Full wwPDB EM Validation Report

Nov 3, 2024 – 09:23 AM EST

PDB ID	:	6X87
EMDB ID	:	EMD-22089
Title	:	CryoEM structure of the Plasmodium berghei circumsporozoite protein in complex with inhibitory mouse antibody 3D11.
Authors	:	Kucharska, I.; Thai, E.; Rubinstein, J.; Julien, J.P.
Deposited on	:	2020-06-01
Resolution	:	3.20 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:

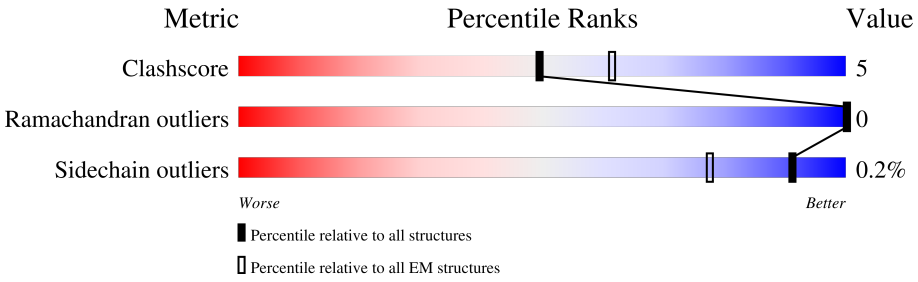
EMDB validation analysis	:	0.0.1.dev113
MolProbity	:	4.02b-467
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.20 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 <=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	217	7% 85% 13%
1	C	217	58% 87% 11%
1	E	217	5% 86% 12%
1	G	217	50% 88% 10%
1	I	217	12% 88% 11%
1	K	217	86% 12%
1	M	217	27% 85% 13%
2	B	221	13% 82% 17%

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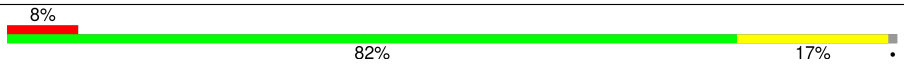
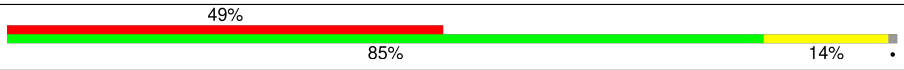
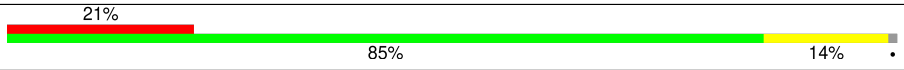
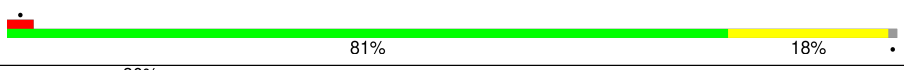
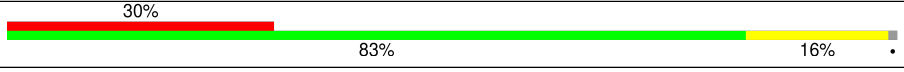
Mol	Chain	Length	Quality of chain
2	D	221	
2	F	221	
2	H	221	
2	J	221	
2	L	221	
2	N	221	
3	X	334	

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 23173 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 3D11 Fab heavy chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	K	213	Total	C	N	O	S	0	0
			1571	993	256	314	8		
1	M	213	Total	C	N	O	S	0	0
			1571	993	256	314	8		
1	I	213	Total	C	N	O	S	0	0
			1571	993	256	314	8		
1	G	213	Total	C	N	O	S	0	0
			1571	993	256	314	8		
1	E	213	Total	C	N	O	S	0	0
			1571	993	256	314	8		
1	C	213	Total	C	N	O	S	0	0
			1571	993	256	314	8		
1	A	213	Total	C	N	O	S	0	0
			1571	993	256	314	8		

- Molecule 2 is a protein called 3D11 Fab kappa chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	L	219	Total	C	N	O	S	0	0
			1677	1053	284	334	6		
2	N	219	Total	C	N	O	S	0	0
			1677	1053	284	334	6		
2	J	219	Total	C	N	O	S	0	0
			1677	1053	284	334	6		
2	H	219	Total	C	N	O	S	0	0
			1677	1053	284	334	6		
2	F	219	Total	C	N	O	S	0	0
			1677	1053	284	334	6		
2	D	219	Total	C	N	O	S	0	0
			1677	1053	284	334	6		
2	B	219	Total	C	N	O	S	0	0
			1677	1053	284	334	6		

- Molecule 3 is a protein called Circumsporozoite protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
3	X	61	Total	C	N	O	0	0
			437	271	76	90		

There are 43 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
X	-101	GLU	-	expression tag	UNP D1L8V5
X	-100	PHE	-	expression tag	UNP D1L8V5
X	-99	ALA	-	expression tag	UNP D1L8V5
X	-98	THR	-	expression tag	UNP D1L8V5
X	-97	MET	-	expression tag	UNP D1L8V5
X	-96	GLY	-	expression tag	UNP D1L8V5
X	-95	ILE	-	expression tag	UNP D1L8V5
X	-94	LEU	-	expression tag	UNP D1L8V5
X	-93	PRO	-	expression tag	UNP D1L8V5
X	-92	SER	-	expression tag	UNP D1L8V5
X	-91	PRO	-	expression tag	UNP D1L8V5
X	-90	GLY	-	expression tag	UNP D1L8V5
X	-89	MET	-	expression tag	UNP D1L8V5
X	-88	PRO	-	expression tag	UNP D1L8V5
X	-87	ALA	-	expression tag	UNP D1L8V5
X	-86	LEU	-	expression tag	UNP D1L8V5
X	-85	LEU	-	expression tag	UNP D1L8V5
X	-84	SER	-	expression tag	UNP D1L8V5
X	-83	LEU	-	expression tag	UNP D1L8V5
X	-82	VAL	-	expression tag	UNP D1L8V5
X	-81	SER	-	expression tag	UNP D1L8V5
X	-80	LEU	-	expression tag	UNP D1L8V5
X	-79	LEU	-	expression tag	UNP D1L8V5
X	-78	SER	-	expression tag	UNP D1L8V5
X	-77	VAL	-	expression tag	UNP D1L8V5
X	-76	LEU	-	expression tag	UNP D1L8V5
X	-75	LEU	-	expression tag	UNP D1L8V5
X	-74	MET	-	expression tag	UNP D1L8V5
X	-73	GLY	-	expression tag	UNP D1L8V5
X	-72	CYS	-	expression tag	UNP D1L8V5
X	-71	VAL	-	expression tag	UNP D1L8V5
X	-70	ALA	-	expression tag	UNP D1L8V5
X	-69	GLN	-	expression tag	UNP D1L8V5
X	-68	GLN	-	expression tag	UNP D1L8V5
X	30	PRO	UNK	conflict	UNP D1L8V5
X	187	GLN	ASN	conflict	UNP D1L8V5
X	226	PRO	-	expression tag	UNP D1L8V5

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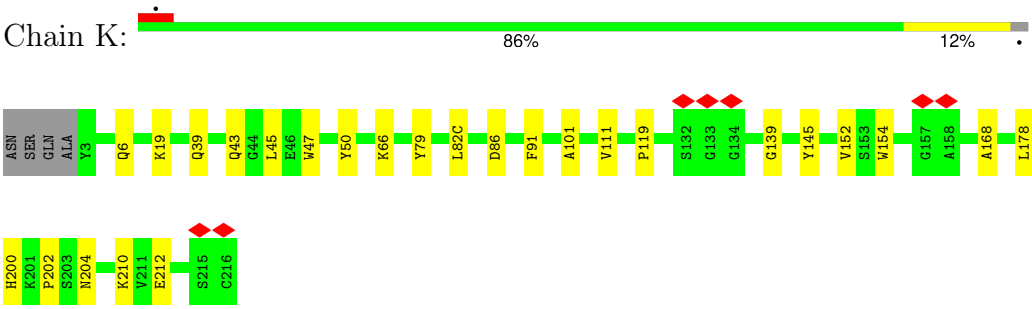
Chain	Residue	Modelled	Actual	Comment	Reference
X	227	HIS	-	expression tag	UNP D1L8V5
X	228	HIS	-	expression tag	UNP D1L8V5
X	229	HIS	-	expression tag	UNP D1L8V5
X	230	HIS	-	expression tag	UNP D1L8V5
X	231	HIS	-	expression tag	UNP D1L8V5
X	232	HIS	-	expression tag	UNP D1L8V5

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.

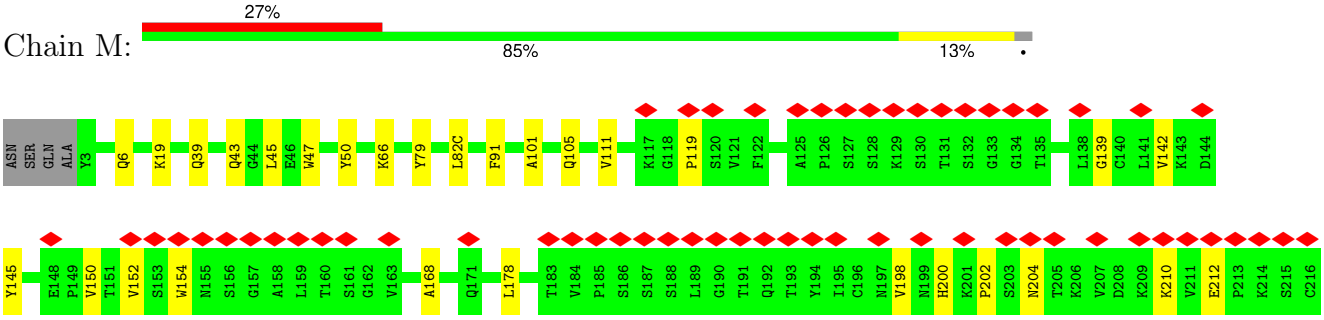
• Molecule 1: 3D11 Fab heavy chain

Chain K:



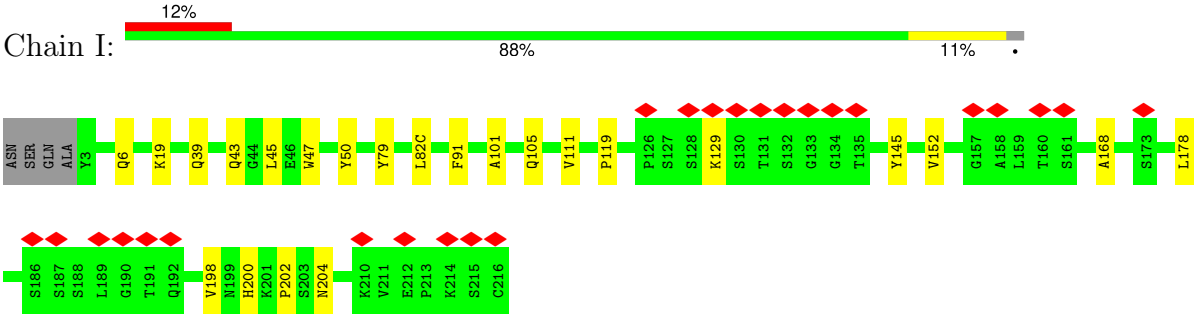
• Molecule 1: 3D11 Fab heavy chain

Chain M:



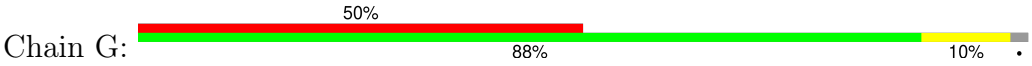
• Molecule 1: 3D11 Fab heavy chain

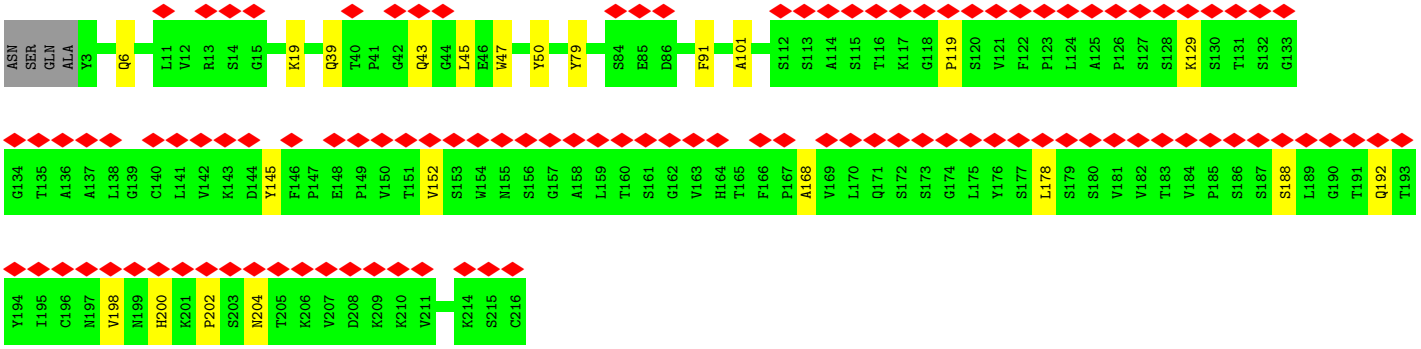
Chain I:



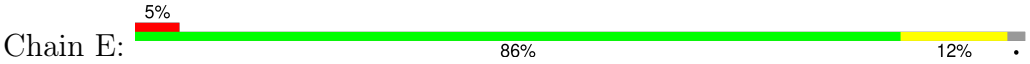
• Molecule 1: 3D11 Fab heavy chain

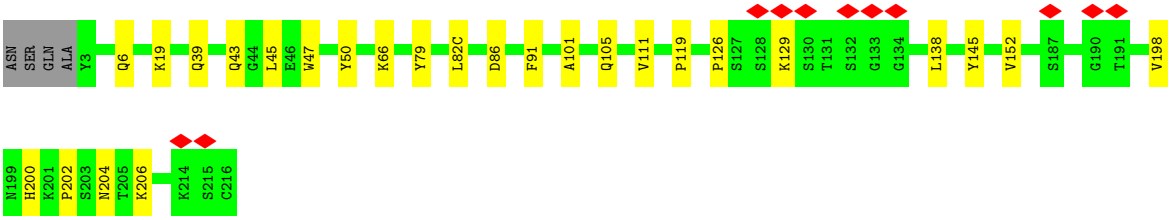
Chain G:



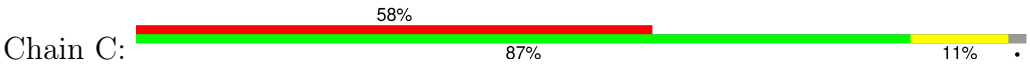


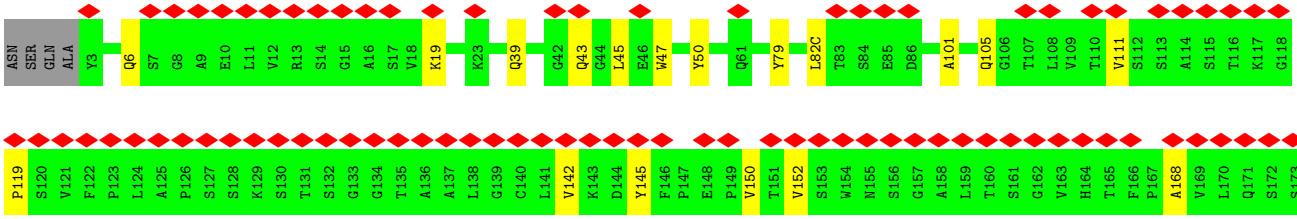
• Molecule 1: 3D11 Fab heavy chain



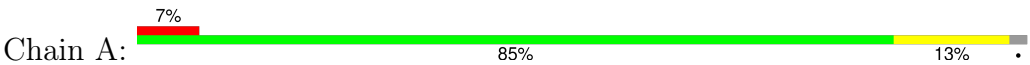


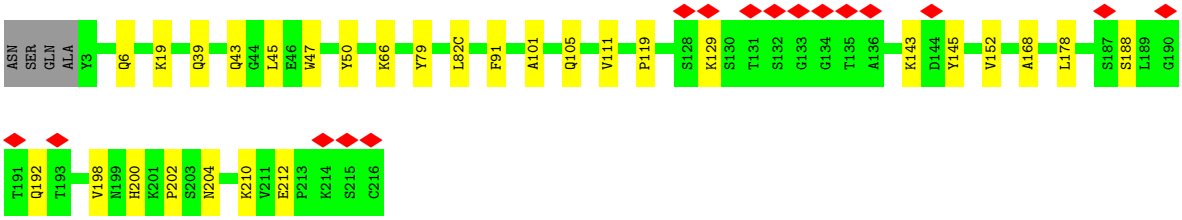
• Molecule 1: 3D11 Fab heavy chain





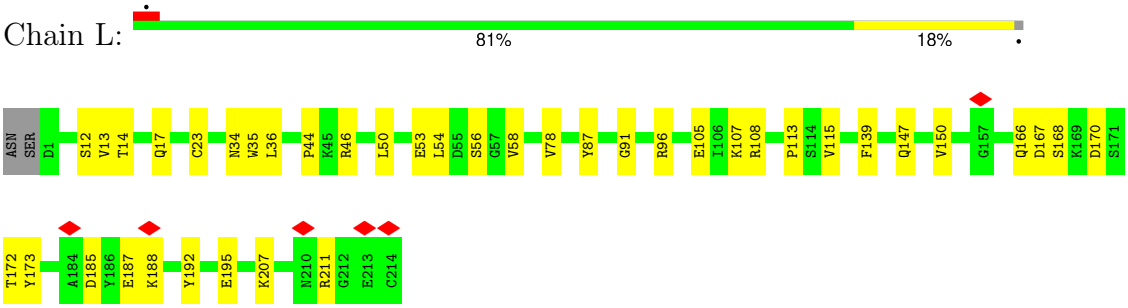
• Molecule 1: 3D11 Fab heavy chain





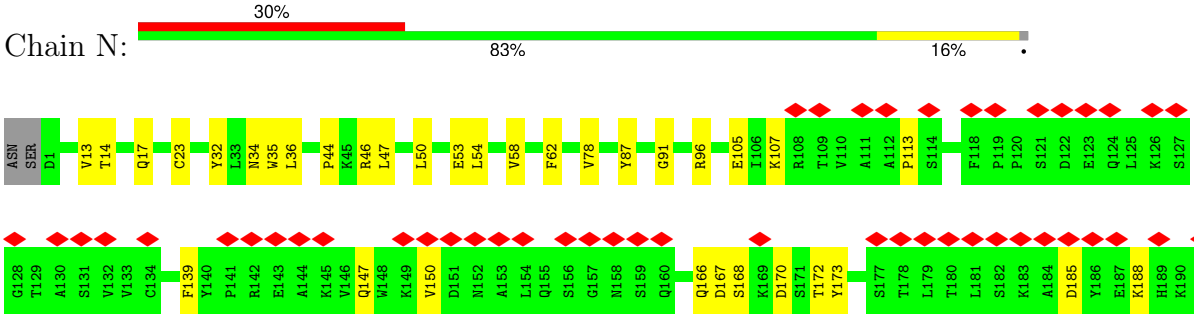
• Molecule 2: 3D11 Fab kappa chain

Chain L:



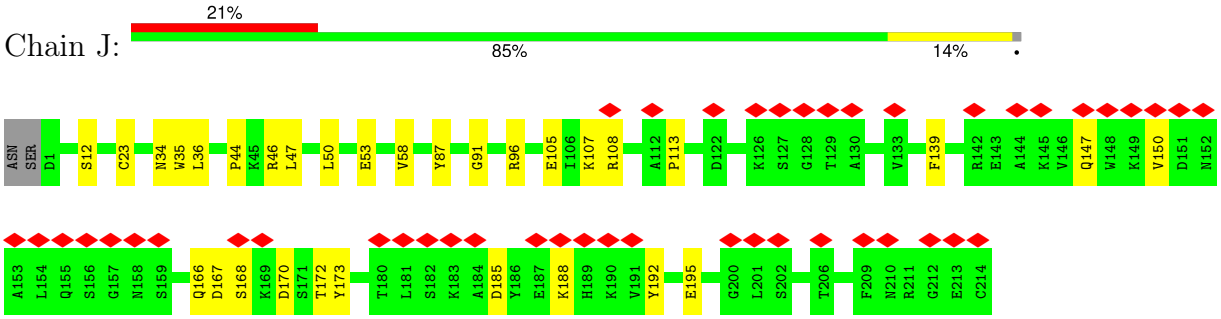
• Molecule 2: 3D11 Fab kappa chain

Chain N:



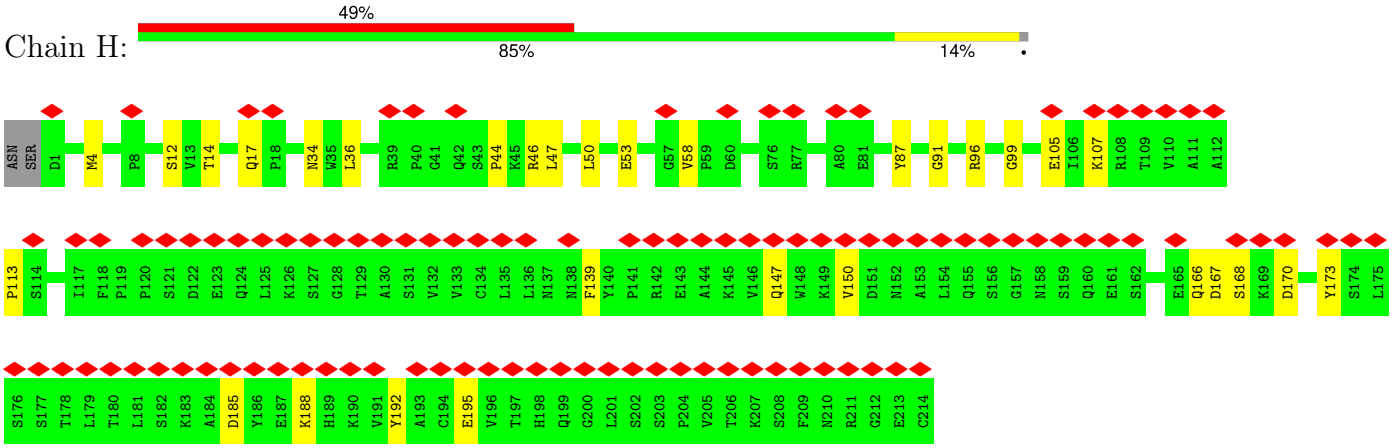
• Molecule 2: 3D11 Fab kappa chain

Chain J:



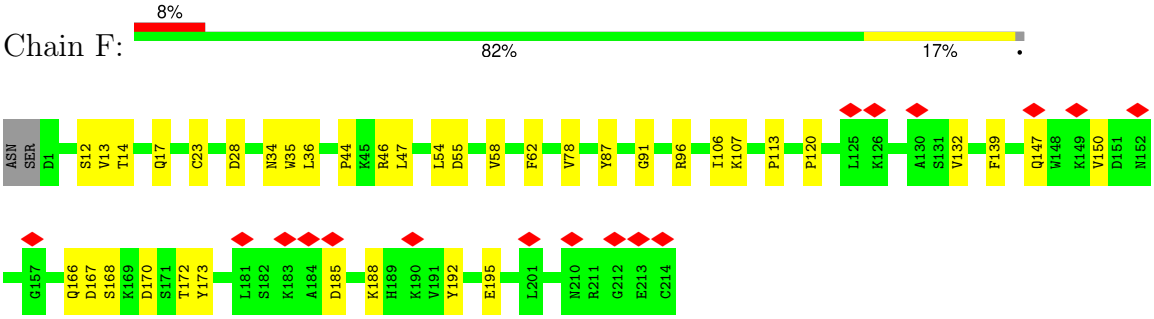
• Molecule 2: 3D11 Fab kappa chain

Chain H:



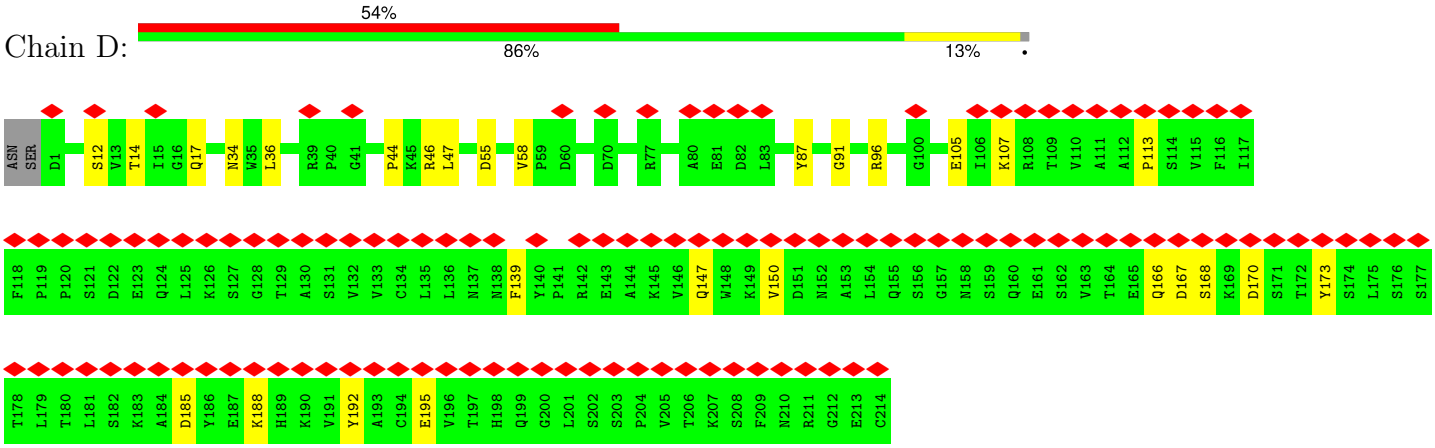
• Molecule 2: 3D11 Fab kappa chain

Chain F:



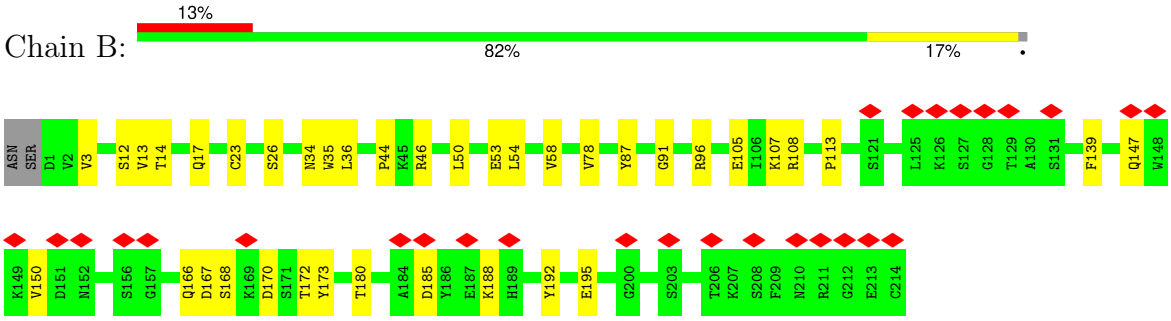
• Molecule 2: 3D11 Fab kappa chain

Chain D:



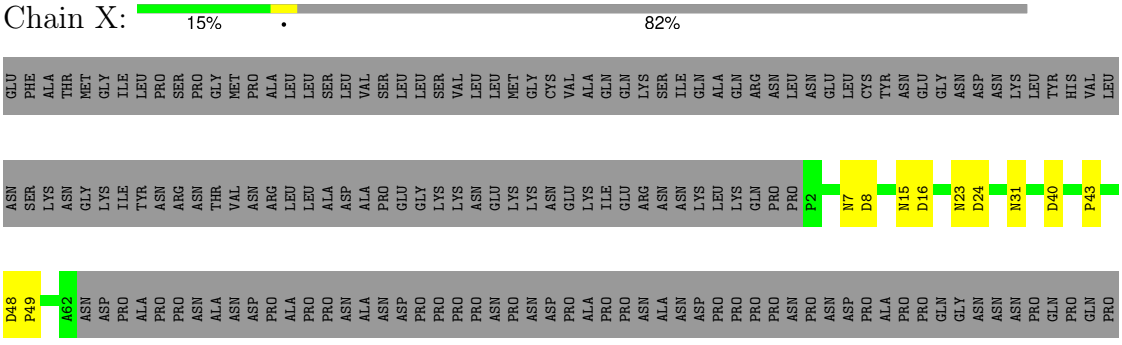
• Molecule 2: 3D11 Fab kappa chain

Chain B:

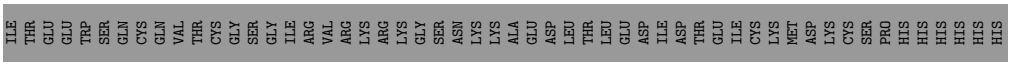


• Molecule 3: Circumsporozoite protein

Chain X:




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


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

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	165747	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 ($e^-/Å^2$)	42.7	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	48.388	Depositor
Minimum map value	-31.469	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	1.000	Depositor
Recommended contour level	3.7	Depositor
Map size (Å)	339.19998, 339.19998, 339.19998	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.06, 1.06, 1.06	Depositor

5 Model quality

5.1 Standard geometry

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|>5$	RMSZ	#$\|Z\|>5$
1	A	0.26	0/1610	0.48	0/2194
1	C	0.25	0/1610	0.47	0/2194
1	E	0.26	0/1610	0.47	0/2194
1	G	0.25	0/1610	0.47	0/2194
1	I	0.26	0/1610	0.47	0/2194
1	K	0.26	0/1610	0.48	0/2194
1	M	0.26	0/1610	0.47	0/2194
2	B	0.25	0/1712	0.45	0/2324
2	D	0.24	0/1712	0.44	0/2324
2	F	0.25	0/1712	0.45	0/2324
2	H	0.24	0/1712	0.44	0/2324
2	J	0.25	0/1712	0.45	0/2324
2	L	0.25	0/1712	0.45	0/2324
2	N	0.24	0/1712	0.44	0/2324
3	X	0.27	0/469	0.41	0/676
All	All	0.25	0/23723	0.46	0/32302

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

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	1571	0	1529	19	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	1571	0	1529	13	0
1	E	1571	0	1529	16	0
1	G	1571	0	1529	13	0
1	I	1571	0	1529	15	0
1	K	1571	0	1529	15	0
1	M	1571	0	1529	18	0
2	B	1677	0	1649	23	0
2	D	1677	0	1649	16	0
2	F	1677	0	1649	24	0
2	H	1677	0	1649	19	0
2	J	1677	0	1649	19	0
2	L	1677	0	1649	24	0
2	N	1677	0	1649	21	0
3	X	437	0	379	11	0
All	All	23173	0	22625	251	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 5.

