



## Full wwPDB EM Validation Report ⓘ

Jun 30, 2025 – 12:13 AM EDT

PDB ID : 9CJZ / pdb\_00009cjz  
EMDB ID : EMD-45637  
Title : CryoEM structure of NC99 hemagglutinin trimer in complex with Fab T009 3-E04  
Authors : Li, N.; Tsybovsky, Y.; Sangesland, M.; Kanekiyo, M.  
Deposited on : 2024-07-08  
Resolution : 3.80 Å(reported)  
Based on initial model : 8D21

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>  
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

EMDB validation analysis : 0.0.1.dev118  
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

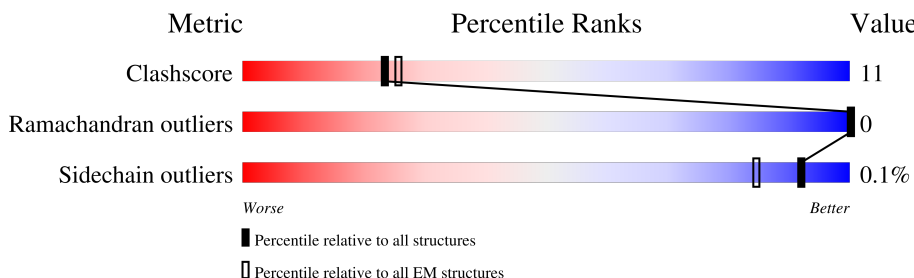
# 1 Overall quality at a glance

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	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  $\geq 3$ , 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  $\leq 5\%$ . 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	326	
1	C	326	
1	E	326	
2	B	222	
2	D	222	
2	F	222	
3	H	122	
3	J	122	

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Mol	Chain	Length	Quality of chain
3	M	122	 66% 24% 11%
4	K	108	 50% 30% 20%
4	L	108	 61% 22% 17%
4	N	108	 60% 24% 16%

## 2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 15429 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 Hemagglutinin HA1 chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	291	Total	C	N	O	S	0	0
			2300	1464	393	434	9		
1	C	293	Total	C	N	O	S	0	0
			2311	1471	393	438	9		
1	E	293	Total	C	N	O	S	0	0
			2315	1473	396	437	9		

- Molecule 2 is a protein called Hemagglutinin HA2 chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	162	Total	C	N	O	S	0	0
			1324	827	228	262	7		
2	D	162	Total	C	N	O	S	0	0
			1324	827	228	262	7		
2	F	162	Total	C	N	O	S	0	0
			1324	827	228	262	7		

There are 141 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	47	GLN	GLY	conflict	UNP Q6WG00
B	177	SER	-	expression tag	UNP Q6WG00
B	178	GLY	-	expression tag	UNP Q6WG00
B	179	ARG	-	expression tag	UNP Q6WG00
B	180	LEU	-	expression tag	UNP Q6WG00
B	181	VAL	-	expression tag	UNP Q6WG00
B	182	PRO	-	expression tag	UNP Q6WG00
B	183	ARG	-	expression tag	UNP Q6WG00
B	184	GLY	-	expression tag	UNP Q6WG00
B	185	SER	-	expression tag	UNP Q6WG00
B	186	PRO	-	expression tag	UNP Q6WG00
B	187	GLY	-	expression tag	UNP Q6WG00
B	188	SER	-	expression tag	UNP Q6WG00

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Chain	Residue	Modelled	Actual	Comment	Reference
B	189	GLY	-	expression tag	UNP Q6WG00
B	190	TYR	-	expression tag	UNP Q6WG00
B	191	ILE	-	expression tag	UNP Q6WG00
B	192	PRO	-	expression tag	UNP Q6WG00
B	193	GLU	-	expression tag	UNP Q6WG00
B	194	ALA	-	expression tag	UNP Q6WG00
B	195	PRO	-	expression tag	UNP Q6WG00
B	196	ARG	-	expression tag	UNP Q6WG00
B	197	ASP	-	expression tag	UNP Q6WG00
B	198	GLY	-	expression tag	UNP Q6WG00
B	199	GLN	-	expression tag	UNP Q6WG00
B	200	ALA	-	expression tag	UNP Q6WG00
B	201	TYR	-	expression tag	UNP Q6WG00
B	202	VAL	-	expression tag	UNP Q6WG00
B	203	ARG	-	expression tag	UNP Q6WG00
B	204	LYS	-	expression tag	UNP Q6WG00
B	205	ASP	-	expression tag	UNP Q6WG00
B	206	GLY	-	expression tag	UNP Q6WG00
B	207	GLU	-	expression tag	UNP Q6WG00
B	208	TRP	-	expression tag	UNP Q6WG00
B	209	VAL	-	expression tag	UNP Q6WG00
B	210	LEU	-	expression tag	UNP Q6WG00
B	211	LEU	-	expression tag	UNP Q6WG00
B	212	SER	-	expression tag	UNP Q6WG00
B	213	THR	-	expression tag	UNP Q6WG00
B	214	PHE	-	expression tag	UNP Q6WG00
B	215	LEU	-	expression tag	UNP Q6WG00
B	216	GLY	-	expression tag	UNP Q6WG00
B	217	HIS	-	expression tag	UNP Q6WG00
B	218	HIS	-	expression tag	UNP Q6WG00
B	219	HIS	-	expression tag	UNP Q6WG00
B	220	HIS	-	expression tag	UNP Q6WG00
B	221	HIS	-	expression tag	UNP Q6WG00
B	222	HIS	-	expression tag	UNP Q6WG00
D	47	GLN	GLY	conflict	UNP Q6WG00
D	177	SER	-	expression tag	UNP Q6WG00
D	178	GLY	-	expression tag	UNP Q6WG00
D	179	ARG	-	expression tag	UNP Q6WG00
D	180	LEU	-	expression tag	UNP Q6WG00
D	181	VAL	-	expression tag	UNP Q6WG00
D	182	PRO	-	expression tag	UNP Q6WG00
D	183	ARG	-	expression tag	UNP Q6WG00

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Chain	Residue	Modelled	Actual	Comment	Reference
D	184	GLY	-	expression tag	UNP Q6WG00
D	185	SER	-	expression tag	UNP Q6WG00
D	186	PRO	-	expression tag	UNP Q6WG00
D	187	GLY	-	expression tag	UNP Q6WG00
D	188	SER	-	expression tag	UNP Q6WG00
D	189	GLY	-	expression tag	UNP Q6WG00
D	190	TYR	-	expression tag	UNP Q6WG00
D	191	ILE	-	expression tag	UNP Q6WG00
D	192	PRO	-	expression tag	UNP Q6WG00
D	193	GLU	-	expression tag	UNP Q6WG00
D	194	ALA	-	expression tag	UNP Q6WG00
D	195	PRO	-	expression tag	UNP Q6WG00
D	196	ARG	-	expression tag	UNP Q6WG00
D	197	ASP	-	expression tag	UNP Q6WG00
D	198	GLY	-	expression tag	UNP Q6WG00
D	199	GLN	-	expression tag	UNP Q6WG00
D	200	ALA	-	expression tag	UNP Q6WG00
D	201	TYR	-	expression tag	UNP Q6WG00
D	202	VAL	-	expression tag	UNP Q6WG00
D	203	ARG	-	expression tag	UNP Q6WG00
D	204	LYS	-	expression tag	UNP Q6WG00
D	205	ASP	-	expression tag	UNP Q6WG00
D	206	GLY	-	expression tag	UNP Q6WG00
D	207	GLU	-	expression tag	UNP Q6WG00
D	208	TRP	-	expression tag	UNP Q6WG00
D	209	VAL	-	expression tag	UNP Q6WG00
D	210	LEU	-	expression tag	UNP Q6WG00
D	211	LEU	-	expression tag	UNP Q6WG00
D	212	SER	-	expression tag	UNP Q6WG00
D	213	THR	-	expression tag	UNP Q6WG00
D	214	PHE	-	expression tag	UNP Q6WG00
D	215	LEU	-	expression tag	UNP Q6WG00
D	216	GLY	-	expression tag	UNP Q6WG00
D	217	HIS	-	expression tag	UNP Q6WG00
D	218	HIS	-	expression tag	UNP Q6WG00
D	219	HIS	-	expression tag	UNP Q6WG00
D	220	HIS	-	expression tag	UNP Q6WG00
D	221	HIS	-	expression tag	UNP Q6WG00
D	222	HIS	-	expression tag	UNP Q6WG00
F	47	GLN	GLY	conflict	UNP Q6WG00
F	177	SER	-	expression tag	UNP Q6WG00
F	178	GLY	-	expression tag	UNP Q6WG00

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Chain	Residue	Modelled	Actual	Comment	Reference
F	179	ARG	-	expression tag	UNP Q6WG00
F	180	LEU	-	expression tag	UNP Q6WG00
F	181	VAL	-	expression tag	UNP Q6WG00
F	182	PRO	-	expression tag	UNP Q6WG00
F	183	ARG	-	expression tag	UNP Q6WG00
F	184	GLY	-	expression tag	UNP Q6WG00
F	185	SER	-	expression tag	UNP Q6WG00
F	186	PRO	-	expression tag	UNP Q6WG00
F	187	GLY	-	expression tag	UNP Q6WG00
F	188	SER	-	expression tag	UNP Q6WG00
F	189	GLY	-	expression tag	UNP Q6WG00
F	190	TYR	-	expression tag	UNP Q6WG00
F	191	ILE	-	expression tag	UNP Q6WG00
F	192	PRO	-	expression tag	UNP Q6WG00
F	193	GLU	-	expression tag	UNP Q6WG00
F	194	ALA	-	expression tag	UNP Q6WG00
F	195	PRO	-	expression tag	UNP Q6WG00
F	196	ARG	-	expression tag	UNP Q6WG00
F	197	ASP	-	expression tag	UNP Q6WG00
F	198	GLY	-	expression tag	UNP Q6WG00
F	199	GLN	-	expression tag	UNP Q6WG00
F	200	ALA	-	expression tag	UNP Q6WG00
F	201	TYR	-	expression tag	UNP Q6WG00
F	202	VAL	-	expression tag	UNP Q6WG00
F	203	ARG	-	expression tag	UNP Q6WG00
F	204	LYS	-	expression tag	UNP Q6WG00
F	205	ASP	-	expression tag	UNP Q6WG00
F	206	GLY	-	expression tag	UNP Q6WG00
F	207	GLU	-	expression tag	UNP Q6WG00
F	208	TRP	-	expression tag	UNP Q6WG00
F	209	VAL	-	expression tag	UNP Q6WG00
F	210	LEU	-	expression tag	UNP Q6WG00
F	211	LEU	-	expression tag	UNP Q6WG00
F	212	SER	-	expression tag	UNP Q6WG00
F	213	THR	-	expression tag	UNP Q6WG00
F	214	PHE	-	expression tag	UNP Q6WG00
F	215	LEU	-	expression tag	UNP Q6WG00
F	216	GLY	-	expression tag	UNP Q6WG00
F	217	HIS	-	expression tag	UNP Q6WG00
F	218	HIS	-	expression tag	UNP Q6WG00
F	219	HIS	-	expression tag	UNP Q6WG00
F	220	HIS	-	expression tag	UNP Q6WG00

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Chain	Residue	Modelled	Actual	Comment	Reference
F	221	HIS	-	expression tag	UNP Q6WG00
F	222	HIS	-	expression tag	UNP Q6WG00

- Molecule 3 is a protein called 3-E04 Heavy chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	H	109	Total	C	N	O	S	0	0
			841	540	137	162	2		
3	J	109	Total	C	N	O	S	0	0
			841	540	137	162	2		
3	M	109	Total	C	N	O	S	0	0
			841	540	137	162	2		

- Molecule 4 is a protein called 3-E04 Light chain.

