Full wwPDB EM Validation Report ⓘ

Nov 25, 2024 – 01:25 PM EST

PDB ID	:	9E8N
EMDB ID	:	EMD-47725
Title	:	Nub1/Fat10-processing human 26S proteasome bound to Txnl1 with Rpt3 at top of spiral staircase
Authors	:	Arkinson, C.; Gee, C.L.; Martin, A.
Deposited on	:	2024-11-05
Resolution	:	3.62 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 ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

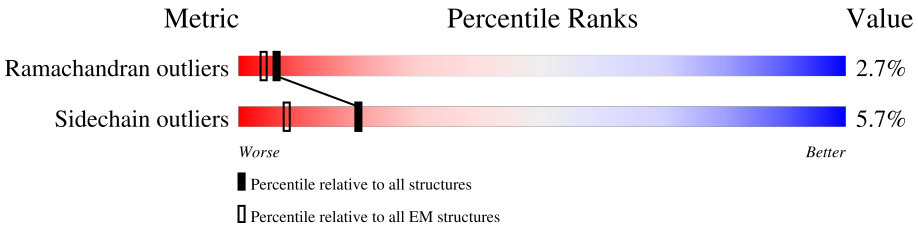
EMDB validation analysis	:	0.0.1.dev113
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.40

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.62 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	A	433	8% 80% 12% • 7%
2	C	406	32% 74% 16% 9%
3	D	418	18% 71% 14% • 13%
4	G	246	47% 90% 7% •
5	H	234	44% 89% 8% • •
6	I	261	52% 85% 9% • 5%
7	J	248	41% 86% 9% • •
8	L	263	46% 84% 6% 10%
9	M	255	45% 85% 9% 6%

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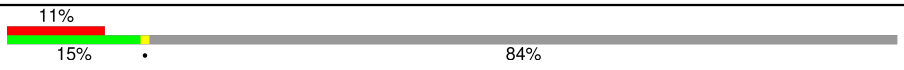
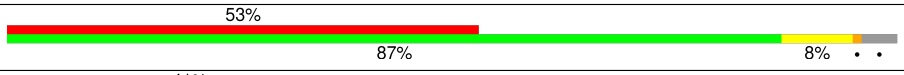
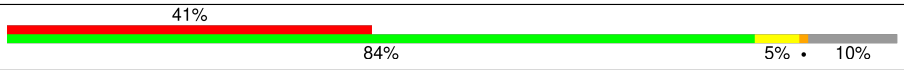
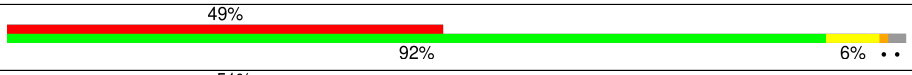
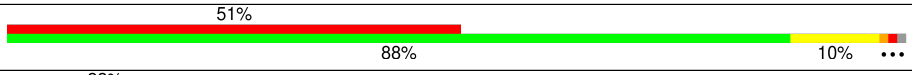
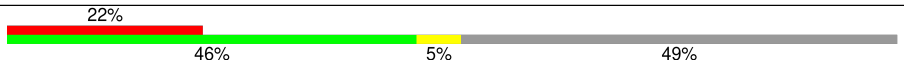
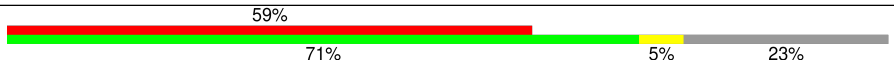
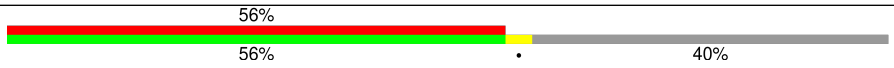
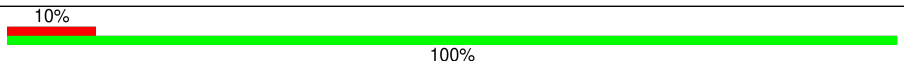
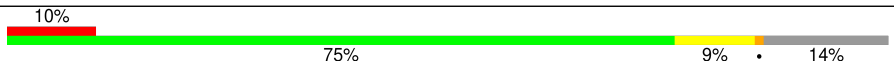
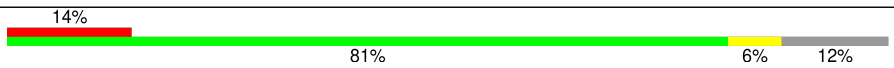
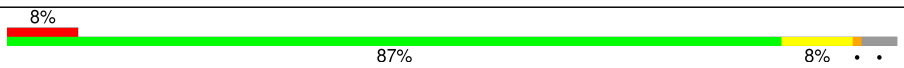
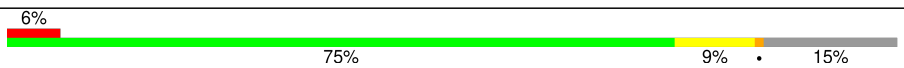
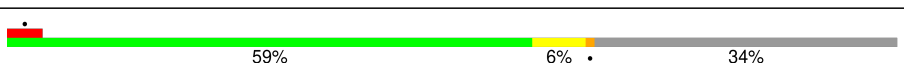
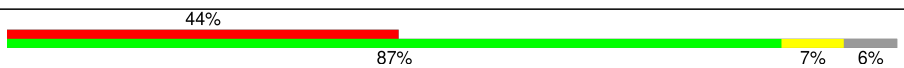
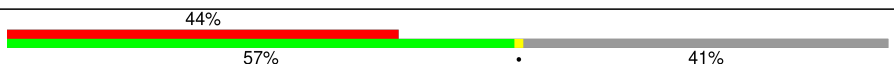
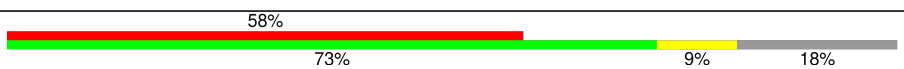
Mol	Chain	Length	Quality of chain
10	O	277	
11	W	456	
12	X	422	
13	Y	389	
14	a	376	
15	b	377	
16	d	350	
17	g	601	
18	u	289	
19	v	10	
20	B	440	
21	Z	324	
22	E	389	
23	F	439	
24	c	424	
25	K	241	
26	e	70	
27	U	953	
28	f	908	
29	V	534	

2 Entry composition (i)

There are 33 unique types of molecules in this entry. The entry contains 70912 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 regulatory subunit 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	404	3168	1993	558	600	17	0	0

- Molecule 2 is a protein called 26S protease regulatory subunit 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	C	368	2926	1847	524	537	18	0	0

- Molecule 3 is a protein called 26S proteasome regulatory subunit 6B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	D	365	2904	1838	503	550	13	0	0

- Molecule 4 is a protein called Proteasome subunit alpha type-6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	G	239	1820	1157	304	346	13	0	0

- Molecule 5 is a protein called Proteasome subunit alpha type-2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	H	228	1704	1084	287	327	6	0	0

- Molecule 6 is a protein called Proteasome subunit alpha type-4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	I	248	1895	1195	324	368	8	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
7	J	238	Total	C	N	O	S	0	0
			1699	1053	307	334	5		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
8	L	237	Total	C	N	O	S	0	0
			1845	1156	333	345	11		

- Molecule 9 is a protein called Proteasome subunit alpha type-3.

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

- Molecule 10 is a protein called Proteasome subunit beta type-7.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	O	44	Total	C	N	O	S	0	0
			355	222	64	66	3		

- Molecule 11 is a protein called 26S proteasome non-ATPase regulatory subunit 12.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	W	438	Total	C	N	O	S	0	0
			3570	2261	609	677	23		

- Molecule 12 is a protein called 26S proteasome non-ATPase regulatory subunit 11.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	X	378	Total	C	N	O	S	0	0
			2994	1909	507	566	12		

- Molecule 13 is a protein called 26S proteasome non-ATPase regulatory subunit 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	Y	380	Total	C	N	O	S	0	0
			3127	1995	535	580	17		

- Molecule 14 is a protein called 26S proteasome non-ATPase regulatory subunit 13.

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

- Molecule 15 is a protein called 26S proteasome non-ATPase regulatory subunit 4.

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

- Molecule 16 is a protein called 26S proteasome non-ATPase regulatory subunit 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	d	269	Total	C	N	O	S	0	0
			2188	1414	359	406	9		

- Molecule 17 is a protein called Isoform 2 of NEDD8 ultimate buster 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	g	95	Total	C	N	O	S	0	0
			771	487	139	144	1		

- Molecule 18 is a protein called Thioredoxin-like protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	u	172	Total	C	N	O	S	0	0
			1376	865	226	276	9		

- Molecule 19 is a protein called substrate.

Mol	Chain	Residues	Atoms				AltConf	Trace
19	v	10	Total	C	N	O	0	0
			50	30	10	10		

- Molecule 20 is a protein called 26S proteasome regulatory subunit 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	B	377	Total	C	N	O	S	0	0
			2962	1865	507	575	15		

- Molecule 21 is a protein called 26S proteasome non-ATPase regulatory subunit 7.

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

- Molecule 22 is a protein called 26S protease regulatory subunit 10B.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	E	375	Total	C	N	O	S	0	0
			2980	1875	529	560	16		

- Molecule 23 is a protein called 26S proteasome regulatory subunit 6A.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	F	371	Total	C	N	O	S	0	0
			2911	1840	502	552	17		

- Molecule 24 is a protein called 26S proteasome non-ATPase regulatory subunit 14.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	c	279	Total	C	N	O	S	0	0
			2201	1393	378	411	19		

There are 114 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
c	311	LEU	-	expression tag	UNP O00487
c	312	ILE	-	expression tag	UNP O00487
c	313	ASN	-	expression tag	UNP O00487
c	314	HIS	-	expression tag	UNP O00487
c	315	HIS	-	expression tag	UNP O00487
c	316	HIS	-	expression tag	UNP O00487
c	317	HIS	-	expression tag	UNP O00487
c	318	HIS	-	expression tag	UNP O00487
c	319	HIS	-	expression tag	UNP O00487
c	320	ASP	-	expression tag	UNP O00487
c	321	TYR	-	expression tag	UNP O00487
c	322	ASP	-	expression tag	UNP O00487
c	323	ILE	-	expression tag	UNP O00487
c	324	PRO	-	expression tag	UNP O00487
c	325	THR	-	expression tag	UNP O00487
c	326	THR	-	expression tag	UNP O00487
c	327	ALA	-	expression tag	UNP O00487
c	328	SER	-	expression tag	UNP O00487
c	329	GLU	-	expression tag	UNP O00487

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Chain	Residue	Modelled	Actual	Comment	Reference
c	330	ASN	-	expression tag	UNP O00487
c	331	LEU	-	expression tag	UNP O00487
c	332	TYR	-	expression tag	UNP O00487
c	333	PHE	-	expression tag	UNP O00487
c	334	GLN	-	expression tag	UNP O00487
c	335	GLY	-	expression tag	UNP O00487
c	336	GLU	-	expression tag	UNP O00487
c	337	LEU	-	expression tag	UNP O00487
c	338	GLY	-	expression tag	UNP O00487
c	339	MET	-	expression tag	UNP O00487
c	340	ARG	-	expression tag	UNP O00487
c	341	GLY	-	expression tag	UNP O00487
c	342	SER	-	expression tag	UNP O00487
c	343	ALA	-	expression tag	UNP O00487
c	344	GLY	-	expression tag	UNP O00487
c	345	LYS	-	expression tag	UNP O00487
c	346	ALA	-	expression tag	UNP O00487
c	347	GLY	-	expression tag	UNP O00487
c	348	GLU	-	expression tag	UNP O00487
c	349	GLY	-	expression tag	UNP O00487
c	350	GLU	-	expression tag	UNP O00487
c	351	ILE	-	expression tag	UNP O00487
c	352	PRO	-	expression tag	UNP O00487
c	353	ALA	-	expression tag	UNP O00487
c	354	PRO	-	expression tag	UNP O00487
c	355	LEU	-	expression tag	UNP O00487
c	356	ALA	-	expression tag	UNP O00487
c	357	GLY	-	expression tag	UNP O00487
c	358	THR	-	expression tag	UNP O00487
c	359	VAL	-	expression tag	UNP O00487
c	360	SER	-	expression tag	UNP O00487
c	361	LYS	-	expression tag	UNP O00487
c	362	ILE	-	expression tag	UNP O00487
c	363	LEU	-	expression tag	UNP O00487
c	364	VAL	-	expression tag	UNP O00487
c	365	LYS	-	expression tag	UNP O00487
c	366	GLU	-	expression tag	UNP O00487
c	367	GLY	-	expression tag	UNP O00487
c	368	ASP	-	expression tag	UNP O00487
c	369	THR	-	expression tag	UNP O00487
c	370	VAL	-	expression tag	UNP O00487
c	371	LYS	-	expression tag	UNP O00487

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Chain	Residue	Modelled	Actual	Comment	Reference
c	372	ALA	-	expression tag	UNP O00487
c	373	GLY	-	expression tag	UNP O00487
c	374	GLN	-	expression tag	UNP O00487
c	375	THR	-	expression tag	UNP O00487
c	376	VAL	-	expression tag	UNP O00487
c	377	LEU	-	expression tag	UNP O00487
c	378	VAL	-	expression tag	UNP O00487
c	379	LEU	-	expression tag	UNP O00487
c	380	GLU	-	expression tag	UNP O00487
c	381	ALA	-	expression tag	UNP O00487
c	382	MET	-	expression tag	UNP O00487
c	383	LYS	-	expression tag	UNP O00487
c	384	MET	-	expression tag	UNP O00487
c	385	GLU	-	expression tag	UNP O00487
c	386	THR	-	expression tag	UNP O00487
c	387	GLU	-	expression tag	UNP O00487
c	388	ILE	-	expression tag	UNP O00487
c	389	ASN	-	expression tag	UNP O00487
c	390	ALA	-	expression tag	UNP O00487
c	391	PRO	-	expression tag	UNP O00487
c	392	THR	-	expression tag	UNP O00487
c	393	ASP	-	expression tag	UNP O00487
c	394	GLY	-	expression tag	UNP O00487
c	395	LYS	-	expression tag	UNP O00487
c	396	VAL	-	expression tag	UNP O00487
c	397	GLU	-	expression tag	UNP O00487
c	398	LYS	-	expression tag	UNP O00487
c	399	VAL	-	expression tag	UNP O00487
c	400	LEU	-	expression tag	UNP O00487
c	401	VAL	-	expression tag	UNP O00487
c	402	LYS	-	expression tag	UNP O00487
c	403	GLU	-	expression tag	UNP O00487
c	404	ARG	-	expression tag	UNP O00487
c	405	ASP	-	expression tag	UNP O00487
c	406	ALA	-	expression tag	UNP O00487
c	407	VAL	-	expression tag	UNP O00487
c	408	GLN	-	expression tag	UNP O00487
c	409	GLY	-	expression tag	UNP O00487
c	410	GLY	-	expression tag	UNP O00487
c	411	GLN	-	expression tag	UNP O00487
c	412	GLY	-	expression tag	UNP O00487
c	413	LEU	-	expression tag	UNP O00487

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Chain	Residue	Modelled	Actual	Comment	Reference
c	414	ILE	-	expression tag	UNP O00487
c	415	LYS	-	expression tag	UNP O00487
c	416	ILE	-	expression tag	UNP O00487
c	417	GLY	-	expression tag	UNP O00487
c	418	VAL	-	expression tag	UNP O00487
c	419	HIS	-	expression tag	UNP O00487
c	420	HIS	-	expression tag	UNP O00487
c	421	HIS	-	expression tag	UNP O00487
c	422	HIS	-	expression tag	UNP O00487
c	423	HIS	-	expression tag	UNP O00487
c	424	HIS	-	expression tag	UNP O00487

- Molecule 25 is a protein called Proteasome subunit alpha type-5.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	K	227	Total	C	N	O	S	0	0
			1720	1082	283	345	10		

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

Mol	Chain	Residues	Atoms				AltConf	Trace
26	e	41	Total	C	N	O	0	0
			349	212	55	82		

- Molecule 27 is a protein called 26S proteasome non-ATPase regulatory subunit 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	U	838	Total	C	N	O	S	0	0
			6536	4148	1110	1234	44		

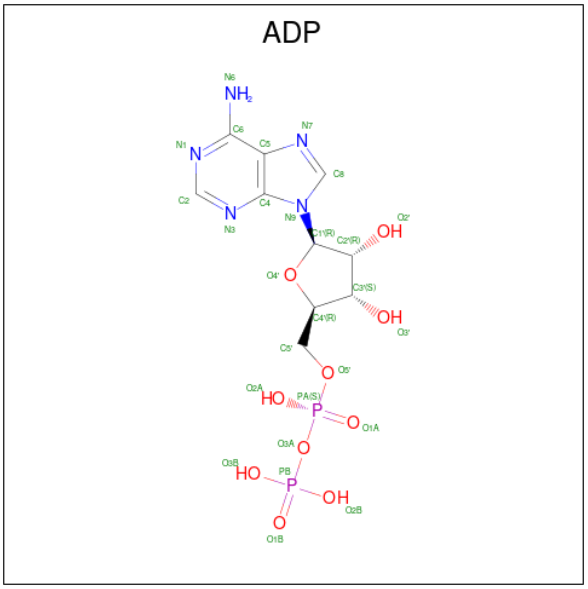
- Molecule 28 is a protein called 26S proteasome non-ATPase regulatory subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	f	842	Total	C	N	O	S	0	0
			6512	4117	1105	1245	45		

- Molecule 29 is a protein called 26S proteasome non-ATPase regulatory subunit 3.

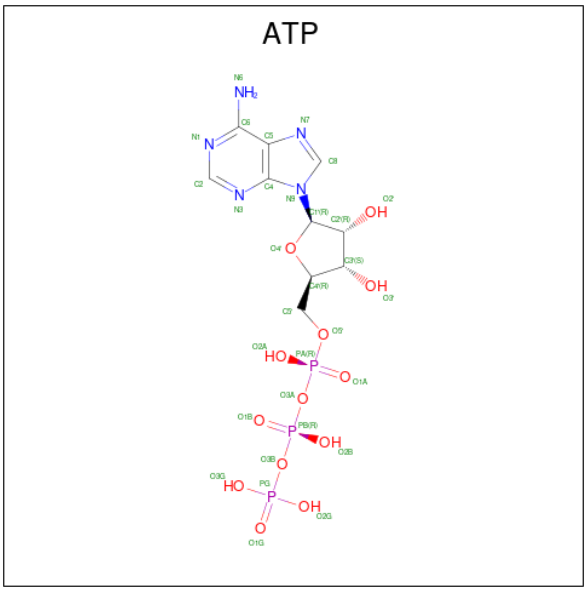
Mol	Chain	Residues	Atoms					AltConf	Trace
29	V	440	Total	C	N	O	S	0	0
			3586	2285	640	648	13		

- Molecule 30 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: $C_{10}H_{15}N_5O_{10}P_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
30	A	1	Total	C	N	O	P	0
			27	10	5	10	2	
30	C	1	Total	C	N	O	P	0
			27	10	5	10	2	
30	D	1	Total	C	N	O	P	0
			27	10	5	10	2	
30	B	1	Total	C	N	O	P	0
			27	10	5	10	2	

- Molecule 31 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$) (labeled as "Ligand of Interest" by depositor).



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

- Molecule 32 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
32	E	1	Total	Mg	0
			1	1	
32	F	1	Total	Mg	0
			1	1	

- Molecule 33 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

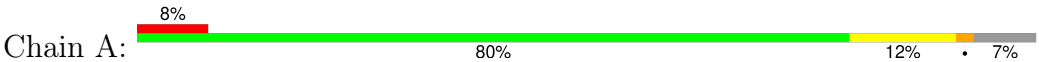
Mol	Chain	Residues	Atoms		AltConf
33	c	1	Total	Zn	0
			1	1	

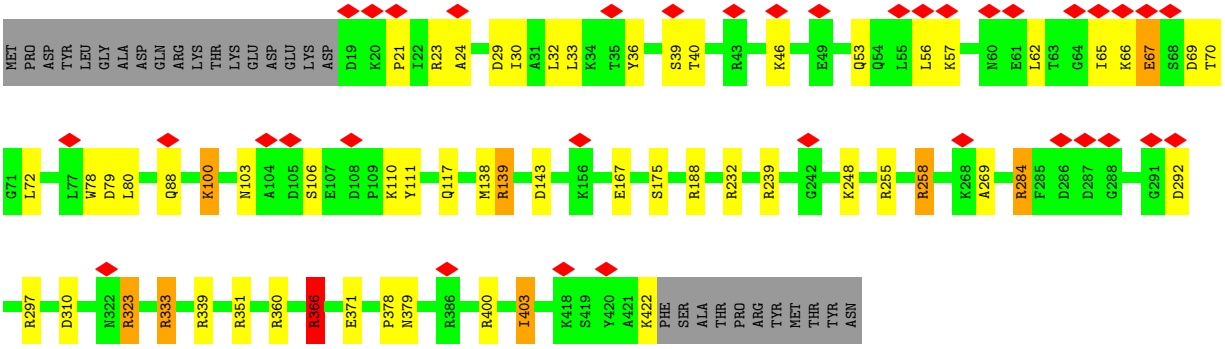
3 Residue-property plots (i)

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: 26S proteasome regulatory subunit 7

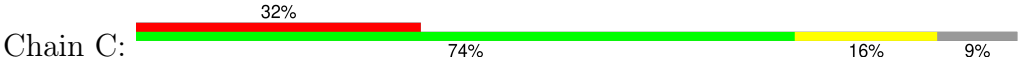
Chain A:

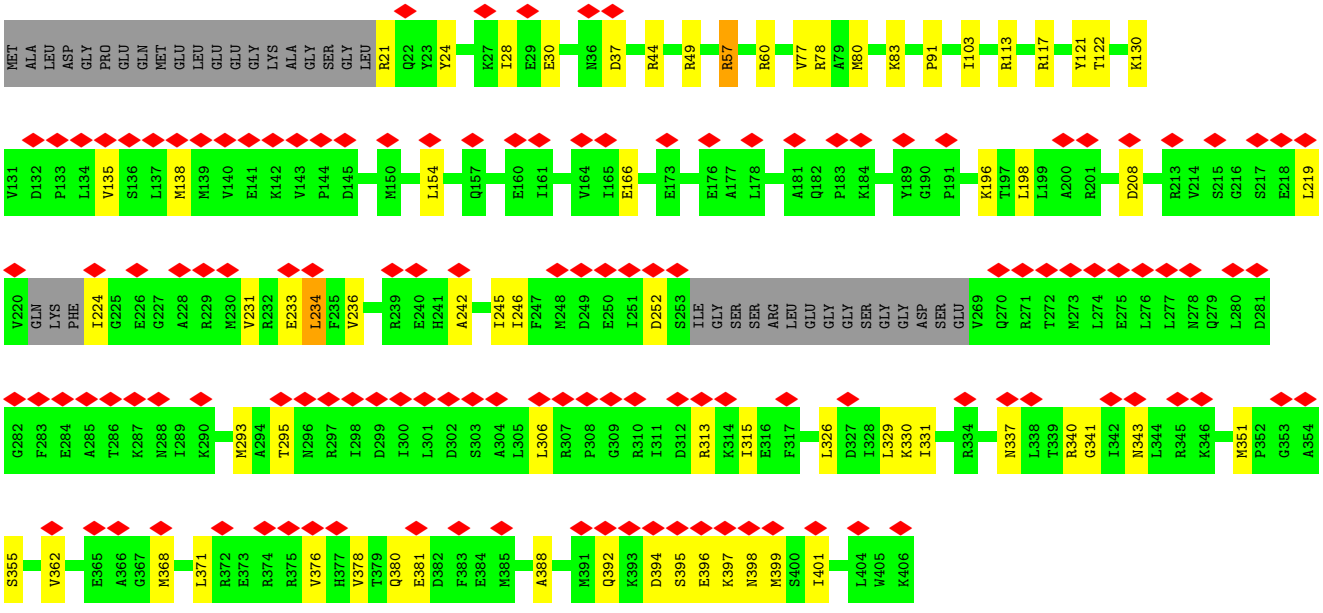




• Molecule 2: 26S protease regulatory subunit 8

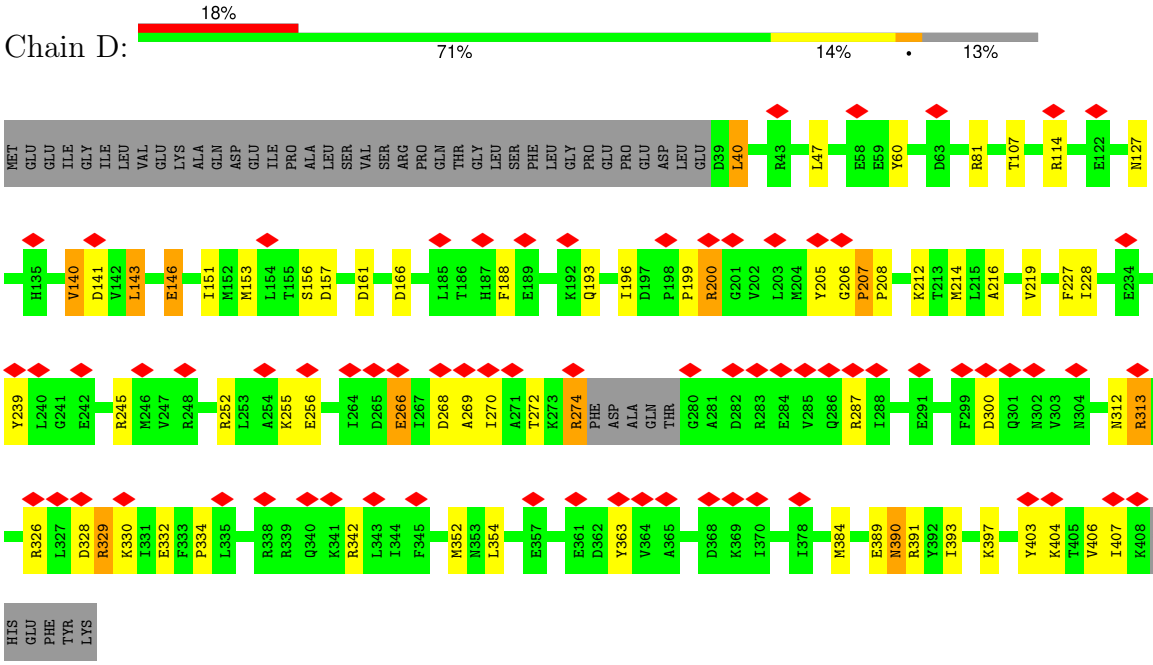
Chain C:





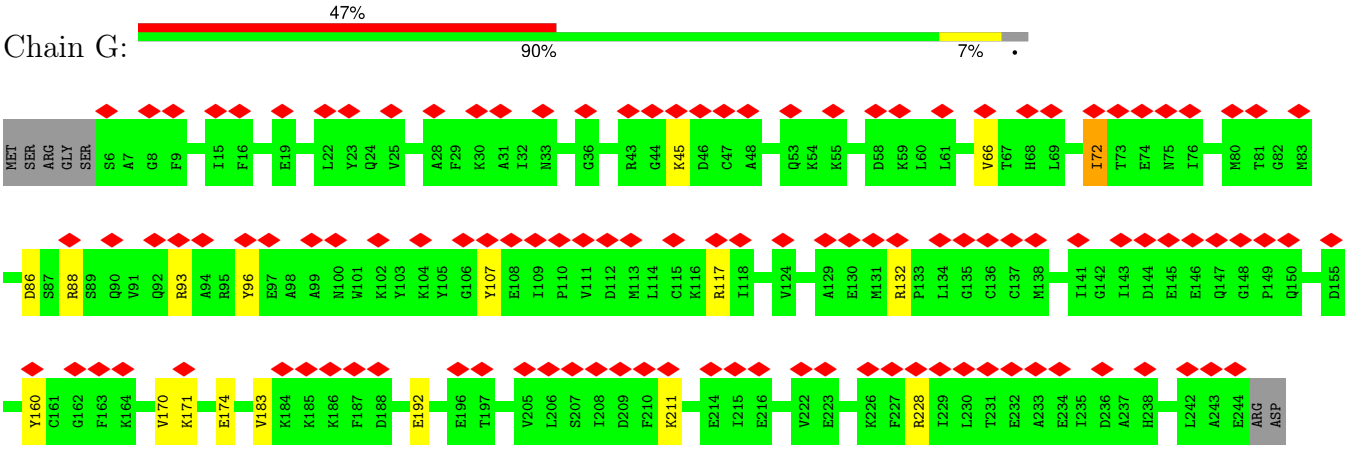
• Molecule 3: 26S proteasome regulatory subunit 6B

Chain D:



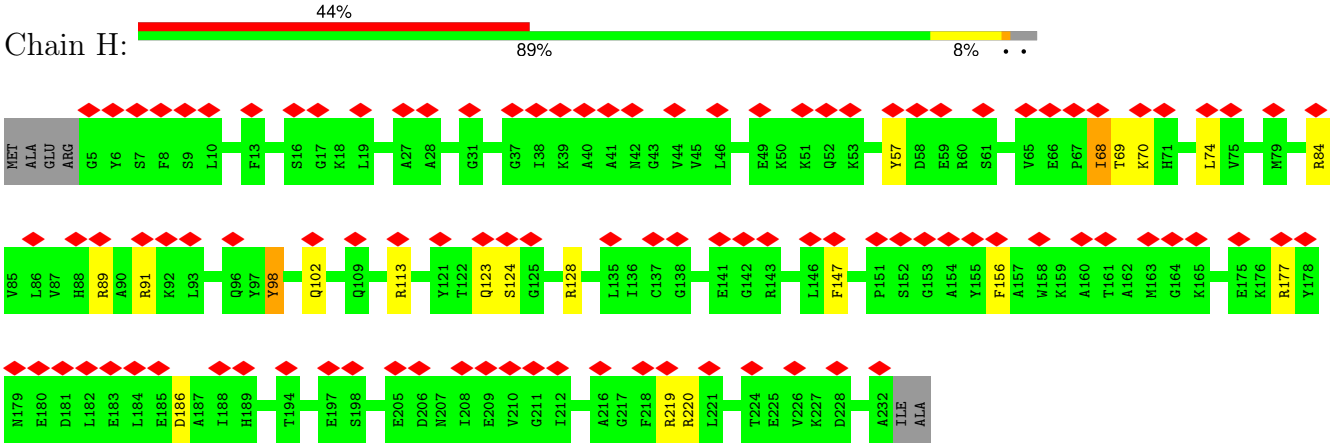
• Molecule 4: Proteasome subunit alpha type-6

Chain G:



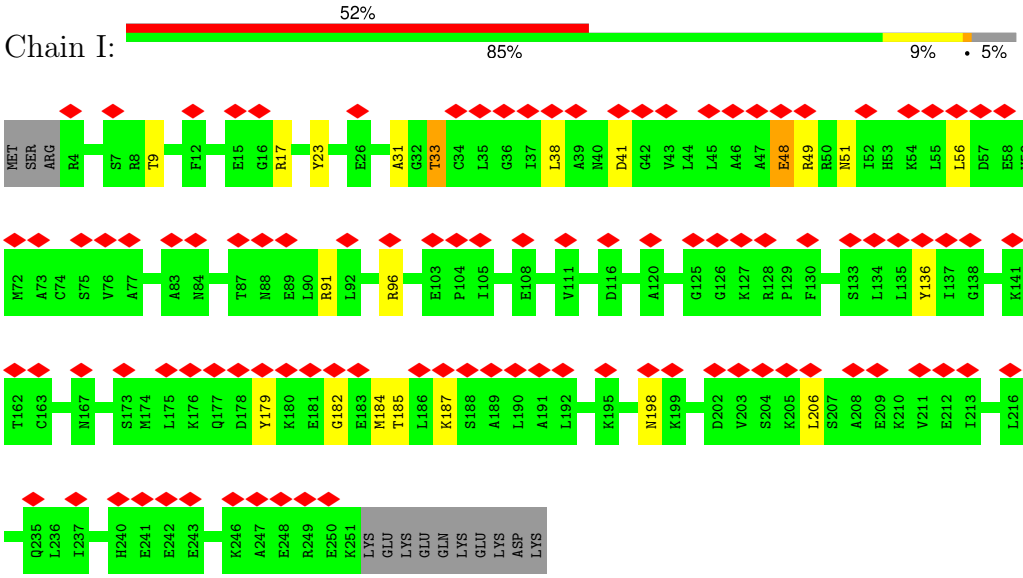
• Molecule 5: Proteasome subunit alpha type-2

Chain H:



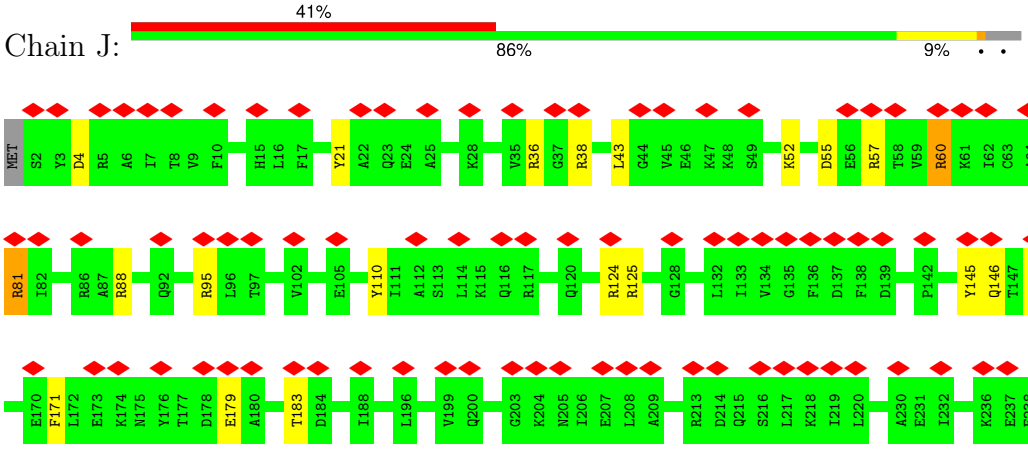
• Molecule 6: Proteasome subunit alpha type-4

Chain I:



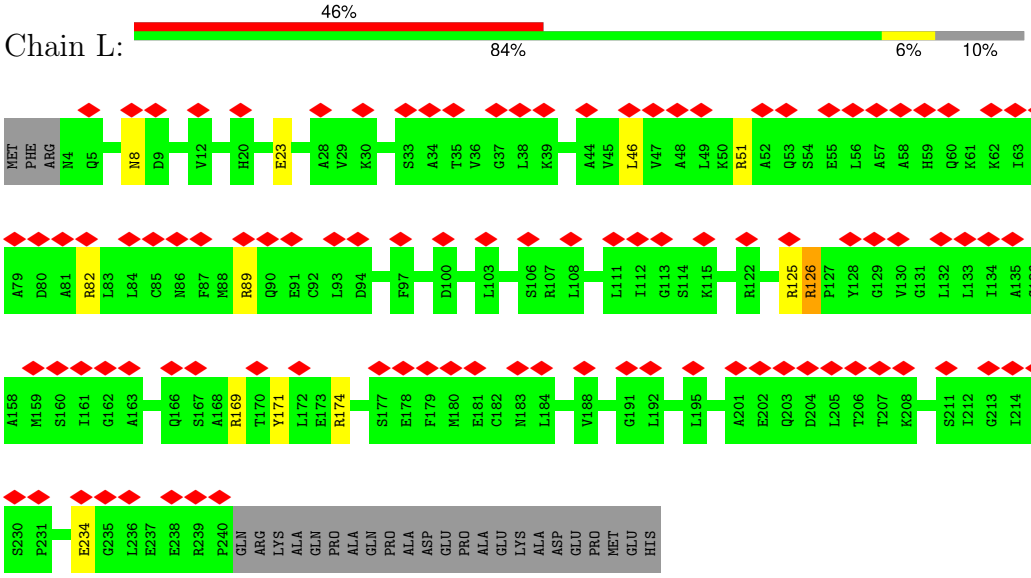
• Molecule 7: Proteasome subunit alpha type-7

Chain J:



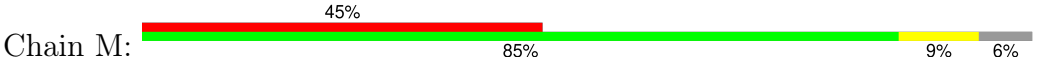
• Molecule 8: Proteasome subunit alpha type-1

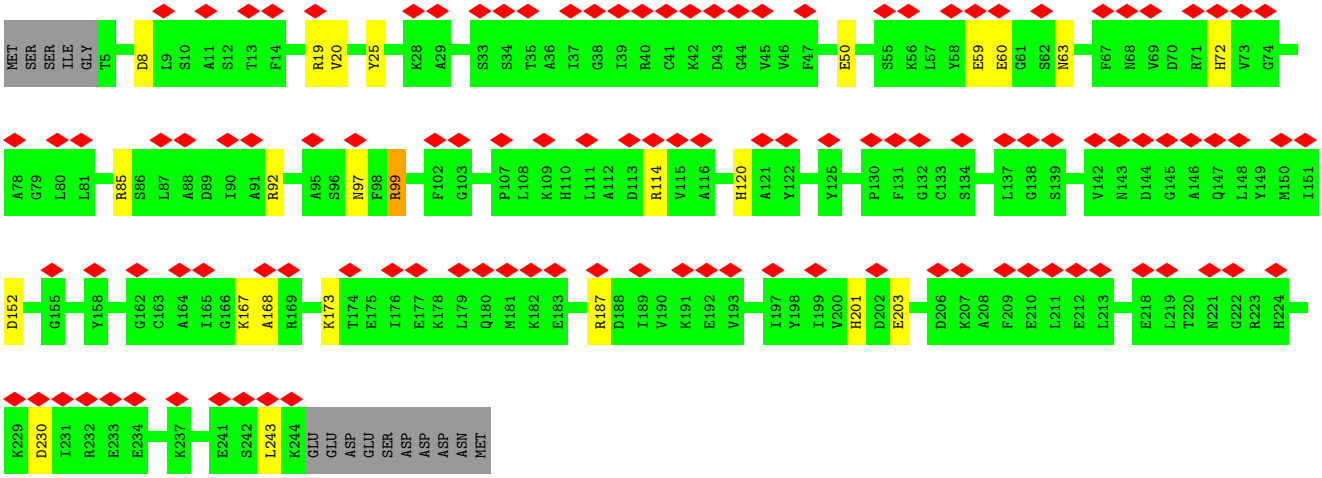
Chain L:



• Molecule 9: Proteasome subunit alpha type-3

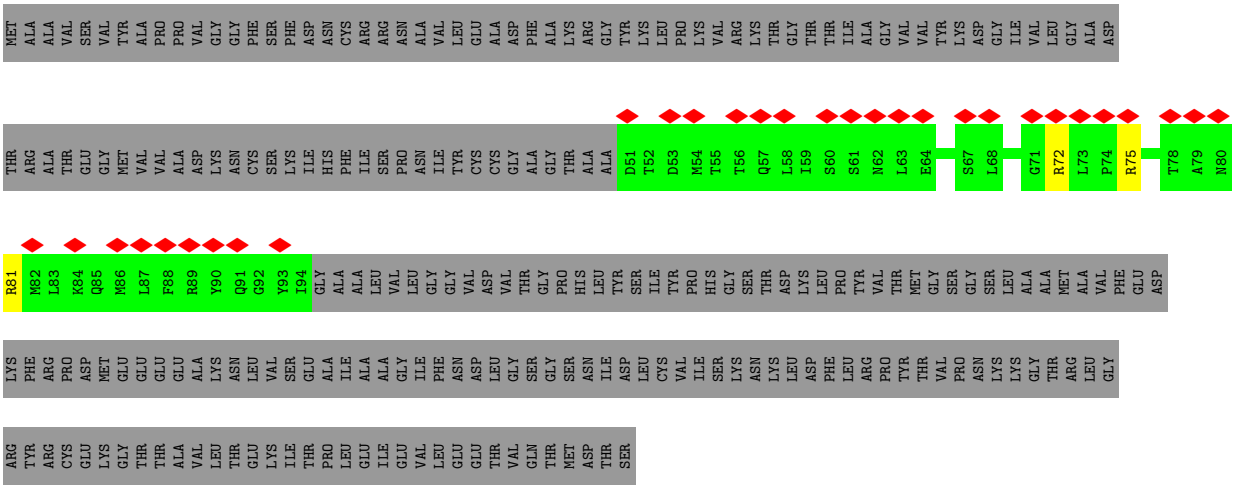
Chain M:





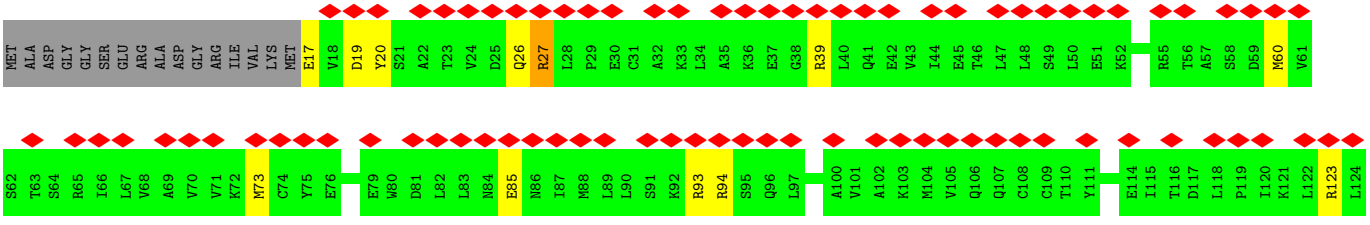
• Molecule 10: Proteasome subunit beta type-7

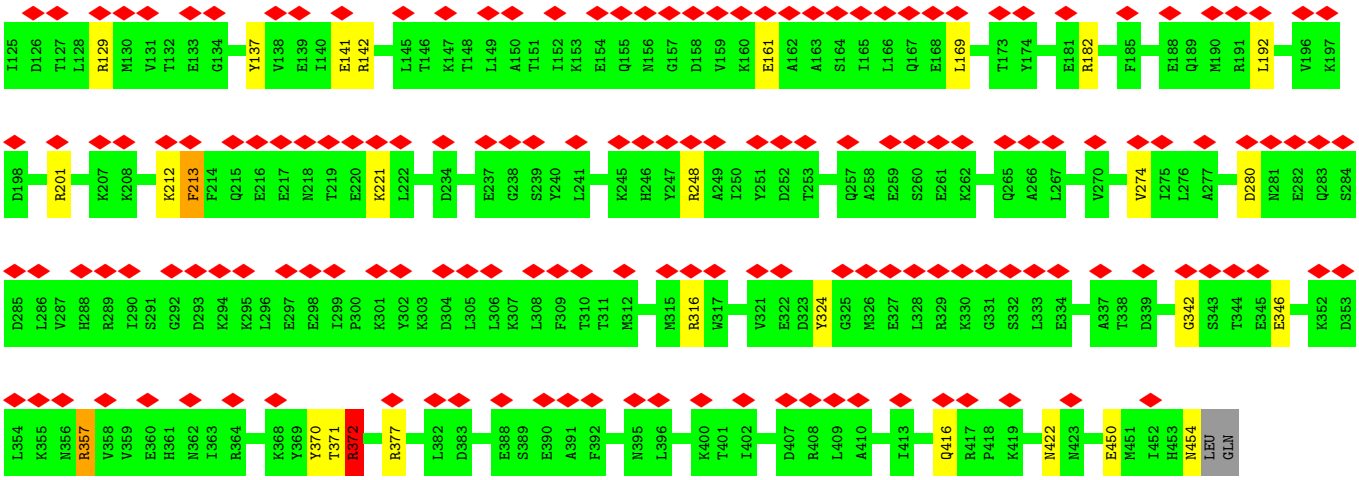
Chain O:



• Molecule 11: 26S proteasome non-ATPase regulatory subunit 12

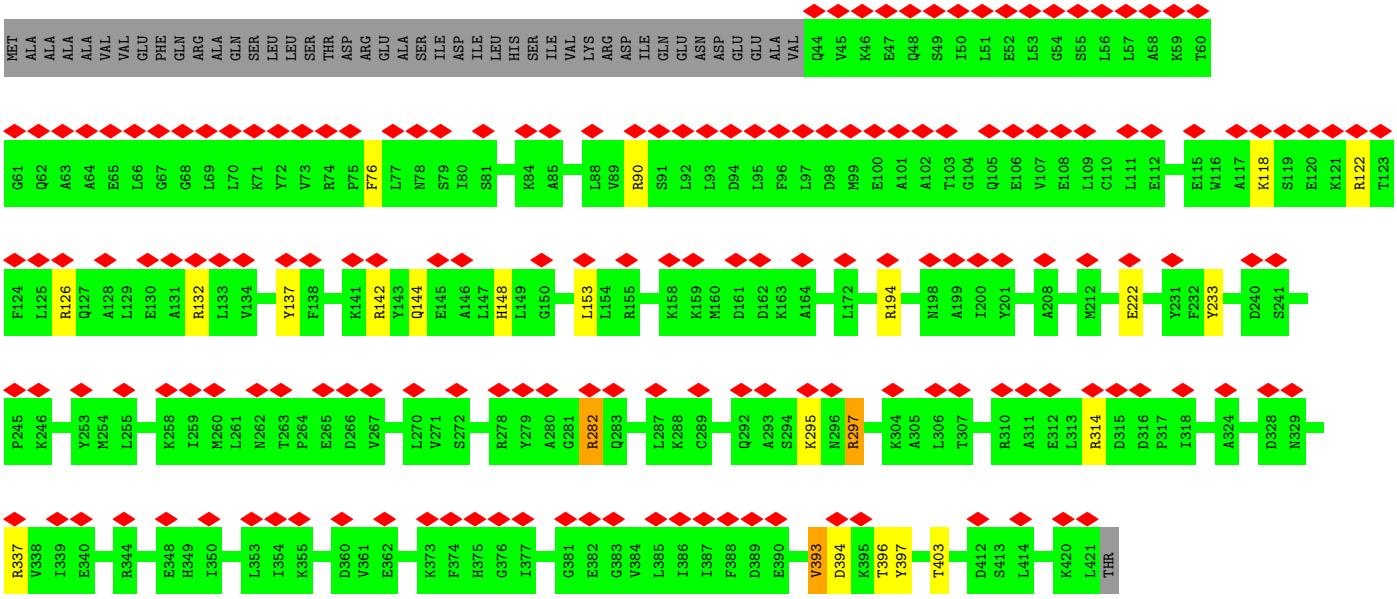
Chain W:





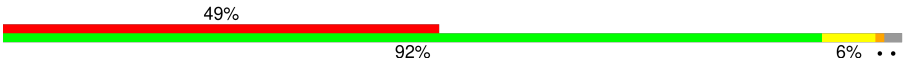
• Molecule 12: 26S proteasome non-ATPase regulatory subunit 11

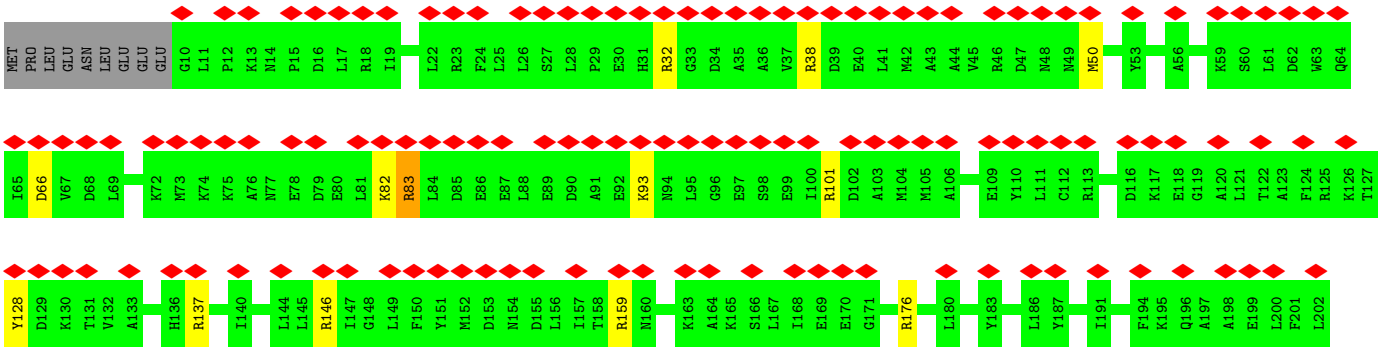
Chain X:

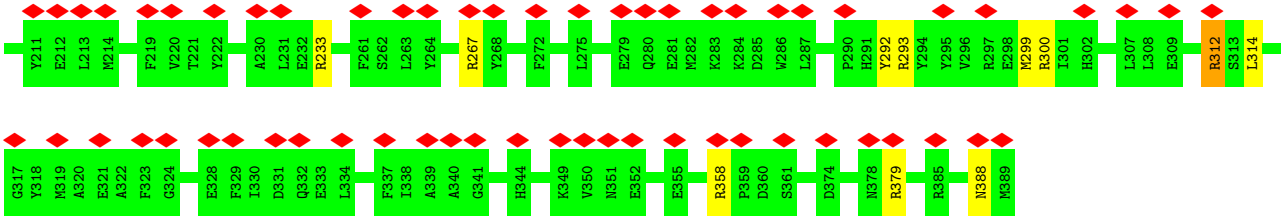


• Molecule 13: 26S proteasome non-ATPase regulatory subunit 6

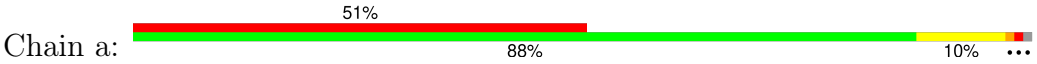
Chain Y:

