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wwPDB

P R O T E I N D A T A B A N K

wwPDB EM Validation Summary Report (i)

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PDB ID	:	6JP8
EMDB ID	:	EMD-9867
Title	:	Rabbit Cav1.1-Bay K8644 Complex
Authors	:	Zhao, Y.; Huang, G.; Wu, J.; Yan, N.
Deposited on	:	2019-03-26
Resolution	:	2.70 Å(reported)

This is a wwPDB EM Validation Summary 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 (i) 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 (i)) were used in the production of this report:

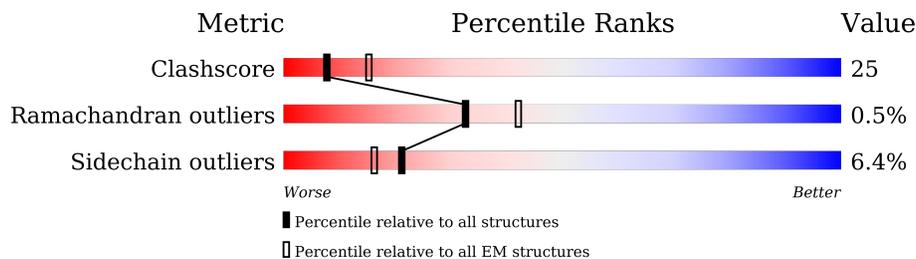|		
EMDB validation analysis	:	0.0.1.dev70
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1   Overall quality at a glance ⓘ

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

The reported resolution of this entry is 2.70 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	Percentile Ranks	Value
Clashscore		25
Ramachandran outliers		0.5%
Sidechain outliers		6.4%

Worse — *Better*

▮ Percentile relative to all structures
▯ Percentile relative to all EM structures

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

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=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	E	222	69% / 49% 20% 7% 24%
2	B	450	22% / 19% • 78%
2	C	450	40% / 30% 9% 60%
3	A	1873	33% / 51% 16% • 32%
4	F	1046	24% / 52% 36% • 7%
5	D	2	100% / 50% 50%
5	G	2	100% / 100%
5	J	2	50% / 100%

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Mol	Chain	Length	Quality of chain
5	K	2	100% / 100%
6	H	3	67% / 33% 33% 33%
6	I	3	33% / 67% 33%
7	L	3	100% / 67% 33%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
5	NAG	D	1	-	-	X	-
7	NAG	L	1	-	-	X	-

2 Entry composition ⓘ

There are 11 unique types of molecules in this entry. The entry contains 21801 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 Voltage-dependent calcium channel gamma-1 subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	E	169	Total 1326	C 872	N 216	O 220	S 18	0	0

- Molecule 2 is a protein called Voltage-dependent L-type calcium channel subunit beta-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	100	Total 710	C 455	N 125	O 129	S 1	0	0
2	C	178	Total 1367	C 876	N 232	O 254	S 5	0	0

There are 10 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	75	GLN	-	expression tag	UNP P19517
B	76	GLY	-	expression tag	UNP P19517
B	77	PRO	-	expression tag	UNP P19517
B	78	HIS	-	expression tag	UNP P19517
B	79	MET	-	expression tag	UNP P19517
C	75	GLN	-	expression tag	UNP P19517
C	76	GLY	-	expression tag	UNP P19517
C	77	PRO	-	expression tag	UNP P19517
C	78	HIS	-	expression tag	UNP P19517
C	79	MET	-	expression tag	UNP P19517

- Molecule 3 is a protein called Voltage-dependent L-type calcium channel subunit alpha-1S.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	A	1274	Total 10219	C 6728	N 1668	O 1753	S 70	0	0

- Molecule 4 is a protein called Voltage-dependent calcium channel subunit alpha-2/delta-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	F	973	Total 7804	C 4942	N 1320	O 1510	S 32	1	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	?	-	SER	See sequence details	UNP P13806

- Molecule 5 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-3)-2-a cetamido-2-deoxy-beta-D-glucopyranose.

Mol	Chain	Residues	Atoms				AltConf	Trace
5	D	2	Total 28	C 16	N 2	O 10	0	0
5	G	2	Total 28	C 16	N 2	O 10	0	0
5	J	2	Total 28	C 16	N 2	O 10	0	0
5	K	2	Total 28	C 16	N 2	O 10	0	0

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

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

- Molecule 7 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-3)-2-a cetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.
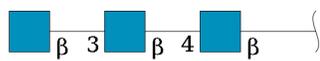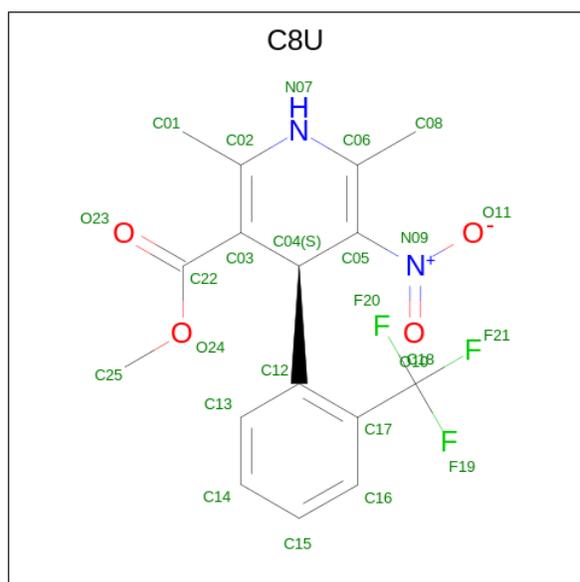
Mol	Chain	Residues	Atoms				AltConf	Trace
7	L	3	Total 42	C 24	N 3	O 15	0	0

- Molecule 8 is methyl (4 {S})-2,6-dimethyl-5-nitro-4-[2-(trifluoromethyl)phenyl]-1,4-dihydro pyridine-3-carboxylate (three-letter code: C8U) (formula: $C_{16}H_{15}F_3N_2O_4$).

Mol	Chain	Residues	Atoms					AltConf
8	A	1	Total 25	C 16	F 3	N 2	O 4	0

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

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

- Molecule 10 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		AltConf
10	A	2	Total	Ca	0
			2	2	

- Molecule 11 is ETHANOLAMINE (three-letter code: ETA) (formula: C_2H_7NO).

