



## Full wwPDB EM Validation Report ⓘ

Nov 2, 2022 – 08:00 AM EDT

PDB ID : 5TCP  
EMDB ID : EMD-8398  
Title : Near-atomic resolution cryo-EM structure of the periplasmic domains of PrgH and PrgK  
Authors : Worrall, L.J.; Hong, C.; Vuckovic, M.; Bergeron, J.R.C.; Huang, R.K.; Yu, Z.; Strynadka, N.C.J.  
Deposited on : 2016-09-15  
Resolution : 4.30 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](mailto:validation@mail.wwpdb.org)

A user guide is available at

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

The types of validation reports are described at

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

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

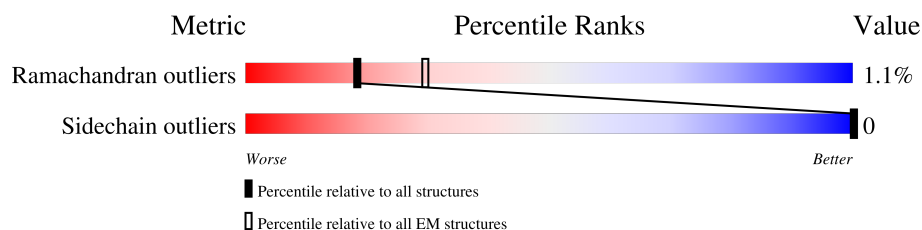
EMDB validation analysis : 0.0.1.dev43  
MolProbity : 4.02b-467  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.9  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.31.2

# 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 4.30 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)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion  $< 40\%$ ). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	0	235	78%22%
1	2	235	77%22%
1	4	235	78%22%
1	6	235	78%22%
1	8	235	78%22%
1	B	235	77%22%
1	D	235	78%22%
1	F	235	78%22%
1	H	235	78%22%

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Mol	Chain	Length	Quality of chain	
1	J	235	5% 	78% 22%
1	L	235	• 	78% 22%
1	N	235	5% 	78% 22%
1	P	235	• 	78% 22%
1	R	235	• 	78% 22%
1	T	235	• 	78% 22%
1	V	235	6% 	78% 22%
1	X	235	• 	78% 22%
1	Z	235	5% 	78% 22%
1	a	235	5% 	78% 22%
1	c	235	5% 	78% 22%
1	e	235	5% 	78% 22%
1	g	235	5% 	78% 22%
1	i	235	5% 	78% 22%
1	k	235	5% 	78% 22%
2	1	263	• 	72% 26%
2	3	263	• 	72% 26%
2	5	263	• 	72% 26%
2	7	263	• 	72% 26%
2	9	263	• 	72% 26%
2	A	263	• 	72% 26%
2	C	263	• 	72% 26%
2	E	263	• 	72% 26%
2	G	263	• 	72% 26%
2	I	263	• 	72% 26%

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Mol	Chain	Length	Quality of chain
2	K	263	
2	M	263	
2	O	263	
2	Q	263	
2	S	263	
2	U	263	
2	W	263	
2	Y	263	
2	b	263	
2	d	263	
2	f	263	
2	h	263	
2	j	263	
2	l	263	

## 2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 72888 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 Lipoprotein PrgK.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	0	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		
1	2	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		
1	4	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		
1	6	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		
1	8	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		
1	B	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		
1	D	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		
1	F	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		
1	H	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		
1	J	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		
1	L	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		
1	N	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		
1	P	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		
1	R	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		
1	T	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		
1	V	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		
1	X	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		

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Mol	Chain	Residues	Atoms					AltConf	Trace
1	Z	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		
1	a	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		
1	c	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		
1	e	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		
1	g	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		
1	i	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		
1	k	184	Total	C	N	O	S	0	0
			1437	905	250	279	3		

- Molecule 2 is a protein called Protein PrgH.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	1	194	Total	C	N	O	S	0	0
			1600	1011	288	297	4		
2	3	194	Total	C	N	O	S	0	0
			1600	1011	288	297	4		
2	5	194	Total	C	N	O	S	0	0
			1600	1011	288	297	4		
2	7	194	Total	C	N	O	S	0	0
			1600	1011	288	297	4		
2	9	194	Total	C	N	O	S	0	0
			1600	1011	288	297	4		
2	A	194	Total	C	N	O	S	0	0
			1600	1011	288	297	4		
2	C	194	Total	C	N	O	S	0	0
			1600	1011	288	297	4		
2	E	194	Total	C	N	O	S	0	0
			1600	1011	288	297	4		
2	G	194	Total	C	N	O	S	0	0
			1600	1011	288	297	4		
2	I	194	Total	C	N	O	S	0	0
			1600	1011	288	297	4		
2	K	194	Total	C	N	O	S	0	0
			1600	1011	288	297	4		
2	M	194	Total	C	N	O	S	0	0
			1600	1011	288	297	4		

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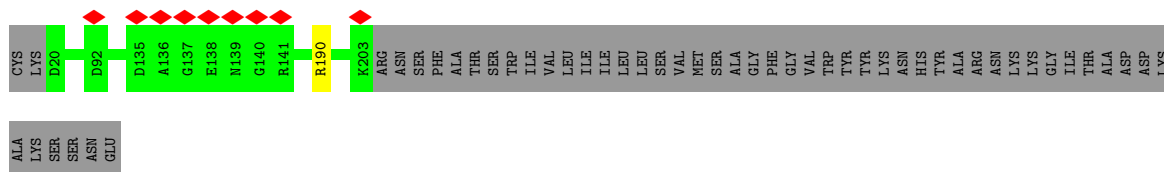
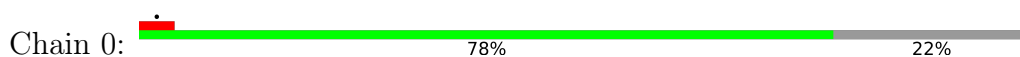
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Mol	Chain	Residues	Atoms					AltConf	Trace
2	O	194	Total 1600	C 1011	N 288	O 297	S 4	0	0
2	Q	194	Total 1600	C 1011	N 288	O 297	S 4	0	0
2	S	194	Total 1600	C 1011	N 288	O 297	S 4	0	0
2	U	194	Total 1600	C 1011	N 288	O 297	S 4	0	0
2	W	194	Total 1600	C 1011	N 288	O 297	S 4	0	0
2	Y	194	Total 1600	C 1011	N 288	O 297	S 4	0	0
2	b	194	Total 1600	C 1011	N 288	O 297	S 4	0	0
2	d	194	Total 1600	C 1011	N 288	O 297	S 4	0	0
2	f	194	Total 1600	C 1011	N 288	O 297	S 4	0	0
2	h	194	Total 1600	C 1011	N 288	O 297	S 4	0	0
2	j	194	Total 1600	C 1011	N 288	O 297	S 4	0	0
2	l	194	Total 1600	C 1011	N 288	O 297	S 4	0	0

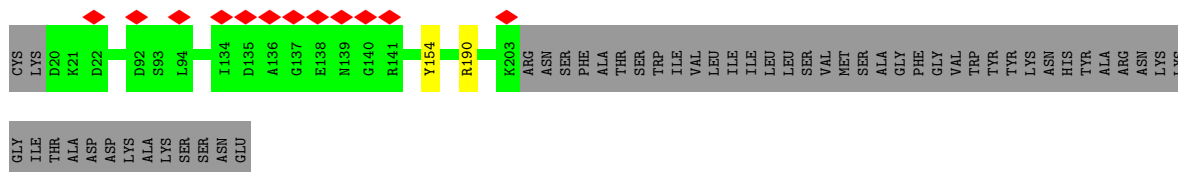
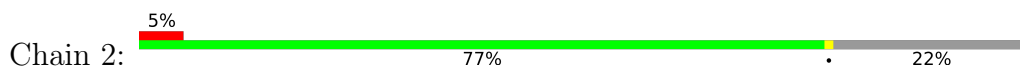
### 3 Residue-property plots [i](#)

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.

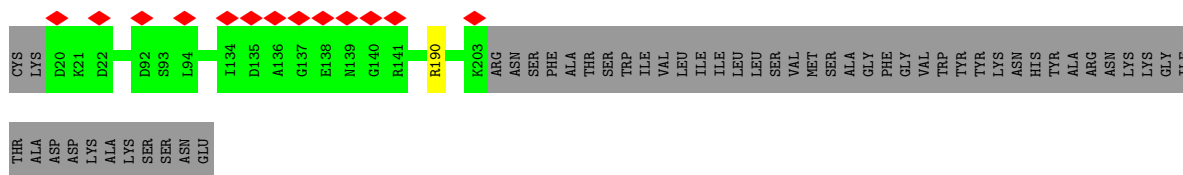
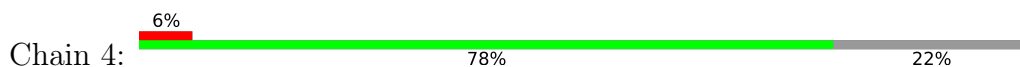
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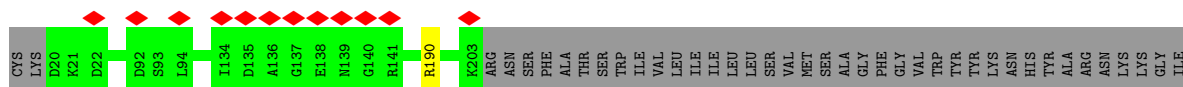
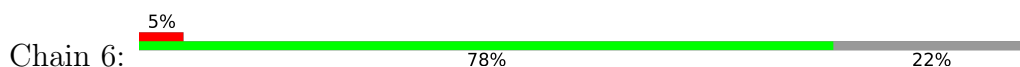
- Molecule 1: Lipoprotein PrgK



