wwPDB EM Validation Summary Report (i)

Nov 25, 2024 – 02:54 PM JST

PDB ID	:	8XZV
EMDB ID	:	EMD-38799
Title	:	Architecture of the spinach plastid-encoded RNA polymerase
Authors	:	Wang, G.-L.; Yu, L.-J.; Lu, C.
Deposited on	:	2024-01-21
Resolution	:	3.16 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 (i) 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 (i)) were used in the production of this report:

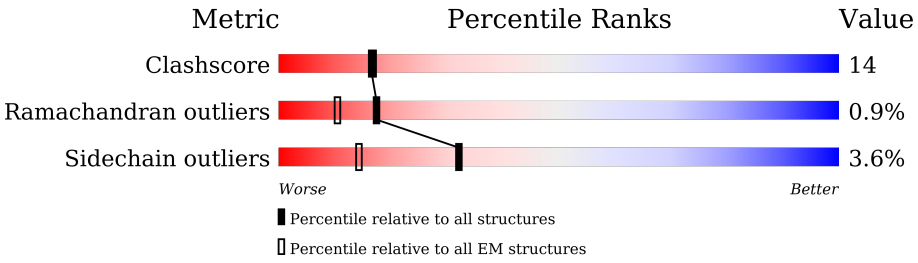
EMDB validation analysis	:	0.0.1.dev113
MolProbity	:	4.02b-467
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	: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

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.16 Å.

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



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

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=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	335	47% 19% 33%
1	O	335	7% 48% 18% 33%
2	B	1070	20% 77% 22%
3	C	677	29% 69% 29%
4	D	1357	27% 72% 16% 10%
5	E	472	67% 13% 19%
6	F	181	49% 15% 36%
6	R	181	56% 28% 33% 36%

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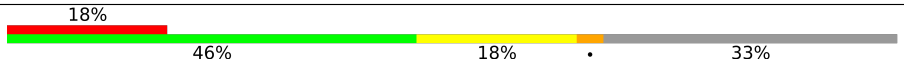
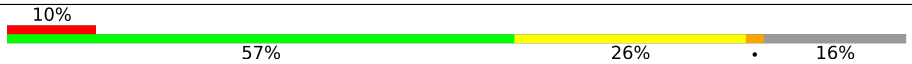
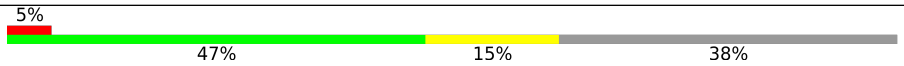
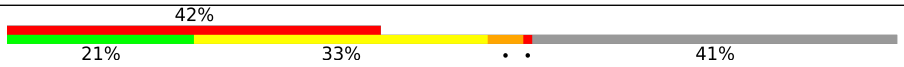
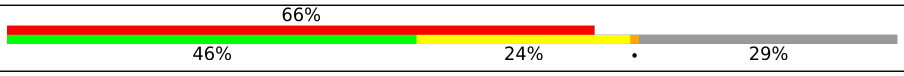
Mol	Chain	Length	Quality of chain
7	G	518	
8	H	892	
9	I	490	
10	K	324	
11	L	284	
12	M	273	
13	N	678	
14	P	170	
15	Q	143	
16	S	583	
17	J	774	

2 Entry composition (i)

There are 18 unique types of molecules in this entry. The entry contains 58999 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 DNA-directed RNA polymerase subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	225	Total	C	N	O	S	0	0
			1775	1123	309	333	10		
1	O	223	Total	C	N	O	S	0	0
			1761	1115	307	329	10		

- Molecule 2 is a protein called DNA-directed RNA polymerase subunit beta.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	1070	Total	C	N	O	S	0	0
			8517	5403	1505	1575	34		

- Molecule 3 is a protein called DNA-directed RNA polymerase subunit beta'.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	677	Total	C	N	O	S	0	0
			5507	3525	969	985	28		

- Molecule 4 is a protein called DNA-directed RNA polymerase subunit beta".

Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	1216	Total	C	N	O	S	1	0
			8374	5215	1551	1582	26		

- Molecule 5 is a protein called Fructokinase-like 1, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	E	382	Total	C	N	O	S	0	0
			3079	1957	521	584	17		

- Molecule 6 is a protein called Thioredoxin-like protein CITRX, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	F	116	Total	C	N	O	S	0	0
			940	596	154	181	9		
6	R	116	Total	C	N	O	S	0	0
			940	596	154	181	9		

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	21	PHE	SER	conflict	UNP A0A9R0J865
R	21	PHE	SER	conflict	UNP A0A9R0J865

- Molecule 7 is a protein called Protein PLASTID TRANSCRIPTIONALLY ACTIVE 12.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	237	Total	C	N	O	S	0	0
			2009	1273	354	374	8		

- Molecule 8 is a protein called pTAC3.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	595	Total	C	N	O	S	0	0
			4653	2944	823	860	26		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
H	892	ALA	SER	conflict	UNP A0A9R0IP63

- Molecule 9 is a protein called Protein PLASTID TRANSCRIPTIONALLY ACTIVE 14 isoform X2.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	I	413	Total	C	N	O	S	0	0
			3373	2162	575	615	21		

- Molecule 10 is a protein called pTAC6.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	K	214	Total	C	N	O	S	0	0
			1803	1137	320	339	7		

- Molecule 11 is a protein called superoxide dismutase.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	L	224	Total	C	N	O	S	0	0
			1817	1176	299	338	4		

- Molecule 12 is a protein called superoxide dismutase.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	M	215	Total	C	N	O	S	0	0
			1763	1145	294	318	6		

- Molecule 13 is a protein called Protein PLASTID TRANSCRIPTIONALLY ACTIVE 10.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	N	475	Total	C	N	O	S	0	0
			4032	2565	693	756	18		

- Molecule 14 is a protein called Protein PLASTID TRANSCRIPTIONALLY ACTIVE 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	P	105	Total	C	N	O	S	0	0
			840	525	148	162	5		

- Molecule 15 is a protein called pTAC18.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	Q	104	Total	C	N	O	S	0	0
			902	587	156	157	2		

- Molecule 16 is a protein called Fructokinase-like 2, chloroplastic isoform X2.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	S	344	Total	C	N	O	S	0	0
			2695	1721	462	494	18		

There are 10 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
S	114	VAL	-	insertion	UNP A0A9R0K4E6
S	115	LEU	-	insertion	UNP A0A9R0K4E6
S	116	HIS	-	insertion	UNP A0A9R0K4E6
S	117	THR	-	insertion	UNP A0A9R0K4E6
S	118	GLU	-	insertion	UNP A0A9R0K4E6
S	119	MET	-	insertion	UNP A0A9R0K4E6

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Chain	Residue	Modelled	Actual	Comment	Reference
S	120	LYS	-	insertion	UNP A0A9R0K4E6
S	121	LEU	-	insertion	UNP A0A9R0K4E6
S	122	PHE	-	insertion	UNP A0A9R0K4E6
S	123	SER	-	insertion	UNP A0A9R0K4E6

- Molecule 17 is a protein called MurE.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	J	546	Total	C	N	O	S	0	0
			4218	2640	726	826	26		

- Molecule 18 is FE (III) ION (three-letter code: FE) (formula: Fe) (labeled as "Ligand of Interest" by depositor).

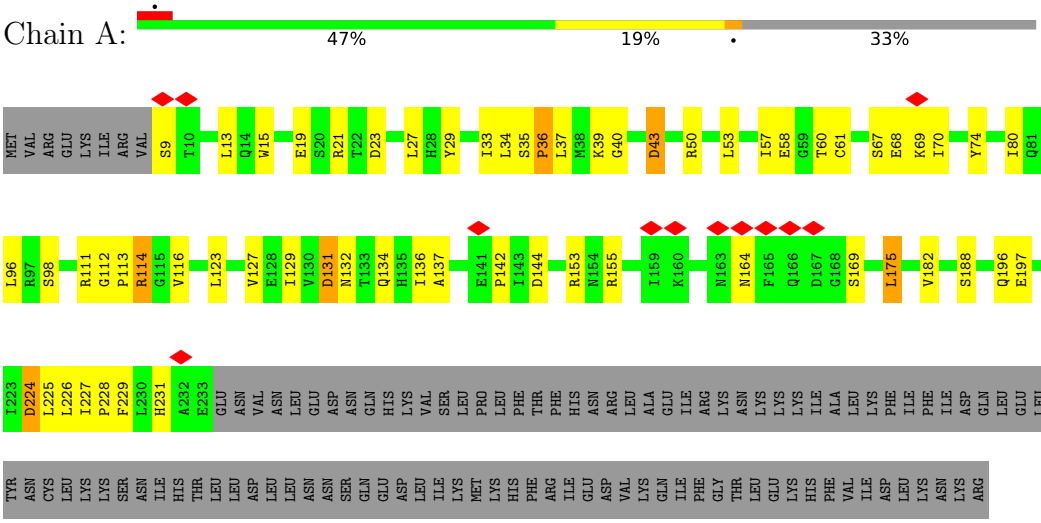
Mol	Chain	Residues	Atoms		AltConf
18	L	1	Total	Fe	0
			1	1	

3 Residue-property plots (i)

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

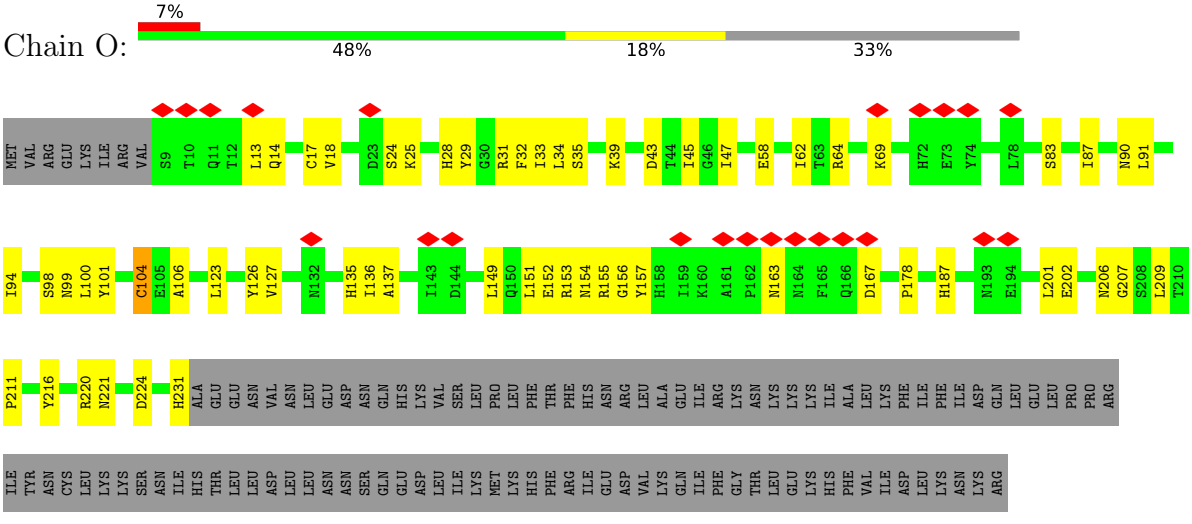
• Molecule 1: DNA-directed RNA polymerase subunit alpha

Chain A:



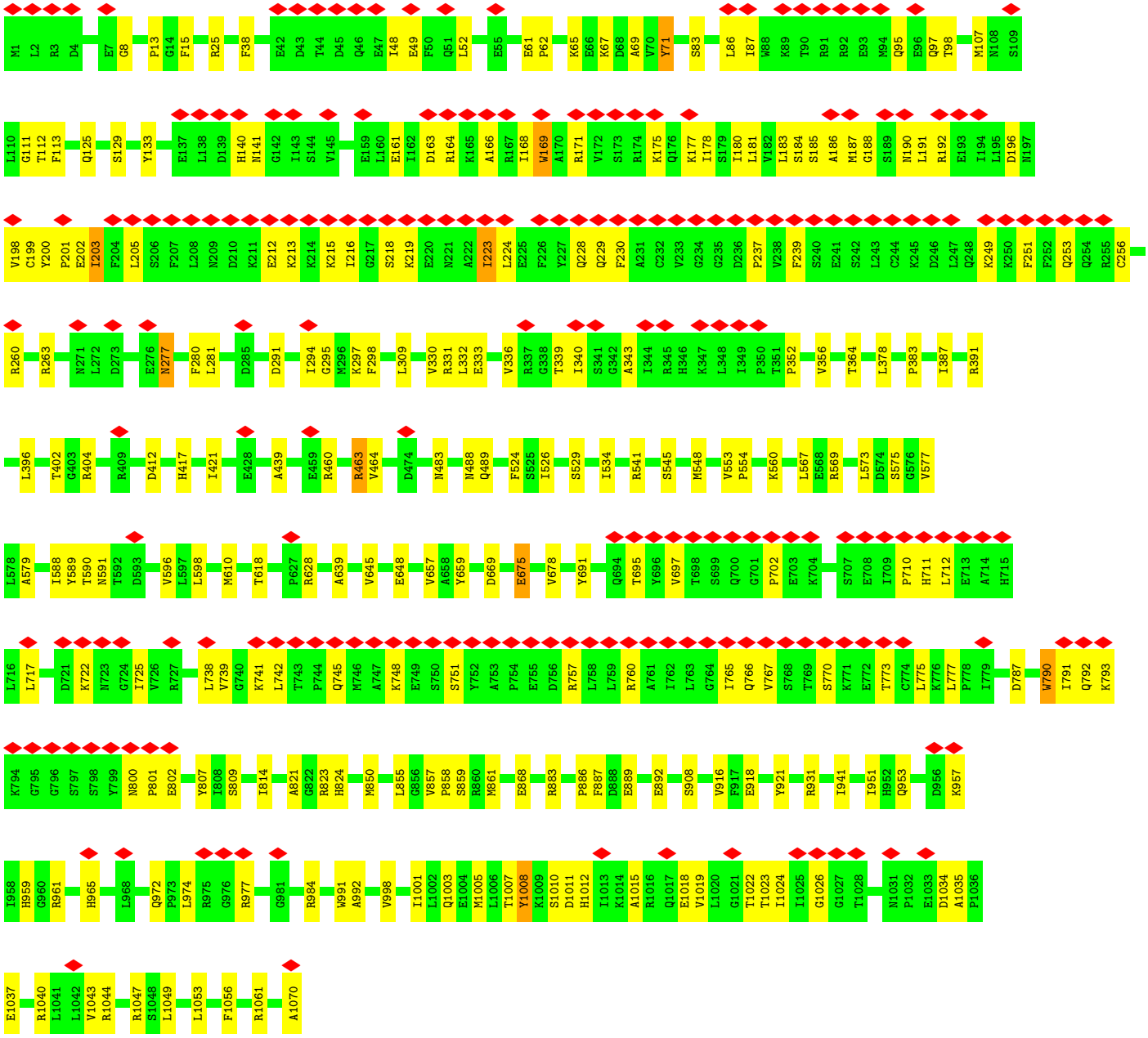
• Molecule 1: DNA-directed RNA polymerase subunit alpha

