



wwPDB EM Validation Summary Report ⓘ

Mar 5, 2026 – 06:01 PM UTC

PDB ID : 6N09 / pdb_00006n09
EMDB ID : EMD-9313
Title : Cryo-EM structure of the HO BMC shell: subregion classified for BMC-T:
TD-TD-TD
Authors : Greber, B.J.; Sutter, M.; Kerfeld, C.A.
Deposited on : 2018-11-06
Resolution : 3.50 Å(reported)
Based on initial model : 5V74

This is a wwPDB EM Validation Summary 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.dev132
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

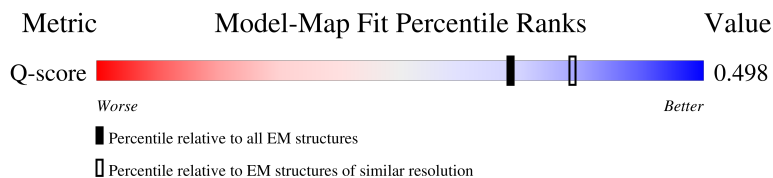
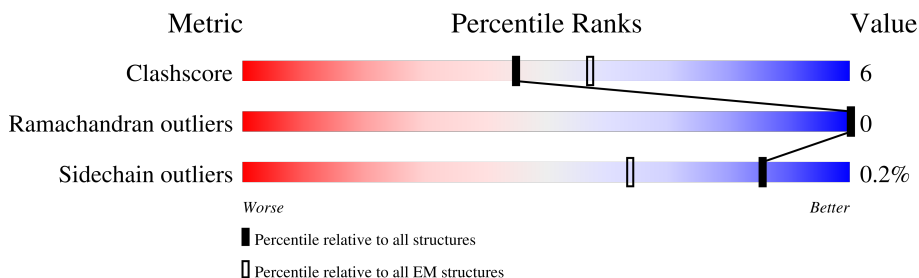
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.50 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.



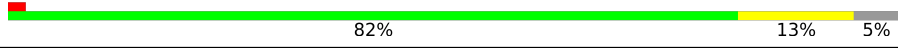
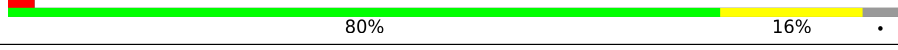
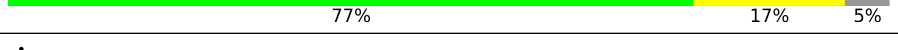
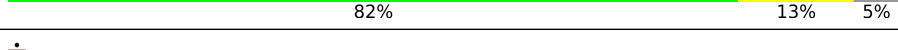
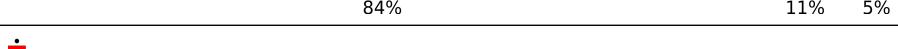
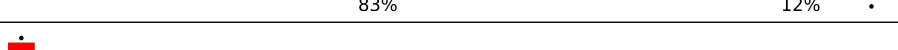
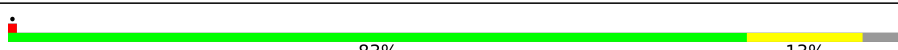
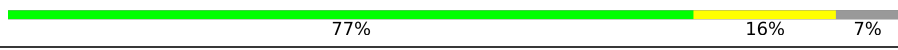
Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	13950 (3.00 - 4.00)

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	A	212	 83% 12% 5%
1	B	212	 75% 20% 5%
1	C	212	 82% 14% 5%
1	D	212	 79% 16% 5%

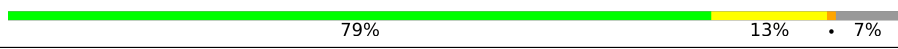
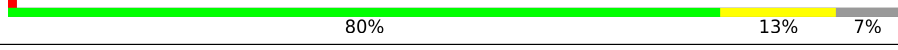
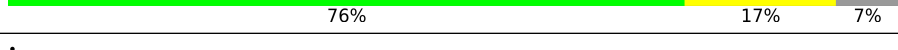
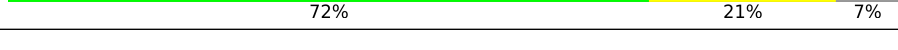
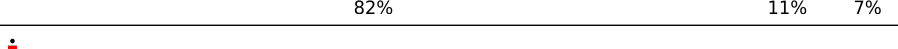
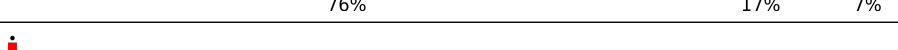
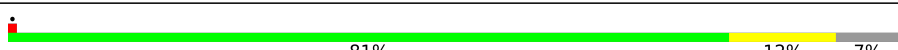
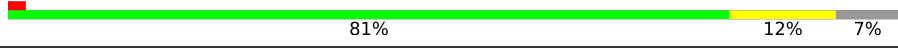
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Mol	Chain	Length	Quality of chain
1	E	212	
1	F	212	
1	G	212	
1	H	212	
1	I	212	
1	J	212	
1	K	212	
1	L	212	
1	M	212	
1	N	212	
1	O	212	
1	P	212	
1	Q	212	
1	R	212	
1	S	212	
1	T	212	
1	U	212	
1	V	212	
1	W	212	
1	X	212	
2	GA	99	
2	GB	99	
2	GC	99	
2	GD	99	
2	GE	99	

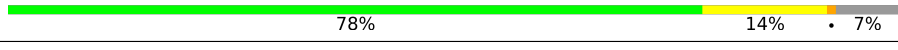
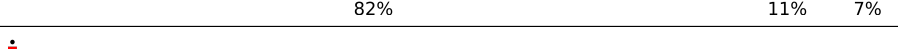
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Mol	Chain	Length	Quality of chain
2	GF	99	
2	HA	99	
2	HB	99	
2	HC	99	
2	HD	99	
2	HE	99	
2	HF	99	
2	IA	99	
2	IB	99	
2	IC	99	
2	ID	99	
2	IE	99	
2	IF	99	
2	JA	99	
2	JB	99	
2	JC	99	
2	JD	99	
2	JE	99	
2	JF	99	
2	KA	99	
2	KB	99	
2	KC	99	
2	KD	99	
2	KE	99	
2	KF	99	

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Mol	Chain	Length	Quality of chain
2	LA	99	
2	LB	99	
2	LC	99	
2	LD	99	
2	LE	99	
2	LF	99	

2 Entry composition [i](#)

There are 2 unique types of molecules in this entry. The entry contains 60325 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 Microcompartments protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	202	Total	C	N	O	S	0	0
			1525	971	265	286	3		
1	B	202	Total	C	N	O	S	0	0
			1525	971	265	286	3		
1	C	202	Total	C	N	O	S	0	0
			1525	971	265	286	3		
1	D	202	Total	C	N	O	S	0	0
			1525	971	265	286	3		
1	E	202	Total	C	N	O	S	0	0
			1525	971	265	286	3		
1	F	201	Total	C	N	O	S	0	0
			1520	968	264	285	3		
1	G	202	Total	C	N	O	S	0	0
			1525	971	265	286	3		
1	H	203	Total	C	N	O	S	0	0
			1533	977	266	287	3		
1	I	203	Total	C	N	O	S	0	0
			1533	977	266	287	3		
1	J	203	Total	C	N	O	S	0	0
			1533	977	266	287	3		
1	K	201	Total	C	N	O	S	0	0
			1520	968	264	285	3		
1	L	201	Total	C	N	O	S	0	0
			1520	968	264	285	3		
1	M	202	Total	C	N	O	S	0	0
			1525	971	265	286	3		
1	N	203	Total	C	N	O	S	0	0
			1533	977	266	287	3		
1	O	203	Total	C	N	O	S	0	0
			1533	977	266	287	3		
1	P	203	Total	C	N	O	S	0	0
			1533	977	266	287	3		
1	Q	201	Total	C	N	O	S	0	0
			1520	968	264	285	3		

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Mol	Chain	Residues	Atoms					AltConf	Trace
1	R	201	Total	C	N	O	S	0	0
			1520	968	264	285	3		
1	S	202	Total	C	N	O	S	0	0
			1525	971	265	286	3		
1	T	203	Total	C	N	O	S	0	0
			1533	977	266	287	3		
1	U	203	Total	C	N	O	S	0	0
			1533	977	266	287	3		
1	V	203	Total	C	N	O	S	0	0
			1533	977	266	287	3		
1	W	201	Total	C	N	O	S	0	0
			1520	968	264	285	3		
1	X	201	Total	C	N	O	S	0	0
			1520	968	264	285	3		

- Molecule 2 is a protein called Microcompartments protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	GA	92	Total	C	N	O	S	0	0
			658	413	120	122	3		
2	GB	92	Total	C	N	O	S	0	0
			658	413	120	122	3		
2	GC	92	Total	C	N	O	S	0	0
			658	413	120	122	3		
2	GD	92	Total	C	N	O	S	0	0
			658	413	120	122	3		
2	GE	92	Total	C	N	O	S	0	0
			658	413	120	122	3		
2	GF	92	Total	C	N	O	S	0	0
			658	413	120	122	3		
2	HA	92	Total	C	N	O	S	0	0
			658	413	120	122	3		
2	HB	92	Total	C	N	O	S	0	0
			658	413	120	122	3		
2	HC	92	Total	C	N	O	S	0	0
			658	413	120	122	3		
2	HD	92	Total	C	N	O	S	0	0
			658	413	120	122	3		
2	HE	92	Total	C	N	O	S	0	0
			658	413	120	122	3		
2	HF	92	Total	C	N	O	S	0	0
			658	413	120	122	3		

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Mol	Chain	Residues	Atoms					AltConf	Trace
2	IA	92	Total 658	C 413	N 120	O 122	S 3	0	0
2	IB	92	Total 658	C 413	N 120	O 122	S 3	0	0
2	IC	92	Total 658	C 413	N 120	O 122	S 3	0	0
2	ID	92	Total 658	C 413	N 120	O 122	S 3	0	0
2	IE	92	Total 658	C 413	N 120	O 122	S 3	0	0
2	IF	92	Total 658	C 413	N 120	O 122	S 3	0	0
2	JA	92	Total 658	C 413	N 120	O 122	S 3	0	0
2	JB	92	Total 658	C 413	N 120	O 122	S 3	0	0
2	JC	92	Total 658	C 413	N 120	O 122	S 3	0	0
2	JD	92	Total 658	C 413	N 120	O 122	S 3	0	0
2	JE	92	Total 658	C 413	N 120	O 122	S 3	0	0
2	JF	92	Total 658	C 413	N 120	O 122	S 3	0	0
2	KA	92	Total 658	C 413	N 120	O 122	S 3	0	0
2	KB	92	Total 658	C 413	N 120	O 122	S 3	0	0
2	KC	92	Total 658	C 413	N 120	O 122	S 3	0	0
2	KD	92	Total 658	C 413	N 120	O 122	S 3	0	0
2	KE	92	Total 658	C 413	N 120	O 122	S 3	0	0
2	KF	92	Total 658	C 413	N 120	O 122	S 3	0	0
2	LA	92	Total 658	C 413	N 120	O 122	S 3	0	0
2	LB	92	Total 658	C 413	N 120	O 122	S 3	0	0
2	LC	92	Total 658	C 413	N 120	O 122	S 3	0	0