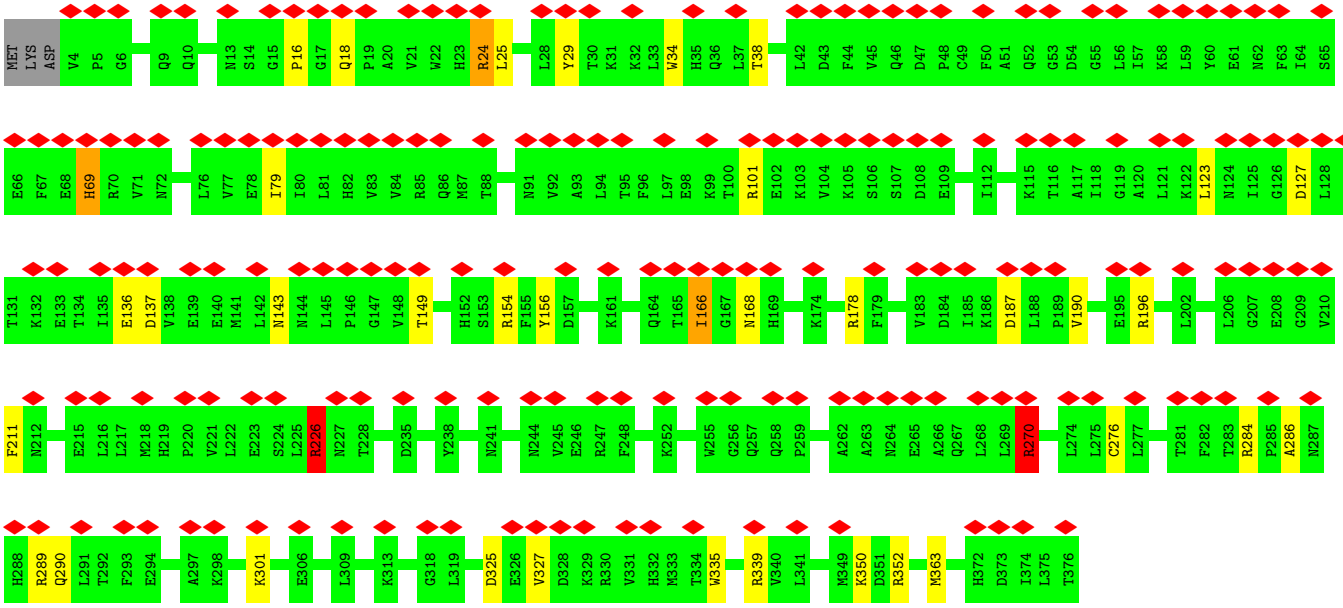




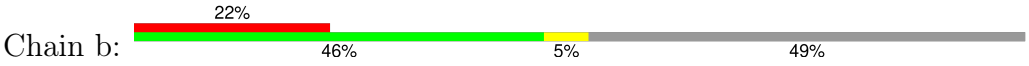


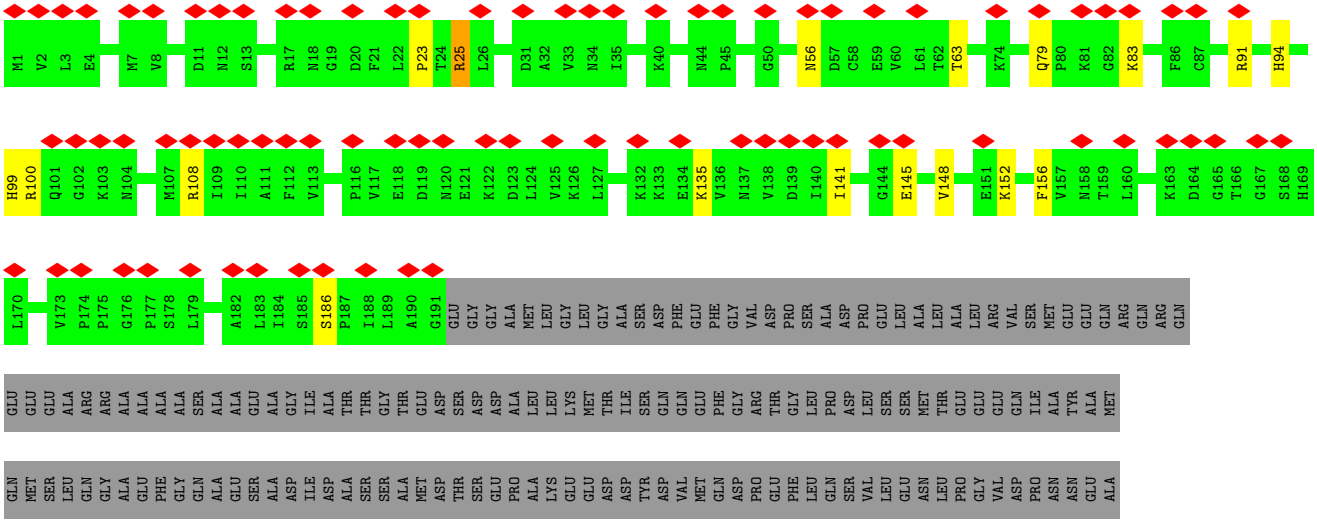
• Molecule 14: 26S proteasome non-ATPase regulatory subunit 13





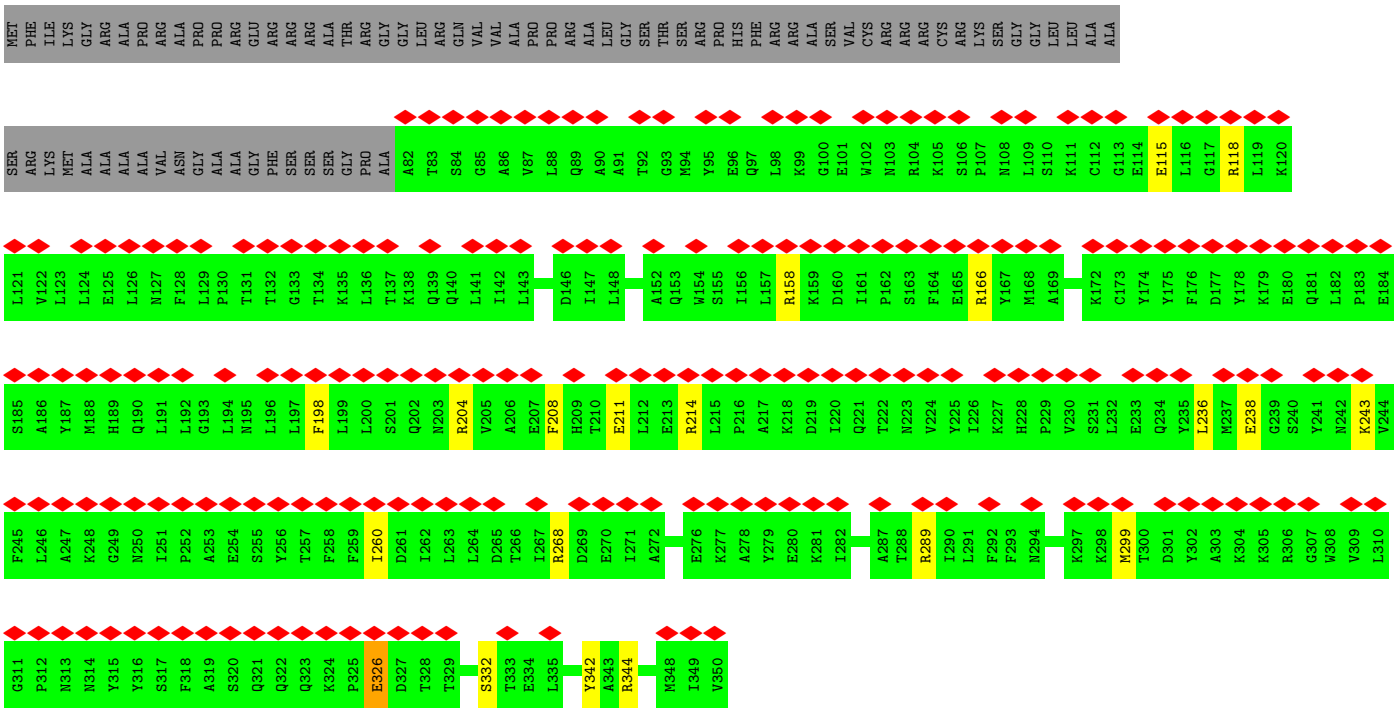
• Molecule 15: 26S proteasome non-ATPase regulatory subunit 4





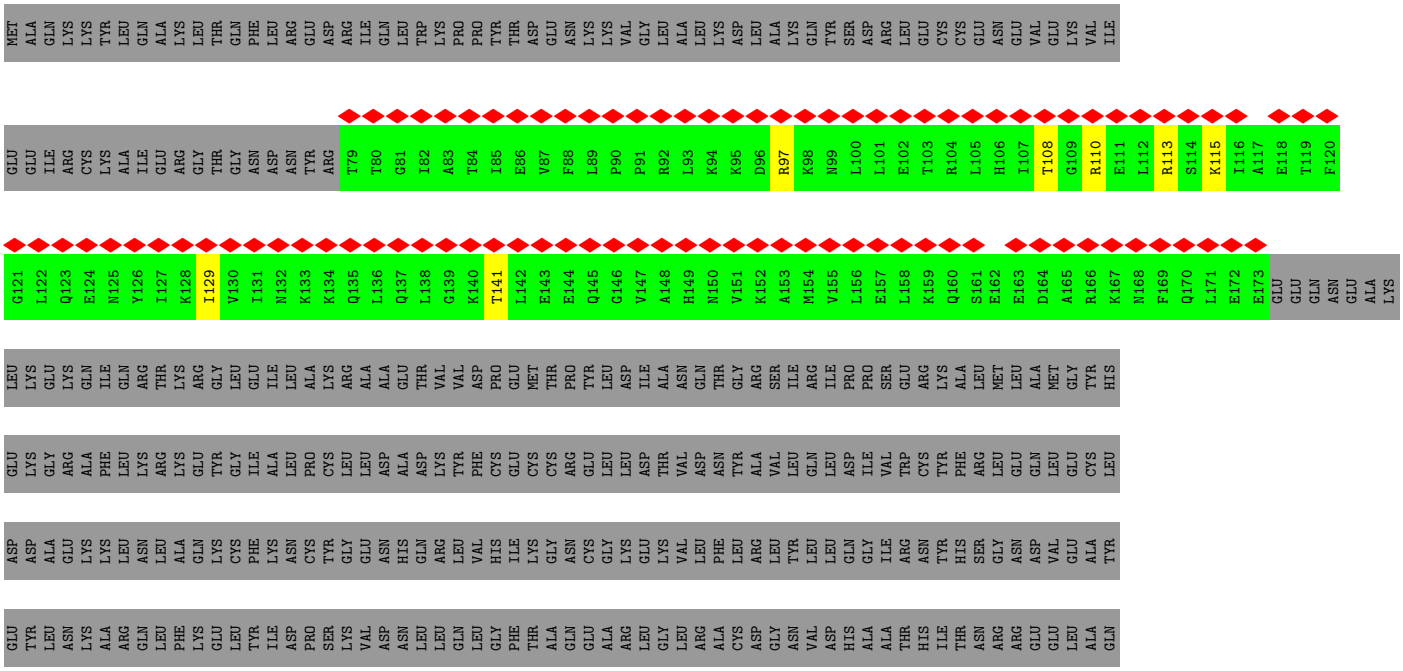
• Molecule 16: 26S proteasome non-ATPase regulatory subunit 8

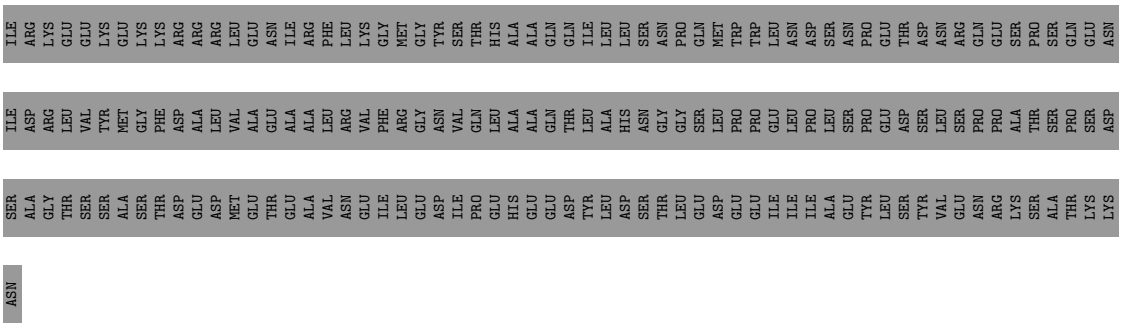
Chain d:



• Molecule 17: Isoform 2 of NEDD8 ultimate buster 1

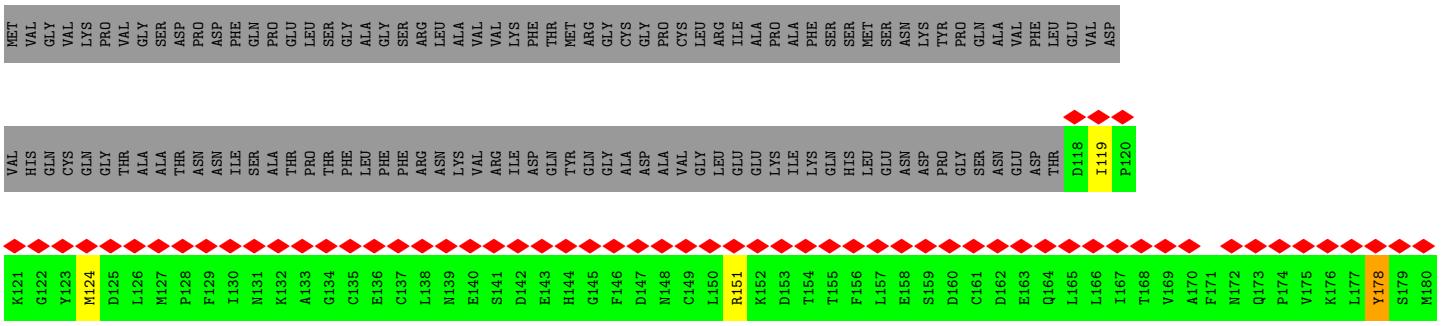
Chain g:





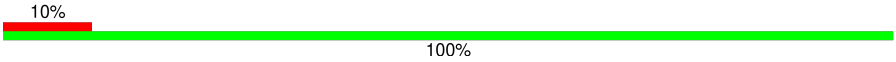
• Molecule 18: Thioredoxin-like protein 1

Chain u:



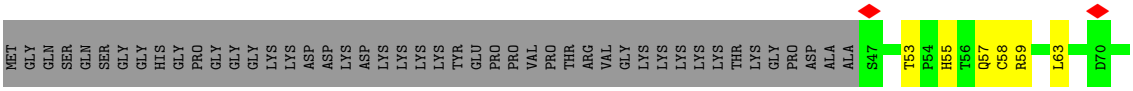
• Molecule 19: substrate

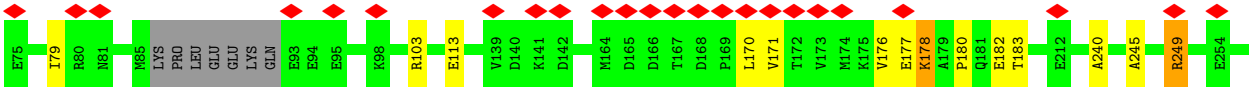
Chain v:

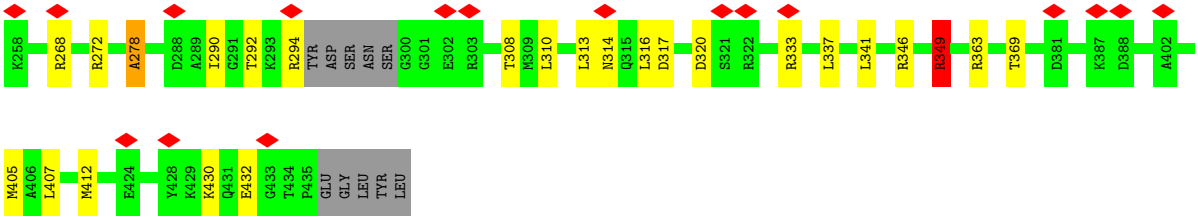


• Molecule 20: 26S proteasome regulatory subunit 4

Chain B:

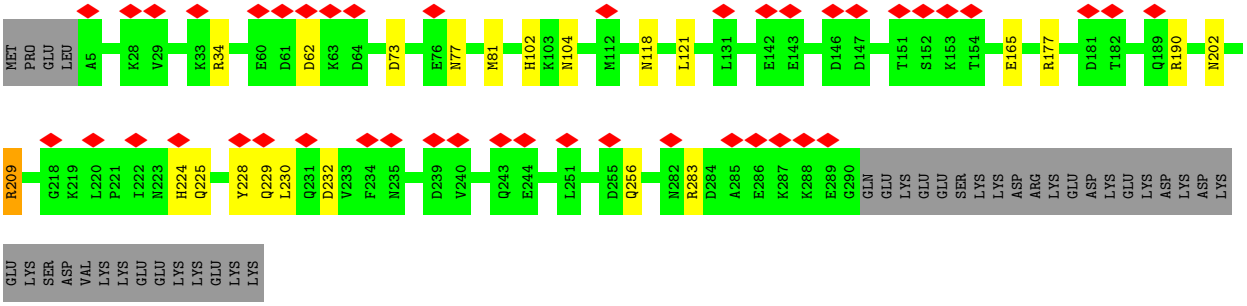






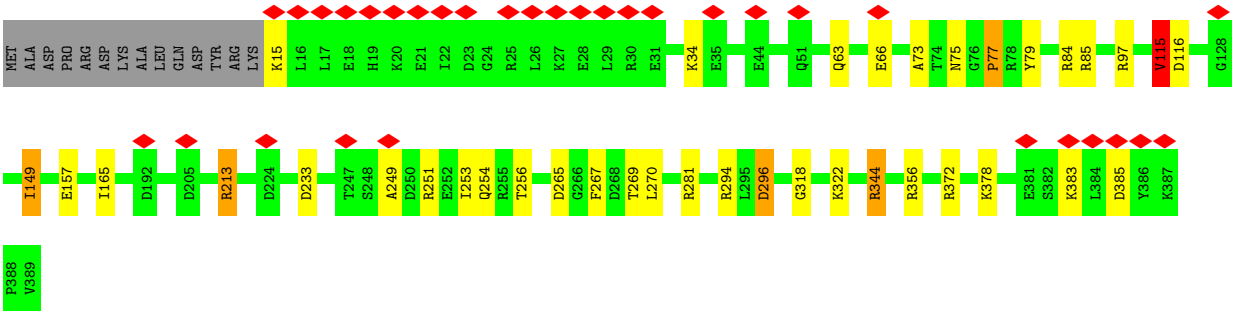
• Molecule 21: 26S proteasome non-ATPase regulatory subunit 7

Chain Z:



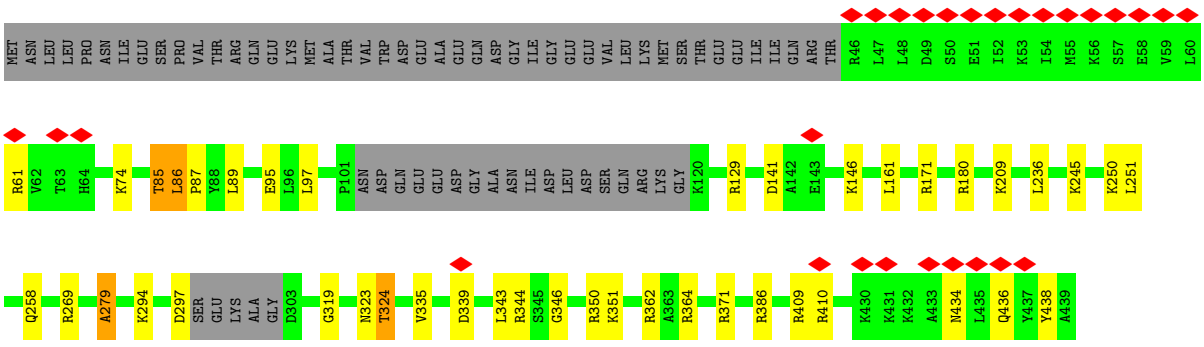
• Molecule 22: 26S protease regulatory subunit 10B

Chain E:



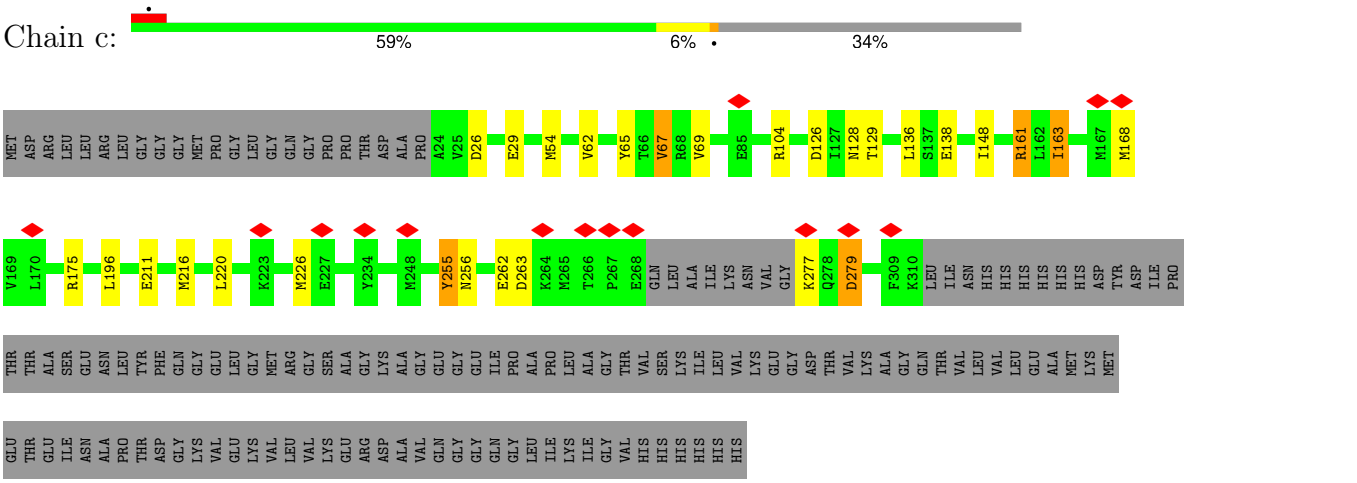
• Molecule 23: 26S proteasome regulatory subunit 6A

Chain F:



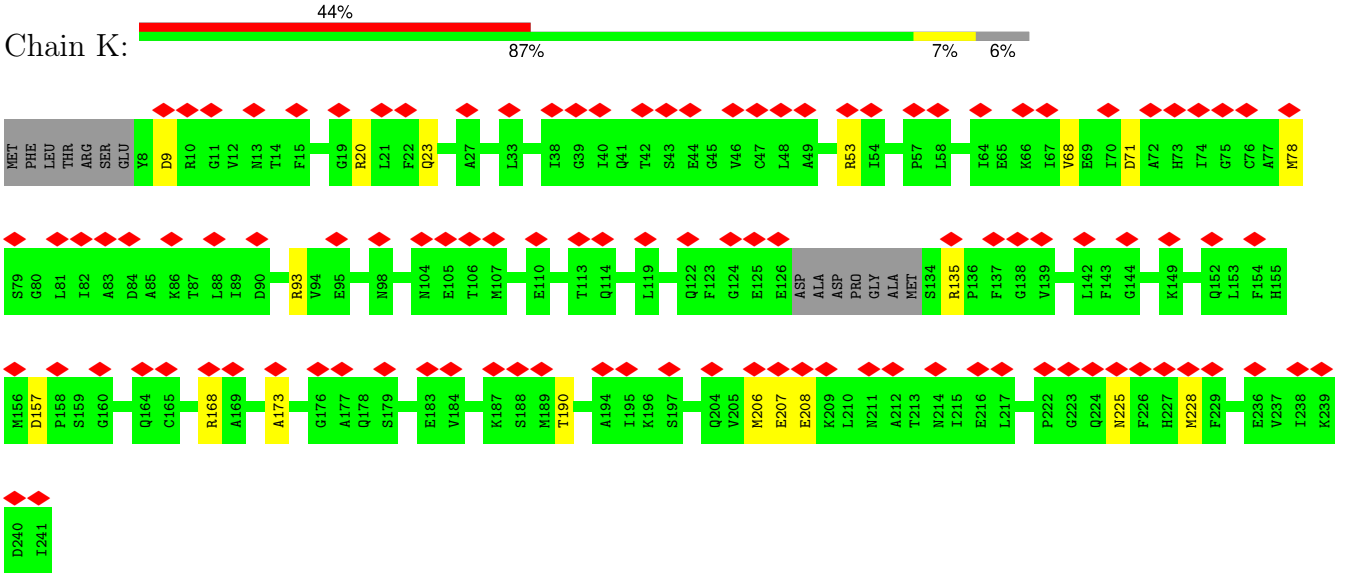
• Molecule 24: 26S proteasome non-ATPase regulatory subunit 14

Chain c:



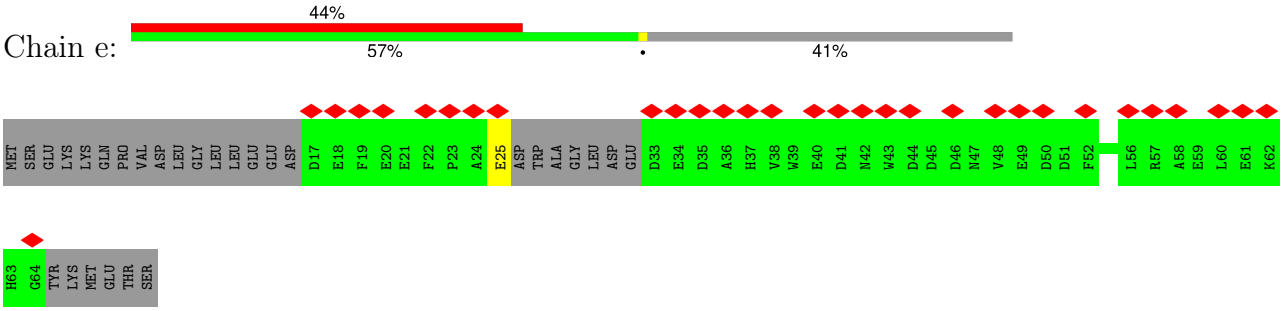
• Molecule 25: Proteasome subunit alpha type-5

Chain K:



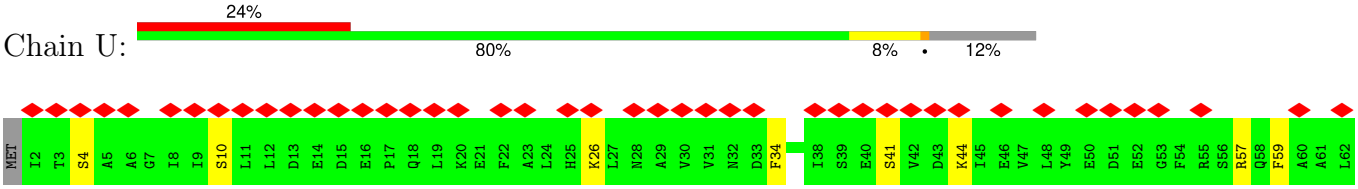
• Molecule 26: 26S proteasome complex subunit SEM1

