Full wwPDB EM Validation Report ⓘ

Sep 8, 2025 – 06:45 PM EDT

PDB ID	:	9N4L / pdb_00009n4l
EMDB ID	:	EMD-48897
Title	:	Composite map for GluK2 in the apo state with asymmetric ligand binding domain
Authors	:	Gangwar, S.P.; Yelshanskaya, M.V.; Yen, L.Y.; Newton, T.P.; Sobolevsky, A.I.
Deposited on	:	2025-02-03
Resolution	:	4.24 Å(reported)

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

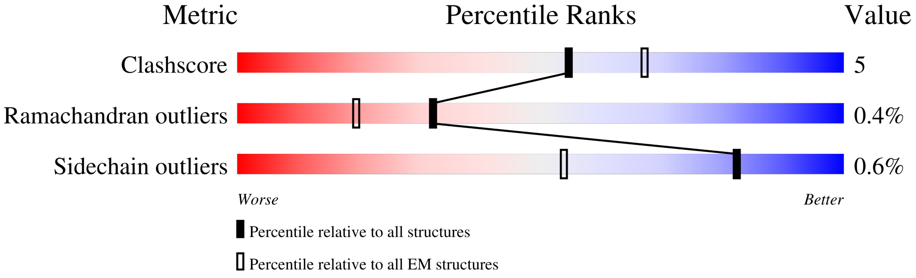
EMDB validation analysis	:	0.0.1.dev126
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4-5-2 with Phenix2.0rc1
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.45.1

1 Overall quality at a glance ⓘ

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

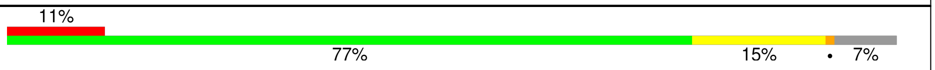
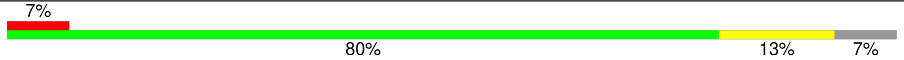
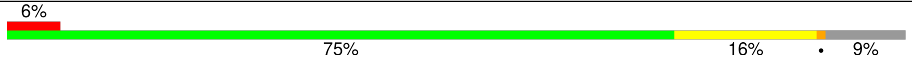
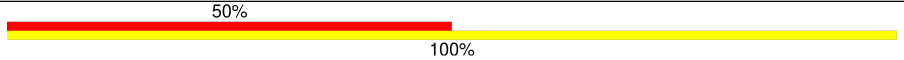
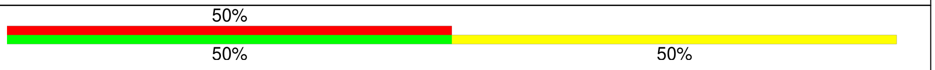
The reported resolution of this entry is 4.24 Å.

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	908	
1	B	908	
1	C	908	
1	D	908	
2	E	2	
2	G	2	
2	I	2	
2	J	2	

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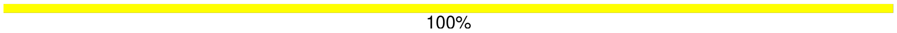
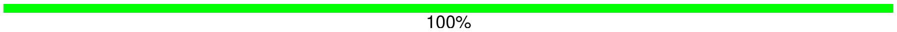
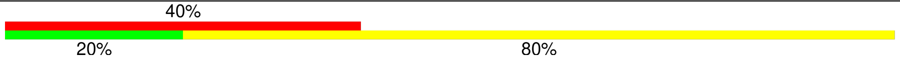
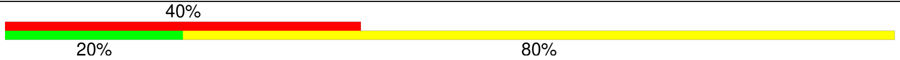
Mol	Chain	Length	Quality of chain
2	L	2	
2	M	2	
3	F	5	
4	H	5	
4	K	5	

2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 27183 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.

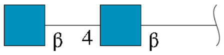
- Molecule 1 is a protein called Glutamate receptor ionotropic, kainate 2.

Mol	Chain	Residues	Atoms	AltConf	Trace
1	A	842	Total C N O S 6677 4278 1117 1242 40	0	0
1	B	842	Total C N O S 6677 4278 1117 1242 40	0	0
1	C	842	Total C N O S 6677 4278 1117 1242 40	0	0
1	D	828	Total C N O S 6577 4218 1099 1220 40	0	0

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	567	VAL	ILE	conflict	UNP P42260
A	571	CYS	TYR	conflict	UNP P42260
B	567	VAL	ILE	conflict	UNP P42260
B	571	CYS	TYR	conflict	UNP P42260
C	567	VAL	ILE	conflict	UNP P42260
C	571	CYS	TYR	conflict	UNP P42260
D	567	VAL	ILE	conflict	UNP P42260
D	571	CYS	TYR	conflict	UNP P42260

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

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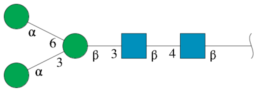
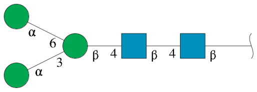
Mol	Chain	Residues	Atoms	AltConf	Trace
2	I	2	Total C N O 28 16 2 10	0	0
2	J	2	Total C N O 28 16 2 10	0	0
2	L	2	Total C N O 28 16 2 10	0	0
2	M	2	Total C N O 28 16 2 10	0	0

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



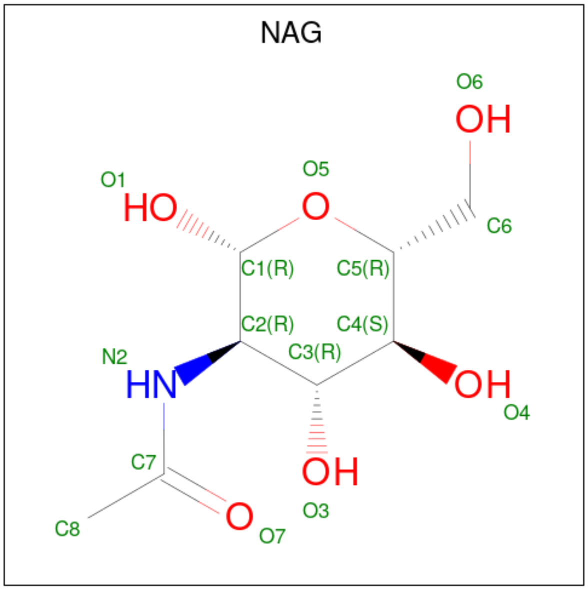
Mol	Chain	Residues	Atoms	AltConf	Trace
3	F	5	Total C N O 61 34 2 25	0	0

- Molecule 4 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
4	H	5	Total C N O 61 34 2 25	0	0
4	K	5	Total C N O 61 34 2 25	0	0

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



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

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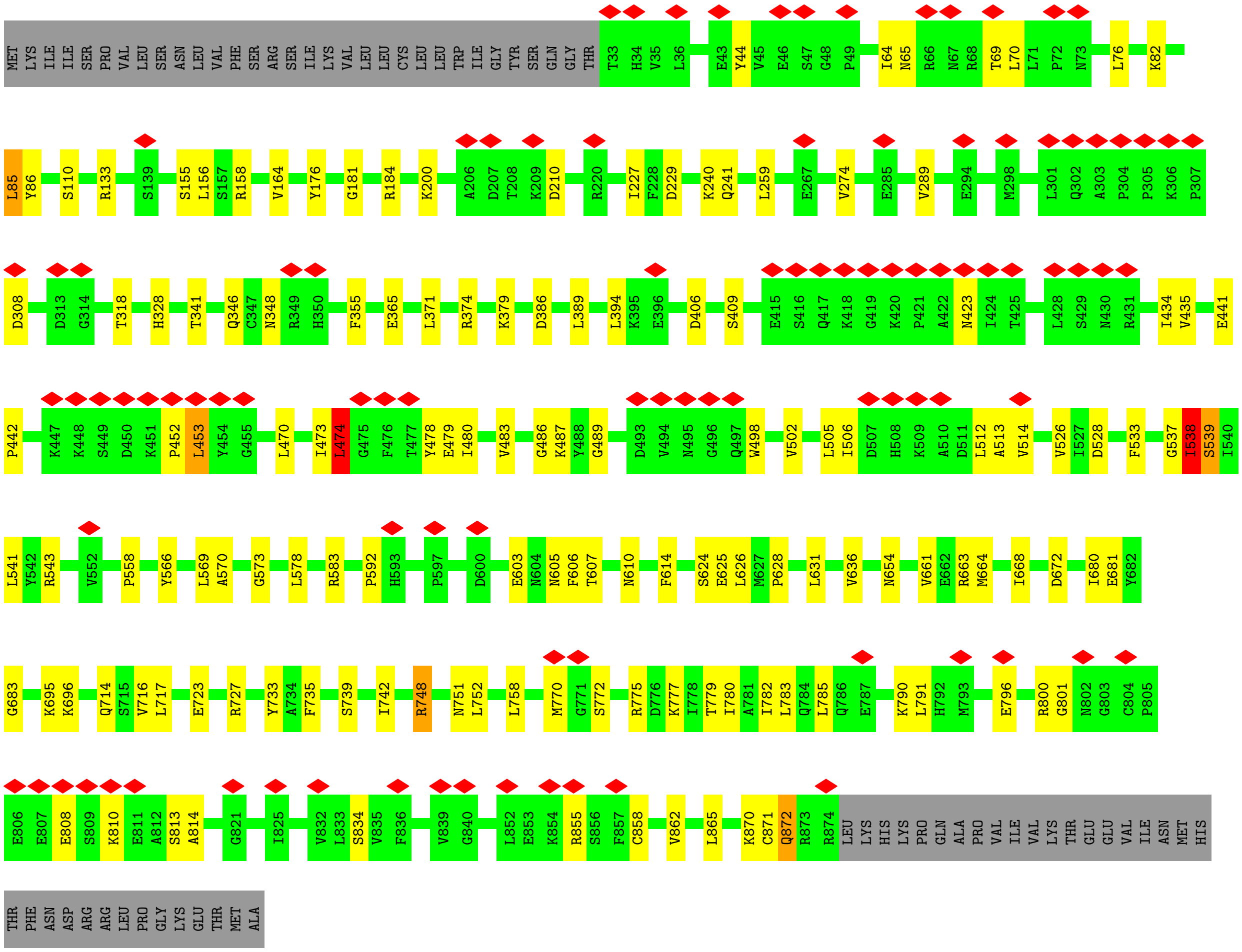
Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
5	D	1	14	8	1	5	0
			Total	C	N	O	
5	D	1	14	8	1	5	0

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.

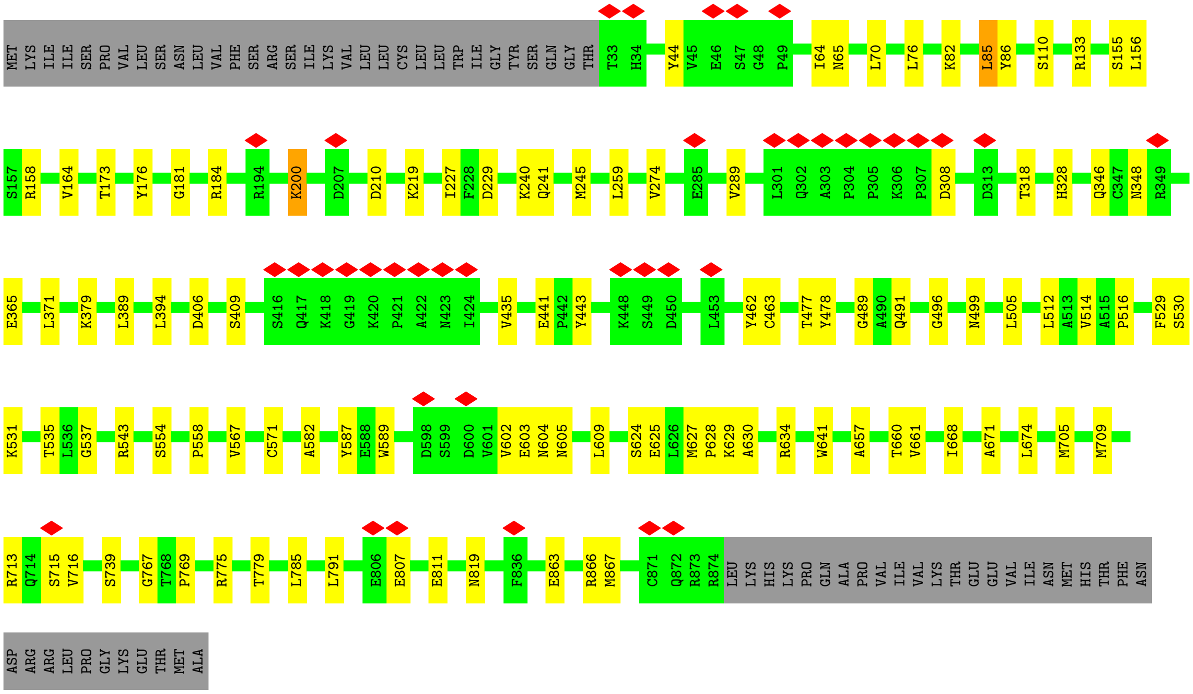
- Molecule 1: Glutamate receptor ionotropic, kainate 2

Chain A:



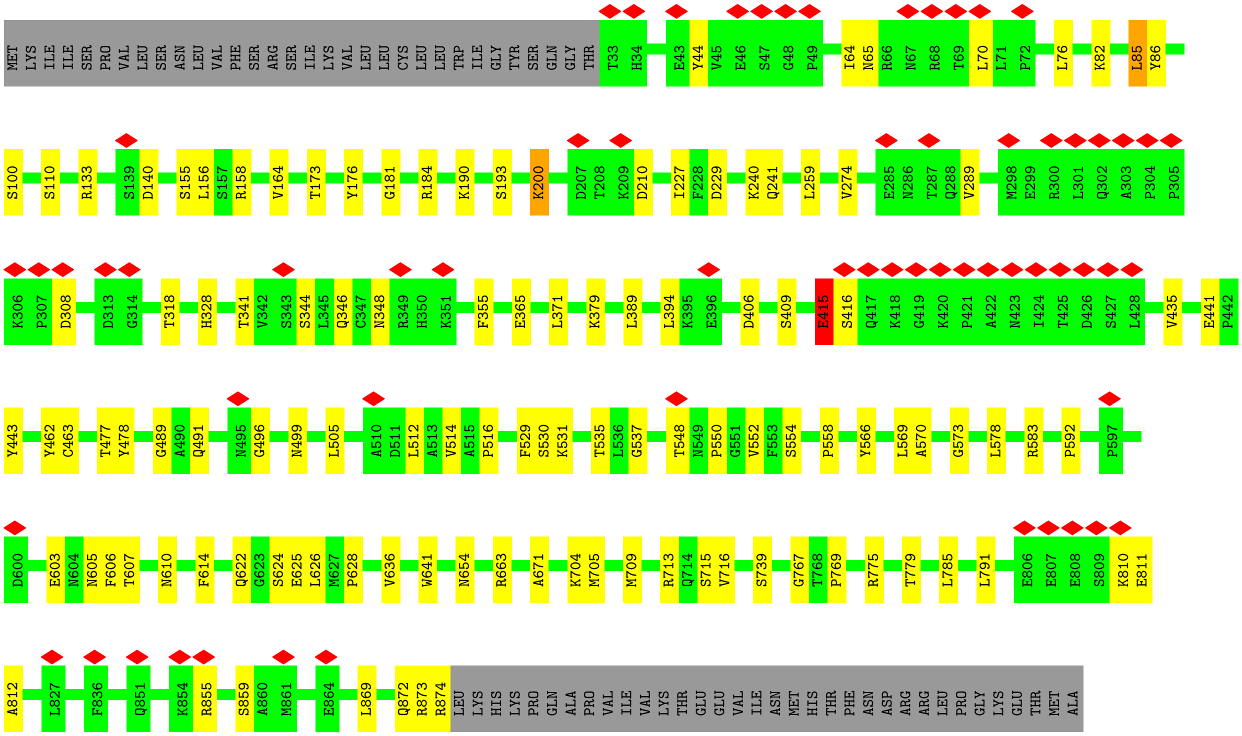
- Molecule 1: Glutamate receptor ionotropic, kainate 2

Chain B:



