O	0	0
			28	16	2	10		
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	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		

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula:  $C_8H_{15}NO_6$ ).



Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
5	A	1	Total	C	N	O	0
			154	88	11	55	
5	A	1	Total	C	N	O	0
			154	88	11	55	
5	A	1	Total	C	N	O	0
			154	88	11	55	
5	A	1	Total	C	N	O	0
			154	88	11	55	
5	A	1	Total	C	N	O	0
			154	88	11	55	
5	A	1	Total	C	N	O	0
			154	88	11	55	
5	A	1	Total	C	N	O	0
			154	88	11	55	
5	A	1	Total	C	N	O	0
			154	88	11	55	
5	B	1	Total	C	N	O	0
			154	88	11	55	

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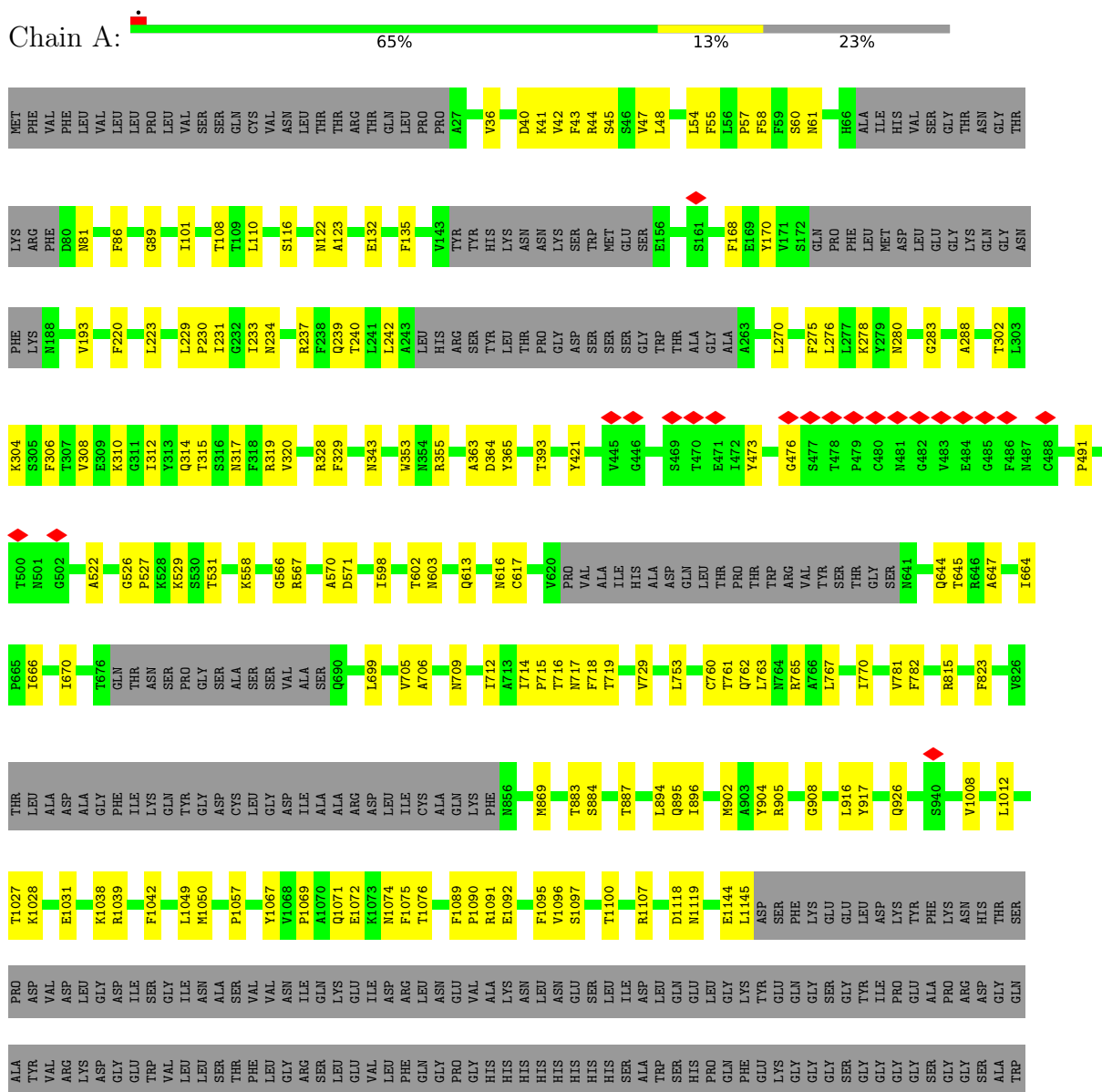
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Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
5	B	1	Total 154	C 88	N 11	O 55	0
5	B	1	Total 154	C 88	N 11	O 55	0
5	B	1	Total 154	C 88	N 11	O 55	0
5	B	1	Total 154	C 88	N 11	O 55	0
5	B	1	Total 154	C 88	N 11	O 55	0
5	B	1	Total 154	C 88	N 11	O 55	0
5	B	1	Total 154	C 88	N 11	O 55	0
5	B	1	Total 154	C 88	N 11	O 55	0
5	B	1	Total 154	C 88	N 11	O 55	0
5	B	1	Total 154	C 88	N 11	O 55	0
5	B	1	Total 154	C 88	N 11	O 55	0
5	B	1	Total 154	C 88	N 11	O 55	0
5	B	1	Total 154	C 88	N 11	O 55	0
5	E	1	Total 154	C 88	N 11	O 55	0
5	E	1	Total 154	C 88	N 11	O 55	0
5	E	1	Total 154	C 88	N 11	O 55	0
5	E	1	Total 154	C 88	N 11	O 55	0
5	E	1	Total 154	C 88	N 11	O 55	0
5	E	1	Total 154	C 88	N 11	O 55	0
5	E	1	Total 154	C 88	N 11	O 55	0
5	E	1	Total 154	C 88	N 11	O 55	0
5	E	1	Total 154	C 88	N 11	O 55	0
5	E	1	Total 154	C 88	N 11	O 55	0
5	E	1	Total 154	C 88	N 11	O 55	0
5	E	1	Total 154	C 88	N 11	O 55	0
5	E	1	Total 154	C 88	N 11	O 55	0

### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and 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



SER  
HIS  
PRO  
GLN  
PHE  
GLU  
LYS

● Molecule 1: Spike glycoprotein



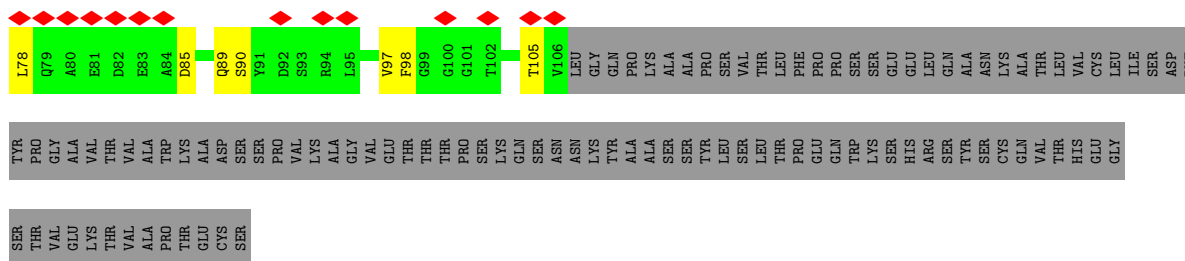
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L84	P85	F86	G89	A93	I105	F106	M122	I128	C131	F132	F133	Q134	F135	V143	TTR	HIS	ASN	ASN	ASP	SER	SER	TRP	MET	GLY	SER	SER	E156	E169	S172	GLN	PRO	PHE	LEU	LEU	MET	ASP	LEU	GLU	GLY	GLY	LYS	GLN	THR	ASN	GLY	PHE	THR	LYS	LYS	ARG	PHE	D86	M81	P82	V83
S205	K206	H207	L216	Q218	G219	F220	S221	A222	L223	G232	I233	N234	I235	A243	LEU	HIS	ARG	A344	SER	TTR	LEU	THR	LEU	PRO	PRO	ASN	GLY	ASP	ASP	SER	SER	SER	SER	SER	GLY	THR	TRP	THR	ALA	GLY	ALA	A263	A264	Y265	Y266	L270	R273	L276	M280	T284	D287	A288	V289	T302	F306
K310	T315	S316	N317	R328	N331	N334	L335	C336	P337	F338	V341	F342	N343	A344	T345	R346	F347	A348	S349	V350	Y351	S352	W353	N354	R355	S359	N360	A363	D364	Y365	N370	S371	A372	S375	K378	C379	Y380	G381	N388	D389	L390	C391	F392	T393	N394	V395	Y396								
A397	F400	Y401	G404	D405	E406	V407	R408	Q409	I410	A411	A412	G413	Q414	T415	N416	G417	I418	A419	D420	Y421	M422	Y423	K424	L425	P426	D427	F428	F429	T430	G431	C432	N437	S438	N439	M440	L441	D442	S443	K444	V445	G446	G447	M448	Y449	Y453	R454	L455	F456	R457	K458	S459	M460	L461	P463	
F464	E465	R466	D467	L468	S469	T470	E471	L472	V473	Q474	A475	G476	T478	P479	C480	N481	G482	V483	E484	G485	F486	N487	C488	Y489	F490	P491	L492	Q493	F497	Q498	P499	T500	N501	G502	W503	G504	Y505	V511	V512	L513	S514	F515	E516	L517	L518	H519	A520	P521	A522	T523	W524	C525	G526	P527	T531
V534	V539	G545	V551	F562	W563	F565	R567	D571	T588	L611	R616	W620	PRO	VAL	ALA	ILE	HIS	ALA	ASP	GLN	LEU	THR	PRO	THR	TRP	ARG	VAL	VAL	TTR	SER	THR	GLY	N541	T645	W646	A647	L664	P665	L666	G667	L670	T676	GLN												
THR	ASN	SER	PRO	GLY	ALA	SER	VAL	VAL	ALA	ALA	Q690	L699	M709	L712	K713	L714	P715	T716	M729	S730	M731	D737	M740	Y741	C749	F759	L763	Q774	D775	K776	E780	V781	F782	A783	Q784	I788	F802	L805	L806	R815	S816	E819													
K825	W826	THR	LEU	ALA	ASP	ALA	GLY	PHE	GLY	ILE	LYS	TTR	GLY	CYS	LEU	ILE	ALA	ALA	ARG	ASP	LEU	ILE	ILE	CYS	ALA	ALA	GLN	LYS	PHE	H856	Y873	T883	Q895	L896	F902	L916	Y917	A930	L934	T961	L962	Y963	K964	Q965	N969	F970	G971	A972							
L977	I980	E990	I993	I997	Q1002	S1003	L1004	E1017	K1028	R1039	F1042	I1081	Q1071	F1075	T1076	A1080	I1081	GLN	LYS	E1092	V1096	S1097	R1107	I1132	N1135	D1139	Q1142	P1143	E1144	L1145	ASP	SER	PHE	LYS	LYS	L962	Y963	K964	Q965	N969	F970	G971	A972												
ASN	HIS	THR	SER	PRO	ALA	VAL	ASP	GLY	ASP	GLY	ILE	LYS	TTR	GLY	CYS	LEU	ILE	ALA	ARG	ASP	LEU	ILE	ILE	CYS	ALA	ALA	GLN	LYS	PHE	H856	Y873	T883	Q895	L896	F902	L916	Y917	A930	L934	T961	L962	Y963	K964	Q965	N969	F970	G971	A972							
ARG	ASP	GLY	GLN	ALA	TYR	VAL	ARG	LYS	ASP	GLY	ILE	LYS	TTR	GLY	CYS	LEU	ILE	ALA	ARG	ASP	LEU	ILE	ILE	CYS	ALA	ALA	GLN	LYS	PHE	H856	Y873	T883	Q895	L896	F902	L916	Y917	A930	L934	T961	L962	Y963	K964	Q965	N969	F970	G971	A972							
GLY	SER	ALA	TRP	SER	HIS	PRO	GLN	PHE	GLU	LYS																																													

● Molecule 1: Spike glycoprotein









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

Chain F:  100%

MAG1  
MAG2

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

Chain G:  50% 50%

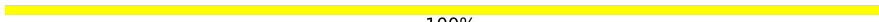
MAG1  
MAG2

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

Chain I:  50% 50%

MAG1  
MAG2

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

Chain K:  100%

MAG1  
MAG2

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

Chain M:  50% 50%

MAG1  
MAG2

- 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



- 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





NAG1  
NAG2

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

Chain V:  100%



NAG1  
NAG2

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

Chain W:  50%  
50% 50%



NAG1  
NAG2

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

Chain X:  100%



NAG1  
NAG2

## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	71104	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TECNAI ARCTICA	Depositor
Voltage (kV)	200	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	60	Depositor
Minimum defocus (nm)	700	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	45000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.531	Depositor
Minimum map value	-0.172	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.016	Depositor
Recommended contour level	0.09	Depositor
Map size ( $\text{\AA}$ )	375.40802, 375.40802, 375.40802	wwPDB
Map dimensions	432, 432, 432	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	0.869, 0.869, 0.869	Depositor

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

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

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	A	0.34	0/7222	0.61	3/9891 (0.0%)
1	B	0.34	0/7181	0.60	2/9840 (0.0%)
1	E	0.33	0/7222	0.58	2/9891 (0.0%)
2	C	0.27	0/600	0.50	0/833
2	H	0.32	0/600	0.51	0/833
3	D	0.42	0/545	0.57	0/754
3	L	0.47	0/545	0.59	0/754
All	All	0.34	0/23915	0.59	7/32796 (0.0%)

There are no bond length outliers.

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	709	ASN	CB-CA-C	-12.87	84.66	110.40
1	E	343	ASN	CB-CA-C	6.34	123.08	110.40
1	B	273	ARG	CG-CD-NE	-6.09	99.01	111.80
1	A	709	ASN	N-CA-CB	5.70	120.86	110.60
1	A	320	VAL	C-N-CA	-5.38	108.24	121.70
1	B	616	ASN	CB-CA-C	-5.31	99.78	110.40
1	E	709	ASN	N-CA-CB	-5.20	101.24	110.60

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	7064	0	6229	145	0
1	B	7026	0	6163	124	0
1	E	7064	0	6229	159	0
2	C	596	0	292	24	0
2	H	596	0	292	43	0
3	D	538	0	262	14	0
3	L	538	0	262	13	0
4	F	28	0	25	0	0
4	G	28	0	25	1	0
4	I	28	0	25	2	0
4	K	28	0	25	1	0
4	M	28	0	25	1	0
4	N	28	0	25	1	0
4	O	28	0	25	0	0
4	P	28	0	25	0	0
4	Q	28	0	25	1	0
4	R	28	0	25	2	0
4	S	28	0	25	0	0
4	T	28	0	25	0	0
4	V	28	0	25	1	0
4	W	28	0	25	2	0
4	X	28	0	25	0	0
5	A	154	0	143	11	0
5	B	154	0	143	4	0
5	E	154	0	143	8	0
All	All	24304	0	20533	458	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 10.

All (458) 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:421:TYR:OH	2:H:53:PRO:CG	1.87	1.23
1:A:421:TYR:OH	2:H:53:PRO:CD	1.88	1.21
1:A:421:TYR:CE2	2:H:53:PRO:HD2	1.81	1.15
1:A:421:TYR:CZ	2:H:53:PRO:HG2	1.83	1.14
1:A:421:TYR:OH	2:H:53:PRO:CB	2.02	1.06
1:A:616:ASN:HB3	5:A:1305:NAG:HN2	1.23	1.02

