wwPDB EM Validation Summary Report ⓘ

Jul 14, 2025 – 06:21 PM EDT

PDB ID	:	9N0D / pdb_00009n0d
EMDB ID	:	EMD-48781
Title	:	JUNV GP1, GP2, SSP complex with neutralizing antibody in a pseudotyped virus membrane
Authors	:	Taylor, L.J.; Sawaya, M.R.; Castells-Graells, R.; Rodriguez, J.A.
Deposited on	:	2025-01-24
Resolution	:	3.80 Å(reported)

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

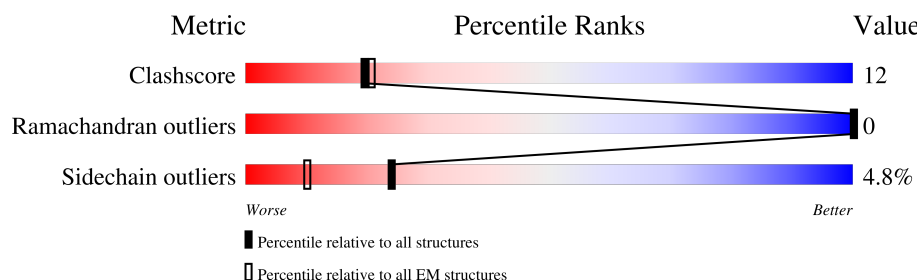|		
EMDB validation analysis	:	0.0.1.dev118
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4-5-2 with Phenix2.0rc1
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.44

1 Overall quality at a glance ⓘ

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

The reported resolution of this entry is 3.80 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		12
Ramachandran outliers		0
Sidechain outliers		4.8%

Worse *Better*

▮ Percentile relative to all structures

▯ Percentile relative to all EM structures

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	57	42% / 68% 28% •
1	F	57	42% / 65% 33% •
1	K	57	40% / 67% 30% •
2	B	187	• / 67% 30% •
2	G	187	• / 68% 30% •
2	L	187	• / 67% 32% •
3	C	234	23% / 68% 27% • •
3	H	234	23% / 70% 25% • •

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Mol	Chain	Length	Quality of chain
3	M	234	23% ▬ 69% 26% ··
4	D	106	65% 34% ·
4	I	106	67% 32% ·
4	N	106	69% 30% ·
5	E	119	8% 56% 42% ·
5	J	119	7% 56% 42% ·
5	O	119	8% 59% 39% ·
6	R	3	33% 100%
6	W	3	33% 100%
6	Y	3	67% 33%
6	b	3	33% 100%
6	h	3	67% 33%
6	n	3	67% 33%

2 Entry composition ⓘ

There are 8 unique types of molecules in this entry. The entry contains 16989 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 Pre-glycoprotein polyprotein GP complex.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	57	Total	C	N	O	S	0	0
			441	296	68	75	2		
1	F	57	Total	C	N	O	S	0	0
			441	296	68	75	2		
1	K	57	Total	C	N	O	S	0	0
			441	296	68	75	2		

- Molecule 2 is a protein called Pre-glycoprotein polyprotein GP complex.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	187	Total	C	N	O	S	0	0
			1517	979	257	270	11		
2	G	187	Total	C	N	O	S	0	0
			1517	979	257	270	11		
2	L	187	Total	C	N	O	S	0	0
			1517	979	257	270	11		

- Molecule 3 is a protein called Pre-glycoprotein polyprotein GP complex.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	224	Total	C	N	O	S	0	0
			1829	1173	318	321	17		
3	H	224	Total	C	N	O	S	0	0
			1829	1173	318	321	17		
3	M	224	Total	C	N	O	S	0	0
			1829	1173	318	321	17		

- Molecule 4 is a protein called neutralizing antibody light chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	106	Total	C	N	O	S	0	0
			796	502	132	157	5		

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Mol	Chain	Residues	Atoms					AltConf	Trace
4	I	106	Total	C	N	O	S	0	0
			796	502	132	157	5		
4	N	106	Total	C	N	O	S	0	0
			796	502	132	157	5		

- Molecule 5 is a protein called neutralizing antibody heavy chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	E	119	Total	C	N	O	S	0	0
			917	575	156	180	6		
5	J	119	Total	C	N	O	S	0	0
			917	575	156	180	6		
5	O	119	Total	C	N	O	S	0	0
			917	575	156	180	6		

- Molecule 6 is an oligosaccharide called beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.
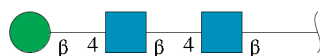
Mol	Chain	Residues	Atoms				AltConf	Trace
6	Y	3	Total	C	N	O	0	0
			39	22	2	15		
6	h	3	Total	C	N	O	0	0
			39	22	2	15		
6	n	3	Total	C	N	O	0	0
			39	22	2	15		
6	R	3	Total	C	N	O	0	0
			39	22	2	15		
6	W	3	Total	C	N	O	0	0
			39	22	2	15		
6	b	3	Total	C	N	O	0	0
			39	22	2	15		

- Molecule 7 is MYRISTIC ACID (CCD ID: MYR) (formula: $C_{14}H_{28}O_2$).

MYR
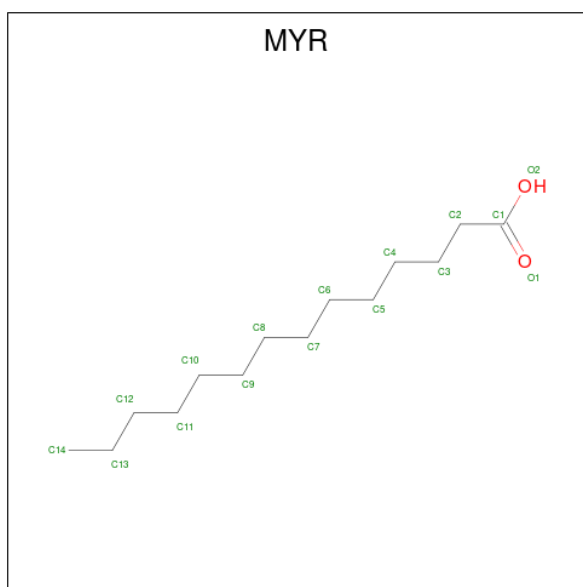
Mol	Chain	Residues	Atoms			AltConf
7	A	1	Total 15	C 14	O 1	0
7	F	1	Total 15	C 14	O 1	0
7	K	1	Total 15	C 14	O 1	0

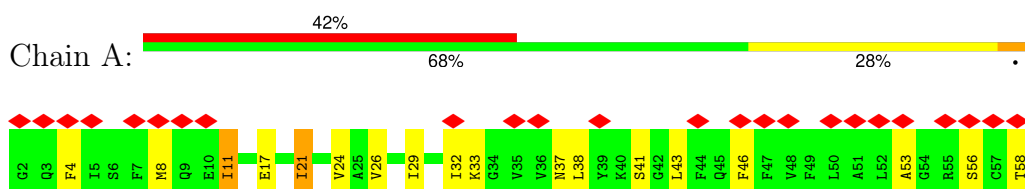- Molecule 8 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $C_8H_{15}NO_6$).

NAG

Mol	Chain	Residues	Atoms				AltConf
8	B	1	Total 14	C 8	N 1	O 5	0
8	B	1	Total 14	C 8	N 1	O 5	0
8	C	1	Total 14	C 8	N 1	O 5	0
8	C	1	Total 14	C 8	N 1	O 5	0
8	C	1	Total 14	C 8	N 1	O 5	0
8	G	1	Total 14	C 8	N 1	O 5	0
8	G	1	Total 14	C 8	N 1	O 5	0
8	H	1	Total 14	C 8	N 1	O 5	0
8	H	1	Total 14	C 8	N 1	O 5	0
8	H	1	Total 14	C 8	N 1	O 5	0
8	L	1	Total 14	C 8	N 1	O 5	0
8	L	1	Total 14	C 8	N 1	O 5	0
8	M	1	Total 14	C 8	N 1	O 5	0
8	M	1	Total 14	C 8	N 1	O 5	0
8	M	1	Total 14	C 8	N 1	O 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: Pre-glycoprotein polyprotein GP complex

Chain A:

- Molecule 1: Pre-glycoprotein polyprotein GP complex

Chain F:

- Molecule 1: Pre-glycoprotein polyprotein GP complex

Chain K:

- Molecule 2: Pre-glycoprotein polyprotein GP complex

Chain B:

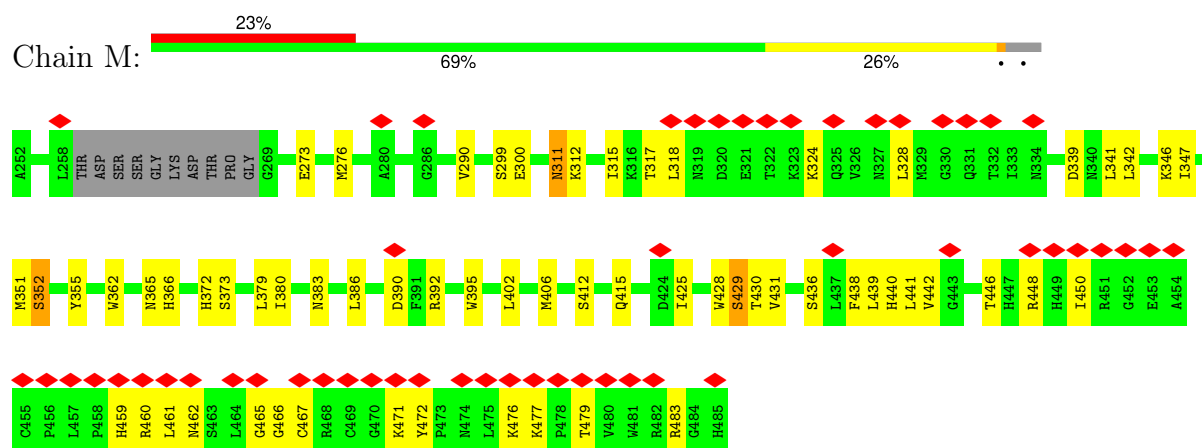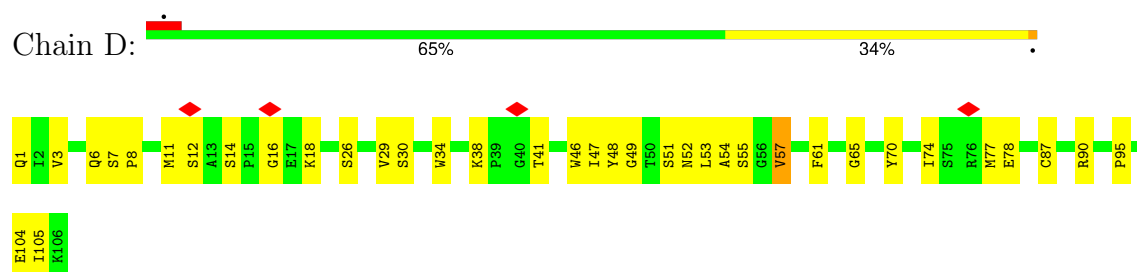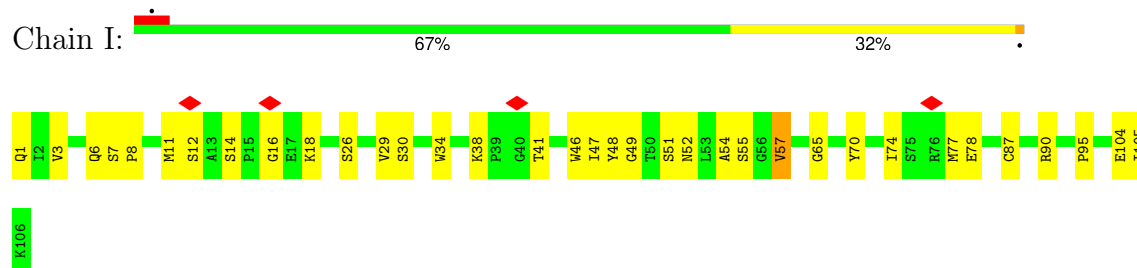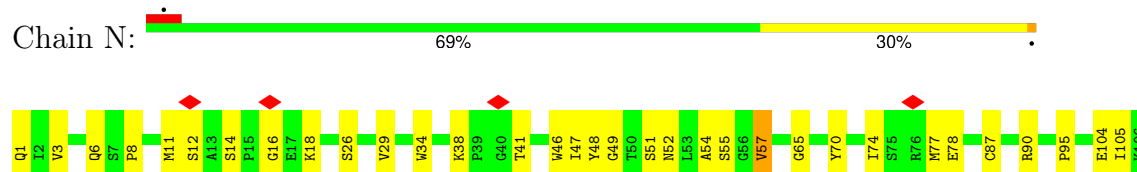- Molecule 2: Pre-glycoprotein polyprotein GP complex

Chain G:

A61 I64 G65 L66 H67 T68 E69 F70 Q71 T72 V73 G79 N83 H86 L91 C92 T93 L94 H98 I101 A106 S107 D113 A116 V117 L118 Y122 I125 I126 Q127 M132 I142 W147 V152 W156 Y157 L158 P161 F162 L163 C164 R165

N166 R167 T168 K169 T170 E171 I174 F175 Q176 S180 K181 T182 E186 K193 L199 Y200 R201 D205 S206 C207 L208 K211 L212 C213 Q218 L224 Q225 C226 D229 H235 F236 I243 R247

• Molecule 2: Pre-glycoprotein polyprotein GP complex

Chain L:

67%   32%

A61 I64 G65 L66 H67 T68 E69 F70 Q71 T72 V73 G79 N83 H86 L91 C92 T93 L94 N95 K96 S97 H98 I101 A106 S107 D113 L118 Y122 I125 I126 Q127 M132 S133 W134 C135 I142 W147 V152 W156 Y157 L158 P161 F162

L163 C164 R165 N166 R167 T168 K169 T170 E171 G172 F173 I174 F175 Q176 S180 K181 T182 E186 K193 L199 Y200 R201 D205 S206 C207 L208 K211 L212 C213 Q218 L224 Q225 C226 D229 H235 F236 K241 N242 I243 R247

• Molecule 3: Pre-glycoprotein polyprotein GP complex

Chain C:

23%
68%   27%

A252 S255 W256 S257 L258 THR ASP SER GLY LYS ASP THR PRO GLY G269 E273 M276 A280 G286 V290 S299 E300 M304 L305 N311 K312 I315 K316 T317 L318 N319 D320 E321 T322 K323 K324 Q325 V326 N327 L328 M329 G330 Q331 T332 I333 N334 A335 L336

D339 N340 L341 L342 K346 I347 M351 S352 Y355 W362 N365 H366 H372 S373 L379 I380 N383 L386 D390 F391 R392 W395 L402 M406 S412 Q415 L420 D424 I425 W428 S429 T430 V431 S436 L437 F438 L439 H440 L441 V442 G443

T446 H447 R448 H449 I450 R451 G452 E453 A454 C455 P456 L457 P458 H459 R460 L461 N462 S463 L464 G465 G466 C467 R468 C469 G470 K471 Y472 P473 N474 L475 K476 K477 P478 T479 V480 W481 R482 R483 G484 H485

• Molecule 3: Pre-glycoprotein polyprotein GP complex

Chain H:

23%
70%   25%

A252 W256 S257 L258 THR ASP SER GLY LYS ASP THR PRO GLY G269 E273 M276 A280 G286 V290 S299 E300 M304 N311 K312 I315 K316 T317 L318 N319 D320 E321 T322 K323 K324 Q325 V326 N327 L328 M329 G330 Q331 T332 I333 N334 A335 L336 D339 N340

L341 L342 K346 I347 M351 S352 W362 N365 H366 H372 S373 L379 I380 N383 L386 D390 F391 R392 W395 L402 M406 S412 Q415 D424 S429 T430 S436 L437 F438 H440 L441 V442 G443 T446 H447 R448 H449 I450 R451 G452 E453

A454 C455 P456 L457 P458 H459 R460 L461 N462 S463 L464 G465 G466 C467 R468 C469 G470 K471 Y472 P473 N474 L475 K476 K477 P478 T479 V480 W481 R482 R483 G484 H485

• Molecule 3: Pre-glycoprotein polyprotein GP complex

Chain M:

23%

69%　　　　　26%

A252 L258 THR ASP SER GLY LYS ASP THR PRO GLY G269 E273 M276 A280 G286 V290 S299 E300 N311 K312 I315 K316 T317 L318 N319 D320 E321 T322 K323 K324 Q325 V326 N327 L328 M329 G330 Q331 T332 I333 N334 D339 N340 L341 L342 K346 I347

M351 S352 Y355 W362 N365 H366 H372 S373 L379 I380 N383 L386 D390 F391 R392 W395 L402 M406 S412 Q415 D424 I425 W428 S429 T430 V431 S436 L437 F438 L439 H440 L441 V442 G443 T446 H447 R448 H449 I450 R451 G452 E453 A454

C455 P456 L457 P458 H459 R460 L461 N462 S463 L464 G465 G466 C467 R468 C469 G470 K471 Y472 P473 N474 L475 K476 K477 P478 T479 V480 W481 R482 R483 G484 H485

• Molecule 4: neutralizing antibody light chain

Chain D:

65%　　　　　34%

Q1 I2 V3 Q6 S7 P8 M11 S12 A13 S14 P15 G16 E17 K18 S26 V29 S30 W34 K38 P39 G40 T41 W46 I47 Y48 G49 T50 S51 N52 L53 A54 S55 G56 V57 F61 G65 Y70 I74 S75 R76 M77 E78 C87 R90 P95

E104 I105 K106

• Molecule 4: neutralizing antibody light chain

Chain I:

67%　　　　　32%

Q1 I2 V3 Q6 S7 P8 M11 S12 A13 S14 P15 G16 E17 K18 S26 V29 S30 W34 K38 P39 G40 T41 W46 I47 Y48 G49 T50 S51 N52 L53 A54 S55 G56 V57 G65 Y70 I74 S75 R76 M77 E78 C87 R90 P95 E104 I105

K106

• Molecule 4: neutralizing antibody light chain

Chain N:

69%　　　　　30%

Q1 I2 V3 Q6 S7 P8 M11 S12 A13 S14 P15 G16 E17 K18 S26 V29 W34 K38 P39 G40 T41 W46 I47 Y48 G49 T50 S51 N52 L53 A54 S55 G56 V57 G65 Y70 I74 S75 R76 M77 E78 C87 R90 P95 E104 I105 K106

• Molecule 5: neutralizing antibody heavy chain

Chain E:

8%

56%　　　　　42%

V2 A3 L4 S7 G10 L11 V12 L18 K19 L20 S21 C22 S28 F29 S30 N31 A32 G33 M34 S35 W36 V37 R38 Q39 T40 P41 D42 R43 L47 V48 A49 A50 I51 N52 R53 D54 G55 V64 R67 F68 R72 D73 N74 A75 K76 N77 T78 L79 Q82 M83

L86 K87 S88 E89 D90 T91 A92 M93 Y94 E99 D100 Y101 Y102 Y105 F106 Y107 V108 M109 W112 G115 T119 V120 A121

• Molecule 5: neutralizing antibody heavy chain

Chain J:

7%
56%   42%

V2 A3 L4 S7 G10 L11 V12 L18 K19 L20 S21 C22 S28 F29 S30 N31 A32 G33 M34 S35 W36 V37 R38 Q39 T40 P41 D42 R43 L47 V48 A49 A50 I51 N52 R53 D54 G55 V64 R67 F68 R72 D73 N74 A75 K76 N77 T78 L79 Q82 M83