All (251) 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:L:147:GLN:HB2	2:L:195:GLU:HB2	1.76	0.66
2:L:50:LEU:HB2	2:L:53:GLU:HG3	1.77	0.66
2:N:50:LEU:HB2	2:N:53:GLU:HG3	1.77	0.65
2:H:50:LEU:HB2	2:H:53:GLU:HG3	1.79	0.64
2:B:50:LEU:HB2	2:B:53:GLU:HG3	1.79	0.64
1:E:152:VAL:HG22	1:E:198:VAL:HG12	1.80	0.63
2:J:50:LEU:HB2	2:J:53:GLU:HG3	1.81	0.63
1:A:152:VAL:HG22	1:A:198:VAL:HG12	1.81	0.62
2:L:185:ASP:HA	2:L:188:LYS:HD3	1.84	0.60
2:L:46:ARG:NH1	3:X:31:ASN:OD1	2.34	0.60
1:K:39:GLN:HB2	1:K:45:LEU:HD23	1.84	0.60
2:J:113:PRO:HB3	2:J:139:PHE:HB3	1.84	0.59
2:J:185:ASP:HA	2:J:188:LYS:HD3	1.85	0.59
2:N:185:ASP:HA	2:N:188:LYS:HD3	1.84	0.59
3:X:15:ASN:OD1	2:J:46:ARG:NH1	2.36	0.58
2:L:91:GLY:HA2	2:L:96:ARG:HD2	1.86	0.58
1:M:152:VAL:HG22	1:M:198:VAL:HG12	1.85	0.58
2:B:150:VAL:HG13	2:B:192:TYR:HE1	1.69	0.58
1:I:152:VAL:HG22	1:I:198:VAL:HG12	1.86	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:185:ASP:HA	2:D:188:LYS:HD3	1.85	0.57
2:B:113:PRO:HB3	2:B:139:PHE:HB3	1.86	0.57
1:G:152:VAL:HG22	1:G:198:VAL:HG12	1.86	0.57
2:D:46:ARG:NE	2:D:55:ASP:OD1	2.37	0.57
2:D:113:PRO:HB3	2:D:139:PHE:HB3	1.86	0.57
2:B:185:ASP:HA	2:B:188:LYS:HD3	1.86	0.56
2:J:147:GLN:HB2	2:J:195:GLU:HB2	1.87	0.56
2:F:185:ASP:HA	2:F:188:LYS:HD3	1.86	0.56
2:N:147:GLN:HB2	2:N:195:GLU:HB2	1.85	0.56
1:E:6:GLN:HE22	1:E:91:PHE:HA	1.69	0.56
2:F:147:GLN:HB2	2:F:195:GLU:HB2	1.87	0.56
1:C:152:VAL:HG22	1:C:198:VAL:HG12	1.87	0.56
1:A:39:GLN:HB2	1:A:45:LEU:HD23	1.88	0.56
2:N:113:PRO:HB3	2:N:139:PHE:HB3	1.88	0.55
2:H:36:LEU:HD13	2:H:44:PRO:HB3	1.88	0.55
1:A:47:TRP:HZ2	1:A:50:TYR:HD1	1.53	0.55
3:X:23:ASN:OD1	2:F:46:ARG:NH1	2.39	0.55
1:I:6:GLN:HE22	1:I:91:PHE:HA	1.72	0.55
1:K:152:VAL:HG22	1:K:198:VAL:HG12	1.89	0.54
2:D:91:GLY:HA2	2:D:96:ARG:HD2	1.89	0.54
2:L:113:PRO:HB3	2:L:139:PHE:HB3	1.89	0.54
2:N:91:GLY:HA2	2:N:96:ARG:HD2	1.87	0.54
2:H:185:ASP:HA	2:H:188:LYS:HD3	1.88	0.54
2:F:170:ASP:OD1	2:F:170:ASP:N	2.41	0.54
2:J:91:GLY:HA2	2:J:96:ARG:HD2	1.90	0.54
2:F:91:GLY:HA2	2:F:96:ARG:HD2	1.89	0.54
2:N:170:ASP:OD1	2:N:170:ASP:N	2.41	0.54
2:H:147:GLN:HB2	2:H:195:GLU:HB2	1.89	0.54
1:E:119:PRO:HB3	1:E:145:TYR:HB3	1.89	0.54
2:D:170:ASP:OD1	2:D:170:ASP:N	2.41	0.54
2:J:36:LEU:HD11	2:J:87:TYR:HB2	1.90	0.54
2:B:170:ASP:OD1	2:B:170:ASP:N	2.41	0.54
1:C:101:ALA:HB2	2:D:46:ARG:HH21	1.72	0.53
1:I:39:GLN:HB2	1:I:45:LEU:HD23	1.89	0.53
1:E:39:GLN:HB2	1:E:45:LEU:HD23	1.90	0.53
2:H:170:ASP:OD1	2:H:170:ASP:N	2.41	0.53
2:D:147:GLN:HB2	2:D:195:GLU:HB2	1.90	0.53
2:J:170:ASP:OD1	2:J:170:ASP:N	2.41	0.53
2:N:166:GLN:HB3	2:N:173:TYR:CZ	2.43	0.53
1:I:47:TRP:HZ2	1:I:50:TYR:HD1	1.56	0.53
2:N:150:VAL:HG13	2:N:192:TYR:HE1	1.74	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:113:PRO:HB3	2:H:139:PHE:HB3	1.90	0.53
2:F:150:VAL:HG13	2:F:192:TYR:HE1	1.73	0.53
2:L:170:ASP:OD1	2:L:170:ASP:N	2.41	0.53
1:E:43:GLN:N	1:E:43:GLN:OE1	2.41	0.53
3:X:7:ASN:OD1	2:H:46:ARG:NH1	2.41	0.52
1:G:43:GLN:OE1	1:G:43:GLN:N	2.42	0.52
1:K:119:PRO:HB3	1:K:145:TYR:HB3	1.89	0.52
2:L:105:GLU:OE1	2:L:173:TYR:OH	2.26	0.52
1:M:39:GLN:HB2	1:M:45:LEU:HD23	1.91	0.52
2:H:91:GLY:HA2	2:H:96:ARG:HD2	1.91	0.52
2:B:166:GLN:HB3	2:B:173:TYR:CZ	2.44	0.52
1:M:43:GLN:OE1	1:M:43:GLN:N	2.42	0.52
1:E:126:PRO:HG3	1:E:138:LEU:HB3	1.92	0.52
1:C:168:ALA:HB2	1:C:178:LEU:HD23	1.92	0.52
2:L:36:LEU:HD13	2:L:44:PRO:HB3	1.91	0.51
1:A:168:ALA:HB2	1:A:178:LEU:HD23	1.91	0.51
2:F:113:PRO:HB3	2:F:139:PHE:HB3	1.92	0.51
1:A:43:GLN:OE1	1:A:43:GLN:N	2.42	0.51
2:L:150:VAL:HG13	2:L:192:TYR:HE1	1.75	0.51
1:I:119:PRO:HB3	1:I:145:TYR:HB3	1.93	0.51
1:I:200:HIS:CD2	1:I:202:PRO:HD2	2.45	0.51
2:H:150:VAL:HG13	2:H:192:TYR:HE1	1.75	0.51
1:A:143:LYS:NZ	2:B:180:THR:OG1	2.37	0.51
2:B:13:VAL:HG21	2:B:78:VAL:HG21	1.92	0.51
2:B:147:GLN:HB2	2:B:195:GLU:HB2	1.92	0.51
2:H:47:LEU:HA	2:H:58:VAL:HG11	1.92	0.51
1:C:43:GLN:OE1	1:C:43:GLN:N	2.42	0.51
2:N:36:LEU:HD11	2:N:87:TYR:HB2	1.92	0.51
2:D:36:LEU:HD13	2:D:44:PRO:HB3	1.92	0.51
2:B:105:GLU:OE1	2:B:173:TYR:OH	2.28	0.51
1:K:200:HIS:CD2	1:K:202:PRO:HD2	2.47	0.50
2:J:150:VAL:HG13	2:J:192:TYR:HE1	1.75	0.50
2:F:12:SER:HB3	2:F:107:LYS:HB3	1.93	0.50
1:M:6:GLN:HE22	1:M:91:PHE:HA	1.75	0.50
1:G:6:GLN:HE22	1:G:91:PHE:HA	1.77	0.50
2:B:91:GLY:HA2	2:B:96:ARG:HD2	1.93	0.50
2:L:12:SER:HB3	2:L:107:LYS:HB3	1.94	0.50
1:M:200:HIS:CD2	1:M:202:PRO:HD2	2.47	0.50
1:G:168:ALA:HB2	1:G:178:LEU:HD23	1.94	0.50
1:E:200:HIS:CD2	1:E:202:PRO:HD2	2.47	0.50
2:F:14:THR:OG1	2:F:17:GLN:OE1	2.30	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:L:36:LEU:HD11	2:L:87:TYR:HB2	1.94	0.50
1:G:200:HIS:CD2	1:G:202:PRO:HD2	2.46	0.50
1:A:200:HIS:CD2	1:A:202:PRO:HD2	2.48	0.49
2:H:14:THR:OG1	2:H:17:GLN:OE1	2.29	0.49
1:I:43:GLN:OE1	1:I:43:GLN:N	2.41	0.49
2:D:36:LEU:HD11	2:D:87:TYR:HB2	1.93	0.49
1:I:82(C):LEU:HD22	1:I:111:VAL:HG21	1.93	0.49
1:M:168:ALA:HB2	1:M:178:LEU:HD23	1.94	0.49
2:D:47:LEU:HA	2:D:58:VAL:HG11	1.95	0.49
2:D:166:GLN:HB3	2:D:173:TYR:CZ	2.47	0.49
2:F:13:VAL:HG21	2:F:78:VAL:HG21	1.95	0.49
1:A:19:LYS:HE2	1:A:79:TYR:HB3	1.93	0.49
2:H:166:GLN:HB3	2:H:173:TYR:CZ	2.47	0.49
2:B:14:THR:OG1	2:B:17:GLN:OE1	2.31	0.48
1:K:6:GLN:HE22	1:K:91:PHE:HA	1.78	0.48
1:M:101:ALA:HB2	2:N:46:ARG:HH21	1.78	0.48
2:F:166:GLN:HB3	2:F:173:TYR:CZ	2.47	0.48
1:E:101:ALA:HB2	2:F:46:ARG:HH21	1.78	0.48
1:E:82(C):LEU:HD22	1:E:111:VAL:HG21	1.95	0.48
2:F:36:LEU:HD13	2:F:44:PRO:HB3	1.95	0.48
1:C:200:HIS:CD2	1:C:202:PRO:HD2	2.47	0.48
1:K:43:GLN:OE1	1:K:43:GLN:N	2.42	0.48
1:M:19:LYS:HE2	1:M:79:TYR:HB3	1.96	0.48
2:J:47:LEU:HA	2:J:58:VAL:HG11	1.96	0.48
2:D:12:SER:HB3	2:D:107:LYS:HB3	1.96	0.48
2:L:13:VAL:HG21	2:L:78:VAL:HG21	1.96	0.48
2:J:105:GLU:OE1	2:J:173:TYR:OH	2.32	0.48
3:X:49:PRO:HD3	2:N:32:TYR:CE2	2.48	0.48
1:E:47:TRP:HZ2	1:E:50:TYR:HD1	1.62	0.48
1:I:200:HIS:O	1:I:204:ASN:N	2.45	0.48
2:J:167:ASP:OD1	2:J:168:SER:N	2.47	0.48
1:K:101:ALA:HB2	2:L:46:ARG:HH21	1.79	0.47
1:K:168:ALA:HB2	1:K:178:LEU:HD23	1.95	0.47