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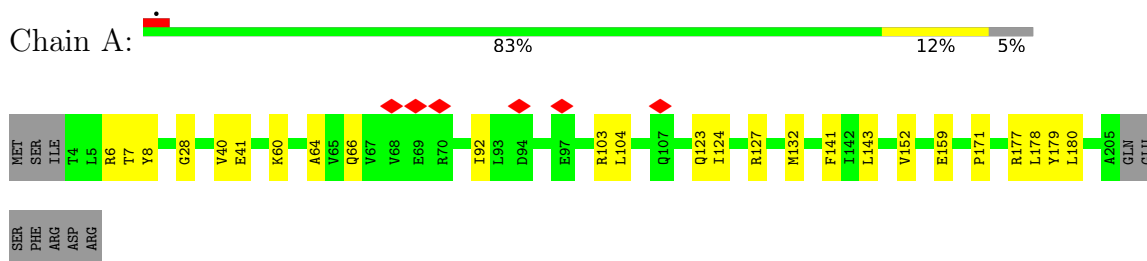
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Mol	Chain	Residues	Atoms					AltConf	Trace
2	LD	92	Total 658	C 413	N 120	O 122	S 3	0	0
2	LE	92	Total 658	C 413	N 120	O 122	S 3	0	0
2	LF	92	Total 658	C 413	N 120	O 122	S 3	0	0

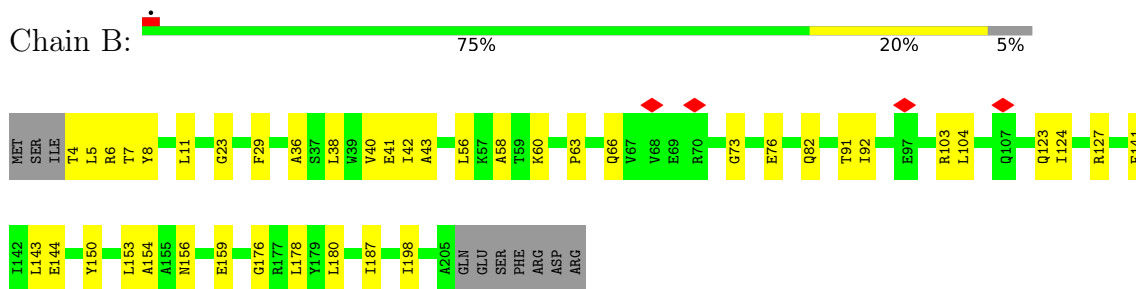
3 Residue-property plots [i](#)

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.

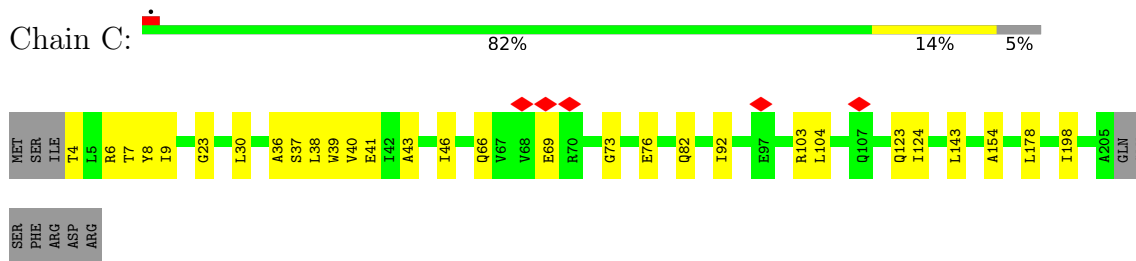
- Molecule 1: Microcompartments protein



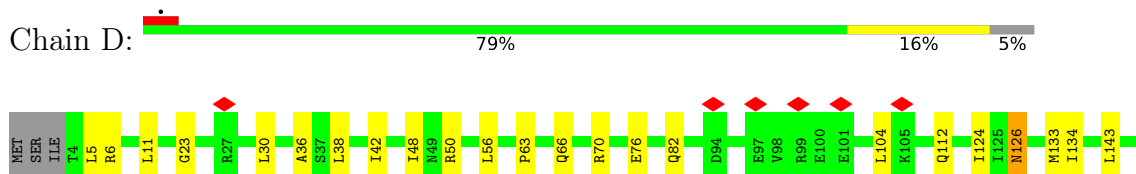
- Molecule 1: Microcompartments protein

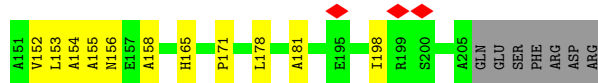


- Molecule 1: Microcompartments protein

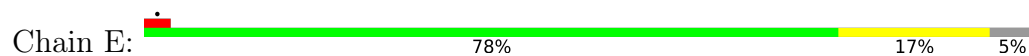


- Molecule 1: Microcompartments protein

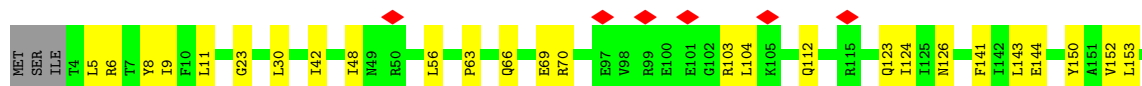
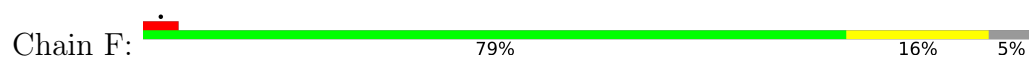




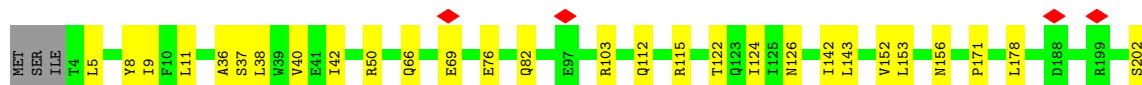
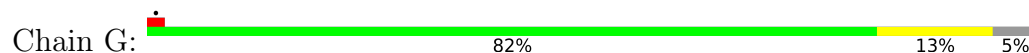
- Molecule 1: Microcompartments protein



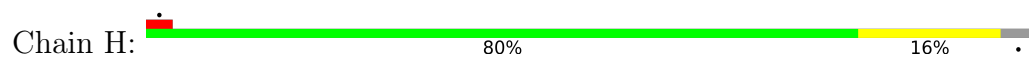
- Molecule 1: Microcompartments protein



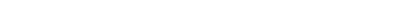
- Molecule 1: Microcompartments protein

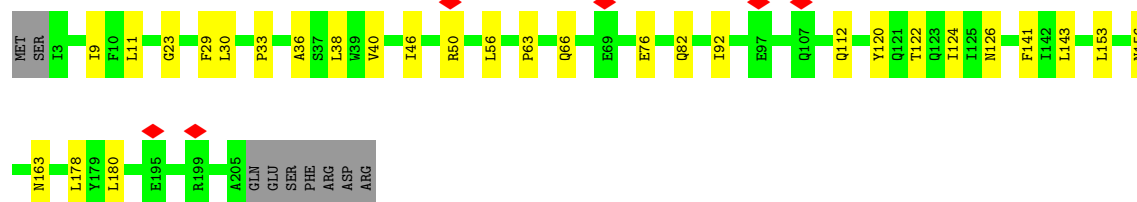


- Molecule 1: Microcompartments protein

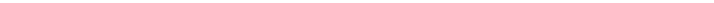


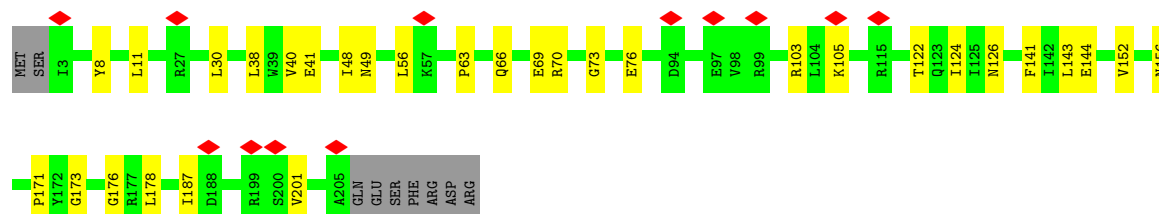
- Molecule 1: Microcompartments protein

Chain I:  82% 14%

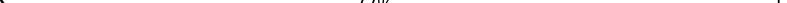


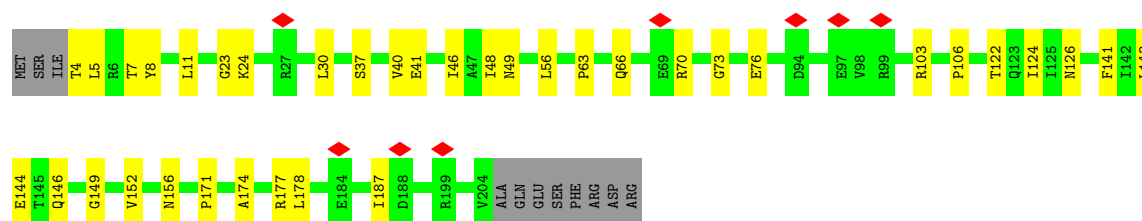
- Molecule 1: Microcompartments protein

Chain J:  6% 81% 15%



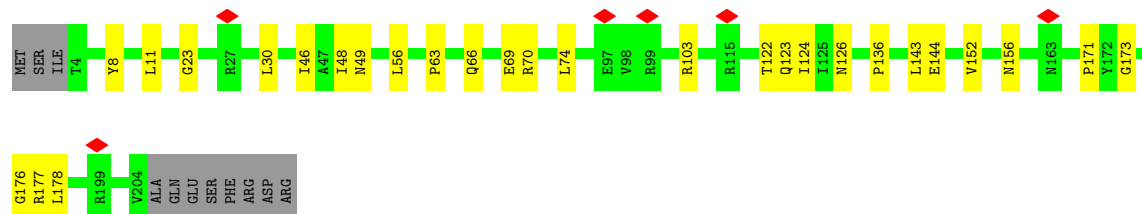
- Molecule 1: Microcompartments protein

Chain K:  77% 17% 5%



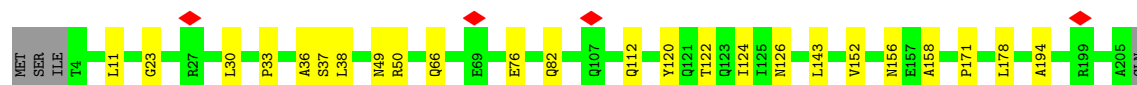
- Molecule 1: Microcompartments protein

Chain L:  82% 13% 5%



- Molecule 1: Microcompartments protein

Chain M:  84% 11% 5%



GLU
SER
PHE
ARG
ASP
ARG

• Molecule 1: Microcompartments protein

Chain N:  83% 12% .

