wwPDB EM Validation Summary Report ⓘ

Nov 20, 2022 – 10:53 am GMT

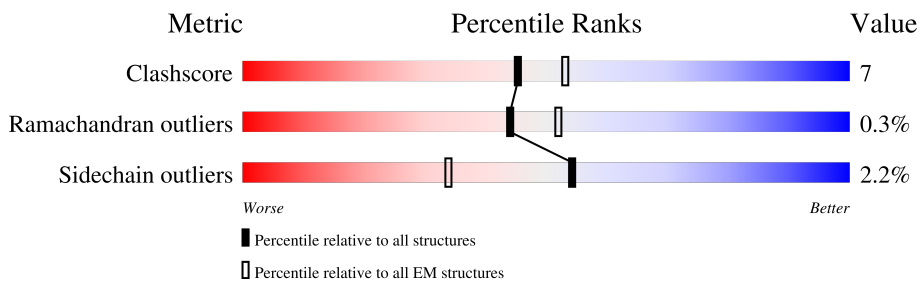|		
PDB ID	:	6I3M
EMDB ID	:	EMD-4404
Title	:	eIF2B:eIF2 complex, phosphorylated on eIF2 alpha serine 52.
Authors	:	Adomavicius, T.; Roseman, A.M.; Pavitt, G.D.
Deposited on	:	2018-11-06
Resolution	:	3.93 Å(reported)
Based on initial models	:	5B04, 3JAP

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 3.93 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	Percentile Ranks	Value
Clashscore		7
Ramachandran outliers		0.3%
Sidechain outliers		2.2%

Worse　　　　　　　　　　　　　　　　*Better*

▌ Percentile relative to all structures

▯ Percentile relative to all EM structures

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 <=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	305	7% / 82% / 18%
1	B	305	7% / 82% / 18%
2	C	651	6% / 44% / 9% / 47%
2	D	651	6% / 44% / 8% / 47%
3	E	381	10% / 73% / 20% / 7%
3	F	381	10% / 74% / 19% / 7%
4	G	712	· / 47% / 11% / 42%
4	H	712	· / 46% / 11% / 42%

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Mol	Chain	Length	Quality of chain
5	I	578	28% / 38% / 8% / 54%
5	J	578	28% / 38% / 9% / 54%
6	K	304	41% / 63% / 17% / 18%
6	L	304	42% / 64% / 15% / 18%
7	M	285	6% / 5% / 94%
7	N	285	6% / 5% / 94%
8	O	527	75% / 57% / 16% / 25%
8	P	527	75% / 57% / 16% / 25%

2 Entry composition ⓘ

There are 8 unique types of molecules in this entry. The entry contains 37012 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 Translation initiation factor eIF-2B subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	305	Total	C	N	O	S	0	0
			2393	1526	400	456	11		
1	B	305	Total	C	N	O	S	0	0
			2393	1526	400	456	11		

- Molecule 2 is a protein called Translation initiation factor eIF-2B subunit delta.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	C	342	Total	C	N	O	S	0	0
			2677	1715	446	505	11		
2	D	342	Total	C	N	O	S	0	0
			2677	1715	446	505	11		

- Molecule 3 is a protein called Translation initiation factor eIF-2B subunit beta.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	E	354	Total	C	N	O	S	0	0
			2797	1774	484	530	9		
3	F	354	Total	C	N	O	S	0	0
			2797	1774	484	530	9		

- Molecule 4 is a protein called Translation initiation factor eIF-2B subunit epsilon.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	G	410	Total	C	N	O	S	0	0
			3265	2061	549	635	20		
4	H	410	Total	C	N	O	S	0	0
			3265	2061	549	635	20		

- Molecule 5 is a protein called Translation initiation factor eIF-2B subunit gamma.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	I	268	Total 2187	C 1398	N 372	O 408	S 9	0	0
5	J	268	Total 2187	C 1398	N 372	O 408	S 9	0	0

- Molecule 6 is a protein called Eukaryotic translation initiation factor 2 subunit alpha.

Mol	Chain	Residues	Atoms						AltConf	Trace
6	K	249	Total 2010	C 1283	N 333	O 385	P 1	S 8	0	0
6	L	249	Total 2010	C 1283	N 333	O 385	P 1	S 8	0	0

- Molecule 7 is a protein called Eukaryotic translation initiation factor 2 subunit beta.

Mol	Chain	Residues	Atoms				AltConf	Trace
7	M	17	Total 143	C 96	N 24	O 23	0	0
7	N	17	Total 143	C 96	N 24	O 23	0	0

- Molecule 8 is a protein called Eukaryotic translation initiation factor 2 subunit gamma.

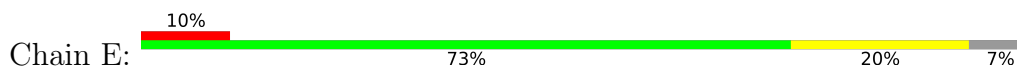| Mol	Chain	Residues	Atoms					AltConf	Trace
8	O	396	Total 3034	C 1932	N 542	O 544	S 16	0	0
8	P	396	Total 3034	C 1932	N 542	O 544	S 16	0	0

