



Full wwPDB EM Validation Report ⓘ

Oct 19, 2024 – 04:48 PM EDT

PDB ID : 6B8H
EMDB ID : EMD-7067
Title : Mosaic model of yeast mitochondrial ATP synthase monomer
Authors : Guo, H.; Bueler, S.A.; Rubinstein, J.L.
Deposited on : 2017-10-07
Resolution : 3.60 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:

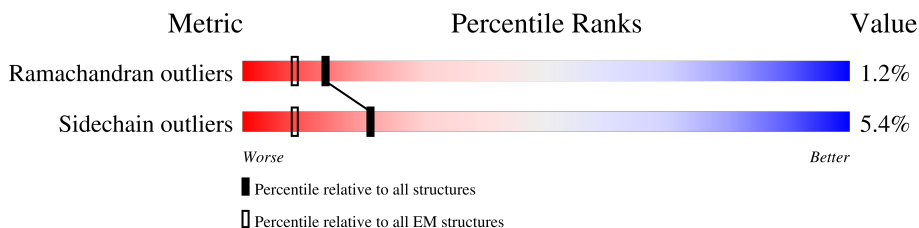
EMDB validation analysis : 0.0.1.dev113
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA,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

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 3.60 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. 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	0	76	
1	1	76	
1	2	76	
1	3	76	
1	4	76	
1	5	76	
1	6	76	
1	7	76	
1	8	76	

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Mol	Chain	Length	Quality of chain
1	9	76	47%
1	J	76	97%
1	L	76	99%
1	M	76	99%
1	N	76	97%
1	P	76	96%
1	Q	76	99%
1	R	76	97%
1	S	76	97%
1	T	76	99%
1	U	76	97%
2	A	48	100%
2	V	48	96%
3	a	249	60%
3	p	249	100%
4	b	209	96%
4	q	209	93%
5	d	173	87%
5	r	173	91%
6	e	49	100%
6	s	49	100%
7	f	95	88%
7	t	95	85%
8	g	106	100%
8	u	106	99%

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Mol	Chain	Length	Quality of chain
9	i	59	100% 100%
9	w	59	100% 100%
10	k	68	16% 35% 65%
10	x	68	35% 65%
11	B	510	96% 89% 7%
11	C	510	98% 92% 6%
11	K	510	98% 94% 5%
11	W	510	96% 89% 7%
11	X	510	98% 92% 6%
11	n	510	98% 94% 5%
12	D	478	98% 94%
12	E	478	98% 92% 6%
12	F	478	98% 92% 5%
12	Y	478	98% 94%
12	Z	478	98% 92% 6%
12	c	478	98% 92% 5%
13	G	278	54% 83% 12% 5%
13	j	278	95% 83% 12% 5%
14	H	138	17% 72% 14% 14%
14	l	138	86% 72% 14% 14%
15	I	61	28% 62% 13% 21%
15	m	61	79% 62% 13% 21%
16	O	195	83% 78% 17%
16	o	195	83% 78% 17%
17	h	21	100% 100%

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Mol	Chain	Length	Quality of chain
17	v	21	 100% 100%

2 Entry composition [i](#)

There are 19 unique types of molecules in this entry. The entry contains 75614 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 ATP synthase subunit 9, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	1	75	537	359	83	91	4	0	0
1	2	75	537	359	83	91	4	0	0
1	3	74	529	354	82	90	3	0	0
1	4	75	537	359	83	91	4	0	0
1	5	75	537	359	83	91	4	0	0
1	6	74	529	354	82	90	3	0	0
1	7	73	522	348	81	89	4	0	0
1	8	75	537	359	83	91	4	0	0
1	9	74	529	354	82	90	3	0	0
1	0	75	537	359	83	91	4	0	0
1	L	75	537	359	83	91	4	0	0
1	M	75	537	359	83	91	4	0	0
1	N	74	529	354	82	90	3	0	0
1	P	75	537	359	83	91	4	0	0
1	Q	75	537	359	83	91	4	0	0
1	R	74	529	354	82	90	3	0	0
1	S	73	522	348	81	89	4	0	0

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Mol	Chain	Residues	Atoms					AltConf	Trace
1	T	75	Total	C	N	O	S	0	0
			537	359	83	91	4		
1	U	74	Total	C	N	O	S	0	0
			529	354	82	90	3		
1	J	75	Total	C	N	O	S	0	0
			537	359	83	91	4		

- Molecule 2 is a protein called ATP synthase protein 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	A	48	Total	C	N	O	S	0	0
			410	287	59	60	4		
2	V	48	Total	C	N	O	S	0	0
			410	287	59	60	4		

- Molecule 3 is a protein called ATP synthase subunit a.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	a	249	Total	C	N	O	S	0	0
			1971	1338	296	326	11		
3	p	249	Total	C	N	O	S	0	0
			1971	1338	296	326	11		

- Molecule 4 is a protein called ATP synthase subunit 4, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	b	200	Total	C	N	O	S	0	0
			1153	715	210	227	1		
4	q	200	Total	C	N	O	S	0	0
			1153	715	210	227	1		

- Molecule 5 is a protein called ATP synthase subunit d, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	d	157	Total	C	N	O	S	0	0
			930	573	173	182	2		
5	r	157	Total	C	N	O	S	0	0
			930	573	173	182	2		

- Molecule 6 is a protein called ATP synthase subunit e, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
6	e	49	Total	C	N	O	0	0
			245	147	49	49		
6	s	49	Total	C	N	O	0	0
			245	147	49	49		

- Molecule 7 is a protein called ATP synthase subunit f, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	f	84	Total	C	N	O	S	0	0
			607	396	108	102	1		
7	t	84	Total	C	N	O	S	0	0
			607	396	108	102	1		

- Molecule 8 is a protein called AATP synthase subunit g.

Mol	Chain	Residues	Atoms				AltConf	Trace
8	g	106	Total	C	N	O	0	0
			530	318	106	106		
8	u	106	Total	C	N	O	0	0
			530	318	106	106		

- Molecule 9 is a protein called ATP synthase subunit J, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	i	59	Total	C	N	O	S	0	0
			473	313	78	80	2		
9	w	59	Total	C	N	O	S	0	0
			473	313	78	80	2		

- Molecule 10 is a protein called ATP synthase subunit K, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	k	24	Total	C	N	O	S	0	0
			180	122	30	27	1		
10	x	24	Total	C	N	O	S	0	0
			180	122	30	27	1		

- Molecule 11 is a protein called ATP synthase subunit alpha, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	K	501	Total	C	N	O	S	0	0
			3745	2363	665	714	3		

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Mol	Chain	Residues	Atoms					AltConf	Trace
11	B	492	Total	C	N	O	S	0	0
			3700	2336	656	705	3		
11	C	500	Total	C	N	O	S	0	0
			3739	2359	664	713	3		
11	n	501	Total	C	N	O	S	0	0
			3745	2363	665	714	3		
11	W	492	Total	C	N	O	S	0	0
			3700	2336	656	705	3		
11	X	500	Total	C	N	O	S	0	0
			3739	2359	664	713	3		

- Molecule 12 is a protein called ATP synthase subunit beta, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	D	470	Total	C	N	O	S	0	0
			3549	2250	604	689	6		
12	E	468	Total	C	N	O	S	0	0
			3536	2243	602	685	6		
12	F	469	Total	C	N	O	S	0	0
			3543	2247	603	687	6		
12	Y	470	Total	C	N	O	S	0	0
			3549	2250	604	689	6		
12	Z	468	Total	C	N	O	S	0	0
			3536	2243	602	685	6		
12	c	469	Total	C	N	O	S	0	0
			3543	2247	603	687	6		

- Molecule 13 is a protein called ATP synthase subunit gamma, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	G	265	Total	C	N	O	S	0	0
			2030	1277	355	388	10		
13	j	265	Total	C	N	O	S	0	0
			2030	1277	355	388	10		

- Molecule 14 is a protein called ATP synthase subunit delta, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	H	119	Total	C	N	O	S	0	0
			751	470	133	146	2		
14	l	119	Total	C	N	O	S	0	0
			751	470	133	146	2		

- Molecule 15 is a protein called ATP synthase catalytic sector F1 epsilon subunit.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
15	I	48	Total 324	C 201	N 56	O 67	0	0
15	m	48	Total 324	C 201	N 56	O 67	0	0

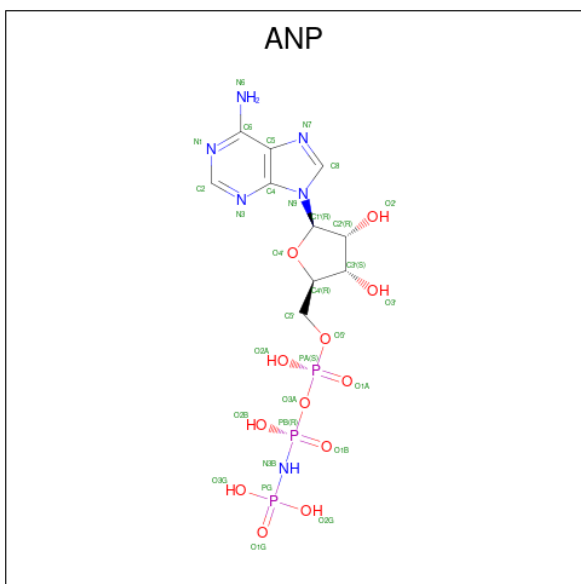
- Molecule 16 is a protein called ATP synthase subunit 5, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
16	O	161	Total 795	C 473	N 161	O 161	0	0
16	o	161	Total 795	C 473	N 161	O 161	0	0

- Molecule 17 is a protein called ATP synthase subunit h.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
17	h	21	Total 105	C 63	N 21	O 21	0	0
17	v	21	Total 105	C 63	N 21	O 21	0	0

- Molecule 18 is PHOSPHOAMINOPHOSPHONIC ACID-ADENYLATE ESTER (three-letter code: ANP) (formula: $C_{10}H_{17}N_6O_{12}P_3$).



Mol	Chain	Residues	Atoms					AltConf
18	K	1	Total 31	C 10	N 6	O 12	P 3	0
18	B	1	Total 31	C 10	N 6	O 12	P 3	0
18	C	1	Total 31	C 10	N 6	O 12	P 3	0
18	D	1	Total 31	C 10	N 6	O 12	P 3	0
18	F	1	Total 31	C 10	N 6	O 12	P 3	0
18	n	1	Total 31	C 10	N 6	O 12	P 3	0
18	W	1	Total 31	C 10	N 6	O 12	P 3	0
18	X	1	Total 31	C 10	N 6	O 12	P 3	0
18	Y	1	Total 31	C 10	N 6	O 12	P 3	0
18	c	1	Total 31	C 10	N 6	O 12	P 3	0

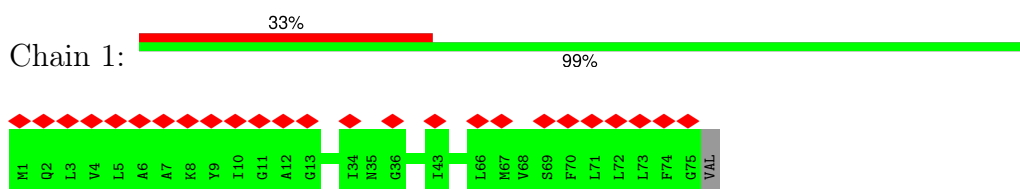
- Molecule 19 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
19	K	1	Total 1	Mg 1	0
19	B	1	Total 1	Mg 1	0
19	C	1	Total 1	Mg 1	0
19	D	1	Total 1	Mg 1	0
19	F	1	Total 1	Mg 1	0
19	n	1	Total 1	Mg 1	0
19	W	1	Total 1	Mg 1	0
19	X	1	Total 1	Mg 1	0
19	Y	1	Total 1	Mg 1	0
19	c	1	Total 1	Mg 1	0

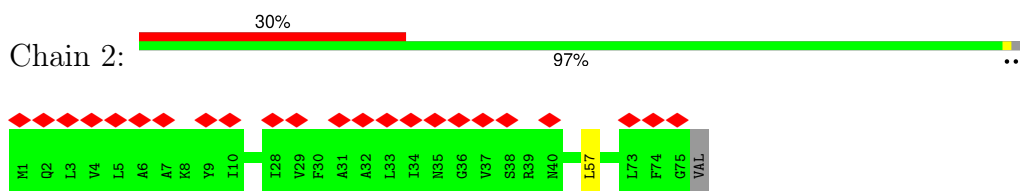
3 Residue-property plots [i](#)

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.

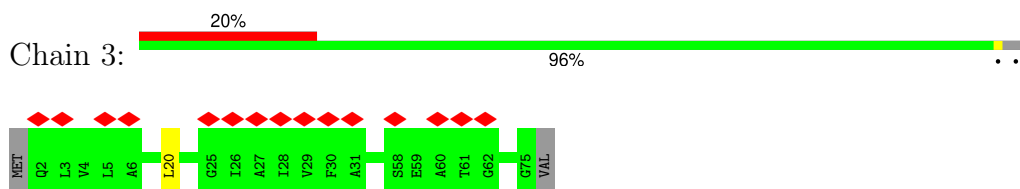
- Molecule 1: ATP synthase subunit 9, mitochondrial



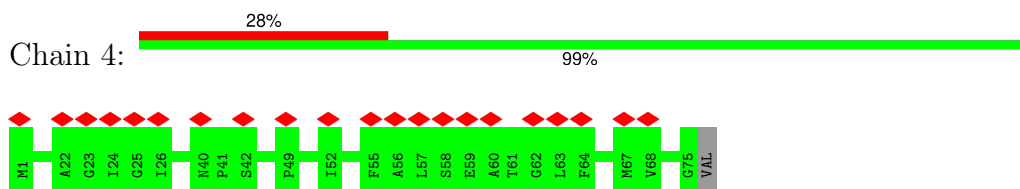
- Molecule 1: ATP synthase subunit 9, mitochondrial



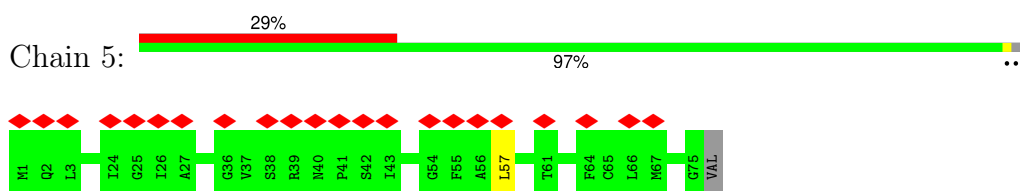
- Molecule 1: ATP synthase subunit 9, mitochondrial



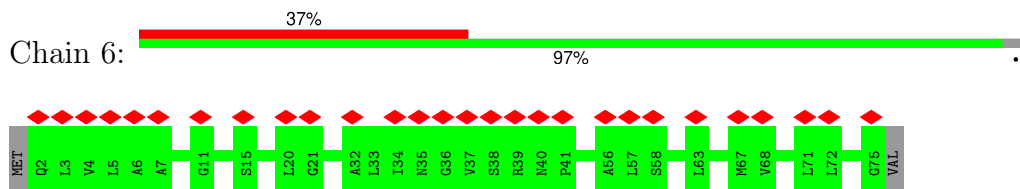
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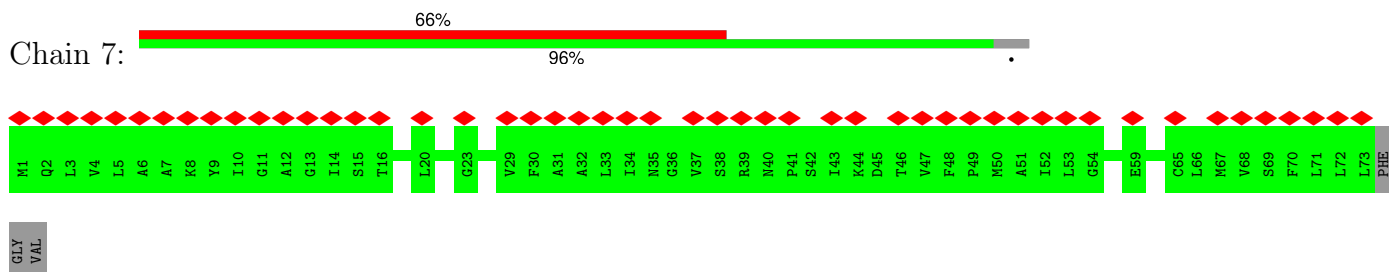
- Molecule 1: ATP synthase subunit 9, mitochondrial



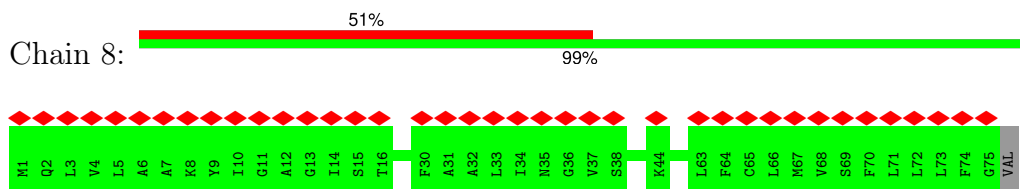
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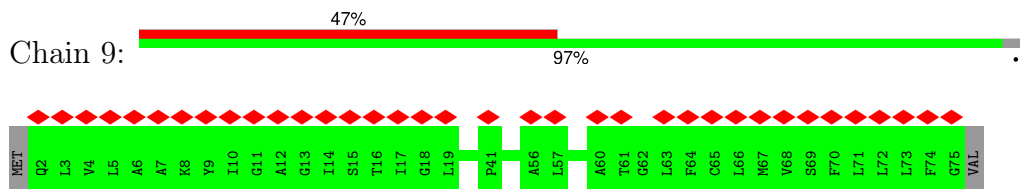
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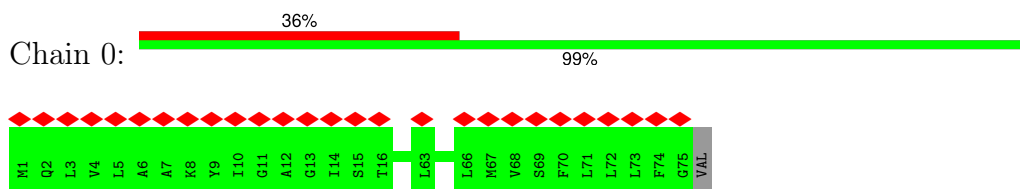
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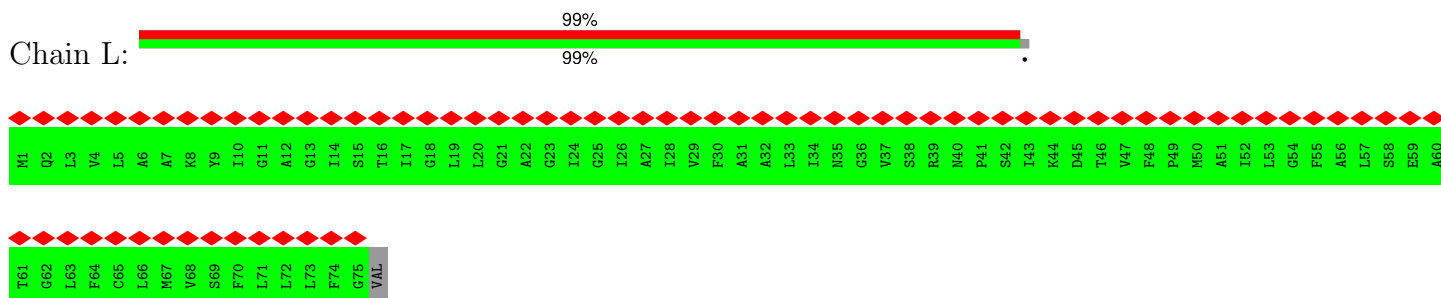
• Molecule 1: ATP synthase subunit 9, mitochondrial



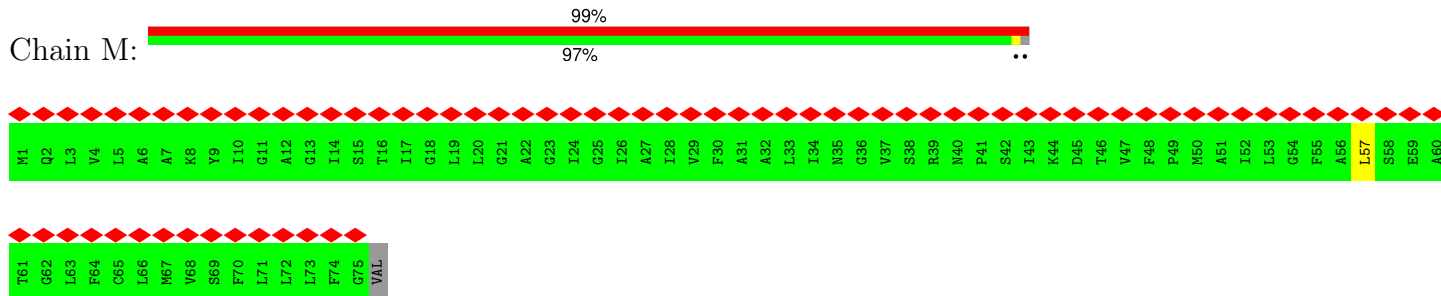
• Molecule 1: ATP synthase subunit 9, mitochondrial



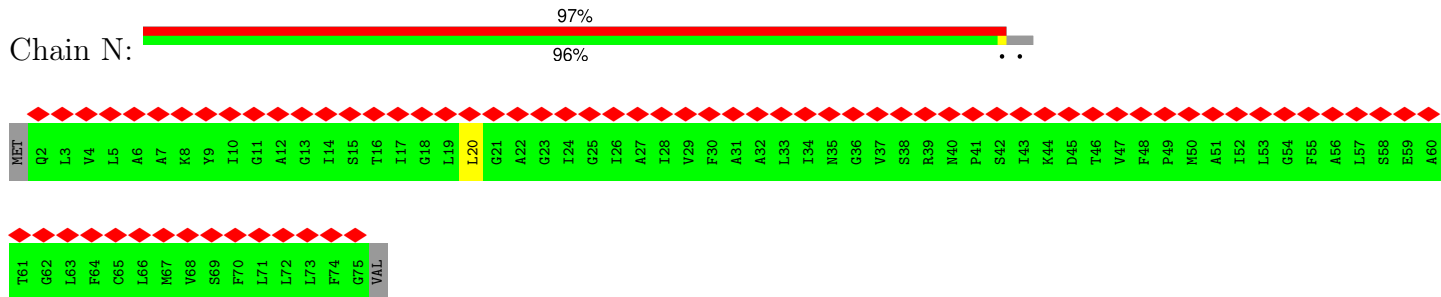
• Molecule 1: ATP synthase subunit 9, mitochondrial



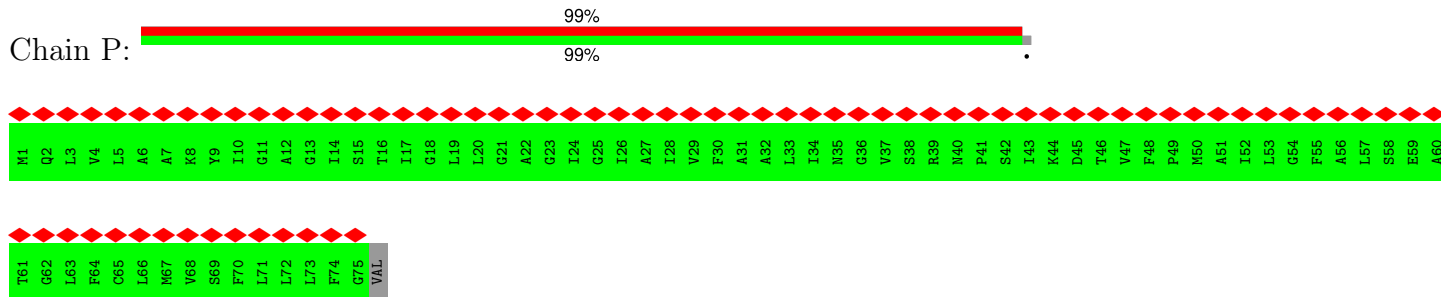
• Molecule 1: ATP synthase subunit 9, mitochondrial



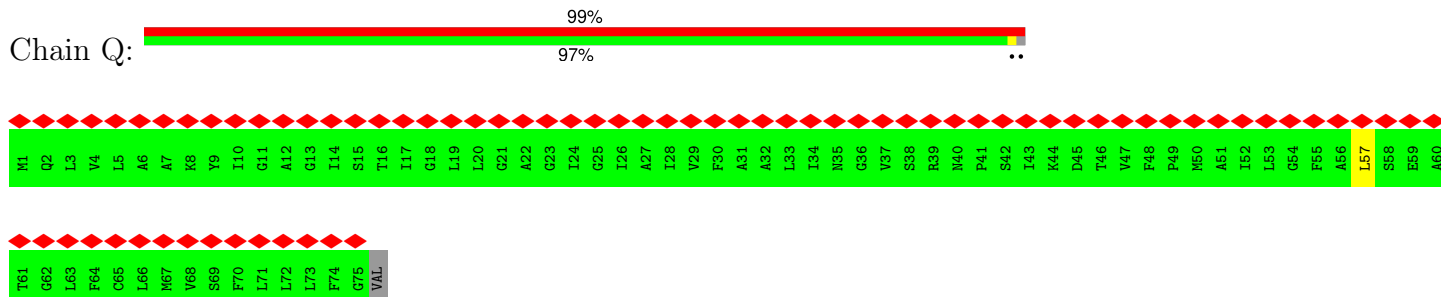
• Molecule 1: ATP synthase subunit 9, mitochondrial



