Full wwPDB EM Validation Report ⓘ

Oct 13, 2024 – 11:25 AM EDT

PDB ID	:	8G4X
EMDB ID	:	EMD-29733
Title	:	Native GABA-A receptor from the mouse brain, meta-alpha1-alpha3-beta2-gamma2 subtype, in complex with GABA and allopregnanolone
Authors	:	Sun, C.; Gouaux, E.
Deposited on	:	2023-02-10
Resolution	:	2.56 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:

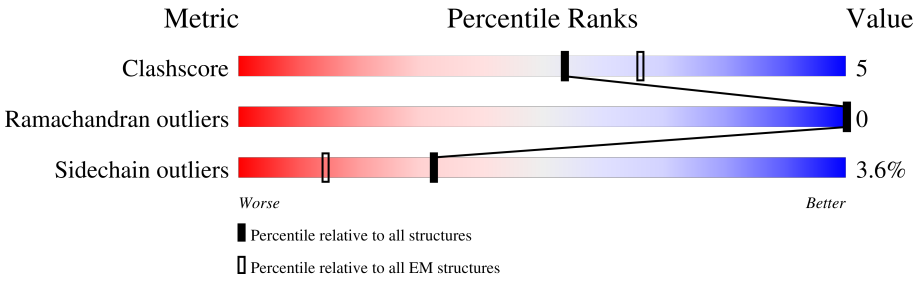
EMDB validation analysis	:	0.0.1.dev113
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.56 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% 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	455	66% 10% 24%
2	B	512	54% 10% 35%
2	E	512	53% 12% 35%
3	D	474	57% 9% 33%
4	H	223	49% 48%
5	L	213	44% 51%
6	C	492	58% 11% 30%
7	N	3	33% 67%

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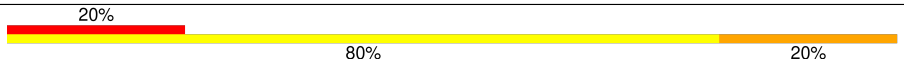
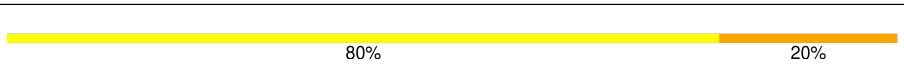
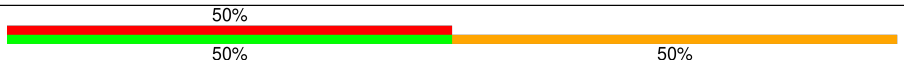
Mol	Chain	Length	Quality of chain
8	F	7	
9	G	4	
10	I	5	
10	K	5	
10	M	5	
11	J	2	

2 Entry composition (i)

There are 15 unique types of molecules in this entry. The entry contains 31615 atoms, of which 15717 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 alpha-1.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
1	A	346	5585	1811	2782	471	505	16	0	0

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

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
2	B	333	5454	1787	2729	436	486	16	0	0
2	E	333	Total	C	H	N	O	S	0	0
			5456	1787	2729	437	487	16		

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

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
3	D	318	5186	1698	2581	428	465	14	0	0

- Molecule 4 is a protein called Heavy Chain of 8E3 Fab.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
4	H	117	1783	587	863	152	177	4	0	0

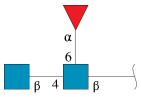
- Molecule 5 is a protein called Light Chain of 8E3 Fab.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
5	L	105	1542	503	750	131	154	4	0	0

- Molecule 6 is a protein called Gamma-aminobutyric acid receptor subunit alpha-3.

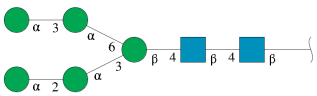
Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
6	C	343	5546	1807	2770	458	497	14	0	0

- Molecule 7 is an oligosaccharide called 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
			Total	C	H	N	O		
7	N	3	72	22	34	2	14	0	0

- Molecule 8 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[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.

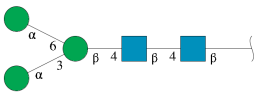


Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	H	N	O		
8	F	7	153	46	70	2	35	0	0

- Molecule 9 is an oligosaccharide called 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
			Total	C	H	N	O		
9	G	4	93	28	43	2	20	0	0

- Molecule 10 is an oligosaccharide called 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.

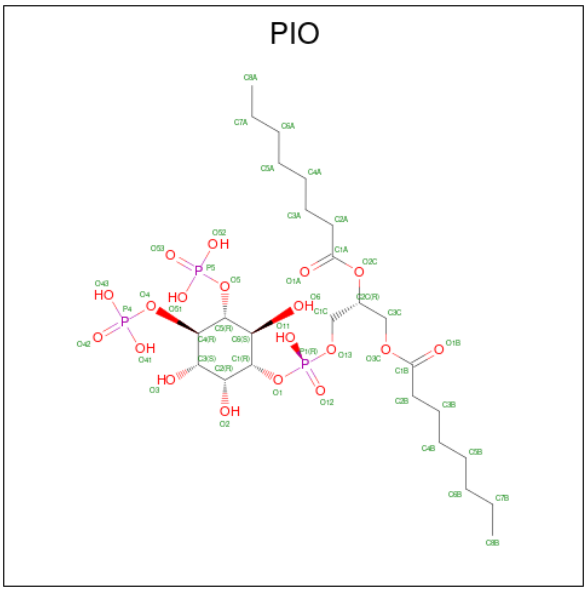


Mol	Chain	Residues	Atoms					AltConf	Trace
10	I	5	Total	C	H	N	O	0	0
			113	34	52	2	25		
10	K	5	Total	C	H	N	O	0	0
			113	34	52	2	25		
10	M	5	Total	C	H	N	O	0	0
			113	34	52	2	25		

- Molecule 11 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.

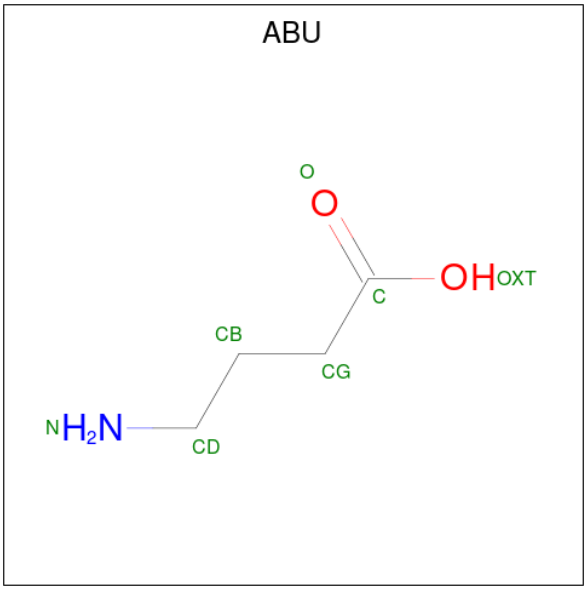
Mol	Chain	Residues	Atoms					AltConf	Trace
11	J	2	Total	C	H	N	O	0	0
			53	16	25	2	10		

- Molecule 12 is [(2R)-2-octanoyloxy-3-[oxidanyl-[(1R,2R,3S,4R,5R,6S)-2,3,6-tris(oxidanyl)-4,5-diphosphonooxy-cyclohexyl]oxy-phosphoryl]oxy-propyl] octanoate (three-letter code: PIO) (formula: $C_{25}H_{49}O_{19}P_3$).



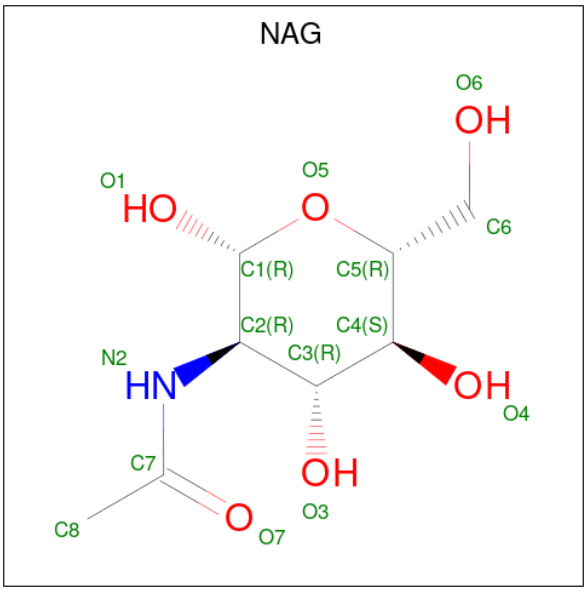
Mol	Chain	Residues	Atoms					AltConf
12	A	1	Total	C	H	O	P	0
			91	25	44	19	3	
12	C	1	Total	C	H	O	P	0
			91	25	44	19	3	

- Molecule 13 is GAMMA-AMINO-BUTANOIC ACID (three-letter code: ABU) (formula: $C_4H_9NO_2$) (labeled as "Ligand of Interest" by depositor).



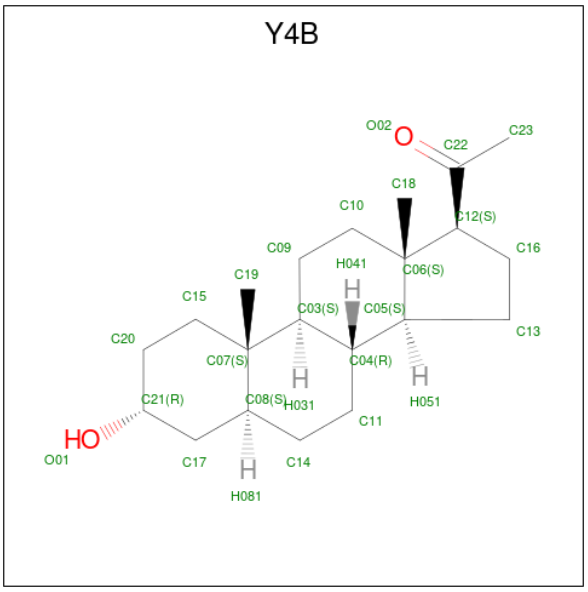
Mol	Chain	Residues	Atoms					AltConf
13	B	1	Total	C	H	N	O	0
			15	4	8	1	2	
13	E	1	Total	C	H	N	O	0
			15	4	8	1	2	

- Molecule 14 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms					AltConf
14	D	1	Total	C	H	N	O	0
			27	8	13	1	5	

- Molecule 15 is allopregnanolone (three-letter code: Y4B) (formula: $C_{21}H_{34}O_2$) (labeled as "Ligand of Interest" by depositor).



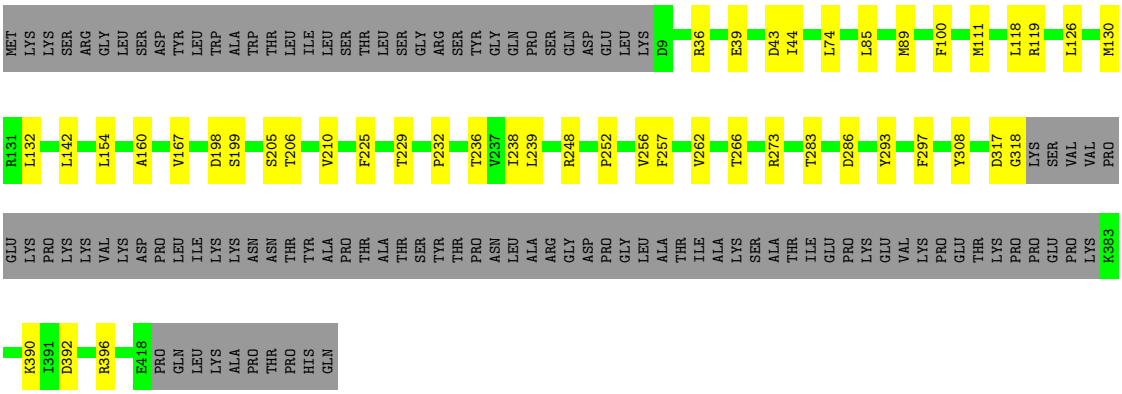
Mol	Chain	Residues	Atoms				AltConf
15	E	1	Total	C	H	O	0
			57	21	34	2	
15	C	1	Total	C	H	O	0
			57	21	34	2	

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.

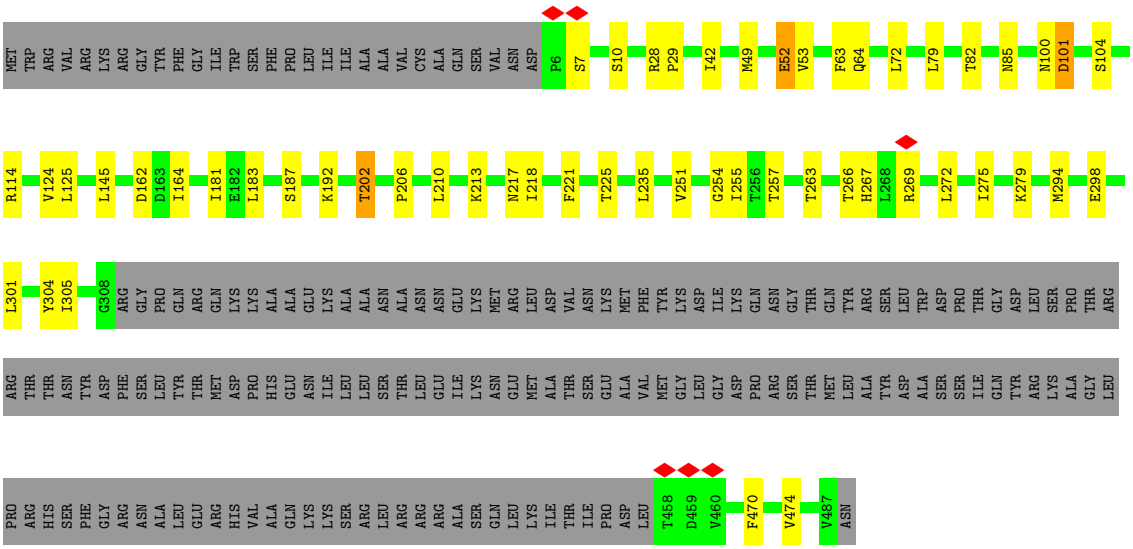
• Molecule 1: Gamma-aminobutyric acid receptor subunit alpha-1

Chain A:



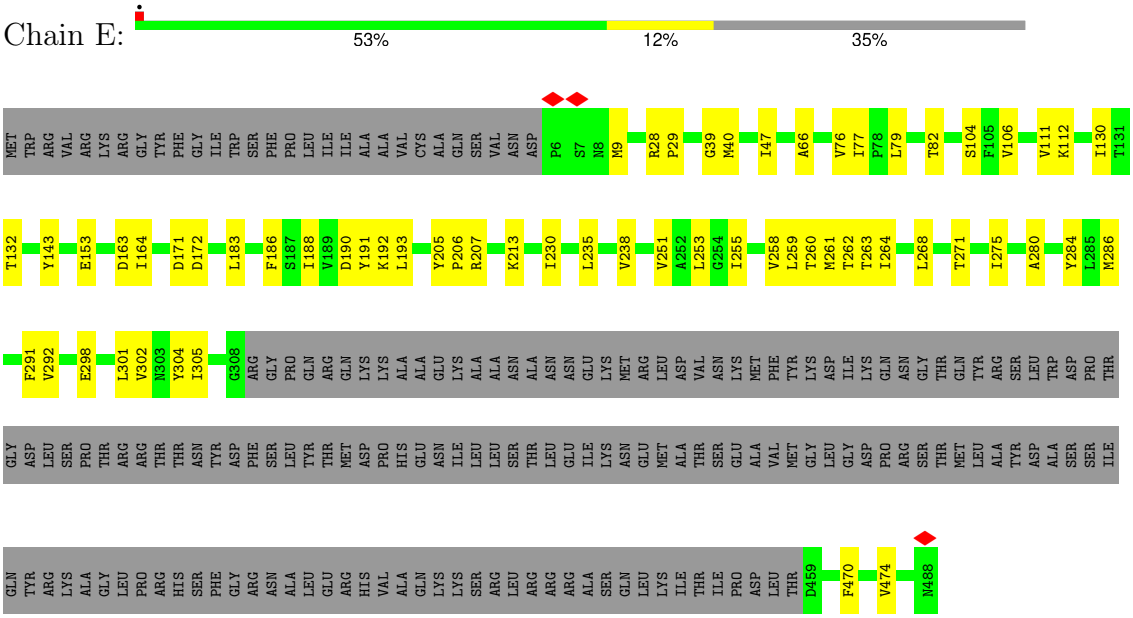
• Molecule 2: Gamma-aminobutyric acid receptor subunit beta-2

Chain B:



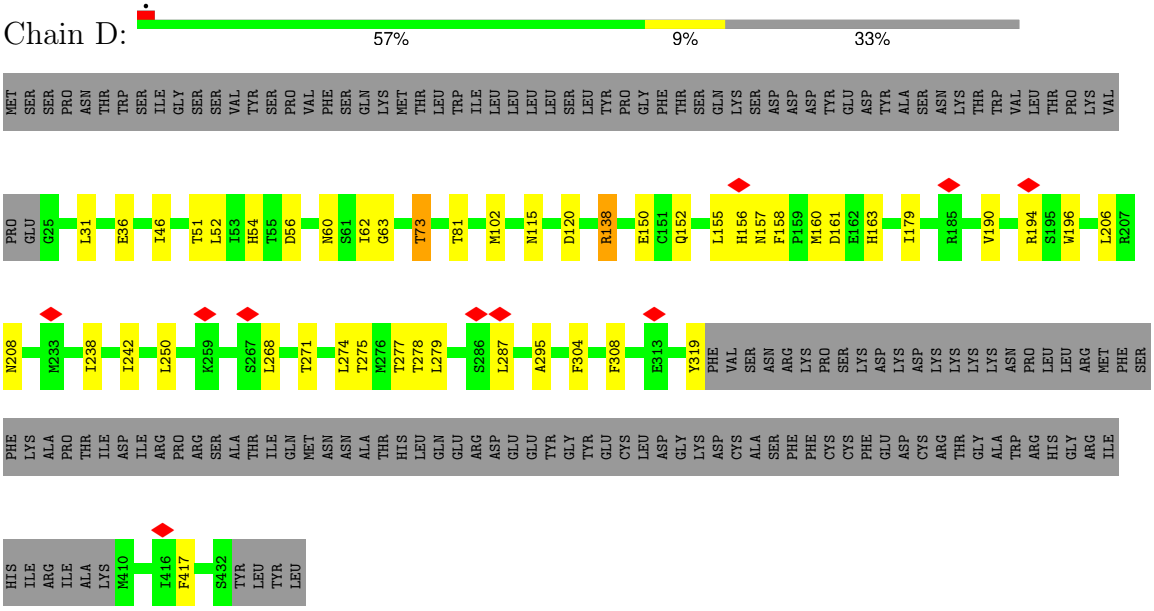
• Molecule 2: Gamma-aminobutyric acid receptor subunit beta-2

