WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB EM Validation Report ⓘ

Oct 26, 2024 – 03:49 PM EDT

PDB ID	:	6NMI
EMDB ID	:	EMD-0452
Title	:	Cryo-EM structure of the human TFIIH core complex
Authors	:	Greber, B.J.; Toso, D.; Fang, J.; Nogales, E.
Deposited on	:	2019-01-10
Resolution	:	3.70 Å(reported)
Based on initial models	:	2JNJ, 1G25, 5OQJ, 5O85, 4ERN, 5OF4, 2DII

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

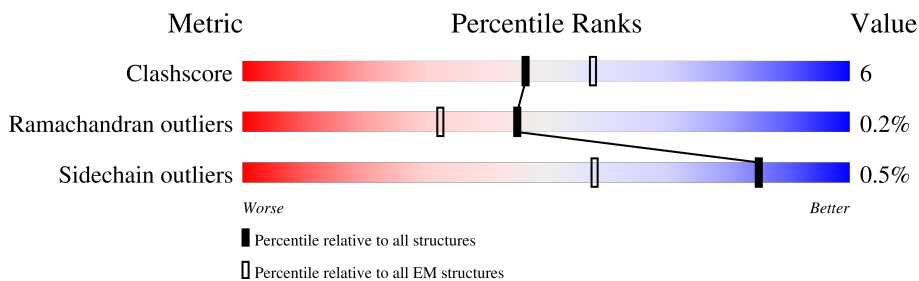|		
EMDB validation analysis	:	0.0.1.dev113
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4.02b-467
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

1 Overall quality at a glance ⓘ

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

The reported resolution of this entry is 3.70 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		6
Ramachandran outliers		0.2%
Sidechain outliers		0.5%

Worse   *Better*

▮ Percentile relative to all structures

▯ Percentile relative to all EM structures

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

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=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	653	12% — 83% — 17%
2	B	760	5% — 80% — 19% ·
3	C	548	36% — 69% — 5% — 26%
4	D	462	12% — 81% — 17% ·
5	E	366	11% — 84% — 15%
6	F	308	5% — 69% — 15% · 15%
7	G	71	18% — 82% — 11% — 7%
8	H	309	27% — 61% — 7% — 32%

2 Entry composition ⓘ

There are 10 unique types of molecules in this entry. The entry contains 24379 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 General transcription and DNA repair factor IIH helicase subunit XPB.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	653	5190	3304	899	957	30	0	0

- Molecule 2 is a protein called General transcription and DNA repair factor IIH helicase subunit XPD.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	760	6040	3856	1056	1099	29	0	0

- Molecule 3 is a protein called General transcription factor IIH subunit 1, p62.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	408	2657	1657	489	504	7	0	0

- Molecule 4 is a protein called General transcription factor IIH subunit 4, p52.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	D	452	3589	2307	631	637	14	0	0

- Molecule 5 is a protein called General transcription factor IIH subunit 2, p44.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	E	366	2710	1703	476	505	26	0	0

- Molecule 6 is a protein called General transcription factor IIH subunit 3, p34.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	F	263	Total 2065	C 1323	N 344	O 379	S 19	0	0

- Molecule 7 is a protein called General transcription factor IIH subunit 5, p8.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	66	Total 522	C 336	N 83	O 100	S 3	0	0

- Molecule 8 is a protein called CDK-activating kinase assembly factor MAT1.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	210	Total 1592	C 986	N 281	O 316	S 9	0	0

- Molecule 9 is IRON/SULFUR CLUSTER (three-letter code: SF4) (formula: Fe_4S_4).
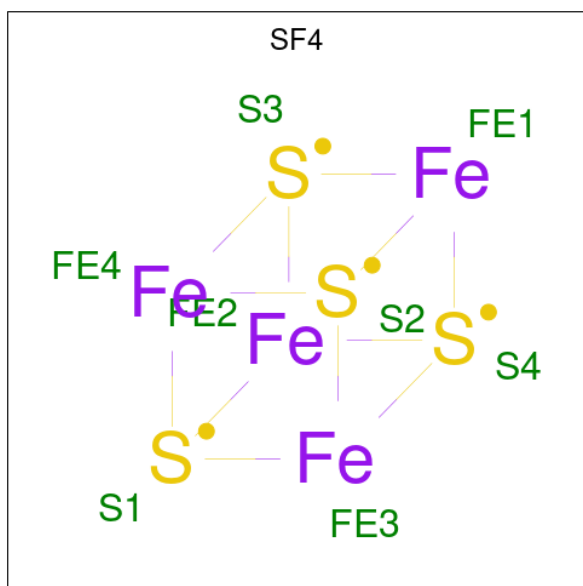
Mol	Chain	Residues	Atoms			AltConf
9	B	1	Total 8	Fe 4	S 4	0

- Molecule 10 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
10	E	3	Total 3	Zn 3	0

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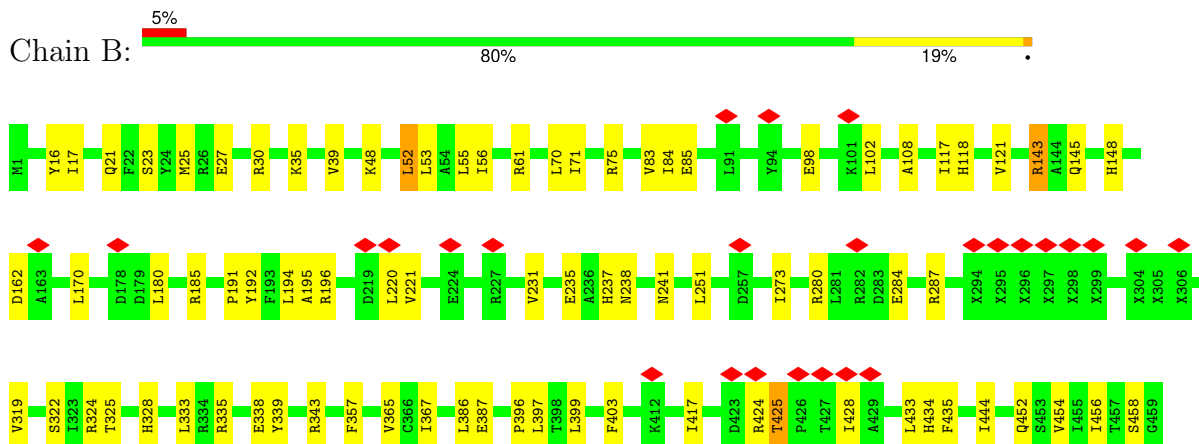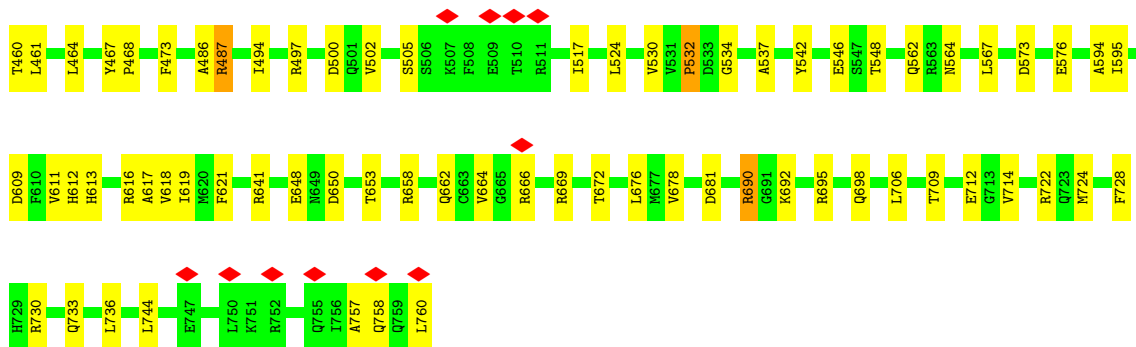| Mol	Chain	Residues	Atoms		AltConf
10	F	1	Total 1	Zn 1	0
10	H	2	Total 2	Zn 2	0

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.

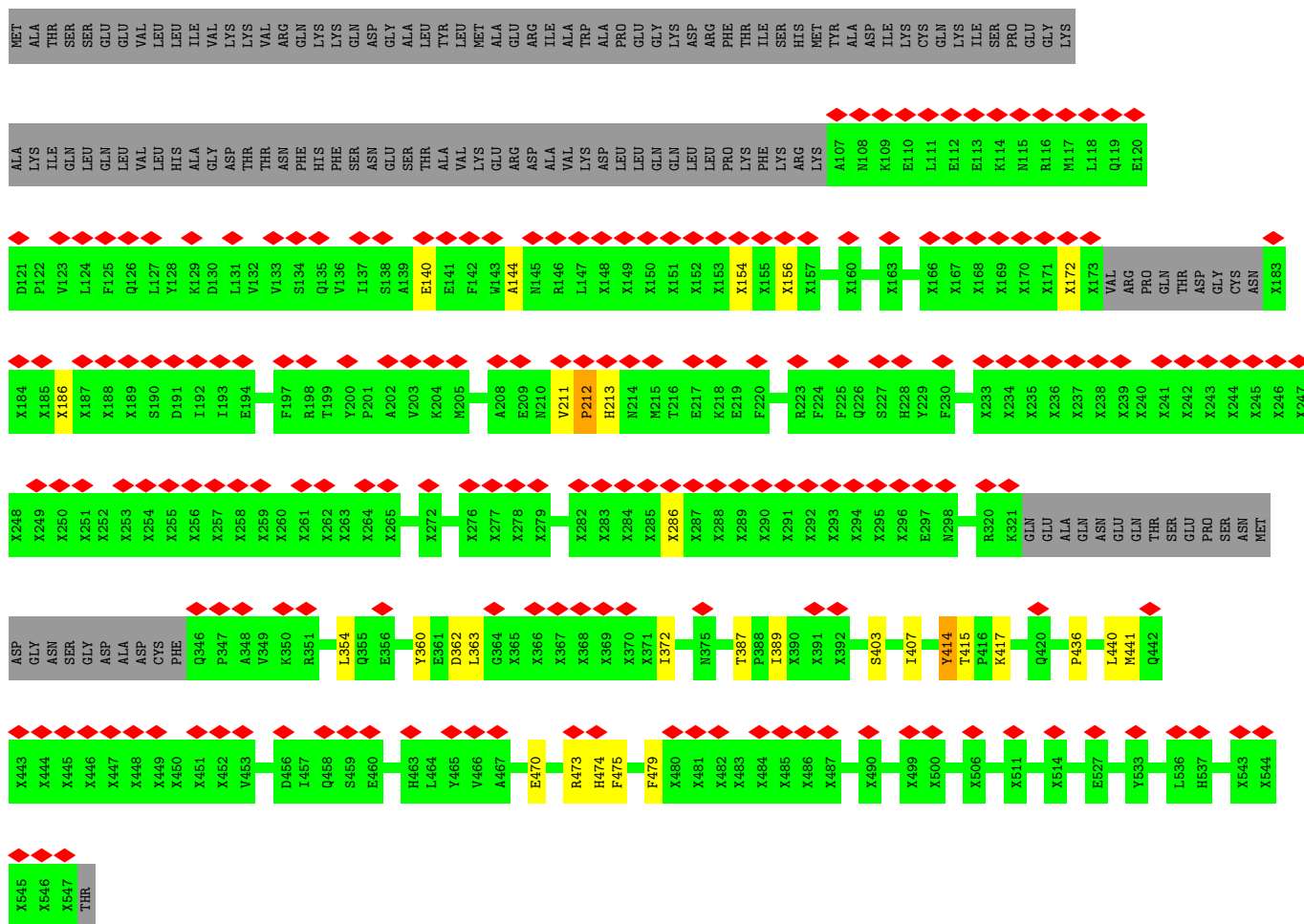• Molecule 1: General transcription and DNA repair factor IIH helicase subunit XPB

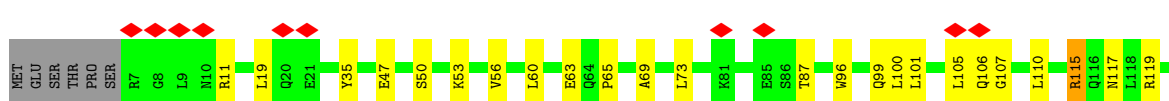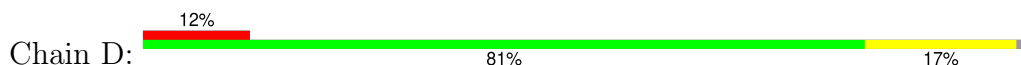• Molecule 2: General transcription and DNA repair factor IIH helicase subunit XPD