Chain O:



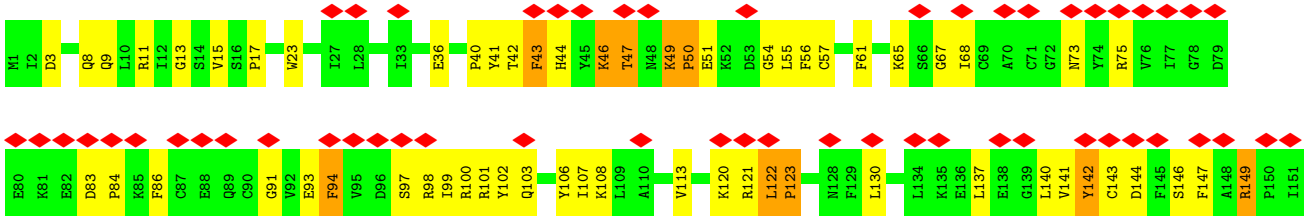
• Molecule 2: DNA-directed RNA polymerase subunit beta

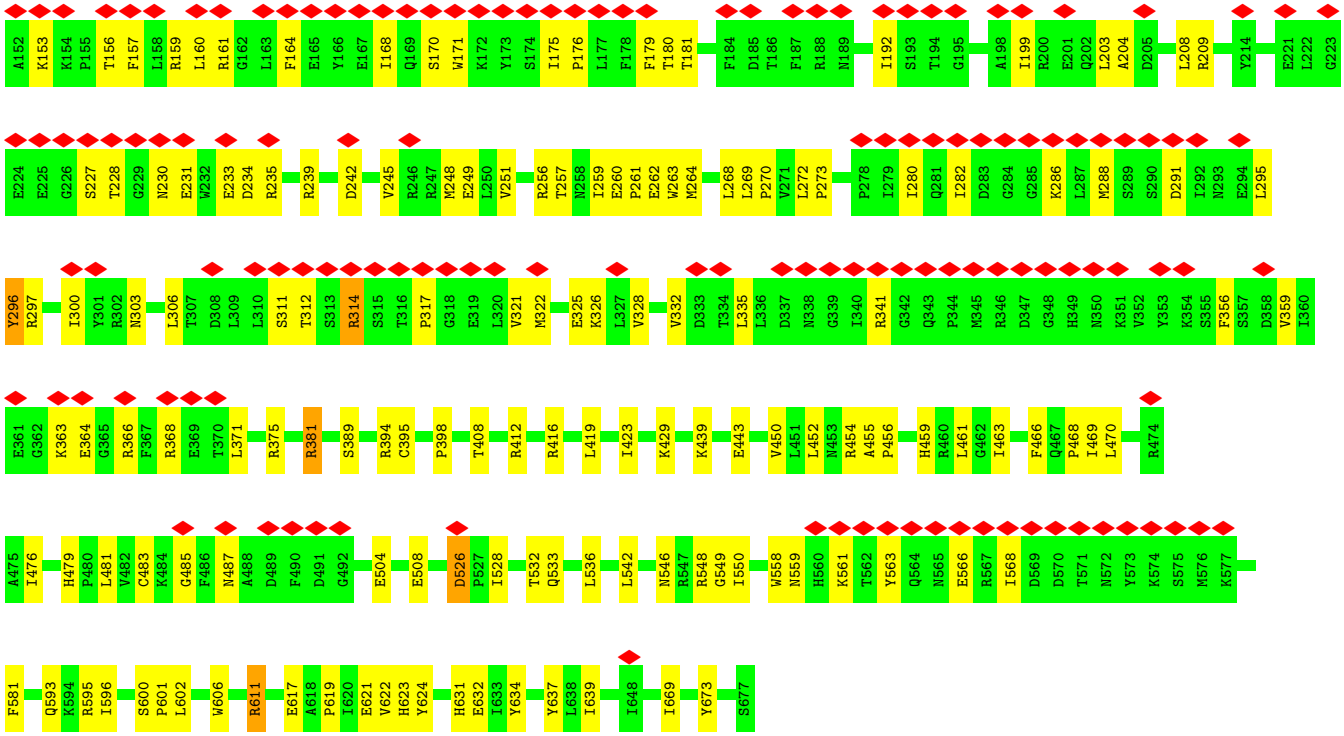
Chain B:



• Molecule 3: DNA-directed RNA polymerase subunit beta'

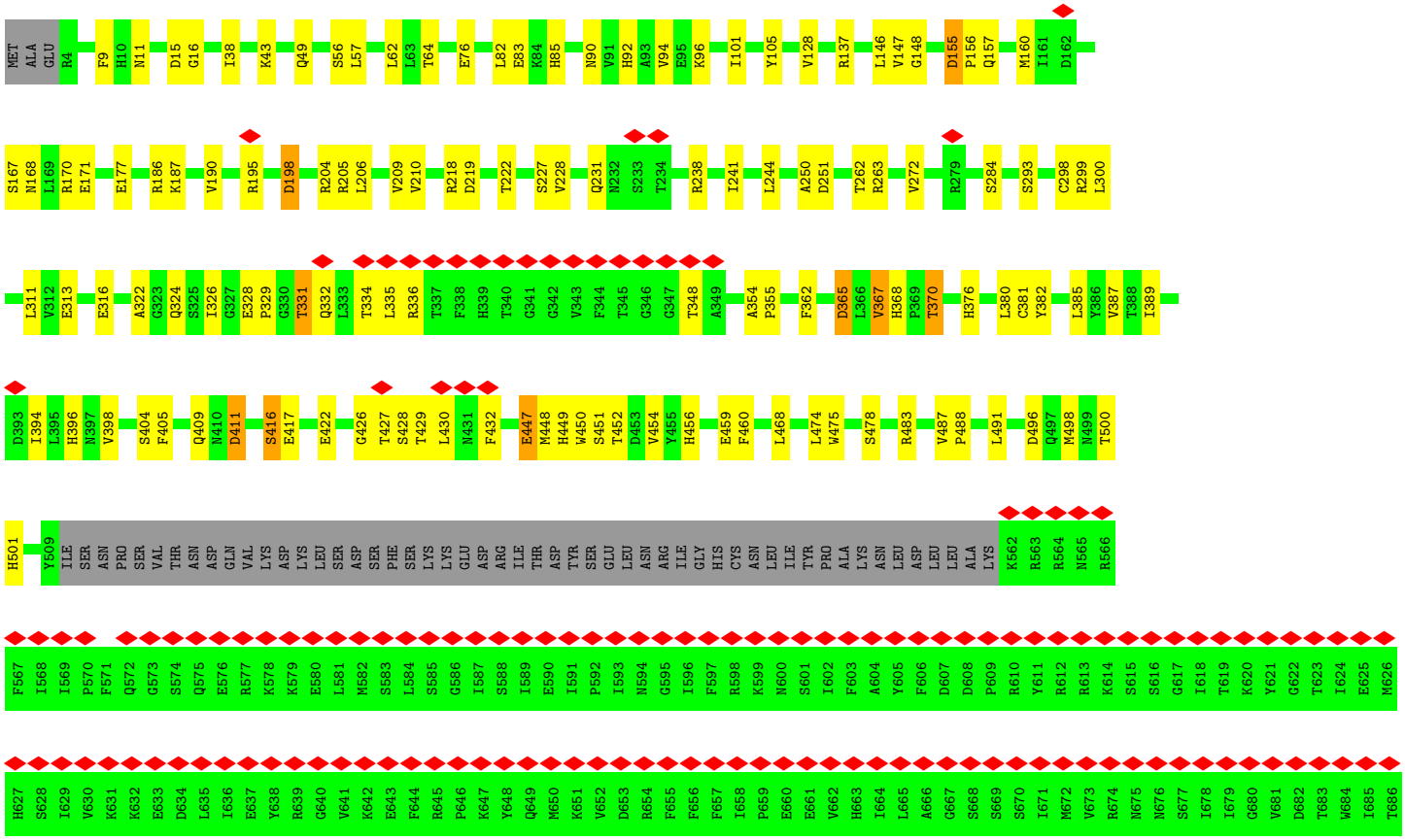
Chain C:

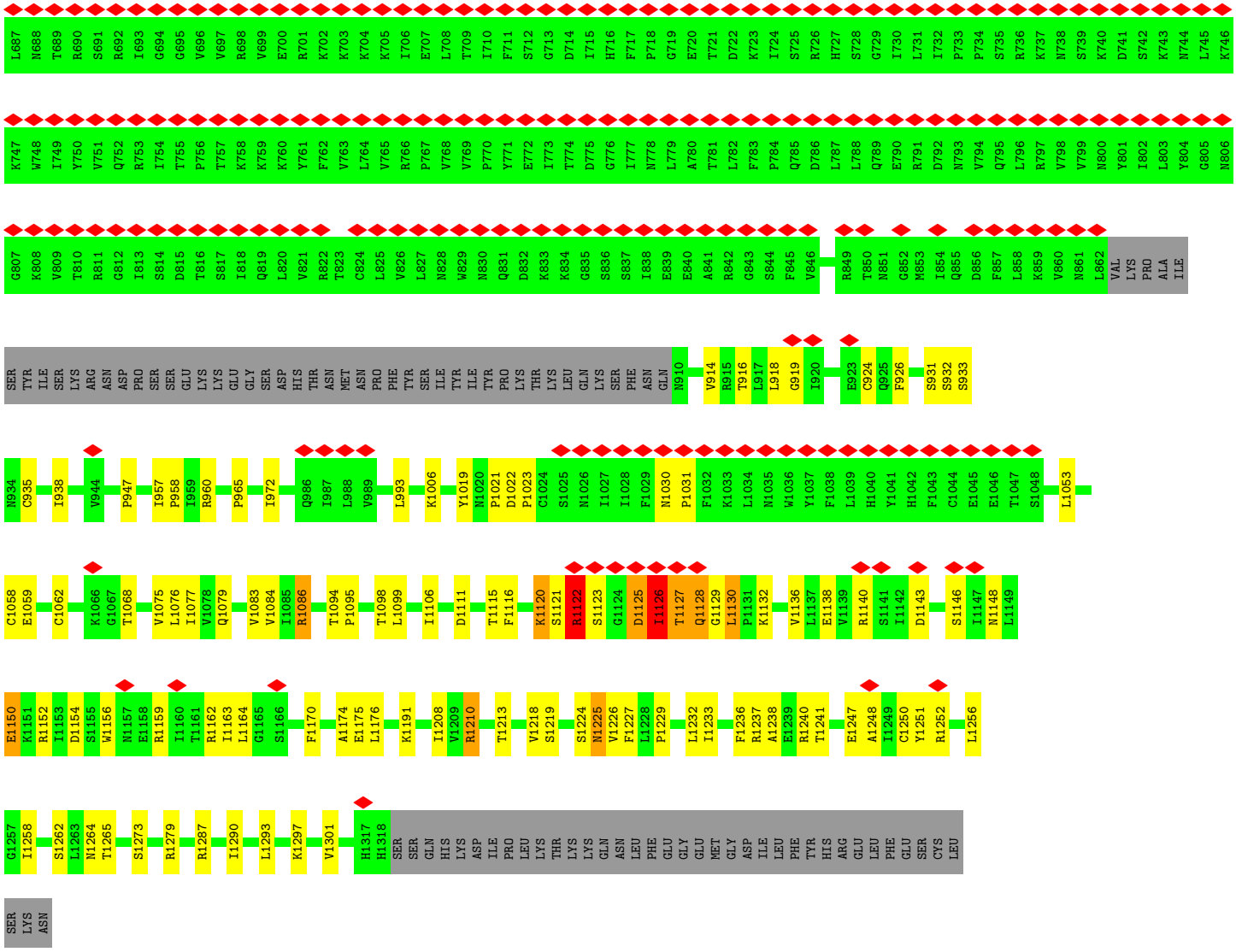




• Molecule 4: DNA-directed RNA polymerase subunit beta"