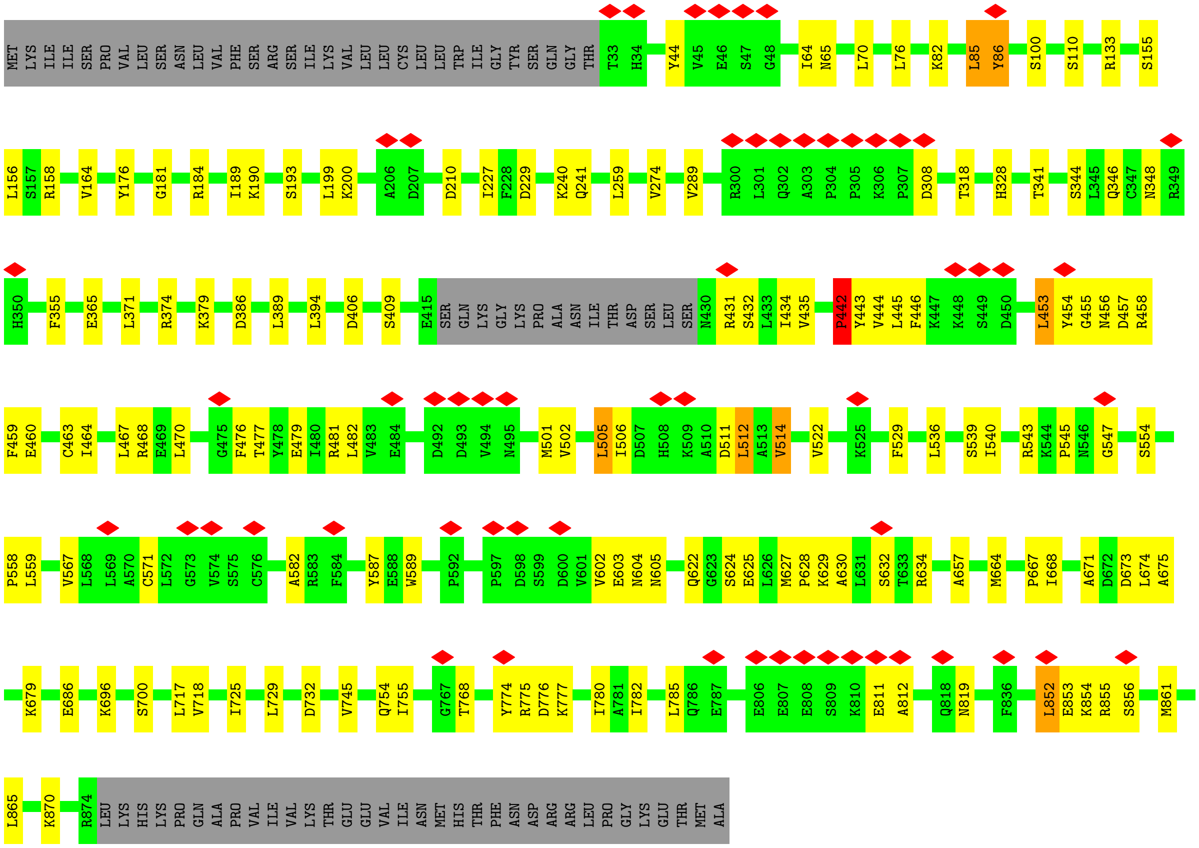
- Molecule 1: Glutamate receptor ionotropic, kainate 2

Chain C:

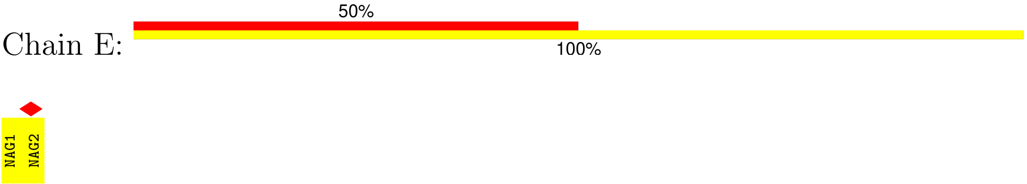


- Molecule 1: Glutamate receptor ionotropic, kainate 2

Chain D:



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



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

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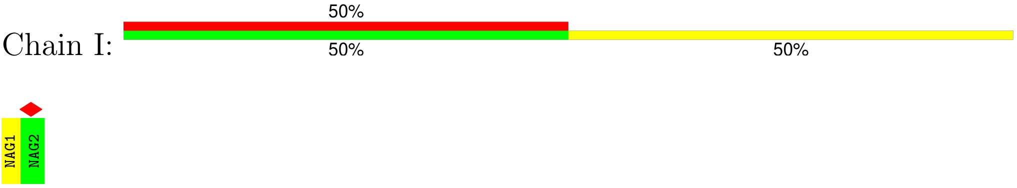

- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

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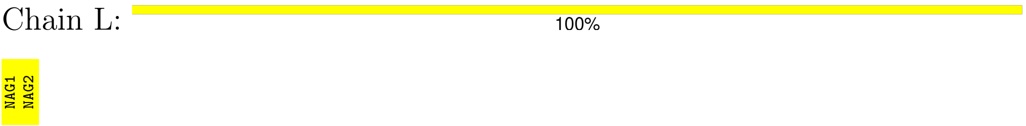
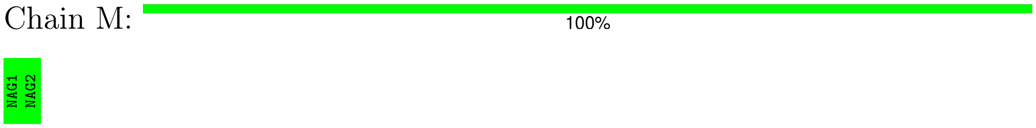
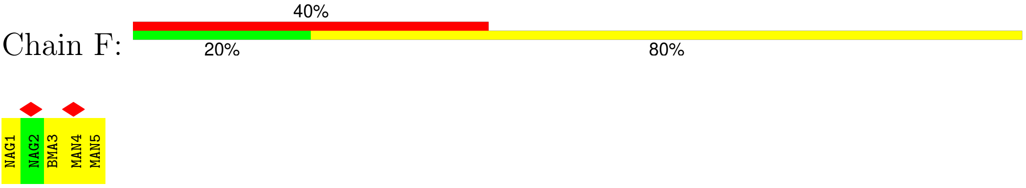


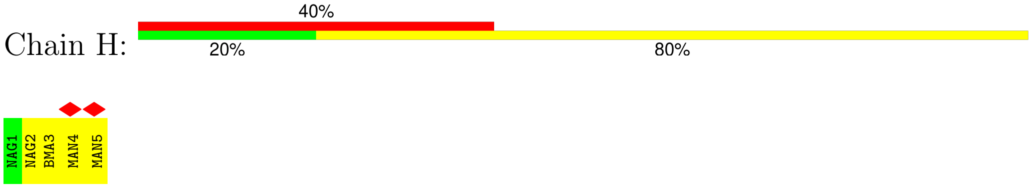
- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



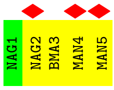
- Molecule 3: alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 4: 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



- Molecule 4: 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


NAG1
NAG2
BMA3
MAN4
MAN5

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	91353	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{Å}^2)$	50	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	58.134	Depositor
Minimum map value	-43.070	Depositor
Average map value	-0.015	Depositor
Map value standard deviation	1.298	Depositor
Recommended contour level	5.67	Depositor
Map size (Å)	314.88, 314.88, 314.88	wwPDB
Map dimensions	384, 384, 384	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.82, 0.82, 0.82	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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

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	0.26	0/6827	0.75	8/9240 (0.1%)
1	B	0.25	0/6827	0.76	5/9240 (0.1%)
1	C	0.26	0/6827	0.77	10/9240 (0.1%)
1	D	0.27	0/6725	0.77	9/9101 (0.1%)
All	All	0.26	0/27206	0.76	32/36821 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	5
1	B	0	4
1	C	0	5
1	D	0	4
All	All	0	18

There are no bond length outliers.

All (32) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	716	VAL	N-CA-C	-9.32	102.52	113.42
1	C	716	VAL	N-CA-C	-9.32	102.52	113.42
1	C	552	VAL	N-CA-C	-7.60	106.49	113.71
1	C	810	LYS	CA-C-N	6.38	133.73	121.54
1	C	810	LYS	C-N-CA	6.38	133.73	121.54
1	D	453	LEU	CA-CB-CG	6.04	137.45	116.30
1	A	872	GLN	N-CA-C	-6.00	103.71	113.19
1	C	415	GLU	CA-C-N	5.99	132.97	121.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	415	GLU	C-N-CA	5.99	132.97	121.54
1	C	548	THR	CA-C-N	5.96	129.27	122.83
1	C	548	THR	C-N-CA	5.96	129.27	122.83
1	D	547	GLY	CA-C-N	5.88	132.76	121.54
1	D	547	GLY	C-N-CA	5.88	132.76	121.54
1	A	538	ILE	CA-C-N	5.64	132.31	121.54
1	A	538	ILE	C-N-CA	5.64	132.31	121.54
1	B	807	GLU	CA-C-N	5.56	132.15	121.54
1	B	807	GLU	C-N-CA	5.56	132.15	121.54
1	A	85	LEU	CA-C-N	5.52	132.08	121.54
1	A	85	LEU	C-N-CA	5.52	132.08	121.54
1	C	85	LEU	CA-C-N	5.51	132.07	121.54
1	C	85	LEU	C-N-CA	5.51	132.07	121.54
1	D	85	LEU	CA-C-N	5.49	132.03	121.54
1	D	85	LEU	C-N-CA	5.49	132.03	121.54
1	B	85	LEU	CA-C-N	5.48	132.00	121.54
1	B	85	LEU	C-N-CA	5.48	132.00	121.54
1	A	748	ARG	N-CA-C	-5.20	106.88	113.43
1	D	455	GLY	CA-C-N	5.20	131.94	123.93
1	D	455	GLY	C-N-CA	5.20	131.94	123.93
1	A	453	LEU	CA-CB-CG	5.15	134.33	116.30
1	A	716	VAL	N-CA-C	-5.11	108.31	113.47
1	D	442	PRO	CA-C-N	5.06	131.20	121.54
1	D	442	PRO	C-N-CA	5.06	131.20	121.54

There are no chirality outliers.

All (18) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	423	ASN	Peptide
1	A	452	PRO	Peptide
1	A	474	LEU	Peptide
1	A	538	ILE	Peptide
1	A	85	LEU	Peptide
1	B	441	GLU	Peptide
1	B	558	PRO	Peptide
1	B	715	SER	Peptide
1	B	85	LEU	Peptide
1	C	415	GLU	Mainchain,Peptide
1	C	441	GLU	Peptide
1	C	715	SER	Peptide
1	C	85	LEU	Peptide

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Mol	Chain	Res	Type	Group
1	D	442	PRO	Peptide
1	D	558	PRO	Peptide
1	D	667	PRO	Peptide
1	D	85	LEU	Peptide