Chain E:



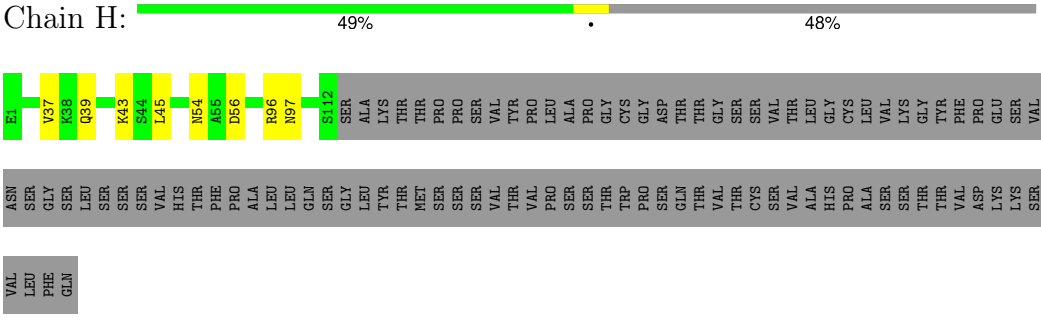
• Molecule 3: Gamma-aminobutyric acid receptor subunit gamma-2

Chain D:



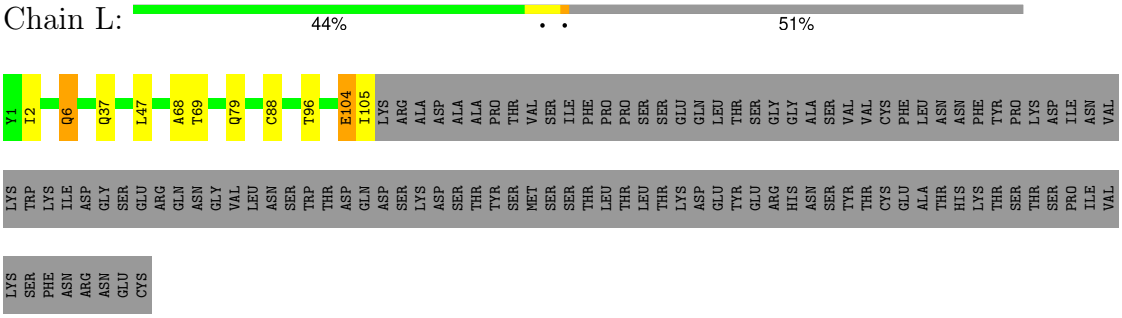
• Molecule 4: Heavy Chain of 8E3 Fab

Chain H:



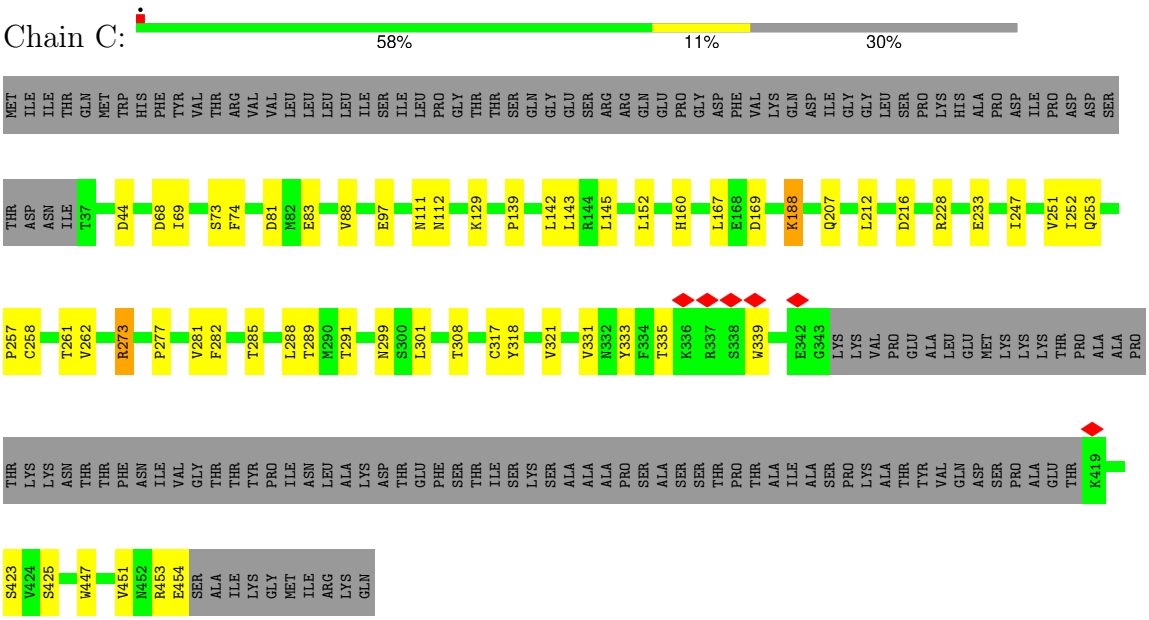
• Molecule 5: Light Chain of 8E3 Fab

Chain L:



• Molecule 6: Gamma-aminobutyric acid receptor subunit alpha-3

Chain C:



• Molecule 7: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose

Chain N:

• Molecule 8: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[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

Chain F:

• Molecule 9: 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

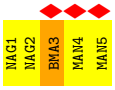
Chain G:

• Molecule 10: 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

Chain I:

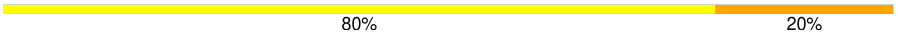
• Molecule 10: alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain K:



• Molecule 10: 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

Chain M:



• Molecule 11: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain J:

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	172304	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 ($e^-/Å^2$)	50	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2100	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.760	Depositor
Minimum map value	-0.313	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.020	Depositor
Recommended contour level	0.1	Depositor
Map size (Å)	299.16, 299.16, 299.16	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.83100003, 0.83100003, 0.83100003	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: Y4B, NAG, MAN, ABU, BMA, FUC, PIO

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	0/2874	0.57	0/3904
2	B	0.27	0/2796	0.54	0/3806
2	E	0.28	0/2798	0.53	0/3807
3	D	0.26	0/2676	0.53	0/3646
4	H	0.27	0/946	0.49	0/1284
5	L	0.28	0/811	0.53	0/1103
6	C	0.28	0/2850	0.56	0/3879
All	All	0.28	0/15751	0.54	0/21429

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

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	2803	2782	2782	22	0
2	B	2725	2729	2729	29	0
2	E	2727	2729	2728	39	0
3	D	2605	2581	2581	26	0
4	H	920	863	863	5	0
5	L	792	750	750	6	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	C	2776	2770	2769	27	0
7	N	38	34	34	5	0
8	F	83	70	70	1	0
9	G	50	43	43	2	0
10	I	61	52	52	2	0
10	K	61	52	52	1	0
10	M	61	52	52	2	0
11	J	28	25	25	1	0
12	A	47	44	44	1	0
12	C	47	44	44	2	0
13	B	7	8	0	1	0
13	E	7	8	0	0	0
14	D	14	13	13	0	0
15	C	23	34	0	0	0
15	E	23	34	0	0	0
All	All	15898	15717	15631	156	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 5.

All (156) 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)
6:C:285:THR:O	6:C:289:THR:OG1	2.04	0.75
7:N:1:NAG:O3	7:N:2:NAG:O5	2.04	0.74
2:E:28:ARG:NH1	2:E:29:PRO:O	2.22	0.73
2:E:76:VAL:HG23	2:E:77:ILE:HG23	1.69	0.73
6:C:273:ARG:NH1	6:C:423:SER:O	2.23	0.71
3:D:271:THR:O	3:D:275:THR:OG1	2.03	0.69
6:C:425:SER:OG	12:C:501:PIO:O12	2.10	0.69
5:L:2:ILE:O	5:L:96:THR:OG1	2.10	0.67
6:C:257:PRO:O	6:C:261:THR:OG1	2.07	0.65
6:C:331:VAL:O	6:C:335:THR:OG1	2.11	0.65
2:B:28:ARG:NH1	2:B:29:PRO:O	2.29	0.65
1:A:119:ARG:NH2	2:E:205:TYR:OH	2.30	0.65
3:D:275:THR:O	3:D:278:THR:OG1	2.12	0.64
2:E:470:PHE:O	2:E:474:VAL:HG12	1.98	0.64
2:E:304:TYR:O	2:E:304:TYR:CG	2.51	0.64
2:E:238:VAL:HG13	2:E:253:LEU:HD21	1.81	0.63
2:E:235:LEU:O	2:E:238:VAL:HG12	1.99	0.62
2:E:190:ASP:OD1	2:E:191:TYR:N	2.33	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:470:PHE:O	2:B:474:VAL:HG22	1.99	0.62
2:B:202:THR:OG1	13:B:501:ABU:O	2.17	0.61
2:E:304:TYR:O	2:E:304:TYR:CD2	2.53	0.60
3:D:238:ILE:HA	3:D:242:ILE:HD12	1.83	0.60
3:D:274:LEU:O	3:D:277:THR:OG1	2.19	0.60
10:I:2:NAG:H3	10:I:2:NAG:H83	1.84	0.60
2:B:221:PHE:O	2:B:225:THR:OG1	2.19	0.59
2:E:47:ILE:HB	2:E:183:LEU:HD21	1.84	0.58
2:E:106:VAL:HG12	2:E:130:ILE:HG12	1.86	0.58
2:E:230:ILE:HD11	2:E:284:TYR:OH	2.03	0.58
6:C:69:ILE:HG23	6:C:88:VAL:HG13	1.85	0.58
2:B:187:SER:OG	2:B:217:ASN:OD1	2.08	0.58
3:D:208:ASN:OD1	11:J:1:NAG:N2	2.36	0.57
2:E:298:GLU:O	2:E:302:VAL:HG23	2.05	0.57
2:B:101:ASP:OD1	2:B:104:SER:OG	2.13	0.56
1:A:167:VAL:HG23	1:A:210:VAL:HG21	1.86	0.56
2:E:301:LEU:C	2:E:301:LEU:HD13	2.25	0.56
2:E:261:MET:HG3	2:E:292:VAL:HG21	1.88	0.55
4:H:54:ASN:ND2	4:H:56:ASP:OD2	2.39	0.55
2:E:39:GLY:N	2:E:66:ALA:O	2.38	0.55
7:N:1:NAG:O3	7:N:1:NAG:O7	2.24	0.55
3:D:63:GLY:N	3:D:73:THR:O	2.40	0.55
6:C:454:GLU:N	6:C:454:GLU:OE1	2.38	0.55
8:F:2:NAG:H83	8:F:2:NAG:H3	1.89	0.55
5:L:6:GLN:NE2	5:L:88:CYS:SG	2.80	0.54
6:C:447:TRP:O	6:C:451:VAL:HG22	2.08	0.54
2:B:275:ILE:HD12	2:B:275:ILE:O	2.08	0.53
1:A:43:ASP:OD1	1:A:44:ILE:N	2.42	0.53
3:D:161:ASP:OD2	3:D:163:HIS:NE2	2.42	0.53
2:B:272:LEU:HD13	2:B:279:LYS:HE3	1.90	0.53
7:N:2:NAG:H3	7:N:2:NAG:H83	1.90	0.53
2:B:294:MET:O	2:B:298:GLU:N	2.42	0.53
1:A:317:ASP:OD1	1:A:318:GLY:N	2.41	0.53
3:D:274:LEU:HD12	2:E:260:THR:HG21	1.91	0.52
3:D:155:LEU:HD23	3:D:287:LEU:HD22	1.92	0.52
3:D:157:ASN:O	3:D:160:MET:N	2.42	0.52
2:B:52:GLU:OE1	2:B:53:VAL:N	2.43	0.52
10:K:2:NAG:O3	10:K:3:BMA:O5	2.27	0.51
9:G:2:NAG:H83	9:G:2:NAG:H3	1.92	0.51
3:D:31:LEU:HD22	3:D:102:MET:HE3	1.93	0.51
2:B:301:LEU:C	2:B:301:LEU:HD23	2.30	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:56:ASP:N	3:D:56:ASP:OD1	2.44	0.51
2:E:259:LEU:O	2:E:262:THR:OG1	2.21	0.51
5:L:68:ALA:O	5:L:69:THR:OG1	2.27	0.50
1:A:390:LYS:NZ	12:A:601:PIO:O1A	2.44	0.50
1:A:111:MET:HE1	2:E:106:VAL:HG13	1.94	0.50
4:H:37:VAL:HG11	4:H:45:LEU:HD22	1.94	0.50
6:C:247:ILE:O	6:C:251:VAL:HG23	2.11	0.50
3:D:274:LEU:CD1	2:E:260:THR:HG21	2.42	0.50
3:D:62:ILE:HD12	3:D:196:TRP:CZ3	2.45	0.50
2:E:268:LEU:O	2:E:271:THR:OG1	2.26	0.50
3:D:158:PHE:O	3:D:295:ALA:HB3	2.13	0.49
1:A:74:LEU:HD12	1:A:126:LEU:HD11	1.94	0.48
1:A:118:LEU:HD21	1:A:126:LEU:HD23	1.94	0.48
6:C:288:LEU:O	6:C:291:THR:OG1	2.29	0.48
2:B:213:LYS:HB2	10:I:1:NAG:H82	1.96	0.48
3:D:115:ASN:O	3:D:150:GLU:N	2.44	0.48
2:E:213:LYS:HB2	10:M:1:NAG:H81	1.96	0.48
6:C:169:ASP:OD2	6:C:453:ARG:NH1	2.47	0.48
1:A:262:VAL:O	1:A:266:THR:HG23	2.14	0.47
10:M:2:NAG:H83	10:M:2:NAG:H3	1.96	0.47
2:B:304:TYR:CD1	2:B:304:TYR:O	2.67	0.47
2:E:104:SER:HB3	2:E:132:THR:HG22	1.96	0.47
5:L:104:GLU:OE1	5:L:105:ILE:N	2.46	0.47
6:C:207:GLN:OE1	6:C:207:GLN:N	2.43	0.47
5:L:37:GLN:HB2	5:L:47:LEU:HD11	1.96	0.47
1:A:225:PHE:O	1:A:229:THR:OG1	2.21	0.47
2:E:104:SER:CB	2:E:132:THR:HG22	2.45	0.47
4:H:96:ARG:NH1	4:H:97:ASN:OD1	2.47	0.47
2:E:275:ILE:HD12	2:E:275:ILE:O	2.14	0.47
12:C:501:PIO:P1	12:C:501:PIO:HO2	2.38	0.47
3:D:46:ILE:HG22	2:E:9:MET:SD	2.54	0.46
2:B:164:ILE:HG23	2:B:206:PRO:HG3	1.97	0.46
9:G:2:NAG:O3	9:G:3:BMA:O5	2.30	0.46
6:C:97:GLU:OE1	6:C:97:GLU:N	2.46	0.46
2:E:143:TYR:O	2:E:280:ALA:HB3	2.16	0.46
1:A:252:PRO:O	1:A:256:VAL:HG23	2.15	0.46
2:B:7:SER:O	2:B:10:SER:OG	2.30	0.46
2:B:42:ILE:HD12	2:B:63:PHE:CD1	2.51	0.45
3:D:158:PHE:CE2	3:D:287:LEU:HD21	2.50	0.45
6:C:83:GLU:OE1	6:C:129:LYS:NZ	2.42	0.45
1:A:142:LEU:O	1:A:283:THR:HG22	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:181:ILE:HG22	2:B:183:LEU:CD1	2.46	0.45
6:C:317:CYS:O	6:C:321:VAL:HG23	2.16	0.45
1:A:198:ASP:OD1	1:A:199:SER:N	2.50	0.45
2:E:153:GLU:OE1	2:E:207:ARG:NH1	2.50	0.45
1:A:232:PRO:O	1:A:236:THR:OG1	2.24	0.45
3:D:81:THR:HG21	3:D:138:ARG:HE	1.82	0.44
2:B:162:ASP:N	2:B:162:ASP:OD1	2.50	0.44
3:D:206:LEU:O	3:D:206:LEU:HD12	2.17	0.44
2:E:259:LEU:O	2:E:263:THR:HG23	2.18	0.44
6:C:129:LYS:N	6:C:160:HIS:O	2.48	0.44
6:C:167:LEU:O	6:C:308:THR:HG22	2.17	0.44
1:A:85:LEU:HD13	1:A:89:MET:HG2	1.99	0.44
6:C:68:ASP:N	6:C:68:ASP:OD1	2.50	0.44
2:E:47:ILE:HD12	2:E:188:ILE:HD11	2.00	0.44
6:C:81:ASP:N	6:C:81:ASP:OD1	2.49	0.44
1:A:100:PHE:HE2	1:A:154:LEU:HD11	1.83	0.43
2:B:72:LEU:HD12	2:B:124:VAL:HG21	1.99	0.43
6:C:143:LEU:HD11	6:C:145:LEU:HD21	1.99	0.43
2:B:85:ASN:O	2:B:114:ARG:NH2	2.52	0.43
2:E:171:ASP:OD1	2:E:171:ASP:N	2.51	0.43
2:E:192:LYS:C	2:E:193:LEU:HD23	2.39	0.43
6:C:258:CYS:O	6:C:262:VAL:HG23	2.19	0.43
3:D:156:HIS:O	3:D:295:ALA:HB2	2.19	0.42
3:D:190:VAL:HG13	3:D:196:TRP:CZ2	2.54	0.42
1:A:273:ARG:NH1	1:A:286:ASP:OD2	2.52	0.42
1:A:160:ALA:HB1	2:B:82:THR:CG2	2.48	0.42
6:C:111:ASN:OD1	6:C:112:ASN:N	2.53	0.42
2:B:100:ASN:OD1	2:B:100:ASN:N	2.52	0.42
3:D:54:HIS:O	3:D:81:THR:N	2.47	0.42
5:L:79:GLN:OE1	5:L:79:GLN:N	2.52	0.42
1:A:262:VAL:HG11	2:B:235:LEU:CD1	2.50	0.42
3:D:158:PHE:CZ	3:D:287:LEU:HD21	2.55	0.42
2:B:251:VAL:O	2:B:255:ILE:HG22	2.20	0.42
1:A:39:GLU:OE2	4:H:96:ARG:NH1	2.52	0.42
2:B:304:TYR:O	2:B:304:TYR:CG	2.73	0.42
2:E:183:LEU:HD13	2:E:186:PHE:HB2	2.02	0.41
2:E:193:LEU:HD23	2:E:193:LEU:N	2.35	0.41
6:C:139:PRO:HD3	7:N:1:NAG:H82	2.01	0.41
2:B:263:THR:O	2:B:267:HIS:N	2.48	0.41
3:D:51:THR:HB	3:D:179:ILE:HD13	2.03	0.41
2:B:254:GLY:O	2:B:257:THR:OG1	2.30	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:C:277:PRO:O	6:C:281:VAL:HG23	2.20	0.41
3:D:152:GLN:OE1	3:D:152:GLN:N	2.45	0.41
2:E:258:VAL:O	2:E:262:THR:HG23	2.21	0.41
1:A:392:ASP:O	1:A:396:ARG:N	2.52	0.41
6:C:188:LYS:N	6:C:233:GLU:O	2.48	0.41
2:E:164:ILE:HG23	2:E:206:PRO:HG3	2.03	0.41
6:C:74:PHE:CD1	6:C:212:LEU:HD21	2.56	0.41
2:E:291:PHE:CE1	2:E:474:VAL:HG13	2.56	0.41
7:N:1:NAG:HO3	7:N:2:NAG:C1	2.28	0.40
1:A:130:MET:SD	1:A:132:LEU:HD21	2.61	0.40
2:B:145:LEU:HD13	2:B:218:ILE:HD13	2.04	0.40
2:E:251:VAL:HG12	2:E:255:ILE:HD12	2.02	0.40
2:B:269:ARG:HH21	6:C:252:ILE:HG21	1.86	0.40
4:H:39:GLN:HB2	4:H:45:LEU:HD23	2.04	0.40
2:E:111:VAL:HG22	2:E:112:LYS:H	1.86	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	342/455 (75%)	330 (96%)	12 (4%)	0	100	100
2	B	329/512 (64%)	319 (97%)	10 (3%)	0	100	100
2	E	329/512 (64%)	322 (98%)	7 (2%)	0	100	100
3	D	314/474 (66%)	309 (98%)	5 (2%)	0	100	100
4	H	115/223 (52%)	108 (94%)	7 (6%)	0	100	100
5	L	103/213 (48%)	100 (97%)	3 (3%)	0	100	100
6	C	339/492 (69%)	330 (97%)	9 (3%)	0	100	100
All	All	1871/2881 (65%)	1818 (97%)	53 (3%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains

