Full wwPDB EM Validation Report ⓘ

Oct 26, 2024 – 06:50 PM EDT

PDB ID	:	6MSH
EMDB ID	:	EMD-9220
Title	:	Cryo-EM structures and dynamics of substrate-engaged human 26S proteasome
Authors	:	Mao, Y.D.
Deposited on	:	2018-10-16
Resolution	:	3.60 Å(reported)

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

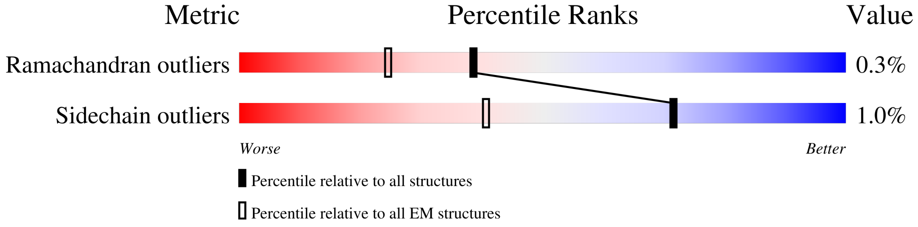
EMDB validation analysis	:	0.0.1.dev113
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

1 Overall quality at a glance

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

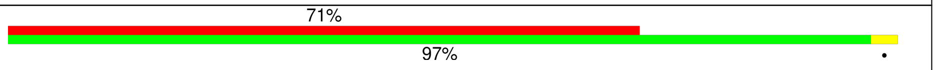
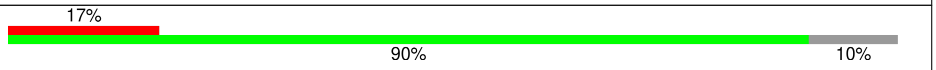
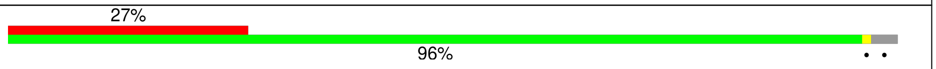
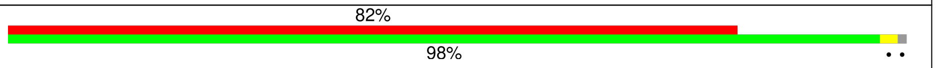
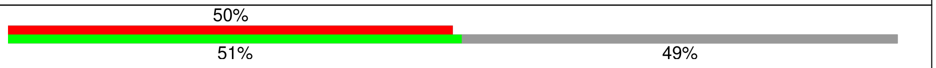
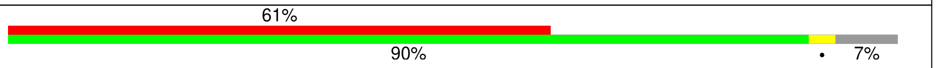
The reported resolution of this entry is 3.60 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	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	U	953	
2	V	533	
3	W	456	
4	X	422	
5	Y	389	
6	Z	324	
7	a	376	
8	b	377	
9	c	309	

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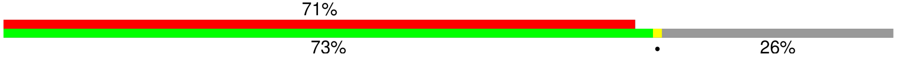
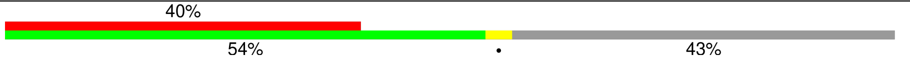
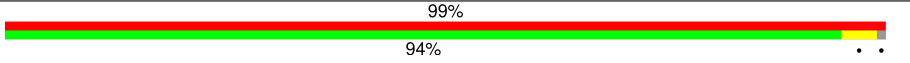
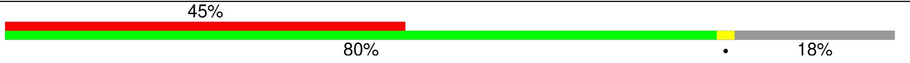
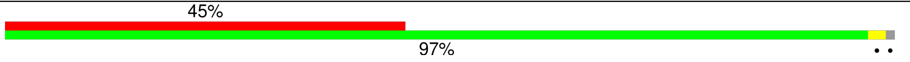
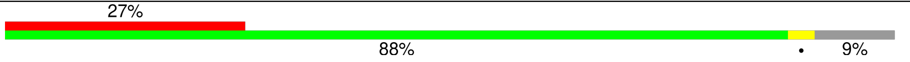
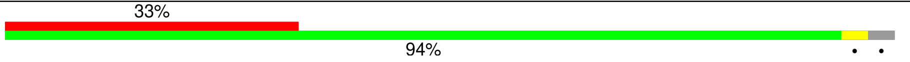
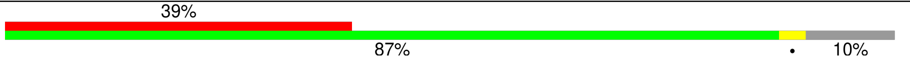
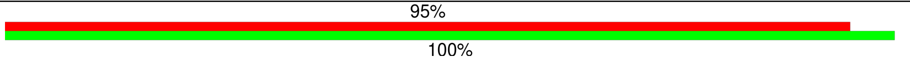
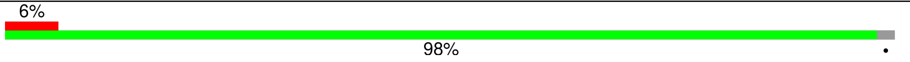
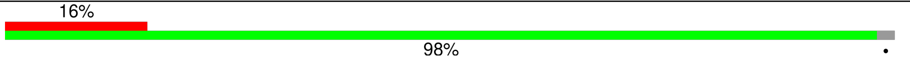
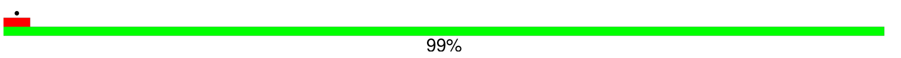
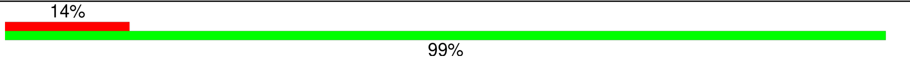
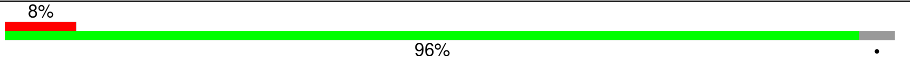
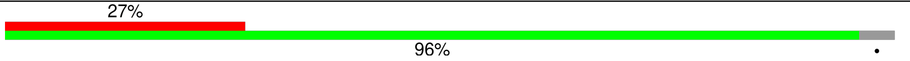
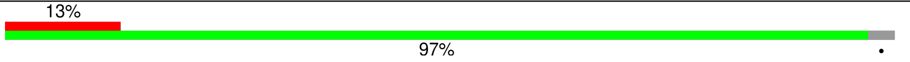
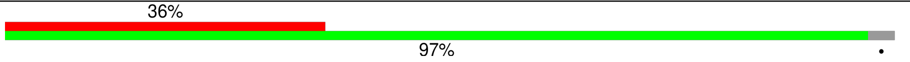
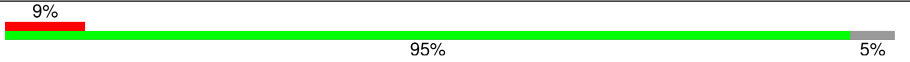
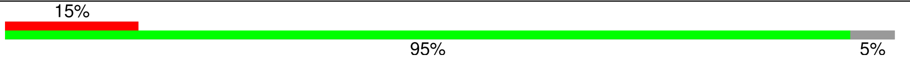
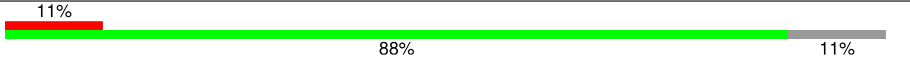
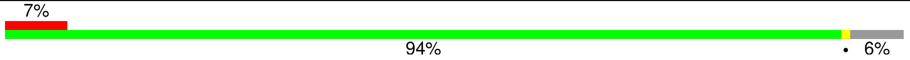
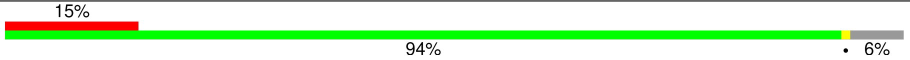
Mol	Chain	Length	Quality of chain
10	d	349	
11	e	70	
12	f	892	
13	A	433	
14	B	440	
15	C	398	
16	D	418	
17	E	403	
18	F	439	
19	v	22	
20	G	245	
20	g	245	
21	H	233	
21	h	233	
22	I	260	
22	i	260	
23	J	247	
23	j	247	
24	K	240	
24	k	240	
25	L	268	
25	l	268	
26	M	254	
26	m	254	
27	N	238	

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Mol	Chain	Length	Quality of chain
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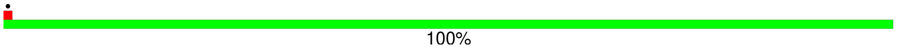
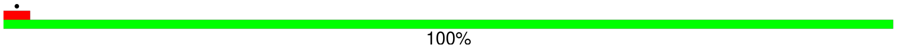
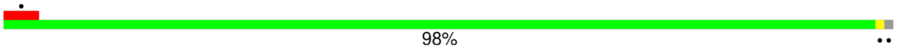
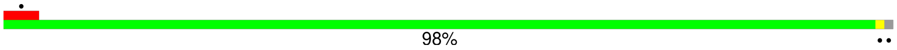
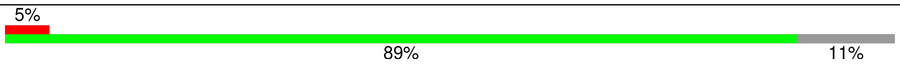
28	O	276	
28	o	276	
29	P	204	
29	p	204	
30	Q	201	
30	q	201	
31	R	262	
31	r	262	
32	S	240	
32	s	240	
33	T	263	
33	t	263	

2 Entry composition ⓘ

There are 36 unique types of molecules in this entry. The entry contains 103729 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 26S proteasome non-ATPase regulatory subunit 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	U	820	6398	4062	1086	1206	44	0	0

- Molecule 2 is a protein called 26S proteasome non-ATPase regulatory subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	V	480	3852	2444	684	710	14	0	0

- Molecule 3 is a protein called 26S proteasome non-ATPase regulatory subunit 12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	W	456	3703	2339	635	704	25	0	0

- Molecule 4 is a protein called 26S proteasome non-ATPase regulatory subunit 11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	X	380	3009	1918	509	570	12	0	0

- Molecule 5 is a protein called 26S proteasome non-ATPase regulatory subunit 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	Y	378	3115	1987	533	578	17	0	0

- Molecule 6 is a protein called 26S proteasome non-ATPase regulatory subunit 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	Z	286	2281	1457	392	427	5	0	0

- Molecule 7 is a protein called 26S proteasome non-ATPase regulatory subunit 13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	a	373	2995	1911	510	559	15	0	0

- Molecule 8 is a protein called 26S proteasome non-ATPase regulatory subunit 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	b	191	1458	910	261	279	8	0	0

- Molecule 9 is a protein called 26S proteasome non-ATPase regulatory subunit 14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	c	287	2260	1430	389	422	19	0	0

- Molecule 10 is a protein called 26S proteasome non-ATPase regulatory subunit 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	d	257	2116	1371	346	390	9	0	0

- Molecule 11 is a protein called 26S proteasome complex subunit SEM1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	e	40	334	200	55	77	2	0	0

- Molecule 12 is a protein called 26S proteasome non-ATPase regulatory subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	f	886	6840	4300	1171	1324	45	0	0

- Molecule 13 is a protein called 26S proteasome regulatory subunit 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	A	356	2767	1741	488	521	17	0	0

- Molecule 14 is a protein called 26S proteasome regulatory subunit 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	B	350	Total	C	N	O	S	0	0
			2706	1703	458	533	12		

- Molecule 15 is a protein called 26S proteasome regulatory subunit 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	C	396	Total	C	N	O	S	0	0
			3105	1954	558	576	17		

- Molecule 16 is a protein called 26S proteasome regulatory subunit 6B.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	D	380	Total	C	N	O	S	0	0
			3040	1923	524	580	13		

- Molecule 17 is a protein called 26S proteasome regulatory subunit 10B.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	E	389	Total	C	N	O	S	0	0
			3097	1947	552	581	17		

- Molecule 18 is a protein called 26S proteasome regulatory subunit 6A.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	F	395	Total	C	N	O	S	0	0
			3098	1951	533	596	18		

- Molecule 19 is a protein called substrate.

Mol	Chain	Residues	Atoms				AltConf	Trace
19	v	22	Total	C	N	O	0	0
			110	66	22	22		

- Molecule 20 is a protein called Proteasome subunit alpha type-6.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	G	240	Total	C	N	O	S	0	0
			1826	1160	305	348	13		
20	g	240	Total	C	N	O	S	0	0
			1826	1160	305	348	13		

- Molecule 21 is a protein called Proteasome subunit alpha type-2.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	H	232	Total 1708	C 1081	N 289	O 333	S 5	0	0
21	h	232	Total 1708	C 1081	N 289	O 333	S 5	0	0

- Molecule 22 is a protein called Proteasome subunit alpha type-4.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	I	250	Total 1912	C 1204	N 329	O 371	S 8	0	0
22	i	250	Total 1912	C 1204	N 329	O 371	S 8	0	0

- Molecule 23 is a protein called Proteasome subunit alpha type-7.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	J	239	Total 1704	C 1056	N 308	O 335	S 5	0	0
23	j	239	Total 1704	C 1056	N 308	O 335	S 5	0	0

- Molecule 24 is a protein called Proteasome subunit alpha type-5.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	K	228	Total 1722	C 1080	N 284	O 348	S 10	0	0
24	k	228	Total 1722	C 1080	N 284	O 348	S 10	0	0

- Molecule 25 is a protein called Proteasome subunit alpha type-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	L	238	Total 1850	C 1159	N 334	O 346	S 11	0	0
25	l	238	Total 1850	C 1159	N 334	O 346	S 11	0	0

- Molecule 26 is a protein called Proteasome subunit alpha type-3.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	M	240	Total 1856	C 1178	N 314	O 353	S 11	0	0

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Mol	Chain	Residues	Atoms					AltConf	Trace
26	m	240	Total	C	N	O	S	0	0
			1856	1178	314	353	11		

- Molecule 27 is a protein called Proteasome subunit beta type-6.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	N	191	Total	C	N	O	S	0	0
			1430	893	245	280	12		
27	n	191	Total	C	N	O	S	0	0
			1430	893	245	280	12		

- Molecule 28 is a protein called Proteasome subunit beta type-7.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	O	220	Total	C	N	O	S	0	0
			1643	1033	280	318	12		
28	o	220	Total	C	N	O	S	0	0
			1643	1033	280	318	12		

- Molecule 29 is a protein called Proteasome subunit beta type-3.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	P	204	Total	C	N	O	S	0	0
			1585	1010	262	294	19		
29	p	204	Total	C	N	O	S	0	0
			1585	1010	262	294	19		

- Molecule 30 is a protein called Proteasome subunit beta type-2.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	Q	199	Total	C	N	O	S	0	0
			1570	1006	265	290	9		
30	q	199	Total	C	N	O	S	0	0
			1570	1006	265	290	9		

- Molecule 31 is a protein called Proteasome subunit beta type-5.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	R	201	Total	C	N	O	S	0	0
			1548	974	273	292	9		
31	r	201	Total	C	N	O	S	0	0
			1548	974	273	292	9		

- Molecule 32 is a protein called Proteasome subunit beta type-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	S	213	Total	C	N	O	S	0	0
			1641	1036	282	313	10		
32	s	213	Total	C	N	O	S	0	0
			1641	1036	282	313	10		

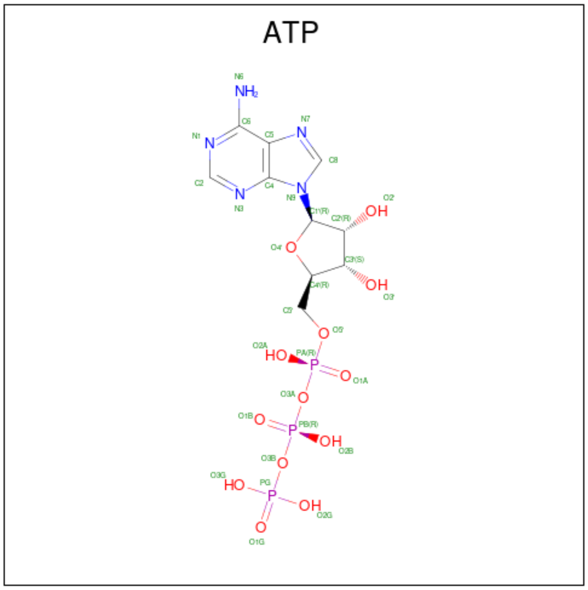
- Molecule 33 is a protein called Proteasome subunit beta type-4.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	T	215	Total	C	N	O	S	0	0
			1667	1052	285	318	12		
33	t	215	Total	C	N	O	S	0	0
			1667	1052	285	318	12		

- Molecule 34 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
34	c	1	Total	Zn	0
			1	1	

- Molecule 35 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$).



Mol	Chain	Residues	Atoms					AltConf
35	C	1	Total	C	N	O	P	0
			31	10	5	13	3	

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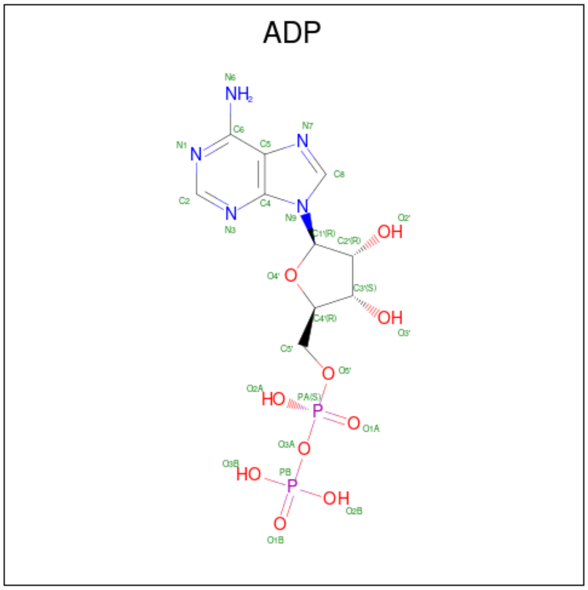
Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
35	D	1	31	10	5	13	3	0
35	E	1	31	10	5	13	3	0

- Molecule 36 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: $C_{10}H_{15}N_5O_{10}P_2$).



