



wwPDB EM Validation Summary Report ⓘ

Dec 13, 2022 – 12:19 am GMT

PDB ID : 6TM5
EMDB ID : EMD-10518
Title : Cryo-EM structure of the Anaphase-promoting complex/Cyclosome, in complex with the Nek2A substrate at 3.9 angstrom resolution
Authors : Alfieri, C.; Barford, D.
Deposited on : 2019-12-03
Resolution : 3.90 Å(reported)

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

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

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.dev43
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.3

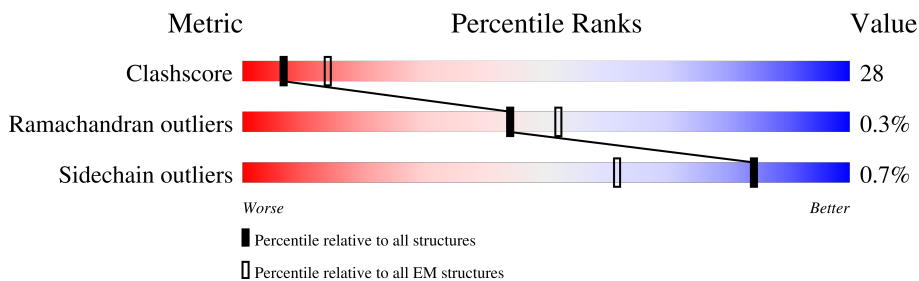
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.90 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.





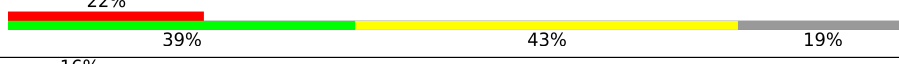





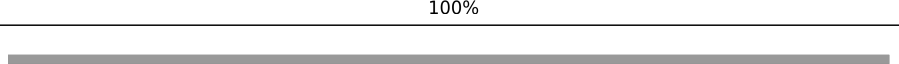
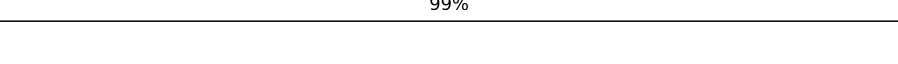
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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

Mol	Chain	Length	Quality of chain
1	A	1944	<div style="display: flex; justify-content: space-between;"> <div style="width: 13%; border-bottom: 2px solid red;"></div> <div style="width: 40%; border-bottom: 2px solid green;"></div> <div style="width: 40%; border-bottom: 2px solid yellow;"></div> <div style="width: 19%; border-bottom: 2px solid grey;"></div> </div>
2	B	84	<div style="display: flex; justify-content: space-between;"> <div style="width: 50%; border-bottom: 2px solid red;"></div> <div style="width: 48%; border-bottom: 2px solid green;"></div> <div style="width: 100%; border-bottom: 2px solid yellow;"></div> <div style="width: 1%; border-bottom: 2px solid grey;"></div> </div>
3	C	597	<div style="display: flex; justify-content: space-between;"> <div style="width: 12%; border-bottom: 2px solid red;"></div> <div style="width: 46%; border-bottom: 2px solid green;"></div> <div style="width: 42%; border-bottom: 2px solid yellow;"></div> <div style="width: 12%; border-bottom: 2px solid grey;"></div> </div>
3	P	597	<div style="display: flex; justify-content: space-between;"> <div style="width: 21%; border-bottom: 2px solid red;"></div> <div style="width: 43%; border-bottom: 2px solid green;"></div> <div style="width: 40%; border-bottom: 2px solid yellow;"></div> <div style="width: 18%; border-bottom: 2px solid grey;"></div> </div>
4	D	121	<div style="display: flex; justify-content: space-between;"> <div style="width: 8%; border-bottom: 2px solid red;"></div> <div style="width: 31%; border-bottom: 2px solid green;"></div> <div style="width: 14%; border-bottom: 2px solid yellow;"></div> <div style="width: 55%; border-bottom: 2px solid grey;"></div> </div>
5	E	110	<div style="display: flex; justify-content: space-between;"> <div style="width: 49%; border-bottom: 2px solid red;"></div> <div style="width: 28%; border-bottom: 2px solid green;"></div> <div style="width: 23%; border-bottom: 2px solid yellow;"></div> <div style="width: 49%; border-bottom: 2px solid grey;"></div> </div>
6	F	824	<div style="display: flex; justify-content: space-between;"> <div style="width: 55%; border-bottom: 2px solid red;"></div> <div style="width: 30%; border-bottom: 2px solid green;"></div> <div style="width: 26%; border-bottom: 2px solid yellow;"></div> <div style="width: 44%; border-bottom: 2px solid grey;"></div> </div>
6	H	824	<div style="display: flex; justify-content: space-between;"> <div style="width: 58%; border-bottom: 2px solid red;"></div> <div style="width: 32%; border-bottom: 2px solid green;"></div> <div style="width: 27%; border-bottom: 2px solid yellow;"></div> <div style="width: 41%; border-bottom: 2px solid grey;"></div> </div>

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Mol	Chain	Length	Quality of chain
7	G	85	
7	W	85	
8	I	808	
9	J	620	
9	K	620	
10	L	185	
11	M	74	
12	N	822	
13	O	755	
14	T	15	
15	X	599	
15	Y	599	
16	S	445	
17	Q	445	

2 Entry composition [i](#)

There are 18 unique types of molecules in this entry. The entry contains 63885 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 Anaphase-promoting complex subunit 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1569	11890	7656	2014	2140	80	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	356	PHE	PRO	conflict	UNP Q9H1A4

- Molecule 2 is a protein called Anaphase-promoting complex subunit 11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	84	649	416	117	99	17	1	0

- Molecule 3 is a protein called Cell division cycle protein 23 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	524	4306	2774	727	781	24	0	0
3	P	492	4046	2613	679	730	24	0	0

- Molecule 4 is a protein called Anaphase-promoting complex subunit 15.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
4	D	55	436	277	73	86	0	0

- Molecule 5 is a protein called Anaphase-promoting complex subunit 16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	E	56	450	290	74	85	1	0	0

- Molecule 6 is a protein called Cell division cycle protein 27 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	F	460	Total	C	N	O	S	0	0
			3618	2320	608	666	24		
6	H	488	Total	C	N	O	S	0	0
			3879	2489	655	709	26		

- Molecule 7 is a protein called Anaphase-promoting complex subunit CDC26.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	G	25	Total	C	N	O	S	0	0
			220	137	41	41	1		
7	W	26	Total	C	N	O	S	0	0
			218	136	41	40	1		

- Molecule 8 is a protein called Anaphase-promoting complex subunit 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	I	736	Total	C	N	O	S	0	0
			5726	3676	957	1059	34		

- Molecule 9 is a protein called Cell division cycle protein 16 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	J	504	Total	C	N	O	S	0	0
			4053	2604	687	737	25		
9	K	493	Total	C	N	O	S	0	0
			3988	2564	672	728	24		

- Molecule 10 is a protein called Anaphase-promoting complex subunit 10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	L	182	Total	C	N	O	S	0	0
			1435	898	263	268	6		

- Molecule 11 is a protein called Anaphase-promoting complex subunit 13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	M	59	Total	C	N	O	S	0	0
			481	304	79	96	2		

- Molecule 12 is a protein called Anaphase-promoting complex subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	N	676	5337	3425	943	944	25	0	0

- Molecule 13 is a protein called Anaphase-promoting complex subunit 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	O	688	5400	3443	940	989	28	0	0

- Molecule 14 is a protein called Apc1 loop.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
14	T	15	79	47	16	16	0	0

- Molecule 15 is a protein called Anaphase-promoting complex subunit 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	X	484	3767	2390	649	704	24	0	0
15	Y	496	3862	2446	666	724	26	0	0

- Molecule 16 is a protein called Serine/threonine-protein kinase Nek2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	S	2	19	11	5	2	1	0	0

There is a discrepancy between the modelled and reference sequences:

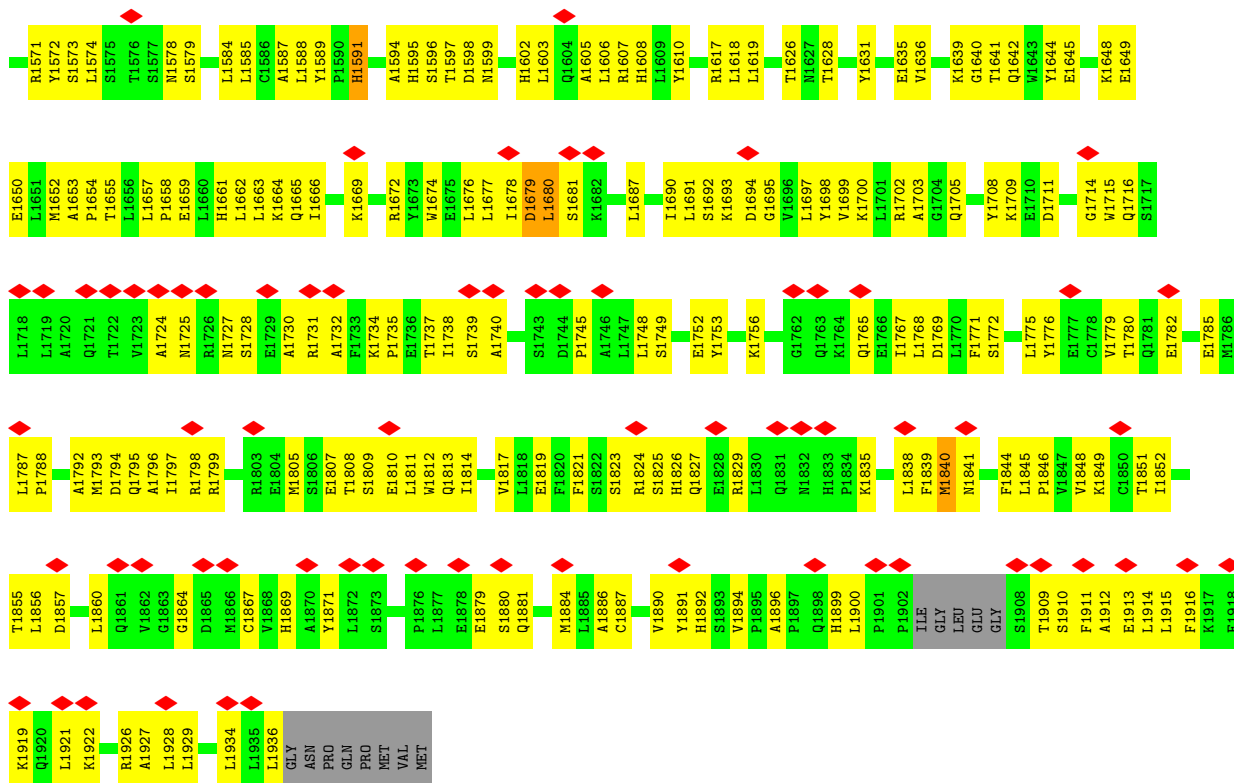
Chain	Residue	Modelled	Actual	Comment	Reference
S	449	ALA	MET	conflict	UNP P51955

- Molecule 17 is a protein called Serine/threonine-protein kinase Nek2.

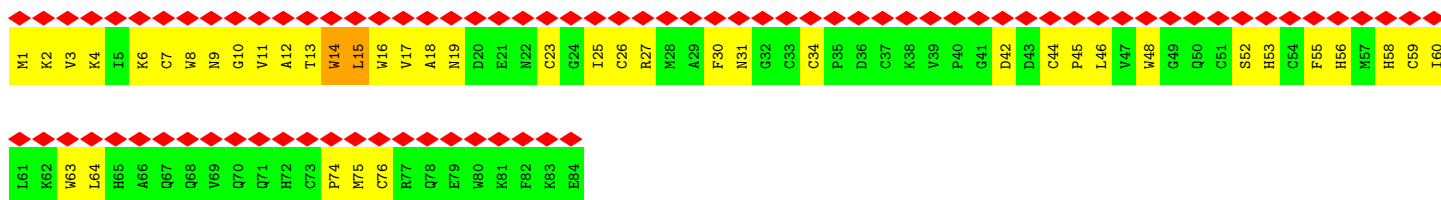
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	Q	3	23	13	6	3	1	0	0

- Molecule 18 is ZINC ION (three-letter code: ZN) (formula: Zn).

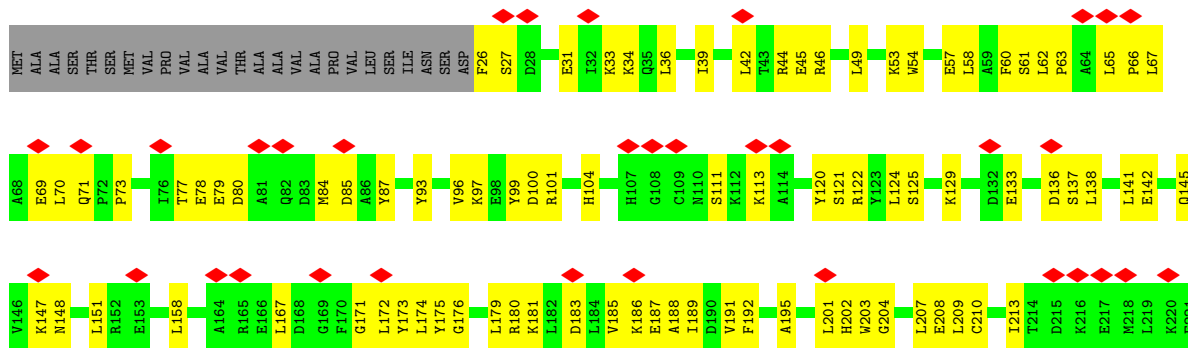
Mol	Chain	Residues	Atoms		AltConf
18	B	3	Total 3	Zn 3	0