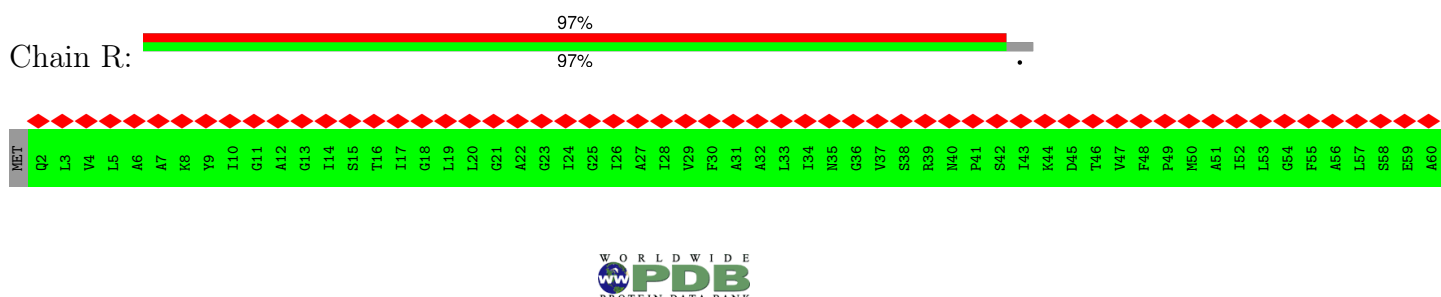
• Molecule 1: ATP synthase subunit 9, mitochondrial

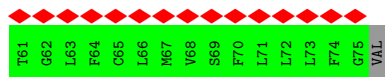


• Molecule 1: ATP synthase subunit 9, mitochondrial

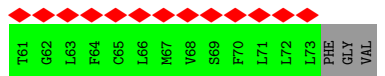
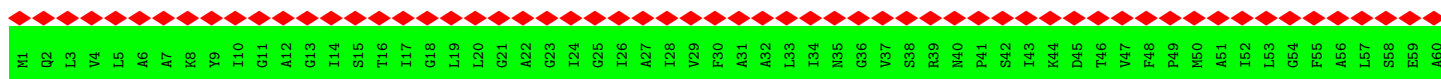


• Molecule 1: ATP synthase subunit 9, mitochondrial

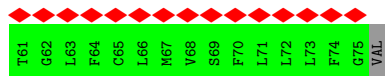
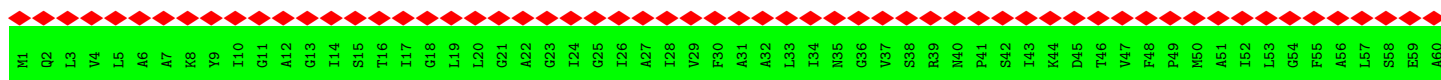




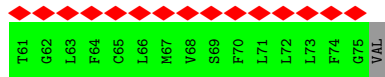
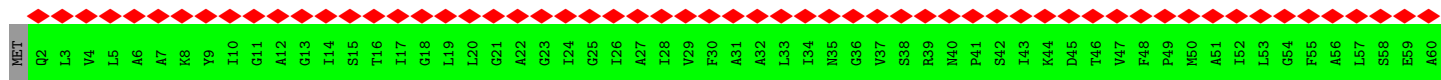
• Molecule 1: ATP synthase subunit 9, mitochondrial



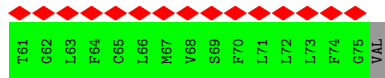
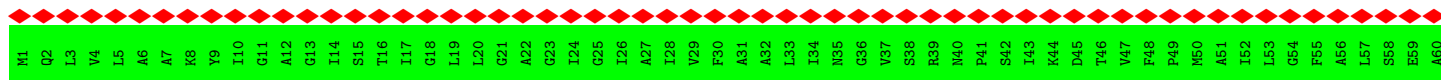
• Molecule 1: ATP synthase subunit 9, mitochondrial



• Molecule 1: ATP synthase subunit 9, mitochondrial

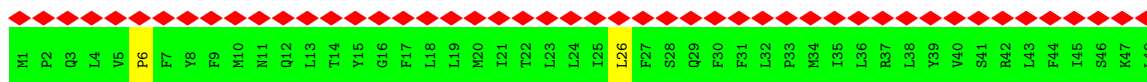


• Molecule 1: ATP synthase subunit 9, mitochondrial



• Molecule 2: ATP synthase protein 8

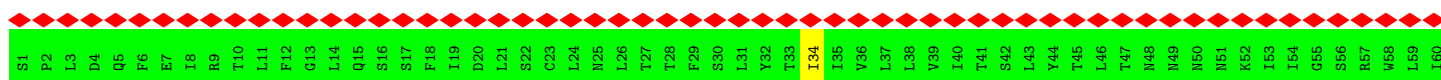




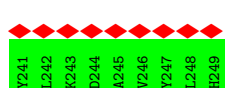
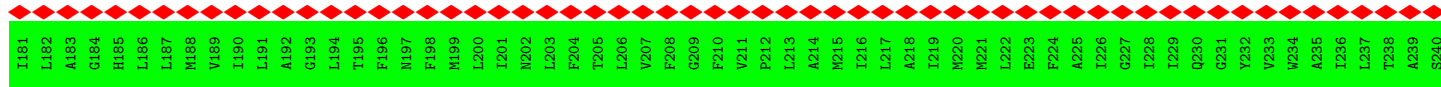
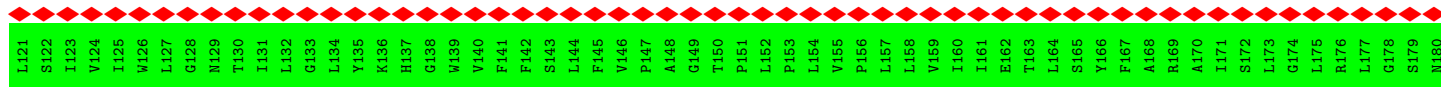
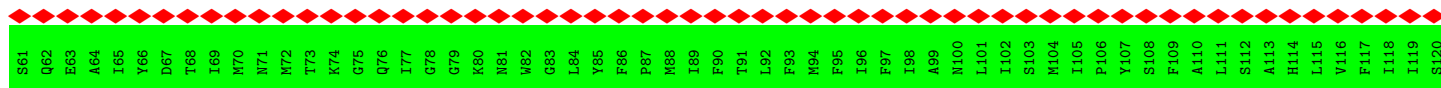
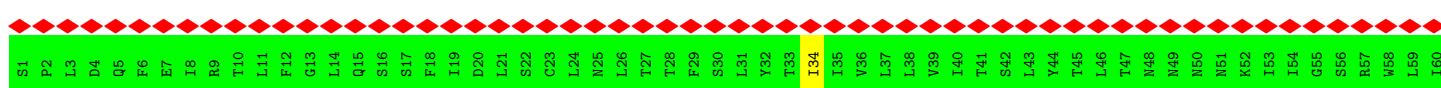
• Molecule 2: ATP synthase protein 8



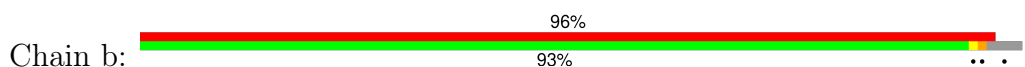
• Molecule 3: ATP synthase subunit a

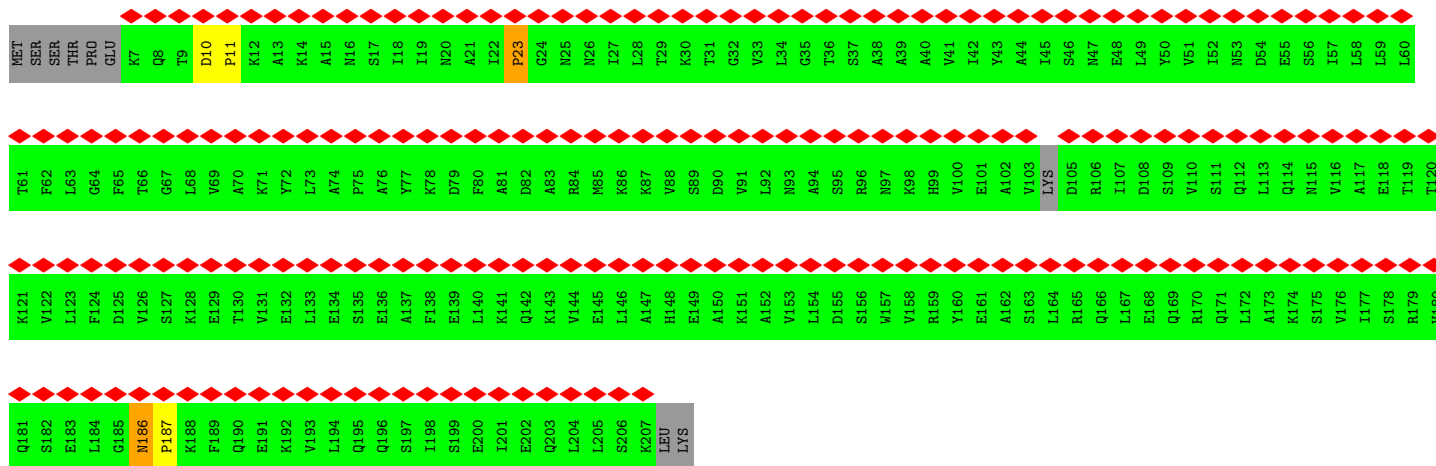


• Molecule 3: ATP synthase subunit a

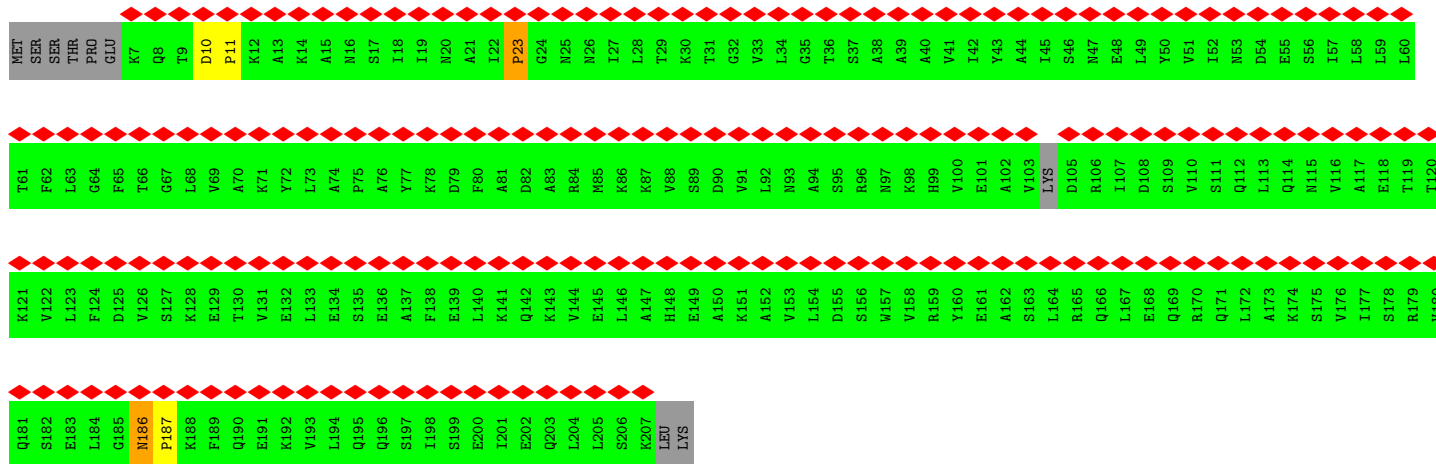
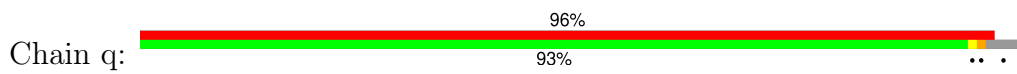


• Molecule 4: ATP synthase subunit 4, mitochondrial

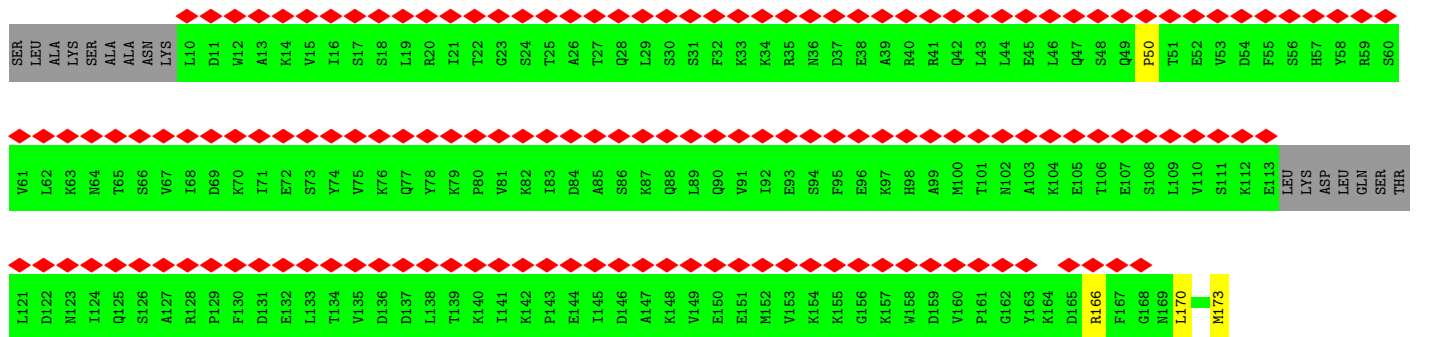
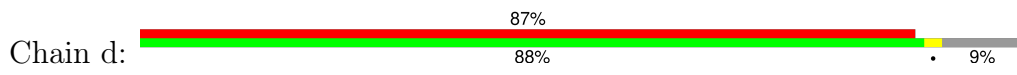




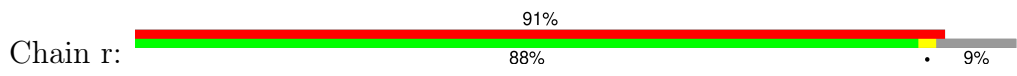
• Molecule 4: ATP synthase subunit 4, mitochondrial

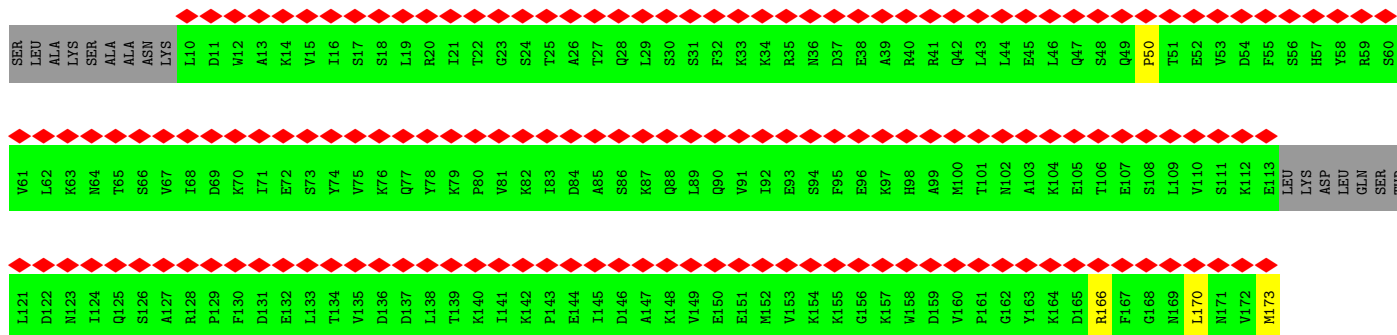


• Molecule 5: ATP synthase subunit d, mitochondrial

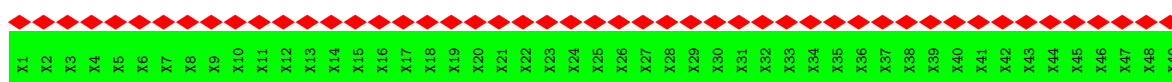


• Molecule 5: ATP synthase subunit d, mitochondrial

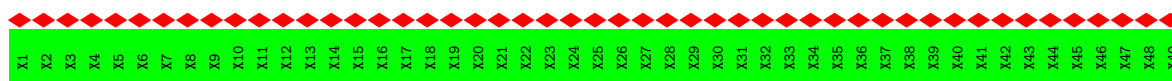




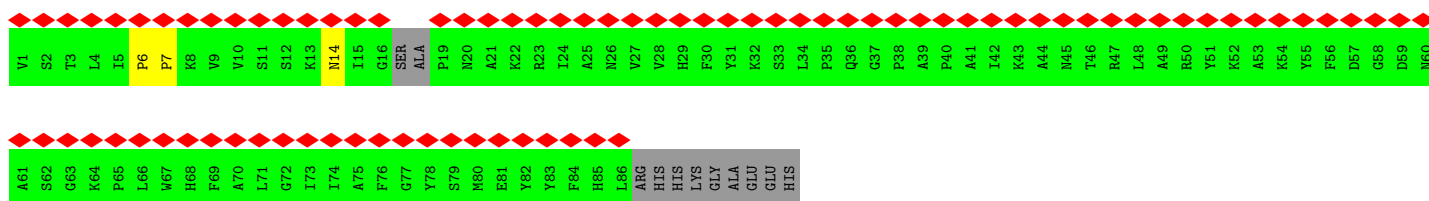
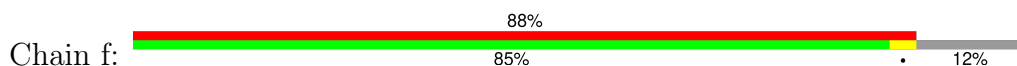
• Molecule 6: ATP synthase subunit e, mitochondrial



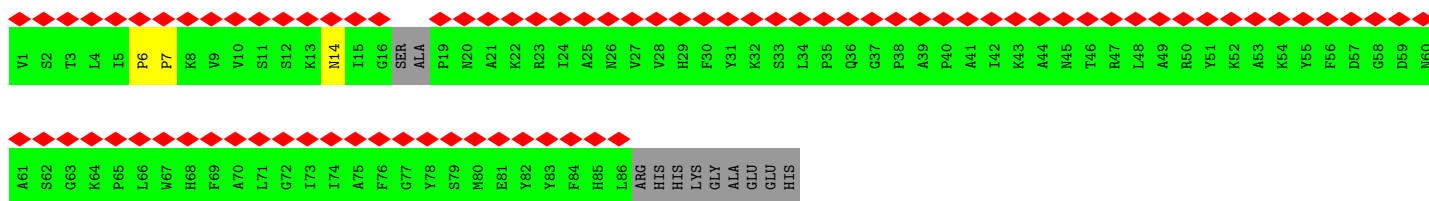
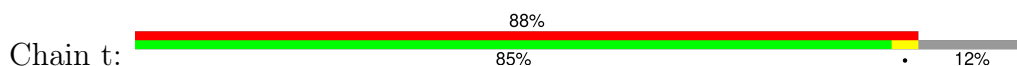
• Molecule 6: ATP synthase subunit e, mitochondrial



• Molecule 7: ATP synthase subunit f, mitochondrial

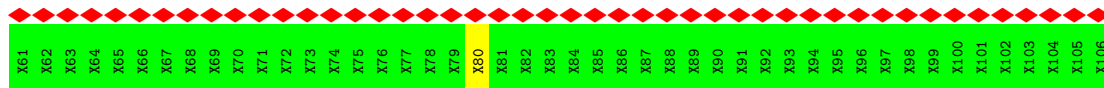
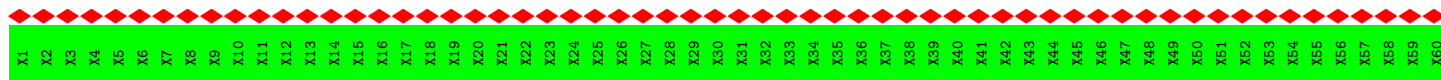


• Molecule 7: ATP synthase subunit f, mitochondrial

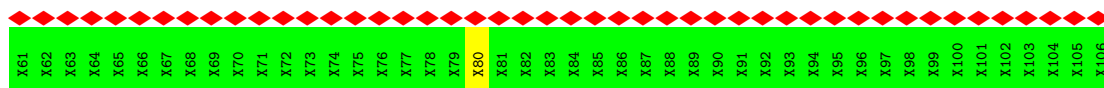
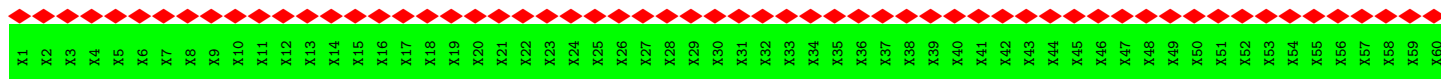


• Molecule 8: AATP synthase subunit g

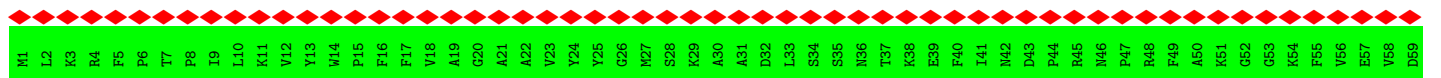




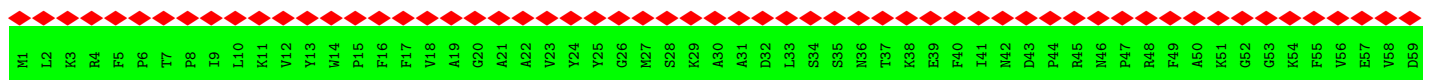
• Molecule 8: AATP synthase subunit g



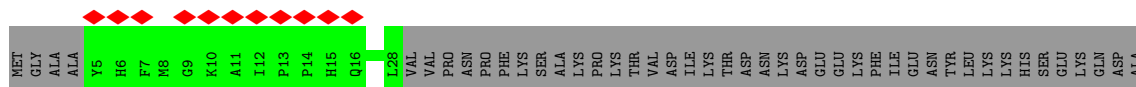
• Molecule 9: ATP synthase subunit J, mitochondrial



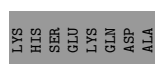
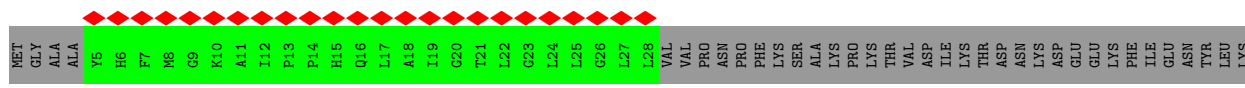
• Molecule 9: ATP synthase subunit J, mitochondrial



• Molecule 10: ATP synthase subunit K, mitochondrial

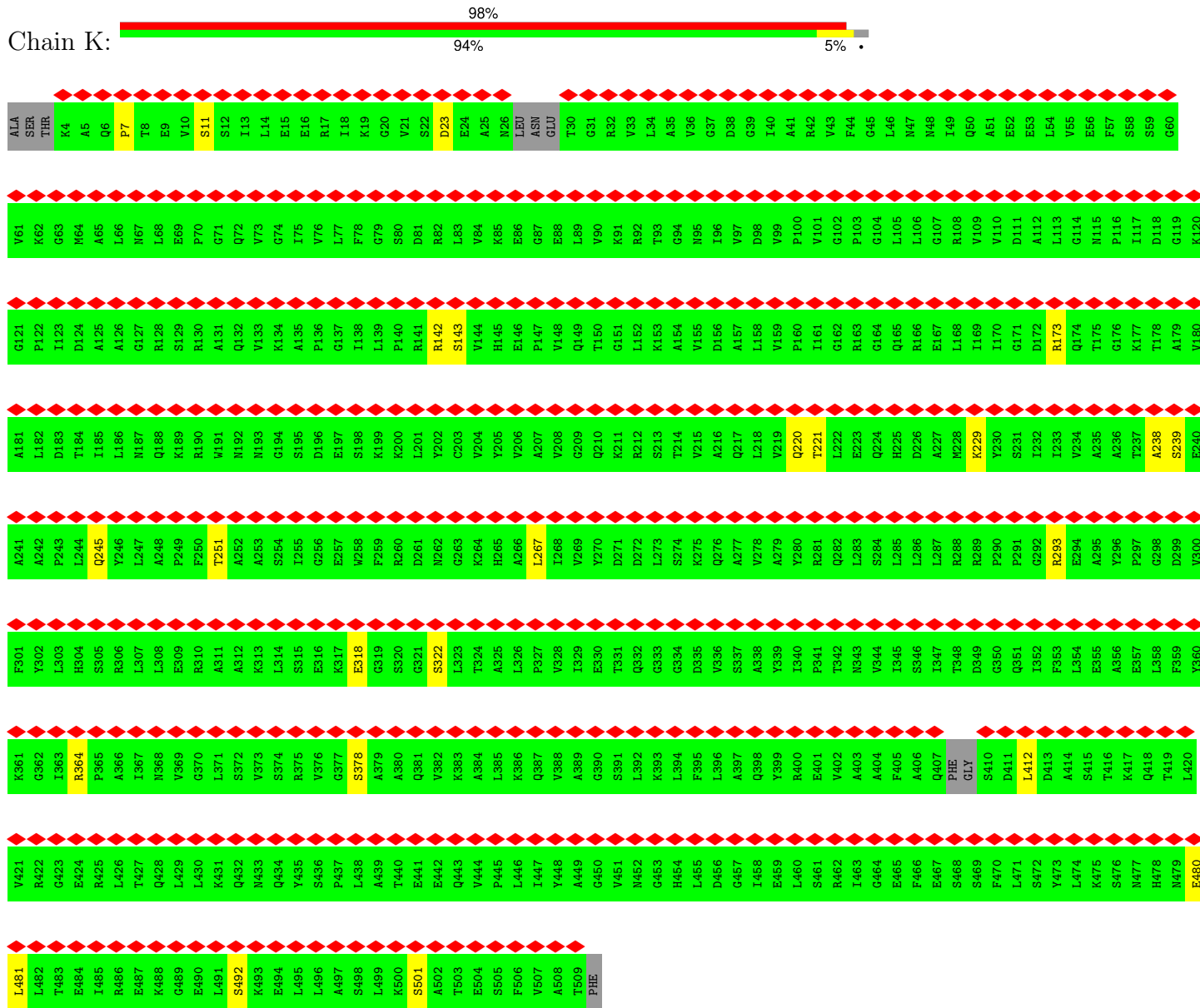


• Molecule 10: ATP synthase subunit K, mitochondrial



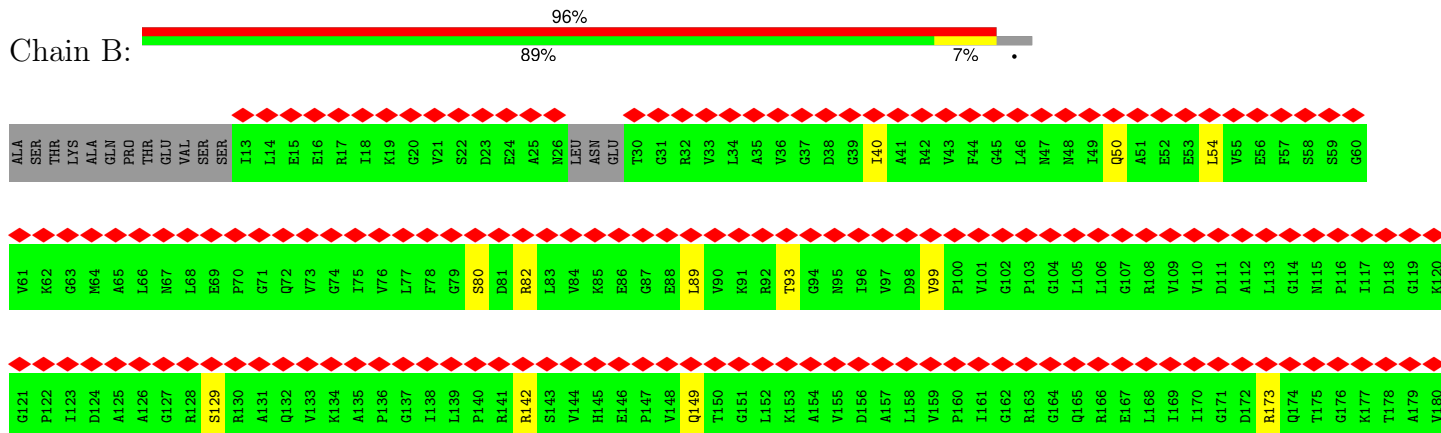
● Molecule 11: ATP synthase subunit alpha, mitochondrial