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	308/404 (76%)	298 (97%)	10 (3%)	34	47
2	B	303/457 (66%)	292 (96%)	11 (4%)	30	43
2	E	303/457 (66%)	295 (97%)	8 (3%)	41	56
3	D	292/436 (67%)	278 (95%)	14 (5%)	21	30
4	H	98/195 (50%)	97 (99%)	1 (1%)	73	83
5	L	82/188 (44%)	80 (98%)	2 (2%)	44	59
6	C	307/435 (71%)	292 (95%)	15 (5%)	21	30
All	All	1693/2572 (66%)	1632 (96%)	61 (4%)	32	43

All (61) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	36	ARG
1	A	205	SER
1	A	206	THR
1	A	238	ILE
1	A	239	LEU
1	A	248	ARG
1	A	257	PHE
1	A	293	TYR
1	A	297	PHE
1	A	308	TYR
2	B	49	MET
2	B	52	GLU
2	B	64	GLN
2	B	79	LEU
2	B	101	ASP
2	B	125	LEU
2	B	192	LYS
2	B	202	THR

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Mol	Chain	Res	Type
2	B	210	LEU
2	B	266	THR
2	B	305	ILE
3	D	36	GLU
3	D	52	LEU
3	D	60	ASN
3	D	73	THR
3	D	120	ASP
3	D	138	ARG
3	D	194	ARG
3	D	250	LEU
3	D	268	LEU
3	D	279	LEU
3	D	304	PHE
3	D	308	PHE
3	D	319	TYR
3	D	417	PHE
2	E	40	MET
2	E	79	LEU
2	E	82	THR
2	E	163	ASP
2	E	172	ASP
2	E	264	ILE
2	E	286	MET
2	E	305	ILE
4	H	43	LYS
5	L	6	GLN
5	L	104	GLU
6	C	44	ASP
6	C	73	SER
6	C	142	LEU
6	C	152	LEU
6	C	188	LYS
6	C	216	ASP
6	C	228	ARG
6	C	253	GLN
6	C	273	ARG
6	C	282	PHE
6	C	299	ASN
6	C	301	LEU
6	C	318	TYR
6	C	333	TYR

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Mol	Chain	Res	Type
6	C	339	TRP

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

Mol	Chain	Res	Type
3	D	426	ASN
6	C	332	ASN
6	C	443	ASN
6	C	452	ASN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

31 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	$\#\|Z\| > 2$
8	NAG	F	1	8,1	14,14,15	0.31	0	17,19,21	0.45	0
8	NAG	F	2	8	14,14,15	0.28	0	17,19,21	1.25	1 (5%)
8	BMA	F	3	8	11,11,12	0.43	0	15,15,17	0.75	0
8	MAN	F	4	8	11,11,12	0.56	0	15,15,17	0.92	2 (13%)
8	MAN	F	5	8	11,11,12	0.51	0	15,15,17	0.93	2 (13%)
8	MAN	F	6	8	11,11,12	0.63	0	15,15,17	0.90	1 (6%)
8	MAN	F	7	8	11,11,12	0.62	0	15,15,17	0.96	2 (13%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
9	NAG	G	1	2,9	14,14,15	0.73	1 (7%)	17,19,21	0.83	1 (5%)
9	NAG	G	2	9	14,14,15	0.47	0	17,19,21	1.34	2 (11%)
9	BMA	G	3	9	11,11,12	0.56	0	15,15,17	0.80	0
9	MAN	G	4	9	11,11,12	0.62	0	15,15,17	0.99	2 (13%)
10	NAG	I	1	10,2	14,14,15	0.49	0	17,19,21	0.46	0
10	NAG	I	2	10	14,14,15	0.26	0	17,19,21	1.30	2 (11%)
10	BMA	I	3	10	11,11,12	0.82	1 (9%)	15,15,17	0.95	0
10	MAN	I	4	10	11,11,12	0.68	1 (9%)	15,15,17	1.15	2 (13%)
10	MAN	I	5	10	11,11,12	0.63	0	15,15,17	1.13	2 (13%)
11	NAG	J	1	3,11	14,14,15	0.30	0	17,19,21	0.77	1 (5%)
11	NAG	J	2	11	14,14,15	0.25	0	17,19,21	0.41	0
10	NAG	K	1	10,2	14,14,15	0.32	0	17,19,21	0.73	1 (5%)
10	NAG	K	2	10	14,14,15	0.18	0	17,19,21	0.41	0
10	BMA	K	3	10	11,11,12	1.12	1 (9%)	15,15,17	1.10	1 (6%)
10	MAN	K	4	10	11,11,12	1.02	1 (9%)	15,15,17	1.30	2 (13%)
10	MAN	K	5	10	11,11,12	0.63	0	15,15,17	1.23	2 (13%)
10	NAG	M	1	10,2	14,14,15	0.47	0	17,19,21	0.61	0
10	NAG	M	2	10	14,14,15	0.22	0	17,19,21	1.31	2 (11%)
10	BMA	M	3	10	11,11,12	0.90	0	15,15,17	1.10	1 (6%)
10	MAN	M	4	10	11,11,12	0.71	0	15,15,17	1.22	2 (13%)
10	MAN	M	5	10	11,11,12	0.67	0	15,15,17	0.98	2 (13%)
7	NAG	N	1	6,7	14,14,15	0.59	0	17,19,21	0.73	1 (5%)
7	NAG	N	2	7	14,14,15	0.33	0	17,19,21	1.32	2 (11%)
7	FUC	N	3	7	10,10,11	0.74	0	14,14,16	0.79	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
8	NAG	F	1	8,1	-	4/6/23/26	0/1/1/1
8	NAG	F	2	8	-	4/6/23/26	0/1/1/1
8	BMA	F	3	8	-	0/2/19/22	0/1/1/1
8	MAN	F	4	8	-	1/2/19/22	0/1/1/1
8	MAN	F	5	8	-	2/2/19/22	0/1/1/1
8	MAN	F	6	8	-	2/2/19/22	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
8	MAN	F	7	8	-	0/2/19/22	0/1/1/1
9	NAG	G	1	2,9	-	2/6/23/26	0/1/1/1
9	NAG	G	2	9	-	6/6/23/26	0/1/1/1
9	BMA	G	3	9	-	2/2/19/22	0/1/1/1
9	MAN	G	4	9	-	1/2/19/22	0/1/1/1
10	NAG	I	1	10,2	-	2/6/23/26	0/1/1/1
10	NAG	I	2	10	-	4/6/23/26	0/1/1/1
10	BMA	I	3	10	-	2/2/19/22	0/1/1/1
10	MAN	I	4	10	-	0/2/19/22	0/1/1/1
10	MAN	I	5	10	-	0/2/19/22	0/1/1/1
11	NAG	J	1	3,11	-	2/6/23/26	0/1/1/1
11	NAG	J	2	11	-	0/6/23/26	0/1/1/1
10	NAG	K	1	10,2	-	2/6/23/26	0/1/1/1
10	NAG	K	2	10	-	2/6/23/26	0/1/1/1
10	BMA	K	3	10	-	2/2/19/22	0/1/1/1
10	MAN	K	4	10	-	1/2/19/22	1/1/1/1
10	MAN	K	5	10	-	2/2/19/22	1/1/1/1
10	NAG	M	1	10,2	-	2/6/23/26	0/1/1/1
10	NAG	M	2	10	-	4/6/23/26	0/1/1/1
10	BMA	M	3	10	-	2/2/19/22	0/1/1/1
10	MAN	M	4	10	-	0/2/19/22	1/1/1/1
10	MAN	M	5	10	-	0/2/19/22	1/1/1/1
7	NAG	N	1	6,7	-	3/6/23/26	0/1/1/1
7	NAG	N	2	7	-	6/6/23/26	0/1/1/1
7	FUC	N	3	7	-	-	0/1/1/1

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
10	K	4	MAN	C1-C2	2.79	1.58	1.52
10	K	3	BMA	O3-C3	2.75	1.49	1.43
9	G	1	NAG	O5-C1	-2.56	1.39	1.43
10	I	3	BMA	C1-C2	2.51	1.58	1.52
10	I	4	MAN	C1-C2	2.09	1.57	1.52

All (36) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
10	I	2	NAG	C2-N2-C7	4.31	128.68	122.90
9	G	2	NAG	C2-N2-C7	4.28	128.63	122.90
8	F	2	NAG	C2-N2-C7	4.25	128.59	122.90
10	M	2	NAG	C2-N2-C7	4.24	128.58	122.90
7	N	2	NAG	C2-N2-C7	4.23	128.57	122.90
10	K	4	MAN	C1-O5-C5	4.13	117.72	112.19
10	K	5	MAN	C1-O5-C5	3.84	117.33	112.19
10	K	3	BMA	O3-C3-C2	3.78	117.76	110.05
10	M	4	MAN	C1-O5-C5	3.72	117.17	112.19
10	M	3	BMA	O3-C3-C2	3.28	116.74	110.05
10	I	5	MAN	C1-O5-C5	3.17	116.44	112.19
10	I	4	MAN	C1-O5-C5	2.90	116.07	112.19
10	M	5	MAN	C1-O5-C5	2.64	115.72	112.19
9	G	4	MAN	C1-O5-C5	2.41	115.41	112.19
9	G	2	NAG	C1-C2-N2	2.35	114.14	110.43
9	G	1	NAG	C2-N2-C7	2.33	126.02	122.90
8	F	5	MAN	C1-O5-C5	2.33	115.30	112.19
7	N	1	NAG	C1-O5-C5	2.30	115.27	112.19
8	F	6	MAN	O2-C2-C3	-2.29	105.41	110.15
11	J	1	NAG	C2-N2-C7	2.27	125.94	122.90
10	I	4	MAN	O2-C2-C3	-2.26	105.47	110.15
10	K	1	NAG	C2-N2-C7	2.26	125.93	122.90
8	F	4	MAN	O2-C2-C3	-2.24	105.52	110.15
10	M	4	MAN	O2-C2-C3	-2.23	105.53	110.15
10	M	2	NAG	C1-C2-N2	2.21	113.92	110.43
10	K	4	MAN	O2-C2-C3	-2.20	105.59	110.15
8	F	7	MAN	C1-O5-C5	2.20	115.13	112.19
9	G	4	MAN	O2-C2-C3	-2.20	105.60	110.15
10	I	5	MAN	O2-C2-C3	-2.18	105.64	110.15
8	F	7	MAN	O2-C2-C3	-2.17	105.65	110.15
10	K	5	MAN	O2-C2-C3	-2.16	105.68	110.15
8	F	4	MAN	C1-O5-C5	2.15	115.06	112.19
8	F	5	MAN	O2-C2-C3	-2.09	105.81	110.15
10	I	2	NAG	C1-C2-N2	2.08	113.70	110.43
7	N	2	NAG	C1-C2-N2	2.06	113.67	110.43
10	M	5	MAN	O2-C2-C3	-2.02	105.97	110.15

There are no chirality outliers.

All (60) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	N	1	NAG	O5-C5-C6-O6
9	G	3	BMA	O5-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
10	K	3	BMA	O5-C5-C6-O6
8	F	1	NAG	O5-C5-C6-O6
8	F	5	MAN	O5-C5-C6-O6
8	F	6	MAN	O5-C5-C6-O6
9	G	2	NAG	O5-C5-C6-O6
7	N	1	NAG	C4-C5-C6-O6
10	I	1	NAG	O5-C5-C6-O6
9	G	2	NAG	C4-C5-C6-O6
10	I	3	BMA	O5-C5-C6-O6
10	I	1	NAG	C4-C5-C6-O6
10	I	3	BMA	C4-C5-C6-O6
8	F	1	NAG	C4-C5-C6-O6
9	G	3	BMA	C4-C5-C6-O6
10	K	3	BMA	C4-C5-C6-O6
8	F	6	MAN	C4-C5-C6-O6
7	N	2	NAG	C8-C7-N2-C2
7	N	2	NAG	O7-C7-N2-C2
8	F	2	NAG	C8-C7-N2-C2
8	F	2	NAG	O7-C7-N2-C2
9	G	1	NAG	C8-C7-N2-C2
9	G	1	NAG	O7-C7-N2-C2
9	G	2	NAG	C8-C7-N2-C2
9	G	2	NAG	O7-C7-N2-C2
10	I	2	NAG	C8-C7-N2-C2
10	I	2	NAG	O7-C7-N2-C2
10	K	1	NAG	C8-C7-N2-C2
10	K	1	NAG	O7-C7-N2-C2
10	M	2	NAG	C8-C7-N2-C2
10	M	2	NAG	O7-C7-N2-C2
11	J	1	NAG	C8-C7-N2-C2
11	J	1	NAG	O7-C7-N2-C2
10	M	1	NAG	O5-C5-C6-O6
8	F	5	MAN	C4-C5-C6-O6
7	N	2	NAG	C4-C5-C6-O6
10	K	5	MAN	C4-C5-C6-O6
10	K	5	MAN	O5-C5-C6-O6
10	K	2	NAG	O5-C5-C6-O6
10	K	2	NAG	C4-C5-C6-O6
7	N	2	NAG	O5-C5-C6-O6
8	F	4	MAN	O5-C5-C6-O6
9	G	4	MAN	O5-C5-C6-O6
10	K	4	MAN	O5-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
10	M	1	NAG	C4-C5-C6-O6
7	N	2	NAG	C1-C2-N2-C7
8	F	1	NAG	C1-C2-N2-C7
8	F	2	NAG	C1-C2-N2-C7
9	G	2	NAG	C1-C2-N2-C7
10	M	2	NAG	C1-C2-N2-C7
10	M	3	BMA	C4-C5-C6-O6
7	N	1	NAG	C3-C2-N2-C7
7	N	2	NAG	C3-C2-N2-C7
8	F	1	NAG	C3-C2-N2-C7
8	F	2	NAG	C3-C2-N2-C7
9	G	2	NAG	C3-C2-N2-C7
10	I	2	NAG	C3-C2-N2-C7
10	M	3	BMA	O5-C5-C6-O6
10	I	2	NAG	C1-C2-N2-C7
10	M	2	NAG	C3-C2-N2-C7

All (4) ring outliers are listed below:

Mol	Chain	Res	Type	Atoms
10	M	5	MAN	C1-C2-C3-C4-C5-O5
10	K	4	MAN	C1-C2-C3-C4-C5-O5
10	K	5	MAN	C1-C2-C3-C4-C5-O5
10	M	4	MAN	C1-C2-C3-C4-C5-O5