1:M:47:TRP:HZ2	1:M:50:TYR:HD1	1.61	0.47
2:H:12:SER:HB3	2:H:107:LYS:HB3	1.97	0.47
2:D:150:VAL:HG13	2:D:192:TYR:HE1	1.79	0.47
2:B:36:LEU:HD13	2:B:44:PRO:HB3	1.95	0.47
1:G:101:ALA:HB2	2:H:46:ARG:HH21	1.79	0.47
3:X:48:ASP:OD2	3:X:48:ASP:N	2.47	0.47
1:A:200:HIS:O	1:A:204:ASN:N	2.47	0.47
2:F:46:ARG:NE	2:F:55:ASP:OD1	2.43	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:36:LEU:HD11	2:B:87:TYR:HB2	1.96	0.47
1:C:19:LYS:HE2	1:C:79:TYR:HB3	1.95	0.47
2:L:14:THR:OG1	2:L:17:GLN:OE1	2.32	0.47
1:C:6:GLN:H	1:C:105:GLN:NE2	2.13	0.47
2:J:36:LEU:HD13	2:J:44:PRO:HB3	1.97	0.47
2:N:167:ASP:OD1	2:N:168:SER:N	2.47	0.46
2:H:36:LEU:HD11	2:H:87:TYR:HB2	1.96	0.46
2:D:167:ASP:OD1	2:D:168:SER:N	2.49	0.46
2:J:166:GLN:HB3	2:J:173:TYR:CZ	2.50	0.46
1:G:119:PRO:HB3	1:G:145:TYR:HB3	1.98	0.46
2:B:167:ASP:OD1	2:B:168:SER:N	2.48	0.46
1:G:47:TRP:HZ2	1:G:50:TYR:HD1	1.63	0.46
2:F:36:LEU:HD11	2:F:87:TYR:HB2	1.96	0.46
1:I:168:ALA:HB2	1:I:178:LEU:HD23	1.97	0.46
2:B:150:VAL:HG13	2:B:192:TYR:CE1	2.50	0.46
1:G:19:LYS:HE2	1:G:79:TYR:HB3	1.98	0.46
2:L:167:ASP:OD1	2:L:168:SER:N	2.48	0.46
1:C:39:GLN:HB2	1:C:45:LEU:HD23	1.97	0.46
2:B:12:SER:HB3	2:B:107:LYS:HB3	1.96	0.46
1:K:47:TRP:HZ2	1:K:50:TYR:HD1	1.64	0.46
2:N:14:THR:OG1	2:N:17:GLN:OE1	2.34	0.46
1:A:82(C):LEU:HD22	1:A:111:VAL:HG21	1.98	0.46
2:F:120:PRO:HD3	2:F:132:VAL:HG22	1.98	0.45
2:H:105:GLU:OE1	2:H:173:TYR:OH	2.33	0.45
1:E:200:HIS:O	1:E:204:ASN:N	2.47	0.45
2:F:47:LEU:HA	2:F:58:VAL:HG11	1.98	0.45
1:M:200:HIS:O	1:M:204:ASN:N	2.46	0.45
2:H:34:ASN:HB3	2:H:46:ARG:HD2	1.99	0.45
1:E:6:GLN:H	1:E:105:GLN:HE22	1.65	0.45
1:A:119:PRO:HB3	1:A:145:TYR:HB3	1.99	0.45
1:G:39:GLN:HB2	1:G:45:LEU:HD23	2.00	0.44
1:A:6:GLN:HE22	1:A:91:PHE:HA	1.82	0.44
1:A:210:LYS:HE2	1:A:212:GLU:HB2	2.00	0.44
1:K:66:LYS:NZ	1:K:86:ASP:OD2	2.50	0.44
1:I:19:LYS:HE2	1:I:79:TYR:HB3	1.98	0.44
1:A:101:ALA:HB2	2:B:46:ARG:HH21	1.82	0.44
2:L:166:GLN:HA	2:L:172:THR:O	2.18	0.44
2:L:56:SER:HB2	2:F:28:ASP:HB3	1.99	0.44
2:N:105:GLU:OE1	2:N:173:TYR:OH	2.34	0.44
1:G:200:HIS:O	1:G:204:ASN:N	2.45	0.44
2:B:166:GLN:HA	2:B:172:THR:O	2.18	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:N:23:CYS:HB2	2:N:35:TRP:CH2	2.53	0.43
2:F:167:ASP:OD1	2:F:168:SER:N	2.49	0.43
1:M:6:GLN:H	1:M:105:GLN:HE22	1.66	0.43
1:I:129:LYS:HA	1:I:129:LYS:HD3	1.85	0.43
1:K:82(C):LEU:HD22	1:K:111:VAL:HG21	2.00	0.43
2:H:167:ASP:OD1	2:H:168:SER:N	2.48	0.43
1:M:6:GLN:H	1:M:105:GLN:NE2	2.16	0.43
1:M:119:PRO:HB3	1:M:145:TYR:HB3	2.01	0.43
1:K:200:HIS:O	1:K:204:ASN:N	2.46	0.43
2:H:4:MET:HB2	2:H:99:GLY:HA2	2.01	0.43
1:K:210:LYS:HE2	1:K:212:GLU:HB2	2.01	0.43
1:K:139:GLY:HA2	1:K:154:TRP:CZ2	2.54	0.43
2:L:166:GLN:HB3	2:L:173:TYR:CZ	2.53	0.43
1:A:6:GLN:H	1:A:105:GLN:HE22	1.67	0.43
1:A:129:LYS:HA	1:A:129:LYS:HD3	1.84	0.43
1:I:101:ALA:HB2	2:J:46:ARG:HH21	1.83	0.43
1:E:129:LYS:HA	1:E:129:LYS:HD3	1.85	0.43
3:X:8:ASP:N	3:X:8:ASP:OD2	2.51	0.42
1:I:6:GLN:H	1:I:105:GLN:HE22	1.65	0.42
1:C:119:PRO:HB3	1:C:145:TYR:HB3	2.00	0.42
1:M:82(C):LEU:HD22	1:M:111:VAL:HG21	2.01	0.42
1:M:139:GLY:HA2	1:M:154:TRP:CZ2	2.54	0.42
2:F:13:VAL:O	2:F:106:ILE:HA	2.19	0.42
2:F:54:LEU:HD21	2:F:62:PHE:O	2.20	0.42
1:A:66:LYS:HE3	1:A:66:LYS:HB2	1.81	0.42
2:J:108:ARG:HH11	2:J:172:THR:HG22	1.84	0.42
2:D:14:THR:OG1	2:D:17:GLN:OE1	2.37	0.42
2:L:23:CYS:HB2	2:L:35:TRP:CH2	2.55	0.42
3:X:16:ASP:OD2	3:X:16:ASP:N	2.51	0.42
2:N:47:LEU:HA	2:N:58:VAL:HG11	2.01	0.42
2:F:150:VAL:HG13	2:F:192:TYR:CE1	2.54	0.42
2:L:108:ARG:HH11	2:L:172:THR:HG22	1.85	0.42
2:L:187:GLU:HA	2:L:211:ARG:HH12	1.84	0.42
1:C:47:TRP:HZ2	1:C:50:TYR:HD1	1.66	0.42
2:J:12:SER:HB3	2:J:107:LYS:HB3	2.01	0.42
1:G:129:LYS:HA	1:G:129:LYS:HD3	1.85	0.42
1:E:19:LYS:HE2	1:E:79:TYR:HB3	2.00	0.42
2:B:108:ARG:HH11	2:B:172:THR:HG22	1.85	0.42
3:X:40:ASP:N	3:X:40:ASP:OD2	2.53	0.42
1:E:66:LYS:NZ	1:E:86:ASP:OD2	2.53	0.42
2:N:36:LEU:HD13	2:N:44:PRO:HB3	2.00	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:188:SER:HB2	1:G:192:GLN:HB2	2.01	0.41
1:C:142:VAL:HG11	1:C:150:VAL:HG21	2.02	0.41
1:K:19:LYS:HE2	1:K:79:TYR:HB3	2.02	0.41
3:X:43:PRO:HG3	1:A:50:TYR:OH	2.21	0.41
2:F:23:CYS:HB2	2:F:35:TRP:CH2	2.56	0.41
1:C:188:SER:HB2	1:C:192:GLN:HB2	2.02	0.41
2:B:54:LEU:HD23	2:B:58:VAL:HG23	2.03	0.41
2:B:3:VAL:HG22	2:B:26:SER:HB3	2.02	0.41
2:N:14:THR:HG23	2:N:107:LYS:HG2	2.02	0.41
1:I:6:GLN:H	1:I:105:GLN:NE2	2.19	0.41
2:L:54:LEU:HD23	2:L:58:VAL:HG23	2.02	0.41
1:M:142:VAL:HG11	1:M:150:VAL:HG21	2.03	0.41
1:M:210:LYS:HE2	1:M:212:GLU:HB2	2.03	0.41
2:N:54:LEU:HD21	2:N:62:PHE:O	2.20	0.41
2:J:23:CYS:HB2	2:J:35:TRP:CH2	2.56	0.41
2:J:36:LEU:CD1	2:J:87:TYR:HB2	2.51	0.41
2:F:166:GLN:HA	2:F:172:THR:O	2.21	0.41
1:C:82(C):LEU:HD22	1:C:111:VAL:HG21	2.03	0.41
2:D:105:GLU:OE1	2:D:173:TYR:OH	2.37	0.41
1:A:188:SER:HB2	1:A:192:GLN:HB2	2.02	0.41
2:L:115:VAL:HG13	2:L:207:LYS:HG3	2.03	0.41
1:E:198:VAL:O	1:E:206:LYS:HA	2.21	0.40
2:N:13:VAL:HG21	2:N:78:VAL:HG21	2.02	0.40
2:B:23:CYS:HB2	2:B:35:TRP:CH2	2.56	0.40
3:X:24:ASP:N	3:X:24:ASP:OD2	2.54	0.40
1:M:66:LYS:HE3	1:M:66:LYS:HB2	1.83	0.40
2:N:166:GLN:HA	2:N:172:THR:O	2.22	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	A	211/217 (97%)	200 (95%)	11 (5%)	0	100	100
1	C	211/217 (97%)	200 (95%)	11 (5%)	0	100	100
1	E	211/217 (97%)	200 (95%)	11 (5%)	0	100	100
1	G	211/217 (97%)	200 (95%)	11 (5%)	0	100	100
1	I	211/217 (97%)	200 (95%)	11 (5%)	0	100	100
1	K	211/217 (97%)	199 (94%)	12 (6%)	0	100	100
1	M	211/217 (97%)	200 (95%)	11 (5%)	0	100	100
2	B	217/221 (98%)	210 (97%)	7 (3%)	0	100	100
2	D	217/221 (98%)	210 (97%)	7 (3%)	0	100	100
2	F	217/221 (98%)	210 (97%)	7 (3%)	0	100	100
2	H	217/221 (98%)	210 (97%)	7 (3%)	0	100	100
2	J	217/221 (98%)	210 (97%)	7 (3%)	0	100	100
2	L	217/221 (98%)	210 (97%)	7 (3%)	0	100	100
2	N	217/221 (98%)	210 (97%)	7 (3%)	0	100	100
3	X	59/334 (18%)	59 (100%)	0	0	100	100
All	All	3055/3400 (90%)	2928 (96%)	127 (4%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains (i)