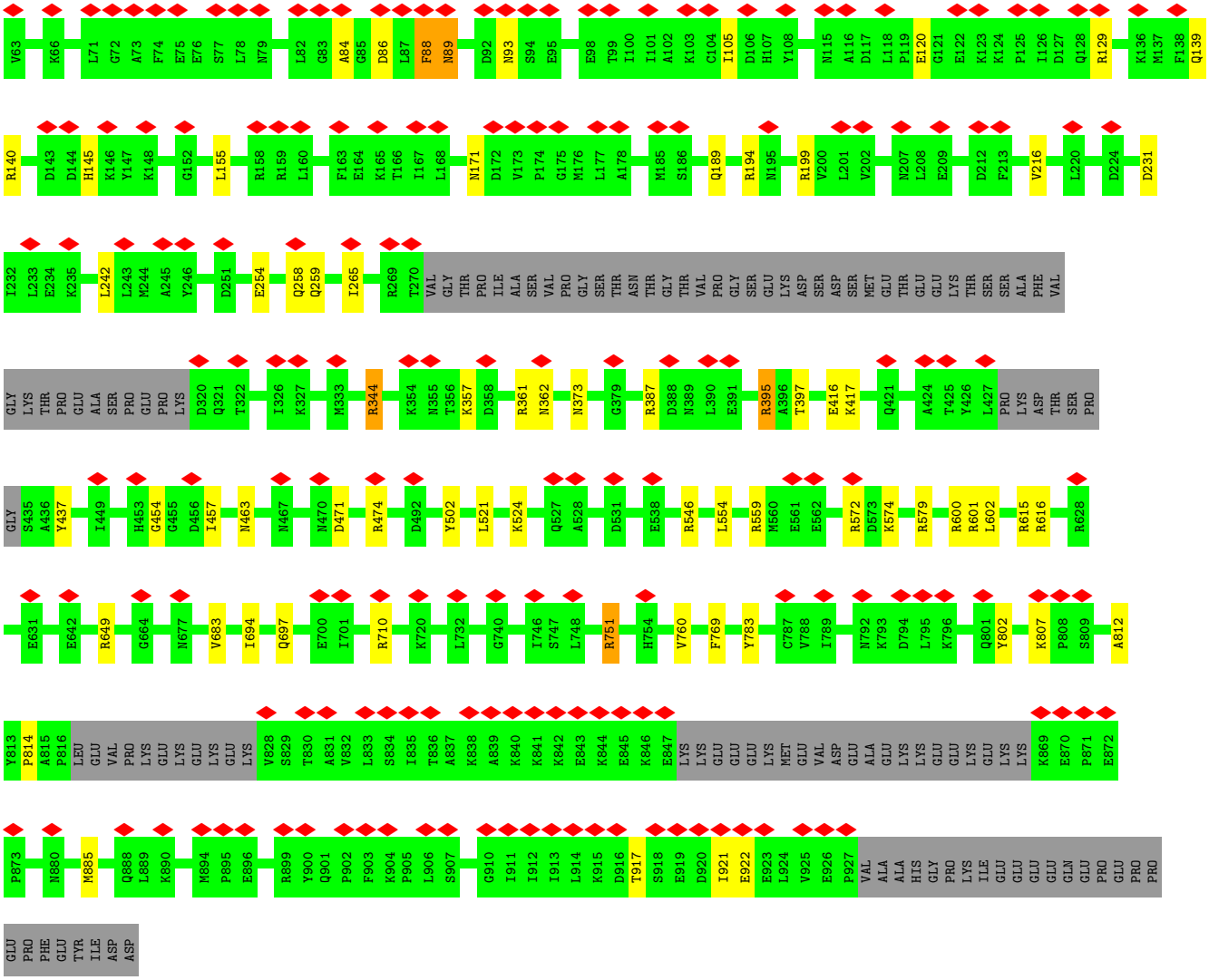
Chain e:



• Molecule 27: 26S proteasome non-ATPase regulatory subunit 1

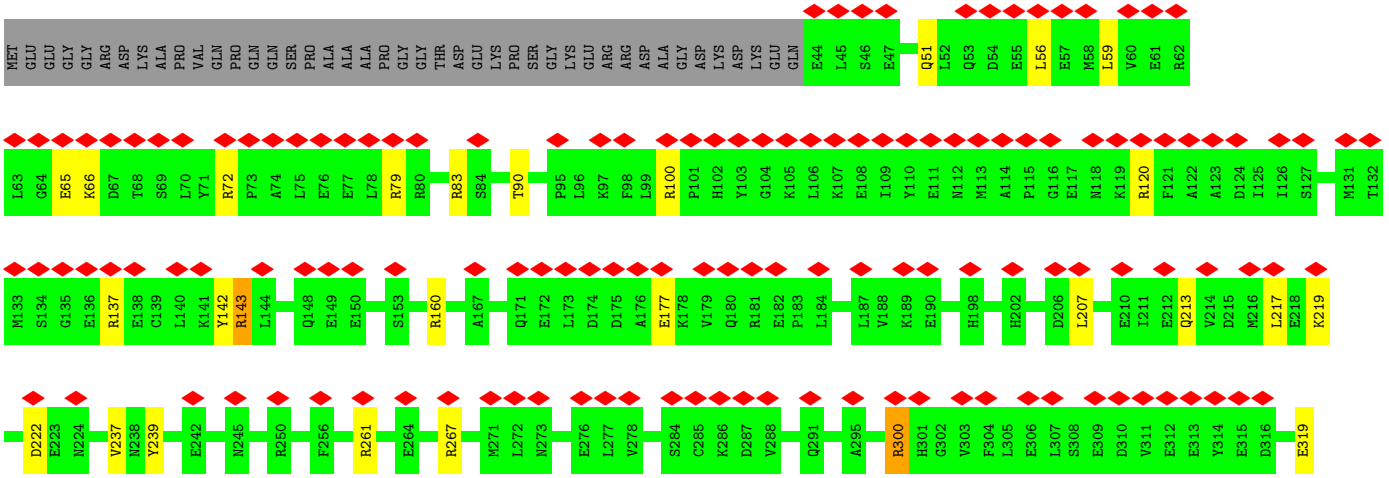
Chain U:

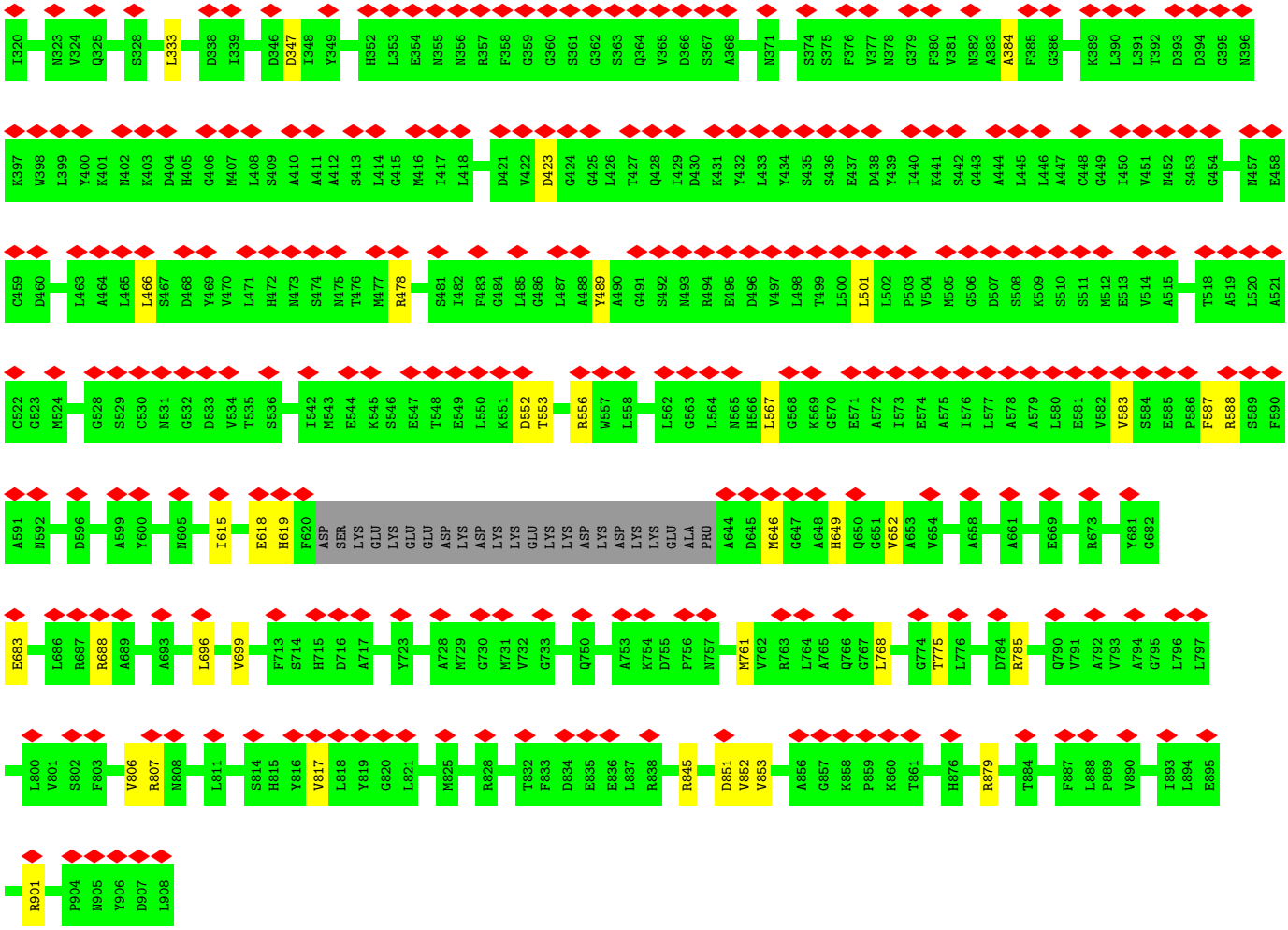




• Molecule 28: 26S proteasome non-ATPase regulatory subunit 2

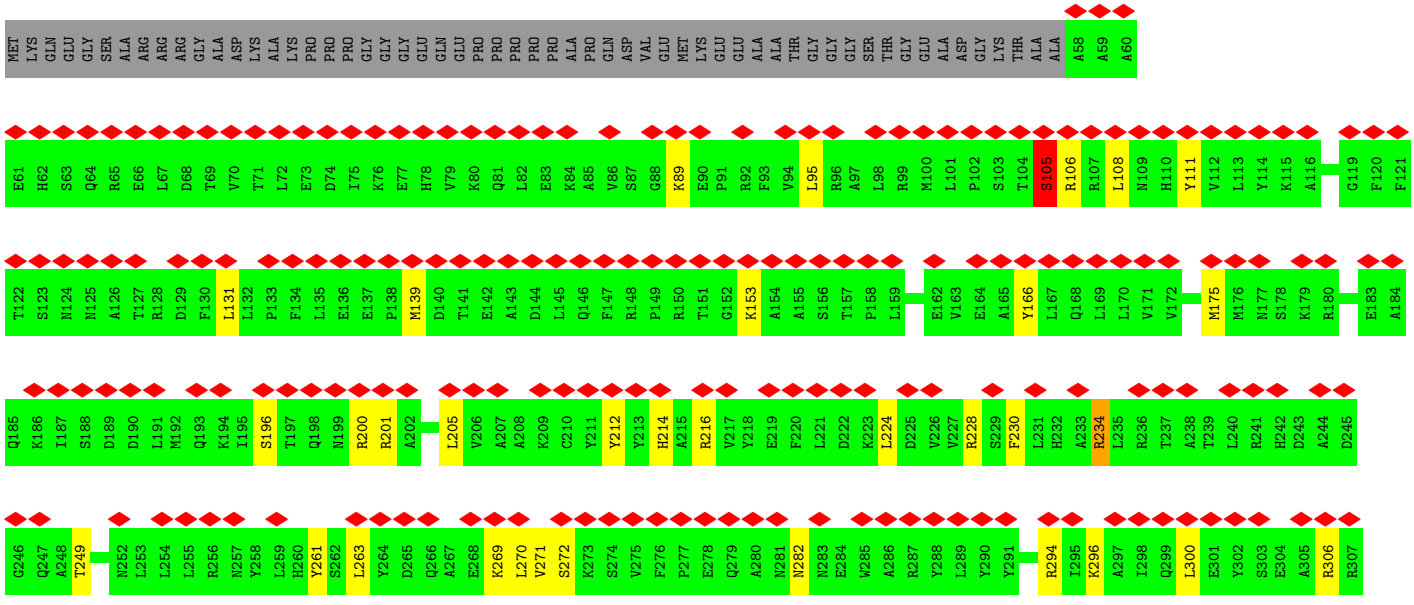
Chain f:





• Molecule 29: 26S proteasome non-ATPase regulatory subunit 3

Chain V:




T308 M309 T310 N311 A312 L313 R314 P317 Q318 H319 T320 H329 L332 E336 L337 L338 L339 G340 E341 I342 P343 D344 R345 L346 Q347 F348 R349 Q350 P351 S352 L353 K354 R355 S356 L357 Y360 F361 L362 L363 T364 Q365 A366 V367 R368 T369 G370 N371 L372 A373 K374 F375 N376 Q377 D380
Q381 F382 G383 E384 K385 F386 Q387 A388 D389 G390 T391 Y392 T393 L394 I395 I396 R397 L398 R399 H400 N401 V402 I403 K404 T405 G406 V407 R408 M409 I410 S411 L412 R416 I417 A420 Q424 K425 L426 Q427 L428 D429 S430 P431 E432 D433 A434 E435 F436 I437 V438 A439 K440 A441 I442 R443 D444 G445
V446 I447 E448 I451 N452 H453 E454 K455 G456 Y457 V458 Q459 S460 K461 E462 M463 I464 D465 I466 Y467 R470 S490 R495 F496 P497 PRO LYS SER TYR ASN LYS ASP LEU GLU SER ALA GLU GLU ARG ARG GLU ARG GLU GLN GLN ASP LEU GLU PHE ALA LYS GLU MET ALA GLU ASP
ASP ASP ASP SER PHE PRO

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	15623	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	50	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	1700	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.854	Depositor
Minimum map value	-0.598	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.036	Depositor
Recommended contour level	0.16	Depositor
Map size (Å)	356.32, 356.32, 356.32	wwPDB
Map dimensions	340, 340, 340	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.048, 1.048, 1.048	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: MG, 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	A	0.63	0/3218	1.09	18/4343 (0.4%)
2	C	0.52	0/2964	0.84	7/3985 (0.2%)
3	D	0.60	0/2949	0.97	10/3979 (0.3%)
4	G	0.64	0/1853	0.99	7/2515 (0.3%)
5	H	0.62	0/1740	1.01	10/2365 (0.4%)
6	I	0.64	0/1925	1.01	4/2606 (0.2%)
7	J	1.52	2/1723 (0.1%)	1.19	17/2351 (0.7%)
8	L	0.65	0/1880	1.06	8/2545 (0.3%)
9	M	0.67	0/1891	1.08	7/2552 (0.3%)
10	O	0.67	0/359	1.04	3/483 (0.6%)
11	W	0.63	0/3618	1.02	15/4868 (0.3%)
12	X	0.62	0/3038	1.01	12/4095 (0.3%)
13	Y	0.69	0/3185	1.04	14/4290 (0.3%)
14	a	0.64	0/3053	1.08	10/4133 (0.2%)
15	b	0.58	0/1478	1.06	4/2001 (0.2%)
16	d	0.69	0/2234	1.01	8/3018 (0.3%)
17	g	0.64	0/778	1.05	3/1041 (0.3%)
18	u	0.67	0/1403	1.01	2/1892 (0.1%)
20	B	0.58	0/3003	0.96	8/4049 (0.2%)
21	Z	0.59	0/2324	1.00	6/3150 (0.2%)
22	E	0.60	0/3026	1.00	12/4073 (0.3%)
23	F	0.59	0/2950	1.02	13/3975 (0.3%)
24	c	0.72	1/2242 (0.0%)	1.03	8/3029 (0.3%)
25	K	0.60	0/1746	1.00	5/2364 (0.2%)
26	e	0.68	0/357	1.04	0/483
27	U	0.61	0/6647	1.07	28/8988 (0.3%)
28	f	0.62	0/6623	1.03	21/8965 (0.2%)
29	V	0.72	3/3649 (0.1%)	1.02	12/4916 (0.2%)
All	All	0.67	6/71856 (0.0%)	1.03	272/97054 (0.3%)

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
1	A	0	5
2	C	0	3
3	D	0	4
4	G	0	1
6	I	0	2
7	J	0	3
8	L	0	5
11	W	0	5
12	X	0	1
13	Y	0	3
14	a	0	4
15	b	0	1
16	d	0	1
18	u	0	1
20	B	0	1
21	Z	0	1
22	E	0	1
23	F	0	1
24	c	0	4
27	U	0	1
28	f	0	3
29	V	0	4
All	All	0	55

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	J	71	MET	CA-C	56.46	2.99	1.52
29	V	105	SER	C-N	-22.15	0.83	1.34
24	c	196	LEU	C-N	20.09	1.80	1.34
29	V	108	LEU	C-N	-7.32	1.17	1.34
29	V	89	LYS	C-N	-6.78	1.18	1.34
7	J	71	MET	N-CA	5.60	1.57	1.46