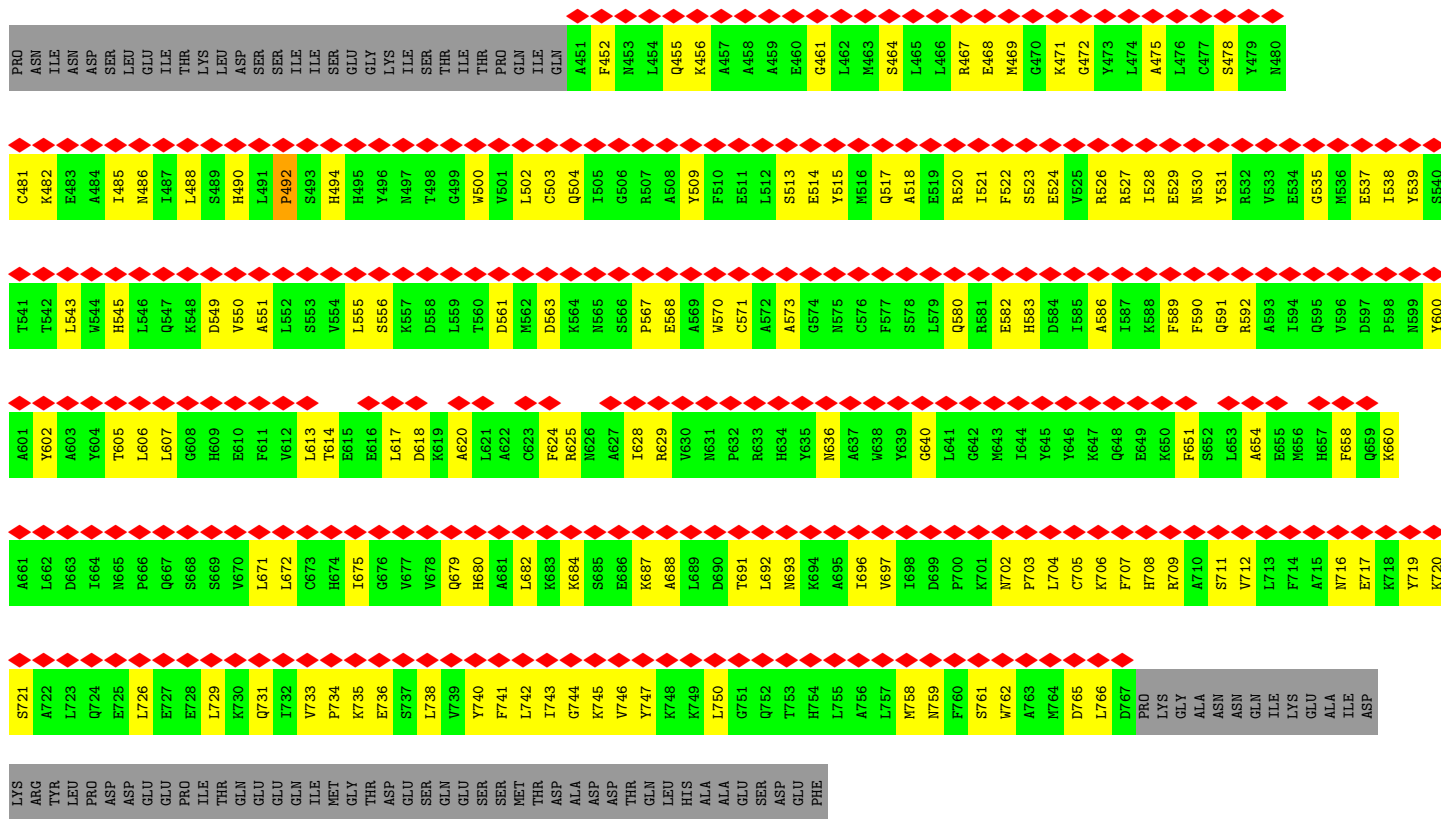


• Molecule 2: Anaphase-promoting complex subunit 11

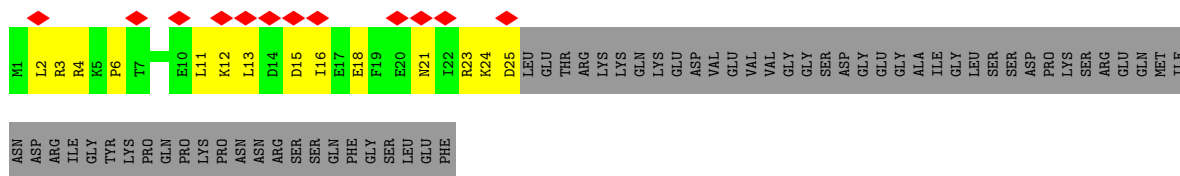


• Molecule 3: Cell division cycle protein 23 homolog





• Molecule 7: Anaphase-promoting complex subunit CDC26

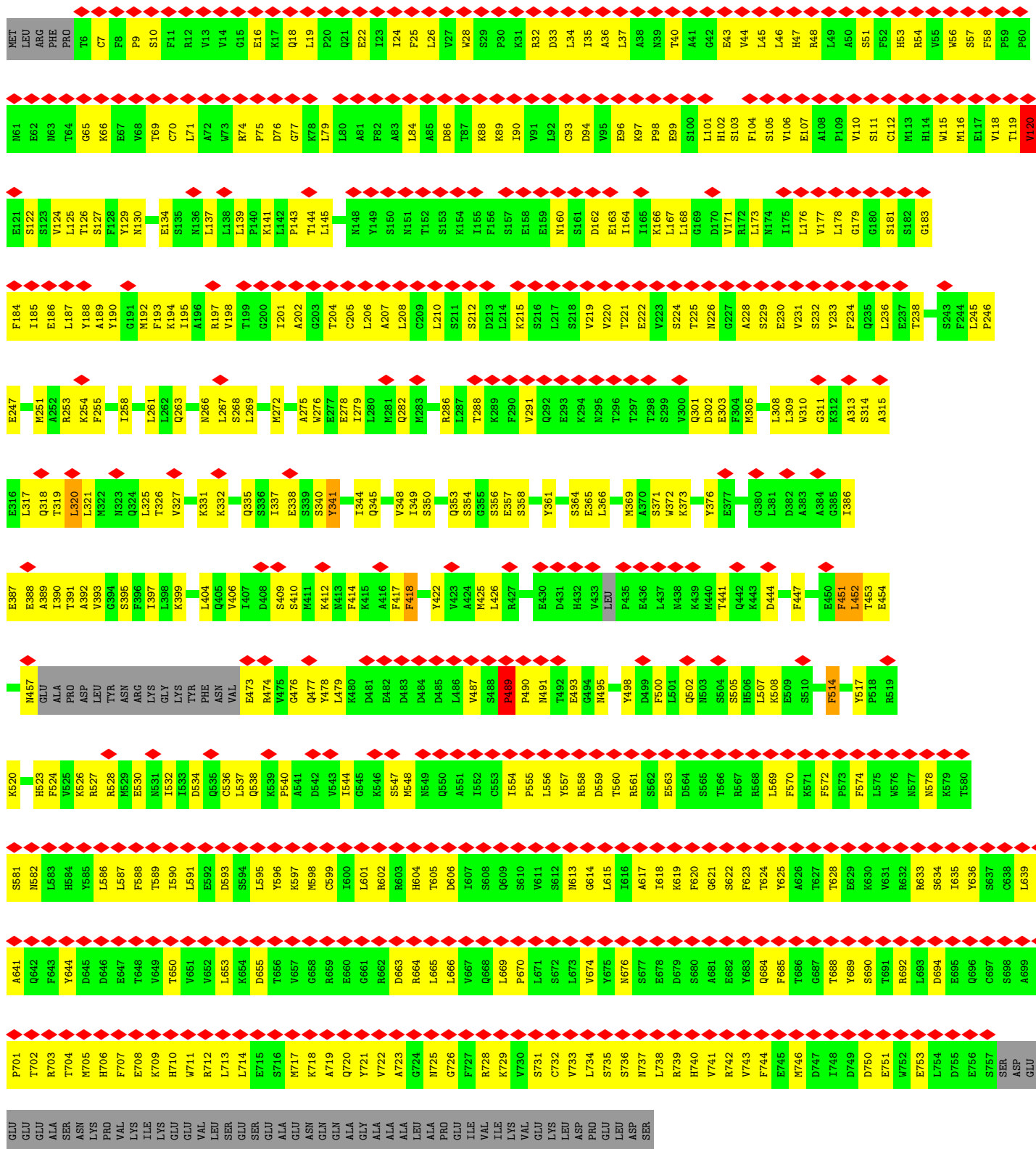


• Molecule 7: Anaphase-promoting complex subunit CDC26



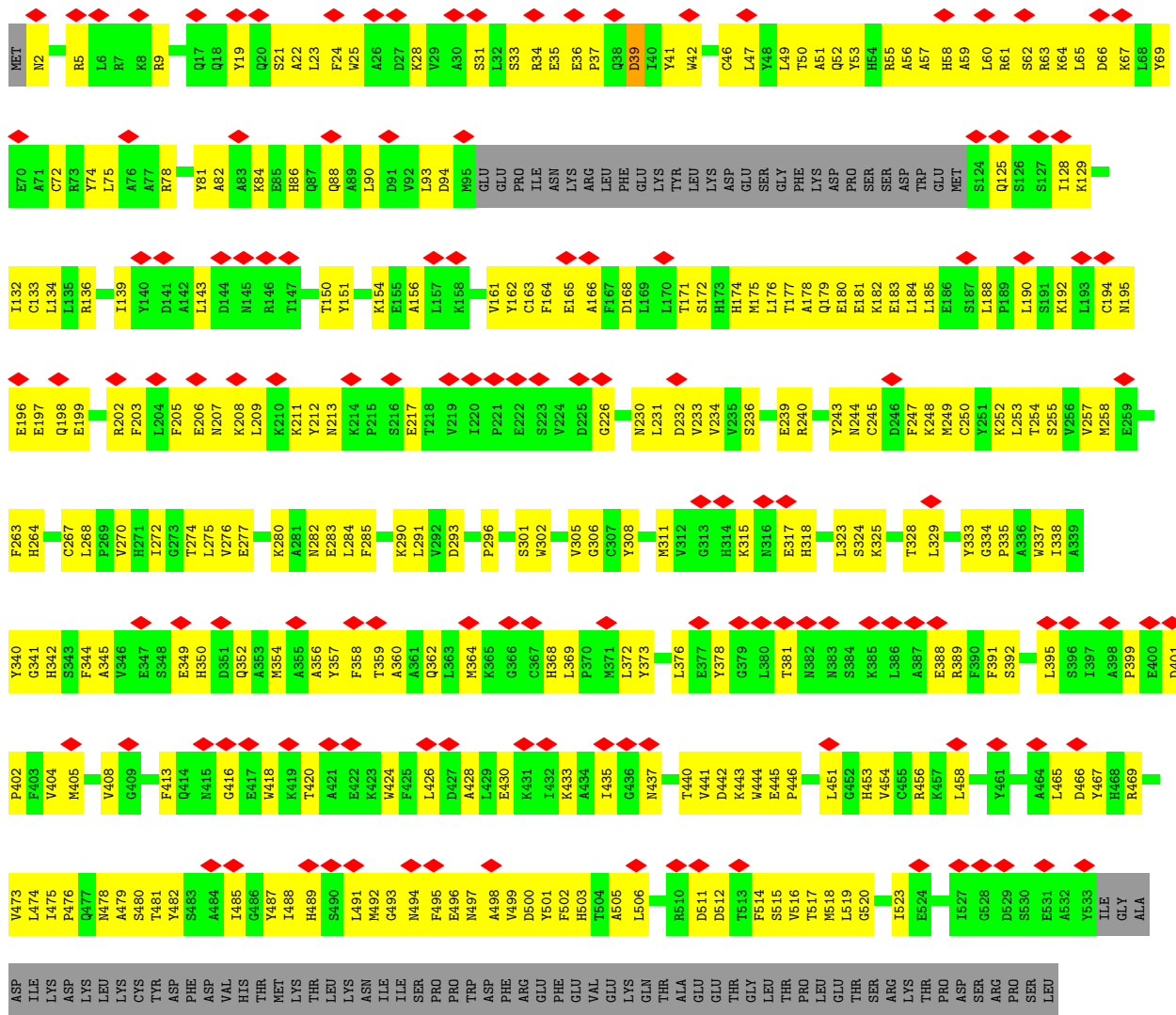
• Molecule 8: Anaphase-promoting complex subunit 4





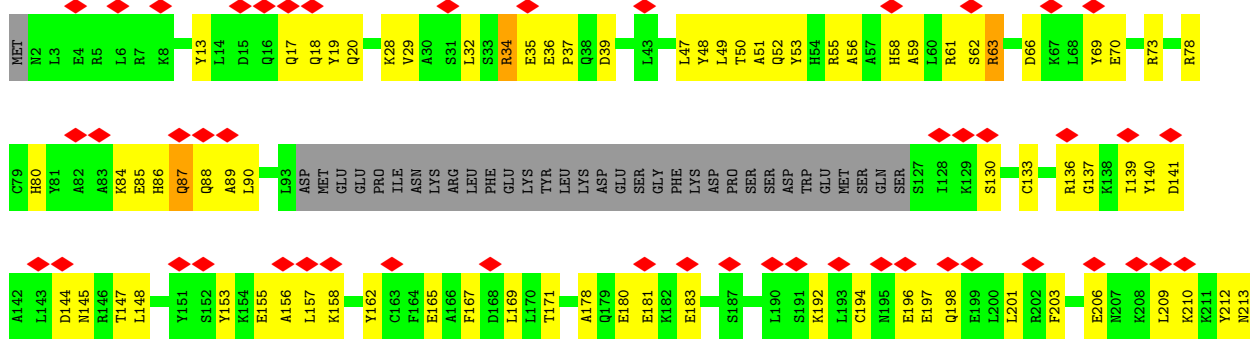
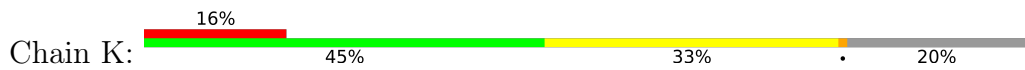
● Molecule 9: Cell division cycle protein 16 homolog





