



Full wwPDB EM Validation Report ⓘ

May 4, 2025 – 11:43 AM EDT

PDB ID : 8DYT / pdb_00008dyt
EMDB ID : EMD-27781
Title : Cryo-EM structure of 227 Fab in complex with (NPNA)8 peptide
Authors : Martin, G.M.; Ward, A.B.
Deposited on : 2022-08-05
Resolution : 3.30 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

The following versions of software and data (see [references ⓘ](#)) 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) : 2.43.1

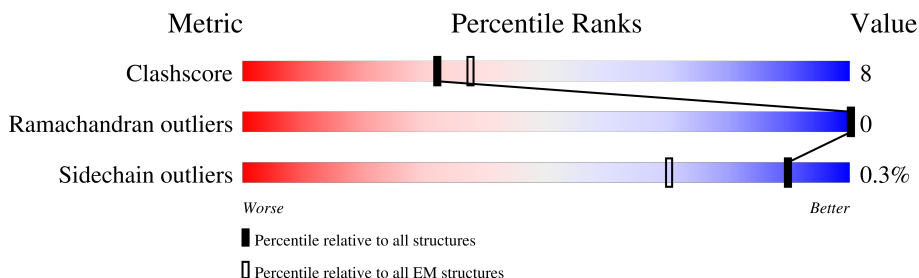
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.30 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.








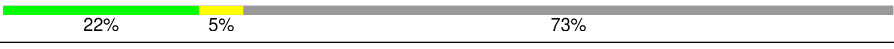

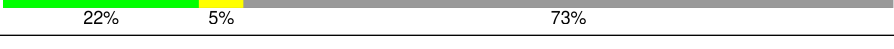
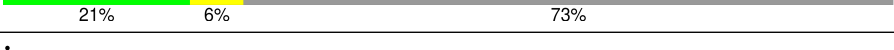
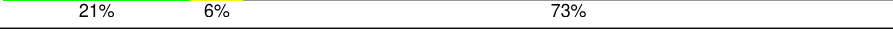
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. 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	I	32	<div> <div>6%</div> <div>75%</div> <div>25%</div> </div>
1	J	32	<div> <div>6%</div> <div>78%</div> <div>22%</div> </div>
2	B	217	<div> <div>43%</div> <div>7%</div> <div>50%</div> </div>
2	D	217	<div> <div>41%</div> <div>8%</div> <div>50%</div> </div>
2	F	217	<div> <div>37%</div> <div>12%</div> <div>50%</div> </div>
2	L	217	<div> <div>39%</div> <div>11%</div> <div>50%</div> </div>
2	N	217	<div> <div>36%</div> <div>13%</div> <div>50%</div> </div>
2	P	217	<div> <div>42%</div> <div>8%</div> <div>50%</div> </div>

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
2	R	217	
2	T	217	
3	A	453	
3	C	453	
3	E	453	
3	H	453	
3	M	453	
3	O	453	
3	Q	453	
3	S	453	

2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 14578 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 Circumsporozoite protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
1	I	32	Total	C	N	O	0	0
			225	128	48	49		
1	J	32	Total	C	N	O	0	0
			225	128	48	49		

- Molecule 2 is a protein called 227 Fab light chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	L	108	Total	C	N	O	S	0	0
			787	491	132	162	2		
2	B	108	Total	C	N	O	S	0	0
			787	491	132	162	2		
2	D	108	Total	C	N	O	S	0	0
			787	491	132	162	2		
2	F	108	Total	C	N	O	S	0	0
			787	491	132	162	2		
2	N	108	Total	C	N	O	S	0	0
			787	491	132	162	2		
2	P	108	Total	C	N	O	S	0	0
			787	491	132	162	2		
2	R	108	Total	C	N	O	S	0	0
			787	491	132	162	2		
2	T	108	Total	C	N	O	S	0	0
			787	491	132	162	2		

- Molecule 3 is a protein called 227 Fab heavy chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	H	124	Total	C	N	O	S	0	0
			979	621	174	179	5		
3	A	124	Total	C	N	O	S	0	0
			979	621	174	179	5		
3	C	124	Total	C	N	O	S	0	0
			979	621	174	179	5		

Continued on next page...

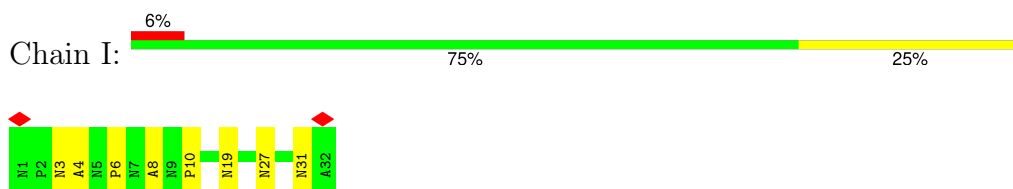
Continued from previous page...

Mol	Chain	Residues	Atoms					AltConf	Trace
3	E	124	Total 979	C 621	N 174	O 179	S 5	0	0
3	M	124	Total 979	C 621	N 174	O 179	S 5	0	0
3	O	124	Total 979	C 621	N 174	O 179	S 5	0	0
3	Q	124	Total 979	C 621	N 174	O 179	S 5	0	0
3	S	124	Total 979	C 621	N 174	O 179	S 5	0	0

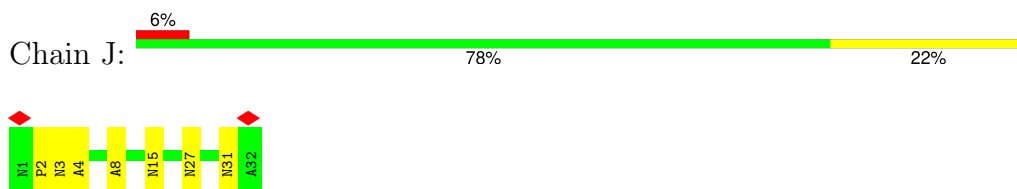
3 Residue-property plots [i](#)

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.

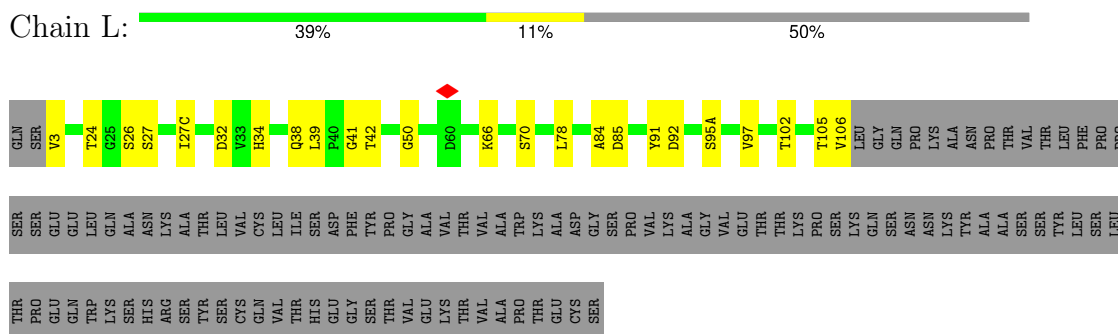
- Molecule 1: Circumsporozoite protein



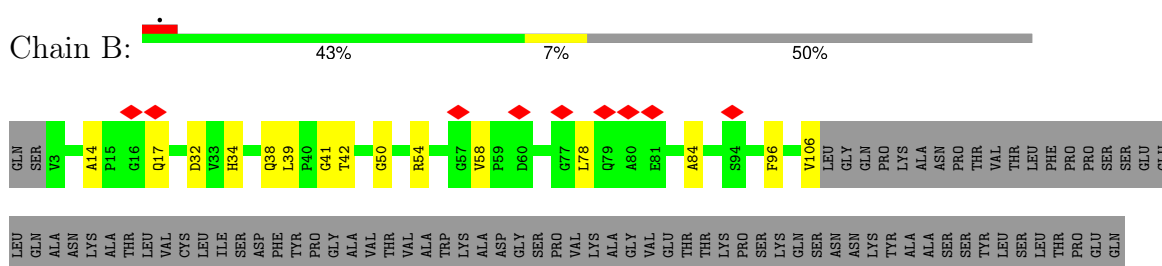
- Molecule 1: Circumsporozoite protein



- Molecule 2: 227 Fab light chain



- Molecule 2: 227 Fab light chain



TRP
LYS
SER
HIS
ARG
SER
TVR
SER
CYS
GLN
VAL
THR
HIS
GLU
GLY
SER
THR
VAL
GLU
LYS
CYS
SER

• Molecule 2: 227 Fab light chain


Chain D: 

GLN
SER
V3
I21
I27C
D32
V33
H34
Q38
L39
P40
G41
I48
Y49
G50
N53
K66
L73
A84
D85
D92
S95A
T102
V106
LEU
GLY
GLN
PRO
LYS
ASN
LYS
ALA
PRO
THR
SER
THR
LEU
PHE
PRO
PRO
SER
SER
SER
GLU
GLU
LEU
LEU
ASN

LYS
ALA
THR
LEU
VAL
CYS
LEU
ILE
ASP
PHE
GLY
THR
PRO
GLY
VAL
THR
VAL
ALA
TRP
LYS
ASP
ALA
GLY
SER
PRO
VAL
LYS
ALA
GLY
VAL
GLU
THR
LYS
PRO
SER
LYS
GLN
SER

ARG
SER
TYR
SER
CYS
GLN
VAL
THR
HIS
GLU
GLY
SER
THR
VAL
LYS
THR
VAL
PRO
THR
CYS
SER

• Molecule 2: 227 Fab light chain


Chain F: 

GLN
SER
V3
P7
A14
Q17
R18
I21
M27B
Y31
D32
V33
H34
L39
I48
Y49
G50
N51
G52
S56
D60
R61
F62
K66
V71
I75
T76
D82
E83
A84
Q89
D92
S95A
F98
T102
V106
LEU
GLY
GLN
PRO

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

ASN
LYS
TYR
ALA
ALA
SER
SER
SER
TYR
LEU
SER
LEU
THR
PRO
GLU
GLN
GLY
THR
SER
CYS
VAL
THR
HIS
HIS
GLY
GLY
SER
THR
VAL
GLU
LYS
VAL
ALA
PRO
GLU
CYS
SER

• Molecule 2: 227 Fab light chain

Chain N: 

GLN
SER
V3
P7
A14
Q17
R18
I21
M27B
Y31
D32
V33
H34
L39
I48
Y49
G50
N51
G52
N53
R54
F55
S56
D60
R61
F62
K66
V71
I75
T76
D82
E83
A84
Q89
D92
S95A
F98
T102
V106
LEU
GLY

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

SER
ASN
LYS
LYS
TYR
ALA
ALA
SER
SER
TYR
LEU
SER
SER
THR
PRO
GLU
GLN
TRP
LYS
SER
HIS
HIS
SER
SER
TYR
SER
CYS
GLN
VAL
THR
HIS
HIS
GLY
GLY
SER
THR
VAL
GLU
LYS
THR
VAL
ALA
TRP
LYS
CYS
SER

