wwPDB EM Validation Summary Report (i)

Mar 25, 2026 – 08:28 PM UTC

PDB ID	:	9K2V / pdb_00009k2v
EMDB ID	:	EMD-61998
Title	:	Cyanophage A4 pre-ejectosome
Authors	:	Hou, P.; Li, Q.; Zhou, C.Z.
Deposited on	:	2024-10-18
Resolution	:	3.40 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:

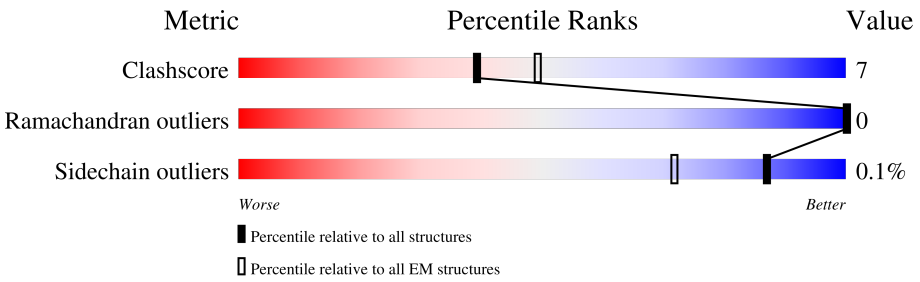
EMDB validation analysis	:	0.0.1.dev132
MolProbity	:	4-5-2 with Phenix2.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

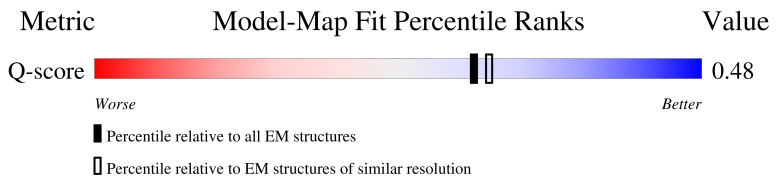
1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.40 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)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	14717 (2.90 - 3.90)

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	F	653	5% • 94%
1	G	653	5% • 94%
1	H	653	5% • 94%
1	I	653	5% • 94%

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Mol	Chain	Length	Quality of chain
1	J	653	5% • 94%
1	K	653	5% • 94%
1	L	653	• • 94%
1	M	653	5% • 94%
1	N	653	• • 94%
1	O	653	5% • 94%
2	V	380	• 19% 5% 76%
2	W	380	• 19% 5% 76%
2	X	380	• 19% 6% 76%
2	Y	380	19% 6% 76%
2	Z	380	• 19% 5% 76%
2	v	380	• 20% • 76%
2	w	380	• 20% • 76%
2	x	380	• 19% 6% 76%
2	y	380	• 19% 5% 76%
2	z	380	• 21% • 76%
3	A	1058	5% 72% 14% 14%
3	B	1058	5% 70% 16% 14%
3	C	1058	5% 72% 14% 14%
3	D	1058	• 70% 15% 14%
3	E	1058	5% 72% 13% 14%
3	a	1058	• 35% 9% 56%
3	b	1058	• 34% 10% 56%
3	c	1058	• 34% 9% 56%
3	d	1058	• 34% 10% 56%

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Mol	Chain	Length	Quality of chain
3	e	1058	36% 7% 56%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 63405 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 Portal protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
1	K	40	290	178	50	62	0	0
1	M	40	290	178	50	62	0	0
1	O	40	290	178	50	62	0	0
1	G	40	290	178	50	62	0	0
1	I	40	290	178	50	62	0	0
1	F	40	290	178	50	62	0	0
1	H	40	290	178	50	62	0	0
1	J	40	290	178	50	62	0	0
1	L	40	290	178	50	62	0	0
1	N	40	290	178	50	62	0	0

- Molecule 2 is a protein called Internal virion protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	V	92	706	422	138	142	4	0	0
2	W	92	706	422	138	142	4	0	0
2	X	92	706	422	138	142	4	0	0
2	Y	92	706	422	138	142	4	0	0
2	Z	92	706	422	138	142	4	0	0

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Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	v	92	706	422	138	142	4	0	0
2	w	92	706	422	138	142	4	0	0
2	x	92	706	422	138	142	4	0	0
2	y	92	706	422	138	142	4	0	0
2	z	92	706	422	138	142	4	0	0

- Molecule 3 is a protein called Internal protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	E	907	7028	4342	1304	1361	21	0	0
3	d	462	3660	2236	682	732	10	0	0
3	A	907	7028	4342	1304	1361	21	0	0
3	e	462	3660	2236	682	732	10	0	0
3	B	907	7028	4342	1304	1361	21	0	0
3	a	462	3660	2236	682	732	10	0	0
3	C	907	7028	4342	1304	1361	21	0	0
3	b	462	3660	2236	682	732	10	0	0
3	D	907	7028	4342	1304	1361	21	0	0
3	c	462	3660	2236	682	732	10	0	0

- Molecule 4 is ZINC ION (CCD ID: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
4	E	1	1	1	0
4	A	1	1	1	0

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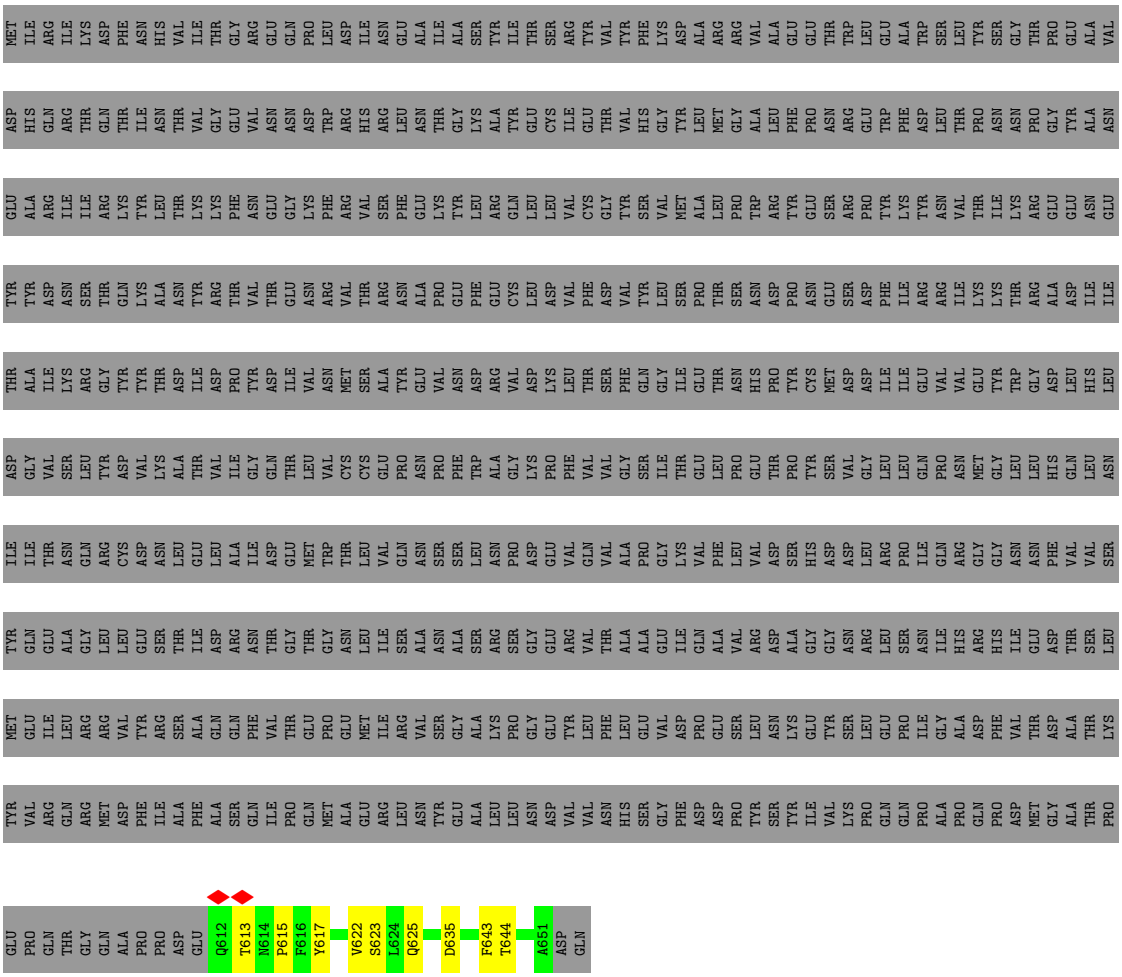
Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
4	B	1	1	1	0
			Total	Zn	
4	C	1	1	1	0
			Total	Zn	
4	D	1	1	1	0

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.

