Full wwPDB EM Validation Report

Apr 4, 2022 – 01:09 pm BST

PDB ID	:	7QO3
EMDB ID	:	EMD-14082
Title	:	Structure of the 26S proteasome-Ubp6 complex in the si state (Core Particle and Lid)
Authors	:	Hung, K.Y.S.; Klumpe, S.; Eisele, M.R.; Elsasser, S.; Geng, T.T.; Cheng, T.C.; Joshi, T.; Rudack, T.; Sakata, E.; Finley, D.
Deposited on	:	2021-12-23
Resolution	:	6.10 Å(reported)

This is a Full wwPDB EM Validation 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 following versions of software and data (see references (1)) were used in the production of this report:

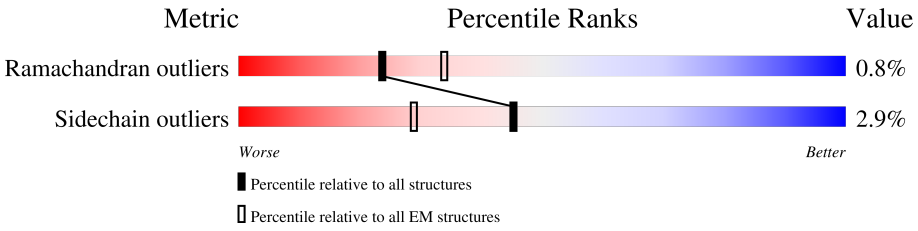
EMDB validation analysis	:	0.0.0.dev97
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.27

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 6.10 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	A	252	8% 92%
1	a	252	92% 92%
2	B	250	10% 95% 5%
2	b	250	96% 95% 5%
3	C	258	10% 91% 5%
3	c	258	92% 91% 5%
4	D	254	6% 88% 7%
4	d	254	91% 80% 11% 7%
5	E	260	9% 90% 6%

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Mol	Chain	Length	Quality of chain
5	e	260	90% 90% 6%
6	F	234	8% 92% 5%
6	f	234	94% 92% 5%
7	G	288	6% 79% 5% 16%
7	g	288	80% 79% 5% 16%
8	1	215	5% 82% 8% 9%
8	h	215	19% 82% 9% 9%
9	2	261	5% 74% 10% 13%
9	i	261	16% 74% 10% 13%
10	3	205	7% 89% 10%
10	j	205	18% 89% 10%
11	4	198	5% 88% 10%
11	k	198	11% 88% 10%
12	5	287	66% 7% 26%
12	l	287	22% 66% 7% 26%
13	6	241	86% 8%
13	m	241	21% 86% 8%
14	7	266	7% 83% 14%
14	n	266	15% 83% 14%
15	W	268	23% 71% 26%
16	V	306	25% 88% 6% 6%
17	T	274	52% 93%
18	X	156	78% 77% 19%
19	Y	89	70% 89% 10%
20	Z	993	91% 80% 8% 9%

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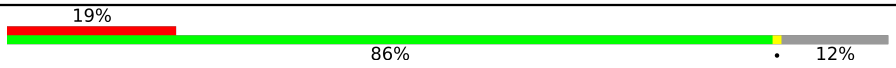
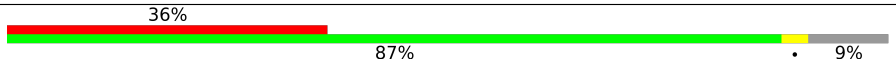
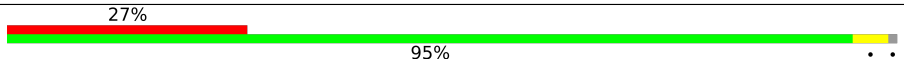
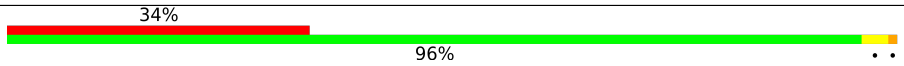
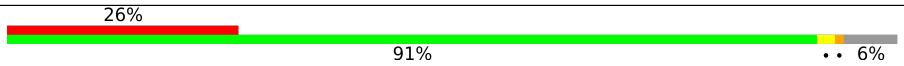
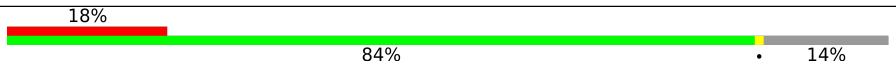
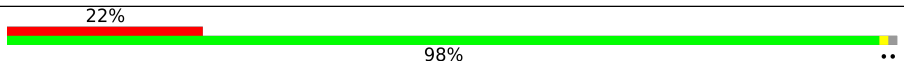
Mol	Chain	Length	Quality of chain
21	N	945	
22	S	523	
23	P	445	
24	Q	434	
25	R	429	
26	U	338	
27	O	393	

2 Entry composition (i)

There are 27 unique types of molecules in this entry. The entry contains 90281 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

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

Mol	Chain	Residues	Atoms					AltConf	Trace
1	a	241	Total	C	N	O	S	0	0
			1907	1214	320	365	8		
1	A	241	Total	C	N	O	S	0	0
			1907	1214	320	365	8		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
2	b	249	Total	C	N	O	S	0	0
			1907	1214	314	376	3		
2	B	249	Total	C	N	O	S	0	0
			1907	1214	314	376	3		

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

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
4	d	236	Total	C	N	O	S	0	0
			1850	1158	323	365	4		
4	D	236	Total	C	N	O	S	0	0
			1850	1158	323	365	4		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
5	e	244	Total	C	N	O	S	0	0
			1882	1176	316	383	7		
5	E	244	Total	C	N	O	S	0	0
			1882	1176	316	383	7		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
6	f	231	Total	C	N	O	S	0	0
			1773	1114	307	348	4		
6	F	231	Total	C	N	O	S	0	0
			1773	1114	307	348	4		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
7	g	242	Total	C	N	O	S	0	0
			1885	1199	328	354	4		
7	G	242	Total	C	N	O	S	0	0
			1885	1199	328	354	4		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
8	h	196	Total	C	N	O	S	0	0
			1512	955	250	300	7		
8	1	196	Total	C	N	O	S	0	0
			1512	955	250	300	7		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
9	i	226	Total	C	N	O	S	0	0
			1719	1082	298	332	7		
9	2	226	Total	C	N	O	S	0	0
			1719	1082	298	332	7		

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

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

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Mol	Chain	Residues	Atoms					AltConf	Trace
10	3	204	Total	C	N	O	S	0	0
			1581	1010	258	305	8		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
11	k	195	Total	C	N	O	S	0	0
			1561	992	264	299	6		
11	4	195	Total	C	N	O	S	0	0
			1561	992	264	299	6		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
12	l	212	Total	C	N	O	S	0	0
			1644	1045	280	312	7		
12	5	212	Total	C	N	O	S	0	0
			1644	1045	280	312	7		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
13	m	222	Total	C	N	O	S	0	0
			1757	1115	303	335	4		
13	6	222	Total	C	N	O	S	0	0
			1757	1115	303	335	4		

- Molecule 14 is a protein called Proteasome subunit beta type-7.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	n	229	Total	C	N	O	S	0	0
			1790	1133	306	344	7		
14	7	229	Total	C	N	O	S	0	0
			1790	1133	306	344	7		

- Molecule 15 is a protein called 26S proteasome regulatory subunit RPN10.

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

- Molecule 16 is a protein called Ubiquitin carboxyl-terminal hydrolase RPN11.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	V	289	Total	C	N	O	S	0	0
			2274	1425	389	446	14		

- Molecule 17 is a protein called 26S proteasome regulatory subunit RPN12.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	T	266	Total	C	N	O	S	0	0
			2192	1405	349	432	6		

- Molecule 18 is a protein called 26S proteasome regulatory subunit RPN13.

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

- Molecule 19 is a protein called 26S proteasome complex subunit SEM1.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	Y	89	Total	C	N	O	S	0	0
			731	447	119	164	1		

- Molecule 20 is a protein called 26S proteasome regulatory subunit RPN1.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	Z	906	Total	C	N	O	S	0	0
			7005	4416	1150	1409	30		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
21	N	832	Total	C	N	O	S	0	0
			6418	4078	1077	1238	25		

- Molecule 22 is a protein called 26S proteasome regulatory subunit RPN3.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
23	P	440	Total	C	N	O	S	0	0
			3608	2297	604	697	10		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
24	Q	434	Total	C	N	O	S	0	0
			3499	2225	577	681	16		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
25	R	405	Total	C	N	O	S	0	0
			3258	2077	535	636	10		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
26	U	290	Total	C	N	O	S	0	0
			2306	1454	392	453	7		

- Molecule 27 is a protein called 26S proteasome regulatory subunit RPN9.

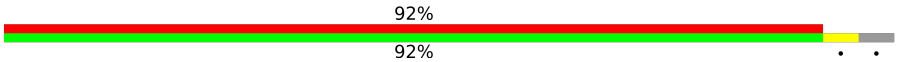
Mol	Chain	Residues	Atoms					AltConf	Trace
27	O	388	Total	C	N	O	S	0	0
			3186	2051	519	608	8		

3 Residue-property plots (i)

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

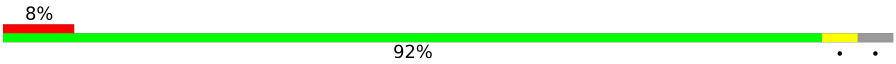
• Molecule 1: Proteasome subunit alpha type-1

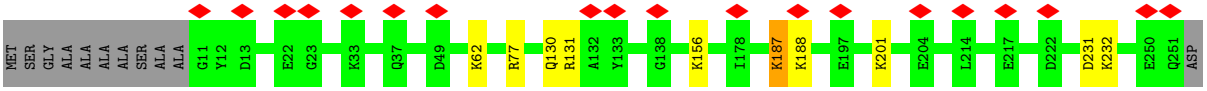
Chain a:



• Molecule 1: Proteasome subunit alpha type-1

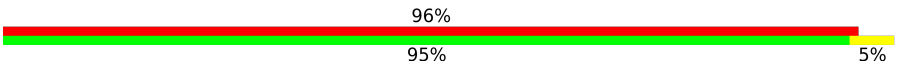
Chain A:

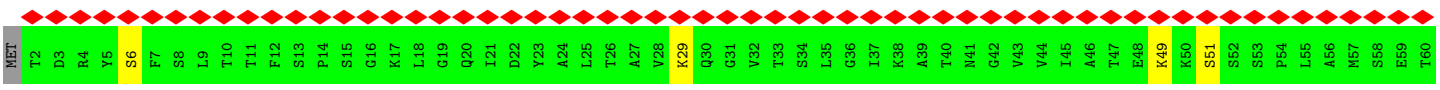


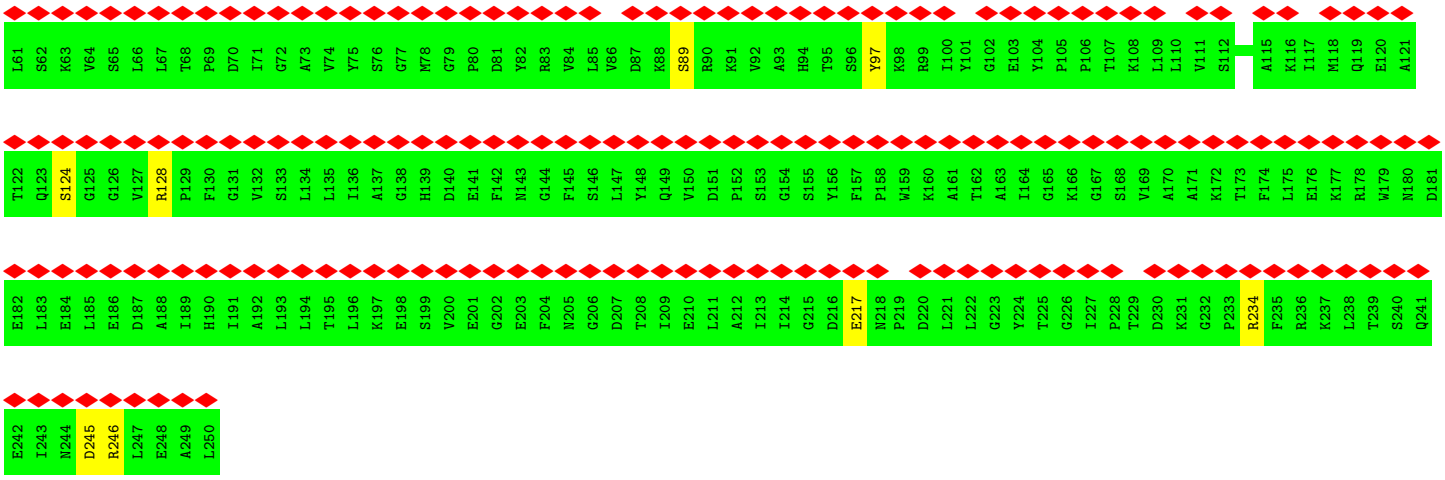


• Molecule 2: Proteasome subunit alpha type-2

Chain b:

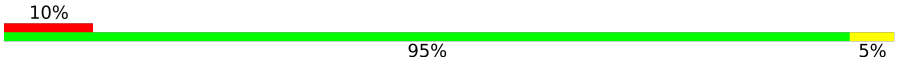


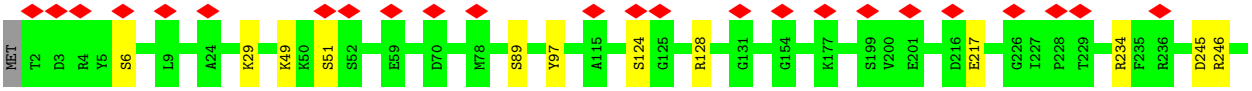




• Molecule 2: Proteasome subunit alpha type-2

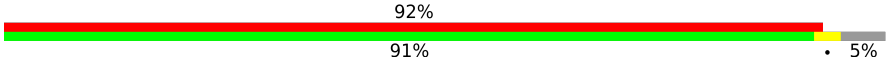
Chain B:

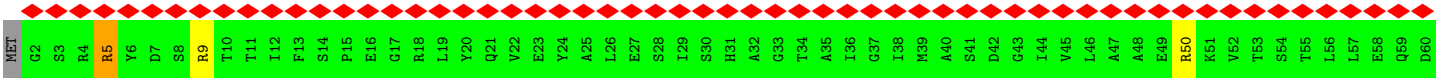


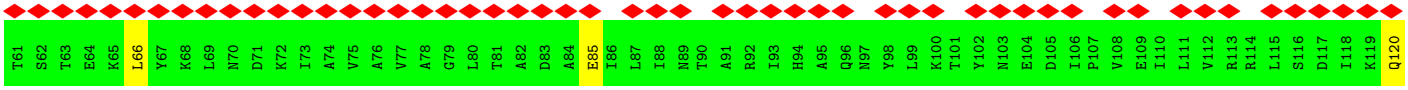


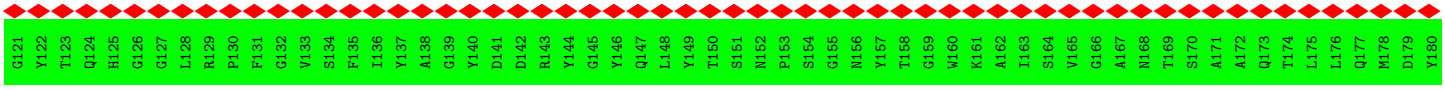
• Molecule 3: Proteasome subunit alpha type-3

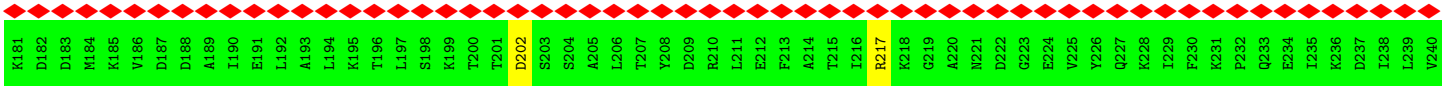
Chain c:

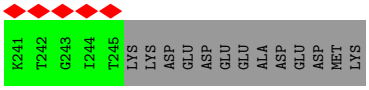






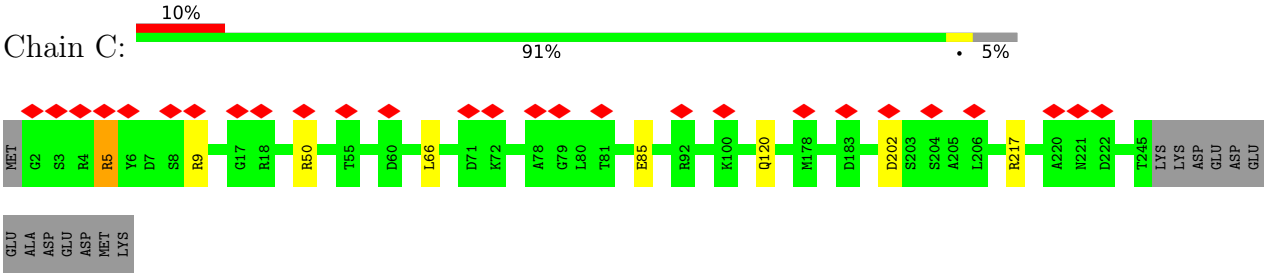






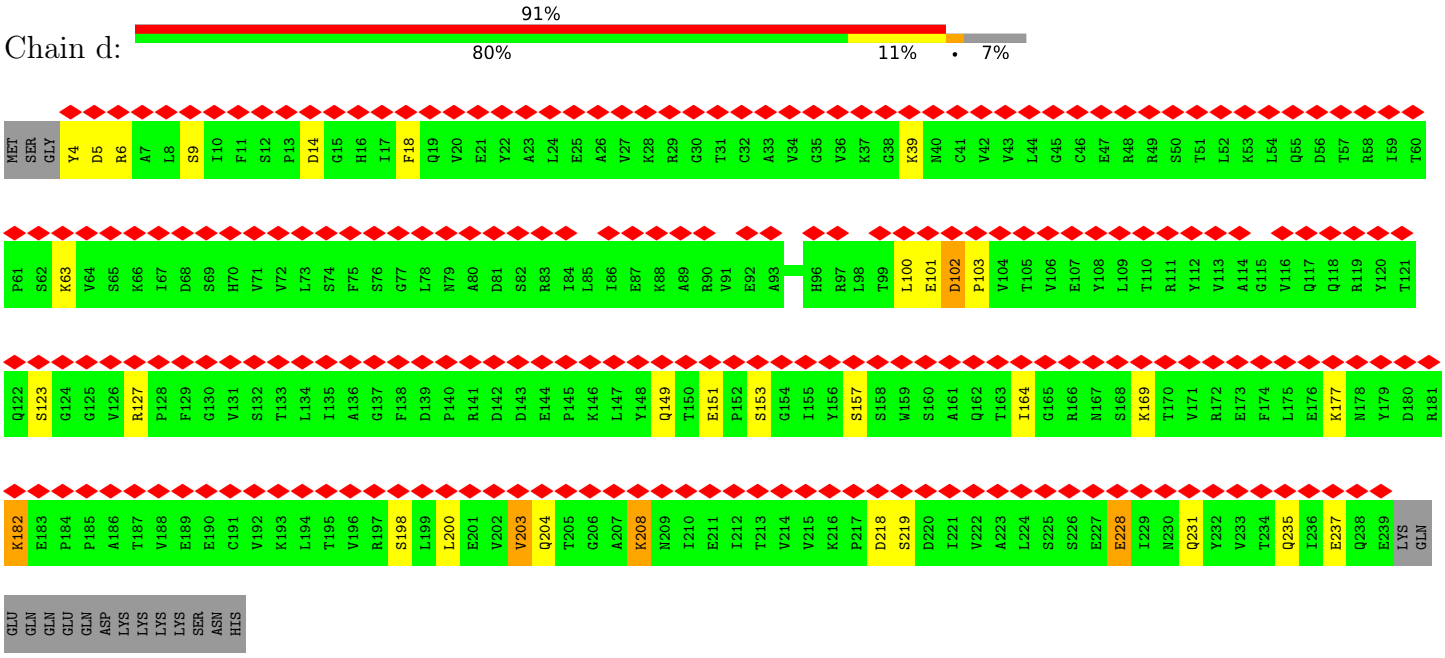
• Molecule 3: Proteasome subunit alpha type-3

Chain C:



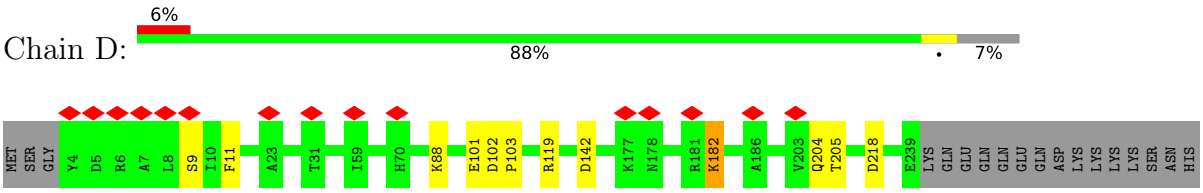
• Molecule 4: Proteasome subunit alpha type-4

Chain d:



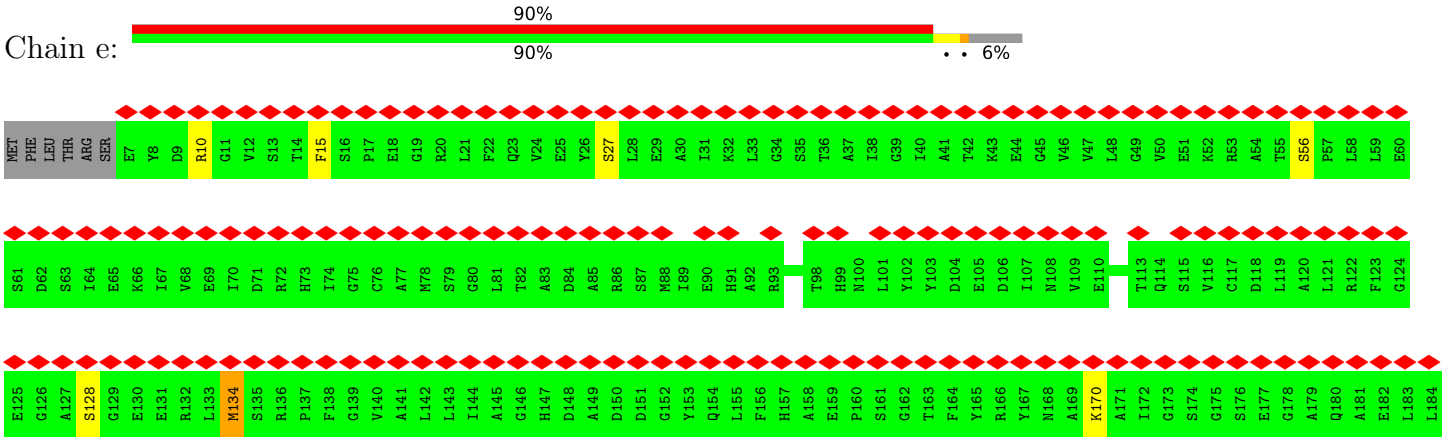
• Molecule 4: Proteasome subunit alpha type-4

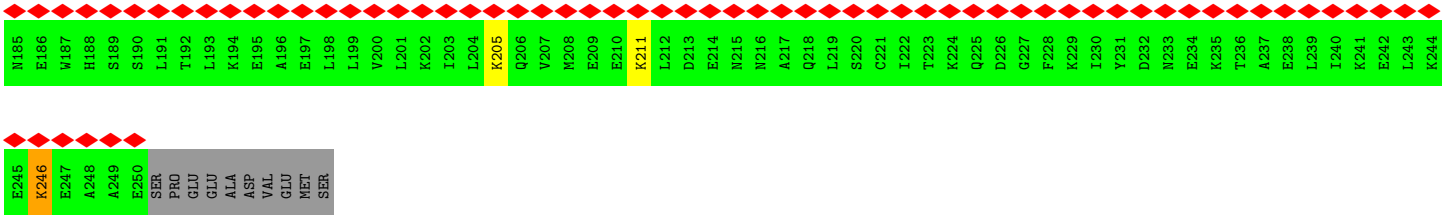
Chain D:



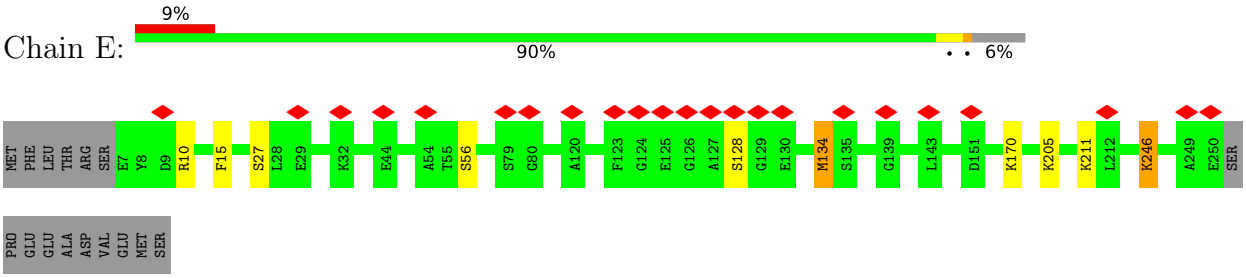
• Molecule 5: Proteasome subunit alpha type-5

Chain e:

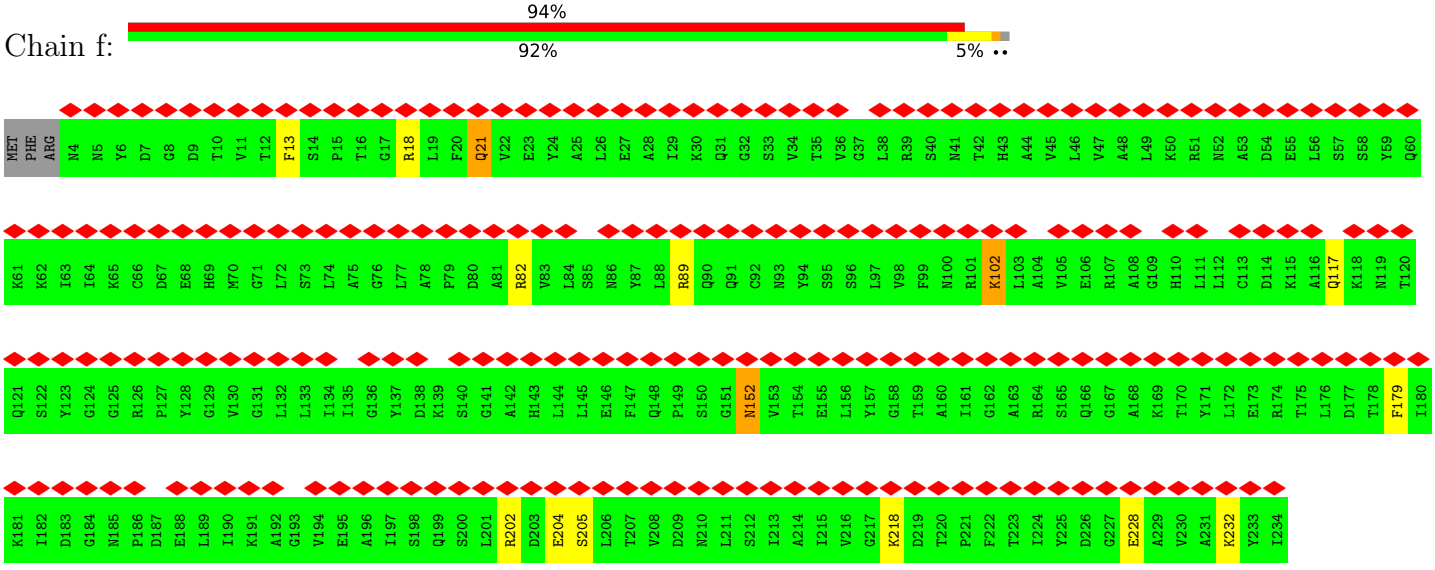




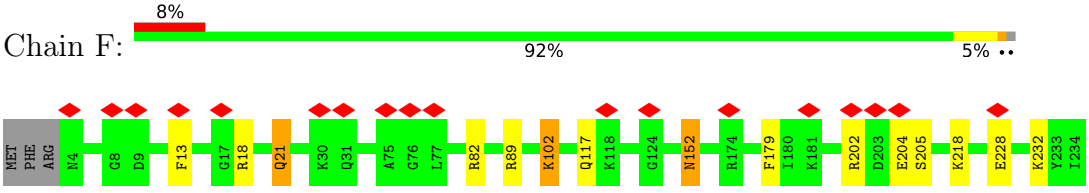
• Molecule 5: Proteasome subunit alpha type-5



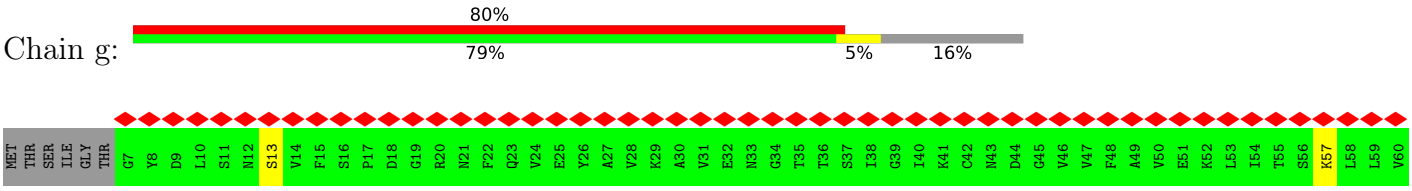
• Molecule 6: Proteasome subunit alpha type-6

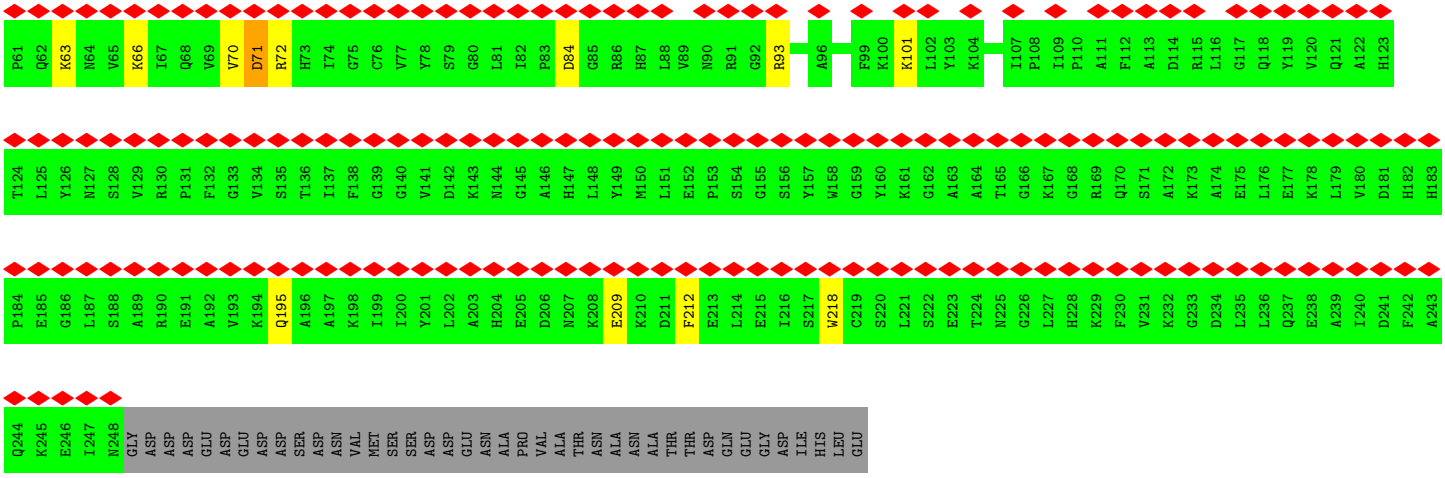


• Molecule 6: Proteasome subunit alpha type-6



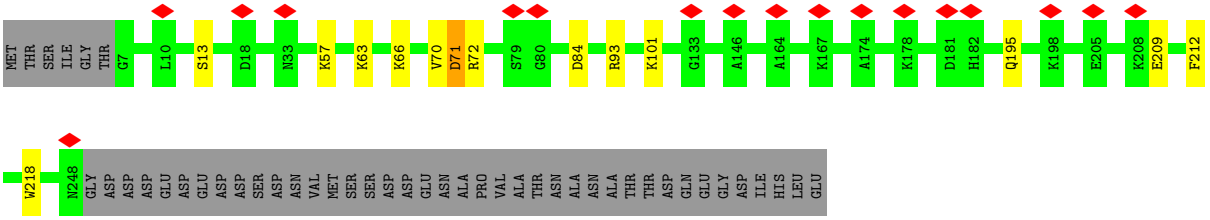
• Molecule 7: Probable proteasome subunit alpha type-7





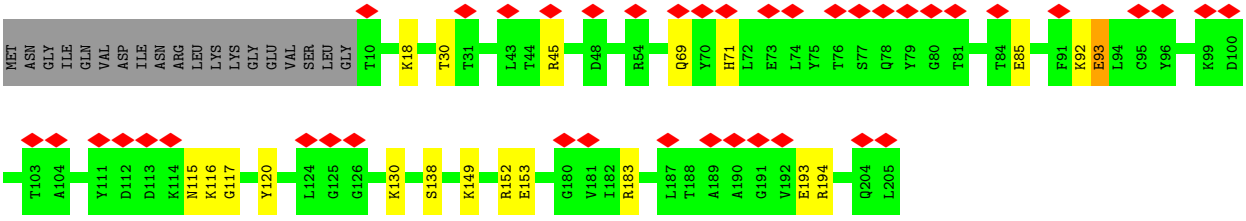
• Molecule 7: Probable proteasome subunit alpha type-7

Chain G:



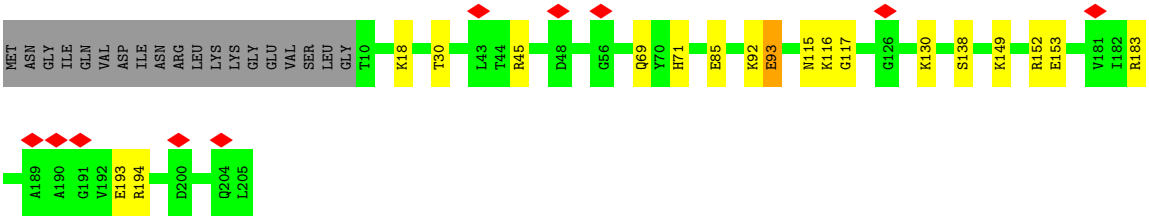
• Molecule 8: Proteasome subunit beta type-1

Chain h:

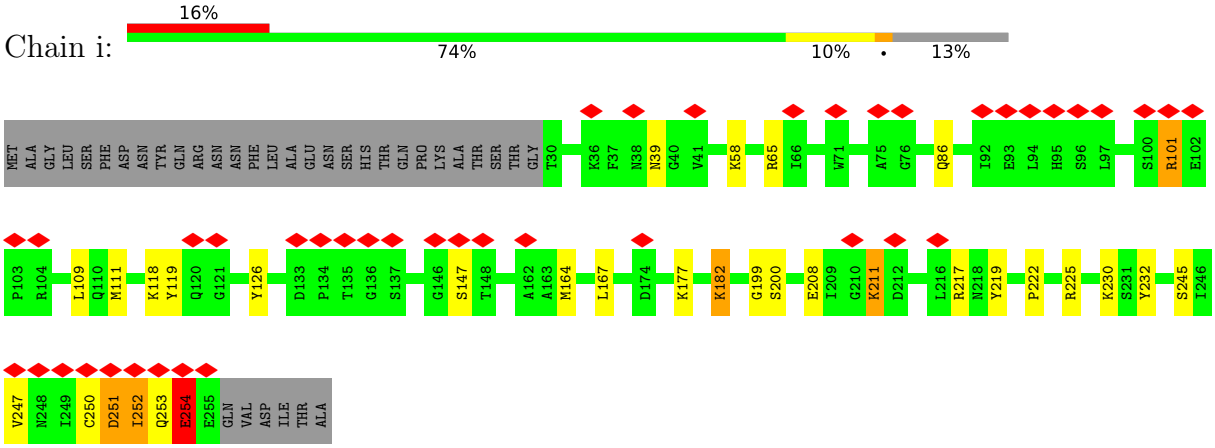


• Molecule 8: Proteasome subunit beta type-1

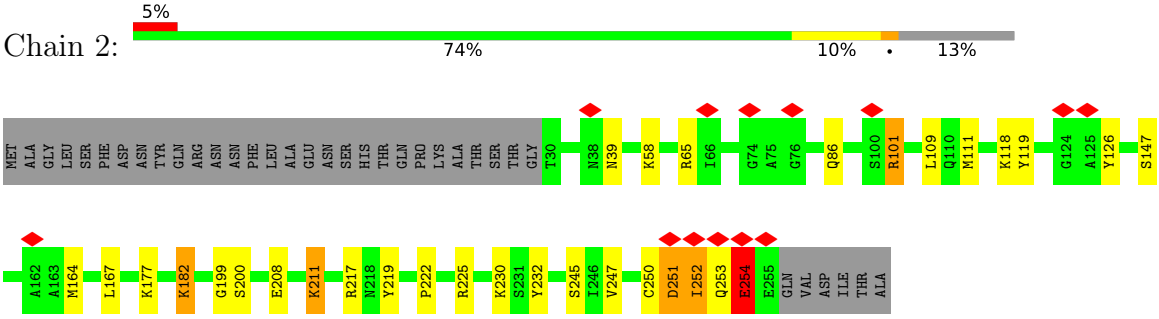
Chain 1:



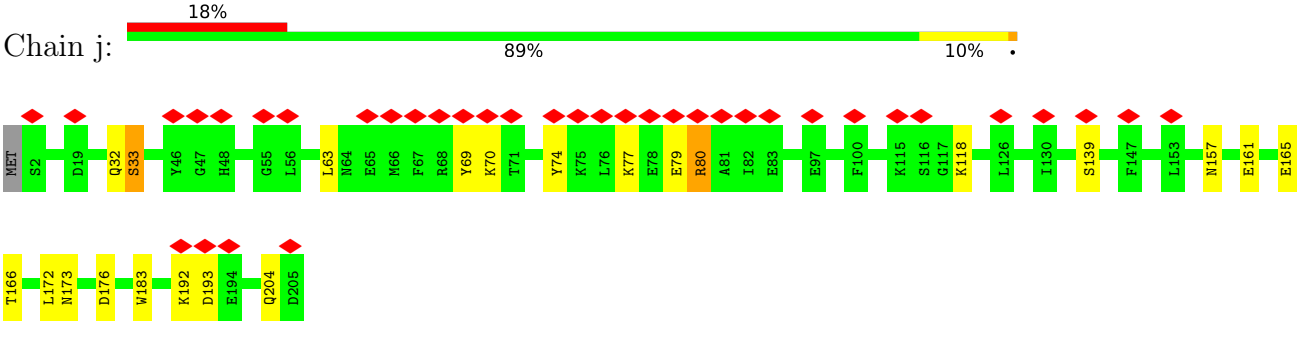
• Molecule 9: Proteasome subunit beta type-2



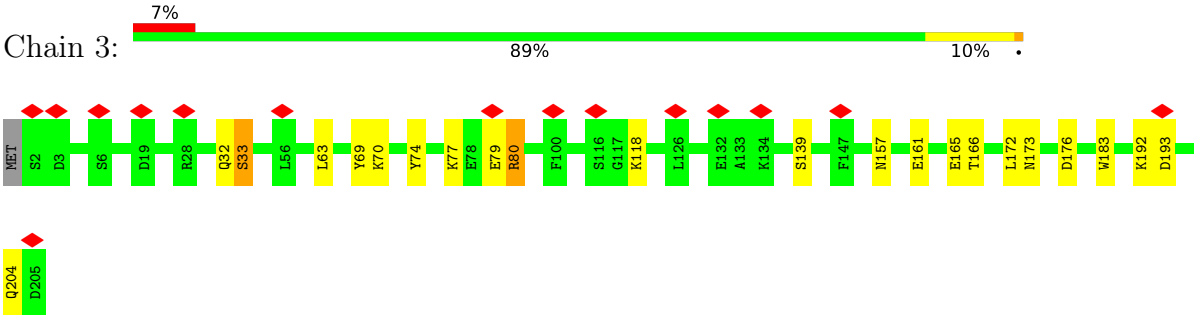
• Molecule 9: Proteasome subunit beta type-2



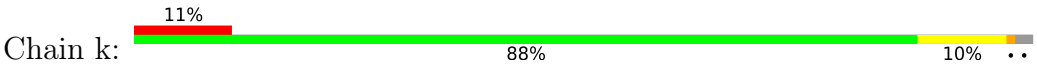
• Molecule 10: Proteasome subunit beta type-3