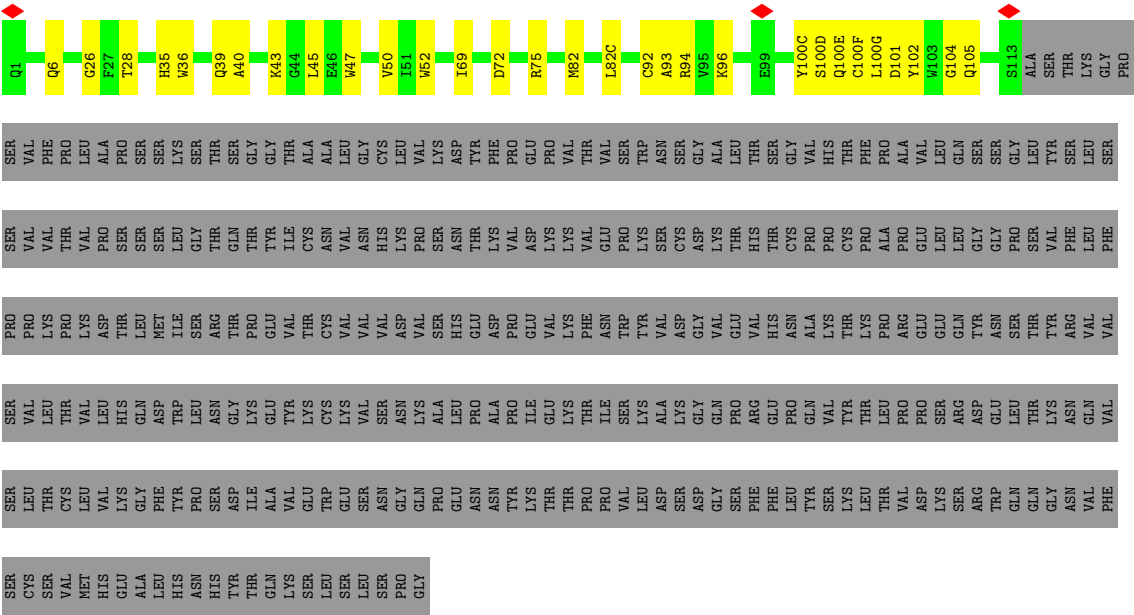
• Molecule 2: 227 Fab light chain

Chain P: 

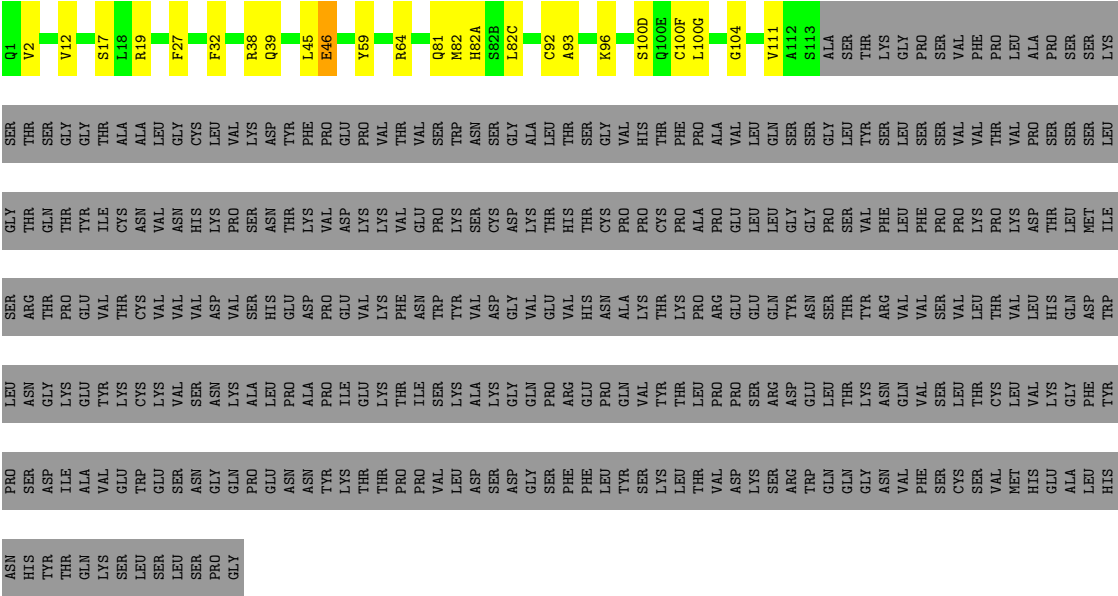
GLN
SER
V3
I21
I27C
D32
Q38
L39
P40
G41
I48
Y49
G50
N53
K66
L73
A84
D85
D92
S95A
T102
V106
LEU
GLY
GLN
PRO
LYS
ASN
LYS
ALA
PRO
THR
VAL
SER
THR
LEU
PHE
PRO
PRO
SER
SER
GLU
GLU
GLN
TRP
LYS
ALA
ASN
LYS
ALA

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

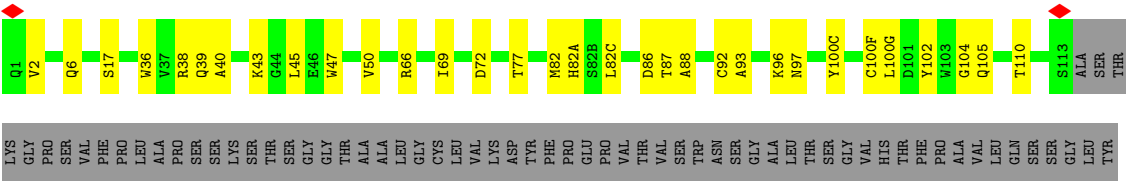
TYR
SER
CYS
GLN
VAL
THR
HIS
GLY
SER
SER
VAL
GLY
LYS
THR
VAL
VAL
ALA
PRO
THR
THR
GLY
CYS
SER



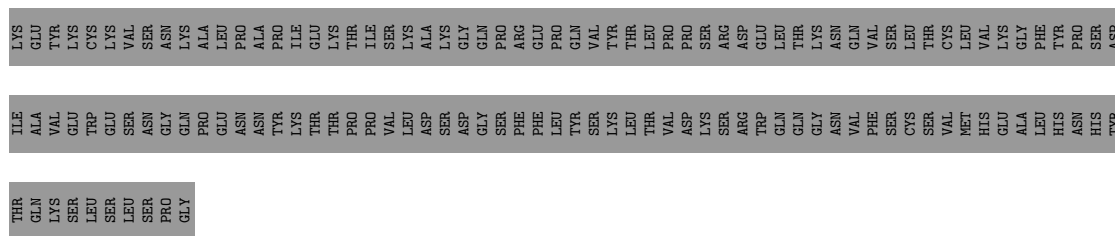
• Molecule 3: 227 Fab heavy chain



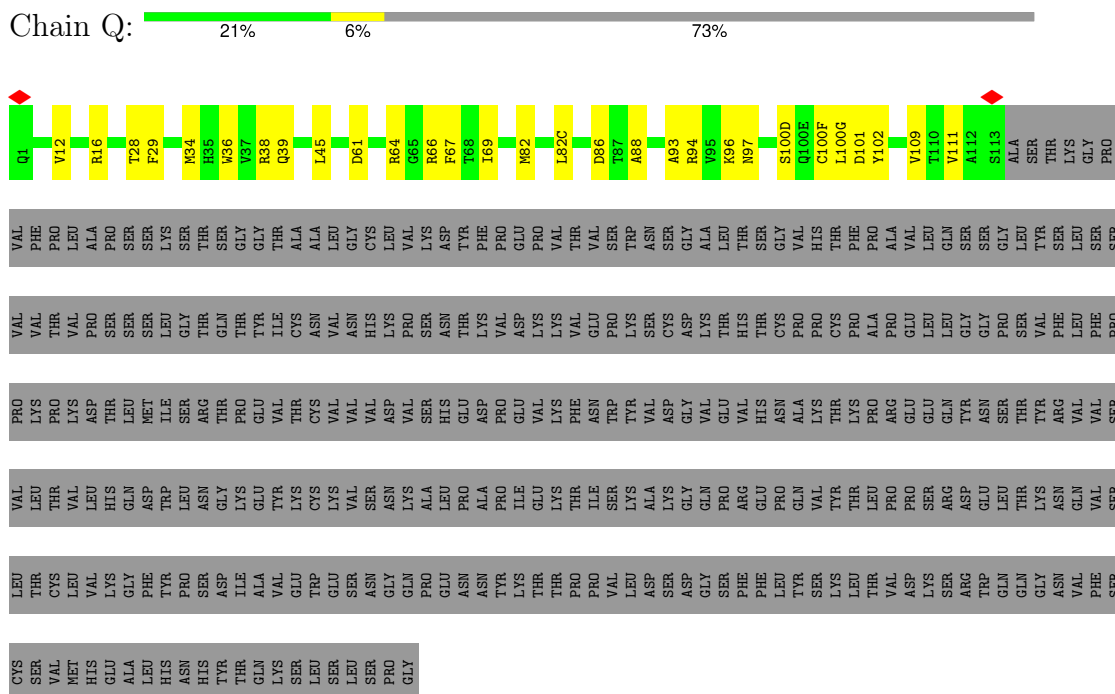
• Molecule 3: 227 Fab heavy chain



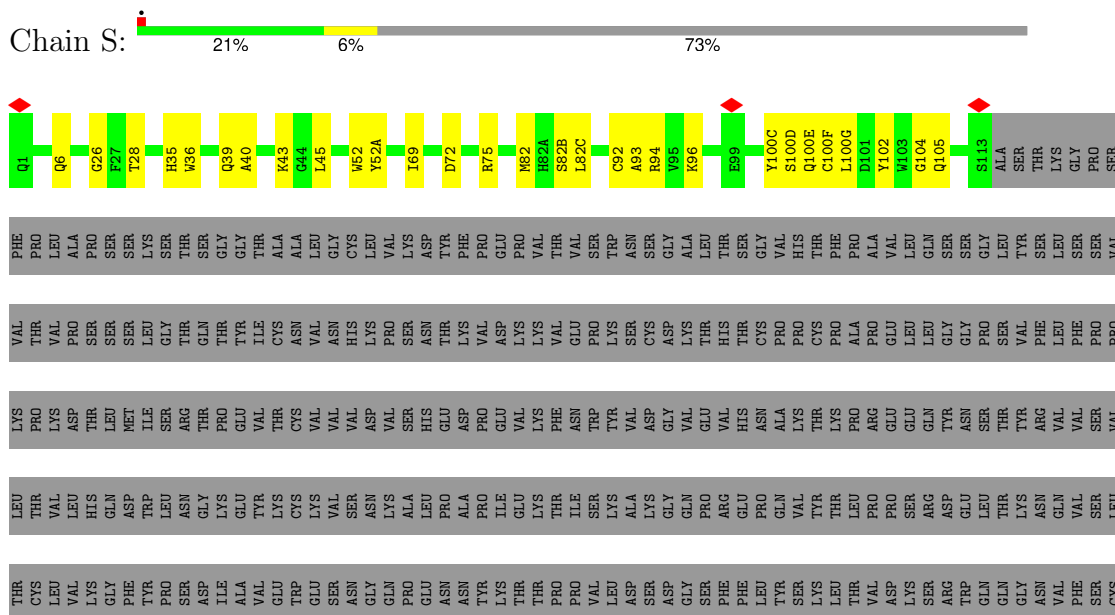




- Molecule 3: 227 Fab heavy chain



- Molecule 3: 227 Fab heavy chain



SER
VAL
MET
HIS
GLU
ALA
LEU
HIS
ASN
HIS
TYR
THR
GLN
LYS
SER
LEU
SER
LEU
SER
PRO
GLY

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	70120	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TECNAI ARCTICA	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	6.268	Depositor
Minimum map value	-3.176	Depositor
Average map value	0.005	Depositor
Map value standard deviation	0.203	Depositor
Recommended contour level	1	Depositor
Map size (Å)	253.0, 253.0, 253.0	wwPDB
Map dimensions	220, 220, 220	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.15, 1.15, 1.15	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	I	0.34	0/232	0.52	0/325
1	J	0.33	0/232	0.36	0/325
2	B	0.24	0/805	0.39	0/1098
2	D	0.33	0/805	0.43	0/1098
2	F	0.25	0/805	0.39	0/1098
2	L	0.30	0/805	0.42	0/1098
2	N	0.25	0/805	0.39	0/1098
2	P	0.33	0/805	0.41	0/1098
2	R	0.30	0/805	0.41	0/1098
2	T	0.24	0/805	0.38	0/1098
3	A	0.28	0/1004	0.38	0/1361
3	C	0.34	0/1004	0.40	0/1361
3	E	0.28	0/1004	0.39	0/1361
3	H	0.33	0/1004	0.39	0/1361
3	M	0.28	0/1004	0.39	0/1361
3	O	0.34	0/1004	0.39	0/1361
3	Q	0.33	0/1004	0.39	0/1361
3	S	0.27	0/1004	0.38	0/1361
All	All	0.30	0/14936	0.40	0/20322