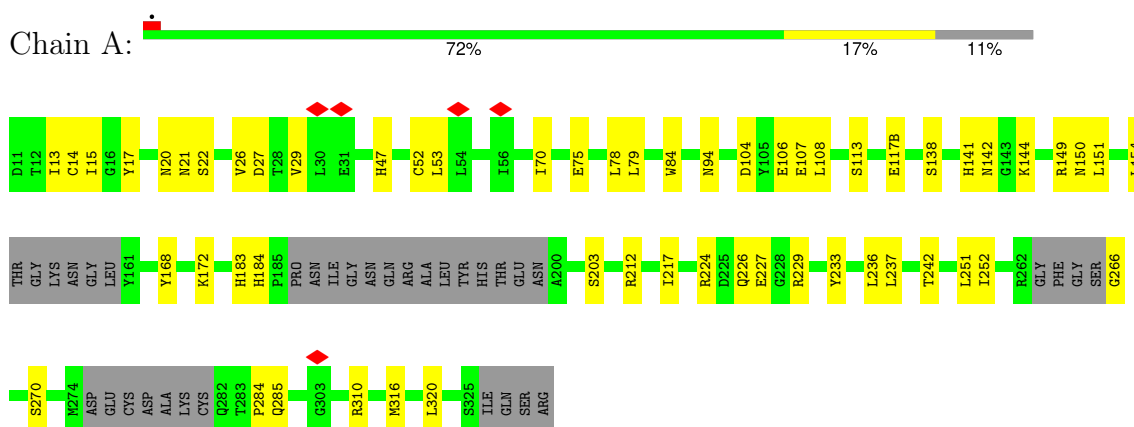
Mol	Chain	Residues	Atoms					AltConf	Trace
4	K	86	Total	C	N	O	S	0	0
			646	410	108	125	3		
4	L	90	Total	C	N	O	S	0	0
			677	428	115	131	3		
4	N	91	Total	C	N	O	S	0	0
			685	432	116	134	3		



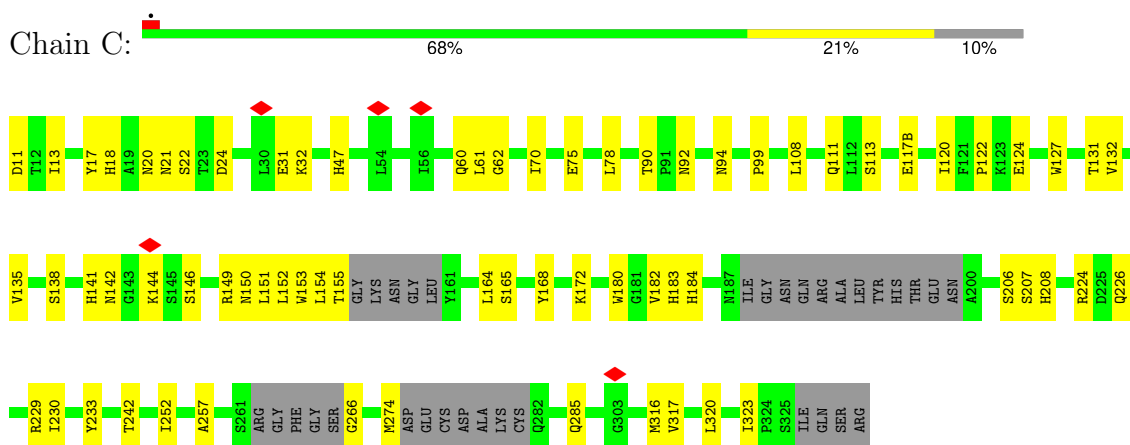
### 3 Residue-property plots

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.

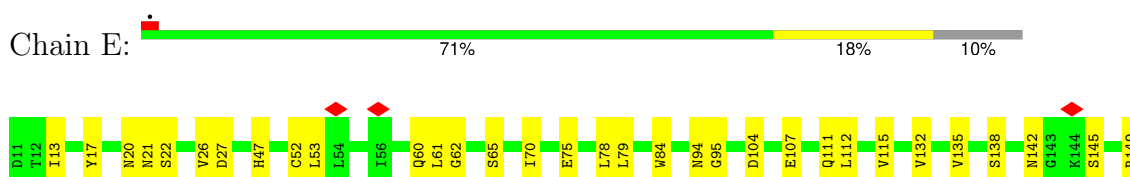
- Molecule 1: Hemagglutinin HA1 chain

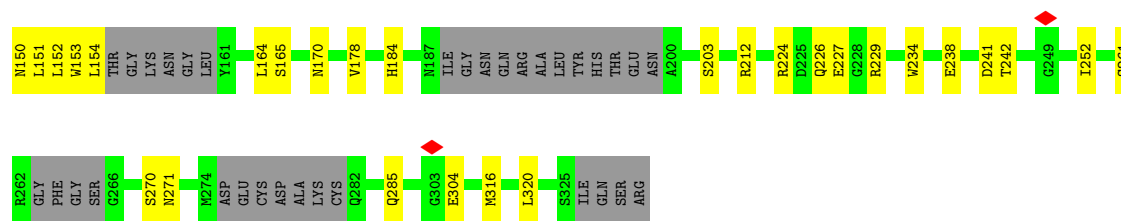


- Molecule 1: Hemagglutinin HA1 chain



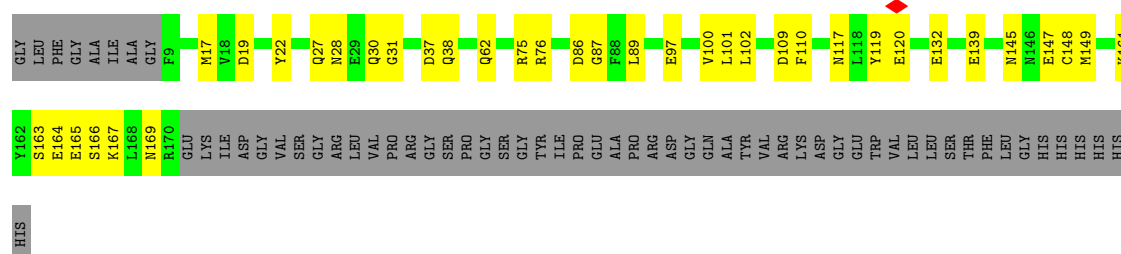
- Molecule 1: Hemagglutinin HA1 chain





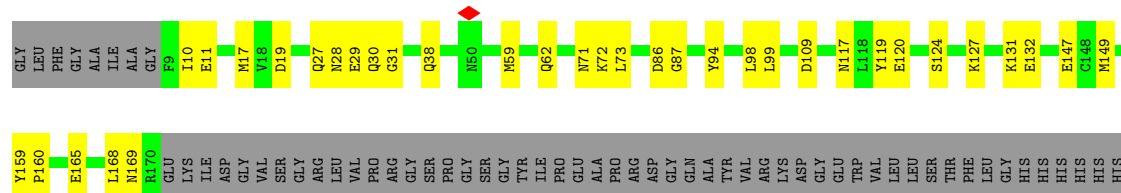
- Molecule 2: Hemagglutinin HA2 chain

Chain B: 56% 17% 27%



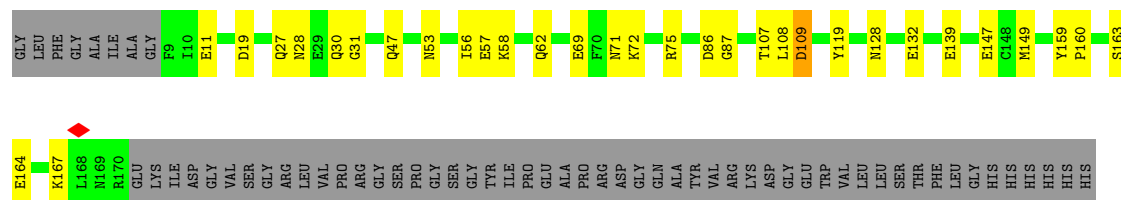
- Molecule 2: Hemagglutinin HA2 chain

Chain D: 57% 16% 27%



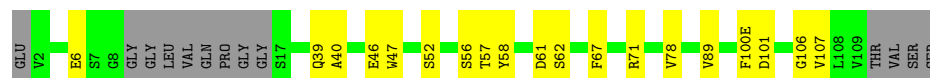
- Molecule 2: Hemagglutinin HA2 chain

Chain F: 59% 14% 27%



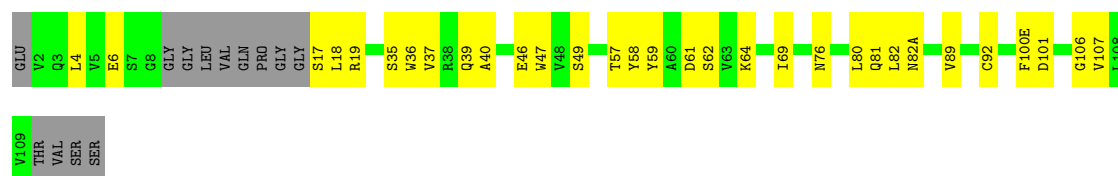
- Molecule 3: 3-E04 Heavy chain

Chain H: 74% 16% 11%



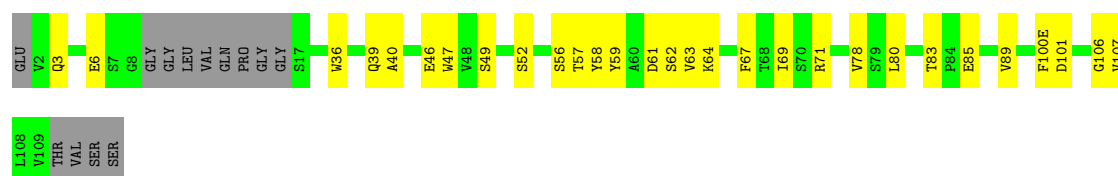
- Molecule 3: 3-E04 Heavy chain

Chain J:  64% 25% 11%



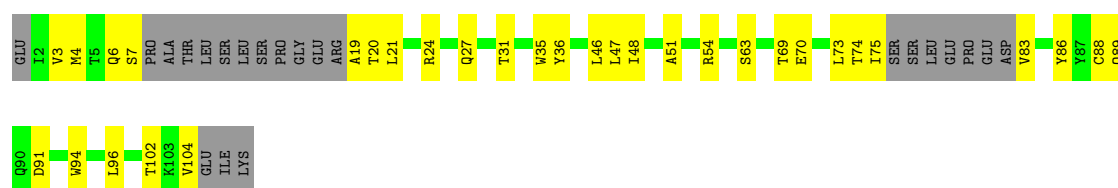
- Molecule 3: 3-E04 Heavy chain

Chain M:  66% 24% 11%



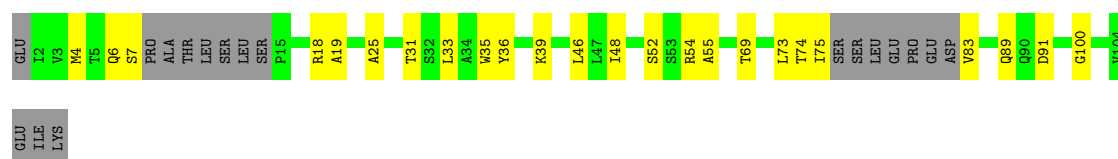
- Molecule 4: 3-E04 Light chain

Chain K:  50% 30% 20%



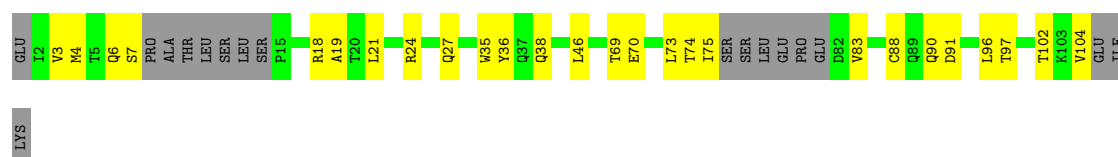
- Molecule 4: 3-E04 Light chain

Chain L:  61% 22% 17%



- Molecule 4: 3-E04 Light chain

Chain N:  60% 24% 16%



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C3	Depositor
Number of particles used	160012	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	40	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2700	Depositor
Magnification	22500	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	1.772	Depositor
Minimum map value	-1.381	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.025	Depositor
Recommended contour level	0.15	Depositor
Map size (Å)	399.6, 399.6, 399.6	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.11, 1.11, 1.11	Depositor

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

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	0.14	0/2360	0.30	0/3214
1	C	0.15	0/2372	0.30	0/3233
1	E	0.14	0/2376	0.30	0/3237
2	B	0.14	0/1350	0.28	0/1815
2	D	0.14	0/1350	0.29	0/1815
2	F	0.14	0/1350	0.30	0/1815
3	H	0.14	0/862	0.25	0/1173
3	J	0.16	0/862	0.31	0/1173
3	M	0.16	0/862	0.30	0/1173
4	K	0.15	0/660	0.30	0/895
4	L	0.15	0/692	0.28	0/937
4	N	0.17	0/700	0.31	0/948
All	All	0.15	0/15796	0.30	0/21428

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [i](#)

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	2300	0	2233	42	0
1	C	2311	0	2240	53	0
1	E	2315	0	2246	42	0
2	B	1324	0	1250	30	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	D	1324	0	1250	29	0
2	F	1324	0	1250	24	0
3	H	841	0	817	15	0
3	J	841	0	817	27	0
3	M	841	0	817	27	0
4	K	646	0	628	26	0
4	L	677	0	658	19	0
4	N	685	0	662	20	0
All	All	15429	0	14868	327	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 11.

