



wwPDB EM Validation Summary Report ⓘ

Mar 20, 2024 – 01:54 AM JST

PDB ID : 6KRD
EMDB ID : EMD-0756
Title : TRiC at 0.05 mM ADP-AlFx, Conformation 4, 0.05-C4
Authors : Jin, M.; Cong, Y.
Deposited on : 2019-08-21
Resolution : 4.38 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

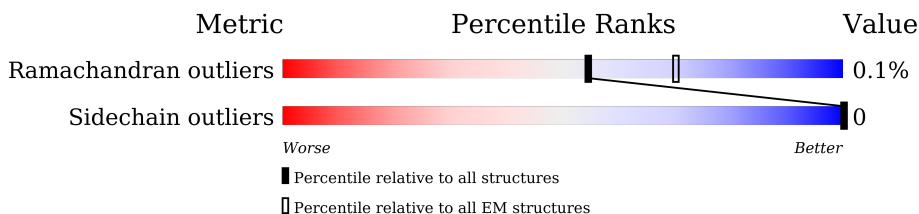
EMDB validation analysis : 0.0.1.dev70
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

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 4.38 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	A	559	
1	a	559	
2	B	527	
2	b	527	
3	D	528	
3	d	528	
4	E	562	
4	e	562	
5	G	534	

Continued on next page...

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Mol	Chain	Length	Quality of chain
5	g	534	
6	Q	568	
6	q	568	
7	Z	546	
7	z	546	
8	H	550	
8	h	550	

2 Entry composition [i](#)

There are 8 unique types of molecules in this entry. The entry contains 61005 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 T-complex protein 1 subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	a	511	Total	C	N	O	S	0	0
			3851	2411	672	749	19		
1	A	513	Total	C	N	O	S	0	0
			3865	2420	675	751	19		

- Molecule 2 is a protein called T-complex protein 1 subunit beta.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	b	502	Total	C	N	O	S	0	0
			3811	2385	658	754	14		
2	B	504	Total	C	N	O	S	0	0
			3824	2392	661	757	14		

- Molecule 3 is a protein called T-complex protein 1 subunit delta.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	d	480	Total	C	N	O	S	0	0
			3655	2284	647	708	16		
3	D	429	Total	C	N	O	S	0	0
			3255	2024	579	638	14		

- Molecule 4 is a protein called T-complex protein 1 subunit epsilon.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	e	501	Total	C	N	O	S	0	0
			3839	2411	659	748	21		
4	E	495	Total	C	N	O	S	0	0
			3786	2373	650	742	21		

- Molecule 5 is a protein called T-complex protein 1 subunit gamma.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	g	493	3769	2368	658	717	26	0	0
5	G	462	3518	2210	621	664	23	0	0

- Molecule 6 is a protein called T-complex protein 1 subunit theta.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	q	524	3978	2508	677	767	26	0	0
6	Q	523	3974	2506	676	766	26	0	0

- Molecule 7 is a protein called T-complex protein 1 subunit zeta.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	z	524	4030	2535	696	782	17	0	0
7	Z	531	4086	2566	708	795	17	0	0

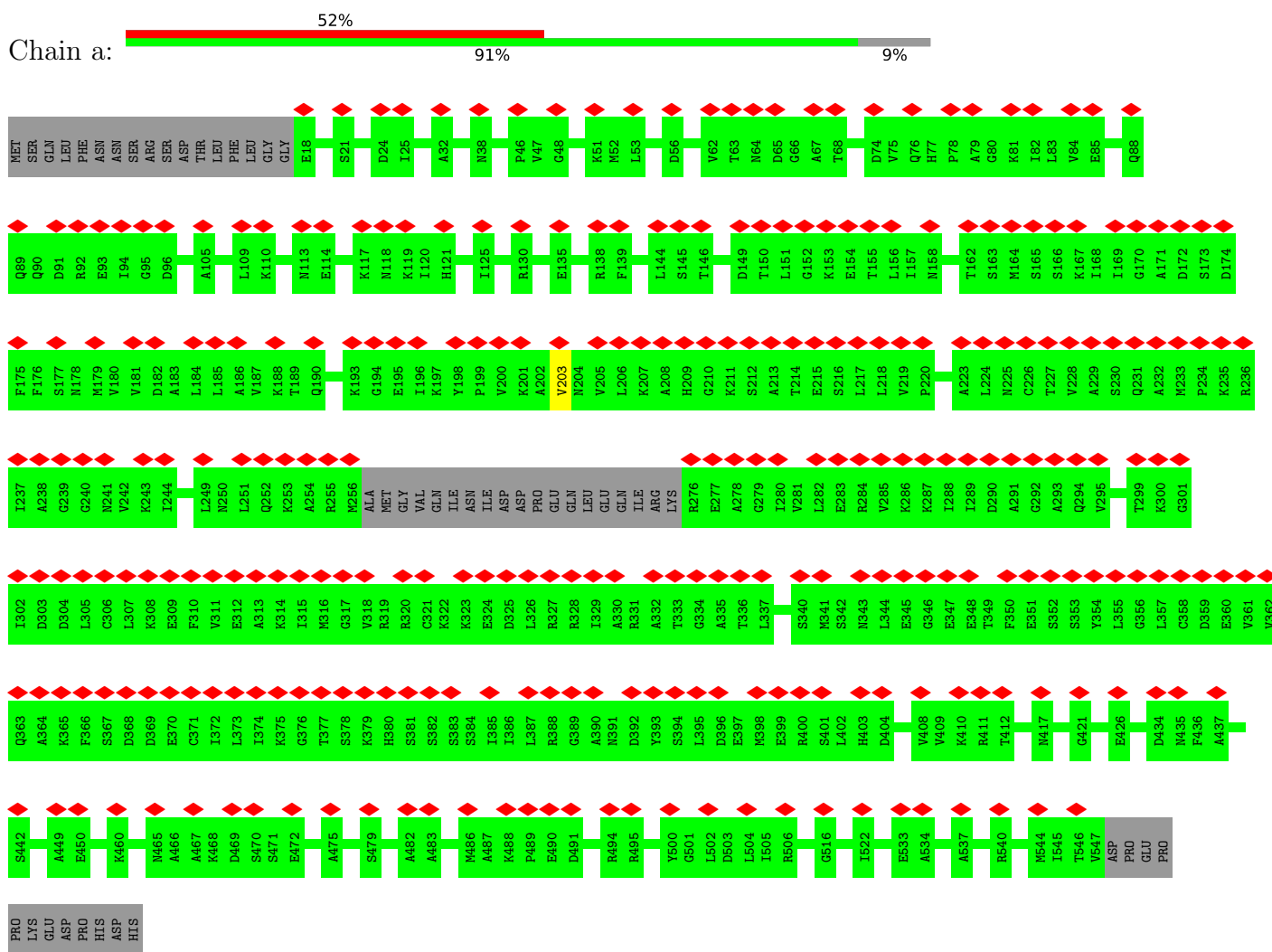
- Molecule 8 is a protein called T-complex protein 1 subunit eta.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	h	507	3882	2447	664	752	19	0	0
8	H	507	3882	2447	664	752	19	0	0

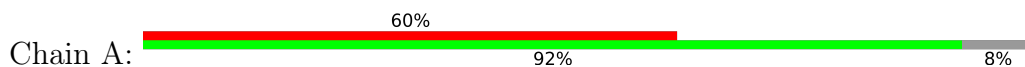
3 Residue-property plots

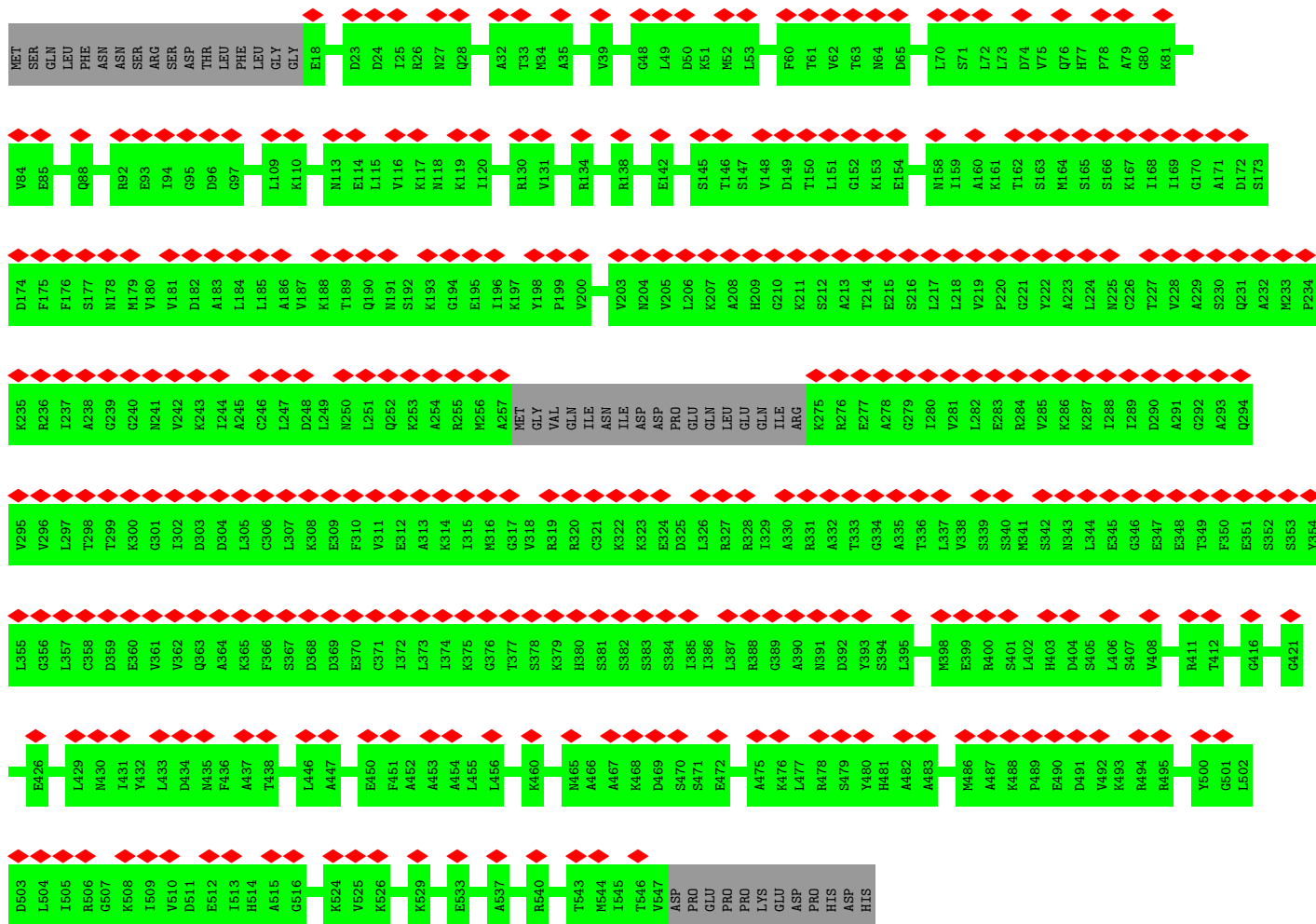
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: T-complex protein 1 subunit alpha