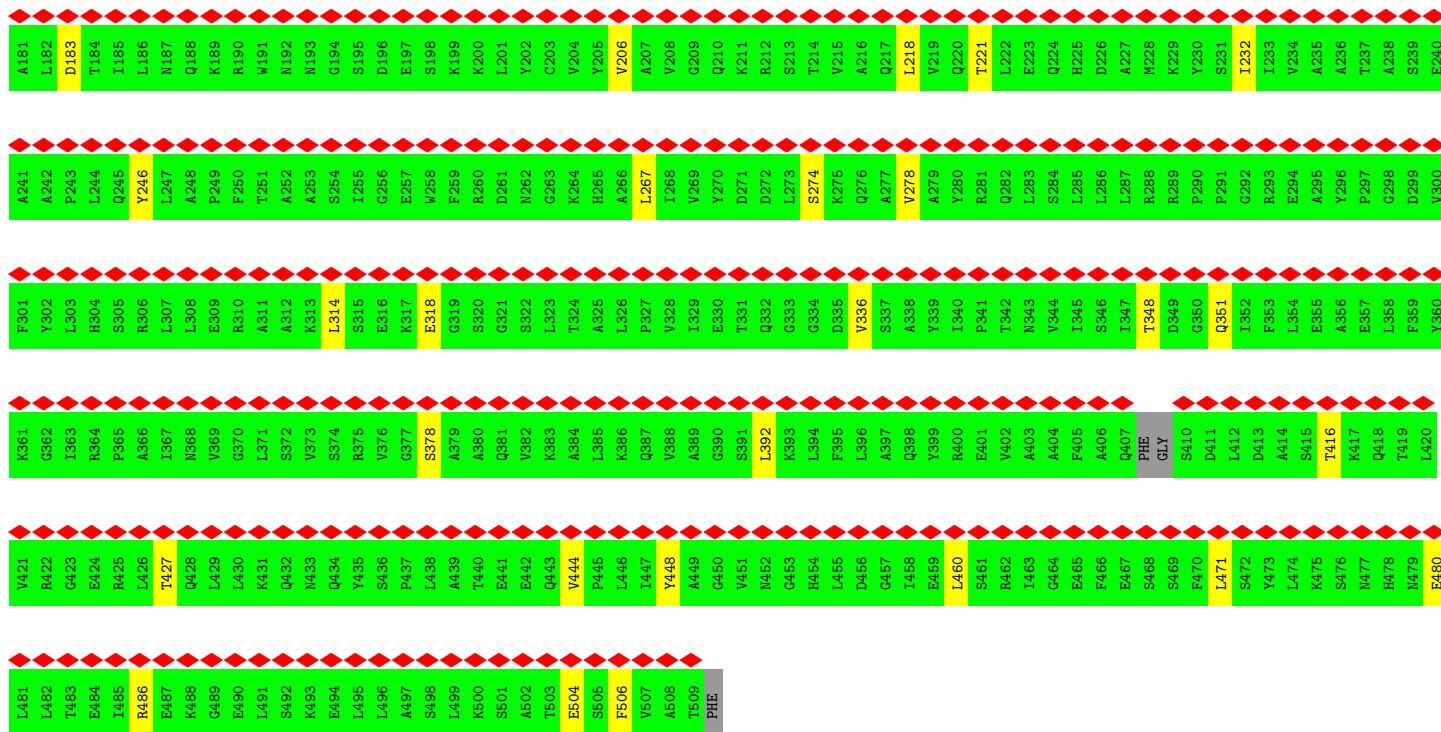
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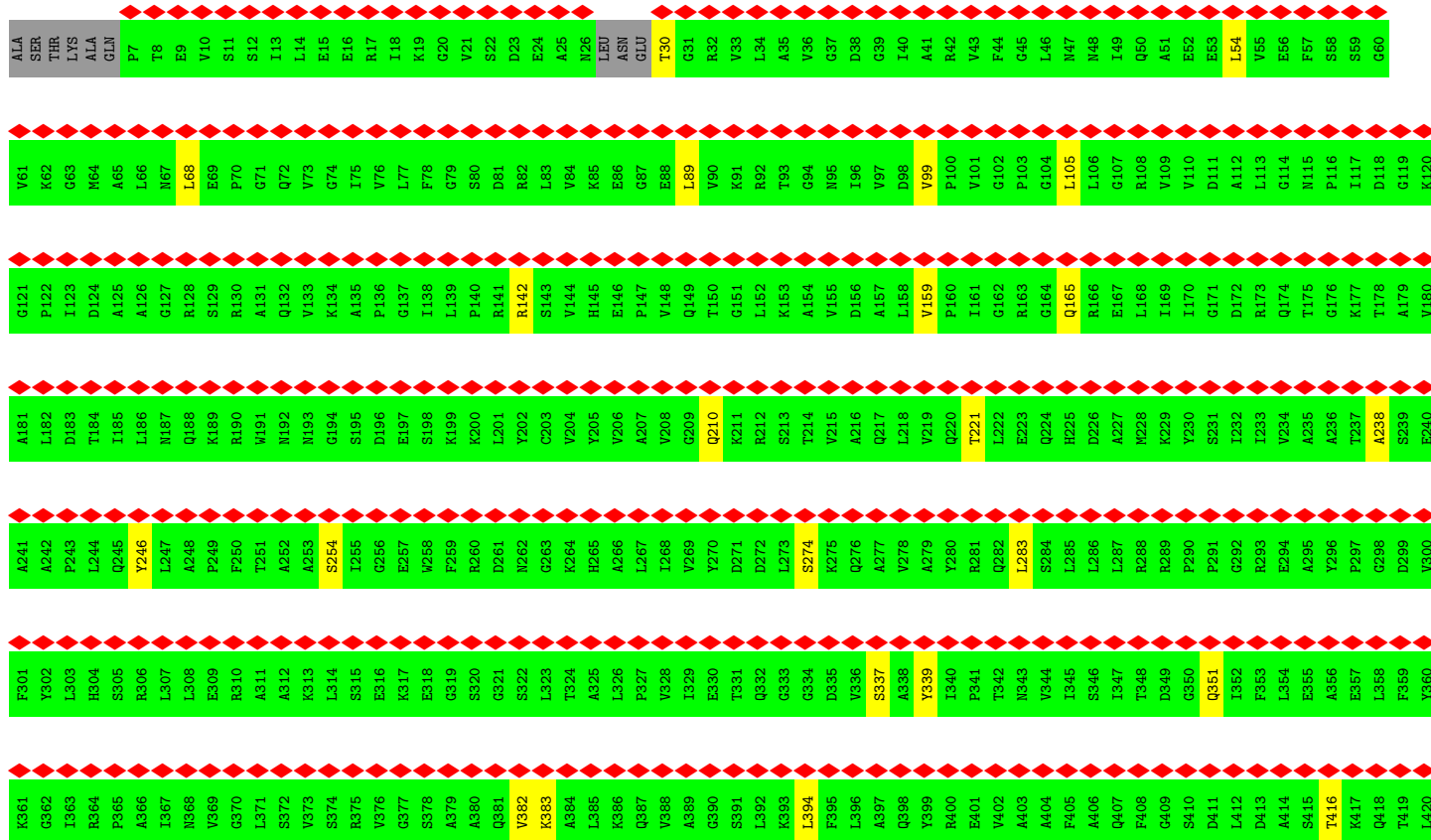
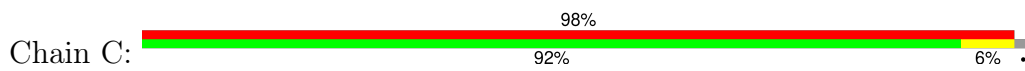
● Molecule 11: ATP synthase subunit alpha, mitochondrial

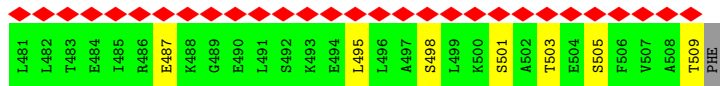
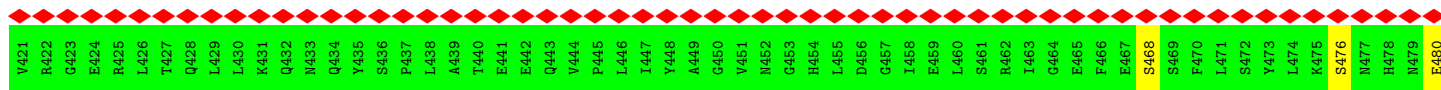
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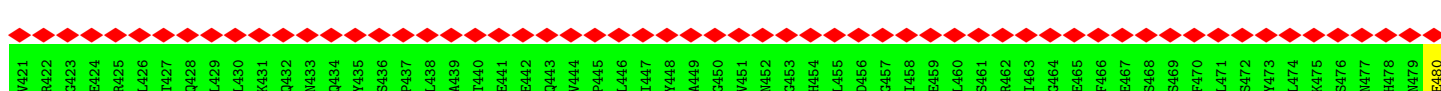
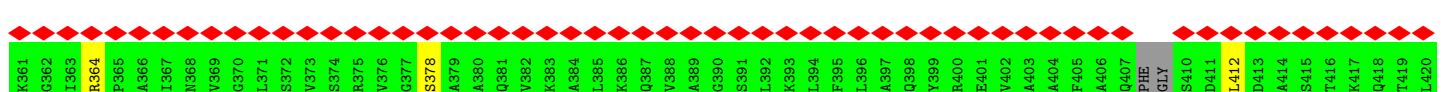
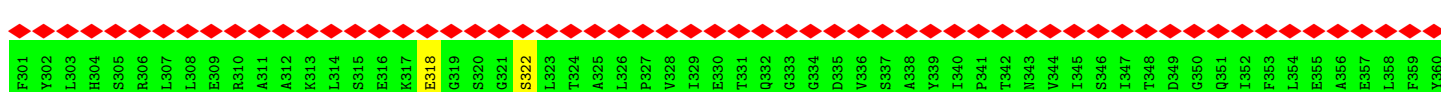
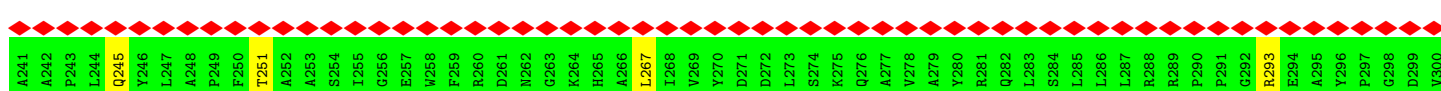
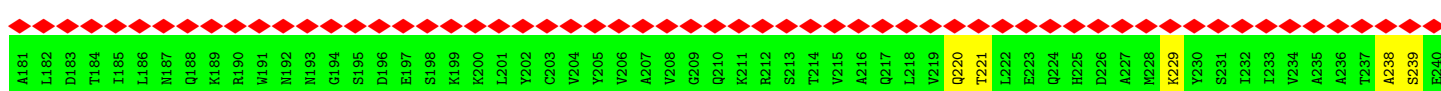
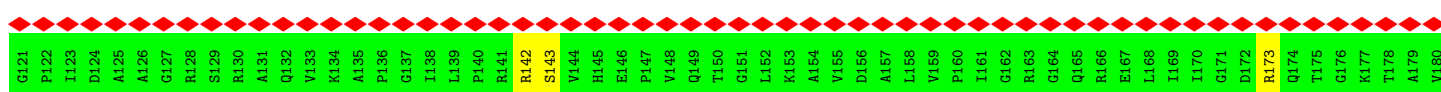
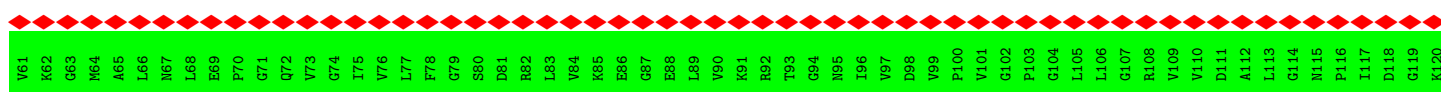
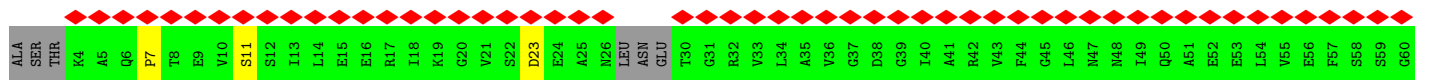
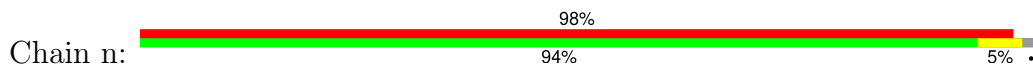


• Molecule 11: ATP synthase subunit alpha, mitochondrial

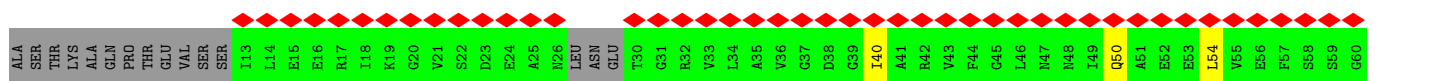
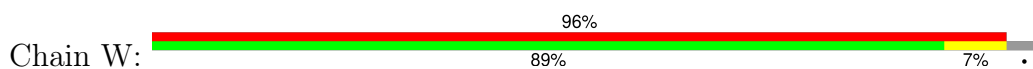


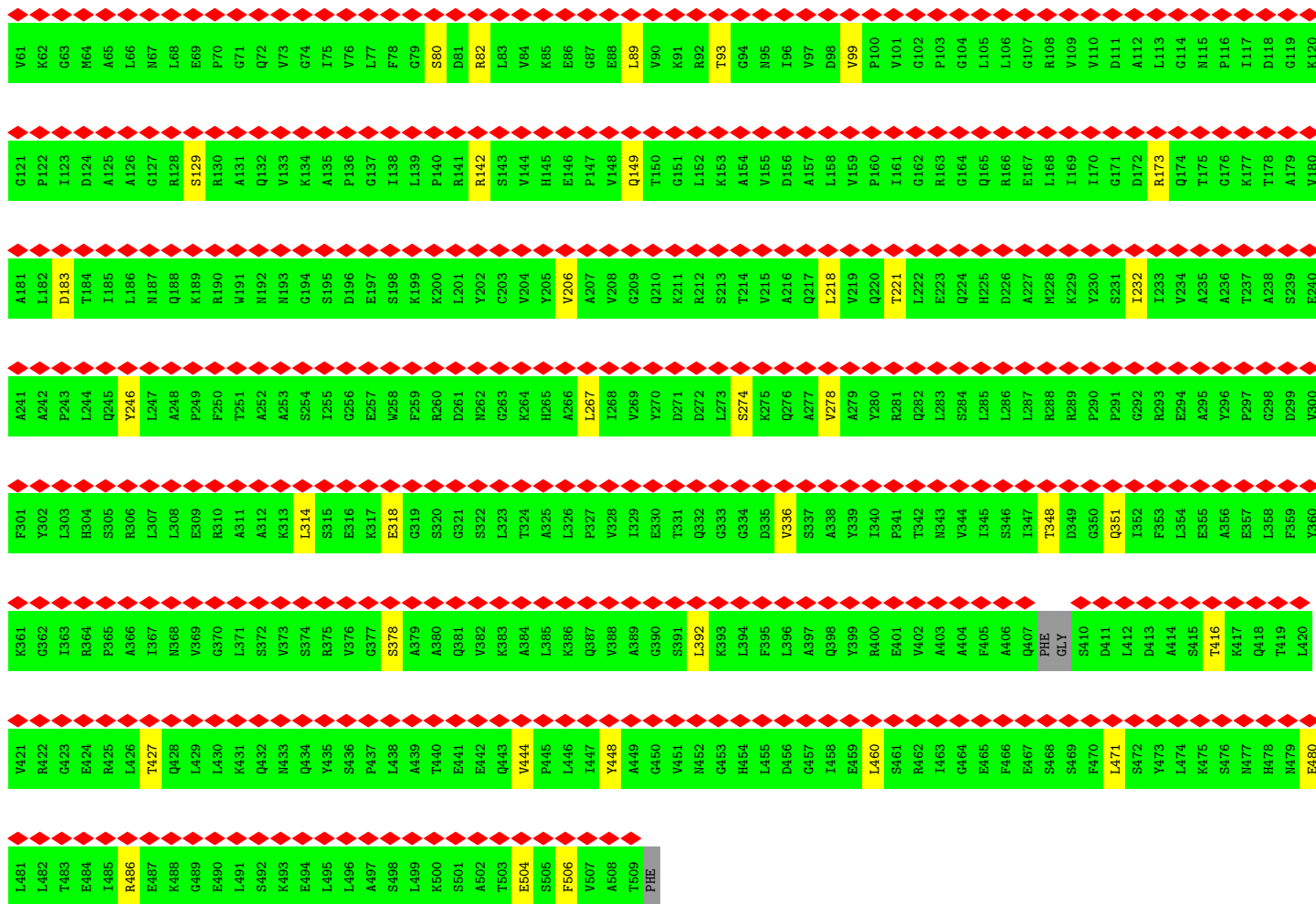


• Molecule 11: ATP synthase subunit alpha, mitochondrial

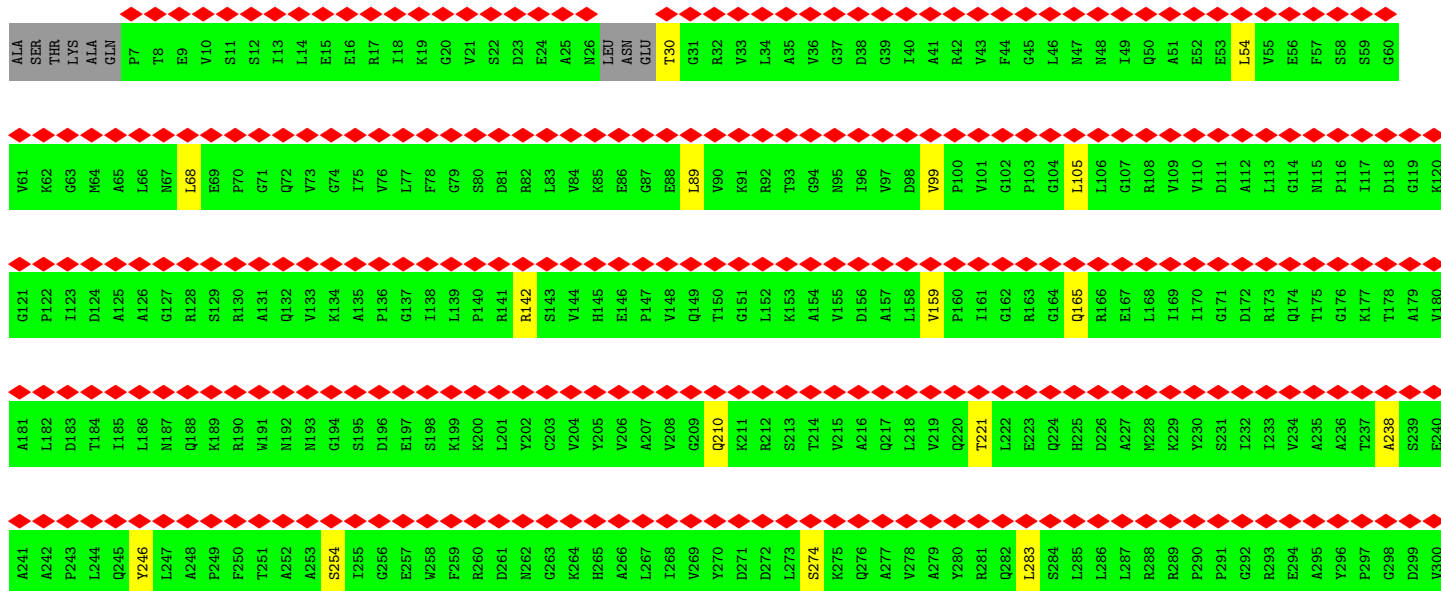
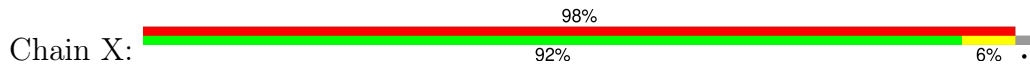


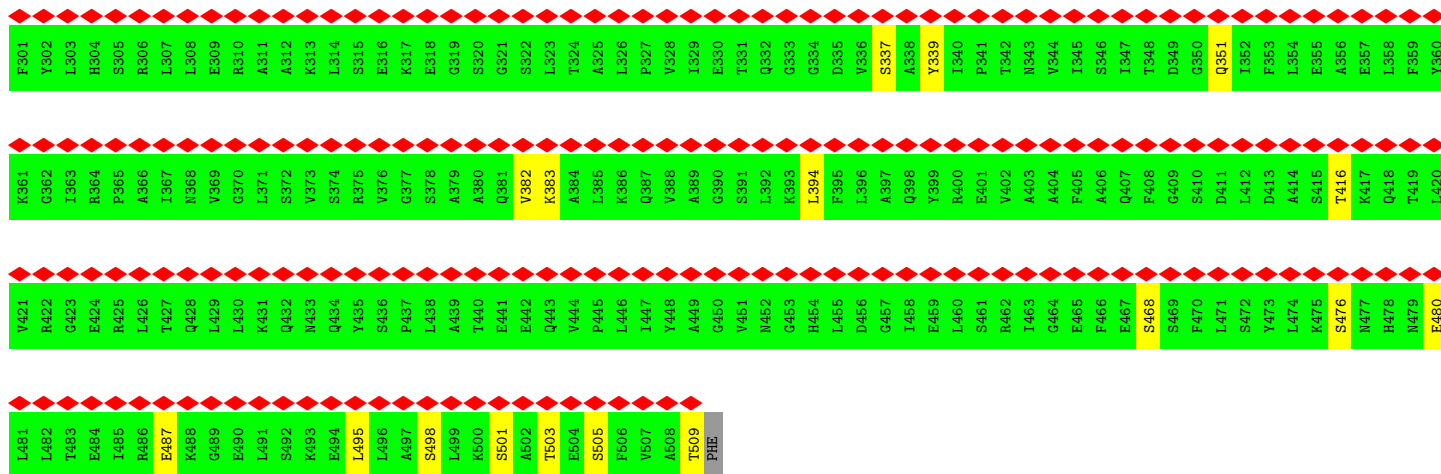
• Molecule 11: ATP synthase subunit alpha, mitochondrial