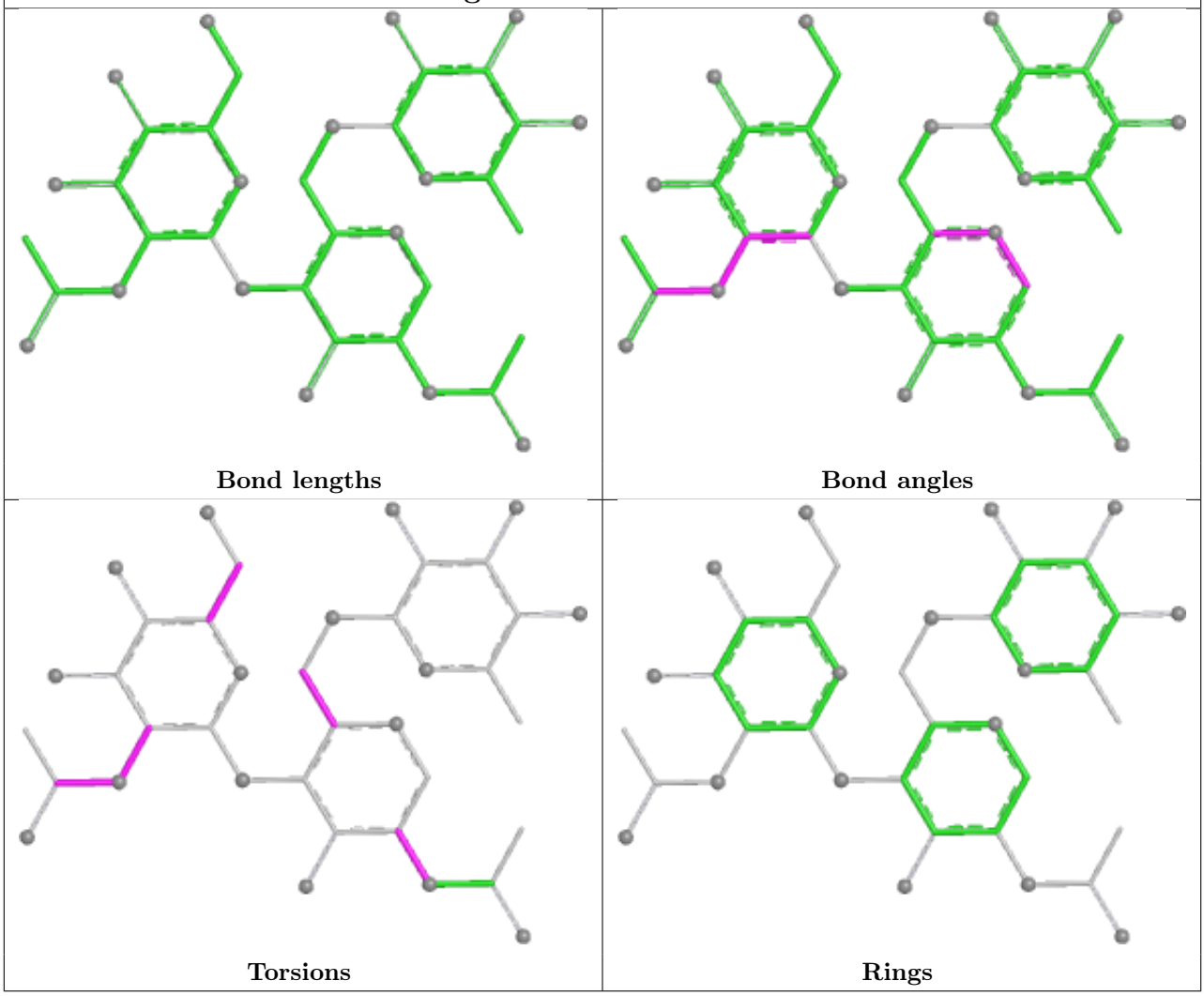
12 monomers are involved in 14 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
10	M	2	NAG	1	0
9	G	3	BMA	1	0
9	G	2	NAG	2	0
11	J	1	NAG	1	0
10	I	1	NAG	1	0
10	K	2	NAG	1	0
7	N	2	NAG	3	0
10	K	3	BMA	1	0
7	N	1	NAG	4	0
8	F	2	NAG	1	0
10	M	1	NAG	1	0
10	I	2	NAG	1	0

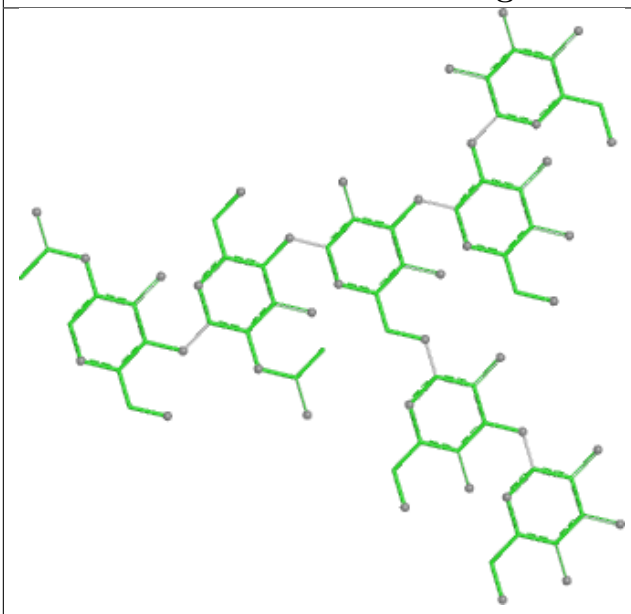
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths,

bond angles, torsion angles, and ring geometry for oligosaccharide.