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	I	225	0	194	8	0
1	J	225	0	194	8	0
2	B	787	0	752	11	0
2	D	787	0	752	10	0
2	F	787	0	752	16	0
2	L	787	0	752	17	0
2	N	787	0	752	17	0
2	P	787	0	752	9	0
2	R	787	0	752	16	0
2	T	787	0	752	11	0
3	A	979	0	947	21	0
3	C	979	0	947	19	0
3	E	979	0	947	18	0
3	H	979	0	947	18	0
3	M	979	0	947	19	0
3	O	979	0	947	16	0
3	Q	979	0	947	22	0
3	S	979	0	947	25	0
All	All	14578	0	13980	240	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 8.

All (240) 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)
3:E:17:SER:HG	3:E:82(A):HIS:HD1	1.27	0.82
3:S:82:MET:HE2	3:S:82(C):LEU:HD21	1.64	0.78
3:A:82:MET:HE2	3:A:82(C):LEU:HD21	1.66	0.77
1:I:3:ASN:ND2	3:A:100(C):TYR:O	2.18	0.76
2:R:3:VAL:HB	2:R:97:VAL:HG11	1.69	0.75
2:L:3:VAL:HB	2:L:97:VAL:HG11	1.69	0.75
1:J:15:ASN:ND2	3:Q:97:ASN:OD1	2.22	0.72
1:J:31:ASN:ND2	3:M:97:ASN:OD1	2.24	0.71
3:C:17:SER:HG	3:C:82(A):HIS:HD1	1.36	0.69
2:R:26:SER:OG	2:R:27:SER:N	2.26	0.68
3:O:82:MET:HE3	3:O:82(C):LEU:HD21	1.77	0.67
3:O:17:SER:HG	3:O:82(A):HIS:HD1	1.37	0.67
1:I:31:ASN:ND2	3:E:97:ASN:OD1	2.27	0.67
2:T:14:ALA:N	2:T:17:GLN:OE1	2.29	0.66
1:J:3:ASN:ND2	3:S:100(C):TYR:O	2.29	0.66
2:L:26:SER:OG	2:L:27:SER:N	2.26	0.66

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:14:ALA:N	2:B:17:GLN:OE1	2.28	0.66
3:C:82:MET:HE3	3:C:82(C):LEU:HD21	1.77	0.66
3:H:39:GLN:HB2	3:H:45:LEU:HD23	1.79	0.65
3:M:93:ALA:HB1	3:M:100(G):LEU:HB3	1.80	0.64
2:F:32:ASP:HB3	2:F:50:GLY:HA2	1.79	0.64
2:F:61:ARG:NH2	2:F:82:ASP:OD1	2.26	0.64
3:Q:39:GLN:HB2	3:Q:45:LEU:HD23	1.79	0.64
2:B:96:PHE:HZ	3:A:100(E):GLN:HE21	1.46	0.63
3:E:93:ALA:HB1	3:E:100(G):LEU:HB3	1.80	0.63
2:F:39:LEU:HD23	2:F:84:ALA:HB2	1.81	0.63
2:N:39:LEU:HD23	2:N:84:ALA:HB2	1.81	0.63
3:S:72:ASP:OD2	3:S:75:ARG:HG2	1.99	0.62
3:S:93:ALA:HB1	3:S:100(G):LEU:HB3	1.81	0.62
3:A:72:ASP:OD2	3:A:75:ARG:HG2	1.99	0.62
2:L:32:ASP:HB3	2:L:50:GLY:HA2	1.82	0.62
3:H:93:ALA:HB1	3:H:100(G):LEU:HB3	1.81	0.61
3:O:93:ALA:HB1	3:O:100(G):LEU:HB3	1.81	0.61
2:N:32:ASP:HB3	2:N:50:GLY:HA2	1.80	0.61
3:C:93:ALA:HB1	3:C:100(G):LEU:HB3	1.80	0.61
3:Q:93:ALA:HB1	3:Q:100(G):LEU:HB3	1.81	0.61
2:N:61:ARG:NH2	2:N:82:ASP:OD1	2.24	0.61
1:I:4:ALA:HB3	3:A:52:TRP:HZ2	1.65	0.60
3:A:93:ALA:HB1	3:A:100(G):LEU:HB3	1.83	0.60
3:O:39:GLN:HB2	3:O:45:LEU:HD23	1.83	0.60
3:O:81:GLN:HE21	3:O:82(A):HIS:CE1	2.19	0.60
3:C:39:GLN:HB2	3:C:45:LEU:HD23	1.83	0.60
3:C:81:GLN:HE21	3:C:82(A):HIS:CE1	2.18	0.60
3:M:17:SER:OG	3:M:82(A):HIS:ND1	2.33	0.60
3:O:38:ARG:NH2	3:O:46:GLU:OE2	2.33	0.60
2:F:33:VAL:HG11	2:F:71:VAL:HG21	1.84	0.60
2:R:32:ASP:HB3	2:R:50:GLY:HA2	1.83	0.59
2:R:34:HIS:NE2	3:Q:100(D):SER:O	2.33	0.59
2:P:39:LEU:HD23	2:P:84:ALA:HB2	1.84	0.59
2:N:33:VAL:HG11	2:N:71:VAL:HG21	1.84	0.59
2:D:39:LEU:HD23	2:D:84:ALA:HB2	1.85	0.58
1:J:2:PRO:O	3:S:100(E):GLN:NE2	2.36	0.58
2:T:78:LEU:HG	2:T:106:VAL:HG12	1.86	0.58
3:E:39:GLN:HB2	3:E:45:LEU:HD23	1.87	0.57
3:M:39:GLN:HB2	3:M:45:LEU:HD23	1.87	0.57
2:R:78:LEU:HG	2:R:106:VAL:HG22	1.87	0.57
2:L:78:LEU:HG	2:L:106:VAL:HG22	1.87	0.57

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:39:LEU:HD23	2:B:84:ALA:HB2	1.85	0.56
2:L:34:HIS:NE2	3:H:100(D):SER:O	2.34	0.56
2:T:96:PHE:HZ	3:S:100(E):GLN:HE21	1.53	0.56
2:T:39:LEU:HD23	2:T:84:ALA:HB2	1.86	0.56
3:Q:61:ASP:OD2	3:S:26:GLY:N	2.33	0.56
3:Q:101:ASP:OD1	3:Q:102:TYR:N	2.39	0.56
3:H:101:ASP:OD1	3:H:102:TYR:N	2.39	0.55
2:L:38:GLN:HB3	2:L:85:ASP:HB2	1.88	0.55
3:A:40:ALA:HB3	3:A:43:LYS:HB2	1.88	0.55
2:R:38:GLN:HB3	2:R:85:ASP:HB2	1.87	0.55
3:S:40:ALA:HB3	3:S:43:LYS:HB2	1.87	0.55
1:J:4:ALA:HB3	3:S:52:TRP:HZ2	1.72	0.54
3:H:61:ASP:OD2	3:A:26:GLY:N	2.34	0.54
2:P:32:ASP:HB3	2:P:50:GLY:HA2	1.90	0.54
3:S:6:GLN:H	3:S:105:GLN:NE2	2.06	0.53
2:D:32:ASP:HB3	2:D:50:GLY:HA2	1.89	0.53
3:E:66:ARG:NH1	3:E:86:ASP:OD2	2.38	0.53
2:B:39:LEU:HD12	2:B:42:THR:HG21	1.91	0.53
3:O:92:CYS:O	3:O:104:GLY:N	2.42	0.53
2:L:34:HIS:CE1	3:H:100(F):CYS:HB3	2.44	0.53
2:T:39:LEU:HD12	2:T:42:THR:HG21	1.91	0.53
3:H:67:PHE:CE1	3:H:82:MET:HB3	2.44	0.53
3:H:96:LYS:HB3	3:H:100(F):CYS:SG	2.49	0.53
2:B:38:GLN:NE2	2:B:41:GLY:O	2.42	0.52
2:R:34:HIS:CE1	3:Q:100(F):CYS:HB3	2.44	0.52
3:Q:96:LYS:HB3	3:Q:100(F):CYS:SG	2.50	0.52
2:B:78:LEU:HG	2:B:106:VAL:HG12	1.90	0.52
3:Q:94:ARG:NH2	3:Q:101:ASP:OD2	2.43	0.52
1:J:27:ASN:ND2	3:M:100(C):TYR:O	2.42	0.52
2:T:38:GLN:NE2	2:T:41:GLY:O	2.42	0.52
1:I:10:PRO:HD2	2:L:91:TYR:OH	2.09	0.52
3:A:6:GLN:H	3:A:105:GLN:NE2	2.06	0.52
3:E:6:GLN:O	3:E:105:GLN:NE2	2.43	0.52
3:C:38:ARG:NH2	3:C:46:GLU:OE2	2.33	0.52
3:H:94:ARG:NH2	3:H:101:ASP:OD2	2.43	0.51
3:E:92:CYS:O	3:E:104:GLY:N	2.42	0.51
3:M:66:ARG:NH1	3:M:86:ASP:OD2	2.42	0.51
2:R:38:GLN:NE2	2:R:41:GLY:O	2.43	0.51
2:N:48:ILE:HD12	2:N:52:GLY:HA2	1.92	0.51
1:J:8:ALA:HB2	3:S:52(A):TYR:CD2	2.47	0.50
3:E:36:TRP:HD1	3:E:69:ILE:HD12	1.77	0.50