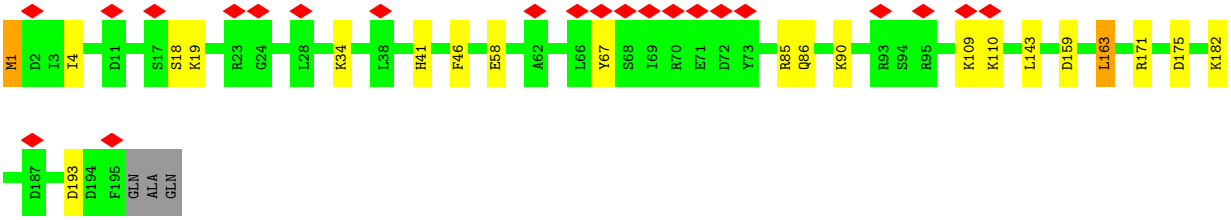


• Molecule 10: Proteasome subunit beta type-3

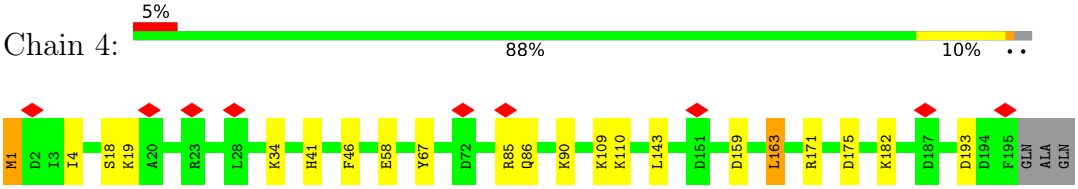


• Molecule 11: Proteasome subunit beta type-4

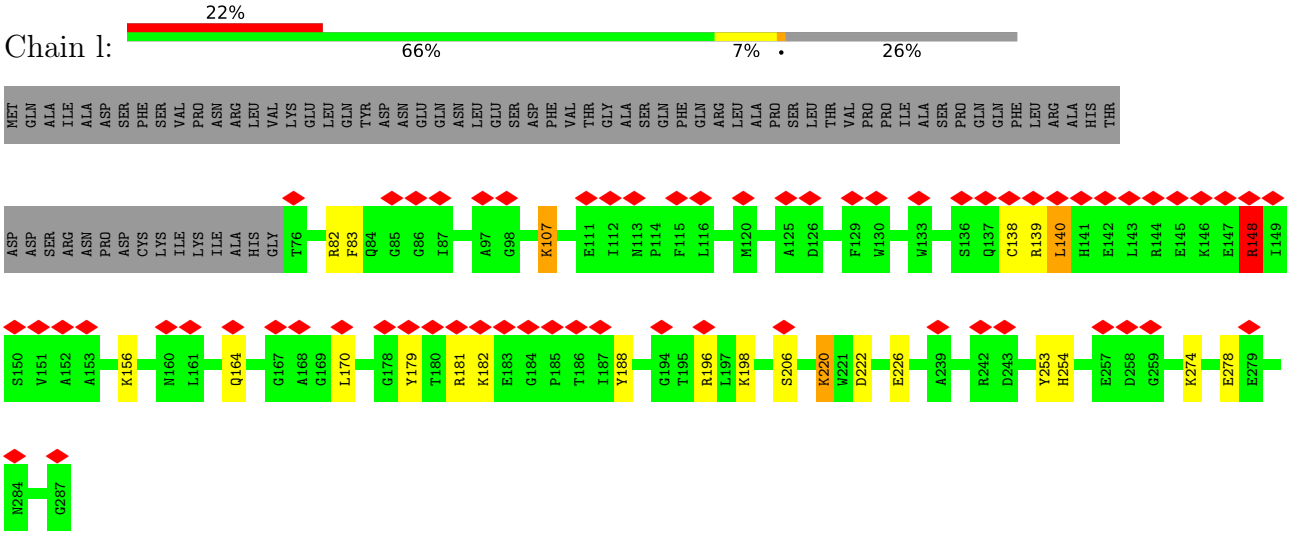




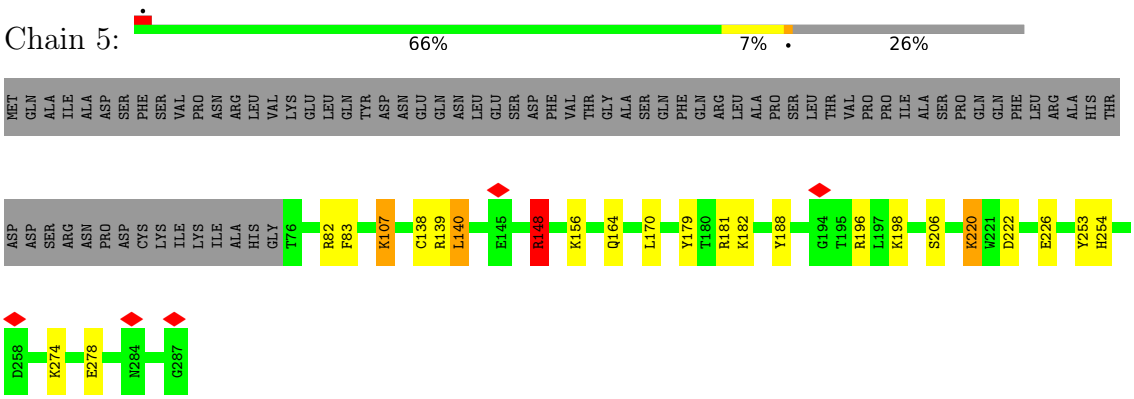
• Molecule 11: Proteasome subunit beta type-4



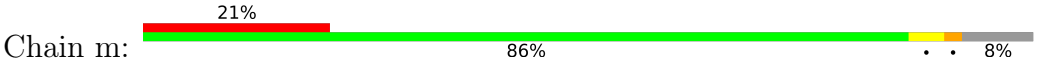
• Molecule 12: Proteasome subunit beta type-5

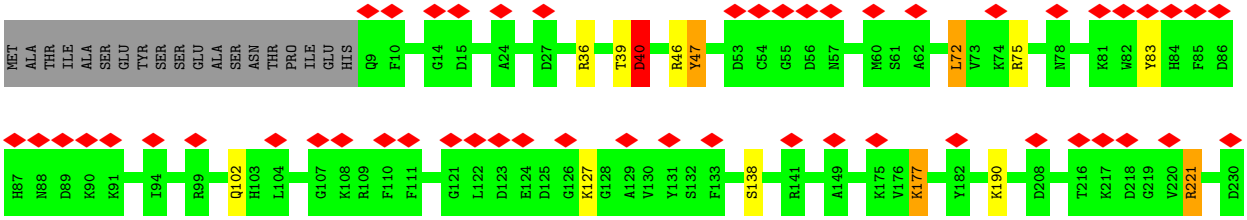


• Molecule 12: Proteasome subunit beta type-5

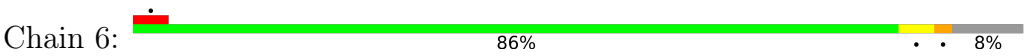


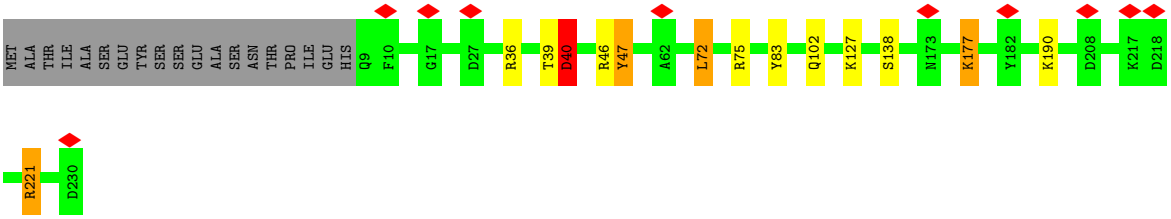
• Molecule 13: Proteasome subunit beta type-6



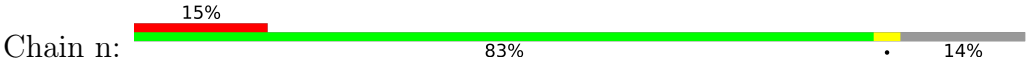


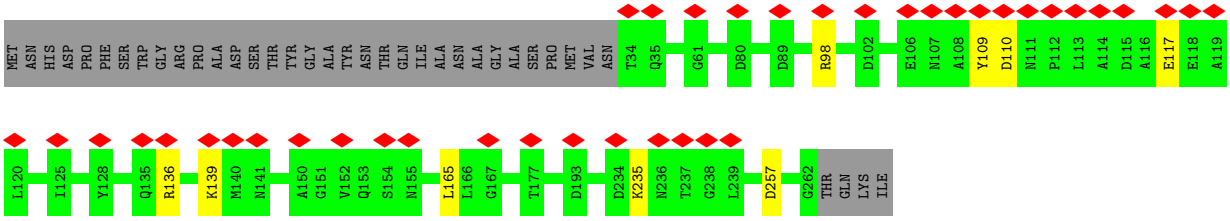
• Molecule 13: Proteasome subunit beta type-6



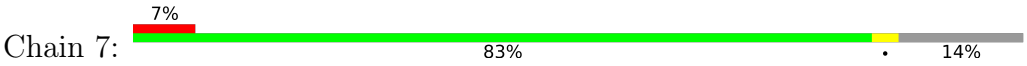


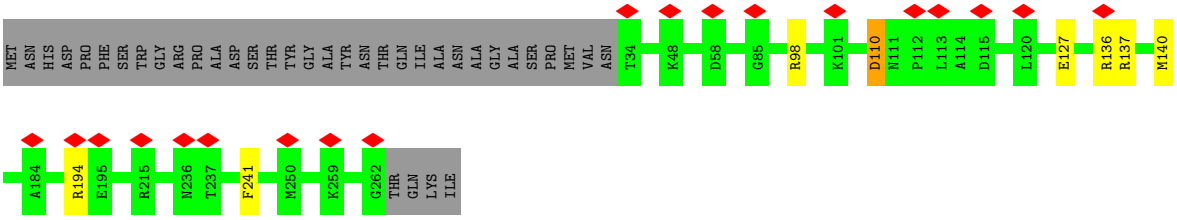
• Molecule 14: Proteasome subunit beta type-7



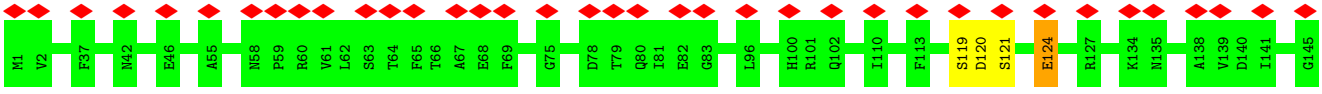


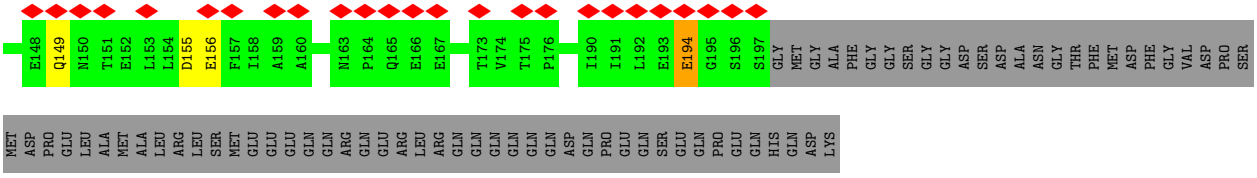
• Molecule 14: Proteasome subunit beta type-7





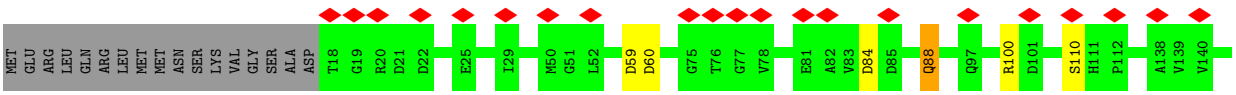
• Molecule 15: 26S proteasome regulatory subunit RPN10

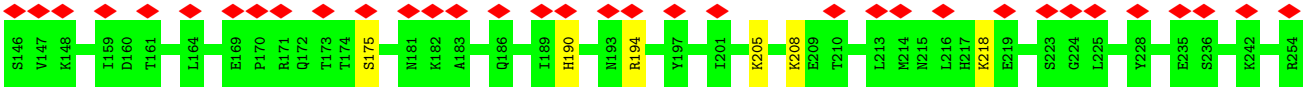


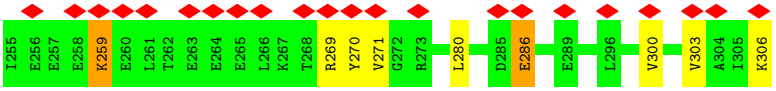


• Molecule 16: Ubiquitin carboxyl-terminal hydrolase RPN11

Chain V:

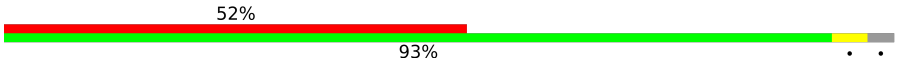


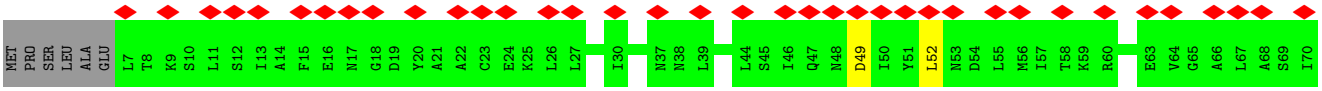


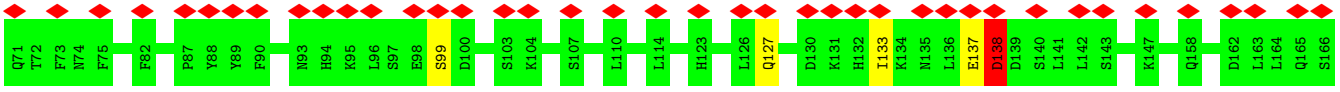


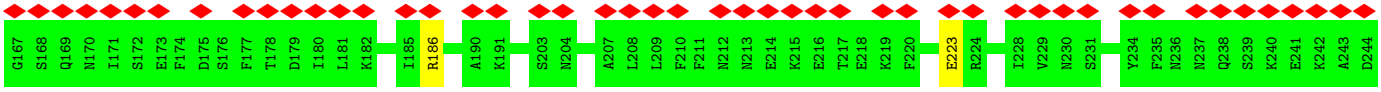
• Molecule 17: 26S proteasome regulatory subunit RPN12

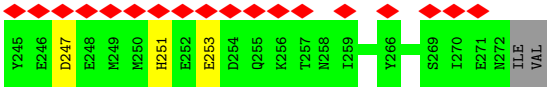
Chain T:





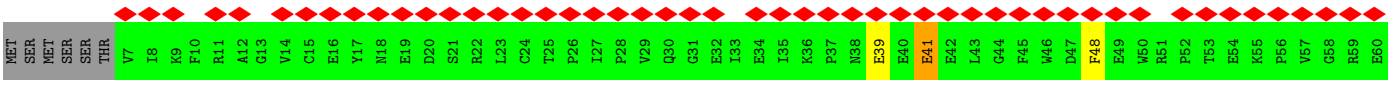


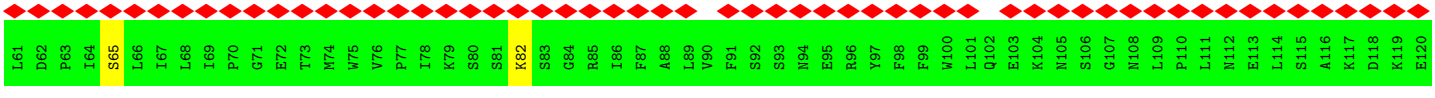


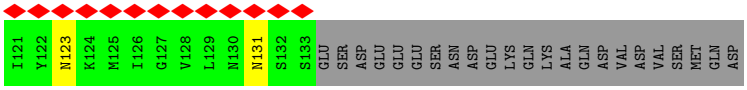


• Molecule 18: 26S proteasome regulatory subunit RPN13

Chain X:

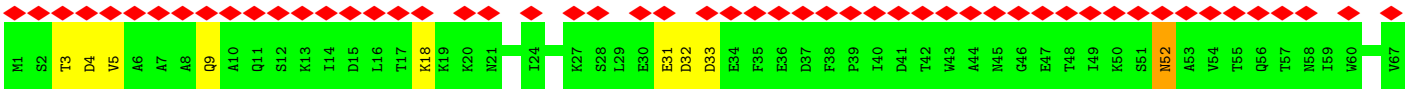


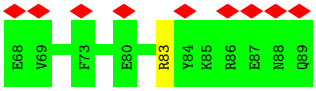




• Molecule 19: 26S proteasome complex subunit SEM1

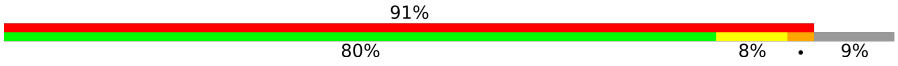
Chain Y:

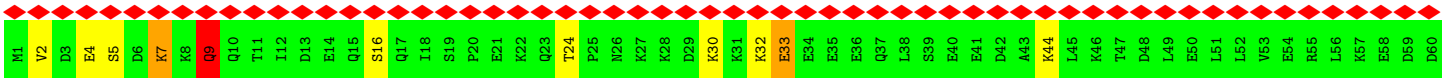


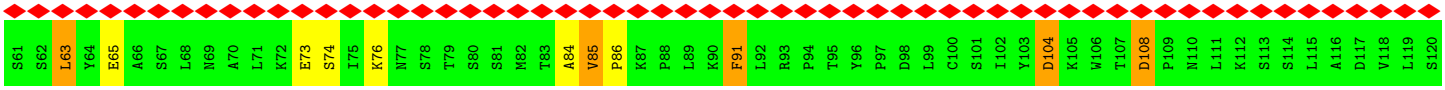


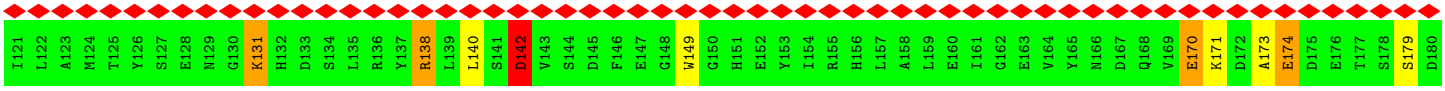
• Molecule 20: 26S proteasome regulatory subunit RPN1

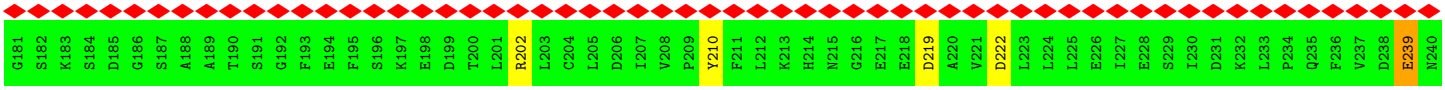
Chain Z:

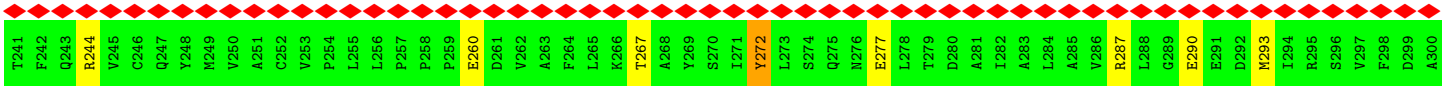


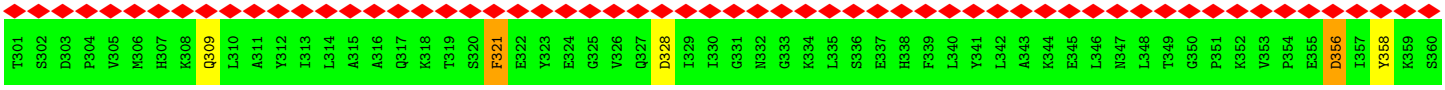


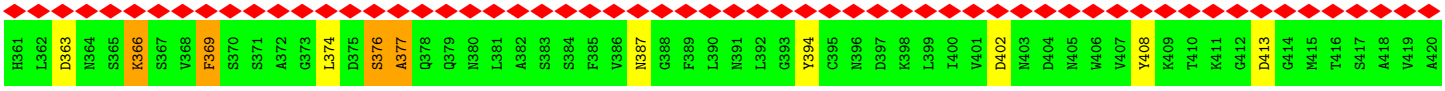


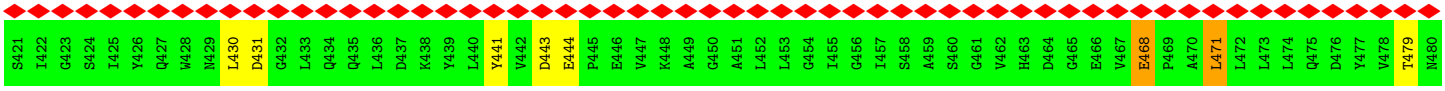


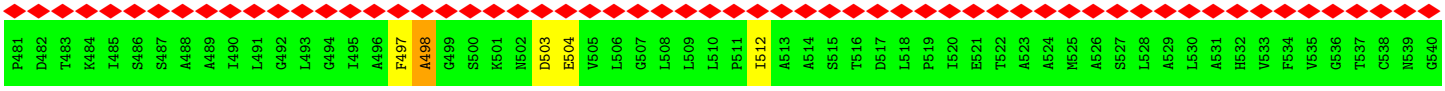


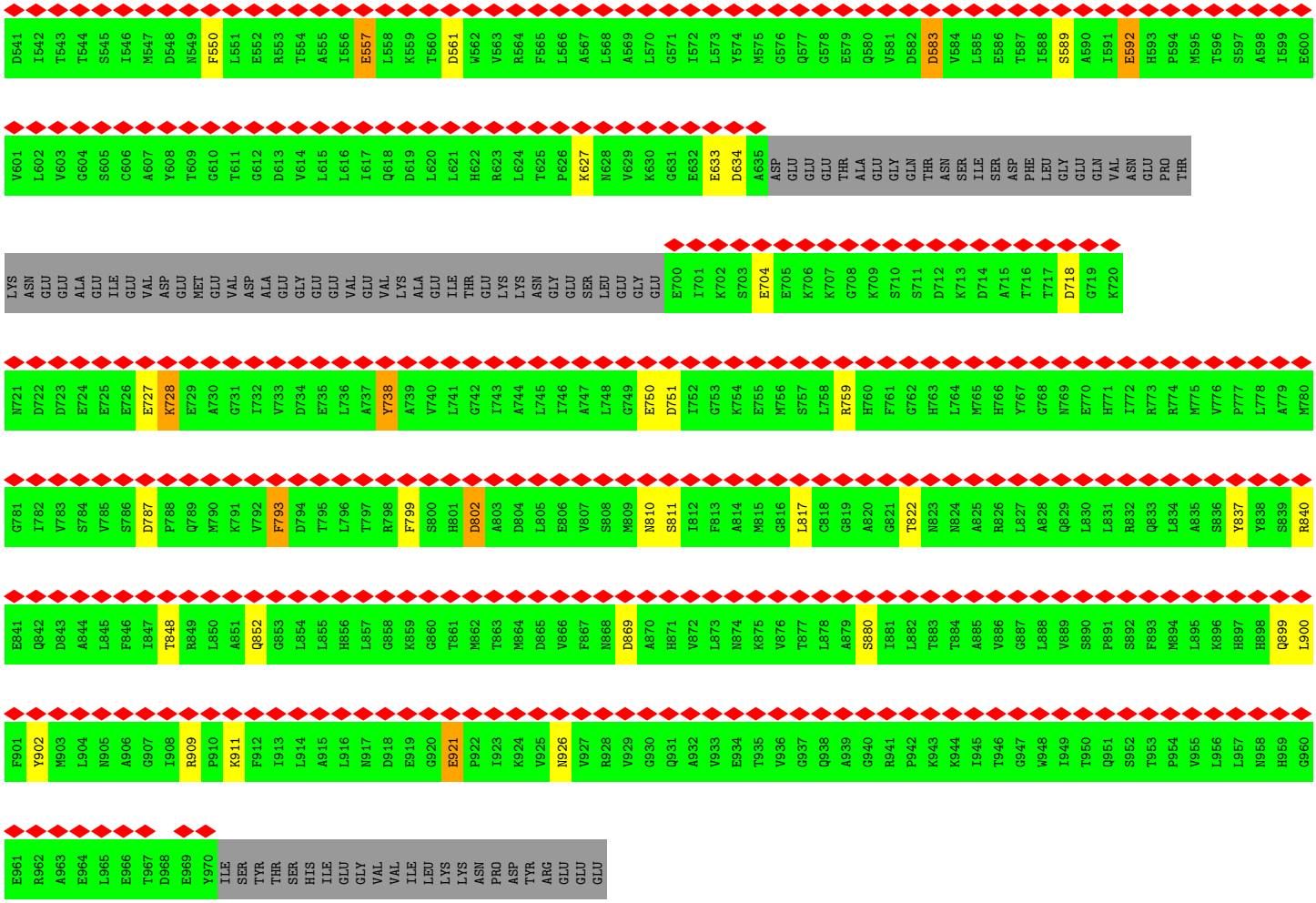






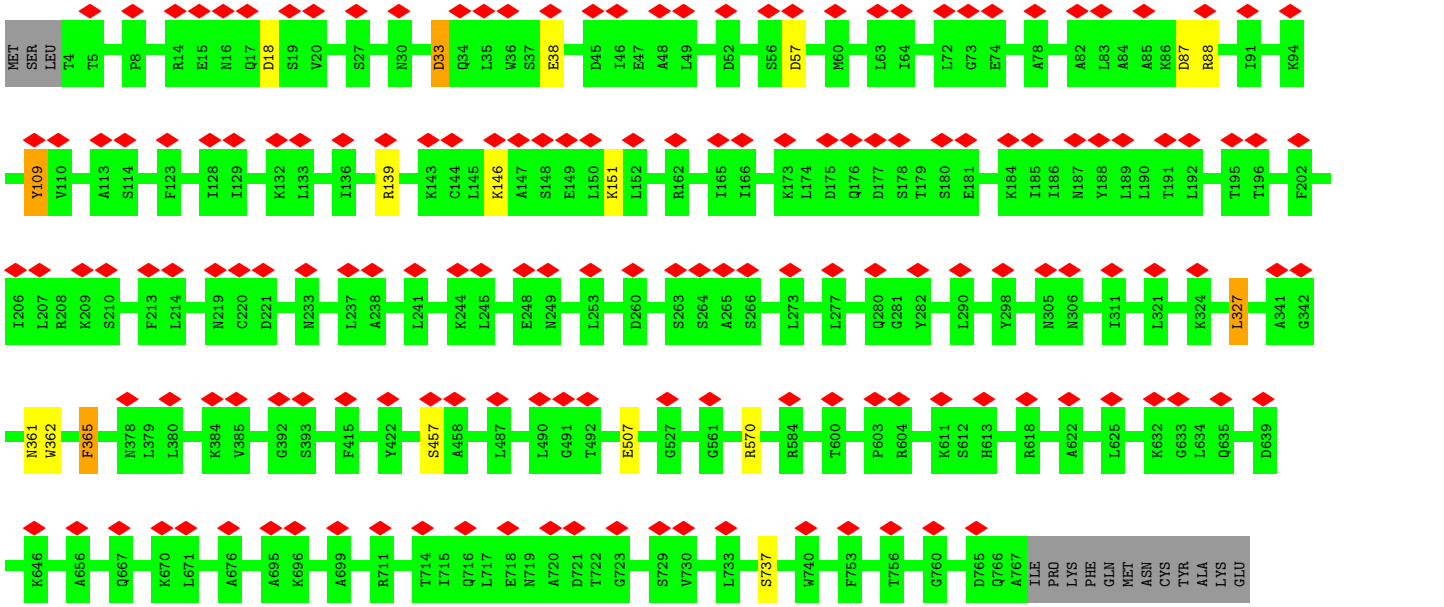


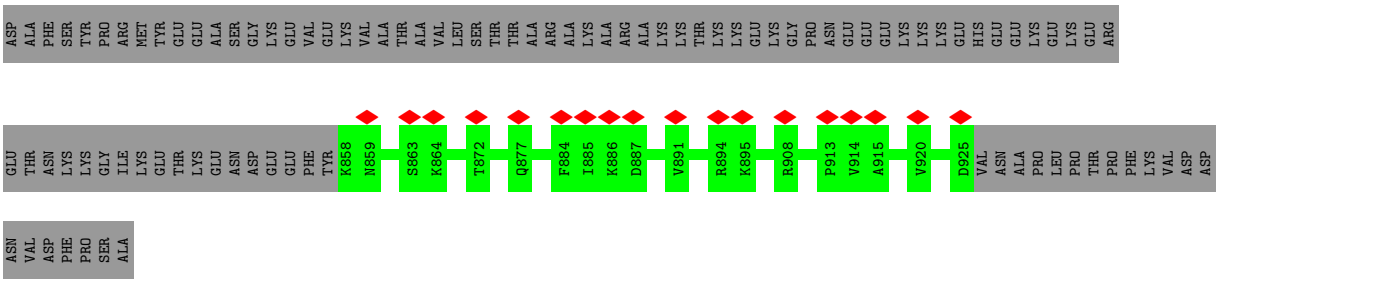




• Molecule 21: 26S proteasome regulatory subunit RPN2

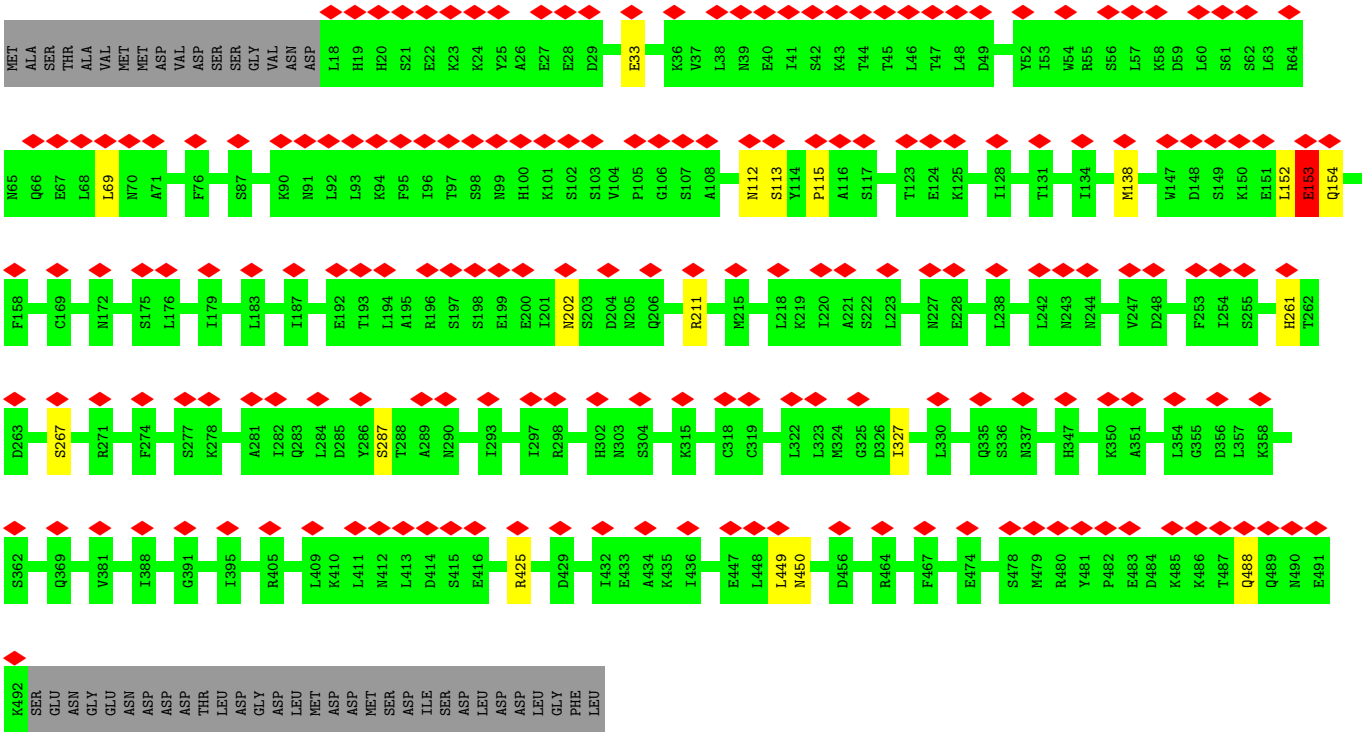
Chain N:





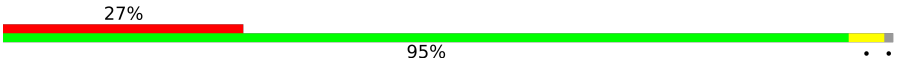
• Molecule 22: 26S proteasome regulatory subunit RPN3

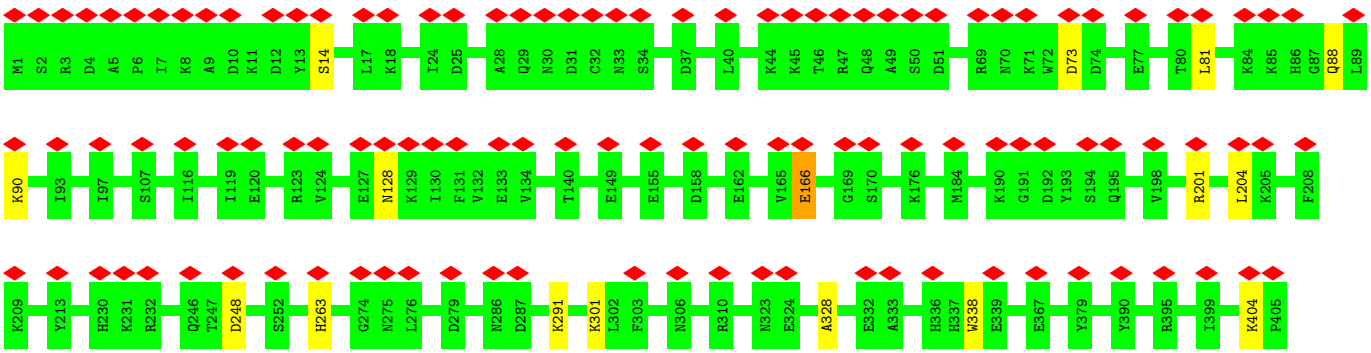
Chain S:

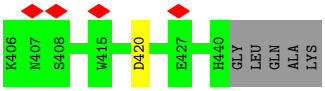


• Molecule 23: 26S proteasome regulatory subunit RPN5

Chain P:

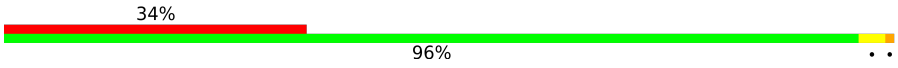


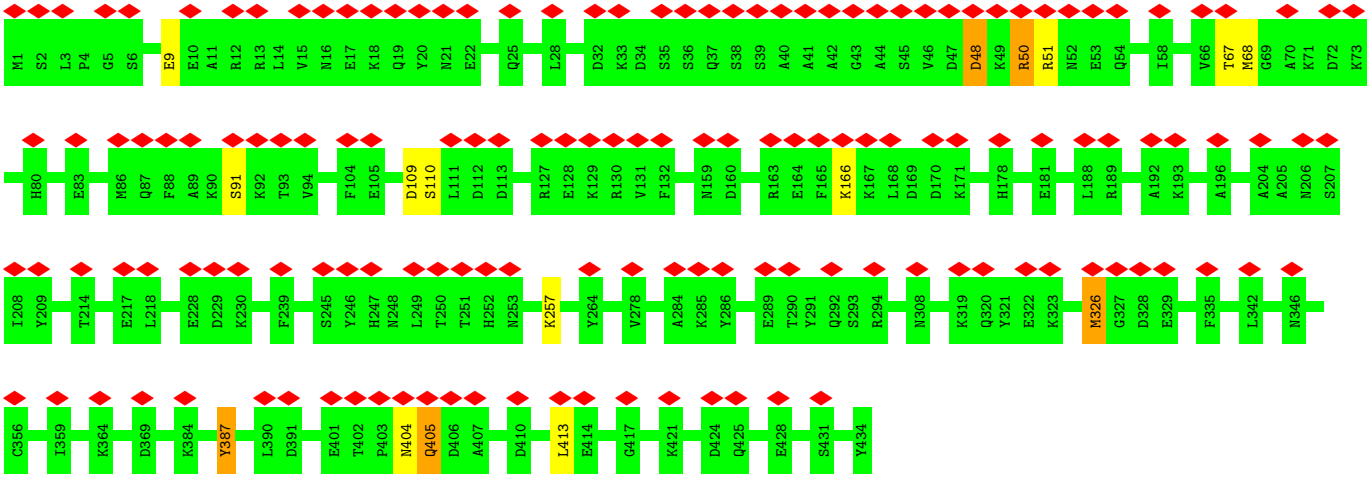




• Molecule 24: 26S proteasome regulatory subunit RPN6

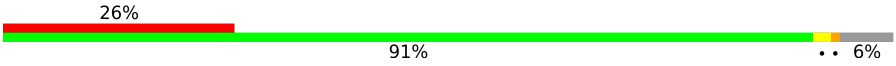
Chain Q:

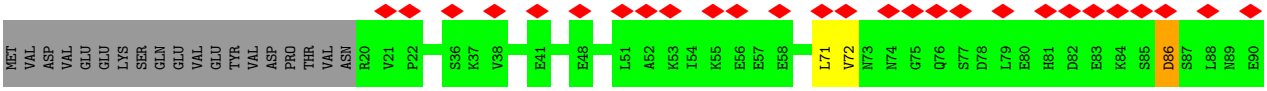




• Molecule 25: 26S proteasome regulatory subunit RPN7

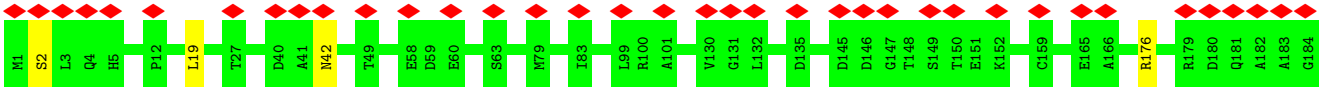
Chain R:

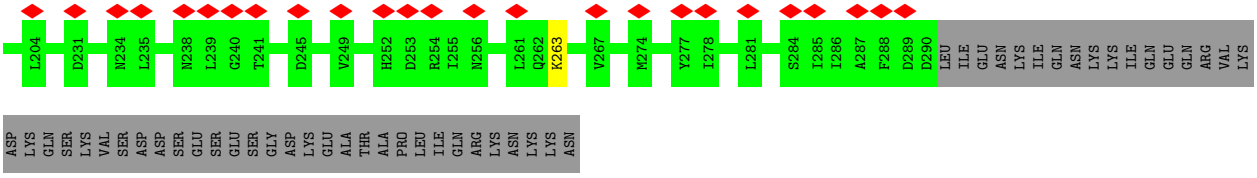




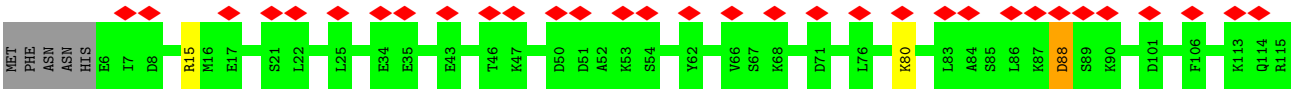
• Molecule 26: 26S proteasome regulatory subunit RPN8

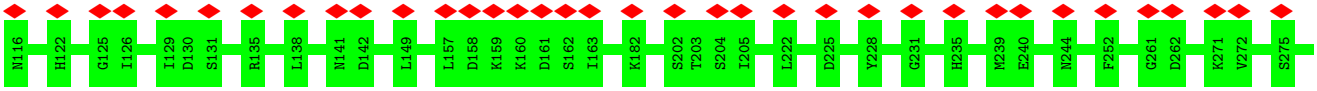
Chain U:

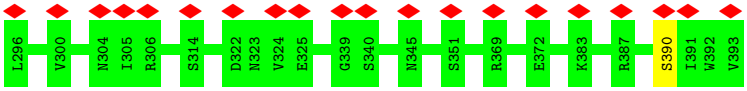




• Molecule 27: 26S proteasome regulatory subunit RPN9







4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	88243	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	60	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	25.065	Depositor
Minimum map value	-11.917	Depositor
Average map value	-0.005	Depositor
Map value standard deviation	0.815	Depositor
Recommended contour level	5.4	Depositor
Map size (Å)	588.0, 588.0, 588.0	wwPDB
Map dimensions	280, 280, 280	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	2.1, 2.1, 2.1	Depositor

5 Model quality (i)

5.1 Standard geometry (i)

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|$ >5	RMSZ	#$\|Z\|$ >5
1	A	0.62	2/1945 (0.1%)	1.00	9/2634 (0.3%)
1	a	0.62	2/1945 (0.1%)	1.00	8/2634 (0.3%)
2	B	0.57	0/1944	0.91	3/2632 (0.1%)
2	b	0.57	0/1944	0.91	3/2632 (0.1%)
3	C	0.52	0/1934	0.91	8/2618 (0.3%)
3	c	0.52	0/1934	0.91	8/2618 (0.3%)
4	D	0.61	3/1879 (0.2%)	0.88	5/2546 (0.2%)
4	d	0.56	0/1879	1.14	16/2546 (0.6%)
5	E	0.68	2/1908 (0.1%)	0.99	9/2571 (0.4%)
5	e	0.68	2/1908 (0.1%)	0.99	9/2571 (0.4%)
6	F	0.69	4/1800 (0.2%)	0.93	5/2433 (0.2%)
6	f	0.69	4/1800 (0.2%)	0.93	5/2433 (0.2%)
7	G	0.59	1/1925 (0.1%)	0.95	5/2599 (0.2%)
7	g	0.59	1/1925 (0.1%)	0.95	5/2599 (0.2%)
8	1	0.81	3/1541 (0.2%)	1.10	13/2087 (0.6%)
8	h	0.81	4/1541 (0.3%)	1.10	13/2087 (0.6%)
9	2	0.93	9/1750 (0.5%)	1.21	17/2373 (0.7%)
9	i	0.93	9/1750 (0.5%)	1.21	17/2373 (0.7%)
10	3	0.90	8/1611 (0.5%)	1.05	10/2174 (0.5%)
10	j	0.90	8/1611 (0.5%)	1.05	10/2174 (0.5%)
11	4	0.92	7/1589 (0.4%)	1.22	19/2142 (0.9%)
11	k	0.92	7/1589 (0.4%)	1.22	19/2142 (0.9%)
12	5	0.79	4/1681 (0.2%)	1.21	19/2274 (0.8%)
12	l	0.79	4/1681 (0.2%)	1.21	19/2274 (0.8%)
13	6	0.91	6/1795 (0.3%)	1.17	14/2420 (0.6%)
13	m	0.91	6/1795 (0.3%)	1.17	14/2420 (0.6%)
14	7	0.48	0/1821	0.92	5/2470 (0.2%)
14	n	0.50	0/1821	0.93	7/2470 (0.3%)
15	W	0.48	0/1557	0.82	3/2111 (0.1%)
16	V	0.69	4/2309 (0.2%)	1.21	18/3115 (0.6%)
17	T	0.45	0/2235	0.87	7/3017 (0.2%)
18	X	0.52	1/1058 (0.1%)	0.93	5/1432 (0.3%)
19	Y	0.45	0/741	0.96	5/1000 (0.5%)
20	Z	0.66	2/7122 (0.0%)	1.27	77/9645 (0.8%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
21	N	0.45	0/6521	0.80	11/8824 (0.1%)
22	S	0.46	0/3966	0.81	4/5355 (0.1%)
23	P	0.45	0/3663	0.82	7/4940 (0.1%)
24	Q	0.42	0/3556	0.82	7/4787 (0.1%)
25	R	0.44	0/3313	0.84	9/4469 (0.2%)
26	U	0.54	1/2340 (0.0%)	0.83	3/3168 (0.1%)
27	O	0.47	2/3247 (0.1%)	0.88	6/4380 (0.1%)
All	All	0.64	106/91874 (0.1%)	1.00	456/124189 (0.4%)

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
4	d	0	8
5	E	0	1
5	e	0	1
6	F	0	3
6	f	0	3
7	G	0	2
7	g	0	2
8	1	0	1
8	h	0	1
9	2	0	3
9	i	0	3
12	5	0	1
12	l	0	1
15	W	0	2
16	V	0	4
17	T	0	6
18	X	0	3
19	Y	0	3
20	Z	0	41
21	N	0	2
22	S	0	2
23	P	0	3
24	Q	0	4
25	R	0	1
All	All	0	101