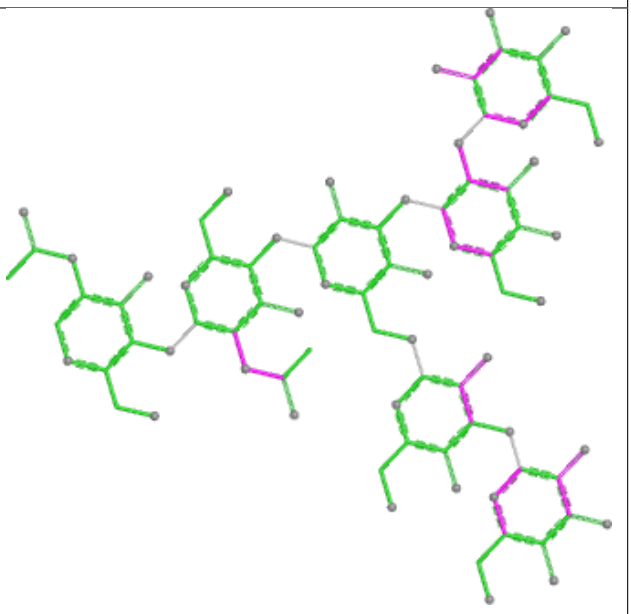
Oligosaccharide Chain N



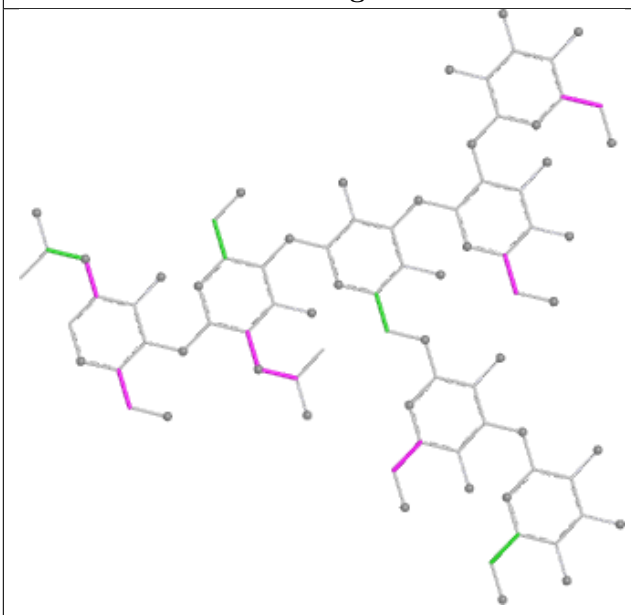
Oligosaccharide Chain F



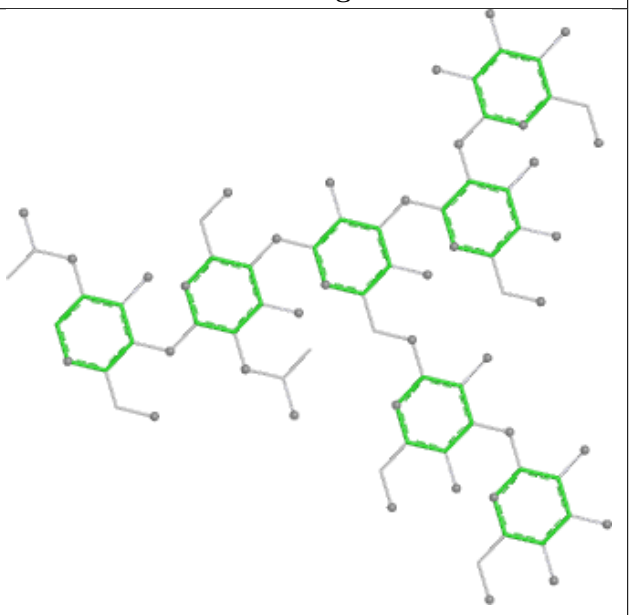
Bond lengths



Bond angles

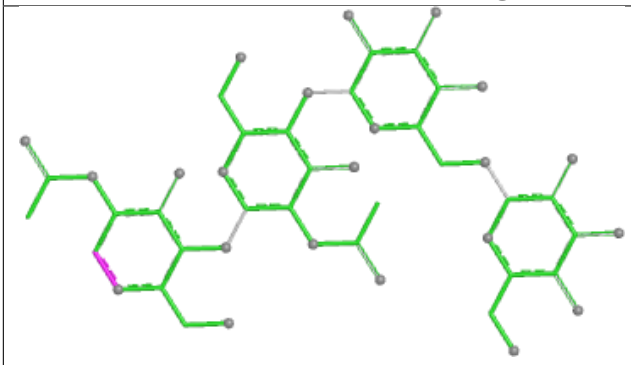


Torsions

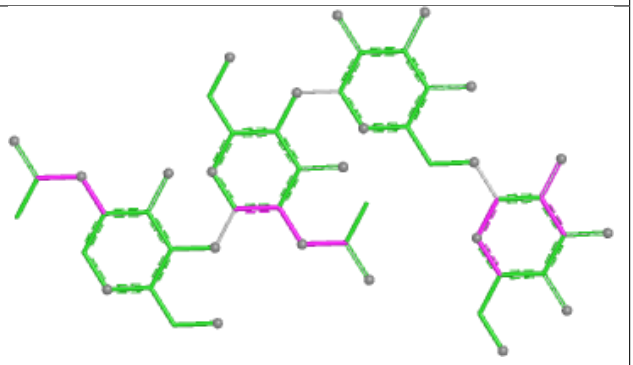


Rings

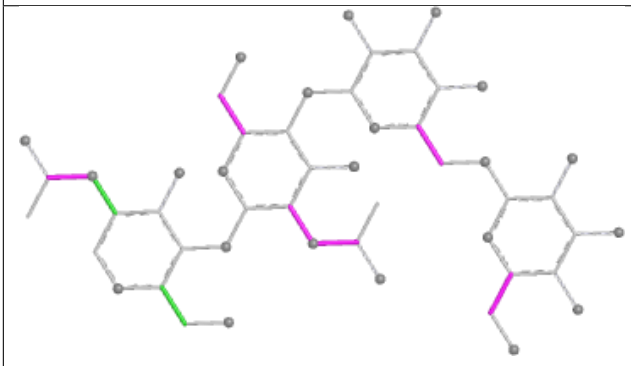
Oligosaccharide Chain G



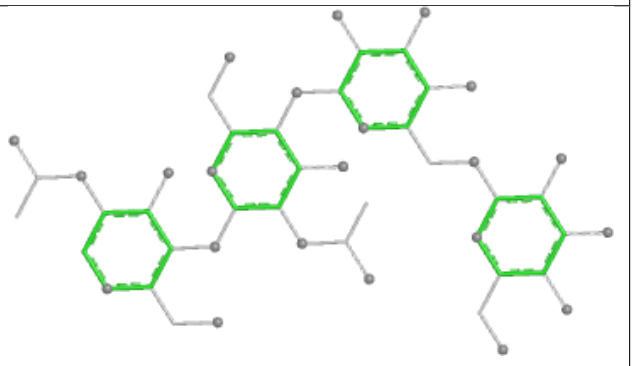
Bond lengths



Bond angles

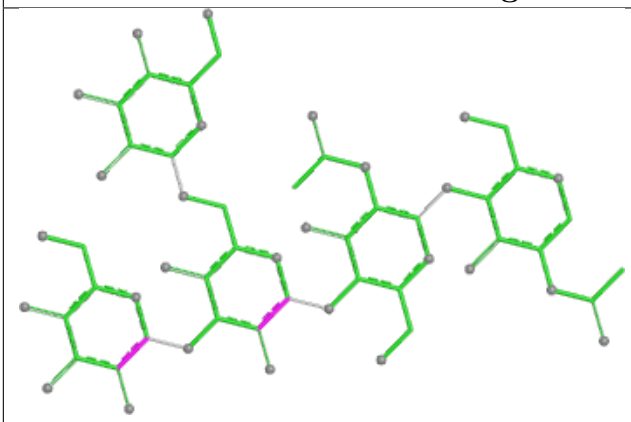


Torsions

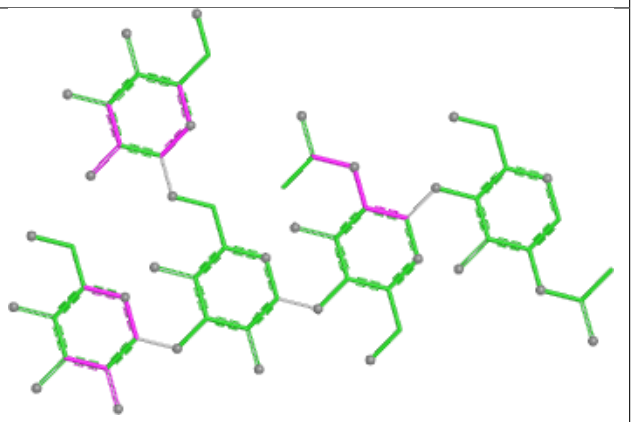


Rings

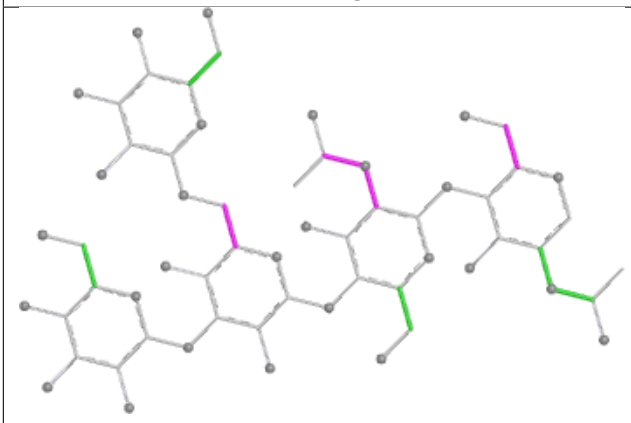
Oligosaccharide Chain I



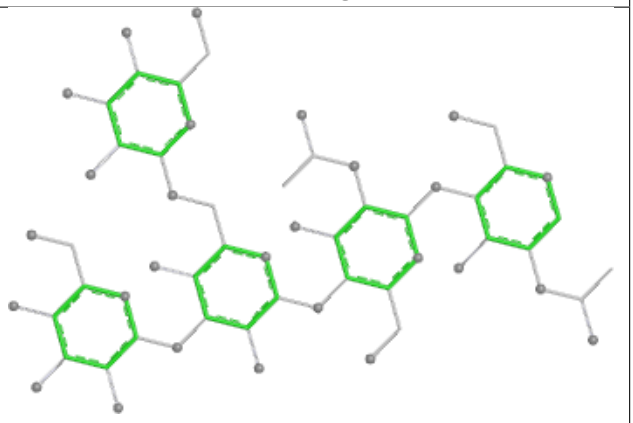
Bond lengths



Bond angles

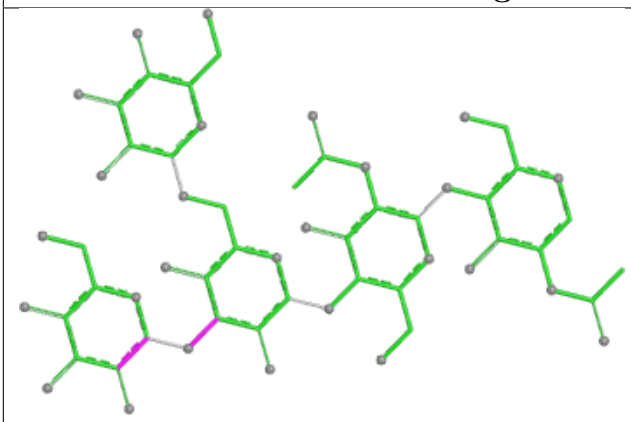


Torsions

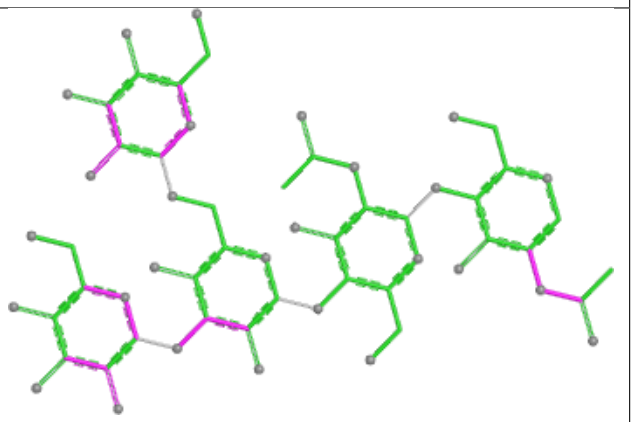


Rings

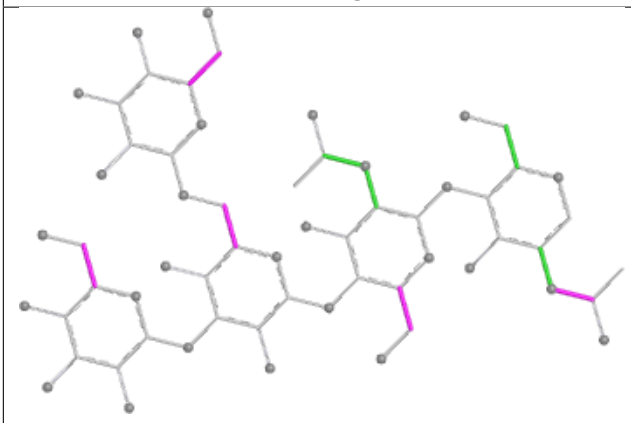
Oligosaccharide Chain K



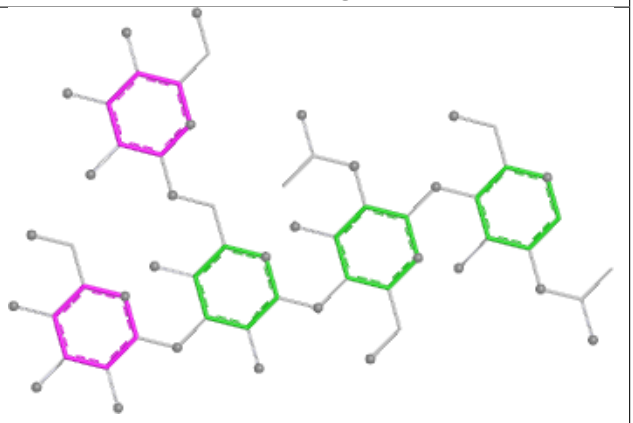
Bond lengths



Bond angles

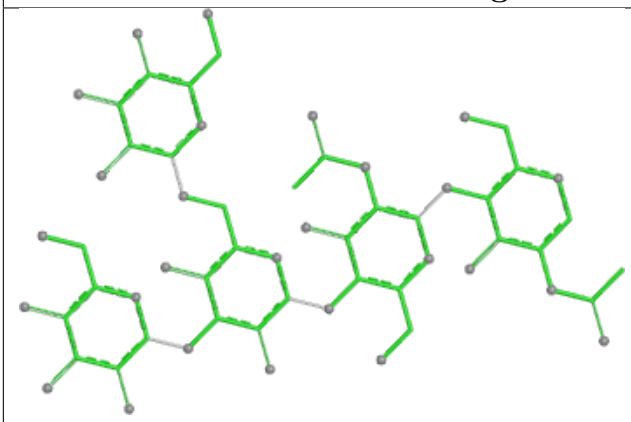


Torsions

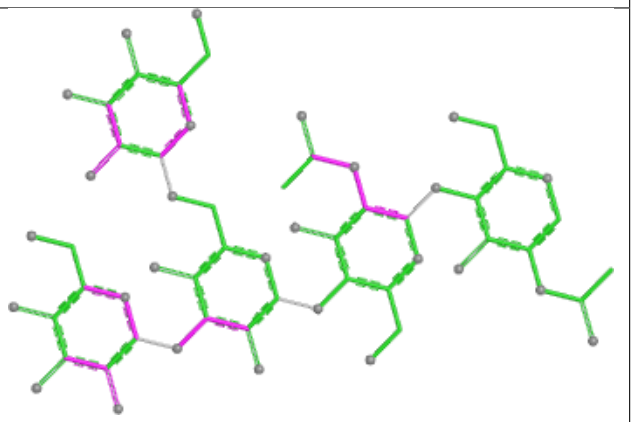


Rings

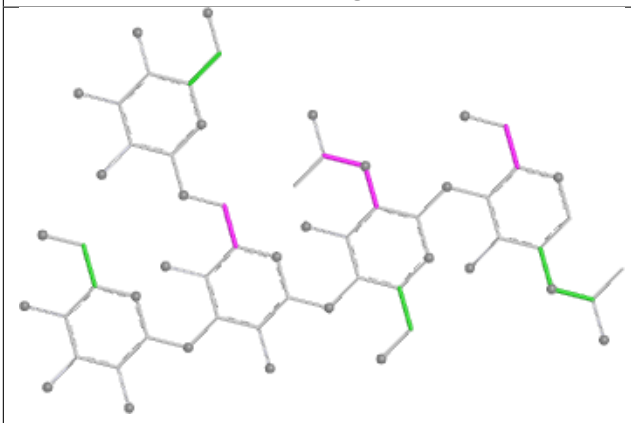
Oligosaccharide Chain M



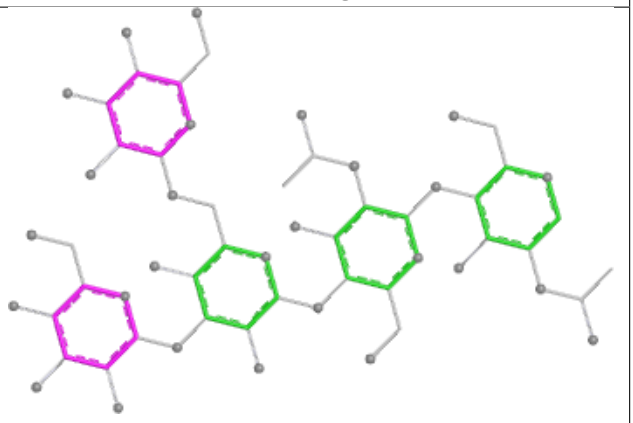
Bond lengths



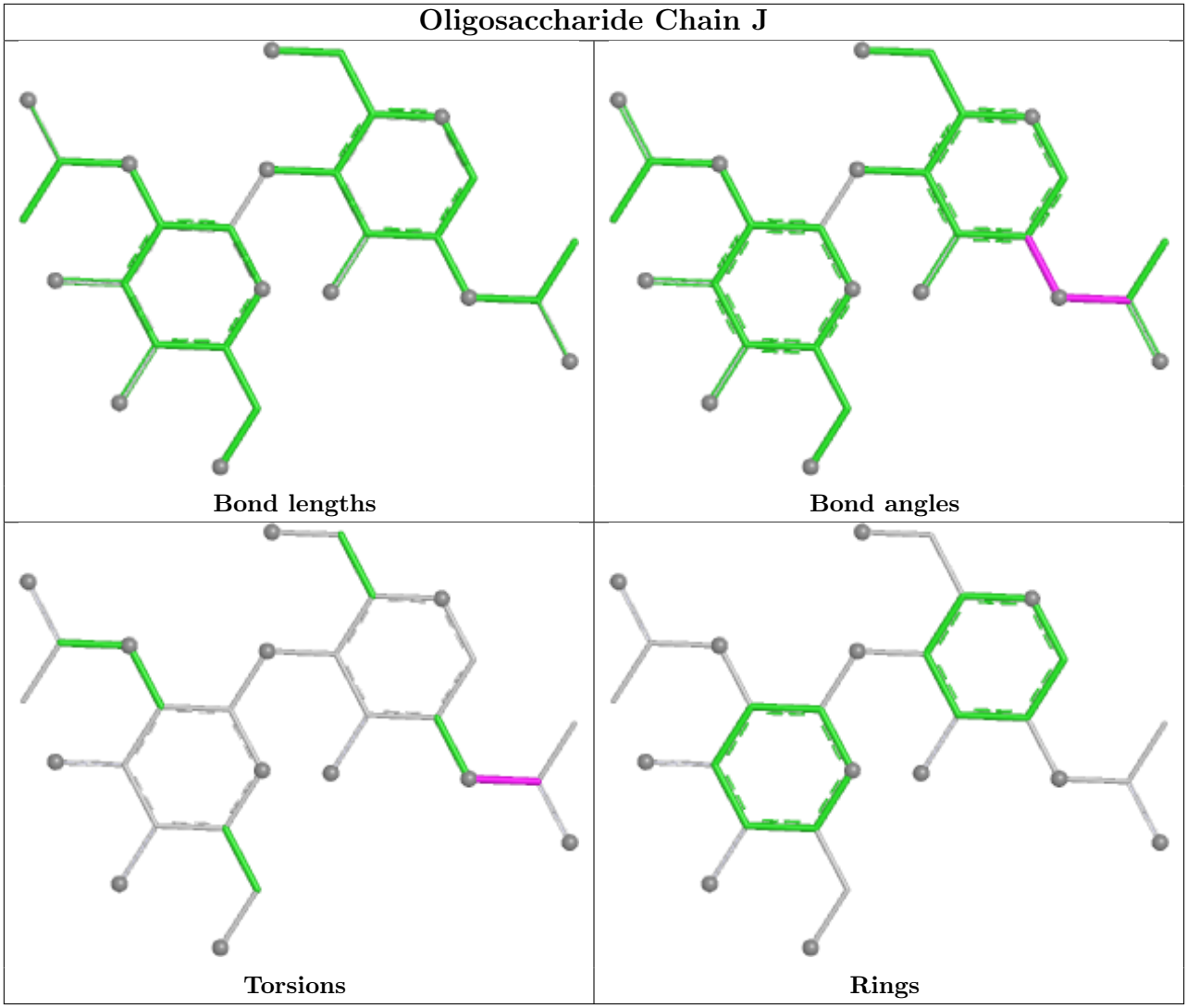
Bond angles



Torsions



Rings



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	$\#\|Z\| > 2$
14	NAG	D	501	3	14,14,15	0.20	0	17,19,21	0.69	1 (5%)
15	Y4B	E	501	-	26,26,26	1.46	4 (15%)	42,42,42	2.23	17 (40%)
13	ABU	E	502	-	6,6,6	0.90	0	6,6,6	1.38	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
15	Y4B	C	502	-	26,26,26	1.10	2 (7%)	42,42,42	2.09	14 (33%)
13	ABU	B	501	-	6,6,6	0.91	0	6,6,6	1.33	1 (16%)
12	PIO	C	501	-	47,47,47	1.41	10 (21%)	62,65,65	1.29	8 (12%)
12	PIO	A	601	-	47,47,47	1.41	11 (23%)	62,65,65	1.29	10 (16%)

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
14	NAG	D	501	3	-	4/6/23/26	0/1/1/1
15	Y4B	E	501	-	-	2/4/62/62	0/4/4/4
13	ABU	E	502	-	-	2/4/4/4	-
15	Y4B	C	502	-	-	0/4/62/62	0/4/4/4
13	ABU	B	501	-	-	3/4/4/4	-
12	PIO	C	501	-	-	9/44/68/68	0/1/1/1
12	PIO	A	601	-	-	17/44/68/68	0/1/1/1

All (27) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
15	E	501	Y4B	C14-C08	-3.50	1.44	1.53
15	E	501	Y4B	C06-C12	-3.35	1.50	1.56
12	C	501	PIO	P4-O4	3.31	1.65	1.59
12	A	601	PIO	P4-O4	3.23	1.65	1.59
12	C	501	PIO	P5-O5	3.22	1.65	1.59
12	A	601	PIO	P5-O5	3.11	1.65	1.59
15	C	502	Y4B	C07-C03	3.10	1.61	1.56
15	E	501	Y4B	C09-C03	-2.84	1.49	1.53
15	E	501	Y4B	C12-C22	-2.60	1.48	1.51
12	A	601	PIO	O2C-C2C	-2.58	1.40	1.46
12	C	501	PIO	O3C-C1B	2.51	1.40	1.33
12	C	501	PIO	O2C-C2C	-2.49	1.40	1.46
12	A	601	PIO	O3C-C1B	2.41	1.40	1.33
12	C	501	PIO	O2C-C1A	2.33	1.40	1.34
12	A	601	PIO	P5-O51	-2.32	1.46	1.54
12	A	601	PIO	P4-O41	-2.28	1.46	1.54
12	A	601	PIO	P4-O43	-2.27	1.46	1.54
12	A	601	PIO	P5-O52	-2.27	1.46	1.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
12	C	501	PIO	P4-O43	-2.27	1.46	1.54
12	C	501	PIO	P5-O51	-2.26	1.46	1.54
12	C	501	PIO	P4-O41	-2.24	1.46	1.54
12	C	501	PIO	P5-O52	-2.24	1.46	1.54
12	A	601	PIO	O2C-C1A	2.23	1.40	1.34
12	A	601	PIO	O3C-C3C	-2.17	1.40	1.45
12	A	601	PIO	P1-O11	-2.04	1.45	1.55
15	C	502	Y4B	C04-C05	2.02	1.57	1.53
12	C	501	PIO	O3C-C3C	-2.00	1.40	1.45

All (51) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
15	E	501	Y4B	C23-C22-C12	5.12	126.52	117.65
15	C	502	Y4B	C09-C03-C04	-5.01	104.79	111.78
15	C	502	Y4B	C07-C03-C04	4.68	117.19	112.43
15	E	501	Y4B	O02-C22-C23	-4.49	113.25	121.17
15	E	501	Y4B	C17-C08-C14	4.48	119.48	111.73
15	C	502	Y4B	O02-C22-C23	-4.31	113.57	121.17
15	E	501	Y4B	C13-C05-C04	4.28	125.93	119.10
15	C	502	Y4B	C13-C05-C04	4.25	125.88	119.10
15	E	501	Y4B	C09-C03-C04	-4.08	106.08	111.78
12	C	501	PIO	O2C-C1A-C2A	3.83	119.77	111.48
12	A	601	PIO	O2C-C1A-C2A	3.59	119.25	111.48
15	E	501	Y4B	C07-C03-C04	3.30	115.78	112.43
15	C	502	Y4B	C09-C03-C07	3.01	117.30	113.91
12	C	501	PIO	O3C-C1B-C2B	3.00	120.99	111.83
15	C	502	Y4B	C23-C22-C12	2.99	122.82	117.65
15	E	501	Y4B	C18-C06-C10	-2.98	106.22	110.61
15	E	501	Y4B	C16-C12-C06	-2.91	101.61	104.21
15	C	502	Y4B	C20-C15-C07	2.89	117.62	112.74
15	E	501	Y4B	C10-C06-C12	2.81	119.49	116.11
15	E	501	Y4B	C19-C07-C08	2.80	115.12	110.44
15	E	501	Y4B	C13-C05-C06	-2.74	100.62	103.84
12	A	601	PIO	O1-C1-C2	2.68	114.41	108.73
15	C	502	Y4B	C18-C06-C10	-2.61	106.76	110.61
12	A	601	PIO	O3C-C1B-C2B	2.58	119.71	111.83
15	C	502	Y4B	C10-C06-C12	2.57	119.20	116.11
15	E	501	Y4B	C14-C08-C07	-2.57	108.00	112.31
15	E	501	Y4B	C15-C07-C03	2.52	115.25	111.34
12	A	601	PIO	O11-P1-O12	-2.52	100.74	112.44
15	C	502	Y4B	C17-C08-C07	2.43	115.25	112.66

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
15	C	502	Y4B	C13-C05-C06	-2.40	101.02	103.84
15	C	502	Y4B	C15-C20-C21	2.38	113.64	110.48
12	C	501	PIO	O1-C1-C2	2.37	113.75	108.73
15	C	502	Y4B	C14-C11-C04	2.37	115.93	112.16
12	C	501	PIO	O11-P1-O12	-2.35	101.49	112.44
14	D	501	NAG	C2-N2-C7	2.31	125.99	122.90
13	B	501	ABU	OXT-C-CG	2.30	121.27	114.00
15	E	501	Y4B	C08-C17-C21	2.30	116.17	112.71
12	C	501	PIO	O41-P4-O4	2.20	114.44	105.85
12	A	601	PIO	O52-P5-O5	2.18	114.33	105.85
15	E	501	Y4B	C10-C06-C05	2.16	110.47	107.25
15	E	501	Y4B	C14-C11-C04	2.14	115.58	112.16
12	A	601	PIO	O41-P4-O4	2.14	114.18	105.85
12	C	501	PIO	O52-P5-O5	2.14	114.17	105.85
12	A	601	PIO	O43-P4-O4	2.13	114.16	105.85
15	C	502	Y4B	C16-C12-C06	-2.12	102.31	104.21
12	C	501	PIO	O43-P4-O4	2.12	114.11	105.85
12	C	501	PIO	O51-P5-O5	2.11	114.07	105.85
12	A	601	PIO	P5-O5-C5	-2.09	117.85	123.43
15	E	501	Y4B	C03-C07-C08	-2.06	105.65	108.51
12	A	601	PIO	O2-C2-C1	2.03	115.13	109.94
12	A	601	PIO	O51-P5-O5	2.02	113.72	105.85

There are no chirality outliers.

All (37) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
12	A	601	PIO	C2-C1-O1-P1
12	A	601	PIO	C1C-O13-P1-O1
12	A	601	PIO	C1C-O13-P1-O12
12	C	501	PIO	C2-C1-O1-P1
13	B	501	ABU	CD-CB-CG-C
15	E	501	Y4B	C06-C12-C22-C23
15	E	501	Y4B	C06-C12-C22-O02
12	A	601	PIO	C2B-C1B-O3C-C3C
14	D	501	NAG	C4-C5-C6-O6
12	A	601	PIO	O2C-C2C-C3C-O3C
14	D	501	NAG	C8-C7-N2-C2
14	D	501	NAG	O7-C7-N2-C2
12	A	601	PIO	C1B-C2B-C3B-C4B
12	A	601	PIO	O1B-C1B-O3C-C3C
14	D	501	NAG	O5-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
12	A	601	PIO	C3B-C4B-C5B-C6B
12	C	501	PIO	C3B-C4B-C5B-C6B
12	A	601	PIO	C4A-C5A-C6A-C7A
12	A	601	PIO	C1C-C2C-C3C-O3C
12	C	501	PIO	O2C-C2C-C3C-O3C
12	C	501	PIO	C2B-C1B-O3C-C3C
12	C	501	PIO	C5A-C6A-C7A-C8A
12	A	601	PIO	C2A-C1A-O2C-C2C
12	C	501	PIO	O1B-C1B-O3C-C3C
12	A	601	PIO	O1A-C1A-O2C-C2C
12	C	501	PIO	C1C-C2C-C3C-O3C
12	A	601	PIO	C5B-C6B-C7B-C8B
13	B	501	ABU	CG-CB-CD-N
13	E	502	ABU	OXT-C-CG-CB
12	A	601	PIO	O13-C1C-C2C-O2C
13	E	502	ABU	O-C-CG-CB
12	A	601	PIO	C3-C4-O4-P4
12	C	501	PIO	O1A-C1A-O2C-C2C
12	A	601	PIO	C2A-C3A-C4A-C5A
12	A	601	PIO	C4B-C5B-C6B-C7B
13	B	501	ABU	OXT-C-CG-CB
12	C	501	PIO	C2A-C1A-O2C-C2C

There are no ring outliers.

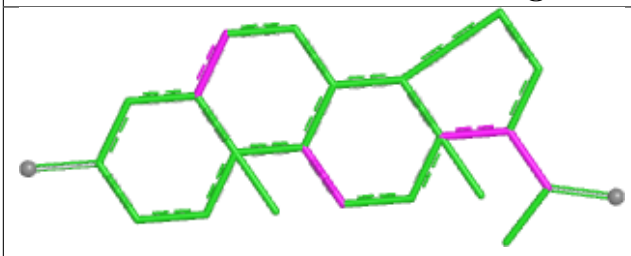
3 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
13	B	501	ABU	1	0
12	C	501	PIO	2	0
12	A	601	PIO	1	0

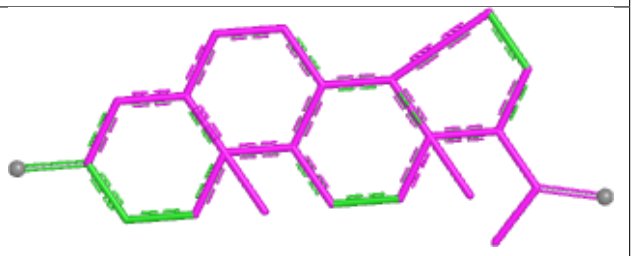
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

equivalents in the CSD to analyse the geometry.