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	6677	0	6653	82	0
1	B	6677	0	6653	59	0
1	C	6677	0	6656	60	0
1	D	6577	0	6551	82	0
2	E	28	0	25	0	0
2	G	28	0	25	0	0
2	I	28	0	25	0	0
2	J	28	0	25	1	0
2	L	28	0	25	0	0
2	M	28	0	25	0	0
3	F	61	0	52	0	0
4	H	61	0	52	0	0
4	K	61	0	52	0	0
5	A	70	0	65	3	0
5	B	42	0	39	0	0
5	C	42	0	39	0	0
5	D	70	0	65	0	0
All	All	27183	0	27027	266	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 (266) 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:B:775:ARG:HH12	1:C:775:ARG:HH12	1.30	0.77
1:B:535:THR:HG21	1:C:535:THR:HG21	1.72	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:65:ASN:HD21	1:C:76:LEU:H	1.43	0.67
1:D:65:ASN:HD21	1:D:76:LEU:H	1.43	0.67
1:A:607:THR:H	1:A:610:ASN:HB2	1.59	0.67
1:A:683:GLY:HA3	1:A:735:PHE:HA	1.76	0.67
1:C:607:THR:H	1:C:610:ASN:HB2	1.59	0.67
1:A:65:ASN:HD21	1:A:76:LEU:H	1.43	0.66
1:D:434:ILE:H	1:D:511:ASP:HB2	1.62	0.65
1:B:65:ASN:HD21	1:B:76:LEU:H	1.43	0.65
1:B:463:CYS:HB3	1:B:514:VAL:HG12	1.79	0.65
1:C:463:CYS:HB3	1:C:514:VAL:HG12	1.79	0.64
1:A:631:LEU:HD13	1:B:609:LEU:HD11	1.81	0.63
1:D:589:TRP:HB3	1:D:602:VAL:HB	1.81	0.63
1:B:435:VAL:HG22	1:B:512:LEU:HB2	1.81	0.62
1:B:589:TRP:HB3	1:B:602:VAL:HB	1.81	0.62
1:C:435:VAL:HG22	1:C:512:LEU:HB2	1.81	0.62
1:D:454:TYR:HB3	1:D:457:ASP:HB3	1.82	0.61
1:A:751:ASN:HB2	5:A:1005:NAG:H62	1.82	0.61
1:B:660:THR:HG23	1:B:661:VAL:HG22	1.82	0.61
1:C:855:ARG:HB3	1:C:859:SER:HB3	1.82	0.61
1:D:259:LEU:HB2	1:D:318:THR:HG21	1.84	0.60
1:B:259:LEU:HB2	1:B:318:THR:HG21	1.84	0.60
1:A:259:LEU:HB2	1:A:318:THR:HG21	1.84	0.60
1:C:259:LEU:HB2	1:C:318:THR:HG21	1.84	0.59
1:B:110:SER:O	1:B:133:ARG:NH1	2.36	0.59
1:D:110:SER:O	1:D:133:ARG:NH1	2.36	0.59
1:B:529:PHE:HA	1:B:767:GLY:HA2	1.84	0.59
1:D:481:ARG:NH1	1:D:482:LEU:O	2.36	0.59
1:C:110:SER:O	1:C:133:ARG:NH1	2.36	0.58
1:A:181:GLY:HA2	1:A:184:ARG:HE	1.67	0.58
1:C:181:GLY:HA2	1:C:184:ARG:HE	1.67	0.58
1:B:181:GLY:HA2	1:B:184:ARG:HE	1.67	0.58
1:D:181:GLY:HA2	1:D:184:ARG:HE	1.67	0.58
1:A:110:SER:O	1:A:133:ARG:NH1	2.36	0.58
1:A:434:ILE:HA	1:A:479:GLU:HB3	1.85	0.58
1:C:529:PHE:HA	1:C:767:GLY:HA2	1.85	0.57
1:B:657:ALA:O	1:C:663:ARG:NH1	2.39	0.56
1:D:467:LEU:HA	1:D:470:LEU:HB2	1.87	0.56
1:A:210:ASP:HA	1:A:241:GLN:HE22	1.71	0.56
1:C:240:LYS:NZ	1:C:308:ASP:O	2.39	0.56
1:D:240:LYS:NZ	1:D:308:ASP:O	2.39	0.56
1:B:210:ASP:HA	1:B:241:GLN:HE22	1.71	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:775:ARG:NH1	1:A:779:THR:OG1	2.39	0.56
1:D:456:ASN:HD22	1:D:479:GLU:HA	1.72	0.55
1:D:210:ASP:HA	1:D:241:GLN:HE22	1.71	0.55
1:A:240:LYS:NZ	1:A:308:ASP:O	2.39	0.55
1:A:487:LYS:HG2	1:A:489:GLY:H	1.72	0.55
1:C:210:ASP:HA	1:C:241:GLN:HE22	1.71	0.55
1:A:435:VAL:HG22	1:A:512:LEU:HB3	1.89	0.55
1:D:435:VAL:HG12	1:D:512:LEU:HB3	1.88	0.54
1:A:69:THR:HG21	5:A:1001:NAG:H2	1.89	0.54
1:B:240:LYS:NZ	1:B:308:ASP:O	2.39	0.54
1:A:406:ASP:HB3	1:A:409:SER:HB3	1.90	0.54
1:B:582:ALA:O	1:B:604:ASN:ND2	2.38	0.54
1:A:543:ARG:NH1	5:A:1004:NAG:O7	2.40	0.54
1:C:406:ASP:HB3	1:C:409:SER:HB3	1.90	0.54
1:C:558:PRO:O	1:C:654:ASN:ND2	2.38	0.54
1:C:671:ALA:HB1	1:C:705:MET:HE1	1.89	0.54
1:D:502:VAL:O	1:D:506:ILE:N	2.40	0.54
1:A:44:TYR:HB2	1:A:82:LYS:HB3	1.90	0.54
1:B:44:TYR:HB2	1:B:82:LYS:HB3	1.90	0.54
1:C:44:TYR:HB2	1:C:82:LYS:HB3	1.90	0.54
1:C:641:TRP:CD2	1:D:622:GLN:HG3	2.43	0.54
1:D:582:ALA:O	1:D:604:ASN:ND2	2.38	0.54
1:A:156:LEU:HD11	1:A:259:LEU:HD21	1.90	0.53
1:B:671:ALA:HB1	1:B:705:MET:HE1	1.89	0.53
1:D:432:SER:HB2	1:D:476:PHE:HB2	1.90	0.53
1:D:603:GLU:OE2	1:D:605:ASN:ND2	2.41	0.53
1:A:782:ILE:HD12	1:A:785:LEU:HD12	1.89	0.53
1:D:156:LEU:HD11	1:D:259:LEU:HD21	1.90	0.53
1:A:772:SER:HB3	1:A:775:ARG:HB2	1.90	0.53
1:B:603:GLU:OE2	1:B:605:ASN:ND2	2.41	0.53
1:B:406:ASP:HB3	1:B:409:SER:HB3	1.90	0.53
1:B:489:GLY:HA2	1:B:499:ASN:HB2	1.91	0.53
1:B:604:ASN:O	1:C:873:ARG:NH2	2.42	0.53
1:D:406:ASP:HB3	1:D:409:SER:HB3	1.90	0.53
1:C:156:LEU:HD11	1:C:259:LEU:HD21	1.90	0.52
1:D:522:VAL:HG21	1:D:696:LYS:HZ2	1.74	0.52
1:D:44:TYR:HB2	1:D:82:LYS:HB3	1.90	0.52
1:B:156:LEU:HD11	1:B:259:LEU:HD21	1.90	0.52
1:A:664:MET:HG2	1:D:664:MET:HE1	1.92	0.52
1:D:539:SER:OG	1:D:754:GLN:NE2	2.41	0.51
1:A:470:LEU:HD23	1:A:473:ILE:HD11	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:855:ARG:HE	1:D:856:SER:H	1.58	0.51
1:D:725:ILE:HD12	1:D:745:VAL:HG11	1.93	0.51
1:A:558:PRO:O	1:A:654:ASN:ND2	2.38	0.51
1:B:668:ILE:HD13	1:B:674:LEU:HD13	1.93	0.51
1:A:483:VAL:HG13	1:A:486:GLY:H	1.76	0.51
1:A:796:GLU:O	1:A:800:ARG:NE	2.40	0.51
1:C:140:ASP:HB3	1:D:86:TYR:CZ	2.45	0.51
1:D:501:MET:SD	1:D:501:MET:N	2.83	0.51
1:A:663:ARG:HH22	1:A:813:SER:HB2	1.76	0.51
1:C:529:PHE:O	1:C:775:ARG:NE	2.42	0.51
1:D:554:SER:OG	1:D:819:ASN:O	2.23	0.50
1:B:554:SER:OG	1:B:819:ASN:O	2.23	0.50
1:C:489:GLY:HA2	1:C:499:ASN:HB2	1.91	0.50
1:A:478:TYR:HD2	1:A:480:ILE:H	1.59	0.50
1:D:768:THR:OG1	1:D:775:ARG:NE	2.44	0.50
1:C:155:SER:HA	1:C:158:ARG:HE	1.77	0.49
1:D:463:CYS:HB3	1:D:514:VAL:HB	1.94	0.49
1:B:529:PHE:O	1:B:775:ARG:NE	2.42	0.49
1:A:512:LEU:HD13	1:A:514:VAL:H	1.78	0.49
1:D:776:ASP:O	1:D:780:ILE:N	2.38	0.49
1:C:704:LYS:HB3	1:D:700:SER:HB3	1.94	0.49
1:B:155:SER:HA	1:B:158:ARG:HE	1.77	0.49
1:C:566:TYR:O	1:C:570:ALA:N	2.43	0.49
1:C:785:LEU:HB3	1:C:791:LEU:HB2	1.94	0.49
1:D:811:GLU:HG2	1:D:812:ALA:H	1.78	0.49
1:D:155:SER:HA	1:D:158:ARG:HE	1.77	0.49
1:B:531:LYS:HG2	1:B:779:THR:HG23	1.95	0.49
1:A:663:ARG:HH12	1:A:813:SER:HB2	1.78	0.49
1:C:443:TYR:HA	1:C:462:TYR:HB3	1.95	0.49
1:A:474:LEU:HD21	1:A:777:LYS:HB3	1.93	0.48
1:A:537:GLY:HA3	1:A:758:LEU:HB3	1.94	0.48
1:B:443:TYR:HA	1:B:462:TYR:HB3	1.95	0.48
1:A:155:SER:HA	1:A:158:ARG:HE	1.77	0.48
1:D:464:ILE:O	1:D:468:ARG:N	2.43	0.48
1:A:785:LEU:HD22	1:A:790:LYS:HB2	1.95	0.48
1:A:506:ILE:HD11	1:A:526:VAL:HB	1.96	0.48
1:A:538:ILE:O	1:A:739:SER:N	2.46	0.48
1:A:663:ARG:NH1	1:A:813:SER:O	2.46	0.48
1:A:870:LYS:O	1:A:872:GLN:N	2.46	0.48
1:B:785:LEU:HB3	1:B:791:LEU:HB2	1.94	0.48
1:D:686:GLU:HB3	1:D:717:LEU:HB3	1.95	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:531:LYS:HG2	1:C:779:THR:HG23	1.95	0.47
1:A:566:TYR:O	1:A:570:ALA:N	2.43	0.47
1:D:365:GLU:HG2	1:D:379:LYS:HE3	1.97	0.47
1:A:780:ILE:HA	1:A:783:LEU:HB2	1.96	0.47
1:C:505:LEU:HD22	1:C:769:PRO:HD3	1.97	0.47
1:A:346:GLN:HG3	1:A:348:ASN:H	1.80	0.47
1:D:454:TYR:HB2	1:D:458:ARG:HB3	1.97	0.47
1:D:587:TYR:HB2	1:D:630:ALA:HB2	1.97	0.47
1:A:505:LEU:HD21	1:A:513:ALA:HB2	1.96	0.47
1:C:365:GLU:HG2	1:C:379:LYS:HE3	1.97	0.47
1:A:176:TYR:HA	1:A:229:ASP:HB3	1.98	0.46
1:A:583:ARG:HB3	1:B:867:MET:HG2	1.96	0.46
1:D:861:MET:O	1:D:865:LEU:N	2.47	0.46
1:A:541:LEU:HD12	1:A:742:ILE:HG23	1.98	0.46
1:C:346:GLN:HG3	1:C:348:ASN:H	1.80	0.46
1:C:176:TYR:HA	1:C:229:ASP:HB3	1.97	0.46
1:D:176:TYR:HA	1:D:229:ASP:HB3	1.98	0.46
1:B:346:GLN:HG3	1:B:348:ASN:H	1.80	0.46
1:A:808:GLU:OE1	1:A:810:LYS:NZ	2.38	0.46
1:B:505:LEU:HD22	1:B:769:PRO:HD3	1.97	0.46
1:D:346:GLN:HG3	1:D:348:ASN:H	1.80	0.46
1:A:365:GLU:HG2	1:A:379:LYS:HE3	1.97	0.46
1:A:661:VAL:HG11	1:B:811:GLU:HB3	1.98	0.46
1:A:862:VAL:HA	1:A:865:LEU:HB2	1.98	0.46
1:A:714:GLN:H	1:A:717:LEU:HB2	1.80	0.46
1:B:365:GLU:HG2	1:B:379:LYS:HE3	1.97	0.46
1:D:543:ARG:HH21	1:D:729:LEU:HD12	1.80	0.45
1:D:782:ILE:HG23	1:D:785:LEU:HD22	1.98	0.45
1:D:540:ILE:HB	1:D:755:ILE:HG13	1.98	0.45
1:B:491:GLN:HE21	1:B:496:GLY:HA2	1.81	0.45
1:B:543:ARG:HH22	2:J:2:NAG:H83	1.80	0.45
1:B:587:TYR:HB2	1:B:630:ALA:HB2	1.97	0.45
1:D:852:LEU:HD12	1:D:853:GLU:HG2	1.99	0.45
1:B:176:TYR:HA	1:B:229:ASP:HB3	1.97	0.45
1:C:491:GLN:HE21	1:C:496:GLY:HA2	1.81	0.45
1:D:567:VAL:O	1:D:571:CYS:N	2.50	0.45
1:D:671:ALA:HA	1:D:674:LEU:HB3	1.98	0.45
1:D:854:LYS:H	1:D:854:LYS:HD2	1.81	0.45
1:A:668:ILE:HD11	1:A:680:ILE:HG12	1.98	0.45
1:A:775:ARG:O	1:A:779:THR:N	2.48	0.44
1:D:686:GLU:N	1:D:718:VAL:O	2.45	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:774:TYR:HA	1:D:777:LYS:HB2	1.99	0.44
1:A:528:ASP:HB2	1:A:770:MET:HA	1.99	0.44
1:B:567:VAL:O	1:B:571:CYS:N	2.50	0.44
1:C:550:PRO:HB2	1:C:554:SER:HB2	1.98	0.44
1:D:454:TYR:O	1:D:458:ARG:N	2.49	0.44
1:D:671:ALA:O	1:D:675:ALA:N	2.51	0.44
1:A:289:VAL:HG13	1:A:371:LEU:HD22	2.00	0.44
1:A:569:LEU:O	1:A:573:GLY:N	2.50	0.44
1:C:569:LEU:O	1:C:573:GLY:N	2.50	0.44
1:C:583:ARG:HG3	1:D:870:LYS:HE3	1.99	0.44
1:A:533:PHE:HB2	1:A:791:LEU:HD21	1.99	0.44
1:B:629:LYS:O	1:B:634:ARG:NE	2.47	0.44
1:C:578:LEU:HB2	1:C:636:VAL:HG11	2.00	0.44
1:D:100:SER:O	1:D:344:SER:OG	2.32	0.44
1:A:543:ARG:HA	1:A:752:LEU:HA	2.00	0.43
1:A:606:PHE:HZ	1:A:628:PRO:HB3	1.83	0.43
1:C:289:VAL:HG13	1:C:371:LEU:HD22	2.00	0.43
1:A:578:LEU:HB2	1:A:636:VAL:HG11	2.00	0.43
1:D:431:ARG:HD2	1:D:432:SER:H	1.83	0.43
1:D:732:ASP:N	1:D:732:ASP:OD1	2.51	0.43
1:A:274:VAL:HG23	1:A:394:LEU:HD23	2.01	0.43
1:B:219:LYS:NZ	1:B:245:MET:O	2.44	0.43
1:B:709:MET:O	1:B:713:ARG:NH2	2.51	0.43
1:A:605:ASN:O	1:A:610:ASN:ND2	2.51	0.43
1:B:443:TYR:CG	1:B:516:PRO:HG3	2.54	0.43
1:C:274:VAL:HG23	1:C:394:LEU:HD23	2.01	0.43
1:D:432:SER:HB2	1:D:477:THR:H	1.83	0.43
1:D:289:VAL:HG13	1:D:371:LEU:HD22	2.00	0.43
1:D:442:PRO:O	1:D:444:VAL:N	2.45	0.43
1:D:529:PHE:O	1:D:775:ARG:NH2	2.52	0.43
1:B:625:GLU:N	1:B:625:GLU:OE1	2.51	0.43
1:C:605:ASN:O	1:C:610:ASN:ND2	2.51	0.43
1:D:625:GLU:OE1	1:D:625:GLU:N	2.51	0.43
1:B:289:VAL:HG13	1:B:371:LEU:HD22	2.00	0.43
1:D:374:ARG:NH2	1:D:386:ASP:OD1	2.44	0.43
1:C:164:VAL:HG11	1:C:227:ILE:HD11	2.01	0.43
1:D:668:ILE:HG23	1:D:673:ASP:HB2	2.01	0.43
1:B:274:VAL:HG23	1:B:394:LEU:HD23	2.01	0.43
1:B:537:GLY:H	1:B:739:SER:HB3	1.84	0.43
1:B:164:VAL:HG11	1:B:227:ILE:HD11	2.01	0.42
1:B:641:TRP:CG	1:C:622:GLN:HG3	2.54	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:64:ILE:HD11	1:C:70:LEU:HB2	2.01	0.42
1:C:100:SER:O	1:C:344:SER:OG	2.32	0.42
1:C:606:PHE:HZ	1:C:628:PRO:HB3	1.83	0.42
1:A:164:VAL:HG11	1:A:227:ILE:HD11	2.01	0.42
1:C:443:TYR:CG	1:C:516:PRO:HG3	2.54	0.42
1:C:477:THR:OG1	1:C:478:TYR:N	2.49	0.42
1:D:446:PHE:HA	1:D:459:PHE:HA	2.00	0.42
1:A:614:PHE:HB2	1:A:626:LEU:HG	2.01	0.42
1:B:530:SER:OG	1:B:531:LYS:N	2.53	0.42
1:D:164:VAL:HG11	1:D:227:ILE:HD11	2.01	0.42
1:D:274:VAL:HG23	1:D:394:LEU:HD23	2.01	0.42
1:A:498:TRP:HB3	1:A:502:VAL:HG13	2.00	0.42
1:B:863:GLU:HA	1:B:866:ARG:HB3	2.02	0.42
1:C:709:MET:O	1:C:713:ARG:NH2	2.51	0.42
1:A:64:ILE:HD11	1:A:70:LEU:HB2	2.01	0.42
1:A:834:SER:OG	1:D:632:SER:O	2.37	0.42
1:C:537:GLY:H	1:C:739:SER:HB3	1.84	0.42
1:D:624:SER:OG	1:D:625:GLU:N	2.53	0.42
1:D:627:MET:HA	1:D:628:PRO:HD3	1.72	0.42
1:A:64:ILE:HD13	1:A:328:HIS:CE1	2.55	0.42
1:A:723:GLU:O	1:A:727:ARG:N	2.52	0.42
1:C:614:PHE:HB2	1:C:626:LEU:HG	2.01	0.42
1:D:629:LYS:O	1:D:634:ARG:NE	2.47	0.42
1:C:64:ILE:HD13	1:C:328:HIS:CE1	2.55	0.42
1:D:64:ILE:HD11	1:D:70:LEU:HB2	2.01	0.42
1:A:663:ARG:HD3	1:D:657:ALA:HB1	2.01	0.42
1:B:64:ILE:HD11	1:B:70:LEU:HB2	2.01	0.42
1:A:374:ARG:NH2	1:A:386:ASP:OD1	2.44	0.41
1:A:539:SER:HB3	1:A:742:ILE:HD12	2.02	0.41
1:A:541:LEU:HD21	1:A:752:LEU:HD13	2.02	0.41
1:A:624:SER:OG	1:A:625:GLU:N	2.53	0.41
1:A:672:ASP:OD2	1:D:679:LYS:N	2.53	0.41
1:A:681:GLU:HB2	1:A:733:TYR:HA	2.02	0.41
1:D:64:ILE:HD13	1:D:328:HIS:CE1	2.55	0.41
1:B:624:SER:OG	1:B:625:GLU:N	2.53	0.41
1:B:627:MET:HA	1:B:628:PRO:HD3	1.73	0.41
1:C:624:SER:OG	1:C:625:GLU:N	2.53	0.41
1:B:443:TYR:O	1:B:462:TYR:N	2.50	0.41
1:C:530:SER:OG	1:C:531:LYS:N	2.52	0.41
1:D:341:THR:H	1:D:355:PHE:HZ	1.69	0.41
1:A:695:LYS:HG3	1:A:696:LYS:HG3	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:64:ILE:HD13	1:B:328:HIS:CE1	2.55	0.41
1:D:445:LEU:O	1:D:460:GLU:N	2.53	0.41
1:A:441:GLU:HA	1:A:442:PRO:HA	1.84	0.41
1:B:477:THR:OG1	1:B:478:TYR:N	2.49	0.41
1:C:872:GLN:O	1:C:874:ARG:NH2	2.53	0.41
1:D:190:LYS:O	1:D:193:SER:OG	2.35	0.41
1:A:341:THR:H	1:A:355:PHE:HZ	1.69	0.41
1:A:748:ARG:CZ	1:A:801:GLY:H	2.34	0.41
1:A:814:ALA:HB1	1:D:559:LEU:HA	2.02	0.41
1:D:505:LEU:HD13	1:D:505:LEU:HA	1.91	0.41
1:A:592:PRO:HG3	1:A:603:GLU:HB3	2.02	0.41
1:C:190:LYS:O	1:C:193:SER:OG	2.35	0.41
1:C:341:THR:H	1:C:355:PHE:HZ	1.69	0.41
1:C:592:PRO:HG3	1:C:603:GLU:HB3	2.02	0.40
1:D:189:ILE:HA	1:D:199:LEU:HD11	2.04	0.40
1:B:173:THR:HG23	1:B:200:LYS:HB3	2.04	0.40
1:C:173:THR:HG23	1:C:200:LYS:HB3	2.04	0.40
1:A:855:ARG:HD3	1:A:858:CYS:HB3	2.03	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	840/908 (92%)	734 (87%)	103 (12%)	3 (0%)	30	67
1	B	840/908 (92%)	729 (87%)	110 (13%)	1 (0%)	48	83
1	C	840/908 (92%)	723 (86%)	112 (13%)	5 (1%)	22	59
1	D	824/908 (91%)	718 (87%)	102 (12%)	4 (0%)	25	63
All	All	3344/3632 (92%)	2904 (87%)	427 (13%)	13 (0%)	32	67

All (13) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	86	TYR
1	B	86	TYR
1	C	86	TYR
1	D	86	TYR
1	A	539	SER
1	C	416	SER
1	D	443	TYR
1	C	415	GLU
1	C	811	GLU
1	C	812	ALA
1	D	442	PRO
1	D	545	PRO
1	A	871	CYS

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	733/794 (92%)	729 (100%)	4 (0%)	86	90
1	B	733/794 (92%)	731 (100%)	2 (0%)	91	92
1	C	733/794 (92%)	730 (100%)	3 (0%)	89	91
1	D	721/794 (91%)	713 (99%)	8 (1%)	70	80
All	All	2920/3176 (92%)	2903 (99%)	17 (1%)	82	88

All (17) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	200	LYS
1	A	389	LEU
1	A	453	LEU
1	A	474	LEU
1	B	200	LYS
1	B	389	LEU
1	C	200	LYS
1	C	389	LEU
1	C	869	LEU

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Mol	Chain	Res	Type
1	D	200	LYS
1	D	389	LEU
1	D	453	LEU
1	D	505	LEU
1	D	512	LEU
1	D	514	VAL
1	D	536	LEU
1	D	852	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (38) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	34	HIS
1	A	65	ASN
1	A	348	ASN
1	A	367	HIS
1	A	596	ASN
1	A	754	GLN
1	A	819	ASN
1	B	65	ASN
1	B	348	ASN
1	B	350	HIS
1	B	367	HIS
1	B	491	GLN
1	B	605	ASN
1	B	747	GLN
1	B	802	ASN
1	C	65	ASN
1	C	67	ASN
1	C	186	GLN
1	C	348	ASN
1	C	350	HIS
1	C	367	HIS
1	C	417	GLN
1	C	491	GLN
1	C	593	HIS
1	C	596	ASN
1	C	747	GLN
1	C	802	ASN
1	D	65	ASN
1	D	67	ASN
1	D	84	ASN

