



## wwPDB EM Validation Summary Report ⓘ

Nov 3, 2024 – 06:26 am GMT

PDB ID : 6HCG  
EMDB ID : EMD-0193  
Title : Klebsiella pneumoniae type II secretion system outer membrane complex.  
PulD, PulS and PulC HR domain.  
Authors : Chernyatina, A.A.; Low, H.H.  
Deposited on : 2018-08-15  
Resolution : 4.30 Å(reported)

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

# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

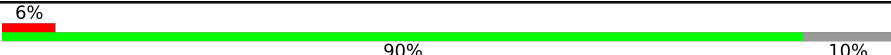
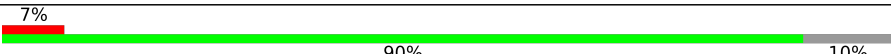


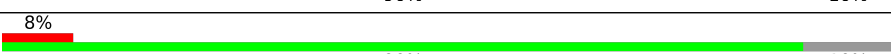
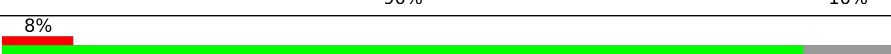
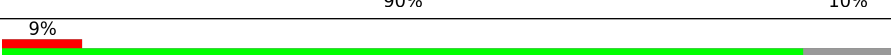

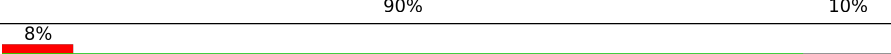
The reported resolution of this entry is 4.30 Å.

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	207382	16835
Sidechain outliers	206894	16415

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

Mol	Chain	Length	Quality of chain
1	A	657	 6%                      90%                      10%
1	B	657	 7%                      90%                      10%
1	C	657	 7%                      90%                      10%
1	D	657	 7%                      90%                      10%
1	E	657	 8%                      90%                      10%
1	F	657	 8%                      90%                      10%
1	G	657	 9%                      90%                      10%
1	H	657	 9%                      90%                      10%
1	I	657	 8%                      90%                      10%

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Mol	Chain	Length	Quality of chain
1	J	657	
1	K	657	
1	L	657	
1	M	657	
1	N	657	
1	O	657	
2	P	143	
2	Q	143	
2	R	143	
2	S	143	
2	T	143	
2	U	143	
2	V	143	
2	W	143	
2	X	143	
2	Y	143	
2	Z	143	
2	a	143	
2	b	143	
2	c	143	
2	d	143	
3	e	280	
3	f	280	
3	g	280	
3	h	280	

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Mol	Chain	Length	Quality of chain
3	i	280	<div> <div>17%</div> <div>24%</div> <div>76%</div> </div>
3	j	280	<div> <div>18%</div> <div>24%</div> <div>76%</div> </div>
3	k	280	<div> <div>17%</div> <div>24%</div> <div>76%</div> </div>
3	l	280	<div> <div>17%</div> <div>24%</div> <div>76%</div> </div>
3	m	280	<div> <div>17%</div> <div>24%</div> <div>76%</div> </div>
3	n	280	<div> <div>18%</div> <div>24%</div> <div>76%</div> </div>
3	o	280	<div> <div>20%</div> <div>24%</div> <div>76%</div> </div>
3	p	280	<div> <div>20%</div> <div>24%</div> <div>76%</div> </div>
3	q	280	<div> <div>19%</div> <div>24%</div> <div>76%</div> </div>
3	r	280	<div> <div>20%</div> <div>24%</div> <div>76%</div> </div>
3	s	280	<div> <div>19%</div> <div>24%</div> <div>76%</div> </div>

## 2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 85185 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 Type II secretion system protein D.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	592	Total 4447	C 2780	N 779	O 878	S 10	0	0
1	B	592	Total 4447	C 2780	N 779	O 878	S 10	0	0
1	C	592	Total 4447	C 2780	N 779	O 878	S 10	0	0
1	D	592	Total 4447	C 2780	N 779	O 878	S 10	0	0
1	E	592	Total 4447	C 2780	N 779	O 878	S 10	0	0
1	F	592	Total 4447	C 2780	N 779	O 878	S 10	0	0
1	G	592	Total 4447	C 2780	N 779	O 878	S 10	0	0
1	H	592	Total 4447	C 2780	N 779	O 878	S 10	0	0
1	I	592	Total 4447	C 2780	N 779	O 878	S 10	0	0
1	J	592	Total 4447	C 2780	N 779	O 878	S 10	0	0
1	K	592	Total 4447	C 2780	N 779	O 878	S 10	0	0
1	L	592	Total 4447	C 2780	N 779	O 878	S 10	0	0
1	M	592	Total 4447	C 2780	N 779	O 878	S 10	0	0
1	N	592	Total 4447	C 2780	N 779	O 878	S 10	0	0
1	O	592	Total 4447	C 2780	N 779	O 878	S 10	0	0

- Molecule 2 is a protein called Pullulanase.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	P	93	Total	C	N	O	S	0	0
			720	441	134	143	2		
2	Q	93	Total	C	N	O	S	0	0
			720	441	134	143	2		
2	R	93	Total	C	N	O	S	0	0
			720	441	134	143	2		
2	S	93	Total	C	N	O	S	0	0
			720	441	134	143	2		
2	T	93	Total	C	N	O	S	0	0
			720	441	134	143	2		
2	U	93	Total	C	N	O	S	0	0
			720	441	134	143	2		
2	V	93	Total	C	N	O	S	0	0
			720	441	134	143	2		
2	W	93	Total	C	N	O	S	0	0
			720	441	134	143	2		
2	X	93	Total	C	N	O	S	0	0
			720	441	134	143	2		
2	Y	93	Total	C	N	O	S	0	0
			720	441	134	143	2		
2	Z	93	Total	C	N	O	S	0	0
			720	441	134	143	2		
2	a	93	Total	C	N	O	S	0	0
			720	441	134	143	2		
2	b	93	Total	C	N	O	S	0	0
			720	441	134	143	2		
2	c	93	Total	C	N	O	S	0	0
			720	441	134	143	2		
2	d	93	Total	C	N	O	S	0	0
			720	441	134	143	2		

- Molecule 3 is a protein called Pectic enzymes secretion protein OutC.

Mol	Chain	Residues	Atoms				AltConf	Trace
3	e	68	Total	C	N	O	0	0
			512	326	92	94		
3	f	68	Total	C	N	O	0	0
			512	326	92	94		
3	g	68	Total	C	N	O	0	0
			512	326	92	94		
3	h	68	Total	C	N	O	0	0
			512	326	92	94		
3	i	68	Total	C	N	O	0	0
			512	326	92	94		

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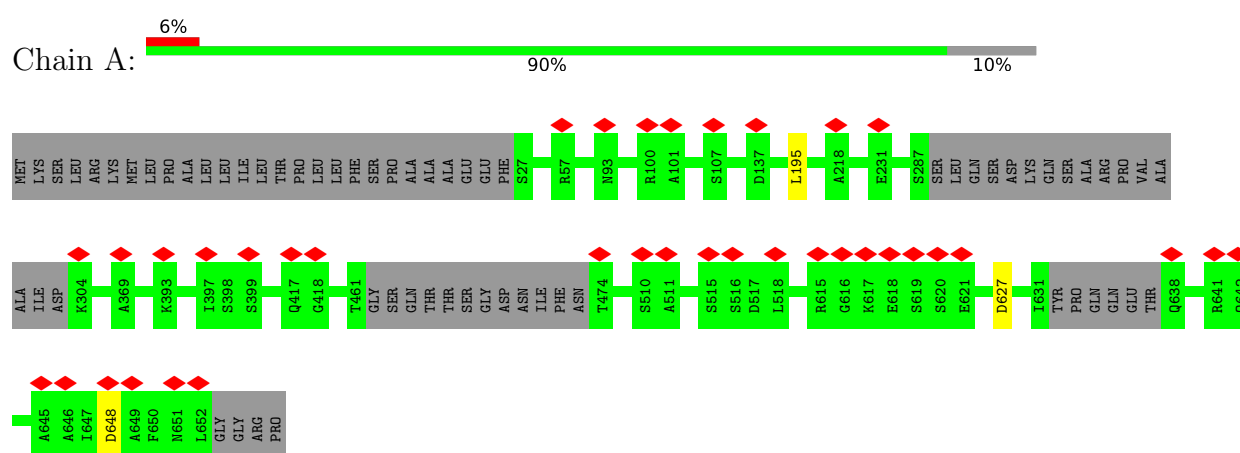
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Mol	Chain	Residues	Atoms				AltConf	Trace
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3	k	68	Total 512	C 326	N 92	O 94	0	0
3	l	68	Total 512	C 326	N 92	O 94	0	0
3	m	68	Total 512	C 326	N 92	O 94	0	0
3	n	68	Total 512	C 326	N 92	O 94	0	0
3	o	68	Total 512	C 326	N 92	O 94	0	0
3	p	68	Total 512	C 326	N 92	O 94	0	0
3	q	68	Total 512	C 326	N 92	O 94	0	0
3	r	68	Total 512	C 326	N 92	O 94	0	0
3	s	68	Total 512	C 326	N 92	O 94	0	0

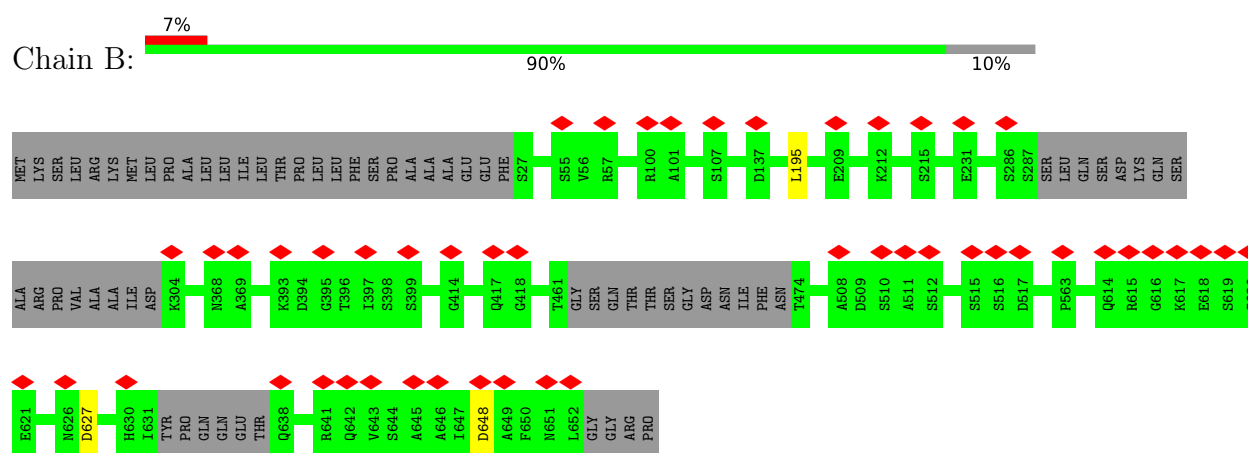
### 3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

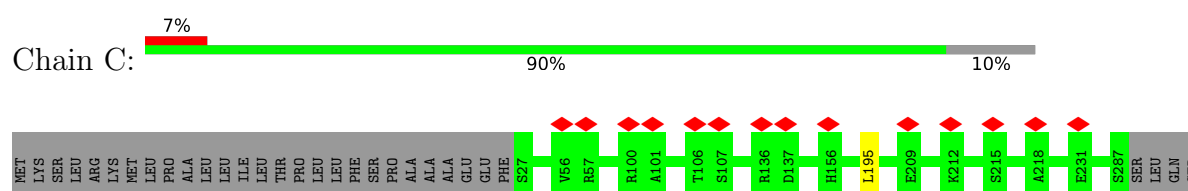
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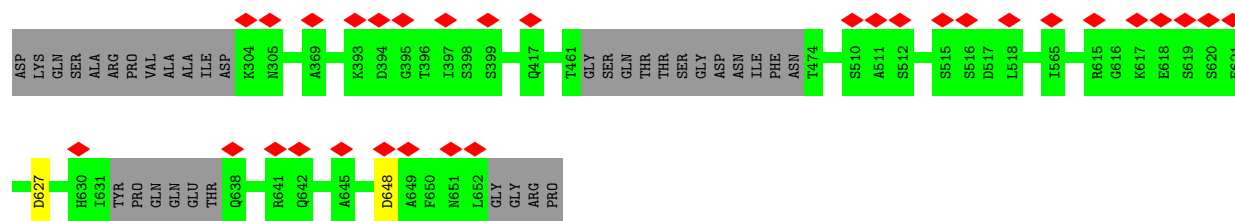
- Molecule 1: Type II secretion system protein D



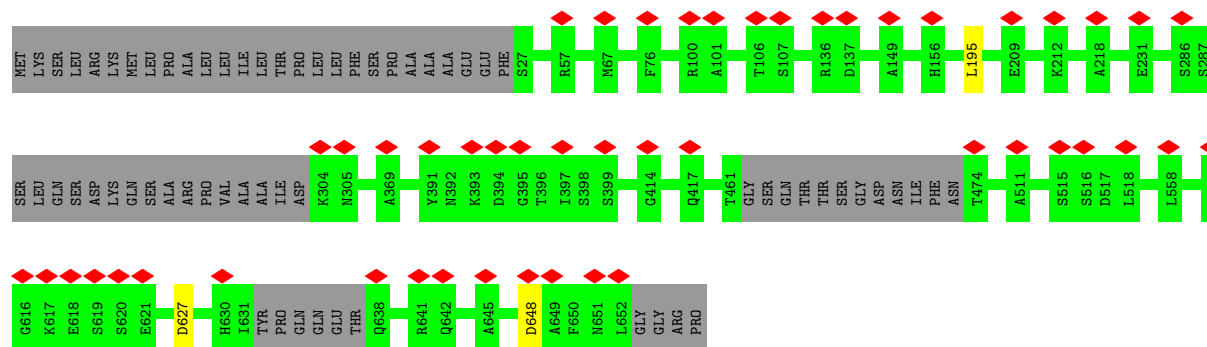
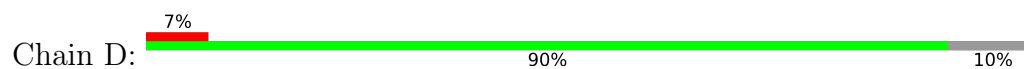
- Molecule 1: Type II secretion system protein D



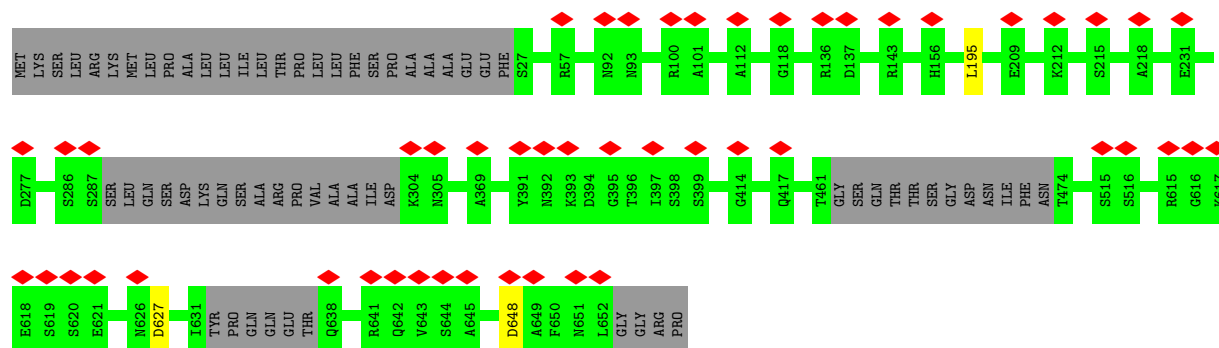
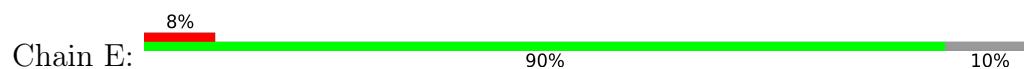




