W O R L D W I D E

wwPDB

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

Full wwPDB EM Validation Report (i)

Dec 3, 2024 – 02:58 AM JST

PDB ID	:	9JYY
EMDB ID	:	EMD-61909
Title	:	core proteins of mature T7
Authors	:	Liu, H.R.; Chen, W.Y.
Deposited on	:	2024-10-13
Resolution	:	3.00 Å(reported)

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 3.00 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
Ramachandran outliers		0.6%
Sidechain outliers		0.3%

Worse   *Better*

▐ Percentile relative to all structures
❒ Percentile relative to all EM structures
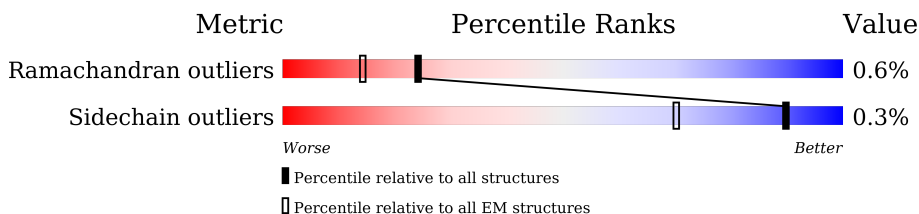
Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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	88	19% 81%
1	B	88	19% 81%
1	C	88	19% 81%
1	D	88	18% 82%
1	E	88	18% 82%
1	F	88	18% 82%
1	a	88	19% 81%
1	b	88	18% 82%
2	S	196	12% / 57% 43%

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Mol	Chain	Length	Quality of chain
2	T	196	12% · 56% · 43%
2	c	196	14% · 57% · 43%
2	d	196	12% · 57% · 43%
2	e	196	14% · 57% · 43%
2	f	196	15% · 56% · 43%
2	g	196	13% · 57% · 43%
2	h	196	11% · 57% · 43%
3	G	747	6% · 89% · 10%
3	H	747	7% · 89% · 10%
3	M	747	6% · 90% · 10%
3	N	747	7% · 89% · 10%
3	O	747	6% · 90% · 10%
3	P	747	7% · 89% · 10%
3	Q	747	6% · 90% · 10%
3	R	747	6% · 89% · 10%
4	I	1318	6% · 92% · 7%
4	J	1318	6% · 92% · 7%
4	K	1318	6% · 92% · 7%
4	L	1318	6% · 92% · 7%

2 Entry composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 87740 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 Protein 6.7.

Mol	Chain	Residues	Atoms				AltConf	Trace
1	a	17	Total 116	C 66	N 17	O 33	0	0
1	b	16	Total 112	C 64	N 16	O 32	0	0
1	A	17	Total 116	C 66	N 17	O 33	0	0
1	D	16	Total 112	C 64	N 16	O 32	0	0
1	B	17	Total 116	C 66	N 17	O 33	0	0
1	E	16	Total 112	C 64	N 16	O 32	0	0
1	C	17	Total 116	C 66	N 17	O 33	0	0
1	F	16	Total 112	C 64	N 16	O 32	0	0

- Molecule 2 is a protein called Internal virion protein gp14.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	S	112	Total 843	C 513	N 160	O 165	S 5	0	0
2	T	111	Total 835	C 507	N 159	O 164	S 5	0	0
2	c	112	Total 843	C 513	N 160	O 165	S 5	0	0
2	d	111	Total 835	C 507	N 159	O 164	S 5	0	0
2	e	112	Total 843	C 513	N 160	O 165	S 5	0	0
2	f	111	Total 835	C 507	N 159	O 164	S 5	0	0
2	g	112	Total 843	C 513	N 160	O 165	S 5	0	0

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Mol	Chain	Residues	Atoms					AltConf	Trace
2	h	111	Total	C	N	O	S	0	0
			835	507	159	164	5		

- Molecule 3 is a protein called Internal virion protein gp15.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	M	671	Total	C	N	O	S	0	0
			5335	3300	940	1065	30		
3	N	671	Total	C	N	O	S	0	0
			5335	3300	940	1065	30		
3	O	671	Total	C	N	O	S	0	0
			5335	3300	940	1065	30		
3	P	671	Total	C	N	O	S	0	0
			5335	3300	940	1065	30		
3	Q	671	Total	C	N	O	S	0	0
			5335	3300	940	1065	30		
3	R	671	Total	C	N	O	S	0	0
			5335	3300	940	1065	30		
3	G	671	Total	C	N	O	S	0	0
			5335	3300	940	1065	30		
3	H	671	Total	C	N	O	S	0	0
			5335	3300	940	1065	30		

- Molecule 4 is a protein called Peptidoglycan transglycosylase gp16.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	I	1223	Total	C	N	O	S	0	0
			9359	5853	1654	1805	47		
4	J	1223	Total	C	N	O	S	0	0
			9359	5853	1654	1805	47		
4	K	1223	Total	C	N	O	S	0	0
			9359	5853	1654	1805	47		
4	L	1223	Total	C	N	O	S	0	0
			9359	5853	1654	1805	47		

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: Protein 6.7

Chain a:

- Molecule 1: Protein 6.7

Chain b:

- Molecule 1: Protein 6.7

Chain A:

- Molecule 1: Protein 6.7

Chain D:

GLY SER ALA ARG MET LYS SER ILE ARG LYS SER ALA PHE GLY LYS LYS

• Molecule 1: Protein 6.7

Chain B:
19%   81%

MET CYS PHE SER PRO LYS ILE LYS THR PRO LYS MET ASP THR ASN GLN ILE ARG ALA VAL GLU PRO ALA PRO LEU THR GLN GLU VAL SER SER VAL GLU F34 E44 G50 ARG LYS GLY LEU LYS VAL GLU ARG ASP SER VAL ALA LYS SER LYS SER GLY ASN GLY SER

ALA ARG MET LYS SER SER ILE ARG LYS SER ALA PHE GLY LYS LYS

• Molecule 1: Protein 6.7

Chain E:
18%   82%

MET CYS PHE SER PRO LYS ILE LYS THR PRO LYS MET ASP THR ASN GLN ILE ARG ALA VAL GLU PRO ALA PRO LEU THR GLN GLU VAL SER SER VAL GLU F34 T43 E44 G45 S49 GLY ARG LYS GLY LEU LYS VAL GLU ARG ASP SER VAL ALA LYS SER LYS SER ALA SER GLY

ASN GLY SER ALA ARG MET LYS SER SER ILE ARG LYS SER ALA PHE GLY LYS LYS LYS

• Molecule 1: Protein 6.7

Chain C:
19%   81%

MET CYS PHE SER PRO LYS ILE LYS THR PRO LYS MET ASP THR ASN GLN ILE ARG ALA VAL GLU PRO ALA PRO LEU THR GLN GLU VAL SER SER VAL GLU F34 E44 G50 ARG LYS GLY LEU LYS VAL GLU ARG ASP SER VAL ALA LYS SER LYS SER GLY ASN GLY SER

ALA ARG MET LYS SER SER ILE ARG LYS SER ALA PHE GLY LYS LYS LYS

• Molecule 1: Protein 6.7

Chain F:
18%   82%

MET CYS PHE SER PRO LYS ILE LYS THR PRO LYS MET ASP THR ASN GLN ILE ARG ALA VAL GLU PRO ALA PRO LEU THR GLN GLU VAL SER SER VAL GLU F34 E44 G45 S49 GLY ARG LYS GLY LEU LYS VAL GLU ARG ASP SER VAL ALA LYS SER LYS SER ALA SER GLY ASN

GLY SER ALA ARG MET LYS SER SER ILE ARG LYS SER ALA PHE GLY LYS LYS LYS

• Molecule 2: Internal virion protein gp14

Chain S:
12%
57%   43%

MET CYS TRP A4 I7 P8 I9 A14 Q15 A16 I17 S18 G19 Q20 N21 A22 Q23 A24 I27 A28 R36 Q48 N49 A50 E62 G86 GLU SER MET LEU GLU GLY SER SER MET ASP ARG ILE LYS ARG V101 T102 E103 E109 E115 L129 GLY GLY THR GLN

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

THR GLY ARG

• Molecule 2: Internal virion protein gp14

Chain T:

12%

56% · 43%

MET CYS TRP A4 A5 A6 I7 P8 I9 A10 I11 A16 I17 S18 G19 Q20 N21 A22 Q23 A24 K25 M26 I27 R36 Q37 A50 R82 G86 GLU SER MET LEU GLU GLY SER SER MET ASP ARG ILE LYS ARG V101 T102 E103 A126 Q127 Q128 LEU GLY GLY THR GLN SER

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

GLY ARG

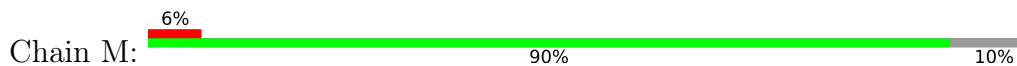• Molecule 2: Internal virion protein gp14

Chain c:

14%

57% 43%

MET CYS TRP A4 I7 P8 I9 A10 I11 A14 Q15 A16 I17 S18 G19 Q20 N21 A22 Q23 A24 I27 Q48 N49 A50 E62 R82 G86 GLU SER MET LEU GLU GLY SER SER MET ASP ARG ILE LYS ARG V101 T102 E103 G104 Q105 E115 D120 Q127 Q128

L129 GLY GLY THR GLN SER ALA ALA SER GLN ILE ASP GLU ILE TYR LYS SER GLU GLN LYS GLN LYS SER LYS LEU GLN MET VAL LEU ASP PRO LEU ALA ILE MET GLY SER SER ALA ALA SER ALA TYR ALA SER GLY ALA PHE ASP SER LYS SER THR THR LYS ALA PRO ILE VAL ALA ALA

ALA LYS GLY THR LYS THR GLY ARG

• Molecule 2: Internal virion protein gp14

Chain d:

12%

57% 43%

MET CYS TRP A4 A5 A6 I7 P8 I9 A10 I11 A14 Q15 A16 I17 S18 G19 Q20 N21 A22 M26 I27 A28 A29 Q30 R43 N49 A50 R82 G86 GLU SER MET LEU GLU GLY SER SER MET ASP ARG ILE LYS ARG V101 T102 Q128 LEU GLY GLY THR GLN SER

