



## Full wwPDB EM Validation Report ⓘ

Nov 23, 2022 – 08:58 AM EST

PDB ID : 7UAR  
EMDB ID : EMD-26431  
Title : Structure of the SARS-CoV-2 S 6P trimer in complex with the neutralizing antibody Fab fragment, C1717  
Authors : Barnes, C.O.  
Deposited on : 2022-03-13  
Resolution : 3.50 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:

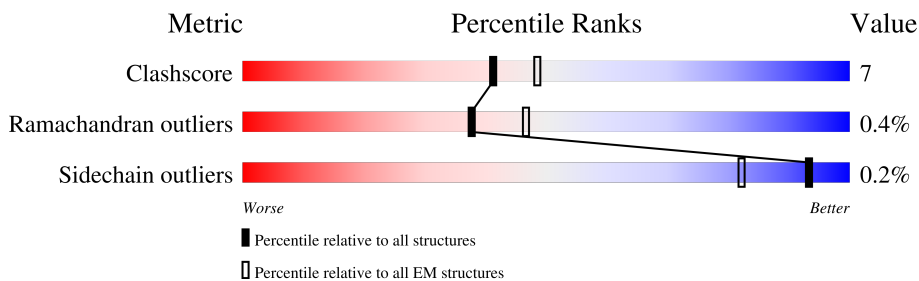
EMDB validation analysis : 0.0.1.dev43  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
MolProbity : 4.02b-467  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.9  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson 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 3.50 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



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

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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	1256	
1	B	1256	
1	C	1256	
2	D	227	
2	F	227	
2	H	227	
3	E	216	
3	G	216	

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Mol	Chain	Length	Quality of chain
3	L	216	
4	I	2	
4	J	2	
4	M	2	
4	N	2	
4	O	2	
4	P	2	
5	K	4	

## 2 Entry composition i

There are 6 unique types of molecules in this entry. The entry contains 27996 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	968	7393	4729	1230	1401	33	0	0
1	B	983	7505	4797	1244	1430	34	0	0
1	C	976	7355	4702	1217	1402	34	0	0

There are 165 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	?	-	ARG	deletion	UNP P0DTC2
A	?	-	ARG	deletion	UNP P0DTC2
A	?	-	ARG	deletion	UNP P0DTC2
A	817	PRO	PHE	conflict	UNP P0DTC2
A	892	PRO	ALA	conflict	UNP P0DTC2
A	899	PRO	ALA	conflict	UNP P0DTC2
A	942	PRO	ALA	conflict	UNP P0DTC2
A	986	PRO	LYS	conflict	UNP P0DTC2
A	987	PRO	VAL	conflict	UNP P0DTC2
A	1214	SER	-	expression tag	UNP P0DTC2
A	1215	GLY	-	expression tag	UNP P0DTC2
A	1216	ARG	-	expression tag	UNP P0DTC2
A	1217	LEU	-	expression tag	UNP P0DTC2
A	1218	VAL	-	expression tag	UNP P0DTC2
A	1219	PRO	-	expression tag	UNP P0DTC2
A	1220	ARG	-	expression tag	UNP P0DTC2
A	1221	GLY	-	expression tag	UNP P0DTC2
A	1222	SER	-	expression tag	UNP P0DTC2
A	1223	PRO	-	expression tag	UNP P0DTC2
A	1224	GLY	-	expression tag	UNP P0DTC2
A	1225	SER	-	expression tag	UNP P0DTC2
A	1226	GLY	-	expression tag	UNP P0DTC2
A	1227	TYR	-	expression tag	UNP P0DTC2
A	1228	ILE	-	expression tag	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
A	1229	PRO	-	expression tag	UNP P0DTC2
A	1230	GLU	-	expression tag	UNP P0DTC2
A	1231	ALA	-	expression tag	UNP P0DTC2
A	1232	PRO	-	expression tag	UNP P0DTC2
A	1233	ARG	-	expression tag	UNP P0DTC2
A	1234	ASP	-	expression tag	UNP P0DTC2
A	1235	GLY	-	expression tag	UNP P0DTC2
A	1236	GLN	-	expression tag	UNP P0DTC2
A	1237	ALA	-	expression tag	UNP P0DTC2
A	1238	TYR	-	expression tag	UNP P0DTC2
A	1239	VAL	-	expression tag	UNP P0DTC2
A	1240	ARG	-	expression tag	UNP P0DTC2
A	1241	LYS	-	expression tag	UNP P0DTC2
A	1242	ASP	-	expression tag	UNP P0DTC2
A	1243	GLY	-	expression tag	UNP P0DTC2
A	1244	GLU	-	expression tag	UNP P0DTC2
A	1245	TRP	-	expression tag	UNP P0DTC2
A	1246	VAL	-	expression tag	UNP P0DTC2
A	1247	LEU	-	expression tag	UNP P0DTC2
A	1248	LEU	-	expression tag	UNP P0DTC2
A	1249	SER	-	expression tag	UNP P0DTC2
A	1250	THR	-	expression tag	UNP P0DTC2
A	1251	PHE	-	expression tag	UNP P0DTC2
A	1252	LEU	-	expression tag	UNP P0DTC2
A	1253	GLY	-	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	HIS	-	expression tag	UNP P0DTC2
A	1259	HIS	-	expression tag	UNP P0DTC2
B	?	-	ARG	deletion	UNP P0DTC2
B	?	-	ARG	deletion	UNP P0DTC2
B	?	-	ARG	deletion	UNP P0DTC2
B	817	PRO	PHE	conflict	UNP P0DTC2
B	892	PRO	ALA	conflict	UNP P0DTC2
B	899	PRO	ALA	conflict	UNP P0DTC2
B	942	PRO	ALA	conflict	UNP P0DTC2
B	986	PRO	LYS	conflict	UNP P0DTC2
B	987	PRO	VAL	conflict	UNP P0DTC2
B	1214	SER	-	expression tag	UNP P0DTC2
B	1215	GLY	-	expression tag	UNP P0DTC2

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

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Chain	Residue	Modelled	Actual	Comment	Reference
B	1258	HIS	-	expression tag	UNP P0DTC2
B	1259	HIS	-	expression tag	UNP P0DTC2
C	?	-	ARG	deletion	UNP P0DTC2
C	?	-	ARG	deletion	UNP P0DTC2
C	?	-	ARG	deletion	UNP P0DTC2
C	817	PRO	PHE	conflict	UNP P0DTC2
C	892	PRO	ALA	conflict	UNP P0DTC2
C	899	PRO	ALA	conflict	UNP P0DTC2
C	942	PRO	ALA	conflict	UNP P0DTC2
C	986	PRO	LYS	conflict	UNP P0DTC2
C	987	PRO	VAL	conflict	UNP P0DTC2
C	1214	SER	-	expression tag	UNP P0DTC2
C	1215	GLY	-	expression tag	UNP P0DTC2
C	1216	ARG	-	expression tag	UNP P0DTC2
C	1217	LEU	-	expression tag	UNP P0DTC2
C	1218	VAL	-	expression tag	UNP P0DTC2
C	1219	PRO	-	expression tag	UNP P0DTC2
C	1220	ARG	-	expression tag	UNP P0DTC2
C	1221	GLY	-	expression tag	UNP P0DTC2
C	1222	SER	-	expression tag	UNP P0DTC2
C	1223	PRO	-	expression tag	UNP P0DTC2
C	1224	GLY	-	expression tag	UNP P0DTC2
C	1225	SER	-	expression tag	UNP P0DTC2
C	1226	GLY	-	expression tag	UNP P0DTC2
C	1227	TYR	-	expression tag	UNP P0DTC2
C	1228	ILE	-	expression tag	UNP P0DTC2
C	1229	PRO	-	expression tag	UNP P0DTC2
C	1230	GLU	-	expression tag	UNP P0DTC2
C	1231	ALA	-	expression tag	UNP P0DTC2
C	1232	PRO	-	expression tag	UNP P0DTC2
C	1233	ARG	-	expression tag	UNP P0DTC2
C	1234	ASP	-	expression tag	UNP P0DTC2
C	1235	GLY	-	expression tag	UNP P0DTC2
C	1236	GLN	-	expression tag	UNP P0DTC2
C	1237	ALA	-	expression tag	UNP P0DTC2
C	1238	TYR	-	expression tag	UNP P0DTC2
C	1239	VAL	-	expression tag	UNP P0DTC2
C	1240	ARG	-	expression tag	UNP P0DTC2
C	1241	LYS	-	expression tag	UNP P0DTC2
C	1242	ASP	-	expression tag	UNP P0DTC2
C	1243	GLY	-	expression tag	UNP P0DTC2
C	1244	GLU	-	expression tag	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
C	1245	TRP	-	expression tag	UNP P0DTC2
C	1246	VAL	-	expression tag	UNP P0DTC2
C	1247	LEU	-	expression tag	UNP P0DTC2
C	1248	LEU	-	expression tag	UNP P0DTC2
C	1249	SER	-	expression tag	UNP P0DTC2
C	1250	THR	-	expression tag	UNP P0DTC2
C	1251	PHE	-	expression tag	UNP P0DTC2
C	1252	LEU	-	expression tag	UNP P0DTC2
C	1253	GLY	-	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	HIS	-	expression tag	UNP P0DTC2
C	1259	HIS	-	expression tag	UNP P0DTC2

- Molecule 2 is a protein called C1717 Fab Heavy Chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	H	119	918	582	156	176	4	1	0
2	D	119	918	582	156	176	4	1	0
2	F	119	918	582	156	176	4	1	0

- Molecule 3 is a protein called C1717 Fab Light Chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	L	110	798	488	141	166	3	0	0
3	E	110	798	488	141	166	3	0	0
3	G	110	798	488	141	166	3	0	0

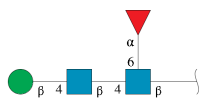
- Molecule 4 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.





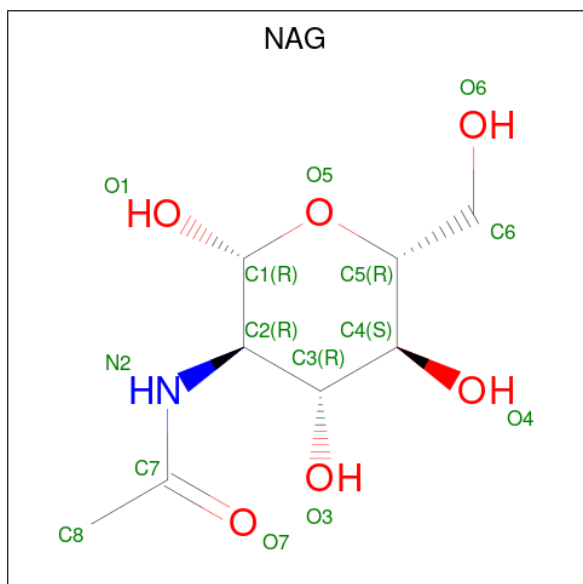
Mol	Chain	Residues	Atoms				AltConf	Trace
4	I	2	Total	C	N	O	0	0
			28	16	2	10		
4	J	2	Total	C	N	O	0	0
			28	16	2	10		
4	M	2	Total	C	N	O	0	0
			28	16	2	10		
4	N	2	Total	C	N	O	0	0
			28	16	2	10		
4	O	2	Total	C	N	O	0	0
			28	16	2	10		
4	P	2	Total	C	N	O	0	0
			28	16	2	10		

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



Mol	Chain	Residues	Atoms				AltConf	Trace
5	K	4	Total	C	N	O	0	0
			49	28	2	19		

- Molecule 6 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula:  $C_8H_{15}NO_6$ ).



Mol	Chain	Residues	Atoms				AltConf
6	A	1	Total	C	N	O	0
			140	80	10	50	
6	A	1	Total	C	N	O	0
			140	80	10	50	
6	A	1	Total	C	N	O	0
			140	80	10	50	
6	A	1	Total	C	N	O	0
			140	80	10	50	
6	A	1	Total	C	N	O	0
			140	80	10	50	
6	A	1	Total	C	N	O	0
			140	80	10	50	
6	A	1	Total	C	N	O	0
			140	80	10	50	
6	A	1	Total	C	N	O	0
			140	80	10	50	
6	A	1	Total	C	N	O	0
			140	80	10	50	
6	B	1	Total	C	N	O	0
			112	64	8	40	
6	B	1	Total	C	N	O	0
			112	64	8	40	
6	B	1	Total	C	N	O	0
			112	64	8	40	
6	B	1	Total	C	N	O	0
			112	64	8	40	
6	B	1	Total	C	N	O	0
			112	64	8	40	
6	B	1	Total	C	N	O	0
			112	64	8	40	
6	B	1	Total	C	N	O	0
			112	64	8	40	
6	B	1	Total	C	N	O	0
			112	64	8	40	
6	C	1	Total	C	N	O	0
			126	72	9	45	
6	C	1	Total	C	N	O	0
			126	72	9	45	
6	C	1	Total	C	N	O	0
			126	72	9	45	
6	C	1	Total	C	N	O	0
			126	72	9	45	

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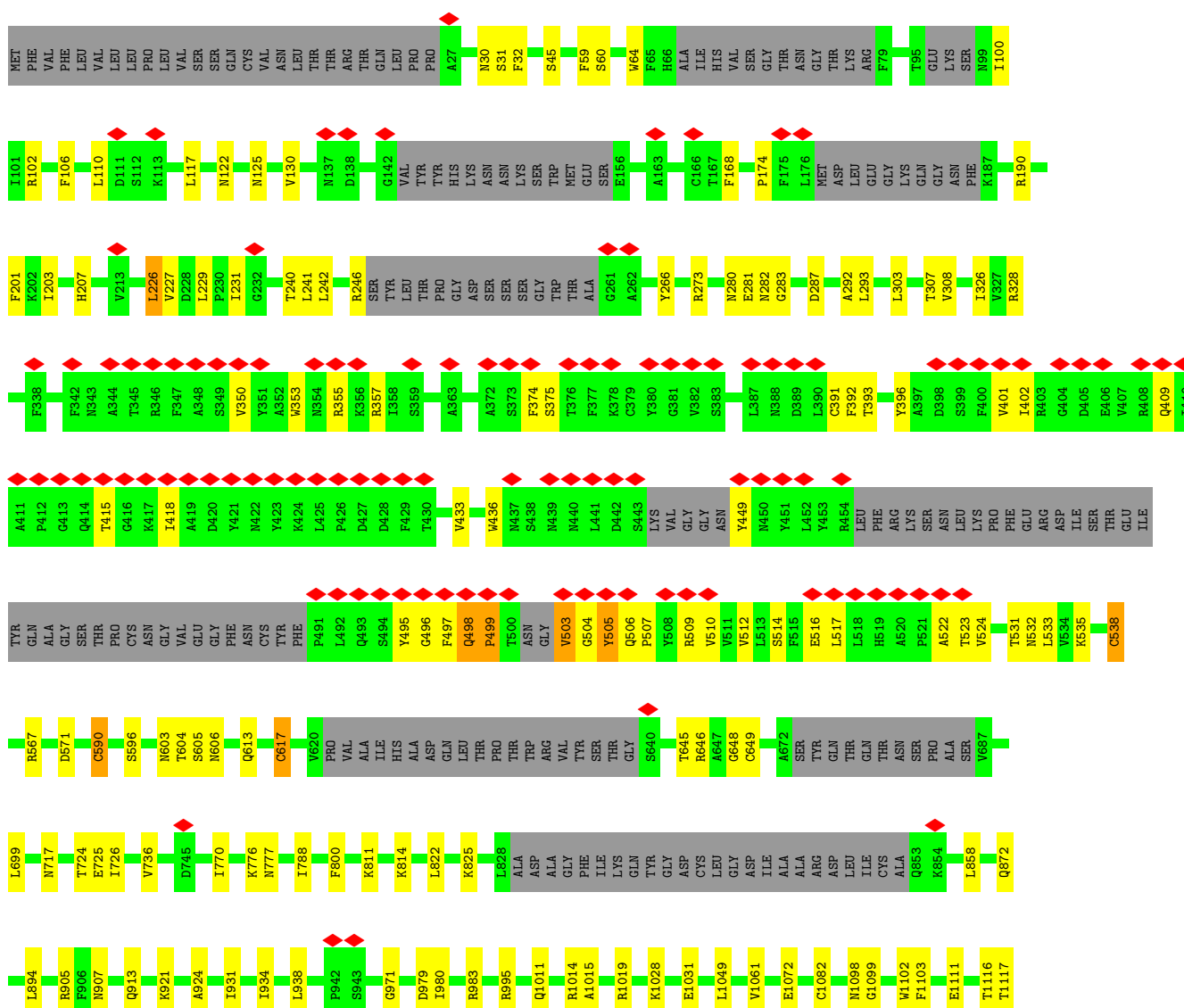
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Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
6	C	1	Total 126	C 72	N 9	O 45	0
6	C	1	Total 126	C 72	N 9	O 45	0
6	C	1	Total 126	C 72	N 9	O 45	0
6	C	1	Total 126	C 72	N 9	O 45	0
6	C	1	Total 126	C 72	N 9	O 45	0