All (327) 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:D:27:GLN:OE1	3:J:58:TYR:OH	1.91	0.88
2:B:27:GLN:OE1	3:H:58:TYR:OH	1.91	0.87
2:F:27:GLN:OE1	3:M:58:TYR:OH	1.93	0.86
3:H:46:GLU:OE1	3:H:47:TRP:N	2.10	0.84
1:C:11:ASP:N	2:D:27:GLN:O	2.13	0.82
1:C:131:THR:OG1	1:C:155:THR:OG1	1.89	0.82
1:A:168:TYR:O	1:A:242:THR:OG1	1.97	0.82
1:E:107:GLU:OE1	1:E:107:GLU:N	2.13	0.81
1:C:316:MET:HE2	1:C:316:MET:HA	1.63	0.80
2:B:165:GLU:O	2:B:167:LYS:NZ	2.15	0.78
3:H:6:GLU:OE2	3:H:106:GLY:N	2.17	0.78
3:J:46:GLU:OE1	3:J:47:TRP:N	2.17	0.78
1:C:70:ILE:O	1:C:150:ASN:ND2	2.17	0.77
3:M:46:GLU:OE1	3:M:47:TRP:N	2.17	0.77
2:F:57:GLU:OE2	2:F:58:LYS:NZ	2.18	0.76
3:M:6:GLU:OE2	3:M:106:GLY:N	2.17	0.76
3:J:6:GLU:OE2	3:J:106:GLY:N	2.20	0.75
3:M:59:TYR:OH	3:M:69:ILE:HG22	1.86	0.75
3:M:61:ASP:OD1	3:M:62:SER:N	2.18	0.75
4:L:6:GLN:NE2	4:L:100:GLY:O	2.20	0.75
2:F:163:SER:O	2:F:167:LYS:NZ	2.20	0.75
1:E:138:SER:O	1:E:224:ARG:NH2	2.20	0.75
2:B:147:GLU:OE1	2:B:147:GLU:N	2.21	0.74
2:B:163:SER:O	2:B:167:LYS:NZ	2.19	0.74
2:F:147:GLU:N	2:F:147:GLU:OE1	2.20	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:M:85:GLU:OE2	3:M:85:GLU:N	2.21	0.73
1:C:60:GLN:OE1	1:C:61:LEU:N	2.21	0.73
1:E:60:GLN:OE1	1:E:61:LEU:N	2.22	0.72
1:E:316:MET:HE2	1:E:316:MET:HA	1.70	0.72
1:A:75:GLU:OE2	1:A:94:ASN:ND2	2.23	0.72
1:A:70:ILE:O	1:A:150:ASN:ND2	2.23	0.72
2:B:166:SER:O	2:B:169:ASN:ND2	2.23	0.71
2:F:119:TYR:OH	2:F:132:GLU:OE1	2.08	0.70
3:J:59:TYR:OH	3:J:69:ILE:HG22	1.90	0.70
1:C:168:TYR:O	1:C:242:THR:OG1	2.09	0.69
1:E:75:GLU:OE2	1:E:94:ASN:ND2	2.26	0.69
2:B:86:ASP:OD1	2:B:87:GLY:N	2.25	0.69
1:C:113:SER:HG	1:C:266:GLY:N	1.91	0.69
1:C:131:THR:OG1	1:C:155:THR:O	2.11	0.68
3:J:47:TRP:NE1	3:J:49:SER:O	2.26	0.68
4:K:27:GLN:O	4:K:69:THR:OG1	2.11	0.68
2:D:147:GLU:N	2:D:147:GLU:OE1	2.26	0.68
1:E:47:HIS:NE2	1:E:285:GLN:O	2.27	0.67
2:D:124:SER:O	2:D:127:LYS:NZ	2.19	0.67
1:C:124:GLU:N	1:C:124:GLU:OE1	2.28	0.66
1:E:70:ILE:O	1:E:150:ASN:ND2	2.27	0.66
2:F:164:GLU:N	2:F:164:GLU:OE1	2.28	0.66
3:J:61:ASP:OD1	3:J:62:SER:N	2.28	0.66
4:K:74:THR:O	4:K:75:ILE:HD13	1.95	0.66
1:E:238:GLU:N	1:E:241:ASP:OD2	2.29	0.66
2:B:76:ARG:NH2	2:F:69:GLU:O	2.29	0.65
1:E:13:ILE:HD11	2:F:149:MET:SD	2.37	0.65
1:E:104:ASP:OD1	1:E:234:TRP:NE1	2.29	0.65
1:A:47:HIS:NE2	1:A:285:GLN:O	2.30	0.65
3:J:6:GLU:HG2	3:J:107:VAL:HG23	1.79	0.65
3:H:39:GLN:OE1	3:H:40:ALA:N	2.30	0.64
3:M:59:TYR:OH	3:M:69:ILE:N	2.30	0.64
1:C:75:GLU:OE2	1:C:94:ASN:ND2	2.29	0.64
2:D:17:MET:O	2:D:17:MET:SD	2.56	0.64
4:N:74:THR:O	4:N:75:ILE:HD13	1.97	0.64
4:L:74:THR:O	4:L:75:ILE:HD13	1.97	0.64
1:A:316:MET:HE2	1:A:316:MET:HA	1.80	0.63
1:E:60:GLN:OE1	1:E:62:GLY:N	2.30	0.63
3:H:6:GLU:HG2	3:H:107:VAL:HG23	1.80	0.63
4:L:39:LYS:NZ	4:L:83:VAL:O	2.18	0.63
4:K:19:ALA:O	4:K:75:ILE:N	2.31	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:62:GLN:OE1	2:F:62:GLN:N	2.31	0.62
1:C:13:ILE:HD11	2:D:149:MET:SD	2.38	0.62
1:A:14:CYS:O	1:A:15:ILE:HD13	1.98	0.62
1:C:20:ASN:OD1	1:C:22:SER:N	2.31	0.62
1:A:113:SER:HG	1:A:266:GLY:N	1.97	0.62
3:J:101:ASP:CG	4:K:46:LEU:HD22	2.24	0.62
1:E:52:CYS:SG	1:E:53:LEU:N	2.73	0.62
3:M:39:GLN:OE1	3:M:40:ALA:N	2.32	0.62
1:C:60:GLN:OE1	1:C:62:GLY:N	2.33	0.61
3:M:6:GLU:HG2	3:M:107:VAL:HG23	1.82	0.61
2:B:164:GLU:OE1	2:B:164:GLU:N	2.32	0.61
2:F:109:ASP:N	2:F:109:ASP:OD1	2.31	0.61
4:L:54:ARG:NH1	4:L:55:ALA:O	2.32	0.61
4:N:83:VAL:HG13	4:N:104:VAL:CG2	2.31	0.61
4:N:21:LEU:HD11	4:N:102:THR:HG21	1.82	0.61
4:K:89:GLN:NE2	4:K:91:ASP:OD2	2.34	0.61
2:B:62:GLN:N	2:B:62:GLN:OE1	2.33	0.61
2:F:86:ASP:OD1	2:F:87:GLY:N	2.34	0.60
3:J:39:GLN:OE1	3:J:40:ALA:N	2.33	0.60
1:A:52:CYS:SG	1:A:53:LEU:N	2.74	0.60
2:F:28:ASN:OD1	2:F:30:GLN:N	2.34	0.60
2:D:28:ASN:OD1	2:D:30:GLN:N	2.35	0.60
1:C:111:GLN:OE1	2:F:75:ARG:NH1	2.34	0.60
1:A:270:SER:OG	1:A:284:PRO:O	2.16	0.60
2:D:119:TYR:OH	2:D:132:GLU:OE1	2.19	0.60
2:D:62:GLN:OE1	2:D:62:GLN:N	2.34	0.60
1:E:170:ASN:O	1:E:170:ASN:ND2	2.35	0.60
2:B:161:LYS:O	2:B:161:LYS:NZ	2.23	0.59
1:E:170:ASN:OD1	1:E:242:THR:OG1	2.20	0.59
2:B:17:MET:HE1	2:B:22:TYR:C	2.27	0.59
4:K:69:THR:HG22	4:K:69:THR:O	2.02	0.59
2:F:71:ASN:OD1	2:F:72:LYS:N	2.34	0.58
1:C:108:LEU:O	1:C:108:LEU:HD12	2.02	0.58
2:D:38:GLN:N	2:D:38:GLN:OE1	2.34	0.58
3:M:39:GLN:O	3:M:89:VAL:N	2.36	0.58
1:A:141:HIS:N	1:A:144:LYS:O	2.34	0.58
4:K:6:GLN:NE2	4:K:88:CYS:SG	2.73	0.58
2:B:109:ASP:OD1	2:B:110:PHE:N	2.37	0.58
3:H:61:ASP:OD1	3:H:62:SER:N	2.37	0.58
3:M:6:GLU:CG	3:M:107:VAL:HG23	2.34	0.58
4:K:31:THR:HG23	4:K:51:ALA:HB2	1.85	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:148:CYS:SG	2:B:149:MET:HE3	2.44	0.57
1:C:316:MET:SD	1:C:317:VAL:N	2.77	0.57
2:D:86:ASP:OD1	2:D:87:GLY:N	2.38	0.57
4:K:4:MET:HE3	4:K:4:MET:HA	1.87	0.57
4:K:35:TRP:CE3	4:K:73:LEU:HD11	2.40	0.57
1:E:164:LEU:HD23	1:E:165:SER:N	2.20	0.56
4:L:69:THR:HG22	4:L:69:THR:O	2.05	0.56
1:A:251:LEU:HD23	1:A:252:ILE:N	2.20	0.56
3:H:39:GLN:N	3:H:89:VAL:O	2.37	0.56
3:J:39:GLN:N	3:J:89:VAL:O	2.36	0.56
4:N:69:THR:HG22	4:N:69:THR:O	2.04	0.56
1:C:138:SER:O	1:C:224:ARG:NH2	2.36	0.56
3:J:18:LEU:N	3:J:82:LEU:O	2.35	0.56
3:J:59:TYR:CZ	3:J:69:ILE:HG22	2.40	0.56
1:C:164:LEU:HD23	1:C:165:SER:N	2.20	0.56
3:H:6:GLU:CG	3:H:107:VAL:HG23	2.36	0.55
2:B:119:TYR:OH	2:B:132:GLU:OE1	2.23	0.55
4:L:19:ALA:HB3	4:L:75:ILE:HB	1.88	0.55
3:M:39:GLN:N	3:M:89:VAL:O	2.39	0.55
4:L:48:ILE:HD12	4:L:52:SER:HA	1.90	0.54
2:B:19:ASP:OD1	2:B:19:ASP:N	2.40	0.54
3:J:19:ARG:NE	3:J:81:GLN:OE1	2.41	0.54
1:A:236:LEU:HD23	1:A:237:LEU:N	2.23	0.54
2:D:10:ILE:HG13	2:D:10:ILE:O	2.07	0.54
4:L:6:GLN:OE1	4:L:100:GLY:N	2.41	0.54
4:N:6:GLN:OE1	4:N:102:THR:HG23	2.08	0.54
1:C:18:HIS:HA	2:D:17:MET:HE1	1.90	0.53
4:L:35:TRP:CE3	4:L:73:LEU:HD11	2.43	0.53
3:M:101:ASP:CG	4:N:46:LEU:HD22	2.33	0.53
2:D:109:ASP:OD1	2:D:109:ASP:N	2.41	0.53
4:N:19:ALA:HB3	4:N:75:ILE:HB	1.89	0.53
1:A:203:SER:OG	1:A:212:ARG:NH2	2.41	0.53
1:C:122:PRO:O	1:C:127:TRP:NE1	2.41	0.53
1:E:20:ASN:OD1	1:E:22:SER:N	2.42	0.53
4:K:24:ARG:NH2	4:K:70:GLU:OE2	2.42	0.53
3:M:3:GLN:OE1	3:M:3:GLN:N	2.42	0.53
3:M:59:TYR:CZ	3:M:69:ILE:HG22	2.43	0.53
1:A:20:ASN:OD1	1:A:22:SER:N	2.41	0.53
4:N:6:GLN:NE2	4:N:88:CYS:SG	2.81	0.53
3:J:6:GLU:CG	3:J:107:VAL:HG23	2.39	0.52
3:H:71:ARG:HB2	3:H:78:VAL:HG12	1.92	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:H:100(E):PHE:N	4:L:36:TYR:OH	2.40	0.52
2:D:131:LYS:NZ	2:D:132:GLU:O	2.27	0.52
3:H:52:SER:OG	3:H:56:SER:OG	2.14	0.52
3:M:100(E):PHE:N	4:N:36:TYR:OH	2.38	0.52
1:C:61:LEU:HD23	1:C:61:LEU:H	1.74	0.52
1:C:151:LEU:C	1:C:151:LEU:HD12	2.35	0.52
2:B:28:ASN:OD1	2:B:30:GLN:N	2.42	0.52
2:B:28:ASN:OD1	2:B:31:GLY:N	2.39	0.52
2:F:19:ASP:OD1	2:F:19:ASP:N	2.41	0.51
3:J:59:TYR:OH	3:J:69:ILE:N	2.42	0.51
1:A:242:THR:HG23	1:A:242:THR:O	2.11	0.51
2:B:139:GLU:OE1	2:B:139:GLU:N	2.44	0.51
1:A:26:VAL:HG22	1:A:27:ASP:H	1.74	0.51
1:C:323:ILE:HD11	2:D:11:GLU:O	2.11	0.51
1:A:20:ASN:OD1	1:A:21:ASN:N	2.44	0.51
1:A:316:MET:HE1	2:B:100:VAL:O	2.10	0.50
1:E:20:ASN:OD1	1:E:21:ASN:N	2.44	0.50
1:C:47:HIS:NE2	1:C:285:GLN:O	2.44	0.50
1:E:17:TYR:OH	2:F:11:GLU:O	2.29	0.50
4:K:19:ALA:N	4:K:75:ILE:O	2.44	0.50
4:K:86:TYR:N	4:K:102:THR:OG1	2.43	0.50
4:L:89:GLN:NE2	4:L:91:ASP:OD2	2.37	0.50
2:D:165:GLU:OE2	2:D:169:ASN:ND2	2.42	0.50
1:E:17:TYR:CG	1:E:320:LEU:HD23	2.46	0.50
4:K:35:TRP:CD1	4:K:73:LEU:HD21	2.46	0.50
3:J:39:GLN:O	3:J:89:VAL:N	2.44	0.50
1:A:151:LEU:C	1:A:151:LEU:HD12	2.37	0.50
1:C:183:HIS:HA	1:C:230:ILE:HG22	1.94	0.50
2:F:139:GLU:N	2:F:139:GLU:OE1	2.45	0.50
4:K:20:THR:O	4:K:21:LEU:HD22	2.11	0.49
4:L:74:THR:C	4:L:75:ILE:HD13	2.37	0.49