L86 K87 S88 E89 D90 T91 A92 M93 Y94 Y95 E99 D100 Y101 Y102 Y105 F106 Y107 V108 M109 G115 T119 V120 A121

• Molecule 5: neutralizing antibody heavy chain

Chain O:

8%
59%   39%

V2 A3 L4 S7 G10 L11 V12 L18 K19 C22 S28 F29 S30 N31 A32 G33 M34 S35 W36 V37 R38 Q39 T40 P41 D42 R43 L47 V48 A49 A50 I51 N52 R53 D54 G55 V64 R67 F68 R72 D73 N74 A75 K76 N77 T78 L79 Q82 M83 L86

K87 S88 E89 D90 T91 A92 M93 Y94 Y95 E99 D100 Y101 Y102 Y105 F106 Y107 V108 M109 G115 T119 V120 A121

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

Chain Y:

67%   33%

NAG1 NAG2 BMA3

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

Chain h:

67%   33%

NAG1 NAG2 BMA3

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

Chain n:

67%   33%

NAG1 NAG2 BMA3

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

Chain R:

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

Chain W:

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

Chain b:

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	279624	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{Å}^2)$	50	Depositor
Minimum defocus (nm)	200	Depositor
Maximum defocus (nm)	600	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	4.722	Depositor
Minimum map value	-3.918	Depositor
Average map value	-0.006	Depositor
Map value standard deviation	0.106	Depositor
Recommended contour level	0.58	Depositor
Map size (Å)	318.72, 318.72, 318.72	wwPDB
Map dimensions	384, 384, 384	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.83, 0.83, 0.83	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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

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	0.13	0/449	0.39	0/605
1	F	0.13	0/449	0.39	0/605
1	K	0.13	0/449	0.39	0/605
2	B	0.15	0/1564	0.58	5/2123 (0.2%)
2	G	0.15	0/1564	0.58	5/2123 (0.2%)
2	L	0.15	0/1564	0.58	5/2123 (0.2%)
3	C	0.12	0/1877	0.36	0/2536
3	H	0.13	0/1877	0.36	0/2536
3	M	0.13	0/1877	0.36	0/2536
4	D	0.13	0/816	0.32	0/1107
4	I	0.13	0/816	0.32	0/1107
4	N	0.13	0/816	0.32	0/1107
5	E	0.15	0/935	0.38	0/1264
5	J	0.15	0/935	0.38	0/1264
5	O	0.15	0/935	0.38	0/1264
All	All	0.14	0/16923	0.43	15/22905 (0.1%)

There are no bond length outliers.

The worst 5 of 15 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	G	106	ALA	CB-CA-C	-12.30	87.44	109.70
2	L	106	ALA	CB-CA-C	-12.29	87.46	109.70
2	B	106	ALA	CB-CA-C	-12.29	87.46	109.70
2	B	106	ALA	N-CA-C	-10.51	91.00	108.76
2	L	106	ALA	N-CA-C	-10.51	91.00	108.76

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	441	0	461	17	0
1	F	441	0	461	21	0
1	K	441	0	461	20	0
2	B	1517	0	1470	39	0
2	G	1517	0	1470	37	0
2	L	1517	0	1470	37	0
3	C	1829	0	1799	50	0
3	H	1829	0	1799	47	0
3	M	1829	0	1799	47	0
4	D	796	0	776	21	0
4	I	796	0	776	20	0
4	N	796	0	776	18	0
5	E	917	0	877	34	0
5	J	917	0	877	34	0
5	O	917	0	877	31	0
6	R	39	0	34	0	0
6	W	39	0	34	0	0
6	Y	39	0	34	2	0
6	b	39	0	34	0	0
6	h	39	0	34	2	0
6	n	39	0	34	2	0
7	A	15	0	27	1	0
7	F	15	0	27	1	0
7	K	15	0	27	1	0
8	B	28	0	26	1	0
8	C	42	0	39	0	0
8	G	28	0	26	0	0
8	H	42	0	39	0	0
8	L	28	0	26	1	0
8	M	42	0	39	0	0
All	All	16989	0	16629	412	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 12.

The worst 5 of 412 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)
2:G:61:ALA:HA	2:G:70:PHE:O	1.66	0.95
2:L:61:ALA:HA	2:L:70:PHE:O	1.66	0.94
2:B:61:ALA:HA	2:B:70:PHE:O	1.66	0.93
2:L:66:LEU:HG	2:L:67:HIS:HD2	1.42	0.85
2:B:66:LEU:HG	2:B:67:HIS:HD2	1.41	0.85

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	55/57 (96%)	53 (96%)	2 (4%)	0	100	100
1	F	55/57 (96%)	53 (96%)	2 (4%)	0	100	100
1	K	55/57 (96%)	53 (96%)	2 (4%)	0	100	100
2	B	185/187 (99%)	166 (90%)	19 (10%)	0	100	100
2	G	185/187 (99%)	166 (90%)	19 (10%)	0	100	100
2	L	185/187 (99%)	166 (90%)	19 (10%)	0	100	100
3	C	220/234 (94%)	209 (95%)	11 (5%)	0	100	100
3	H	220/234 (94%)	209 (95%)	11 (5%)	0	100	100
3	M	220/234 (94%)	209 (95%)	11 (5%)	0	100	100
4	D	104/106 (98%)	97 (93%)	7 (7%)	0	100	100
4	I	104/106 (98%)	97 (93%)	7 (7%)	0	100	100
4	N	104/106 (98%)	97 (93%)	7 (7%)	0	100	100
5	E	115/119 (97%)	104 (90%)	11 (10%)	0	100	100
5	J	115/119 (97%)	104 (90%)	11 (10%)	0	100	100
5	O	115/119 (97%)	104 (90%)	11 (10%)	0	100	100
All	All	2037/2109 (97%)	1887 (93%)	150 (7%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2   Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	47/47 (100%)	44 (94%)	3 (6%)	14	39
1	F	47/47 (100%)	45 (96%)	2 (4%)	25	49
1	K	47/47 (100%)	45 (96%)	2 (4%)	25	49
2	B	170/170 (100%)	160 (94%)	10 (6%)	16	41
2	G	170/170 (100%)	160 (94%)	10 (6%)	16	41
2	L	170/170 (100%)	160 (94%)	10 (6%)	16	41
3	C	204/212 (96%)	194 (95%)	10 (5%)	21	45
3	H	204/212 (96%)	194 (95%)	10 (5%)	21	45
3	M	204/212 (96%)	194 (95%)	10 (5%)	21	45
4	D	87/88 (99%)	83 (95%)	4 (5%)	23	47
4	I	87/88 (99%)	83 (95%)	4 (5%)	23	47
4	N	87/88 (99%)	83 (95%)	4 (5%)	23	47
5	E	97/97 (100%)	94 (97%)	3 (3%)	35	56
5	J	97/97 (100%)	94 (97%)	3 (3%)	35	56
5	O	97/97 (100%)	94 (97%)	3 (3%)	35	56
All	All	1815/1842 (98%)	1727 (95%)	88 (5%)	24	46

5 of 88 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
5	J	74	ASN
3	M	290	VAL
1	K	11	ILE
2	L	122	TYR
3	M	318	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 18

such sidechains are listed below:

Mol	Chain	Res	Type
2	L	218	GLN
5	O	82	GLN
5	O	77	ASN
2	G	218	GLN
2	L	198	HIS

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 ⓘ

18 monosaccharides are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#|Z| > 2$	Counts	RMSZ	$\#|Z| > 2$
6	NAG	R	1	6,2	14,14,15	0.74	0	17,19,21	1.13	1 (5%)
6	NAG	R	2	6	14,14,15	0.68	0	17,19,21	0.98	1 (5%)
6	BMA	R	3	6	11,11,12	0.83	0	15,15,17	2.17	3 (20%)
6	NAG	W	1	6,2	14,14,15	0.74	0	17,19,21	1.12	1 (5%)
6	NAG	W	2	6	14,14,15	0.68	0	17,19,21	0.98	1 (5%)
6	BMA	W	3	6	11,11,12	0.84	0	15,15,17	2.18	3 (20%)
6	NAG	Y	1	6,3	14,14,15	0.83	0	17,19,21	1.19	2 (11%)
6	NAG	Y	2	6	14,14,15	0.71	0	17,19,21	0.98	1 (5%)
6	BMA	Y	3	6	11,11,12	0.83	0	15,15,17	2.11	3 (20%)
6	NAG	b	1	6,2	14,14,15	0.74	0	17,19,21	1.12	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#|Z| > 2$	Counts	RMSZ	$\#|Z| > 2$
6	NAG	b	2	6	14,14,15	0.68	0	17,19,21	0.98	1 (5%)
6	BMA	b	3	6	11,11,12	0.82	0	15,15,17	2.17	3 (20%)
6	NAG	h	1	6,3	14,14,15	0.84	0	17,19,21	1.19	2 (11%)
6	NAG	h	2	6	14,14,15	0.70	0	17,19,21	0.97	1 (5%)
6	BMA	h	3	6	11,11,12	0.84	0	15,15,17	2.12	3 (20%)
6	NAG	n	1	6,3	14,14,15	0.83	0	17,19,21	1.19	2 (11%)
6	NAG	n	2	6	14,14,15	0.70	0	17,19,21	0.98	1 (5%)
6	BMA	n	3	6	11,11,12	0.84	0	15,15,17	2.11	3 (20%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	NAG	R	1	6,2	-	1/6/23/26	0/1/1/1
6	NAG	R	2	6	-	1/6/23/26	0/1/1/1
6	BMA	R	3	6	-	1/2/19/22	0/1/1/1
6	NAG	W	1	6,2	-	1/6/23/26	0/1/1/1
6	NAG	W	2	6	-	1/6/23/26	0/1/1/1
6	BMA	W	3	6	-	1/2/19/22	0/1/1/1
6	NAG	Y	1	6,3	-	1/6/23/26	0/1/1/1
6	NAG	Y	2	6	-	0/6/23/26	0/1/1/1
6	BMA	Y	3	6	-	1/2/19/22	0/1/1/1
6	NAG	b	1	6,2	-	1/6/23/26	0/1/1/1
6	NAG	b	2	6	-	1/6/23/26	0/1/1/1
6	BMA	b	3	6	-	1/2/19/22	0/1/1/1
6	NAG	h	1	6,3	-	1/6/23/26	0/1/1/1
6	NAG	h	2	6	-	0/6/23/26	0/1/1/1
6	BMA	h	3	6	-	1/2/19/22	0/1/1/1
6	NAG	n	1	6,3	-	1/6/23/26	0/1/1/1
6	NAG	n	2	6	-	0/6/23/26	0/1/1/1
6	BMA	n	3	6	-	1/2/19/22	0/1/1/1

There are no bond length outliers.