ETA

O

OH

CA

C

H₂N

N

Mol	Chain	Residues	Atoms				AltConf
11	F	1	Total 4	C 2	N 1	O 1	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: Voltage-dependent calcium channel gamma-1 subunit

Chain E:

• Molecule 2: Voltage-dependent L-type calcium channel subunit beta-1

Chain B:

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

ASP GLU ASN GLN LEU GLU ASP ALA CYS GLU HIS LEU ALA GLU TYR LEU GLU GLU ALA TYR TRP LYS ALA THR HIS PRO SER SER THR PRO PRO ASN PRO LEU LEU ASN ARG THR MET ALA THR ALA LEU ALA SER PRO ALA PRO VAL SER ASN ASN GLN VAL VAL LEU THR

SER LEU ARG ASN LEU SER PHE TRP GLY LEU GLU THR SER GLN ARG GLY GLY ALA VAL PRO GLN GLN GLU HIS ALA MET

• Molecule 2: Voltage-dependent L-type calcium channel subunit beta-1

Chain C:

GLN GLY PRO HIS MET ALA LEU ARG LYS GLU GLY ALA GLU ALA GLN GLN ALA LEU ALA GLN LEU GLU LYS ALA LYS THR LYS PRO VAL ALA PHE ALA VAL ARG THR ASN VAL GLY TYR ASN PRO SER PRO GLY ASP GLU VAL PRO VAL GLN GLY VAL ALA ILE THR PHE GLU PRO LYS ASP PHE LEU

HIS ILE LYS GLU LYS TYR ASN ASN ASP TRP TRP ILE GLY ARG LEU VAL LYS GLU GLY CYS GLU VAL GLY PHE ILE PRO SER PRO VAL LYS LEU ASP SER LEU ARG LEU LEU GLN GLU GLN LYS LEU ARG GLN ASN ARG LEU SER SER SER LYS SER GLY ASP ASN SER SER SER LEU

GLY ASP VAL VAL THR GLY THR ARG ARG PRO THR PRO PRO ALA SER GLY ASN GLU MET THR ASN LEU ALA PHE GLU LEU GLU LEU GLU ASP GLU ALA GLU LEU GLY GLU GLN GLY SER SER GLY LYS THR SER VAL SER VAL THR PRO PRO HIS GLY THR

ARG ILE PRO PHE LYS LYS THR GLU HIS **V265 P266 P267 Y268 D269 V270 V271 P272 S273 M274 R275 P276 I277 I278 L279 V280 G281 P282 S283 L284 K285 G286 Y287 E288 V289 T290 D291 M292 M293 Q294 K295 A296 L297 F298 D299 F300 L301 K302 H303 L304 F305 D306 G307 R308 I309 S310 I311 T312 R313 V314**

T315 A316 D317 I318 S319 L320 A321 LYS ARG SER VAL LEU ASN ASN PRO SER LYS HIS ILE ILE ILE GLU ARG SER ASN THR **R341 S342 S343 L344 A345 E346 V347 Q348 S349 E350 I351 E352 R353 I354 F355 E356 L357 A358 R359 T360 L361 Q362 L363 V364 A365 L366 D367 A368 D369 T370 I371 N372 H373 P374**

A375 Q376 L377 S378 K379 T380 S381 L382 A383 P384 I385 I386 V387 Y388 I389 K390 I391 T392 S393 P394 K395 V396 L397 Q398 R399 L400 I401 K402 S403 R404 G405 K406 S407 Q408 S409 K410 H411 L412 N413 V414 Q415 I416 A417 A418 S419 E420 K421 L422 A423 Q424 C425 P426 P427 E428 M429 F430 D431 I432 I433 L434

D435 E436 N437 Q438 L439 E440 D441 A442 C443 E444 H445 L446 A447 E448 Y449 L450 E451 A452 Y453 W454 K455 A456 T457 H458 PRO SER SER THR PRO PRO ASN PRO LEU LEU ASN ARG THR MET ALA THR ALA LEU ALA SER PRO ALA PRO VAL SER ASN LEU GLN VAL VAL LEU THR

SER LEU ARG ARG ASN LEU SER PHE TRP GLY LEU GLU THR SER GLN ARG GLY GLY ALA VAL PRO GLN GLN GLU HIS ALA MET

• Molecule 3: Voltage-dependent L-type calcium channel subunit alpha-1S

Chain A:

MET GLU PRO SER SER PRO GLN ASP GLU GLY LEU ARG LYS LYS GLN PRO LYS LYS PRO LEU PRO GLU VAL LEU PRO ARG PRO PRO ARG ALA LEU **F32 C33 L34 T35 L36 Q37 N38 P39 L40 R41 K42 A43 C44 I45 S46 I47 V48 E49 W50 K51 P52 F53 E54 T55 I56 I57 L58 V59**

F62 A63 N64 P75 L86 L89 E90 Y91 L94 T95 S98 I99 E100 A101 A102 M103 K104 I105 I106 A107 Y108 G109 F110 L111 F112 H113 Q114 D115 A116 Y117 L118 R119 S120 G121 W122 N123 V124 L125 D126 F127 I128 I129 V130 F131 L132 G133 V134 F135 T136 A137 I138 L139 E140 Q141 V142

N143 V144 ILE GLN SER ASN THR ALA PRO MET SER LYS GLY ALA GLY LEU ASP **V161 K162 A163 F167 L170 R171 P172 L173 R174 L175 V176 S177 G178 V179 P180 S181 L182 Q183 V184 V185 L186 N187 S188 I189 F190 K191 L194 P195 L196 I199 Y210 I213 G214 L215 K219**

• Molecule 4: Voltage-dependent calcium channel subunit alpha-2/delta-1

• Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain D:

• Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain G:

• Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain J:

• Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain K:

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

Chain H:

• Molecule 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 7: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain L:

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	542394	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{Å}^2$)	48	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 QUANTUM (4k x 4k)	Depositor
Maximum map value	0.284	Depositor
Minimum map value	-0.187	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.007	Depositor
Recommended contour level	0.044	Depositor
Map size (Å)	349.12, 349.12, 349.12	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.091, 1.091, 1.091	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: ETA, BMA, NAG, C8U, CA

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	E	0.52	0/1358	0.71	0/1832
2	B	0.28	0/723	0.45	0/979
2	C	0.30	0/1394	0.49	0/1892
3	A	0.46	0/10463	0.71	0/14191
4	F	0.81	1/7974 (0.0%)	0.78	0/10816
All	All	0.60	1/21912 (0.0%)	0.72	0/29710

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	F	665	ALA	C-N	-6.95	1.21	1.34

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	E	1326	0	1345	162	0
2	B	710	0	633	7	0
2	C	1367	0	1343	78	0
3	A	10219	0	10309	420	0
4	F	7804	0	7608	544	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	D	28	0	25	8	0
5	G	28	0	25	1	0
5	J	28	0	25	0	0
5	K	28	0	25	7	0
6	H	39	0	34	4	0
6	I	39	0	34	1	0
7	L	42	0	37	12	0
8	A	25	0	0	1	0
9	A	14	0	13	0	0
9	F	98	0	91	15	0
10	A	2	0	0	0	0
11	F	4	0	0	2	0
All	All	21801	0	21547	1097	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 25.

