



Full wwPDB EM Validation Report ⓘ

Oct 6, 2024 – 05:20 am BST

PDB ID : 7NP7
EMDB ID : EMD-12514
Title : Structure of an intact ESX-5 inner membrane complex, Composite C1 model
Authors : Fahrenkamp, D.; Bunduc, C.M.; Wald, J.; Ummels, R.; Bitter, W.; Houben, E.N.G.; Marlovits, T.C.
Deposited on : 2021-02-26
Resolution : 4.03 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

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

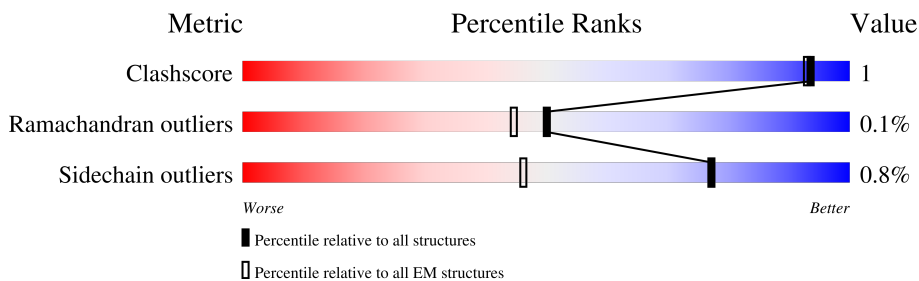
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 4.03 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	B1	506	
1	B2	506	
1	B3	506	
1	B4	506	
1	B5	506	
1	B6	506	
2	C1	1391	
2	C2	1391	

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Mol	Chain	Length	Quality of chain
2	C3	1391	
2	C4	1391	
2	C5	1391	
2	C6	1391	
3	D1	503	
3	D2	503	
3	D3	503	
3	D4	503	
3	D5	503	
3	D6	503	
3	D7	503	
3	D8	503	
3	D9	503	
3	DA	503	
3	DB	503	
3	DC	503	
4	P1	585	
4	P2	585	
4	P3	585	

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 182470 atoms, of which 92300 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 ESX-5 secretion system ATPase EccB5.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
1	B1	478	Total	C	H	N	O	S	0	0
			7218	2266	3631	639	671	11		
1	B2	478	Total	C	H	N	O	S	0	0
			7218	2266	3631	639	671	11		
1	B3	478	Total	C	H	N	O	S	0	0
			7218	2266	3631	639	671	11		
1	B4	480	Total	C	H	N	O	S	0	0
			7212	2262	3621	644	675	10		
1	B5	480	Total	C	H	N	O	S	0	0
			7212	2262	3621	644	675	10		
1	B6	480	Total	C	H	N	O	S	0	0
			7212	2262	3621	644	675	10		

- Molecule 2 is a protein called ESX-5 secretion system protein EccC5.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
2	C1	406	Total	C	H	N	O	S	0	0
			6335	2052	3145	536	576	26		
2	C2	406	Total	C	H	N	O	S	0	0
			6335	2052	3145	536	576	26		
2	C3	406	Total	C	H	N	O	S	0	0
			6335	2052	3145	536	576	26		
2	C4	406	Total	C	H	N	O	S	0	0
			6335	2052	3145	536	576	26		
2	C5	406	Total	C	H	N	O	S	0	0
			6335	2052	3145	536	576	26		
2	C6	406	Total	C	H	N	O	S	0	0
			6335	2052	3145	536	576	26		

- Molecule 3 is a protein called ESX-5 secretion system protein EccD5.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
3	D1	485	Total	C	H	N	O	S	0	0
			7458	2353	3823	633	628	21		

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Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
3	D2	405	Total	C	H	N	O	S	0	0
			6155	1919	3166	528	524	18		
3	D3	485	Total	C	H	N	O	S	0	0
			7459	2353	3824	633	628	21		
3	D4	415	Total	C	H	N	O	S	0	0
			6308	1969	3245	541	535	18		
3	D5	485	Total	C	H	N	O	S	0	0
			7459	2353	3824	633	628	21		
3	D6	405	Total	C	H	N	O	S	0	0
			6155	1919	3166	528	524	18		
3	D7	485	Total	C	H	N	O	S	0	0
			7459	2353	3824	633	628	21		
3	D8	405	Total	C	H	N	O	S	0	0
			6154	1919	3165	528	524	18		
3	D9	485	Total	C	H	N	O	S	0	0
			7459	2353	3824	633	628	21		
3	DA	405	Total	C	H	N	O	S	0	0
			6156	1919	3167	528	524	18		
3	DB	485	Total	C	H	N	O	S	0	0
			7459	2353	3824	633	628	21		
3	DC	405	Total	C	H	N	O	S	0	0
			6154	1919	3165	528	524	18		

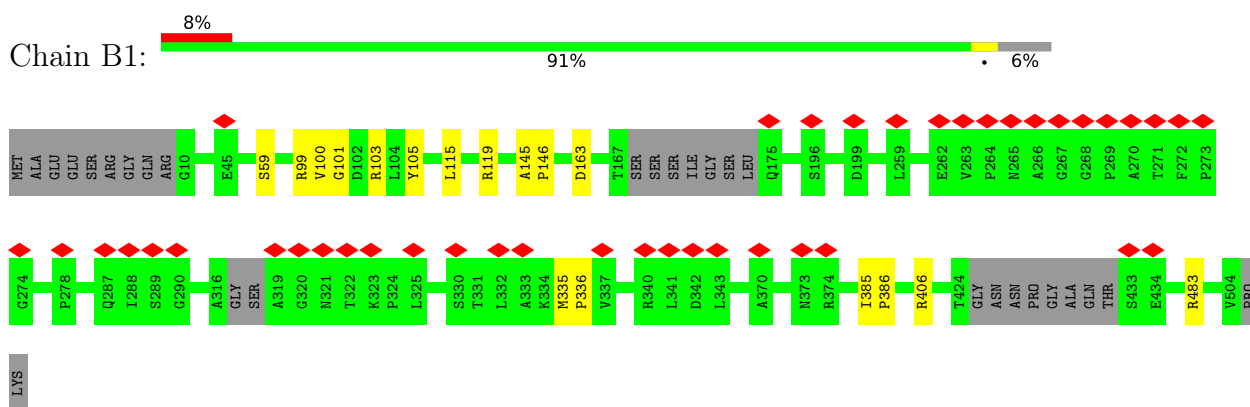
- Molecule 4 is a protein called Mycosin-5.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
4	P1	444	Total	C	H	N	O	S	0	0
			6445	2046	3219	554	611	15		
4	P2	444	Total	C	H	N	O	S	0	0
			6445	2046	3219	554	611	15		
4	P3	444	Total	C	H	N	O	S	0	0
			6445	2046	3219	554	611	15		

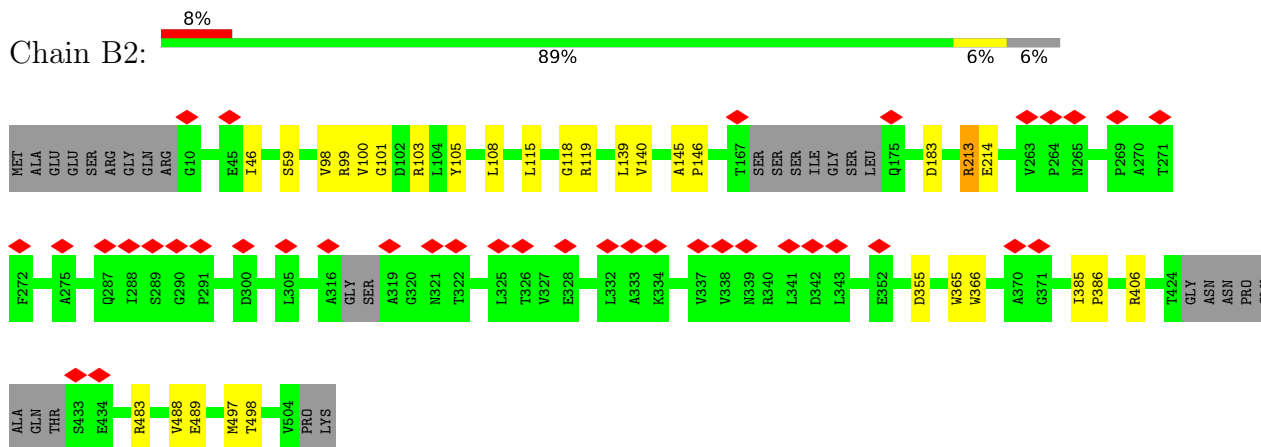
3 Residue-property plots

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.

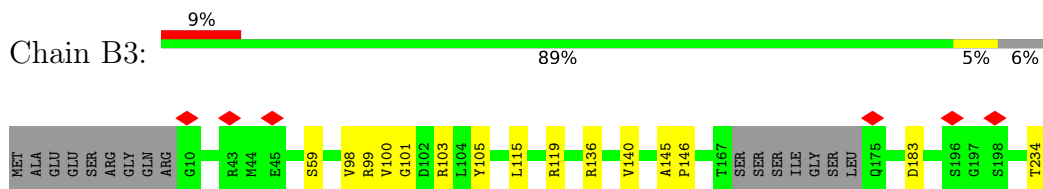
- Molecule 1: ESX-5 secretion system ATPase EccB5

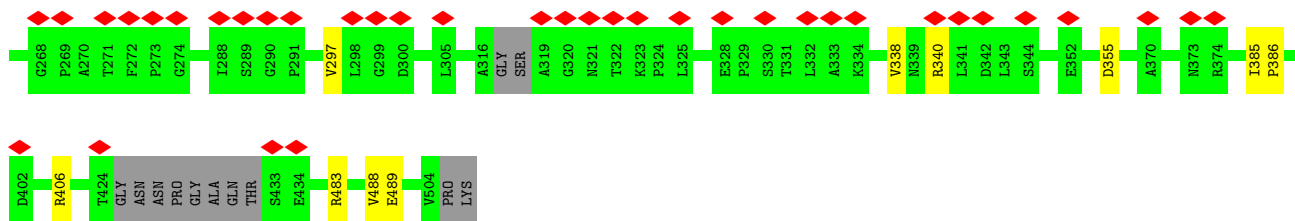


- Molecule 1: ESX-5 secretion system ATPase EccB5

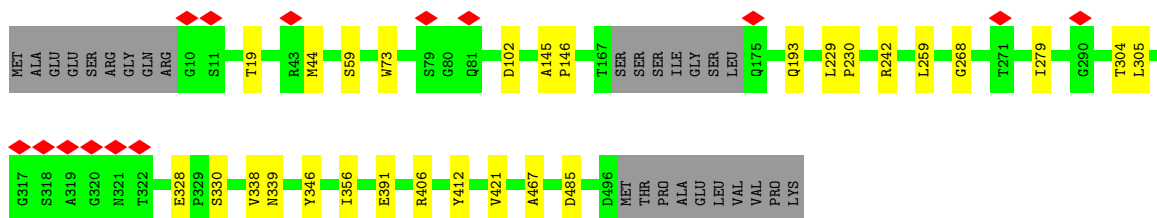


- Molecule 1: ESX-5 secretion system ATPase EccB5

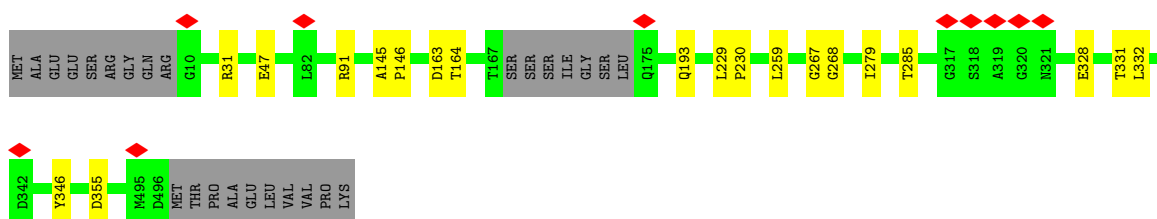




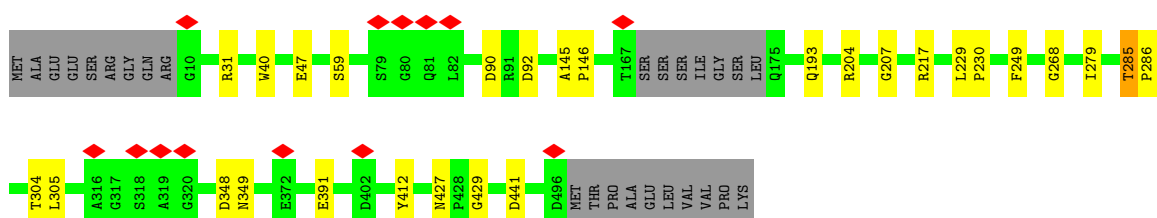
• Molecule 1: ESX-5 secretion system ATPase EccB5



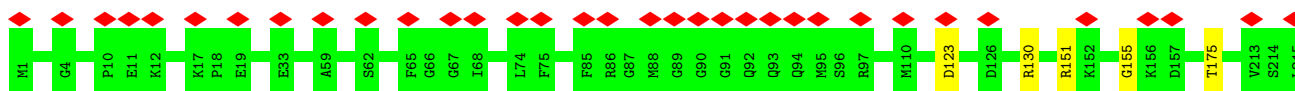
• Molecule 1: ESX-5 secretion system ATPase EccB5