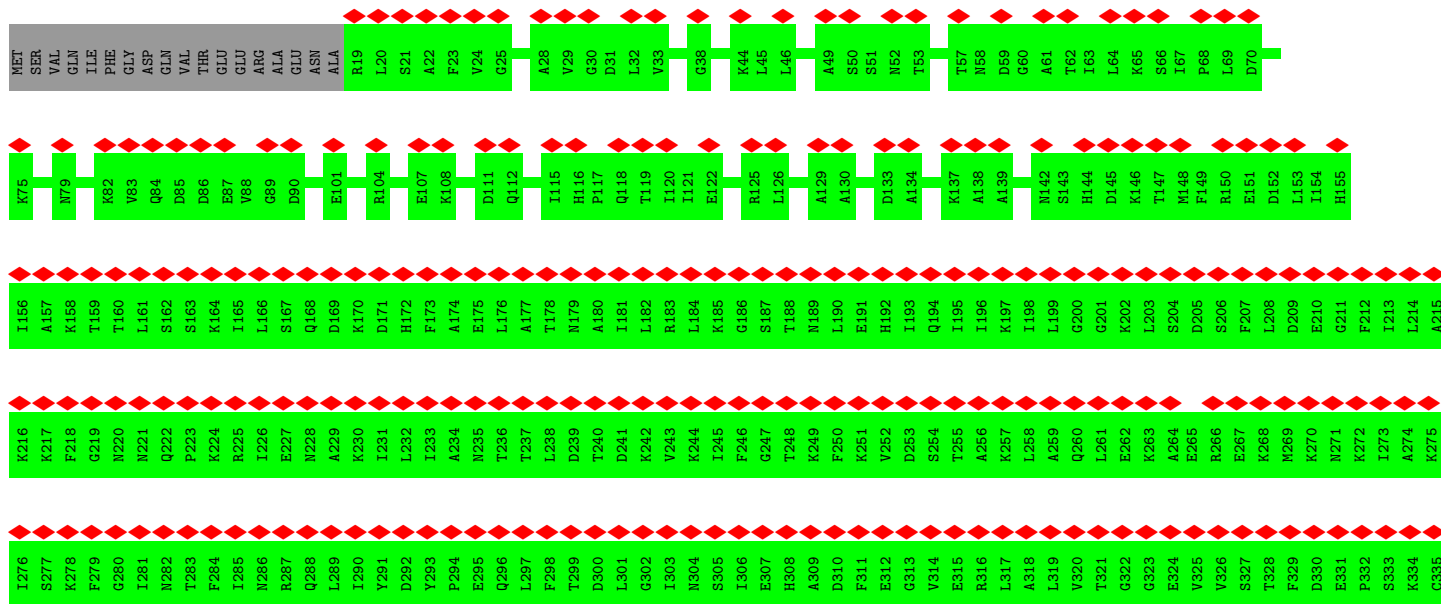
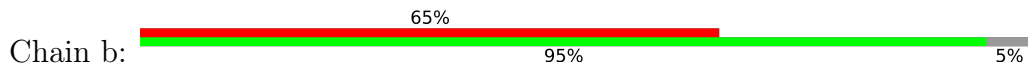


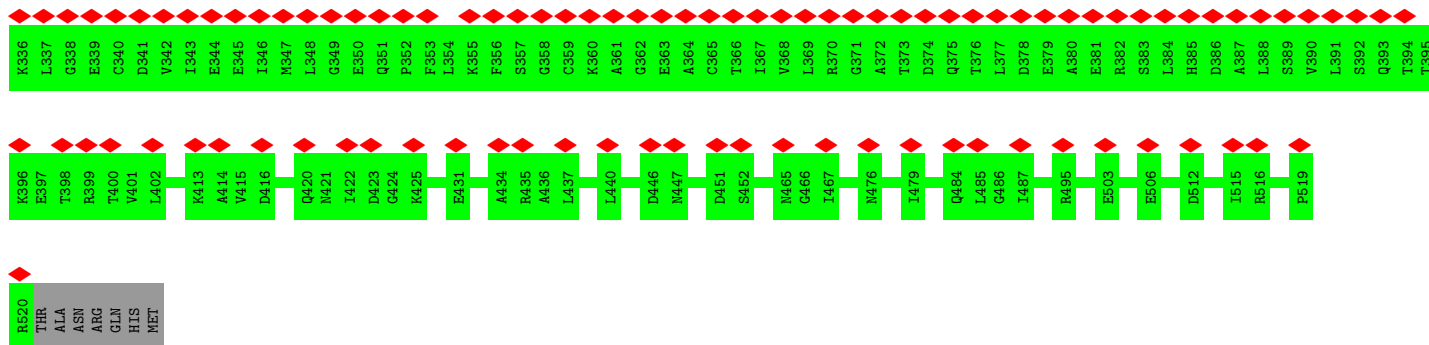
- Molecule 1: T-complex protein 1 subunit alpha