### 3 Residue-property plots i

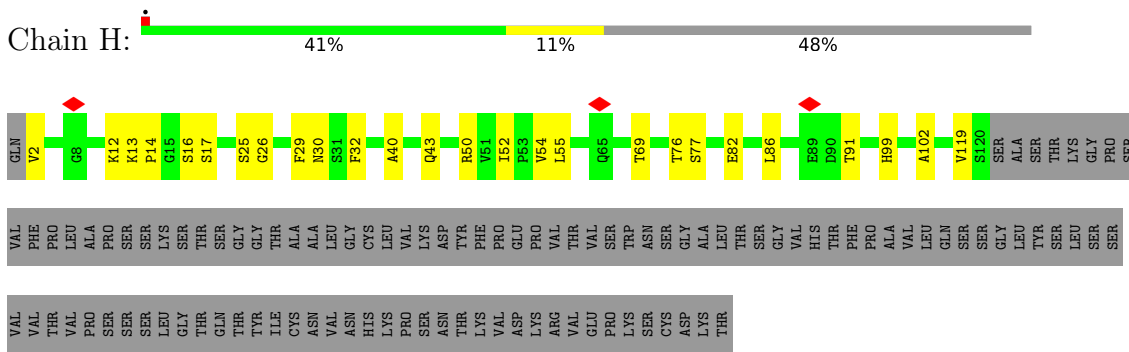
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

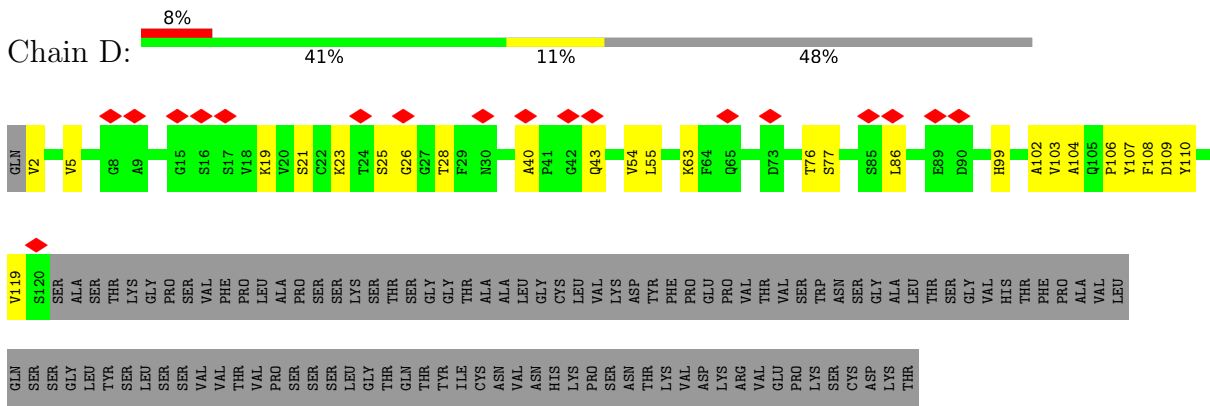




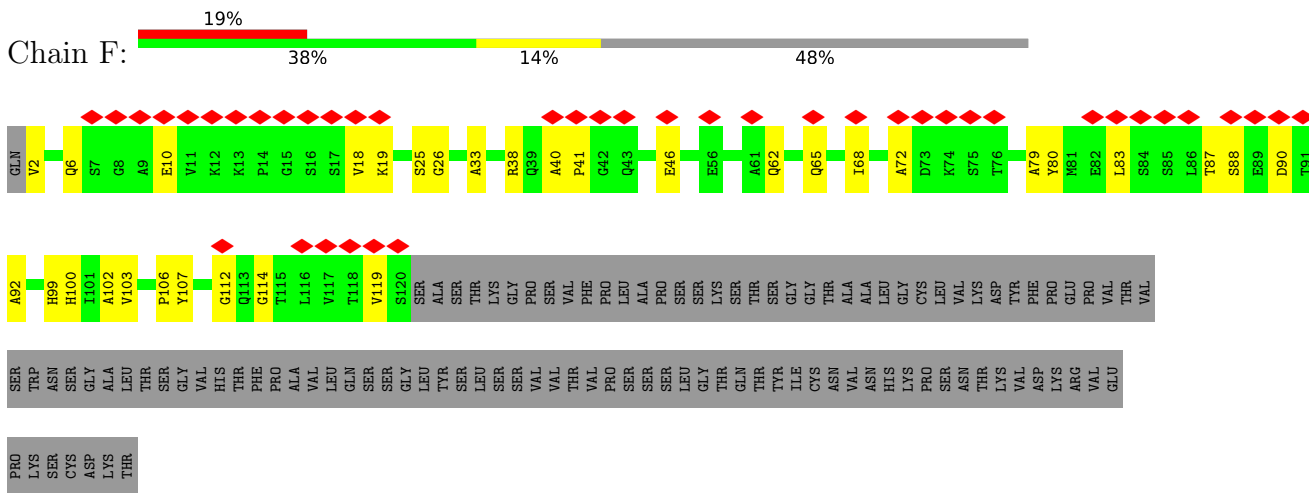




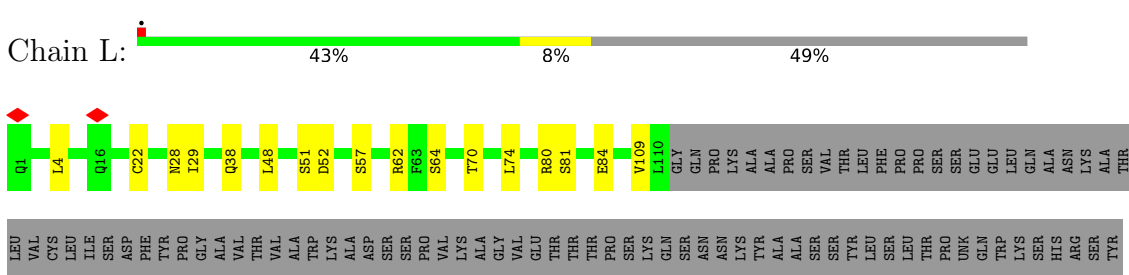
• Molecule 2: C1717 Fab Heavy Chain



• Molecule 2: C1717 Fab Heavy Chain



• Molecule 3: C1717 Fab Light Chain



SER  
CYS  
GLN  
VAL  
THR  
THR  
HIS  
GLU  
GLY  
SER  
THR  
THR  
VAL  
GLU  
LYS  
LYS  
THR  
VAL  
VAL  
ALA  
ALA  
PRO  
PRO  
THR  
THR  
GLU  
GLY  
CYS  
SER

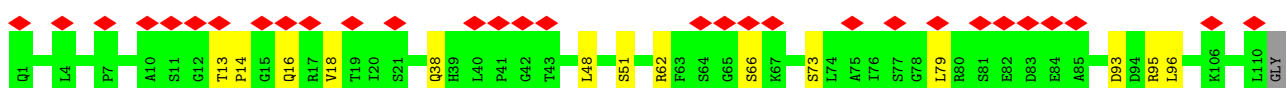
● Molecule 3: C1717 Fab Light Chain



PRO  
SER  
SER  
GLU  
GLY  
LEU  
LEU  
GLN  
ALA  
ASN  
LYS  
SER  
ALA  
LYS  
THR  
LEU  
VAL  
VAL  
CYS  
GLN  
VAL  
LEU  
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HIS  
SER  
SER  
TYR  
SER  
CYS  
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HIS  
SER  
GLY  
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CYS  
SER

● Molecule 3: C1717 Fab Light Chain



GLN  
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ALA  
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VAL  
THR  
THR  
PHE  
LEU  
PRO  
PRO  
SER  
SER  
SER  
UNK  
GLN  
GLY  
LEU  
LEU  
GLN  
ALA  
ASN  
LYS  
SER  
ALA  
THR  
TYR  
SER  
SER  
CYS  
GLN  
VAL  
VAL  
THR  
THR  
HIS  
SER  
GLY  
PHE  
ASP  
TYR  
PRO  
GLY  
VAL  
ALA  
VAL  
VAL  
THR  
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VAL  
ALA  
ALA  
LYS  
LYS  
ALA  
ASP  
SER  
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PRO  
PRO  
VAL  
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LYS  
LYS  
GLY  
VAL  
VAL  
GLU  
THR  
THR  
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THR  
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GLN

SER  
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LYS  
TYR  
ALA  
ALA  
SER  
SER  
TYR  
LEU  
SER  
LEU  
THR  
PRO  
UNK  
GLN  
TRP  
LYS  
SER  
HIS  
SER  
ARG  
SER  
TYR  
SER  
SER  
CYS  
GLN  
VAL  
VAL  
THR  
THR  
HIS  
GLY  
GLY  
SER  
THR  
VAL  
GLY  
VAL  
LYS  
THR  
THR  
VAL  
ALA  
ALA  
PRO  
THR  
CYS  
SER

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



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



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







- 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 5: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	636528	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	60	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	2.951	Depositor
Minimum map value	-2.023	Depositor
Average map value	-0.001	Depositor
Map value standard deviation	0.055	Depositor
Recommended contour level	0.262	Depositor
Map size (Å)	368.064, 368.064, 368.064	wwPDB
Map dimensions	432, 432, 432	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.852, 0.852, 0.852	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, BMA, FUC

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	0.30	0/7557	0.63	8/10304 (0.1%)
1	B	0.32	1/7669 (0.0%)	0.65	6/10455 (0.1%)
1	C	0.33	1/7515 (0.0%)	0.64	5/10257 (0.0%)
2	D	0.26	0/940	0.53	0/1278
2	F	0.25	0/940	0.52	0/1278
2	H	0.27	0/940	0.53	0/1278
3	E	0.25	0/814	0.51	0/1107
3	G	0.26	0/814	0.54	0/1107
3	L	0.27	0/814	0.57	0/1107
All	All	0.31	2/28003 (0.0%)	0.62	19/38171 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	B	0	3
1	C	0	1
All	All	0	5

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	379	CYS	CB-SG	5.94	1.92	1.82
1	B	379	CYS	CB-SG	5.92	1.92	1.82

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	432	CYS	CA-CB-SG	12.63	136.73	114.00
1	C	662	CYS	CA-CB-SG	10.96	133.72	114.00
1	B	432	CYS	CA-CB-SG	10.26	132.46	114.00
1	B	234	ASN	CB-CA-C	-7.87	94.65	110.40
1	A	538	CYS	CA-CB-SG	7.74	127.93	114.00
1	A	717	ASN	N-CA-CB	7.18	123.53	110.60
1	A	590	CYS	CA-CB-SG	6.70	126.06	114.00
1	A	1126	CYS	CA-CB-SG	6.70	126.07	114.00
1	A	282	ASN	CB-CA-C	6.23	122.86	110.40
1	B	131	CYS	CA-CB-SG	5.97	124.74	114.00
1	C	61	ASN	CB-CA-C	5.93	122.27	110.40
1	A	617	CYS	CA-CB-SG	5.79	124.41	114.00
1	C	671	CYS	CA-CB-SG	5.54	123.97	114.00
1	A	283	GLY	N-CA-C	5.46	126.76	113.10
1	A	226	LEU	CA-CB-CG	5.46	127.86	115.30
1	C	61	ASN	N-CA-CB	-5.36	100.95	110.60
1	B	131	CYS	CB-CA-C	5.31	121.02	110.40
1	B	1126	CYS	CA-CB-SG	5.29	123.52	114.00
1	B	463	PRO	CA-N-CD	-5.28	104.10	111.50

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	983	ARG	Sidechain
1	B	1039	ARG	Sidechain
1	B	567	ARG	Sidechain
1	B	995	ARG	Sidechain
1	C	567	ARG	Sidechain

## 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	7393	0	7101	108	0
1	B	7505	0	7203	112	0
1	C	7355	0	6980	122	0
2	D	918	0	891	15	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	F	918	0	891	24	0
2	H	918	0	891	17	0
3	E	798	0	769	8	0
3	G	798	0	769	9	0
3	L	798	0	769	13	0
4	I	28	0	25	0	0
4	J	28	0	25	0	0
4	M	28	0	25	1	0
4	N	28	0	25	3	0
4	O	28	0	25	0	0
4	P	28	0	25	0	0
5	K	49	0	43	0	0
6	A	140	0	130	6	0
6	B	112	0	104	4	0
6	C	126	0	117	3	0
All	All	27996	0	26808	407	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 7.