T460 L461 L464 Y467 P468 F473 A486 R487 T494 R497 D500 Q501 V502 S505 S506 K507 F508 E509 T510 R511 I517 L524 V530 V531 P532 D533 G534 A537 Y542 E546 S547 T548 Q562 R563 N564 L567 D573 E576 A594 I595

D609 F610 V611 H612 H613 R616 A617 V618 I619 M620 F621 R641 E648 N649 D650 T653 R658 Q662 C663 V664 G665 R666 R669 T672 L676 M677 V678 D681 R690 Q691 K692 R695 Q698 L706 T709 E712 Q713 V714 R722 Q723 M724 F728

H729 R730 Q733 L736 L744 E747 L750 K751 R752 Q755 I756 A757 Q758 Q759 L760

• Molecule 3: General transcription factor IIH subunit 1, p62

Chain C:

36%

69% 5% 26%

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

ALA LYS ILE GLN LEU GLN LEU VAL LEU HIS ALA GLY ASP THR THR ASN PHE HIS PHE SER ASN GLU SER THR ALA VAL LYS GLU ARG ASP VAL LYS ASP LEU GLN LEU LEU PRO LYS PHE LYS ARG LYS A107 N108 K109 E110 L111 E112 E113 K114 N115 R116 M117 L118 Q119 E120

D121 P122 V123 L124 F125 Q126 L127 Y128 K129 D130 L131 V132 V133 S134 Q135 V136 I137 S138 A139 E140 E141 F142 W143 A144 N145 R146 L147 X148 X149 X150 X151 X152 X153 X154 X155 X156 X157 X160 X163 X166 X167 X168 X169 X170 X171 X172 X173 VAL ARG PRO GLN THR ASP GLY CYS ASN X183

X184 X185 X186 X187 X188 X189 S190 D191 I192 I193 E194 F197 R198 T199 Y200 P201 A202 V203 K204 M205 A208 E209 N210 V211 P212 H213 N214 M215 T216 E217 K218 E219 F220 R223 F224 F225 Q226 S227 Y229 H228 F230 X233 X234 X235 X236 X237 X238 X239 X240 X241 X242 X243 X244 X245 X246 X247

X248 X249 X250 X251 X252 X253 X254 X255 X256 X257 X258 X259 X260 X261 X262 X263 X264 X265 X272 X276 X277 X278 X279 X282 X283 X284 X285 X286 X287 X288 X289 X290 X291 X292 X293 X294 X295 X296 E297 N298 R320 K321 GLN GLU ALA GLN ASN GLU GLN THR SER GLU PRO SER ASN MET

ASP GLY ASN SER GLY ASP ALA ASP CYS PHE Q346 P347 A348 V349 K350 R351 L354 Q355 E356 Y360 E361 D362 L363 G364 X365 X366 X367 X368 X369 X370 X371 I372 N375 T387 P388 I389 X390 X391 X392 S403 I407 Y414 T415 P416 K417 Q420 P436 L440 M441 Q442

X443 X444 X445 X446 X447 X448 X449 X450 X451 X452 V453 D456 I457 Q458 S459 E460 H463 L464 Y465 V466 A467 E470 R473 H474 F475 F479 X480 X481 X482 X483 X484 X485 X486 X487 X490 X499 X500 X506 X511 X514 E527 Y533 L536 H537 X543 X544
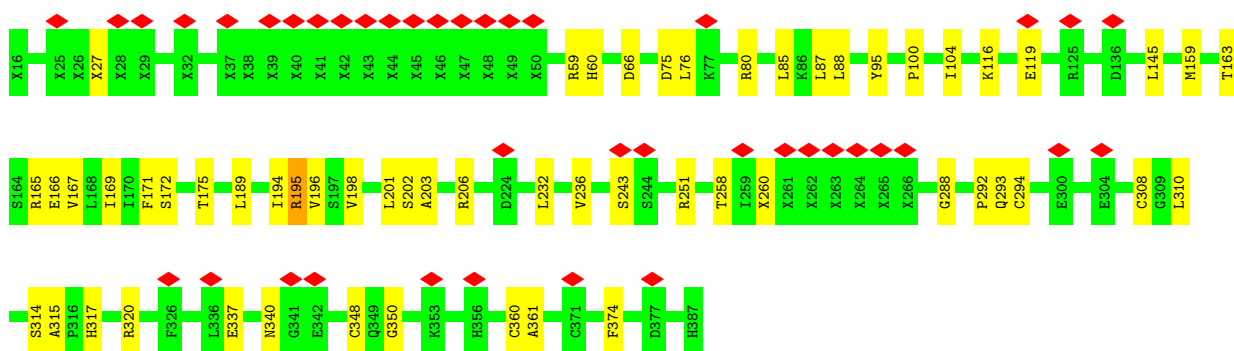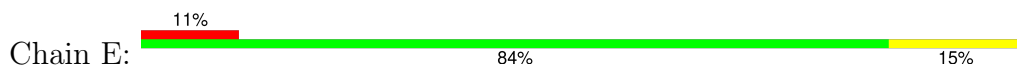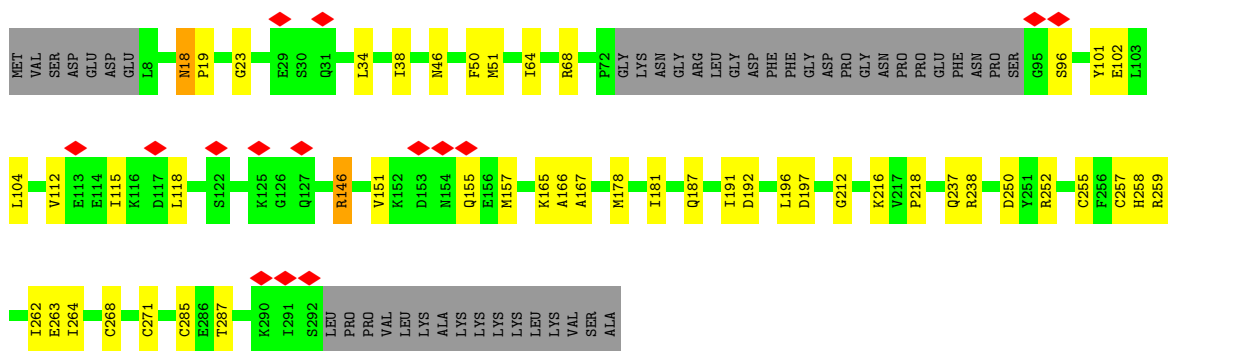
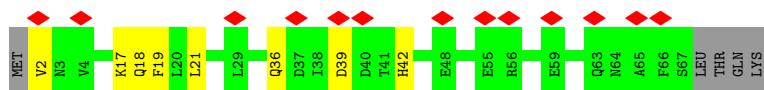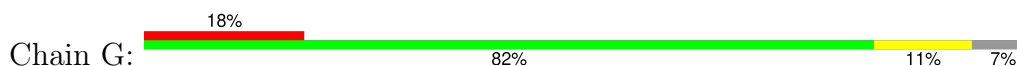X545 X546 X547 THR

• Molecule 4: General transcription factor IIH subunit 4, p52
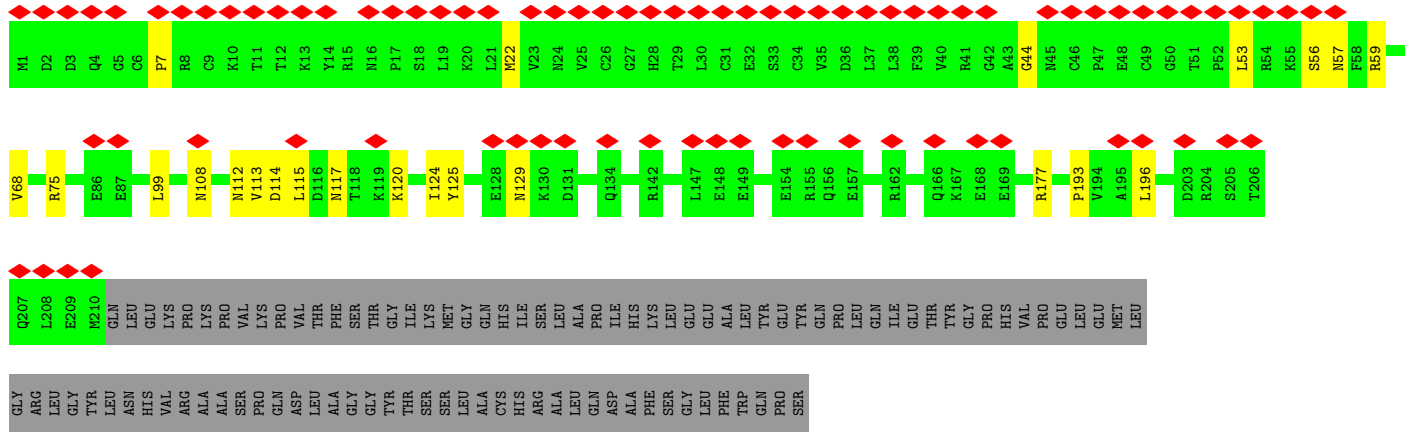
Chain D:

12%

81% 17% •

MET GLU SER THR PRO SER R7 G8 L9 N10 R11 L19 Q20 E21 Y35 E47 S50 K53 V56 L60 E63 Q64 P65 A69 L73 K81 E85 S86 T87 W96 Q99 L100 L101 L105 Q106 G107 L110 R115 Q116 N117 L118 R119

![Worldwide Protein Data Bank logo]

L123 W129 S130 D131 S134 Q135 L136 K140 H141 A152 L160 M163 P167 A170 V171 L175 Q181 T188 E189 P190 G191 E192 F215 L220 Q221 T222 I233 Q239 L240 L245 G246 Y249 S255 D256 S257 L258 L259 L265 R266 Q273

K277 R280 R285 L286 V294 S295 G296 A297 G298 G299 T300 V301 H302 Q303 P304 V308 V309 E310 T311 N312 Y313 Y316 Y336 R337 V343 M376 I387 E405 G406 V407 N410 Q411 F412 L413 S414 Q415 F418 H424 A425 R426 E427 L428 G429 V430 F433

E434 A437 K438 R439 L440 M441 V442 A446 G447 H448 S449 D450 V451 K452 R453 K456 R457 Q458 LYS HIS SER SER

• Molecule 5: General transcription factor IIH subunit 2, p44

Chain E:

11%

84% 15%

X16 X25 X26 X27 X28 X29 X32 X37 X38 X39 X40 X41 X42 X43 X44 X45 X46 X47 X48 X49 X50 R59 H60 D66 D75 L76 K77 R80 L85 K86 L87 L88 Y95 P100 I104 K116 E119 R125 D136 L145 M159 T163

S164 R165 E166 V167 L168 I169 I170 F171 S172 T175 L189 I194 R195 V196 S197 V198 L201 S202 A203 R206 D224 L232 V236 S243 S244 R251 T258 I259 Y260 K261 K262 K263 X264 X265 X266 G288 P292 Q293 C294 E300 E304 C308 G309 L310

S314 A315 P316 H317 R320 F326 L336 E337 N340 G341 E342 C348 Q349 G350 K353 H356 C360 A361 C371 F374 D377 H387

• Molecule 6: General transcription factor IIH subunit 3, p34

Chain F:

5%

69% 15% • 15%

MET VAL SER ASP GLU ASP GLU L8 N18 P19 G23 E29 S30 Q31 L34 I38 N46 F50 M51 I64 R68 P72 GLY LYS ASN GLY ARG LEU GLY ASP PHE PHE GLY ASP PRO GLY ASN PRO GLU PHE ASN PRO SER G95 S96 Y101 E102 L103

L104 V112 E113 E114 I115 K116 D117 L118 S122 K125 G126 Q127 R146 V151 K152 D153 N154 Q155 E156 M157 K165 A166 A167 M178 I181 Q187 I191 D192 L196 D197 G212 K216 V217 P218 Q237 R238 D250 Y251 R252 C255 F256 C257 H258 R259