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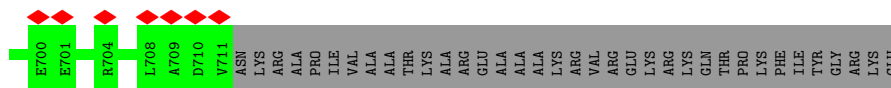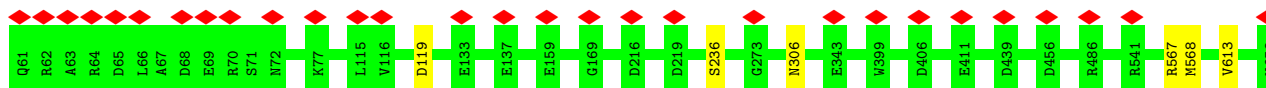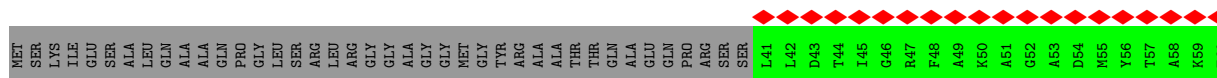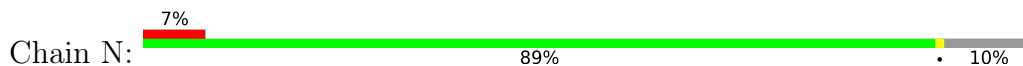
GLY ARG

• Molecule 2: Internal virion protein gp14

Chain e:

14%

57% 43%

MET CYS TRP A4 I7 P8 I9 A14 Q15 A16 I17 S18 G19 Q20 N21 A22 Q23 A24 I27 A28 R36 Q48 N49 A50 E62 G86 GLU SER MET LEU GLU GLY SER SER MET ASP ARG ILE LYS ARG V101 T102 E103 E109 E115 N116 D120 A126

L129 GLY GLY THR GLN SER ALA ALA SER GLN ILE ASP GLU ILE TYR LYS SER GLU GLN LYS GLN GLN LYS SER LEU LEU GLN MET VAL LEU ASP PRO LEU ALA ILE MET GLY SER SER ALA ALA SER ALA TYR ALA PHE ASP SER LYS SER THR THR LYS ALA PRO ILE VAL ALA

ALA LYS GLY THR LYS THR GLY ARG

• Molecule 2: Internal virion protein gp14

Chain f:

15%
56% • 43%

MET CYS TRP A4 A5 A6 I7 P8 I9 A10 I11 A14 Q15 A16 I17 S18 G19 Q20 N21 A22 Q23 A24 K25 M26 I27 A28 A29 Q30 R36 Q37 R43 Q48 N49 A50 Q73 R82 G86 GLU SER MET LEU GLU GLY SER SER MET ASP ARG ILE LYS ARG V101 T102

E103 E109 E115 Q128 LEU GLY GLY THR GLN SER ALA ALA SER GLN ILE ASP GLU ILE TYR LYS SER GLU GLN LYS GLN GLN LYS SER LEU LEU GLN MET VAL LEU ASP PRO LEU ALA ILE MET GLY SER SER ALA ALA SER ALA TYR ALA SER GLY ALA PHE ASP SER LYS SER THR

THR LYS ALA PRO ILE VAL ALA LYS GLY THR LYS THR GLY ARG

• Molecule 2: Internal virion protein gp14

Chain g:

13%
57% 43%

MET CYS TRP A4 I7 P8 A14 Q15 A16 I17 S18 G19 Q20 N21 A22 Q23 A24 K25 M26 I27 A28 R36 N49 A50 G86 GLU SER MET LEU GLU GLY SER SER MET ASP ARG ILE LYS ARG V101 T102 E103 G104 Q105 F106 E109 E115 D120 L129 GLY GLY

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

THR LYS THR GLY ARG

• Molecule 2: Internal virion protein gp14

Chain h:

11%
57% 43%

MET CYS TRP A4 A5 A6 I7 P8 I9 A10 I11 A16 I17 Q20 N21 A22 Q23 M26 I27 A28 R36 E40 A50 G86 GLU SER MET LEU GLU GLY SER SER MET ASP ARG ILE LYS ARG V101 T102 E103 G104 E115 Q128 LEU GLY GLY THR GLN SER ALA

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

ARG

• Molecule 3: Internal virion protein gp15

Chain M:

6%
90% 10%

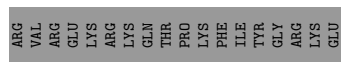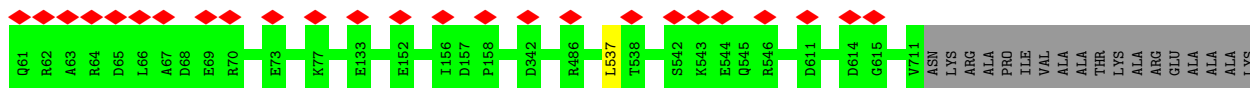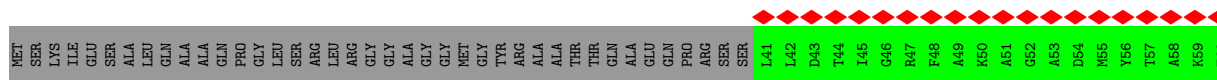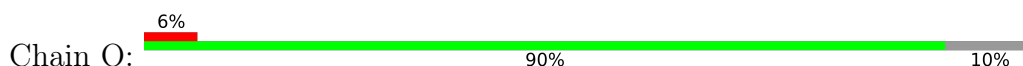MET SER LYS ILE GLU SER ALA LEU GLN ALA ALA GLN PRO GLY LEU SER ARG LEU ARG GLY GLY ALA GLY LEU MET GLY TYR ARG ALA ALA THR THR GLN ILE ALA GLU GLN PRO ARG SER SER L41 L42 D43 T44 I45 G46 R47 F48 A49 K50 A51 G52 A53 D54 M55 Y56 T57 A58 K59 E60
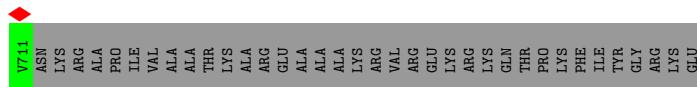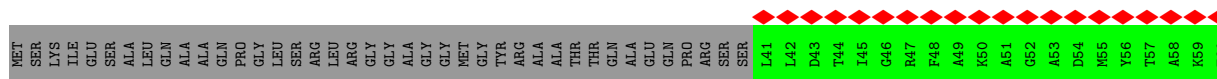
Q61 R62 A63 R64 D65 L66 A67 D68 E69 R70 K77 R130 I156 D162 D219 A274 D342 E343 Q344 D406 R486 S542 K543 E544 Q545 R546 D611 D614 G615 V711 ASN LYS ARG ALA PRO ILE VAL ALA ALA THR LYS ALA ARG GLU ALA ALA ALA
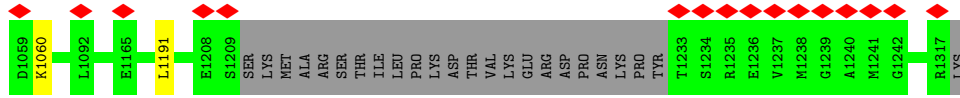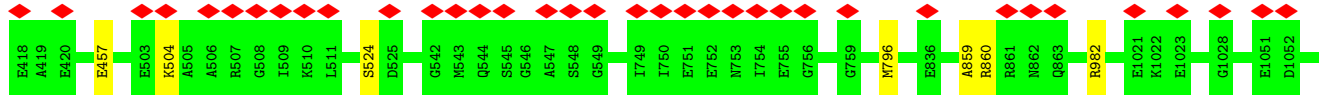
LYS ARG VAL ARG GLU LYS ARG LYS GLN THR PRO LYS PHE ILE TYR GLY ARG LYS GLU

• Molecule 3: Internal virion protein gp15

Chain N: 7%   89%   10%

MET SER LYS ILE GLU SER ALA LEU GLN ALA ALA GLN PRO GLY LEU SER ARG LEU ARG GLY GLY ALA GLY GLY MET GLY TYR ARG ALA ALA THR THR GLN ALA GLU GLN PRO ARG SER SER L41 L42 D43 T44 I45 G46 R47 F48 A49 K50 A51 G52 A53 D54 M55 Y56 T57 A58 K59 E60

Q61 R62 A63 R64 D65 L66 A67 D68 E69 R70 S71 N72 K77 L115 V116 D119 E133 E137 E159 G169 D216 D219 S236 G273 N306 E343 W399 D406 E411 D439 D456 R486 R541 R567 M568 V613 N658

E700 E701 R704 L708 A709 D710 V711 ASN LYS ARG ALA PRO ILE VAL ALA ALA THR LYS ALA ARG GLU ALA ALA ALA LYS ARG VAL ARG GLU LYS ARG LYS GLN THR PRO LYS PHE ILE TYR GLY ARG LYS GLU

• Molecule 3: Internal virion protein gp15

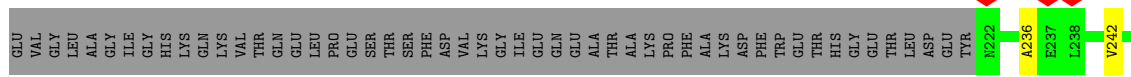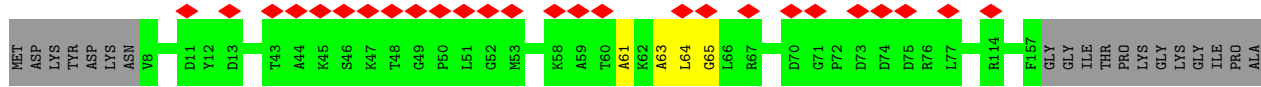Chain O: 6%   90%   10%

MET SER LYS ILE GLU SER ALA LEU GLN ALA ALA GLN PRO GLY LEU SER ARG LEU ARG GLY GLY ALA GLY GLY MET GLY TYR ARG ALA ALA THR THR GLN ALA GLU GLN PRO ARG SER SER L41 L42 D43 T44 I45 G46 R47 F48 A49 K50 A51 G52 A53 D54 M55 Y56 T57 A58 K59 E60

Q61 R62 A63 R64 D65 L66 A67 D68 E69 R70 E73 K77 E133 E152 I156 D157 P158 D342 R486 L537 T538 S542 K543 E544 Q545 R546 D611 D614 G615 V711 ASN LYS ARG ALA PRO ILE VAL ALA ALA THR LYS ALA ARG GLU ALA ALA ALA LYS

ARG VAL ARG GLU LYS ARG LYS GLN THR PRO LYS PHE ILE TYR GLY ARG LYS GLU

• Molecule 3: Internal virion protein gp15

Chain P: 7%   89%   10%

MET SER LYS ILE GLU SER ALA LEU GLN ALA ALA GLN PRO GLY LEU SER ARG LEU ARG GLY GLY ALA GLY GLY MET GLY TYR ARG ALA ALA THR THR GLN ALA GLU GLN PRO ARG SER SER L41 L42 D43 T44 I45 G46 R47 F48 A49 K50 A51 G52 A53 D54 M55 Y56 T57 A58 K59 E60