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Mol	Chain	Res	Type
1	D	348	ASN
1	D	350	HIS
1	D	367	HIS
1	D	456	ASN
1	D	677	GLN
1	D	721	ASN
1	D	747	GLN
1	D	754	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

27 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	$\#\|Z\| > 2$
2	NAG	E	1	2,1	14,14,15	1.73	1 (7%)	17,19,21	1.92	2 (11%)
2	NAG	E	2	2	14,14,15	0.74	1 (7%)	17,19,21	1.18	2 (11%)
3	NAG	F	1	1,3	14,14,15	0.93	2 (14%)	17,19,21	1.25	1 (5%)
3	NAG	F	2	3	14,14,15	0.62	0	17,19,21	0.71	0
3	BMA	F	3	3	11,11,12	1.76	3 (27%)	15,15,17	1.50	4 (26%)
3	MAN	F	4	3	11,11,12	1.40	3 (27%)	15,15,17	1.50	2 (13%)
3	MAN	F	5	3	11,11,12	1.05	1 (9%)	15,15,17	1.43	2 (13%)
2	NAG	G	1	2,1	14,14,15	0.88	1 (7%)	17,19,21	1.43	1 (5%)
2	NAG	G	2	2	14,14,15	0.27	0	17,19,21	0.60	0

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Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
4	NAG	H	1	4,1	14,14,15	0.42	0	17,19,21	0.70	0
4	NAG	H	2	4	14,14,15	0.70	1 (7%)	17,19,21	0.49	0
4	BMA	H	3	4	11,11,12	0.78	0	15,15,17	0.87	1 (6%)
4	MAN	H	4	4	11,11,12	1.70	4 (36%)	15,15,17	1.61	2 (13%)
4	MAN	H	5	4	11,11,12	1.48	2 (18%)	15,15,17	1.91	4 (26%)
2	NAG	I	1	2,1	14,14,15	0.78	1 (7%)	17,19,21	0.70	0
2	NAG	I	2	2	14,14,15	0.58	0	17,19,21	0.62	0
2	NAG	J	1	2,1	14,14,15	0.34	0	17,19,21	0.75	0
2	NAG	J	2	2	14,14,15	0.88	1 (7%)	17,19,21	1.12	3 (17%)
4	NAG	K	1	4,1	14,14,15	0.38	0	17,19,21	0.46	0
4	NAG	K	2	4	14,14,15	0.50	0	17,19,21	1.11	1 (5%)
4	BMA	K	3	4	11,11,12	1.43	2 (18%)	15,15,17	1.49	1 (6%)
4	MAN	K	4	4	11,11,12	1.48	4 (36%)	15,15,17	1.43	2 (13%)
4	MAN	K	5	4	11,11,12	1.60	4 (36%)	15,15,17	1.60	2 (13%)
2	NAG	L	1	2,1	14,14,15	0.36	0	17,19,21	1.23	2 (11%)
2	NAG	L	2	2	14,14,15	0.42	0	17,19,21	0.70	1 (5%)
2	NAG	M	1	2,1	14,14,15	0.55	0	17,19,21	0.70	0
2	NAG	M	2	2	14,14,15	0.38	0	17,19,21	0.66	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
2	NAG	E	1	2,1	-	4/6/23/26	0/1/1/1
2	NAG	E	2	2	-	4/6/23/26	0/1/1/1
3	NAG	F	1	1,3	-	4/6/23/26	0/1/1/1
3	NAG	F	2	3	-	2/6/23/26	0/1/1/1
3	BMA	F	3	3	-	1/2/19/22	0/1/1/1
3	MAN	F	4	3	-	2/2/19/22	1/1/1/1
3	MAN	F	5	3	-	2/2/19/22	0/1/1/1
2	NAG	G	1	2,1	-	2/6/23/26	0/1/1/1
2	NAG	G	2	2	-	2/6/23/26	0/1/1/1
4	NAG	H	1	4,1	-	4/6/23/26	0/1/1/1
4	NAG	H	2	4	-	1/6/23/26	0/1/1/1
4	BMA	H	3	4	-	2/2/19/22	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	MAN	H	4	4	-	2/2/19/22	1/1/1/1
4	MAN	H	5	4	-	2/2/19/22	0/1/1/1
2	NAG	I	1	2,1	-	2/6/23/26	0/1/1/1
2	NAG	I	2	2	-	4/6/23/26	0/1/1/1
2	NAG	J	1	2,1	-	2/6/23/26	0/1/1/1
2	NAG	J	2	2	-	4/6/23/26	0/1/1/1
4	NAG	K	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	K	2	4	-	4/6/23/26	0/1/1/1
4	BMA	K	3	4	-	2/2/19/22	0/1/1/1
4	MAN	K	4	4	-	0/2/19/22	0/1/1/1
4	MAN	K	5	4	-	1/2/19/22	1/1/1/1
2	NAG	L	1	2,1	-	2/6/23/26	0/1/1/1
2	NAG	L	2	2	-	2/6/23/26	0/1/1/1
2	NAG	M	1	2,1	-	2/6/23/26	0/1/1/1
2	NAG	M	2	2	-	2/6/23/26	0/1/1/1

All (31) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	1	NAG	O5-C1	6.10	1.53	1.43
3	F	3	BMA	C2-C3	3.30	1.57	1.52
4	K	3	BMA	C4-C3	3.05	1.60	1.52
3	F	3	BMA	C4-C3	2.96	1.60	1.52
4	H	4	MAN	C1-C2	2.93	1.59	1.52
4	H	4	MAN	O5-C5	2.90	1.49	1.43
2	J	2	NAG	C1-C2	2.85	1.56	1.52
3	F	5	MAN	C1-C2	2.83	1.59	1.52
3	F	4	MAN	O5-C5	2.82	1.48	1.43
4	H	5	MAN	C2-C3	2.80	1.56	1.52
4	H	5	MAN	C1-C2	2.75	1.58	1.52
4	K	3	BMA	C1-C2	2.72	1.58	1.52
4	K	5	MAN	O5-C5	2.67	1.48	1.43
4	K	5	MAN	C2-C3	2.66	1.56	1.52
3	F	3	BMA	O3-C3	2.56	1.49	1.43
3	F	4	MAN	C2-C3	2.52	1.56	1.52
3	F	1	NAG	O5-C1	2.44	1.47	1.43
3	F	1	NAG	C1-C2	2.42	1.55	1.52
2	E	2	NAG	C1-C2	2.32	1.55	1.52
4	K	4	MAN	O5-C5	2.30	1.47	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	K	4	MAN	C4-C5	2.28	1.57	1.53
4	K	4	MAN	C2-C3	2.27	1.56	1.52
4	H	2	NAG	C1-C2	2.21	1.55	1.52
2	G	1	NAG	O5-C1	2.19	1.47	1.43
4	H	4	MAN	C2-C3	2.19	1.55	1.52
4	K	5	MAN	C1-C2	2.17	1.57	1.52
4	H	4	MAN	C4-C3	2.13	1.57	1.52
4	K	4	MAN	C4-C3	2.10	1.57	1.52
2	I	1	NAG	O5-C1	2.04	1.47	1.43
4	K	5	MAN	C4-C3	2.03	1.57	1.52
3	F	4	MAN	C1-C2	2.00	1.57	1.52

All (33) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	E	1	NAG	C1-O5-C5	6.59	121.02	112.19
4	H	5	MAN	C1-O5-C5	5.61	119.70	112.19
4	K	5	MAN	C1-O5-C5	5.16	119.10	112.19
4	H	4	MAN	C1-O5-C5	5.13	119.06	112.19
2	G	1	NAG	C1-O5-C5	5.04	118.94	112.19
3	F	4	MAN	C1-O5-C5	4.53	118.25	112.19
3	F	5	MAN	C1-O5-C5	4.03	117.59	112.19
3	F	1	NAG	C1-O5-C5	3.97	117.50	112.19
4	K	3	BMA	C1-O5-C5	3.95	117.48	112.19
2	L	1	NAG	C2-N2-C7	3.31	127.34	122.90
4	K	4	MAN	C1-O5-C5	3.30	116.61	112.19
4	K	2	NAG	C2-N2-C7	3.23	127.23	122.90
2	E	2	NAG	C2-N2-C7	3.17	127.15	122.90
2	J	2	NAG	C2-N2-C7	3.10	127.05	122.90
4	H	5	MAN	C1-C2-C3	2.89	113.86	109.64
2	E	2	NAG	C1-O5-C5	2.78	115.91	112.19
2	E	1	NAG	C4-C3-C2	-2.56	107.27	111.02
2	L	2	NAG	C1-O5-C5	2.53	115.57	112.19
3	F	3	BMA	C1-O5-C5	2.47	115.50	112.19
4	H	3	BMA	C1-O5-C5	2.46	115.48	112.19
3	F	3	BMA	C2-C3-C4	2.41	115.10	110.86
4	K	4	MAN	C2-C3-C4	2.39	115.06	110.86
2	J	2	NAG	C1-O5-C5	2.23	115.17	112.19
3	F	4	MAN	O2-C2-C3	-2.16	105.68	110.15
4	H	4	MAN	O2-C2-C3	-2.15	105.71	110.15
3	F	5	MAN	O2-C2-C3	-2.14	105.72	110.15
2	L	1	NAG	C1-C2-N2	2.13	113.79	110.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	H	5	MAN	O2-C2-C3	-2.12	105.77	110.15
4	H	5	MAN	C2-C3-C4	2.10	114.56	110.86
2	J	2	NAG	C1-C2-N2	2.07	113.70	110.43
3	F	3	BMA	O5-C5-C4	-2.05	105.83	110.83
4	K	5	MAN	C2-C3-C4	2.03	114.44	110.86
3	F	3	BMA	C1-C2-C3	2.02	112.59	109.64

There are no chirality outliers.

All (63) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	J	2	NAG	O5-C5-C6-O6
3	F	1	NAG	C4-C5-C6-O6
2	J	1	NAG	C4-C5-C6-O6
4	H	5	MAN	O5-C5-C6-O6
3	F	5	MAN	C4-C5-C6-O6
3	F	2	NAG	O5-C5-C6-O6
2	E	1	NAG	O5-C5-C6-O6
2	E	1	NAG	C4-C5-C6-O6
2	L	2	NAG	C4-C5-C6-O6
4	K	2	NAG	O5-C5-C6-O6
2	L	2	NAG	O5-C5-C6-O6
3	F	1	NAG	O5-C5-C6-O6
2	G	1	NAG	O5-C5-C6-O6
2	J	2	NAG	C4-C5-C6-O6
2	J	1	NAG	O5-C5-C6-O6
3	F	5	MAN	O5-C5-C6-O6
3	F	4	MAN	C4-C5-C6-O6
4	H	5	MAN	C4-C5-C6-O6
4	H	4	MAN	C4-C5-C6-O6
4	H	4	MAN	O5-C5-C6-O6
2	G	1	NAG	C4-C5-C6-O6
4	K	3	BMA	C4-C5-C6-O6
3	F	2	NAG	C4-C5-C6-O6
2	I	2	NAG	O5-C5-C6-O6
2	E	1	NAG	C8-C7-N2-C2
2	E	1	NAG	O7-C7-N2-C2
2	I	1	NAG	C8-C7-N2-C2
2	I	1	NAG	O7-C7-N2-C2
2	I	2	NAG	C8-C7-N2-C2
2	I	2	NAG	O7-C7-N2-C2
2	M	1	NAG	C8-C7-N2-C2

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Mol	Chain	Res	Type	Atoms
2	M	1	NAG	O7-C7-N2-C2
2	M	2	NAG	C8-C7-N2-C2
2	M	2	NAG	O7-C7-N2-C2
3	F	1	NAG	C8-C7-N2-C2
3	F	1	NAG	O7-C7-N2-C2
4	H	1	NAG	C8-C7-N2-C2
4	H	1	NAG	O7-C7-N2-C2
4	K	1	NAG	O5-C5-C6-O6
4	K	3	BMA	O5-C5-C6-O6
3	F	4	MAN	O5-C5-C6-O6
2	E	2	NAG	C4-C5-C6-O6
2	G	2	NAG	O5-C5-C6-O6
2	G	2	NAG	C4-C5-C6-O6
4	H	1	NAG	O5-C5-C6-O6
2	E	2	NAG	O5-C5-C6-O6
4	K	5	MAN	O5-C5-C6-O6
4	K	2	NAG	C4-C5-C6-O6
2	I	2	NAG	C4-C5-C6-O6
4	H	3	BMA	O5-C5-C6-O6
3	F	3	BMA	O5-C5-C6-O6
4	K	1	NAG	C4-C5-C6-O6
2	J	2	NAG	C1-C2-N2-C7
4	H	2	NAG	O5-C5-C6-O6
2	E	2	NAG	C1-C2-N2-C7
2	L	1	NAG	C1-C2-N2-C7
4	K	2	NAG	C1-C2-N2-C7
2	E	2	NAG	C3-C2-N2-C7
2	J	2	NAG	C3-C2-N2-C7
2	L	1	NAG	C3-C2-N2-C7
4	K	2	NAG	C3-C2-N2-C7
4	H	1	NAG	C4-C5-C6-O6
4	H	3	BMA	C4-C5-C6-O6

All (3) ring outliers are listed below:

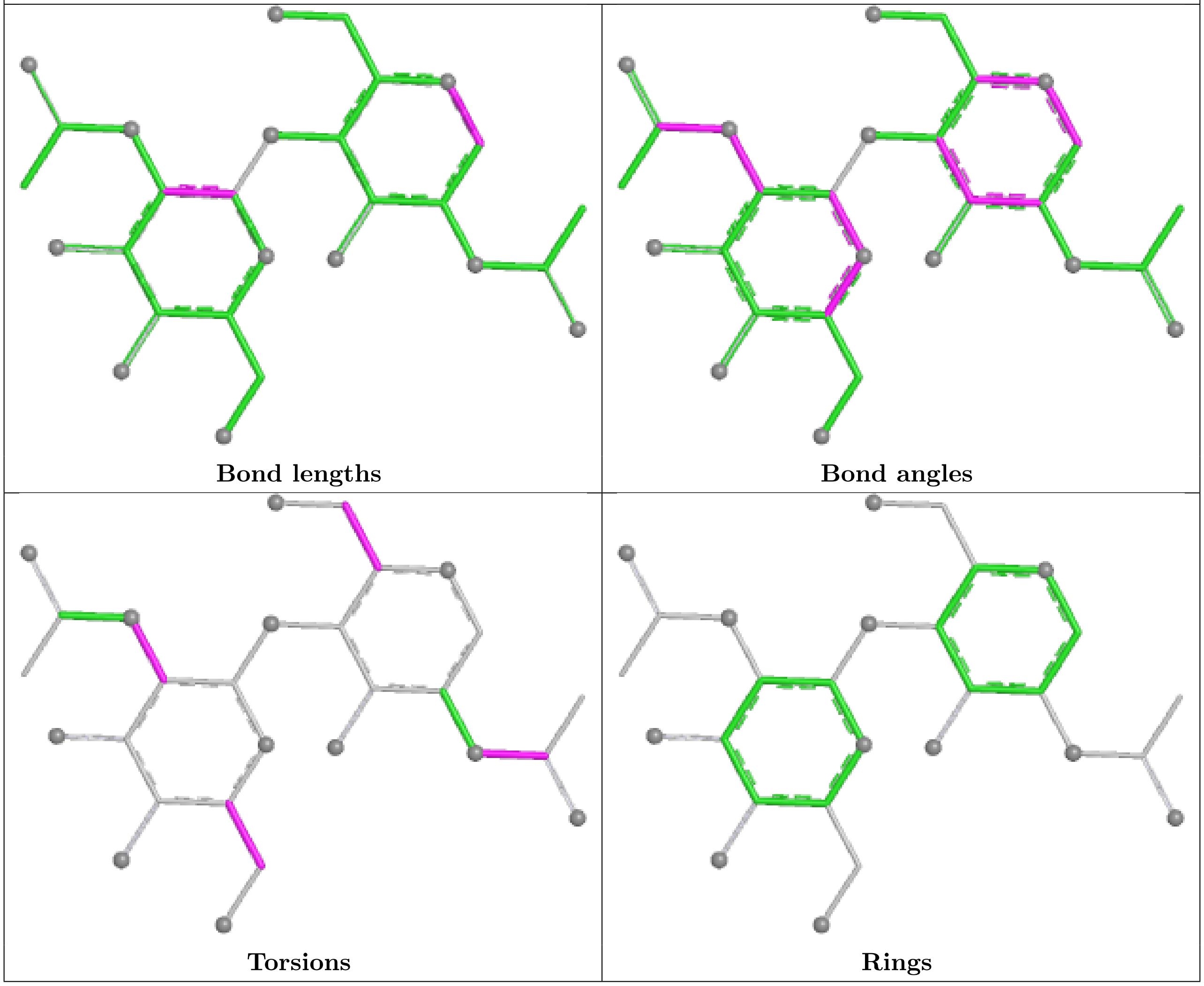
Mol	Chain	Res	Type	Atoms
3	F	4	MAN	C1-C2-C3-C4-C5-O5
4	H	4	MAN	C1-C2-C3-C4-C5-O5
4	K	5	MAN	C1-C2-C3-C4-C5-O5

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	J	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.