3:M:36:TRP:CD2	3:M:80:LEU:HD11	2.47	0.49
3:J:100(E):PHE:N	4:K:36:TYR:OH	2.43	0.49
2:F:53:ASN:O	2:F:57:GLU:OE1	2.30	0.49
3:H:101:ASP:CG	4:L:46:LEU:HD22	2.38	0.49
4:K:35:TRP:CG	4:K:73:LEU:HD21	2.47	0.49
1:A:29:VAL:HG12	2:F:47:GLN:NE2	2.28	0.49
4:L:7:SER:O	4:L:7:SER:OG	2.27	0.48
4:N:35:TRP:CE3	4:N:73:LEU:HD11	2.48	0.48
4:L:35:TRP:CD1	4:L:73:LEU:HD21	2.48	0.48
1:E:142:ASN:ND2	1:E:142:ASN:O	2.47	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:N:38:GLN:O	4:N:38:GLN:NE2	2.47	0.48
4:N:74:THR:C	4:N:75:ILE:HD13	2.38	0.48
3:M:36:TRP:CG	3:M:80:LEU:HD11	2.49	0.48
4:N:24:ARG:NH1	4:N:70:GLU:OE2	2.47	0.48
3:M:6:GLU:N	3:M:6:GLU:OE1	2.47	0.47
1:C:17:TYR:CG	1:C:320:LEU:HD23	2.48	0.47
4:K:54:ARG:NH2	4:K:63:SER:OG	2.40	0.47
1:C:18:HIS:CA	2:D:17:MET:HE1	2.44	0.47
1:A:13:ILE:HD11	2:B:149:MET:SD	2.54	0.47
1:A:251:LEU:HD23	1:A:251:LEU:C	2.40	0.47
1:C:141:HIS:N	1:C:144:LYS:O	2.48	0.47
3:M:83:THR:HG22	3:M:85:GLU:OE2	2.15	0.47
1:A:142:ASN:O	1:A:142:ASN:ND2	2.48	0.47
1:E:184:HIS:HB2	1:E:229:ARG:O	2.14	0.46
1:E:203:SER:OG	1:E:212:ARG:NH2	2.47	0.46
3:H:6:GLU:N	3:H:6:GLU:OE1	2.48	0.46
2:B:117:ASN:HA	2:B:120:GLU:OE2	2.16	0.46
2:D:29:GLU:OE1	3:J:64:LYS:NZ	2.49	0.46
1:A:107:GLU:OE1	2:D:73:LEU:HD12	2.16	0.46
1:C:31:GLU:OE1	1:C:32:LYS:N	2.44	0.46
2:B:37:ASP:OD1	2:B:38:GLN:N	2.43	0.46
1:A:117(B):GLU:OE1	1:A:172:LYS:NZ	2.48	0.46
2:D:71:ASN:OD1	2:D:72:LYS:N	2.46	0.46
1:E:226:GLN:OE1	1:E:227:GLU:N	2.42	0.46
3:M:47:TRP:NE1	3:M:49:SER:O	2.49	0.46
4:N:96:LEU:O	4:N:97:THR:HG23	2.16	0.46
1:A:226:GLN:OE1	1:A:227:GLU:N	2.45	0.45
1:C:142:ASN:ND2	1:C:142:ASN:O	2.49	0.45
2:D:28:ASN:OD1	2:D:31:GLY:N	2.45	0.45
3:J:36:TRP:CD2	3:J:80:LEU:HD11	2.51	0.45
4:K:19:ALA:HB3	4:K:75:ILE:HB	1.97	0.45
1:A:154:LEU:HD13	1:A:251:LEU:O	2.16	0.45
3:M:52:SER:OG	3:M:56:SER:OG	2.32	0.45
4:N:7:SER:O	4:N:7:SER:OG	2.28	0.45
1:C:20:ASN:OD1	1:C:21:ASN:N	2.49	0.45
1:C:164:LEU:HD23	1:C:164:LEU:C	2.42	0.45
1:E:78:LEU:O	1:E:79:LEU:C	2.59	0.45
3:J:36:TRP:CG	3:J:80:LEU:HD11	2.51	0.45
3:J:101:ASP:OD1	4:K:46:LEU:HD22	2.17	0.45
1:A:17:TYR:CG	1:A:320:LEU:HD23	2.51	0.45
1:C:120:ILE:HD11	1:C:257:ALA:HB3	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:L:48:ILE:HD11	4:L:73:LEU:CD2	2.46	0.45
4:N:90:GLN:C	4:N:91:ASP:OD2	2.60	0.45
1:C:152:LEU:O	1:C:154:LEU:HD12	2.17	0.45
1:E:316:MET:HA	1:E:316:MET:CE	2.45	0.45
1:C:131:THR:N	1:C:155:THR:O	2.50	0.45
1:E:78:LEU:HD11	1:E:149:ARG:HB3	1.99	0.45
3:M:71:ARG:HB2	3:M:78:VAL:HG12	2.00	0.45
1:A:138:SER:O	1:A:224:ARG:NH2	2.48	0.44
1:E:65:SER:OG	1:E:95:GLY:O	2.34	0.44
1:E:61:LEU:H	1:E:61:LEU:HD23	1.81	0.44
1:A:78:LEU:HD11	1:A:149:ARG:HB3	1.98	0.44
1:C:206:SER:OG	1:C:207:SER:N	2.50	0.44
1:E:164:LEU:HD23	1:E:164:LEU:C	2.41	0.44
1:C:61:LEU:N	1:C:61:LEU:HD23	2.32	0.44
1:C:78:LEU:HD11	1:C:149:ARG:HB3	1.99	0.44
2:F:28:ASN:OD1	2:F:31:GLY:N	2.46	0.44
4:K:3:VAL:HG12	4:K:4:MET:N	2.33	0.44
4:N:35:TRP:CD1	4:N:73:LEU:HD21	2.53	0.44
1:A:104:ASP:OD1	1:A:106:GLU:N	2.42	0.44
1:E:132:VAL:HG13	1:E:152:LEU:HD13	2.00	0.44
1:A:108:LEU:O	1:A:108:LEU:HD12	2.18	0.44
1:A:151:LEU:HD13	1:A:252:ILE:CG2	2.47	0.44
1:C:182:VAL:HG22	1:C:183:HIS:N	2.32	0.44
2:D:117:ASN:O	2:D:120:GLU:OE1	2.35	0.44
2:B:75:ARG:NH1	1:E:111:GLN:OE1	2.50	0.44
2:B:145:ASN:ND2	2:B:147:GLU:OE1	2.50	0.44
2:D:19:ASP:OD1	2:D:19:ASP:N	2.38	0.44
1:C:207:SER:OG	1:C:208:HIS:ND1	2.49	0.43
3:M:57:THR:HG22	3:M:58:TYR:N	2.32	0.43
4:N:3:VAL:HG12	4:N:4:MET:N	2.32	0.43
1:C:117(B):GLU:OE1	1:C:172:LYS:NZ	2.48	0.43
1:E:270:SER:OG	1:E:271:ASN:N	2.52	0.43
1:A:184:HIS:HB2	1:A:229:ARG:O	2.19	0.43
1:E:151:LEU:HD12	1:E:151:LEU:C	2.43	0.43
3:J:37:VAL:O	3:J:37:VAL:HG23	2.19	0.43
2:D:94:TYR:CE2	2:D:98:LEU:HD11	2.53	0.43
2:F:128:ASN:C	2:F:128:ASN:OD1	2.61	0.43
2:D:59:MET:HE3	2:D:59:MET:HA	1.99	0.43
2:B:117:ASN:O	2:B:120:GLU:OE2	2.37	0.43
1:E:84:TRP:O	1:E:84:TRP:CG	2.72	0.43
2:B:101:LEU:HD23	2:B:102:LEU:HD22	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:153:TRP:CD1	1:E:154:LEU:N	2.87	0.42
1:E:135:VAL:HG21	1:E:145:SER:HB3	2.01	0.42
3:M:52:SER:HG	3:M:56:SER:HG	1.58	0.42
3:J:57:THR:HG22	3:J:58:TYR:N	2.34	0.42
4:K:83:VAL:HA	4:K:104:VAL:HG23	2.01	0.42
1:C:24:ASP:OD1	1:C:24:ASP:N	2.52	0.42
1:C:180:TRP:HB2	1:C:252:ILE:O	2.20	0.42
2:D:159:TYR:HB3	2:D:160:PRO:HD3	2.02	0.42
3:H:57:THR:HG22	3:H:58:TYR:N	2.34	0.42
3:J:17:SER:OG	3:J:82(A):ASN:ND2	2.50	0.42
1:A:217:ILE:HG23	1:A:217:ILE:O	2.20	0.42
2:D:99:LEU:C	2:D:99:LEU:HD23	2.45	0.42
1:E:70:ILE:HD11	1:E:112:LEU:CD2	2.50	0.42
4:K:7:SER:O	4:K:7:SER:OG	2.29	0.42
2:F:53:ASN:O	2:F:56:ILE:HG12	2.19	0.42
4:N:18:ARG:HA	4:N:18:ARG:NE	2.34	0.42
1:A:233:TYR:CD1	1:A:233:TYR:N	2.88	0.42
1:C:184:HIS:HB2	1:C:229:ARG:O	2.20	0.42
3:J:35:SER:OG	3:J:36:TRP:N	2.53	0.42
4:N:27:GLN:O	4:N:69:THR:OG1	2.25	0.42
2:F:107:THR:HG23	2:F:108:LEU:N	2.35	0.41
3:J:76:ASN:OD1	3:J:76:ASN:N	2.53	0.41
4:L:31:THR:O	4:L:33:LEU:N	2.52	0.41
2:B:97:GLU:O	2:B:100:VAL:HG12	2.20	0.41
1:C:233:TYR:N	1:C:233:TYR:CD1	2.88	0.41
1:C:151:LEU:HD13	1:C:252:ILE:CG2	2.50	0.41
1:C:316:MET:HA	1:C:316:MET:CE	2.43	0.41
1:C:153:TRP:CD1	1:C:154:LEU:N	2.88	0.41
4:L:4:MET:HE1	4:L:25:ALA:HB2	2.02	0.41
1:E:115:VAL:HG23	1:E:261:SER:H	1.86	0.41
1:A:310:ARG:CZ	2:B:89:LEU:HD21	2.51	0.41
1:C:90:THR:HG22	1:C:92:ASN:OD1	2.20	0.41
2:D:168:LEU:HD13	2:D:168:LEU:C	2.46	0.41
4:K:47:LEU:O	4:K:48:ILE:C	2.64	0.41
1:A:106:GLU:N	1:A:106:GLU:OE1	2.54	0.41
1:E:151:LEU:HD13	1:E:252:ILE:CG2	2.51	0.41
1:E:178:VAL:HG13	1:E:178:VAL:O	2.21	0.41
1:E:304:GLU:OE1	1:E:304:GLU:N	2.53	0.41
1:A:78:LEU:O	1:A:79:LEU:C	2.63	0.41
1:A:316:MET:CE	2:B:100:VAL:HG23	2.50	0.41
2:B:17:MET:HE1	2:B:22:TYR:O	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:135:VAL:HG12	1:C:146:SER:HA	2.03	0.41
2:F:159:TYR:HB3	2:F:160:PRO:HD3	2.02	0.41
4:K:63:SER:O	4:K:74:THR:N	2.40	0.41
3:M:67:PHE:N	3:M:67:PHE:CD1	2.89	0.41
1:A:104:ASP:OD1	1:A:104:ASP:C	2.64	0.41
1:E:26:VAL:HG22	1:E:27:ASP:H	1.86	0.41
3:H:67:PHE:N	3:H:67:PHE:CD1	2.86	0.41
3:J:4:LEU:HD21	3:J:92:CYS:HB3	2.03	0.41
1:C:132:VAL:O	1:C:132:VAL:HG12	2.21	0.40
4:K:94:TRP:HZ3	4:K:96:LEU:HD21	1.86	0.40
1:C:99:PRO:HG2	1:C:226:GLN:HB2	2.04	0.40
1:A:183:HIS:CD2	1:A:183:HIS:C	2.99	0.40
1:C:274:MET:SD	1:C:274:MET:C	3.04	0.40
4:L:18:ARG:NE	4:L:18:ARG:HA	2.36	0.40
3:M:63:VAL:O	3:M:64:LYS:C	2.62	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	281/326 (86%)	258 (92%)	23 (8%)	0	100	100
1	C	283/326 (87%)	261 (92%)	22 (8%)	0	100	100
1	E	283/326 (87%)	261 (92%)	22 (8%)	0	100	100
2	B	160/222 (72%)	153 (96%)	7 (4%)	0	100	100
2	D	160/222 (72%)	154 (96%)	6 (4%)	0	100	100
2	F	160/222 (72%)	153 (96%)	7 (4%)	0	100	100
3	H	105/122 (86%)	96 (91%)	9 (9%)	0	100	100
3	J	105/122 (86%)	95 (90%)	10 (10%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	M	105/122 (86%)	97 (92%)	8 (8%)	0	100	100
4	K	80/108 (74%)	71 (89%)	9 (11%)	0	100	100
4	L	84/108 (78%)	76 (90%)	8 (10%)	0	100	100
4	N	85/108 (79%)	76 (89%)	9 (11%)	0	100	100
All	All	1891/2334 (81%)	1751 (93%)	140 (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	259/287 (90%)	258 (100%)	1 (0%)	89	91
1	C	261/287 (91%)	261 (100%)	0	100	100
1	E	261/287 (91%)	261 (100%)	0	100	100
2	B	144/189 (76%)	144 (100%)	0	100	100
2	D	144/189 (76%)	144 (100%)	0	100	100
2	F	144/189 (76%)	143 (99%)	1 (1%)	81	86
3	H	93/102 (91%)	93 (100%)	0	100	100
3	J	93/102 (91%)	93 (100%)	0	100	100
3	M	93/102 (91%)	93 (100%)	0	100	100
4	K	70/90 (78%)	70 (100%)	0	100	100
4	L	73/90 (81%)	73 (100%)	0	100	100
4	N	74/90 (82%)	74 (100%)	0	100	100
All	All	1709/2004 (85%)	1707 (100%)	2 (0%)	92	95

