wwPDB EM Validation Summary Report (i)

Nov 20, 2022 – 07:28 pm GMT

PDB ID	:	4CR2
EMDB ID	:	EMD-2594
Title	:	Deep classification of a large cryo-EM dataset defines the conformational landscape of the 26S proteasome
Authors	:	Unverdorben, P.; Beck, F.; Sledz, P.; Schweitzer, A.; Pfeifer, G.; Plitzko, J.M.; Baumeister, W.; Foerster, F.
Deposited on	:	2014-02-25
Resolution	:	7.70 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:

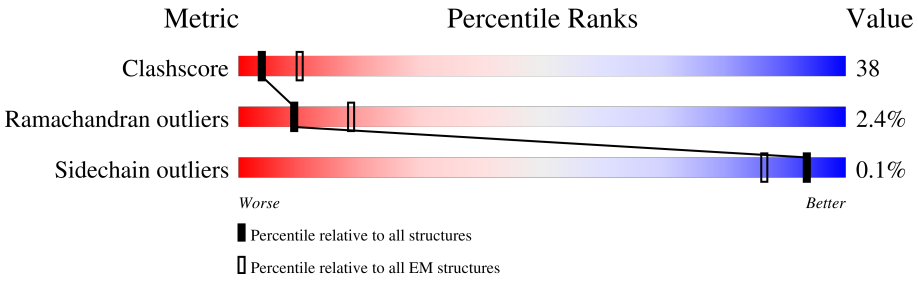
EMDB validation analysis	:	0.0.1.dev43
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.2

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 7.70 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=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	35% 45% 47% · 5%
2	2	261	28% 54% 30% · 15%
3	3	205	37% 55% 41% ·
4	4	198	23% 56% 42% ·
5	5	287	18% 45% 27% · 26%
6	6	241	27% 58% 33% · 8%
7	7	266	30% 51% 35% · 12%
8	A	252	35% 54% 39% · ·

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Mol	Chain	Length	Quality of chain
9	B	250	38% 63% 34%
10	C	258	32% 52% 41% 5%
11	D	254	30% 56% 37% 5%
12	E	260	33% 59% 32% 7%
13	F	234	30% 50% 45%
14	G	288	33% 51% 31% 15%
15	H	467	34% 38% 33% 6% 23%
16	I	437	31% 49% 29% 17%
17	J	405	26% 48% 41% 8%
18	K	428	31% 50% 37% 11%
19	L	437	29% 46% 34% 17%
20	M	434	32% 47% 33% 15%
21	N	945	22% 50% 38% 10%
22	O	393	26% 55% 41%
23	P	445	12% 53% 36% 7%
24	Q	434	17% 57% 40%
25	R	429	24% 50% 41% 7%
26	S	523	23% 40% 25% 33%
27	T	274	18% 48% 47%
28	U	338	18% 42% 30% 25%
29	V	306	22% 47% 31% 19%
30	W	268	32% 36% 34% 26%
31	X	156	33% 33% 46% 19%
32	Y	89	13% 8% 79%
33	Z	993	30% 38% 39% 5% 18%

2 Entry composition (i)

There are 33 unique types of molecules in this entry. The entry contains 80139 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 COMPONENT PRE3.

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

- Molecule 2 is a protein called PROTEASOME COMPONENT PUP1.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	2	223	Total	C	N	O	S	0	0
			1692	1067	294	324	7		

- Molecule 3 is a protein called PROTEASOME COMPONENT PUP3.

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

- Molecule 4 is a protein called PROTEASOME COMPONENT C11.

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

- Molecule 5 is a protein called PROTEASOME COMPONENT PRE2.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	5	212	Total	C	N	O	S	0	0
			1646	1045	282	312	7		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
5	33	ARG	LYS	SEE REMARK 999	UNP P30656

- Molecule 6 is a protein called PROTEASOME COMPONENT C5.

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

- Molecule 7 is a protein called PROTEASOME COMPONENT PRE4.

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

- Molecule 8 is a protein called PROTEASOME COMPONENT C7-ALPHA.

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

- Molecule 9 is a protein called PROTEASOME COMPONENT Y7.

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

- Molecule 10 is a protein called PROTEASOME COMPONENT Y13.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	C	245	Total	C	N	O	S	0	0
			1913	1207	323	380	3		

- Molecule 11 is a protein called PROTEASOME COMPONENT PRE6.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	D	242	Total	C	N	O	S	0	0
			1899	1186	333	376	4		

- Molecule 12 is a protein called PROTEASOME COMPONENT PUP2.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	E	243	Total	C	N	O	S	0	0
			1867	1165	315	380	7		

- Molecule 13 is a protein called PROTEASOME COMPONENT PRE5.

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

- Molecule 14 is a protein called PROTEASOME COMPONENT C1.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	G	245	Total	C	N	O	S	0	0
			1900	1207	331	358	4		

- Molecule 15 is a protein called 26S PROTEASE REGULATORY SUBUNIT 7 HOMOLOG.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	H	359	Total	C	N	O	S	0	0
			2792	1755	499	523	15		

- Molecule 16 is a protein called 26S PROTEASE REGULATORY SUBUNIT 4 HOMOLOG.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	I	362	Total	C	N	O	S	0	0
			2822	1773	471	563	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	361	Total	C	N	O	S	0	0
			2853	1798	507	536	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	415	Total	C	N	O	S	0	0
			3401	2166	571	655	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	353	Total	C	N	O	S	0	0
			2893	1857	482	541	13		

- 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 26S PROTEASOME REGULATORY SUBUNIT RPN11.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	V	247	Total	C	N	O	S	0	0
			1942	1225	328	376	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	19	Total	C	N	O	0	0
			168	101	30	37		

- Molecule 33 is a protein called 26S PROTEASOME REGULATORY SUBUNIT RPN1.

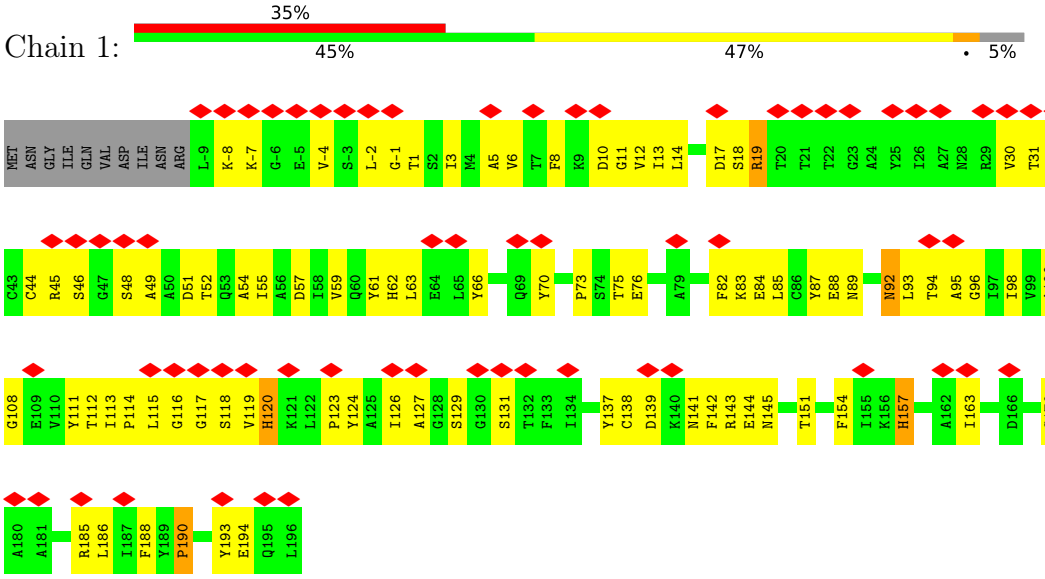
Mol	Chain	Residues	Atoms					AltConf	Trace
33	Z	813	Total	C	N	O	S	0	0
			6289	3995	1029	1236	29		

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.

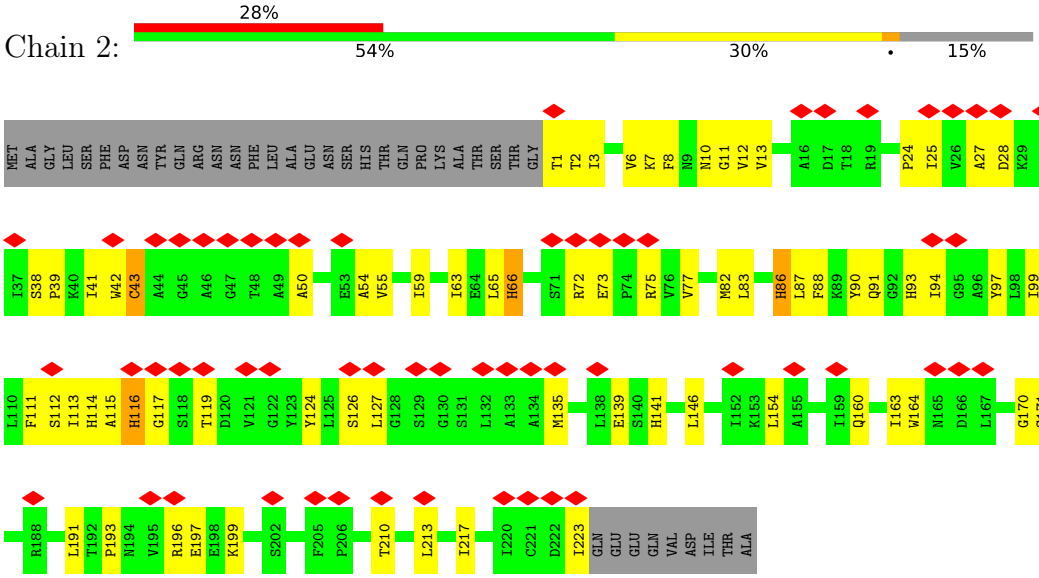
• Molecule 1: PROTEASOME COMPONENT PRE3

Chain 1:



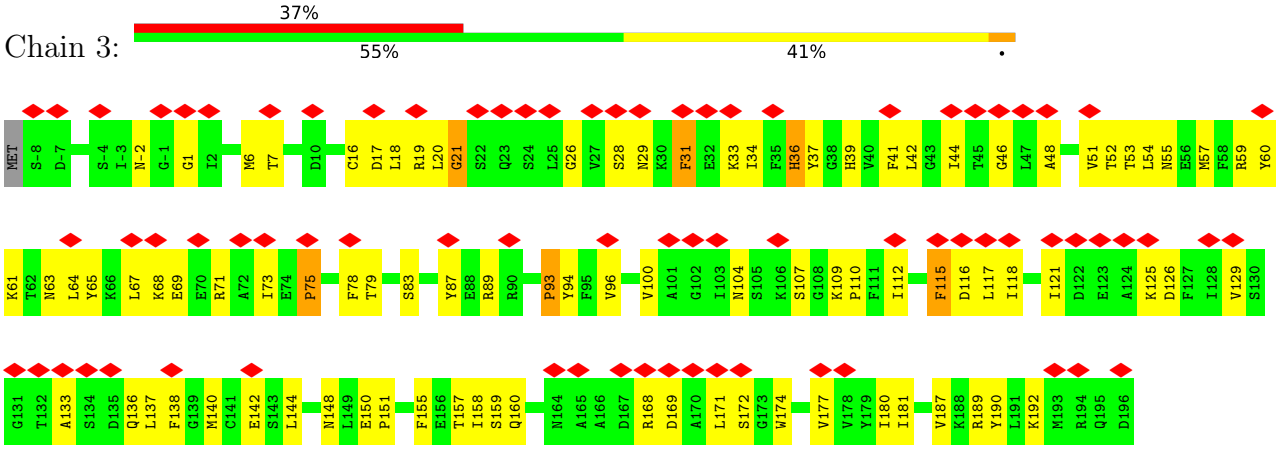
• Molecule 2: PROTEASOME COMPONENT PUP1

Chain 2:



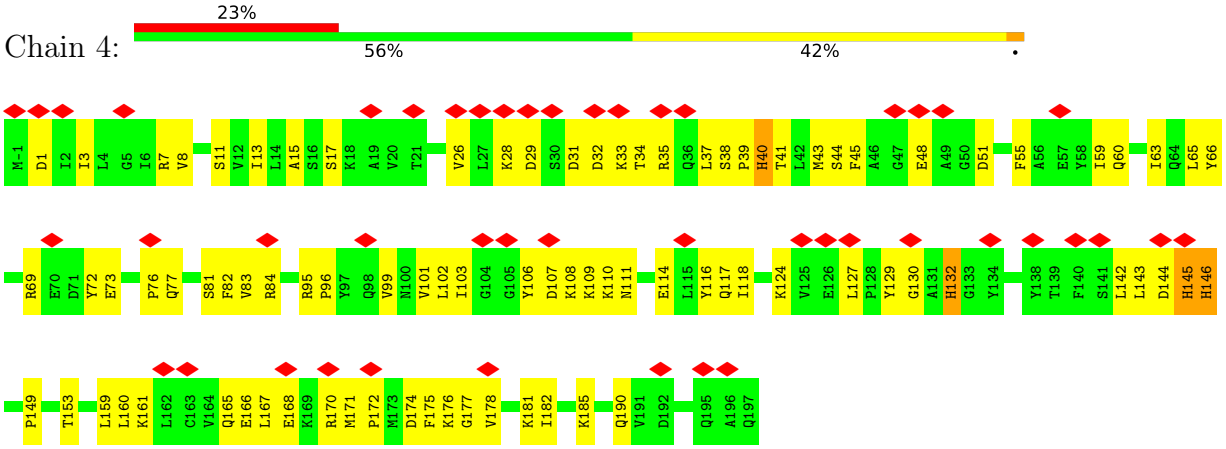
• Molecule 3: PROTEASOME COMPONENT PUP3

Chain 3:



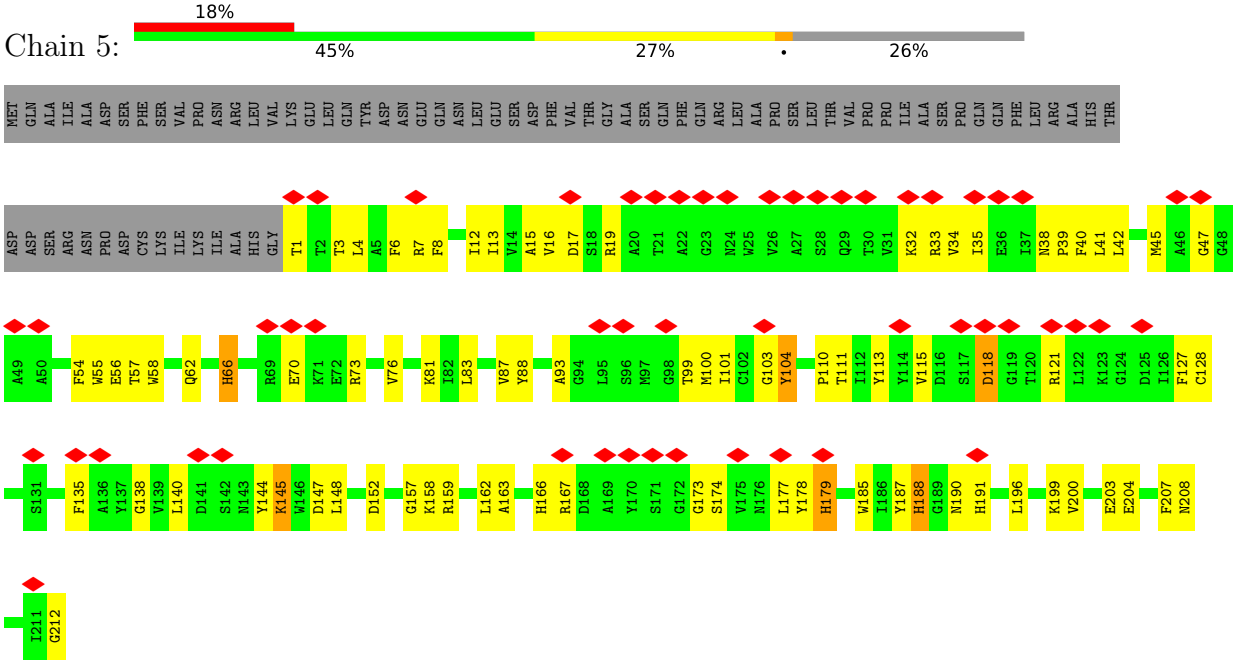
• Molecule 4: PROTEASOME COMPONENT C11

Chain 4:



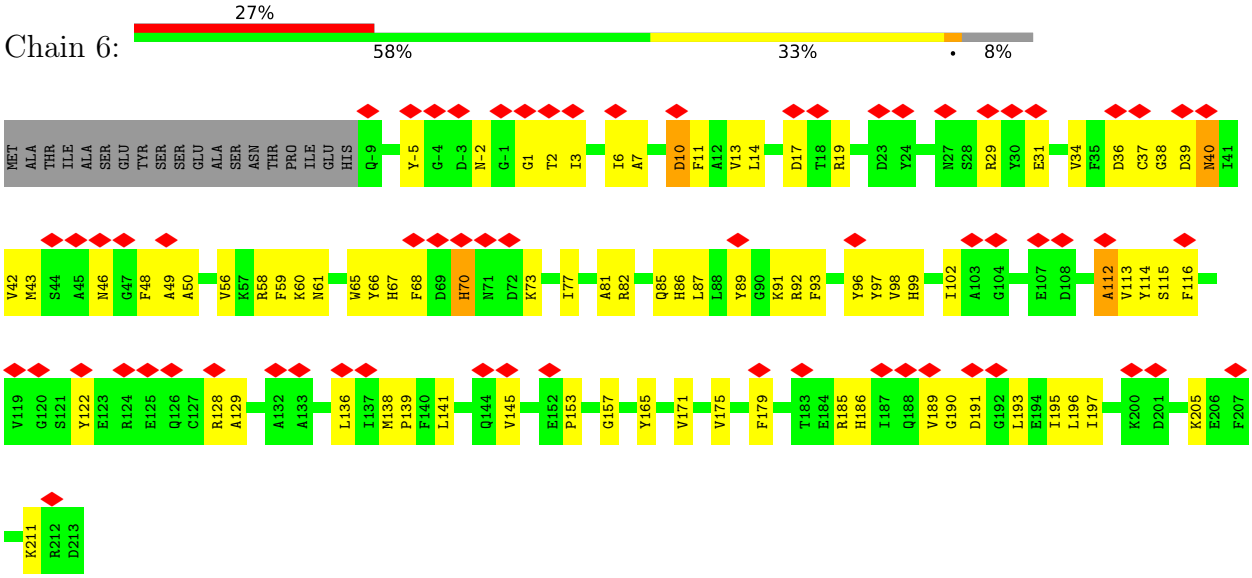
• Molecule 5: PROTEASOME COMPONENT PRE2

Chain 5:



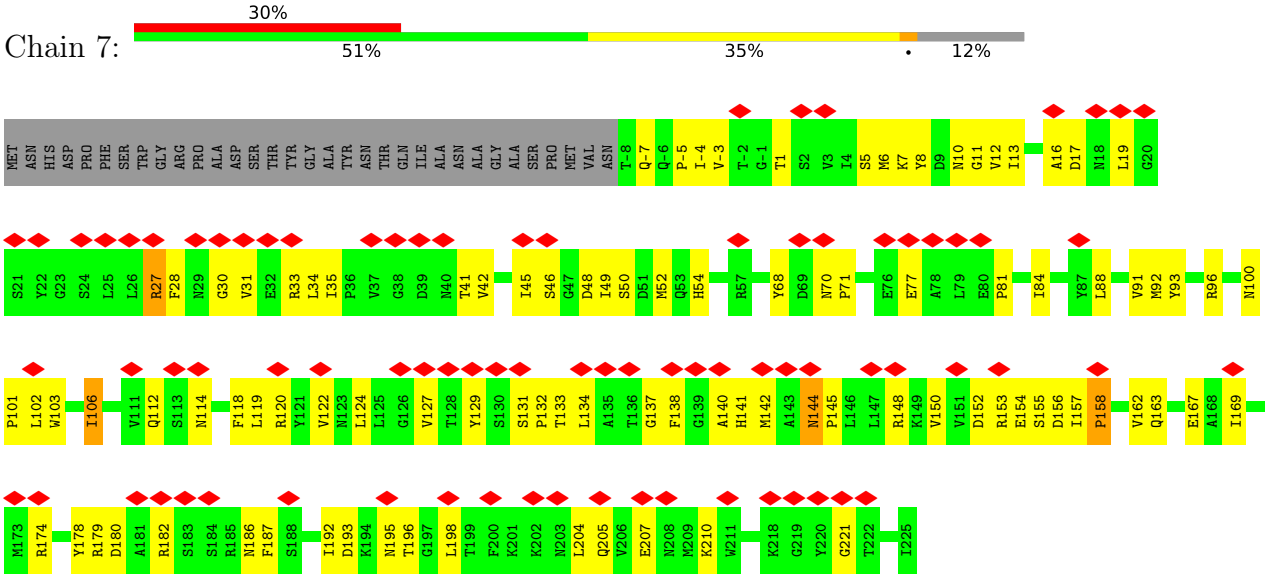
• Molecule 6: PROTEASOME COMPONENT C5

Chain 6:



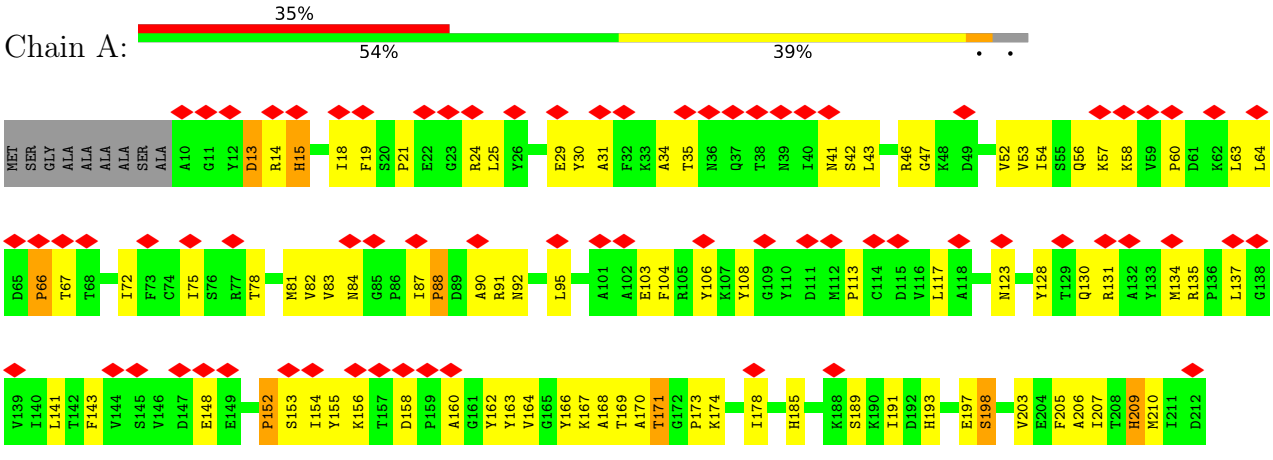
• Molecule 7: PROTEASOME COMPONENT PRE4

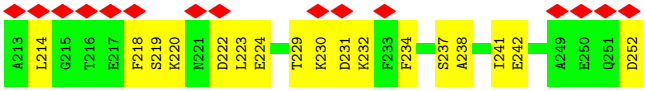
Chain 7:



• Molecule 8: PROTEASOME COMPONENT C7-ALPHA

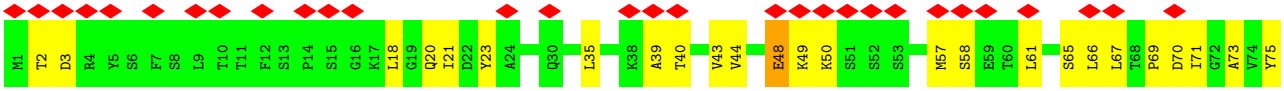
Chain A:

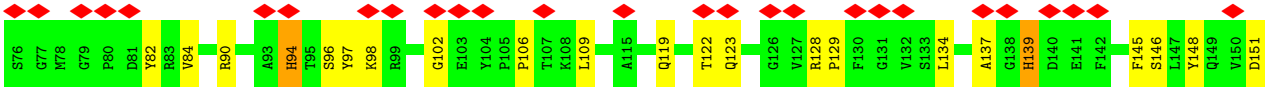


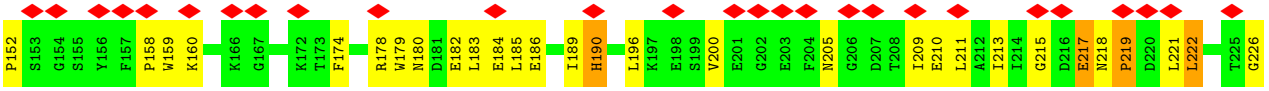


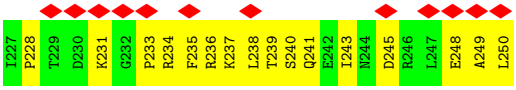
• Molecule 9: PROTEASOME COMPONENT Y7

Chain B:



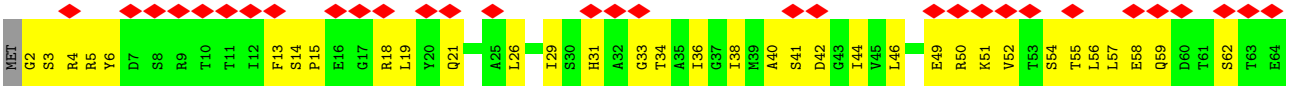


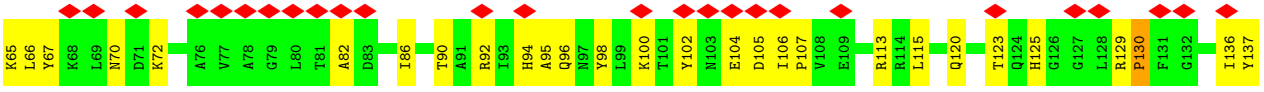


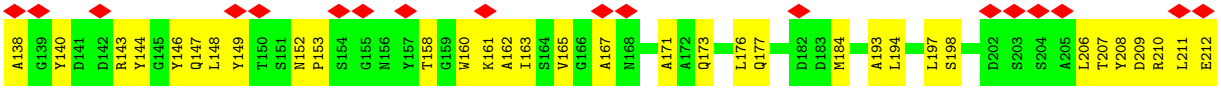


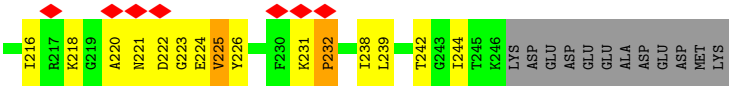
• Molecule 10: PROTEASOME COMPONENT Y13

Chain C:



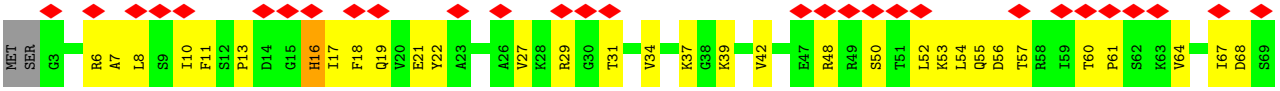


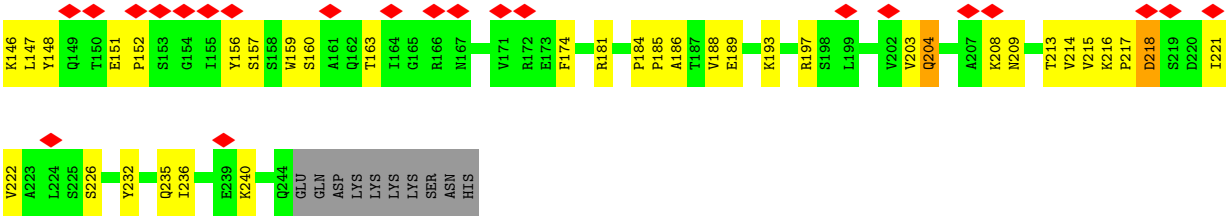




• Molecule 11: PROTEASOME COMPONENT PRE6

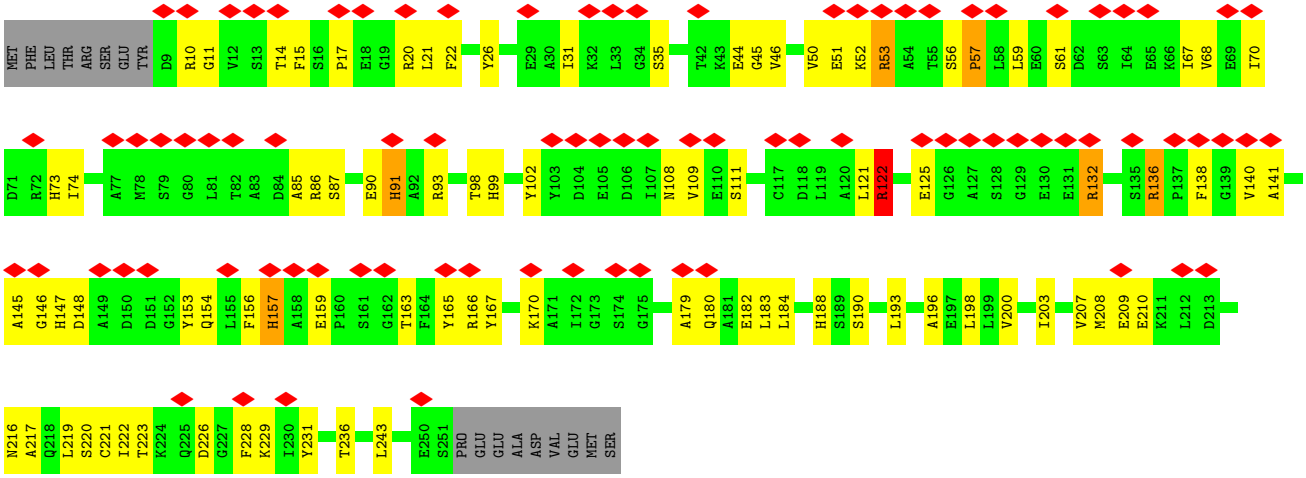
Chain D:





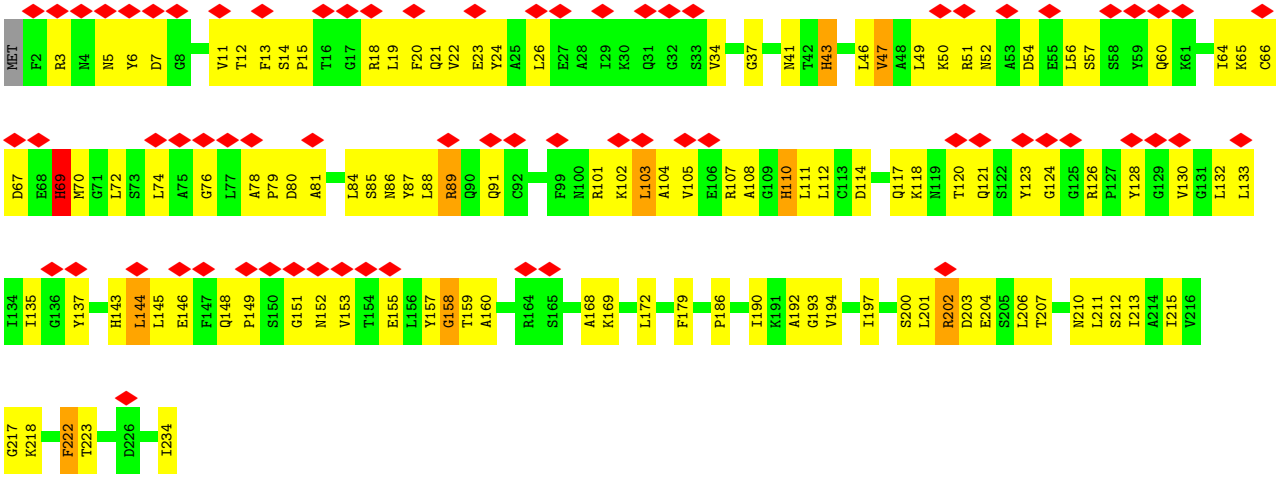
• Molecule 12: PROTEASOME COMPONENT PUP2

Chain E:



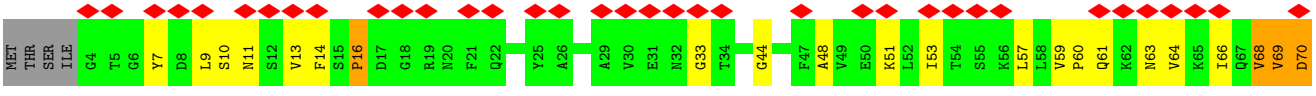
• Molecule 13: PROTEASOME COMPONENT PRE5

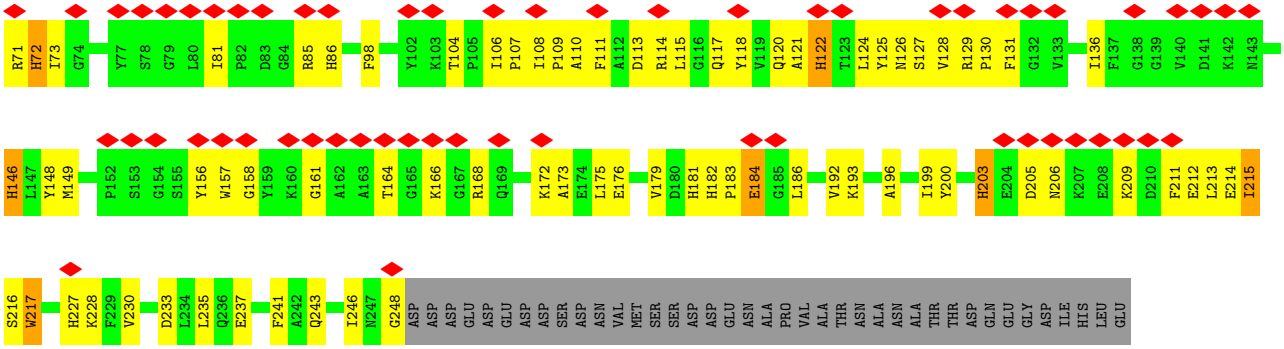
Chain F:



• Molecule 14: PROTEASOME COMPONENT C1

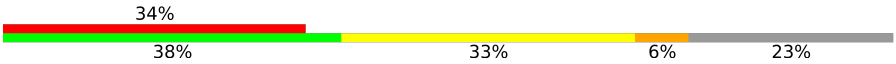
Chain G:

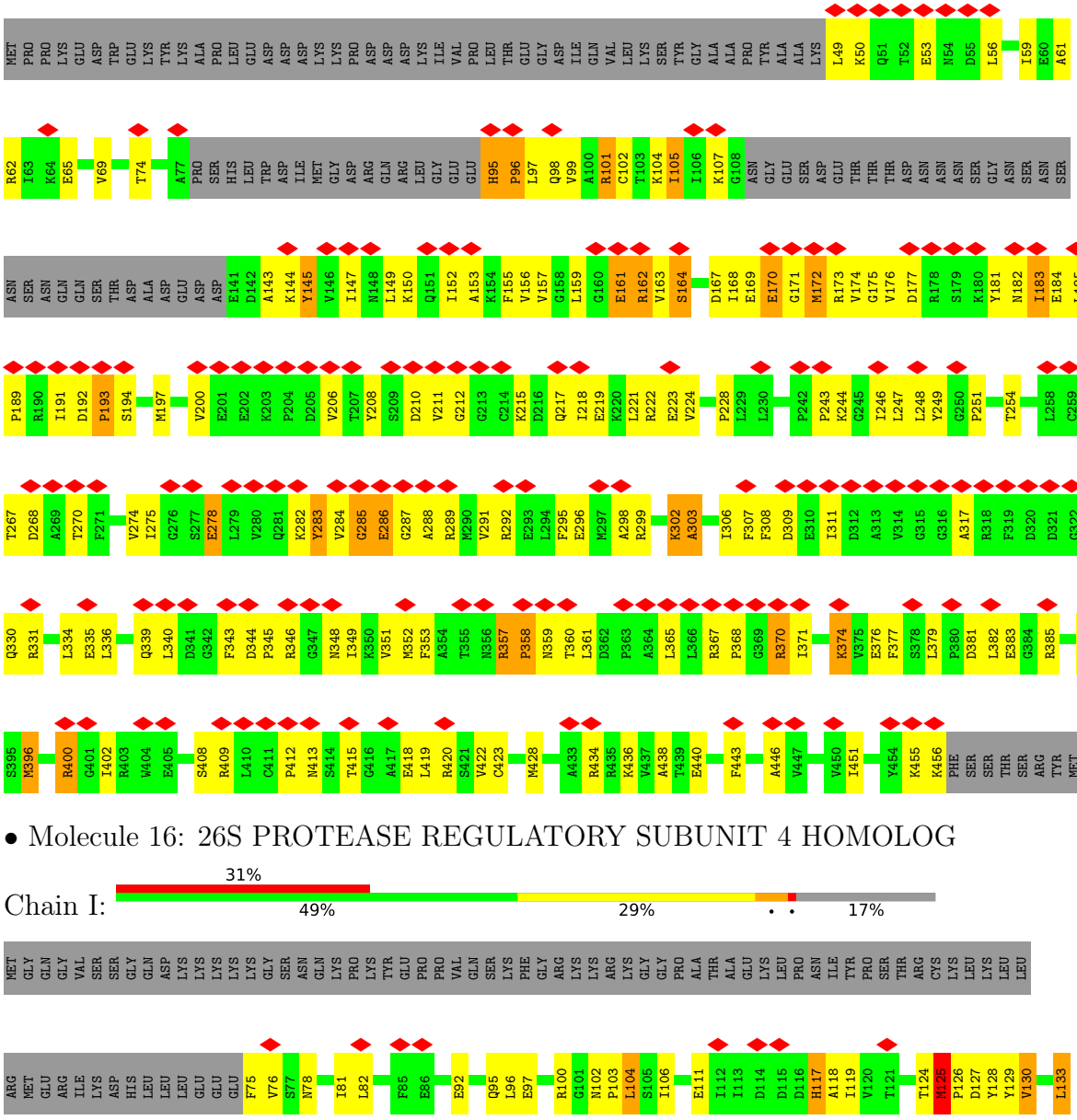




• Molecule 15: 26S PROTEASE REGULATORY SUBUNIT 7 HOMOLOG

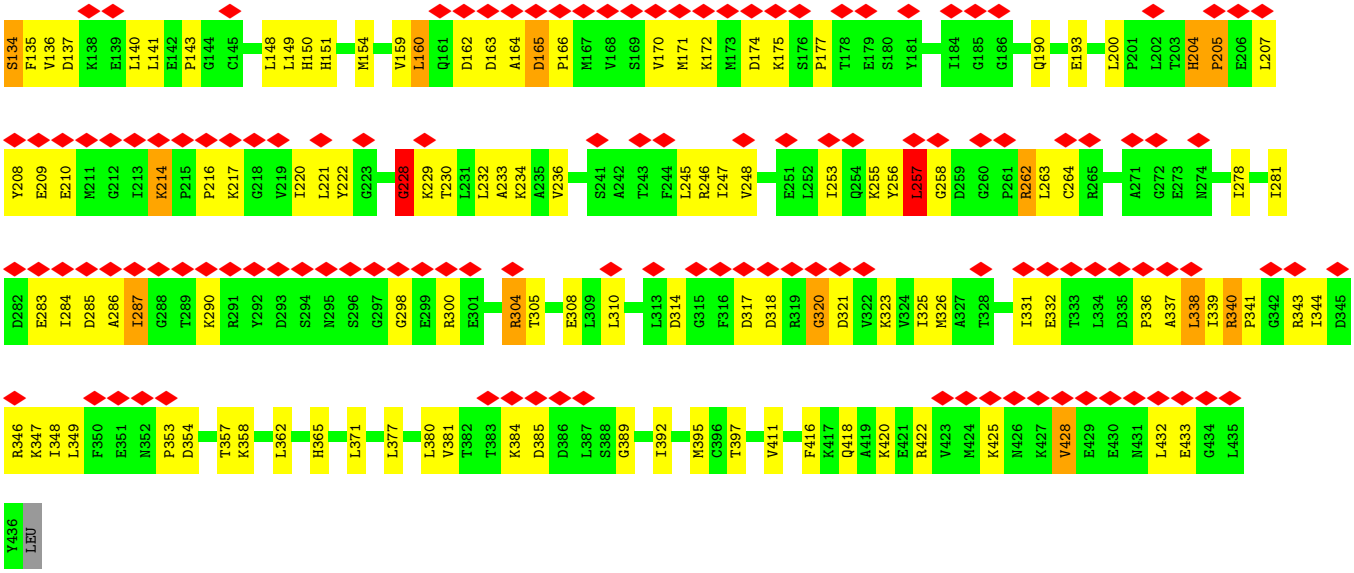
Chain H:





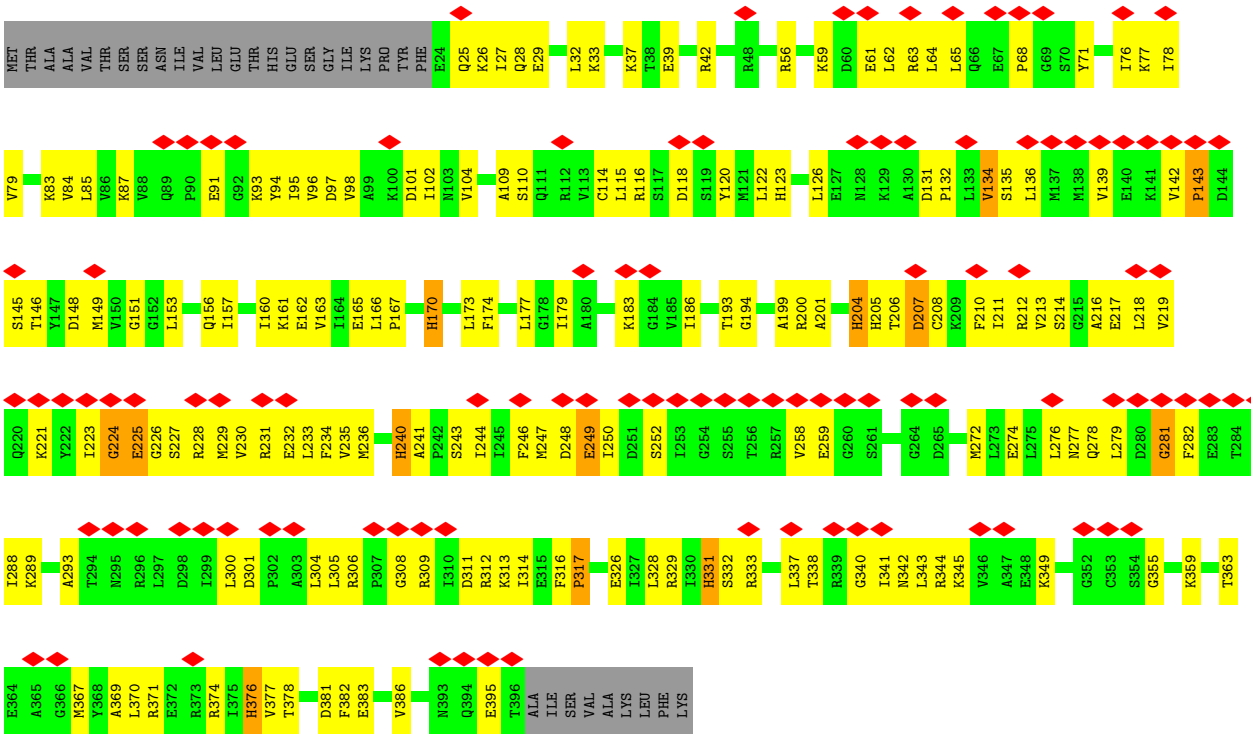
• Molecule 16: 26S PROTEASE REGULATORY SUBUNIT 4 HOMOLOG

Chain I:



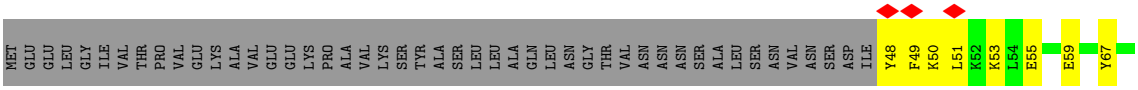
• Molecule 17: 26S PROTEASE REGULATORY SUBUNIT 8 HOMOLOG

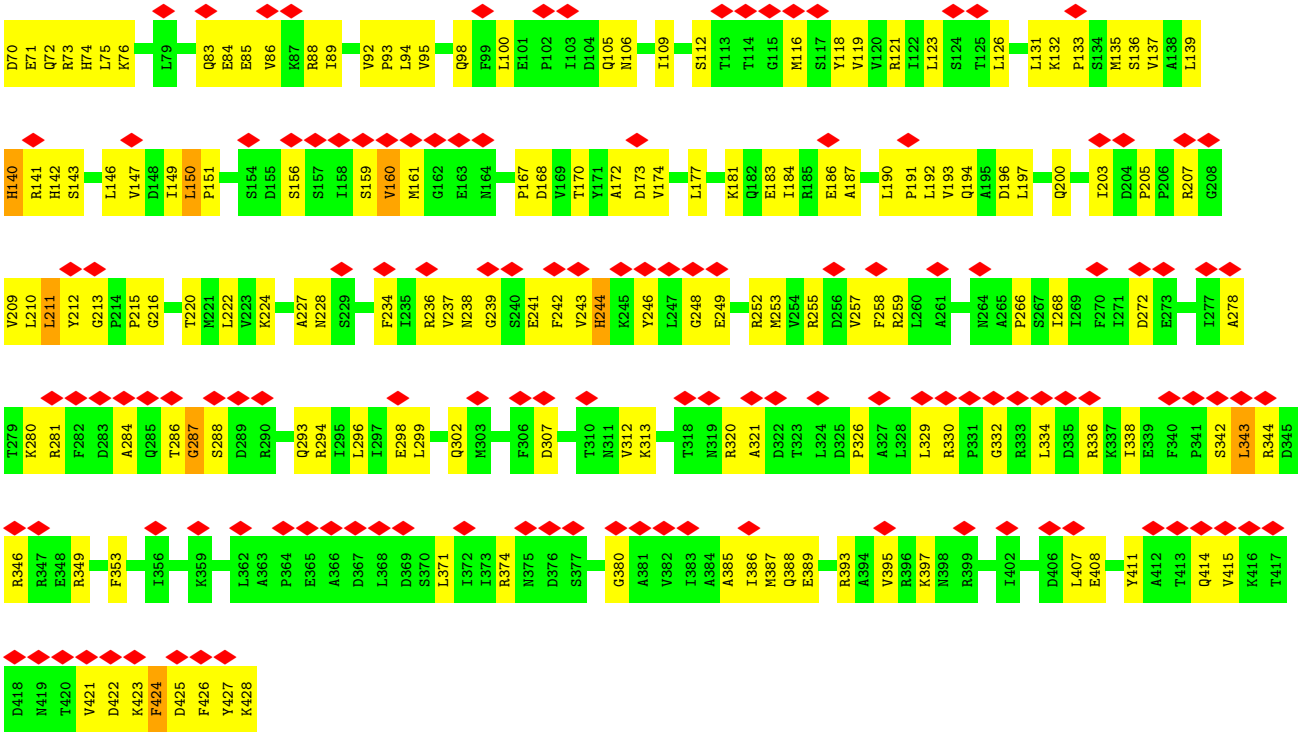
Chain J:



• Molecule 18: 26S PROTEASE REGULATORY SUBUNIT 6B HOMOLOG

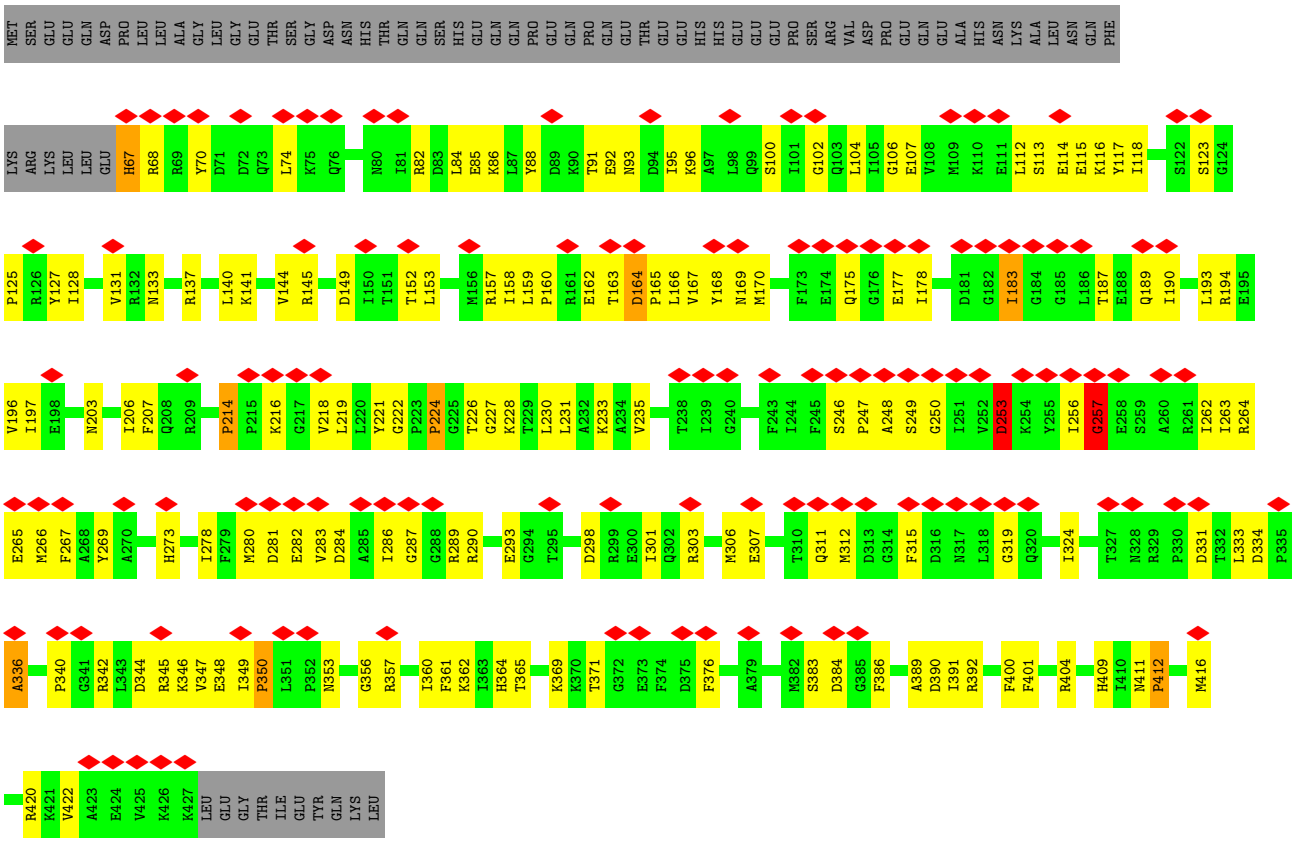
Chain K:





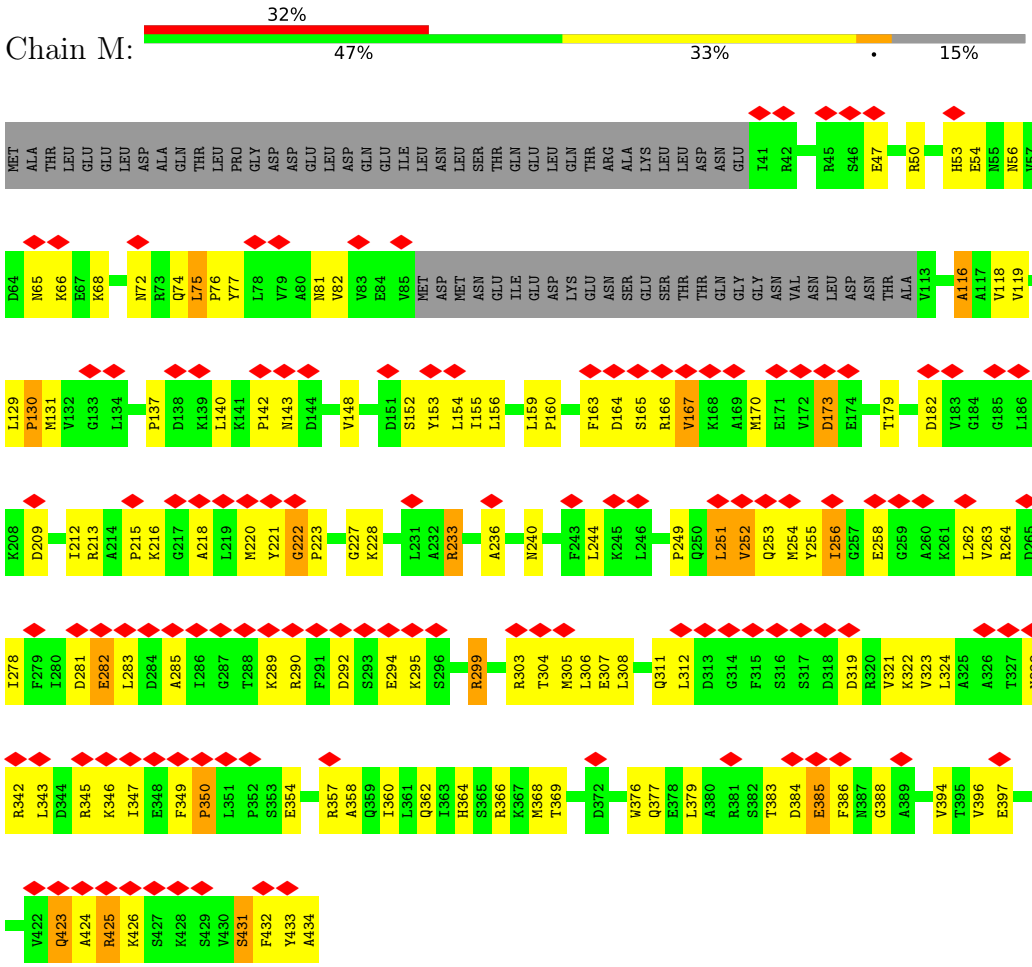
• Molecule 19: 26S PROTEASE SUBUNIT RPT4

Chain L:



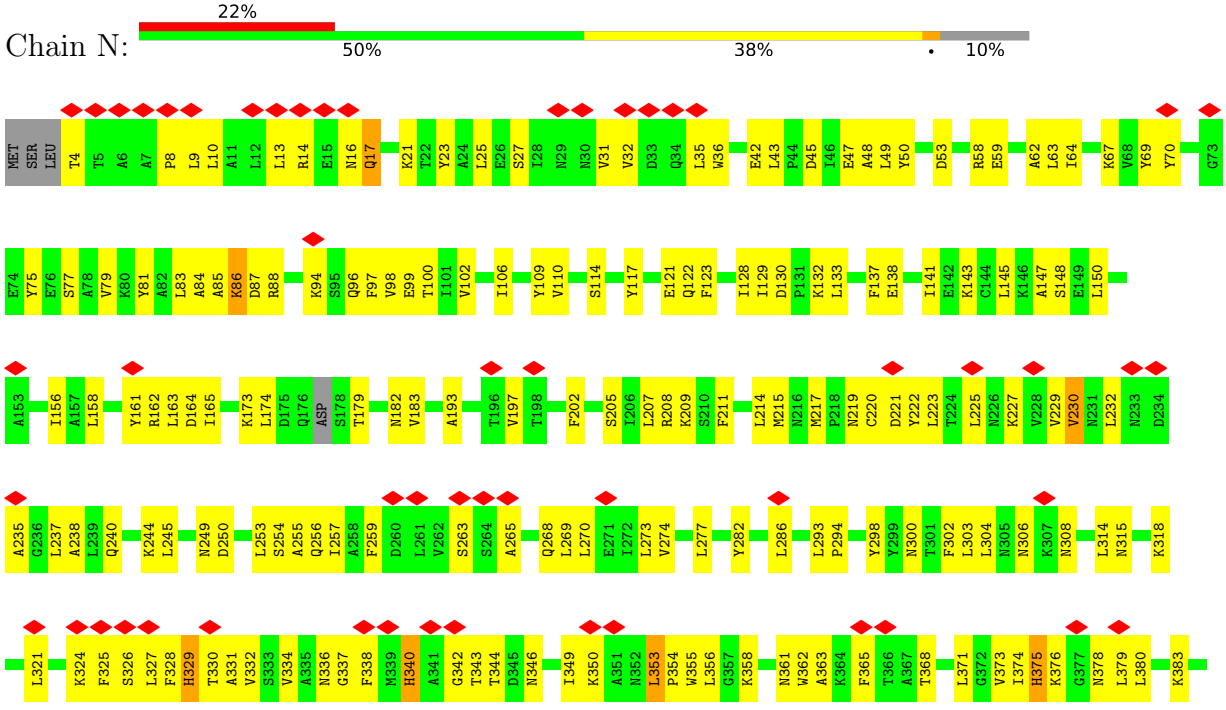
• Molecule 20: 26S PROTEASE REGULATORY SUBUNIT 6A

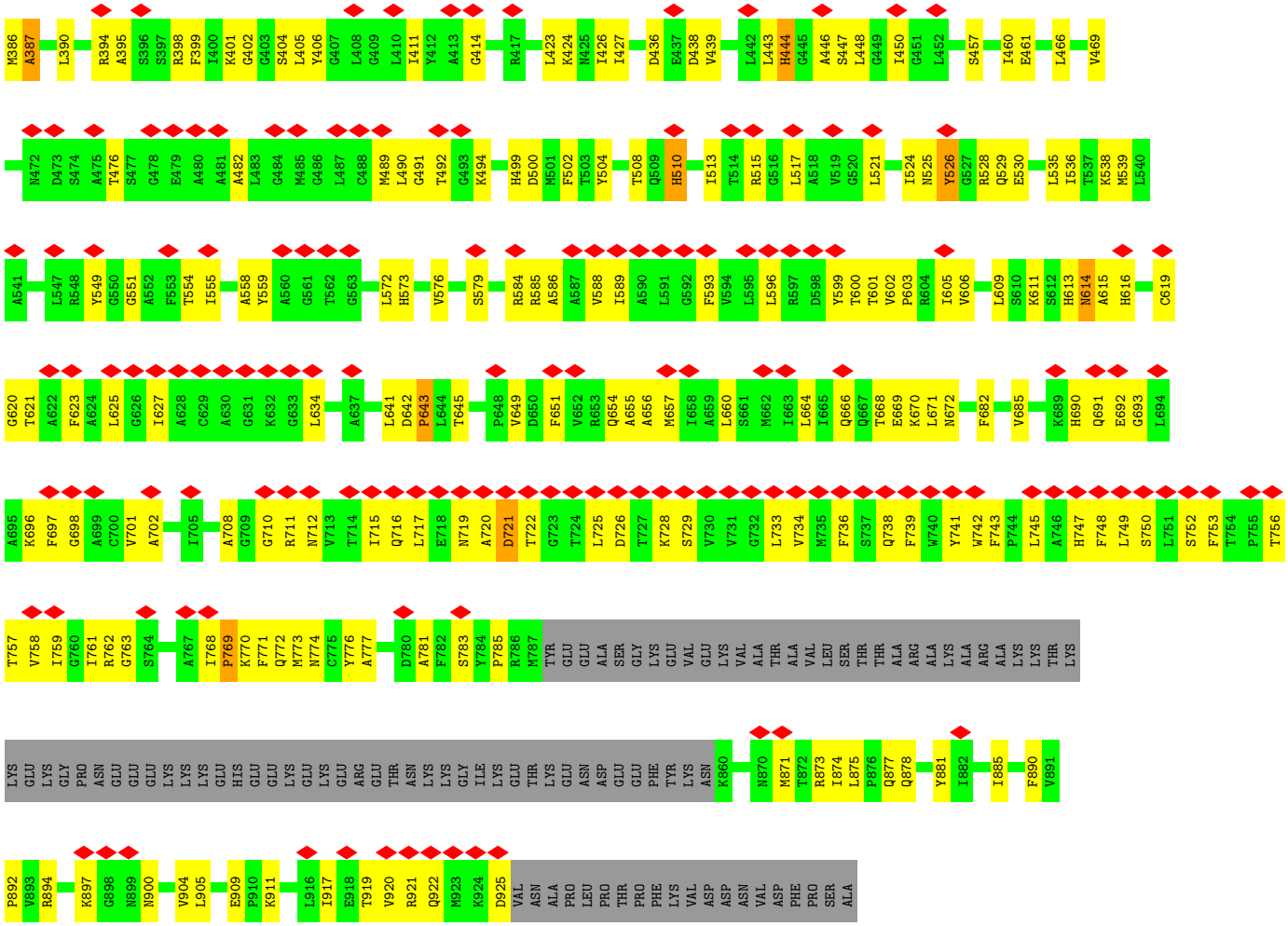
Chain M:



• Molecule 21: 26S PROTEASOME REGULATORY SUBUNIT RPN2

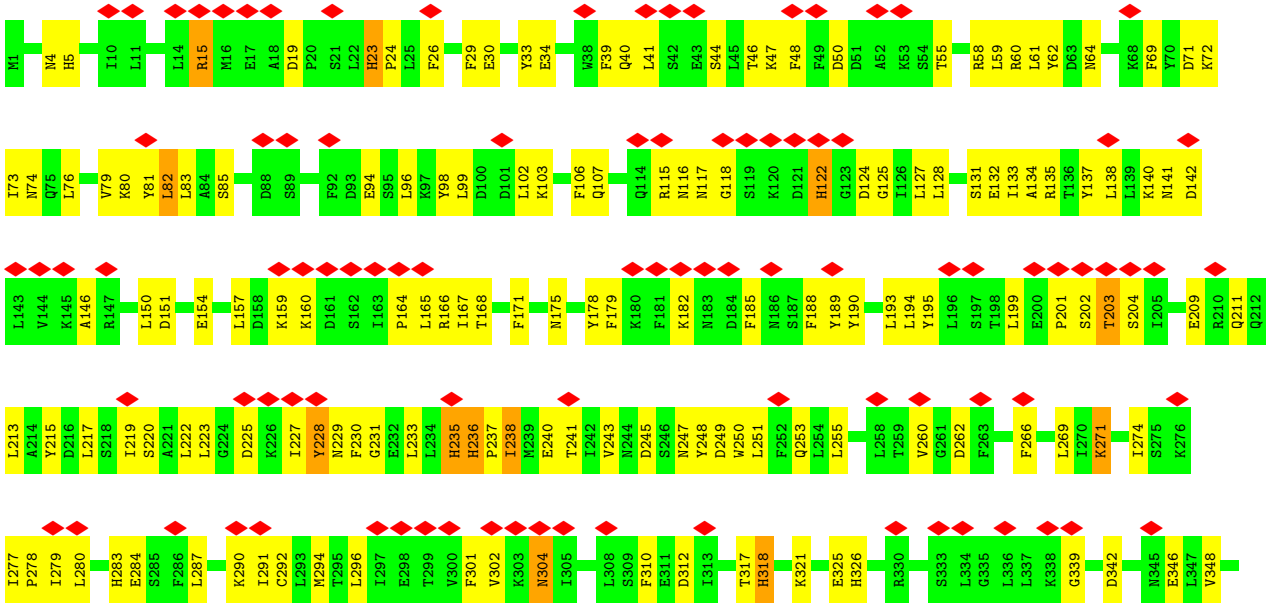
Chain N:

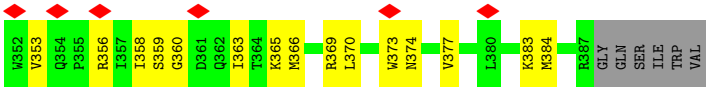




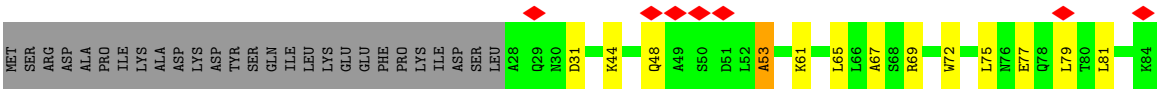
• Molecule 22: 26S PROTEASOME REGULATORY SUBUNIT RPN9

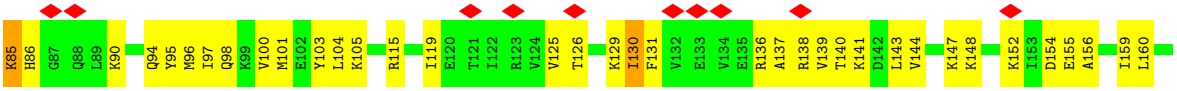
Chain O:

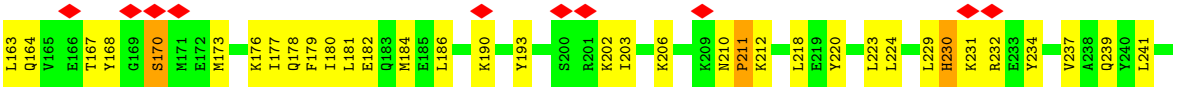


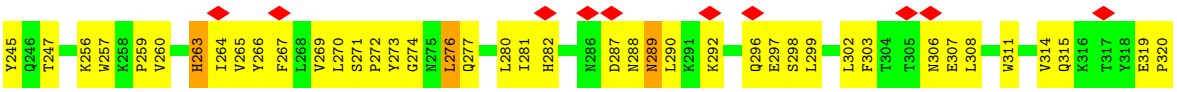


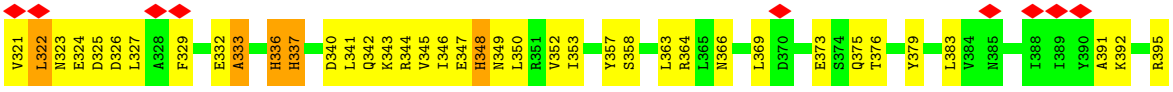
• Molecule 23: 26S PROTEASOME REGULATORY SUBUNIT RPN5