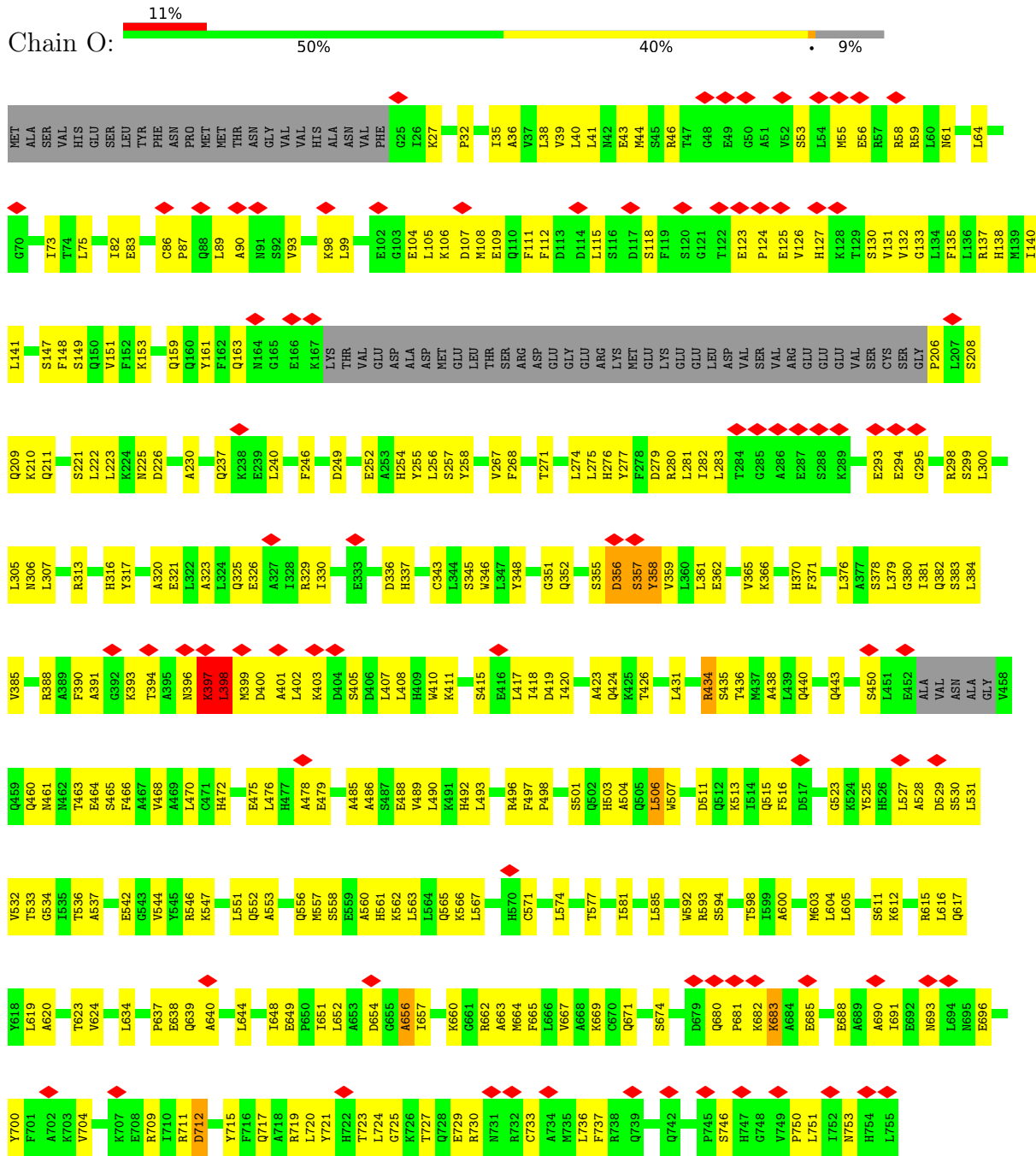
GLU
GLU
THR
PHE
GLU
ILE
GLU
MET
ASN
GLU
SER
ASP
MET
SER
ASN
HIS
SER
THR

• Molecule 9: Cell division cycle protein 16 homolog

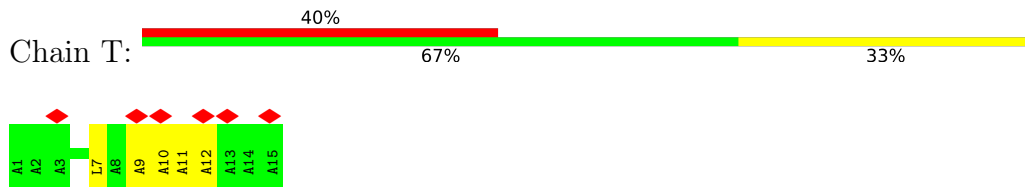


A786	A787	A788	E789	L790	L791	L792	L793	L794	L795	L796	L797	L798	L799	Q800	K801	K802	V803	R804	D805	Q806	Q807	L808	V809	Y810	Y811	A812	G813	Y814	Y815	R816	L817	P818	LYS	ASN	CYS	SER																									
M726	M727	V728	L729	L730	ASP	ASP	ASP	GLU	ASP	ASP	GLY	MET	ALA	SER	GLN	ALA	ASP	GLN	K747	E748	E749	E750	L751	L752	L753	F754	W755	T756	Y757	I758	Q759	W760	M761	L762	T763	N764	L765	L766	E766	S767	L768	S769	L770	D771	R772	I773	Y774	M775	M776	L777	R778	M779	F780	V781	W782	T783	G784	P785			
D606	E607	K608	L609	E610	V611	P612	E613	D614	E615	R616	A617	A618	L619	E620	A621	Y622	C623	K624	K625	Y626	E627	E628	Q628	L629	K630	E631	M632	R633	T634	L635	S636	K637	K638	H639	T640	L641	G642	L643	V644	T645	M646	D647	V648	E649	P650	L651	G652	T653	T654	T655	T656	T657	T658	H659	Q660	P661	V662	A664	V665		
I666	L667	L668	Y669	F670	Q671	D672	Q673	D674	S675	W676	T677	L678	E679	E680	L681	S682	K683	A684	V685	K686	M687	P688	V689	A690	L691	L692	R693	R694	R695	M696	S697	V698	L700	Q701	Q702	G703	V704	L705	R706	E707	E708	P709	P710	G711	T712	F713	S714	V715	I716	E717	E718	E719	R720	P721	Q722	D723	R724	D725			
K546	L547	R548	F549	G550	E551	A552	P553	M554	H555	F556	C557	E558	V559	M560	L561	K562	D563	M564	A565	D566	S567	R568	R569	I570	M571	A572	M573	I574	R575	E576	E577	D578	E579	K580	P581	P582	E583	E584	E585	Q586	P587	P588	F589	G590	V591	Y592	A593	V594	I595	L596	S597	S598	E599	F600	P602	P603	F604	K605			
D486	ALA	ASP	PRO	GLY	LYS	SER	SER	LYS	ARG	SER	S499	D500	I501	S502	S503	L504	V505	S506	I508	Y509	G510	S511	K512	D513	L514	F515	I516	M517	E518	Y519	R520	S521	L522	L523	A524	D525	R526	L527	L528	H529	Q530	F531	S532	F533	S534	P535	E536	R537	E538	I539	R540	N541	E542	E543	L544	L545					
K362	Y363	C364	L365	E366	T368	D369	Q370	R371	Q372	Q373	L374	L375	V376	S377	L378	K379	A380	A381	L382	E383	T384	R385	L386	L387	H388	P389	G390	V391	N392	T393	C394	I396	I397	T398	L399	Y400	I401	S402	A403	I404	K405	A406	L407	R408	V409	L410	D411	P412	S413	M414	V415	I416	L417	E418	V419	A420	C421				
K302	V303	F304	LEU	GLN	ASP	GLY	PRO	ALA	ARG	PRO	ALA	ALA	SER	PRO	GLU	GLY	N319	T320	L321	R322	R323	W324	R325	T282	T283	T284	L285	H286	Q287	V288	T289	R270	E271	R272	M273	E274	D275	R276	C277	R278	G279	E280	Y281	E282	R283	S284	F285	L286	E288	F289	H290	W292	I293	E294	R295	V296	V297	G298	W299	L300	G301
E422	P423	I424	R425	R426	Y427	L428	R429	T430	E432	D433	T434	V435	R436	Q437	L438	V439	A440	C441	L442	L443	GLY	ASP	ASP	THR	GLY	ASP	LEU	ALA	VAL	LEU	SER	LYS	THR	ASP	THR	LEU	GLU	THR	I401	GLY	ASP	SER	ASP	S474	W480	V481	P482	D483	P484	V485											
D122	D123	P124	Y125	L126	R127	S128	L129	E130	L131	L132	E133	K134	W135	T136	R137	L138	G139	L140	L141	M142	G143	T144	G145	A146	G148	L149	R150	E151	E152	V153	H154	T155	M156	L157	Q158	R159	V160	S161	A162	D163	E164	T165	P166	C167	T168	L169	L170	L171	L172	D173	Q174	R175	L176	Y177	G178	E179	F180	L181			
R182	V183	Y184	M185	Q186	S187	K188	R189	K190	G191	GLY	GLY	THR	ASP	PRO	GLU	LEU	GLY	GLY	LEU	ASP	ASP	ARG	TYR	ARG	ARG	TYR	ARG	LEU	LEU	GLN	PRO	PRO	LEU	LEU	ALA	CYS	ALA	GLY	LYS	GLN	GLN	CYS	W232	C233	R234	Q235	A236	L237	E238	F239	Q240	H241									
Q242	L243	S244	Q245	V246	L247	R248	R249	L250	S251	L252	L253	E254	V256	S257	A258	E259	A260	V261	T262	T263	T264	L265	H266	Q267	V268	T269	R270	E271	R272	M273	E274	D275	R276	C277	R278	G279	E280	Y281	E282	R283	S284	F285	L286	E288	F289	H290	W292	I293	E294	R295	V296	V297	G298	W299	L300	G301					