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:N:7:PRO:O	2:N:102:THR:HG22	2.12	0.50
2:F:7:PRO:O	2:F:102:THR:HG22	2.11	0.50
2:F:48:ILE:HD12	2:F:52:GLY:HA2	1.94	0.50
3:A:96:LYS:HB3	3:A:100(F):CYS:SG	2.52	0.50
2:L:38:GLN:NE2	2:L:41:GLY:O	2.44	0.49
3:C:92:CYS:O	3:C:104:GLY:N	2.42	0.49
3:M:36:TRP:HD1	3:M:69:ILE:HD12	1.77	0.49
3:S:96:LYS:HB3	3:S:100(F):CYS:SG	2.52	0.49
3:H:96:LYS:HB2	3:H:101:ASP:HB3	1.94	0.49
2:N:21:ILE:HG23	2:N:102:THR:HG21	1.95	0.49
2:T:32:ASP:HB3	2:T:50:GLY:HA2	1.94	0.49
2:F:21:ILE:HG23	2:F:102:THR:HG21	1.95	0.49
2:P:38:GLN:HB3	2:P:85:ASP:HB2	1.95	0.49
3:Q:67:PHE:CE1	3:Q:82:MET:HB3	2.47	0.49
2:R:42:THR:HG22	2:R:42:THR:O	2.12	0.48
3:A:94:ARG:HH21	3:A:102:TYR:HD2	1.61	0.48
2:L:27(C):ILE:HG23	2:L:66:LYS:HZ2	1.78	0.48
3:Q:96:LYS:HB2	3:Q:101:ASP:HB3	1.95	0.48
2:L:42:THR:O	2:L:42:THR:HG22	2.12	0.48
3:A:96:LYS:HB2	3:A:101:ASP:HB3	1.96	0.48
2:R:27(C):ILE:HG23	2:R:66:LYS:NZ	2.29	0.48
2:R:92:ASP:O	2:R:95(A):SER:N	2.45	0.48
3:M:92:CYS:O	3:M:104:GLY:N	2.43	0.48
2:P:38:GLN:NE2	2:P:41:GLY:O	2.47	0.48
2:D:38:GLN:NE2	2:D:41:GLY:O	2.47	0.48
2:D:38:GLN:HB3	2:D:85:ASP:HB2	1.95	0.47
2:B:32:ASP:HB3	2:B:50:GLY:HA2	1.96	0.47
2:F:66:LYS:HA	2:F:71:VAL:HG12	1.97	0.47
2:N:66:LYS:HA	2:N:71:VAL:HG12	1.97	0.47
3:S:94:ARG:HH21	3:S:102:TYR:HD1	1.61	0.47
2:L:27(C):ILE:HG23	2:L:66:LYS:NZ	2.29	0.47
3:A:92:CYS:O	3:A:104:GLY:N	2.47	0.47
3:M:40:ALA:HB3	3:M:43:LYS:HB2	1.97	0.47
3:H:28:THR:HG23	3:C:64:ARG:NH2	2.30	0.46
3:S:82(C):LEU:HD23	3:S:82(C):LEU:HA	1.76	0.46
3:Q:64:ARG:HH22	3:S:28:THR:HG23	1.81	0.46
3:A:35:HIS:ND1	3:A:100(G):LEU:HD21	2.31	0.46
1:J:3:ASN:OD1	3:S:100(D):SER:HA	2.15	0.46
3:H:36:TRP:HD1	3:H:69:ILE:HD12	1.80	0.46
3:M:72:ASP:HB3	3:M:77:THR:HG22	1.97	0.46
3:O:64:ARG:NH2	3:Q:28:THR:HG23	2.30	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:E:72:ASP:HB3	3:E:77:THR:HG22	1.97	0.46
3:Q:36:TRP:HD1	3:Q:69:ILE:HD12	1.80	0.46
1:I:8:ALA:HB1	3:H:58:TYR:OH	2.16	0.46
3:E:87:THR:OG1	3:E:110:THR:HA	2.16	0.45
3:E:40:ALA:HB3	3:E:43:LYS:HB2	1.97	0.45
2:R:39:LEU:HD23	2:R:84:ALA:HB2	1.98	0.45
3:H:64:ARG:HH22	3:A:28:THR:HG23	1.81	0.45
2:L:92:ASP:O	2:L:95(A):SER:N	2.48	0.45
3:A:39:GLN:HB2	3:A:45:LEU:HD23	1.99	0.45
3:S:36:TRP:HD1	3:S:69:ILE:HD12	1.81	0.45
3:A:36:TRP:HD1	3:A:69:ILE:HD12	1.81	0.45
3:S:39:GLN:HB2	3:S:45:LEU:HD23	1.99	0.44
3:Q:12:VAL:O	3:Q:111:VAL:HA	2.18	0.44
2:L:39:LEU:HD23	2:L:84:ALA:HB2	2.00	0.44
2:B:34:HIS:NE2	3:A:100(D):SER:O	2.45	0.44
2:F:18:ARG:HD2	2:F:76:THR:HG22	2.00	0.44
2:N:18:ARG:HD2	2:N:76:THR:HG22	1.99	0.44
2:B:34:HIS:CE1	3:A:100(F):CYS:HB3	2.52	0.44
3:M:2:VAL:HG11	3:M:102:TYR:CD1	2.53	0.44
3:M:96:LYS:HB3	3:M:100(F):CYS:SG	2.58	0.44
2:T:39:LEU:HB2	2:T:42:THR:HB	1.99	0.44
2:B:39:LEU:HB2	2:B:42:THR:HB	1.99	0.43
3:C:59:TYR:O	3:C:64:ARG:NH2	2.51	0.43
3:E:82:MET:HE2	3:E:82(C):LEU:HD21	2.00	0.43
3:E:96:LYS:HB3	3:E:100(F):CYS:SG	2.58	0.43
2:N:54:ARG:HH21	2:N:60:ASP:N	2.15	0.43
3:M:35:HIS:NE2	3:M:100(E):GLN:OE1	2.44	0.43
3:M:82:MET:HE2	3:M:82(C):LEU:HD21	2.01	0.43
2:R:27(C):ILE:HG23	2:R:66:LYS:HZ2	1.83	0.43
2:D:92:ASP:O	2:D:95(A):SER:N	2.49	0.43
3:S:35:HIS:ND1	3:S:100(G):LEU:HD21	2.32	0.43
3:E:2:VAL:HG11	3:E:102:TYR:CD1	2.53	0.43
2:D:49:TYR:O	2:D:53:ASN:HB2	2.19	0.43
2:D:27(C):ILE:HG22	2:D:66:LYS:HE2	2.01	0.43
2:T:34:HIS:CE1	3:S:100(F):CYS:HB3	2.53	0.43
3:C:82(C):LEU:HD23	3:C:82(C):LEU:HA	1.91	0.43
3:E:47:TRP:HZ2	3:E:50:VAL:HG12	1.84	0.43
2:N:27(B):ASN:O	2:N:31:TYR:HB2	2.19	0.43
2:T:34:HIS:NE2	3:S:100(D):SER:O	2.48	0.43
3:H:28:THR:HG23	3:C:64:ARG:HH22	1.84	0.43
2:D:48:ILE:HD12	2:D:73:LEU:HD12	2.01	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:P:49:TYR:O	2:P:53:ASN:HB2	2.19	0.43
2:P:27(C):ILE:HG22	2:P:66:LYS:HE2	2.01	0.42
2:P:92:ASP:O	2:P:95(A):SER:N	2.50	0.42
3:S:92:CYS:O	3:S:104:GLY:N	2.47	0.42
3:C:32:PHE:CZ	2:F:95(A):SER:HB2	2.54	0.42
3:O:96:LYS:HB3	3:O:100(F):CYS:SG	2.60	0.42
2:F:27(B):ASN:O	2:F:31:TYR:HB2	2.19	0.42
2:R:24:THR:HG22	2:R:70:SER:HB3	2.02	0.42
2:N:89:GLN:HG3	2:N:98:PHE:CZ	2.54	0.42
3:M:47:TRP:HZ2	3:M:50:VAL:HG12	1.83	0.42
2:L:39:LEU:HD12	2:L:42:THR:HG21	2.00	0.42
2:F:34:HIS:CE1	3:E:100(F):CYS:HB3	2.54	0.42
3:E:38:ARG:HG3	3:E:88:ALA:CB	2.49	0.42
2:N:34:HIS:CE1	3:M:100(F):CYS:HB3	2.54	0.42
3:M:20:LEU:HD22	3:M:107:VAL:HG11	2.02	0.42
3:M:43:LYS:HA	3:M:43:LYS:HD2	1.82	0.42
3:O:59:TYR:O	3:O:64:ARG:NH2	2.51	0.42
2:D:21:ILE:HG23	2:D:102:THR:HG21	2.01	0.42
2:F:89:GLN:HG3	2:F:98:PHE:CZ	2.54	0.42
3:H:12:VAL:O	3:H:111:VAL:HA	2.19	0.42
2:N:14:ALA:O	2:N:17:GLN:HG2	2.19	0.42
3:O:12:VAL:O	3:O:111:VAL:HA	2.20	0.42
2:F:14:ALA:O	2:F:17:GLN:HG2	2.20	0.41
3:O:2:VAL:HG13	3:O:27:PHE:CD1	2.55	0.41
2:B:54:ARG:HD2	2:B:58:VAL:HG12	2.02	0.41
3:C:12:VAL:O	3:C:111:VAL:HA	2.20	0.41
3:C:96:LYS:HB3	3:C:100(F):CYS:SG	2.59	0.41
2:N:27(B):ASN:ND2	2:N:92:ASP:CG	2.78	0.41
2:L:24:THR:HG22	2:L:70:SER:HB3	2.02	0.41
2:N:62:PHE:CD1	2:N:75:ILE:HG12	2.56	0.41
2:N:95(A):SER:HB2	3:O:32:PHE:CZ	2.56	0.41
2:P:48:ILE:HD12	2:P:73:LEU:HD12	2.01	0.41
1:I:6:PRO:HB3	3:A:52:TRP:CD2	2.56	0.41
3:C:2:VAL:HG13	3:C:27:PHE:CD1	2.55	0.41
2:F:27(B):ASN:ND2	2:F:92:ASP:CG	2.78	0.41
2:P:21:ILE:HG23	2:P:102:THR:HG21	2.02	0.41
1:I:19:ASN:OD1	3:C:100(D):SER:HA	2.20	0.41
1:I:27:ASN:ND2	3:E:100(C):TYR:O	2.51	0.41
2:T:54:ARG:HD2	2:T:58:VAL:HG12	2.02	0.41
3:O:64:ARG:HH22	3:Q:28:THR:HG23	1.84	0.41
3:H:12:VAL:HG21	3:H:18:LEU:HB2	2.03	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:R:85:ASP:HA	2:R:102:THR:O	2.21	0.41
2:R:39:LEU:HD12	2:R:42:THR:HG21	2.01	0.41
3:Q:16:ARG:O	3:Q:82(C):LEU:HB2	2.20	0.41
2:L:85:ASP:HA	2:L:102:THR:O	2.21	0.41
3:M:64:ARG:NH2	3:O:28:THR:HG23	2.36	0.41
3:Q:66:ARG:NH2	3:Q:86:ASP:OD2	2.52	0.41
3:S:82(B):SER:O	3:S:82(B):SER:OG	2.35	0.41
3:C:12:VAL:HG11	3:C:82(C):LEU:HD12	2.03	0.41
3:Q:64:ARG:NH2	3:S:28:THR:HG23	2.36	0.41
3:S:94:ARG:O	3:S:100(G):LEU:HA	2.21	0.41
3:A:47:TRP:HZ2	3:A:50:VAL:HG12	1.86	0.40
3:O:12:VAL:HG11	3:O:82(C):LEU:HD12	2.03	0.40
3:Q:38:ARG:HG3	3:Q:88:ALA:CB	2.51	0.40
3:C:19:ARG:HB2	3:C:81:GLN:OE1	2.22	0.40
3:H:38:ARG:HG3	3:H:88:ALA:CB	2.51	0.40
3:Q:29:PHE:HE1	3:Q:34:MET:HE2	1.86	0.40
2:D:34:HIS:CE1	3:C:100(F):CYS:HB3	2.57	0.40
2:F:62:PHE:CD1	2:F:75:ILE:HG12	2.56	0.40
3:Q:82:MET:HE1	3:Q:109:VAL:HG11	2.02	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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	I	30/32 (94%)	27 (90%)	3 (10%)	0	100	100
1	J	30/32 (94%)	28 (93%)	2 (7%)	0	100	100
2	B	106/217 (49%)	100 (94%)	6 (6%)	0	100	100
2	D	106/217 (49%)	98 (92%)	8 (8%)	0	100	100
2	F	106/217 (49%)	101 (95%)	5 (5%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	L	106/217 (49%)	99 (93%)	7 (7%)	0	100	100
2	N	106/217 (49%)	100 (94%)	6 (6%)	0	100	100
2	P	106/217 (49%)	98 (92%)	8 (8%)	0	100	100
2	R	106/217 (49%)	99 (93%)	7 (7%)	0	100	100
2	T	106/217 (49%)	100 (94%)	6 (6%)	0	100	100
3	A	122/453 (27%)	116 (95%)	6 (5%)	0	100	100
3	C	122/453 (27%)	118 (97%)	4 (3%)	0	100	100
3	E	122/453 (27%)	118 (97%)	4 (3%)	0	100	100
3	H	122/453 (27%)	117 (96%)	5 (4%)	0	100	100
3	M	122/453 (27%)	118 (97%)	4 (3%)	0	100	100
3	O	122/453 (27%)	118 (97%)	4 (3%)	0	100	100
3	Q	122/453 (27%)	117 (96%)	5 (4%)	0	100	100
3	S	122/453 (27%)	116 (95%)	6 (5%)	0	100	100
All	All	1884/5424 (35%)	1788 (95%)	96 (5%)	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	I	24/24 (100%)	24 (100%)	0	100	100
1	J	24/24 (100%)	24 (100%)	0	100	100
2	B	87/181 (48%)	87 (100%)	0	100	100
2	D	87/181 (48%)	87 (100%)	0	100	100
2	F	87/181 (48%)	87 (100%)	0	100	100
2	L	87/181 (48%)	86 (99%)	1 (1%)	70	82
2	N	87/181 (48%)	87 (100%)	0	100	100
2	P	87/181 (48%)	87 (100%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	R	87/181 (48%)	86 (99%)	1 (1%)	70	82
2	T	87/181 (48%)	87 (100%)	0	100	100
3	A	103/401 (26%)	103 (100%)	0	100	100
3	C	103/401 (26%)	102 (99%)	1 (1%)	73	84
3	E	103/401 (26%)	103 (100%)	0	100	100
3	H	103/401 (26%)	103 (100%)	0	100	100
3	M	103/401 (26%)	102 (99%)	1 (1%)	73	84
3	O	103/401 (26%)	102 (99%)	1 (1%)	73	84
3	Q	103/401 (26%)	103 (100%)	0	100	100
3	S	103/401 (26%)	103 (100%)	0	100	100
All	All	1568/4704 (33%)	1563 (100%)	5 (0%)	90	94

