



Full wwPDB EM Validation Report ⓘ

Mar 5, 2026 – 07:38 PM UTC

PDB ID : 8DD2 / pdb_00008dd2
EMDB ID : EMD-27332
Title : Human GABAA receptor alpha1-beta2-gamma2 subtype in complex with GABA plus Zolpidem
Authors : Zhu, S.; Hibbs, R.E.
Deposited on : 2022-06-17
Resolution : 2.90 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

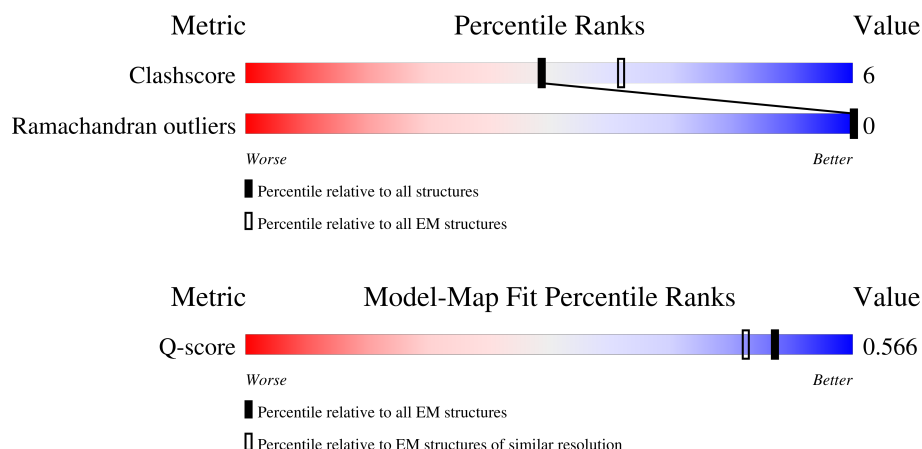
EMDB validation analysis : 0.0.1.dev132
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

1 Overall quality at a glance

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

The reported resolution of this entry is 2.90 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)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Q-score	-	25397	13054 (2.40 - 3.40)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. 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	364	
1	C	364	
2	B	358	
2	D	358	
3	E	417	

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Mol	Chain	Length	Quality of chain
4	I	213	
4	L	213	
5	J	454	
5	K	454	
6	F	3	
6	H	3	
6	M	3	
7	G	10	
8	N	2	

2 Entry composition

There are 11 unique types of molecules in this entry. The entry contains 17459 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 Gamma-aminobutyric acid receptor subunit beta-2.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	334	Total	C	N	O	S	0	0
			2732	1791	440	485	16		
1	C	334	Total	C	N	O	S	0	0
			2732	1791	440	485	16		

There are 62 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	308	SER	-	linker	UNP P47870
A	309	GLN	-	linker	UNP P47870
A	310	PRO	-	linker	UNP P47870
A	311	ALA	-	linker	UNP P47870
A	312	ARG	-	linker	UNP P47870
A	313	ALA	-	linker	UNP P47870
A	314	ALA	-	linker	UNP P47870
A	341	ASN	-	expression tag	UNP P47870
A	342	VAL	-	expression tag	UNP P47870
A	343	ASP	-	expression tag	UNP P47870
A	344	GLY	-	expression tag	UNP P47870
A	345	SER	-	expression tag	UNP P47870
A	346	GLY	-	expression tag	UNP P47870
A	347	ALA	-	expression tag	UNP P47870
A	348	THR	-	expression tag	UNP P47870
A	349	ASN	-	expression tag	UNP P47870
A	350	PHE	-	expression tag	UNP P47870
A	351	SER	-	expression tag	UNP P47870
A	352	LEU	-	expression tag	UNP P47870
A	353	LEU	-	expression tag	UNP P47870
A	354	LYS	-	expression tag	UNP P47870
A	355	GLN	-	expression tag	UNP P47870
A	356	ALA	-	expression tag	UNP P47870
A	357	GLY	-	expression tag	UNP P47870
A	358	ASP	-	expression tag	UNP P47870
A	359	VAL	-	expression tag	UNP P47870

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Chain	Residue	Modelled	Actual	Comment	Reference
A	360	GLU	-	expression tag	UNP P47870
A	361	GLU	-	expression tag	UNP P47870
A	362	ASN	-	expression tag	UNP P47870
A	363	PRO	-	expression tag	UNP P47870
A	364	GLY	-	expression tag	UNP P47870
C	308	SER	-	linker	UNP P47870
C	309	GLN	-	linker	UNP P47870
C	310	PRO	-	linker	UNP P47870
C	311	ALA	-	linker	UNP P47870
C	312	ARG	-	linker	UNP P47870
C	313	ALA	-	linker	UNP P47870
C	314	ALA	-	linker	UNP P47870
C	341	ASN	-	expression tag	UNP P47870
C	342	VAL	-	expression tag	UNP P47870
C	343	ASP	-	expression tag	UNP P47870
C	344	GLY	-	expression tag	UNP P47870
C	345	SER	-	expression tag	UNP P47870
C	346	GLY	-	expression tag	UNP P47870
C	347	ALA	-	expression tag	UNP P47870
C	348	THR	-	expression tag	UNP P47870
C	349	ASN	-	expression tag	UNP P47870
C	350	PHE	-	expression tag	UNP P47870
C	351	SER	-	expression tag	UNP P47870
C	352	LEU	-	expression tag	UNP P47870
C	353	LEU	-	expression tag	UNP P47870
C	354	LYS	-	expression tag	UNP P47870
C	355	GLN	-	expression tag	UNP P47870
C	356	ALA	-	expression tag	UNP P47870
C	357	GLY	-	expression tag	UNP P47870
C	358	ASP	-	expression tag	UNP P47870
C	359	VAL	-	expression tag	UNP P47870
C	360	GLU	-	expression tag	UNP P47870
C	361	GLU	-	expression tag	UNP P47870
C	362	ASN	-	expression tag	UNP P47870
C	363	PRO	-	expression tag	UNP P47870
C	364	GLY	-	expression tag	UNP P47870

- Molecule 2 is a protein called Gamma-aminobutyric acid receptor subunit alpha-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	338	Total	C	N	O	S	0	0
			2730	1763	461	490	16		

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Mol	Chain	Residues	Atoms					AltConf	Trace
2	D	338	Total	C	N	O	S	0	0
			2730	1763	461	490	16		

There are 92 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	313	SER	-	expression tag	UNP P14867
B	314	GLN	-	expression tag	UNP P14867
B	315	PRO	-	expression tag	UNP P14867
B	316	ALA	-	expression tag	UNP P14867
B	317	ARG	-	expression tag	UNP P14867
B	318	ALA	-	expression tag	UNP P14867
B	319	ALA	-	expression tag	UNP P14867
B	320	LYS	-	expression tag	UNP P14867
B	321	ILE	-	expression tag	UNP P14867
B	322	ASP	-	expression tag	UNP P14867
B	323	ARG	-	expression tag	UNP P14867
B	324	LEU	-	expression tag	UNP P14867
B	325	SER	-	expression tag	UNP P14867
B	326	ARG	-	expression tag	UNP P14867
B	327	ILE	-	expression tag	UNP P14867
B	328	ALA	-	expression tag	UNP P14867
B	329	PHE	-	expression tag	UNP P14867
B	330	PRO	-	expression tag	UNP P14867
B	331	LEU	-	expression tag	UNP P14867
B	332	LEU	-	expression tag	UNP P14867
B	333	PHE	-	expression tag	UNP P14867
B	334	GLY	-	expression tag	UNP P14867
B	335	ILE	-	expression tag	UNP P14867
B	336	PHE	-	expression tag	UNP P14867
B	337	ASN	-	expression tag	UNP P14867
B	338	LEU	-	expression tag	UNP P14867
B	339	VAL	-	expression tag	UNP P14867
B	340	TYR	-	expression tag	UNP P14867
B	341	TRP	-	expression tag	UNP P14867
B	342	ALA	-	expression tag	UNP P14867
B	343	THR	-	expression tag	UNP P14867
B	344	TYR	-	expression tag	UNP P14867
B	345	LEU	-	expression tag	UNP P14867
B	346	ASN	-	expression tag	UNP P14867
B	347	ARG	-	expression tag	UNP P14867
B	348	GLU	-	expression tag	UNP P14867

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Chain	Residue	Modelled	Actual	Comment	Reference
B	349	PRO	-	expression tag	UNP P14867
B	350	GLN	-	expression tag	UNP P14867
B	351	LEU	-	expression tag	UNP P14867
B	352	LYS	-	expression tag	UNP P14867
B	353	ALA	-	expression tag	UNP P14867
B	354	PRO	-	expression tag	UNP P14867
B	355	THR	-	expression tag	UNP P14867
B	356	PRO	-	expression tag	UNP P14867
B	357	HIS	-	expression tag	UNP P14867
B	358	GLN	-	expression tag	UNP P14867
D	313	SER	-	expression tag	UNP P14867
D	314	GLN	-	expression tag	UNP P14867
D	315	PRO	-	expression tag	UNP P14867
D	316	ALA	-	expression tag	UNP P14867
D	317	ARG	-	expression tag	UNP P14867
D	318	ALA	-	expression tag	UNP P14867
D	319	ALA	-	expression tag	UNP P14867
D	320	LYS	-	expression tag	UNP P14867
D	321	ILE	-	expression tag	UNP P14867
D	322	ASP	-	expression tag	UNP P14867
D	323	ARG	-	expression tag	UNP P14867
D	324	LEU	-	expression tag	UNP P14867
D	325	SER	-	expression tag	UNP P14867
D	326	ARG	-	expression tag	UNP P14867
D	327	ILE	-	expression tag	UNP P14867
D	328	ALA	-	expression tag	UNP P14867
D	329	PHE	-	expression tag	UNP P14867
D	330	PRO	-	expression tag	UNP P14867
D	331	LEU	-	expression tag	UNP P14867
D	332	LEU	-	expression tag	UNP P14867
D	333	PHE	-	expression tag	UNP P14867
D	334	GLY	-	expression tag	UNP P14867
D	335	ILE	-	expression tag	UNP P14867
D	336	PHE	-	expression tag	UNP P14867
D	337	ASN	-	expression tag	UNP P14867
D	338	LEU	-	expression tag	UNP P14867
D	339	VAL	-	expression tag	UNP P14867
D	340	TYR	-	expression tag	UNP P14867
D	341	TRP	-	expression tag	UNP P14867
D	342	ALA	-	expression tag	UNP P14867
D	343	THR	-	expression tag	UNP P14867
D	344	TYR	-	expression tag	UNP P14867

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Chain	Residue	Modelled	Actual	Comment	Reference
D	345	LEU	-	expression tag	UNP P14867
D	346	ASN	-	expression tag	UNP P14867
D	347	ARG	-	expression tag	UNP P14867
D	348	GLU	-	expression tag	UNP P14867
D	349	PRO	-	expression tag	UNP P14867
D	350	GLN	-	expression tag	UNP P14867
D	351	LEU	-	expression tag	UNP P14867
D	352	LYS	-	expression tag	UNP P14867
D	353	ALA	-	expression tag	UNP P14867
D	354	PRO	-	expression tag	UNP P14867
D	355	THR	-	expression tag	UNP P14867
D	356	PRO	-	expression tag	UNP P14867
D	357	HIS	-	expression tag	UNP P14867
D	358	GLN	-	expression tag	UNP P14867

- Molecule 3 is a protein called Gamma-aminobutyric acid receptor subunit gamma-2.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	E	333	Total	C	N	O	S	0	0
			2729	1781	448	485	15		

There are 95 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	-36	TRP	-	expression tag	UNP P18507
E	-35	SER	-	expression tag	UNP P18507
E	-34	HIS	-	expression tag	UNP P18507
E	-33	PRO	-	expression tag	UNP P18507
E	-32	GLN	-	expression tag	UNP P18507
E	-31	PHE	-	expression tag	UNP P18507
E	-30	GLU	-	expression tag	UNP P18507
E	-29	LYS	-	expression tag	UNP P18507
E	-28	GLY	-	expression tag	UNP P18507
E	-27	GLY	-	expression tag	UNP P18507
E	-26	GLY	-	expression tag	UNP P18507
E	-25	SER	-	expression tag	UNP P18507
E	-24	GLY	-	expression tag	UNP P18507
E	-23	GLY	-	expression tag	UNP P18507
E	-22	GLY	-	expression tag	UNP P18507
E	-21	SER	-	expression tag	UNP P18507
E	-20	GLY	-	expression tag	UNP P18507
E	-19	GLY	-	expression tag	UNP P18507

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Chain	Residue	Modelled	Actual	Comment	Reference
E	-18	SER	-	expression tag	UNP P18507
E	-17	SER	-	expression tag	UNP P18507
E	-16	ALA	-	expression tag	UNP P18507
E	-15	TRP	-	expression tag	UNP P18507
E	-14	SER	-	expression tag	UNP P18507
E	-13	HIS	-	expression tag	UNP P18507
E	-12	PRO	-	expression tag	UNP P18507
E	-11	GLN	-	expression tag	UNP P18507
E	-10	PHE	-	expression tag	UNP P18507
E	-9	GLU	-	expression tag	UNP P18507
E	-8	LYS	-	expression tag	UNP P18507
E	-7	LEU	-	expression tag	UNP P18507
E	-6	GLU	-	expression tag	UNP P18507
E	-5	VAL	-	expression tag	UNP P18507
E	-4	LEU	-	expression tag	UNP P18507
E	-3	PHE	-	expression tag	UNP P18507
E	-2	GLN	-	expression tag	UNP P18507
E	-1	GLY	-	expression tag	UNP P18507
E	0	PRO	-	expression tag	UNP P18507
E	323	SER	-	expression tag	UNP P18507
E	324	GLN	-	expression tag	UNP P18507
E	325	PRO	-	expression tag	UNP P18507
E	326	ALA	-	expression tag	UNP P18507
E	327	ARG	-	expression tag	UNP P18507
E	328	ALA	-	expression tag	UNP P18507
E	329	ALA	-	expression tag	UNP P18507
E	330	LYS	-	expression tag	UNP P18507
E	331	MET	-	expression tag	UNP P18507
E	332	ASP	-	expression tag	UNP P18507
E	333	SER	-	expression tag	UNP P18507
E	334	TYR	-	expression tag	UNP P18507
E	335	ALA	-	expression tag	UNP P18507
E	336	ARG	-	expression tag	UNP P18507
E	337	ILE	-	expression tag	UNP P18507
E	338	PHE	-	expression tag	UNP P18507
E	339	PHE	-	expression tag	UNP P18507
E	340	PRO	-	expression tag	UNP P18507
E	341	THR	-	expression tag	UNP P18507
E	342	ALA	-	expression tag	UNP P18507
E	343	PHE	-	expression tag	UNP P18507
E	344	CYS	-	expression tag	UNP P18507
E	345	LEU	-	expression tag	UNP P18507

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Chain	Residue	Modelled	Actual	Comment	Reference
E	346	PHE	-	expression tag	UNP P18507
E	347	ASN	-	expression tag	UNP P18507
E	348	LEU	-	expression tag	UNP P18507
E	349	VAL	-	expression tag	UNP P18507
E	350	TYR	-	expression tag	UNP P18507
E	351	TRP	-	expression tag	UNP P18507
E	352	VAL	-	expression tag	UNP P18507
E	353	SER	-	expression tag	UNP P18507
E	354	TYR	-	expression tag	UNP P18507
E	355	LEU	-	expression tag	UNP P18507
E	356	TYR	-	expression tag	UNP P18507
E	357	LEU	-	expression tag	UNP P18507
E	358	SER	-	expression tag	UNP P18507
E	359	ARG	-	expression tag	UNP P18507
E	360	GLY	-	expression tag	UNP P18507
E	361	SER	-	expression tag	UNP P18507
E	362	GLY	-	expression tag	UNP P18507
E	363	ALA	-	expression tag	UNP P18507
E	364	THR	-	expression tag	UNP P18507
E	365	ASN	-	expression tag	UNP P18507
E	366	PHE	-	expression tag	UNP P18507
E	367	SER	-	expression tag	UNP P18507
E	368	LEU	-	expression tag	UNP P18507
E	369	LEU	-	expression tag	UNP P18507
E	370	LYS	-	expression tag	UNP P18507
E	371	GLN	-	expression tag	UNP P18507
E	372	ALA	-	expression tag	UNP P18507
E	373	GLY	-	expression tag	UNP P18507
E	374	ASP	-	expression tag	UNP P18507
E	375	VAL	-	expression tag	UNP P18507
E	376	GLU	-	expression tag	UNP P18507
E	377	GLU	-	expression tag	UNP P18507
E	378	ASN	-	expression tag	UNP P18507
E	379	PRO	-	expression tag	UNP P18507
E	380	GLY	-	expression tag	UNP P18507

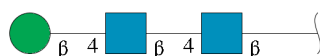
- Molecule 4 is a protein called Kappa Fab Light Chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	I	105	Total	C	N	O	S	0	0
			802	504	130	163	5		
4	L	106	Total	C	N	O	S	0	0
			811	510	132	164	5		

- Molecule 5 is a protein called IgG2b Fab Heavy Chain.