- Molecule 1: Lipoprotein PrgK



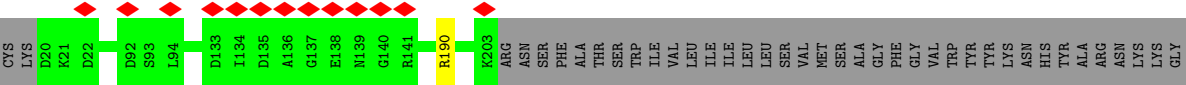
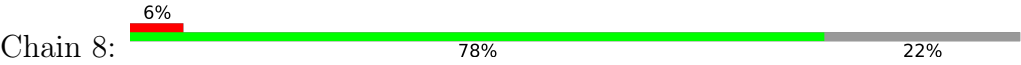
- Molecule 1: Lipoprotein PrgK





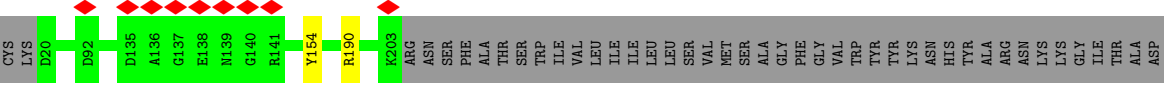
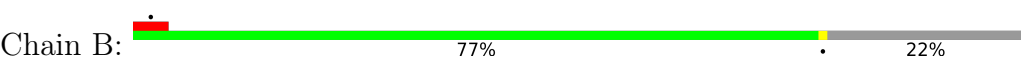
THR  
ALA  
ASP  
ASP  
LYS  
LYS  
ALA  
LYS  
SER  
SER  
ASN  
GLU

• Molecule 1: Lipoprotein PrgK



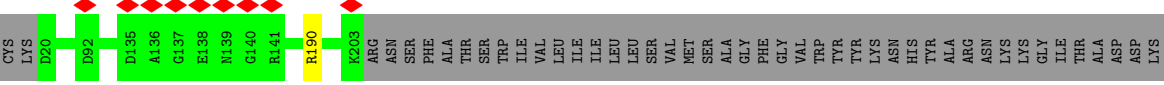
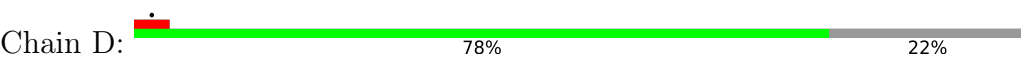
ILE  
THR  
ALA  
ASP  
ASP  
LYS  
LYS  
ALA  
LYS  
SER  
SER  
ASN  
GLU

• Molecule 1: Lipoprotein PrgK



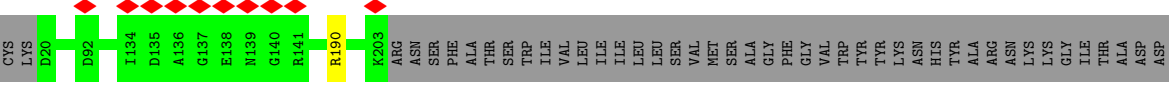
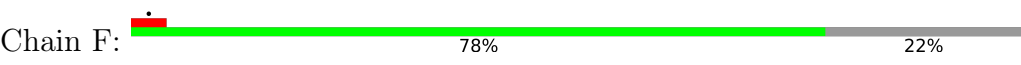
ASP  
LYS  
ALA  
LYS  
SER  
SER  
ASN  
GLU

• Molecule 1: Lipoprotein PrgK



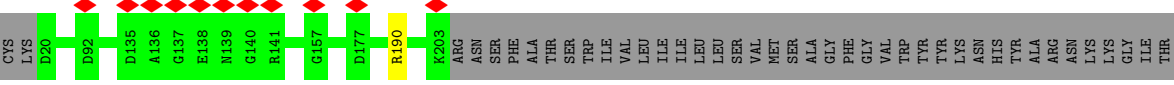
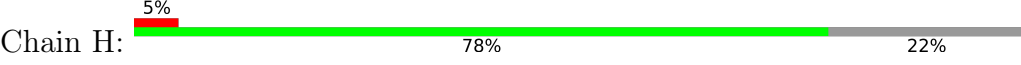
ALA  
LYS  
SER  
SER  
ASN  
GLU

• Molecule 1: Lipoprotein PrgK




LYS  
ALA  
LYS  
SER  
SER  
ASN  
GLU

• Molecule 1: Lipoprotein PrgK



ALA  
ASP  
ASP  
LYS  
LYS  
ALA  
LYS  
SER  
SER  
ASN  
GLU


• Molecule 1: Lipoprotein PrgK

Chain J:  5% 78% 22%

CYS  
LYS  
D20  
L54  
D92  
D135  
A136  
G137  
E138  
N139  
G140  
R141  
D177  
D181  
R190  
K203  
ARG  
ASN  
SER  
PHE  
ALA  
THR  
SER  
TRP  
ILE  
VAL  
LEU  
ILE  
ILE  
LEU  
SER  
VAL  
MET  
SER  
ALA  
GLY  
PHE  
GLY  
VAL  
TRP  
TYR  
TYR  
LYS  
ASN  
HIS  
TYR  
ALA  
ARG  
ASN  
LYS  
GLY

ILE  
THR  
ALA  
ASP  
LYS  
LYS  
ALA  
LYS  
SER  
SER  
ASN  
GLU


• Molecule 1: Lipoprotein PrgK

Chain L:  5% 78% 22%

CYS  
LYS  
D20  
D92  
D135  
A136  
G137  
E138  
N139  
G140  
R141  
R190  
K203  
ARG  
ASN  
SER  
PHE  
ALA  
THR  
SER  
TRP  
ILE  
VAL  
LEU  
ILE  
ILE  
LEU  
SER  
VAL  
MET  
SER  
ALA  
GLY  
PHE  
GLY  
VAL  
TRP  
TYR  
TYR  
LYS  
ASN  
HIS  
TYR  
ALA  
ARG  
ASN  
LYS  
GLY  
THR  
ALA  
ASP  
LYS

ALA  
LYS  
SER  
SER  
ASN  
GLU


• Molecule 1: Lipoprotein PrgK

Chain N:  5% 78% 22%

CYS  
LYS  
D20  
L54  
D92  
D135  
A136  
G137  
E138  
N139  
G140  
R141  
G157  
R190  
K203  
ARG  
ASN  
SER  
PHE  
ALA  
THR  
SER  
TRP  
ILE  
VAL  
LEU  
ILE  
ILE  
LEU  
SER  
VAL  
MET  
SER  
ALA  
GLY  
PHE  
GLY  
VAL  
TRP  
TYR  
TYR  
LYS  
ASN  
HIS  
TYR  
ALA  
ARG  
ASN  
LYS  
GLY  
THR  
ALA  
ASP  
ILE  
THR

ALA  
ASP  
ASP  
LYS  
LYS  
ALA  
LYS  
SER  
SER  
ASN  
GLU


• Molecule 1: Lipoprotein PrgK

Chain P:  5% 78% 22%

CYS  
LYS  
D20  
D92  
D135  
A136  
G137  
E138  
N139  
G140  
R141  
R190  
K203  
ARG  
ASN  
SER  
PHE  
ALA  
THR  
SER  
TRP  
ILE  
VAL  
LEU  
ILE  
ILE  
LEU  
SER  
VAL  
MET  
SER  
ALA  
GLY  
PHE  
GLY  
VAL  
TRP  
TYR  
TYR  
LYS  
ASN  
HIS  
TYR  
ALA  
ARG  
ASN  
LYS  
GLY  
THR  
ALA  
ASP  
LYS

ALA  
LYS  
SER  
SER  
ASN  
GLU

• Molecule 1: Lipoprotein PrgK

Chain R:  5% 78% 22%

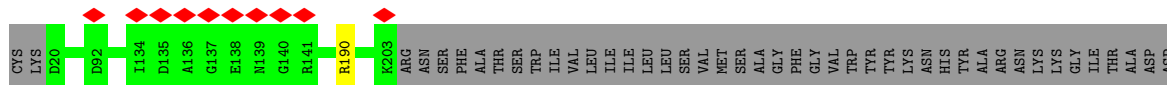
CYS  
LYS  
D20  
D92  
I134  
D135  
A136  
G137  
E138  
N139  
G140  
R141  
R190  
K203  
ARG  
ASN  
SER  
PHE  
ALA  
THR  
SER  
TRP  
ILE  
VAL  
LEU  
ILE  
ILE  
LEU  
SER  
VAL  
MET  
SER  
ALA  
GLY  
PHE  
GLY  
VAL  
TRP  
TYR  
TYR  
LYS  
ASN  
HIS  
TYR  
ALA  
ARG  
ASN  
LYS  
GLY  
THR  
ALA  
ASP  
ASP

ALA  
LYS  
SER  
SER  
ASN  
GLU

LYS  
ALA  
LYS  
SER  
SER  
ASN  
GLU

• Molecule 1: Lipoprotein PrgK

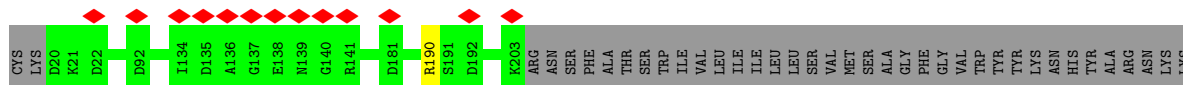
Chain T:



LYS  
ALA  
LYS  
SER  
SER  
ASN  
GLU

• Molecule 1: Lipoprotein PrgK

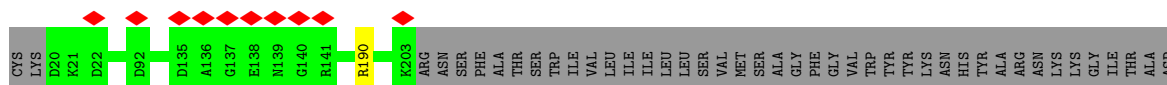
Chain V:



GLY  
ILE  
THR  
ALA  
ASP  
LYS  
ALA  
LYS  
SER  
SER  
ASN  
GLU

• Molecule 1: Lipoprotein PrgK

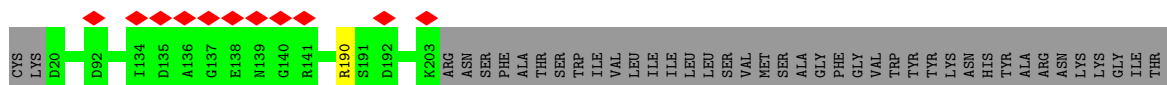
Chain X:



ASP  
LYS  
ALA  
LYS  
SER  
SER  
ASN  
GLU

• Molecule 1: Lipoprotein PrgK

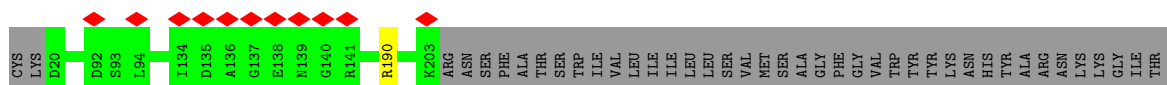
Chain Z:



ASP  
ASP  
LYS  
ALA  
LYS  
SER  
SER  
ASN  
GLU


• Molecule 1: Lipoprotein PrgK

Chain a:



ASP  
ASP  
LYS  
LYS  
ALA  
LYS  
SER  
SER  
SER  
ASN  
GLU


• Molecule 1: Lipoprotein PrgK

Chain c:  5% 78% 22%

CYS LYS D20 D92 D133 I134 D135 A136 G137 E138 N139 G140 R141 R190 K203 ARG ASN SER PHE ALA THR SER TRP ILE VAL LEU ILE ILE LEU LEU SER VAL MET SER ALA GLY PHE GLY VAL TRP TYR TYR LYS ASN HIS TYR ALA ARG ASN LYS GLY ILE THR ALA ASP

ASP  
LYS  
ALA  
LYS  
SER  
SER  
ASN  
GLU


• Molecule 1: Lipoprotein PrgK

Chain e:  5% 78% 22%

CYS LYS D20 D92 S93 L94 I134 D135 A136 G137 E138 N139 G140 R141 R190 K203 ARG ASN SER PHE ALA THR SER TRP ILE VAL LEU ILE ILE LEU LEU SER VAL MET SER ALA GLY PHE GLY VAL TRP TYR TYR LYS ASN HIS TYR ALA ARG ASN LYS GLY ILE THR ALA

ASP  
ASP  
LYS  
LYS  
ALA  
LYS  
SER  
SER  
ASN  
GLU


• Molecule 1: Lipoprotein PrgK

Chain g:  5% 78% 22%

CYS LYS D20 D92 S93 L94 I134 D135 A136 G137 E138 N139 G140 R141 R190 K203 ARG ASN SER PHE ALA THR SER TRP ILE VAL LEU ILE ILE LEU LEU SER VAL MET SER ALA GLY PHE GLY VAL TRP TYR TYR LYS ASN HIS TYR ALA ARG ASN LYS GLY ILE THR ALA

ASP  
ASP  
LYS  
LYS  
ALA  
LYS  
SER  
SER  
ASN  
GLU


• Molecule 1: Lipoprotein PrgK

Chain i:  5% 78% 22%

CYS LYS D20 D92 S93 L94 I134 D135 A136 G137 E138 N139 G140 R141 R190 K203 ARG ASN SER PHE ALA THR SER TRP ILE VAL LEU ILE ILE LEU LEU SER VAL MET SER ALA GLY PHE GLY VAL TRP TYR TYR LYS ASN HIS TYR ALA ARG ASN LYS GLY ILE THR ALA

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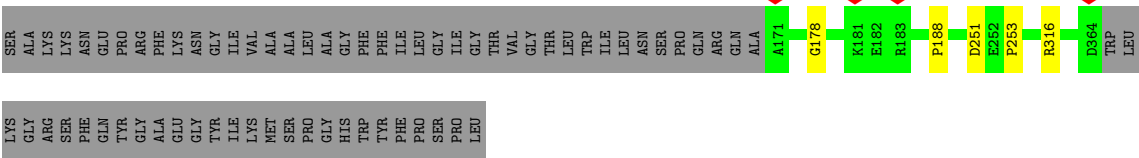
• Molecule 1: Lipoprotein PrgK

Chain k:  5% 78% 22%

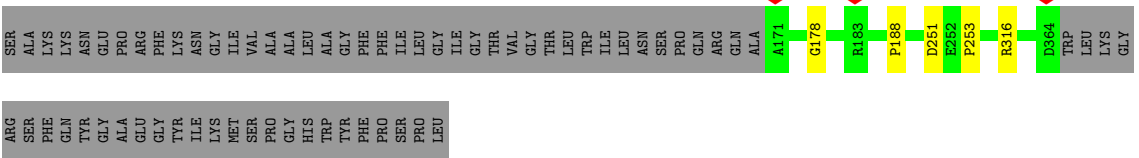
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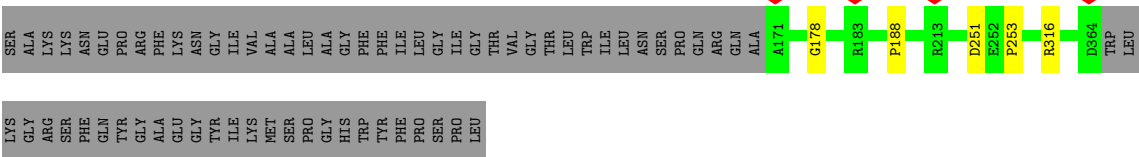
• Molecule 2: Protein PrgH



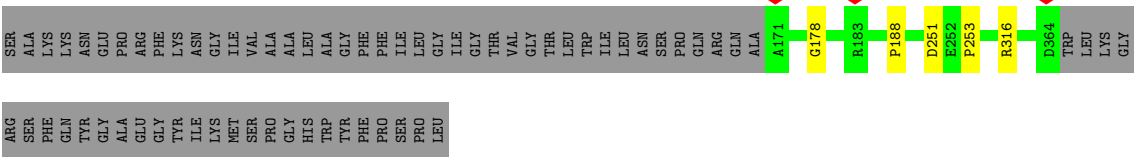
• Molecule 2: Protein PrgH



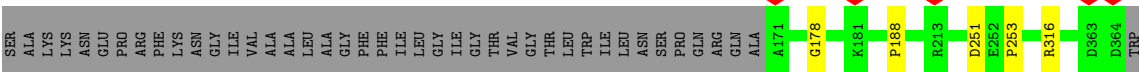
• Molecule 2: Protein PrgH



• Molecule 2: Protein PrgH



• Molecule 2: Protein PrgH



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• Molecule 2: Protein PrgH



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• Molecule 2: Protein PrgH



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• Molecule 2: Protein PrgH



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• Molecule 2: Protein PrgH



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• Molecule 2: Protein PrgH



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• Molecule 2: Protein PrgH



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• Molecule 2: Protein PrgH



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• Molecule 2: Protein PrgH



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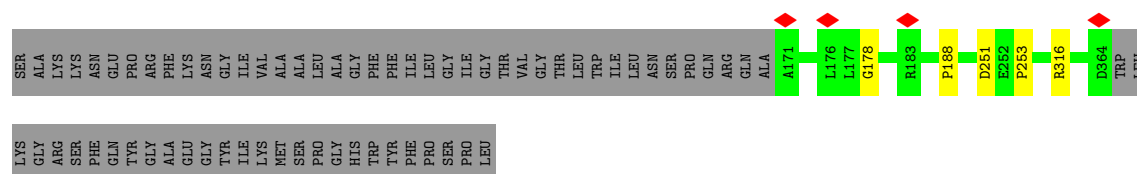
• Molecule 2: Protein PrgH



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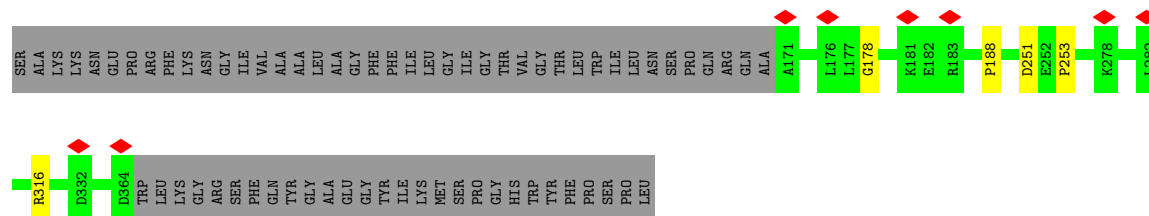
• Molecule 2: Protein PrgH