The worst 5 of 33 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	W	3	BMA	C1-O5-C5	6.88	121.40	112.19
6	R	3	BMA	C1-O5-C5	6.86	121.38	112.19

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	b	3	BMA	C1-O5-C5	6.84	121.35	112.19
6	h	3	BMA	C1-O5-C5	6.61	121.04	112.19
6	n	3	BMA	C1-O5-C5	6.59	121.02	112.19

There are no chirality outliers.

5 of 15 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	Y	3	BMA	O5-C5-C6-O6
6	h	3	BMA	O5-C5-C6-O6
6	n	3	BMA	O5-C5-C6-O6
6	R	1	NAG	O5-C5-C6-O6
6	R	2	NAG	O5-C5-C6-O6

There are no ring outliers.

3 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	n	1	NAG	2	0
6	Y	1	NAG	2	0
6	h	1	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 oligosaccharide.

Oligosaccharide Chain Y

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain h

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain n

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain R

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain W

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain b

Bond lengths

Bond angles

Torsions

Rings

5.6 Ligand geometry (i)

18 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	$\#|Z| > 2$
8	NAG	M	501	3	14,14,15	0.74	0	17,19,21	0.95	1 (5%)
8	NAG	B	301	2	14,14,15	0.71	0	17,19,21	0.73	0
8	NAG	H	503	3	14,14,15	0.72	0	17,19,21	0.78	0
7	MYR	K	101	1	13,14,15	0.34	0	12,13,15	0.39	0
8	NAG	L	302	2	14,14,15	0.70	0	17,19,21	0.89	1 (5%)
8	NAG	M	503	3	14,14,15	0.73	0	17,19,21	0.78	0
8	NAG	L	301	2	14,14,15	0.72	0	17,19,21	0.74	0
7	MYR	A	101	1	13,14,15	0.33	0	12,13,15	0.39	0
8	NAG	G	302	2	14,14,15	0.70	0	17,19,21	0.88	1 (5%)
8	NAG	C	502	3	14,14,15	0.72	0	17,19,21	0.79	0
8	NAG	B	302	2	14,14,15	0.70	0	17,19,21	0.88	1 (5%)
8	NAG	H	502	3	14,14,15	0.72	0	17,19,21	0.80	0
8	NAG	C	501	3	14,14,15	0.74	0	17,19,21	0.95	1 (5%)
8	NAG	C	503	3	14,14,15	0.72	0	17,19,21	0.78	0
7	MYR	F	101	1	13,14,15	0.33	0	12,13,15	0.39	0
8	NAG	H	501	3	14,14,15	0.73	0	17,19,21	0.94	1 (5%)
8	NAG	G	301	2	14,14,15	0.72	0	17,19,21	0.73	0
8	NAG	M	502	3	14,14,15	0.72	0	17,19,21	0.80	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
8	NAG	M	501	3	-	3/6/23/26	0/1/1/1
8	NAG	B	301	2	-	0/6/23/26	0/1/1/1
8	NAG	H	503	3	-	1/6/23/26	0/1/1/1
7	MYR	K	101	1	-	3/12/12/13	-
8	NAG	L	302	2	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
8	NAG	M	503	3	-	1/6/23/26	0/1/1/1
8	NAG	L	301	2	-	0/6/23/26	0/1/1/1
7	MYR	A	101	1	-	3/12/12/13	-
8	NAG	G	302	2	-	2/6/23/26	0/1/1/1
8	NAG	C	502	3	-	0/6/23/26	0/1/1/1
8	NAG	B	302	2	-	2/6/23/26	0/1/1/1
8	NAG	H	502	3	-	0/6/23/26	0/1/1/1
8	NAG	C	501	3	-	3/6/23/26	0/1/1/1
8	NAG	C	503	3	-	1/6/23/26	0/1/1/1
7	MYR	F	101	1	-	3/12/12/13	-
8	NAG	H	501	3	-	3/6/23/26	0/1/1/1
8	NAG	G	301	2	-	0/6/23/26	0/1/1/1
8	NAG	M	502	3	-	0/6/23/26	0/1/1/1

There are no bond length outliers.

The worst 5 of 6 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
8	M	501	NAG	C2-N2-C7	2.15	125.78	122.90
8	C	501	NAG	C2-N2-C7	2.14	125.77	122.90
8	H	501	NAG	C2-N2-C7	2.14	125.76	122.90
8	B	302	NAG	O5-C1-C2	-2.10	108.04	111.29
8	G	302	NAG	O5-C1-C2	-2.10	108.05	111.29

There are no chirality outliers.

5 of 27 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	A	101	MYR	O1-C1-C2-C3
7	F	101	MYR	O1-C1-C2-C3
7	K	101	MYR	O1-C1-C2-C3
8	B	302	NAG	C4-C5-C6-O6
8	G	302	NAG	C4-C5-C6-O6

There are no ring outliers.

5 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	K	101	MYR	1	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	L	302	NAG	1	0
7	A	101	MYR	1	0
8	B	302	NAG	1	0
7	F	101	MYR	1	0

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

The following chains have linkage breaks:

Mol	Chain	Number of breaks
5	E	1
5	J	1
5	O	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	E	22:CYS	C	24:ALA	N	4.15
1	J	22:CYS	C	24:ALA	N	4.15
1	O	22:CYS	C	24:ALA	N	4.15

6 Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-48781. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

6.1 Orthogonal projections ⓘ
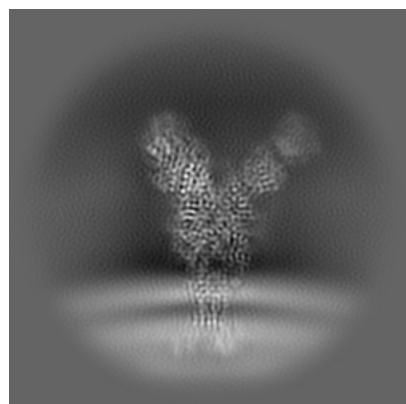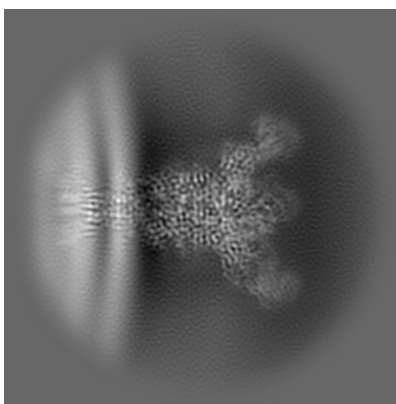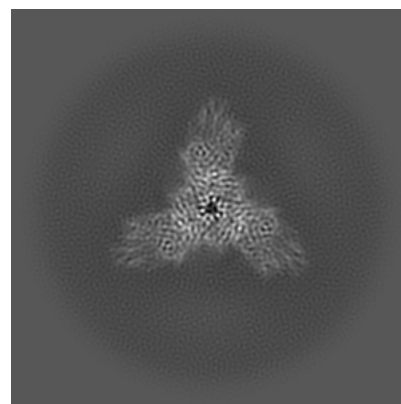
6.1.1 Primary map

X　　　　　　　　　　　Y　　　　　　　　　　　Z

6.1.2 Raw map

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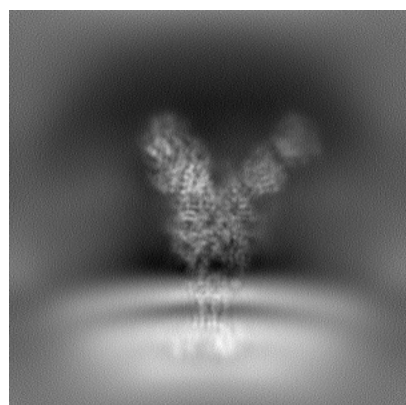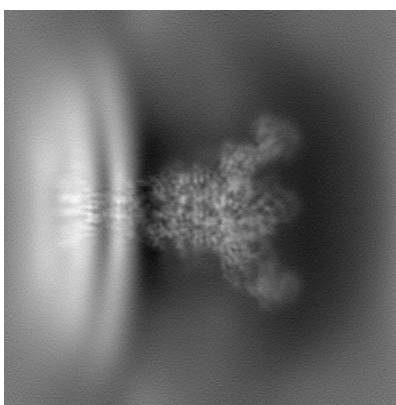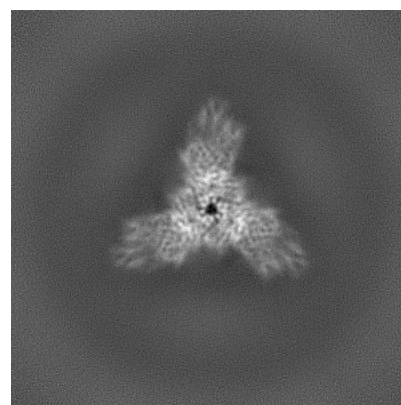
The images above show the map projected in three orthogonal directions.