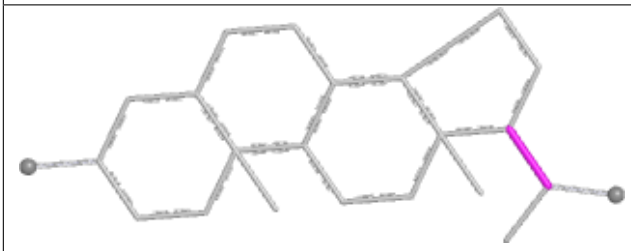
Ligand Y4B E 501



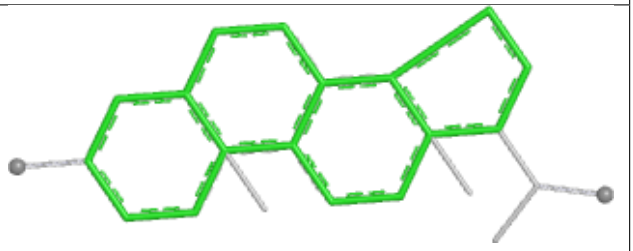
Bond lengths



Bond angles

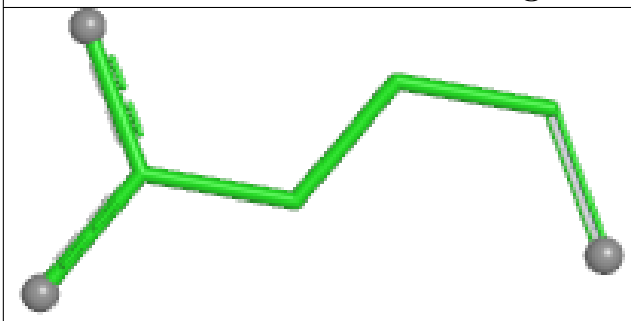


Torsions

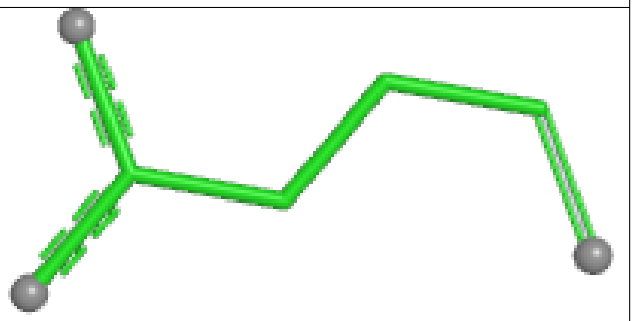


Rings

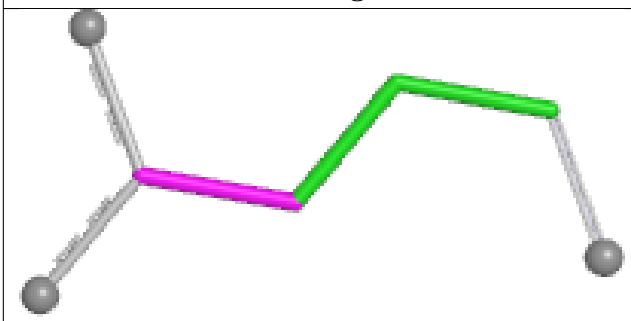
Ligand ABU E 502



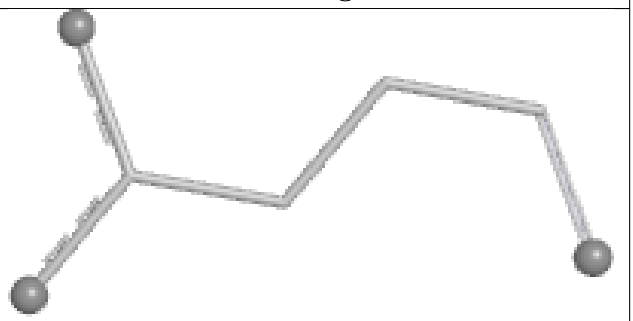
Bond lengths



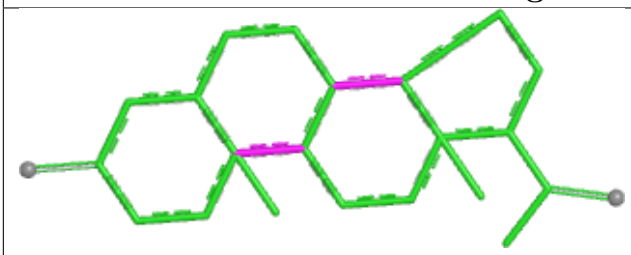
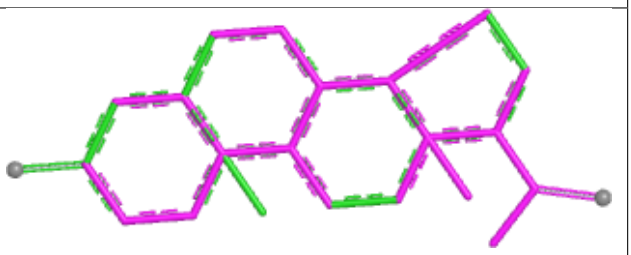
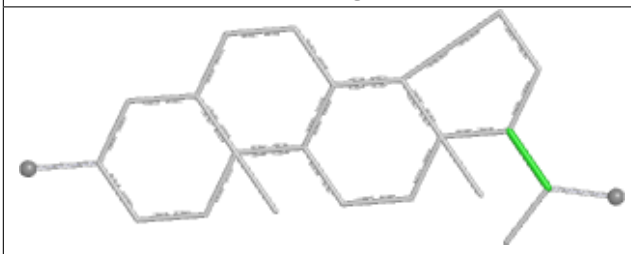
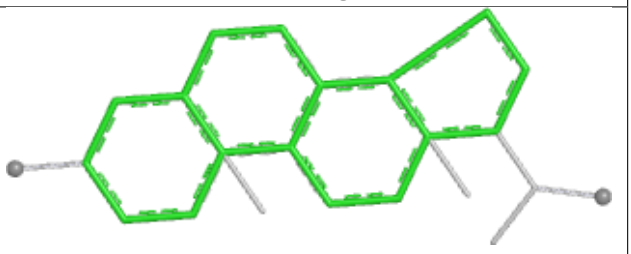
Bond angles

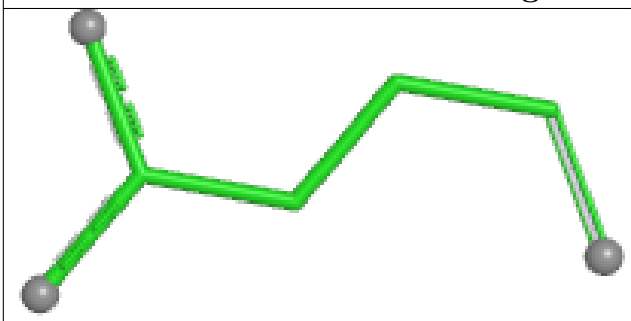
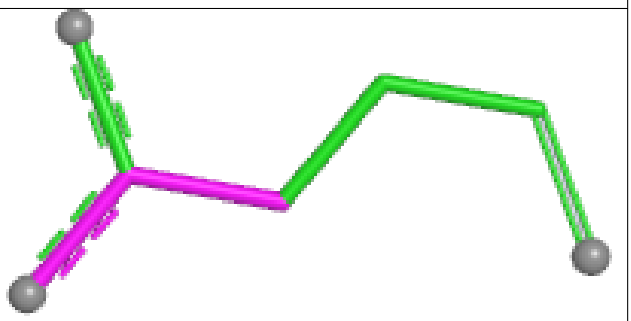
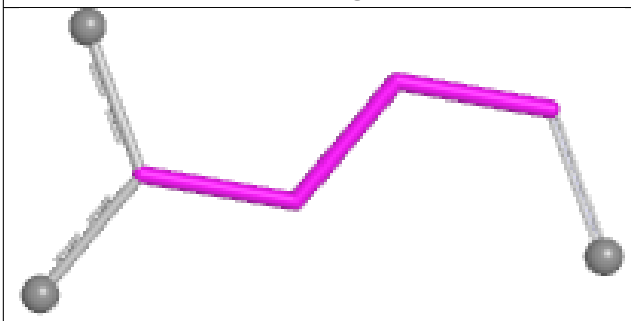
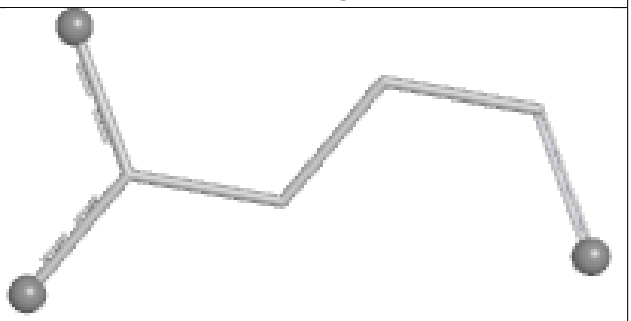


Torsions

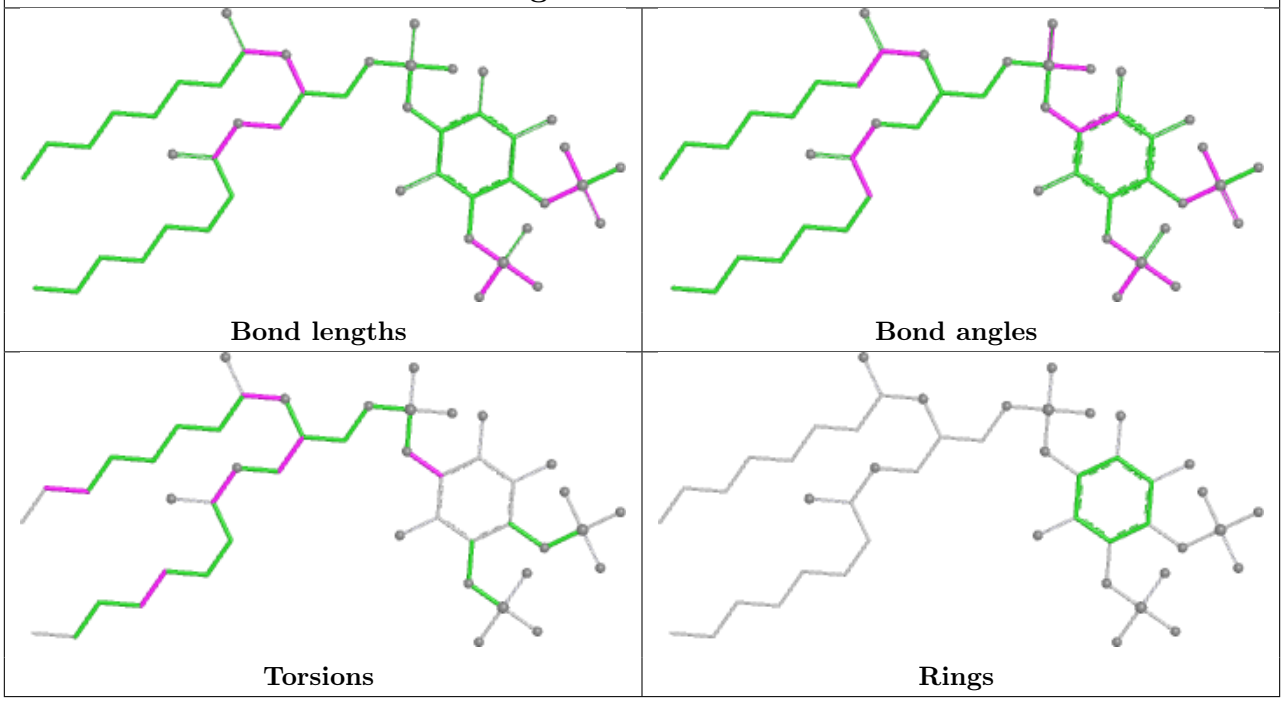


Rings

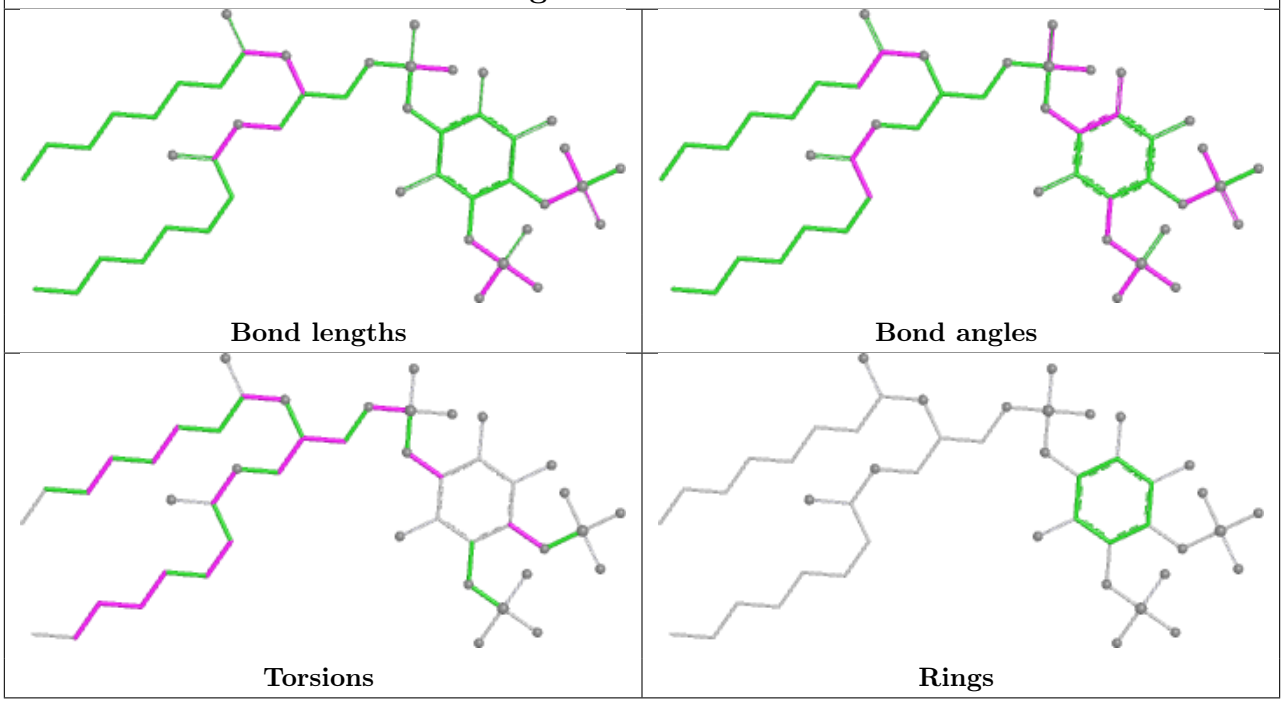
Ligand Y4B C 502	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand ABU B 501	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand PIO C 501



Ligand PIO A 601



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

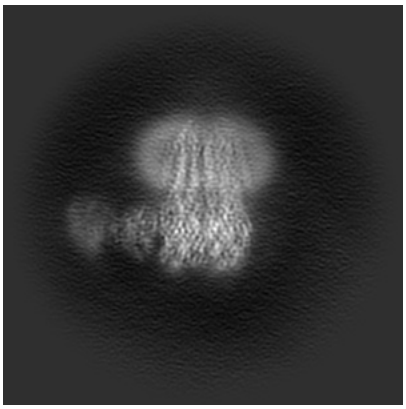
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-29733. These allow visual inspection of the internal detail of the map and identification of artifacts.

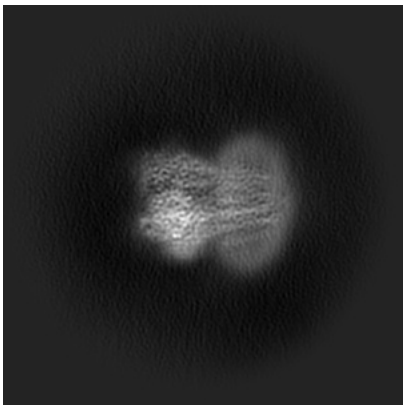
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

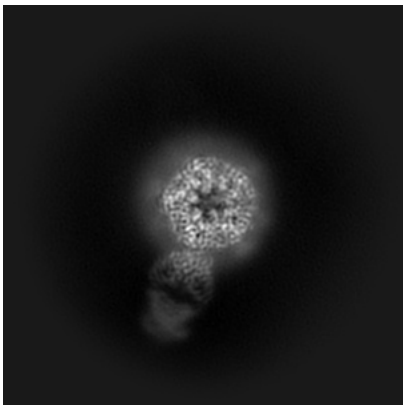
6.1.1 Primary map



X

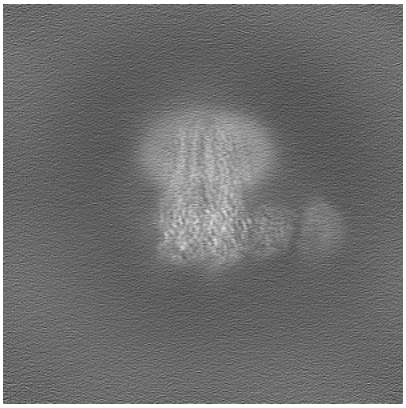


Y

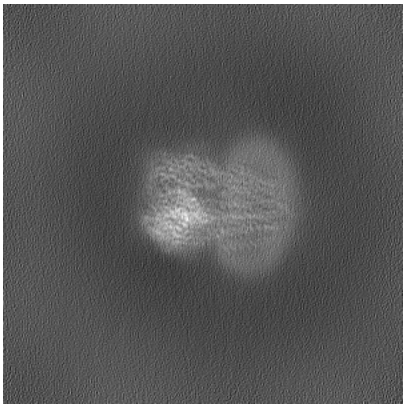


Z

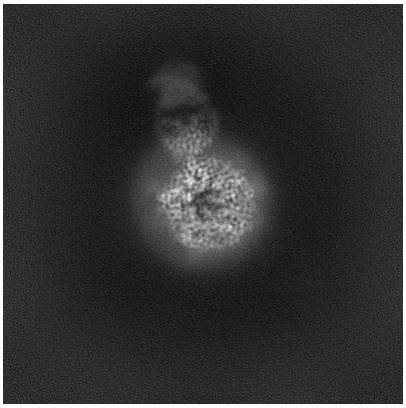
6.1.2 Raw map



X



Y

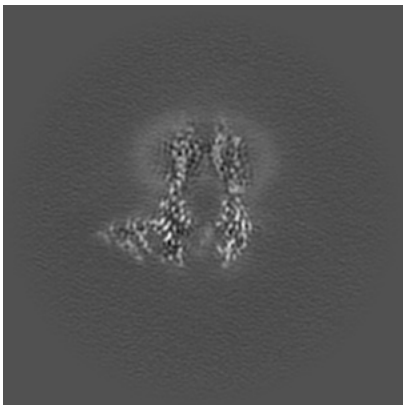


Z

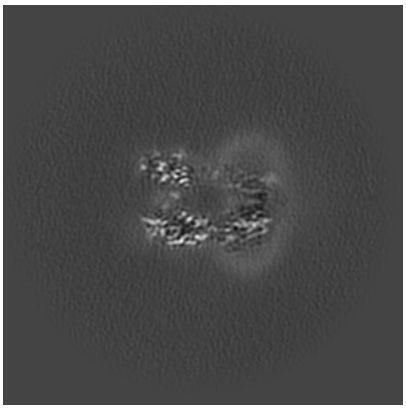
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