The worst 5 of 1097 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)
4:F:784:ASN:ND2	9:F:1120:NAG:C1	1.68	1.53
4:F:678:ASN:HD21	5:K:1:NAG:C1	1.19	1.52
3:A:226:CYS:HB3	3:A:254:CYS:SG	1.48	1.50
4:F:326:ASN:ND2	9:F:1104:NAG:C1	1.72	1.50
4:F:988:ASN:HD21	9:F:1122:NAG:C1	1.18	1.48

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	E	159/222 (72%)	147 (92%)	9 (6%)	3 (2%)	8	20
2	B	98/450 (22%)	89 (91%)	9 (9%)	0	100	100
2	C	174/450 (39%)	162 (93%)	12 (7%)	0	100	100
3	A	1260/1873 (67%)	1181 (94%)	76 (6%)	3 (0%)	47	73
4	F	968/1046 (92%)	876 (90%)	86 (9%)	6 (1%)	25	50
All	All	2659/4041 (66%)	2455 (92%)	192 (7%)	12 (0%)	32	54

5 of 12 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	206	ARG
3	A	1101	TYR
4	F	349	TYR
1	E	218	ALA
3	A	1174	ALA

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	E	143/192 (74%)	128 (90%)	15 (10%)	7	16
2	B	58/391 (15%)	57 (98%)	1 (2%)	60	84
2	C	143/391 (37%)	141 (99%)	2 (1%)	67	86
3	A	1097/1628 (67%)	1039 (95%)	58 (5%)	22	48
4	F	868/924 (94%)	797 (92%)	71 (8%)	11	26
All	All	2309/3526 (66%)	2162 (94%)	147 (6%)	21	39

5 of 147 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
4	F	525	LEU
4	F	1062	CYS
4	F	542	ASN

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Mol	Chain	Res	Type
4	F	785	LYS
3	A	1010	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 43 such sidechains are listed below:

Mol	Chain	Res	Type
4	F	511	ASN
4	F	773	ASN
4	F	520	ASN
4	F	570	ASN
4	F	866	ASN

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 ⓘ

17 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	$\#|Z| > 2$
5	NAG	D	1	5	14,14,15	0.29	0	17,19,21	1.02	1 (5%)
5	NAG	D	2	5	14,14,15	0.31	0	17,19,21	0.54	0
5	NAG	G	1	4,5	14,14,15	0.31	0	17,19,21	0.61	0
5	NAG	G	2	5	14,14,15	0.29	0	17,19,21	0.61	0
6	NAG	H	1	4,6	14,14,15	0.71	1 (7%)	17,19,21	0.70	0
6	NAG	H	2	6	14,14,15	0.37	0	17,19,21	0.77	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
6	BMA	H	3	6	11,11,12	0.75	0	15,15,17	0.97	1 (6%)
6	NAG	I	1	4,6	14,14,15	0.83	1 (7%)	17,19,21	0.83	0
6	NAG	I	2	6	14,14,15	1.60	1 (7%)	17,19,21	0.92	1 (5%)
6	BMA	I	3	6	11,11,12	0.93	0	15,15,17	1.05	1 (6%)
5	NAG	J	1	4,5	14,14,15	0.53	0	17,19,21	0.62	0
5	NAG	J	2	5	14,14,15	0.31	0	17,19,21	0.39	0
5	NAG	K	1	5	14,14,15	0.29	0	17,19,21	0.66	0
5	NAG	K	2	5	14,14,15	0.29	0	17,19,21	0.58	0
7	NAG	L	1	4,7	14,14,15	0.29	0	17,19,21	0.65	0
7	NAG	L	2	7	14,14,15	0.31	0	17,19,21	0.69	0
7	NAG	L	3	7	14,14,15	0.27	0	17,19,21	1.33	1 (5%)

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	D	1	5	-	5/6/23/26	0/1/1/1
5	NAG	D	2	5	-	2/6/23/26	0/1/1/1
5	NAG	G	1	4,5	-	0/6/23/26	0/1/1/1
5	NAG	G	2	5	-	3/6/23/26	0/1/1/1
6	NAG	H	1	4,6	-	0/6/23/26	0/1/1/1
6	NAG	H	2	6	-	2/6/23/26	0/1/1/1
6	BMA	H	3	6	-	0/2/19/22	0/1/1/1
6	NAG	I	1	4,6	-	2/6/23/26	0/1/1/1
6	NAG	I	2	6	-	2/6/23/26	0/1/1/1
6	BMA	I	3	6	-	2/2/19/22	0/1/1/1
5	NAG	J	1	4,5	-	2/6/23/26	0/1/1/1
5	NAG	J	2	5	-	0/6/23/26	0/1/1/1
5	NAG	K	1	5	-	4/6/23/26	0/1/1/1
5	NAG	K	2	5	-	6/6/23/26	0/1/1/1
7	NAG	L	1	4,7	-	2/6/23/26	0/1/1/1
7	NAG	L	2	7	-	5/6/23/26	0/1/1/1
7	NAG	L	3	7	-	4/6/23/26	0/1/1/1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	I	2	NAG	O5-C1	-5.83	1.34	1.43
6	I	1	NAG	O5-C1	-2.62	1.39	1.43
6	H	1	NAG	O5-C1	-2.33	1.40	1.43

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	L	3	NAG	C1-O5-C5	4.34	118.08	112.19
5	D	1	NAG	C3-C4-C5	2.52	114.73	110.24
6	H	3	BMA	C1-O5-C5	2.47	115.53	112.19
6	I	2	NAG	C4-C3-C2	2.28	114.35	111.02
6	I	3	BMA	O5-C1-C2	-2.01	107.66	110.77

There are no chirality outliers.

5 of 41 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	D	1	NAG	C8-C7-N2-C2
5	D	1	NAG	O7-C7-N2-C2
5	K	1	NAG	C8-C7-N2-C2
5	K	1	NAG	O7-C7-N2-C2
7	L	1	NAG	C8-C7-N2-C2

There are no ring outliers.

11 monomers are involved in 33 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	G	2	NAG	1	0
5	K	1	NAG	5	0
5	K	2	NAG	4	0
5	D	1	NAG	8	0
6	H	1	NAG	4	0
5	D	2	NAG	4	0
6	I	1	NAG	1	0
7	L	2	NAG	2	0
7	L	1	NAG	7	0
7	L	3	NAG	4	0
5	G	1	NAG	1	0

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

Oligosaccharide Chain D

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain G

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain J

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain K

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain H

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain I

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain L

Bond lengths

Bond angles

Torsions

Rings

5.6 Ligand geometry ⓘ

Of 12 ligands modelled in this entry, 2 are monoatomic - leaving 10 for Mogul analysis.