6.2   Central slices ⓘ
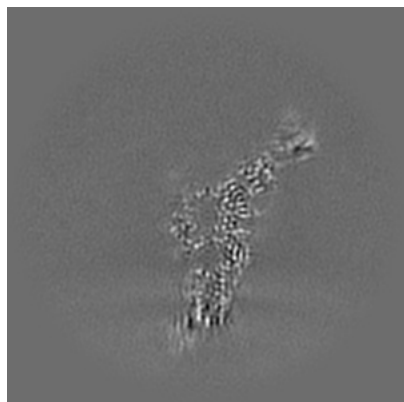
6.2.1   Primary map
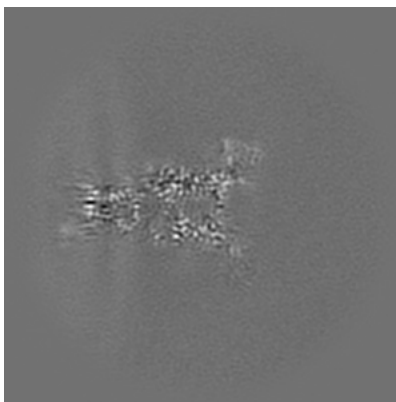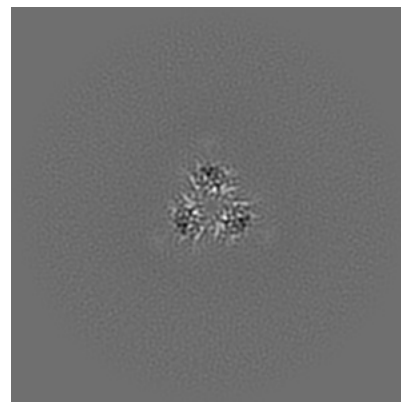
X Index: 192   Y Index: 192   Z Index: 192

6.2.2   Raw map
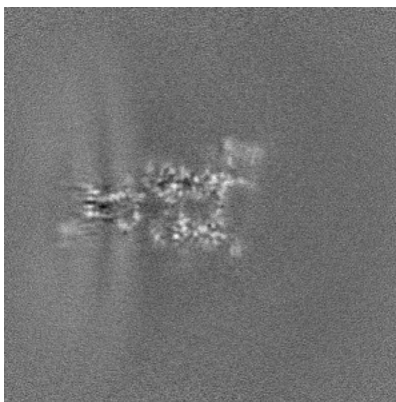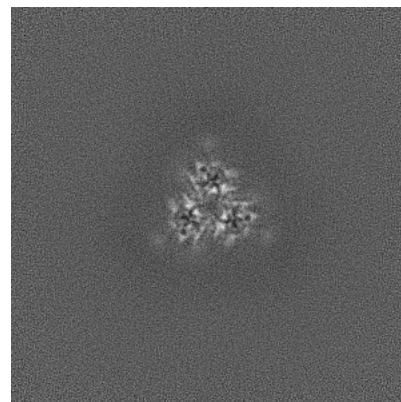
X Index: 192   Y Index: 192   Z Index: 192

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

6.3 Largest variance slices (i)

6.3.1 Primary map
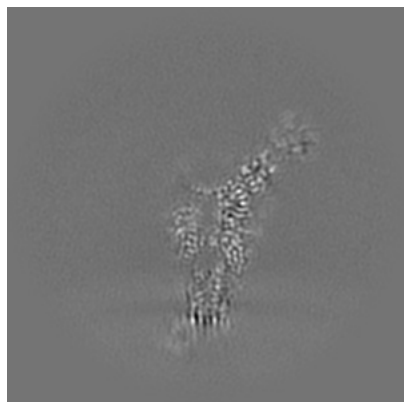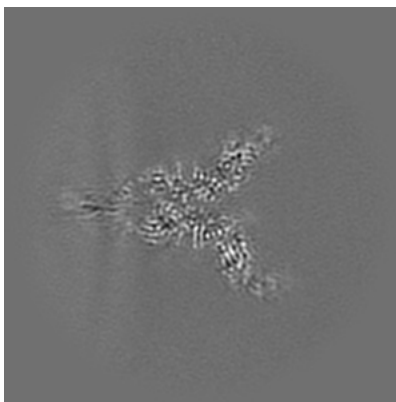
| X Index: 189 | Y Index: 174 | Z Index: 223 |
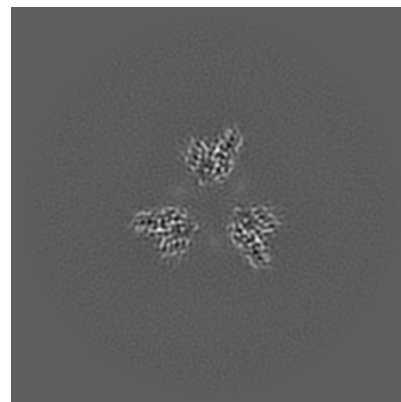
6.3.2 Raw map
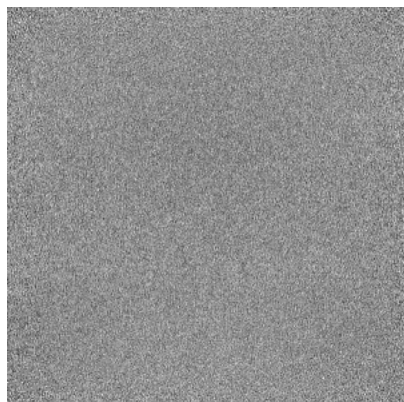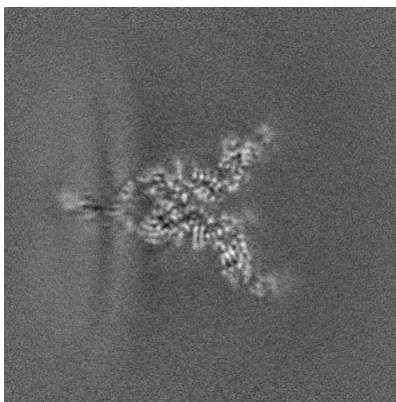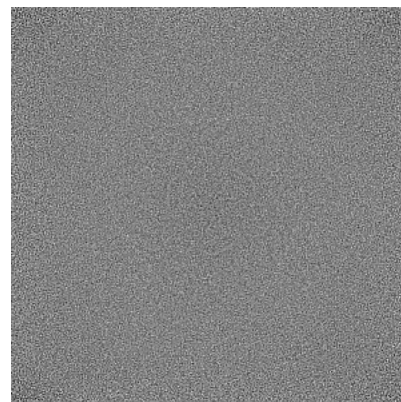
| X Index: 0 | Y Index: 174 | Z Index: 383 |

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
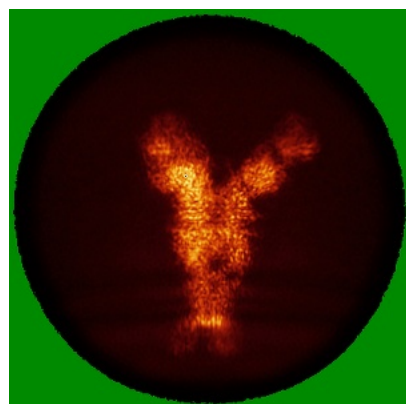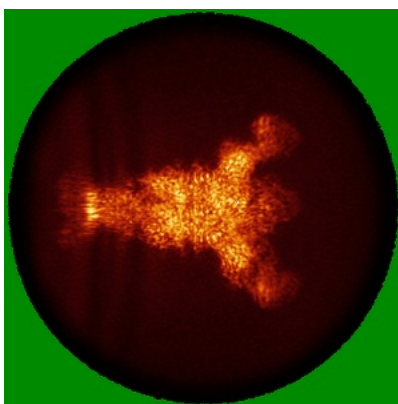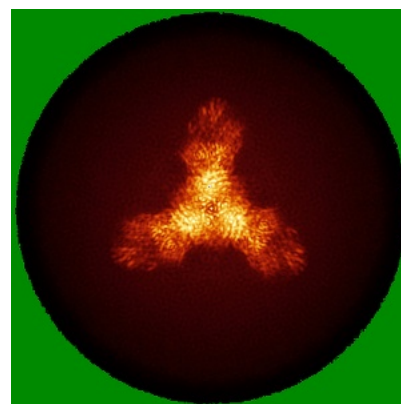
| X | Y | Z |

6.4.2 Raw map

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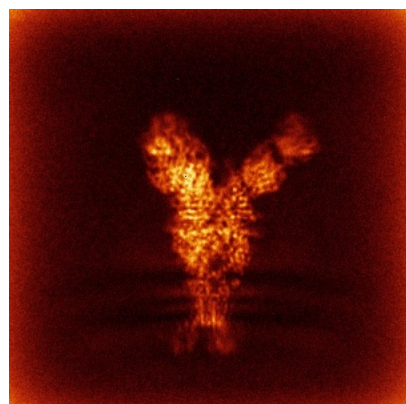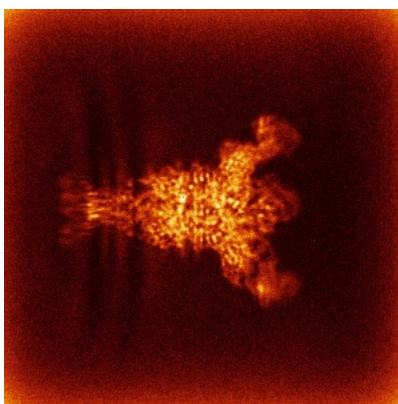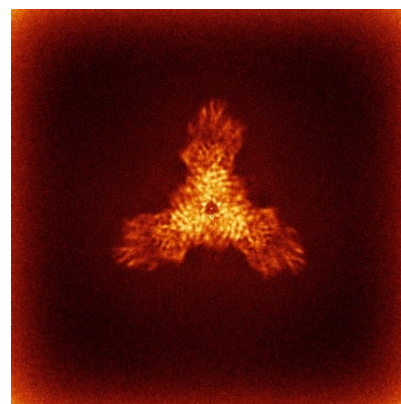
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5   Orthogonal surface views   ⓘ