All (5) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	L	105	THR
3	C	46	GLU
3	M	87	THR
3	O	46	GLU
2	R	105	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
3	H	39	GLN
3	A	82(A)	HIS
3	A	105	GLN
2	D	53	ASN
3	C	81	GLN
3	E	105	GLN
3	M	105	GLN
2	P	53	ASN
3	O	81	GLN
3	Q	39	GLN
3	S	82(A)	HIS
3	S	105	GLN

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.

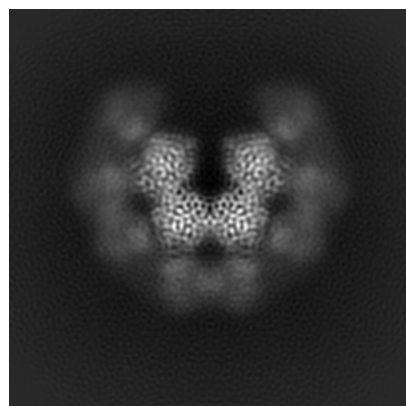
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-27781. These allow visual inspection of the internal detail of the map and identification of artifacts.

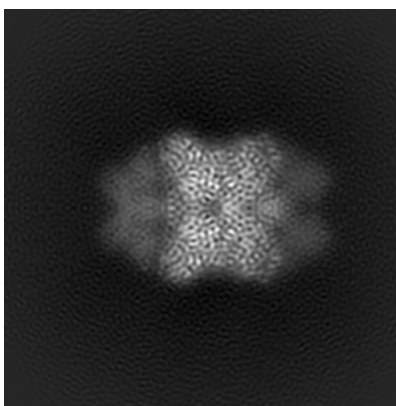
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

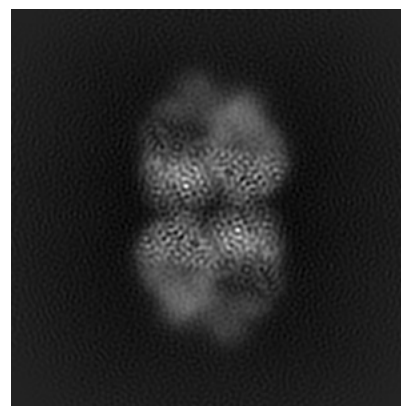
6.1.1 Primary map



X

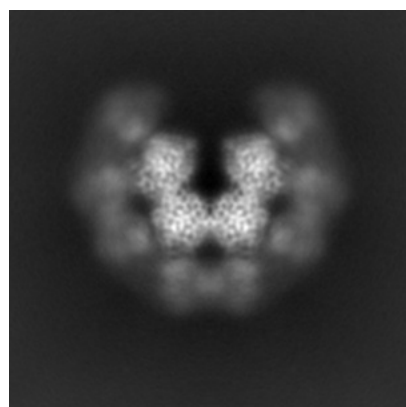


Y

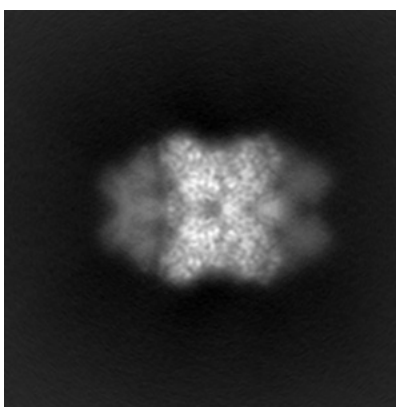


Z

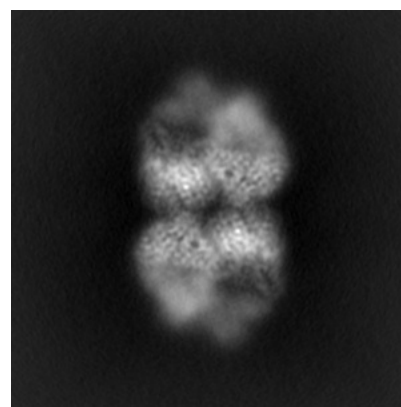
6.1.2 Raw map



X



Y

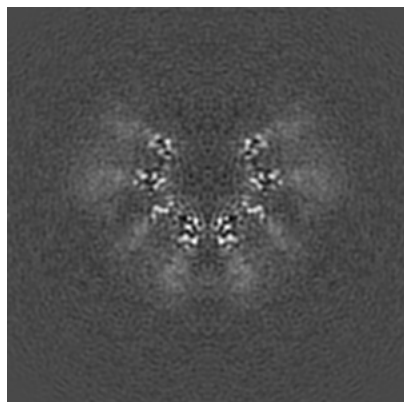


Z

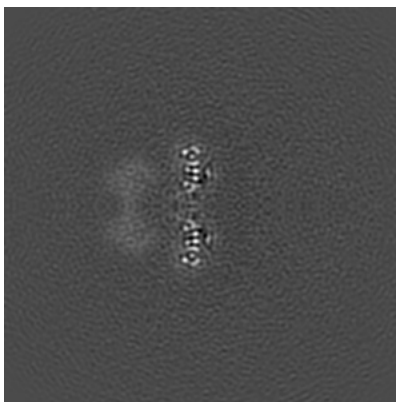
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

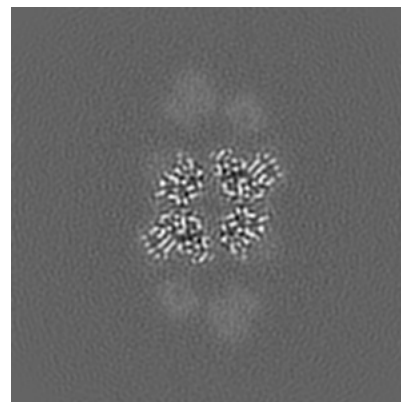
6.2.1 Primary map



X Index: 110

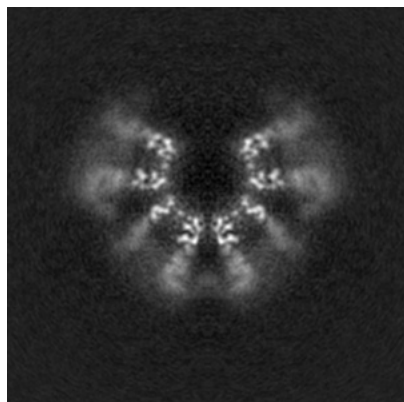


Y Index: 110

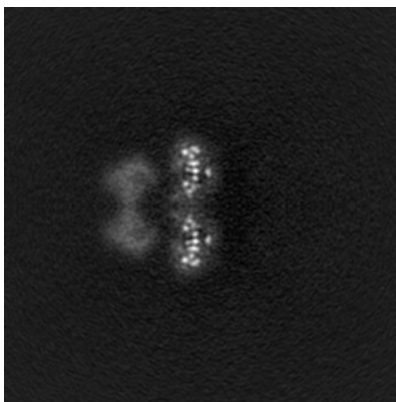


Z Index: 110

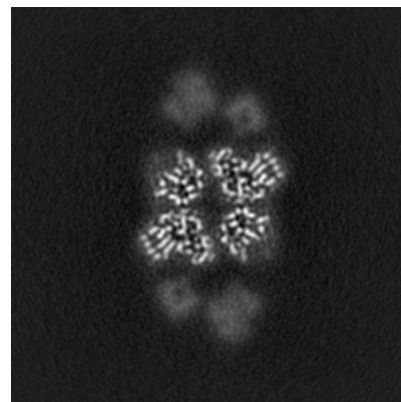
6.2.2 Raw map



X Index: 110



Y Index: 110

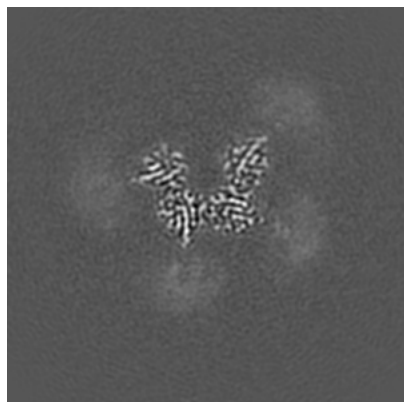


Z Index: 110

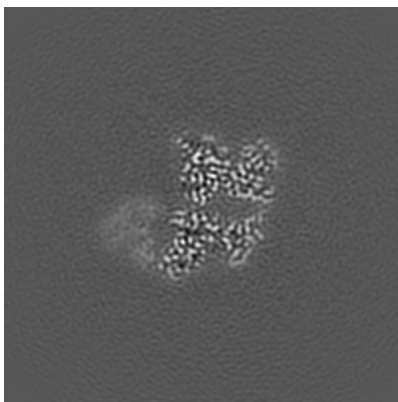
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