3 Residue-property plots ⓘ

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

- Molecule 1: Translation initiation factor eIF-2B subunit alpha
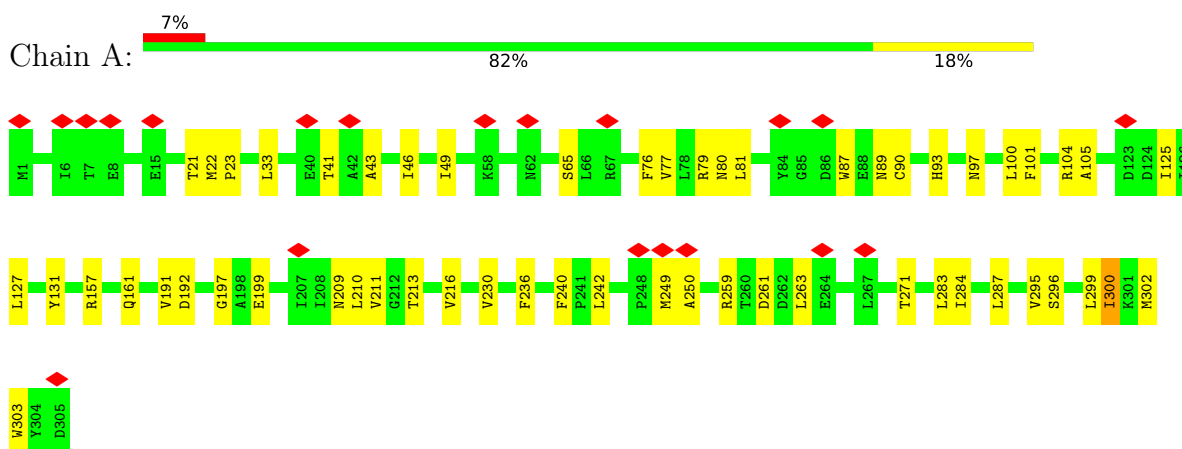
- Molecule 1: Translation initiation factor eIF-2B subunit alpha
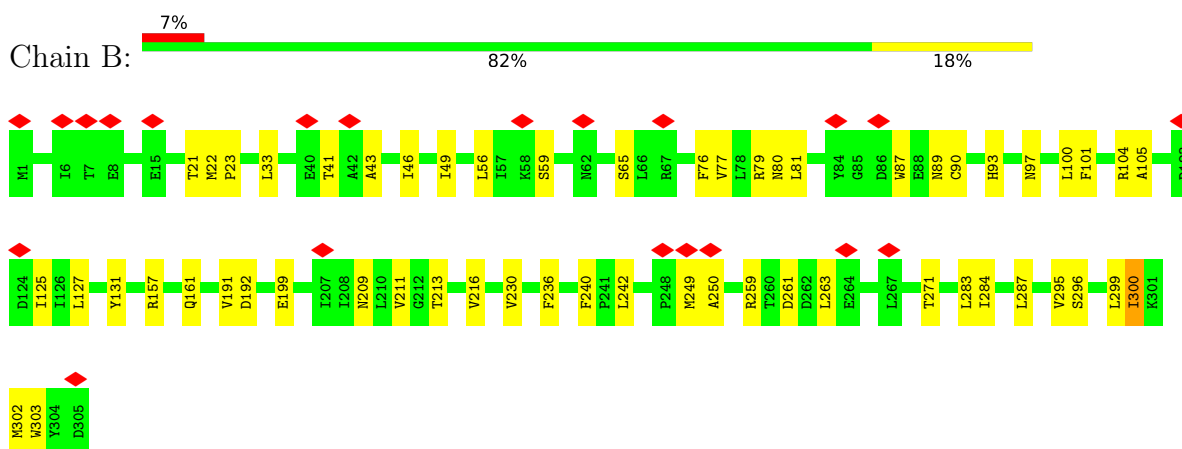
- Molecule 2: Translation initiation factor eIF-2B subunit delta
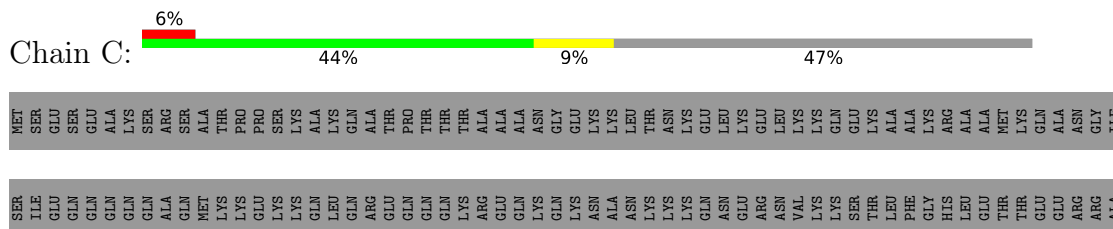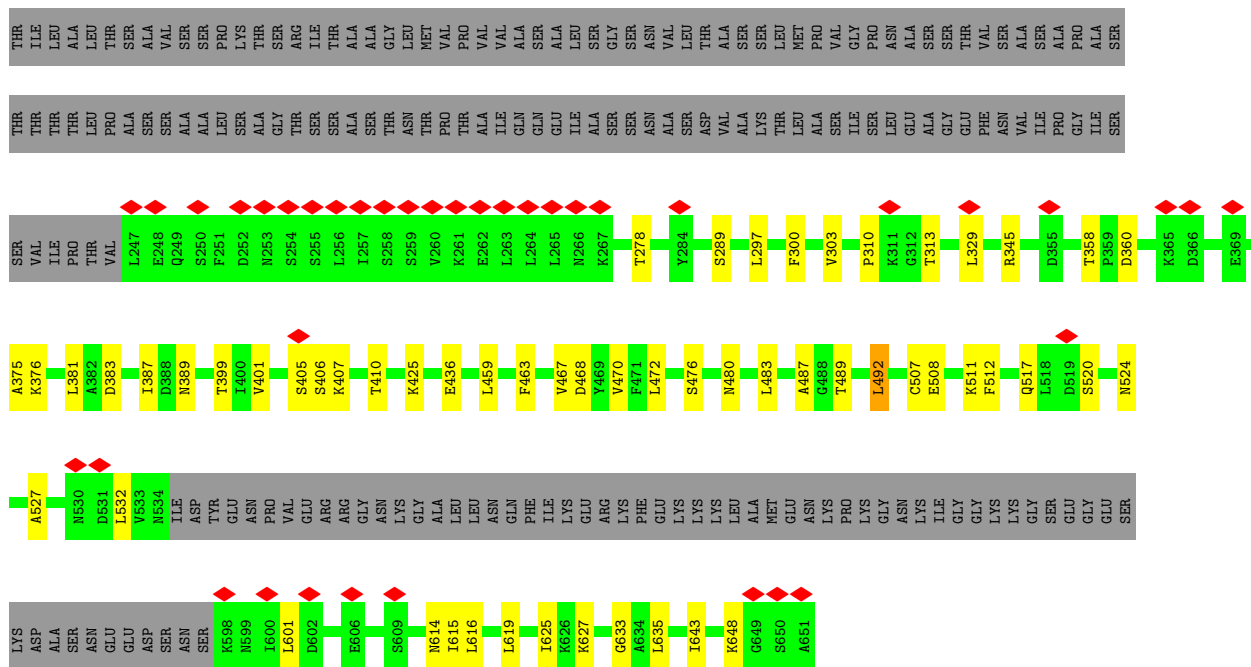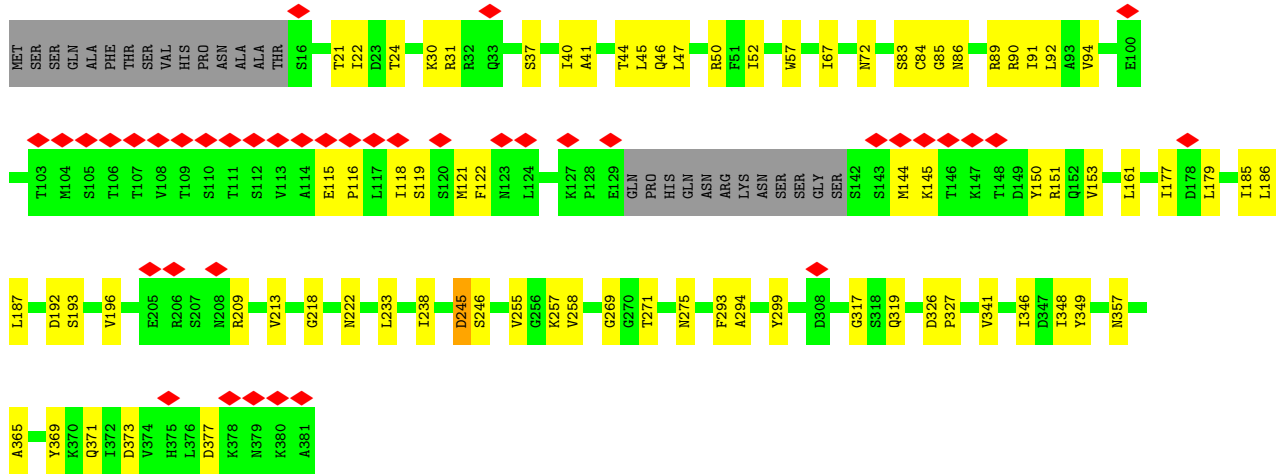
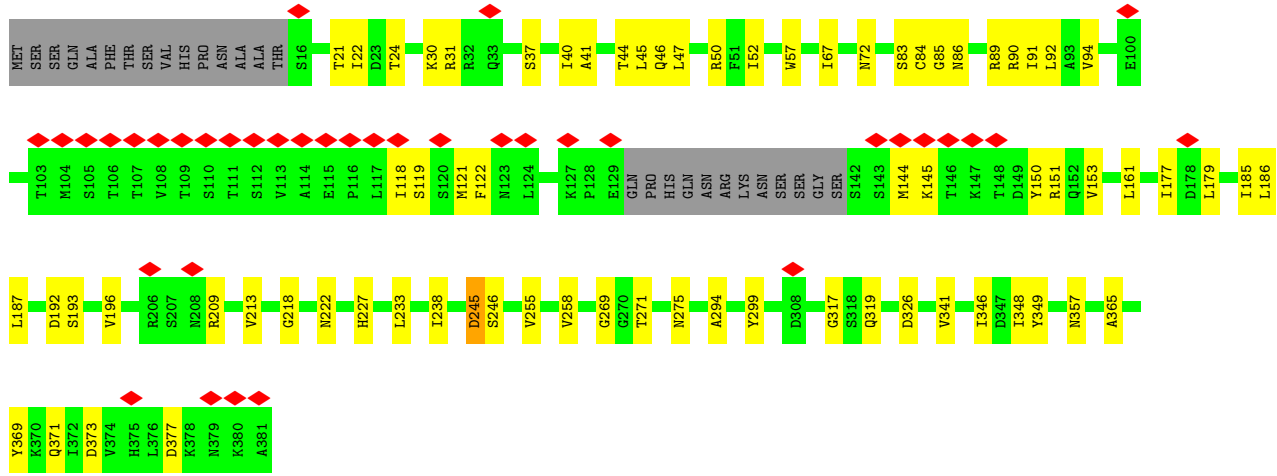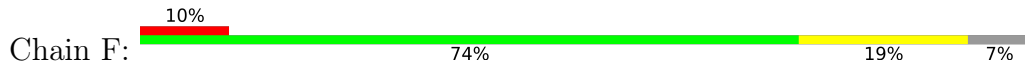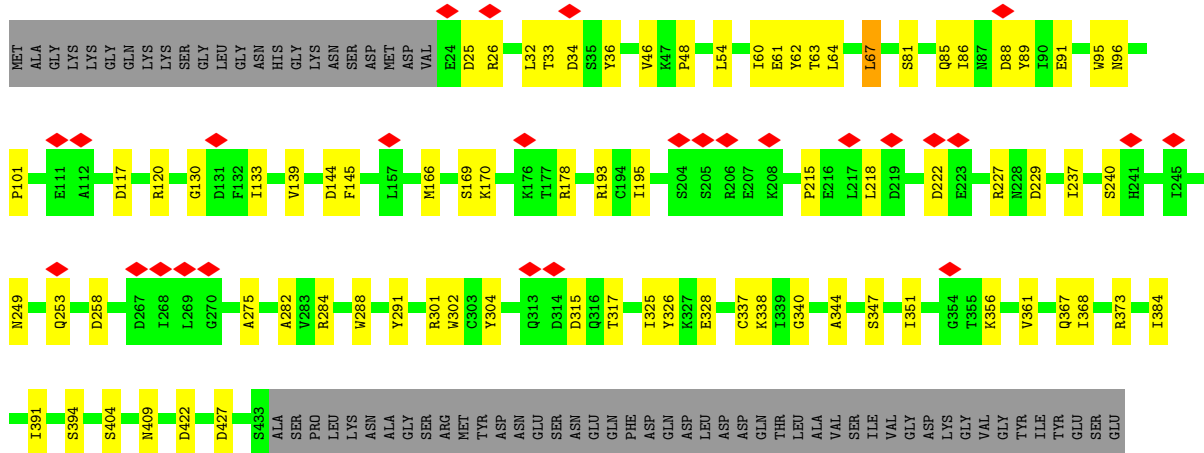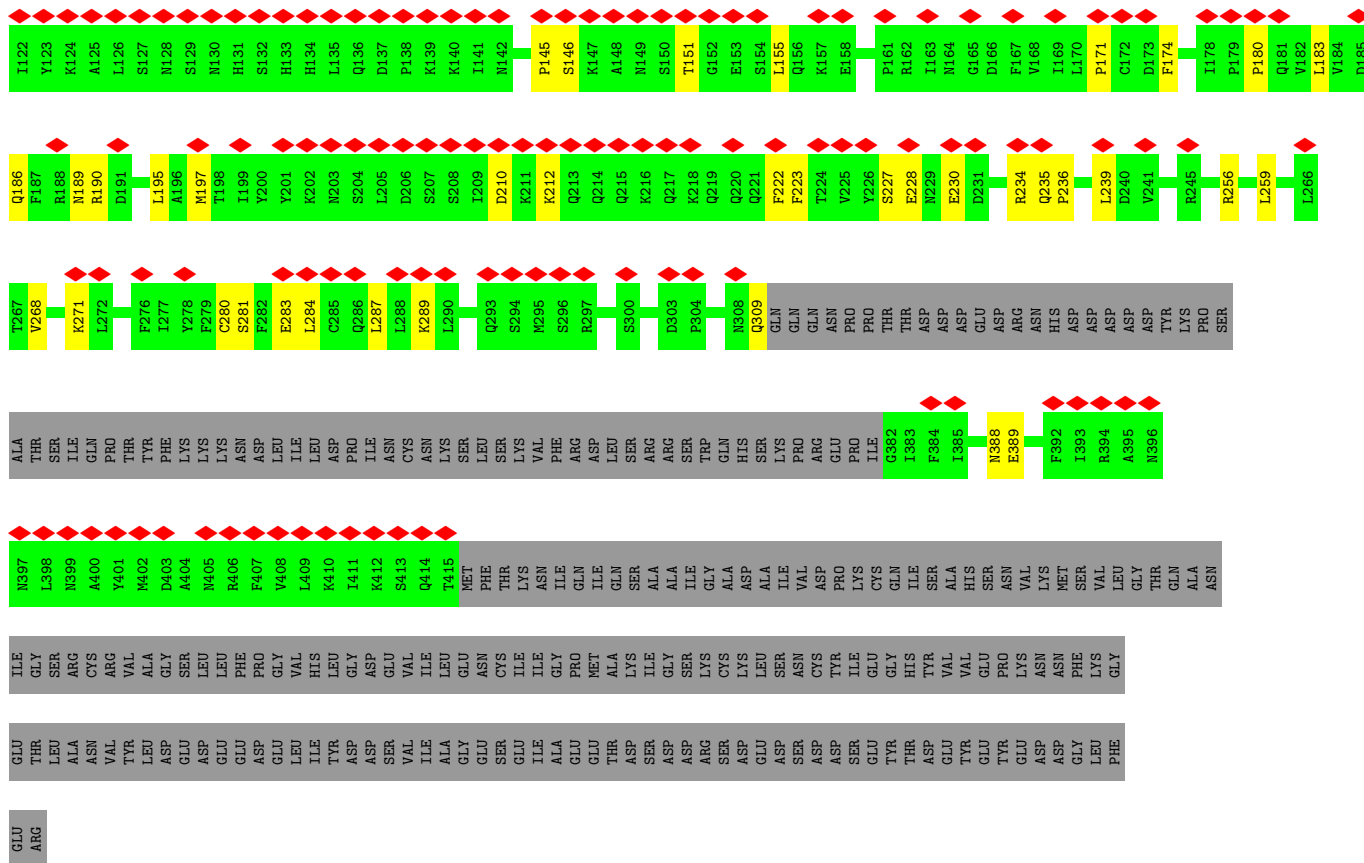• Molecule 2: Translation initiation factor eIF-2B subunit delta
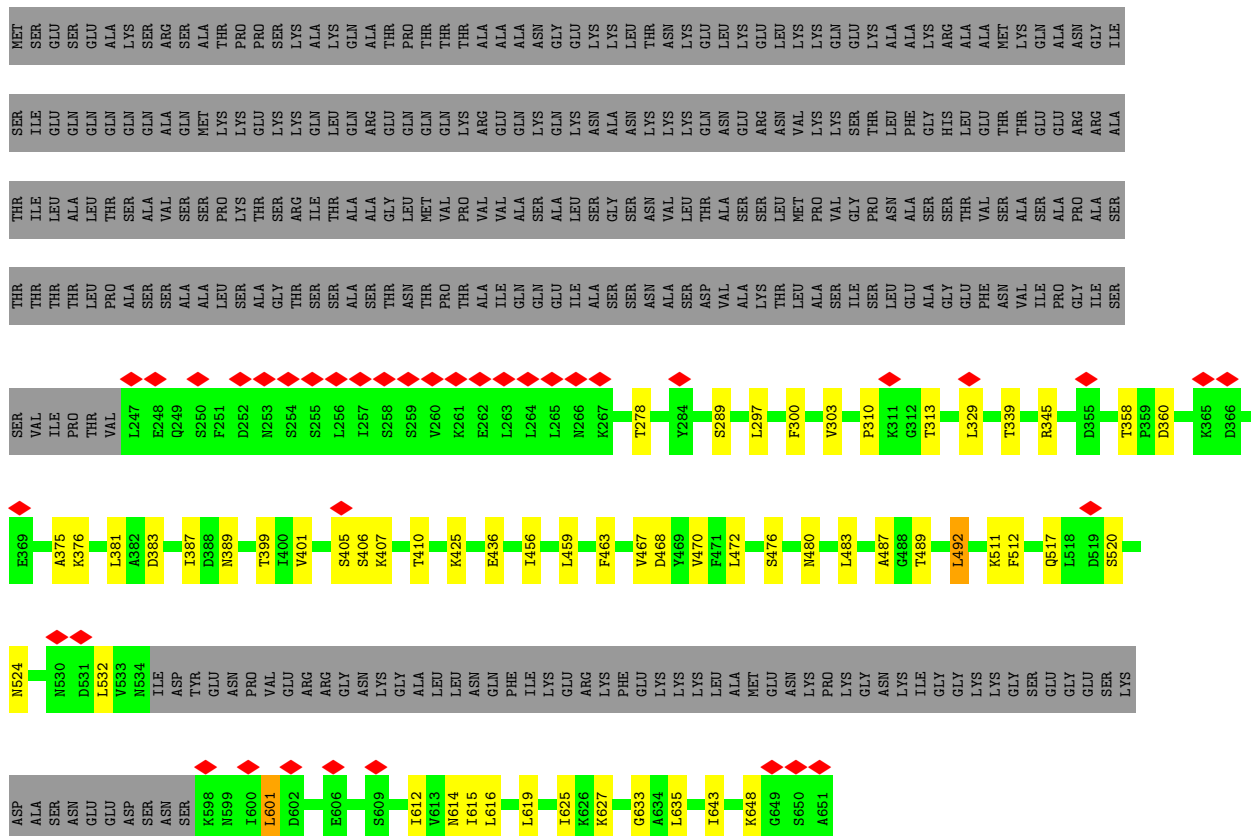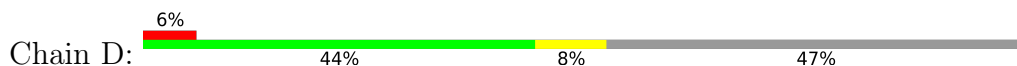
• Molecule 3: Translation initiation factor eIF-2B subunit beta