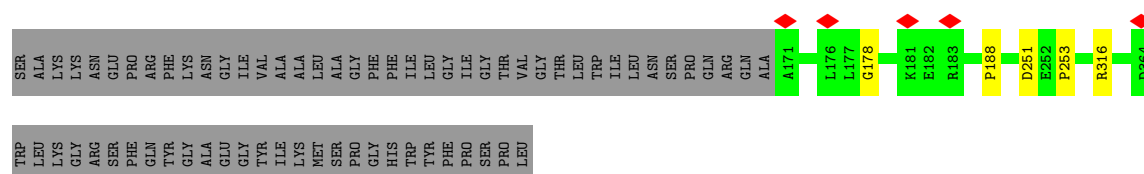
• Molecule 2: Protein PrgH

Chain U: 72% 26%



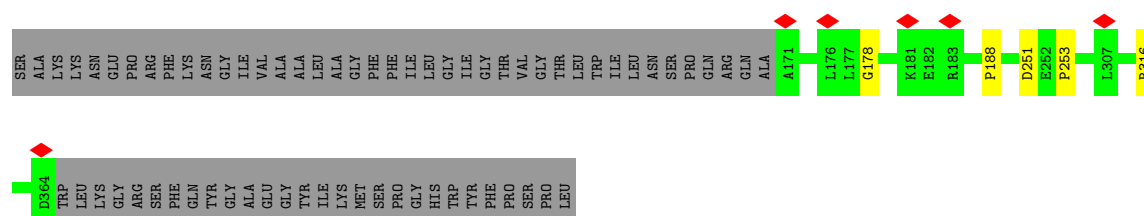
• Molecule 2: Protein PrgH

Chain W: 72% 26%



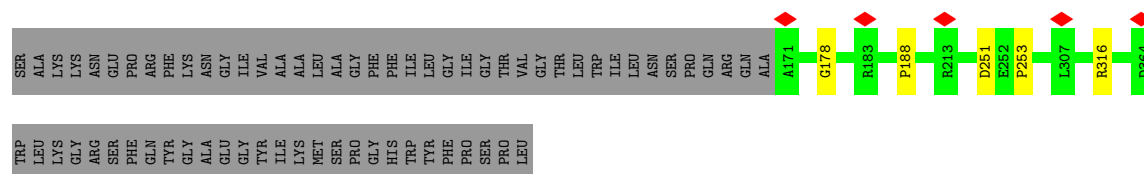
• Molecule 2: Protein PrgH

Chain Y: 72% 26%



• Molecule 2: Protein PrgH

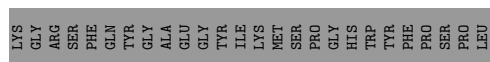
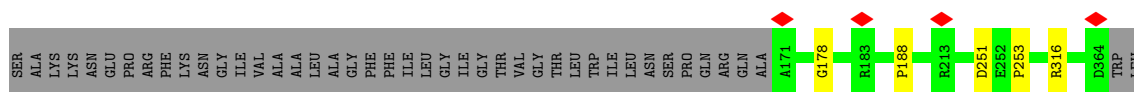
Chain b: 72% 26%



• Molecule 2: Protein PrgH

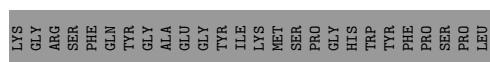
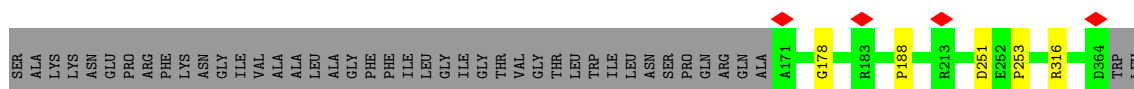


Chain d:  72% 26%



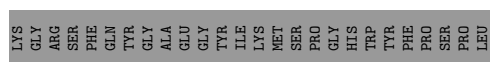
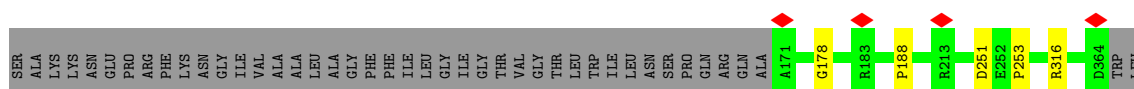
• Molecule 2: Protein PrgH

Chain f:  72% 26%



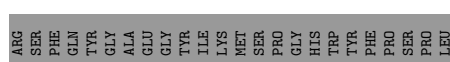
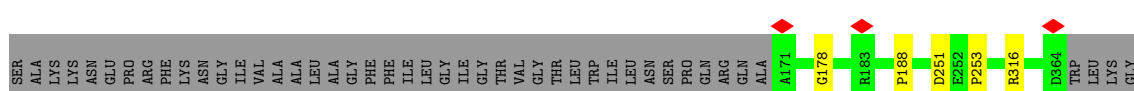
• Molecule 2: Protein PrgH

Chain h:  72% 26%



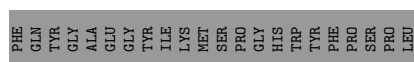
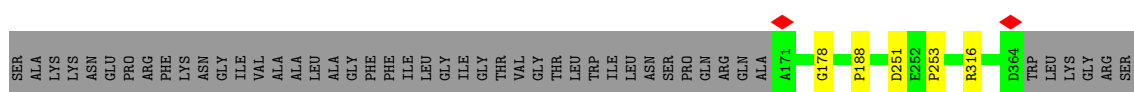
• Molecule 2: Protein PrgH

Chain j:  72% 26%



• Molecule 2: Protein PrgH

Chain l:  72% 26%



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C24	Depositor
Number of particles used	67800	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	1.3	Depositor
Minimum defocus (nm)	1300	Depositor
Maximum defocus (nm)	3200	Depositor
Magnification	29240	Depositor
Image detector	GATAN K2 QUANTUM (4k x 4k)	Depositor
Maximum map value	0.247	Depositor
Minimum map value	-0.223	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.011	Depositor
Recommended contour level	0.06	Depositor
Map size (Å)	513.0, 513.0, 513.0	wwPDB
Map dimensions	300, 300, 300	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.71, 1.71, 1.71	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	0	0.77	0/1465	0.68	1/1989 (0.1%)
1	2	0.77	0/1465	0.68	2/1989 (0.1%)
1	4	0.77	0/1465	0.68	1/1989 (0.1%)
1	6	0.77	0/1465	0.68	1/1989 (0.1%)
1	8	0.77	0/1465	0.68	1/1989 (0.1%)
1	B	0.77	0/1465	0.68	2/1989 (0.1%)
1	D	0.77	0/1465	0.68	1/1989 (0.1%)
1	F	0.77	0/1465	0.68	1/1989 (0.1%)
1	H	0.77	0/1465	0.68	1/1989 (0.1%)
1	J	0.77	0/1465	0.68	1/1989 (0.1%)
1	L	0.77	0/1465	0.68	1/1989 (0.1%)
1	N	0.77	0/1465	0.68	1/1989 (0.1%)
1	P	0.77	0/1465	0.68	1/1989 (0.1%)
1	R	0.77	0/1465	0.68	1/1989 (0.1%)
1	T	0.77	0/1465	0.68	1/1989 (0.1%)
1	V	0.77	0/1465	0.68	1/1989 (0.1%)
1	X	0.77	0/1465	0.68	1/1989 (0.1%)
1	Z	0.77	0/1465	0.68	1/1989 (0.1%)
1	a	0.77	0/1465	0.68	1/1989 (0.1%)
1	c	0.77	0/1465	0.68	1/1989 (0.1%)
1	e	0.77	0/1465	0.68	1/1989 (0.1%)
1	g	0.77	0/1465	0.68	1/1989 (0.1%)
1	i	0.77	0/1465	0.68	1/1989 (0.1%)
1	k	0.77	0/1465	0.68	1/1989 (0.1%)
2	1	0.77	0/1632	0.70	1/2204 (0.0%)
2	3	0.77	0/1632	0.70	1/2204 (0.0%)
2	5	0.77	0/1632	0.71	1/2204 (0.0%)
2	7	0.77	0/1632	0.70	1/2204 (0.0%)
2	9	0.77	0/1632	0.70	1/2204 (0.0%)
2	A	0.77	0/1632	0.70	1/2204 (0.0%)
2	C	0.77	0/1632	0.70	1/2204 (0.0%)
2	E	0.77	0/1632	0.70	1/2204 (0.0%)
2	G	0.77	0/1632	0.71	1/2204 (0.0%)
2	I	0.77	0/1632	0.70	1/2204 (0.0%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
2	K	0.77	0/1632	0.70	1/2204 (0.0%)
2	M	0.77	0/1632	0.70	1/2204 (0.0%)
2	O	0.77	0/1632	0.70	1/2204 (0.0%)
2	Q	0.77	0/1632	0.70	1/2204 (0.0%)
2	S	0.77	0/1632	0.70	1/2204 (0.0%)
2	U	0.77	0/1632	0.70	1/2204 (0.0%)
2	W	0.76	0/1632	0.70	1/2204 (0.0%)
2	Y	0.77	0/1632	0.70	1/2204 (0.0%)
2	b	0.77	0/1632	0.70	1/2204 (0.0%)
2	d	0.77	0/1632	0.70	1/2204 (0.0%)
2	f	0.77	0/1632	0.70	1/2204 (0.0%)
2	h	0.77	0/1632	0.70	1/2204 (0.0%)
2	j	0.77	0/1632	0.70	1/2204 (0.0%)
2	l	0.77	0/1632	0.70	1/2204 (0.0%)
All	All	0.77	0/74328	0.69	50/100632 (0.0%)

There are no bond length outliers.