MET SER I3 Y8 L11 F29 A36 S37 L38 W39 V40 Q66 E69 E97 V98 R99 K105 Q112 R115 A119 T122 Q123 I124 I125 N126 M133 L143 V152 N156 P171 L178 R199 S200 V201 A205 GLN

GLU
SER
PHE
ARG
ASP
ARG

• Molecule 1: Microcompartments protein

Chain O:  84% 12% .

MET SER I3 Y7 Y8 D12 F29 A36 S37 L38 V39 V40 E41 N49 R50 V51 L56 Q66 E69 E76 Q82 T92 E97 V98 R99 R103 L104 K105 T122 Q123 I124 I125 N126 M132 L143 V152 P171 L178 R199

A205
GLN
GLU
SER
PHE
ARG
ASP
ARG

• Molecule 1: Microcompartments protein

Chain P:  82% 14% .

MET SER I3 Y8 L11 K24 R27 L30 L42 T48 N49 R50 L56 Q66 E69 R70 L74 D94 E97 V98 R99 R103 R115 T122 N126 R127 N128 P136 F141 E144 V152 A155 N156 E157 A158 P171 Y172

G173 G176 E184 I187 R199 A205
GLN
GLU
SER
PHE
ARG
ASP
ARG

• Molecule 1: Microcompartments protein

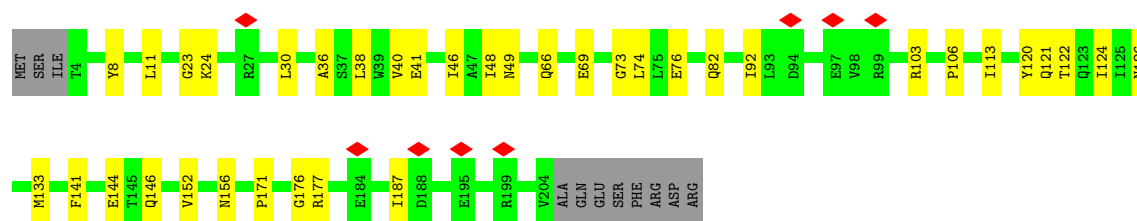
Chain Q:  5% 83% 12% 5%

MET SER ILE T4 Y8 L11 G23 R27 L30 L38 V39 V40 E41 N49 L56 P63 Q66 E69 G73 E76 T92 L93 D94 E97 V98 R99 K105 T122 Q123 I124 I125 N126 G131 M132 F141 I142 L143 E144 N156

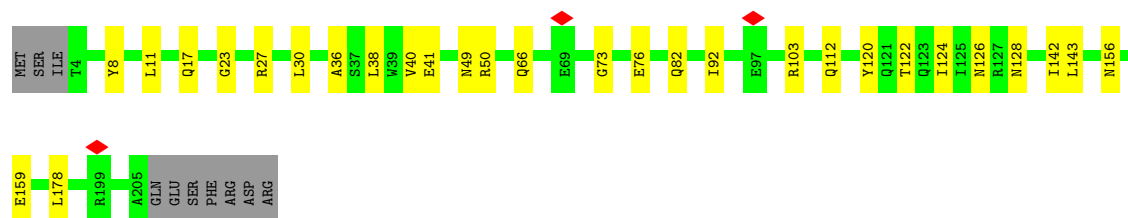
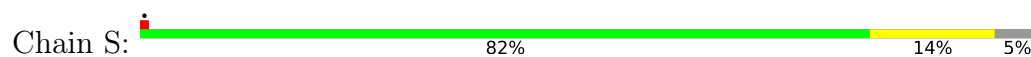
R177 L178 I187 D188 E195 R199 V204
ALA
GLN
GLU
SER
PHE
ARG
ASP
ARG

• Molecule 1: Microcompartments protein

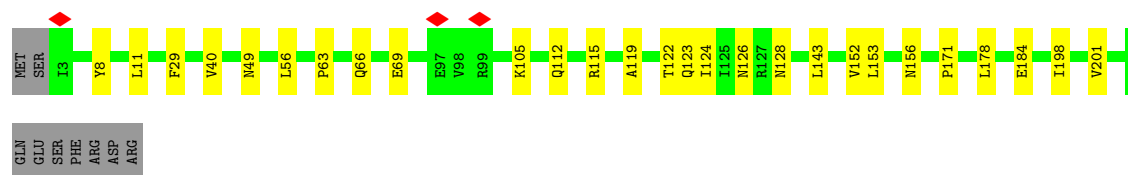
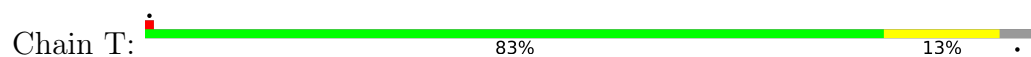
Chain R:  77% 17% 5%



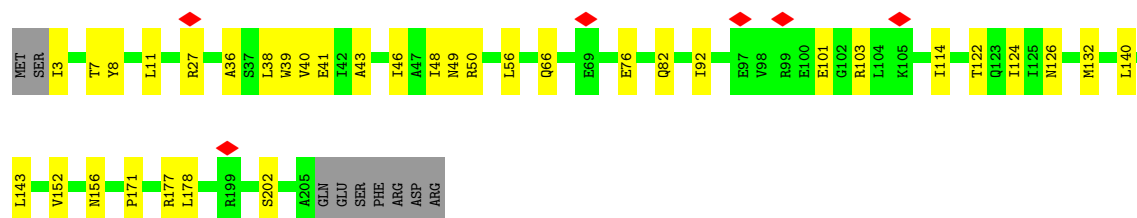
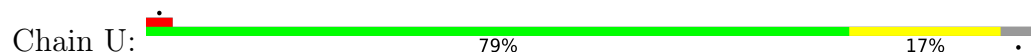
• Molecule 1: Microcompartments protein



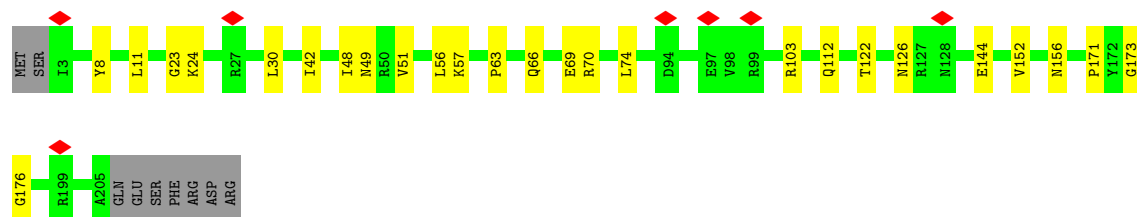
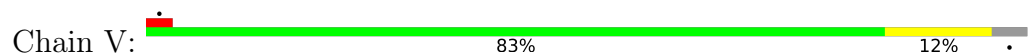
• Molecule 1: Microcompartments protein



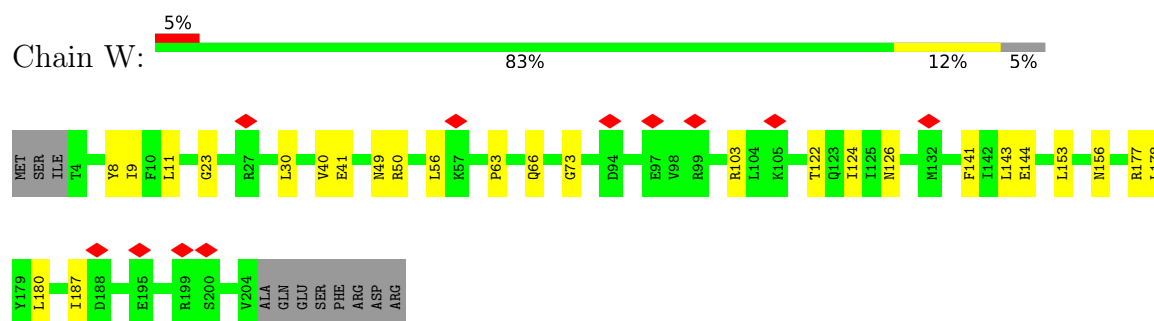
• Molecule 1: Microcompartments protein



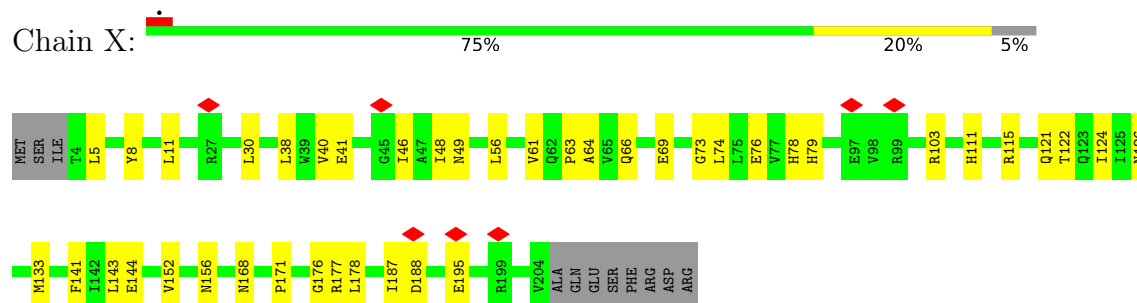
• Molecule 1: Microcompartments protein



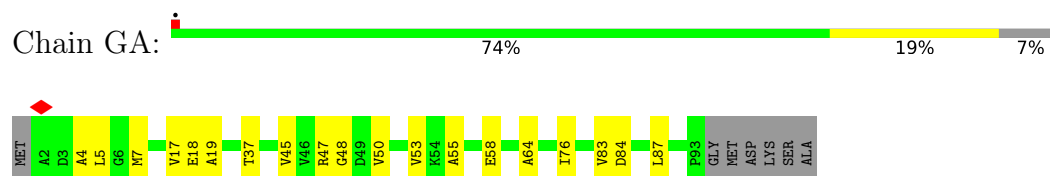
- Molecule 1: Microcompartments protein



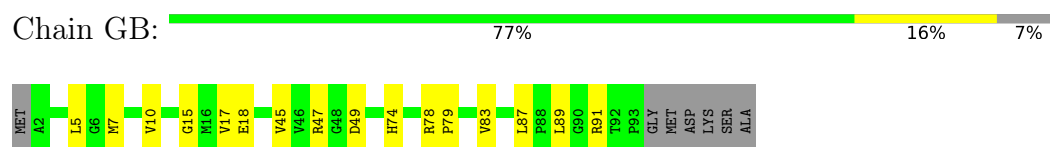
- Molecule 1: Microcompartments protein



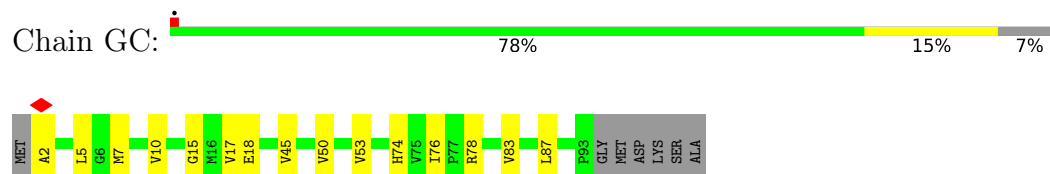
- Molecule 2: Microcompartments protein



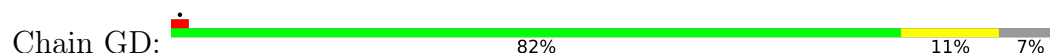
- Molecule 2: Microcompartments protein

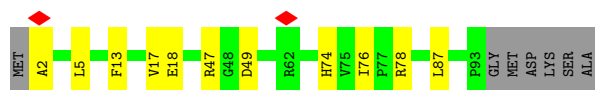


- Molecule 2: Microcompartments protein

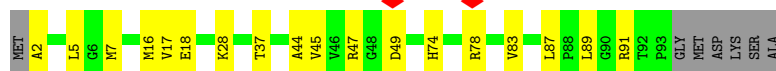
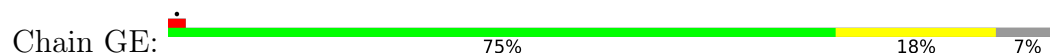


