wwPDB EM Validation Summary Report (i)

Jun 26, 2025 – 04:07 PM JST

PDB ID	:	6J2Q / pdb_00006j2q
EMDB ID	:	EMD-9771
Title	:	Yeast proteasome in Ub-accepted state (C1-b)
Authors	:	Cong, Y.
Deposited on	:	2019-01-02
Resolution	:	3.80 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:

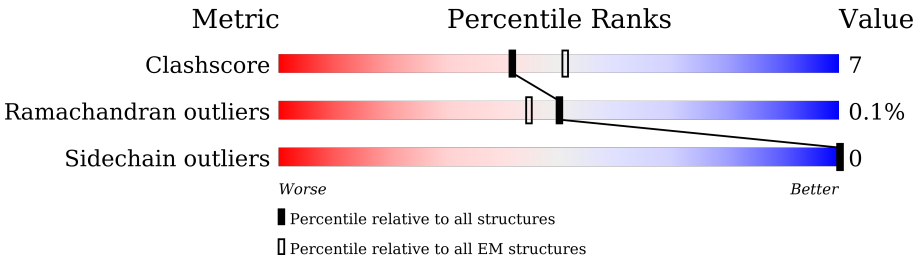
EMDB validation analysis	:	0.0.1.dev118
MolProbity	:	4-5-2 with Phenix2.0rc1
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.44

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 3.80 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	1	215	7% 73% 22% 5%
1	b	215	7% 80% 15% 5%
2	2	261	70% 15% 15%
2	i	261	67% 18% 15%
3	3	205	78% 21%
3	h	205	81% 18%
4	4	198	6% 79% 21%
4	g	198	7% 75% 25%

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Mol	Chain	Length	Quality of chain
5	5	287	5% 60% 14% 26%
5	f	287	61% 13% 26%
6	6	241	5% 77% 15% 8%
6	e	241	7% 71% 21% 8%
7	7	266	70% 18% 12%
7	a	266	70% 18% 12%
8	A	252	77% 19%
8	c	252	5% 78% 19%
9	B	250	79% 21%
9	j	250	7% 86% 14%
10	C	258	9% 77% 18% 5%
10	d	258	5% 74% 20% 5%
11	D	254	78% 17% 5%
11	n	254	78% 17% 5%
12	E	260	5% 75% 18% 7%
12	m	260	7% 80% 13% 7%
13	F	234	5% 77% 22%
13	l	234	86% 14%
14	G	288	68% 16% 16%
14	k	288	71% 14% 15%
15	H	467	13% 57% 19% 24%
16	I	437	19% 68% 14% 17%
17	J	405	21% 73% 20% 8%
18	K	428	13% 68% 21% 11%
19	L	437	16% 68% 17% 15%

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Mol	Chain	Length	Quality of chain
20	M	434	15% 67% 18% 15%
21	N	945	23% 77% 13% 10%
22	O	393	44% 82% 16%
23	P	445	19% 80% 17%
24	Q	434	18% 90% 9%
25	R	429	21% 76% 17% 7%
26	S	523	27% 80% 11% 9%
27	T	274	25% 88% 12%
28	U	338	11% 64% 12% 25%
29	V	306	23% 64% 21% 16%
30	W	268	46% 57% 17% 26%
31	X	156	81% 67% 15% 19%
32	Y	89	11% 24% 7% 70%
33	Z	993	54% 69% 12% 18%

2 Entry composition (i)

There are 33 unique types of molecules in this entry. The entry contains 106311 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 Proteasome subunit beta type-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	1	205	Total	C	N	O	S	0	0
			1576	996	261	312	7		
1	b	205	Total	C	N	O	S	0	0
			1576	996	261	312	7		

- Molecule 2 is a protein called Proteasome subunit beta type-2.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	2	222	Total	C	N	O	S	0	0
			1684	1061	293	323	7		
2	i	222	Total	C	N	O	S	0	0
			1684	1061	293	323	7		

- Molecule 3 is a protein called Proteasome subunit beta type-3.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	3	204	Total	C	N	O	S	0	0
			1581	1010	258	305	8		
3	h	204	Total	C	N	O	S	0	0
			1581	1010	258	305	8		

- Molecule 4 is a protein called Proteasome subunit beta type-4.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	4	198	Total	C	N	O	S	0	0
			1585	1005	269	305	6		
4	g	198	Total	C	N	O	S	0	0
			1585	1005	269	305	6		

- Molecule 5 is a protein called Proteasome subunit beta type-5.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	5	212	Total	C	N	O	S	0	0
			1644	1045	280	312	7		
5	f	212	Total	C	N	O	S	0	0
			1644	1045	280	312	7		

- Molecule 6 is a protein called Proteasome subunit beta type-6.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	6	222	Total	C	N	O	S	0	0
			1757	1115	303	335	4		
6	e	222	Total	C	N	O	S	0	0
			1757	1115	303	335	4		

- Molecule 7 is a protein called Proteasome subunit beta type-7.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	7	233	Total	C	N	O	S	0	0
			1824	1154	312	351	7		
7	a	233	Total	C	N	O	S	0	0
			1824	1154	312	351	7		

- Molecule 8 is a protein called Proteasome subunit alpha type-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	A	243	Total	C	N	O	S	0	0
			1921	1221	322	370	8		
8	c	243	Total	C	N	O	S	0	0
			1921	1221	322	370	8		

- Molecule 9 is a protein called Proteasome subunit alpha type-2.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	B	250	Total	C	N	O	S	0	0
			1915	1219	315	377	4		
9	j	250	Total	C	N	O	S	0	0
			1915	1219	315	377	4		

- Molecule 10 is a protein called Proteasome subunit alpha type-3.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	C	244	Total	C	N	O	S	0	0
			1904	1201	321	379	3		

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Mol	Chain	Residues	Atoms					AltConf	Trace
10	d	244	Total	C	N	O	S	0	0
			1904	1201	321	379	3		

- Molecule 11 is a protein called Proteasome subunit alpha type-4.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	D	241	Total	C	N	O	S	0	0
			1890	1181	331	374	4		
11	n	241	Total	C	N	O	S	0	0
			1890	1181	331	374	4		

- Molecule 12 is a protein called Proteasome subunit alpha type-5.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	E	242	Total	C	N	O	S	0	0
			1861	1162	314	378	7		
12	m	242	Total	C	N	O	S	0	0
			1861	1162	314	378	7		

- Molecule 13 is a protein called Proteasome subunit alpha type-6.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	F	233	Total	C	N	O	S	0	0
			1795	1129	312	350	4		
13	l	233	Total	C	N	O	S	0	0
			1795	1129	312	350	4		

- Molecule 14 is a protein called Probable proteasome subunit alpha type-7.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	G	243	Total	C	N	O	S	0	0
			1888	1201	328	355	4		
14	k	244	Total	C	N	O	S	0	0
			1896	1205	330	357	4		

- Molecule 15 is a protein called 26S protease regulatory subunit 7 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	H	355	Total	C	N	O	S	0	0
			2787	1755	500	515	17		

- Molecule 16 is a protein called 26S protease regulatory subunit 4 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	I	363	Total	C	N	O	S	0	0
			2831	1779	472	565	15		

- Molecule 17 is a protein called 26S protease regulatory subunit 8 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	J	373	Total	C	N	O	S	0	0
			2928	1837	527	547	17		

- Molecule 18 is a protein called 26S protease regulatory subunit 6B homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	K	381	Total	C	N	O	S	0	0
			3019	1898	530	581	10		

- Molecule 19 is a protein called 26S protease subunit RPT4.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	L	371	Total	C	N	O	S	0	0
			2937	1852	519	554	12		

- Molecule 20 is a protein called 26S protease regulatory subunit 6A.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	M	367	Total	C	N	O	S	0	0
			2866	1799	503	553	11		

- Molecule 21 is a protein called 26S proteasome regulatory subunit RPN2.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	N	849	Total	C	N	O	S	0	0
			6562	4174	1099	1261	28		

- Molecule 22 is a protein called 26S proteasome regulatory subunit RPN9.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	O	387	Total	C	N	O	S	0	0
			3182	2047	520	606	9		

- Molecule 23 is a protein called 26S proteasome regulatory subunit RPN5.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	P	432	Total	C	N	O	S	0	0
			3545	2260	592	684	9		

- Molecule 24 is a protein called 26S proteasome regulatory subunit RPN6.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	Q	431	Total	C	N	O	S	0	0
			3471	2205	574	676	16		

- Molecule 25 is a protein called 26S proteasome regulatory subunit RPN7.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	R	400	Total	C	N	O	S	0	0
			3218	2051	527	630	10		

- Molecule 26 is a protein called 26S proteasome regulatory subunit RPN3.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	S	475	Total	C	N	O	S	0	0
			3894	2488	653	738	15		

- Molecule 27 is a protein called 26S proteasome regulatory subunit RPN12.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	T	272	Total	C	N	O	S	0	0
			2235	1432	355	441	7		

- Molecule 28 is a protein called 26S proteasome regulatory subunit RPN8.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	U	255	Total	C	N	O	S	0	0
			2061	1312	352	391	6		

- Molecule 29 is a protein called Ubiquitin carboxyl-terminal hydrolase RPN11.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	V	258	Total	C	N	O	S	0	0
			2025	1273	344	395	13		

- Molecule 30 is a protein called 26S proteasome regulatory subunit RPN10.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	W	197	Total	C	N	O	S	0	0
			1534	962	269	300	3		

- Molecule 31 is a protein called 26S proteasome regulatory subunit RPN13.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	X	127	Total	C	N	O	S	0	0
			1032	664	169	195	4		

- Molecule 32 is a protein called 26S proteasome complex subunit SEM1.

Mol	Chain	Residues	Atoms				AltConf	Trace
32	Y	27	Total	C	N	O	0	0
			236	143	39	54		

- Molecule 33 is a protein called 26S proteasome regulatory subunit RPN1.

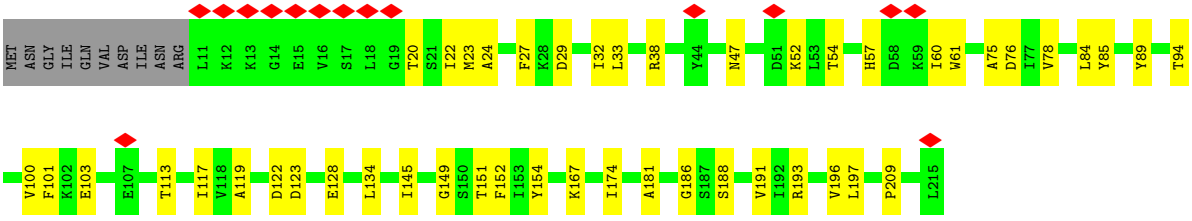
Mol	Chain	Residues	Atoms					AltConf	Trace
33	Z	813	Total	C	N	O	S	0	0
			6290	3995	1029	1237	29		

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.

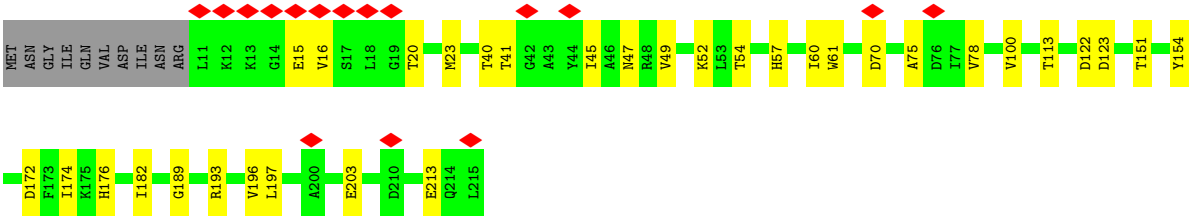
• Molecule 1: Proteasome subunit beta type-1

Chain 1:



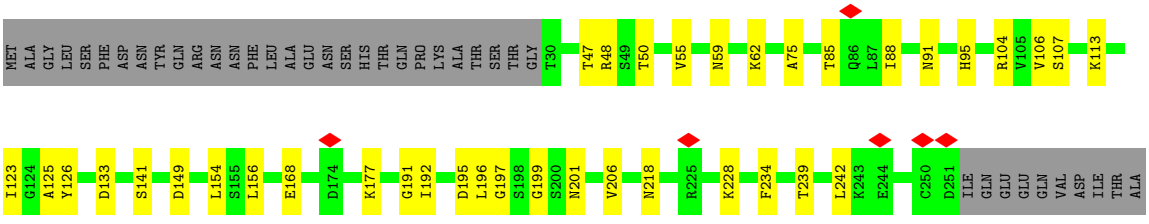
• Molecule 1: Proteasome subunit beta type-1

Chain b:



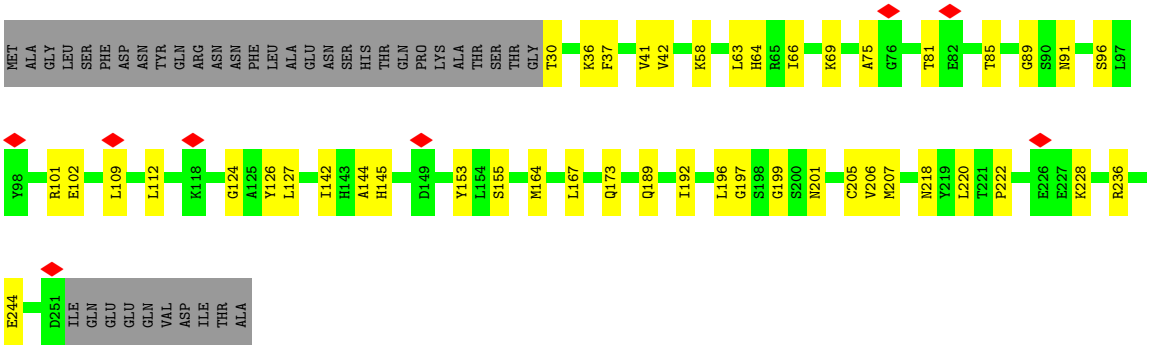
• Molecule 2: Proteasome subunit beta type-2

Chain 2:

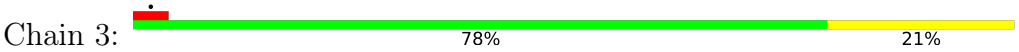


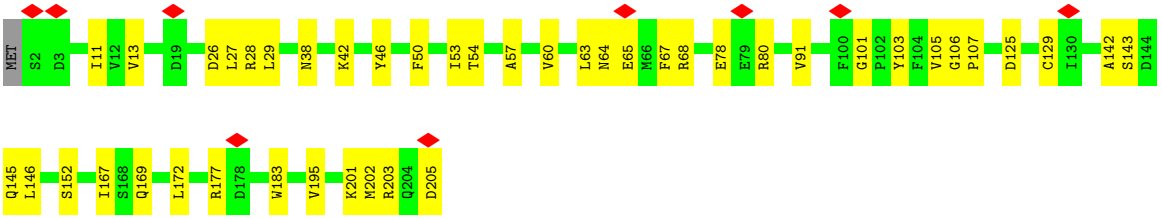
• Molecule 2: Proteasome subunit beta type-2

Chain i:

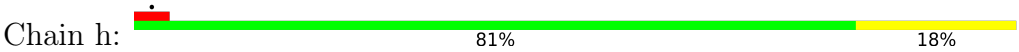


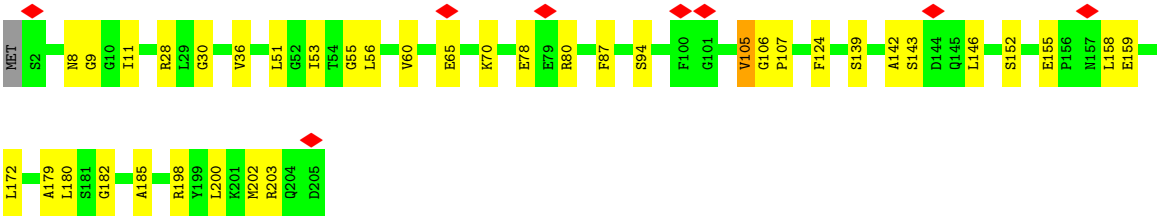
• Molecule 3: Proteasome subunit beta type-3



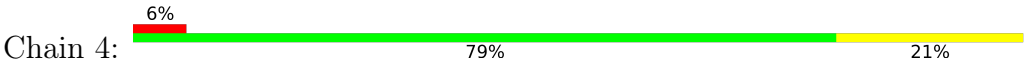


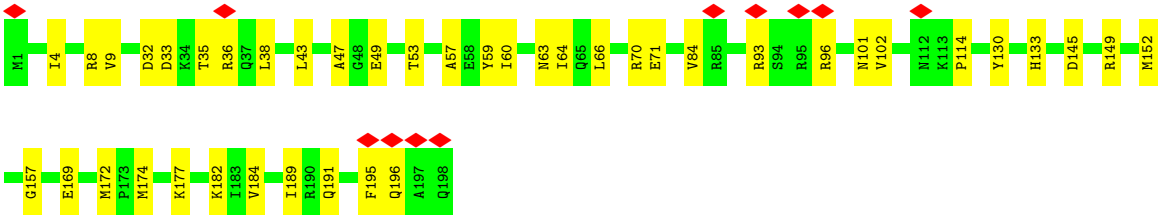
• Molecule 3: Proteasome subunit beta type-3