All (272) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
29	V	105	SER	O-C-N	-20.09	90.56	122.70
22	E	115	VAL	CA-CB-CG1	15.94	134.81	110.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
24	c	163	ILE	O-C-N	-13.40	101.26	122.70
7	J	71	MET	O-C-N	-12.06	103.41	122.70
20	B	272	ARG	NE-CZ-NH2	11.34	125.97	120.30
24	c	161	ARG	NE-CZ-NH2	11.19	125.90	120.30
7	J	71	MET	N-CA-CB	-10.82	91.12	110.60
15	b	25	ARG	NE-CZ-NH2	10.56	125.58	120.30
1	A	403	ILE	CA-CB-CG1	10.27	130.51	111.00
24	c	126	ASP	CB-CG-OD1	10.04	127.34	118.30
1	A	239	ARG	NE-CZ-NH2	9.56	125.08	120.30
15	b	100	ARG	NE-CZ-NH2	9.36	124.98	120.30
22	E	213	ARG	NE-CZ-NH2	9.20	124.90	120.30
17	g	113	ARG	NE-CZ-NH2	9.14	124.87	120.30
27	U	616	ARG	NE-CZ-NH2	9.06	124.83	120.30
7	J	71	MET	CB-CA-C	8.91	128.23	110.40
23	F	171	ARG	NE-CZ-NH2	8.87	124.73	120.30
3	D	342	ARG	NE-CZ-NH2	8.86	124.73	120.30
9	M	187	ARG	NE-CZ-NH2	8.71	124.66	120.30
9	M	99	ARG	NE-CZ-NH2	8.67	124.63	120.30
1	A	297	ARG	NE-CZ-NH2	8.66	124.63	120.30
11	W	201	ARG	NE-CZ-NH2	8.63	124.61	120.30
1	A	255	ARG	NE-CZ-NH2	8.60	124.60	120.30
1	A	351	ARG	NE-CZ-NH2	8.58	124.59	120.30
22	E	97	ARG	NE-CZ-NH2	8.52	124.56	120.30
8	L	125	ARG	NE-CZ-NH2	8.45	124.53	120.30
27	U	649	ARG	NE-CZ-NH2	8.44	124.52	120.30
20	B	349	ARG	NE-CZ-NH2	8.41	124.51	120.30
27	U	572	ARG	NE-CZ-NH2	8.40	124.50	120.30
10	O	72	ARG	NE-CZ-NH2	8.19	124.39	120.30
1	A	333	ARG	NE-CZ-NH2	7.94	124.27	120.30
23	F	350	ARG	NE-CZ-NH2	7.87	124.23	120.30
27	U	710	ARG	NE-CZ-NH2	7.72	124.16	120.30
29	V	306	ARG	NE-CZ-NH2	7.71	124.15	120.30
11	W	142	ARG	NE-CZ-NH2	7.70	124.15	120.30
8	L	51	ARG	NE-CZ-NH2	7.65	124.12	120.30
2	C	60	ARG	NE-CZ-NH2	7.56	124.08	120.30
1	A	258	ARG	NE-CZ-NH1	-7.55	116.52	120.30
11	W	129	ARG	NE-CZ-NH2	7.55	124.07	120.30
28	f	588	ARG	NE-CZ-NH2	7.54	124.07	120.30
13	Y	38	ARG	NE-CZ-NH2	7.51	124.06	120.30
1	A	339	ARG	NE-CZ-NH2	7.50	124.05	120.30
27	U	199	ARG	NE-CZ-NH2	7.46	124.03	120.30
29	V	216	ARG	NE-CZ-NH2	7.43	124.02	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
11	W	93	ARG	NE-CZ-NH2	7.41	124.00	120.30
8	L	174	ARG	NE-CZ-NH2	7.39	124.00	120.30
12	X	122	ARG	NE-CZ-NH2	7.37	123.99	120.30
28	f	137	ARG	NE-CZ-NH2	7.35	123.98	120.30
8	L	169	ARG	NE-CZ-NH2	7.35	123.98	120.30
23	F	269	ARG	NE-CZ-NH2	7.35	123.97	120.30
28	f	845	ARG	NE-CZ-NH2	7.34	123.97	120.30
13	Y	233	ARG	NE-CZ-NH2	7.31	123.96	120.30
4	G	228	ARG	NE-CZ-NH2	7.24	123.92	120.30
12	X	194	ARG	NE-CZ-NH2	7.22	123.91	120.30
25	K	20	ARG	NE-CZ-NH2	7.21	123.91	120.30
12	X	90	ARG	NE-CZ-NH2	7.20	123.90	120.30
3	D	287	ARG	NE-CZ-NH2	7.20	123.90	120.30
12	X	132	ARG	NE-CZ-NH2	7.18	123.89	120.30
24	c	161	ARG	NE-CZ-NH1	-7.17	116.72	120.30
14	a	289	ARG	NE-CZ-NH2	7.15	123.88	120.30
1	A	284	ARG	NE-CZ-NH2	7.12	123.86	120.30
14	a	178	ARG	NE-CZ-NH2	7.11	123.86	120.30
2	C	78	ARG	NE-CZ-NH2	7.11	123.86	120.30
11	W	182	ARG	NE-CZ-NH2	7.06	123.83	120.30
7	J	81	ARG	NE-CZ-NH2	7.04	123.82	120.30
5	H	84	ARG	NE-CZ-NH2	7.02	123.81	120.30
28	f	79	ARG	NE-CZ-NH2	7.00	123.80	120.30
28	f	901	ARG	NE-CZ-NH2	6.98	123.79	120.30
25	K	93	ARG	NE-CZ-NH2	6.92	123.76	120.30
3	D	326	ARG	NE-CZ-NH2	6.87	123.74	120.30
7	J	57	ARG	NE-CZ-NH2	6.86	123.73	120.30
11	W	370	TYR	CB-CG-CD2	-6.85	116.89	121.00
29	V	349	ARG	NE-CZ-NH2	6.84	123.72	120.30
13	Y	137	ARG	NE-CZ-NH2	6.84	123.72	120.30
29	V	105	SER	CA-C-N	6.83	132.24	117.20
22	E	115	VAL	N-CA-CB	-6.81	96.52	111.50
9	M	92	ARG	NE-CZ-NH2	6.80	123.70	120.30
28	f	261	ARG	NE-CZ-NH2	6.78	123.69	120.30
21	Z	209	ARG	NE-CZ-NH2	6.77	123.68	120.30
1	A	323	ARG	NE-CZ-NH2	6.76	123.68	120.30
14	a	270	ARG	NE-CZ-NH2	6.75	123.68	120.30
16	d	268	ARG	NE-CZ-NH2	6.75	123.67	120.30
7	J	70	CYS	C-N-CA	6.71	138.47	121.70
28	f	785	ARG	NE-CZ-NH2	6.70	123.65	120.30
28	f	879	ARG	NE-CZ-NH2	6.70	123.65	120.30
7	J	60	ARG	NE-CZ-NH2	6.68	123.64	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
21	Z	34	ARG	NE-CZ-NH2	6.68	123.64	120.30
11	W	357	ARG	NE-CZ-NH2	6.67	123.64	120.30
20	B	278	ALA	CB-CA-C	6.67	120.11	110.10
2	C	44	ARG	NE-CZ-NH2	6.63	123.61	120.30
3	D	200	ARG	NE-CZ-NH2	6.59	123.59	120.30
14	a	196	ARG	NE-CZ-NH2	6.58	123.59	120.30
25	K	168	ARG	NE-CZ-NH2	6.57	123.58	120.30
13	Y	159	ARG	NE-CZ-NH2	6.57	123.58	120.30
10	O	75	ARG	NE-CZ-NH2	6.56	123.58	120.30
24	c	126	ASP	OD1-CG-OD2	-6.56	110.84	123.30
13	Y	293	ARG	NE-CZ-NH1	6.56	123.58	120.30
20	B	333	ARG	NE-CZ-NH2	6.55	123.57	120.30
4	G	93	ARG	NE-CZ-NH2	6.54	123.57	120.30
5	H	128	ARG	NE-CZ-NH2	6.52	123.56	120.30
28	f	688	ARG	NE-CZ-NH2	6.51	123.56	120.30
27	U	395	ARG	NE-CZ-NH2	6.51	123.56	120.30
12	X	126	ARG	NE-CZ-NH2	6.49	123.54	120.30
7	J	36	ARG	NE-CZ-NH2	6.46	123.53	120.30
7	J	71	MET	CA-CB-CG	6.46	124.29	113.30
13	Y	379	ARG	NE-CZ-NH2	6.46	123.53	120.30
29	V	416	ARG	NE-CZ-NH2	6.46	123.53	120.30
27	U	579	ARG	NE-CZ-NH2	6.46	123.53	120.30
12	X	142	ARG	NE-CZ-NH2	6.45	123.53	120.30
12	X	282	ARG	NE-CZ-NH2	6.44	123.52	120.30
27	U	615	ARG	NE-CZ-NH2	6.43	123.52	120.30
28	f	807	ARG	NE-CZ-NH2	6.42	123.51	120.30
3	D	81	ARG	NE-CZ-NH2	6.41	123.51	120.30
21	Z	283	ARG	NE-CZ-NH2	6.41	123.50	120.30
8	L	89	ARG	NE-CZ-NH2	6.40	123.50	120.30
11	W	370	TYR	C-N-CA	6.40	137.71	121.70
27	U	344	ARG	NE-CZ-NH2	6.38	123.49	120.30
1	A	239	ARG	NE-CZ-NH1	-6.38	117.11	120.30
11	W	123	ARG	NE-CZ-NH2	6.37	123.48	120.30
23	F	362	ARG	NE-CZ-NH2	6.34	123.47	120.30
23	F	279	ALA	CB-CA-C	6.33	119.59	110.10
6	I	17	ARG	NE-CZ-NH2	6.33	123.46	120.30
14	a	284	ARG	NE-CZ-NH2	6.29	123.44	120.30
27	U	546	ARG	NE-CZ-NH2	6.27	123.44	120.30
2	C	57	ARG	NE-CZ-NH2	6.26	123.43	120.30
7	J	124	ARG	NE-CZ-NH2	6.24	123.42	120.30
5	H	57	TYR	CB-CG-CD2	-6.24	117.26	121.00
1	A	258	ARG	NE-CZ-NH2	6.21	123.40	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	J	125	ARG	NE-CZ-NH2	6.20	123.40	120.30
3	D	252	ARG	NE-CZ-NH2	6.20	123.40	120.30
16	d	289	ARG	NE-CZ-NH2	6.20	123.40	120.30
28	f	143	ARG	NE-CZ-NH2	6.18	123.39	120.30
14	a	24	ARG	NE-CZ-NH2	6.15	123.37	120.30
29	V	408	ARG	NE-CZ-NH2	6.14	123.37	120.30
29	V	470	ARG	NE-CZ-NH2	6.13	123.36	120.30
29	V	234	ARG	NE-CZ-NH2	6.10	123.35	120.30
27	U	601	ARG	NE-CZ-NH2	6.09	123.35	120.30
16	d	166	ARG	NE-CZ-NH2	6.09	123.34	120.30
15	b	108	ARG	NE-CZ-NH2	6.08	123.34	120.30
1	A	239	ARG	CD-NE-CZ	6.08	132.11	123.60
1	A	400	ARG	NE-CZ-NH2	6.08	123.34	120.30
6	I	91	ARG	NE-CZ-NH2	6.08	123.34	120.30
17	g	97	ARG	NE-CZ-NH2	6.08	123.34	120.30
25	K	53	ARG	NE-CZ-NH2	6.08	123.34	120.30
20	B	249	ARG	NE-CZ-NH2	6.06	123.33	120.30
6	I	23	TYR	CB-CG-CD2	-6.06	117.36	121.00
28	f	478	ARG	NE-CZ-NH2	6.04	123.32	120.30
27	U	751	ARG	NE-CZ-NH2	6.01	123.31	120.30
6	I	96	ARG	NE-CZ-NH2	6.01	123.30	120.30
3	D	274	ARG	NE-CZ-NH2	6.00	123.30	120.30
8	L	82	ARG	NE-CZ-NH2	6.00	123.30	120.30
18	u	151	ARG	NE-CZ-NH2	5.99	123.30	120.30
4	G	117	ARG	NE-CZ-NH2	5.99	123.30	120.30
11	W	27	ARG	NE-CZ-NH2	5.97	123.29	120.30
13	Y	176	ARG	NE-CZ-NH2	5.94	123.27	120.30
23	F	61	ARG	NE-CZ-NH2	5.93	123.27	120.30
27	U	600	ARG	NE-CZ-NH2	5.91	123.26	120.30
13	Y	300	ARG	NE-CZ-NH2	5.91	123.25	120.30
7	J	95	ARG	NE-CZ-NH2	5.91	123.25	120.30
5	H	113	ARG	NE-CZ-NH2	5.89	123.25	120.30
27	U	616	ARG	NE-CZ-NH1	-5.86	117.37	120.30
28	f	72	ARG	NE-CZ-NH2	5.86	123.23	120.30
28	f	83	ARG	NE-CZ-NH2	5.84	123.22	120.30
11	W	94	ARG	NE-CZ-NH2	5.82	123.21	120.30
16	d	118	ARG	NE-CZ-NH2	5.82	123.21	120.30
27	U	387	ARG	NE-CZ-NH2	5.79	123.20	120.30
2	C	113	ARG	NE-CZ-NH2	5.78	123.19	120.30
4	G	132	ARG	NE-CZ-NH2	5.76	123.18	120.30
17	g	110	ARG	NE-CZ-NH2	5.76	123.18	120.30
23	F	386	ARG	NE-CZ-NH2	5.75	123.18	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
13	Y	83	ARG	NE-CZ-NH2	5.75	123.17	120.30
20	B	363	ARG	NE-CZ-NH2	5.75	123.17	120.30
28	f	267	ARG	NE-CZ-NH2	5.75	123.17	120.30
22	E	233	ASP	CB-CG-OD1	5.73	123.46	118.30
29	V	108	LEU	O-C-N	-5.72	113.55	122.70
12	X	297	ARG	NE-CZ-NH2	5.69	123.15	120.30
2	C	326	LEU	CA-CB-CG	5.69	128.38	115.30
23	F	364	ARG	NE-CZ-NH2	5.68	123.14	120.30
29	V	294	ARG	NE-CZ-NH2	5.67	123.14	120.30
13	Y	101	ARG	NE-CZ-NH2	5.67	123.13	120.30
11	W	316	ARG	NE-CZ-NH2	5.65	123.12	120.30
4	G	72	ILE	C-N-CA	5.64	135.81	121.70
5	H	91	ARG	NE-CZ-NH2	5.63	123.12	120.30
12	X	137	TYR	CB-CG-CD2	-5.63	117.62	121.00
5	H	220	ARG	NE-CZ-NH2	5.63	123.11	120.30
25	K	135	ARG	NE-CZ-NH2	5.63	123.11	120.30
9	M	25	TYR	CB-CG-CD2	-5.61	117.63	121.00
22	E	281	ARG	NE-CZ-NH2	5.59	123.10	120.30
22	E	356	ARG	NE-CZ-NH2	5.58	123.09	120.30
29	V	228	ARG	NE-CZ-NH2	5.57	123.08	120.30
20	B	268	ARG	NE-CZ-NH2	5.56	123.08	120.30
13	Y	312	ARG	NE-CZ-NH2	5.55	123.07	120.30
28	f	100	ARG	NE-CZ-NH2	5.55	123.07	120.30
27	U	559	ARG	NE-CZ-NH2	5.55	123.07	120.30
7	J	88	ARG	NE-CZ-NH2	5.54	123.07	120.30
14	a	154	ARG	NE-CZ-NH2	5.54	123.07	120.30
14	a	101	ARG	NE-CZ-NH2	5.52	123.06	120.30
21	Z	190	ARG	NE-CZ-NH2	5.51	123.06	120.30
11	W	372	ARG	NE-CZ-NH2	5.51	123.05	120.30
27	U	88	PHE	CB-CG-CD2	-5.51	116.94	120.80
1	A	366	ARG	NE-CZ-NH2	5.50	123.05	120.30
4	G	88	ARG	NE-CZ-NH2	5.50	123.05	120.30
22	E	344	ARG	NE-CZ-NH2	5.49	123.05	120.30
24	c	196	LEU	O-C-N	-5.49	113.92	122.70
13	Y	358	ARG	NE-CZ-NH2	5.47	123.04	120.30
16	d	342	TYR	CB-CG-CD2	-5.47	117.72	121.00
14	a	226	ARG	NE-CZ-NH2	5.47	123.03	120.30
5	H	89	ARG	NE-CZ-NH2	5.46	123.03	120.30
20	B	103	ARG	NE-CZ-NH2	5.45	123.02	120.30
28	f	142	TYR	CB-CG-CD2	-5.44	117.74	121.00
13	Y	146	ARG	NE-CZ-NH2	5.43	123.01	120.30
1	A	139	ARG	NE-CZ-NH2	5.41	123.00	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
28	f	160	ARG	NE-CZ-NH2	5.40	123.00	120.30
22	E	79	TYR	CB-CA-C	-5.40	99.59	110.40
27	U	474	ARG	NE-CZ-NH2	5.40	123.00	120.30
13	Y	267	ARG	NE-CZ-NH2	5.38	122.99	120.30
28	f	120	ARG	NE-CZ-NH2	5.38	122.99	120.30
27	U	361	ARG	NE-CZ-NH2	5.37	122.99	120.30
16	d	204	ARG	NE-CZ-NH2	5.37	122.98	120.30
21	Z	177	ARG	NE-CZ-NH2	5.36	122.98	120.30
9	M	85	ARG	NE-CZ-NH2	5.31	122.95	120.30
27	U	129	ARG	NE-CZ-NH2	5.31	122.95	120.30
3	D	114	ARG	NE-CZ-NH1	5.30	122.95	120.30
28	f	556	ARG	NE-CZ-NH2	5.29	122.94	120.30
22	E	85	ARG	NE-CZ-NH2	5.28	122.94	120.30
23	F	409	ARG	NE-CZ-NH2	5.27	122.94	120.30
9	M	114	ARG	NE-CZ-NH2	5.27	122.94	120.30
23	F	171	ARG	NH1-CZ-NH2	-5.26	113.61	119.40
27	U	88	PHE	CB-CG-CD1	5.24	124.47	120.80
12	X	233	TYR	CB-CG-CD2	-5.24	117.86	121.00
24	c	279	ASP	CB-CA-C	5.24	120.88	110.40
27	U	57	ARG	NE-CZ-NH2	5.23	122.91	120.30
18	u	259	ARG	NE-CZ-NH2	5.22	122.91	120.30
1	A	188	ARG	NE-CZ-NH2	5.22	122.91	120.30
23	F	324	THR	CA-CB-CG2	5.22	119.71	112.40
2	C	117	ARG	NE-CZ-NH2	5.21	122.91	120.30
21	Z	62	ASP	CB-CG-OD2	5.21	122.99	118.30
3	D	114	ARG	NE-CZ-NH2	5.19	122.89	120.30
5	H	69	THR	N-CA-CB	5.19	120.15	110.30
3	D	140	VAL	CG1-CB-CG2	-5.18	102.61	110.90
7	J	71	MET	CA-C-N	5.18	128.60	117.20
5	H	68	ILE	C-N-CA	5.17	134.62	121.70
4	G	93	ARG	NE-CZ-NH1	-5.15	117.72	120.30
23	F	371	ARG	NE-CZ-NH2	5.15	122.88	120.30
27	U	502	TYR	CB-CG-CD2	-5.15	117.91	121.00
16	d	214	ARG	NE-CZ-NH2	5.14	122.87	120.30
22	E	372	ARG	NE-CZ-NH2	5.14	122.87	120.30
27	U	783	TYR	CB-CG-CD2	-5.14	117.92	121.00
7	J	21	TYR	CB-CG-CD2	-5.14	117.92	121.00
24	c	255	TYR	CB-CG-CD2	-5.13	117.92	121.00
23	F	410	ARG	NE-CZ-NH2	5.13	122.86	120.30
15	b	91	ARG	NE-CZ-NH2	5.12	122.86	120.30
14	a	352	ARG	NE-CZ-NH2	5.12	122.86	120.30
27	U	649	ARG	NE-CZ-NH1	-5.12	117.74	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
27	U	471	ASP	N-CA-CB	-5.12	101.38	110.60
27	U	194	ARG	NE-CZ-NH2	5.11	122.86	120.30
5	H	98	TYR	CB-CG-CD2	-5.11	117.94	121.00
10	O	81	ARG	NE-CZ-NH2	5.10	122.85	120.30
16	d	158	ARG	NE-CZ-NH2	5.10	122.85	120.30
28	f	300	ARG	NE-CZ-NH2	5.10	122.85	120.30
8	L	125	ARG	NH1-CZ-NH2	-5.10	113.79	119.40
22	E	115	VAL	CG1-CB-CG2	-5.09	102.76	110.90
7	J	71	MET	N-CA-C	5.06	124.65	111.00
1	A	360	ARG	NE-CZ-NH2	5.05	122.82	120.30
27	U	88	PHE	CA-CB-CG	5.05	126.01	113.90
8	L	126	ARG	NE-CZ-NH1	5.04	122.82	120.30
12	X	314	ARG	NE-CZ-NH2	5.04	122.82	120.30
12	X	337	ARG	NE-CZ-NH2	5.03	122.81	120.30
11	W	39	ARG	NE-CZ-NH2	5.01	122.81	120.30
11	W	213	PHE	CB-CG-CD2	-5.01	117.29	120.80
9	M	19	ARG	NE-CZ-NH2	5.01	122.80	120.30
7	J	38	ARG	NE-CZ-NH2	5.00	122.80	120.30

There are no chirality outliers.

All (55) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	111	TYR	Sidechain
1	A	258	ARG	Sidechain
1	A	284	ARG	Sidechain
1	A	323	ARG	Sidechain
1	A	333	ARG	Sidechain
20	B	349	ARG	Sidechain
2	C	242	ALA	Peptide
2	C	57	ARG	Sidechain
2	C	77	VAL	Peptide
3	D	140	VAL	Mainchain
3	D	274	ARG	Sidechain
3	D	329	ARG	Sidechain
3	D	363	TYR	Sidechain
22	E	213	ARG	Sidechain
23	F	86	LEU	Peptide
4	G	96	TYR	Sidechain
6	I	179	TYR	Sidechain
6	I	48	GLU	Mainchain
7	J	110	TYR	Sidechain

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Mol	Chain	Res	Type	Group
7	J	145	TYR	Sidechain
7	J	81	ARG	Sidechain
8	L	126	ARG	Sidechain
8	L	137	TYR	Sidechain
8	L	153	TYR	Sidechain
8	L	171	TYR	Sidechain
8	L	221	PHE	Sidechain
27	U	34	PHE	Sidechain
29	V	105	SER	Mainchain
29	V	212	TYR	Sidechain
29	V	261	TYR	Sidechain
29	V	360	TYR	Sidechain
11	W	137	TYR	Sidechain
11	W	248	ARG	Sidechain
11	W	324	TYR	Sidechain
11	W	357	ARG	Sidechain
11	W	372	ARG	Sidechain
12	X	282	ARG	Sidechain
13	Y	128	TYR	Sidechain
13	Y	312	ARG	Sidechain
13	Y	32	ARG	Sidechain
21	Z	209	ARG	Sidechain
14	a	156	TYR	Sidechain
14	a	226	ARG	Sidechain
14	a	270	ARG	Sidechain
14	a	29	TYR	Sidechain
15	b	25	ARG	Sidechain
24	c	161	ARG	Mainchain
24	c	163	ILE	Mainchain
24	c	255	TYR	Sidechain
24	c	65	TYR	Sidechain
16	d	344	ARG	Sidechain
28	f	239	TYR	Sidechain
28	f	489	TYR	Sidechain
28	f	587	PHE	Sidechain
18	u	178	TYR	Sidechain

5.2 Too-close contacts (i)

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

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	402/433 (93%)	352 (88%)	29 (7%)	21 (5%)	1 15
2	C	362/406 (89%)	275 (76%)	56 (16%)	31 (9%)	0 7
3	D	361/418 (86%)	247 (68%)	82 (23%)	32 (9%)	0 7
4	G	237/246 (96%)	218 (92%)	16 (7%)	3 (1%)	10 41
5	H	226/234 (97%)	210 (93%)	14 (6%)	2 (1%)	14 48
6	I	246/261 (94%)	223 (91%)	14 (6%)	9 (4%)	2 22
7	J	236/248 (95%)	214 (91%)	17 (7%)	5 (2%)	5 32
8	L	235/263 (89%)	216 (92%)	17 (7%)	2 (1%)	14 48
9	M	238/255 (93%)	214 (90%)	17 (7%)	7 (3%)	3 26
10	O	42/277 (15%)	42 (100%)	0	0	100 100
11	W	436/456 (96%)	427 (98%)	6 (1%)	3 (1%)	19 53
12	X	376/422 (89%)	355 (94%)	18 (5%)	3 (1%)	16 50
13	Y	378/389 (97%)	368 (97%)	9 (2%)	1 (0%)	37 67
14	a	371/376 (99%)	333 (90%)	27 (7%)	11 (3%)	3 26
15	b	189/377 (50%)	169 (89%)	14 (7%)	6 (3%)	3 25
16	d	267/350 (76%)	250 (94%)	15 (6%)	2 (1%)	19 53
17	g	93/601 (16%)	87 (94%)	6 (6%)	0	100 100
18	u	170/289 (59%)	151 (89%)	16 (9%)	3 (2%)	7 35
20	B	371/440 (84%)	307 (83%)	50 (14%)	14 (4%)	2 21
21	Z	284/324 (88%)	254 (89%)	30 (11%)	0	100 100
22	E	373/389 (96%)	310 (83%)	47 (13%)	16 (4%)	2 19
23	F	365/439 (83%)	306 (84%)	42 (12%)	17 (5%)	2 17
24	c	275/424 (65%)	230 (84%)	38 (14%)	7 (2%)	4 29
25	K	223/241 (92%)	199 (89%)	20 (9%)	4 (2%)	7 35
26	e	37/70 (53%)	32 (86%)	5 (14%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
27	U	828/953 (87%)	755 (91%)	56 (7%)	17 (2%)	5 32
28	f	838/908 (92%)	772 (92%)	55 (7%)	11 (1%)	10 41
29	V	426/534 (80%)	388 (91%)	28 (7%)	10 (2%)	5 31
All	All	8885/11023 (81%)	7904 (89%)	744 (8%)	237 (3%)	6 28

All (237) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	36	TYR
1	A	39	SER
2	C	80	MET
2	C	91	PRO
2	C	121	TYR
2	C	233	GLU
2	C	234	LEU
2	C	236	VAL
2	C	315	ILE
2	C	329	LEU
2	C	337	ASN
2	C	376	VAL
2	C	395	SER
2	C	396	GLU
3	D	40	LEU
3	D	146	GLU
3	D	156	SER
3	D	214	MET
3	D	269	ALA
3	D	270	ILE
3	D	317	LEU
3	D	407	ILE
6	I	33	THR
6	I	221	GLY
14	a	69	HIS
14	a	301	LYS
14	a	327	VAL
15	b	186	SER
20	B	53	THR
20	B	278	ALA
20	B	317	ASP
20	B	412	MET
22	E	66	GLU

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Mol	Chain	Res	Type
22	E	73	ALA
22	E	84	ARG
22	E	149	ILE
22	E	251	ARG
22	E	269	THR
22	E	296	ASP
23	F	85	THR
23	F	89	LEU
23	F	258	GLN
23	F	279	ALA
23	F	339	ASP
24	c	62	VAL
24	c	262	GLU
24	c	279	ASP
27	U	145	HIS
28	f	699	VAL
29	V	106	ARG
29	V	196	SER
29	V	495	ARG
29	V	496	PHE
1	A	30	ILE
1	A	100	LYS
1	A	110	LYS
1	A	138	MET
1	A	378	PRO
2	C	198	LEU
2	C	330	LYS
2	C	343	ASN
2	C	388	ALA
2	C	394	ASP
3	D	141	ASP
3	D	208	PRO
3	D	212	LYS
3	D	239	TYR
3	D	266	GLU
3	D	313	ARG
3	D	354	LEU
4	G	170	VAL
5	H	70	LYS
5	H	124	SER
6	I	31	ALA
6	I	182	GLY

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Mol	Chain	Res	Type
6	I	206	LEU
7	J	4	ASP
7	J	52	LYS
8	L	139	ASP
9	M	60	GLU
12	X	393	VAL
14	a	166	ILE
16	d	332	SER
18	u	278	PHE
20	B	57	GLN
20	B	79	ILE
20	B	178	LYS
22	E	157	GLU
22	E	265	ASP
22	E	385	ASP
23	F	95	GLU
23	F	294	LYS
23	F	319	GLY
23	F	324	THR
23	F	343	LEU
24	c	29	GLU
25	K	208	GLU
27	U	84	ALA
27	U	89	ASN
27	U	521	LEU
27	U	814	PRO
28	f	219	LYS
28	f	806	VAL
29	V	427	GLN
1	A	106	SER
1	A	139	ARG
1	A	310	ASP
1	A	366	ARG
1	A	379	ASN
2	C	122	THR
2	C	380	GLN
3	D	216	ALA
3	D	272	THR
3	D	389	GLU
3	D	390	ASN
4	G	171	LYS
6	I	51	ASN

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Mol	Chain	Res	Type
6	I	184	MET
6	I	220	ASN
9	M	201	HIS
9	M	203	GLU
11	W	342	GLY
12	X	394	ASP
14	a	16	PRO
14	a	143	ASN
14	a	149	THR
14	a	187	ASP
15	b	23	PRO
15	b	99	HIS
20	B	292	THR
22	E	116	ASP
22	E	270	LEU
23	F	129	ARG
23	F	209	LYS
24	c	263	ASP
27	U	171	ASN
27	U	242	LEU
27	U	395	ARG
27	U	416	GLU
27	U	812	ALA
28	f	384	ALA
28	f	567	LEU
28	f	852	VAL
29	V	105	SER
29	V	272	SER
1	A	24	ALA
1	A	80	LEU
1	A	167	GLU
2	C	130	LYS
2	C	135	VAL
2	C	196	LYS
3	D	107	THR
3	D	161	ASP
3	D	334	PRO
3	D	403	TYR
7	J	183	THR
9	M	167	LYS
12	X	222	GLU
14	a	286	ALA

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Mol	Chain	Res	Type
18	u	279	LYS
20	B	240	ALA
20	B	245	ALA
23	F	245	LYS
24	c	138	GLU
27	U	362	ASN
27	U	454	GLY
27	U	807	LYS
28	f	775	THR
28	f	851	ASP
29	V	201	ARG
1	A	67	GLU
1	A	69	ASP
1	A	79	ASP
1	A	269	ALA
1	A	292	ASP
2	C	103	ILE
2	C	246	ILE
2	C	341	GLY
2	C	355	SER
2	C	381	GLU
3	D	143	LEU
3	D	206	GLY
3	D	255	LYS
3	D	300	ASP
3	D	352	MET
7	J	73	PHE
7	J	179	GLU
8	L	8	ASN
11	W	19	ASP
15	b	56	ASN
15	b	79	GLN
15	b	148	VAL
16	d	326	GLU
18	u	119	ILE
20	B	177	GLU
20	B	182	GLU
22	E	77	PRO
22	E	249	ALA
23	F	180	ARG
25	K	173	ALA
25	K	207	GLU

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Mol	Chain	Res	Type
27	U	4	SER
27	U	397	THR
28	f	90	THR
29	V	282	ASN
2	C	378	VAL
3	D	207	PRO
4	G	45	LYS
6	I	185	THR
9	M	8	ASP
9	M	168	ALA
11	W	169	LEU
13	Y	388	ASN
14	a	168	ASN
23	F	346	GLY
23	F	436	GLN
25	K	23	GLN
27	U	120	GLU
27	U	697	GLN
29	V	205	LEU
14	a	130	VAL
20	B	176	VAL
22	E	318	GLY
23	F	87	PRO
24	c	67	VAL
20	B	180	PRO
1	A	21	PRO
2	C	362	VAL
2	C	401	ILE
9	M	20	VAL
2	C	331	ILE
3	D	228	ILE
22	E	115	VAL
28	f	652	VAL
3	D	199	PRO
3	D	219	VAL
28	f	853	VAL

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	346/372 (93%)	318 (92%)	28 (8%)	9	34
2	C	325/352 (92%)	296 (91%)	29 (9%)	8	32
3	D	319/366 (87%)	284 (89%)	35 (11%)	5	24
4	G	192/210 (91%)	183 (95%)	9 (5%)	22	50
5	H	168/191 (88%)	158 (94%)	10 (6%)	16	44
6	I	191/221 (86%)	179 (94%)	12 (6%)	15	43
7	J	152/211 (72%)	145 (95%)	7 (5%)	23	51
8	L	198/224 (88%)	195 (98%)	3 (2%)	60	77
9	M	192/212 (91%)	181 (94%)	11 (6%)	17	46
10	O	41/228 (18%)	41 (100%)	0	100	100
11	W	403/416 (97%)	380 (94%)	23 (6%)	17	46
12	X	325/362 (90%)	314 (97%)	11 (3%)	32	59
13	Y	335/344 (97%)	327 (98%)	8 (2%)	44	67
14	a	333/336 (99%)	310 (93%)	23 (7%)	13	39
15	b	167/312 (54%)	159 (95%)	8 (5%)	21	50
16	d	237/294 (81%)	227 (96%)	10 (4%)	25	54
17	g	85/527 (16%)	81 (95%)	4 (5%)	22	50
18	u	156/253 (62%)	151 (97%)	5 (3%)	34	61
20	B	332/385 (86%)	305 (92%)	27 (8%)	9	34
21	Z	257/295 (87%)	241 (94%)	16 (6%)	15	43
22	E	329/341 (96%)	311 (94%)	18 (6%)	18	47
23	F	319/379 (84%)	302 (95%)	17 (5%)	19	48
24	c	246/359 (68%)	229 (93%)	17 (7%)	13	39
25	K	186/203 (92%)	177 (95%)	9 (5%)	21	50
26	e	37/63 (59%)	36 (97%)	1 (3%)	40	64
27	U	714/816 (88%)	673 (94%)	41 (6%)	17	46
28	f	709/763 (93%)	677 (96%)	32 (4%)	23	52
29	V	388/460 (84%)	362 (93%)	26 (7%)	13	41
All	All	7682/9495 (81%)	7242 (94%)	440 (6%)	20	46