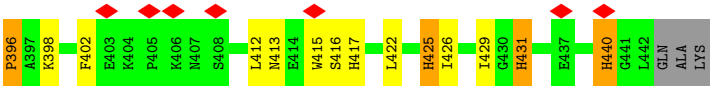




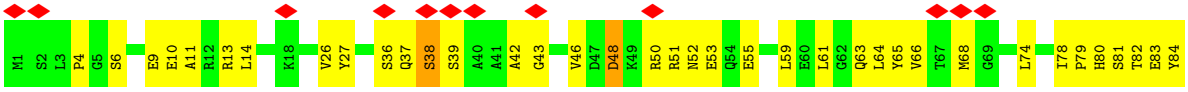


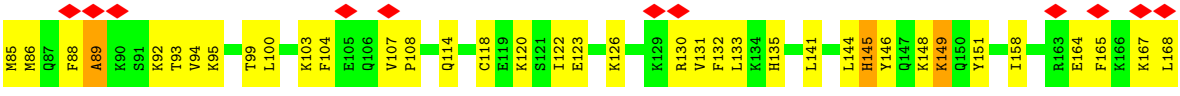


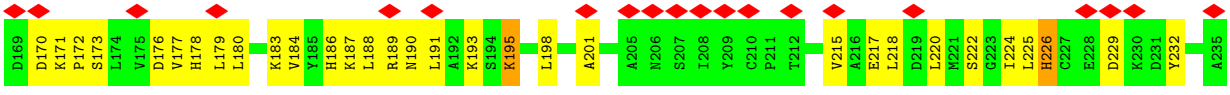


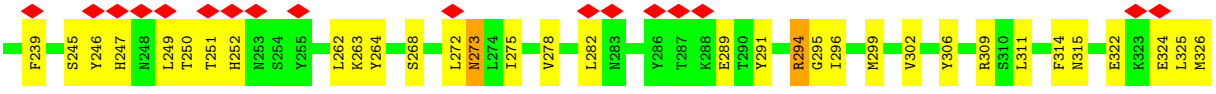


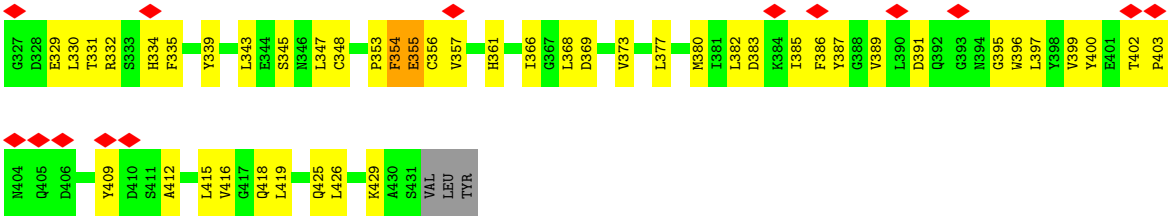
• Molecule 24: 26S PROTEASOME REGULATORY SUBUNIT RPN6





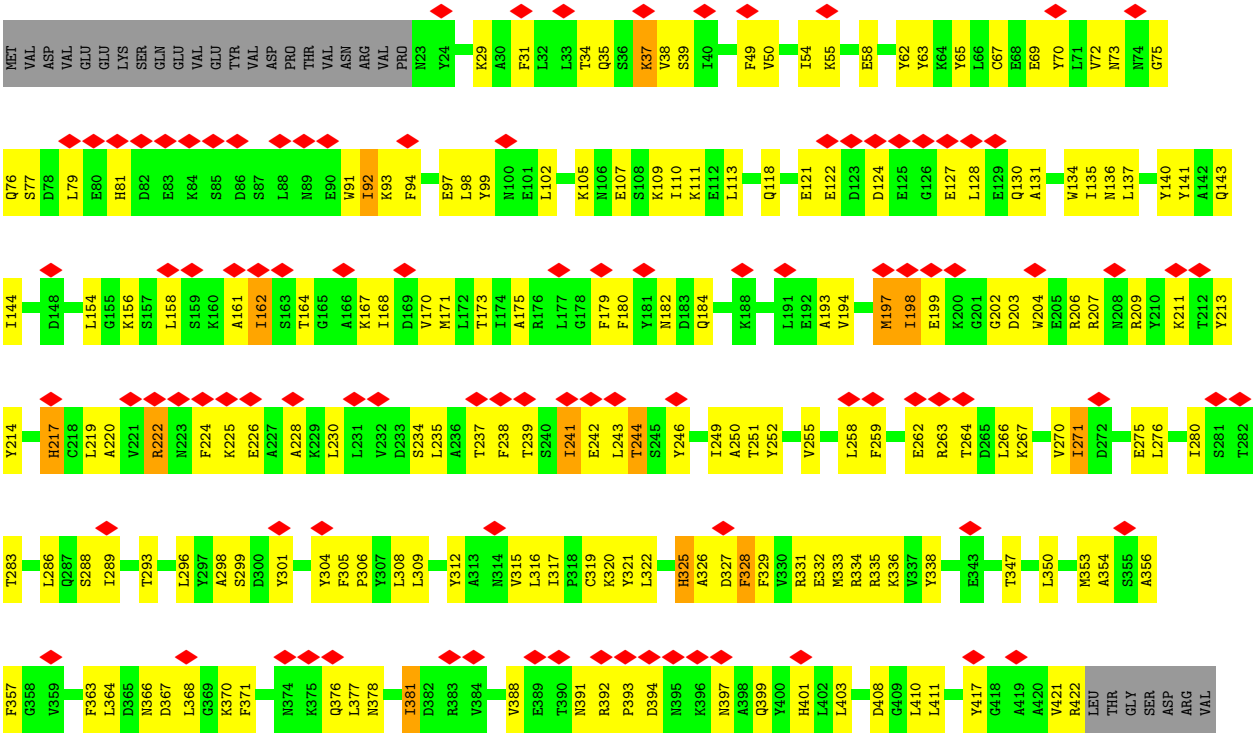






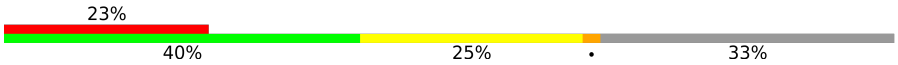
• Molecule 25: 26S PROTEASOME REGULATORY SUBUNIT RPN7

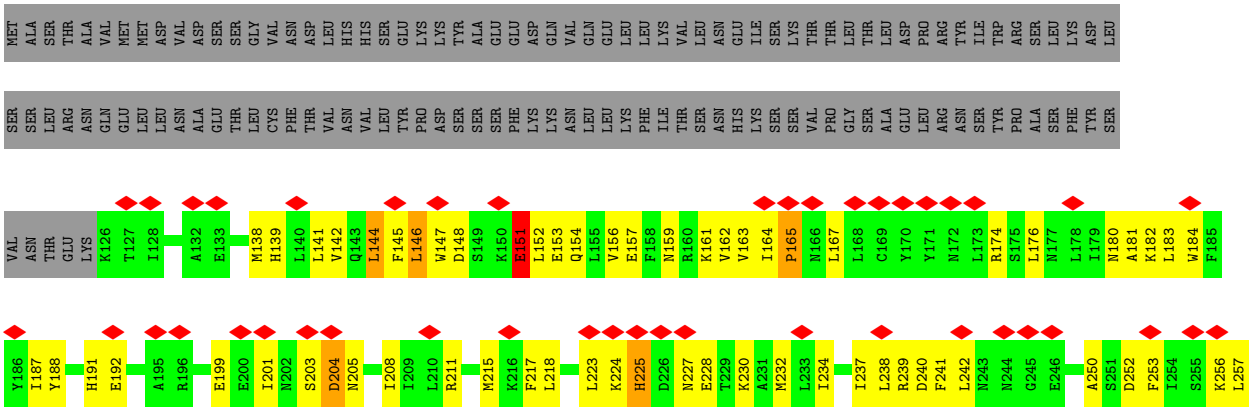
Chain R:

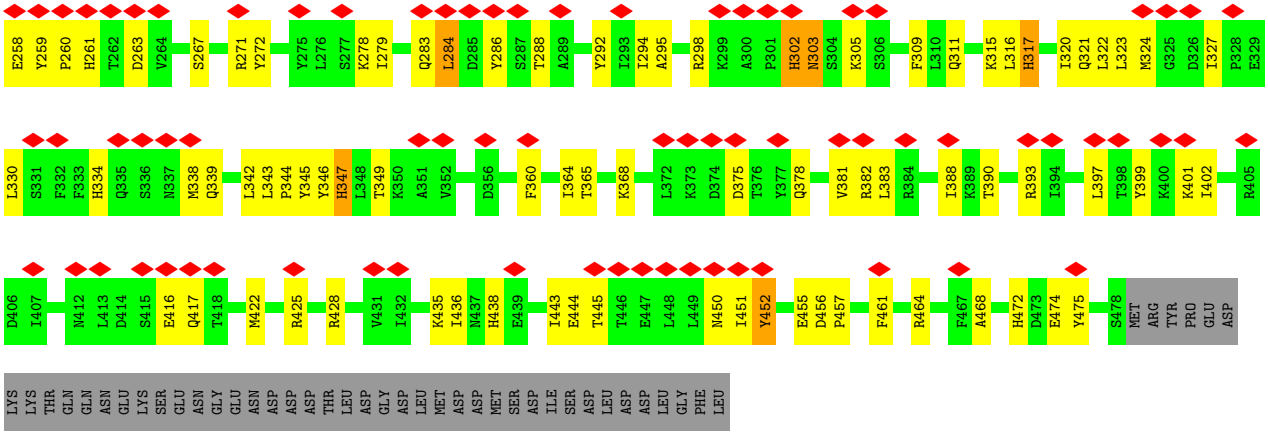


• Molecule 26: 26S PROTEASOME REGULATORY SUBUNIT RPN3

Chain S:

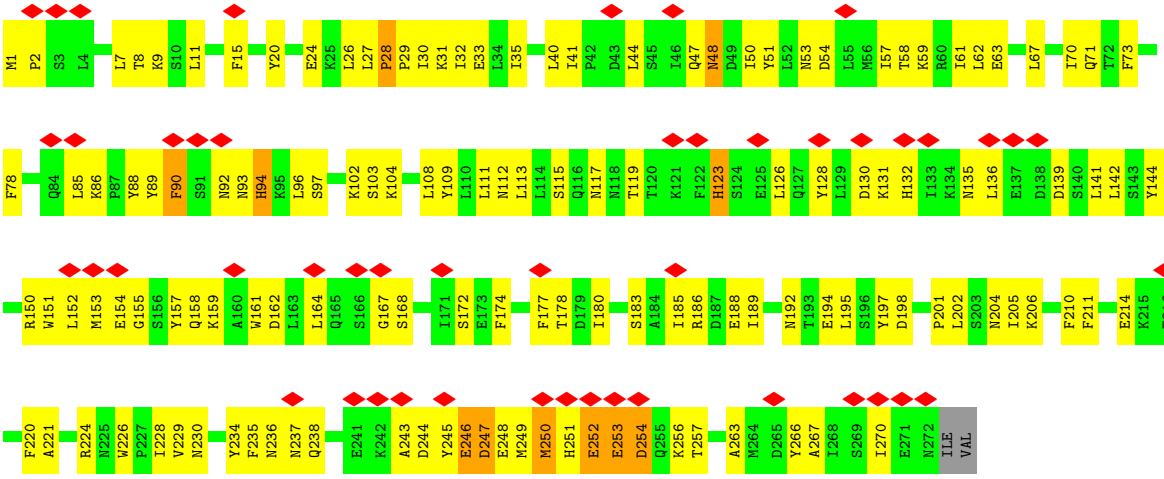






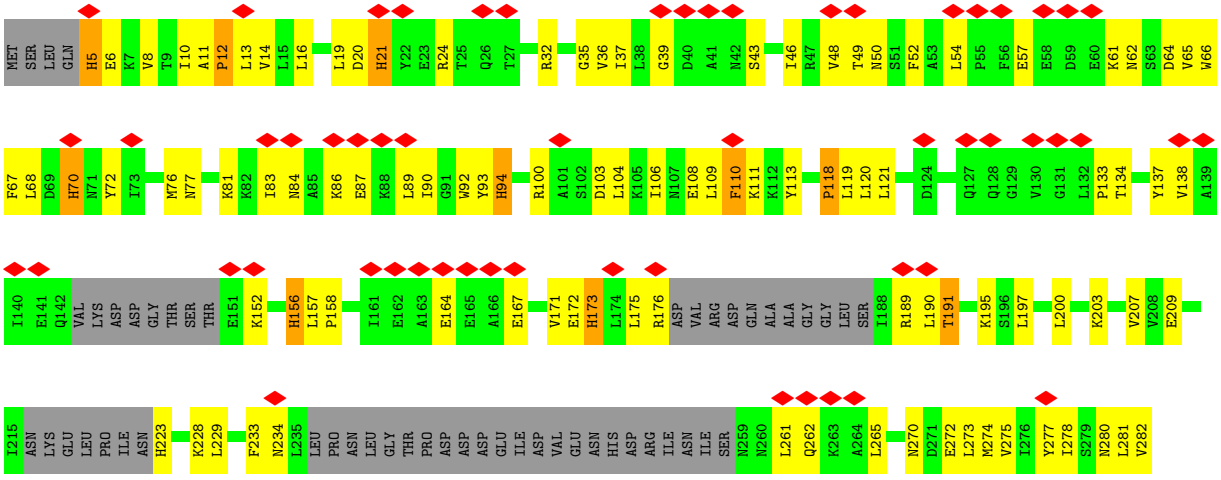
• Molecule 27: 26S PROTEASOME REGULATORY SUBUNIT RPN12

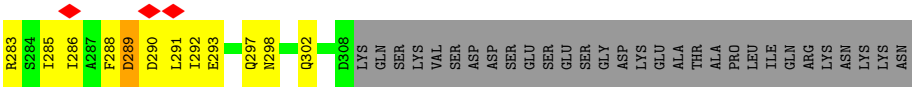
Chain T:



• Molecule 28: 26S PROTEASOME REGULATORY SUBUNIT RPN8

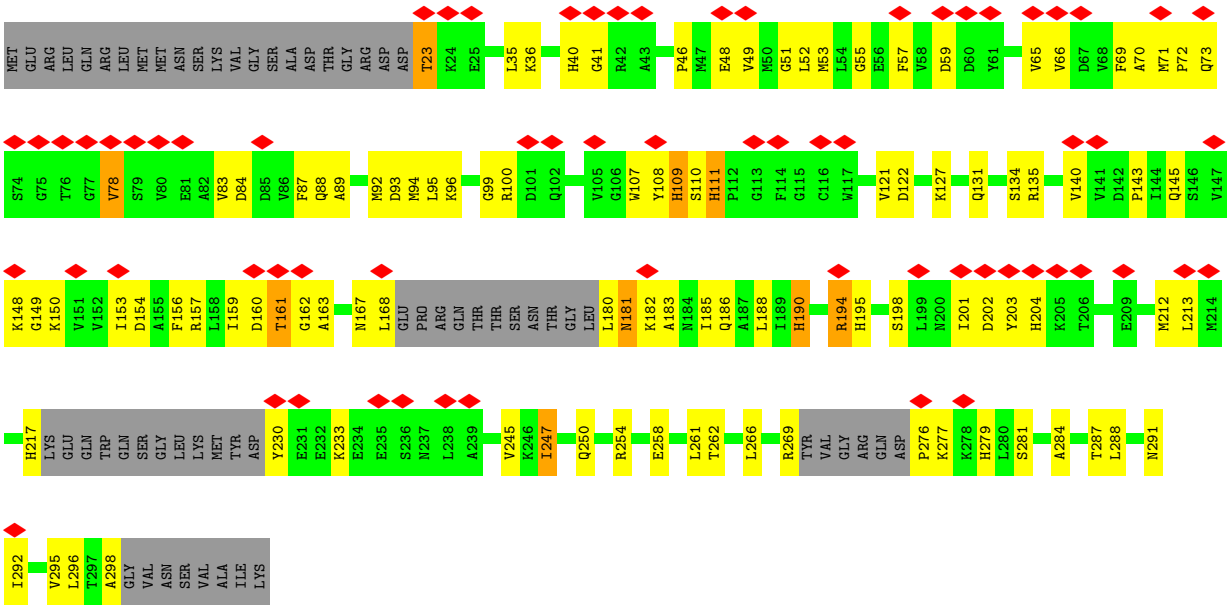
Chain U:





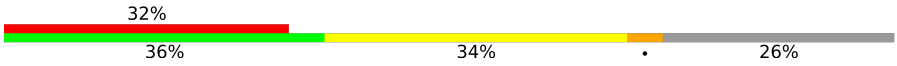
• Molecule 29: 26S PROTEASOME REGULATORY SUBUNIT RPN11