All (106) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	e	211	LYS	CB-CG	-12.88	1.17	1.52
5	E	211	LYS	CB-CG	-12.87	1.17	1.52
4	D	11	PHE	CD2-CE2	-10.90	1.17	1.39
8	1	69	GLN	CD-NE2	-10.26	1.07	1.32
8	h	69	GLN	CD-NE2	-10.25	1.07	1.32
11	k	86	GLN	CD-NE2	-9.93	1.08	1.32
11	4	86	GLN	CD-NE2	-9.93	1.08	1.32
4	D	11	PHE	CB-CG	-9.43	1.35	1.51
6	F	152	ASN	CG-ND2	-9.39	1.09	1.32
6	f	152	ASN	CG-ND2	-9.38	1.09	1.32
10	j	173	ASN	CG-ND2	-9.24	1.09	1.32
10	3	173	ASN	CG-ND2	-9.24	1.09	1.32
13	6	102	GLN	CD-NE2	-8.83	1.10	1.32
13	m	102	GLN	CD-NE2	-8.83	1.10	1.32
10	j	204	GLN	CD-NE2	-8.48	1.11	1.32
10	3	204	GLN	CD-NE2	-8.47	1.11	1.32
8	h	69	GLN	CD-OE1	-8.16	1.05	1.24
8	1	69	GLN	CD-OE1	-8.15	1.06	1.24
1	a	130	GLN	CD-NE2	-8.15	1.12	1.32
1	A	130	GLN	CD-NE2	-8.13	1.12	1.32
11	k	86	GLN	CD-OE1	-7.82	1.06	1.24
11	4	86	GLN	CD-OE1	-7.79	1.06	1.24
20	Z	149	TRP	CB-CG	-7.64	1.36	1.50
6	f	152	ASN	CG-OD1	-7.52	1.07	1.24
6	F	152	ASN	CG-OD1	-7.50	1.07	1.24
11	k	182	LYS	CE-NZ	-7.48	1.30	1.49
11	4	182	LYS	CE-NZ	-7.46	1.30	1.49
9	2	86	GLN	CD-NE2	-7.45	1.14	1.32
9	i	86	GLN	CD-NE2	-7.40	1.14	1.32
10	j	161	GLU	CB-CG	-7.38	1.38	1.52
10	3	161	GLU	CB-CG	-7.37	1.38	1.52
6	f	21	GLN	CD-NE2	-7.30	1.14	1.32
13	6	46	ARG	CZ-NH2	-7.28	1.23	1.33
6	F	21	GLN	CD-NE2	-7.27	1.14	1.32
13	m	46	ARG	CZ-NH2	-7.25	1.23	1.33
10	j	173	ASN	CG-OD1	-7.14	1.08	1.24
10	3	173	ASN	CG-OD1	-7.13	1.08	1.24
11	4	110	LYS	CG-CD	-7.09	1.28	1.52
11	k	110	LYS	CG-CD	-7.09	1.28	1.52
27	O	88	ASP	CG-OD1	-7.08	1.09	1.25
9	i	252	ILE	CG1-CD1	-7.06	1.01	1.50
9	2	252	ILE	CG1-CD1	-7.06	1.01	1.50
26	U	19	LEU	CG-CD2	-6.98	1.26	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
27	O	88	ASP	CG-OD2	-6.97	1.09	1.25
9	i	86	GLN	CD-OE1	-6.87	1.08	1.24
9	2	86	GLN	CD-OE1	-6.87	1.08	1.24
16	V	205	LYS	CD-CE	-6.85	1.34	1.51
10	j	74	TYR	CE2-CZ	-6.78	1.29	1.38
6	F	21	GLN	CD-OE1	-6.75	1.09	1.24
13	6	102	GLN	CD-OE1	-6.74	1.09	1.24
6	f	21	GLN	CD-OE1	-6.73	1.09	1.24
10	3	74	TYR	CE2-CZ	-6.71	1.29	1.38
11	k	110	LYS	CE-NZ	-6.71	1.32	1.49
13	m	102	GLN	CD-OE1	-6.70	1.09	1.24
11	4	110	LYS	CB-CG	-6.70	1.34	1.52
11	4	110	LYS	CE-NZ	-6.68	1.32	1.49
11	k	110	LYS	CB-CG	-6.67	1.34	1.52
1	a	130	GLN	CD-OE1	-6.50	1.09	1.24
1	A	130	GLN	CD-OE1	-6.50	1.09	1.24
12	5	226	GLU	CB-CG	-6.38	1.40	1.52
12	l	226	GLU	CB-CG	-6.38	1.40	1.52
10	3	161	GLU	CG-CD	-6.30	1.42	1.51
10	j	161	GLU	CG-CD	-6.29	1.42	1.51
13	m	47	TYR	CE2-CZ	-6.26	1.30	1.38
12	l	83	PHE	CE2-CZ	-6.20	1.25	1.37
13	6	47	TYR	CE2-CZ	-6.20	1.30	1.38
9	i	250	CYS	CB-SG	-6.13	1.71	1.82
9	2	250	CYS	CB-SG	-6.12	1.71	1.82
12	5	83	PHE	CE2-CZ	-6.12	1.25	1.37
10	j	204	GLN	CD-OE1	-6.09	1.10	1.24
10	3	204	GLN	CD-OE1	-6.08	1.10	1.24
5	E	211	LYS	CG-CD	-5.96	1.32	1.52
5	e	211	LYS	CG-CD	-5.94	1.32	1.52
13	m	127	LYS	CE-NZ	-5.81	1.34	1.49
13	6	127	LYS	CE-NZ	-5.80	1.34	1.49
8	1	153	GLU	CB-CG	-5.78	1.41	1.52
9	2	119	TYR	CE1-CZ	-5.74	1.31	1.38
9	i	119	TYR	CE1-CZ	-5.71	1.31	1.38
8	h	153	GLU	CB-CG	-5.70	1.41	1.52
12	5	253	TYR	CE1-CZ	-5.59	1.31	1.38
12	l	253	TYR	CE1-CZ	-5.58	1.31	1.38
11	k	109	LYS	CG-CD	-5.54	1.33	1.52
11	4	109	LYS	CG-CD	-5.53	1.33	1.52
13	6	127	LYS	CB-CG	-5.47	1.37	1.52
13	m	127	LYS	CB-CG	-5.45	1.37	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
16	V	208	LYS	CE-NZ	-5.40	1.35	1.49
7	G	66	LYS	CE-NZ	-5.39	1.35	1.49
7	g	66	LYS	CE-NZ	-5.37	1.35	1.49
16	V	280	LEU	CG-CD2	-5.25	1.32	1.51
9	2	219	TYR	CE1-CZ	-5.21	1.31	1.38
18	X	41	GLU	CD-OE2	-5.21	1.20	1.25
9	i	219	TYR	CE1-CZ	-5.18	1.31	1.38
4	D	11	PHE	CG-CD2	-5.17	1.30	1.38
20	Z	44	LYS	CE-NZ	-5.13	1.36	1.49
9	2	126	TYR	CE1-CZ	-5.11	1.31	1.38
9	2	232	TYR	CD1-CE1	-5.11	1.31	1.39
9	i	232	TYR	CD1-CE1	-5.09	1.31	1.39
9	i	126	TYR	CD1-CE1	-5.09	1.31	1.39
9	i	126	TYR	CE1-CZ	-5.08	1.31	1.38
9	2	126	TYR	CD1-CE1	-5.07	1.31	1.39
10	j	32	GLN	CB-CG	-5.05	1.39	1.52
10	3	32	GLN	CB-CG	-5.04	1.39	1.52
8	h	120	TYR	CE2-CZ	-5.04	1.32	1.38
12	5	181	ARG	CG-CD	-5.04	1.39	1.51
16	V	218	LYS	CE-NZ	-5.03	1.36	1.49
12	l	181	ARG	CG-CD	-5.01	1.39	1.51