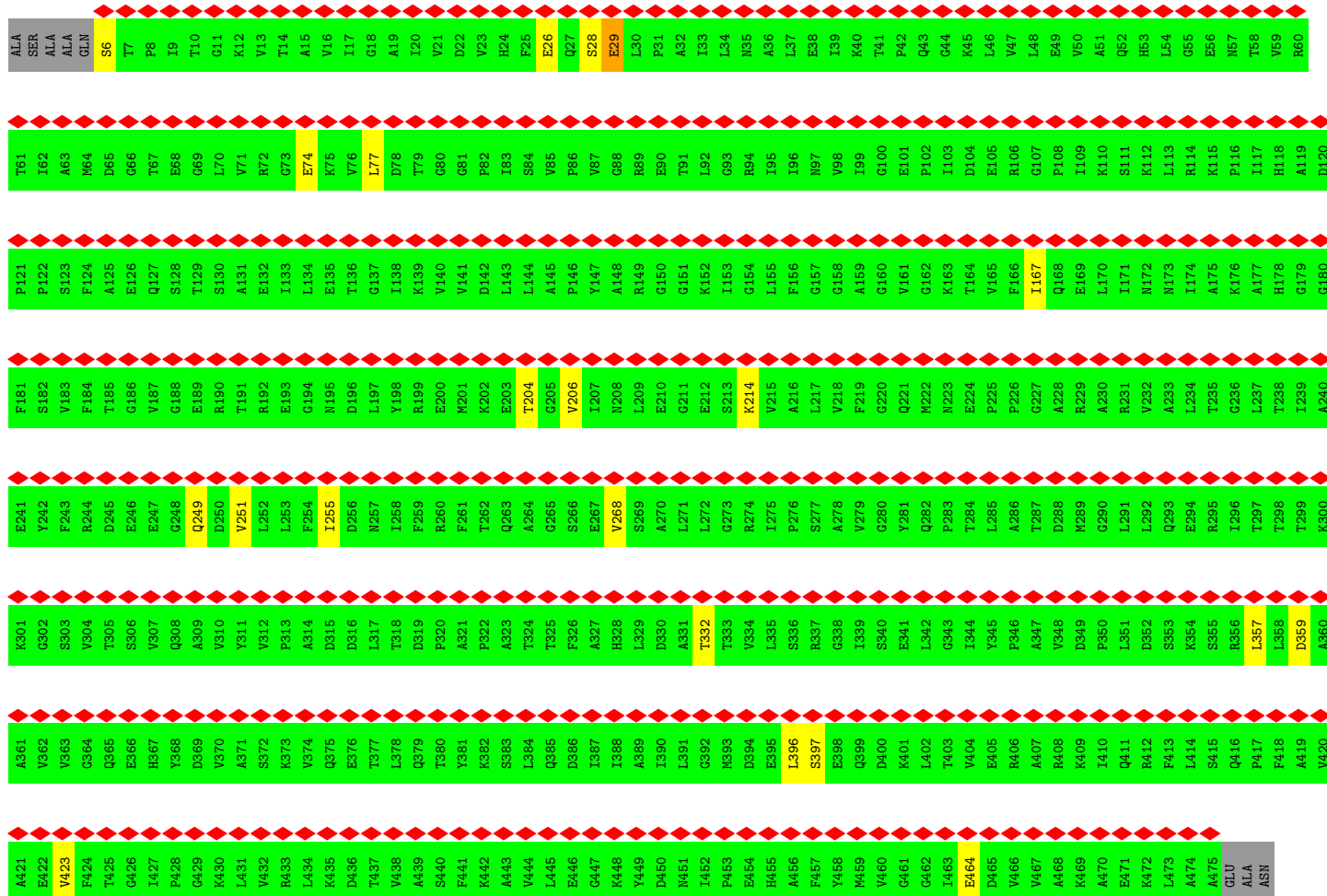


• Molecule 11: ATP synthase subunit alpha, mitochondrial

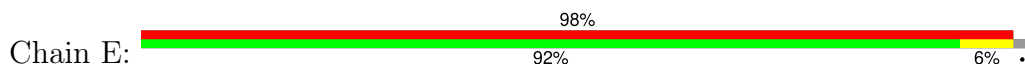




• Molecule 12: ATP synthase subunit beta, mitochondrial

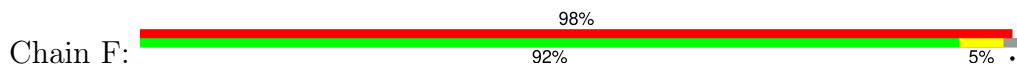


• Molecule 12: ATP synthase subunit beta, mitochondrial

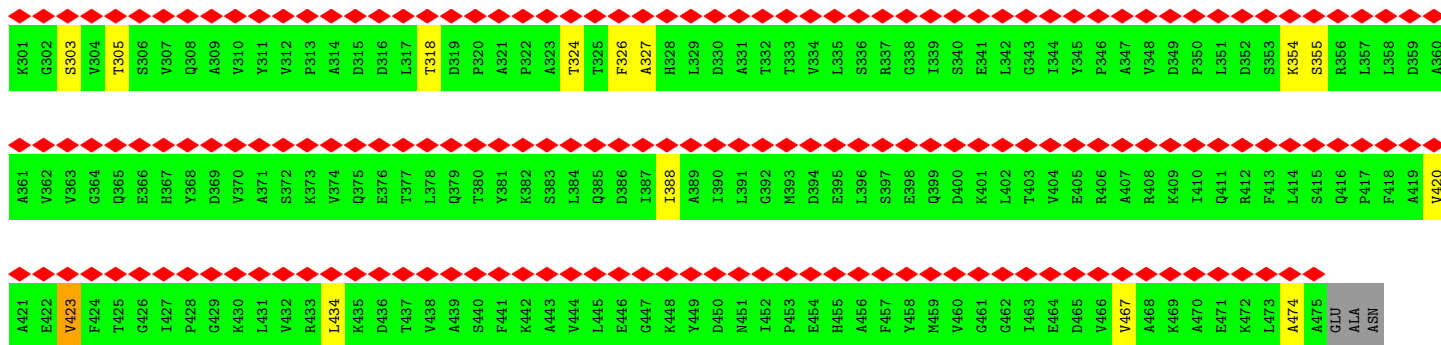


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T61	I62	A63	M64	D65	G66	T67	E68	G69	L70	V71	R72	G73	E74	V75	K76	V77	D78	T79	G80	G81	V82	P82	H83	S84	H85	P86	H87	G88	R89	E90	A91	L92	L93	G94	N95	I96	I97	V98	I99	G100	E101	P102	I103	D104	E105	L106	G107	P108	I109	A51	Q52	H53	L54	G55	E56	N57	T58	V59	R60
P121	P122	S123	F124	A125	E126	Q127	S128	T129	S130	K131	E132	L133	L134	E135	T136	G137	I138	K139	V140	V141	D142	L143	L144	A145	P146	Y147	A148	R149	G150	G151	K152	I153	G154	L155	F156	G157	G158	A159	G160	V161	G162	K163	T164	V165	F166	I167	Q168	E169	I109	A51	Q52	H53	L54	G55	E56	N57	T58	V59	R60
F181	S182	V183	F184	T185	G186	V187	G188	E189	R190	T191	R192	G193	G194	N195	D196	L197	Y198	R199	E200	M201	K202	E203	T204	G205	V206	I207	N208	L209	E210	G211	E212	S213	K214	V215	A216	L217	V218	F219	G220	Q221	H222	N223	E224	P225	P226	G227	A228	R229	A230	A231	V232	A233	L234	T235	G236	L237	T238	I239	A240
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K301	G302	S303	V304	T305	S306	V307	Q308	A309	V310	Y311	L312	P313	A314	D315	D316	L317	T318	D319	P320	A321	P322	A323	T324	F325	F326	A327	H328	L329	D330	A331	T332	G333	V334	L335	S336	G337	I338	I339	S340	E341	L342	G343	I344	Y345	P346	A347	V348	D349	G290	L291	L292	Q293	E294	R295	I296	T297	T298	T299	A360
A361	V362	V363	G364	Q365	E366	H367	Y368	D369	V370	A371	S372	K373	V374	Q375	E376	T377	L378	Q379	T380	Y381	K382	S383	L384	Q385	D386	I387	I388	A389	I390	L391	G392	M393	D394	E395	L396	S397	E398	Q399	D400	K401	L402	T403	V404	E405	R406	A407	R408	K409	I410	Q411	R412	F413	L414	S415	Q416	P417	F418	A419	V420
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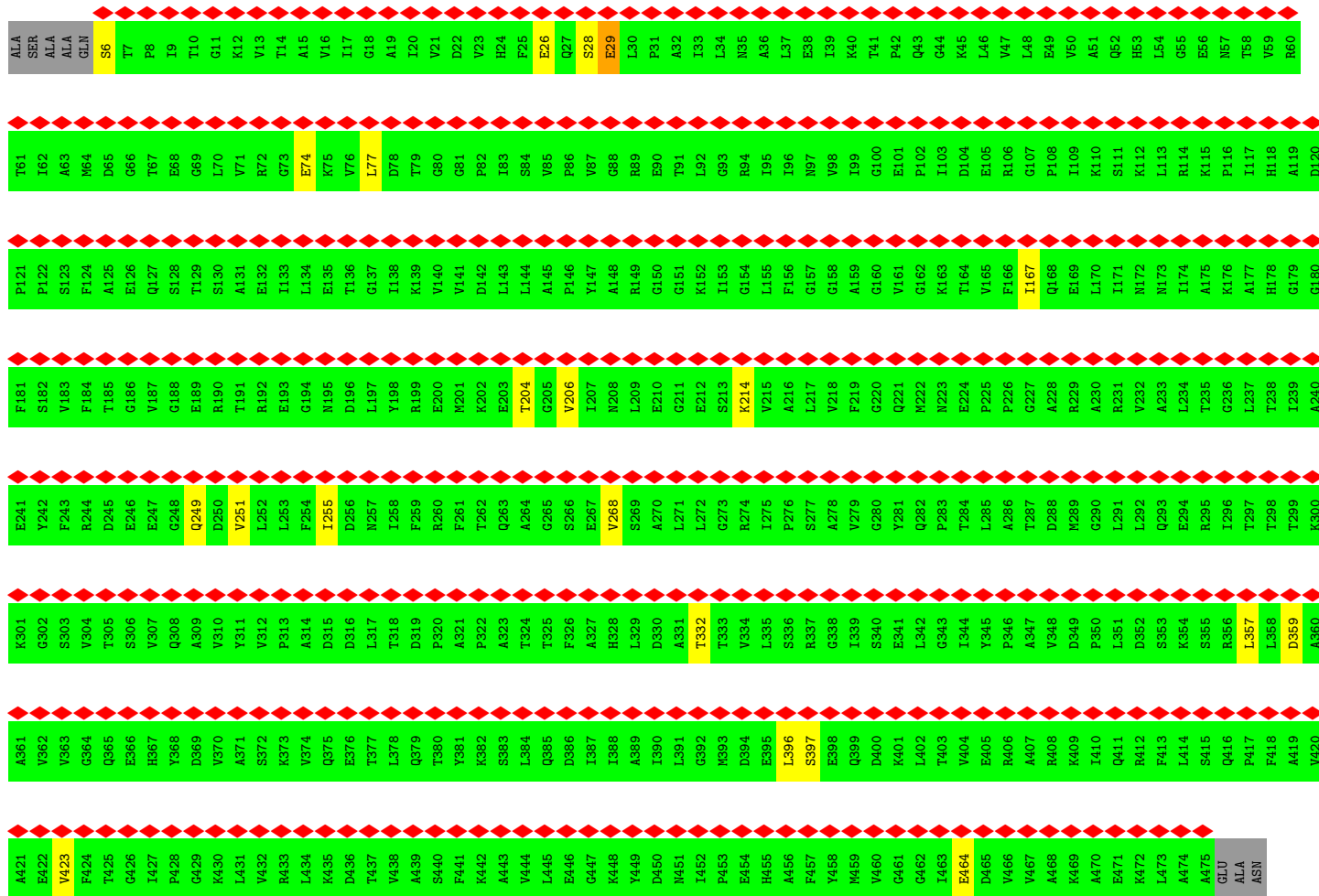
• Molecule 12: ATP synthase subunit beta, mitochondrial

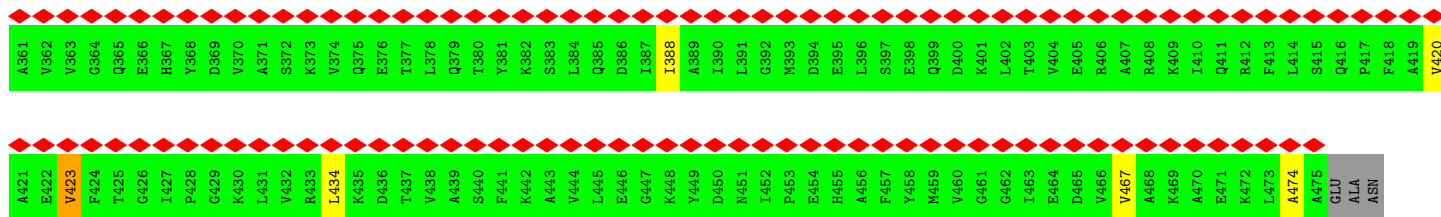


ALA	SER	ALA	ALA	GLN	SER	T7	P8	I9	T10	G11	K12	V13	T14	A15	V16	I17	H18	A19	I20	V21	D22	V23	H24	F25	E26	Q27	S28	E29	L30	P31	A32	L33	L34	N35	A36	L37	E38	I39	K40	T41	P42	Q43	G44	K45	L46	V47	L48	E49	V50	A51	Q52	H53	L54	G55	E56	N57	T58	V59	R60
T61	I62	A63	M64	D65	G66	T67	E68	G69	L70	V71	R72	G73	E74	V75	K76	V77	D78	T79	G80	G81	V82	P82	H83	S84	H85	P86	H87	G88	R89	E90	A91	L92	L93	G94	N95	I96	I97	V98	I99	G100	E101	P102	I103	D104	E105	L106	G107	P108	I109	A51	Q52	H53	L54	G55	E56	N57	T58	V59	R60
P121	P122	S123	F124	A125	E126	Q127	S128	T129	S130	K131	E132	L133	L134	E135	T136	G137	I138	K139	V140	V141	D142	L143	L144	A145	P146	Y147	A148	R149	G150	G151	K152	I153	G154	L155	F156	G157	G158	A159	G160	V161	G162	K163	T164	V165	F166	I167	Q168	E169	I109	A51	Q52	H53	L54	G55	E56	N57	T58	V59	R60
F181	S182	V183	F184	T185	G186	V187	G188	E189	R190	T191	R192	G193	G194	N195	D196	L197	Y198	R199	E200	M201	K202	E203	T204	G205	V206	I207	N208	L209	E210	G211	E212	S213	K214	V215	A216	L217	V218	F219	G220	Q221	H222	N223	E224	P225	P226	G227	A228	R229	A230	A231	V232	A233	L234	T235	G236	L237	T238	I239	A240
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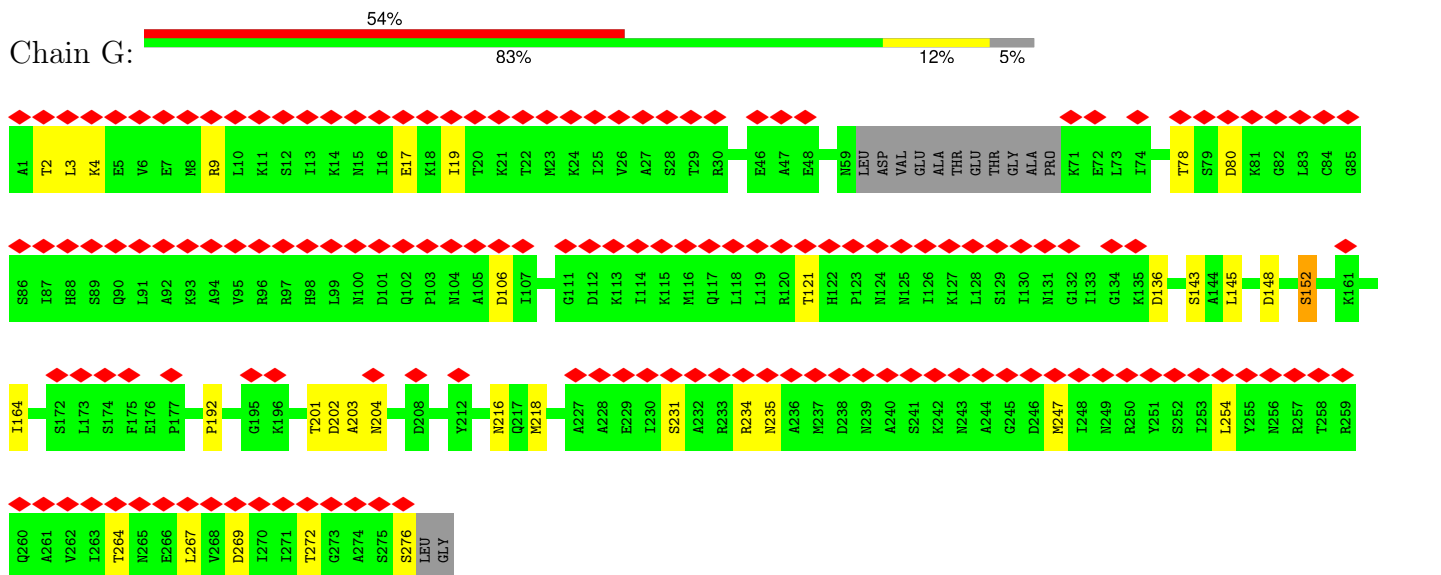


• Molecule 12: ATP synthase subunit beta, mitochondrial

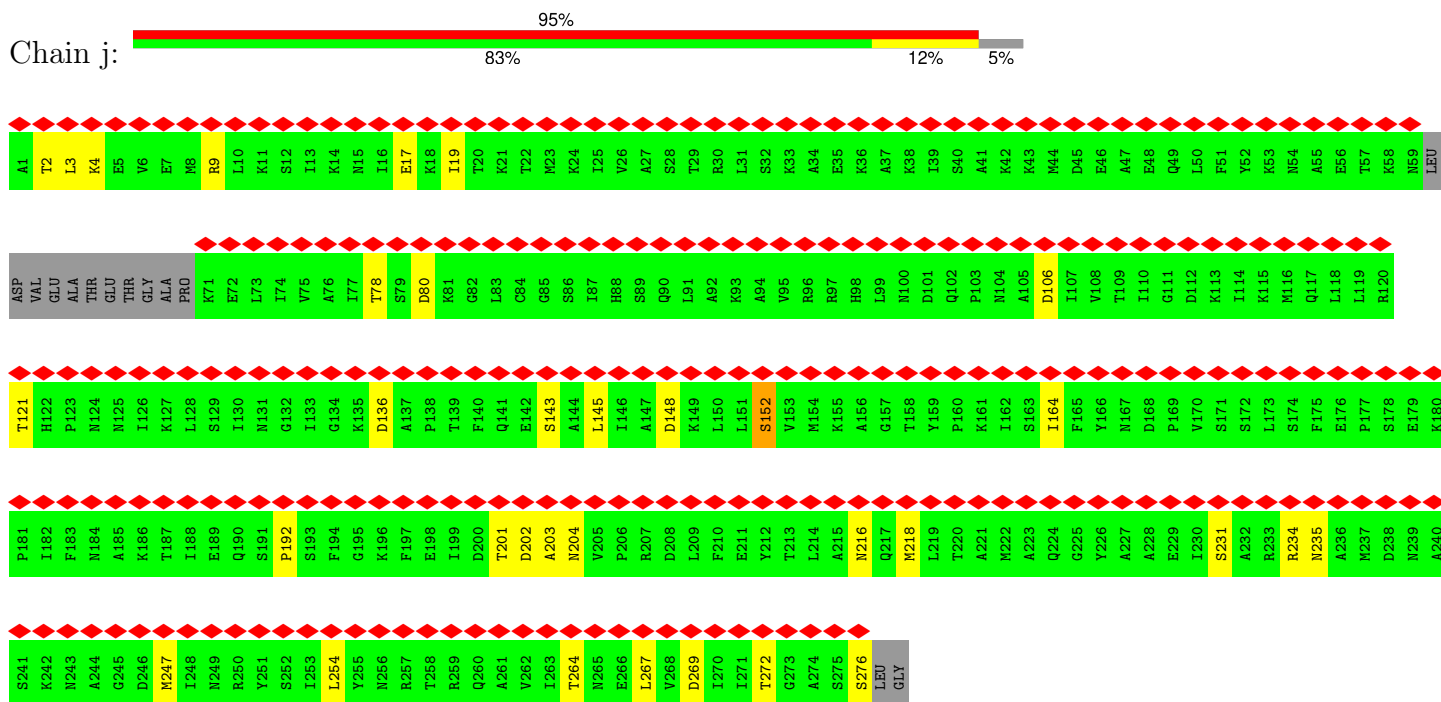




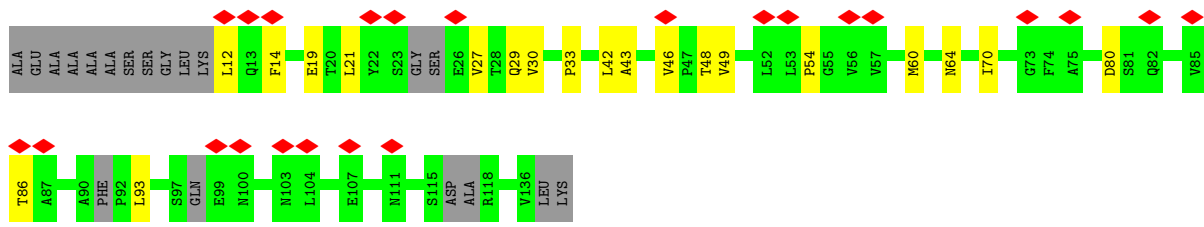
• Molecule 13: ATP synthase subunit gamma, mitochondrial



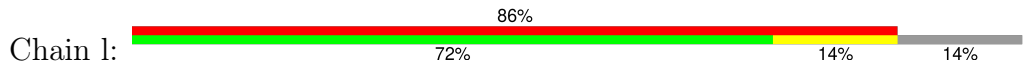
• Molecule 13: ATP synthase subunit gamma, mitochondrial



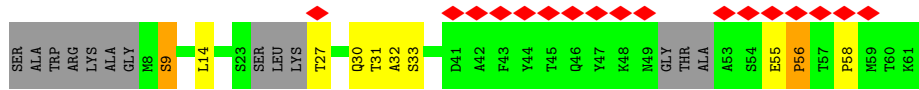
• Molecule 14: ATP synthase subunit delta, mitochondrial



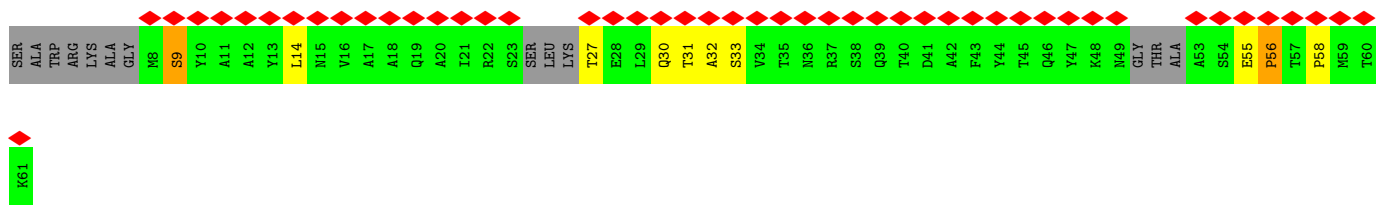
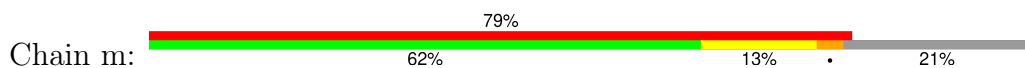
• Molecule 14: ATP synthase subunit delta, mitochondrial



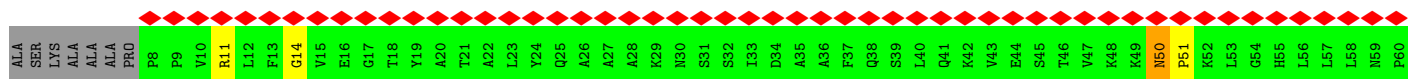
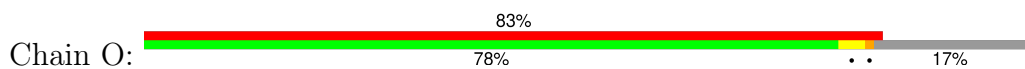
• Molecule 15: ATP synthase catalytic sector F1 epsilon subunit

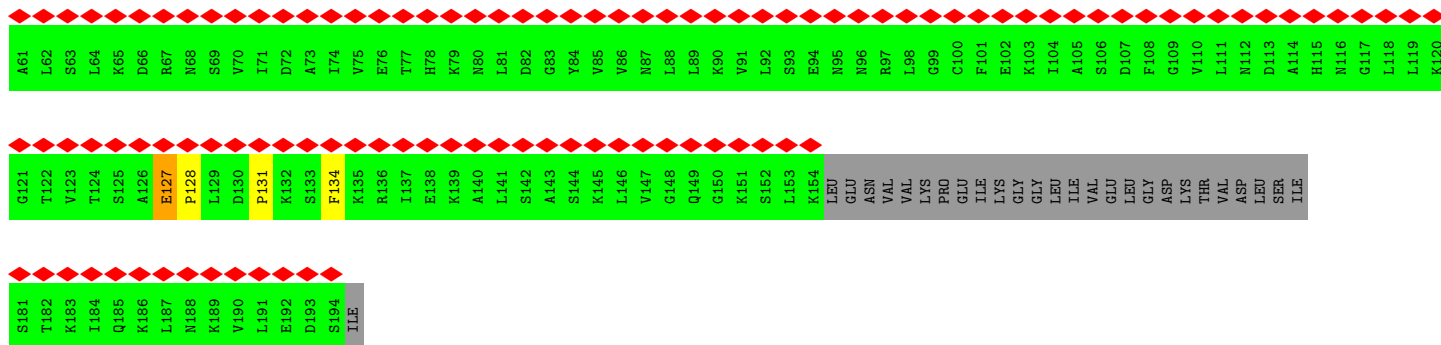


• Molecule 15: ATP synthase catalytic sector F1 epsilon subunit

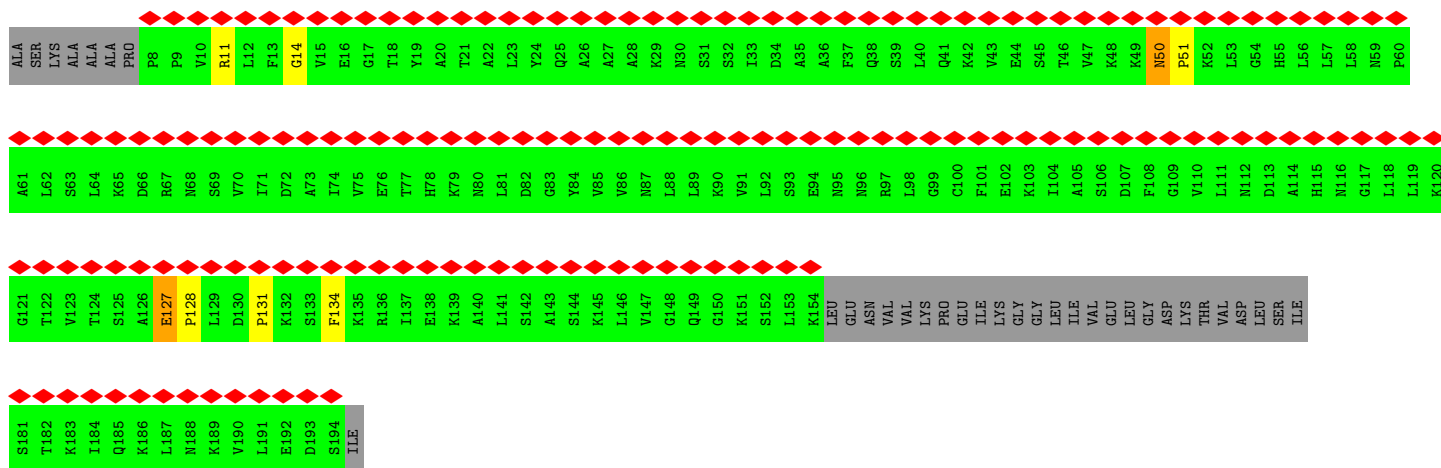
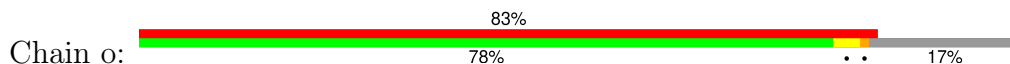