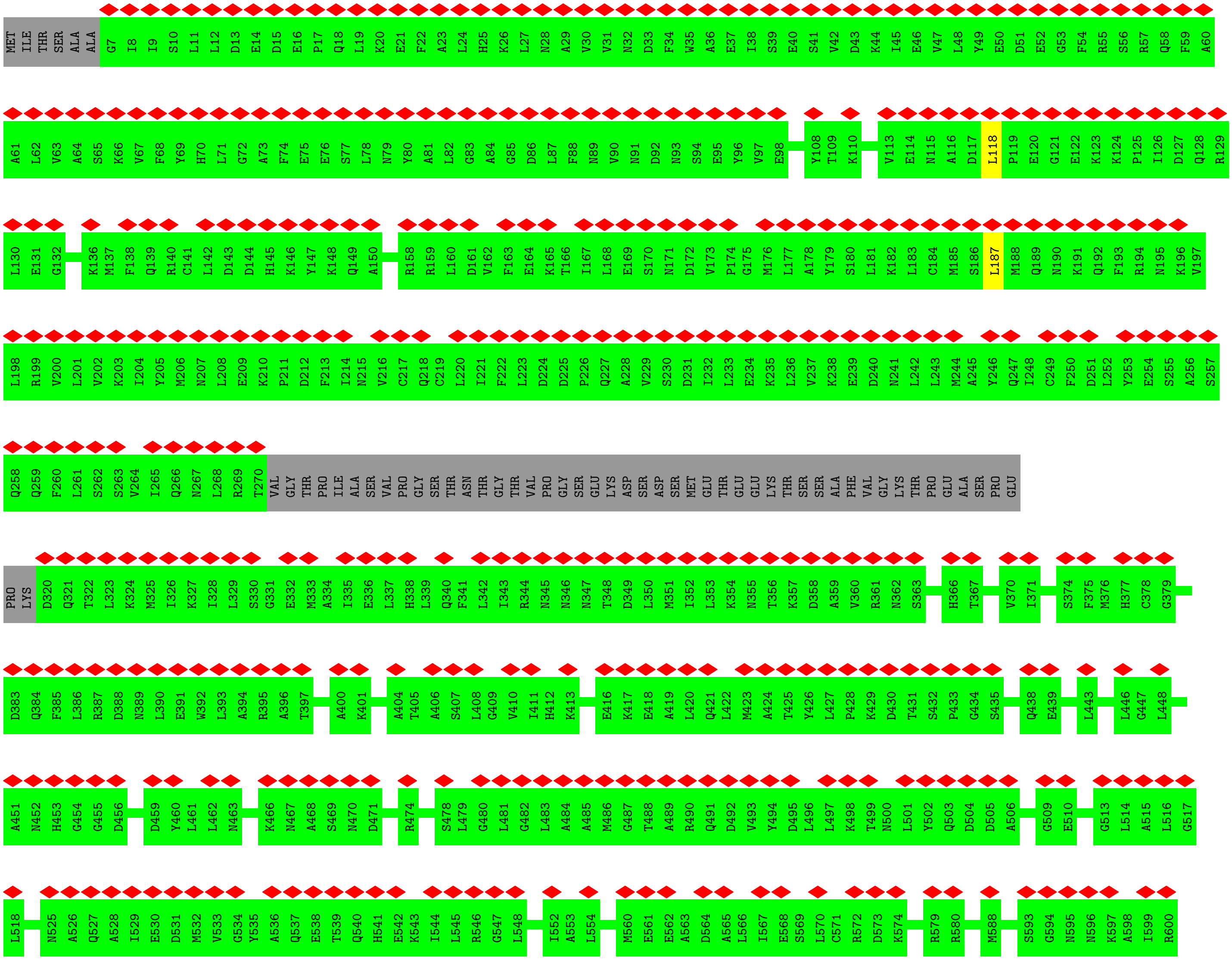
Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
36	F	1	27	10	5	10	2	0

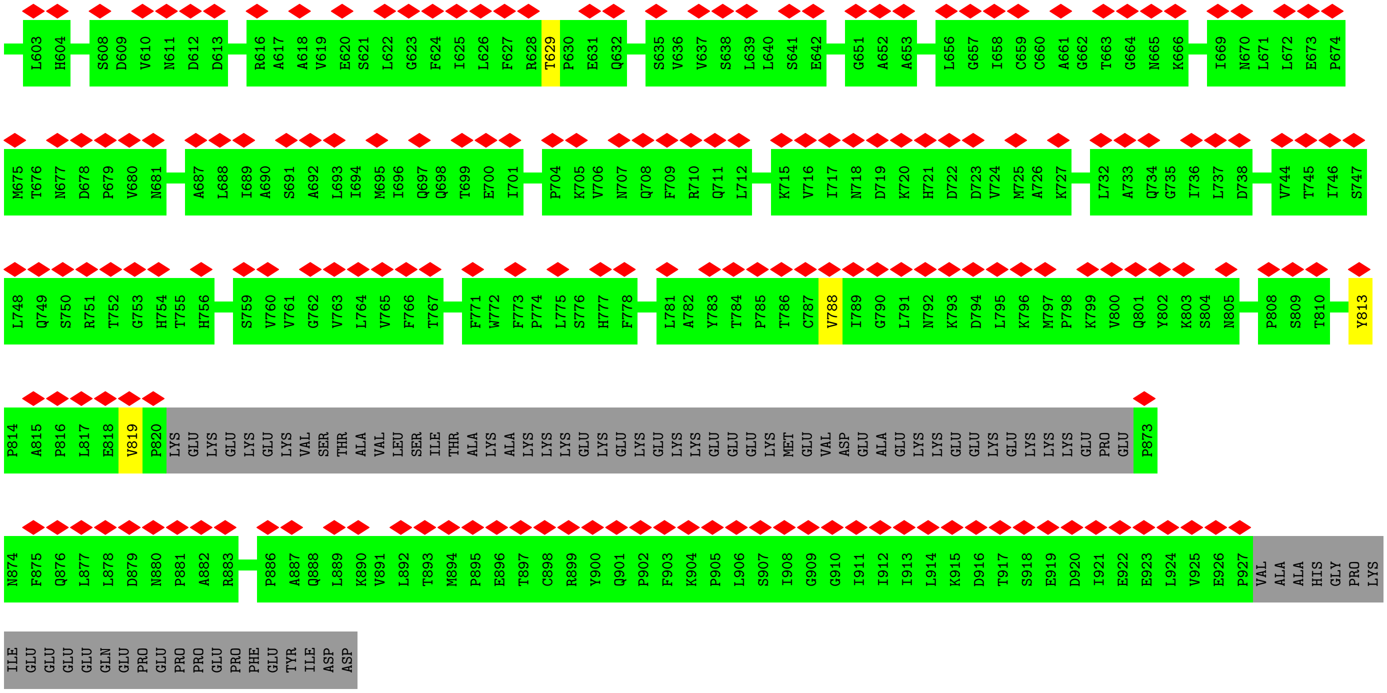
3 Residue-property plots

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

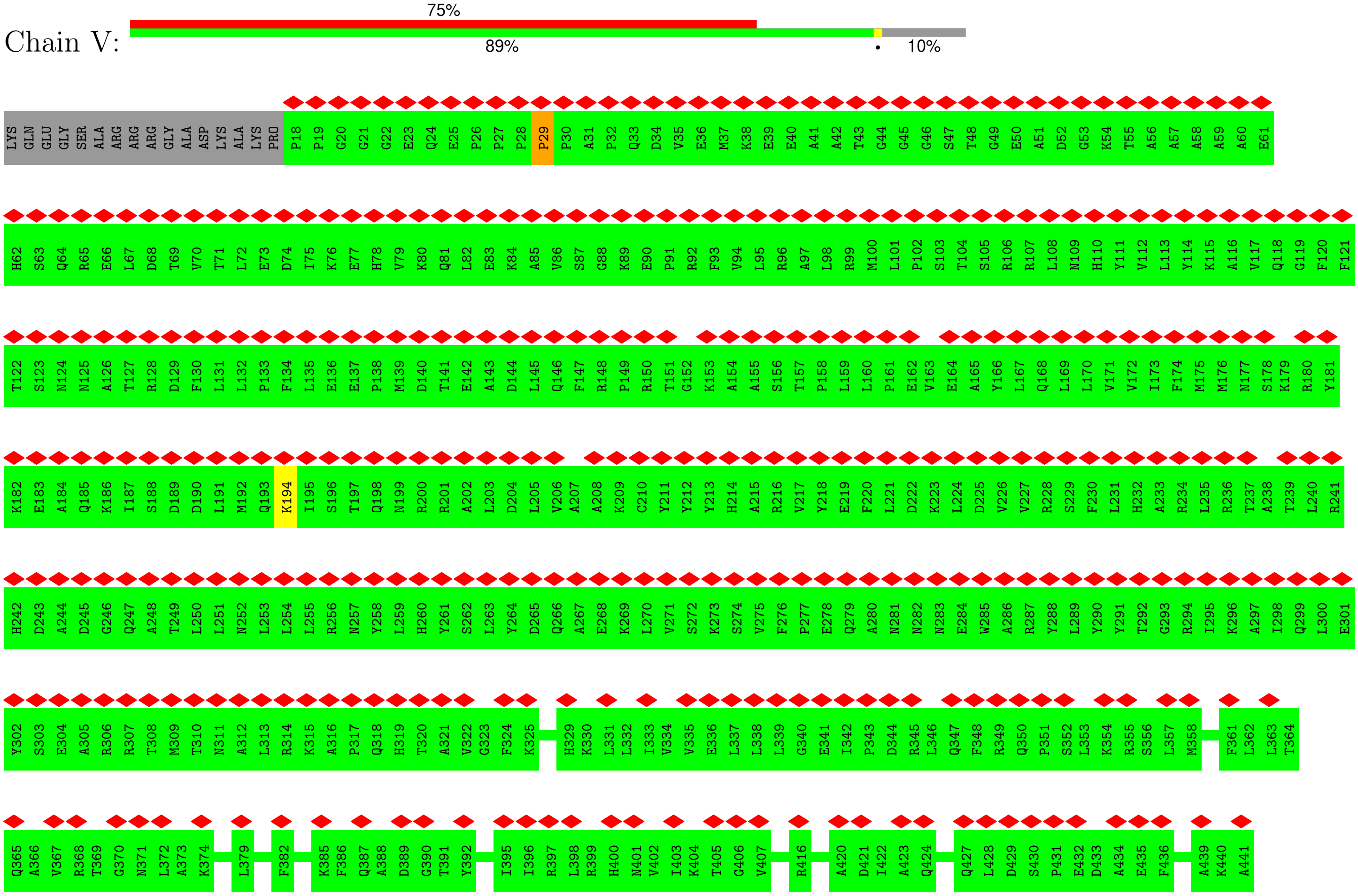
- Molecule 1: 26S proteasome non-ATPase regulatory subunit 1

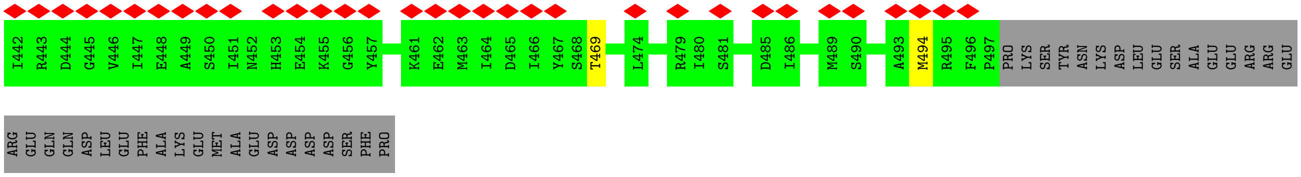
Chain U:





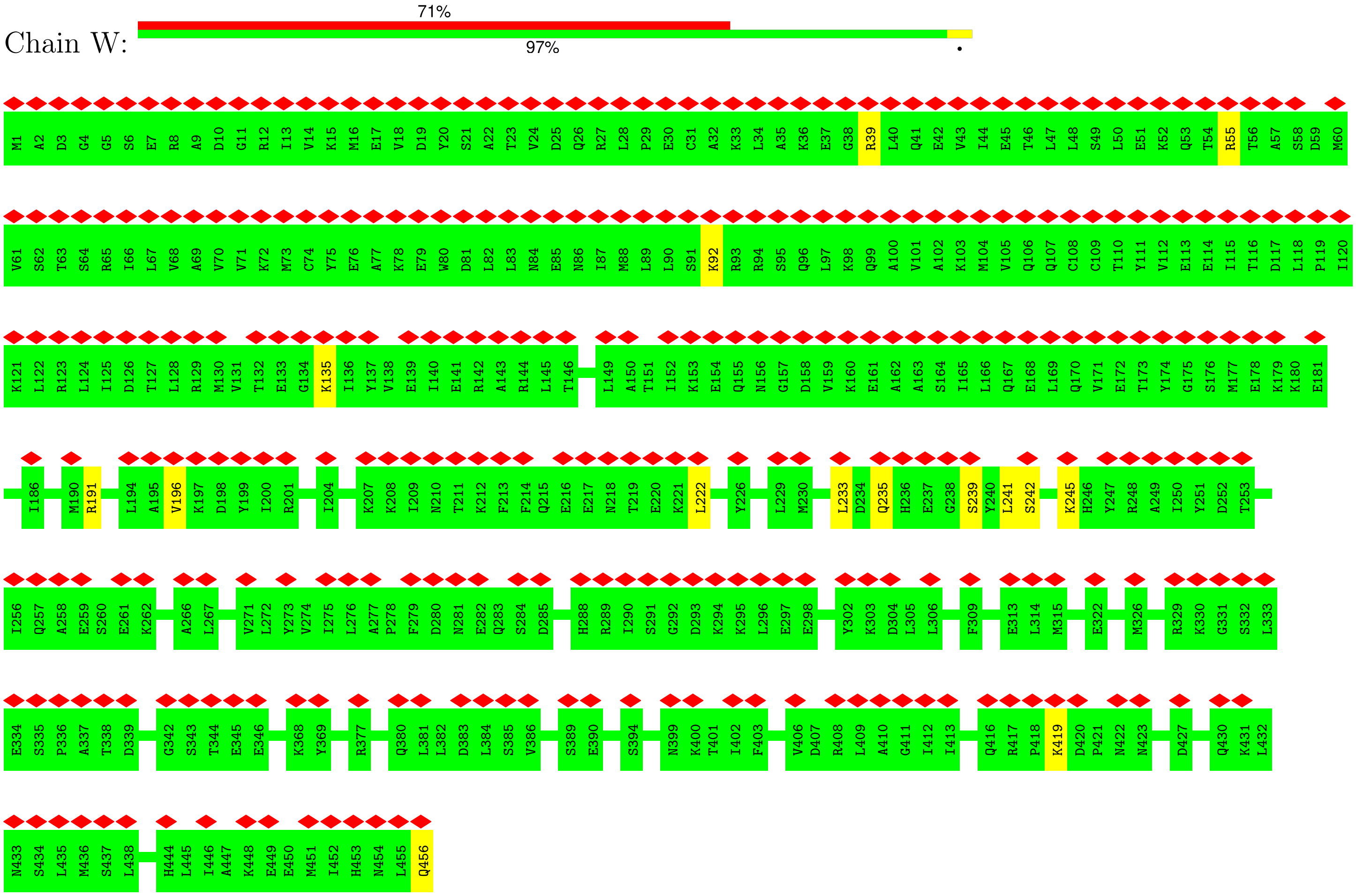
- Molecule 2: 26S proteasome non-ATPase regulatory subunit 3





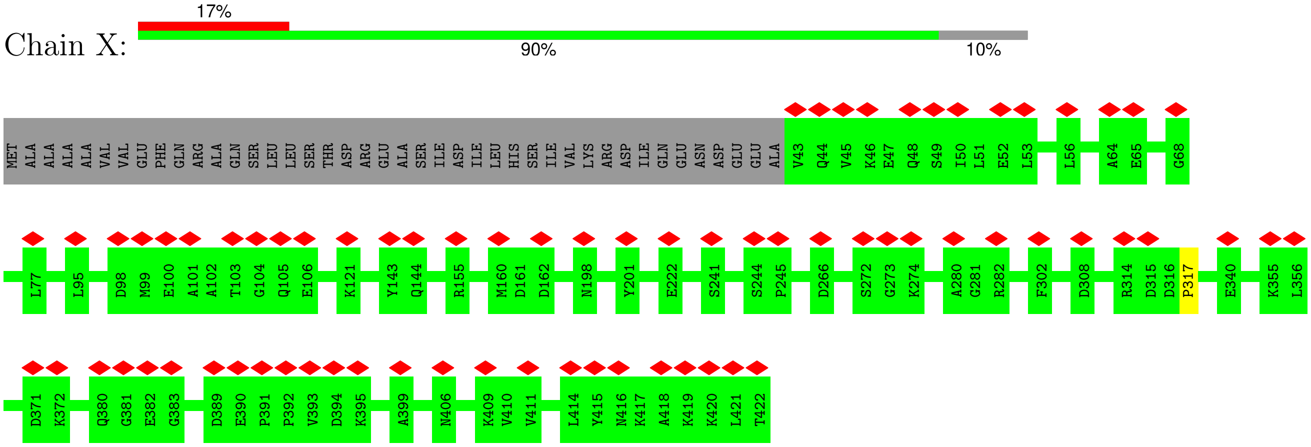
- Molecule 3: 26S proteasome non-ATPase regulatory subunit 12

Chain W:

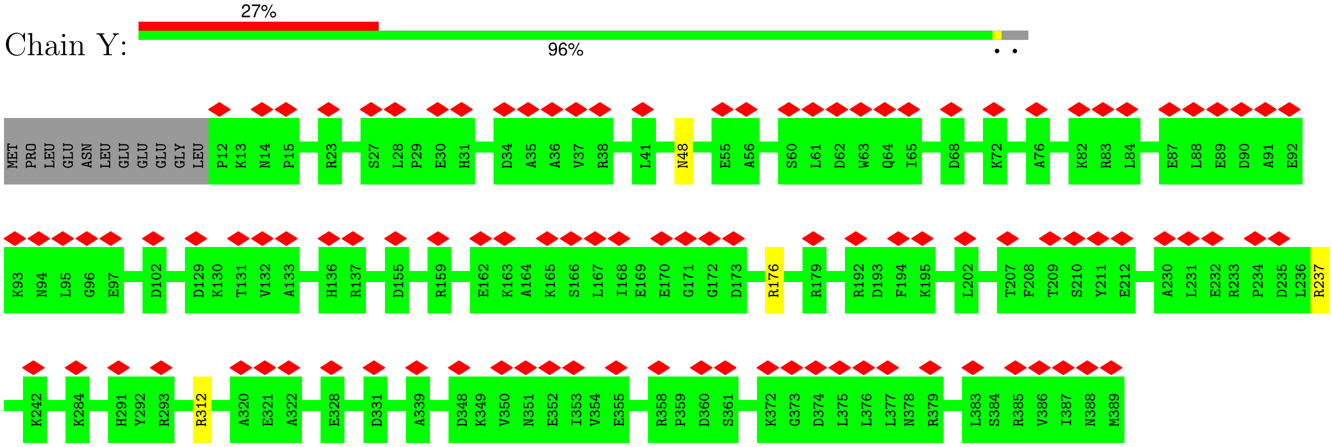


- Molecule 4: 26S proteasome non-ATPase regulatory subunit 11

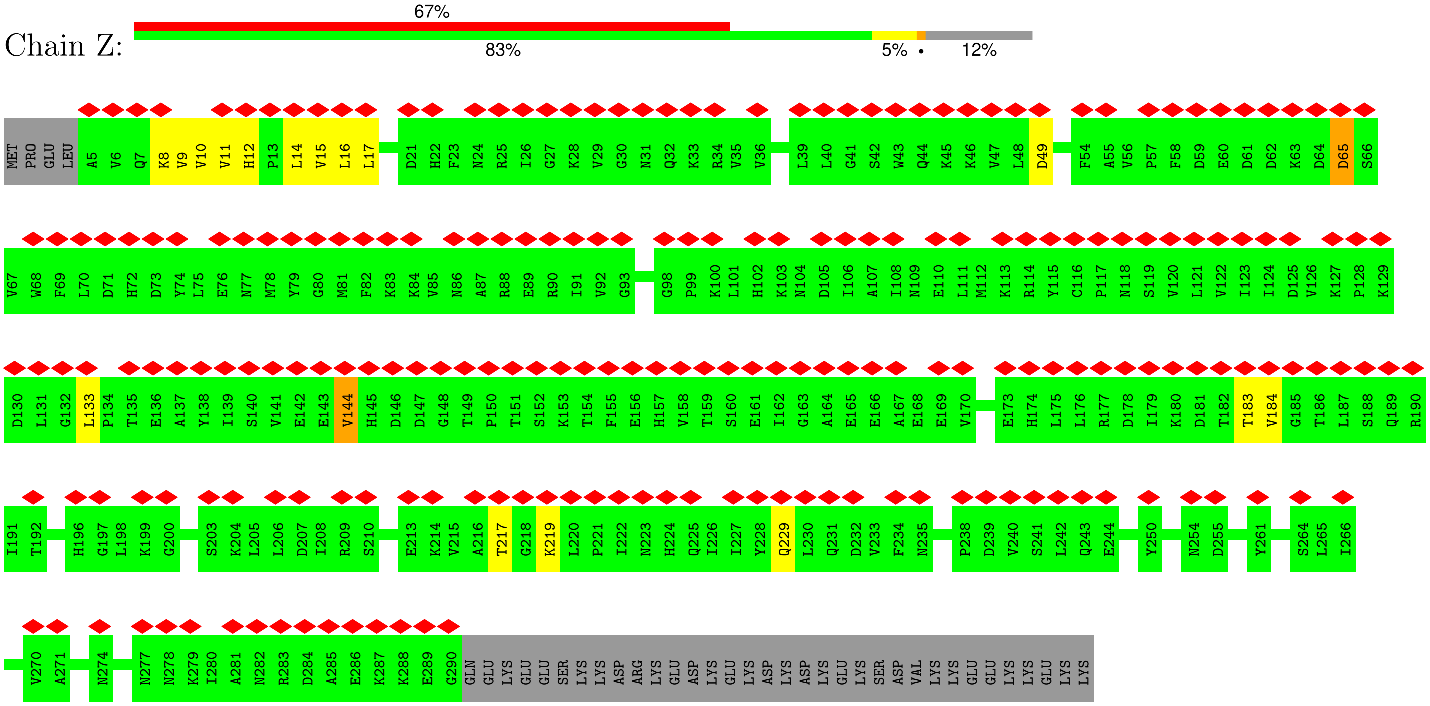
Chain X:



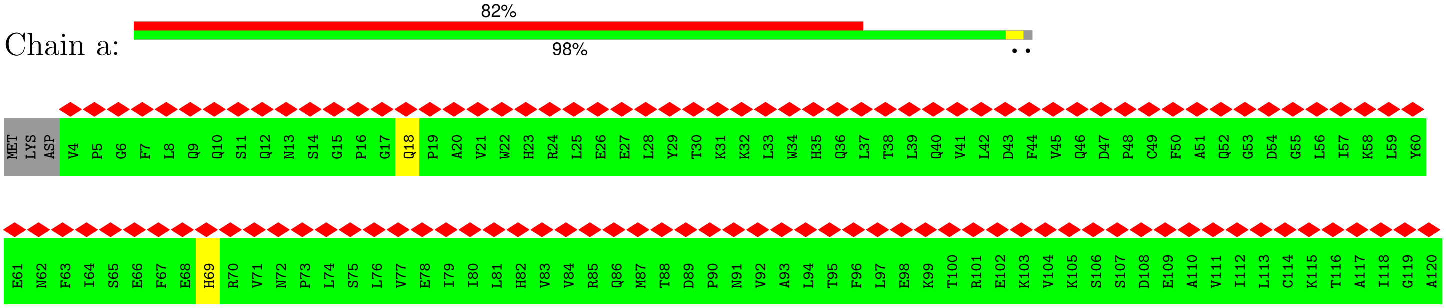
- Molecule 5: 26S proteasome non-ATPase regulatory subunit 6

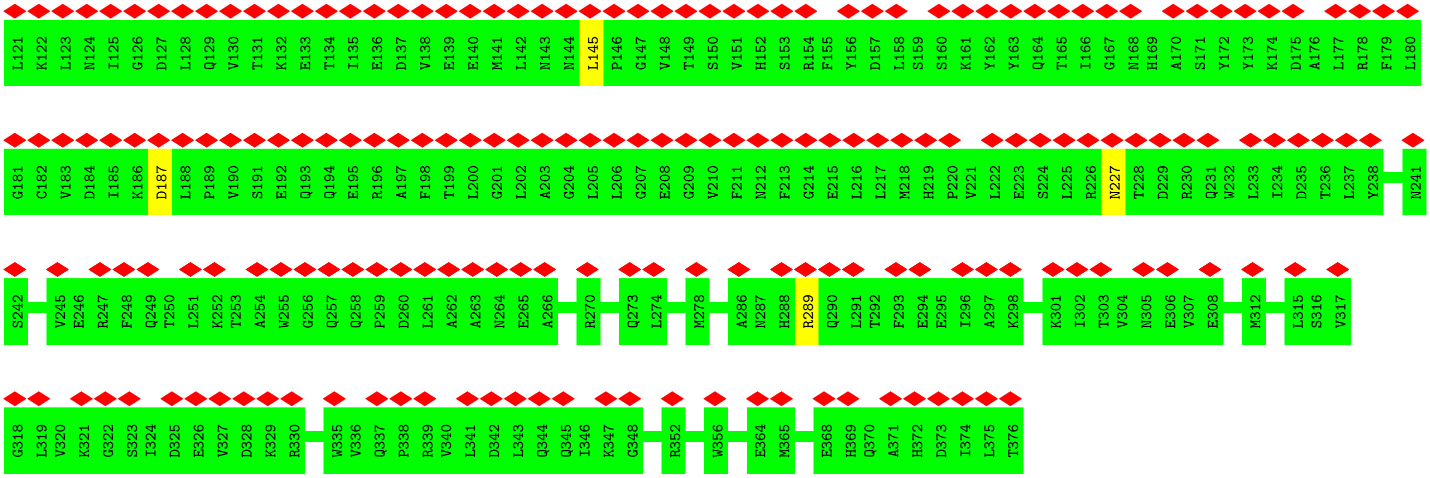


- Molecule 6: 26S proteasome non-ATPase regulatory subunit 7



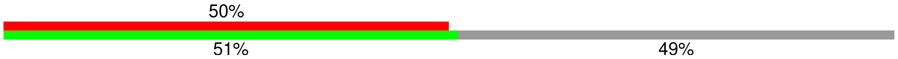
- Molecule 7: 26S proteasome non-ATPase regulatory subunit 13

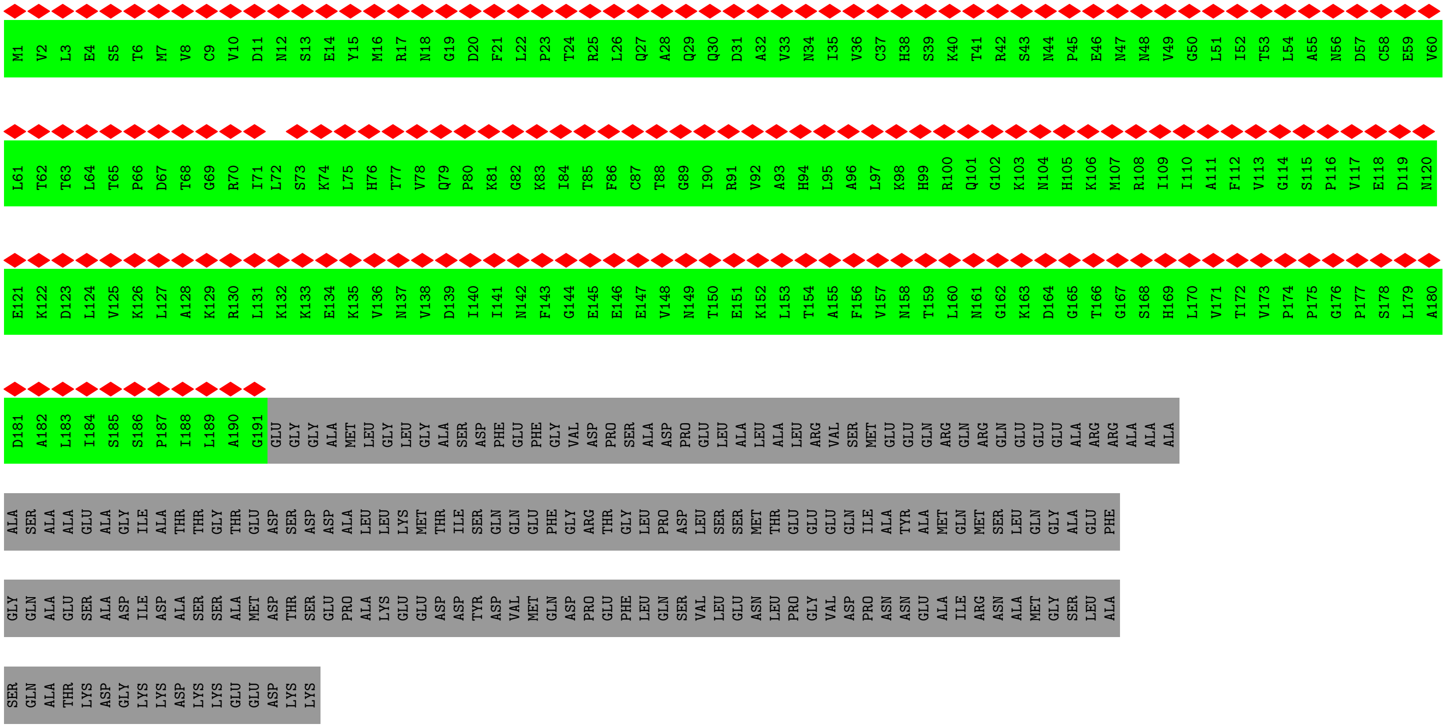




- Molecule 8: 26S proteasome non-ATPase regulatory subunit 4

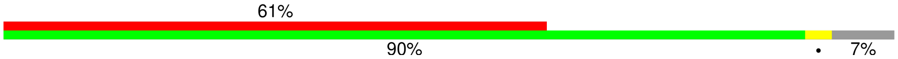
Chain b:

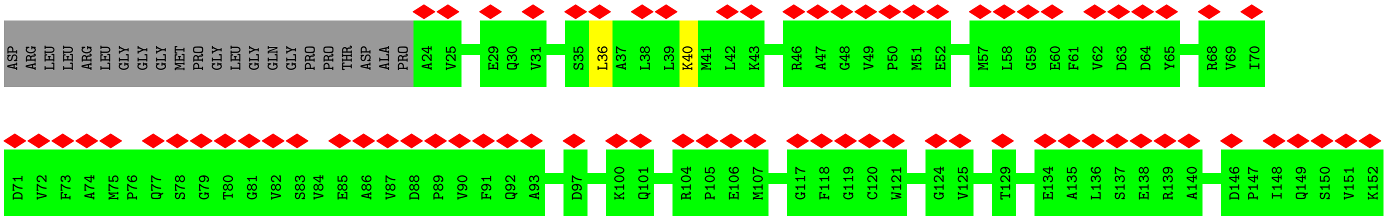


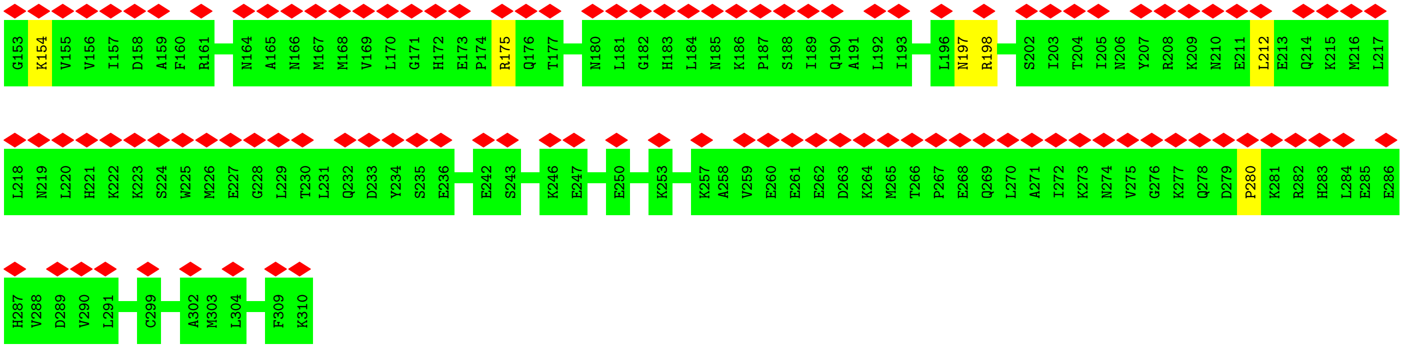


- Molecule 9: 26S proteasome non-ATPase regulatory subunit 14

Chain c:

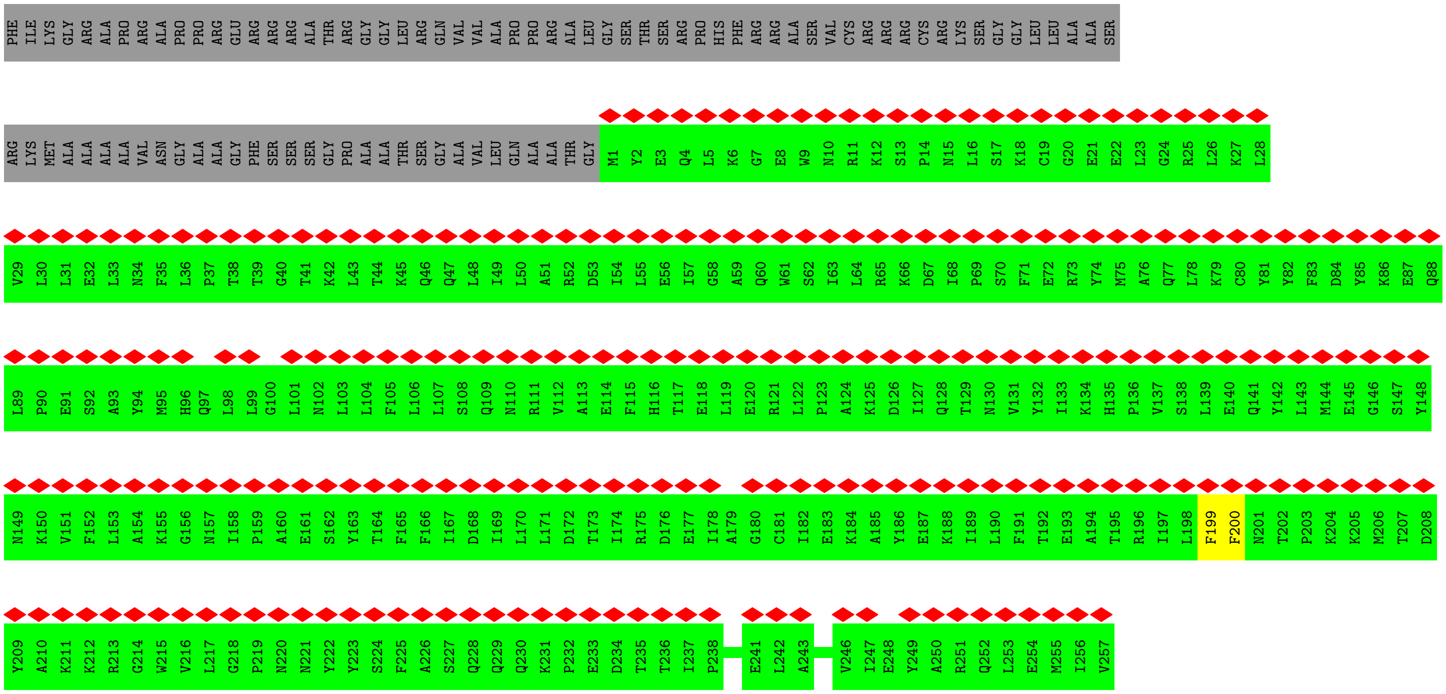






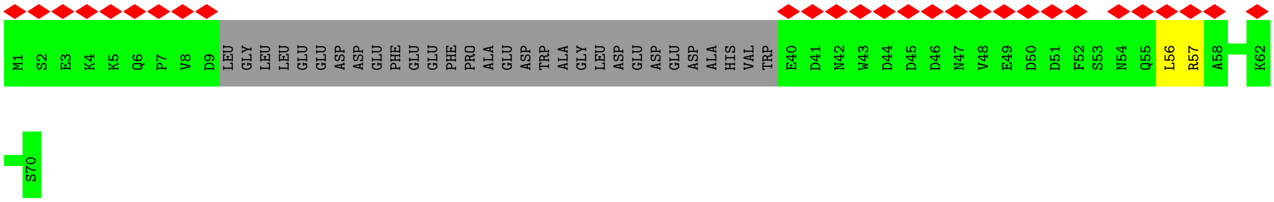
- Molecule 10: 26S proteasome non-ATPase regulatory subunit 8

Chain d:



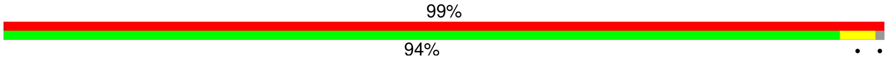
- Molecule 11: 26S proteasome complex subunit SEM1

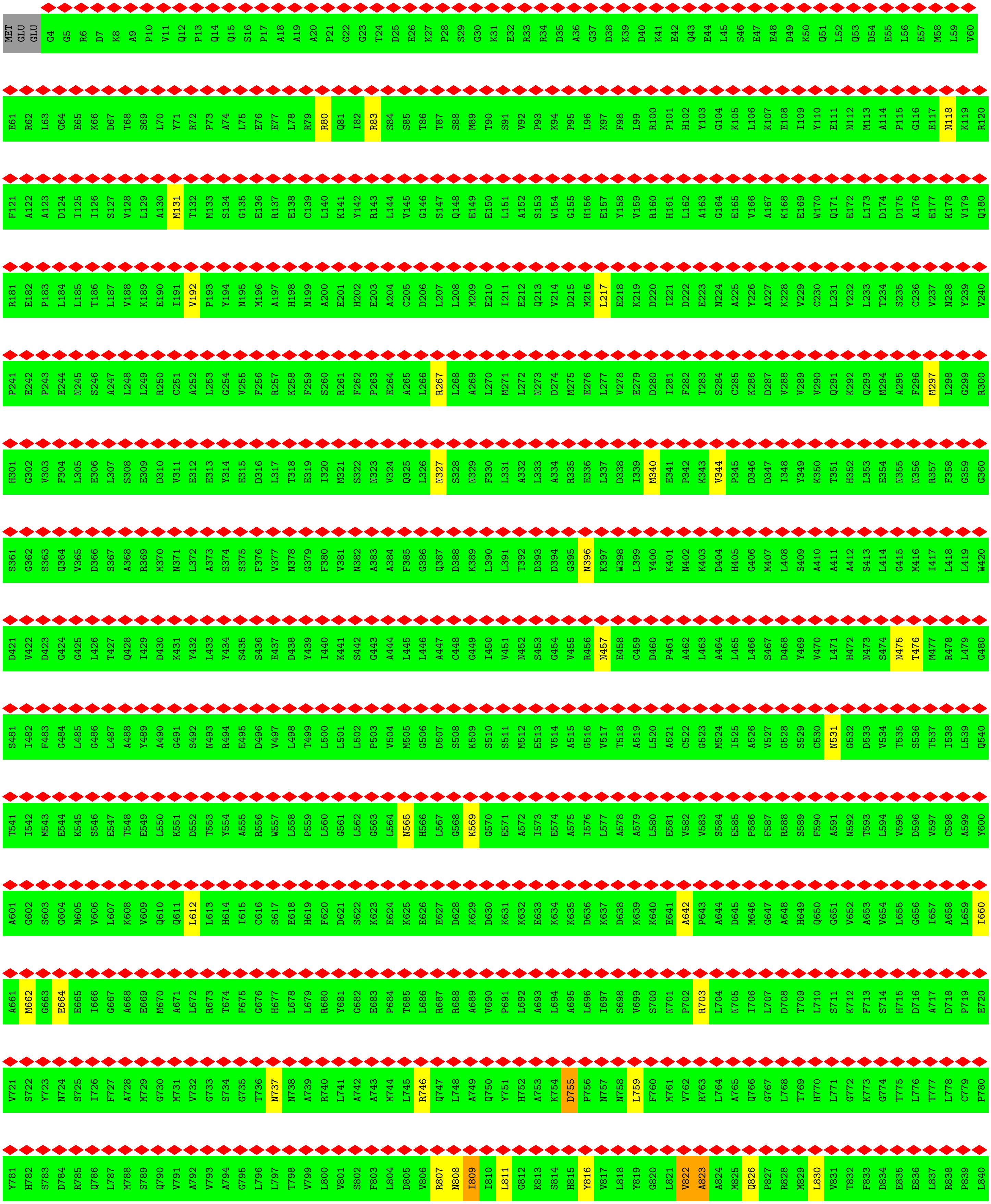
Chain e:



- Molecule 12: 26S proteasome non-ATPase regulatory subunit 2

Chain f:

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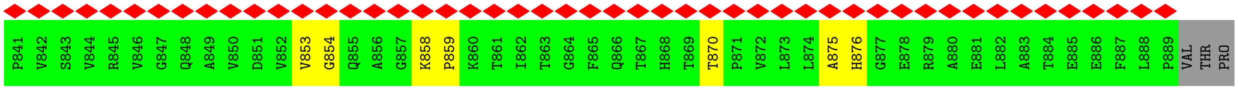
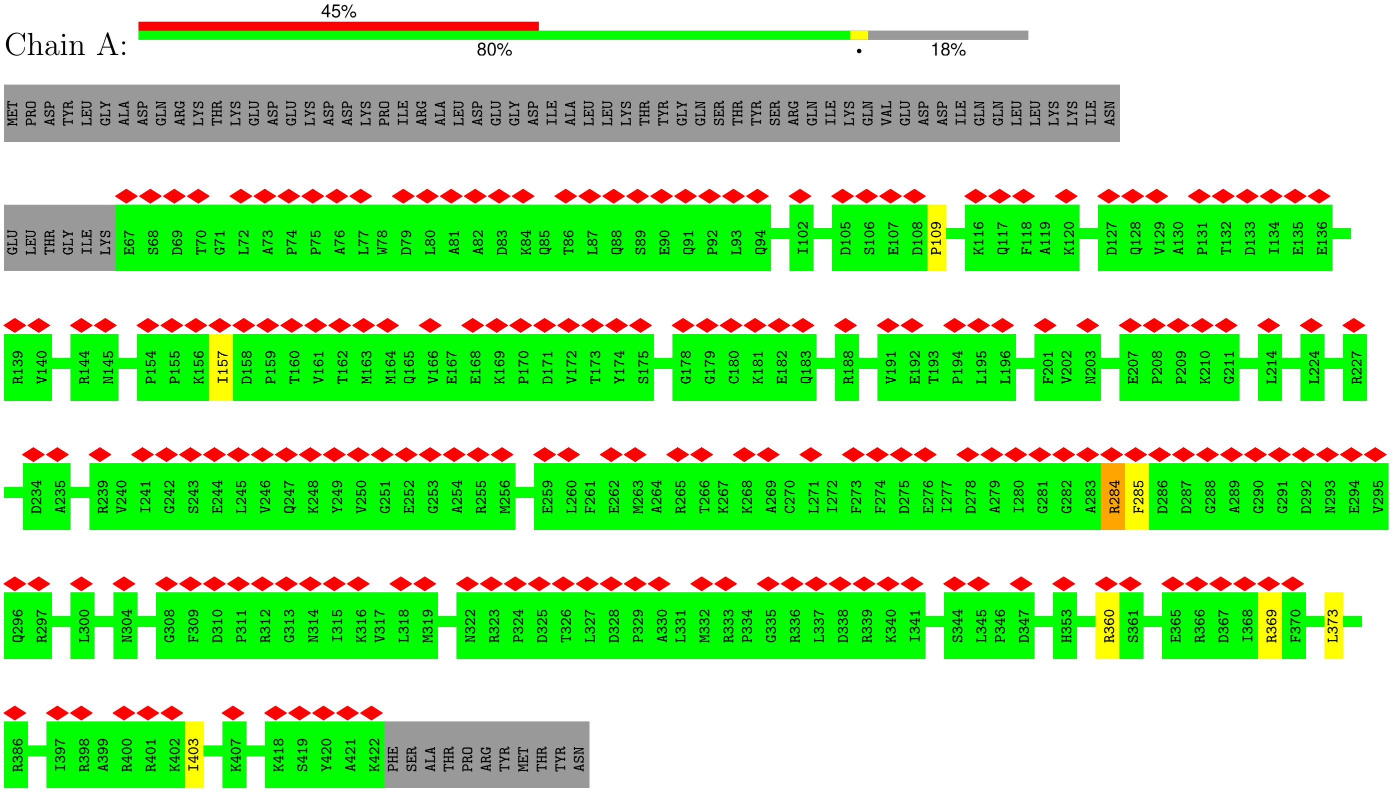
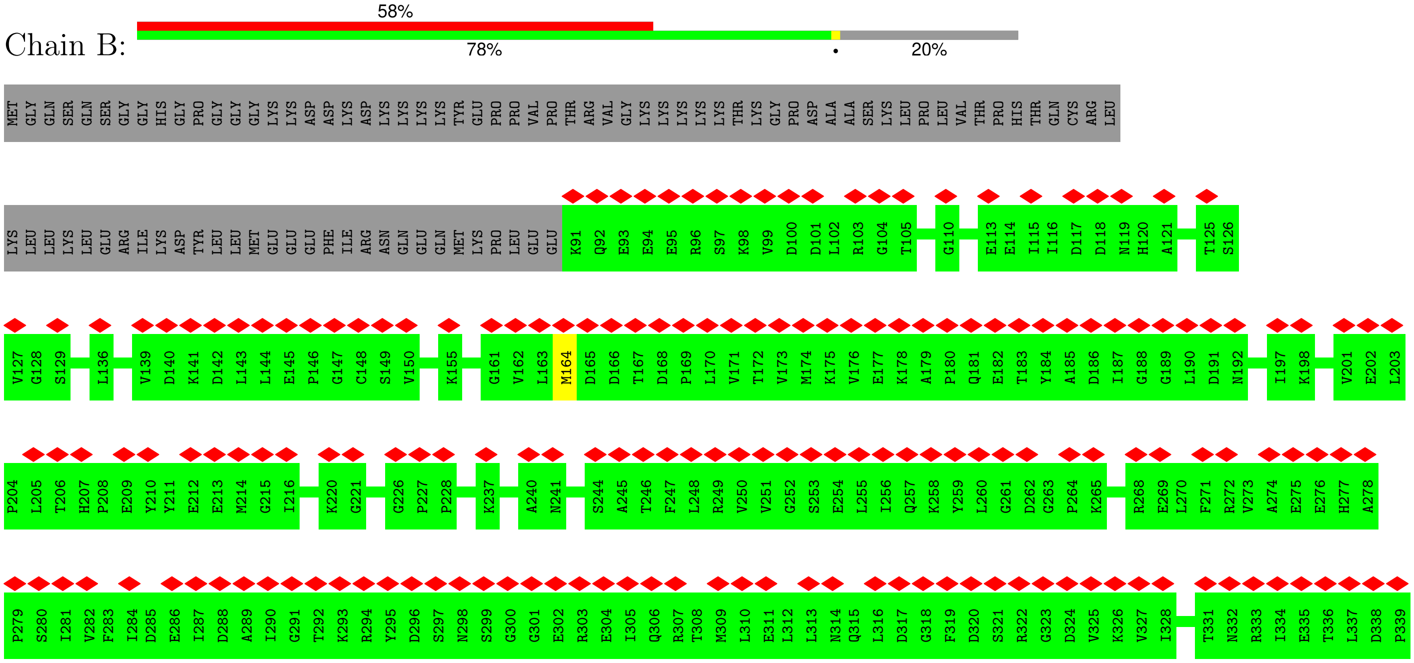
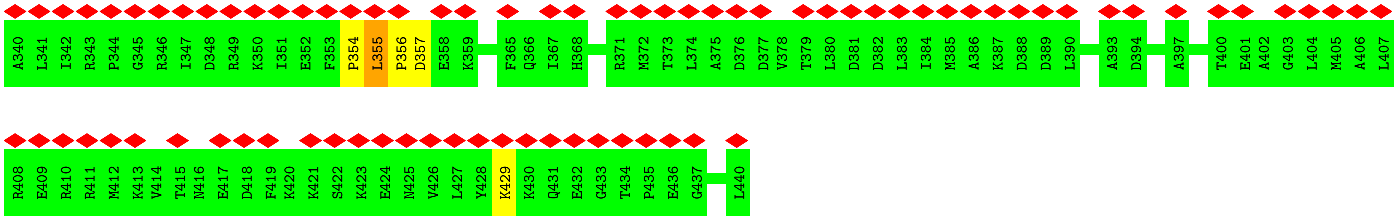


- Molecule 13: 26S proteasome regulatory subunit 7



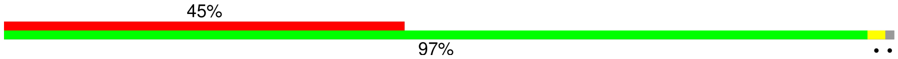
- Molecule 14: 26S proteasome regulatory subunit 4

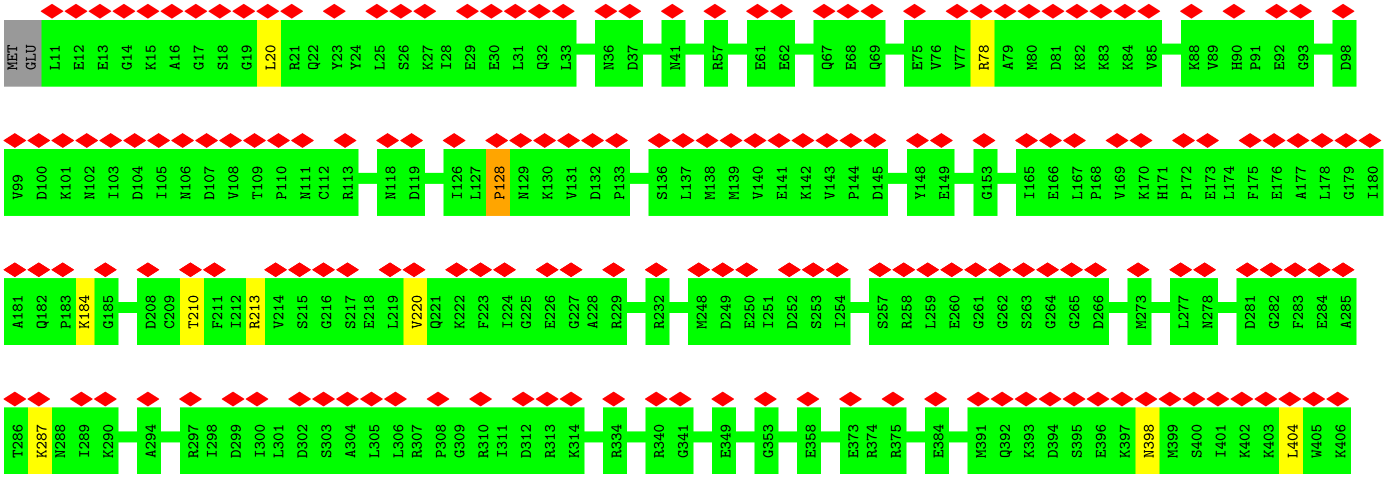




- Molecule 15: 26S proteasome regulatory subunit 8

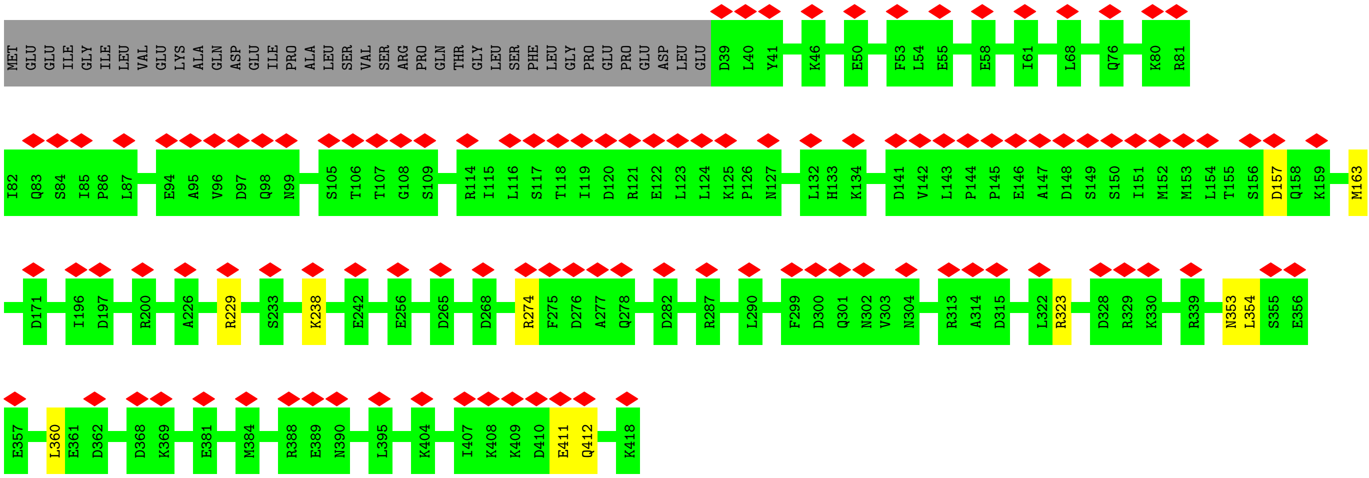
Chain C:





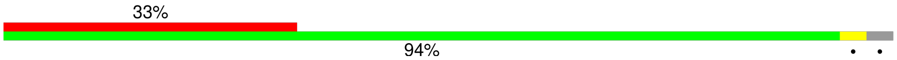
- Molecule 16: 26S proteasome regulatory subunit 6B

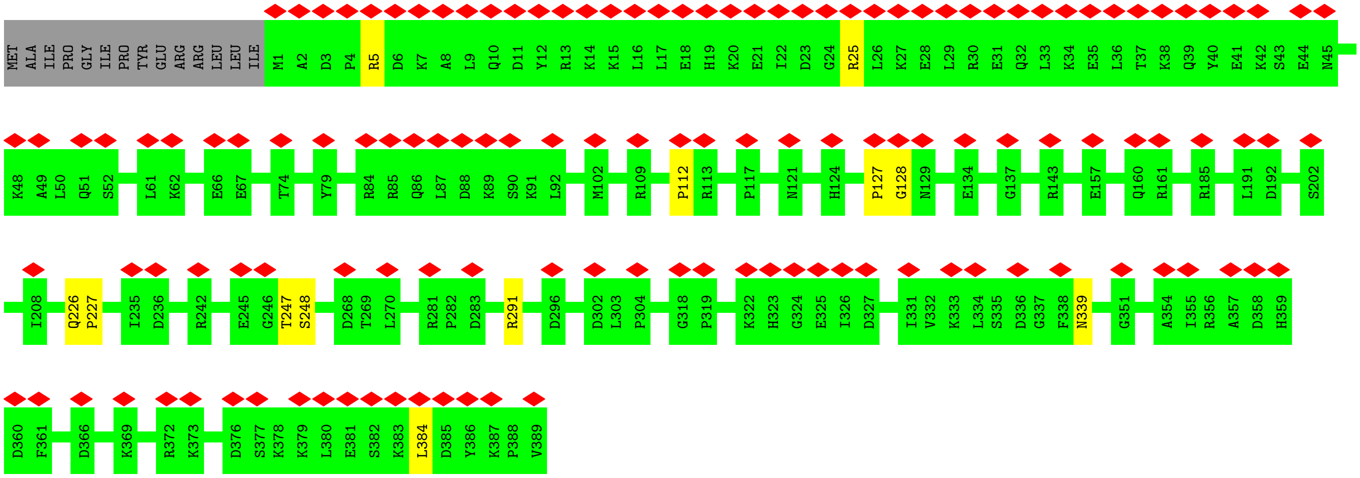
Chain D:



- Molecule 17: 26S proteasome regulatory subunit 10B

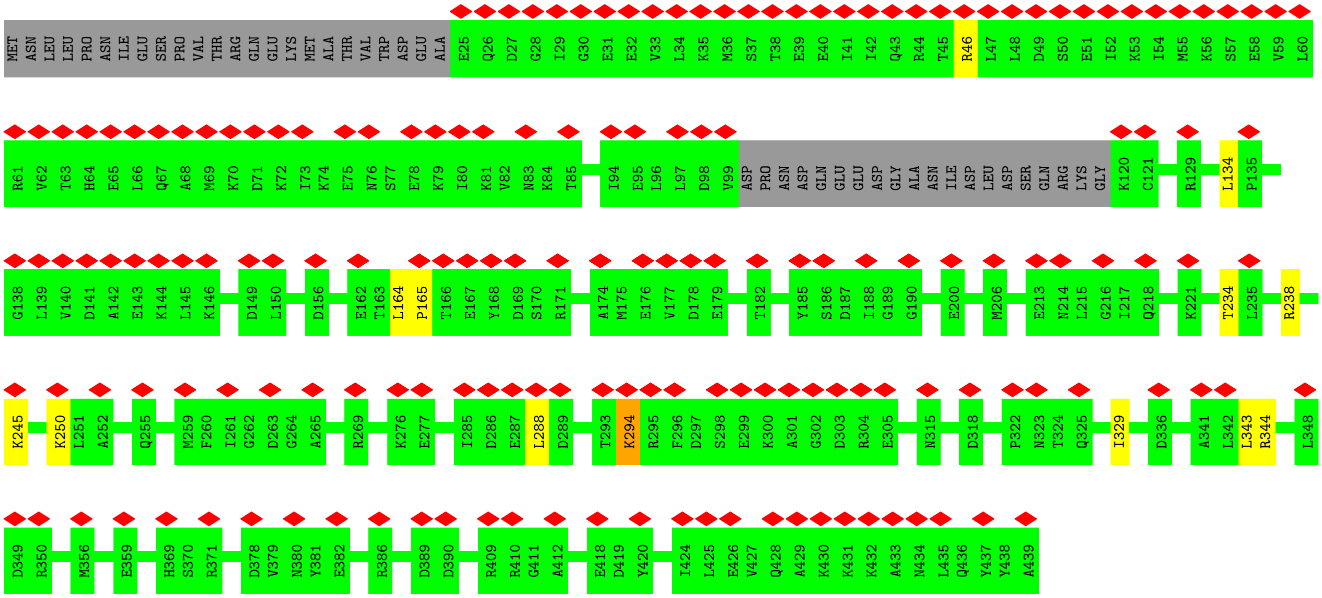
Chain E:





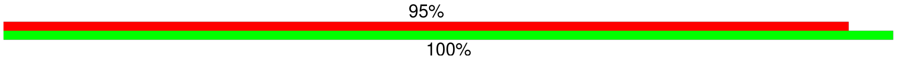
- Molecule 18: 26S proteasome regulatory subunit 6A

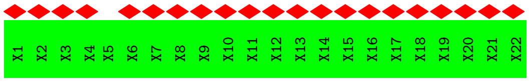
Chain F:



- Molecule 19: substrate

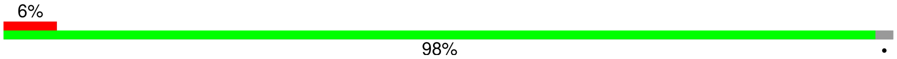
Chain v:

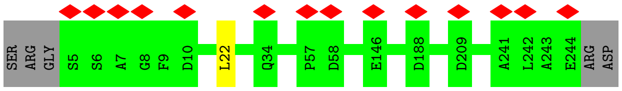




- Molecule 20: Proteasome subunit alpha type-6

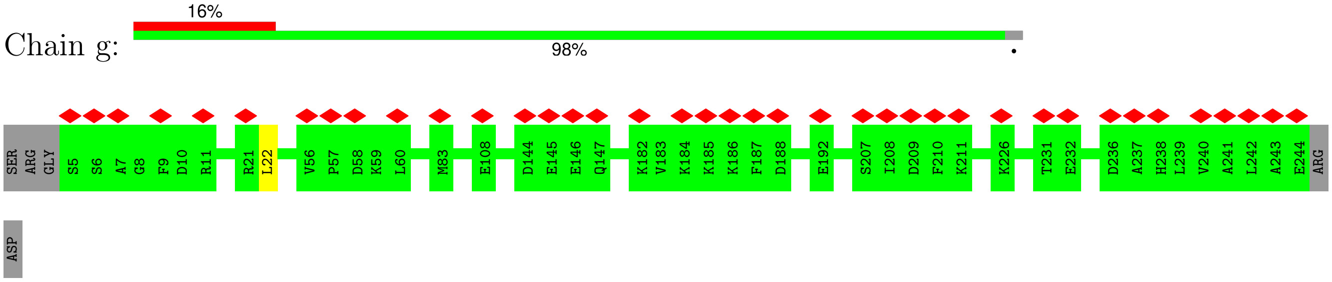
Chain G:





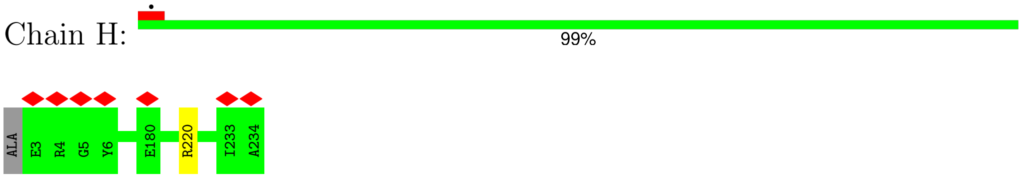
- Molecule 20: Proteasome subunit alpha type-6

Chain g:



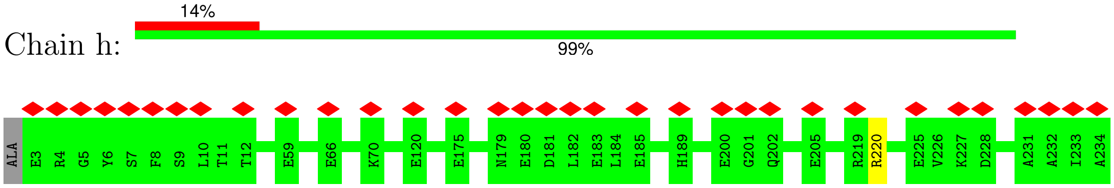
- Molecule 21: Proteasome subunit alpha type-2

Chain H:



- Molecule 21: Proteasome subunit alpha type-2

Chain h:



- Molecule 22: Proteasome subunit alpha type-4

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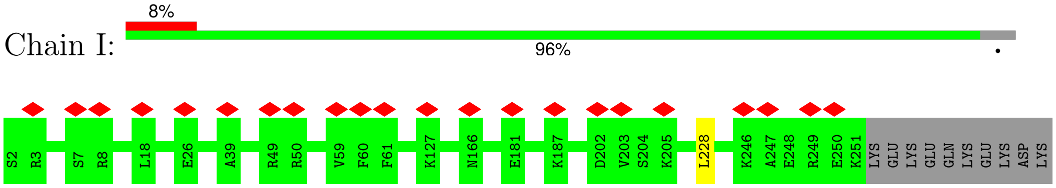
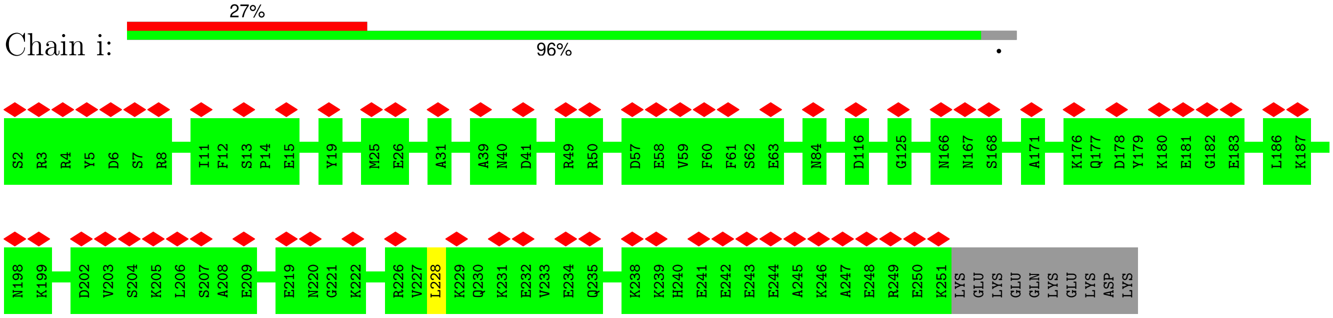