• Molecule 1: ESX-5 secretion system ATPase EccB5



• Molecule 2: ESX-5 secretion system protein EccC5



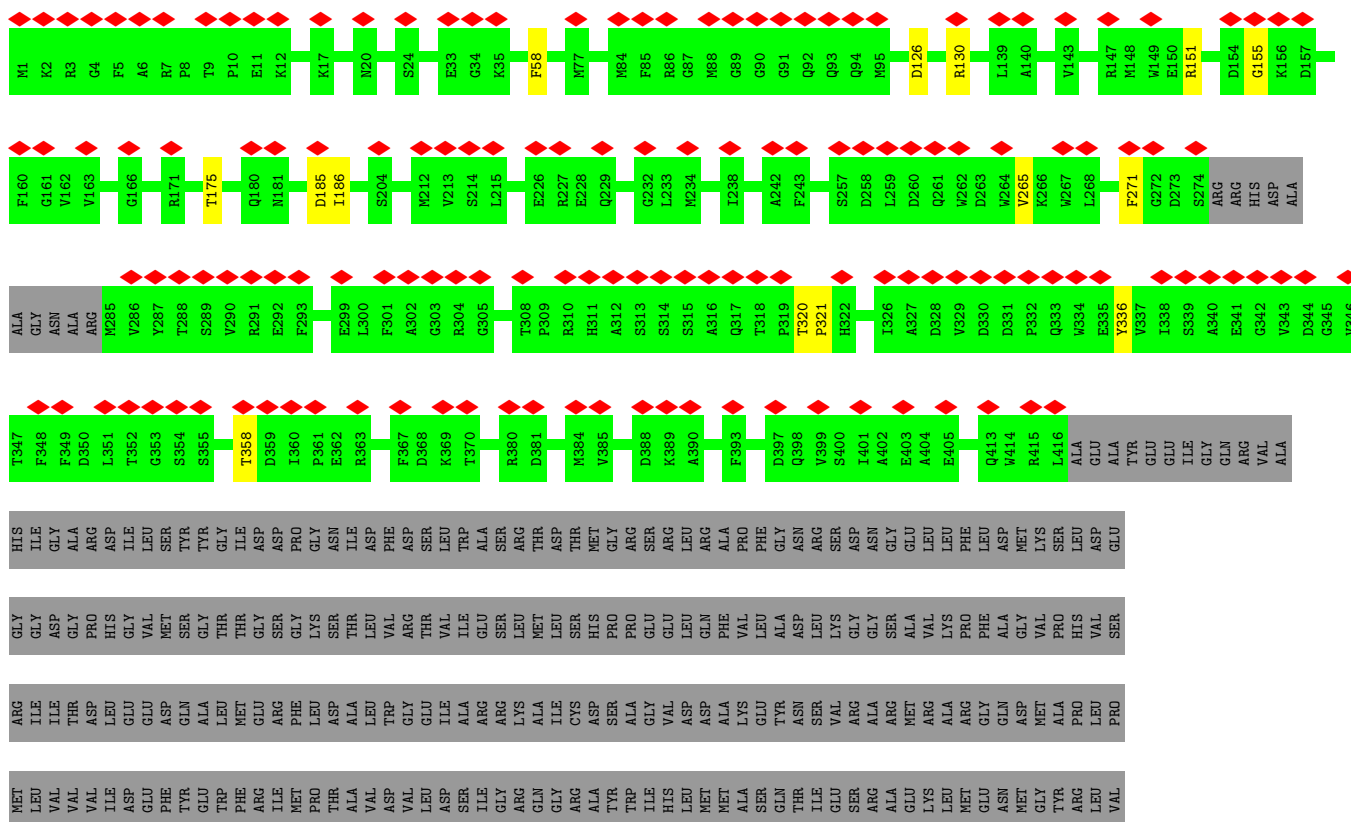
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D328	V329	D330	D331	Y336	V337	I338	S339	A340	V346	T347	L351	T352	G353	V357	T358	D359	I360	R363	K364	L365	Q366	F367	D368	D381	D388	E403	L411	A412	L416	ALA	GLU	ALA	ALA	TYR	GLU	GLU	GLY	GLN	VAL	ARG	VAL	ALA	ALA	ARG	ARG	LEU					
SER	TYR	GLY	THR	ILE	ASP	PRO	ASN	PHE	ASP	SER	TRP	ALA	SER	THR	THR	ARG	PRO	GLU	GLU	LEU	ALA	ALA	PHE	GLY	ASN	GLY	GLY	LEU	PHE	ASP	ASN	GLY	LYS	GLY	ALA	LYS	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	VAL				
MET	SER	GLY	THR	GLY	SER	GLY	LYS	PRO	ARG	THR	THR	THR	THR	MET	ILE	SER	PRO	GLU	VAL	GLY	GLY	VAL	LEU	ALA	GLY	GLY	ALA	GLY	ALA	GLY	ALA	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY			
ASP	GLN	ALA	ALA	GLY	GLU	ARG	PHE	LEU	GLY	THR	ILE	ARG	ARG	ALA	ILE	ARG	ALA	VAL	VAL	ASP	ASP	PHE	VAL	LYS	ARG	ALA	ALA	ALA	ALA	ALA	GLN	ASP	GLY	MET	VAL	VAL	ALA	PRO	HIS	VAL	VAL	VAL	VAL	VAL	VAL	GLU					
PHE	TYR	GLU	TRP	PHE	GLY	ILE	MET	PRO	ASP	THR	ASP	ALA	VAL	GLN	ASP	ILE	GLY	GLY	GLY	GLY	GLY	ARG	GLN	PHE	ALA	ALA	ALA	ALA	ALA	ALA	ASN	ASP	GLY	TYR	GLY	TYR	GLY	ARG	LEU	VAL	VAL	VAL	VAL	VAL	VAL	VAL	ALA				
ALA	GLN	ALA	ALA	VAL	PRO	ASN	ALA	ALA	VAL	THR	ALA	GLY	GLY	GLY	THR	PHE	ARG	GLY	GLY	GLY	GLY	GLY	PRO	PHE	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ASP			
TYR	ILE	ARG	PRO	GLY	LEU	PHE	THR	THR	VAL	GLU	VAL	GLY	GLY	GLY	PRO	ASP	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	ILE			
ILE	ASP	GLN	GLY	THR	LYS	PHE	ASN	THR	THR	THR	THR	THR	THR	GLN	GLN	GLN	VAL	VAL	VAL	VAL	PHE	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	HIS			
ASP	GLN	PRO	TRP	THR	VAL	ASP	ASP	ALA	ASN	VAL	VAL	ILE	GLY	GLY	GLY	ALA	ALA	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR			
VAL	SER	ARG	ILE	HIS	PRO	GLY	GLY	THR	ASP	THR	ASP	THR	ARG	ARG	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR			
PRO	ASP	GLY	PHE	ASP	VAL	VAL	VAL	VAL	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR		
PHE	GLY	SER	ARG	ILE	LEU	ARG	LEU	ARG	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA		
SER	THR	PRO	ASP	VAL	PHE	GLU	CYS	THR	CYS	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL		
SER	GLU	LEU	ASP	ALA	PRO	VAL	THR	ALA	GLY	ASN	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY			
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TRP	SER	GLY	PRO	ILE	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	
ALA	LEU	HIS	GLN	ALA	ASN	ALA	PRO	ASP	ASP	ASP	GLY	PHE	ILE	ILE	GLY	GLY	LYS	LYS	GLY	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO

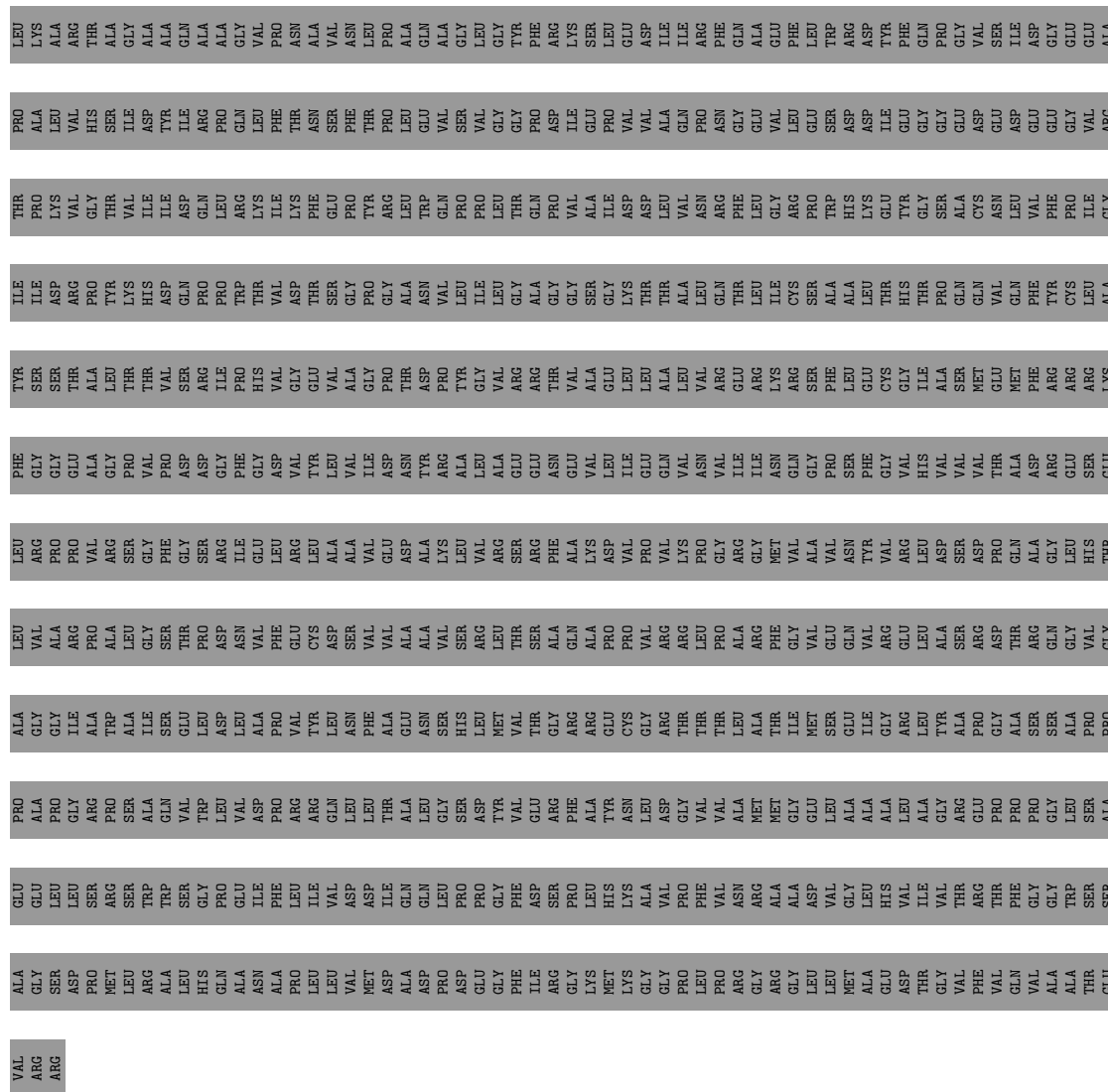
● Molecule 2: ESX-5 secretion system protein EccC5



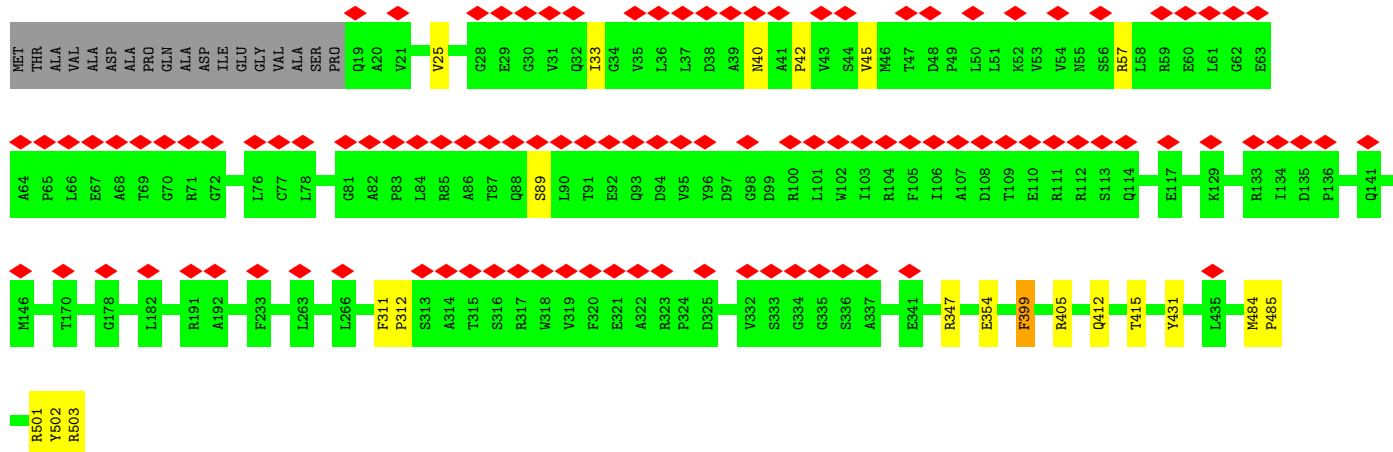
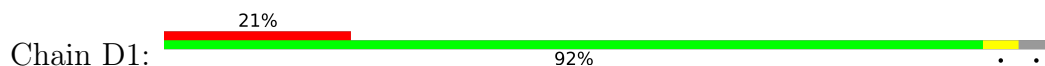
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PRO	ARG	GLN	LEU	VAL	LEU	LEU	ASP	GLY	VAL	VAL	VAL	VAL	THR	GLY	GLY	GLY	ILE
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PRO	VAL	TYR	LEU	ASN	ASN	HIS	LEU	VAL	VAL	VAL	THR	VAL	PRO	ALA	GLY	GLY	ASP
PRO	ARG	GLN	LEU	VAL	LEU	LEU	THR	THR	VAL	VAL	VAL	THR	PRO	ALA	GLY	GLY	ILE
PHE	LEU	ILE	VAL	ASP	GLN	ASN	ASN	THR	ASP	ASP	THR	THR	ASP	THR	TRP	ALA	ALA
ALA	PRO	LEU	LEU	VAL	VAL	MET	ASP	THR	ALA	ALA	ALA	THR	THR	THR	ARG	ARG	ASN

• Molecule 2: ESX-5 secretion system protein EccC5

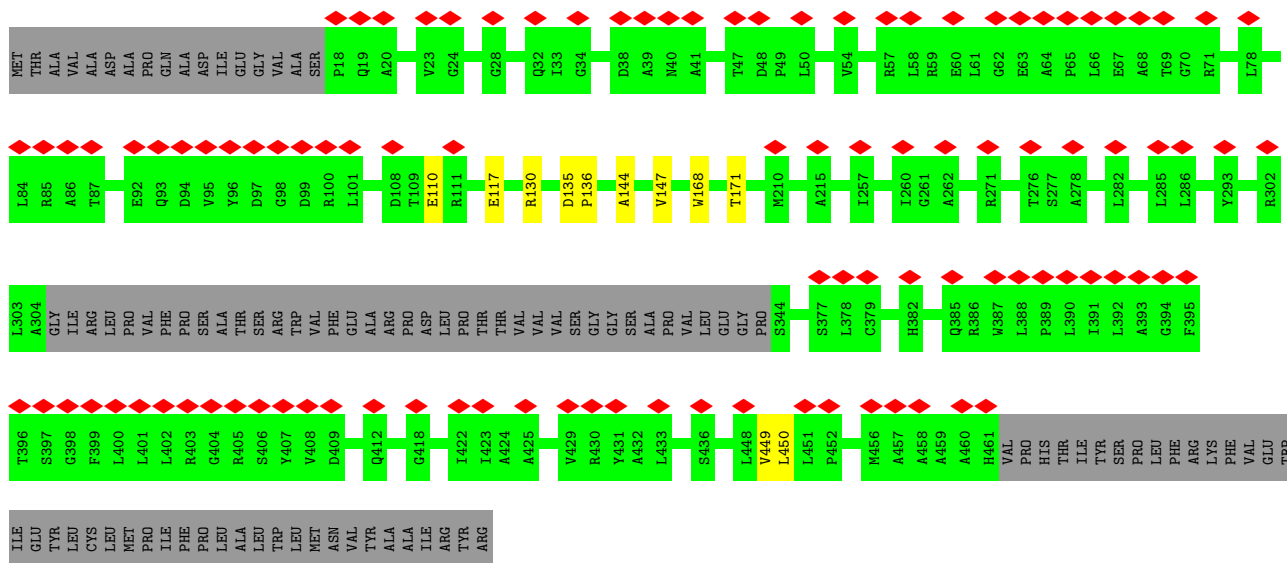
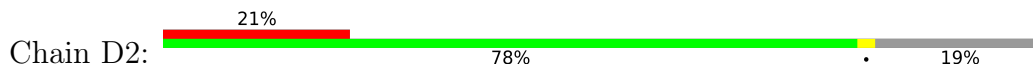




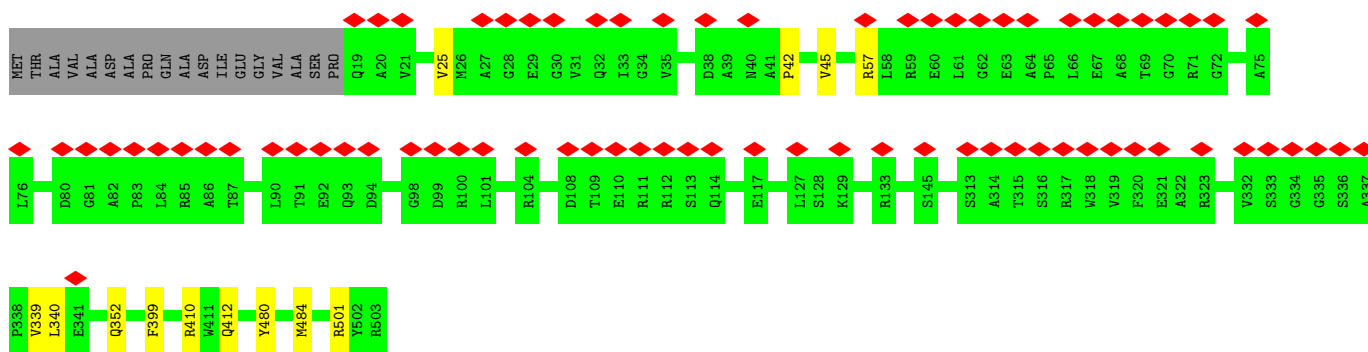
● Molecule 3: ESX-5 secretion system protein EccD5



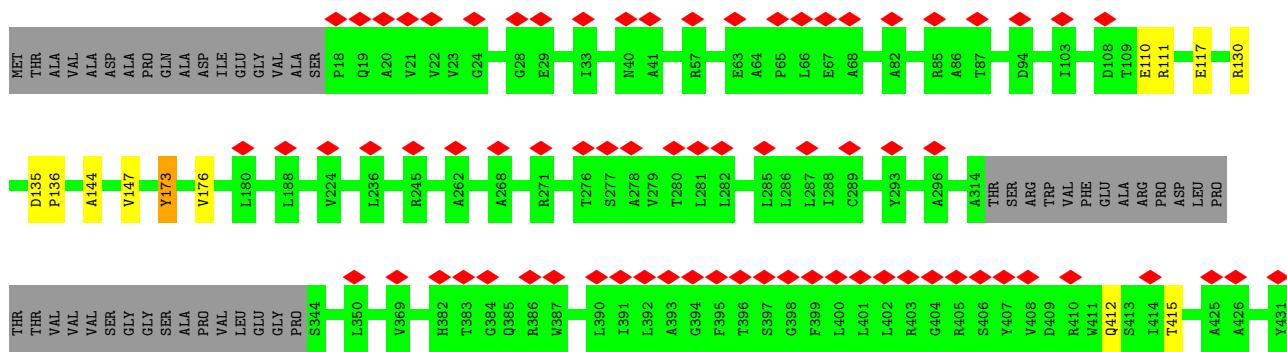
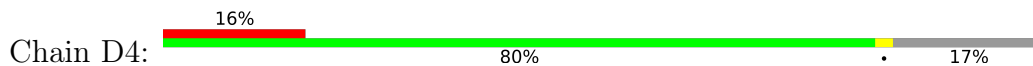
• Molecule 3: ESX-5 secretion system protein EccD5

