



wwPDB EM Validation Summary Report ⓘ

Dec 7, 2024 – 07:09 am GMT

PDB ID : 8RX1
EMDB ID : EMD-19570
Title : CryoEM structure of the gTuRC-CM1dim complex
Authors : Llorca, O.; Serna, M.; Gonzalez-Rodriguez, N.
Deposited on : 2024-02-06
Resolution : 3.57 Å(reported)
Based on initial models : 7AS4, 6X0V

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

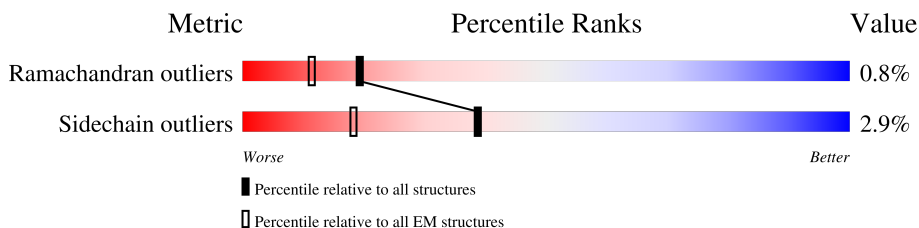
EMDB validation analysis : 0.0.1.dev113
MolProbity : 4.02b-467
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.40

1 Overall quality at a glance

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

The reported resolution of this entry is 3.57 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 ≥ 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	1	451	 27% 90% 7%
1	2	451	 61% 89% 8%
1	O	451	 41% 87% 5% 7%
1	P	451	 26% 88% 7%
1	Q	451	 7% 90% 7%
1	R	451	 90% 7%
1	S	451	 91% 7%
1	T	451	 89% 7%
1	U	451	 90% 7%

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Mol	Chain	Length	Quality of chain
1	V	451	91% 8%
1	W	451	88% 8%
1	X	451	90% 7%
1	Y	451	92% 7%
1	Z	451	88% 5% 7%
2	7	364	20% 98% ..
3	A	902	22% 62% 34%
3	C	902	66% 32%
3	E	902	68% 29%
3	M	902	12% 67% 30%
3	f	902	5% 11% 89%
3	k	902	69% 29%
4	B	907	8% 66% 33%
4	D	907	63% 36%
4	F	907	65% 34%
4	N	907	37% 62% 36%
4	b	907	13% 87%
4	n	907	64% 35%
5	G	229	13% 86%
5	H	229	15% 85%
5	g	229	15% 85%
5	h	229	6% 15% 85%
5	i	229	12% 86%
5	j	229	7% 14% 86%
5	s	229	15% 85%

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Mol	Chain	Length	Quality of chain
5	t	229	 15% 85%
5	u	229	 15% 85%
5	v	229	 14% 85%
6	I	667	 76% 22%
6	K	667	 82% 16%
7	J	1024	 57% 41%
8	L	1819	 33% 66%
8	d	1819	 8% 92%
9	a	82	 79% 21%
9	c	82	 5% 71% 28%
10	e	158	 11% 29% 71%

2 Entry composition [i](#)

There are 10 unique types of molecules in this entry. The entry contains 123860 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 Tubulin gamma-1 chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	1	420	Total 3365	C 2130	N 583	O 637	S 15	0	0
1	2	415	Total 3311	C 2095	N 574	O 627	S 15	0	0
1	O	420	Total 3365	C 2130	N 583	O 637	S 15	0	0
1	P	420	Total 3359	C 2127	N 580	O 637	S 15	0	0
1	Q	420	Total 3371	C 2133	N 586	O 637	S 15	0	0
1	R	420	Total 3365	C 2130	N 583	O 637	S 15	0	0
1	S	420	Total 3371	C 2133	N 586	O 637	S 15	0	0
1	T	420	Total 3359	C 2127	N 580	O 637	S 15	0	0
1	U	420	Total 3365	C 2130	N 583	O 637	S 15	0	0
1	V	417	Total 3325	C 2109	N 571	O 630	S 15	0	0
1	W	417	Total 3342	C 2114	N 579	O 634	S 15	0	0
1	X	420	Total 3371	C 2133	N 586	O 637	S 15	0	0
1	Y	419	Total 3363	C 2129	N 585	O 634	S 15	0	0
1	Z	420	Total 3365	C 2130	N 583	O 637	S 15	0	0

- Molecule 2 is a protein called Actin b.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
2	7	360	Total 1812	C 1091	N 360	O 361	0	0

- Molecule 3 is a protein called Gamma-tubulin complex component 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	A	599	Total	C	N	O	S	0	0
			4846	3135	802	877	32		
3	C	614	Total	C	N	O	S	0	0
			4973	3216	824	901	32		
3	E	638	Total	C	N	O	S	0	0
			5196	3351	870	942	33		
3	M	633	Total	C	N	O	S	0	0
			5158	3325	865	935	33		
3	f	95	Total	C	N	O		0	0
			481	291	95	95			
3	k	636	Total	C	N	O	S	0	0
			5180	3339	868	940	33		

- Molecule 4 is a protein called Gamma-tubulin complex component 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	B	610	Total	C	N	O	S	0	0
			5015	3195	885	910	25		
4	D	581	Total	C	N	O	S	0	0
			4790	3058	839	868	25		
4	F	599	Total	C	N	O	S	0	0
			4921	3140	865	891	25		
4	N	583	Total	C	N	O	S	0	0
			4810	3072	848	865	25		
4	b	116	Total	C	N	O	S	0	0
			933	591	171	169	2		
4	n	594	Total	C	N	O	S	0	0
			4875	3113	852	885	25		

- Molecule 5 is a protein called CM1.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	G	31	Total	C	N	O	S	0	0
			270	173	46	50	1		
5	H	35	Total	C	N	O	S	0	0
			317	202	55	58	2		
5	g	35	Total	C	N	O	S	0	0
			303	192	54	55	2		
5	h	35	Total	C	N	O	S	0	0
			317	202	55	58	2		
5	i	31	Total	C	N	O	S	0	0
			274	176	46	50	2		

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Mol	Chain	Residues	Atoms					AltConf	Trace
5	j	32	Total	C	N	O	S	0	0
			290	187	48	54	1		
5	s	35	Total	C	N	O	S	0	0
			303	192	54	55	2		
5	t	35	Total	C	N	O	S	0	0
			303	192	54	55	2		
5	u	35	Total	C	N	O	S	0	0
			317	202	55	58	2		
5	v	35	Total	C	N	O	S	0	0
			317	202	55	58	2		

- Molecule 6 is a protein called Gamma-tubulin complex component 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	I	521	Total	C	N	O	S	0	0
			4203	2722	714	749	18		
6	K	562	Total	C	N	O	S	0	0
			4573	2961	778	816	18		

- Molecule 7 is a protein called Gamma-tubulin complex component 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	J	601	Total	C	N	O	S	0	0
			4837	3127	811	872	27		

- Molecule 8 is a protein called Gamma-tubulin complex component 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	L	617	Total	C	N	O	S	0	0
			4928	3217	830	855	26		
8	d	147	Total	C	N	O	S	0	0
			1152	727	198	219	8		

- Molecule 9 is a protein called Mitotic-spindle organizing protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	a	65	Total	C	N	O	S	0	0
			484	299	85	96	4		
9	c	59	Total	C	N	O	S	0	0
			454	281	79	90	4		

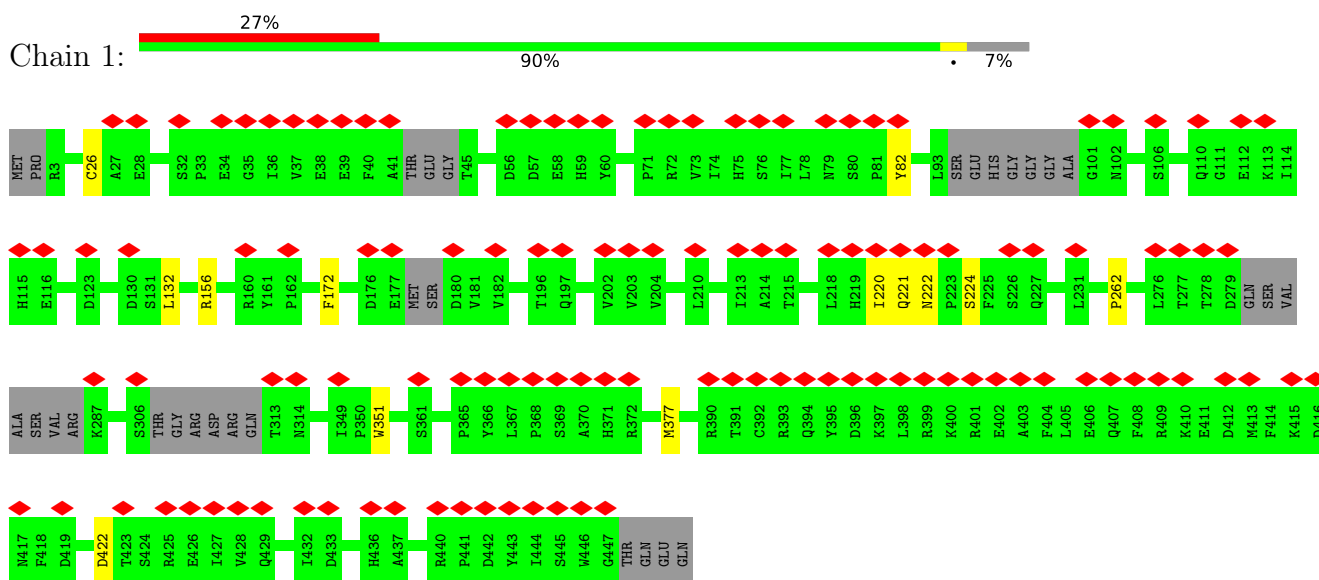
- Molecule 10 is a protein called Mitotic-spindle organizing protein 2A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
10	e	46	231	139	46	46	0	0

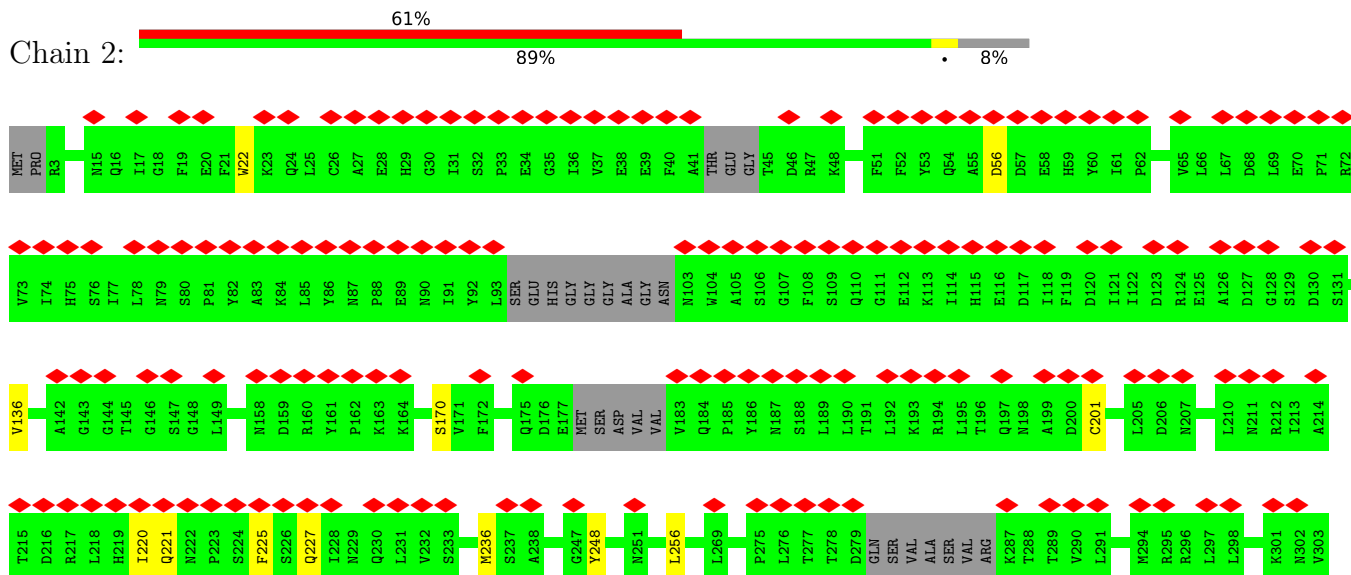
3 Residue-property plots [i](#)

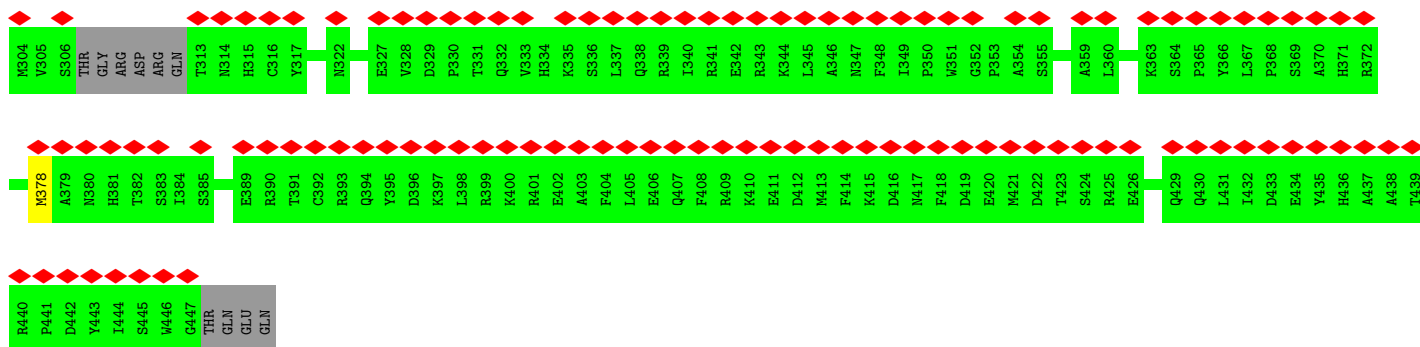
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