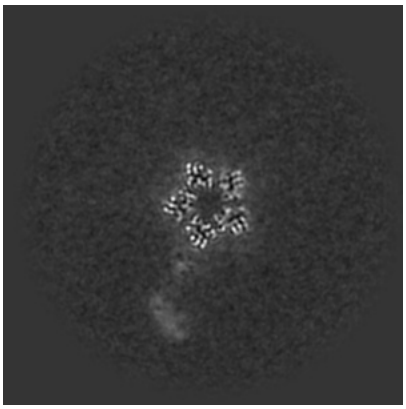
6.2.1 Primary map



X Index: 180

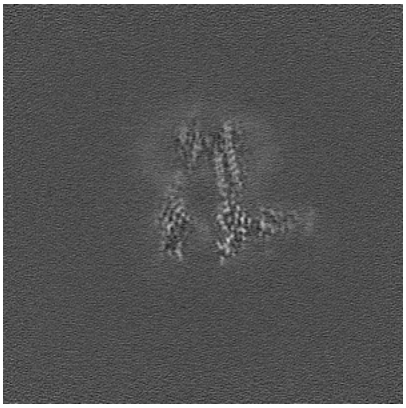


Y Index: 180

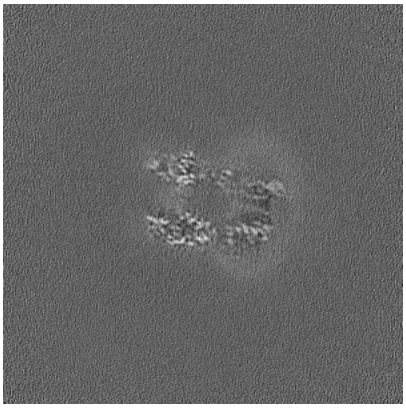


Z Index: 180

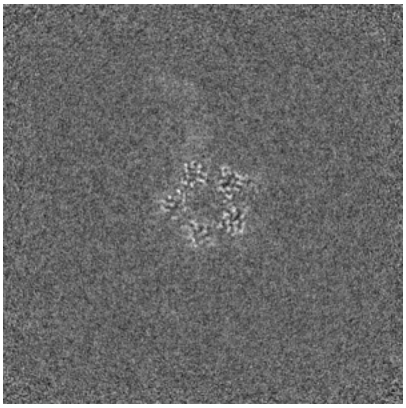
6.2.2 Raw map



X Index: 180



Y Index: 180

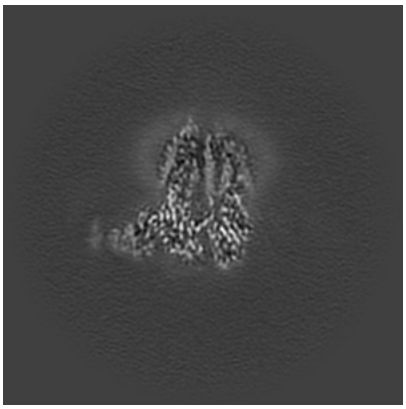


Z Index: 180

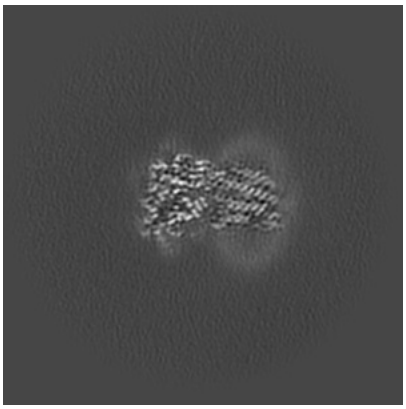
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

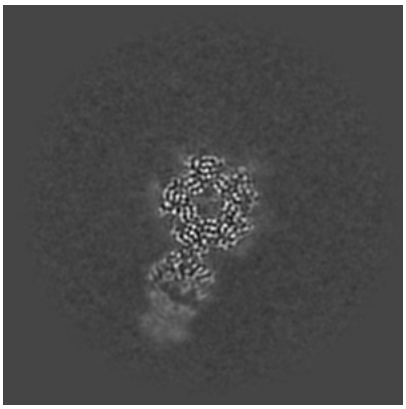
6.3.1 Primary map



X Index: 171

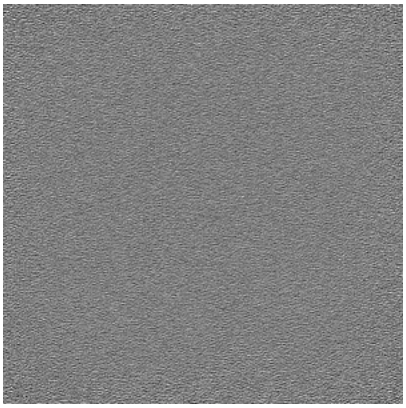


Y Index: 161

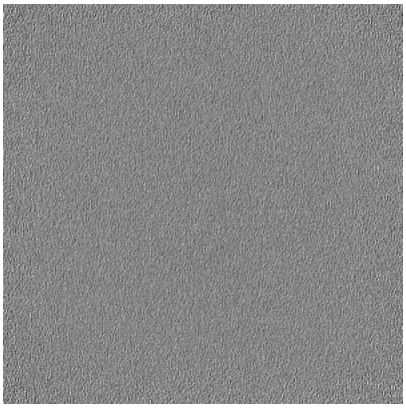


Z Index: 160

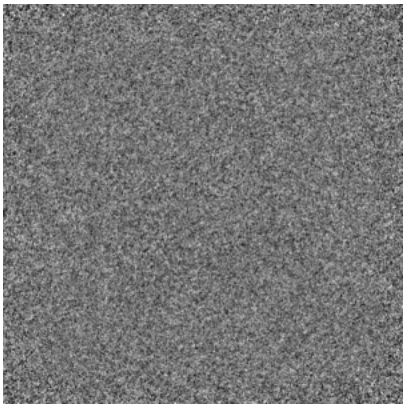
6.3.2 Raw map



X Index: 0



Y Index: 0

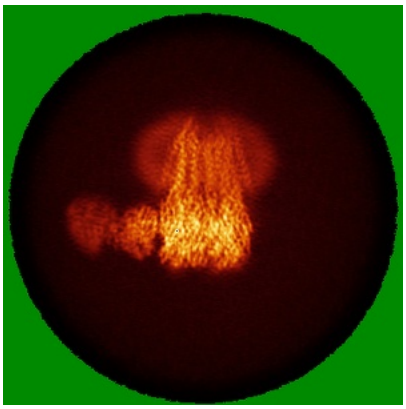


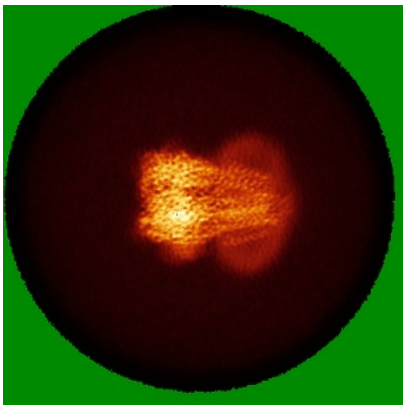
Z Index: 0

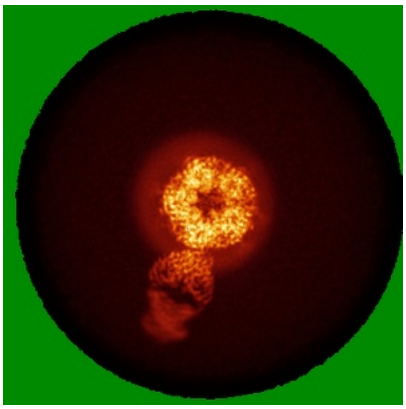
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) (i)

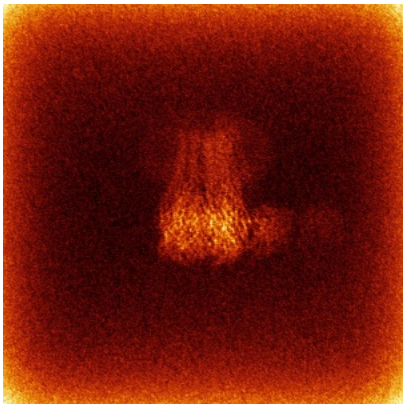
6.4.1 Primary map

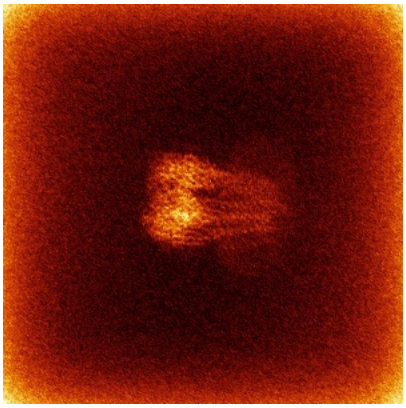

X

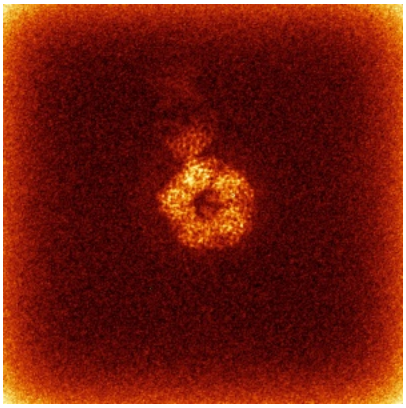

Y


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.

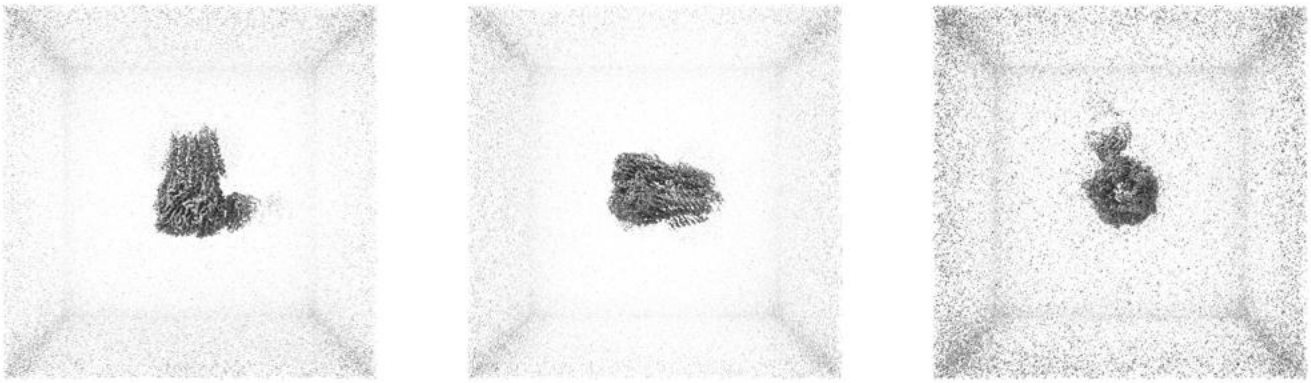
6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.1. 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



X Y Z

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

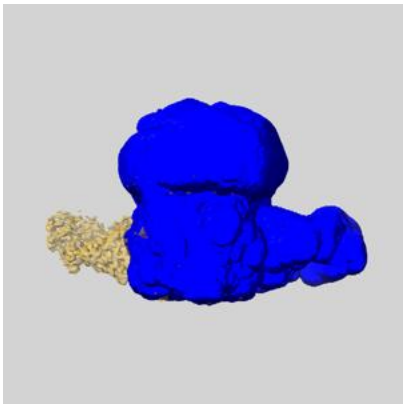
6.6 Mask visualisation (i)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

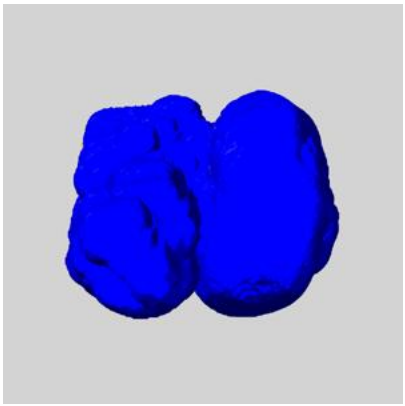
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

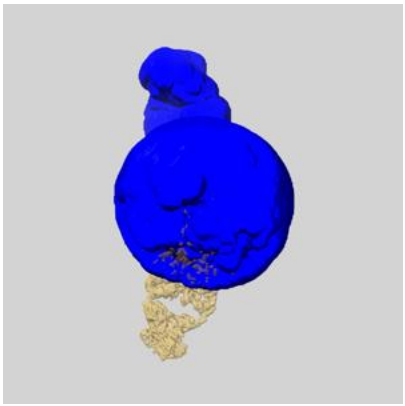
6.6.1 emd_29733_msk_1.map (i)



X



Y

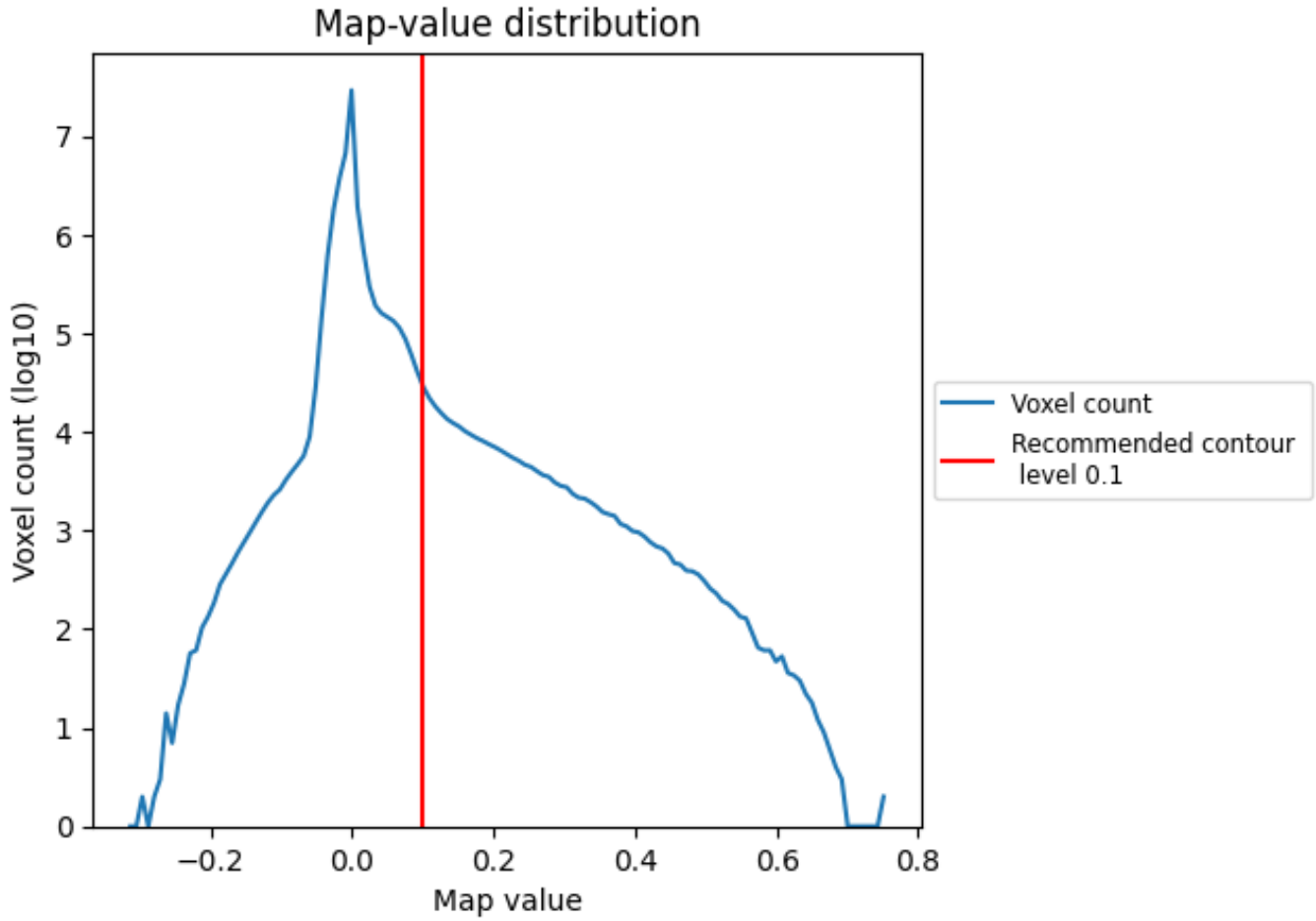


Z

7 Map analysis

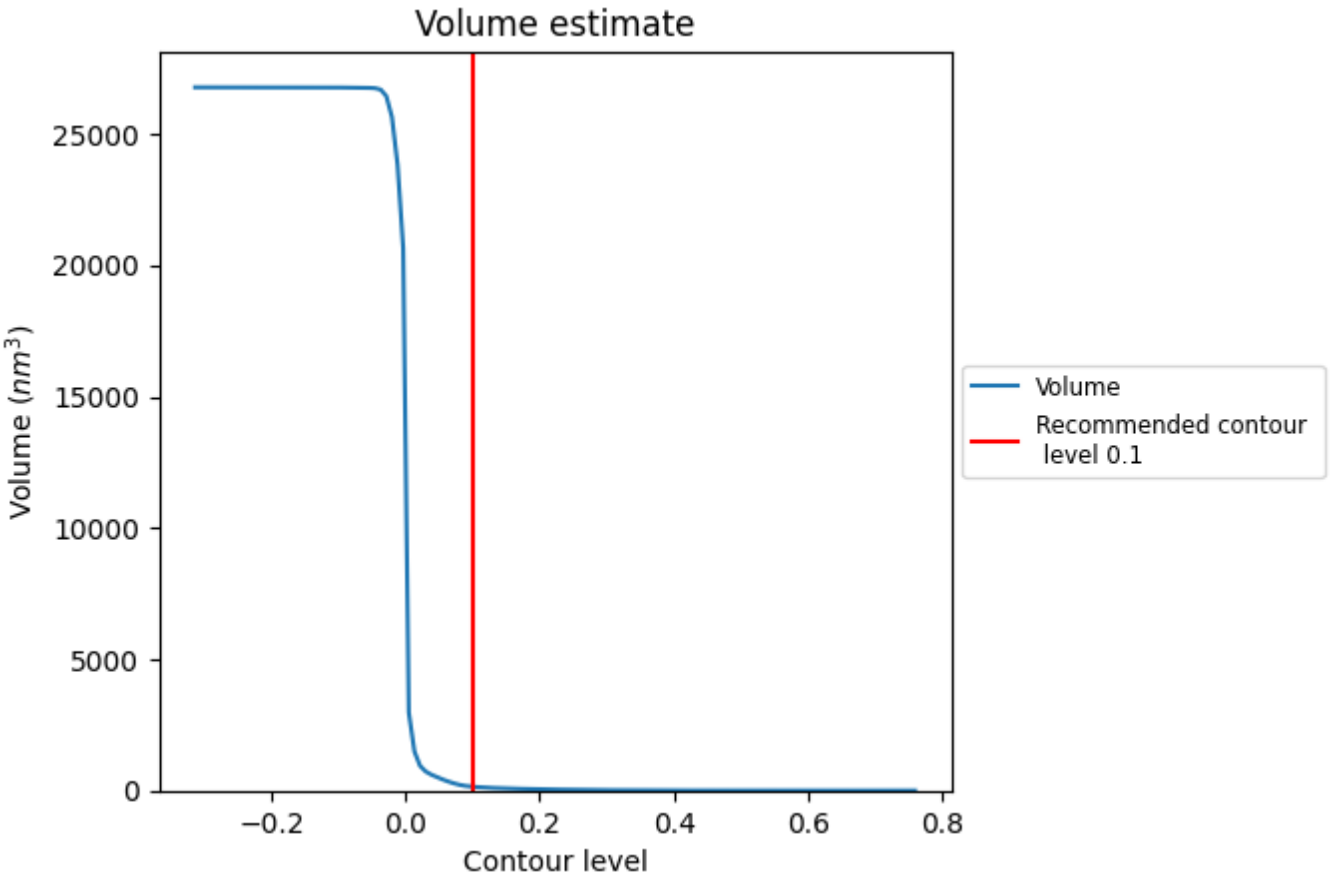
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