- Molecule 2: Microcompartments protein

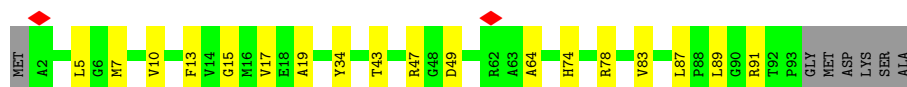
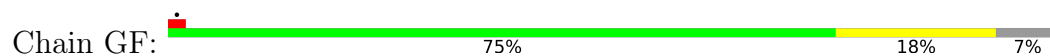




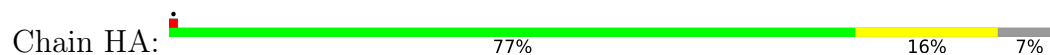
- Molecule 2: Microcompartments protein



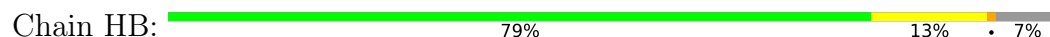
- Molecule 2: Microcompartments protein



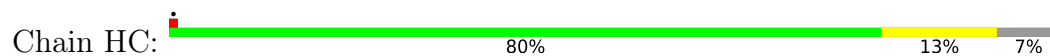
- Molecule 2: Microcompartments protein



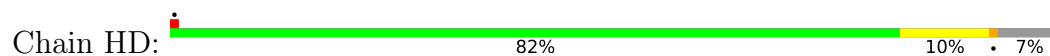
- Molecule 2: Microcompartments protein



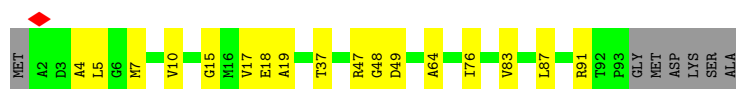
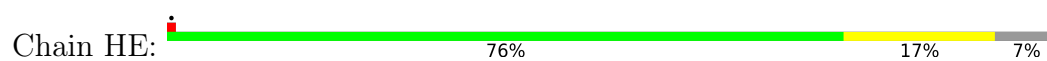
- Molecule 2: Microcompartments protein



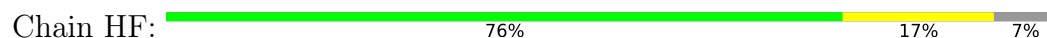
- Molecule 2: Microcompartments protein



- Molecule 2: Microcompartments protein



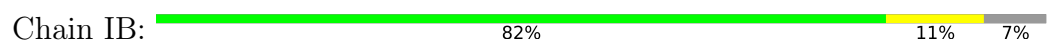
- Molecule 2: Microcompartments protein



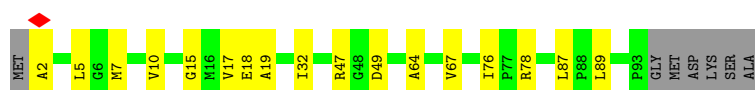
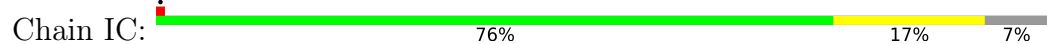
- Molecule 2: Microcompartments protein



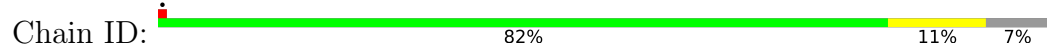
- Molecule 2: Microcompartments protein



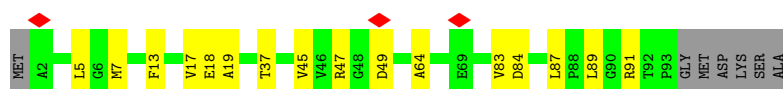
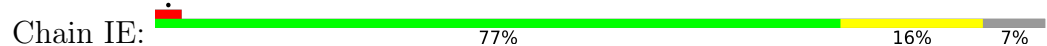
- Molecule 2: Microcompartments protein



- Molecule 2: Microcompartments protein



- Molecule 2: Microcompartments protein



• Molecule 2: Microcompartments protein

Chain IF:  79% 14% 7%



• Molecule 2: Microcompartments protein

Chain JA:  73% 19% 7%



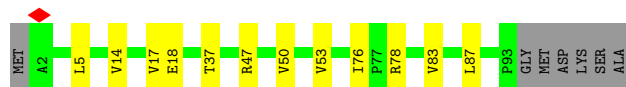
• Molecule 2: Microcompartments protein

Chain JB:  80% 12% 7%



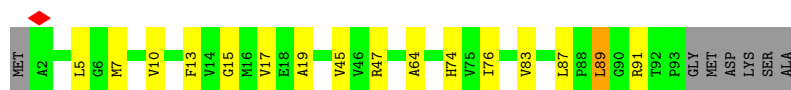
• Molecule 2: Microcompartments protein

Chain JC:  81% 12% 7%



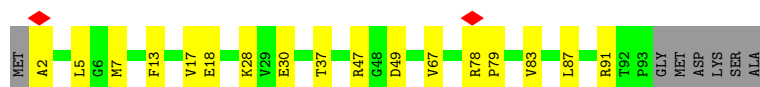
• Molecule 2: Microcompartments protein

Chain JD:  77% 15% 7%



• Molecule 2: Microcompartments protein

Chain JE:  76% 17% 7%

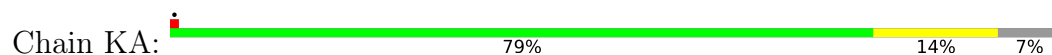


• Molecule 2: Microcompartments protein

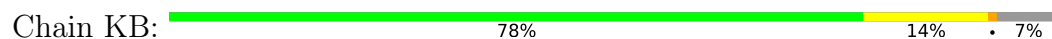
Chain JF:  71% 22% 7%



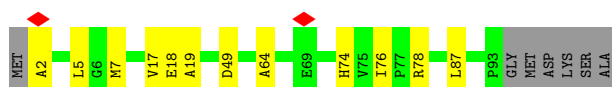
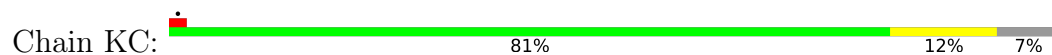
- Molecule 2: Microcompartments protein



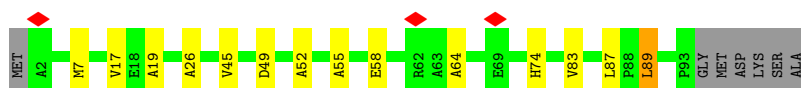
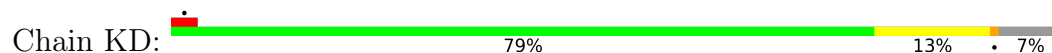
- Molecule 2: Microcompartments protein



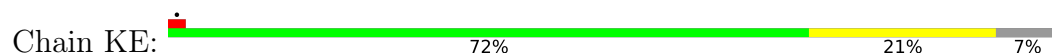
- Molecule 2: Microcompartments protein



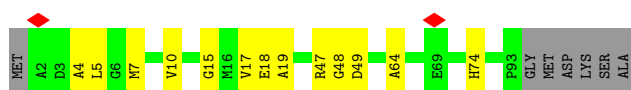
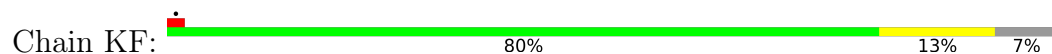
- Molecule 2: Microcompartments protein



- Molecule 2: Microcompartments protein

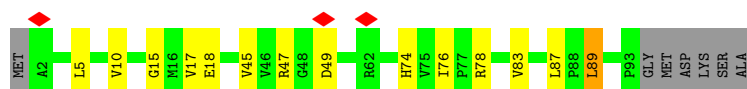


- Molecule 2: Microcompartments protein



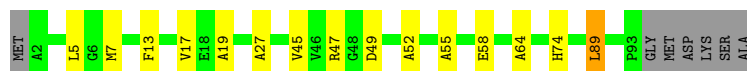
- Molecule 2: Microcompartments protein

Chain LA:  79% 13% 7%



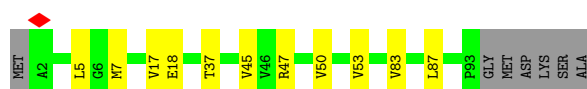
• Molecule 2: Microcompartments protein

Chain LB:  78% 14% 7%



• Molecule 2: Microcompartments protein

Chain LC:  82% 11% 7%



• Molecule 2: Microcompartments protein

Chain LD:  77% 15% 7%



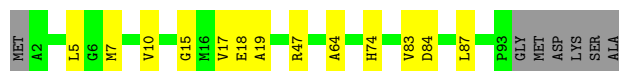
• Molecule 2: Microcompartments protein

Chain LE:  73% 20% 7%



• Molecule 2: Microcompartments protein

Chain LF:  80% 13% 7%



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	106640	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION; Initial CTF fitting using CTFFIND4, CTF correction applied within RELION	Depositor
Microscope	FEI TITAN	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	25	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	3500	Depositor
Magnification	48543	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.167	Depositor
Minimum map value	-0.087	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.03	Depositor
Map size ($\text{\AA}$)	527.36, 527.36, 527.36	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing ($\text{\AA}$)	1.03, 1.03, 1.03	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	0.35	0/1551	0.57	0/2111
1	B	0.35	0/1551	0.58	0/2111
1	C	0.36	0/1551	0.56	0/2111
1	D	0.30	0/1551	0.50	0/2111
1	E	0.30	0/1551	0.50	0/2111
1	F	0.29	0/1546	0.48	0/2104
1	G	0.36	0/1551	0.55	0/2111
1	H	0.36	0/1559	0.55	0/2122
1	I	0.35	0/1559	0.55	0/2122
1	J	0.31	0/1559	0.48	0/2122
1	K	0.30	0/1546	0.49	0/2104
1	L	0.31	0/1546	0.51	0/2104
1	M	0.35	0/1551	0.54	0/2111
1	N	0.36	0/1559	0.54	0/2122
1	O	0.34	0/1559	0.55	0/2122
1	P	0.31	0/1559	0.49	0/2122
1	Q	0.30	0/1546	0.49	0/2104
1	R	0.31	0/1546	0.50	0/2104
1	S	0.35	0/1551	0.55	0/2111
1	T	0.37	0/1559	0.56	0/2122
1	U	0.35	0/1559	0.55	0/2122
1	V	0.31	0/1559	0.50	0/2122
1	W	0.30	0/1546	0.49	0/2104
1	X	0.30	0/1546	0.50	0/2104
2	GA	0.38	0/666	0.53	0/904
2	GB	0.40	0/666	0.54	0/904
2	GC	0.40	0/666	0.52	0/904
2	GD	0.39	0/666	0.52	0/904
2	GE	0.38	0/666	0.51	0/904
2	GF	0.38	0/666	0.52	0/904
2	HA	0.39	0/666	0.53	0/904
2	HB	0.37	0/666	0.53	0/904
2	HC	0.39	0/666	0.51	0/904
2	HD	0.41	0/666	0.56	0/904