- Molecule 1: Tubulin gamma-1 chain

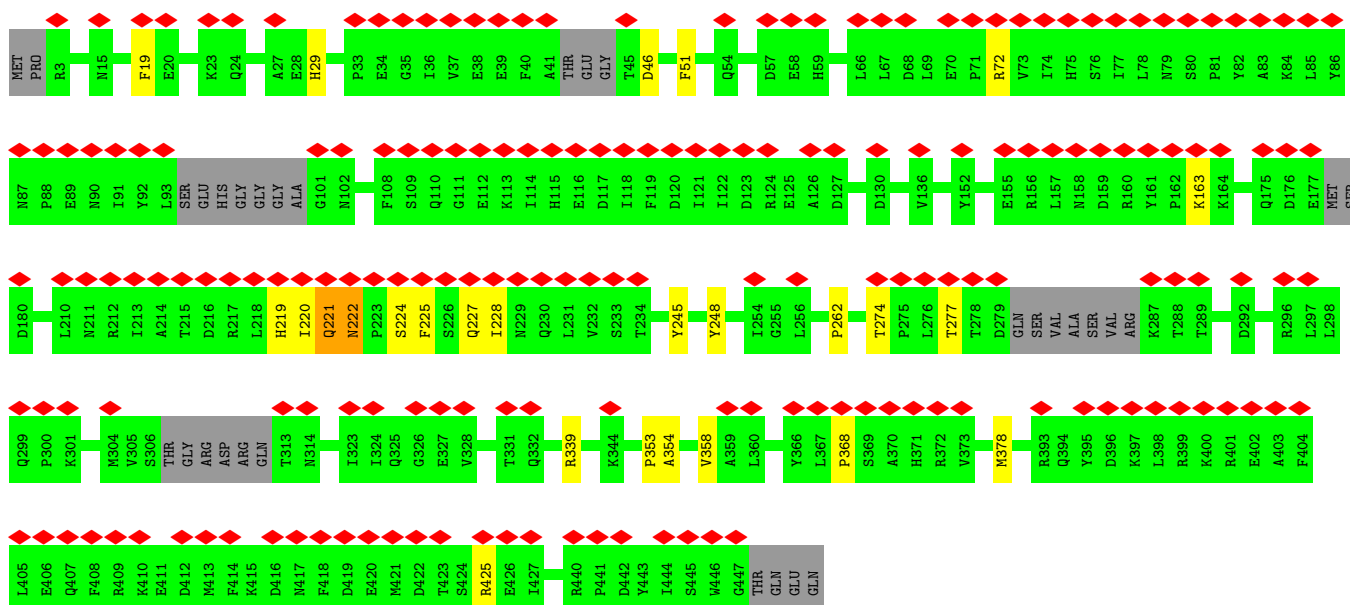
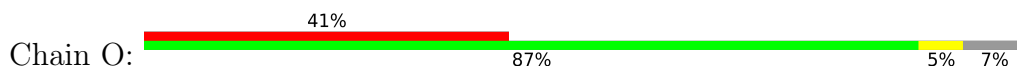


- Molecule 1: Tubulin gamma-1 chain

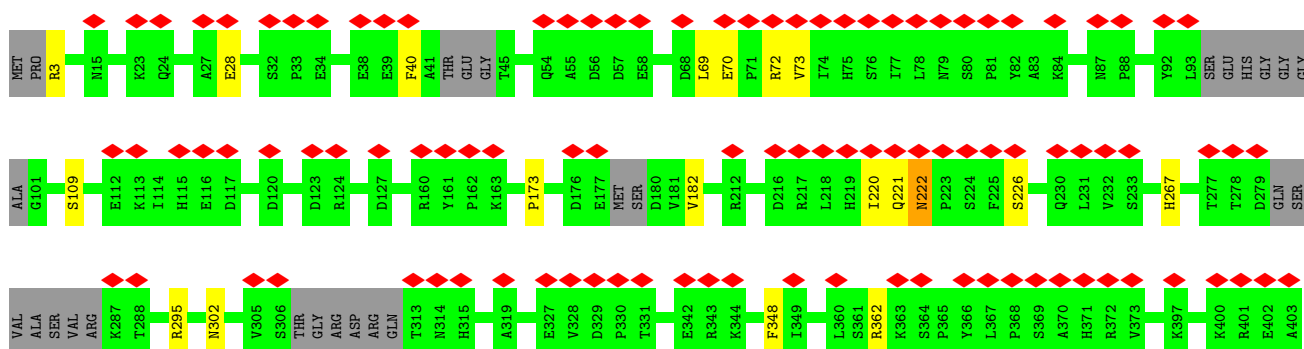
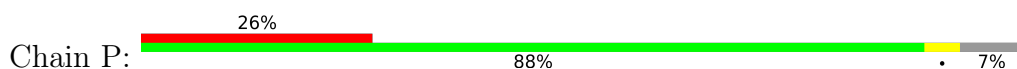


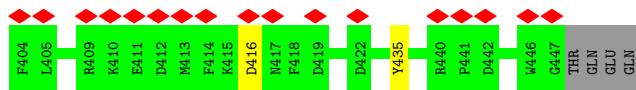


• Molecule 1: Tubulin gamma-1 chain

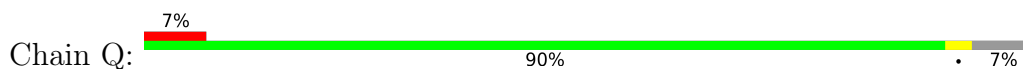


• Molecule 1: Tubulin gamma-1 chain

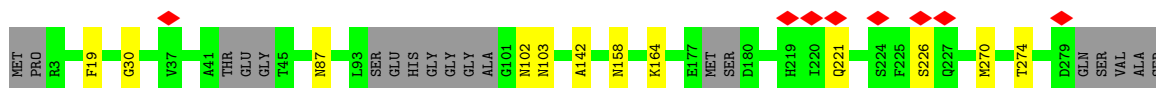
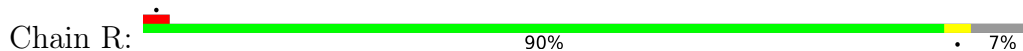




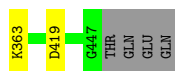
- Molecule 1: Tubulin gamma-1 chain



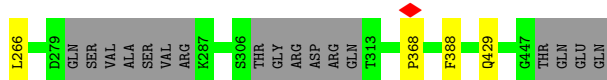
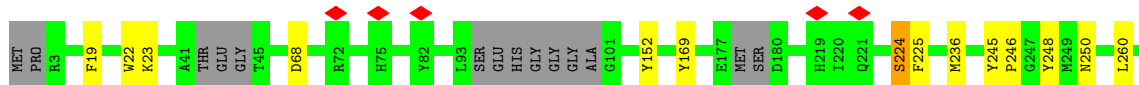
- Molecule 1: Tubulin gamma-1 chain