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:421:TYR:CZ	2:H:53:PRO:HD2	1.95	1.01
1:A:421:TYR:OH	2:H:54:GLY:N	1.93	1.01
1:A:421:TYR:CZ	2:H:53:PRO:CG	2.42	1.01
1:A:421:TYR:OH	2:H:53:PRO:CA	2.10	1.00
1:E:132:GLU:HG2	1:E:165:ASN:HB2	1.41	0.99
2:C:53:PRO:HG2	1:E:421:TYR:CE2	2.00	0.96
1:A:421:TYR:OH	2:H:53:PRO:HD2	1.66	0.96
1:A:421:TYR:CZ	2:H:53:PRO:CD	2.53	0.92
1:A:421:TYR:HH	2:H:53:PRO:CB	1.82	0.91
1:A:421:TYR:CE2	2:H:53:PRO:CD	2.56	0.88
1:A:421:TYR:HE2	2:H:53:PRO:HD2	1.35	0.87
1:A:122:ASN:OD1	5:A:1306:NAG:N2	2.08	0.86
1:B:122:ASN:OD1	5:B:1307:NAG:N2	2.08	0.86
1:A:421:TYR:HH	2:H:53:PRO:C	1.80	0.85
1:E:603:ASN:OD1	5:E:1302:NAG:N2	2.08	0.85
2:C:53:PRO:CG	1:E:421:TYR:OH	2.26	0.83
1:A:421:TYR:OH	2:H:53:PRO:C	2.17	0.82
2:C:53:PRO:HG2	1:E:421:TYR:HE2	1.43	0.82
2:H:17[A]:SER:CB	2:H:82(A):ASN:HA	2.10	0.82
1:E:1081:ILE:HD12	1:E:1135:ASN:HD22	1.45	0.81
2:H:17[B]:SER:CB	2:H:82(A):ASN:HA	2.10	0.81
1:A:393:THR:HA	1:A:522:ALA:HA	1.62	0.81
2:H:18:LEU:N	2:H:82:MET:O	2.13	0.80
1:E:780:GLU:O	1:E:784:GLN:NE2	2.16	0.79
1:E:123:ALA:HB3	5:E:1306:NAG:HN2	1.47	0.78
1:B:780:GLU:O	1:B:784:GLN:NE2	2.15	0.78
2:C:54:GLY:N	1:E:421:TYR:OH	2.17	0.78
1:A:1092:GLU:O	1:A:1107:ARG:NH1	2.16	0.77
3:D:24:THR:HA	3:D:70:SER:HA	1.65	0.77
1:E:426:PRO:HB3	1:E:463:PRO:HB3	1.65	0.77
1:E:1028:LYS:NZ	1:E:1042:PHE:O	2.18	0.76
1:E:278:LYS:HB2	1:E:306:PHE:CE2	2.22	0.75
1:B:341:VAL:HG11	1:B:397:ALA:HB1	1.68	0.75
1:E:393:THR:HA	1:E:522:ALA:HA	1.68	0.75
2:C:53:PRO:HG2	1:E:421:TYR:CZ	2.22	0.75
2:H:71:ARG:HA	2:H:78:LEU:HA	1.69	0.74
1:B:1081:ILE:HD12	1:B:1135:ASN:HD22	1.52	0.73
2:C:71:ARG:HA	2:C:78:LEU:HA	1.69	0.73
1:E:85:PRO:HA	1:E:237:ARG:HD2	1.70	0.73
1:A:319:ARG:NH1	1:B:740:MET:SD	2.62	0.73
1:B:472:ILE:HA	1:B:491:PRO:HD3	1.69	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:421:TYR:HH	2:H:53:PRO:HB2	1.52	0.72
2:C:53:PRO:HG2	1:E:421:TYR:OH	1.88	0.72
1:E:1074:ASN:OD1	5:E:1304:NAG:N2	2.24	0.71
1:E:767:LEU:HD21	1:E:1008:VAL:HG22	1.73	0.70
1:E:282:ASN:OD1	5:E:1301:NAG:N2	2.24	0.70
1:A:421:TYR:HH	2:H:54:GLY:N	1.85	0.69
2:C:21:SER:HA	2:C:79:TYR:HA	1.74	0.69
1:B:421:TYR:HA	1:B:461:LEU:H	1.56	0.69
1:E:54:LEU:HB3	1:E:270:LEU:HB3	1.75	0.69
1:A:81:ASN:O	1:A:239:GLN:NE2	2.26	0.68
2:H:21:SER:HA	2:H:79:TYR:HA	1.74	0.68
1:A:421:TYR:OH	2:H:53:PRO:N	2.25	0.68
1:A:896:ILE:HG12	1:E:712:ILE:HG13	1.75	0.68
1:E:811:LYS:HD2	1:E:812:PRO:HD2	1.76	0.67
2:C:37:VAL:HA	2:C:48:VAL:H	1.59	0.67
1:E:201:PHE:CE2	1:E:203:ILE:HD11	2.30	0.67
2:H:37:VAL:HA	2:H:48:VAL:H	1.59	0.67
1:B:562:PHE:O	1:B:564:GLN:NE2	2.28	0.67
1:A:717:ASN:OD1	4:I:1:NAG:N2	2.28	0.66
1:B:699:LEU:HB3	1:E:873:TYR:HE1	1.60	0.66
2:C:53:PRO:CD	1:E:421:TYR:OH	2.43	0.66
1:E:271:GLN:HG2	1:E:273:ARG:HG2	1.77	0.66
1:A:767:LEU:HD21	1:A:1008:VAL:HG22	1.78	0.65
1:A:763:LEU:HD22	1:A:1008:VAL:HG21	1.77	0.65
1:B:302:THR:HG21	1:B:315:THR:HA	1.79	0.65
1:B:816:SER:OG	1:B:819:GLU:OE1	2.13	0.65
1:A:715:PRO:HA	1:A:1072:GLU:HA	1.79	0.64
1:B:363:ALA:O	1:B:526:GLY:HA2	1.98	0.64
1:E:1130:ILE:HG22	5:E:1310:NAG:H81	1.78	0.64
1:B:729:VAL:HG11	1:B:781:VAL:HG11	1.79	0.64
1:E:132:GLU:HG2	1:E:165:ASN:CB	2.24	0.64
1:A:101:ILE:HD11	1:A:240:THR:HB	1.80	0.63
1:A:317:ASN:ND2	1:B:737:ASP:OD2	2.30	0.63
1:A:421:TYR:HH	2:H:53:PRO:CA	2.00	0.63
1:E:193:VAL:HG23	1:E:223:LEU:HD22	1.79	0.63
1:A:421:TYR:CE2	2:H:53:PRO:HG2	2.34	0.63
1:A:558:LYS:HE3	1:A:558:LYS:HA	1.78	0.63
1:E:763:LEU:HD12	1:E:1008:VAL:HG21	1.81	0.62
1:B:280:ASN:ND2	1:B:284:THR:OG1	2.32	0.62
4:N:1:NAG:H62	4:N:2:NAG:H2	1.81	0.62
1:A:132:GLU:N	1:A:132:GLU:OE1	2.33	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:10:GLY:O	2:C:114:ILE:N	2.30	0.62
1:E:715:PRO:HA	1:E:1072:GLU:HA	1.82	0.62
1:A:310:LYS:HG2	1:A:664:ILE:HD11	1.81	0.61
1:E:55:PHE:O	1:E:271:GLN:NE2	2.34	0.61
2:H:10:GLY:O	2:H:114:ILE:N	2.30	0.61
1:E:884:SER:O	1:E:887:THR:HG22	2.01	0.61
3:D:27:SER:HA	3:D:28:GLY:HA3	1.80	0.61
1:A:1091:ARG:HH12	1:A:1119:ASN:HA	1.65	0.61
1:B:712:ILE:HG13	1:E:896:ILE:HG12	1.82	0.60
1:E:135:PHE:HA	1:E:160:TYR:HA	1.82	0.60
1:B:317:ASN:ND2	1:E:737:ASP:OD2	2.34	0.60
1:E:388:ASN:HA	1:E:526:GLY:HA3	1.83	0.60
1:B:930:ALA:O	1:B:934:ILE:HD12	2.02	0.60
1:A:616:ASN:CB	5:A:1305:NAG:HN2	2.07	0.59
1:A:278:LYS:HB2	1:A:306:PHE:CE2	2.38	0.59
1:B:216:LEU:HD21	1:B:266:TYR:CZ	2.38	0.59
2:C:53:PRO:HD2	1:E:421:TYR:OH	2.01	0.59
1:B:420:ASP:O	1:B:461:LEU:N	2.35	0.59
2:C:53:PRO:CB	1:E:421:TYR:OH	2.51	0.59
1:E:234:ASN:HB2	5:E:1308:NAG:N2	2.18	0.59
1:B:759:PHE:O	1:B:763:LEU:HD23	2.02	0.59
1:A:699:LEU:HD12	1:B:873:TYR:CZ	2.38	0.58
1:B:776:LYS:NZ	1:B:780:GLU:OE2	2.26	0.58
1:B:1002:GLN:NE2	1:E:1005:GLN:OE1	2.36	0.58
1:A:54:LEU:HB3	1:A:270:LEU:HB3	1.84	0.58
1:A:884:SER:O	1:A:887:THR:HG22	2.04	0.58
1:B:1028:LYS:NZ	1:B:1042:PHE:O	2.37	0.58
1:A:926:GLN:NE2	4:I:1:NAG:O6	2.37	0.58
1:E:310:LYS:HG2	1:E:664:ILE:HD11	1.86	0.58
1:A:823:PHE:HD2	1:A:1057:PRO:HD3	1.68	0.57
1:B:816:SER:H	1:B:819:GLU:CD	2.06	0.57
1:B:409:GLN:O	1:B:419:ALA:HB2	2.04	0.57
1:B:86:PHE:CZ	1:B:89:GLY:HA2	2.40	0.57
2:C:3:GLN:O	2:C:25:SER:N	2.37	0.57
1:E:234:ASN:HB2	5:E:1308:NAG:C7	2.34	0.57
1:A:473:TYR:H	1:A:491:PRO:HD3	1.69	0.57
1:A:234:ASN:HB2	5:A:1308:NAG:N2	2.19	0.56
1:E:48:LEU:HD22	1:E:306:PHE:HE2	1.71	0.56
1:E:271:GLN:CG	1:E:273:ARG:HG2	2.36	0.56
1:E:452:LEU:HA	1:E:494:SER:HA	1.86	0.56
1:B:106:PHE:HB3	1:B:235:ILE:HD12	1.88	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:3:GLN:O	2:H:25:SER:N	2.36	0.56
1:A:616:ASN:HB3	5:A:1305:NAG:N2	2.07	0.56
1:E:1076:THR:O	1:E:1097:SER:N	2.39	0.55
1:A:36:VAL:HB	1:A:220:PHE:HE1	1.71	0.55
1:A:108:THR:O	1:A:237:ARG:NH2	2.30	0.55
1:E:1092:GLU:O	1:E:1107:ARG:NH1	2.39	0.55
1:A:86:PHE:CZ	1:A:89:GLY:HA2	2.42	0.55
1:A:712:ILE:HG21	1:A:1096:VAL:HG12	1.89	0.55
1:E:567:ARG:HD3	1:E:571:ASP:HA	1.88	0.55
1:E:759:PHE:O	1:E:763:LEU:HD23	2.06	0.55
1:B:131:CYS:HB2	1:B:133:PHE:CE1	2.42	0.55
1:E:280:ASN:ND2	1:E:284:THR:OG1	2.40	0.55
1:B:331:ASN:HB2	5:B:1310:NAG:N2	2.21	0.55
1:E:167:THR:HG22	5:E:1307:NAG:H62	1.88	0.55
1:E:105:ILE:HD11	1:E:239:GLN:HB3	1.89	0.55
2:H:17[B]:SER:HA	2:H:82(A):ASN:HA	1.87	0.55
1:A:168:PHE:CE1	1:A:231:ILE:HD11	2.42	0.54
1:E:1129:VAL:HG13	1:E:1132:ILE:HB	1.89	0.54
2:H:17[A]:SER:HA	2:H:82(A):ASN:HA	1.88	0.54
2:C:50:VAL:N	2:C:58:PHE:O	2.41	0.54
3:D:36:TYR:HA	3:D:46:LEU:HA	1.89	0.54
1:E:811:LYS:HG3	1:E:813:SER:H	1.71	0.54
3:L:36:TYR:HA	3:L:46:LEU:HA	1.89	0.54
1:B:54:LEU:O	1:B:270:LEU:HD23	2.07	0.54
1:B:534:VAL:HG21	1:B:539:VAL:HG11	1.90	0.54
1:B:895:GLN:O	1:B:896:ILE:HD13	2.08	0.54
1:E:420:ASP:O	1:E:460:ASN:HA	2.08	0.54
1:E:729:VAL:HG11	1:E:781:VAL:HG11	1.90	0.54
1:E:781:VAL:C	1:E:784:GLN:HE22	2.10	0.54
1:E:887:THR:CG2	1:E:894:LEU:H	2.21	0.53
2:H:17[A]:SER:CA	2:H:82(A):ASN:HA	2.38	0.53
2:H:50:VAL:N	2:H:58:PHE:O	2.41	0.53
2:C:20:LEU:O	2:C:80:LEU:N	2.42	0.53
1:A:43:PHE:HB3	1:E:566:GLY:HA2	1.90	0.53
1:E:353:TRP:HZ3	1:E:355:ARG:HB2	1.74	0.53
1:E:645:THR:HG23	1:E:647:ALA:H	1.74	0.53
4:Q:1:NAG:H62	4:Q:2:NAG:C7	2.39	0.53
1:B:447:GLY:HA2	1:B:497:PHE:O	2.09	0.53
1:A:280:ASN:OD1	1:A:283:GLY:N	2.42	0.53
1:A:823:PHE:CD2	1:A:1057:PRO:HD3	2.43	0.53
1:E:900:MET:HG2	1:E:917:TYR:OH	2.09	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1076:THR:O	1:B:1097:SER:N	2.42	0.53
1:A:229:LEU:HB3	1:A:231:ILE:CD1	2.39	0.52
1:B:353:TRP:HZ3	1:B:355:ARG:HB2	1.73	0.52
1:E:961:THR:HG22	1:E:965:GLN:HE22	1.75	0.52
1:A:705:VAL:HG21	1:B:883:THR:OG1	2.10	0.52
1:A:1076:THR:O	1:A:1097:SER:N	2.41	0.52
1:B:1092:GLU:O	1:B:1107:ARG:NH1	2.43	0.52
1:E:809:PRO:HA	1:E:814:LYS:NZ	2.23	0.52
1:A:312:ILE:HD12	1:A:598:ILE:HD11	1.91	0.52
1:B:802:PHE:HB3	1:B:806:LEU:HD23	1.91	0.52
2:C:22:CYS:N	2:C:78:LEU:O	2.40	0.52
2:C:34:MET:O	2:C:51:ILE:N	2.43	0.52
1:E:663:ASP:HB3	1:E:672:ALA:O	2.09	0.52
2:H:34:MET:O	2:H:51:ILE:N	2.43	0.52
3:L:24:THR:HA	3:L:70:SER:HA	1.90	0.52
1:A:302:THR:HG21	1:A:315:THR:HA	1.92	0.52
1:A:421:TYR:CE2	2:H:53:PRO:CG	2.88	0.52
1:B:815:ARG:HD2	1:B:819:GLU:HG3	1.92	0.52
1:E:57:PRO:O	1:E:60:SER:OG	2.23	0.52
1:A:1144:GLU:HG3	1:A:1145:LEU:HD22	1.92	0.52
1:E:816:SER:OG	1:E:819:GLU:HG2	2.09	0.52
2:H:20:LEU:O	2:H:80:LEU:N	2.42	0.52
1:B:365:TYR:HD2	1:B:388:ASN:HA	1.75	0.52
1:E:195:LYS:HE2	1:E:204:TYR:HE1	1.74	0.52
1:A:1028:LYS:NZ	1:A:1042:PHE:O	2.43	0.52
1:A:234:ASN:HB2	5:A:1308:NAG:C7	2.39	0.51
1:A:887:THR:CG2	1:A:894:LEU:H	2.24	0.51
1:B:204:TYR:HB3	1:B:223:LEU:HB3	1.92	0.51
1:B:232:GLY:O	5:B:1309:NAG:H81	2.10	0.51
1:B:1017:GLU:HA	1:E:1019:ARG:HH22	1.74	0.51
1:E:815:ARG:HB3	1:E:819:GLU:HG3	1.93	0.51
1:B:365:TYR:HE1	1:B:515:PHE:CZ	2.27	0.51
2:H:22:CYS:N	2:H:78:LEU:O	2.40	0.51
1:E:52:GLN:OE1	1:E:274:THR:OG1	2.22	0.51
1:E:57:PRO:HG3	1:E:271:GLN:NE2	2.25	0.51
1:A:308:VAL:HB	1:A:602:THR:HG23	1.93	0.51
1:A:917:TYR:HB3	1:E:1129:VAL:HG23	1.93	0.51
1:A:44:ARG:HB3	1:A:47:VAL:CG1	2.41	0.51
1:A:276:LEU:HD11	1:A:304:LYS:HA	1.93	0.51
2:C:52:TYR:N	2:C:56:SER:O	2.42	0.51
2:C:53:PRO:HD2	1:E:421:TYR:CZ	2.46	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:781:VAL:HG13	1:E:782:PHE:CD2	2.46	0.51
1:A:421:TYR:HE2	2:H:53:PRO:CD	2.09	0.51
1:E:276:LEU:HD11	1:E:304:LYS:HA	1.93	0.51
1:E:278:LYS:HB2	1:E:306:PHE:CZ	2.45	0.51
1:E:552:LEU:HD21	1:E:587:ILE:HG12	1.93	0.51
1:A:781:VAL:HG13	1:A:782:PHE:CD2	2.46	0.50
1:E:311:GLY:HA2	1:E:664:ILE:HD12	1.93	0.50
1:B:396:TYR:O	1:B:514:SER:N	2.32	0.50
1:E:330:PRO:HG3	1:E:579:PRO:HB3	1.92	0.50
1:A:902:MET:HB3	1:A:916:LEU:CD2	2.41	0.50
1:E:533:LEU:HD11	1:E:585:LEU:HD11	1.94	0.50
1:E:932:GLY:O	1:E:935:GLN:HG2	2.11	0.50
1:A:110:LEU:O	1:A:135:PHE:HB2	2.11	0.50
1:B:393:THR:HA	1:B:522:ALA:HA	1.92	0.50
3:D:26:SER:O	3:D:28:GLY:N	2.28	0.50
2:H:17[B]:SER:CA	2:H:82(A):ASN:HA	2.38	0.50
1:A:363:ALA:O	1:A:526:GLY:HA2	2.12	0.50
1:A:762:GLN:OE1	1:E:961:THR:HG21	2.12	0.50
1:E:1075:PHE:HB3	1:E:1096:VAL:HB	1.93	0.50
1:B:566:GLY:HA2	1:E:43:PHE:HB3	1.93	0.49
1:E:969:ASN:OD1	1:E:970:PHE:N	2.45	0.49
1:A:193:VAL:HG23	1:A:223:LEU:HD22	1.95	0.49
1:B:342:PHE:CD2	4:R:1:NAG:H83	2.47	0.49
1:A:761:THR:HG22	1:A:765:ARG:HH12	1.77	0.49
1:B:805:ILE:HG13	1:B:806:LEU:HD22	1.95	0.49
3:L:12:SER:HA	3:L:105:THR:O	2.13	0.49
1:B:206:LYS:HB2	1:B:223:LEU:HD23	1.95	0.49
2:H:52:TYR:N	2:H:56:SER:O	2.42	0.49
1:B:781:VAL:HG13	1:B:782:PHE:CD2	2.47	0.48
1:E:204:TYR:HB3	1:E:223:LEU:HB3	1.95	0.48
1:E:328:ARG:NH2	1:E:580:GLN:OE1	2.46	0.48
1:B:534:VAL:CG2	1:B:539:VAL:HG11	2.43	0.48
3:D:12:SER:HA	3:D:105:THR:O	2.13	0.48
1:A:36:VAL:HB	1:A:220:PHE:CE1	2.48	0.48
1:E:92:PHE:CE1	1:E:265:TYR:HB2	2.48	0.48
3:L:16:GLY:N	3:L:78:LEU:O	2.46	0.48
3:L:30:GLY:C	3:L:32:TYR:N	2.65	0.48
1:A:883:THR:OG1	1:E:705:VAL:HG21	2.13	0.48
1:B:48:LEU:HB3	1:B:276:LEU:HD11	1.95	0.48
1:B:64:TRP:HE1	1:B:264:ALA:HB1	1.78	0.48
1:B:645:THR:HG23	1:B:647:ALA:H	1.79	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:376:THR:O	1:E:434:ILE:HA	2.13	0.48
1:A:476:GLY:HA2	2:H:28:THR:H	1.79	0.48
3:D:26:SER:O	3:D:27(C):ILE:N	2.45	0.48
3:L:50:GLY:O	3:L:53:ASN:N	2.24	0.48
1:A:869:MET:HE3	1:A:869:MET:HB3	1.66	0.48
1:B:1144:GLU:HG3	1:B:1145:LEU:HD22	1.96	0.48
1:E:110:LEU:O	1:E:135:PHE:HB2	2.14	0.48
1:E:802:PHE:HZ	1:E:898:PHE:CZ	2.32	0.48
1:E:48:LEU:HD22	1:E:306:PHE:CE2	2.49	0.47
1:E:340:GLU:O	1:E:344:ALA:HB2	2.14	0.47
1:A:40:ASP:OD1	1:A:41:LYS:N	2.37	0.47
1:A:54:LEU:O	1:A:270:LEU:HD23	2.14	0.47
1:B:220:PHE:HD1	1:B:287:ASP:HA	1.78	0.47
1:B:815:ARG:HB3	1:B:819:GLU:CG	2.44	0.47
1:E:195:LYS:HE2	1:E:204:TYR:CE1	2.50	0.47
1:A:902:MET:HB3	1:A:916:LEU:HD21	1.96	0.47
1:E:44:ARG:HB3	1:E:47:VAL:CG1	2.44	0.47
3:L:90:SER:O	3:L:97:VAL:N	2.48	0.47
1:A:1074:ASN:OD1	5:A:1303:NAG:N2	2.47	0.47
1:B:1139:ASP:O	1:B:1139:ASP:OD2	2.32	0.47
3:D:89:GLN:HA	3:D:98:PHE:HA	1.96	0.47
1:E:353:TRP:CZ3	1:E:355:ARG:HB2	2.50	0.47
1:E:756:TYR:HB3	1:E:759:PHE:HD2	1.79	0.47
1:A:230:PRO:C	1:E:521:PRO:HG2	2.35	0.47
1:B:218:GLN:O	1:B:218:GLN:HG2	2.15	0.47
3:L:89:GLN:HA	3:L:98:PHE:HA	1.96	0.47
1:A:895:GLN:HG2	1:E:706:ALA:C	2.35	0.47
1:A:904:TYR:OH	1:E:1094:VAL:HB	2.14	0.47
1:B:781:VAL:C	1:B:784:GLN:HE22	2.17	0.47
1:E:878:LEU:HD21	1:E:1053:PRO:O	2.15	0.47
1:E:887:THR:HG21	1:E:894:LEU:HB2	1.96	0.47
1:A:567:ARG:HD3	1:A:571:ASP:HA	1.97	0.47
1:A:908:GLY:O	1:A:1038:LYS:HE2	2.15	0.47
1:B:567:ARG:HD3	1:B:571:ASP:HA	1.97	0.46
1:A:353:TRP:HZ3	1:A:355:ARG:HB2	1.80	0.46
1:A:895:GLN:HG2	1:E:706:ALA:O	2.15	0.46
3:L:37:GLN:N	3:L:45:LYS:O	2.49	0.46
4:K:1:NAG:O3	4:K:2:NAG:O5	2.25	0.46
1:A:363:ALA:HB1	1:A:365:TYR:CE1	2.50	0.46
1:B:611:LEU:CD1	1:B:666:ILE:HG23	2.46	0.46
1:B:665:PRO:HB2	1:E:864:LEU:HD11	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:749:CYS:SG	1:B:997:ILE:HD11	2.56	0.46
3:D:50:GLY:O	3:D:53:ASN:N	2.24	0.46
1:B:93:ALA:HA	1:B:190:ARG:O	2.15	0.46
1:B:392:PHE:CD2	1:B:515:PHE:HB3	2.50	0.46
1:A:714:ILE:HD11	1:A:1096:VAL:HG11	1.97	0.46
1:A:716:THR:HG22	1:A:1071:GLN:O	2.16	0.46
1:B:699:LEU:HB3	1:E:873:TYR:CE1	2.47	0.46
1:A:364:ASP:HA	1:A:527:PRO:HD3	1.98	0.46
1:A:645:THR:HG23	1:A:647:ALA:H	1.80	0.46
1:E:271:GLN:HE21	1:E:273:ARG:CG	2.29	0.46
1:A:421:TYR:CZ	2:H:54:GLY:N	2.80	0.46
1:B:342:PHE:HD2	4:R:1:NAG:H83	1.81	0.46
1:B:380:TYR:O	1:B:430:THR:HA	2.16	0.46
3:D:37:GLN:N	3:D:45:LYS:O	2.49	0.46
1:E:31:SER:OG	1:E:60:SER:N	2.48	0.46
1:B:289:VAL:HG23	1:B:306:PHE:CE2	2.51	0.45
1:E:1054:GLN:N	1:E:1061:VAL:O	2.47	0.45
1:B:133:PHE:HB3	1:B:135:PHE:CE1	2.51	0.45
1:B:990:GLU:HA	1:B:993:ILE:HG22	1.97	0.45
2:C:53:PRO:CG	1:E:421:TYR:CE2	2.86	0.45
1:A:719:THR:HA	1:A:926:GLN:OE1	2.16	0.45
1:A:1091:ARG:NH1	1:A:1119:ASN:HA	2.29	0.45
1:E:117:LEU:HD21	1:E:119:ILE:HD11	1.99	0.45
1:B:815:ARG:HB3	1:B:819:GLU:HG2	1.98	0.45
1:E:134:GLN:O	1:E:161:SER:N	2.32	0.45
1:A:329:PHE:HD1	1:A:529:LYS:O	1.99	0.45
1:B:36:VAL:HB	1:B:220:PHE:HE2	1.82	0.45
1:A:45:SER:HA	1:A:280:ASN:O	2.17	0.45
1:A:328:ARG:NH1	1:A:531:THR:O	2.50	0.45
1:B:667:GLY:HA2	1:E:864:LEU:HD13	1.98	0.45
1:A:887:THR:HG21	1:A:894:LEU:H	1.82	0.45
1:B:363:ALA:N	1:B:525:CYS:O	2.44	0.45
1:E:770:ILE:HD11	1:E:1012:LEU:HD23	1.99	0.45
1:E:961:THR:O	1:E:965:GLN:NE2	2.49	0.45
1:B:714:ILE:HD11	1:B:1096:VAL:HG11	1.98	0.45
2:C:54:GLY:N	1:E:421:TYR:HH	2.13	0.45
1:E:362:VAL:HA	1:E:525:CYS:O	2.16	0.45
1:E:412:PRO:HB3	1:E:426:PRO:O	2.17	0.45
1:E:878:LEU:HD11	1:E:1052:PHE:HB3	1.99	0.45
1:B:341:VAL:HG11	1:B:397:ALA:CB	2.43	0.45
1:E:289:VAL:HG23	1:E:306:PHE:CE1	2.52	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:715:PRO:HB3	1:A:1069:PRO:HB3	1.98	0.44
3:D:27(B):ASN:HA	3:D:93:SER:O	2.17	0.44
1:A:770:ILE:HD11	1:A:1012:LEU:HD23	1.98	0.44
1:B:816:SER:N	1:B:819:GLU:OE2	2.30	0.44
3:D:25:GLY:N	3:D:69:THR:O	2.49	0.44
1:E:202:LYS:O	1:E:203:ILE:HD13	2.17	0.44
4:V:1:NAG:H62	4:V:2:NAG:C7	2.47	0.44
1:A:343:ASN:OD1	4:M:1:NAG:O5	2.33	0.44
1:A:603:ASN:OD1	5:A:1301:NAG:H2	2.18	0.44
1:B:353:TRP:CZ2	1:B:466:ARG:HB2	2.53	0.44
1:B:969:ASN:OD1	1:B:970:PHE:N	2.49	0.44
1:E:36:VAL:O	1:E:222:ALA:HA	2.17	0.44
1:E:1129:VAL:HG11	1:E:1132:ILE:HD12	1.99	0.44
2:H:10:GLY:H	2:H:113:VAL:HA	1.83	0.44
1:B:1017:GLU:HG3	1:E:1019:ARG:NH2	2.32	0.44
1:E:194:PHE:CD1	1:E:203:ILE:HD12	2.52	0.44
1:E:599:THR:OG1	1:E:608:VAL:HG12	2.17	0.44
1:E:964:LYS:HE2	1:E:964:LYS:HB2	1.79	0.43
1:B:220:PHE:CD1	1:B:287:ASP:HA	2.54	0.43
1:B:364:ASP:HA	1:B:527:PRO:HD3	2.00	0.43
2:C:53:PRO:CG	1:E:421:TYR:HE2	2.24	0.43
1:E:874:THR:O	1:E:878:LEU:HD23	2.18	0.43
4:W:1:NAG:O3	4:W:2:NAG:O5	2.22	0.43
1:A:116:SER:HA	1:A:233:ILE:HD11	1.98	0.43
1:B:341:VAL:HG12	1:B:511:VAL:HG11	2.00	0.43
1:A:706:ALA:HB1	5:A:1303:NAG:H62	1.99	0.43
1:B:36:VAL:HB	1:B:220:PHE:CE2	2.53	0.43
1:B:741:TYR:CD2	1:B:1004:LEU:HD12	2.54	0.43
1:E:318:PHE:N	1:E:593:GLY:O	2.47	0.43
1:E:378:LYS:HD2	1:E:380:TYR:OH	2.18	0.43
1:A:101:ILE:HD12	1:A:242:LEU:HB2	2.01	0.43
1:B:825:LYS:O	1:B:825:LYS:HG2	2.19	0.43
1:E:734:THR:HG21	1:E:959:LEU:HD11	1.99	0.43
1:B:353:TRP:CZ3	1:B:355:ARG:HB2	2.53	0.43
1:B:676:THR:HA	1:B:690:GLN:HA	2.00	0.43
2:C:10:GLY:H	2:C:113:VAL:HA	1.82	0.43
1:E:271:GLN:N	1:E:271:GLN:OE1	2.52	0.43
3:L:38:GLN:N	3:L:85:ASP:O	2.47	0.43
4:W:1:NAG:HO3	4:W:2:NAG:C1	2.30	0.43
1:B:731:MET:HG2	1:B:774:GLN:OE1	2.19	0.43
1:B:977:LEU:O	1:B:980:ILE:HG22	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:887:THR:HG21	1:E:894:LEU:H	1.82	0.42
1:B:31:SER:OG	1:B:60:SER:N	2.52	0.42
1:B:716:THR:HG22	1:B:1071:GLN:O	2.18	0.42
1:E:81:ASN:O	1:E:239:GLN:NE2	2.42	0.42
3:L:4:LEU:CB	3:L:25:GLY:HA3	2.48	0.42
1:A:48:LEU:HD12	1:A:276:LEU:HD21	2.01	0.42
1:A:314:GLN:HE21	1:A:613:GLN:HE22	1.67	0.42
1:B:82:PRO:HG2	1:B:84:LEU:HD21	2.02	0.42
1:E:86:PHE:CZ	1:E:89:GLY:HA2	2.55	0.42
1:E:887:THR:HG23	1:E:894:LEU:H	1.85	0.42
1:B:191:GLU:O	1:B:205:SER:HA	2.19	0.42
1:A:168:PHE:CZ	1:A:170:TYR:HB2	2.54	0.42
1:A:718:PHE:CG	1:A:1067:TYR:HE2	2.38	0.42
1:A:763:LEU:O	1:A:767:LEU:HD23	2.19	0.42
1:B:190:ARG:HG2	1:B:207:HIS:ND1	2.35	0.42
1:B:1075:PHE:HB3	1:B:1096:VAL:HB	2.01	0.42
3:D:38:GLN:N	3:D:85:ASP:O	2.47	0.42
1:A:1039:ARG:HD2	1:B:1039:ARG:HD2	2.01	0.42
1:A:1075:PHE:HB3	1:A:1096:VAL:HB	2.01	0.42
1:B:220:PHE:CD2	1:B:221:SER:N	2.88	0.42
1:E:775:ASP:CG	1:E:864:LEU:HD23	2.40	0.42
1:E:1116:THR:HG22	1:E:1138:TYR:HB3	2.00	0.42
1:A:55:PHE:HB2	1:A:275:PHE:CE1	2.54	0.42
1:A:570:ALA:HB1	1:B:963:VAL:HG11	2.02	0.42
1:E:116:SER:HA	1:E:233:ILE:HD11	2.00	0.42
1:A:887:THR:HG21	1:A:894:LEU:HB2	2.02	0.42
1:B:666:ILE:HD12	1:B:670:ILE:HG22	2.02	0.42
1:B:715:PRO:HD3	1:E:894:LEU:CD1	2.50	0.42
1:E:710:ASN:O	1:E:1076:THR:HA	2.20	0.42
1:A:699:LEU:HB3	1:B:788:ILE:HD11	2.00	0.42
1:A:815:ARG:CZ	1:A:823:PHE:HD1	2.33	0.42
1:A:894:LEU:HD13	1:E:715:PRO:HD3	2.02	0.42
1:E:106:PHE:HB3	1:E:235:ILE:HD13	2.00	0.42
1:E:775:ASP:OD2	1:E:864:LEU:HD23	2.20	0.42
1:A:617:CYS:N	1:A:644:GLN:OE1	2.42	0.41
1:B:232:GLY:C	5:B:1309:NAG:H81	2.41	0.41
1:B:902:MET:HB3	1:B:916:LEU:CD2	2.50	0.41
1:B:1139:ASP:OD2	1:B:1142:GLN:HG2	2.20	0.41
3:L:61:ARG:O	3:L:75:ILE:HA	2.20	0.41
1:E:328:ARG:NH1	1:E:531:THR:O	2.53	0.41
1:A:58:PHE:HZ	1:A:288:ALA:HB3	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:348:ALA:O	1:B:400:PHE:HA	2.21	0.41
1:A:715:PRO:CB	1:A:1069:PRO:HB3	2.50	0.41
1:B:551:VAL:HG13	1:B:588:THR:HB	2.01	0.41
1:E:905:ARG:HD3	1:E:1049:LEU:O	2.20	0.41
1:A:57:PRO:HB2	1:A:60:SER:HB3	2.01	0.41
1:A:666:ILE:HB	1:A:670:ILE:O	2.21	0.41
1:B:328:ARG:NH1	1:B:531:THR:O	2.52	0.41
1:E:864:LEU:HD13	1:E:864:LEU:HA	1.87	0.41
1:A:753:LEU:HD21	1:A:760:CYS:SG	2.60	0.41
1:A:905:ARG:NH1	1:A:1049:LEU:O	2.47	0.41
1:B:105:ILE:HG23	1:B:135:PHE:HE2	1.85	0.41
1:B:128:ILE:O	1:B:169:GLU:HA	2.21	0.41
1:E:312:ILE:HD12	1:E:598:ILE:HG12	2.01	0.41
1:A:123:ALA:HB3	5:A:1306:NAG:H82	2.03	0.41
1:A:905:ARG:CD	1:A:1050:MET:HE2	2.51	0.41
1:B:310:LYS:HG2	1:B:664:ILE:HD11	2.02	0.41
1:A:353:TRP:CZ3	1:A:355:ARG:HB2	2.56	0.41
1:A:714:ILE:CD1	1:A:1096:VAL:HG11	2.51	0.41
1:A:1090:PRO:HD3	1:A:1095:PHE:CE2	2.55	0.41
1:A:1091:ARG:HH22	1:A:1118:ASP:C	2.24	0.41
1:B:1080:ALA:O	1:B:1132:ILE:HG13	2.21	0.41
1:E:296:LEU:HD21	1:E:602:THR:HG22	2.02	0.41
1:E:378:LYS:O	1:E:432:CYS:HA	2.21	0.41
1:A:42:VAL:HG22	1:E:565:PHE:CZ	2.56	0.41
1:A:1089:PHE:HE1	1:B:917:TYR:HD2	1.69	0.41
1:E:809:PRO:HA	1:E:814:LYS:HZ3	1.83	0.41
1:A:61:ASN:OD1	5:A:1304:NAG:O5	2.39	0.40
1:B:216:LEU:HD21	1:B:266:TYR:CE1	2.55	0.40
1:E:64:TRP:HE1	1:E:264:ALA:HB1	1.86	0.40
1:B:336:CYS:HB2	1:B:338:PHE:CE1	2.55	0.40
1:E:1080:ALA:O	1:E:1132:ILE:HG13	2.21	0.40
1:A:729:VAL:HG11	1:A:781:VAL:HG11	2.03	0.40
1:E:1103:PHE:HZ	4:G:1:NAG:H62	1.86	0.40
1:A:566:GLY:HA2	1:B:43:PHE:HB3	2.03	0.40
1:A:1027:THR:O	1:A:1031:GLU:OE1	2.39	0.40
1:B:709:ASN:OD1	1:B:709:ASN:N	2.55	0.40
3:D:66:LYS:HA	3:D:71:ALA:HA	2.03	0.40
1:A:712:ILE:CD1	1:B:896:ILE:HG23	2.51	0.40
1:B:961:THR:O	1:B:965:GLN:HG2	2.22	0.40
1:E:780:GLU:OE1	1:E:780:GLU:HA	2.21	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	982/1288 (76%)	953 (97%)	28 (3%)	1 (0%)	51	84
1	B	982/1288 (76%)	955 (97%)	27 (3%)	0	100	100
1	E	982/1288 (76%)	952 (97%)	30 (3%)	0	100	100
2	C	115/233 (49%)	102 (89%)	13 (11%)	0	100	100
2	H	115/233 (49%)	102 (89%)	13 (11%)	0	100	100
3	D	109/217 (50%)	101 (93%)	8 (7%)	0	100	100
3	L	109/217 (50%)	96 (88%)	13 (12%)	0	100	100
All	All	3394/4764 (71%)	3261 (96%)	132 (4%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1100	THR