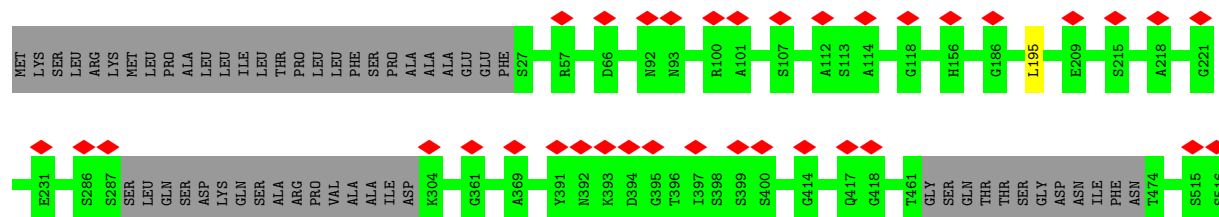
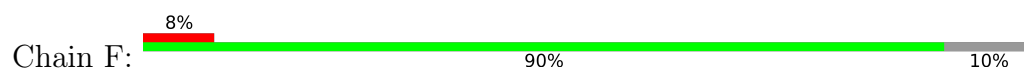
• Molecule 1: Type II secretion system protein D

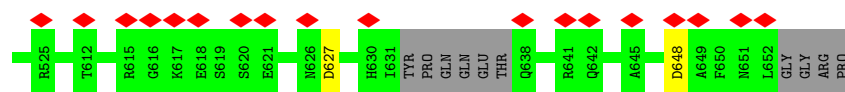


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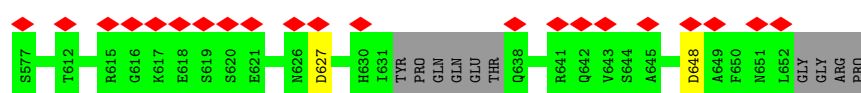
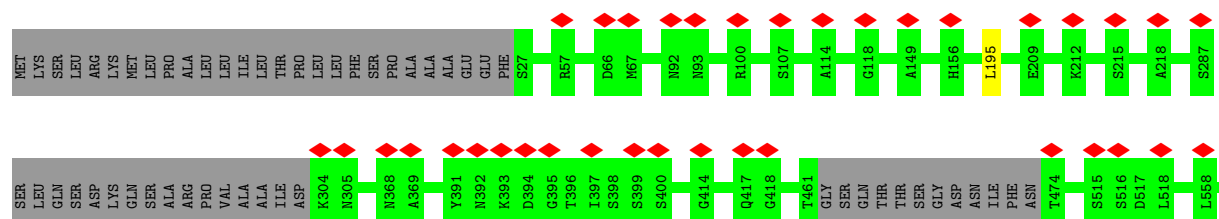
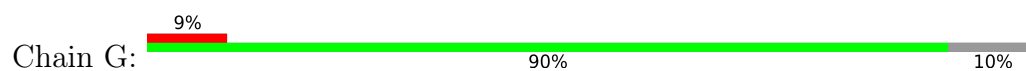


• Molecule 1: Type II secretion system protein D

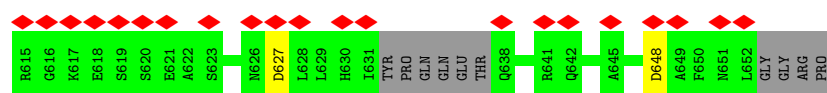
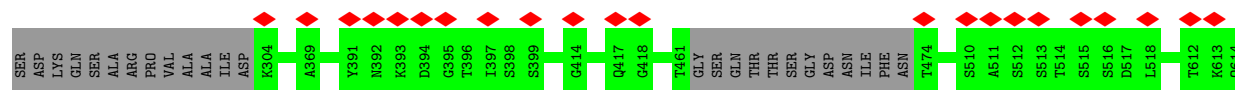
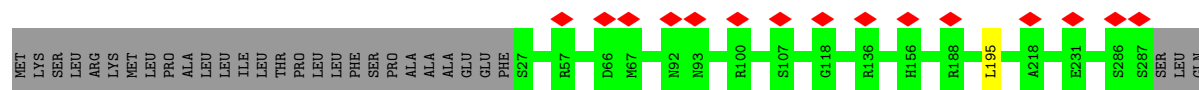
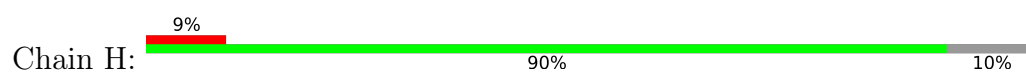




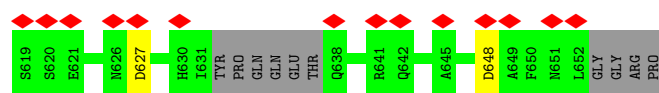
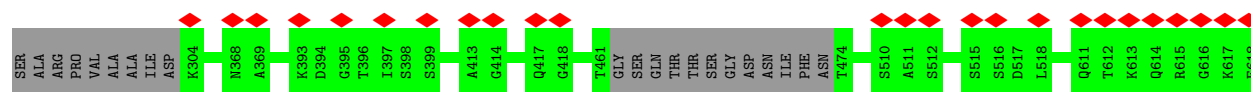
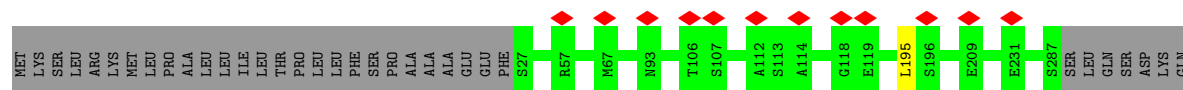
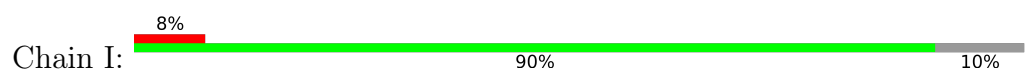
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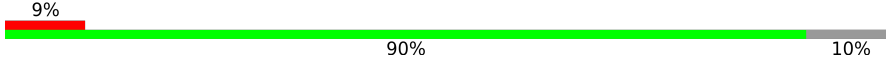
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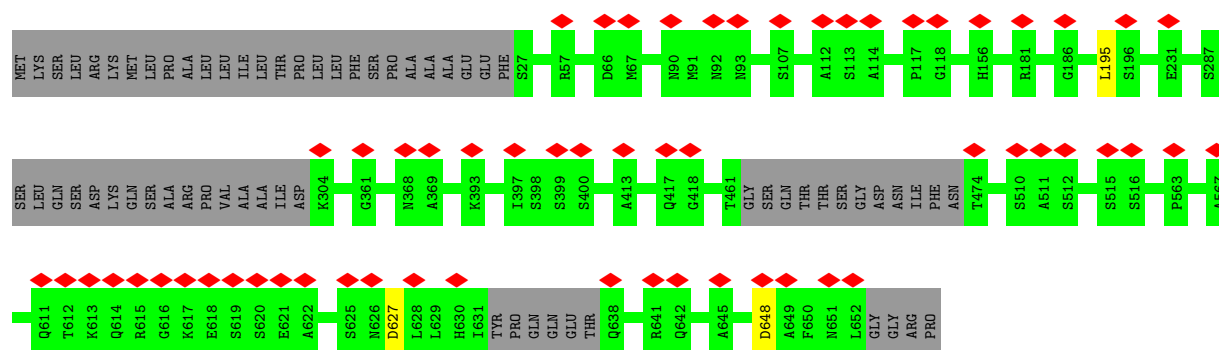


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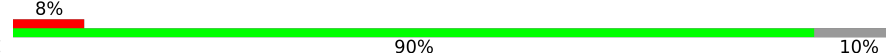


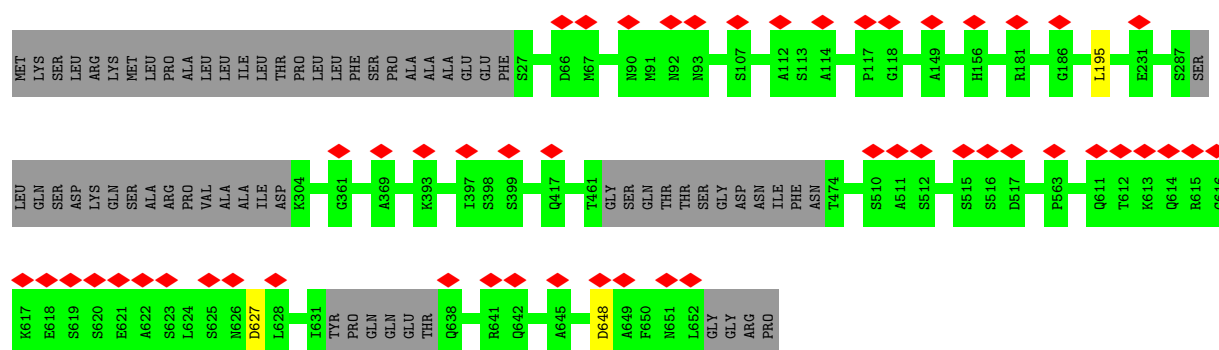
• Molecule 1: Type II secretion system protein D

Chain J: 

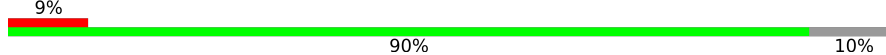


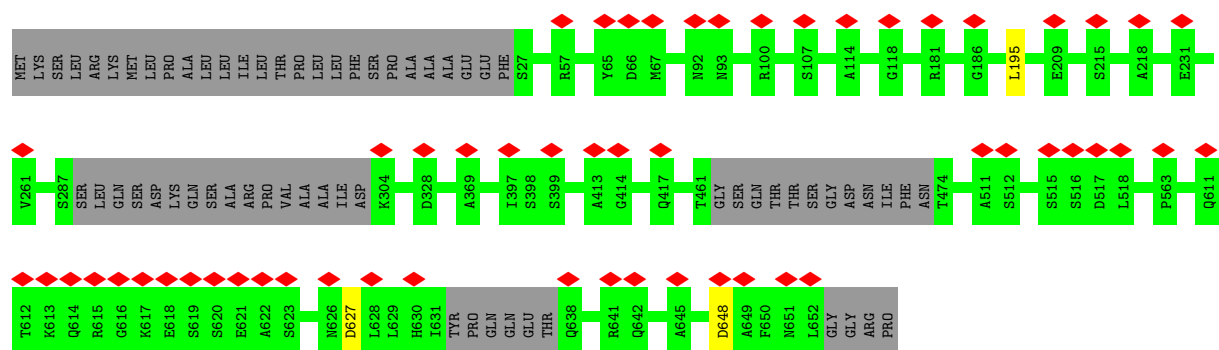
• Molecule 1: Type II secretion system protein D

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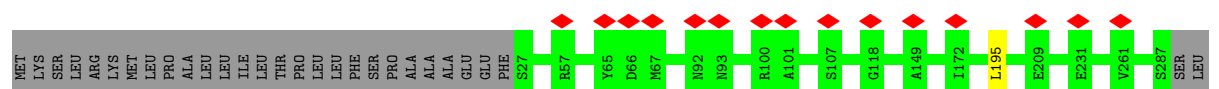
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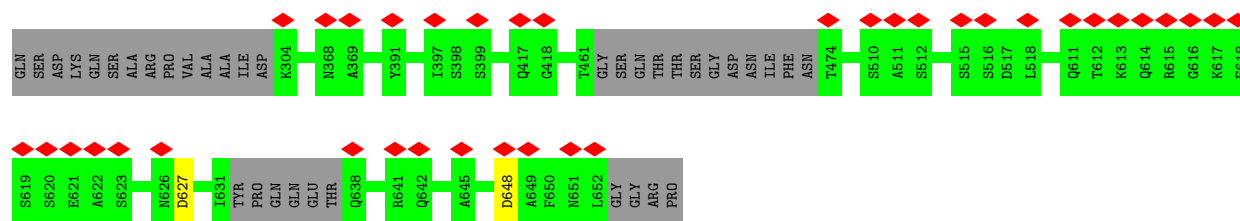
Chain L: 



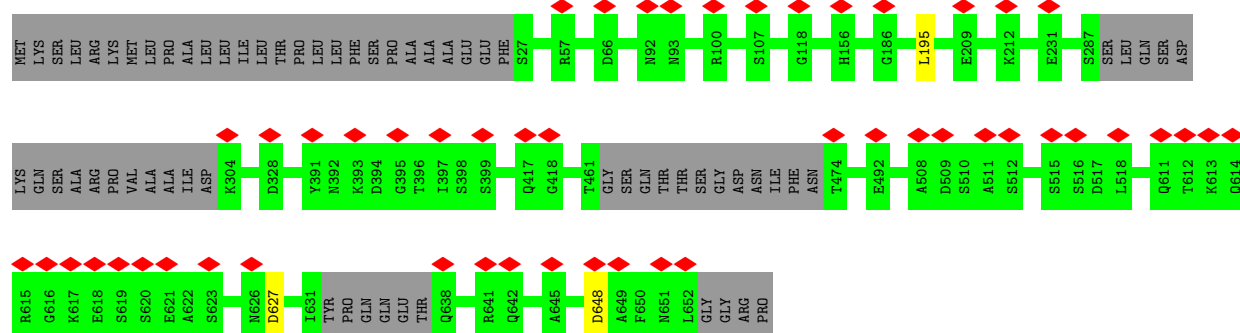
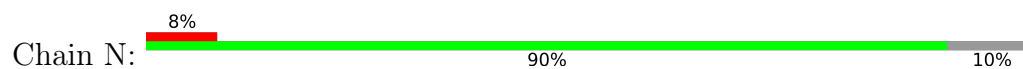
• Molecule 1: Type II secretion system protein D

Chain M: 

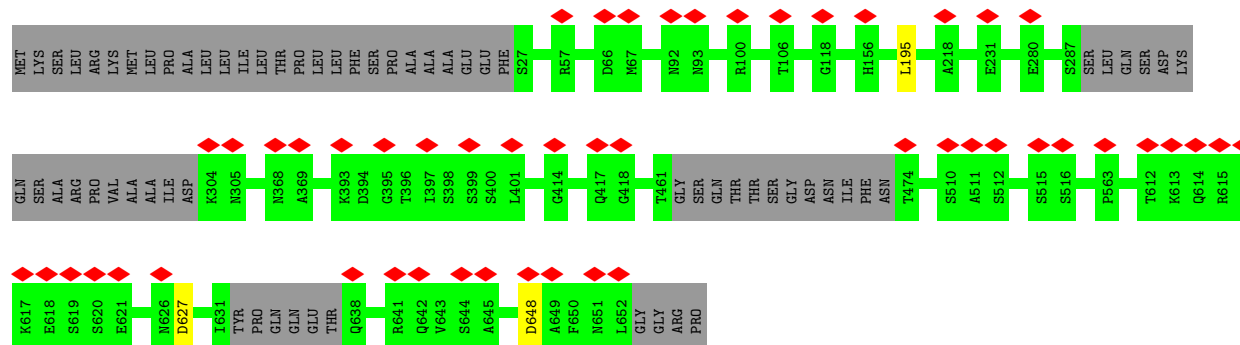
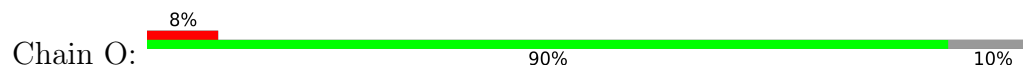