I262 E263 I264 C268 C271 C285 E286 T287 K290 I291 S292 LEU PRO PRO VAL LEU LYS ALA LYS LYS LYS LEU LYS LYS LEU LYS VAL SER ALA

• Molecule 7: General transcription factor IIH subunit 5, p8

Chain G:

18%

82% 11% 7%

MET V2 N3 V4 K17 Q18 F19 L20 L21 L29 Q36 D37 I38 D39 D40 T41 H42 E48 E55 R56 E59 Q63 N64 A65 F66 S67 LEU THR GLN LYS

• Molecule 8: CDK-activating kinase assembly factor MAT1

Chain H:

27%

61% 7% 32%

M1 D2 D3 Q4 G5 C6 P7 R8 C9 K10 T11 T12 K13 Y14 R15 N16 P17 S18 L19 K20 L21 M22 V23 N24 V25 C26 G27 H28 T29 L30 C31 E32 S33 C34 V35 D36 L37 L38 F39 V40 R41 G42 A43 G44 N45 C46 P47 E48 C49 G50 T51 P52 L53 R54 K55 S56 N57 F58 R59

V68 R75 E86 E87 L99 N108 N112 V113 D114 L115 D116 N117 T118 K119 K120 I124 Y125 E128 N129 K130 D131 Q134 R142 L147 E148 E149 E154 R155 Q156 E157 R162 Q166 K167 E168 E169 R177 P193 V194 A195 L196 D203 R204 S205 T206

Q207 L208 E209 M210 GLN LEU GLU LYS PRO LYS PRO VAL LYS PRO VAL THR PHE SER THR GLY ILE LYS MET GLY GLN HIS ILE SER LEU ALA PRO ILE HIS LYS LEU GLU GLU ALA LEU TYR GLU TYR GLN PRO LEU GLN ILE GLU GLU THR TYR GLY PRO HIS VAL PRO GLU LEU GLU MET LEU

GLY ARG LEU GLY TYR LEU ASN HIS VAL ARG ALA ALA SER PRO GLN ASP LEU ALA GLY GLY TYR THR SER SER LEU ALA CYS HIS ARG ALA LEU GLN ASP ALA PHE SER GLY LEU PHE TRP GLN PRO SER

4   Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	138659	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION; CTF correction during 3D reconstruction in RELION 3.	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{Å}^2)$	50	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	700	Depositor
Magnification	43478	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.148	Depositor
Minimum map value	-0.069	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.004	Depositor
Recommended contour level	0.0172	Depositor
Map size (Å)	294.4, 294.4, 294.4	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.15, 1.15, 1.15	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, SF4

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	0.40	0/5206	0.61	0/7035
2	B	0.44	0/6028	0.66	2/8157 (0.0%)
3	C	0.34	0/1847	0.57	1/2499 (0.0%)
4	D	0.38	0/3672	0.61	0/4979
5	E	0.42	0/2484	0.63	0/3364
6	F	0.39	0/2102	0.56	0/2844
7	G	0.33	0/528	0.63	0/713
8	H	0.32	0/1609	0.55	0/2170
All	All	0.40	0/23476	0.62	3/31761 (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	5
2	B	0	3
3	C	0	3
4	D	0	3
5	E	0	2
8	H	0	1
All	All	0	17

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	444	ILE	CG1-CB-CG2	-6.12	97.93	111.40
2	B	52	LEU	CA-CB-CG	6.02	129.14	115.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	C	414	TYR	C-N-CA	5.60	135.70	121.70

There are no chirality outliers.

All (17) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	400	PRO	Peptide
1	A	475	ASP	Peptide
1	A	476	LYS	Peptide
1	A	503	ALA	Peptide
1	A	55	GLU	Peptide
2	B	102	LEU	Peptide
2	B	425	THR	Peptide
2	B	532	PRO	Peptide
3	C	211	VAL	Peptide
3	C	212	PRO	Peptide
3	C	415	THR	Peptide
4	D	134	SER	Peptide
4	D	189	GLU	Peptide
4	D	192	GLU	Peptide
5	E	260	UNK	Peptide
5	E	315	ALA	Peptide
8	H	56	SER	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	5190	0	5150	66	0
2	B	6040	0	5970	88	0
3	C	2657	0	1864	20	0
4	D	3589	0	3621	43	0
5	E	2710	0	2472	41	0
6	F	2065	0	2098	37	0
7	G	522	0	528	6	0
8	H	1592	0	1461	14	0
9	B	8	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
10	E	3	0	0	0	0
10	F	1	0	0	0	0
10	H	2	0	0	0	0
All	All	24379	0	23164	280	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 6.