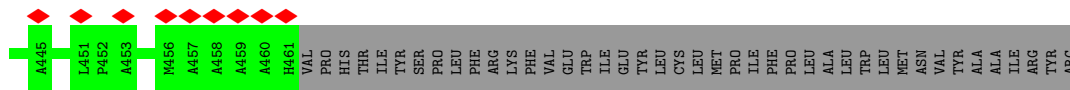


• Molecule 3: ESX-5 secretion system protein EccD5

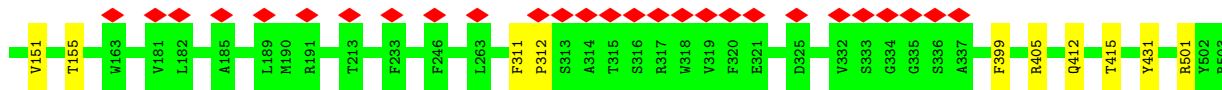
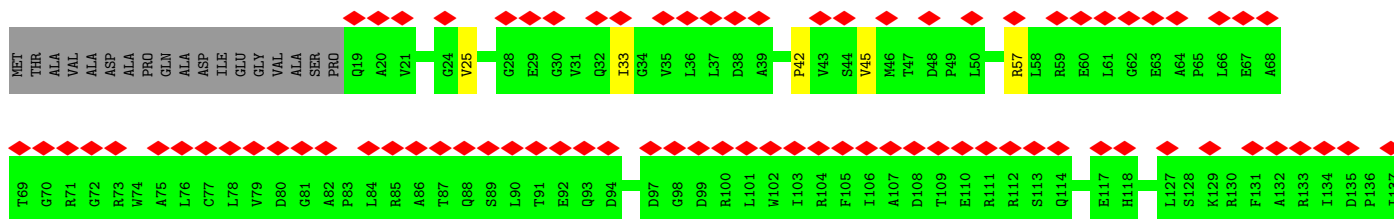


• Molecule 3: ESX-5 secretion system protein EccD5

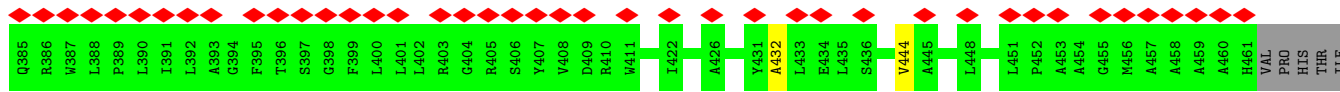
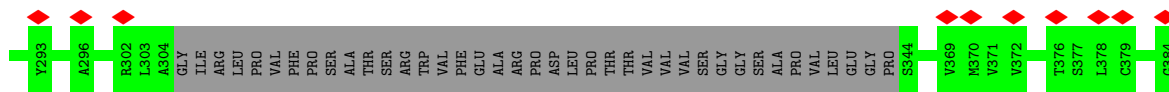
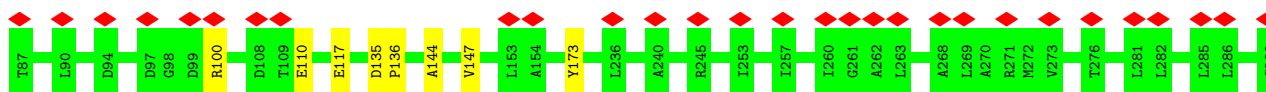
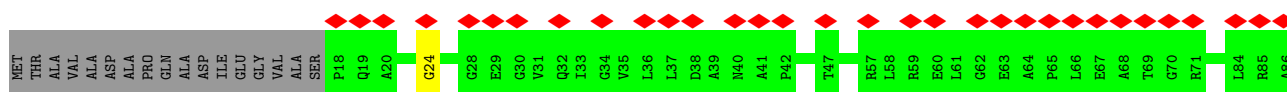
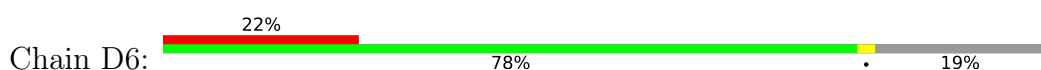




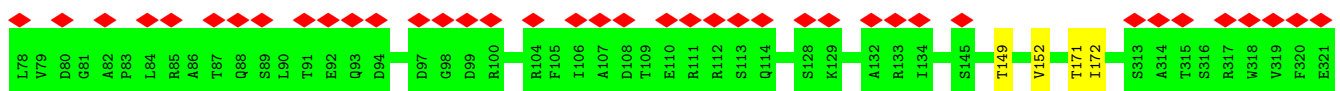
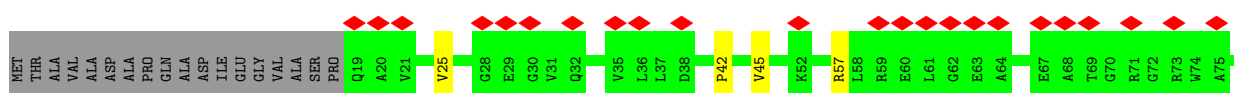
• Molecule 3: ESX-5 secretion system protein EccD5



• Molecule 3: ESX-5 secretion system protein EccD5

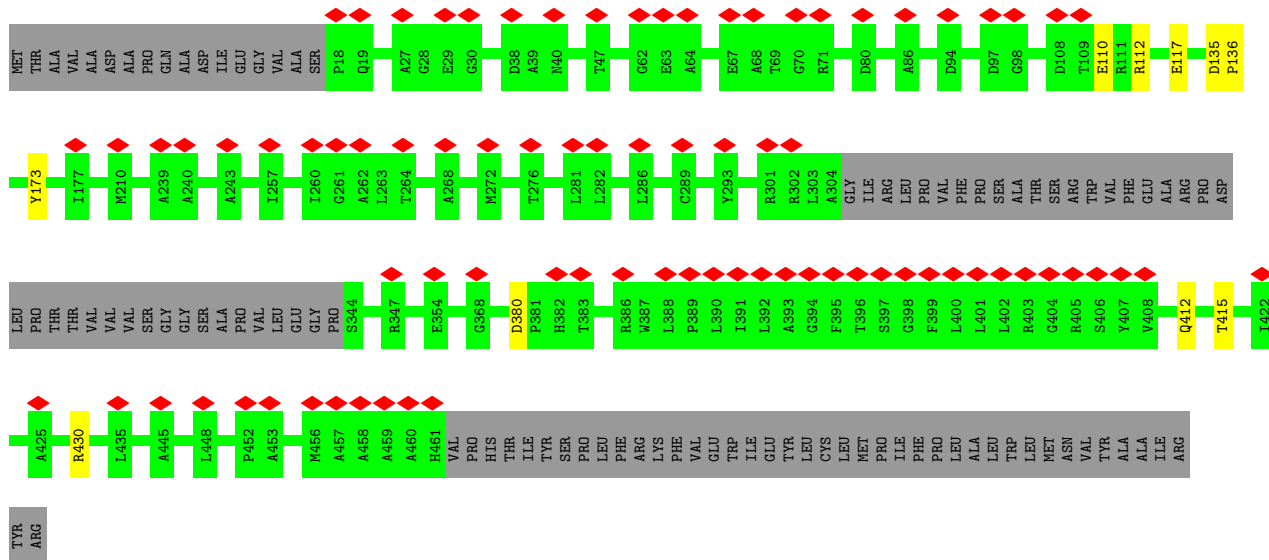
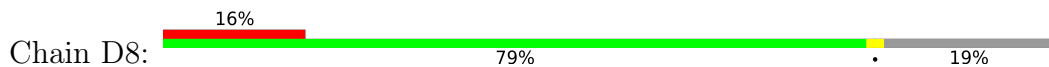


• Molecule 3: ESX-5 secretion system protein EccD5

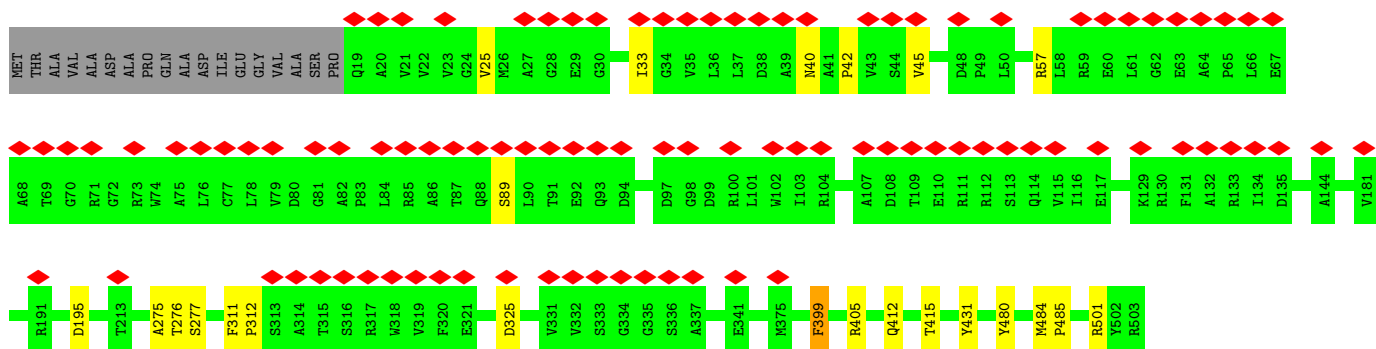




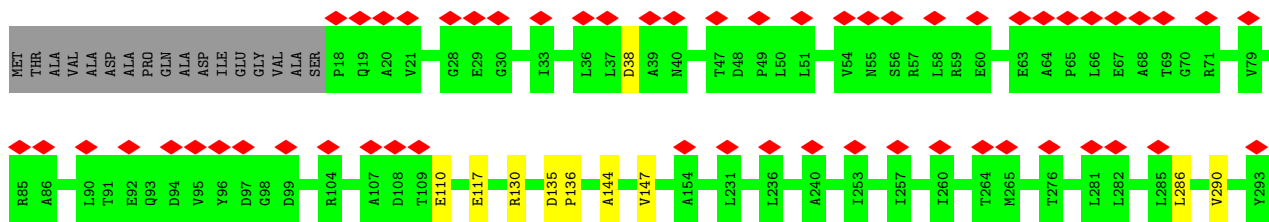
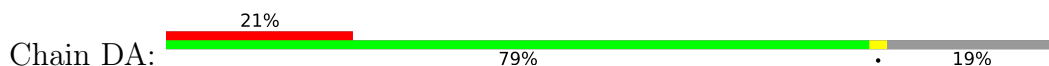
• Molecule 3: ESX-5 secretion system protein EccD5

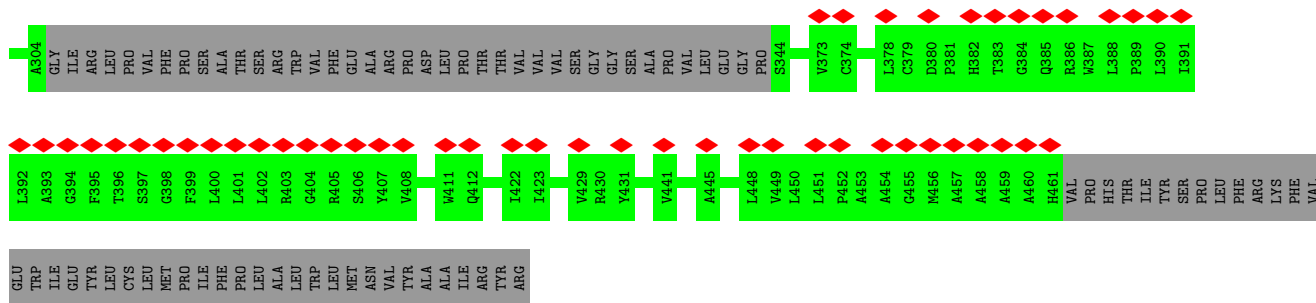


• Molecule 3: ESX-5 secretion system protein EccD5

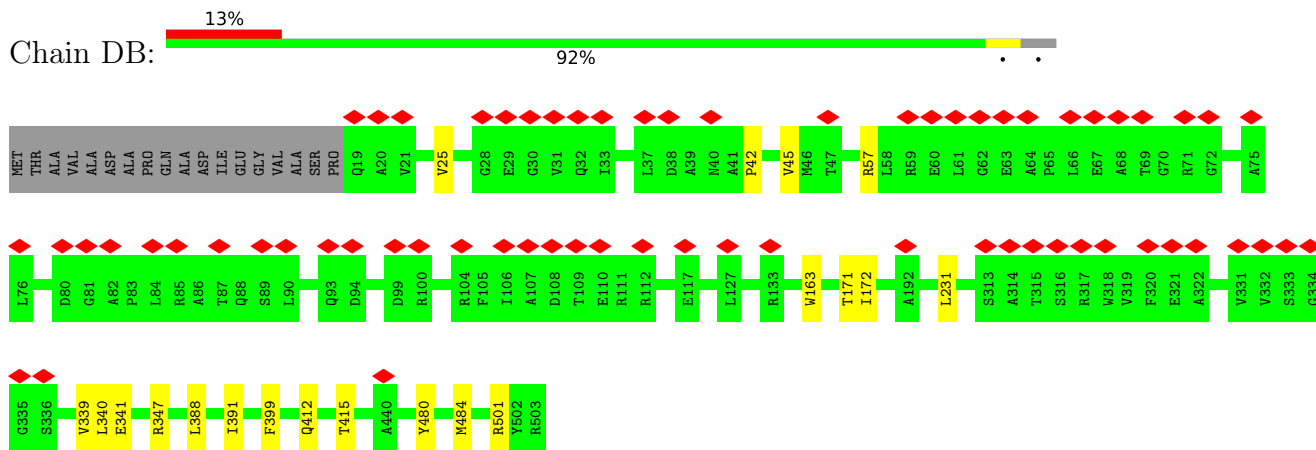


• Molecule 3: ESX-5 secretion system protein EccD5

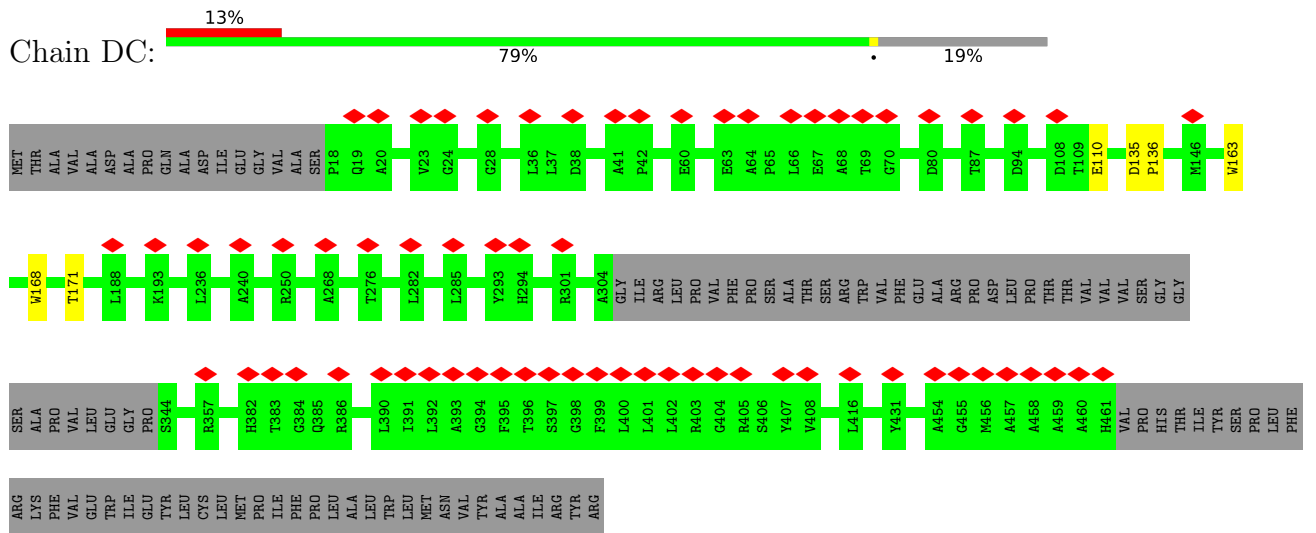




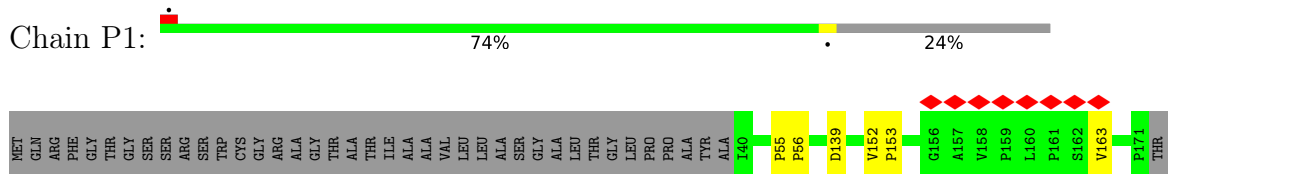
• Molecule 3: ESX-5 secretion system protein EccD5