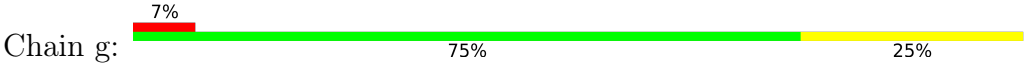


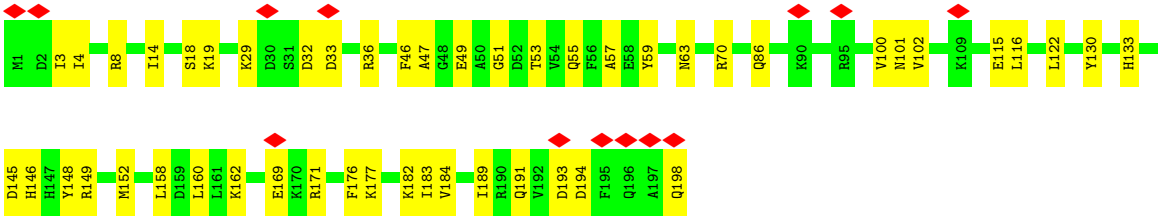
• Molecule 4: Proteasome subunit beta type-4



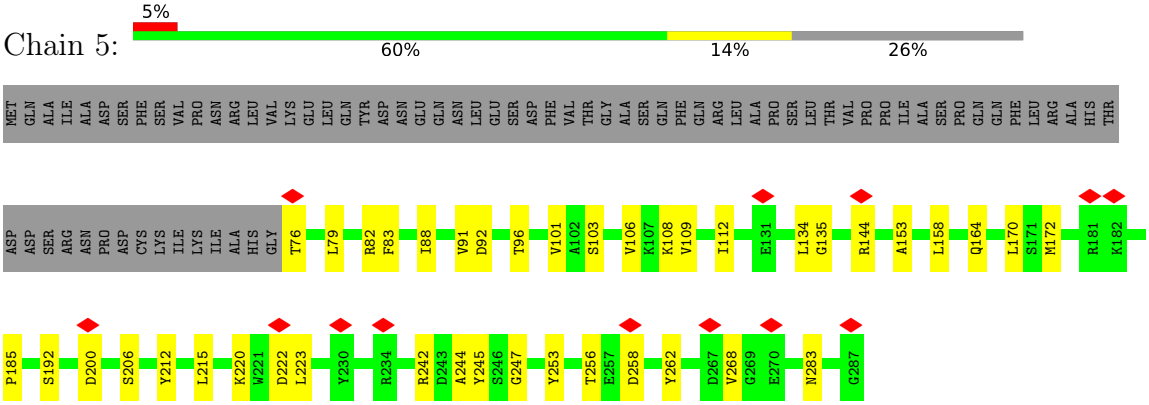


• Molecule 4: Proteasome subunit beta type-4

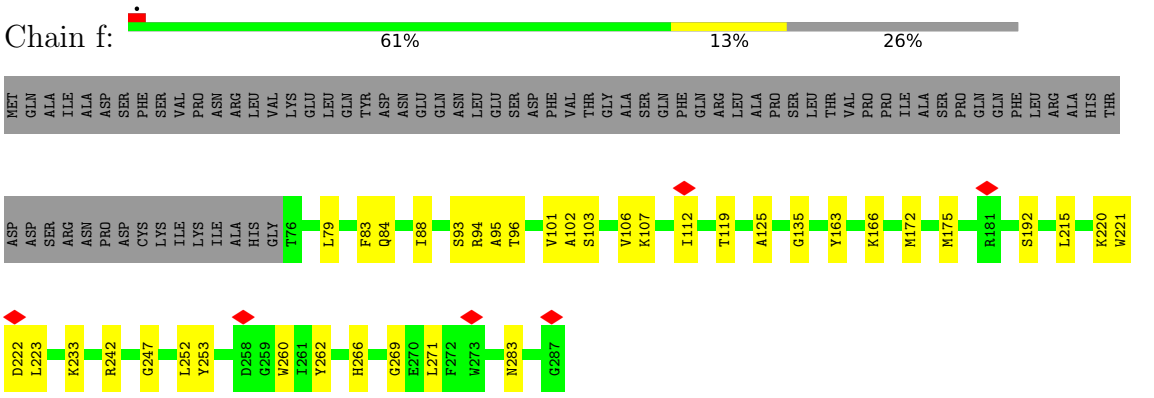




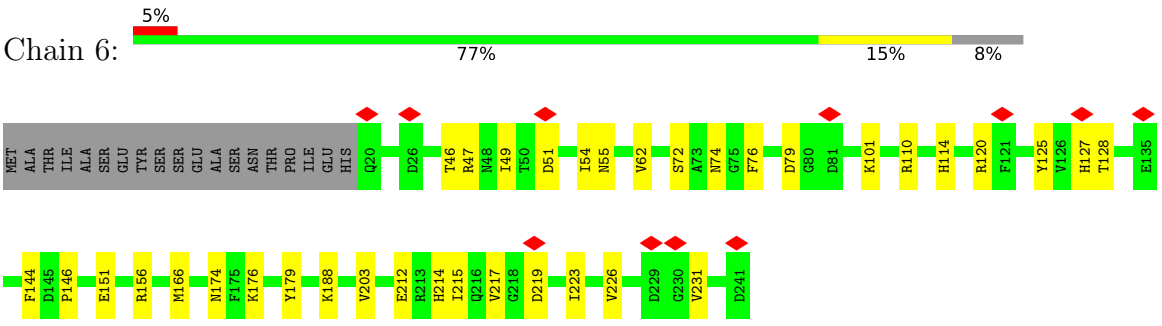
• Molecule 5: Proteasome subunit beta type-5



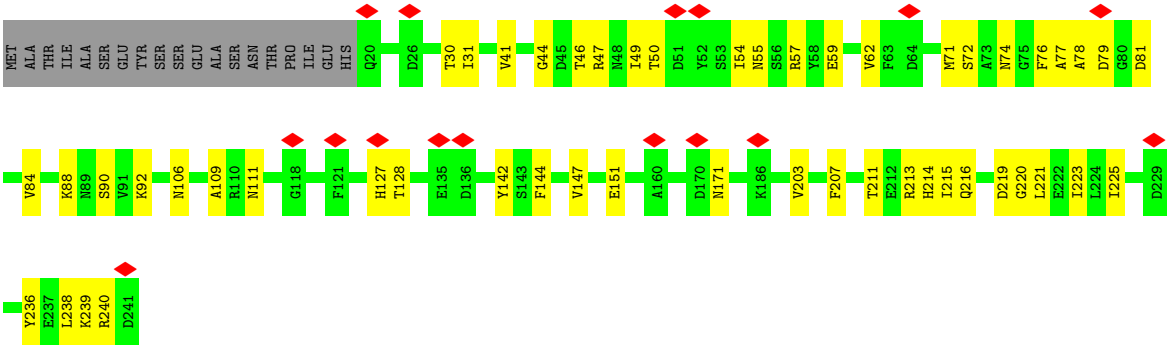
• Molecule 5: Proteasome subunit beta type-5



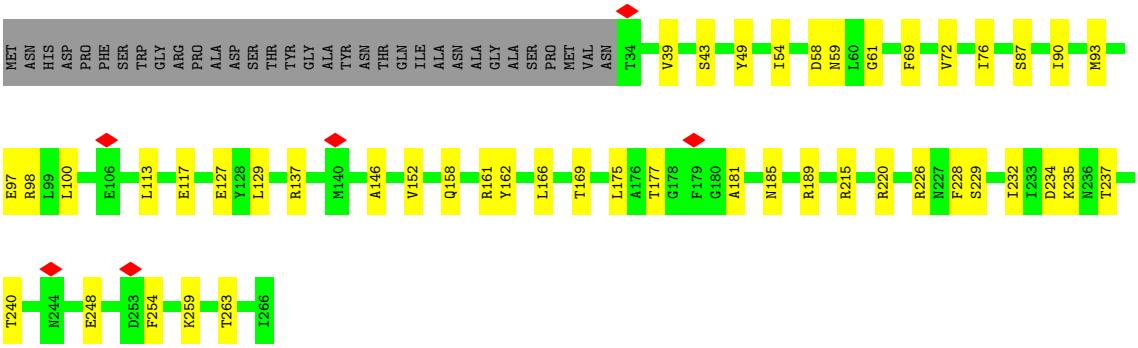
• Molecule 6: Proteasome subunit beta type-6



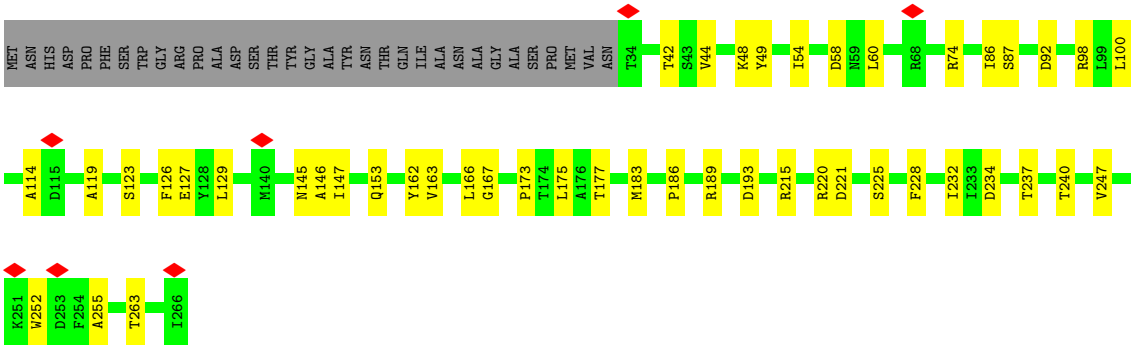
• Molecule 6: Proteasome subunit beta type-6



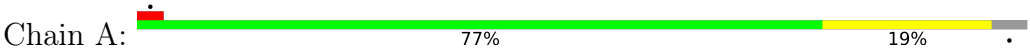
• Molecule 7: Proteasome subunit beta type-7

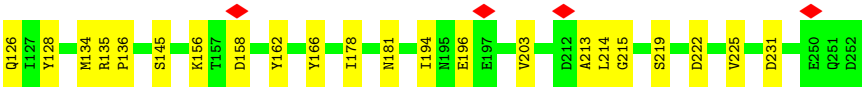


• Molecule 7: Proteasome subunit beta type-7

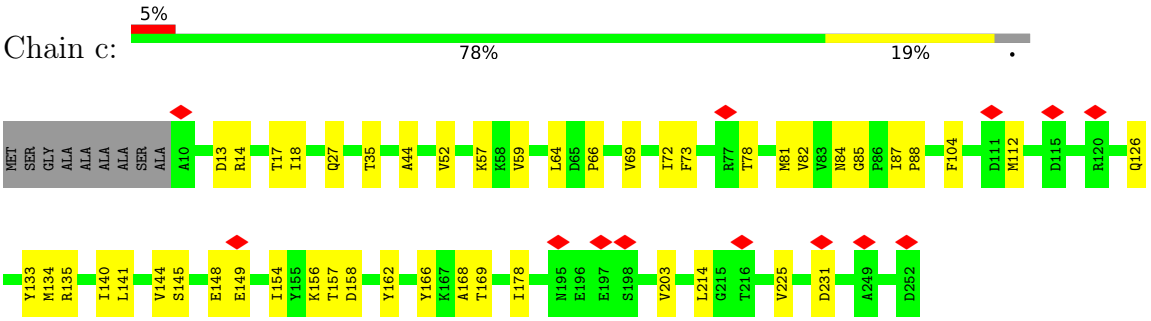


• Molecule 8: Proteasome subunit alpha type-1

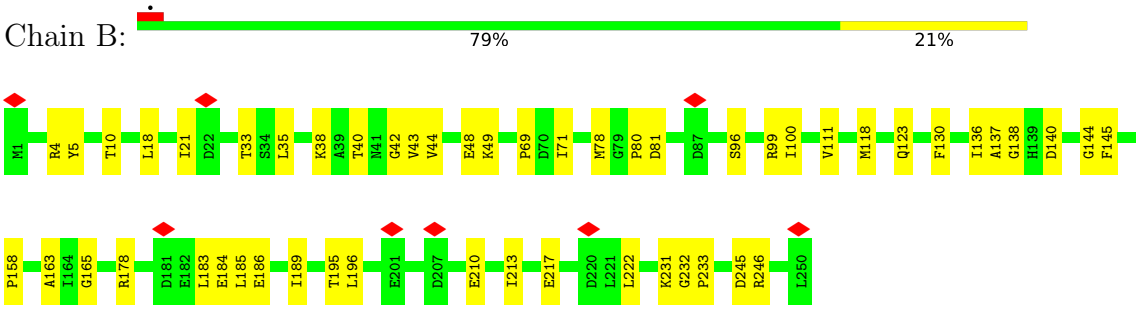




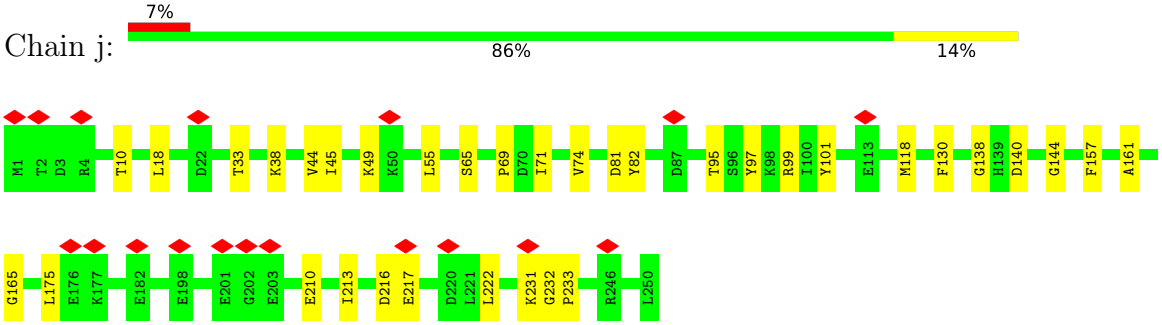
• Molecule 8: Proteasome subunit alpha type-1



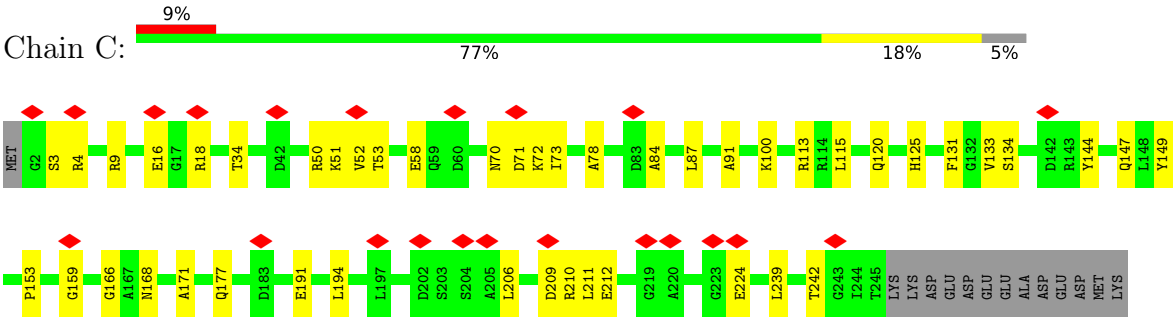
• Molecule 9: Proteasome subunit alpha type-2



• Molecule 9: Proteasome subunit alpha type-2

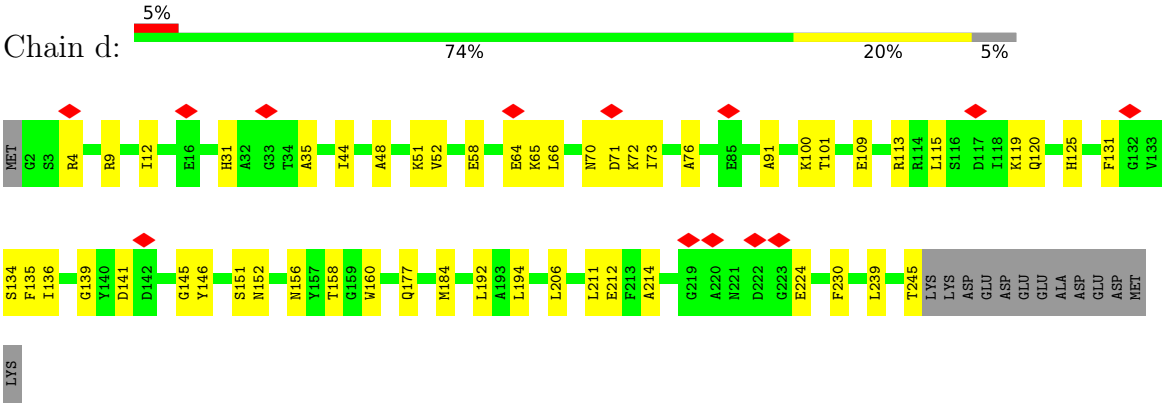


• Molecule 10: Proteasome subunit alpha type-3



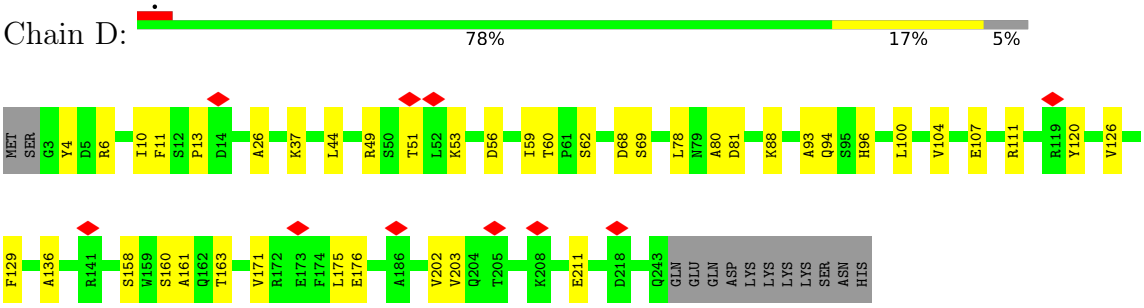
• Molecule 10: Proteasome subunit alpha type-3