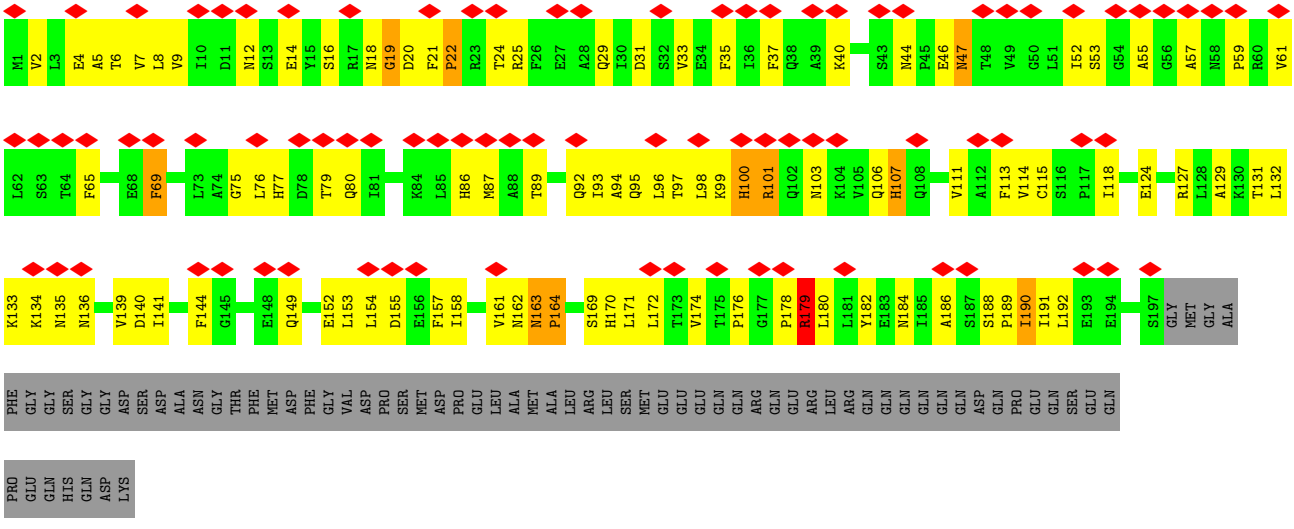
Chain V:



• Molecule 30: 26S PROTEASOME REGULATORY SUBUNIT RPN10

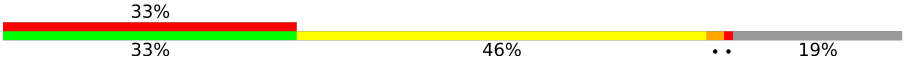
Chain W:

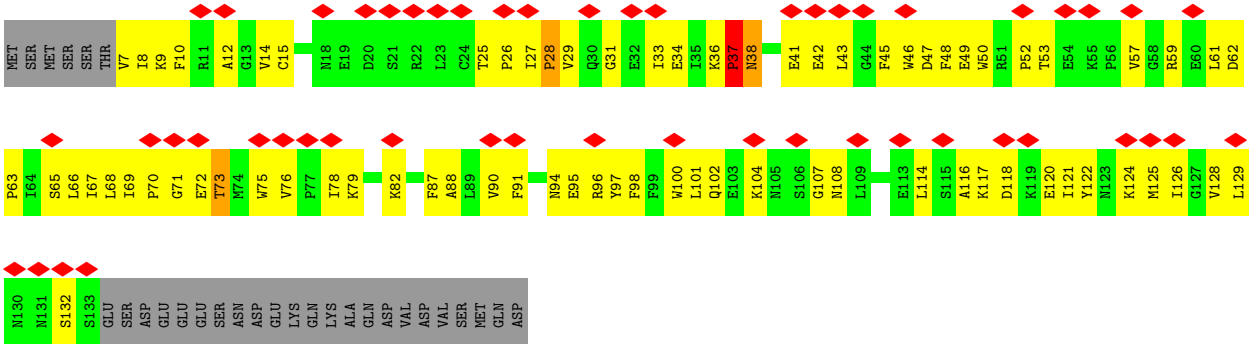




• Molecule 31: 26S PROTEASOME REGULATORY SUBUNIT RPN13

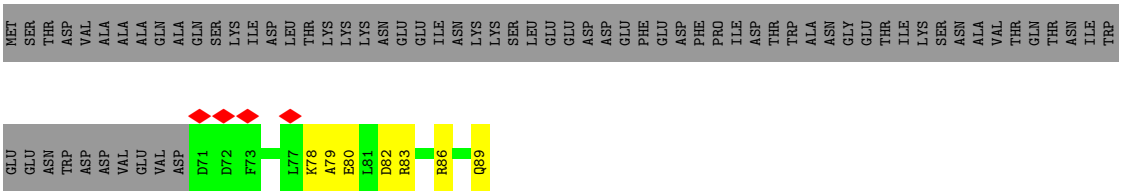
Chain X:





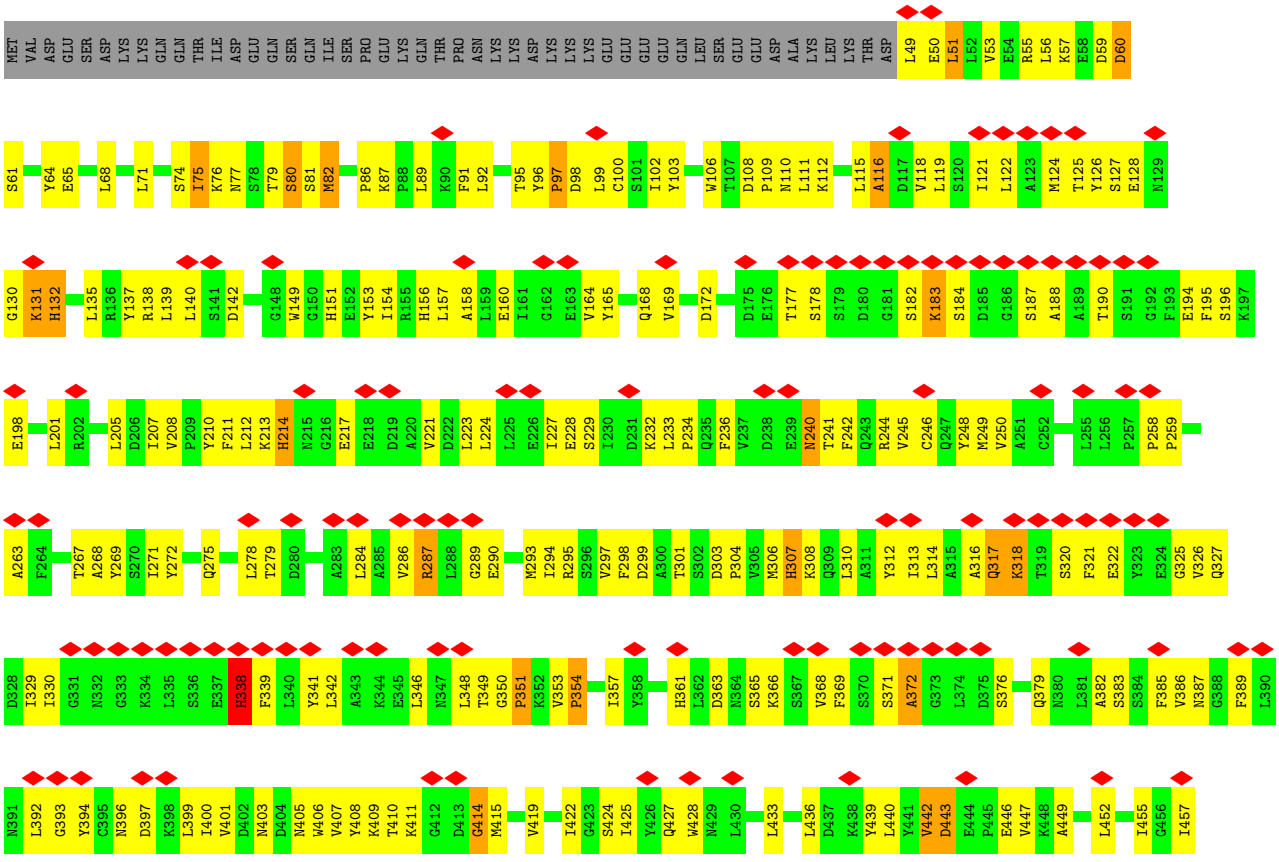
• Molecule 32: 26S PROTEASOME COMPLEX SUBUNIT SEM1

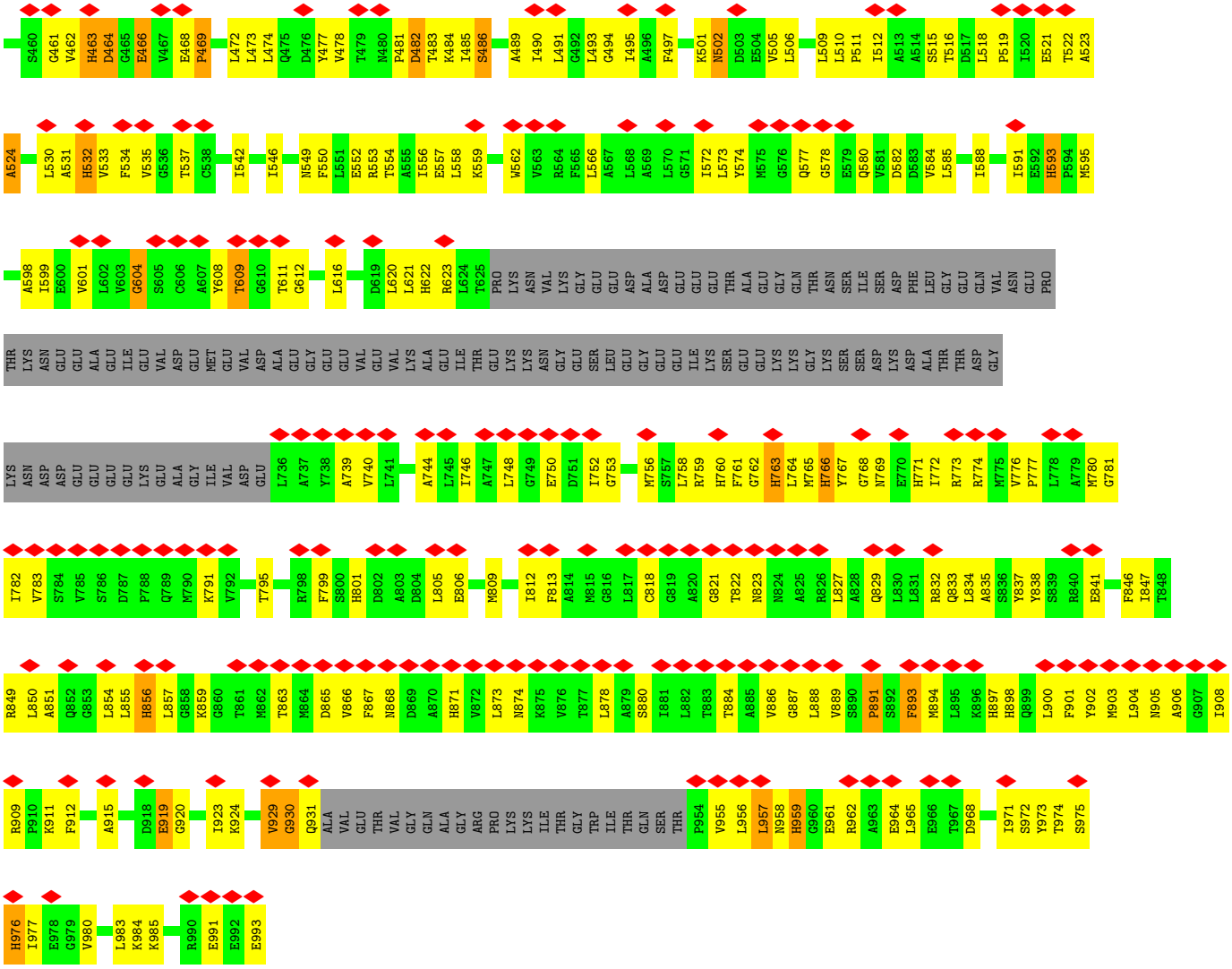
Chain Y:



• Molecule 33: 26S PROTEASOME REGULATORY SUBUNIT RPN1

Chain Z:




S460 G461 V462 H463 D464 G465 E466 V467 E468 P469 L472 L473 L474 Q475 D476 Y477 V478 T479 N480 P481 D482 T483 K484 I485 S486 A489 I490 L491 G492 L493 G494 I495 A496 F497 K501 N502 D503 E504 V505 L506 L509 L510 P511 I512 A513 A514 S515 T516 D517 L518 P519 I520 E521 T522 A523
A524 L530 A531 H532 V533 F534 V535 G536 T537 C538 I542 I546 N549 F550 L551 E552 R553 T554 A555 I556 E557 L558 K559 W562 V563 R564 F565 L566 A567 L568 A569 L570 G571 I572 L573 Y574 M575 G576 Q577 G578 E579 Q580 V581 D582 D583 V584 L585 I588 I591 E592 H593 P594 M595
A598 I599 E600 V601 L602 V603 G604 S605 C606 A607 Y608 T609 G610 T611 G612 L616 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 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 A744 L745 I746 A747 L748 G749 E750 D751 I752 G753 M756 S757 L758 R759 H760 F761 G762 H763 L764 M765 H766 Y767 G768 N769 E770 H771 I772 R773 R774 M775 V776 P777 L778 A779 M780 G781
I782 V783 S784 V785 S786 D787 P788 Q789 M790 K791 V792 T795 R798 F799 S800 H801 D802 A803 D804 L805 E806 M809 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 F846 I847 T848
R849 L850 A851 Q852 G853 L854 L855 H856 L857 G858 K859 G860 T861 M862 T863 M864 D865 V866 F867 N868 D869 A870 H871 V872 L873 N874 K875 V876 T877 L878 A879 S880 I881 L882 T883 T884 A885 V886 G887 L888 V889 S890 P891 S892 F893 M894 L895 K896 H897 H898 Q899 L900 F901 Y902 M903 L904 N905 A906 G907 I908
R909 P910 K911 F912 A915 D918 E919 G920 I923 K924 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 E964 L965 E966 T967 D968 I971 S972 Y973 T974 S975
H976 I977 E978 G979 V980 L983 K984 K985 R990 E991 E992 E993

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	1300000	Depositor
Resolution determination method	Not provided	
CTF correction method	MICROGRAPH	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/Å^2$)	25	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	3500	Depositor
Magnification	Not provided	
Image detector	TVIPS TEMCAM-F816 (8k x 8k)	Depositor
Maximum map value	6.242	Depositor
Minimum map value	-4.111	Depositor
Average map value	0.010	Depositor
Map value standard deviation	0.157	Depositor
Recommended contour level	0.74	Depositor
Map size (Å)	557.2, 557.2, 557.2	wwPDB
Map dimensions	280, 280, 280	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.99, 1.99, 1.99	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	1.19	7/1605 (0.4%)	1.18	2/2171 (0.1%)
2	2	1.20	10/1723 (0.6%)	1.23	3/2337 (0.1%)
3	3	1.17	7/1611 (0.4%)	1.16	0/2174
4	4	1.17	7/1613 (0.4%)	1.17	1/2173 (0.0%)
5	5	1.18	9/1683 (0.5%)	1.13	2/2277 (0.1%)
6	6	1.16	7/1795 (0.4%)	1.17	2/2420 (0.1%)
7	7	1.16	7/1855 (0.4%)	1.17	3/2514 (0.1%)
8	A	1.20	10/1959 (0.5%)	1.16	1/2652 (0.0%)
9	B	1.23	9/1952 (0.5%)	1.17	3/2642 (0.1%)
10	C	1.14	6/1943 (0.3%)	1.20	0/2629
11	D	1.16	6/1928 (0.3%)	1.21	2/2610 (0.1%)
12	E	1.23	11/1892 (0.6%)	1.23	4/2549 (0.2%)
13	F	1.17	8/1823 (0.4%)	1.21	4/2463 (0.2%)
14	G	1.24	12/1940 (0.6%)	1.20	3/2619 (0.1%)
15	H	1.12	8/2831 (0.3%)	1.23	13/3808 (0.3%)
16	I	1.14	11/2859 (0.4%)	1.16	10/3853 (0.3%)
17	J	1.19	13/2963 (0.4%)	1.17	4/3978 (0.1%)
18	K	1.15	12/3061 (0.4%)	1.19	7/4129 (0.2%)
19	L	1.18	11/2896 (0.4%)	1.27	9/3895 (0.2%)
20	M	1.18	12/2903 (0.4%)	1.26	15/3909 (0.4%)
21	N	1.12	19/6670 (0.3%)	1.13	12/9023 (0.1%)
22	O	1.09	13/3243 (0.4%)	1.10	1/4374 (0.0%)
23	P	1.04	12/3452 (0.3%)	1.11	1/4657 (0.0%)
24	Q	1.09	14/3527 (0.4%)	1.09	4/4748 (0.1%)
25	R	1.06	6/3272 (0.2%)	1.07	1/4412 (0.0%)
26	S	1.08	13/2945 (0.4%)	1.07	2/3976 (0.1%)
27	T	1.03	5/2279 (0.2%)	1.11	5/3077 (0.2%)
28	U	1.16	11/2087 (0.5%)	1.10	3/2811 (0.1%)
29	V	1.19	14/1969 (0.7%)	1.17	1/2652 (0.0%)
30	W	1.19	9/1557 (0.6%)	1.24	7/2111 (0.3%)
31	X	1.16	5/1058 (0.5%)	1.18	3/1432 (0.2%)
32	Y	1.04	0/169	1.14	0/223
33	Z	1.11	31/6403 (0.5%)	1.11	10/8686 (0.1%)
All	All	1.14	335/81466 (0.4%)	1.16	138/109984 (0.1%)

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
7	7	0	1
11	D	0	1
12	E	0	3
13	F	0	1
15	H	0	8
16	I	0	4
18	K	0	2
19	L	0	4
20	M	0	2
21	N	0	1
22	O	0	4
23	P	0	2
24	Q	0	1
25	R	0	2
27	T	0	4
29	V	0	1
30	W	0	1
33	Z	0	2
All	All	0	44

The worst 5 of 335 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
20	M	251	LEU	C-N	-21.72	0.84	1.34
17	J	224	GLY	C-N	17.02	1.73	1.34
19	L	257	GLY	C-N	-8.59	1.14	1.34
25	R	306	PRO	N-CD	8.54	1.59	1.47
22	O	201	PRO	N-CD	8.22	1.59	1.47

The worst 5 of 138 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
19	L	257	GLY	O-C-N	-21.29	88.64	122.70
20	M	299	ARG	NE-CZ-NH1	14.99	127.79	120.30
19	L	257	GLY	CA-C-N	13.23	146.30	117.20
19	L	257	GLY	C-N-CA	12.51	152.97	121.70
18	K	252	ARG	NE-CZ-NH2	-11.18	114.71	120.30

There are no chirality outliers.