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	$\#|Z| > 2$
9	NAG	A	1902	-	14,14,15	0.30	0	17,19,21	0.55	0
8	C8U	A	1901	-	22,26,26	3.59	7 (31%)	30,39,39	2.61	11 (36%)
11	ETA	F	1101	-	3,3,3	0.39	0	2,2,2	0.52	0
9	NAG	F	1104	-	14,14,15	0.29	0	17,19,21	0.70	0
9	NAG	F	1122	-	14,14,15	0.29	0	17,19,21	0.62	0
9	NAG	F	1107	4	14,14,15	0.30	0	17,19,21	0.61	0
9	NAG	F	1121	-	14,14,15	0.45	0	17,19,21	0.51	0
9	NAG	F	1120	-	14,14,15	0.30	0	17,19,21	0.61	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
9	NAG	F	1115	4	14,14,15	0.80	1 (7%)	17,19,21	1.01	1 (5%)
9	NAG	F	1114	4	14,14,15	0.25	0	17,19,21	0.66	1 (5%)

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
9	NAG	A	1902	-	-	2/6/23/26	0/1/1/1
8	C8U	A	1901	-	-	9/18/40/40	0/2/2/2
11	ETA	F	1101	-	-	1/1/1/1	-
9	NAG	F	1104	-	-	3/6/23/26	0/1/1/1
9	NAG	F	1122	-	-	2/6/23/26	0/1/1/1
9	NAG	F	1107	4	-	2/6/23/26	0/1/1/1
9	NAG	F	1121	-	-	0/6/23/26	0/1/1/1
9	NAG	F	1120	-	-	2/6/23/26	0/1/1/1
9	NAG	F	1115	4	-	0/6/23/26	0/1/1/1
9	NAG	F	1114	4	-	0/6/23/26	0/1/1/1

The worst 5 of 8 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
8	A	1901	C8U	C02-C03	13.86	1.52	1.35
8	A	1901	C8U	C02-N07	4.85	1.45	1.38
8	A	1901	C8U	C06-N07	4.79	1.44	1.38
8	A	1901	C8U	O10-N09	-3.12	1.17	1.22
8	A	1901	C8U	O24-C22	2.86	1.39	1.33

The worst 5 of 13 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	A	1901	C8U	C01-C02-C03	-8.34	119.28	127.62
8	A	1901	C8U	C08-C06-N07	5.16	119.59	113.45
8	A	1901	C8U	C01-C02-N07	5.12	119.53	113.45
8	A	1901	C8U	O24-C22-C03	4.45	120.23	112.30
9	F	1115	NAG	C1-O5-C5	3.63	117.11	112.19

There are no chirality outliers.

5 of 21 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
8	A	1901	C8U	C06-C05-N09-O10
9	F	1104	NAG	C8-C7-N2-C2
9	F	1104	NAG	O7-C7-N2-C2
8	A	1901	C8U	C03-C22-O24-C25
9	A	1902	NAG	O5-C5-C6-O6

There are no ring outliers.

8 monomers are involved in 18 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	A	1901	C8U	1	0
11	F	1101	ETA	2	0
9	F	1104	NAG	3	0
9	F	1122	NAG	4	0
9	F	1107	NAG	1	0
9	F	1121	NAG	3	0
9	F	1120	NAG	2	0
9	F	1115	NAG	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for 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 C8U A 1901