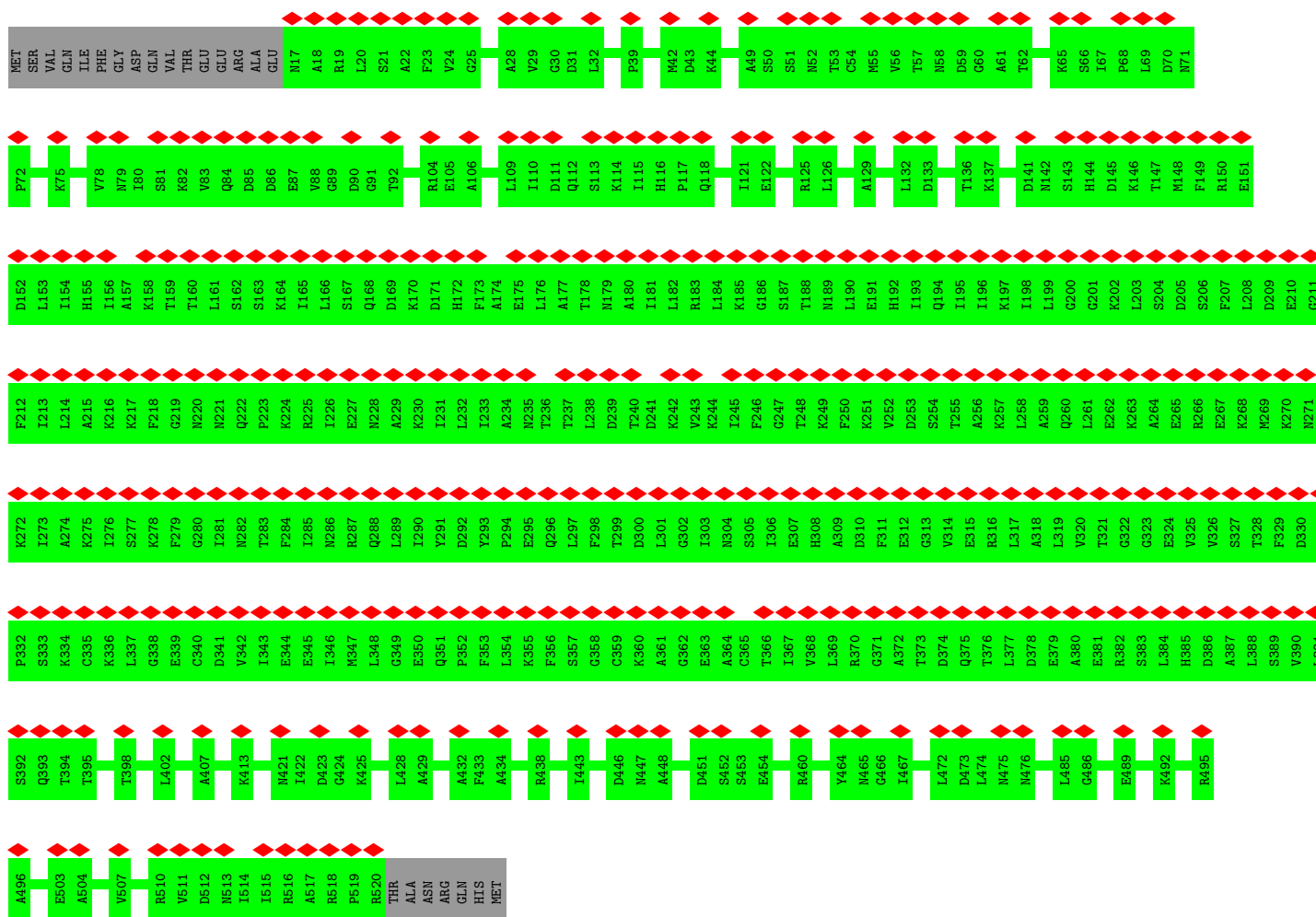


• Molecule 2: T-complex protein 1 subunit beta

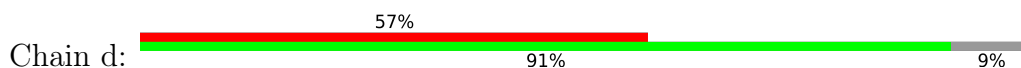


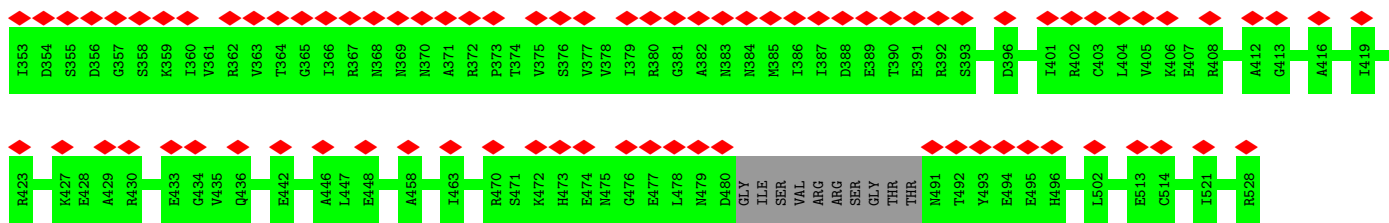


• Molecule 2: T-complex protein 1 subunit beta

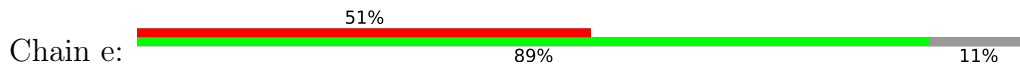


• Molecule 3: T-complex protein 1 subunit delta

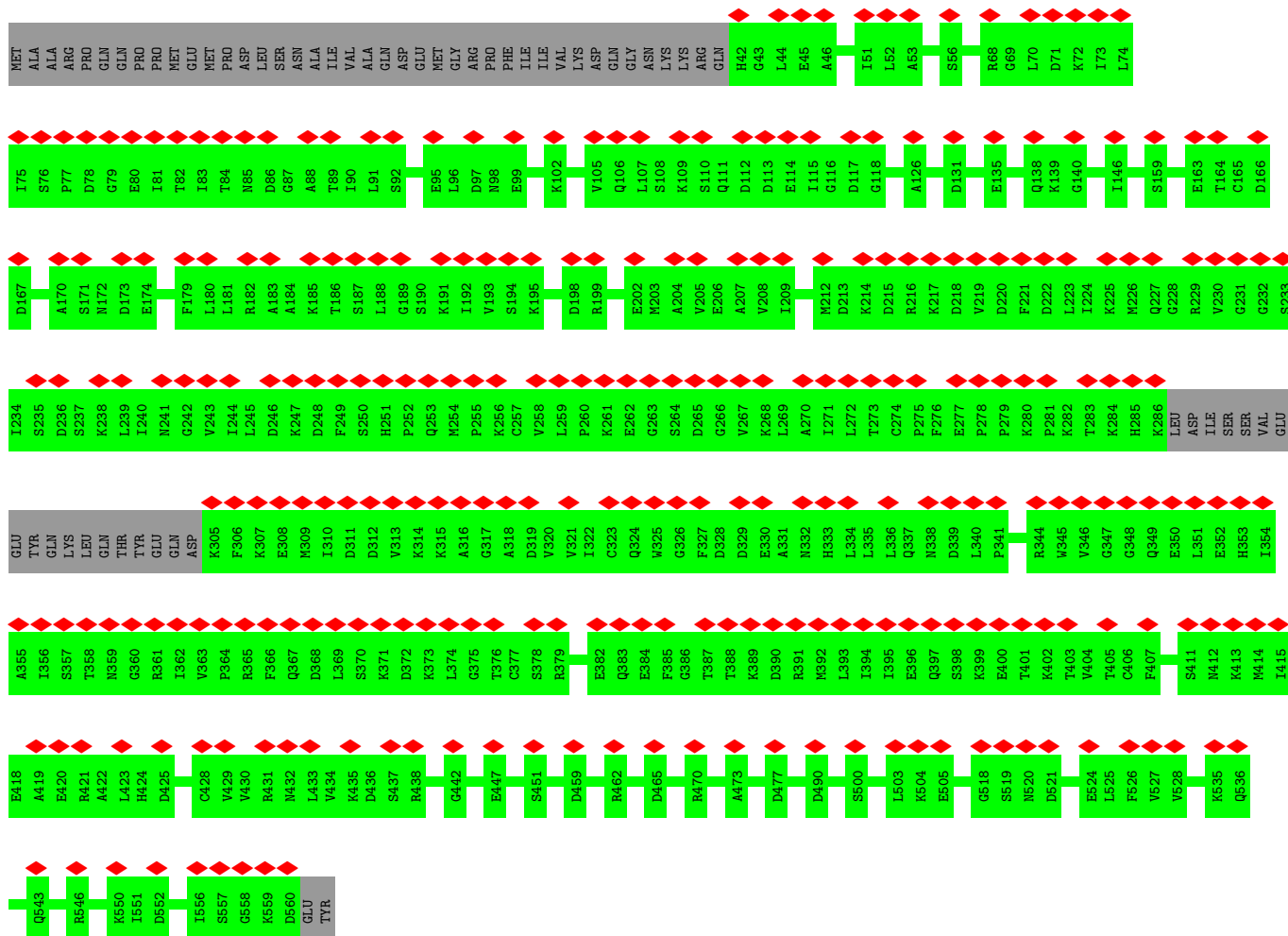




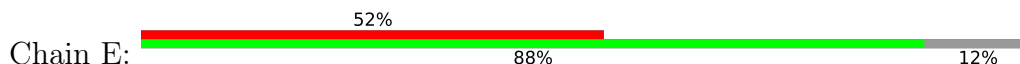
• Molecule 4: T-complex protein 1 subunit epsilon



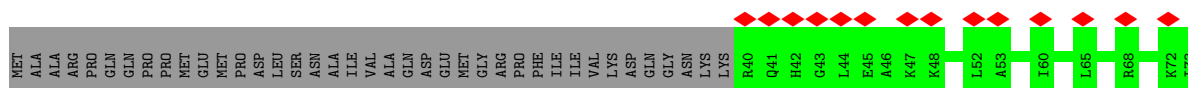
Chain e:

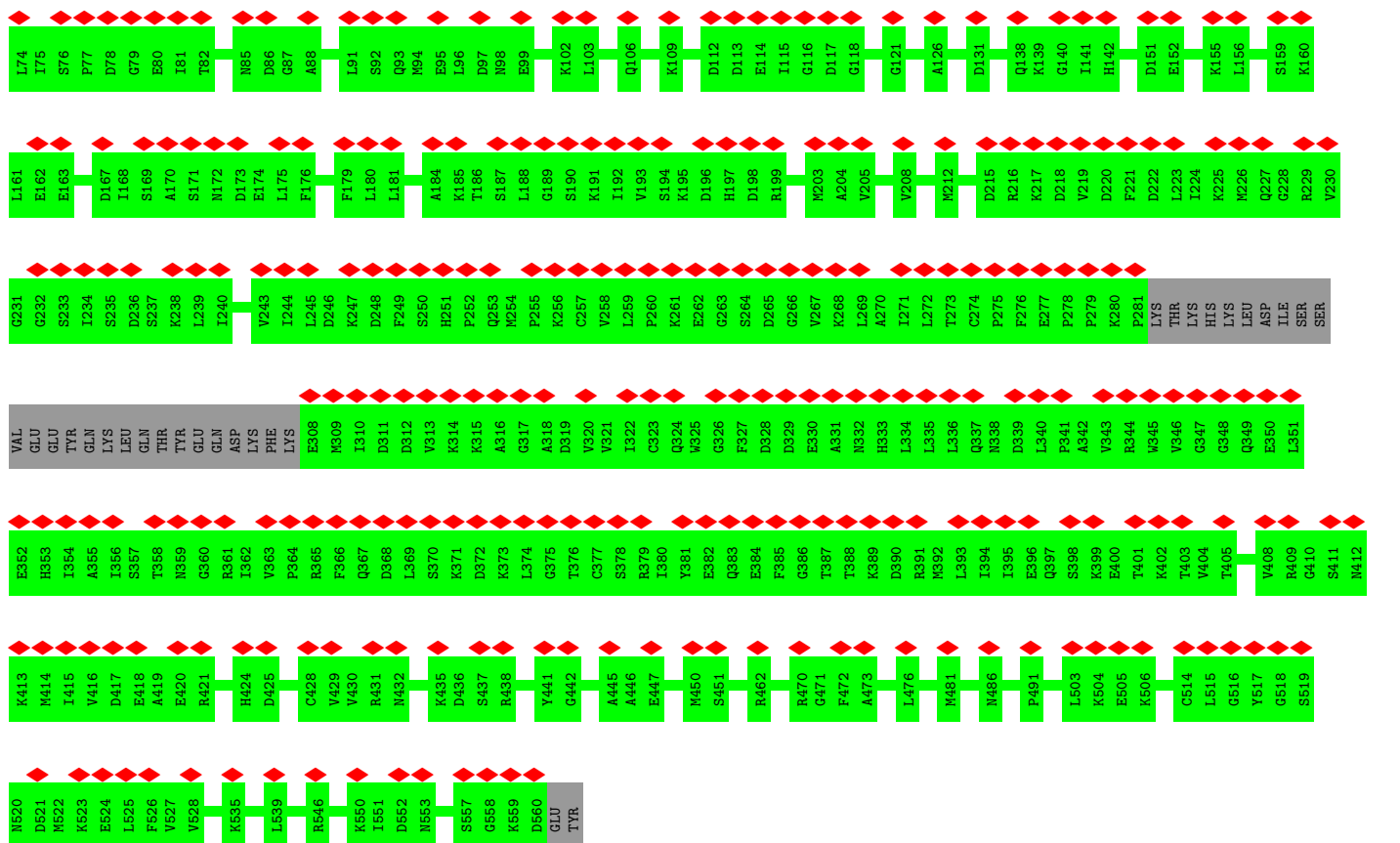


• Molecule 4: T-complex protein 1 subunit epsilon

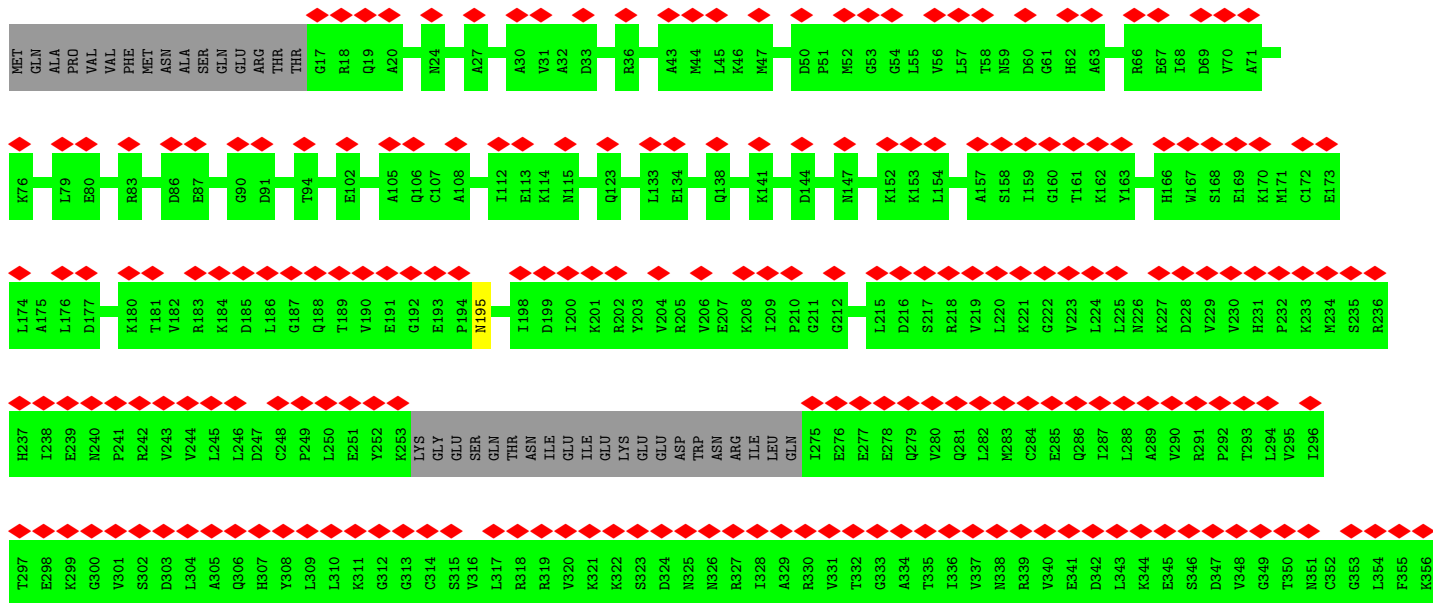
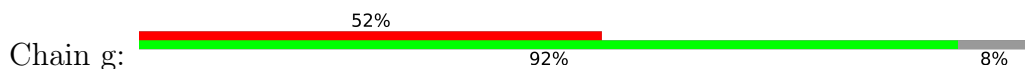