All (280) 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)
5:E:294:CYS:HB3	5:E:308:CYS:SG	1.93	1.09
2:B:534:GLY:HA2	2:B:594:ALA:O	1.62	0.98
6:F:191:ILE:O	6:F:212:GLY:HA3	1.67	0.94
6:F:268:CYS:HB3	6:F:271:CYS:SG	2.14	0.87
1:A:374:TRP:O	1:A:378:PHE:HB2	1.83	0.77
6:F:46:ASN:O	6:F:50:PHE:HB2	1.85	0.76
4:D:130:SER:HB2	4:D:239:GLN:HE22	1.55	0.72
8:H:125:TYR:O	8:H:129:ASN:HB2	1.91	0.70
2:B:487:ARG:HE	2:B:724:MET:HG2	1.59	0.67
2:B:468:PRO:HA	2:B:473:PHE:HB3	1.78	0.66
7:G:39:ASP:HB3	7:G:42:HIS:H	1.63	0.64
5:E:116:LYS:HE2	5:E:119:GLU:HG2	1.80	0.64
7:G:17:LYS:NZ	7:G:39:ASP:O	2.32	0.62
2:B:16:TYR:HE2	2:B:730:ARG:HE	1.48	0.62
5:E:350:GLY:HA3	6:F:146:ARG:HH22	1.65	0.62
1:A:74:ARG:NH2	5:E:27:UNK:O	2.33	0.61
1:A:455:LEU:HD22	1:A:483:LEU:HG	1.81	0.61
1:A:182:PRO:HB3	1:A:268:VAL:HG21	1.83	0.60
2:B:23:SER:HB2	2:B:757:ALA:HB2	1.82	0.60
2:B:231:VAL:HB	2:B:454:VAL:HG12	1.83	0.60
2:B:617:ALA:HA	2:B:676:LEU:O	2.01	0.60
1:A:325:ARG:NH1	2:B:712:GLU:OE2	2.34	0.59
2:B:333:LEU:HD13	2:B:397:LEU:HD11	1.83	0.59
4:D:60:LEU:O	4:D:119:ARG:NH2	2.35	0.59
2:B:728:PHE:HE2	2:B:733:GLN:HE21	1.51	0.59
1:A:105:GLU:HG3	1:A:122:SER:HB3	1.85	0.58
5:E:337:GLU:O	5:E:340:ASN:ND2	2.37	0.58
8:H:108:ASN:OD1	8:H:112:ASN:ND2	2.36	0.58
5:E:360:CYS:SG	5:E:361:ALA:N	2.77	0.58
6:F:38:ILE:HG21	6:F:115:ILE:HD13	1.86	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:338:GLU:HG3	8:H:68:VAL:HG21	1.85	0.57
2:B:143:ARG:NH2	2:B:162:ASP:OD2	2.37	0.57
5:E:292:PRO:HB3	6:F:263:GLU:HG3	1.85	0.57
2:B:284:GLU:OE2	2:B:287:ARG:NH2	2.37	0.57
1:A:109:ARG:NH1	1:A:492:ASN:OD1	2.37	0.57
2:B:84:ILE:HG13	2:B:108:ALA:HB2	1.87	0.57
4:D:35:TYR:O	4:D:117:ASN:ND2	2.38	0.57
2:B:532:PRO:HG3	5:E:203:ALA:HB1	1.85	0.57
6:F:166:ALA:HB2	6:F:196:LEU:HD12	1.86	0.57
2:B:192:TYR:OH	2:B:196:ARG:NH2	2.37	0.56
4:D:69:ALA:O	4:D:73:LEU:HB2	2.04	0.56
3:C:470:GLU:OE2	3:C:474:HIS:NE2	2.38	0.56
2:B:339:TYR:OH	2:B:343:ARG:NH2	2.35	0.56
2:B:71:ILE:HB	2:B:231:VAL:HG22	1.88	0.56
2:B:396:PRO:O	2:B:399:LEU:HB3	2.06	0.56
4:D:336:TYR:HB2	4:D:343:VAL:HB	1.88	0.56
5:E:145:LEU:HD11	5:E:169:ILE:HD13	1.87	0.56
6:F:197:ASP:O	6:F:216:LYS:NZ	2.39	0.56
2:B:322:SER:HB3	8:H:99:LEU:HB3	1.88	0.56
1:A:677:GLN:NE2	4:D:313:TYR:OH	2.35	0.56
2:B:17:ILE:HD11	2:B:744:LEU:HD21	1.87	0.56
3:C:407:ILE:HD11	6:F:34:LEU:HD22	1.88	0.56
6:F:285:CYS:SG	6:F:287:THR:OG1	2.64	0.56
3:C:475:PHE:O	3:C:479:PHE:HB2	2.06	0.55
4:D:129:TRP:O	4:D:239:GLN:NE2	2.39	0.55
4:D:255:SER:H	4:D:258:LEU:HD12	1.71	0.55
1:A:374:TRP:NE1	1:A:441:ASP:OD2	2.39	0.55
2:B:325:THR:HB	2:B:328:HIS:HD2	1.71	0.55
1:A:344:ALA:HB2	1:A:502:ILE:HD11	1.88	0.55
4:D:53:LYS:NZ	6:F:51:MET:O	2.38	0.55
2:B:237:HIS:CE1	2:B:460:THR:HB	2.42	0.54
6:F:165:LYS:NZ	6:F:167:ALA:O	2.37	0.54
1:A:365:GLY:HA2	1:A:441:ASP:HB2	1.89	0.54
2:B:690:ARG:O	2:B:698:GLN:NE2	2.41	0.54
2:B:39:VAL:HG22	2:B:456:ILE:HB	1.88	0.54
2:B:238:ASN:HB3	2:B:241:ASN:HB2	1.88	0.54
1:A:306:ILE:HD13	1:A:404:SER:HA	1.90	0.54
3:C:436:PRO:HA	3:C:441:MET:HG2	1.90	0.54
4:D:424:HIS:HD2	4:D:451:VAL:HG22	1.73	0.54
4:D:433:PHE:HB3	4:D:442:VAL:HB	1.90	0.54
2:B:56:ILE:HG21	2:B:70:LEU:HD13	1.89	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:54:ASP:OD2	4:D:337:ARG:NH1	2.38	0.53
1:A:480:LEU:HD22	1:A:483:LEU:HD22	1.89	0.53
5:E:80:ARG:NH2	5:E:202:SER:OG	2.41	0.53
5:E:100:PRO:HG3	5:E:320:ARG:HD2	1.91	0.53
3:C:470:GLU:OE1	3:C:473:ARG:NH1	2.41	0.53
4:D:294:VAL:HG12	4:D:296:GLY:H	1.73	0.53
5:E:348:CYS:SG	6:F:146:ARG:NH1	2.81	0.53
1:A:510:VAL:HG22	1:A:690:ILE:HB	1.90	0.53
2:B:61:ARG:NH2	2:B:98:GLU:OE2	2.42	0.53
5:E:169:ILE:HG22	5:E:171:PHE:HB2	1.91	0.53
6:F:151:VAL:HG13	6:F:155:GLN:HG3	1.91	0.53
2:B:609:ASP:OD1	2:B:666:ARG:NH1	2.42	0.52
6:F:101:TYR:HD2	6:F:104:LEU:HG	1.74	0.52
6:F:192:ASP:OD2	6:F:238:ARG:NH2	2.42	0.52
6:F:255:CYS:SG	6:F:258:HIS:N	2.70	0.52
1:A:530:ARG:HA	1:A:533:LEU:HD12	1.90	0.52
2:B:35:LYS:HG2	2:B:452:GLN:HE21	1.74	0.52
2:B:658:ARG:O	2:B:662:GLN:HB2	2.09	0.52
5:E:159:MET:HB2	5:E:165:ARG:HD3	1.91	0.52
2:B:458:SER:HB2	2:B:461:LEU:HG	1.90	0.52
3:C:387:THR:O	6:F:259:ARG:NH2	2.42	0.52
2:B:343:ARG:HG2	2:B:357:PHE:HE1	1.74	0.52
1:A:76:LEU:HB2	1:A:144:SER:HA	1.92	0.52
1:A:566:PHE:HZ	1:A:715:LYS:HG2	1.74	0.51
4:D:245:LEU:HD11	4:D:285:ARG:HD3	1.92	0.51
1:A:374:TRP:O	1:A:378:PHE:CB	2.57	0.51
1:A:388:GLN:HB3	1:A:404:SER:HB3	1.93	0.51
8:H:113:VAL:O	8:H:117:ASN:ND2	2.42	0.51
2:B:618:VAL:HG11	2:B:664:VAL:HA	1.91	0.51
2:B:280:ARG:NH2	2:B:387:GLU:OE1	2.29	0.51
5:E:258:THR:O	5:E:288:GLY:N	2.44	0.51
6:F:257:CYS:SG	6:F:258:HIS:ND1	2.81	0.51
1:A:363:VAL:HB	1:A:407:ILE:HG12	1.93	0.51
2:B:695:ARG:HH12	2:B:758:GLN:HB2	1.76	0.51
1:A:366:ASN:ND2	1:A:442:GLU:OE1	2.44	0.50
5:E:172:SER:HA	5:E:201:LEU:HB2	1.92	0.50
1:A:361:CYS:SG	1:A:362:LEU:N	2.85	0.50
4:D:63:GLU:OE2	4:D:115:ARG:NH2	2.45	0.50
1:A:308:ILE:HG12	1:A:384:ILE:HG12	1.94	0.50
2:B:417:ILE:HG23	2:B:434:HIS:HB2	1.94	0.50
1:A:472:ARG:HH21	1:A:480:LEU:HB2	1.77	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:688:LYS:HE3	1:A:690:ILE:HD11	1.94	0.49
2:B:722:ARG:HE	5:E:202:SER:HA	1.77	0.49
8:H:22:MET:HA	8:H:59:ARG:O	2.12	0.49
2:B:17:ILE:HB	2:B:21:GLN:HG2	1.94	0.49
4:D:266:ARG:HE	4:D:273:GLN:HB2	1.77	0.49
6:F:178:MET:HA	6:F:181:ILE:HD12	1.94	0.49
2:B:220:LEU:HD12	2:B:221:VAL:HG23	1.94	0.49
2:B:650:ASP:OD1	2:B:692:LYS:NZ	2.35	0.49
4:D:181:GLN:NE2	4:D:222:THR:OG1	2.45	0.49
2:B:461:LEU:HD22	2:B:467:TYR:HE2	1.77	0.49
6:F:46:ASN:HD22	6:F:104:LEU:HD22	1.77	0.49
8:H:120:LYS:HE3	8:H:124:ILE:HD11	1.94	0.49
2:B:235:GLU:OE2	2:B:666:ARG:NH2	2.33	0.49
1:A:472:ARG:HD2	1:A:474:ASP:H	1.78	0.49
5:E:59:ARG:NH1	5:E:236:VAL:O	2.42	0.49
2:B:180:LEU:HD21	2:B:195:ALA:HB2	1.95	0.49
2:B:27:GLU:OE2	2:B:30:ARG:NH1	2.46	0.49
2:B:425:THR:HG23	2:B:428:ILE:HB	1.95	0.49
3:C:414:TYR:HE2	6:F:112:VAL:HG22	1.77	0.48
4:D:100:LEU:HD23	4:D:106:GLN:HA	1.94	0.48
8:H:44:GLY:HA2	8:H:53:LEU:HD22	1.94	0.48
1:A:640:LEU:HG	1:A:644:LEU:HD12	1.94	0.48
2:B:237:HIS:HE1	2:B:460:THR:HB	1.78	0.48
4:D:19:LEU:HD23	4:D:47:GLU:HG3	1.96	0.48
1:A:591:GLN:OE1	1:A:595:ASN:ND2	2.47	0.48
5:E:374:PHE:HE1	6:F:187:GLN:HE21	1.62	0.48
2:B:494:ILE:HD12	2:B:706:LEU:HD12	1.96	0.48
4:D:152:ALA:HB1	4:D:286:LEU:HG	1.96	0.47
1:A:276:MET:O	1:A:280:LEU:N	2.33	0.47
4:D:56:VAL:HG13	4:D:110:LEU:HD21	1.96	0.47
5:E:167:VAL:HB	5:E:196:VAL:HG22	1.95	0.47
1:A:297:PHE:O	1:A:359:LYS:NZ	2.37	0.47
1:A:351:VAL:HG22	1:A:378:PHE:HD1	1.78	0.47
3:C:417:LYS:HB3	4:D:123:LEU:HD22	1.96	0.47
5:E:76:LEU:HD23	5:E:80:ARG:HG2	1.96	0.47
1:A:519:TYR:HE2	7:G:19:PHE:HB2	1.79	0.47
2:B:567:LEU:HA	2:B:595:ILE:HG23	1.97	0.47
2:B:403:PHE:HE1	2:B:435:PHE:HB2	1.80	0.47
4:D:50:SER:HB2	6:F:237:GLN:HE21	1.79	0.47
1:A:48:GLU:O	1:A:51:THR:OG1	2.26	0.47
1:A:187:HIS:HD2	1:A:289:TYR:HE2	1.63	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:486:ALA:HB2	2:B:736:LEU:HB2	1.97	0.47
4:D:240:LEU:HD11	4:D:265:LEU:HD21	1.97	0.47
8:H:125:TYR:O	8:H:129:ASN:CB	2.61	0.47
1:A:521:GLU:HG3	1:A:713:LEU:HD11	1.96	0.47
2:B:530:VAL:HG21	2:B:714:VAL:HG13	1.96	0.47
1:A:497:GLN:HB3	1:A:504:LYS:HG2	1.97	0.46
2:B:53:LEU:HD11	2:B:83:VAL:HG13	1.97	0.46
2:B:191:PRO:HA	2:B:194:LEU:HB3	1.96	0.46
2:B:273:ILE:HG21	2:B:386:LEU:HD22	1.96	0.46
5:E:60:HIS:HD2	5:E:163:THR:HG21	1.80	0.46
2:B:85:GLU:HG3	3:C:354:LEU:HD13	1.97	0.46
2:B:335:ARG:HH22	8:H:75:ARG:HD3	1.79	0.46
6:F:250:ASP:HB2	6:F:252:ARG:HG2	1.97	0.46
1:A:165:LYS:HD2	1:A:181:HIS:CE1	2.51	0.46
1:A:364:LEU:HD21	1:A:413:LEU:HD22	1.97	0.46
2:B:619:ILE:HA	2:B:678:VAL:HG22	1.97	0.46
2:B:669:ARG:HD2	3:C:360:TYR:HE1	1.80	0.46
5:E:80:ARG:HD3	5:E:201:LEU:HD13	1.97	0.46
5:E:314:SER:HB3	5:E:317:HIS:HD2	1.81	0.46
1:A:613:THR:HB	1:A:614:SER:HB3	1.98	0.46
4:D:412:PHE:HA	7:G:2:VAL:HG21	1.98	0.46
6:F:255:CYS:HB3	6:F:262:ILE:HD11	1.98	0.45
1:A:369:VAL:HG21	1:A:615:PHE:HA	1.97	0.45
3:C:154:UNK:C	3:C:156:UNK:H	2.29	0.45
3:C:440:LEU:HD11	6:F:218:PRO:HD3	1.98	0.45
4:D:171:VAL:HG13	4:D:175:LEU:HB3	1.98	0.45
4:D:308:VAL:HB	4:D:316:TYR:HB2	1.98	0.45
1:A:177:VAL:O	1:A:269:SER:HA	2.16	0.45
4:D:309:VAL:H	4:D:376:MET:HE3	1.82	0.45
5:E:75:ASP:OD2	5:E:80:ARG:NH2	2.37	0.45
1:A:413:LEU:HD23	1:A:454:VAL:HG22	1.99	0.45
1:A:612:ASP:HA	1:A:613:THR:HA	1.68	0.45
2:B:500:ASP:HB2	2:B:502:VAL:HG23	1.99	0.45
6:F:68:ARG:HD2	6:F:118:LEU:HD13	1.98	0.45
1:A:624:ILE:HG12	1:A:660:TYR:HB2	1.99	0.45
6:F:18:ASN:HD22	6:F:19:PRO:HD2	1.82	0.45
2:B:48:LYS:O	2:B:52:LEU:HB2	2.17	0.44
2:B:118:HIS:CD2	2:B:121:VAL:HG23	2.52	0.44
4:D:407:VAL:HG11	4:D:448:HIS:HB2	1.98	0.44
3:C:360:TYR:HD2	3:C:363:LEU:HD12	1.82	0.44
4:D:249:TYR:OH	6:F:102:GLU:OE2	2.30	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:440:LEU:HD22	7:G:36:GLN:HE22	1.81	0.44
8:H:114:ASP:HA	8:H:117:ASN:HD22	1.82	0.44
5:E:87:LEU:HD23	5:E:87:LEU:HA	1.78	0.44
1:A:134:SER:O	1:A:138:GLU:HB2	2.18	0.44
2:B:75:ARG:NH2	2:B:235:GLU:OE2	2.51	0.44
2:B:616:ARG:O	2:B:676:LEU:N	2.51	0.44
3:C:372:ILE:HD11	5:E:243:SER:HA	1.99	0.44
4:D:65:PRO:HB2	4:D:107:GLY:HA3	1.99	0.44
6:F:19:PRO:HD2	6:F:64:ILE:HG23	2.00	0.44
2:B:424:ARG:NH2	3:C:286:UNK:O	2.51	0.43
8:H:193:PRO:HG2	8:H:196:LEU:HD12	1.99	0.43
4:D:160:LEU:HD23	4:D:163:MET:HE3	2.00	0.43
6:F:268:CYS:CB	6:F:271:CYS:SG	2.90	0.43
1:A:336:GLY:HA3	1:A:488:LEU:HD13	1.99	0.43
2:B:573:ASP:HB2	2:B:576:GLU:HB2	2.00	0.43
6:F:96:SER:HB3	6:F:102:GLU:HG2	1.99	0.43
5:E:169:ILE:HB	5:E:198:VAL:HG22	2.00	0.43
1:A:361:CYS:HB3	1:A:405:VAL:HG22	2.00	0.43
2:B:319:VAL:HG11	2:B:324:ARG:HH21	1.84	0.43
2:B:562:GLN:HE21	2:B:567:LEU:HD12	1.84	0.43
1:A:52:LYS:HZ2	1:A:63:LEU:HB2	1.84	0.43
4:D:220:LEU:HD21	4:D:233:ILE:HG21	2.01	0.43
1:A:339:VAL:HG21	1:A:470:LEU:HG	2.01	0.43
1:A:522:TYR:HE1	1:A:534:TYR:HD1	1.67	0.43
2:B:251:LEU:HD22	2:B:433:LEU:HD23	2.00	0.43
4:D:101:LEU:HB2	4:D:105:LEU:HB2	2.00	0.43
1:A:300:ASP:OD2	1:A:303:ASN:ND2	2.45	0.43
1:A:612:ASP:OD1	1:A:612:ASP:N	2.52	0.43
7:G:18:GLN:HG3	7:G:21:LEU:HD12	2.00	0.43
1:A:51:THR:HG22	1:A:53:VAL:HG23	2.01	0.42
1:A:398:ASP:OD1	1:A:398:ASP:N	2.51	0.42
5:E:189:LEU:HD22	5:E:194:ILE:HG21	2.01	0.42
1:A:562:ALA:HB3	1:A:568:LEU:HD13	2.01	0.42
2:B:365:VAL:O	2:B:367:ILE:N	2.52	0.42
4:D:87:THR:HG23	4:D:96:TRP:HZ3	1.84	0.42
8:H:113:VAL:HG12	8:H:115:LEU:H	1.84	0.42
2:B:613:HIS:CE1	5:E:206:ARG:HG2	2.54	0.42
4:D:311:THR:HA	4:D:387:ILE:HD11	2.02	0.42
2:B:641:ARG:NH2	2:B:648:GLU:OE1	2.53	0.42
2:B:653:THR:HG22	2:B:692:LYS:HD2	2.02	0.42
5:E:60:HIS:CD2	5:E:163:THR:HG21	2.54	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:E:66:ASP:OD2	5:E:172:SER:N	2.36	0.42
2:B:118:HIS:HD2	2:B:121:VAL:HG23	1.83	0.42
2:B:542:TYR:O	2:B:546:GLU:HB2	2.18	0.42
1:A:134:SER:O	1:A:138:GLU:CB	2.67	0.42
2:B:524:LEU:HD11	2:B:595:ILE:HD11	2.02	0.42
2:B:611:VAL:HG12	2:B:612:HIS:H	1.85	0.42
4:D:99:GLN:O	4:D:107:GLY:N	2.53	0.42
2:B:564:ASN:O	5:E:175:THR:OG1	2.38	0.42
3:C:140:GLU:O	3:C:144:ALA:HB2	2.19	0.42
5:E:232:LEU:HD23	5:E:232:LEU:HA	1.89	0.42
2:B:25:MET:SD	2:B:55:LEU:HB2	2.59	0.42
5:E:293:GLN:HB2	5:E:310:LEU:HD22	2.02	0.41
4:D:136:LEU:HD12	4:D:280:ARG:HH21	1.85	0.41
6:F:255:CYS:SG	6:F:257:CYS:N	2.88	0.41
1:A:178:GLU:HG2	1:A:269:SER:HB3	2.01	0.41
1:A:184:VAL:O	1:A:188:LEU:HB2	2.20	0.41
2:B:170:LEU:HD21	2:B:194:LEU:HD21	2.01	0.41
4:D:300:THR:HG22	4:D:302:HIS:H	1.84	0.41
2:B:145:GLN:HA	2:B:148:HIS:CE1	2.55	0.41
5:E:88:LEU:HA	5:E:88:LEU:HD23	1.88	0.41
5:E:251:ARG:HE	6:F:264:ILE:HG21	1.86	0.41
3:C:172:UNK:N	3:C:186:UNK:O	2.54	0.41
5:E:166:GLU:HA	5:E:195:ARG:O	2.20	0.41
5:E:314:SER:HB3	5:E:317:HIS:CD2	2.55	0.41
4:D:53:LYS:HE3	4:D:53:LYS:HB2	1.91	0.41
2:B:117:ILE:HG23	2:B:185:ARG:HE	1.84	0.41
2:B:497:ARG:HB3	2:B:709:THR:HA	2.02	0.41
2:B:505:SER:HA	2:B:681:ASP:HB2	2.03	0.41
5:E:95:TYR:HD2	5:E:104:ILE:HD11	1.85	0.41
1:A:103:ILE:HD13	1:A:136:ILE:HG23	2.03	0.41
1:A:280:LEU:HG	1:A:291:LEU:HD11	2.02	0.41
2:B:464:LEU:HB2	2:B:760:LEU:HD12	2.03	0.41
2:B:537:ALA:HB1	2:B:621:PHE:HE2	1.86	0.41
3:C:403:SER:HB2	6:F:23:GLY:HA3	2.03	0.41
4:D:414:SER:O	4:D:439:ARG:NH1	2.45	0.41
1:A:568:LEU:HD11	1:A:606:PHE:HB3	2.02	0.41
2:B:672:THR:OG1	3:C:362:ASP:OD1	2.33	0.41
1:A:203:GLU:OE2	8:H:177:ARG:NH1	2.54	0.40
2:B:517:ILE:HG23	2:B:548:THR:HG23	2.04	0.40
5:E:85:LEU:HD12	5:E:85:LEU:HA	1.94	0.40
3:C:389:ILE:HG13	6:F:259:ARG:HE	1.86	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:476:LYS:O	1:A:478:VAL:N	2.54	0.40
1:A:531:ILE:O	1:A:535:THR:OG1	2.28	0.40
1:A:505:VAL:HA	1:A:657:ALA:HB3	2.03	0.40
4:D:424:HIS:CD2	4:D:451:VAL:HG22	2.55	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	632/653 (97%)	569 (90%)	62 (10%)	1 (0%)	44	72
2	B	731/760 (96%)	641 (88%)	90 (12%)	0	100	100
3	C	236/548 (43%)	200 (85%)	34 (14%)	2 (1%)	16	49
4	D	450/462 (97%)	406 (90%)	43 (10%)	1 (0%)	44	72
5	E	309/366 (84%)	276 (89%)	33 (11%)	0	100	100
6	F	259/308 (84%)	244 (94%)	15 (6%)	0	100	100
7	G	64/71 (90%)	59 (92%)	5 (8%)	0	100	100
8	H	208/309 (67%)	181 (87%)	25 (12%)	2 (1%)	13	44
All	All	2889/3477 (83%)	2576 (89%)	307 (11%)	6 (0%)	45	72