Bond lengths

Bond angles

Torsions

Rings
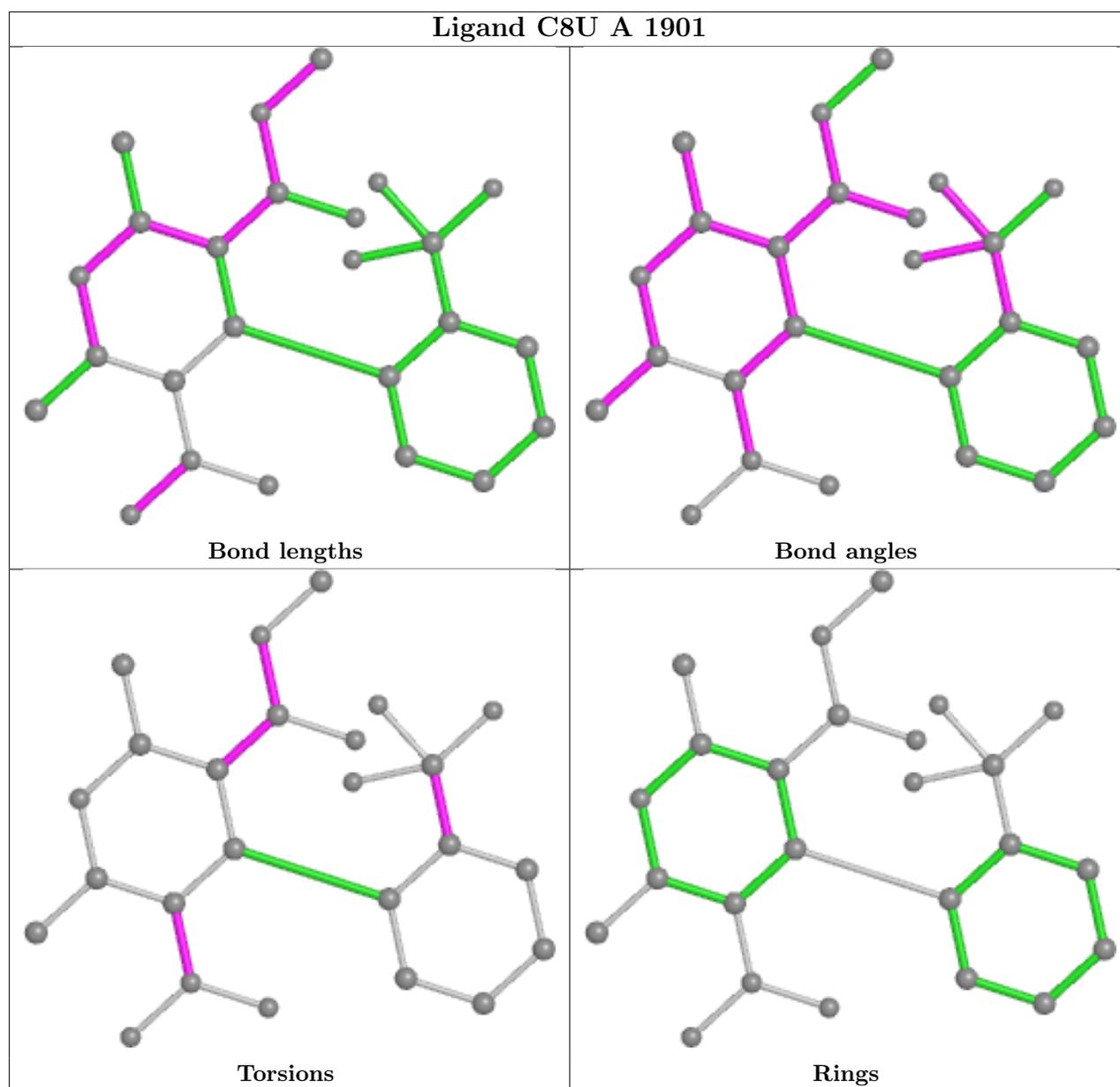
5.7 Other polymers ⓘ

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-9867. 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 |
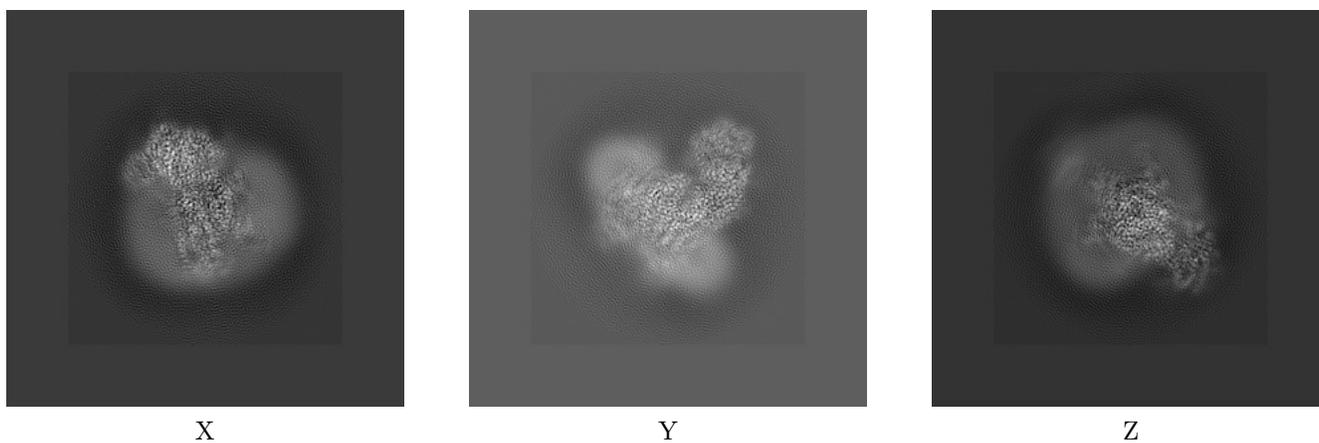
The images above show the map projected in three orthogonal directions.

6.2   Central slices ⓘ

6.2.1   Primary map

| X Index: 160 | Y Index: 160 | Z Index: 160 |
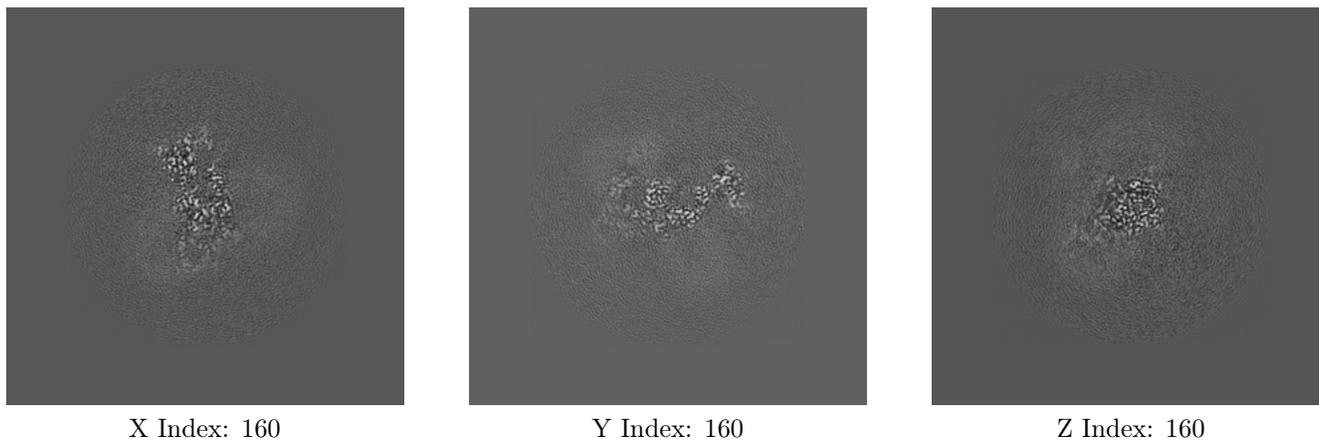
The images above show central slices of the map in three orthogonal directions.

6.3　Largest variance slices　ⓘ
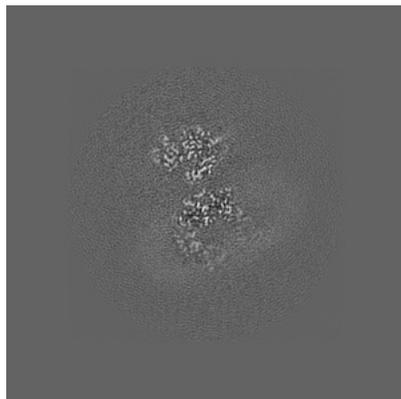
6.3.1　Primary map
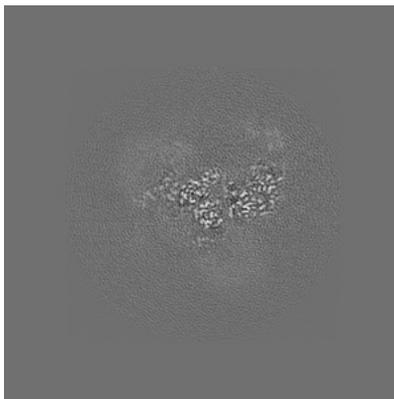
| X Index: 172 | Y Index: 148 | Z Index: 161 |
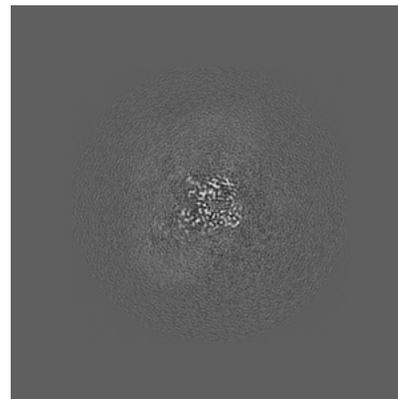
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1　Primary map

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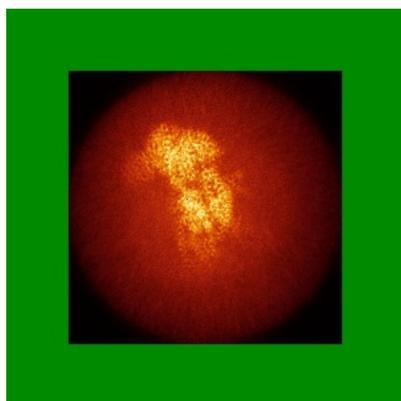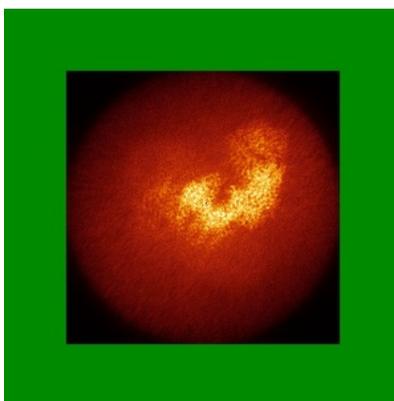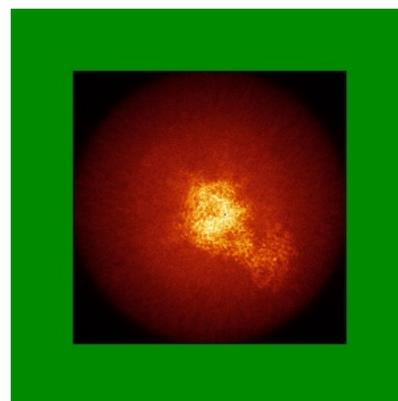
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views (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 0.044. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.6 Mask visualisation (i)