- Molecule 1: Tubulin gamma-1 chain

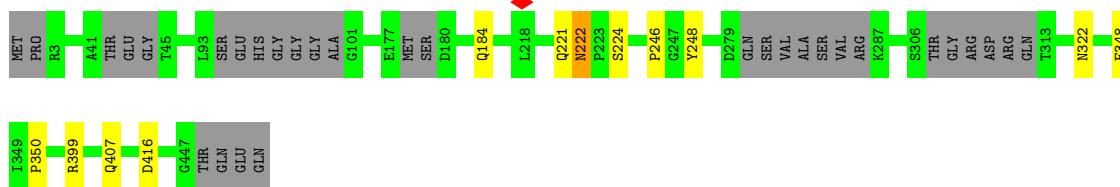


- Molecule 1: Tubulin gamma-1 chain




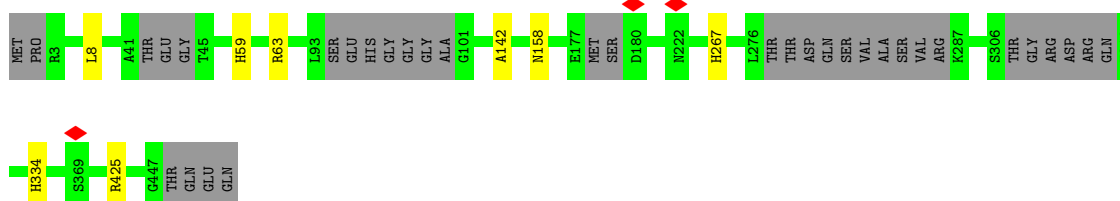
- Molecule 1: Tubulin gamma-1 chain

Chain U:  90% • 7%




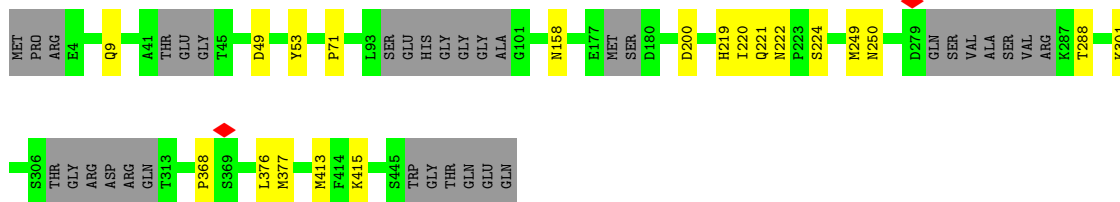
• Molecule 1: Tubulin gamma-1 chain

Chain V:  91% • 8%



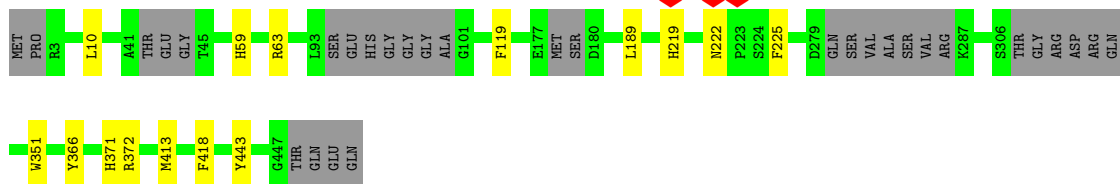
• Molecule 1: Tubulin gamma-1 chain

Chain W:  88% • 8%



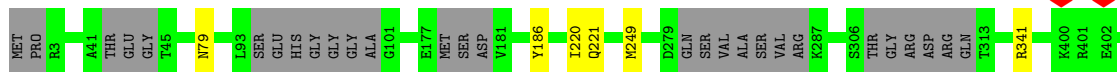
• Molecule 1: Tubulin gamma-1 chain

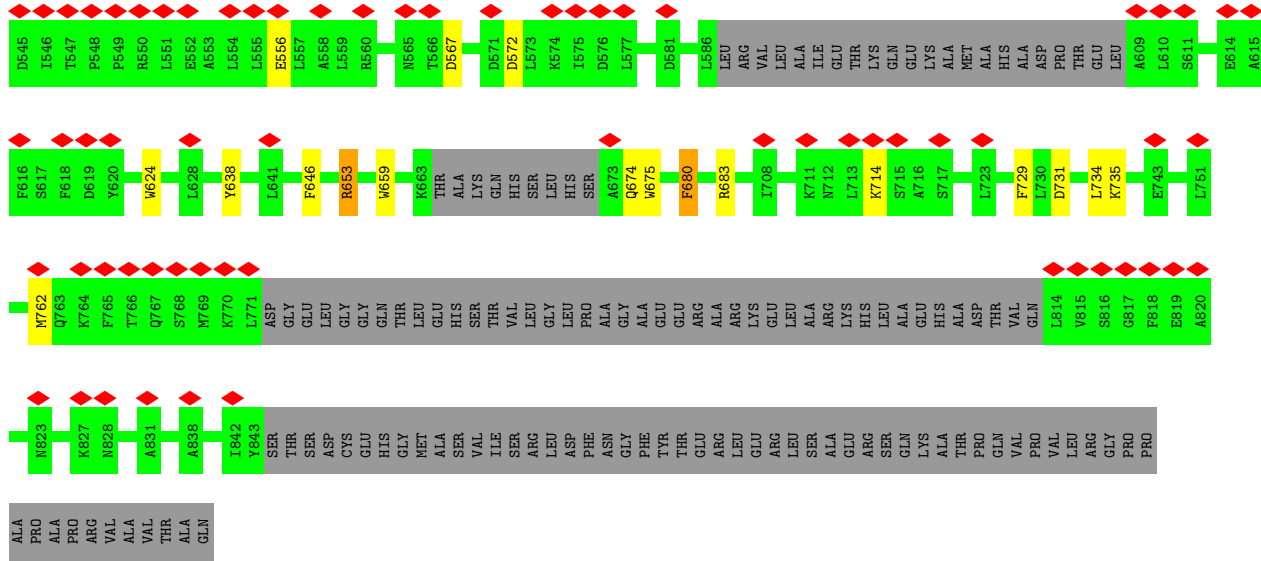
Chain X:  90% • 7%



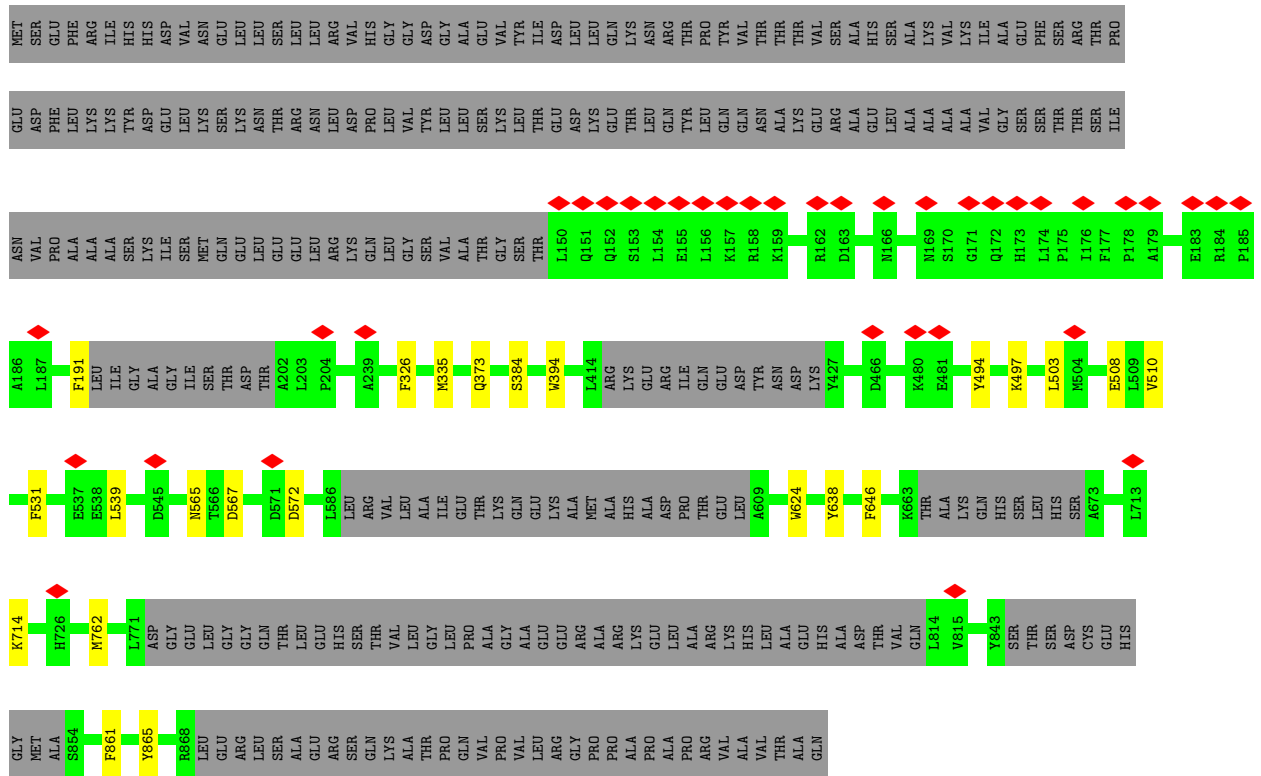
• Molecule 1: Tubulin gamma-1 chain

Chain Y:  92% • 7%

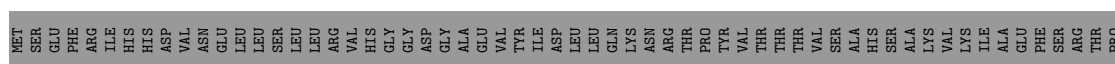


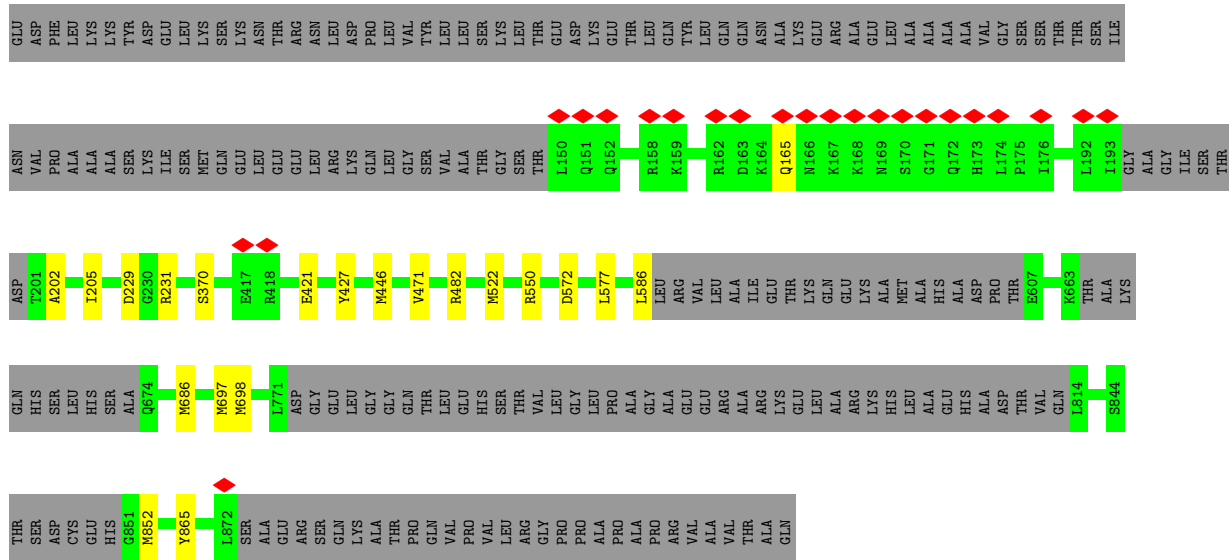


• Molecule 3: Gamma-tubulin complex component 2

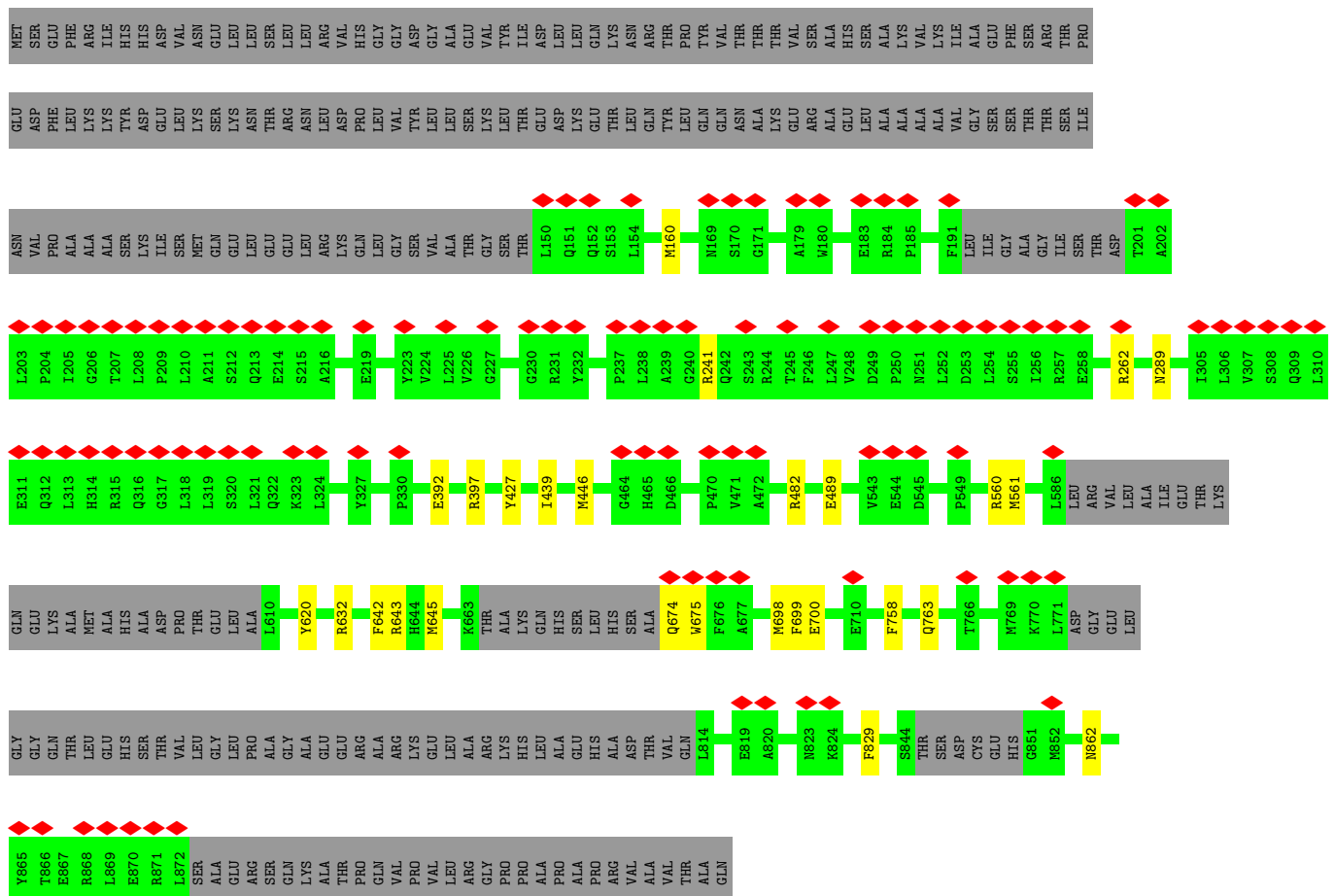


• Molecule 3: Gamma-tubulin complex component 2



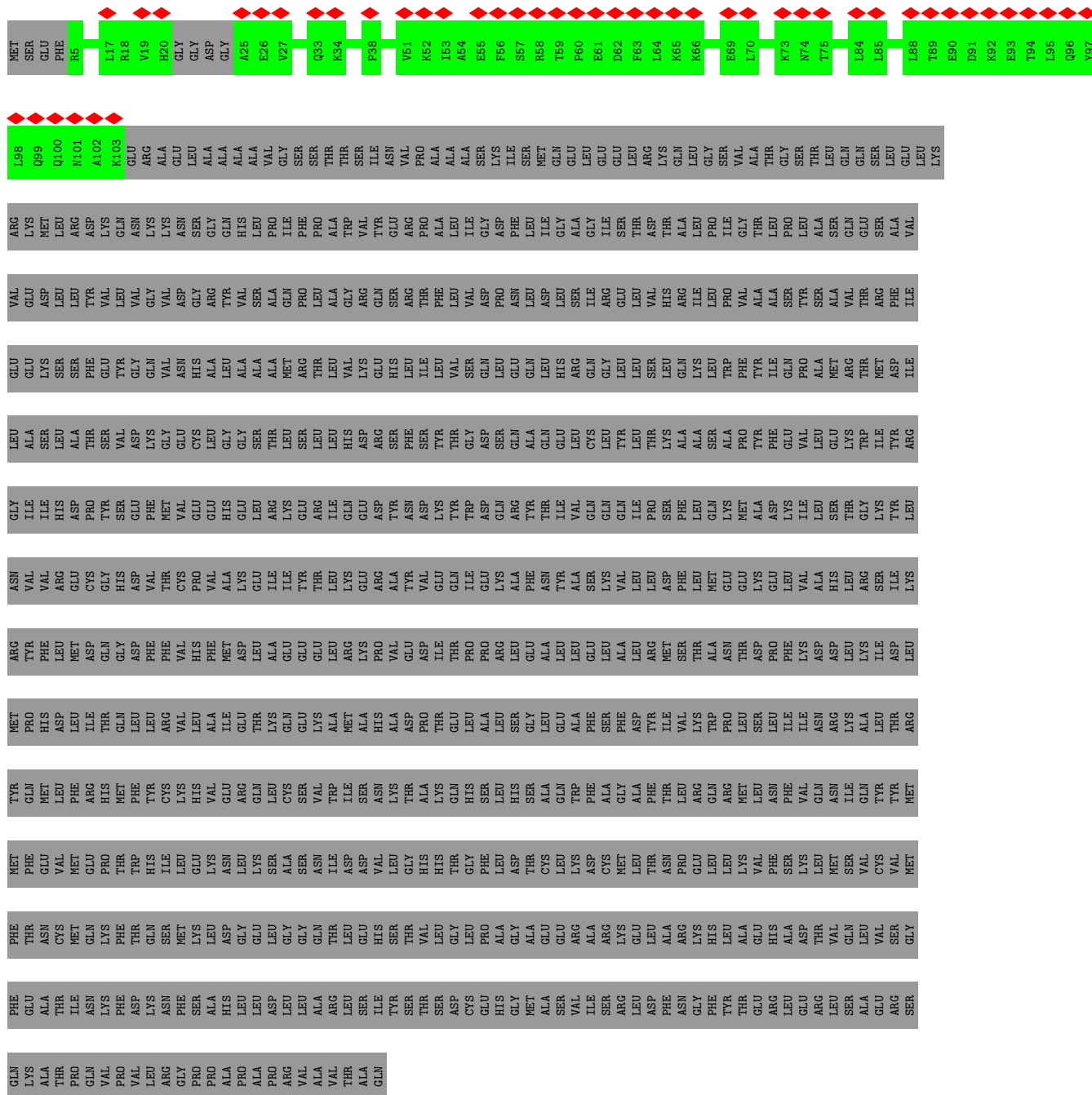


● Molecule 3: Gamma-tubulin complex component 2

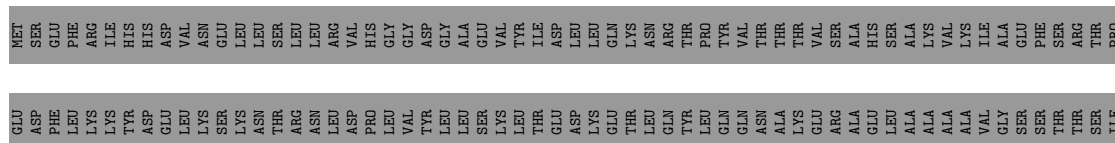


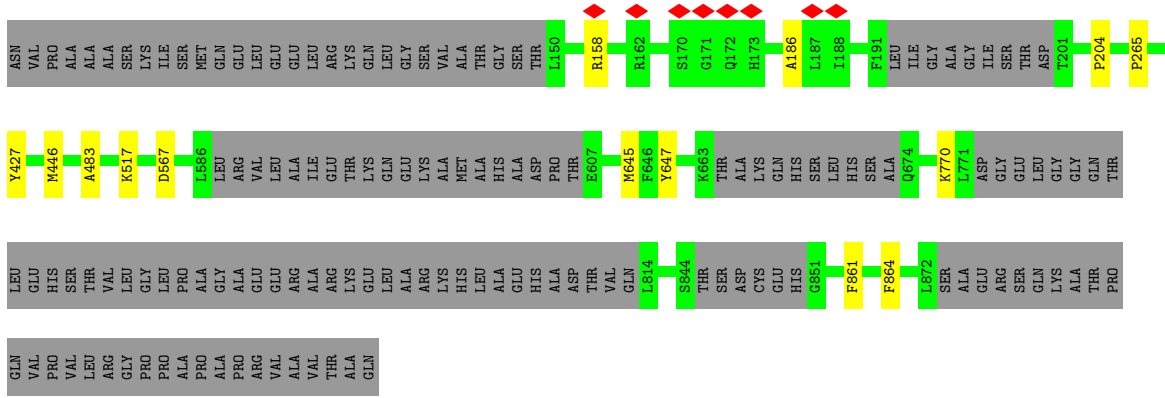
● Molecule 3: Gamma-tubulin complex component 2