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	C	213	HIS
8	H	57	ASN
8	H	7	PRO
3	C	212	PRO
4	D	190	PRO
1	A	477	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	558/559 (100%)	556 (100%)	2 (0%)	89	93
2	B	640/643 (100%)	637 (100%)	3 (0%)	86	92
3	C	176/334 (53%)	176 (100%)	0	100	100
4	D	384/399 (96%)	381 (99%)	3 (1%)	79	85
5	E	279/279 (100%)	278 (100%)	1 (0%)	89	93
6	F	234/272 (86%)	231 (99%)	3 (1%)	65	77
7	G	59/64 (92%)	59 (100%)	0	100	100
8	H	158/283 (56%)	158 (100%)	0	100	100
All	All	2488/2833 (88%)	2476 (100%)	12 (0%)	85	92

All (12) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	198	ARG
1	A	472	ARG
2	B	143	ARG
2	B	487	ARG
2	B	690	ARG
4	D	11	ARG
4	D	115	ARG
4	D	215	PHE
5	E	195	ARG
6	F	18	ASN
6	F	146	ARG
6	F	157	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (29) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	181	HIS
1	A	187	HIS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	591	GLN
1	A	595	ASN
1	A	677	GLN
2	B	118	HIS
2	B	237	HIS
2	B	238	ASN
2	B	328	HIS
2	B	452	GLN
2	B	562	GLN
2	B	733	GLN
3	C	524	HIS
4	D	181	GLN
4	D	239	GLN
4	D	424	HIS
5	E	235	HIS
5	E	256	GLN
5	E	257	HIS
5	E	340	ASN
6	F	18	ASN
6	F	187	GLN
6	F	225	GLN
6	F	248	HIS
7	G	36	GLN
7	G	42	HIS
8	H	108	ASN
8	H	112	ASN
8	H	117	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 7 ligands modelled in this entry, 6 are monoatomic - leaving 1 for Mogul analysis.

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	$\#\|Z\| > 2$
9	SF4	B	1000	2	0,12,12	-	-	-		

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
9	SF4	B	1000	2	-	-	0/6/5/5

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)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	A	1
5	E	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	203:GLU	C	248:UNK	N	29.49
1	E	274:UNK	C	281:UNK	N	8.01

6 Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-0452. 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 ⓘ
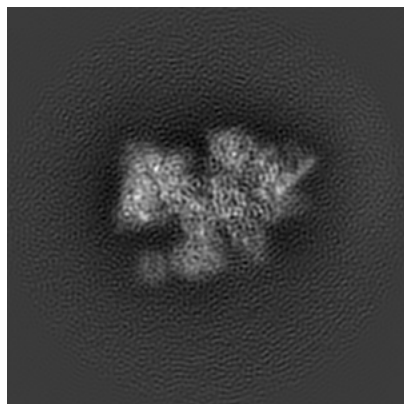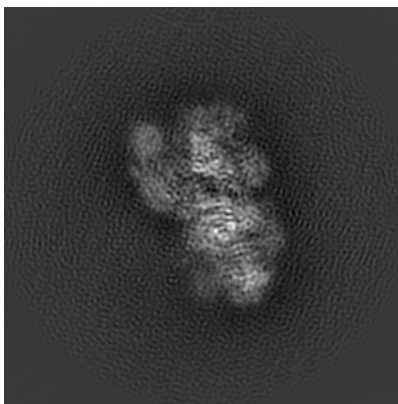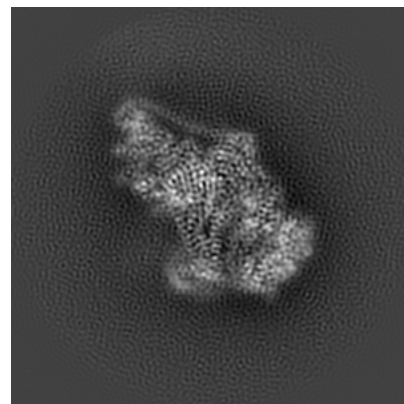
6.1.1 Primary map

| X | Y | Z |

6.1.2 Raw map

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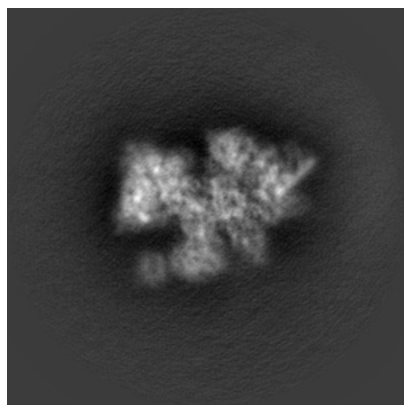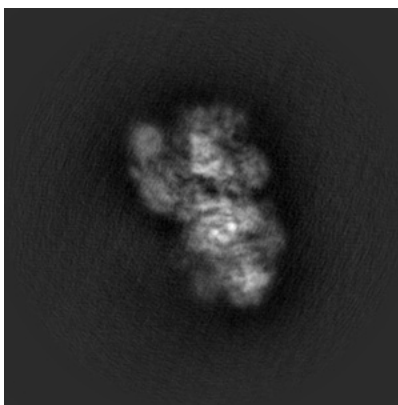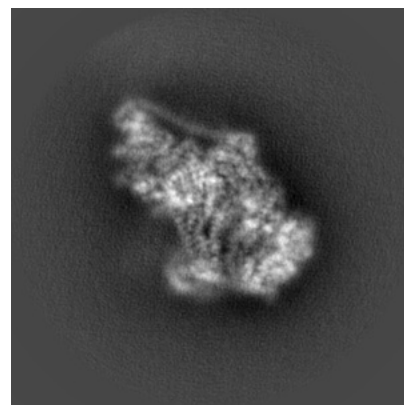
The images above show the map projected in three orthogonal directions.