All (50) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	Z	190	ARG	NE-CZ-NH2	-5.78	117.41	120.30
1	4	190	ARG	NE-CZ-NH2	-5.78	117.41	120.30
1	N	190	ARG	NE-CZ-NH2	-5.78	117.41	120.30
1	P	190	ARG	NE-CZ-NH2	-5.75	117.42	120.30
1	e	190	ARG	NE-CZ-NH2	-5.74	117.43	120.30
1	D	190	ARG	NE-CZ-NH2	-5.73	117.43	120.30
1	X	190	ARG	NE-CZ-NH2	-5.73	117.44	120.30
1	k	190	ARG	NE-CZ-NH2	-5.72	117.44	120.30
1	T	190	ARG	NE-CZ-NH2	-5.72	117.44	120.30
1	V	190	ARG	NE-CZ-NH2	-5.72	117.44	120.30
1	a	190	ARG	NE-CZ-NH2	-5.72	117.44	120.30
1	2	190	ARG	NE-CZ-NH2	-5.70	117.45	120.30
1	c	190	ARG	NE-CZ-NH2	-5.69	117.45	120.30
1	R	190	ARG	NE-CZ-NH2	-5.69	117.46	120.30
1	g	190	ARG	NE-CZ-NH2	-5.69	117.46	120.30
1	6	190	ARG	NE-CZ-NH2	-5.68	117.46	120.30
1	H	190	ARG	NE-CZ-NH2	-5.67	117.47	120.30
1	F	190	ARG	NE-CZ-NH2	-5.66	117.47	120.30
1	L	190	ARG	NE-CZ-NH2	-5.65	117.47	120.30
1	B	190	ARG	NE-CZ-NH2	-5.64	117.48	120.30
1	J	190	ARG	NE-CZ-NH2	-5.60	117.50	120.30
1	i	190	ARG	NE-CZ-NH2	-5.60	117.50	120.30

*Continued on next page...*

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	0	190	ARG	NE-CZ-NH2	-5.59	117.51	120.30
1	8	190	ARG	NE-CZ-NH2	-5.58	117.51	120.30
2	9	316	ARG	NE-CZ-NH2	-5.40	117.60	120.30
2	O	316	ARG	NE-CZ-NH2	-5.34	117.63	120.30
2	C	316	ARG	NE-CZ-NH2	-5.34	117.63	120.30
2	Q	316	ARG	NE-CZ-NH2	-5.33	117.64	120.30
2	Y	316	ARG	NE-CZ-NH2	-5.33	117.64	120.30
2	K	316	ARG	NE-CZ-NH2	-5.31	117.64	120.30
2	5	316	ARG	NE-CZ-NH2	-5.30	117.65	120.30
2	h	316	ARG	NE-CZ-NH2	-5.30	117.65	120.30
2	3	316	ARG	NE-CZ-NH2	-5.29	117.65	120.30
2	G	316	ARG	NE-CZ-NH2	-5.29	117.65	120.30
2	b	316	ARG	NE-CZ-NH2	-5.29	117.66	120.30
2	d	316	ARG	NE-CZ-NH2	-5.28	117.66	120.30
2	l	316	ARG	NE-CZ-NH2	-5.28	117.66	120.30
2	S	316	ARG	NE-CZ-NH2	-5.28	117.66	120.30
2	M	316	ARG	NE-CZ-NH2	-5.27	117.67	120.30
2	7	316	ARG	NE-CZ-NH2	-5.25	117.67	120.30
2	A	316	ARG	NE-CZ-NH2	-5.25	117.67	120.30
2	f	316	ARG	NE-CZ-NH2	-5.24	117.68	120.30
2	U	316	ARG	NE-CZ-NH2	-5.23	117.68	120.30
2	j	316	ARG	NE-CZ-NH2	-5.23	117.68	120.30
2	W	316	ARG	NE-CZ-NH2	-5.22	117.69	120.30
2	E	316	ARG	NE-CZ-NH2	-5.21	117.69	120.30
2	1	316	ARG	NE-CZ-NH2	-5.21	117.70	120.30
2	I	316	ARG	NE-CZ-NH2	-5.18	117.71	120.30
1	B	154	TYR	CB-CG-CD2	-5.03	117.98	121.00
1	2	154	TYR	CB-CG-CD2	-5.01	118.00	121.00

There are no chirality outliers.

There are no planarity outliers.

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

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

## 5.3 Torsion angles ⓘ

### 5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	0	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	2	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	4	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	6	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	8	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	B	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	D	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	F	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	H	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	J	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	L	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	N	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	P	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	R	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	T	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	V	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	X	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	Z	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	a	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	c	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	e	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	g	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	i	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
1	k	182/235 (77%)	175 (96%)	7 (4%)	0	100	100
2	1	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	3	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
2	5	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
2	7	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
2	9	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
2	A	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
2	C	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
2	E	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
2	G	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
2	I	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
2	K	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
2	M	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
2	O	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
2	Q	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
2	S	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
2	U	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
2	W	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
2	Y	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
2	b	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
2	d	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
2	f	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
2	h	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
2	j	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
2	l	192/263 (73%)	182 (95%)	6 (3%)	4 (2%)	7	39
All	All	8976/11952 (75%)	8568 (96%)	312 (4%)	96 (1%)	18	52

All (96) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	1	251	ASP
2	3	251	ASP
2	5	251	ASP
2	7	251	ASP
2	9	251	ASP
2	A	251	ASP

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Mol	Chain	Res	Type
2	C	251	ASP
2	E	251	ASP
2	G	251	ASP
2	I	251	ASP
2	K	251	ASP
2	M	251	ASP
2	O	251	ASP
2	Q	251	ASP
2	S	251	ASP
2	U	251	ASP
2	W	251	ASP
2	Y	251	ASP
2	b	251	ASP
2	d	251	ASP
2	f	251	ASP
2	h	251	ASP
2	j	251	ASP
2	l	251	ASP
2	1	178	GLY
2	3	178	GLY
2	5	178	GLY
2	7	178	GLY
2	9	178	GLY
2	A	178	GLY
2	C	178	GLY
2	E	178	GLY
2	G	178	GLY
2	I	178	GLY
2	K	178	GLY
2	M	178	GLY
2	O	178	GLY
2	Q	178	GLY
2	S	178	GLY
2	U	178	GLY
2	W	178	GLY
2	Y	178	GLY
2	b	178	GLY
2	d	178	GLY
2	f	178	GLY
2	h	178	GLY
2	j	178	GLY
2	l	178	GLY

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Mol	Chain	Res	Type
2	1	188	PRO
2	1	253	PRO
2	3	188	PRO
2	3	253	PRO
2	5	188	PRO
2	5	253	PRO
2	7	188	PRO
2	7	253	PRO
2	9	188	PRO
2	9	253	PRO
2	A	188	PRO
2	A	253	PRO
2	C	188	PRO
2	C	253	PRO
2	E	188	PRO
2	E	253	PRO
2	G	188	PRO
2	G	253	PRO
2	I	188	PRO
2	I	253	PRO
2	K	188	PRO
2	K	253	PRO
2	M	188	PRO
2	M	253	PRO
2	O	188	PRO
2	O	253	PRO
2	Q	188	PRO
2	Q	253	PRO
2	S	188	PRO
2	S	253	PRO
2	U	188	PRO
2	U	253	PRO
2	W	188	PRO
2	W	253	PRO
2	Y	188	PRO
2	Y	253	PRO
2	b	188	PRO
2	b	253	PRO
2	d	188	PRO
2	d	253	PRO
2	f	188	PRO
2	f	253	PRO

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Mol	Chain	Res	Type
2	h	188	PRO
2	h	253	PRO
2	j	188	PRO
2	j	253	PRO
2	l	188	PRO
2	l	253	PRO

### 5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	0	157/200 (78%)	157 (100%)	0	100	100
1	2	157/200 (78%)	157 (100%)	0	100	100
1	4	157/200 (78%)	157 (100%)	0	100	100
1	6	157/200 (78%)	157 (100%)	0	100	100
1	8	157/200 (78%)	157 (100%)	0	100	100
1	B	157/200 (78%)	157 (100%)	0	100	100
1	D	157/200 (78%)	157 (100%)	0	100	100
1	F	157/200 (78%)	157 (100%)	0	100	100
1	H	157/200 (78%)	157 (100%)	0	100	100
1	J	157/200 (78%)	157 (100%)	0	100	100
1	L	157/200 (78%)	157 (100%)	0	100	100
1	N	157/200 (78%)	157 (100%)	0	100	100
1	P	157/200 (78%)	157 (100%)	0	100	100
1	R	157/200 (78%)	157 (100%)	0	100	100
1	T	157/200 (78%)	157 (100%)	0	100	100
1	V	157/200 (78%)	157 (100%)	0	100	100
1	X	157/200 (78%)	157 (100%)	0	100	100
1	Z	157/200 (78%)	157 (100%)	0	100	100
1	a	157/200 (78%)	157 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	c	157/200 (78%)	157 (100%)	0	100	100
1	e	157/200 (78%)	157 (100%)	0	100	100
1	g	157/200 (78%)	157 (100%)	0	100	100
1	i	157/200 (78%)	157 (100%)	0	100	100
1	k	157/200 (78%)	157 (100%)	0	100	100
2	1	167/221 (76%)	167 (100%)	0	100	100
2	3	167/221 (76%)	167 (100%)	0	100	100
2	5	167/221 (76%)	167 (100%)	0	100	100
2	7	167/221 (76%)	167 (100%)	0	100	100
2	9	167/221 (76%)	167 (100%)	0	100	100
2	A	167/221 (76%)	167 (100%)	0	100	100
2	C	167/221 (76%)	167 (100%)	0	100	100
2	E	167/221 (76%)	167 (100%)	0	100	100
2	G	167/221 (76%)	167 (100%)	0	100	100
2	I	167/221 (76%)	167 (100%)	0	100	100
2	K	167/221 (76%)	167 (100%)	0	100	100
2	M	167/221 (76%)	167 (100%)	0	100	100
2	O	167/221 (76%)	167 (100%)	0	100	100
2	Q	167/221 (76%)	167 (100%)	0	100	100
2	S	167/221 (76%)	167 (100%)	0	100	100
2	U	167/221 (76%)	167 (100%)	0	100	100
2	W	167/221 (76%)	167 (100%)	0	100	100
2	Y	167/221 (76%)	167 (100%)	0	100	100
2	b	167/221 (76%)	167 (100%)	0	100	100
2	d	167/221 (76%)	167 (100%)	0	100	100
2	f	167/221 (76%)	167 (100%)	0	100	100
2	h	167/221 (76%)	167 (100%)	0	100	100
2	j	167/221 (76%)	167 (100%)	0	100	100
2	l	167/221 (76%)	167 (100%)	0	100	100
All	All	7776/10104 (77%)	7776 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

### 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 monosaccharides 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.