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
2	HE	0.38	0/666	0.53	0/904
2	HF	0.38	0/666	0.51	0/904
2	IA	0.38	0/666	0.50	0/904
2	IB	0.41	0/666	0.52	0/904
2	IC	0.39	0/666	0.54	0/904
2	ID	0.40	0/666	0.50	0/904
2	IE	0.39	0/666	0.53	0/904
2	IF	0.38	0/666	0.51	0/904
2	JA	0.40	0/666	0.53	0/904
2	JB	0.36	0/666	0.50	0/904
2	JC	0.38	0/666	0.49	0/904
2	JD	0.40	0/666	0.55	0/904
2	JE	0.38	0/666	0.52	0/904
2	JF	0.39	0/666	0.51	0/904
2	KA	0.37	0/666	0.50	0/904
2	KB	0.40	0/666	0.54	0/904
2	KC	0.39	0/666	0.53	0/904
2	KD	0.40	0/666	0.53	0/904
2	KE	0.38	0/666	0.50	0/904
2	KF	0.38	0/666	0.52	0/904
2	LA	0.40	0/666	0.57	0/904
2	LB	0.36	0/666	0.52	0/904
2	LC	0.40	0/666	0.49	0/904
2	LD	0.41	0/666	0.54	0/904
2	LE	0.39	0/666	0.53	0/904
2	LF	0.39	0/666	0.49	0/904
All	All	0.35	0/61237	0.52	0/83258

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	D	0	1
1	E	0	1
1	F	0	1
All	All	0	3

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	D	126	ASN	Peptide
1	E	126	ASN	Peptide
1	F	126	ASN	Peptide

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	1525	0	1549	17	0
1	B	1525	0	1549	29	0
1	C	1525	0	1549	19	0
1	D	1525	0	1549	23	0
1	E	1525	0	1549	24	0
1	F	1520	0	1544	23	0
1	G	1525	0	1549	18	0
1	H	1533	0	1560	24	0
1	I	1533	0	1560	20	0
1	J	1533	0	1560	21	0
1	K	1520	0	1544	26	0
1	L	1520	0	1544	22	0
1	M	1525	0	1549	17	0
1	N	1533	0	1560	19	0
1	O	1533	0	1560	18	0
1	P	1533	0	1560	22	0
1	Q	1520	0	1544	16	0
1	R	1520	0	1544	27	0
1	S	1525	0	1549	20	0
1	T	1533	0	1560	17	0
1	U	1533	0	1560	24	0
1	V	1533	0	1560	20	0
1	W	1520	0	1544	17	0
1	X	1520	0	1544	30	0
2	GA	658	0	678	15	0
2	GB	658	0	678	14	0
2	GC	658	0	678	13	0
2	GD	658	0	678	11	0
2	GE	658	0	678	14	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	GF	658	0	678	14	0
2	HA	658	0	678	11	0
2	HB	658	0	678	10	0
2	HC	658	0	678	11	0
2	HD	658	0	678	11	0
2	HE	658	0	678	15	0
2	HF	658	0	678	14	0
2	IA	658	0	678	15	0
2	IB	658	0	678	8	0
2	IC	658	0	678	16	0
2	ID	658	0	678	12	0
2	IE	658	0	678	15	0
2	IF	658	0	678	12	0
2	JA	658	0	678	14	0
2	JB	658	0	678	8	0
2	JC	658	0	678	11	0
2	JD	658	0	678	14	0
2	JE	658	0	678	17	0
2	JF	658	0	678	17	0
2	KA	658	0	678	11	0
2	KB	658	0	678	13	0
2	KC	658	0	678	12	0
2	KD	658	0	678	12	0
2	KE	658	0	678	16	0
2	KF	658	0	678	9	0
2	LA	658	0	678	11	0
2	LB	658	0	678	11	0
2	LC	658	0	678	11	0
2	LD	658	0	678	13	0
2	LE	658	0	678	17	0
2	LF	658	0	678	9	0
All	All	60325	0	61648	772	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 6.

The worst 5 of 772 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)
1:B:66:GLN:HB3	1:C:124:ILE:HG21	1.73	0.71
1:A:66:GLN:HB3	1:B:124:ILE:HG21	1.73	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:HB:47:ARG:HH12	2:HB:79:PRO:HG3	1.57	0.70
1:A:124:ILE:HG21	1:C:66:GLN:HB3	1.74	0.69
1:B:41:GLU:HA	1:B:73:GLY:O	1.93	0.68

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	200/212 (94%)	191 (96%)	9 (4%)	0	100	100
1	B	200/212 (94%)	187 (94%)	13 (6%)	0	100	100
1	C	200/212 (94%)	194 (97%)	6 (3%)	0	100	100
1	D	200/212 (94%)	193 (96%)	7 (4%)	0	100	100
1	E	200/212 (94%)	191 (96%)	9 (4%)	0	100	100
1	F	199/212 (94%)	189 (95%)	10 (5%)	0	100	100
1	G	200/212 (94%)	188 (94%)	12 (6%)	0	100	100
1	H	201/212 (95%)	189 (94%)	12 (6%)	0	100	100
1	I	201/212 (95%)	193 (96%)	8 (4%)	0	100	100
1	J	201/212 (95%)	193 (96%)	8 (4%)	0	100	100
1	K	199/212 (94%)	190 (96%)	9 (4%)	0	100	100
1	L	199/212 (94%)	191 (96%)	8 (4%)	0	100	100
1	M	200/212 (94%)	191 (96%)	9 (4%)	0	100	100
1	N	201/212 (95%)	195 (97%)	6 (3%)	0	100	100
1	O	201/212 (95%)	190 (94%)	11 (6%)	0	100	100
1	P	201/212 (95%)	194 (96%)	7 (4%)	0	100	100
1	Q	199/212 (94%)	192 (96%)	7 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	R	199/212 (94%)	189 (95%)	10 (5%)	0	100	100
1	S	200/212 (94%)	188 (94%)	12 (6%)	0	100	100
1	T	201/212 (95%)	195 (97%)	6 (3%)	0	100	100
1	U	201/212 (95%)	193 (96%)	8 (4%)	0	100	100
1	V	201/212 (95%)	192 (96%)	9 (4%)	0	100	100
1	W	199/212 (94%)	192 (96%)	7 (4%)	0	100	100
1	X	199/212 (94%)	191 (96%)	8 (4%)	0	100	100
2	GA	90/99 (91%)	90 (100%)	0	0	100	100
2	GB	90/99 (91%)	87 (97%)	3 (3%)	0	100	100
2	GC	90/99 (91%)	89 (99%)	1 (1%)	0	100	100
2	GD	90/99 (91%)	87 (97%)	3 (3%)	0	100	100
2	GE	90/99 (91%)	86 (96%)	4 (4%)	0	100	100
2	GF	90/99 (91%)	86 (96%)	4 (4%)	0	100	100
2	HA	90/99 (91%)	88 (98%)	2 (2%)	0	100	100
2	HB	90/99 (91%)	88 (98%)	2 (2%)	0	100	100
2	HC	90/99 (91%)	90 (100%)	0	0	100	100
2	HD	90/99 (91%)	87 (97%)	3 (3%)	0	100	100
2	HE	90/99 (91%)	87 (97%)	3 (3%)	0	100	100
2	HF	90/99 (91%)	88 (98%)	2 (2%)	0	100	100
2	IA	90/99 (91%)	88 (98%)	2 (2%)	0	100	100
2	IB	90/99 (91%)	88 (98%)	2 (2%)	0	100	100
2	IC	90/99 (91%)	85 (94%)	5 (6%)	0	100	100
2	ID	90/99 (91%)	89 (99%)	1 (1%)	0	100	100
2	IE	90/99 (91%)	88 (98%)	2 (2%)	0	100	100
2	IF	90/99 (91%)	88 (98%)	2 (2%)	0	100	100
2	JA	90/99 (91%)	87 (97%)	3 (3%)	0	100	100
2	JB	90/99 (91%)	86 (96%)	4 (4%)	0	100	100
2	JC	90/99 (91%)	87 (97%)	3 (3%)	0	100	100
2	JD	90/99 (91%)	86 (96%)	4 (4%)	0	100	100
2	JE	90/99 (91%)	88 (98%)	2 (2%)	0	100	100
2	JF	90/99 (91%)	88 (98%)	2 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	KA	90/99 (91%)	88 (98%)	2 (2%)	0	100	100
2	KB	90/99 (91%)	89 (99%)	1 (1%)	0	100	100
2	KC	90/99 (91%)	89 (99%)	1 (1%)	0	100	100
2	KD	90/99 (91%)	88 (98%)	2 (2%)	0	100	100
2	KE	90/99 (91%)	89 (99%)	1 (1%)	0	100	100
2	KF	90/99 (91%)	86 (96%)	4 (4%)	0	100	100
2	LA	90/99 (91%)	89 (99%)	1 (1%)	0	100	100
2	LB	90/99 (91%)	88 (98%)	2 (2%)	0	100	100
2	LC	90/99 (91%)	88 (98%)	2 (2%)	0	100	100
2	LD	90/99 (91%)	86 (96%)	4 (4%)	0	100	100
2	LE	90/99 (91%)	87 (97%)	3 (3%)	0	100	100
2	LF	90/99 (91%)	89 (99%)	1 (1%)	0	100	100
All	All	8042/8652 (93%)	7748 (96%)	294 (4%)	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	154/164 (94%)	154 (100%)	0	100	100
1	B	154/164 (94%)	154 (100%)	0	100	100
1	C	154/164 (94%)	154 (100%)	0	100	100
1	D	154/164 (94%)	154 (100%)	0	100	100
1	E	154/164 (94%)	154 (100%)	0	100	100
1	F	154/164 (94%)	154 (100%)	0	100	100
1	G	154/164 (94%)	154 (100%)	0	100	100
1	H	155/164 (94%)	155 (100%)	0	100	100
1	I	155/164 (94%)	155 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	J	155/164 (94%)	155 (100%)	0	100	100
1	K	154/164 (94%)	154 (100%)	0	100	100
1	L	154/164 (94%)	154 (100%)	0	100	100
1	M	154/164 (94%)	154 (100%)	0	100	100
1	N	155/164 (94%)	155 (100%)	0	100	100
1	O	155/164 (94%)	155 (100%)	0	100	100
1	P	155/164 (94%)	155 (100%)	0	100	100
1	Q	154/164 (94%)	154 (100%)	0	100	100
1	R	154/164 (94%)	154 (100%)	0	100	100
1	S	154/164 (94%)	154 (100%)	0	100	100
1	T	155/164 (94%)	155 (100%)	0	100	100
1	U	155/164 (94%)	155 (100%)	0	100	100
1	V	155/164 (94%)	155 (100%)	0	100	100
1	W	154/164 (94%)	154 (100%)	0	100	100
1	X	154/164 (94%)	153 (99%)	1 (1%)	78	79
2	GA	63/68 (93%)	63 (100%)	0	100	100
2	GB	63/68 (93%)	63 (100%)	0	100	100
2	GC	63/68 (93%)	63 (100%)	0	100	100
2	GD	63/68 (93%)	63 (100%)	0	100	100
2	GE	63/68 (93%)	63 (100%)	0	100	100
2	GF	63/68 (93%)	63 (100%)	0	100	100
2	HA	63/68 (93%)	63 (100%)	0	100	100
2	HB	63/68 (93%)	62 (98%)	1 (2%)	55	70
2	HC	63/68 (93%)	63 (100%)	0	100	100
2	HD	63/68 (93%)	62 (98%)	1 (2%)	55	70
2	HE	63/68 (93%)	63 (100%)	0	100	100
2	HF	63/68 (93%)	63 (100%)	0	100	100
2	IA	63/68 (93%)	63 (100%)	0	100	100
2	IB	63/68 (93%)	62 (98%)	1 (2%)	55	70
2	IC	63/68 (93%)	63 (100%)	0	100	100
2	ID	63/68 (93%)	63 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	IE	63/68 (93%)	63 (100%)	0	100	100
2	IF	63/68 (93%)	63 (100%)	0	100	100
2	JA	63/68 (93%)	62 (98%)	1 (2%)	55	70
2	JB	63/68 (93%)	62 (98%)	1 (2%)	55	70
2	JC	63/68 (93%)	63 (100%)	0	100	100
2	JD	63/68 (93%)	62 (98%)	1 (2%)	55	70
2	JE	63/68 (93%)	63 (100%)	0	100	100
2	JF	63/68 (93%)	63 (100%)	0	100	100
2	KA	63/68 (93%)	63 (100%)	0	100	100
2	KB	63/68 (93%)	62 (98%)	1 (2%)	55	70
2	KC	63/68 (93%)	63 (100%)	0	100	100
2	KD	63/68 (93%)	62 (98%)	1 (2%)	55	70
2	KE	63/68 (93%)	63 (100%)	0	100	100
2	KF	63/68 (93%)	63 (100%)	0	100	100
2	LA	63/68 (93%)	62 (98%)	1 (2%)	55	70
2	LB	63/68 (93%)	62 (98%)	1 (2%)	55	70
2	LC	63/68 (93%)	63 (100%)	0	100	100
2	LD	63/68 (93%)	62 (98%)	1 (2%)	55	70
2	LE	63/68 (93%)	63 (100%)	0	100	100
2	LF	63/68 (93%)	63 (100%)	0	100	100
All	All	5973/6384 (94%)	5961 (100%)	12 (0%)	85	85