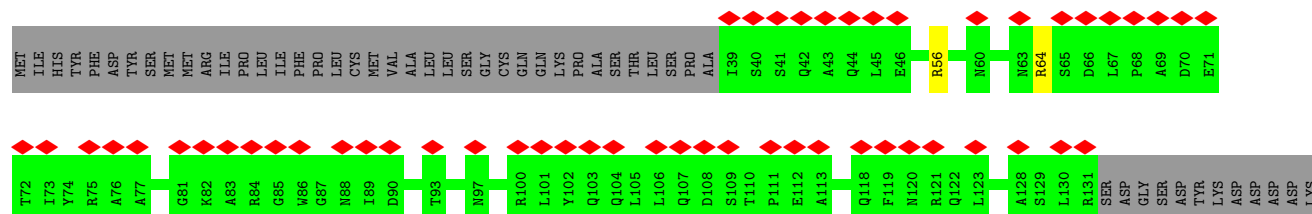
• Molecule 1: Type II secretion system protein D



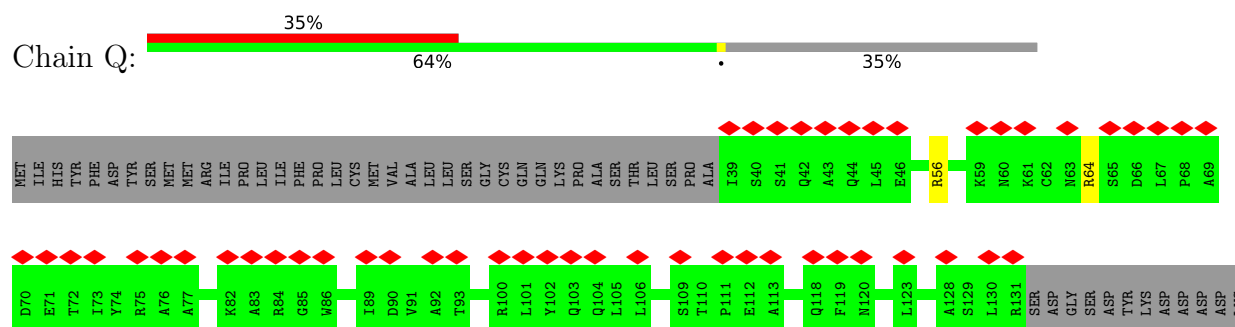
• Molecule 1: Type II secretion system protein D



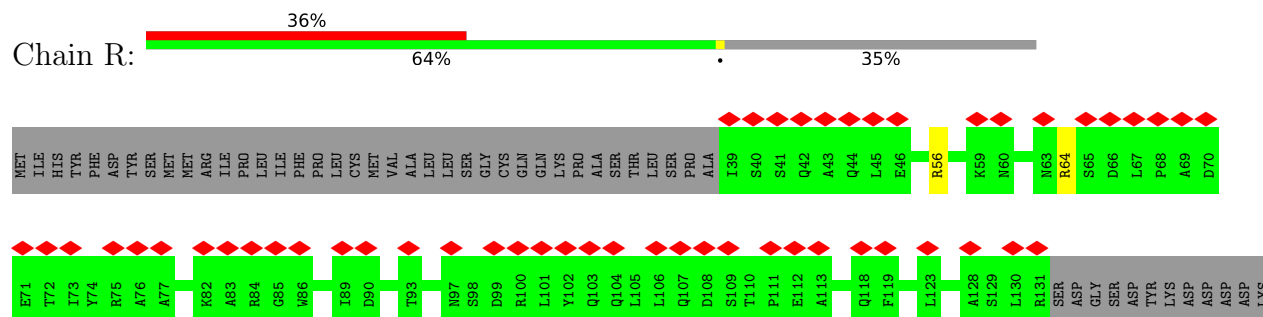
• Molecule 2: Pullulanase



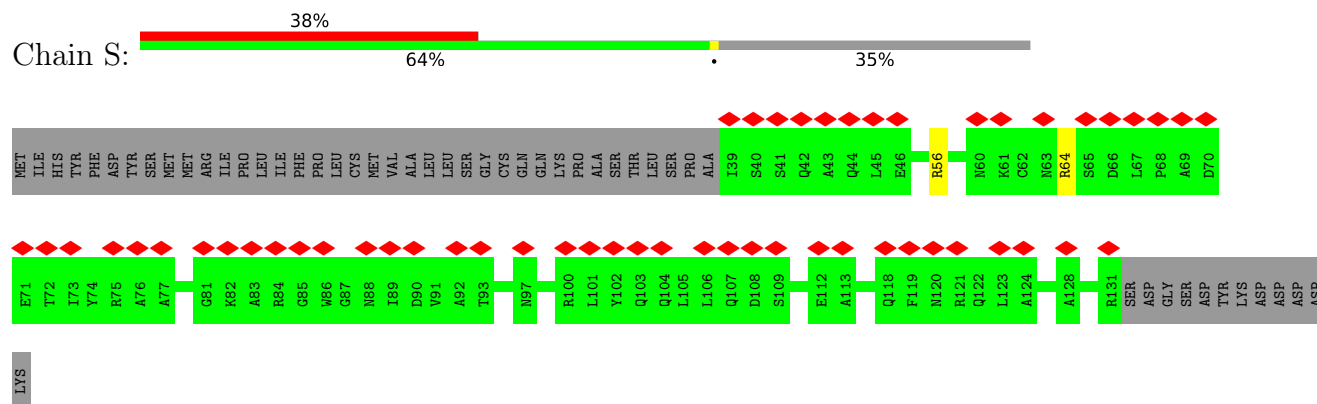
• Molecule 2: Pullulanase



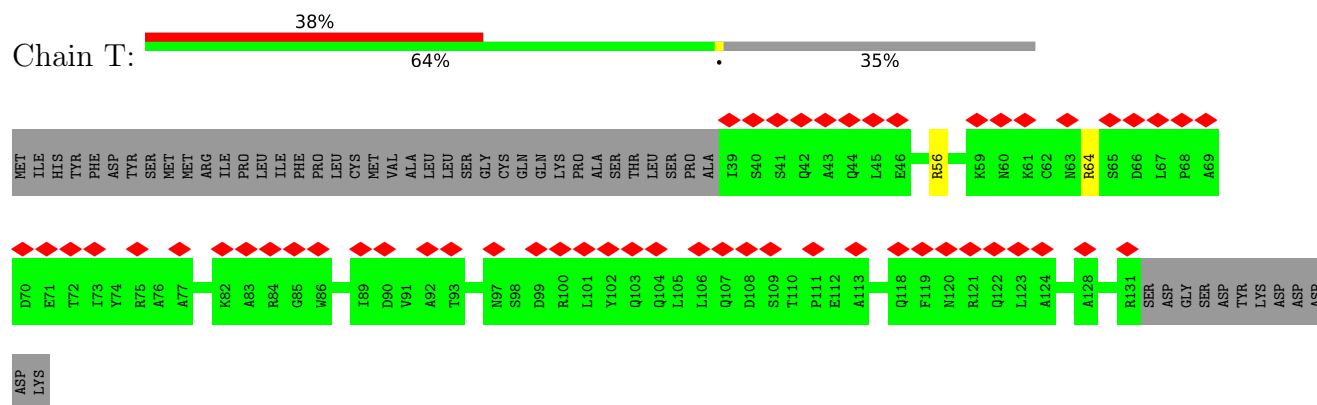
## ● Molecule 2: Pullulanase



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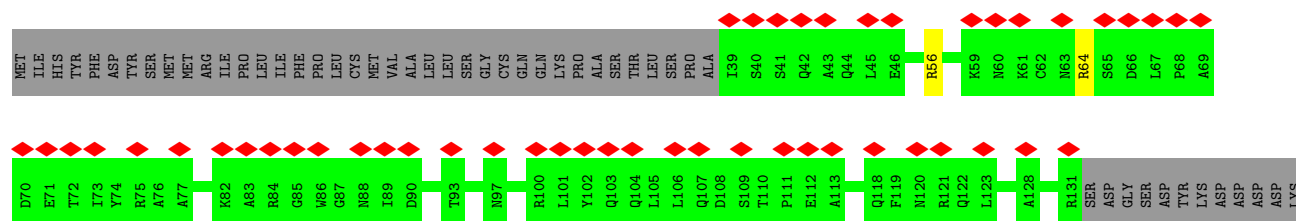


## ● Molecule 2: Pullulanase

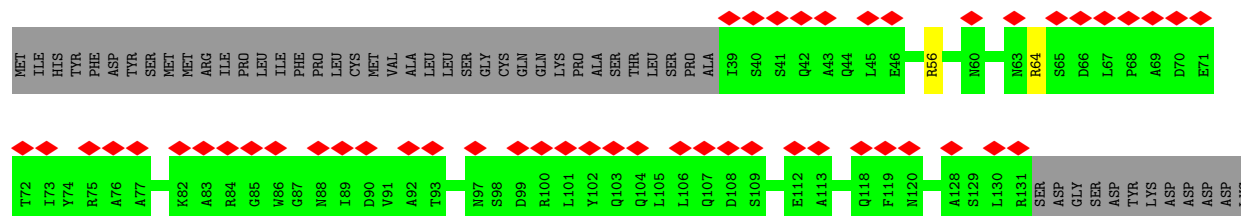


## ● Molecule 2: Pullulanase

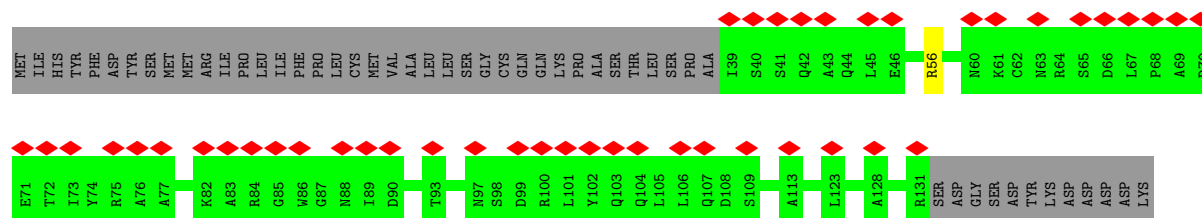




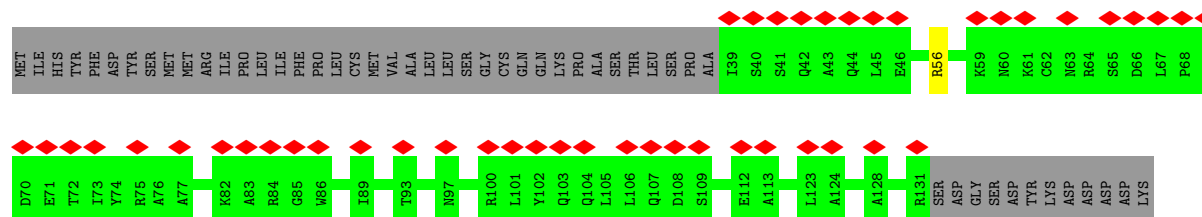
• Molecule 2: Pullulanase



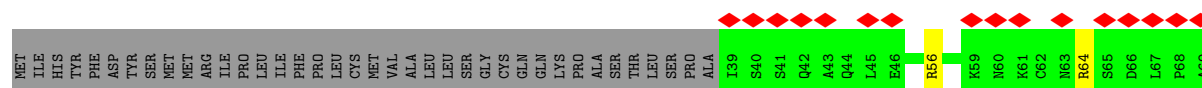
• Molecule 2: Pullulanase

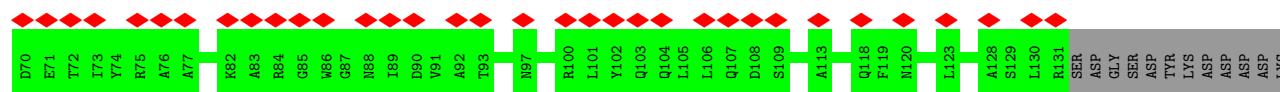


• Molecule 2: Pullulanase

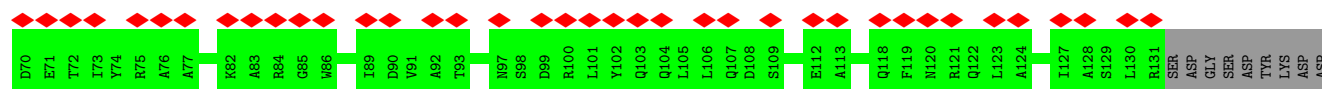
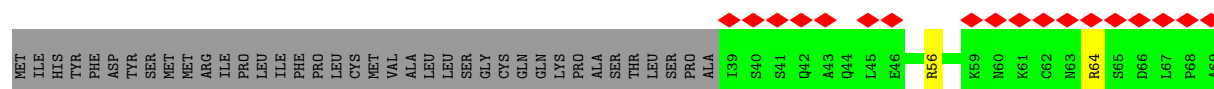
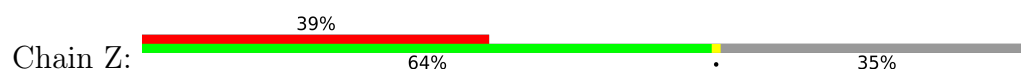


• Molecule 2: Pullulanase

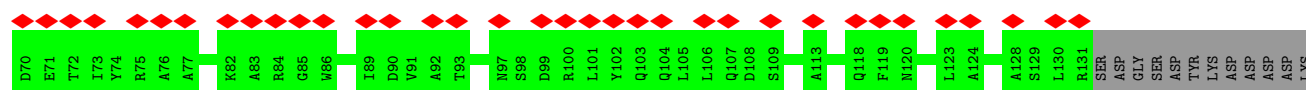
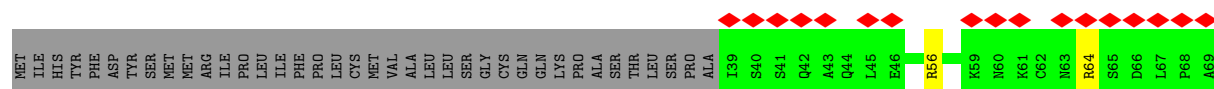




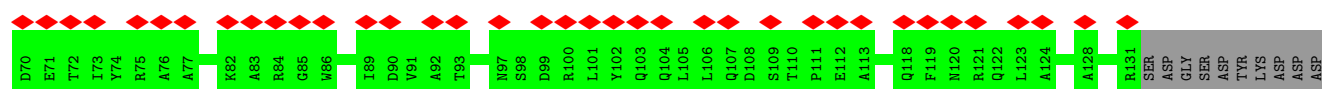
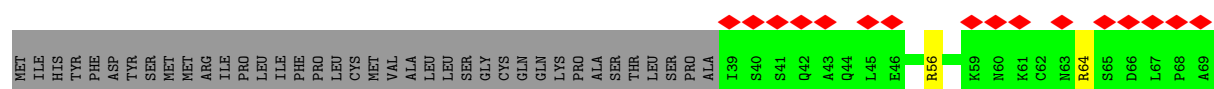
- Molecule 2: Pullulanase