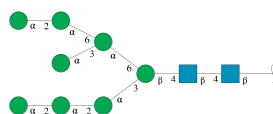
Mol	Chain	Residues	Atoms					AltConf	Trace
5	J	116	Total	C	N	O	S	0	0
			907	574	151	178	4		
5	K	117	Total	C	N	O	S	0	0
			914	578	152	180	4		

- Molecule 6 is an oligosaccharide called beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				AltConf	Trace
6	F	3	Total	C	N	O	0	0
			39	22	2	15		
6	H	3	Total	C	N	O	0	0
			39	22	2	15		
6	M	3	Total	C	N	O	0	0
			39	22	2	15		

- Molecule 7 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



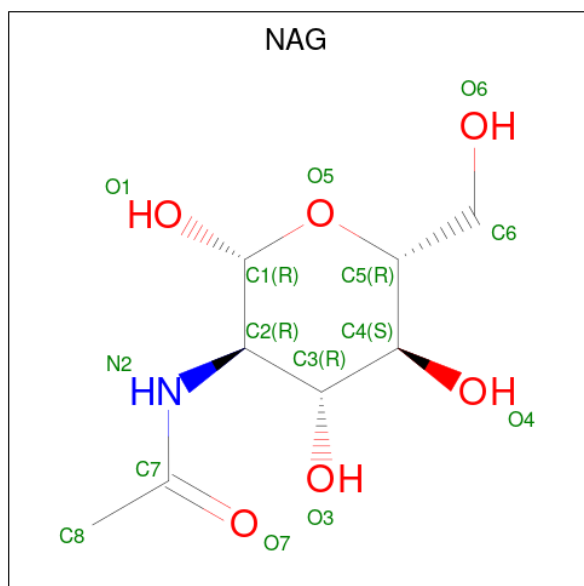
Mol	Chain	Residues	Atoms				AltConf	Trace
7	G	10	Total	C	N	O	0	0
			116	64	2	50		

- Molecule 8 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



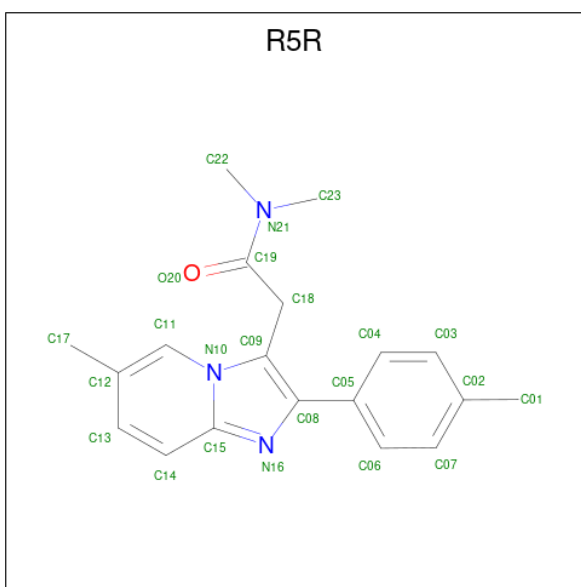
Mol	Chain	Residues	Atoms				AltConf	Trace
8	N	2	Total	C	N	O	0	0
			28	16	2	10		

- Molecule 9 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $C_8H_{15}NO_6$).



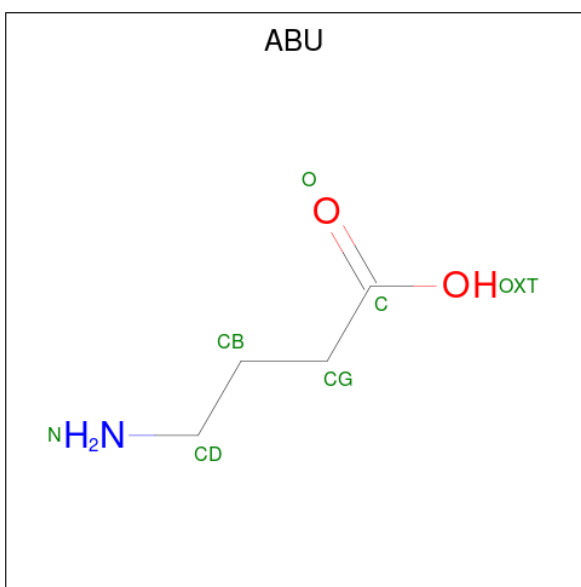
Mol	Chain	Residues	Atoms				AltConf
9	A	1	Total	C	N	O	0
			14	8	1	5	
9	C	1	Total	C	N	O	0
			14	8	1	5	

- Molecule 10 is Zolpidem (CCD ID: R5R) (formula: $C_{19}H_{21}N_3O$).



Mol	Chain	Residues	Atoms				AltConf
10	A	1	Total	C	N	O	0
			23	19	3	1	
10	C	1	Total	C	N	O	0
			23	19	3	1	
10	D	1	Total	C	N	O	0
			23	19	3	1	

- Molecule 11 is GAMMA-AMINO-BUTANOIC ACID (CCD ID: ABU) (formula: $C_4H_9NO_2$).



Mol	Chain	Residues	Atoms				AltConf
11	A	1	Total	C	N	O	0
			7	4	1	2	

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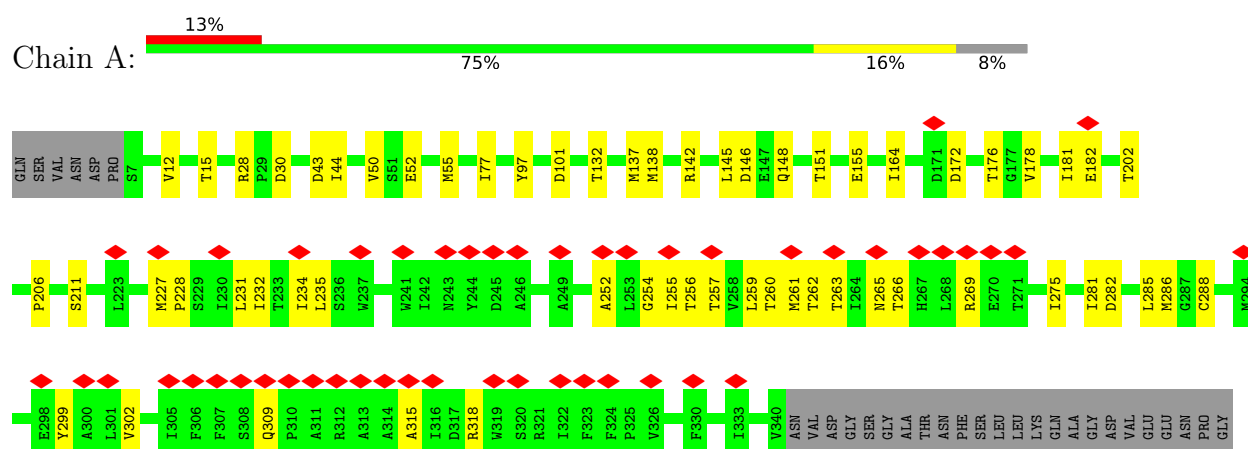
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Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
11	C	1	7	4	1	2	0

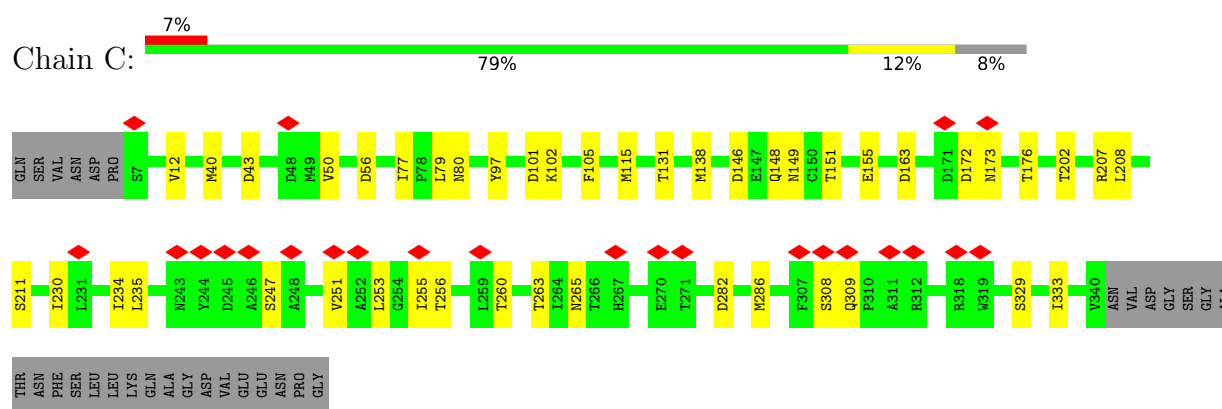
3 Residue-property plots

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.

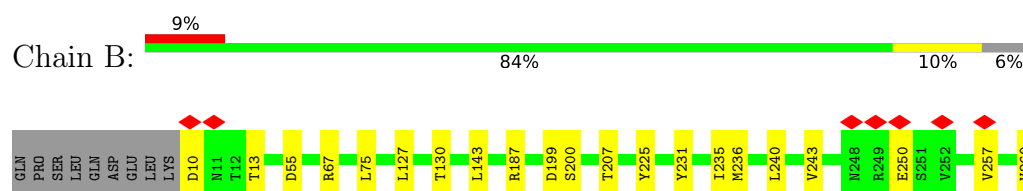
• Molecule 1: Gamma-aminobutyric acid receptor subunit beta-2

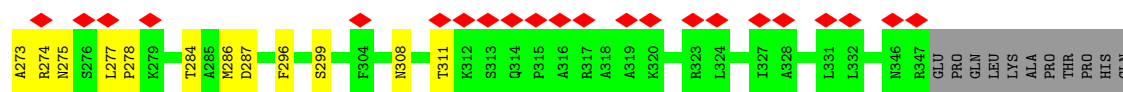


• Molecule 1: Gamma-aminobutyric acid receptor subunit beta-2

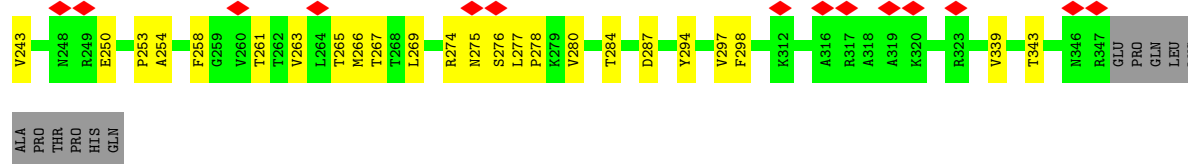
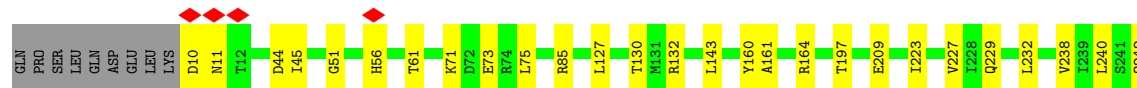
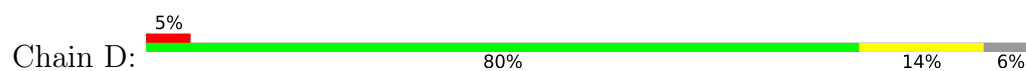


• Molecule 2: Gamma-aminobutyric acid receptor subunit alpha-1

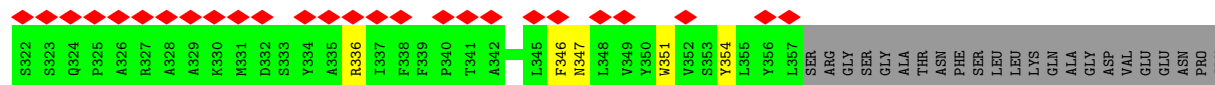
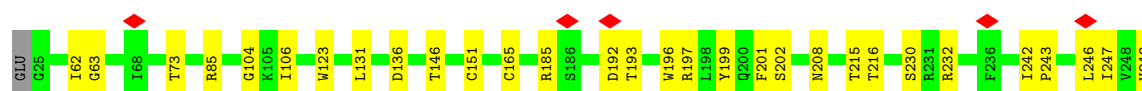
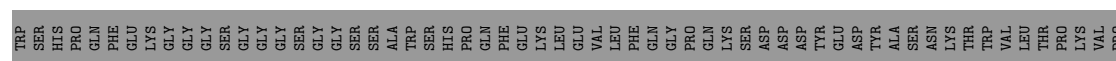




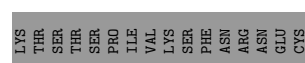
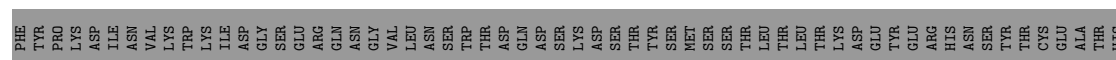
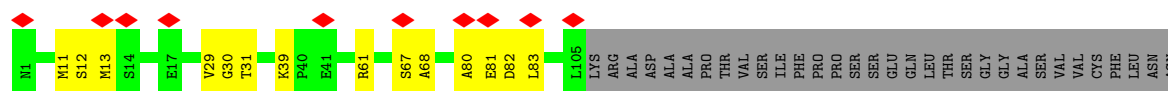
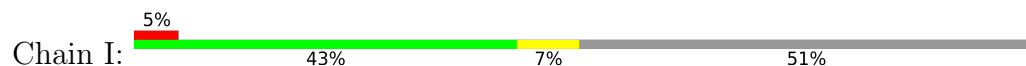
• Molecule 2: Gamma-aminobutyric acid receptor subunit alpha-1



• Molecule 3: Gamma-aminobutyric acid receptor subunit gamma-2



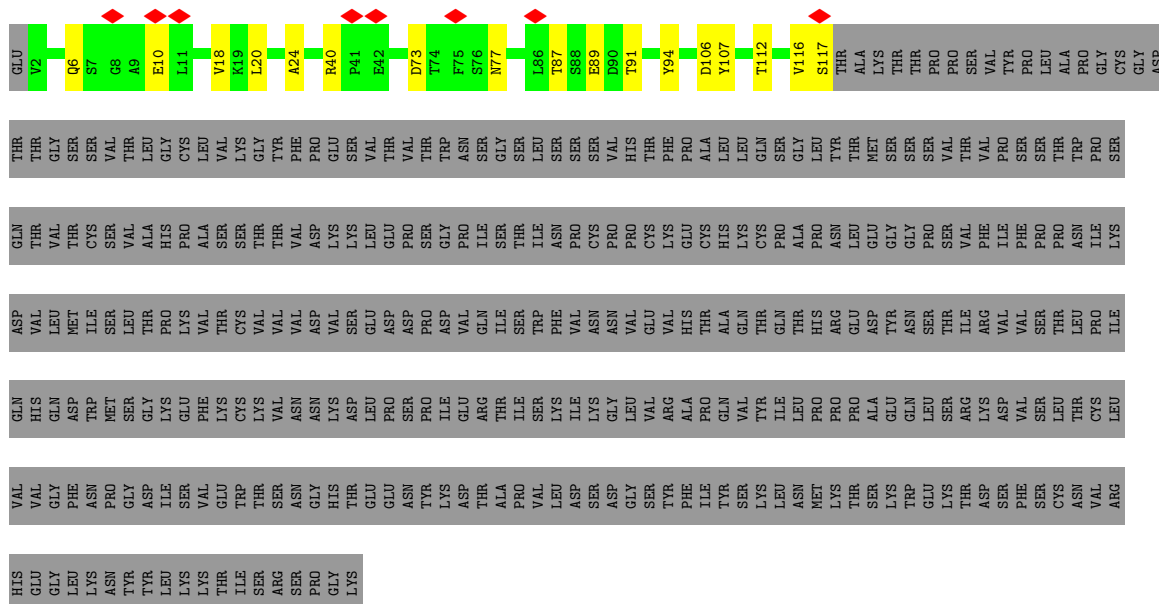
• Molecule 4: Kappa Fab Light Chain



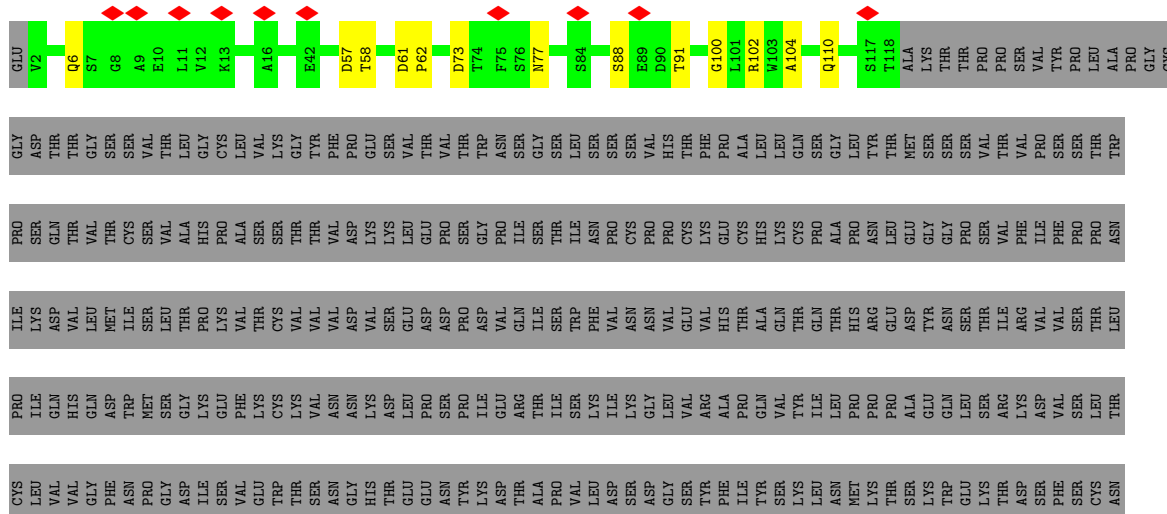
• Molecule 4: Kappa Fab Light Chain



- Molecule 5: IgG2b Fab Heavy Chain



- Molecule 5: IgG2b Fab Heavy Chain



VAL
ARG
HIS
GLU
GLY
LEU
LYS
ASN
TYR
LEU
LYS
THR
ILE
SER
ARG
SER
PRO
GLY
LYS

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



MAG1
MAG2
BNA3

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



MAG1
MAG2
BNA3

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



MAG1
MAG2
BNA3

- Molecule 7: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



MAG1
MAG2
BNA3
MAN4
MAN5
MAN6
MAN7
MAN8
MAN9
MAN10

- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



MAG1
MAG2

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	413941	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 ($e^-/\text{\AA}^2$)	55.7	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.084	Depositor
Minimum map value	-0.043	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.0145	Depositor
Map size (Å)	233.52, 233.52, 233.52	wwPDB
Map dimensions	280, 280, 280	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.834, 0.834, 0.834	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: ABU, R5R, NAG, BMA, MAN