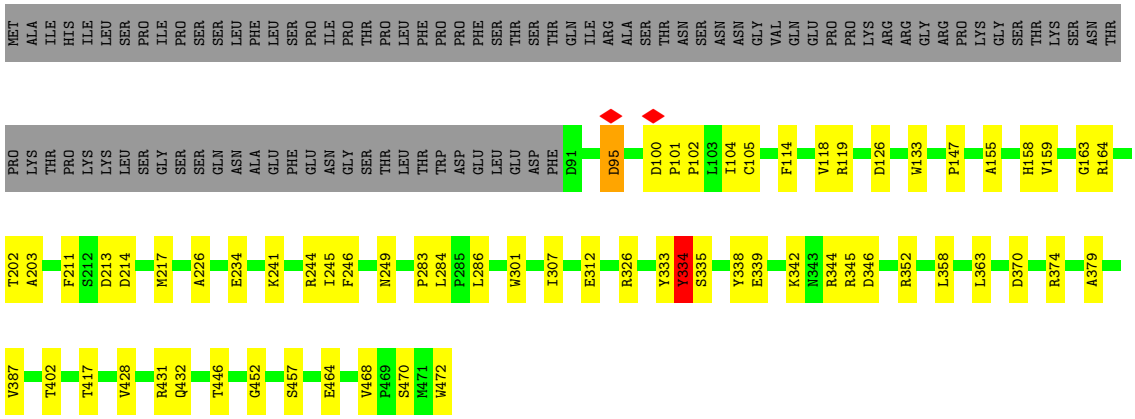
Chain D:





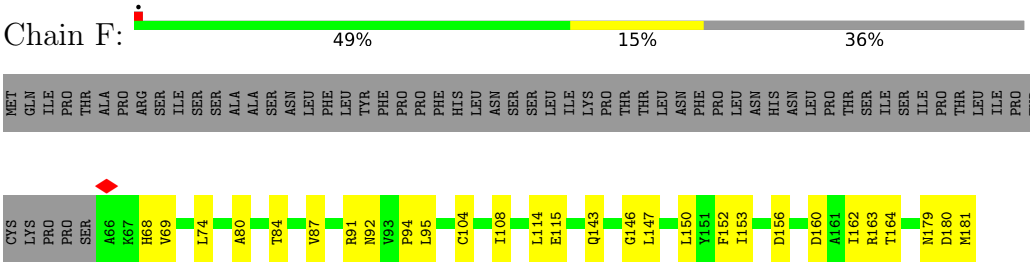
• Molecule 5: Fructokinase-like 1, chloroplastic

Chain E:



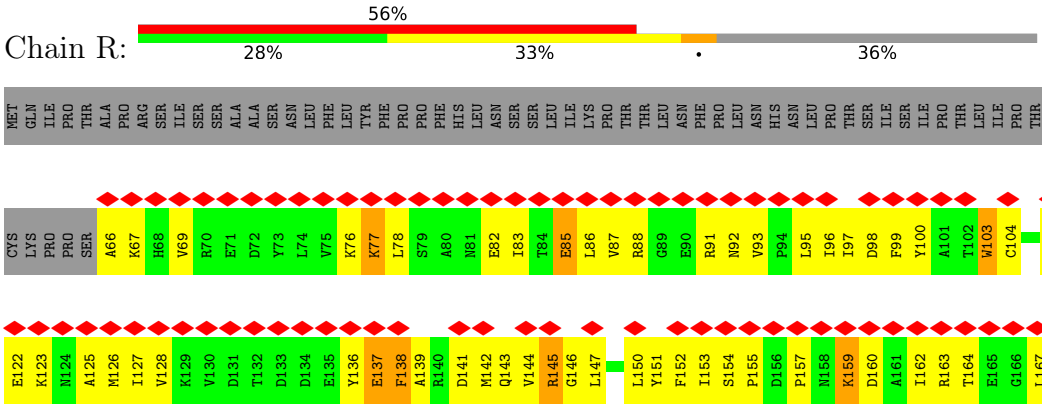
• Molecule 6: Thioredoxin-like protein CITRX, chloroplastic

Chain F:



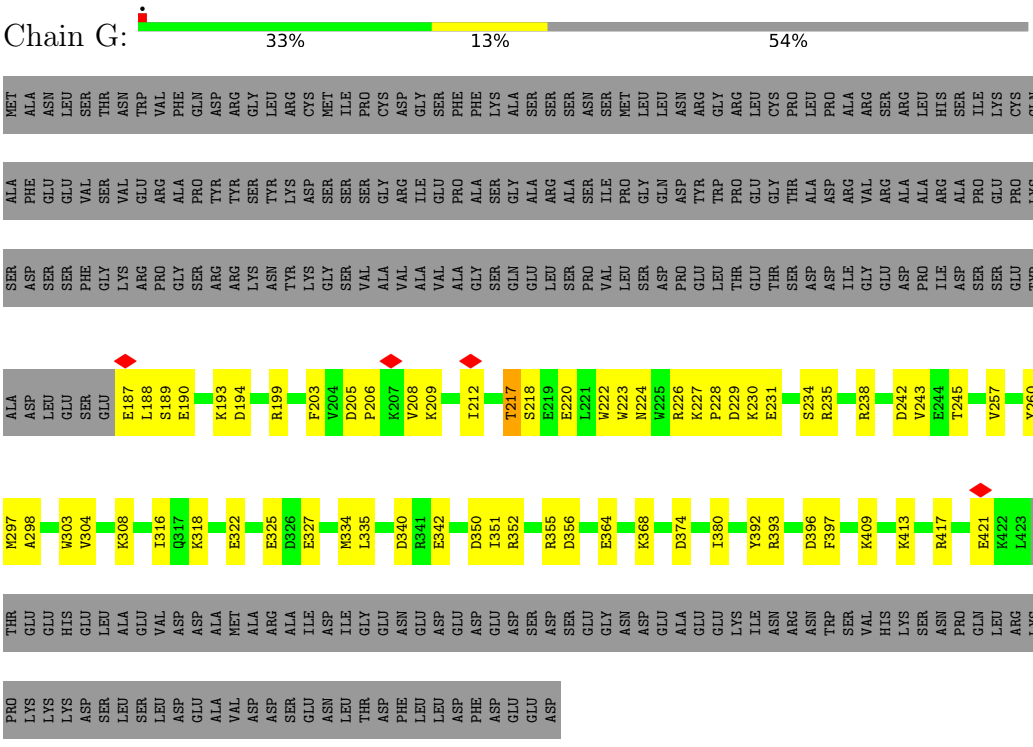
• Molecule 6: Thioredoxin-like protein CITRX, chloroplastic

Chain R:



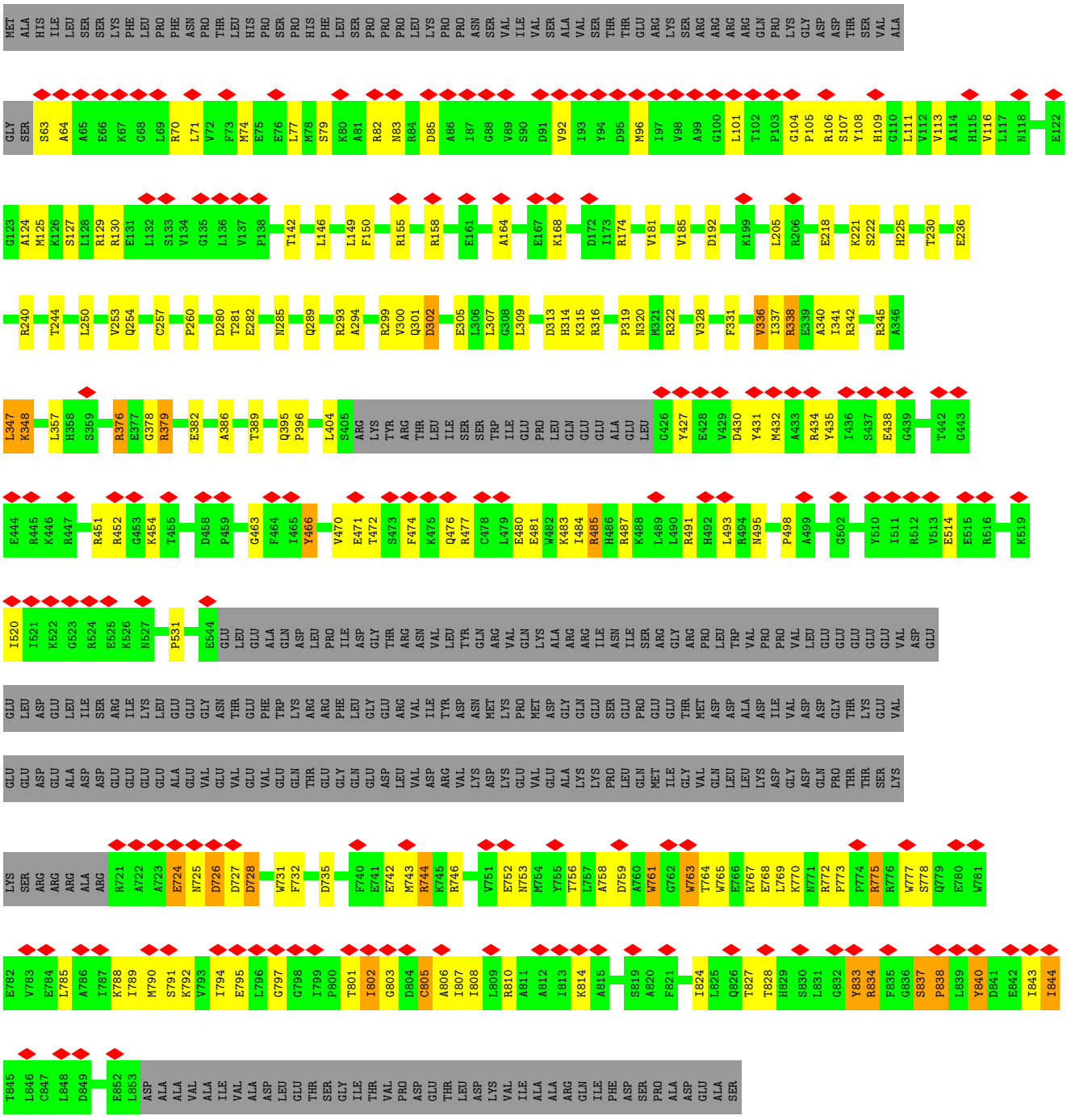
• Molecule 7: Protein PLASTID TRANSCRIPTIONALLY ACTIVE 12

Chain G:



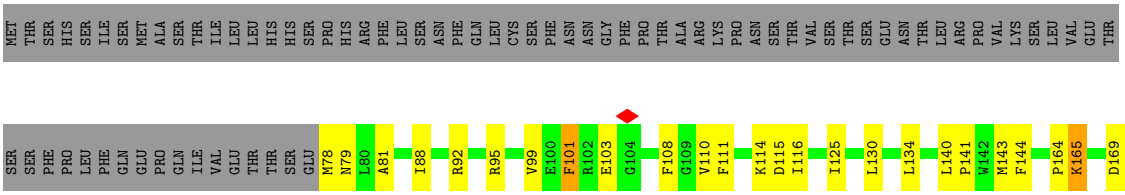
• Molecule 8: pTAC3

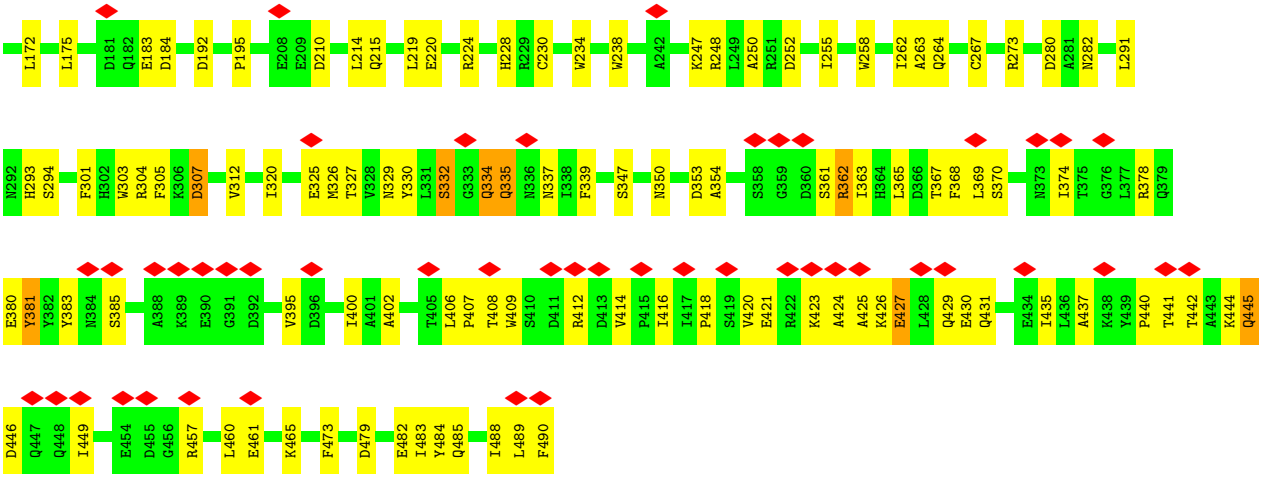
Chain H:



• Molecule 9: Protein PLASTID TRANSCRIPTIONALLY ACTIVE 14 isoform X2

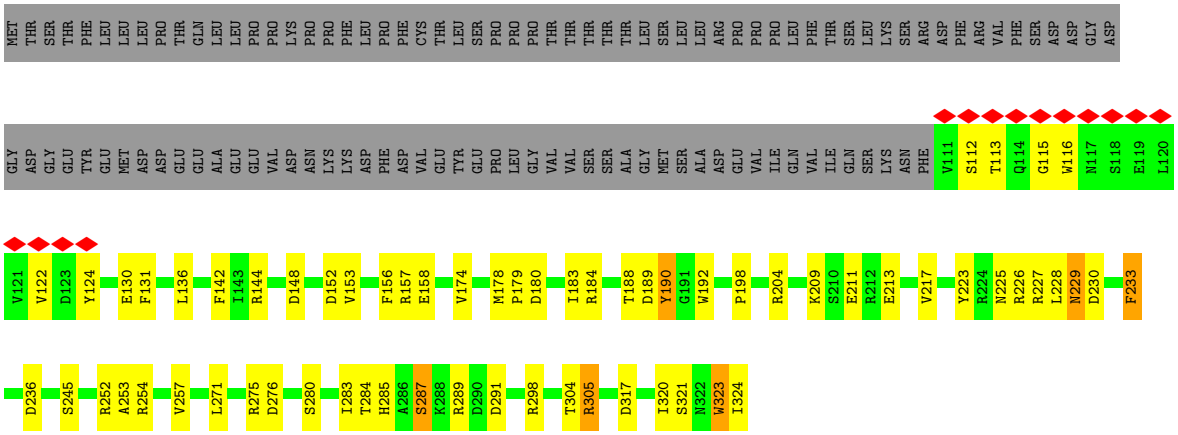
Chain I:





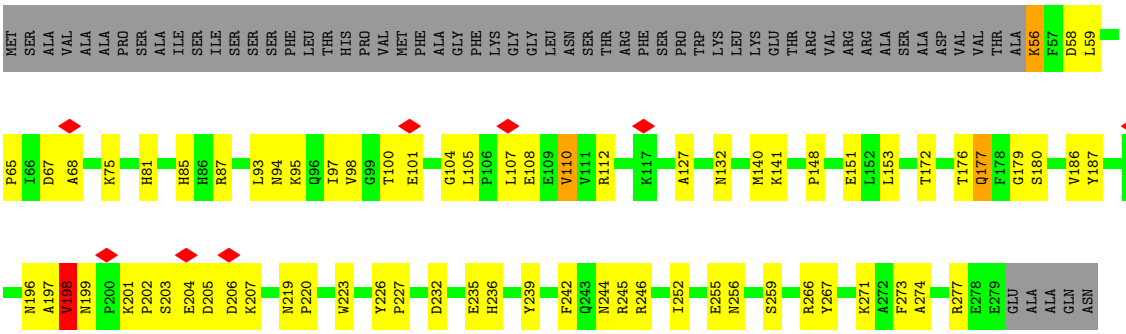
- Molecule 10: pTAC6

Chain K:



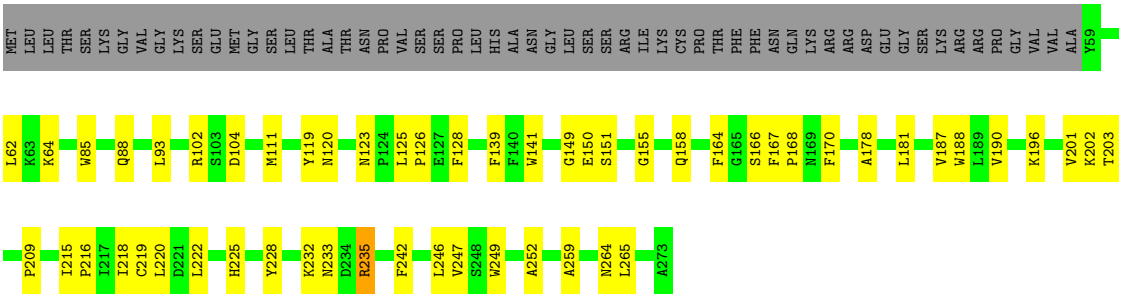
- Molecule 11: superoxide dismutase

Chain L:

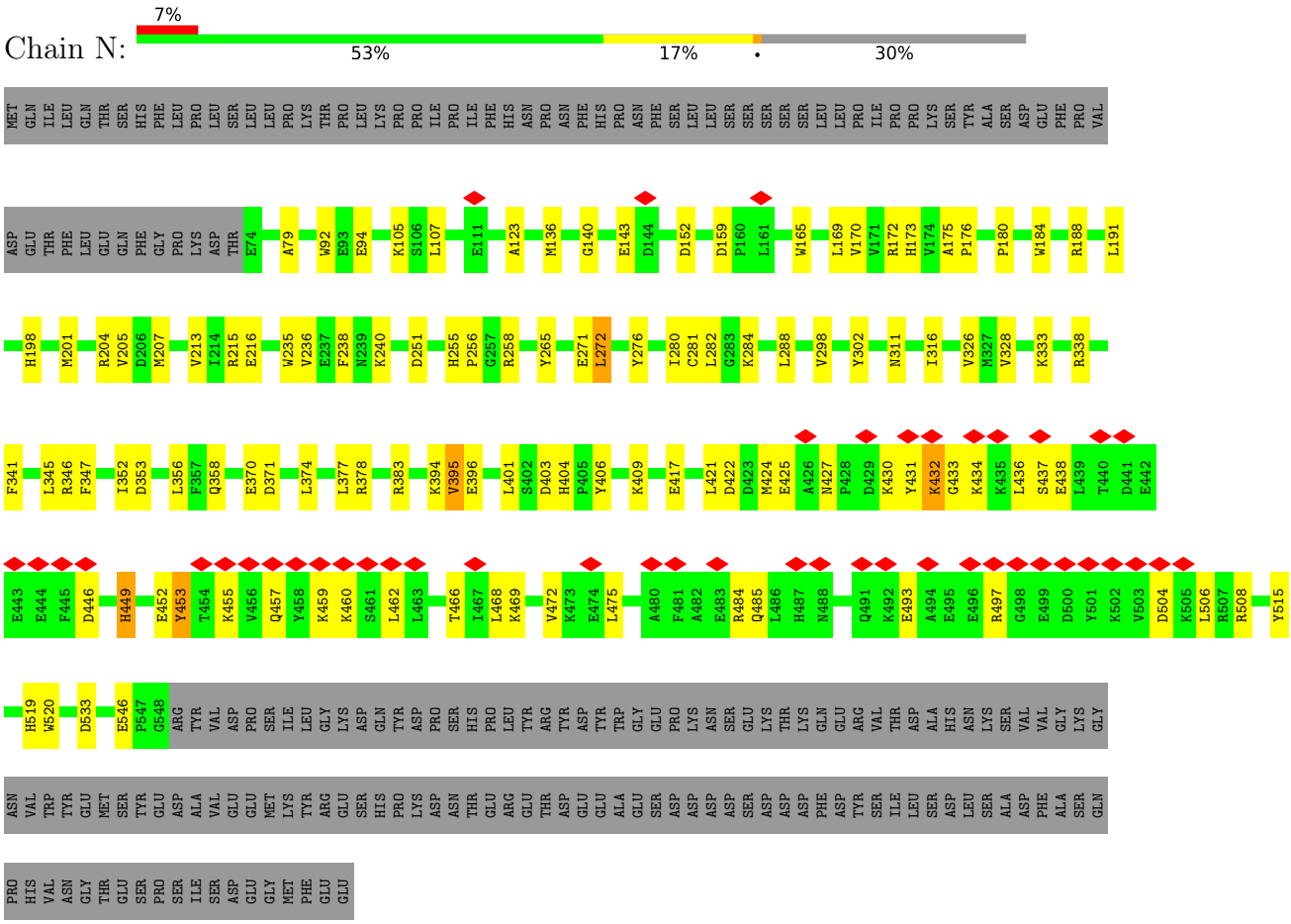


- Molecule 12: superoxide dismutase

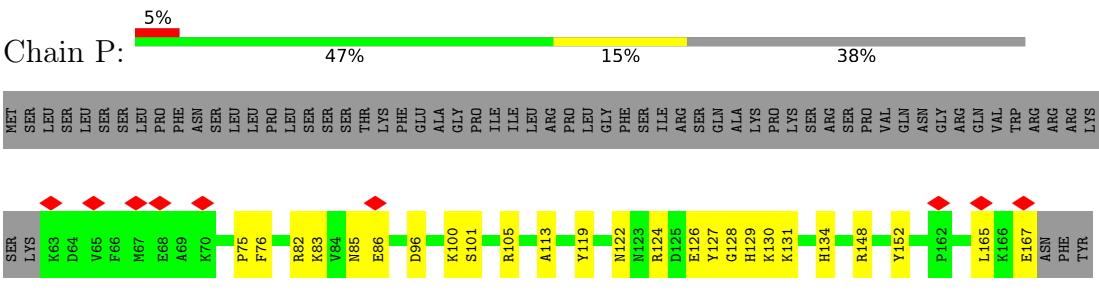
Chain M:



• Molecule 13: Protein PLASTID TRANSCRIPTIONALLY ACTIVE 10

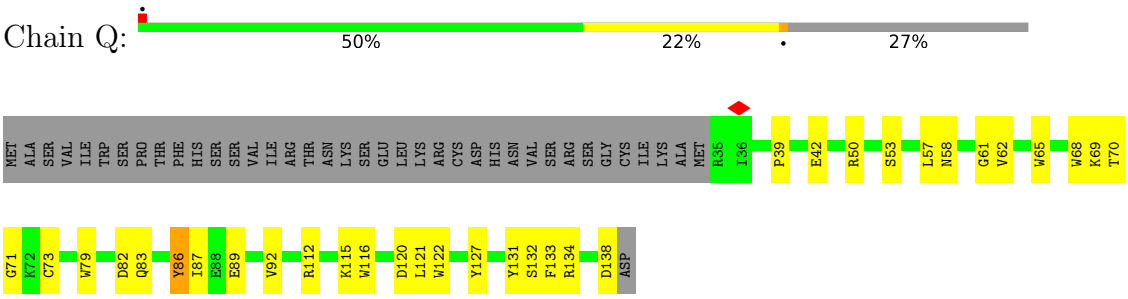


• Molecule 14: Protein PLASTID TRANSCRIPTIONALLY ACTIVE 7



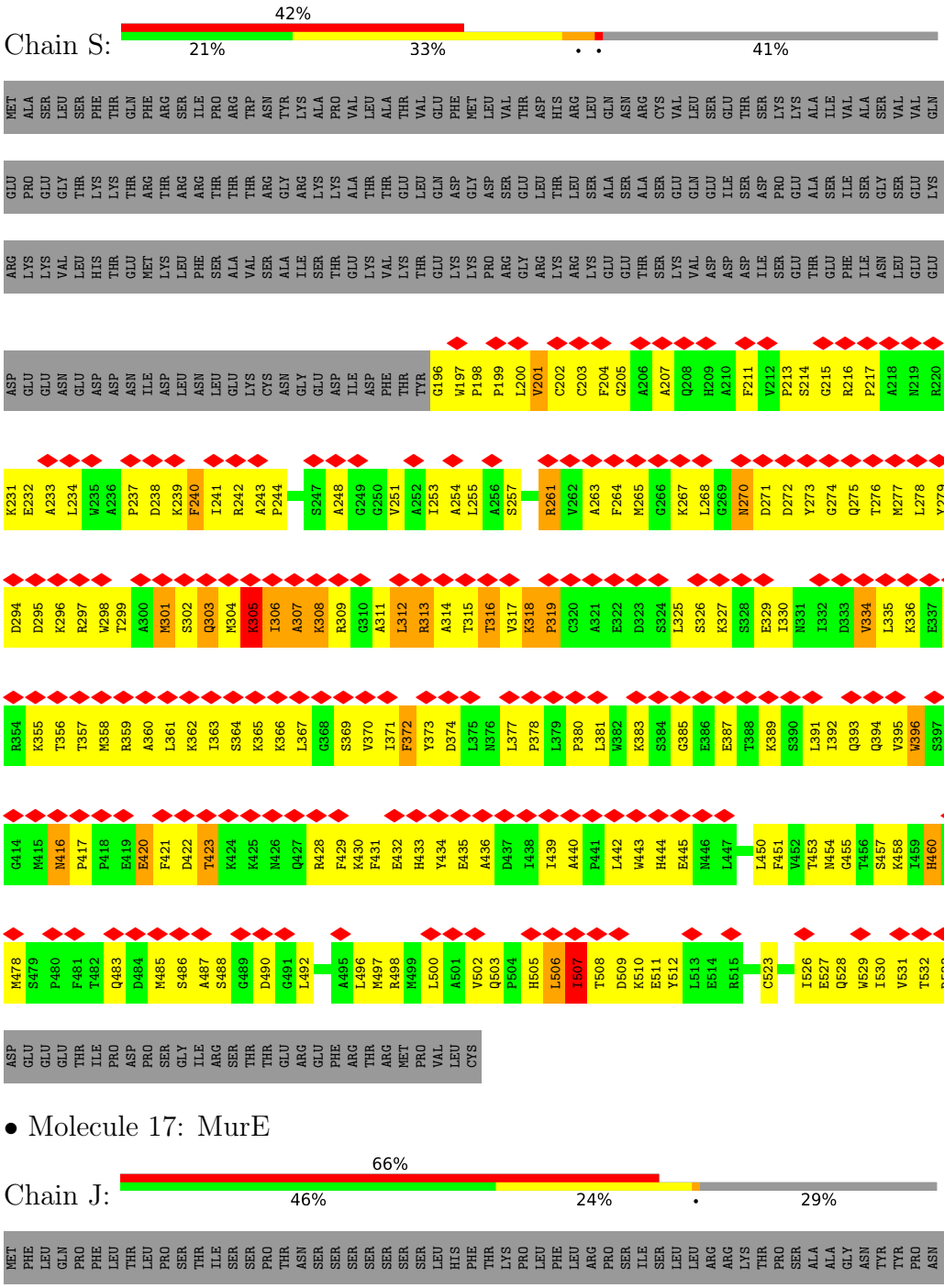
• Molecule 15: pTAC18

Chain Q:



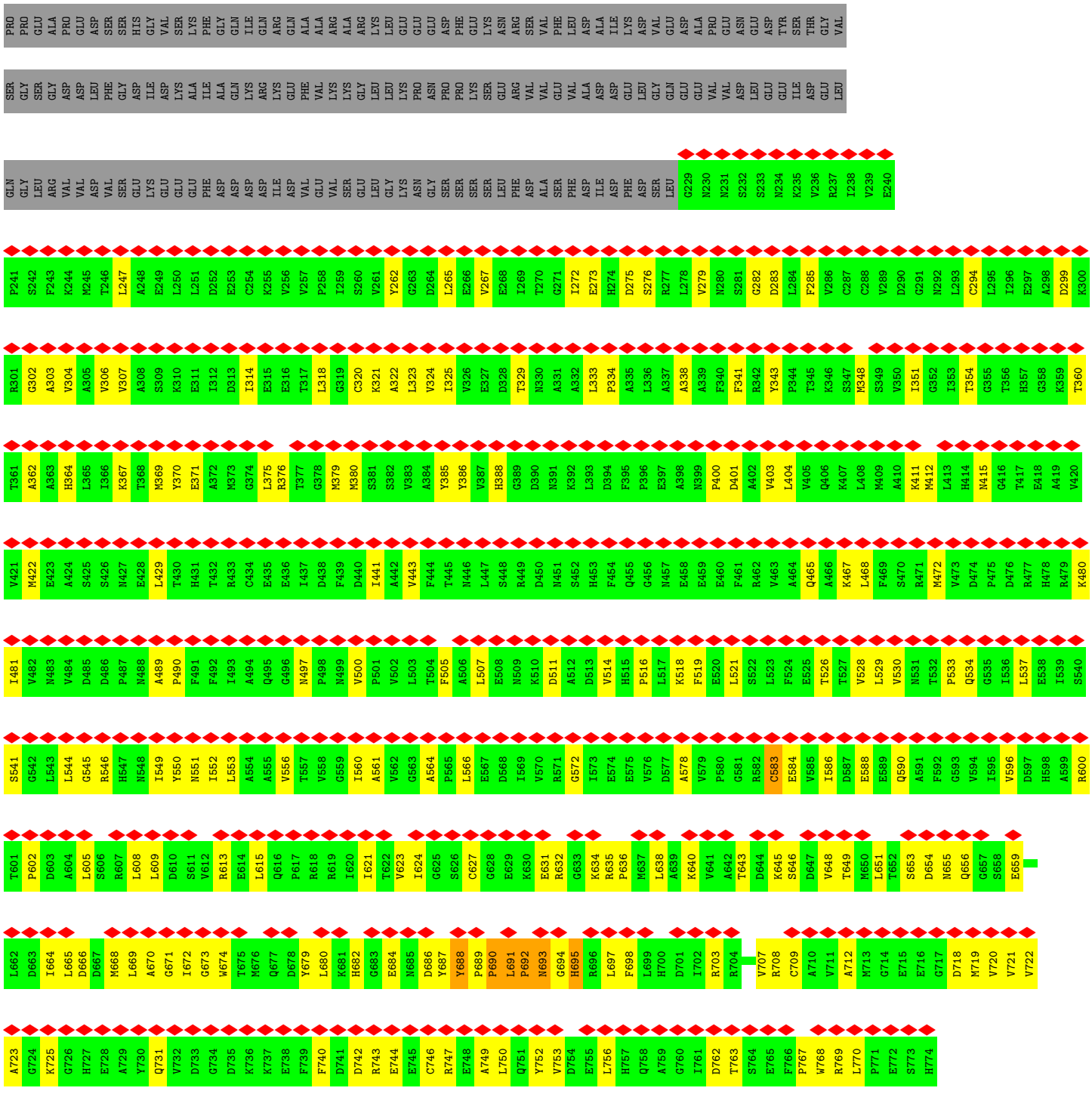
• Molecule 16: Fructokinase-like 2, chloroplastic isoform X2

Chain S:



• Molecule 17: MurE

Chain J:


PRO PRO GLU ALA PRO GLU ASP SER SER HIS GLY VAL SER LYS PHE GLY GLN ILE GLN ARG GLN ALA ALA ARG ALA ARG LYS LEU GLU GLU GLU ASP PHE GLU LYS ASN ARG SER VAL PHE LEU ASP ALA ILE LYS ASP VAL GLU ASP ALA PRO GLU ASN GLU ASP TYR SER THR GLY VAL
SER GLY SER GLY ASP ASP LEU PHE GLY ASP ILE ASP LYS ALA ILE ALA GLN LYS ARG LYS GLU PHE VAL LYS LYS GLY LEU LEU LYS PRO ASN PRO PRO LYS SER GLU ARG VAL VAL GLU VAL ALA ASP GLU GLU ILE ASP GLU LEU
GLN GLY LEU ARG VAL VAL ASP VAL SER GLU LYS GLU GLU GLU PHE ASP ASP ASP ASP ILE ASP VAL GLU VAL SER GLU LEU GLY LYS ASN GLY SER SER SER SER LEU PHE ASP ALA SER PHE ASP ILE ASP PHE ASP SER LEU G229 N230 N231 S232 S233 N234 K235 V236 R237 I238 V239 E240
P241 S242 F243 K244 M245 T246 L247 A248 E249 L250 L251 D252 E253 C254 K255 V256 V257 P258 I259 S260 V261 Y262 G263 D264 L265 E266 V267 E268 I269 T270 G271 I272 E273 H274 D275 S276 R277 L278 V279 N280 S281 G282 D283 L284 F285 V286 C287 C288 V289 D290 G291 N292 L293 C294 L295 I296 E297 A298 D299 K300
R301 G302 A303 V304 A305 V306 V307 A308 S309 K310 E311 I312 D313 I314 E315 E316 T317 L318 G319 C320 K321 A322 L323 V324 I325 V326 E327 D328 T329 N330 A331 A332 L333 P334 A335 L336 A337 A338 A339 F340 F341 R342 Y343 P344 T345 K346 S347 M348 S349 V350 I351 G352 I353 T354 G355 T356 H357 G358 K359 T360
T361 A362 A363 H364 L365 I366 K367 T368 M369 Y370 E371 A372 M373 G374 L375 R376 T377 G378 M379 M380 S381 S382 V383 A384 Y385 Y386 V387 H388 G389 D390 N391 K392 L393 D394 F395 P396 E397 A398 N399 P400 D401 A402 V403 L404 V405 Q406 K407 L408 M409 A410 K411 M412 L413 H414 N415 G416 T417 E418 A419 V420
V421 M422 E423 A424 S425 S426 N427 E428 L429 T430 H431 T432 R433 C434 E435 E436 I437 D438 F439 D440 I441 A442 V443 F444 T445 N446 L447 S448 R449 D450 N451 S452 H453 F454 Q455 G456 N457 E458 E459 E460 F461 R462 V463 A464 Q465 A466 K467 L468 F469 S470 R471 M472 V473 D474 P475 D476 R477 H478 R479 K480
I481 V482 N483 V484 D485 D486 P487 N488 A489 P490 F491 F492 I493 A494 Q495 G496 N497 P498 N499 V500 P501 V502 L503 T504 F505 A506 L507 E508 N509 K510 D511 A512 D513 V514 H515 P516 L517 K518 F519 E520 L521 S522 L523 F524 E525 T526 T527 V528 L529 V530 N531 T532 P533 Q534 G535 I536 L537 E538 I539 S540
S541 G542 L543 L544 G545 R546 H547 N548 I549 Y550 N551 I552 L553 A554 A555 V556 T557 V558 G559 I560 A561 V562 G563 A564 P565 L566 E567 D568 I569 V570 R571 G572 I573 E574 E575 V576 D577 A578 V579 P580 G581 R582 C583 E584 V585 I586 D587 E588 E589 Q590 A591 F592 G593 V594 I595 V596 D597 H598 A599 R600
T601 P602 D603 A604 L605 S606 R607 L608 L609 D610 S611 V612 R613 E614 L615 Q616 P617 R618 R619 I620 I621 T622 V623 I624 G625 S626 C627 G628 E629 K630 E631 R632 G633 K634 R635 P636 M637 L638 A639 K640 V641 A642 T643 D644 K645 S646 D647 V648 T649 M650 L651 T652 S653 D654 N655 Q656 G657 S658 E659
L662 D663 I664 L665 D666 D667 M668 L669 A670 G671 I672 G673 W674 T675 M676 Q677 D678 Y679 L680 K681 H682 G683 E684 N685 D686 Y687 Y688 P689 P690 L691 P692 N693 G694 H695 R696 L697 F698 L699 H700 D701 I702 R703 R704 V707 R708 C709 A710 V711 A712 M713 G714 E715 E716 G717 D718 M719 V720 V721 V722
A723 G724 K725 G726 H727 E728 A729 Y730 Q731 V732 D733 G734 D735 K736 K737 E738 F739 F740 D741 D742 R743 E744 E745 C746 R747 E748 A749 L750 Q751 Y752 V753 D754 E755 L756 H757 Q758 A759 G760 I761 D762 T763 S764 E765 P766 P767 W768 R769 L770 P771 E772 S773 H774

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	180924	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	50.0	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	1.697	Depositor
Minimum map value	-1.051	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.043	Depositor
Recommended contour level	0.23	Depositor
Map size (Å)	563.2, 563.2, 563.2	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.1, 1.1, 1.1	Depositor

5 Model quality

5.1 Standard geometry

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

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	0.26	0/1810	0.54	0/2454
1	O	0.25	0/1796	0.52	0/2435
2	B	0.25	0/8691	0.52	0/11741
3	C	0.26	0/5636	0.52	0/7617
4	D	0.28	0/8497	0.53	0/11580
5	E	0.26	0/3154	0.49	0/4268
6	F	0.25	0/956	0.50	0/1292
6	R	0.27	0/956	0.58	0/1292
7	G	0.25	0/2062	0.51	0/2781
8	H	0.29	0/4745	0.57	0/6417
9	I	0.25	0/3456	0.52	0/4675
10	K	0.26	0/1849	0.54	0/2507
11	L	0.30	0/1877	0.50	0/2558
12	M	0.25	0/1820	0.44	0/2478
13	N	0.25	0/4139	0.48	0/5582
14	P	0.27	0/857	0.52	0/1152
15	Q	0.27	0/932	0.54	0/1261
16	S	0.31	0/2756	0.66	0/3731
17	J	0.25	0/4293	0.53	0/5820
All	All	0.26	0/60282	0.53	0/81641

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1775	0	1783	60	0
1	O	1761	0	1772	43	0
2	B	8517	0	8571	168	0
3	C	5507	0	5546	156	0
4	D	8374	0	7240	196	0
5	E	3079	0	2992	42	0
6	F	940	0	934	22	0
6	R	940	0	934	92	0
7	G	2009	0	1967	56	0
8	H	4653	0	4517	148	0
9	I	3373	0	3321	92	0
10	K	1803	0	1752	53	0
11	L	1817	0	1720	53	0
12	M	1763	0	1698	34	0
13	N	4032	0	3891	87	0
14	P	840	0	804	26	0
15	Q	902	0	870	22	0
16	S	2695	0	2712	280	0
17	J	4218	0	4148	153	0
18	L	1	0	0	0	0
All	All	58999	0	57172	1572	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 14.

The worst 5 of 1572 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:H:96:MET:HB2	8:H:101:LEU:HB2	1.33	1.05
6:R:160:ASP:HA	16:S:305:LYS:HB3	1.42	1.00
16:S:270:ASN:O	16:S:275:GLN:HG3	1.63	0.98
16:S:304:MET:HE2	16:S:316:THR:HA	1.48	0.93
16:S:421:PHE:HB2	16:S:433:HIS:HB3	1.52	0.91

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	223/335 (67%)	207 (93%)	15 (7%)	1 (0%)	30 61
1	O	221/335 (66%)	203 (92%)	18 (8%)	0	100 100
2	B	1068/1070 (100%)	975 (91%)	86 (8%)	7 (1%)	19 51
3	C	675/677 (100%)	605 (90%)	64 (10%)	6 (1%)	14 45
4	D	1211/1357 (89%)	1063 (88%)	131 (11%)	17 (1%)	9 36
5	E	380/472 (80%)	359 (94%)	18 (5%)	3 (1%)	16 47
6	F	114/181 (63%)	109 (96%)	5 (4%)	0	100 100
6	R	114/181 (63%)	97 (85%)	16 (14%)	1 (1%)	14 45
7	G	235/518 (45%)	205 (87%)	30 (13%)	0	100 100
8	H	589/892 (66%)	496 (84%)	87 (15%)	6 (1%)	13 43
9	I	411/490 (84%)	328 (80%)	82 (20%)	1 (0%)	44 72
10	K	212/324 (65%)	194 (92%)	17 (8%)	1 (0%)	25 57
11	L	222/284 (78%)	180 (81%)	38 (17%)	4 (2%)	7 31
12	M	213/273 (78%)	198 (93%)	15 (7%)	0	100 100
13	N	473/678 (70%)	446 (94%)	25 (5%)	2 (0%)	30 61
14	P	103/170 (61%)	89 (86%)	14 (14%)	0	100 100
15	Q	102/143 (71%)	88 (86%)	14 (14%)	0	100 100
16	S	342/583 (59%)	249 (73%)	78 (23%)	15 (4%)	2 13
17	J	544/774 (70%)	479 (88%)	62 (11%)	3 (1%)	22 54
All	All	7452/9737 (76%)	6570 (88%)	815 (11%)	67 (1%)	17 45

5 of 67 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	36	PRO
2	B	212	GLU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
3	C	123	PRO
4	D	447	GLU
4	D	947	PRO

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	198/305 (65%)	190 (96%)	8 (4%)	27	55
1	O	197/305 (65%)	192 (98%)	5 (2%)	42	67
2	B	929/929 (100%)	914 (98%)	15 (2%)	58	77
3	C	599/599 (100%)	576 (96%)	23 (4%)	28	56
4	D	702/1214 (58%)	676 (96%)	26 (4%)	29	57
5	E	336/418 (80%)	331 (98%)	5 (2%)	60	78
6	F	104/166 (63%)	102 (98%)	2 (2%)	52	73
6	R	104/166 (63%)	97 (93%)	7 (7%)	13	39
7	G	217/460 (47%)	214 (99%)	3 (1%)	62	80
8	H	470/772 (61%)	442 (94%)	28 (6%)	16	43
9	I	363/437 (83%)	344 (95%)	19 (5%)	19	47
10	K	203/305 (67%)	195 (96%)	8 (4%)	27	55
11	L	189/236 (80%)	182 (96%)	7 (4%)	29	57
12	M	186/235 (79%)	181 (97%)	5 (3%)	40	65
13	N	433/623 (70%)	423 (98%)	10 (2%)	45	69
14	P	87/147 (59%)	85 (98%)	2 (2%)	45	69
15	Q	94/130 (72%)	89 (95%)	5 (5%)	19	47
16	S	290/508 (57%)	260 (90%)	30 (10%)	6	22
17	J	462/666 (69%)	447 (97%)	15 (3%)	34	61
All	All	6163/8621 (72%)	5940 (96%)	223 (4%)	32	58

5 of 223 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
9	I	184	ASP
17	J	740	PHE
11	L	266	ARG
17	J	691	LEU
16	S	457	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 23 such sidechains are listed below:

Mol	Chain	Res	Type
11	L	219	ASN
16	S	483	GLN
13	N	255	HIS
16	S	528	GLN
3	C	44	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 oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 1 ligands modelled in this entry, 1 is 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.