All (440) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	23	ARG
1	A	29	ASP
1	A	32	LEU
1	A	33	LEU
1	A	40	THR
1	A	46	LYS
1	A	53	GLN
1	A	56	LEU
1	A	57	LYS
1	A	62	LEU
1	A	65	ILE
1	A	66	LYS
1	A	67	GLU
1	A	70	THR
1	A	72	LEU
1	A	78	TRP
1	A	88	GLN
1	A	100	LYS
1	A	103	ASN
1	A	117	GLN
1	A	143	ASP
1	A	175	SER
1	A	232	ARG
1	A	248	LYS
1	A	366	ARG
1	A	371	GLU
1	A	403	ILE
1	A	422	LYS
2	C	21	ARG
2	C	24	TYR
2	C	28	ILE
2	C	30	GLU
2	C	37	ASP
2	C	49	ARG
2	C	83	LYS
2	C	138	MET
2	C	154	LEU
2	C	166	GLU
2	C	208	ASP
2	C	219	LEU
2	C	224	ILE
2	C	231	VAL
2	C	234	LEU

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Mol	Chain	Res	Type
2	C	245	ILE
2	C	252	ASP
2	C	293	MET
2	C	295	THR
2	C	306	LEU
2	C	313	ARG
2	C	340	ARG
2	C	351	MET
2	C	368	MET
2	C	371	LEU
2	C	392	GLN
2	C	397	LYS
2	C	398	ASN
2	C	399	MET
3	D	40	LEU
3	D	47	LEU
3	D	60	TYR
3	D	127	ASN
3	D	143	LEU
3	D	146	GLU
3	D	151	ILE
3	D	153	MET
3	D	157	ASP
3	D	166	ASP
3	D	188	PHE
3	D	193	GLN
3	D	196	ILE
3	D	200	ARG
3	D	205	TYR
3	D	207	PRO
3	D	227	PHE
3	D	238	LYS
3	D	245	ARG
3	D	256	GLU
3	D	266	GLU
3	D	268	ASP
3	D	312	ASN
3	D	313	ARG
3	D	328	ASP
3	D	329	ARG
3	D	330	LYS
3	D	332	GLU

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Mol	Chain	Res	Type
3	D	384	MET
3	D	390	ASN
3	D	391	ARG
3	D	393	ILE
3	D	397	LYS
3	D	404	LYS
3	D	406	VAL
4	G	66	VAL
4	G	72	ILE
4	G	86	ASP
4	G	107	TYR
4	G	160	TYR
4	G	174	GLU
4	G	183	VAL
4	G	192	GLU
4	G	211	LYS
5	H	68	ILE
5	H	74	LEU
5	H	98	TYR
5	H	102	GLN
5	H	123	GLN
5	H	147	PHE
5	H	156	PHE
5	H	177	ARG
5	H	186	ASP
5	H	219	ARG
6	I	9	THR
6	I	33	THR
6	I	38	LEU
6	I	41	ASP
6	I	48	GLU
6	I	49	ARG
6	I	56	LEU
6	I	68	LEU
6	I	69	ASN
6	I	136	TYR
6	I	187	LYS
6	I	198	ASN
7	J	43	LEU
7	J	55	ASP
7	J	60	ARG
7	J	68	ASN

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Mol	Chain	Res	Type
7	J	146	GLN
7	J	148	ASP
7	J	171	PHE
8	L	23	GLU
8	L	46	LEU
8	L	234	GLU
9	M	50	GLU
9	M	59	GLU
9	M	63	ASN
9	M	72	HIS
9	M	97	ASN
9	M	99	ARG
9	M	120	HIS
9	M	152	ASP
9	M	173	LYS
9	M	230	ASP
9	M	243	LEU
11	W	17	GLU
11	W	20	TYR
11	W	26	GLN
11	W	27	ARG
11	W	60	MET
11	W	73	MET
11	W	85	GLU
11	W	141	GLU
11	W	161	GLU
11	W	192	LEU
11	W	212	LYS
11	W	213	PHE
11	W	221	LYS
11	W	274	VAL
11	W	280	ASP
11	W	346	GLU
11	W	371	THR
11	W	372	ARG
11	W	377	ARG
11	W	416	GLN
11	W	422	ASN
11	W	450	GLU
11	W	454	ASN
12	X	76	PHE
12	X	118	LYS

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Mol	Chain	Res	Type
12	X	144	GLN
12	X	148	HIS
12	X	153	LEU
12	X	295	LYS
12	X	297	ARG
12	X	393	VAL
12	X	396	THR
12	X	397	TYR
12	X	403	THR
13	Y	50	MET
13	Y	66	ASP
13	Y	82	LYS
13	Y	83	ARG
13	Y	93	LYS
13	Y	292	TYR
13	Y	299	MET
13	Y	314	LEU
14	a	18	GLN
14	a	24	ARG
14	a	25	LEU
14	a	34	TRP
14	a	38	THR
14	a	69	HIS
14	a	79	ILE
14	a	123	LEU
14	a	127	ASP
14	a	136	GLU
14	a	137	ASP
14	a	166	ILE
14	a	190	VAL
14	a	211	PHE
14	a	226	ARG
14	a	270	ARG
14	a	276	CYS
14	a	290	GLN
14	a	325	ASP
14	a	335	TRP
14	a	339	ARG
14	a	350	LYS
14	a	363	MET
15	b	63	THR
15	b	83	LYS

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Mol	Chain	Res	Type
15	b	94	HIS
15	b	135	LYS
15	b	141	ILE
15	b	145	GLU
15	b	152	LYS
15	b	156	PHE
16	d	115	GLU
16	d	198	PHE
16	d	208	PHE
16	d	211	GLU
16	d	236	LEU
16	d	238	GLU
16	d	243	LYS
16	d	260	ILE
16	d	299	MET
16	d	326	GLU
17	g	108	THR
17	g	115	LYS
17	g	129	ILE
17	g	141	THR
18	u	124	MET
18	u	178	TYR
18	u	225	ILE
18	u	264	THR
18	u	270	VAL
20	B	55	HIS
20	B	58	CYS
20	B	59	ARG
20	B	63	LEU
20	B	113	GLU
20	B	170	LEU
20	B	171	VAL
20	B	178	LYS
20	B	183	THR
20	B	249	ARG
20	B	290	ILE
20	B	294	ARG
20	B	308	THR
20	B	310	LEU
20	B	313	LEU
20	B	314	ASN
20	B	316	LEU

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Mol	Chain	Res	Type
20	B	320	ASP
20	B	337	LEU
20	B	341	LEU
20	B	346	ARG
20	B	349	ARG
20	B	369	THR
20	B	405	MET
20	B	407	LEU
20	B	430	LYS
20	B	432	GLU
21	Z	73	ASP
21	Z	77	ASN
21	Z	81	MET
21	Z	102	HIS
21	Z	104	ASN
21	Z	118	ASN
21	Z	121	LEU
21	Z	165	GLU
21	Z	202	ASN
21	Z	224	HIS
21	Z	225	GLN
21	Z	228	TYR
21	Z	229	GLN
21	Z	230	LEU
21	Z	232	ASP
21	Z	256	GLN
22	E	15	LYS
22	E	34	LYS
22	E	63	GLN
22	E	75	ASN
22	E	77	PRO
22	E	115	VAL
22	E	149	ILE
22	E	165	ILE
22	E	253	ILE
22	E	254	GLN
22	E	256	THR
22	E	267	PHE
22	E	294	ARG
22	E	296	ASP
22	E	322	LYS
22	E	344	ARG

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Mol	Chain	Res	Type
22	E	378	LYS
22	E	383	LYS
23	F	74	LYS
23	F	85	THR
23	F	86	LEU
23	F	97	LEU
23	F	141	ASP
23	F	146	LYS
23	F	161	LEU
23	F	236	LEU
23	F	250	LYS
23	F	251	LEU
23	F	297	ASP
23	F	323	ASN
23	F	335	VAL
23	F	344	ARG
23	F	351	LYS
23	F	434	ASN
23	F	438	TYR
24	c	26	ASP
24	c	54	MET
24	c	67	VAL
24	c	69	VAL
24	c	104	ARG
24	c	128	ASN
24	c	129	THR
24	c	136	LEU
24	c	148	ILE
24	c	168	MET
24	c	175	ARG
24	c	211	GLU
24	c	216	MET
24	c	220	LEU
24	c	226	MET
24	c	256	ASN
24	c	277	LYS
25	K	9	ASP
25	K	68	VAL
25	K	71	ASP
25	K	78	MET
25	K	157	ASP
25	K	190	THR

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Mol	Chain	Res	Type
25	K	206	MET
25	K	225	ASN
25	K	228	MET
26	e	25	GLU
27	U	10	SER
27	U	26	LYS
27	U	41	SER
27	U	44	LYS
27	U	59	PHE
27	U	86	ASP
27	U	88	PHE
27	U	89	ASN
27	U	93	ASN
27	U	105	ILE
27	U	139	GLN
27	U	140	ARG
27	U	155	LEU
27	U	189	GLN
27	U	216	VAL
27	U	231	ASP
27	U	254	GLU
27	U	258	GLN
27	U	259	GLN
27	U	265	ILE
27	U	344	ARG
27	U	357	LYS
27	U	373	ASN
27	U	417	LYS
27	U	437	TYR
27	U	457	ILE
27	U	463	ASN
27	U	524	LYS
27	U	554	LEU
27	U	574	LYS
27	U	602	LEU
27	U	683	VAL
27	U	694	ILE
27	U	751	ARG
27	U	760	VAL
27	U	769	PHE
27	U	802	TYR
27	U	885	MET

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Mol	Chain	Res	Type
27	U	917	THR
27	U	921	ILE
27	U	922	GLU
28	f	51	GLN
28	f	56	LEU
28	f	59	LEU
28	f	65	GLU
28	f	66	LYS
28	f	143	ARG
28	f	177	GLU
28	f	207	LEU
28	f	213	GLN
28	f	217	LEU
28	f	222	ASP
28	f	237	VAL
28	f	300	ARG
28	f	319	GLU
28	f	333	LEU
28	f	347	ASP
28	f	423	ASP
28	f	466	LEU
28	f	501	LEU
28	f	552	ASP
28	f	553	THR
28	f	583	VAL
28	f	615	ILE
28	f	618	GLU
28	f	619	HIS
28	f	646	MET
28	f	649	HIS
28	f	683	GLU
28	f	696	LEU
28	f	761	MET
28	f	768	LEU
28	f	817	VAL
29	V	95	LEU
29	V	111	TYR
29	V	131	LEU
29	V	139	MET
29	V	153	LYS
29	V	166	TYR
29	V	175	MET

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Mol	Chain	Res	Type
29	V	200	ARG
29	V	214	HIS
29	V	224	LEU
29	V	230	PHE
29	V	234	ARG
29	V	249	THR
29	V	263	LEU
29	V	269	LYS
29	V	270	LEU
29	V	271	VAL
29	V	296	LYS
29	V	300	LEU
29	V	309	MET
29	V	361	PHE
29	V	363	LEU
29	V	384	GLU
29	V	397	ARG
29	V	401	ASN
29	V	426	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (45) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	88	GLN
2	C	279	GLN
2	C	332	HIS
2	C	398	ASN
3	D	49	GLN
3	D	187	HIS
3	D	193	GLN
3	D	294	ASN
3	D	312	ASN
3	D	380	GLN
3	D	390	ASN
6	I	198	ASN
8	L	143	HIS
9	M	97	ASN
14	a	69	HIS
15	b	142	ASN
16	d	202	GLN
20	B	55	HIS
20	B	81	ASN

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Mol	Chain	Res	Type
20	B	82	GLN
20	B	306	GLN
21	Z	157	HIS
22	E	75	ASN
22	E	262	ASN
22	E	300	HIS
24	c	44	HIS
24	c	92	GLN
24	c	185	ASN
24	c	190	GLN
24	c	194	HIS
24	c	197	ASN
24	c	199	HIS
27	U	697	GLN
28	f	161	HIS
28	f	327	ASN
28	f	619	HIS
28	f	650	GLN
28	f	677	HIS
29	V	78	HIS
29	V	81	GLN
29	V	110	HIS
29	V	118	GLN
29	V	125	ASN
29	V	193	GLN
29	V	281	ASN

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 (i)

Of 9 ligands modelled in this entry, 3 are monoatomic - leaving 6 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	$\#\|Z\| > 2$
31	ATP	F	501	32	28,33,33	1.92	5 (17%)	34,52,52	1.42	4 (11%)
30	ADP	D	501	-	24,29,29	0.75	0	29,45,45	0.83	1 (3%)
30	ADP	B	501	-	24,29,29	1.32	3 (12%)	29,45,45	1.35	4 (13%)
30	ADP	C	501	-	24,29,29	0.73	0	29,45,45	0.79	1 (3%)
30	ADP	A	501	-	24,29,29	1.27	3 (12%)	29,45,45	1.40	4 (13%)
31	ATP	E	501	32	28,33,33	2.12	6 (21%)	34,52,52	1.56	5 (14%)

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
31	ATP	F	501	32	-	2/18/38/38	0/3/3/3
30	ADP	D	501	-	-	4/12/32/32	0/3/3/3
30	ADP	B	501	-	-	0/12/32/32	0/3/3/3
30	ADP	C	501	-	-	4/12/32/32	0/3/3/3
30	ADP	A	501	-	-	5/12/32/32	0/3/3/3
31	ATP	E	501	32	-	2/18/38/38	0/3/3/3

All (17) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
31	E	501	ATP	PA-O3A	-6.30	1.52	1.59
31	F	501	ATP	PA-O3A	-5.39	1.53	1.59
31	F	501	ATP	PB-O3B	-4.90	1.54	1.59
31	E	501	ATP	PB-O3A	-4.79	1.54	1.59
31	E	501	ATP	PB-O3B	-4.77	1.54	1.59
31	F	501	ATP	PB-O3A	-4.08	1.55	1.59

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
30	B	501	ADP	PA-O3A	-3.14	1.56	1.59
30	A	501	ADP	PA-O3A	-3.00	1.56	1.59
31	E	501	ATP	C1'-N9	-2.61	1.43	1.49
30	B	501	ADP	O4'-C1'	2.49	1.44	1.40
31	F	501	ATP	C1'-N9	-2.46	1.43	1.49
31	E	501	ATP	O4'-C1'	2.18	1.43	1.40
30	A	501	ADP	O4'-C1'	2.11	1.43	1.40
30	A	501	ADP	C1'-N9	-2.10	1.44	1.49
30	B	501	ADP	C4-N3	-2.07	1.32	1.35
31	F	501	ATP	PG-O2G	-2.07	1.47	1.54
31	E	501	ATP	PG-O2G	-2.01	1.47	1.54

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
31	E	501	ATP	C4-C5-N7	4.78	114.39	109.34
31	F	501	ATP	C4-C5-N7	4.74	114.35	109.34
30	B	501	ADP	C4-C5-N7	4.36	113.94	109.34
30	A	501	ADP	C4-C5-N7	4.02	113.58	109.34
30	A	501	ADP	O2A-PA-O3A	3.75	117.42	107.27
31	E	501	ATP	O3G-PG-O3B	3.37	115.93	104.64
31	E	501	ATP	O2B-PB-O3B	3.23	116.01	107.27
31	E	501	ATP	O2B-PB-O3A	2.88	115.05	107.27
31	F	501	ATP	O2B-PB-O3A	2.87	115.03	107.27
30	B	501	ADP	O2A-PA-O3A	2.86	114.99	107.27
31	F	501	ATP	O2G-PG-O3B	2.46	112.89	104.64
31	E	501	ATP	O3A-PB-O1B	-2.36	103.60	110.70
30	D	501	ADP	C5-C6-N6	2.28	123.78	120.31
30	C	501	ADP	C5-C6-N6	2.28	123.78	120.31
30	B	501	ADP	O3B-PB-O3A	2.14	111.81	104.64
30	B	501	ADP	C4'-O4'-C1'	2.07	111.82	109.92
30	A	501	ADP	C1'-N9-C4	-2.07	123.00	126.64
30	A	501	ADP	C5-C6-N6	2.07	123.46	120.31
31	F	501	ATP	O3A-PB-O1B	2.05	116.87	110.70

There are no chirality outliers.

All (17) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
30	A	501	ADP	C5'-O5'-PA-O2A
30	A	501	ADP	C5'-O5'-PA-O3A
30	C	501	ADP	C4'-C5'-O5'-PA

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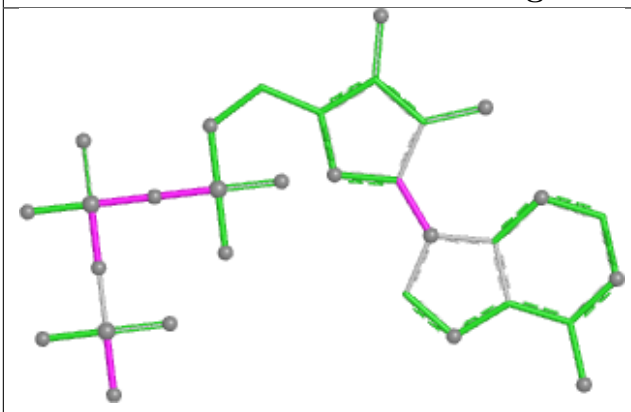
Mol	Chain	Res	Type	Atoms
31	E	501	ATP	C5'-O5'-PA-O3A
30	C	501	ADP	C3'-C4'-C5'-O5'
30	D	501	ADP	O4'-C4'-C5'-O5'
30	D	501	ADP	C3'-C4'-C5'-O5'
30	A	501	ADP	C3'-C4'-C5'-O5'
30	C	501	ADP	O4'-C4'-C5'-O5'
30	A	501	ADP	O4'-C4'-C5'-O5'
30	D	501	ADP	C4'-C5'-O5'-PA
30	A	501	ADP	PA-O3A-PB-O2B
31	F	501	ATP	PG-O3B-PB-O2B
30	C	501	ADP	C5'-O5'-PA-O1A
30	D	501	ADP	C5'-O5'-PA-O1A
31	E	501	ATP	C5'-O5'-PA-O1A
31	F	501	ATP	PA-O3A-PB-O2B

There are no ring outliers.

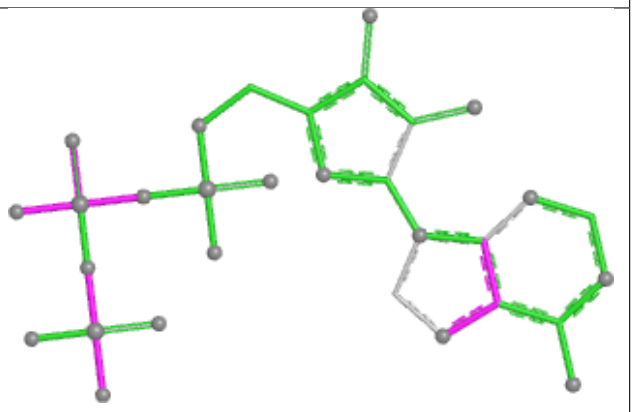
No monomer is involved in short contacts.

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.

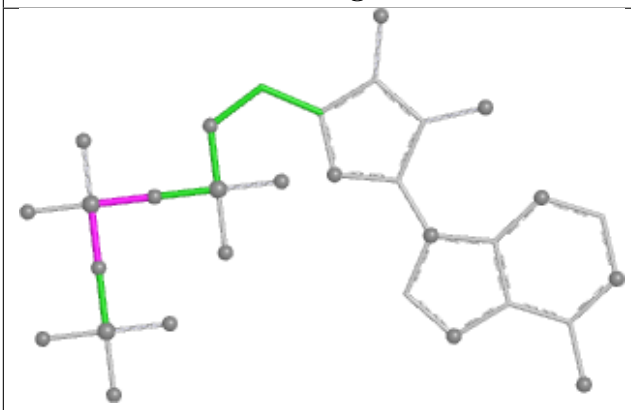
Ligand ATP F 501



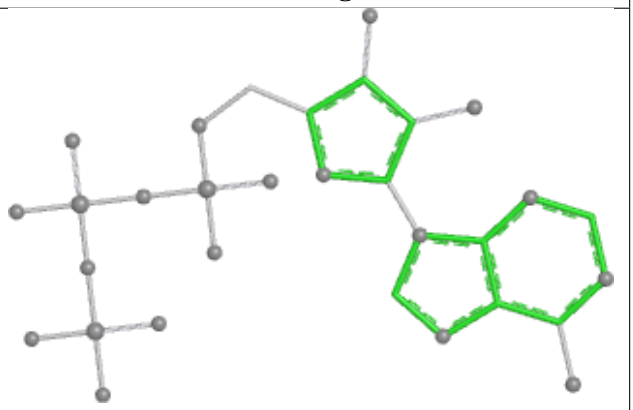
Bond lengths



Bond angles

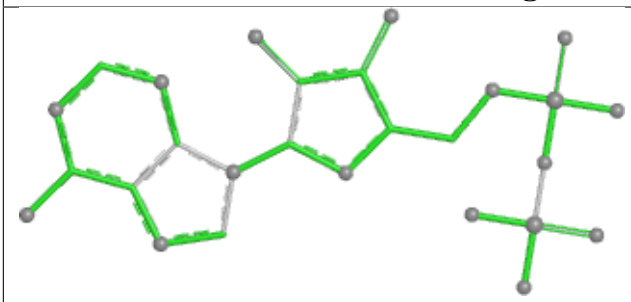


Torsions

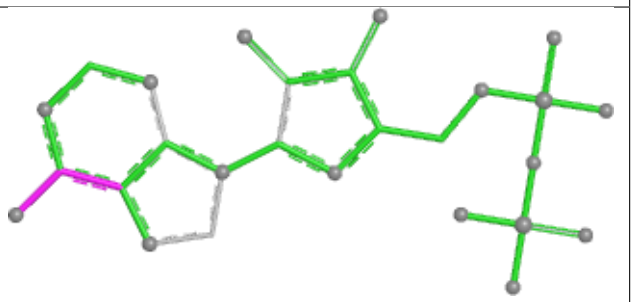


Rings

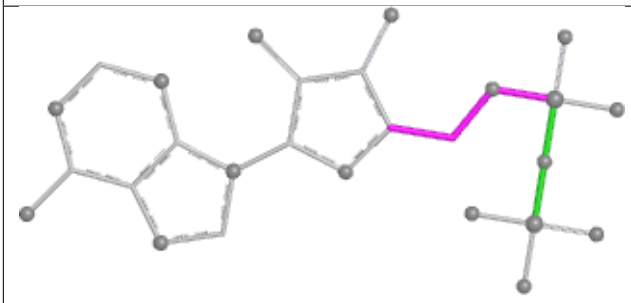
Ligand ADP D 501



Bond lengths



Bond angles



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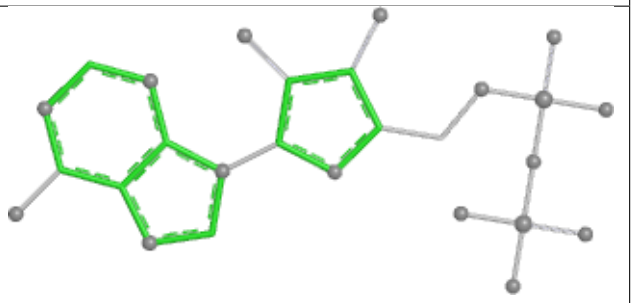
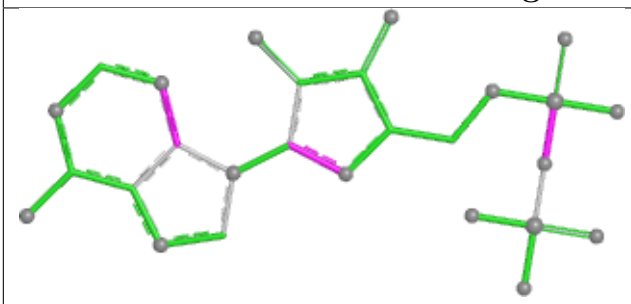
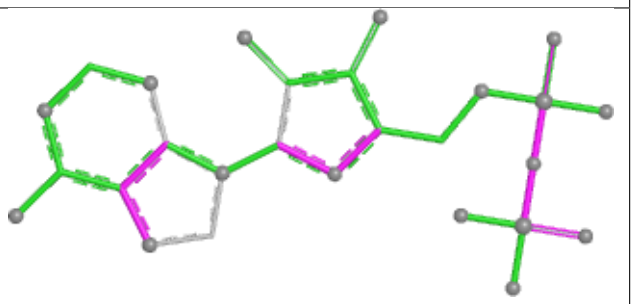