5 of 12 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	KD	89	LEU
2	LA	89	LEU
1	X	168	ASN
2	LB	89	LEU
2	JA	89	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 93 such sidechains are listed below:

Mol	Chain	Res	Type
1	K	66	GLN
1	P	156	ASN
1	L	66	GLN
1	M	168	ASN
1	R	168	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.

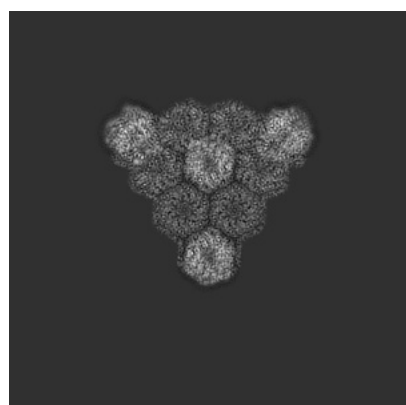
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-9313. These allow visual inspection of the internal detail of the map and identification of artifacts.

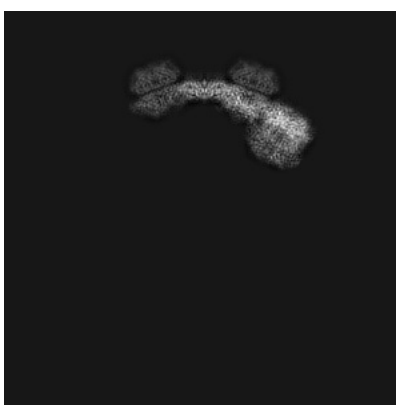
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

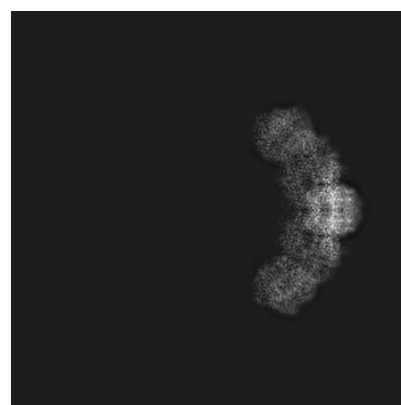
6.1.1 Primary map



X



Y

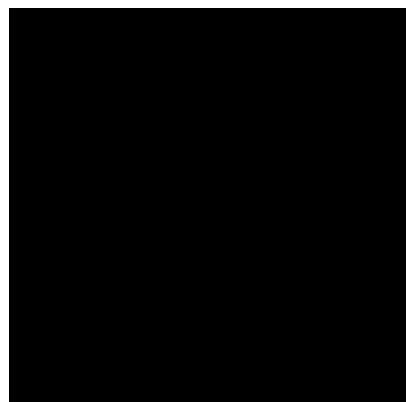


Z

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

6.2 Central slices [i](#)

6.2.1 Primary map



X Index: 256



Y Index: 256



Z Index: 256

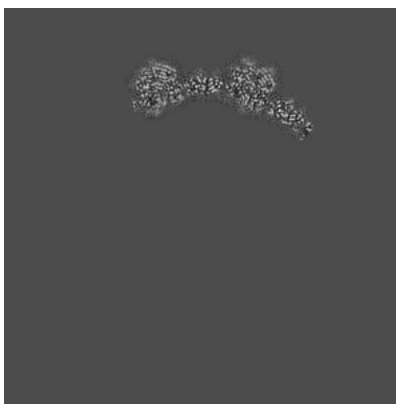
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

6.3.1 Primary map



X Index: 410



Y Index: 242

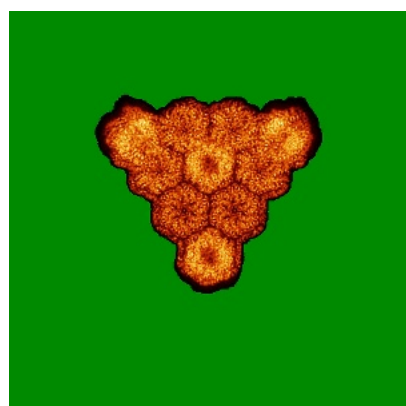


Z Index: 342

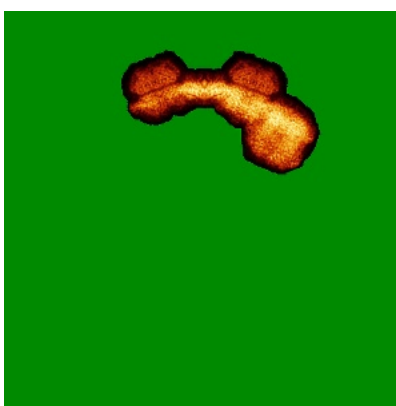
The images above show the largest variance slices of the map in three orthogonal directions.

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

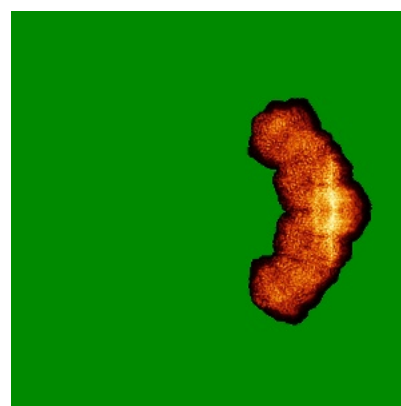
6.4.1 Primary map



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

This section was not generated.