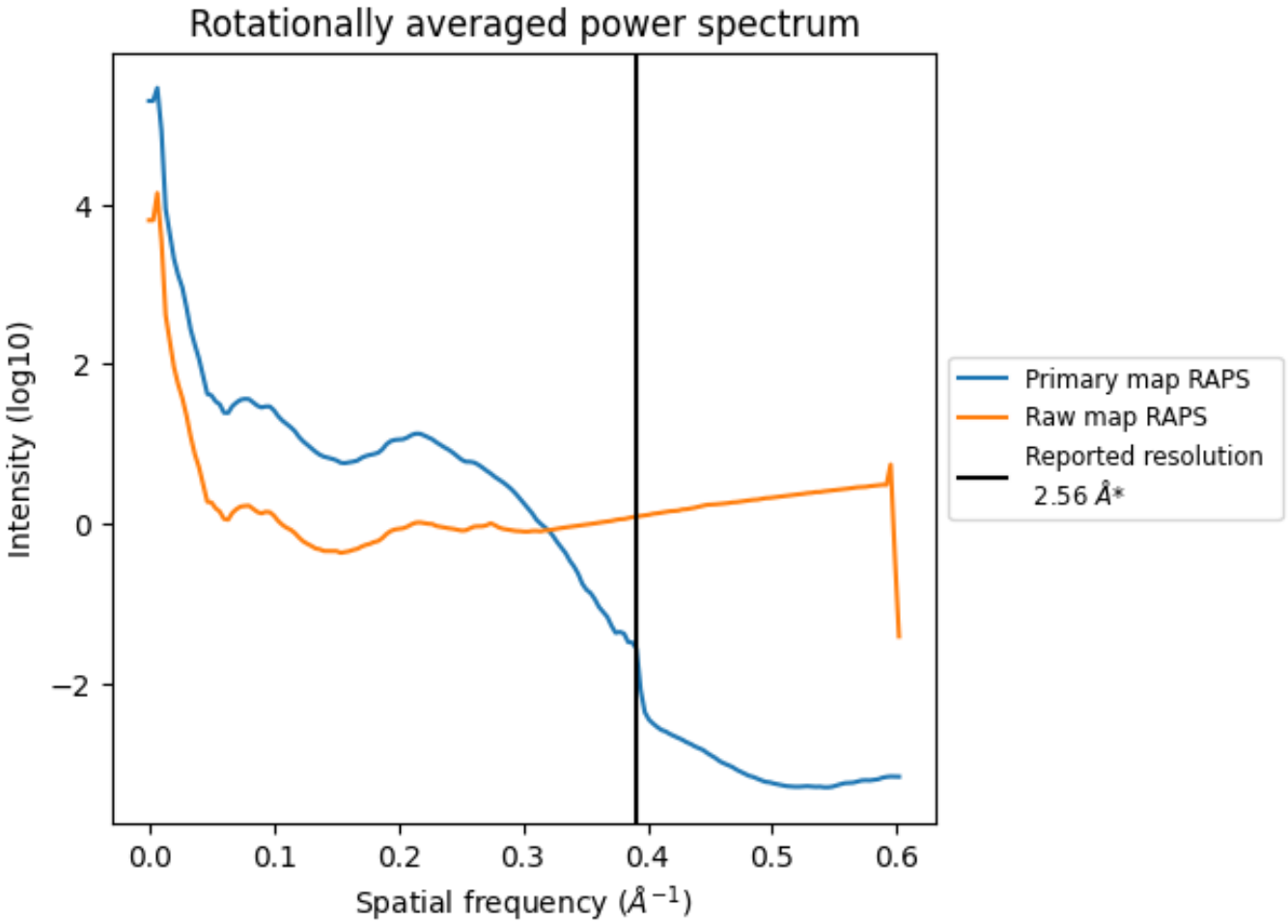
7.2 Volume estimate



The volume at the recommended contour level is 147 nm^3; this corresponds to an approximate mass of 132 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)

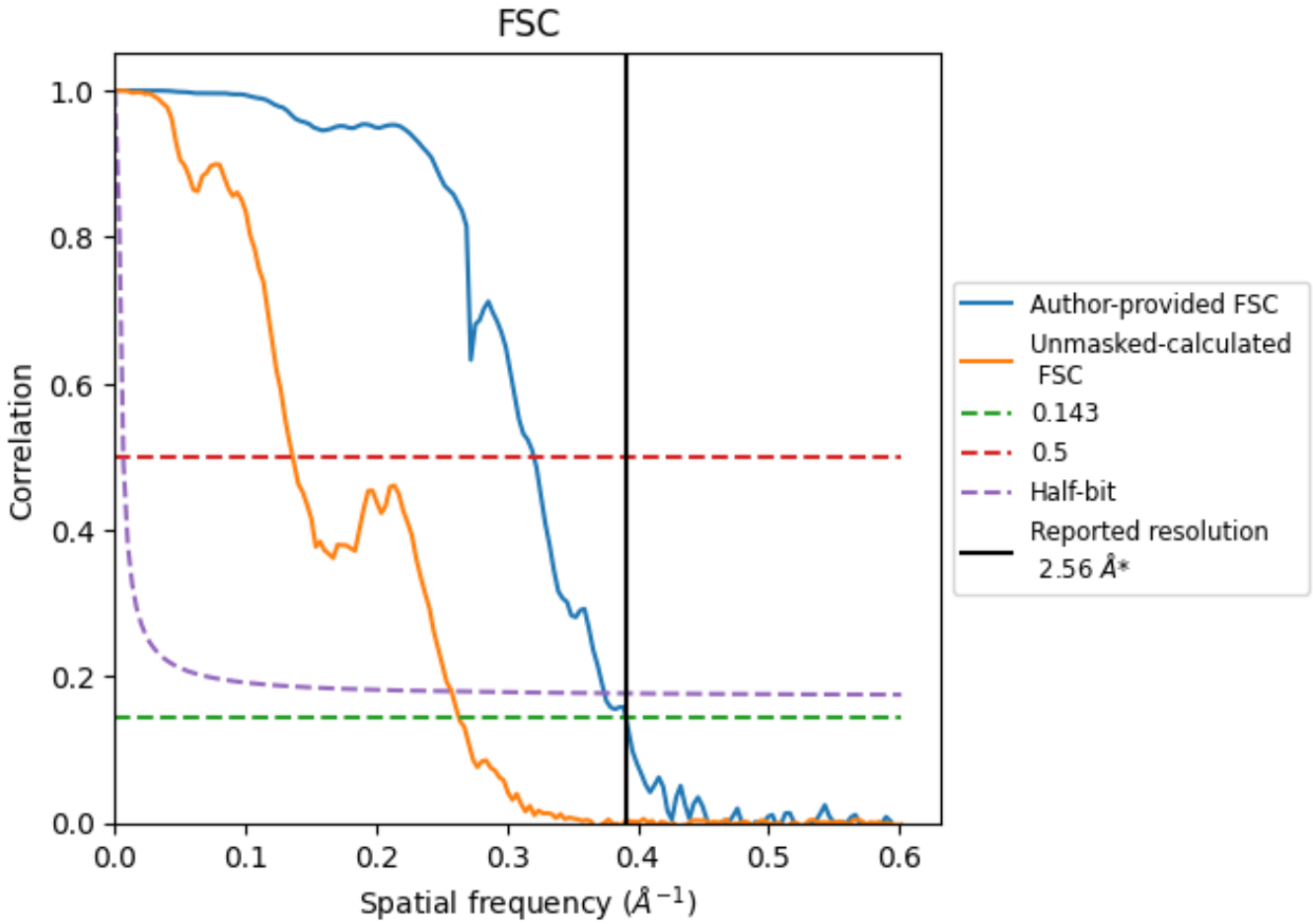


*Reported resolution corresponds to spatial frequency of 0.391 $Å^{-1}$

8 Fourier-Shell correlation

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

8.1 FSC



*Reported resolution corresponds to spatial frequency of 0.391 Å^{-1}

8.2 Resolution estimates (i)

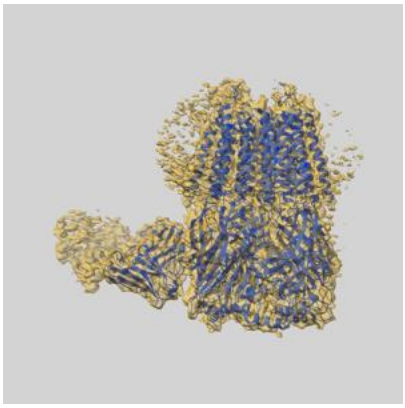
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.56	-	-
Author-provided FSC curve	2.56	3.12	2.67
Unmasked-calculated*	3.80	7.35	3.88

*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 3.80 differs from the reported value 2.56 by more than 10 %

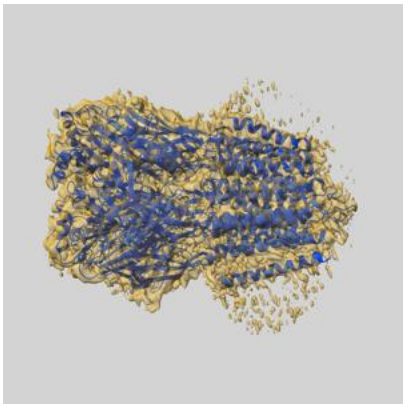
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-29733 and PDB model 8G4X. Per-residue inclusion information can be found in section 3 on page 9.

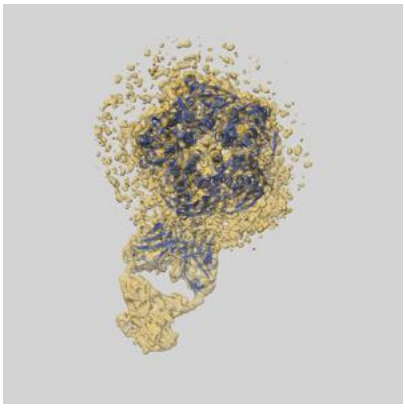
9.1 Map-model overlay



X



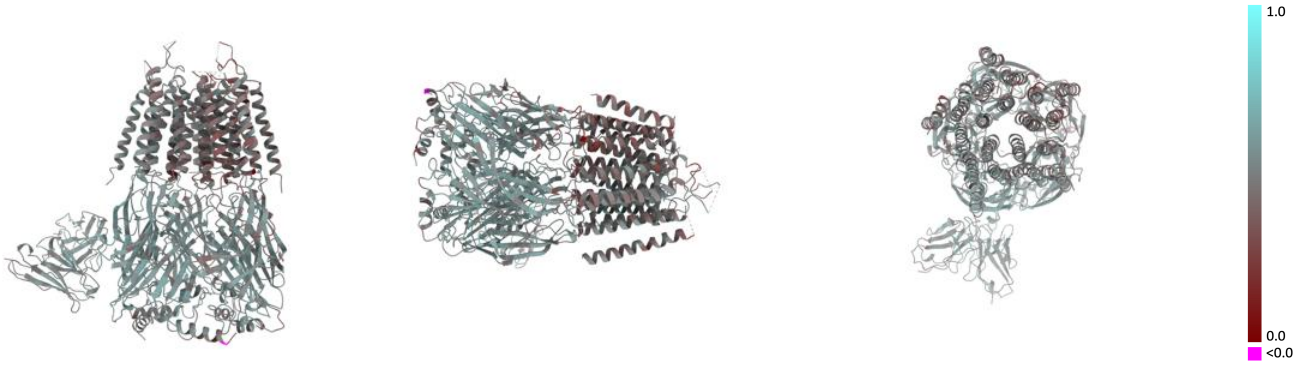
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.1 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.

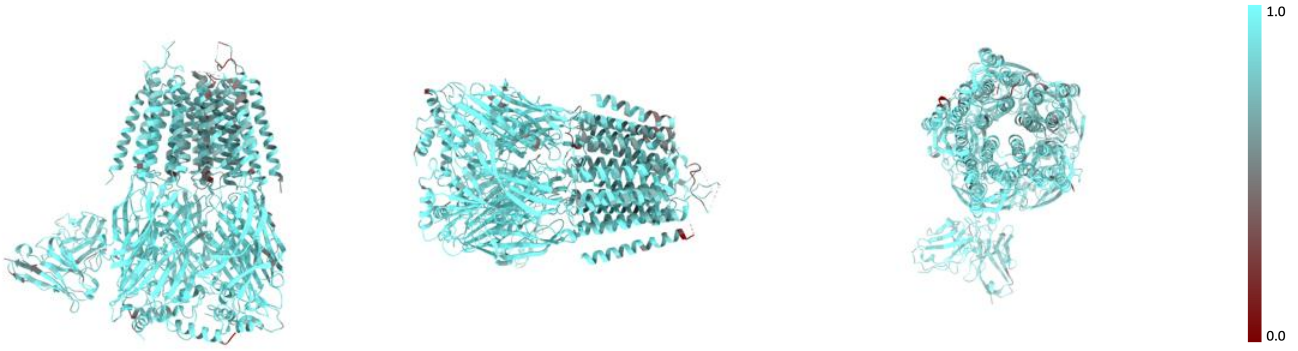
9.2 Q-score mapped to coordinate model



X Y Z

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

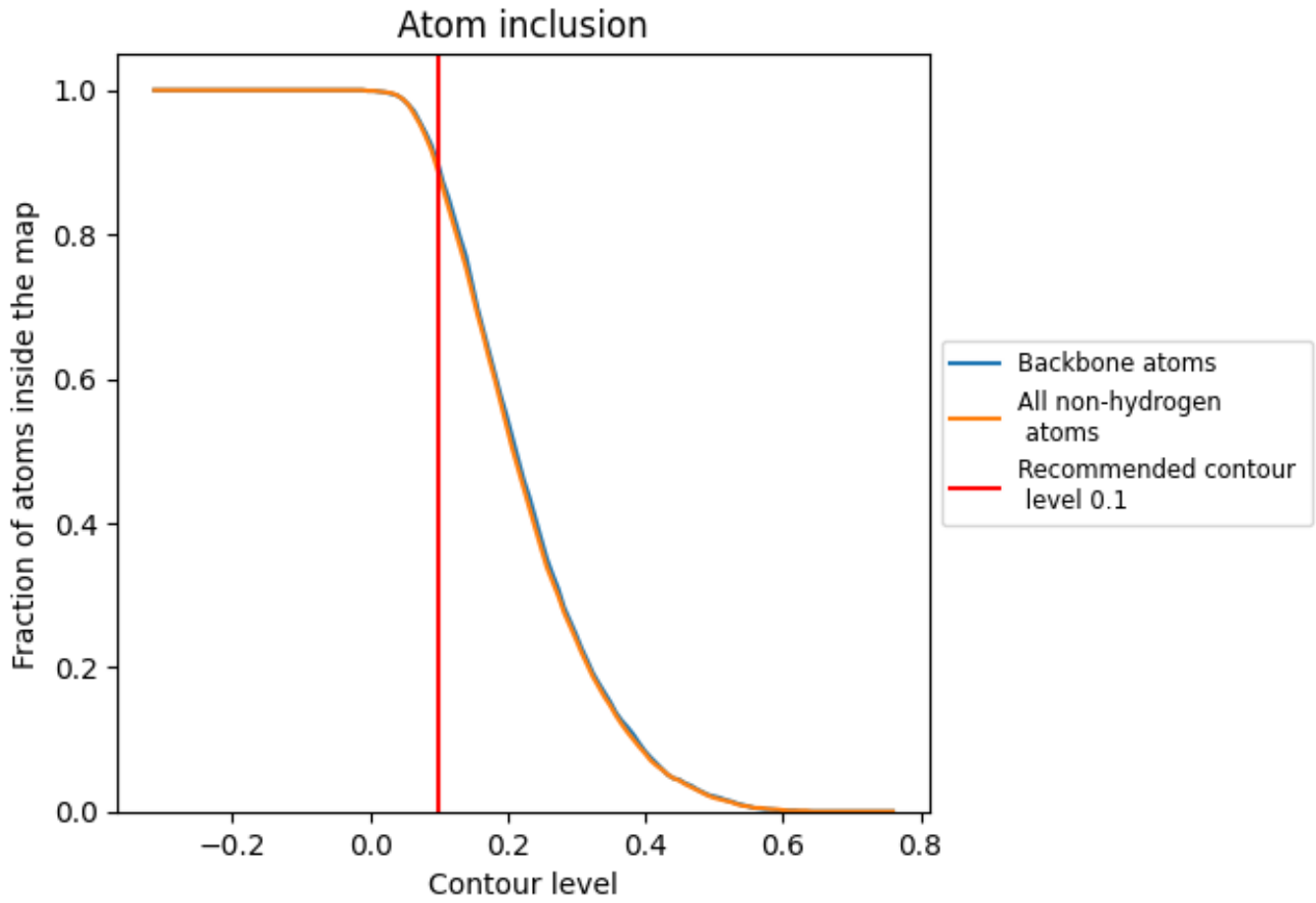
9.3 Atom inclusion mapped to coordinate model



X Y Z

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 (0.1).

9.4 Atom inclusion (i)



At the recommended contour level, 89% of all backbone atoms, 88% 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 (0.1) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8840	0.5040
A	0.9310	0.5410
B	0.9060	0.5060
C	0.8850	0.4970
D	0.8460	0.4680
E	0.9110	0.5110
F	0.8070	0.5020
G	0.4800	0.4040
H	0.8850	0.5130
I	0.7050	0.3840
J	0.4290	0.2820
K	0.3930	0.3740
L	0.8950	0.5160
M	0.7700	0.3740
N	0.7630	0.4480