All (456) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
16	V	259	LYS	CG-CD-CE	21.63	176.79	111.90
20	Z	33	GLU	OE1-CD-OE2	-17.74	102.02	123.30
20	Z	366	LYS	CG-CD-CE	16.98	162.82	111.90
27	O	88	ASP	CB-CG-OD1	15.90	132.62	118.30
1	a	201	LYS	CD-CE-NZ	-15.85	75.25	111.70
1	A	201	LYS	CD-CE-NZ	-15.83	75.28	111.70
12	l	196	ARG	NE-CZ-NH1	15.80	128.20	120.30
12	5	196	ARG	NE-CZ-NH1	15.73	128.17	120.30
12	l	196	ARG	NE-CZ-NH2	-15.56	112.52	120.30
12	5	196	ARG	NE-CZ-NH2	-15.46	112.57	120.30
8	1	18	LYS	CD-CE-NZ	-15.06	77.06	111.70
8	h	18	LYS	CD-CE-NZ	-15.06	77.06	111.70
20	Z	366	LYS	CB-CG-CD	15.05	150.73	111.60
9	2	109	LEU	CB-CG-CD2	15.01	136.52	111.00
9	i	109	LEU	CB-CG-CD2	15.00	136.49	111.00
27	O	88	ASP	OD1-CG-OD2	-14.86	95.06	123.30
24	Q	326	MET	CB-CG-SD	14.52	155.95	112.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
13	m	46	ARG	NE-CZ-NH2	-14.00	113.30	120.30
13	m	46	ARG	NE-CZ-NH1	13.98	127.29	120.30
13	6	46	ARG	NE-CZ-NH2	-13.91	113.34	120.30
13	6	46	ARG	NE-CZ-NH1	13.85	127.22	120.30
11	4	1	MET	CA-CB-CG	-13.79	89.85	113.30
11	k	1	MET	CA-CB-CG	-13.79	89.86	113.30
27	O	88	ASP	CB-CG-OD2	13.68	130.61	118.30
13	m	127	LYS	CD-CE-NZ	12.59	140.65	111.70
13	6	127	LYS	CD-CE-NZ	12.57	140.62	111.70
23	P	166	GLU	OE1-CD-OE2	-12.10	108.78	123.30
8	h	183	ARG	NE-CZ-NH1	12.06	126.33	120.30
8	1	183	ARG	NE-CZ-NH1	11.99	126.30	120.30
20	Z	33	GLU	CG-CD-OE1	11.54	141.38	118.30
8	1	183	ARG	CG-CD-NE	11.53	136.00	111.80
8	h	183	ARG	CG-CD-NE	11.50	135.94	111.80
11	k	1	MET	CG-SD-CE	-11.43	81.92	100.20
11	4	1	MET	CG-SD-CE	-11.42	81.93	100.20
17	T	138	ASP	CB-CG-OD2	-11.42	108.02	118.30
11	4	19	LYS	CD-CE-NZ	11.31	137.72	111.70
11	k	19	LYS	CD-CE-NZ	11.31	137.71	111.70
4	d	208	LYS	CB-CG-CD	11.03	140.28	111.60
9	i	167	LEU	CB-CG-CD1	-10.93	92.42	111.00
9	2	167	LEU	CB-CG-CD1	-10.93	92.42	111.00
26	U	19	LEU	CB-CG-CD2	-10.89	92.49	111.00
17	T	138	ASP	CB-CG-OD1	10.64	127.88	118.30
12	5	181	ARG	NE-CZ-NH2	10.54	125.57	120.30
12	l	181	ARG	NE-CZ-NH2	10.46	125.53	120.30
20	Z	366	LYS	CD-CE-NZ	-10.34	87.92	111.70
20	Z	33	GLU	CG-CD-OE2	-10.03	98.24	118.30
13	6	221	ARG	NE-CZ-NH1	9.94	125.27	120.30
13	m	221	ARG	NE-CZ-NH1	9.93	125.26	120.30
7	g	57	LYS	CD-CE-NZ	9.88	134.42	111.70
7	G	57	LYS	CD-CE-NZ	9.84	134.33	111.70
9	i	252	ILE	CA-CB-CG1	-9.79	92.39	111.00
9	2	252	ILE	CA-CB-CG1	-9.79	92.41	111.00
9	2	109	LEU	CB-CG-CD1	-9.52	94.82	111.00
9	i	109	LEU	CB-CG-CD1	-9.51	94.83	111.00
4	d	39	LYS	CD-CE-NZ	9.40	133.33	111.70
6	F	218	LYS	CD-CE-NZ	-9.33	90.24	111.70
10	j	77	LYS	CD-CE-NZ	-9.32	90.26	111.70
10	3	77	LYS	CD-CE-NZ	-9.32	90.25	111.70
6	f	218	LYS	CD-CE-NZ	-9.31	90.28	111.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	d	228	GLU	OE1-CD-OE2	-9.26	112.19	123.30
16	V	205	LYS	CD-CE-NZ	-9.18	90.58	111.70
20	Z	468	GLU	OE1-CD-OE2	-9.16	112.31	123.30
5	e	170	LYS	CD-CE-NZ	9.11	132.64	111.70
23	P	166	GLU	CG-CD-OE2	-9.09	100.12	118.30
5	E	170	LYS	CD-CE-NZ	9.09	132.60	111.70
20	Z	321	PHE	CB-CG-CD2	-9.08	114.44	120.80
21	N	146	LYS	CD-CE-NZ	-9.00	91.00	111.70
16	V	259	LYS	CD-CE-NZ	-8.90	91.23	111.70
5	e	205	LYS	CD-CE-NZ	-8.88	91.28	111.70
5	E	205	LYS	CD-CE-NZ	-8.87	91.31	111.70
12	5	181	ARG	NE-CZ-NH1	-8.87	115.87	120.30
4	d	208	LYS	CG-CD-CE	8.86	138.48	111.90
6	f	232	LYS	CD-CE-NZ	8.82	131.99	111.70
1	A	232	LYS	CD-CE-NZ	-8.80	91.45	111.70
1	a	232	LYS	CD-CE-NZ	-8.80	91.46	111.70
6	F	232	LYS	CD-CE-NZ	8.80	131.94	111.70
15	W	194	GLU	OE1-CD-OE2	-8.79	112.76	123.30
12	l	181	ARG	NE-CZ-NH1	-8.77	115.92	120.30
3	C	5	ARG	CG-CD-NE	8.68	130.04	111.80
3	c	5	ARG	CG-CD-NE	8.67	130.02	111.80
20	Z	498	ALA	N-CA-CB	-8.60	98.07	110.10
9	i	118	LYS	CD-CE-NZ	8.52	131.29	111.70
9	2	118	LYS	CD-CE-NZ	8.52	131.30	111.70
20	Z	902	TYR	CB-CG-CD2	-8.41	115.95	121.00
19	Y	18	LYS	CB-CG-CD	8.39	133.42	111.60
20	Z	63	LEU	CB-CG-CD2	8.36	125.20	111.00
7	g	63	LYS	CD-CE-NZ	8.30	130.79	111.70
4	D	119	ARG	NE-CZ-NH2	-8.29	116.16	120.30
7	G	63	LYS	CD-CE-NZ	8.29	130.76	111.70
5	E	10	ARG	CB-CG-CD	8.26	133.07	111.60
5	e	10	ARG	CB-CG-CD	8.25	133.06	111.60
11	4	163	LEU	CB-CG-CD1	8.22	124.97	111.00
11	k	163	LEU	CB-CG-CD1	8.21	124.96	111.00
10	3	172	LEU	CB-CG-CD2	8.18	124.90	111.00
10	j	172	LEU	CB-CG-CD2	8.16	124.87	111.00
17	T	186	ARG	NE-CZ-NH2	-8.15	116.22	120.30
21	N	365	PHE	CB-CG-CD2	-8.14	115.10	120.80
24	Q	48	ASP	CB-CA-C	-8.14	94.11	110.40
12	l	148	ARG	NE-CZ-NH2	-8.14	116.23	120.30
17	T	186	ARG	NE-CZ-NH1	8.11	124.35	120.30
11	4	110	LYS	CD-CE-NZ	-8.08	93.12	111.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
11	k	110	LYS	CD-CE-NZ	-8.07	93.14	111.70
12	5	148	ARG	NE-CZ-NH2	-8.07	116.27	120.30
8	h	130	LYS	CD-CE-NZ	8.06	130.25	111.70
22	S	211	ARG	NE-CZ-NH1	-8.05	116.27	120.30
8	1	130	LYS	CD-CE-NZ	8.05	130.21	111.70
13	m	177	LYS	CD-CE-NZ	-8.02	93.25	111.70
13	6	177	LYS	CD-CE-NZ	-8.02	93.25	111.70
12	5	156	LYS	CD-CE-NZ	8.02	130.15	111.70
23	P	166	GLU	CG-CD-OE1	8.02	134.33	118.30
12	l	156	LYS	CD-CE-NZ	8.01	130.12	111.70
20	Z	497	PHE	CB-CG-CD2	-8.01	115.20	120.80
11	k	4	ILE	CG1-CB-CG2	-7.99	93.83	111.40
11	4	4	ILE	CG1-CB-CG2	-7.98	93.84	111.40
20	Z	759	ARG	NE-CZ-NH2	7.92	124.26	120.30
16	V	88	GLN	CA-CB-CG	7.89	130.75	113.40
19	Y	83	ARG	CG-CD-NE	7.81	128.21	111.80
12	5	182	LYS	CD-CE-NZ	7.79	129.62	111.70
12	l	182	LYS	CD-CE-NZ	7.78	129.60	111.70
12	5	107	LYS	CD-CE-NZ	7.76	129.56	111.70
12	l	107	LYS	CD-CE-NZ	7.75	129.52	111.70
16	V	100	ARG	NE-CZ-NH2	-7.69	116.45	120.30
20	Z	900	LEU	CB-CG-CD1	7.69	124.07	111.00
25	R	287	GLN	CA-CB-CG	7.69	130.31	113.40
9	i	58	LYS	CD-CE-NZ	-7.65	94.10	111.70
9	2	58	LYS	CD-CE-NZ	-7.64	94.12	111.70
18	X	41	GLU	OE1-CD-OE2	-7.64	114.13	123.30
19	Y	83	ARG	NE-CZ-NH1	7.63	124.11	120.30
13	m	75	ARG	NE-CZ-NH1	7.60	124.10	120.30
13	6	75	ARG	NE-CZ-NH1	7.58	124.09	120.30
16	V	306	LYS	N-CA-C	-7.58	90.54	111.00
7	g	71	ASP	N-CA-C	-7.55	90.62	111.00
7	G	71	ASP	N-CA-C	-7.54	90.64	111.00
1	A	187	LYS	CB-CG-CD	7.51	131.12	111.60
1	a	187	LYS	CB-CG-CD	7.50	131.10	111.60
11	4	163	LEU	CB-CG-CD2	-7.46	98.33	111.00
20	Z	759	ARG	NE-CZ-NH1	-7.46	116.57	120.30
11	k	163	LEU	CB-CG-CD2	-7.45	98.34	111.00
8	1	194	ARG	CG-CD-NE	7.40	127.35	111.80
8	h	194	ARG	CG-CD-NE	7.40	127.33	111.80
4	D	88	LYS	CB-CG-CD	7.35	130.70	111.60
20	Z	104	ASP	CB-CG-OD2	-7.34	111.69	118.30
7	g	66	LYS	CB-CG-CD	-7.28	92.68	111.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	G	66	LYS	CB-CG-CD	-7.27	92.70	111.60
20	Z	30	LYS	CA-CB-CG	7.27	129.39	113.40
4	D	182	LYS	CB-CG-CD	7.26	130.47	111.60
8	h	149	LYS	CD-CE-NZ	7.25	128.38	111.70
8	1	149	LYS	CD-CE-NZ	7.24	128.35	111.70
1	A	188	LYS	CD-CE-NZ	-7.21	95.12	111.70
20	Z	104	ASP	CB-CG-OD1	7.20	124.78	118.30
1	a	188	LYS	CD-CE-NZ	-7.19	95.17	111.70
11	k	109	LYS	CA-CB-CG	-7.18	97.61	113.40
11	4	109	LYS	CA-CB-CG	-7.17	97.62	113.40
18	X	41	GLU	CG-CD-OE1	7.17	132.64	118.30
1	A	131	ARG	NE-CZ-NH2	7.16	123.88	120.30
1	a	131	ARG	NE-CZ-NH2	7.16	123.88	120.30
16	V	303	VAL	CA-CB-CG2	7.14	121.61	110.90
25	R	376	GLN	CA-CB-CG	7.13	129.09	113.40
21	N	365	PHE	CB-CG-CD1	7.12	125.78	120.80
13	6	221	ARG	NE-CZ-NH2	-7.12	116.74	120.30
25	R	179	PHE	CB-CG-CD2	7.11	125.78	120.80
11	k	171	ARG	NE-CZ-NH1	7.11	123.86	120.30
5	e	10	ARG	CG-CD-NE	7.07	126.65	111.80
5	E	10	ARG	CG-CD-NE	7.07	126.65	111.80
13	m	221	ARG	NE-CZ-NH2	-7.07	116.77	120.30
16	V	208	LYS	CD-CE-NZ	-7.04	95.51	111.70
11	4	171	ARG	NE-CZ-NH1	7.03	123.82	120.30
20	Z	369	PHE	CB-CG-CD2	-7.02	115.88	120.80
10	j	118	LYS	CA-CB-CG	7.01	128.81	113.40
10	3	118	LYS	CA-CB-CG	7.00	128.80	113.40
20	Z	471	LEU	CA-CB-CG	6.95	131.29	115.30
6	f	228	GLU	CA-CB-CG	-6.95	98.12	113.40
20	Z	802	ASP	N-CA-CB	-6.94	98.11	110.60
11	k	90	LYS	CD-CE-NZ	-6.94	95.74	111.70
6	F	228	GLU	CA-CB-CG	-6.93	98.14	113.40
11	4	90	LYS	CD-CE-NZ	-6.93	95.77	111.70
20	Z	374	LEU	CB-CG-CD2	6.90	122.72	111.00
8	h	183	ARG	CB-CG-CD	6.89	129.53	111.60
21	N	146	LYS	CG-CD-CE	6.89	132.58	111.90
22	S	153	GLU	OE1-CD-OE2	-6.89	115.03	123.30
8	1	183	ARG	CB-CG-CD	6.86	129.44	111.60
23	P	204	LEU	CB-CG-CD2	6.86	122.67	111.00
11	k	109	LYS	CG-CD-CE	6.85	132.45	111.90
23	P	338	TRP	CA-CB-CG	6.85	126.71	113.70
13	m	36	ARG	NE-CZ-NH1	6.84	123.72	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
11	4	109	LYS	CG-CD-CE	6.84	132.41	111.90
20	Z	430	LEU	CB-CG-CD1	-6.79	99.46	111.00
20	Z	9	GLN	CA-CB-CG	6.75	128.24	113.40
14	n	98	ARG	NE-CZ-NH2	6.74	123.67	120.30
21	N	109	TYR	CB-CG-CD2	-6.74	116.96	121.00
13	6	36	ARG	NE-CZ-NH1	6.70	123.65	120.30
13	6	40	ASP	N-CA-C	-6.64	93.07	111.00
13	m	40	ASP	N-CA-C	-6.63	93.10	111.00
20	Z	557	GLU	CA-CB-CG	6.62	127.97	113.40
24	Q	405	GLN	N-CA-C	-6.62	93.12	111.00
20	Z	142	ASP	CB-CG-OD1	6.62	124.25	118.30
20	Z	7	LYS	CD-CE-NZ	6.61	126.89	111.70
8	1	183	ARG	CA-CB-CG	-6.60	98.88	113.40
4	D	182	LYS	CA-CB-CG	6.57	127.86	113.40
4	d	14	ASP	CB-CG-OD1	6.57	124.21	118.30
9	2	251	ASP	CB-CG-OD1	-6.57	112.39	118.30
8	h	183	ARG	CA-CB-CG	-6.57	98.95	113.40
11	4	109	LYS	CB-CG-CD	6.56	128.67	111.60
11	k	109	LYS	CB-CG-CD	6.56	128.65	111.60
16	V	194	ARG	NE-CZ-NH1	6.56	123.58	120.30
9	i	217	ARG	NE-CZ-NH1	-6.55	117.03	120.30
10	3	69	TYR	CB-CG-CD1	6.55	124.93	121.00
9	2	217	ARG	NE-CZ-NH1	-6.54	117.03	120.30
10	j	69	TYR	CB-CG-CD1	6.53	124.92	121.00
9	i	251	ASP	CB-CG-OD1	-6.50	112.45	118.30
20	Z	131	LYS	CB-CG-CD	6.47	128.42	111.60
25	R	287	GLN	CB-CA-C	-6.47	97.47	110.40
20	Z	287	ARG	NE-CZ-NH2	-6.46	117.07	120.30
18	X	48	PHE	CB-CG-CD2	-6.46	116.28	120.80
9	2	65	ARG	NE-CZ-NH2	6.45	123.52	120.30
16	V	88	GLN	CB-CG-CD	6.44	128.35	111.60
9	2	217	ARG	CG-CD-NE	-6.43	98.29	111.80
10	j	63	LEU	CB-CG-CD2	6.43	121.93	111.00
9	i	217	ARG	CG-CD-NE	-6.43	98.30	111.80
20	Z	91	PHE	CB-CG-CD2	-6.43	116.30	120.80
2	b	49	LYS	CD-CE-NZ	6.42	126.47	111.70
2	B	49	LYS	CD-CE-NZ	6.42	126.46	111.70
15	W	124	GLU	OE1-CD-OE2	-6.41	115.60	123.30
1	A	77	ARG	CB-CG-CD	6.41	128.26	111.60
10	3	63	LEU	CB-CG-CD2	6.41	121.89	111.00
9	i	65	ARG	NE-CZ-NH2	6.40	123.50	120.30
1	a	77	ARG	CB-CG-CD	6.40	128.23	111.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
20	Z	376	SER	N-CA-C	6.37	128.19	111.00
20	Z	497	PHE	CB-CG-CD1	6.36	125.25	120.80
5	E	211	LYS	CA-CB-CG	-6.36	99.40	113.40
25	R	125	GLU	OE1-CD-OE2	-6.36	115.67	123.30
20	Z	244	ARG	NE-CZ-NH2	-6.35	117.13	120.30
8	h	85	GLU	CA-CB-CG	6.35	127.36	113.40
20	Z	358	TYR	CB-CG-CD1	6.34	124.80	121.00
5	e	211	LYS	CA-CB-CG	-6.33	99.47	113.40
8	1	85	GLU	CA-CB-CG	6.33	127.33	113.40
26	U	19	LEU	CB-CG-CD1	6.31	121.72	111.00
21	N	33	ASP	CB-CG-OD1	6.30	123.97	118.30
24	Q	68	MET	N-CA-C	-6.30	93.99	111.00
5	e	246	LYS	CD-CE-NZ	6.30	126.18	111.70
5	E	246	LYS	CD-CE-NZ	6.28	126.14	111.70
25	R	179	PHE	CB-CG-CD1	-6.27	116.41	120.80
20	Z	441	TYR	CB-CG-CD2	-6.26	117.25	121.00
16	V	286	GLU	CA-CB-CG	6.25	127.16	113.40
20	Z	592	GLU	OE1-CD-OE2	-6.23	115.83	123.30
9	2	211	LYS	CD-CE-NZ	-6.21	97.41	111.70
9	i	211	LYS	CD-CE-NZ	-6.21	97.42	111.70
18	X	48	PHE	CB-CG-CD1	6.20	125.14	120.80
20	Z	504	GLU	CA-CB-CG	6.20	127.03	113.40
20	Z	272	TYR	CB-CG-CD2	-6.17	117.30	121.00
9	2	182	LYS	CB-CG-CD	6.17	127.64	111.60
20	Z	84	ALA	C-N-CA	6.17	137.12	121.70
25	R	86	ASP	CB-CG-OD1	6.16	123.84	118.30
9	i	182	LYS	CB-CG-CD	6.14	127.56	111.60
4	d	182	LYS	CB-CG-CD	6.14	127.56	111.60
12	5	82	ARG	CG-CD-NE	6.13	124.68	111.80
12	l	82	ARG	CG-CD-NE	6.13	124.67	111.80
19	Y	83	ARG	NE-CZ-NH2	-6.12	117.24	120.30
13	m	127	LYS	CG-CD-CE	-6.12	93.54	111.90
13	6	127	LYS	CG-CD-CE	-6.12	93.54	111.90
20	Z	85	VAL	C-N-CD	-6.12	107.14	120.60
11	k	1	MET	N-CA-C	-6.10	94.54	111.00
11	4	1	MET	N-CA-C	-6.09	94.55	111.00
20	Z	471	LEU	CB-CG-CD2	-6.09	100.64	111.00
11	k	163	LEU	CA-CB-CG	6.09	129.30	115.30
14	7	136	ARG	CG-CD-NE	-6.09	99.02	111.80
11	4	163	LEU	CA-CB-CG	6.08	129.27	115.30
21	N	570	ARG	NE-CZ-NH1	6.07	123.34	120.30
8	h	152	ARG	NE-CZ-NH1	6.06	123.33	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
16	V	194	ARG	NE-CZ-NH2	-6.06	117.27	120.30
20	Z	76	LYS	CD-CE-NZ	-6.06	97.77	111.70
16	V	259	LYS	CB-CG-CD	-6.05	95.86	111.60
4	d	63	LYS	CD-CE-NZ	-6.05	97.78	111.70
8	1	152	ARG	NE-CZ-NH1	6.02	123.31	120.30
1	A	77	ARG	CG-CD-NE	6.01	124.42	111.80
20	Z	900	LEU	CA-CB-CG	6.00	129.09	115.30
1	a	77	ARG	CG-CD-NE	5.99	124.38	111.80
3	c	9	ARG	CG-CD-NE	5.97	124.35	111.80
3	C	9	ARG	CG-CD-NE	5.97	124.34	111.80
14	n	110	ASP	CB-CA-C	-5.97	98.47	110.40
20	Z	170	GLU	CG-CD-OE1	5.96	130.22	118.30
5	E	211	LYS	CD-CE-NZ	-5.94	98.04	111.70
17	T	127	GLN	CA-CB-CG	5.94	126.46	113.40
5	e	211	LYS	CD-CE-NZ	-5.93	98.07	111.70
4	d	4	TYR	N-CA-C	-5.92	95.02	111.00
20	Z	30	LYS	CB-CG-CD	5.91	126.97	111.60
25	R	376	GLN	N-CA-CB	-5.91	99.97	110.60
14	n	136	ARG	CG-CD-NE	-5.90	99.40	111.80
20	Z	728	LYS	N-CA-C	-5.90	95.07	111.00
12	l	179	TYR	CB-CG-CD2	-5.89	117.47	121.00
16	V	306	LYS	N-CA-CB	5.89	121.19	110.60
20	Z	170	GLU	CA-CB-CG	5.88	126.33	113.40
14	7	140	MET	CB-CG-SD	5.87	130.00	112.40
21	N	570	ARG	NE-CZ-NH2	-5.86	117.37	120.30
10	3	69	TYR	CA-CB-CG	5.86	124.53	113.40
4	d	149	GLN	CA-CB-CG	-5.86	100.52	113.40
10	j	69	TYR	CA-CB-CG	5.85	124.51	113.40
12	5	179	TYR	CB-CG-CD2	-5.85	117.49	121.00
4	d	177	LYS	CD-CE-NZ	-5.85	98.25	111.70
11	4	175	ASP	CB-CG-OD1	5.85	123.56	118.30
11	k	143	LEU	CB-CG-CD1	5.84	120.93	111.00
11	4	143	LEU	CB-CG-CD1	5.84	120.93	111.00
23	P	88	GLN	C-N-CA	5.84	136.29	121.70
11	k	175	ASP	CB-CG-OD1	5.81	123.53	118.30
4	D	11	PHE	CB-CG-CD2	-5.79	116.75	120.80
21	N	327	LEU	CA-CB-CG	5.78	128.59	115.30
10	j	80	ARG	CG-CD-NE	-5.77	99.68	111.80
14	n	98	ARG	NE-CZ-NH1	-5.77	117.42	120.30
10	3	80	ARG	CG-CD-NE	-5.77	99.68	111.80
27	O	15	ARG	NE-CZ-NH1	5.77	123.19	120.30
22	S	138	MET	CA-CB-CG	5.77	123.10	113.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
20	Z	108	ASP	CB-CG-OD1	5.76	123.48	118.30
6	F	89	ARG	NE-CZ-NH1	5.76	123.18	120.30
20	Z	287	ARG	NE-CZ-NH1	5.76	123.18	120.30
8	h	152	ARG	CA-CB-CG	-5.75	100.75	113.40
4	d	14	ASP	CB-CG-OD2	-5.75	113.13	118.30
8	1	152	ARG	CA-CB-CG	-5.75	100.76	113.40
13	m	40	ASP	N-CA-CB	5.74	120.94	110.60
13	6	40	ASP	N-CA-CB	5.74	120.92	110.60
12	5	196	ARG	CD-NE-CZ	5.73	131.63	123.60
27	O	80	LYS	CA-CB-CG	-5.73	100.80	113.40
20	Z	142	ASP	CB-CG-OD2	-5.73	113.15	118.30
20	Z	358	TYR	CB-CG-CD2	-5.73	117.56	121.00
26	U	263	LYS	CD-CE-NZ	5.72	124.86	111.70
1	A	231	ASP	CB-CG-OD1	5.72	123.45	118.30
10	j	63	LEU	CB-CG-CD1	-5.71	101.30	111.00
5	E	134	MET	CB-CG-SD	5.70	129.51	112.40
10	3	63	LEU	CB-CG-CD1	-5.70	101.30	111.00
20	Z	7	LYS	CB-CG-CD	5.70	126.43	111.60
1	a	231	ASP	CB-CG-OD1	5.70	123.43	118.30
5	e	134	MET	CB-CG-SD	5.70	129.50	112.40
14	n	109	TYR	C-N-CA	5.70	135.94	121.70
12	l	196	ARG	CD-NE-CZ	5.69	131.57	123.60
17	T	49	ASP	CB-CG-OD1	5.69	123.42	118.30
20	Z	728	LYS	N-CA-CB	5.69	120.84	110.60
6	f	89	ARG	NE-CZ-NH1	5.67	123.13	120.30
27	O	80	LYS	CB-CG-CD	5.66	126.31	111.60
3	C	9	ARG	CB-CG-CD	-5.64	96.93	111.60
12	l	140	LEU	CB-CG-CD1	5.64	120.59	111.00
12	5	140	LEU	CB-CG-CD1	5.64	120.58	111.00
11	k	46	PHE	CB-CG-CD1	5.63	124.74	120.80
12	5	188	TYR	CB-CG-CD1	5.63	124.38	121.00
19	Y	18	LYS	CG-CD-CE	5.63	128.78	111.90
3	c	9	ARG	CB-CG-CD	-5.62	96.99	111.60
15	W	156	GLU	OE1-CD-OE2	-5.61	116.57	123.30
7	g	101	LYS	CD-CE-NZ	-5.60	98.81	111.70
7	G	101	LYS	CD-CE-NZ	-5.59	98.83	111.70
3	C	50	ARG	NE-CZ-NH2	-5.59	117.51	120.30
11	4	46	PHE	CB-CG-CD1	5.58	124.71	120.80
12	l	188	TYR	CB-CG-CD1	5.58	124.35	121.00
12	l	170	LEU	CB-CG-CD1	5.58	120.48	111.00
16	V	269	ARG	NE-CZ-NH1	-5.57	117.52	120.30
24	Q	387	TYR	N-CA-C	-5.57	95.97	111.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	d	182	LYS	CG-CD-CE	-5.56	95.21	111.90
20	Z	140	LEU	CB-CG-CD2	5.56	120.46	111.00
3	c	50	ARG	NE-CZ-NH2	-5.55	117.52	120.30
20	Z	108	ASP	CB-CG-OD2	-5.54	113.31	118.30
12	5	170	LEU	CB-CG-CD1	5.54	120.42	111.00
16	V	269	ARG	NE-CZ-NH2	5.54	123.07	120.30
14	7	110	ASP	N-CA-C	-5.52	96.09	111.00
4	d	102	ASP	CB-CA-C	-5.51	99.38	110.40
16	V	303	VAL	CA-CB-CG1	-5.50	102.65	110.90
20	Z	377	ALA	CB-CA-C	5.48	118.32	110.10
17	T	223	GLU	CG-CD-OE2	-5.48	107.34	118.30
20	Z	909	ARG	NE-CZ-NH1	5.47	123.04	120.30
20	Z	817	LEU	CB-CG-CD2	5.47	120.30	111.00
14	n	117	GLU	N-CA-CB	-5.47	100.75	110.60
3	C	66	LEU	CA-CB-CG	-5.47	102.73	115.30
3	c	66	LEU	CA-CB-CG	-5.46	102.73	115.30
9	i	111	MET	CG-SD-CE	-5.46	91.47	100.20
24	Q	413	LEU	CB-CG-CD2	5.46	120.28	111.00
24	Q	48	ASP	N-CA-C	5.45	125.70	111.00
14	n	139	LYS	CB-CG-CD	5.44	125.75	111.60
9	2	111	MET	CG-SD-CE	-5.44	91.50	100.20
20	Z	793	PHE	CB-CG-CD2	-5.42	117.00	120.80
20	Z	170	GLU	CG-CD-OE2	-5.42	107.46	118.30
13	m	72	LEU	CA-CB-CG	5.40	127.72	115.30
13	6	72	LEU	CA-CB-CG	5.40	127.72	115.30
12	l	139	ARG	NE-CZ-NH1	5.39	123.00	120.30
12	l	220	LYS	CB-CG-CD	5.39	125.61	111.60
12	5	220	LYS	CB-CG-CD	5.38	125.59	111.60
3	C	202	ASP	CB-CG-OD1	5.37	123.14	118.30
5	E	134	MET	CG-SD-CE	-5.37	91.61	100.20
5	e	134	MET	CG-SD-CE	-5.37	91.61	100.20
9	2	208	GLU	CA-CB-CG	-5.36	101.61	113.40
20	Z	837	TYR	CB-CG-CD2	5.36	124.22	121.00
20	Z	9	GLN	CB-CG-CD	5.35	125.52	111.60
2	b	234	ARG	CG-CD-NE	-5.35	100.56	111.80
2	B	234	ARG	CG-CD-NE	-5.35	100.57	111.80
9	i	208	GLU	CA-CB-CG	-5.35	101.64	113.40
3	c	202	ASP	CB-CG-OD1	5.34	123.10	118.30
12	5	139	ARG	NE-CZ-NH1	5.33	122.97	120.30
20	Z	921	GLU	OE1-CD-OE2	-5.33	116.91	123.30
20	Z	321	PHE	CB-CG-CD1	5.32	124.53	120.80
2	b	246	ARG	NE-CZ-NH1	-5.32	117.64	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	c	217	ARG	NE-CZ-NH2	-5.31	117.64	120.30
20	Z	277	GLU	CA-CB-CG	-5.29	101.76	113.40
12	5	170	LEU	CA-CB-CG	5.27	127.42	115.30
20	Z	356	ASP	CB-CG-OD1	5.26	123.04	118.30
14	7	194	ARG	NE-CZ-NH2	5.25	122.93	120.30
13	m	221	ARG	CG-CD-NE	5.25	122.82	111.80
12	l	170	LEU	CA-CB-CG	5.25	127.36	115.30
20	Z	911	LYS	N-CA-CB	5.24	120.03	110.60
25	R	287	GLN	N-CA-CB	5.24	120.03	110.60
6	f	102	LYS	CD-CE-NZ	5.24	123.75	111.70
6	F	102	LYS	CD-CE-NZ	5.24	123.75	111.70
13	6	221	ARG	CG-CD-NE	5.23	122.79	111.80
20	Z	738	TYR	CA-CB-CG	5.21	123.31	113.40
21	N	139	ARG	CG-CD-NE	5.21	122.74	111.80
4	d	5	ASP	CB-CG-OD2	5.21	122.99	118.30
18	X	41	GLU	CG-CD-OE2	-5.20	107.89	118.30
8	1	153	GLU	CA-CB-CG	5.20	124.84	113.40
8	h	153	GLU	CA-CB-CG	5.20	124.83	113.40
21	N	38	GLU	CA-CB-CG	-5.20	101.97	113.40
3	C	217	ARG	NE-CZ-NH2	-5.18	117.71	120.30
12	5	253	TYR	CB-CG-CD1	5.18	124.11	121.00
12	l	253	TYR	CB-CG-CD1	5.18	124.11	121.00
3	c	50	ARG	CD-NE-CZ	5.18	130.85	123.60
3	C	50	ARG	CD-NE-CZ	5.17	130.84	123.60
20	Z	376	SER	CB-CA-C	-5.17	100.27	110.10
11	k	34	LYS	CD-CE-NZ	5.16	123.57	111.70
12	l	148	ARG	CD-NE-CZ	5.15	130.81	123.60
11	4	34	LYS	CD-CE-NZ	5.15	123.54	111.70
9	2	101	ARG	CG-CD-NE	5.14	122.61	111.80
13	m	190	LYS	CD-CE-NZ	5.14	123.53	111.70
10	3	193	ASP	CB-CA-C	-5.14	100.12	110.40
4	d	5	ASP	CB-CG-OD1	-5.14	113.68	118.30
10	j	193	ASP	CB-CA-C	-5.14	100.13	110.40
2	B	246	ARG	NE-CZ-NH1	-5.14	117.73	120.30
12	5	148	ARG	CD-NE-CZ	5.14	130.79	123.60
20	Z	909	ARG	NE-CZ-NH2	-5.14	117.73	120.30
13	6	190	LYS	CD-CE-NZ	5.13	123.51	111.70
9	i	225	ARG	NE-CZ-NH1	-5.13	117.73	120.30
22	S	152	LEU	N-CA-C	-5.13	97.14	111.00
4	d	200	LEU	CB-CG-CD2	5.12	119.70	111.00
9	i	101	ARG	CG-CD-NE	5.12	122.55	111.80
20	Z	728	LYS	CA-CB-CG	5.11	124.63	113.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
20	Z	202	ARG	NE-CZ-NH1	5.10	122.85	120.30
14	7	98	ARG	NE-CZ-NH2	-5.10	117.75	120.30
8	h	93	GLU	CA-CB-CG	5.09	124.59	113.40
8	1	93	GLU	CA-CB-CG	5.07	124.55	113.40
20	Z	759	ARG	CB-CG-CD	5.07	124.77	111.60
20	Z	30	LYS	CD-CE-NZ	5.06	123.34	111.70
9	2	225	ARG	NE-CZ-NH1	-5.06	117.77	120.30
20	Z	512	ILE	CA-CB-CG2	-5.06	100.79	110.90
9	2	254	GLU	CA-CB-CG	5.05	124.52	113.40
20	Z	138	ARG	CD-NE-CZ	5.04	130.66	123.60
20	Z	704	GLU	CG-CD-OE1	5.04	128.37	118.30
9	i	254	GLU	CA-CB-CG	5.03	124.47	113.40
1	A	231	ASP	CB-CG-OD2	-5.03	113.77	118.30
16	V	300	VAL	CA-CB-CG2	-5.03	103.35	110.90
10	3	32	GLN	N-CA-C	5.03	124.58	111.00
11	4	110	LYS	CA-CB-CG	-5.03	102.34	113.40
10	j	32	GLN	N-CA-C	5.02	124.56	111.00
11	k	110	LYS	CA-CB-CG	-5.02	102.36	113.40
23	P	81	LEU	CB-CG-CD2	5.01	119.53	111.00

There are no chirality outliers.