6.2   Central slices ⓘ
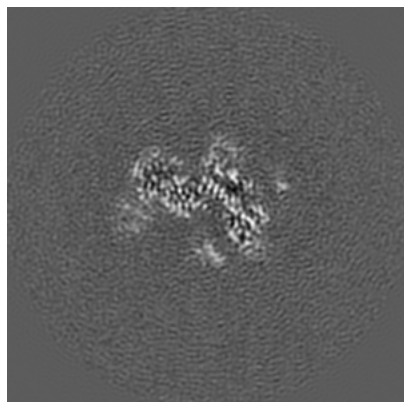
6.2.1   Primary map
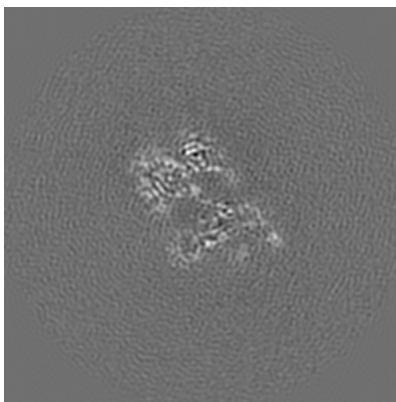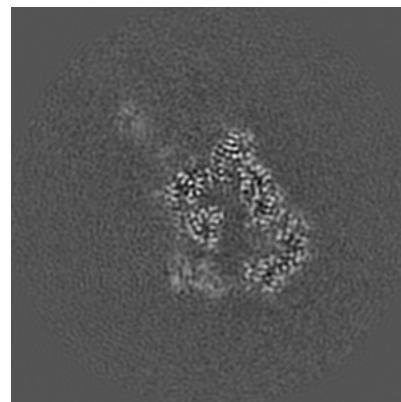
X Index: 128   Y Index: 128   Z Index: 128

6.2.2   Raw map
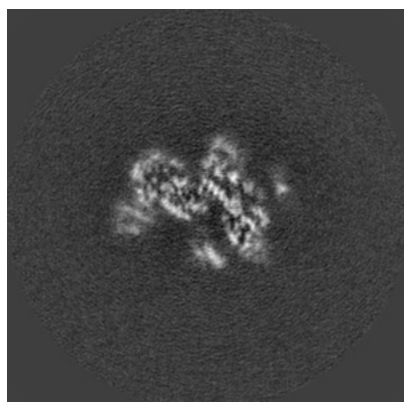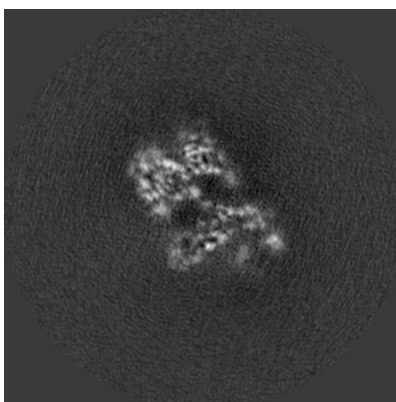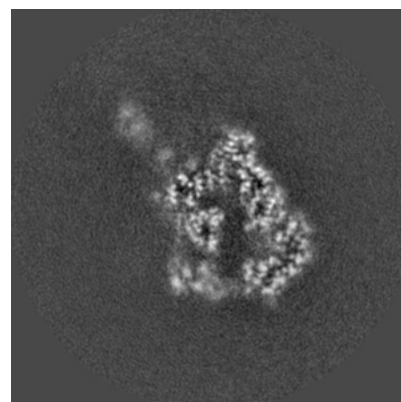
X Index: 128   Y Index: 128   Z Index: 128

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

6.3 Largest variance slices ⓘ

6.3.1 Primary map
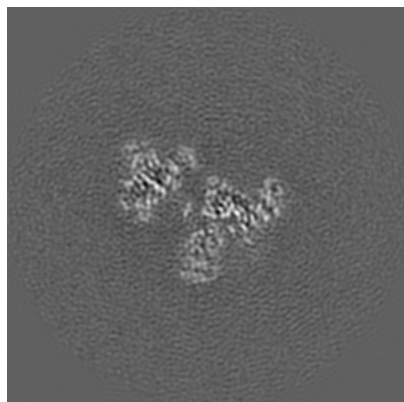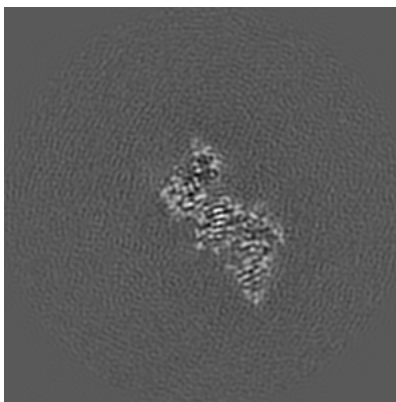
| X Index: 151 | Y Index: 146 | Z Index: 138 |
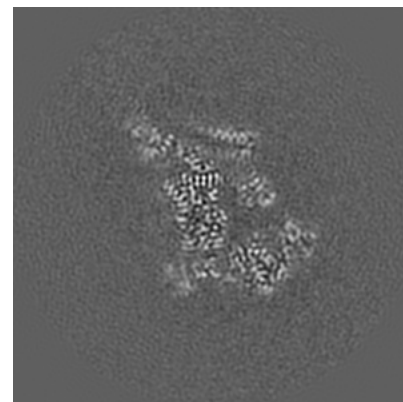
6.3.2 Raw map
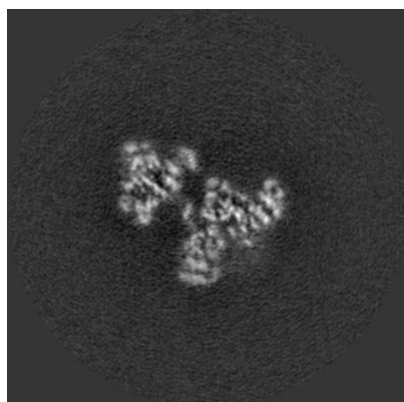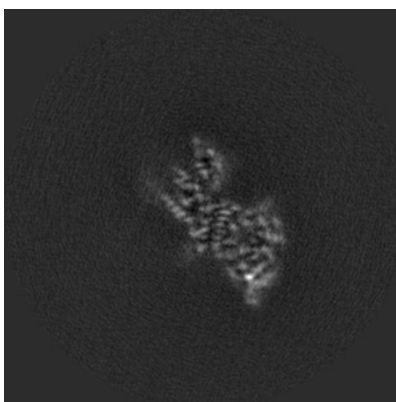
| X Index: 151 | Y Index: 143 | Z Index: 138 |
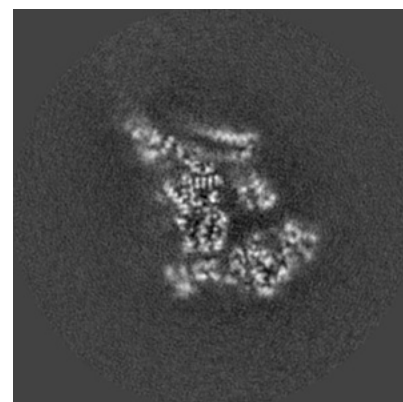
The images above show the largest variance slices of the map in three orthogonal directions.

6.4   Orthogonal standard-deviation projections (False-color) ⓘ

6.4.1   Primary map
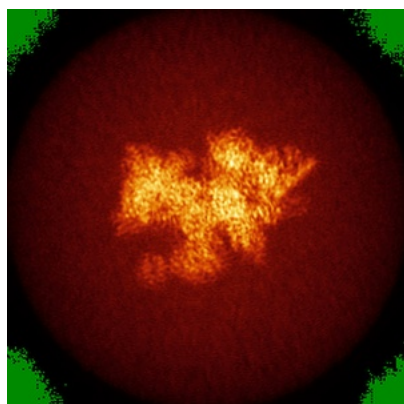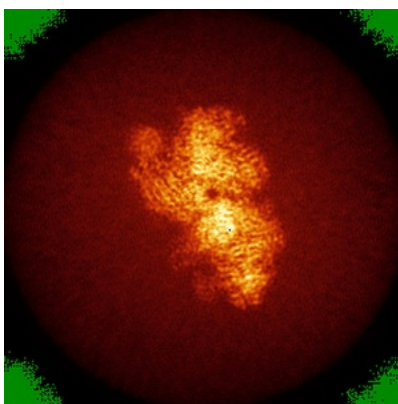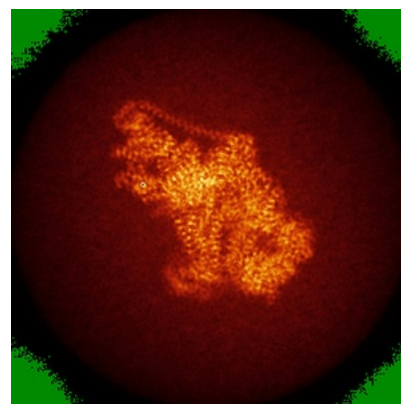
| X | Y | Z |

6.4.2   Raw map

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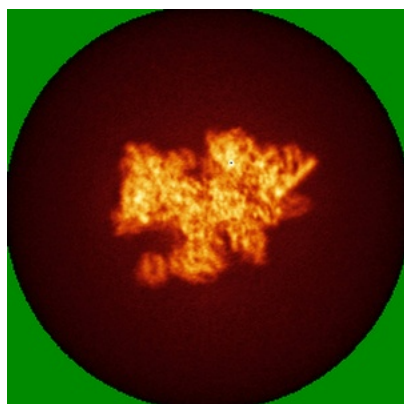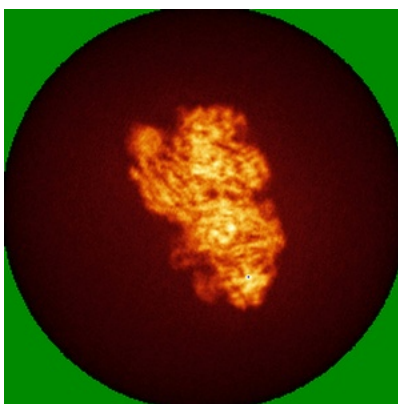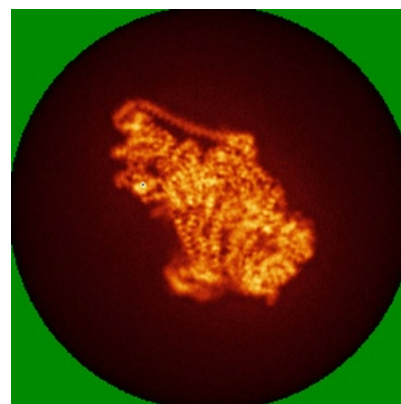
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views (i)

6.5.1 Primary map

X	Y	Z
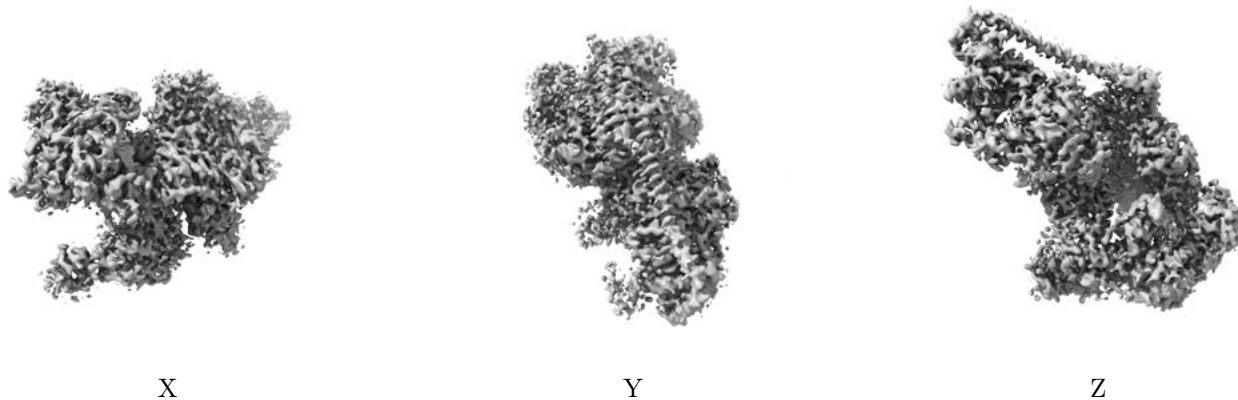
The images above show the 3D surface view of the map at the recommended contour level 0.0172. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map

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.