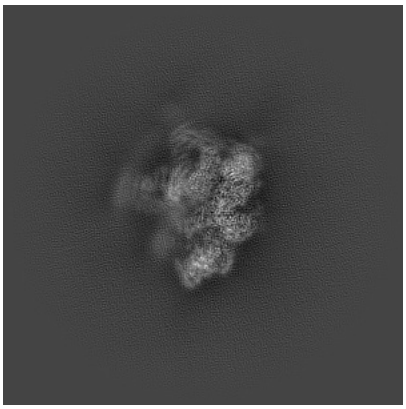
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-38799. These allow visual inspection of the internal detail of the map and identification of artifacts.

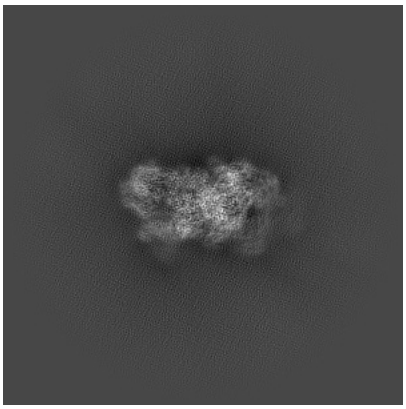
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

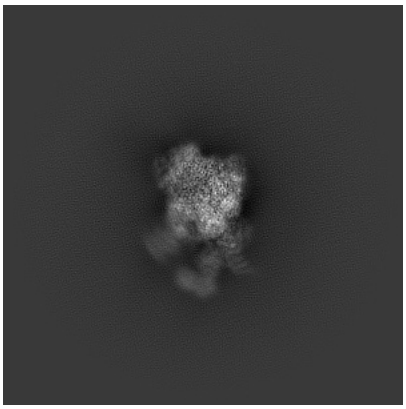
6.1.1 Primary map



X

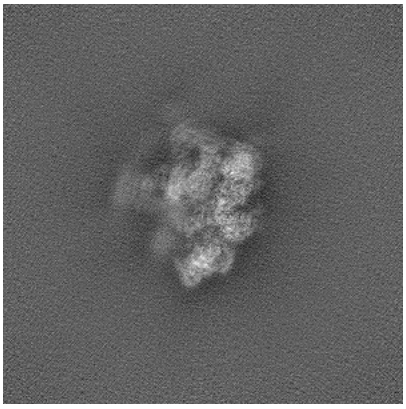


Y

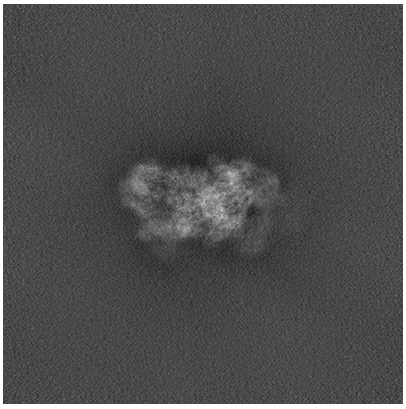


Z

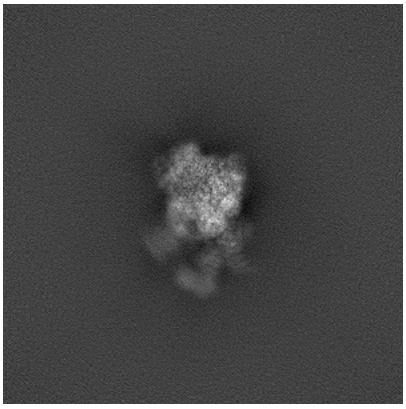
6.1.2 Raw map



X



Y

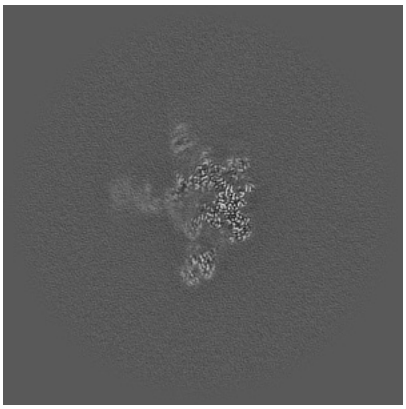


Z

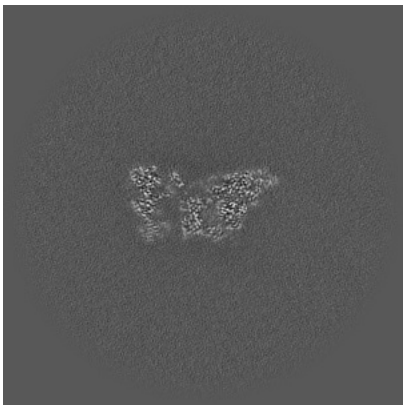
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

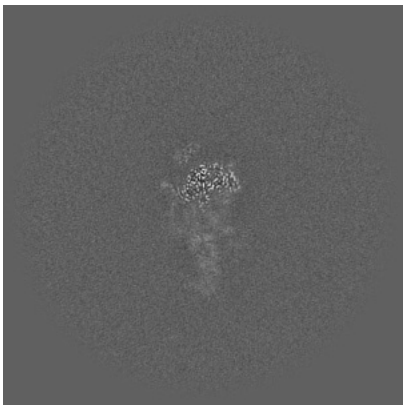
6.2.1 Primary map



X Index: 256

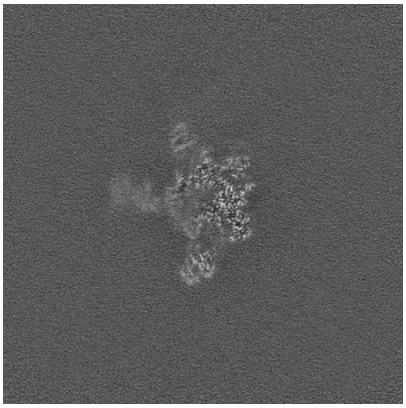


Y Index: 256

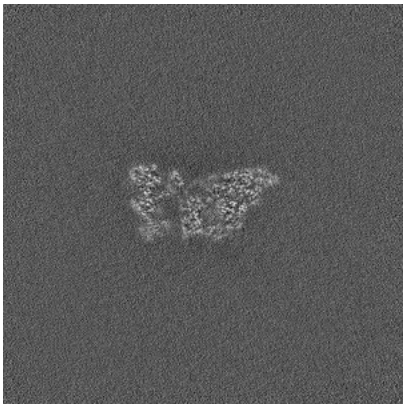


Z Index: 256

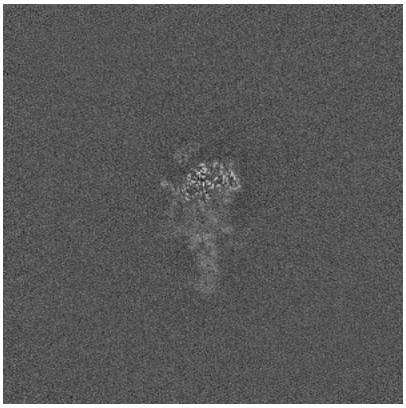
6.2.2 Raw map



X Index: 256



Y Index: 256

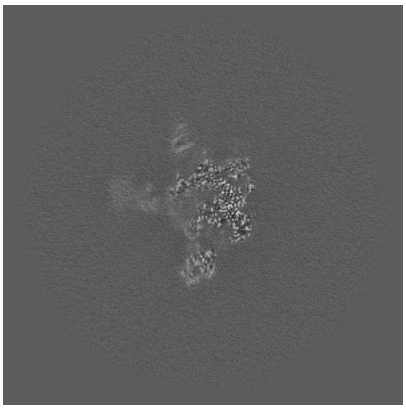


Z Index: 256

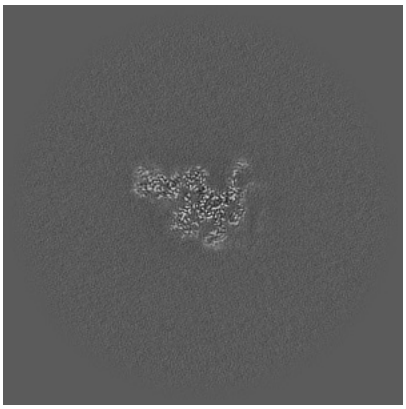
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

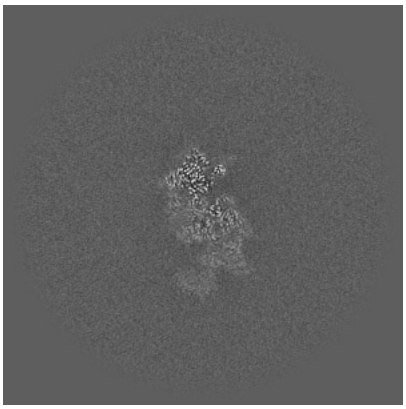
6.3.1 Primary map



X Index: 255

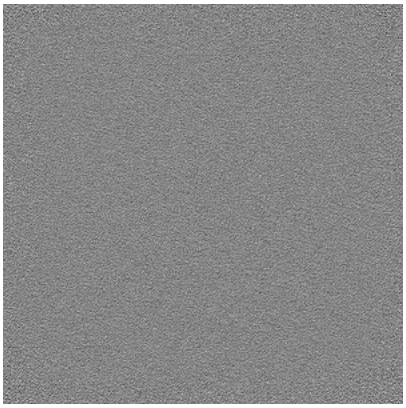


Y Index: 283

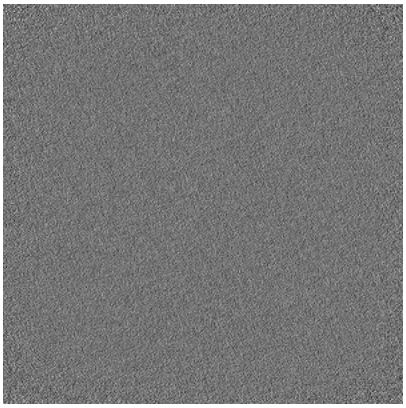


Z Index: 278

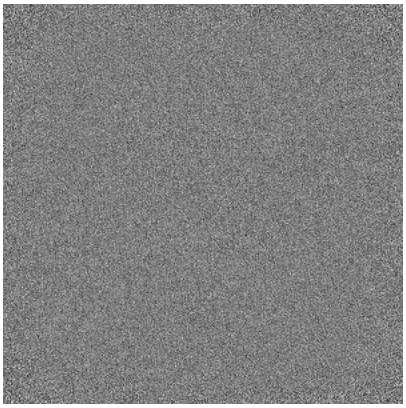
6.3.2 Raw map



X Index: 0



Y Index: 0

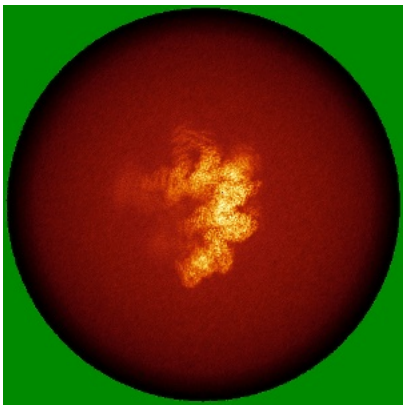


Z Index: 0

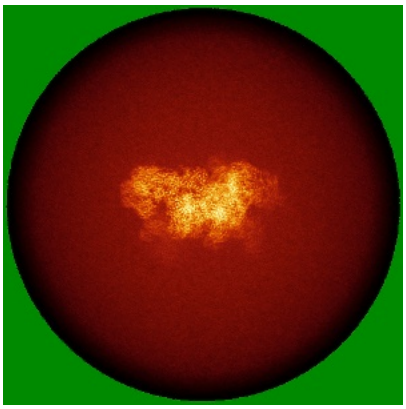
The images above show the largest variance slices of the map in three orthogonal directions.