### 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	631/1116 (56%)	631 (100%)	0	100	100
1	B	620/1116 (56%)	620 (100%)	0	100	100
1	E	631/1116 (56%)	631 (100%)	0	100	100
2	C	8/200 (4%)	8 (100%)	0	100	100
2	H	8/200 (4%)	8 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	D	2/180 (1%)	2 (100%)	0	100	100
3	L	2/180 (1%)	2 (100%)	0	100	100
All	All	1902/4108 (46%)	1902 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	613	GLN
1	A	926	GLN
1	A	1135	ASN
1	B	1002	GLN
1	B	1135	ASN
1	E	314	GLN
1	E	965	GLN
1	E	1005	GLN
1	E	1135	ASN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

30 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	F	1	4,1	14,14,15	0.28	0	17,19,21	0.59	0
4	NAG	F	2	4	14,14,15	0.27	0	17,19,21	0.60	0
4	NAG	G	1	4,1	14,14,15	0.28	0	17,19,21	0.59	0
4	NAG	G	2	4	14,14,15	0.28	0	17,19,21	0.60	0
4	NAG	I	1	4,1	14,14,15	0.39	0	17,19,21	0.58	0
4	NAG	I	2	4	14,14,15	0.56	0	17,19,21	0.52	0
4	NAG	K	1	4,1	14,14,15	0.19	0	17,19,21	0.63	0
4	NAG	K	2	4	14,14,15	0.15	0	17,19,21	0.59	0
4	NAG	M	1	4,1	14,14,15	0.17	0	17,19,21	0.65	0
4	NAG	M	2	4	14,14,15	0.17	0	17,19,21	0.61	0
4	NAG	N	1	4,1	14,14,15	0.20	0	17,19,21	1.98	4 (23%)
4	NAG	N	2	4	14,14,15	1.76	2 (14%)	17,19,21	1.35	1 (5%)
4	NAG	O	1	4,1	14,14,15	0.20	0	17,19,21	0.61	0
4	NAG	O	2	4	14,14,15	0.48	0	17,19,21	0.54	0
4	NAG	P	1	4,1	14,14,15	0.17	0	17,19,21	0.70	0
4	NAG	P	2	4	14,14,15	0.15	0	17,19,21	0.56	0
4	NAG	Q	1	4,1	14,14,15	0.16	0	17,19,21	0.57	0
4	NAG	Q	2	4	14,14,15	0.21	0	17,19,21	0.58	0
4	NAG	R	1	4,1	14,14,15	0.27	0	17,19,21	0.87	0
4	NAG	R	2	4	14,14,15	0.62	1 (7%)	17,19,21	0.61	0
4	NAG	S	1	4,1	14,14,15	0.17	0	17,19,21	0.62	0
4	NAG	S	2	4	14,14,15	0.17	0	17,19,21	0.57	0
4	NAG	T	1	4,1	14,14,15	0.17	0	17,19,21	0.59	0
4	NAG	T	2	4	14,14,15	0.38	0	17,19,21	0.54	0
4	NAG	V	1	4,1	14,14,15	0.18	0	17,19,21	0.66	0
4	NAG	V	2	4	14,14,15	0.26	0	17,19,21	0.58	0
4	NAG	W	1	4,1	14,14,15	0.98	1 (7%)	17,19,21	1.06	2 (11%)
4	NAG	W	2	4	14,14,15	0.51	0	17,19,21	0.56	0
4	NAG	X	1	4,1	14,14,15	0.13	0	17,19,21	0.59	0
4	NAG	X	2	4	14,14,15	0.28	0	17,19,21	0.55	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	F	1	4,1	-	4/6/23/26	0/1/1/1
4	NAG	F	2	4	-	0/6/23/26	0/1/1/1
4	NAG	G	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	G	2	4	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	NAG	I	1	4,1	-	0/6/23/26	0/1/1/1
4	NAG	I	2	4	-	2/6/23/26	0/1/1/1
4	NAG	K	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	K	2	4	-	2/6/23/26	0/1/1/1
4	NAG	M	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	M	2	4	-	1/6/23/26	0/1/1/1
4	NAG	N	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	N	2	4	-	0/6/23/26	0/1/1/1
4	NAG	O	1	4,1	-	1/6/23/26	0/1/1/1
4	NAG	O	2	4	-	2/6/23/26	0/1/1/1
4	NAG	P	1	4,1	-	1/6/23/26	0/1/1/1
4	NAG	P	2	4	-	0/6/23/26	0/1/1/1
4	NAG	Q	1	4,1	-	0/6/23/26	0/1/1/1
4	NAG	Q	2	4	-	2/6/23/26	0/1/1/1
4	NAG	R	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	R	2	4	-	1/6/23/26	0/1/1/1
4	NAG	S	1	4,1	-	0/6/23/26	0/1/1/1
4	NAG	S	2	4	-	0/6/23/26	0/1/1/1
4	NAG	T	1	4,1	-	1/6/23/26	0/1/1/1
4	NAG	T	2	4	-	2/6/23/26	0/1/1/1
4	NAG	V	1	4,1	-	0/6/23/26	0/1/1/1
4	NAG	V	2	4	-	2/6/23/26	0/1/1/1
4	NAG	W	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	W	2	4	-	2/6/23/26	0/1/1/1
4	NAG	X	1	4,1	-	0/6/23/26	0/1/1/1
4	NAG	X	2	4	-	0/6/23/26	0/1/1/1

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	N	2	NAG	O5-C1	5.63	1.52	1.43
4	N	2	NAG	C1-C2	3.35	1.57	1.52
4	W	1	NAG	O5-C1	3.20	1.48	1.43
4	R	2	NAG	O5-C1	2.03	1.47	1.43

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	N	1	NAG	O4-C4-C5	5.38	122.66	109.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	N	2	NAG	C1-O5-C5	5.36	119.46	112.19
4	N	1	NAG	O4-C4-C3	4.44	120.61	110.35
4	N	1	NAG	C1-O5-C5	2.57	115.67	112.19
4	W	1	NAG	O4-C4-C5	2.41	115.29	109.30
4	N	1	NAG	C4-C3-C2	-2.31	107.64	111.02
4	W	1	NAG	O4-C4-C3	2.25	115.54	110.35

There are no chirality outliers.