All (407) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:605:SER:HG	2:F:2:VAL:N	1.61	0.98
1:A:226:LEU:HD23	1:A:227:VAL:HG23	1.48	0.95
1:B:379:CYS:HA	1:B:432:CYS:HB3	1.48	0.95
1:C:379:CYS:HA	1:C:432:CYS:HB3	1.51	0.93
1:C:1134:ASN:HB3	6:C:1309:NAG:HN2	1.41	0.85
1:A:1135:ASN:OD1	1:A:1136:THR:N	2.10	0.83
1:B:604:THR:HG21	1:B:687:VAL:HG11	1.61	0.82
1:B:106:PHE:HB2	1:B:117:LEU:HB3	1.61	0.82
1:B:1126:CYS:HB2	1:B:1132:ILE:HD13	1.61	0.82
1:B:203:ILE:HG12	1:B:227:VAL:HG22	1.63	0.80
1:C:216:LEU:HD11	1:C:266:TYR:HE2	1.46	0.79
1:B:158:ARG:O	1:B:160:TYR:N	2.17	0.76
1:C:1129:VAL:HG13	1:C:1132:ILE:HG21	1.67	0.76
1:A:788:ILE:HD12	1:A:872:GLN:HE22	1.51	0.75
3:E:38:GLN:HG2	3:E:48:LEU:HD11	1.69	0.74
1:C:650:LEU:HD21	1:C:653:ALA:HB3	1.69	0.74
1:C:517:LEU:HG	1:C:518:LEU:HG	1.67	0.74
1:A:603:ASN:OD1	6:A:1306:NAG:N2	2.22	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:34:ARG:NH2	1:C:191:GLU:OE2	2.21	0.73
1:C:918:GLU:N	1:C:918:GLU:OE1	2.21	0.73
1:B:104:TRP:HD1	1:B:238:PHE:HZ	1.37	0.73
1:A:436:TRP:HE1	1:A:509:ARG:HH21	1.34	0.72
1:A:1129:VAL:HB	1:A:1132:ILE:HD11	1.71	0.72
1:B:379:CYS:HA	1:B:432:CYS:CB	2.18	0.72
1:A:229:LEU:HD22	1:A:231:ILE:HB	1.72	0.72
1:C:378:LYS:NZ	1:C:380:TYR:OH	2.22	0.72
1:B:293:LEU:HD23	2:H:102:ALA:HB2	1.70	0.71
1:B:130:VAL:HG11	1:B:231:ILE:HG23	1.73	0.71
1:B:801:ASN:OD1	6:B:1306:NAG:N2	2.23	0.71
1:B:61:ASN:O	1:B:62:VAL:HG22	1.91	0.70
1:C:293:LEU:HD23	2:F:102:ALA:HB2	1.72	0.70
1:A:596:SER:OG	1:A:613:GLN:NE2	2.23	0.70
1:C:216:LEU:HD11	1:C:266:TYR:CE2	2.27	0.70
1:C:90:VAL:HG13	1:C:267:VAL:HG13	1.75	0.69
2:F:62:GLN:O	2:F:65:GLN:NE2	2.25	0.69
1:B:96:GLU:OE2	1:B:190:ARG:NH1	2.25	0.69
1:B:770:ILE:HD11	1:B:1012:LEU:HD23	1.74	0.69
1:C:1106:GLN:HE21	1:C:1109:PHE:HB3	1.57	0.69
1:A:604:THR:O	2:D:2:VAL:N	2.25	0.69
1:A:122:ASN:OD1	1:A:125:ASN:N	2.24	0.68
1:B:384:PRO:HA	1:B:387:LEU:HD23	1.75	0.68
1:C:278:LYS:NZ	3:G:51:SER:OG	2.20	0.68
1:A:596:SER:HG	1:A:613:GLN:HE21	1.38	0.67
1:A:293:LEU:HD23	2:D:102:ALA:HB2	1.76	0.67
1:B:134:GLN:HE21	1:B:162:SER:HB3	1.60	0.67
1:B:367:VAL:HG23	1:B:368:LEU:HD12	1.78	0.66
1:A:606:ASN:HD21	2:D:28:THR:HA	1.60	0.66
1:C:560:LEU:HG	1:C:561:PRO:HD2	1.78	0.66
1:C:605:SER:OG	2:F:2:VAL:N	2.29	0.65
1:B:905:ARG:NH1	1:B:1049:LEU:O	2.28	0.65
1:B:1017:GLU:HG2	1:C:1019:ARG:HH22	1.62	0.65
1:C:931:ILE:O	1:C:934:ILE:HG22	1.97	0.64
1:B:931:ILE:O	1:B:934:ILE:HG22	1.98	0.64
1:B:433:VAL:HG23	1:B:512:VAL:HG12	1.80	0.63
1:B:129:LYS:HA	1:B:168:PHE:O	1.98	0.63
1:B:1134:ASN:OD1	6:B:1308:NAG:N2	2.30	0.63
1:C:439:ASN:OD1	1:C:443:SER:OG	2.14	0.63
1:B:689:SER:O	1:B:690:GLN:HG3	1.99	0.63
1:A:894:LEU:HB3	1:C:713:ALA:HB3	1.80	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:605:SER:HG	2:H:2:VAL:N	1.97	0.63
2:H:12:LYS:NZ	2:H:17:SER:O	2.32	0.63
1:C:654:GLU:OE2	1:C:691:SER:OG	2.17	0.62
1:C:568:ASP:OD1	1:C:569:ILE:N	2.32	0.62
1:C:231:ILE:HG12	1:C:233:ILE:HG23	1.80	0.62
3:L:38:GLN:HB2	3:L:48:LEU:HD11	1.81	0.62
2:F:19:LYS:HD2	2:F:80:TYR:HB3	1.82	0.62
1:C:738:CYS:SG	1:C:739:THR:N	2.73	0.61
1:B:278:LYS:NZ	3:L:51:SER:OG	2.26	0.61
1:C:324:GLU:O	1:C:539:VAL:HG13	1.99	0.61
1:A:770:ILE:HD11	1:A:1015:ALA:HB2	1.82	0.61
1:A:726:ILE:HG12	1:A:1061:VAL:HG22	1.83	0.61
1:A:1098:ASN:OD1	1:A:1099:GLY:N	2.31	0.61
1:C:383:SER:OG	1:C:386:LYS:HG3	2.01	0.61
1:A:117:LEU:HD12	1:A:231:ILE:HD13	1.81	0.60
1:B:140:PHE:O	1:B:158:ARG:NH1	2.35	0.60
2:F:99:HIS:CD2	2:F:100:HIS:H	2.18	0.60
1:A:355:ARG:HG2	1:A:357:ARG:NH1	2.17	0.60
1:A:498:GLN:CB	1:A:499:PRO:HD3	2.31	0.60
1:A:905:ARG:NH1	1:A:1049:LEU:O	2.35	0.60
4:N:1:NAG:O3	4:N:2:NAG:O5	2.17	0.60
6:A:1303:NAG:H83	6:A:1303:NAG:H3	1.83	0.59
1:B:976:VAL:HG23	1:B:979:ASP:HB2	1.84	0.59
1:A:1103:PHE:HZ	6:A:1309:NAG:H62	1.66	0.59
1:C:64:TRP:CD1	1:C:266:TYR:HE1	2.21	0.59
1:C:811:LYS:HG3	1:C:812:PRO:HD2	1.84	0.59
1:B:53:ASP:OD1	1:B:54:LEU:N	2.33	0.59
1:A:497:PHE:O	1:A:498:GLN:C	2.40	0.58
1:C:495:TYR:OH	1:C:505:TYR:O	2.22	0.58
1:C:770:ILE:HD11	1:C:1012:LEU:HD23	1.84	0.58
2:F:41:PRO:HD3	2:F:92:ALA:HA	1.86	0.58
1:A:122:ASN:HD21	1:A:125:ASN:HB2	1.69	0.58
4:M:1:NAG:H83	4:M:1:NAG:H3	1.85	0.58
1:B:555:SER:OG	1:B:586:ASP:HB2	2.04	0.58
1:A:449:TYR:HE1	1:A:496:GLY:HA2	1.68	0.57
1:C:379:CYS:HA	1:C:432:CYS:CB	2.31	0.57
1:B:715:PRO:HA	1:B:1072:GLU:HA	1.87	0.57
1:A:45:SER:OG	1:A:281:GLU:O	2.20	0.56
1:C:231:ILE:HG23	1:C:233:ILE:HG12	1.87	0.56
2:D:86:LEU:HD21	2:D:119:VAL:HG21	1.87	0.56
1:A:777:ASN:OD1	1:A:1019:ARG:NH1	2.38	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:A:1305:NAG:H83	6:A:1305:NAG:H3	1.88	0.56
2:D:109:ASP:OD1	2:D:110:TYR:N	2.39	0.56
1:C:34:ARG:HH22	1:C:189:LEU:HD11	1.71	0.56
3:L:84:GLU:OE2	3:L:109:VAL:N	2.37	0.56
1:C:299:THR:HG22	1:C:308:VAL:HG11	1.88	0.56
1:B:115:GLN:HA	1:B:132:GLU:HG3	1.88	0.56
1:C:328:ARG:O	1:C:329:PHE:HD1	1.89	0.55
1:C:1134:ASN:OD1	1:C:1135:ASN:N	2.39	0.55
1:C:84:LEU:HD12	1:C:85:PRO:HD2	1.87	0.55
1:A:506:GLN:OE1	1:A:507:PRO:HD2	2.06	0.55
1:B:331:ASN:HB3	6:B:1304:NAG:N2	2.22	0.55
1:C:1125:ASN:ND2	1:C:1127:ASP:OD2	2.39	0.55
1:C:664:ILE:O	1:C:672:ALA:N	2.35	0.55
1:A:303:LEU:HD23	1:A:308:VAL:HG12	1.88	0.54
1:C:1126:CYS:HB2	1:C:1132:ILE:HD11	1.89	0.54
1:A:503:VAL:HG13	1:A:505:TYR:CE1	2.43	0.54
1:B:809:PRO:HA	1:B:814:LYS:HD3	1.89	0.54
1:A:402:ILE:HD11	1:A:510:VAL:HG21	1.89	0.54
1:C:367:VAL:HG23	1:C:368:LEU:HD22	1.89	0.54
1:C:336:CYS:SG	1:C:358:ILE:HG23	2.48	0.54
1:C:604:THR:O	2:F:2:VAL:N	2.41	0.54
1:A:31:SER:OG	1:A:60:SER:N	2.41	0.54
1:C:905:ARG:NH1	1:C:1049:LEU:O	2.40	0.53
1:A:433:VAL:HG23	1:A:512:VAL:HG22	1.91	0.53
1:B:296:LEU:O	1:B:299:THR:HG22	2.08	0.53
1:C:656:VAL:HG11	1:C:693:ILE:HD12	1.90	0.53
2:F:40:ALA:HA	2:F:92:ALA:HA	1.89	0.53
1:A:393:THR:HA	1:A:522:ALA:HA	1.89	0.53
1:C:28:TYR:HD2	6:C:1301:NAG:O5	1.91	0.53
1:B:604:THR:O	2:H:2:VAL:N	2.41	0.53
1:C:761:THR:HG22	1:C:765:ARG:NH1	2.23	0.53
1:B:334:ASN:O	1:B:362:VAL:HG12	2.07	0.53
1:B:596:SER:OG	1:B:613:GLN:OE1	2.21	0.53
2:F:33:ALA:HB3	2:F:99:HIS:HB3	1.90	0.53
1:B:1017:GLU:HG2	1:C:1019:ARG:NH2	2.23	0.53
1:C:130:VAL:HG12	1:C:168:PHE:HB3	1.90	0.53
1:C:170:TYR:CE2	1:C:172:SER:HB2	2.44	0.53
1:C:231:ILE:HD13	1:C:233:ILE:HD13	1.91	0.52
1:C:1129:VAL:HG13	1:C:1132:ILE:CG2	2.39	0.52
1:C:741:TYR:CE1	1:C:966:LEU:HD11	2.45	0.52
1:A:800:PHE:HE1	1:A:924:ALA:HA	1.73	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:A:1302:NAG:H3	6:A:1302:NAG:H83	1.91	0.52
1:A:280:ASN:OD1	1:A:281:GLU:N	2.40	0.52
1:A:1011:GLN:OE1	1:A:1014:ARG:NH1	2.43	0.52
1:A:287:ASP:OD2	2:D:104:ALA:HB3	2.10	0.51
1:A:374:PHE:HA	1:A:436:TRP:HB3	1.92	0.51
1:B:560:LEU:HB3	1:B:561:PRO:HD2	1.92	0.51
1:C:715:PRO:HA	1:C:1071:GLN:O	2.10	0.51
1:B:199:GLY:HA2	1:B:232:GLY:HA2	1.92	0.51
1:B:552:LEU:HD23	1:B:585:LEU:HD13	1.92	0.51
1:B:707:TYR:HD1	1:C:883:THR:HG23	1.76	0.51
1:C:816:SER:OG	1:C:819:GLU:HG2	2.10	0.51
1:A:130:VAL:HG12	1:A:130:VAL:O	2.11	0.51
1:B:393:THR:HA	1:B:522:ALA:HA	1.92	0.51
1:B:492:LEU:H	1:B:492:LEU:HD23	1.75	0.51
1:B:1125:ASN:ND2	1:B:1127:ASP:OD2	2.44	0.51
1:A:396:TYR:HB2	1:A:514:SER:OG	2.11	0.51
1:C:334:ASN:O	1:C:362:VAL:HG12	2.11	0.51
1:A:503:VAL:O	1:A:505:TYR:N	2.42	0.51
1:A:1072:GLU:OE1	1:A:1072:GLU:N	2.44	0.51
1:A:1103:PHE:CZ	6:A:1309:NAG:H62	2.45	0.51
1:C:87:ASN:OD1	1:C:88:ASP:N	2.43	0.51
1:B:748:GLU:O	1:B:752:LEU:HD12	2.11	0.51
1:B:983:ARG:HH11	1:B:983:ARG:CB	2.23	0.51
1:C:438:SER:O	1:C:438:SER:OG	2.27	0.50
1:B:316:SER:OG	1:B:317:ASN:N	2.44	0.50
1:A:776:LYS:HE3	1:A:1019:ARG:HH22	1.76	0.50
1:A:1139:ASP:OD1	1:A:1139:ASP:N	2.43	0.50
3:L:28:ASN:OD1	3:L:29:ILE:N	2.44	0.50
3:E:55:ARG:NH1	3:E:59:VAL:O	2.44	0.50
1:A:357:ARG:HH21	1:A:396:TYR:HA	1.77	0.50
1:A:907:ASN:HD22	1:A:913:GLN:HE21	1.59	0.50
1:C:1014:ARG:O	1:C:1017:GLU:HG2	2.12	0.50
2:F:87:THR:N	2:F:90:ASP:OD2	2.36	0.50
2:F:6:GLN:NE2	2:F:114:GLY:H	2.09	0.50
1:A:355:ARG:HG2	1:A:357:ARG:HH12	1.75	0.50
1:A:495:TYR:HB3	1:A:497:PHE:CE1	2.47	0.50
1:B:214:ARG:H	1:B:214:ARG:HD3	1.76	0.50
1:B:331:ASN:HB3	6:B:1304:NAG:C7	2.42	0.50
2:H:54:VAL:HG13	2:H:55:LEU:HD13	1.93	0.50
3:L:4:LEU:HD21	3:L:29:ILE:HD11	1.94	0.50
3:L:80:ARG:HG2	3:L:81:SER:H	1.76	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:117:LEU:HD13	1:B:231:ILE:HD13	1.94	0.49
1:B:662:CYS:HB2	1:B:697:MET:HB3	1.95	0.49
1:B:200:TYR:HE2	1:B:230:PRO:HB3	1.77	0.49
1:C:200:TYR:CE1	1:C:230:PRO:HB3	2.47	0.49
1:C:811:LYS:NZ	1:C:820:ASP:OD2	2.32	0.49
1:A:449:TYR:CE1	1:A:496:GLY:HA2	2.45	0.49
1:C:1090:PRO:HG3	1:C:1095:PHE:CE2	2.48	0.49
1:B:983:ARG:HH11	1:B:983:ARG:HB3	1.77	0.49
3:L:4:LEU:HD23	3:L:22:CYS:SG	2.52	0.49
2:F:6:GLN:HE21	2:F:114:GLY:H	1.61	0.49
1:C:1126:CYS:HB2	1:C:1132:ILE:CD1	2.43	0.49
1:C:743:CYS:SG	1:C:750:SER:N	2.85	0.48
2:F:38:ARG:O	2:F:46:GLU:N	2.40	0.48
1:B:328:ARG:HG3	1:B:543:PHE:HE1	1.79	0.48
1:C:853:GLN:O	1:C:854:LYS:HE2	2.13	0.48
1:C:912:THR:OG1	1:C:914:ASN:OD1	2.17	0.48
1:A:503:VAL:C	1:A:505:TYR:H	2.16	0.48
1:A:506:GLN:CD	1:A:507:PRO:HD2	2.33	0.48
1:C:726:ILE:HG12	1:C:1061:VAL:HG22	1.95	0.48
3:E:28:ASN:OD1	3:E:29:ILE:HG12	2.13	0.48
1:C:595:VAL:HG22	1:C:612:TYR:HD1	1.79	0.48
1:C:1077:THR:HG22	1:C:1078:ALA:N	2.29	0.48
1:C:814:LYS:HG3	1:C:814:LYS:O	2.14	0.48
1:B:83:VAL:HG21	1:B:237:ARG:HH21	1.78	0.47
1:B:106:PHE:HB3	1:B:235:ILE:HG23	1.96	0.47
1:B:1116:THR:HG22	1:B:1117:THR:N	2.29	0.47
1:C:560:LEU:HD23	1:C:562:PHE:CE2	2.49	0.47
1:C:1105:THR:HG22	1:C:1112:PRO:HA	1.96	0.47
2:D:25:SER:OG	2:D:26:GLY:N	2.48	0.47
3:G:66:SER:OG	3:G:73:SER:OG	2.32	0.47
1:B:212:LEU:HD12	1:B:212:LEU:O	2.14	0.47
1:B:426:PRO:HG2	1:B:429:PHE:HB2	1.96	0.47
1:C:646:ARG:HG3	1:C:646:ARG:O	2.13	0.47
1:B:131:CYS:CB	1:B:166:CYS:HA	2.44	0.47
1:A:393:THR:OG1	1:A:516:GLU:O	2.27	0.47
1:A:725:GLU:OE2	1:A:1028:LYS:NZ	2.48	0.47
1:B:176:LEU:HG	1:B:190:ARG:HD2	1.96	0.47
1:C:344:ALA:HB3	1:C:347:PHE:HE2	1.78	0.47
3:G:13:THR:HG23	3:G:16:GLN:OE1	2.13	0.47
1:A:646:ARG:HD2	1:A:646:ARG:O	2.15	0.47
1:A:921:LYS:HB2	1:A:921:LYS:HE2	1.65	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:329:PHE:O	1:B:580:GLN:NE2	2.45	0.47
1:C:36:VAL:HG11	1:C:220:PHE:CE2	2.50	0.47
2:F:25:SER:OG	2:F:26:GLY:N	2.47	0.47
3:G:93:ASP:OD2	3:G:96:LEU:N	2.41	0.47
1:C:551:VAL:HG22	1:C:588:THR:O	2.15	0.47
2:F:6:GLN:HE22	2:F:112:GLY:HA3	1.79	0.47
1:B:40:ASP:OD1	1:B:40:ASP:N	2.47	0.46
1:C:557:LYS:HB2	1:C:584:ILE:HG21	1.97	0.46
3:E:36:TRP:HD1	3:E:49:MET:HB2	1.80	0.46
1:B:203:ILE:CG1	1:B:227:VAL:HG22	2.41	0.46
2:H:29:PHE:HE2	2:H:77:SER:HA	1.80	0.46
1:A:102:ARG:HG3	1:A:102:ARG:HH11	1.81	0.46
1:B:567:ARG:HH11	1:B:567:ARG:HB2	1.80	0.46
1:B:707:TYR:CD1	1:C:883:THR:HG23	2.50	0.46
1:A:517:LEU:HD23	1:A:517:LEU:H	1.79	0.46
2:H:25:SER:OG	2:H:26:GLY:N	2.47	0.46
3:G:38:GLN:HB3	3:G:48:LEU:HD11	1.97	0.46
1:B:551:VAL:HG22	1:B:588:THR:O	2.16	0.46
1:B:786:LYS:HG3	1:B:787:GLN:HG3	1.97	0.46
1:C:617:CYS:HB3	1:C:649:CYS:HB3	1.90	0.46
1:C:736:VAL:HG22	1:C:858:LEU:HD23	1.97	0.46
1:B:309:GLU:HG2	1:B:313:TYR:OH	2.16	0.46
1:A:350:VAL:O	1:A:353:TRP:HE3	1.99	0.46
1:A:699:LEU:HD12	1:B:873:TYR:CZ	2.51	0.46
2:D:54:VAL:HG13	2:D:55:LEU:HG	1.97	0.46
1:A:497:PHE:CZ	1:A:507:PRO:HD3	2.51	0.45
1:B:1037:SER:OG	1:B:1039:ARG:HG2	2.16	0.45
1:C:973:ILE:HG23	1:C:992:GLN:OE1	2.15	0.45
1:A:617:CYS:HB3	1:A:649:CYS:HB3	1.92	0.45
1:C:391:CYS:HB3	1:C:524:VAL:O	2.17	0.45
1:C:867:ASP:OD1	1:C:868:GLU:N	2.50	0.45
1:C:36:VAL:HG11	1:C:220:PHE:CZ	2.51	0.45
6:C:1309:NAG:O7	6:C:1309:NAG:O3	2.29	0.45
1:A:409:GLN:NE2	1:A:415:THR:O	2.30	0.45
1:C:200:TYR:HE1	1:C:230:PRO:HB3	1.82	0.45
1:C:523:THR:HG23	1:C:524:VAL:HG23	1.99	0.45
1:C:531:THR:HG22	1:C:532:ASN:N	2.32	0.45
2:D:108:PHE:O	3:E:47:LEU:HD21	2.16	0.45
1:A:355:ARG:C	1:A:357:ARG:HH12	2.20	0.45
1:A:533:LEU:HD11	1:A:535:LYS:HE3	1.97	0.45
1:C:568:ASP:HB2	1:C:574:ASP:HB2	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:170:TYR:HE2	1:C:172:SER:HB2	1.81	0.45
1:C:338:PHE:CE2	1:C:358:ILE:HD13	2.51	0.45
1:C:662:CYS:HB3	1:C:671:CYS:HB2	1.81	0.45
1:B:121:ASN:OD1	1:B:126:VAL:HG12	2.17	0.44
1:C:28:TYR:CD1	1:C:63:THR:HA	2.52	0.44
1:A:538:CYS:HB3	1:A:590:CYS:HB3	1.81	0.44
1:A:979:ASP:OD1	1:A:980:ILE:N	2.51	0.44
1:C:94:SER:OG	1:C:101:ILE:HG13	2.17	0.44
1:A:30:ASN:HD21	1:A:59:PHE:HD1	1.63	0.44
1:C:48:LEU:HD21	1:C:278:LYS:HG3	1.99	0.44
1:C:205:SER:OG	1:C:226:LEU:HD22	2.17	0.44
2:F:18:VAL:HG12	2:F:83:LEU:HB2	2.00	0.44
1:A:1116:THR:HG22	1:A:1117:THR:N	2.32	0.44
1:B:273:ARG:NH2	1:B:290:ASP:OD1	2.51	0.44
1:C:948:LEU:O	1:C:951:VAL:HG22	2.17	0.44
1:A:168:PHE:CE2	1:A:229:LEU:HD21	2.52	0.44
1:A:724:THR:OG1	1:A:934:ILE:HD11	2.18	0.44
1:A:811:LYS:HE2	1:A:811:LYS:HB2	1.74	0.44
1:B:40:ASP:OD2	1:B:44:ARG:NH1	2.42	0.44
1:B:869:MET:HB3	1:B:869:MET:HE2	1.84	0.44
1:A:100:ILE:HG22	1:A:242:LEU:HB2	1.99	0.44
1:A:391:CYS:SG	1:A:392:PHE:N	2.90	0.44
1:C:541:PHE:CZ	1:C:587:ILE:HD13	2.52	0.44
1:A:872:GLN:OE1	1:C:699:LEU:HD13	2.18	0.44
2:H:50:ARG:NH1	2:H:52:ILE:HD11	2.33	0.44
1:A:523:THR:HG23	1:A:524:VAL:HG13	2.00	0.44
1:B:58:PHE:CE2	1:B:290:ASP:HB2	2.53	0.44
1:B:136:CYS:SG	1:B:159:VAL:HA	2.58	0.44
1:B:605:SER:HB3	1:B:607:GLN:OE1	2.18	0.44
1:C:342:PHE:HE2	1:C:511:VAL:HG21	1.83	0.44
1:C:533:LEU:HD23	1:C:533:LEU:H	1.83	0.44
2:F:83:LEU:HD23	2:F:83:LEU:HA	1.90	0.44
3:G:18:VAL:HG22	3:G:79:LEU:HD11	1.99	0.44
2:D:76:THR:O	2:D:77:SER:OG	2.34	0.43
1:A:645:THR:OG1	1:A:648:GLY:O	2.20	0.43
1:B:546:LEU:HD21	1:B:573:THR:HG21	2.00	0.43
3:L:64:SER:O	3:L:74:LEU:HD12	2.19	0.43
1:A:64:TRP:CD1	1:A:266:TYR:HE1	2.37	0.43
1:B:27:ALA:O	1:B:28:TYR:HD1	2.02	0.43
1:B:503:VAL:HA	1:B:506:GLN:NE2	2.32	0.43
1:C:914:ASN:O	1:C:918:GLU:OE1	2.37	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:65:PHE:CE2	1:B:84:LEU:HD21	2.54	0.43
1:B:101:ILE:HD12	1:B:265:TYR:OH	2.19	0.43
3:E:38:GLN:CG	3:E:48:LEU:HD11	2.44	0.43
1:A:375:SER:HB2	1:A:436:TRP:HA	2.00	0.43
1:C:124:THR:CG2	1:C:174:PRO:HG3	2.49	0.43
1:C:344:ALA:HB3	1:C:347:PHE:CE2	2.53	0.43
1:A:931:ILE:O	1:A:934:ILE:HG22	2.18	0.43
1:B:130:VAL:O	1:B:130:VAL:HG13	2.18	0.43
2:H:30:ASN:HA	2:H:54:VAL:HB	2.01	0.43
2:H:76:THR:O	2:H:77:SER:OG	2.34	0.43
2:D:103:VAL:HG21	2:D:107:TYR:HE1	1.82	0.43
1:A:106:PHE:HB2	1:A:117:LEU:HB3	2.01	0.43
1:A:307:THR:HB	3:E:57:SER:HB2	2.01	0.43
2:D:5:VAL:HG23	2:D:23:LYS:HB3	2.00	0.43
1:B:194:PHE:HD1	1:B:203:ILE:HG22	1.83	0.43
2:H:16:SER:O	2:H:86:LEU:HD23	2.18	0.43
1:A:30:ASN:OD1	1:A:59:PHE:HA	2.18	0.43
1:A:814:LYS:HE3	1:A:814:LYS:HB2	1.82	0.43
1:B:58:PHE:CD2	1:B:290:ASP:HB2	2.54	0.43
1:B:562:PHE:O	1:C:41:LYS:NZ	2.41	0.43
1:C:559:PHE:HB3	1:C:577:ARG:NH2	2.34	0.43
1:A:226:LEU:HD23	1:A:227:VAL:CG2	2.34	0.43
1:A:240:THR:HG22	1:A:241:LEU:N	2.34	0.43
1:B:454:ARG:HA	1:B:491:PRO:O	2.19	0.43
1:A:125:ASN:O	1:A:174:PRO:HG3	2.19	0.42
1:A:273:ARG:HE	1:A:292:ALA:HB3	1.84	0.42
1:C:124:THR:HG22	1:C:174:PRO:HG3	2.01	0.42
1:C:709:ASN:OD1	1:C:709:ASN:O	2.37	0.42
1:A:1082:CYS:HB2	1:A:1126:CYS:HB2	1.88	0.42
1:B:131:CYS:HB2	1:B:166:CYS:HA	2.02	0.42
1:B:326:ILE:O	1:B:326:ILE:HG13	2.19	0.42
1:A:326:ILE:O	1:A:326:ILE:HG13	2.19	0.42
1:B:726:ILE:HG13	1:B:1061:VAL:HG22	2.00	0.42
1:C:662:CYS:HB2	1:C:671:CYS:HB3	1.63	0.42
1:A:531:THR:HG22	1:A:532:ASN:N	2.34	0.42
1:A:822:LEU:HD21	1:A:938:LEU:HD21	2.01	0.42
1:C:56:LEU:HD12	1:C:57:PRO:HD2	2.00	0.42
2:F:88:SER:HA	2:F:119:VAL:HG11	2.02	0.42
1:A:350:VAL:HB	1:A:401:VAL:O	2.19	0.42
1:B:197:ILE:HD11	1:B:202:LYS:NZ	2.33	0.42
1:A:567:ARG:HD3	1:A:571:ASP:HA	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:379:CYS:CA	1:C:432:CYS:HB3	2.25	0.42
2:H:32:PHE:HD1	2:H:99:HIS:O	2.02	0.42
2:H:40:ALA:HB3	2:H:43:GLN:HB2	2.02	0.42
1:C:303:LEU:HD23	1:C:308:VAL:HG12	2.02	0.42
1:C:341:VAL:HG23	1:C:342:PHE:CD2	2.55	0.42
1:C:559:PHE:O	1:C:577:ARG:NH2	2.51	0.42
1:A:907:ASN:ND2	1:A:913:GLN:HE21	2.18	0.42
1:B:336:CYS:HB2	1:B:338:PHE:CE2	2.54	0.42
1:B:48:LEU:CD2	1:B:278:LYS:HG3	2.50	0.42
1:B:200:TYR:CE2	1:B:230:PRO:HB3	2.54	0.42
1:C:618:THR:O	1:C:618:THR:HG22	2.19	0.42
1:A:825:LYS:HA	1:A:825:LYS:HD3	1.83	0.41
1:B:121:ASN:OD1	1:B:122:ASN:N	2.53	0.41
1:B:216:LEU:HA	1:B:217:PRO:HD3	1.76	0.41
1:B:307:THR:HB	3:L:57:SER:HB2	2.02	0.41
1:B:334:ASN:O	1:B:362:VAL:N	2.41	0.41
1:C:361:CYS:O	1:C:524:VAL:HG13	2.19	0.41
2:F:10:GLU:HG3	2:F:18:VAL:HG21	2.01	0.41
2:F:72:ALA:HA	2:F:79:ALA:HA	2.02	0.41
2:F:103:VAL:HG11	2:F:107:TYR:HE1	1.85	0.41
3:G:95:ARG:HA	3:G:95:ARG:HD2	1.89	0.41
1:B:342:PHE:HE1	1:B:511:VAL:HG11	1.83	0.41
1:C:811:LYS:HG3	1:C:812:PRO:CD	2.49	0.41
1:B:603:ASN:OD1	4:N:1:NAG:H2	2.21	0.41
3:L:28:ASN:OD1	3:L:29:ILE:HG12	2.19	0.41
1:A:1031:GLU:OE1	1:C:1039:ARG:HB3	2.20	0.41
1:B:50:SER:OG	1:B:304:LYS:NZ	2.54	0.41
1:B:278:LYS:NZ	3:L:51:SER:O	2.53	0.41
1:B:603:ASN:OD1	4:N:1:NAG:H4	2.21	0.41
2:D:19:LYS:NZ	2:D:21:SER:HB3	2.35	0.41
1:B:1090:PRO:HG3	1:B:1095:PHE:CE2	2.55	0.41
3:G:13:THR:HA	3:G:14:PRO:HD3	1.95	0.41
1:A:201:PHE:HE2	1:A:203:ILE:HD11	1.85	0.41
1:A:418:ILE:HD12	1:A:418:ILE:H	1.85	0.41
1:A:971:GLY:C	1:A:995:ARG:HH11	2.24	0.41
1:B:328:ARG:HG3	1:B:543:PHE:CE1	2.56	0.41
1:B:398:ASP:HB2	1:B:512:VAL:CG2	2.50	0.41
2:H:13:LYS:HD2	2:H:14:PRO:HD2	2.02	0.41
2:D:99:HIS:NE2	2:D:106:PRO:HA	2.35	0.41
1:A:1111:GLU:OE1	1:A:1111:GLU:HA	2.20	0.41
1:C:462:LYS:HE3	1:C:462:LYS:HB2	1.67	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:L:51:SER:O	3:L:52:ASP:OD1	2.39	0.41
1:A:776:LYS:HE2	1:A:1019:ARG:HH12	1.86	0.41
1:C:328:ARG:C	1:C:329:PHE:HD1	2.25	0.41
2:H:91:THR:HB	2:H:119:VAL:HG22	2.03	0.41
1:A:190:ARG:HG2	1:A:207:HIS:ND1	2.36	0.41
2:H:29:PHE:CE2	2:H:77:SER:HA	2.55	0.40
2:D:40:ALA:HB3	2:D:43:GLN:HB2	2.02	0.40
1:A:604:THR:HG22	1:A:605:SER:OG	2.21	0.40
1:A:736:VAL:HG22	1:A:858:LEU:HG	2.03	0.40
1:B:33:THR:HA	1:B:58:PHE:CD1	2.56	0.40
3:L:70:THR:O	3:L:70:THR:HG22	2.22	0.40
1:A:328:ARG:HH21	1:A:533:LEU:HD23	1.86	0.40
1:B:822:LEU:O	1:B:826:VAL:HG12	2.22	0.40
3:E:34:VAL:HG22	3:E:52:ASP:OD1	2.22	0.40
1:A:1102:TRP:HB2	1:A:1135:ASN:ND2	2.37	0.40
1:B:538:CYS:HB2	1:B:590:CYS:HB3	1.89	0.40
1:C:211:ASN:HB2	3:G:95:ARG:NH1	2.36	0.40
2:H:69:THR:HB	2:H:82:GLU:OE1	2.22	0.40
2:F:68:ILE:HG12	2:F:83:LEU:HD21	2.03	0.40
2:F:99:HIS:NE2	2:F:106:PRO:HA	2.37	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	944/1256 (75%)	895 (95%)	44 (5%)	5 (0%)	29 68
1	B	959/1256 (76%)	901 (94%)	52 (5%)	6 (1%)	25 64
1	C	950/1256 (76%)	913 (96%)	37 (4%)	0	100 100
2	D	118/227 (52%)	111 (94%)	7 (6%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	F	118/227 (52%)	113 (96%)	5 (4%)	0	100	100
2	H	118/227 (52%)	112 (95%)	6 (5%)	0	100	100
3	E	108/216 (50%)	102 (94%)	5 (5%)	1 (1%)	17	56
3	G	108/216 (50%)	100 (93%)	7 (6%)	1 (1%)	17	56
3	L	108/216 (50%)	101 (94%)	6 (6%)	1 (1%)	17	56
All	All	3531/5097 (69%)	3348 (95%)	169 (5%)	14 (0%)	38	72