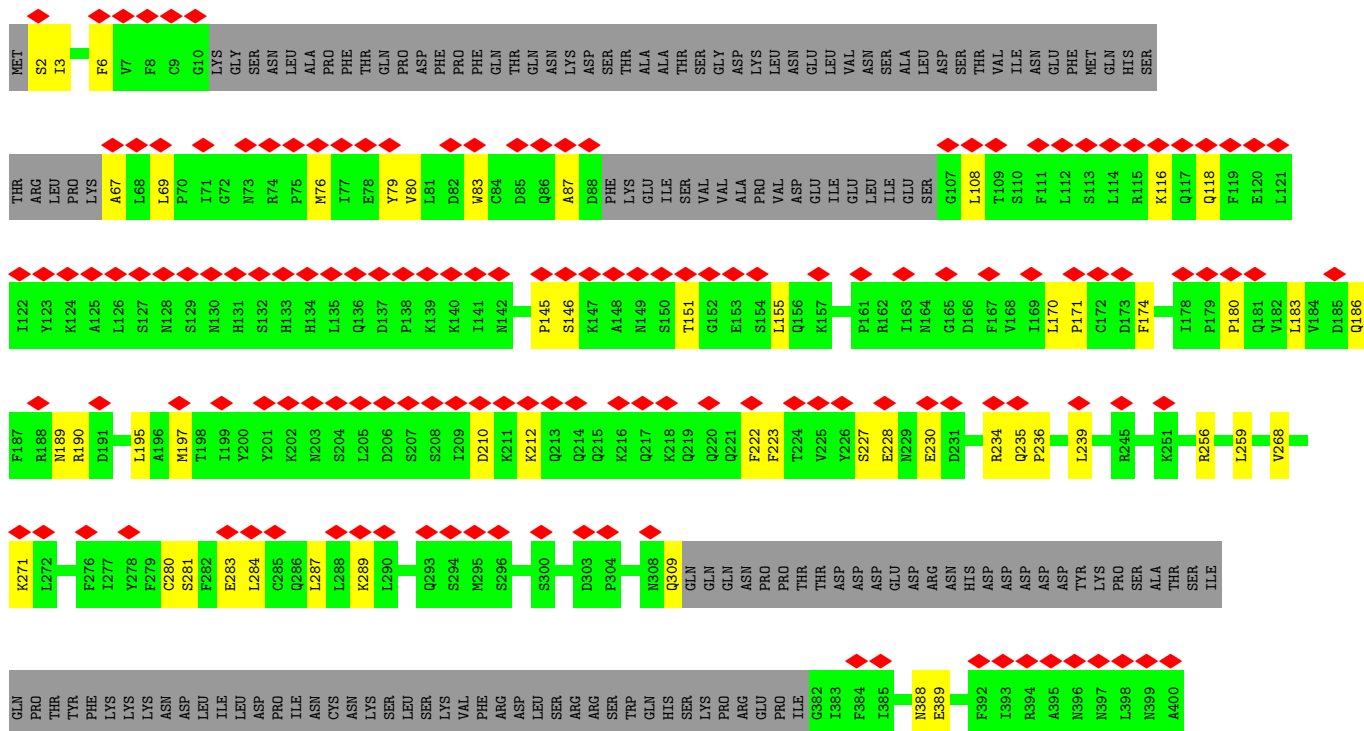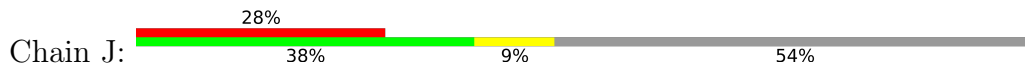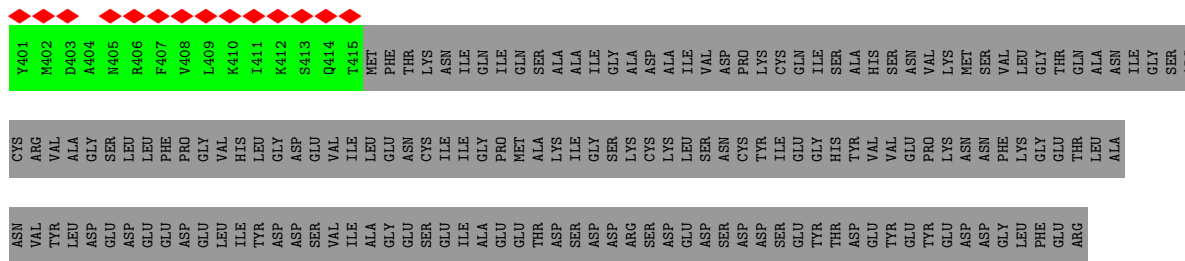• Molecule 3: Translation initiation factor eIF-2B subunit beta

Chain F:

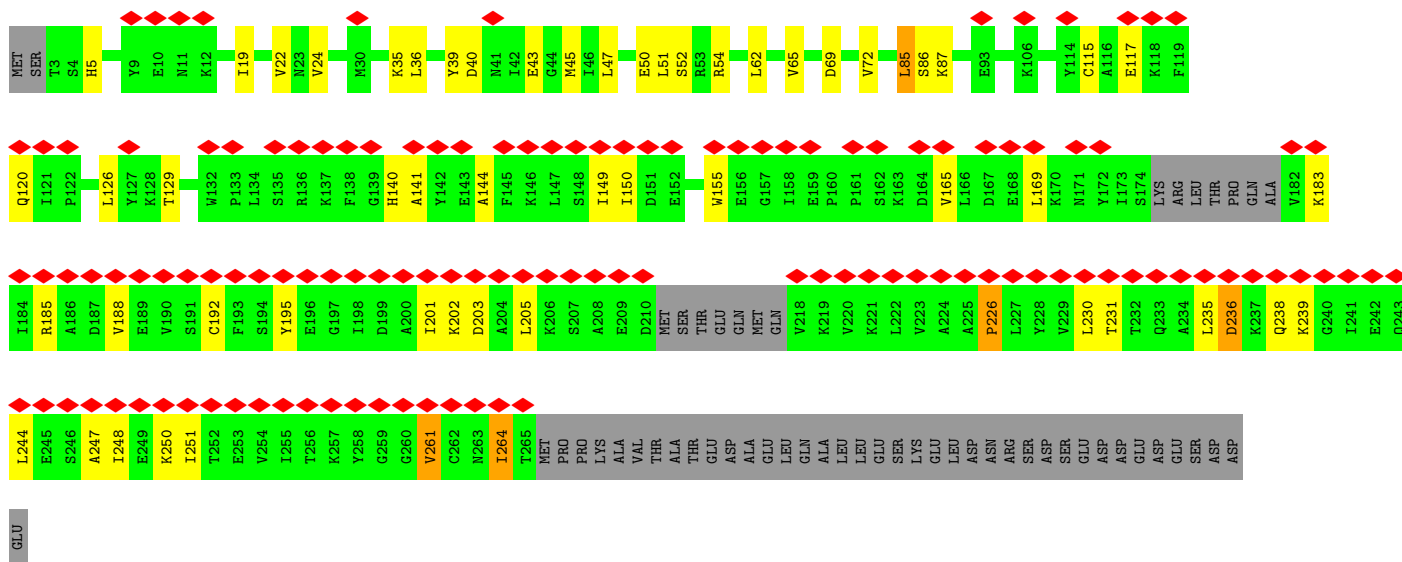• Molecule 4: Translation initiation factor eIF-2B subunit epsilon

Chain G:

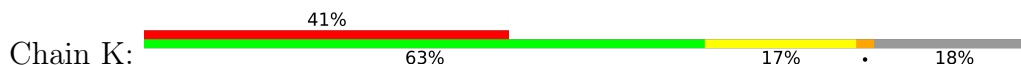• Molecule 4: Translation initiation factor eIF-2B subunit epsilon

Chain H:

46% 11% 42%

• Molecule 5: Translation initiation factor eIF-2B subunit gamma

Chain I:

28%

38% 8% 54%

• Molecule 5: Translation initiation factor eIF-2B subunit gamma

Y401 M402 D403 A404 N405 R406 F407 V408 L409 K410 I411 K412 S413 Q414 T415 MET PHE THR LYS ASN ILE GLN ILE SER ALA ALA ILE GLY ASP ALA ILE VAL ASP LYS CYS ILE SER GLN ILE SER ALA HIS SER ASN VAL LYS MET SER VAL LEU GLY THR GLN ALA ASN ILE GLY SER ARG

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

ASN VAL TYR LEU ASP GLU GLU ASP GLU LEU ILE TYR ASP SER VAL ILE ALA GLY GLU SER GLU ILE ALA GLU THR ASP SER ASP ARG SER ASP GLU SER ASP SER GLU TYR THR ASP GLU GLU TYR GLU ASP ASP GLY LEU PHE GLU ARG