Q61 R62 A63 R64 D65 L66 A67 D68 E69 R70 S71 N72 K77 N111 V116 R130 E137 E159 G169 D216 S236 G273 E343 Q344 M345 K405 D406 E411 D436 D439 R486 R541 R567 M568 N658 K697 L708 A709 D710

V711 ASN LYS ARG ALA PRO ILE VAL ALA ALA THR LYS ALA ARG GLU ALA ALA ALA LYS ARG VAL ARG GLU LYS ARG LYS GLN THR PRO LYS PHE ILE TYR GLY ARG LYS GLU

• Molecule 3: Internal virion protein gp15

Chain Q:

6%

90% 10%

MET SER LYS ILE GLU SER ALA LEU GLN ALA GLN PRO GLY LEU SER ARG LEU ARG GLY GLY ALA GLY GLY MET GLY TYR ARG ALA ALA THR THR GLN ILE ALA GLU GLN PRO ARG SER SER L41 L42 D43 T44 I45 G46 R47 F48 A49 K50 A51 G52 A53 D54 M55 Y56 T57 A58 K59 E60

Q61 R62 A63 R64 D65 L66 A67 D68 E69 R70 K77 L92 R130 E152 I156 D157 P158 D337 D342 M345 R486 T538 S542 K543 E544 Q545 R546 D611 D612 V613 D614 G615 V711 ASN LYS ARG ALA PRO ILE VAL ALA ALA THR LYS ALA ARG GLU

ALA ALA ALA LYS VAL ARG GLU LYS ARG LYS GLN THR PRO LYS PHE ILE TYR GLY ARG LYS GLU

• Molecule 3: Internal virion protein gp15

Chain R:

6%

89% • 10%

MET SER LYS ILE GLU SER ALA LEU GLN ALA GLN PRO GLY LEU SER ARG LEU ARG GLY GLY ALA GLY GLY MET GLY TYR ARG ALA ALA THR THR GLN ILE ALA GLU GLN PRO ARG SER SER L41 L42 D43 T44 I45 G46 R47 F48 A49 K50 A51 G52 A53 D54 M55 Y56 T57 A58 K59 E60

Q61 R62 A63 R64 D65 L66 A67 D68 E69 N72 N111 V116 E133 G169 D210 D216 S236 D237 G273 E343 D406 E411 S454 K455 D456 R486 R541 Q545 R567 M568 R704 A709 D710 V711 ASN LYS ARG ALA PRO ILE VAL

ALA ALA THR LYS ARG GLU GLU ALA ALA ALA LYS ARG VAL ARG GLU LYS ARG LYS GLN THR PRO LYS PHE ILE TYR GLY ARG LYS GLU

• Molecule 3: Internal virion protein gp15

Chain G:

6%

89% 10%

MET SER LYS ILE GLU SER ALA LEU GLN ALA GLN PRO GLY LEU SER ARG LEU ARG GLY GLY ALA GLY GLY MET GLY TYR ARG ALA ALA THR THR GLN ILE ALA GLU GLN PRO ARG SER SER L41 L42 D43 T44 I45 G46 R47 F48 A49 K50 A51 G52 A53 D54 M55 Y56 T57 A58 K59 E60

Q61 R62 A63 R64 D65 L66 A67 D68 E69 R70 E73 K77 E152 I156 D157 P158 D162 P235 Q340 P341 D342 E343 Q344 M345 E350 R486 L537 S542 K543 E544 Q545 R546 D611 D614 G615 Q660 D710 V711 ASN LYS ARG ALA PRO ILE VAL

ALA ALA THR LYS ALA ARG GLU GLU ALA ALA ALA LYS ARG VAL ARG GLU LYS ARG LYS GLN THR PRO LYS PHE ILE TYR GLY ARG LYS GLU

• Molecule 3: Internal virion protein gp15

Chain H:

7%

89% 10%

MET SER LYS ILE GLU SER ALA LEU GLN ALA GLN PRO GLY LEU SER ARG LEU ARG GLY GLY ALA GLY GLY MET GLY TYR ARG ALA ALA THR THR GLN ILE ALA GLU GLN PRO ARG SER SER L41 L42 D43 T44 I45 G46 R47 F48 A49 K50 A51 G52 A53 D54 M55 Y56 T57 A58 K59 E60

Q61 R62 A63 R64 D65 L66 A67 D68 E69 R70 S71 N72 K77 V116 E159 D210 Q239 G273 D342 E343 W399 D406 E411 D439 D456 R486 R541 R567 M568 N658 E701 R704 L708 A709 D710 V711 ASN LYS ARG ALA PRO

ILE VAL ALA ALA THR LYS ALA ARG GLU ALA ALA ALA LYS ARG VAL ARG GLU LYS ARG GLN THR PRO LYS PHE ILE TYR GLY ARG LYS GLU

• Molecule 4: Peptidoglycan transglycosylase gp16

Chain I:

6%
92%
7%

MET ASP LYS TYR ASP LYS ASN V8 P42 T43 A44 K45 S46 K47 T48 G49 P50 L51 G52 Q55 K58 A59 T60 A61 K62 A63 L64 G65 L66 R67 V68 T69 D70 G71 D74 D75 R76 R114 F157 GLY GLY ILE THR PRO LYS LYS GLY ILE PRO ALA GLU VAL GLY

LEU ALA GLY ILE GLY HIS LYS GLN LYS VAL THR GLN GLU LEU PRO GLU SER THR SER PHE ASP VAL LYS GLY ILE GLU GLN ALA THR ALA LYS PRO PHE ALA LYS ASP PHE TRP GLU THR HIS GLY GLU THR LEU ASP GLU TYR N222 G229 N232 E237 V242 V362

E418 E457 E503 K504 A505 A506 R507 G508 I509 K510 L511 S524 D525 D528 T541 G542 M543 Q544 S545 G546 A547 S548 G549 R624 I749 I750 E751 E752 N753 I754 E755 G756 M796 E836 A859 R860 R861 N862 Q863 R982 N990 K1016 E1021 K1022 E1023

P1033 E1051 D1052 D1059 K1060 S1209 SER LYS MET ALA ARG SER THR ILE LEU PRO LYS ASP THR VAL LYS GLU ARG ASP PRO ASN LYS PRO TYR T1233 S1234 R1235 E1236 V1237 M1238 G1239 A1240 M1241 R1316 R1317 LYS

• Molecule 4: Peptidoglycan transglycosylase gp16

Chain J:

6%
92%
7%

MET ASP LYS TYR ASP LYS ASN V8 D11 T43 A44 K45 S46 K47 T48 G49 P50 L51 G52 M53 M54 K58 A59 T60 A61 L64 G65 L66 R67 D70 G71 P72 D73 D74 D75 R114 E155 T156 F157 GLY GLY ILE THR PRO LYS LYS GLY ILE PRO ALA GLU VAL

GLY LEU ALA GLY ILE GLY HIS LYS GLN LYS VAL THR GLN GLU LEU PRO GLU SER THR SER PHE ASP VAL LYS GLY ILE GLU GLN ALA THR ALA LYS PRO PHE ALA LYS ASP PHE TRP GLU THR HIS GLY GLU THR LEU ASP GLU TYR N222 G229 F230 K231 N232 E237 V242

T349 G350 K351 V362 E418 E457 E503 K504 A505 A506 R507 G508 I509 K510 L511 D525 D526 A527 D528 T541 G542 M543 Q544 S545 G546 A547 S548 G549 R624 I749 I750 E751 E752 N753 I754 E755 G756 G759 M796 E836 G837 D838 A859 R860 R861 N862 Q863

R982 E1021 K1022 E1023 V1031 E1051 D1052 K1060 D1094 E1165 R1187 L1191 E1208 S1209 SER LYS MET ALA ARG SER THR ILE LEU PRO LYS ASP THR VAL LYS GLU ARG ASP PRO ASN LYS PRO TYR T1233 S1234 R1235 E1236 V1237 M1238 G1239 A1240 M1241 R1317 LYS

• Molecule 4: Peptidoglycan transglycosylase gp16

Chain K:

6%
92%
7%

MET ASP LYS TYR ASP LYS ASN V8 D11 P42 T43 A44 K45 S46 K47 T48 G49 P50 L51 G52 M53 M54 K58 A59 T60 A61 K62 A63 L64 G65 L66 R67 V68 T69 D70 G71 D74 D75 R114 F157 GLY GLY ILE THR PRO LYS LYS GLY ILE PRO ALA GLU VAL

GLY LEU ALA GLY ILE GLY HIS LYS GLN LYS VAL THR GLN GLU LEU PRO GLU SER THR SER PHE ASP VAL LYS GLY ILE GLU GLN ALA THR ALA LYS PRO PHE ALA LYS ASP PHE TRP GLU THR HIS GLY GLU THR LEU ASP GLU TYR N222 N232 E237 V242 T349

E418 A419 E420 E457 E503 K504 A505 A506 R507 G508 I509 K510 L511 S524 D525 G542 M543 Q544 S545 G546 A547 S548 G549 I749 I750 E751 E752 N753 I754 E755 G756 G759 M796 E836 A859 R860 R861 N862 Q863 R982 E1021 K1022 E1023 G1028 E1051 D1052

D1059 K1060 L1092 E1165 L1191 E1208 S1209 SER LYS MET ALA ARG SER THR ILE LEU PRO LYS ASP THR VAL LYS GLU ARG ASP PRO ASN LYS PRO TYR T1233 S1234 R1235 E1236 V1237 M1238 G1239 A1240 M1241 G1242 R1317 LYS

• Molecule 4: Peptidoglycan transglycosylase gp16

6%

Chain L:

92%　　　　　　　　　　　　　　• 7%

MET ASP LYS TYR ASP LYS ASN V8 D11 Y12 D13 T43 A44 K45 S46 K47 T48 G49 P50 L51 G52 M53 K58 A59 T60 A61 K62 A63 L64 G65 L66 R67 D70 G71 P72 D73 D74 D75 R76 L77 R114 F157 GLY GLY ILE THR PRO LYS GLY LYS ILE PRO ALA

GLU VAL GLY LEU ALA GLY ILE GLY HIS LYS GLN LYS VAL THR GLN GLU LEU PRO GLU SER THR SER PHE ASP VAL LYS GLY ILE GLU GLN GLU ALA THR ALA LYS PRO PHE ALA LYS ASP PHE TRP GLU THR HIS GLY GLU THR LEU ASP GLU TYR N222 A236 E237 L238 V242

V362 E418 E457 E503 K504 A505 A506 R507 G508 I509 K510 L511 D525 D528 G542 M543 Q544 S545 G546 A547 S548 G549 S748 I749 I750 E751 E752 N753 I754 E755 G756 M796 E836 A859 R860 R861 N862 Q863 R982 K1016 E1021 K1022 E1023 E1051 D1052