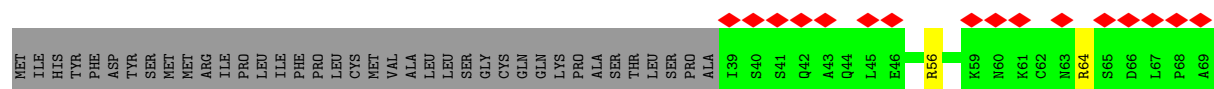
- Molecule 2: Pullulanase

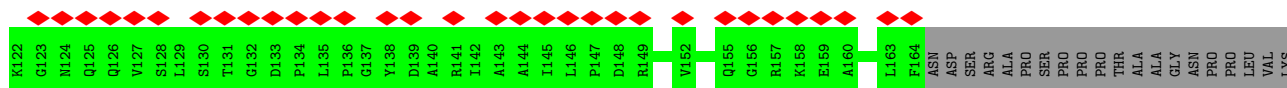


- Molecule 2: Pullulanase

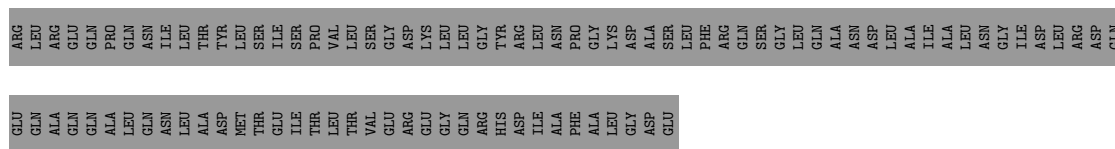


- Molecule 2: Pullulanase

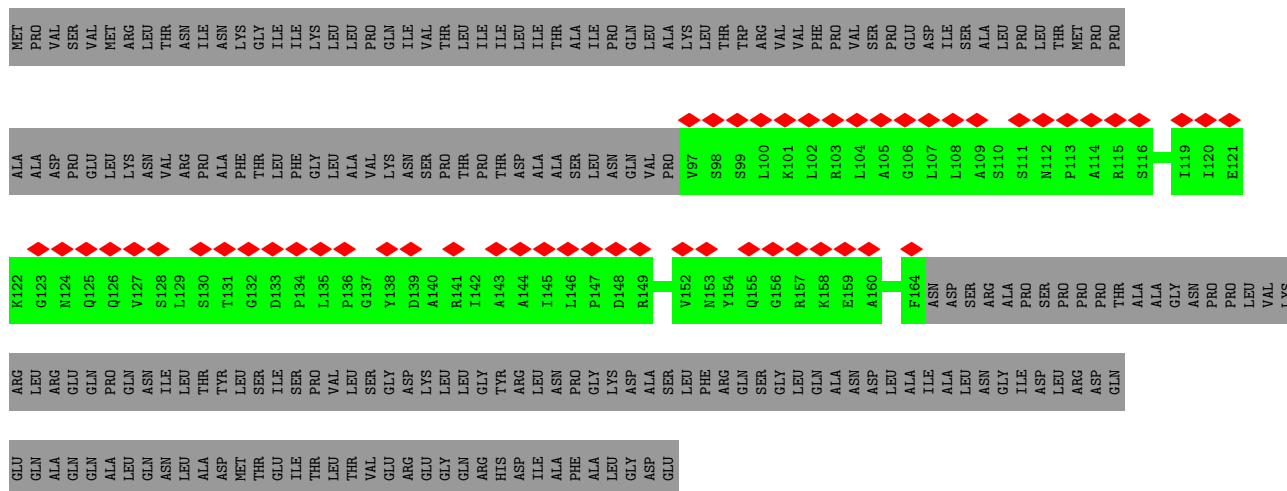




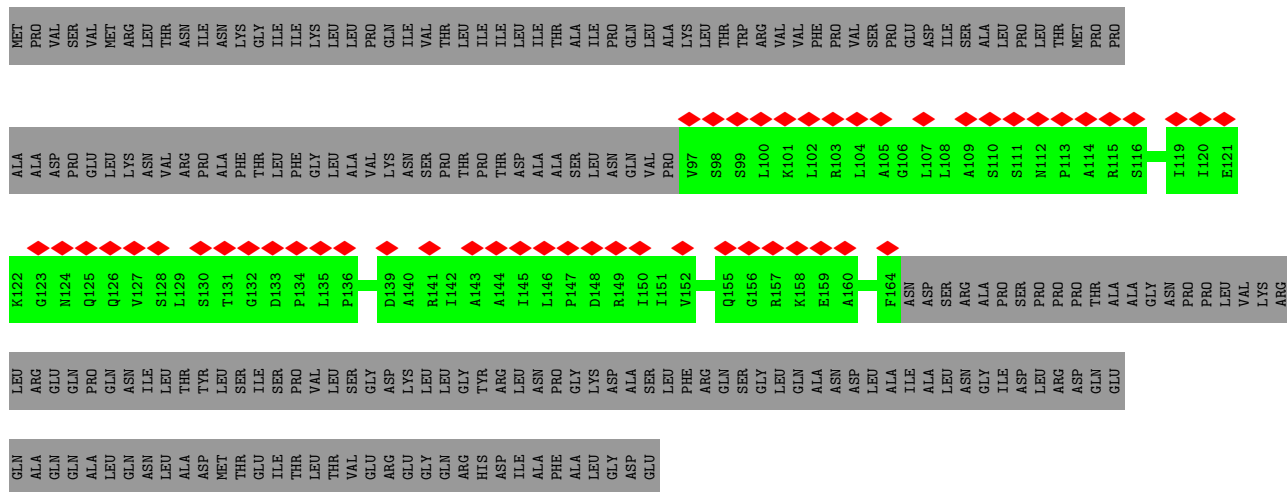




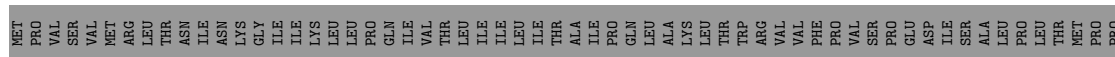
- Molecule 3: Pectic enzymes secretion protein OutC

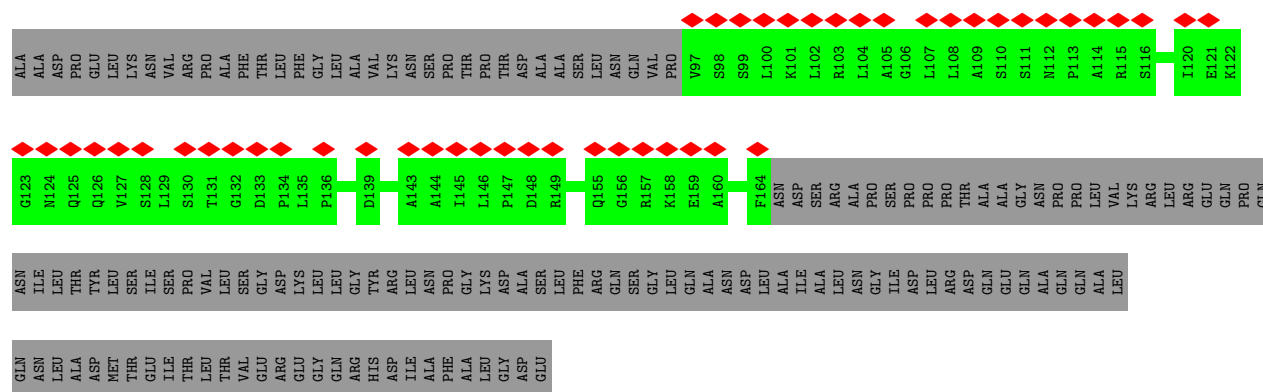


- Molecule 3: Pectic enzymes secretion protein OutC

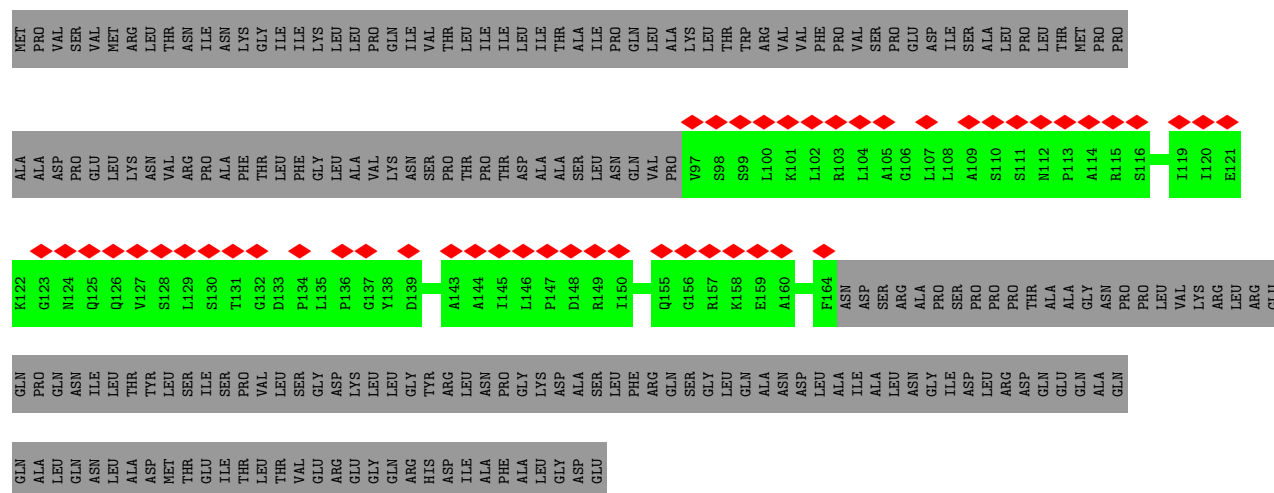


- Molecule 3: Pectic enzymes secretion protein OutC

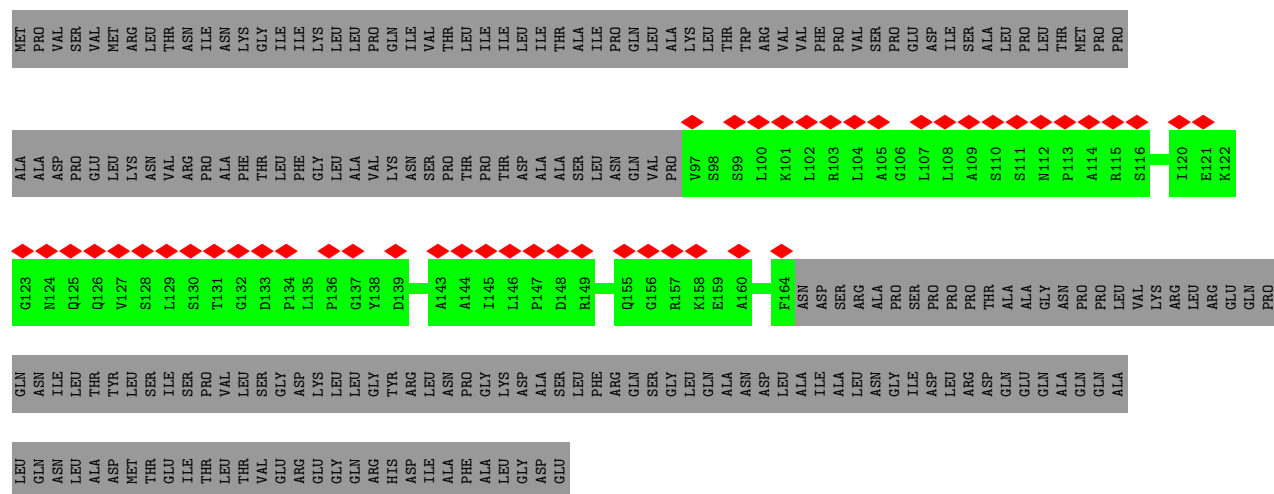




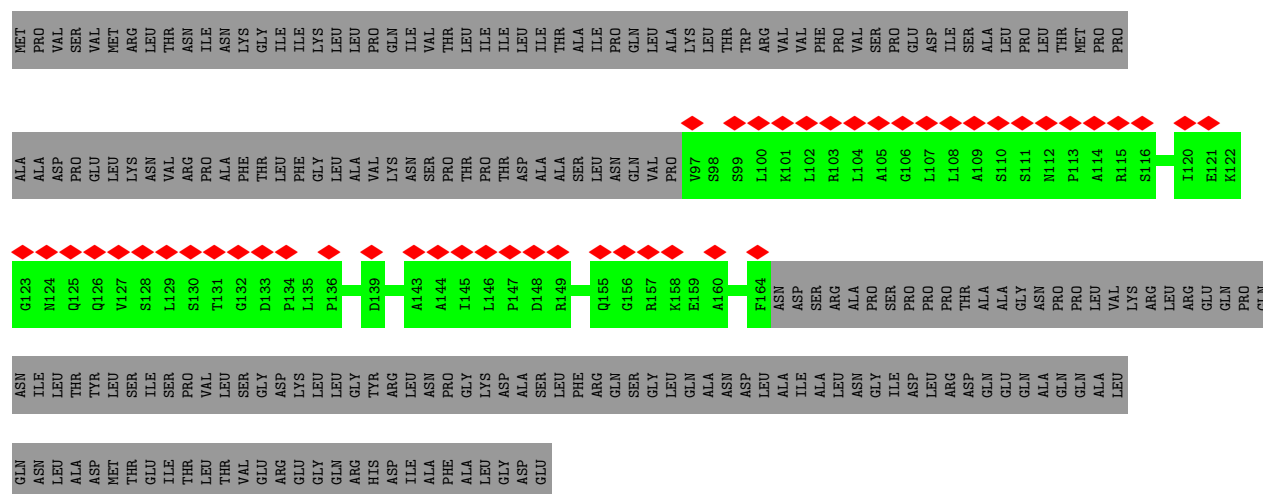
• Molecule 3: Pectic enzymes secretion protein OutC



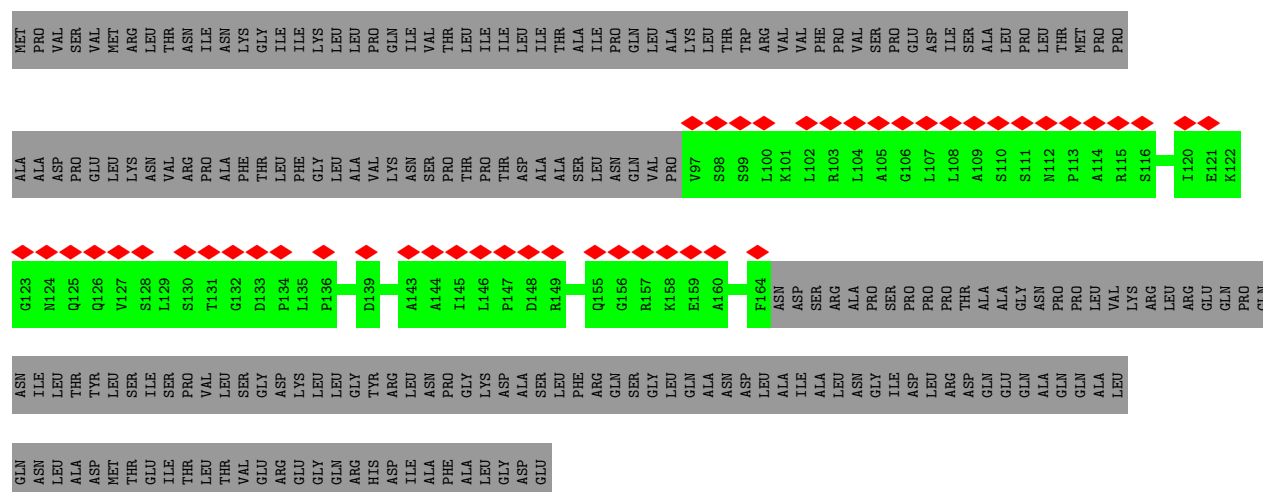
• Molecule 3: Pectic enzymes secretion protein OutC