All (14) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	498	GLN
1	A	499	PRO
1	B	159	VAL
1	B	285	ILE
1	A	32	PHE
1	A	110	LEU
1	A	504	GLY
1	B	62	VAL
3	L	62	ARG
3	E	62	ARG
3	G	62	ARG
1	B	218	GLN
1	B	235	ILE
1	B	123	ALA

### 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	804/1096 (73%)	801 (100%)	3 (0%)	91	96
1	B	820/1096 (75%)	818 (100%)	2 (0%)	93	98
1	C	788/1096 (72%)	788 (100%)	0	100	100
2	D	98/192 (51%)	97 (99%)	1 (1%)	76	88

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	F	98/192 (51%)	98 (100%)	0	100	100
2	H	98/192 (51%)	98 (100%)	0	100	100
3	E	90/180 (50%)	90 (100%)	0	100	100
3	G	90/180 (50%)	90 (100%)	0	100	100
3	L	90/180 (50%)	90 (100%)	0	100	100
All	All	2976/4404 (68%)	2970 (100%)	6 (0%)	93	98

All (6) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	246	ARG
1	A	503	VAL
1	A	505	TYR
1	B	207	HIS
1	B	214	ARG
2	D	63	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	613	GLN
1	A	872	GLN
1	A	913	GLN
1	B	134	GLN
1	C	1106	GLN
2	F	99	HIS

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates i

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
4	NAG	I	1	4,1	14,14,15	0.37	0	17,19,21	0.53	0
4	NAG	I	2	4	14,14,15	0.28	0	17,19,21	0.55	0
4	NAG	J	1	4,1	14,14,15	1.16	1 (7%)	17,19,21	0.77	0
4	NAG	J	2	4	14,14,15	0.45	0	17,19,21	0.45	0
5	NAG	K	1	1,5	14,14,15	0.32	0	17,19,21	0.42	0
5	NAG	K	2	5	14,14,15	0.27	0	17,19,21	0.48	0
5	BMA	K	3	5	11,11,12	0.60	0	15,15,17	0.75	0
5	FUC	K	4	5	10,10,11	0.63	0	14,14,16	0.91	1 (7%)
4	NAG	M	1	4,1	14,14,15	0.54	0	17,19,21	1.24	1 (5%)
4	NAG	M	2	4	14,14,15	0.24	0	17,19,21	0.36	0
4	NAG	N	1	4,1	14,14,15	1.20	2 (14%)	17,19,21	1.21	1 (5%)
4	NAG	N	2	4	14,14,15	0.40	0	17,19,21	0.66	1 (5%)
4	NAG	O	1	4,1	14,14,15	0.20	0	17,19,21	0.37	0
4	NAG	O	2	4	14,14,15	0.21	0	17,19,21	0.41	0
4	NAG	P	1	4,1	14,14,15	0.20	0	17,19,21	0.71	0
4	NAG	P	2	4	14,14,15	0.30	0	17,19,21	0.41	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	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	J	1	4,1	-	0/6/23/26	0/1/1/1
4	NAG	J	2	4	-	2/6/23/26	0/1/1/1
5	NAG	K	1	1,5	-	4/6/23/26	0/1/1/1
5	NAG	K	2	5	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	BMA	K	3	5	-	0/2/19/22	0/1/1/1
5	FUC	K	4	5	-	-	0/1/1/1
4	NAG	M	1	4,1	-	3/6/23/26	0/1/1/1
4	NAG	M	2	4	-	0/6/23/26	0/1/1/1
4	NAG	N	1	4,1	-	4/6/23/26	0/1/1/1
4	NAG	N	2	4	-	0/6/23/26	0/1/1/1
4	NAG	O	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	O	2	4	-	0/6/23/26	0/1/1/1
4	NAG	P	1	4,1	-	3/6/23/26	0/1/1/1
4	NAG	P	2	4	-	0/6/23/26	0/1/1/1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	J	1	NAG	O5-C1	-4.12	1.37	1.43
4	N	1	NAG	O5-C1	3.79	1.49	1.43
4	N	1	NAG	C1-C2	2.25	1.55	1.52

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	N	1	NAG	C1-O5-C5	4.45	118.23	112.19
4	M	1	NAG	C2-N2-C7	4.26	128.97	122.90
4	N	2	NAG	C1-O5-C5	2.35	115.37	112.19
5	K	4	FUC	C1-O5-C5	2.01	117.34	112.78

There are no chirality outliers.