K1060 L1092 Q1093 D1094 E1165 E1208 S1209 SER LYS MET ALA ARG SER THR ILE LEU PRO LYS ASP THR VAL LYS GLU ARG ASP PRO ASN LYS PRO TYR T1233 S1234 R1235 E1236 V1237 M1238 G1239 A1240 M1241 M1249 R1316 R1317 LYS

4   Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	45731	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 $(e^-/\text{Å}^2)$	35	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	4000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	19.307	Depositor
Minimum map value	-11.325	Depositor
Average map value	0.004	Depositor
Map value standard deviation	0.908	Depositor
Recommended contour level	2	Depositor
Map size (Å)	339.19998, 339.19998, 339.19998	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.06, 1.06, 1.06	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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	0.25	0/116	0.48	0/155
1	B	0.24	0/116	0.51	0/155
1	C	0.24	0/116	0.47	0/155
1	D	0.31	0/112	0.52	0/150
1	E	0.32	0/112	0.53	0/150
1	F	0.31	0/112	0.58	0/150
1	a	0.25	0/116	0.47	0/155
1	b	0.31	0/112	0.51	0/150
2	S	0.29	0/846	0.52	0/1135
2	T	0.27	0/838	0.54	0/1124
2	c	0.28	0/846	0.54	0/1135
2	d	0.27	0/838	0.52	0/1124
2	e	0.28	0/846	0.51	0/1135
2	f	0.28	0/838	0.54	0/1124
2	g	0.28	0/846	0.52	0/1135
2	h	0.27	0/838	0.54	0/1124
3	G	0.33	0/5415	0.54	0/7291
3	H	0.32	0/5415	0.54	0/7291
3	M	0.34	0/5415	0.54	0/7291
3	N	0.33	0/5415	0.54	0/7291
3	O	0.33	0/5415	0.54	0/7291
3	P	0.33	0/5415	0.52	0/7291
3	Q	0.34	0/5415	0.53	1/7291 (0.0%)
3	R	0.33	0/5415	0.54	0/7291
4	I	0.34	0/9514	0.55	0/12824
4	J	0.34	0/9514	0.56	0/12824
4	K	0.34	0/9514	0.55	0/12824
4	L	0.34	0/9514	0.56	0/12824
All	All	0.33	0/89024	0.54	1/119880 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	Q	538	THR	N-CA-C	5.07	124.70	111.00

There are no chirality outliers.

There are no planarity outliers.

5.2   Too-close contacts   ⓘ

Due to software issues we are unable to calculate clashes - this section is therefore empty.

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	15/88 (17%)	15 (100%)	0	0	100	100
1	B	15/88 (17%)	15 (100%)	0	0	100	100
1	C	15/88 (17%)	15 (100%)	0	0	100	100
1	D	14/88 (16%)	14 (100%)	0	0	100	100
1	E	14/88 (16%)	14 (100%)	0	0	100	100
1	F	14/88 (16%)	14 (100%)	0	0	100	100
1	a	15/88 (17%)	15 (100%)	0	0	100	100
1	b	14/88 (16%)	14 (100%)	0	0	100	100
2	S	108/196 (55%)	106 (98%)	2 (2%)	0	100	100
2	T	107/196 (55%)	104 (97%)	3 (3%)	0	100	100
2	c	108/196 (55%)	104 (96%)	4 (4%)	0	100	100
2	d	107/196 (55%)	105 (98%)	2 (2%)	0	100	100
2	e	108/196 (55%)	105 (97%)	3 (3%)	0	100	100
2	f	107/196 (55%)	106 (99%)	1 (1%)	0	100	100
2	g	108/196 (55%)	106 (98%)	2 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	h	107/196 (55%)	105 (98%)	2 (2%)	0	100	100
3	G	669/747 (90%)	642 (96%)	25 (4%)	2 (0%)	37	70
3	H	669/747 (90%)	636 (95%)	31 (5%)	2 (0%)	37	70
3	M	669/747 (90%)	642 (96%)	27 (4%)	0	100	100
3	N	669/747 (90%)	642 (96%)	24 (4%)	3 (0%)	30	66
3	O	669/747 (90%)	634 (95%)	34 (5%)	1 (0%)	48	81
3	P	669/747 (90%)	641 (96%)	25 (4%)	3 (0%)	30	66
3	Q	669/747 (90%)	640 (96%)	29 (4%)	0	100	100
3	R	669/747 (90%)	634 (95%)	31 (5%)	4 (1%)	22	57
4	I	1217/1318 (92%)	1118 (92%)	86 (7%)	13 (1%)	12	44
4	J	1217/1318 (92%)	1120 (92%)	85 (7%)	12 (1%)	13	46
4	K	1217/1318 (92%)	1112 (91%)	95 (8%)	10 (1%)	16	51
4	L	1217/1318 (92%)	1119 (92%)	84 (7%)	14 (1%)	11	41
All	All	11196/13520 (83%)	10537 (94%)	595 (5%)	64 (1%)	24	57

All (64) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	I	61	ALA
4	I	63	ALA
4	I	504	LYS
4	I	1060	LYS
4	J	61	ALA
4	J	242	VAL
4	J	504	LYS
4	J	1060	LYS
4	K	61	ALA
4	K	242	VAL
4	K	504	LYS
4	K	524	SER
4	K	1060	LYS
4	L	61	ALA
4	L	242	VAL
4	L	504	LYS
4	L	1060	LYS
3	R	237	ASP
4	I	362	VAL

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Mol	Chain	Res	Type
4	I	796	MET
4	I	860	ARG
4	J	362	VAL
4	J	526	ASP
4	J	796	MET
4	J	860	ARG
4	K	796	MET
4	K	860	ARG
4	L	362	VAL
4	L	796	MET
4	L	860	ARG
3	N	567	ARG
3	P	567	ARG
3	R	567	ARG
3	G	235	PRO
4	J	351	LYS
4	L	64	LEU
4	L	236	ALA
4	L	457	GLU
3	O	537	LEU
3	P	236	SER
3	R	236	SER
3	G	537	LEU
3	H	567	ARG
4	I	457	GLU
4	I	982	ARG
4	J	457	GLU
4	J	982	ARG
4	K	982	ARG
4	L	65	GLY
4	L	982	ARG
3	N	236	SER
3	R	568	MET
4	I	66	LEU
4	I	859	ALA
4	J	859	ALA
4	K	457	GLU
4	L	63	ALA
4	L	859	ALA
3	P	568	MET
4	I	242	VAL
4	K	859	ALA

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Mol	Chain	Res	Type
3	N	568	MET
3	H	568	MET
4	I	1033	PRO

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	13/73 (18%)	13 (100%)	0	100	100
1	B	13/73 (18%)	13 (100%)	0	100	100
1	C	13/73 (18%)	13 (100%)	0	100	100
1	D	13/73 (18%)	13 (100%)	0	100	100
1	E	13/73 (18%)	13 (100%)	0	100	100
1	F	13/73 (18%)	13 (100%)	0	100	100
1	a	13/73 (18%)	13 (100%)	0	100	100
1	b	13/73 (18%)	13 (100%)	0	100	100
2	S	83/149 (56%)	83 (100%)	0	100	100
2	T	82/149 (55%)	81 (99%)	1 (1%)	67	86
2	c	83/149 (56%)	83 (100%)	0	100	100
2	d	82/149 (55%)	82 (100%)	0	100	100
2	e	83/149 (56%)	83 (100%)	0	100	100
2	f	82/149 (55%)	80 (98%)	2 (2%)	44	74
2	g	83/149 (56%)	83 (100%)	0	100	100
2	h	82/149 (55%)	82 (100%)	0	100	100
3	G	569/624 (91%)	566 (100%)	3 (0%)	86	94
3	H	569/624 (91%)	568 (100%)	1 (0%)	92	97
3	M	569/624 (91%)	569 (100%)	0	100	100
3	N	569/624 (91%)	566 (100%)	3 (0%)	86	94
3	O	569/624 (91%)	569 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles		
3	P	569/624 (91%)	568 (100%)	1 (0%)	92	97	
3	Q	569/624 (91%)	569 (100%)	0	100	100	
3	R	569/624 (91%)	568 (100%)	1 (0%)	92	97	
4	I	979/1059 (92%)	974 (100%)	5 (0%)	86	94	
4	J	979/1059 (92%)	974 (100%)	5 (0%)	86	94	
4	K	979/1059 (92%)	974 (100%)	5 (0%)	86	94	
4	L	979/1059 (92%)	976 (100%)	3 (0%)	91	96	
All	All	9232/11004 (84%)	9202 (100%)	30 (0%)	90	96	

All (30) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	T	37	GLN
2	f	37	GLN
2	f	73	GLN
3	N	119	ASP
3	N	306	ASN
3	N	613	VAL
3	P	111	ASN
3	R	111	ASN
3	G	340	GLN
3	G	537	LEU
3	G	660	GLN
3	H	239	GLN
4	I	68	VAL
4	I	69	THR
4	I	362	VAL
4	I	624	ARG
4	I	990	ASN
4	J	349	THR
4	J	624	ARG
4	J	1031	VAL
4	J	1187	ARG
4	J	1191	LEU
4	K	66	LEU
4	K	68	VAL
4	K	69	THR
4	K	349	THR
4	K	1191	LEU
4	L	362	VAL

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Mol	Chain	Res	Type
4	L	1021	GLU
4	L	1249	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (36) such sidechains are listed below:

Mol	Chain	Res	Type
2	T	48	GLN
2	T	73	GLN
2	c	71	ASN
2	d	49	ASN
2	h	73	GLN
3	M	242	GLN
3	M	364	ASN
3	M	658	ASN
3	N	82	GLN
3	N	295	GLN
3	O	589	ASN
3	O	658	ASN
3	O	695	ASN
3	P	82	GLN
3	P	95	GLN
3	P	295	GLN
3	P	318	ASN
3	Q	140	HIS
3	Q	144	GLN
3	Q	472	GLN
3	Q	658	ASN
3	Q	695	ASN
3	R	678	GLN
3	G	88	ASN
3	G	197	ASN
3	G	239	GLN
3	G	658	ASN
3	H	111	ASN
3	H	451	GLN
4	I	269	ASN
4	I	990	ASN
4	J	442	ASN
4	K	442	ASN
4	L	240	ASN
4	L	442	ASN
4	L	875	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 ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

There are no ligands in this entry.