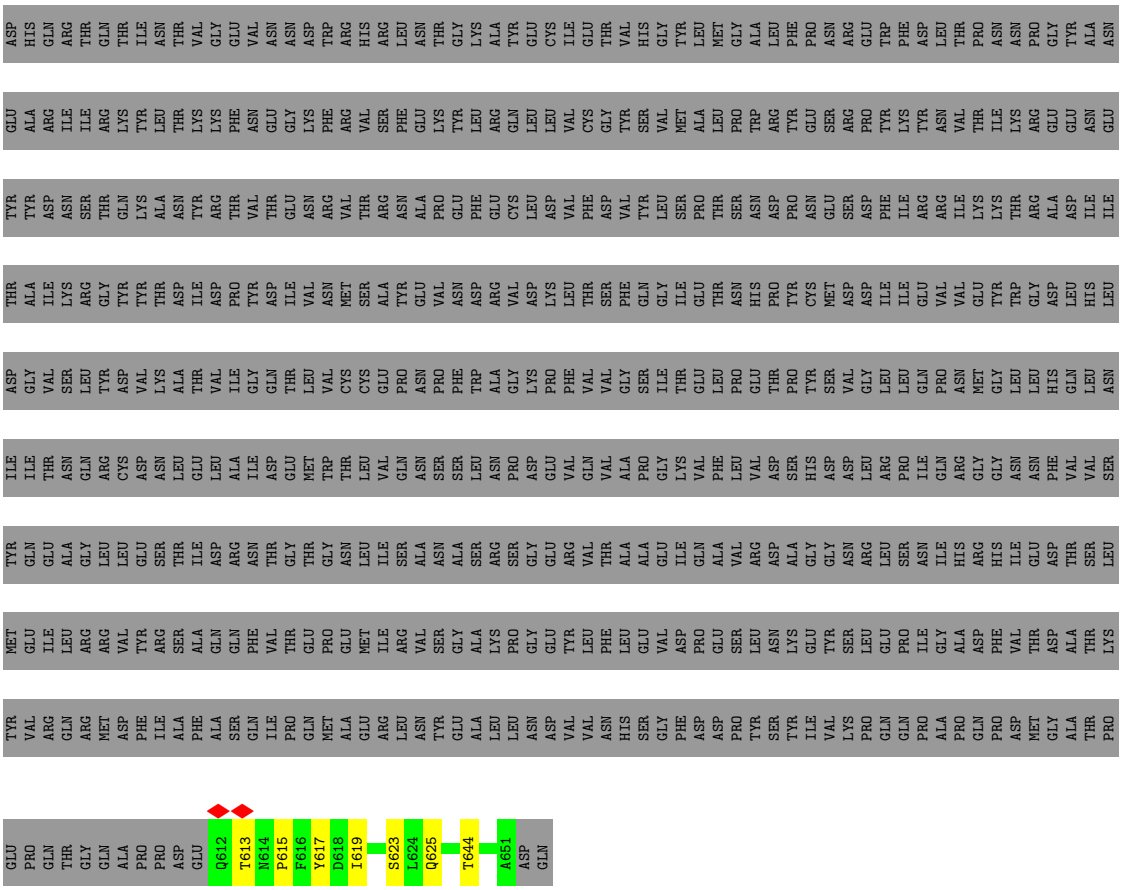
- Molecule 1: Portal protein

Chain K: 5% • 94%



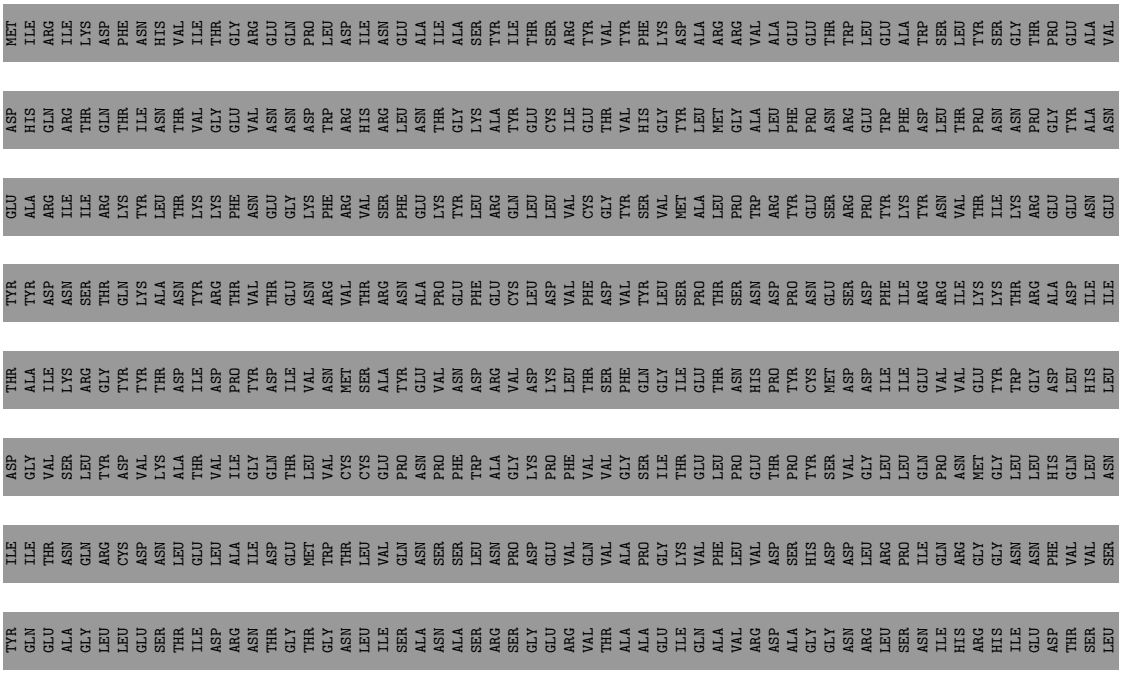
- Molecule 1: Portal protein

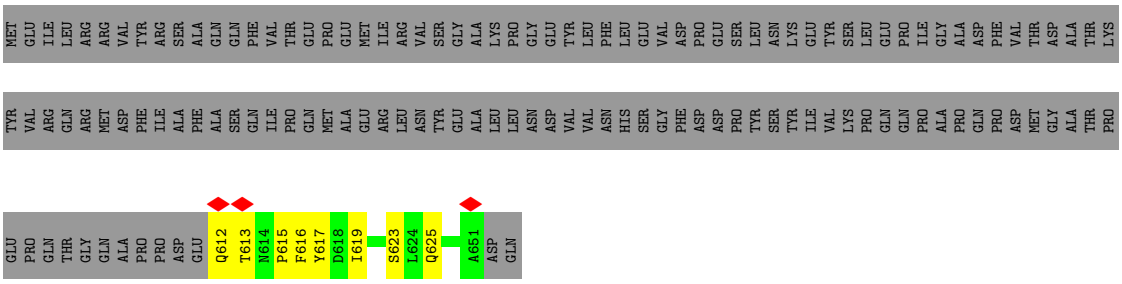
Chain M: 5% • 94%



- Molecule 1: Portal protein

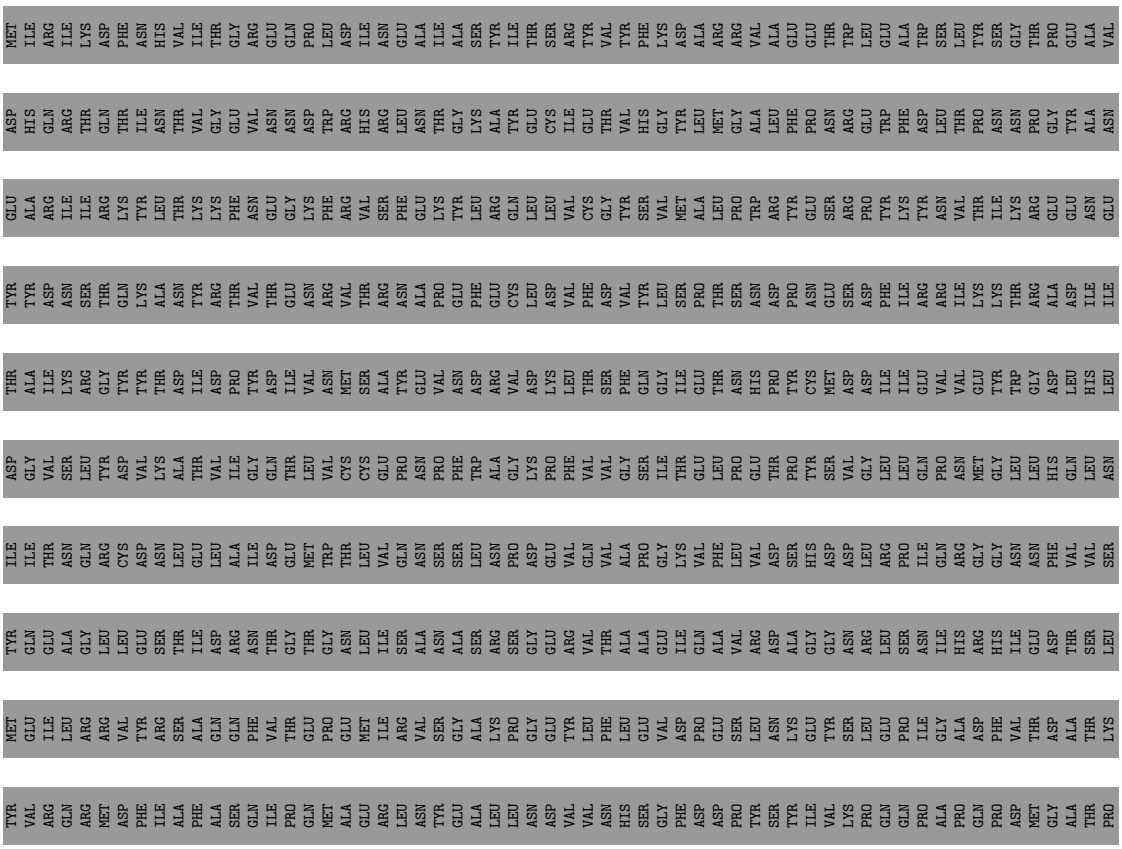
Chain O: 5% • 94%





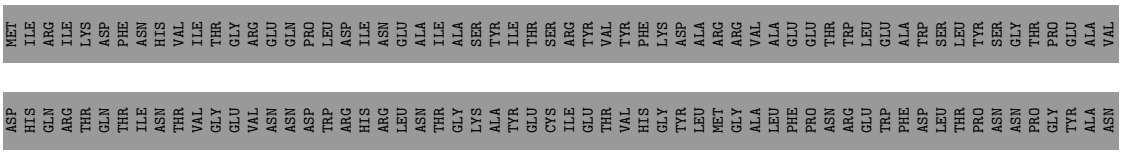
• Molecule 1: Portal protein

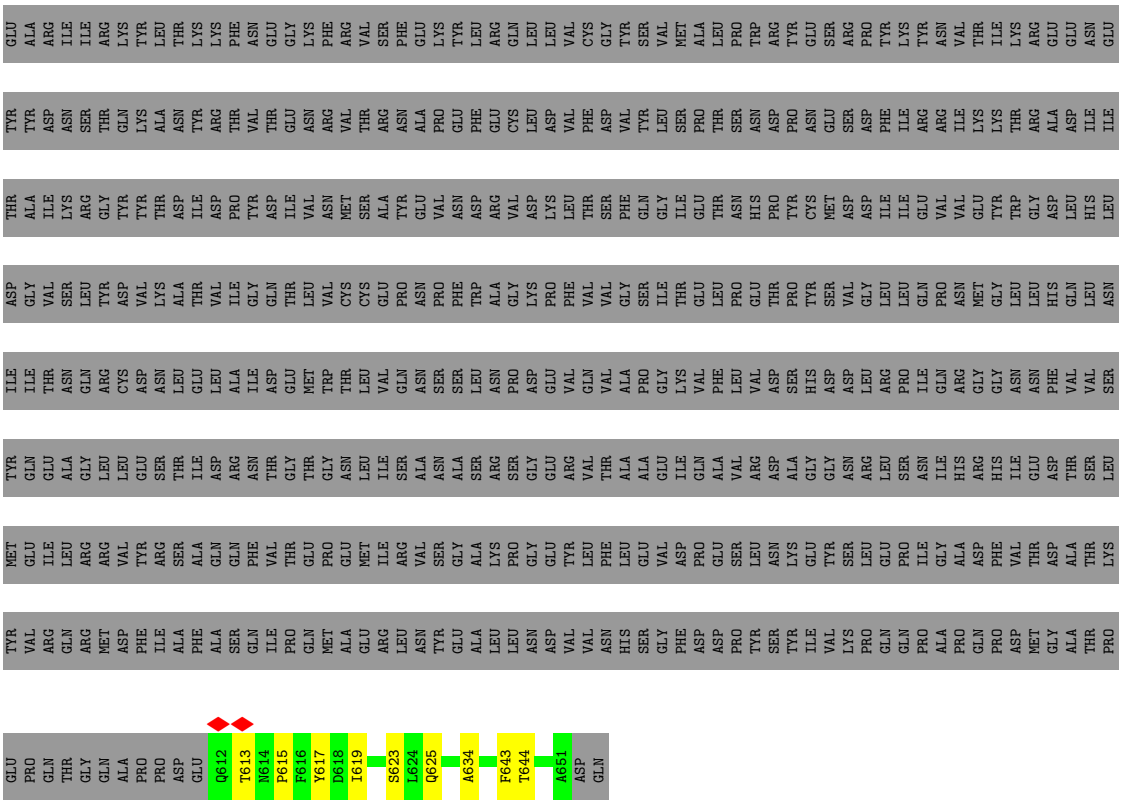
Chain G: 5% • 94%



• Molecule 1: Portal protein

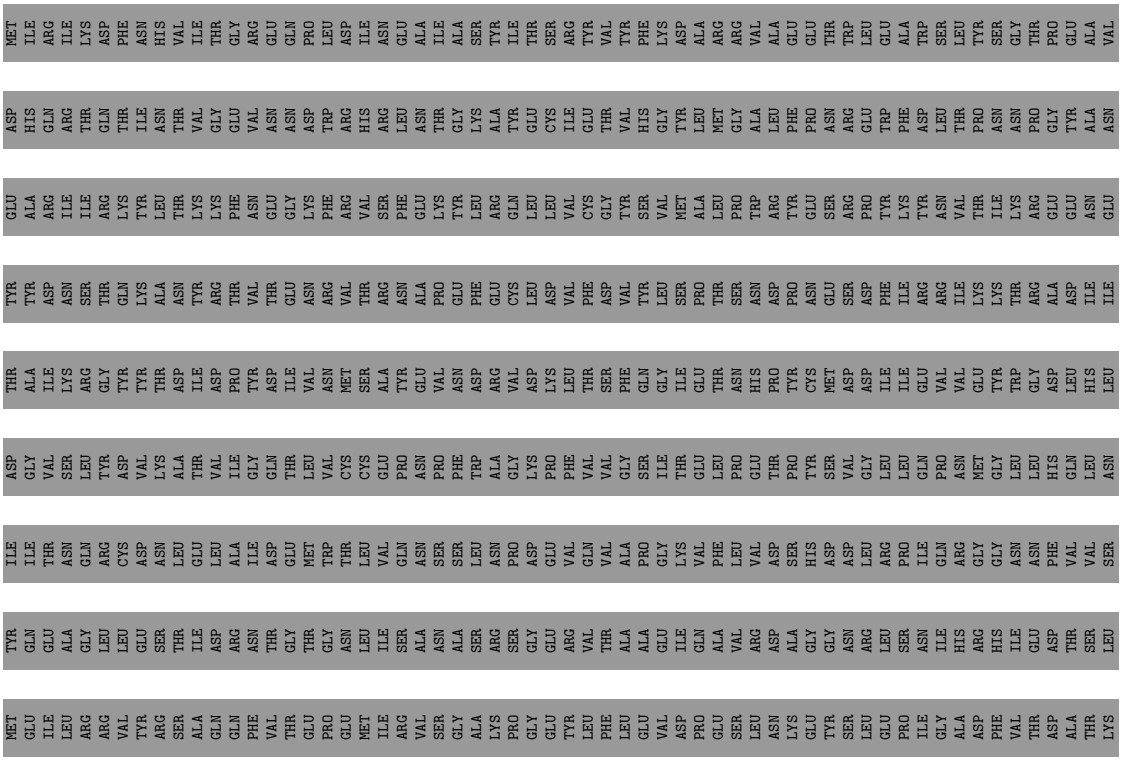
Chain I: 5% • 94%

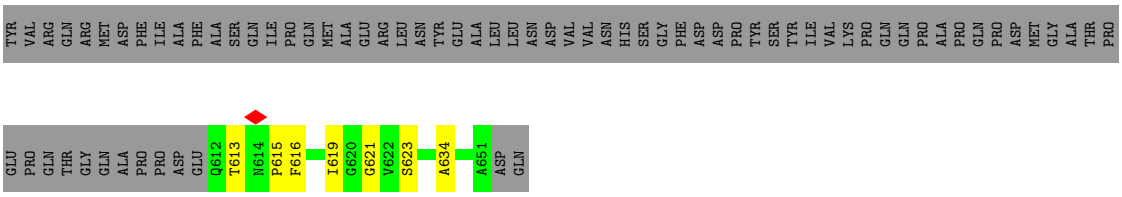




- Molecule 1: Portal protein

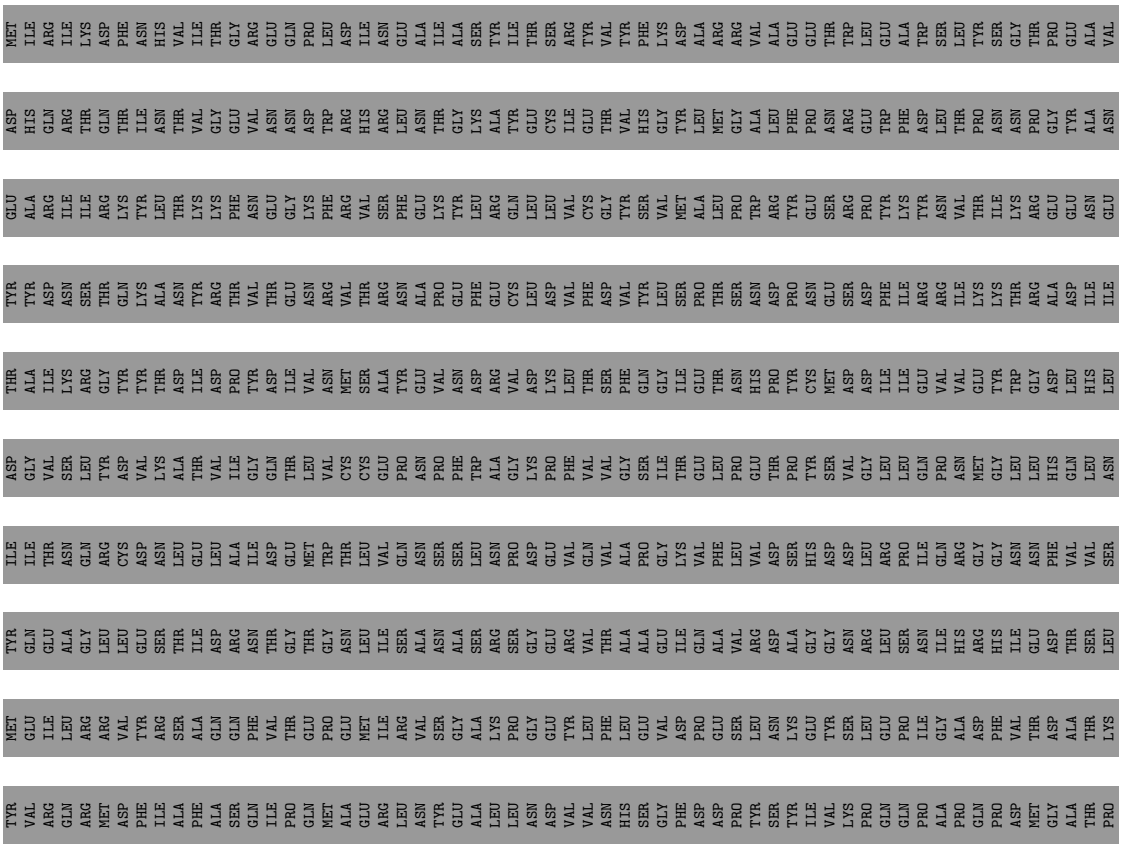
Chain F: 5% 94%





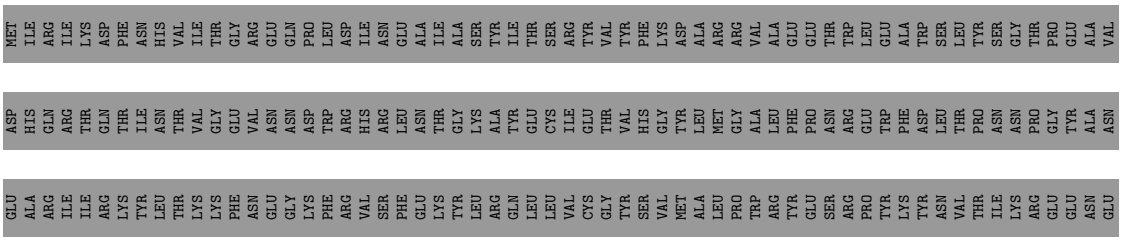
- Molecule 1: Portal protein

Chain H: 5% • 94%



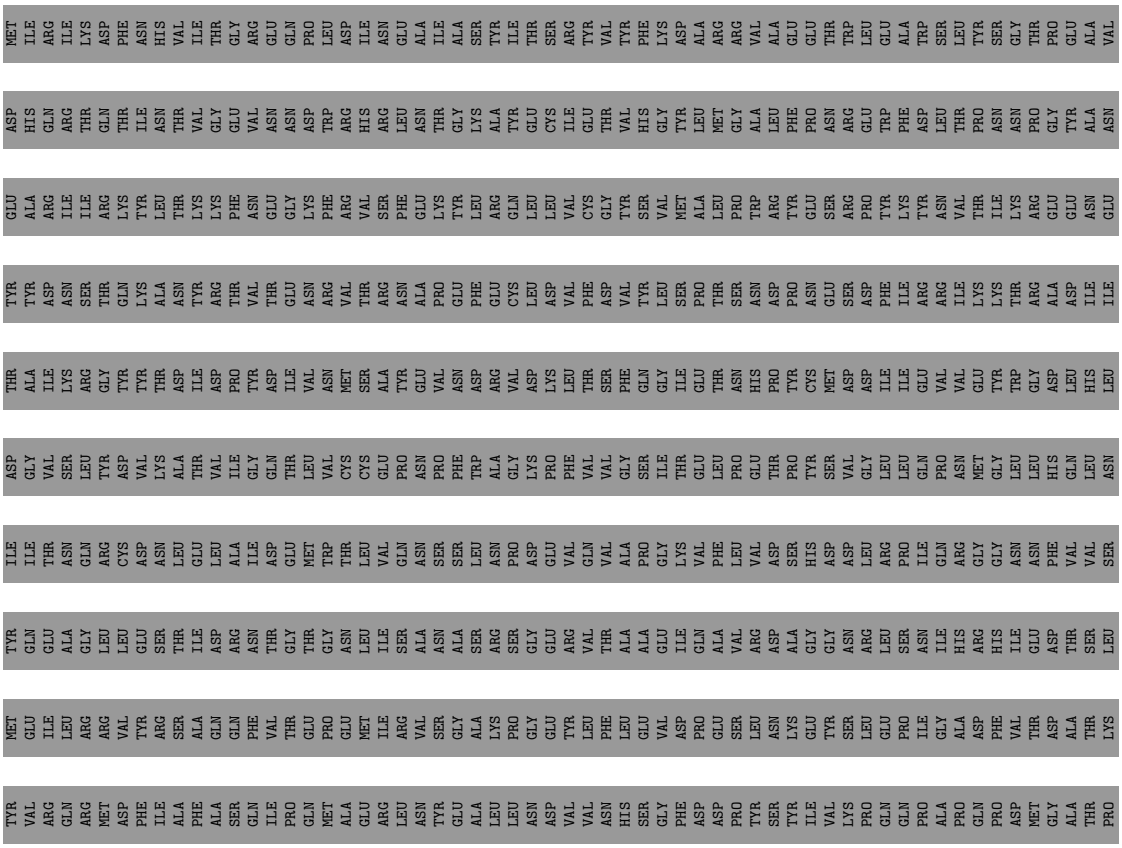
- Molecule 1: Portal protein

Chain J: 5% • 94%



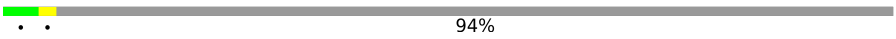
• Molecule 1: Portal protein

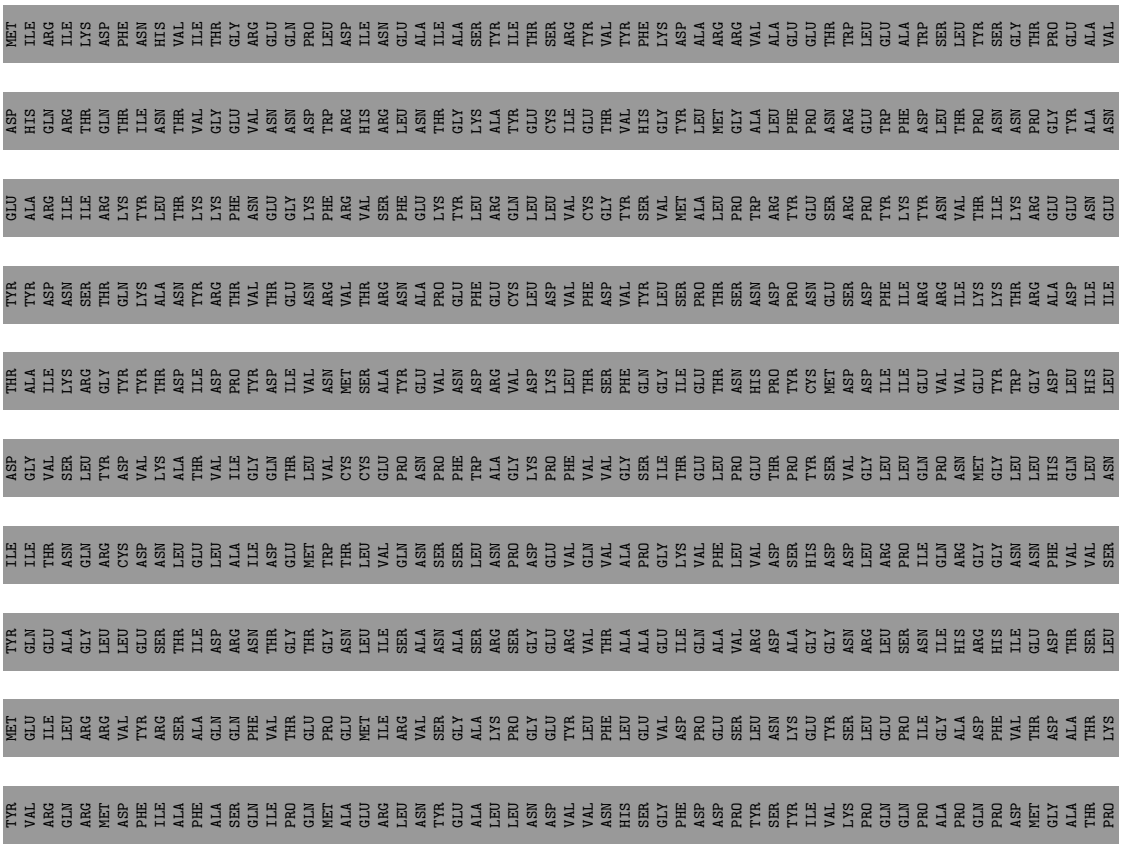
Chain L: 94%



- Molecule 1: Portal protein

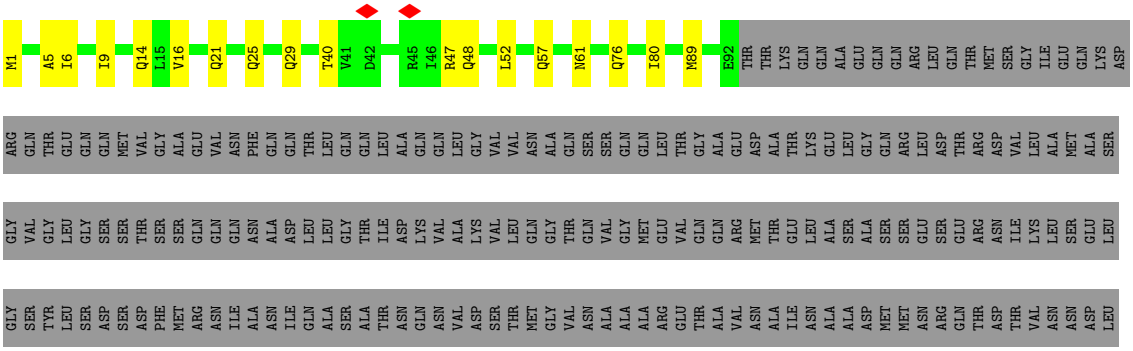
Chain N:

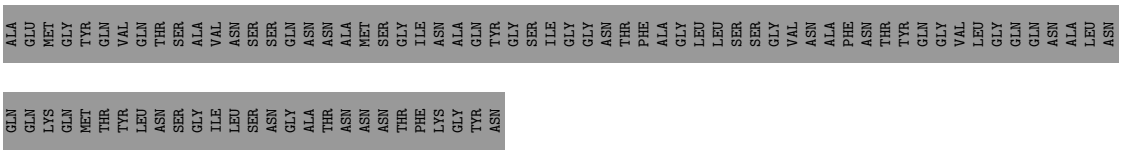




- Molecule 2: Internal virion protein

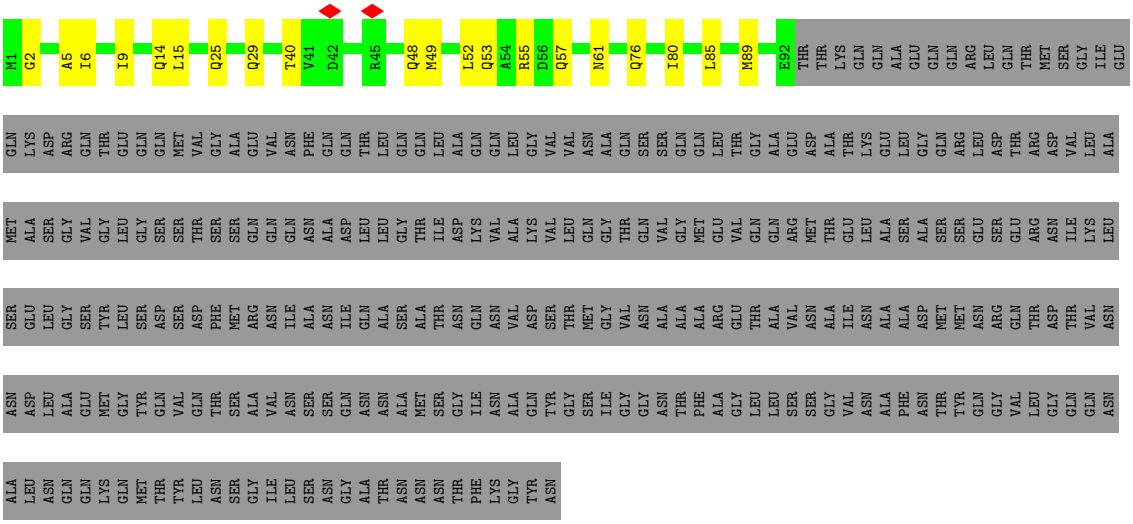
Chain V:





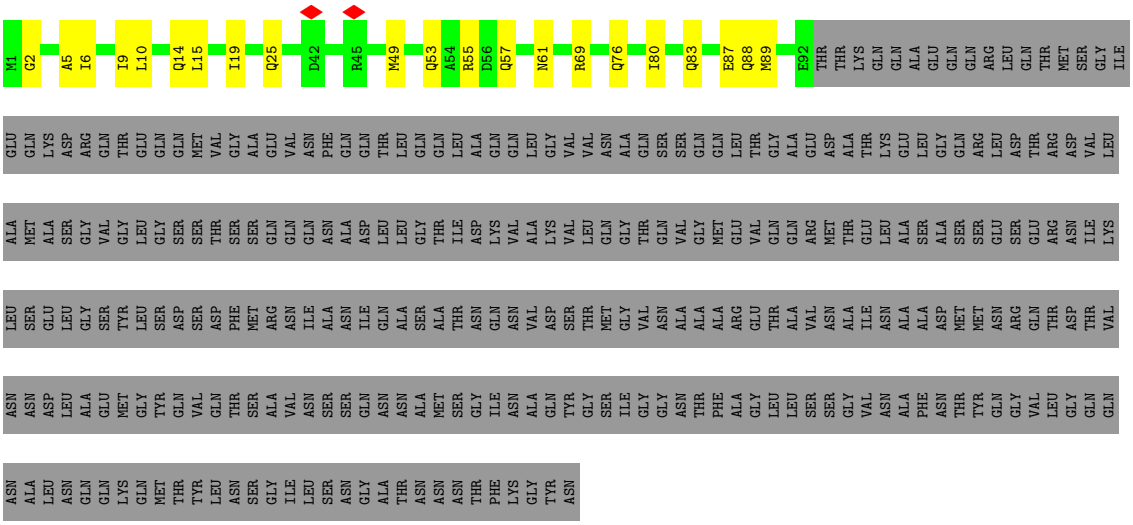
• Molecule 2: Internal virion protein

Chain W:



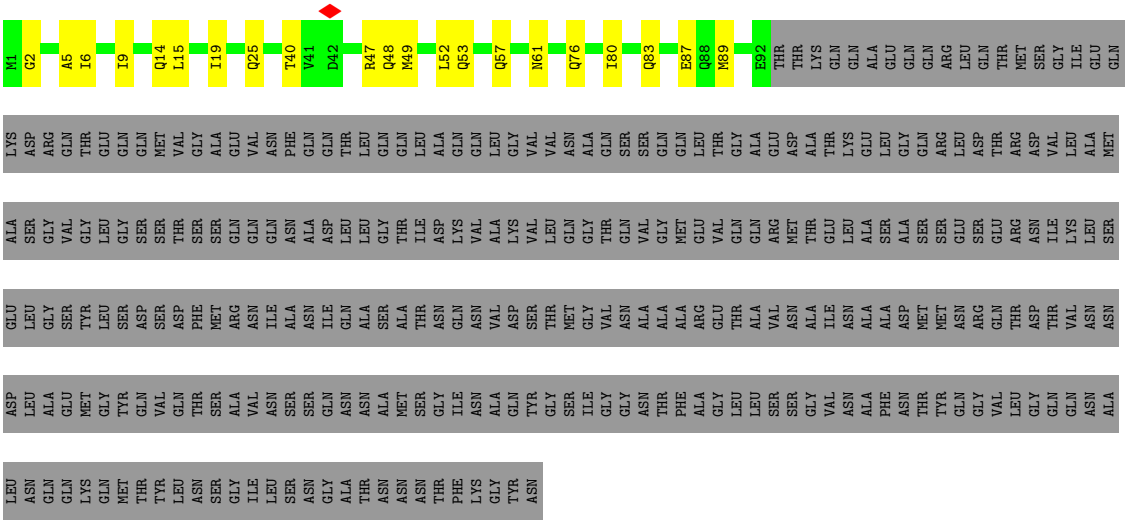
• Molecule 2: Internal virion protein

Chain X:



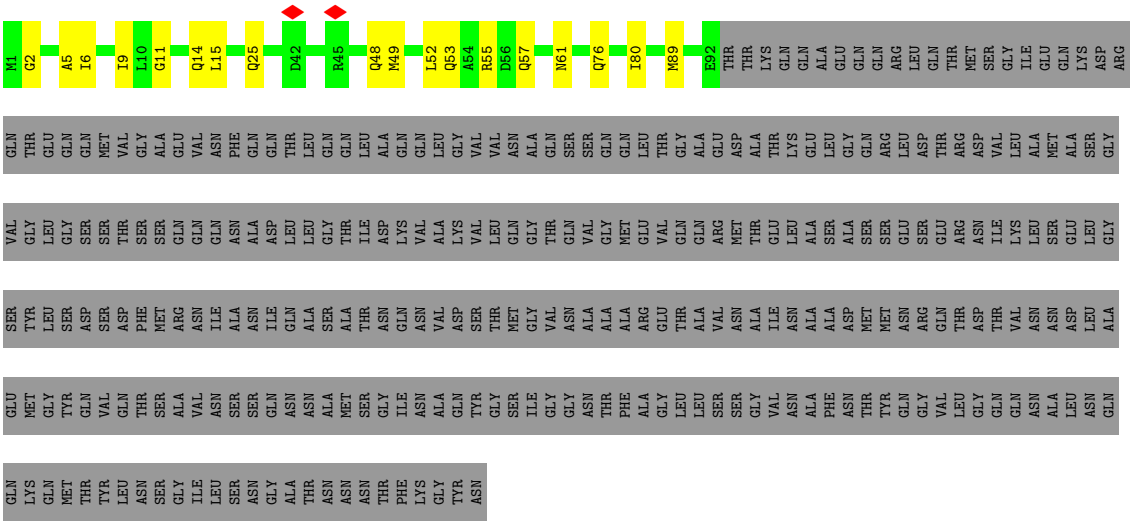
• Molecule 2: Internal virion protein

Chain Y:



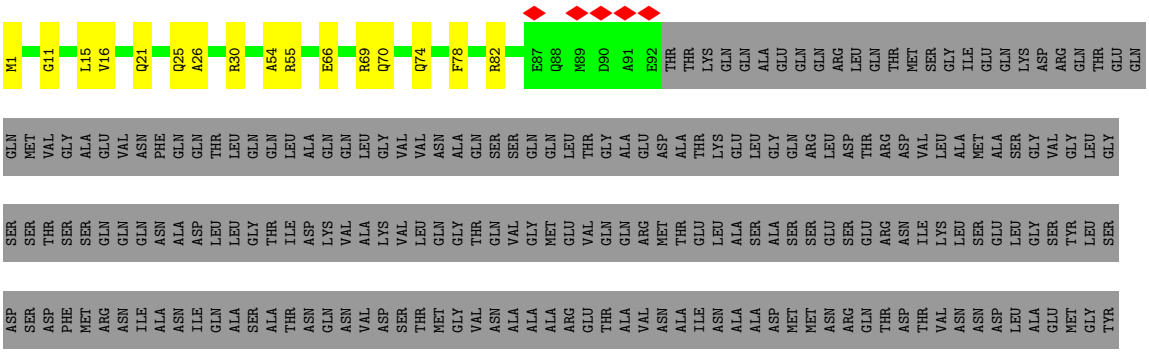
- Molecule 2: Internal virion protein

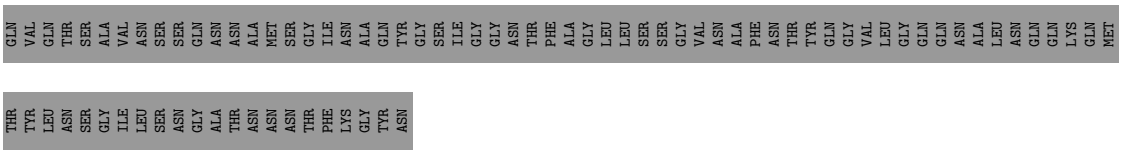
Chain Z:



- Molecule 2: Internal virion protein

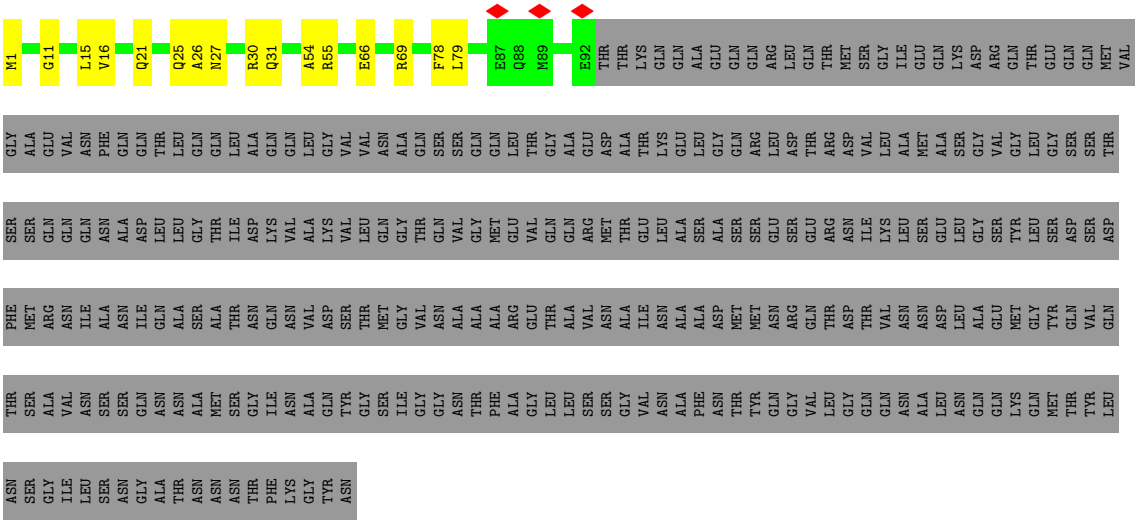
Chain v:





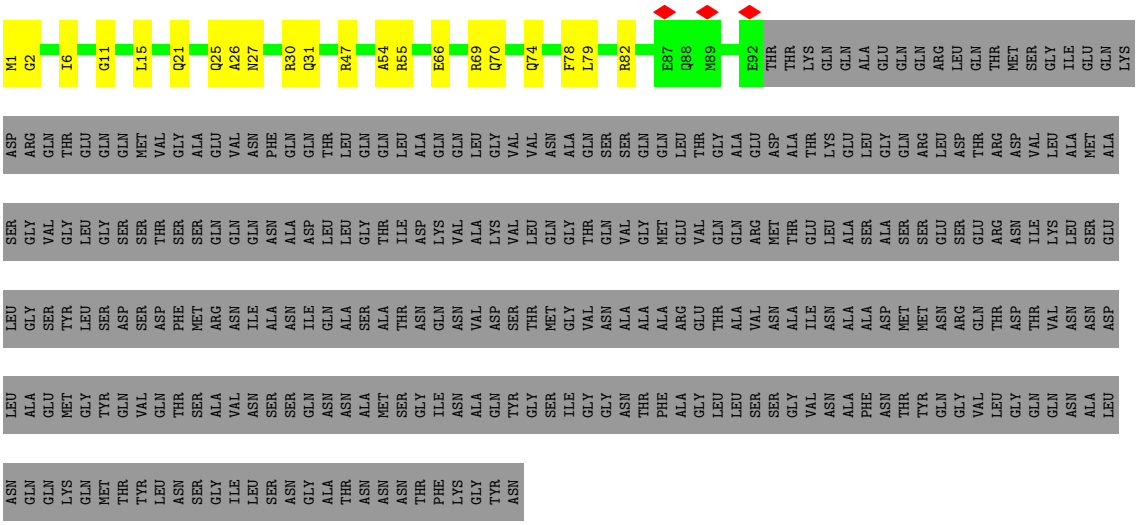
• Molecule 2: Internal virion protein

Chain w:



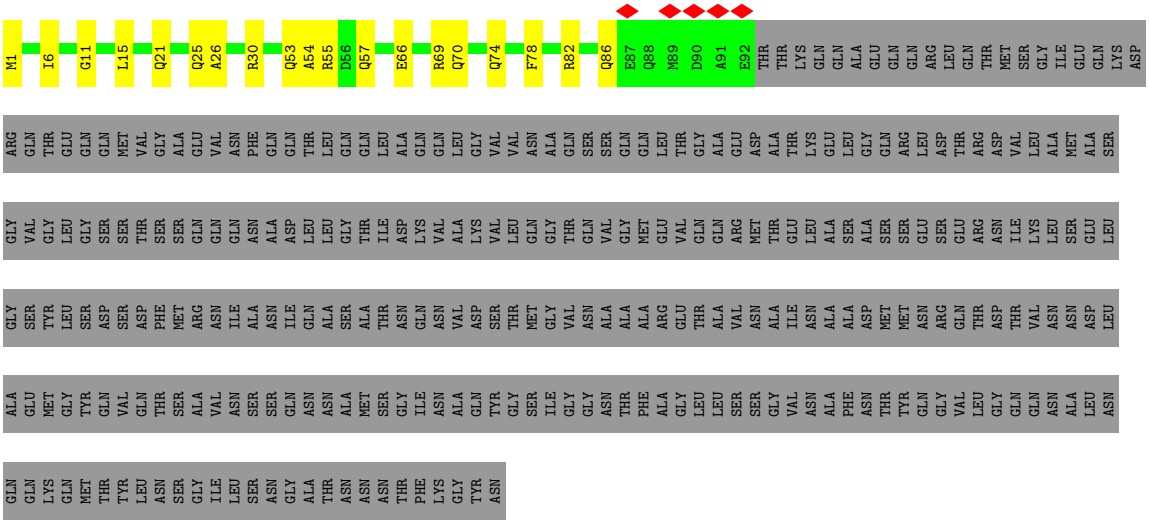
• Molecule 2: Internal virion protein

Chain x:



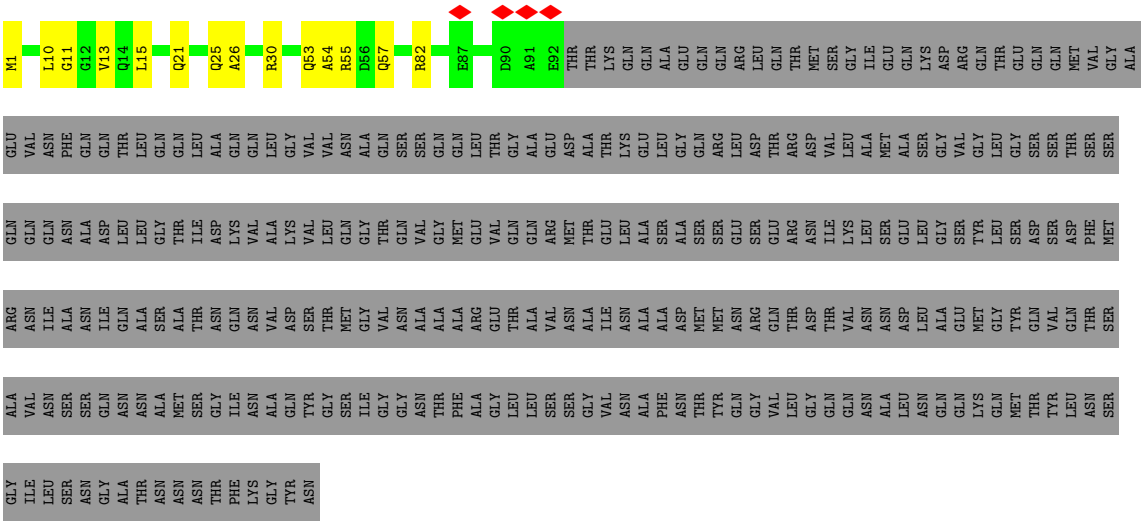
• Molecule 2: Internal virion protein

Chain y:



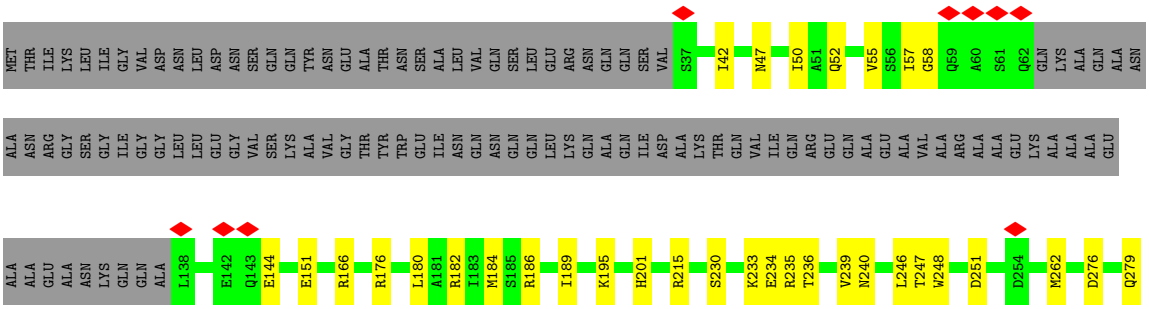
• Molecule 2: Internal virion protein

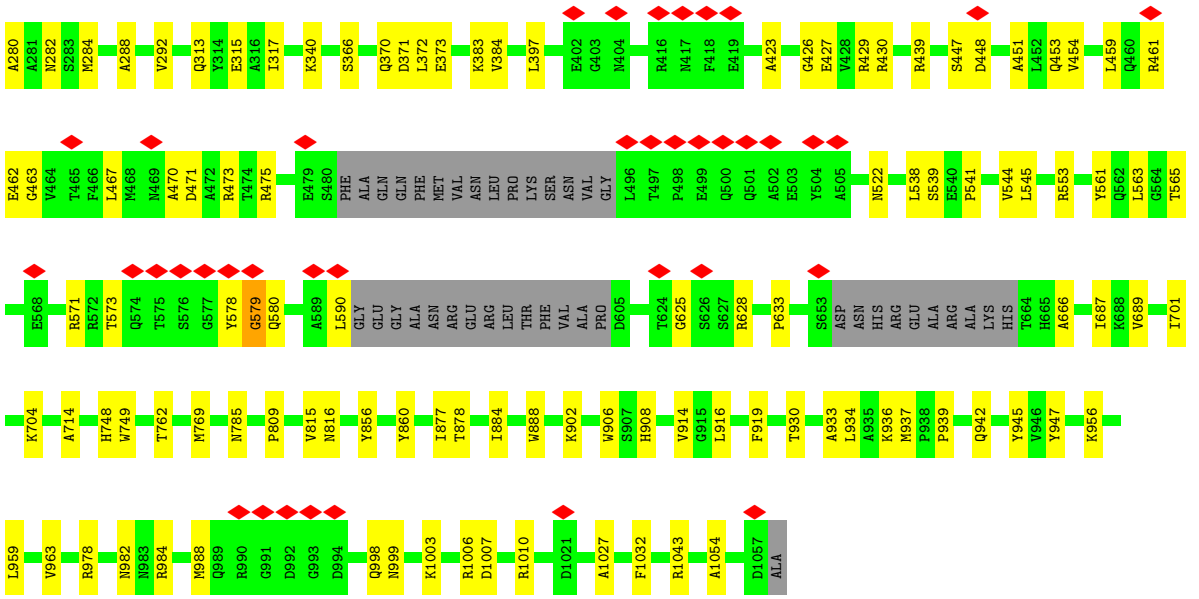
Chain z:



• Molecule 3: Internal protein

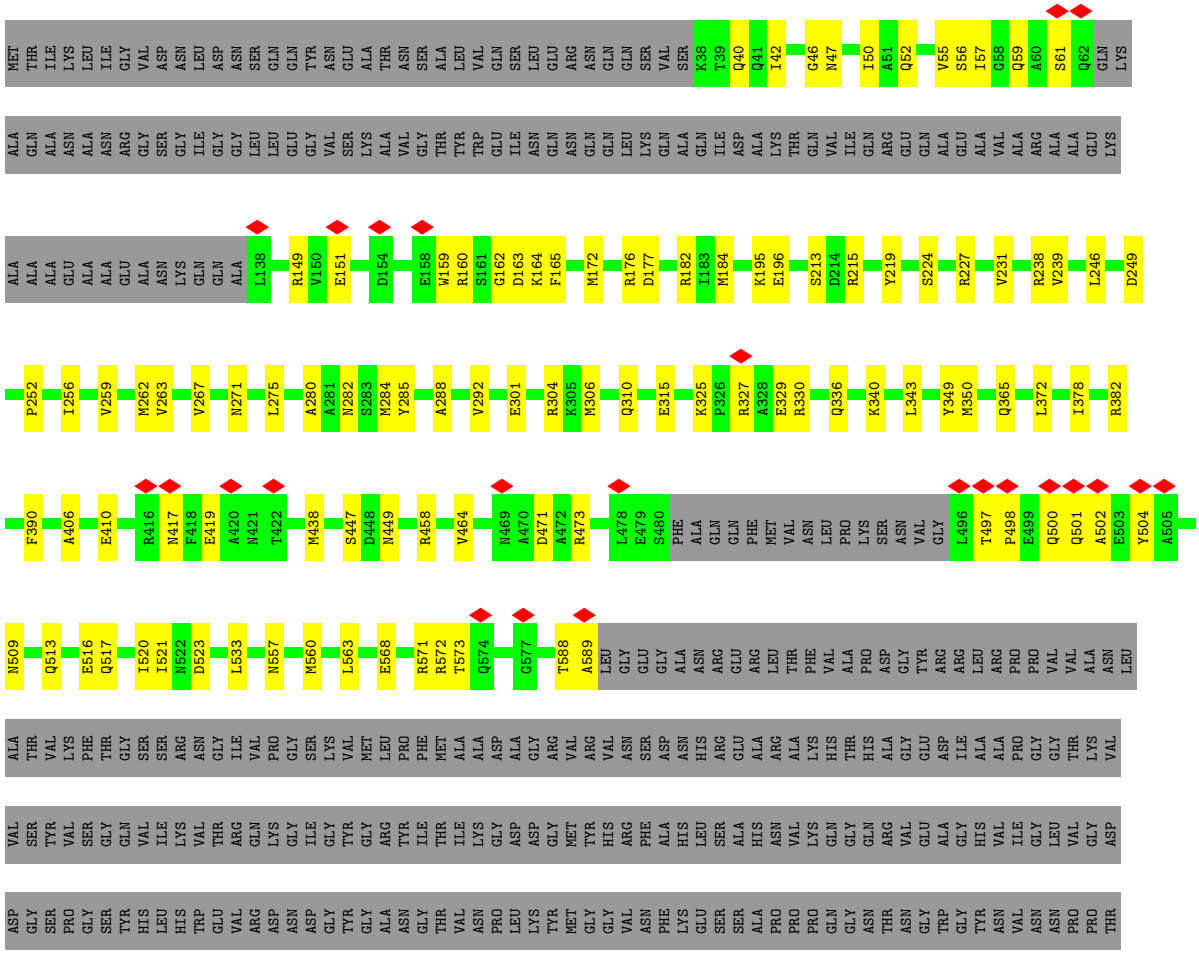
Chain E:

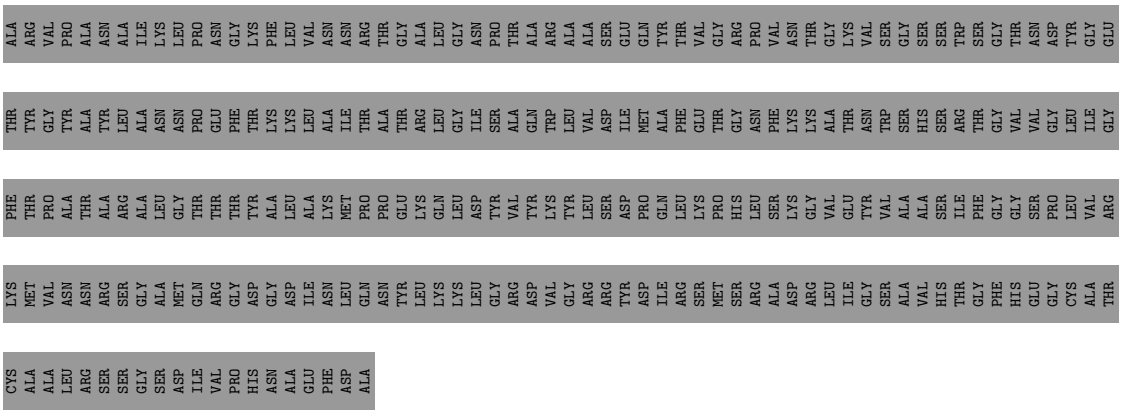




- Molecule 3: Internal protein

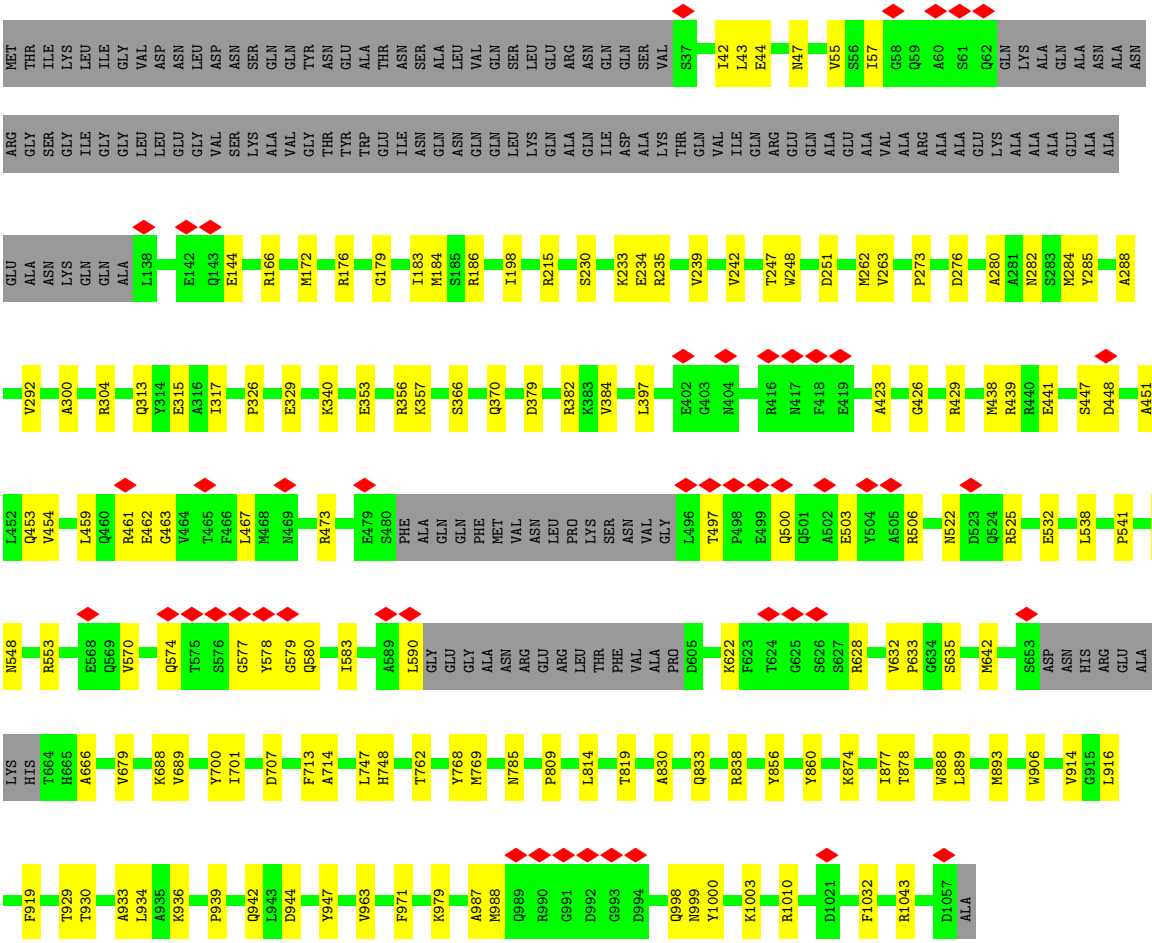
Chain d:





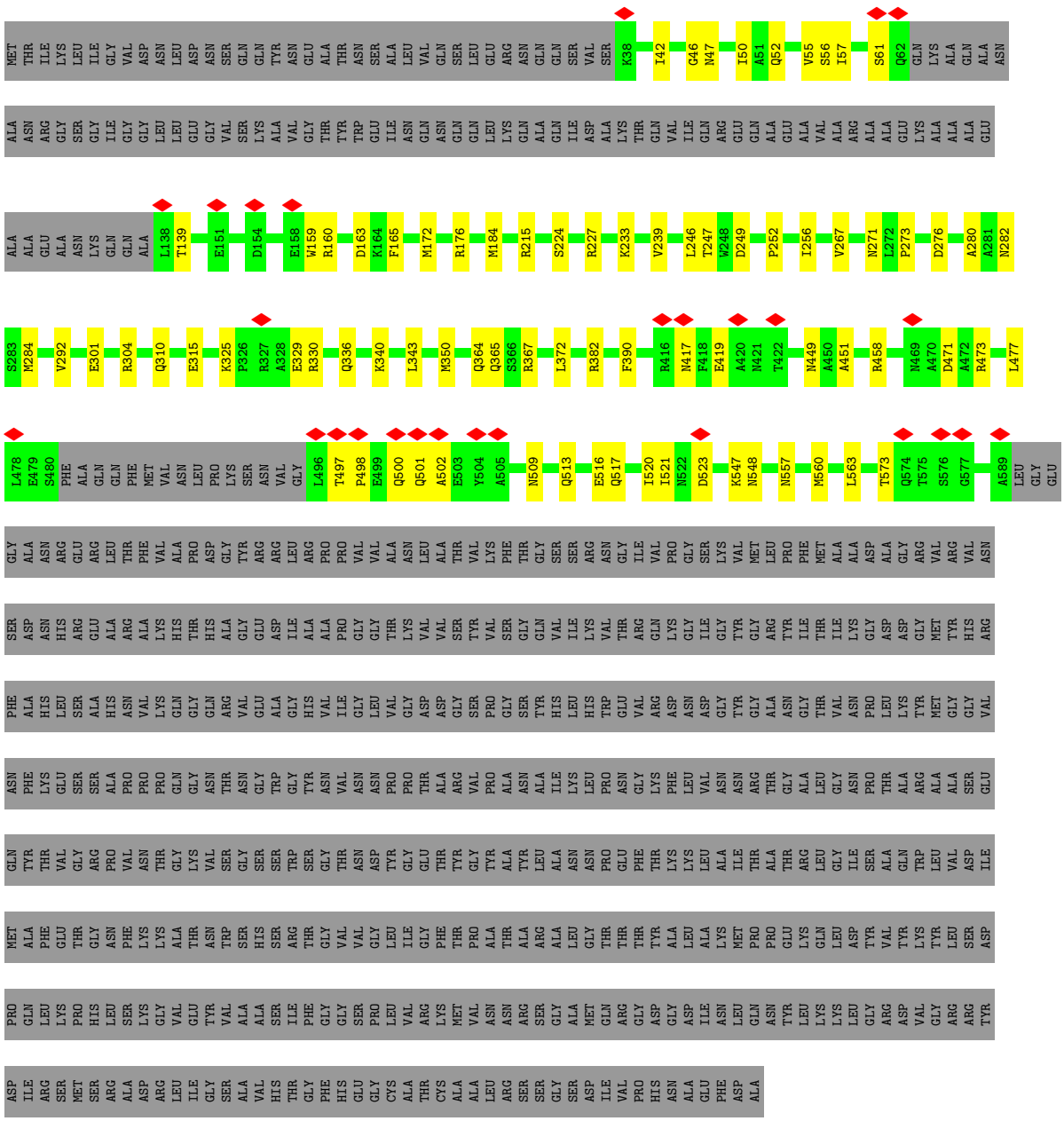
- Molecule 3: Internal protein

Chain A:



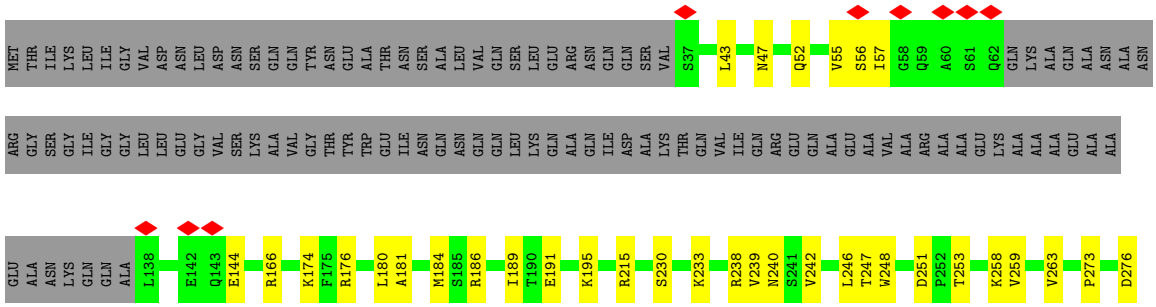
- Molecule 3: Internal protein

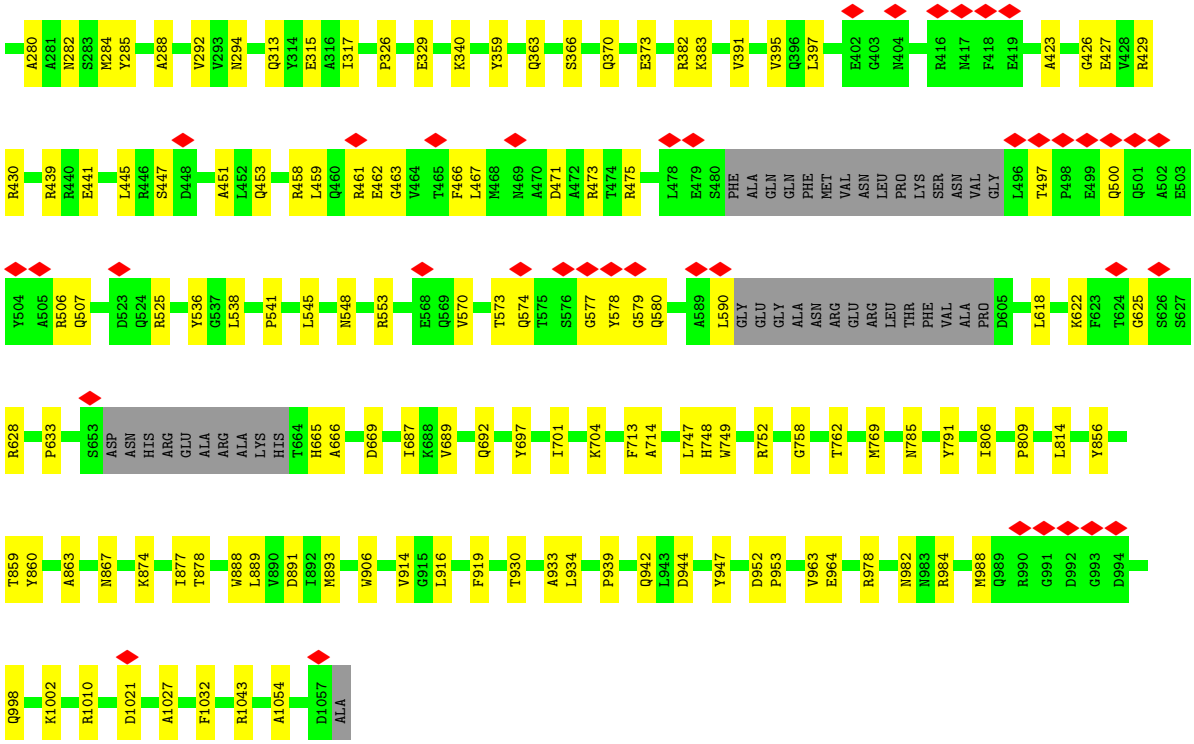
Chain e:



• Molecule 3: Internal protein

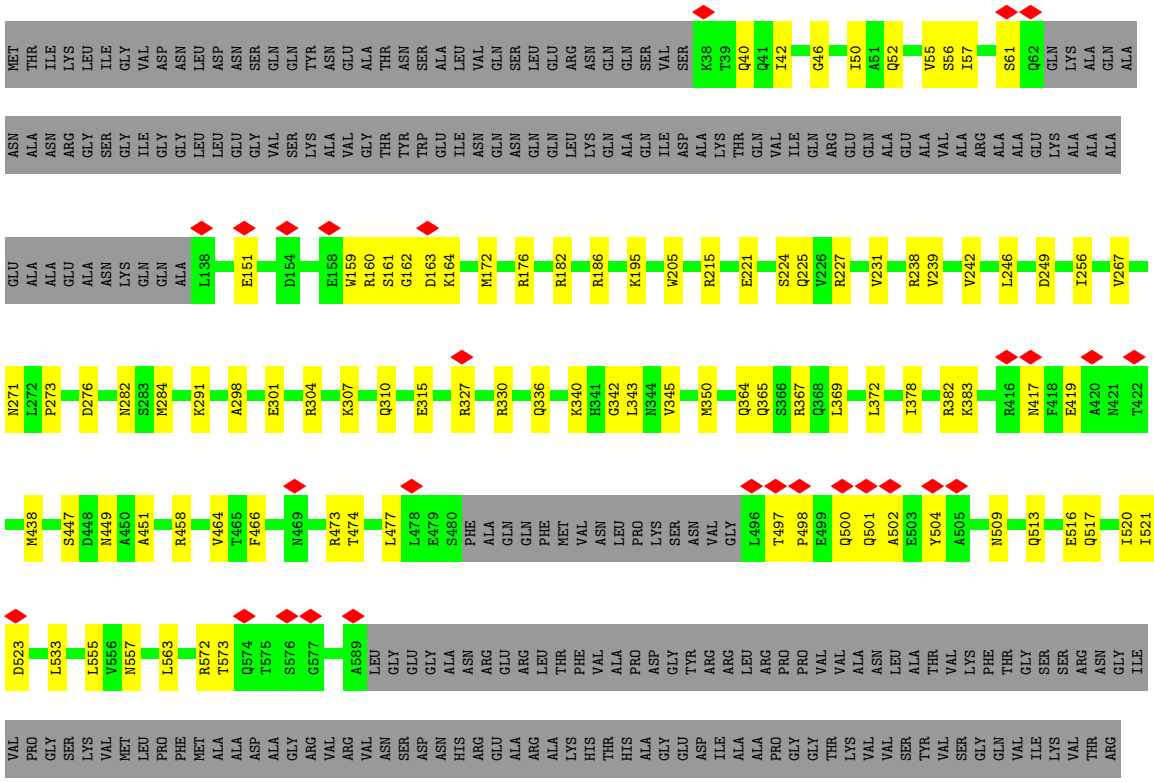
Chain B:

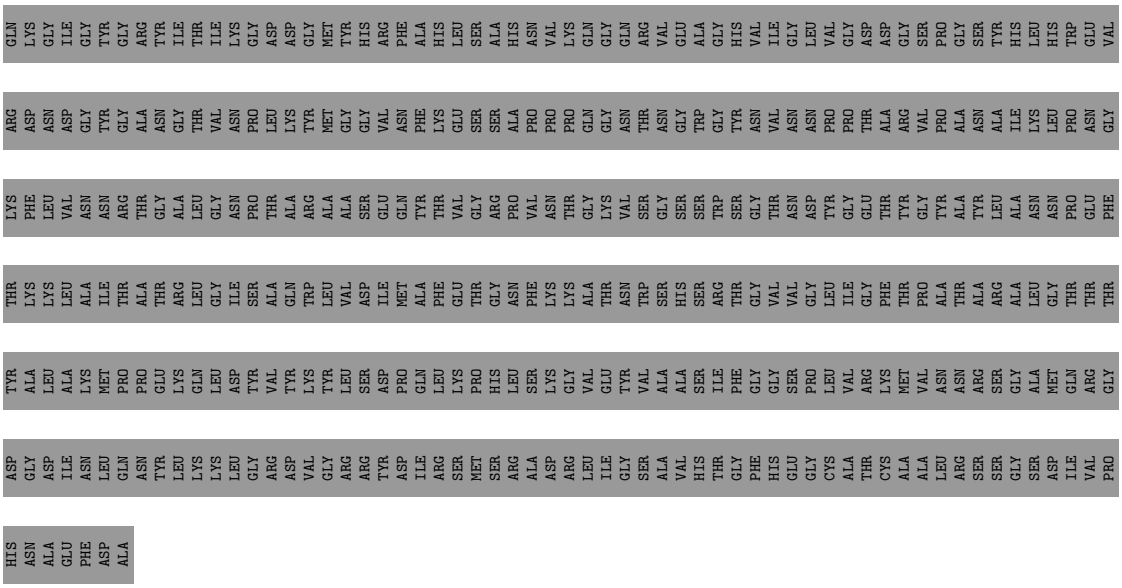




- Molecule 3: Internal protein

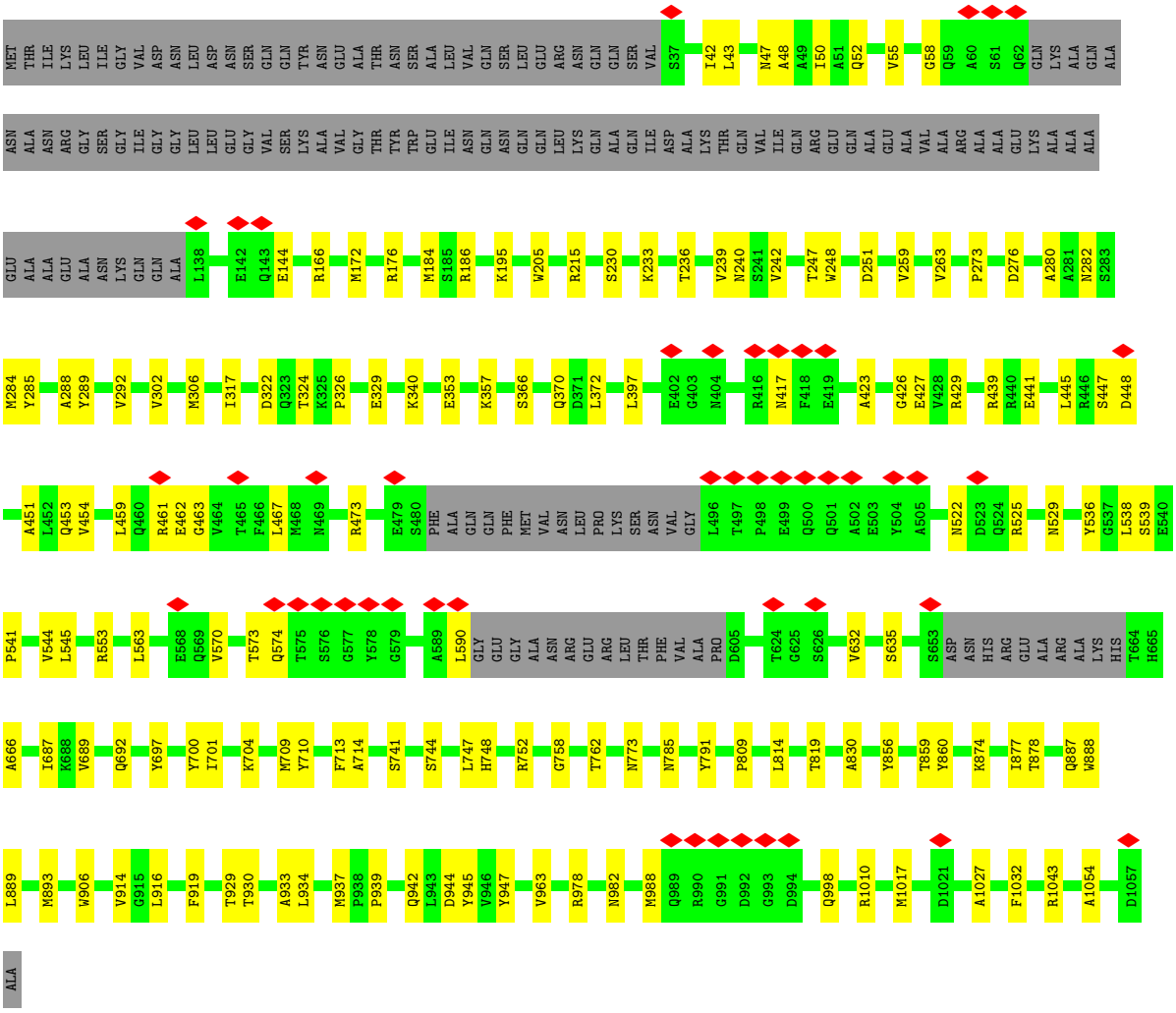
Chain a:





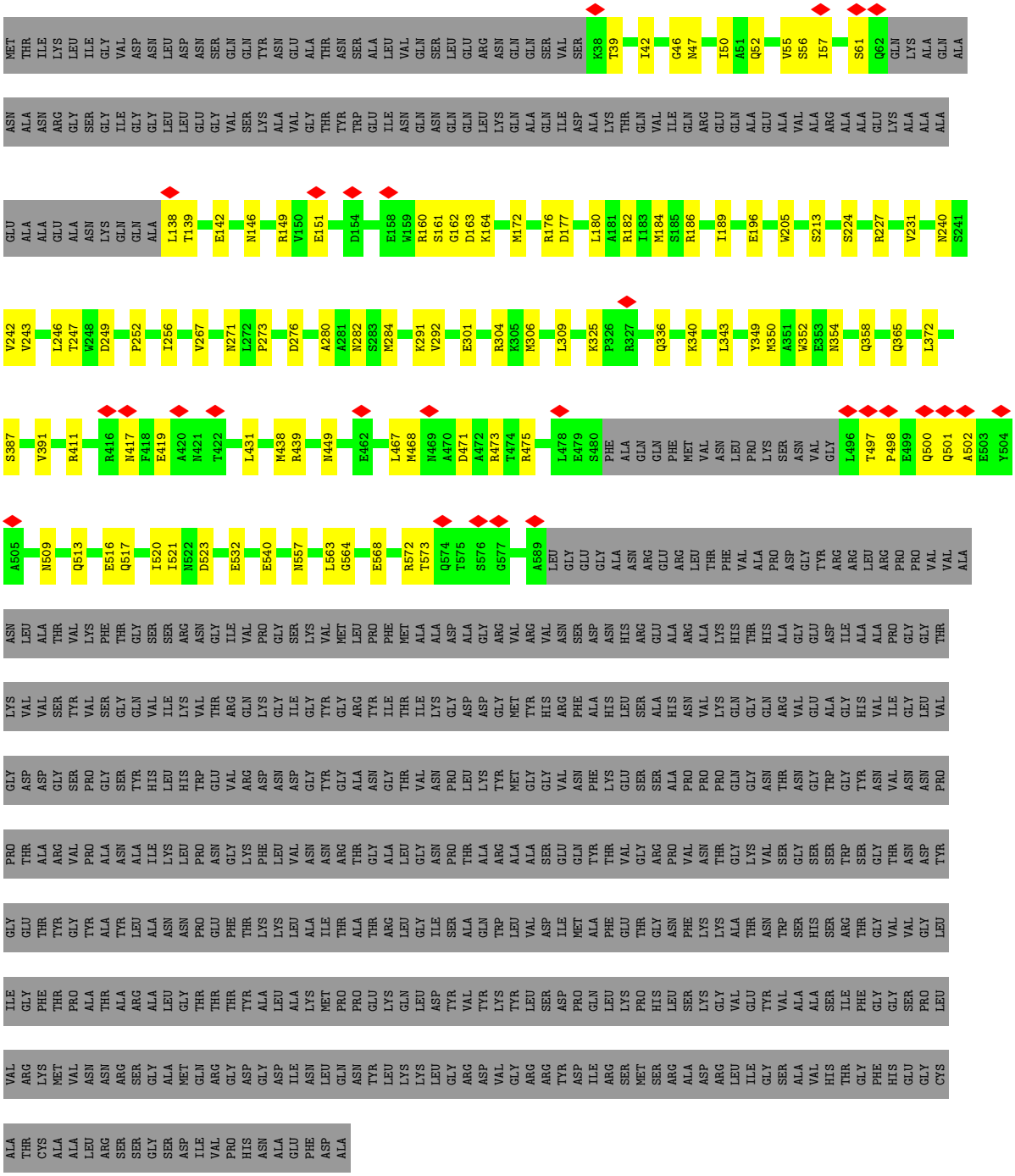
- Molecule 3: Internal protein

Chain C:



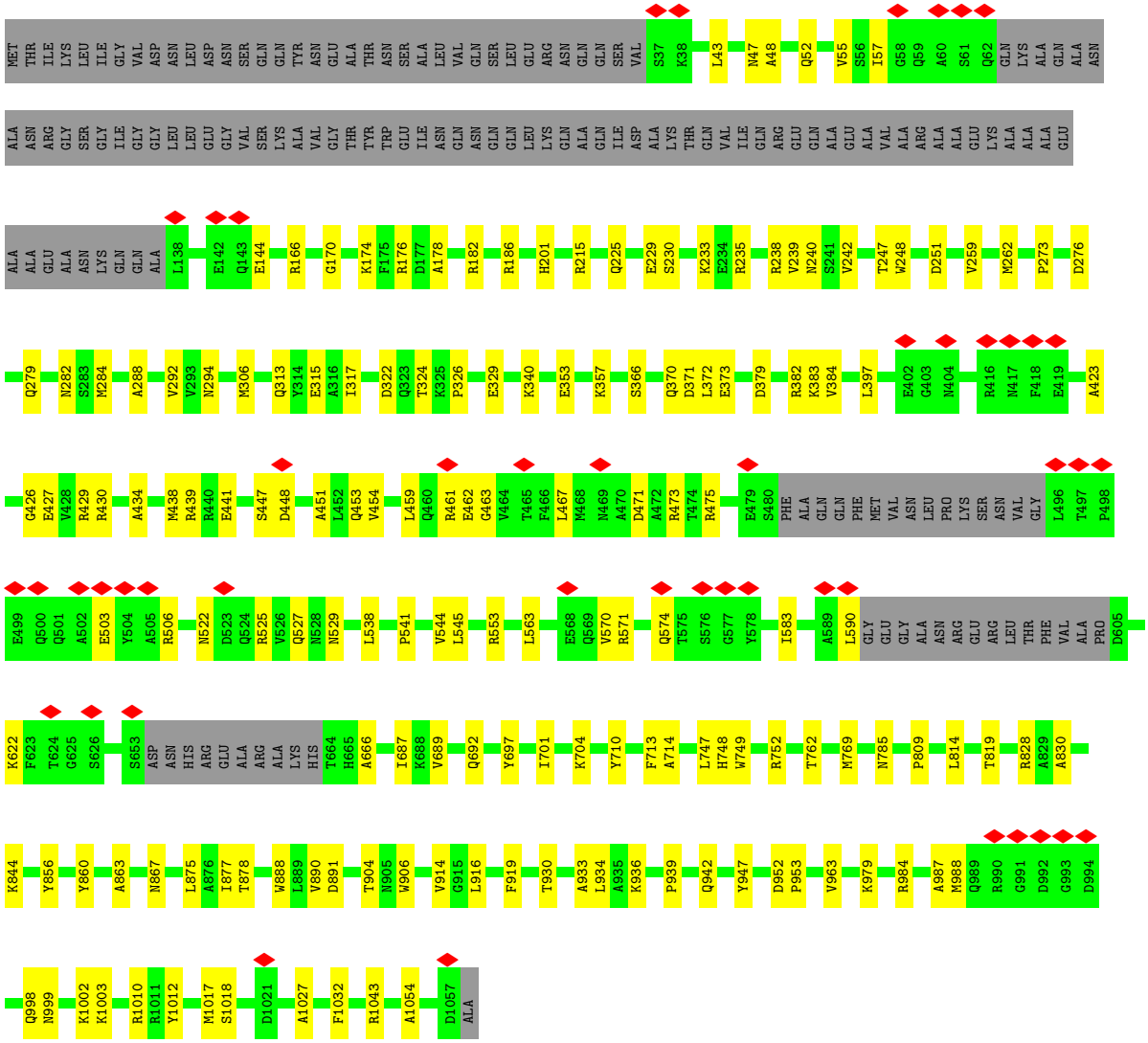
• Molecule 3: Internal protein

Chain b: 34% 10% 56%



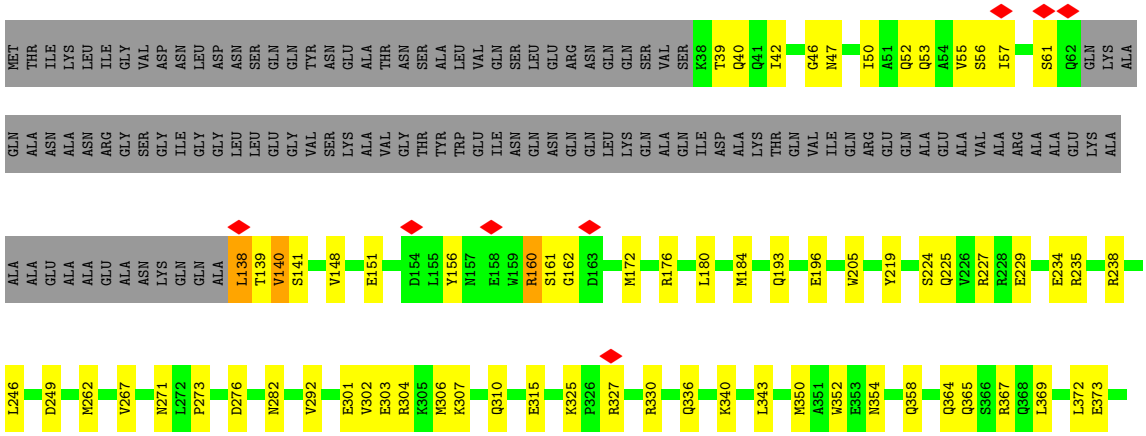
• Molecule 3: Internal protein

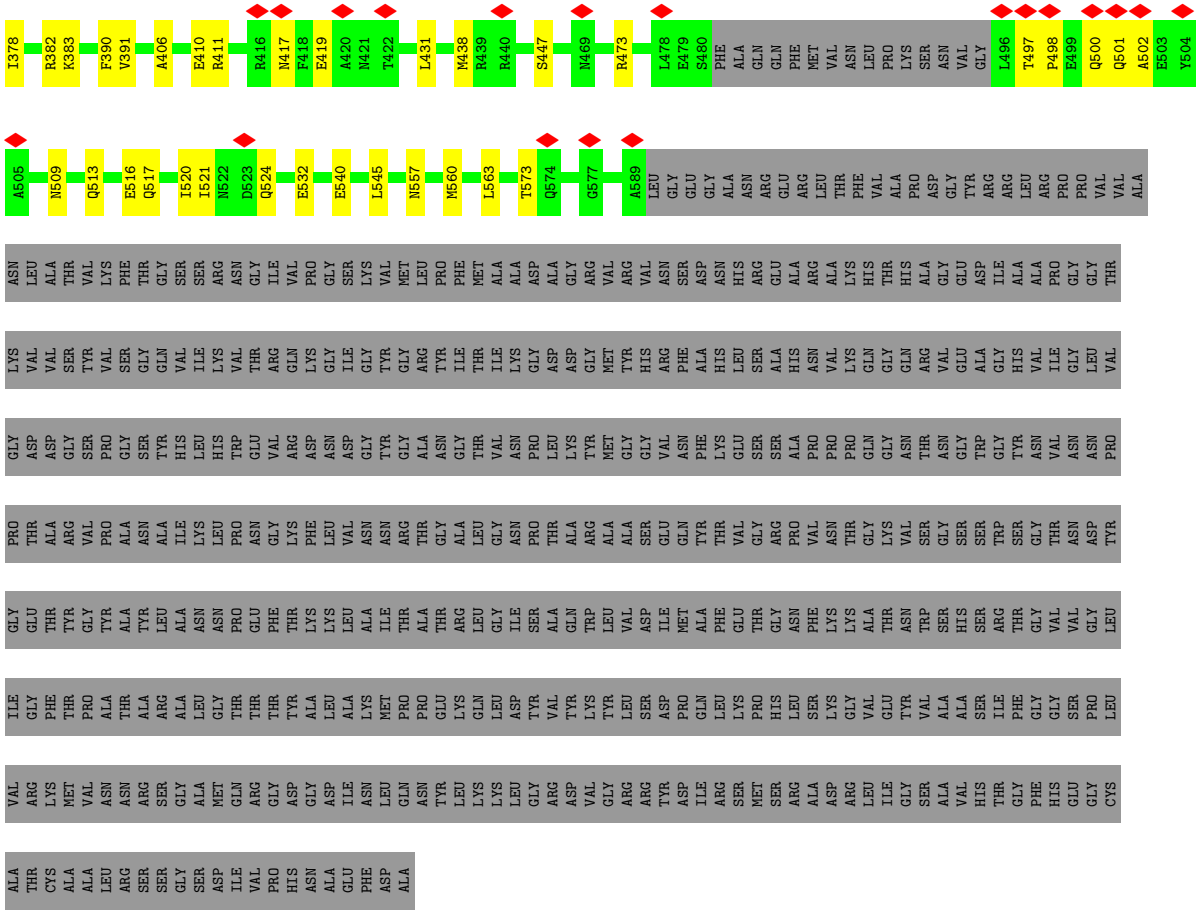
Chain D: 70% 15% 14%



- Molecule 3: Internal protein

Chain c:




I378 R382 K383 F390 V391 A406 E410 R411 R416 N417 F418 E419 A420 N421 T422 L431 M438 R439 R440 S447 N469 R473 L478 E479 S480 PHE ALA GLN GLN PHE MET VAL ASN LEU PRO LYS SER ASN VAL GLY L496 T497 P498 E499 Q500 Q501 A502 E503 Y504
A505 N509 Q513 E516 Q517 I520 I521 N522 D523 Q524 E532 E540 L545 N557 M560 L563 T573 Q574 G577 A589 LEU GLY GLU GLY ALA ASN ARG GLU ARG LEU THR PHE VAL ALA PRO ASP GLY TYR ARG LEU ARG PRO PRO VAL VAL ALA
ASN LEU ALA THR VAL LYS PHE THR GLY SER SER ARG ASN GLY ILE VAL PRO GLY SER LYS VAL MET LEU PRO PHE MET ALA ALA ASP ALA GLY ARG VAL ARG VAL ASN SER ASP ASN HIS ARG GLU ALA ARG ALA LYS HIS THR HIS ALA GLY GLU ASP ILE ALA ALA PRO GLY GLY THR
LYS VAL VAL SER TYR VAL SER GLY GLN VAL ILE ILE LYS VAL THR ARG GLN LYS GLY ILE GLY TYR GLY ARG TYR ILE THR ILE LYS GLY ASP ASP GLY MET TYR HIS ARG PHE ALA HIS LEU SER ALA HIS ASN VAL LYS GLN GLY GLN ARG VAL GLU ALA GLY HIS VAL ILE GLY LEU VAL
GLY ASP ASP GLY SER PRO GLY SER TYR HIS LEU HIS TRP GLU VAL ARG ASP ASN ASP GLY TYR GLY ALA ASN GLY THR VAL ASN PRO LEU LYS TYR MET GLY HIS GLY VAL ASN PHE LYS GLU SER SER ALA PRO PRO PRO GLN GLY ASN THR ASN GLY TRP GLY TYR ASN VAL ASN ASP PRO
PRO THR ALA ARG VAL PRO ALA ASN ALA ILE LYS LEU PRO ASN GLY LYS PHE LEU VAL ASN ASN ARG THR GLY ALA LEU GLY ASN PRO THR ALA ARG ALA ALA SER GLU GLN TYR THR VAL GLY ARG PRO VAL ASN THR GLY LYS VAL SER GLY SER SER TRP SER GLY THR ASN ASP TYR
GLY GLU THR TYR GLY TYR ALA TYR LEU ALA ASN ASN PRO GLU PHE THR LYS LYS LEU ALA ILE THR ALA THR ARG LEU GLY ILE SER ALA GLN TRP LEU VAL ASP ILE MET ALA PHE GLU THR GLY ASN PHE LYS LYS ALA THR ASN TRP SER HIS SER ARG THR GLY VAL VAL GLY LEU
ILE GLY PHE THR PRO ALA THR ALA ARG ALA LEU GLY THR THR THR TYR ALA LEU ALA LYS MET PRO PRO GLU LYS GLN LEU ASP TYR VAL TYR LYS TYR LEU SER ASP PRO GLN LEU LYS PRO HIS LEU SER LYS GLY VAL GLU TYR VAL ALA ALA SER ILE PHE GLY GLY SER PRO LEU
VAL ARG LYS MET VAL ASN ASN ARG SER GLY ALA MET GLN ARG GLY ASP GLY ASP ILE ASN LEU GLN ASN TYR LEU LYS LYS LEU GLY ARG ASP VAL GLY ARG ARG TYR ASP ILE ARG SER MET SER ARG ALA ASP ARG LEU ILE GLY SER ALA VAL HIS THR GLY PHE HIS GLU GLY CYS
ALA THR CYS ALA ALA LEU ARG SER SER GLY SER ASP ILE VAL PRO HIS ASN ALA GLU PHE ASP ALA

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	107142	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 ($e^-/Å^2$)	55	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K2 QUANTUM (4k x 4k)	Depositor
Maximum map value	0.047	Depositor
Minimum map value	-0.030	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.004	Depositor
Map size (Å)	321.00003, 321.00003, 321.00003	wwPDB
Map dimensions	300, 300, 300	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.07, 1.07, 1.07	Depositor

5 Model quality (i)

5.1 Standard geometry (i)

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

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\|>5$	RMSZ	$\#\|Z\|>5$
1	F	0.10	0/293	0.36	0/400
1	G	0.11	0/293	0.29	0/400
1	H	0.10	0/293	0.35	0/400
1	I	0.11	0/293	0.31	0/400
1	J	0.10	0/293	0.38	0/400
1	K	0.12	0/293	0.42	1/400 (0.2%)
1	L	0.09	0/293	0.36	0/400
1	M	0.10	0/293	0.27	0/400
1	N	0.10	0/293	0.35	0/400
1	O	0.11	0/293	0.28	0/400
2	V	0.09	0/708	0.22	0/949
2	W	0.09	0/708	0.24	0/949
2	X	0.10	0/708	0.24	0/949
2	Y	0.10	0/708	0.24	0/949
2	Z	0.10	0/708	0.27	0/949
2	v	0.14	0/708	0.26	0/949
2	w	0.16	0/708	0.34	0/949
2	x	0.14	0/708	0.27	0/949
2	y	0.14	0/708	0.25	0/949
2	z	0.16	0/708	0.33	0/949
3	A	0.11	0/7146	0.33	3/9662 (0.0%)
3	B	0.12	0/7146	0.34	4/9662 (0.0%)
3	C	0.11	0/7146	0.28	0/9662
3	D	0.11	0/7146	0.28	0/9662
3	E	0.11	0/7146	0.33	3/9662 (0.0%)
3	a	0.17	0/3701	0.34	3/4993 (0.1%)
3	b	0.17	0/3701	0.37	4/4993 (0.1%)
3	c	0.17	0/3701	0.53	5/4993 (0.1%)
3	d	0.16	0/3701	0.30	0/4993
3	e	0.17	0/3701	0.32	0/4993
All	All	0.13	0/64245	0.33	23/86765 (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
3	a	0	1
3	b	0	1
3	c	0	1
3	d	0	1
3	e	0	1
All	All	0	5

There are no bond length outliers.

The worst 5 of 23 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	c	162	GLY	N-CA-C	-22.71	74.37	111.38
3	A	579	GLY	N-CA-C	-16.20	88.35	111.03
3	B	579	GLY	N-CA-C	-15.28	89.64	111.03
3	E	579	GLY	N-CA-C	-15.21	89.73	111.03
3	c	161	SER	CB-CA-C	13.87	133.76	110.74

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	a	160	ARG	Sidechain
3	b	160	ARG	Sidechain
3	c	160	ARG	Sidechain
3	d	160	ARG	Sidechain
3	e	160	ARG	Sidechain

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	F	290	0	270	6	0
1	G	290	0	270	10	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	H	290	0	270	7	0
1	I	290	0	270	10	0
1	J	290	0	270	7	0
1	K	290	0	270	8	0
1	L	290	0	270	7	0
1	M	290	0	270	7	0
1	N	290	0	270	7	0
1	O	290	0	270	8	0
2	V	706	0	698	17	0
2	W	706	0	698	17	0
2	X	706	0	698	20	0
2	Y	706	0	698	19	0
2	Z	706	0	698	18	0
2	v	706	0	698	14	0
2	w	706	0	698	12	0
2	x	706	0	698	16	0
2	y	706	0	698	14	0
2	z	706	0	698	10	0
3	A	7028	0	6915	106	0
3	B	7028	0	6915	111	0
3	C	7028	0	6915	107	0
3	D	7028	0	6915	108	0
3	E	7028	0	6915	100	0
3	a	3660	0	3597	68	0
3	b	3660	0	3597	74	0
3	c	3660	0	3597	76	0
3	d	3660	0	3597	82	0
3	e	3660	0	3597	63	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
4	E	1	0	0	0	0
All	All	63405	0	62240	910	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 7.

The worst 5 of 910 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:E:578:TYR:CD2	3:E:579:GLY:O	1.92	1.23
3:c:138:LEU:O	3:c:138:LEU:HG	1.65	0.96
3:E:578:TYR:CE2	3:E:579:GLY:O	2.18	0.96
3:b:138:LEU:HD12	3:b:146:ASN:ND2	1.84	0.92
1:O:613:THR:HG22	1:O:615:PRO:HD2	1.52	0.90

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	F	38/653 (6%)	36 (95%)	2 (5%)	0	100	100
1	G	38/653 (6%)	37 (97%)	1 (3%)	0	100	100
1	H	38/653 (6%)	36 (95%)	2 (5%)	0	100	100
1	I	38/653 (6%)	37 (97%)	1 (3%)	0	100	100
1	J	38/653 (6%)	36 (95%)	2 (5%)	0	100	100
1	K	38/653 (6%)	36 (95%)	2 (5%)	0	100	100
1	L	38/653 (6%)	36 (95%)	2 (5%)	0	100	100
1	M	38/653 (6%)	36 (95%)	2 (5%)	0	100	100
1	N	38/653 (6%)	36 (95%)	2 (5%)	0	100	100
1	O	38/653 (6%)	36 (95%)	2 (5%)	0	100	100
2	V	90/380 (24%)	90 (100%)	0	0	100	100
2	W	90/380 (24%)	90 (100%)	0	0	100	100
2	X	90/380 (24%)	90 (100%)	0	0	100	100
2	Y	90/380 (24%)	90 (100%)	0	0	100	100
2	Z	90/380 (24%)	90 (100%)	0	0	100	100
2	v	90/380 (24%)	90 (100%)	0	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	w	90/380 (24%)	90 (100%)	0	0	100	100
2	x	90/380 (24%)	90 (100%)	0	0	100	100
2	y	90/380 (24%)	90 (100%)	0	0	100	100
2	z	90/380 (24%)	90 (100%)	0	0	100	100
3	A	897/1058 (85%)	873 (97%)	24 (3%)	0	100	100
3	B	897/1058 (85%)	870 (97%)	27 (3%)	0	100	100
3	C	897/1058 (85%)	869 (97%)	28 (3%)	0	100	100
3	D	897/1058 (85%)	869 (97%)	28 (3%)	0	100	100
3	E	897/1058 (85%)	868 (97%)	29 (3%)	0	100	100
3	a	456/1058 (43%)	451 (99%)	5 (1%)	0	100	100
3	b	456/1058 (43%)	452 (99%)	4 (1%)	0	100	100
3	c	456/1058 (43%)	451 (99%)	5 (1%)	0	100	100
3	d	456/1058 (43%)	449 (98%)	7 (2%)	0	100	100
3	e	456/1058 (43%)	451 (99%)	5 (1%)	0	100	100
All	All	8045/20910 (38%)	7865 (98%)	180 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	F	30/572 (5%)	30 (100%)	0	100	100
1	G	30/572 (5%)	30 (100%)	0	100	100
1	H	30/572 (5%)	30 (100%)	0	100	100
1	I	30/572 (5%)	30 (100%)	0	100	100
1	J	30/572 (5%)	30 (100%)	0	100	100
1	K	30/572 (5%)	30 (100%)	0	100	100
1	L	30/572 (5%)	30 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	M	30/572 (5%)	30 (100%)	0	100	100
1	N	30/572 (5%)	30 (100%)	0	100	100
1	O	30/572 (5%)	30 (100%)	0	100	100
2	V	73/306 (24%)	73 (100%)	0	100	100
2	W	73/306 (24%)	73 (100%)	0	100	100
2	X	73/306 (24%)	73 (100%)	0	100	100
2	Y	73/306 (24%)	73 (100%)	0	100	100
2	Z	73/306 (24%)	73 (100%)	0	100	100
2	v	73/306 (24%)	73 (100%)	0	100	100
2	w	73/306 (24%)	73 (100%)	0	100	100
2	x	73/306 (24%)	73 (100%)	0	100	100
2	y	73/306 (24%)	73 (100%)	0	100	100
2	z	73/306 (24%)	73 (100%)	0	100	100
3	A	735/850 (86%)	735 (100%)	0	100	100
3	B	735/850 (86%)	735 (100%)	0	100	100
3	C	735/850 (86%)	735 (100%)	0	100	100
3	D	735/850 (86%)	734 (100%)	1 (0%)	88	89
3	E	735/850 (86%)	735 (100%)	0	100	100
3	a	386/850 (45%)	386 (100%)	0	100	100
3	b	386/850 (45%)	385 (100%)	1 (0%)	86	84
3	c	386/850 (45%)	385 (100%)	1 (0%)	86	84
3	d	386/850 (45%)	386 (100%)	0	100	100
3	e	386/850 (45%)	385 (100%)	1 (0%)	86	84
All	All	6635/17280 (38%)	6631 (100%)	4 (0%)	87	89

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	e	139	THR
3	b	139	THR
3	D	527	GLN
3	c	140	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 123

such sidechains are listed below:

Mol	Chain	Res	Type
3	A	157	ASN
3	D	417	ASN
3	B	40	GLN
3	D	415	ASN
3	c	363	GLN

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 5 ligands modelled in this entry, 5 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

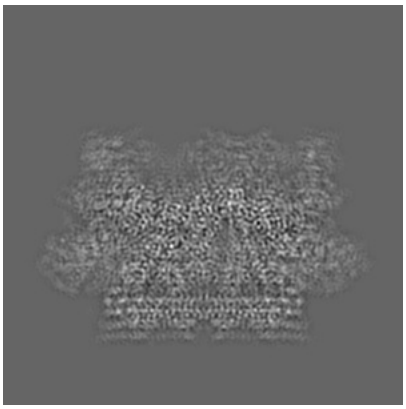
6 Map visualisation (i)

This section contains visualisations of the EMDB entry EMD-61998. These allow visual inspection of the internal detail of the map and identification of artifacts.