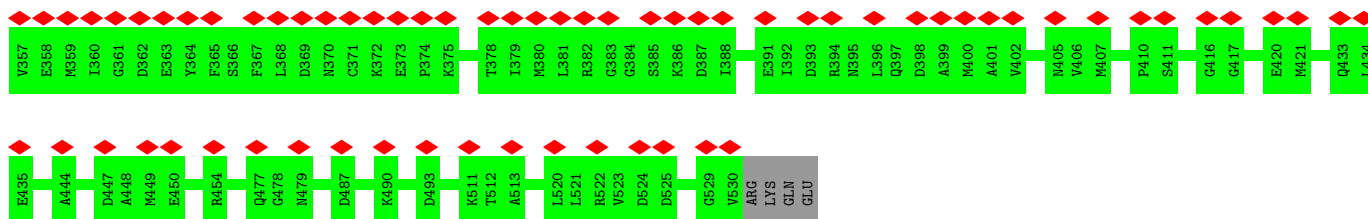
Chain E:



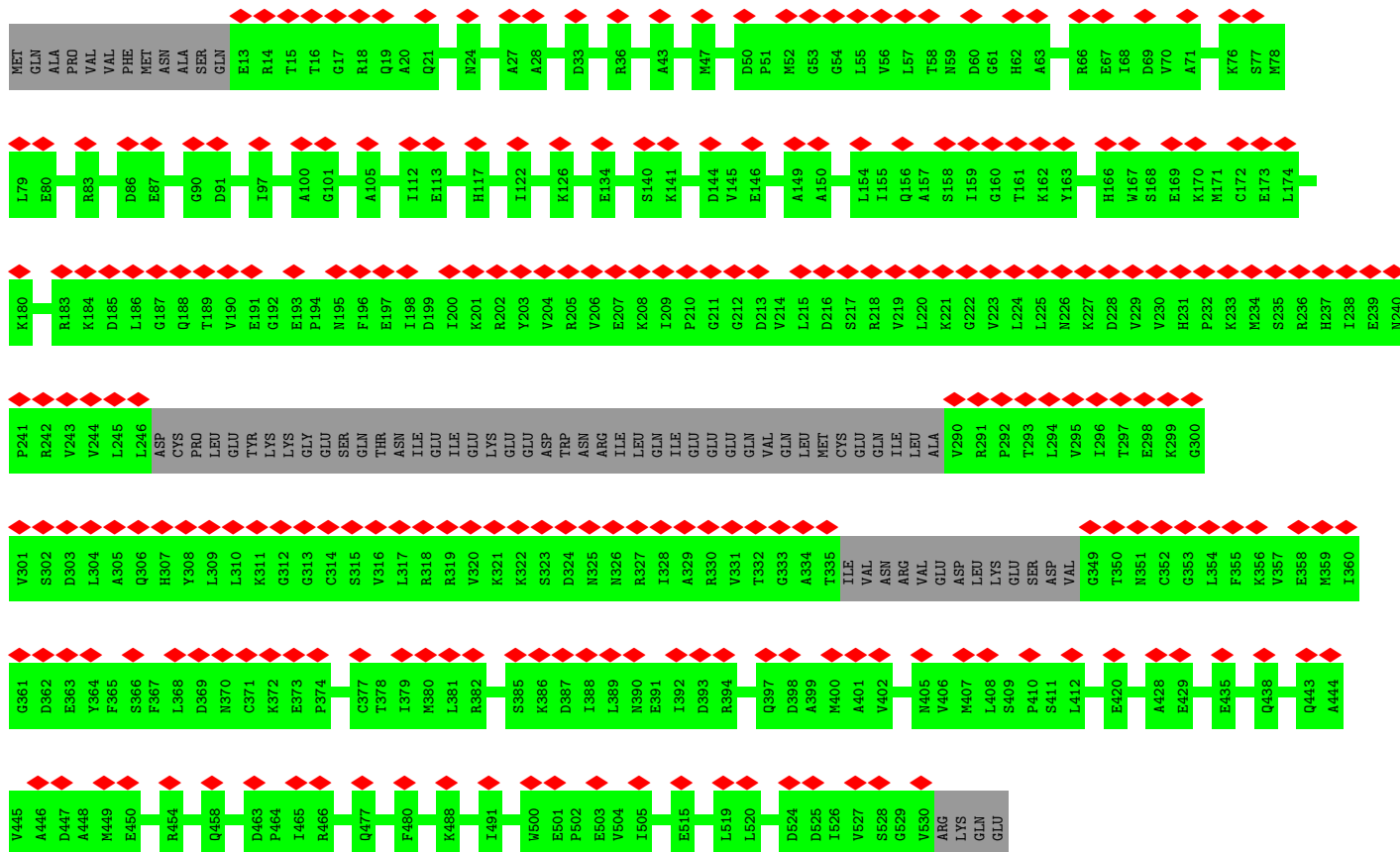
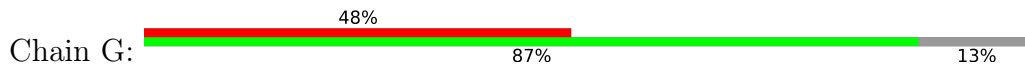


• Molecule 5: T-complex protein 1 subunit gamma

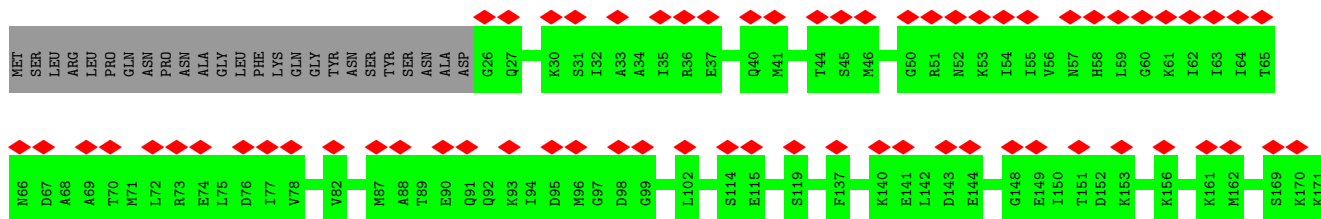
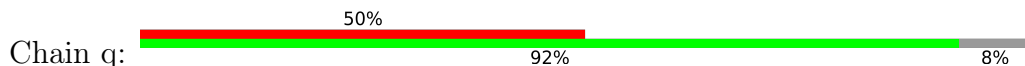