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	84	TRP

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Mol	Chain	Res	Type
2	F	109	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	141	HIS
1	A	183	HIS
1	A	208	HIS
1	C	141	HIS
1	C	271	ASN
2	D	50	ASN
1	E	141	HIS
2	F	25	HIS
3	J	82(A)	ASN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

### 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

### 5.7 Other polymers [i](#)

There are no such residues in this entry.

### 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.



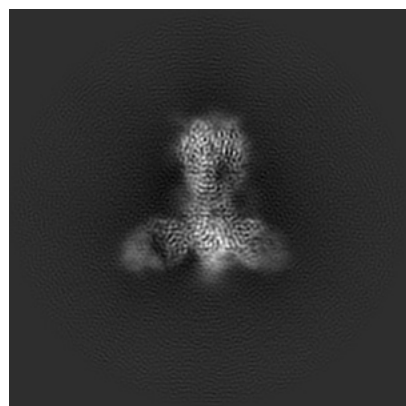
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-45637. These allow visual inspection of the internal detail of the map and identification of artifacts.

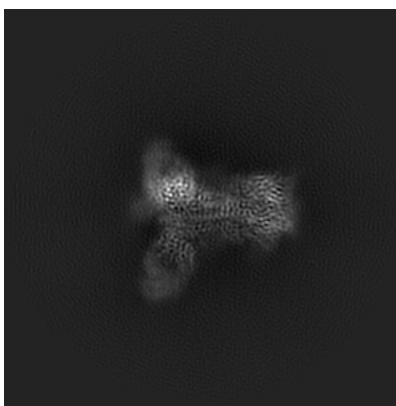
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

### 6.1 Orthogonal projections [i](#)

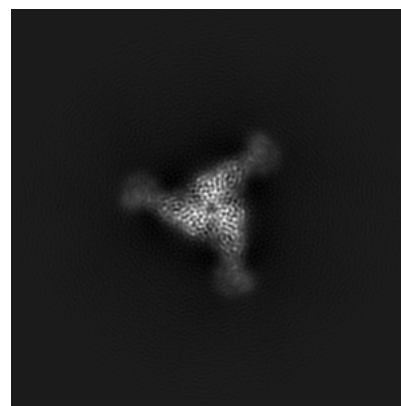
#### 6.1.1 Primary map



X

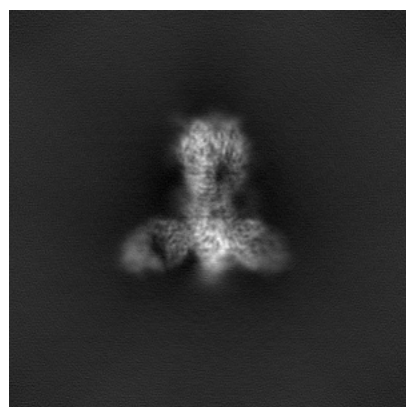


Y

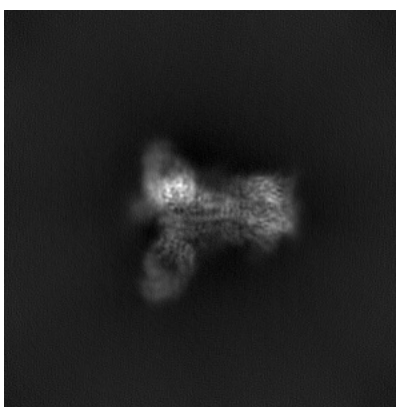


Z

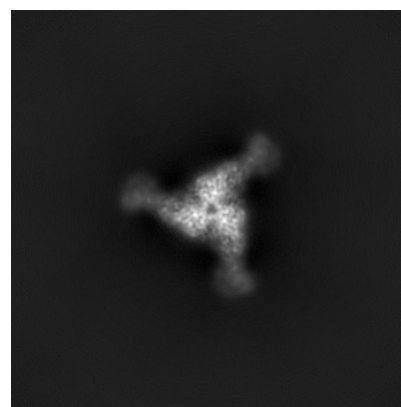
#### 6.1.2 Raw map



X



Y

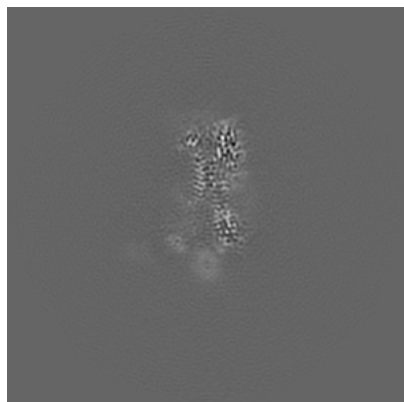


Z

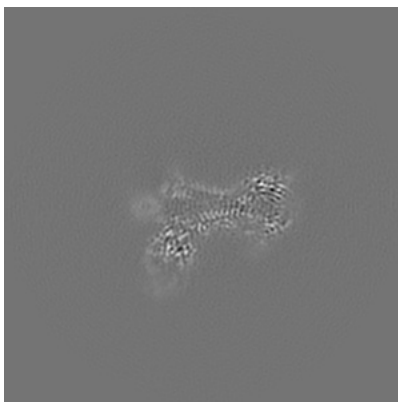
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

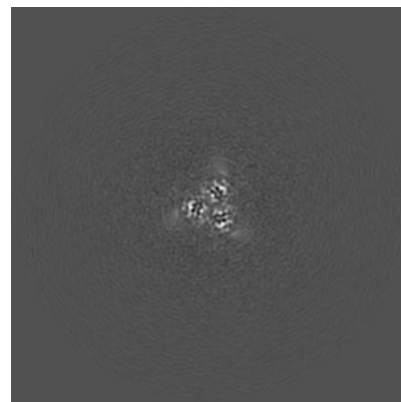
### 6.2.1 Primary map



X Index: 180

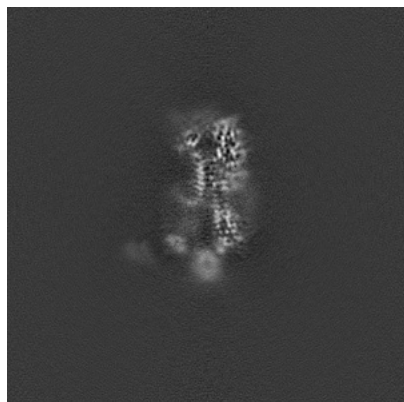


Y Index: 180

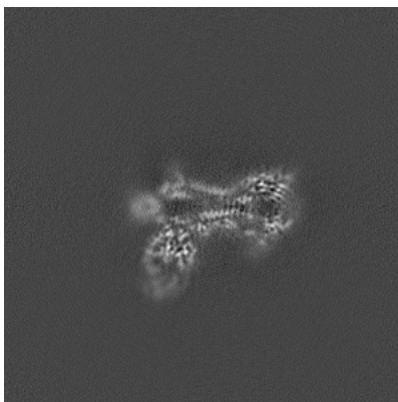


Z Index: 180

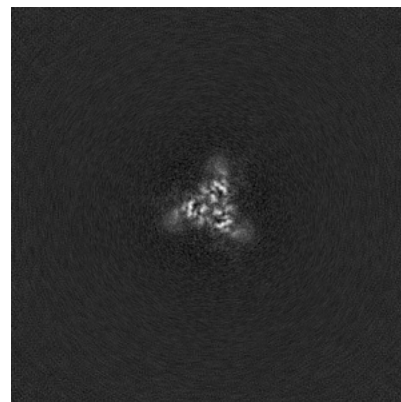
### 6.2.2 Raw map



X Index: 180



Y Index: 180

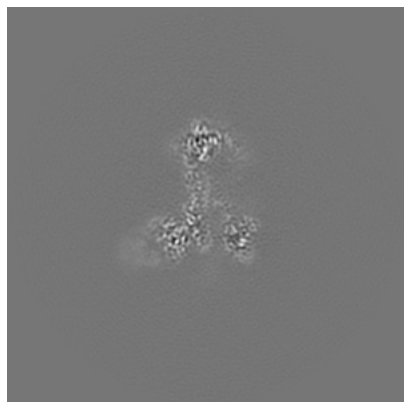


Z Index: 180

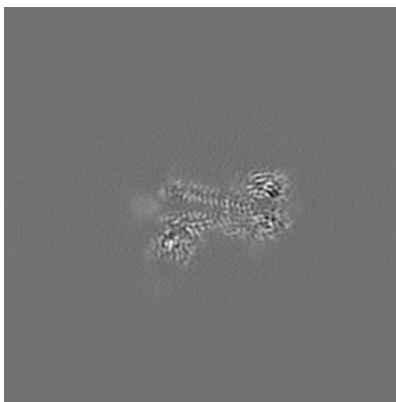
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