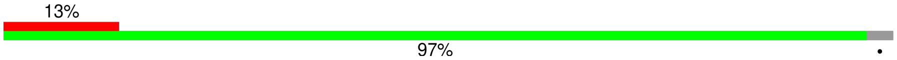
- Molecule 22: Proteasome subunit alpha type-4

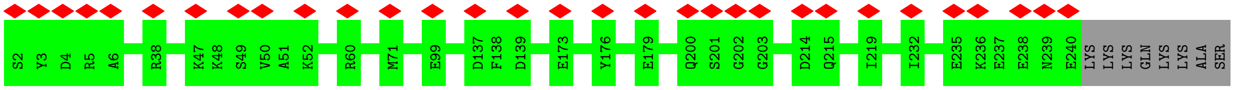
Chain i:



- Molecule 23: Proteasome subunit alpha type-7

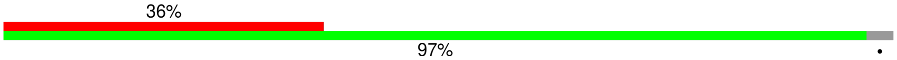
Chain J:

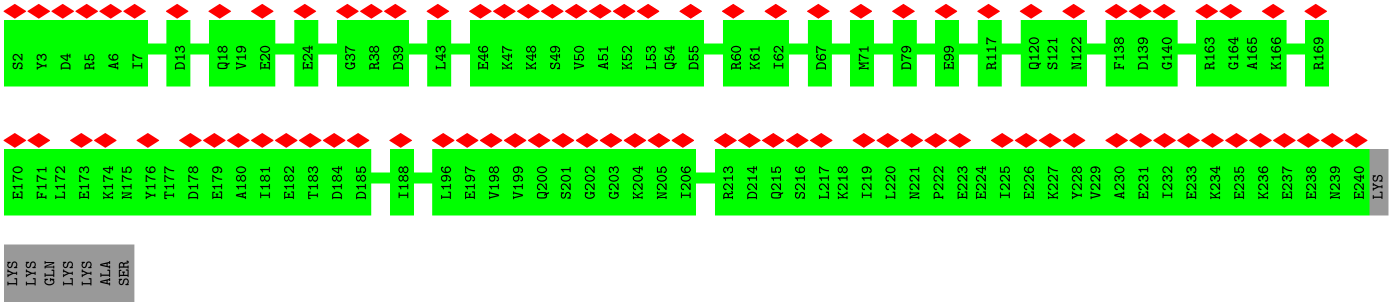




- Molecule 23: Proteasome subunit alpha type-7

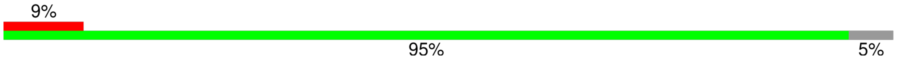
Chain j:

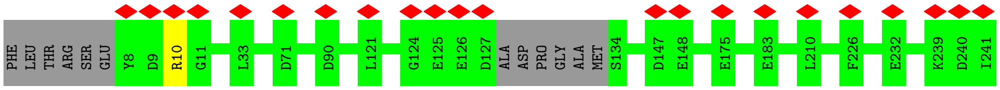




- Molecule 24: Proteasome subunit alpha type-5

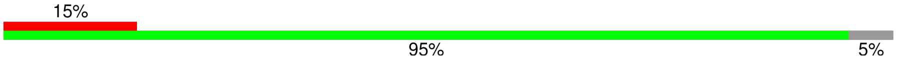
Chain K:

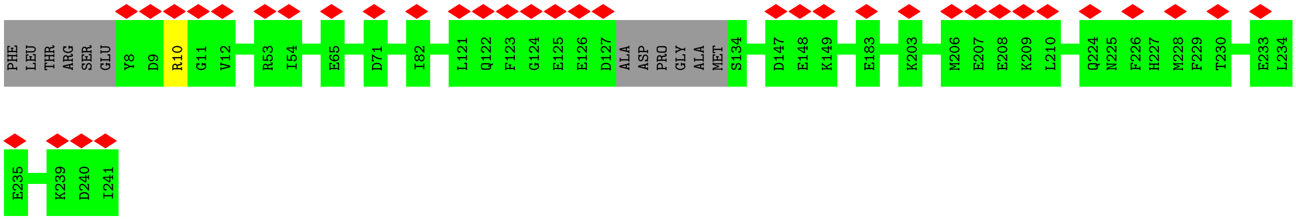




- Molecule 24: Proteasome subunit alpha type-5

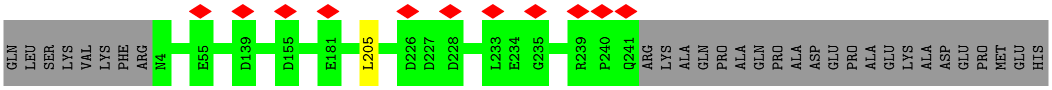
Chain k:





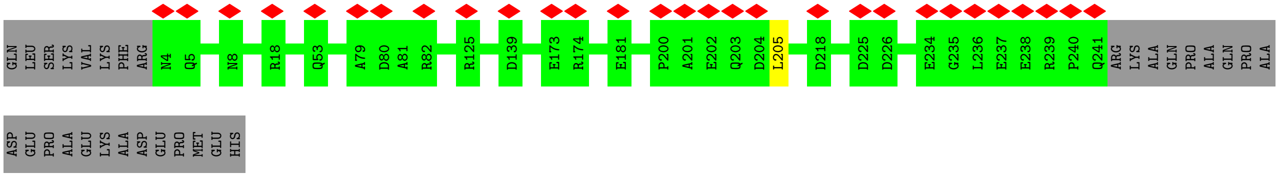
- Molecule 25: Proteasome subunit alpha type-1

Chain L:

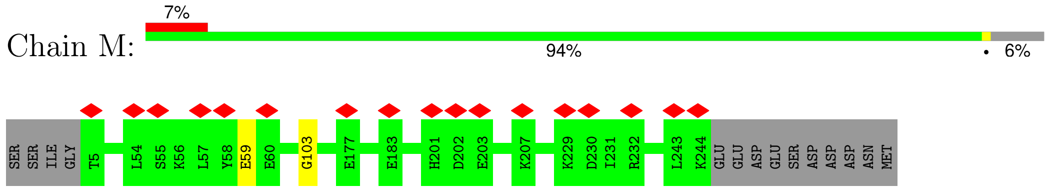


- Molecule 25: Proteasome subunit alpha type-1

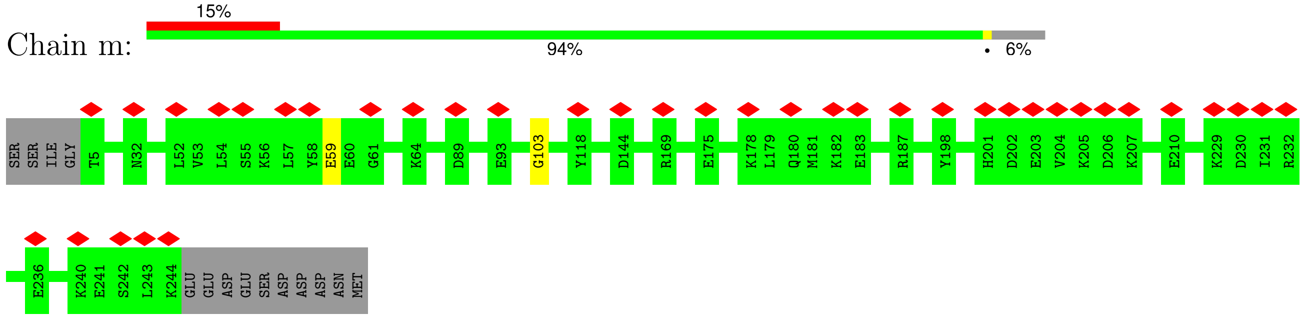
Chain l:



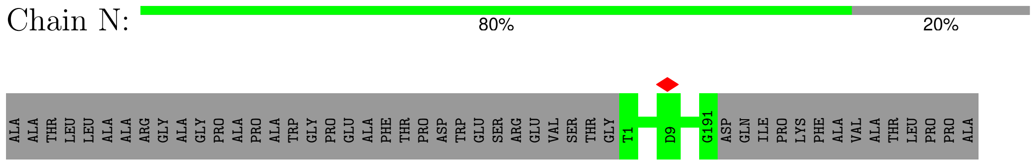
- Molecule 26: Proteasome subunit alpha type-3



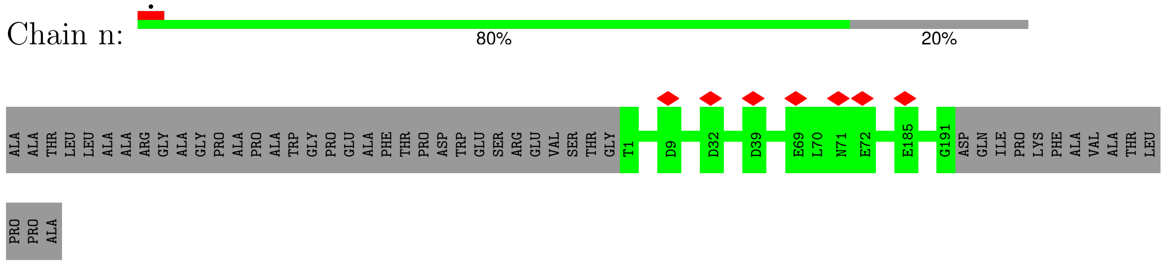
- Molecule 26: Proteasome subunit alpha type-3



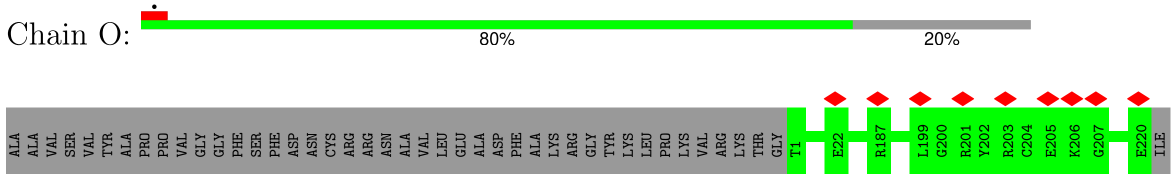
- Molecule 27: Proteasome subunit beta type-6



- Molecule 27: Proteasome subunit beta type-6

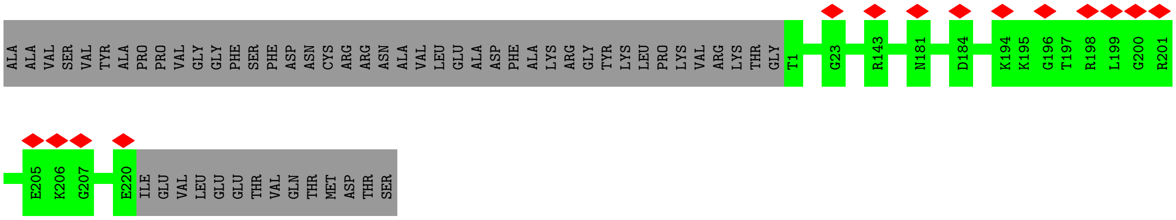


- Molecule 28: Proteasome subunit beta type-7



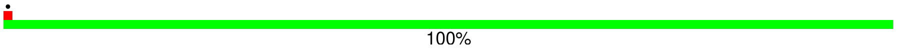
- Molecule 28: Proteasome subunit beta type-7

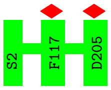
Chain o:



- Molecule 29: Proteasome subunit beta type-3

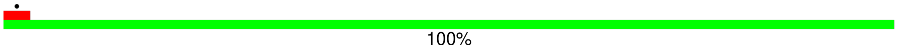
Chain P:

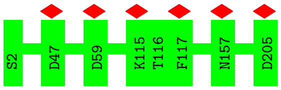




- Molecule 29: Proteasome subunit beta type-3

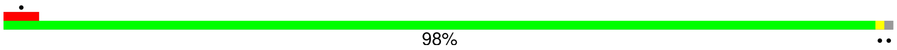
Chain p:

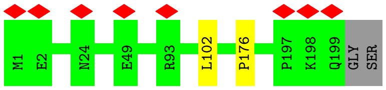




- Molecule 30: Proteasome subunit beta type-2

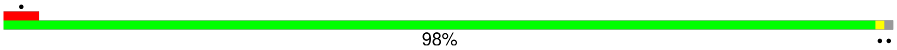
Chain Q:

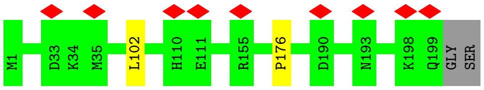




- Molecule 30: Proteasome subunit beta type-2

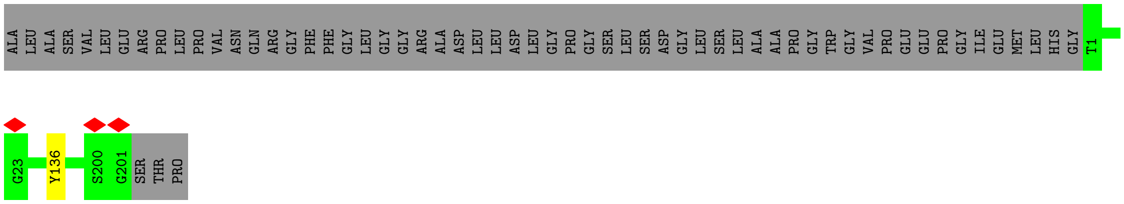
Chain q:





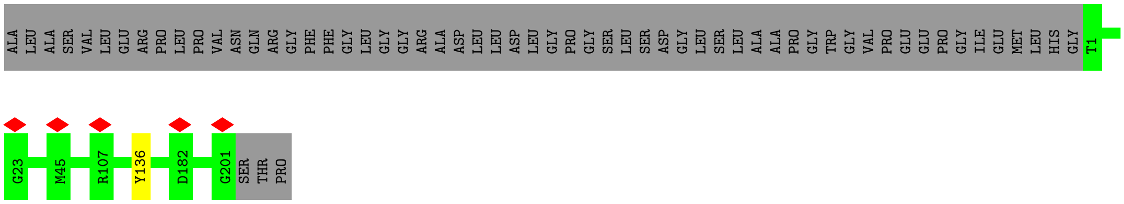
- Molecule 31: Proteasome subunit beta type-5

Chain R:



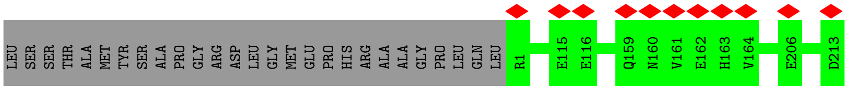
- Molecule 31: Proteasome subunit beta type-5

Chain r:



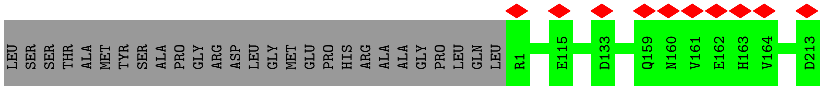
- Molecule 32: Proteasome subunit beta type-1

Chain S:



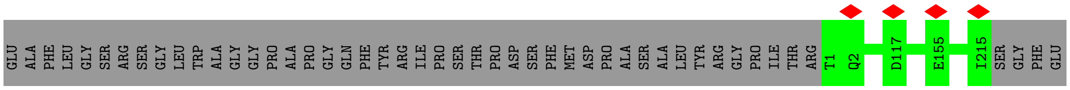
- Molecule 32: Proteasome subunit beta type-1

Chain s:



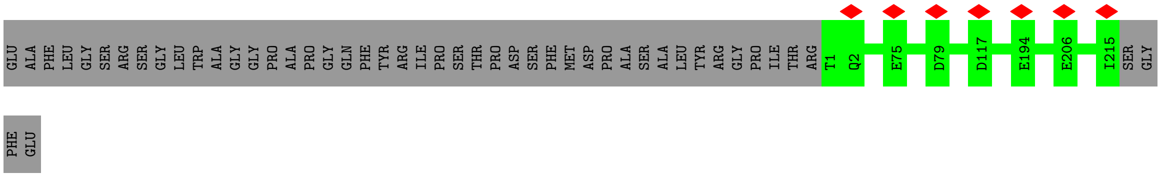
- Molecule 33: Proteasome subunit beta type-4

Chain T:



- Molecule 33: Proteasome subunit beta type-4

Chain t:



4 Experimental information ⓘ

Property	**Value**	**Source**
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	71651	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{Å}^2)$	44	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	0.016	Depositor
Minimum map value	-0.006	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.001	Depositor
Recommended contour level	0.006	Depositor
Map size (Å)	411.0, 411.0, 411.0	wwPDB
Map dimensions	600, 600, 600	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.685, 0.685, 0.685	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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

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	U	0.31	0/6513	0.56	1/8816 (0.0%)
2	V	0.34	0/3929	0.63	0/5309
3	W	0.31	0/3751	0.59	1/5042 (0.0%)
4	X	0.39	0/3053	0.57	0/4115
5	Y	0.38	0/3173	0.61	0/4273
6	Z	0.30	0/2324	0.61	2/3150 (0.1%)
7	a	0.31	0/3053	0.59	1/4133 (0.0%)
8	b	0.29	0/1478	0.58	0/2001
9	c	0.33	0/2302	0.63	1/3110 (0.0%)
10	d	0.32	0/2162	0.59	0/2919
11	e	0.32	0/338	0.65	1/450 (0.2%)
12	f	0.33	1/6954 (0.0%)	0.71	6/9399 (0.1%)
13	A	0.34	0/2814	0.55	0/3801
14	B	0.32	0/2745	0.57	0/3709
15	C	0.35	0/3146	0.60	1/4226 (0.0%)
16	D	0.41	0/3090	0.63	1/4168 (0.0%)
17	E	0.37	0/3145	0.62	1/4233 (0.0%)
18	F	0.37	0/3137	0.63	3/4223 (0.1%)
20	G	0.47	0/1859	0.57	0/2523
20	g	0.47	0/1859	0.57	0/2523
21	H	0.50	0/1743	0.59	1/2372 (0.0%)
21	h	0.50	0/1743	0.59	1/2372 (0.0%)
22	I	0.43	0/1942	0.59	0/2628
22	i	0.43	0/1942	0.59	0/2628
23	J	0.41	0/1728	0.54	0/2358
23	j	0.41	0/1728	0.54	0/2358
24	K	0.39	0/1747	0.56	0/2364
24	k	0.39	0/1747	0.56	0/2364
25	L	0.43	0/1885	0.59	0/2552
25	l	0.43	0/1885	0.59	0/2552
26	M	0.46	0/1891	0.59	0/2552
26	m	0.46	0/1891	0.59	0/2552

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
27	N	0.43	0/1454	0.53	0/1967
27	n	0.43	0/1454	0.53	0/1967
28	O	0.42	0/1670	0.55	0/2265
28	o	0.42	0/1670	0.55	0/2265
29	P	0.45	0/1614	0.54	0/2177
29	p	0.45	0/1614	0.54	0/2177
30	Q	0.47	0/1603	0.62	0/2174
30	q	0.47	0/1603	0.62	0/2174
31	R	0.46	0/1579	0.52	0/2134
31	r	0.46	0/1579	0.52	0/2134
32	S	0.42	0/1671	0.54	0/2253
32	s	0.42	0/1671	0.54	0/2253
33	T	0.44	0/1700	0.53	0/2305
33	t	0.44	0/1700	0.53	0/2305
All	All	0.39	1/105279 (0.0%)	0.59	21/142325 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
2	V	0	1
6	Z	0	2
7	a	0	1
10	d	0	1
12	f	0	12
13	A	0	2
15	C	0	2
16	D	0	2
17	E	0	1
18	F	0	1
All	All	0	25

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
12	f	192	VAL	C-N	5.92	1.45	1.34

All (21) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
12	f	830	LEU	CA-CB-CG	7.96	133.61	115.30
18	F	343	LEU	CA-CB-CG	7.43	132.40	115.30
11	e	56	LEU	CA-CB-CG	7.33	132.15	115.30
12	f	759	LEU	CA-CB-CG	6.76	130.84	115.30
12	f	612	LEU	CA-CB-CG	6.74	130.79	115.30
6	Z	133	LEU	CA-CB-CG	6.52	130.30	115.30
7	a	187	ASP	CB-CG-OD1	6.16	123.85	118.30
12	f	811	LEU	CA-CB-CG	6.13	129.41	115.30
1	U	187	LEU	CA-CB-CG	6.11	129.34	115.30
9	c	212	LEU	CA-CB-CG	5.77	128.56	115.30
21	H	220	ARG	NE-CZ-NH2	-5.71	117.45	120.30
17	E	384	LEU	CA-CB-CG	5.61	128.19	115.30
21	h	220	ARG	NE-CZ-NH2	-5.57	117.51	120.30
15	C	404	LEU	CA-CB-CG	5.46	127.86	115.30
12	f	217	LEU	CA-CB-CG	5.45	127.84	115.30
18	F	294	LYS	C-N-CA	5.44	135.30	121.70
6	Z	65	ASP	CB-CG-OD1	5.37	123.14	118.30
16	D	354	LEU	CA-CB-CG	5.36	127.63	115.30
12	f	858	LYS	C-N-CD	5.15	139.21	128.40
3	W	222	LEU	CA-CB-CG	5.00	126.80	115.30
18	F	164	LEU	CA-CB-CG	5.00	126.80	115.30

There are no chirality outliers.