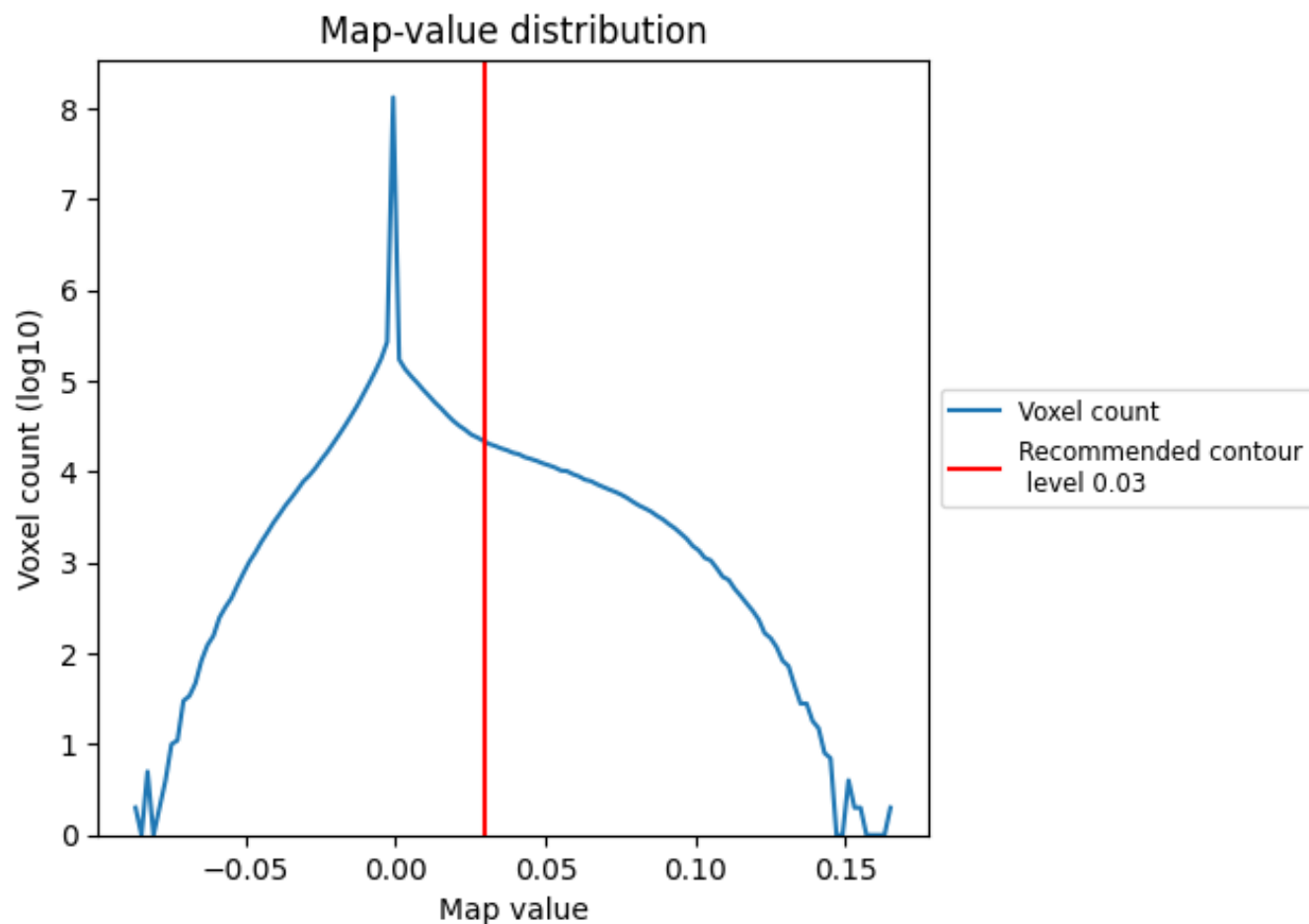
6.6 Mask visualisation

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

7 Map analysis [i](#)

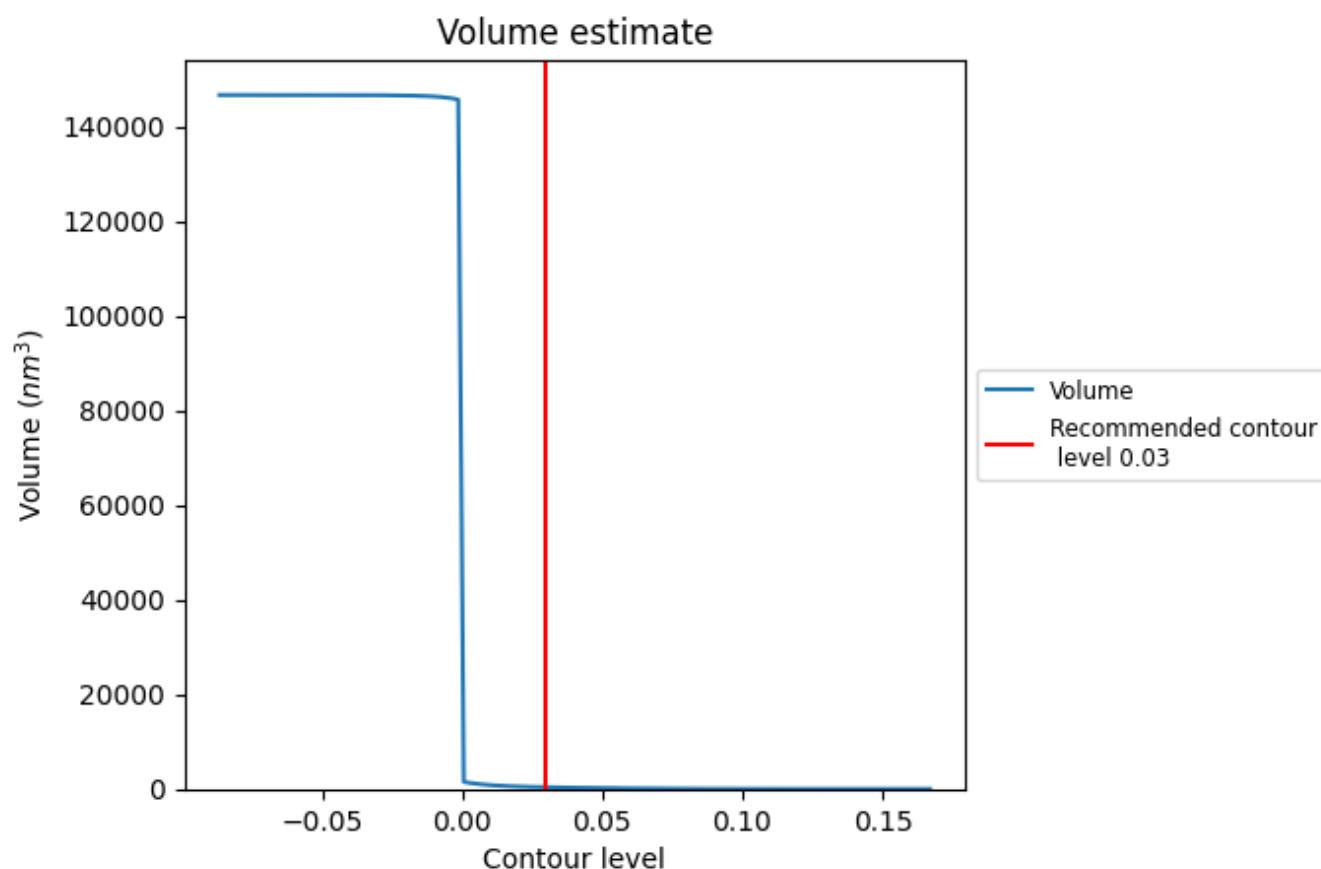
This section contains the results of statistical analysis of the map.

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.

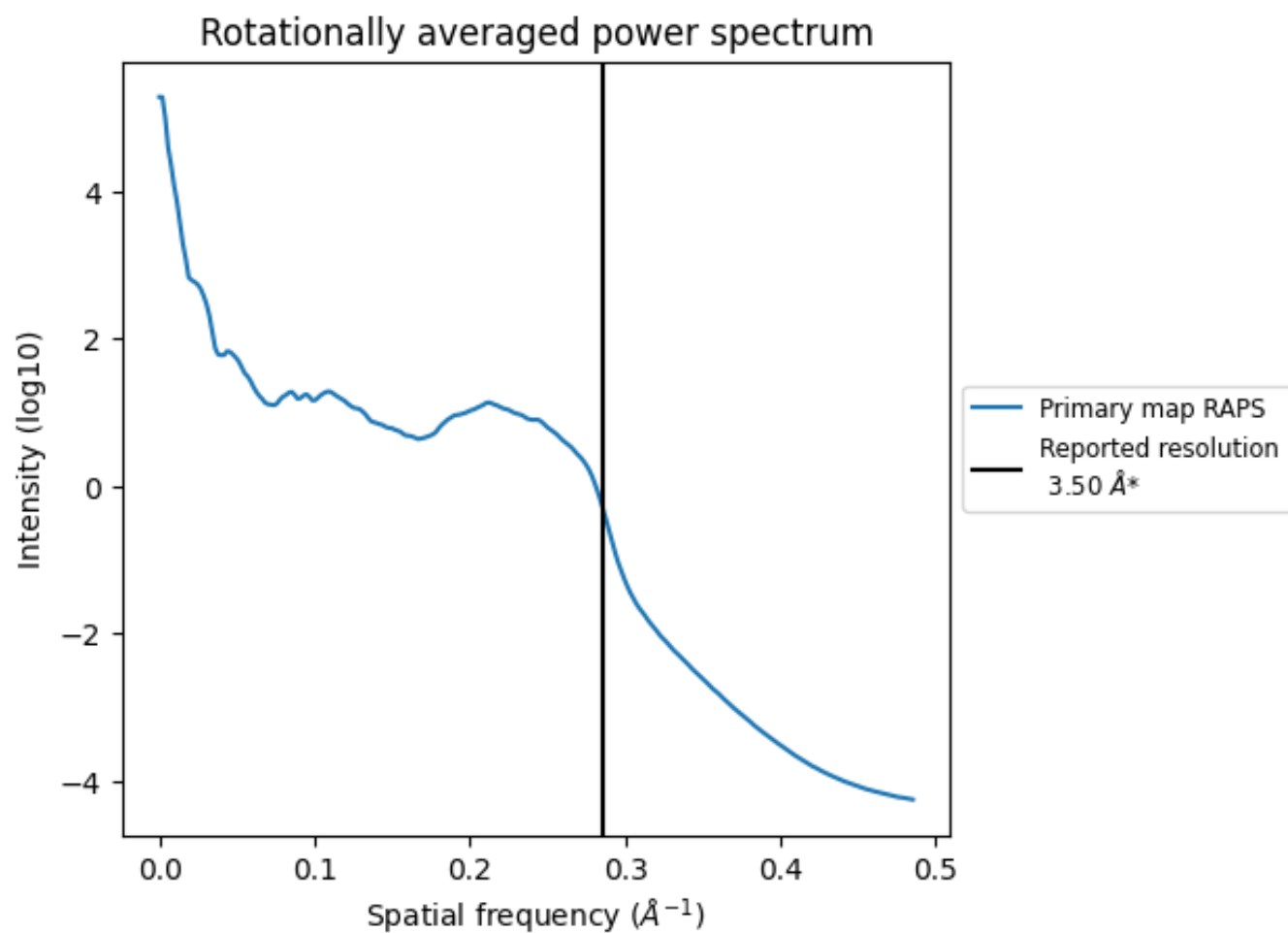
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 360 nm³; this corresponds to an approximate mass of 325 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 0.286 Å⁻¹