All (37) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	K	1	NAG	O5-C5-C6-O6
4	V	2	NAG	O5-C5-C6-O6
4	Q	2	NAG	O5-C5-C6-O6
4	R	1	NAG	O5-C5-C6-O6
4	I	2	NAG	O5-C5-C6-O6
4	M	1	NAG	O5-C5-C6-O6
4	R	1	NAG	C4-C5-C6-O6
4	O	2	NAG	O5-C5-C6-O6
4	T	2	NAG	O5-C5-C6-O6
4	N	1	NAG	O5-C5-C6-O6
4	Q	2	NAG	C4-C5-C6-O6
4	K	1	NAG	C4-C5-C6-O6
4	V	2	NAG	C4-C5-C6-O6
4	F	1	NAG	C4-C5-C6-O6
4	T	2	NAG	C4-C5-C6-O6
4	O	2	NAG	C4-C5-C6-O6
4	G	1	NAG	C8-C7-N2-C2
4	N	1	NAG	C4-C5-C6-O6
4	W	1	NAG	O5-C5-C6-O6
4	I	2	NAG	C4-C5-C6-O6
4	M	1	NAG	C4-C5-C6-O6
4	F	1	NAG	O5-C5-C6-O6
4	K	2	NAG	O5-C5-C6-O6
4	G	1	NAG	O7-C7-N2-C2
4	F	1	NAG	C8-C7-N2-C2
4	P	1	NAG	O5-C5-C6-O6
4	F	1	NAG	O7-C7-N2-C2
4	G	2	NAG	C8-C7-N2-C2
4	W	1	NAG	C4-C5-C6-O6
4	R	2	NAG	C4-C5-C6-O6
4	K	2	NAG	C4-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
4	G	2	NAG	O7-C7-N2-C2
4	T	1	NAG	O5-C5-C6-O6
4	M	2	NAG	O5-C5-C6-O6
4	W	2	NAG	C1-C2-N2-C7
4	O	1	NAG	O5-C5-C6-O6
4	W	2	NAG	C3-C2-N2-C7

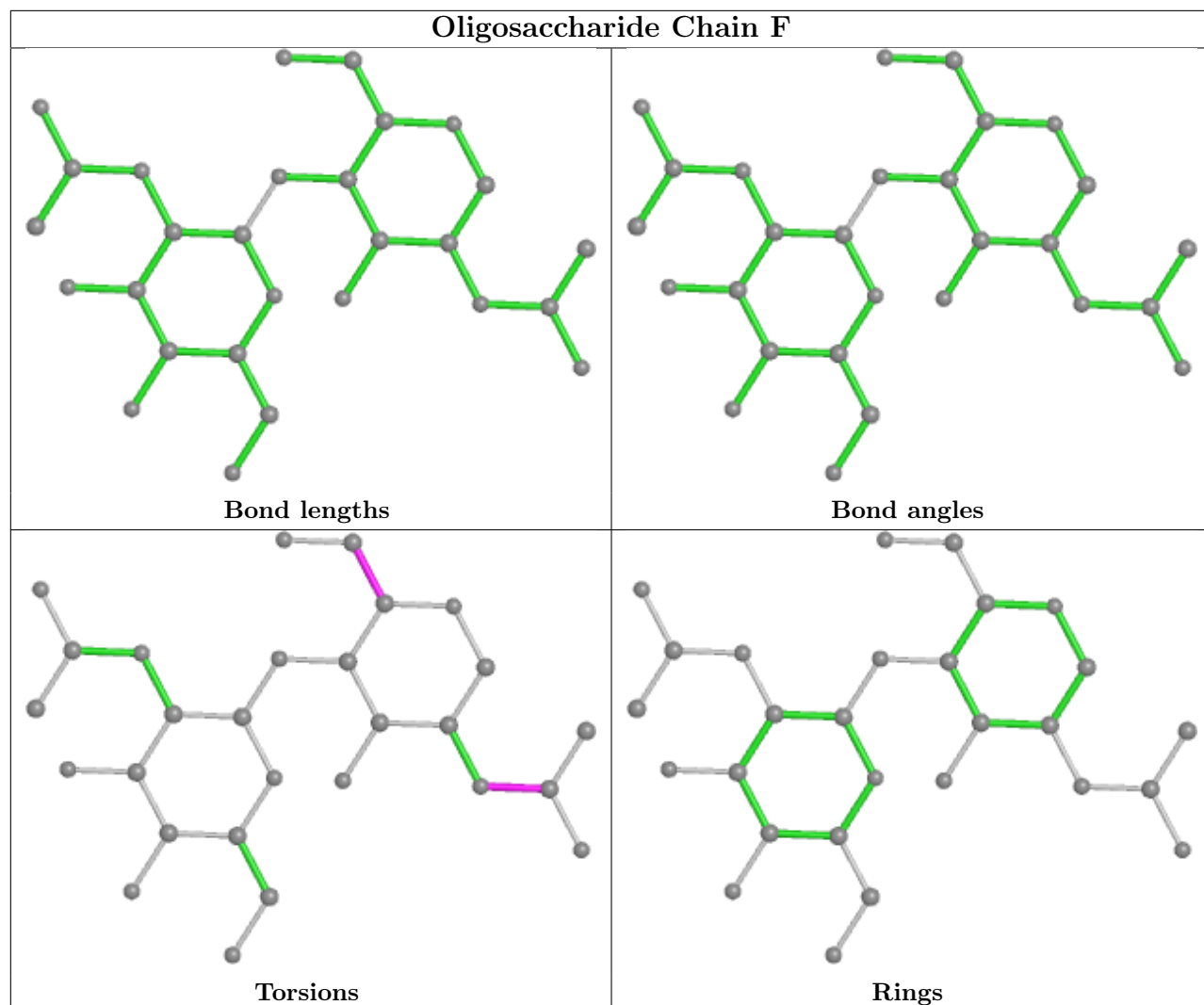
There are no ring outliers.

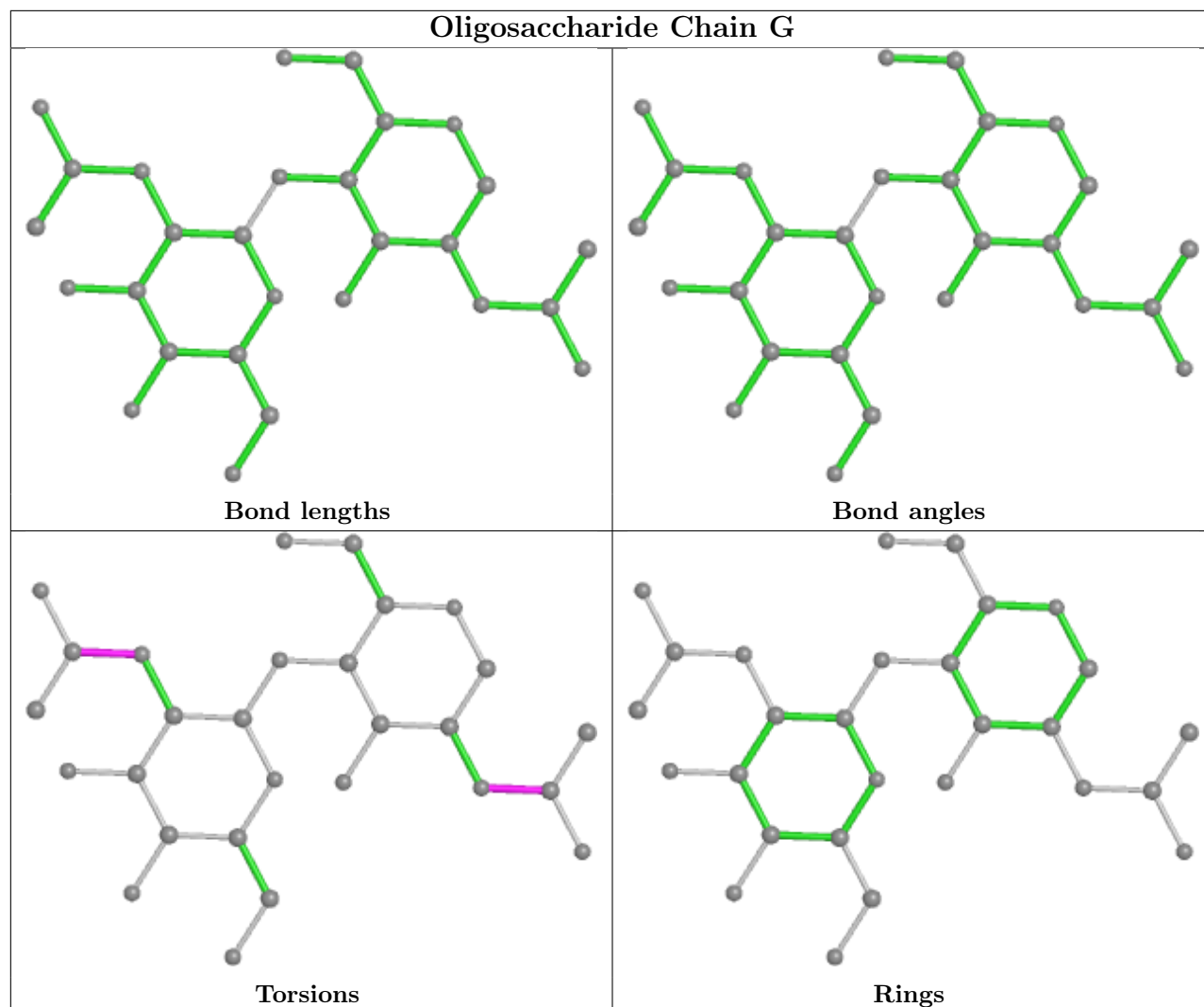
14 monomers are involved in 12 short contacts:

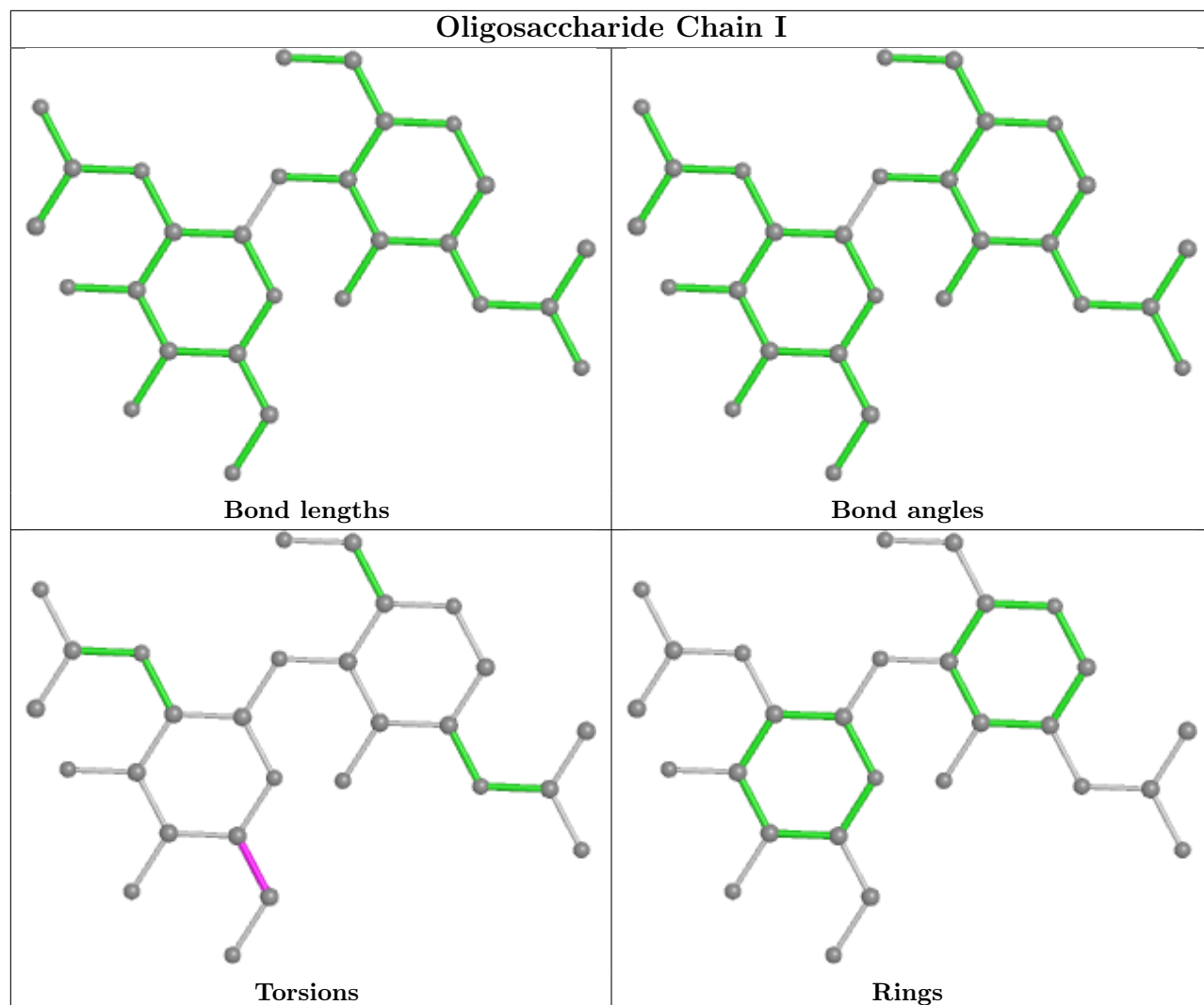
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	V	2	NAG	1	0
4	G	1	NAG	1	0
4	Q	2	NAG	1	0
4	K	2	NAG	1	0
4	I	1	NAG	2	0
4	R	1	NAG	2	0
4	K	1	NAG	1	0
4	V	1	NAG	1	0
4	Q	1	NAG	1	0
4	W	2	NAG	2	0
4	M	1	NAG	1	0
4	N	1	NAG	1	0
4	N	2	NAG	1	0
4	W	1	NAG	2	0

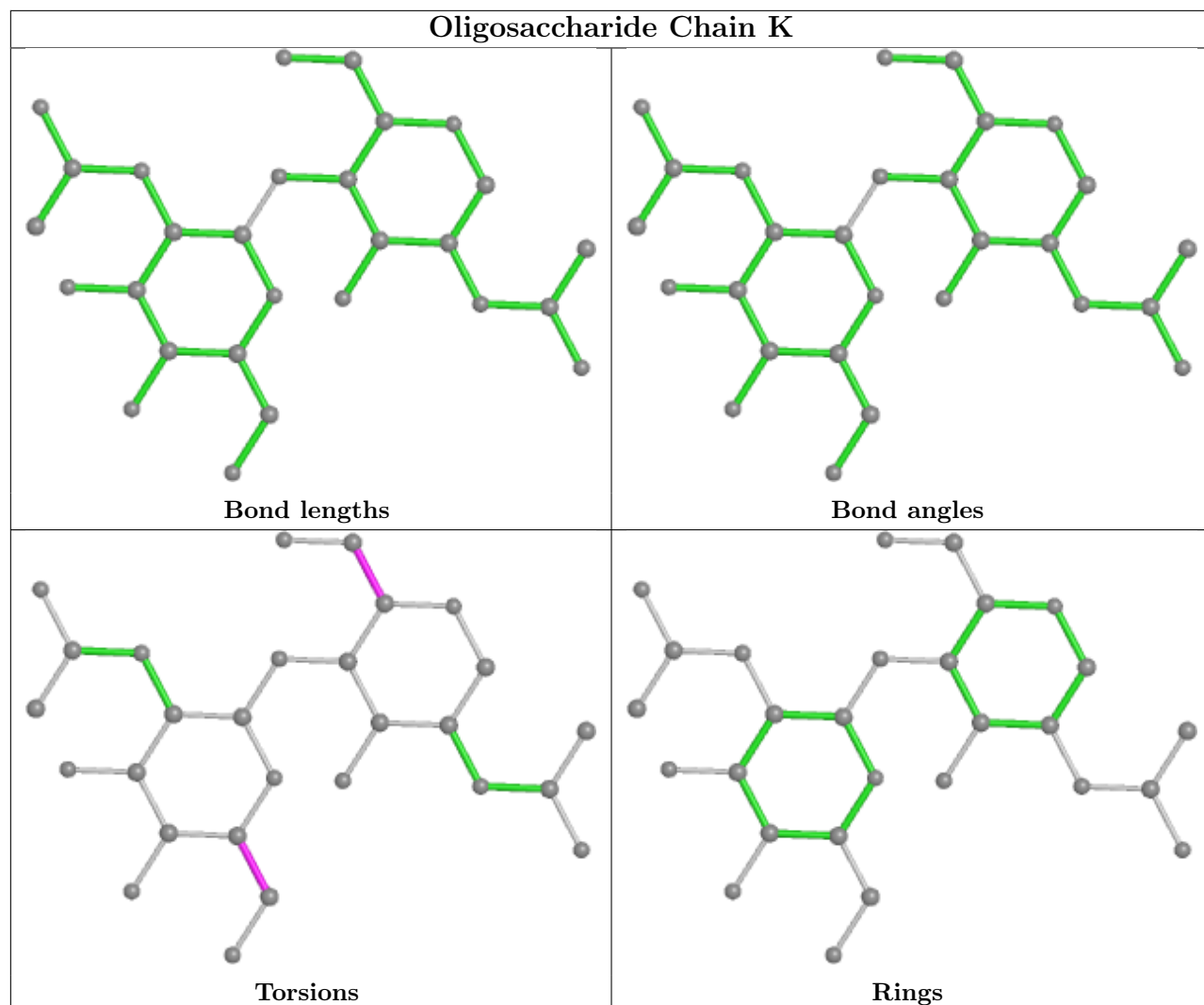
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