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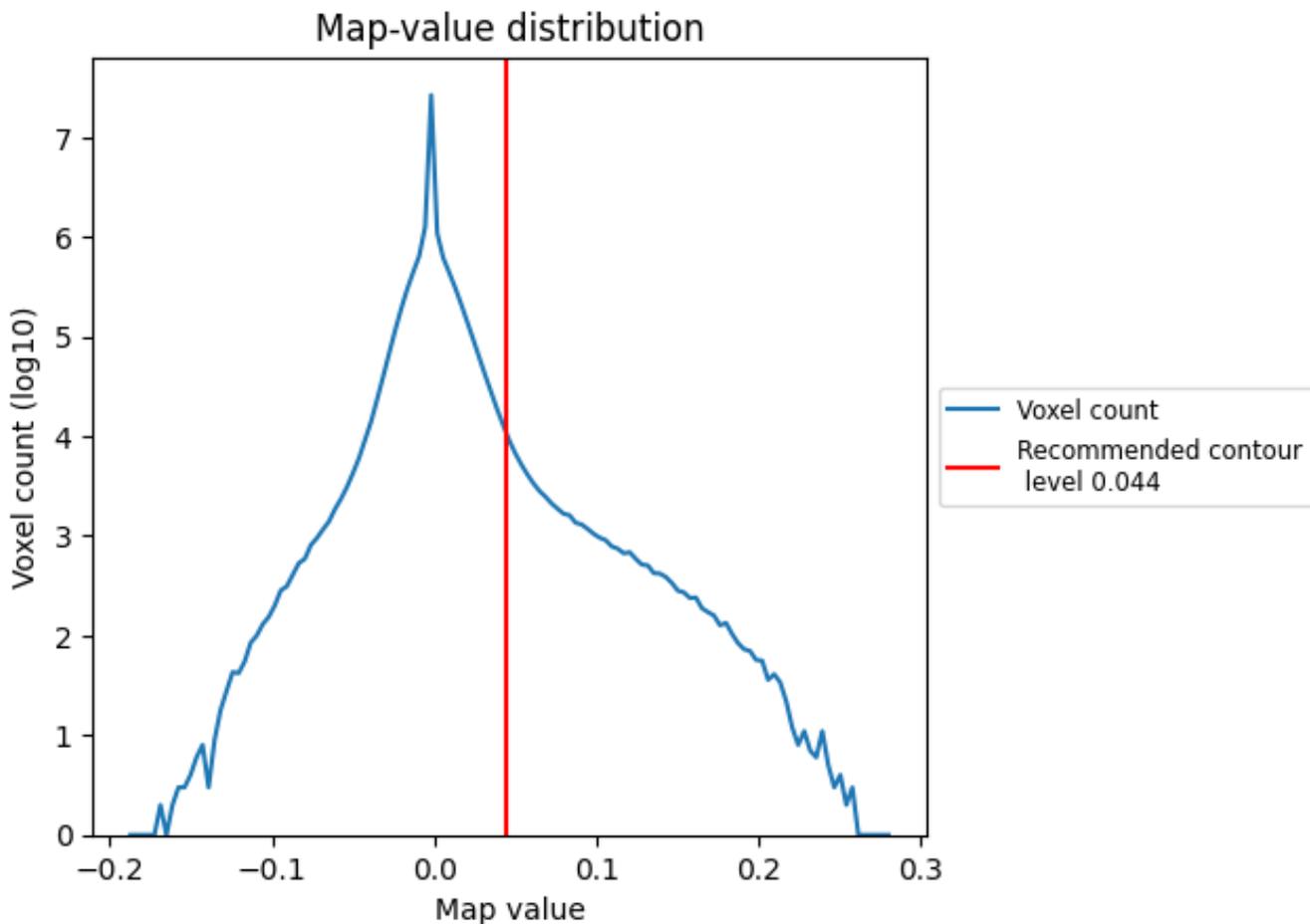
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2 Volume estimate (i)
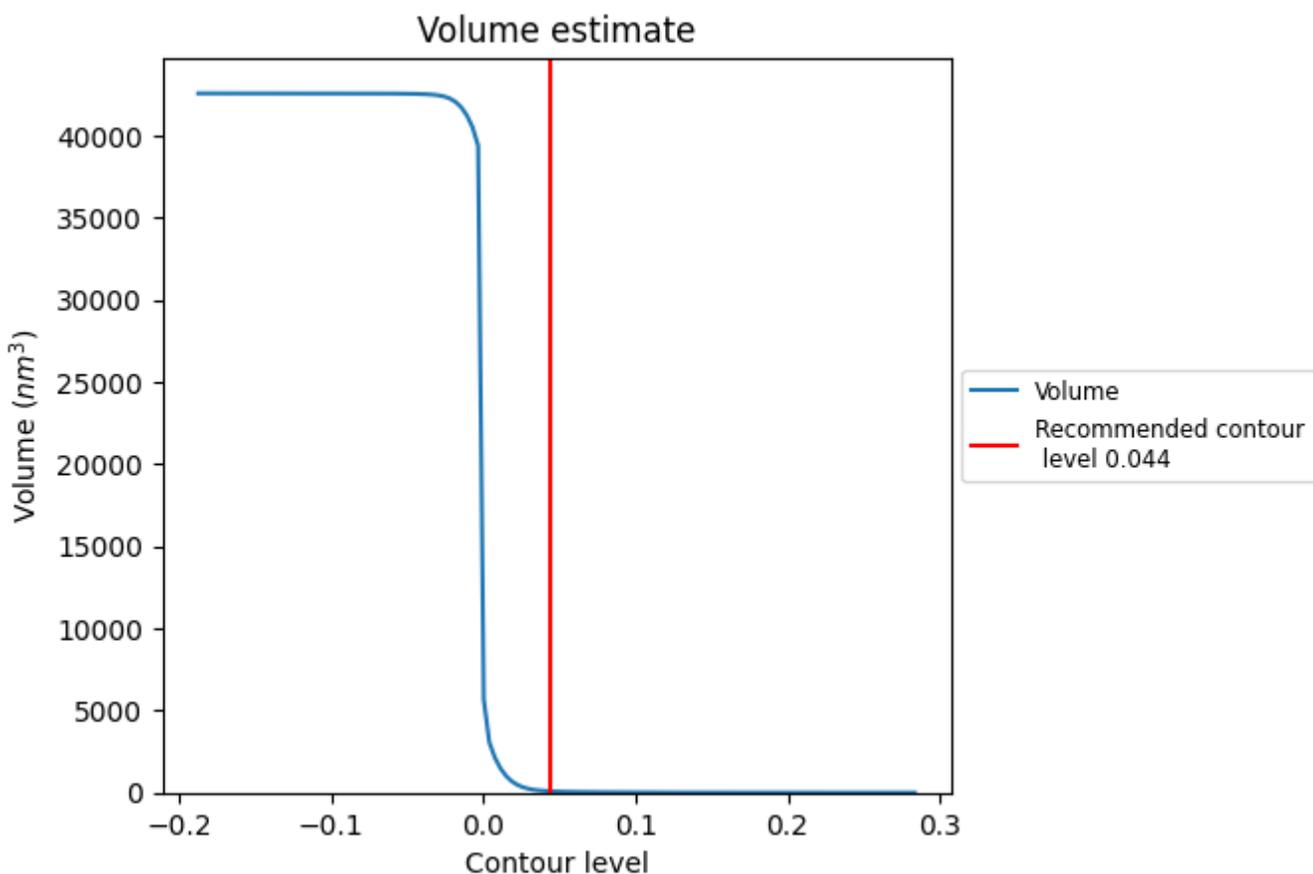
The volume at the recommended contour level is 83 nm^3; this corresponds to an approximate mass of 75 kDa.