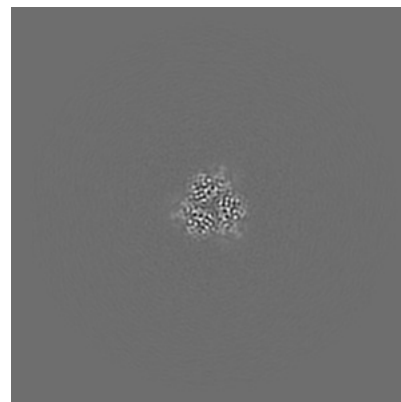
### 6.3.1 Primary map



X Index: 194

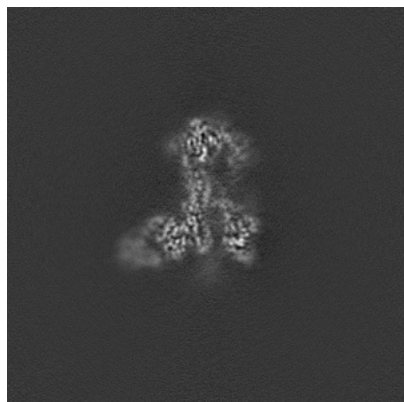


Y Index: 176

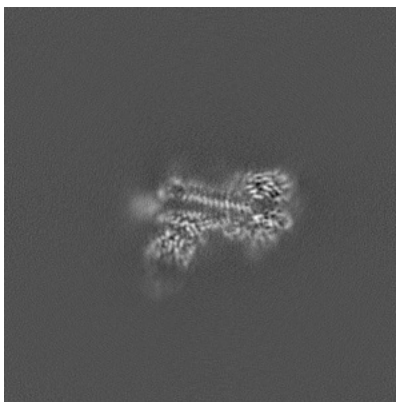


Z Index: 239

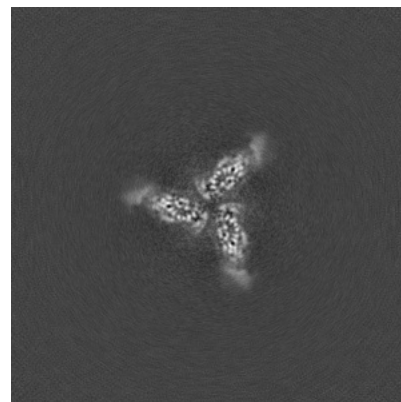
### 6.3.2 Raw map



X Index: 193



Y Index: 175

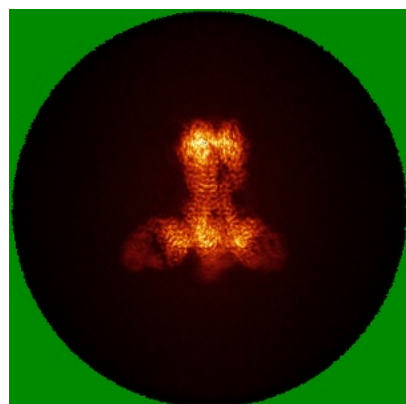


Z Index: 158

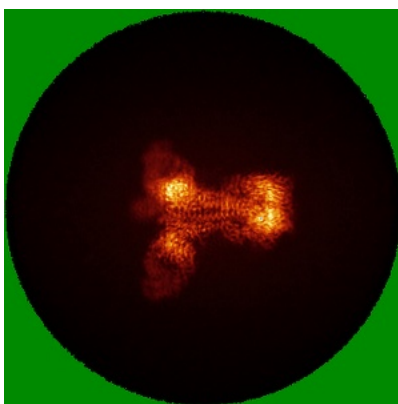
The images above show the largest variance slices of the map in three orthogonal directions.

## 6.4 Orthogonal standard-deviation projections (False-color) [i](#)

### 6.4.1 Primary map



X

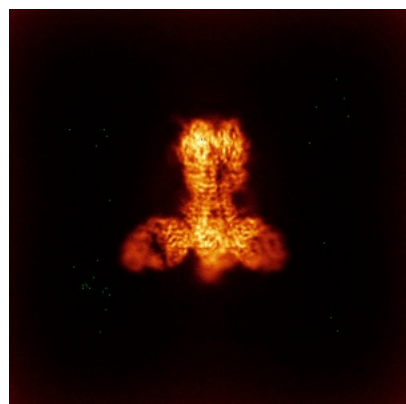


Y

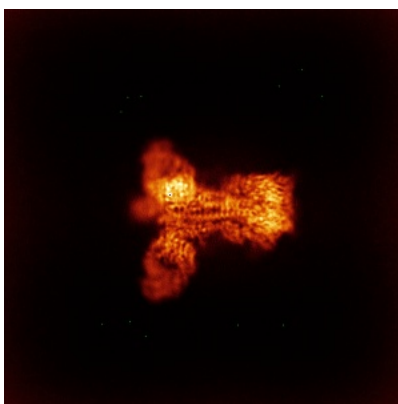


Z

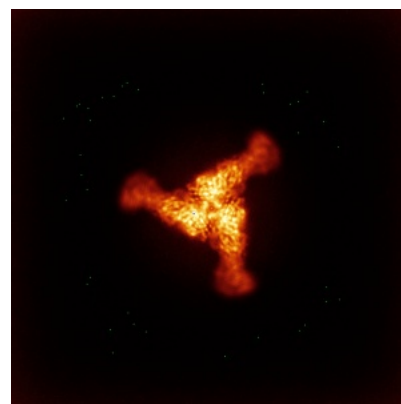
### 6.4.2 Raw map



X



Y



Z

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

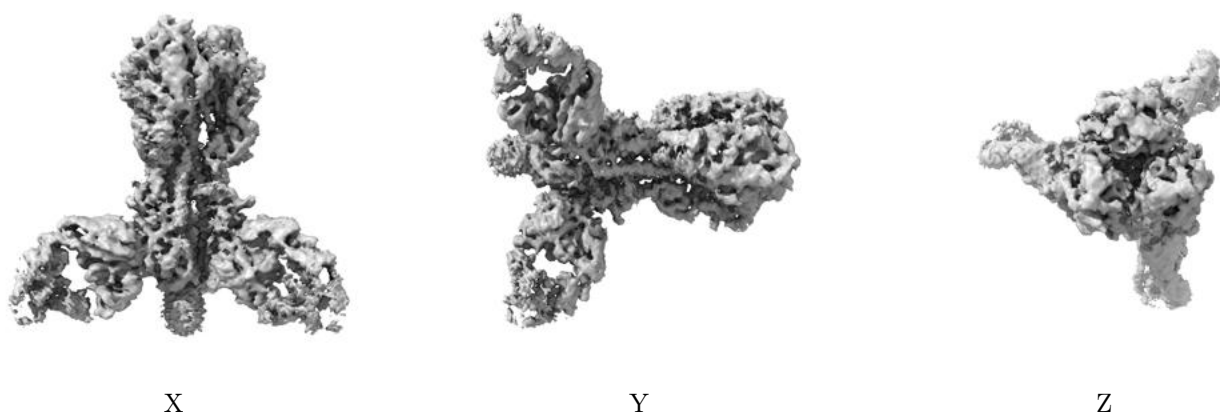
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.15. 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



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

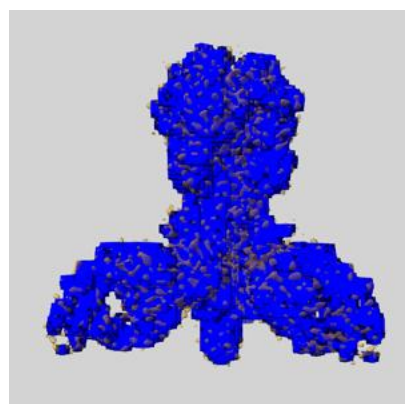
## 6.6 Mask visualisation [i](#)

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

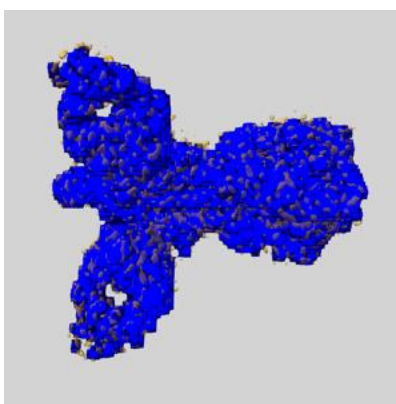
A mask typically either:

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

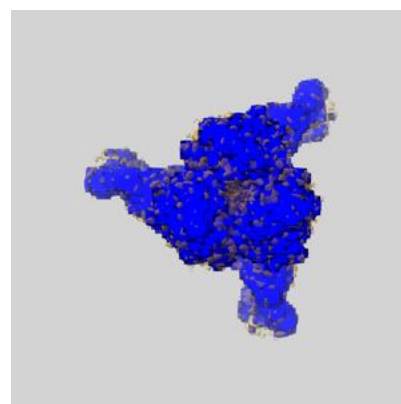
### 6.6.1 emd\_45637\_msk\_1.map [i](#)