• Molecule 13: Anaphase-promoting complex subunit 5



• Molecule 14: Apc1 loop



• Molecule 15: Anaphase-promoting complex subunit 7

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	233840	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 ($e^-/\text{\AA}^2$)	29	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.201	Depositor
Minimum map value	-0.165	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.004	Depositor
Recommended contour level	0.023	Depositor
Map size (Å)	388.69998, 388.69998, 388.69998	wwPDB
Map dimensions	338, 338, 338	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.15, 1.15, 1.15	Depositor

5 Model quality i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section:
ZN

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.57	0/12168	0.64	0/16587
2	B	0.35	0/674	0.53	0/913
3	C	0.63	0/4404	0.60	0/5945
3	P	0.49	0/4141	0.55	0/5593
4	D	0.50	0/446	0.55	0/610
5	E	0.51	0/459	0.52	0/619
6	F	0.46	0/3704	0.54	0/5019
6	H	0.55	0/3969	0.58	1/5366 (0.0%)
7	G	0.34	0/221	0.53	0/292
7	W	0.50	0/219	0.67	0/291
8	I	0.52	0/5849	0.60	2/7937 (0.0%)
9	J	0.48	0/4152	0.53	0/5623
9	K	0.51	0/4086	0.54	0/5533
10	L	0.44	0/1468	0.56	0/1993
11	M	0.45	0/490	0.62	1/665 (0.2%)
12	N	0.42	0/5442	0.57	3/7376 (0.0%)
13	O	0.60	0/5499	0.63	0/7432
14	T	0.38	0/78	0.87	0/107
15	X	0.34	0/3827	0.51	0/5180
15	Y	0.35	0/3922	0.54	1/5304 (0.0%)
16	S	0.19	0/18	0.29	0/21
17	Q	0.67	0/22	0.65	0/26
All	All	0.51	0/65258	0.58	8/88432 (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
1	A	0	8

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Mol	Chain	#Chirality outliers	#Planarity outliers
2	B	0	2
6	F	0	1
6	H	0	1
8	I	0	4
9	K	0	1
12	N	0	7
13	O	0	7
14	T	0	1
All	All	0	32

There are no bond length outliers.

The worst 5 of 8 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
12	N	121	ARG	C-N-CA	6.52	138.00	121.70
6	H	148	LEU	CA-CB-CG	6.34	129.88	115.30
8	I	489	PRO	C-N-CD	-6.19	106.97	120.60
15	Y	413	LEU	CA-CB-CG	6.11	129.34	115.30
11	M	16	ASP	CB-CG-OD1	5.76	123.48	118.30

There are no chirality outliers.

5 of 32 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	128	TRP	Peptide
1	A	140	LYS	Peptide
1	A	424	ASN	Peptide
1	A	824	ASP	Peptide
1	A	855	GLU	Peptide

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	11890	0	11565	689	0
2	B	649	0	597	65	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	C	4306	0	4275	222	0
3	P	4046	0	3998	241	0
4	D	436	0	396	24	0
5	E	450	0	435	22	0
6	F	3618	0	3452	199	0
6	H	3879	0	3805	209	0
7	G	220	0	233	19	0
7	W	218	0	222	32	0
8	I	5726	0	5594	368	0
9	J	4053	0	3960	228	0
9	K	3988	0	3913	172	0
10	L	1435	0	1382	86	0
11	M	481	0	457	35	0
12	N	5337	0	5257	359	0
13	O	5400	0	5418	280	0
14	T	79	0	77	3	0
15	X	3767	0	3820	234	0
15	Y	3862	0	3915	286	0
16	S	19	0	21	7	0
17	Q	23	0	24	30	0
18	B	3	0	0	0	0
All	All	63885	0	62816	3499	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 28.

The worst 5 of 3499 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)
3:P:400:ARG:NH1	17:Q:499:ARG:HB2	1.18	1.42
3:P:277:ARG:NH2	17:Q:498:MET:HE2	1.11	1.38
3:P:400:ARG:NH1	17:Q:499:ARG:CB	1.91	1.33
3:P:400:ARG:NH1	17:Q:498:MET:O	1.62	1.33
3:P:277:ARG:NH2	17:Q:498:MET:CE	1.92	1.32

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	1539/1944 (79%)	1253 (81%)	283 (18%)	3 (0%)	47	79
2	B	83/84 (99%)	73 (88%)	10 (12%)	0	100	100
3	C	520/597 (87%)	462 (89%)	58 (11%)	0	100	100
3	P	486/597 (81%)	437 (90%)	49 (10%)	0	100	100
4	D	53/121 (44%)	45 (85%)	8 (15%)	0	100	100
5	E	54/110 (49%)	52 (96%)	2 (4%)	0	100	100
6	F	454/824 (55%)	423 (93%)	30 (7%)	1 (0%)	47	79
6	H	484/824 (59%)	424 (88%)	57 (12%)	3 (1%)	25	63
7	G	23/85 (27%)	23 (100%)	0	0	100	100
7	W	24/85 (28%)	22 (92%)	1 (4%)	1 (4%)	3	26
8	I	732/808 (91%)	620 (85%)	108 (15%)	4 (0%)	29	67
9	J	500/620 (81%)	457 (91%)	42 (8%)	1 (0%)	47	79
9	K	489/620 (79%)	448 (92%)	41 (8%)	0	100	100
10	L	180/185 (97%)	154 (86%)	26 (14%)	0	100	100
11	M	55/74 (74%)	48 (87%)	7 (13%)	0	100	100
12	N	662/822 (80%)	592 (89%)	66 (10%)	4 (1%)	25	63
13	O	682/755 (90%)	588 (86%)	89 (13%)	5 (1%)	22	60
14	T	13/15 (87%)	9 (69%)	3 (23%)	1 (8%)	1	16
15	X	480/599 (80%)	447 (93%)	33 (7%)	0	100	100
15	Y	492/599 (82%)	453 (92%)	37 (8%)	2 (0%)	34	71
17	Q	1/445 (0%)	1 (100%)	0	0	100	100
All	All	8006/10813 (74%)	7031 (88%)	950 (12%)	25 (0%)	44	75

5 of 25 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
8	I	452	LEU
12	N	434	THR
12	N	531	PHE
15	Y	215	LYS
1	A	1840	MET

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	A	1243/1720 (72%)	1234 (99%)	9 (1%)	84	90
2	B	65/75 (87%)	65 (100%)	0	100	100
3	C	452/520 (87%)	449 (99%)	3 (1%)	84	90
3	P	422/520 (81%)	419 (99%)	3 (1%)	84	90
4	D	46/115 (40%)	46 (100%)	0	100	100
5	E	47/89 (53%)	47 (100%)	0	100	100
6	F	371/727 (51%)	371 (100%)	0	100	100
6	H	408/727 (56%)	405 (99%)	3 (1%)	84	90
7	G	25/77 (32%)	25 (100%)	0	100	100
7	W	23/77 (30%)	23 (100%)	0	100	100
8	I	614/730 (84%)	611 (100%)	3 (0%)	88	93
9	J	425/548 (78%)	421 (99%)	4 (1%)	78	87
9	K	423/548 (77%)	418 (99%)	5 (1%)	71	83
10	L	155/170 (91%)	154 (99%)	1 (1%)	86	91
11	M	52/67 (78%)	51 (98%)	1 (2%)	57	75
12	N	549/724 (76%)	545 (99%)	4 (1%)	84	90
13	O	573/650 (88%)	566 (99%)	7 (1%)	71	83
14	T	1/2 (50%)	1 (100%)	0	100	100
15	X	406/513 (79%)	406 (100%)	0	100	100
15	Y	417/513 (81%)	414 (99%)	3 (1%)	84	90

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
16	S	2/401 (0%)	2 (100%)	0	100	100
17	Q	2/402 (0%)	2 (100%)	0	100	100
All	All	6721/9915 (68%)	6675 (99%)	46 (1%)	84	90

5 of 46 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
11	M	16	ASP
13	O	420	ILE
12	N	272	ARG
12	N	660	THR
13	O	506	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 149 such sidechains are listed below:

Mol	Chain	Res	Type
3	P	71	GLN
15	Y	385	ASN
3	P	236	HIS
15	X	78	GLN
6	H	657	HIS

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 3 ligands modelled in this entry, 3 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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.