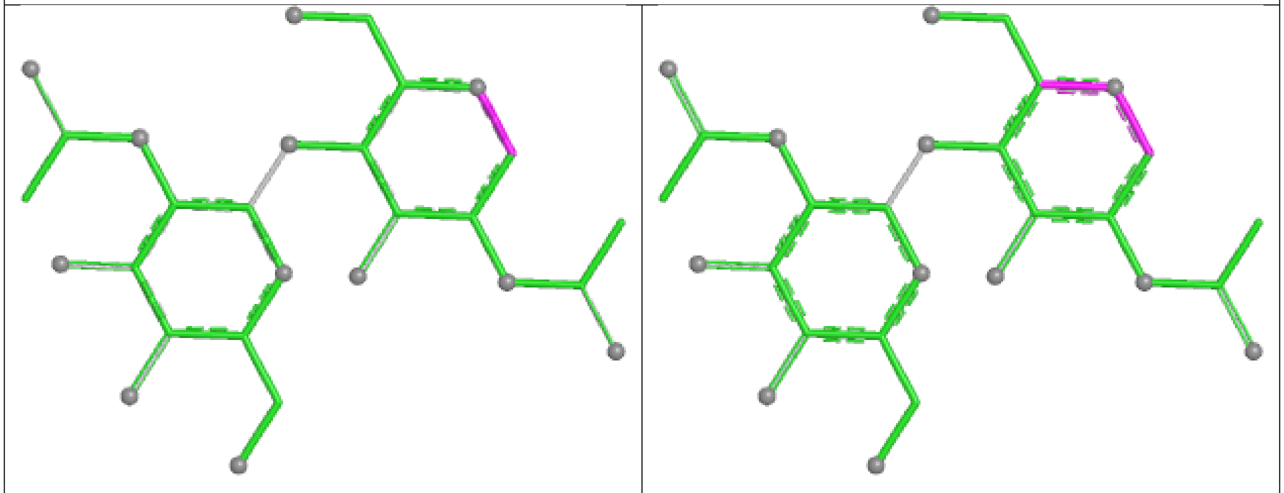
Oligosaccharide Chain E



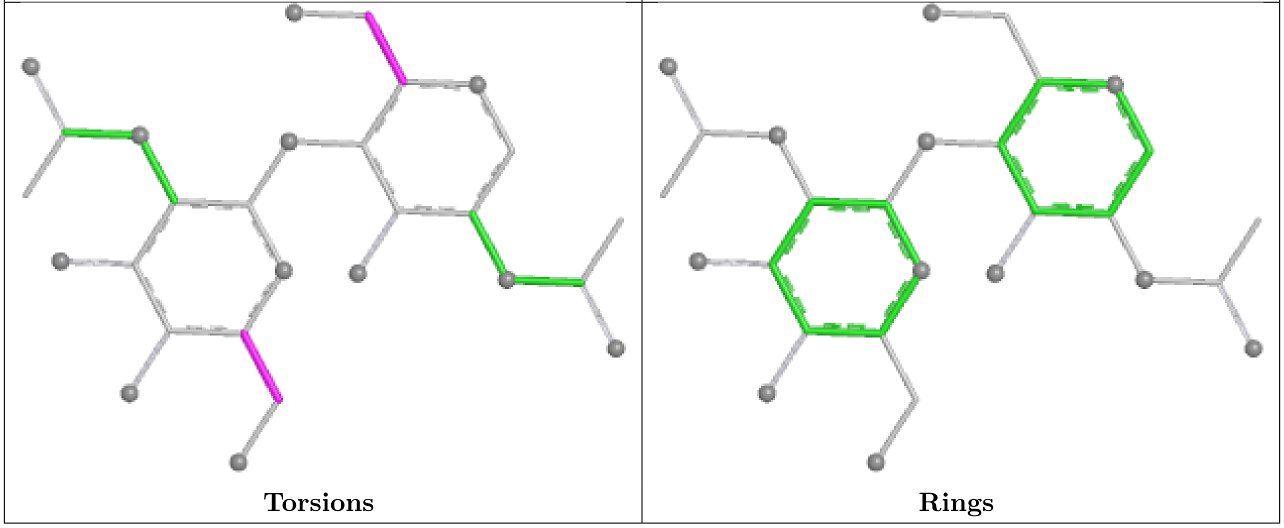
Bond lengths **Bond angles**

Torsions **Rings**

Oligosaccharide Chain G

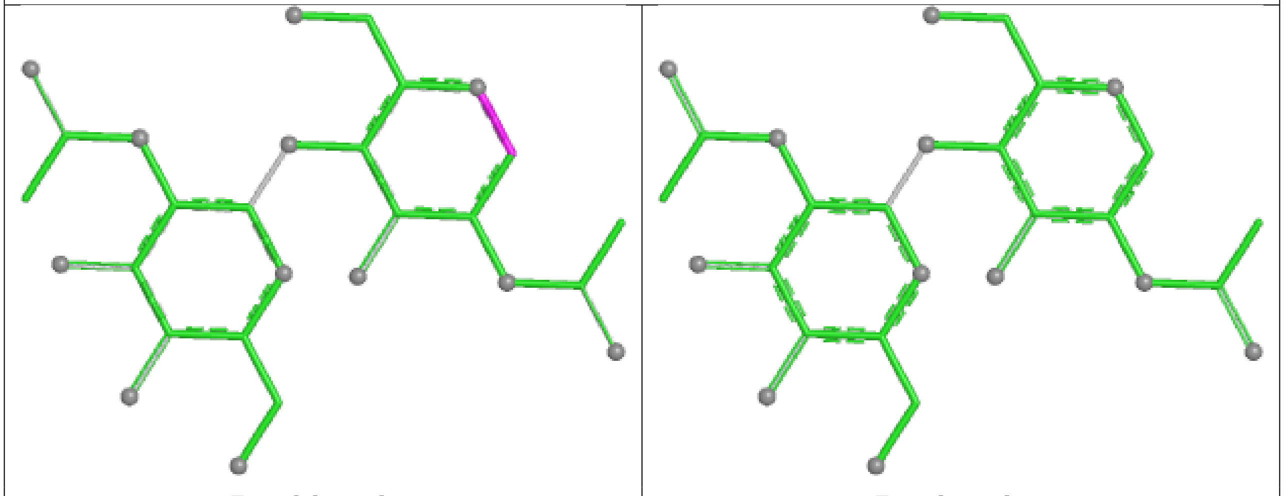


Bond lengths **Bond angles**

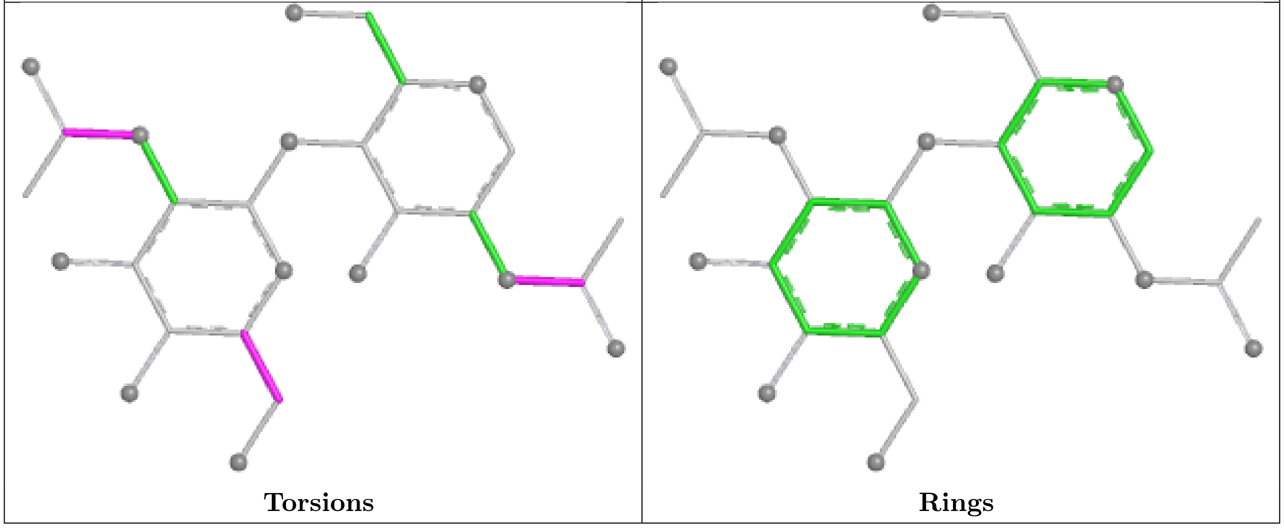


Torsions **Rings**

Oligosaccharide Chain I

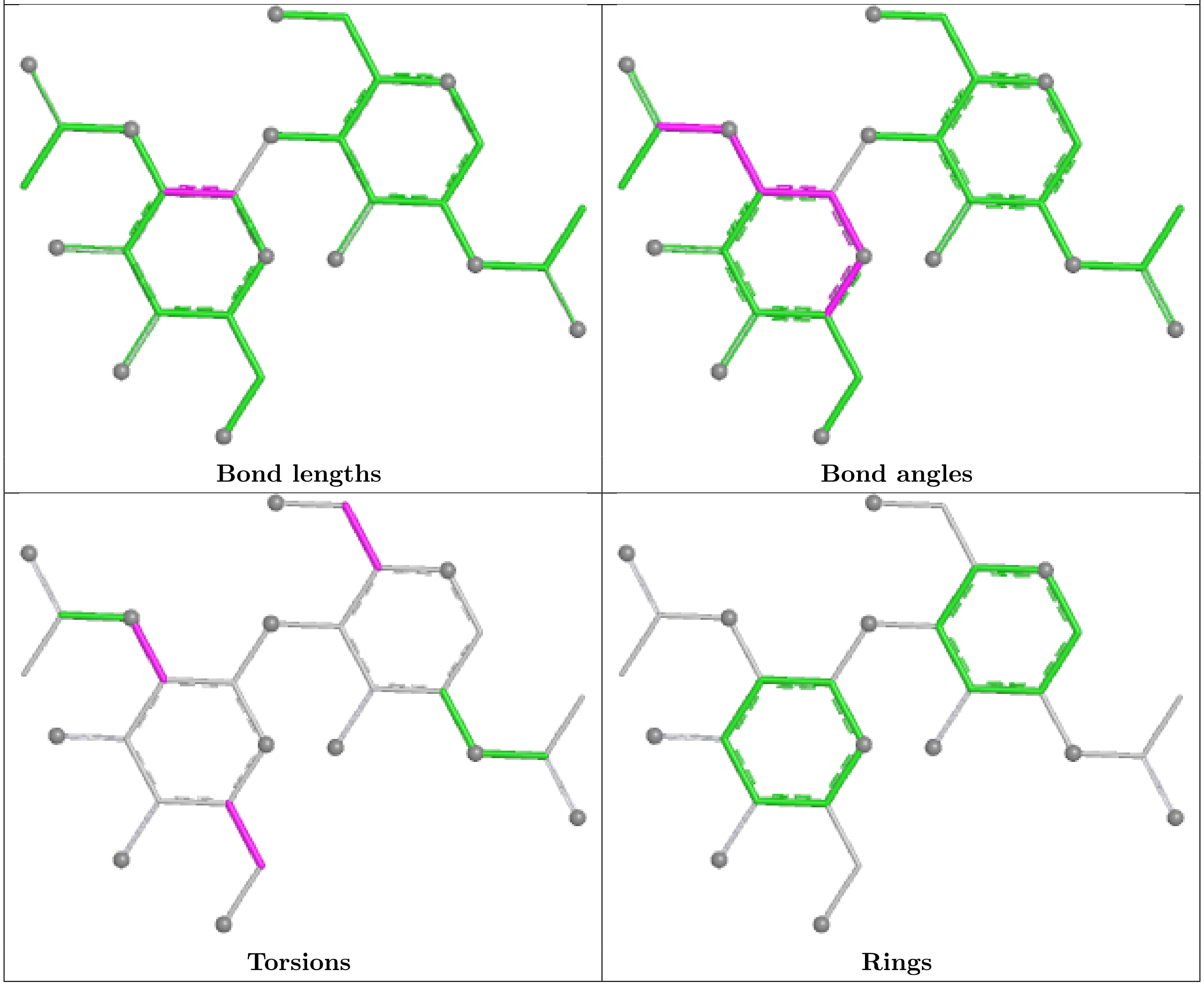


Bond lengths Bond angles



Torsions Rings

Oligosaccharide Chain J



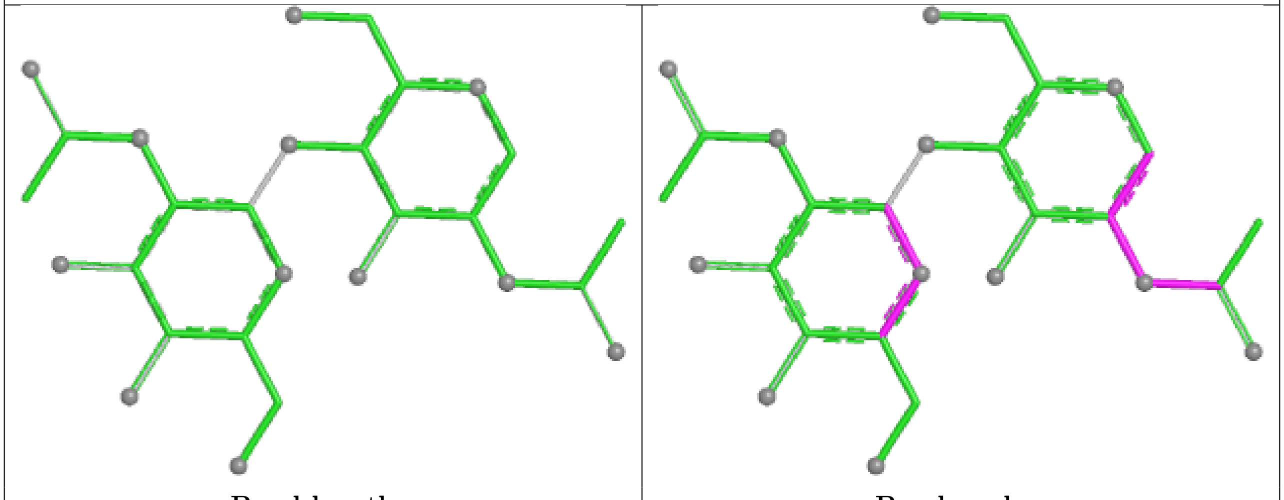
Bond lengths

Bond angles

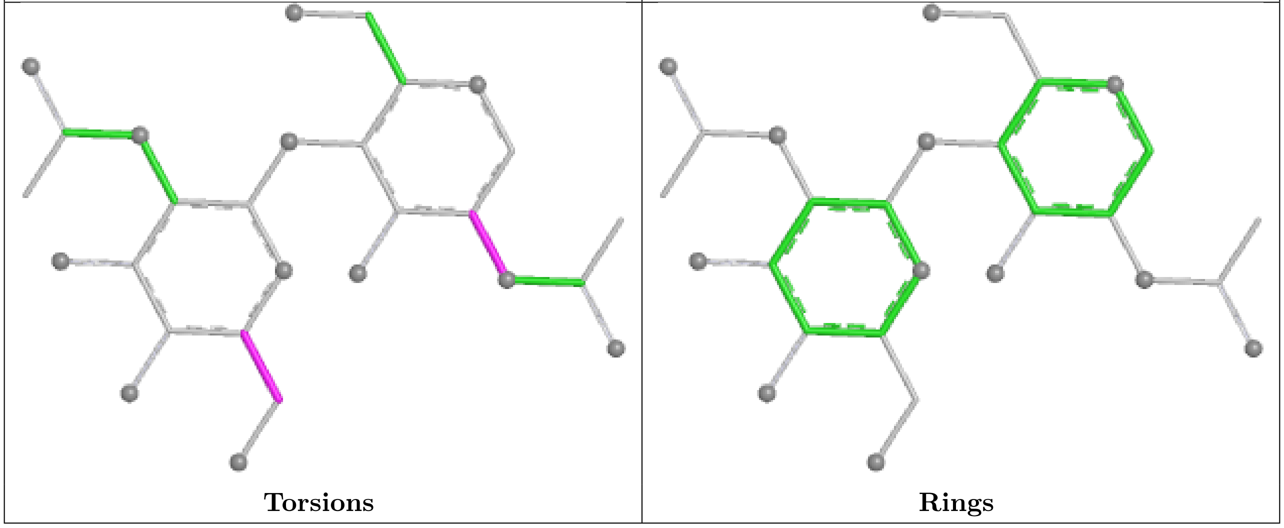
Torsions

Rings

Oligosaccharide Chain L

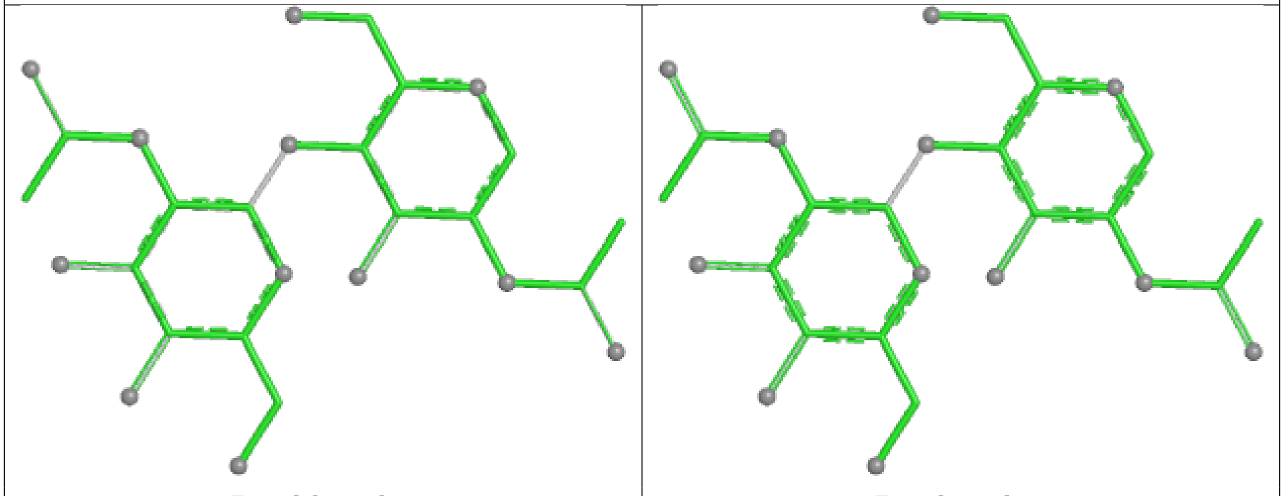


Bond lengths **Bond angles**



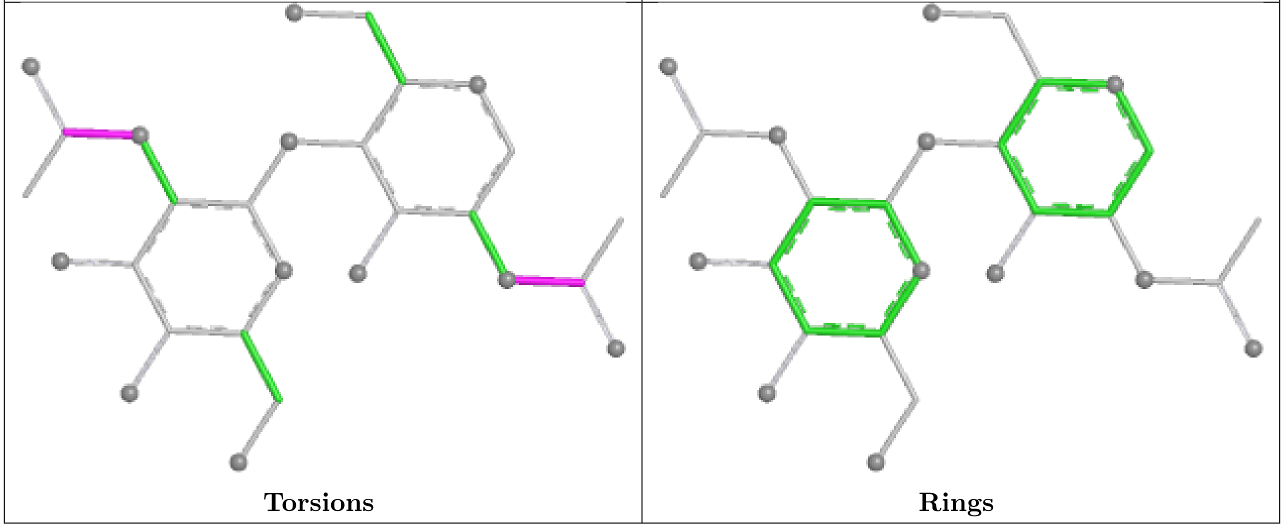
Torsions **Rings**

Oligosaccharide Chain M



Bond lengths

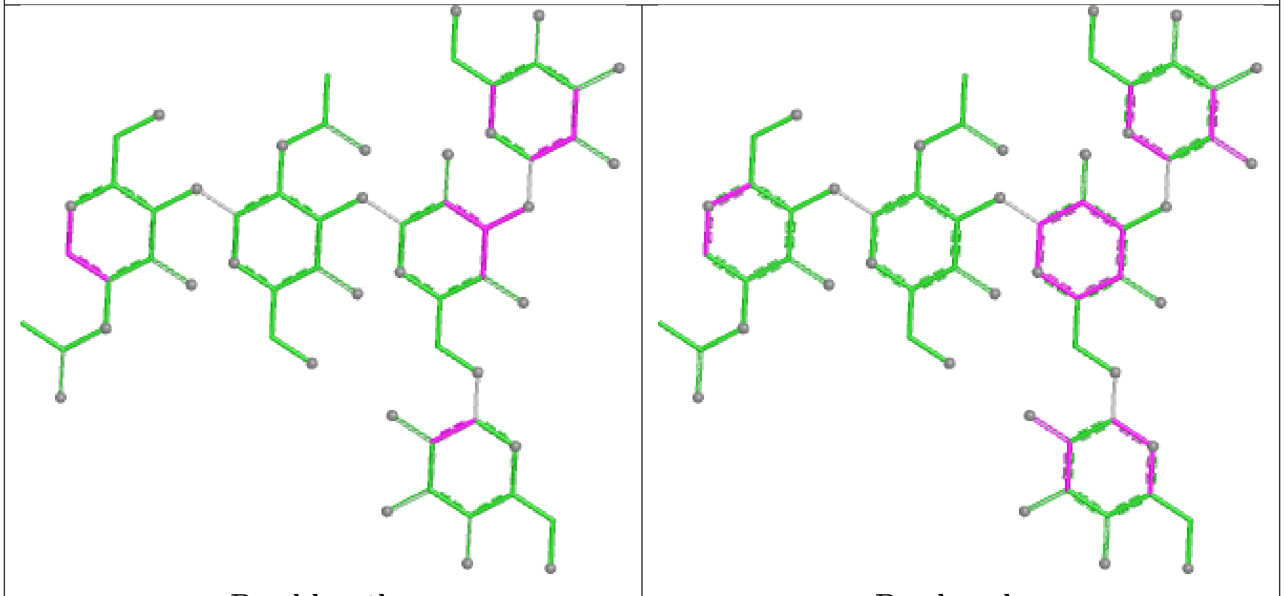
Bond angles



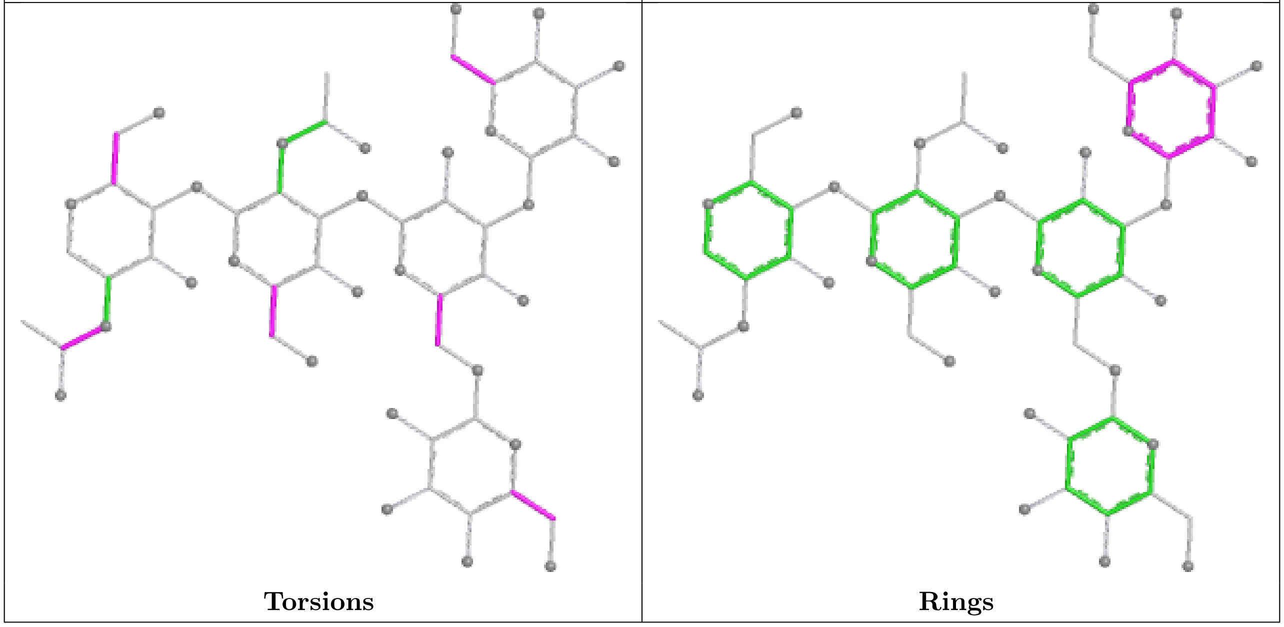
Torsions

Rings

Oligosaccharide Chain F

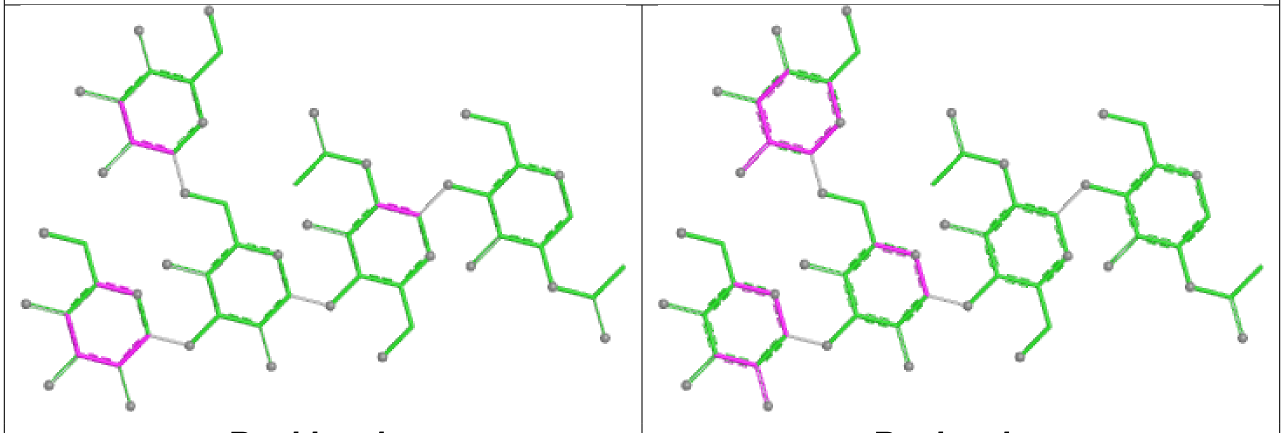


Bond lengths **Bond angles**



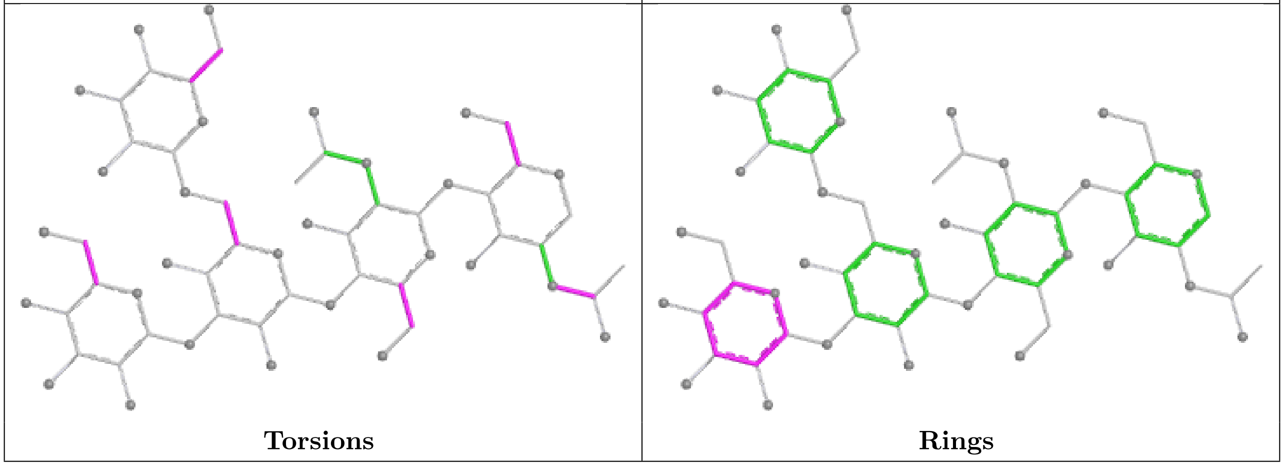
Torsions **Rings**

Oligosaccharide Chain H



Bond lengths

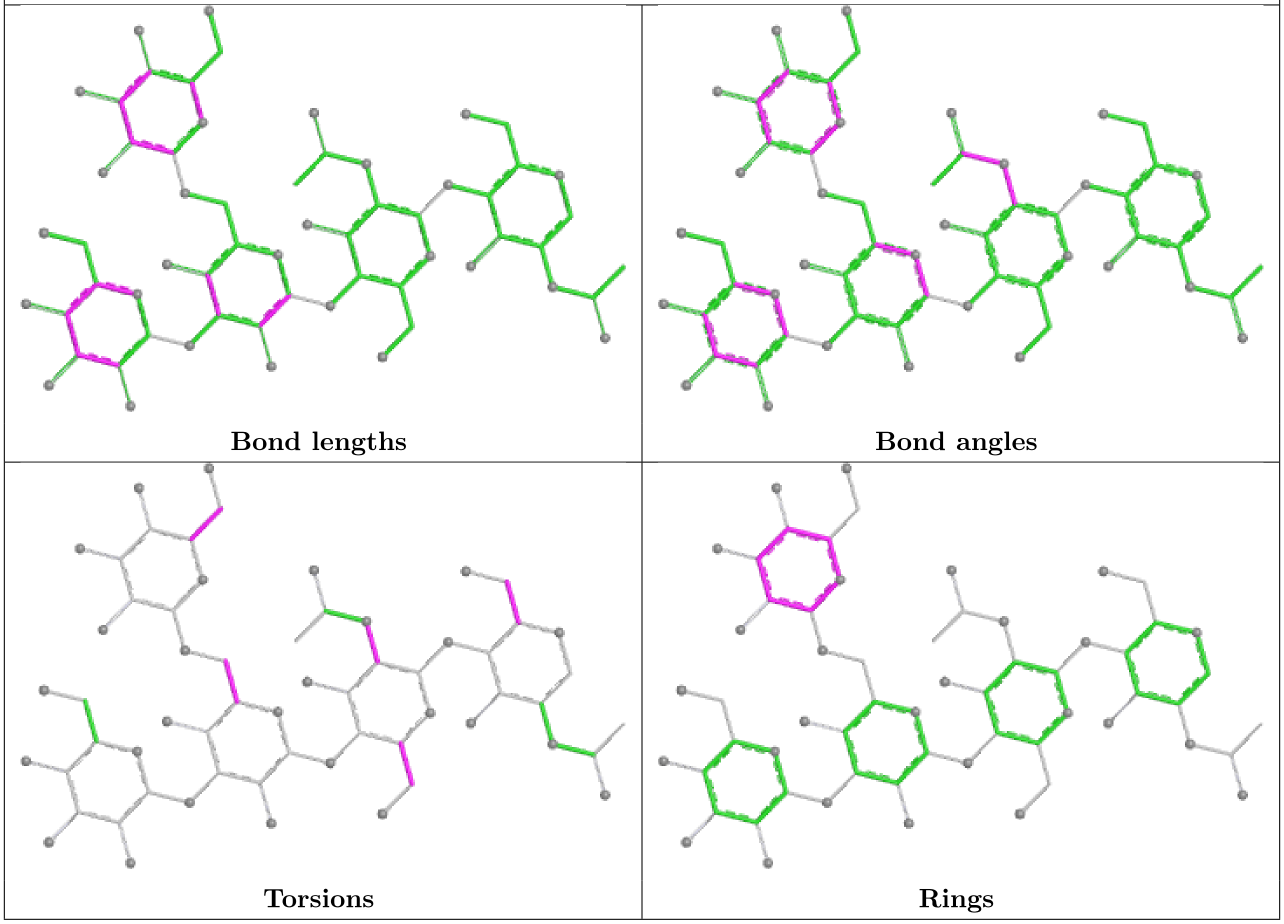
Bond angles



Torsions

Rings

Oligosaccharide Chain K



5.6 Ligand geometry ⓘ

16 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
5	NAG	A	1003	1	14,14,15	0.70	0	17,19,21	1.32	3 (17%)
5	NAG	B	1003	1	14,14,15	0.34	0	17,19,21	0.57	0