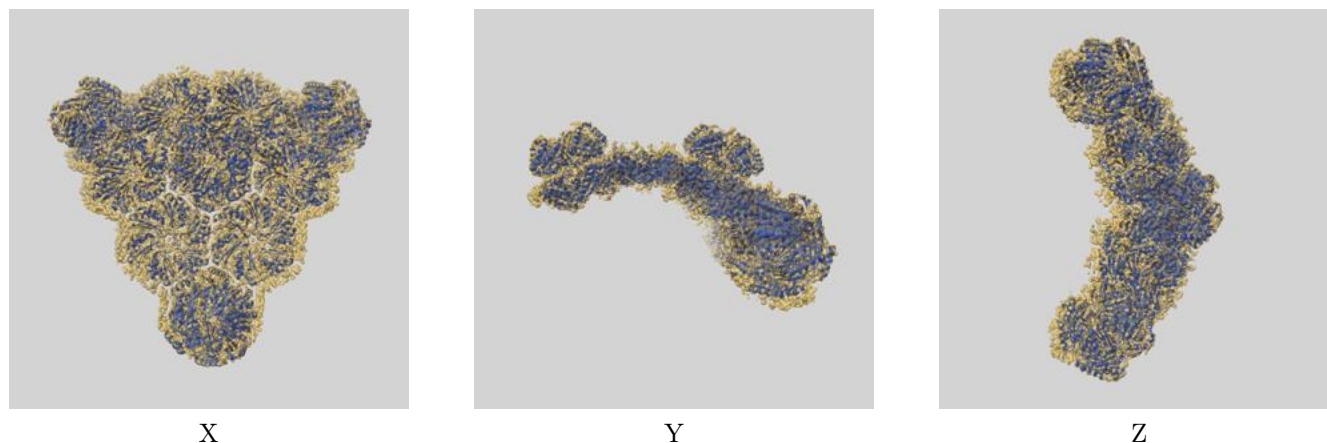
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

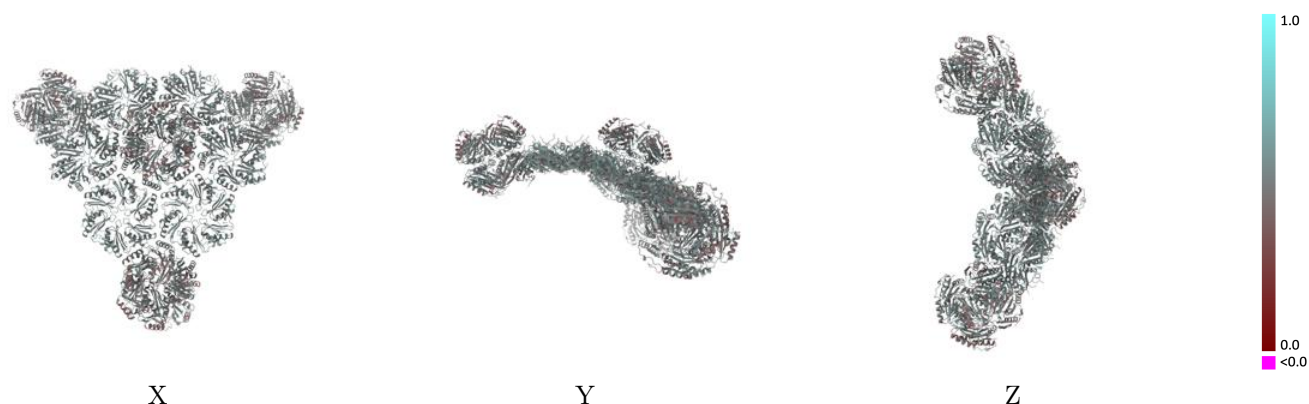
This section contains information regarding the fit between EMDB map EMD-9313 and PDB model 6N09. Per-residue inclusion information can be found in [section 3](#) on [page 10](#).

9.1 Map-model overlay [i](#)



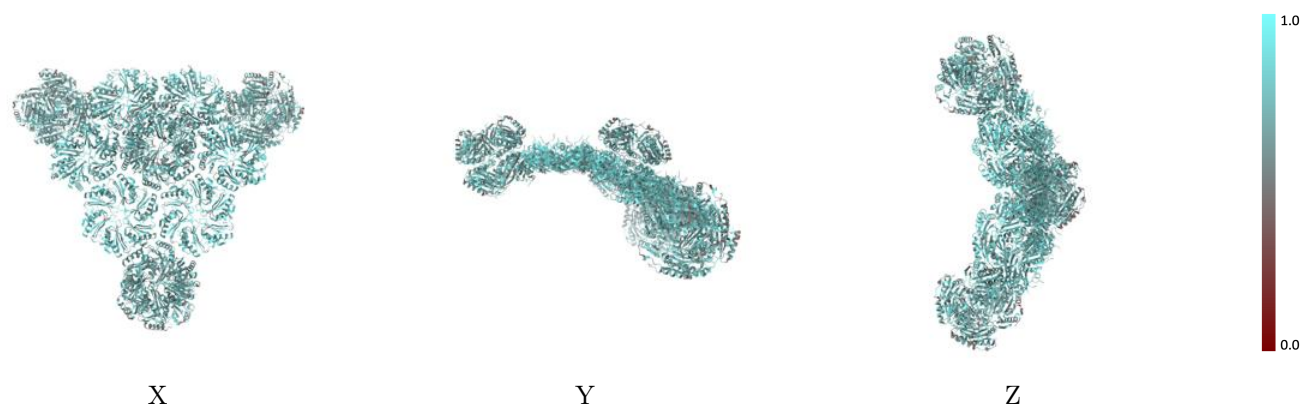
The images above show the 3D surface view of the map at the recommended contour level 0.03 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



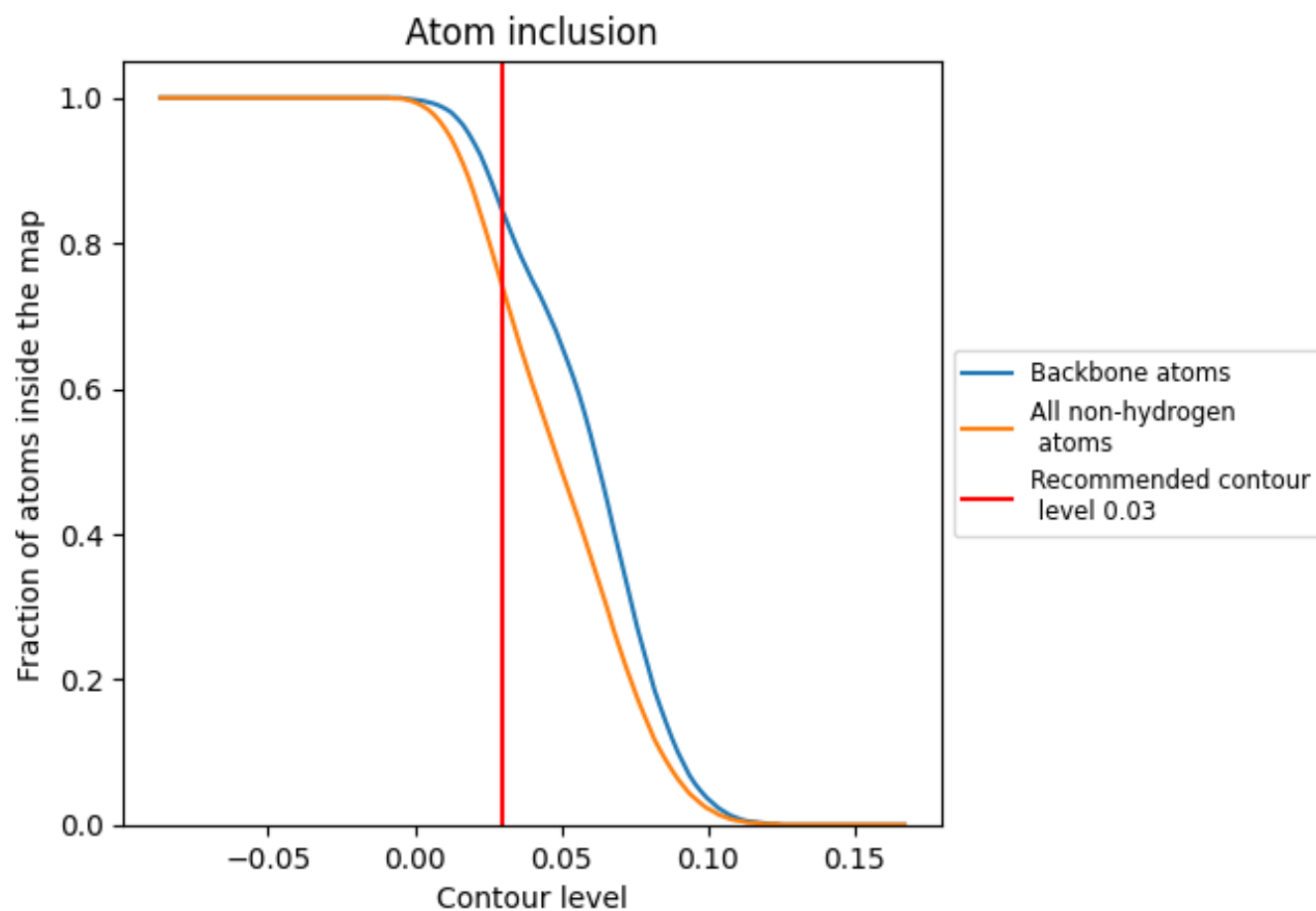
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.03).

9.4 Atom inclusion [i](#)



At the recommended contour level, 84% of all backbone atoms, 74% 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 (0.03) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7380	 0.4980
A	 0.7300	 0.4940
B	 0.7250	 0.4900
C	 0.7280	 0.4940
D	 0.6960	 0.4780
E	 0.6940	 0.4800
F	 0.6990	 0.4810
G	 0.7320	 0.4980
GA	 0.7610	 0.5160
GB	 0.7900	 0.5180
GC	 0.7870	 0.5180
GD	 0.7950	 0.5230
GE	 0.7810	 0.5170
GF	 0.7700	 0.5120
H	 0.7260	 0.4870
HA	 0.7830	 0.5160
HB	 0.7690	 0.5150
HC	 0.7760	 0.5230
HD	 0.7870	 0.5240
HE	 0.7870	 0.5210
HF	 0.7830	 0.5220
I	 0.7240	 0.4880
IA	 0.7620	 0.5180
IB	 0.7950	 0.5190
IC	 0.7750	 0.5170
ID	 0.7930	 0.5270
IE	 0.7900	 0.5170
IF	 0.7720	 0.5070
J	 0.6870	 0.4710
JA	 0.7950	 0.5240
JB	 0.7860	 0.5190
JC	 0.7610	 0.5210
JD	 0.7870	 0.5210
JE	 0.7760	 0.5170
JF	 0.7750	 0.5200



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Chain	Atom inclusion	Q-score
K	 0.6960	 0.4760
KA	 0.7720	 0.5170
KB	 0.7930	 0.5160
KC	 0.7830	 0.5160
KD	 0.7840	 0.5260
KE	 0.7950	 0.5160
KF	 0.7610	 0.5110
L	 0.6990	 0.4790
LA	 0.7870	 0.5210
LB	 0.7860	 0.5130
LC	 0.7670	 0.5140
LD	 0.7890	 0.5270
LE	 0.7840	 0.5240
LF	 0.7900	 0.5220
M	 0.7260	 0.4930
N	 0.7200	 0.4930
O	 0.7200	 0.4920
P	 0.7020	 0.4790
Q	 0.6780	 0.4690
R	 0.6780	 0.4780
S	 0.7390	 0.4940
T	 0.7320	 0.4970
U	 0.7190	 0.4870
V	 0.6980	 0.4740
W	 0.6850	 0.4670
X	 0.6930	 0.4750