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# $ Z > 5$	RMSZ	# $ Z > 5$
1	A	0.17	0/2804	0.33	0/3818
1	C	0.18	0/2804	0.32	0/3818
2	B	0.18	0/2799	0.31	0/3805
2	D	0.20	0/2799	0.34	0/3805
3	E	0.17	0/2805	0.31	0/3822
4	I	0.16	0/820	0.29	0/1112
4	L	0.17	0/829	0.29	0/1123
5	J	0.13	0/928	0.26	0/1260
5	K	0.14	0/935	0.25	0/1270
All	All	0.17	0/17523	0.31	0/23833

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2732	0	2741	46	0
1	C	2732	0	2740	40	0
2	B	2730	0	2723	24	0
2	D	2730	0	2724	38	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	E	2729	0	2714	42	0
4	I	802	0	771	9	0
4	L	811	0	784	5	0
5	J	907	0	877	10	0
5	K	914	0	884	8	0
6	F	39	0	34	2	0
6	H	39	0	34	1	0
6	M	39	0	34	1	0
7	G	116	0	97	5	0
8	N	28	0	25	2	0
9	A	14	0	13	0	0
9	C	14	0	13	3	0
10	A	23	0	0	1	0
10	C	23	0	0	3	0
10	D	23	0	0	0	0
11	A	7	0	0	1	0
11	C	7	0	0	3	0
All	All	17459	0	17208	201	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 6.

All (201) 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:286:MET:SD	10:C:402:R5R:C01	2.66	0.84
3:E:201:PHE:O	3:E:232:ARG:NH1	2.15	0.79
3:E:284:ARG:NH1	3:E:297:ASP:OD2	2.16	0.79
1:A:259:LEU:O	1:A:262:THR:OG1	2.04	0.75
2:B:240:LEU:O	2:B:243:VAL:HG12	1.86	0.75
4:I:61:ARG:NE	4:I:82:ASP:OD2	2.23	0.71
1:C:146:ASP:OD2	1:C:148:GLN:NE2	2.22	0.71
2:B:308:ASN:O	2:B:311:THR:HG22	1.92	0.70
1:C:97:TYR:HH	11:C:403:ABU:N	1.88	0.70
2:D:164:ARG:NH1	2:D:209:GLU:OE2	2.26	0.68
2:D:71:LYS:NZ	2:D:73:GLU:OE2	2.29	0.66
5:J:6:GLN:NE2	5:J:94:TYR:O	2.28	0.66
1:A:97:TYR:OH	1:A:155:GLU:OE2	2.13	0.65
2:D:274:ARG:NH1	2:D:287:ASP:OD2	2.30	0.65
2:B:274:ARG:NH1	2:B:287:ASP:OD2	2.30	0.64
5:J:40:ARG:NH2	5:J:89:GLU:OE2	2.30	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:231:TYR:O	2:B:235:ILE:HD12	1.97	0.64
5:K:57:ASP:OD1	5:K:58:THR:N	2.31	0.63
1:C:40:MET:HG3	1:C:208:LEU:HD12	1.81	0.63
2:B:296:PHE:O	2:B:299:SER:OG	2.12	0.62
3:E:85:ARG:NH2	3:E:136:ASP:O	2.32	0.62
2:D:56:HIS:NE2	2:D:276:SER:O	2.32	0.62
2:D:250:GLU:N	2:D:250:GLU:OE1	2.33	0.61
4:I:80:ALA:O	4:I:83:LEU:HD13	2.01	0.60
1:A:43:ASP:OD1	1:A:176:THR:OG1	2.19	0.60
1:C:172:ASP:OD1	1:C:173:ASN:N	2.35	0.60
1:A:254:GLY:O	1:A:257:THR:OG1	2.17	0.59
10:C:402:R5R:C23	2:D:232:LEU:HD21	2.31	0.59
1:A:142:ARG:O	1:A:145:LEU:N	2.34	0.59
1:A:151:THR:HG22	1:A:211:SER:HB3	1.85	0.59
1:C:255:ILE:HG21	2:D:261:THR:HG21	1.82	0.59
1:A:256:THR:HG21	3:E:270:ILE:HG12	1.85	0.58
1:C:211:SER:OG	6:H:1:NAG:O7	2.13	0.58
1:A:202:THR:OG1	11:A:403:ABU:OXT	2.12	0.58
3:E:63:GLY:N	3:E:73:THR:O	2.37	0.58
4:L:29:VAL:O	4:L:29:VAL:HG23	2.03	0.58
1:A:146:ASP:OD2	1:A:148:GLN:NE2	2.36	0.57
3:E:302:VAL:HG21	3:E:346:PHE:CE1	2.39	0.57
4:I:82:ASP:C	4:I:83:LEU:HD12	2.29	0.57
1:A:231:LEU:O	1:A:234:ILE:N	2.39	0.56
2:B:263:VAL:HG11	1:C:235:LEU:HD13	1.88	0.56
1:A:255:ILE:O	1:A:259:LEU:HD23	2.05	0.56
4:I:30:GLY:O	4:I:31:THR:OG1	2.21	0.55
2:B:67:ARG:HG3	2:B:130:THR:HG23	1.89	0.55
1:A:44:ILE:CG2	1:A:181:ILE:HD11	2.36	0.55
2:B:143:LEU:O	2:B:284:THR:HG22	2.07	0.55
3:E:302:VAL:HG21	3:E:346:PHE:CZ	2.41	0.55
3:E:123:TRP:CE3	7:G:8:MAN:H61	2.42	0.54
1:A:12:VAL:HG22	1:A:77:ILE:HD13	1.89	0.54
1:A:211:SER:OG	6:F:1:NAG:O7	2.23	0.54
2:D:298:PHE:HZ	3:E:249:VAL:HG12	1.71	0.54
2:D:265:THR:O	2:D:269:LEU:HD13	2.08	0.54
3:E:255:PHE:O	3:E:336:ARG:NH2	2.41	0.53
1:A:178:VAL:HA	1:A:181:ILE:HD12	1.89	0.53
3:E:283:ALA:HB1	3:E:296:MET:HE2	1.90	0.53
2:B:273:ALA:HB1	2:B:286:MET:HE3	1.90	0.53
4:L:31:THR:OG1	5:K:102:ARG:NH1	2.41	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:E:136:ASP:OD1	3:E:136:ASP:N	2.42	0.53
3:E:123:TRP:HB3	7:G:8:MAN:H62	1.91	0.53
5:K:91:THR:O	5:K:91:THR:HG23	2.09	0.53
1:C:12:VAL:HG22	1:C:77:ILE:HD13	1.90	0.53
4:I:39:LYS:NZ	4:I:81:GLU:O	2.42	0.52
3:E:254:SER:HB2	3:E:268:LEU:HD22	1.92	0.52
2:B:250:GLU:OE1	2:B:250:GLU:N	2.43	0.52
2:B:263:VAL:HG11	1:C:235:LEU:CD1	2.40	0.52
2:D:75:LEU:HD12	2:D:127:LEU:HD11	1.92	0.51
5:J:106:ASP:OD1	5:J:107:TYR:N	2.43	0.51
1:A:231:LEU:O	1:A:235:LEU:HD12	2.11	0.51
4:I:12:SER:C	4:I:13:MET:HE3	2.35	0.51
4:I:29:VAL:O	4:I:29:VAL:HG23	2.10	0.51
1:C:43:ASP:OD1	1:C:176:THR:OG1	2.29	0.51
1:A:281:ILE:O	1:A:285:LEU:HD23	2.10	0.51
1:C:77:ILE:HG22	1:C:79:LEU:HD23	1.93	0.51
3:E:287:LEU:HD12	3:E:288:PRO:HD2	1.94	0.50
5:K:100:GLY:N	5:K:104:ALA:O	2.44	0.50
3:E:192:ASP:OD1	3:E:193:THR:N	2.44	0.49
2:D:143:LEU:O	2:D:284:THR:HG22	2.12	0.49
3:E:298:LEU:O	3:E:302:VAL:HG23	2.12	0.49
1:C:247:SER:O	1:C:251:VAL:HG23	2.13	0.49
5:J:24:ALA:O	5:J:77:ASN:ND2	2.41	0.49
1:A:52:GLU:O	1:A:55:MET:HE2	2.12	0.49
1:A:255:ILE:HD11	2:B:261:THR:OG1	2.13	0.49
3:E:215:THR:HG22	3:E:216:THR:N	2.27	0.49
1:C:260:THR:O	1:C:263:THR:HG22	2.14	0.48
3:E:197:ARG:NE	3:E:199:TYR:OH	2.41	0.48
3:E:295:ALA:HB2	3:E:354:TYR:CE1	2.48	0.48
5:J:73:ASP:O	5:J:73:ASP:OD1	2.32	0.48
2:B:55:ASP:N	2:B:55:ASP:OD1	2.46	0.48
2:D:294:TYR:CE1	3:E:246:LEU:HD23	2.49	0.48
1:C:80:ASN:OD1	9:C:401:NAG:N2	2.47	0.47
11:C:403:ABU:OXT	2:D:130:THR:HG21	2.15	0.47
2:D:223:ILE:HG12	2:D:227:VAL:HG23	1.95	0.47
2:D:238:VAL:O	2:D:242:GLN:HG2	2.15	0.47
2:D:197:THR:CG2	4:L:28:TYR:CE1	2.96	0.47
1:A:265:ASN:OD1	10:A:402:R5R:C06	2.62	0.47
1:A:259:LEU:O	1:A:263:THR:HG23	2.15	0.47
1:C:265:ASN:C	1:C:265:ASN:HD22	2.22	0.47
1:C:50:VAL:HG12	1:C:138:MET:HE1	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:C:402:R5R:C23	2:D:232:LEU:CD2	2.93	0.47
1:A:231:LEU:O	1:A:232:ILE:C	2.58	0.46
2:B:257:VAL:HA	2:B:260:VAL:HG22	1.97	0.46
2:B:277:LEU:HB2	2:B:278:PRO:HD2	1.97	0.46
1:C:80:ASN:CG	9:C:401:NAG:N2	2.74	0.46
1:A:227:MET:HB3	1:A:228:PRO:HD3	1.97	0.46
1:C:265:ASN:O	1:C:265:ASN:ND2	2.48	0.46
4:L:49:TYR:O	4:L:53:ASN:HB2	2.16	0.46
1:A:227:MET:O	1:A:231:LEU:HD13	2.16	0.46
2:D:275:ASN:OD1	2:D:276:SER:N	2.49	0.46
5:J:91:THR:HG23	5:J:91:THR:O	2.16	0.46
1:A:299:TYR:O	1:A:302:VAL:HG12	2.16	0.46
1:A:309:GLN:OE1	1:A:309:GLN:N	2.49	0.46
2:B:199:ASP:OD1	2:B:200:SER:N	2.48	0.46
1:A:137:MET:CE	2:B:187:ARG:HA	2.46	0.45
1:A:252:ALA:O	1:A:256:THR:HG22	2.16	0.45
1:C:101:ASP:OD1	2:D:132:ARG:NH1	2.38	0.45
1:C:151:THR:HG22	1:C:211:SER:HB3	1.98	0.45
3:E:106:ILE:HD11	3:E:131:LEU:HD11	1.99	0.45
3:E:123:TRP:HB3	7:G:8:MAN:C6	2.47	0.45
1:A:282:ASP:O	1:A:286:MET:HG2	2.16	0.45
2:D:277:LEU:H	2:D:277:LEU:HD23	1.81	0.45
3:E:62:ILE:HD12	3:E:196:TRP:CZ3	2.53	0.44
1:A:28:ARG:NH2	1:A:30:ASP:O	2.50	0.44
1:A:101:ASP:HB2	1:A:132:THR:HG23	1.98	0.44
2:B:260:VAL:HG12	1:C:253:LEU:HD13	1.98	0.44
1:C:56:ASP:OD2	1:C:102:LYS:NZ	2.47	0.44
1:C:101:ASP:OD1	1:C:101:ASP:O	2.36	0.44
1:A:261:MET:CE	1:A:288:CYS:HB3	2.47	0.44
5:K:73:ASP:O	5:K:77:ASN:N	2.50	0.44
7:G:9:MAN:C1	6:M:1:NAG:HN2	2.29	0.44
2:B:75:LEU:HD12	2:B:127:LEU:HD11	1.99	0.44
4:I:67:SER:OG	4:I:68:ALA:N	2.51	0.44
1:A:164:ILE:HG23	1:A:206:PRO:HG3	1.98	0.44
1:A:315:ALA:O	1:A:318:ARG:HG2	2.17	0.44
2:D:160:TYR:O	2:D:161:ALA:HB3	2.18	0.44
1:A:15:THR:HG21	1:A:77:ILE:HD12	1.99	0.43
2:B:236:MET:HA	2:B:236:MET:HE2	2.00	0.43
1:C:251:VAL:HG21	2:D:254:ALA:HB1	2.00	0.43
1:C:163:ASP:OD2	2:D:85:ARG:NE	2.48	0.43
5:K:6:GLN:O	5:K:110:GLN:NE2	2.52	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:E:287:LEU:HD21	3:E:294:THR:HG21	2.00	0.43
1:C:251:VAL:HG13	2:D:258:PHE:CE1	2.53	0.43
5:J:10:GLU:OE2	5:J:18:VAL:HG21	2.19	0.43
2:B:10:ASP:O	2:B:13:THR:HG22	2.18	0.43
3:E:151:CYS:HB2	3:E:165:CYS:HB2	1.89	0.43
3:E:208:ASN:H	8:N:1:NAG:H83	1.84	0.43
3:E:242:ILE:HB	3:E:243:PRO:HD3	2.01	0.43
2:D:229:GLN:HA	2:D:229:GLN:OE1	2.18	0.43
2:D:267:THR:HG21	3:E:247:ILE:HD11	2.00	0.43
3:E:104:GLY:HA3	7:G:5:MAN:H3	2.00	0.43
2:D:253:PRO:HA	3:E:264:ALA:HB2	2.00	0.42
2:D:263:VAL:HG11	3:E:250:LEU:HD22	2.01	0.42
4:L:30:GLY:O	4:L:67:SER:O	2.37	0.42
2:D:266:MET:HG3	2:D:297:VAL:HG11	2.01	0.42
1:A:211:SER:CB	6:F:1:NAG:O7	2.67	0.42
1:C:282:ASP:O	1:C:286:MET:SD	2.78	0.42
1:C:329:SER:O	1:C:333:ILE:HG12	2.20	0.42
4:I:11:MET:SD	4:I:13:MET:HE1	2.60	0.42
1:A:266:THR:HG22	1:A:269:ARG:HH12	1.83	0.42
2:B:272:SER:O	2:B:275:ASN:OD1	2.37	0.42
1:C:265:ASN:C	1:C:265:ASN:ND2	2.78	0.42
2:D:10:ASP:O	2:D:11:ASN:HB2	2.18	0.42
2:B:207:THR:HG21	1:C:115:MET:HE1	2.02	0.42
1:A:101:ASP:OD1	1:A:101:ASP:C	2.63	0.42
1:A:265:ASN:C	1:A:265:ASN:ND2	2.77	0.42
1:C:79:LEU:HA	9:C:401:NAG:C8	2.50	0.42
1:A:182:GLU:N	1:A:182:GLU:OE1	2.53	0.42
1:A:262:THR:O	1:A:266:THR:HG23	2.19	0.42
2:D:240:LEU:O	2:D:243:VAL:HG12	2.20	0.42
3:E:243:PRO:O	3:E:247:ILE:HG12	2.19	0.42
1:C:230:ILE:O	1:C:234:ILE:HG12	2.20	0.41
2:D:277:LEU:CD1	2:D:284:THR:HG21	2.50	0.41
1:A:101:ASP:OD1	1:A:101:ASP:O	2.38	0.41
2:D:51:GLY:N	2:D:61:THR:O	2.54	0.41
3:E:304:PHE:O	3:E:307:VAL:HG12	2.19	0.41
1:A:50:VAL:HG12	1:A:138:MET:HE1	2.02	0.41
3:E:258:ASN:OD1	3:E:259:LYS:N	2.53	0.41
2:D:274:ARG:NH2	2:D:280:VAL:O	2.54	0.41
5:J:116:VAL:O	5:J:117:SER:OG	2.30	0.41
5:K:88:SER:O	5:K:91:THR:HG22	2.21	0.41
2:D:339:VAL:O	2:D:343:THR:HG23	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:E:185:ARG:HE	8:N:2:NAG:H2	1.84	0.41
5:J:87:THR:O	5:J:116:VAL:HG21	2.21	0.41
1:A:172:ASP:OD1	1:A:172:ASP:N	2.53	0.41
1:C:105:PHE:CZ	1:C:131:THR:CG2	3.04	0.41
1:C:308:SER:OG	1:C:309:GLN:N	2.53	0.41
3:E:263:PRO:HA	3:E:266:THR:HG1	1.86	0.41
3:E:268:LEU:C	3:E:268:LEU:HD23	2.46	0.41
3:E:347:ASN:O	3:E:351:TRP:CD1	2.74	0.41
5:K:61:ASP:OD1	5:K:62:PRO:HD2	2.20	0.41
1:C:251:VAL:HG21	2:D:254:ALA:CB	2.51	0.41
2:D:44:ASP:OD1	2:D:45:ILE:N	2.53	0.41
3:E:202:SER:N	3:E:230:SER:O	2.50	0.41
1:A:260:THR:OG1	3:E:274:LEU:HD21	2.21	0.40
1:C:202:THR:OG1	11:C:403:ABU:O	2.25	0.40
1:C:256:THR:O	1:C:260:THR:HG23	2.21	0.40
3:E:146:THR:O	3:E:146:THR:HG23	2.21	0.40
1:C:155:GLU:OE1	1:C:207:ARG:NH2	2.42	0.40
2:D:277:LEU:HB2	2:D:278:PRO:HD2	2.03	0.40
5:J:20:LEU:HD23	5:J:112:THR:CG2	2.51	0.40
1:C:149:ASN:OD1	1:C:149:ASN:C	2.64	0.40
1:A:275:ILE:O	2:B:225:TYR:HB2	2.22	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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	332/364 (91%)	319 (96%)	13 (4%)	0	100	100
1	C	332/364 (91%)	321 (97%)	11 (3%)	0	100	100
2	B	336/358 (94%)	322 (96%)	14 (4%)	0	100	100
2	D	336/358 (94%)	326 (97%)	10 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	E	331/417 (79%)	312 (94%)	19 (6%)	0	100	100
4	I	103/213 (48%)	93 (90%)	10 (10%)	0	100	100
4	L	104/213 (49%)	96 (92%)	8 (8%)	0	100	100
5	J	114/454 (25%)	110 (96%)	4 (4%)	0	100	100
5	K	115/454 (25%)	109 (95%)	6 (5%)	0	100	100
All	All	2103/3195 (66%)	2008 (96%)	95 (4%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