5	NAG	B	1002	1	14,14,15	0.46	0	17,19,21	1.04	1 (5%)
5	NAG	D	1005	1	14,14,15	1.68	2 (14%)	17,19,21	1.61	1 (5%)
5	NAG	A	1002	1	14,14,15	0.37	0	17,19,21	1.03	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
5	NAG	C	1001	1	14,14,15	0.52	0	17,19,21	0.99	1 (5%)
5	NAG	A	1001	1	14,14,15	0.56	0	17,19,21	0.61	1 (5%)
5	NAG	C	1002	1	14,14,15	0.76	1 (7%)	17,19,21	0.56	0
5	NAG	B	1001	1	14,14,15	0.64	0	17,19,21	1.23	3 (17%)
5	NAG	D	1003	1	14,14,15	0.50	0	17,19,21	0.78	1 (5%)
5	NAG	D	1004	1	14,14,15	0.30	0	17,19,21	0.46	0
5	NAG	D	1001	1	14,14,15	0.31	0	17,19,21	0.79	1 (5%)
5	NAG	C	1003	1	14,14,15	0.31	0	17,19,21	0.40	0
5	NAG	A	1005	1	14,14,15	1.71	2 (14%)	17,19,21	1.51	1 (5%)
5	NAG	A	1004	1	14,14,15	1.27	1 (7%)	17,19,21	1.80	2 (11%)
5	NAG	D	1002	1	14,14,15	0.69	1 (7%)	17,19,21	0.69	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	NAG	A	1003	1	-	3/6/23/26	0/1/1/1
5	NAG	B	1003	1	-	4/6/23/26	0/1/1/1
5	NAG	B	1002	1	-	2/6/23/26	0/1/1/1
5	NAG	D	1005	1	-	2/6/23/26	0/1/1/1
5	NAG	A	1002	1	-	4/6/23/26	0/1/1/1
5	NAG	C	1001	1	-	4/6/23/26	0/1/1/1
5	NAG	A	1001	1	-	2/6/23/26	0/1/1/1
5	NAG	C	1002	1	-	2/6/23/26	0/1/1/1
5	NAG	B	1001	1	-	4/6/23/26	0/1/1/1
5	NAG	D	1003	1	-	2/6/23/26	0/1/1/1
5	NAG	D	1004	1	-	2/6/23/26	0/1/1/1
5	NAG	D	1001	1	-	0/6/23/26	0/1/1/1
5	NAG	C	1003	1	-	2/6/23/26	0/1/1/1
5	NAG	A	1005	1	-	2/6/23/26	0/1/1/1
5	NAG	A	1004	1	-	4/6/23/26	0/1/1/1
5	NAG	D	1002	1	-	3/6/23/26	0/1/1/1