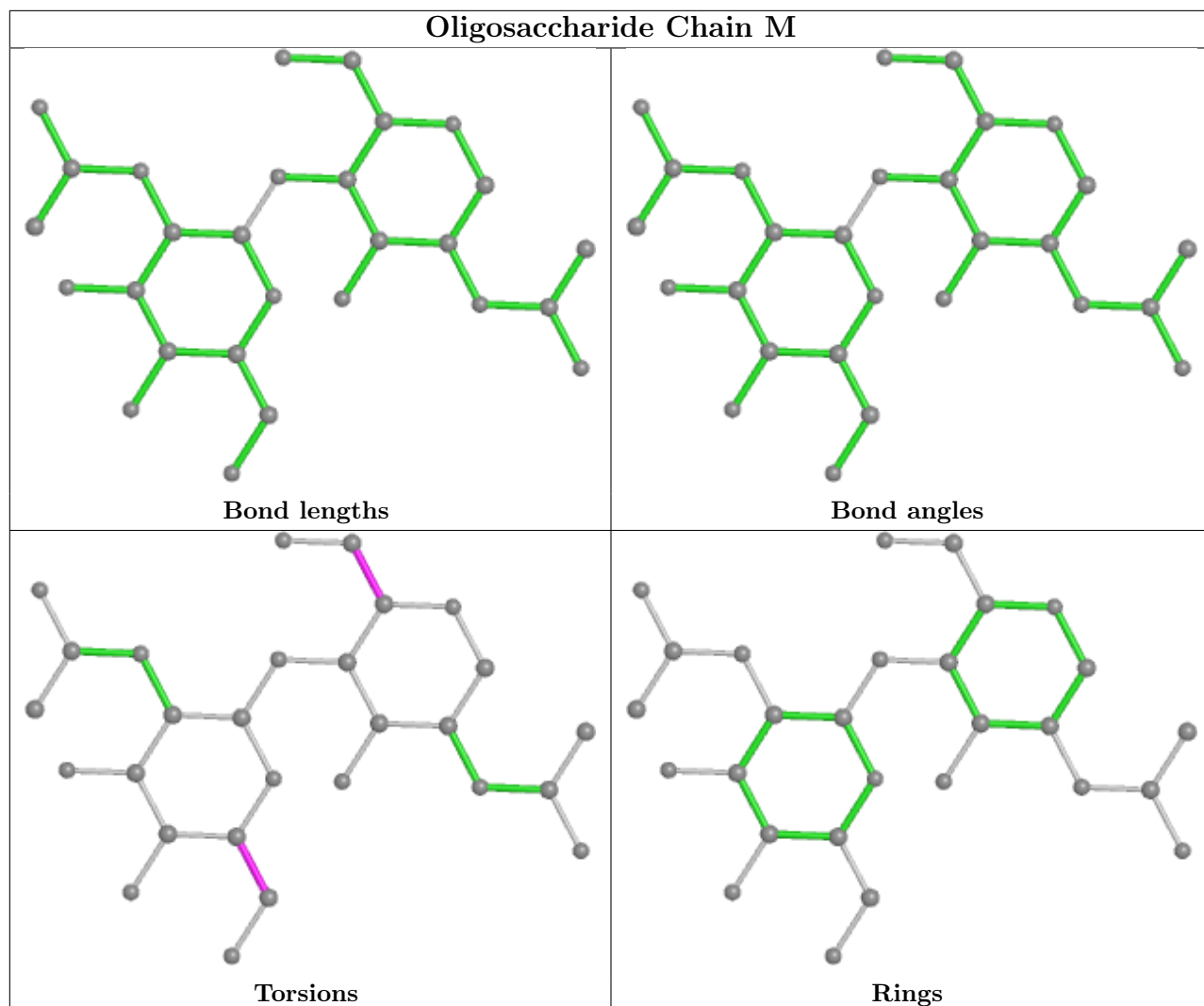


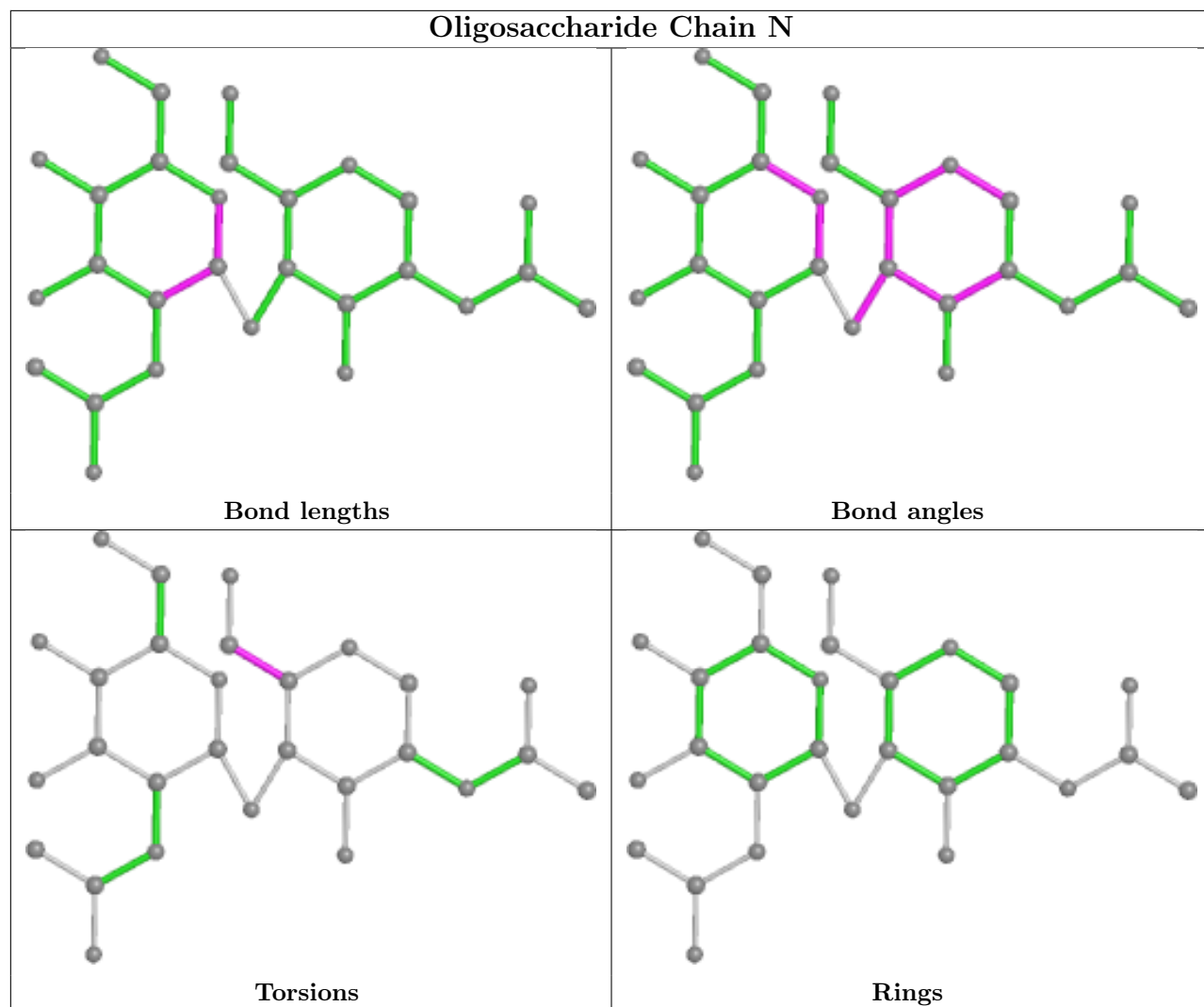


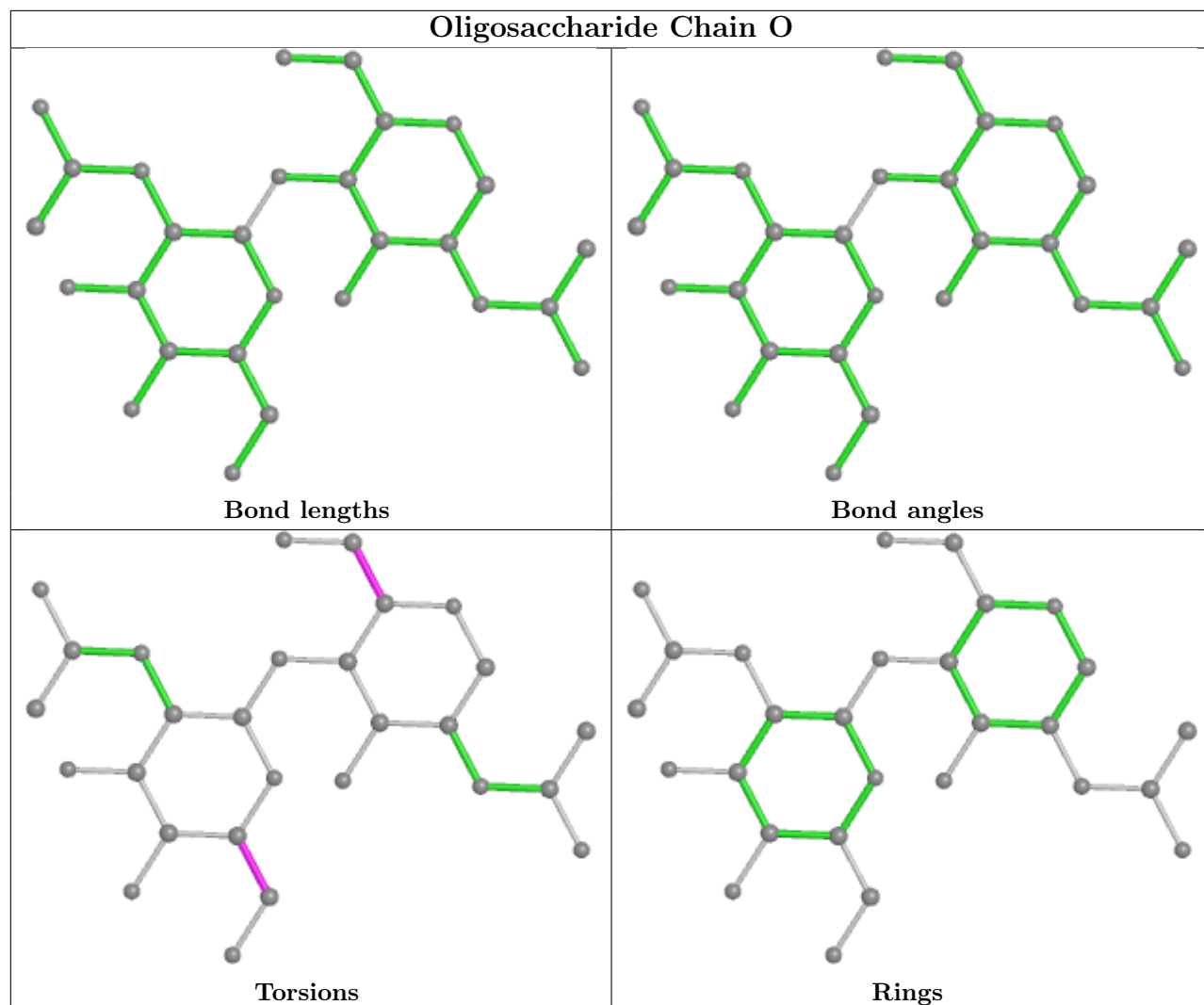


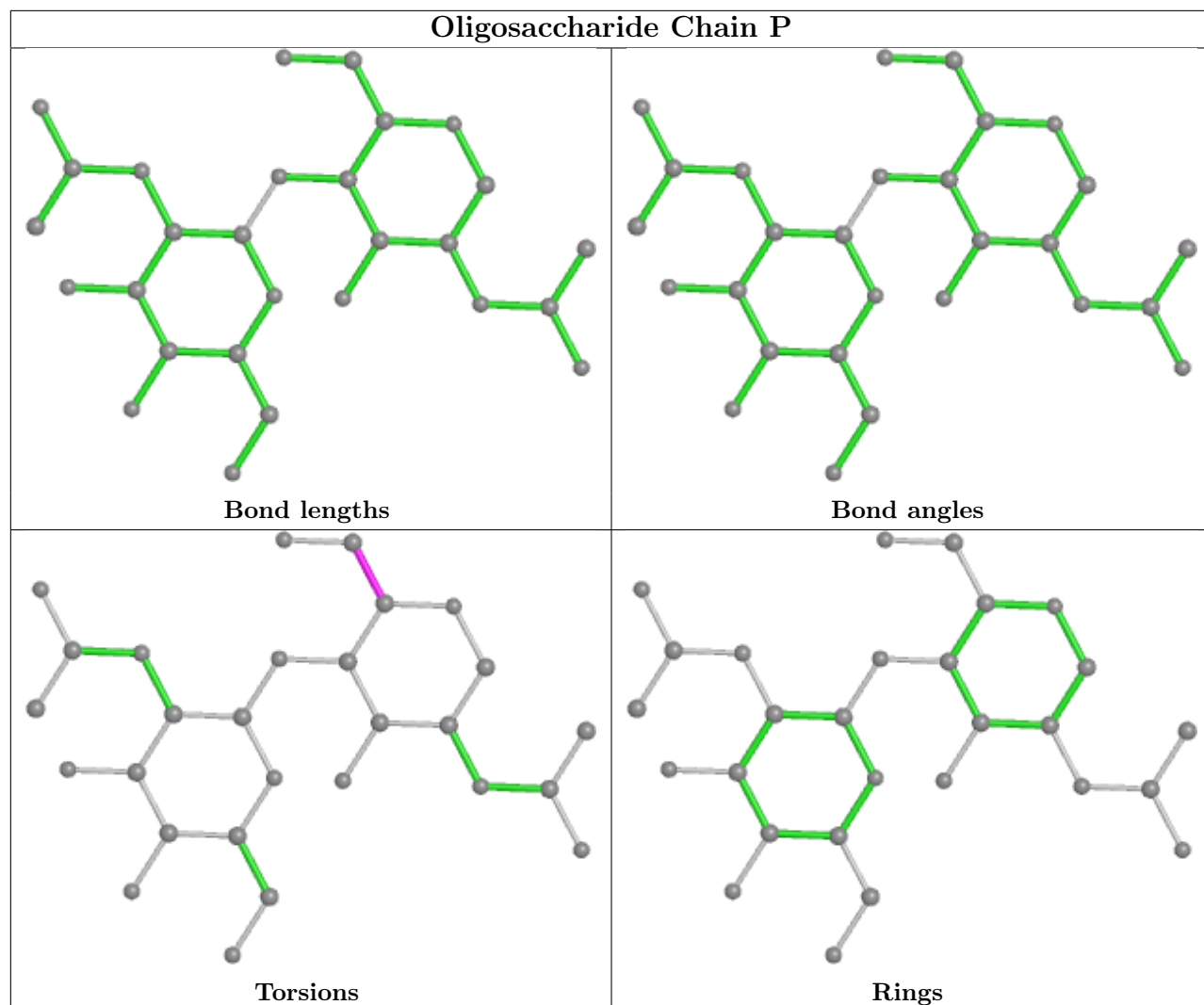




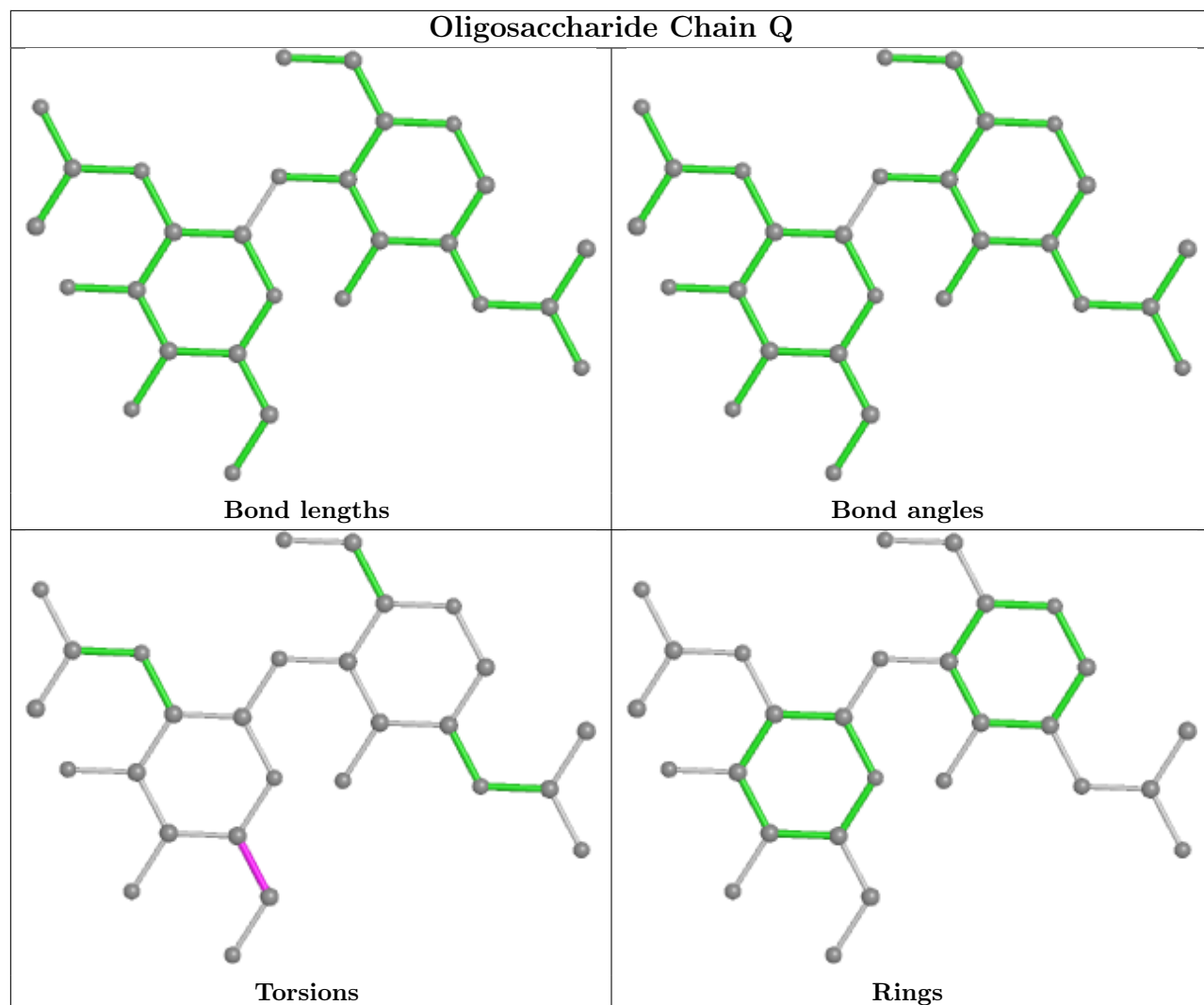


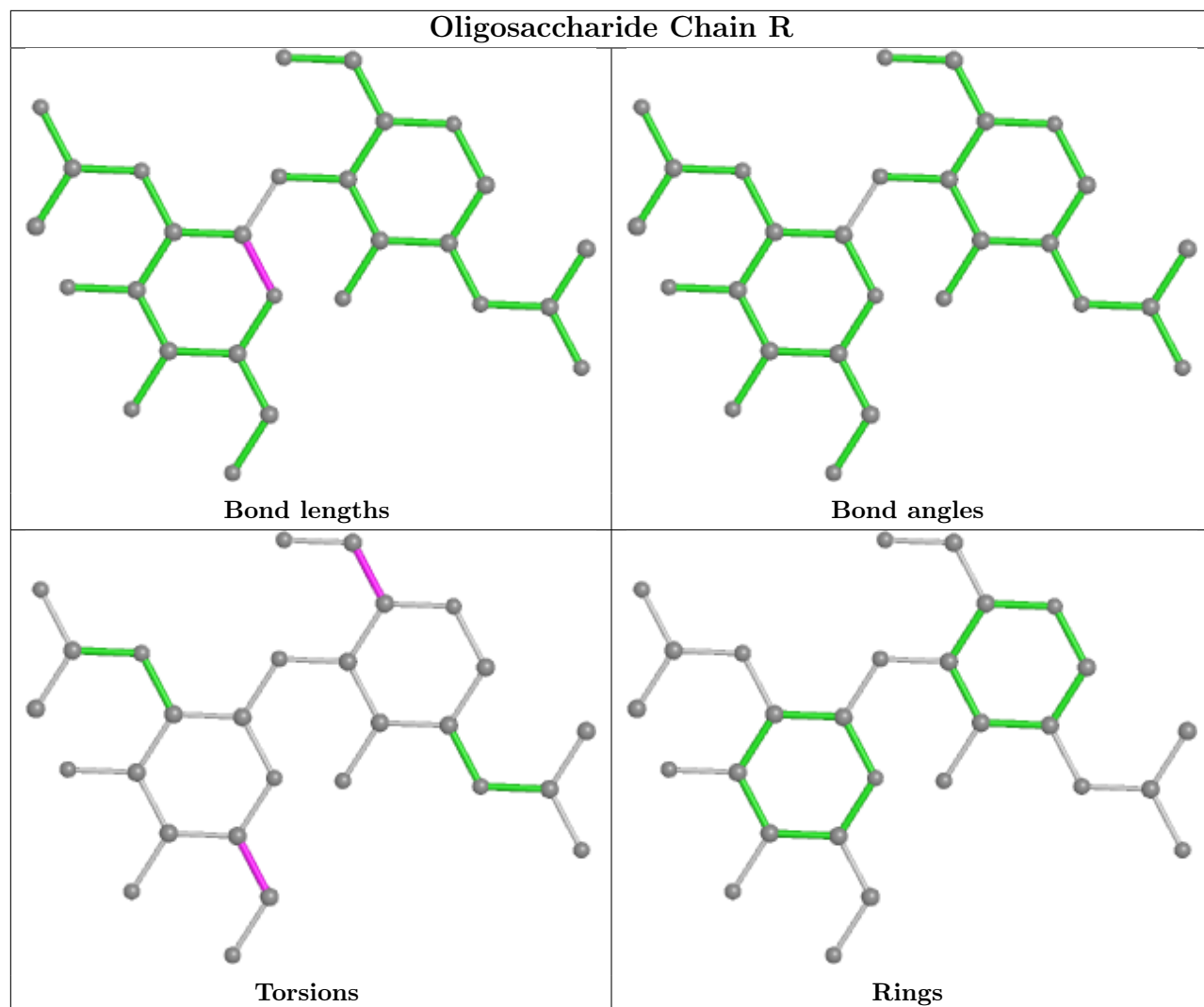


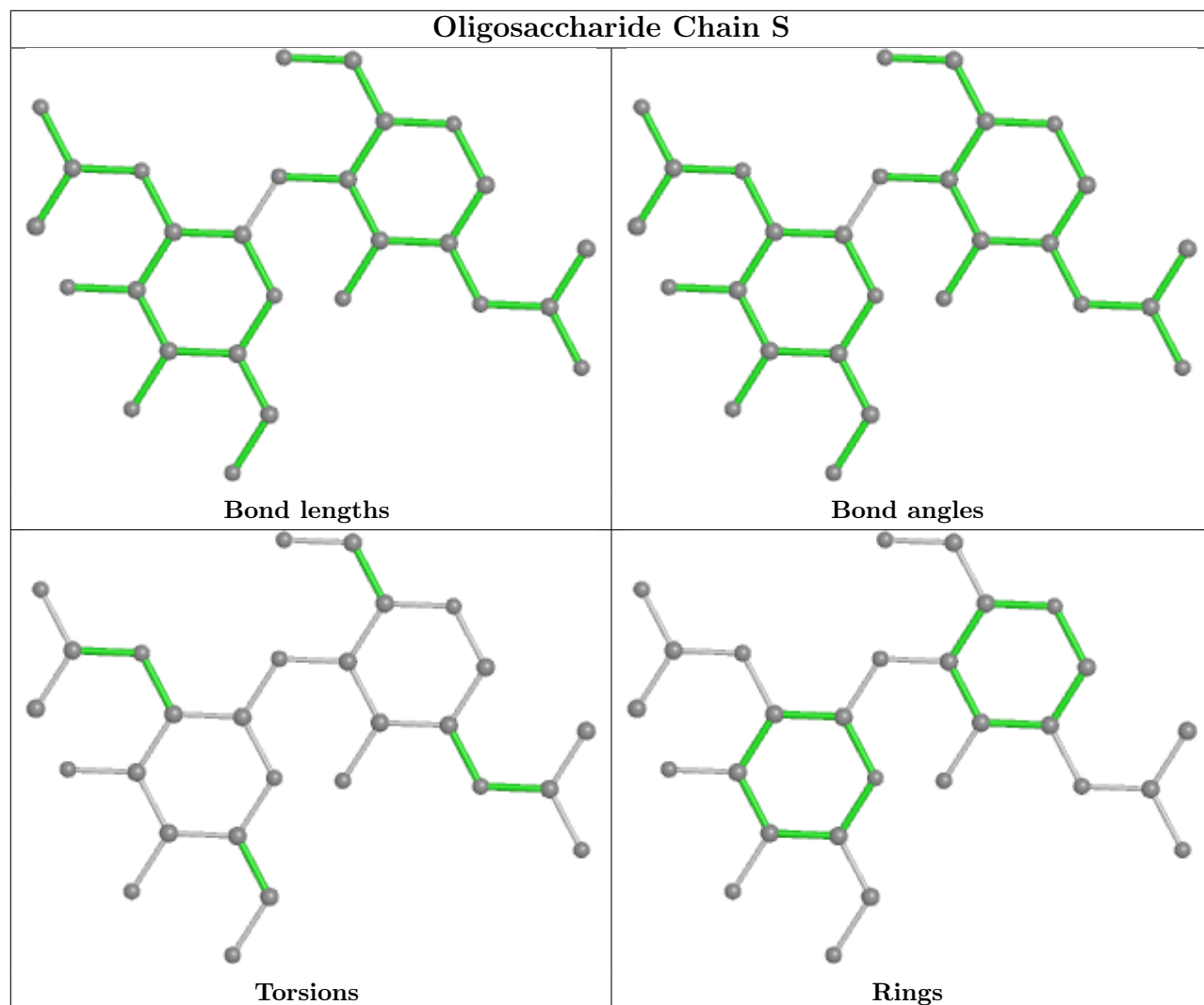


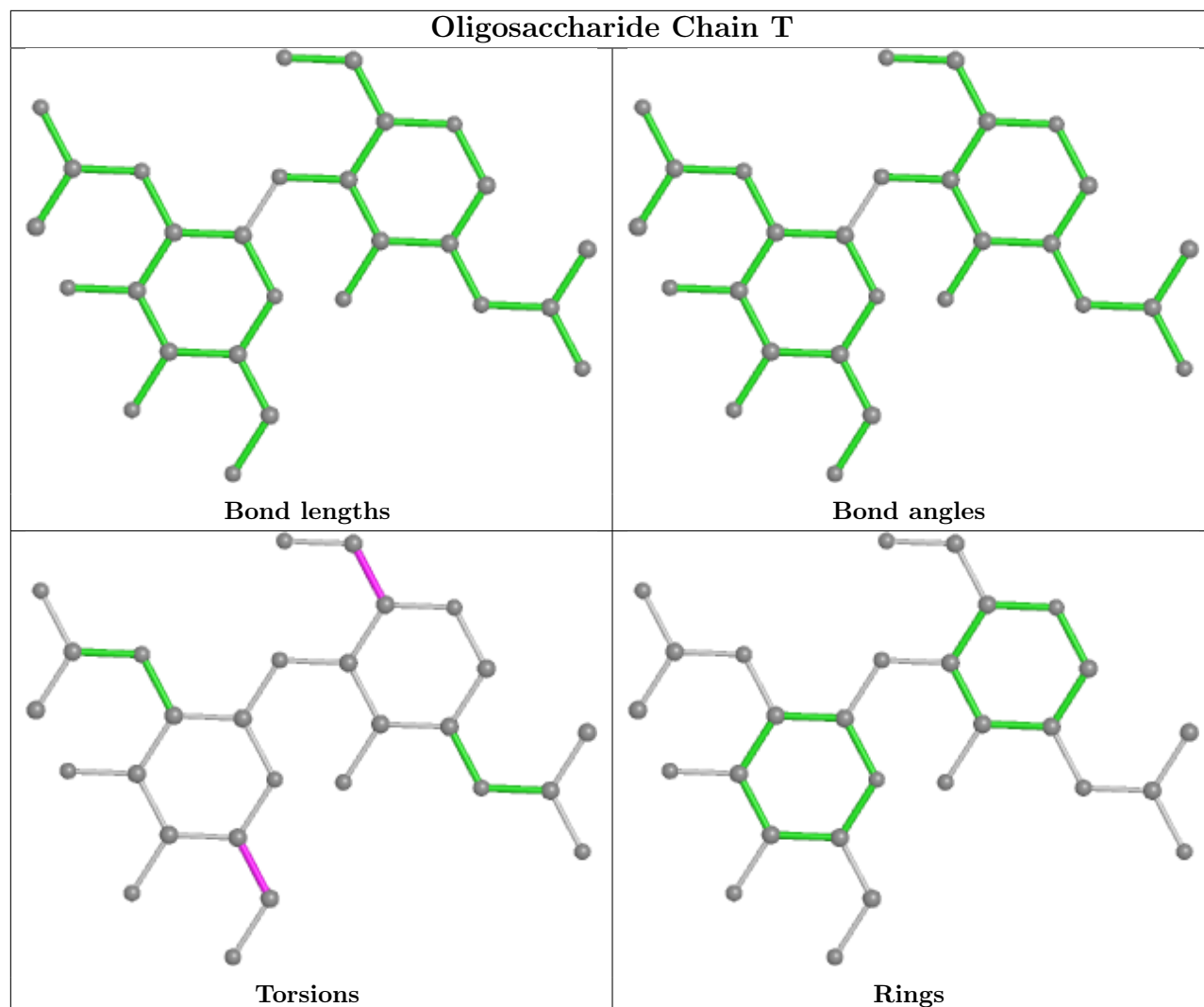


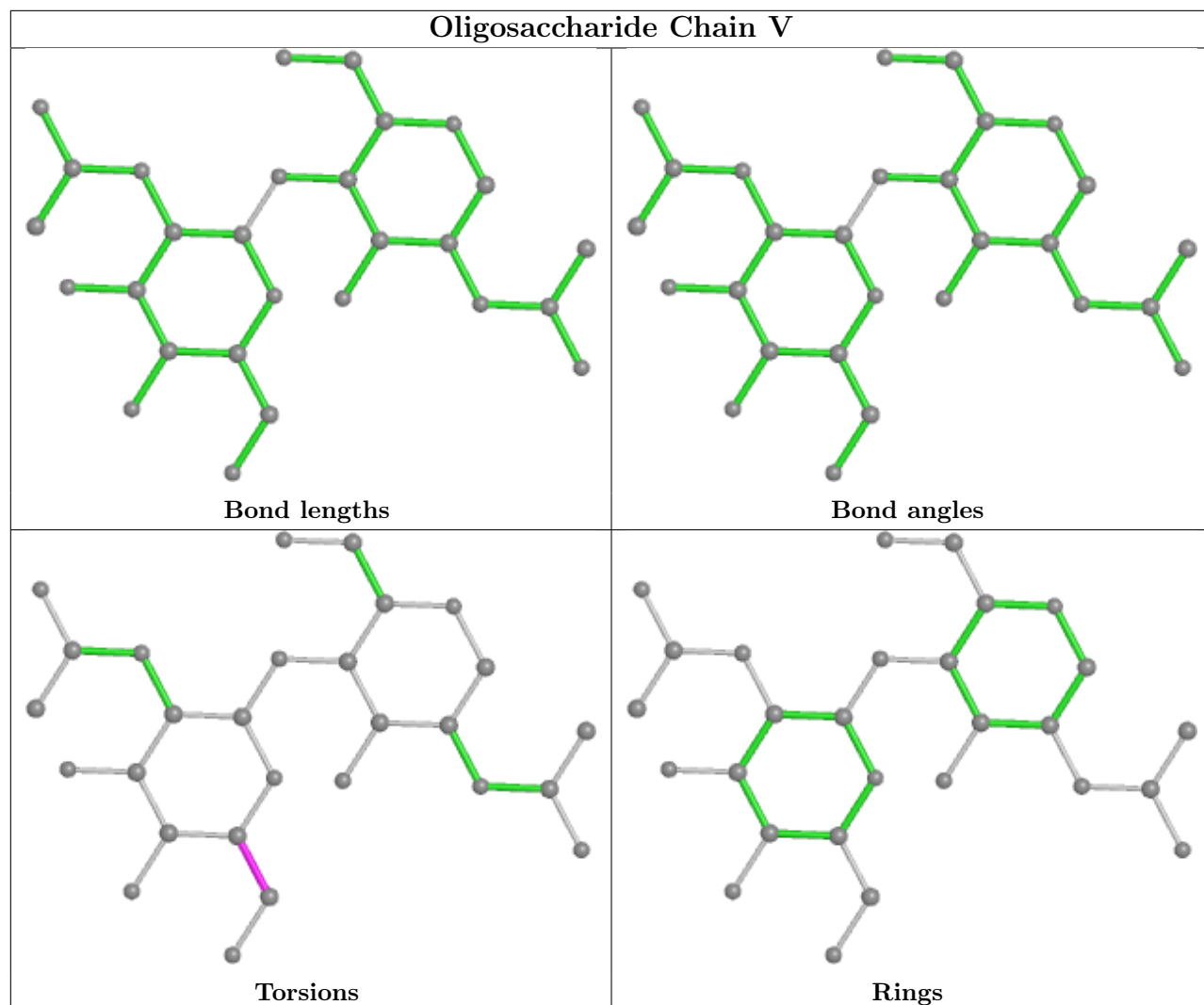


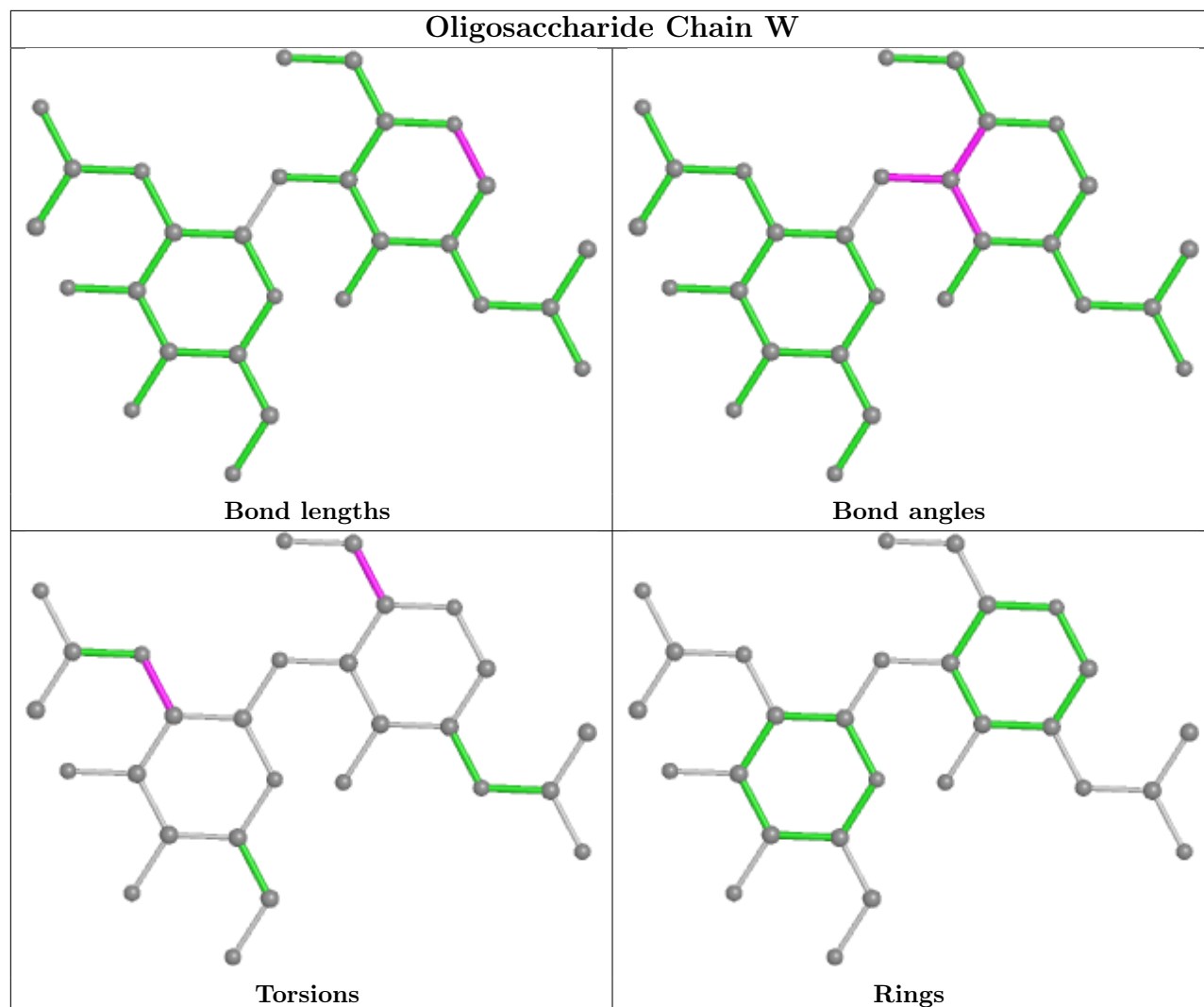


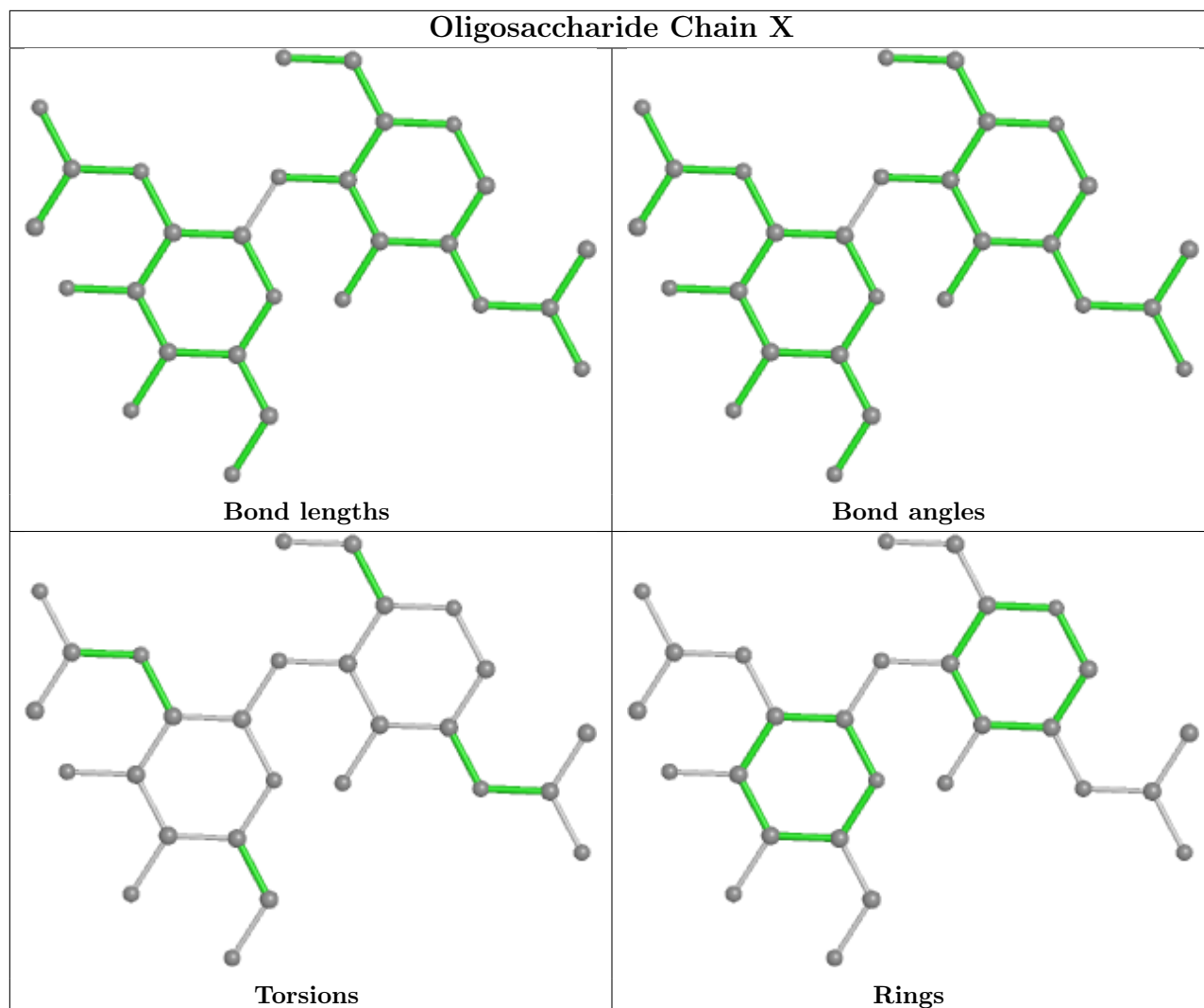












## 5.6 Ligand geometry [i](#)

33 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	A	1301	1	14,14,15	0.25	0	17,19,21	0.61	0
5	NAG	A	1311	1	14,14,15	0.40	0	17,19,21	0.82	0
5	NAG	E	1302	1	14,14,15	0.65	1 (7%)	17,19,21	0.78	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
5	NAG	B	1304	1	14,14,15	0.38	0	17,19,21	0.76	0
5	NAG	B	1306	1	14,14,15	0.51	0	17,19,21	0.72	0
5	NAG	E	1309	1	14,14,15	0.27	0	17,19,21	0.60	0
5	NAG	B	1302	1	14,14,15	0.21	0	17,19,21	0.72	0
5	NAG	A	1303	1	14,14,15	0.40	0	17,19,21	0.86	0
5	NAG	A	1309	1	14,14,15	0.67	1 (7%)	17,19,21	1.09	2 (11%)
5	NAG	E	1311	1	14,14,15	0.29	0	17,19,21	0.62	0
5	NAG	A	1305	1	14,14,15	0.37	0	17,19,21	0.90	1 (5%)
5	NAG	B	1303	1	14,14,15	0.27	0	17,19,21	0.52	0
5	NAG	B	1309	1	14,14,15	0.23	0	17,19,21	0.81	0
5	NAG	A	1308	1	14,14,15	0.55	0	17,19,21	0.51	0
5	NAG	E	1308	1	14,14,15	0.53	0	17,19,21	0.51	0
5	NAG	E	1304	1	14,14,15	0.31	0	17,19,21	0.68	0
5	NAG	E	1306	1	14,14,15	0.57	0	17,19,21	0.69	0
5	NAG	B	1310	1	14,14,15	0.54	0	17,19,21	0.75	0
5	NAG	A	1302	1	14,14,15	0.27	0	17,19,21	0.60	0
5	NAG	A	1306	1	14,14,15	0.51	0	17,19,21	0.64	0
5	NAG	E	1301	1	14,14,15	0.39	0	17,19,21	0.63	0
5	NAG	B	1305	1	14,14,15	0.29	0	17,19,21	0.69	0
5	NAG	B	1311	1	14,14,15	0.18	0	17,19,21	0.56	0
5	NAG	B	1301	1	14,14,15	0.18	0	17,19,21	0.63	0
5	NAG	A	1307	1	14,14,15	0.43	0	17,19,21	0.56	0
5	NAG	B	1307	1	14,14,15	0.61	1 (7%)	17,19,21	0.62	0
5	NAG	E	1310	1	14,14,15	0.33	0	17,19,21	0.63	0
5	NAG	E	1307	1	14,14,15	0.45	0	17,19,21	0.60	0
5	NAG	A	1310	1	14,14,15	0.26	0	17,19,21	0.64	0
5	NAG	A	1304	1	14,14,15	0.84	1 (7%)	17,19,21	0.86	0
5	NAG	E	1305	1	14,14,15	0.34	0	17,19,21	0.70	0
5	NAG	E	1303	1	14,14,15	0.26	0	17,19,21	0.55	0
5	NAG	B	1308	1	14,14,15	0.36	0	17,19,21	0.53	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	A	1301	1	-	2/6/23/26	0/1/1/1
5	NAG	A	1311	1	-	0/6/23/26	0/1/1/1
5	NAG	E	1302	1	-	1/6/23/26	0/1/1/1