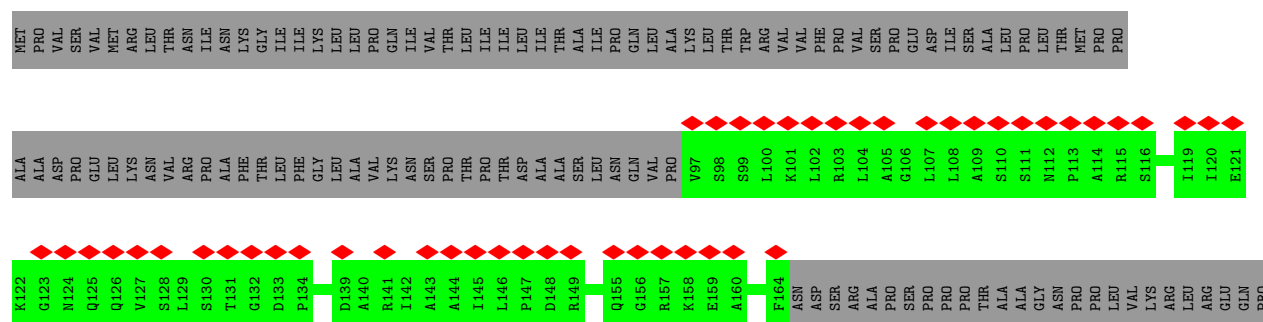
• Molecule 3: Pectic enzymes secretion protein OutC



• Molecule 3: Pectic enzymes secretion protein OutC



• Molecule 3: Pectic enzymes secretion protein OutC



[illegible]

- Molecule 3: Pectic enzymes secretion protein OutC



K122	K123	K124	Q125	Q126	V127	S128	L129	S130	T131	G132	D133	P134	L135	P136	G137	Y138	D139	A140	E141	I142	A143	A144	I145	L146	P147	D148	R149	V152	Q155	G156	R157	K158	E159	A160	F164	ASN	ASP	SER	ARG	ALA	PRO	SER	PRO	THR					
ALA	ALA	ASP	PRO	GLU	LEU	ASN	VAL	ARG	ASN	PRO	ILE	ASN	LYS	LEU	LEU	VAL	LYS	ASN	SER	PRO	THR	LEU	ALA	SER	LEU	ASN	GLN	VAL	PRO	S98	S99	L100	R101	L102	R103	L104	A105	G106	L107	L108	A109	S110	S111	M112	P113	A114			
MET	PRO	VAL	SER	VAL	MET	ARG	THR	ASN	ILE	ASN	LYS	GLY	ILE	LYS	LEU	PRO	GLN	ILE	VAL	THR	LEU	ILE	LEU	THR	ALA	ILE	PRO	GLN	LEU	LYS	LEU	THR	TRP	ARG	VAL	PHE	PRO	VAL	SER	PRO	GLU	ILE	SER	ALA	LEU	PRO	THR	MET	PRO

[illegible]

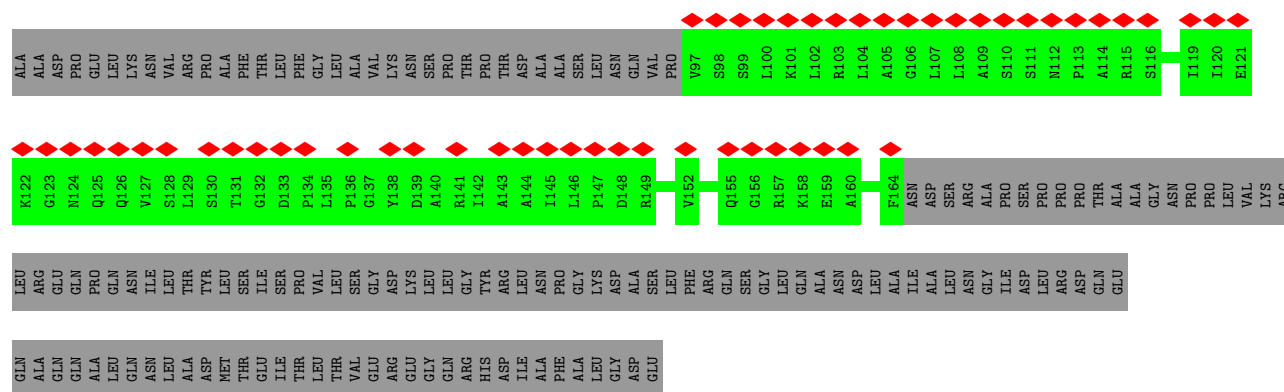
- Molecule 3: Pectic enzymes secretion protein OutC

[illegible][illegible]

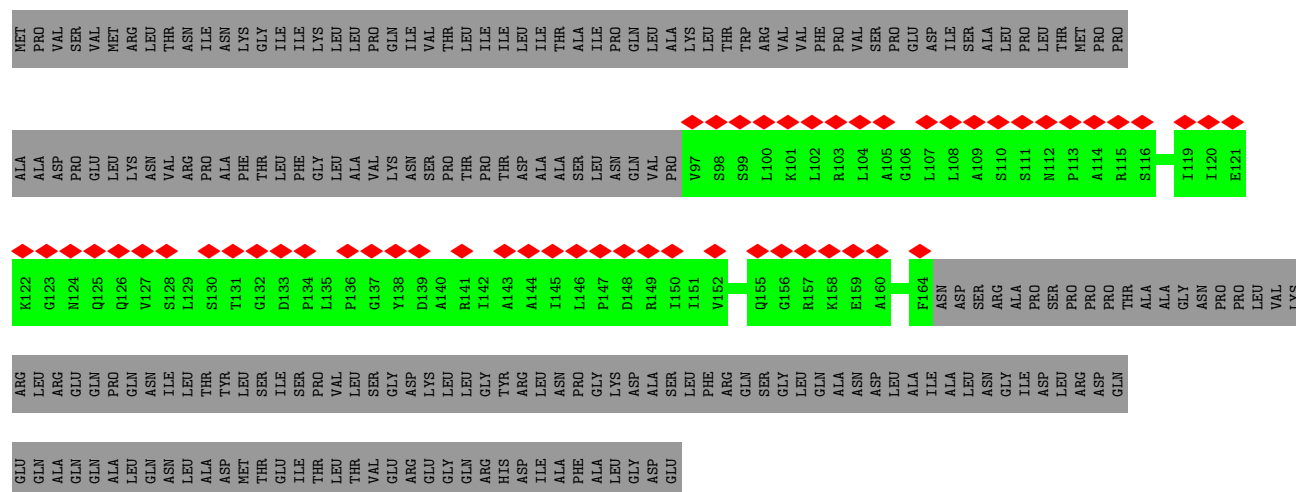
- Molecule 3: Pectic enzymes secretion protein OutC



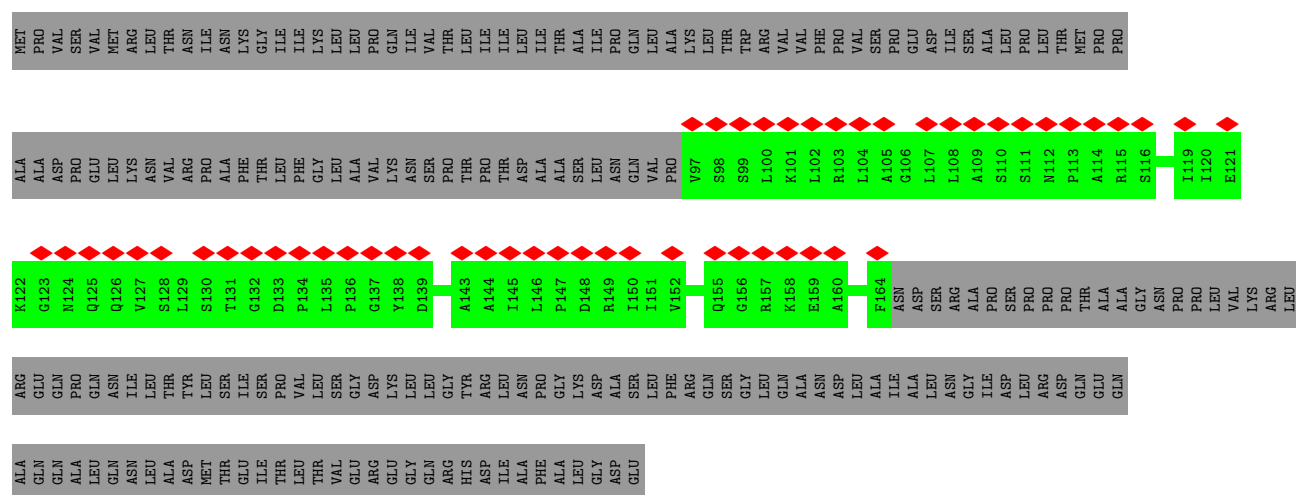
NET	PRO	VAL	SER	VAL	MET	ARG	LEU	THR	ASN	ASN	LYS	GLY	ILE	ILE	LYS	LEU	LEU	PRO	GLN	ILE	ILE	THR	THR	LEU	ILE	ILE	LEU	LEU	THR	ALA	ILE	ILE	PRO	GLN	LEU	ALA	LYS	LEU	THR	THR	TRP	ARG	VAL	VAL	PHE	PRO	VAL	SER	PRO	GLU	ASP	ILE	ILE	ALA	LEU	PRO	LEU	LEU	THR	MET	PRO	PRO
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- Molecule 3: Pectic enzymes secretion protein OutC



- Molecule 3: Pectic enzymes secretion protein OutC



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C15	Depositor
Number of particles used	7284	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 ( $e^-/\text{\AA}^2$ )	1.25	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	23.619	Depositor
Minimum map value	-13.503	Depositor
Average map value	0.124	Depositor
Map value standard deviation	0.884	Depositor
Recommended contour level	4.3	Depositor
Map size (Å)	409.4, 409.4, 409.4	wwPDB
Map dimensions	230, 230, 230	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.78, 1.78, 1.78	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	0.53	0/4496	0.71	3/6106 (0.0%)
1	B	0.53	0/4496	0.71	3/6106 (0.0%)
1	C	0.53	0/4496	0.71	3/6106 (0.0%)
1	D	0.53	0/4496	0.71	3/6106 (0.0%)
1	E	0.53	0/4496	0.71	3/6106 (0.0%)
1	F	0.53	0/4496	0.71	3/6106 (0.0%)
1	G	0.53	0/4496	0.71	3/6106 (0.0%)
1	H	0.53	0/4496	0.71	3/6106 (0.0%)
1	I	0.53	0/4496	0.71	3/6106 (0.0%)
1	J	0.53	0/4496	0.71	3/6106 (0.0%)
1	K	0.53	0/4496	0.71	3/6106 (0.0%)
1	L	0.53	0/4496	0.71	3/6106 (0.0%)
1	M	0.53	0/4496	0.71	3/6106 (0.0%)
1	N	0.53	0/4496	0.71	3/6106 (0.0%)
1	O	0.53	0/4496	0.71	3/6106 (0.0%)
2	P	0.71	0/729	0.93	2/987 (0.2%)
2	Q	0.71	0/729	0.93	2/987 (0.2%)
2	R	0.71	0/729	0.93	2/987 (0.2%)
2	S	0.72	0/729	0.93	2/987 (0.2%)
2	T	0.72	0/729	0.93	2/987 (0.2%)
2	U	0.72	0/729	0.93	2/987 (0.2%)
2	V	0.72	0/729	0.93	2/987 (0.2%)
2	W	0.71	0/729	0.93	1/987 (0.1%)
2	X	0.71	0/729	0.93	1/987 (0.1%)
2	Y	0.72	0/729	0.93	2/987 (0.2%)
2	Z	0.71	0/729	0.93	2/987 (0.2%)
2	a	0.72	0/729	0.93	2/987 (0.2%)
2	b	0.71	0/729	0.93	2/987 (0.2%)
2	c	0.72	0/729	0.93	2/987 (0.2%)
2	d	0.72	0/729	0.93	2/987 (0.2%)
3	e	0.24	0/518	0.42	0/701
3	f	0.24	0/518	0.42	0/701
3	g	0.24	0/518	0.42	0/701
3	h	0.24	0/518	0.42	0/701

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
3	i	0.24	0/518	0.42	0/701
3	j	0.24	0/518	0.42	0/701
3	k	0.24	0/518	0.42	0/701
3	l	0.24	0/518	0.42	0/701
3	m	0.24	0/518	0.42	0/701
3	n	0.24	0/518	0.42	0/701
3	o	0.24	0/518	0.42	0/701
3	p	0.24	0/518	0.42	0/701
3	q	0.24	0/518	0.42	0/701
3	r	0.24	0/518	0.42	0/701
3	s	0.24	0/518	0.42	0/701
All	All	0.54	0/86145	0.72	73/116910 (0.1%)

There are no bond length outliers.

The worst 5 of 73 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	W	56	ARG	NE-CZ-NH2	-5.54	117.53	120.30
2	a	56	ARG	NE-CZ-NH2	-5.51	117.55	120.30
2	c	56	ARG	NE-CZ-NH2	-5.49	117.56	120.30
1	N	195	LEU	CB-CG-CD1	-5.46	101.71	111.00
1	J	195	LEU	CB-CG-CD1	-5.46	101.72	111.00