All (22) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	N	1	NAG	C4-C5-C6-O6
4	N	1	NAG	O5-C5-C6-O6
4	J	2	NAG	O5-C5-C6-O6
4	M	1	NAG	C8-C7-N2-C2
4	M	1	NAG	O7-C7-N2-C2
5	K	1	NAG	C8-C7-N2-C2
5	K	1	NAG	O7-C7-N2-C2
5	K	2	NAG	C8-C7-N2-C2
5	K	2	NAG	O7-C7-N2-C2
4	O	1	NAG	O5-C5-C6-O6

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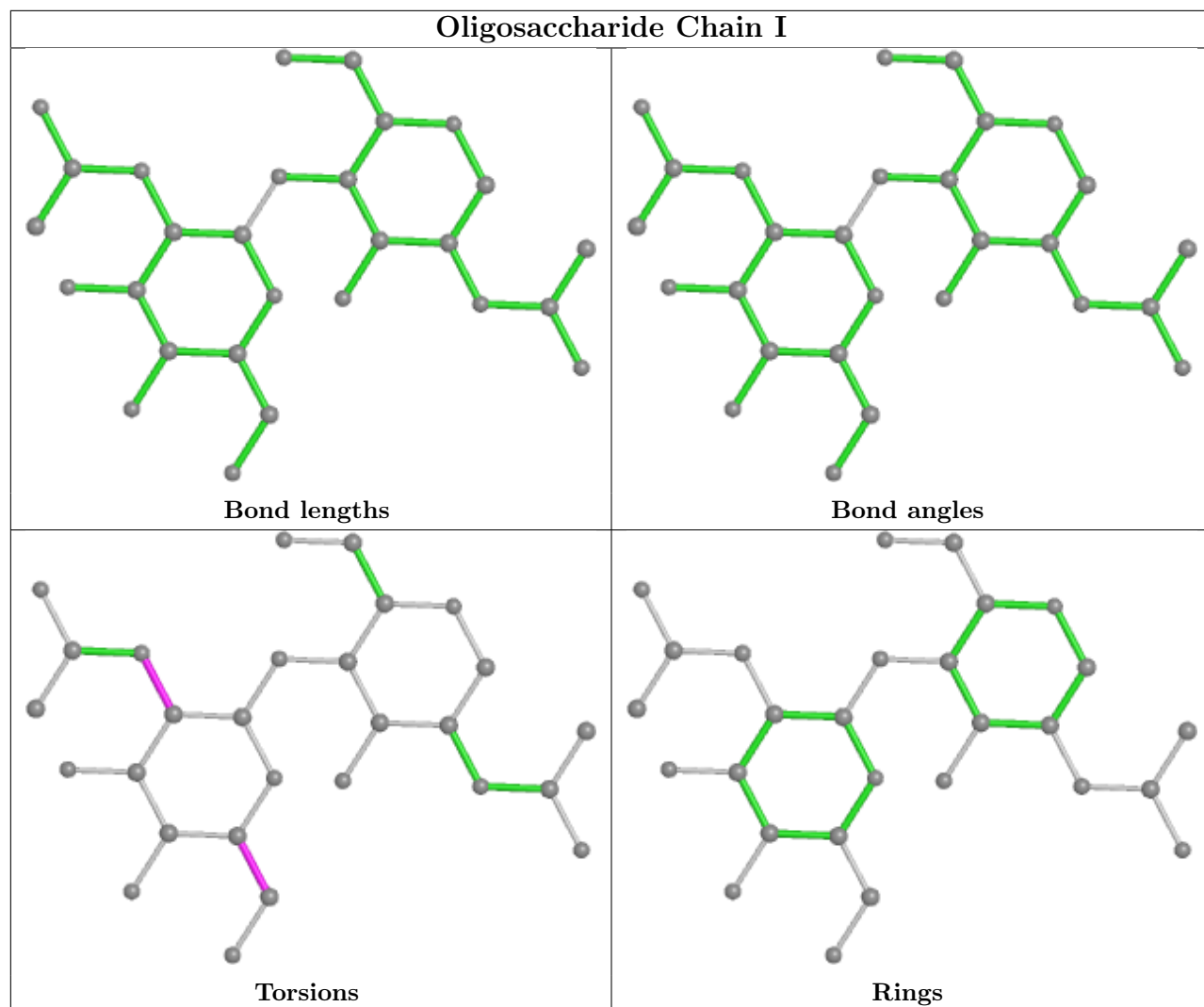
Mol	Chain	Res	Type	Atoms
4	J	2	NAG	C4-C5-C6-O6
4	O	1	NAG	C4-C5-C6-O6
4	P	1	NAG	C4-C5-C6-O6
4	N	1	NAG	C1-C2-N2-C7
5	K	1	NAG	C4-C5-C6-O6
4	P	1	NAG	O5-C5-C6-O6
4	I	2	NAG	O5-C5-C6-O6
5	K	1	NAG	O5-C5-C6-O6
4	N	1	NAG	C3-C2-N2-C7
4	P	1	NAG	C3-C2-N2-C7
4	I	2	NAG	C3-C2-N2-C7
4	M	1	NAG	C3-C2-N2-C7

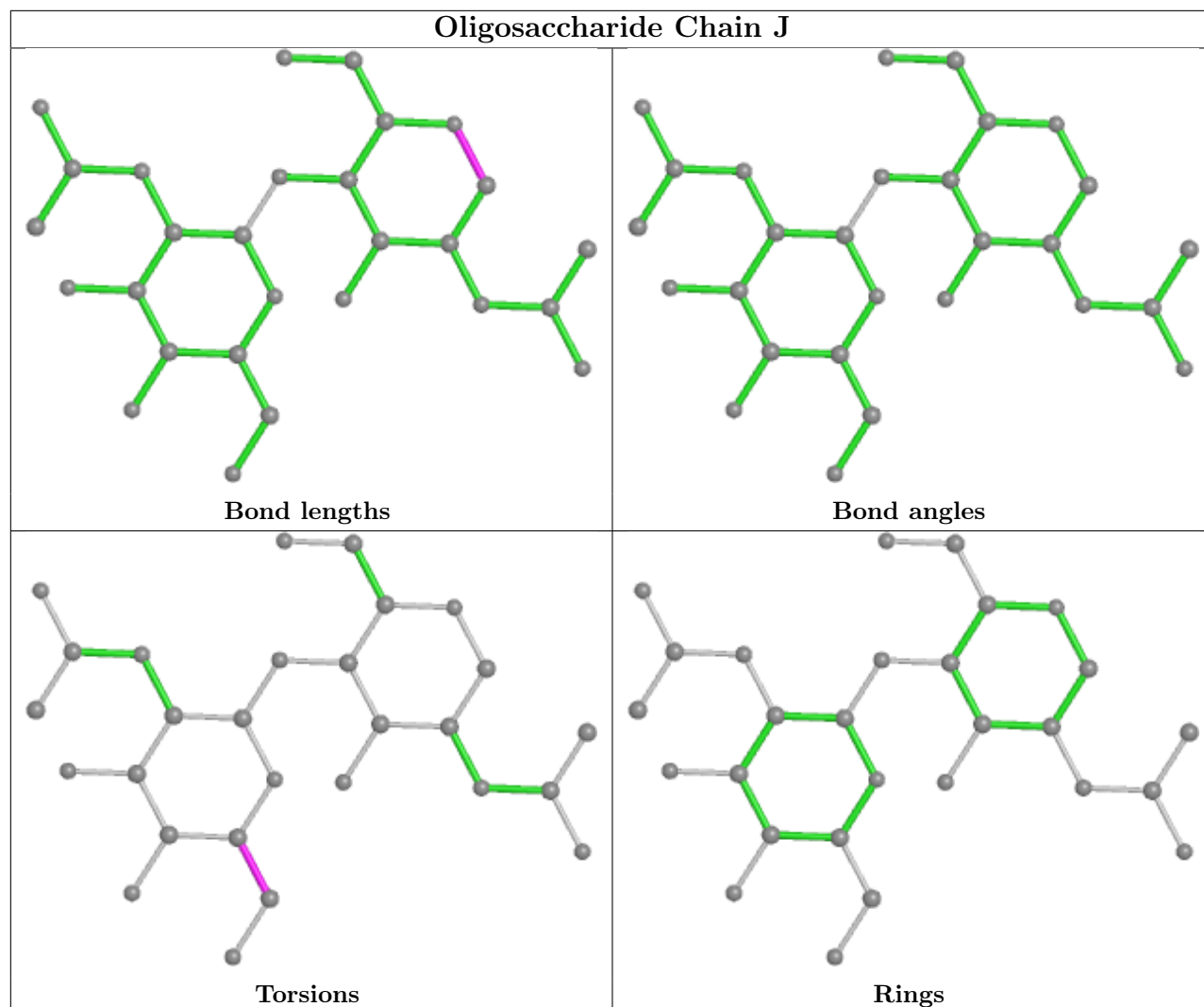
There are no ring outliers.

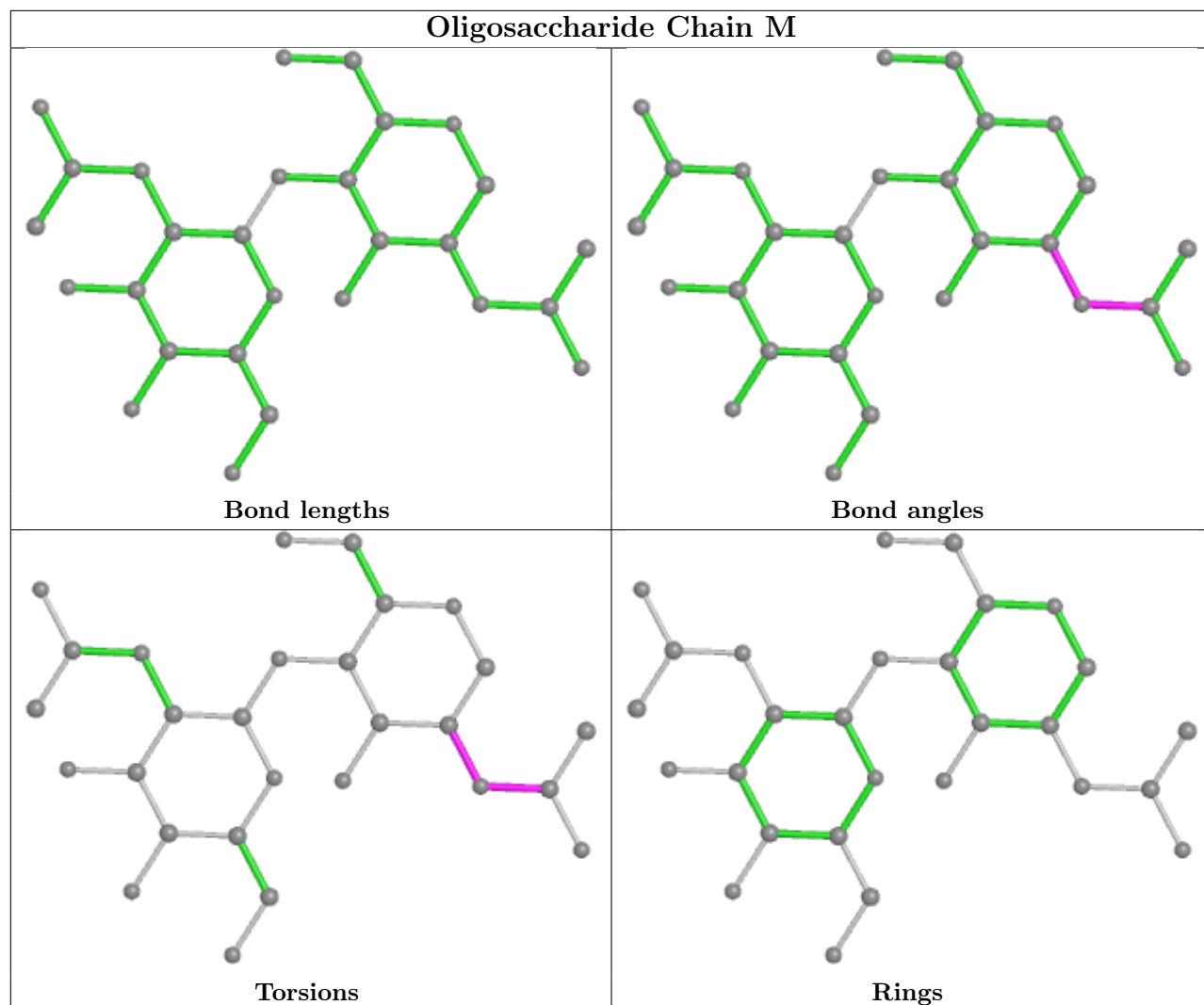
3 monomers are involved in 4 short contacts:

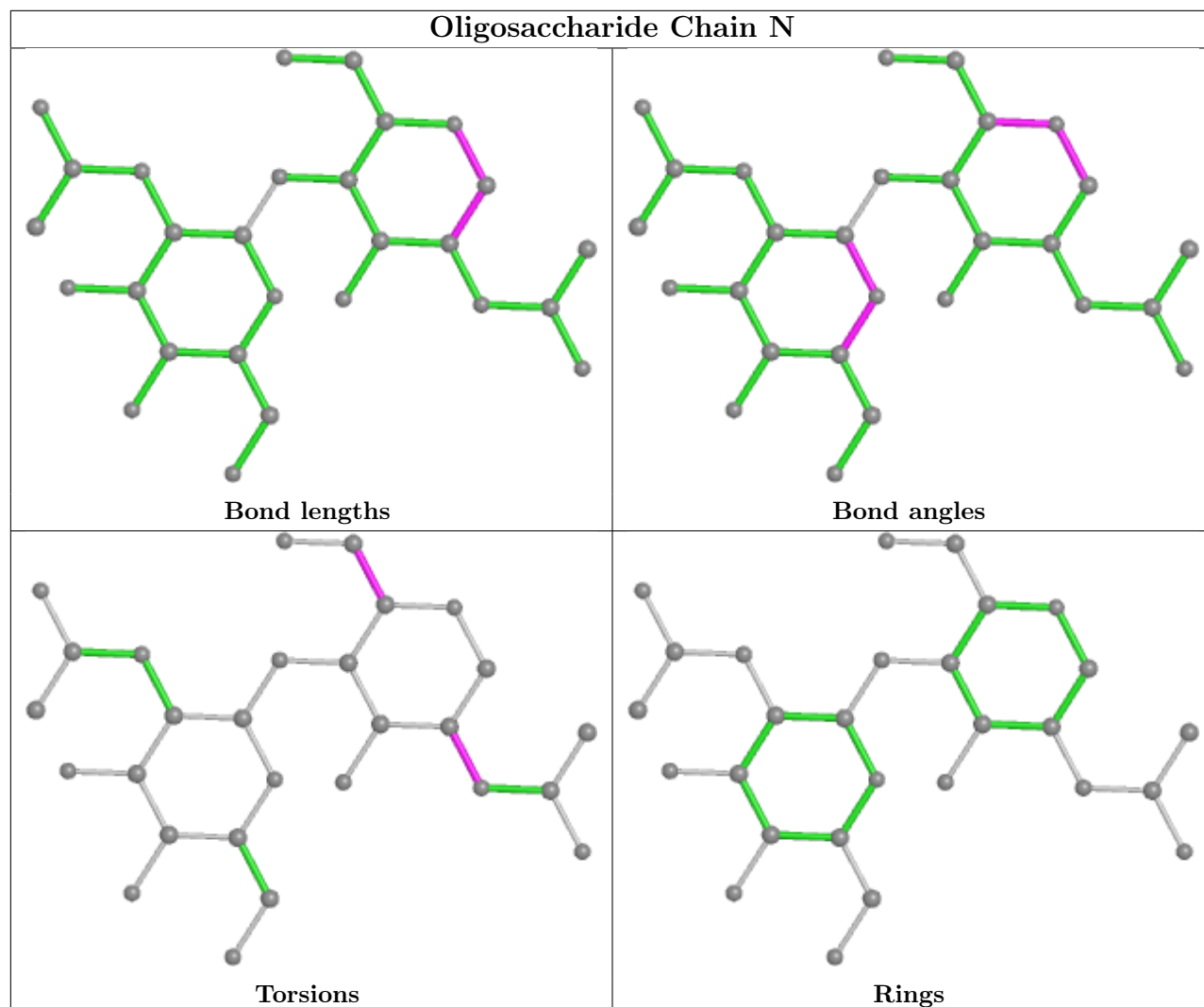
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	M	1	NAG	1	0
4	N	1	NAG	3	0
4	N	2	NAG	1	0