5	NAG	B	1304	1	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	NAG	B	1306	1	-	2/6/23/26	0/1/1/1
5	NAG	E	1309	1	-	2/6/23/26	0/1/1/1
5	NAG	B	1302	1	-	0/6/23/26	0/1/1/1
5	NAG	A	1303	1	-	0/6/23/26	0/1/1/1
5	NAG	A	1309	1	-	1/6/23/26	0/1/1/1
5	NAG	E	1311	1	-	0/6/23/26	0/1/1/1
5	NAG	A	1305	1	-	4/6/23/26	0/1/1/1
5	NAG	B	1303	1	-	0/6/23/26	0/1/1/1
5	NAG	B	1309	1	-	2/6/23/26	0/1/1/1
5	NAG	A	1308	1	-	2/6/23/26	0/1/1/1
5	NAG	E	1308	1	-	2/6/23/26	0/1/1/1
5	NAG	E	1304	1	-	2/6/23/26	0/1/1/1
5	NAG	E	1306	1	-	2/6/23/26	0/1/1/1
5	NAG	B	1310	1	-	0/6/23/26	0/1/1/1
5	NAG	A	1302	1	-	2/6/23/26	0/1/1/1
5	NAG	A	1306	1	-	2/6/23/26	0/1/1/1
5	NAG	E	1301	1	-	4/6/23/26	0/1/1/1
5	NAG	B	1305	1	-	2/6/23/26	0/1/1/1
5	NAG	B	1311	1	-	2/6/23/26	0/1/1/1
5	NAG	B	1301	1	-	2/6/23/26	0/1/1/1
5	NAG	A	1307	1	-	2/6/23/26	0/1/1/1
5	NAG	B	1307	1	-	2/6/23/26	0/1/1/1
5	NAG	E	1310	1	-	1/6/23/26	0/1/1/1
5	NAG	E	1307	1	-	2/6/23/26	0/1/1/1
5	NAG	A	1310	1	-	0/6/23/26	0/1/1/1
5	NAG	A	1304	1	-	2/6/23/26	0/1/1/1
5	NAG	E	1305	1	-	2/6/23/26	0/1/1/1
5	NAG	E	1303	1	-	0/6/23/26	0/1/1/1
5	NAG	B	1308	1	-	1/6/23/26	0/1/1/1

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	1304	NAG	O5-C1	2.87	1.48	1.43
5	E	1302	NAG	C1-C2	2.28	1.55	1.52
5	B	1307	NAG	C1-C2	2.19	1.55	1.52
5	A	1309	NAG	O5-C1	-2.05	1.40	1.43

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	1309	NAG	C2-N2-C7	2.22	126.07	122.90
5	A	1305	NAG	O3-C3-C2	2.11	113.82	109.47
5	A	1309	NAG	O3-C3-C4	-2.05	105.61	110.35

There are no chirality outliers.

All (50) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	1305	NAG	C4-C5-C6-O6
5	B	1307	NAG	O5-C5-C6-O6
5	A	1305	NAG	O5-C5-C6-O6
5	A	1307	NAG	O5-C5-C6-O6
5	B	1301	NAG	O5-C5-C6-O6
5	E	1304	NAG	O5-C5-C6-O6
5	E	1307	NAG	O5-C5-C6-O6
5	A	1308	NAG	C4-C5-C6-O6
5	B	1301	NAG	C4-C5-C6-O6
5	B	1307	NAG	C4-C5-C6-O6
5	B	1305	NAG	O5-C5-C6-O6
5	A	1307	NAG	C4-C5-C6-O6
5	A	1304	NAG	C4-C5-C6-O6
5	A	1304	NAG	O5-C5-C6-O6
5	A	1308	NAG	O5-C5-C6-O6
5	E	1301	NAG	O5-C5-C6-O6
5	A	1306	NAG	O5-C5-C6-O6
5	B	1309	NAG	O5-C5-C6-O6
5	E	1309	NAG	O5-C5-C6-O6
5	B	1304	NAG	O5-C5-C6-O6
5	B	1309	NAG	C4-C5-C6-O6
5	B	1305	NAG	C4-C5-C6-O6
5	E	1301	NAG	C4-C5-C6-O6
5	E	1307	NAG	C4-C5-C6-O6
5	A	1301	NAG	O5-C5-C6-O6
5	B	1304	NAG	C4-C5-C6-O6
5	E	1309	NAG	C4-C5-C6-O6
5	E	1305	NAG	O5-C5-C6-O6
5	E	1304	NAG	C4-C5-C6-O6
5	A	1302	NAG	O5-C5-C6-O6
5	B	1306	NAG	O5-C5-C6-O6
5	E	1305	NAG	C4-C5-C6-O6
5	A	1305	NAG	C1-C2-N2-C7

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Mol	Chain	Res	Type	Atoms