5 of 44 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
7	7	100	ASN	Peptide
11	D	104	VAL	Peptide
12	E	122	ARG	Sidechain
12	E	132	ARG	Sidechain
12	E	136	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	1	1576	0	1555	171	0
2	2	1692	0	1699	108	0
3	3	1581	0	1574	135	0
4	4	1585	0	1590	109	0
5	5	1646	0	1595	95	0
6	6	1757	0	1708	104	0
7	7	1824	0	1832	109	0
8	A	1921	0	1910	162	0
9	B	1915	0	1929	115	0
10	C	1913	0	1914	145	0
11	D	1899	0	1908	141	0
12	E	1867	0	1840	134	0
13	F	1795	0	1797	190	0
14	G	1900	0	1888	161	0
15	H	2792	0	2879	337	0
16	I	2822	0	2868	285	0
17	J	2928	0	3054	250	0
18	K	3019	0	3082	222	0
19	L	2853	0	2925	248	0
20	M	2866	0	2936	262	0
21	N	6562	0	6625	493	0
22	O	3182	0	3207	254	0
23	P	3401	0	3482	280	0
24	Q	3471	0	3494	277	0
25	R	3218	0	3216	296	0
26	S	2893	0	2937	218	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
27	T	2235	0	2207	174	0
28	U	2061	0	2115	247	0
29	V	1942	0	1954	186	0
30	W	1534	0	1542	145	0
31	X	1032	0	1017	103	0
32	Y	168	0	153	12	0
33	Z	6289	0	6235	798	0
All	All	80139	0	80667	6086	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 38.

The worst 5 of 6086 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)
33:Z:574:TYR:CE2	33:Z:584:VAL:HG11	1.29	1.68
23:P:131:PHE:CZ	23:P:167:THR:HG22	1.24	1.65
15:H:172:MET:HB2	16:I:129:TYR:CD2	1.26	1.62
15:H:396:MET:CE	15:H:438:ALA:CB	1.78	1.57
15:H:172:MET:CB	16:I:129:TYR:CE2	1.82	1.57

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%)	188 (93%)	11 (5%)	4 (2%)	7 38
2	2	221/261 (85%)	211 (96%)	10 (4%)	0	100 100
3	3	202/205 (98%)	184 (91%)	15 (7%)	3 (2%)	10 46
4	4	196/198 (99%)	180 (92%)	13 (7%)	3 (2%)	10 46

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
5	5	210/287 (73%)	197 (94%)	10 (5%)	3 (1%)	11	46
6	6	220/241 (91%)	205 (93%)	11 (5%)	4 (2%)	8	40
7	7	231/266 (87%)	212 (92%)	17 (7%)	2 (1%)	17	57
8	A	241/252 (96%)	226 (94%)	12 (5%)	3 (1%)	13	50
9	B	248/250 (99%)	233 (94%)	12 (5%)	3 (1%)	13	50
10	C	243/258 (94%)	229 (94%)	11 (4%)	3 (1%)	13	50
11	D	240/254 (94%)	224 (93%)	14 (6%)	2 (1%)	19	60
12	E	241/260 (93%)	223 (92%)	14 (6%)	4 (2%)	9	42
13	F	231/234 (99%)	214 (93%)	12 (5%)	5 (2%)	6	35
14	G	243/288 (84%)	226 (93%)	13 (5%)	4 (2%)	9	44
15	H	353/467 (76%)	305 (86%)	27 (8%)	21 (6%)	1	17
16	I	358/437 (82%)	318 (89%)	29 (8%)	11 (3%)	4	27
17	J	369/405 (91%)	334 (90%)	26 (7%)	9 (2%)	6	33
18	K	377/428 (88%)	338 (90%)	32 (8%)	7 (2%)	8	38
19	L	359/437 (82%)	318 (89%)	36 (10%)	5 (1%)	11	46
20	M	363/434 (84%)	323 (89%)	29 (8%)	11 (3%)	4	28
21	N	843/945 (89%)	786 (93%)	49 (6%)	8 (1%)	17	57
22	O	385/393 (98%)	340 (88%)	31 (8%)	14 (4%)	3	25
23	P	413/445 (93%)	382 (92%)	19 (5%)	12 (3%)	4	29
24	Q	429/434 (99%)	395 (92%)	23 (5%)	11 (3%)	5	31
25	R	398/429 (93%)	354 (89%)	32 (8%)	12 (3%)	4	28
26	S	351/523 (67%)	312 (89%)	29 (8%)	10 (3%)	5	30
27	T	270/274 (98%)	240 (89%)	18 (7%)	12 (4%)	2	22
28	U	245/338 (72%)	237 (97%)	7 (3%)	1 (0%)	34	72
29	V	239/306 (78%)	222 (93%)	10 (4%)	7 (3%)	4	29
30	W	195/268 (73%)	171 (88%)	14 (7%)	10 (5%)	2	19
31	X	125/156 (80%)	106 (85%)	14 (11%)	5 (4%)	3	23
32	Y	17/89 (19%)	17 (100%)	0	0	100	100
33	Z	807/993 (81%)	722 (90%)	52 (6%)	33 (4%)	3	23
All	All	10066/11670 (86%)	9172 (91%)	652 (6%)	242 (2%)	9	33

5 of 242 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
8	A	168	ALA
11	D	204	GLN
13	F	41	ASN
15	H	183	ILE
15	H	185	LEU

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
2	2	182/214 (85%)	182 (100%)	0	100	100
3	3	172/173 (99%)	172 (100%)	0	100	100
4	4	175/175 (100%)	175 (100%)	0	100	100
5	5	169/235 (72%)	167 (99%)	2 (1%)	71	83
6	6	185/201 (92%)	185 (100%)	0	100	100
7	7	199/224 (89%)	199 (100%)	0	100	100
8	A	207/210 (99%)	207 (100%)	0	100	100
9	B	209/209 (100%)	209 (100%)	0	100	100
10	C	204/216 (94%)	204 (100%)	0	100	100
11	D	214/226 (95%)	214 (100%)	0	100	100
12	E	199/215 (93%)	199 (100%)	0	100	100
13	F	192/193 (100%)	192 (100%)	0	100	100
14	G	201/239 (84%)	200 (100%)	1 (0%)	88	93
15	H	303/399 (76%)	302 (100%)	1 (0%)	92	95
16	I	319/385 (83%)	318 (100%)	1 (0%)	92	95
17	J	325/352 (92%)	325 (100%)	0	100	100
18	K	334/374 (89%)	333 (100%)	1 (0%)	92	95
19	L	308/377 (82%)	307 (100%)	1 (0%)	92	95
20	M	315/375 (84%)	315 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
21	N	713/797 (90%)	713 (100%)	0	100 100
22	O	363/368 (99%)	363 (100%)	0	100 100
23	P	388/415 (94%)	387 (100%)	1 (0%)	92 95
24	Q	388/391 (99%)	388 (100%)	0	100 100
25	R	351/379 (93%)	351 (100%)	0	100 100
26	S	330/489 (68%)	330 (100%)	0	100 100
27	T	254/256 (99%)	254 (100%)	0	100 100
28	U	234/308 (76%)	233 (100%)	1 (0%)	91 94
29	V	217/268 (81%)	217 (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	18/81 (22%)	18 (100%)	0	100 100
33	Z	692/850 (81%)	692 (100%)	0	100 100
All	All	8816/10146 (87%)	8807 (100%)	9 (0%)	93 97

5 of 9 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
23	P	31	ASP
28	U	61	LYS
15	H	164	SER
16	I	257	LEU
18	K	246	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 154 such sidechains are listed below:

Mol	Chain	Res	Type
27	T	204	ASN
33	Z	338	HIS
28	U	77	ASN
30	W	47	ASN
33	Z	833	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 monosaccharides in this entry.

5.6 Ligand geometry (i)

There are no ligands in this entry.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
17	J	2
16	I	1
18	K	1
19	L	1
20	M	1

The worst 5 of 6 chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	J	218:LEU	C	219:VAL	N	3.94
1	I	252:LEU	C	253:ILE	N	3.24
1	K	242:PHE	C	243:VAL	N	2.17
1	J	224:GLY	C	225:GLU	N	1.73
1	L	257:GLY	C	258:GLU	N	1.14

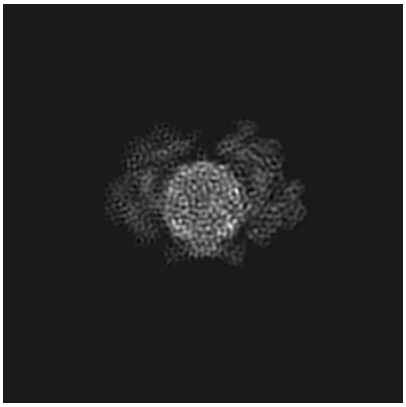
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-2594. These allow visual inspection of the internal detail of the map and identification of artifacts.

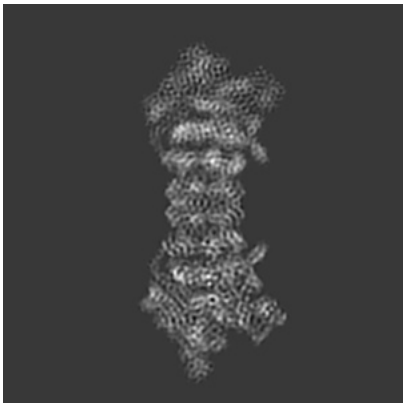
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

6.1.1 Primary map



X



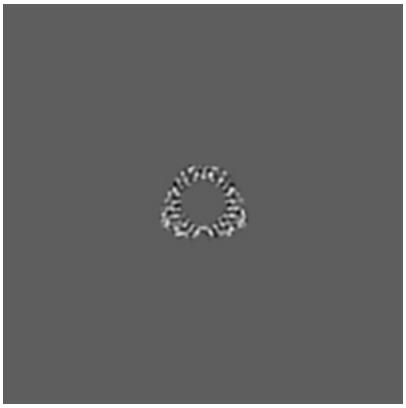
Y

Z

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

6.2 Central slices

6.2.1 Primary map



X Index: 140

Y Index: 140

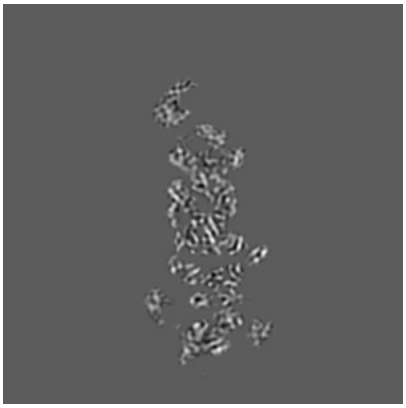
Z Index: 140

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: 72



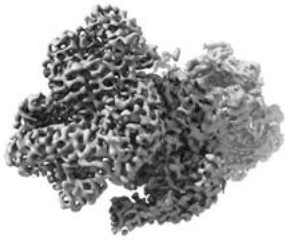
Y Index: 154

Z Index: 139

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

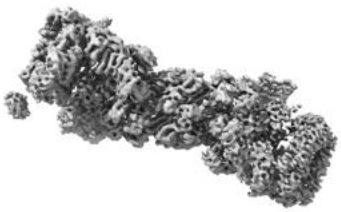
6.4 Orthogonal surface views (i)

6.4.1 Primary map



X

Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.74. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

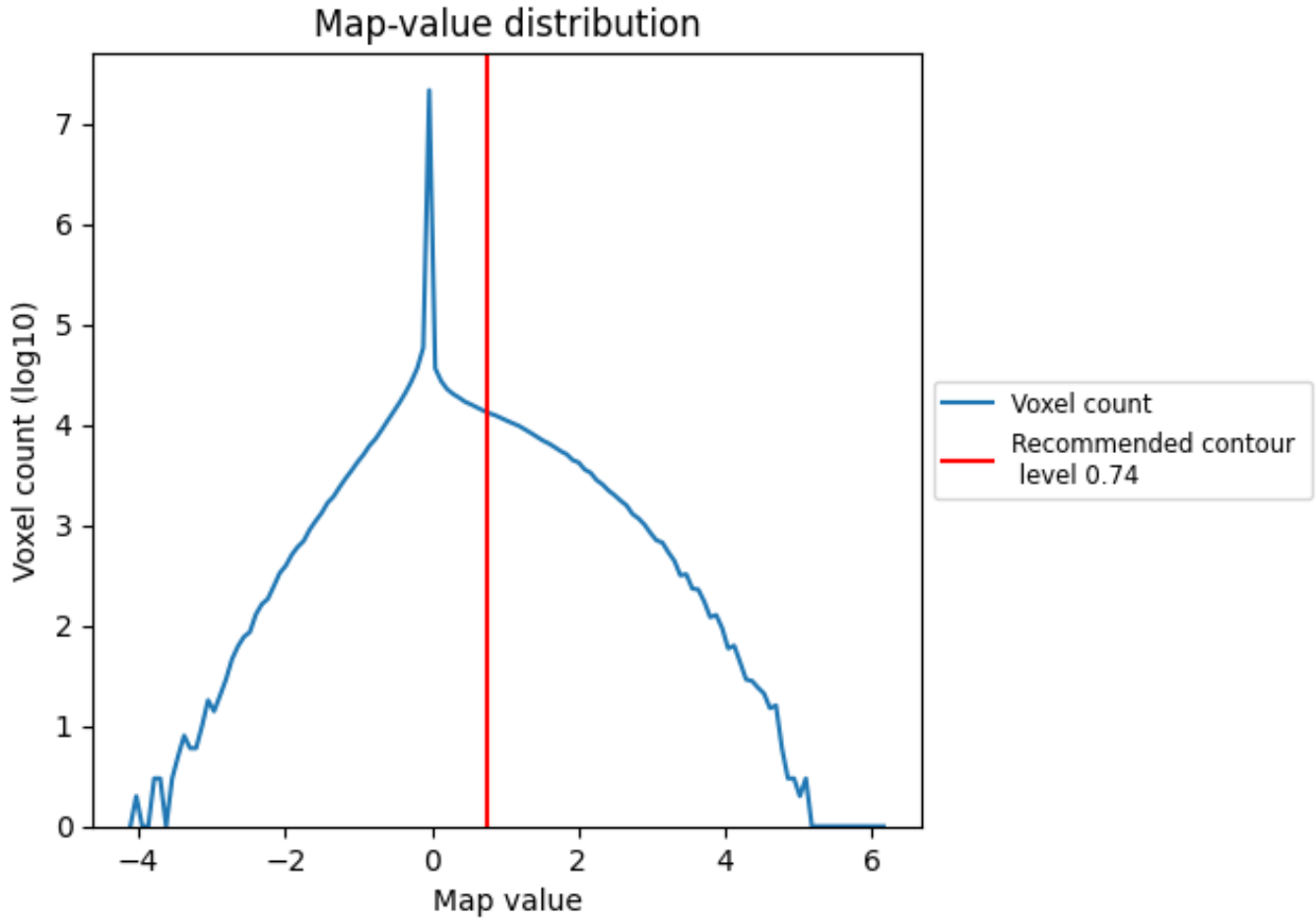
6.5 Mask visualisation (i)