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

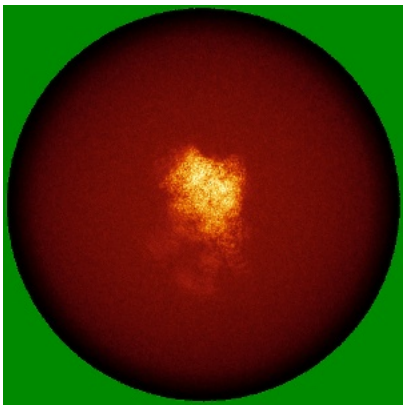
6.4.1 Primary map



X

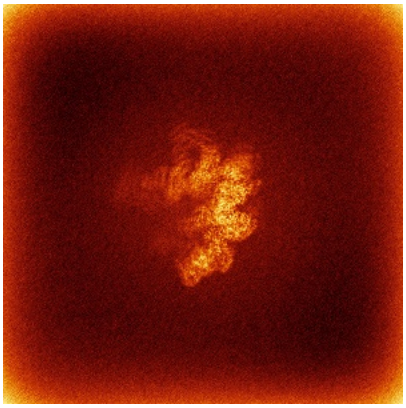


Y

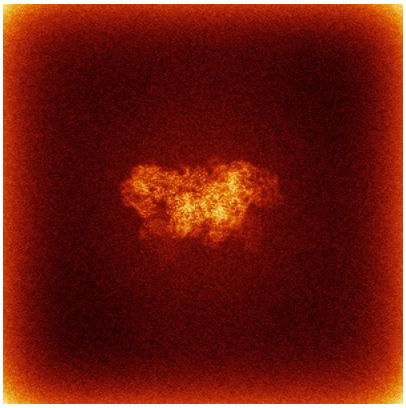


Z

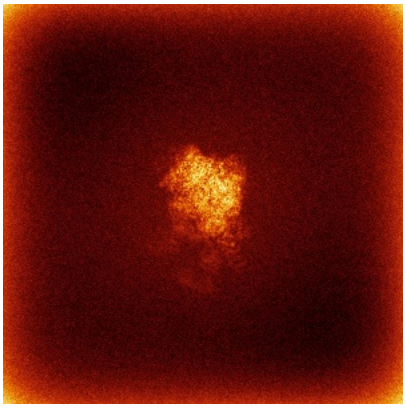
6.4.2 Raw map



X



Y



Z

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

6.5 Orthogonal surface views (i)

6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.23. 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.

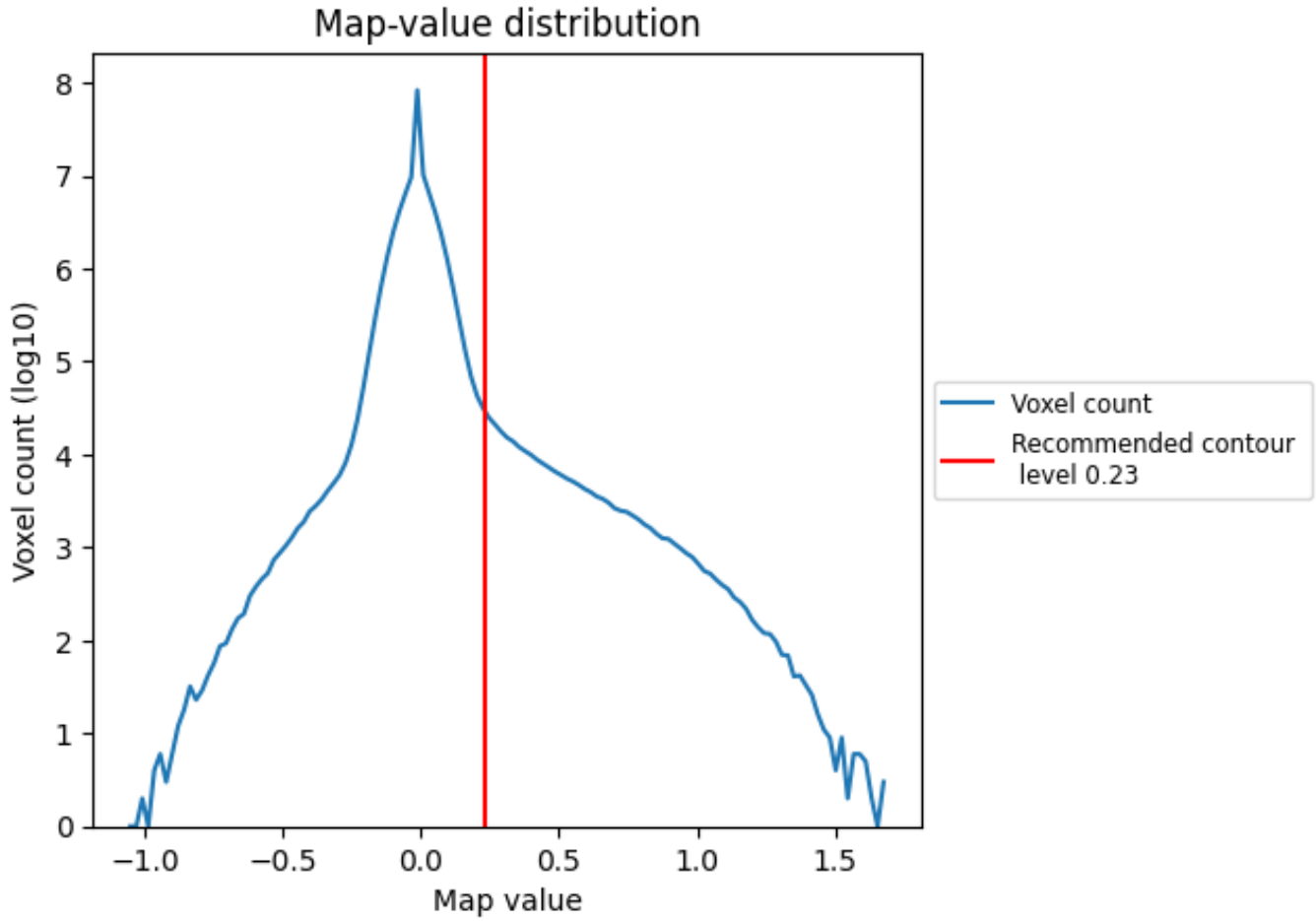
6.6 Mask visualisation (i)

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

7 Map analysis

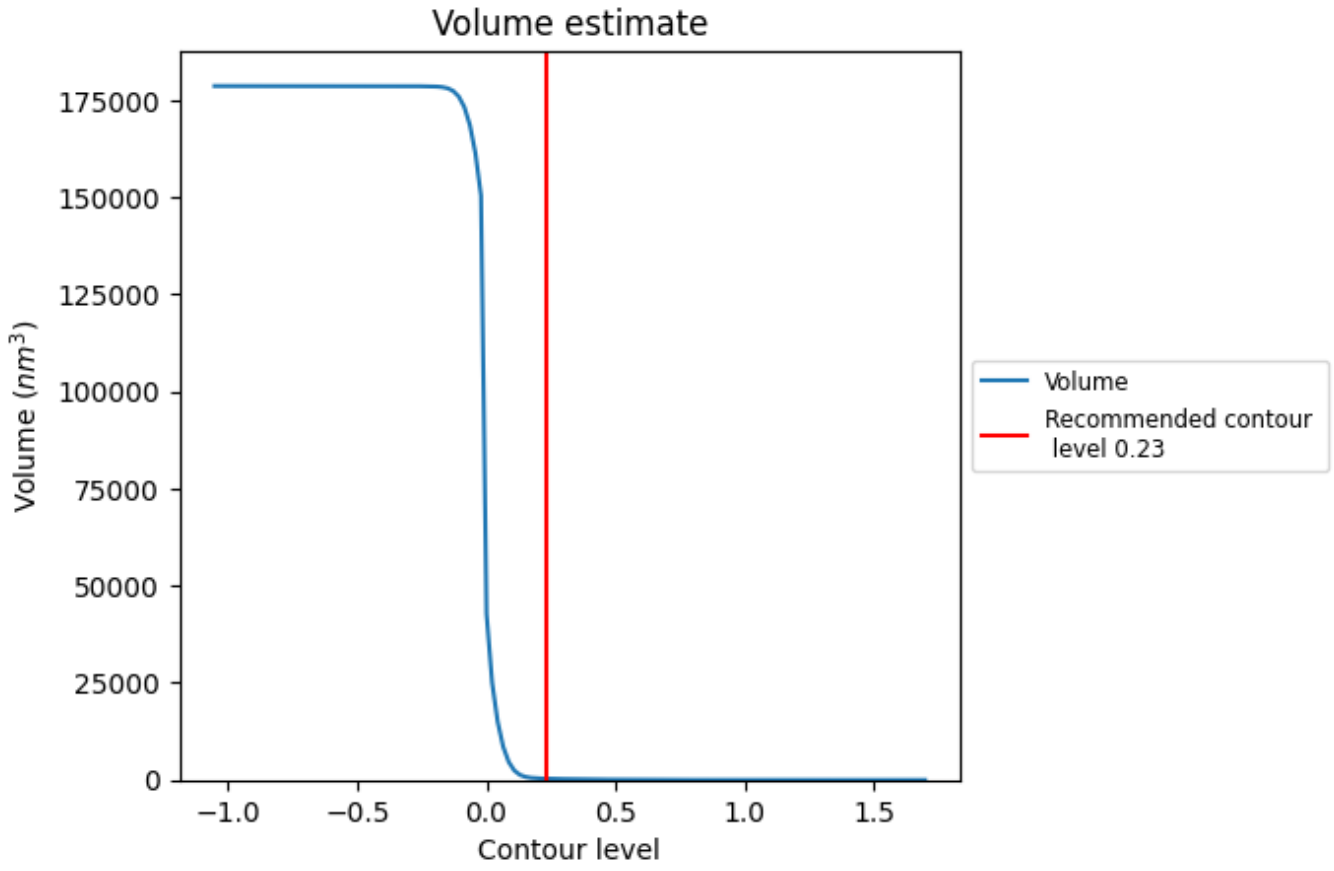
This section contains the results of statistical analysis of the map.

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.

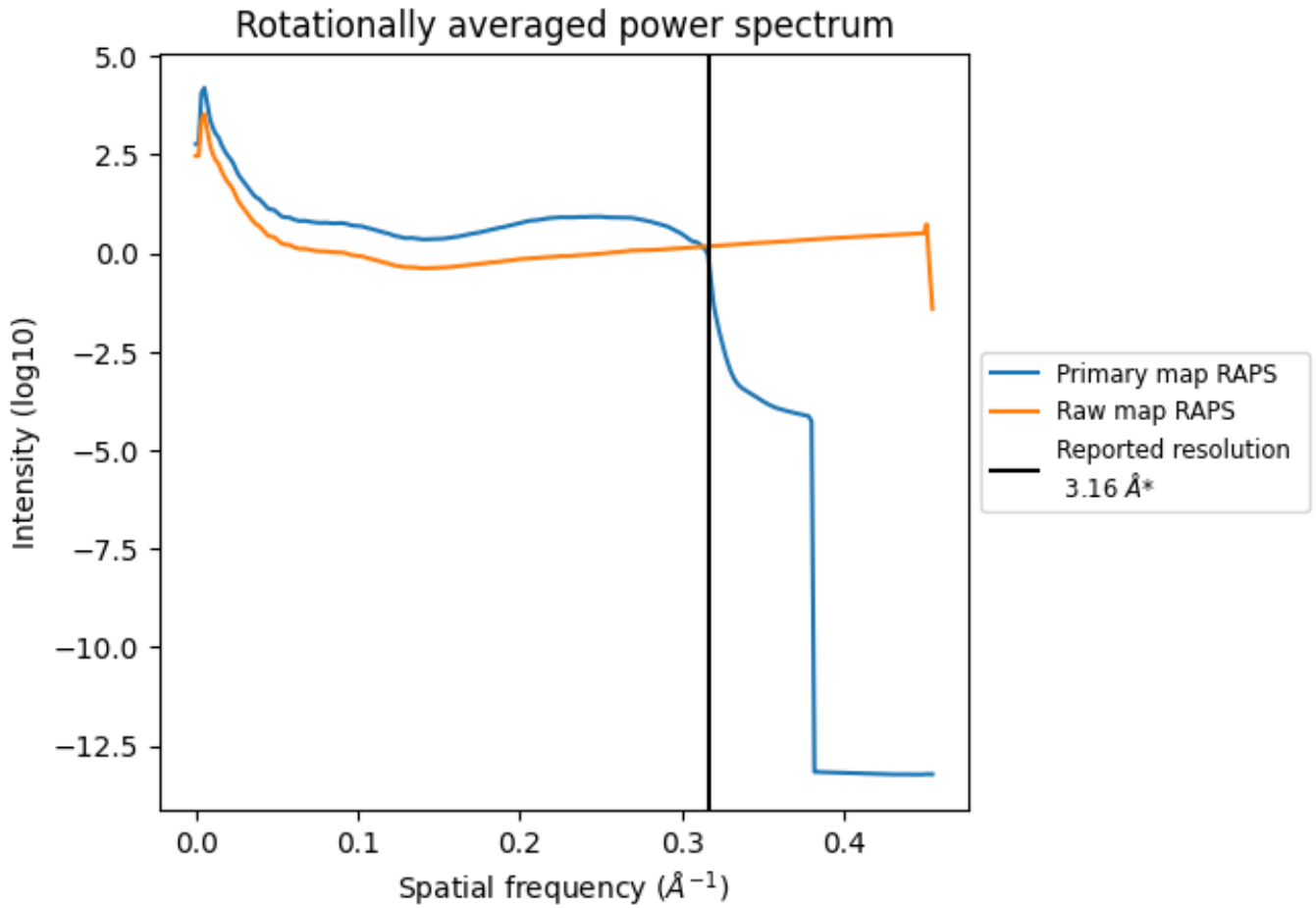
7.2 Volume estimate (i)