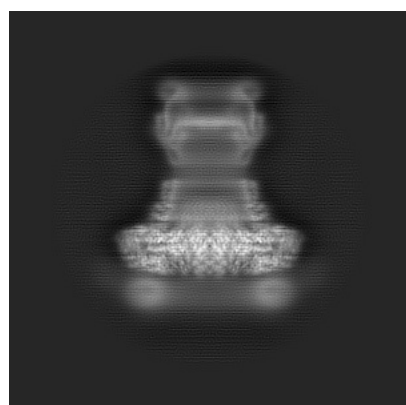
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-8398. These allow visual inspection of the internal detail of the map and identification of artifacts.

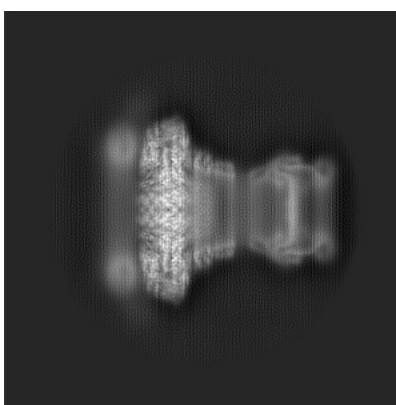
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

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

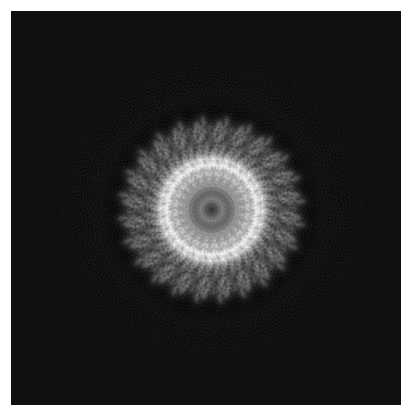
#### 6.1.1 Primary map



X



Y

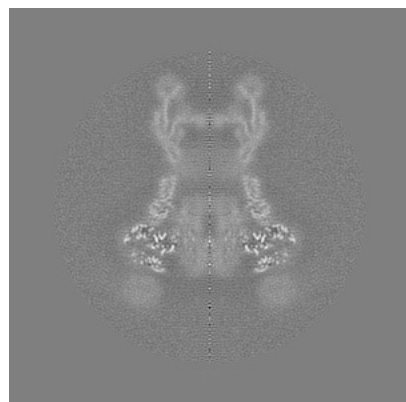


Z

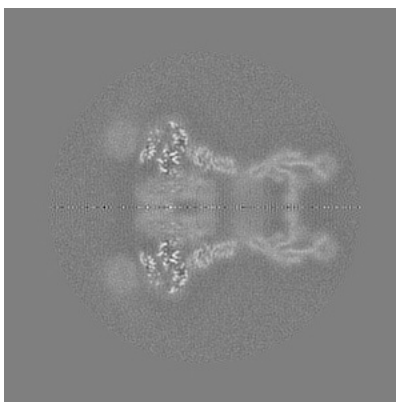
The images above show the map projected in three orthogonal directions.

### 6.2 Central slices [i](#)

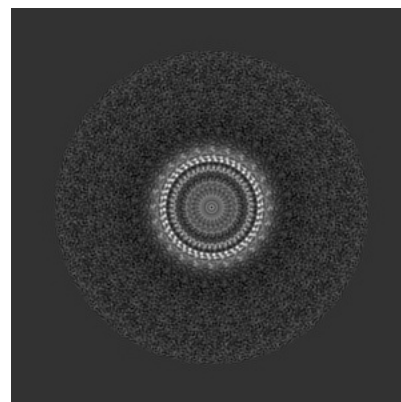
#### 6.2.1 Primary map



X Index: 150



Y Index: 150

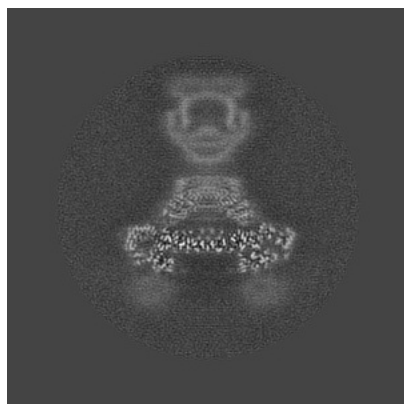


Z Index: 150

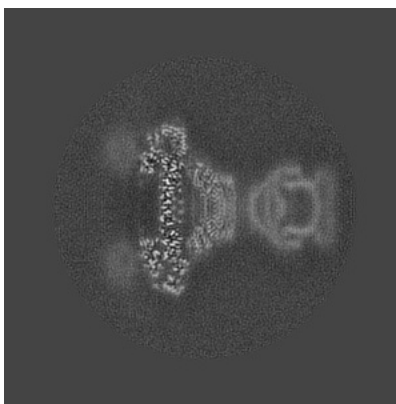
The images above show central slices of the map in three orthogonal directions.

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

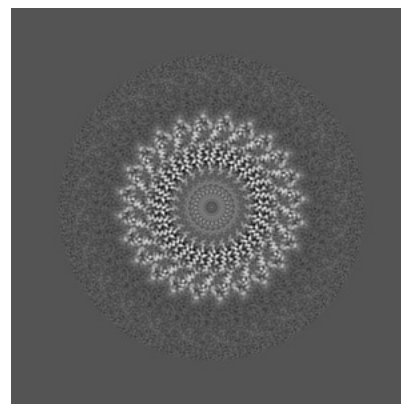
### 6.3.1 Primary map



X Index: 178



Y Index: 178



Z Index: 127

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

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

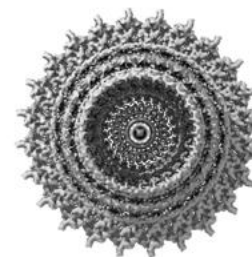
### 6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.06. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

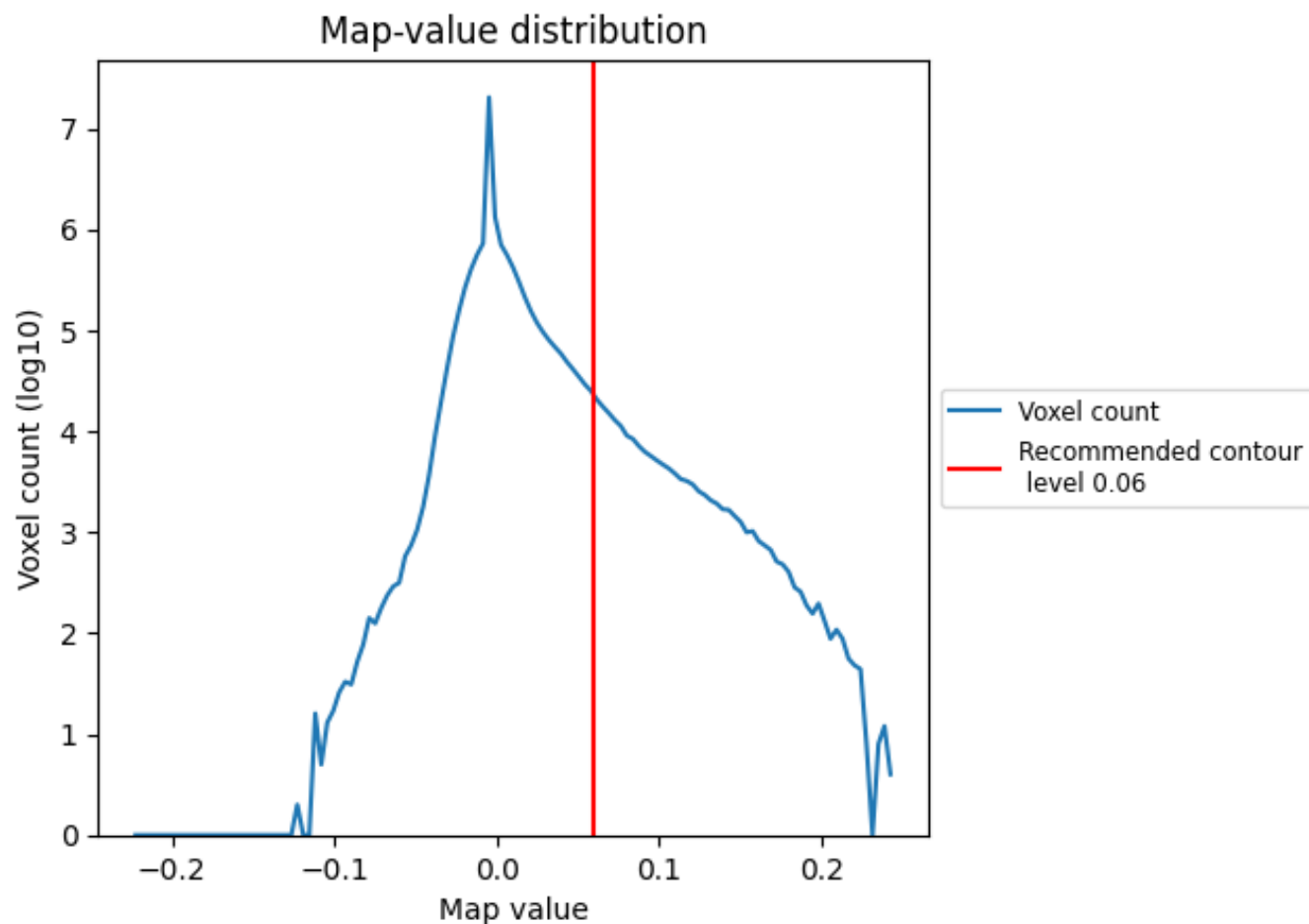
## 6.5 Mask visualisation

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.