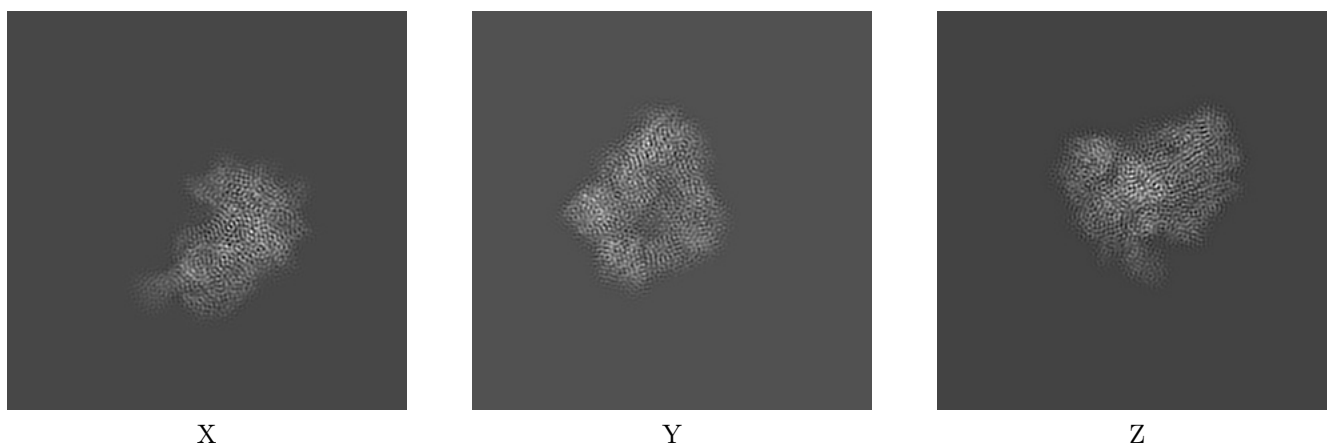
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-10518. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

6.1 Orthogonal projections [i](#)

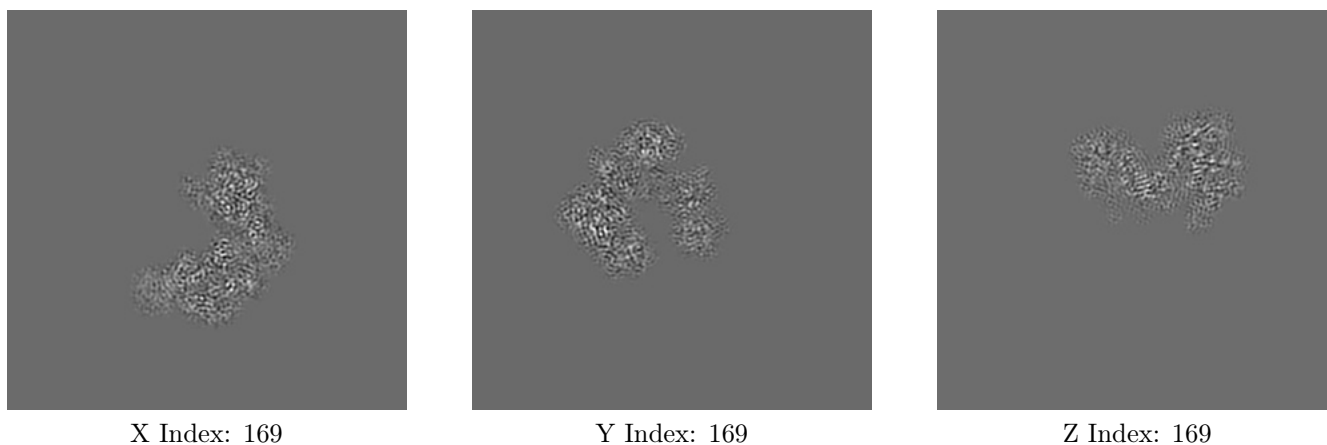
6.1.1 Primary map



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

6.2 Central slices [i](#)

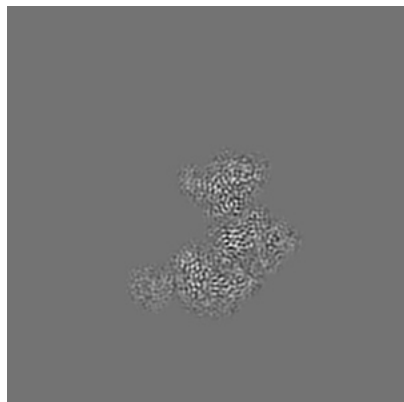
6.2.1 Primary map



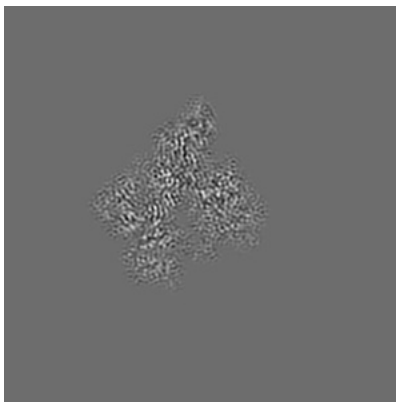
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

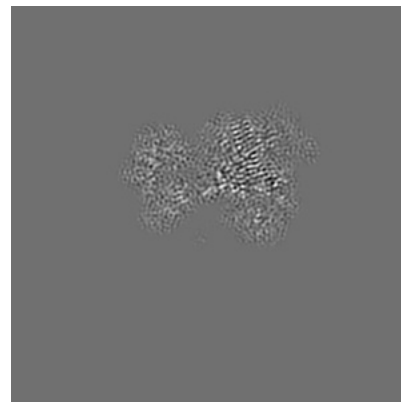
6.3.1 Primary map



X Index: 177



Y Index: 185



Z Index: 139

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

6.4 Orthogonal surface views [i](#)

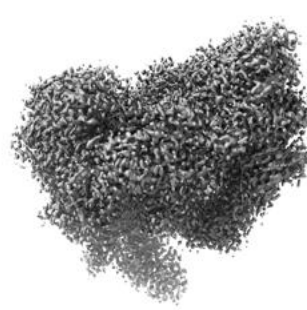
6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.023. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