• Molecule 16: ATP synthase subunit 5, mitochondrial

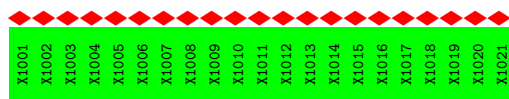




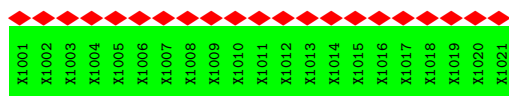
• Molecule 16: ATP synthase subunit 5, mitochondrial



• Molecule 17: ATP synthase subunit h



• Molecule 17: ATP synthase subunit h



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	238848	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 ($e^-/\text{\AA}^2$)	71	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 QUANTUM (4k x 4k)	Depositor
Maximum map value	1.103	Depositor
Minimum map value	-0.374	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.000	Depositor
Recommended contour level	0.156	Depositor
Map size (Å)	464.0, 464.0, 464.0	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.45, 1.45, 1.45	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, ANP

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	0	0.34	0/545	0.60	0/737
1	1	0.35	0/545	0.55	0/737
1	2	0.38	0/545	0.67	1/737 (0.1%)
1	3	0.37	0/537	0.61	1/727 (0.1%)
1	4	0.34	0/545	0.61	0/737
1	5	0.32	0/545	0.58	0/737
1	6	0.33	0/537	0.60	0/727
1	7	0.31	0/529	0.56	0/716
1	8	0.32	0/545	0.56	0/737
1	9	0.32	0/537	0.57	0/727
1	J	0.34	0/545	0.61	0/737
1	L	0.35	0/545	0.55	0/737
1	M	0.38	0/545	0.67	1/737 (0.1%)
1	N	0.37	0/537	0.61	1/727 (0.1%)
1	P	0.34	0/545	0.60	0/737
1	Q	0.32	0/545	0.58	0/737
1	R	0.34	0/537	0.59	0/727
1	S	0.31	0/529	0.56	0/716
1	T	0.32	0/545	0.56	0/737
1	U	0.32	0/537	0.57	0/727
2	A	0.50	0/422	0.77	1/570 (0.2%)
2	V	0.50	0/422	0.77	1/570 (0.2%)
3	a	0.45	0/2023	0.70	0/2758
3	p	0.45	0/2023	0.70	0/2758
4	b	0.46	0/1159	0.72	2/1599 (0.1%)
4	q	0.46	0/1159	0.72	2/1599 (0.1%)
5	d	0.56	0/936	0.81	1/1286 (0.1%)
5	r	0.56	0/936	0.81	1/1286 (0.1%)
7	f	0.40	0/624	0.64	2/845 (0.2%)
7	t	0.41	0/624	0.64	2/845 (0.2%)
9	i	0.42	0/488	0.60	0/659
9	w	0.42	0/488	0.60	0/659

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
10	k	0.28	0/185	0.68	0/250
10	x	0.28	0/185	0.68	0/250
11	B	0.46	0/3753	0.62	0/5080
11	C	0.56	0/3793	0.71	2/5137 (0.0%)
11	K	0.50	0/3798	0.65	0/5143
11	W	0.46	0/3753	0.62	0/5080
11	X	0.56	0/3793	0.71	2/5137 (0.0%)
11	n	0.50	0/3798	0.65	0/5143
12	D	0.55	0/3605	0.67	0/4889
12	E	0.44	0/3592	0.59	1/4870 (0.0%)
12	F	0.52	0/3599	0.69	0/4881
12	Y	0.55	0/3605	0.67	0/4889
12	Z	0.44	0/3592	0.59	1/4870 (0.0%)
12	c	0.52	0/3599	0.69	0/4881
13	G	0.44	0/2055	0.58	0/2766
13	j	0.44	0/2055	0.58	0/2766
14	H	0.46	0/759	0.59	0/1040
14	l	0.46	0/759	0.59	0/1040
15	I	0.48	0/326	0.80	2/445 (0.4%)
15	m	0.48	0/326	0.79	2/445 (0.4%)
16	O	0.61	0/793	0.99	2/1101 (0.2%)
16	o	0.62	0/793	0.99	2/1101 (0.2%)
All	All	0.48	0/74640	0.66	30/101276 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
4	b	0	1
4	q	0	1
8	g	0	2
8	u	0	2
15	I	0	1
15	m	0	1
16	O	0	1
16	o	0	1
All	All	0	10

There are no bond length outliers.

All (30) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	r	170	LEU	CA-CB-CG	7.82	133.28	115.30
5	d	170	LEU	CA-CB-CG	7.81	133.25	115.30
2	V	26	LEU	CA-CB-CG	7.74	133.09	115.30
2	A	26	LEU	CA-CB-CG	7.73	133.08	115.30
15	m	56	PRO	N-CA-CB	6.38	110.96	103.30
15	I	56	PRO	N-CA-CB	6.33	110.90	103.30
1	M	57	LEU	CA-CB-CG	5.82	128.69	115.30
4	b	11	PRO	N-CA-CB	5.82	110.28	103.30
15	I	58	PRO	N-CA-CB	5.80	110.27	103.30
1	2	57	LEU	CA-CB-CG	5.78	128.59	115.30
4	q	11	PRO	N-CA-CB	5.77	110.23	103.30
15	m	58	PRO	N-CA-CB	5.74	110.18	103.30
16	o	127	GLU	CB-CA-C	5.72	121.84	110.40
7	t	6	PRO	N-CA-CB	5.70	110.14	103.30
16	O	127	GLU	CB-CA-C	5.70	121.80	110.40
7	f	6	PRO	N-CA-CB	5.70	110.14	103.30
7	f	7	PRO	N-CA-CB	5.66	110.09	103.30
4	b	23	PRO	N-CA-CB	5.63	110.05	103.30
7	t	7	PRO	N-CA-CB	5.61	110.03	103.30
4	q	23	PRO	N-CA-CB	5.56	109.98	103.30
12	E	285	LEU	CA-CB-CG	5.31	127.52	115.30
12	Z	285	LEU	CA-CB-CG	5.31	127.51	115.30
16	o	134	PHE	CB-CA-C	-5.31	99.78	110.40
16	O	134	PHE	CB-CA-C	-5.28	99.85	110.40
11	C	283	LEU	CA-CB-CG	5.23	127.33	115.30
11	X	283	LEU	CA-CB-CG	5.21	127.28	115.30
11	C	68	LEU	CA-CB-CG	5.16	127.18	115.30
11	X	68	LEU	CA-CB-CG	5.15	127.15	115.30
1	N	20	LEU	CA-CB-CG	5.10	127.04	115.30
1	3	20	LEU	CA-CB-CG	5.08	126.99	115.30

There are no chirality outliers.

All (10) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
15	I	9	SER	Peptide
16	O	50	ASN	Peptide
4	b	186	ASN	Peptide
8	g	80	UNK	Peptide,Mainchain
15	m	9	SER	Peptide
16	o	50	ASN	Peptide
4	q	186	ASN	Peptide
8	u	80	UNK	Peptide,Mainchain

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	0	73/76 (96%)	73 (100%)	0	0	100	100
1	1	73/76 (96%)	71 (97%)	2 (3%)	0	100	100
1	2	73/76 (96%)	71 (97%)	2 (3%)	0	100	100
1	3	72/76 (95%)	72 (100%)	0	0	100	100
1	4	73/76 (96%)	73 (100%)	0	0	100	100
1	5	73/76 (96%)	72 (99%)	1 (1%)	0	100	100
1	6	72/76 (95%)	72 (100%)	0	0	100	100
1	7	71/76 (93%)	71 (100%)	0	0	100	100
1	8	73/76 (96%)	73 (100%)	0	0	100	100
1	9	72/76 (95%)	70 (97%)	2 (3%)	0	100	100
1	J	73/76 (96%)	73 (100%)	0	0	100	100
1	L	73/76 (96%)	71 (97%)	2 (3%)	0	100	100
1	M	73/76 (96%)	71 (97%)	2 (3%)	0	100	100
1	N	72/76 (95%)	72 (100%)	0	0	100	100
1	P	73/76 (96%)	73 (100%)	0	0	100	100
1	Q	73/76 (96%)	72 (99%)	1 (1%)	0	100	100
1	R	72/76 (95%)	72 (100%)	0	0	100	100
1	S	71/76 (93%)	71 (100%)	0	0	100	100
1	T	73/76 (96%)	73 (100%)	0	0	100	100
1	U	72/76 (95%)	70 (97%)	2 (3%)	0	100	100
2	A	46/48 (96%)	43 (94%)	2 (4%)	1 (2%)	5	32

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	V	46/48 (96%)	43 (94%)	2 (4%)	1 (2%)	5	32
3	a	247/249 (99%)	228 (92%)	19 (8%)	0	100	100
3	p	247/249 (99%)	228 (92%)	19 (8%)	0	100	100
4	b	196/209 (94%)	186 (95%)	6 (3%)	4 (2%)	6	34
4	q	196/209 (94%)	186 (95%)	6 (3%)	4 (2%)	6	34
5	d	153/173 (88%)	145 (95%)	7 (5%)	1 (1%)	19	53
5	r	153/173 (88%)	145 (95%)	7 (5%)	1 (1%)	19	53
7	f	80/95 (84%)	70 (88%)	9 (11%)	1 (1%)	10	41
7	t	80/95 (84%)	70 (88%)	9 (11%)	1 (1%)	10	41
9	i	57/59 (97%)	50 (88%)	7 (12%)	0	100	100
9	w	57/59 (97%)	50 (88%)	7 (12%)	0	100	100
10	k	22/68 (32%)	19 (86%)	3 (14%)	0	100	100
10	x	22/68 (32%)	19 (86%)	3 (14%)	0	100	100
11	B	486/510 (95%)	439 (90%)	45 (9%)	2 (0%)	30	63
11	C	496/510 (97%)	449 (90%)	44 (9%)	3 (1%)	22	55
11	K	495/510 (97%)	434 (88%)	56 (11%)	5 (1%)	13	46
11	W	486/510 (95%)	439 (90%)	45 (9%)	2 (0%)	30	63
11	X	496/510 (97%)	449 (90%)	44 (9%)	3 (1%)	22	55
11	n	495/510 (97%)	434 (88%)	56 (11%)	5 (1%)	13	46
12	D	468/478 (98%)	429 (92%)	37 (8%)	2 (0%)	30	63
12	E	466/478 (98%)	424 (91%)	36 (8%)	6 (1%)	10	41
12	F	467/478 (98%)	417 (89%)	42 (9%)	8 (2%)	7	37
12	Y	468/478 (98%)	429 (92%)	37 (8%)	2 (0%)	30	63
12	Z	466/478 (98%)	424 (91%)	36 (8%)	6 (1%)	10	41
12	c	467/478 (98%)	417 (89%)	42 (9%)	8 (2%)	7	37
13	G	261/278 (94%)	229 (88%)	25 (10%)	7 (3%)	4	28
13	j	261/278 (94%)	230 (88%)	24 (9%)	7 (3%)	4	28
14	H	109/138 (79%)	89 (82%)	15 (14%)	5 (5%)	2	18
14	l	109/138 (79%)	89 (82%)	15 (14%)	5 (5%)	2	18
15	I	42/61 (69%)	27 (64%)	9 (21%)	6 (14%)	0	3
15	m	42/61 (69%)	27 (64%)	9 (21%)	6 (14%)	0	3

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
16	O	157/195 (80%)	126 (80%)	24 (15%)	7 (4%)	2	18
16	o	157/195 (80%)	126 (80%)	24 (15%)	7 (4%)	2	18
All	All	9946/10594 (94%)	9045 (91%)	785 (8%)	116 (1%)	14	43

All (116) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	b	187	PRO
7	f	14	ASN
12	D	29	GLU
12	F	28	SER
13	G	152	SER
13	G	202	ASP
13	G	204	ASN
15	I	9	SER
15	I	33	SER
15	I	55	GLU
15	I	56	PRO
16	O	51	PRO
16	O	127	GLU
4	q	187	PRO
7	t	14	ASN
12	Y	29	GLU
12	Z	474	ALA
12	c	28	SER
13	j	152	SER
13	j	202	ASP
13	j	204	ASN
15	m	9	SER
15	m	33	SER
15	m	55	GLU
15	m	56	PRO
16	o	51	PRO
16	o	127	GLU
5	d	50	PRO
11	K	7	PRO
11	C	238	ALA
12	E	123	SER
12	E	474	ALA
12	F	43	GLN
12	F	423	VAL

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Mol	Chain	Res	Type
13	G	203	ALA
14	H	14	PHE
15	I	32	ALA
16	O	131	PRO
5	r	50	PRO
11	n	7	PRO
11	X	238	ALA
12	Z	123	SER
12	c	43	GLN
12	c	423	VAL
13	j	203	ALA
14	l	14	PHE
15	m	32	ALA
16	o	131	PRO
11	K	11	SER
11	K	23	ASP
11	B	392	LEU
12	D	28	SER
12	E	353	SER
14	H	43	ALA
14	H	93	LEU
16	O	14	GLY
11	n	11	SER
11	n	23	ASP
11	W	392	LEU
12	Y	28	SER
12	Z	353	SER
14	l	43	ALA
14	l	93	LEU
16	o	14	GLY
11	K	238	ALA
12	E	126	GLU
12	F	279	VAL
12	F	327	ALA
13	G	192	PRO
13	G	201	THR
16	O	11	ARG
16	O	128	PRO
11	n	229	LYS
11	n	238	ALA
12	Z	126	GLU
12	c	279	VAL

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Mol	Chain	Res	Type
12	c	327	ALA
13	j	192	PRO
13	j	201	THR
16	o	11	ARG
16	o	128	PRO
11	K	229	LYS
11	B	448	TYR
11	C	505	SER
12	F	474	ALA
13	G	78	THR
16	O	50	ASN
11	W	448	TYR
11	X	505	SER
12	c	326	PHE
12	c	474	ALA
13	j	78	THR
16	o	50	ASN
11	C	339	TYR
12	F	326	PHE
14	H	33	PRO
15	I	30	GLN
11	X	339	TYR
14	l	33	PRO
15	m	30	GLN
12	E	461	GLY
12	Z	461	GLY
4	b	186	ASN
4	q	186	ASN
4	b	10	ASP
4	q	10	ASP
2	A	6	PRO
4	b	23	PRO
12	E	141	VAL
12	F	248	GLY
14	H	54	PRO
2	V	6	PRO
4	q	23	PRO
12	Z	141	VAL
12	c	248	GLY
14	l	54	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	0	55/56 (98%)	55 (100%)	0	100	100
1	1	55/56 (98%)	55 (100%)	0	100	100
1	2	55/56 (98%)	55 (100%)	0	100	100
1	3	54/56 (96%)	54 (100%)	0	100	100
1	4	55/56 (98%)	55 (100%)	0	100	100
1	5	55/56 (98%)	54 (98%)	1 (2%)	54	74
1	6	54/56 (96%)	54 (100%)	0	100	100
1	7	54/56 (96%)	54 (100%)	0	100	100
1	8	55/56 (98%)	55 (100%)	0	100	100
1	9	54/56 (96%)	54 (100%)	0	100	100
1	J	55/56 (98%)	55 (100%)	0	100	100
1	L	55/56 (98%)	55 (100%)	0	100	100
1	M	55/56 (98%)	55 (100%)	0	100	100
1	N	54/56 (96%)	54 (100%)	0	100	100
1	P	55/56 (98%)	55 (100%)	0	100	100
1	Q	55/56 (98%)	54 (98%)	1 (2%)	54	74
1	R	54/56 (96%)	54 (100%)	0	100	100
1	S	54/56 (96%)	54 (100%)	0	100	100
1	T	55/56 (98%)	55 (100%)	0	100	100
1	U	54/56 (96%)	54 (100%)	0	100	100
2	A	47/47 (100%)	47 (100%)	0	100	100
2	V	47/47 (100%)	47 (100%)	0	100	100
3	a	217/217 (100%)	216 (100%)	1 (0%)	86	93
3	p	217/217 (100%)	216 (100%)	1 (0%)	86	93
4	b	48/182 (26%)	48 (100%)	0	100	100
4	q	48/182 (26%)	48 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
5	d	42/158 (27%)	40 (95%)	2 (5%)	21	51
5	r	42/158 (27%)	40 (95%)	2 (5%)	21	51
7	f	46/76 (60%)	46 (100%)	0	100	100
7	t	46/76 (60%)	46 (100%)	0	100	100
9	i	49/49 (100%)	49 (100%)	0	100	100
9	w	49/49 (100%)	49 (100%)	0	100	100
10	k	18/57 (32%)	18 (100%)	0	100	100
10	x	18/57 (32%)	18 (100%)	0	100	100
11	B	384/412 (93%)	348 (91%)	36 (9%)	7	30
11	C	384/412 (93%)	356 (93%)	28 (7%)	11	38
11	K	384/412 (93%)	365 (95%)	19 (5%)	21	50
11	W	384/412 (93%)	348 (91%)	36 (9%)	7	30
11	X	384/412 (93%)	356 (93%)	28 (7%)	11	38
11	n	384/412 (93%)	365 (95%)	19 (5%)	21	50
12	D	380/384 (99%)	360 (95%)	20 (5%)	19	48
12	E	378/384 (98%)	357 (94%)	21 (6%)	17	47
12	F	379/384 (99%)	359 (95%)	20 (5%)	19	48
12	Y	380/384 (99%)	360 (95%)	20 (5%)	19	48
12	Z	378/384 (98%)	357 (94%)	21 (6%)	17	47
12	c	379/384 (99%)	359 (95%)	20 (5%)	19	48
13	G	218/236 (92%)	191 (88%)	27 (12%)	4	20
13	j	218/236 (92%)	191 (88%)	27 (12%)	4	20
14	H	54/112 (48%)	39 (72%)	15 (28%)	0	2
14	l	54/112 (48%)	39 (72%)	15 (28%)	0	2
15	I	23/48 (48%)	20 (87%)	3 (13%)	3	19
15	m	23/48 (48%)	20 (87%)	3 (13%)	3	19
All	All	7194/8260 (87%)	6808 (95%)	386 (5%)	21	48

All (386) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	5	57	LEU
3	a	34	ILE

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Mol	Chain	Res	Type
5	d	166	ARG
5	d	173	MET
11	K	142	ARG
11	K	143	SER
11	K	173	ARG
11	K	220	GLN
11	K	221	THR
11	K	239	SER
11	K	245	GLN
11	K	251	THR
11	K	267	LEU
11	K	293	ARG
11	K	318	GLU
11	K	322	SER
11	K	364	ARG
11	K	378	SER
11	K	412	LEU
11	K	480	GLU
11	K	481	LEU
11	K	492	SER
11	K	501	SER
11	B	40	ILE
11	B	50	GLN
11	B	54	LEU
11	B	80	SER
11	B	82	ARG
11	B	89	LEU
11	B	93	THR
11	B	99	VAL
11	B	129	SER
11	B	142	ARG
11	B	149	GLN
11	B	173	ARG
11	B	183	ASP
11	B	206	VAL
11	B	218	LEU
11	B	221	THR
11	B	232	ILE
11	B	246	TYR
11	B	267	LEU
11	B	274	SER
11	B	278	VAL

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Mol	Chain	Res	Type
11	B	314	LEU
11	B	318	GLU
11	B	336	VAL
11	B	348	THR
11	B	351	GLN
11	B	378	SER
11	B	416	THR
11	B	427	THR
11	B	444	VAL
11	B	460	LEU
11	B	471	LEU
11	B	480	GLU
11	B	486	ARG
11	B	504	GLU
11	B	506	PHE
11	C	30	THR
11	C	54	LEU
11	C	89	LEU
11	C	99	VAL
11	C	105	LEU
11	C	142	ARG
11	C	159	VAL
11	C	165	GLN
11	C	210	GLN
11	C	221	THR
11	C	246	TYR
11	C	254	SER
11	C	274	SER
11	C	337	SER
11	C	351	GLN
11	C	382	VAL
11	C	383	LYS
11	C	394	LEU
11	C	416	THR
11	C	468	SER
11	C	476	SER
11	C	480	GLU
11	C	487	GLU
11	C	495	LEU
11	C	498	SER
11	C	501	SER
11	C	503	THR

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Mol	Chain	Res	Type
11	C	509	THR
12	D	6	SER
12	D	26	GLU
12	D	29	GLU
12	D	74	GLU
12	D	77	LEU
12	D	167	ILE
12	D	204	THR
12	D	206	VAL
12	D	214	LYS
12	D	249	GLN
12	D	251	VAL
12	D	255	ILE
12	D	268	VAL
12	D	332	THR
12	D	357	LEU
12	D	359	ASP
12	D	396	LEU
12	D	397	SER
12	D	423	VAL
12	D	464	GLU
12	E	89	ARG
12	E	128	SER
12	E	129	THR
12	E	140	VAL
12	E	165	VAL
12	E	190	ARG
12	E	232	VAL
12	E	298	THR
12	E	299	THR
12	E	324	THR
12	E	352	ASP
12	E	357	LEU
12	E	359	ASP
12	E	376	GLU
12	E	380	THR
12	E	386	ASP
12	E	406	ARG
12	E	433	ARG
12	E	446	GLU
12	E	464	GLU
12	E	465	ASP

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Mol	Chain	Res	Type
12	F	58	THR
12	F	140	VAL
12	F	163	LYS
12	F	167	ILE
12	F	182	SER
12	F	201	MET
12	F	232	VAL
12	F	251	VAL
12	F	261	PHE
12	F	303	SER
12	F	305	THR
12	F	318	THR
12	F	324	THR
12	F	354	LYS
12	F	355	SER
12	F	388	ILE
12	F	420	VAL
12	F	423	VAL
12	F	434	LEU
12	F	467	VAL
13	G	2	THR
13	G	3	LEU
13	G	4	LYS
13	G	9	ARG
13	G	17	GLU
13	G	19	ILE
13	G	80	ASP
13	G	106	ASP
13	G	121	THR
13	G	136	ASP
13	G	143	SER
13	G	145	LEU
13	G	148	ASP
13	G	152	SER
13	G	164	ILE
13	G	216	ASN
13	G	218	MET
13	G	231	SER
13	G	234	ARG
13	G	235	ASN
13	G	247	MET
13	G	254	LEU

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Mol	Chain	Res	Type
13	G	264	THR
13	G	267	LEU
13	G	269	ASP
13	G	272	THR
13	G	276	SER
14	H	12	LEU
14	H	19	GLU
14	H	21	LEU
14	H	27	VAL
14	H	29	GLN
14	H	30	VAL
14	H	42	LEU
14	H	46	VAL
14	H	48	THR
14	H	49	VAL
14	H	60	MET
14	H	64	ASN
14	H	70	ILE
14	H	80	ASP
14	H	86	THR
15	I	14	LEU
15	I	27	THR
15	I	31	THR
1	Q	57	LEU
3	p	34	ILE
5	r	166	ARG
5	r	173	MET
11	n	142	ARG
11	n	143	SER
11	n	173	ARG
11	n	220	GLN
11	n	221	THR
11	n	239	SER
11	n	245	GLN
11	n	251	THR
11	n	267	LEU
11	n	293	ARG
11	n	318	GLU
11	n	322	SER
11	n	364	ARG
11	n	378	SER
11	n	412	LEU

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Mol	Chain	Res	Type
11	n	480	GLU
11	n	481	LEU
11	n	492	SER
11	n	501	SER
11	W	40	ILE
11	W	50	GLN
11	W	54	LEU
11	W	80	SER
11	W	82	ARG
11	W	89	LEU
11	W	93	THR
11	W	99	VAL
11	W	129	SER
11	W	142	ARG
11	W	149	GLN
11	W	173	ARG
11	W	183	ASP
11	W	206	VAL
11	W	218	LEU
11	W	221	THR
11	W	232	ILE
11	W	246	TYR
11	W	267	LEU
11	W	274	SER
11	W	278	VAL
11	W	314	LEU
11	W	318	GLU
11	W	336	VAL
11	W	348	THR
11	W	351	GLN
11	W	378	SER
11	W	416	THR
11	W	427	THR
11	W	444	VAL
11	W	460	LEU
11	W	471	LEU
11	W	480	GLU
11	W	486	ARG
11	W	504	GLU
11	W	506	PHE
11	X	30	THR
11	X	54	LEU

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Mol	Chain	Res	Type
11	X	89	LEU
11	X	99	VAL
11	X	105	LEU
11	X	142	ARG
11	X	159	VAL
11	X	165	GLN
11	X	210	GLN
11	X	221	THR
11	X	246	TYR
11	X	254	SER
11	X	274	SER
11	X	337	SER
11	X	351	GLN
11	X	382	VAL
11	X	383	LYS
11	X	394	LEU
11	X	416	THR
11	X	468	SER
11	X	476	SER
11	X	480	GLU
11	X	487	GLU
11	X	495	LEU
11	X	498	SER
11	X	501	SER
11	X	503	THR
11	X	509	THR
12	Y	6	SER
12	Y	26	GLU
12	Y	29	GLU
12	Y	74	GLU
12	Y	77	LEU
12	Y	167	ILE
12	Y	204	THR
12	Y	206	VAL
12	Y	214	LYS
12	Y	249	GLN
12	Y	251	VAL
12	Y	255	ILE
12	Y	268	VAL
12	Y	332	THR
12	Y	357	LEU
12	Y	359	ASP