X



Y



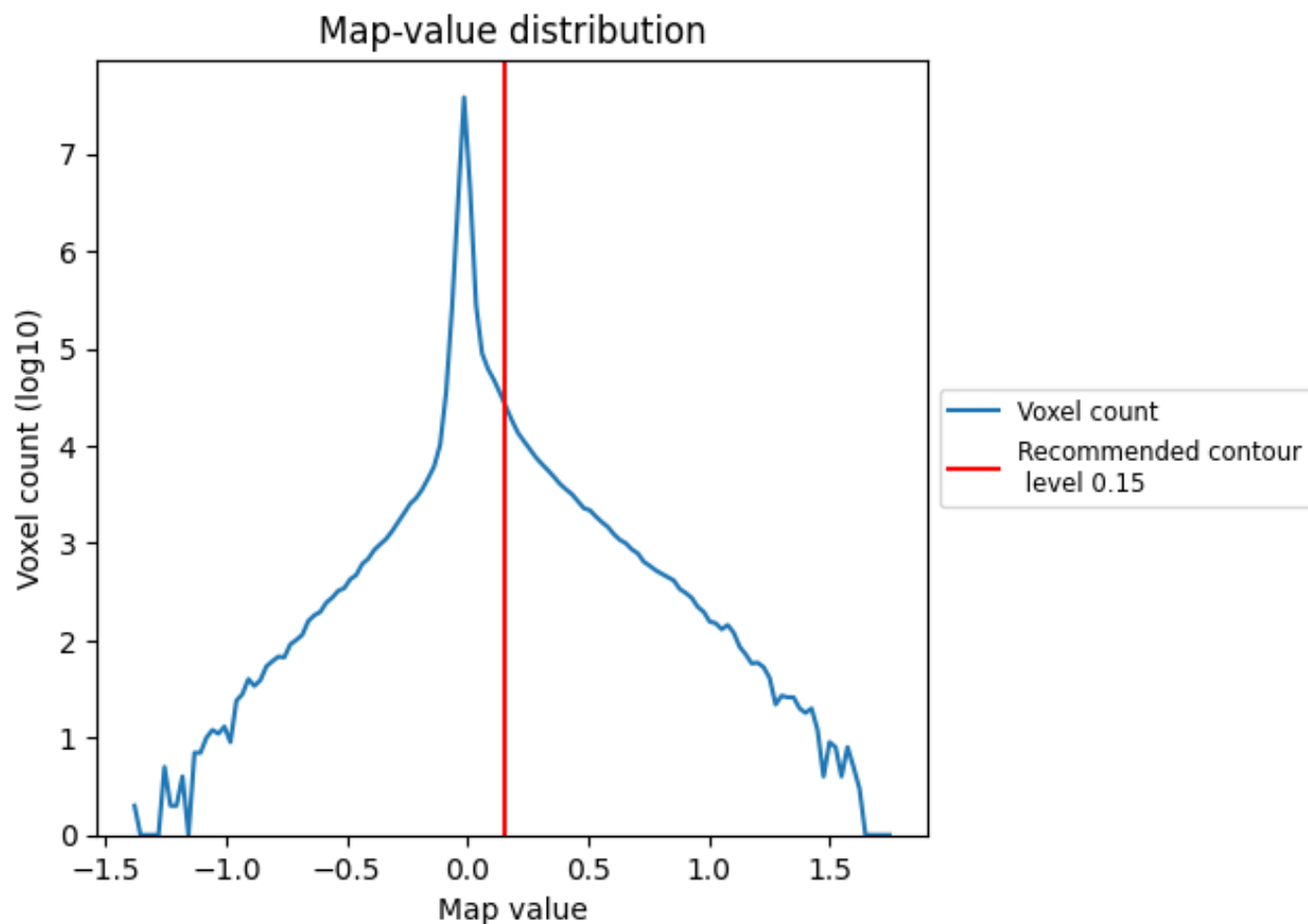
Z



## 7 Map analysis [i](#)

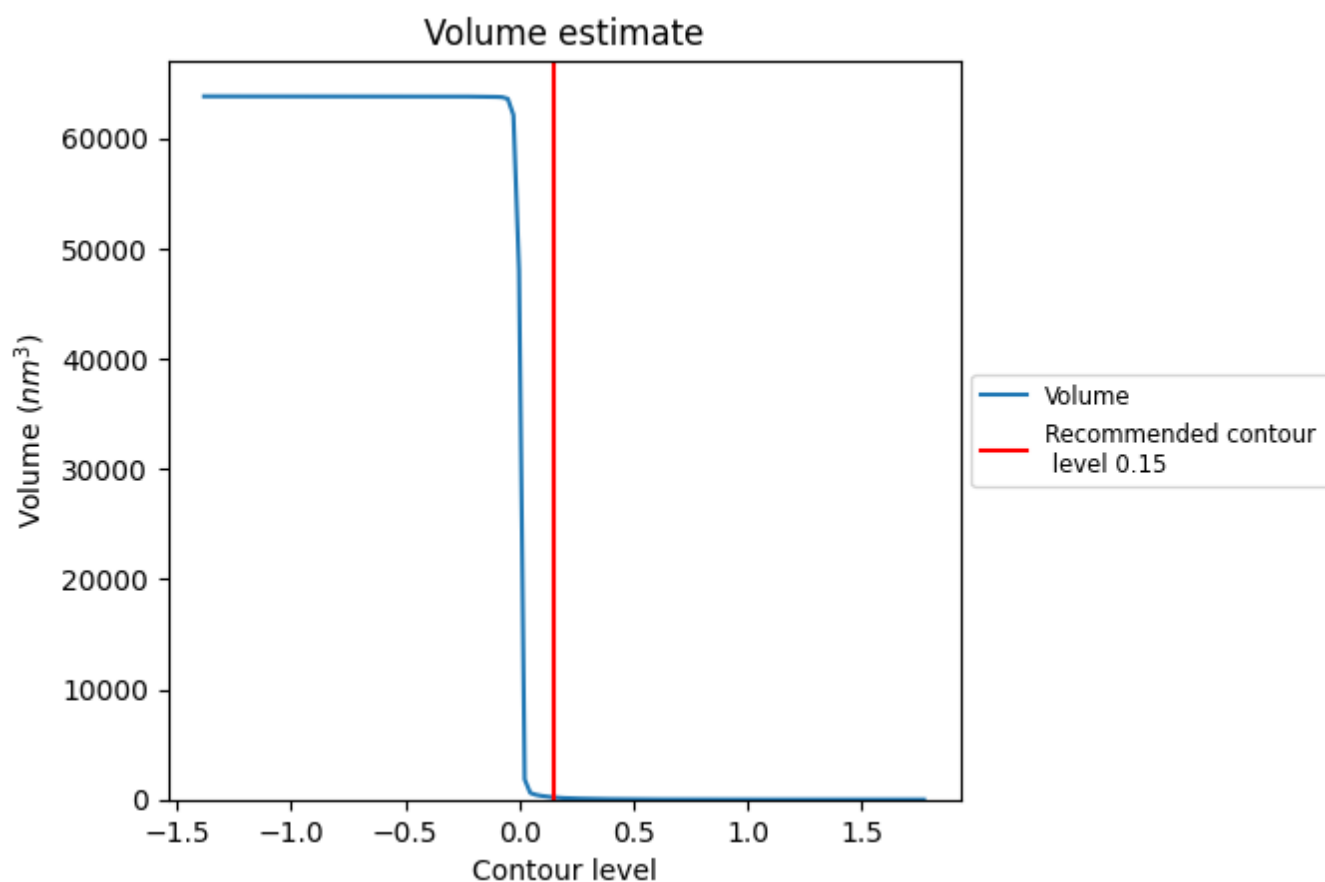
This section contains the results of statistical analysis of the map.

### 7.1 Map-value distribution [i](#)



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](#)

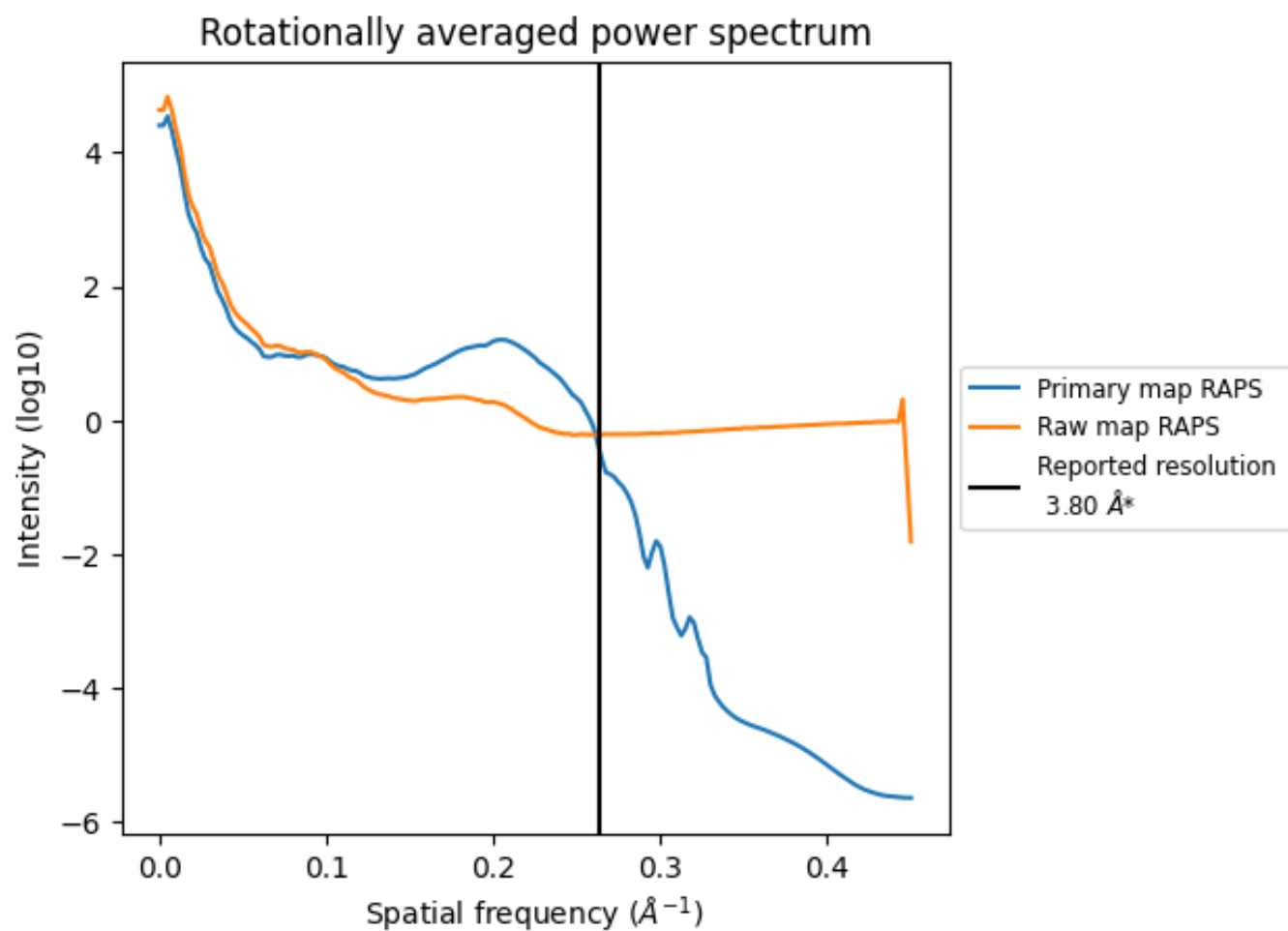


The volume at the recommended contour level is 200 nm<sup>3</sup>; this corresponds to an approximate mass of 181 kDa.

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 ⓘ

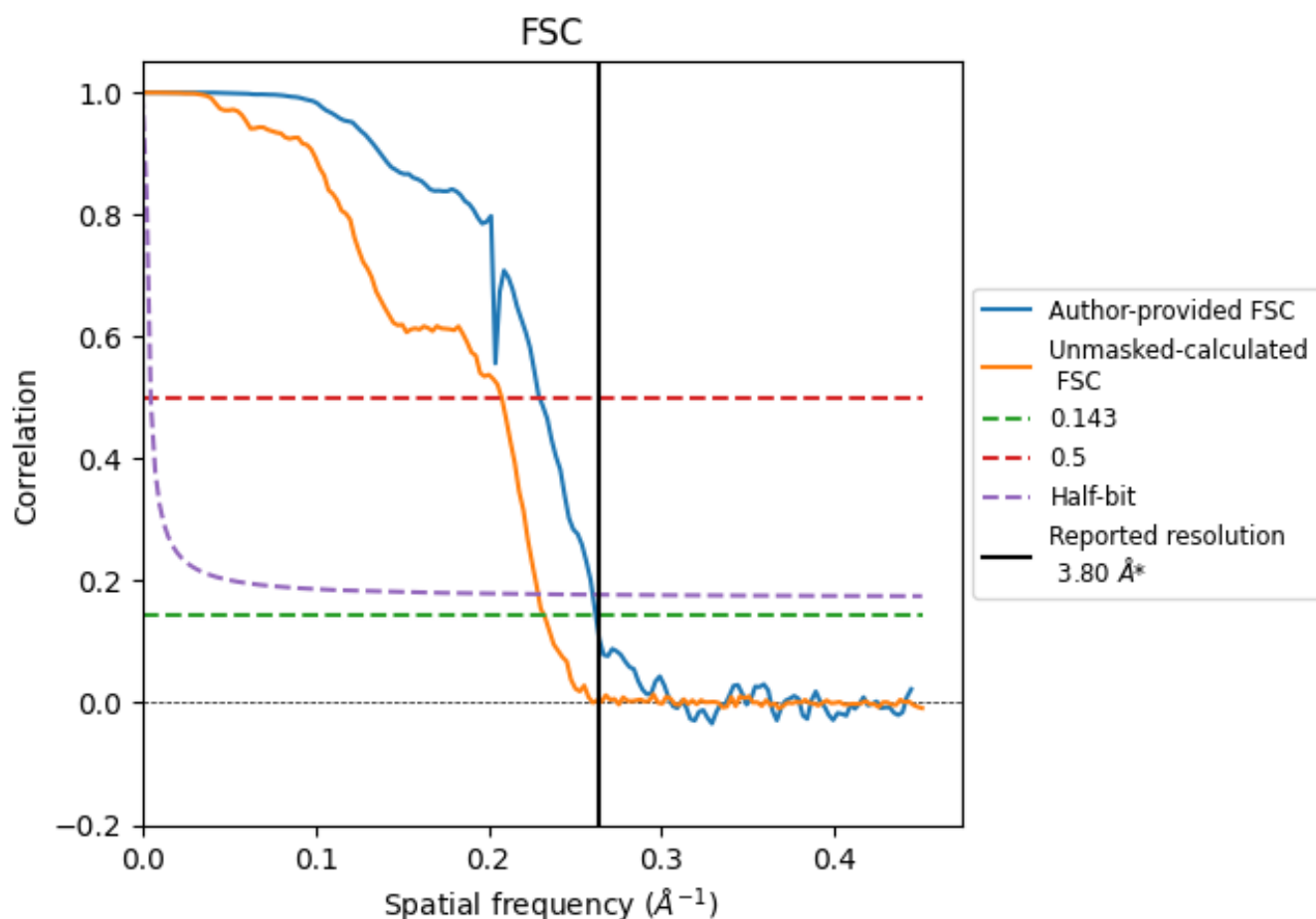


\*Reported resolution corresponds to spatial frequency of 0.263  $\text{\AA}^{-1}$