The volume at the recommended contour level is 331 nm^3; this corresponds to an approximate mass of 299 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)

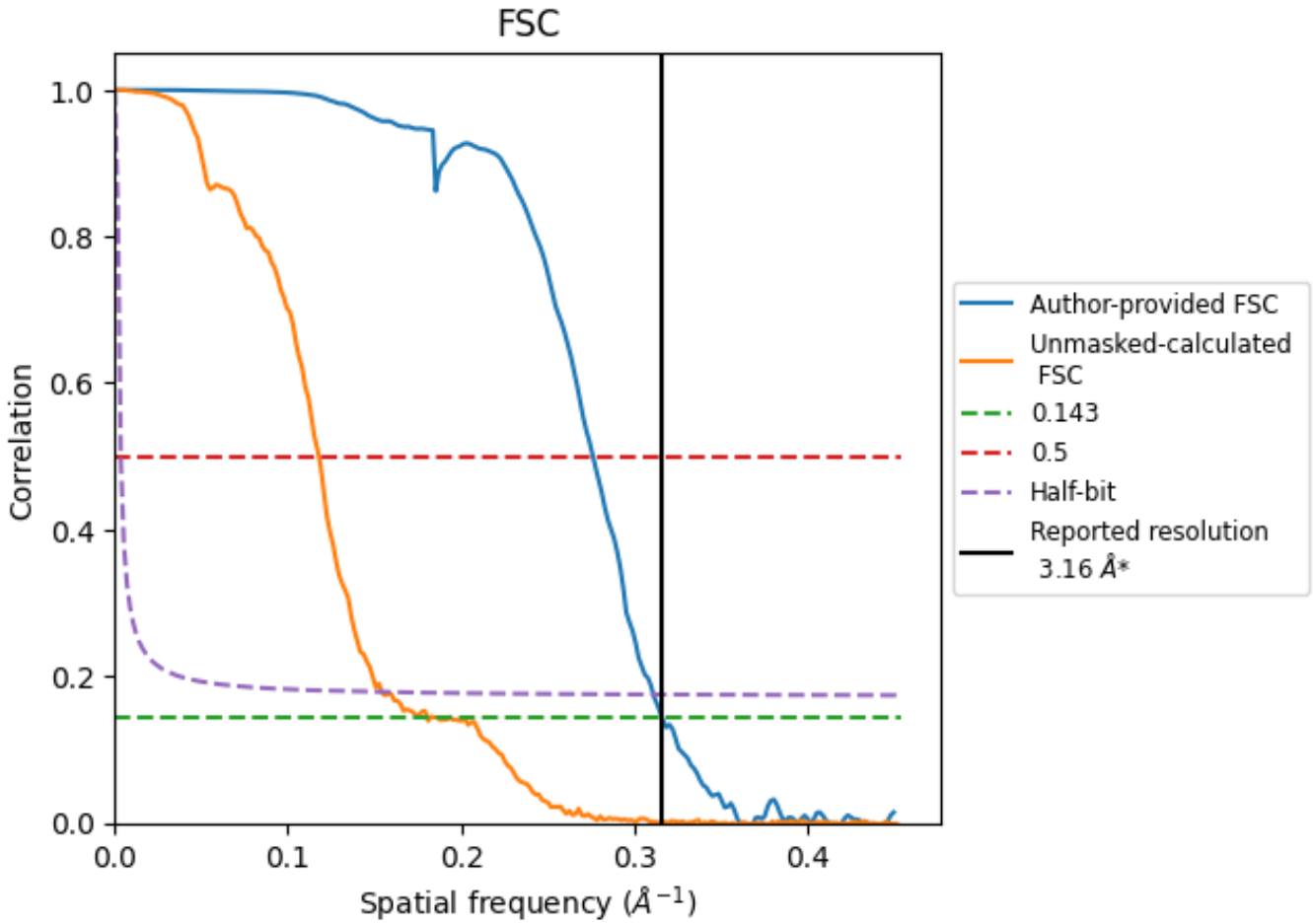


*Reported resolution corresponds to spatial frequency of 0.316 $Å^{-1}$

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 0.316 Å^{-1}

8.2 Resolution estimates (i)

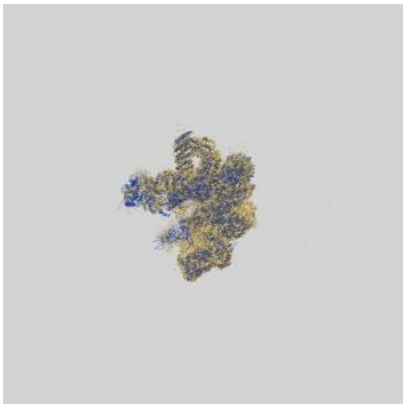
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.16	-	-
Author-provided FSC curve	3.16	3.62	3.21
Unmasked-calculated*	5.54	8.48	6.48

*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 5.54 differs from the reported value 3.16 by more than 10 %

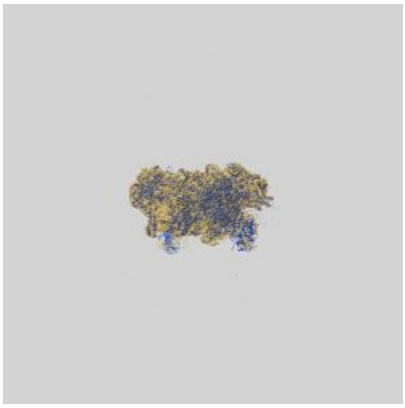
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-38799 and PDB model 8XZV. Per-residue inclusion information can be found in section 3 on page 8.

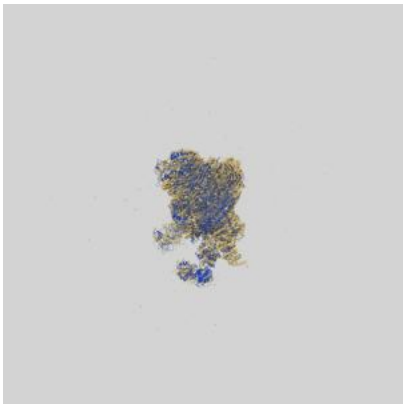
9.1 Map-model overlay



X



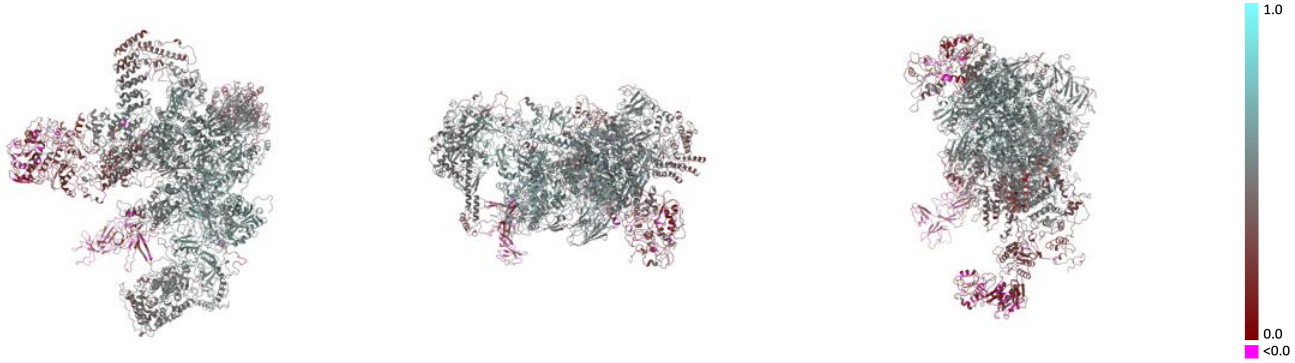
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.23 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.

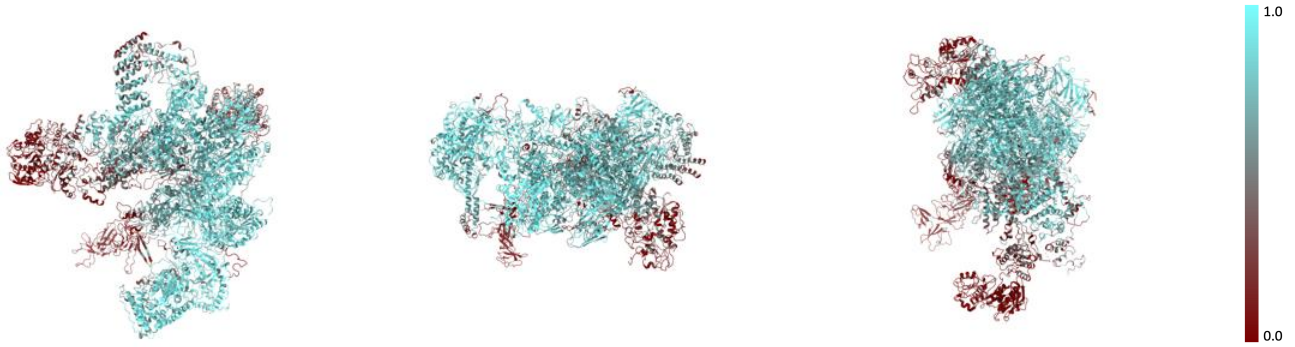
9.2 Q-score mapped to coordinate model (i)



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.

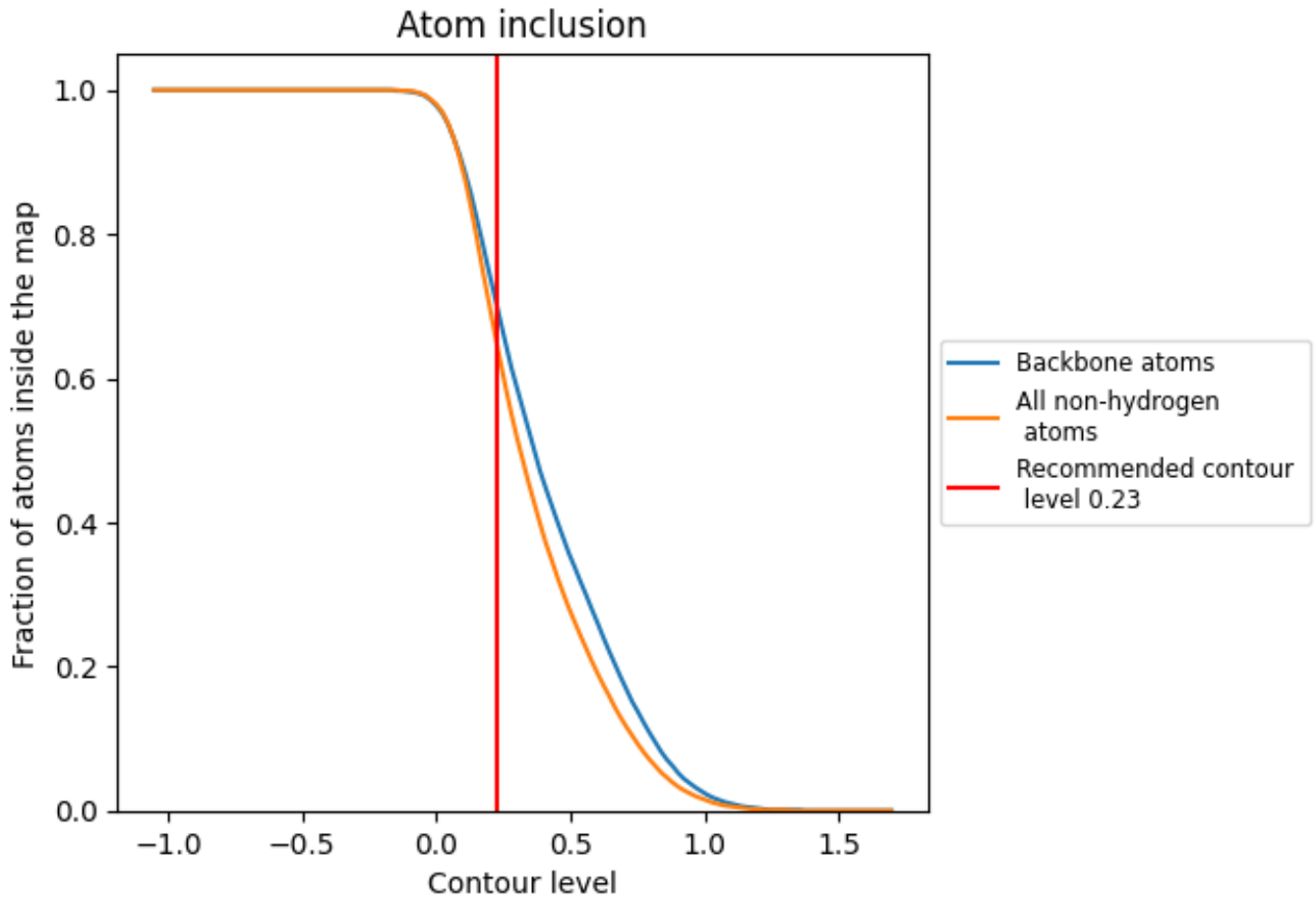
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.23).

9.4 Atom inclusion (i)



At the recommended contour level, 69% of all backbone atoms, 64% 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 (0.23) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6400	0.4440
A	0.7800	0.5120
B	0.6730	0.4890
C	0.5860	0.4520
D	0.6430	0.4480
E	0.8980	0.5620
F	0.8910	0.5520
G	0.8460	0.5320
H	0.6020	0.3940
I	0.7010	0.4500
J	0.1120	0.2100
K	0.7830	0.4900
L	0.8010	0.4440
M	0.8750	0.5030
N	0.7810	0.4970
O	0.7070	0.4860
P	0.7760	0.5010
Q	0.8490	0.5150
R	0.1770	0.2940
S	0.2610	0.2770