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 [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	584/657 (89%)	516 (88%)	68 (12%)	0	100	100
1	B	584/657 (89%)	515 (88%)	69 (12%)	0	100	100
1	C	584/657 (89%)	516 (88%)	68 (12%)	0	100	100
1	D	584/657 (89%)	516 (88%)	68 (12%)	0	100	100
1	E	584/657 (89%)	516 (88%)	68 (12%)	0	100	100
1	F	584/657 (89%)	515 (88%)	69 (12%)	0	100	100
1	G	584/657 (89%)	516 (88%)	68 (12%)	0	100	100
1	H	584/657 (89%)	516 (88%)	68 (12%)	0	100	100
1	I	584/657 (89%)	516 (88%)	68 (12%)	0	100	100
1	J	584/657 (89%)	516 (88%)	68 (12%)	0	100	100
1	K	584/657 (89%)	516 (88%)	68 (12%)	0	100	100
1	L	584/657 (89%)	516 (88%)	68 (12%)	0	100	100
1	M	584/657 (89%)	516 (88%)	68 (12%)	0	100	100
1	N	584/657 (89%)	516 (88%)	68 (12%)	0	100	100
1	O	584/657 (89%)	516 (88%)	68 (12%)	0	100	100
2	P	91/143 (64%)	89 (98%)	2 (2%)	0	100	100
2	Q	91/143 (64%)	89 (98%)	2 (2%)	0	100	100
2	R	91/143 (64%)	89 (98%)	2 (2%)	0	100	100
2	S	91/143 (64%)	89 (98%)	2 (2%)	0	100	100
2	T	91/143 (64%)	89 (98%)	2 (2%)	0	100	100
2	U	91/143 (64%)	89 (98%)	2 (2%)	0	100	100
2	V	91/143 (64%)	89 (98%)	2 (2%)	0	100	100
2	W	91/143 (64%)	89 (98%)	2 (2%)	0	100	100
2	X	91/143 (64%)	89 (98%)	2 (2%)	0	100	100
2	Y	91/143 (64%)	89 (98%)	2 (2%)	0	100	100
2	Z	91/143 (64%)	89 (98%)	2 (2%)	0	100	100
2	a	91/143 (64%)	89 (98%)	2 (2%)	0	100	100
2	b	91/143 (64%)	89 (98%)	2 (2%)	0	100	100
2	c	91/143 (64%)	89 (98%)	2 (2%)	0	100	100
2	d	91/143 (64%)	89 (98%)	2 (2%)	0	100	100
3	e	66/280 (24%)	63 (96%)	3 (4%)	0	100	100
3	f	66/280 (24%)	63 (96%)	3 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	g	66/280 (24%)	63 (96%)	3 (4%)	0	100	100
3	h	66/280 (24%)	63 (96%)	3 (4%)	0	100	100
3	i	66/280 (24%)	63 (96%)	3 (4%)	0	100	100
3	j	66/280 (24%)	63 (96%)	3 (4%)	0	100	100
3	k	66/280 (24%)	63 (96%)	3 (4%)	0	100	100
3	l	66/280 (24%)	63 (96%)	3 (4%)	0	100	100
3	m	66/280 (24%)	63 (96%)	3 (4%)	0	100	100
3	n	66/280 (24%)	63 (96%)	3 (4%)	0	100	100
3	o	66/280 (24%)	63 (96%)	3 (4%)	0	100	100
3	p	66/280 (24%)	63 (96%)	3 (4%)	0	100	100
3	q	66/280 (24%)	63 (96%)	3 (4%)	0	100	100
3	r	66/280 (24%)	63 (96%)	3 (4%)	0	100	100
3	s	66/280 (24%)	63 (96%)	3 (4%)	0	100	100
All	All	11115/16200 (69%)	10018 (90%)	1097 (10%)	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	490/544 (90%)	490 (100%)	0	100	100
1	B	490/544 (90%)	490 (100%)	0	100	100
1	C	490/544 (90%)	490 (100%)	0	100	100
1	D	490/544 (90%)	490 (100%)	0	100	100
1	E	490/544 (90%)	490 (100%)	0	100	100
1	F	490/544 (90%)	490 (100%)	0	100	100
1	G	490/544 (90%)	490 (100%)	0	100	100
1	H	490/544 (90%)	490 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	I	490/544 (90%)	490 (100%)	0	100	100
1	J	490/544 (90%)	490 (100%)	0	100	100
1	K	490/544 (90%)	490 (100%)	0	100	100
1	L	490/544 (90%)	490 (100%)	0	100	100
1	M	490/544 (90%)	490 (100%)	0	100	100
1	N	490/544 (90%)	490 (100%)	0	100	100
1	O	490/544 (90%)	490 (100%)	0	100	100
2	P	78/123 (63%)	78 (100%)	0	100	100
2	Q	78/123 (63%)	78 (100%)	0	100	100
2	R	78/123 (63%)	78 (100%)	0	100	100
2	S	78/123 (63%)	78 (100%)	0	100	100
2	T	78/123 (63%)	78 (100%)	0	100	100
2	U	78/123 (63%)	78 (100%)	0	100	100
2	V	78/123 (63%)	78 (100%)	0	100	100
2	W	78/123 (63%)	78 (100%)	0	100	100
2	X	78/123 (63%)	78 (100%)	0	100	100
2	Y	78/123 (63%)	78 (100%)	0	100	100
2	Z	78/123 (63%)	78 (100%)	0	100	100
2	a	78/123 (63%)	78 (100%)	0	100	100
2	b	78/123 (63%)	78 (100%)	0	100	100
2	c	78/123 (63%)	78 (100%)	0	100	100
2	d	78/123 (63%)	78 (100%)	0	100	100
3	e	55/236 (23%)	55 (100%)	0	100	100
3	f	55/236 (23%)	55 (100%)	0	100	100
3	g	55/236 (23%)	55 (100%)	0	100	100
3	h	55/236 (23%)	55 (100%)	0	100	100
3	i	55/236 (23%)	55 (100%)	0	100	100
3	j	55/236 (23%)	55 (100%)	0	100	100
3	k	55/236 (23%)	55 (100%)	0	100	100
3	l	55/236 (23%)	55 (100%)	0	100	100
3	m	55/236 (23%)	55 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	n	55/236 (23%)	55 (100%)	0	100	100
3	o	55/236 (23%)	55 (100%)	0	100	100
3	p	55/236 (23%)	55 (100%)	0	100	100
3	q	55/236 (23%)	55 (100%)	0	100	100
3	r	55/236 (23%)	55 (100%)	0	100	100
3	s	55/236 (23%)	55 (100%)	0	100	100
All	All	9345/13545 (69%)	9345 (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. 5 of 194 such sidechains are listed below:

Mol	Chain	Res	Type
1	J	353	GLN
1	M	47	ASN
1	K	47	ASN
1	K	611	GLN
1	M	353	GLN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

There are no chain breaks in this entry.

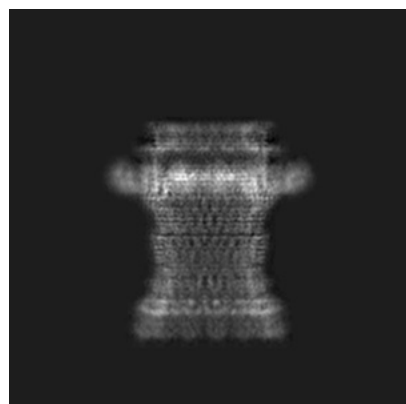
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-0193. These allow visual inspection of the internal detail of the map and identification of artifacts.

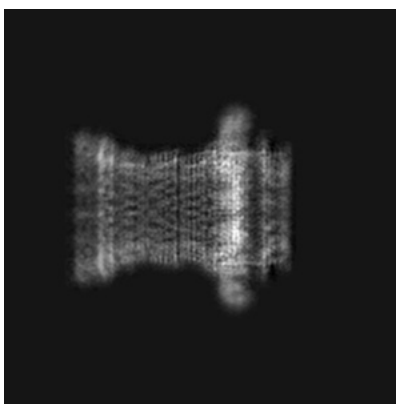
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

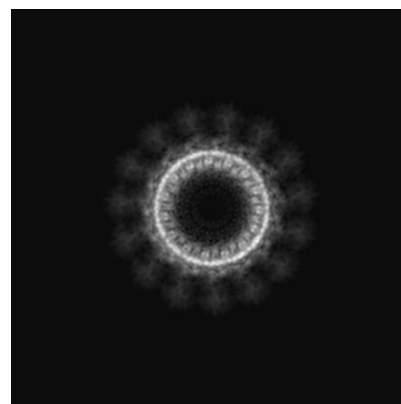
#### 6.1.1 Primary map



X

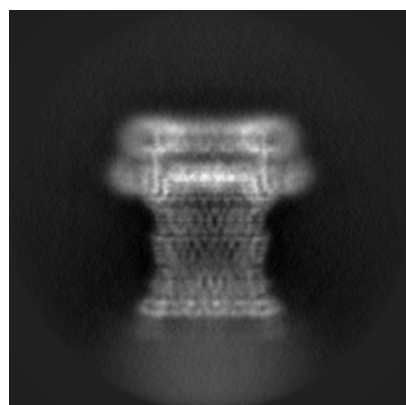


Y

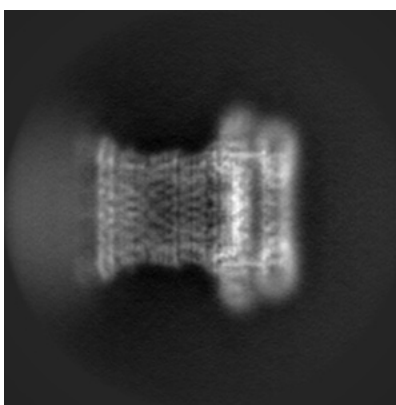


Z

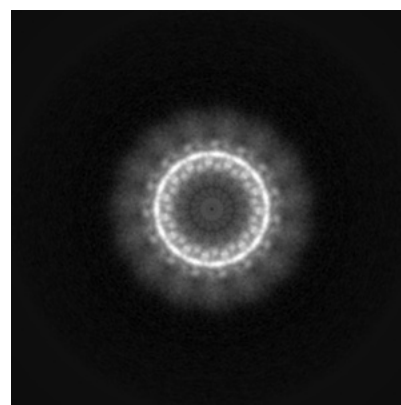
#### 6.1.2 Raw map



X



Y



Z

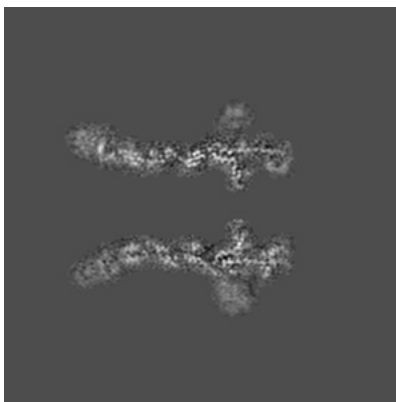
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

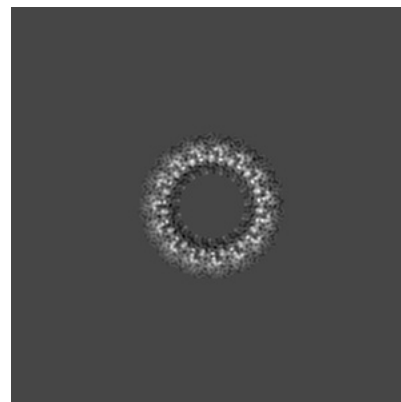
### 6.2.1 Primary map



X Index: 115

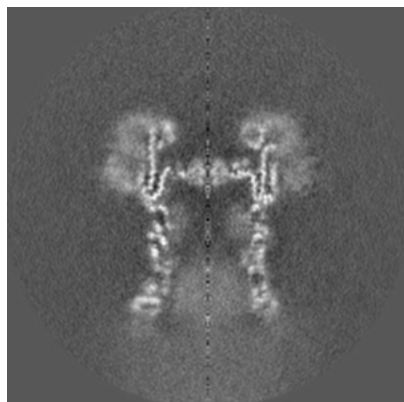


Y Index: 115

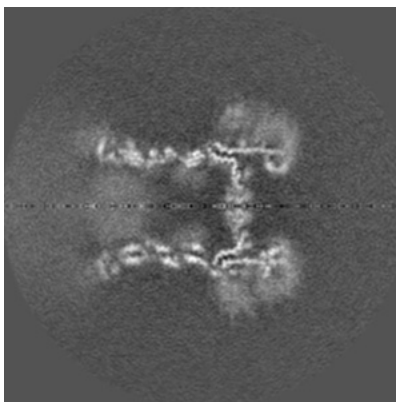


Z Index: 115

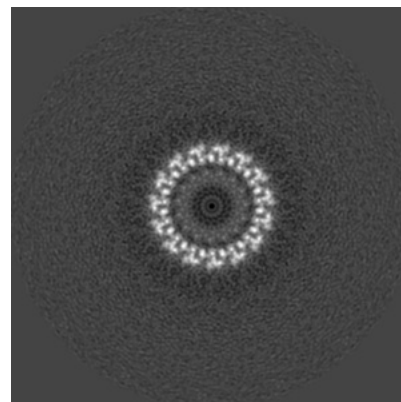
### 6.2.2 Raw map



X Index: 115



Y Index: 115

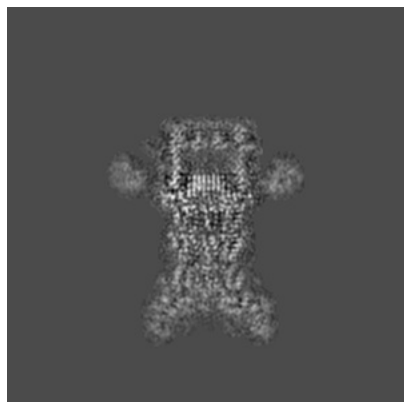


Z Index: 115

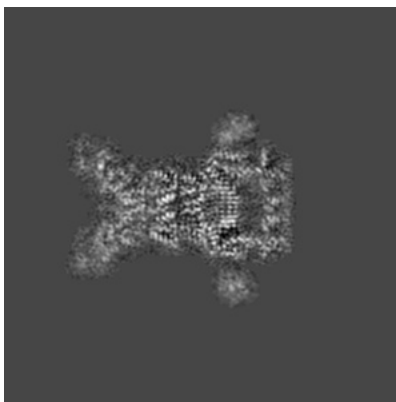
The images above show central slices of the map in three orthogonal directions.