## 8 Fourier-Shell correlation [i](#)

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 [i](#)



\*Reported resolution corresponds to spatial frequency of 0.263  $\text{\AA}^{-1}$

## 8.2 Resolution estimates [i](#)

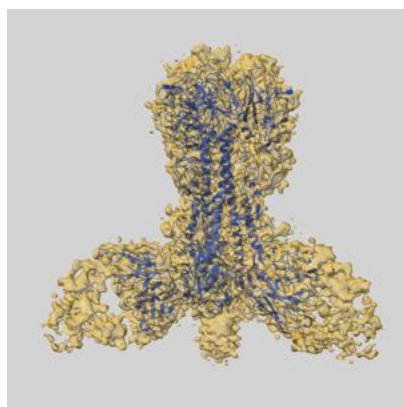
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.80	-	-
Author-provided FSC curve	3.82	4.36	3.84
Unmasked-calculated*	4.31	4.82	4.37

\*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 4.31 differs from the reported value 3.8 by more than 10 %

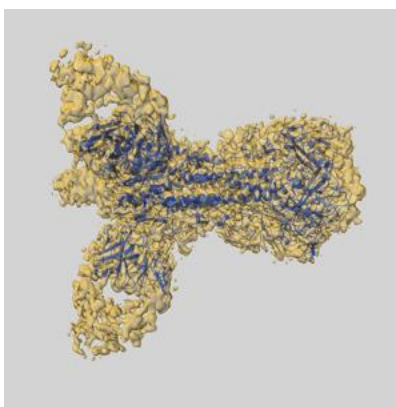
## 9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-45637 and PDB model 9CJZ. Per-residue inclusion information can be found in section [3](#) on page [9](#).

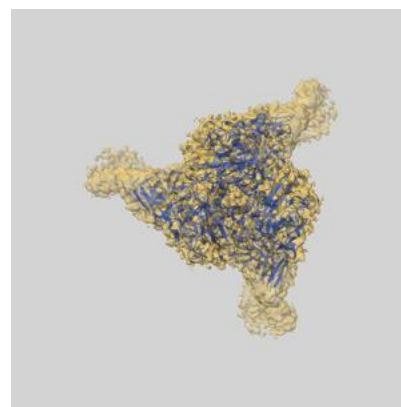
### 9.1 Map-model overlay [i](#)



X



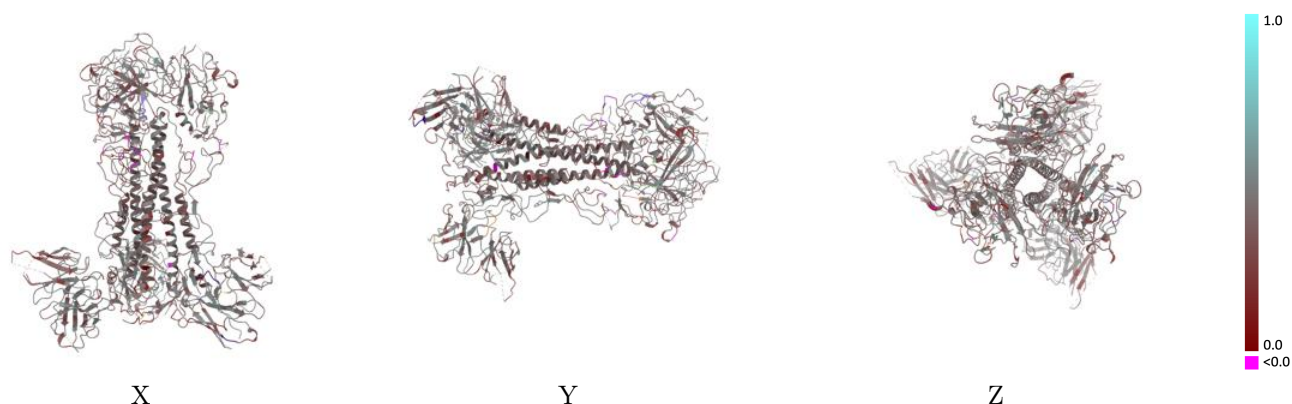
Y



Z

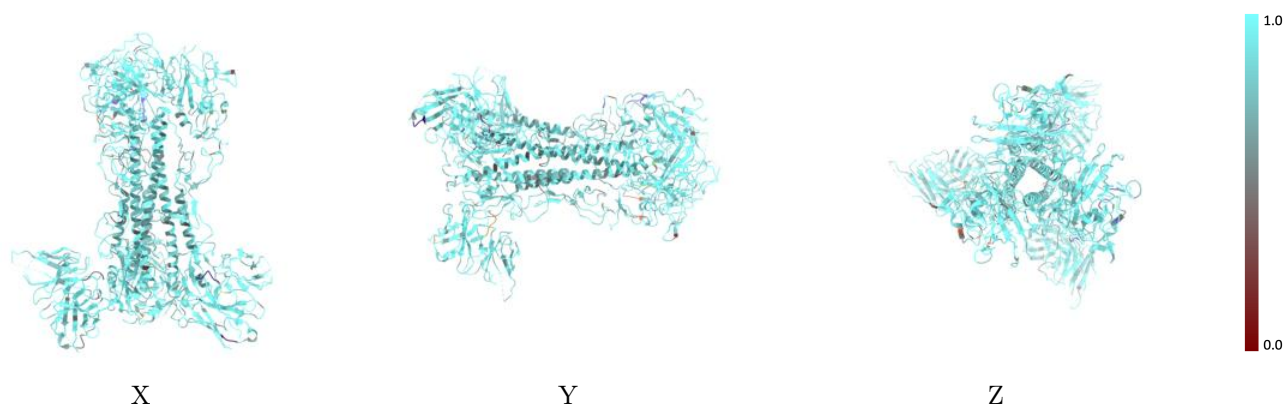
The images above show the 3D surface view of the map at the recommended contour level 0.15 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

## 9.2 Q-score mapped to coordinate model [i](#)



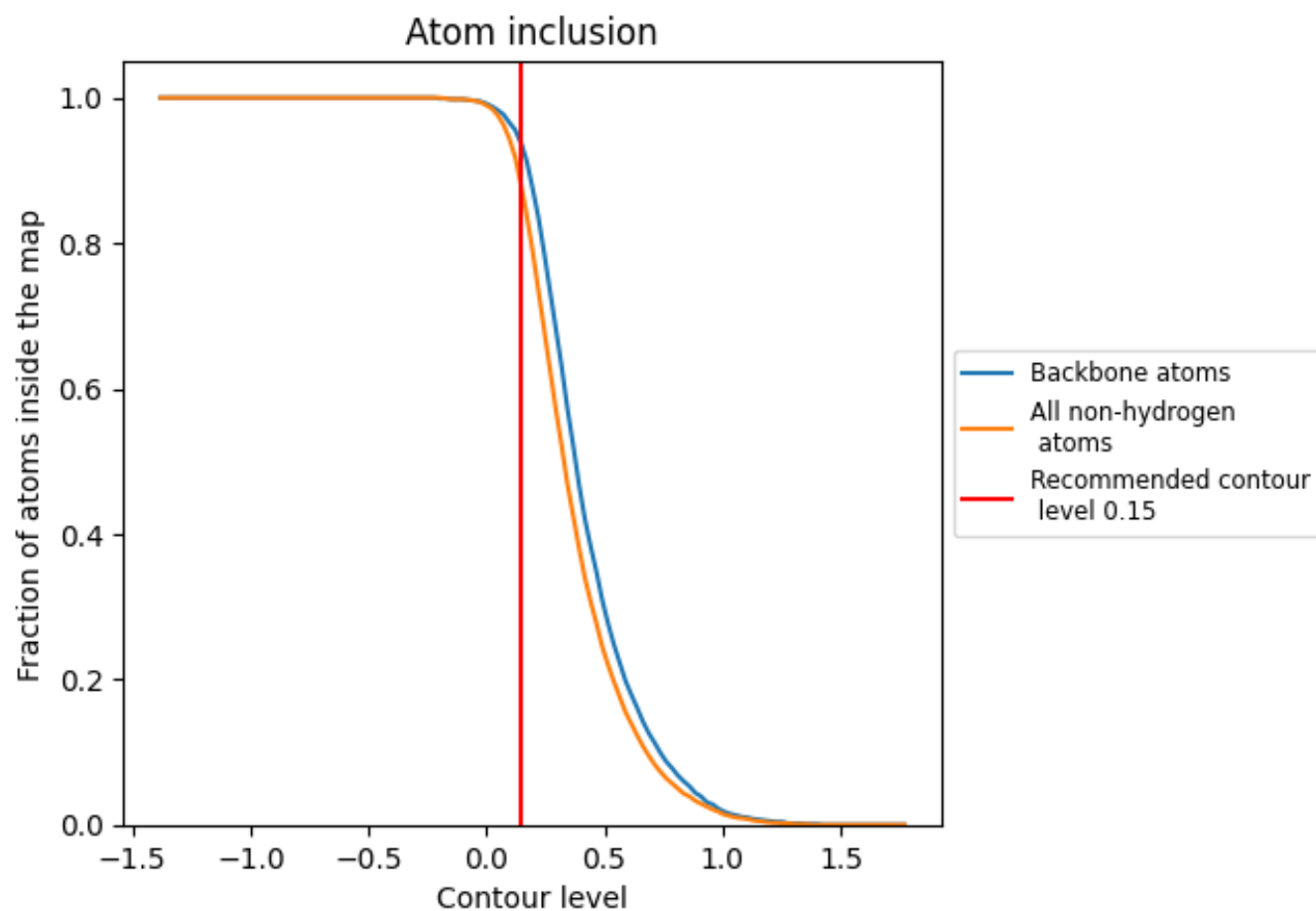
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 [i](#)



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 (0.15).

## 9.4 Atom inclusion [i](#)



At the recommended contour level, 94% of all backbone atoms, 88% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.15) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	<div><div></div></div> 0.8750	<div><div></div></div> 0.4090
A	<div><div></div></div> 0.8710	<div><div></div></div> 0.4020
B	<div><div></div></div> 0.8580	<div><div></div></div> 0.4040
C	<div><div></div></div> 0.8800	<div><div></div></div> 0.4010
D	<div><div></div></div> 0.8490	<div><div></div></div> 0.4010
E	<div><div></div></div> 0.8790	<div><div></div></div> 0.4040
F	<div><div></div></div> 0.8570	<div><div></div></div> 0.4040
H	<div><div></div></div> 0.9060	<div><div></div></div> 0.4360
J	<div><div></div></div> 0.8990	<div><div></div></div> 0.4330
K	<div><div></div></div> 0.8930	<div><div></div></div> 0.4180
L	<div><div></div></div> 0.8750	<div><div></div></div> 0.4100
M	<div><div></div></div> 0.9070	<div><div></div></div> 0.4340
N	<div><div></div></div> 0.8640	<div><div></div></div> 0.4050