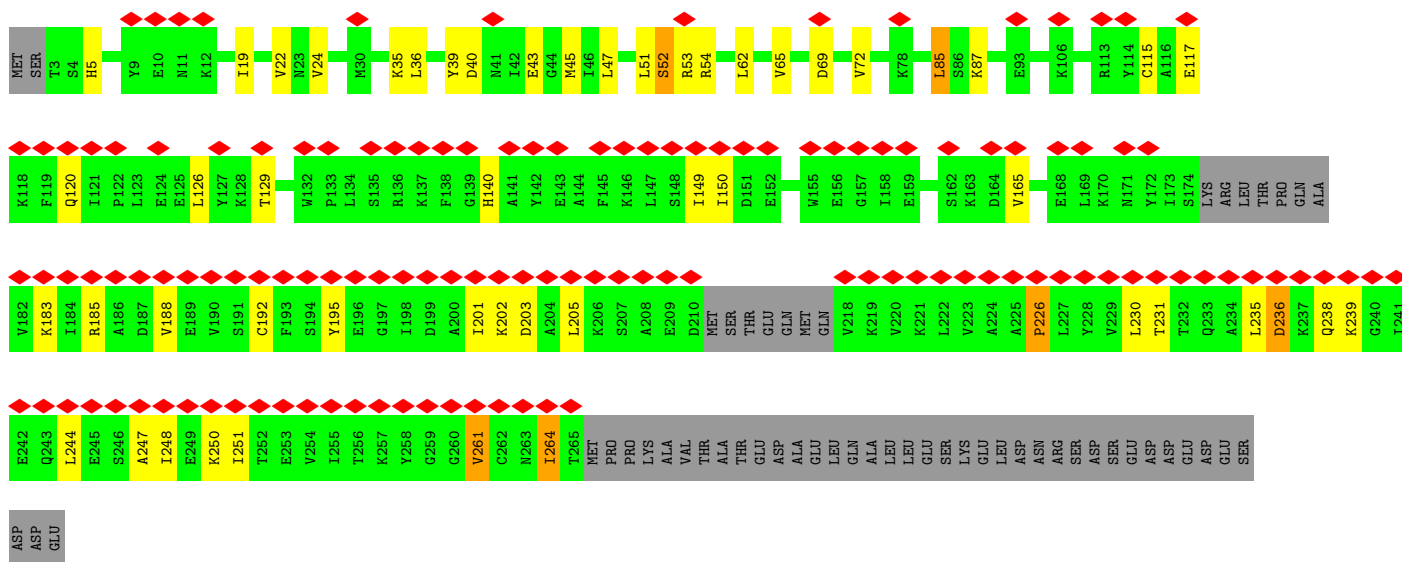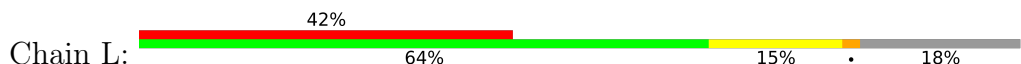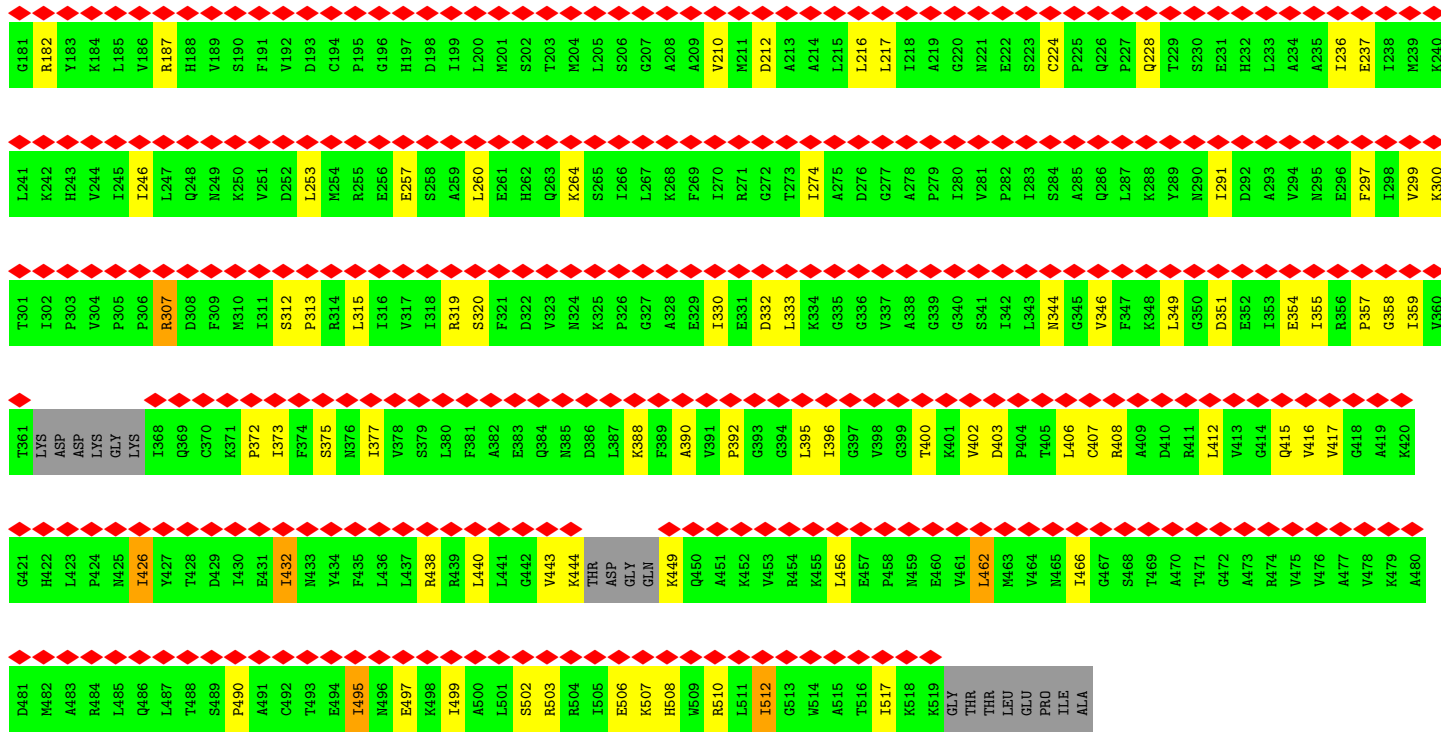• Molecule 6: Eukaryotic translation initiation factor 2 subunit alpha

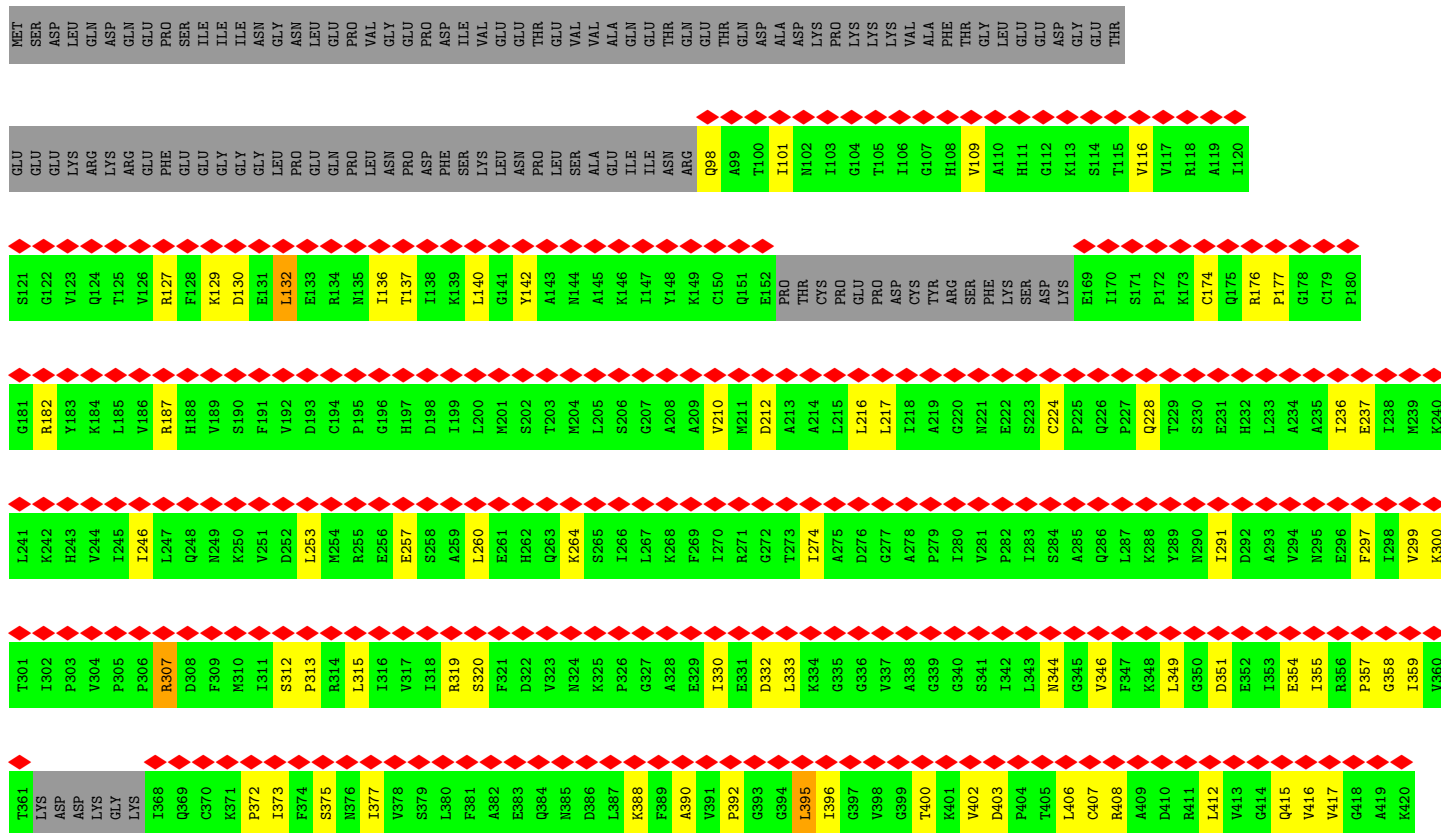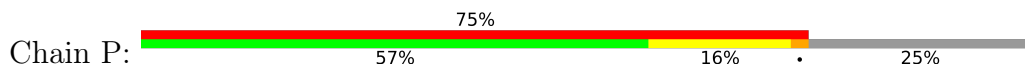Chain K:

• Molecule 6: Eukaryotic translation initiation factor 2 subunit alpha

Chain L:

• Molecule 7: Eukaryotic translation initiation factor 2 subunit beta

Chain M:

6%

5% · 94%

MET SER SER ASP LEU ALA ALA GLU LEU GLY PHE ASP PRO ALA LEU LYS LYS LYS LYS LYS THR LYS LYS VAL ILE PRO ASP ASP PHE ASP ALA ALA VAL ASN GLY LYS ASN GLY SER GLY ASP ASP LEU PHE ALA GLY LEU LYS LYS LYS LYS LYS SER LYS SER VAL SER ALA

ASP ALA GLU ALA GLU LYS GLU PRO THR ASP ASP ILE ALA GLU ALA LEU GLY GLU LEU SER LEU LYS LYS LYS LYS THR LYS ASP SER VAL ASP PHE GLU LYS GLU LEU ALA ALA GLY LEU ASP ASN VAL ASP ALA GLU SER LYS GLU GLY THR PRO SER ALA ASN

SER SER ILE GLN GLN GLU **V127 G128 L129 P130 Y131 S132 E133 L134 L135 S136 R137 F138 F139 N140 I141 L142 R143** THR ASN ASN PRO GLU GLN LEU ALA GLY ASP ARG SER GLY PRO LYS PHE ARG ILE PRO PRO PRO VAL CYS LEU ARG ASP GLY LYS LYS THR ILE PHE SER ASN ILE GLN ASP ILE

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

SER ILE ASN THR GLU LEU LYS ARG GLU GLN GLN SER ASN ARG LEU PHE PHE MET VAL CYS LYS SER CYS GLY SER THR ARG SER VAL SER SER ILE LYS THR GLY PHE GLN ALA THR VAL GLY LYS ARG ARG MET

• Molecule 7: Eukaryotic translation initiation factor 2 subunit beta

Chain N:

6%

5% · 94%

MET SER SER ASP LEU ALA ALA GLU LEU GLY PHE ASP PRO ALA LEU LYS LYS LYS LYS LYS THR LYS LYS VAL ILE PRO ASP ASP PHE ASP ALA ALA VAL ASN GLY LYS ASN GLY SER GLY ASP ASP LEU PHE ALA GLY LEU LYS LYS LYS LYS LYS SER LYS SER VAL SER ALA

ASP ALA GLU ALA GLU LYS GLU PRO THR ASP ASP ILE ALA GLU ALA LEU GLY GLU LEU SER LEU LYS LYS LYS LYS THR LYS ASP SER VAL ASP PHE GLU LYS GLU LEU ALA ALA GLY LEU ASP ASN VAL ASP ALA GLU SER LYS GLU GLY THR PRO SER ALA ASN

SER SER ILE GLN GLN GLU **V127 G128 L129 P130 Y131 S132 E133 L134 L135 S136 R137 F138 F139 N140 I141 L142 R143** THR ASN ASN PRO GLU GLN LEU ALA GLY ASP ARG SER GLY PRO LYS PHE ARG ILE PRO PRO PRO VAL CYS LEU ARG ASP GLY LYS LYS THR ILE PHE SER ASN ILE GLN ASP ILE

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

SER ILE ASN THR GLU LEU LYS ARG GLU GLN GLN SER ASN ARG LEU PHE PHE MET VAL CYS LYS SER CYS GLY SER THR ARG SER VAL SER SER ILE LYS THR GLY PHE GLN ALA THR VAL GLY LYS ARG ARG MET

• Molecule 8: Eukaryotic translation initiation factor 2 subunit gamma

Chain O:

75%

57% 16% · 25%

MET SER ASP LEU GLN ASP GLN GLU PRO SER ILE ILE ILE ASN GLY ASN LEU GLU GLU PRO VAL GLY GLU PRO ASP ILE GLU VAL GLU THR GLU VAL VAL ALA GLN THR GLN GLY THR GLN ASP GLY ALA ASP LYS PRO LYS LYS LYS LYS VAL VAL ALA PHE THR GLY LEU GLU GLU ASP GLY GLU THR