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

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](#)

21 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	$\# Z > 2$
6	NAG	F	1	6,1	14,14,15	0.27	0	17,19,21	0.70	0
6	NAG	F	2	6	14,14,15	0.31	0	17,19,21	0.46	0
6	BMA	F	3	6	11,11,12	0.65	0	15,15,17	0.74	0
7	NAG	G	1	2,7	14,14,15	0.39	0	17,19,21	0.49	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
7	MAN	G	10	7	11,11,12	0.58	0	15,15,17	1.26	1 (6%)
7	NAG	G	2	7	14,14,15	0.22	0	17,19,21	0.47	0
7	BMA	G	3	7	11,11,12	0.63	0	15,15,17	0.84	0
7	MAN	G	4	7	11,11,12	0.63	0	15,15,17	1.11	1 (6%)
7	MAN	G	5	7	11,11,12	0.66	0	15,15,17	1.21	1 (6%)
7	MAN	G	6	7	11,11,12	0.67	0	15,15,17	0.97	2 (13%)
7	MAN	G	7	7	11,11,12	0.20	0	15,15,17	0.76	0
7	MAN	G	8	7	11,11,12	0.26	0	15,15,17	0.50	0
7	MAN	G	9	7	11,11,12	0.24	0	15,15,17	0.76	0
6	NAG	H	1	6,1	14,14,15	0.31	0	17,19,21	0.70	0
6	NAG	H	2	6	14,14,15	0.50	0	17,19,21	0.50	0
6	BMA	H	3	6	11,11,12	0.63	0	15,15,17	0.67	0
6	NAG	M	1	2,6	14,14,15	0.34	0	17,19,21	0.67	1 (5%)
6	NAG	M	2	6	14,14,15	0.35	0	17,19,21	0.66	0
6	BMA	M	3	6	11,11,12	0.49	0	15,15,17	0.69	0
8	NAG	N	1	3,8	14,14,15	0.40	0	17,19,21	0.48	0
8	NAG	N	2	8	14,14,15	0.31	0	17,19,21	0.46	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	NAG	F	1	6,1	-	2/6/23/26	0/1/1/1
6	NAG	F	2	6	-	0/6/23/26	0/1/1/1
6	BMA	F	3	6	-	1/2/19/22	0/1/1/1
7	NAG	G	1	2,7	-	0/6/23/26	0/1/1/1
7	MAN	G	10	7	-	1/2/19/22	0/1/1/1
7	NAG	G	2	7	-	2/6/23/26	0/1/1/1
7	BMA	G	3	7	-	0/2/19/22	0/1/1/1
7	MAN	G	4	7	-	0/2/19/22	0/1/1/1
7	MAN	G	5	7	-	2/2/19/22	0/1/1/1
7	MAN	G	6	7	-	2/2/19/22	0/1/1/1
7	MAN	G	7	7	-	0/2/19/22	0/1/1/1
7	MAN	G	8	7	-	2/2/19/22	0/1/1/1
7	MAN	G	9	7	-	2/2/19/22	0/1/1/1
6	NAG	H	1	6,1	-	2/6/23/26	0/1/1/1
6	NAG	H	2	6	-	2/6/23/26	0/1/1/1
6	BMA	H	3	6	-	1/2/19/22	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	NAG	M	1	2,6	-	4/6/23/26	0/1/1/1
6	NAG	M	2	6	-	2/6/23/26	0/1/1/1
6	BMA	M	3	6	-	0/2/19/22	0/1/1/1
8	NAG	N	1	3,8	-	3/6/23/26	0/1/1/1
8	NAG	N	2	8	-	2/6/23/26	0/1/1/1

There are no bond length outliers.

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	G	10	MAN	C1-O5-C5	4.03	117.58	112.19
7	G	5	MAN	C1-O5-C5	3.79	117.27	112.19
7	G	4	MAN	C1-O5-C5	3.38	116.72	112.19
7	G	6	MAN	C1-O5-C5	2.39	115.39	112.19
7	G	6	MAN	O2-C2-C3	-2.15	105.69	110.15
6	M	1	NAG	O5-C1-C2	-2.14	107.97	111.29

There are no chirality outliers.

All (30) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	M	1	NAG	C8-C7-N2-C2
6	M	1	NAG	O7-C7-N2-C2
7	G	9	MAN	O5-C5-C6-O6
7	G	8	MAN	C4-C5-C6-O6
7	G	9	MAN	C4-C5-C6-O6
7	G	6	MAN	C4-C5-C6-O6
7	G	8	MAN	O5-C5-C6-O6
8	N	2	NAG	C4-C5-C6-O6
6	M	2	NAG	C8-C7-N2-C2
7	G	6	MAN	O5-C5-C6-O6
8	N	2	NAG	O5-C5-C6-O6
6	M	2	NAG	O7-C7-N2-C2
8	N	1	NAG	C8-C7-N2-C2
8	N	1	NAG	O7-C7-N2-C2
6	M	1	NAG	C4-C5-C6-O6
6	H	2	NAG	O5-C5-C6-O6
6	F	3	BMA	O5-C5-C6-O6
6	H	2	NAG	C4-C5-C6-O6
6	M	1	NAG	O5-C5-C6-O6

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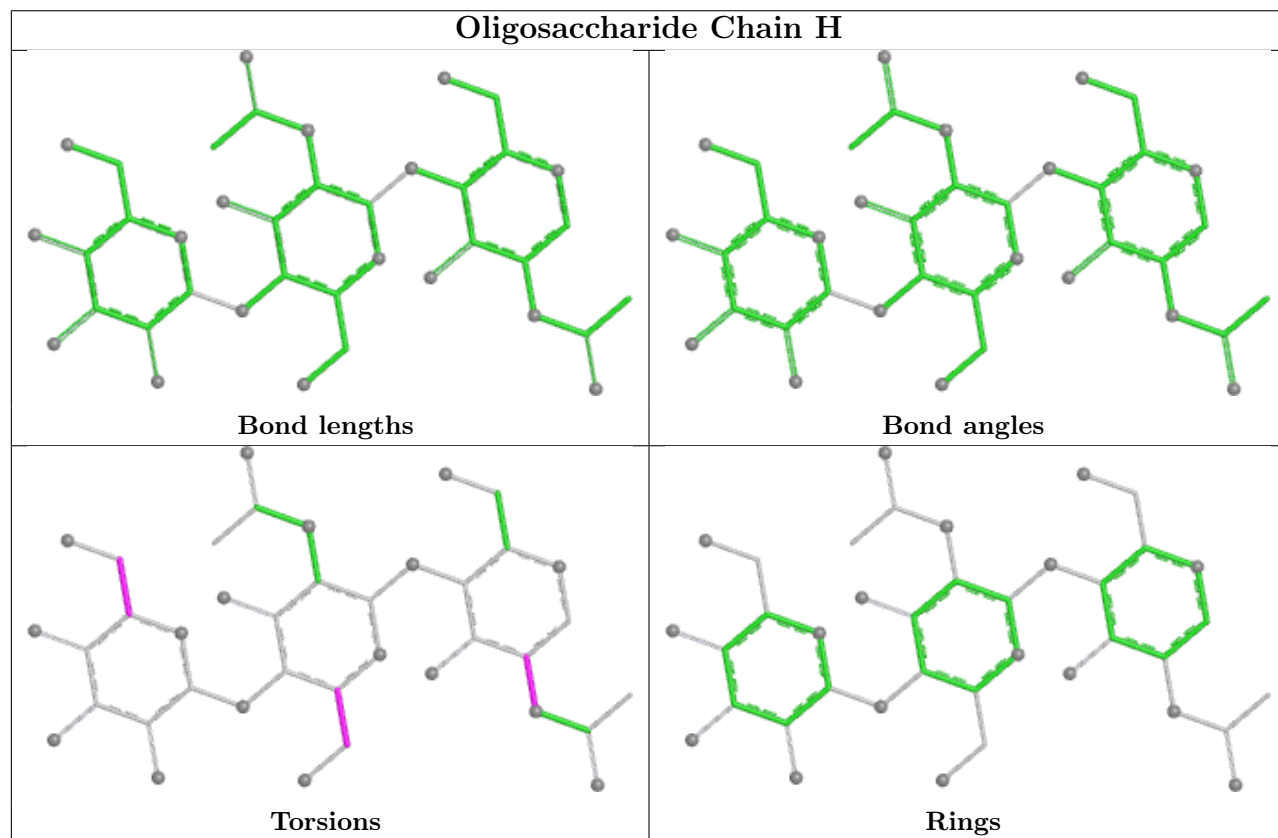
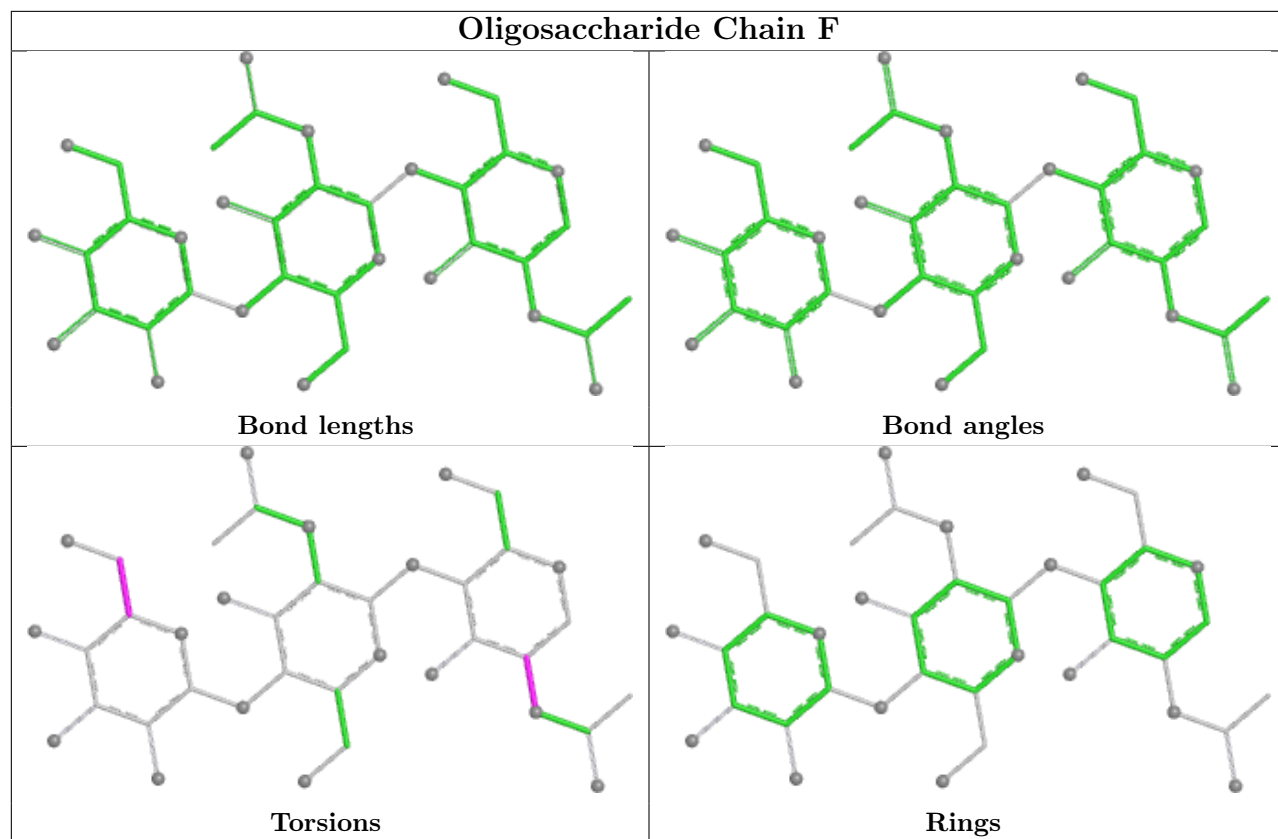
Mol	Chain	Res	Type	Atoms
6	H	3	BMA	O5-C5-C6-O6
7	G	10	MAN	O5-C5-C6-O6
7	G	2	NAG	C4-C5-C6-O6
7	G	2	NAG	O5-C5-C6-O6
7	G	5	MAN	C4-C5-C6-O6
6	F	1	NAG	C3-C2-N2-C7
6	H	1	NAG	C3-C2-N2-C7
7	G	5	MAN	O5-C5-C6-O6
6	F	1	NAG	C1-C2-N2-C7
6	H	1	NAG	C1-C2-N2-C7
8	N	1	NAG	C4-C5-C6-O6

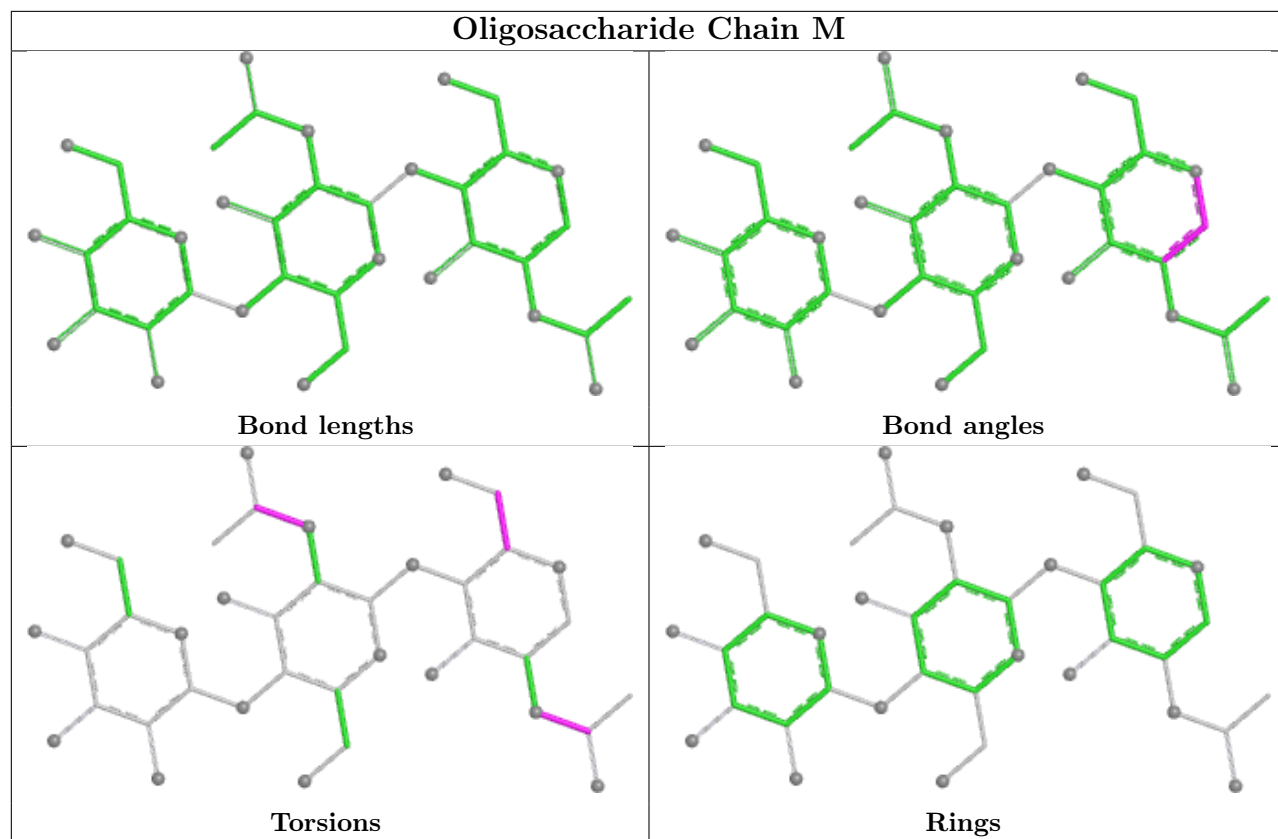
There are no ring outliers.