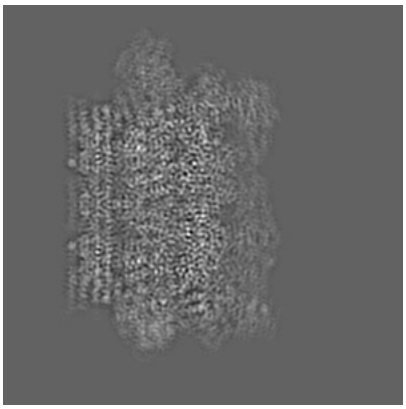
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections (i)

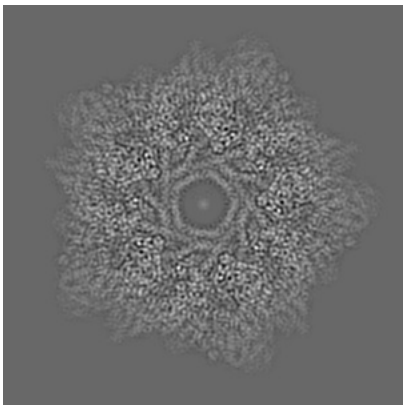
6.1.1 Primary map



X

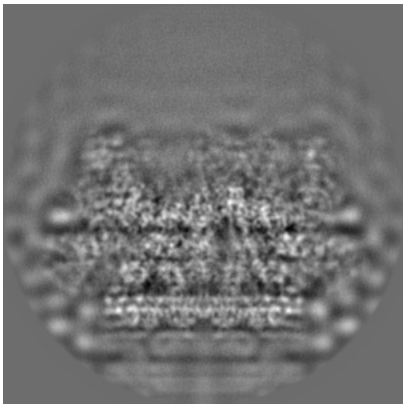


Y

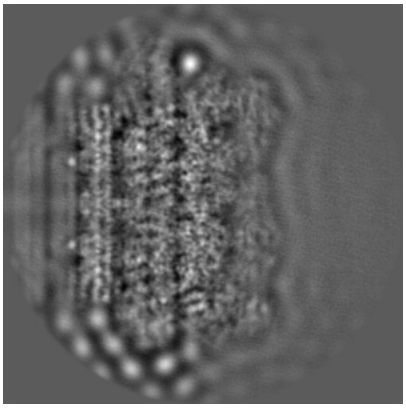


Z

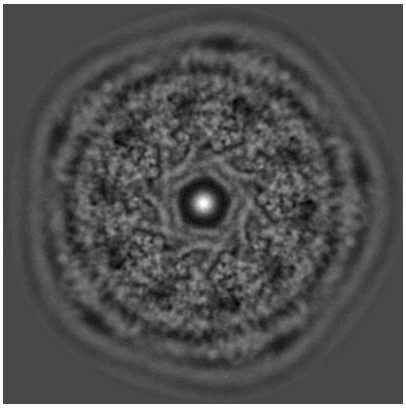
6.1.2 Raw map



X



Y

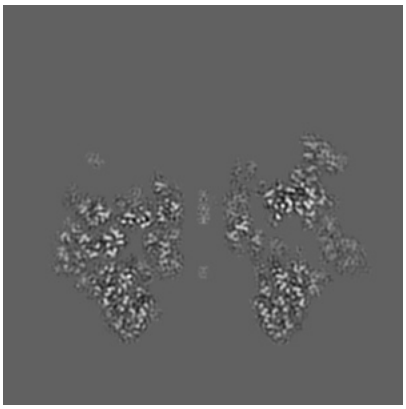


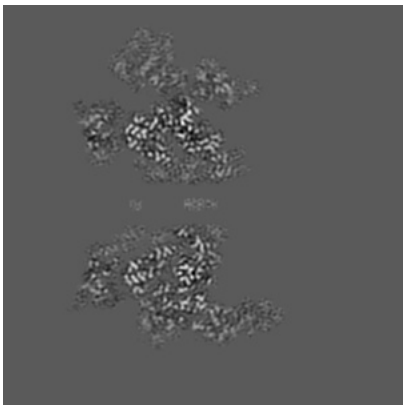
Z

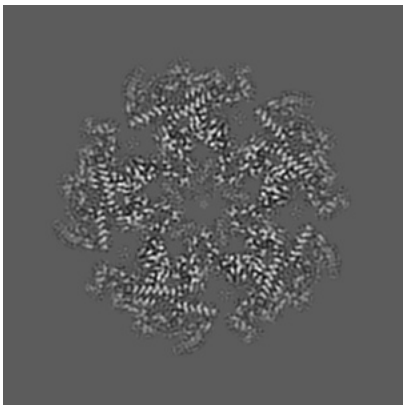
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

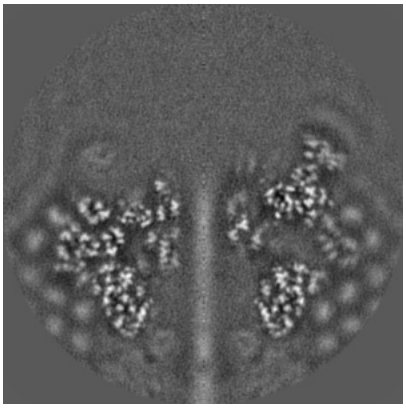
6.2.1 Primary map

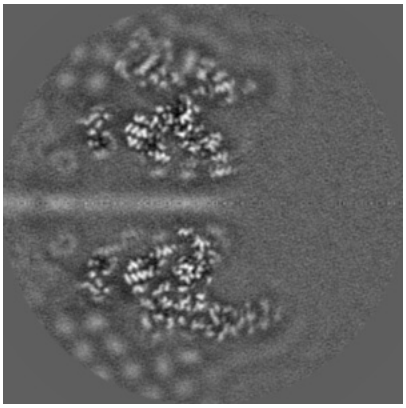

X Index: 150

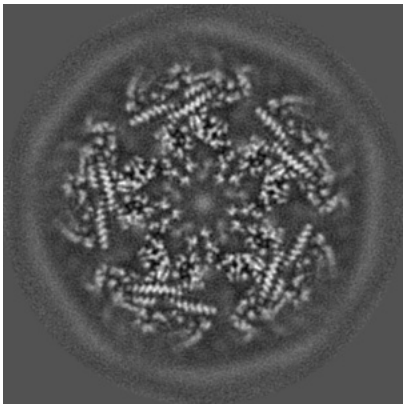

Y Index: 150


Z Index: 150

6.2.2 Raw map


X Index: 150

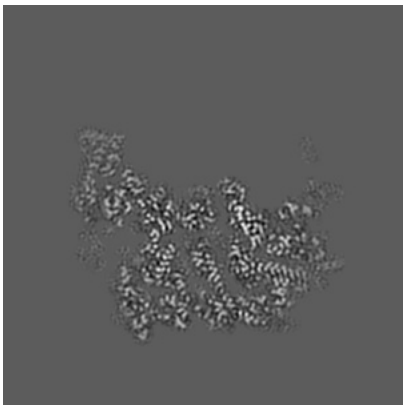

Y Index: 150


Z Index: 150

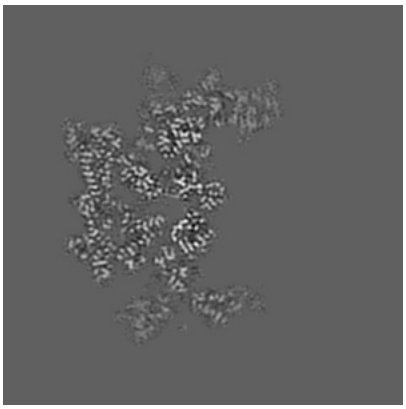
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

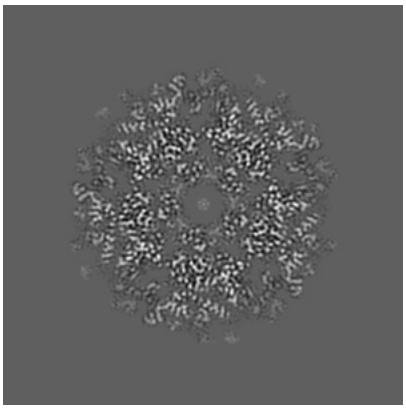
6.3.1 Primary map



X Index: 108

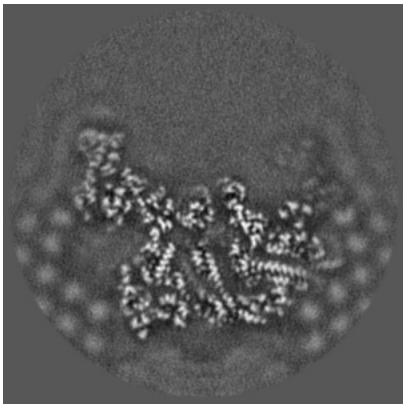


Y Index: 199

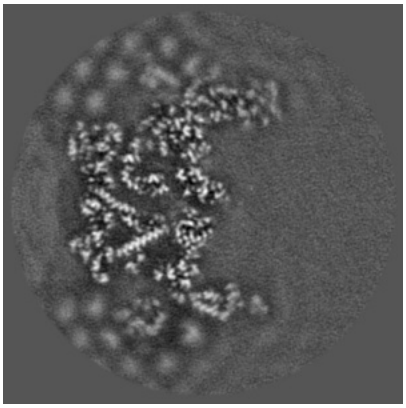


Z Index: 139

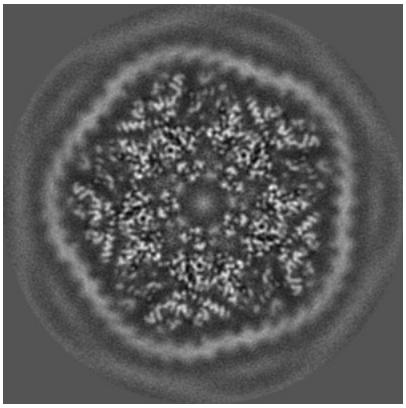
6.3.2 Raw map



X Index: 108



Y Index: 196

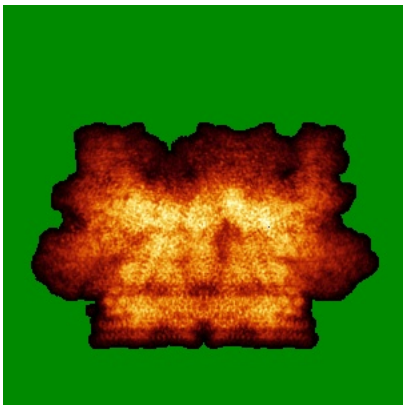


Z Index: 139

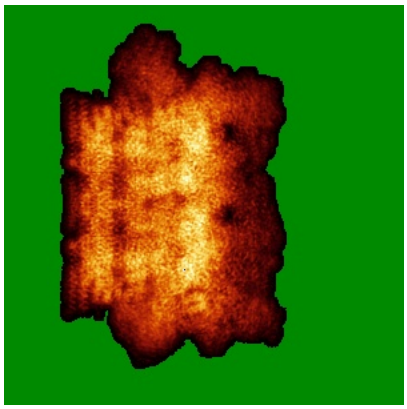
The images above show the largest variance slices of the map in three orthogonal directions.

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

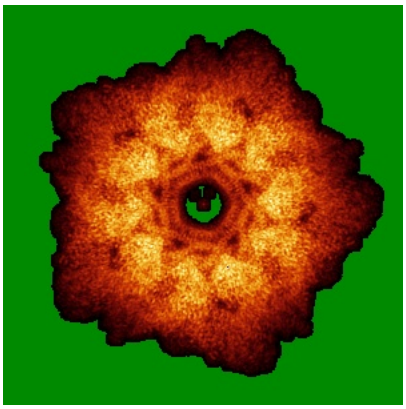
6.4.1 Primary map



X

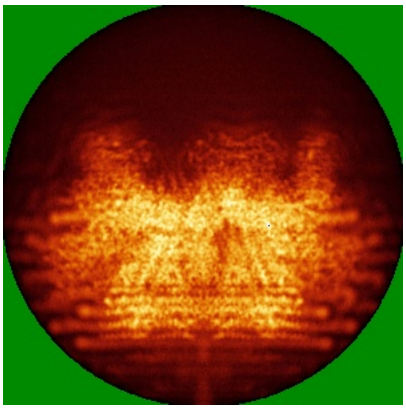


Y

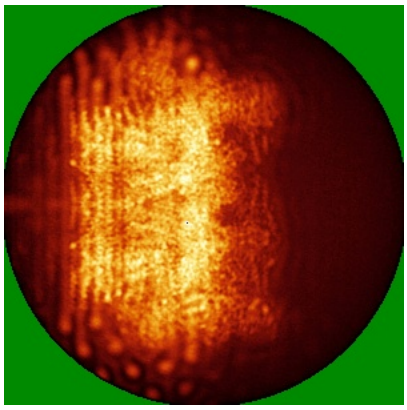


Z

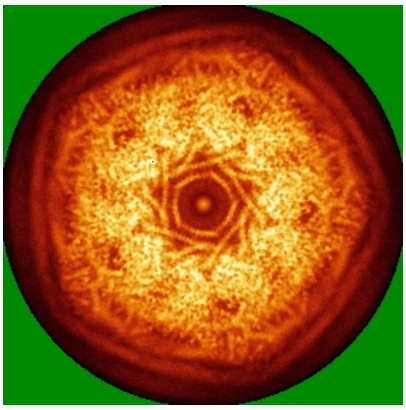
6.4.2 Raw map



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)

This section was not generated.

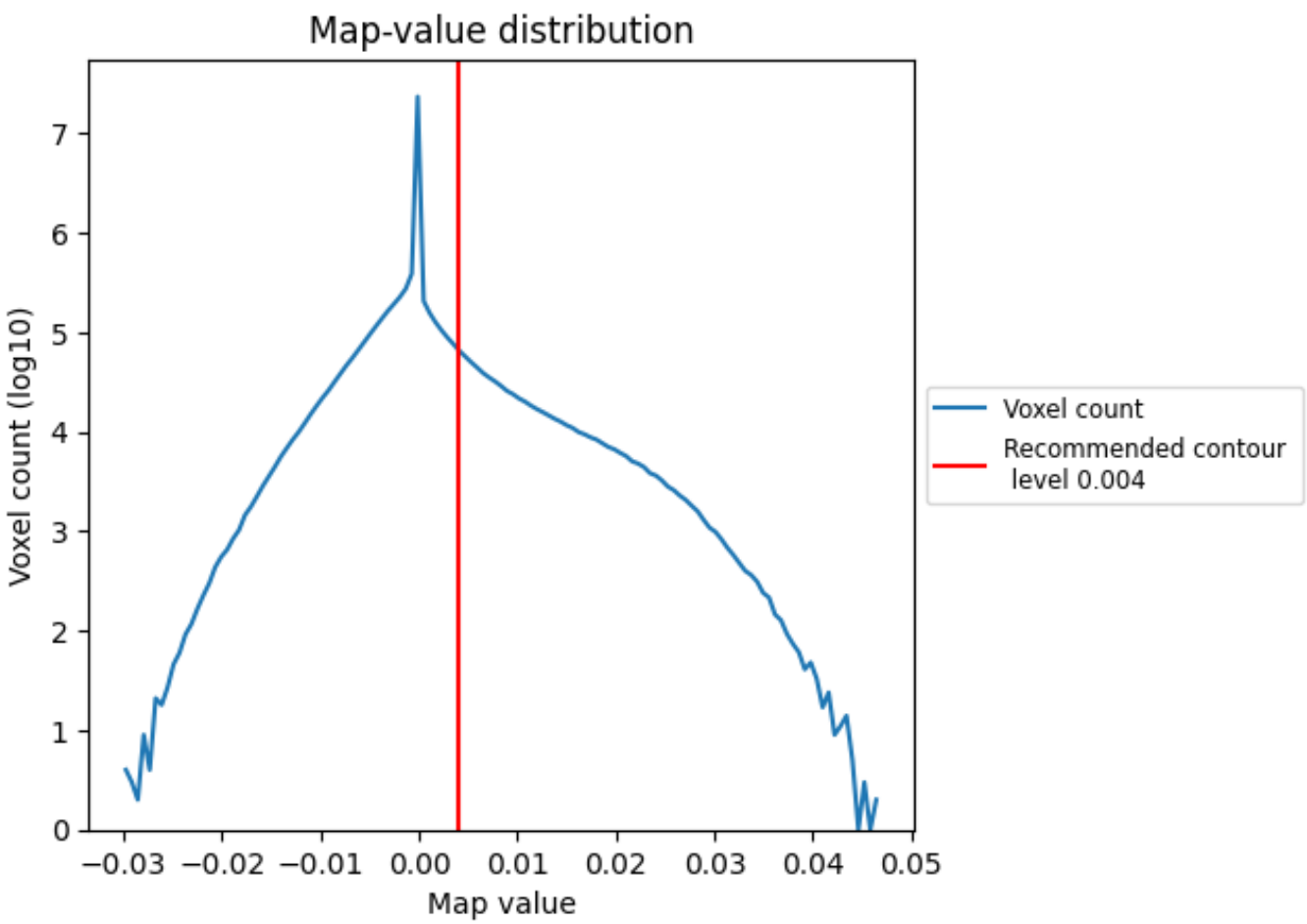
6.6 Mask visualisation (i)

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

7 Map analysis (i)

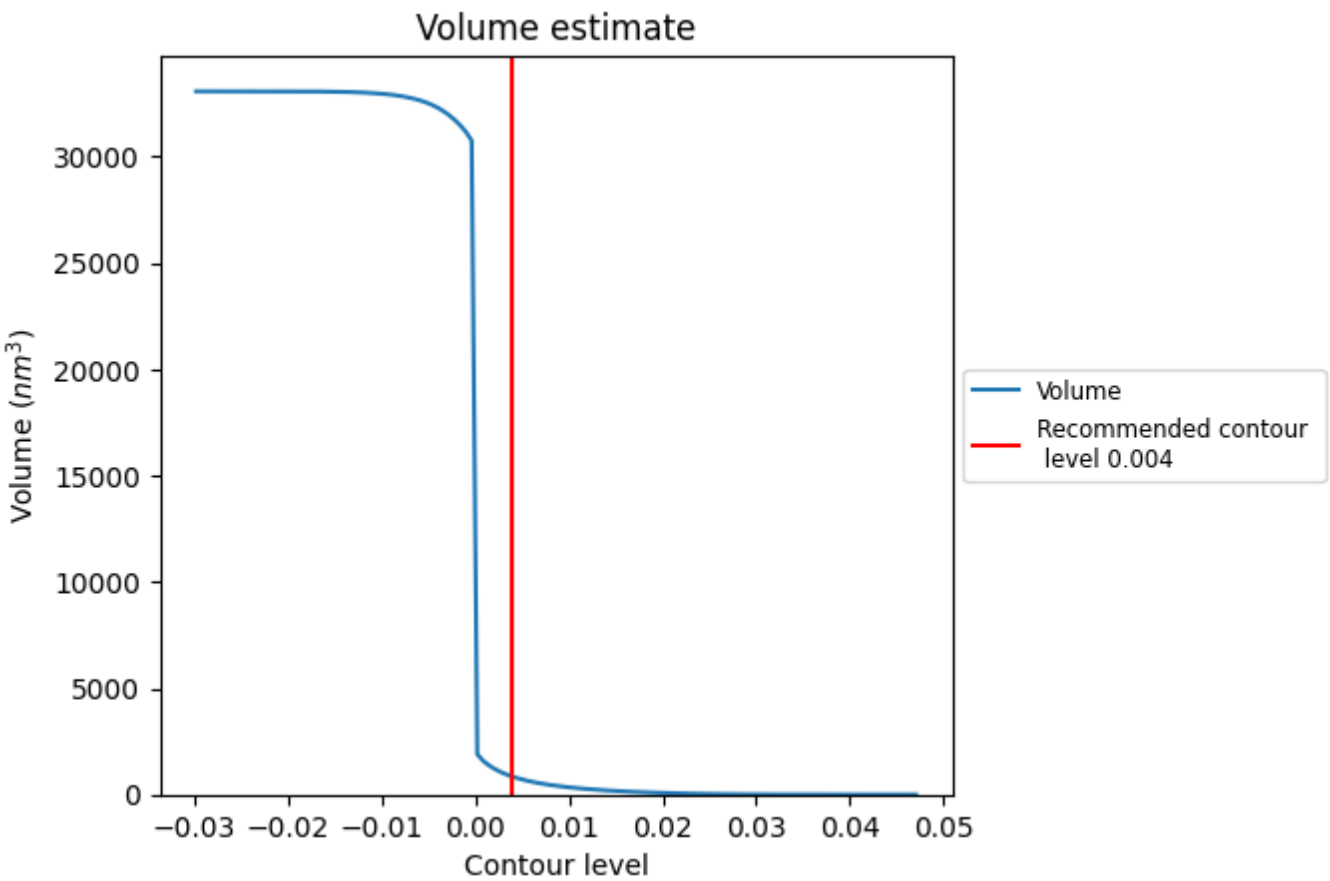
This section contains the results of statistical analysis of the map.