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	177/181 (98%)	177 (100%)	0	100	100
1	C	177/181 (98%)	177 (100%)	0	100	100
1	E	177/181 (98%)	177 (100%)	0	100	100
1	G	177/181 (98%)	177 (100%)	0	100	100
1	I	177/181 (98%)	177 (100%)	0	100	100
1	K	177/181 (98%)	177 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	M	177/181 (98%)	177 (100%)	0	100 100
2	B	192/196 (98%)	191 (100%)	1 (0%)	86 93
2	D	192/196 (98%)	191 (100%)	1 (0%)	86 93
2	F	192/196 (98%)	191 (100%)	1 (0%)	86 93
2	H	192/196 (98%)	192 (100%)	0	100 100
2	J	192/196 (98%)	191 (100%)	1 (0%)	86 93
2	L	192/196 (98%)	191 (100%)	1 (0%)	86 93
2	N	192/196 (98%)	191 (100%)	1 (0%)	86 93
3	X	55/301 (18%)	55 (100%)	0	100 100
All	All	2638/2940 (90%)	2632 (100%)	6 (0%)	91 97

All (6) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	L	34	ASN
2	N	34	ASN
2	J	34	ASN
2	F	34	ASN
2	D	34	ASN
2	B	34	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
2	L	166	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.

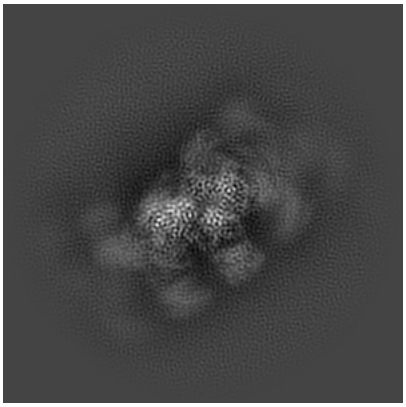
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-22089. These allow visual inspection of the internal detail of the map and identification of artifacts.

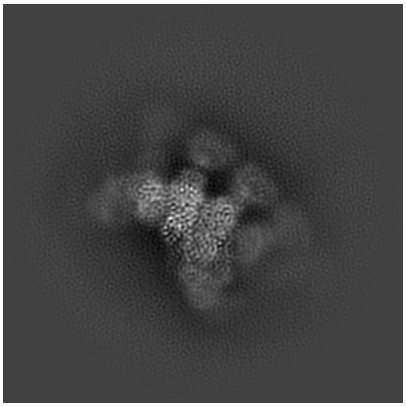
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

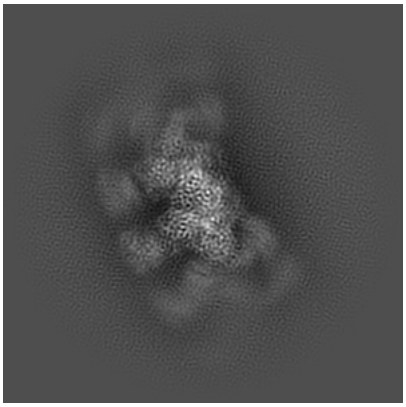
6.1.1 Primary map



X



Y

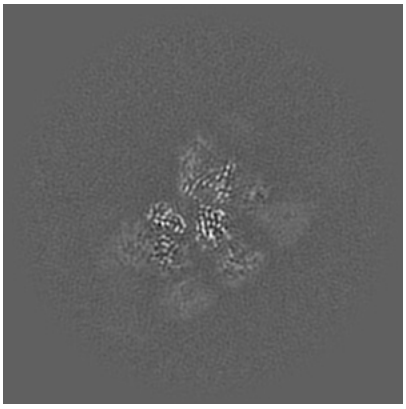


Z

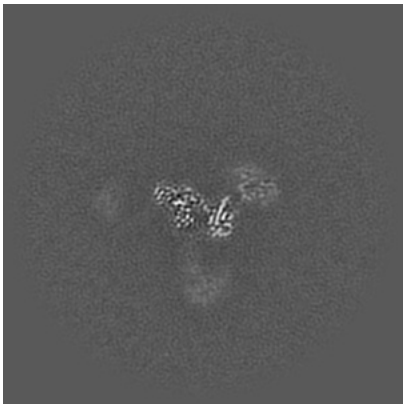
The images above show the map projected in three orthogonal directions.

6.2 Central slices

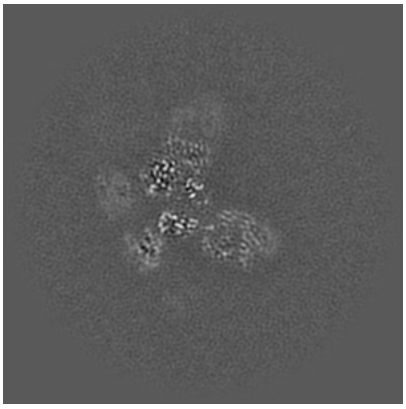
6.2.1 Primary map



X Index: 160



Y Index: 160

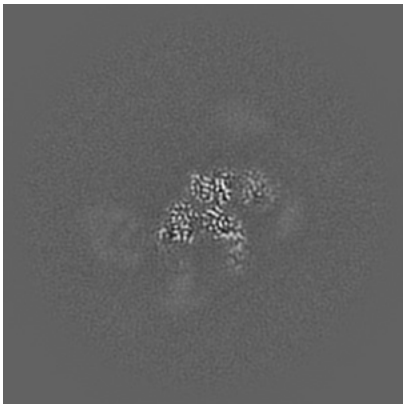


Z Index: 160

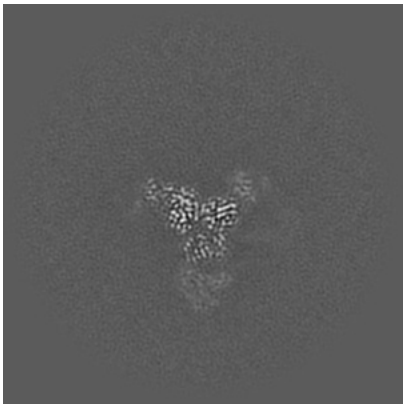
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

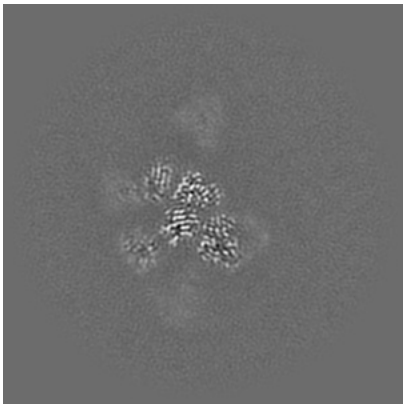
6.3.1 Primary map



X Index: 147



Y Index: 173

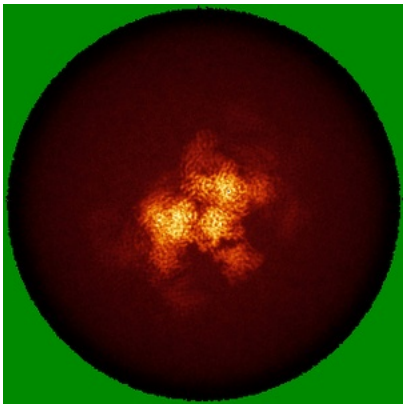


Z Index: 149

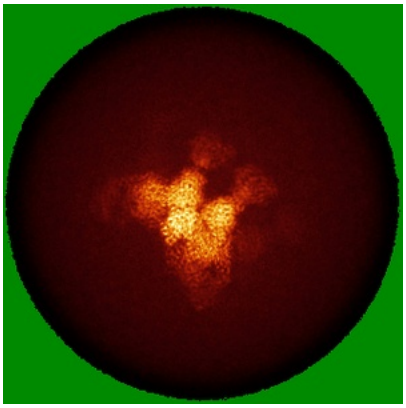
The images above show the largest variance slices of the map in three orthogonal directions.