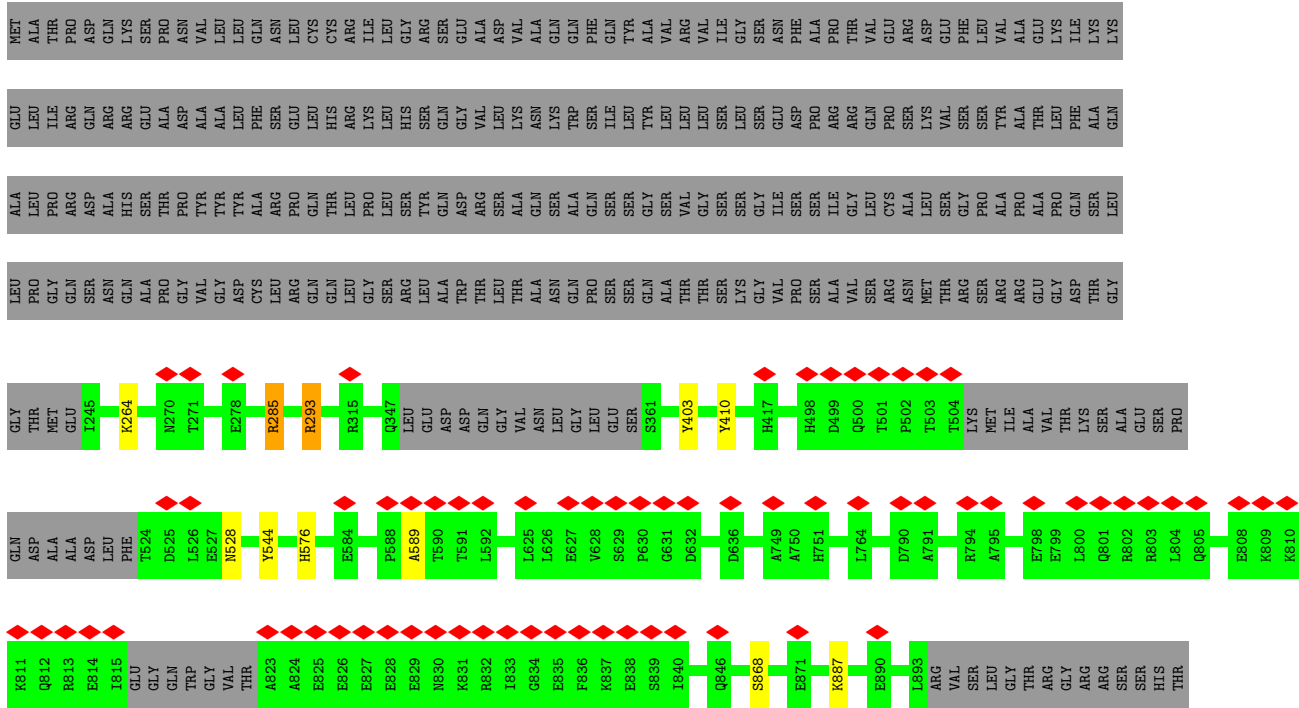


• Molecule 3: Gamma-tubulin complex component 2

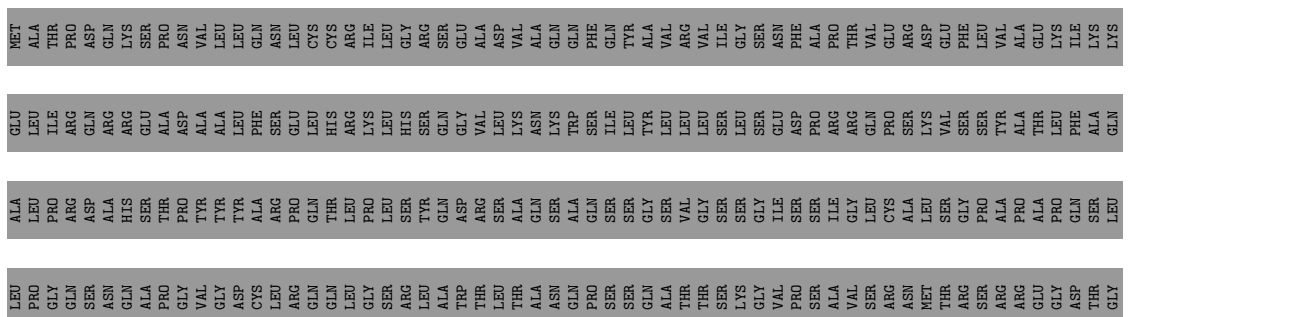


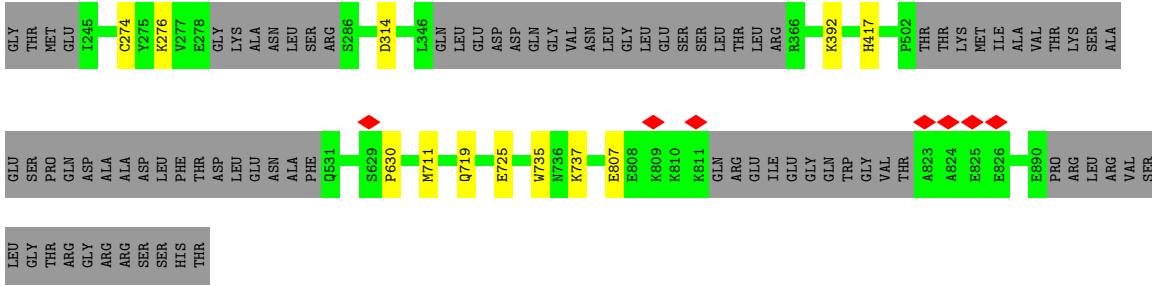


- Molecule 4: Gamma-tubulin complex component 3

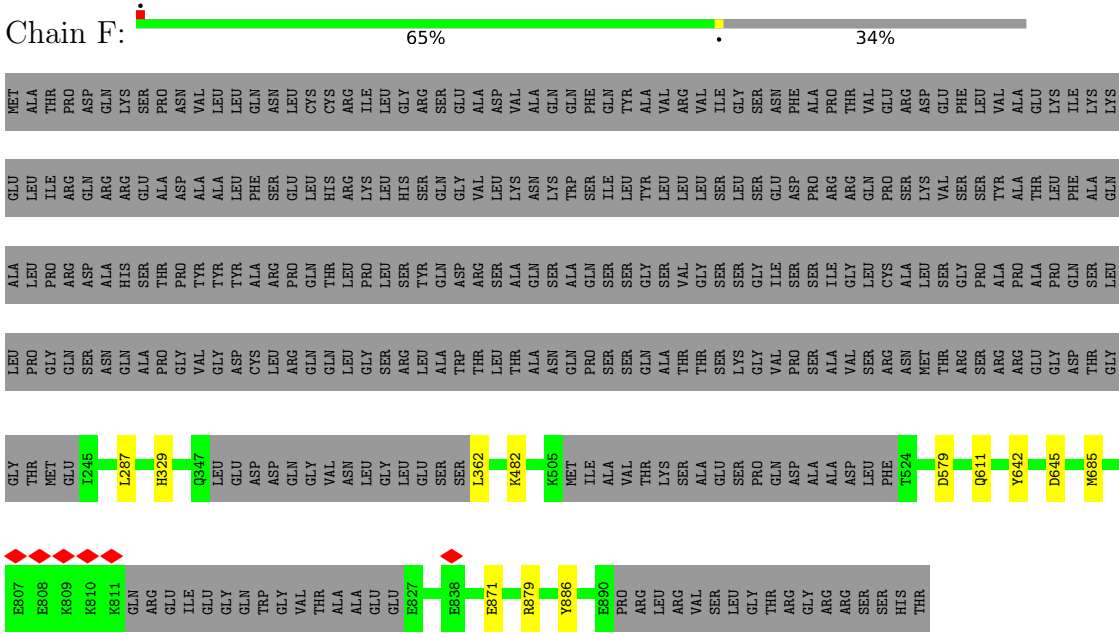


- Molecule 4: Gamma-tubulin complex component 3

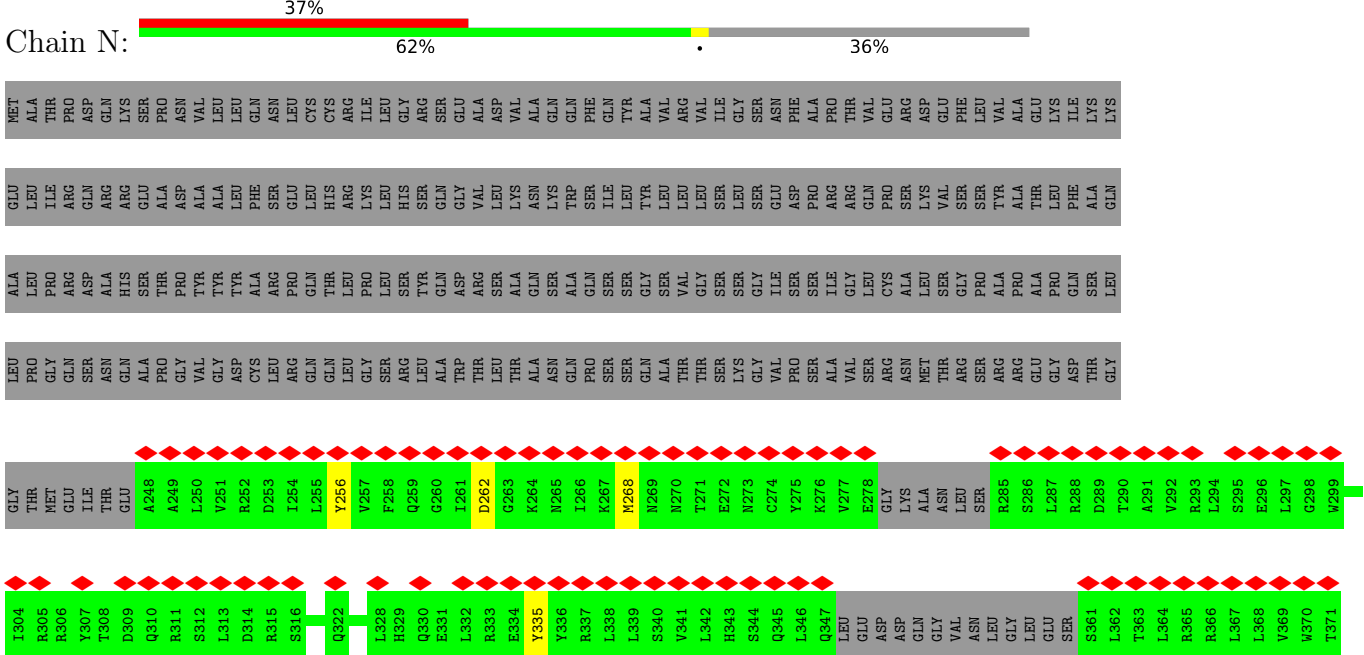


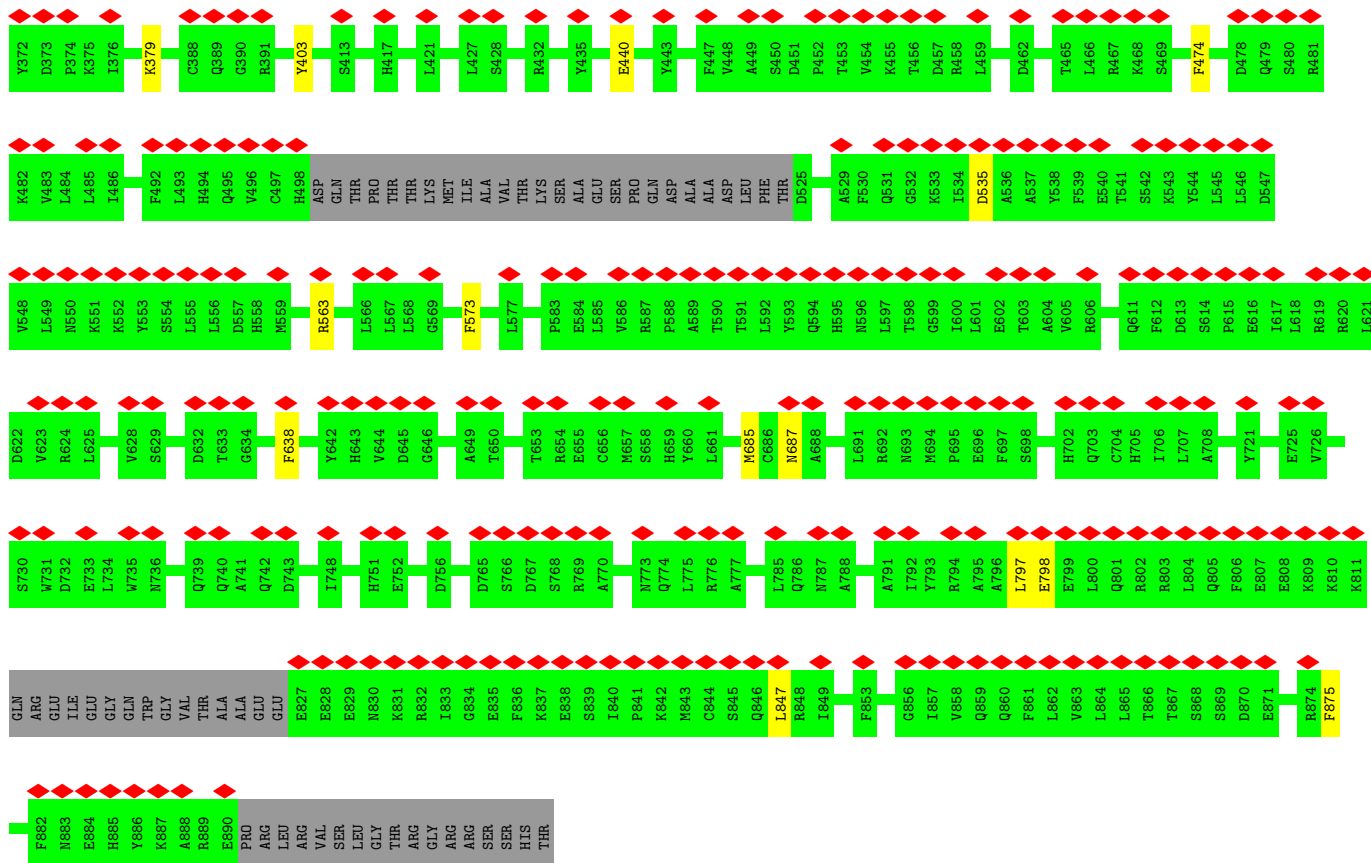


● Molecule 4: Gamma-tubulin complex component 3



● Molecule 4: Gamma-tubulin complex component 3





● Molecule 4: Gamma-tubulin complex component 3

Chain b: 13% 87%

MET	ALA	THR	PRO	ASP	GLN	GLY	K7	R49	R105	ARG	GLN	PRO	LEU	LEU	LEU	SER	LEU	VAL	E827	E828	E829	N830	K831	R832	I833	G834	E835	F836	K837	E838	S839	I840	P841	K842	M843	C844	S845	Q846	L847	R848	I849	F853	G856	I857	V858	Q859	Q860	F861	L862	V863	L864	L865	T866	T867	S868	S869	D870	E871	R874	F875
LEU	CYS	ALA	LEU	THR	ASP	GLY	PRO	ALA	PRO	ALA	GLN	SER	LEU	LEU	PRO	LEU	VAL	SER	E827	E828	E829	N830	K831	R832	I833	G834	E835	F836	K837	E838	S839	I840	P841	K842	M843	C844	S845	Q846	L847	R848	I849	F853	G856	I857	V858	Q859	Q860	F861	L862	V863	L864	L865	T866	T867	S868	S869	D870	E871	R874	F875
SER	ARG	ASN	MET	THR	ARG	THR	ARG	ARG	GLY	GLY	THR	GLY	THR	GLY	THR	THR	THR	THR	E827	E828	E829	N830	K831	R832	I833	G834	E835	F836	K837	E838	S839	I840	P841	K842	M843	C844	S845	Q846	L847	R848	I849	F853	G856	I857	V858	Q859	Q860	F861	L862	V863	L864	L865	T866	T867	S868	S869	D870	E871	R874	F875
LEU	ARG	ASP	ALA	VAL	ARG	ARG	LEU	LEU	ASN	THR	LYS	THR	LEU	ASN	THR	LYS	ILE	ARG	E827	E828	E829	N830	K831	R832	I833	G834	E835	F836	K837	E838	S839	I840	P841	K842	M843	C844	S845	Q846	L847	R848	I849	F853	G856	I857	V858	Q859	Q860	F861	L862	V863	L864	L865	T866	T867	S868	S869	D870	E871	R874	F875
GLN	LEU	GLU	ASP	GLN	VAL	GLY	ASN	VAL	ASN	THR	LEU	THR	ARG	ARG	THR	THR	THR	THR	E827	E828	E829	N830	K831	R832	I833	G834	E835	F836	K837	E838	S839	I840	P841	K842	M843	C844	S845	Q846	L847	R848	I849	F853	G856	I857	V858	Q859	Q860	F861	L862	V863	L864	L865	T866	T867	S868	S869	D870	E871	R874	F875
GLY	ASP	PRO	TYR	MET	THR	ARG	SER	LEU	VAL	VAL	VAL	LEU	LEU	LEU	LEU	VAL	VAL	VAL	E827	E828	E829	N830	K831	R832	I833	G834	E835	F836	K837	E838	S839	I840	P841	K842	M843	C844	S845	Q846	L847	R848	I849	F853	G856	I857	V858	Q859	Q860	F861	L862	V863	L864	L865	T866	T867	S868	S869	D870	E871	R874	F875
ARG	LYS	SER	MET	ILE	GLY	PRO	SER	PHE	THR	THR	LYS	VAL	LEU	LEU	LEU	ILE	ILE	ILE	E827	E828	E829	N830	K831	R832	I833	G834	E835	F836	K837	E838	S839	I840	P841	K842	M843	C844	S845	Q846	L847	R848	I849	F853	G856	I857	V858	Q859	Q860	F861	L862	V863	L864	L865	T866	T867	S868	S869	D870	E871	R874	F875
GLU	ASN	PHE	GLY	GLY	ASP	ILE	ASP	ILE	THR	THR	LYS	THR	LEU	LEU	LEU	LEU	LEU	LEU	E827	E828	E829	N830	K831	R832	I833	G834	E835	F836	K837	E838	S839	I840	P841	K842	M843	C844	S845	Q846	L847	R848	I849	F853	G856	I857	V858	Q859	Q860	F861	L862	V863	L864	L865	T866	T867	S868	S869	D870	E871	R874	F875