6.5.1   Primary map

| X | Y | Z |
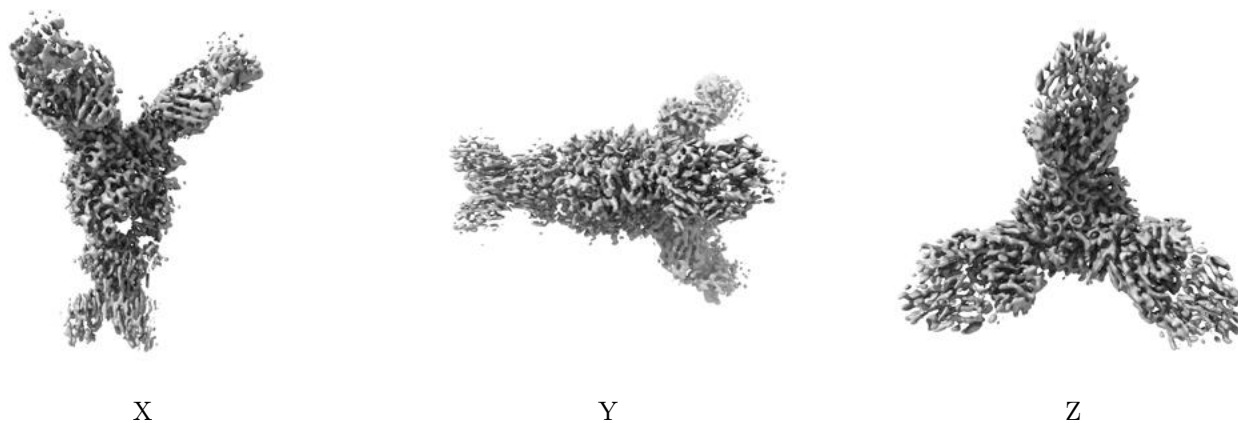
The images above show the 3D surface view of the map at the recommended contour level 0.58. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2   Raw map

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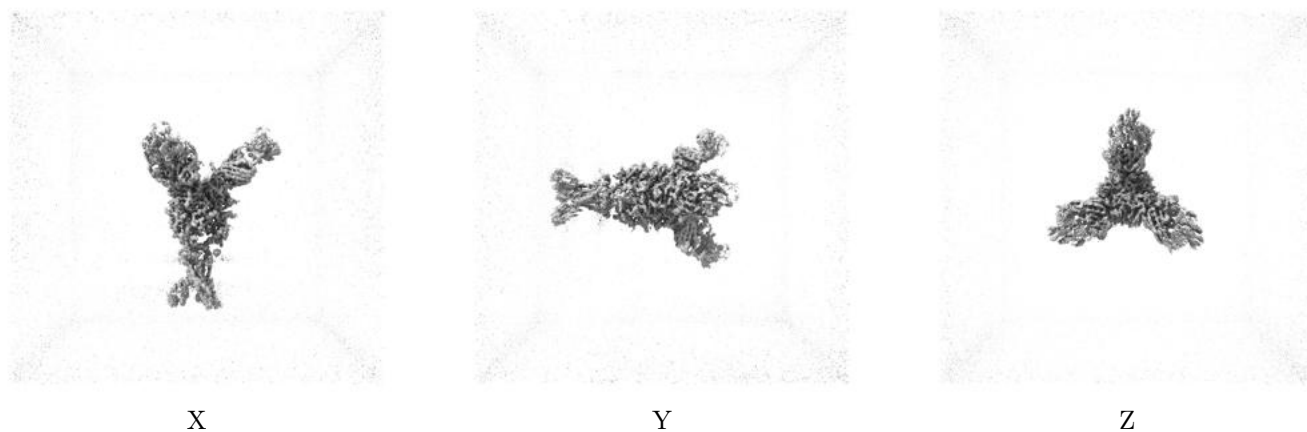
These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

6.6   Mask visualisation   ⓘ

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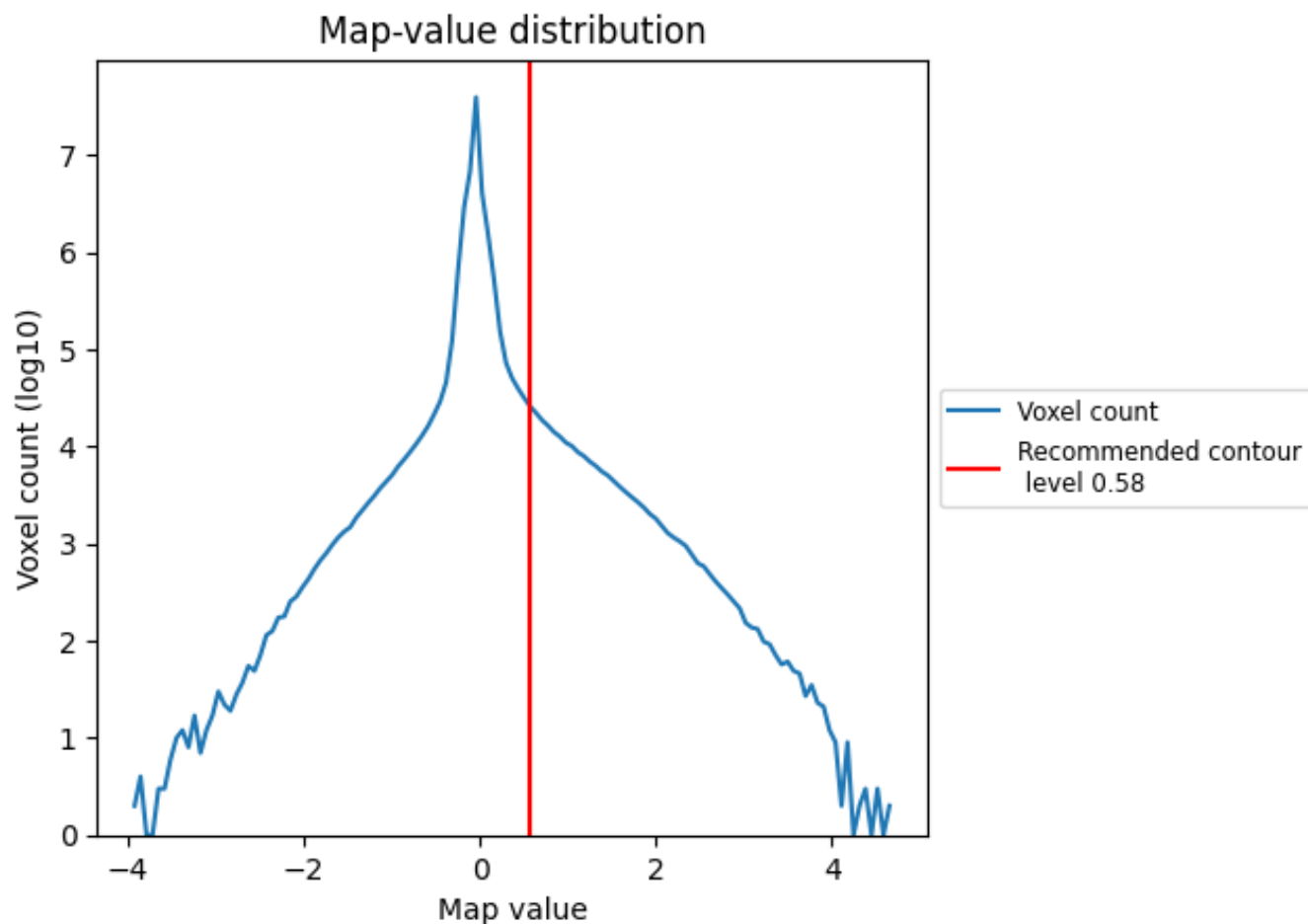
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2 Volume estimate (i)
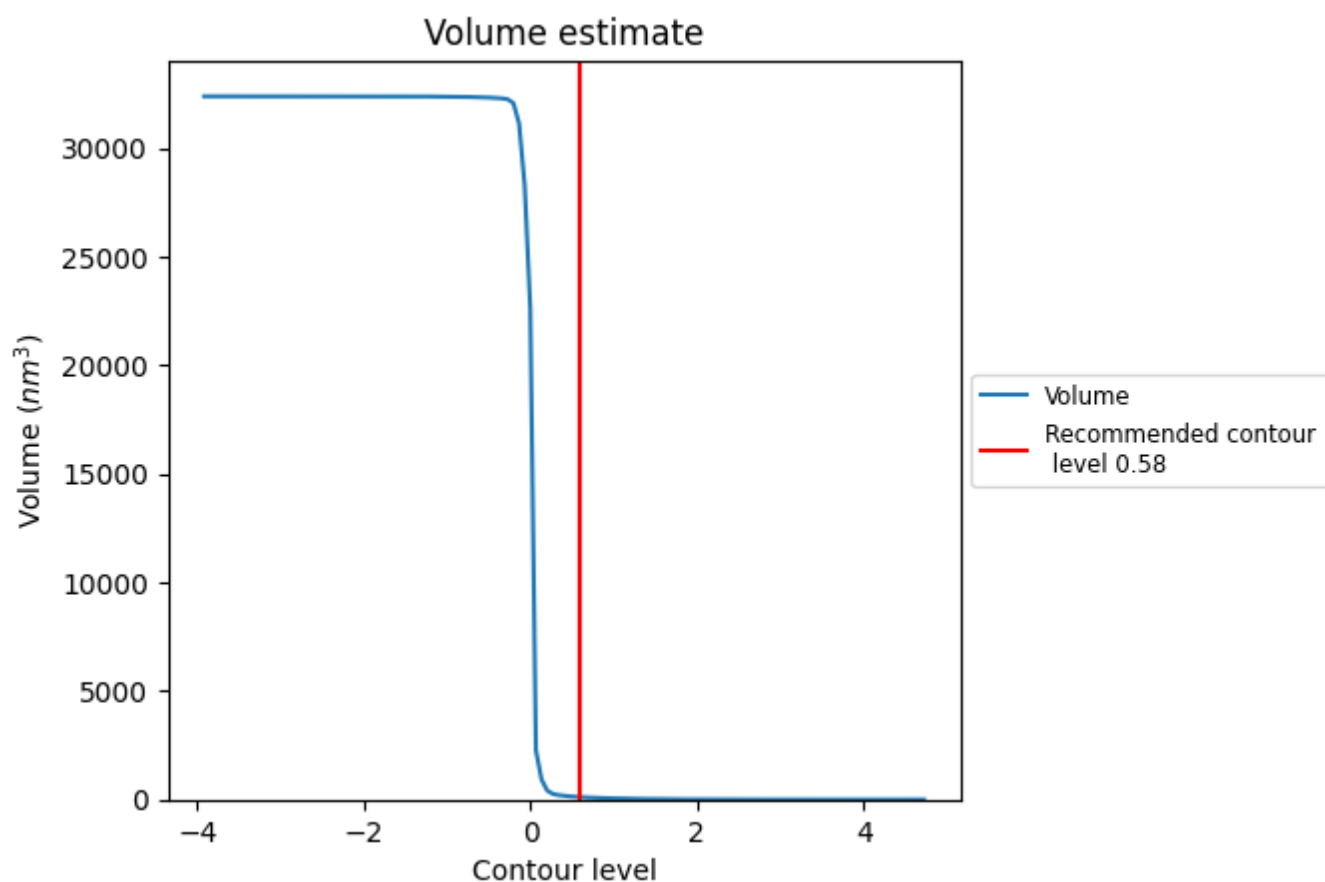
The volume at the recommended contour level is 116 nm^3; this corresponds to an approximate mass of 105 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3   Rotationally averaged power spectrum (i)
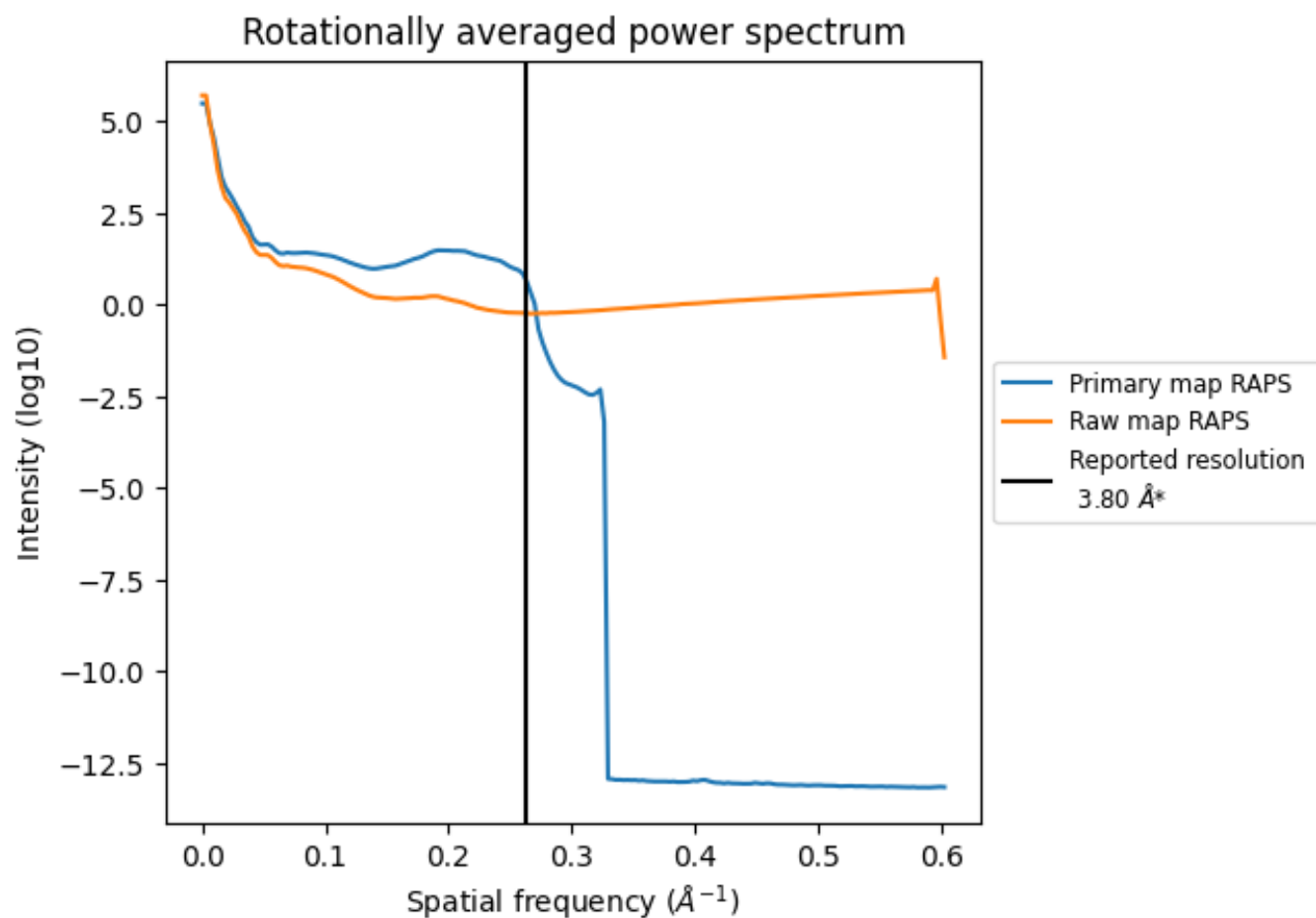
*Reported resolution corresponds to spatial frequency of 0.263 Å^{-1}