• Molecule 5: T-complex protein 1 subunit gamma

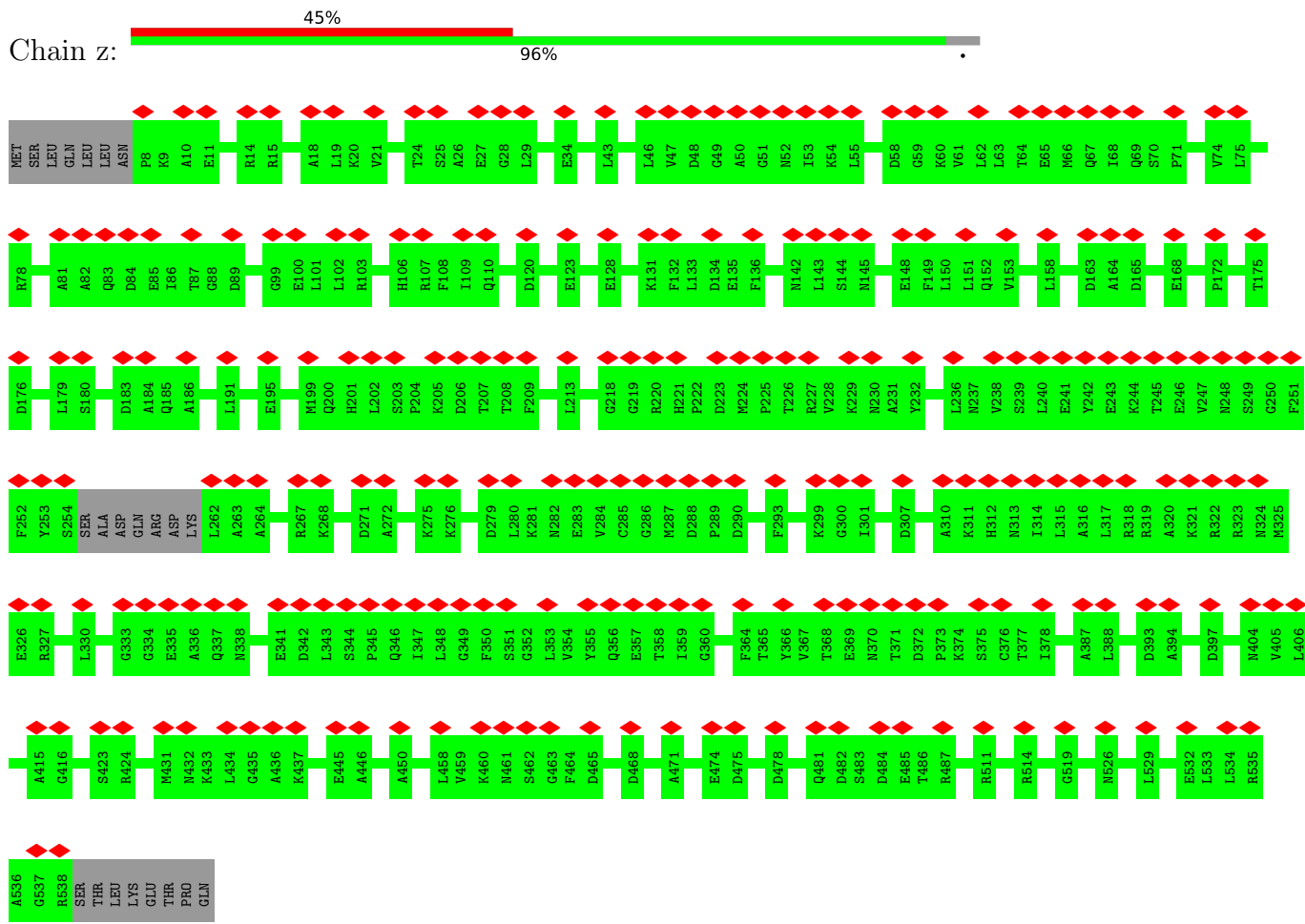


• Molecule 6: T-complex protein 1 subunit theta

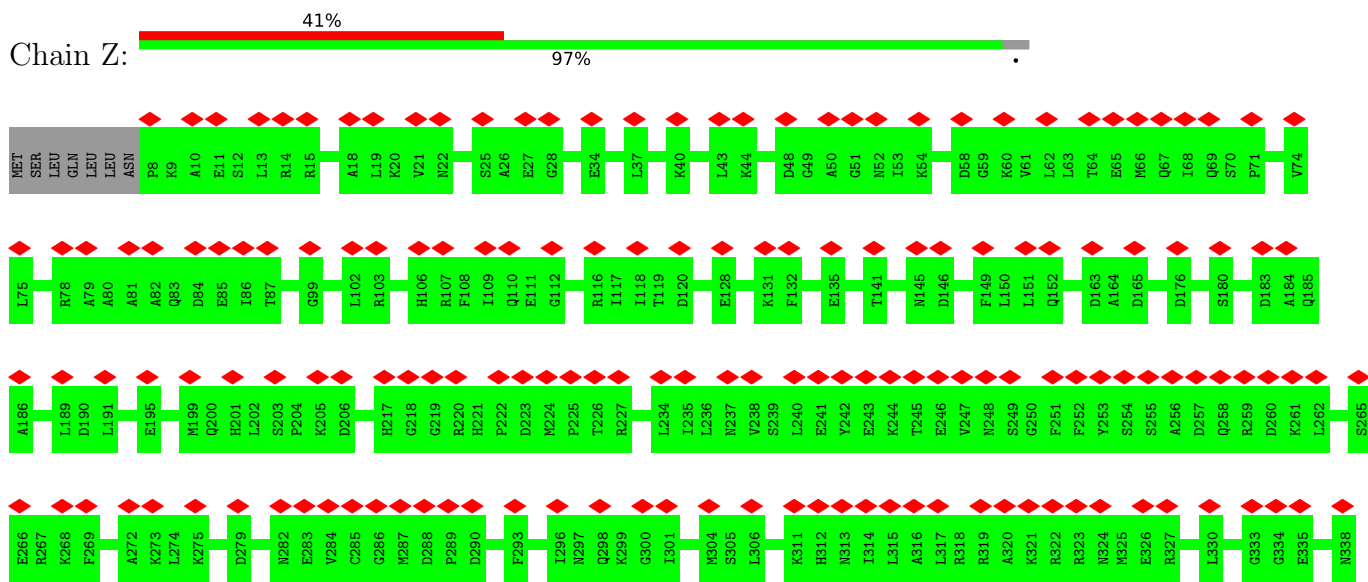


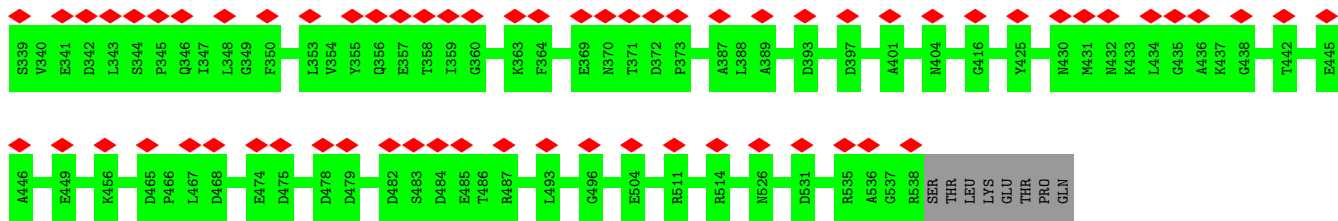
GLY
GLY
PRO
ARG
ALA
PRO
GLN
GLY
PRO
ARG
GLY
ASN
TRP
ASP
GLN
GLU
ASP

• Molecule 7: T-complex protein 1 subunit zeta

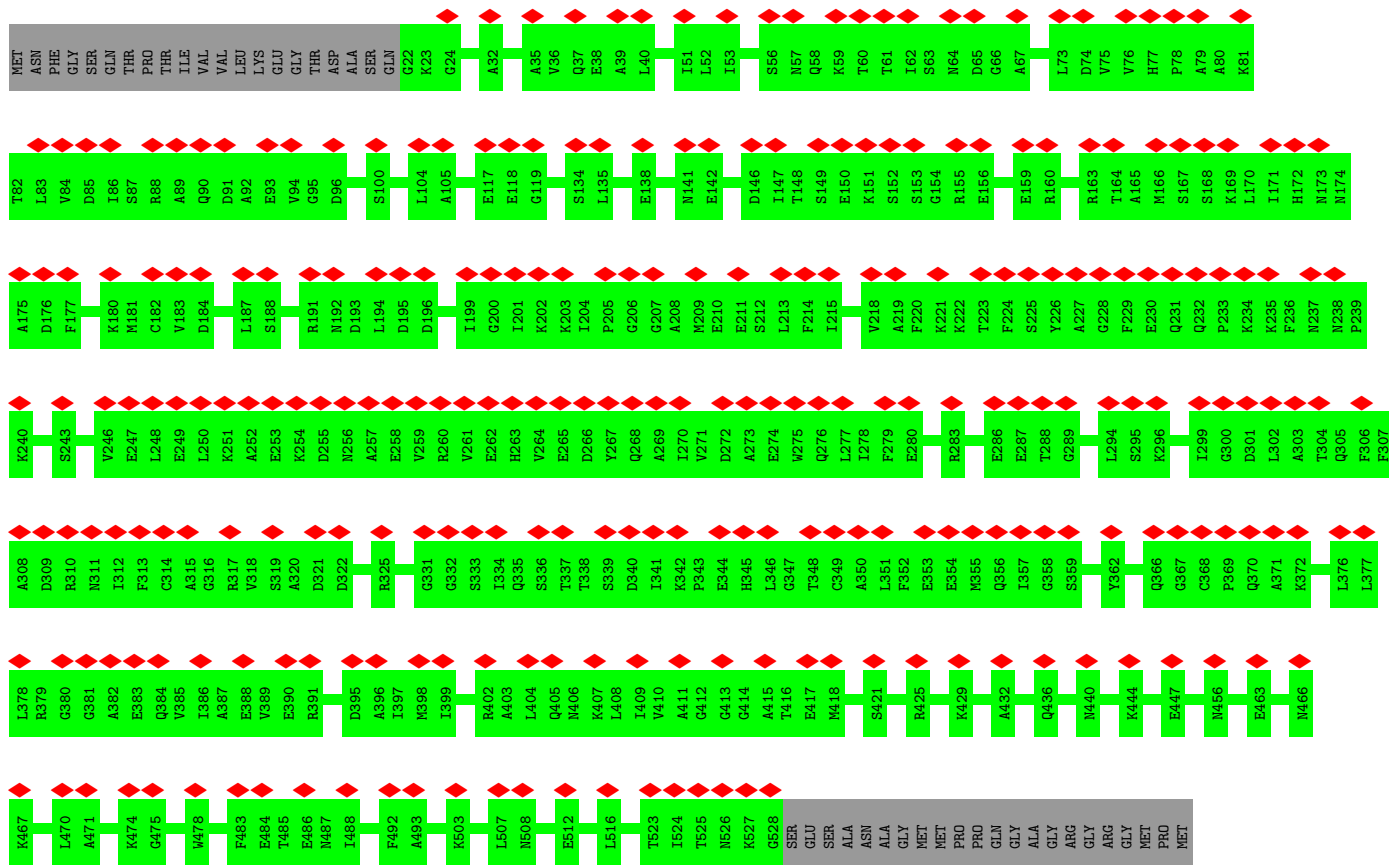
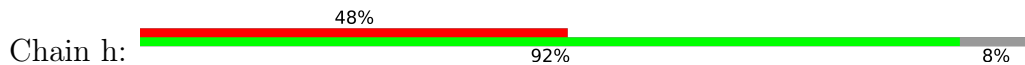


• Molecule 7: T-complex protein 1 subunit zeta

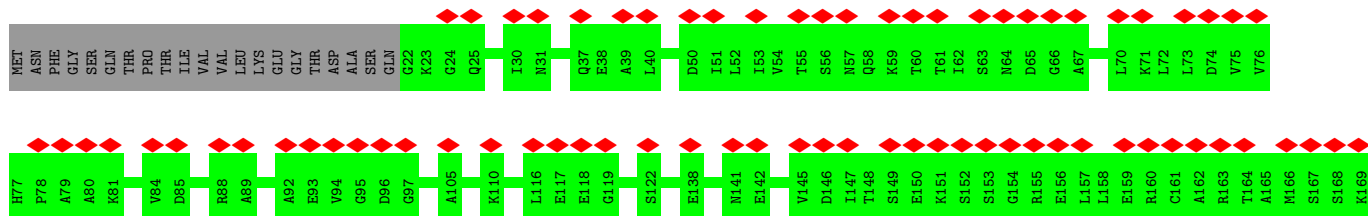
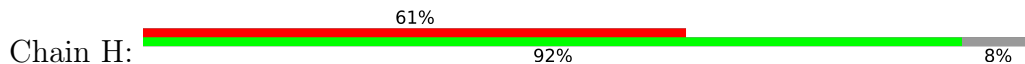




• Molecule 8: T-complex protein 1 subunit eta



• Molecule 8: T-complex protein 1 subunit eta



L170	L171	H172	N173	N174	A175	D176	F177	F178	V179	K180	M181	C182	V183	D184	A185	L189	D190	D193	L194	D195	D196	K197	L198	I199	G200	I201	K202	K203	I204	P205	G206	G207	A208	M209	E210	E211	S212	L213	F214	I215	N216	G217	V218	A219	F220	K221	K222	T223	F224	S225	Y226	A227	G228	F229	E230	Q231	Q232		
P233	K234	K235	F236	N237	N238	P239	K240	I241	L242	S243	L244	N245	V246	E247	L248	E249	L250	K251	A252	E253	K254	D255	N256	A257	E258	V259	R260	V261	E262	H263	V264	E265	D266	Y267	Q268	A269	I270	V271	D272	D273	A273	E274	W275	Q276	L277	I278	F279	E280	K281	L282	R283	Q284	V285	E286	E287	T288	G289	A290	N291
L294	S295	K296	L297	P298	I299	G300	D301	L302	A303	T304	Q305	F306	F307	A308	D309	R310	N311	I312	F313	C314	A315	G316	R317	V318	S319	A320	D321	D322	M323	N324	R325	V326	I327	Q328	A329	V330	G331	G332	S333	I334	Q335	S336	T337	T338	S339	D340	I341	K342	P343	E344	H345	L346	G347	T348	C349	A350	L351	F352	E353
E354	M355	Q356	I357	G358	S359	E360	R361	Y362	N363	L364	F365	Q366	G367	C368	P369	Q370	A371	K372	T375	L376	L377	L378	R379	G380	G381	A382	E383	Q384	V385	I386	A387	E388	V389	E390	R391	S392	L393	H394	D395	A396	I397	M398	I399	V400	R401	R402	A403	L404	K407	L408	I409	V410	A411	A415	S421				
K422	C423	L424	R425	D426	K434	M437	A441	K444	E447	R451	A457	G458	F459	E463	M466	K467	L470	A471	K477	M478	Y479	E484	T485	E486	M487	I488	F492	A493	K494	F495	V496	W497	R503	E512	L516	T523	I524	T525	N526	K527	G528	SER																	
GLU	SER	ALA	ASN	ALA	GLY	MET	MET	PRO	PRO	GLN	ALA	GLY	ARG	ARG	GLY	MET	PRO	MET																																									