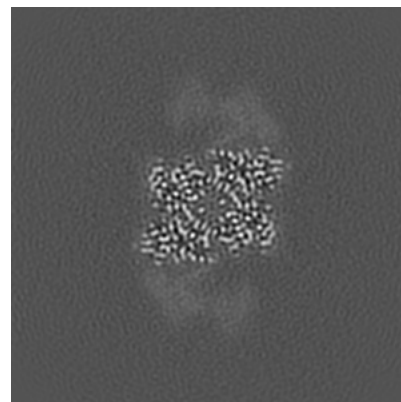
6.3.1 Primary map



X Index: 124

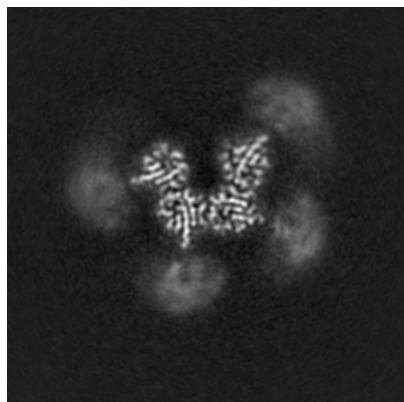


Y Index: 128

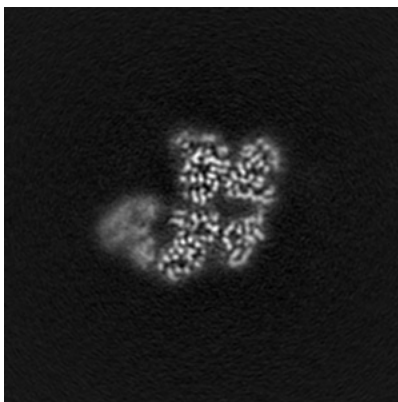


Z Index: 105

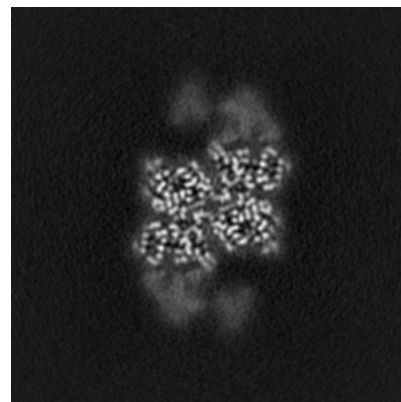
6.3.2 Raw map



X Index: 124



Y Index: 128

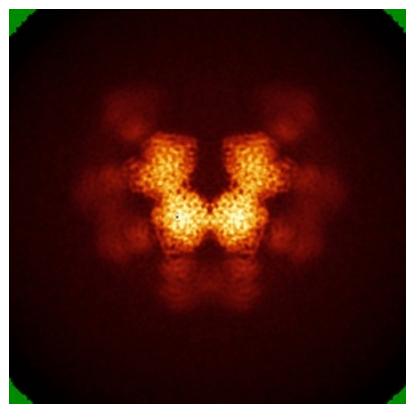


Z Index: 103

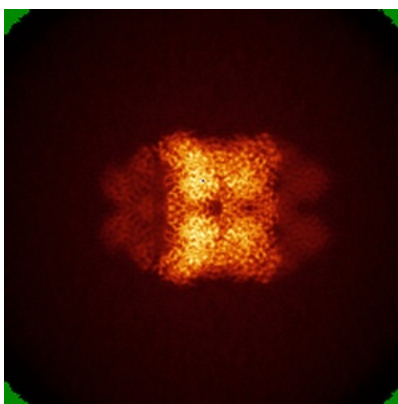
The images above show the largest variance slices of the map in three orthogonal directions.

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

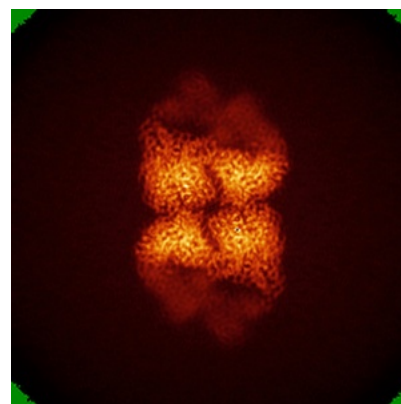
6.4.1 Primary map



X

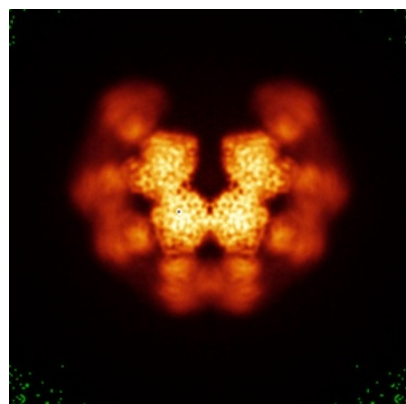


Y

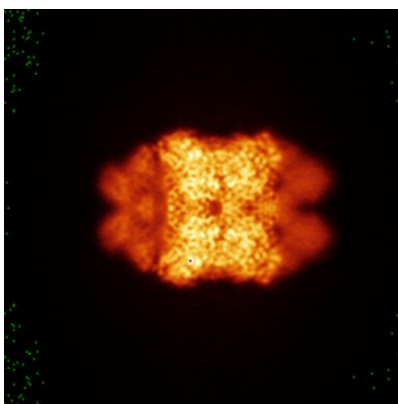


Z

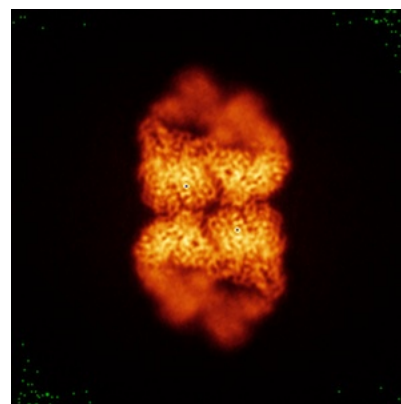
6.4.2 Raw map



X



Y

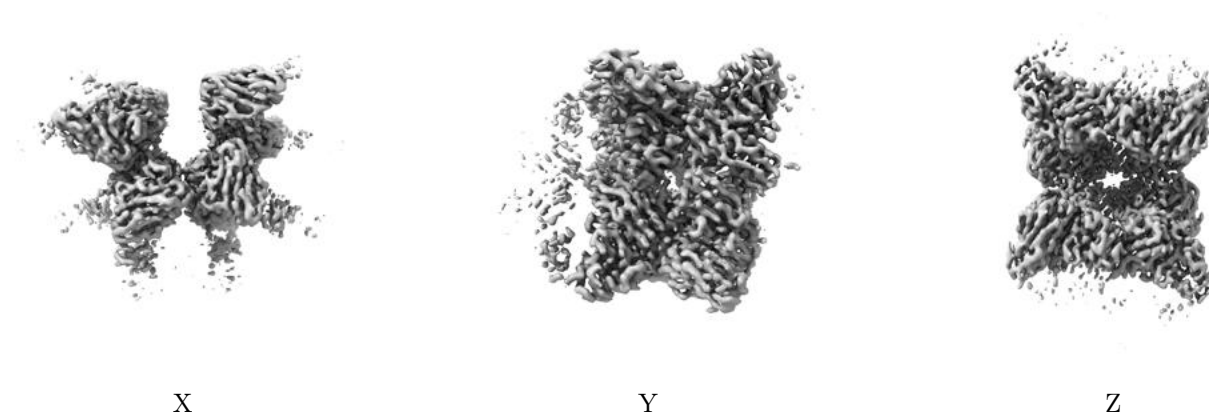


Z

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.

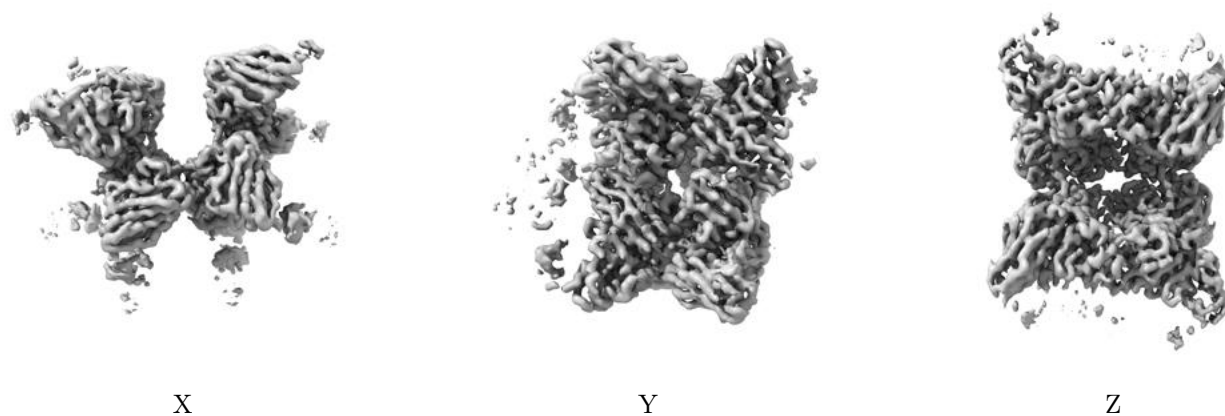
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 1.0. 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



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.