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

• Molecule 4: Gamma-tubulin complex component 3

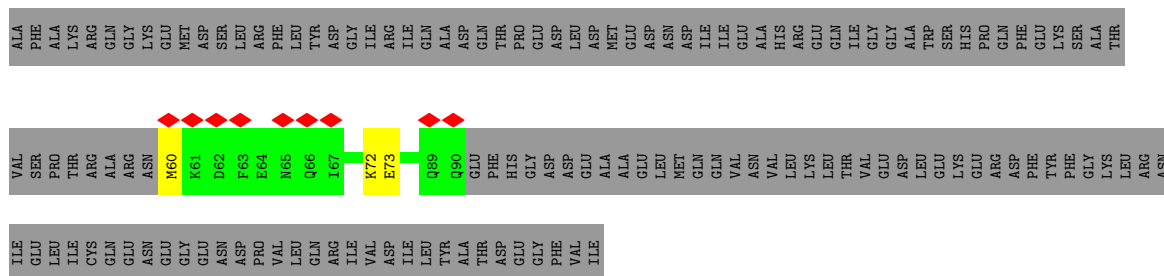


MET	ALA	THR	PRO	GLN	ASP	ASN	LYS	SER	GLY	LEU	VAL	GLN	GLY	LEU
GLU	LEU	ILE	ARG	GLN	ASP	GLY	ARG	GLU	GLY	LEU	PHE	LEU	LEU	GLN
ALA	LEU	PRO	ARG	GLN	ASP	ALA	HIS	SER	GLY	LEU	THR	VAL	ARG	LEU
LEU	PRO	GLY	SER	ASN	GLN	ALA	ALA	GLY	LEU	LEU	CYS	ARG	GLY	GLY
GLY	THR	MET	LEU	HIS	I245	D253	Y275	E278	LYS	ALA	ASN	R285	G347	LEU
ALA	ASP	THR	PRO	THR	THR	Y538	R575	H595	L687	F697	L763	F806	K811	GLU
ARG	GLY	THR	VAL	GLY	LYS	PRO	VAL	ARG	GLY	THR	THR	THR	THR	THR
VAL	ASP	VAL	VAL	VAL	LEU	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL
THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR
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	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	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
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	VAL	VAL	VAL	VAL	VAL
VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL

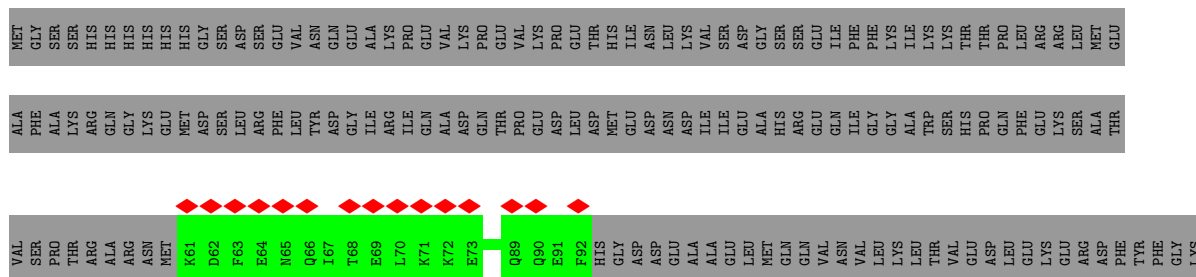
• Molecule 5: CM1



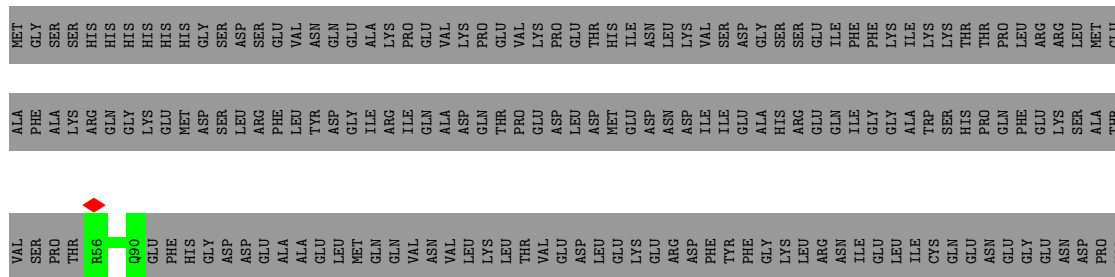
MET	GLY	SER	HIS	HIS	HIS	HIS	HIS	HIS	HIS	GLY	SER	ASP	SER	GLY
ALA	PHE	ALA	ARG	GLM	GLY	LYS	GLU	MET	ASP	SER	LEU	ARG	ARG	LEU
VAL	SER	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR
GLU	ASN	GLU	GLY	ASN	ASP	VAL	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE
ASP	ASN	GLY	ASN	ASP	VAL	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE
VAL	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	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
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VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL
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VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL
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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	VAL	VAL	VAL	VAL	VAL
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VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL



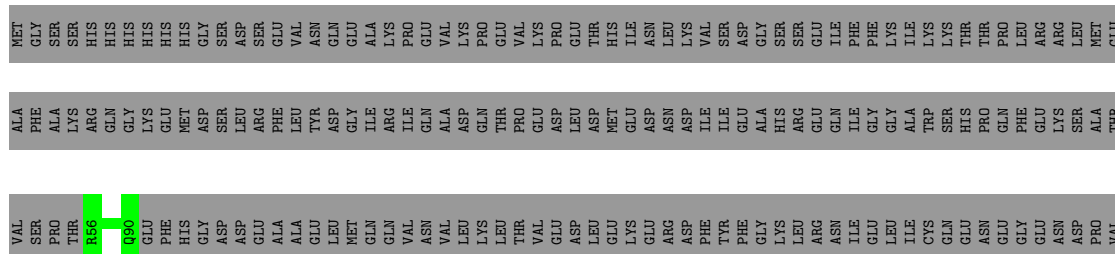
● Molecule 5: CM1



● Molecule 5: CM1



● Molecule 5: CM1



Grid of amino acid sequence logos for EMD-19570, 8RX1. Residues are color-coded: green for highlighted residues (P65, E97, A98) and yellow for other highlighted residues (S3, A19, R29, Q51, V107, P123, R130, C150, E177, A184). Three red diamonds are placed above the P65, E97, and A98 labels.

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	579078	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 ($e^-/\text{\AA}^2$)	55.4	Depositor
Minimum defocus (nm)	900	Depositor
Maximum defocus (nm)	1800	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.066	Depositor
Minimum map value	-0.019	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.011	Depositor
Map size (Å)	601.2, 601.2, 601.2	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.6700001, 1.6700001, 1.6700001	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	1	0.46	0/3433	0.76	0/4651
1	2	0.54	0/3377	0.81	0/4575
1	O	0.52	0/3433	0.80	0/4651
1	P	0.49	0/3427	0.76	0/4644
1	Q	0.44	0/3439	0.78	0/4658
1	R	0.48	0/3433	0.77	0/4651
1	S	0.45	0/3439	0.78	0/4658
1	T	0.49	0/3427	0.80	0/4644
1	U	0.48	0/3433	0.81	0/4651
1	V	0.46	0/3393	0.76	0/4599
1	W	0.47	0/3408	0.84	0/4616
1	X	0.43	0/3439	0.77	0/4658
1	Y	0.49	0/3431	0.80	0/4647
1	Z	0.52	0/3433	0.84	0/4651
2	7	0.30	0/1828	0.52	0/2554
3	A	0.49	0/4951	0.75	0/6692
3	C	0.46	0/5080	0.76	0/6864
3	E	0.46	0/5305	0.77	0/7162
3	M	0.50	0/5267	0.78	0/7110
3	f	0.26	0/482	0.44	0/674
3	k	0.52	0/5289	0.81	0/7140
4	B	0.45	0/5119	0.75	0/6912
4	D	0.43	0/4891	0.77	0/6603
4	F	0.46	0/5024	0.80	0/6784
4	N	0.46	0/4911	0.77	0/6627
4	b	0.46	0/948	0.80	0/1277
4	n	0.48	0/4977	0.79	0/6722
5	G	0.59	0/273	0.81	0/362
5	H	0.45	0/321	0.76	0/424
5	g	0.42	0/306	0.72	0/405
5	h	0.41	0/321	0.60	0/424
5	i	0.53	0/277	0.70	0/366
5	j	0.43	0/294	0.63	0/389
5	s	0.45	0/306	0.82	0/405

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
5	t	0.47	0/306	0.78	0/405
5	u	0.45	0/321	0.80	0/424
5	v	0.45	0/321	0.82	0/424
6	I	0.50	0/4299	0.84	0/5824
6	K	0.43	0/4677	0.74	0/6331
7	J	0.50	0/4939	0.82	0/6693
8	L	0.45	0/5062	0.77	0/6877
8	d	0.47	0/1165	0.81	0/1566
9	a	0.40	0/484	0.78	0/653
9	c	0.50	0/454	0.84	0/611
10	e	0.29	0/232	0.36	0/323
All	All	0.47	0/126375	0.78	0/170981

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
3	A	0	4
4	B	0	2
All	All	0	6

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

5 of 6 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	A	244	ARG	Sidechain
3	A	540	ARG	Sidechain
3	A	653	ARG	Sidechain
3	A	683	ARG	Sidechain
4	B	285	ARG	Sidechain

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	1	408/451 (90%)	373 (91%)	32 (8%)	3 (1%)	19	53
1	2	403/451 (89%)	363 (90%)	40 (10%)	0	100	100
1	O	408/451 (90%)	357 (88%)	43 (10%)	8 (2%)	6	34
1	P	408/451 (90%)	359 (88%)	43 (10%)	6 (2%)	8	39
1	Q	408/451 (90%)	370 (91%)	32 (8%)	6 (2%)	8	39
1	R	408/451 (90%)	363 (89%)	40 (10%)	5 (1%)	11	43
1	S	408/451 (90%)	356 (87%)	49 (12%)	3 (1%)	19	53
1	T	408/451 (90%)	362 (89%)	42 (10%)	4 (1%)	13	46
1	U	408/451 (90%)	365 (90%)	39 (10%)	4 (1%)	13	46
1	V	405/451 (90%)	356 (88%)	46 (11%)	3 (1%)	19	53
1	W	405/451 (90%)	363 (90%)	35 (9%)	7 (2%)	7	36
1	X	408/451 (90%)	360 (88%)	47 (12%)	1 (0%)	44	74
1	Y	407/451 (90%)	353 (87%)	53 (13%)	1 (0%)	44	74
1	Z	408/451 (90%)	355 (87%)	44 (11%)	9 (2%)	5	32
2	7	356/364 (98%)	305 (86%)	48 (14%)	3 (1%)	16	51
3	A	587/902 (65%)	542 (92%)	43 (7%)	2 (0%)	37	67
3	C	600/902 (66%)	549 (92%)	45 (8%)	6 (1%)	13	46
3	E	626/902 (69%)	558 (89%)	64 (10%)	4 (1%)	22	55
3	M	621/902 (69%)	555 (89%)	65 (10%)	1 (0%)	44	74
3	f	91/902 (10%)	81 (89%)	10 (11%)	0	100	100
3	k	624/902 (69%)	564 (90%)	55 (9%)	5 (1%)	16	51
4	B	602/907 (66%)	544 (90%)	57 (10%)	1 (0%)	44	74
4	D	571/907 (63%)	529 (93%)	40 (7%)	2 (0%)	30	62
4	F	591/907 (65%)	535 (90%)	55 (9%)	1 (0%)	44	74
4	N	573/907 (63%)	521 (91%)	51 (9%)	1 (0%)	44	74

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	b	112/907 (12%)	104 (93%)	7 (6%)	1 (1%)	14	48
4	n	584/907 (64%)	526 (90%)	54 (9%)	4 (1%)	19	53
5	G	29/229 (13%)	25 (86%)	4 (14%)	0	100	100
5	H	33/229 (14%)	32 (97%)	1 (3%)	0	100	100
5	g	33/229 (14%)	31 (94%)	2 (6%)	0	100	100
5	h	33/229 (14%)	30 (91%)	3 (9%)	0	100	100
5	i	29/229 (13%)	26 (90%)	3 (10%)	0	100	100
5	j	30/229 (13%)	30 (100%)	0	0	100	100
5	s	33/229 (14%)	31 (94%)	2 (6%)	0	100	100
5	t	33/229 (14%)	30 (91%)	3 (9%)	0	100	100
5	u	33/229 (14%)	33 (100%)	0	0	100	100
5	v	33/229 (14%)	31 (94%)	2 (6%)	0	100	100
6	I	511/667 (77%)	436 (85%)	69 (14%)	6 (1%)	11	43
6	K	548/667 (82%)	504 (92%)	41 (8%)	3 (0%)	25	59
7	J	587/1024 (57%)	499 (85%)	82 (14%)	6 (1%)	13	46
8	L	613/1819 (34%)	537 (88%)	69 (11%)	7 (1%)	12	45
8	d	137/1819 (8%)	128 (93%)	8 (6%)	1 (1%)	19	53
9	a	63/82 (77%)	60 (95%)	3 (5%)	0	100	100
9	c	57/82 (70%)	54 (95%)	3 (5%)	0	100	100
10	e	44/158 (28%)	40 (91%)	4 (9%)	0	100	100
All	All	15117/26140 (58%)	13525 (90%)	1478 (10%)	114 (1%)	19	51

5 of 114 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	B	589	ALA
4	D	314	ASP
3	E	370	SER
4	F	287	LEU
6	I	470	ALA