8　Fourier-Shell correlation ⓘ

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

8.1　FSC ⓘ

*Reported resolution corresponds to spatial frequency of 0.263 Å^{-1}

WORLDWIDE
wwPDB
PROTEIN DATA BANK
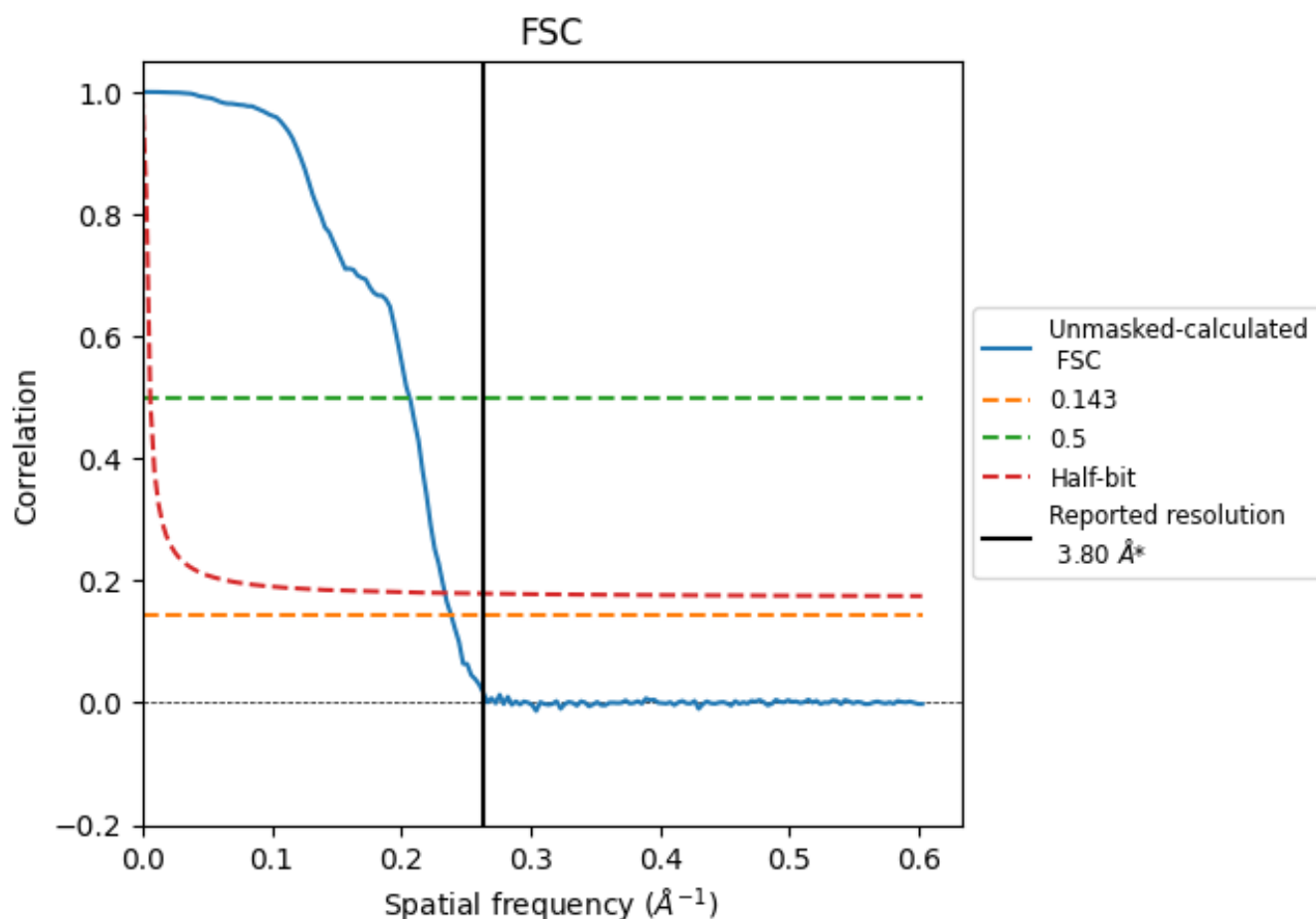
8.2   Resolution estimates ⓘ

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.80	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.19	4.84	4.28

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.19 differs from the reported value 3.8 by more than 10 %

9   Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-48781 and PDB model 9N0D. Per-residue inclusion information can be found in section 3 on page 8.