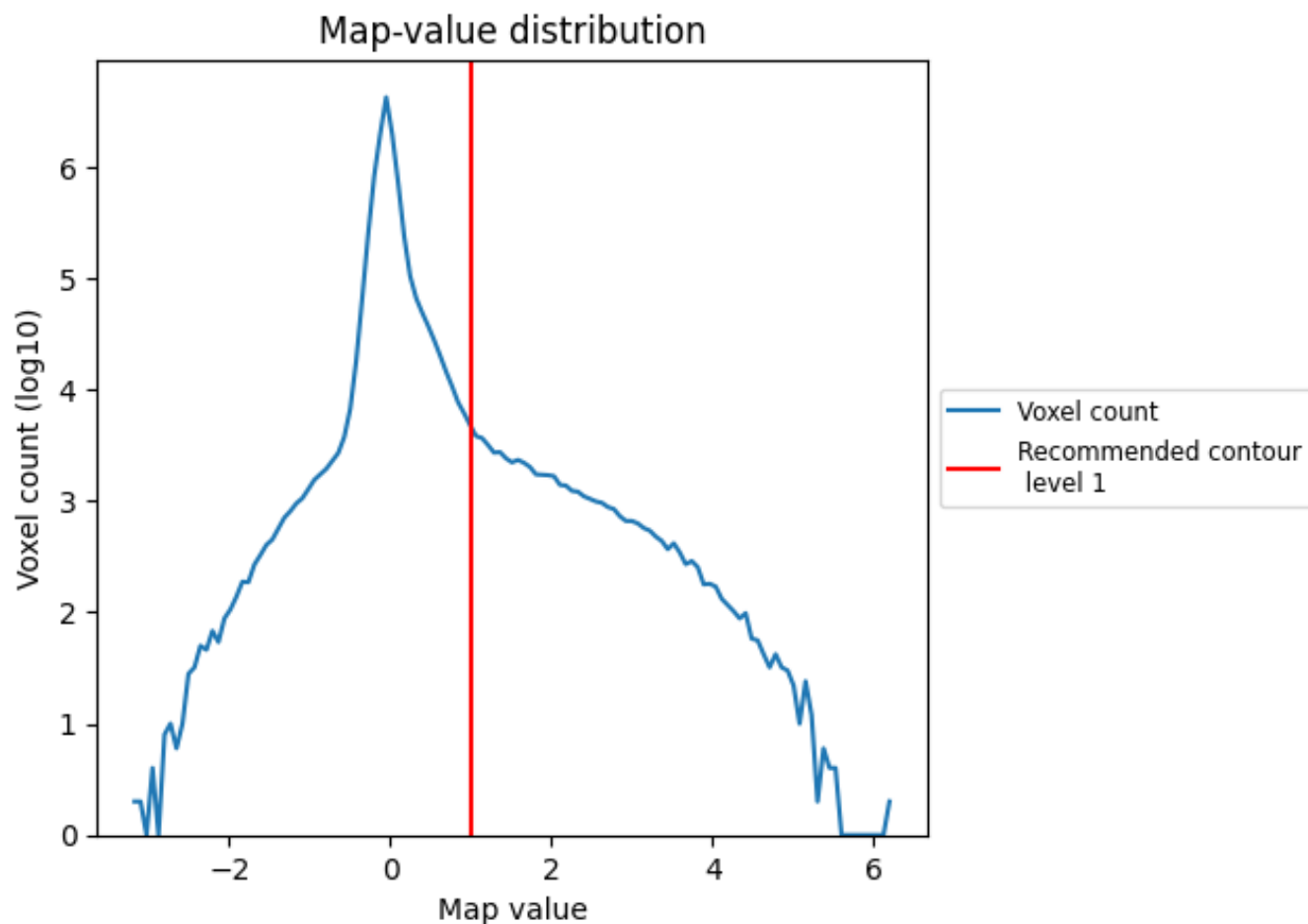
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

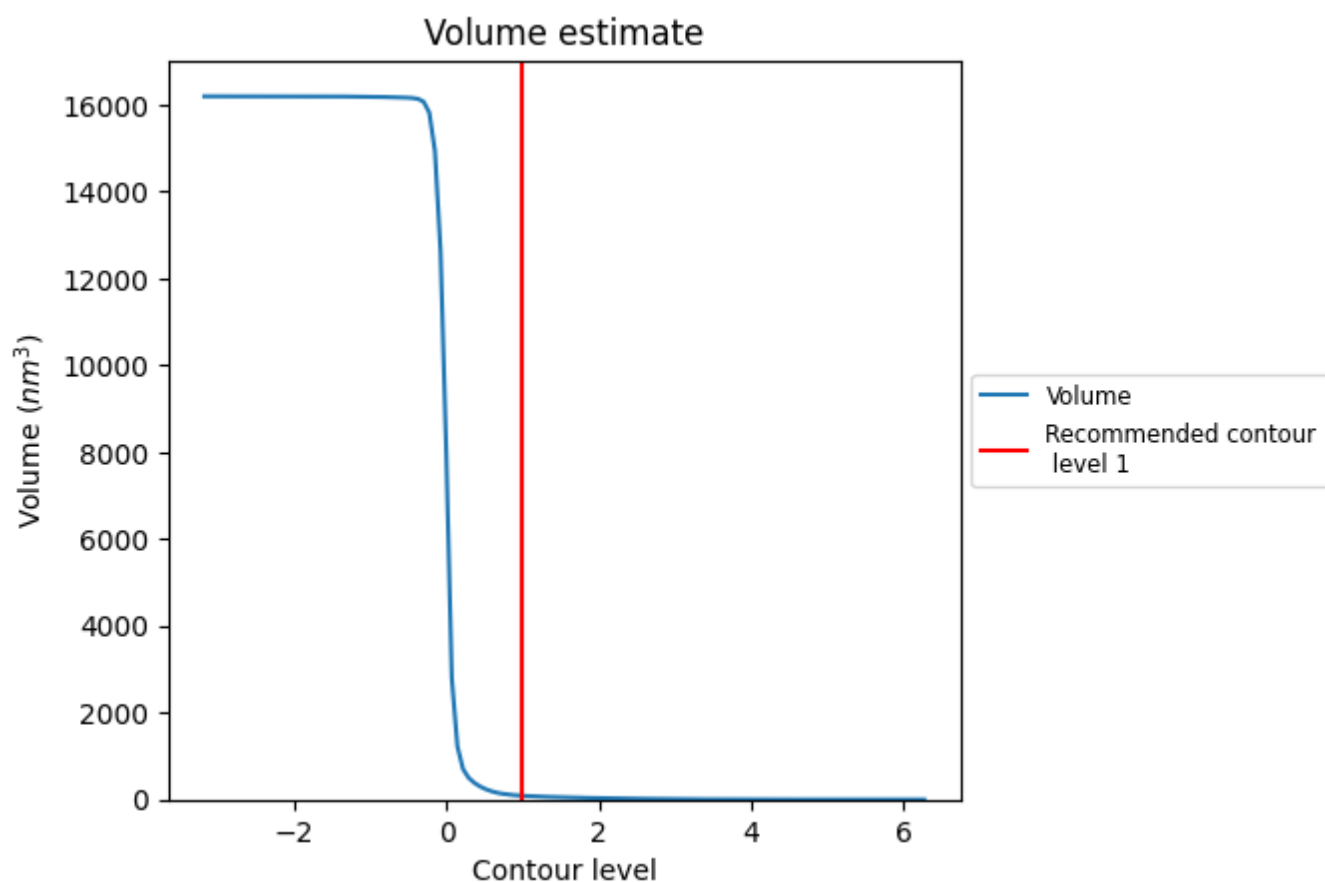
This section contains the results of statistical analysis of the map.

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.

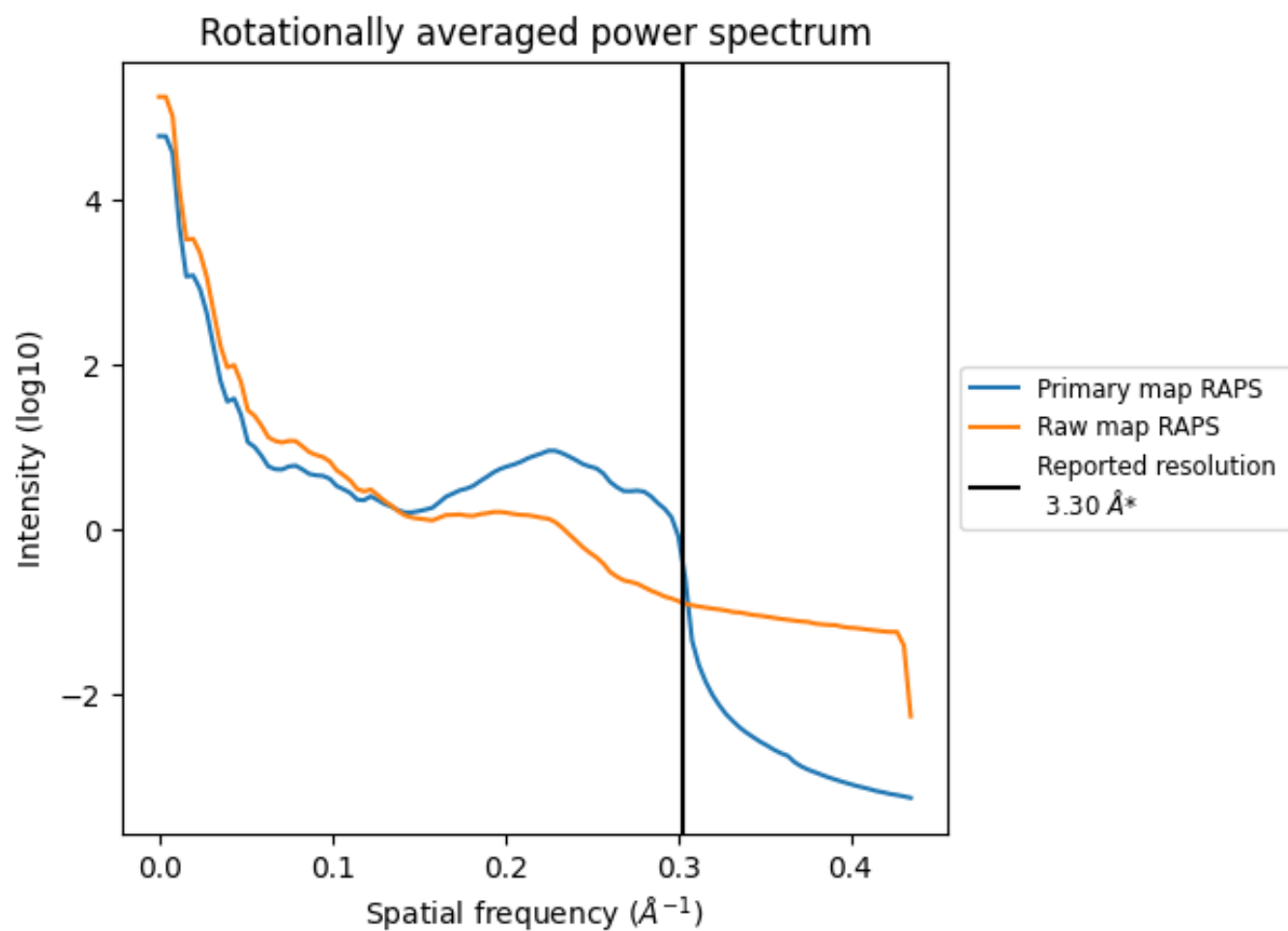
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 87 nm³; this corresponds to an approximate mass of 79 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 ⓘ