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 ⓘ
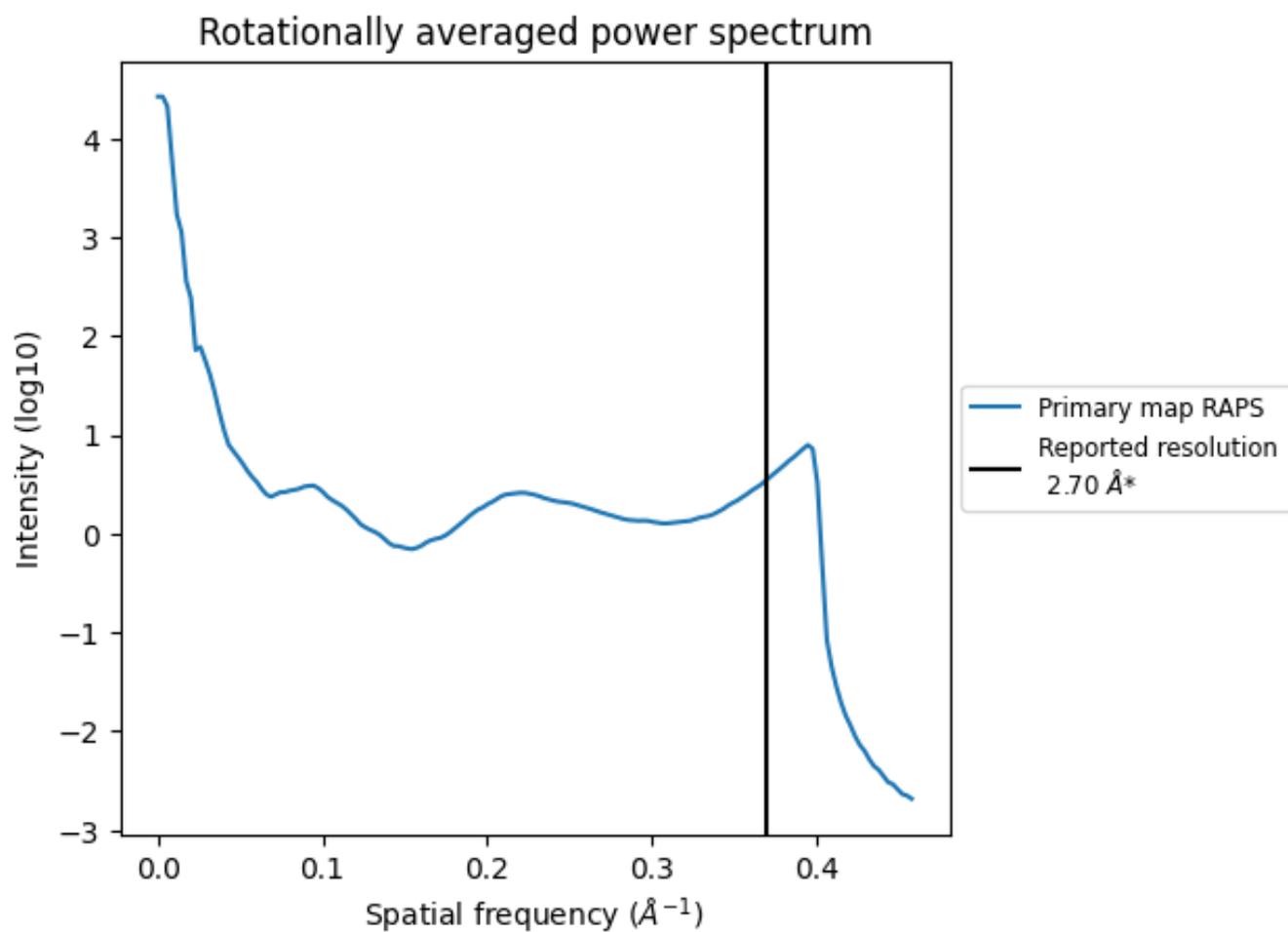
*Reported resolution corresponds to spatial frequency of 0.370 Å^{-1}

8 Fourier-Shell correlation (i)

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-9867 and PDB model 6JP8. Per-residue inclusion information can be found in section 3 on page 9.

9.1   Map-model overlay ⓘ

X   Y   Z
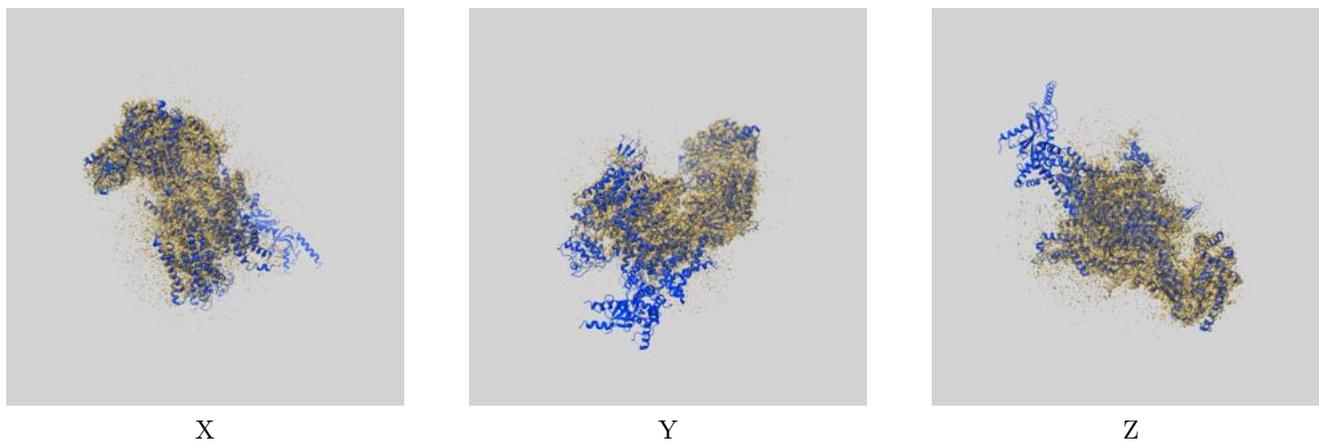
The images above show the 3D surface view of the map at the recommended contour level 0.044 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2　Q-score mapped to coordinate model ⓘ