Chain d:



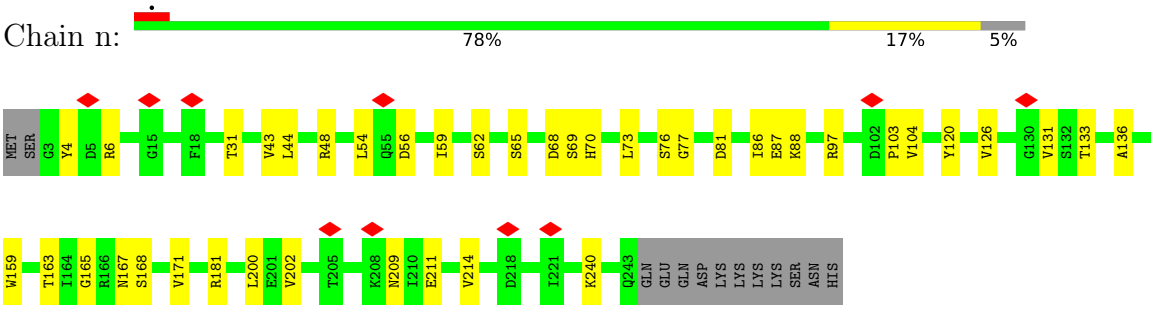
• Molecule 11: Proteasome subunit alpha type-4

Chain D:



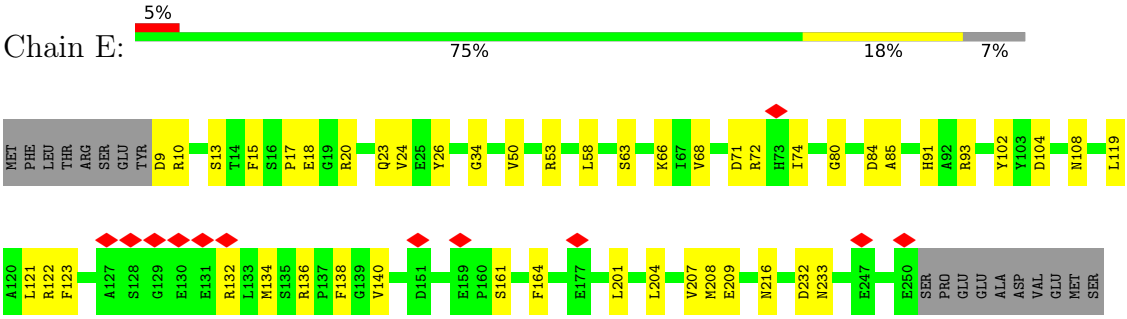
• Molecule 11: Proteasome subunit alpha type-4

Chain n:



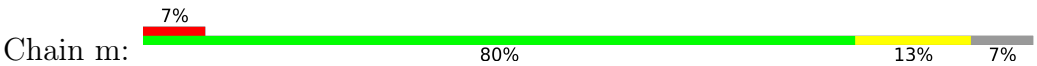
• Molecule 12: Proteasome subunit alpha type-5

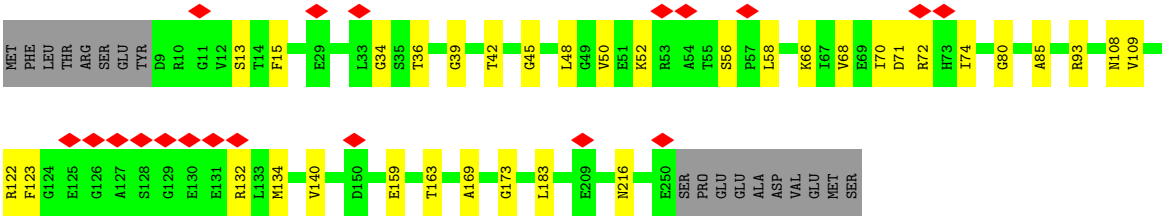
Chain E:



• Molecule 12: Proteasome subunit alpha type-5

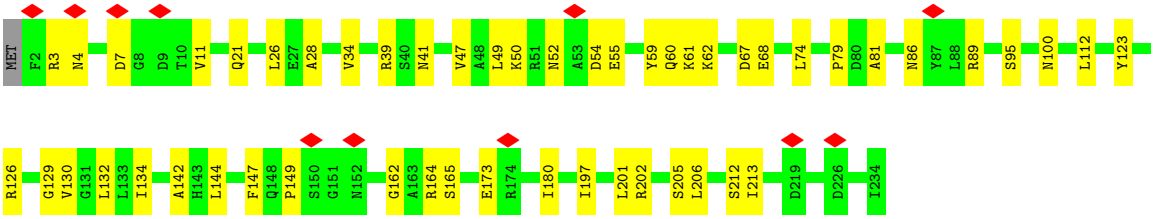
Chain m:





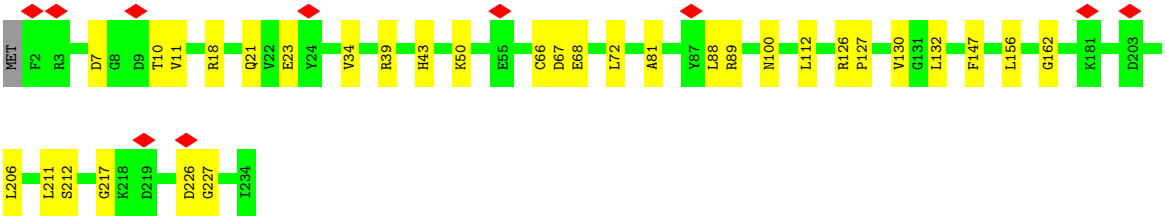
• Molecule 13: Proteasome subunit alpha type-6

Chain F:



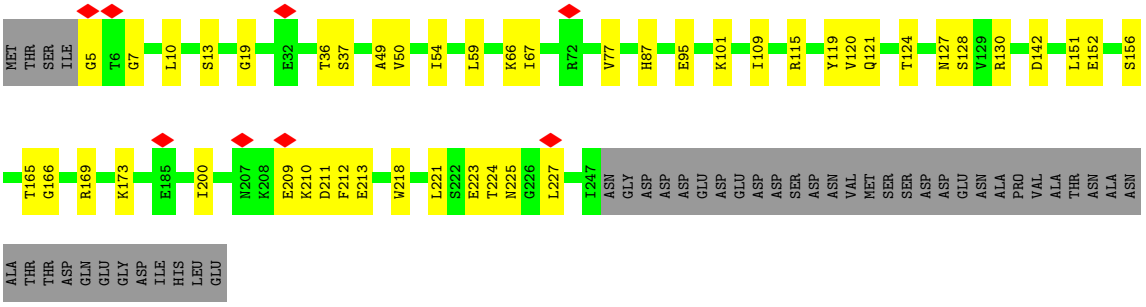
• Molecule 13: Proteasome subunit alpha type-6

Chain l:



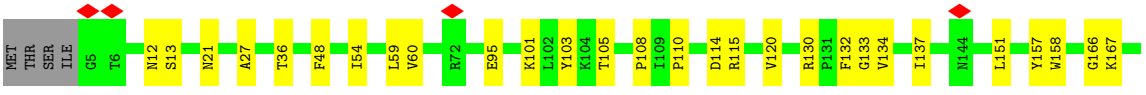
• Molecule 14: Probable proteasome subunit alpha type-7

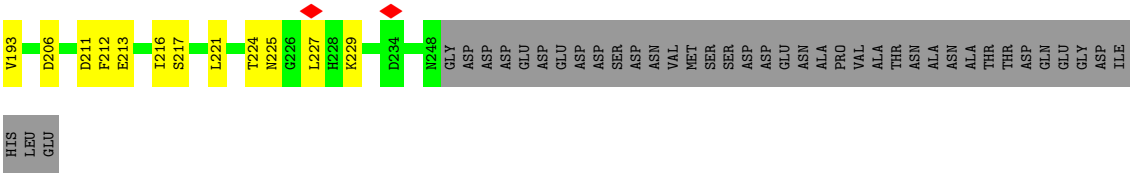
Chain G:



• Molecule 14: Probable proteasome subunit alpha type-7

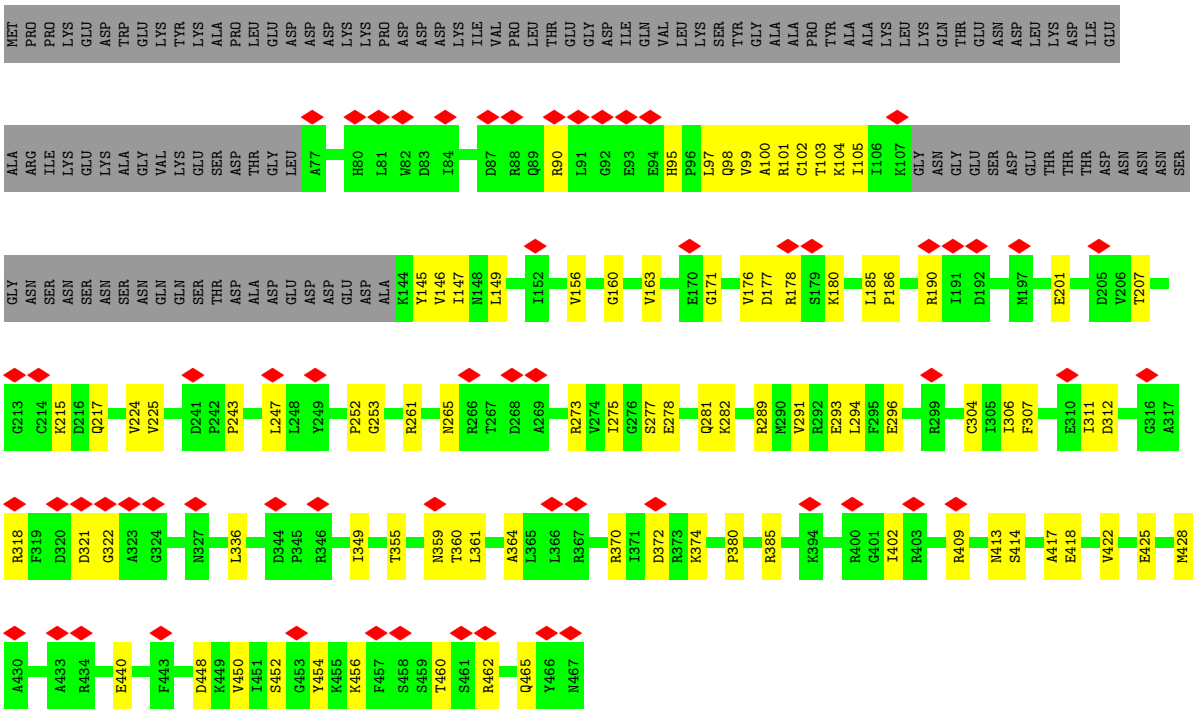
Chain k:





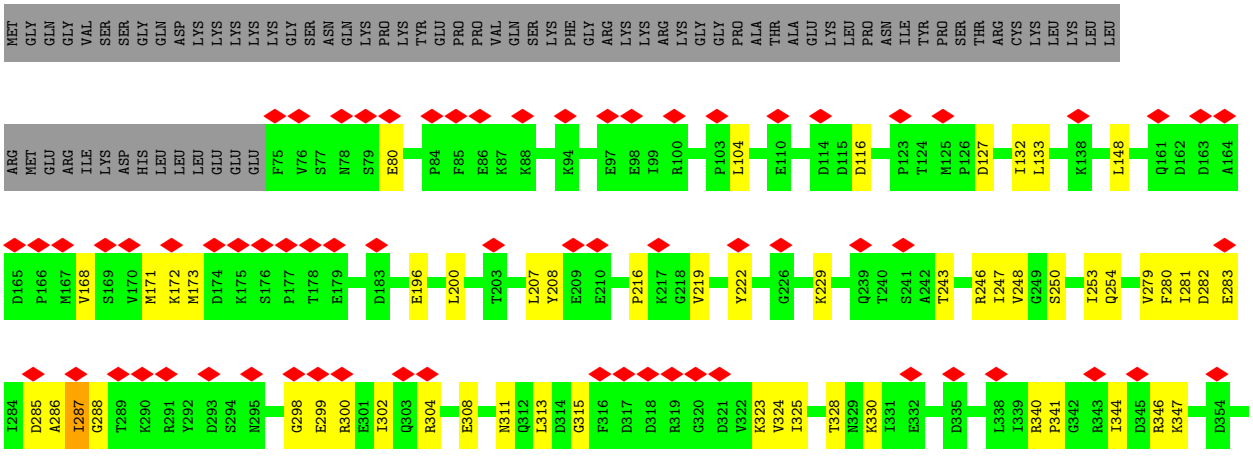
• Molecule 15: 26S protease regulatory subunit 7 homolog

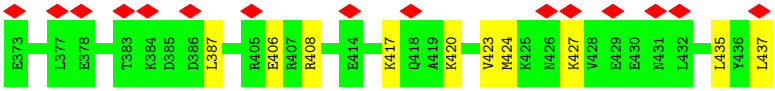
Chain H:



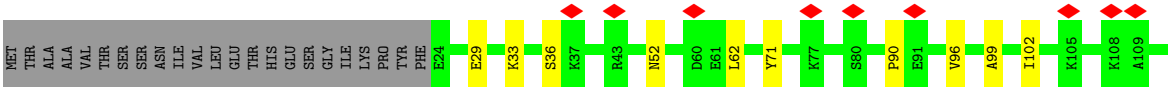
• Molecule 16: 26S protease regulatory subunit 4 homolog

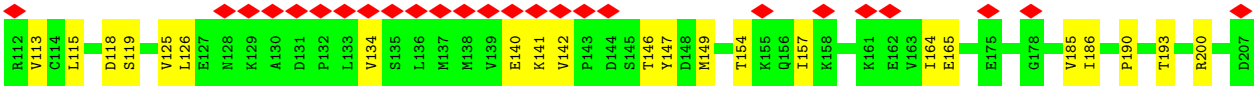
Chain I:

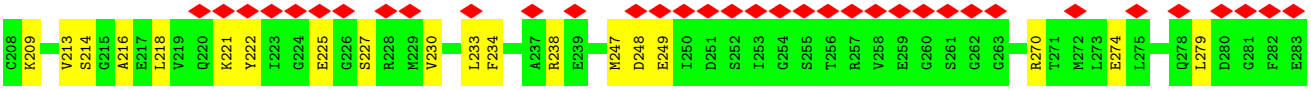


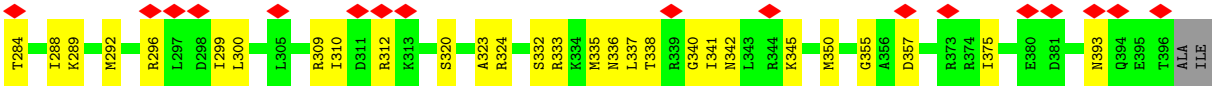


• Molecule 17: 26S protease regulatory subunit 8 homolog

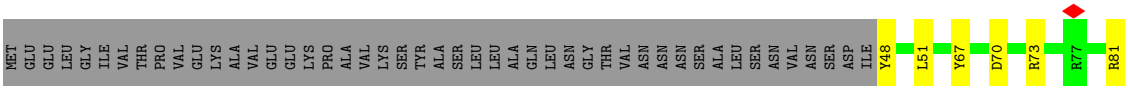


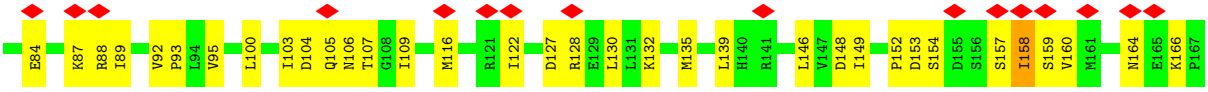


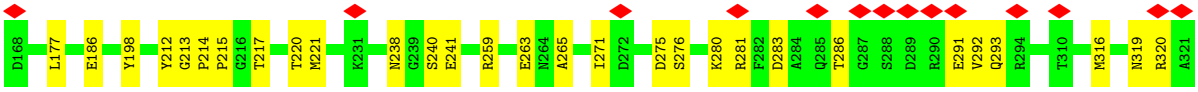


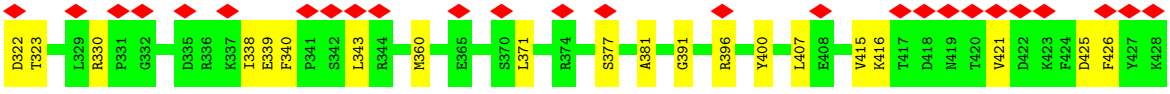


• Molecule 18: 26S protease regulatory subunit 6B homolog

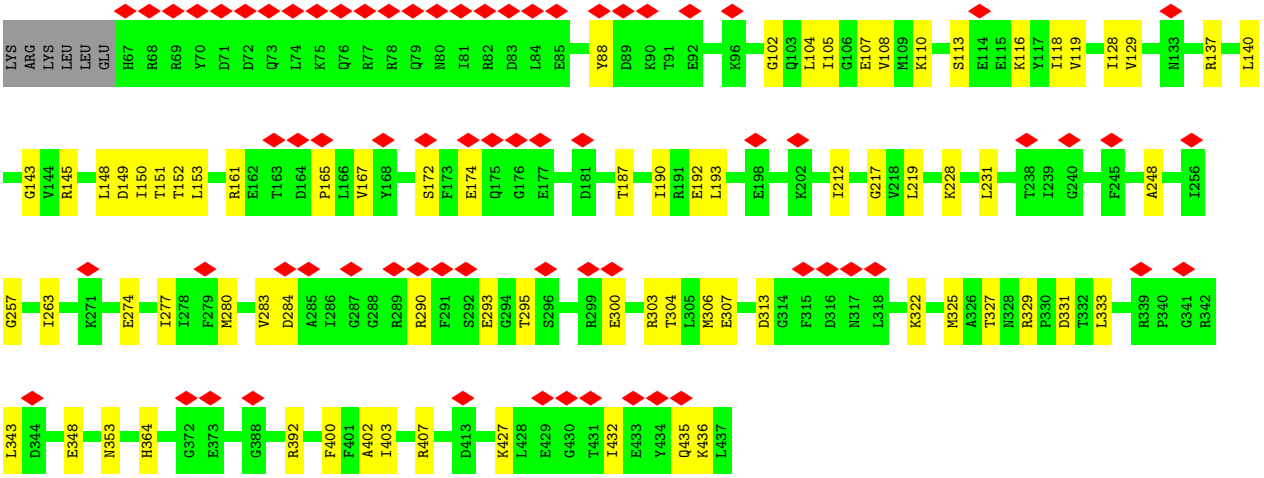






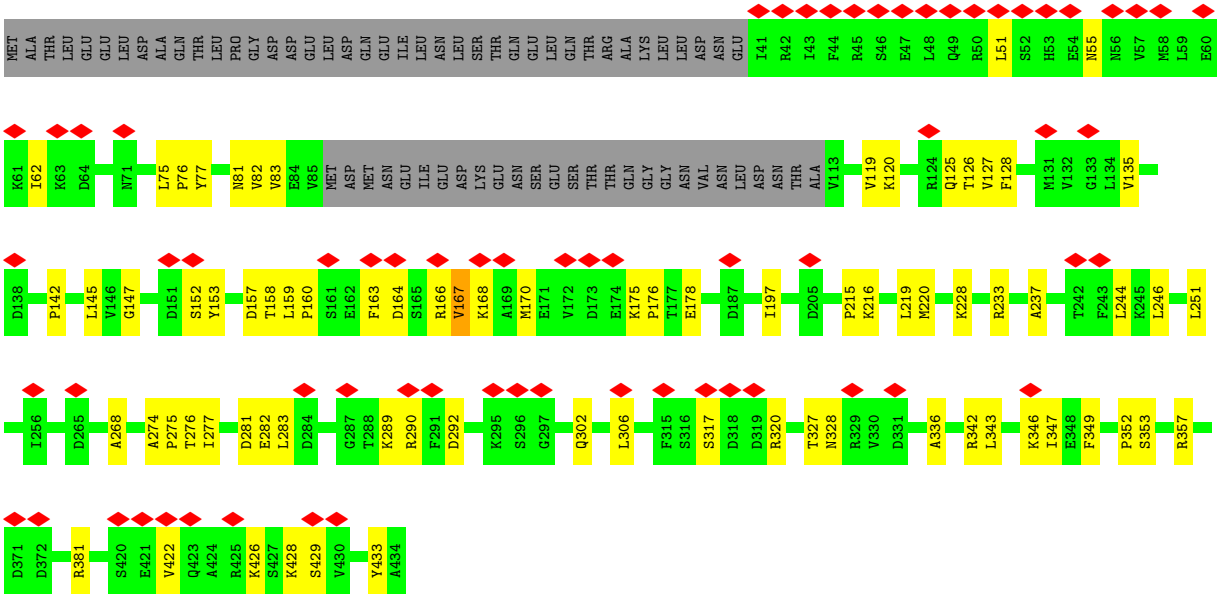


• Molecule 19: 26S protease subunit RPT4



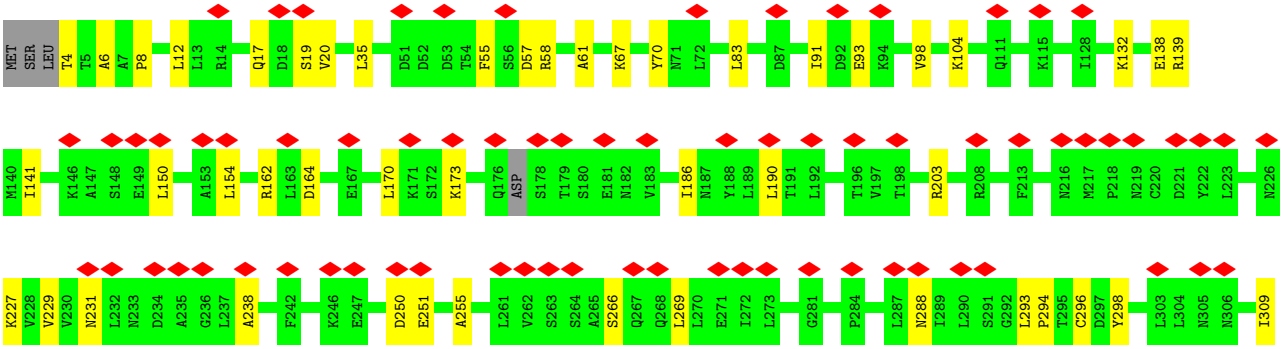
• Molecule 20: 26S protease regulatory subunit 6A

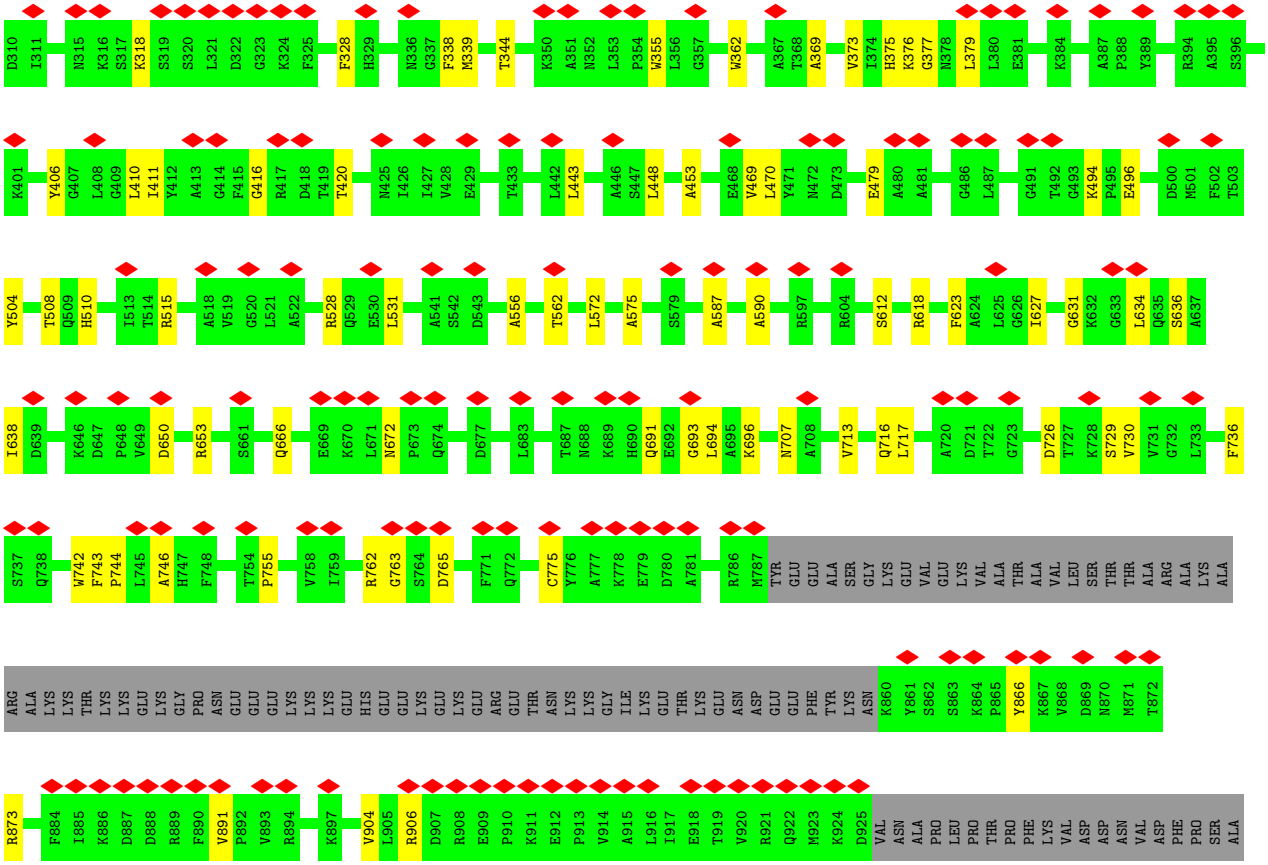
Chain M:



• Molecule 21: 26S proteasome regulatory subunit RPN2

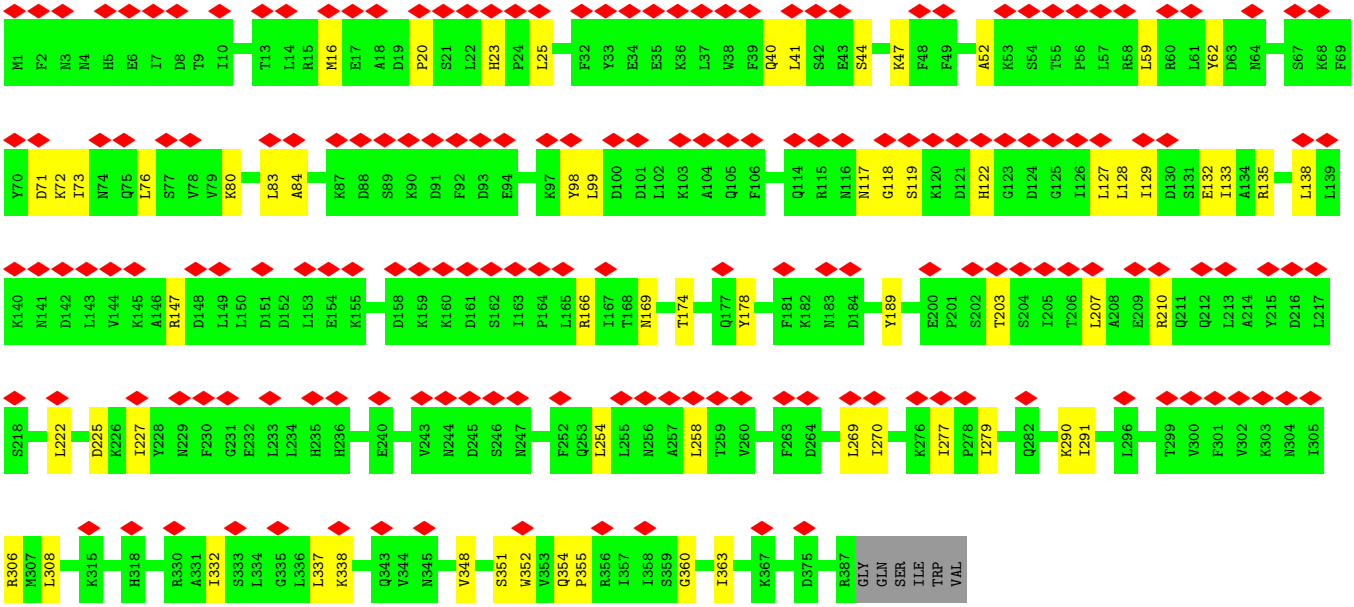
Chain N:



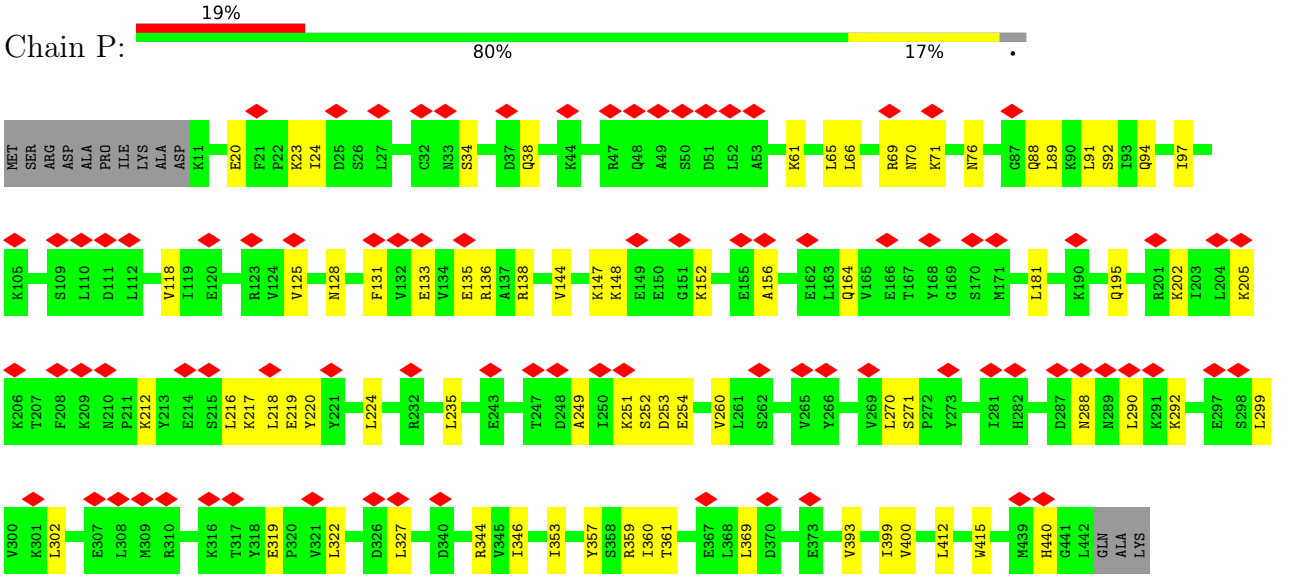


• Molecule 22: 26S proteasome regulatory subunit RPN9

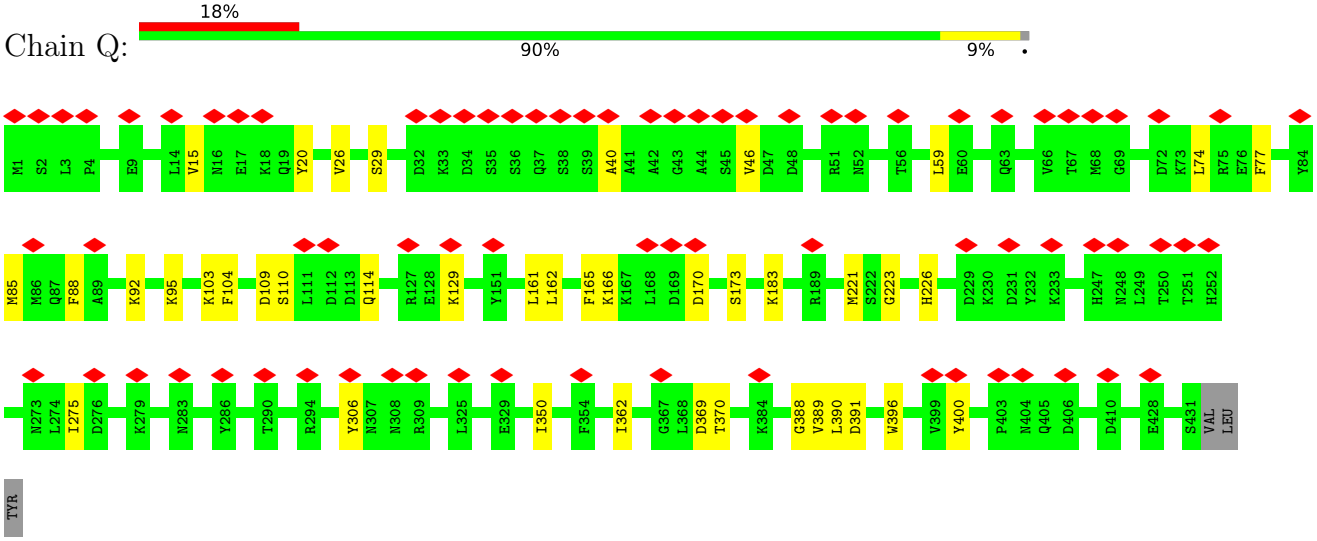
Chain O:



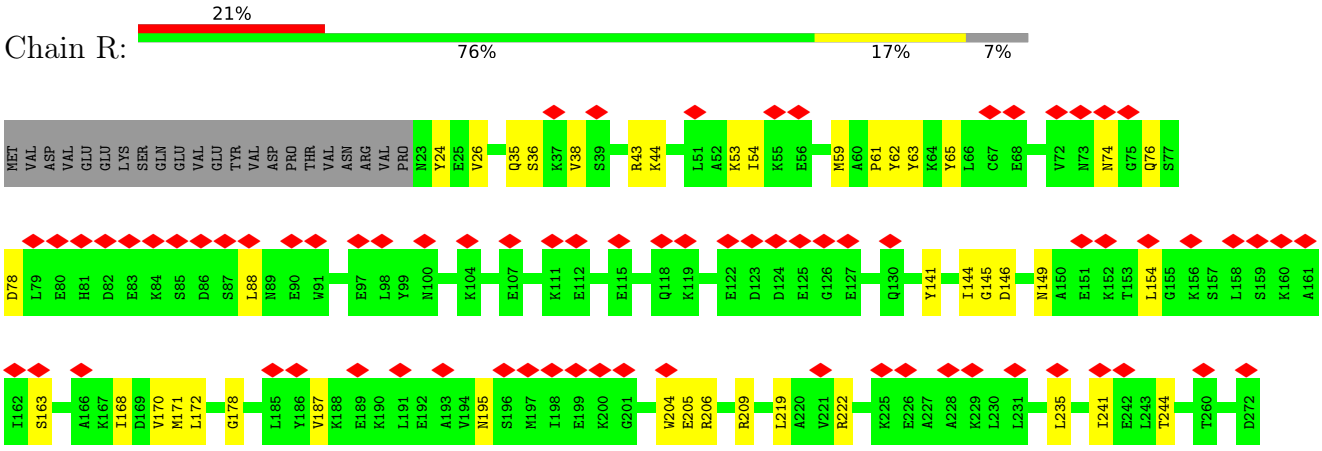
• Molecule 23: 26S proteasome regulatory subunit RPN5

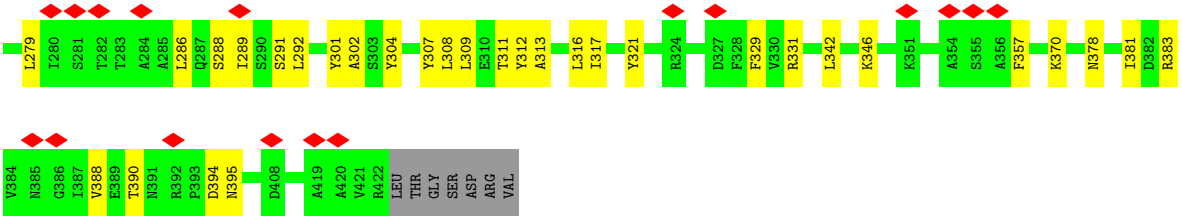


• Molecule 24: 26S proteasome regulatory subunit RPN6

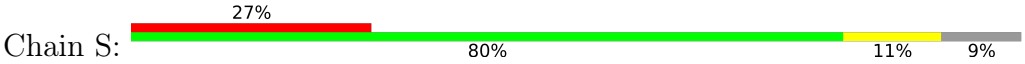


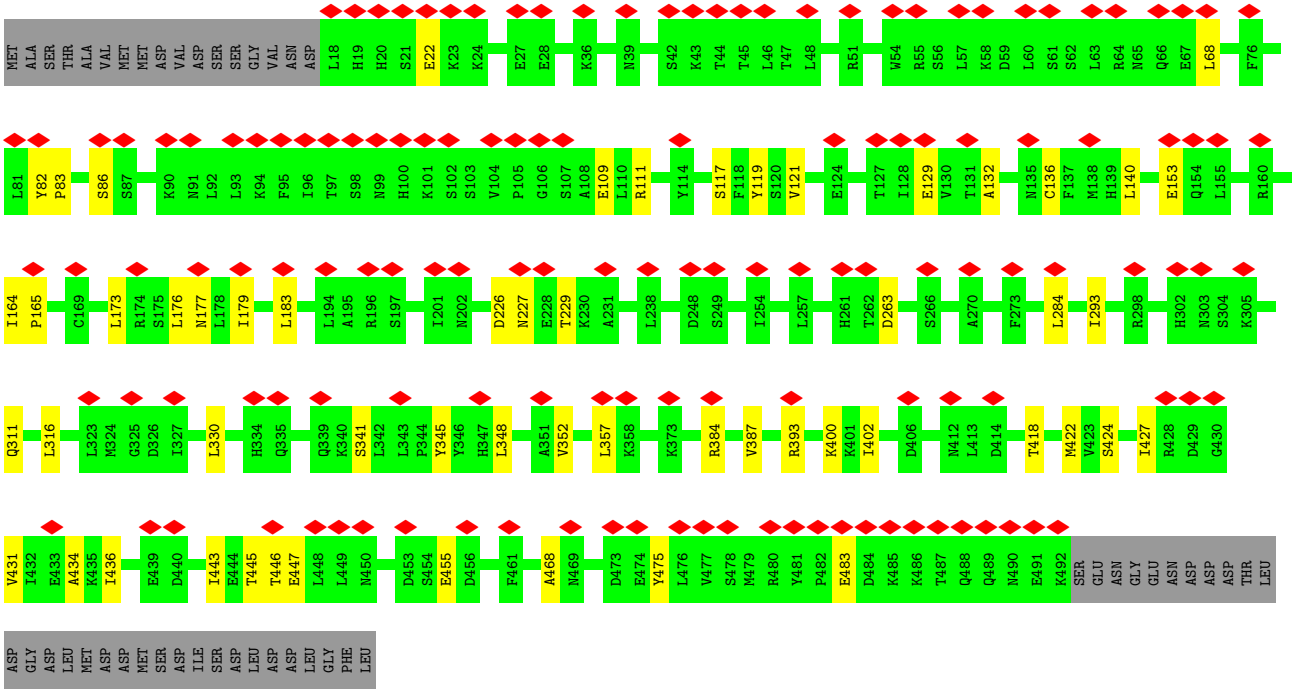
• Molecule 25: 26S proteasome regulatory subunit RPN7



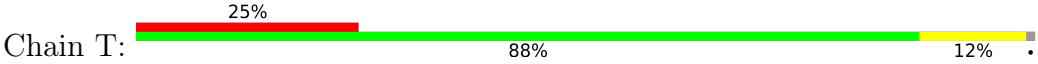


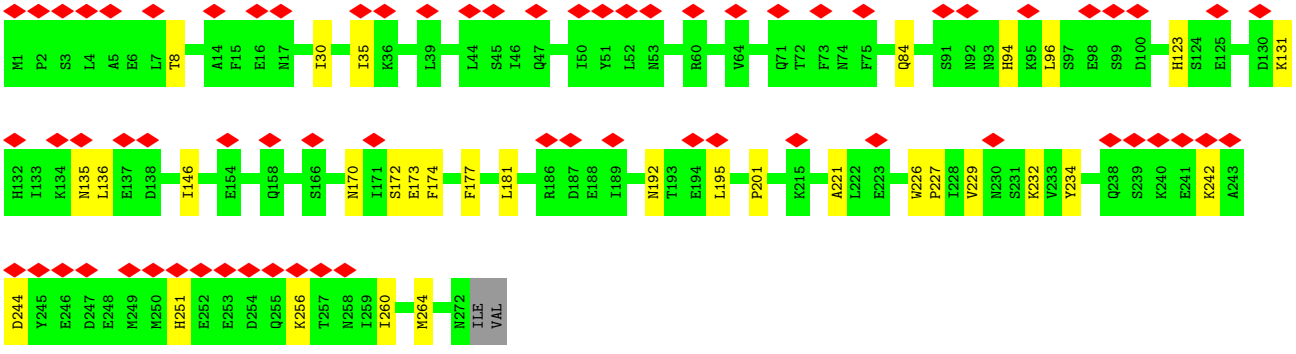
• Molecule 26: 26S proteasome regulatory subunit RPN3



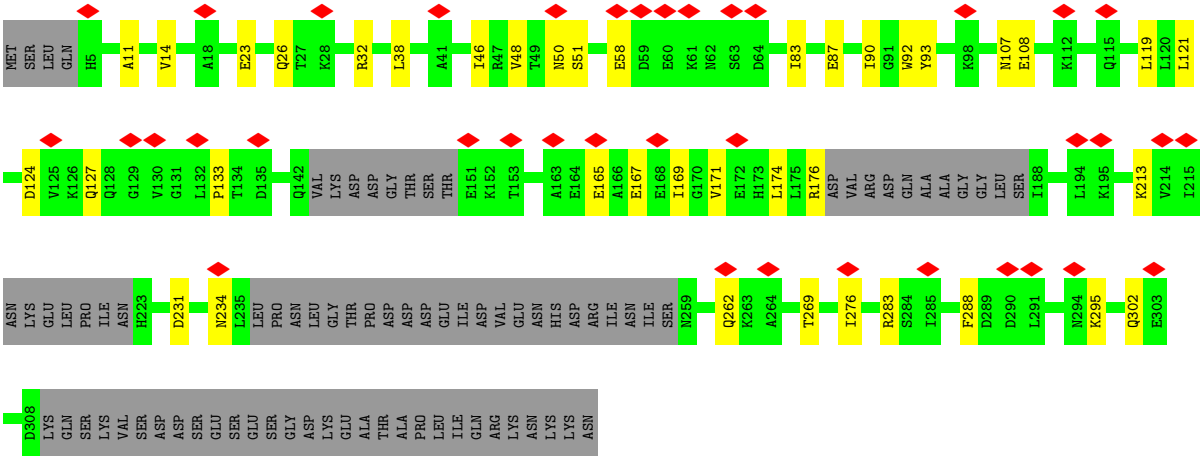


• Molecule 27: 26S proteasome regulatory subunit RPN12



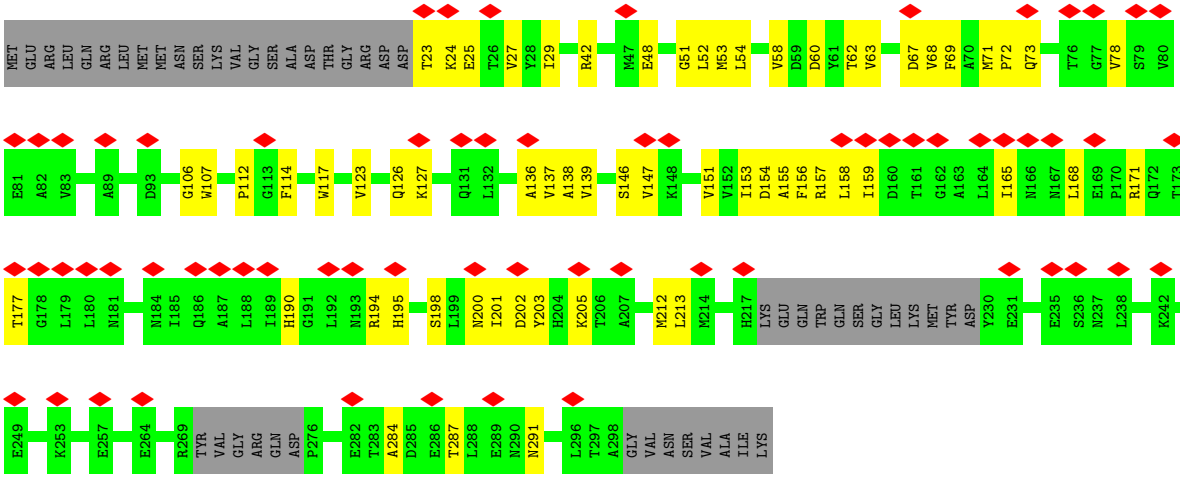


• Molecule 28: 26S proteasome regulatory subunit RPN8



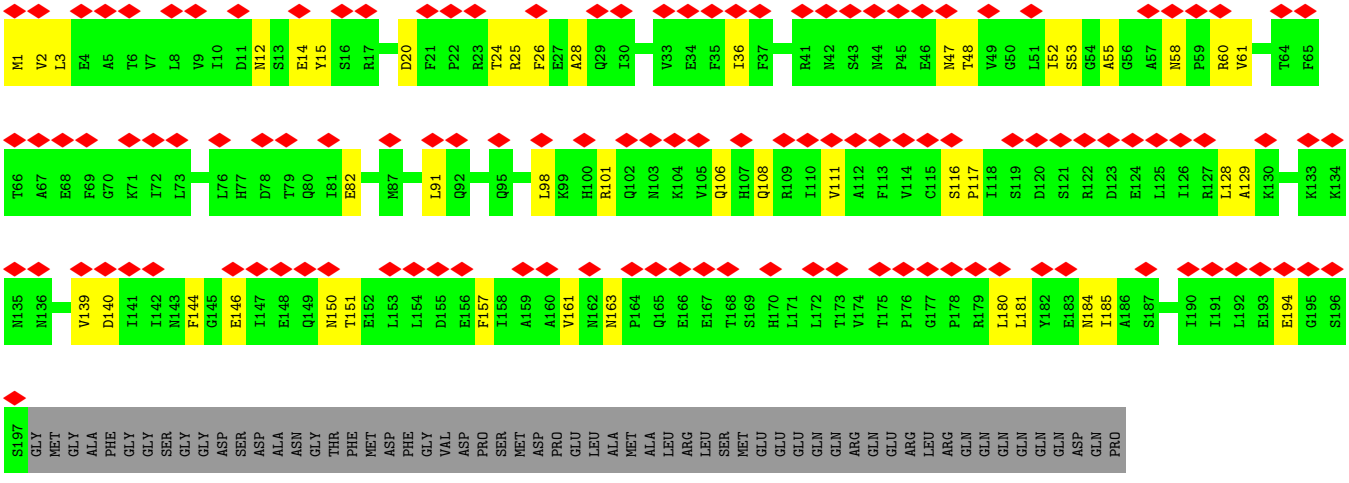
• Molecule 29: Ubiquitin carboxyl-terminal hydrolase RPN11

Chain V:



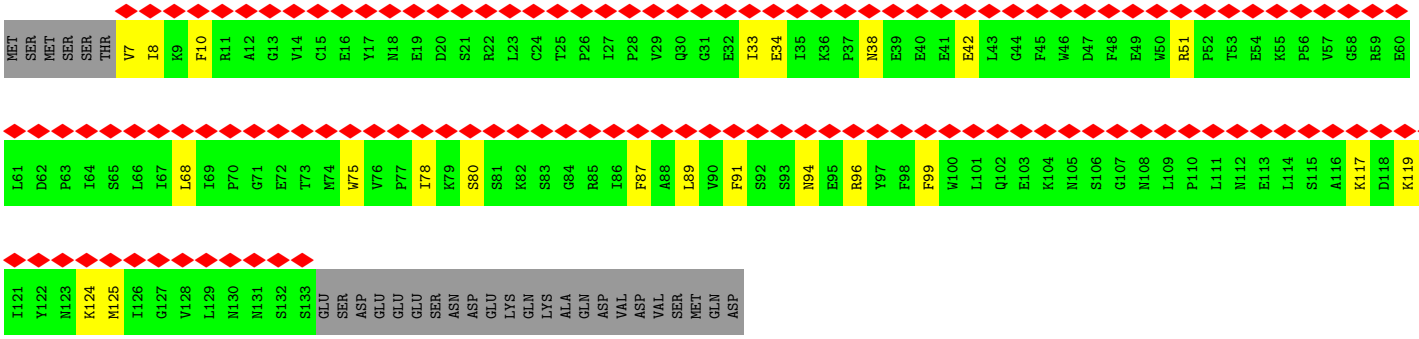
• Molecule 30: 26S proteasome regulatory subunit RPN10

Chain W:



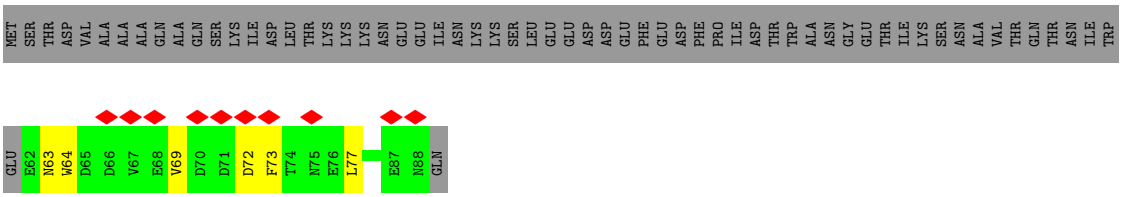
• Molecule 31: 26S proteasome regulatory subunit RPN13

Chain X:



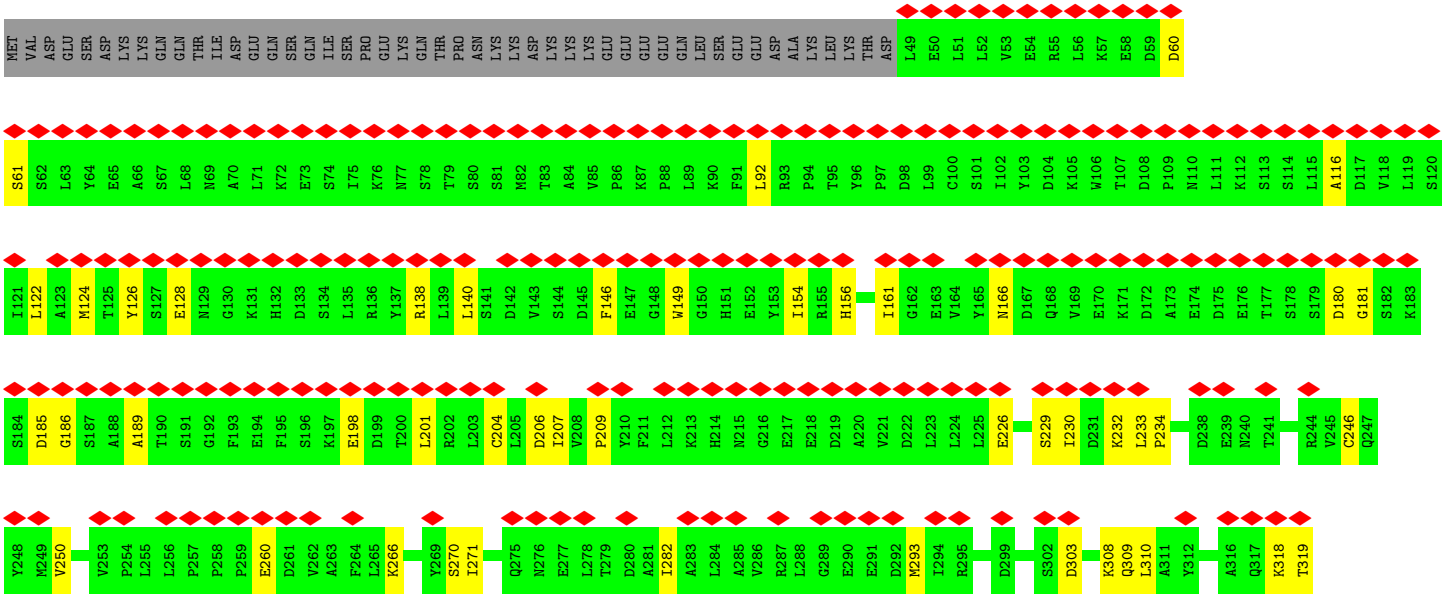
• Molecule 32: 26S proteasome complex subunit SEM1

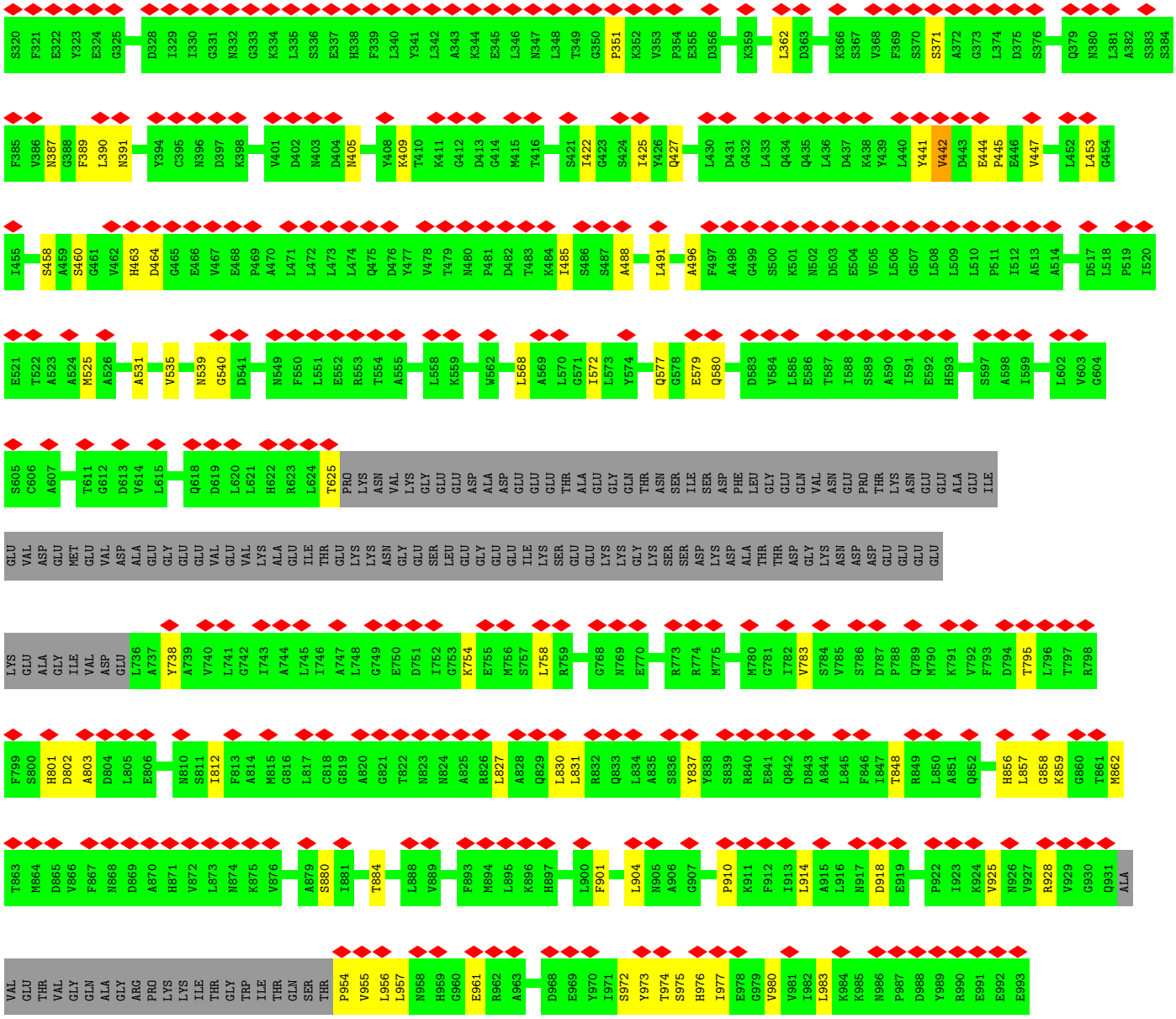
Chain Y:



• Molecule 33: 26S proteasome regulatory subunit RPN1

Chain Z:




S320 F321 E322 Y323 E324 G325 D328 I329 I330 G331 N332 G333 K334 L335 S336 E337 H338 F339 L340 Y341 L342 A343 K344 E345 L346 N347 L348 T349 G350 P351 K352 V353 P354 E355 D356 K359 L362 D363 K366 S367 V368 F369 S370 S371 A372 G373 L374 D375 S376 Q379 N380 L381 A382 S383 S384
F385 V386 N387 G388 F389 L390 N391 Y394 C395 N396 D397 K398 V401 D402 N403 D404 N405 Y408 K409 T410 K411 G412 D413 G414 M415 T416 S421 I422 G423 S424 I425 Y426 Q427 L430 D431 G432 L433 Q434 Q435 L436 D437 K438 Y439 L440 Y441 V442 D443 E444 P445 E446 V447 L452 L453 G454
I455 S458 A459 S460 G461 V462 H463 D464 G465 E466 V467 E468 P469 A470 L471 L472 L473 L474 Q475 D476 Y477 V478 T479 N480 P481 D482 T483 K484 I485 S486 S487 A488 L491 A496 F497 A498 G499 S500 K501 N502 D503 E504 V505 L506 G507 L508 L509 L510 P511 I512 A513 A514 D517 L518 P519 I520
E521 T522 A523 A524 M525 A526 A531 V535 N539 G540 D541 N549 F550 L551 E552 R553 T554 A555 L558 K559 W562 L568 A569 L570 G571 I572 L573 Y574 Q577 G578 E579 Q580 D583 V584 L585 E586 T587 I588 S589 A590 I591 E592 H593 S597 A598 I599 L602 V603 G604
S605 C606 A607 T611 G612 D613 V614 L615 Q618 D619 L620 L621 H622 R623 L624 T625 PRO LYS ASN VAL LYS GLY GLU GLU ASP ALA ASP GLU GLU GLU THR ALA GLU GLY GLN THR ASN SER ILE SER ASP PHE LEU GLY GLU GLN VAL ASN GLU PRO THR LYS ASN GLU GLU ALA GLU ILE
GLU VAL ASP GLU MET GLU VAL ASP ALA GLU GLY GLU GLU VAL GLU VAL LYS ALA GLU ILE THR GLU LYS LYS ASN GLY GLU GLU SER LEU GLU GLY GLU GLU ILE LYS SER GLU GLU LYS LYS GLY LYS SER SER ASP LYS ASP ALA THR THR ASP GLY LYS ASN ASP ASP GLU GLU GLU GLU
LYS GLU ALA GLY ILE VAL ASP GLU L736 A737 Y738 A739 V740 L741 G742 I743 A744 L745 I746 A747 L748 G749 E750 D751 I752 G753 K754 E755 M756 S757 L758 R759 G768 N769 E770 R773 R774 M775 M780 G781 I782 V783 S784 V785 S786 D787 P788 Q789 M790 K791 V792 F793 D794 T795 L796 T797 R798
F799 S800 H801 D802 A803 D804 L805 E806 N810 S811 I812 F813 A814 M815 G816 L817 C818 G819 A820 G821 T822 N823 N824 A825 R826 L827 A828 Q829 L830 L831 R832 Q833 L834 A835 S836 Y837 Y838 S839 R840 E841 Q842 D843 A844 L845 F846 I847 T848 R849 L850 A851 Q852 H856 L857 G858 K859 G860 T861 M862
T863 M864 D865 V866 F867 N868 D869 A870 H871 V872 L873 N874 K875 V876 A879 S880 I881 T884 L888 V889 F893 M894 L895 K896 H897 L900 F901 L904 N905 A906 G907 P910 K911 F912 I913 L914 A915 L916 N917 D918 E919 P922 I923 K924 V925 N926 V927 R928 V929 G930 Q931 ALA
VAL GLU THR VAL GLY GLN ALA GLY ARG PRO LYS LYS ILE THR GLY TRP ILE THR GLN SER THR P954 V955 L956 L957 N958 H959 G960 E961 R962 A963 D968 E969 Y970 I971 S972 Y973 T974 S975 H976 I977 E978 G979 V980 V981 I982 L983 K984 K985 N986 P987 D988 Y989 R990 E991 E992 E993

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	77729	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	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	2.361	Depositor
Minimum map value	-1.289	Depositor
Average map value	0.007	Depositor
Map value standard deviation	0.079	Depositor
Recommended contour level	0.477	Depositor
Map size (Å)	474.47998, 474.47998, 474.47998	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	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	1	0.07	0/1605	0.22	0/2171
1	b	0.07	0/1605	0.23	0/2171
2	2	0.06	0/1715	0.21	0/2326
2	i	0.06	0/1715	0.21	0/2326
3	3	0.08	0/1611	0.25	0/2174
3	h	0.08	0/1611	0.26	0/2174
4	4	0.07	0/1613	0.24	0/2173
4	g	0.07	0/1613	0.22	0/2173
5	5	0.07	0/1681	0.22	0/2274
5	f	0.07	0/1681	0.25	0/2274
6	6	0.08	0/1795	0.26	1/2420 (0.0%)
6	e	0.07	0/1795	0.23	0/2420
7	7	0.08	0/1855	0.25	0/2514
7	a	0.07	0/1855	0.25	0/2514
8	A	0.07	0/1959	0.24	0/2652
8	c	0.07	0/1959	0.22	0/2652
9	B	0.07	0/1952	0.22	0/2642
9	j	0.06	0/1952	0.20	0/2642
10	C	0.07	0/1934	0.23	0/2618
10	d	0.07	0/1934	0.22	0/2618
11	D	0.07	0/1919	0.23	0/2598
11	n	0.07	0/1919	0.22	0/2598
12	E	0.07	0/1886	0.24	0/2541
12	m	0.06	0/1886	0.19	0/2541
13	F	0.07	0/1823	0.23	0/2463
13	l	0.07	0/1823	0.22	0/2463
14	G	0.08	0/1928	0.24	0/2603
14	k	0.07	0/1936	0.22	0/2614
15	H	0.10	0/2834	0.32	0/3816
16	I	0.09	0/2869	0.30	0/3867
17	J	0.09	0/2964	0.26	0/3981
18	K	0.19	1/3062 (0.0%)	0.31	0/4132
19	L	0.21	1/2981 (0.0%)	0.28	0/4008
20	M	0.09	0/2903	0.29	0/3909

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
21	N	0.09	0/6670	0.22	0/9023
22	O	0.11	0/3243	0.27	0/4374
23	P	0.07	0/3599	0.23	0/4854
24	Q	0.07	0/3527	0.22	0/4748
25	R	0.07	0/3272	0.25	0/4412
26	S	0.08	0/3966	0.26	1/5355 (0.0%)
27	T	0.07	0/2279	0.27	1/3077 (0.0%)
28	U	0.06	0/2087	0.19	0/2811
29	V	0.07	0/2054	0.25	0/2770
30	W	0.07	0/1557	0.24	0/2111
31	X	0.07	0/1058	0.23	0/1432
32	Y	0.12	0/239	0.30	0/322
33	Z	0.08	0/6404	0.24	1/8686 (0.0%)
All	All	0.09	2/108128 (0.0%)	0.24	4/146037 (0.0%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
19	L	274	GLU	C-N	10.28	1.57	1.33
18	K	265	ALA	C-N	9.32	1.55	1.33

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
27	T	244	ASP	CB-CA-C	-6.26	109.34	116.54
26	S	153	GLU	CB-CA-C	-5.33	109.99	117.23
33	Z	318	LYS	CB-CA-C	-5.28	110.05	117.23
6	6	51	ASP	CB-CA-C	-5.27	110.48	116.54

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	1	1576	0	1552	31	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	b	1576	0	1552	20	0
2	2	1684	0	1685	26	0
2	i	1684	0	1685	32	0
3	3	1581	0	1571	30	0
3	h	1581	0	1571	26	0
4	4	1585	0	1590	30	0
4	g	1585	0	1590	34	0
5	5	1644	0	1592	31	0
5	f	1644	0	1592	25	0
6	6	1757	0	1708	26	0
6	e	1757	0	1708	41	0
7	7	1824	0	1829	34	0
7	a	1824	0	1829	31	0
8	A	1921	0	1910	34	0
8	c	1921	0	1910	29	0
9	B	1915	0	1929	34	0
9	j	1915	0	1929	21	0
10	C	1904	0	1901	32	0
10	d	1904	0	1901	36	0
11	D	1890	0	1900	30	0
11	n	1890	0	1900	27	0
12	E	1861	0	1836	36	0
12	m	1861	0	1836	20	0
13	F	1795	0	1797	36	0
13	l	1795	0	1797	22	0
14	G	1888	0	1880	33	0
14	k	1896	0	1886	24	0
15	H	2787	0	2851	58	0
16	I	2831	0	2881	52	0
17	J	2928	0	3057	52	0
18	K	3019	0	3084	59	0
19	L	2937	0	3011	55	0
20	M	2866	0	2938	52	0
21	N	6562	0	6625	73	0
22	O	3182	0	3207	36	0
23	P	3545	0	3629	46	0
24	Q	3471	0	3495	23	0
25	R	3218	0	3216	45	0
26	S	3894	0	3938	34	0
27	T	2235	0	2207	20	0
28	U	2061	0	2116	31	0
29	V	2025	0	2035	45	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
30	W	1534	0	1542	27	0
31	X	1032	0	1015	13	0
32	Y	236	0	203	6	0
33	Z	6290	0	6236	69	0
All	All	106311	0	106652	1405	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 1405 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:h:107:PRO:HD2	3:h:124:PHE:HB2	1.58	0.84
5:f:93:SER:HB2	5:f:106:VAL:H	1.46	0.79
22:O:147:ARG:HD3	23:P:288:ASN:HD21	1.47	0.78
29:V:24:LYS:H	29:V:174:THR:HG22	1.50	0.77
19:L:165:PRO:HD2	20:M:83:VAL:HB	1.67	0.75

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	1	203/215 (94%)	191 (94%)	12 (6%)	0	100	100
1	b	203/215 (94%)	193 (95%)	10 (5%)	0	100	100
2	2	220/261 (84%)	213 (97%)	7 (3%)	0	100	100
2	i	220/261 (84%)	214 (97%)	6 (3%)	0	100	100
3	3	202/205 (98%)	193 (96%)	9 (4%)	0	100	100
3	h	202/205 (98%)	192 (95%)	9 (4%)	1 (0%)	25	58