• Molecule 3: ESX-5 secretion system protein EccD5



• Molecule 4: Mycosin-5



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	154929	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	59.5	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.055	Depositor
Minimum map value	-0.025	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.012	Depositor
Map size (\AA)	440.0, 440.0, 440.0	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.1, 1.1, 1.1	Depositor

5 Model quality i

5.1 Standard geometry i

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	B1	0.71	13/3669 (0.4%)	0.79	11/5028 (0.2%)
1	B2	0.79	21/3669 (0.6%)	0.81	17/5028 (0.3%)
1	B3	0.77	20/3669 (0.5%)	0.80	11/5028 (0.2%)
1	B4	0.44	0/3675	0.64	0/5038
1	B5	0.43	0/3675	0.67	0/5038
1	B6	0.43	0/3675	0.65	0/5038
2	C1	0.34	0/3280	0.64	0/4459
2	C2	0.33	0/3280	0.63	0/4459
2	C3	0.35	0/3280	0.62	0/4459
2	C4	0.35	0/3280	0.61	0/4459
2	C5	0.35	0/3280	0.62	0/4459
2	C6	0.34	0/3280	0.62	0/4459
3	D1	0.37	0/3710	0.61	0/5078
3	D2	0.31	0/3038	0.57	0/4151
3	D3	0.40	0/3710	0.62	0/5078
3	D4	0.31	0/3115	0.58	0/4257
3	D5	0.38	0/3710	0.59	0/5078
3	D6	0.31	0/3038	0.58	0/4151
3	D7	0.40	0/3710	0.63	0/5078
3	D8	0.31	0/3038	0.60	0/4151
3	D9	0.37	0/3710	0.60	0/5078
3	DA	0.31	0/3038	0.57	0/4151
3	DB	0.40	0/3710	0.63	0/5078
3	DC	0.31	0/3038	0.60	0/4151
4	P1	0.57	5/3309 (0.2%)	0.72	4/4545 (0.1%)
4	P2	0.56	3/3309 (0.1%)	0.72	3/4545 (0.1%)
4	P3	0.57	4/3309 (0.1%)	0.73	4/4545 (0.1%)
All	All	0.45	66/92204 (0.1%)	0.65	50/126067 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
4	P2	0	1

All (66) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B2	483	ARG	CZ-NH1	-8.53	1.22	1.33
1	B2	483	ARG	CZ-NH2	-8.30	1.22	1.33
1	B1	483	ARG	CZ-NH1	-8.14	1.22	1.33
1	B1	103	ARG	CZ-NH1	-8.11	1.22	1.33
1	B1	103	ARG	CZ-NH2	-8.10	1.22	1.33
1	B2	99	ARG	CZ-NH1	-8.08	1.22	1.33
1	B2	103	ARG	CZ-NH2	-8.00	1.22	1.33
1	B2	119	ARG	CZ-NH2	-8.00	1.22	1.33
1	B2	103	ARG	CZ-NH1	-7.99	1.22	1.33
1	B1	119	ARG	CZ-NH2	-7.96	1.22	1.33
1	B1	119	ARG	CZ-NH1	-7.90	1.22	1.33
4	P3	549	ARG	CZ-NH2	-7.90	1.22	1.33
4	P3	549	ARG	CZ-NH1	-7.84	1.22	1.33
1	B2	119	ARG	CZ-NH1	-7.83	1.22	1.33
1	B1	483	ARG	CZ-NH2	-7.83	1.22	1.33
1	B1	99	ARG	CZ-NH1	-7.81	1.22	1.33
4	P1	549	ARG	CZ-NH1	-7.80	1.23	1.33
4	P1	549	ARG	CZ-NH2	-7.77	1.23	1.33
1	B3	99	ARG	CZ-NH1	-7.73	1.23	1.33
1	B3	483	ARG	CZ-NH1	-7.72	1.23	1.33
1	B2	99	ARG	CZ-NH2	-7.71	1.23	1.33
1	B1	99	ARG	CZ-NH2	-7.69	1.23	1.33
1	B3	103	ARG	CZ-NH2	-7.66	1.23	1.33
1	B3	103	ARG	CZ-NH1	-7.58	1.23	1.33
4	P2	549	ARG	CZ-NH2	-7.58	1.23	1.33
4	P2	549	ARG	CZ-NH1	-7.45	1.23	1.33
1	B3	483	ARG	CZ-NH2	-7.44	1.23	1.33
1	B3	119	ARG	CZ-NH2	-7.37	1.23	1.33
1	B3	99	ARG	CZ-NH2	-7.33	1.23	1.33
4	P2	375	GLN	C-N	7.09	1.50	1.34
1	B3	119	ARG	CZ-NH1	-7.07	1.23	1.33
1	B2	105	TYR	CD1-CE1	-6.67	1.29	1.39
1	B2	105	TYR	CD2-CE2	-6.66	1.29	1.39
1	B1	105	TYR	CD2-CE2	-6.40	1.29	1.39
1	B3	105	TYR	CD2-CE2	-6.32	1.29	1.39
1	B2	98	VAL	CB-CG2	-6.30	1.39	1.52
1	B1	100	VAL	CB-CG2	-6.25	1.39	1.52
1	B1	105	TYR	CD1-CE1	-6.22	1.30	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B3	105	TYR	CD1-CE1	-6.13	1.30	1.39
1	B3	98	VAL	CB-CG2	-6.12	1.40	1.52
1	B2	101	GLY	N-CA	-6.10	1.36	1.46
1	B2	140	VAL	CB-CG1	-6.07	1.40	1.52
1	B2	100	VAL	CB-CG2	-6.03	1.40	1.52
1	B3	101	GLY	N-CA	-6.02	1.37	1.46
1	B3	489	GLU	CB-CG	-5.96	1.40	1.52
1	B3	140	VAL	CB-CG1	-5.86	1.40	1.52
1	B3	100	VAL	CB-CG2	-5.77	1.40	1.52
1	B2	140	VAL	CB-CG2	-5.76	1.40	1.52
4	P1	541	VAL	CB-CG2	-5.75	1.40	1.52
1	B3	488	VAL	CB-CG2	-5.59	1.41	1.52
1	B2	118	GLY	N-CA	-5.53	1.37	1.46
1	B3	488	VAL	CB-CG1	-5.52	1.41	1.52
4	P1	541	VAL	CB-CG1	-5.50	1.41	1.52
4	P3	541	VAL	CB-CG2	-5.50	1.41	1.52
1	B2	488	VAL	CB-CG1	-5.47	1.41	1.52
1	B2	488	VAL	CB-CG2	-5.47	1.41	1.52
4	P3	541	VAL	CB-CG1	-5.46	1.41	1.52
1	B3	140	VAL	CB-CG2	-5.44	1.41	1.52
1	B2	98	VAL	CB-CG1	-5.42	1.41	1.52
1	B2	100	VAL	CB-CG1	-5.39	1.41	1.52
1	B3	100	VAL	CB-CG1	-5.36	1.41	1.52
1	B1	100	VAL	CB-CG1	-5.35	1.41	1.52
1	B3	98	VAL	CB-CG1	-5.29	1.41	1.52
1	B1	101	GLY	N-CA	-5.28	1.38	1.46
1	B2	489	GLU	CB-CG	-5.26	1.42	1.52
4	P1	547	ALA	CA-CB	-5.12	1.41	1.52

All (50) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B1	103	ARG	CA-CB-CG	7.17	129.18	113.40
4	P3	549	ARG	CD-NE-CZ	7.01	133.42	123.60
1	B2	103	ARG	CA-CB-CG	6.82	128.40	113.40
1	B2	105	TYR	CB-CG-CD2	6.60	124.96	121.00
1	B1	99	ARG	CD-NE-CZ	6.44	132.62	123.60
1	B3	103	ARG	CA-CB-CG	6.43	127.55	113.40
1	B1	119	ARG	CD-NE-CZ	6.35	132.49	123.60
4	P1	549	ARG	CD-NE-CZ	6.26	132.36	123.60
1	B3	115	LEU	CA-CB-CG	6.25	129.68	115.30
1	B2	119	ARG	CD-NE-CZ	6.22	132.31	123.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	P2	540	LEU	CA-CB-CG	6.17	129.50	115.30
1	B3	489	GLU	CA-CB-CG	6.16	126.94	113.40
4	P3	549	ARG	CA-CB-CG	6.15	126.93	113.40
1	B3	119	ARG	CD-NE-CZ	6.11	132.16	123.60
1	B2	119	ARG	NE-CZ-NH1	-6.05	117.28	120.30
1	B3	99	ARG	CD-NE-CZ	6.04	132.05	123.60
4	P3	549	ARG	NE-CZ-NH2	-5.99	117.31	120.30
1	B3	105	TYR	CB-CG-CD2	5.89	124.54	121.00
1	B2	99	ARG	CA-CB-CG	5.88	126.33	113.40
1	B1	119	ARG	NE-CZ-NH1	-5.86	117.37	120.30
1	B2	119	ARG	CG-CD-NE	5.84	124.06	111.80
1	B3	119	ARG	NE-CZ-NH1	-5.72	117.44	120.30
1	B1	115	LEU	CA-CB-CG	5.70	128.41	115.30
1	B1	105	TYR	CB-CG-CD2	5.65	124.39	121.00
1	B2	489	GLU	CA-CB-CG	5.63	125.79	113.40
1	B2	483	ARG	NE-CZ-NH1	-5.63	117.49	120.30
1	B1	483	ARG	NE-CZ-NH1	-5.62	117.49	120.30
1	B1	105	TYR	CA-CB-CG	5.59	124.02	113.40
4	P1	549	ARG	NE-CZ-NH1	-5.55	117.52	120.30
4	P1	549	ARG	NE-CZ-NH2	5.52	123.06	120.30
1	B1	119	ARG	CG-CD-NE	5.50	123.34	111.80
1	B2	119	ARG	CA-CB-CG	5.48	125.46	113.40
1	B2	99	ARG	CG-CD-NE	5.44	123.23	111.80
1	B3	483	ARG	CD-NE-CZ	5.37	131.12	123.60
1	B2	115	LEU	CA-CB-CG	5.35	127.60	115.30
1	B2	119	ARG	NE-CZ-NH2	5.34	122.97	120.30
1	B2	103	ARG	CD-NE-CZ	5.30	131.01	123.60
4	P2	549	ARG	NE-CZ-NH2	-5.25	117.68	120.30
1	B1	99	ARG	NE-CZ-NH1	-5.22	117.69	120.30
1	B3	119	ARG	CG-CD-NE	5.22	122.76	111.80
4	P3	549	ARG	NE-CZ-NH1	5.21	122.91	120.30
1	B3	119	ARG	NE-CZ-NH2	5.20	122.90	120.30
1	B3	483	ARG	NE-CZ-NH1	-5.20	117.70	120.30
1	B1	99	ARG	NE-CZ-NH2	5.17	122.89	120.30
4	P1	549	ARG	CA-CB-CG	5.14	124.71	113.40
1	B2	99	ARG	NE-CZ-NH1	-5.12	117.74	120.30
1	B2	483	ARG	NE-CZ-NH2	5.11	122.85	120.30
1	B2	99	ARG	CD-NE-CZ	5.08	130.71	123.60
1	B2	105	TYR	CD1-CG-CD2	-5.07	112.33	117.90
4	P2	549	ARG	CA-CB-CG	5.01	124.43	113.40

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
4	P2	444	ARG	Sidechain

5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B1	3587	3631	3626	6	0
1	B2	3587	3631	3626	11	0
1	B3	3587	3631	3626	9	0
1	B4	3591	3621	3618	16	0
1	B5	3591	3621	3618	9	0
1	B6	3591	3621	3618	15	0
2	C1	3190	3145	3142	11	0
2	C2	3190	3145	3142	8	0
2	C3	3190	3145	3142	10	0
2	C4	3190	3145	3142	10	0
2	C5	3190	3145	3142	13	0
2	C6	3190	3145	3142	9	0
3	D1	3635	3823	3822	12	0
3	D2	2989	3166	3163	6	0
3	D3	3635	3824	3822	6	0
3	D4	3063	3245	3243	7	0
3	D5	3635	3824	3822	5	0
3	D6	2989	3166	3163	5	0
3	D7	3635	3824	3822	8	0
3	D8	2989	3165	3163	5	0
3	D9	3635	3824	3822	13	0
3	DA	2989	3167	3163	5	0
3	DB	3635	3824	3822	11	0
3	DC	2989	3165	3163	3	0
4	P1	3226	3219	3218	6	0
4	P2	3226	3219	3218	5	0
4	P3	3226	3219	3218	11	0
All	All	90170	92300	92228	217	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 1.