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Mol	Chain	Res	Type
12	Y	396	LEU
12	Y	397	SER
12	Y	423	VAL
12	Y	464	GLU
12	Z	89	ARG
12	Z	128	SER
12	Z	129	THR
12	Z	140	VAL
12	Z	165	VAL
12	Z	190	ARG
12	Z	232	VAL
12	Z	298	THR
12	Z	299	THR
12	Z	324	THR
12	Z	352	ASP
12	Z	357	LEU
12	Z	359	ASP
12	Z	376	GLU
12	Z	380	THR
12	Z	386	ASP
12	Z	406	ARG
12	Z	433	ARG
12	Z	446	GLU
12	Z	464	GLU
12	Z	465	ASP
12	c	58	THR
12	c	140	VAL
12	c	163	LYS
12	c	167	ILE
12	c	182	SER
12	c	201	MET
12	c	232	VAL
12	c	251	VAL
12	c	261	PHE
12	c	303	SER
12	c	305	THR
12	c	318	THR
12	c	324	THR
12	c	354	LYS
12	c	355	SER
12	c	388	ILE
12	c	420	VAL

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Mol	Chain	Res	Type
12	c	423	VAL
12	c	434	LEU
12	c	467	VAL
13	j	2	THR
13	j	3	LEU
13	j	4	LYS
13	j	9	ARG
13	j	17	GLU
13	j	19	ILE
13	j	80	ASP
13	j	106	ASP
13	j	121	THR
13	j	136	ASP
13	j	143	SER
13	j	145	LEU
13	j	148	ASP
13	j	152	SER
13	j	164	ILE
13	j	216	ASN
13	j	218	MET
13	j	231	SER
13	j	234	ARG
13	j	235	ASN
13	j	247	MET
13	j	254	LEU
13	j	264	THR
13	j	267	LEU
13	j	269	ASP
13	j	272	THR
13	j	276	SER
14	l	12	LEU
14	l	19	GLU
14	l	21	LEU
14	l	27	VAL
14	l	29	GLN
14	l	30	VAL
14	l	42	LEU
14	l	46	VAL
14	l	48	THR
14	l	49	VAL
14	l	60	MET
14	l	64	ASN

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Mol	Chain	Res	Type
14	l	70	ILE
14	l	80	ASP
14	l	86	THR
15	m	14	LEU
15	m	27	THR
15	m	31	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (60) such sidechains are listed below:

Mol	Chain	Res	Type
1	1	2	GLN
1	9	2	GLN
11	K	145	HIS
11	K	174	GLN
11	K	398	GLN
11	K	407	GLN
11	B	67	ASN
11	B	149	GLN
11	B	192	ASN
11	B	282	GLN
11	B	398	GLN
11	B	454	HIS
11	B	477	ASN
11	C	50	GLN
11	C	210	GLN
11	C	407	GLN
11	C	452	ASN
12	D	195	ASN
12	D	208	ASN
12	E	27	GLN
12	E	43	GLN
12	E	168	GLN
12	E	221	GLN
12	F	52	GLN
12	F	328	HIS
13	G	54	ASN
13	G	90	GLN
13	G	216	ASN
14	H	44	ASN
14	H	78	GLN
15	I	30	GLN
1	L	2	GLN

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Mol	Chain	Res	Type
11	n	145	HIS
11	n	174	GLN
11	n	398	GLN
11	n	407	GLN
11	W	149	GLN
11	W	192	ASN
11	W	282	GLN
11	W	398	GLN
11	W	454	HIS
11	W	477	ASN
11	X	50	GLN
11	X	210	GLN
11	X	407	GLN
11	X	452	ASN
12	Y	195	ASN
12	Y	208	ASN
12	Z	27	GLN
12	Z	43	GLN
12	Z	168	GLN
12	Z	221	GLN
12	c	52	GLN
12	c	328	HIS
13	j	54	ASN
13	j	90	GLN
13	j	216	ASN
14	l	44	ASN
14	l	78	GLN
15	m	30	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 20 ligands modelled in this entry, 10 are monoatomic - leaving 10 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
18	ANP	D	501	19	29,33,33	3.05	8 (27%)	31,52,52	1.81	7 (22%)
18	ANP	F	501	19	29,33,33	3.04	8 (27%)	31,52,52	2.04	8 (25%)
18	ANP	W	601	19	29,33,33	3.01	8 (27%)	31,52,52	1.56	6 (19%)
18	ANP	C	601	19	29,33,33	2.87	8 (27%)	31,52,52	2.45	8 (25%)
18	ANP	B	601	19	29,33,33	3.01	7 (24%)	31,52,52	1.56	6 (19%)
18	ANP	X	601	19	29,33,33	2.87	8 (27%)	31,52,52	2.45	8 (25%)
18	ANP	Y	501	19	29,33,33	3.06	8 (27%)	31,52,52	1.81	7 (22%)
18	ANP	n	601	19	29,33,33	2.96	8 (27%)	31,52,52	1.65	8 (25%)
18	ANP	K	601	19	29,33,33	2.95	8 (27%)	31,52,52	1.65	8 (25%)
18	ANP	c	501	19	29,33,33	3.04	8 (27%)	31,52,52	2.04	8 (25%)

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
18	ANP	D	501	19	-	3/14/38/38	0/3/3/3
18	ANP	F	501	19	-	1/14/38/38	0/3/3/3
18	ANP	W	601	19	-	3/14/38/38	0/3/3/3
18	ANP	C	601	19	-	3/14/38/38	0/3/3/3
18	ANP	B	601	19	-	3/14/38/38	0/3/3/3
18	ANP	X	601	19	-	3/14/38/38	0/3/3/3
18	ANP	Y	501	19	-	3/14/38/38	0/3/3/3
18	ANP	n	601	19	-	1/14/38/38	0/3/3/3
18	ANP	K	601	19	-	1/14/38/38	0/3/3/3
18	ANP	c	501	19	-	1/14/38/38	0/3/3/3

All (79) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
18	n	601	ANP	PG-O1G	9.91	1.61	1.46
18	K	601	ANP	PG-O1G	9.86	1.61	1.46
18	Y	501	ANP	PG-O1G	9.25	1.60	1.46
18	D	501	ANP	PG-O1G	9.22	1.60	1.46
18	X	601	ANP	PG-O1G	9.18	1.60	1.46
18	C	601	ANP	PG-O1G	9.18	1.60	1.46
18	B	601	ANP	PG-O1G	9.07	1.59	1.46
18	W	601	ANP	PG-O1G	9.07	1.59	1.46
18	c	501	ANP	PG-O1G	9.05	1.59	1.46
18	F	501	ANP	PG-O1G	8.99	1.59	1.46
18	Y	501	ANP	PB-O1B	8.53	1.59	1.46
18	W	601	ANP	PB-O1B	8.53	1.59	1.46
18	B	601	ANP	PB-O1B	8.50	1.59	1.46
18	D	501	ANP	PB-O1B	8.48	1.59	1.46
18	n	601	ANP	PB-O1B	7.93	1.58	1.46
18	K	601	ANP	PB-O1B	7.91	1.58	1.46
18	c	501	ANP	PB-O1B	7.68	1.57	1.46
18	C	601	ANP	PB-O1B	7.67	1.57	1.46
18	X	601	ANP	PB-O1B	7.66	1.57	1.46
18	F	501	ANP	PB-O1B	7.65	1.57	1.46
18	F	501	ANP	C4-N3	7.29	1.45	1.35
18	c	501	ANP	C4-N3	7.27	1.45	1.35
18	D	501	ANP	C4-N3	7.17	1.45	1.35
18	Y	501	ANP	C4-N3	7.16	1.45	1.35
18	B	601	ANP	C4-N3	7.05	1.45	1.35
18	W	601	ANP	C4-N3	7.04	1.45	1.35
18	X	601	ANP	C4-N3	5.84	1.43	1.35
18	C	601	ANP	C4-N3	5.80	1.43	1.35
18	K	601	ANP	C4-N3	5.64	1.43	1.35
18	n	601	ANP	C4-N3	5.60	1.43	1.35
18	F	501	ANP	PB-N3B	4.30	1.74	1.63
18	c	501	ANP	PB-N3B	4.26	1.74	1.63
18	Y	501	ANP	PG-N3B	4.25	1.74	1.63
18	D	501	ANP	PG-N3B	4.21	1.74	1.63
18	c	501	ANP	PG-N3B	4.14	1.74	1.63
18	F	501	ANP	PG-N3B	4.11	1.74	1.63
18	B	601	ANP	PG-N3B	4.01	1.73	1.63
18	W	601	ANP	PG-N3B	4.01	1.73	1.63
18	B	601	ANP	PB-N3B	3.70	1.73	1.63
18	W	601	ANP	PB-N3B	3.69	1.73	1.63
18	X	601	ANP	PG-N3B	3.64	1.72	1.63
18	C	601	ANP	PG-N3B	3.62	1.72	1.63

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
18	K	601	ANP	PB-N3B	3.56	1.72	1.63
18	n	601	ANP	PB-N3B	3.53	1.72	1.63
18	X	601	ANP	PB-N3B	3.51	1.72	1.63
18	C	601	ANP	PB-N3B	3.50	1.72	1.63
18	n	601	ANP	PG-N3B	3.41	1.72	1.63
18	K	601	ANP	PG-N3B	3.41	1.72	1.63
18	D	501	ANP	PB-N3B	3.14	1.71	1.63
18	Y	501	ANP	PB-N3B	3.12	1.71	1.63
18	F	501	ANP	PA-O1A	2.52	1.59	1.50
18	c	501	ANP	PA-O1A	2.49	1.59	1.50
18	K	601	ANP	PA-O1A	2.47	1.59	1.50
18	n	601	ANP	PA-O1A	2.47	1.59	1.50
18	D	501	ANP	PA-O1A	2.45	1.59	1.50
18	Y	501	ANP	PA-O1A	2.45	1.59	1.50
18	X	601	ANP	PA-O1A	2.43	1.59	1.50
18	C	601	ANP	PA-O1A	2.41	1.59	1.50
18	B	601	ANP	PA-O1A	2.40	1.59	1.50
18	W	601	ANP	PA-O1A	2.40	1.59	1.50
18	n	601	ANP	PA-O3A	2.38	1.62	1.59
18	c	501	ANP	PG-O3G	2.31	1.63	1.56
18	F	501	ANP	PG-O3G	2.30	1.62	1.56
18	n	601	ANP	C8-N7	2.27	1.38	1.34
18	K	601	ANP	PA-O3A	2.27	1.61	1.59
18	K	601	ANP	C8-N7	2.26	1.38	1.34
18	C	601	ANP	PB-O3A	2.20	1.61	1.59
18	X	601	ANP	PB-O3A	2.18	1.61	1.59
18	c	501	ANP	O4'-C1'	2.17	1.43	1.40
18	F	501	ANP	O4'-C1'	2.13	1.43	1.40
18	Y	501	ANP	C8-N7	2.11	1.38	1.34
18	X	601	ANP	C8-N7	2.11	1.38	1.34
18	D	501	ANP	C8-N7	2.10	1.38	1.34
18	W	601	ANP	O4'-C1'	2.07	1.43	1.40
18	B	601	ANP	O4'-C1'	2.05	1.43	1.40
18	C	601	ANP	C8-N7	2.03	1.38	1.34
18	D	501	ANP	PG-O2G	2.03	1.62	1.56
18	Y	501	ANP	PG-O2G	2.01	1.62	1.56
18	W	601	ANP	C2-N3	2.00	1.35	1.32

All (74) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
18	X	601	ANP	O4'-C1'-N9	9.16	120.89	108.75

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
18	C	601	ANP	O4'-C1'-N9	9.12	120.83	108.75
18	c	501	ANP	O1B-PB-N3B	-5.49	103.68	111.77
18	F	501	ANP	O1B-PB-N3B	-5.47	103.71	111.77
18	C	601	ANP	O1G-PG-N3B	-5.20	104.11	111.77
18	X	601	ANP	O1G-PG-N3B	-5.19	104.12	111.77
18	B	601	ANP	N3-C2-N1	-4.49	122.58	128.67
18	W	601	ANP	N3-C2-N1	-4.48	122.59	128.67
18	F	501	ANP	N3-C2-N1	-4.39	122.71	128.67
18	c	501	ANP	N3-C2-N1	-4.37	122.74	128.67
18	C	601	ANP	N3-C2-N1	-4.22	122.94	128.67
18	X	601	ANP	N3-C2-N1	-4.19	122.99	128.67
18	D	501	ANP	C4-C5-N7	-4.01	105.10	109.34
18	Y	501	ANP	C4-C5-N7	-3.98	105.14	109.34
18	D	501	ANP	N3-C2-N1	-3.75	123.58	128.67
18	n	601	ANP	N3-C2-N1	-3.70	123.65	128.67
18	K	601	ANP	N3-C2-N1	-3.67	123.69	128.67
18	Y	501	ANP	N3-C2-N1	-3.66	123.70	128.67
18	n	601	ANP	C4-C5-N7	-3.64	105.49	109.34
18	K	601	ANP	C4-C5-N7	-3.63	105.50	109.34
18	B	601	ANP	C4-C5-N7	-3.56	105.58	109.34
18	W	601	ANP	C4-C5-N7	-3.52	105.62	109.34
18	D	501	ANP	O1G-PG-N3B	-3.51	106.61	111.77
18	Y	501	ANP	O1G-PG-N3B	-3.50	106.61	111.77
18	Y	501	ANP	O4'-C1'-N9	3.47	113.35	108.75
18	D	501	ANP	O4'-C1'-N9	3.45	113.31	108.75
18	F	501	ANP	O3G-PG-O1G	-3.41	104.89	113.45
18	c	501	ANP	O3G-PG-O1G	-3.41	104.89	113.45
18	C	601	ANP	C4-C5-N7	-3.26	105.89	109.34
18	X	601	ANP	C4-C5-N7	-3.19	105.96	109.34
18	c	501	ANP	C5-C6-N6	-3.11	115.58	120.31
18	F	501	ANP	C5-C6-N6	-3.10	115.59	120.31
18	Y	501	ANP	O2G-PG-O3G	3.04	115.75	107.59
18	D	501	ANP	O2G-PG-O3G	3.01	115.69	107.59
18	K	601	ANP	O1G-PG-N3B	-3.01	107.34	111.77
18	n	601	ANP	O1G-PG-N3B	-3.01	107.34	111.77
18	F	501	ANP	O2B-PB-O1B	2.98	116.27	109.87
18	c	501	ANP	O2B-PB-O1B	2.98	116.26	109.87
18	Y	501	ANP	O2B-PB-O3A	2.94	114.45	104.64
18	D	501	ANP	O2B-PB-O3A	2.92	114.40	104.64
18	c	501	ANP	O2G-PG-O3G	2.89	115.37	107.59
18	F	501	ANP	O2G-PG-O3G	2.88	115.34	107.59
18	n	601	ANP	C4'-O4'-C1'	2.84	112.53	109.92

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
18	K	601	ANP	C4'-O4'-C1'	2.82	112.51	109.92
18	C	601	ANP	C1'-N9-C4	-2.76	121.79	126.64
18	X	601	ANP	C1'-N9-C4	-2.73	121.84	126.64
18	F	501	ANP	N6-C6-N1	2.65	123.99	118.33
18	W	601	ANP	O1G-PG-N3B	-2.63	107.90	111.77
18	B	601	ANP	O1G-PG-N3B	-2.62	107.91	111.77
18	c	501	ANP	N6-C6-N1	2.61	123.91	118.33
18	K	601	ANP	O3'-C3'-C4'	-2.42	104.14	111.08
18	n	601	ANP	O3'-C3'-C4'	-2.40	104.19	111.08
18	c	501	ANP	C6-C5-C4	-2.31	113.40	117.90
18	W	601	ANP	C4'-O4'-C1'	2.29	112.03	109.92
18	F	501	ANP	C6-C5-C4	-2.29	113.45	117.90
18	B	601	ANP	C4'-O4'-C1'	2.29	112.02	109.92
18	n	601	ANP	O2B-PB-O3A	2.24	112.13	104.64
18	X	601	ANP	C2'-C3'-C4'	2.24	106.94	102.61
18	K	601	ANP	O2B-PB-O3A	2.23	112.10	104.64
18	D	501	ANP	O3G-PG-O1G	-2.22	107.87	113.45
18	Y	501	ANP	O3G-PG-O1G	-2.22	107.89	113.45
18	C	601	ANP	C2'-C3'-C4'	2.21	106.88	102.61
18	n	601	ANP	C2'-C3'-C4'	2.15	106.76	102.61
18	K	601	ANP	C2'-C3'-C4'	2.13	106.72	102.61
18	X	601	ANP	O1B-PB-N3B	-2.12	108.64	111.77
18	W	601	ANP	C2'-C3'-C4'	2.11	106.68	102.61
18	B	601	ANP	C5'-C4'-C3'	-2.11	107.63	115.21
18	W	601	ANP	C5'-C4'-C3'	-2.11	107.63	115.21
18	C	601	ANP	O1B-PB-N3B	-2.10	108.67	111.77
18	B	601	ANP	C2'-C3'-C4'	2.09	106.64	102.61
18	C	601	ANP	C6-C5-C4	-2.08	113.85	117.90
18	X	601	ANP	C6-C5-C4	-2.06	113.90	117.90
18	K	601	ANP	O3A-PB-N3B	-2.03	100.95	106.59
18	n	601	ANP	O3A-PB-N3B	-2.02	100.99	106.59

There are no chirality outliers.

All (22) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
18	K	601	ANP	PG-N3B-PB-O1B
18	B	601	ANP	PG-N3B-PB-O1B
18	C	601	ANP	PB-N3B-PG-O1G
18	C	601	ANP	PG-N3B-PB-O1B
18	D	501	ANP	PB-N3B-PG-O1G
18	D	501	ANP	PG-N3B-PB-O1B

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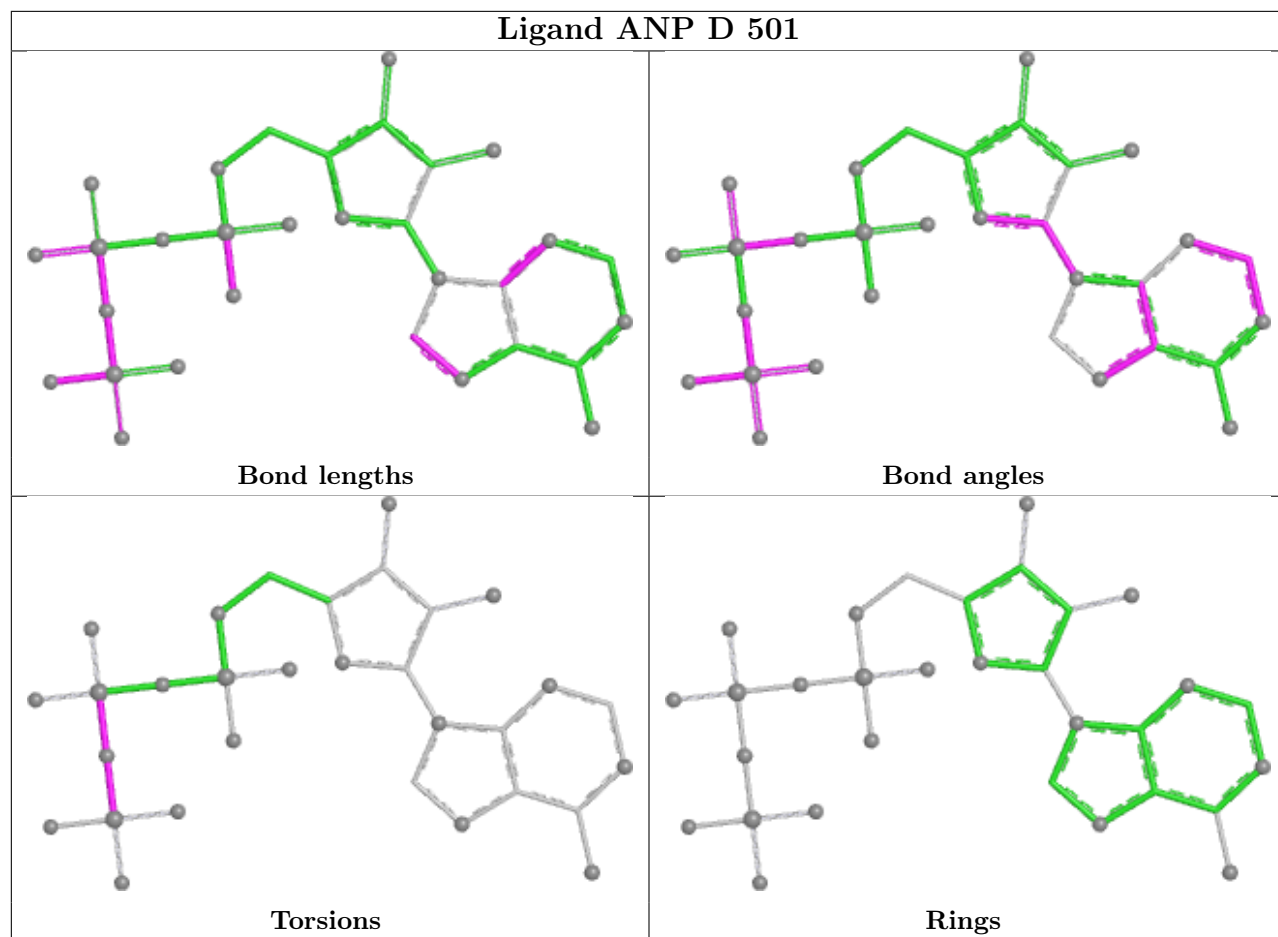
Continued from previous page...

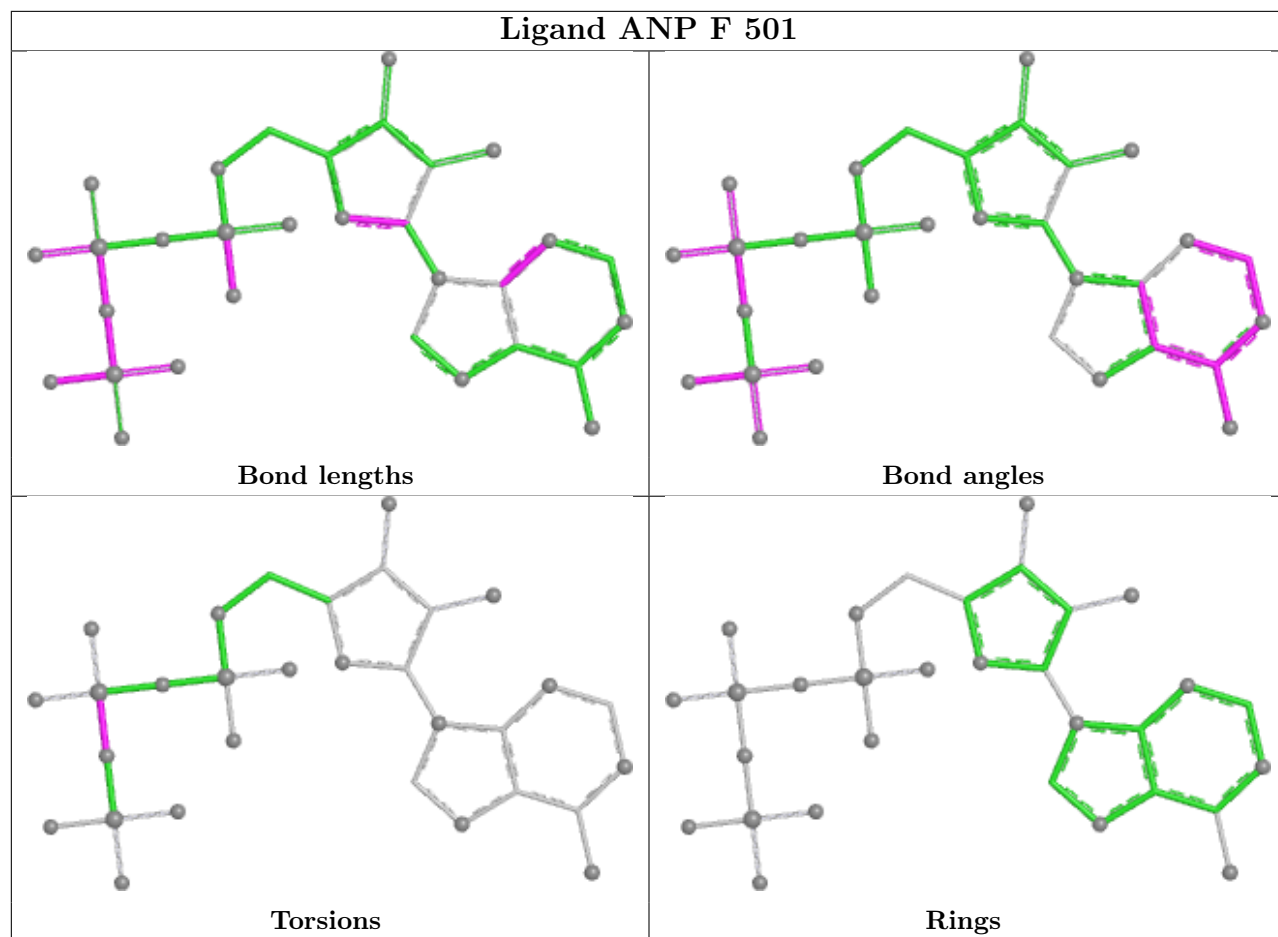
Mol	Chain	Res	Type	Atoms
18	D	501	ANP	PG-N3B-PB-O3A
18	F	501	ANP	PG-N3B-PB-O1B
18	n	601	ANP	PG-N3B-PB-O1B
18	W	601	ANP	PG-N3B-PB-O1B
18	X	601	ANP	PB-N3B-PG-O1G
18	X	601	ANP	PG-N3B-PB-O1B
18	Y	501	ANP	PB-N3B-PG-O1G
18	Y	501	ANP	PG-N3B-PB-O1B
18	Y	501	ANP	PG-N3B-PB-O3A
18	c	501	ANP	PG-N3B-PB-O1B
18	W	601	ANP	C3'-C4'-C5'-O5'
18	B	601	ANP	O4'-C4'-C5'-O5'
18	B	601	ANP	C3'-C4'-C5'-O5'
18	W	601	ANP	O4'-C4'-C5'-O5'
18	C	601	ANP	PB-O3A-PA-O1A
18	X	601	ANP	PB-O3A-PA-O1A