9.1   Map-model overlay ⓘ
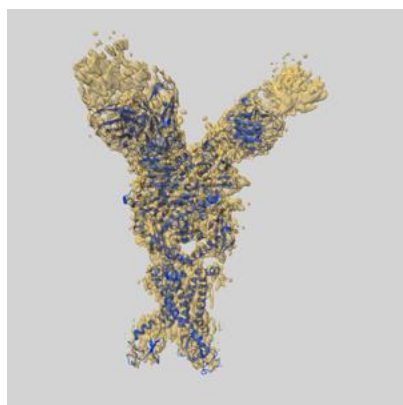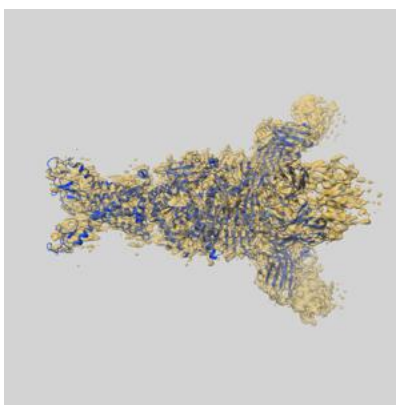
| X | Y | Z |
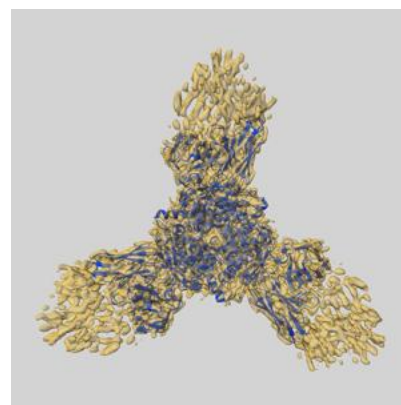
The images above show the 3D surface view of the map at the recommended contour level 0.58 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2   Q-score mapped to coordinate model ⓘ

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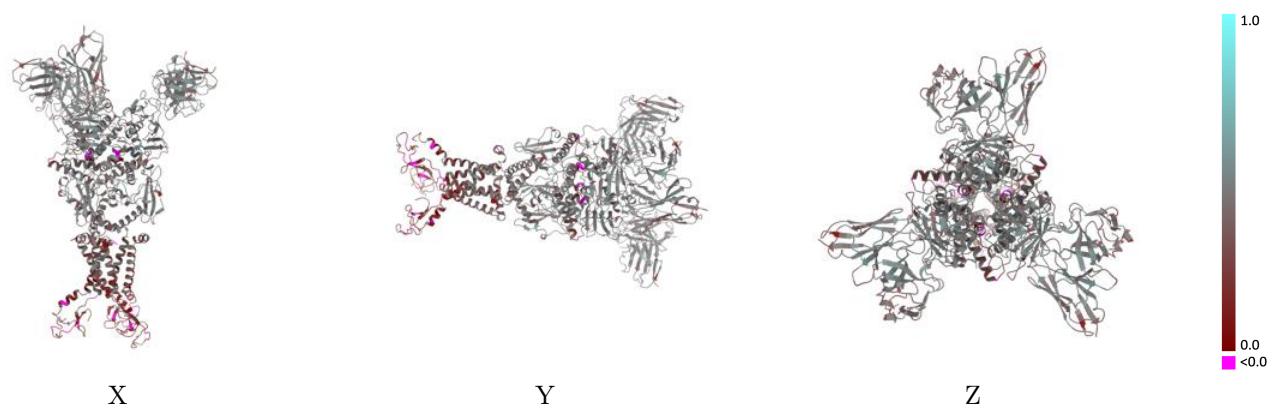
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

9.3   Atom inclusion mapped to coordinate model ⓘ

X   Y   Z
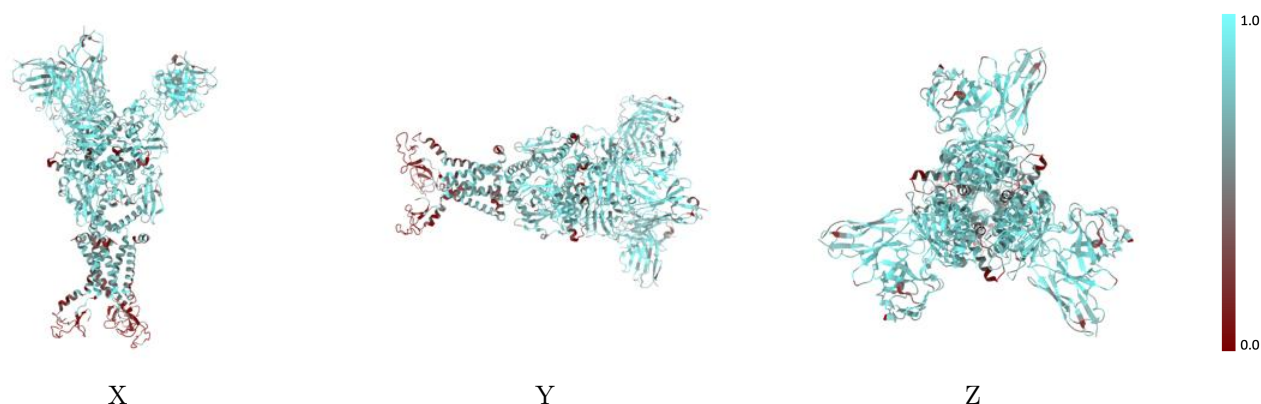
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.58).

9.4   Atom inclusion (i)
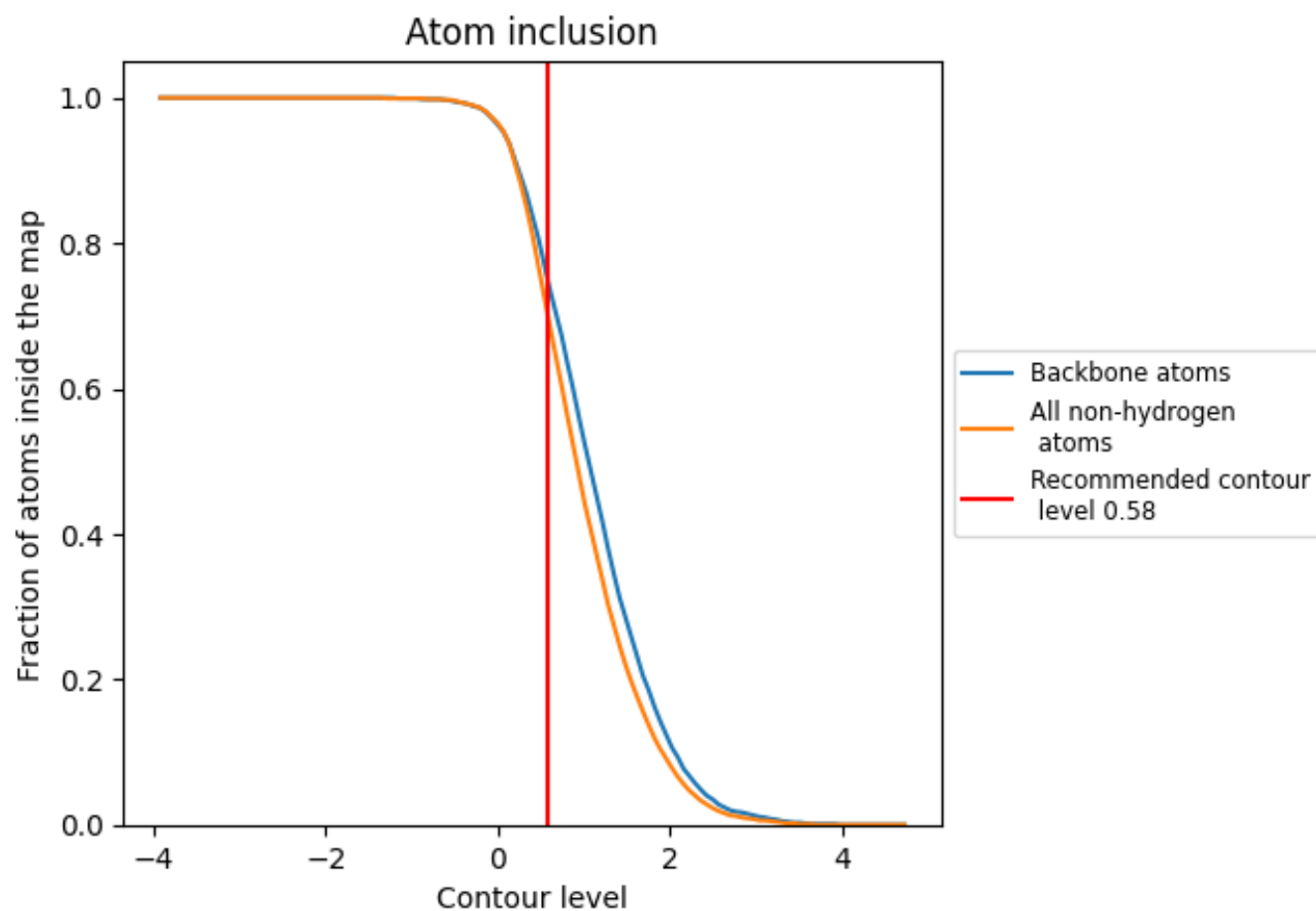
At the recommended contour level, 75% of all backbone atoms, 70% of all non-hydrogen atoms, are inside the map.

9.5   Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.58) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7010	0.4200
A	0.4550	0.3000
B	0.8130	0.4640
C	0.6170	0.3830
D	0.7840	0.4600
E	0.7370	0.4490
F	0.4640	0.3010
G	0.8170	0.4650
H	0.6160	0.3820
I	0.7810	0.4590
J	0.7350	0.4480
K	0.4640	0.3030
L	0.8110	0.4640
M	0.6170	0.3810
N	0.7840	0.4620
O	0.7350	0.4490
R	0.5640	0.4330
W	0.5640	0.4380
Y	0.6920	0.4380
b	0.5640	0.4320
h	0.6920	0.4370
n	0.6920	0.4450

1.0

0.0
<0.0