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

7 Map analysis

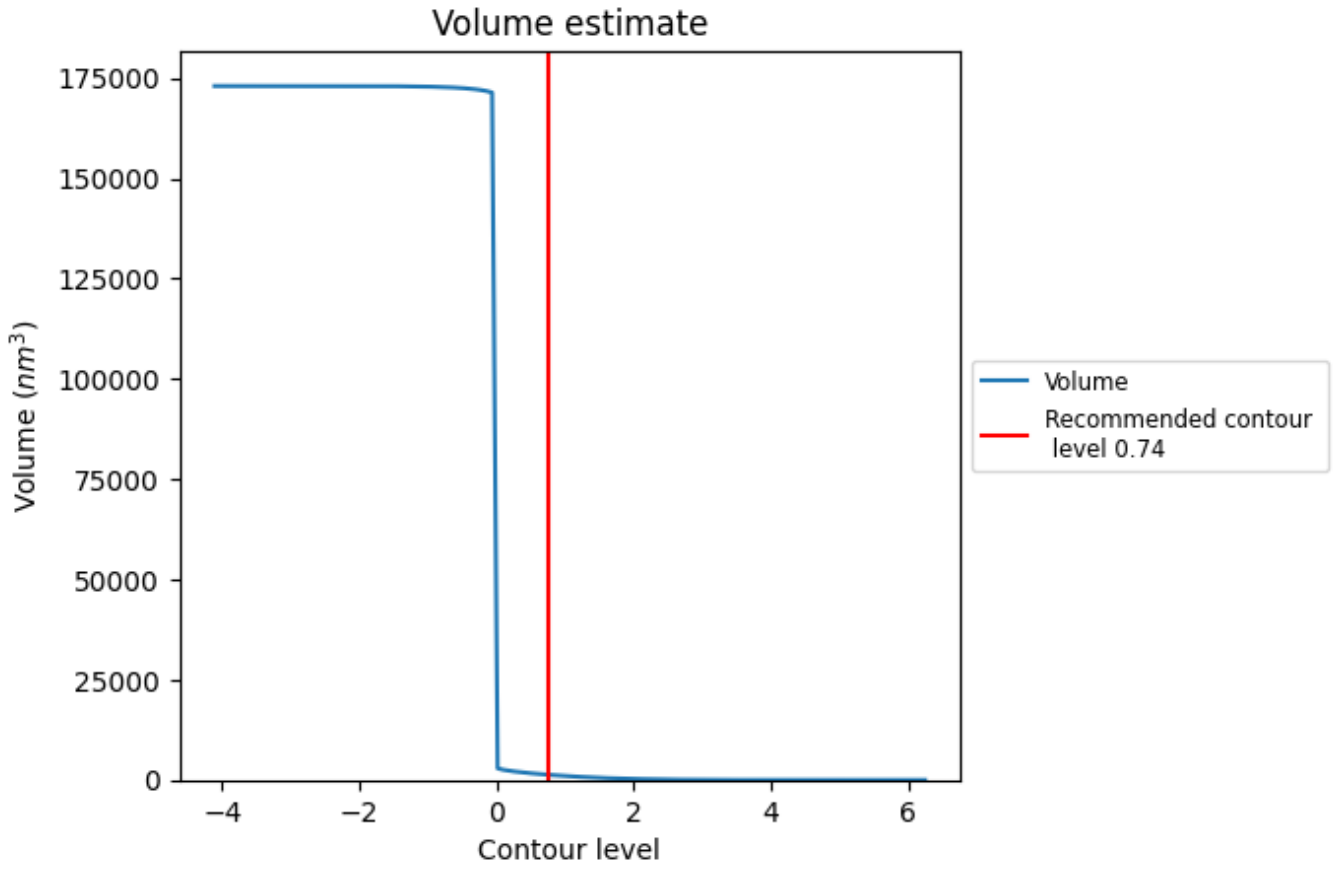
This section contains the results of statistical analysis of the map.

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.

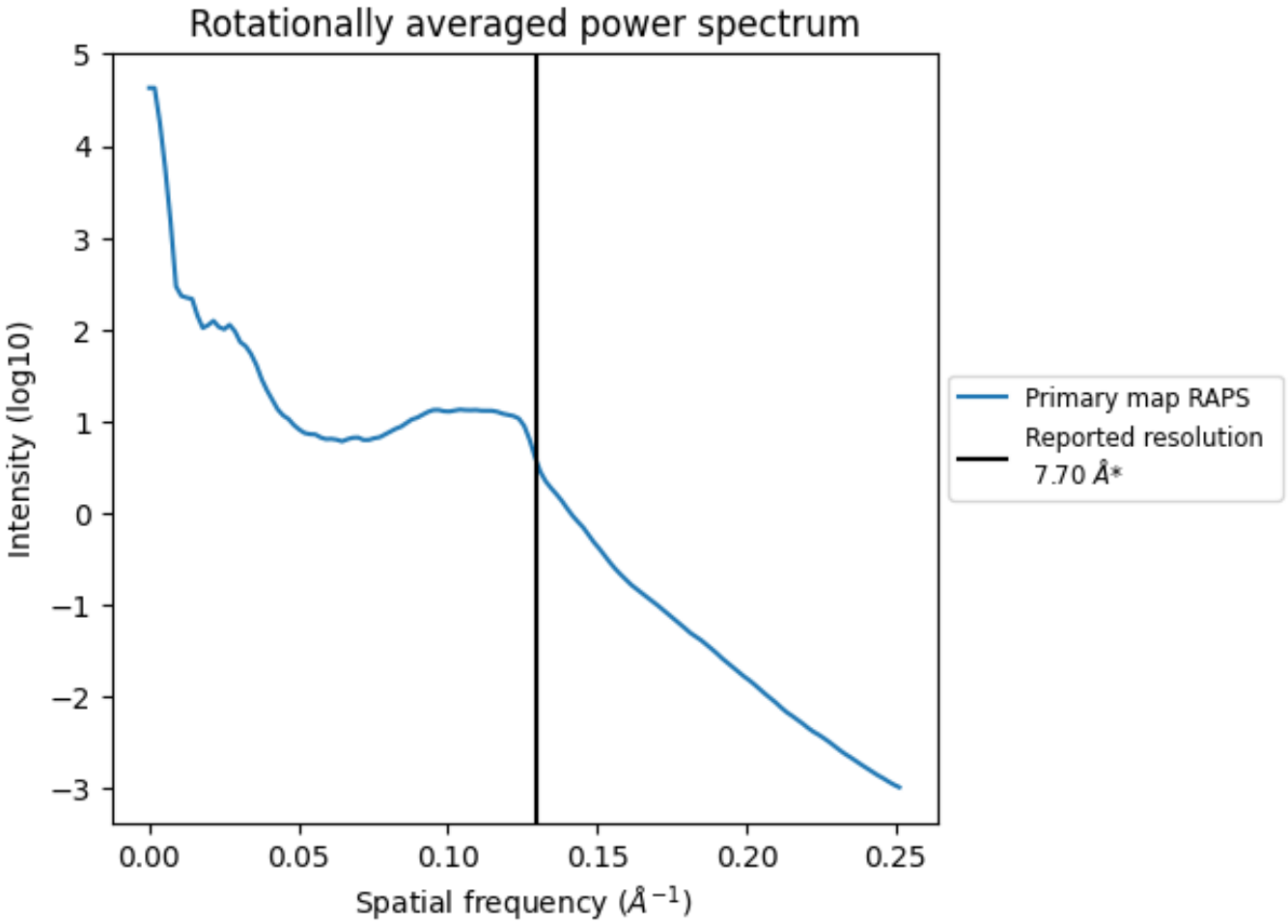
7.2 Volume estimate (i)



The volume at the recommended contour level is 1311 nm^3; this corresponds to an approximate mass of 1184 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 0.130 Å^{-1}

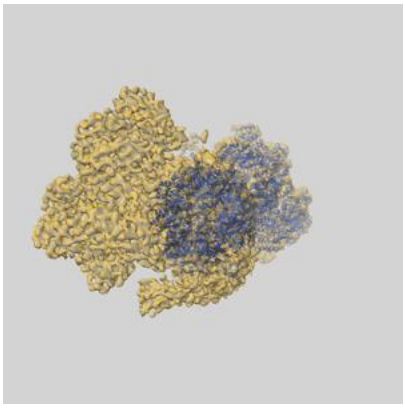
8 Fourier-Shell correlation (i)

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

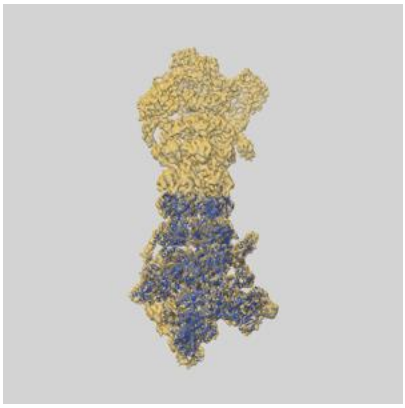
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-2594 and PDB model 4CR2. Per-residue inclusion information can be found in section 3 on page 9.

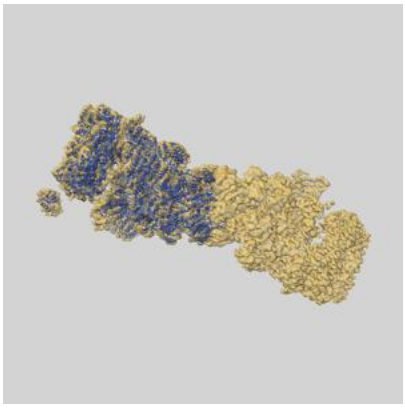
9.1 Map-model overlay



X



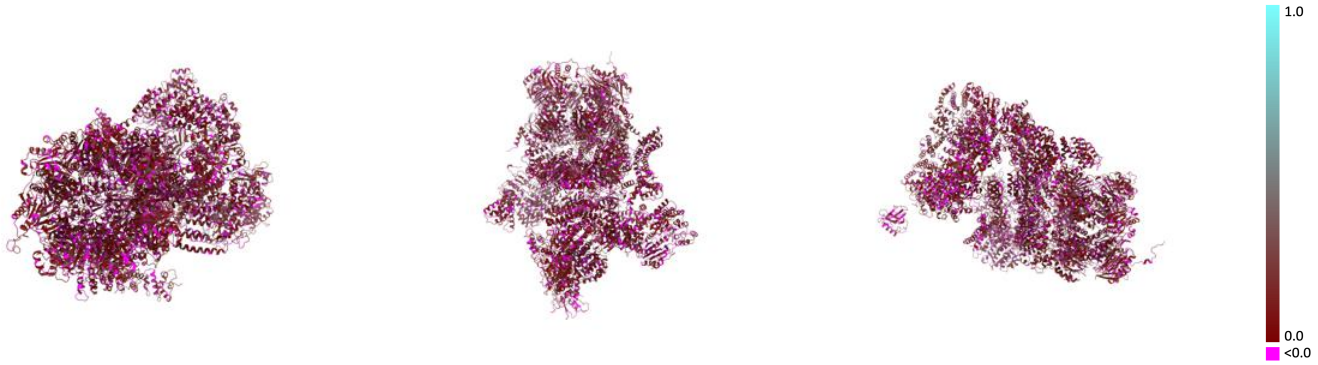
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.74 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.

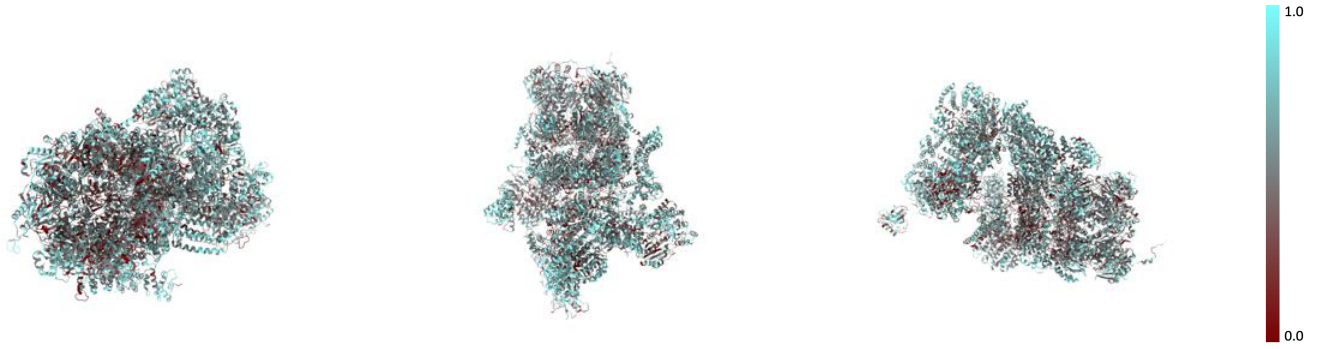
9.2 Q-score mapped to coordinate model (i)



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.

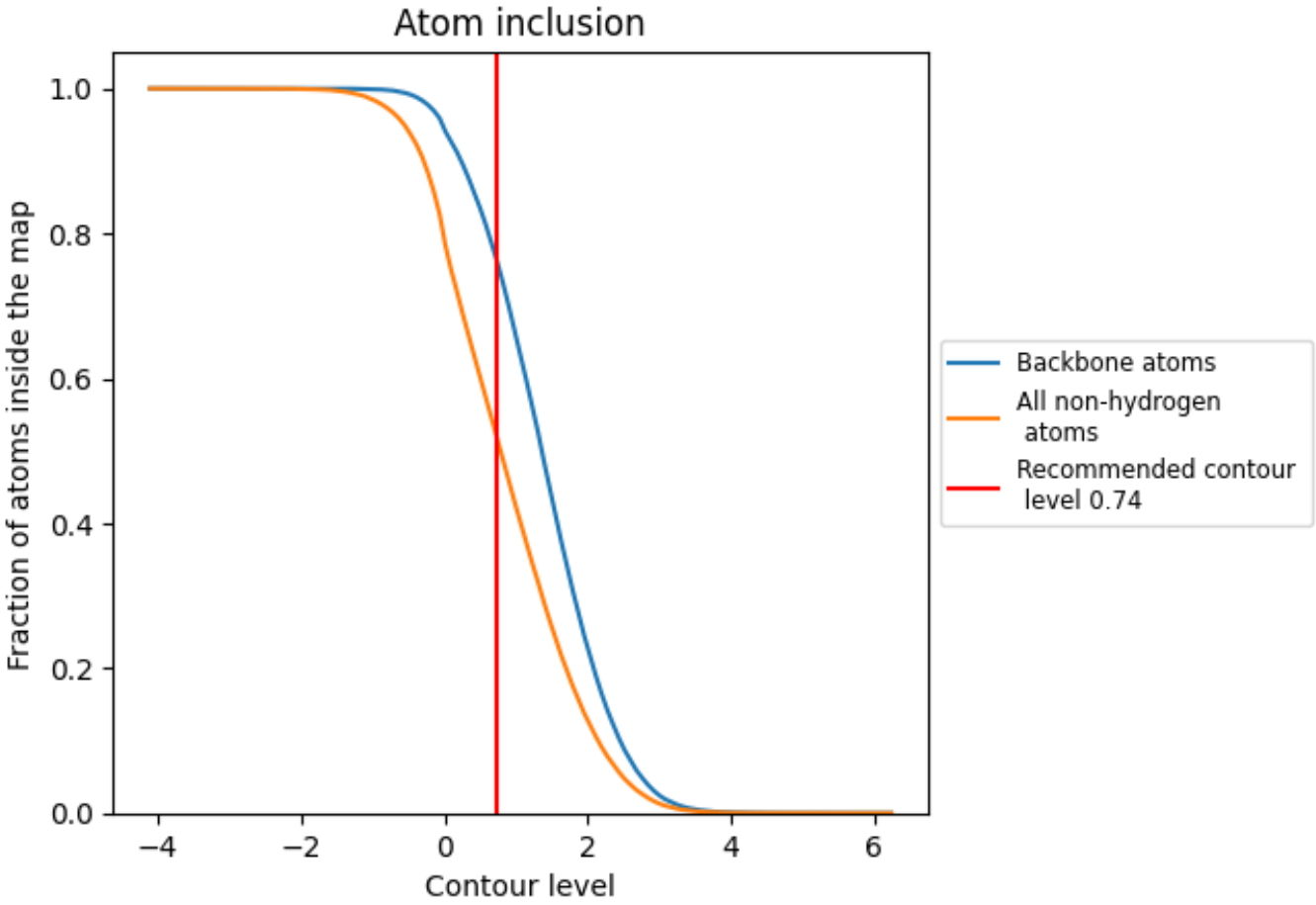
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.74).

9.4 Atom inclusion (i)



At the recommended contour level, 76% of all backbone atoms, 52% 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 (0.74) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.5165	0.1040
1	0.4942	0.0930
2	0.5135	0.1150
3	0.4717	0.1080
4	0.5406	0.1090
5	0.5531	0.1140
6	0.5221	0.1110
7	0.5159	0.1070
A	0.4828	0.1150
B	0.4499	0.1020
C	0.4947	0.1170
D	0.4997	0.1100
E	0.4932	0.1110
F	0.5151	0.1200
G	0.4610	0.1070
H	0.4422	0.0870
I	0.4461	0.0960
J	0.4925	0.1020
K	0.4596	0.1050
L	0.4869	0.1020
M	0.4828	0.1080
N	0.5624	0.1190
O	0.5631	0.0940
P	0.6246	0.1070
Q	0.5850	0.1010
R	0.5544	0.0930
S	0.4814	0.0970
T	0.6074	0.1120
U	0.5486	0.1200
V	0.5172	0.1040
W	0.4583	0.0710
X	0.4906	0.0420
Y	0.5951	0.1020
Z	0.5172	0.0930