All (25) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
13	A	157	ILE	Peptide
13	A	284	ARG	Peptide
15	C	128	PRO	Peptide
15	C	220	VAL	Peptide
16	D	157	ASP	Peptide
16	D	411	GLU	Peptide
17	E	226	GLN	Peptide
18	F	294	LYS	Peptide
2	V	29	PRO	Peptide
6	Z	144	VAL	Peptide
6	Z	183	THR	Peptide
7	a	18	GLN	Peptide
10	d	199	PHE	Peptide
12	f	340	MET	Peptide
12	f	642	ALA	Peptide
12	f	737	ASN	Peptide
12	f	755	ASP	Peptide

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Mol	Chain	Res	Type	Group
12	f	807	ARG	Peptide
12	f	809	ILE	Peptide
12	f	816	TYR	Peptide
12	f	822	VAL	Peptide
12	f	823	ALA	Peptide
12	f	854	GLY	Peptide
12	f	870	THR	Peptide
12	f	875	ALA	Peptide

5.2 Too-close contacts ⓘ

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

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	U	814/953 (85%)	760 (93%)	53 (6%)	1 (0%)	48	79
2	V	478/533 (90%)	436 (91%)	41 (9%)	1 (0%)	44	73
3	W	454/456 (100%)	420 (92%)	34 (8%)	0	100	100
4	X	378/422 (90%)	355 (94%)	22 (6%)	1 (0%)	37	67
5	Y	376/389 (97%)	340 (90%)	36 (10%)	0	100	100
6	Z	284/324 (88%)	240 (84%)	38 (13%)	6 (2%)	5	33
7	a	371/376 (99%)	338 (91%)	32 (9%)	1 (0%)	37	67
8	b	189/377 (50%)	171 (90%)	18 (10%)	0	100	100
9	c	285/309 (92%)	241 (85%)	43 (15%)	1 (0%)	30	63
10	d	255/349 (73%)	216 (85%)	38 (15%)	1 (0%)	30	63
11	e	36/70 (51%)	31 (86%)	5 (14%)	0	100	100
12	f	884/892 (99%)	709 (80%)	164 (19%)	11 (1%)	11	43

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
13	A	354/433 (82%)	310 (88%)	42 (12%)	2 (1%)	22	55
14	B	348/440 (79%)	300 (86%)	44 (13%)	4 (1%)	12	45
15	C	394/398 (99%)	342 (87%)	51 (13%)	1 (0%)	37	67
16	D	378/418 (90%)	335 (89%)	42 (11%)	1 (0%)	37	67
17	E	387/403 (96%)	338 (87%)	43 (11%)	6 (2%)	8	38
18	F	391/439 (89%)	350 (90%)	40 (10%)	1 (0%)	37	67
20	G	238/245 (97%)	228 (96%)	10 (4%)	0	100	100
20	g	238/245 (97%)	228 (96%)	10 (4%)	0	100	100
21	H	230/233 (99%)	216 (94%)	14 (6%)	0	100	100
21	h	230/233 (99%)	216 (94%)	14 (6%)	0	100	100
22	I	248/260 (95%)	230 (93%)	18 (7%)	0	100	100
22	i	248/260 (95%)	230 (93%)	18 (7%)	0	100	100
23	J	237/247 (96%)	223 (94%)	14 (6%)	0	100	100
23	j	237/247 (96%)	223 (94%)	14 (6%)	0	100	100
24	K	224/240 (93%)	212 (95%)	12 (5%)	0	100	100
24	k	224/240 (93%)	212 (95%)	12 (5%)	0	100	100
25	L	236/268 (88%)	223 (94%)	13 (6%)	0	100	100
25	l	236/268 (88%)	223 (94%)	13 (6%)	0	100	100
26	M	238/254 (94%)	216 (91%)	20 (8%)	2 (1%)	16	51
26	m	238/254 (94%)	216 (91%)	20 (8%)	2 (1%)	16	51
27	N	189/238 (79%)	183 (97%)	6 (3%)	0	100	100
27	n	189/238 (79%)	183 (97%)	6 (3%)	0	100	100
28	O	218/276 (79%)	209 (96%)	9 (4%)	0	100	100
28	o	218/276 (79%)	209 (96%)	9 (4%)	0	100	100
29	P	202/204 (99%)	191 (95%)	11 (5%)	0	100	100
29	p	202/204 (99%)	191 (95%)	11 (5%)	0	100	100
30	Q	197/201 (98%)	181 (92%)	15 (8%)	1 (0%)	25	59
30	q	197/201 (98%)	181 (92%)	15 (8%)	1 (0%)	25	59
31	R	199/262 (76%)	190 (96%)	9 (4%)	0	100	100
31	r	199/262 (76%)	190 (96%)	9 (4%)	0	100	100
32	S	211/240 (88%)	202 (96%)	9 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
32	s	211/240 (88%)	202 (96%)	9 (4%)	0	100	100
33	T	213/263 (81%)	198 (93%)	15 (7%)	0	100	100
33	t	213/263 (81%)	198 (93%)	15 (7%)	0	100	100
All	All	13216/14843 (89%)	12036 (91%)	1136 (9%)	44 (0%)	38	67

All (44) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
6	Z	217	THR
10	d	200	PHE
12	f	808	ASN
12	f	853	VAL
14	B	354	PRO
12	f	876	HIS
14	B	356	PRO
14	B	357	ASP
16	D	412	GLN
17	E	127	PRO
17	E	248	SER
7	a	69	HIS
12	f	118	ASN
12	f	476	THR
12	f	664	GLU
12	f	823	ALA
12	f	859	PRO
26	m	59	GLU
4	X	317	PRO
6	Z	10	VAL
12	f	809	ILE
13	A	109	PRO
17	E	247	THR
18	F	165	PRO
26	M	59	GLU
26	M	103	GLY
26	m	103	GLY
6	Z	65	ASP
9	c	280	PRO
12	f	475	ASN
15	C	128	PRO
30	Q	176	PRO
30	q	176	PRO

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Mol	Chain	Res	Type
6	Z	12	HIS
6	Z	184	VAL
12	f	755	ASP
13	A	285	PHE
17	E	112	PRO
6	Z	144	VAL
17	E	227	PRO
1	U	813	TYR
14	B	355	LEU
17	E	128	GLY
2	V	29	PRO

5.3.2 Protein sidechains ⓘ

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	U	700/816 (86%)	696 (99%)	4 (1%)	84	92
2	V	414/459 (90%)	411 (99%)	3 (1%)	81	90
3	W	416/416 (100%)	402 (97%)	14 (3%)	32	60
4	X	327/362 (90%)	327 (100%)	0	100	100
5	Y	334/344 (97%)	330 (99%)	4 (1%)	67	82
6	Z	257/295 (87%)	247 (96%)	10 (4%)	27	57
7	a	333/336 (99%)	330 (99%)	3 (1%)	75	87
8	b	167/312 (54%)	167 (100%)	0	100	100
9	c	252/267 (94%)	246 (98%)	6 (2%)	44	67
10	d	231/293 (79%)	231 (100%)	0	100	100
11	e	38/63 (60%)	37 (97%)	1 (3%)	41	65
12	f	742/748 (99%)	724 (98%)	18 (2%)	44	67
13	A	298/372 (80%)	293 (98%)	5 (2%)	56	75
14	B	300/385 (78%)	297 (99%)	3 (1%)	73	85
15	C	340/346 (98%)	333 (98%)	7 (2%)	48	71

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
16	D	333/366 (91%)	326 (98%)	7 (2%)	48	71
17	E	341/353 (97%)	337 (99%)	4 (1%)	67	82
18	F	340/379 (90%)	331 (97%)	9 (3%)	41	65
20	G	193/209 (92%)	192 (100%)	1 (0%)	86	93
20	g	193/209 (92%)	192 (100%)	1 (0%)	86	93
21	H	164/190 (86%)	164 (100%)	0	100	100
21	h	164/190 (86%)	164 (100%)	0	100	100
22	I	193/220 (88%)	192 (100%)	1 (0%)	86	93
22	i	193/220 (88%)	192 (100%)	1 (0%)	86	93
23	J	152/210 (72%)	152 (100%)	0	100	100
23	j	152/210 (72%)	152 (100%)	0	100	100
24	K	186/202 (92%)	185 (100%)	1 (0%)	86	93
24	k	186/202 (92%)	185 (100%)	1 (0%)	86	93
25	L	198/229 (86%)	197 (100%)	1 (0%)	86	93
25	l	198/229 (86%)	197 (100%)	1 (0%)	86	93
26	M	192/211 (91%)	192 (100%)	0	100	100
26	m	192/211 (91%)	192 (100%)	0	100	100
27	N	148/180 (82%)	148 (100%)	0	100	100
27	n	148/180 (82%)	148 (100%)	0	100	100
28	O	177/227 (78%)	177 (100%)	0	100	100
28	o	177/227 (78%)	177 (100%)	0	100	100
29	P	172/173 (99%)	172 (100%)	0	100	100
29	p	172/173 (99%)	172 (100%)	0	100	100
30	Q	164/171 (96%)	163 (99%)	1 (1%)	84	92
30	q	164/171 (96%)	163 (99%)	1 (1%)	84	92
31	R	153/201 (76%)	152 (99%)	1 (1%)	81	90
31	r	153/201 (76%)	152 (99%)	1 (1%)	81	90
32	S	174/198 (88%)	174 (100%)	0	100	100
32	s	174/198 (88%)	174 (100%)	0	100	100
33	T	175/214 (82%)	175 (100%)	0	100	100
33	t	175/214 (82%)	175 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	11045/12582 (88%)	10935 (99%)	110 (1%)	71 85

All (110) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	U	118	LEU
1	U	629	THR
1	U	788	VAL
1	U	819	VAL
2	V	194	LYS
2	V	469	THR
2	V	494	MET
3	W	39	ARG
3	W	55	ARG
3	W	92	LYS
3	W	135	LYS
3	W	191	ARG
3	W	196	VAL
3	W	233	LEU
3	W	235	GLN
3	W	239	SER
3	W	241	LEU
3	W	242	SER
3	W	245	LYS
3	W	419	LYS
3	W	456	GLN
5	Y	48	ASN
5	Y	176	ARG
5	Y	237	ARG
5	Y	312	ARG
6	Z	8	LYS
6	Z	9	VAL
6	Z	11	VAL
6	Z	14	LEU
6	Z	15	VAL
6	Z	16	LEU
6	Z	17	LEU
6	Z	49	ASP
6	Z	219	LYS
6	Z	229	GLN
7	a	145	LEU
7	a	227	ASN

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Mol	Chain	Res	Type
7	a	289	ARG
9	c	36	LEU
9	c	40	LYS
9	c	154	LYS
9	c	175	ARG
9	c	197	ASN
9	c	198	ARG
11	e	57	ARG
12	f	80	ARG
12	f	83	ARG
12	f	131	MET
12	f	267	ARG
12	f	297	MET
12	f	327	ASN
12	f	344	VAL
12	f	396	ASN
12	f	457	ASN
12	f	531	ASN
12	f	565	ASN
12	f	569	LYS
12	f	660	ILE
12	f	662	MET
12	f	703	ARG
12	f	746	ARG
12	f	822	VAL
12	f	826	GLN
13	A	284	ARG
13	A	360	ARG
13	A	369	ARG
13	A	373	LEU
13	A	403	ILE
14	B	164	MET
14	B	355	LEU
14	B	429	LYS
15	C	20	LEU
15	C	78	ARG
15	C	184	LYS
15	C	210	THR
15	C	213	ARG
15	C	287	LYS
15	C	398	ASN
16	D	163	MET

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Mol	Chain	Res	Type
16	D	229	ARG
16	D	238	LYS
16	D	274	ARG
16	D	323	ARG
16	D	353	ASN
16	D	360	LEU
17	E	5	ARG
17	E	25	ARG
17	E	291	ARG
17	E	339	ASN
18	F	46	ARG
18	F	134	LEU
18	F	234	THR
18	F	238	ARG
18	F	245	LYS
18	F	250	LYS
18	F	288	LEU
18	F	329	ILE
18	F	344	ARG
20	G	22	LEU
22	I	228	LEU
24	K	10	ARG
25	L	205	LEU
30	Q	102	LEU
31	R	136	TYR
20	g	22	LEU
22	i	228	LEU
24	k	10	ARG
25	l	205	LEU
30	q	102	LEU
31	r	136	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (102) such sidechains are listed below:

Mol	Chain	Res	Type
1	U	70	HIS
1	U	596	ASN
1	U	707	ASN
1	U	888	GLN
2	V	281	ASN
2	V	453	HIS
2	V	473	GLN

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Mol	Chain	Res	Type
3	W	86	ASN
3	W	107	GLN
3	W	203	GLN
3	W	257	GLN
3	W	362	ASN
3	W	456	GLN
4	X	148	HIS
4	X	178	HIS
4	X	292	GLN
4	X	296	ASN
5	Y	48	ASN
5	Y	71	ASN
5	Y	136	HIS
6	Z	72	HIS
6	Z	193	ASN
6	Z	229	GLN
6	Z	256	GLN
7	a	152	HIS
7	a	193	GLN
7	a	227	ASN
7	a	249	GLN
7	a	257	GLN
7	a	332	HIS
7	a	370	GLN
9	c	197	ASN
9	c	214	GLN
9	c	287	HIS
10	d	47	GLN
11	e	63	HIS
12	f	43	GLN
12	f	112	ASN
12	f	118	ASN
12	f	291	GLN
12	f	327	ASN
12	f	378	ASN
12	f	382	ASN
12	f	396	ASN
12	f	457	ASN
12	f	531	ASN
12	f	565	ASN
12	f	614	HIS
12	f	619	HIS

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Mol	Chain	Res	Type
12	f	737	ASN
12	f	815	HIS
13	A	85	GLN
13	A	117	GLN
13	A	165	GLN
13	A	358	HIS
14	B	207	HIS
14	B	241	ASN
14	B	277	HIS
14	B	332	ASN
14	B	416	ASN
15	C	53	ASN
15	C	279	GLN
15	C	337	ASN
15	C	398	ASN
16	D	65	GLN
16	D	187	HIS
16	D	222	HIS
16	D	302	ASN
16	D	353	ASN
17	E	194	ASN
17	E	262	ASN
17	E	271	HIS
17	E	300	HIS
17	E	339	ASN
17	E	364	GLN
18	F	243	GLN
18	F	315	ASN
18	F	333	ASN
21	H	102	GLN
21	H	112	GLN
22	I	109	GLN
23	J	116	GLN
23	J	175	ASN
24	K	99	HIS
24	K	214	ASN
27	N	154	GLN
30	Q	71	ASN
30	Q	82	ASN
30	Q	101	ASN
30	Q	132	HIS
31	R	38	ASN

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Mol	Chain	Res	Type
21	h	112	GLN
22	i	109	GLN
23	j	116	GLN
23	j	175	ASN
24	k	99	HIS
24	k	214	ASN
27	n	154	GLN
30	q	71	ASN
30	q	82	ASN
30	q	101	ASN
30	q	132	HIS

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 5 ligands modelled in this entry, 1 is monoatomic - leaving 4 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
35	ATP	C	501	-	28,33,33	0.79	0	34,52,52	1.22	3 (8%)
35	ATP	D	501	-	28,33,33	0.78	0	34,52,52	1.37	4 (11%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#$\|Z\| > 2$	Counts	RMSZ	#$\|Z\| > 2$
35	ATP	E	401	-	28,33,33	0.82	0	34,52,52	1.42	6 (17%)
36	ADP	F	501	-	24,29,29	0.79	0	29,45,45	1.38	4 (13%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
35	ATP	C	501	-	-	2/18/38/38	0/3/3/3
35	ATP	D	501	-	-	6/18/38/38	0/3/3/3
35	ATP	E	401	-	-	1/18/38/38	0/3/3/3
36	ADP	F	501	-	-	7/12/32/32	0/3/3/3

There are no bond length outliers.

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
35	C	501	ATP	N3-C2-N1	-4.16	123.03	128.67
36	F	501	ADP	N3-C2-N1	-3.87	123.41	128.67
35	E	401	ATP	N3-C2-N1	-3.42	124.03	128.67
35	D	501	ATP	N3-C2-N1	-3.40	124.06	128.67
35	D	501	ATP	O4'-C1'-N9	-2.77	105.07	108.75
36	F	501	ADP	C4-C5-N7	-2.38	106.82	109.34
35	E	401	ATP	O2A-PA-O1A	2.34	123.34	112.44
36	F	501	ADP	O2A-PA-O1A	2.27	122.99	112.44
35	C	501	ATP	C4-C5-N7	-2.26	106.95	109.34
35	C	501	ATP	O3G-PG-O2G	2.25	116.24	107.80
35	D	501	ATP	C4'-O4'-C1'	2.23	111.97	109.92
35	E	401	ATP	C1'-N9-C4	2.20	130.51	126.64
35	E	401	ATP	C4-C5-N7	-2.14	107.07	109.34
35	E	401	ATP	C5'-C4'-C3'	-2.13	107.56	115.21
35	E	401	ATP	O4'-C1'-N9	-2.09	105.97	108.75
35	D	501	ATP	C4-C5-N7	-2.06	107.16	109.34
36	F	501	ADP	C4'-O4'-C1'	-2.04	108.06	109.92

There are no chirality outliers.