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	1	374/400 (94%)	364 (97%)	10 (3%)	40	65
1	2	367/400 (92%)	354 (96%)	13 (4%)	31	60
1	O	374/400 (94%)	354 (95%)	20 (5%)	19	48
1	P	373/400 (93%)	357 (96%)	16 (4%)	25	54
1	Q	375/400 (94%)	368 (98%)	7 (2%)	52	73
1	R	374/400 (94%)	365 (98%)	9 (2%)	44	68
1	S	375/400 (94%)	367 (98%)	8 (2%)	48	71
1	T	373/400 (93%)	358 (96%)	15 (4%)	27	56
1	U	374/400 (94%)	365 (98%)	9 (2%)	44	68
1	V	368/400 (92%)	363 (99%)	5 (1%)	62	80
1	W	373/400 (93%)	360 (96%)	13 (4%)	31	60
1	X	375/400 (94%)	361 (96%)	14 (4%)	29	58
1	Y	374/400 (94%)	369 (99%)	5 (1%)	65	82
1	Z	374/400 (94%)	358 (96%)	16 (4%)	25	54
2	7	18/310 (6%)	18 (100%)	0	100	100
3	A	533/791 (67%)	496 (93%)	37 (7%)	13	40
3	C	547/791 (69%)	530 (97%)	17 (3%)	35	62
3	E	573/791 (72%)	556 (97%)	17 (3%)	36	63
3	M	569/791 (72%)	543 (95%)	26 (5%)	23	51
3	f	3/791 (0%)	3 (100%)	0	100	100
3	k	571/791 (72%)	562 (98%)	9 (2%)	58	77
4	B	547/798 (68%)	537 (98%)	10 (2%)	54	74
4	D	524/798 (66%)	514 (98%)	10 (2%)	52	73
4	F	537/798 (67%)	526 (98%)	11 (2%)	50	72
4	N	525/798 (66%)	508 (97%)	17 (3%)	34	62
4	b	101/798 (13%)	100 (99%)	1 (1%)	73	85
4	n	532/798 (67%)	520 (98%)	12 (2%)	45	69
5	G	29/207 (14%)	27 (93%)	2 (7%)	13	40
5	H	35/207 (17%)	35 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
5	g	32/207 (16%)	32 (100%)	0	100	100
5	h	35/207 (17%)	34 (97%)	1 (3%)	37	63
5	i	30/207 (14%)	27 (90%)	3 (10%)	6	28
5	j	32/207 (16%)	32 (100%)	0	100	100
5	s	32/207 (16%)	32 (100%)	0	100	100
5	t	32/207 (16%)	32 (100%)	0	100	100
5	u	35/207 (17%)	35 (100%)	0	100	100
5	v	35/207 (17%)	33 (94%)	2 (6%)	17	46
6	I	468/594 (79%)	458 (98%)	10 (2%)	48	71
6	K	508/594 (86%)	497 (98%)	11 (2%)	47	70
7	J	531/933 (57%)	516 (97%)	15 (3%)	38	64
8	L	540/1546 (35%)	526 (97%)	14 (3%)	41	66
8	d	128/1546 (8%)	127 (99%)	1 (1%)	79	89
9	a	53/62 (86%)	53 (100%)	0	100	100
9	c	53/62 (86%)	52 (98%)	1 (2%)	52	73
10	e	2/118 (2%)	2 (100%)	0	100	100
All	All	13413/22969 (58%)	13026 (97%)	387 (3%)	39	63

5 of 387 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	O	225	PHE
1	T	224	SER
1	O	378	MET
1	Q	377	MET
1	U	322	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 28 such sidechains are listed below:

Mol	Chain	Res	Type
4	N	846	GLN
4	n	417	HIS
1	P	332	GLN
1	Z	219	HIS
1	P	221	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.

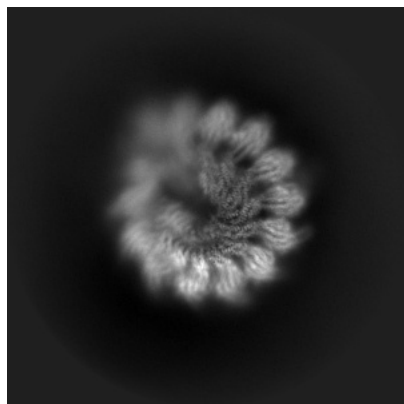
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-19570. These allow visual inspection of the internal detail of the map and identification of artifacts.

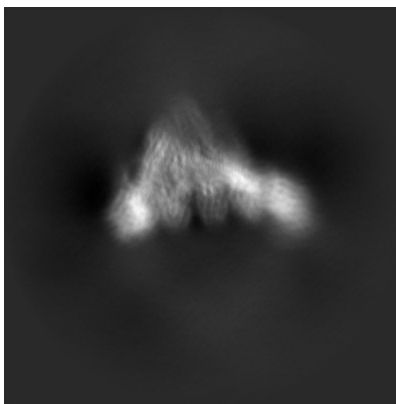
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

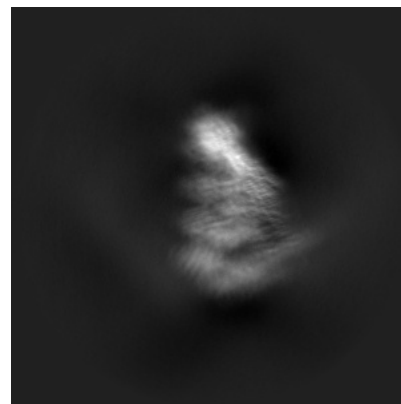
6.1.1 Primary map



X

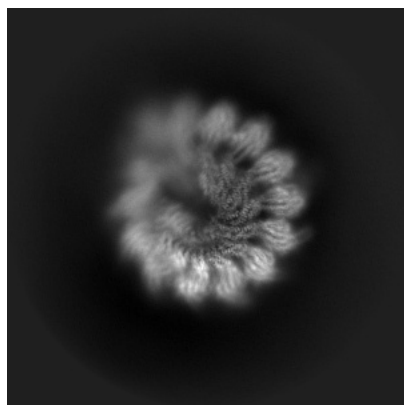


Y

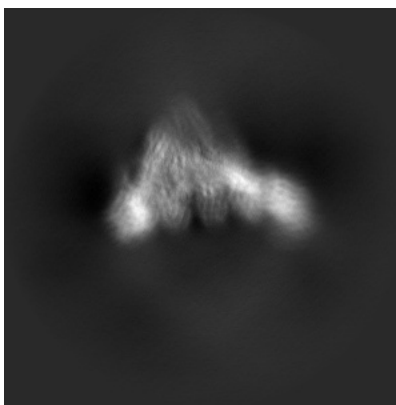


Z

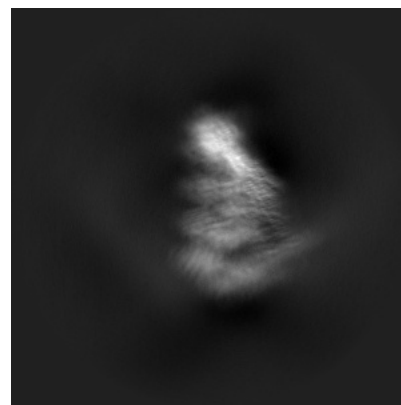
6.1.2 Raw map



X



Y

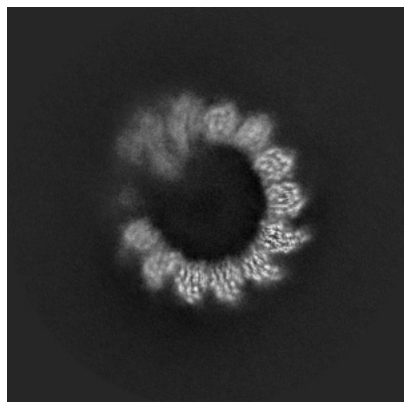


Z

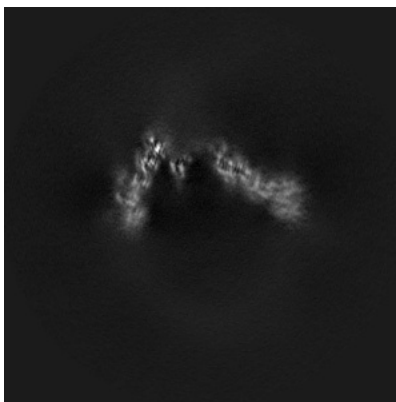
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

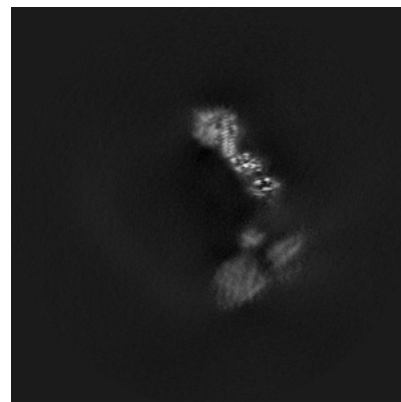
6.2.1 Primary map



X Index: 180

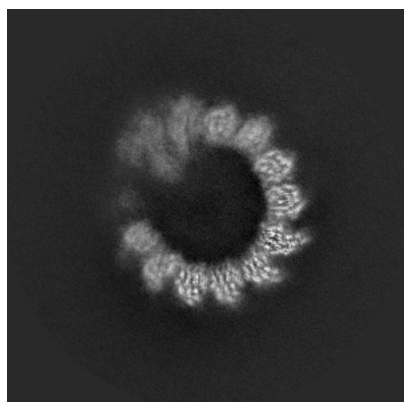


Y Index: 180

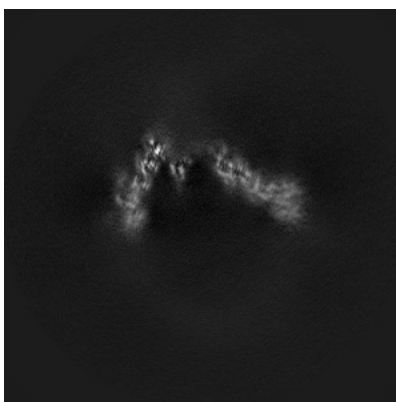


Z Index: 180

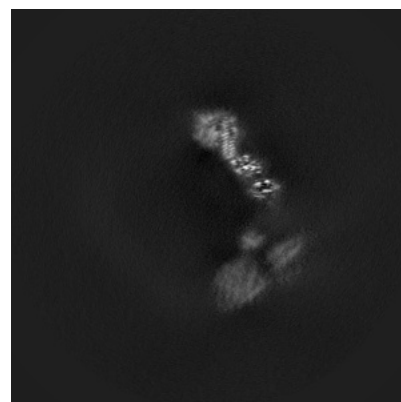
6.2.2 Raw map



X Index: 180



Y Index: 180

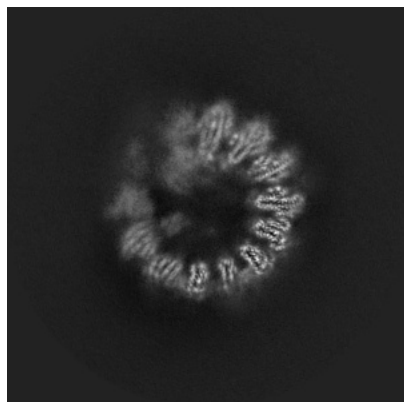


Z Index: 180

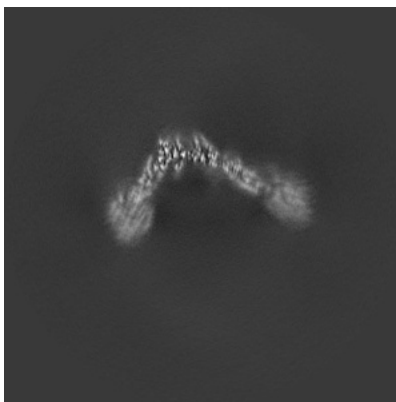
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

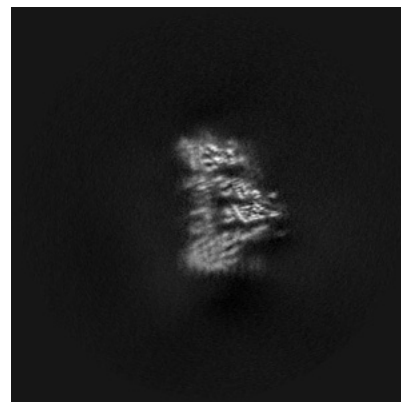
6.3.1 Primary map



X Index: 195

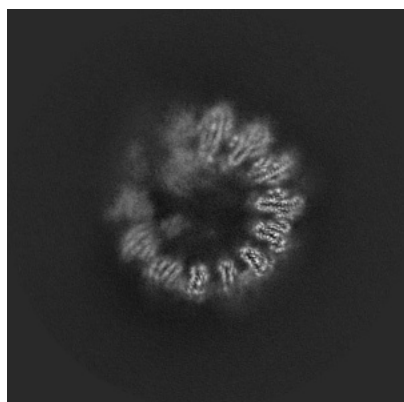


Y Index: 200

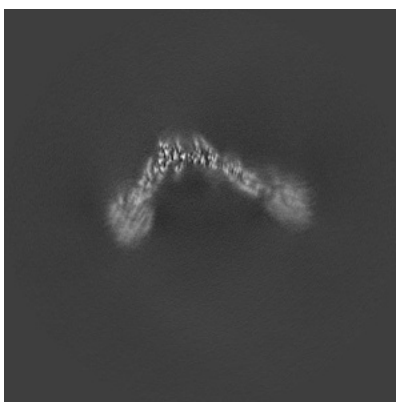


Z Index: 126

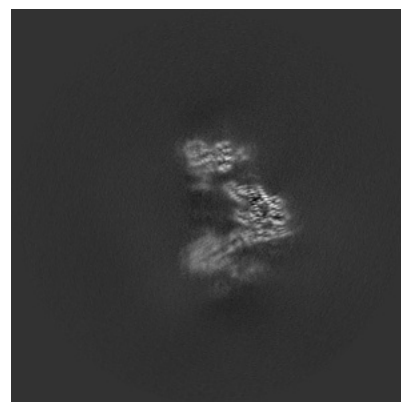
6.3.2 Raw map



X Index: 195



Y Index: 200



Z Index: 132

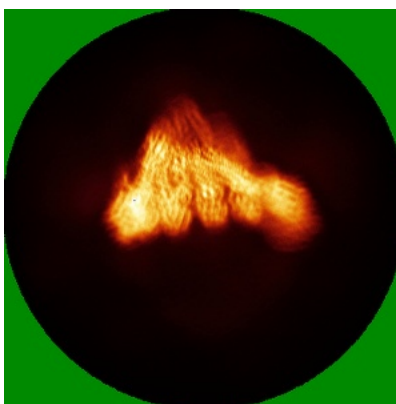
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map



X



Y

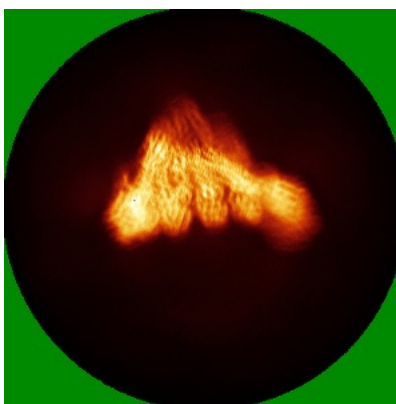


Z

6.4.2 Raw map



X



Y

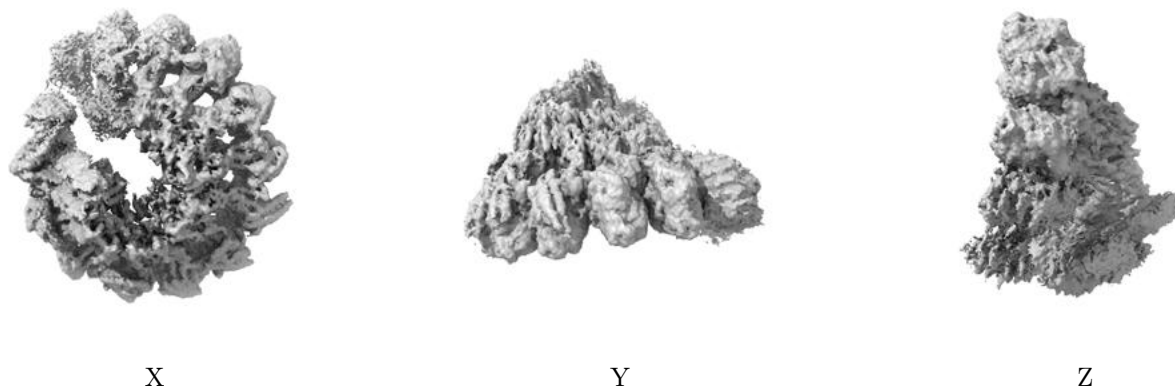


Z

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.