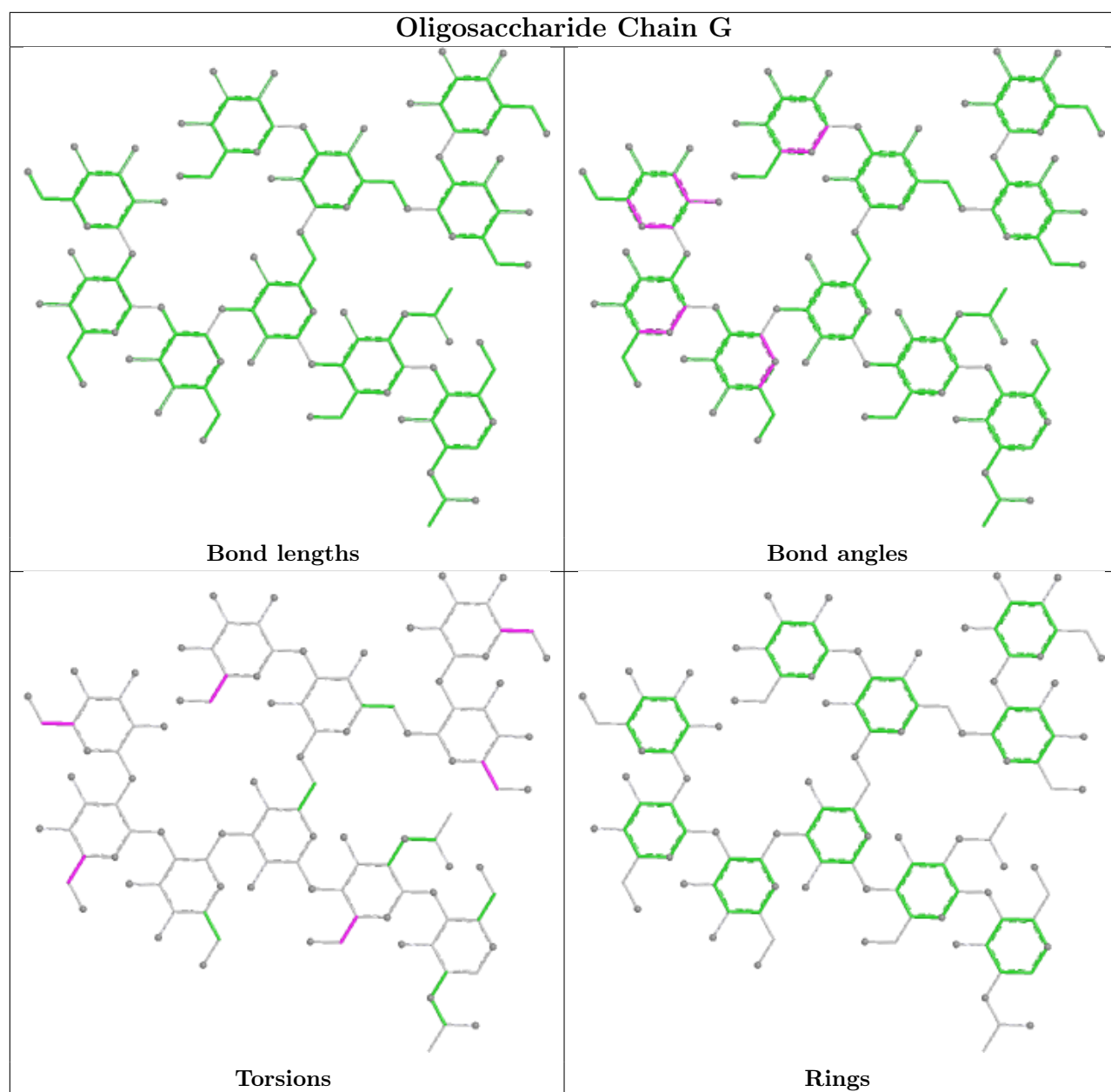
8 monomers are involved in 10 short contacts:

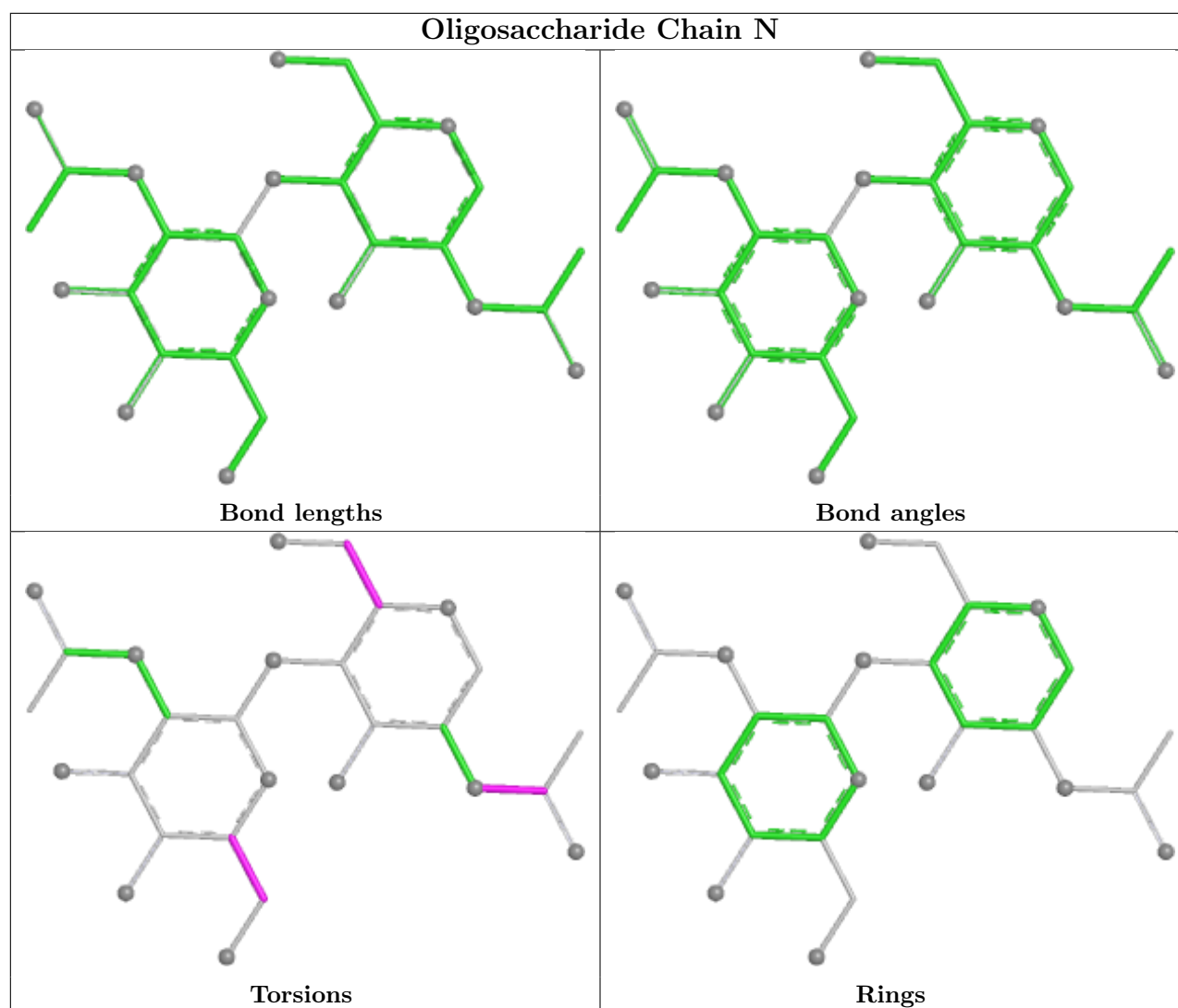
Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	G	8	MAN	3	0
6	F	1	NAG	2	0
7	G	9	MAN	1	0
6	M	1	NAG	1	0
7	G	5	MAN	1	0
6	H	1	NAG	1	0
8	N	2	NAG	1	0
8	N	1	NAG	1	0

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









5.6 Ligand geometry [i](#)

7 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	$\# Z > 2$
10	R5R	A	402	-	25,25,25	1.28	2 (8%)	33,36,36	1.73	8 (24%)
11	ABU	C	403	-	6,6,6	0.92	0	6,6,6	1.12	0
9	NAG	A	401	1	14,14,15	0.31	0	17,19,21	0.60	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
10	R5R	C	402	-	25,25,25	1.32	2 (8%)	33,36,36	1.63	6 (18%)
9	NAG	C	401	1	14,14,15	0.27	0	17,19,21	0.50	0
10	R5R	D	601	-	25,25,25	1.30	2 (8%)	33,36,36	1.63	7 (21%)
11	ABU	A	403	-	6,6,6	0.83	0	6,6,6	1.14	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
10	R5R	A	402	-	-	4/12/12/12	0/3/3/3
11	ABU	C	403	-	-	2/4/4/4	-
9	NAG	A	401	1	-	1/6/23/26	0/1/1/1
10	R5R	C	402	-	-	6/12/12/12	0/3/3/3
9	NAG	C	401	1	-	2/6/23/26	0/1/1/1
10	R5R	D	601	-	-	2/12/12/12	0/3/3/3
11	ABU	A	403	-	-	3/4/4/4	-

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
10	D	601	R5R	C15-N10	-3.86	1.33	1.39
10	A	402	R5R	C11-C12	3.84	1.41	1.35
10	C	402	R5R	C15-N10	-3.70	1.34	1.39
10	C	402	R5R	C11-C12	3.43	1.40	1.35
10	A	402	R5R	C15-N10	-3.28	1.34	1.39
10	D	601	R5R	C11-C12	3.24	1.40	1.35

All (22) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
10	C	402	R5R	C09-N10-C15	4.13	109.64	107.09
10	A	402	R5R	C05-C08-N16	4.05	125.51	119.53
10	D	601	R5R	C05-C08-N16	3.94	125.36	119.53
10	C	402	R5R	C08-N16-C15	3.56	108.78	105.71
10	C	402	R5R	C09-C08-N16	-3.47	107.29	111.40
10	D	601	R5R	C09-C08-N16	-3.44	107.33	111.40
10	A	402	R5R	C09-C08-N16	-3.38	107.40	111.40
10	A	402	R5R	C08-N16-C15	3.21	108.48	105.71

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
10	C	402	R5R	C05-C08-N16	3.12	124.14	119.53
10	A	402	R5R	C18-C09-C08	-3.08	126.28	133.02
10	D	601	R5R	C08-N16-C15	3.01	108.31	105.71
10	A	402	R5R	C18-C09-N10	2.98	127.34	122.28
10	C	402	R5R	N10-C15-N16	-2.79	108.74	111.26
10	D	601	R5R	C09-N10-C15	2.75	108.80	107.09
10	A	402	R5R	C09-N10-C15	2.53	108.66	107.09
10	D	601	R5R	C18-C09-C08	-2.41	127.75	133.02
10	A	402	R5R	N10-C15-N16	-2.41	109.09	111.26
10	A	402	R5R	C11-N10-C15	-2.24	120.64	122.33
10	D	601	R5R	N10-C15-N16	-2.18	109.29	111.26
10	D	601	R5R	C18-C09-N10	2.17	125.96	122.28
10	C	402	R5R	C11-N10-C15	-2.16	120.71	122.33
9	A	401	NAG	C1-O5-C5	2.06	114.95	112.19

There are no chirality outliers.

All (20) torsion outliers are listed below:

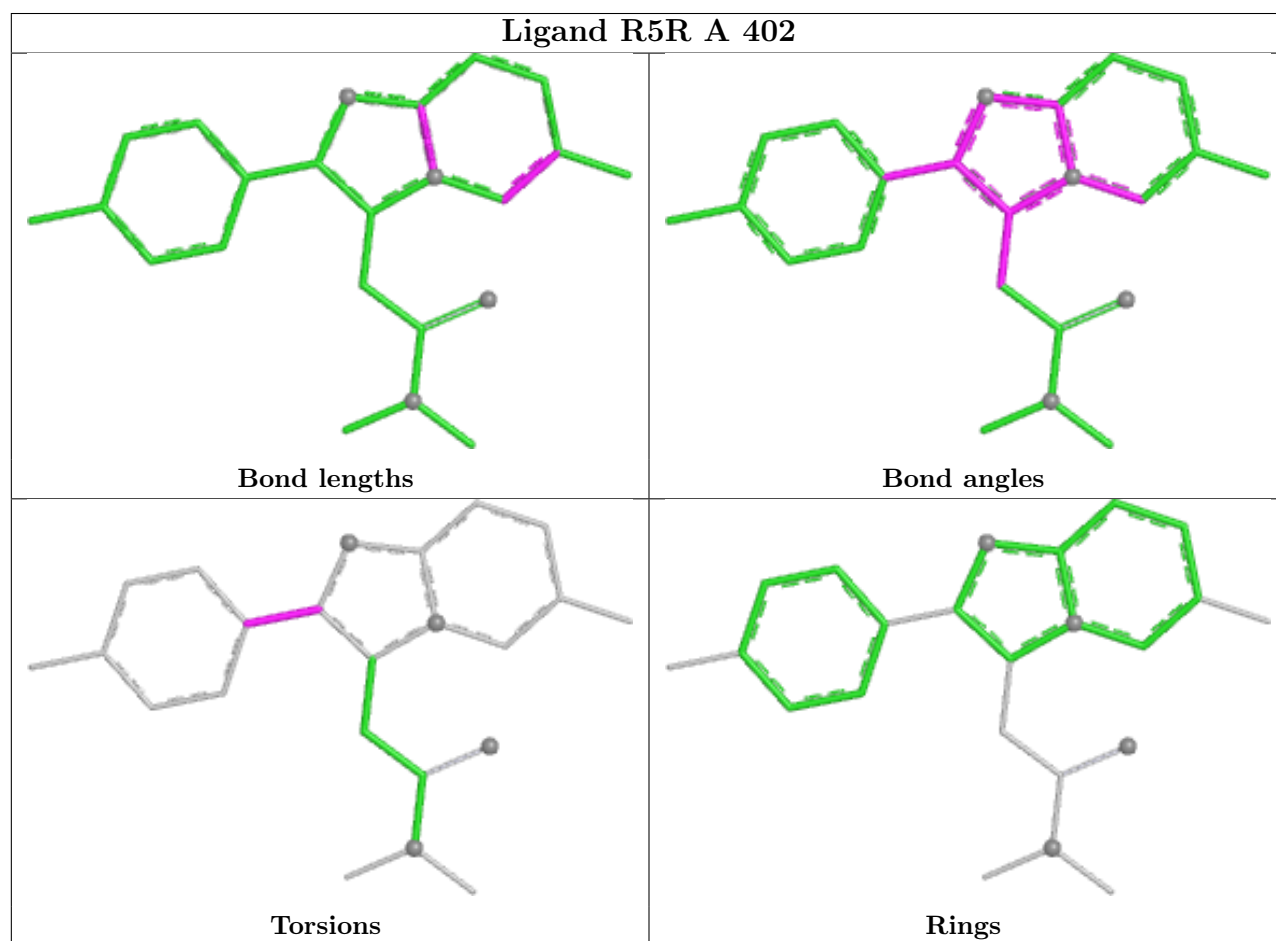
Mol	Chain	Res	Type	Atoms
10	C	402	R5R	C08-C09-C18-C19
10	C	402	R5R	N10-C09-C18-C19
9	C	401	NAG	O5-C5-C6-O6
10	A	402	R5R	C04-C05-C08-C09
9	C	401	NAG	C4-C5-C6-O6
10	A	402	R5R	C06-C05-C08-C09
10	A	402	R5R	C04-C05-C08-N16
10	A	402	R5R	C06-C05-C08-N16
9	A	401	NAG	O5-C5-C6-O6
10	D	601	R5R	C09-C18-C19-O20
10	D	601	R5R	C09-C18-C19-N21
10	C	402	R5R	C06-C05-C08-C09
10	C	402	R5R	C04-C05-C08-C09
10	C	402	R5R	C06-C05-C08-N16
10	C	402	R5R	C04-C05-C08-N16
11	A	403	ABU	CD-CB-CG-C
11	A	403	ABU	OXT-C-CG-CB
11	C	403	ABU	O-C-CG-CB
11	C	403	ABU	OXT-C-CG-CB
11	A	403	ABU	O-C-CG-CB