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

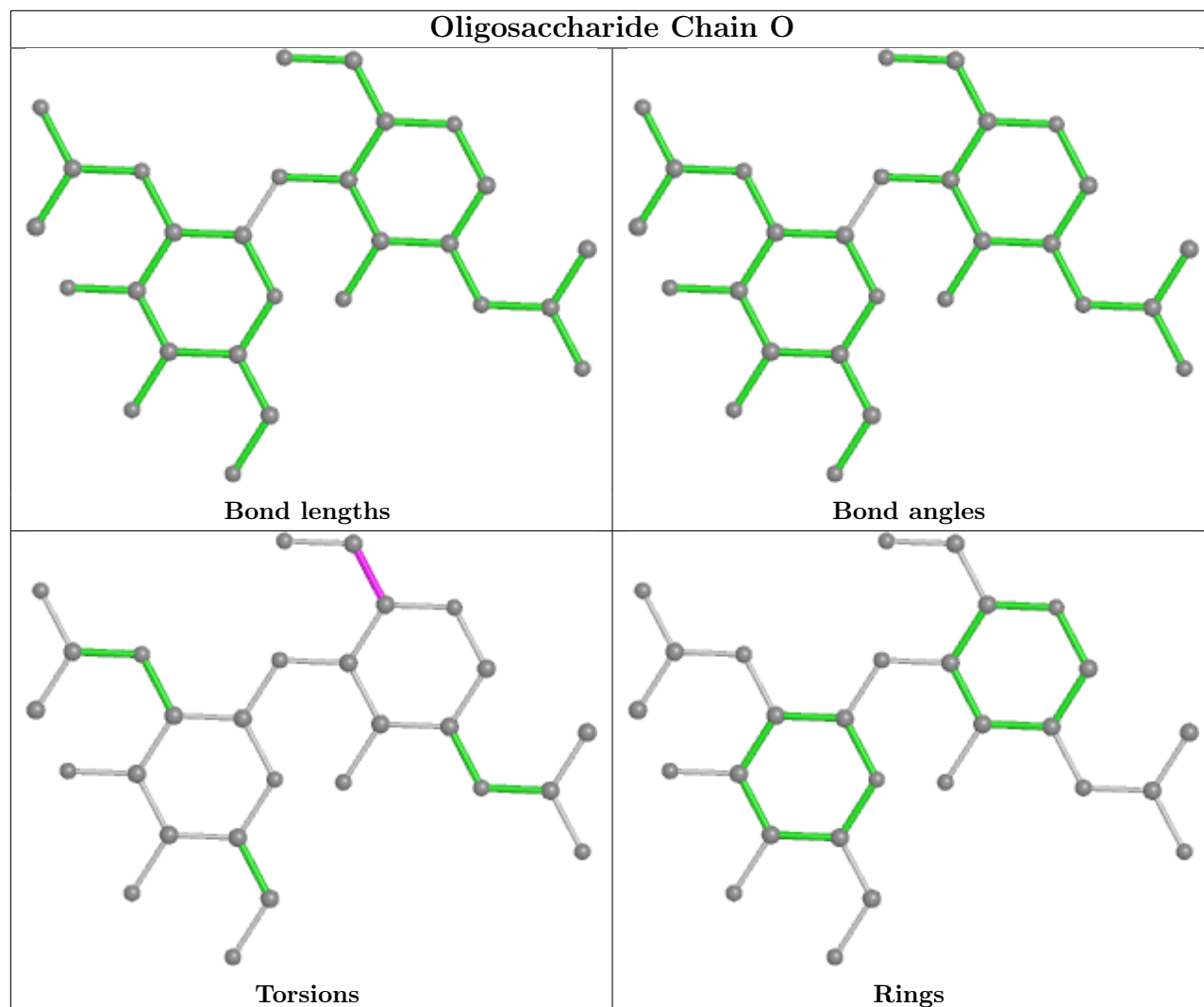


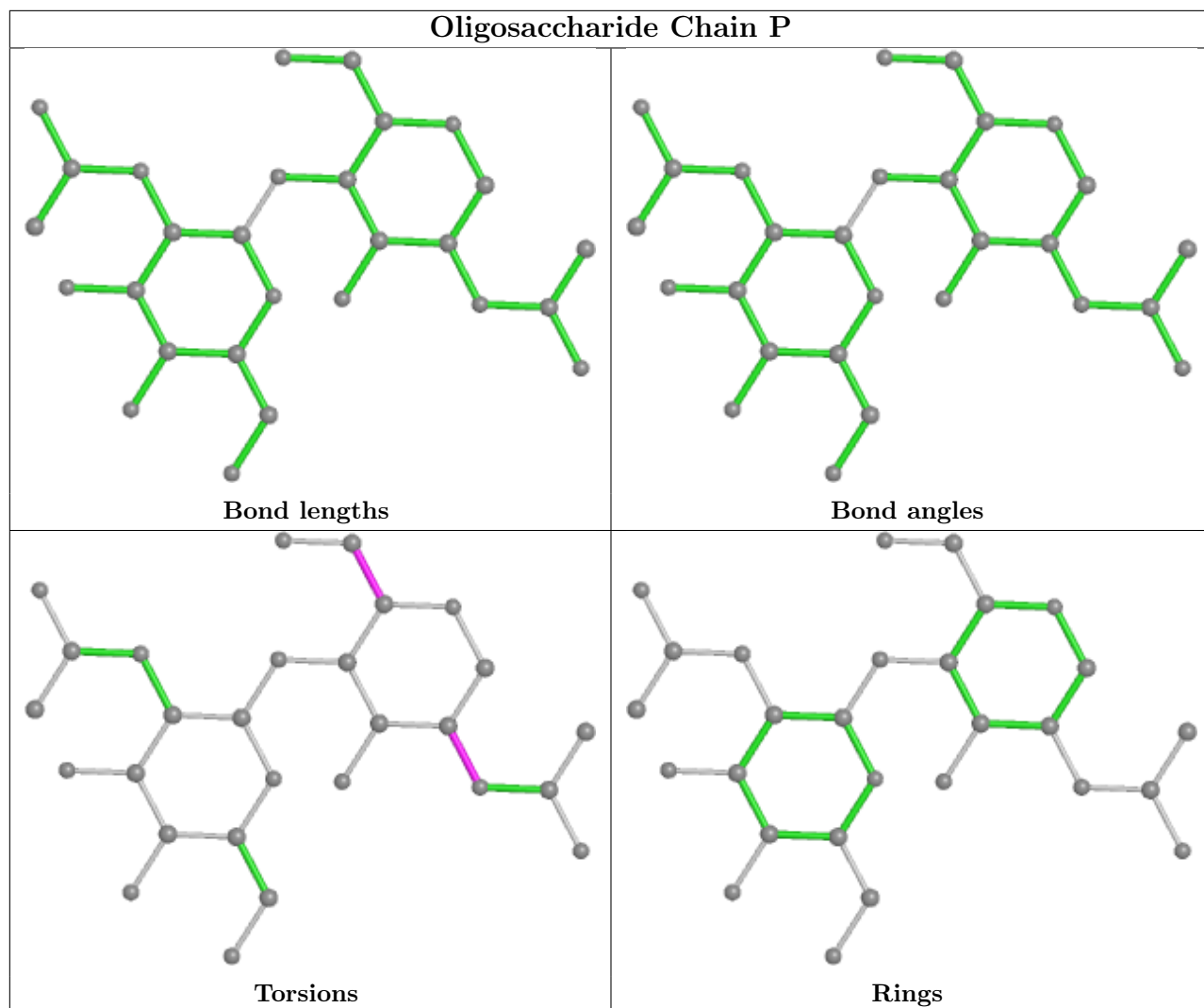


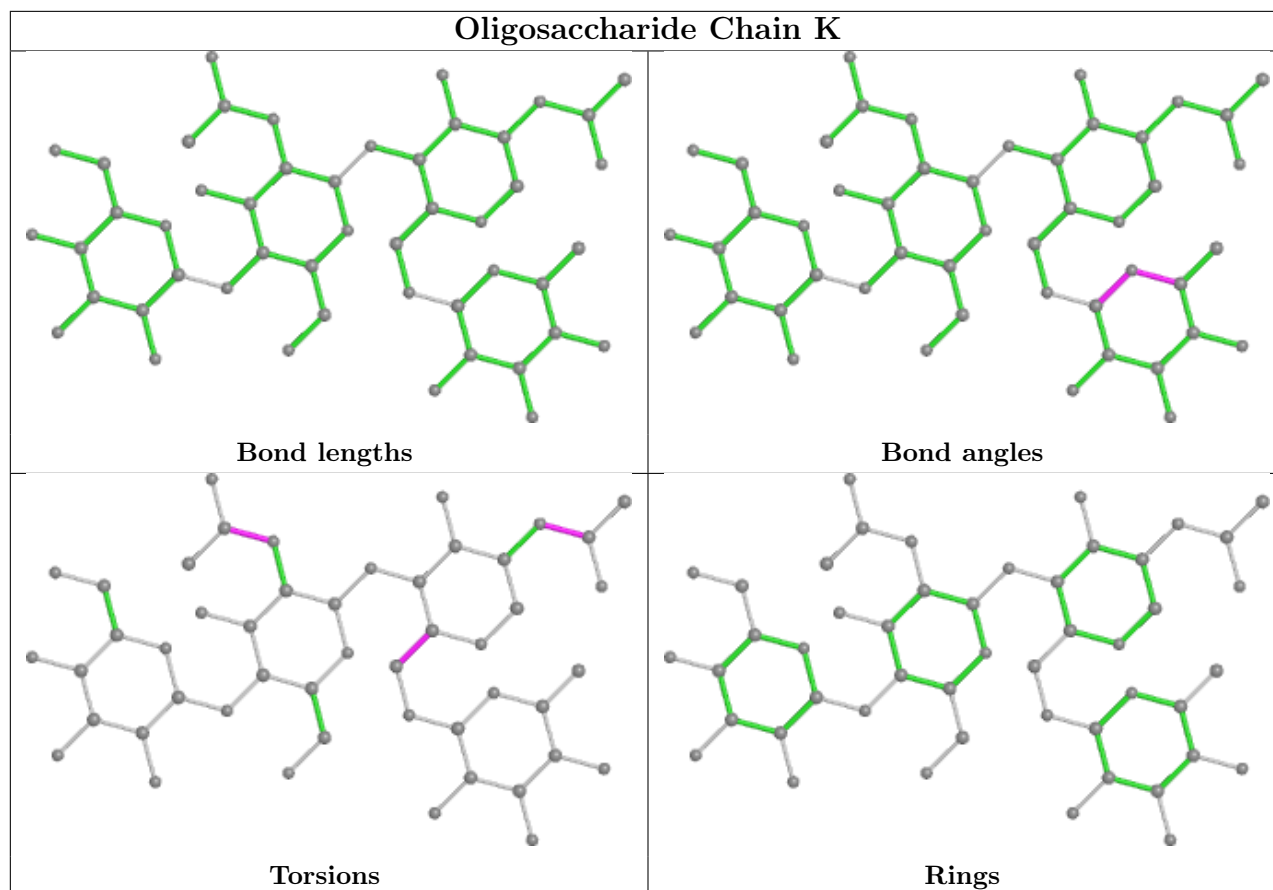












## 5.6 Ligand geometry [i](#)

27 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$
6	NAG	B	1302	1	14,14,15	0.25	0	17,19,21	0.50	0
6	NAG	B	1304	1	14,14,15	0.68	1 (7%)	17,19,21	0.75	1 (5%)
6	NAG	C	1305	1	14,14,15	0.27	0	17,19,21	0.45	0
6	NAG	A	1303	1	14,14,15	0.36	0	17,19,21	1.25	1 (5%)
6	NAG	B	1301	1	14,14,15	0.27	0	17,19,21	0.45	0
6	NAG	A	1306	1	14,14,15	0.78	1 (7%)	17,19,21	0.59	0
6	NAG	C	1306	1	14,14,15	0.47	0	17,19,21	0.60	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
6	NAG	A	1301	1	14,14,15	0.40	0	17,19,21	0.46	0
6	NAG	C	1307	1	14,14,15	0.26	0	17,19,21	0.51	0
6	NAG	C	1303	1	14,14,15	0.40	0	17,19,21	0.49	0
6	NAG	A	1309	1	14,14,15	0.26	0	17,19,21	0.52	0
6	NAG	A	1304	1	14,14,15	0.29	0	17,19,21	0.80	1 (5%)
6	NAG	B	1305	1	14,14,15	0.24	0	17,19,21	0.55	0
6	NAG	C	1308	1	14,14,15	0.44	0	17,19,21	0.62	0
6	NAG	B	1307	1	14,14,15	0.22	0	17,19,21	0.53	0
6	NAG	C	1309	1	14,14,15	0.50	0	17,19,21	0.54	0
6	NAG	A	1305	1	14,14,15	0.39	0	17,19,21	1.25	1 (5%)
6	NAG	C	1304	1	14,14,15	0.23	0	17,19,21	0.39	0
6	NAG	A	1310	1	14,14,15	0.22	0	17,19,21	0.49	0
6	NAG	B	1308	1	14,14,15	0.61	0	17,19,21	0.84	1 (5%)
6	NAG	A	1302	1	14,14,15	0.58	0	17,19,21	1.24	2 (11%)
6	NAG	A	1308	1	14,14,15	0.25	0	17,19,21	0.50	0
6	NAG	A	1307	1	14,14,15	0.23	0	17,19,21	0.53	0
6	NAG	C	1301	1	14,14,15	0.41	0	17,19,21	0.39	0
6	NAG	C	1302	1	14,14,15	0.19	0	17,19,21	0.46	0
6	NAG	B	1303	1	14,14,15	0.22	0	17,19,21	0.46	0
6	NAG	B	1306	1	14,14,15	0.89	1 (7%)	17,19,21	0.63	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	NAG	B	1302	1	-	2/6/23/26	0/1/1/1
6	NAG	B	1304	1	-	4/6/23/26	0/1/1/1
6	NAG	C	1305	1	-	2/6/23/26	0/1/1/1
6	NAG	A	1303	1	-	5/6/23/26	0/1/1/1
6	NAG	B	1301	1	-	2/6/23/26	0/1/1/1
6	NAG	A	1306	1	-	2/6/23/26	0/1/1/1
6	NAG	C	1306	1	-	2/6/23/26	0/1/1/1
6	NAG	A	1301	1	-	0/6/23/26	0/1/1/1
6	NAG	C	1307	1	-	2/6/23/26	0/1/1/1
6	NAG	C	1303	1	-	0/6/23/26	0/1/1/1
6	NAG	A	1309	1	-	3/6/23/26	0/1/1/1
6	NAG	A	1304	1	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	NAG	B	1305	1	-	0/6/23/26	0/1/1/1
6	NAG	C	1308	1	-	3/6/23/26	0/1/1/1
6	NAG	B	1307	1	-	2/6/23/26	0/1/1/1
6	NAG	C	1309	1	-	4/6/23/26	0/1/1/1
6	NAG	A	1305	1	-	5/6/23/26	0/1/1/1
6	NAG	C	1304	1	-	2/6/23/26	0/1/1/1
6	NAG	A	1310	1	-	2/6/23/26	0/1/1/1
6	NAG	B	1308	1	-	1/6/23/26	0/1/1/1
6	NAG	A	1302	1	-	3/6/23/26	0/1/1/1
6	NAG	A	1308	1	-	1/6/23/26	0/1/1/1
6	NAG	A	1307	1	-	2/6/23/26	0/1/1/1
6	NAG	C	1301	1	-	1/6/23/26	0/1/1/1
6	NAG	C	1302	1	-	2/6/23/26	0/1/1/1
6	NAG	B	1303	1	-	4/6/23/26	0/1/1/1
6	NAG	B	1306	1	-	3/6/23/26	0/1/1/1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	B	1306	NAG	C1-C2	2.54	1.56	1.52
6	A	1306	NAG	C1-C2	2.39	1.55	1.52
6	B	1304	NAG	C1-C2	2.22	1.55	1.52

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	A	1305	NAG	C2-N2-C7	4.31	129.04	122.90
6	A	1303	NAG	C2-N2-C7	4.30	129.02	122.90
6	A	1302	NAG	C2-N2-C7	4.25	128.96	122.90
6	B	1308	NAG	C1-O5-C5	2.73	115.89	112.19
6	A	1304	NAG	C1-O5-C5	2.72	115.88	112.19
6	B	1304	NAG	C1-O5-C5	2.63	115.75	112.19
6	A	1302	NAG	C1-C2-N2	2.15	114.17	110.49

There are no chirality outliers.

All (61) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	A	1306	NAG	C4-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
6	C	1305	NAG	C4-C5-C6-O6
6	B	1301	NAG	O5-C5-C6-O6
6	B	1303	NAG	O5-C5-C6-O6
6	C	1305	NAG	O5-C5-C6-O6
6	A	1305	NAG	O5-C5-C6-O6
6	C	1306	NAG	O5-C5-C6-O6
6	C	1309	NAG	O5-C5-C6-O6
6	A	1305	NAG	C4-C5-C6-O6
6	A	1306	NAG	O5-C5-C6-O6
6	A	1310	NAG	O5-C5-C6-O6
6	B	1304	NAG	O5-C5-C6-O6
6	B	1306	NAG	O5-C5-C6-O6
6	C	1306	NAG	C4-C5-C6-O6
6	C	1302	NAG	O5-C5-C6-O6
6	B	1301	NAG	C4-C5-C6-O6
6	C	1304	NAG	C4-C5-C6-O6
6	B	1303	NAG	C4-C5-C6-O6
6	C	1304	NAG	O5-C5-C6-O6
6	C	1307	NAG	O5-C5-C6-O6
6	B	1306	NAG	C4-C5-C6-O6
6	C	1309	NAG	C1-C2-N2-C7
6	C	1308	NAG	O5-C5-C6-O6
6	A	1310	NAG	C4-C5-C6-O6
6	B	1302	NAG	C4-C5-C6-O6
6	A	1302	NAG	C8-C7-N2-C2
6	A	1302	NAG	O7-C7-N2-C2
6	A	1303	NAG	C8-C7-N2-C2
6	A	1303	NAG	O7-C7-N2-C2
6	A	1305	NAG	C8-C7-N2-C2
6	A	1305	NAG	O7-C7-N2-C2
6	B	1304	NAG	C8-C7-N2-C2
6	B	1304	NAG	O7-C7-N2-C2
6	C	1309	NAG	C4-C5-C6-O6
6	A	1303	NAG	C4-C5-C6-O6
6	B	1304	NAG	C4-C5-C6-O6
6	A	1304	NAG	O5-C5-C6-O6
6	A	1309	NAG	C4-C5-C6-O6
6	B	1302	NAG	O5-C5-C6-O6
6	C	1302	NAG	C4-C5-C6-O6
6	A	1307	NAG	O5-C5-C6-O6
6	A	1308	NAG	O5-C5-C6-O6
6	A	1303	NAG	O5-C5-C6-O6

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms
6	C	1301	NAG	O5-C5-C6-O6
6	B	1307	NAG	O5-C5-C6-O6
6	C	1307	NAG	C4-C5-C6-O6
6	A	1309	NAG	O5-C5-C6-O6
6	C	1308	NAG	C4-C5-C6-O6
6	A	1302	NAG	C3-C2-N2-C7
6	A	1303	NAG	C3-C2-N2-C7
6	A	1307	NAG	C3-C2-N2-C7
6	A	1309	NAG	C3-C2-N2-C7
6	B	1303	NAG	C3-C2-N2-C7
6	B	1307	NAG	C3-C2-N2-C7
6	B	1308	NAG	C3-C2-N2-C7
6	C	1308	NAG	C3-C2-N2-C7
6	C	1309	NAG	C3-C2-N2-C7
6	A	1304	NAG	C4-C5-C6-O6
6	B	1303	NAG	C1-C2-N2-C7
6	B	1306	NAG	C1-C2-N2-C7
6	A	1305	NAG	C3-C2-N2-C7

There are no ring outliers.

10 monomers are involved in 13 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	B	1304	NAG	2	0
6	A	1303	NAG	1	0
6	A	1306	NAG	1	0
6	A	1309	NAG	2	0
6	C	1309	NAG	2	0
6	A	1305	NAG	1	0
6	B	1308	NAG	1	0
6	A	1302	NAG	1	0
6	C	1301	NAG	1	0
6	B	1306	NAG	1	0

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

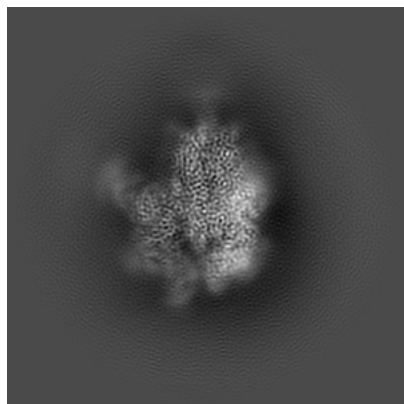
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-26431. These allow visual inspection of the internal detail of the map and identification of artifacts.