All (101) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
8	1	30	THR	Peptide
9	2	199	GLY	Peptide
9	2	252	ILE	Peptide
9	2	253	GLN	Peptide
12	5	148	ARG	Sidechain
5	E	15	PHE	Peptide
6	F	13	PHE	Peptide
6	F	18	ARG	Peptide
6	F	204	GLU	Peptide
7	G	13	SER	Peptide
7	G	70	VAL	Mainchain
21	N	33	ASP	Sidechain
21	N	87	ASP	Mainchain
23	P	128	ASN	Sidechain
23	P	166	GLU	Sidechain
23	P	73	ASP	Sidechain
24	Q	109	ASP	Peptide
24	Q	404	ASN	Peptide

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Mol	Chain	Res	Type	Group
24	Q	50	ARG	Peptide
24	Q	67	THR	Peptide
25	R	125	GLU	Sidechain
22	S	153	GLU	Sidechain
22	S	488	GLN	Sidechain
17	T	133	ILE	Peptide
17	T	137	GLU	Peptide
17	T	138	ASP	Sidechain
17	T	247	ASP	Sidechain
17	T	251	HIS	Peptide
17	T	253	GLU	Sidechain
16	V	175	SER	Peptide
16	V	190	HIS	Sidechain
16	V	270	TYR	Peptide
16	V	59	ASP	Peptide
15	W	124	GLU	Sidechain
15	W	194	GLU	Sidechain
18	X	123	ASN	Sidechain
18	X	131	ASN	Sidechain
18	X	41	GLU	Sidechain
19	Y	3	THR	Peptide
19	Y	31	GLU	Peptide
19	Y	52	ASN	Sidechain
20	Z	104	ASP	Sidechain
20	Z	108	ASP	Sidechain
20	Z	138	ARG	Sidechain
20	Z	142	ASP	Sidechain,Mainchain
20	Z	174	GLU	Mainchain
20	Z	219	ASP	Sidechain
20	Z	222	ASP	Sidechain
20	Z	239	GLU	Sidechain
20	Z	260	GLU	Sidechain
20	Z	272	TYR	Sidechain
20	Z	321	PHE	Sidechain
20	Z	328	ASP	Sidechain
20	Z	33	GLU	Sidechain
20	Z	356	ASP	Sidechain
20	Z	363	ASP	Sidechain
20	Z	369	PHE	Sidechain
20	Z	394	TYR	Sidechain
20	Z	4	GLU	Peptide
20	Z	408	TYR	Sidechain

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Mol	Chain	Res	Type	Group
20	Z	413	ASP	Sidechain
20	Z	468	GLU	Sidechain
20	Z	503	ASP	Sidechain
20	Z	550	PHE	Sidechain
20	Z	583	ASP	Sidechain
20	Z	592	GLU	Sidechain
20	Z	633	GLU	Sidechain
20	Z	634	ASP	Sidechain
20	Z	65	GLU	Sidechain
20	Z	718	ASP	Sidechain
20	Z	727	GLU	Peptide
20	Z	73	GLU	Sidechain
20	Z	750	GLU	Sidechain
20	Z	787	ASP	Sidechain
20	Z	793	PHE	Sidechain
20	Z	799	PHE	Sidechain
20	Z	810	ASN	Sidechain
20	Z	852	GLN	Sidechain
20	Z	9	GLN	Sidechain
20	Z	91	PHE	Sidechain
20	Z	921	GLU	Sidechain
4	d	100	LEU	Peptide
4	d	151	GLU	Sidechain
4	d	18	PHE	Sidechain
4	d	203	VAL	Peptide
4	d	218	ASP	Sidechain
4	d	228	GLU	Sidechain
4	d	231	GLN	Sidechain
4	d	235	GLN	Sidechain
5	e	15	PHE	Peptide
6	f	13	PHE	Peptide
6	f	18	ARG	Peptide
6	f	204	GLU	Peptide
7	g	13	SER	Peptide
7	g	70	VAL	Mainchain
8	h	30	THR	Peptide
9	i	199	GLY	Peptide
9	i	252	ILE	Peptide
9	i	253	GLN	Peptide
12	l	148	ARG	Sidechain

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	A	239/252 (95%)	228 (95%)	11 (5%)	0	100	100
1	a	239/252 (95%)	228 (95%)	11 (5%)	0	100	100
2	B	247/250 (99%)	237 (96%)	9 (4%)	1 (0%)	34	72
2	b	247/250 (99%)	237 (96%)	9 (4%)	1 (0%)	34	72
3	C	242/258 (94%)	229 (95%)	13 (5%)	0	100	100
3	c	242/258 (94%)	229 (95%)	13 (5%)	0	100	100
4	D	234/254 (92%)	218 (93%)	11 (5%)	5 (2%)	7	36
4	d	234/254 (92%)	215 (92%)	14 (6%)	5 (2%)	7	36
5	E	242/260 (93%)	228 (94%)	13 (5%)	1 (0%)	34	72
5	e	242/260 (93%)	228 (94%)	13 (5%)	1 (0%)	34	72
6	F	229/234 (98%)	219 (96%)	9 (4%)	1 (0%)	34	72
6	f	229/234 (98%)	219 (96%)	9 (4%)	1 (0%)	34	72
7	G	240/288 (83%)	234 (98%)	5 (2%)	1 (0%)	34	72
7	g	240/288 (83%)	234 (98%)	5 (2%)	1 (0%)	34	72
8	1	194/215 (90%)	182 (94%)	10 (5%)	2 (1%)	15	54
8	h	194/215 (90%)	182 (94%)	10 (5%)	2 (1%)	15	54
9	2	224/261 (86%)	209 (93%)	11 (5%)	4 (2%)	8	40
9	i	224/261 (86%)	209 (93%)	11 (5%)	4 (2%)	8	40
10	3	202/205 (98%)	186 (92%)	14 (7%)	2 (1%)	15	54
10	j	202/205 (98%)	186 (92%)	14 (7%)	2 (1%)	15	54
11	4	193/198 (98%)	182 (94%)	11 (6%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
11	k	193/198 (98%)	182 (94%)	11 (6%)	0	100	100
12	5	210/287 (73%)	201 (96%)	8 (4%)	1 (0%)	29	69
12	l	210/287 (73%)	201 (96%)	8 (4%)	1 (0%)	29	69
13	6	220/241 (91%)	207 (94%)	11 (5%)	2 (1%)	17	56
13	m	220/241 (91%)	207 (94%)	11 (5%)	2 (1%)	17	56
14	7	227/266 (85%)	199 (88%)	27 (12%)	1 (0%)	34	72
14	n	227/266 (85%)	211 (93%)	16 (7%)	0	100	100
15	W	195/268 (73%)	181 (93%)	13 (7%)	1 (0%)	29	69
16	V	287/306 (94%)	258 (90%)	26 (9%)	3 (1%)	15	54
17	T	264/274 (96%)	240 (91%)	23 (9%)	1 (0%)	34	72
18	X	125/156 (80%)	112 (90%)	12 (10%)	1 (1%)	19	60
19	Y	87/89 (98%)	76 (87%)	8 (9%)	3 (3%)	3	26
20	Z	902/993 (91%)	817 (91%)	70 (8%)	15 (2%)	9	42
21	N	828/945 (88%)	789 (95%)	36 (4%)	3 (0%)	34	72
22	S	473/523 (90%)	438 (93%)	26 (6%)	9 (2%)	8	38
23	P	438/445 (98%)	417 (95%)	19 (4%)	2 (0%)	29	69
24	Q	432/434 (100%)	400 (93%)	26 (6%)	6 (1%)	11	46
25	R	403/429 (94%)	383 (95%)	17 (4%)	3 (1%)	22	62
26	U	288/338 (85%)	274 (95%)	13 (4%)	1 (0%)	41	76
27	O	386/393 (98%)	376 (97%)	10 (3%)	0	100	100
All	All	11394/12531 (91%)	10688 (94%)	617 (5%)	89 (1%)	24	60

All (89) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	b	124	SER
4	d	101	GLU
4	d	204	GLN
5	e	128	SER
6	f	205	SER
7	g	71	ASP
8	h	116	LYS
9	i	251	ASP
9	i	254	GLU
10	j	183	TRP

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Mol	Chain	Res	Type
13	m	40	ASP
2	B	124	SER
4	D	101	GLU
4	D	204	GLN
5	E	128	SER
6	F	205	SER
7	G	71	ASP
8	1	116	LYS
9	2	251	ASP
9	2	254	GLU
10	3	183	TRP
13	6	40	ASP
14	7	110	ASP
16	V	60	ASP
16	V	271	VAL
17	T	138	ASP
19	Y	4	ASP
20	Z	5	SER
20	Z	85	VAL
20	Z	142	ASP
20	Z	173	ALA
20	Z	174	GLU
20	Z	309	GLN
20	Z	366	LYS
20	Z	377	ALA
20	Z	443	ASP
20	Z	444	GLU
20	Z	498	ALA
20	Z	728	LYS
20	Z	802	ASP
20	Z	926	ASN
21	N	88	ARG
21	N	361	ASN
22	S	69	LEU
22	S	153	GLU
22	S	154	GLN
22	S	449	LEU
24	Q	110	SER
24	Q	387	TYR
24	Q	405	GLN
25	R	71	LEU
25	R	72	VAL

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Mol	Chain	Res	Type
25	R	280	ILE
4	d	203	VAL
15	W	149	GLN
19	Y	32	ASP
21	N	362	TRP
22	S	113	SER
22	S	450	ASN
24	Q	48	ASP
24	Q	51	ARG
10	j	33	SER
13	m	138	SER
10	3	33	SER
13	6	138	SER
18	X	39	GLU
23	P	328	ALA
9	i	200	SER
4	D	102	ASP
4	D	103	PRO
9	2	200	SER
16	V	84	ASP
23	P	90	LYS
4	d	103	PRO
12	l	278	GLU
4	D	205	THR
12	5	278	GLU
19	Y	5	VAL
22	S	112	ASN
24	Q	50	ARG
4	d	102	ASP
8	h	117	GLY
9	i	222	PRO
8	1	117	GLY
9	2	222	PRO
20	Z	24	THR
26	U	42	ASN
22	S	327	ILE
22	S	115	PRO

5.3.2 Protein sidechains (i)

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

entries.

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	206/210 (98%)	203 (98%)	3 (2%)	65	80
1	a	206/210 (98%)	203 (98%)	3 (2%)	65	80
2	B	208/209 (100%)	200 (96%)	8 (4%)	33	57
2	b	208/209 (100%)	200 (96%)	8 (4%)	33	57
3	C	203/216 (94%)	200 (98%)	3 (2%)	65	80
3	c	203/216 (94%)	200 (98%)	3 (2%)	65	80
4	D	209/226 (92%)	205 (98%)	4 (2%)	57	75
4	d	209/226 (92%)	196 (94%)	13 (6%)	18	43
5	E	200/215 (93%)	196 (98%)	4 (2%)	55	74
5	e	200/215 (93%)	196 (98%)	4 (2%)	55	74
6	F	190/193 (98%)	183 (96%)	7 (4%)	34	58
6	f	190/193 (98%)	183 (96%)	7 (4%)	34	58
7	G	200/239 (84%)	193 (96%)	7 (4%)	36	59
7	g	200/239 (84%)	193 (96%)	7 (4%)	36	59
8	1	162/178 (91%)	155 (96%)	7 (4%)	29	53
8	h	162/178 (91%)	155 (96%)	7 (4%)	29	53
9	2	185/214 (86%)	174 (94%)	11 (6%)	19	45
9	i	185/214 (86%)	174 (94%)	11 (6%)	19	45
10	3	172/173 (99%)	162 (94%)	10 (6%)	20	45
10	j	172/173 (99%)	162 (94%)	10 (6%)	20	45
11	4	173/175 (99%)	164 (95%)	9 (5%)	23	48
11	k	173/175 (99%)	164 (95%)	9 (5%)	23	48
12	5	169/235 (72%)	158 (94%)	11 (6%)	17	42
12	l	169/235 (72%)	158 (94%)	11 (6%)	17	42
13	6	185/201 (92%)	178 (96%)	7 (4%)	33	57
13	m	185/201 (92%)	178 (96%)	7 (4%)	33	57
14	7	195/224 (87%)	192 (98%)	3 (2%)	65	80
14	n	195/224 (87%)	192 (98%)	3 (2%)	65	80
15	W	171/230 (74%)	167 (98%)	4 (2%)	50	70

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
16	V	253/268 (94%)	249 (98%)	4 (2%)	62 79
17	T	249/256 (97%)	247 (99%)	2 (1%)	81 89
18	X	116/144 (81%)	114 (98%)	2 (2%)	60 78
19	Y	81/81 (100%)	78 (96%)	3 (4%)	34 58
20	Z	773/850 (91%)	736 (95%)	37 (5%)	25 51
21	N	698/797 (88%)	689 (99%)	9 (1%)	69 82
22	S	447/489 (91%)	441 (99%)	6 (1%)	69 82
23	P	412/415 (99%)	404 (98%)	8 (2%)	57 75
24	Q	391/391 (100%)	386 (99%)	5 (1%)	69 82
25	R	356/379 (94%)	348 (98%)	8 (2%)	52 71
26	U	263/308 (85%)	261 (99%)	2 (1%)	81 89
27	O	363/368 (99%)	361 (99%)	2 (1%)	86 92
All	All	9887/10792 (92%)	9598 (97%)	289 (3%)	45 64

All (289) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	a	62	LYS
1	a	156	LYS
1	a	187	LYS
2	b	6	SER
2	b	29	LYS
2	b	51	SER
2	b	89	SER
2	b	97	TYR
2	b	128	ARG
2	b	217	GLU
2	b	245	ASP
3	c	5	ARG
3	c	85	GLU
3	c	120	GLN
4	d	6	ARG
4	d	9	SER
4	d	123	SER
4	d	127	ARG
4	d	153	SER
4	d	157	SER
4	d	164	ILE

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Mol	Chain	Res	Type
4	d	169	LYS
4	d	182	LYS
4	d	198	SER
4	d	208	LYS
4	d	219	SER
4	d	237	GLU
5	e	27	SER
5	e	56	SER
5	e	134	MET
5	e	246	LYS
6	f	21	GLN
6	f	82	ARG
6	f	102	LYS
6	f	117	GLN
6	f	152	ASN
6	f	179	PHE
6	f	202	ARG
7	g	72	ARG
7	g	84	ASP
7	g	93	ARG
7	g	195	GLN
7	g	209	GLU
7	g	212	PHE
7	g	218	TRP
8	h	45	ARG
8	h	71	HIS
8	h	92	LYS
8	h	93	GLU
8	h	115	ASN
8	h	138	SER
8	h	193	GLU
9	i	39	ASN
9	i	101	ARG
9	i	147	SER
9	i	164	MET
9	i	177	LYS
9	i	182	LYS
9	i	211	LYS
9	i	230	LYS
9	i	245	SER
9	i	247	VAL
9	i	254	GLU

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Mol	Chain	Res	Type
10	j	33	SER
10	j	70	LYS
10	j	79	GLU
10	j	80	ARG
10	j	139	SER
10	j	157	ASN
10	j	165	GLU
10	j	166	THR
10	j	176	ASP
10	j	192	LYS
11	k	1	MET
11	k	18	SER
11	k	41	HIS
11	k	58	GLU
11	k	67	TYR
11	k	85	ARG
11	k	159	ASP
11	k	163	LEU
11	k	193	ASP
12	l	107	LYS
12	l	138	CYS
12	l	140	LEU
12	l	148	ARG
12	l	164	GLN
12	l	198	LYS
12	l	206	SER
12	l	220	LYS
12	l	222	ASP
12	l	254	HIS
12	l	274	LYS
13	m	39	THR
13	m	40	ASP
13	m	47	TYR
13	m	72	LEU
13	m	83	TYR
13	m	177	LYS
13	m	221	ARG
14	n	165	LEU
14	n	235	LYS
14	n	257	ASP
1	A	62	LYS
1	A	156	LYS

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Mol	Chain	Res	Type
1	A	187	LYS
2	B	6	SER
2	B	29	LYS
2	B	51	SER
2	B	89	SER
2	B	97	TYR
2	B	128	ARG
2	B	217	GLU
2	B	245	ASP
3	C	5	ARG
3	C	85	GLU
3	C	120	GLN
4	D	9	SER
4	D	142	ASP
4	D	182	LYS
4	D	218	ASP
5	E	27	SER
5	E	56	SER
5	E	134	MET
5	E	246	LYS
6	F	21	GLN
6	F	82	ARG
6	F	102	LYS
6	F	117	GLN
6	F	152	ASN
6	F	179	PHE
6	F	202	ARG
7	G	72	ARG
7	G	84	ASP
7	G	93	ARG
7	G	195	GLN
7	G	209	GLU
7	G	212	PHE
7	G	218	TRP
8	1	45	ARG
8	1	71	HIS
8	1	92	LYS
8	1	93	GLU
8	1	115	ASN
8	1	138	SER
8	1	193	GLU
9	2	39	ASN

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Mol	Chain	Res	Type
9	2	101	ARG
9	2	147	SER
9	2	164	MET
9	2	177	LYS
9	2	182	LYS
9	2	211	LYS
9	2	230	LYS
9	2	245	SER
9	2	247	VAL
9	2	254	GLU
10	3	33	SER
10	3	70	LYS
10	3	79	GLU
10	3	80	ARG
10	3	139	SER
10	3	157	ASN
10	3	165	GLU
10	3	166	THR
10	3	176	ASP
10	3	192	LYS
11	4	1	MET
11	4	18	SER
11	4	41	HIS
11	4	58	GLU
11	4	67	TYR
11	4	85	ARG
11	4	159	ASP
11	4	163	LEU
11	4	193	ASP
12	5	107	LYS
12	5	138	CYS
12	5	140	LEU
12	5	148	ARG
12	5	164	GLN
12	5	198	LYS
12	5	206	SER
12	5	220	LYS
12	5	222	ASP
12	5	254	HIS
12	5	274	LYS
13	6	39	THR
13	6	40	ASP

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Mol	Chain	Res	Type
13	6	47	TYR
13	6	72	LEU
13	6	83	TYR
13	6	177	LYS
13	6	221	ARG
14	7	127	GLU
14	7	137	ARG
14	7	241	PHE
15	W	119	SER
15	W	120	ASP
15	W	121	SER
15	W	155	ASP
16	V	88	GLN
16	V	110	SER
16	V	259	LYS
16	V	286	GLU
17	T	52	LEU
17	T	99	SER
18	X	65	SER
18	X	82	LYS
19	Y	9	GLN
19	Y	33	ASP
19	Y	52	ASN
20	Z	2	VAL
20	Z	7	LYS
20	Z	9	GLN
20	Z	16	SER
20	Z	32	LYS
20	Z	63	LEU
20	Z	74	SER
20	Z	86	PRO
20	Z	131	LYS
20	Z	170	GLU
20	Z	171	LYS
20	Z	179	SER
20	Z	210	TYR
20	Z	239	GLU
20	Z	267	THR
20	Z	290	GLU
20	Z	293	MET
20	Z	376	SER
20	Z	387	ASN

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Mol	Chain	Res	Type
20	Z	402	ASP
20	Z	431	ASP
20	Z	471	LEU
20	Z	479	THR
20	Z	557	GLU
20	Z	561	ASP
20	Z	583	ASP
20	Z	589	SER
20	Z	627	LYS
20	Z	738	TYR
20	Z	751	ASP
20	Z	811	SER
20	Z	822	THR
20	Z	840	ARG
20	Z	848	THR
20	Z	869	ASP
20	Z	880	SER
20	Z	899	GLN
21	N	18	ASP
21	N	57	ASP
21	N	109	TYR
21	N	151	LYS
21	N	327	LEU
21	N	365	PHE
21	N	457	SER
21	N	507	GLU
21	N	737	SER
22	S	33	GLU
22	S	202	ASN
22	S	261	HIS
22	S	267	SER
22	S	287	SER
22	S	425	ARG
23	P	14	SER
23	P	201	ARG
23	P	248	ASP
23	P	263	HIS
23	P	291	LYS
23	P	301	LYS
23	P	404	LYS
23	P	420	ASP
24	Q	9	GLU

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Mol	Chain	Res	Type
24	Q	91	SER
24	Q	166	LYS
24	Q	257	LYS
24	Q	326	MET
25	R	86	ASP
25	R	94	PHE
25	R	124	ASP
25	R	245	SER
25	R	262	GLU
25	R	263	ARG
25	R	287	GLN
25	R	376	GLN
26	U	2	SER
26	U	176	ARG
27	O	88	ASP
27	O	390	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (34) such sidechains are listed below:

Mol	Chain	Res	Type
1	a	130	GLN
2	b	94	HIS
4	d	94	GLN
4	d	96	HIS
9	i	201	ASN
10	j	173	ASN
11	k	65	GLN
14	n	36	GLN
2	B	94	HIS
4	D	40	ASN
9	2	201	ASN
10	3	72	ASN
11	4	65	GLN
14	7	35	GLN
16	V	176	ASN
16	V	217	HIS
20	Z	37	GLN
20	Z	168	GLN
20	Z	364	ASN
20	Z	379	GLN
20	Z	622	HIS
20	Z	763	HIS

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Mol	Chain	Res	Type
20	Z	766	HIS
21	N	336	ASN
22	S	172	ASN
23	P	128	ASN
23	P	348	HIS
24	Q	206	ASN
25	R	184	GLN
25	R	287	GLN
26	U	127	GLN
26	U	181	GLN
26	U	252	HIS
27	O	376	GLN

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 monosaccharides in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

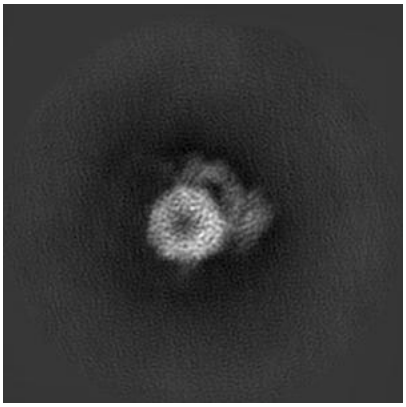
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-14082. These allow visual inspection of the internal detail of the map and identification of artifacts.