GLU GLU GLU LYS ARG LYS GLU ARG GLU PHE GLU GLU GLY GLY GLY LEU PRO GLU GLN PRO LEU ASN ALA SER PHE ASP LYS LEU ASN LEU PRO LEU ASN SER ALA GLU ILE ILE ASN ARG **Q98 A99 T100 I101 N102 I103 G104 T105 I106 G107 H108 V109 A110 H111 G112 K113 S114 T115 V116 V117 R118 A119 I120**

S121 G122 V123 Q124 T125 V126 R127 F128 K129 D130 E131 L132 E133 R134 N135 I136 T137 I138 K139 L140 G141 Y142 A143 N144 A145 K146 I147 Y148 K149 C150 Q151 E152 PRO THR CYS PRO GLU PRO ASP CYS TYR ARG SER PHE LYS SER ASP LYS **E169 I170 S171 P172 K173 C174 Q175 R176 P177 G178 C179 P180**

• Molecule 8: Eukaryotic translation initiation factor 2 subunit gamma

Chain P:

75%

57%   16%   •   25%

G421 H422 L423 P424 N425 I426 Y427 T428 D429 I430 E431 I432 N433 Y434 F435 L436 L437 R438 R439 L440 L441 G442 V443 K444 THR ASP GLY GLN K449 Q450 A451 K452 V453 R454 K455 L456 E457 P458 N459 E460 V461 L462 M463 V464 N465 I466 G467 S468 T469 A470 T471 G472 A473 R474 V475 V476 A477 V478 K479 A480

D481 M482 A483 R484 L485 Q486 L487 T488 S489 P490 A491 C492 T493 E494 I495 N496 E497 K498 I499 A500 L501 S502 R503 R504 I505 E506 K507 H508 W509 R510 L511 I512 G513 W514 A515 T516 I517 K518 K519 GLY THR THR LEU GLU PRO ILE ALA

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C2	Depositor
Number of particles used	64541	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION; CTF determination was performed per micrograph initially. After particle picking and initial reconstruction, per particle CTF determination was performed.	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{Å}^2)$	40	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	5500	Depositor
Magnification	37313	Depositor
Image detector	GATAN K2 QUANTUM (4k x 4k)	Depositor
Maximum map value	0.304	Depositor
Minimum map value	-0.181	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.008	Depositor
Recommended contour level	0.055	Depositor
Map size (Å)	428.80002, 428.80002, 428.80002	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.34, 1.34, 1.34	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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

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	0.34	0/2437	0.62	0/3304
1	B	0.34	0/2437	0.62	0/3304
2	C	0.33	0/2720	0.65	2/3685 (0.1%)
2	D	0.33	0/2720	0.65	2/3685 (0.1%)
3	E	0.35	0/2846	0.65	1/3857 (0.0%)
3	F	0.36	0/2846	0.65	1/3857 (0.0%)
4	G	0.35	0/3327	0.66	3/4512 (0.1%)
4	H	0.35	0/3327	0.66	3/4512 (0.1%)
5	I	0.32	0/2232	0.66	0/3015
5	J	0.32	0/2232	0.66	0/3015
6	K	0.37	0/2027	0.67	2/2726 (0.1%)
6	L	0.37	0/2027	0.67	2/2726 (0.1%)
7	M	0.53	0/146	0.71	0/196
7	N	0.53	0/146	0.71	0/196
8	O	0.47	0/3079	0.70	1/4157 (0.0%)
8	P	0.47	0/3079	0.70	1/4157 (0.0%)
All	All	0.37	0/37628	0.66	18/50904 (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	G	0	1
4	H	0	1
6	K	0	2
6	L	0	2
All	All	0	6

There are no bond length outliers.

WORLDWIDE
wwPDB
PROTEIN DATA BANK

The worst 5 of 18 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	F	245	ASP	CB-CG-OD1	6.49	124.14	118.30
3	E	245	ASP	CB-CG-OD1	6.44	124.09	118.30
4	G	32	LEU	CA-CB-CG	6.05	129.21	115.30
4	H	32	LEU	CA-CB-CG	6.04	129.19	115.30
6	L	85	LEU	CA-CB-CG	5.99	129.07	115.30

There are no chirality outliers.

5 of 6 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
4	G	178	ARG	Peptide
4	H	178	ARG	Peptide
6	K	140	HIS	Peptide
6	K	39	TYR	Peptide
6	L	39	TYR	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	2393	0	2416	39	0
1	B	2393	0	2416	38	0
2	C	2677	0	2787	34	0
2	D	2677	0	2787	36	0
3	E	2797	0	2835	51	0
3	F	2797	0	2835	46	0
4	G	3265	0	3229	45	0
4	H	3265	0	3229	49	0
5	I	2187	0	2173	31	0
5	J	2187	0	2173	32	0
6	K	2010	0	2064	29	0
6	L	2010	0	2064	27	0
7	M	143	0	148	0	0
7	N	143	0	148	0	0
8	O	3034	0	3195	44	0
8	P	3034	0	3195	44	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	37012	0	37694	498	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 7.

The worst 5 of 498 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)
8:P:499:ILE:HD11	8:P:517:ILE:HG13	1.63	0.81
8:O:499:ILE:HD11	8:O:517:ILE:HG13	1.63	0.79
5:J:79:TYR:O	5:J:83:TRP:HB2	1.89	0.72
5:I:79:TYR:O	5:I:83:TRP:HB2	1.89	0.71
6:L:201:ILE:HG22	8:P:330:ILE:HG21	1.73	0.69

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	303/305 (99%)	264 (87%)	39 (13%)	0	100	100
1	B	303/305 (99%)	265 (88%)	38 (12%)	0	100	100
2	C	338/651 (52%)	303 (90%)	35 (10%)	0	100	100
2	D	338/651 (52%)	303 (90%)	35 (10%)	0	100	100
3	E	350/381 (92%)	327 (93%)	23 (7%)	0	100	100
3	F	350/381 (92%)	327 (93%)	23 (7%)	0	100	100
4	G	408/712 (57%)	364 (89%)	44 (11%)	0	100	100
4	H	408/712 (57%)	364 (89%)	44 (11%)	0	100	100
5	I	260/578 (45%)	214 (82%)	46 (18%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
5	J	260/578 (45%)	215 (83%)	45 (17%)	0	100	100
6	K	242/304 (80%)	212 (88%)	29 (12%)	1 (0%)	34	70
6	L	242/304 (80%)	212 (88%)	29 (12%)	1 (0%)	34	70
7	M	15/285 (5%)	13 (87%)	1 (7%)	1 (7%)	1	17
7	N	15/285 (5%)	13 (87%)	1 (7%)	1 (7%)	1	17
8	O	388/527 (74%)	339 (87%)	43 (11%)	6 (2%)	10	45
8	P	388/527 (74%)	339 (87%)	43 (11%)	6 (2%)	10	45
All	All	4608/7486 (62%)	4074 (88%)	518 (11%)	16 (0%)	44	74

5 of 16 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
8	O	129	LYS
8	P	129	LYS
8	O	495	ILE
8	O	507	LYS
8	P	495	ILE

5.3.2   Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	265/265 (100%)	264 (100%)	1 (0%)	91	94
1	B	265/265 (100%)	264 (100%)	1 (0%)	91	94
2	C	308/561 (55%)	307 (100%)	1 (0%)	92	95
2	D	308/561 (55%)	307 (100%)	1 (0%)	92	95
3	E	315/338 (93%)	314 (100%)	1 (0%)	92	95
3	F	315/338 (93%)	314 (100%)	1 (0%)	92	95
4	G	375/649 (58%)	375 (100%)	0	100	100
4	H	375/649 (58%)	375 (100%)	0	100	100
5	I	250/529 (47%)	249 (100%)	1 (0%)	91	94

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
5	J	250/529 (47%)	249 (100%)	1 (0%)	91	94
6	K	223/273 (82%)	211 (95%)	12 (5%)	22	50
6	L	223/273 (82%)	211 (95%)	12 (5%)	22	50
7	M	16/246 (6%)	13 (81%)	3 (19%)	1	10
7	N	16/246 (6%)	13 (81%)	3 (19%)	1	10
8	O	332/449 (74%)	306 (92%)	26 (8%)	12	40
8	P	332/449 (74%)	306 (92%)	26 (8%)	12	40
All	All	4168/6620 (63%)	4078 (98%)	90 (2%)	54	71

5 of 90 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
6	L	244	LEU
8	P	291	ILE
6	L	261	VAL
8	P	132	LEU
8	P	359	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 38 such sidechains are listed below:

Mol	Chain	Res	Type
8	O	98	GLN
8	P	248	GLN
8	O	248	GLN
6	L	109	HIS
8	P	508	HIS

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

2 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The

Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#$|Z| > 2$	Counts	RMSZ	#$|Z| > 2$
6	SEP	K	52	6	8,9,10	1.53	1 (12%)	8,12,14	1.62	2 (25%)
6	SEP	L	52	6	8,9,10	1.53	1 (12%)	8,12,14	1.62	2 (25%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	SEP	K	52	6	-	5/5/8/10	-
6	SEP	L	52	6	-	5/5/8/10	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	L	52	SEP	P-O1P	3.33	1.61	1.50
6	K	52	SEP	P-O1P	3.32	1.61	1.50

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	K	52	SEP	P-OG-CB	-3.19	109.50	118.30
6	L	52	SEP	P-OG-CB	-3.18	109.53	118.30
6	L	52	SEP	OG-CB-CA	2.80	110.87	108.14
6	K	52	SEP	OG-CB-CA	2.79	110.86	108.14

There are no chirality outliers.

5 of 10 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	K	52	SEP	N-CA-CB-OG
6	K	52	SEP	CB-OG-P-O2P
6	L	52	SEP	N-CA-CB-OG
6	L	52	SEP	CB-OG-P-O2P
6	K	52	SEP	CB-OG-P-O1P

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	L	52	SEP	1	0

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

There are no ligands in this entry.

5.7 Other polymers ⓘ

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-4404. 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
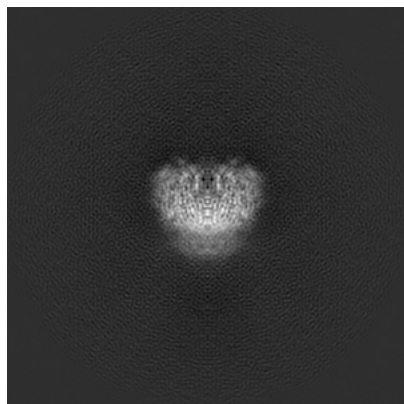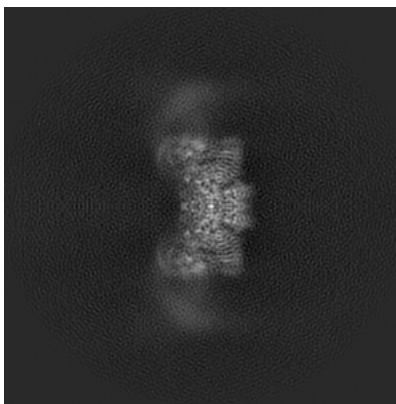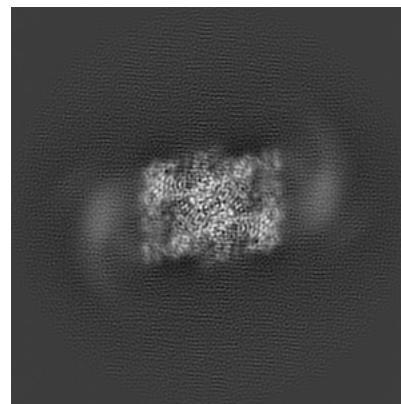
X   Y   Z