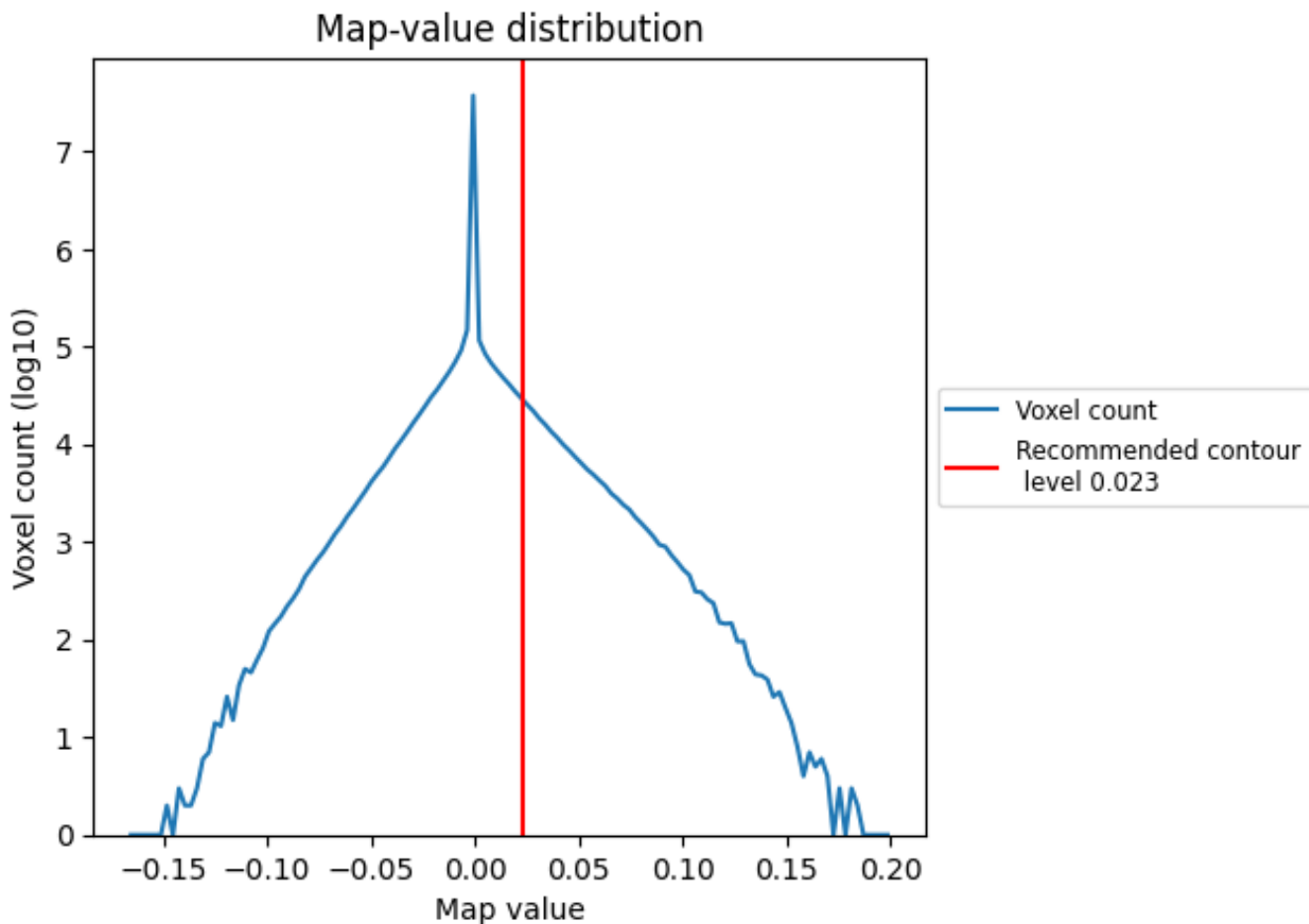
6.5 Mask visualisation

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

7 Map analysis [i](#)

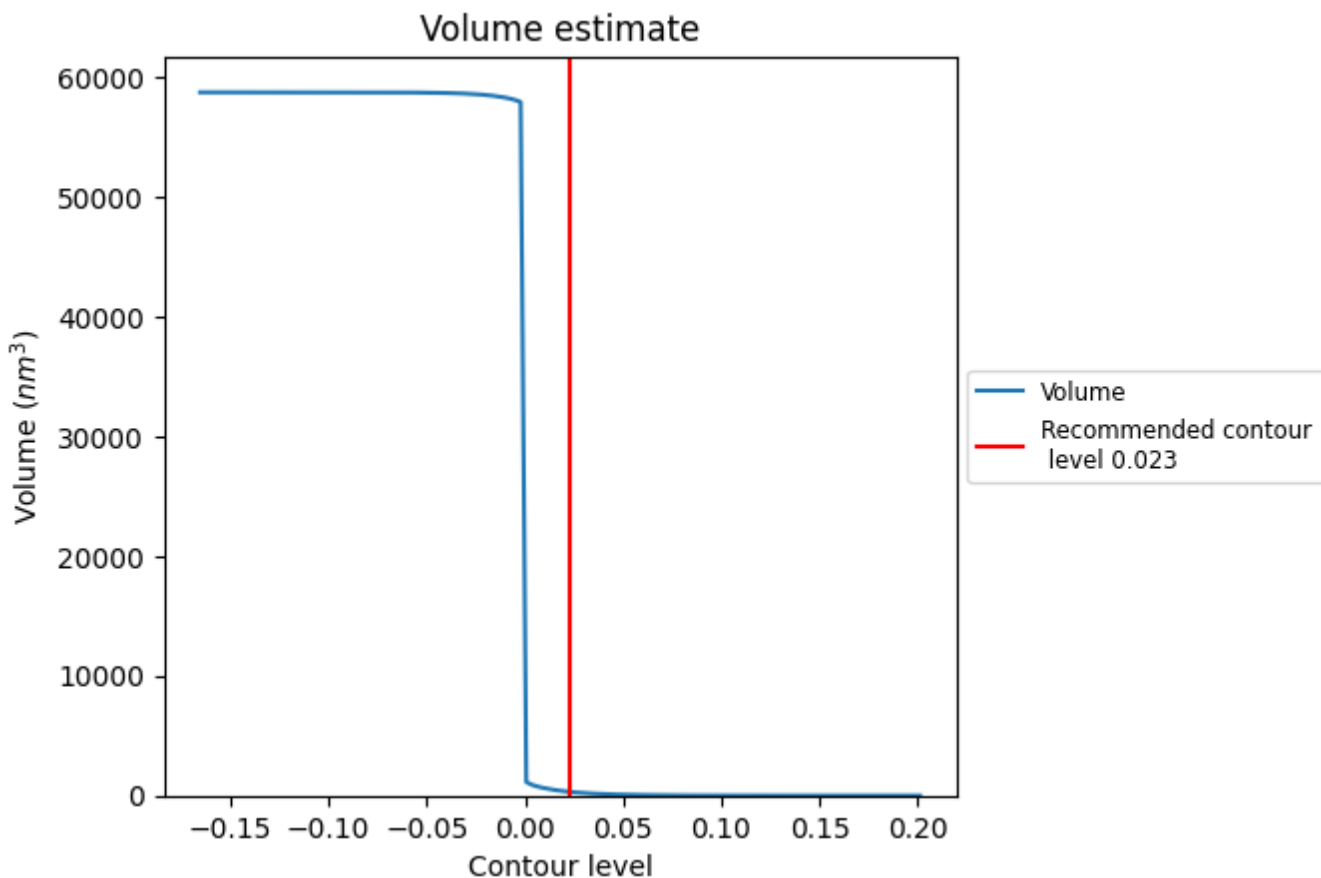
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

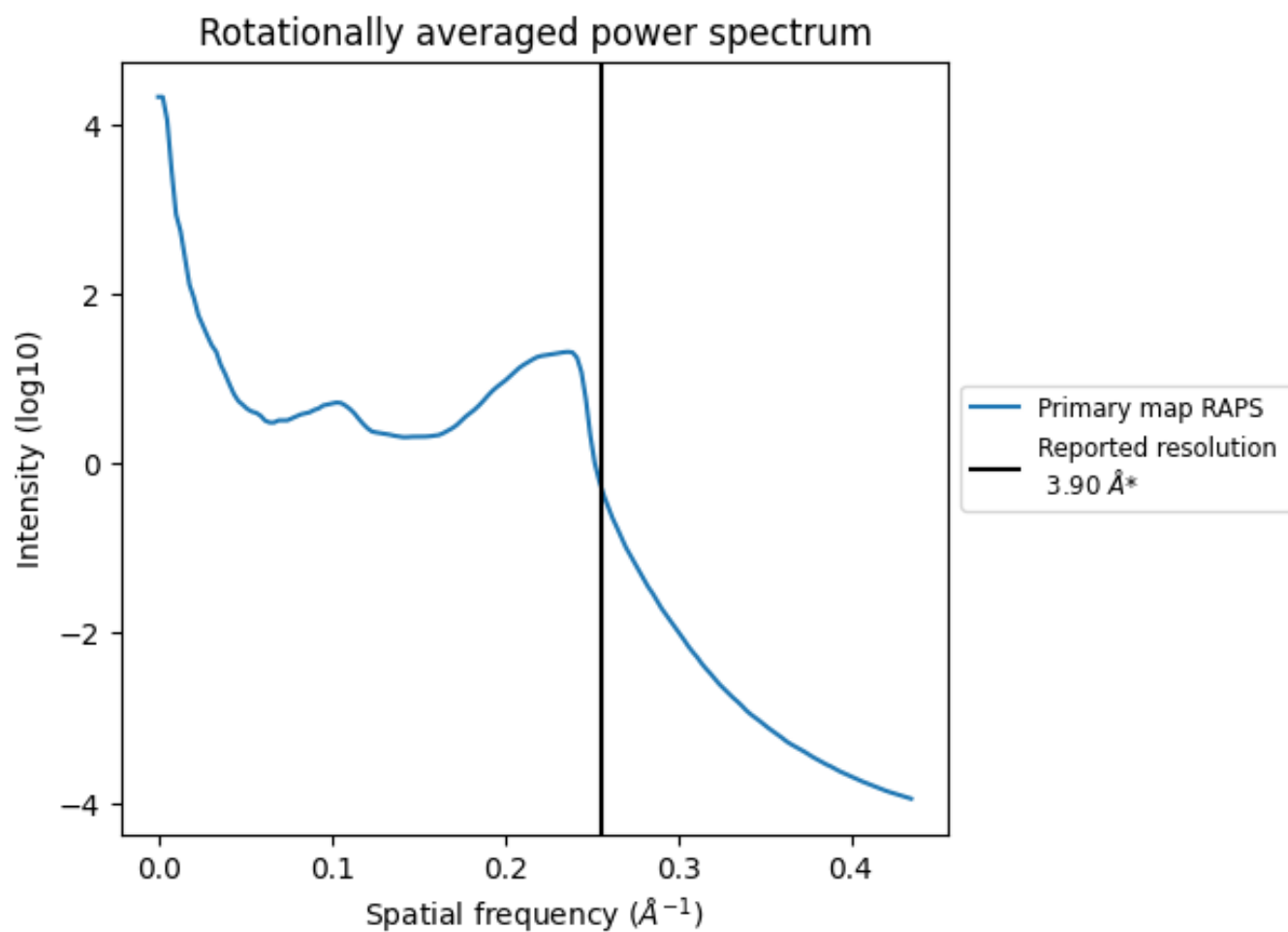
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 308 nm³; this corresponds to an approximate mass of 278 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 0.256\AA^{-1}

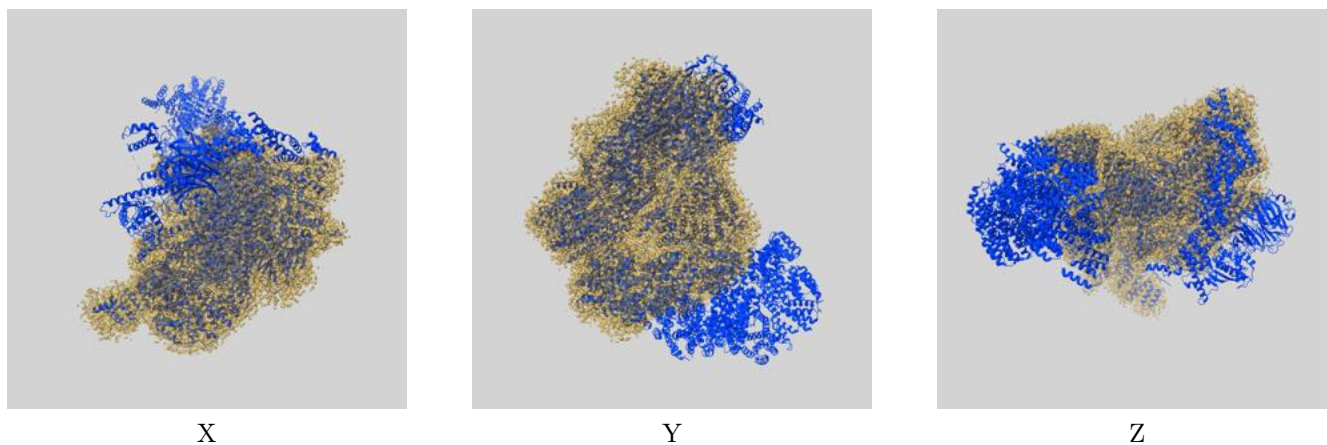
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