All (217) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C4:130:ARG:NH2	3:DA:110:GLU:OE2	2.22	0.72
2:C1:130:ARG:NH2	3:D8:110:GLU:OE2	2.22	0.72
2:C2:130:ARG:NH2	3:D6:110:GLU:OE2	2.25	0.70
2:C3:130:ARG:NH2	3:DC:110:GLU:OE2	2.26	0.69
4:P1:552:VAL:HG23	4:P1:553:PRO:HD3	1.75	0.69
2:C5:185:ASP:OD1	2:C5:186:ILE:N	2.26	0.68
2:C4:185:ASP:OD1	2:C4:186:ILE:N	2.29	0.65
3:D6:432:ALA:HB2	3:D6:444:VAL:HG21	1.83	0.61
1:B6:391:GLU:OE2	1:B6:412:TYR:OH	2.19	0.60
3:D9:412:GLN:O	3:D9:415:THR:HG22	2.03	0.59
1:B5:31:ARG:NH1	1:B5:47:GLU:OE1	2.35	0.58
1:B2:355:ASP:OD1	1:B2:355:ASP:N	2.37	0.57
3:DB:341:GLU:OE2	3:DB:347:ARG:NE	2.26	0.57
2:C5:130:ARG:NH2	3:D4:110:GLU:OE2	2.38	0.56
3:D8:380:ASP:OD2	3:D8:430:ARG:NH2	2.39	0.55
2:C6:130:ARG:NH2	3:D2:110:GLU:OE2	2.40	0.55
3:D1:311:PHE:CG	3:D1:312:PRO:HD2	2.42	0.55
1:B5:328:GLU:O	1:B5:331:THR:HG22	2.05	0.55
1:B6:31:ARG:NH1	1:B6:47:GLU:OE1	2.34	0.55
1:B1:385:ILE:HG23	1:B1:386:PRO:HD2	1.90	0.53
2:C3:358:THR:HG22	2:C3:358:THR:O	2.08	0.53
1:B5:268:GLY:O	1:B5:279:ILE:HG22	2.09	0.53
2:C5:358:THR:HG22	2:C5:358:THR:O	2.09	0.53
1:B5:163:ASP:OD2	1:B5:164:THR:N	2.42	0.52
2:C2:320:THR:CG2	2:C2:321:PRO:HD3	2.40	0.52
2:C6:185:ASP:OD1	2:C6:186:ILE:N	2.43	0.52
3:DA:135:ASP:HB2	3:DA:136:PRO:HD2	1.91	0.52
2:C3:320:THR:CG2	2:C3:321:PRO:HD3	2.39	0.51
2:C4:358:THR:O	2:C4:358:THR:HG22	2.09	0.51
2:C4:320:THR:CG2	2:C4:321:PRO:HD3	2.40	0.51
1:B6:427:ASN:OD1	1:B6:429:GLY:N	2.41	0.51
3:D1:484:MET:HB3	3:D1:485:PRO:HD3	1.93	0.51
3:DB:231:LEU:HD11	4:P3:557:ALA:HA	1.92	0.51
1:B2:213:ARG:NE	1:B2:214:GLU:OE2	2.43	0.51
2:C5:294:ALA:HA	2:C5:298:ALA:HB3	1.93	0.51
4:P3:552:VAL:HG23	4:P3:553:PRO:HD3	1.92	0.51
2:C1:358:THR:HG22	2:C1:358:THR:O	2.11	0.50
2:C1:320:THR:CG2	2:C1:321:PRO:HD3	2.42	0.50
3:D8:135:ASP:HB2	3:D8:136:PRO:HD2	1.93	0.50
2:C6:320:THR:CG2	2:C6:321:PRO:HD3	2.41	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C5:320:THR:CG2	2:C5:321:PRO:HD3	2.41	0.50
3:D5:311:PHE:CG	3:D5:312:PRO:HD2	2.47	0.50
4:P1:442:SER:HB2	4:P1:449:ILE:HG23	1.93	0.50
3:D7:412:GLN:O	3:D7:415:THR:HG22	2.12	0.50
1:B1:59:SER:OG	3:DB:484:MET:HA	2.12	0.49
1:B2:385:ILE:HG23	1:B2:386:PRO:HD2	1.94	0.49
2:C3:294:ALA:HA	2:C3:298:ALA:HB3	1.94	0.49
2:C3:338:ILE:HD11	2:C3:357:TRP:CH2	2.47	0.49
3:D9:311:PHE:CG	3:D9:312:PRO:HD2	2.46	0.49
3:D5:151:VAL:O	3:D5:155:THR:HG23	2.13	0.49
1:B3:385:ILE:HG23	1:B3:386:PRO:HD2	1.95	0.49
2:C6:265:VAL:HG13	2:C6:271:PHE:CD1	2.47	0.49
1:B3:355:ASP:N	1:B3:355:ASP:OD1	2.43	0.49
1:B4:328:GLU:OE2	1:B4:330:SER:N	2.45	0.48
3:D1:25:VAL:N	3:D1:33:ILE:O	2.46	0.48
2:C5:97:ARG:HB3	2:C5:98:PRO:HD3	1.95	0.48
2:C2:185:ASP:OD1	2:C2:186:ILE:N	2.46	0.48
2:C2:358:THR:HG22	2:C2:358:THR:O	2.13	0.48
3:D1:354:GLU:OE1	3:D2:130:ARG:NH1	2.46	0.48
1:B6:145:ALA:HB1	1:B6:146:PRO:HD2	1.96	0.48
2:C6:358:THR:HG22	2:C6:358:THR:O	2.14	0.48
1:B4:304:THR:HG22	1:B4:305:LEU:N	2.29	0.47
1:B2:145:ALA:HB1	1:B2:146:PRO:HD2	1.96	0.47
4:P2:152:VAL:HG13	4:P2:153:PRO:HD2	1.97	0.47
1:B4:391:GLU:OE2	1:B4:412:TYR:OH	2.33	0.47
1:B3:145:ALA:HB1	1:B3:146:PRO:HD2	1.97	0.47
2:C1:123:ASP:OD1	3:D8:112:ARG:NE	2.42	0.46
2:C3:29:ILE:HG22	2:C3:187:GLU:HG3	1.98	0.46
2:C5:115:ARG:NH1	3:D4:117:GLU:OE1	2.48	0.46
2:C5:338:ILE:HD11	2:C5:357:TRP:CH2	2.50	0.46
3:D4:135:ASP:HB2	3:D4:136:PRO:HD2	1.96	0.46
2:C4:294:ALA:HA	2:C4:298:ALA:HB3	1.97	0.46
3:D6:144:ALA:O	3:D6:147:VAL:HG12	2.15	0.46
3:D7:42:PRO:O	3:D7:45:VAL:HG22	2.14	0.46
3:DB:480:TYR:CD1	3:DB:480:TYR:N	2.81	0.46
3:D7:480:TYR:CD1	3:D7:480:TYR:N	2.80	0.46
3:D2:135:ASP:HB2	3:D2:136:PRO:HD2	1.98	0.46
1:B5:355:ASP:OD1	1:B5:355:ASP:N	2.39	0.46
4:P2:163:VAL:O	4:P2:163:VAL:HG13	2.15	0.46
3:D5:412:GLN:O	3:D5:415:THR:HG22	2.16	0.46
3:DB:412:GLN:O	3:DB:415:THR:HG22	2.16	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:P3:163:VAL:HG13	4:P3:163:VAL:O	2.16	0.46
2:C2:320:THR:HG23	2:C2:321:PRO:HD3	1.98	0.46
4:P3:442:SER:HB2	4:P3:449:ILE:HG23	1.96	0.45
2:C1:233:LEU:HD22	2:C1:367:PHE:HZ	1.81	0.45
4:P1:552:VAL:HG23	4:P1:553:PRO:CD	2.43	0.45
4:P2:552:VAL:CG2	4:P2:553:PRO:HD3	2.47	0.45
3:D9:25:VAL:N	3:D9:33:ILE:O	2.47	0.45
1:B6:304:THR:HG22	1:B6:305:LEU:N	2.31	0.45
3:D1:399:PHE:CD1	3:D1:399:PHE:C	2.90	0.45
3:D3:42:PRO:O	3:D3:45:VAL:HG22	2.17	0.45
1:B4:268:GLY:O	1:B4:279:ILE:HG22	2.17	0.45
3:D5:42:PRO:O	3:D5:45:VAL:HG22	2.16	0.45
3:D7:149:THR:O	3:D7:152:VAL:HG22	2.17	0.45
4:P1:163:VAL:O	4:P1:163:VAL:HG13	2.17	0.45
3:DB:340:LEU:HD12	3:DB:340:LEU:O	2.17	0.45
1:B4:145:ALA:HB1	1:B4:146:PRO:HD2	1.98	0.45
1:B1:145:ALA:HB1	1:B1:146:PRO:HD2	1.99	0.44
2:C4:72:PHE:HB2	2:C4:73:PRO:HD3	2.00	0.44
3:D1:412:GLN:O	3:D1:415:THR:HG22	2.17	0.44
2:C1:294:ALA:HA	2:C1:298:ALA:HB3	1.98	0.44
3:DB:339:VAL:HG12	3:DB:340:LEU:N	2.32	0.44
1:B4:259:LEU:O	1:B4:346:TYR:OH	2.22	0.44
1:B6:204:ARG:NH1	1:B6:207:GLY:O	2.50	0.44
1:B6:348:ASP:OD1	1:B6:349:ASN:ND2	2.41	0.44
2:C4:26:PRO:HD2	2:C4:182:MET:SD	2.57	0.44
3:D1:42:PRO:O	3:D1:45:VAL:HG22	2.17	0.44
3:D3:339:VAL:HG12	3:D3:340:LEU:N	2.32	0.44
3:D9:40:ASN:HA	3:D9:89:SER:HB3	2.00	0.44
3:DB:388:LEU:O	3:DB:391:ILE:HG22	2.18	0.44
4:P1:152:VAL:HG13	4:P1:153:PRO:HD2	1.98	0.44
1:B4:102:ASP:OD1	1:B4:102:ASP:N	2.51	0.44
2:C4:320:THR:HG23	2:C4:321:PRO:HD3	2.00	0.44
1:B3:136:ARG:NH1	1:B6:441:ASP:OD1	2.50	0.44
2:C5:208:ASN:ND2	3:D4:111:ARG:O	2.46	0.44
3:D4:144:ALA:O	3:D4:147:VAL:HG12	2.18	0.44
4:P3:152:VAL:HG13	4:P3:153:PRO:HD2	1.98	0.44
4:P3:552:VAL:CG2	4:P3:553:PRO:HD3	2.48	0.44
1:B1:163:ASP:C	1:B1:163:ASP:OD2	2.56	0.44
3:D2:449:VAL:HG13	3:D2:450:LEU:HD12	2.00	0.44
3:D9:42:PRO:O	3:D9:45:VAL:HG22	2.18	0.44
1:B3:297:VAL:O	1:B3:297:VAL:HG13	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B2:108:LEU:HD21	1:B2:139:LEU:HD23	1.99	0.43
2:C5:151:ARG:HD3	2:C5:157:ASP:OD1	2.18	0.43
3:D2:168:TRP:O	3:D2:171:THR:HG22	2.19	0.43
1:B3:338:VAL:HG12	1:B3:340:ARG:H	1.83	0.43
1:B6:217:ARG:CZ	1:B6:249:PHE:CE1	3.02	0.43
2:C3:175:THR:HG23	2:C3:175:THR:O	2.19	0.43
2:C3:233:LEU:HD22	2:C3:367:PHE:HZ	1.84	0.43
2:C1:219:PRO:HD2	2:C1:363:ARG:NH1	2.34	0.43
1:B2:59:SER:OG	3:D7:484:MET:HA	2.19	0.43
2:C6:175:THR:HG23	2:C6:175:THR:O	2.18	0.43
3:D4:412:GLN:O	3:D4:415:THR:HG22	2.18	0.43
1:B4:229:LEU:HB3	1:B4:230:PRO:HD3	2.01	0.43
1:B6:268:GLY:N	1:B6:279:ILE:HG22	2.34	0.43
1:B6:59:SER:OG	3:D1:484:MET:HA	2.19	0.42
2:C1:175:THR:HG23	2:C1:175:THR:O	2.18	0.42
1:B5:259:LEU:O	1:B5:346:TYR:OH	2.30	0.42
3:D4:173:TYR:O	3:D4:176:VAL:HG12	2.19	0.42
1:B3:234:THR:HG23	1:B3:235:PRO:HD2	2.01	0.42
1:B6:285:THR:OG1	1:B6:286:PRO:HD2	2.19	0.42
4:P3:332:VAL:O	4:P3:370:LYS:HE2	2.19	0.42
1:B5:145:ALA:HB1	1:B5:146:PRO:HD2	2.01	0.42
1:B5:229:LEU:HB3	1:B5:230:PRO:HD3	2.01	0.42
2:C6:320:THR:HG23	2:C6:321:PRO:HD3	2.00	0.42
3:D2:144:ALA:O	3:D2:147:VAL:HG12	2.19	0.42
1:B4:338:VAL:CG1	1:B4:339:ASN:N	2.82	0.42
3:D3:480:TYR:CD1	3:D3:480:TYR:N	2.86	0.42
1:B3:59:SER:OG	3:D3:484:MET:HA	2.20	0.42
1:B4:59:SER:OG	3:D9:484:MET:HA	2.18	0.42
2:C1:338:ILE:HD11	2:C1:357:TRP:CZ3	2.54	0.42
3:D6:24:GLY:O	3:D6:100:ARG:HA	2.20	0.42
3:D7:399:PHE:CD1	3:D7:399:PHE:C	2.91	0.42
1:B2:497:MET:O	1:B2:498:THR:HG22	2.20	0.42
2:C2:294:ALA:HA	2:C2:298:ALA:HB3	2.01	0.42
3:DC:135:ASP:HB2	3:DC:136:PRO:HD2	2.01	0.42
1:B5:267:GLY:N	1:B5:279:ILE:HG23	2.35	0.42
3:D1:502:TYR:O	3:D1:503:ARG:C	2.58	0.42
3:D1:347:ARG:CZ	3:D1:347:ARG:HB3	2.50	0.42
3:DB:42:PRO:O	3:DB:45:VAL:HG22	2.20	0.42
2:C1:338:ILE:HD11	2:C1:357:TRP:CH2	2.55	0.41
2:C4:175:THR:O	2:C4:175:THR:HG23	2.19	0.41
3:D3:410:ARG:O	3:D3:412:GLN:N	2.52	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D5:25:VAL:N	3:D5:33:ILE:O	2.51	0.41
3:D6:135:ASP:HB2	3:D6:136:PRO:HD2	2.01	0.41
3:D9:399:PHE:CD1	3:D9:399:PHE:C	2.92	0.41
4:P3:115:HIS:ND1	4:P3:116:PRO:HD2	2.35	0.41
3:D8:412:GLN:O	3:D8:415:THR:HG22	2.20	0.41
3:D9:195:ASP:N	3:D9:195:ASP:OD2	2.53	0.41
3:DA:144:ALA:O	3:DA:147:VAL:HG12	2.20	0.41
1:B6:40:TRP:CD1	1:B6:40:TRP:N	2.88	0.41
3:D7:25:VAL:HG13	3:D7:25:VAL:O	2.20	0.41
3:D9:275:ALA:O	3:D9:276:THR:HG22	2.20	0.41
3:DB:25:VAL:HG13	3:DB:25:VAL:O	2.21	0.41
4:P3:42:PRO:HA	4:P3:43:PRO:HD3	1.97	0.41
1:B1:335:MET:HA	1:B1:336:PRO:HD3	1.95	0.41
1:B2:365:TRP:HD1	1:B2:366:TRP:N	2.19	0.41
1:B3:183:ASP:OD1	1:B3:183:ASP:C	2.58	0.41
1:B4:304:THR:CG2	1:B4:305:LEU:N	2.83	0.41
3:DB:171:THR:HG23	3:DB:172:ILE:N	2.36	0.41
1:B2:213:ARG:NH1	1:B2:214:GLU:OE2	2.54	0.41
1:B6:90:ASP:OD1	1:B6:92:ASP:N	2.47	0.41
3:D1:311:PHE:CD2	3:D1:312:PRO:HD2	2.56	0.41
3:D7:171:THR:HG23	3:D7:172:ILE:N	2.36	0.41
1:B1:385:ILE:CG2	1:B1:386:PRO:HD2	2.50	0.41
2:C2:175:THR:HG23	2:C2:175:THR:O	2.21	0.41
2:C2:320:THR:HG23	2:C2:321:PRO:CD	2.50	0.41
3:D1:40:ASN:HA	3:D1:89:SER:HB3	2.02	0.41
3:D9:276:THR:HG23	3:D9:277:SER:N	2.36	0.41
3:D9:480:TYR:CD1	3:D9:480:TYR:N	2.87	0.41
3:D9:325:ASP:OD1	3:D9:325:ASP:N	2.53	0.41
3:DA:38:ASP:C	3:DA:38:ASP:OD2	2.59	0.41
3:DA:286:LEU:O	3:DA:290:VAL:HG23	2.21	0.41
4:P2:109:ASP:OD2	4:P2:110:THR:N	2.54	0.41
4:P3:386:ASP:N	4:P3:386:ASP:OD1	2.54	0.41
1:B4:356:ILE:H	1:B4:356:ILE:HD12	1.85	0.40
2:C1:346:VAL:HG12	2:C1:347:THR:N	2.36	0.40
2:C3:248:ASP:OD2	2:C3:248:ASP:N	2.54	0.40
2:C5:175:THR:HG23	2:C5:175:THR:O	2.21	0.40
2:C6:126:ASP:O	2:C6:130:ARG:HG2	2.21	0.40
3:DC:168:TRP:O	3:DC:171:THR:HG22	2.21	0.40
2:C3:151:ARG:HD3	2:C3:157:ASP:OD1	2.22	0.40
2:C5:38:TRP:CD1	2:C5:39:LEU:N	2.90	0.40
2:C6:320:THR:HG23	2:C6:321:PRO:CD	2.52	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D9:484:MET:HB3	3:D9:485:PRO:HD3	2.02	0.40
4:P1:55:PRO:HA	4:P1:56:PRO:HD3	1.97	0.40
1:B2:46:ILE:HD11	1:B4:19:THR:HG22	2.02	0.40
1:B2:183:ASP:C	1:B2:183:ASP:OD2	2.60	0.40
1:B4:44:MET:O	1:B4:44:MET:HG3	2.20	0.40
1:B4:268:GLY:N	1:B4:279:ILE:HG22	2.36	0.40
2:C5:336:TYR:CZ	2:C5:337:VAL:HG23	2.57	0.40
1:B4:421:VAL:CG1	1:B4:467:ALA:HB3	2.51	0.40
4:P2:386:ASP:N	4:P2:386:ASP:OD1	2.54	0.40
1:B6:229:LEU:HB3	1:B6:230:PRO:HD3	2.03	0.40
2:C4:85:PHE:CG	2:C4:85:PHE:O	2.74	0.40
3:D3:25:VAL:O	3:D3:25:VAL:HG13	2.22	0.40
4:P3:409:VAL:HA	4:P3:431:ILE:O	2.21	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B1	470/506 (93%)	457 (97%)	13 (3%)	0	100	100
1	B2	470/506 (93%)	464 (99%)	6 (1%)	0	100	100
1	B3	470/506 (93%)	456 (97%)	14 (3%)	0	100	100
1	B4	476/506 (94%)	469 (98%)	7 (2%)	0	100	100
1	B5	476/506 (94%)	468 (98%)	8 (2%)	0	100	100
1	B6	476/506 (94%)	467 (98%)	9 (2%)	0	100	100
2	C1	402/1391 (29%)	390 (97%)	11 (3%)	1 (0%)	44	76
2	C2	402/1391 (29%)	392 (98%)	9 (2%)	1 (0%)	44	76
2	C3	402/1391 (29%)	392 (98%)	9 (2%)	1 (0%)	44	76
2	C4	402/1391 (29%)	392 (98%)	9 (2%)	1 (0%)	44	76

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	C5	402/1391 (29%)	391 (97%)	10 (2%)	1 (0%)	44	76
2	C6	402/1391 (29%)	392 (98%)	9 (2%)	1 (0%)	44	76
3	D1	483/503 (96%)	477 (99%)	6 (1%)	0	100	100
3	D2	401/503 (80%)	395 (98%)	6 (2%)	0	100	100
3	D3	483/503 (96%)	471 (98%)	12 (2%)	0	100	100
3	D4	411/503 (82%)	403 (98%)	8 (2%)	0	100	100
3	D5	483/503 (96%)	475 (98%)	8 (2%)	0	100	100
3	D6	401/503 (80%)	392 (98%)	9 (2%)	0	100	100
3	D7	483/503 (96%)	472 (98%)	11 (2%)	0	100	100
3	D8	401/503 (80%)	393 (98%)	8 (2%)	0	100	100
3	D9	483/503 (96%)	475 (98%)	8 (2%)	0	100	100
3	DA	401/503 (80%)	394 (98%)	7 (2%)	0	100	100
3	DB	483/503 (96%)	474 (98%)	9 (2%)	0	100	100
3	DC	401/503 (80%)	392 (98%)	9 (2%)	0	100	100
4	P1	440/585 (75%)	422 (96%)	18 (4%)	0	100	100
4	P2	440/585 (75%)	425 (97%)	15 (3%)	0	100	100
4	P3	440/585 (75%)	423 (96%)	17 (4%)	0	100	100
All	All	11884/19173 (62%)	11613 (98%)	265 (2%)	6 (0%)	50	81