Rings

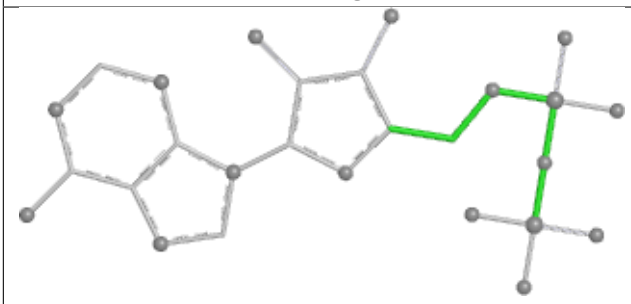
Ligand ADP B 501



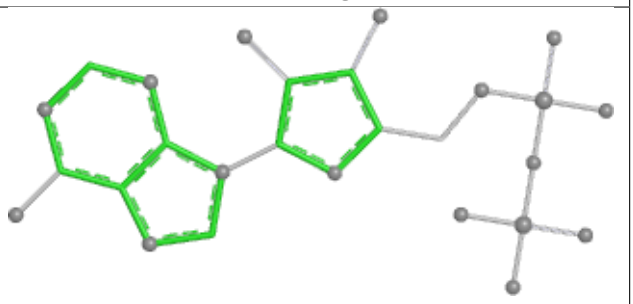
Bond lengths



Bond angles

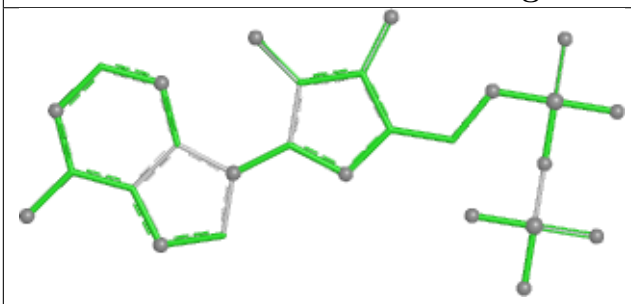


Torsions

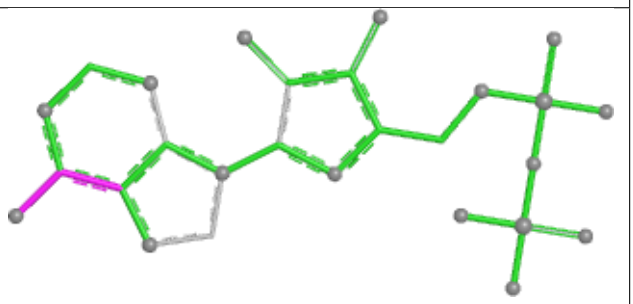


Rings

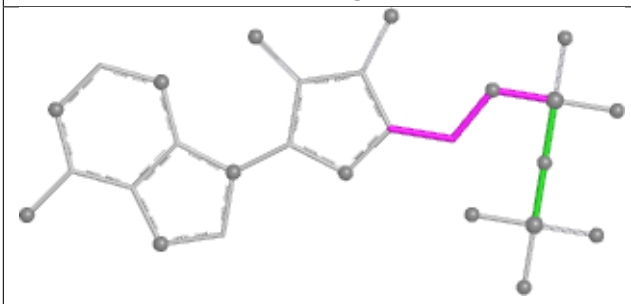
Ligand ADP C 501



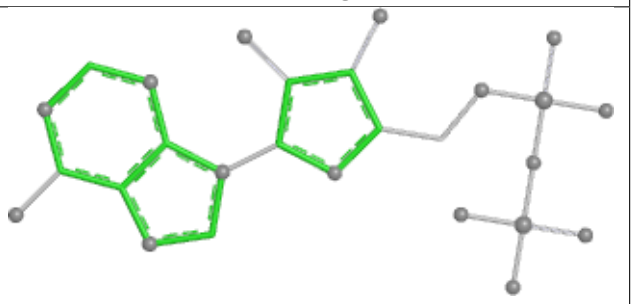
Bond lengths



Bond angles

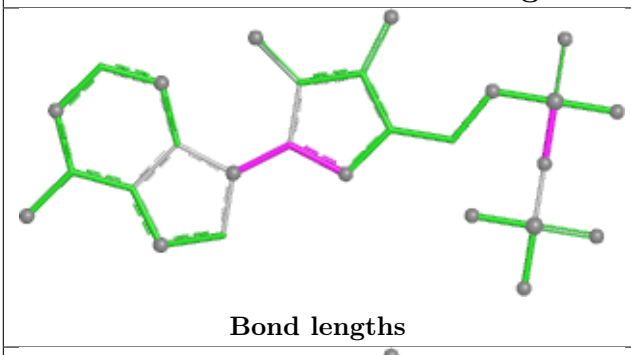


Torsions

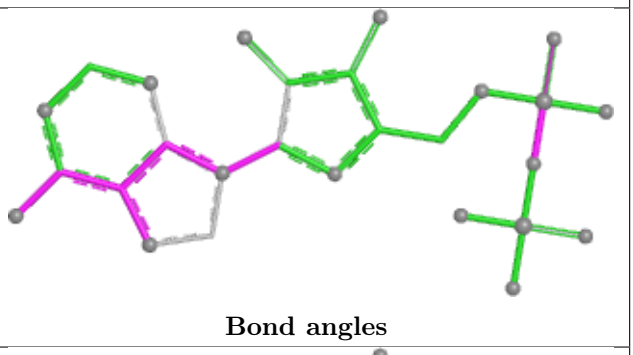


Rings

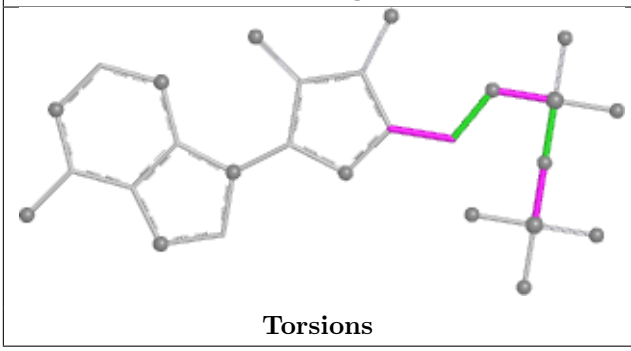
Ligand ADP A 501



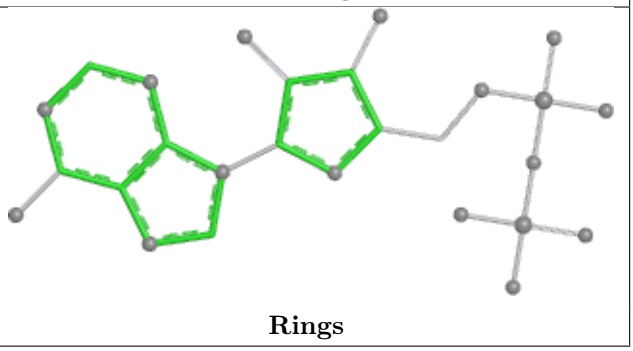
Bond lengths



Bond angles

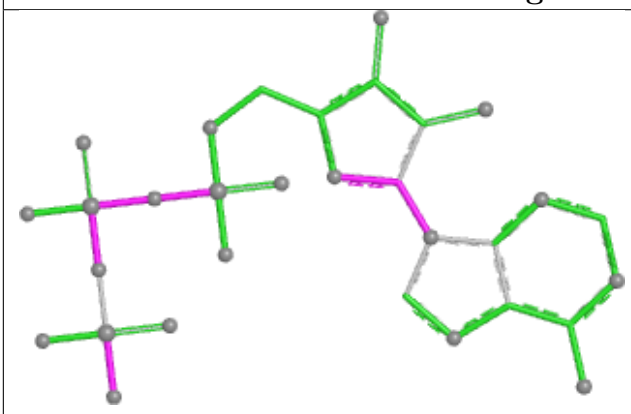


Torsions

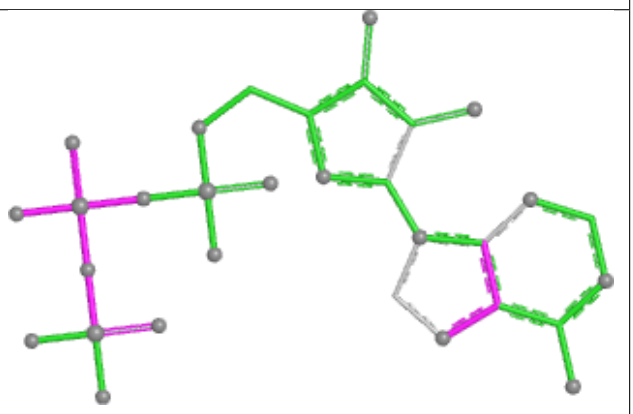


Rings

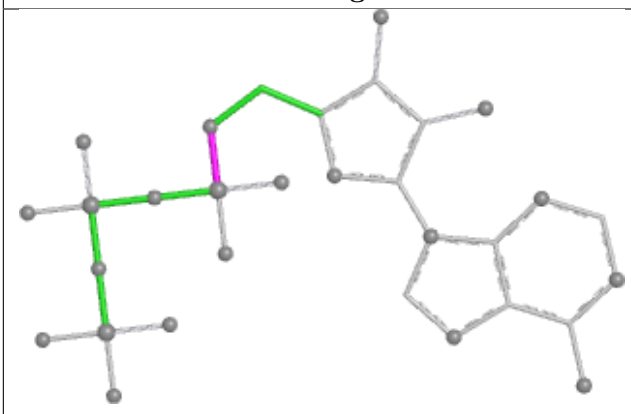
Ligand ATP E 501



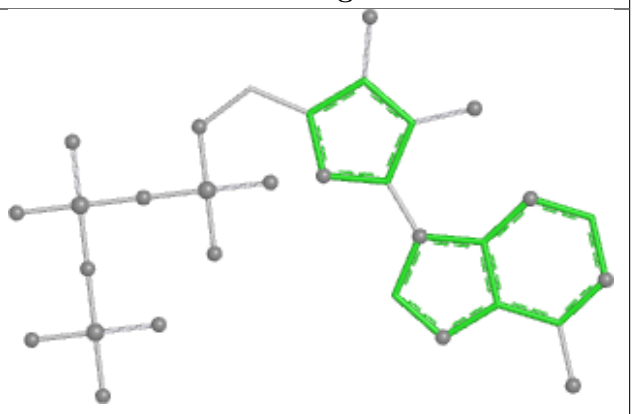
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
29	V	9
24	c	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	V	122:THR	C	123:SER	N	3.04
1	V	67:LEU	C	68:ASP	N	2.75
1	V	174:PHE	C	175:MET	N	2.59
1	V	138:PRO	C	139:MET	N	2.35
1	V	110:HIS	C	111:TYR	N	2.22
1	V	158:PRO	C	159:LEU	N	2.09
1	c	196:LEU	C	197:ASN	N	1.80
1	V	89:LYS	C	90:GLU	N	1.18
1	V	108:LEU	C	109:ASN	N	1.17
1	V	105:SER	C	106:ARG	N	0.83

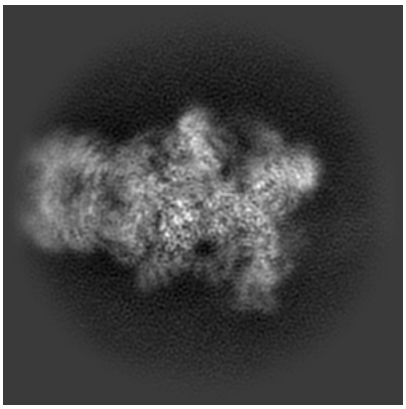
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-47725. These allow visual inspection of the internal detail of the map and identification of artifacts.

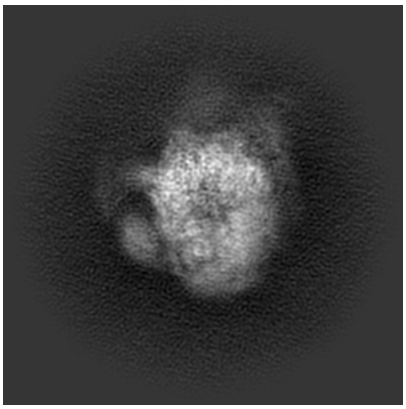
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

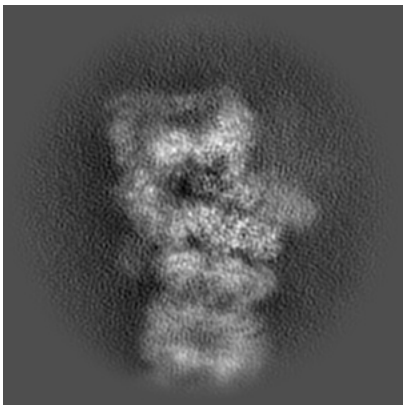
6.1.1 Primary map



X

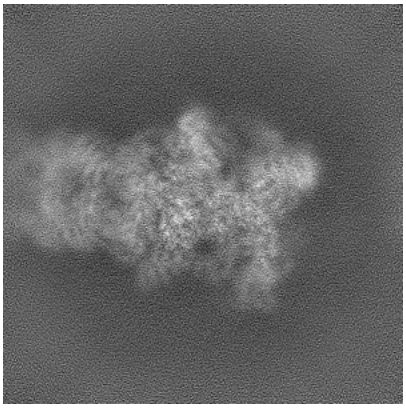


Y

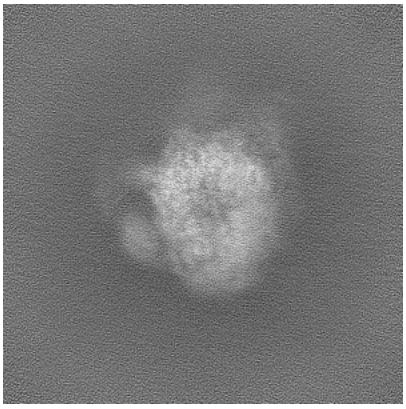


Z

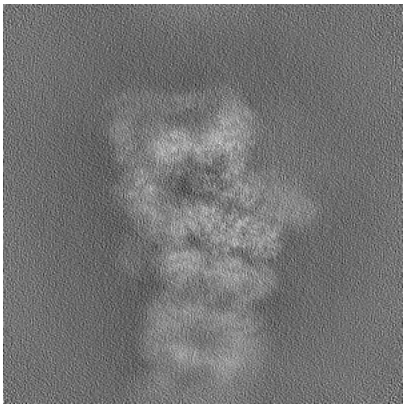
6.1.2 Raw map



X



Y

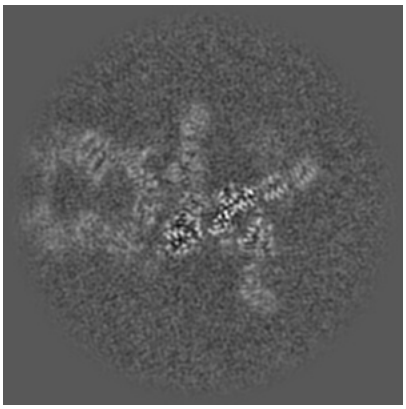


Z

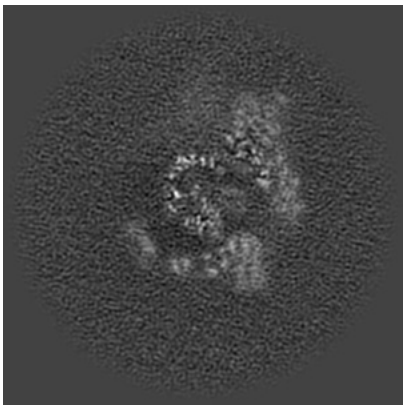
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

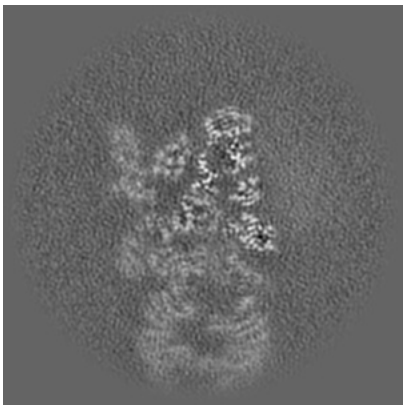
6.2.1 Primary map



X Index: 170

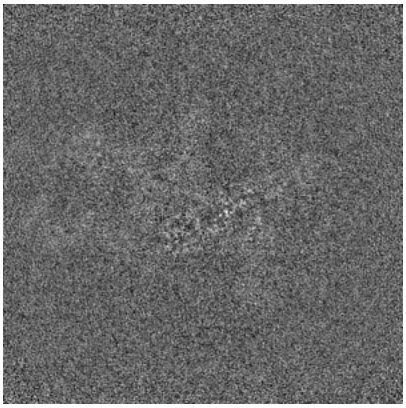


Y Index: 170

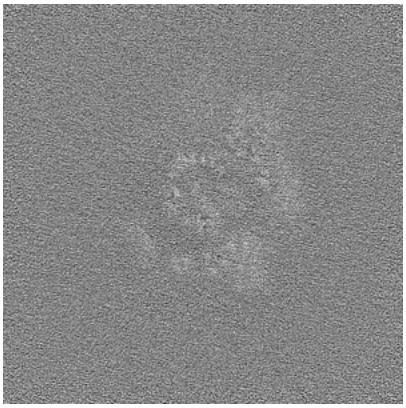


Z Index: 170

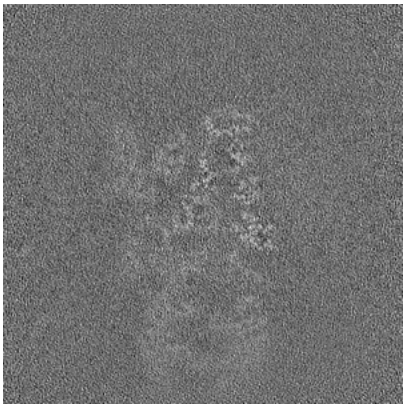
6.2.2 Raw map



X Index: 170



Y Index: 170

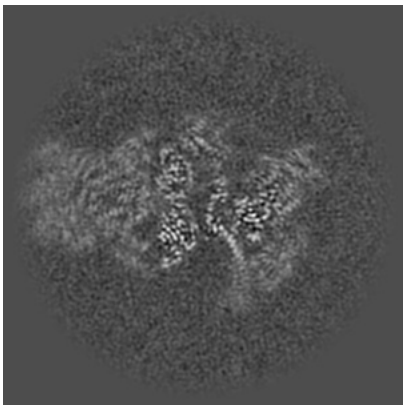


Z Index: 170

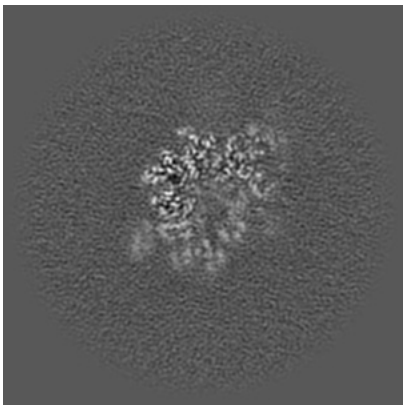
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

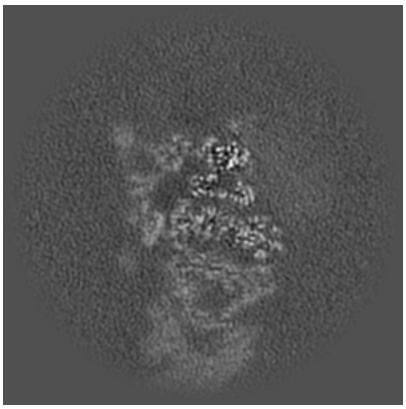
6.3.1 Primary map



X Index: 198

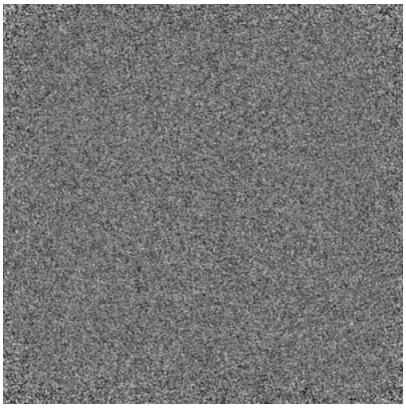


Y Index: 146

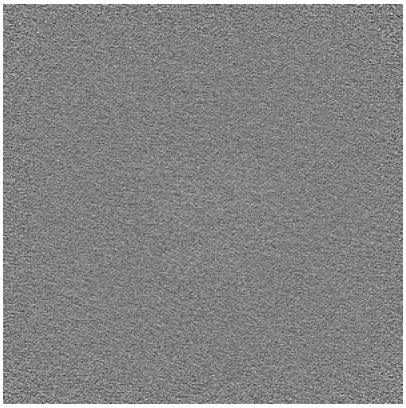


Z Index: 157

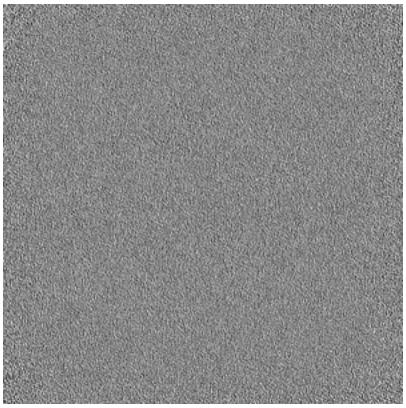
6.3.2 Raw map



X Index: 0



Y Index: 0

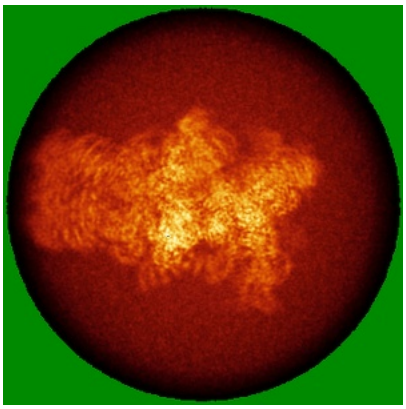


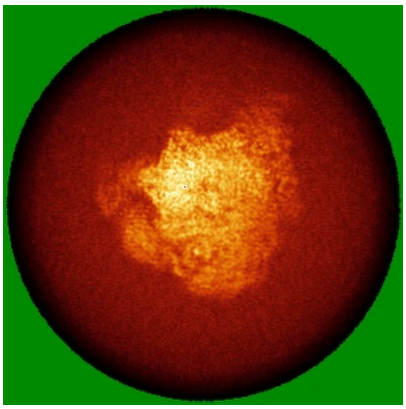
Z Index: 0

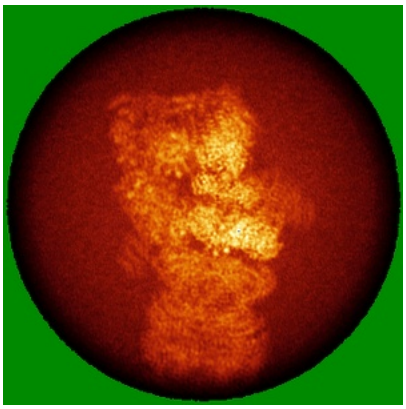
The images above show the largest variance slices of the map in three orthogonal directions.

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

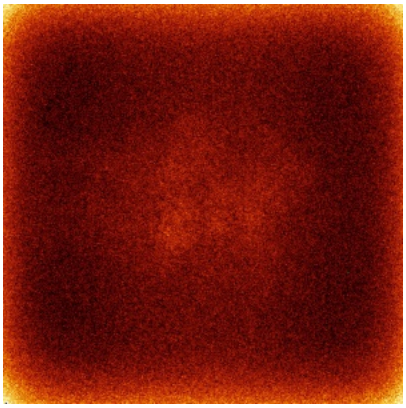
6.4.1 Primary map

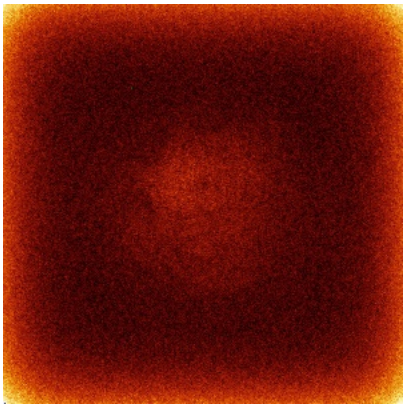

X

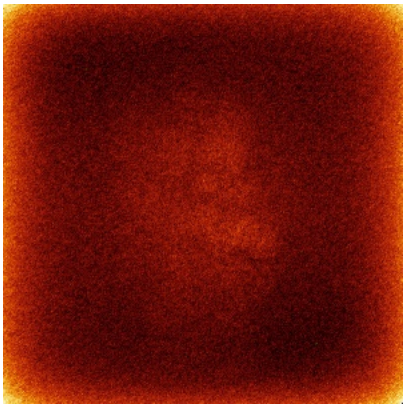

Y


Z

6.4.2 Raw map


X

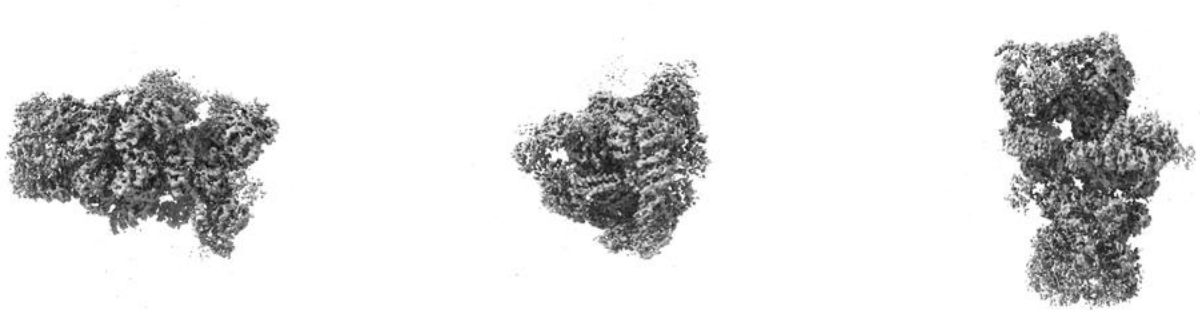

Y


Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views (i)

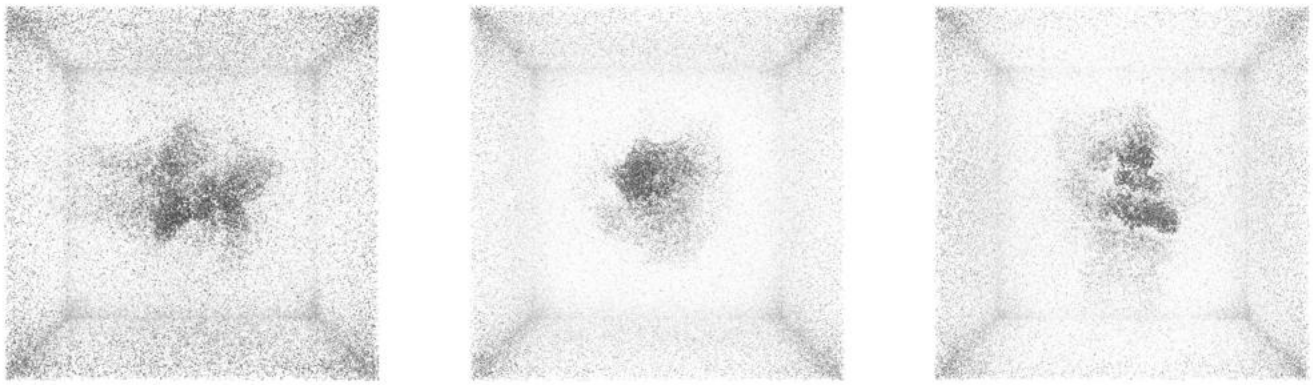
6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.16. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