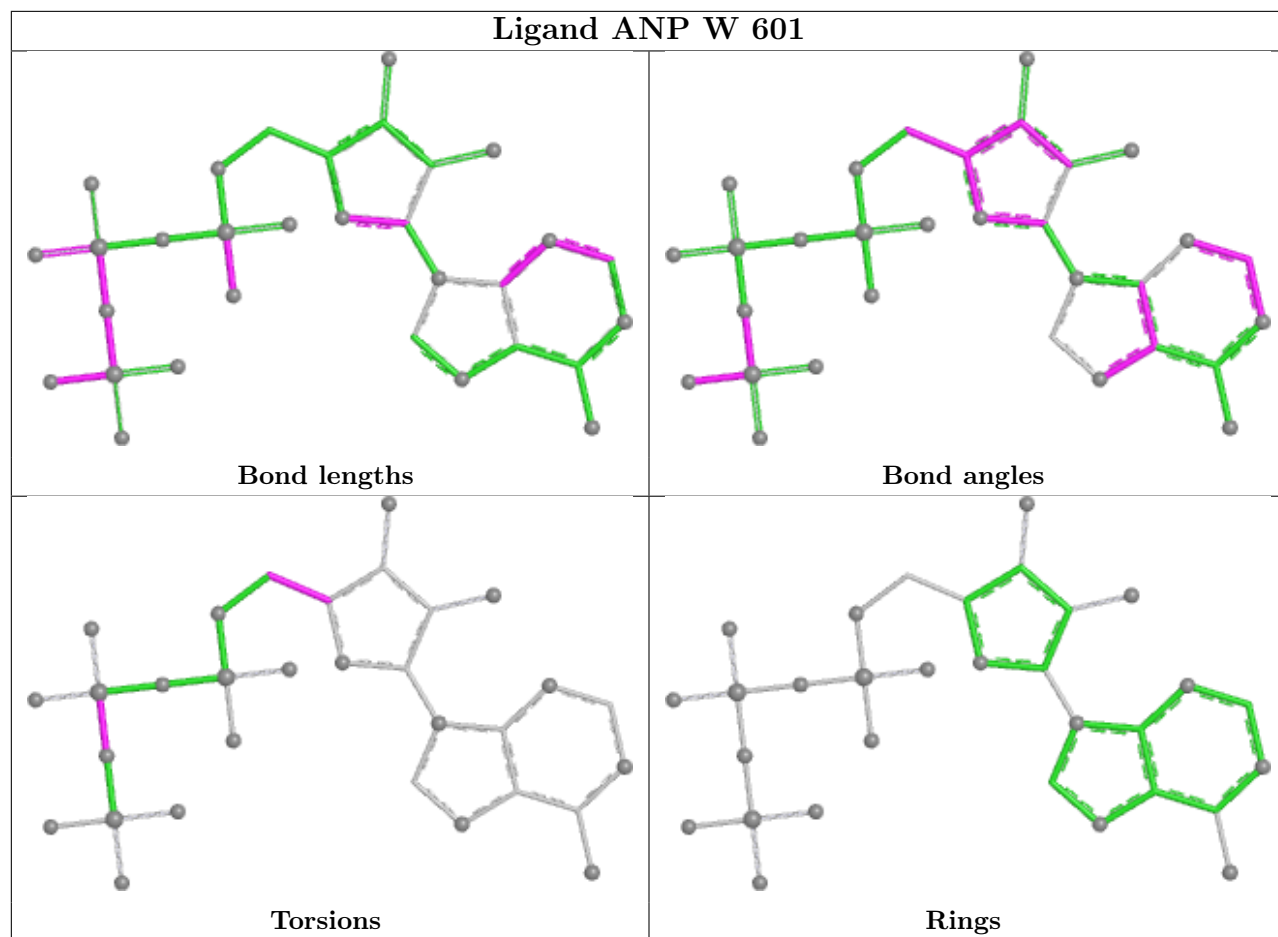
There are no ring outliers.

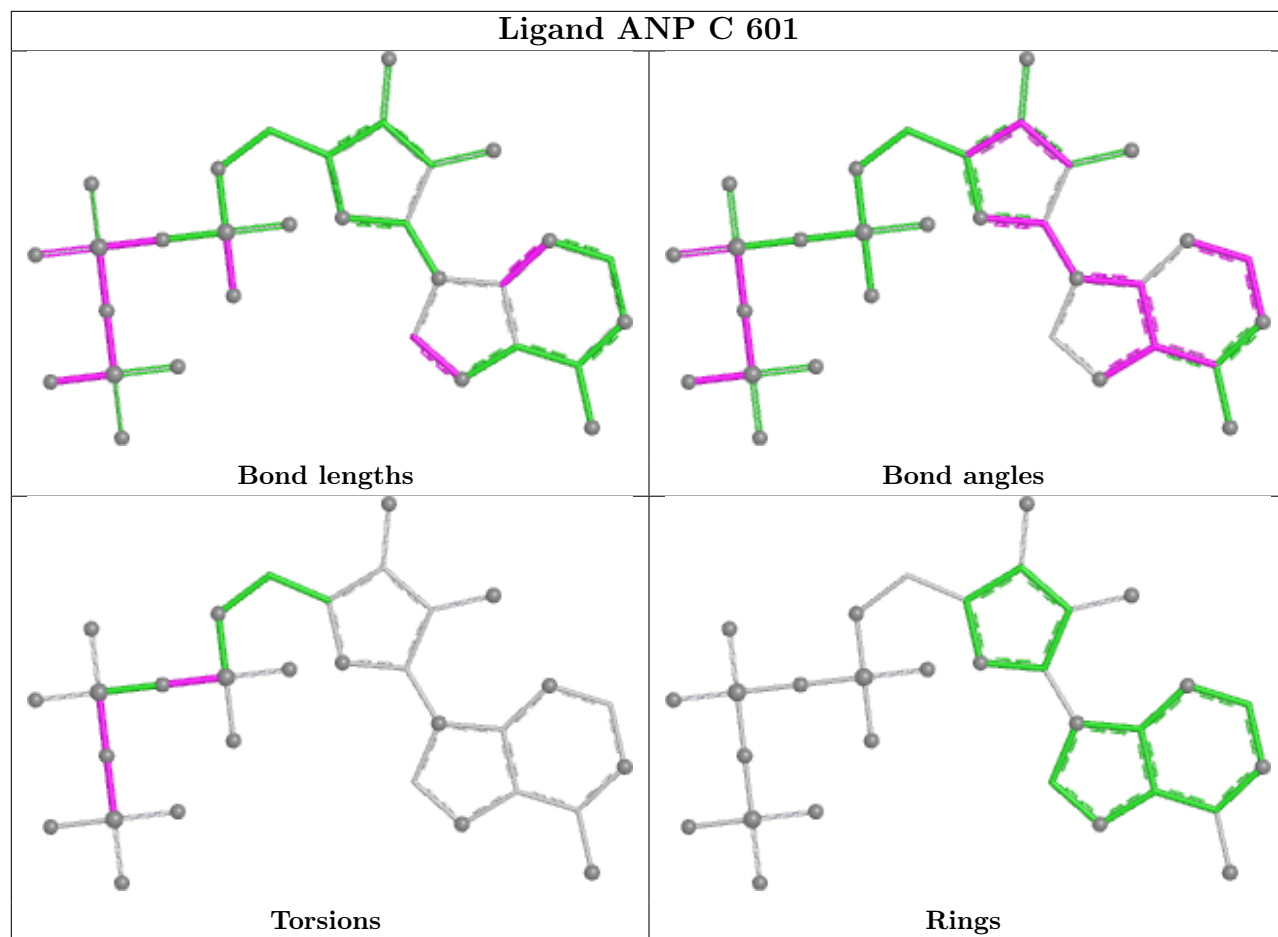
No monomer is involved in short contacts.

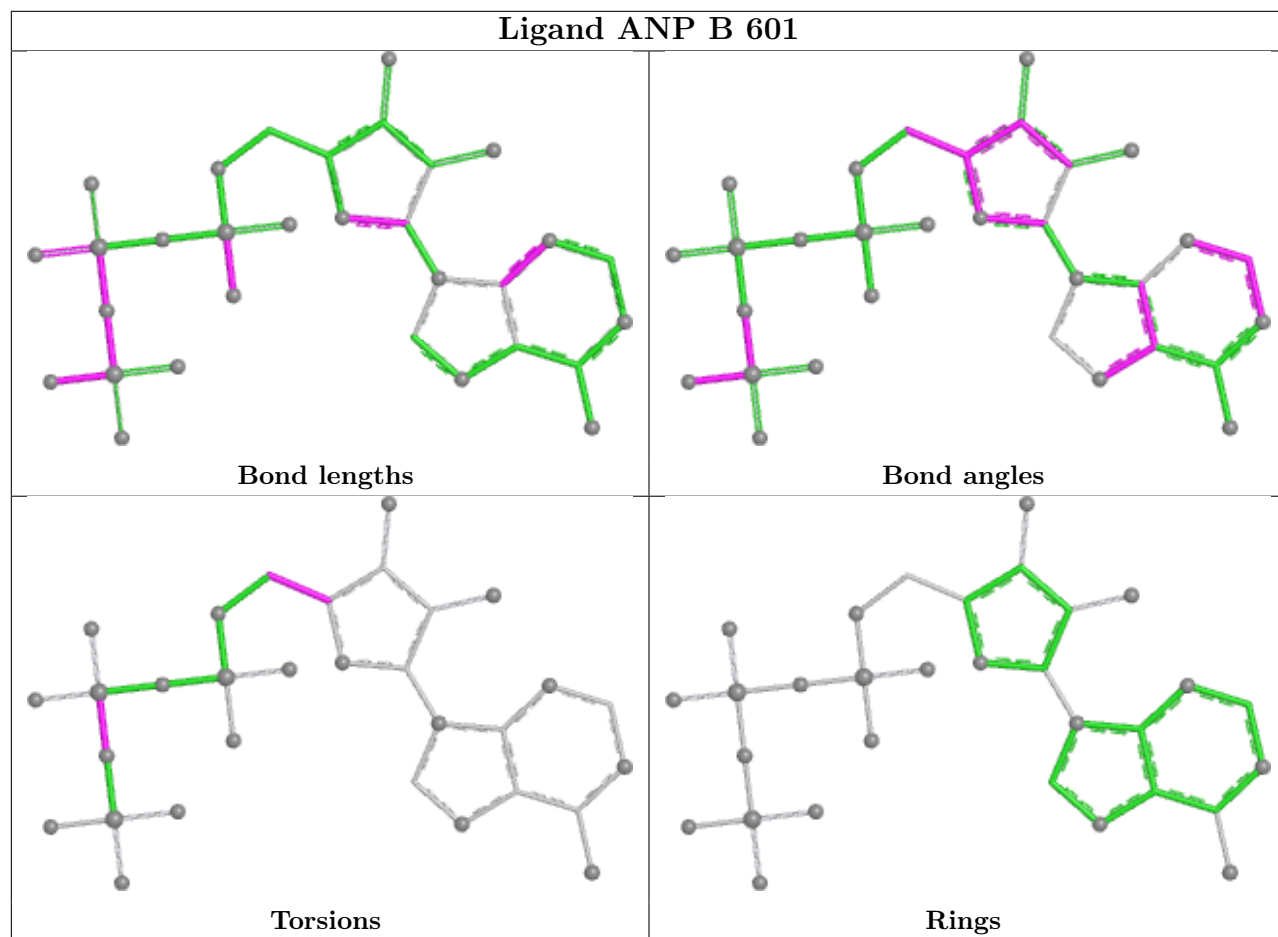
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 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.