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	54639	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	38	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	3.607	Depositor
Minimum map value	-2.255	Depositor
Average map value	0.027	Depositor
Map value standard deviation	0.214	Depositor
Recommended contour level	0.85	Depositor
Map size (\AA)	258.328, 258.328, 258.328	wwPDB
Map dimensions	196, 196, 196	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.318, 1.318, 1.318	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# $ Z > 5$	RMSZ	# $ Z > 5$
1	A	0.23	0/3898	0.41	0/5257
1	a	0.23	0/3884	0.40	0/5239
2	B	0.23	0/3862	0.39	0/5204
2	b	0.23	0/3849	0.39	0/5186
3	D	0.23	0/3279	0.39	0/4417
3	d	0.24	1/3687 (0.0%)	0.39	0/4967
4	E	0.23	0/3830	0.40	0/5158
4	e	0.23	0/3885	0.40	0/5228
5	G	0.23	0/3559	0.39	0/4805
5	g	0.23	0/3813	0.38	0/5150
6	Q	0.24	0/4020	0.41	0/5426
6	q	0.24	0/4024	0.40	0/5431
7	Z	0.23	0/4138	0.39	0/5590
7	z	0.23	0/4081	0.41	0/5513
8	H	0.23	0/3931	0.38	0/5304
8	h	0.24	0/3931	0.39	0/5304
All	All	0.23	1/61671 (0.0%)	0.40	0/83179

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	d	372	ARG	C-N	5.42	1.44	1.34

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

Due to software issues we are unable to calculate clashes - this section is therefore empty.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	509/559 (91%)	481 (94%)	28 (6%)	0	100	100
1	a	507/559 (91%)	483 (95%)	23 (4%)	1 (0%)	47	81
2	B	502/527 (95%)	479 (95%)	23 (5%)	0	100	100
2	b	500/527 (95%)	475 (95%)	25 (5%)	0	100	100
3	D	419/528 (79%)	400 (96%)	18 (4%)	1 (0%)	47	81
3	d	474/528 (90%)	452 (95%)	21 (4%)	1 (0%)	47	81
4	E	491/562 (87%)	467 (95%)	24 (5%)	0	100	100
4	e	497/562 (88%)	473 (95%)	24 (5%)	0	100	100
5	G	456/534 (85%)	440 (96%)	16 (4%)	0	100	100
5	g	489/534 (92%)	469 (96%)	19 (4%)	1 (0%)	47	81
6	Q	521/568 (92%)	500 (96%)	21 (4%)	0	100	100
6	q	522/568 (92%)	498 (95%)	24 (5%)	0	100	100
7	Z	529/546 (97%)	510 (96%)	19 (4%)	0	100	100
7	z	520/546 (95%)	498 (96%)	22 (4%)	0	100	100
8	H	505/550 (92%)	479 (95%)	26 (5%)	0	100	100
8	h	505/550 (92%)	484 (96%)	21 (4%)	0	100	100
All	All	7946/8748 (91%)	7588 (96%)	354 (4%)	4 (0%)	54	85

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
5	g	195	ASN
3	d	213	VAL
1	a	203	VAL
3	D	213	VAL

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	428/471 (91%)	428 (100%)	0	100	100
1	a	427/471 (91%)	427 (100%)	0	100	100
2	B	421/441 (96%)	421 (100%)	0	100	100
2	b	420/441 (95%)	420 (100%)	0	100	100
3	D	365/453 (81%)	365 (100%)	0	100	100
3	d	409/453 (90%)	409 (100%)	0	100	100
4	E	422/483 (87%)	422 (100%)	0	100	100
4	e	428/483 (89%)	428 (100%)	0	100	100
5	G	387/455 (85%)	387 (100%)	0	100	100
5	g	417/455 (92%)	417 (100%)	0	100	100
6	Q	439/473 (93%)	439 (100%)	0	100	100
6	q	439/473 (93%)	439 (100%)	0	100	100
7	Z	448/463 (97%)	448 (100%)	0	100	100
7	z	442/463 (96%)	442 (100%)	0	100	100
8	H	422/454 (93%)	422 (100%)	0	100	100
8	h	422/454 (93%)	422 (100%)	0	100	100
All	All	6736/7386 (91%)	6736 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 35 such sidechains are listed below:

Mol	Chain	Res	Type
7	Z	185	GLN
7	Z	356	GLN
8	h	172	HIS
3	D	289	GLN
3	D	284	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

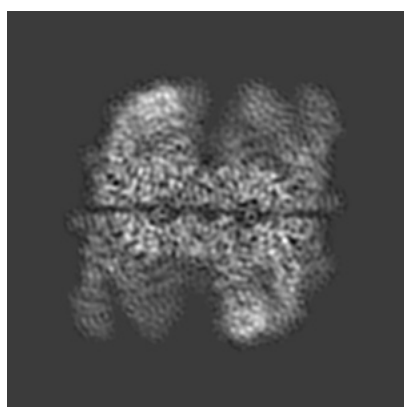
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-0756. These allow visual inspection of the internal detail of the map and identification of artifacts.

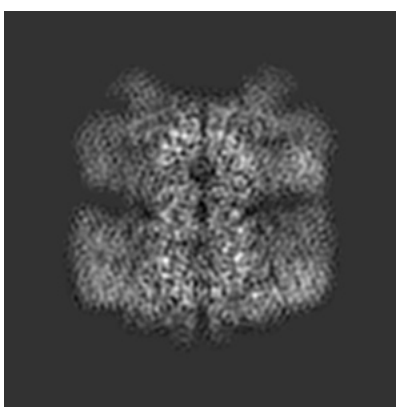
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

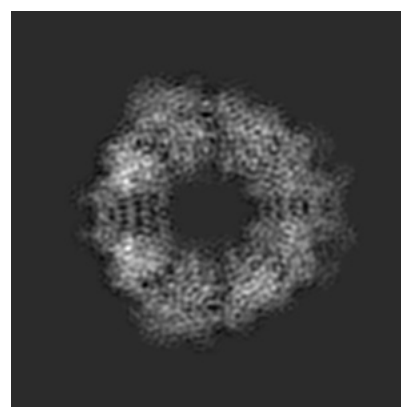
6.1.1 Primary map



X



Y



Z

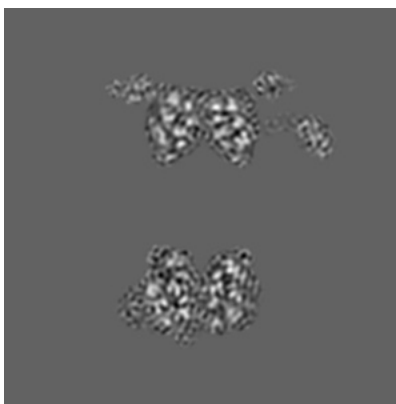
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

6.2.1 Primary map



X Index: 98



Y Index: 98

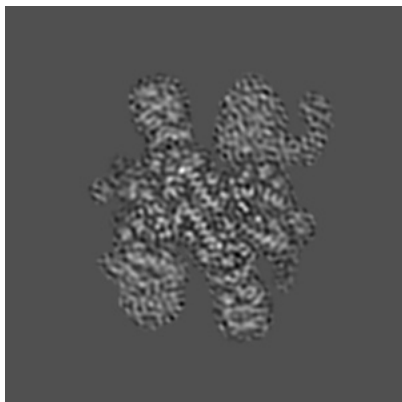


Z Index: 98

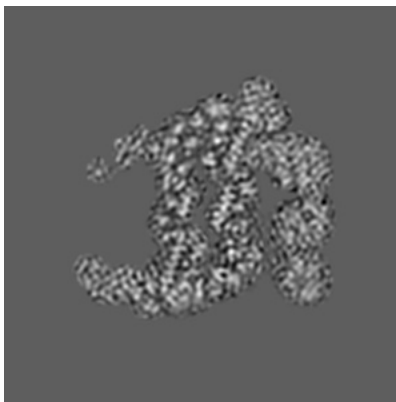
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [\(i\)](#)

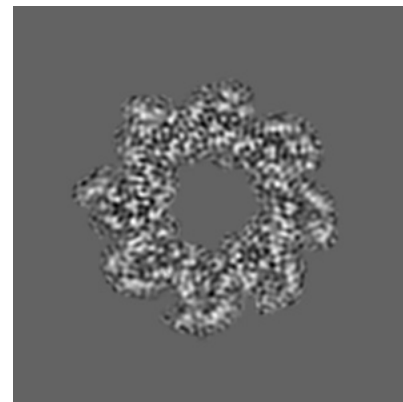
6.3.1 Primary map



X Index: 58



Y Index: 66

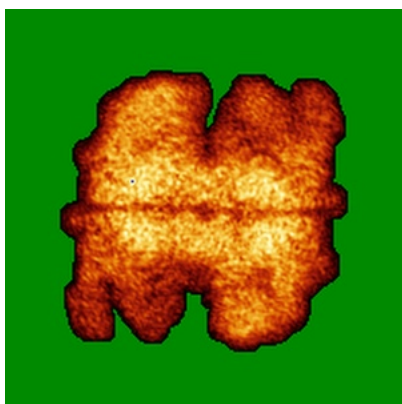


Z Index: 84

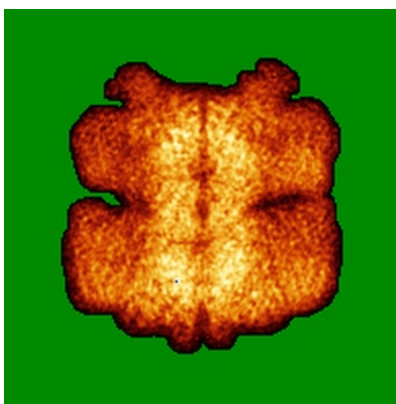
The images above show the largest variance slices of the map in three orthogonal directions.