X Y Z

These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

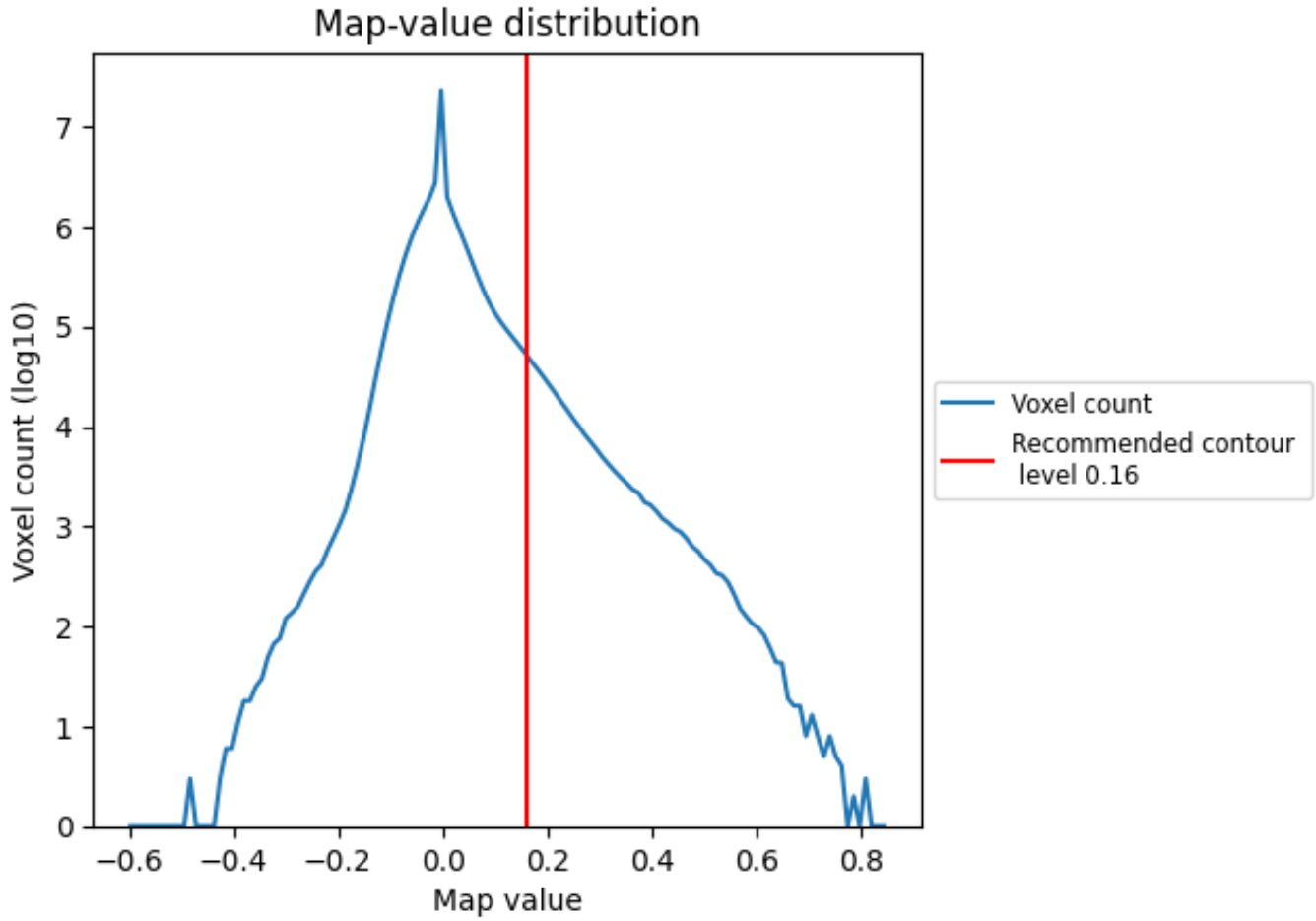
6.6 Mask visualisation (i)

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

7 Map analysis

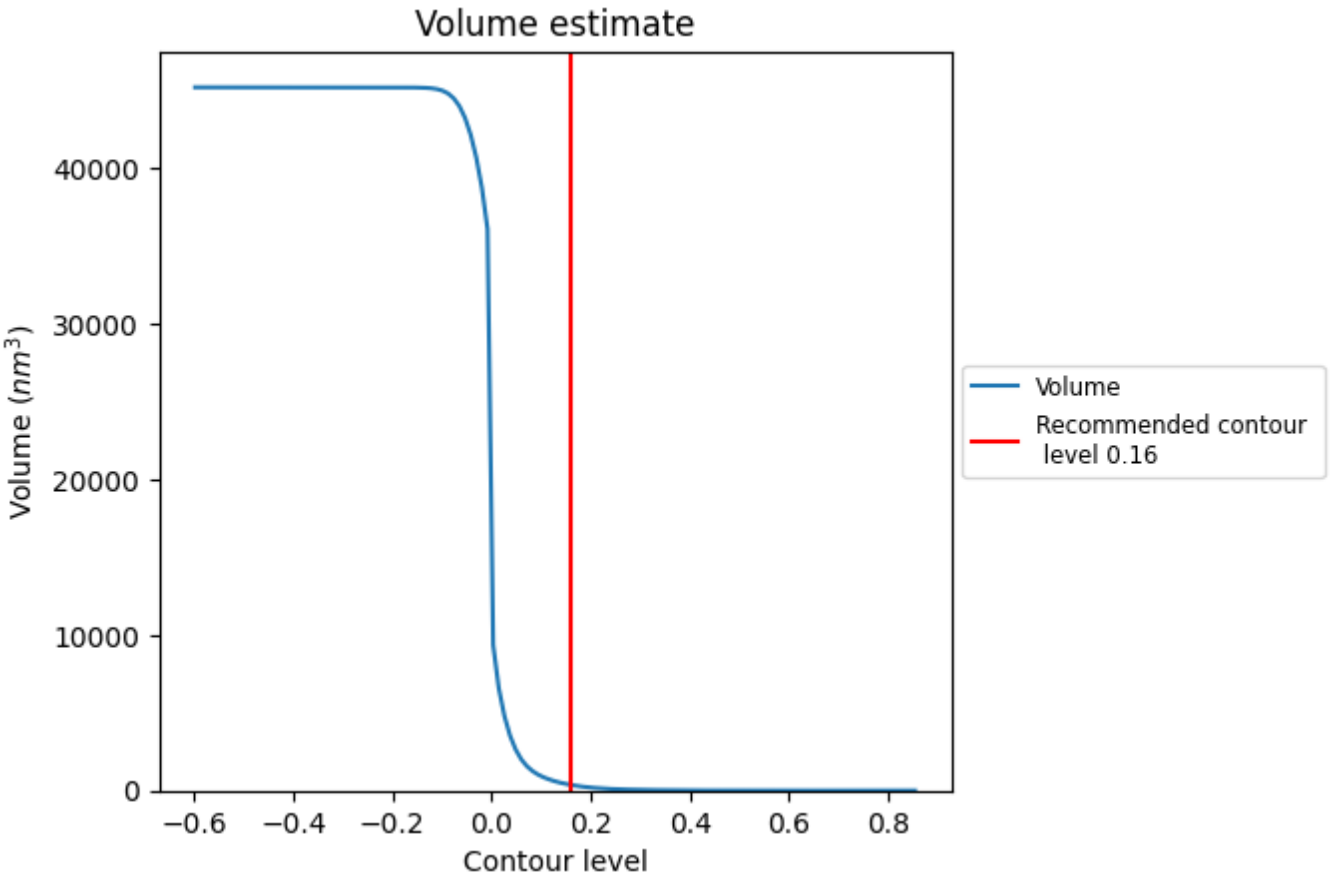
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

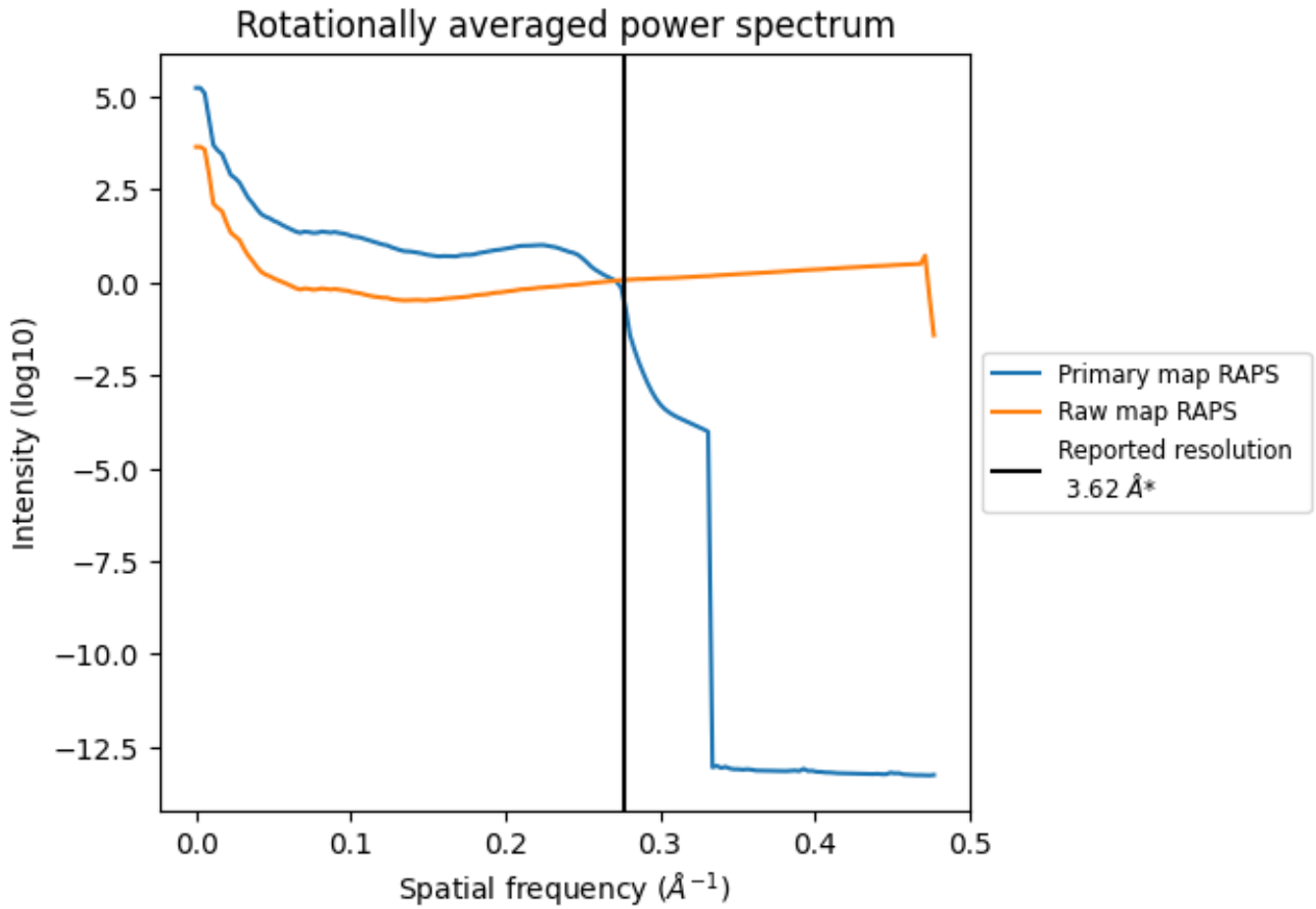
7.2 Volume estimate



The volume at the recommended contour level is 364 nm^3; this corresponds to an approximate mass of 329 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)

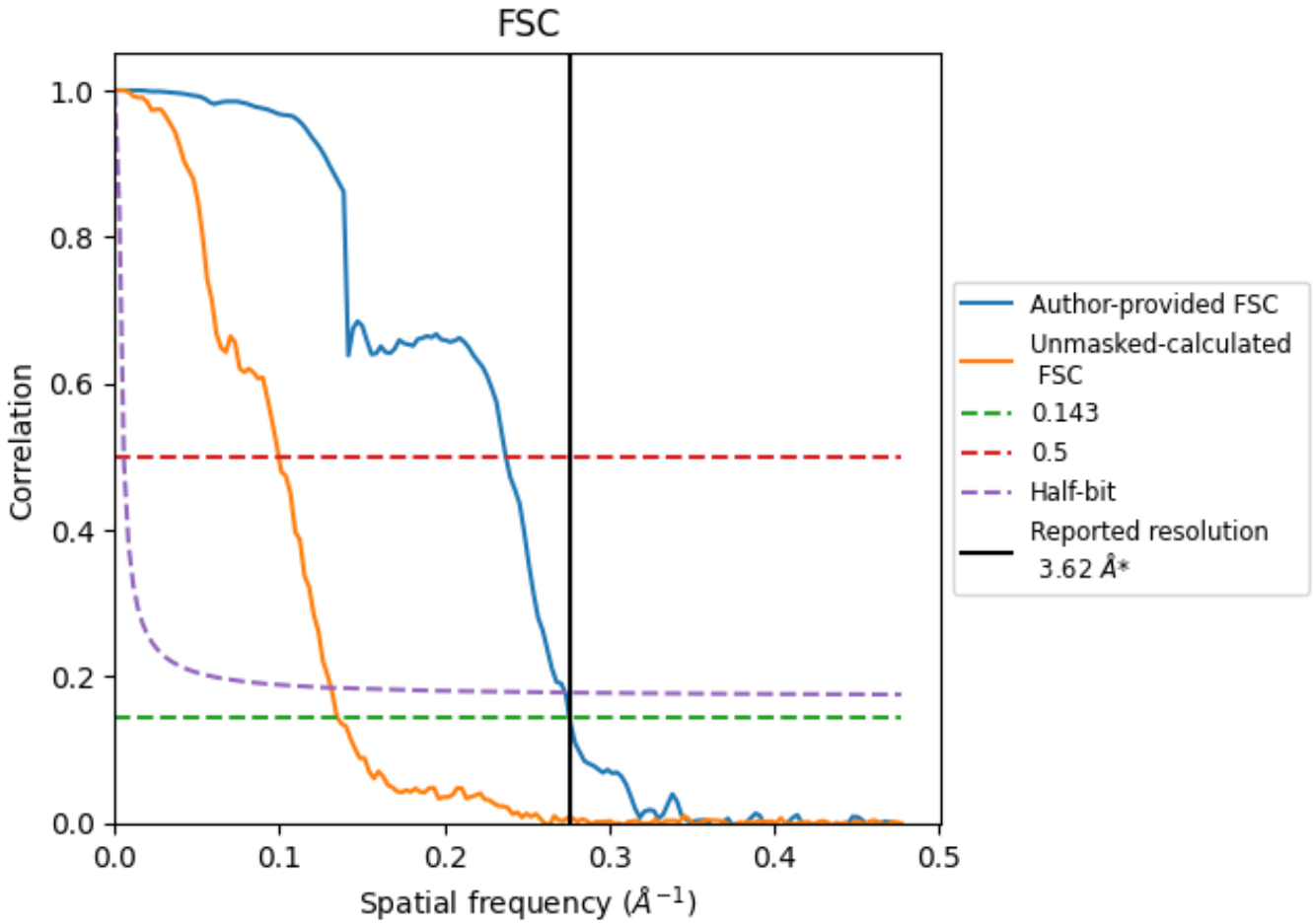


*Reported resolution corresponds to spatial frequency of 0.276 $Å^{-1}$

8 Fourier-Shell correlation

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC



*Reported resolution corresponds to spatial frequency of 0.276 Å^{-1}

8.2 Resolution estimates (i)

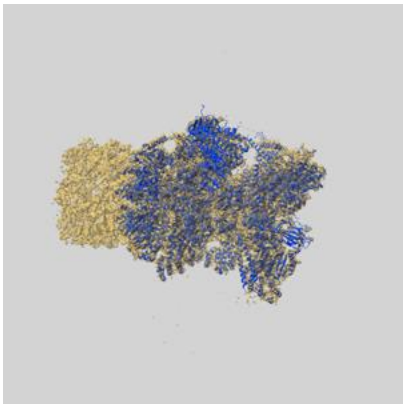
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.62	-	-
Author-provided FSC curve	3.62	4.22	3.66
Unmasked-calculated*	7.39	10.05	7.62

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 7.39 differs from the reported value 3.62 by more than 10 %

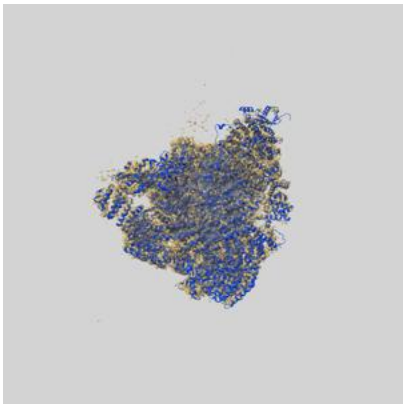
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-47725 and PDB model 9E8N. Per-residue inclusion information can be found in section 3 on page 13.

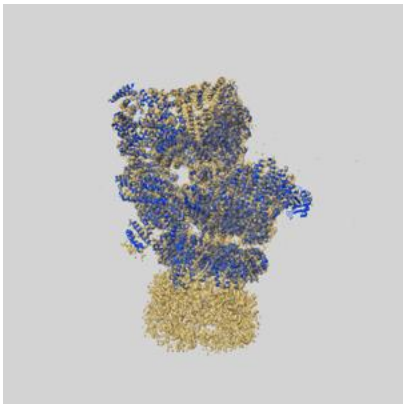
9.1 Map-model overlay



X



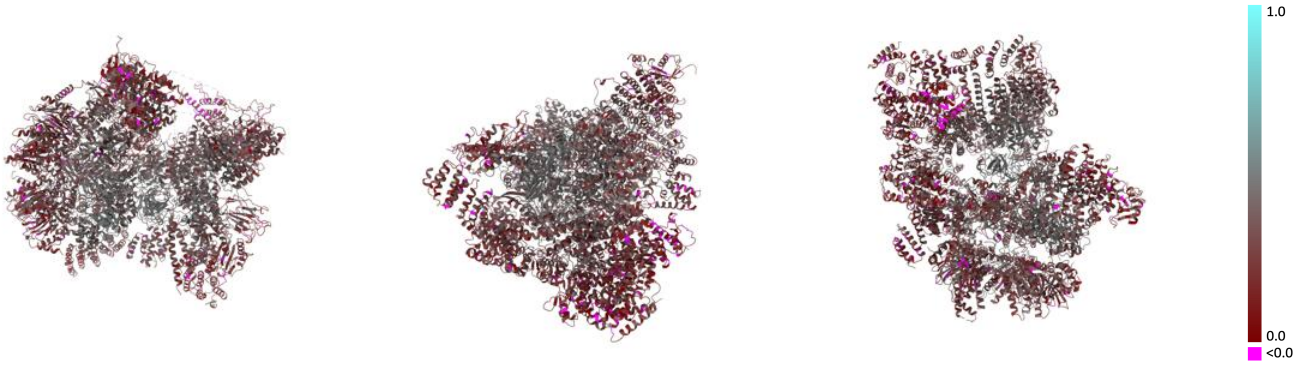
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.16 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.

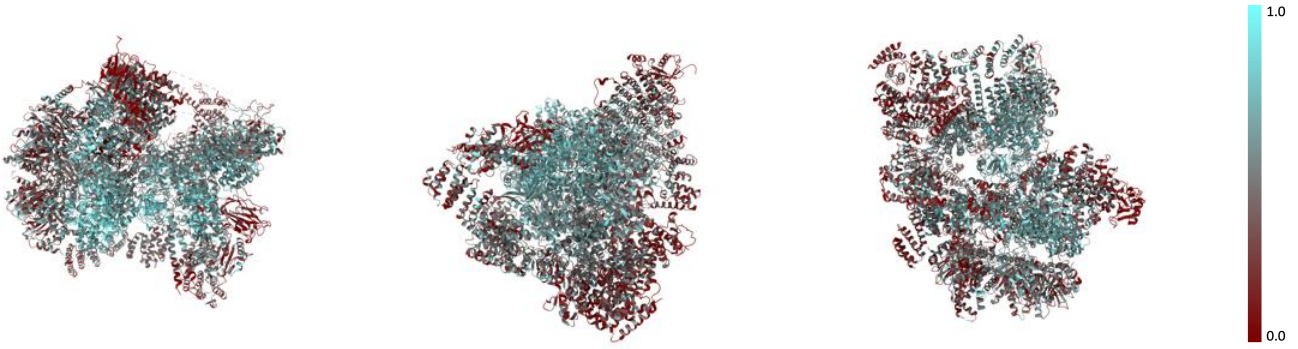
9.2 Q-score mapped to coordinate model (i)



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.

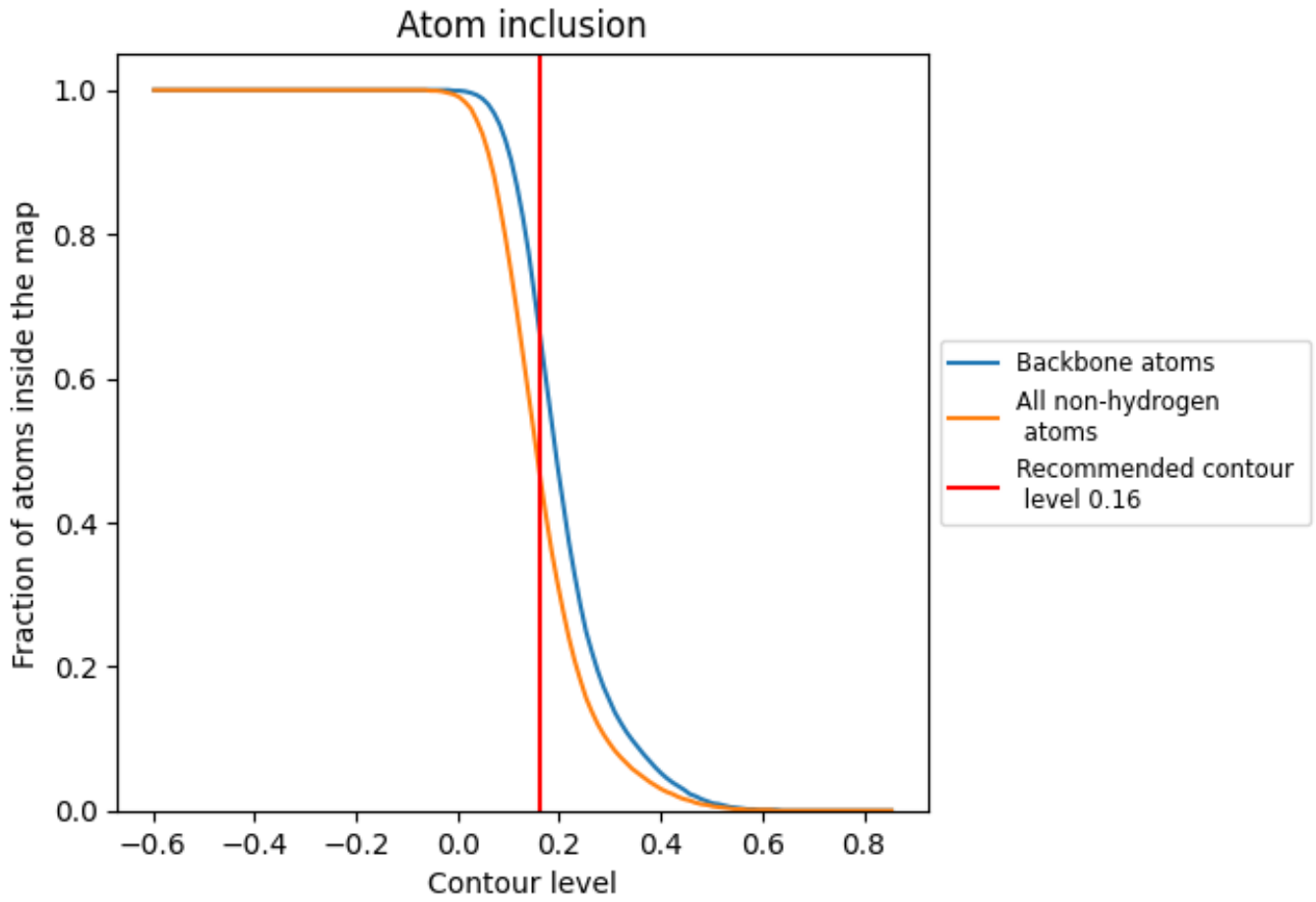
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.16).

9.4 Atom inclusion (i)



At the recommended contour level, 67% of all backbone atoms, 48% 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 (0.16) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.4750	0.3180
A	0.6920	0.4180
B	0.6360	0.4120
C	0.4930	0.3400
D	0.5860	0.3890
E	0.7130	0.4320
F	0.7120	0.4310
G	0.4270	0.3050
H	0.4180	0.3130
I	0.3760	0.3040
J	0.4460	0.2980
K	0.4130	0.2780
L	0.4180	0.2940
M	0.4340	0.2700
O	0.3280	0.2880
U	0.5380	0.3330
V	0.2900	0.2110
W	0.3870	0.2580
X	0.4180	0.2680
Y	0.4110	0.2320
Z	0.6120	0.3730
a	0.3960	0.2560
b	0.4290	0.2780
c	0.7000	0.4210
d	0.2560	0.2150
e	0.2580	0.2570
f	0.4040	0.3020
g	0.0580	0.2230
u	0.1270	0.2950
v	0.7200	0.5070