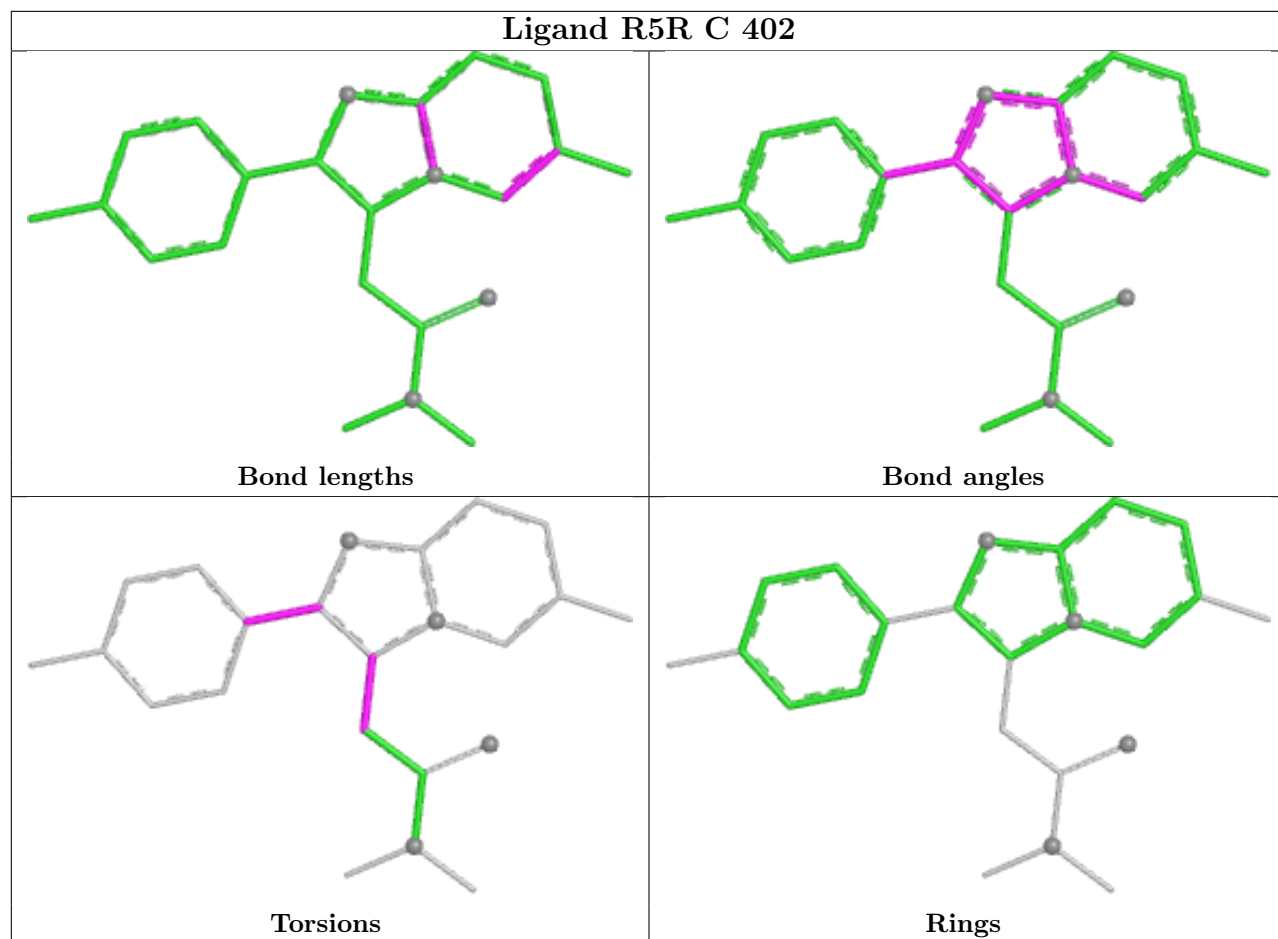
There are no ring outliers.

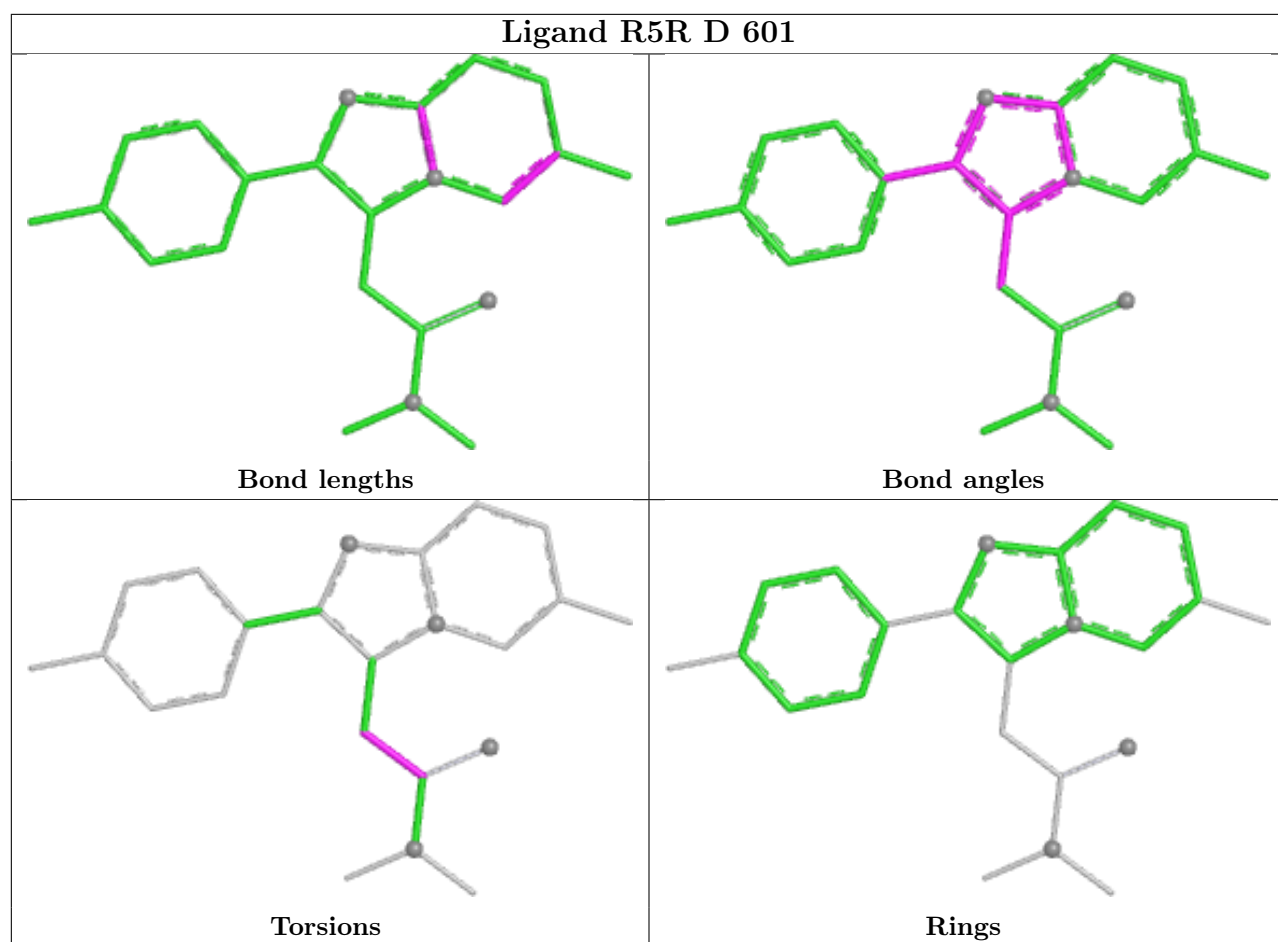
5 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
10	A	402	R5R	1	0
11	C	403	ABU	3	0
10	C	402	R5R	3	0
9	C	401	NAG	3	0
11	A	403	ABU	1	0

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







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.

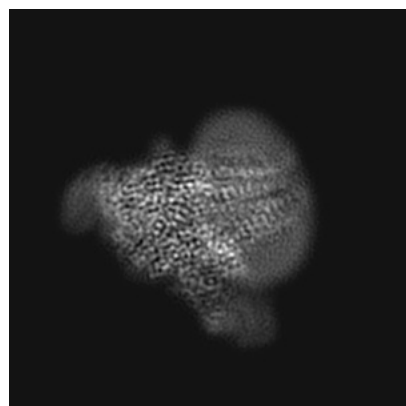
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-27332. These allow visual inspection of the internal detail of the map and identification of artifacts.

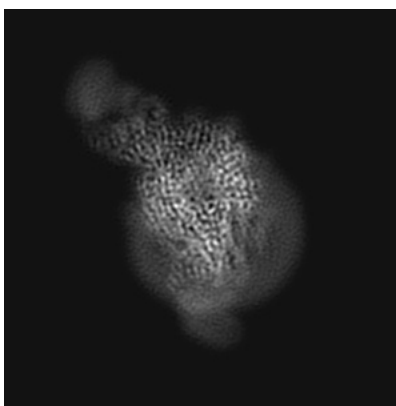
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

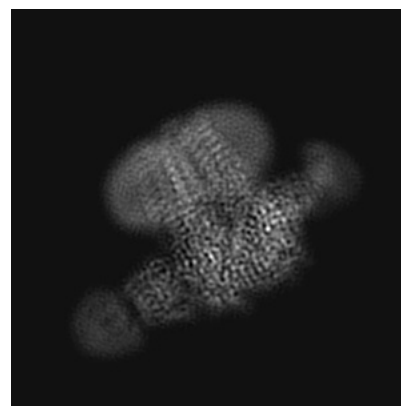
6.1.1 Primary map



X

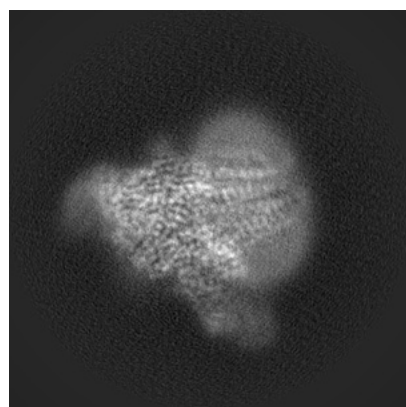


Y

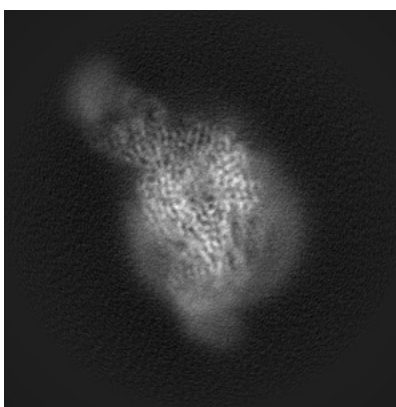


Z

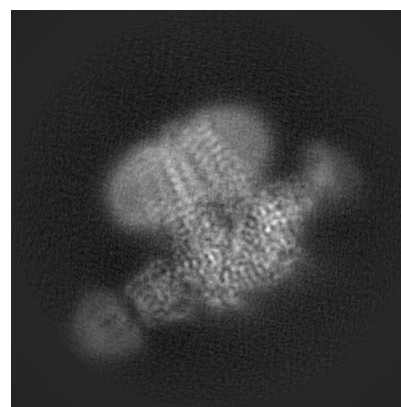
6.1.2 Raw map



X



Y

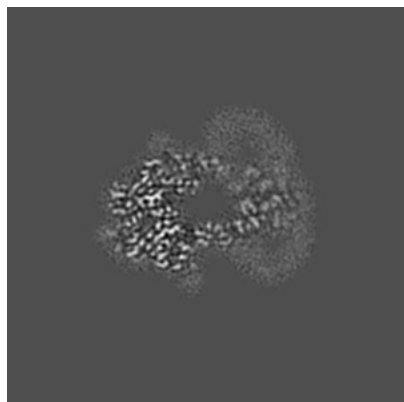


Z

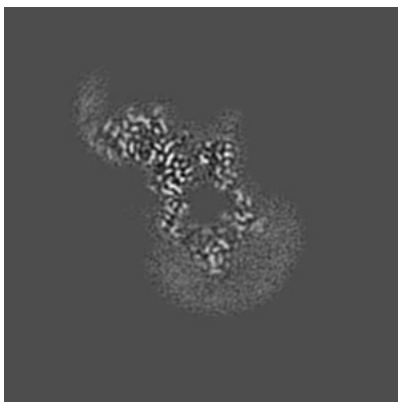
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

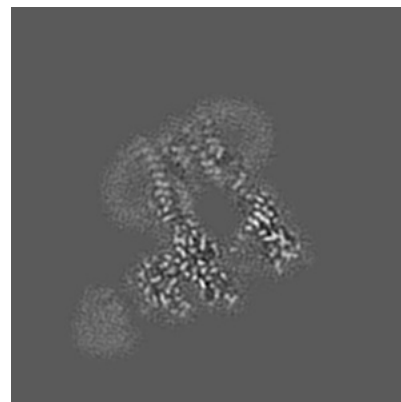
6.2.1 Primary map



X Index: 140

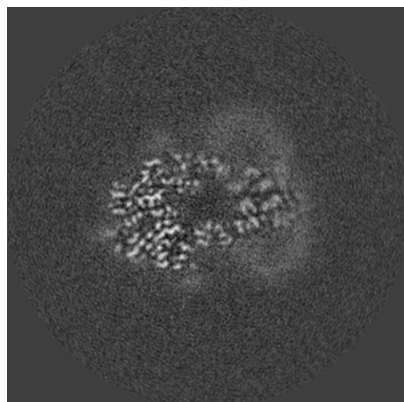


Y Index: 140

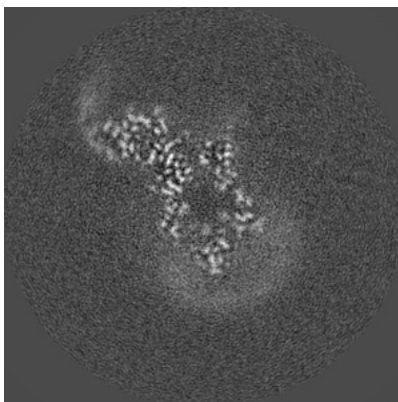


Z Index: 140

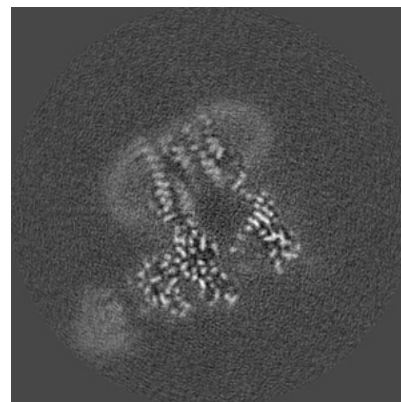
6.2.2 Raw map



X Index: 140



Y Index: 140

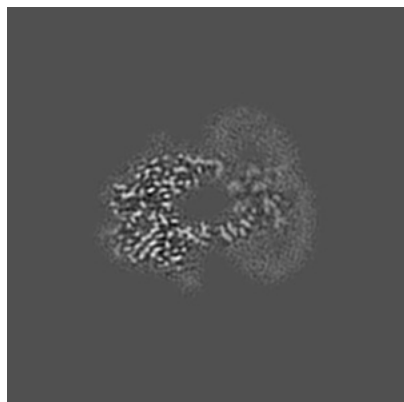


Z Index: 140

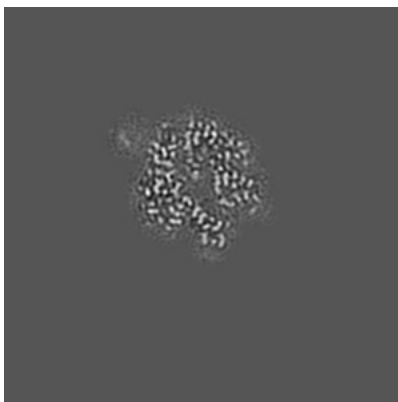
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