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

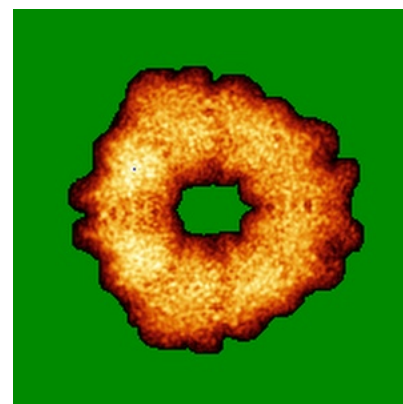
6.4.1 Primary map



X



Y



Z

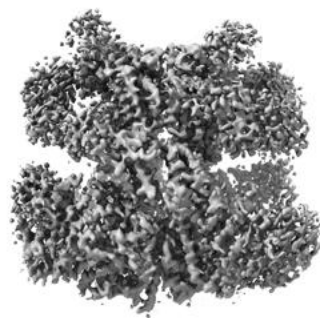
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

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 0.85. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

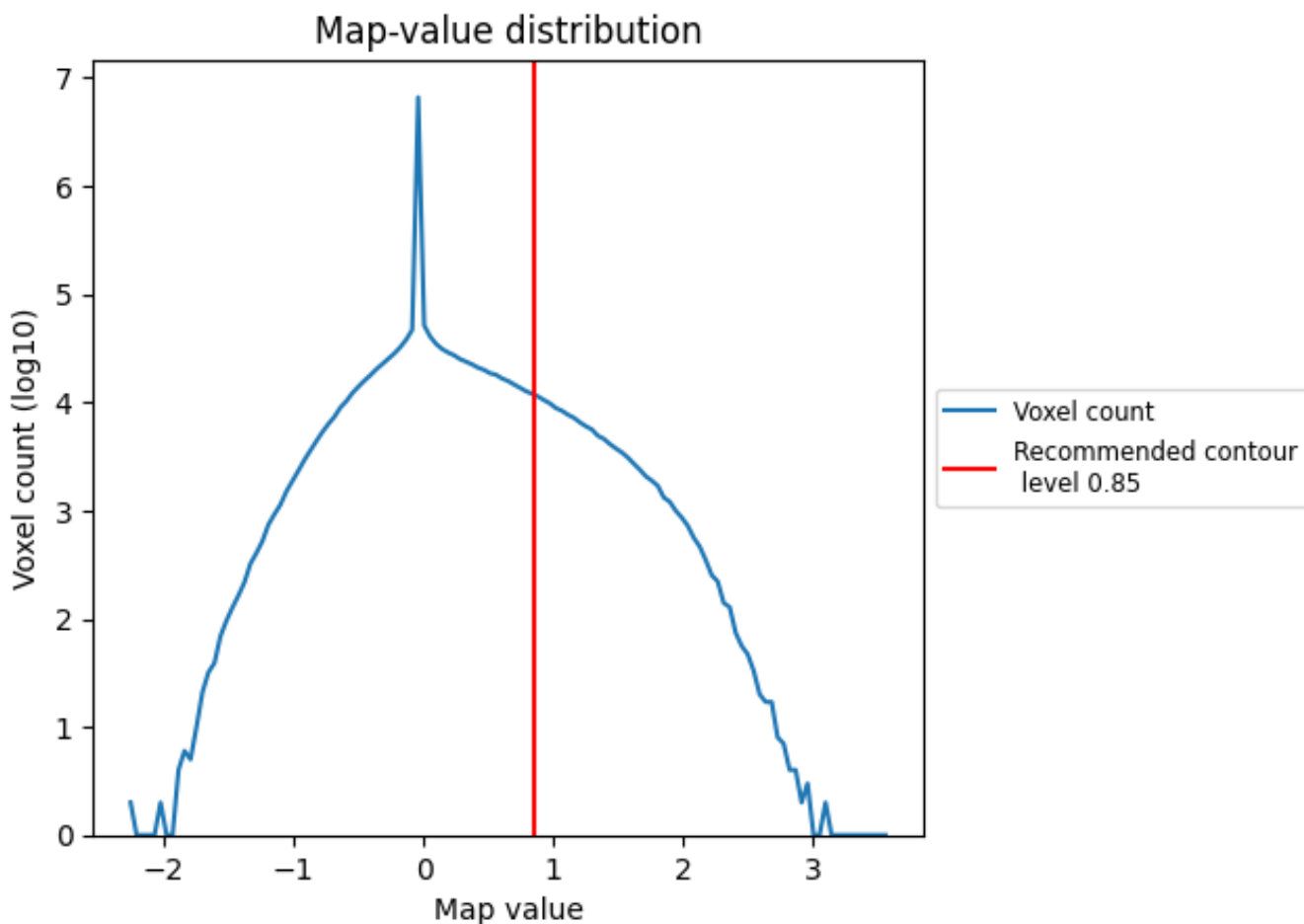
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

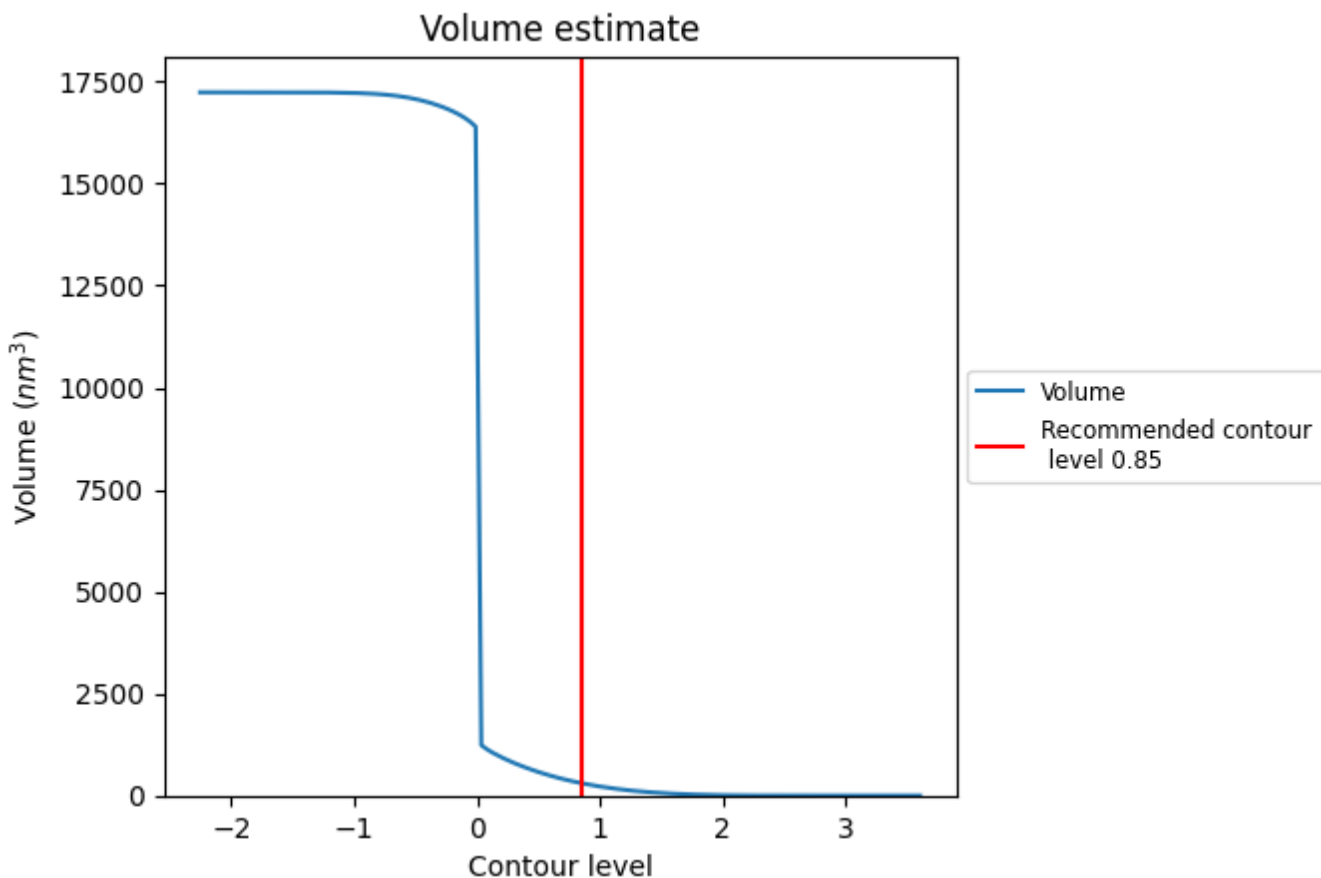
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

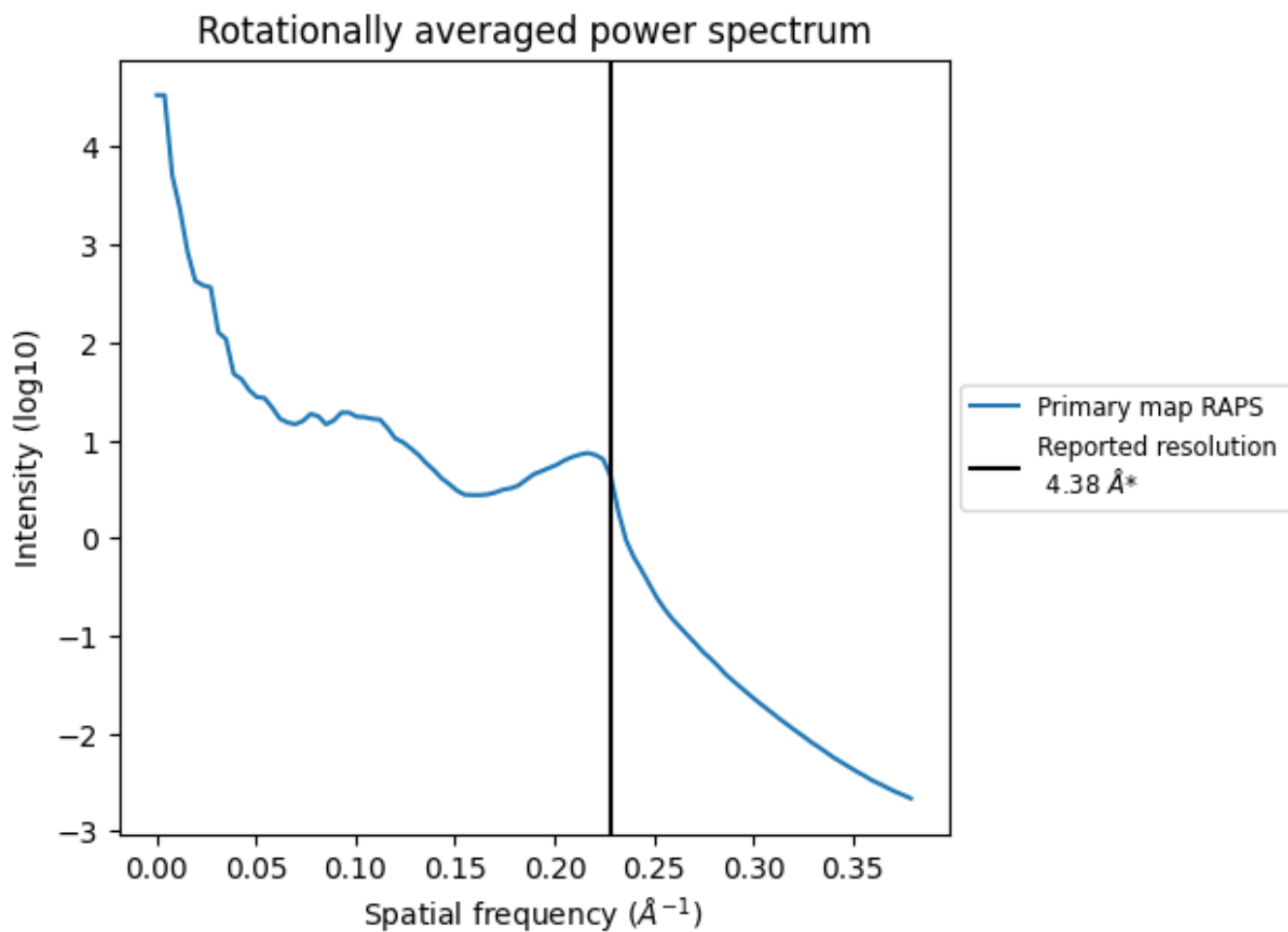
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 304 nm³; this corresponds to an approximate mass of 275 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 0.228\AA^{-1}