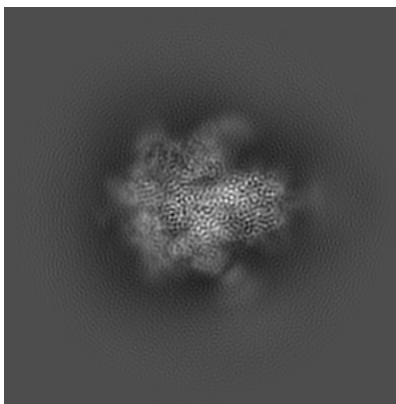
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

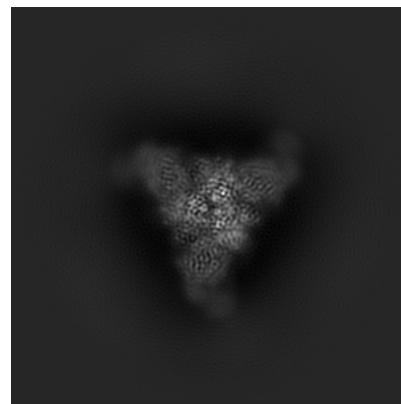
#### 6.1.1 Primary map



X

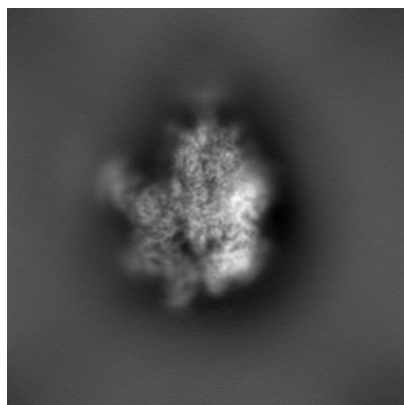


Y

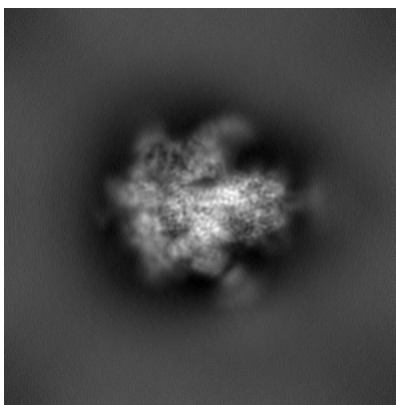


Z

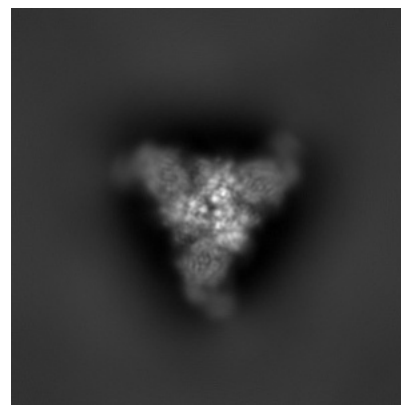
#### 6.1.2 Raw map



X



Y



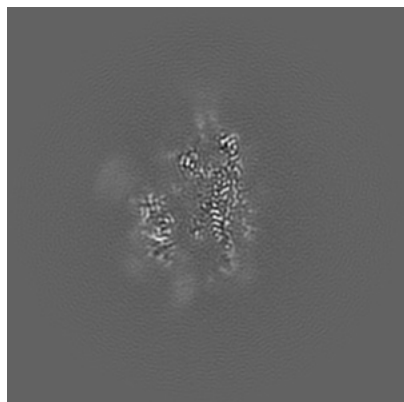
Z

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

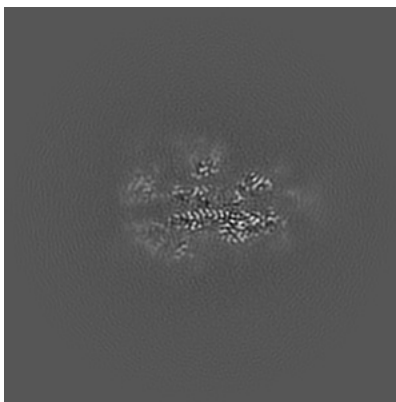


## 6.2 Central slices [i](#)

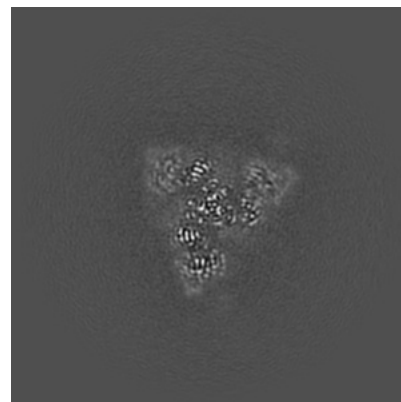
### 6.2.1 Primary map



X Index: 216

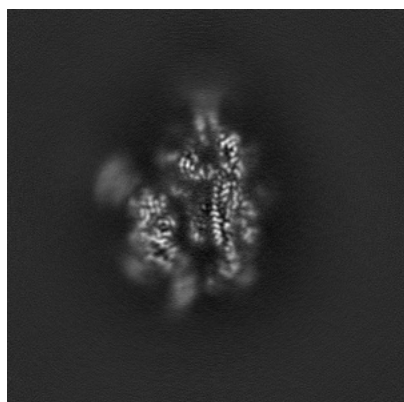


Y Index: 216

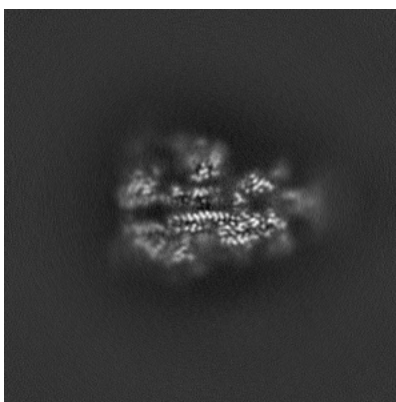


Z Index: 216

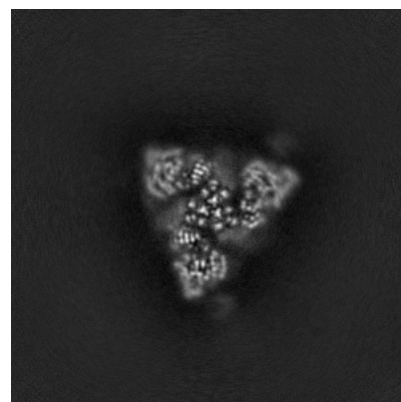
### 6.2.2 Raw map



X Index: 216



Y Index: 216

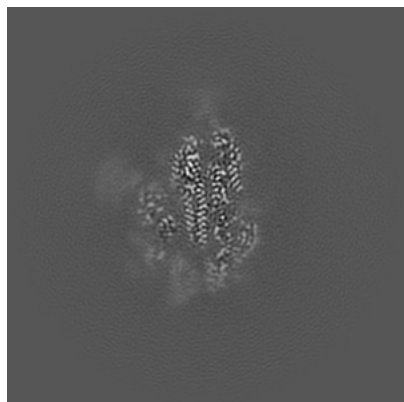


Z Index: 216

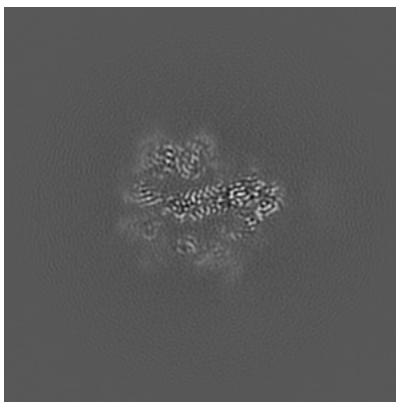
The images above show central slices of the map in three orthogonal directions.

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

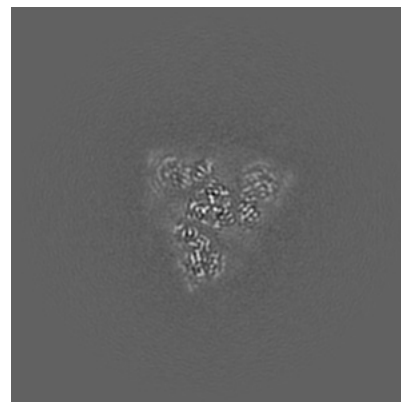
### 6.3.1 Primary map



X Index: 223

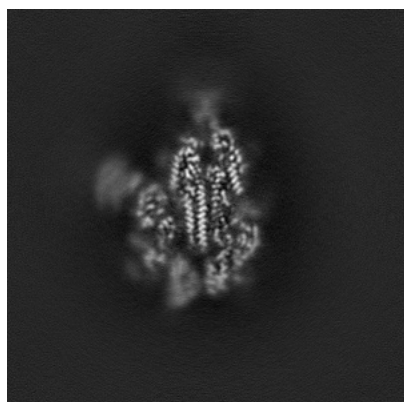


Y Index: 232

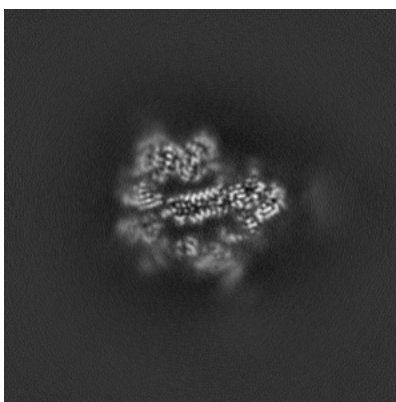


Z Index: 211

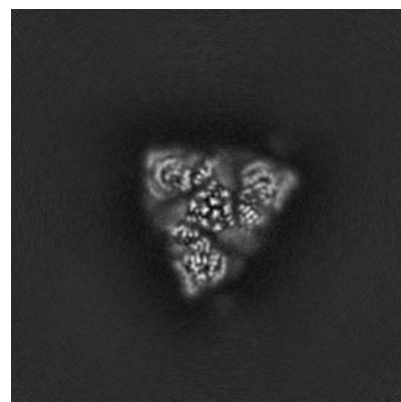
### 6.3.2 Raw map



X Index: 223



Y Index: 232

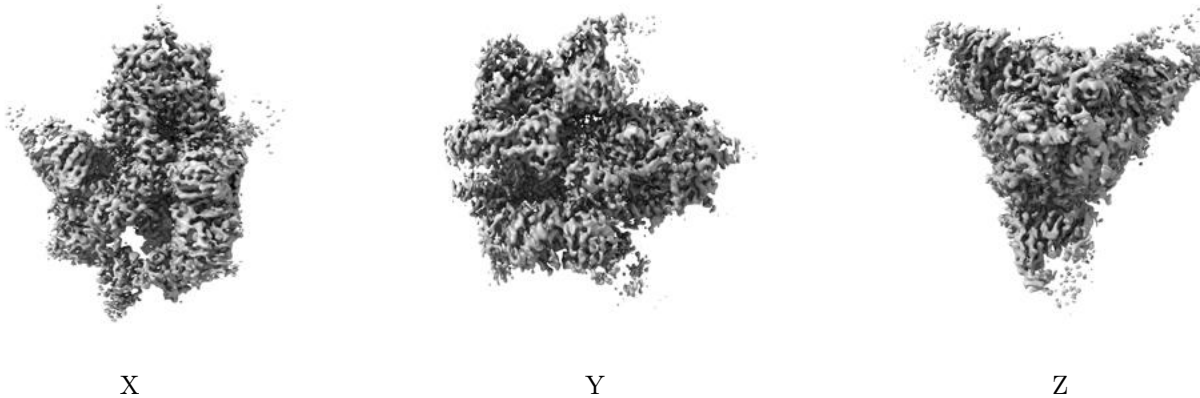


Z Index: 212

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

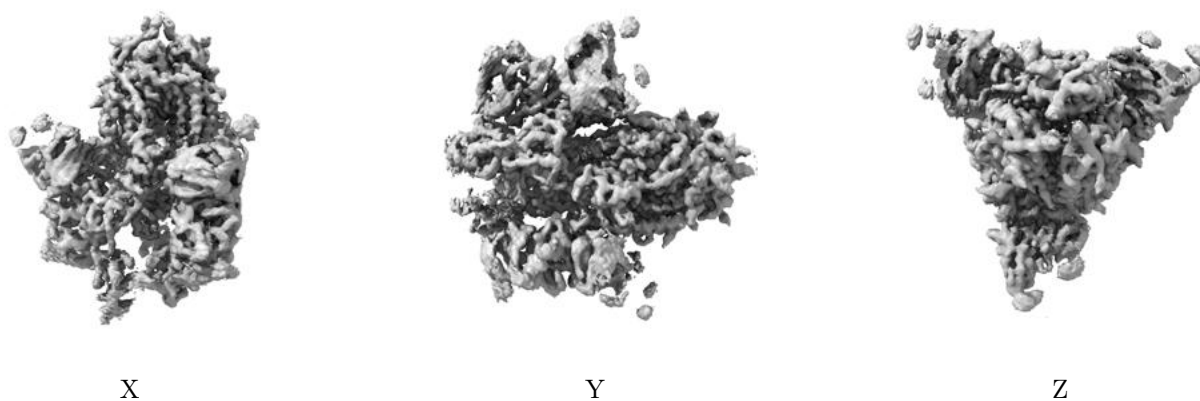
## 6.4 Orthogonal surface views [i](#)

### 6.4.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.262. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

### 6.4.2 Raw map



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

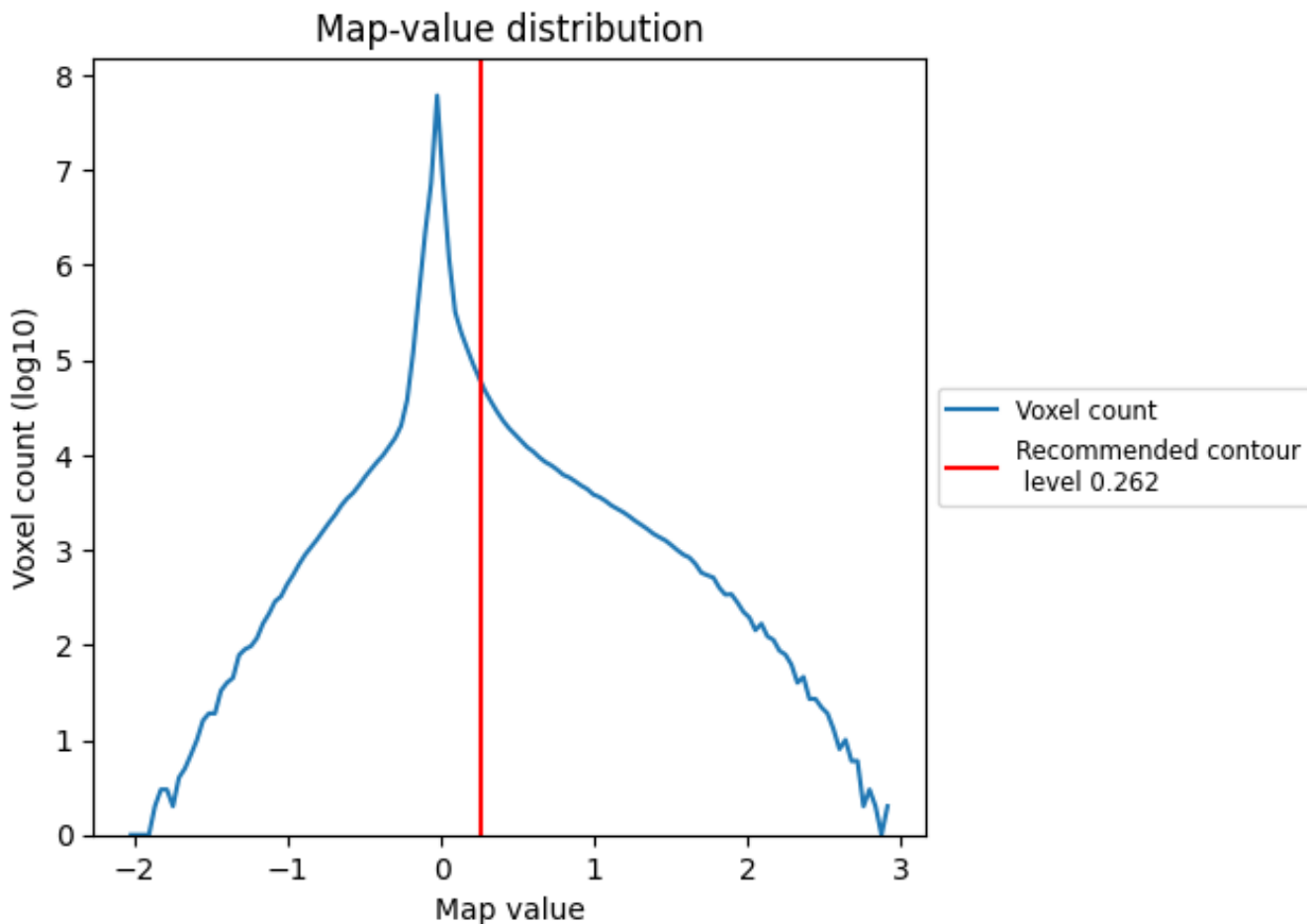
## 6.5 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