6.1.2   Raw map

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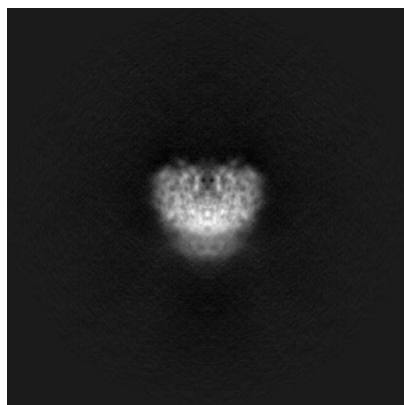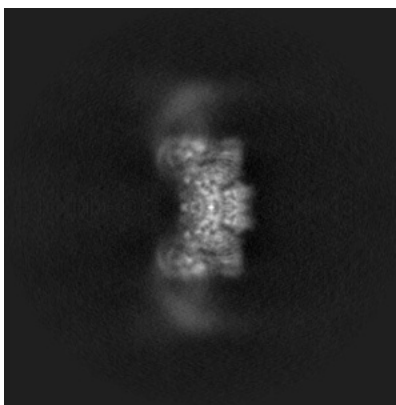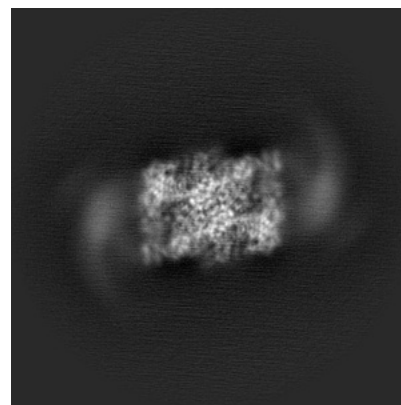
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ
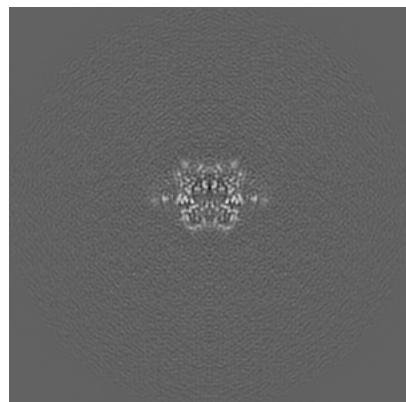
6.2.1 Primary map
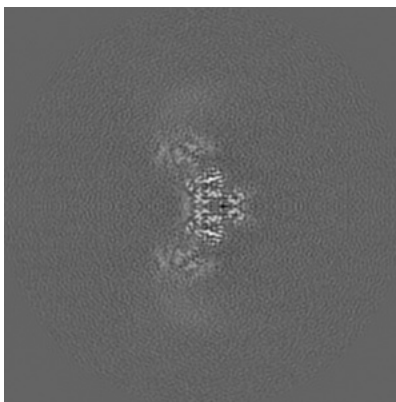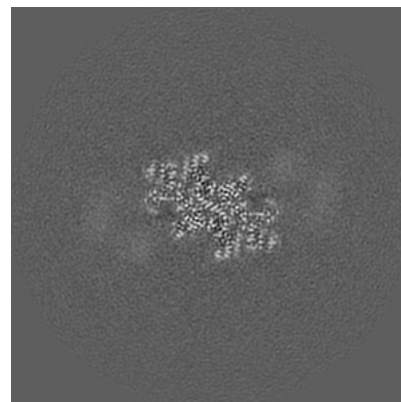
| X Index: 160 | Y Index: 160 | Z Index: 160 |

6.2.2 Raw map
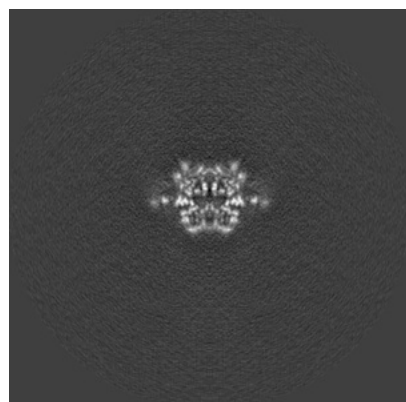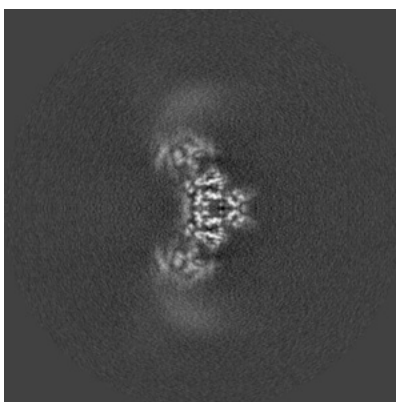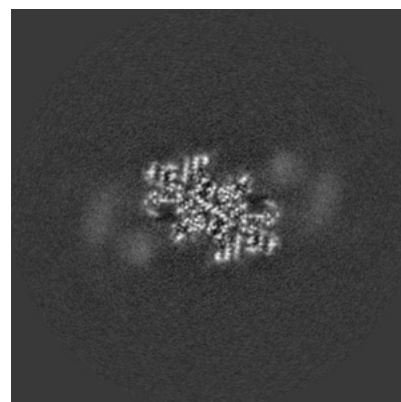
| X Index: 160 | Y Index: 160 | Z Index: 160 |

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

6.3 Largest variance slices ⓘ
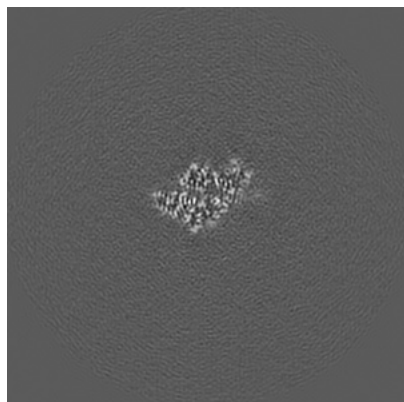
6.3.1 Primary map
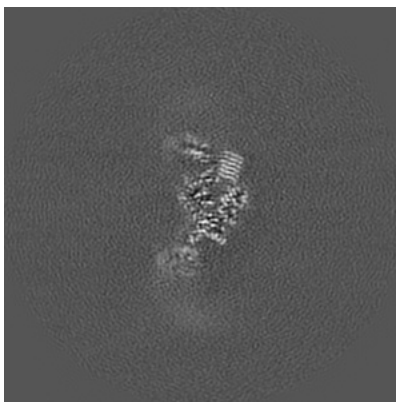
| X Index: 167 | Y Index: 151 | Z Index: 163 |
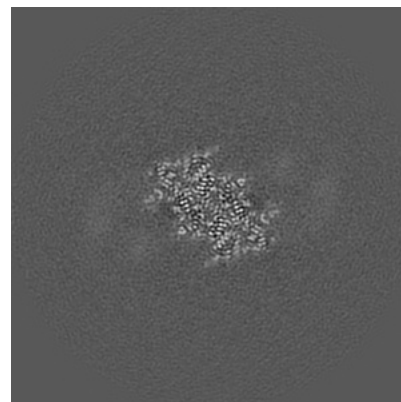
6.3.2 Raw map
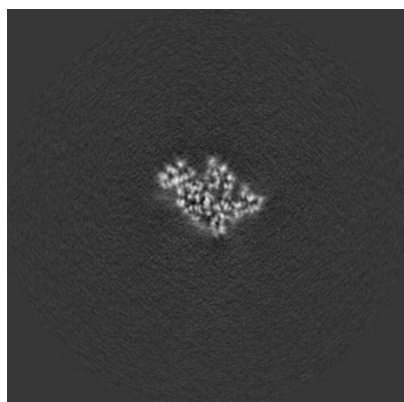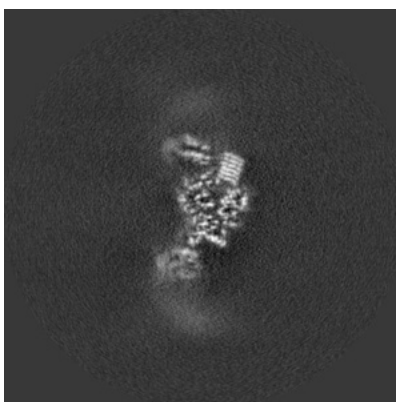
| X Index: 149 | Y Index: 151 | Z Index: 156 |
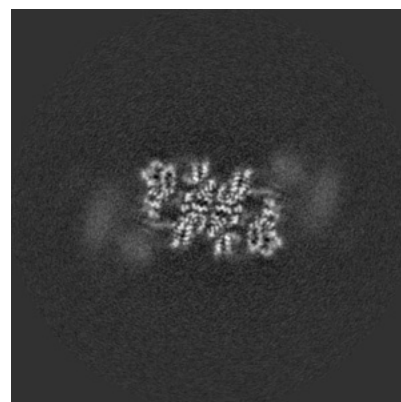
The images above show the largest variance slices of the map in three orthogonal directions.

6.4   Orthogonal surface views ⓘ
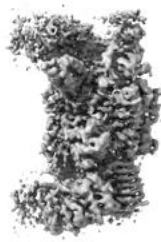
6.4.1   Primary map

X   Y   Z
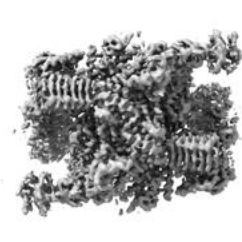
The images above show the 3D surface view of the map at the recommended contour level 0.055. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.4.2   Raw map
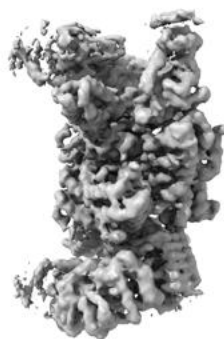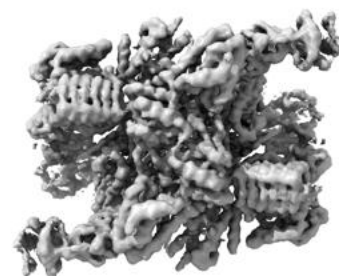
X   Y   Z

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.

6.5　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

6.5.1　emd_4404_msk_1.map (i)

X　　　　　　　　　　　Y　　　　　　　　　　　Z
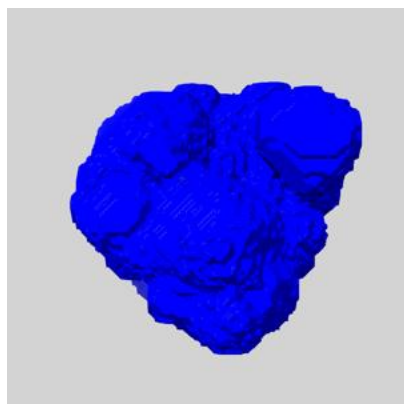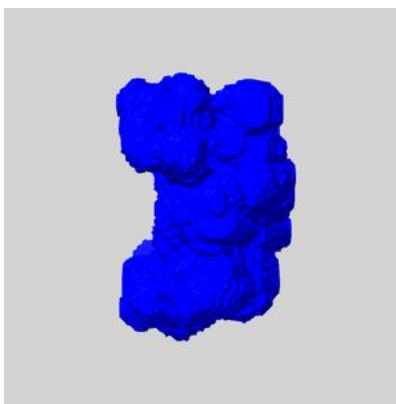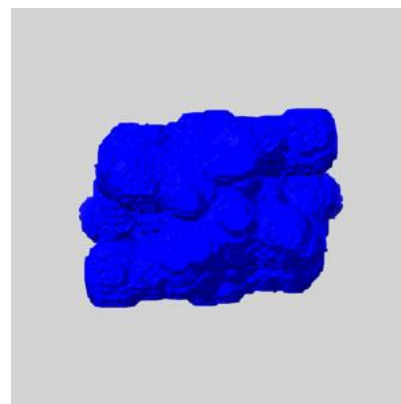
7   Map analysis ⓘ