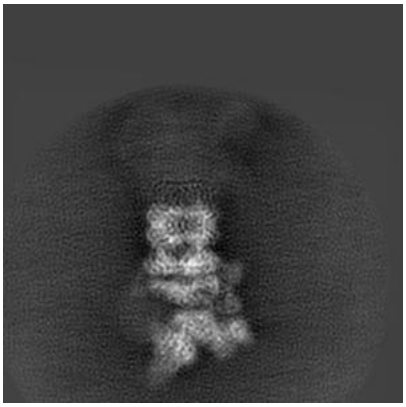
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

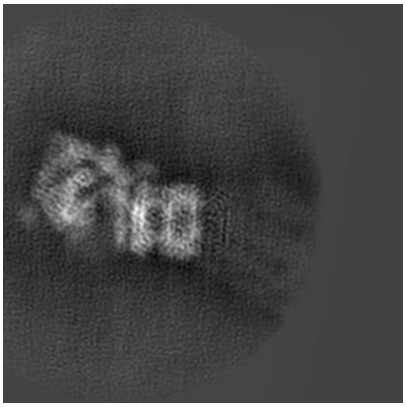
6.1.1 Primary map



X



Y

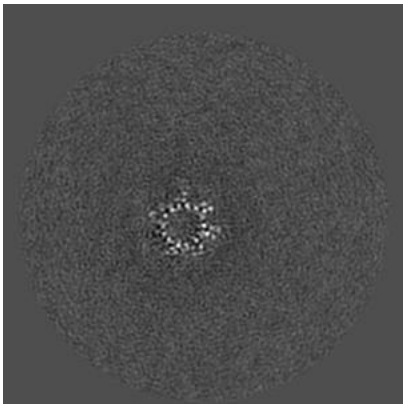


Z

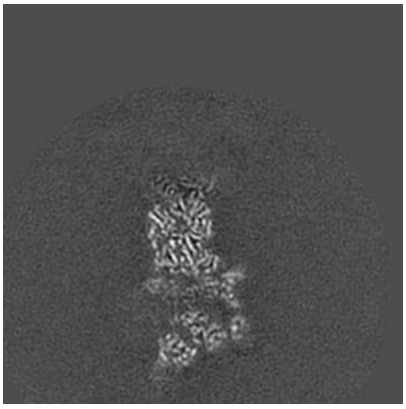
The images above show the map projected in three orthogonal directions.

6.2 Central slices

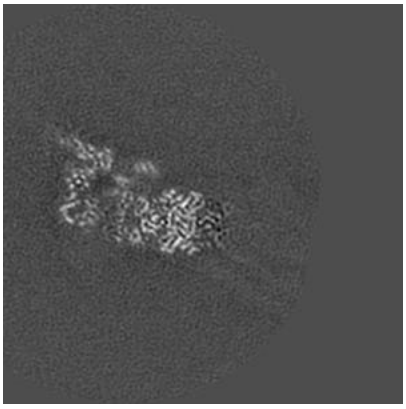
6.2.1 Primary map



X Index: 140



Y Index: 140

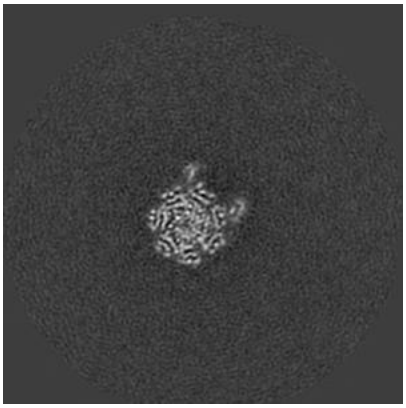


Z Index: 140

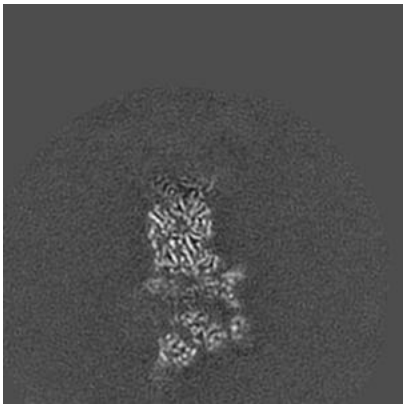
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

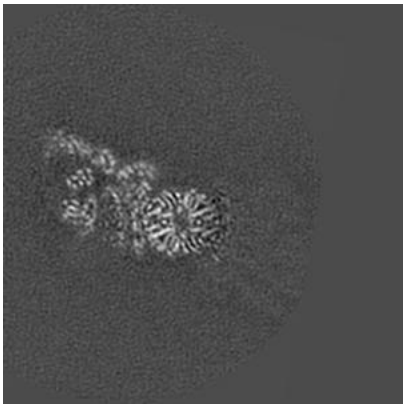
6.3.1 Primary map



X Index: 97



Y Index: 140

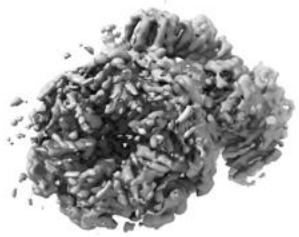


Z Index: 136

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

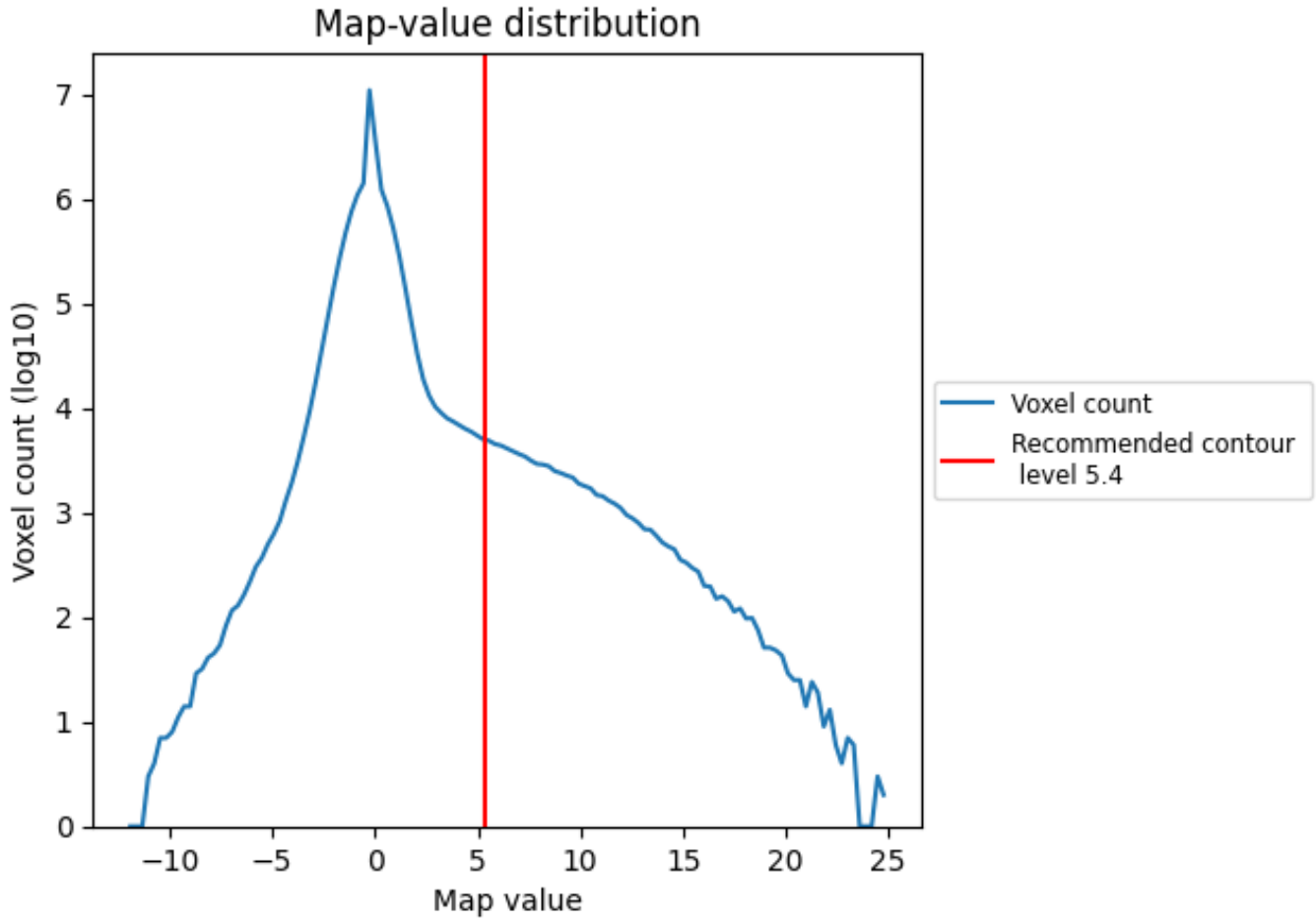
6.5 Mask visualisation (i)

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

7 Map analysis

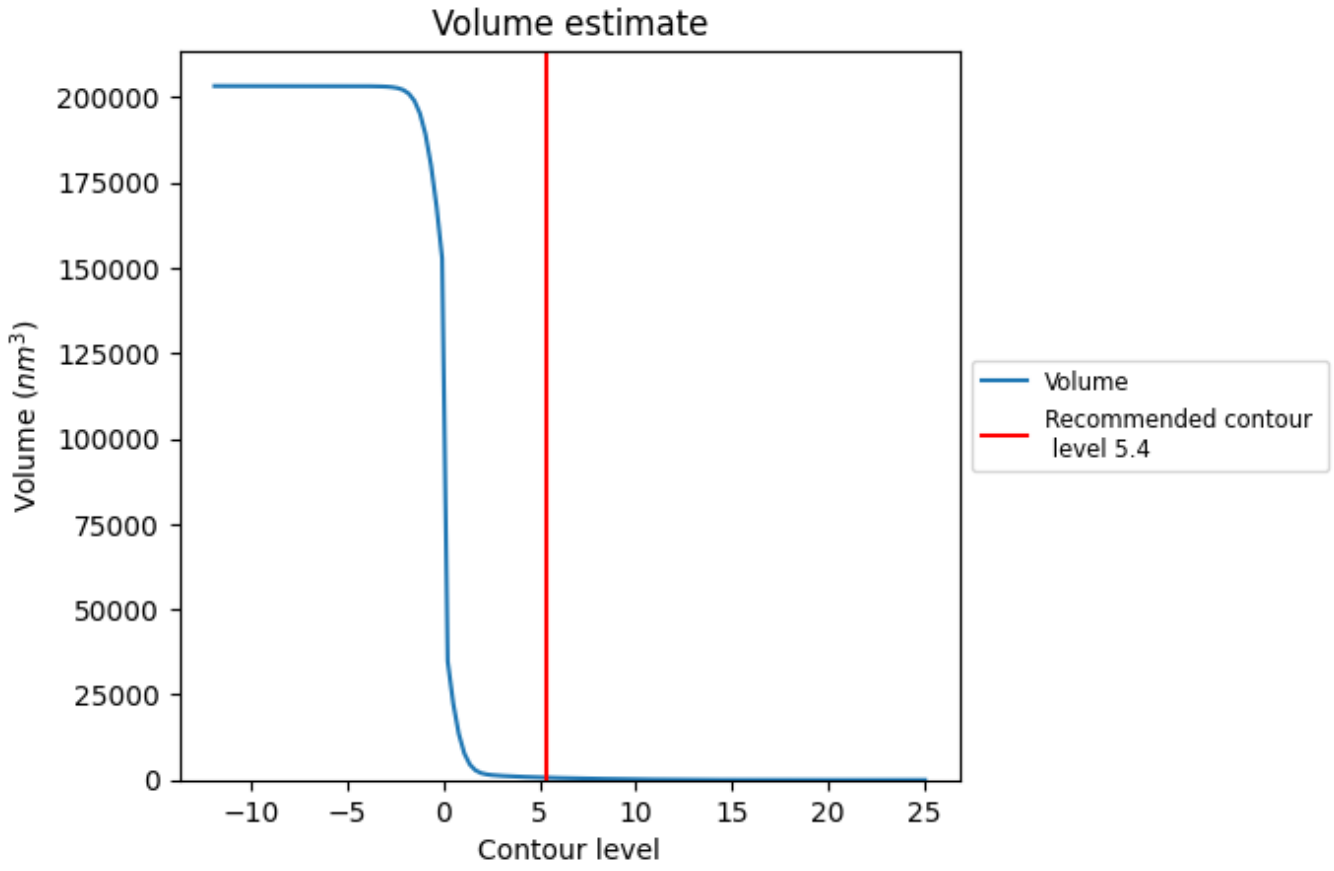
This section contains the results of statistical analysis of the map.

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.

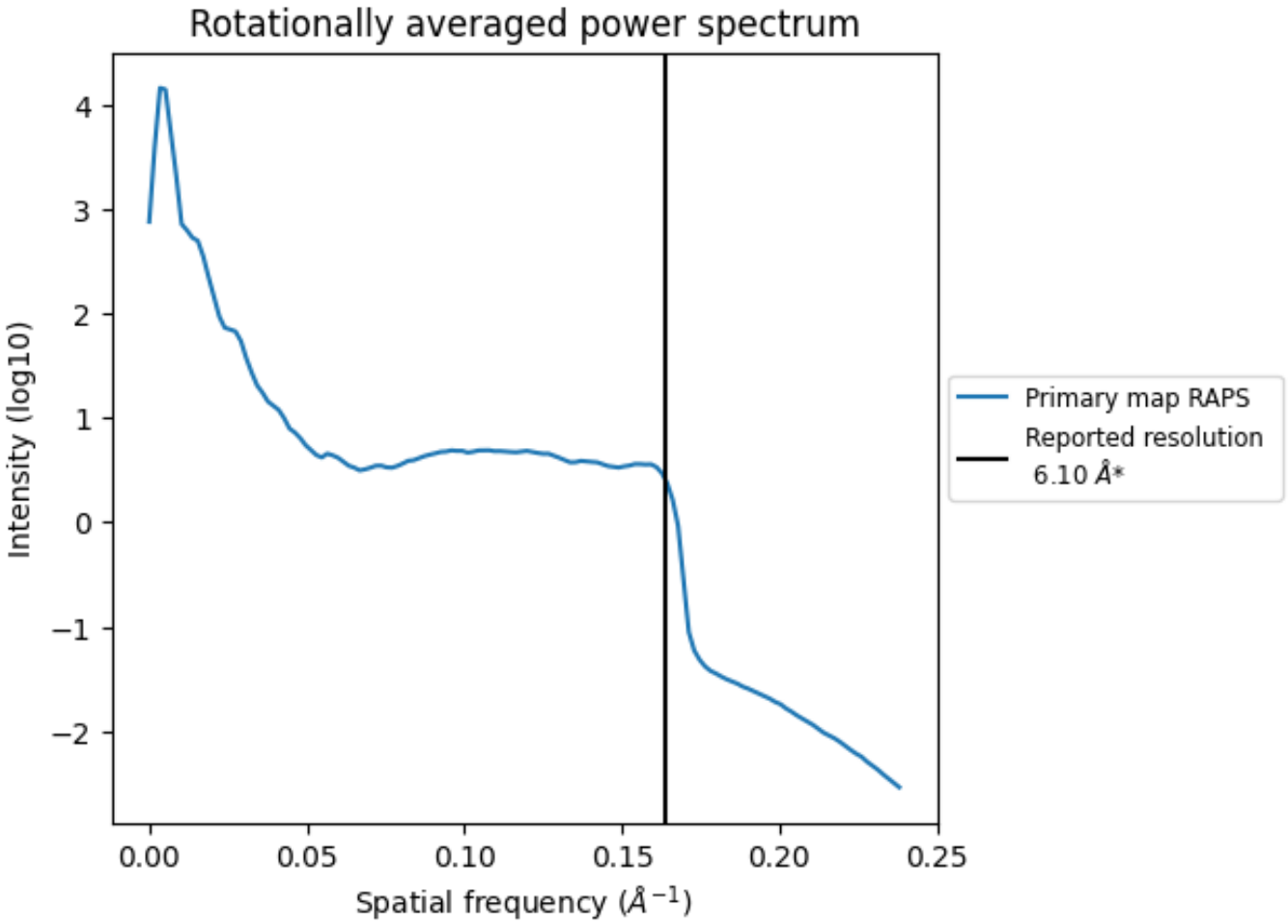
7.2 Volume estimate



The volume at the recommended contour level is 678 nm^3; this corresponds to an approximate mass of 613 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 0.164 Å^{-1}

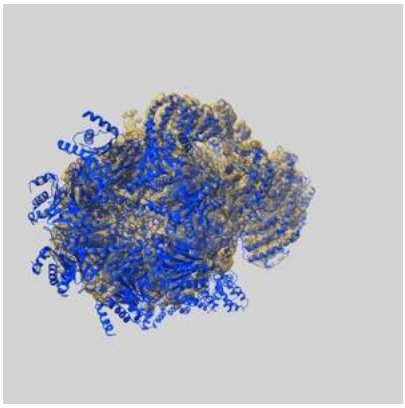
8 Fourier-Shell correlation (i)

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

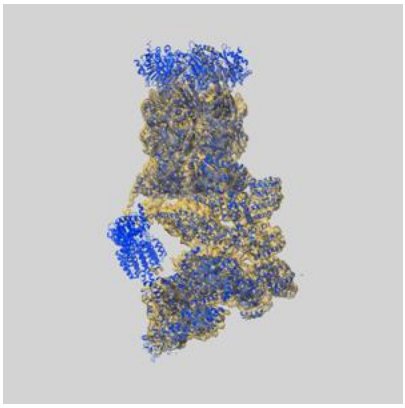
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-14082 and PDB model 7QO3. Per-residue inclusion information can be found in section 3 on page 10.

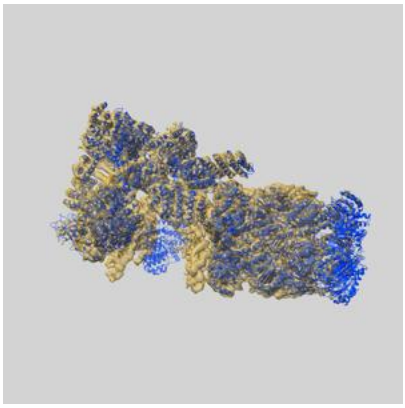
9.1 Map-model overlay



X



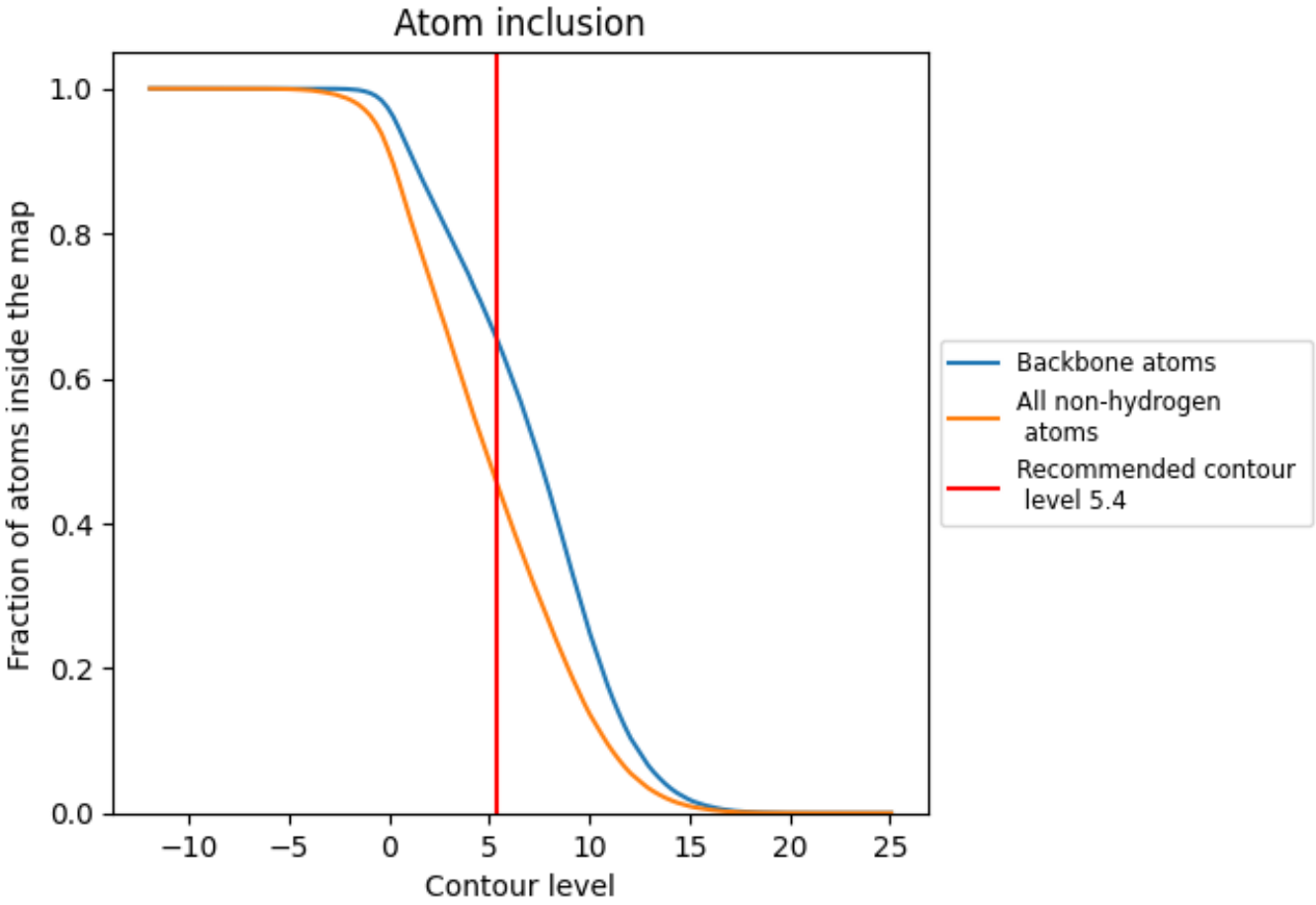
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 5.4 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 Atom inclusion (i)



At the recommended contour level, 65% of all backbone atoms, 45% of all non-hydrogen atoms, are inside the map.