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

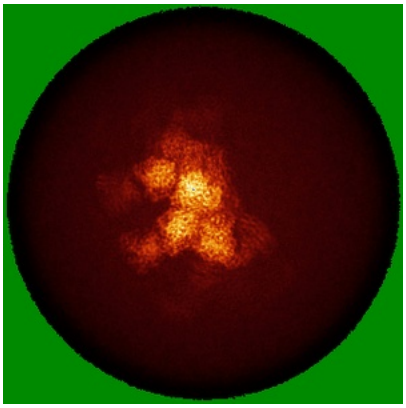
6.4.1 Primary map



X



Y



Z

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

6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 3.7. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

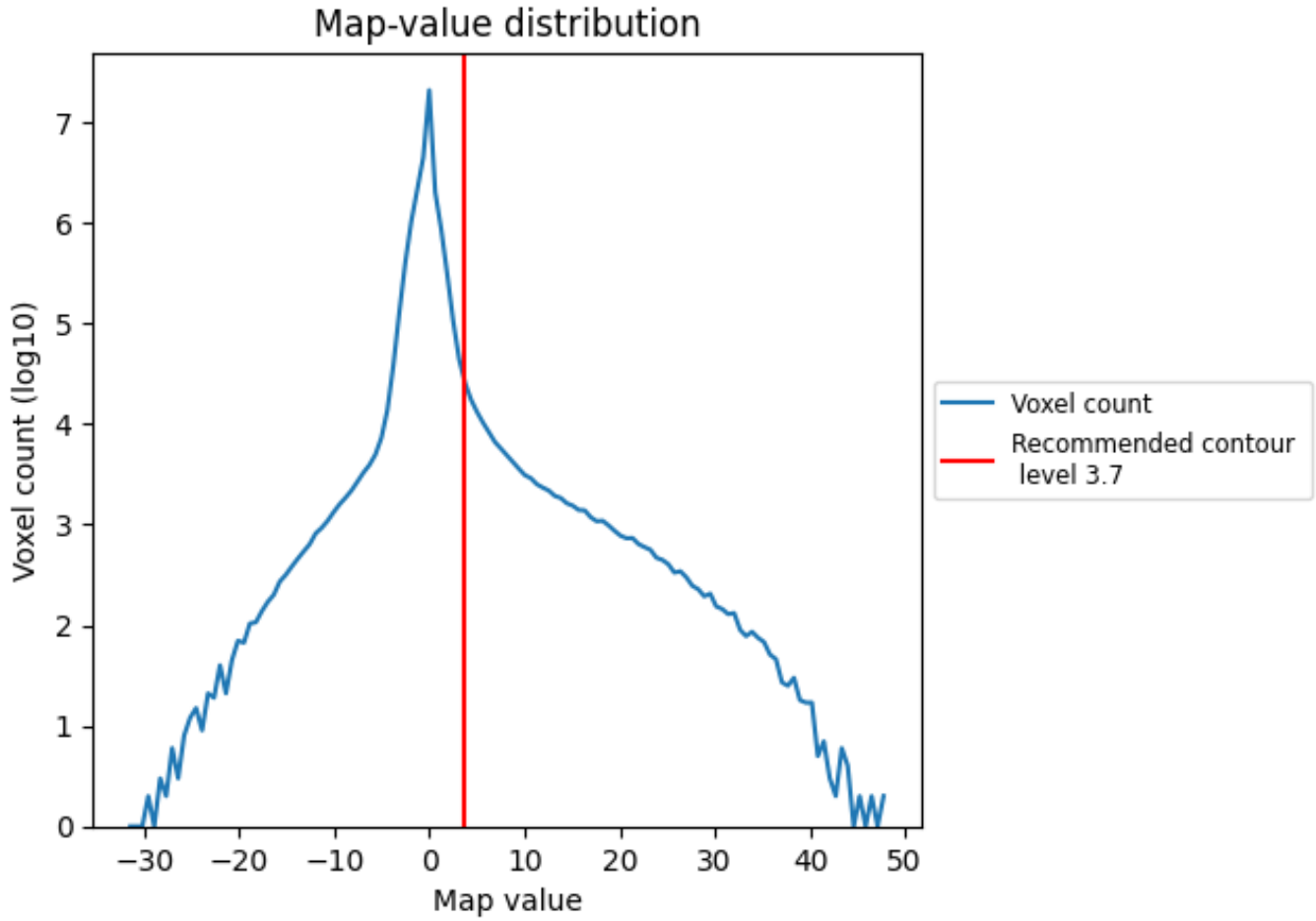
6.6 Mask visualisation (i)

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

7 Map analysis

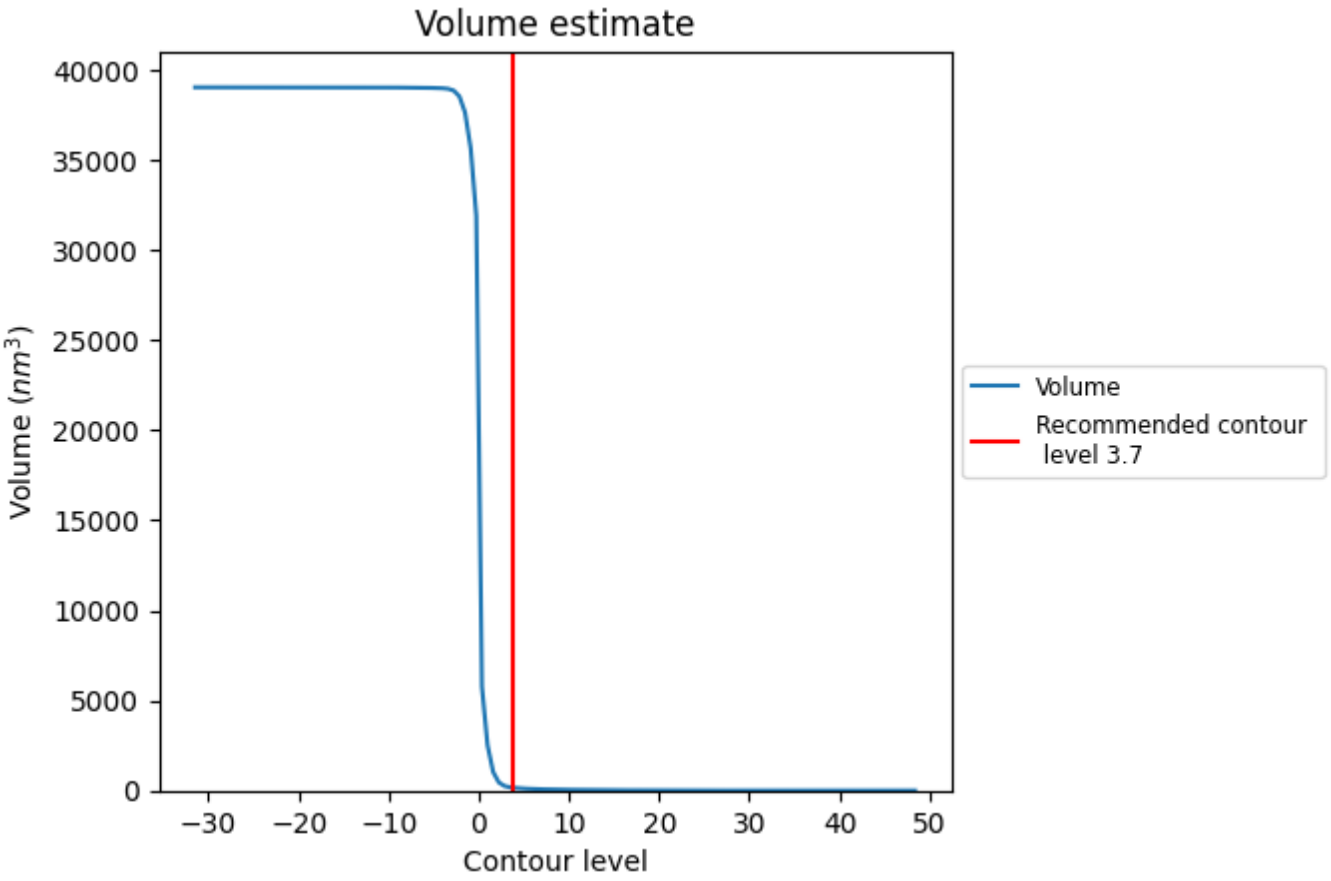
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

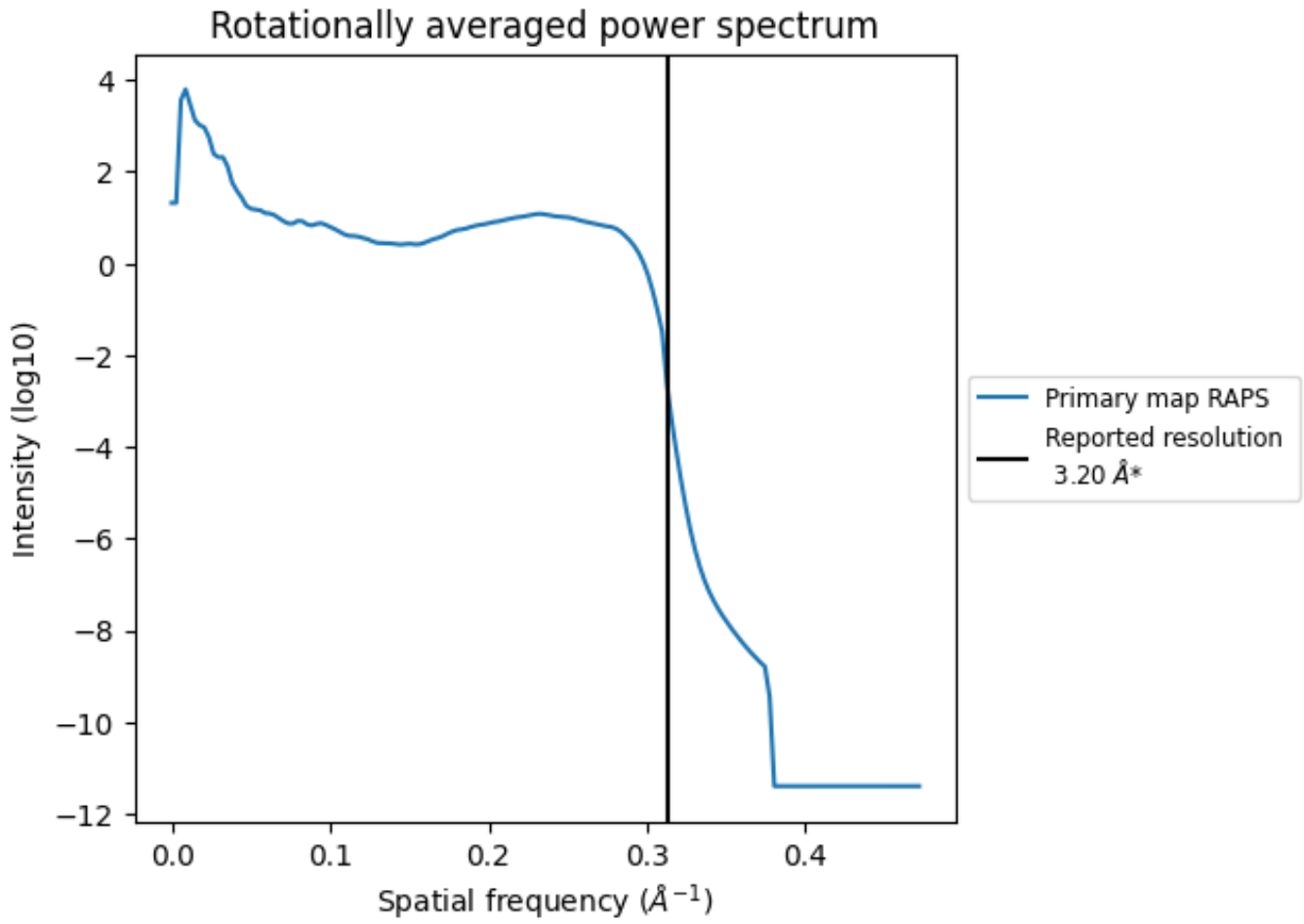
7.2 Volume estimate



The volume at the recommended contour level is 167 nm^3; this corresponds to an approximate mass of 151 kDa.