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-61909. 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
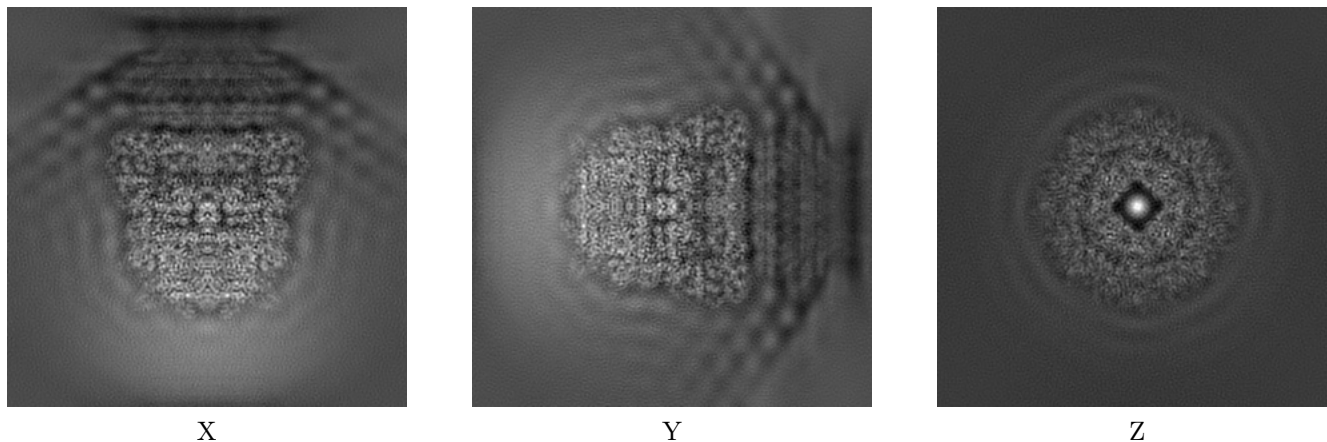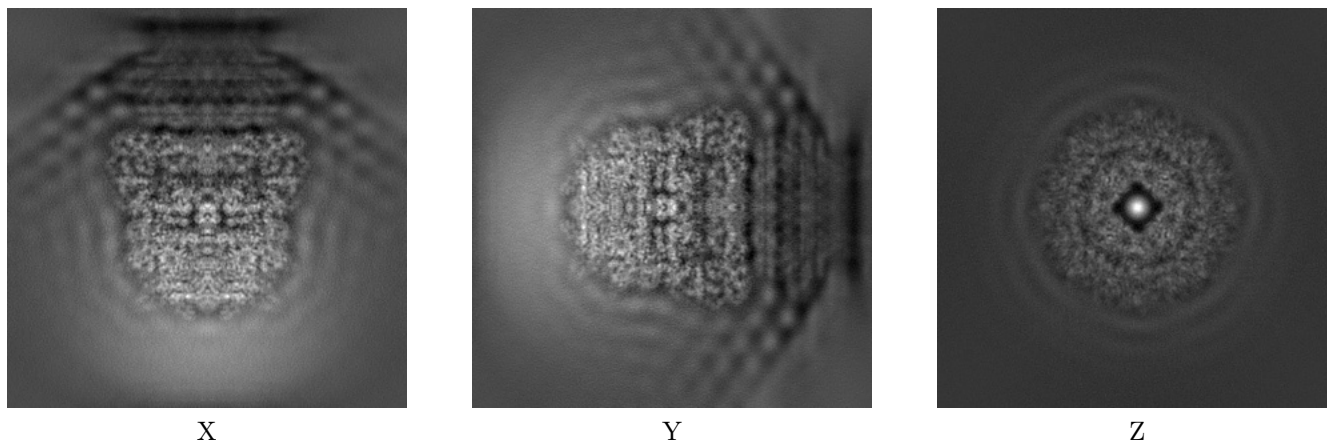
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ
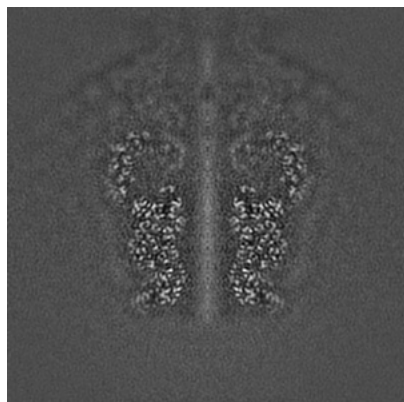
6.2.1 Primary map
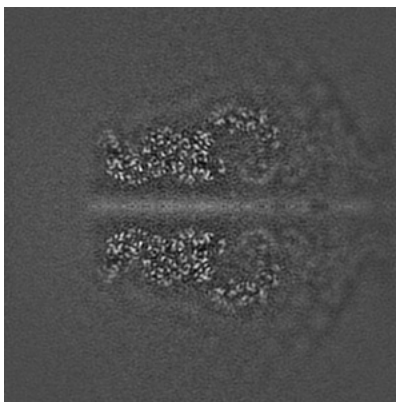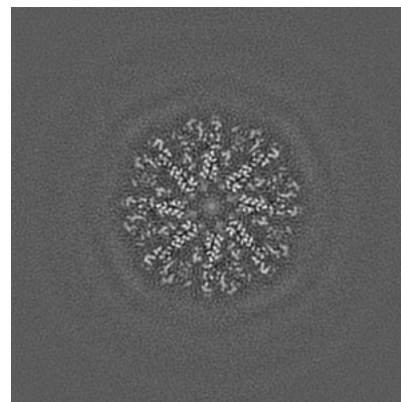
| X Index: 160 | Y Index: 160 | Z Index: 160 |

6.2.2 Raw map
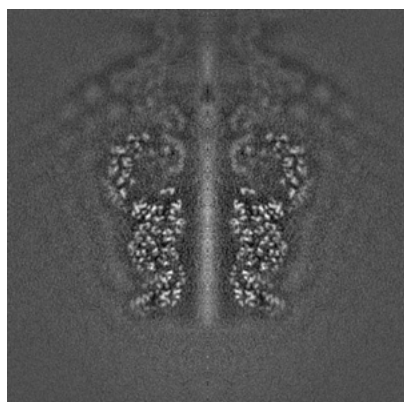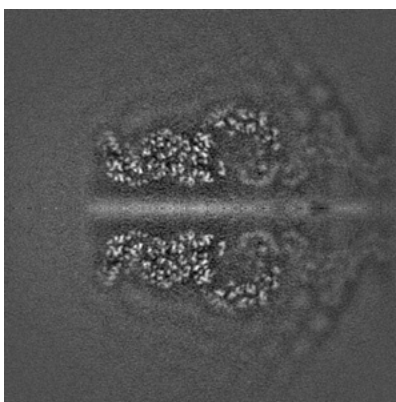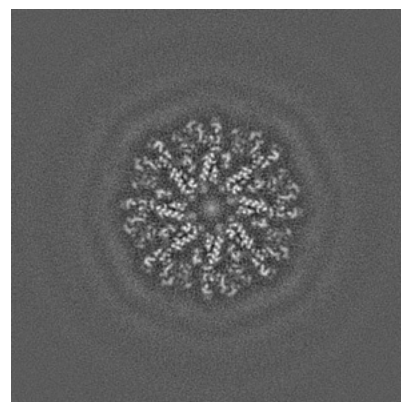
| X Index: 160 | Y Index: 160 | Z Index: 160 |

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

6.3 Largest variance slices ⓘ

6.3.1 Primary map
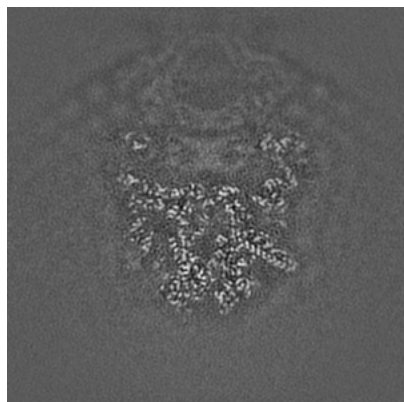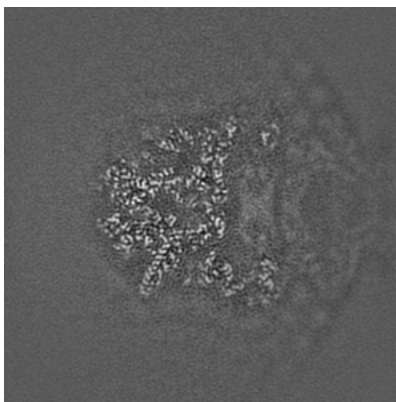
X Index: 181   Y Index: 181   Z Index: 161
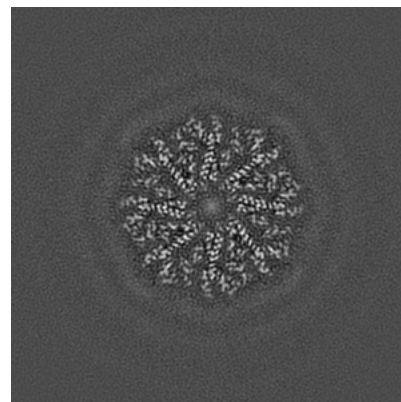
6.3.2 Raw map
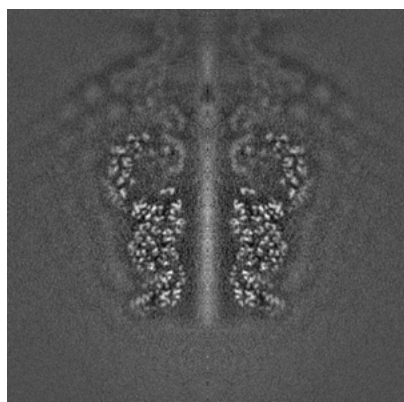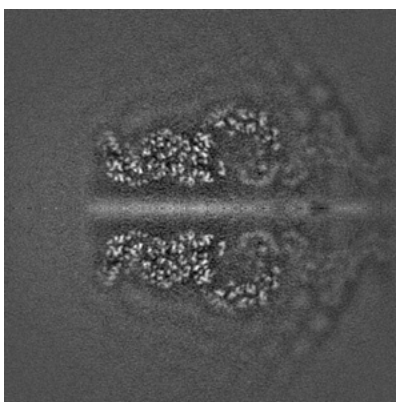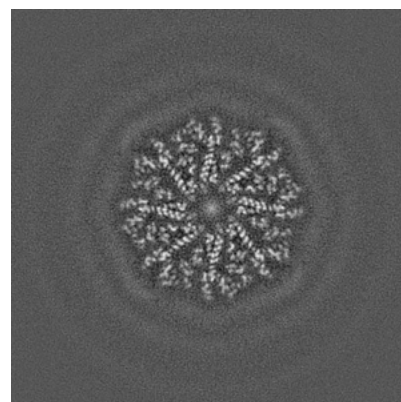
X Index: 160   Y Index: 160   Z Index: 161