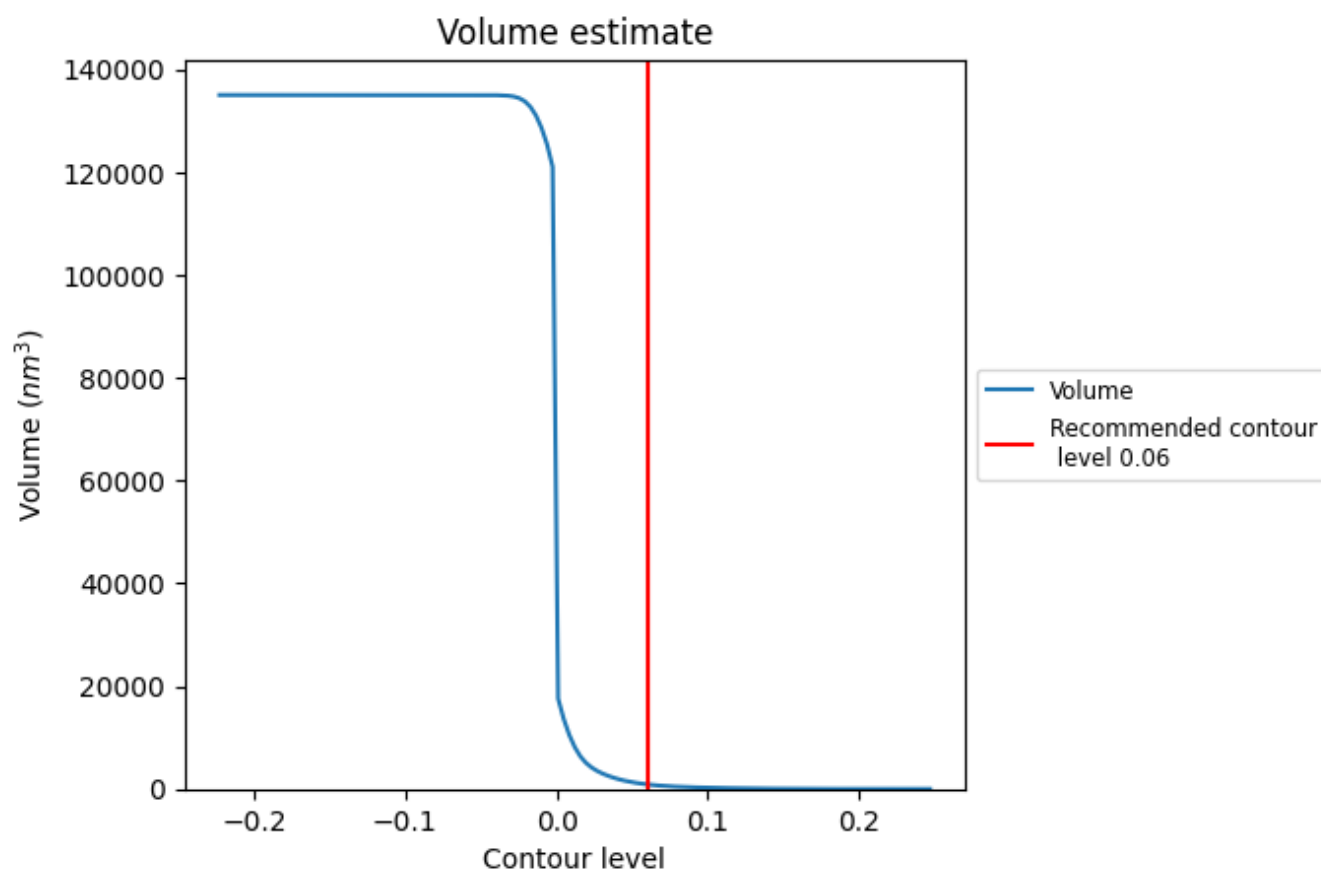
### 7.1 Map-value distribution [i](#)



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.



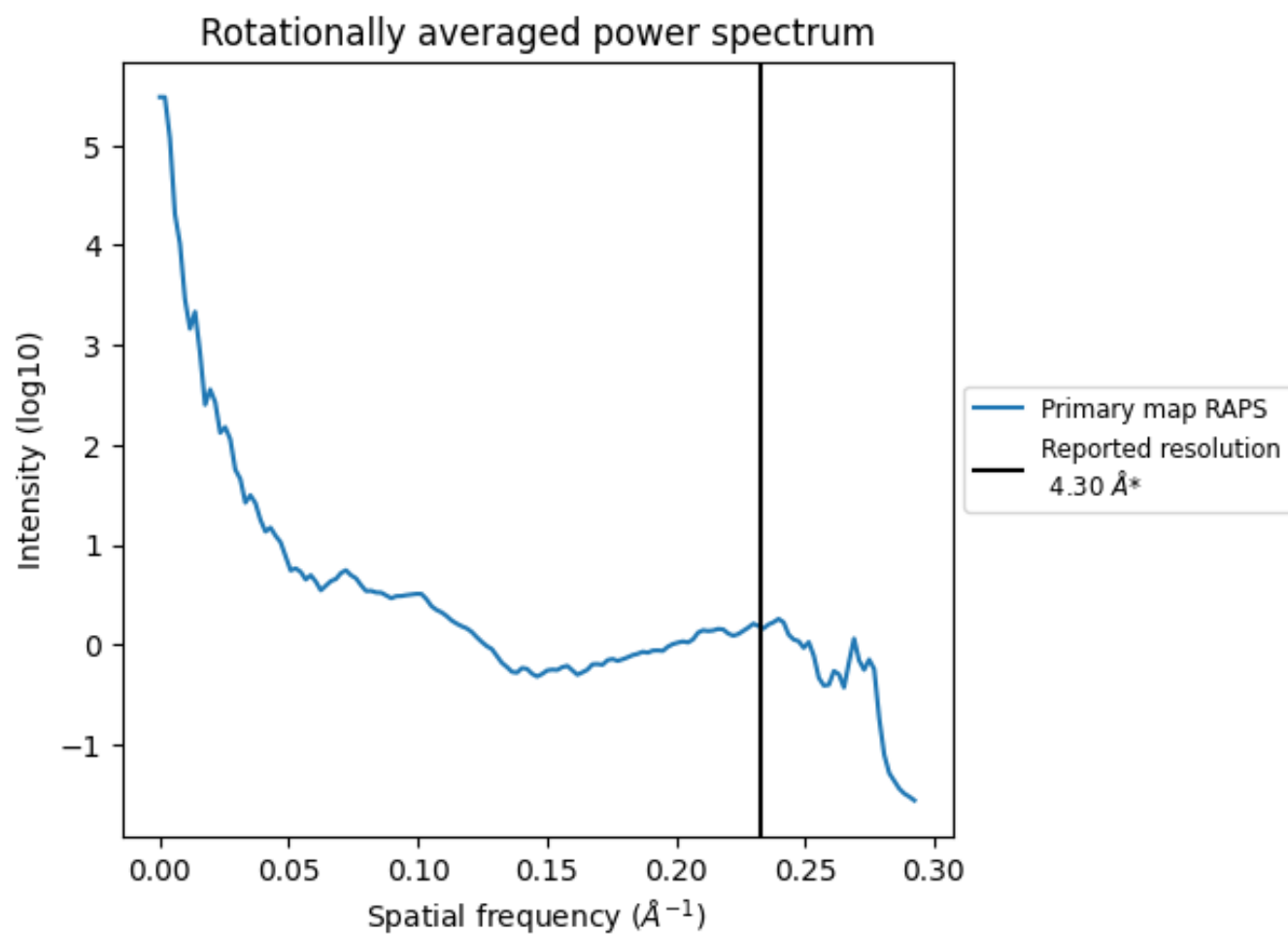
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 883  $\text{nm}^3$ ; this corresponds to an approximate mass of 797 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 0.233 Å<sup>-1</sup>

## 8 Fourier-Shell correlation

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

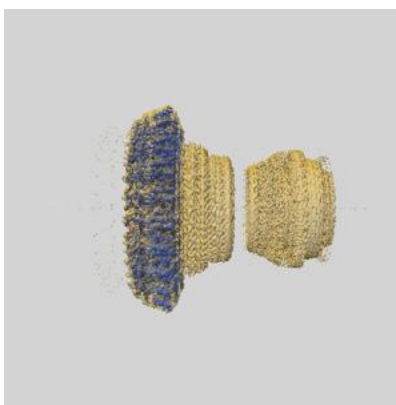
## 9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-8398 and PDB model 5TCP. Per-residue inclusion information can be found in section [3](#) on page [8](#).