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 ⓘ
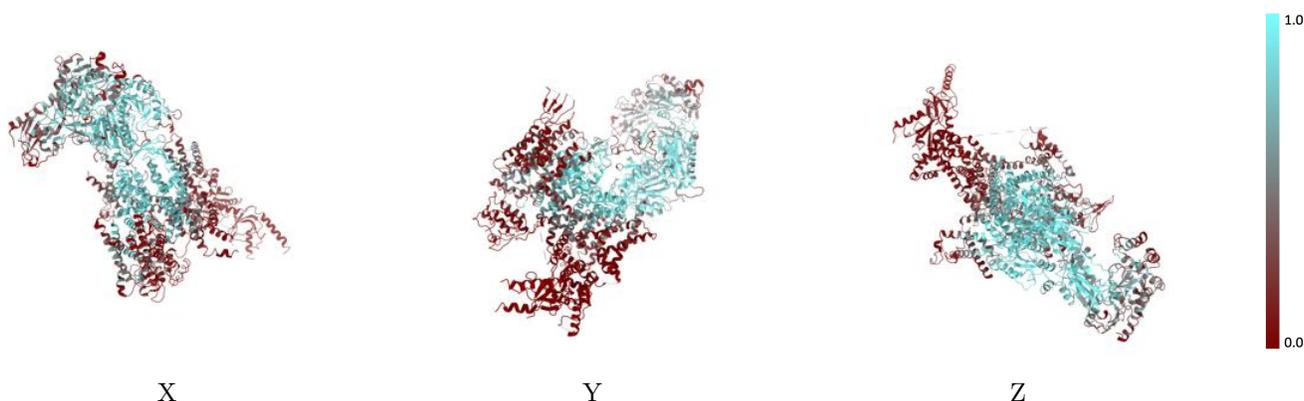
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.044).

9.4 Atom inclusion ⓘ
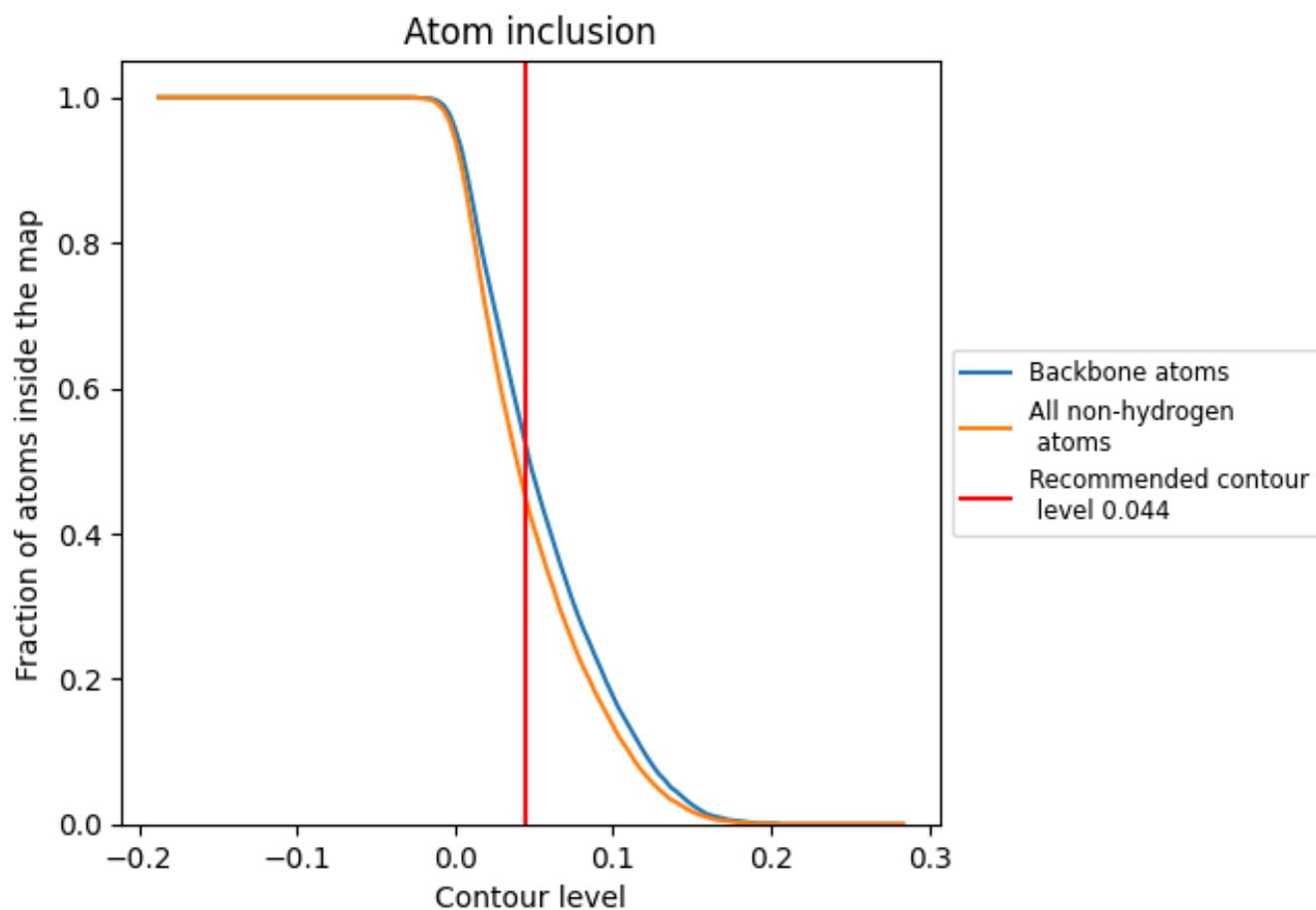
At the recommended contour level, 53% of all backbone atoms, 46% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.044) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.4550	0.3850
A	0.4680	0.4240
B	0.0000	0.0130
C	0.0000	0.0010
D	0.0710	0.2270
E	0.1300	0.1990
F	0.6200	0.4680
G	0.0710	0.1420
H	0.2820	0.2780
I	0.5380	0.4390
J	0.2500	0.3470
K	0.1070	0.2590
L	0.1190	0.2190

1.0

0.0

<0.0