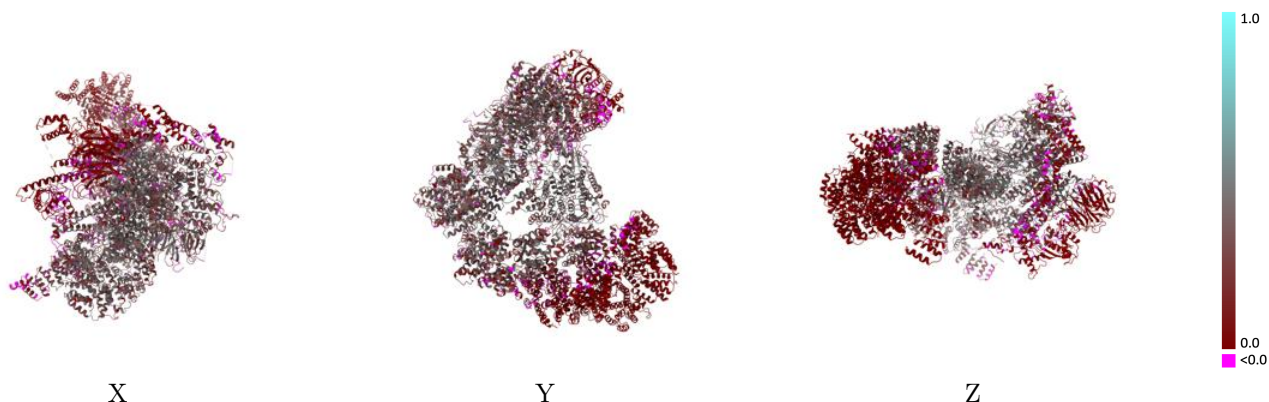
This section contains information regarding the fit between EMDB map EMD-10518 and PDB model 6TM5. Per-residue inclusion information can be found in section 3 on page 8.

9.1 Map-model overlay [i](#)



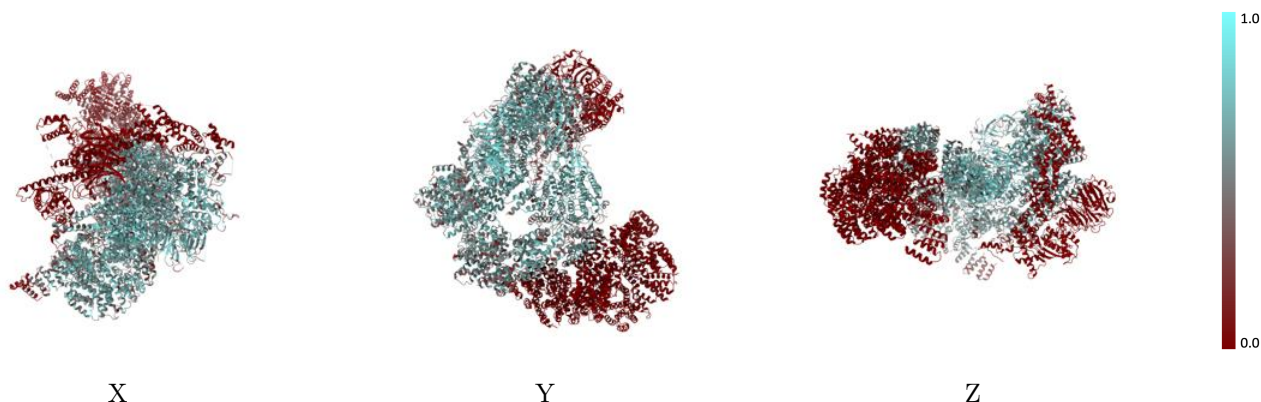
The images above show the 3D surface view of the map at the recommended contour level 0.023 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



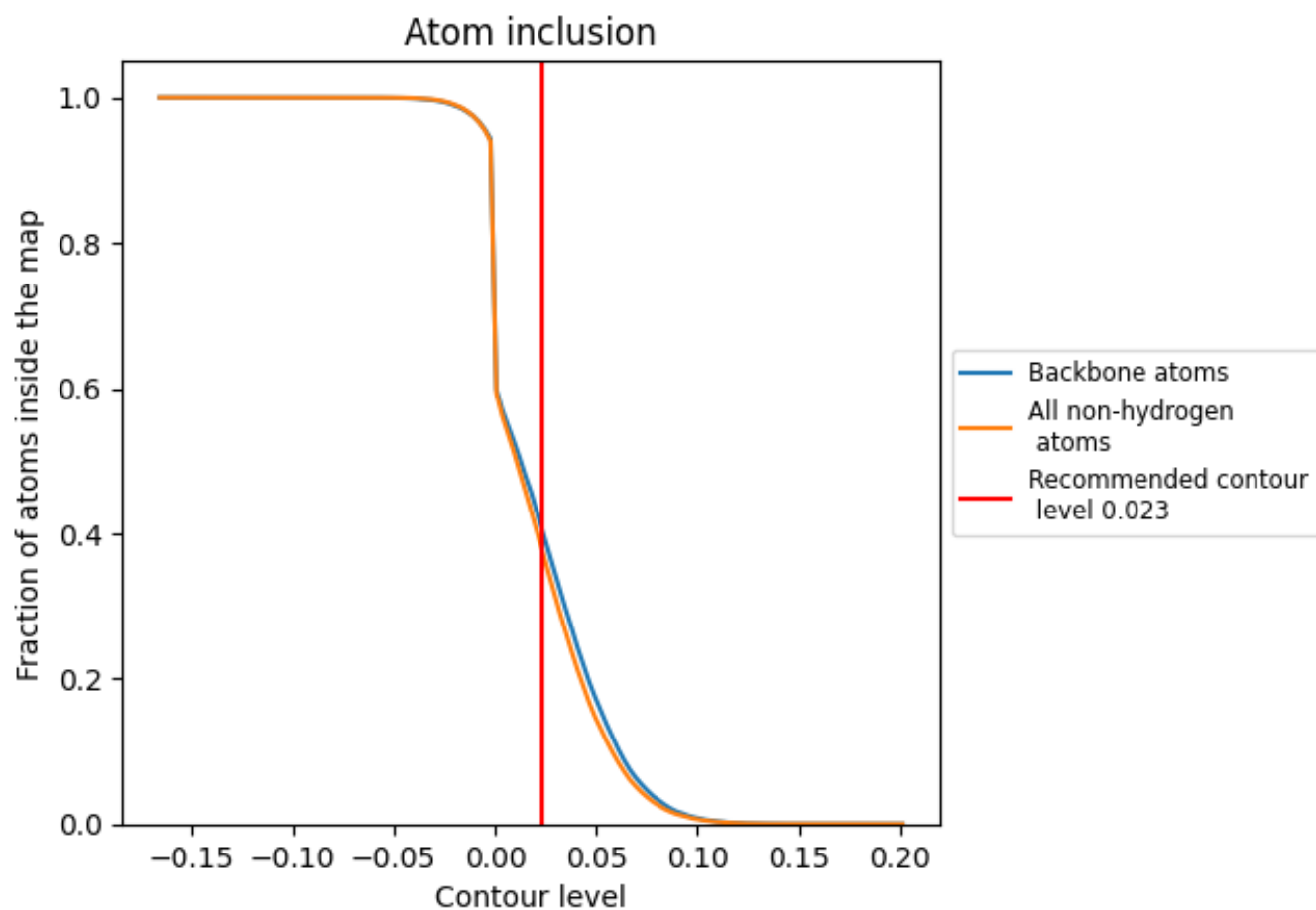
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.023).















































9.4 Atom inclusion [i](#)



At the recommended contour level, 41% of all backbone atoms, 38% 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 (0.023) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.3806	 0.2120
A	 0.6495	 0.3470
B	 0.0016	 0.0290
C	 0.6470	 0.3530
D	 0.6389	 0.3260
E	 0.0383	 0.0930
F	 0.0104	 0.0280
G	 0.4104	 0.2260
H	 0.0278	 0.0560
I	 0.2789	 0.1660
J	 0.5618	 0.2910
K	 0.5759	 0.3100
L	 0.3980	 0.2180
M	 0.5456	 0.3010
N	 0.0272	 0.0550
O	 0.6722	 0.3600
P	 0.5688	 0.2900
Q	 0.5714	 0.4260
S	 0.0000	 0.0000
T	 0.5443	 0.2430
W	 0.5476	 0.3010
X	 0.0000	 0.0010
Y	 0.0000	 0.0000