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



X



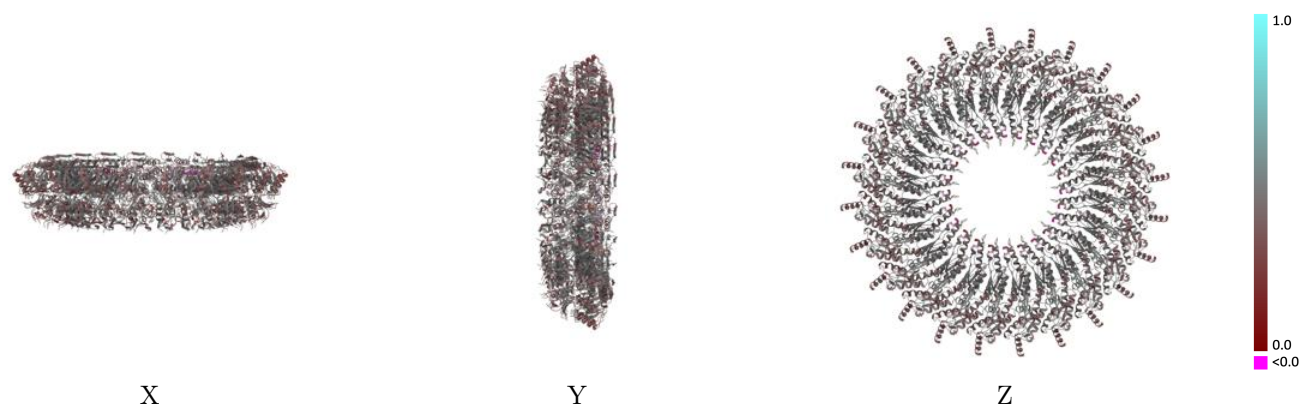
Y



Z

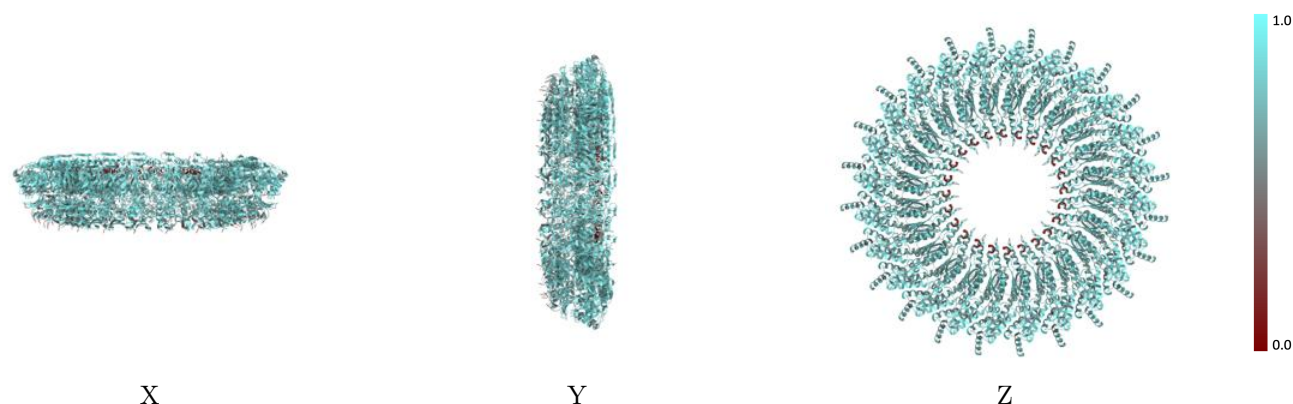
The images above show the 3D surface view of the map at the recommended contour level 0.06 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



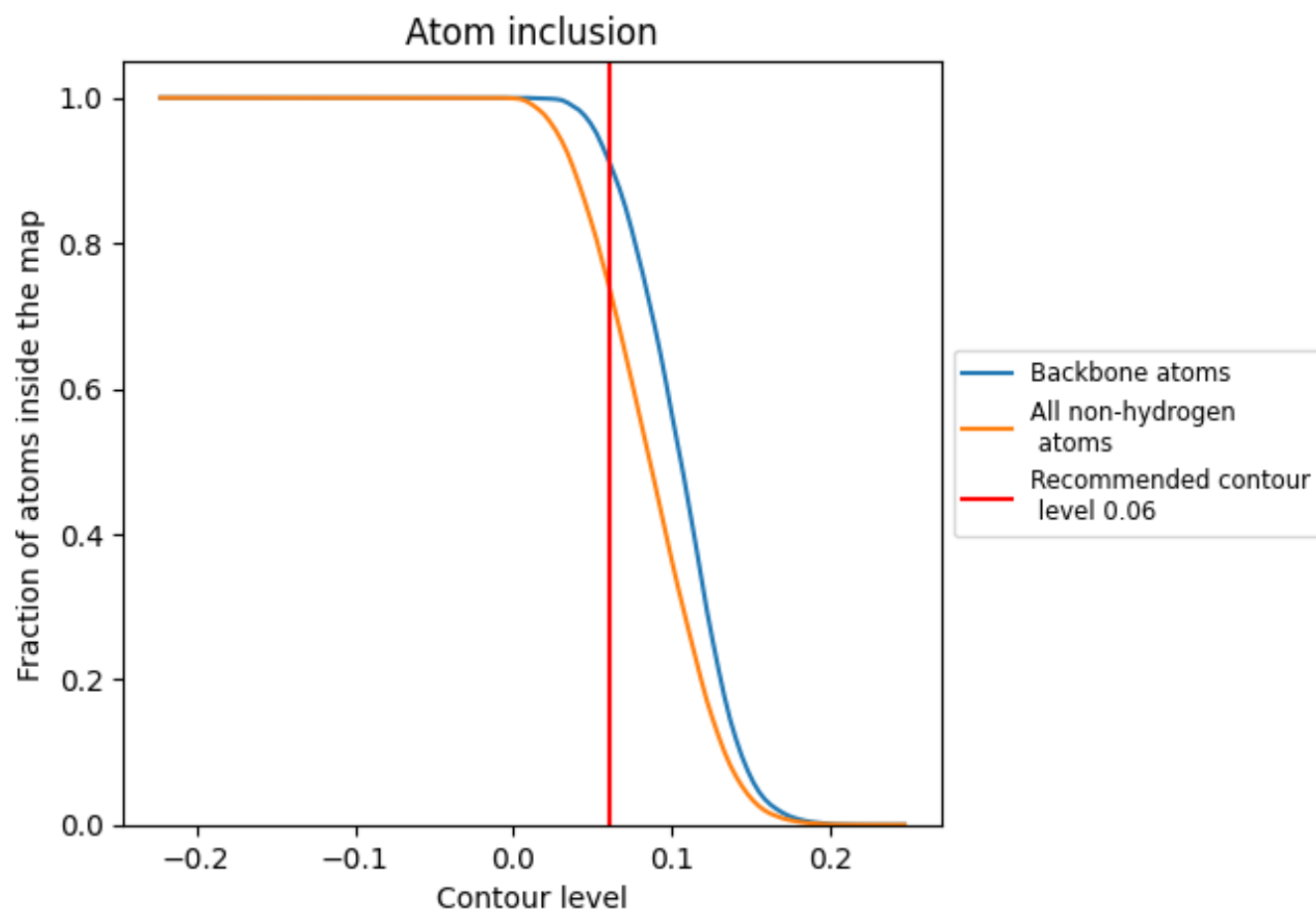
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.06).







































































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 91% 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 (0.06) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7437	 0.4180
0	 0.7594	 0.4460
1	 0.7489	 0.4050
2	 0.7346	 0.4280
3	 0.7553	 0.4020
4	 0.7360	 0.4240
5	 0.7521	 0.3990
6	 0.7339	 0.4270
7	 0.7482	 0.3980
8	 0.7367	 0.4270
9	 0.7360	 0.3910
A	 0.7502	 0.4170
B	 0.7488	 0.4400
C	 0.7534	 0.4150
D	 0.7459	 0.4370
E	 0.7444	 0.4080
F	 0.7367	 0.4320
G	 0.7489	 0.4070
H	 0.7402	 0.4330
I	 0.7450	 0.4020
J	 0.7388	 0.4330
K	 0.7353	 0.3960
L	 0.7381	 0.4320
M	 0.7405	 0.4030
N	 0.7374	 0.4290
O	 0.7379	 0.4010
P	 0.7402	 0.4300
Q	 0.7385	 0.4000
R	 0.7360	 0.4260
S	 0.7521	 0.4040
T	 0.7424	 0.4310
U	 0.7444	 0.4070
V	 0.7339	 0.4340
W	 0.7463	 0.4050
X	 0.7417	 0.4360



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Chain	Atom inclusion	Q-score
Y	 0.7508	 0.4130
Z	 0.7374	 0.4290
a	 0.7374	 0.4310
b	 0.7405	 0.3970
c	 0.7367	 0.4310
d	 0.7424	 0.3950
e	 0.7445	 0.4340
f	 0.7450	 0.4000
g	 0.7445	 0.4360
h	 0.7553	 0.4040
i	 0.7495	 0.4430
j	 0.7521	 0.4090
k	 0.7551	 0.4440
l	 0.7450	 0.4090