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	C2	155	GLY
2	C1	155	GLY
2	C3	155	GLY
2	C4	155	GLY
2	C5	155	GLY
2	C6	155	GLY

5.3.2 Protein sidechains [i](#)

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

The Analysed column shows the number of residues for which the sidechain conformation was

analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	B1	390/411 (95%)	389 (100%)	1 (0%)	91	92
1	B2	390/411 (95%)	388 (100%)	2 (0%)	86	90
1	B3	390/411 (95%)	389 (100%)	1 (0%)	91	92
1	B4	389/411 (95%)	384 (99%)	5 (1%)	65	77
1	B5	389/411 (95%)	385 (99%)	4 (1%)	73	81
1	B6	389/411 (95%)	387 (100%)	2 (0%)	86	90
2	C1	342/1137 (30%)	340 (99%)	2 (1%)	84	88
2	C2	342/1137 (30%)	339 (99%)	3 (1%)	75	83
2	C3	342/1137 (30%)	340 (99%)	2 (1%)	84	88
2	C4	342/1137 (30%)	338 (99%)	4 (1%)	67	79
2	C5	342/1137 (30%)	337 (98%)	5 (2%)	60	75
2	C6	342/1137 (30%)	339 (99%)	3 (1%)	75	83
3	D1	381/393 (97%)	376 (99%)	5 (1%)	65	77
3	D2	311/393 (79%)	310 (100%)	1 (0%)	91	92
3	D3	381/393 (97%)	377 (99%)	4 (1%)	73	81
3	D4	319/393 (81%)	317 (99%)	2 (1%)	84	88
3	D5	381/393 (97%)	376 (99%)	5 (1%)	65	77
3	D6	311/393 (79%)	309 (99%)	2 (1%)	84	88
3	D7	381/393 (97%)	377 (99%)	4 (1%)	73	81
3	D8	311/393 (79%)	309 (99%)	2 (1%)	84	88
3	D9	381/393 (97%)	376 (99%)	5 (1%)	65	77
3	DA	311/393 (79%)	309 (99%)	2 (1%)	84	88
3	DB	381/393 (97%)	377 (99%)	4 (1%)	73	81
3	DC	311/393 (79%)	310 (100%)	1 (0%)	91	92
4	P1	343/453 (76%)	341 (99%)	2 (1%)	84	88
4	P2	343/453 (76%)	341 (99%)	2 (1%)	84	88
4	P3	343/453 (76%)	343 (100%)	0	100	100
All	All	9578/15363 (62%)	9503 (99%)	75 (1%)	77	84

All (75) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B1	406	ARG
1	B2	213	ARG
1	B2	406	ARG
1	B3	406	ARG
1	B4	73	TRP
1	B4	193	GLN
1	B4	242	ARG
1	B4	406	ARG
1	B4	485	ASP
1	B5	91	ARG
1	B5	193	GLN
1	B5	285	THR
1	B5	332	LEU
1	B6	193	GLN
1	B6	285	THR
2	C1	151	ARG
2	C1	336	TYR
2	C2	58	PHE
2	C2	151	ARG
2	C2	336	TYR
2	C3	151	ARG
2	C3	336	TYR
2	C4	37	TRP
2	C4	58	PHE
2	C4	151	ARG
2	C4	336	TYR
2	C5	38	TRP
2	C5	86	ARG
2	C5	151	ARG
2	C5	187	GLU
2	C5	336	TYR
2	C6	58	PHE
2	C6	151	ARG
2	C6	336	TYR
3	D1	57	ARG
3	D1	399	PHE
3	D1	405	ARG
3	D1	431	TYR
3	D1	501	ARG
3	D2	117	GLU
3	D3	57	ARG
3	D3	352	GLN
3	D3	399	PHE

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
3	D3	501	ARG
3	D4	130	ARG
3	D4	173	TYR
3	D5	57	ARG
3	D5	399	PHE
3	D5	405	ARG
3	D5	431	TYR
3	D5	501	ARG
3	D6	117	GLU
3	D6	173	TYR
3	D7	57	ARG
3	D7	340	LEU
3	D7	399	PHE
3	D7	501	ARG
3	D8	117	GLU
3	D8	173	TYR
3	D9	57	ARG
3	D9	399	PHE
3	D9	405	ARG
3	D9	431	TYR
3	D9	501	ARG
3	DA	117	GLU
3	DA	130	ARG
3	DB	57	ARG
3	DB	163	TRP
3	DB	399	PHE
3	DB	501	ARG
3	DC	163	TRP
4	P1	139	ASP
4	P1	391	ASN
4	P2	500	ARG
4	P2	572	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (22) such sidechains are listed below:

Mol	Chain	Res	Type
1	B1	490	HIS
1	B2	339	ASN
1	B2	490	HIS
1	B4	83	ASN
2	C6	133	HIS
3	D1	165	HIS

Continued on next page...

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Mol	Chain	Res	Type
3	D1	461	HIS
3	D1	464	HIS
3	D3	165	HIS
3	D4	118	HIS
3	D5	461	HIS
3	D7	165	HIS
3	D9	165	HIS
3	D9	461	HIS
3	DB	165	HIS
3	DB	461	HIS
3	DB	464	HIS
4	P1	391	ASN
4	P2	283	GLN
4	P2	391	ASN
4	P3	391	ASN
4	P3	450	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

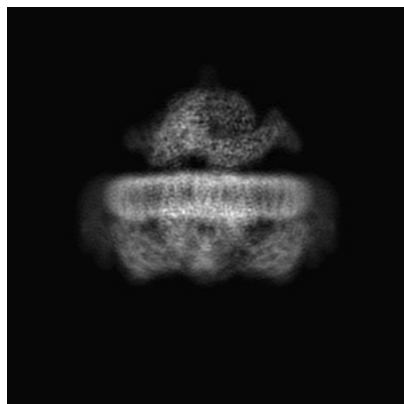
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-12514. These allow visual inspection of the internal detail of the map and identification of artifacts.

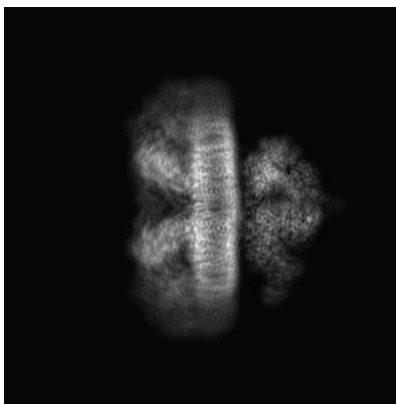
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

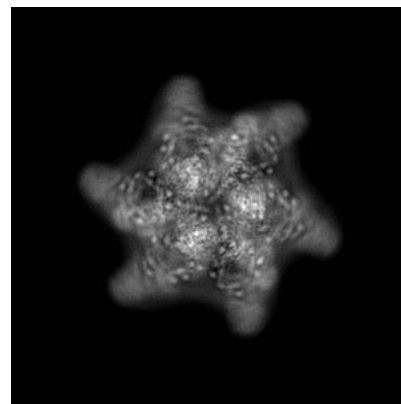
6.1.1 Primary map



X

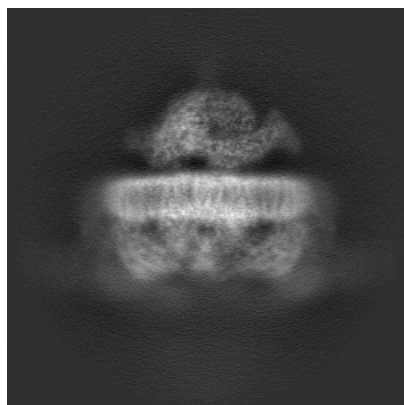


Y

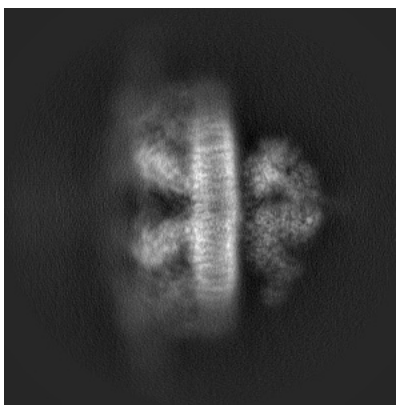


Z

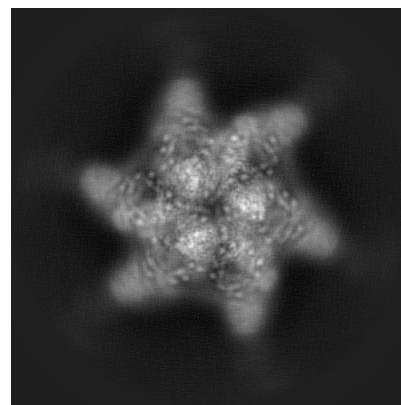
6.1.2 Raw map



X



Y

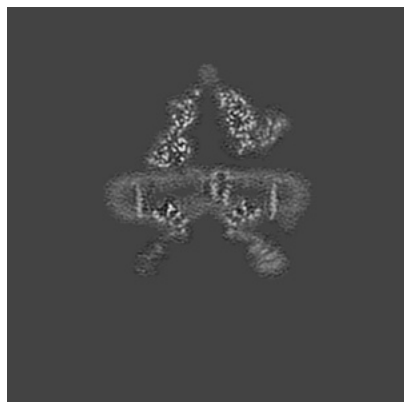


Z

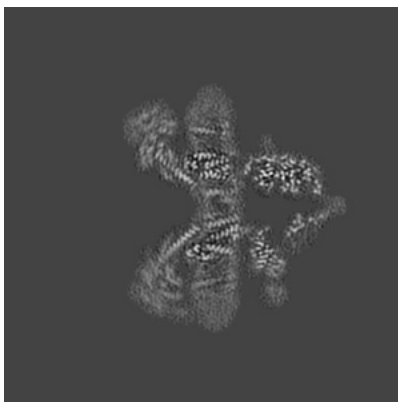
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

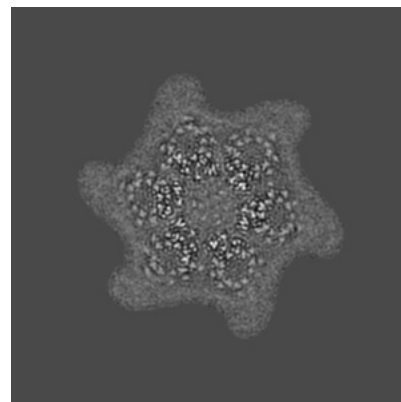
6.2.1 Primary map



X Index: 200

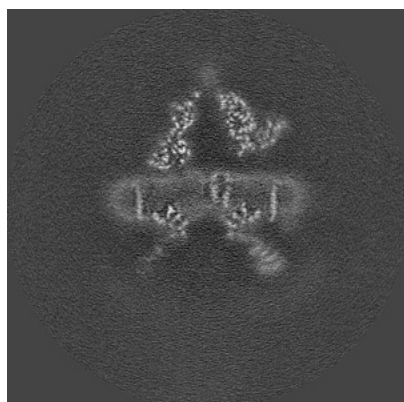


Y Index: 200

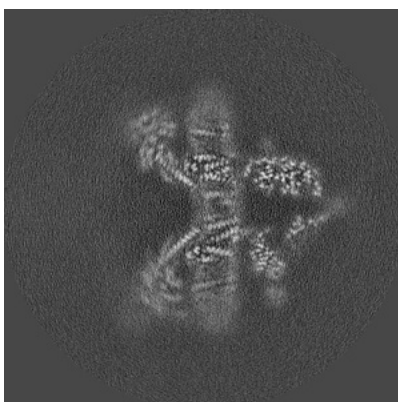


Z Index: 200

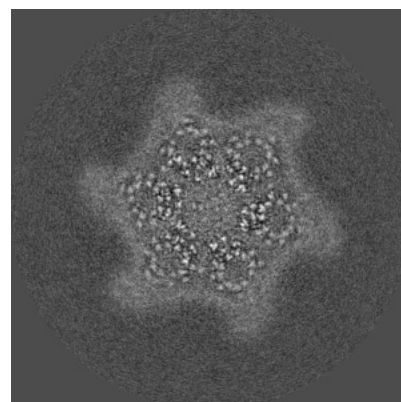
6.2.2 Raw map



X Index: 200



Y Index: 200

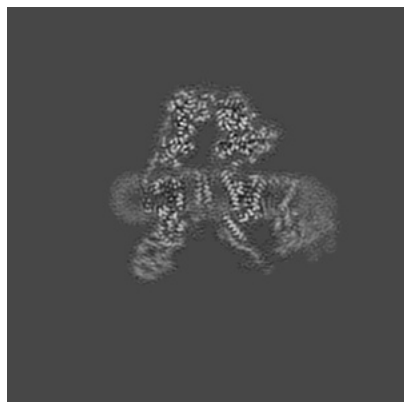


Z Index: 200

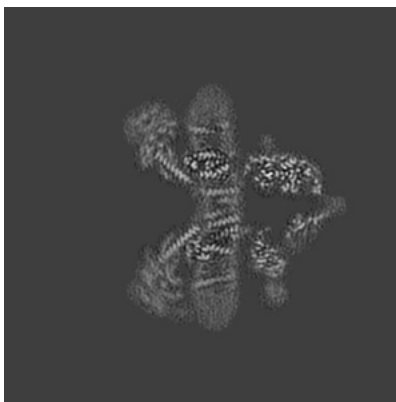
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

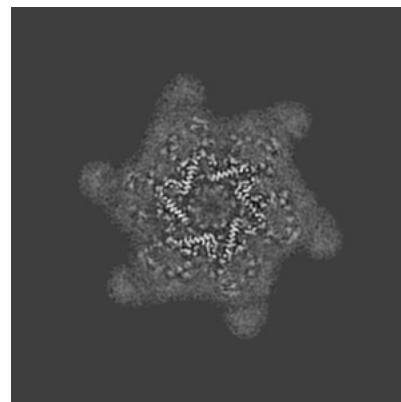
6.3.1 Primary map



X Index: 184

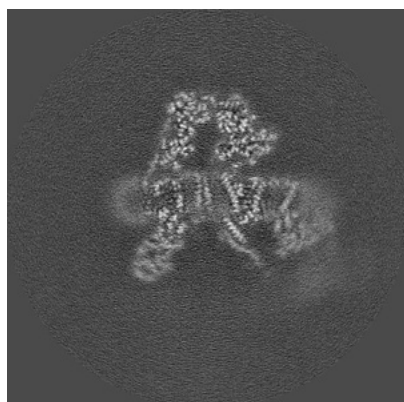


Y Index: 199

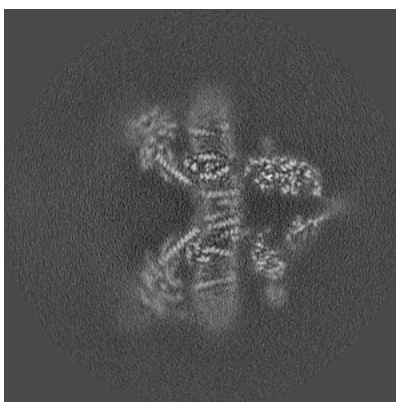


Z Index: 192

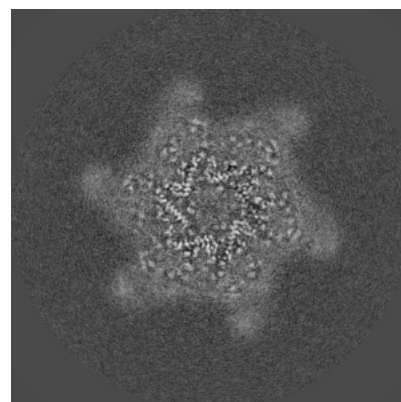
6.3.2 Raw map



X Index: 184



Y Index: 199

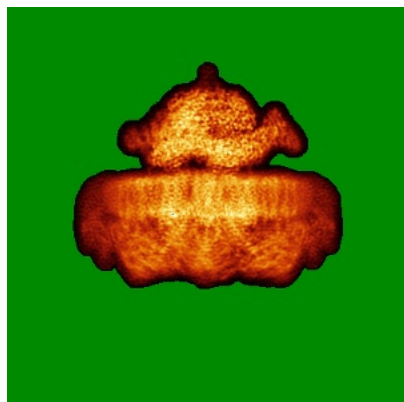


Z Index: 193

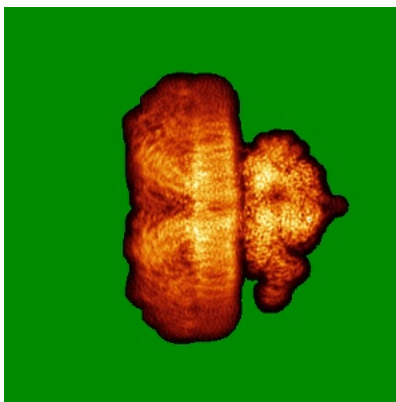
The images above show the largest variance slices of the map in three orthogonal directions.