6.6 Mask visualisation (i)

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

7 Map analysis ⓘ

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

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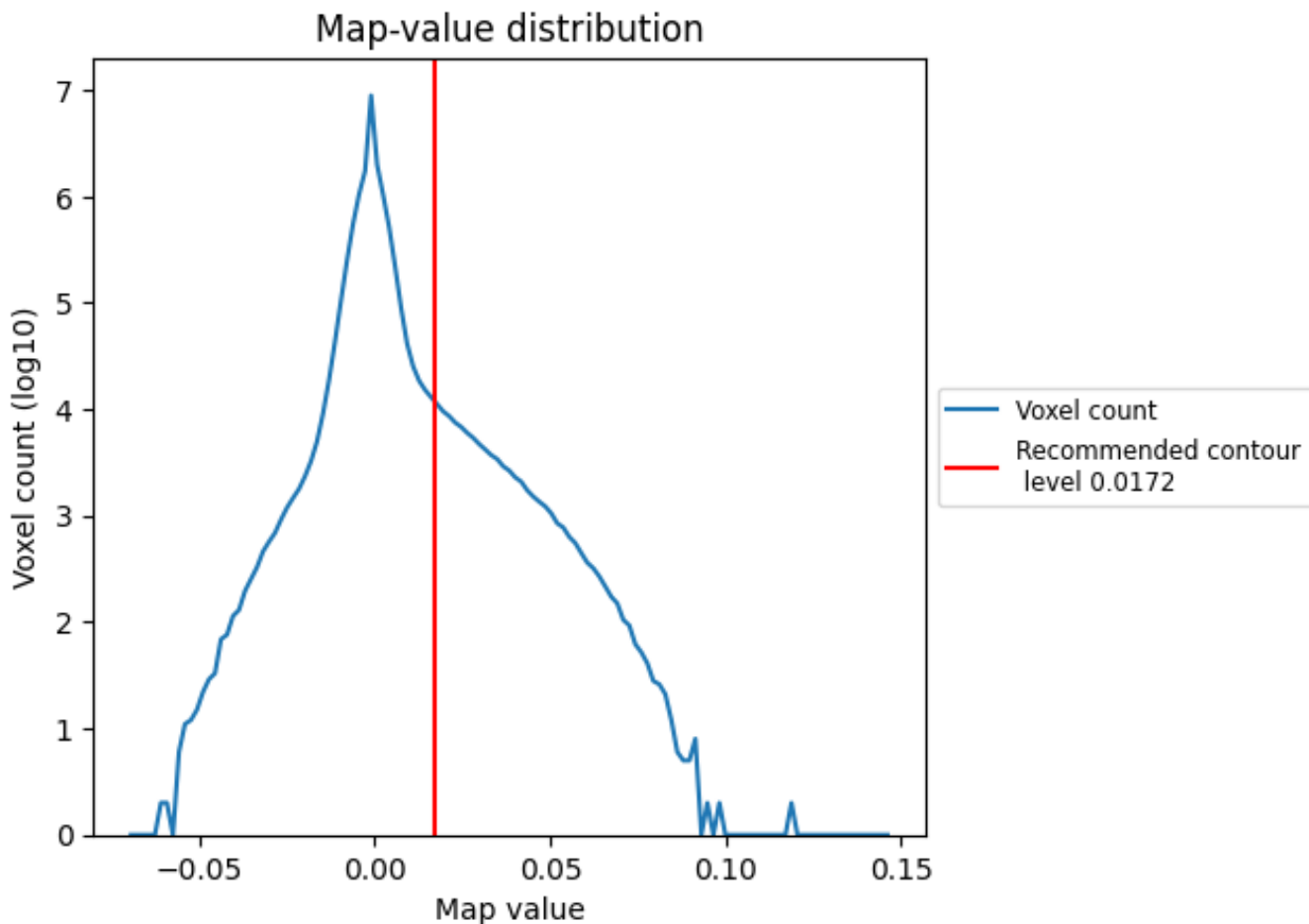
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2 Volume estimate (i)
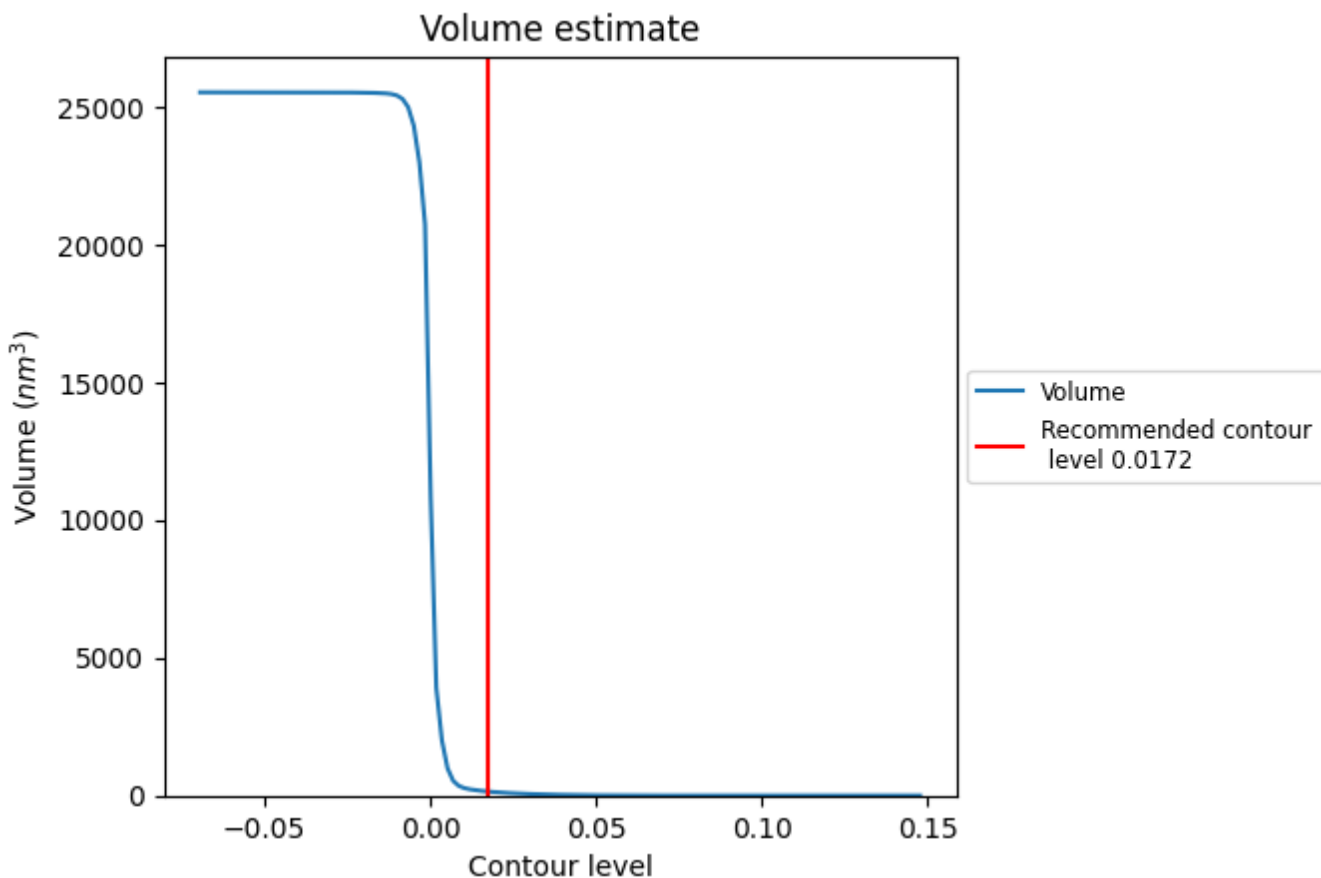
The volume at the recommended contour level is 149 nm^3; this corresponds to an approximate mass of 135 kDa.

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

7.3 Rotationally averaged power spectrum ⓘ
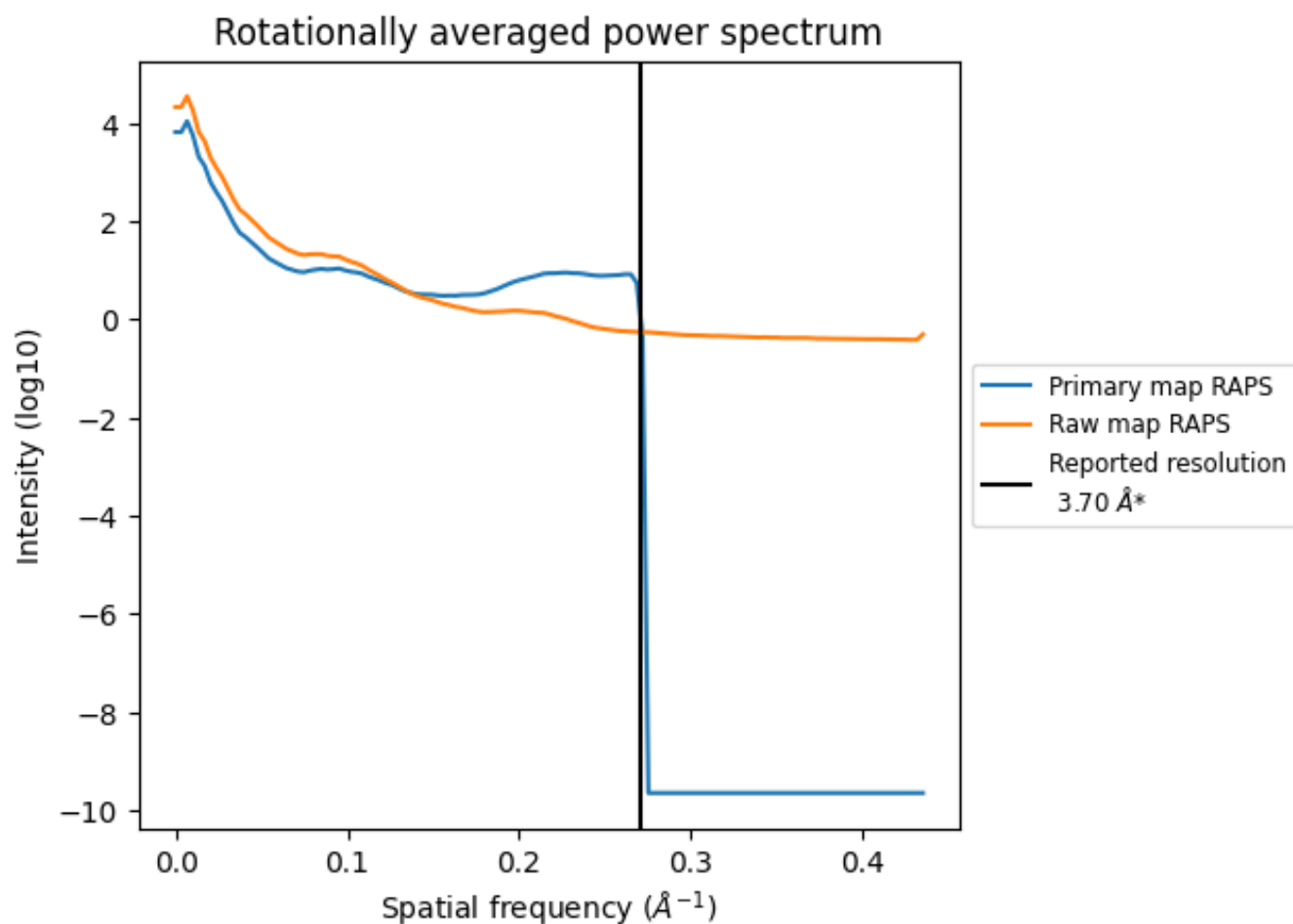
*Reported resolution corresponds to spatial frequency of 0.270 Å^{-1}