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
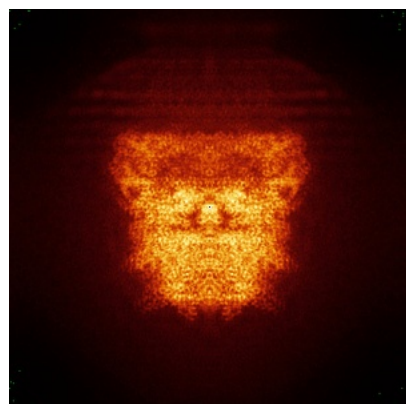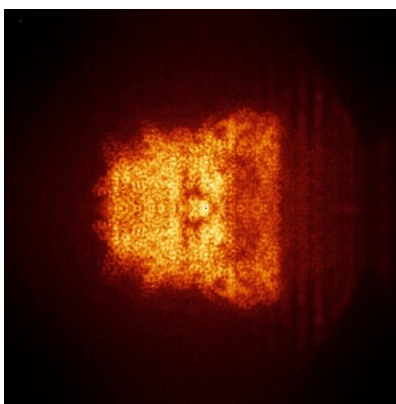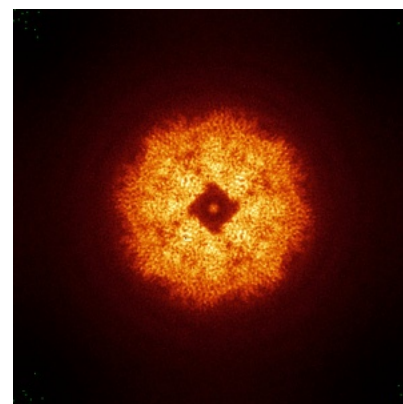
X   Y   Z

6.4.2 Raw map

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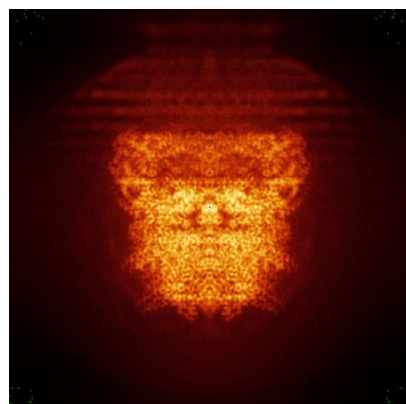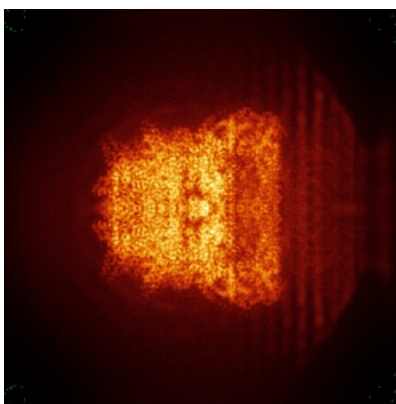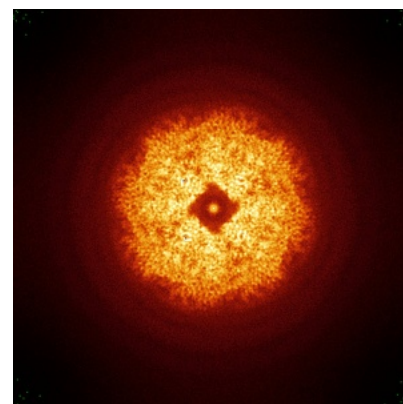
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views ⓘ

6.5.1 Primary map

X	Y	Z
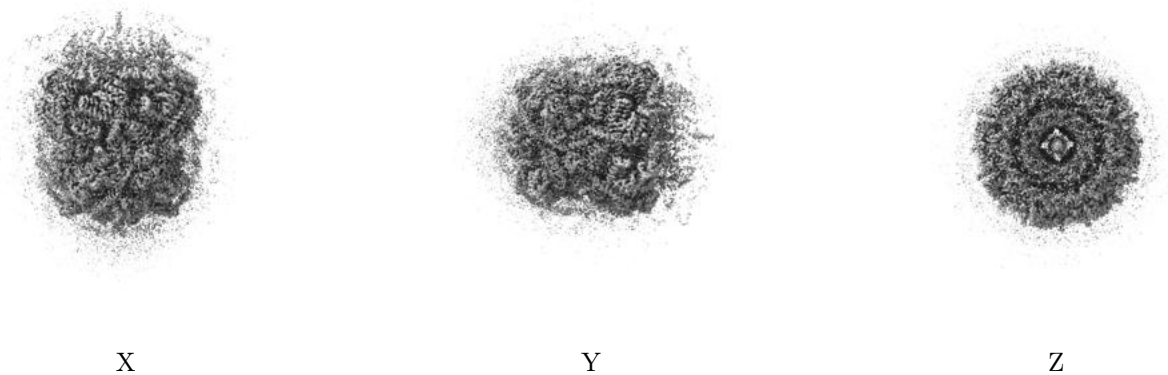
The images above show the 3D surface view of the map at the recommended contour level 2.0. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map

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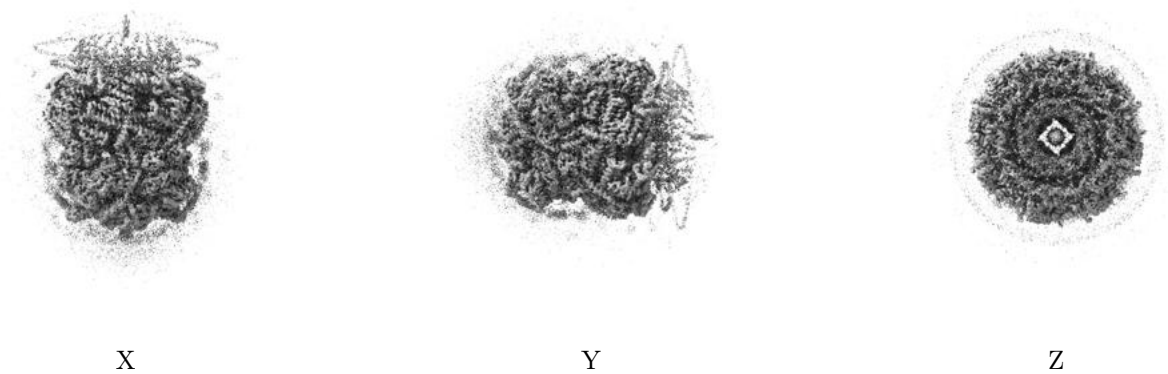
These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

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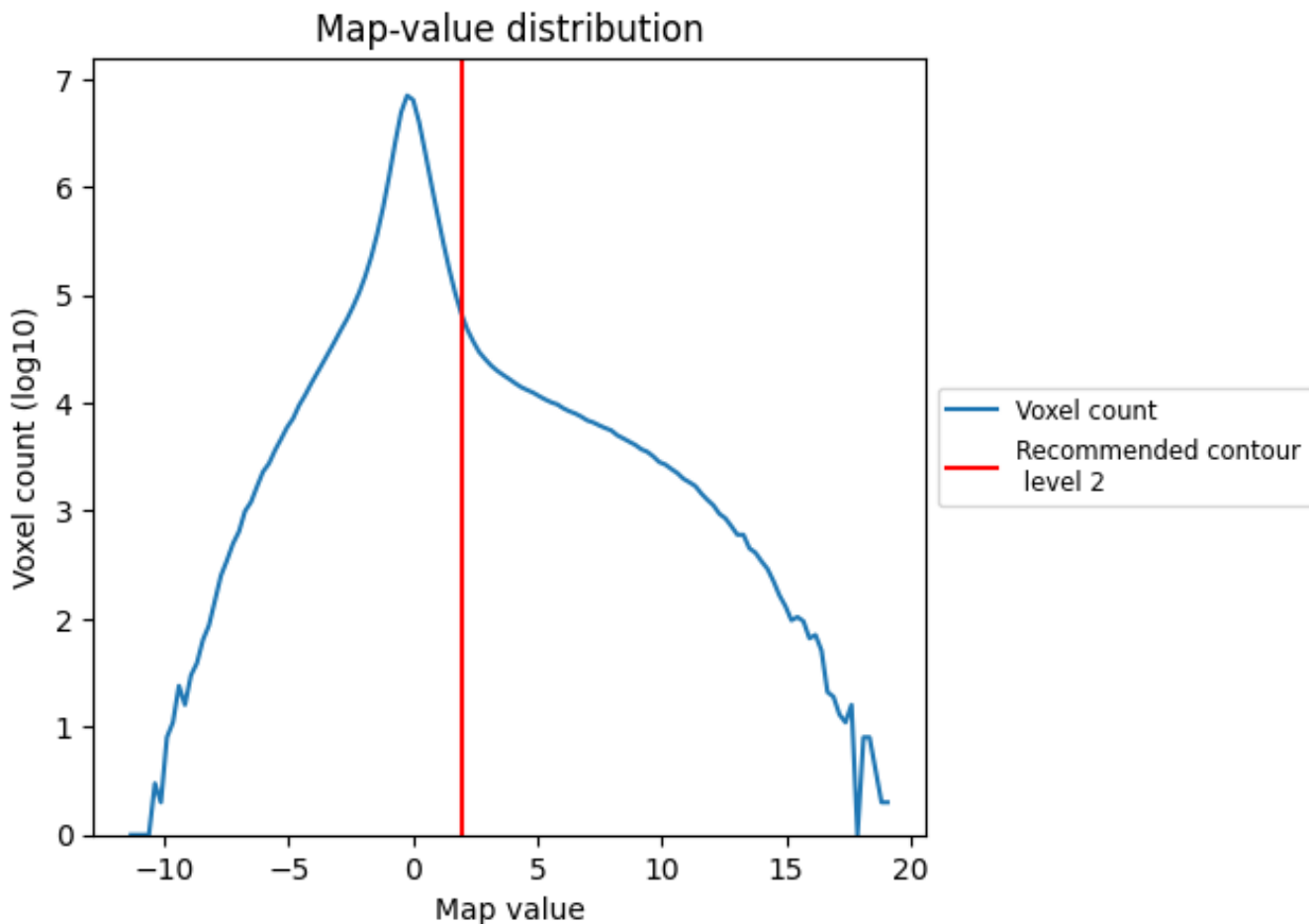
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2　Volume estimate ⓘ
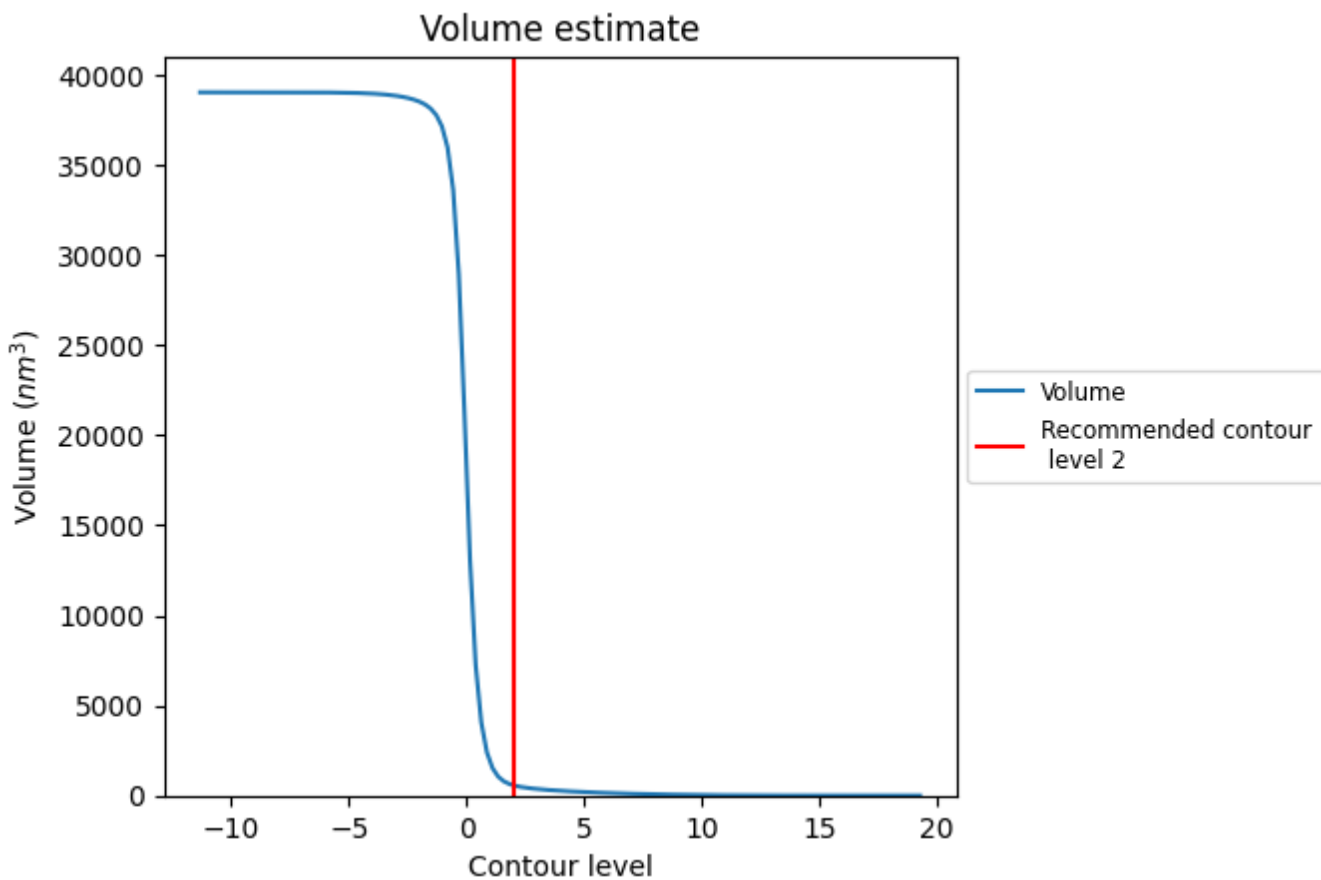
The volume at the recommended contour level is 576 nm^3; this corresponds to an approximate mass of 521 kDa.