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

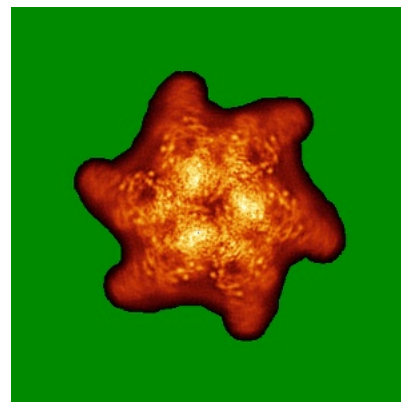
6.4.1 Primary map



X

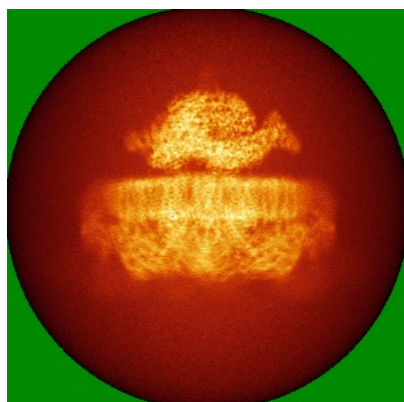


Y

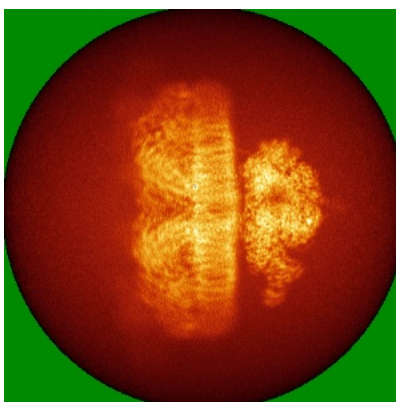


Z

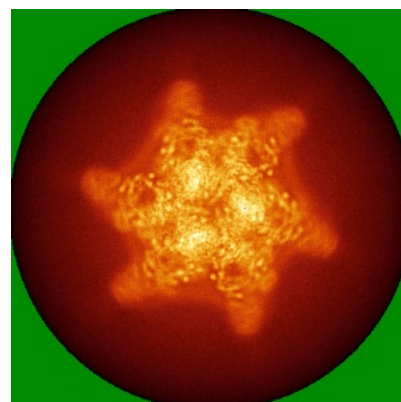
6.4.2 Raw map



X



Y

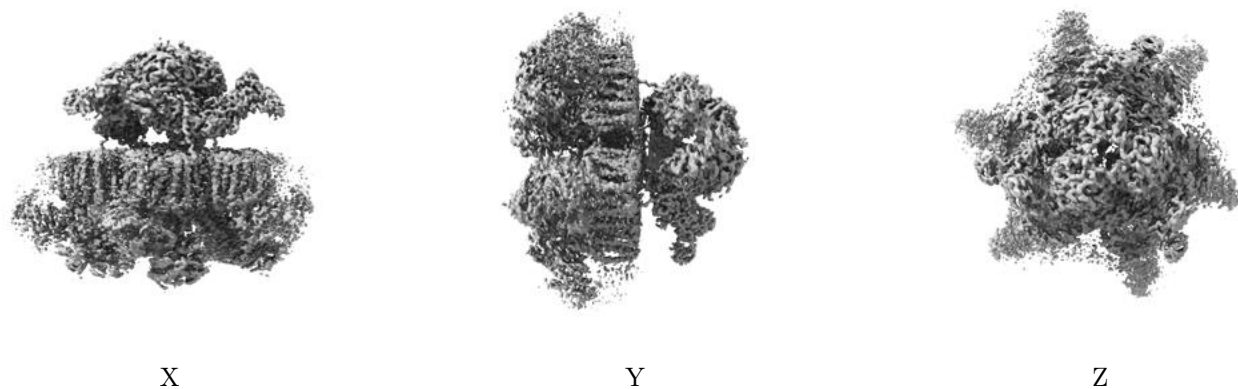


Z

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.

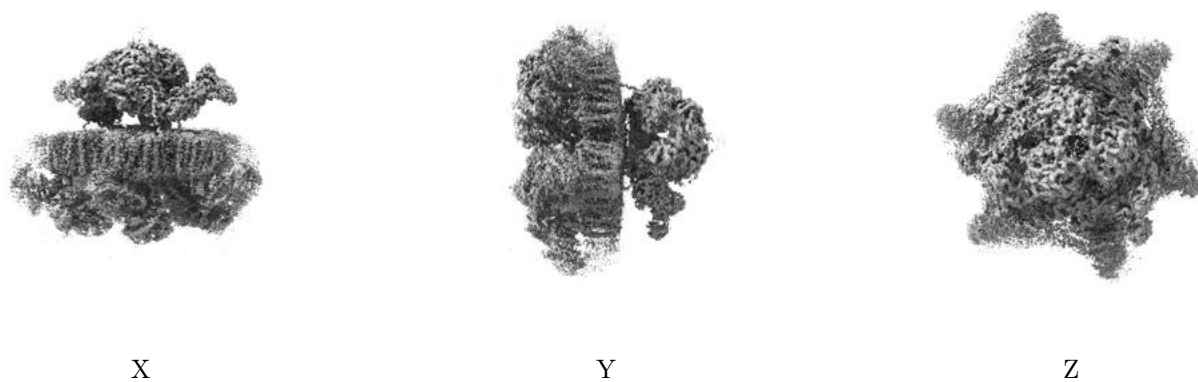
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.012. 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.

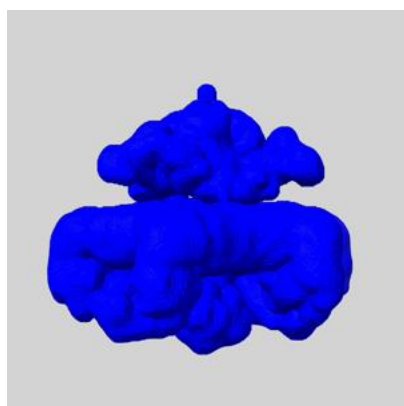
6.6 Mask visualisation [i](#)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

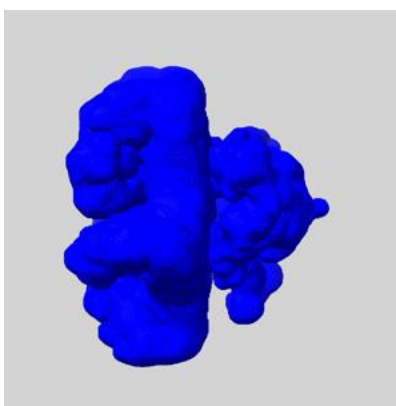
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

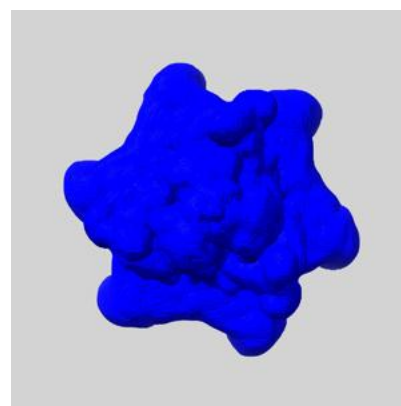
6.6.1 emd_12514_msk_1.map [i](#)



X



Y

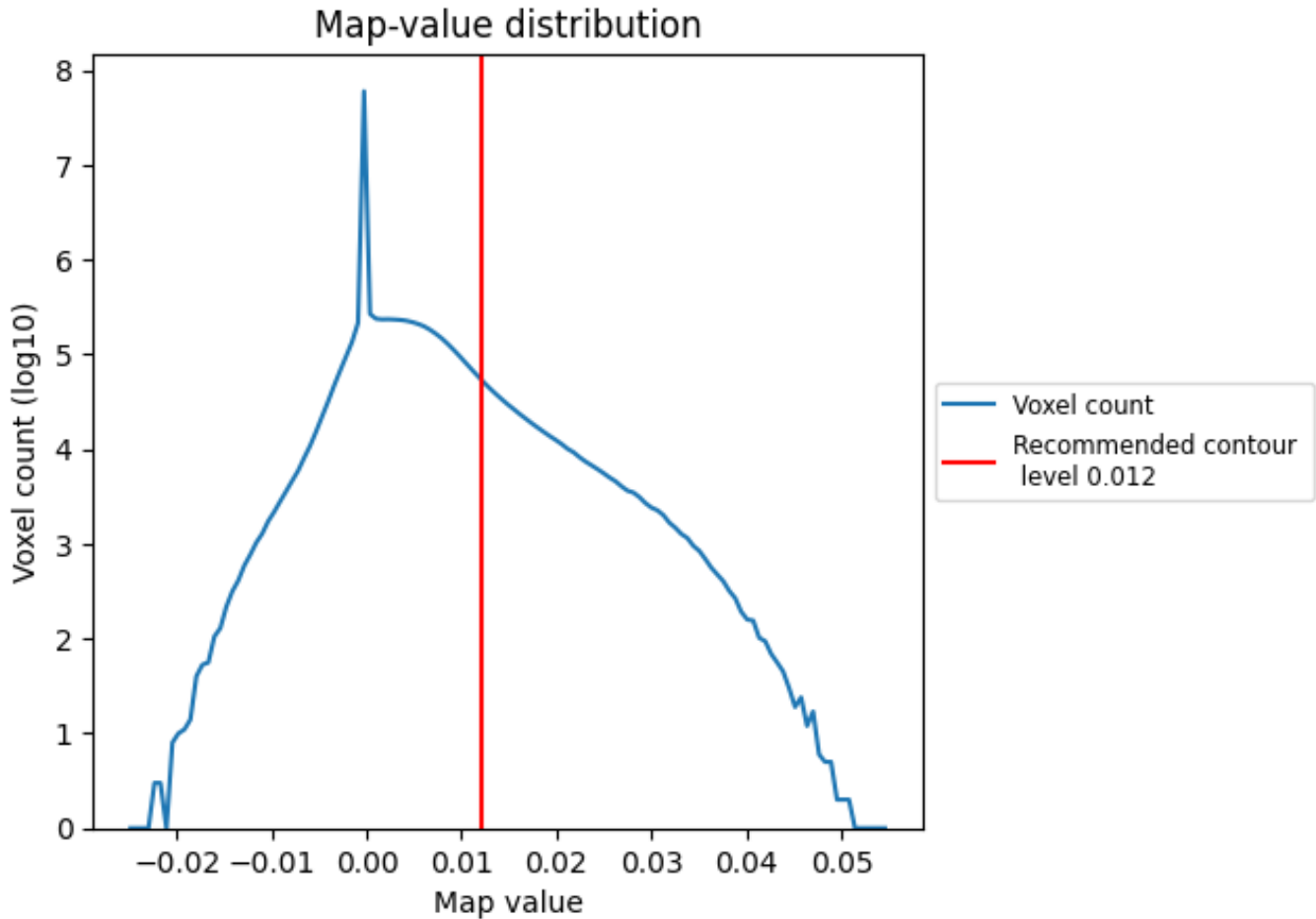


Z

7 Map analysis [i](#)

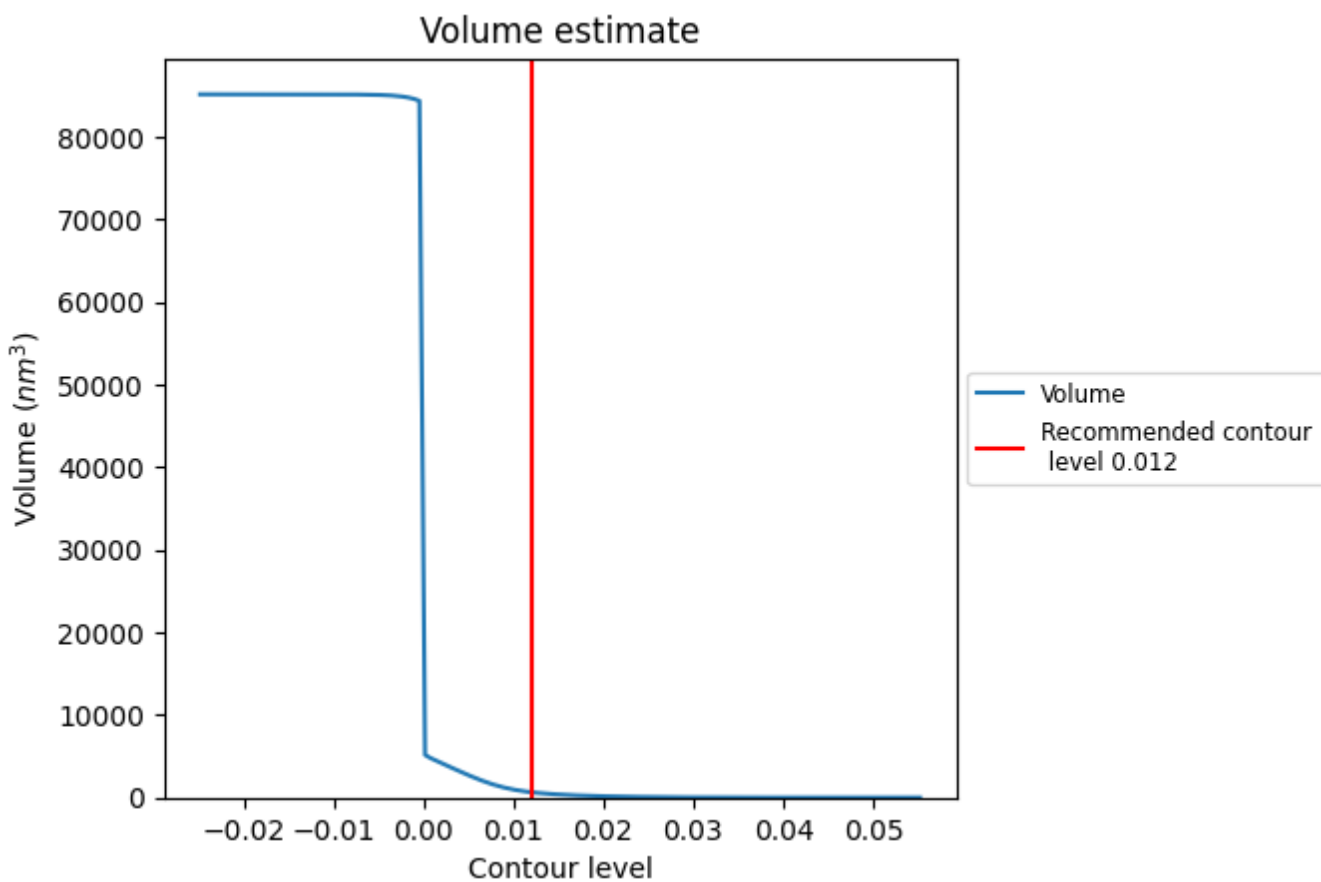
This section contains the results of statistical analysis of the map.

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.