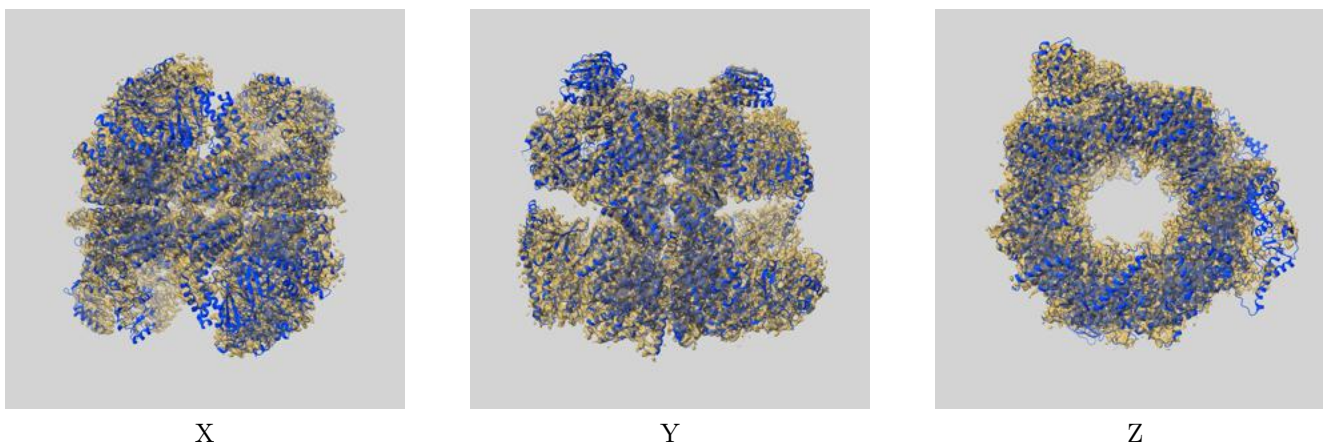
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

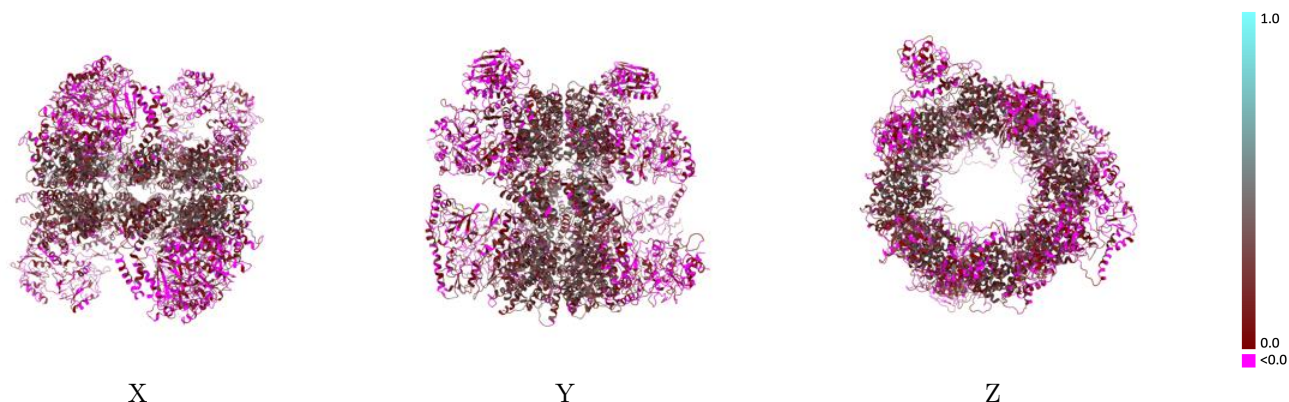
This section contains information regarding the fit between EMDB map EMD-0756 and PDB model 6KRD. Per-residue inclusion information can be found in section [3](#) on page [6](#).

9.1 Map-model overlay [i](#)



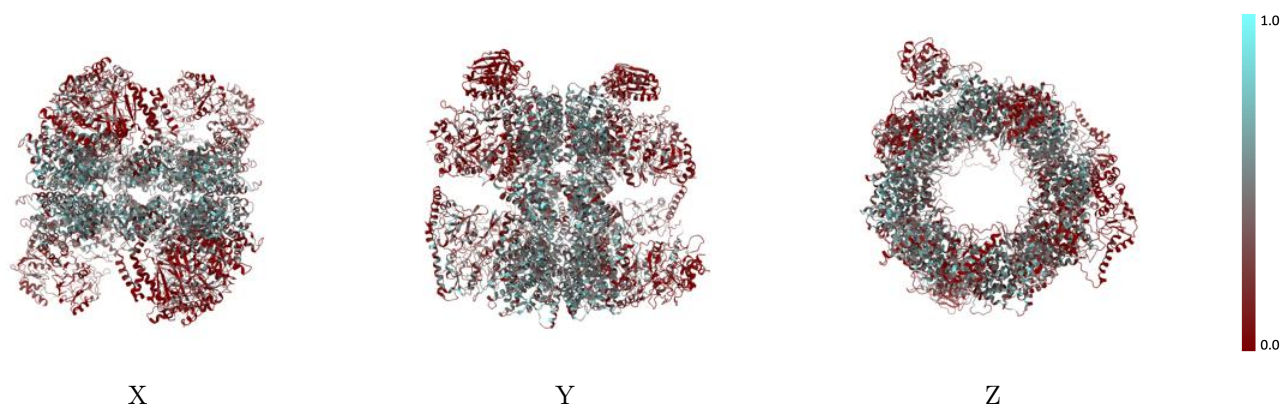
The images above show the 3D surface view of the map at the recommended contour level 0.85 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



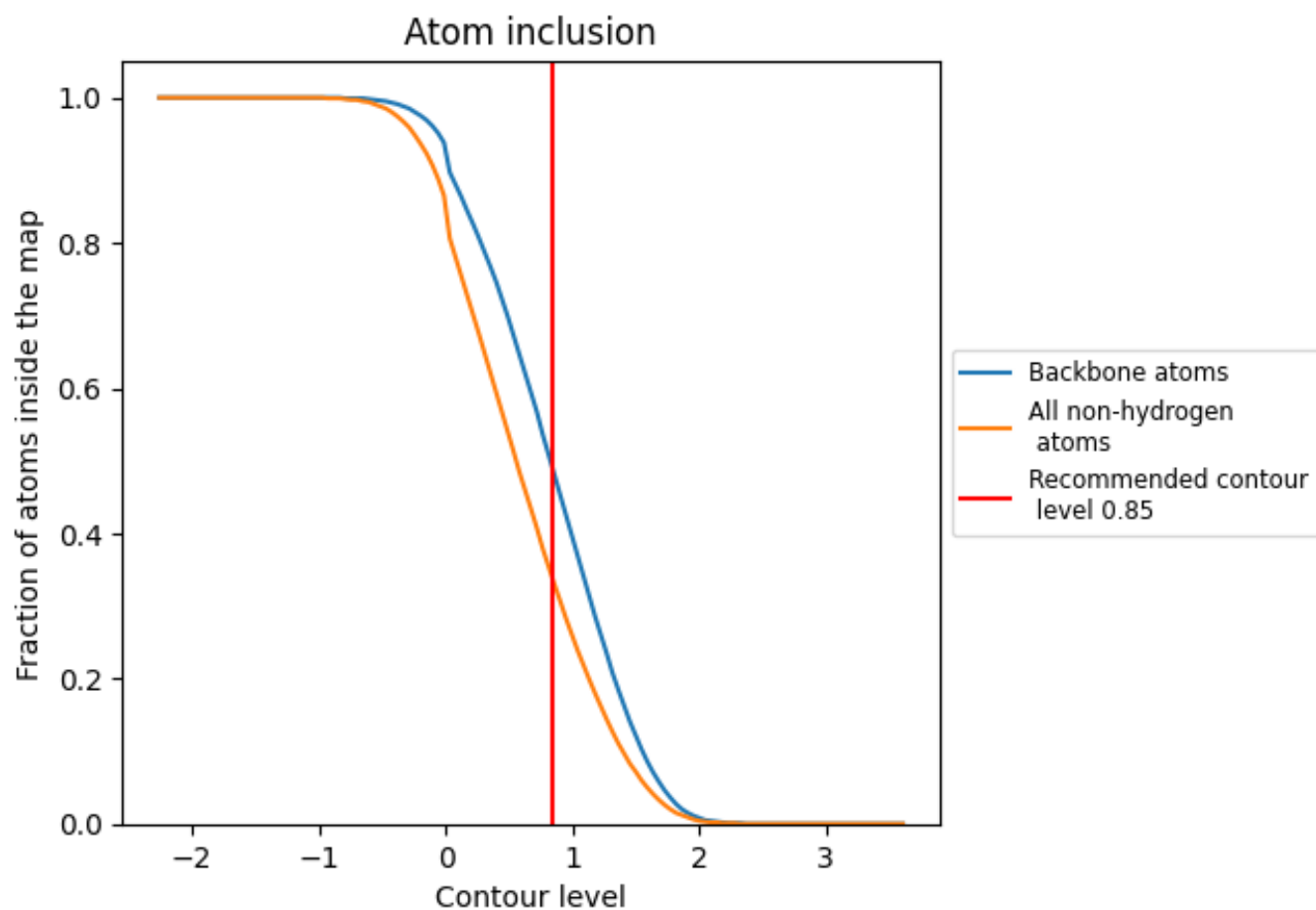
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.85).



































9.4 Atom inclusion [i](#)



At the recommended contour level, 49% of all backbone atoms, 34% 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 (0.85) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.3350	 0.1420
A	 0.3070	 0.1350
B	 0.2350	 0.0910
D	 0.3000	 0.1420
E	 0.3330	 0.1350
G	 0.3610	 0.1620
H	 0.2830	 0.1170
Q	 0.3750	 0.1660
Z	 0.4370	 0.1960
a	 0.3420	 0.1280
b	 0.2410	 0.1080
d	 0.3130	 0.1420
e	 0.3330	 0.1220
g	 0.3390	 0.1380
h	 0.3800	 0.1530
q	 0.3490	 0.1460
z	 0.4190	 0.1880