All (16) torsion outliers are listed below:

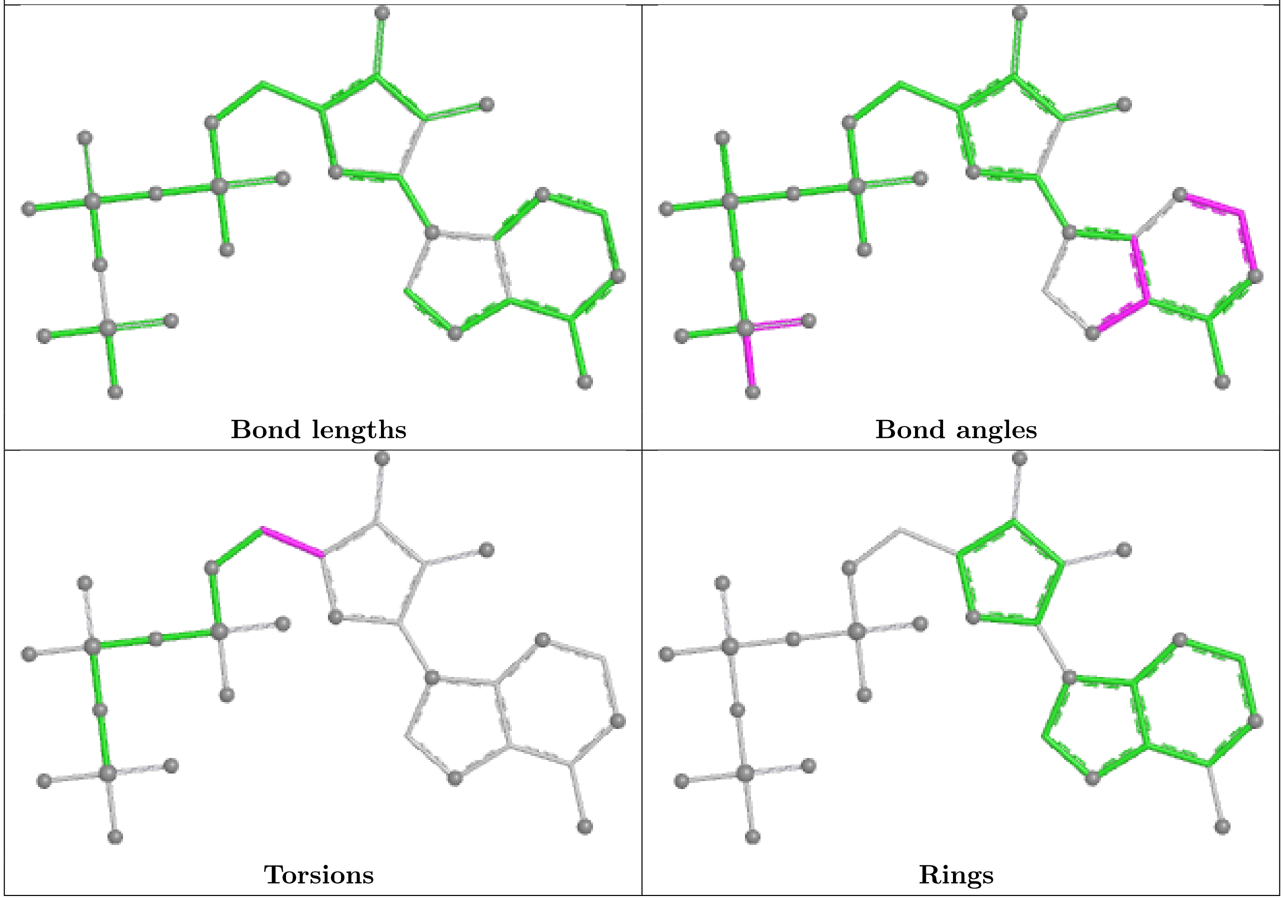
Mol	Chain	Res	Type	Atoms
35	D	501	ATP	C5'-O5'-PA-O1A
35	D	501	ATP	C5'-O5'-PA-O2A
35	D	501	ATP	C5'-O5'-PA-O3A
36	F	501	ADP	PA-O3A-PB-O2B
36	F	501	ADP	PA-O3A-PB-O3B
36	F	501	ADP	C5'-O5'-PA-O1A
36	F	501	ADP	C5'-O5'-PA-O2A
36	F	501	ADP	C5'-O5'-PA-O3A
36	F	501	ADP	O4'-C4'-C5'-O5'
36	F	501	ADP	C3'-C4'-C5'-O5'
35	C	501	ATP	O4'-C4'-C5'-O5'
35	C	501	ATP	C3'-C4'-C5'-O5'
35	E	401	ATP	C4'-C5'-O5'-PA
35	D	501	ATP	PB-O3A-PA-O5'
35	D	501	ATP	O4'-C4'-C5'-O5'
35	D	501	ATP	PB-O3A-PA-O2A

There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand ATP C 501



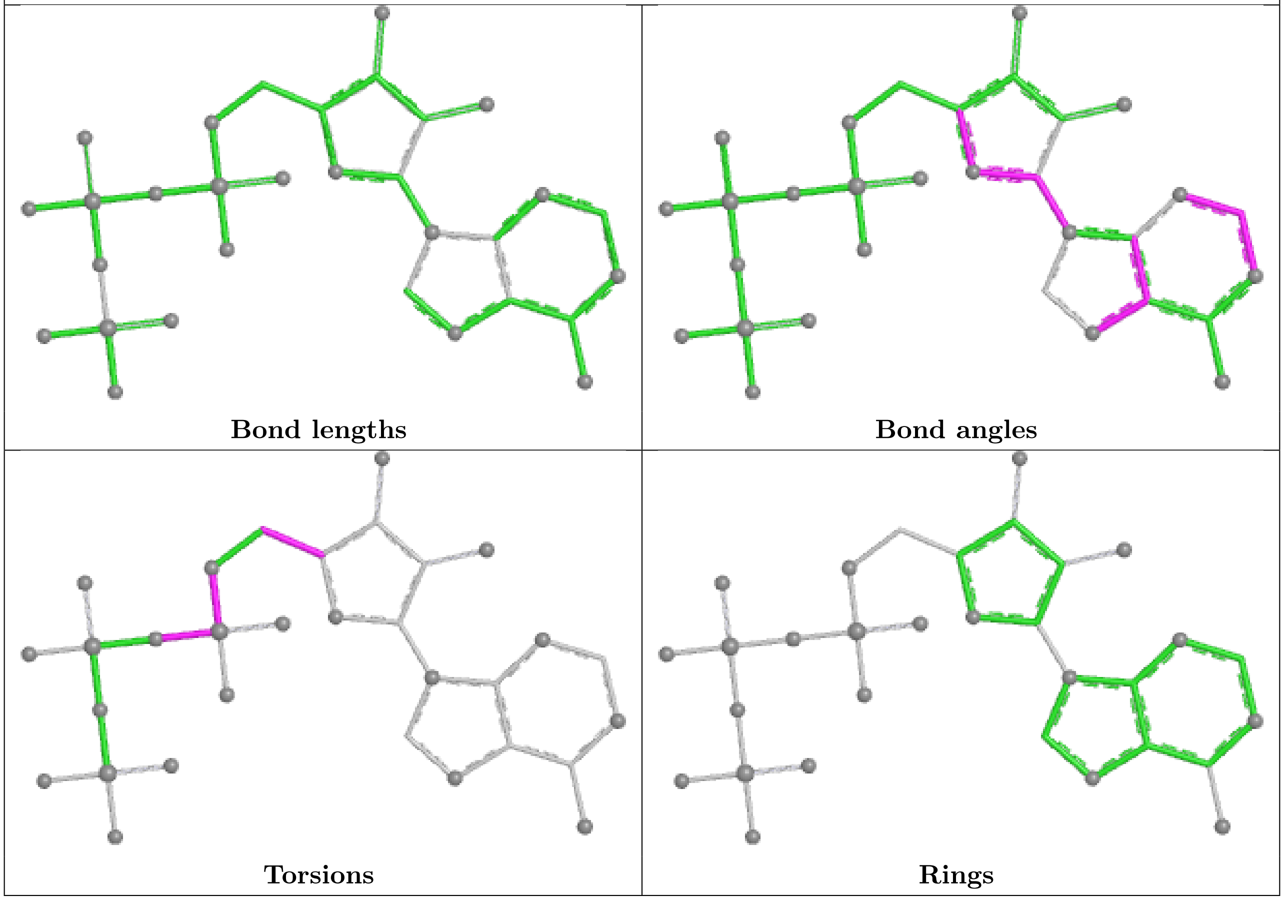
Bond lengths

Bond angles

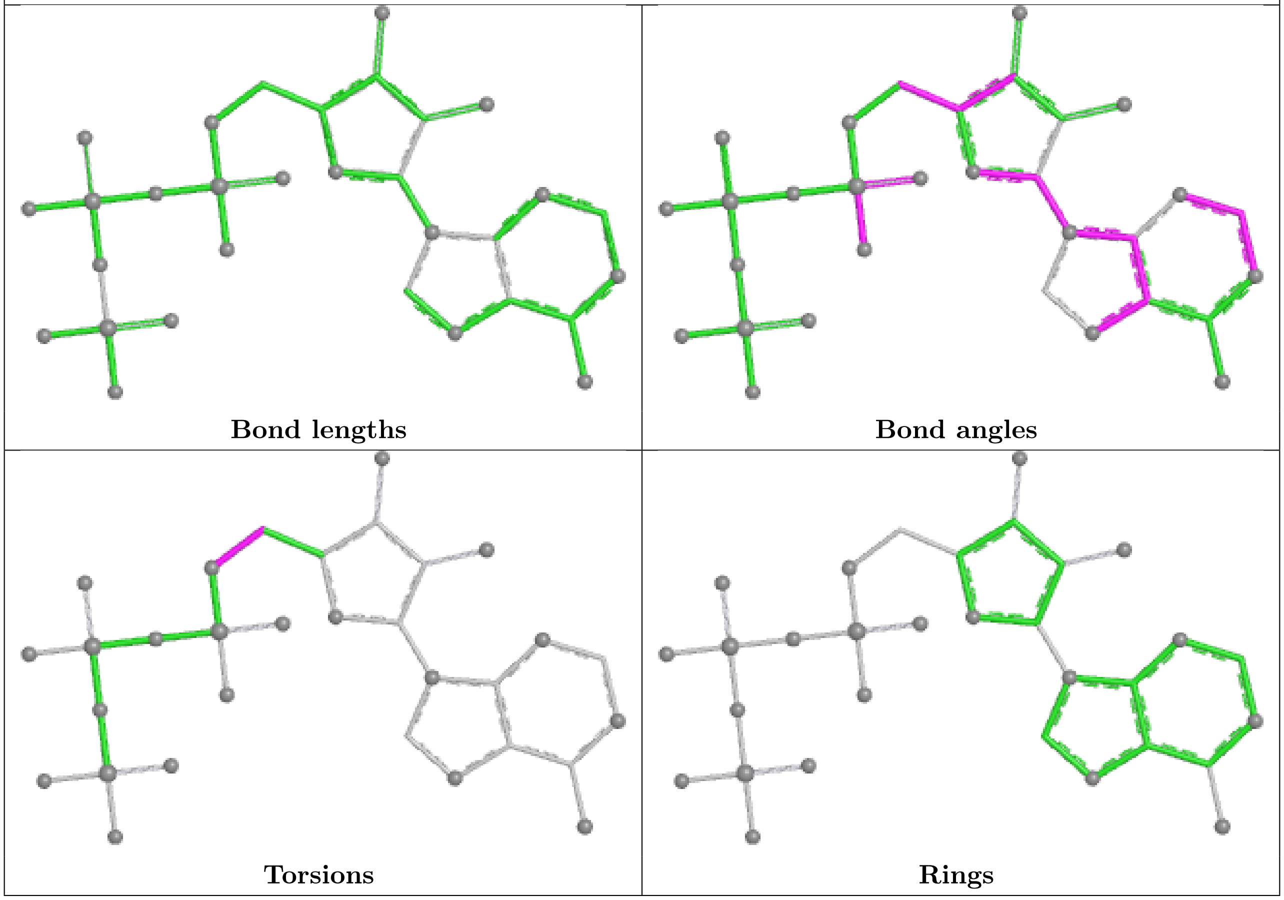
Torsions

Rings

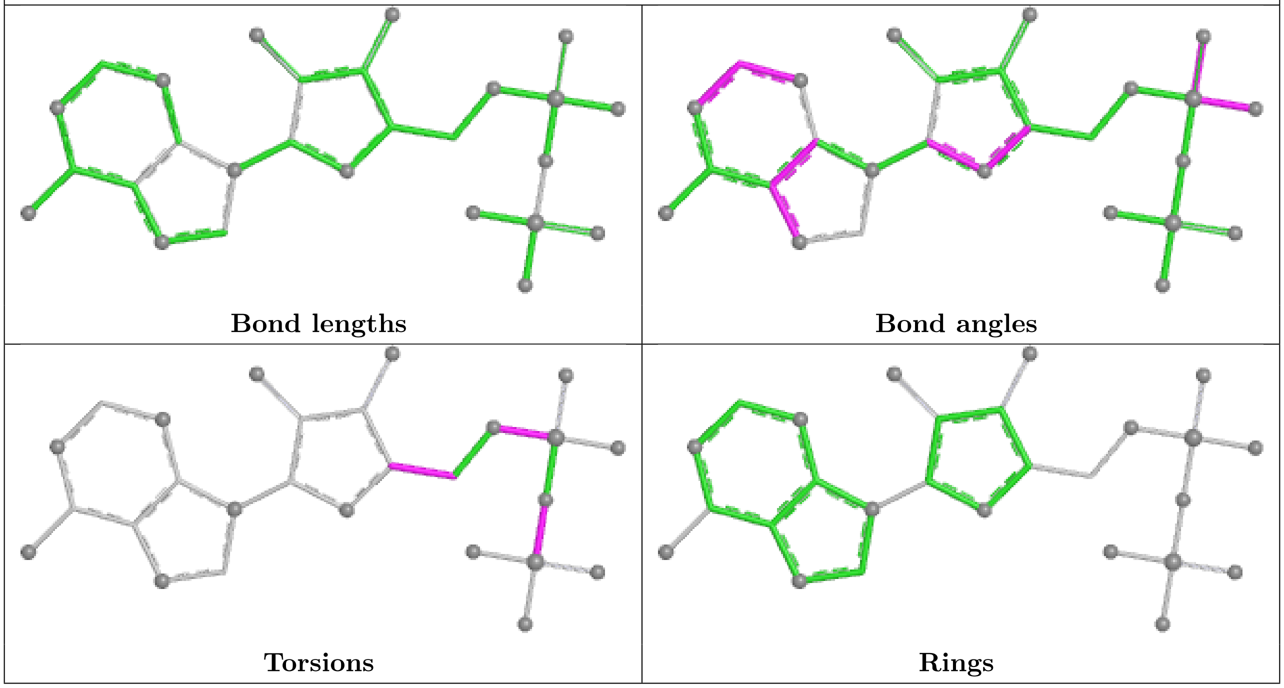
Ligand ATP D 501



Ligand ATP E 401



Ligand ADP F 501



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.

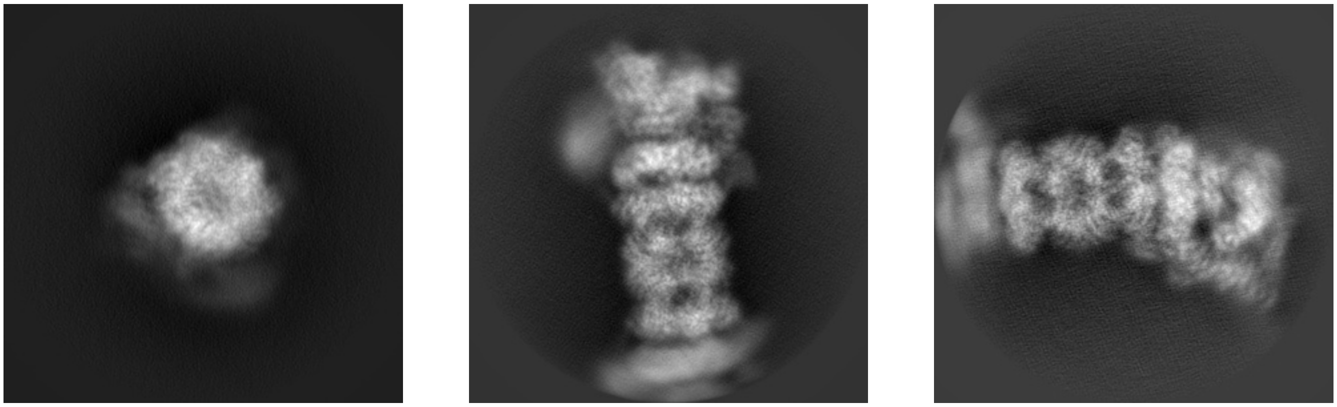
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-9220. 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

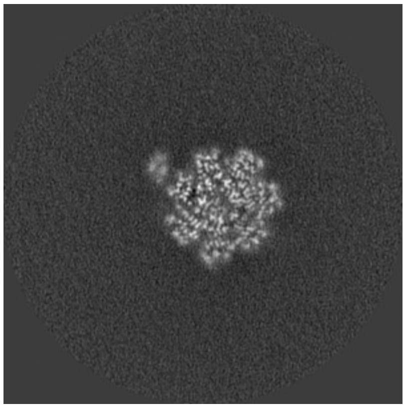


X Y Z

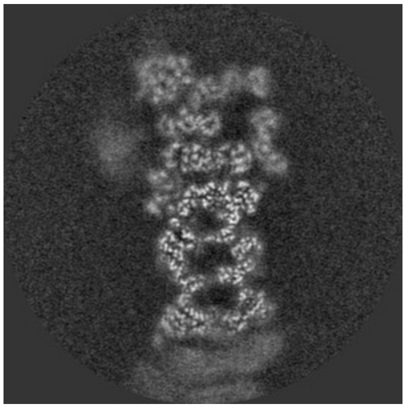
The images above show the map projected in three orthogonal directions.

6.2 Central slices

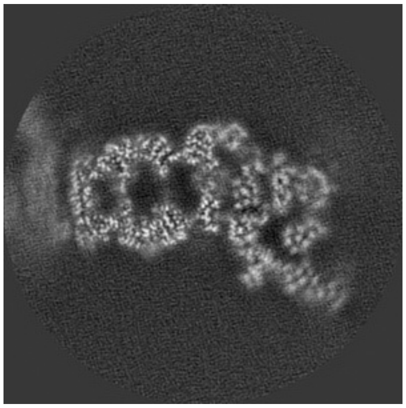
6.2.1 Primary map



X Index: 300



Y Index: 300

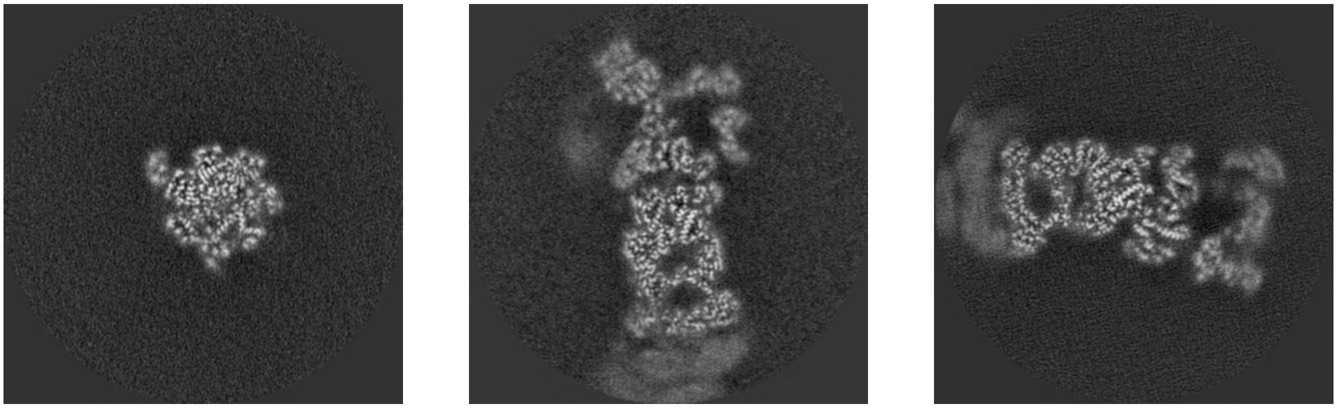


Z Index: 300

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

6.3 Largest variance slices ⓘ

6.3.1 Primary map

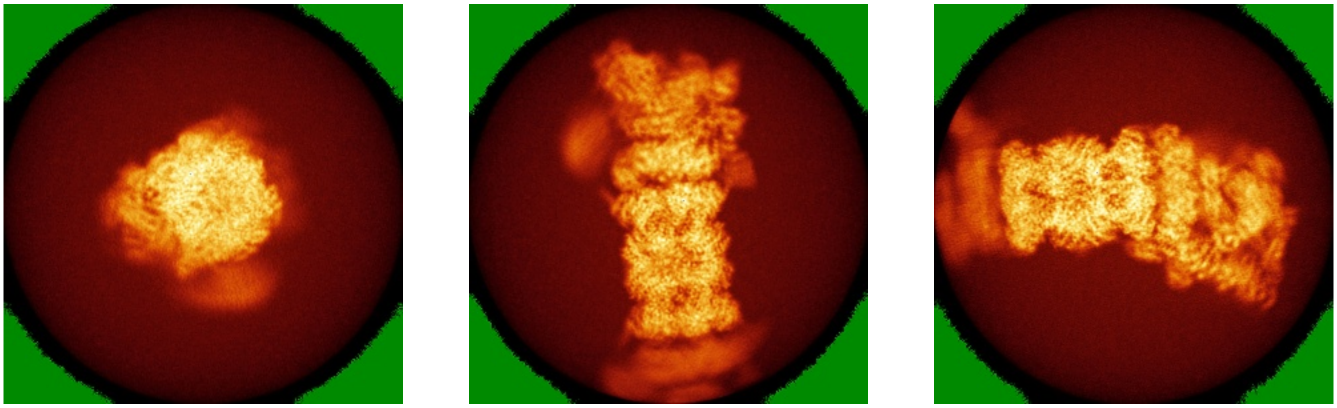


X Index: 307 Y Index: 287 Z Index: 343

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

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

6.4.1 Primary map



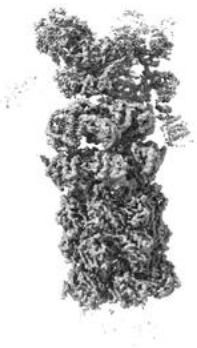
X Y Z

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

6.5.1 Primary map

X



Y

Z

The images above show the 3D surface view of the map at the recommended contour level 0.006. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