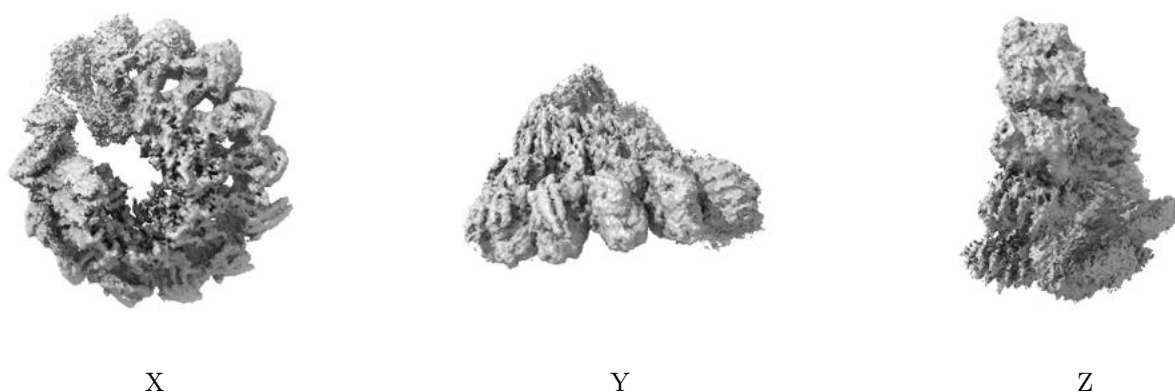
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.011. 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.

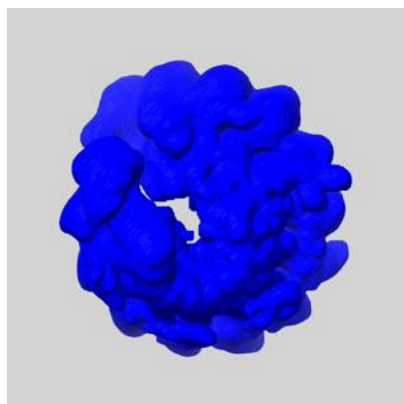
6.6 Mask visualisation [i](#)

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

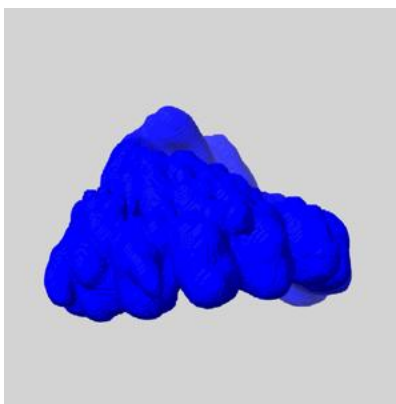
A mask typically either:

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

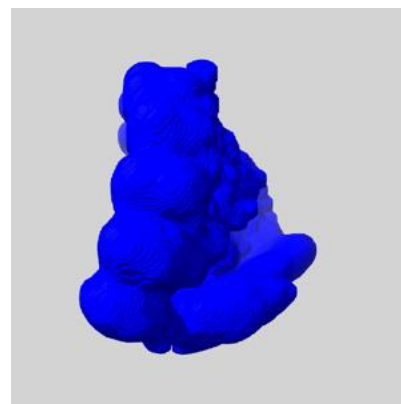
6.6.1 emd_19570_msk_1.map [i](#)



X



Y

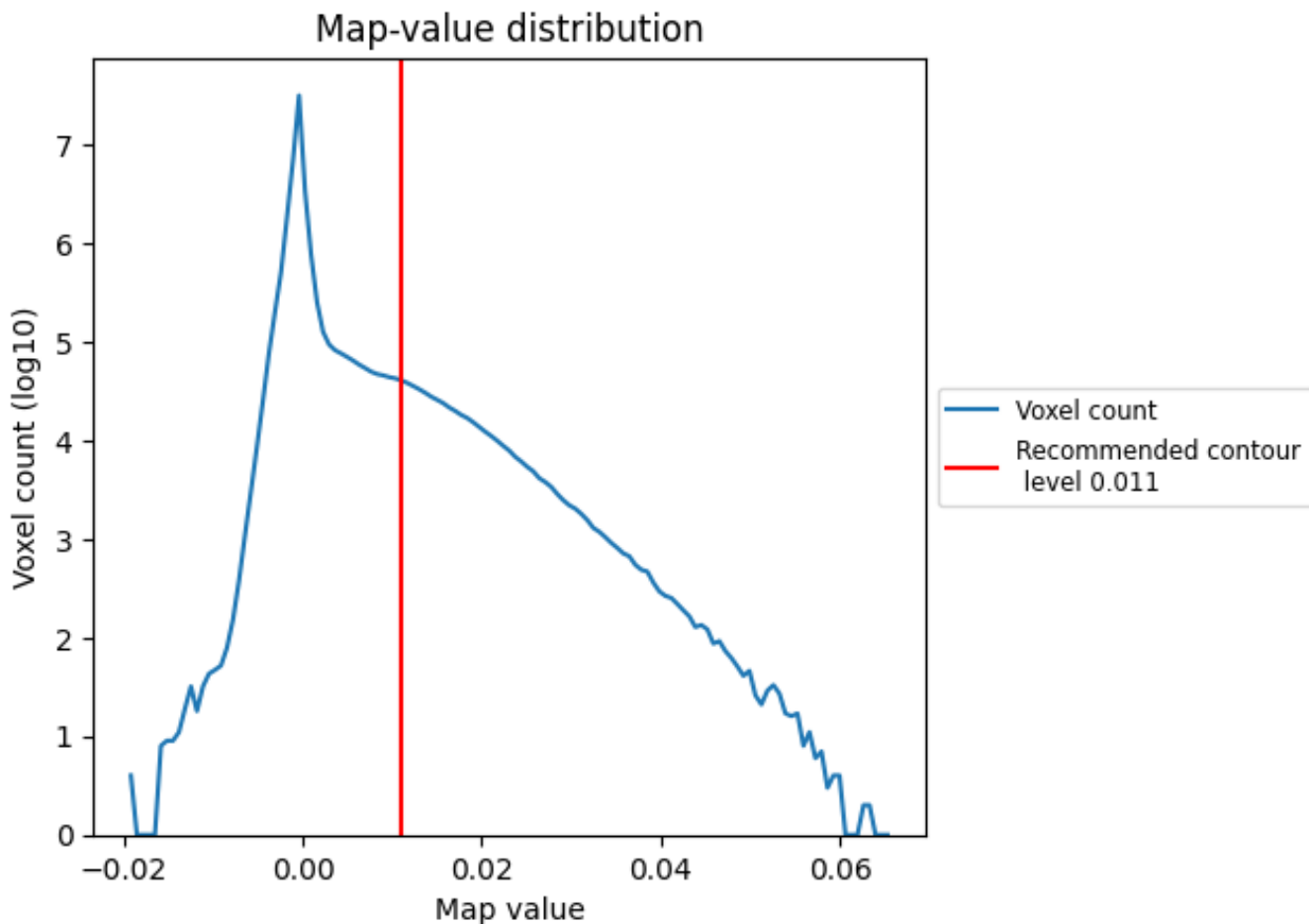


Z

7 Map analysis [i](#)

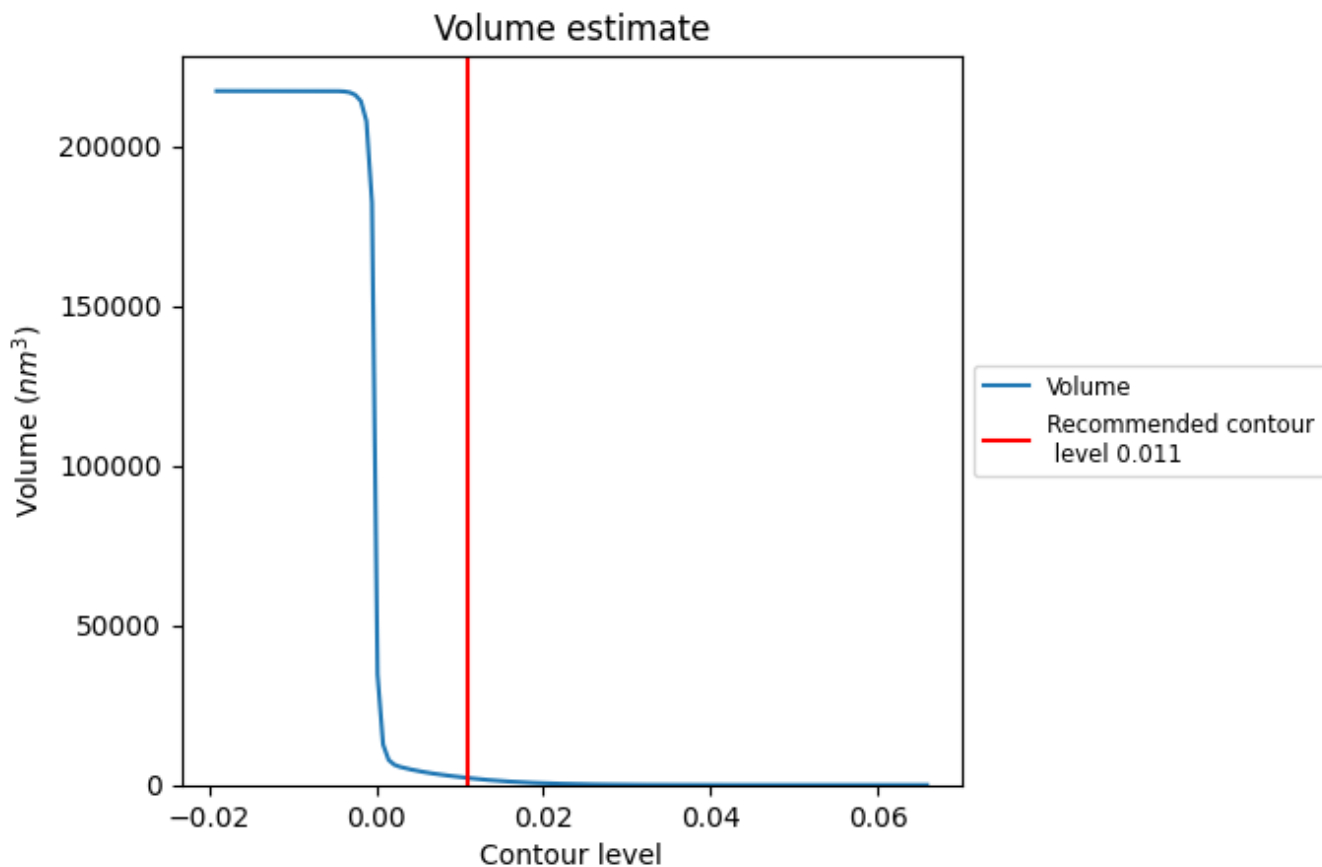
This section contains the results of statistical analysis of the map.

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.

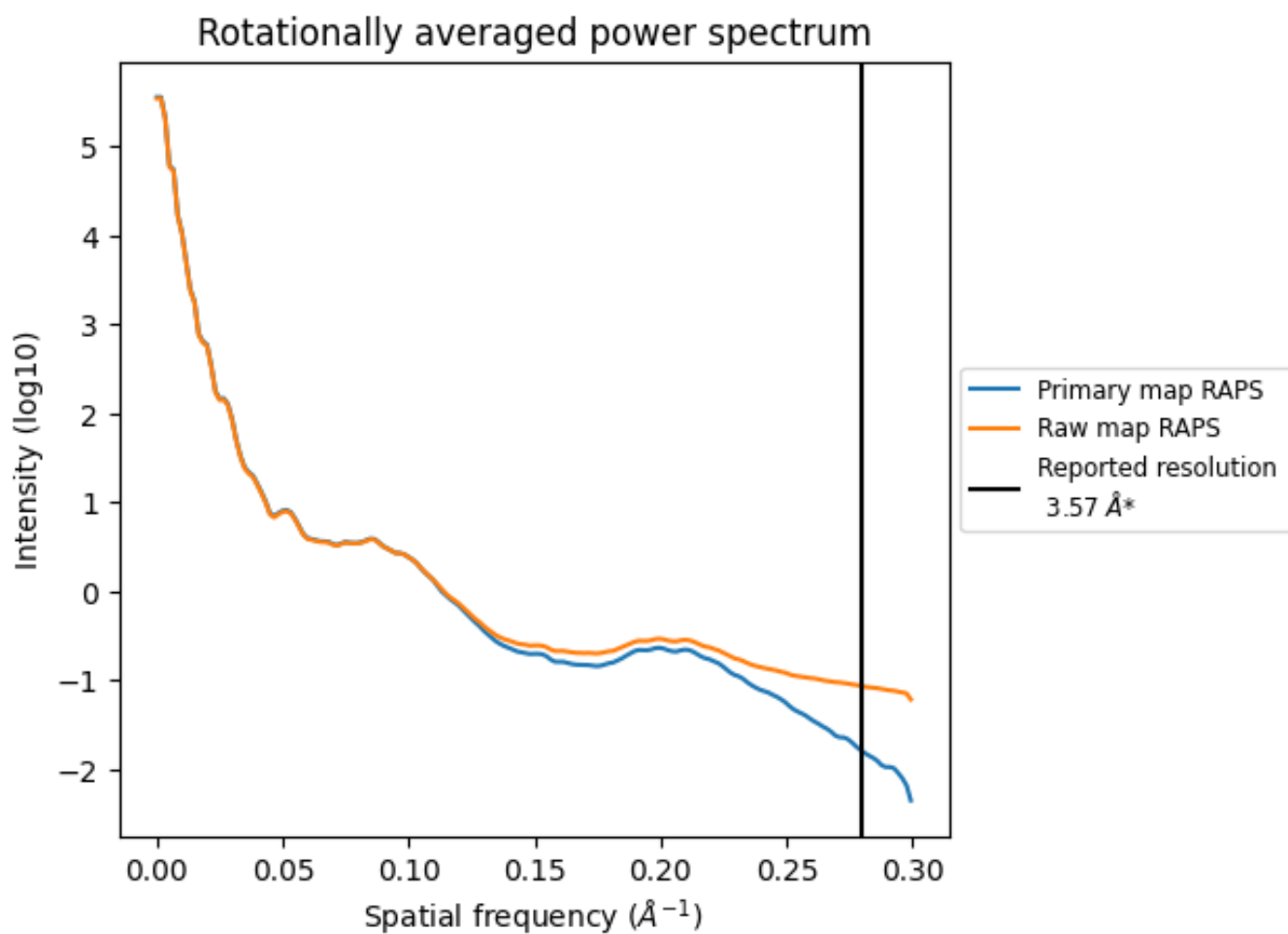
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 2186 nm^3 ; this corresponds to an approximate mass of 1974 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](#)