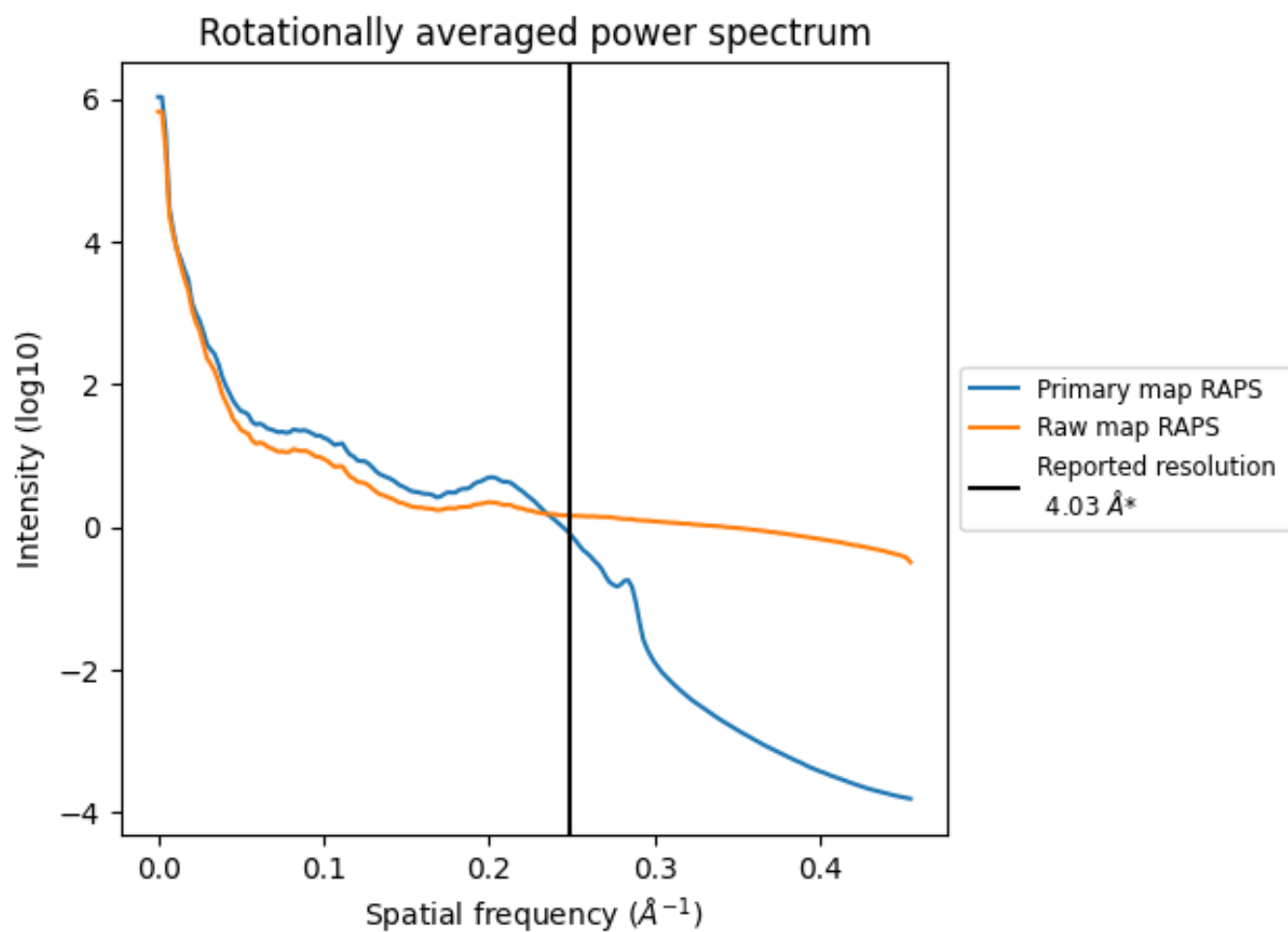
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 643 nm³; this corresponds to an approximate mass of 581 kDa.

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

7.3 Rotationally averaged power spectrum i

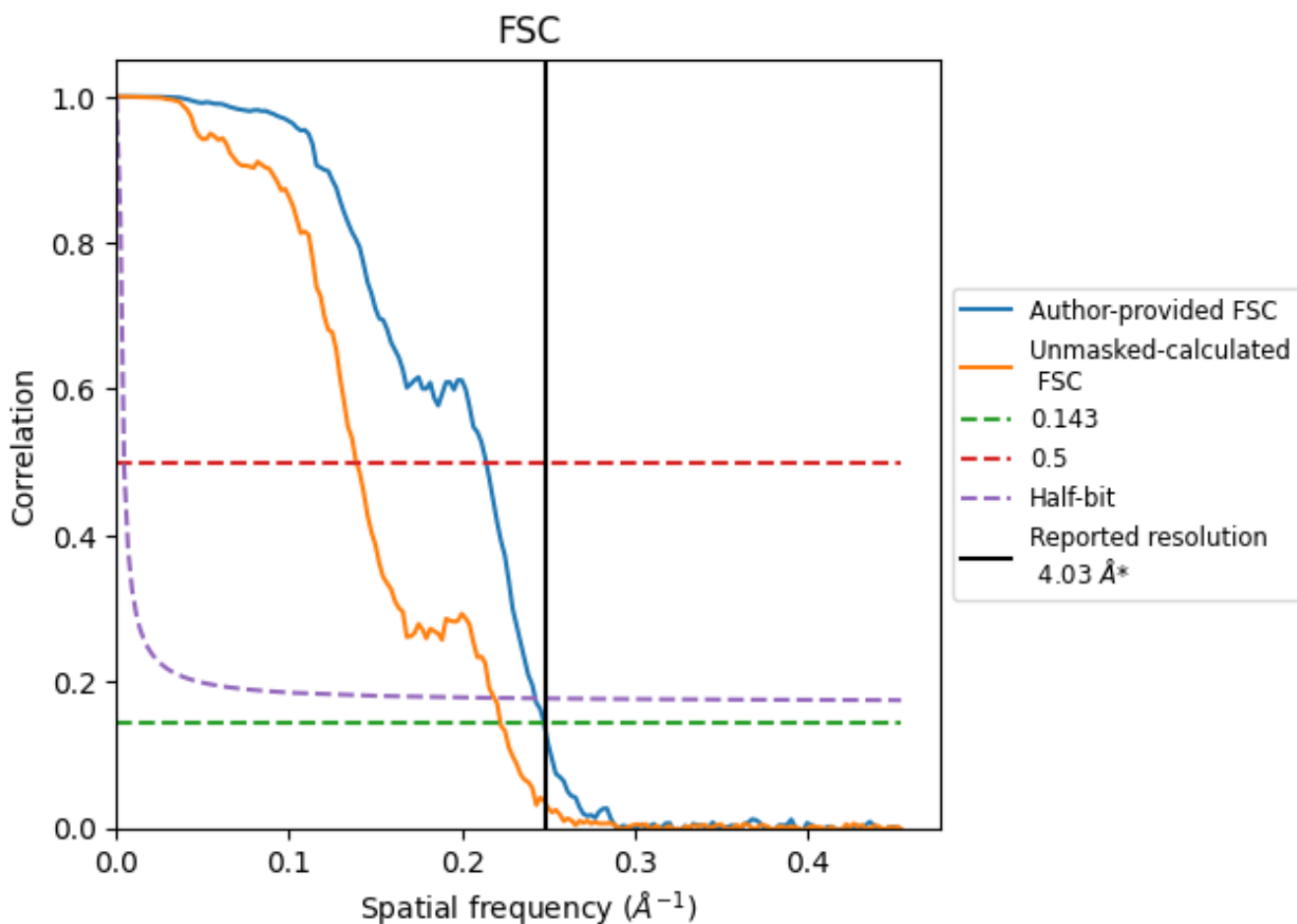


*Reported resolution corresponds to spatial frequency of 0.248 Å⁻¹

8 Fourier-Shell correlation [i](#)

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

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.248 Å⁻¹

8.2 Resolution estimates [i](#)

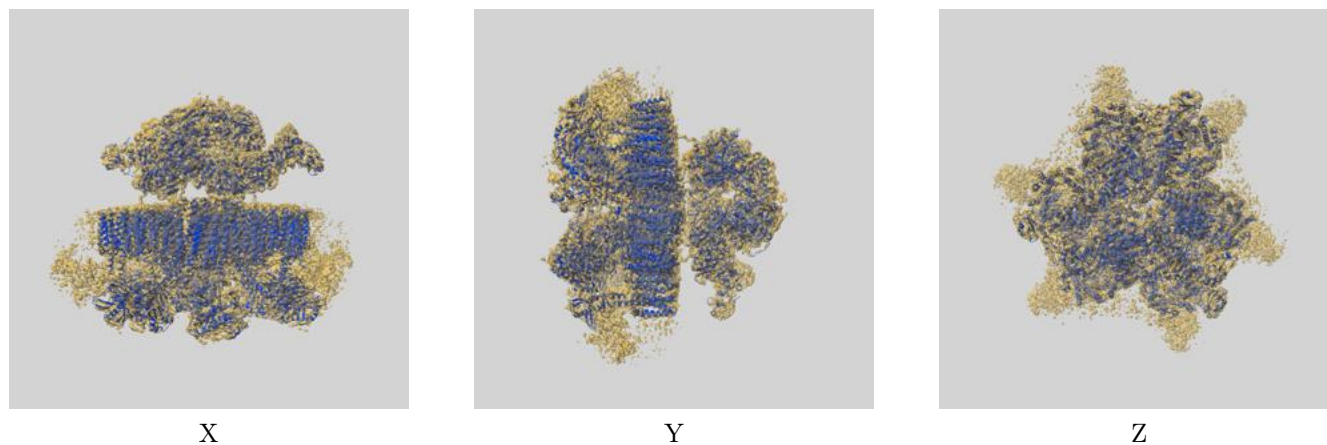
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.03	-	-
Author-provided FSC curve	4.04	4.67	4.12
Unmasked-calculated*	4.49	7.19	4.57

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.49 differs from the reported value 4.03 by more than 10 %

9 Map-model fit [i](#)

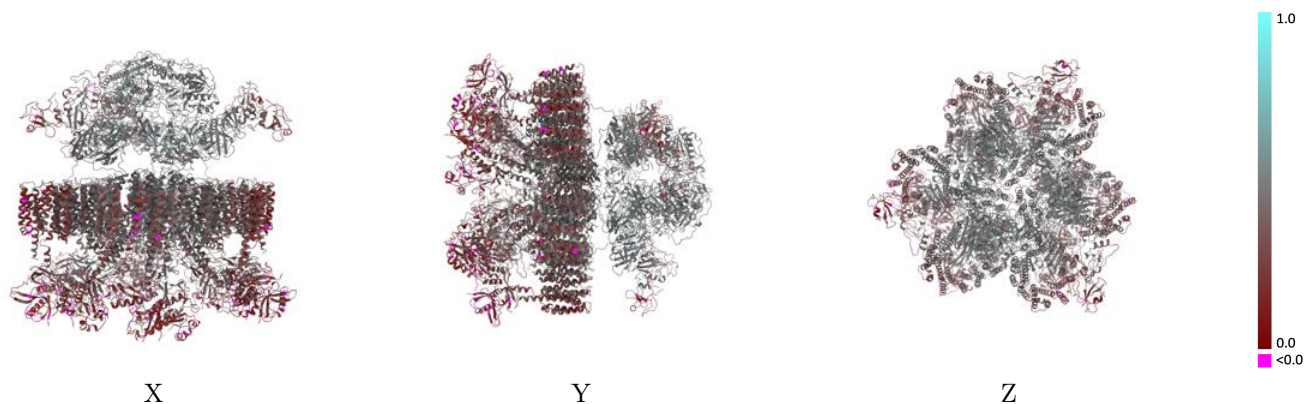
This section contains information regarding the fit between EMDB map EMD-12514 and PDB model 7NP7. Per-residue inclusion information can be found in section 3 on page 6.

9.1 Map-model overlay [i](#)



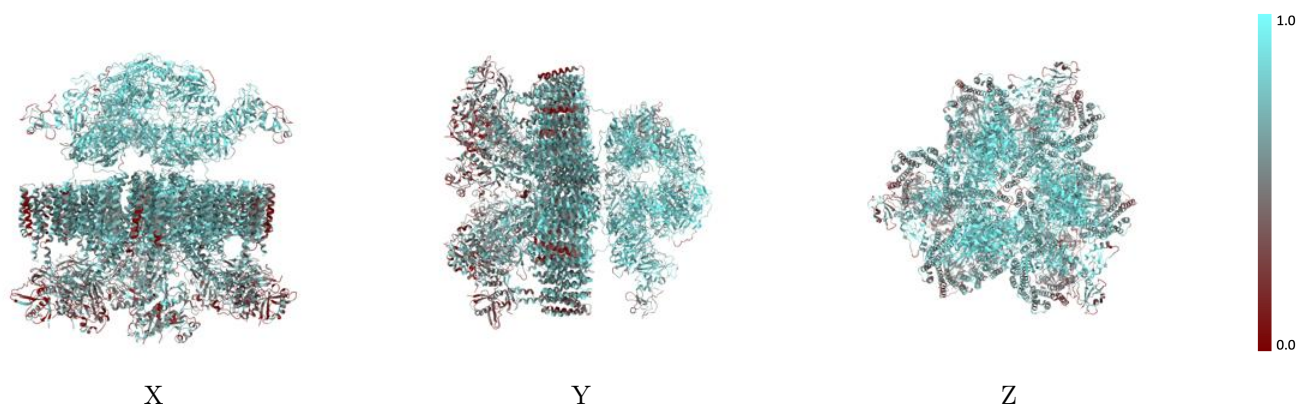
The images above show the 3D surface view of the map at the recommended contour level 0.012 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



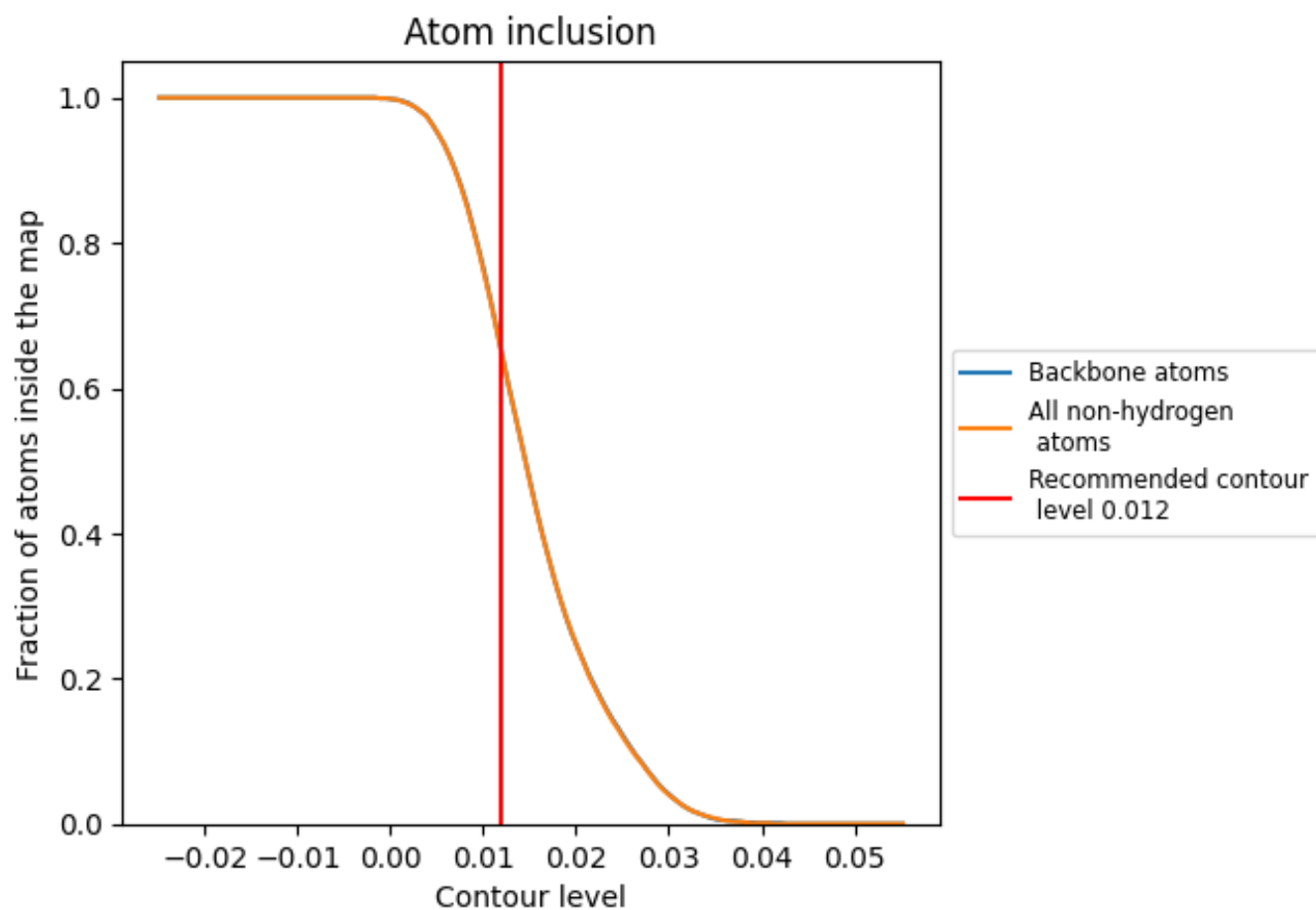
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.012).

























































9.4 Atom inclusion [i](#)



At the recommended contour level, 65% of all backbone atoms, 65% 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 (0.012) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.6470	 0.3830
B1	 0.7560	 0.4350
B2	 0.7520	 0.4340
B3	 0.7460	 0.4370
B4	 0.8020	 0.4640
B5	 0.7990	 0.4670
B6	 0.8040	 0.4690
C1	 0.5940	 0.3420
C2	 0.5030	 0.3010
C3	 0.5960	 0.3340
C4	 0.4950	 0.2960
C5	 0.5970	 0.3310
C6	 0.4970	 0.3000
D1	 0.6130	 0.3480
D2	 0.5510	 0.3160
D3	 0.6820	 0.4000
D4	 0.5990	 0.3450
D5	 0.6090	 0.3480
D6	 0.5460	 0.3110
D7	 0.6820	 0.3960
D8	 0.5990	 0.3530
D9	 0.6060	 0.3490
DA	 0.5550	 0.3150
DB	 0.6840	 0.4000
DC	 0.5990	 0.3430
P1	 0.8190	 0.4760
P2	 0.8130	 0.4760
P3	 0.8140	 0.4780