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.

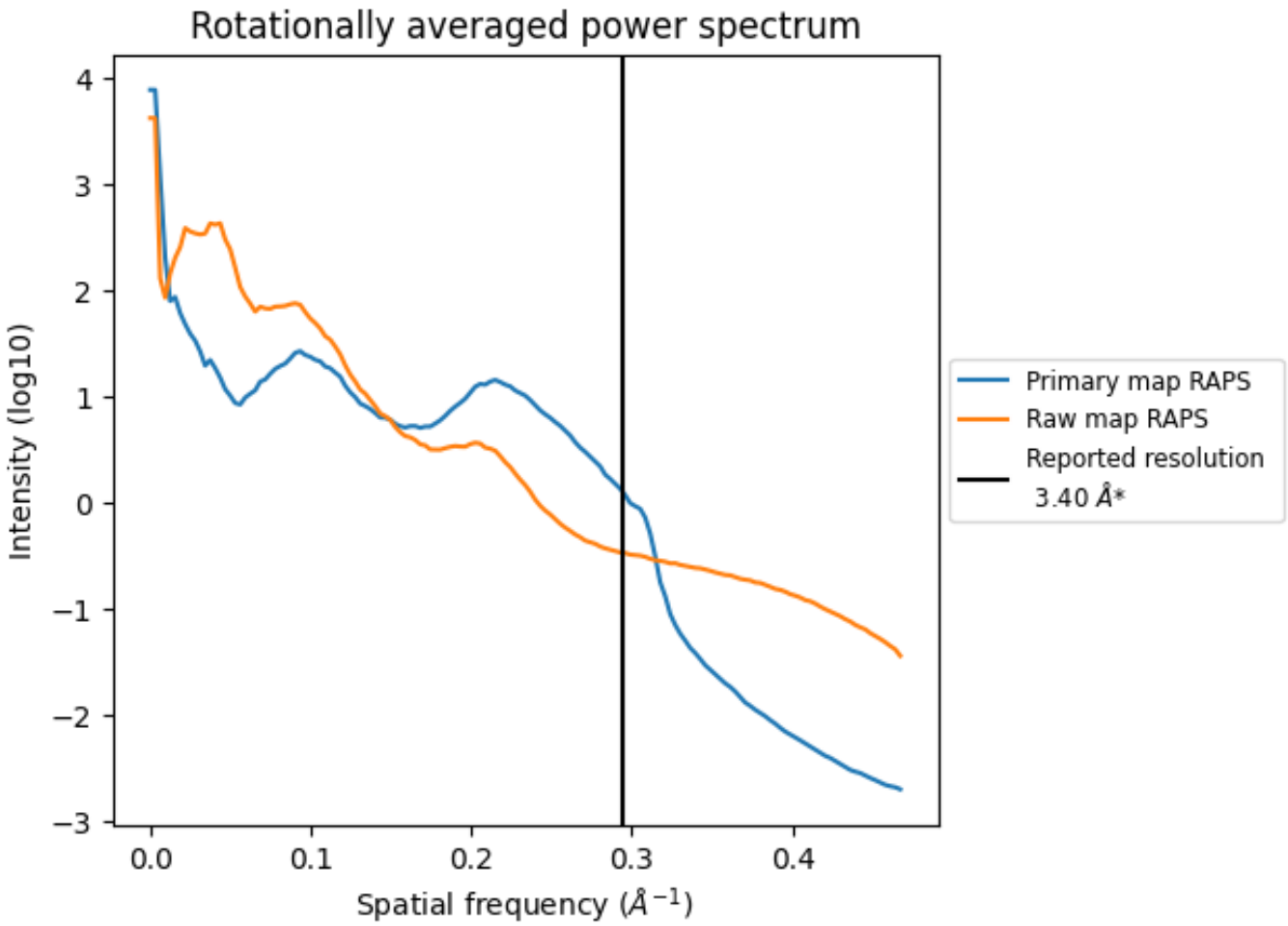
7.2 Volume estimate (i)



The volume at the recommended contour level is 843 nm^3; this corresponds to an approximate mass of 761 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)

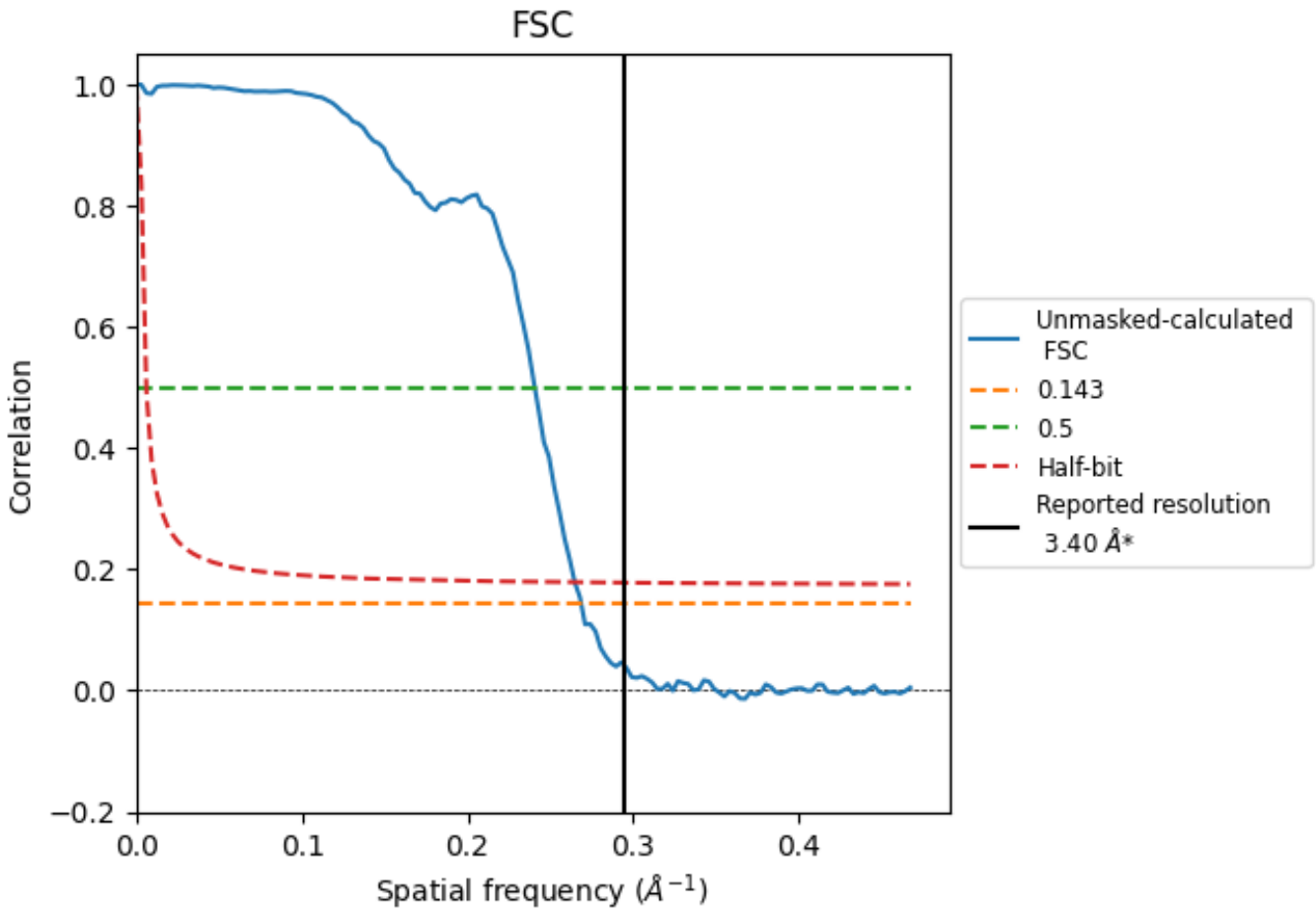


*Reported resolution corresponds to spatial frequency of 0.294 Å^{-1}

8 Fourier-Shell correlation (i)

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 (i)



*Reported resolution corresponds to spatial frequency of 0.294 Å^{-1}

8.2 Resolution estimates (i)

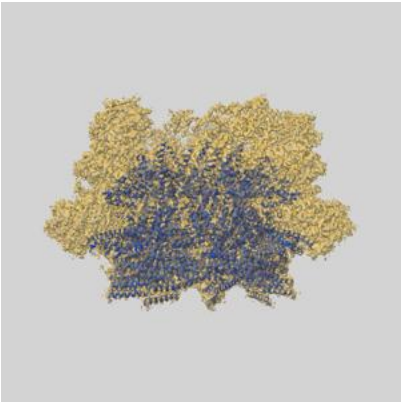
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.40	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.72	4.16	3.78

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

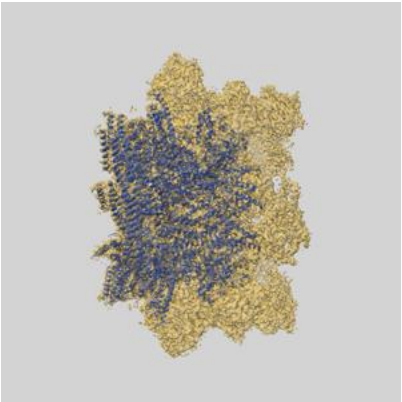
9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-61998 and PDB model 9K2V. Per-residue inclusion information can be found in section 3 on page 8.

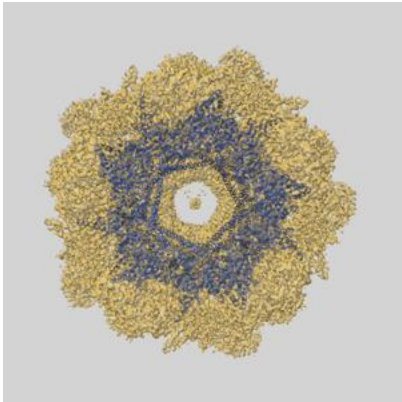
9.1 Map-model overlay (i)



X



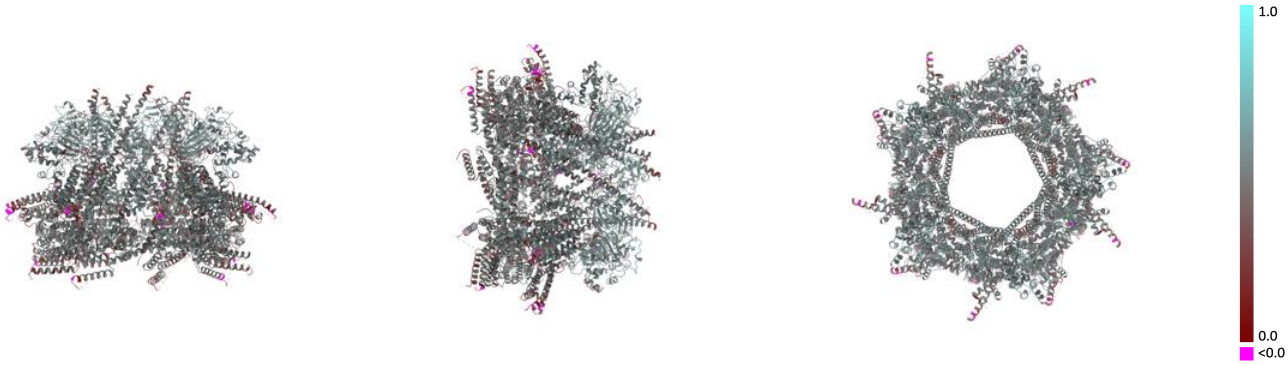
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.004 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.

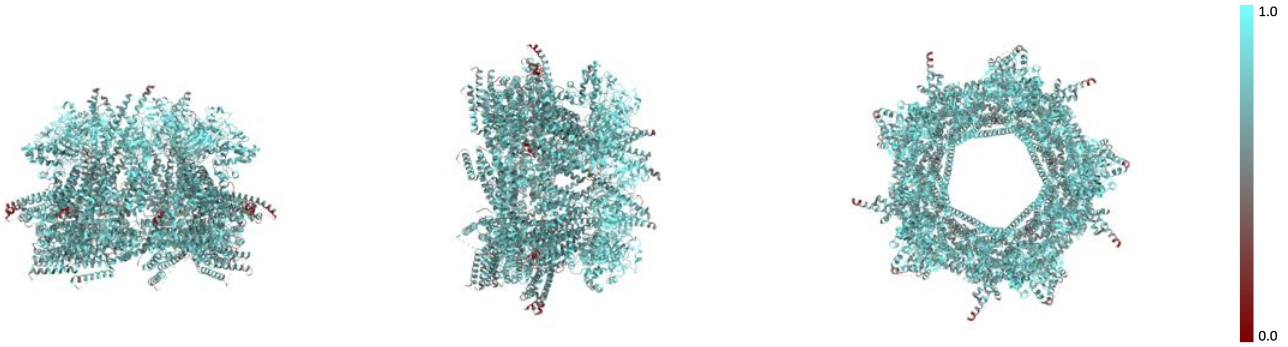
9.2 Q-score mapped to coordinate model (i)



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.

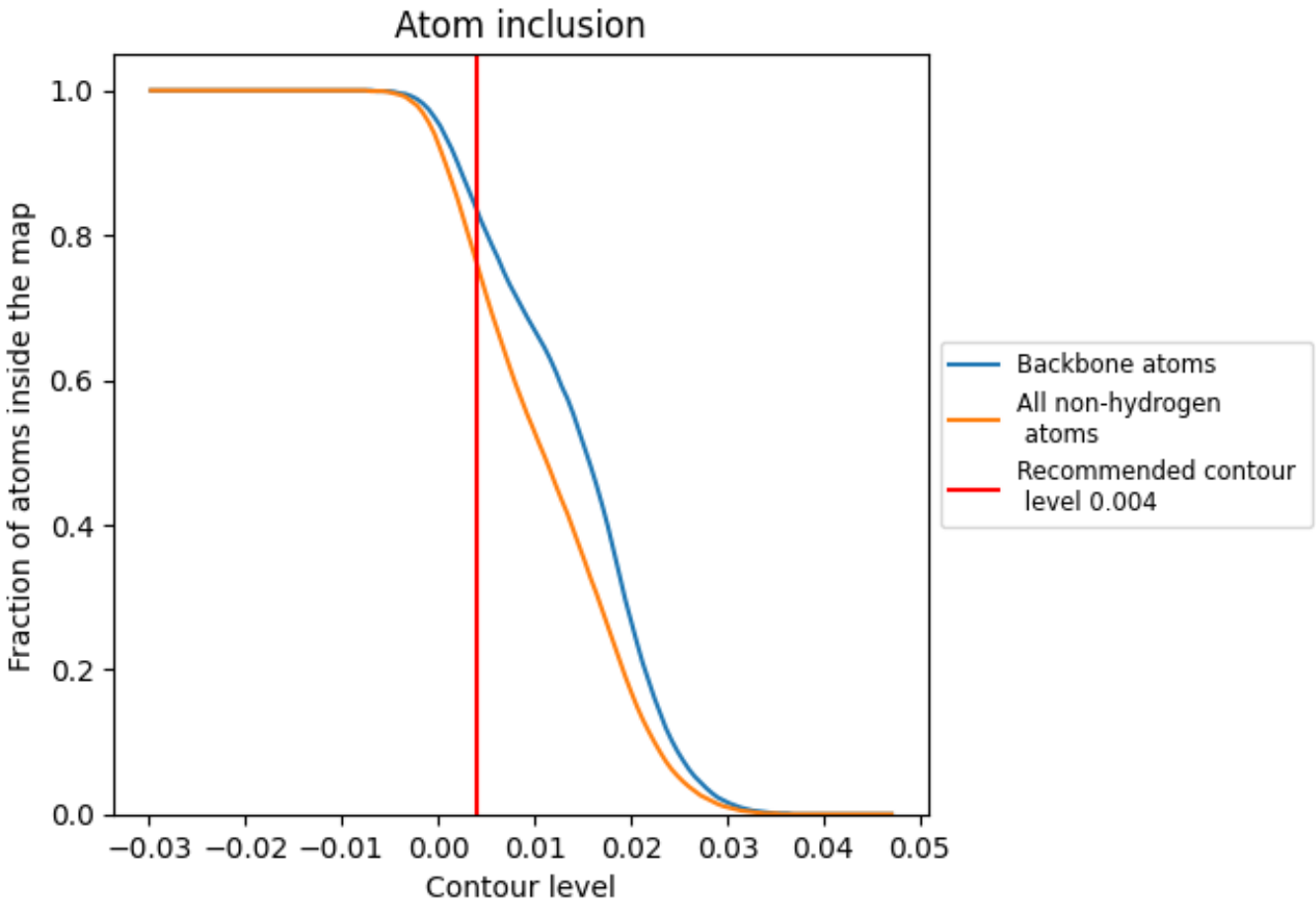
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.004).

9.4 Atom inclusion (i)



At the recommended contour level, 84% of all backbone atoms, 76% 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 (0.004) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7620	0.4800
A	0.7770	0.4950
B	0.7800	0.4950
C	0.7780	0.4940
D	0.7810	0.4940
E	0.7770	0.4960
F	0.7680	0.4950
G	0.7610	0.4510
H	0.7820	0.4910
I	0.7580	0.4570
J	0.7850	0.4990
K	0.7510	0.4640
L	0.7850	0.4980
M	0.7650	0.4680
N	0.7960	0.4990
O	0.7470	0.4550
V	0.7580	0.4870
W	0.7630	0.4760
X	0.7510	0.4750
Y	0.7700	0.4780
Z	0.7630	0.4830
a	0.7260	0.4560
b	0.7300	0.4580
c	0.7350	0.4610
d	0.7290	0.4560
e	0.7310	0.4590
v	0.7510	0.4550
w	0.7440	0.4510
x	0.7570	0.4620
y	0.7440	0.4520
z	0.7470	0.4560