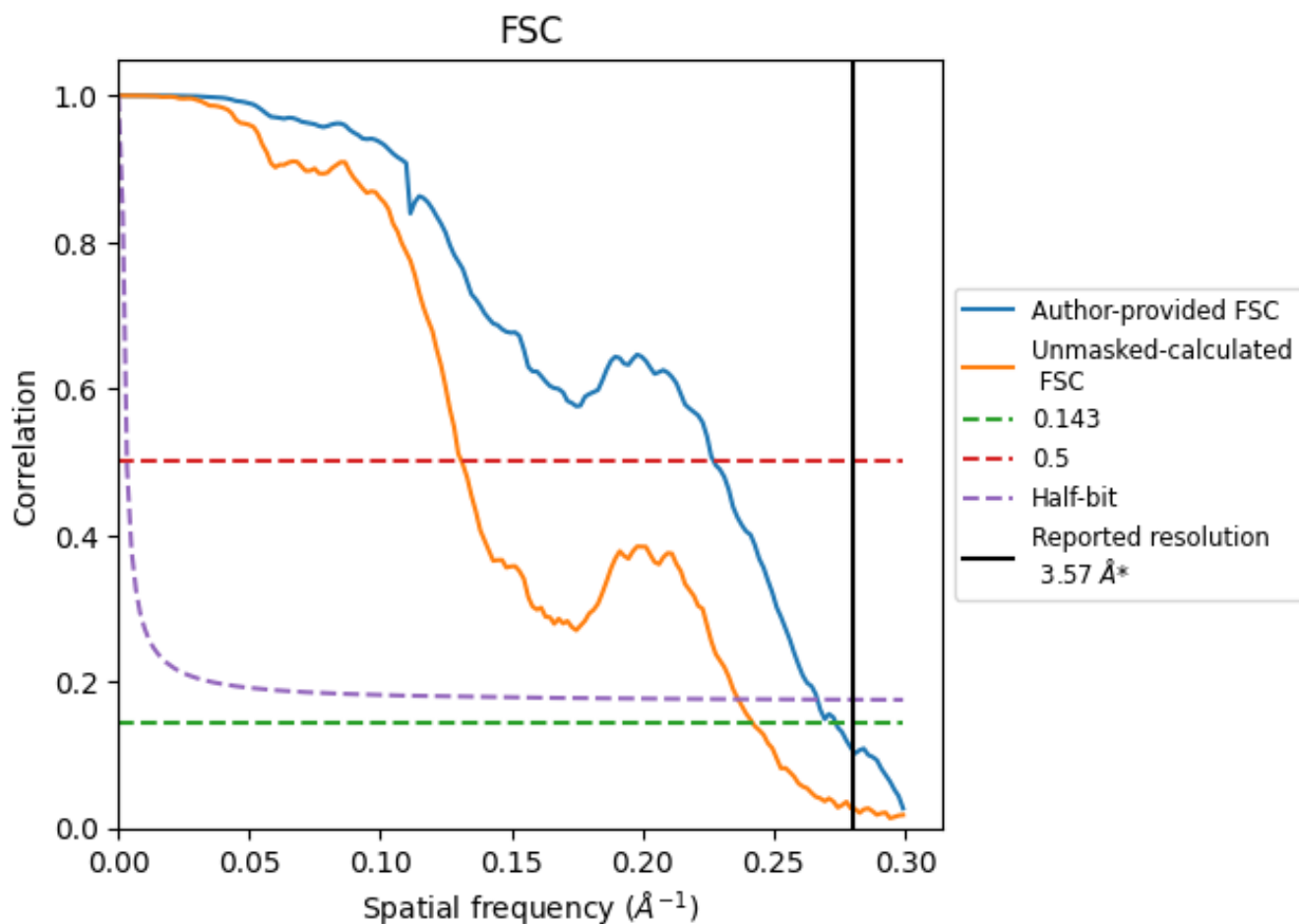


*Reported resolution corresponds to spatial frequency of 0.280 Å⁻¹

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 0.280 Å⁻¹

8.2 Resolution estimates [i](#)

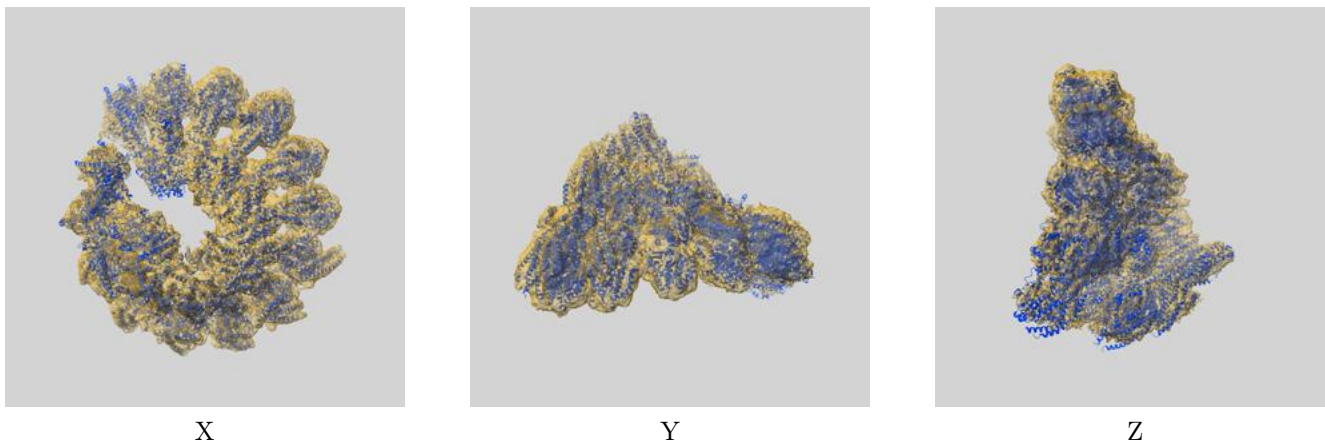
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.57	-	-
Author-provided FSC curve	3.65	4.40	3.75
Unmasked-calculated*	4.13	7.63	4.23

*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 4.13 differs from the reported value 3.57 by more than 10 %

9 Map-model fit [i](#)

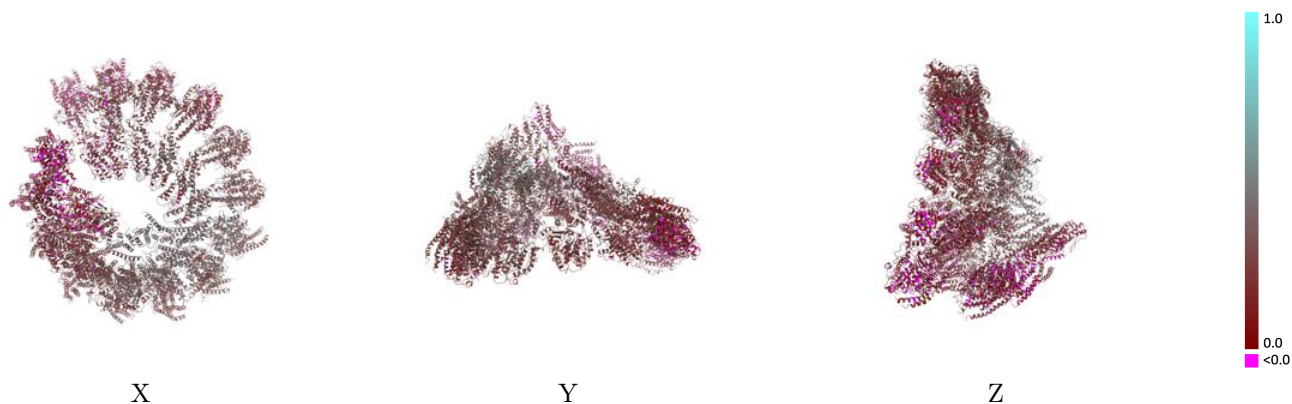
This section contains information regarding the fit between EMDB map EMD-19570 and PDB model 8RX1. Per-residue inclusion information can be found in section 3 on page 9.

9.1 Map-model overlay [i](#)



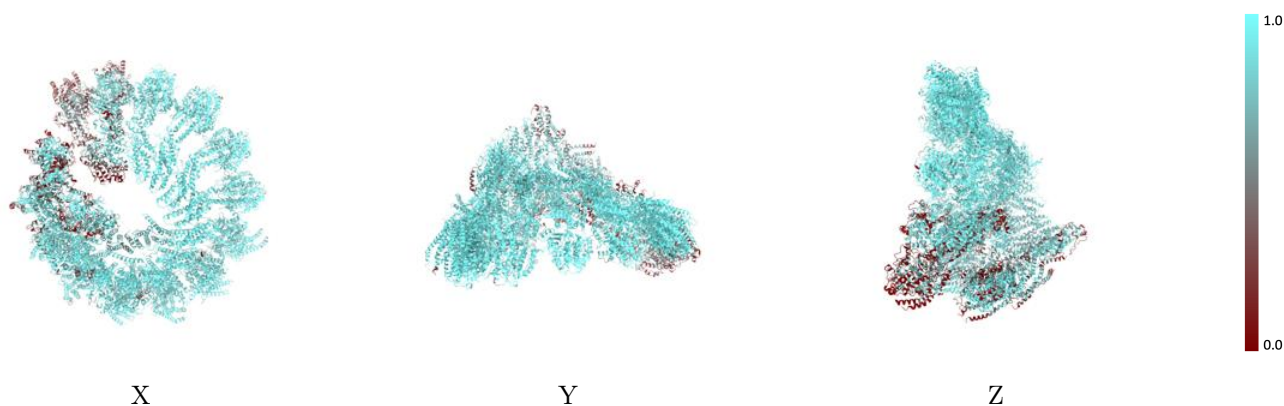
The images above show the 3D surface view of the map at the recommended contour level 0.011 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



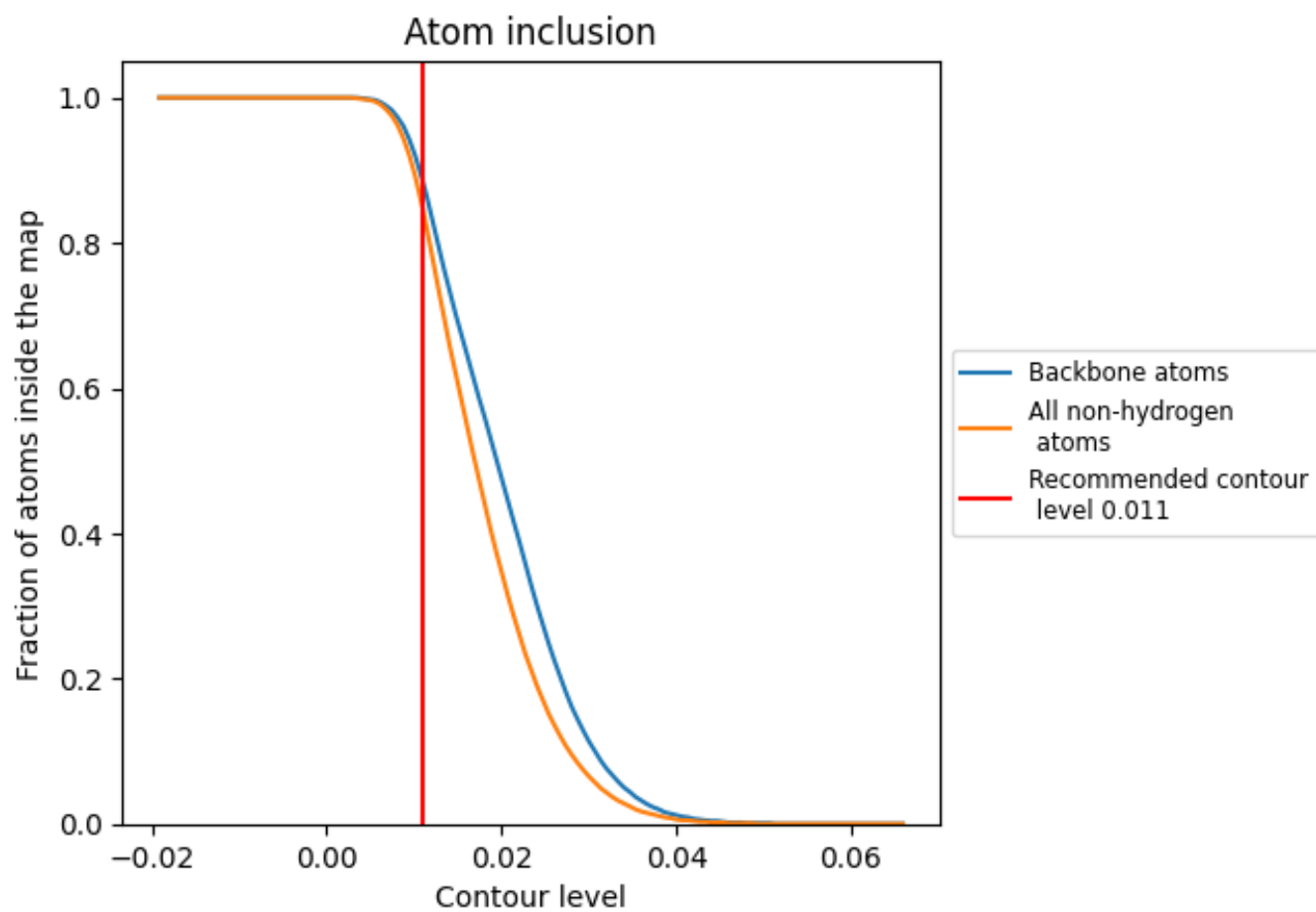
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.011).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 88% of all backbone atoms, 85% 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 (0.011) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8470	 0.2420
1	 0.6500	 0.1390
2	 0.2930	 0.1280
7	 0.7740	 0.2890
A	 0.5960	 0.0970
B	 0.7720	 0.2080
C	 0.8890	 0.2370
D	 0.9390	 0.2560
E	 0.9270	 0.3150
F	 0.9630	 0.3150
G	 0.8450	 0.2400
H	 0.7190	 0.2450
I	 0.9670	 0.3310
J	 0.9680	 0.3030
K	 0.9860	 0.2860
L	 0.9870	 0.2510
M	 0.7860	 0.1870
N	 0.3640	 0.1570
O	 0.5060	 0.1430
P	 0.6560	 0.1500
Q	 0.8800	 0.1800
R	 0.9380	 0.1760
S	 0.9840	 0.2480
T	 0.9640	 0.2310
U	 0.9760	 0.2810
V	 0.9640	 0.3260
W	 0.9760	 0.2510
X	 0.9800	 0.2330
Y	 0.9780	 0.1470
Z	 0.9680	 0.1580
a	 0.8470	 0.3880
b	 0.8690	 0.4020
c	 0.7440	 0.2880
d	 0.8240	 0.3470
e	 0.5630	 0.3180



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Chain	Atom inclusion	Q-score
f	 0.5280	 0.2940
g	 0.9560	 0.2570
h	 0.5900	 0.2510
i	 0.5990	 0.2530
j	 0.4390	 0.2430
k	 0.9510	 0.3560
n	 0.9730	 0.3800
s	 0.9260	 0.2890
t	 0.9830	 0.3430
u	 0.8680	 0.2570
v	 0.9520	 0.2860