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	4	196/198 (99%)	190 (97%)	6 (3%)	0	100	100
4	g	196/198 (99%)	188 (96%)	8 (4%)	0	100	100
5	5	210/287 (73%)	204 (97%)	6 (3%)	0	100	100
5	f	210/287 (73%)	203 (97%)	7 (3%)	0	100	100
6	6	220/241 (91%)	212 (96%)	8 (4%)	0	100	100
6	e	220/241 (91%)	211 (96%)	9 (4%)	0	100	100
7	7	231/266 (87%)	220 (95%)	11 (5%)	0	100	100
7	a	231/266 (87%)	221 (96%)	10 (4%)	0	100	100
8	A	241/252 (96%)	234 (97%)	7 (3%)	0	100	100
8	c	241/252 (96%)	234 (97%)	7 (3%)	0	100	100
9	B	248/250 (99%)	241 (97%)	7 (3%)	0	100	100
9	j	248/250 (99%)	238 (96%)	10 (4%)	0	100	100
10	C	242/258 (94%)	232 (96%)	10 (4%)	0	100	100
10	d	242/258 (94%)	233 (96%)	9 (4%)	0	100	100
11	D	239/254 (94%)	229 (96%)	10 (4%)	0	100	100
11	n	239/254 (94%)	230 (96%)	9 (4%)	0	100	100
12	E	240/260 (92%)	227 (95%)	13 (5%)	0	100	100
12	m	240/260 (92%)	234 (98%)	6 (2%)	0	100	100
13	F	231/234 (99%)	222 (96%)	9 (4%)	0	100	100
13	l	231/234 (99%)	222 (96%)	9 (4%)	0	100	100
14	G	241/288 (84%)	234 (97%)	7 (3%)	0	100	100
14	k	242/288 (84%)	235 (97%)	7 (3%)	0	100	100
15	H	351/467 (75%)	319 (91%)	32 (9%)	0	100	100
16	I	361/437 (83%)	331 (92%)	29 (8%)	1 (0%)	37	69
17	J	371/405 (92%)	338 (91%)	32 (9%)	1 (0%)	37	69
18	K	379/428 (89%)	340 (90%)	37 (10%)	2 (0%)	25	58
19	L	369/437 (84%)	336 (91%)	33 (9%)	0	100	100
20	M	363/434 (84%)	326 (90%)	36 (10%)	1 (0%)	37	69
21	N	843/945 (89%)	814 (97%)	29 (3%)	0	100	100
22	O	385/393 (98%)	352 (91%)	33 (9%)	0	100	100
23	P	430/445 (97%)	398 (93%)	32 (7%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
24	Q	429/434 (99%)	407 (95%)	22 (5%)	0	100 100
25	R	398/429 (93%)	360 (90%)	37 (9%)	1 (0%)	37 69
26	S	473/523 (90%)	453 (96%)	19 (4%)	1 (0%)	44 74
27	T	270/274 (98%)	246 (91%)	24 (9%)	0	100 100
28	U	245/338 (72%)	241 (98%)	4 (2%)	0	100 100
29	V	252/306 (82%)	227 (90%)	23 (9%)	2 (1%)	16 49
30	W	195/268 (73%)	181 (93%)	14 (7%)	0	100 100
31	X	125/156 (80%)	113 (90%)	12 (10%)	0	100 100
32	Y	25/89 (28%)	19 (76%)	5 (20%)	1 (4%)	2 21
33	Z	807/993 (81%)	757 (94%)	49 (6%)	1 (0%)	48 79
All	All	13400/15139 (88%)	12648 (94%)	740 (6%)	12 (0%)	50 79

5 of 12 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
16	I	287	ILE
18	K	158	ILE
18	K	292	VAL
25	R	241	ILE
3	h	105	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	1	169/178 (95%)	169 (100%)	0	100 100
1	b	169/178 (95%)	169 (100%)	0	100 100
2	2	181/214 (85%)	181 (100%)	0	100 100
2	i	181/214 (85%)	181 (100%)	0	100 100
3	3	172/173 (99%)	172 (100%)	0	100 100
3	h	172/173 (99%)	172 (100%)	0	100 100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	4	175/175 (100%)	175 (100%)	0	100	100
4	g	175/175 (100%)	175 (100%)	0	100	100
5	5	169/235 (72%)	169 (100%)	0	100	100
5	f	169/235 (72%)	169 (100%)	0	100	100
6	6	185/201 (92%)	185 (100%)	0	100	100
6	e	185/201 (92%)	185 (100%)	0	100	100
7	7	199/224 (89%)	199 (100%)	0	100	100
7	a	199/224 (89%)	199 (100%)	0	100	100
8	A	207/210 (99%)	207 (100%)	0	100	100
8	c	207/210 (99%)	207 (100%)	0	100	100
9	B	209/209 (100%)	209 (100%)	0	100	100
9	j	209/209 (100%)	209 (100%)	0	100	100
10	C	203/216 (94%)	203 (100%)	0	100	100
10	d	203/216 (94%)	203 (100%)	0	100	100
11	D	213/226 (94%)	213 (100%)	0	100	100
11	n	213/226 (94%)	213 (100%)	0	100	100
12	E	198/215 (92%)	198 (100%)	0	100	100
12	m	198/215 (92%)	198 (100%)	0	100	100
13	F	192/193 (100%)	192 (100%)	0	100	100
13	l	192/193 (100%)	192 (100%)	0	100	100
14	G	200/239 (84%)	200 (100%)	0	100	100
14	k	201/239 (84%)	201 (100%)	0	100	100
15	H	303/399 (76%)	303 (100%)	0	100	100
16	I	320/385 (83%)	320 (100%)	0	100	100
17	J	325/352 (92%)	325 (100%)	0	100	100
18	K	334/374 (89%)	334 (100%)	0	100	100
19	L	317/377 (84%)	317 (100%)	0	100	100
20	M	315/375 (84%)	315 (100%)	0	100	100
21	N	713/797 (90%)	713 (100%)	0	100	100
22	O	363/368 (99%)	363 (100%)	0	100	100
23	P	405/415 (98%)	405 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
24	Q	388/391 (99%)	388 (100%)	0	100	100
25	R	351/379 (93%)	351 (100%)	0	100	100
26	S	447/489 (91%)	447 (100%)	0	100	100
27	T	254/256 (99%)	254 (100%)	0	100	100
28	U	234/308 (76%)	234 (100%)	0	100	100
29	V	227/268 (85%)	227 (100%)	0	100	100
30	W	171/230 (74%)	171 (100%)	0	100	100
31	X	116/144 (81%)	116 (100%)	0	100	100
32	Y	26/81 (32%)	26 (100%)	0	100	100
33	Z	692/850 (81%)	692 (100%)	0	100	100
All	All	11646/13054 (89%)	11646 (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 159 such sidechains are listed below:

Mol	Chain	Res	Type
24	Q	392	GLN
28	U	302	GLN
25	R	378	ASN
26	S	369	GLN
30	W	95	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)

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.

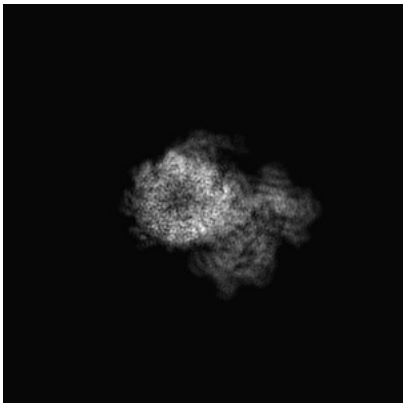
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-9771. These allow visual inspection of the internal detail of the map and identification of artifacts.

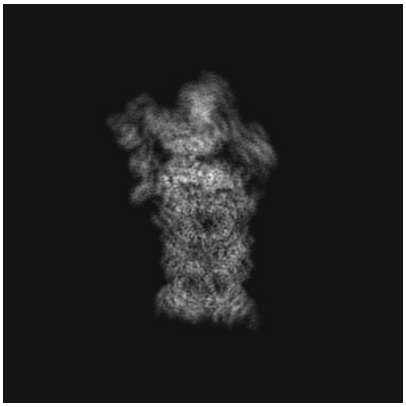
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

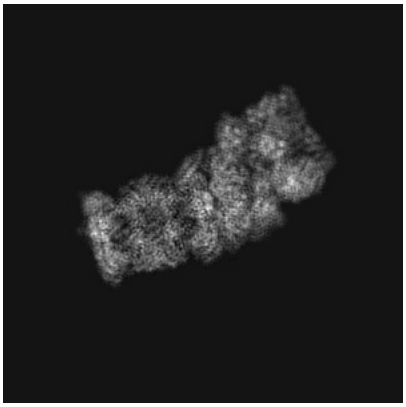
6.1.1 Primary map



X



Y

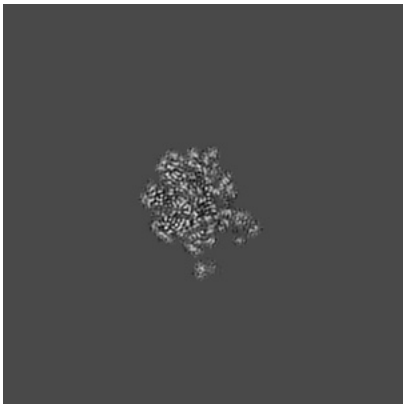


Z

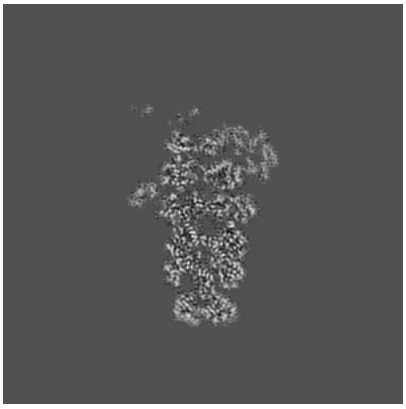
The images above show the map projected in three orthogonal directions.

6.2 Central slices

6.2.1 Primary map



X Index: 180



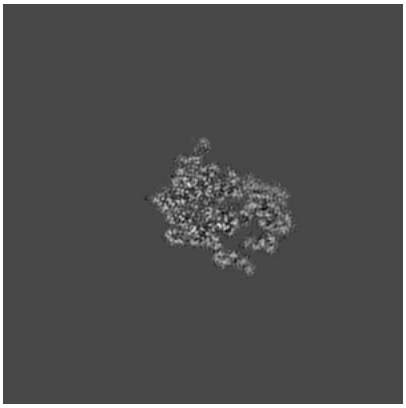
Y Index: 180

Z Index: 180

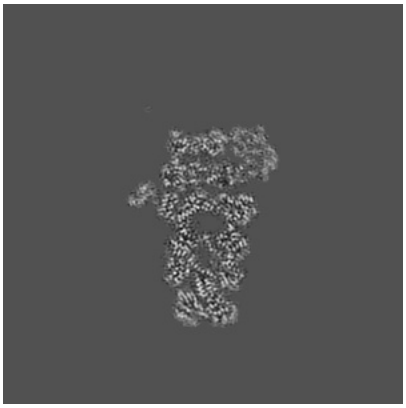
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

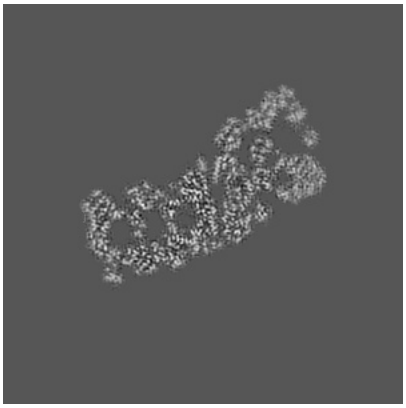
6.3.1 Primary map



X Index: 204



Y Index: 177

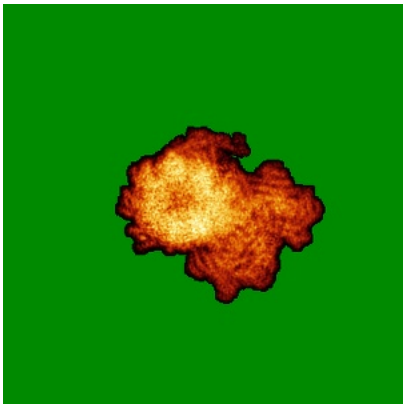


Z Index: 170

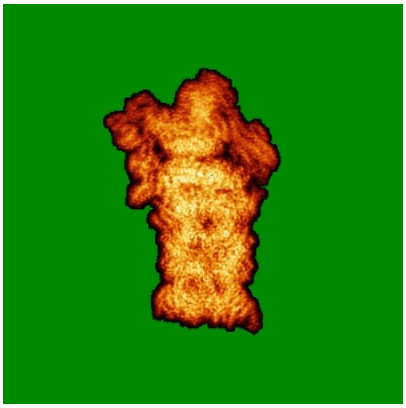
The images above show the largest variance slices of the map in three orthogonal directions.

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

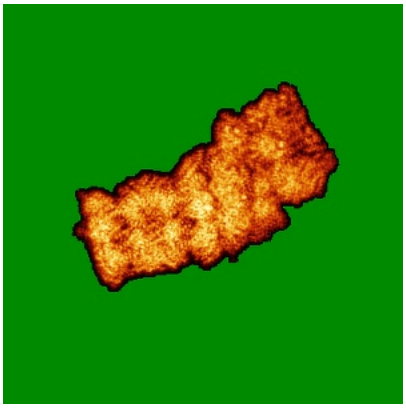
6.4.1 Primary map



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

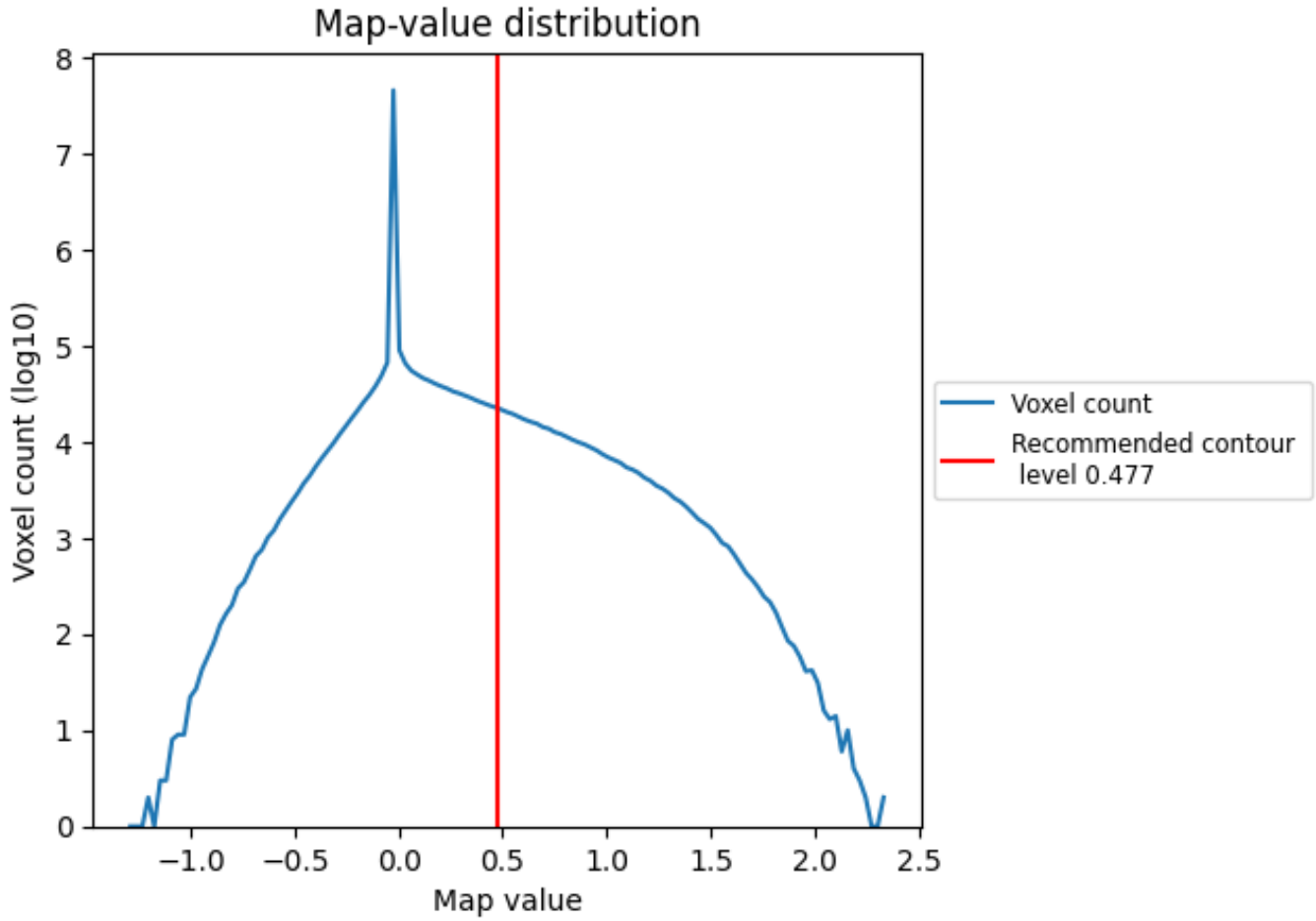
6.6 Mask visualisation (i)