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 ⓘ
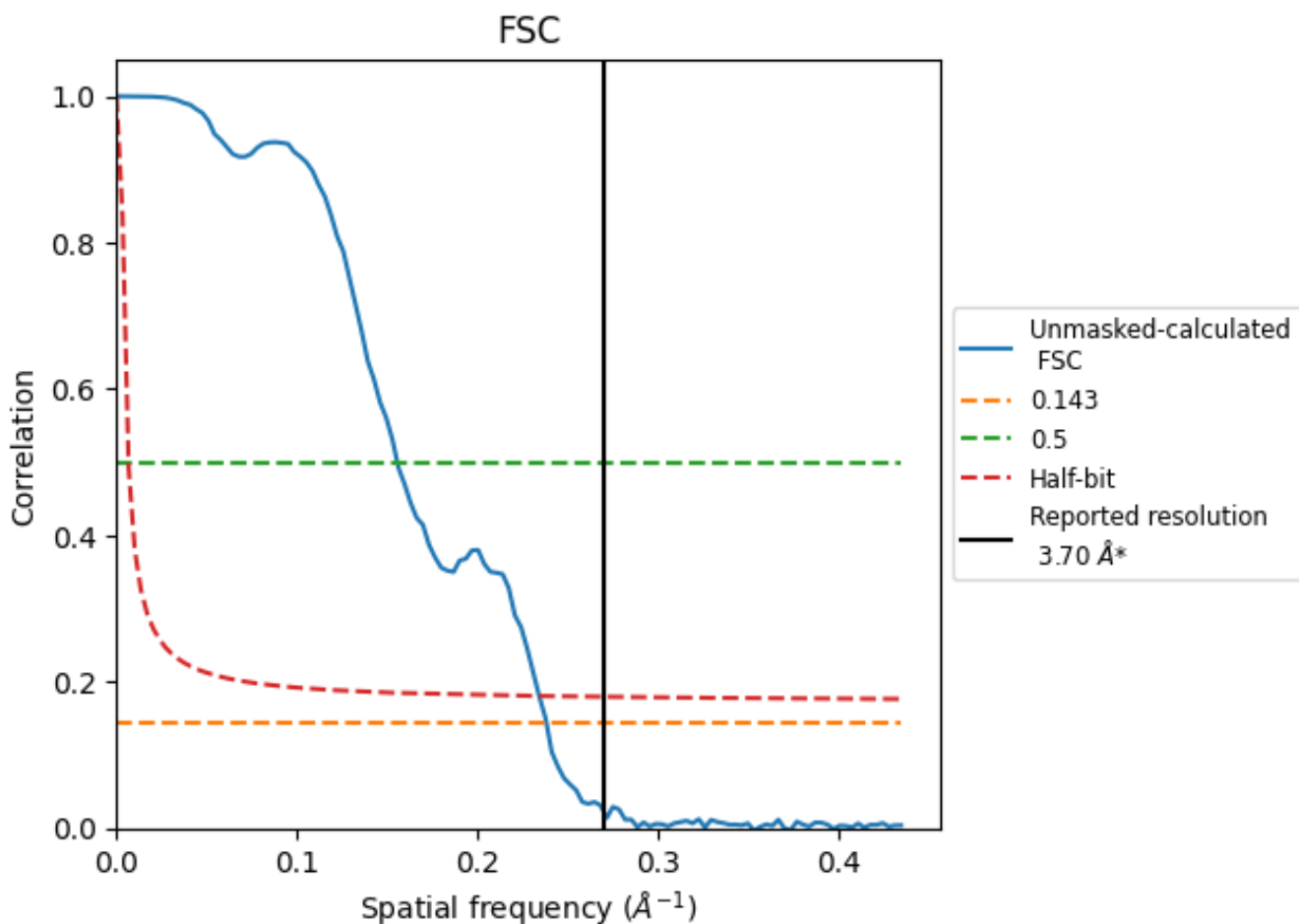
*Reported resolution corresponds to spatial frequency of 0.270 Å^{-1}

8.2 Resolution estimates ⓘ

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.70	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.20	6.43	4.27

*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 4.20 differs from the reported value 3.7 by more than 10 %

9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-0452 and PDB model 6NMI. Per-residue inclusion information can be found in section 3 on page 6.

9.1 Map-model overlay ⓘ
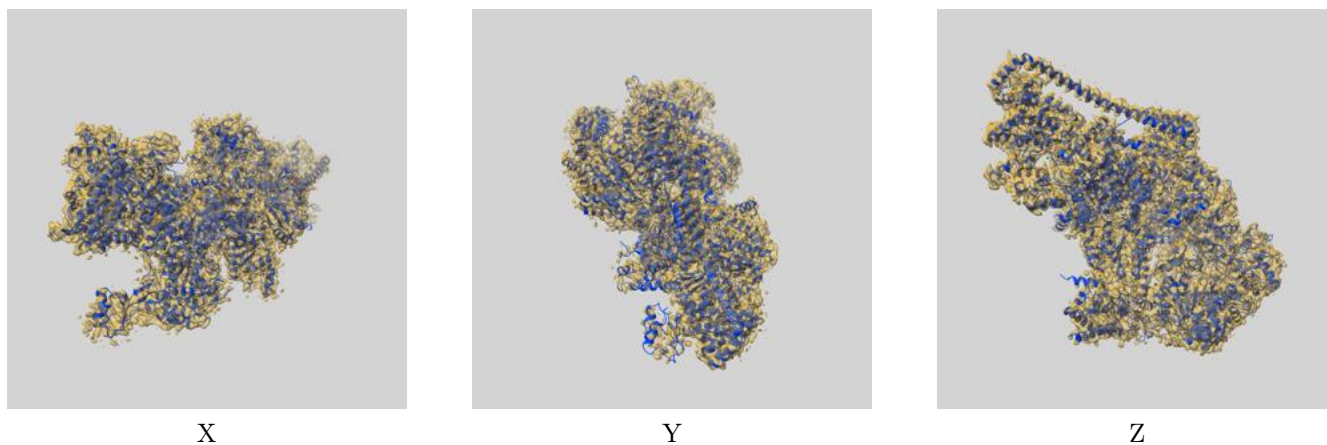
X　　　　　　　　　　　　　Y　　　　　　　　　　　　　Z

The images above show the 3D surface view of the map at the recommended contour level 0.0172 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
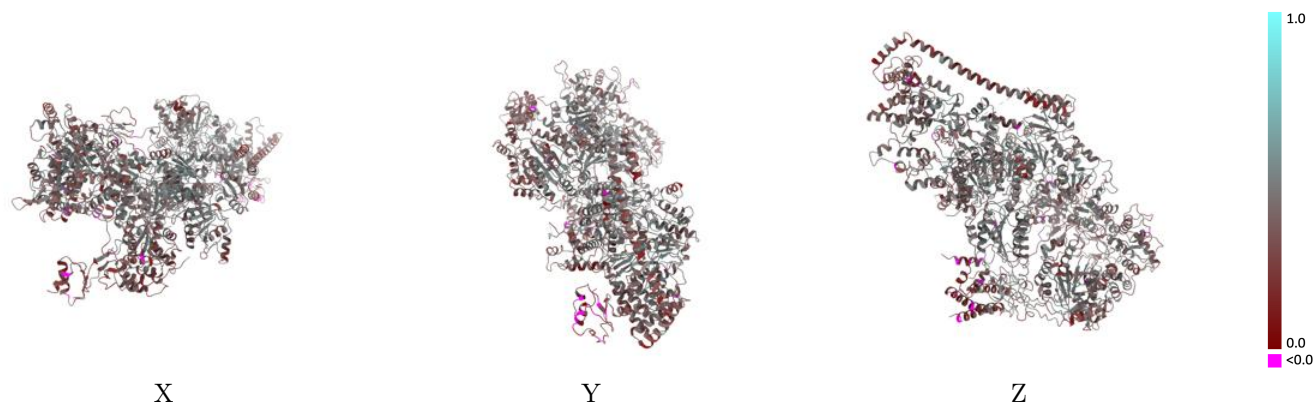
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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
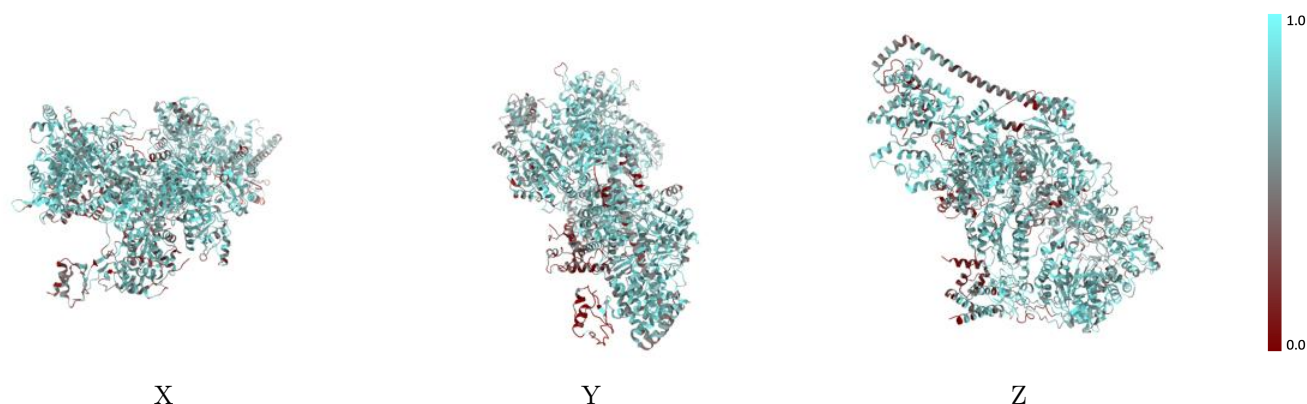
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.0172).

9.4 Atom inclusion ⓘ
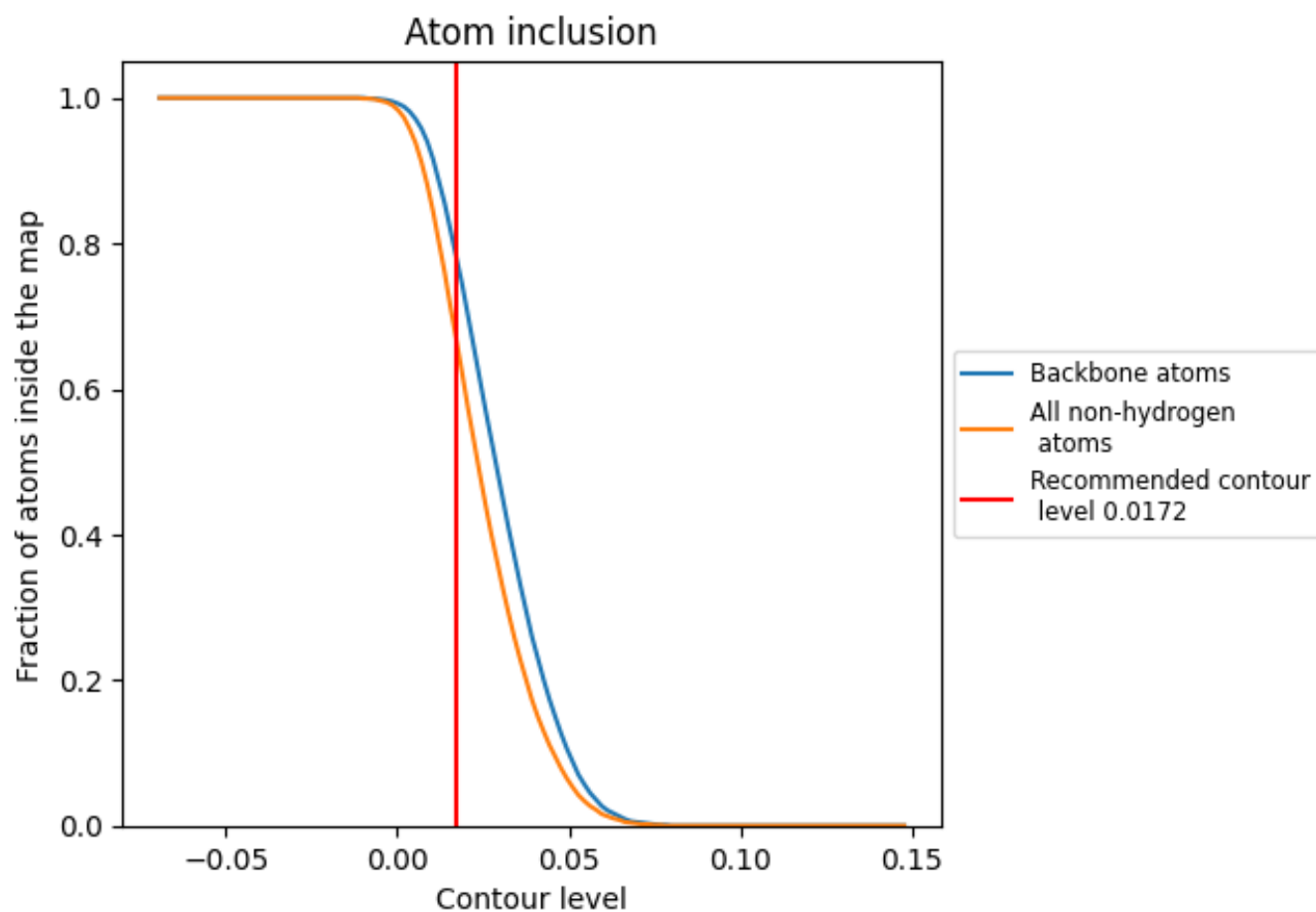
At the recommended contour level, 78% of all backbone atoms, 67% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.0172) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6680	0.4040
A	0.6830	0.4120
B	0.7420	0.4390
C	0.4600	0.3290
D	0.6940	0.4080
E	0.7090	0.4370
F	0.7390	0.4360
G	0.5650	0.3200
H	0.5000	0.2960

1.0

0.0
<0.0