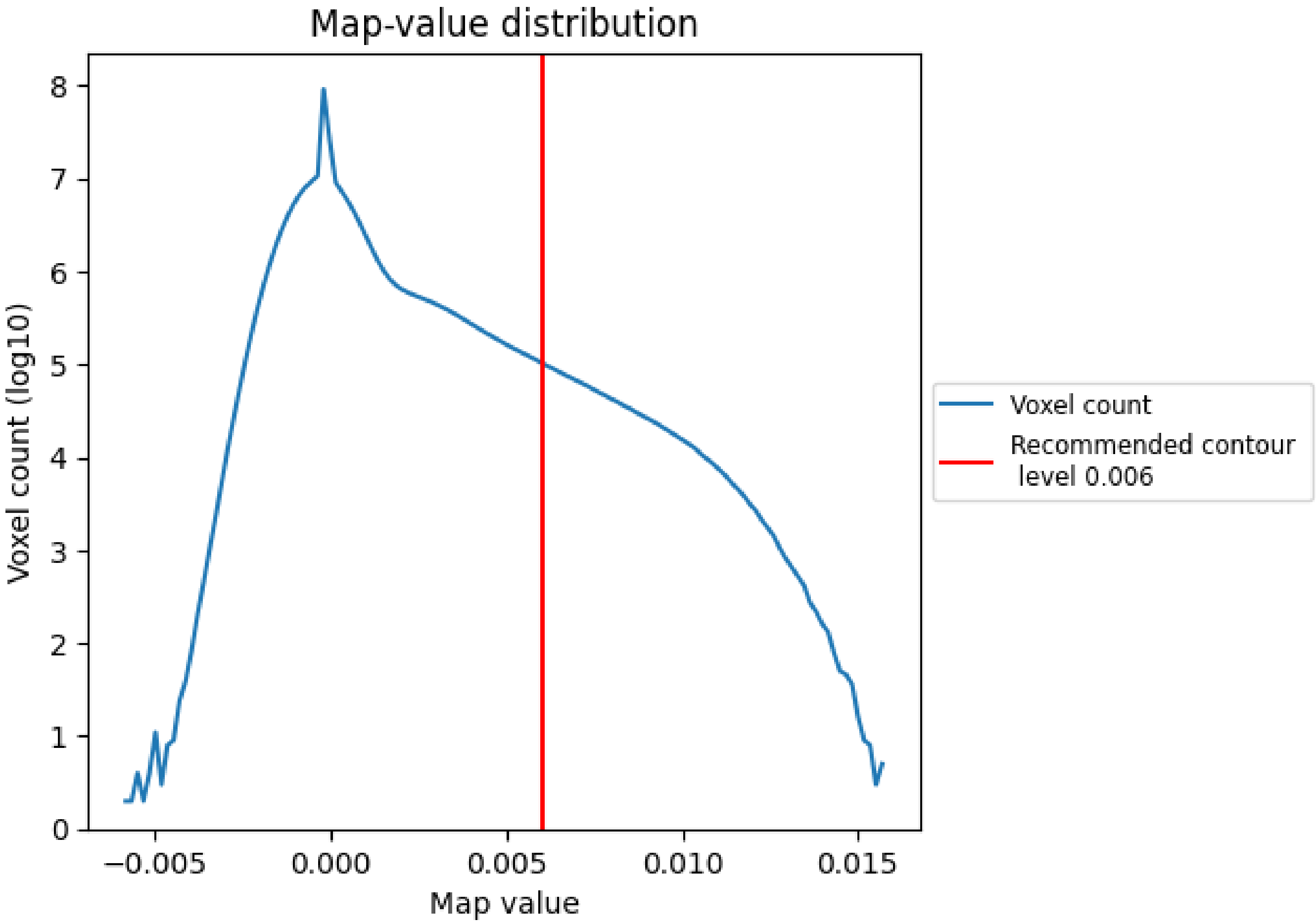
6.6 Mask visualisation

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

7 Map analysis ⓘ

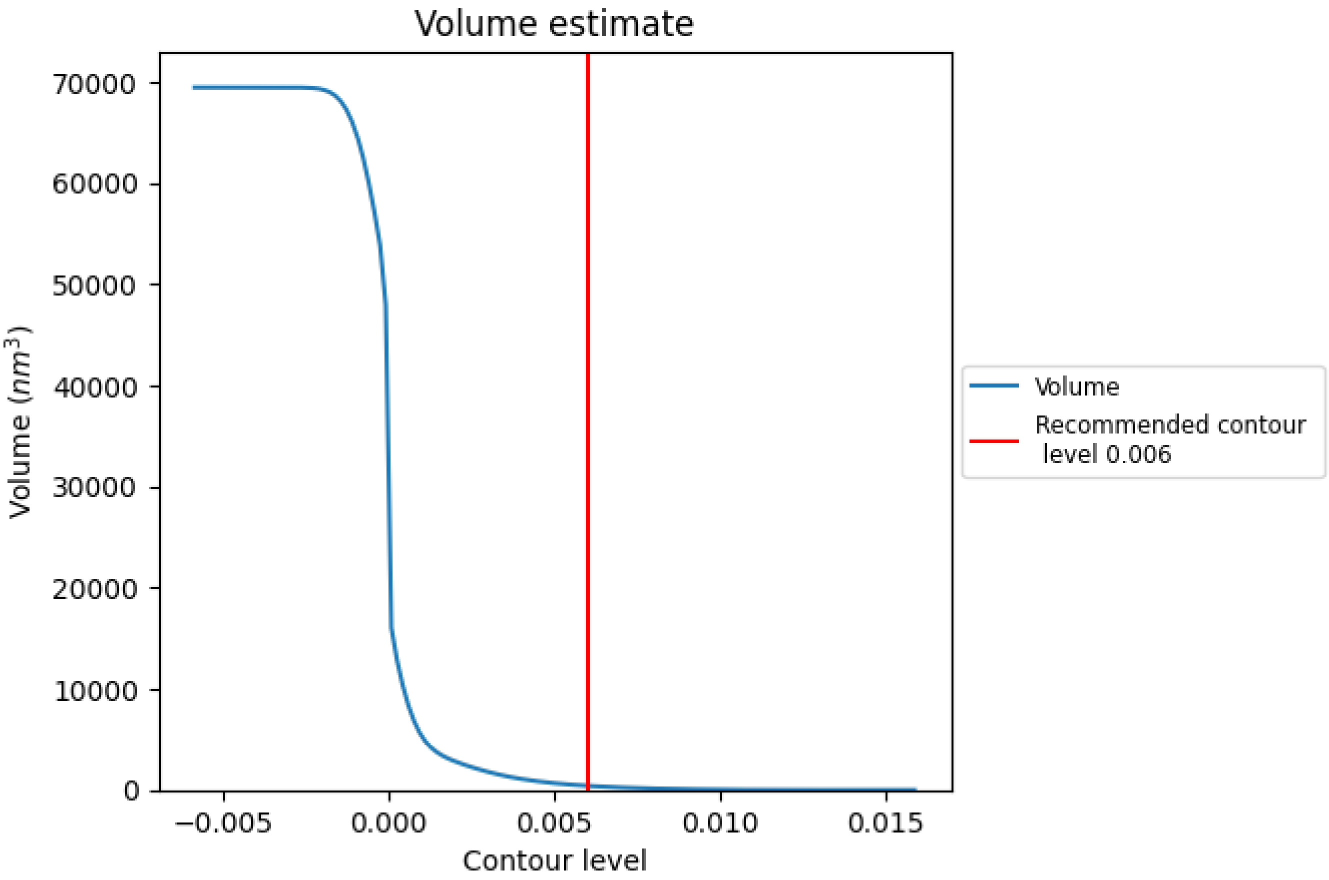
This section contains the results of statistical analysis of the map.

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.

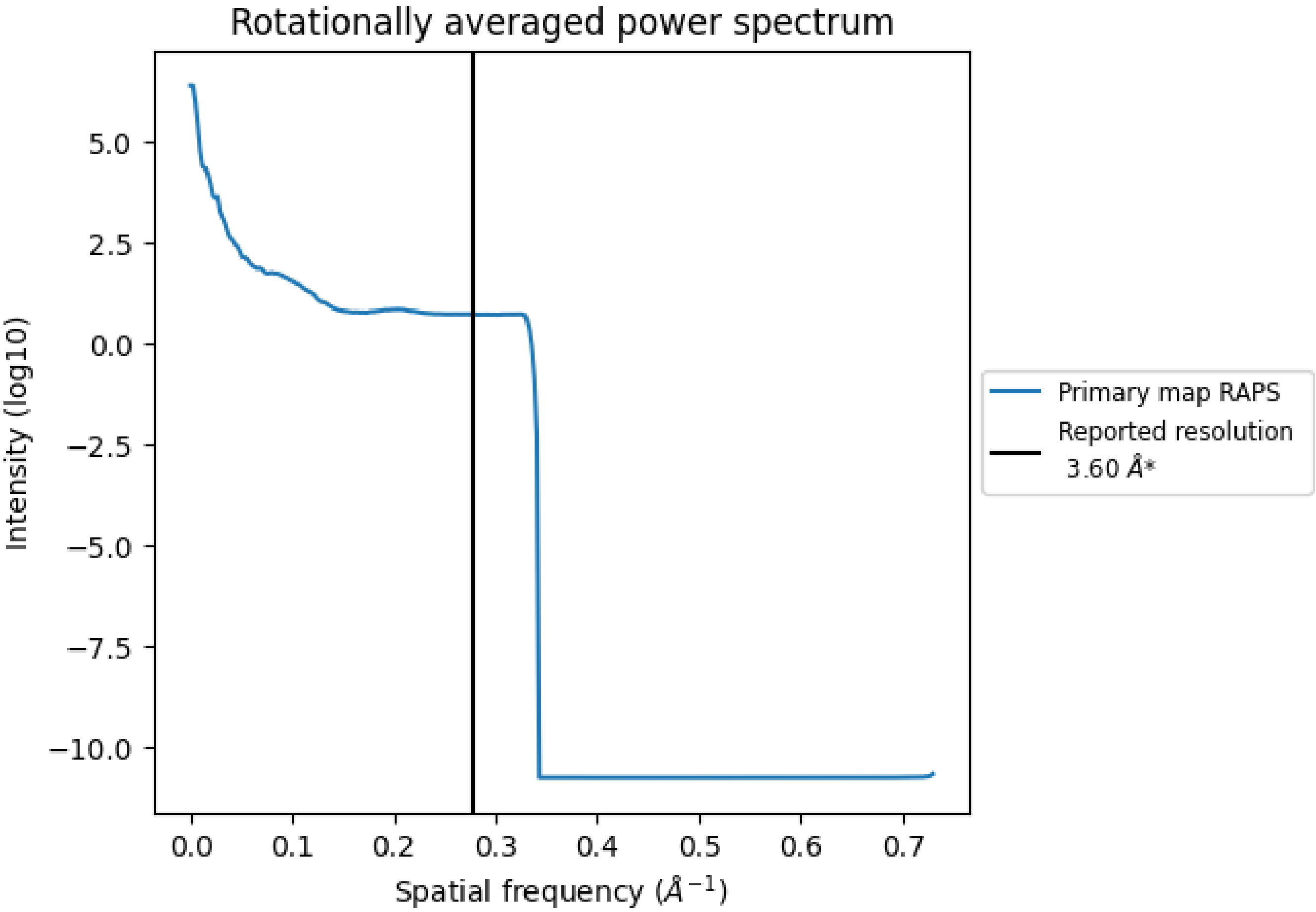
7.2 Volume estimate ⓘ



The volume at the recommended contour level is 414 nm^3; this corresponds to an approximate mass of 374 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 ⓘ



*Reported resolution corresponds to spatial frequency of 0.278 Å^{-1}

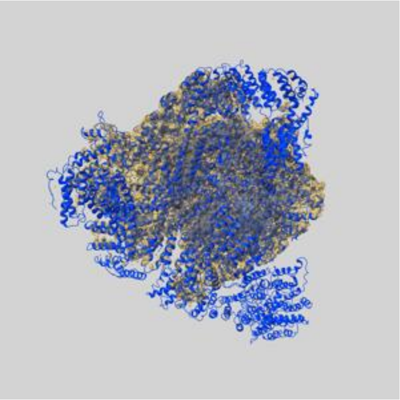
8 Fourier-Shell correlation

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

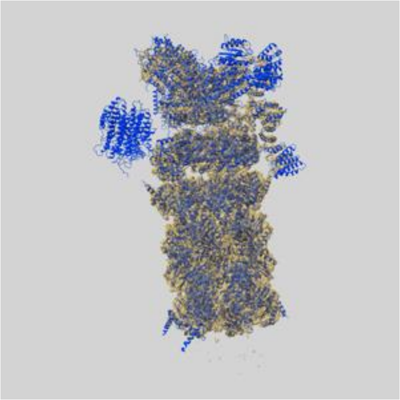
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-9220 and PDB model 6MSH. Per-residue inclusion information can be found in section 3 on page 12.

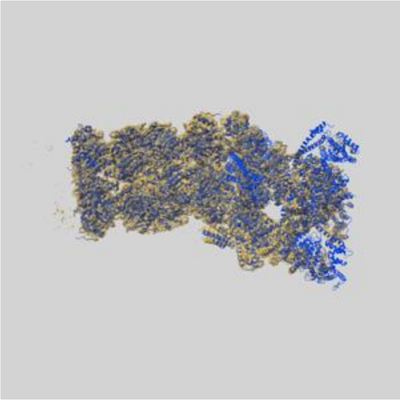
9.1 Map-model overlay



X



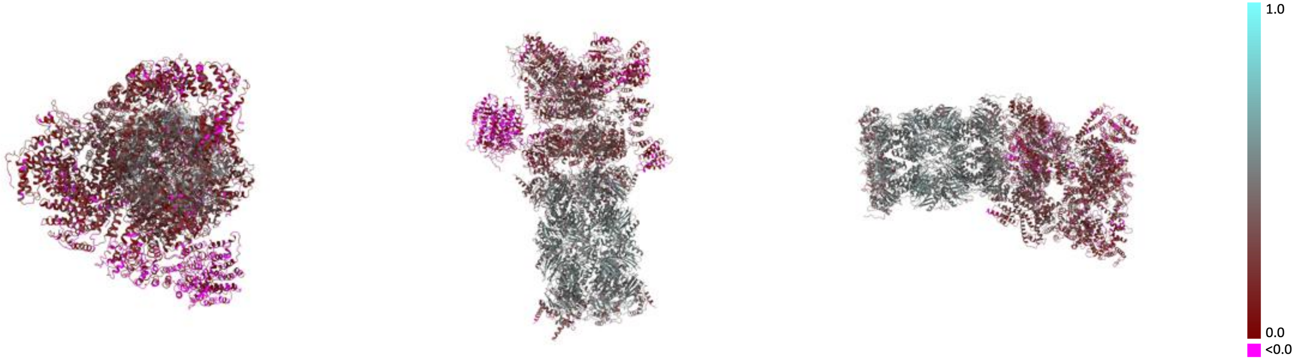
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.006 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.

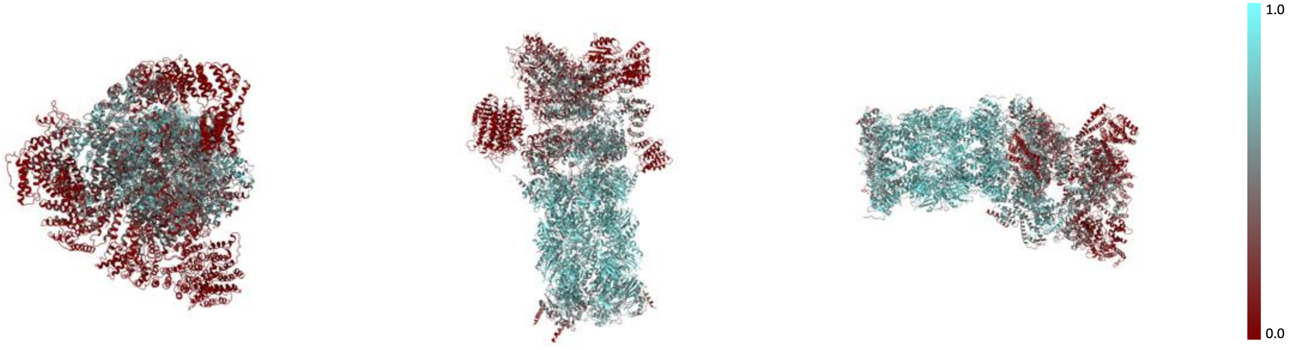
9.2 Q-score mapped to coordinate model (i)



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.

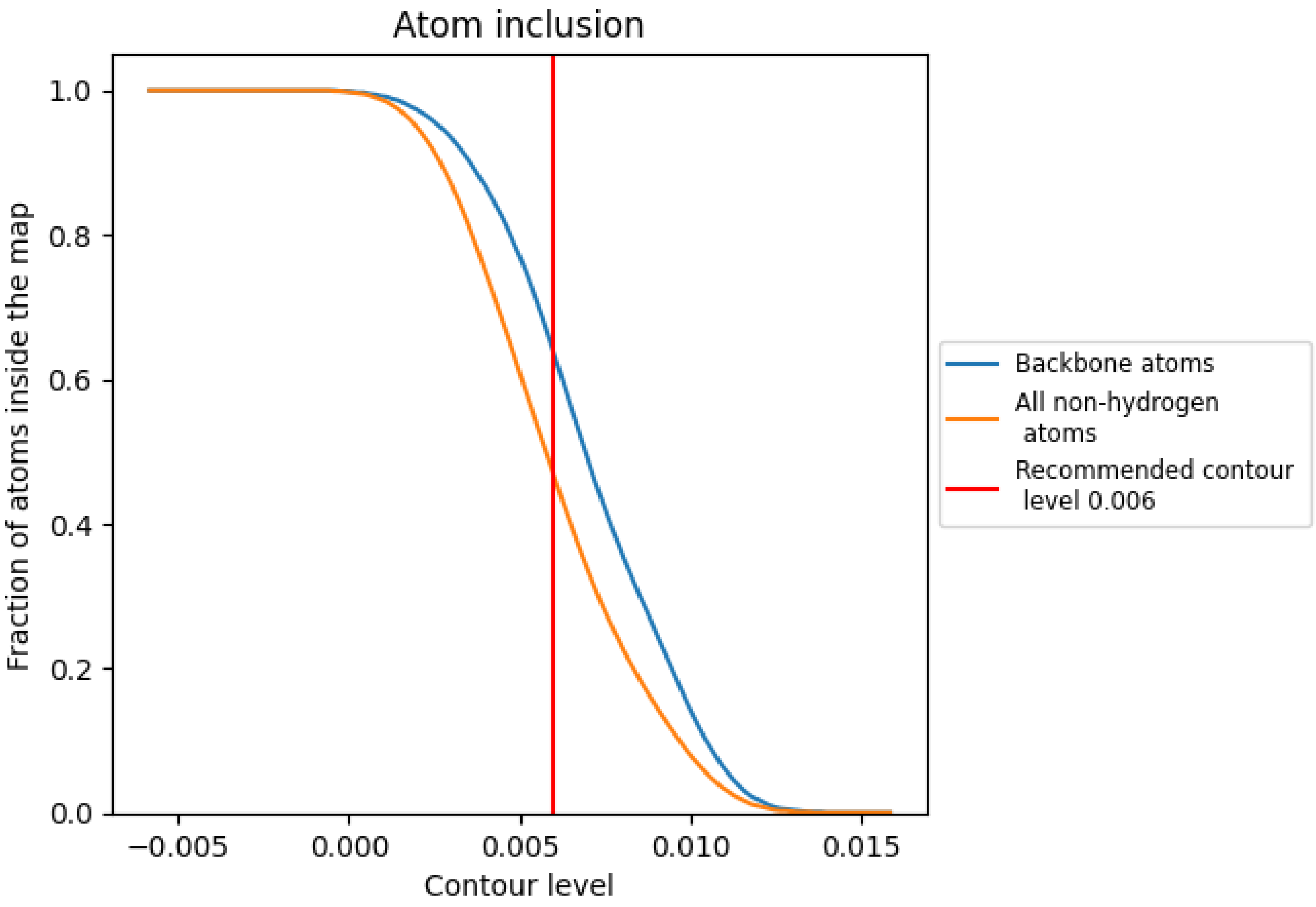
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.006).

9.4 Atom inclusion ⓘ



At the recommended contour level, 64% of all backbone atoms, 47% 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 (0.006) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.4680	0.3220
A	0.3550	0.2230
B	0.2200	0.1930
C	0.4110	0.2770
D	0.5110	0.3430
E	0.4630	0.3010
F	0.4250	0.2540
G	0.7230	0.4480
H	0.7700	0.4580
I	0.6950	0.4170
J	0.6640	0.4090
K	0.6590	0.4270
L	0.7160	0.4530
M	0.6960	0.4230
N	0.7810	0.4940
O	0.7640	0.4890
P	0.7680	0.4970
Q	0.7500	0.4730
R	0.7840	0.5020
S	0.7250	0.4900
T	0.7680	0.4990
U	0.2320	0.2070
V	0.1610	0.1790
W	0.2420	0.1690
X	0.5600	0.2920
Y	0.5320	0.2640
Z	0.2610	0.2130
a	0.1620	0.1660
b	0.0210	0.1490
c	0.3060	0.2540
d	0.0730	0.1700
e	0.2580	0.1920
f	0.0000	0.0170
g	0.6010	0.4430
h	0.6160	0.4520

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Chain	Atom inclusion	Q-score
i	■ 0.5360	■ 0.4160
j	■ 0.4980	■ 0.3920
k	■ 0.5690	■ 0.4300
l	■ 0.6780	■ 0.4630
m	■ 0.6230	■ 0.4350
n	■ 0.7570	■ 0.5040
o	■ 0.7220	■ 0.4950
p	■ 0.7370	■ 0.5030
q	■ 0.7320	■ 0.4850
r	■ 0.7780	■ 0.5130
s	■ 0.7450	■ 0.4980
t	■ 0.7790	■ 0.5080
v	■ 0.0730	■ 0.2000