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

7 Map analysis

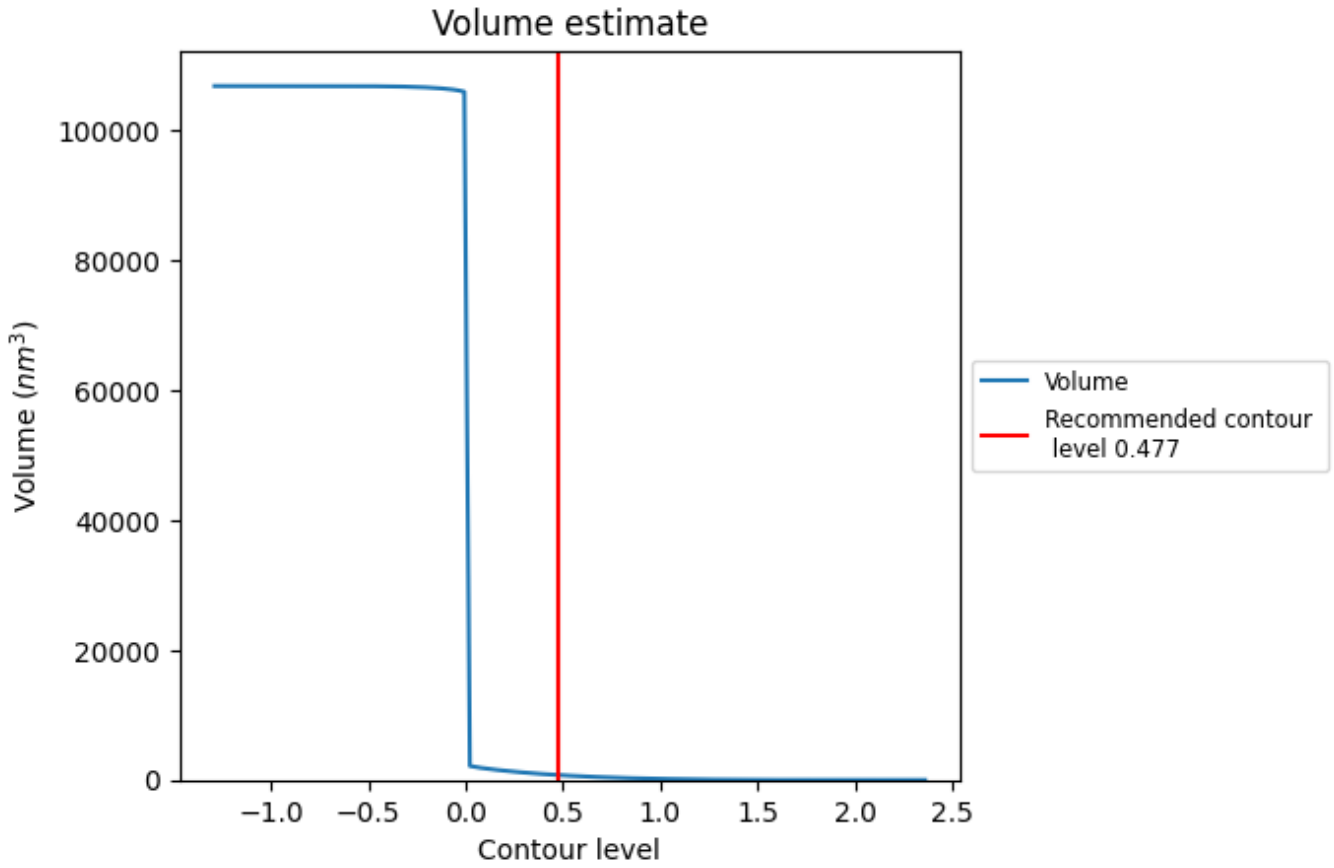
This section contains the results of statistical analysis of the map.

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.

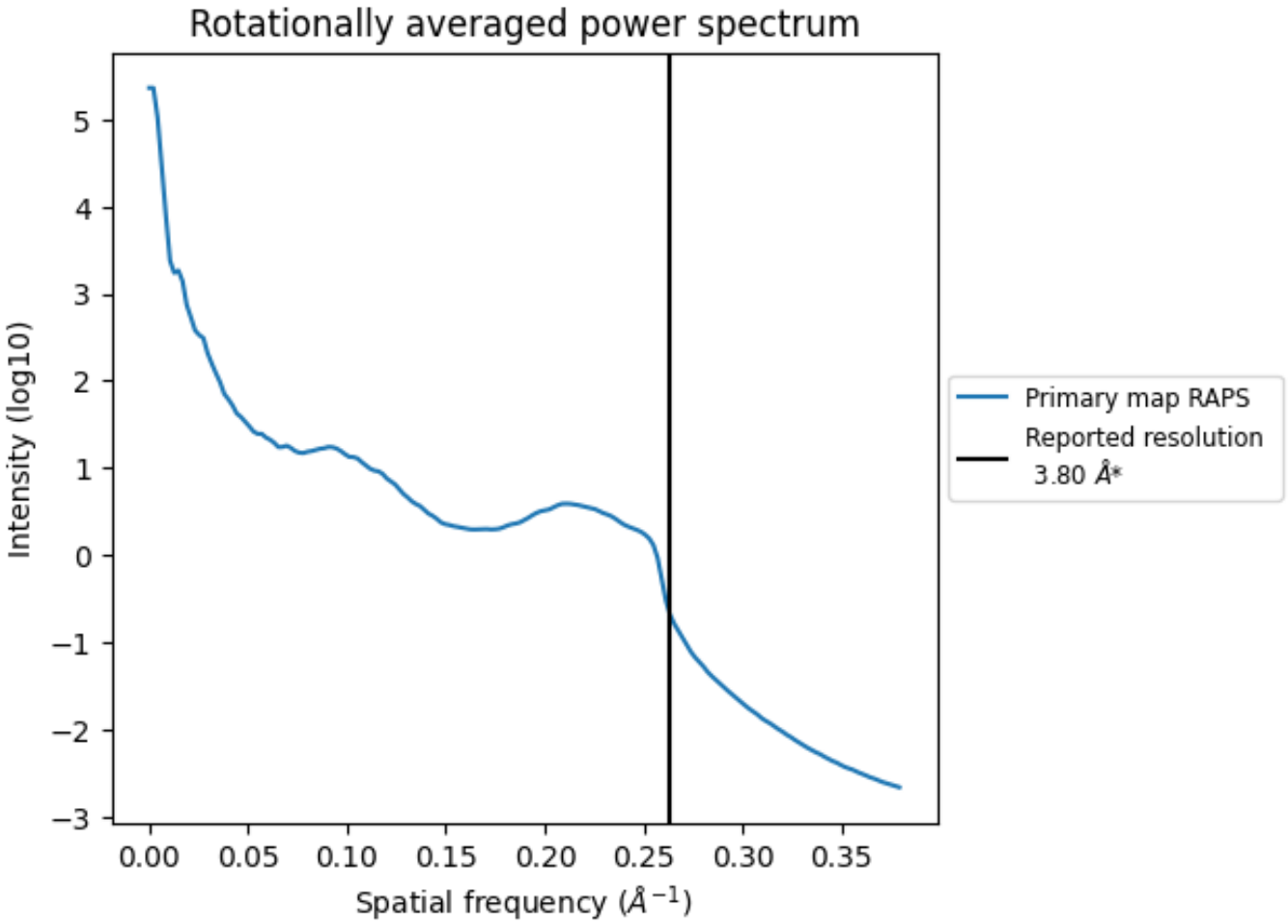
7.2 Volume estimate (i)



The volume at the recommended contour level is 755 nm^3; this corresponds to an approximate mass of 682 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 0.263 Å^{-1}

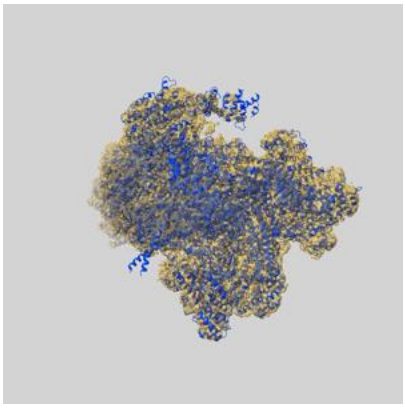
8 Fourier-Shell correlation

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

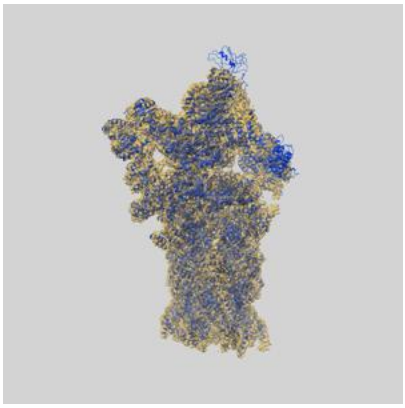
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-9771 and PDB model 6J2Q. Per-residue inclusion information can be found in section 3 on page 11.

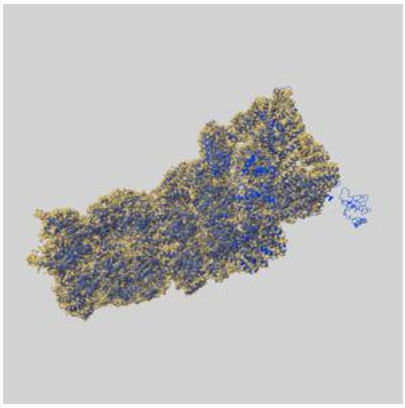
9.1 Map-model overlay



X



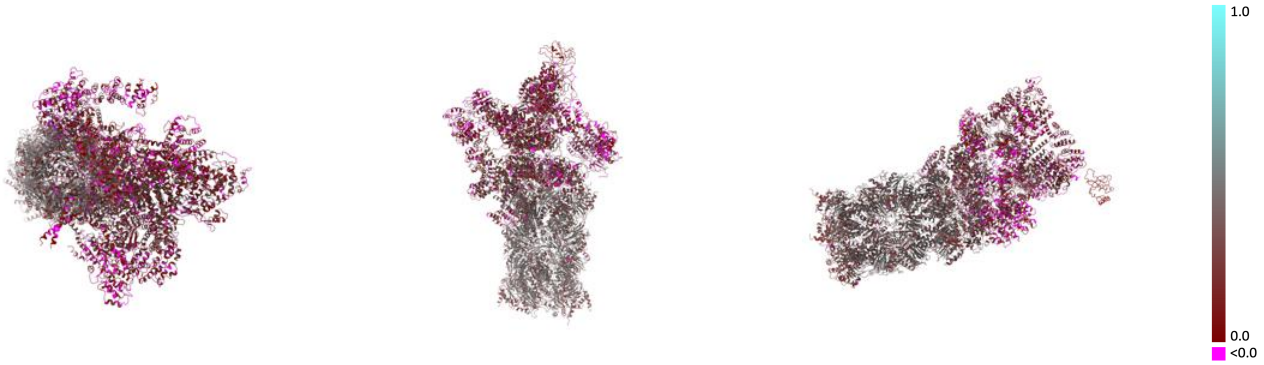
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.477 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

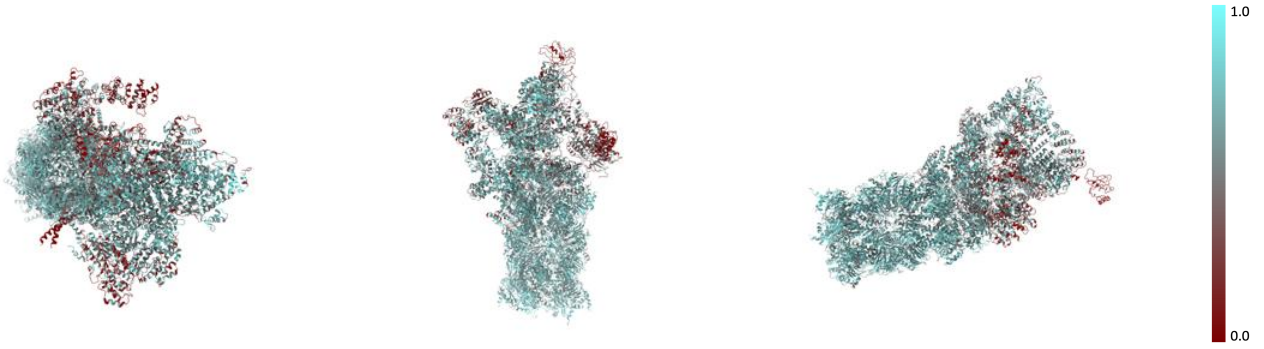
9.2 Q-score mapped to coordinate model



X Y Z

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

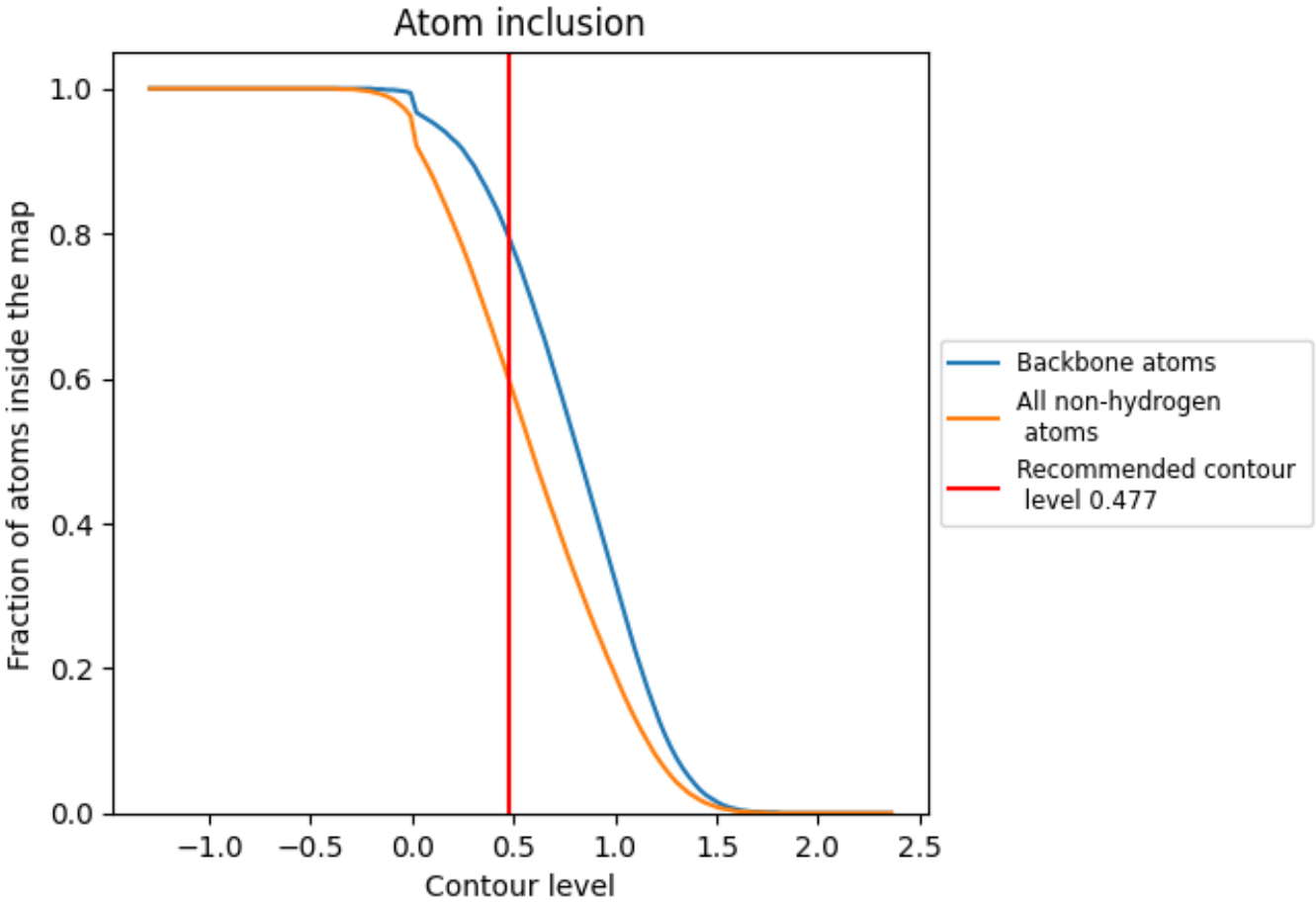
9.3 Atom inclusion mapped to coordinate model



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.477).

9.4 Atom inclusion (i)



At the recommended contour level, 80% of all backbone atoms, 60% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.477) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.5990	0.2640
1	0.6820	0.3770
2	0.7030	0.3890
3	0.6920	0.3750
4	0.6540	0.3380
5	0.7170	0.3640
6	0.6950	0.3630
7	0.7050	0.3920
A	0.6840	0.3760
B	0.6880	0.3720
C	0.6740	0.3520
D	0.7000	0.3510
E	0.6730	0.3450
F	0.6870	0.3640
G	0.6780	0.3670
H	0.5960	0.2570
I	0.5630	0.2350
J	0.5600	0.2260
K	0.5940	0.2550
L	0.5760	0.2710
M	0.5990	0.2710
N	0.5700	0.1740
O	0.4350	0.1190
P	0.5840	0.1860
Q	0.6100	0.2300
R	0.5740	0.1730
S	0.5350	0.1460
T	0.5700	0.1630
U	0.6080	0.2170
V	0.5640	0.1920
W	0.3270	0.0820
X	0.0000	0.0000
Y	0.5090	0.1080
Z	0.2950	0.0840
a	0.6980	0.3830

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Chain	Atom inclusion	Q-score
b	0.6750	0.3670
c	0.6920	0.3330
d	0.6730	0.3040
e	0.6790	0.3620
f	0.7040	0.3770
g	0.6780	0.3430
h	0.6950	0.3750
i	0.6940	0.3730
j	0.6760	0.3430
k	0.7170	0.3360
l	0.7070	0.3380
m	0.6650	0.3260
n	0.6930	0.3070