5	E	1301	NAG	C1-C2-N2-C7
5	A	1301	NAG	C4-C5-C6-O6
5	E	1308	NAG	C4-C5-C6-O6
5	E	1306	NAG	O5-C5-C6-O6
5	A	1309	NAG	O5-C5-C6-O6
5	A	1302	NAG	C4-C5-C6-O6
5	E	1306	NAG	C1-C2-N2-C7
5	B	1311	NAG	C4-C5-C6-O6
5	E	1310	NAG	C1-C2-N2-C7
5	E	1308	NAG	O5-C5-C6-O6
5	A	1306	NAG	C4-C5-C6-O6
5	B	1306	NAG	C4-C5-C6-O6
5	A	1305	NAG	C3-C2-N2-C7
5	E	1301	NAG	C3-C2-N2-C7
5	E	1302	NAG	C4-C5-C6-O6
5	B	1311	NAG	O5-C5-C6-O6
5	B	1308	NAG	O5-C5-C6-O6

There are no ring outliers.

16 monomers are involved in 23 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	1301	NAG	1	0
5	E	1302	NAG	1	0
5	A	1303	NAG	2	0
5	A	1305	NAG	3	0
5	B	1309	NAG	2	0
5	A	1308	NAG	2	0
5	E	1308	NAG	2	0
5	E	1304	NAG	1	0
5	E	1306	NAG	1	0
5	B	1310	NAG	1	0
5	A	1306	NAG	2	0
5	E	1301	NAG	1	0
5	B	1307	NAG	1	0
5	E	1310	NAG	1	0
5	E	1307	NAG	1	0
5	A	1304	NAG	1	0

## 5.7 Other polymers

There are no such residues in this entry.

## 5.8 Polymer linkage issues

There are no chain breaks in this entry.

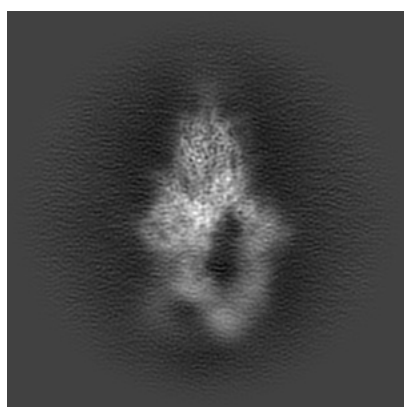
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-23694. These allow visual inspection of the internal detail of the map and identification of artifacts.

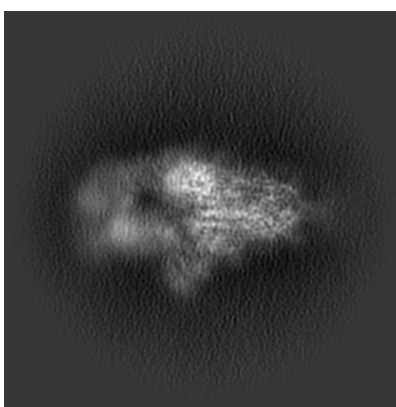
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

### 6.1 Orthogonal projections [i](#)

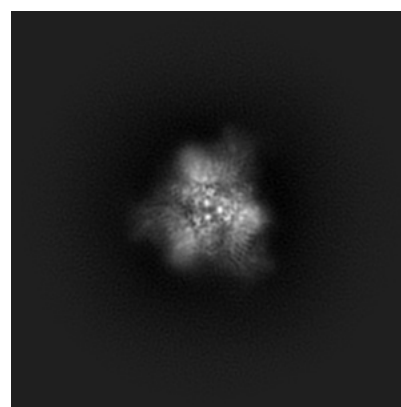
#### 6.1.1 Primary map



X



Y

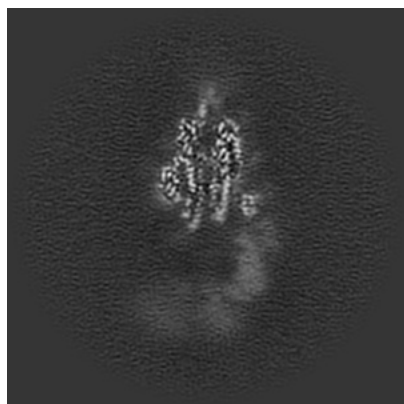


Z

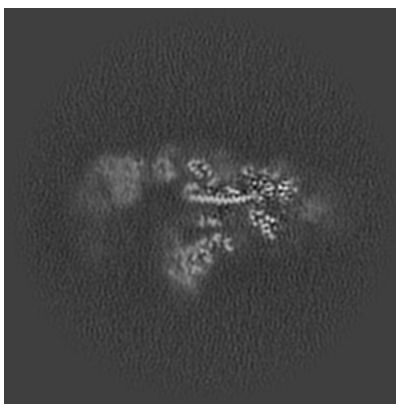
The images above show the map projected in three orthogonal directions.

### 6.2 Central slices [i](#)

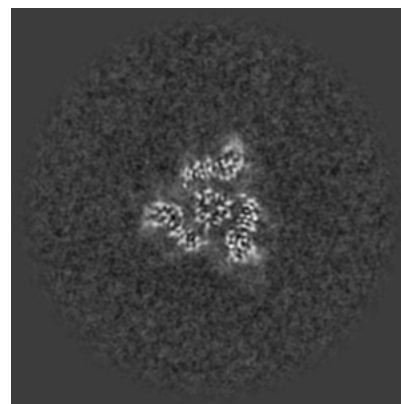
#### 6.2.1 Primary map



X Index: 216



Y Index: 216

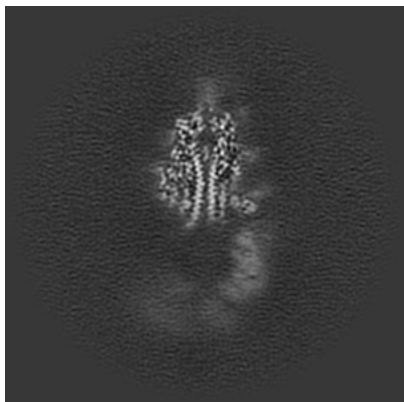


Z Index: 216

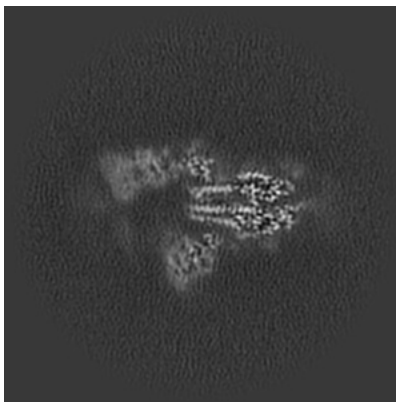
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

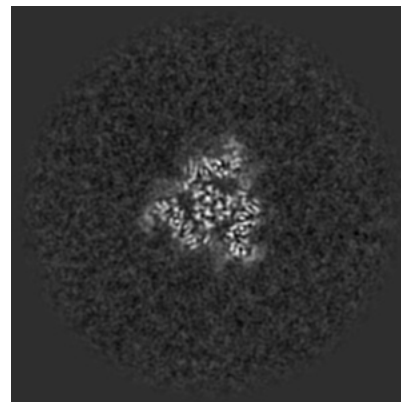
### 6.3.1 Primary map



X Index: 212



Y Index: 207

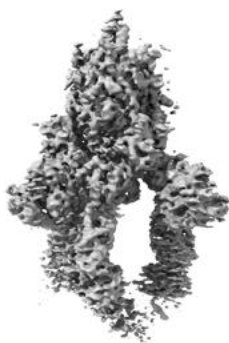


Z Index: 220

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 0.09. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

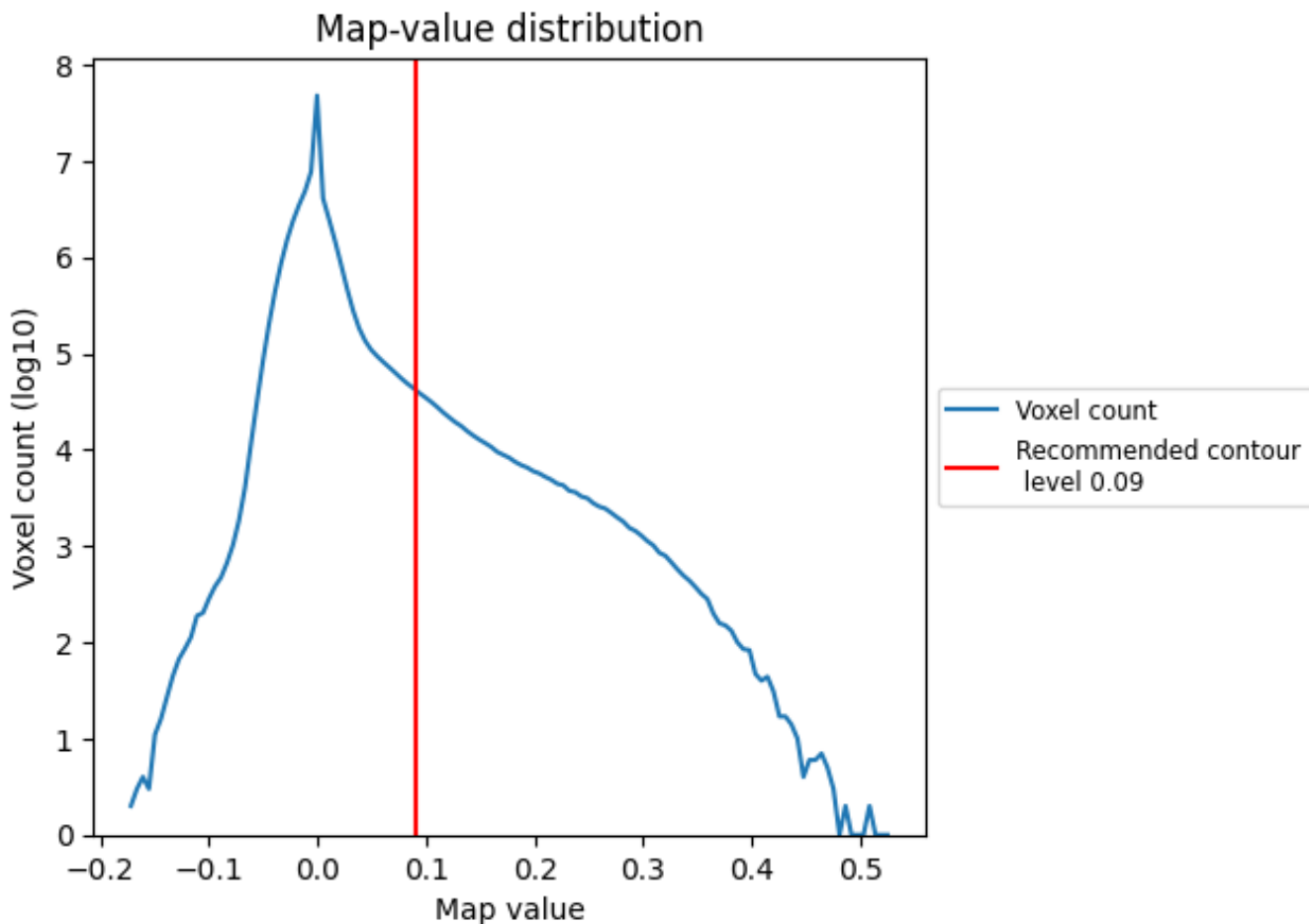
## 6.5 Mask visualisation

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

## 7 Map analysis [i](#)

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

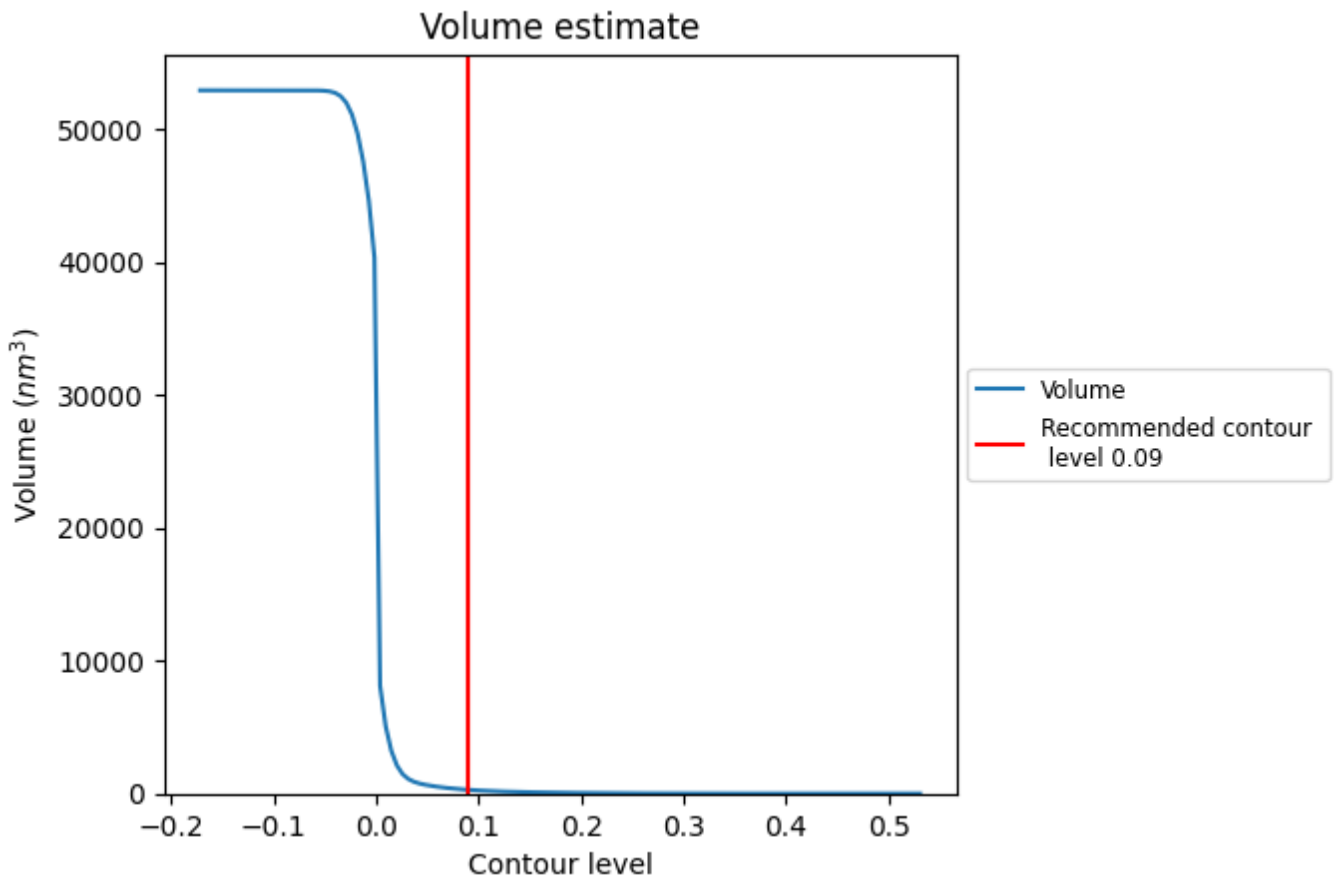
### 7.1 Map-value distribution [i](#)



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.