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

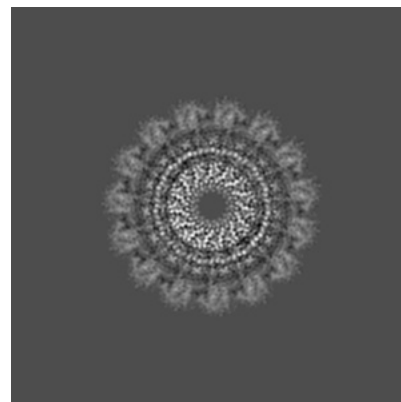
### 6.3.1 Primary map



X Index: 141

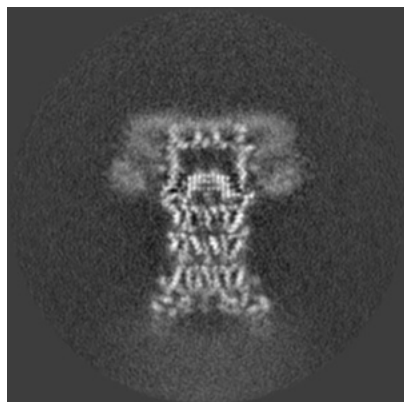


Y Index: 140

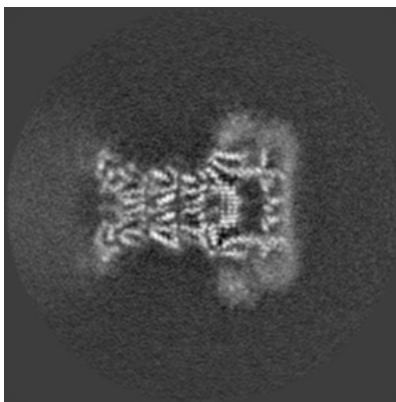


Z Index: 134

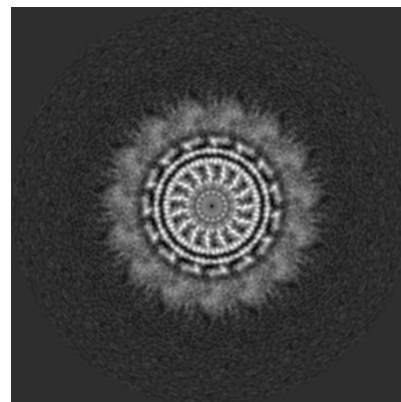
### 6.3.2 Raw map



X Index: 140



Y Index: 140



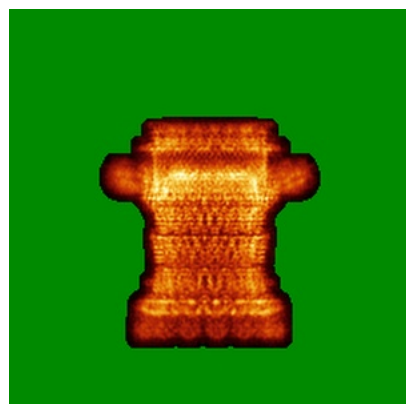
Z Index: 132

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

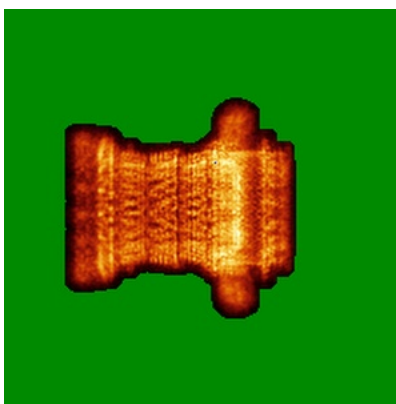


## 6.4 Orthogonal standard-deviation projections (False-color) [i](#)

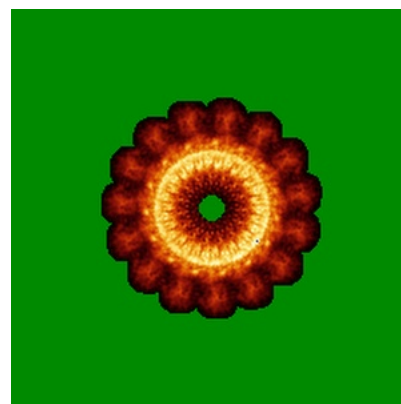
### 6.4.1 Primary map



X



Y

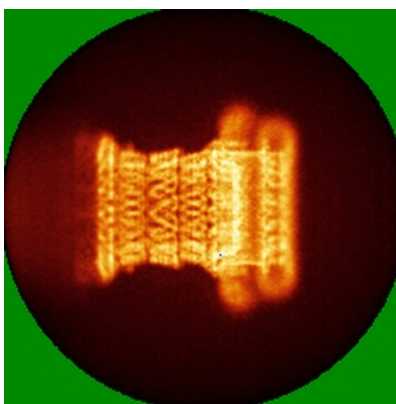


Z

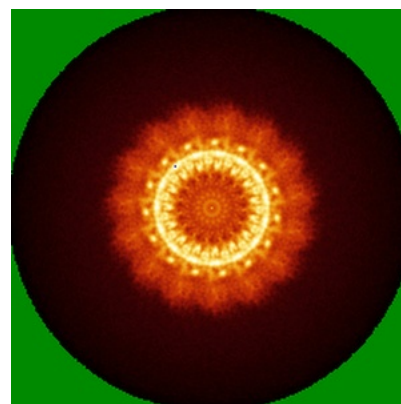
### 6.4.2 Raw map



X



Y

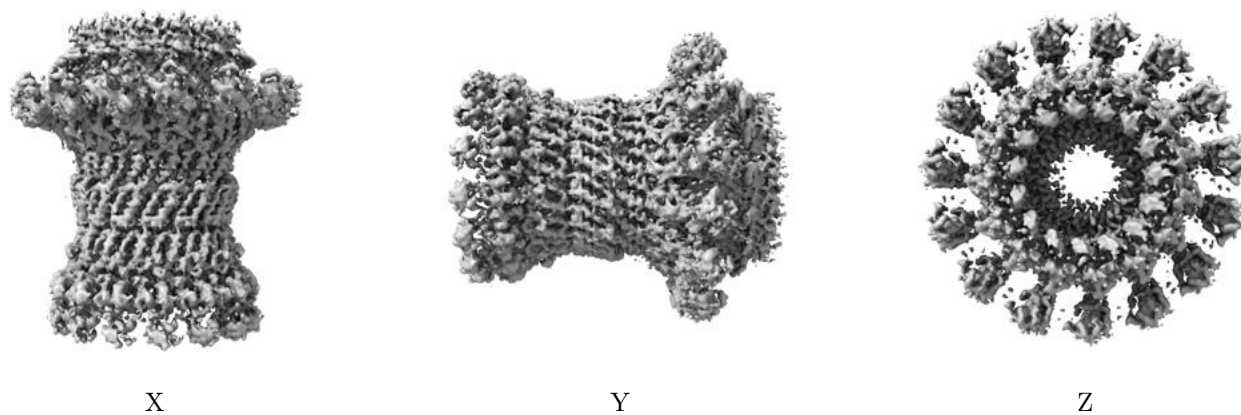


Z

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

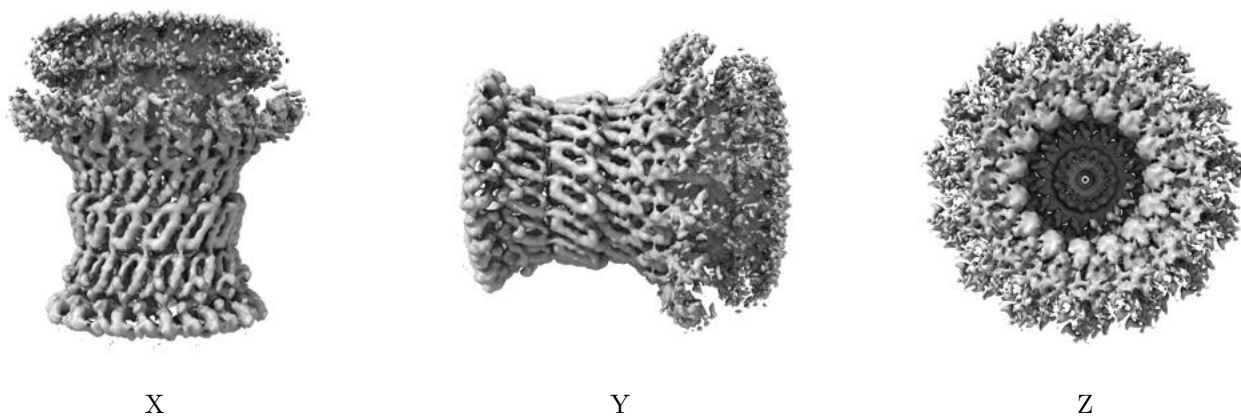
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 4.3. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

### 6.5.2 Raw map



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

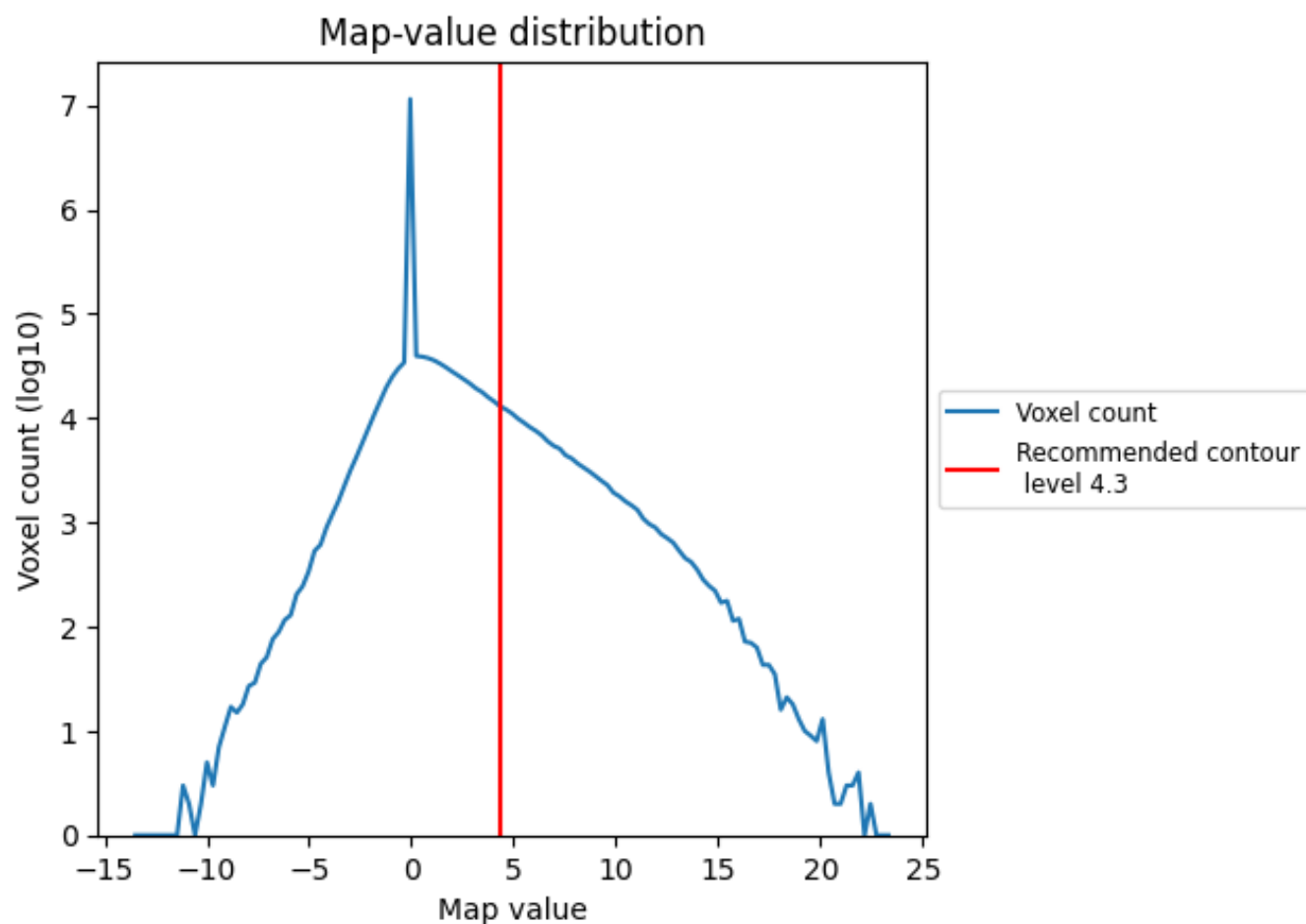
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

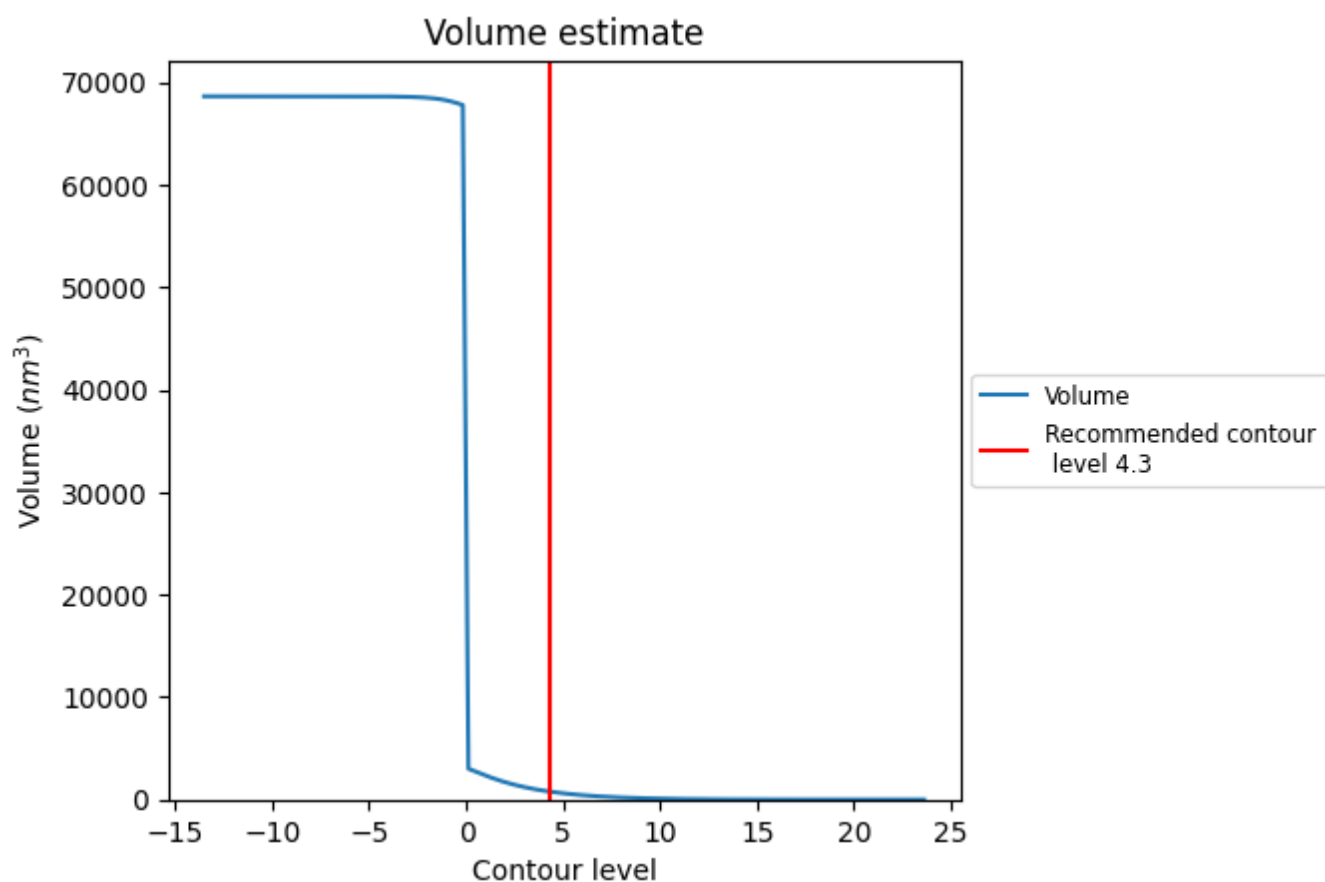
This section contains the results of statistical analysis of the map.

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



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

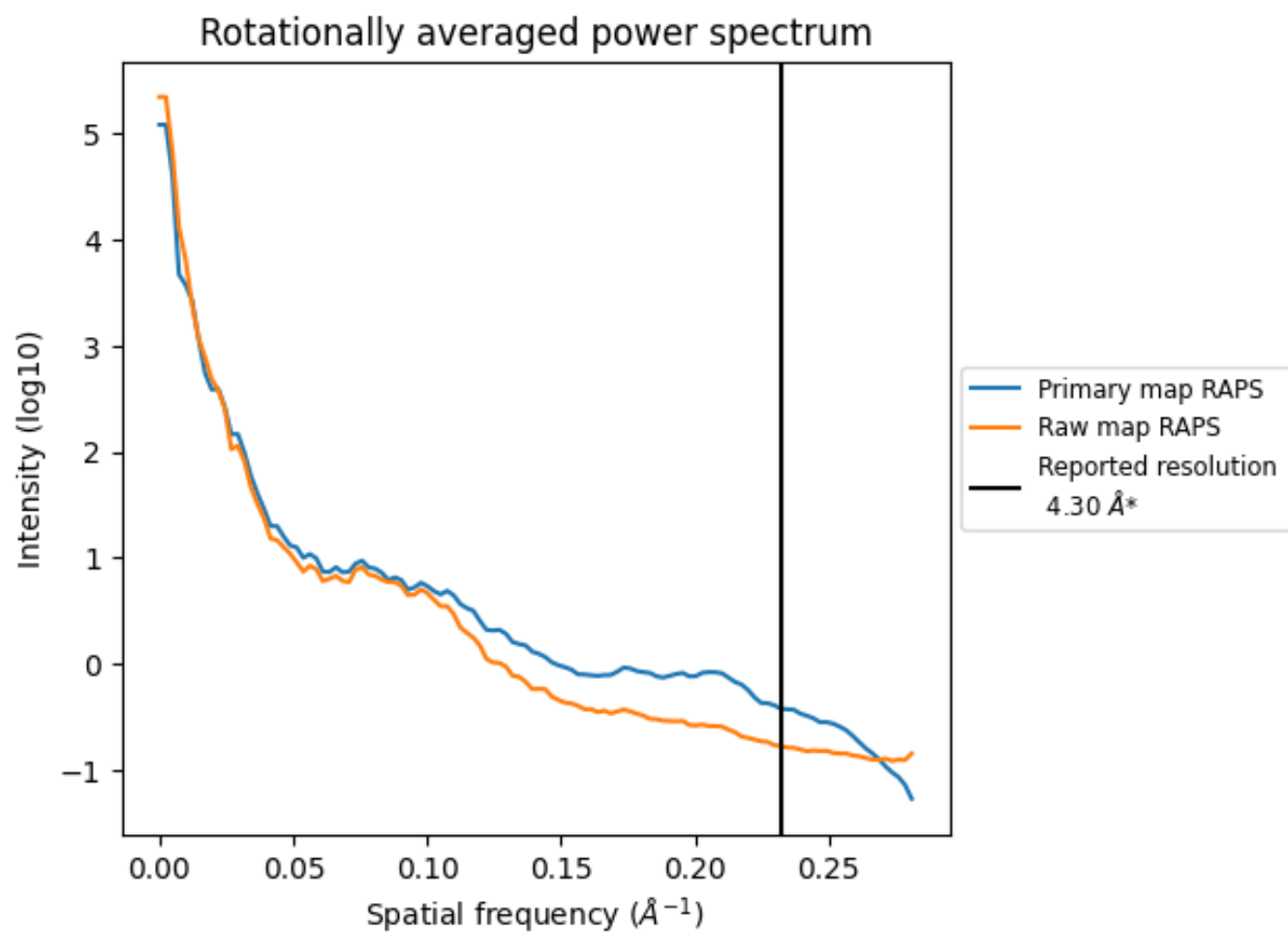
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 783 nm<sup>3</sup>; this corresponds to an approximate mass of 707 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 ⓘ