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   ⓘ
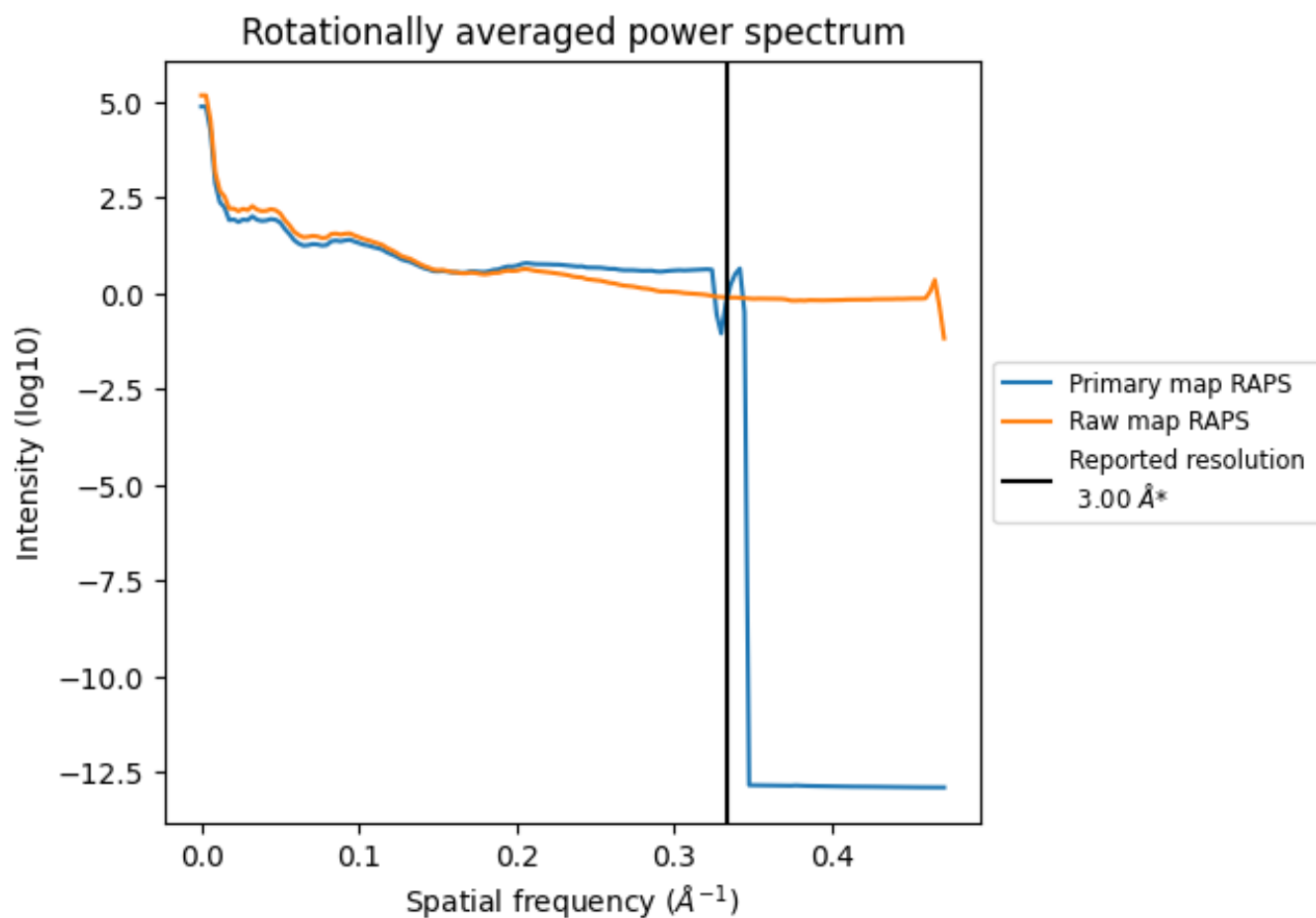
*Reported resolution corresponds to spatial frequency of 0.333 Å^{-1}

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 ⓘ
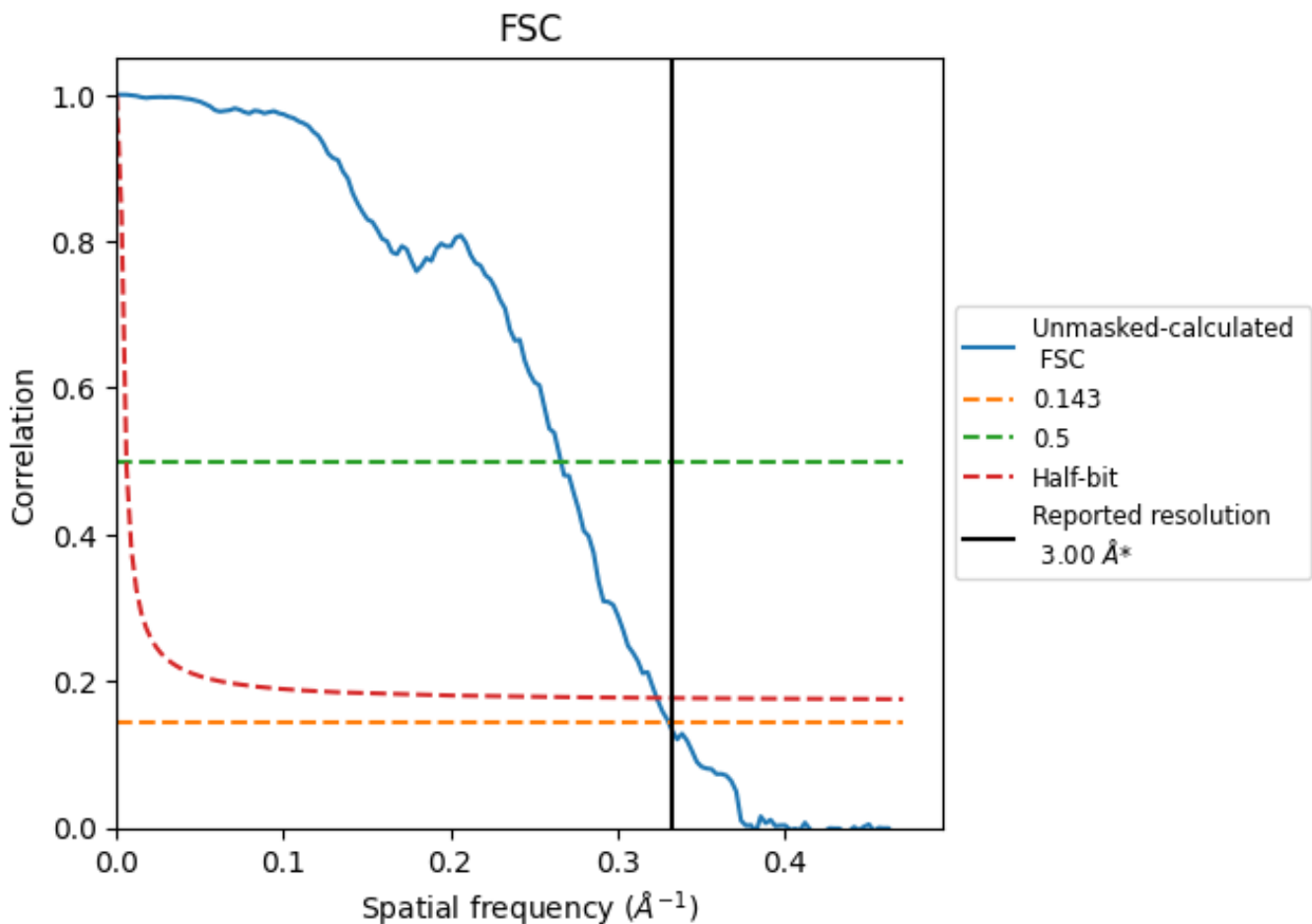
*Reported resolution corresponds to spatial frequency of 0.333 Å^{-1}

8.2   Resolution estimates (i)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.00	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.02	3.76	3.09

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

9   Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-61909 and PDB model 9JYY. Per-residue inclusion information can be found in section 3 on page 6.