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	D	1005	NAG	O5-C1	5.57	1.53	1.43
5	A	1005	NAG	O5-C1	5.43	1.52	1.43
5	A	1004	NAG	O5-C1	4.24	1.50	1.43
5	A	1005	NAG	C1-C2	3.13	1.56	1.52
5	D	1005	NAG	C1-C2	2.75	1.56	1.52
5	C	1002	NAG	C1-C2	2.52	1.55	1.52
5	D	1002	NAG	C1-C2	2.17	1.55	1.52

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	D	1005	NAG	C1-O5-C5	6.19	120.48	112.19
5	A	1004	NAG	C1-O5-C5	6.08	120.33	112.19
5	A	1005	NAG	C1-O5-C5	5.83	120.00	112.19
5	A	1003	NAG	C2-N2-C7	3.44	127.51	122.90
5	A	1002	NAG	C2-N2-C7	3.41	127.47	122.90
5	A	1004	NAG	C2-N2-C7	3.32	127.35	122.90
5	B	1001	NAG	C2-N2-C7	3.27	127.29	122.90
5	C	1001	NAG	C2-N2-C7	3.25	127.26	122.90
5	B	1002	NAG	C2-N2-C7	3.22	127.22	122.90
5	D	1003	NAG	C1-O5-C5	2.90	116.07	112.19
5	D	1001	NAG	C1-O5-C5	2.87	116.04	112.19
5	A	1003	NAG	C1-C2-N2	2.37	114.16	110.43
5	A	1003	NAG	C4-C3-C2	2.25	114.31	111.02
5	B	1001	NAG	C4-C3-C2	2.18	114.22	111.02
5	B	1001	NAG	C3-C4-C5	2.06	113.97	110.23
5	A	1001	NAG	C1-O5-C5	2.02	114.89	112.19

There are no chirality outliers.

All (42) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	B	1001	NAG	O5-C5-C6-O6
5	A	1005	NAG	O5-C5-C6-O6
5	C	1002	NAG	C4-C5-C6-O6
5	C	1001	NAG	O5-C5-C6-O6
5	A	1005	NAG	C4-C5-C6-O6
5	B	1001	NAG	C4-C5-C6-O6
5	C	1002	NAG	O5-C5-C6-O6
5	D	1003	NAG	O5-C5-C6-O6
5	B	1003	NAG	C8-C7-N2-C2
5	B	1003	NAG	O7-C7-N2-C2

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
5	D	1002	NAG	C8-C7-N2-C2
5	D	1002	NAG	O7-C7-N2-C2
5	D	1005	NAG	C8-C7-N2-C2
5	D	1005	NAG	O7-C7-N2-C2
5	C	1001	NAG	C4-C5-C6-O6
5	A	1001	NAG	O5-C5-C6-O6
5	D	1003	NAG	C4-C5-C6-O6
5	A	1004	NAG	O5-C5-C6-O6
5	A	1002	NAG	C4-C5-C6-O6
5	A	1003	NAG	O5-C5-C6-O6
5	D	1004	NAG	C4-C5-C6-O6
5	A	1001	NAG	C4-C5-C6-O6
5	A	1002	NAG	C1-C2-N2-C7
5	A	1003	NAG	C1-C2-N2-C7
5	B	1002	NAG	C1-C2-N2-C7
5	B	1003	NAG	C4-C5-C6-O6
5	C	1003	NAG	C4-C5-C6-O6
5	A	1002	NAG	O5-C5-C6-O6
5	A	1004	NAG	C3-C2-N2-C7
5	C	1003	NAG	O5-C5-C6-O6
5	D	1004	NAG	O5-C5-C6-O6
5	D	1002	NAG	C4-C5-C6-O6
5	B	1003	NAG	O5-C5-C6-O6
5	A	1004	NAG	C1-C2-N2-C7
5	B	1001	NAG	C1-C2-N2-C7
5	C	1001	NAG	C1-C2-N2-C7
5	A	1002	NAG	C3-C2-N2-C7
5	A	1003	NAG	C3-C2-N2-C7
5	B	1001	NAG	C3-C2-N2-C7
5	B	1002	NAG	C3-C2-N2-C7
5	C	1001	NAG	C3-C2-N2-C7
5	A	1004	NAG	C4-C5-C6-O6

There are no ring outliers.

3 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	1001	NAG	1	0
5	A	1005	NAG	1	0
5	A	1004	NAG	1	0

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

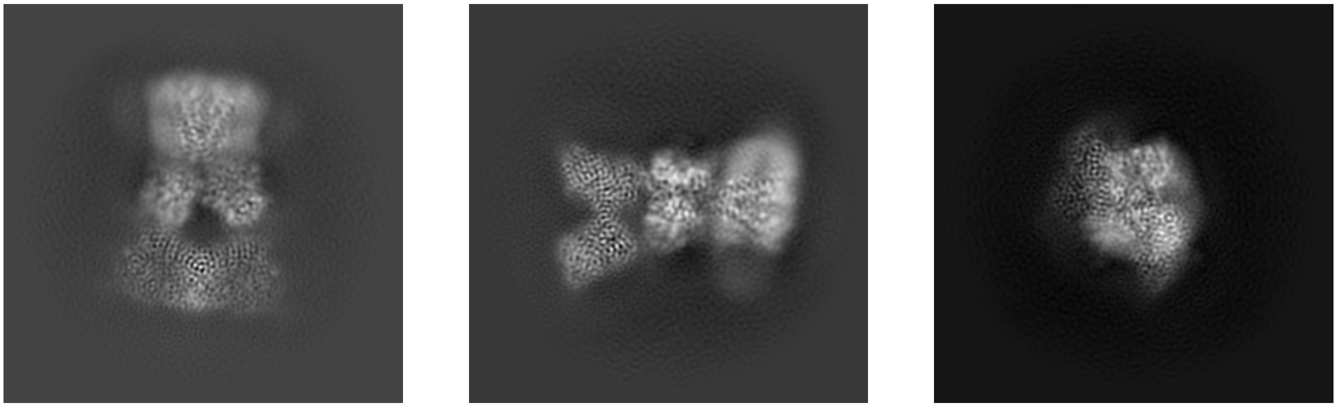
6 Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-48897. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

6.1 Orthogonal projections ⓘ

6.1.1 Primary map

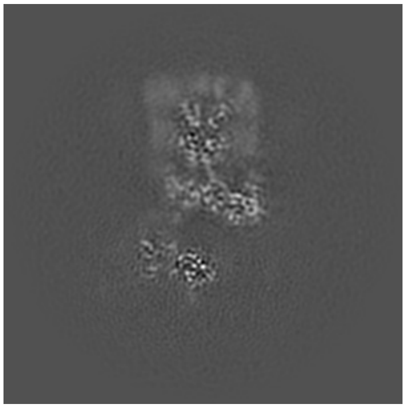


X Y Z

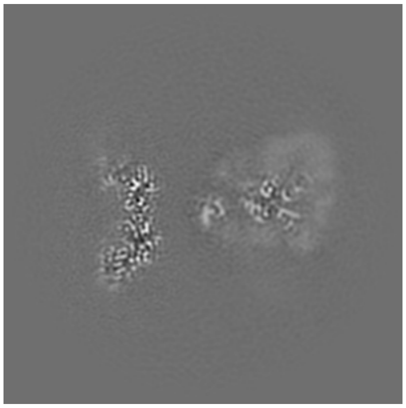
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ

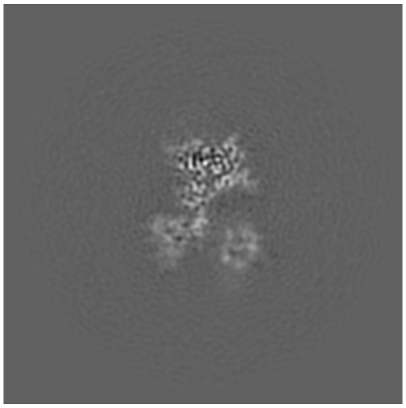
6.2.1 Primary map



X Index: 192



Y Index: 192

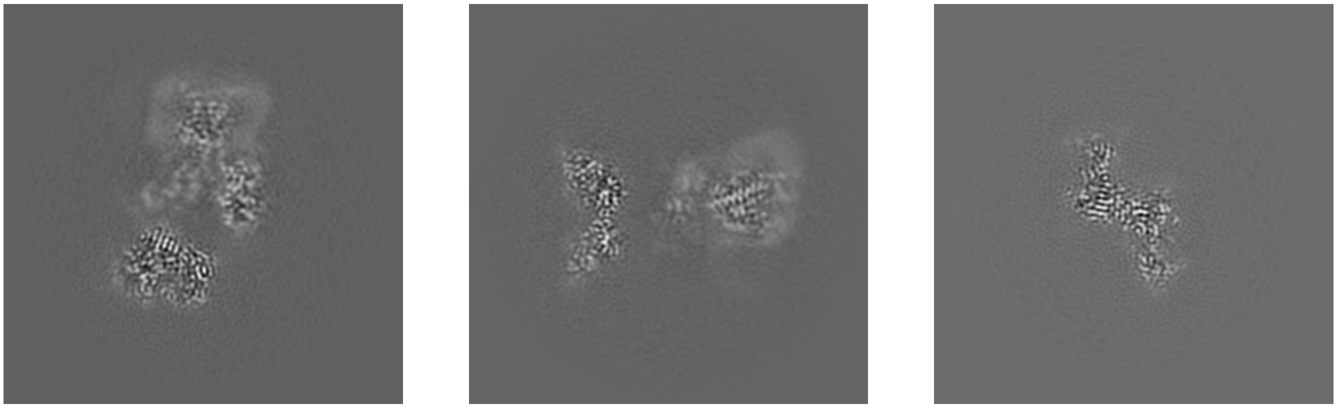


Z Index: 192

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

6.3 Largest variance slices

6.3.1 Primary map

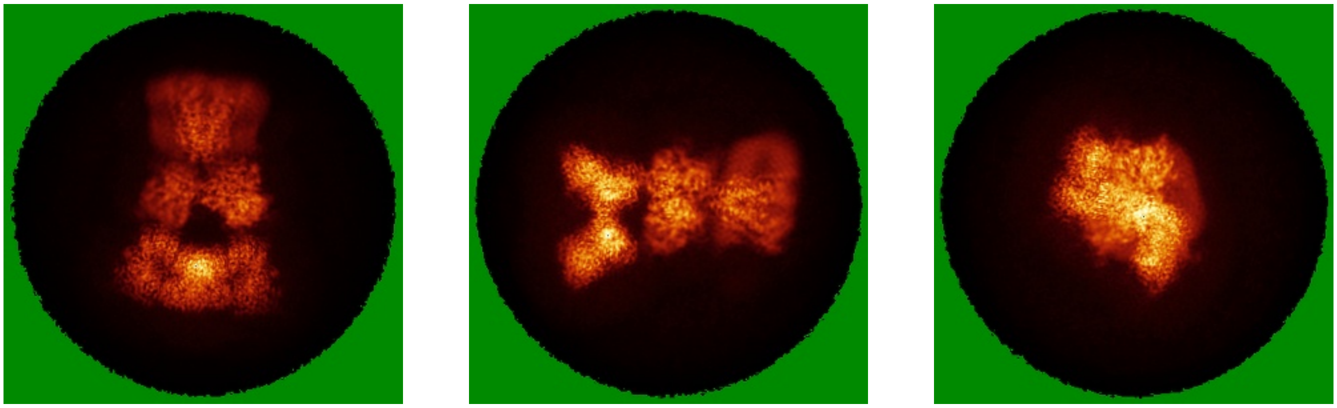


X Index: 211 Y Index: 183 Z Index: 132

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

6.4 Orthogonal standard-deviation projections (False-color)

6.4.1 Primary map

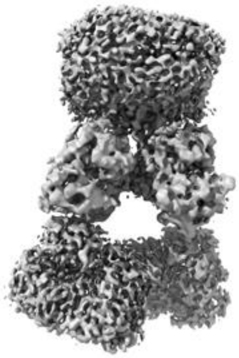


X Y Z

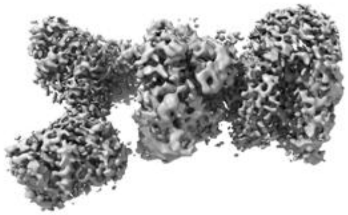
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views ⓘ

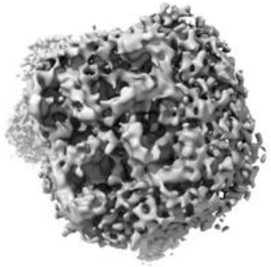
6.5.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 5.67. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