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

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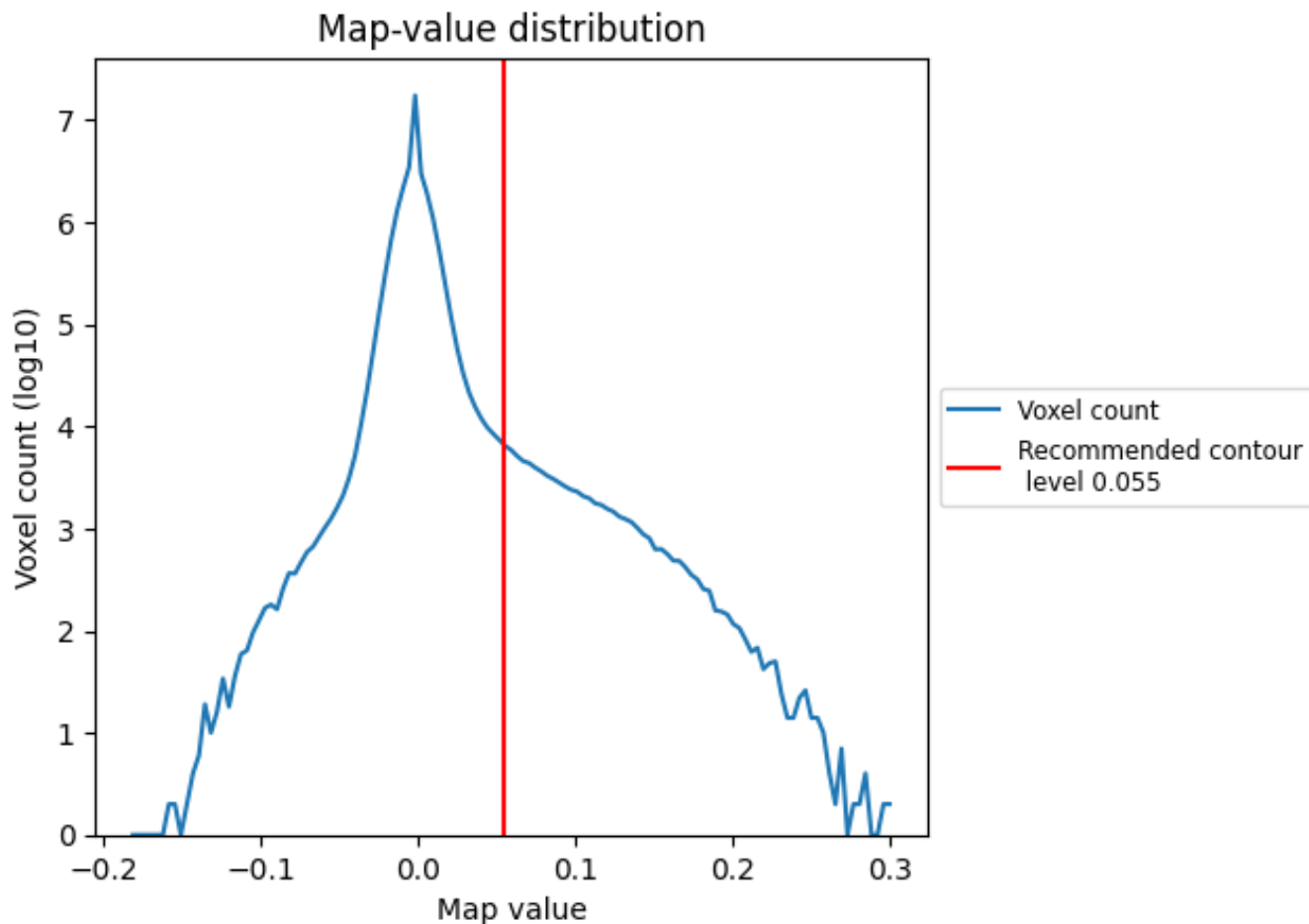
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2 Volume estimate ⓘ
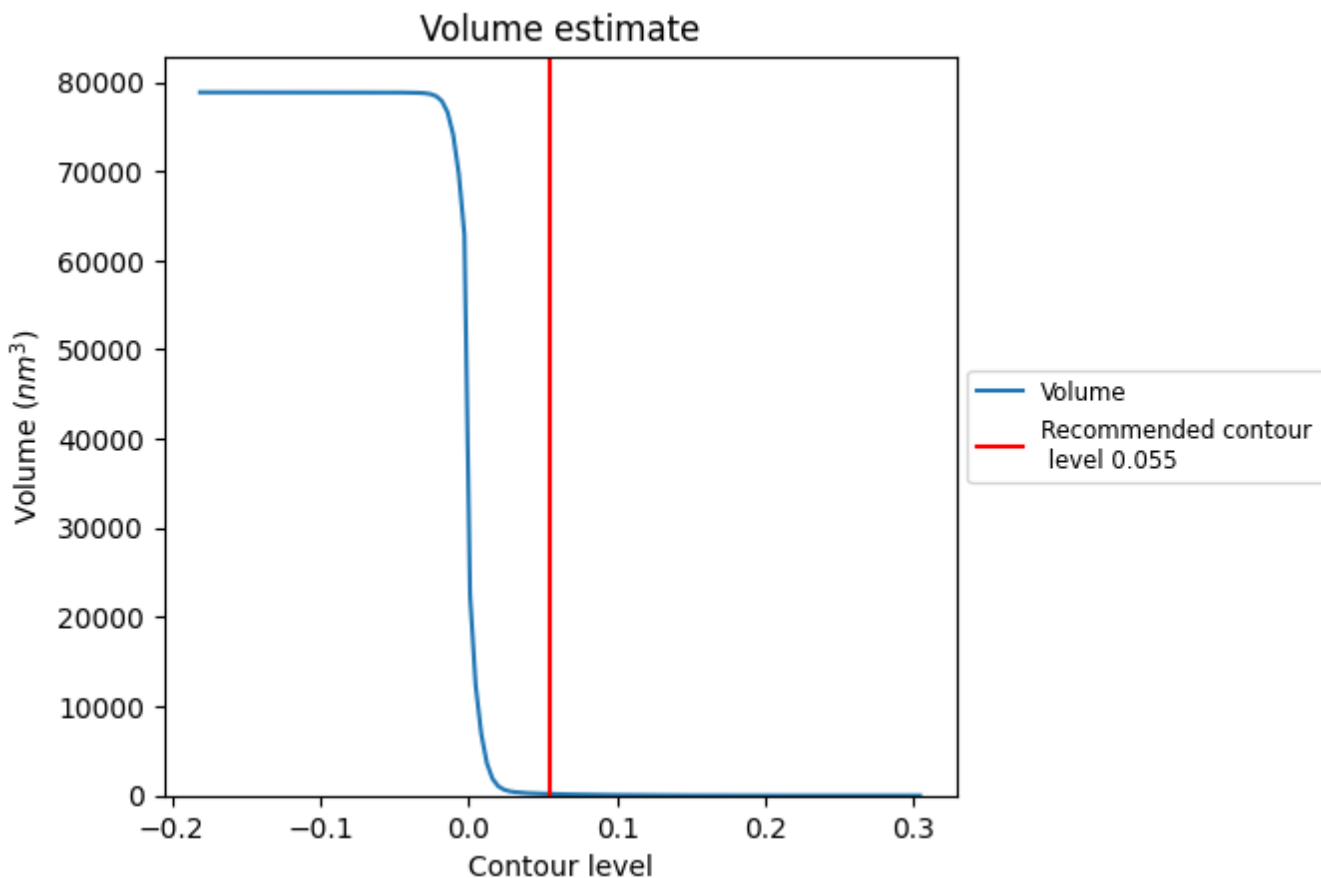
The volume at the recommended contour level is 180 nm^3; this corresponds to an approximate mass of 162 kDa.

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)
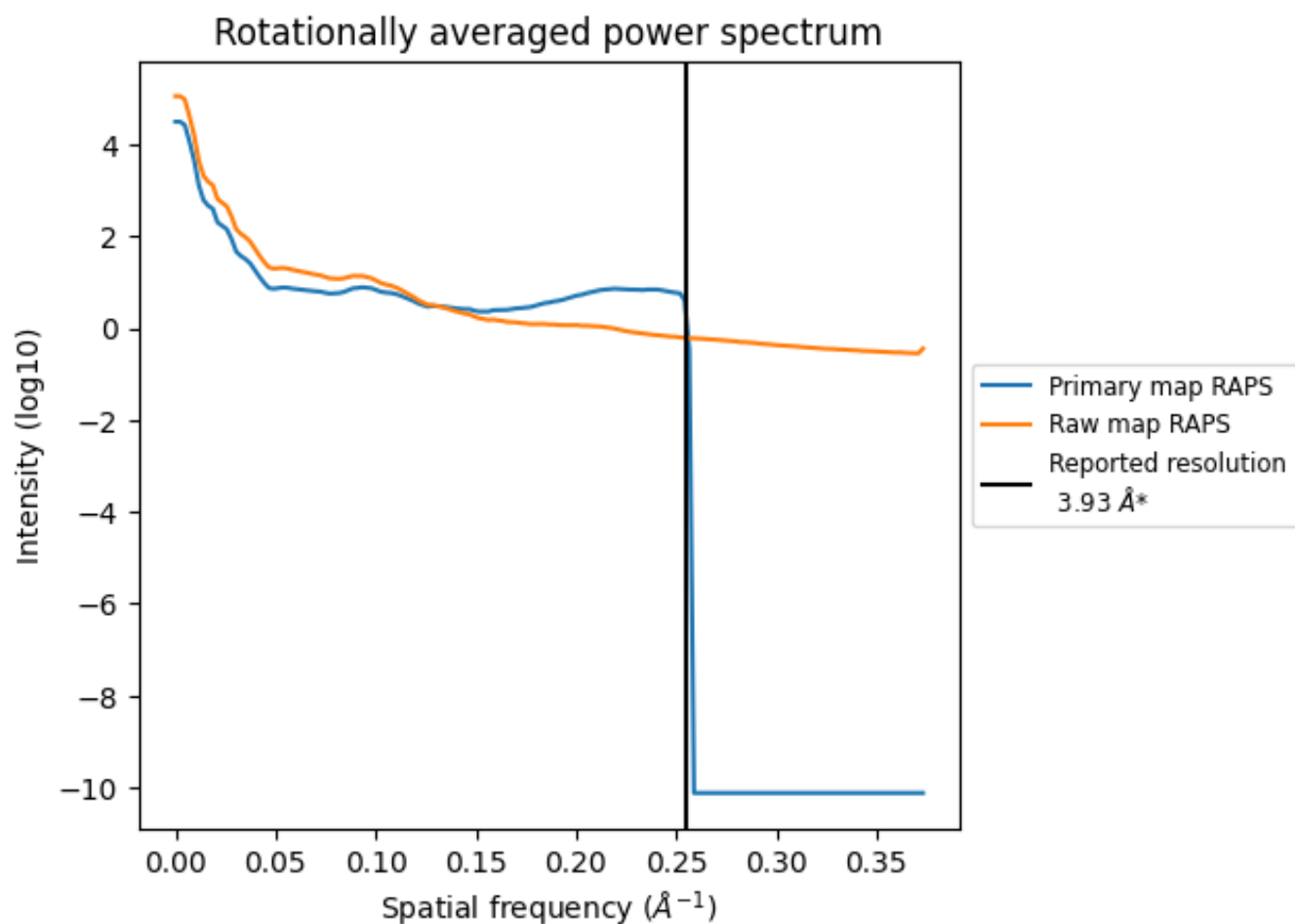
*Reported resolution corresponds to spatial frequency of 0.254 Å^{-1}

8　Fourier-Shell correlation ⓘ

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 ⓘ
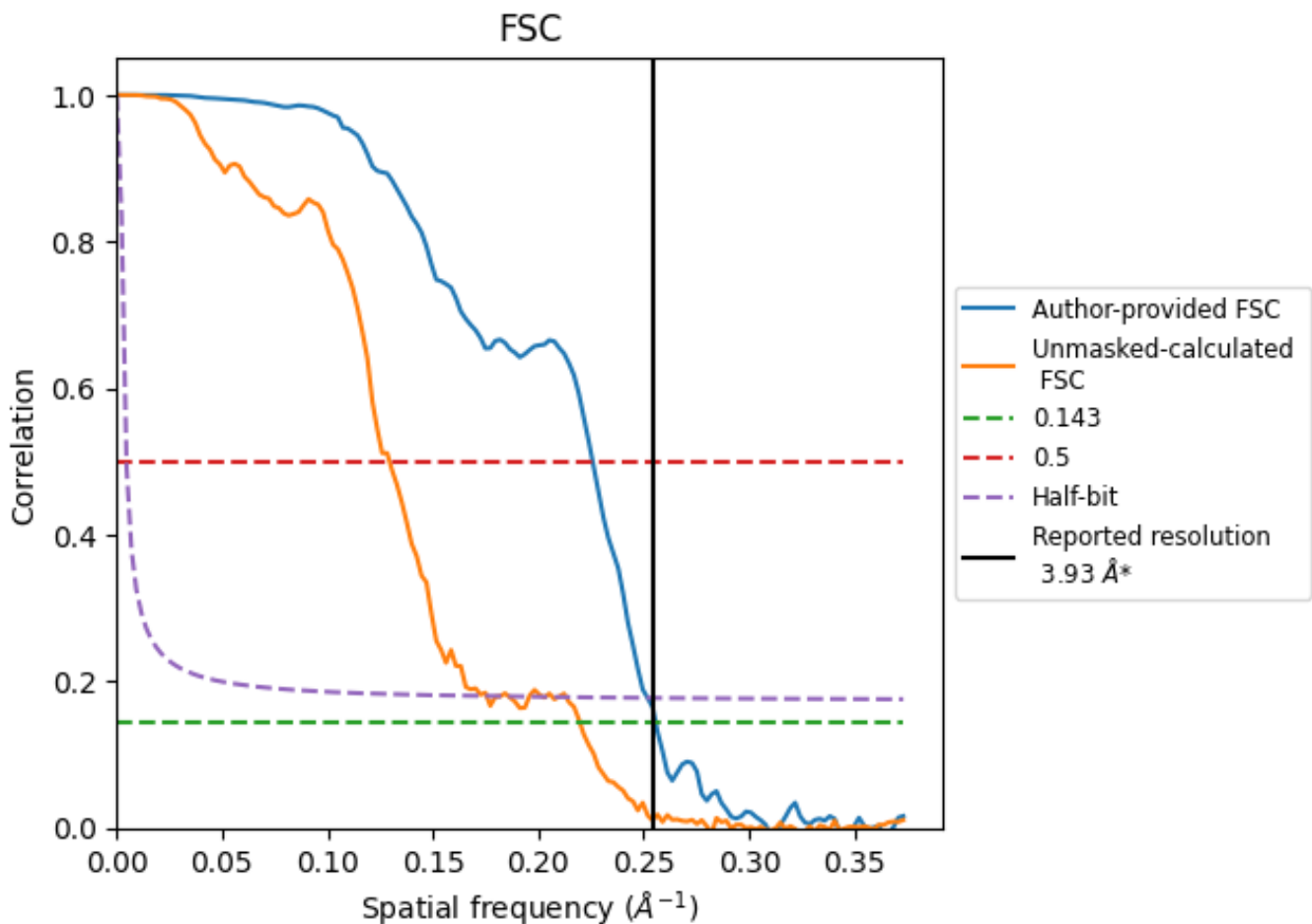
*Reported resolution corresponds to spatial frequency of 0.254 Å^{-1}