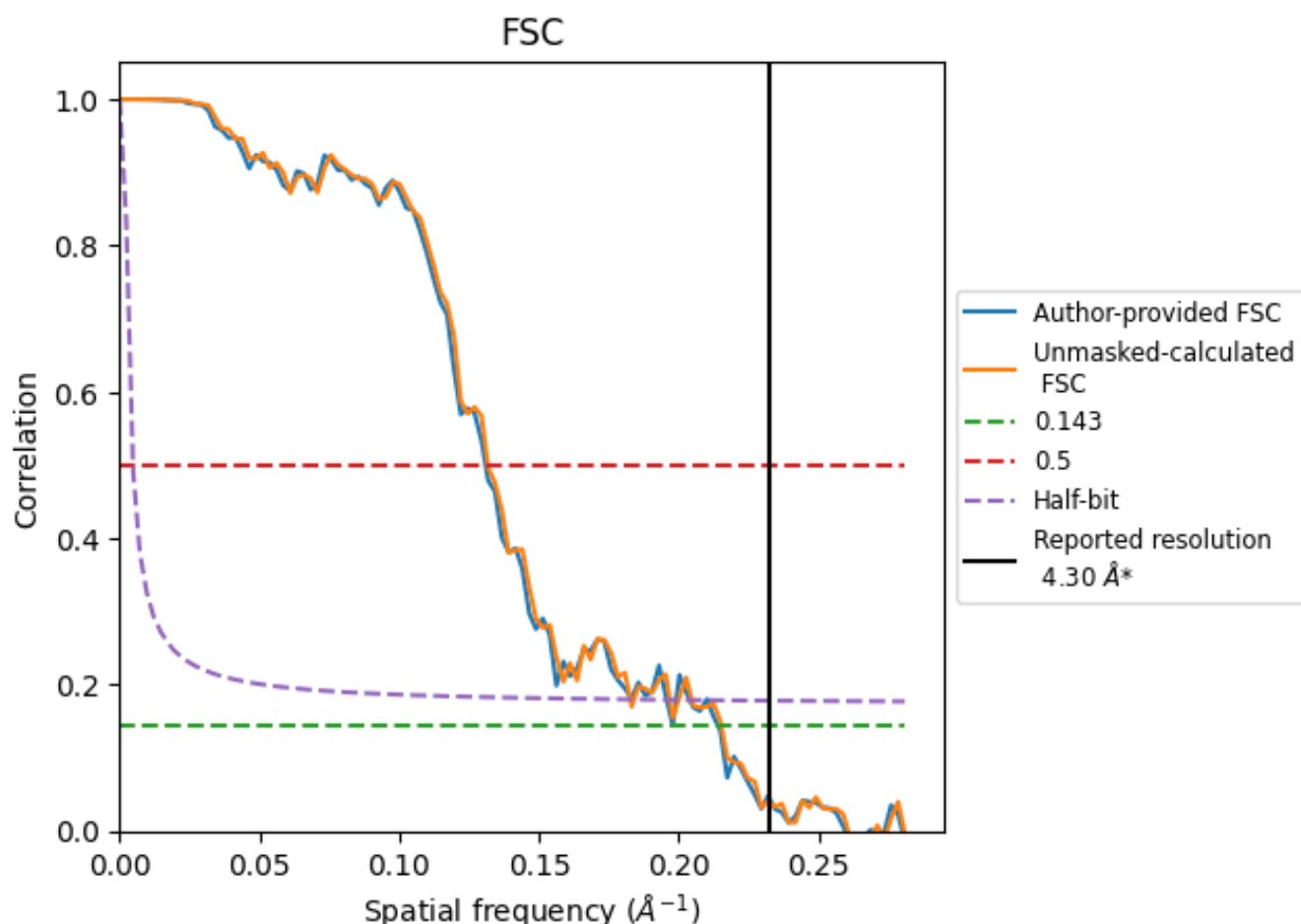


\*Reported resolution corresponds to spatial frequency of 0.233 Å<sup>-1</sup>

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

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

### 8.1 FSC [i](#)



\*Reported resolution corresponds to spatial frequency of 0.233 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

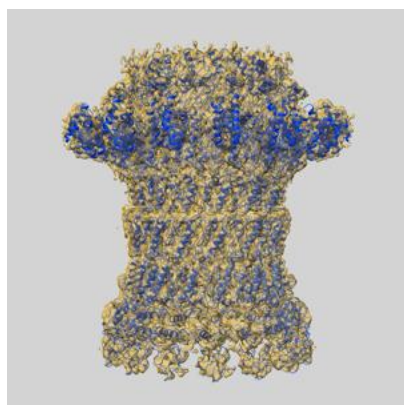
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.30	-	-
Author-provided FSC curve	4.67	7.64	5.11
Unmasked-calculated*	4.64	7.59	5.47

\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

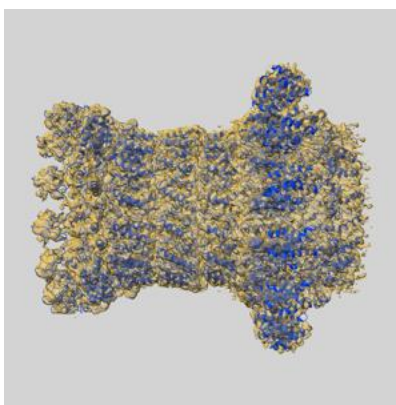
## 9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-0193 and PDB model 6HCG. Per-residue inclusion information can be found in section [3](#) on page [8](#).

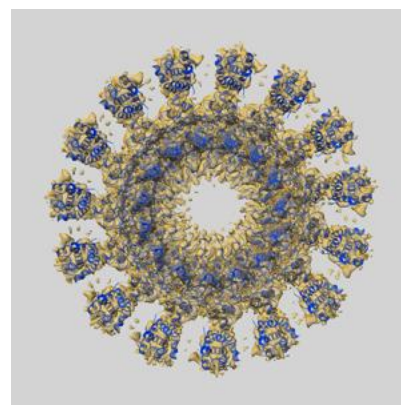
### 9.1 Map-model overlay [i](#)



X



Y

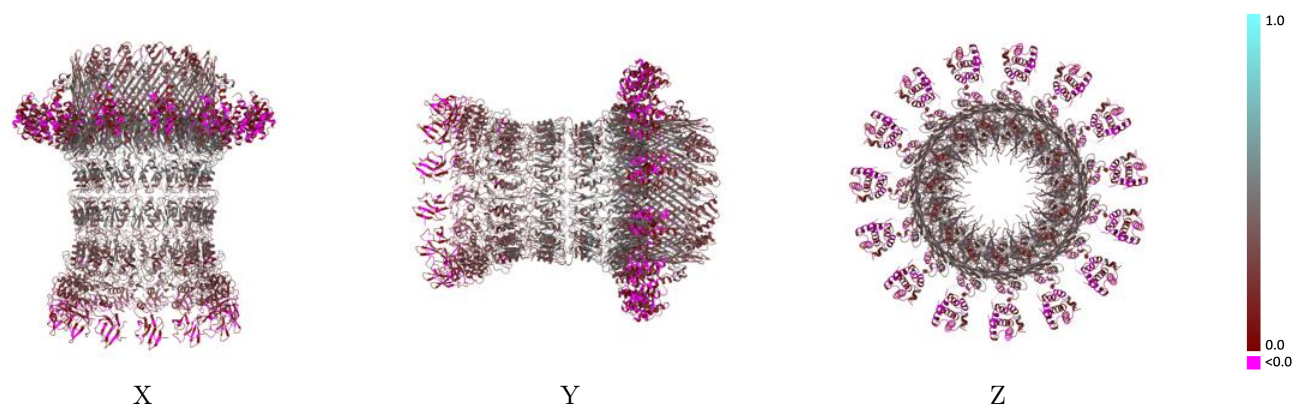


Z

The images above show the 3D surface view of the map at the recommended contour level 4.3 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.

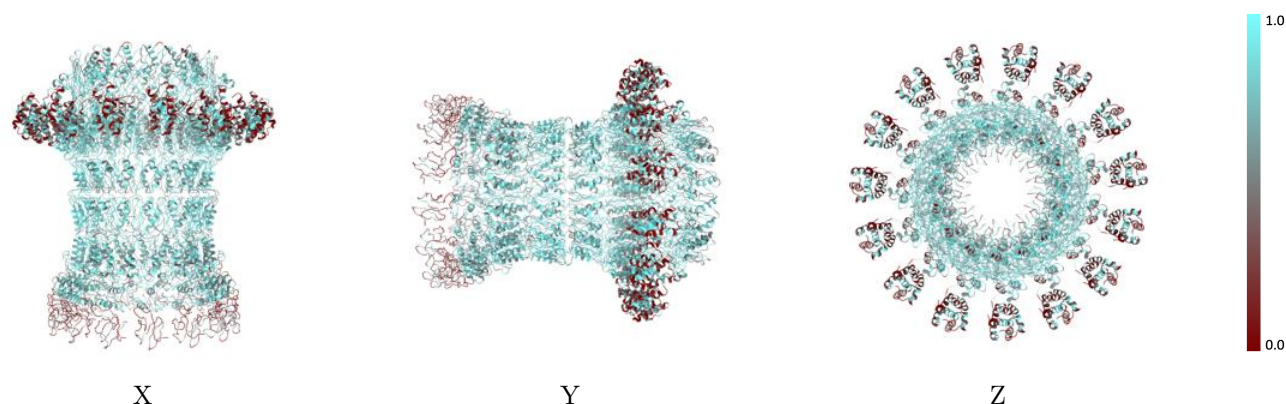


## 9.2 Q-score mapped to coordinate model [i](#)



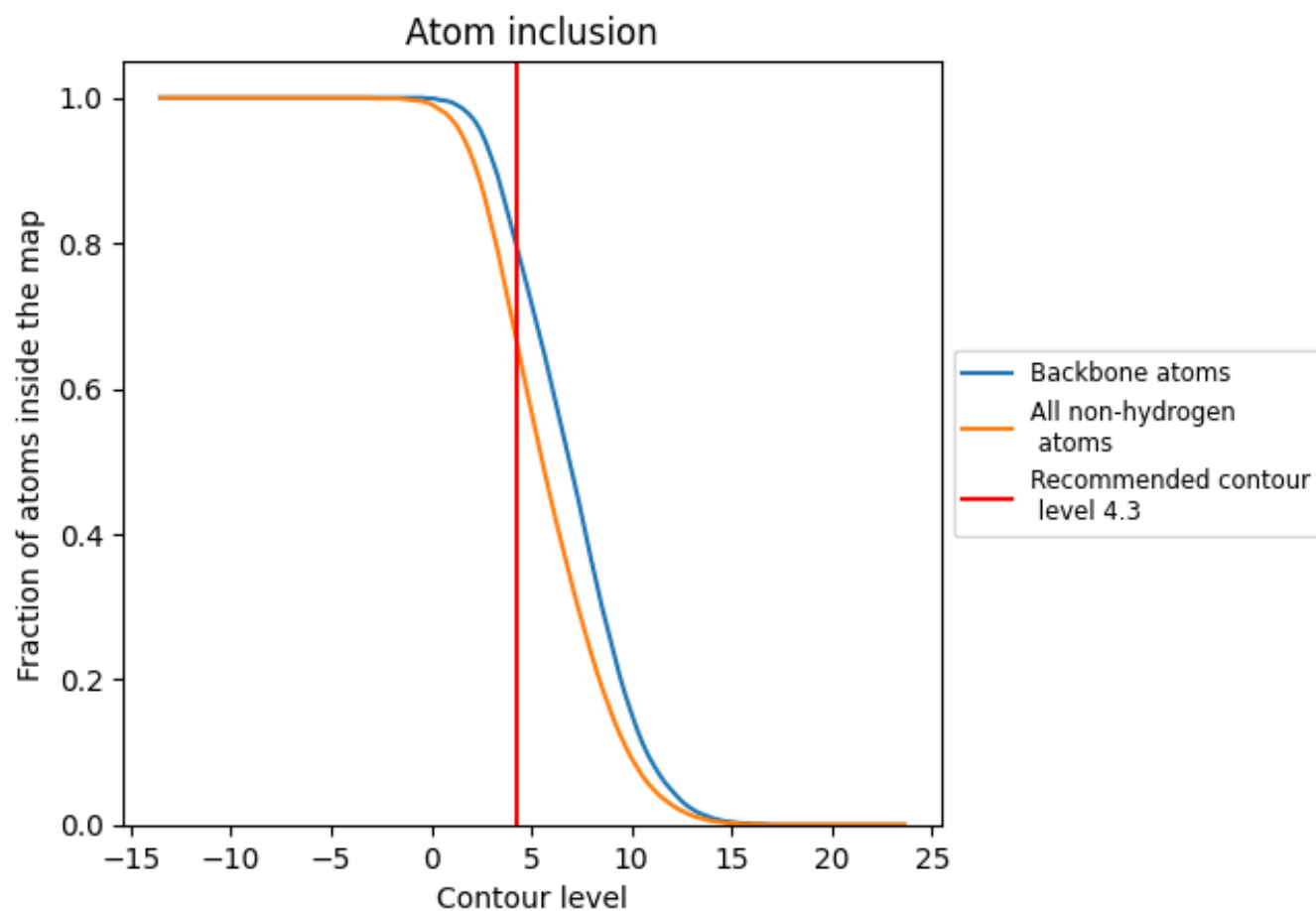
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (4.3).







































































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 79% of all backbone atoms, 66% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary ⓘ























The table lists the average atom inclusion at the recommended contour level (4.3) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.6600	 0.2730
A	 0.7570	 0.3210
B	 0.7560	 0.3230
C	 0.7600	 0.3280
D	 0.7520	 0.3310
E	 0.7490	 0.3250
F	 0.7500	 0.3240
G	 0.7440	 0.3250
H	 0.7450	 0.3230
I	 0.7480	 0.3240
J	 0.7410	 0.3220
K	 0.7480	 0.3230
L	 0.7440	 0.3240
M	 0.7450	 0.3250
N	 0.7450	 0.3230
O	 0.7430	 0.3260
P	 0.3850	 0.0770
Q	 0.4100	 0.0790
R	 0.3960	 0.0830
S	 0.3800	 0.0760
T	 0.3900	 0.0790
U	 0.3880	 0.0810
V	 0.4090	 0.0730
W	 0.4260	 0.0850
X	 0.4300	 0.0780
Y	 0.4060	 0.0810
Z	 0.3690	 0.0660
a	 0.3790	 0.0730
b	 0.3730	 0.0710
c	 0.3620	 0.0770
d	 0.3800	 0.0740
e	 0.2640	 0.1000
f	 0.2440	 0.0950
g	 0.2480	 0.1100
h	 0.2580	 0.1020



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Chain	Atom inclusion	Q-score
i	 0.2600	 0.0910
j	 0.2800	 0.1030
k	 0.3100	 0.0970
l	 0.2920	 0.1010
m	 0.2820	 0.0970
n	 0.2840	 0.1100
o	 0.2200	 0.0980
p	 0.2540	 0.0910
q	 0.2460	 0.1040
r	 0.2300	 0.0920
s	 0.2360	 0.1040