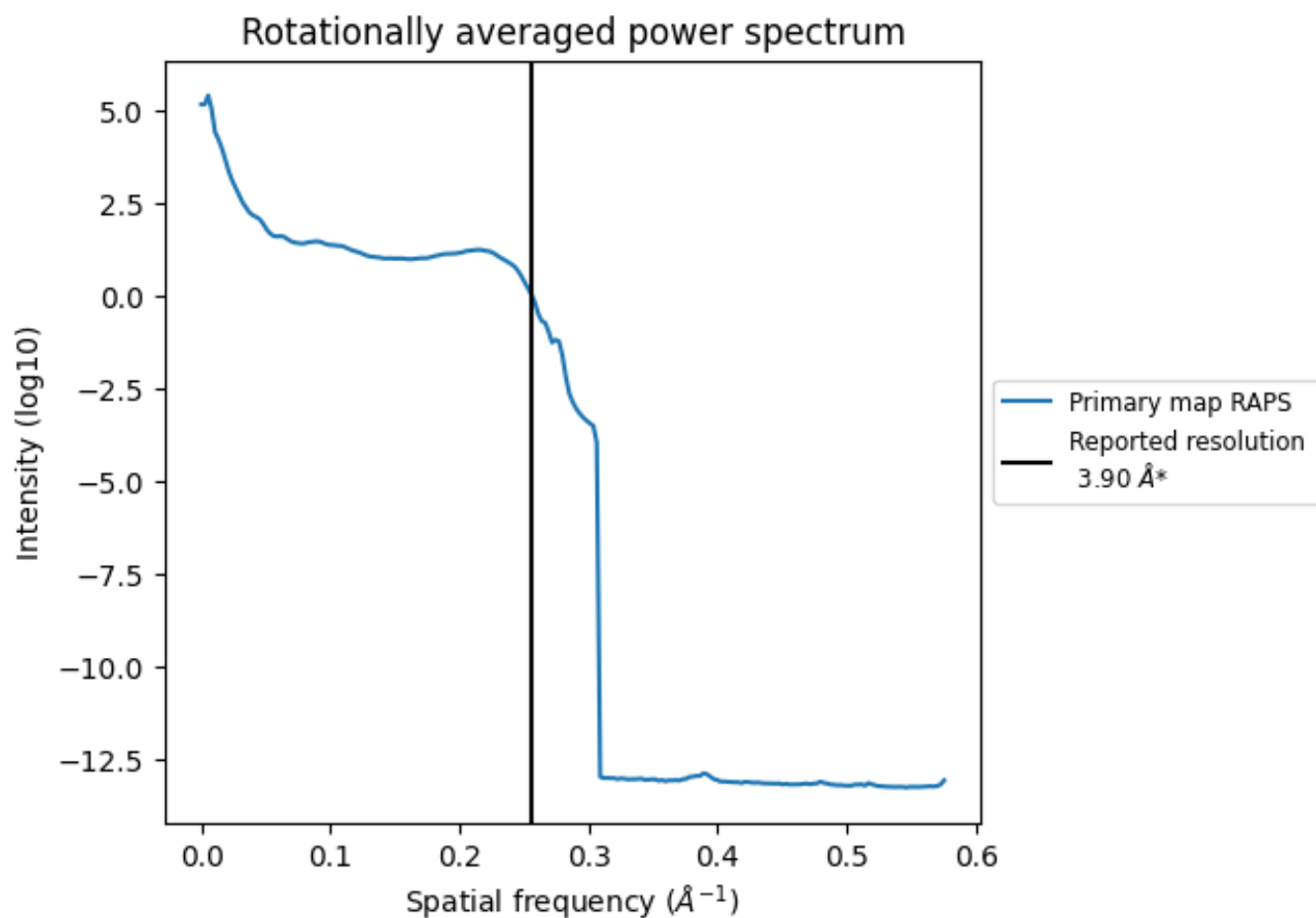
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 282 nm<sup>3</sup>; this corresponds to an approximate mass of 255 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](#)

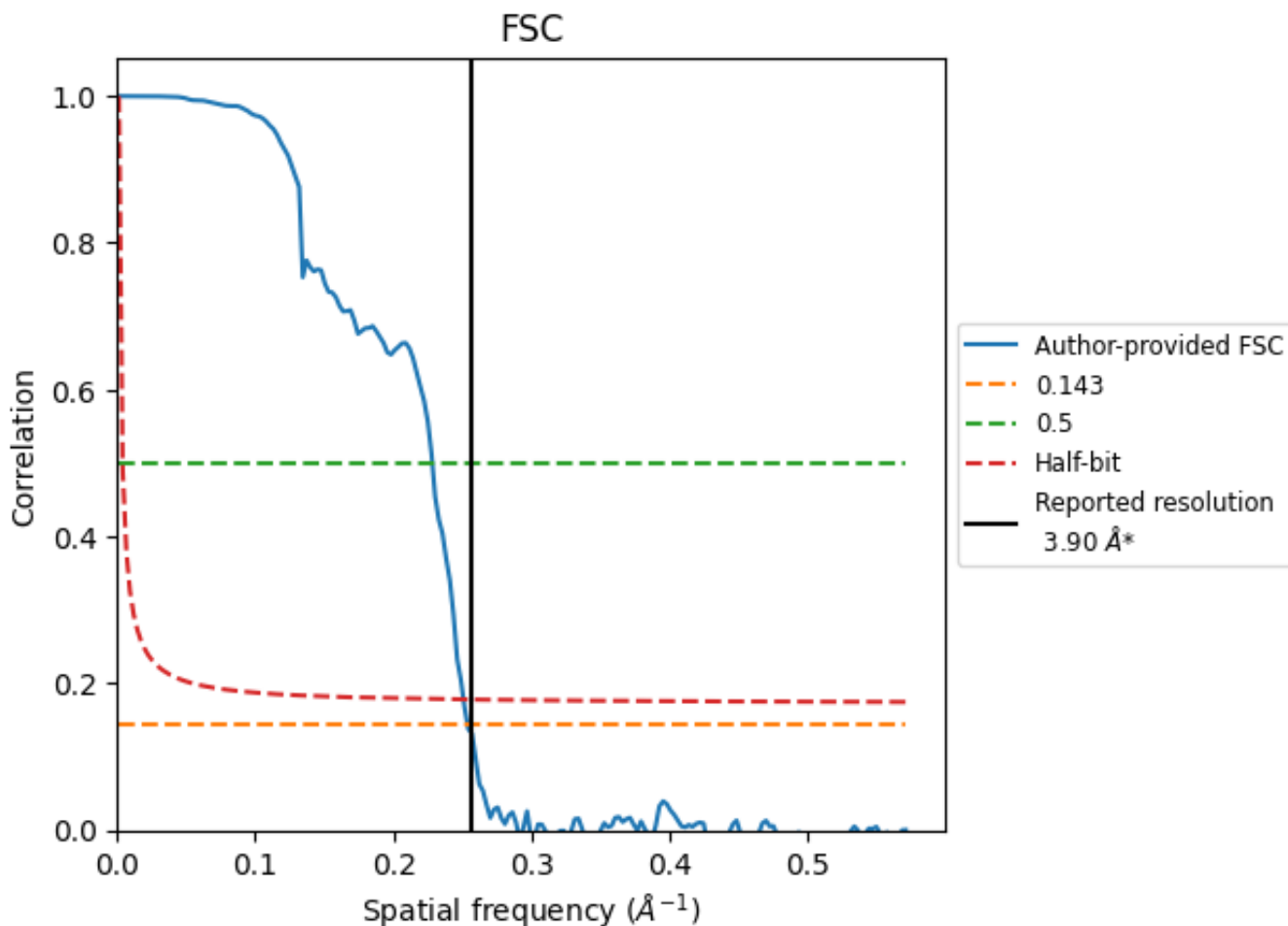


\*Reported resolution corresponds to spatial frequency of  $0.256 \text{ \AA}^{-1}$

## 8 Fourier-Shell correlation [i](#)

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 [i](#)



\*Reported resolution corresponds to spatial frequency of 0.256 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

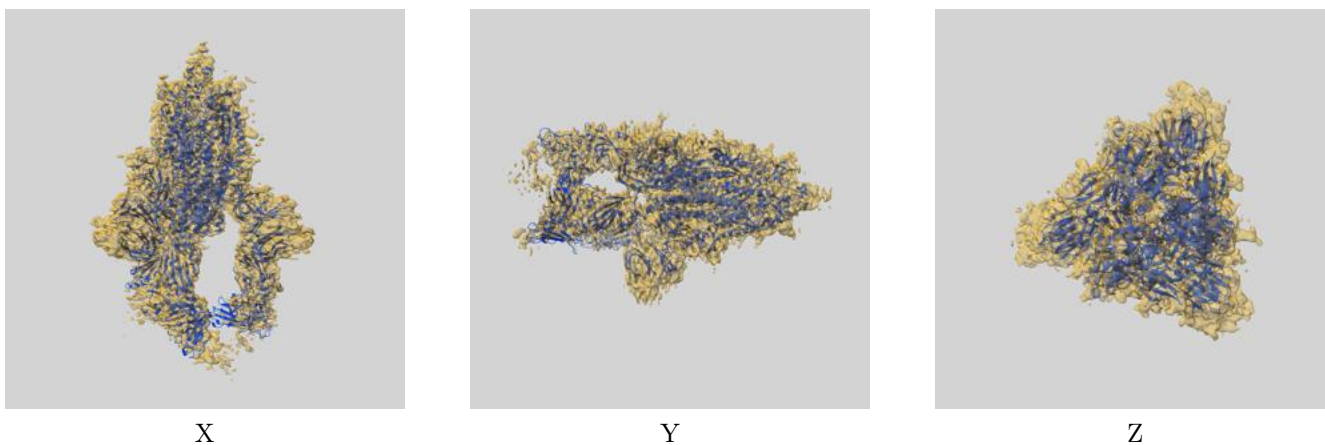
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.90	-	-
Author-provided FSC curve	3.94	4.38	3.98
Unmasked-calculated*	-	-	-

\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

## 9 Map-model fit [i](#)

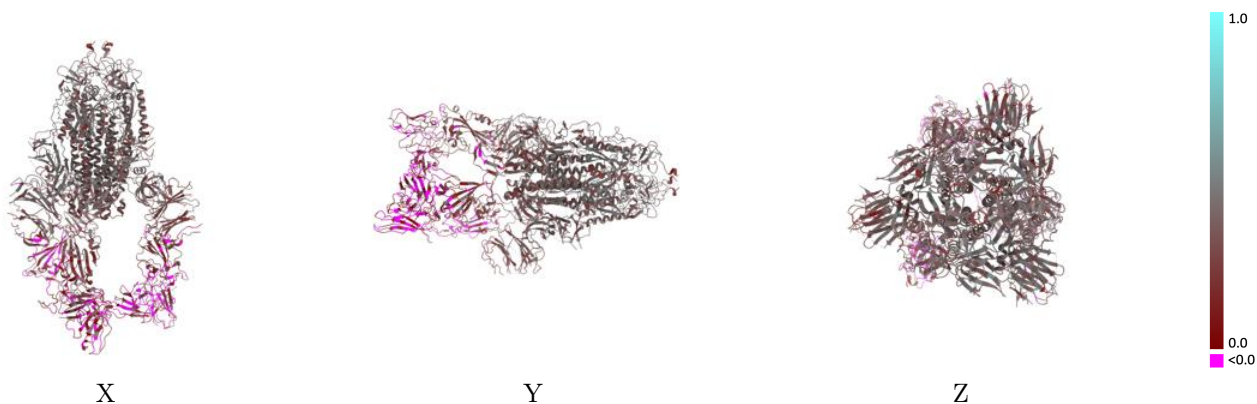
This section contains information regarding the fit between EMDB map EMD-23694 and PDB model 7M6F. Per-residue inclusion information can be found in section 3 on page 14.

### 9.1 Map-model overlay [i](#)



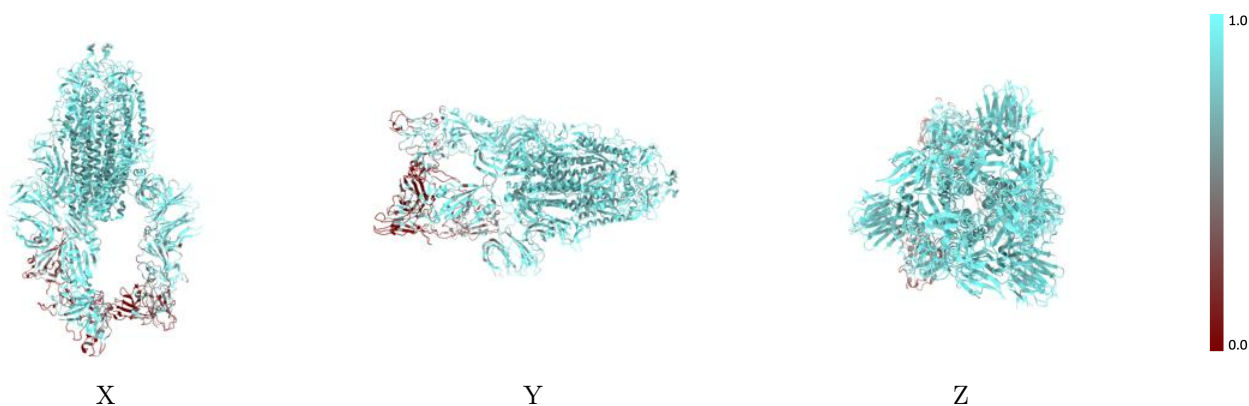
The images above show the 3D surface view of the map at the recommended contour level 0.09 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

## 9.2 Q-score mapped to coordinate model [i](#)



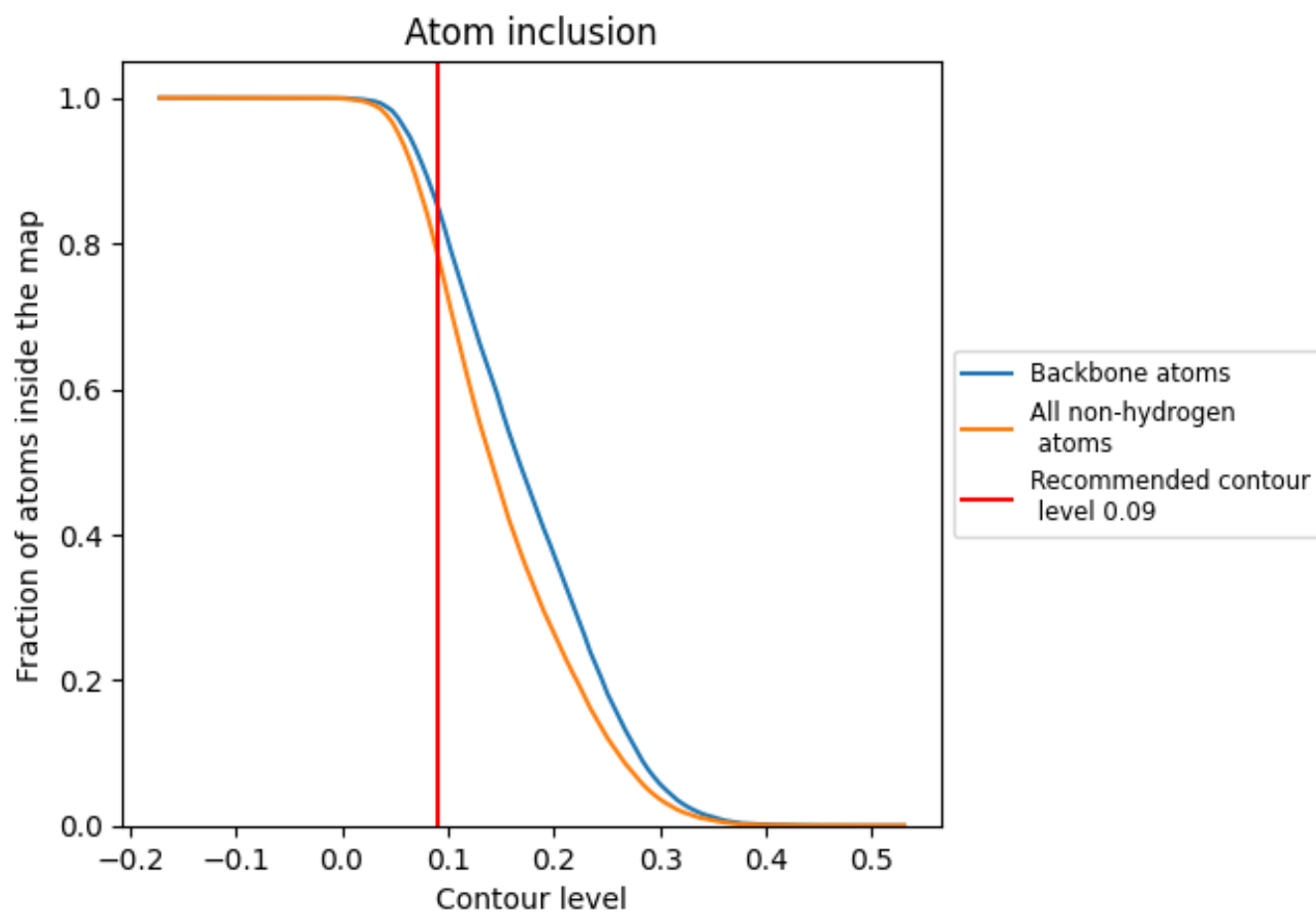
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 [i](#)



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 (0.09).















































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 85% of all backbone atoms, 79% 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 (0.09) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7878	 0.3200
A	 0.8586	 0.3530
B	 0.7945	 0.3410
C	 0.2064	 0.0070
D	 0.3403	 0.0480
E	 0.8278	 0.3370
F	 0.7857	 0.3410
G	 0.6786	 0.1670
H	 0.6024	 0.1410
I	 0.6786	 0.4070
K	 0.7857	 0.3690
L	 0.5992	 0.1480
M	 0.4643	 0.2840
N	 0.4286	 0.1170
O	 0.7143	 0.4150
P	 0.7500	 0.3480
Q	 0.6786	 0.3590
R	 0.4286	 0.0700
S	 0.8571	 0.3850
T	 0.7500	 0.4550
V	 0.8214	 0.4310
W	 0.3571	 0.0630
X	 0.8929	 0.4260