8.2 Resolution estimates ⓘ

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.93	-	-
Author-provided FSC curve	3.91	4.43	3.97
Unmasked-calculated*	4.55	7.73	5.70

*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 4.55 differs from the reported value 3.93 by more than 10 %

9　Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-4404 and PDB model 6I3M. Per-residue inclusion information can be found in section 3 on page 6.

9.1　Map-model overlay ⓘ

| X | Y | Z |
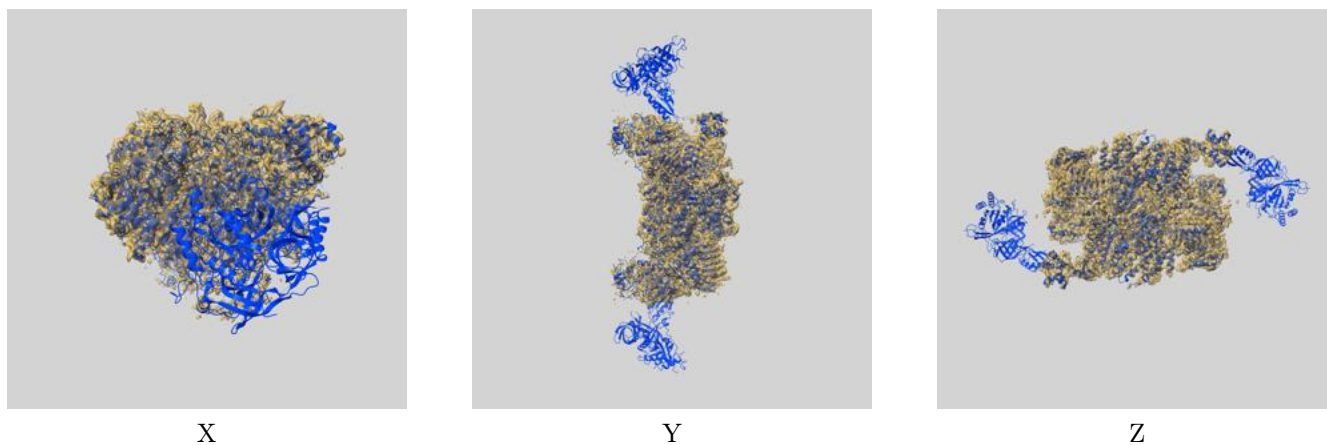
The images above show the 3D surface view of the map at the recommended contour level 0.055 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2　Q-score mapped to coordinate model　ⓘ

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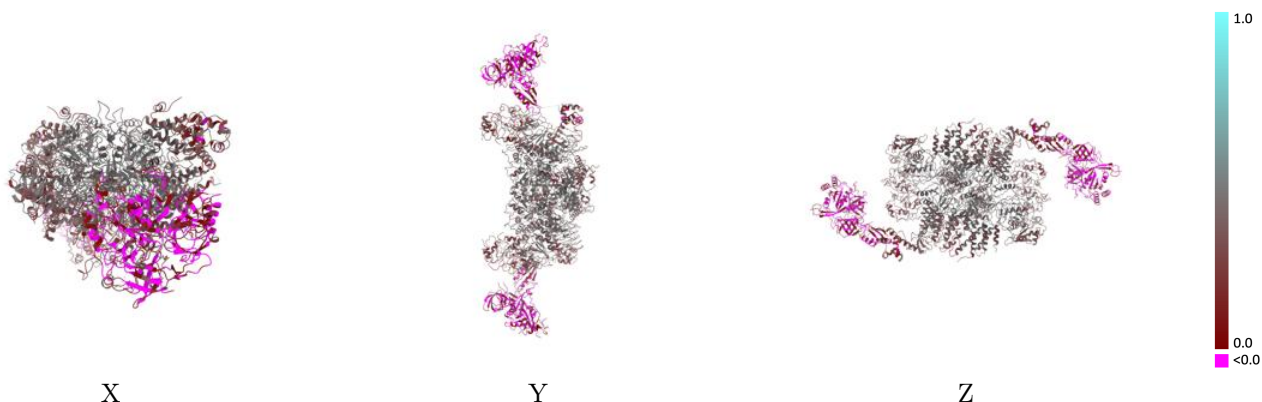
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

9.3　Atom inclusion mapped to coordinate model　ⓘ

X　　　　　　　　　　　Y　　　　　　　　　　　Z
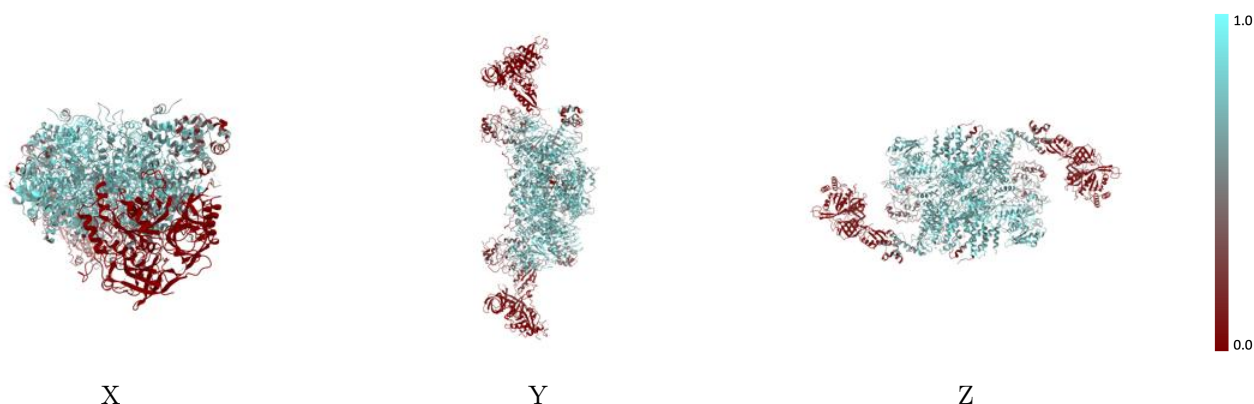
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.055).

## 9.4   Atom inclusion (i)
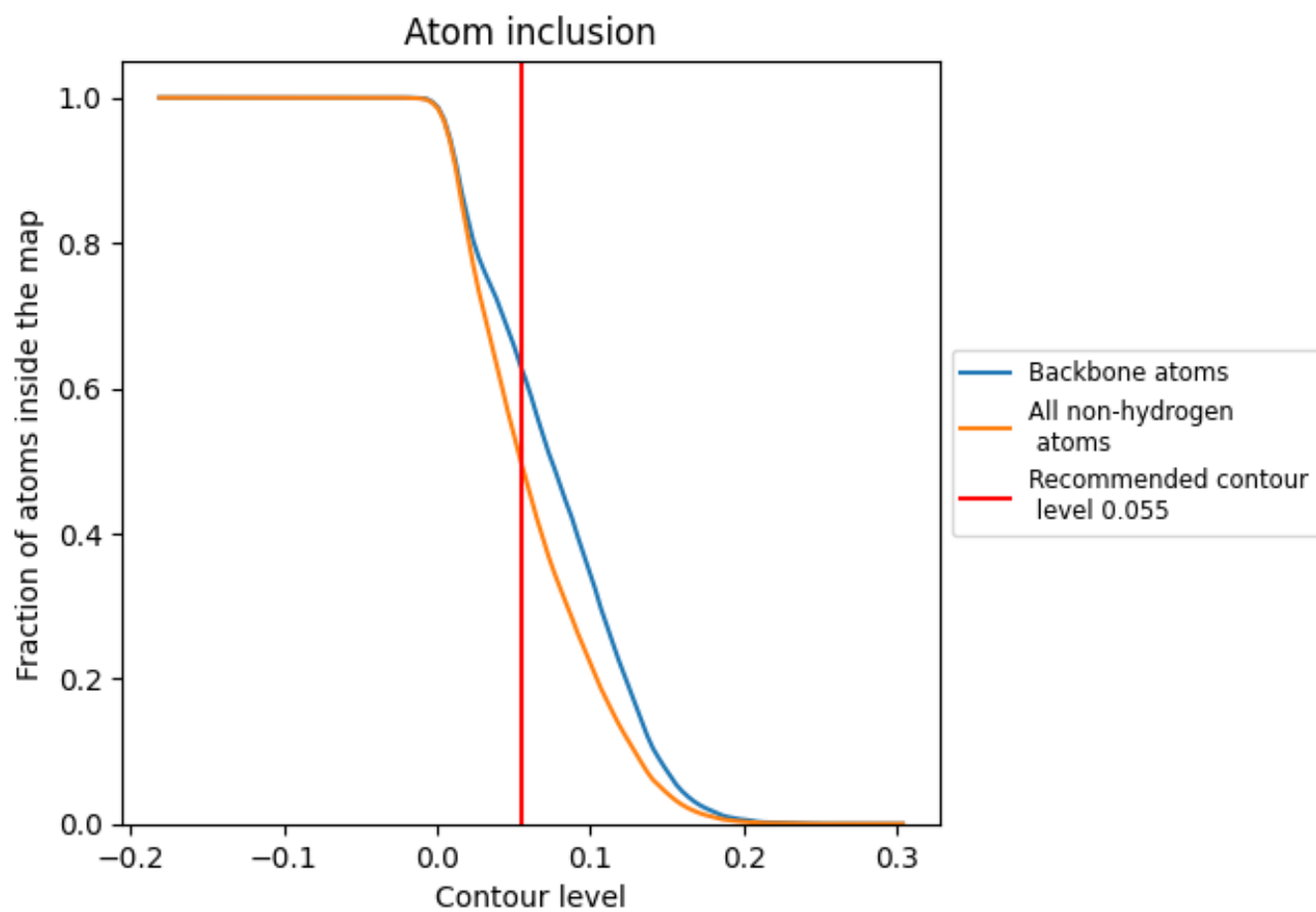
At the recommended contour level, 63% of all backbone atoms, 50% of all non-hydrogen atoms, are inside the map.

9.5   Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.055) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.4974	0.3070
A	0.7136	0.4080
B	0.7111	0.4080
C	0.6676	0.4200
D	0.6679	0.4210
E	0.6855	0.4110
F	0.6866	0.4120
G	0.6972	0.4000
H	0.6994	0.3990
I	0.3562	0.2950
J	0.3586	0.2960
K	0.3653	0.2370
L	0.3612	0.2380
M	0.0000	0.0040
N	0.0000	0.0410
O	0.0000	-0.0010
P	0.0000	-0.0040

1.0

0.0
<0.0