9.1   Map-model overlay ⓘ

X   Y   Z
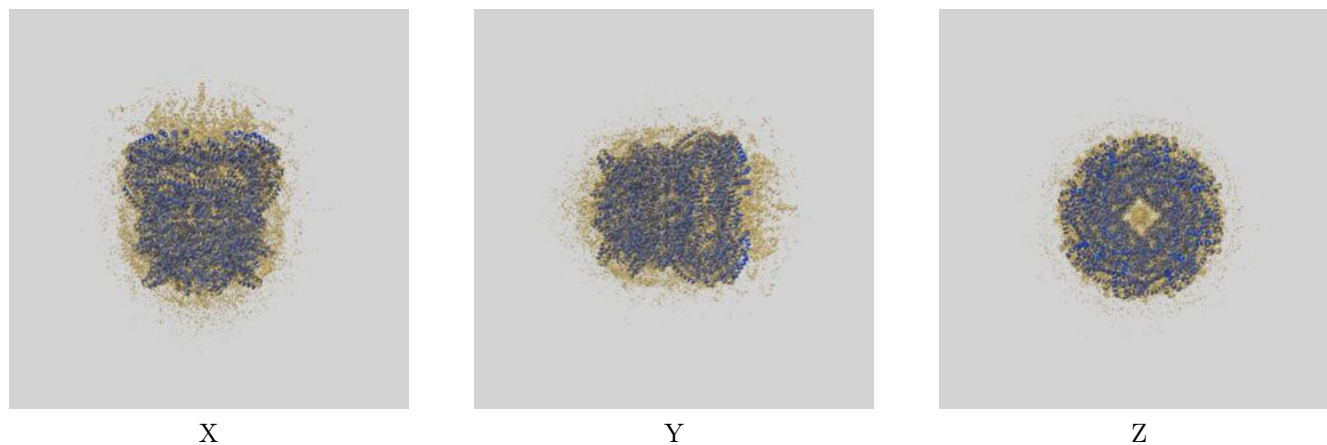
The images above show the 3D surface view of the map at the recommended contour level 2.0 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2　Q-score mapped to coordinate model ⓘ

X　　　　　　　　　　Y　　　　　　　　　　Z
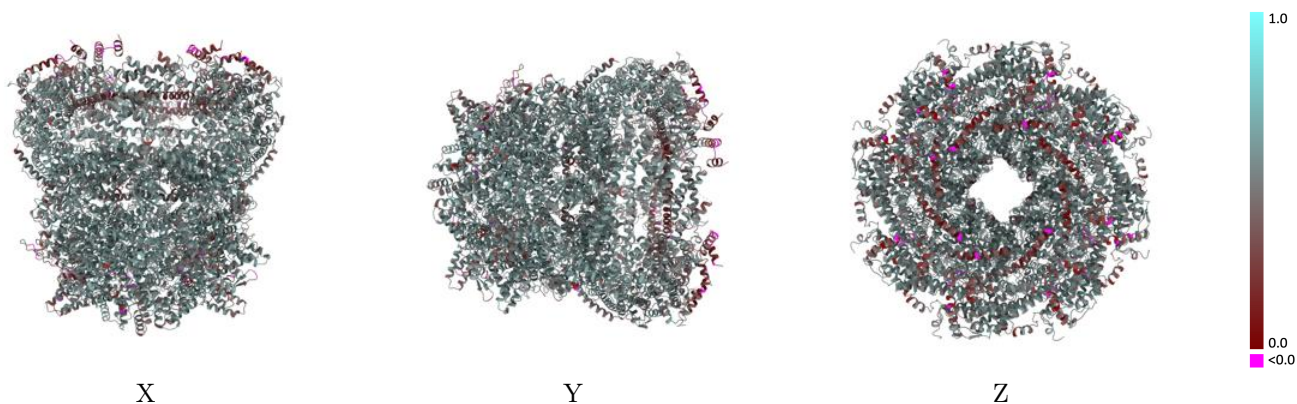
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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
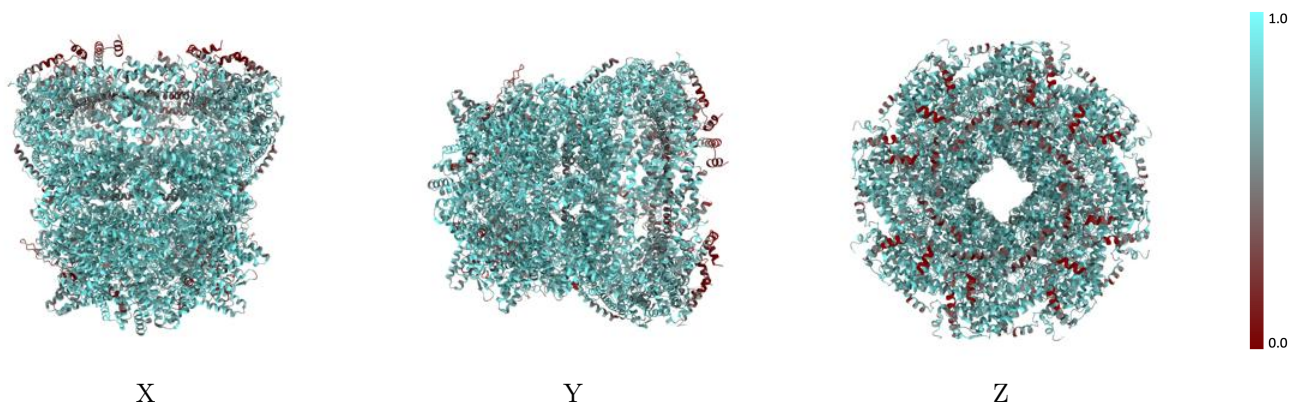
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (2).

9.4　Atom inclusion ⓘ
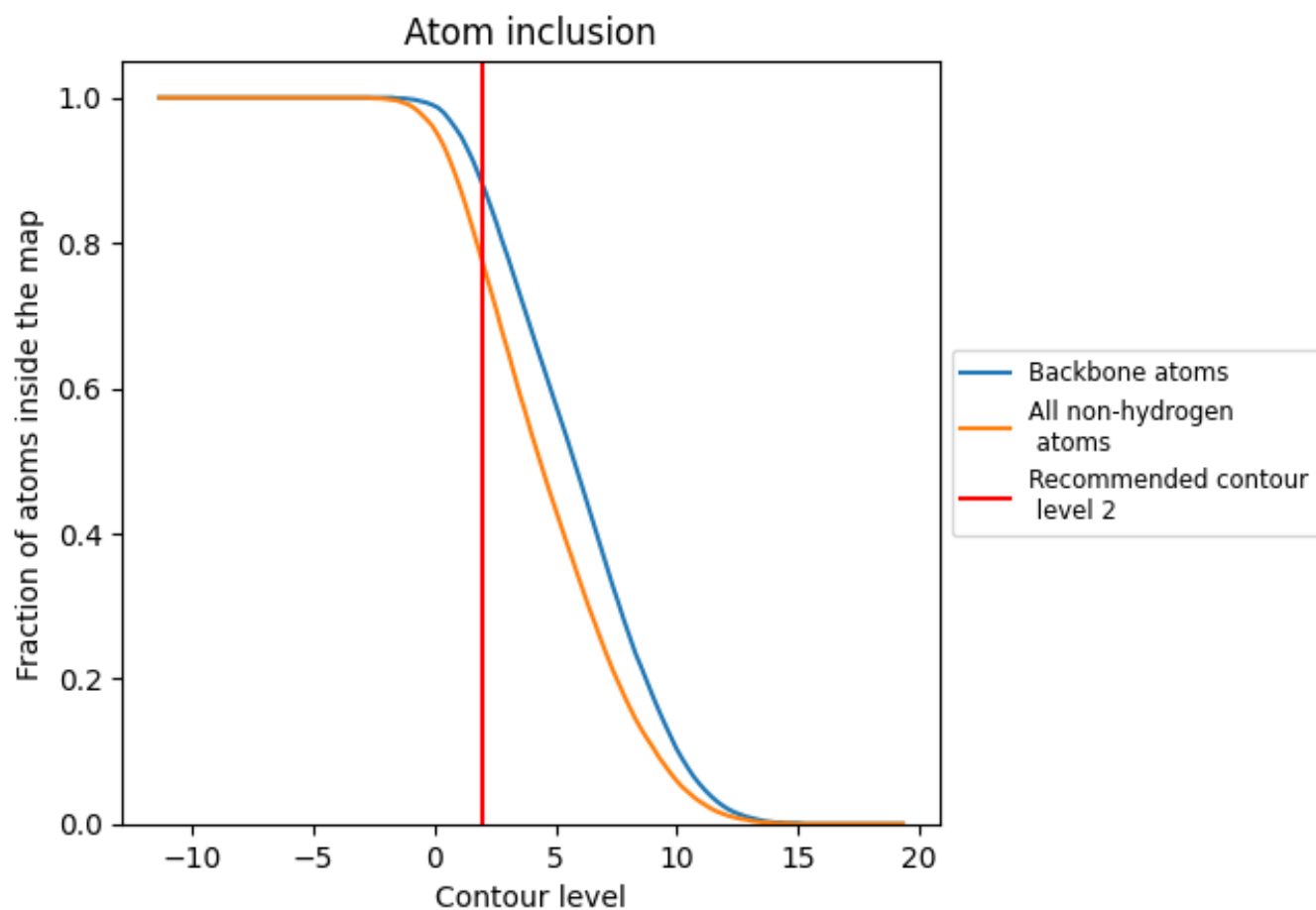
At the recommended contour level, 88% of all backbone atoms, 77% of all non-hydrogen atoms, are inside the map.

9.5　Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (2) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7720	0.5140
A	0.6550	0.4820
B	0.7070	0.5020
C	0.6470	0.4990
D	0.6250	0.4210
E	0.6160	0.4290
F	0.6610	0.4250
G	0.7690	0.5150
H	0.7620	0.5100
I	0.8140	0.5310
J	0.8140	0.5310
K	0.8150	0.5330
L	0.8160	0.5330
M	0.7730	0.5170
N	0.7620	0.5120
O	0.7740	0.5190
P	0.7620	0.5110
Q	0.7710	0.5190
R	0.7630	0.5110
S	0.5990	0.4300
T	0.5860	0.4220
a	0.6720	0.4780
b	0.6340	0.4370
c	0.5810	0.4180
d	0.5670	0.4190
e	0.6010	0.4290
f	0.5730	0.4100
g	0.5960	0.4210
h	0.5900	0.4160

1.0

0.0
<0.0