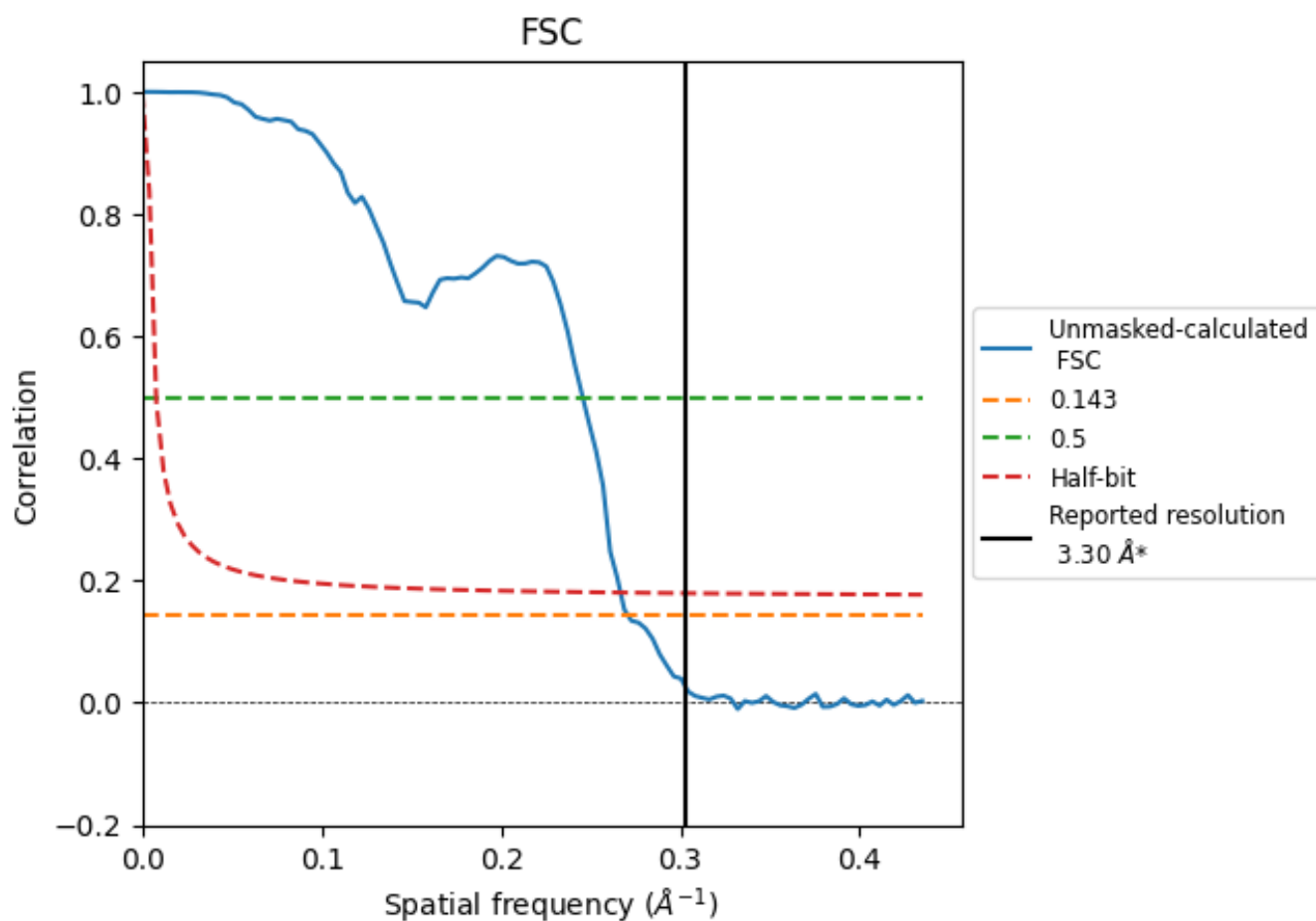


*Reported resolution corresponds to spatial frequency of 0.303 Å⁻¹

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 0.303 \AA^{-1}

8.2 Resolution estimates [i](#)

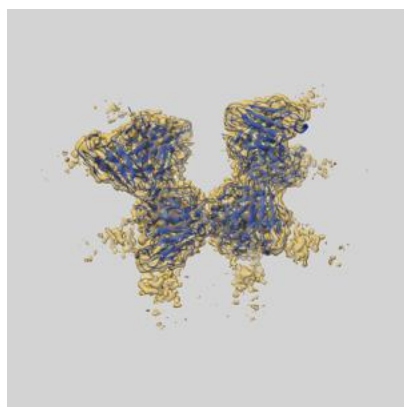
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.30	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.69	4.07	3.75

*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 3.69 differs from the reported value 3.3 by more than 10 %

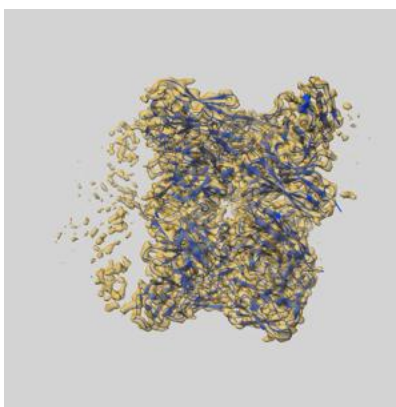
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-27781 and PDB model 8DYT. Per-residue inclusion information can be found in section [3](#) on page [6](#).

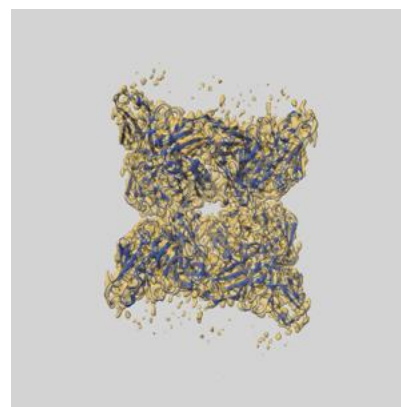
9.1 Map-model overlay [i](#)



X



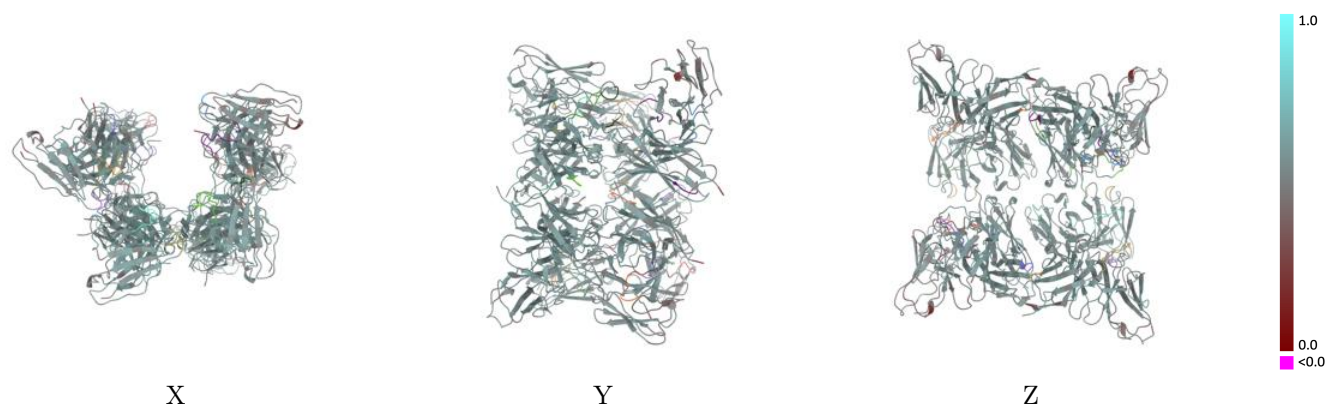
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 1.0 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 [i](#)



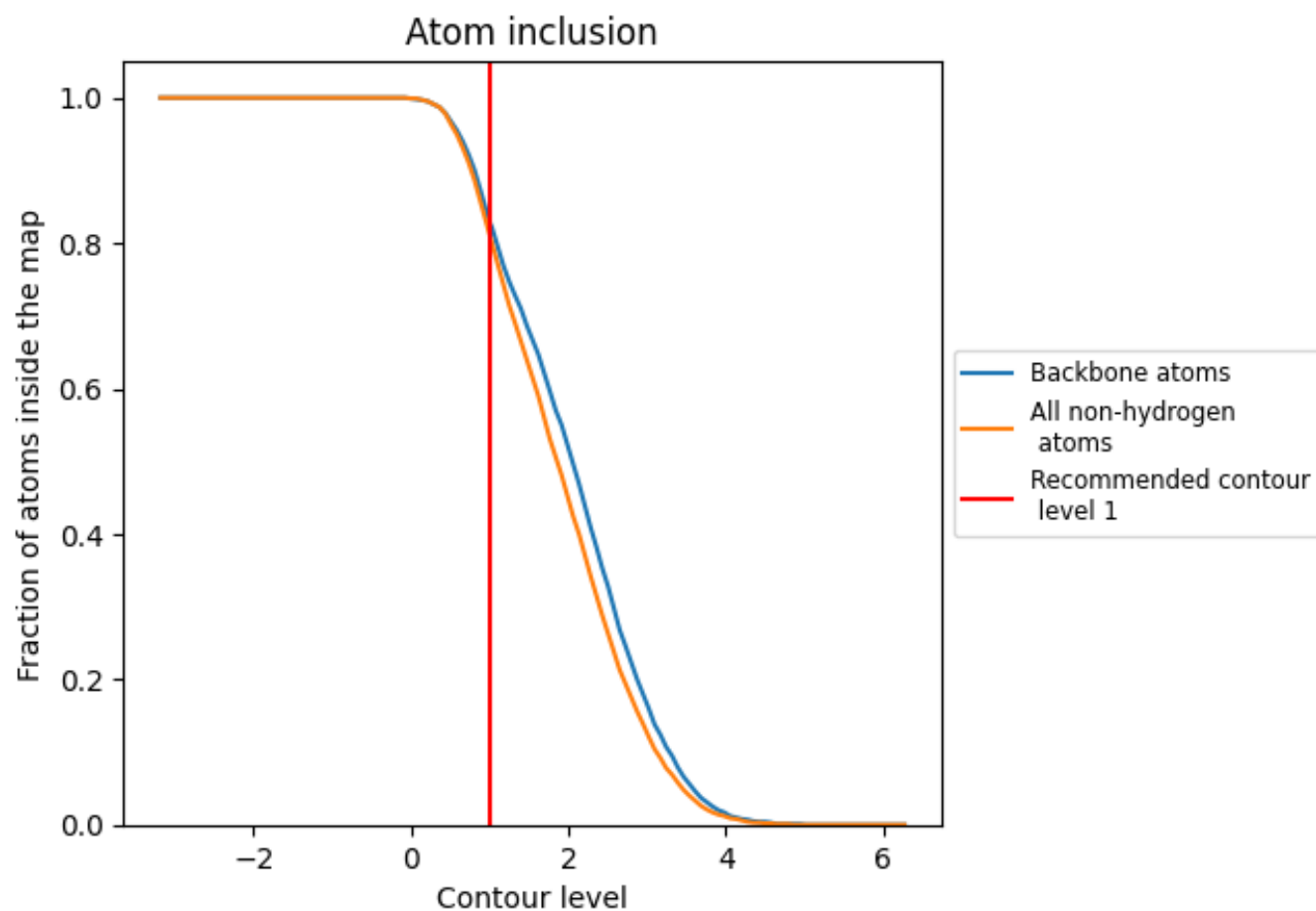
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (1).







































9.4 Atom inclusion [i](#)



At the recommended contour level, 83% of all backbone atoms, 81% 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 (1) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8110	 0.5500
A	 0.8270	 0.5490
B	 0.6980	 0.4960
C	 0.8750	 0.5770
D	 0.8110	 0.5530
E	 0.8190	 0.5560
F	 0.7470	 0.5290
H	 0.8600	 0.5780
I	 0.8360	 0.5490
J	 0.8400	 0.5480
L	 0.8180	 0.5480
M	 0.8170	 0.5570
N	 0.7470	 0.5270
O	 0.8750	 0.5780
P	 0.8100	 0.5530
Q	 0.8590	 0.5790
R	 0.8170	 0.5470
S	 0.8250	 0.5510
T	 0.6980	 0.4990