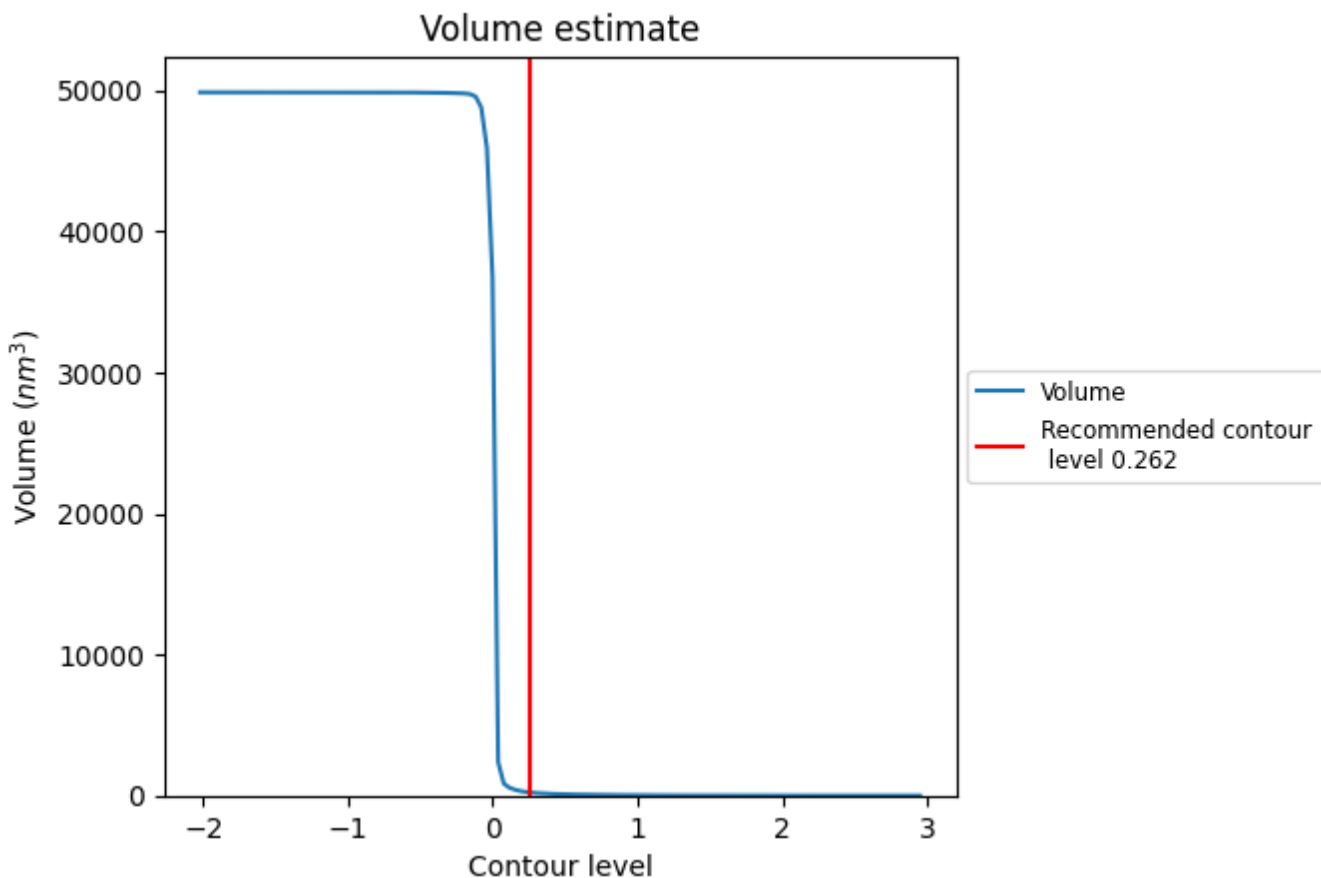
This section contains the results of statistical analysis of the map.

### 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.

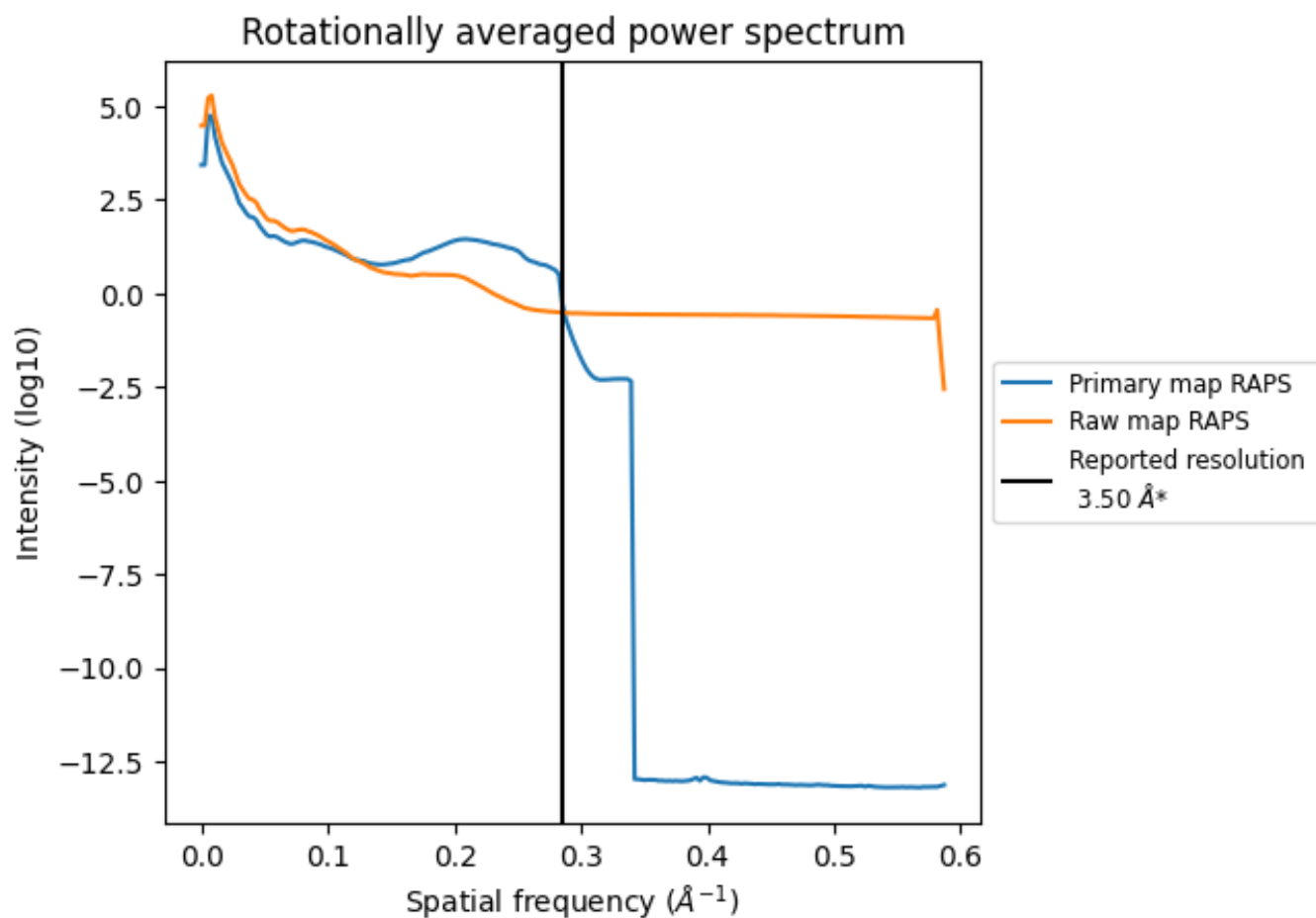
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 215 nm<sup>3</sup>; this corresponds to an approximate mass of 194 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 0.286 Å<sup>-1</sup>

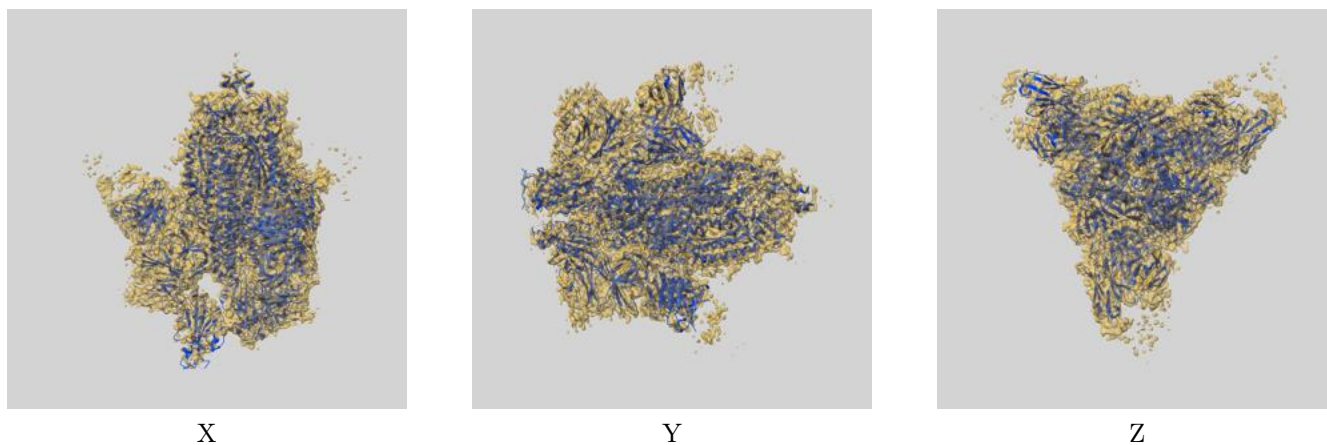
## 8 Fourier-Shell correlation

This section was not generated. No FSC curve or half-maps provided.

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

This section contains information regarding the fit between EMDB map EMD-26431 and PDB model 7UAR. Per-residue inclusion information can be found in section 3 on page 12.

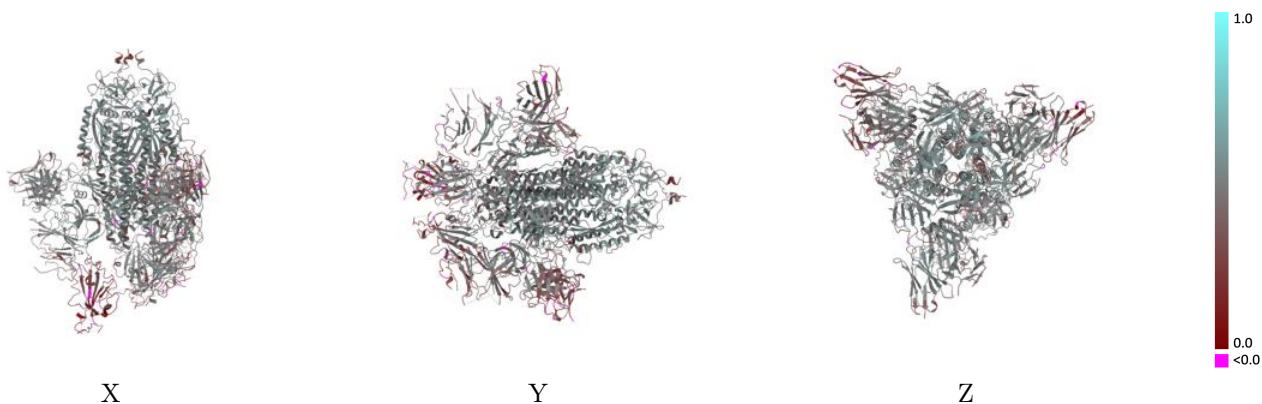
### 9.1 Map-model overlay [i](#)



The images above show the 3D surface view of the map at the recommended contour level 0.262 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.

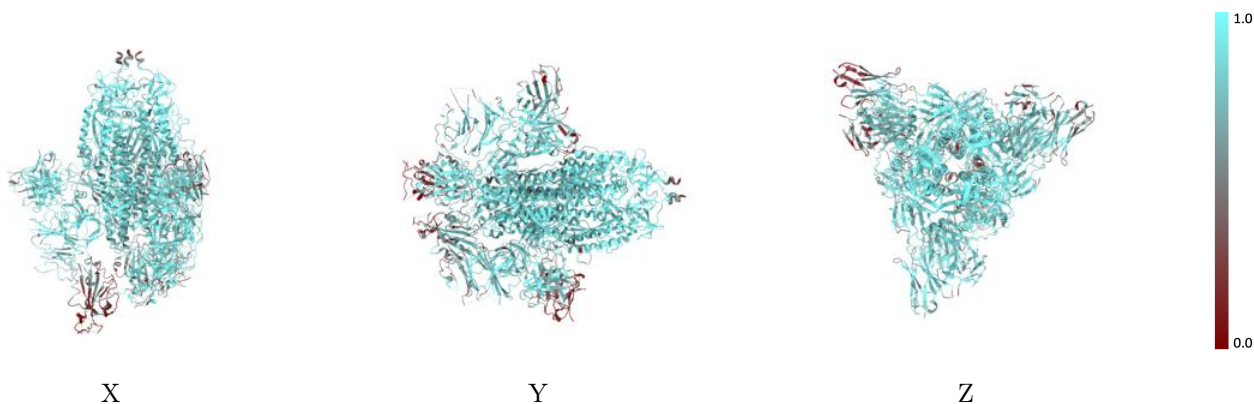


## 9.2 Q-score mapped to coordinate model [i](#)



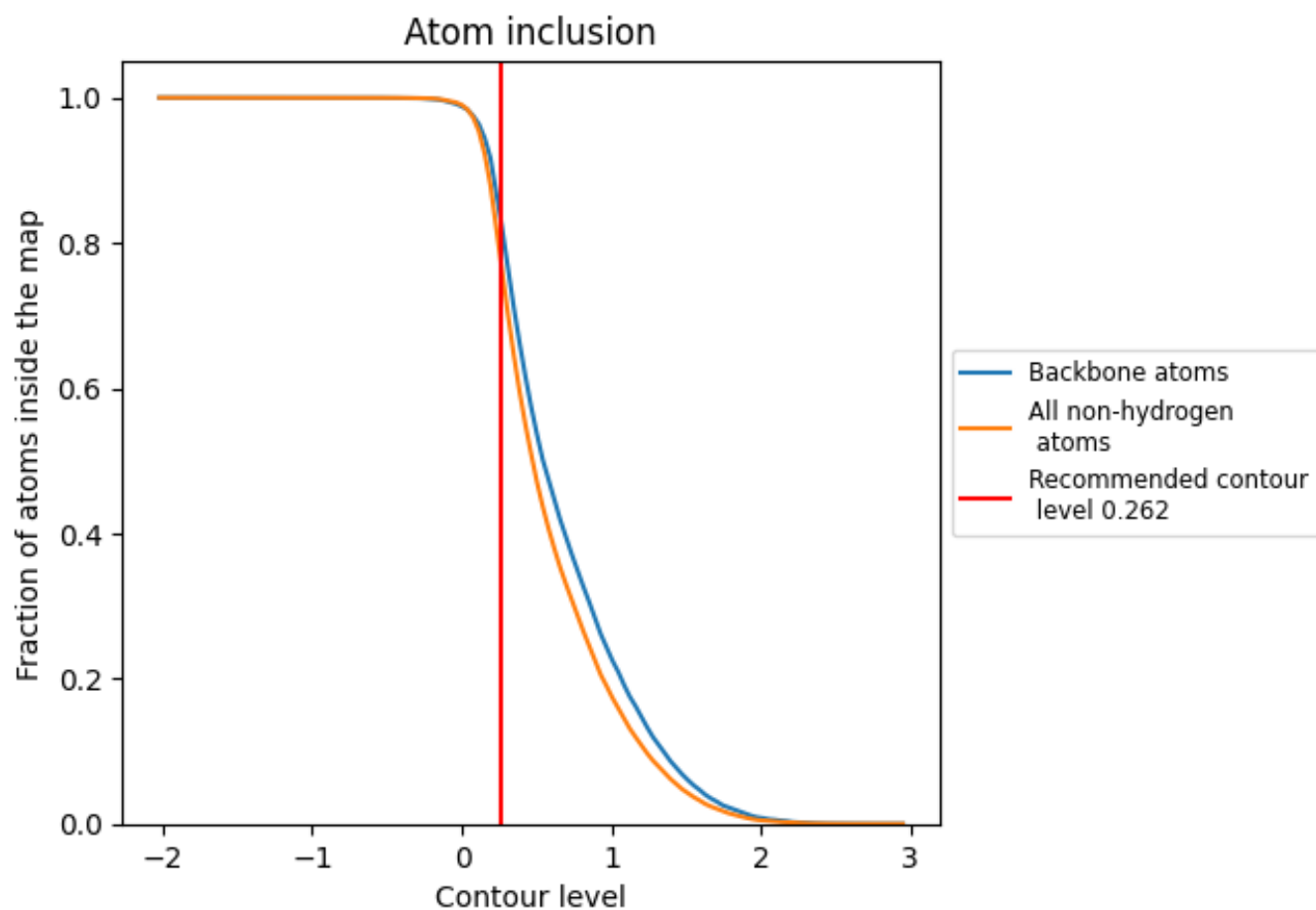
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.262).



































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 83% of all backbone atoms, 77% 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 (0.262) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7743	 0.4440
A	 0.7637	 0.4370
B	 0.7957	 0.4600
C	 0.8181	 0.4620
D	 0.6905	 0.3980
E	 0.6858	 0.4010
F	 0.5922	 0.3420
G	 0.6028	 0.3660
H	 0.8358	 0.4870
I	 0.6429	 0.3860
J	 0.6429	 0.4080
K	 0.3673	 0.3680
L	 0.8174	 0.4610
M	 0.2143	 0.2350
N	 0.3929	 0.1960
O	 0.7500	 0.4670
P	 0.7857	 0.4450