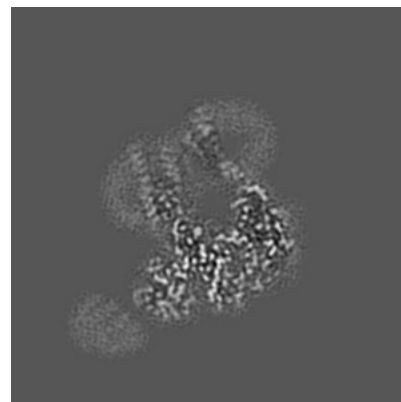
6.3.1 Primary map



X Index: 142

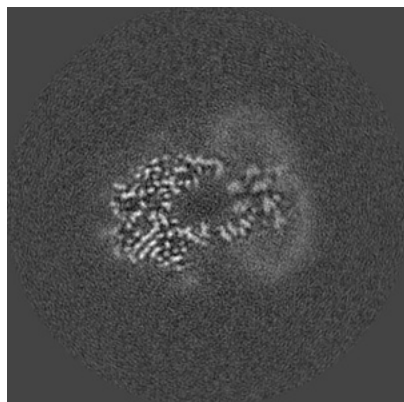


Y Index: 116

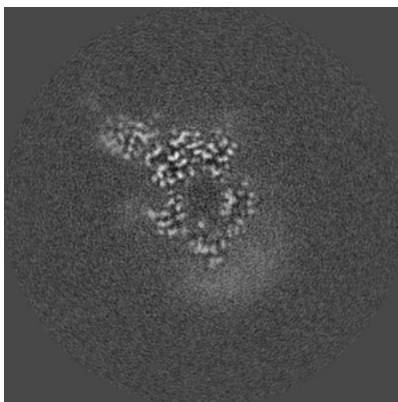


Z Index: 148

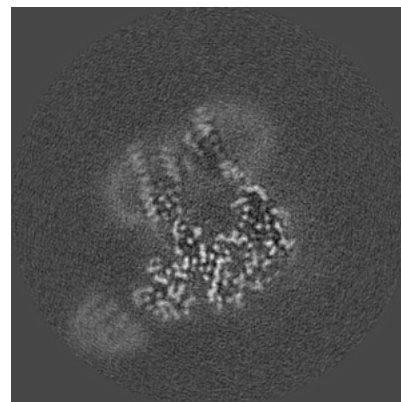
6.3.2 Raw map



X Index: 142



Y Index: 132

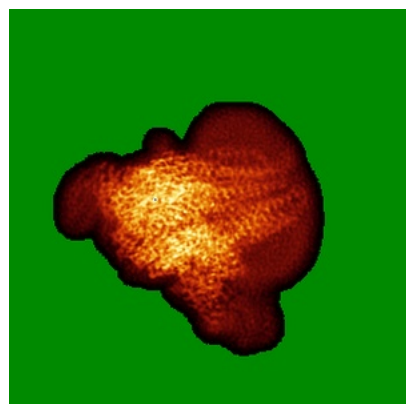


Z Index: 148

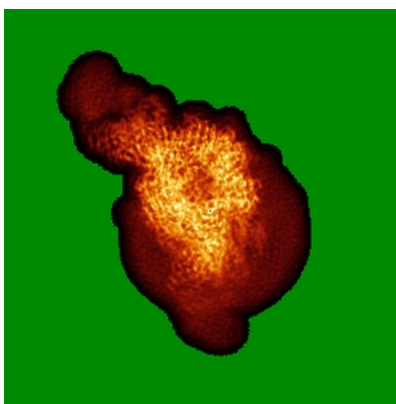
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) [i](#)

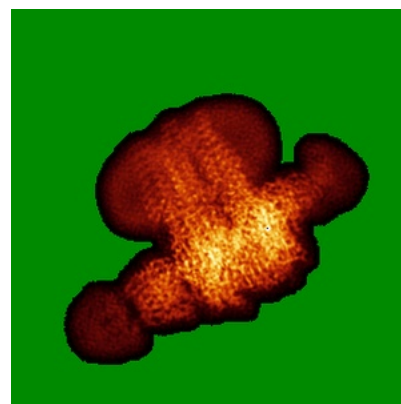
6.4.1 Primary map



X

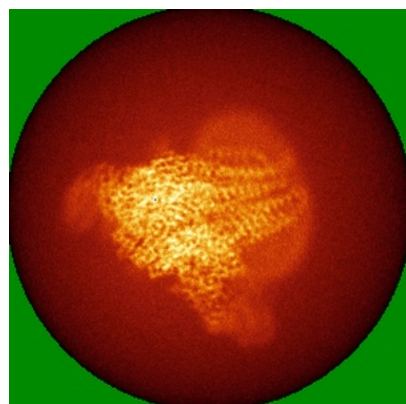


Y

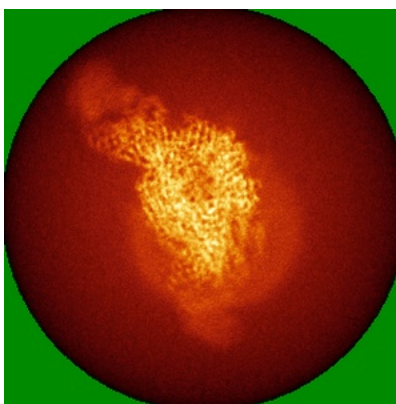


Z

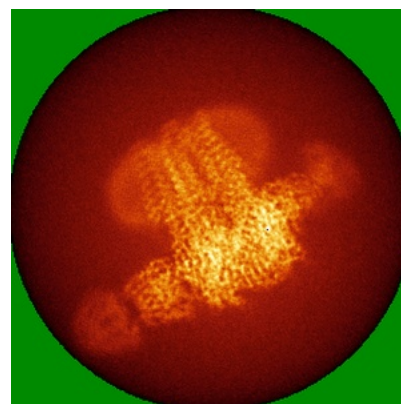
6.4.2 Raw map



X



Y

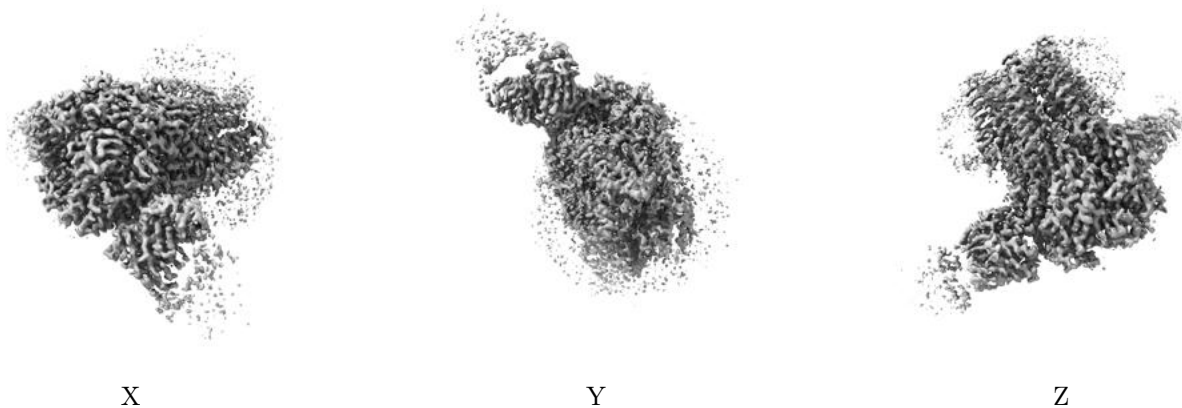


Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

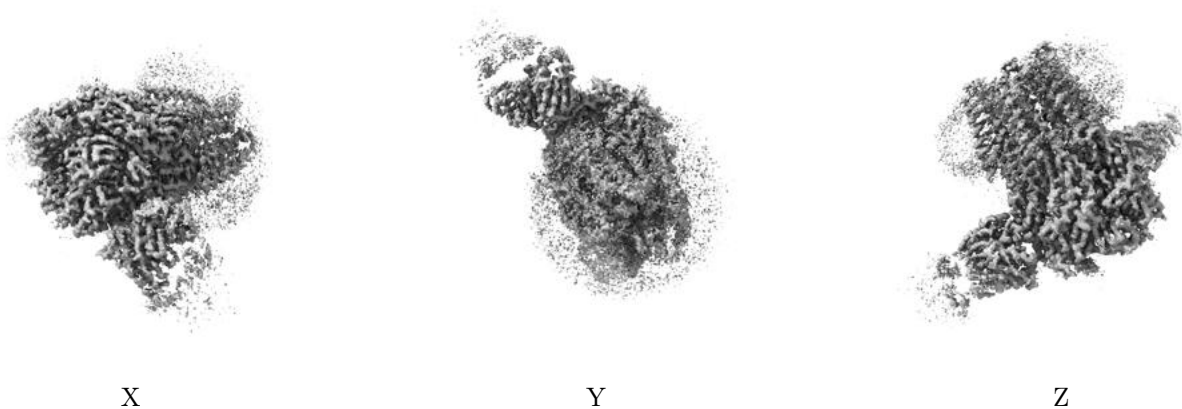
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.0145. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 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.

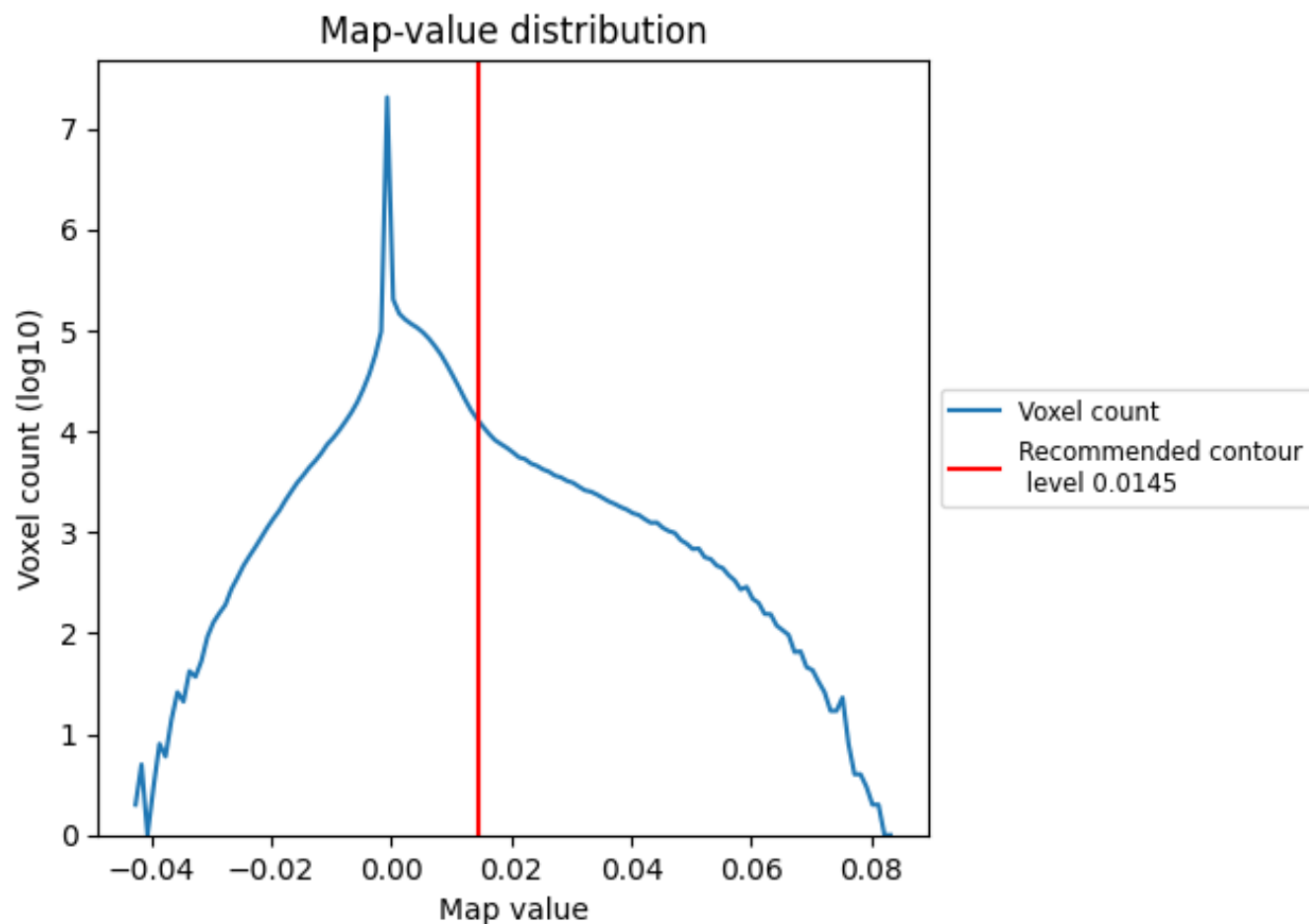
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

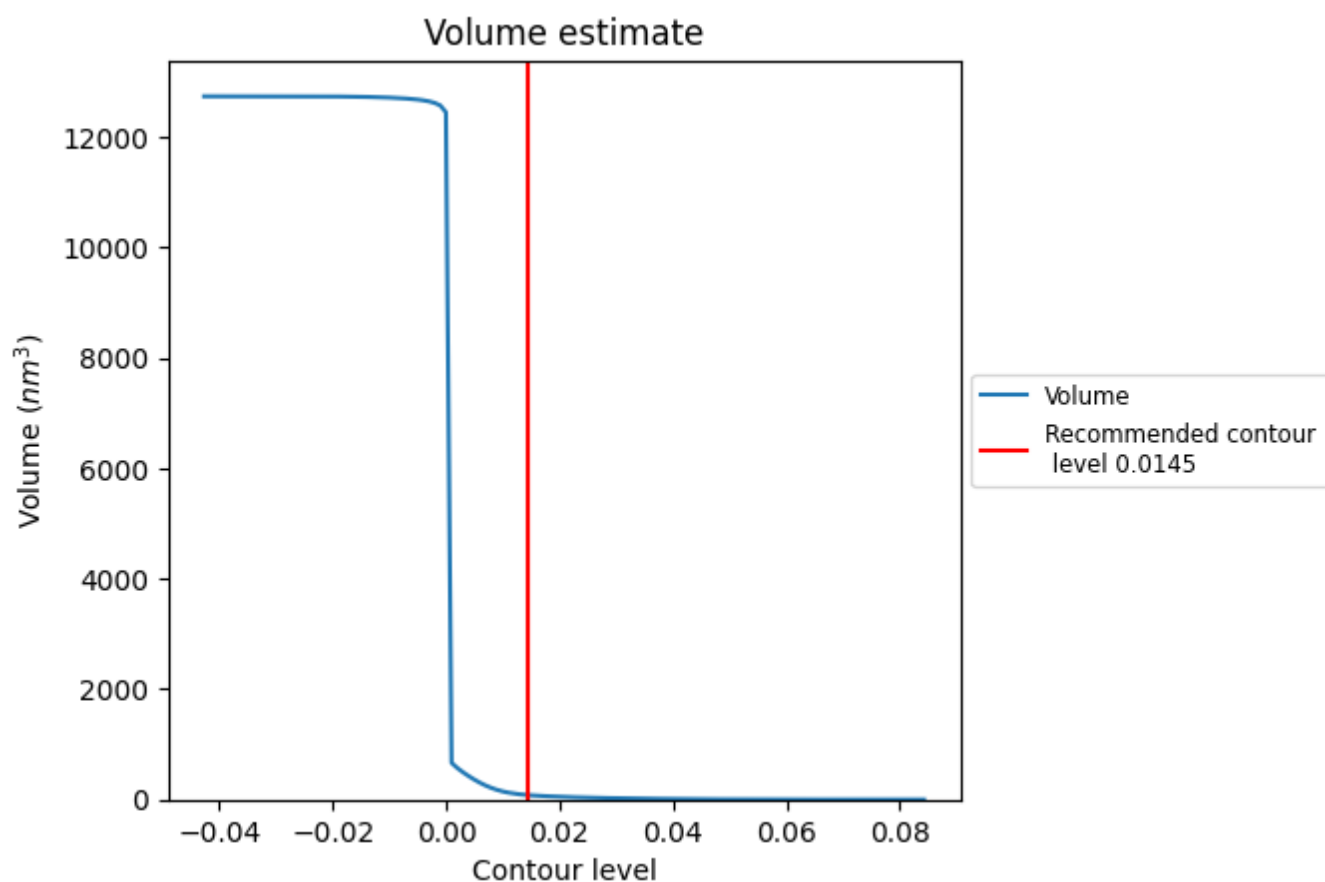
This section contains the results of statistical analysis of the map.

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.