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

7.3 Rotationally averaged power spectrum (i)



*Reported resolution corresponds to spatial frequency of 0.312 Å^{-1}

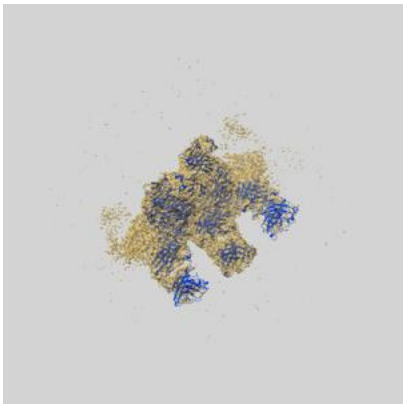
8 Fourier-Shell correlation (i)

This section was not generated. No FSC curve or half-maps provided.

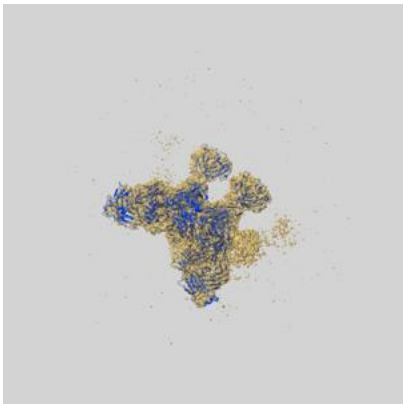
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-22089 and PDB model 6X87. Per-residue inclusion information can be found in section 3 on page 7.

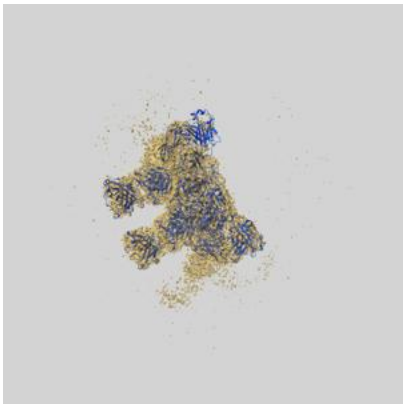
9.1 Map-model overlay



X



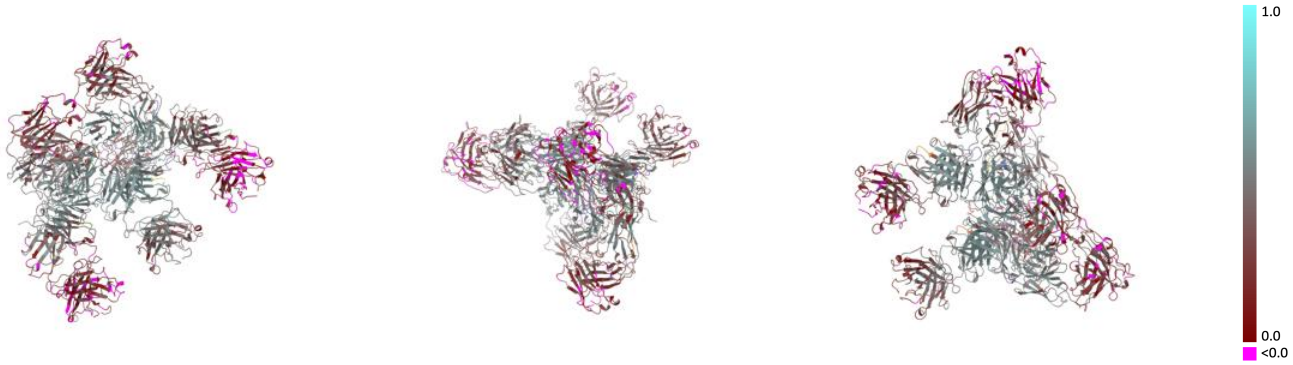
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 3.7 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.

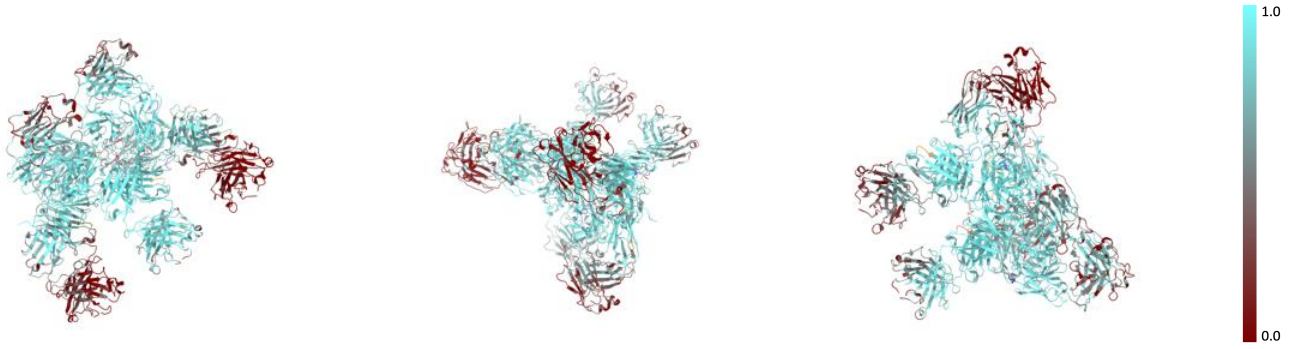
9.2 Q-score mapped to coordinate model (i)



X Y Z

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

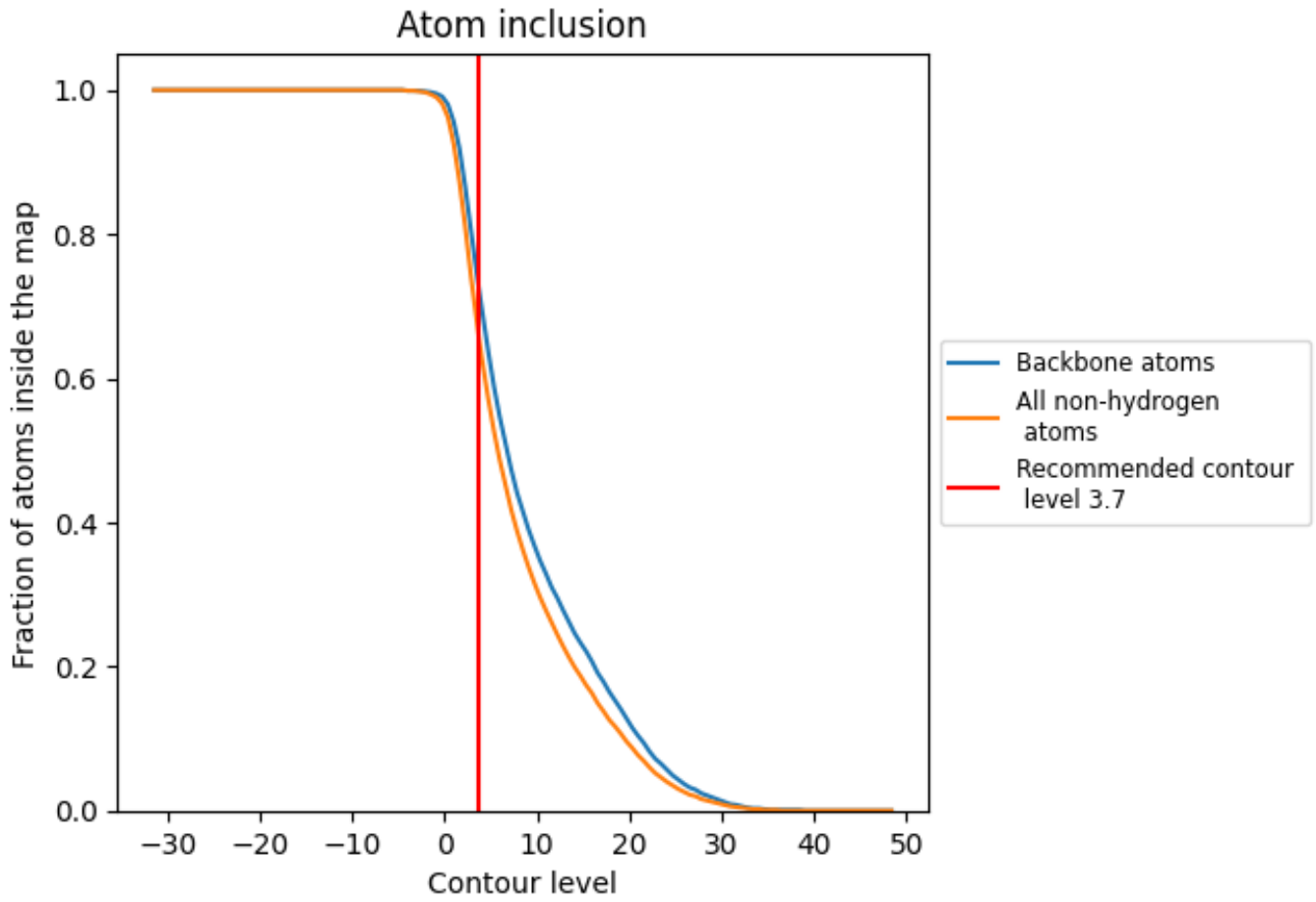
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (3.7).

9.4 Atom inclusion (i)



At the recommended contour level, 72% of all backbone atoms, 66% 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 (3.7) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6560	0.3650
A	0.7990	0.4110
B	0.7540	0.3890
C	0.3570	0.1940
D	0.3820	0.2400
E	0.8170	0.4520
F	0.7640	0.4320
G	0.4400	0.2710
H	0.4280	0.2620
I	0.7450	0.3960
J	0.6660	0.3570
K	0.8660	0.4870
L	0.8570	0.4830
M	0.6260	0.3460
N	0.6040	0.3420
X	0.9470	0.5310