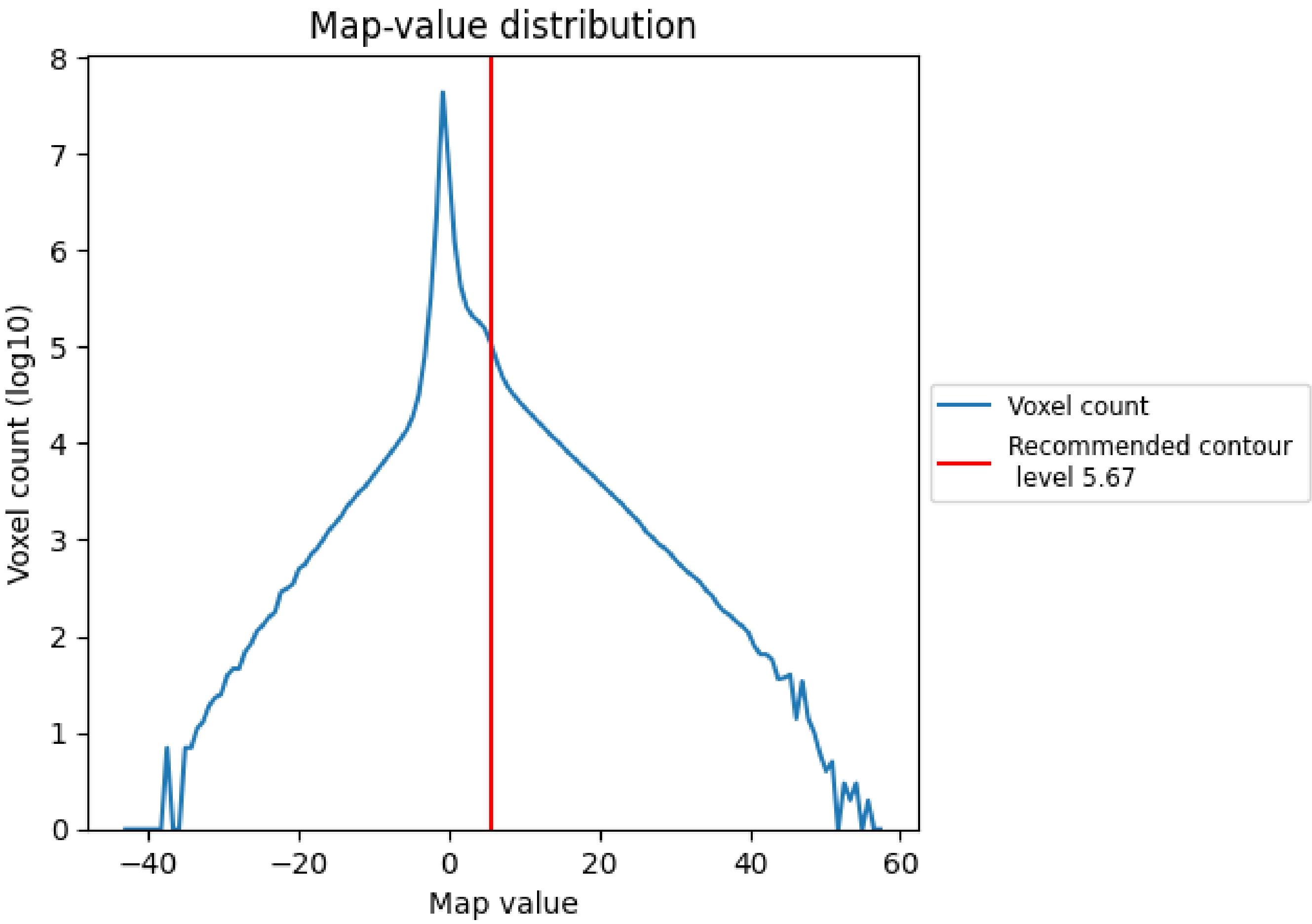
6.6 Mask visualisation ⓘ

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

7 Map analysis ⓘ

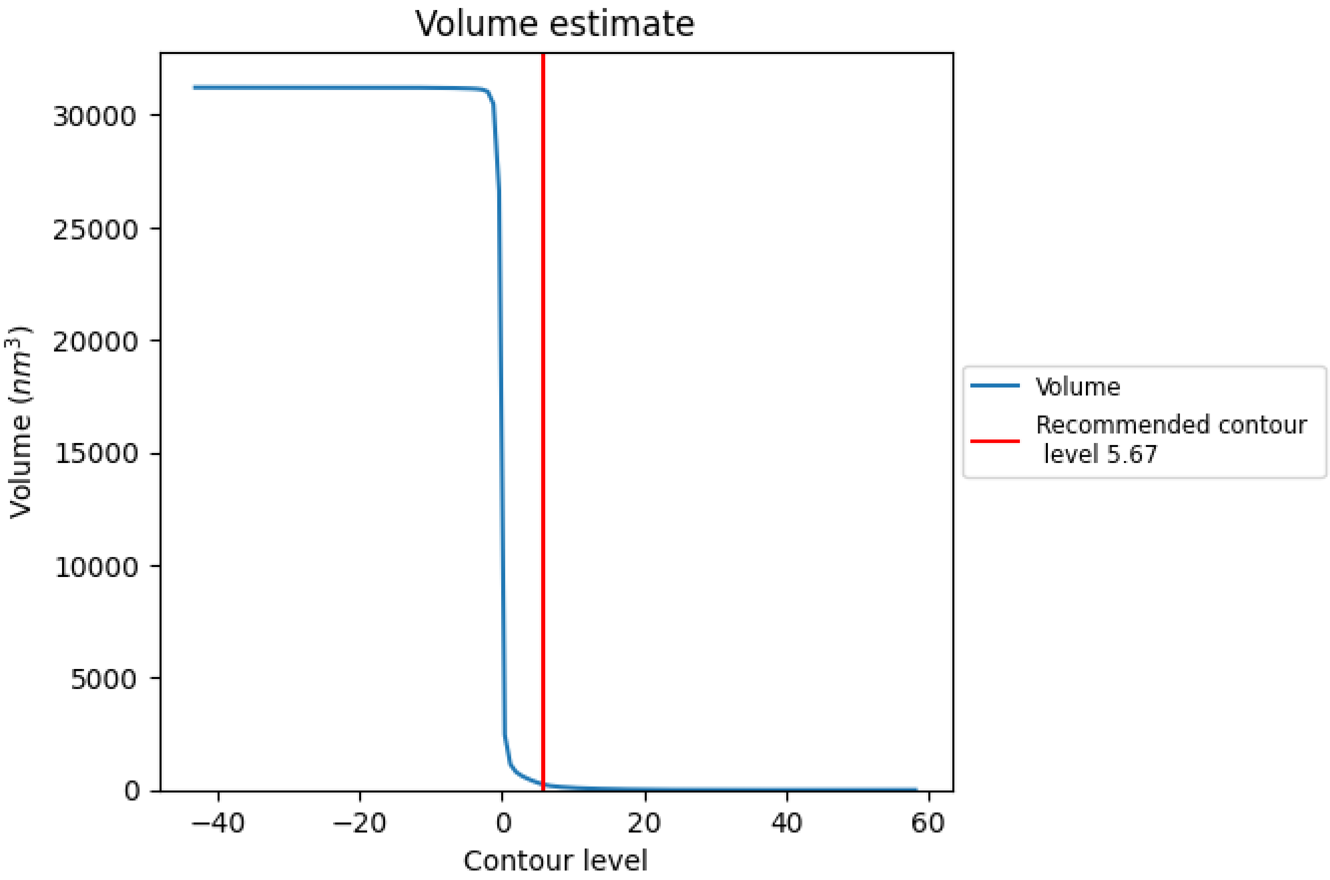
This section contains the results of statistical analysis of the map.

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.

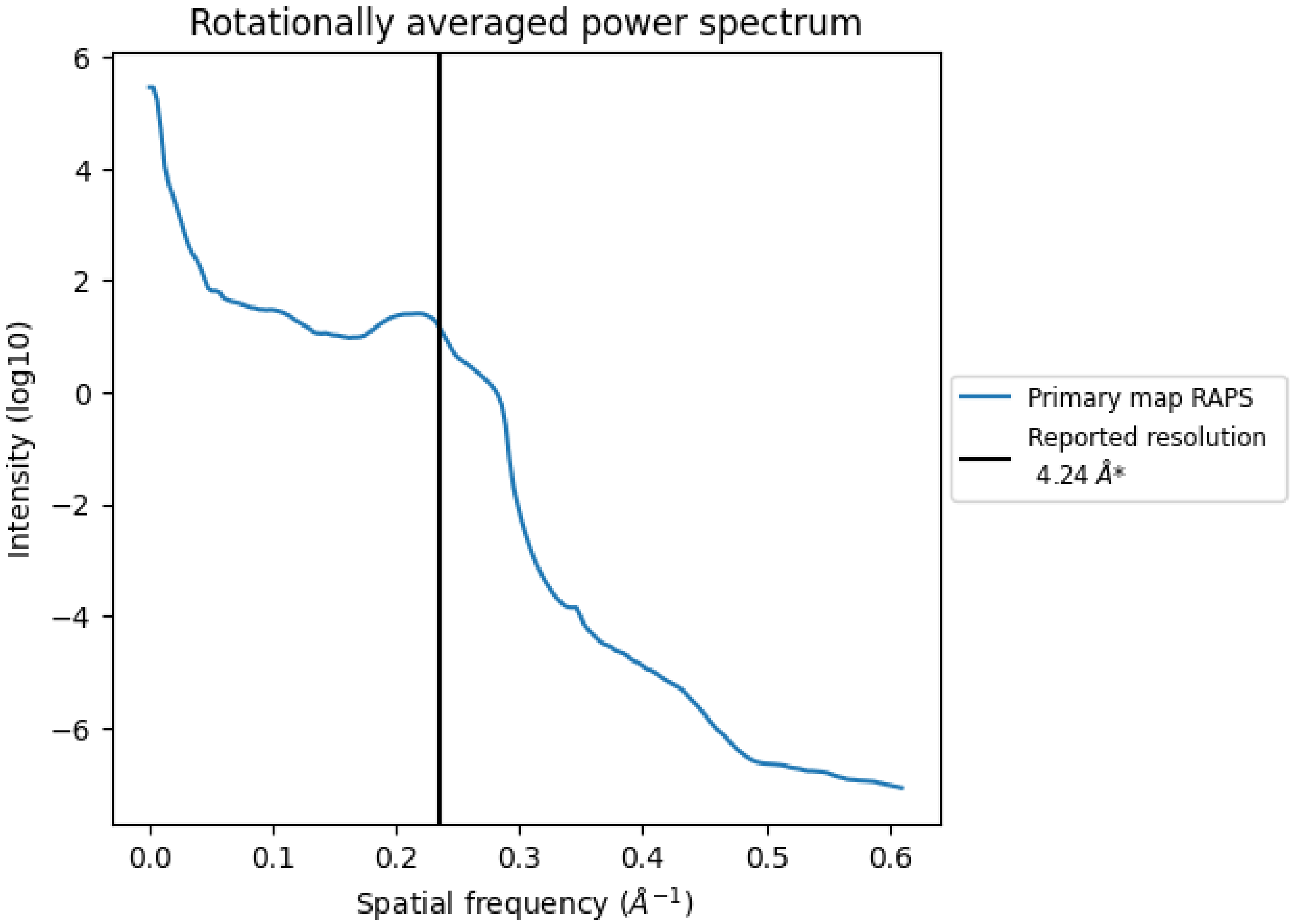
7.2 Volume estimate ⓘ



The volume at the recommended contour level is 260 nm^3; this corresponds to an approximate mass of 235 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 0.236 Å^{-1}

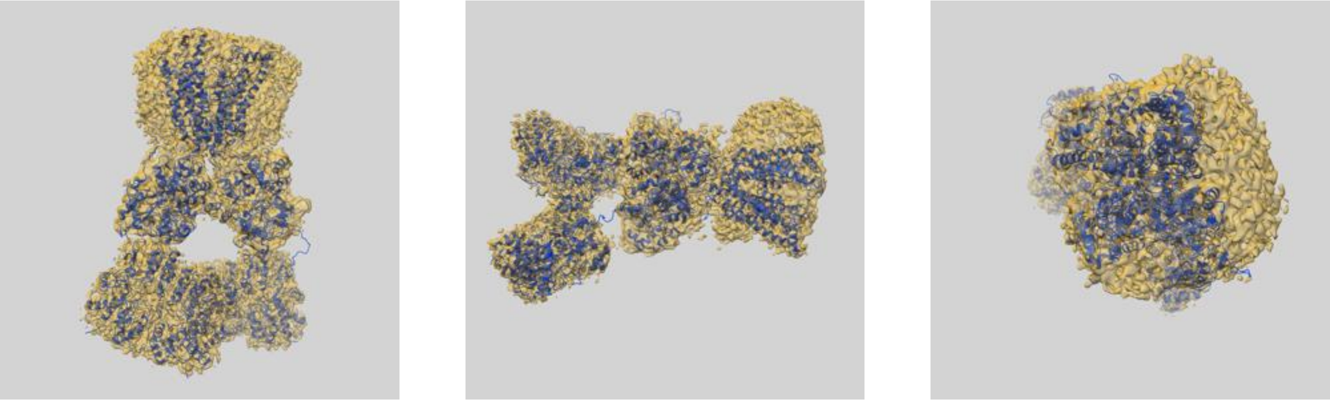
8 Fourier-Shell correlation ⓘ

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

9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-48897 and PDB model 9N4L. Per-residue inclusion information can be found in section 3 on page 8.

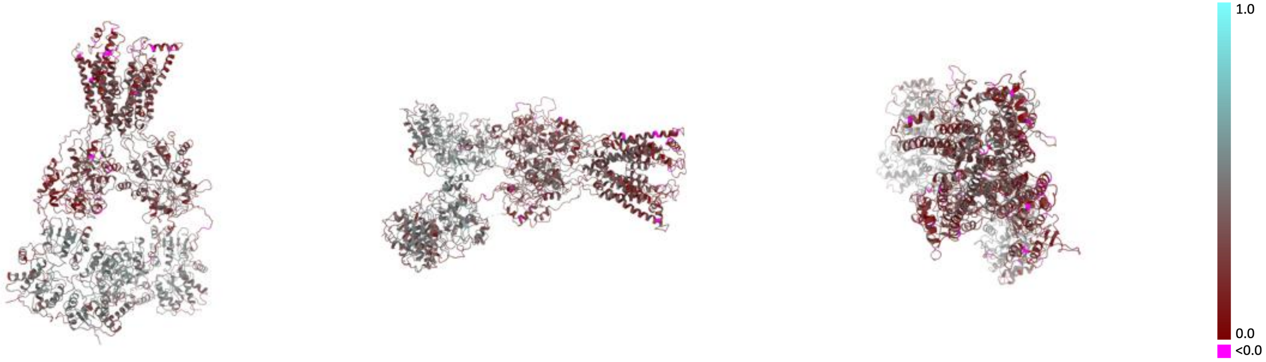
9.1 Map-model overlay ⓘ



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 5.67 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.

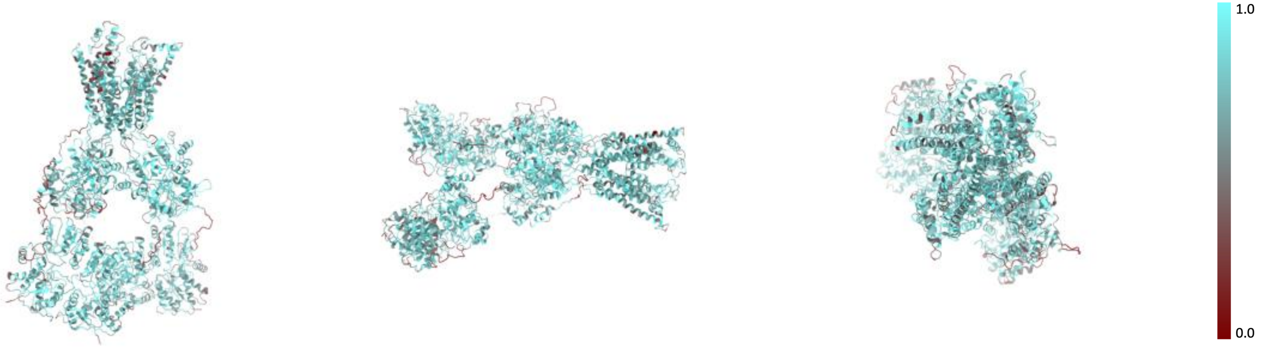
9.2 Q-score mapped to coordinate model ⓘ



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.

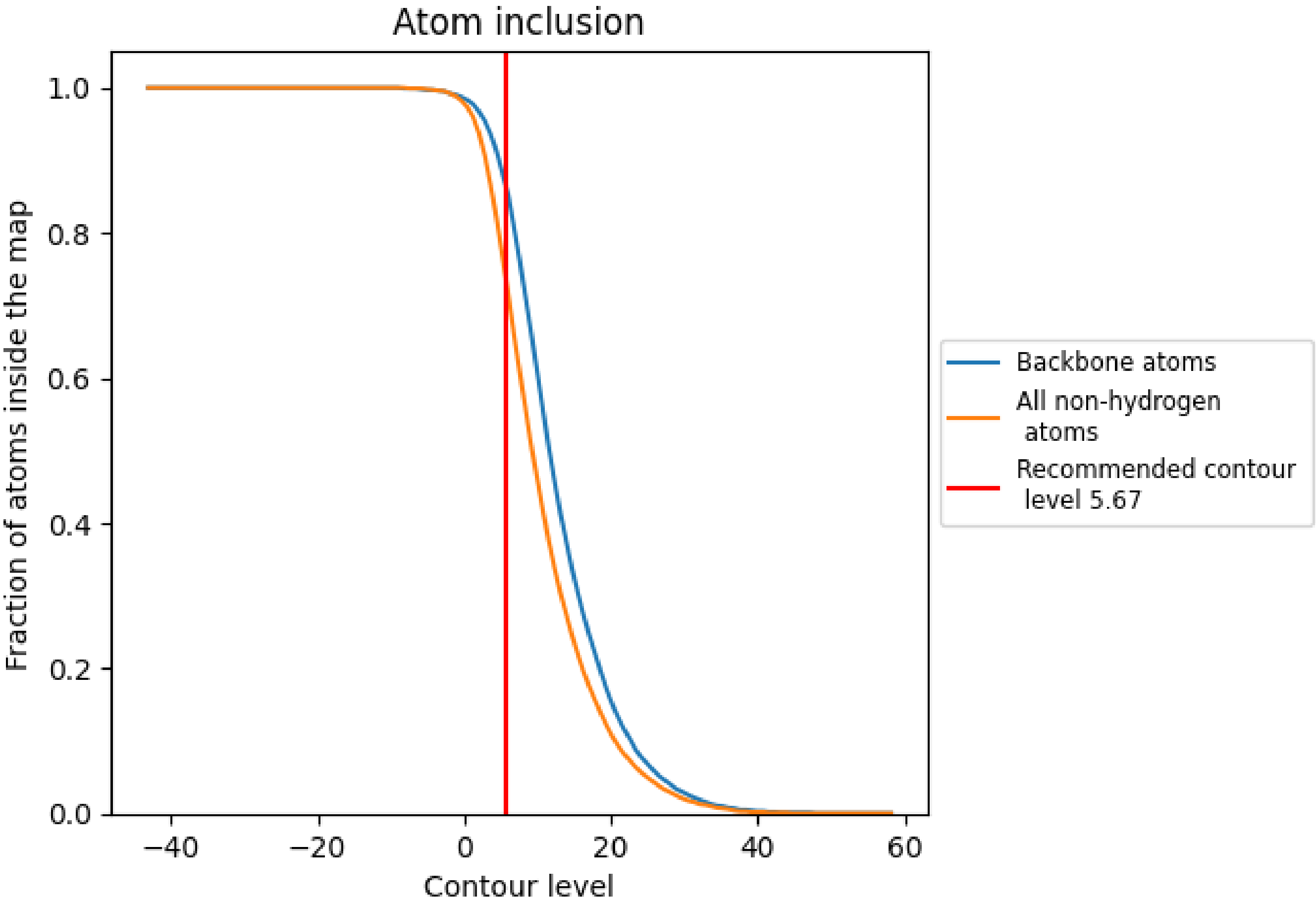
9.3 Atom inclusion mapped to coordinate model ⓘ



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 (5.67).

9.4 Atom inclusion ⓘ



At the recommended contour level, 86% of all backbone atoms, 74% 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 (5.67) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7360	0.3520
A	0.7020	0.3220
B	0.7710	0.3720
C	0.7350	0.3650
D	0.7470	0.3480
E	0.4290	0.3650
F	0.4920	0.3560
G	0.5360	0.2840
H	0.5080	0.4070
I	0.3210	0.3370
J	0.7500	0.3730
K	0.4100	0.3610
L	0.7500	0.4200
M	0.7500	0.4280