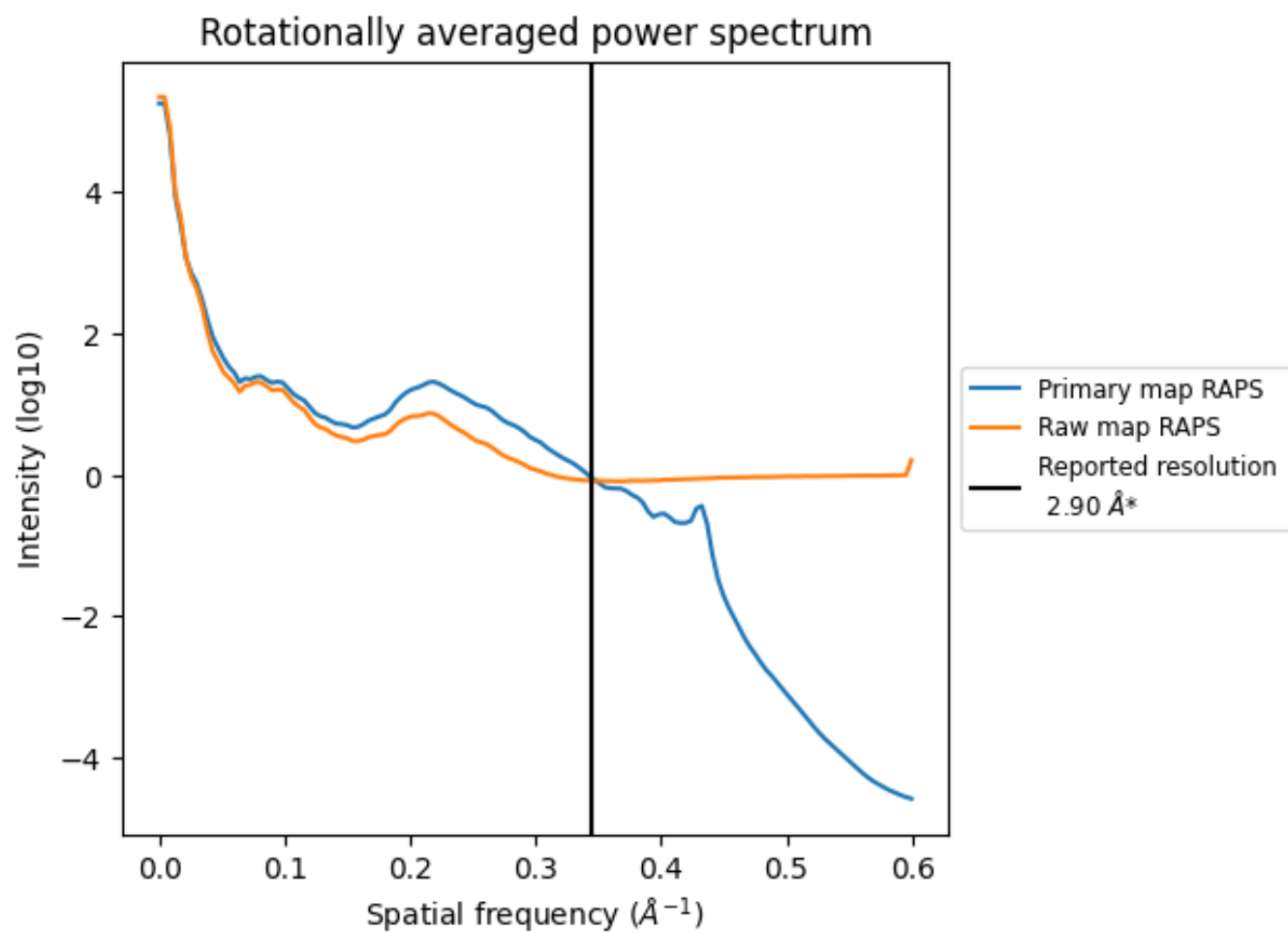
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 81 nm³; this corresponds to an approximate mass of 73 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 ⓘ

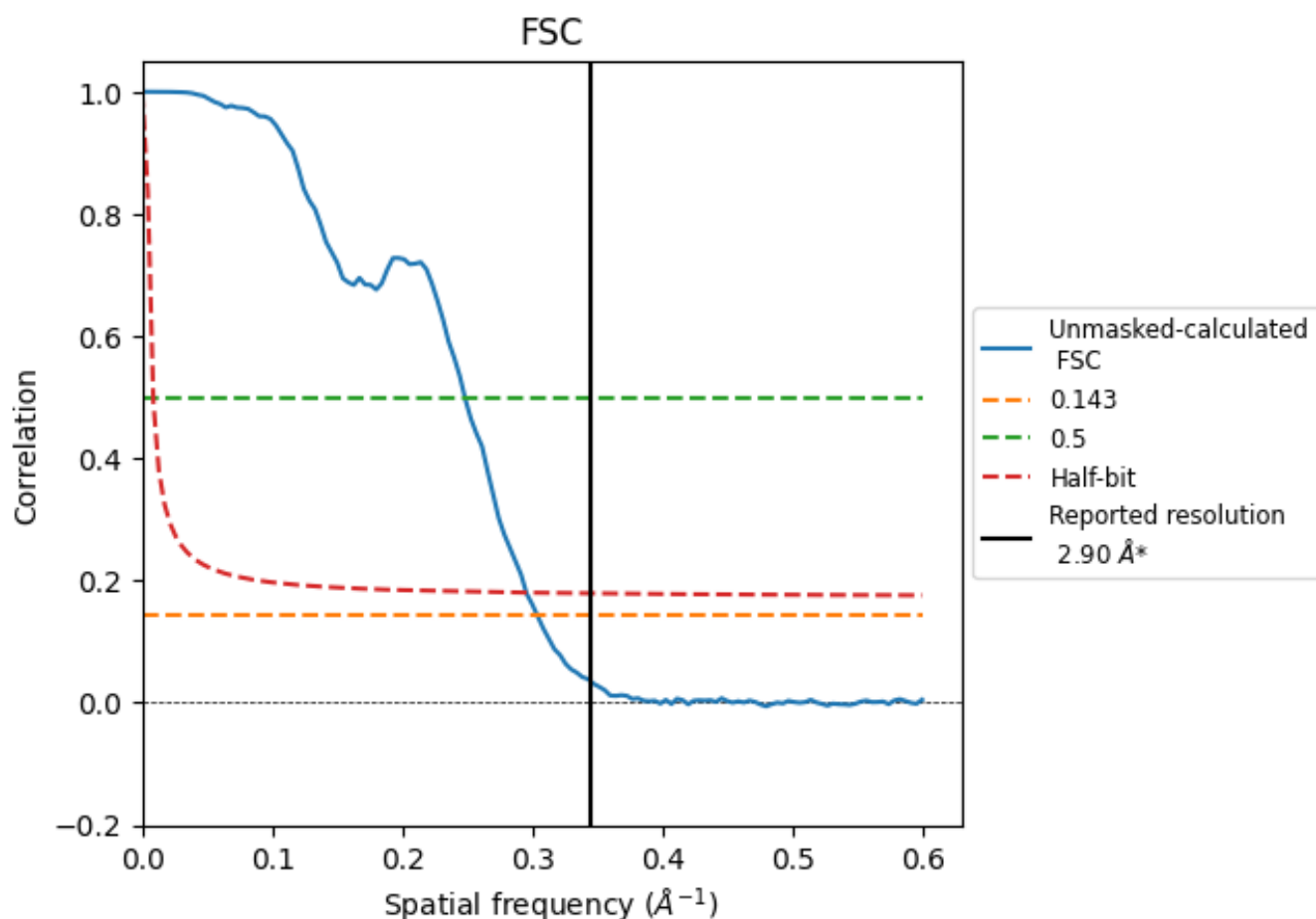


*Reported resolution corresponds to spatial frequency of 0.345 Å⁻¹

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 0.345 $\text{\AA}^{-1}$

8.2 Resolution estimates [i](#)

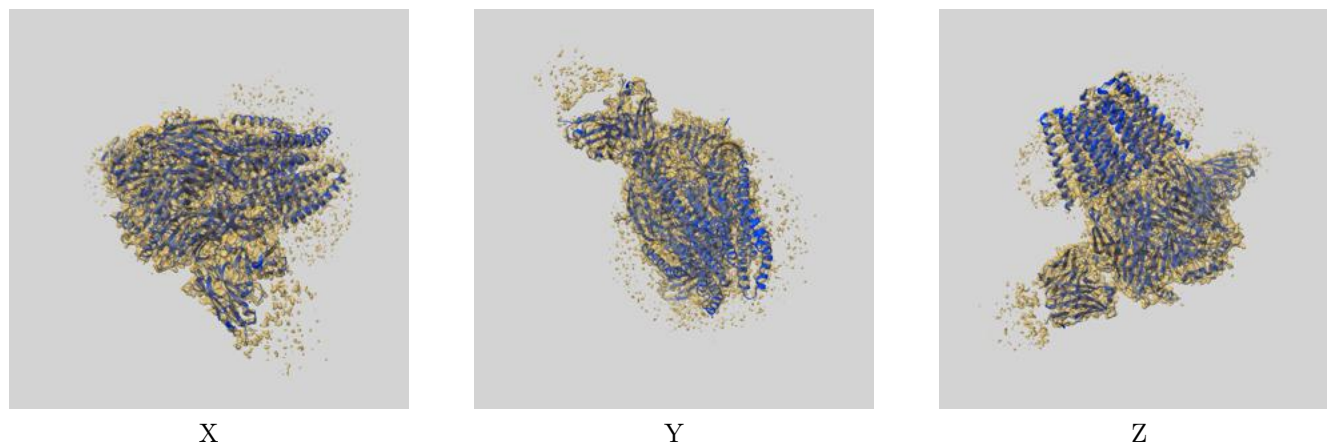
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.90	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.29	4.03	3.39

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.29 differs from the reported value 2.9 by more than 10 %

9 Map-model fit [i](#)

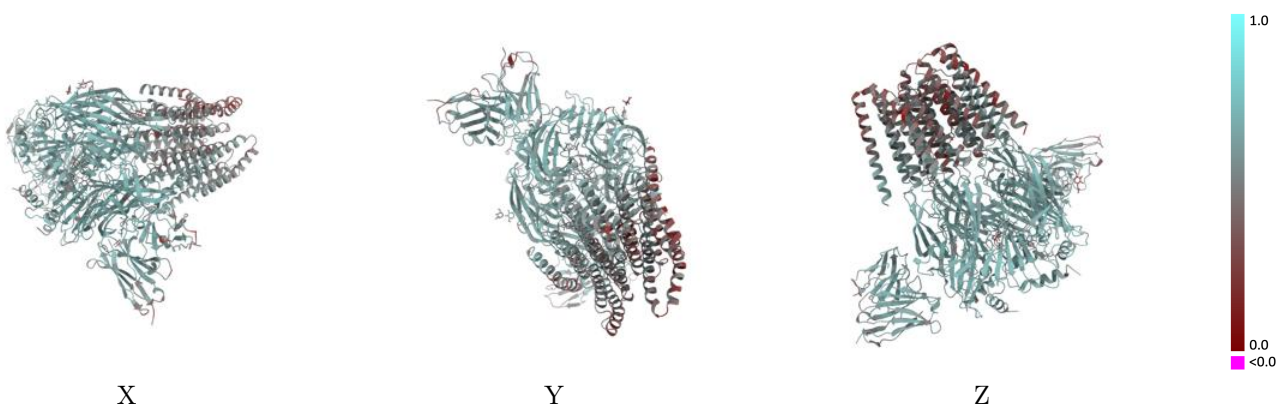
This section contains information regarding the fit between EMDB map EMD-27332 and PDB model 8DD2. Per-residue inclusion information can be found in [section 3](#) on [page 15](#).

9.1 Map-model overlay [i](#)



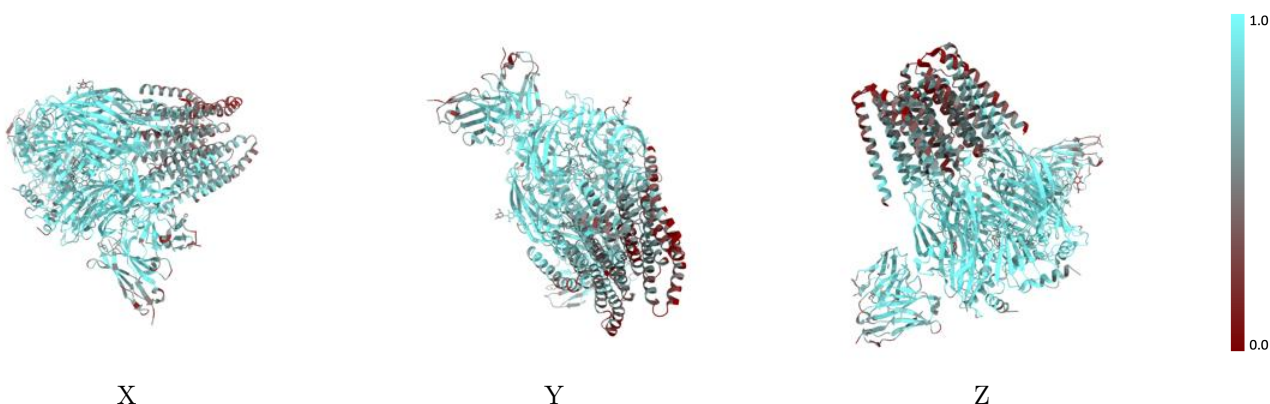
The images above show the 3D surface view of the map at the recommended contour level 0.0145 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



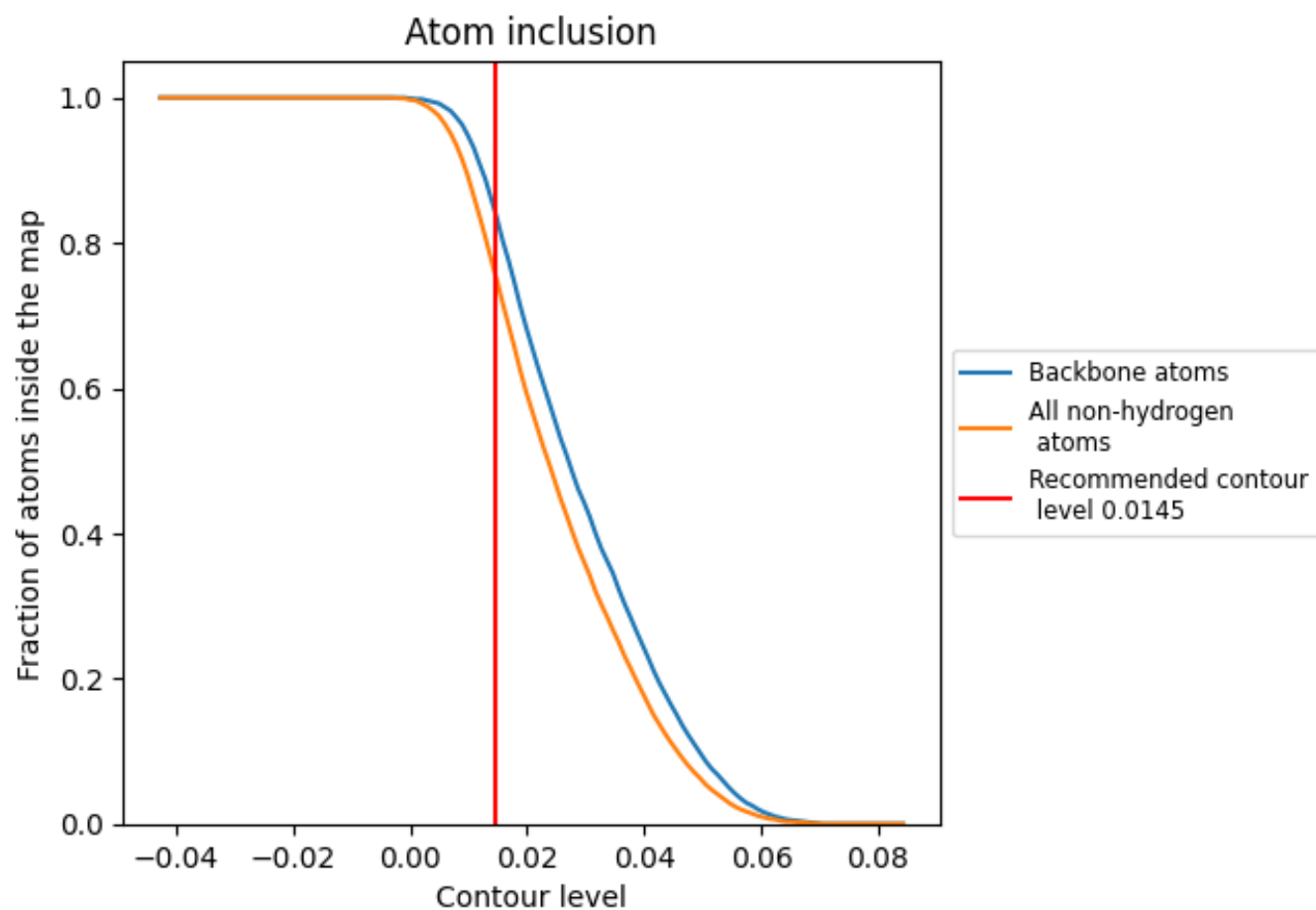
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.0145).

9.4 Atom inclusion [i](#)



At the recommended contour level, 84% of all backbone atoms, 76% 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 (0.0145) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7580	 0.5660
A	 0.7380	 0.5530
B	 0.7880	 0.5750
C	 0.7960	 0.5790
D	 0.8130	 0.5900
E	 0.7100	 0.5390
F	 0.5130	 0.4670
G	 0.6380	 0.4850
H	 0.6920	 0.5210
I	 0.7570	 0.5710
J	 0.7310	 0.5750
K	 0.7120	 0.5630
L	 0.7140	 0.5570
M	 0.6150	 0.5010
N	 0.4640	 0.3860