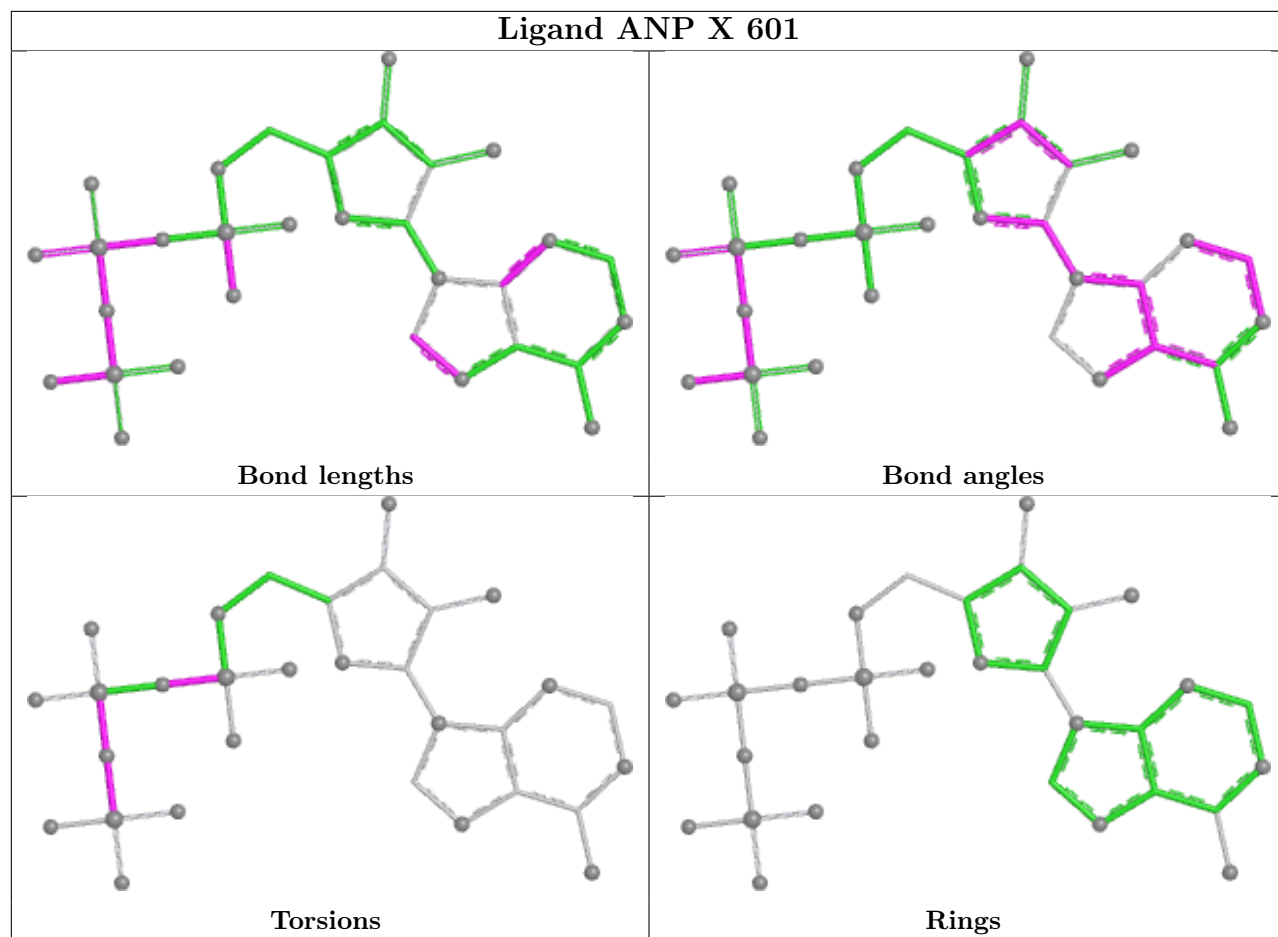


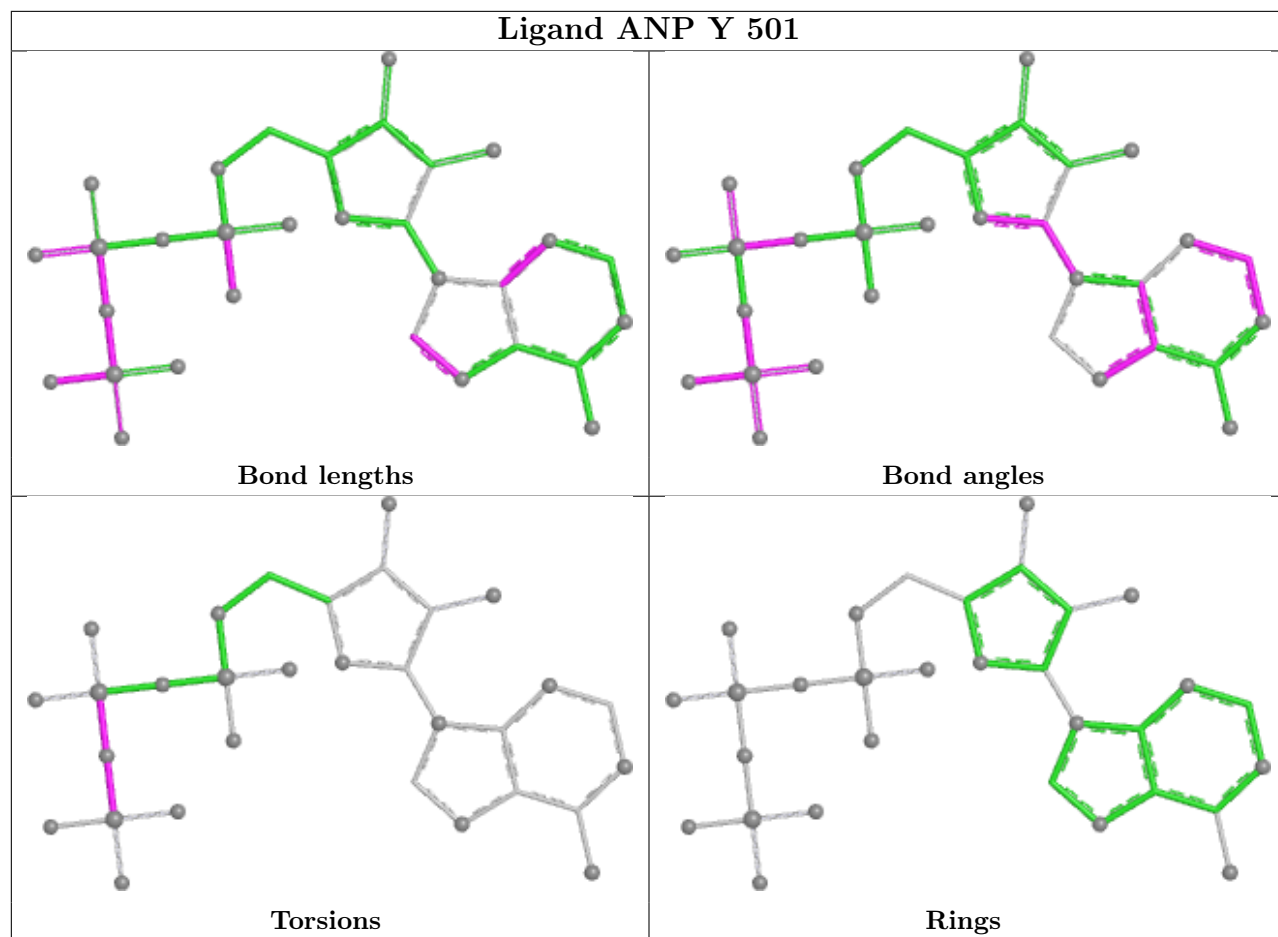


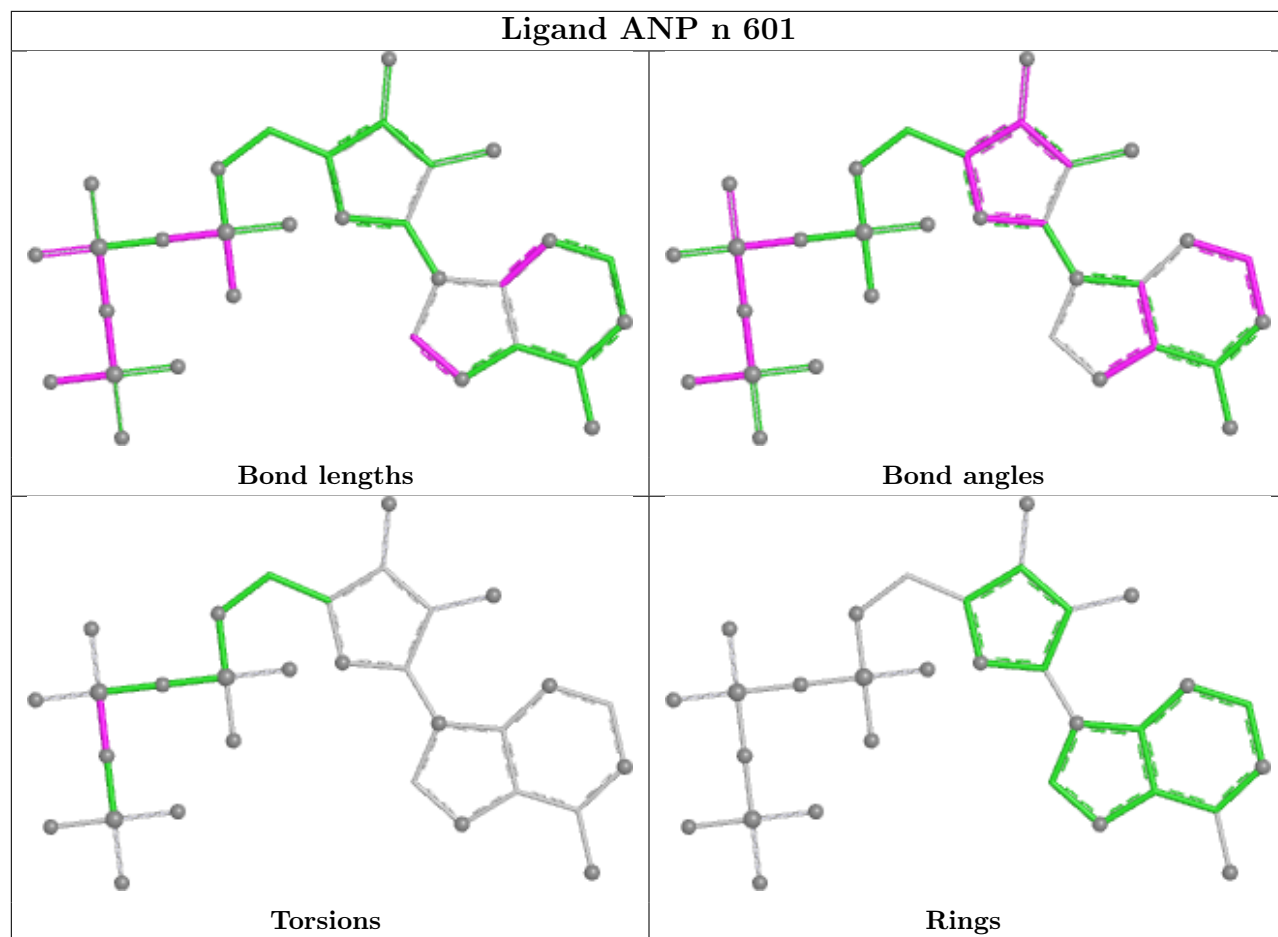


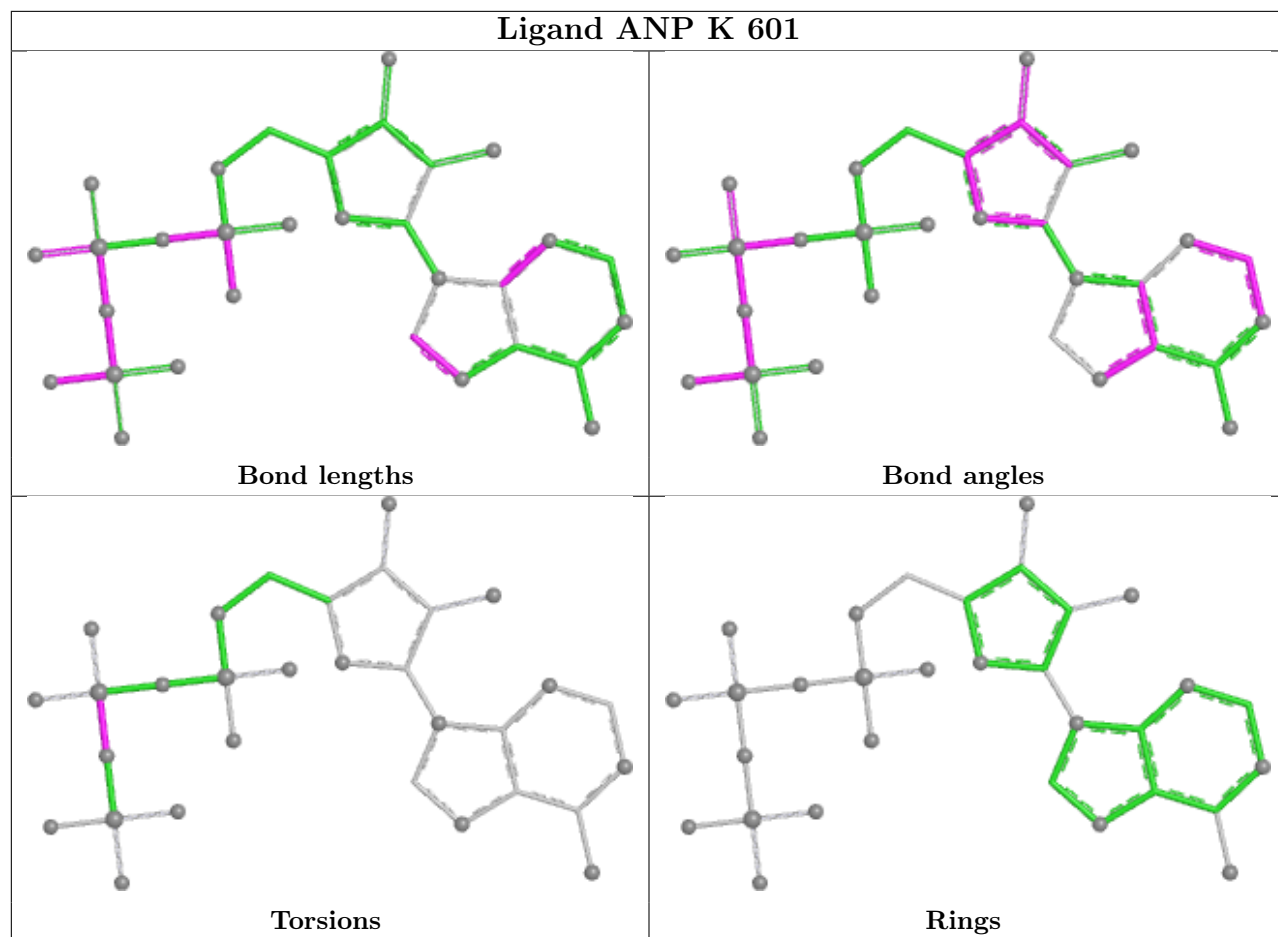


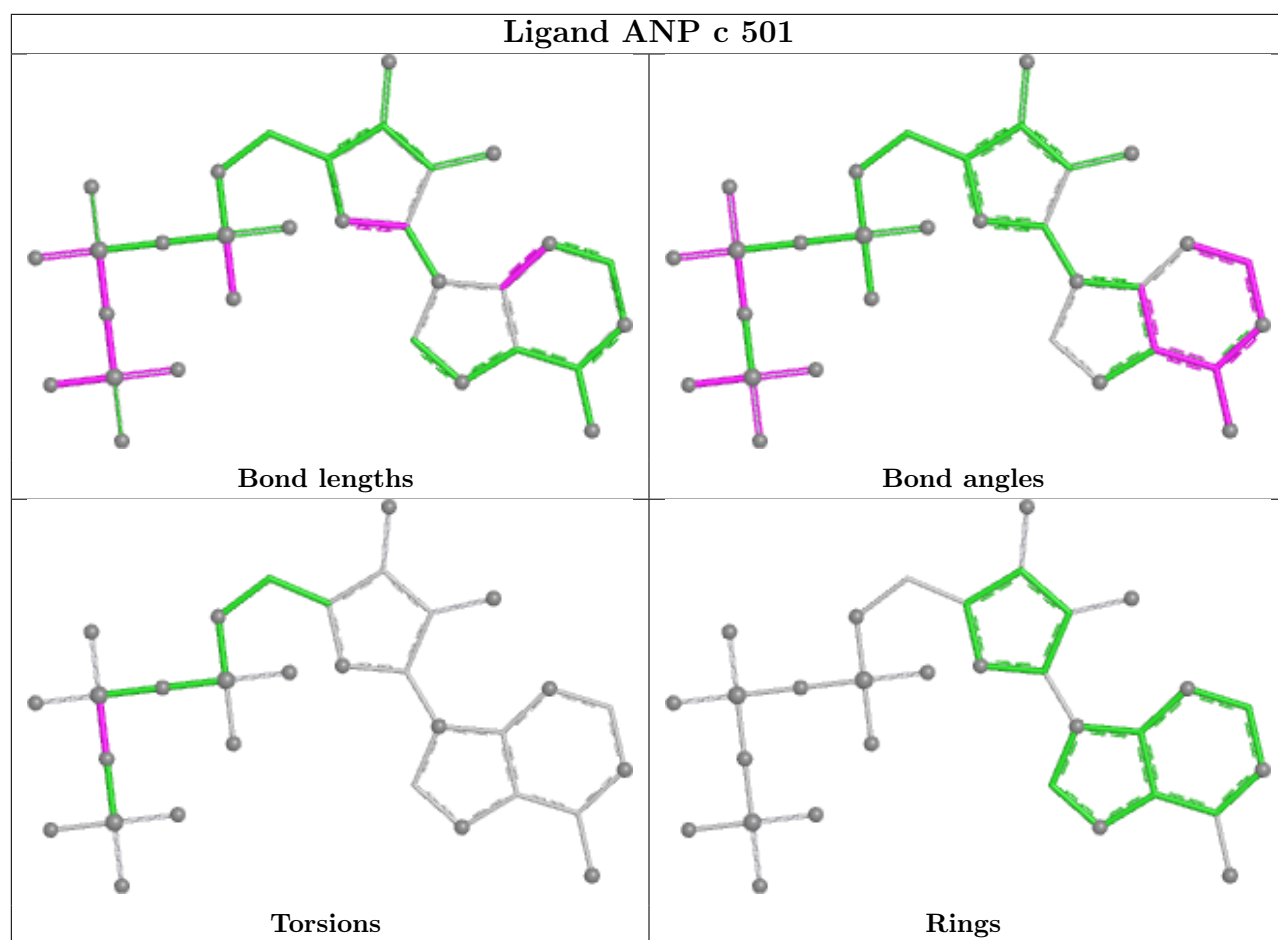












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

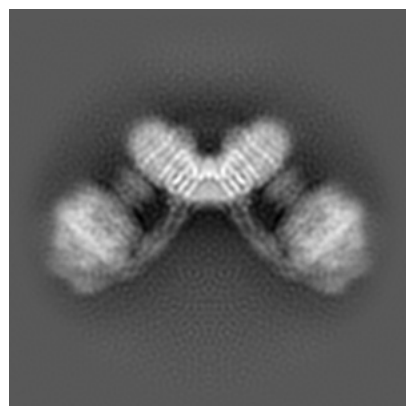
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-7067. These allow visual inspection of the internal detail of the map and identification of artifacts.

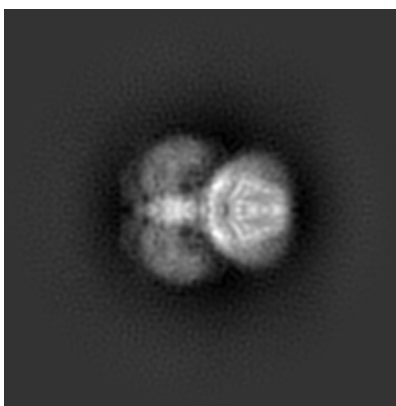
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

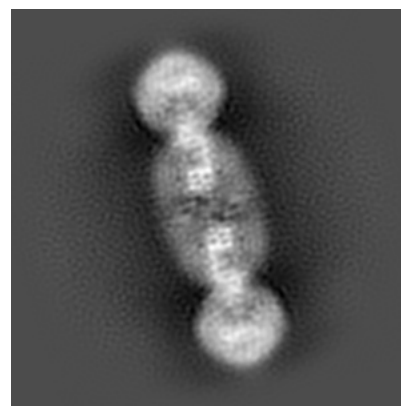
6.1.1 Primary map



X

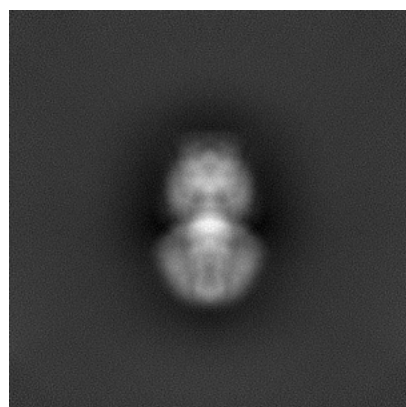


Y

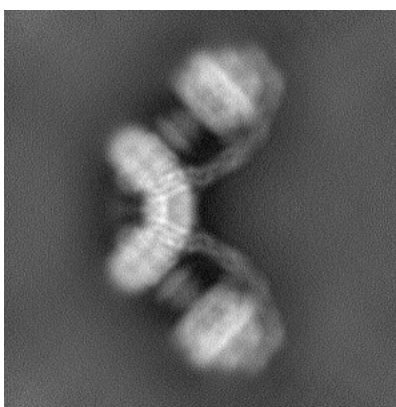


Z

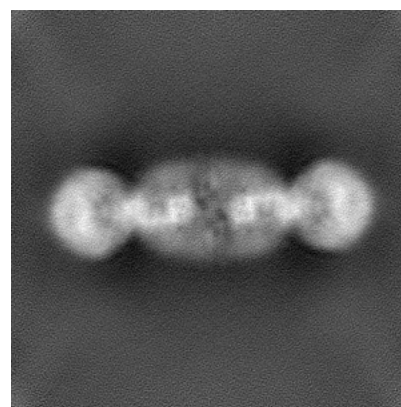
6.1.2 Raw map



X



Y

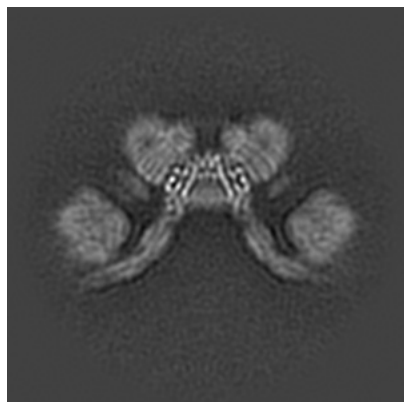


Z

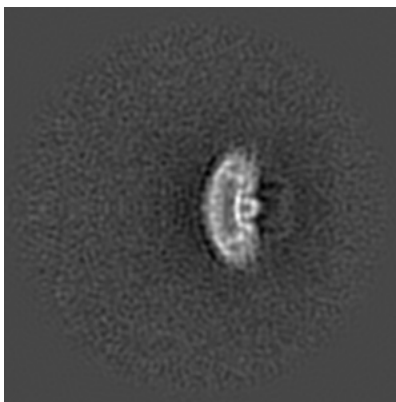
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

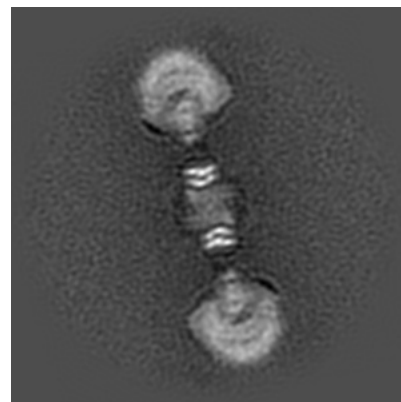
6.2.1 Primary map



X Index: 160

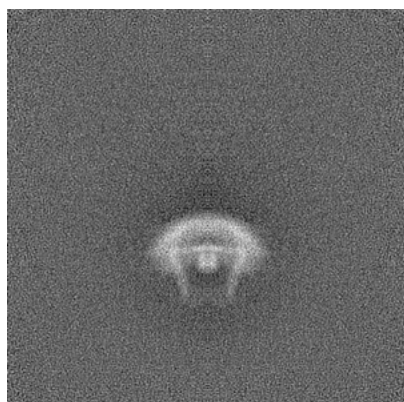


Y Index: 160

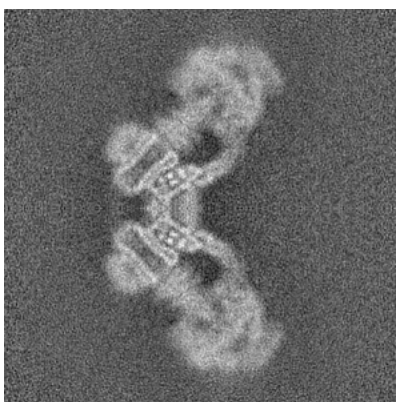


Z Index: 160

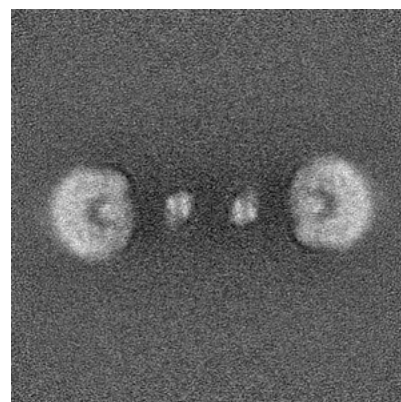
6.2.2 Raw map



X Index: 160



Y Index: 160

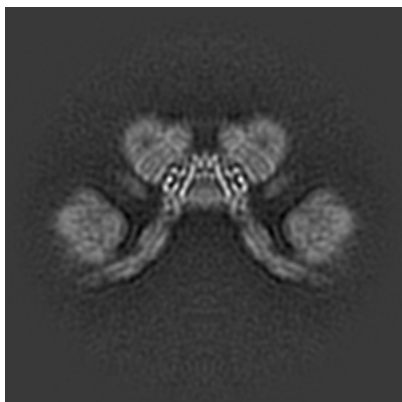


Z Index: 160

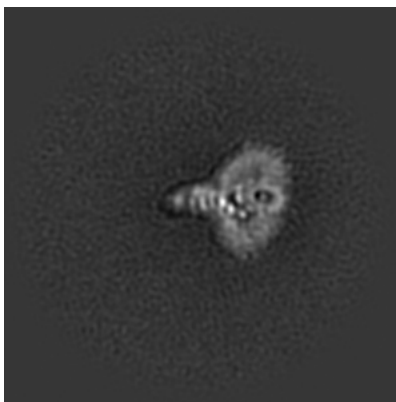
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

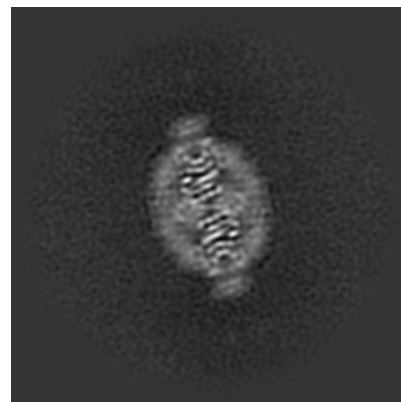
6.3.1 Primary map



X Index: 159

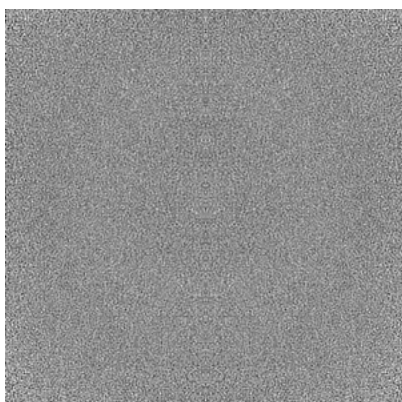


Y Index: 130

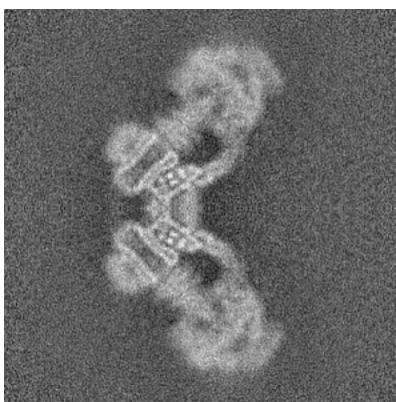


Z Index: 188

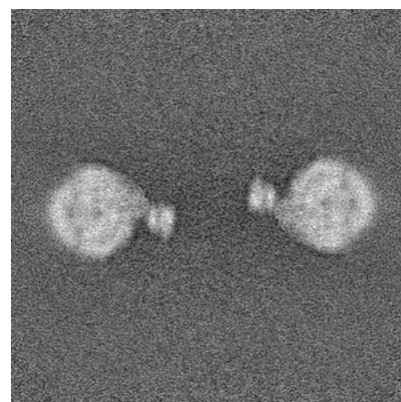
6.3.2 Raw map



X Index: 0



Y Index: 160

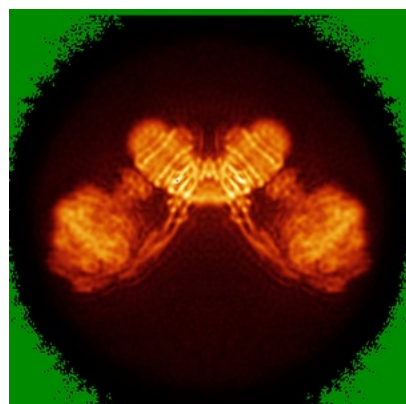


Z Index: 181

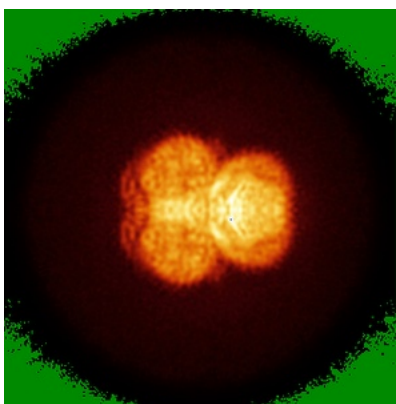
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) [i](#)

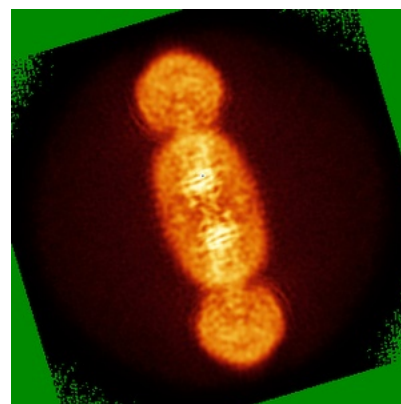
6.4.1 Primary map



X

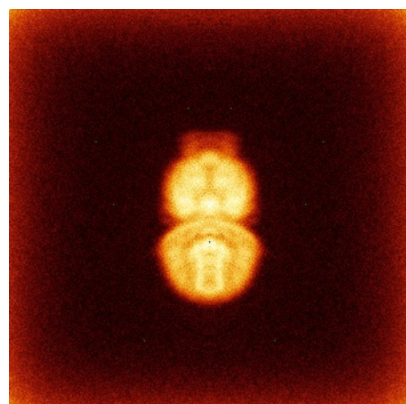


Y

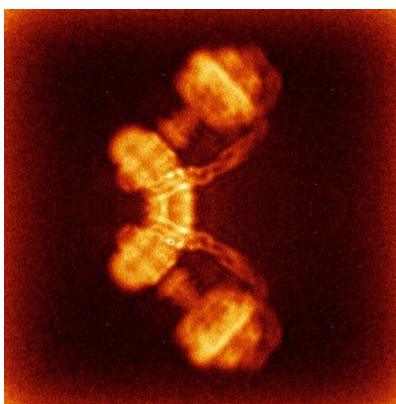


Z

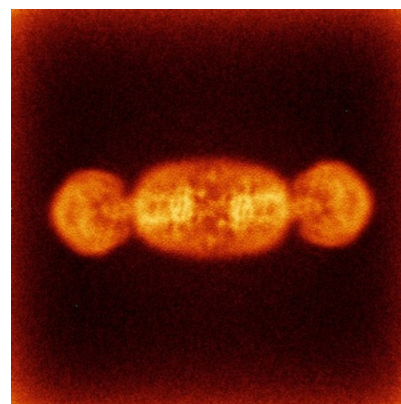
6.4.2 Raw map



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.

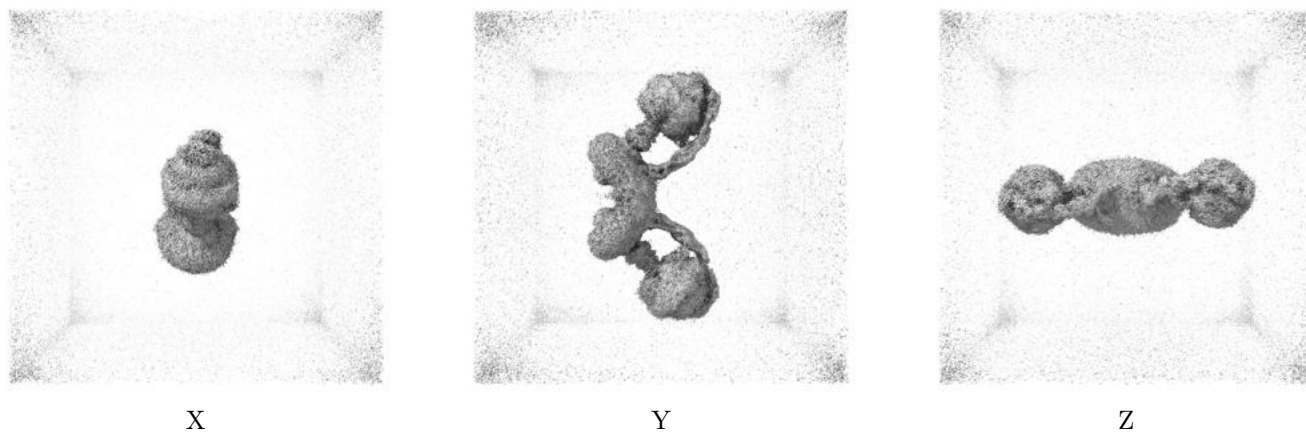
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.156. 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



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.

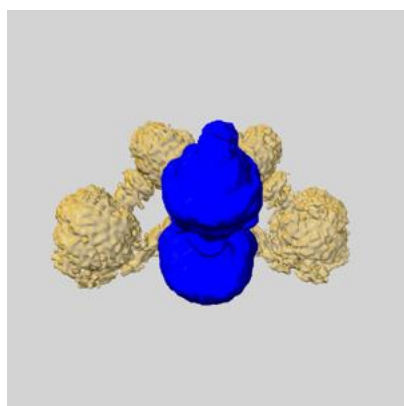
6.6 Mask visualisation [i](#)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

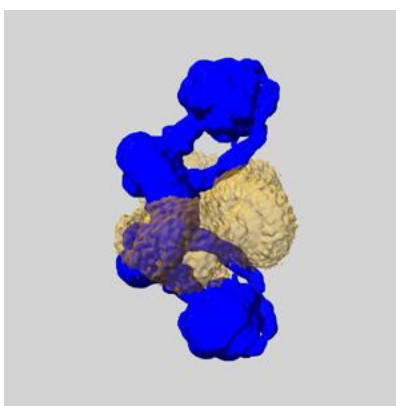
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

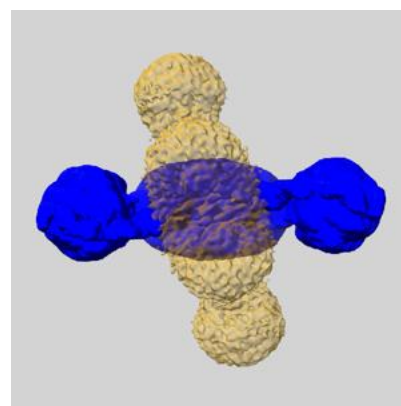
6.6.1 emd_7067_msk_1.map [i](#)



X



Y

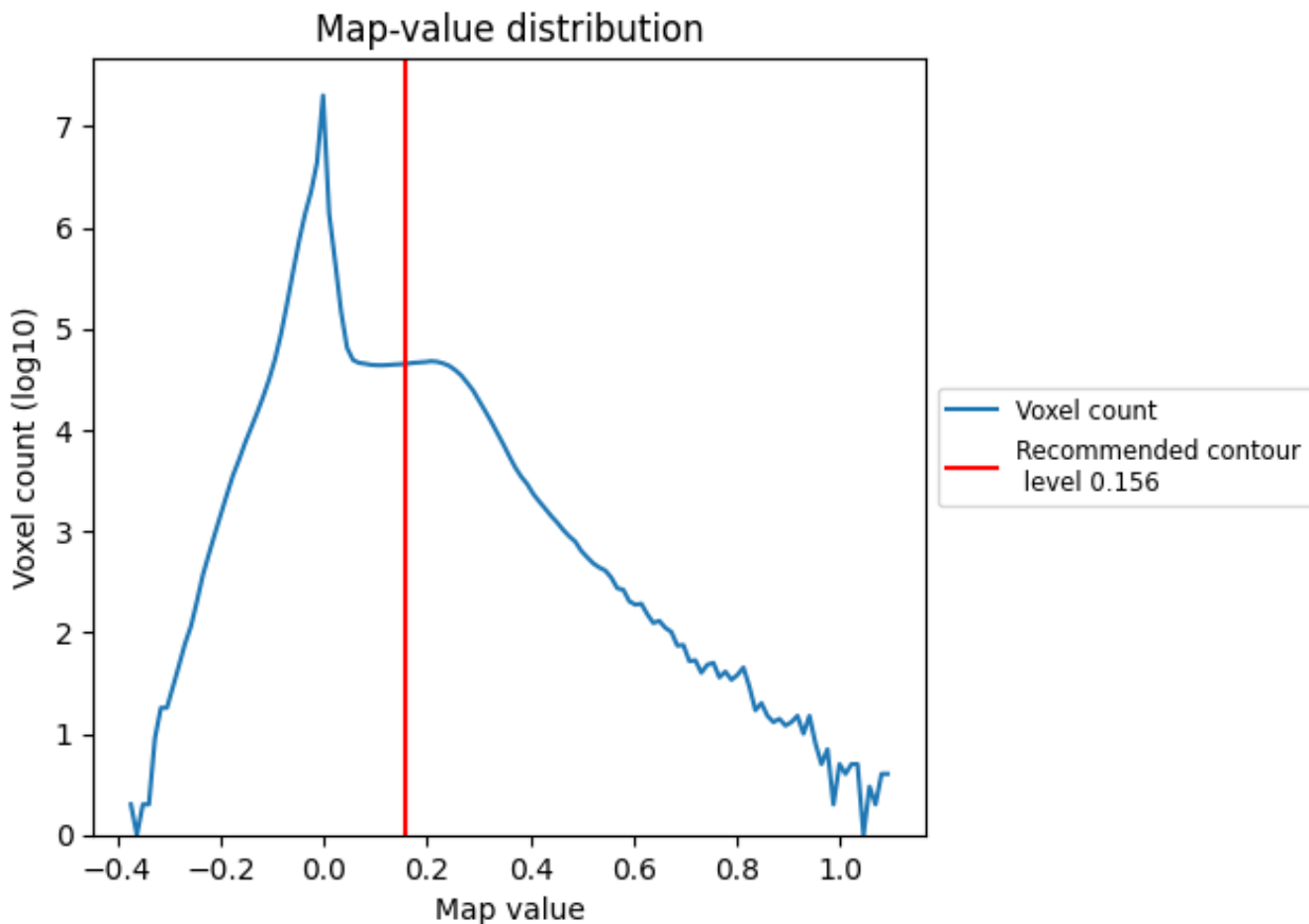


Z

7 Map analysis [i](#)

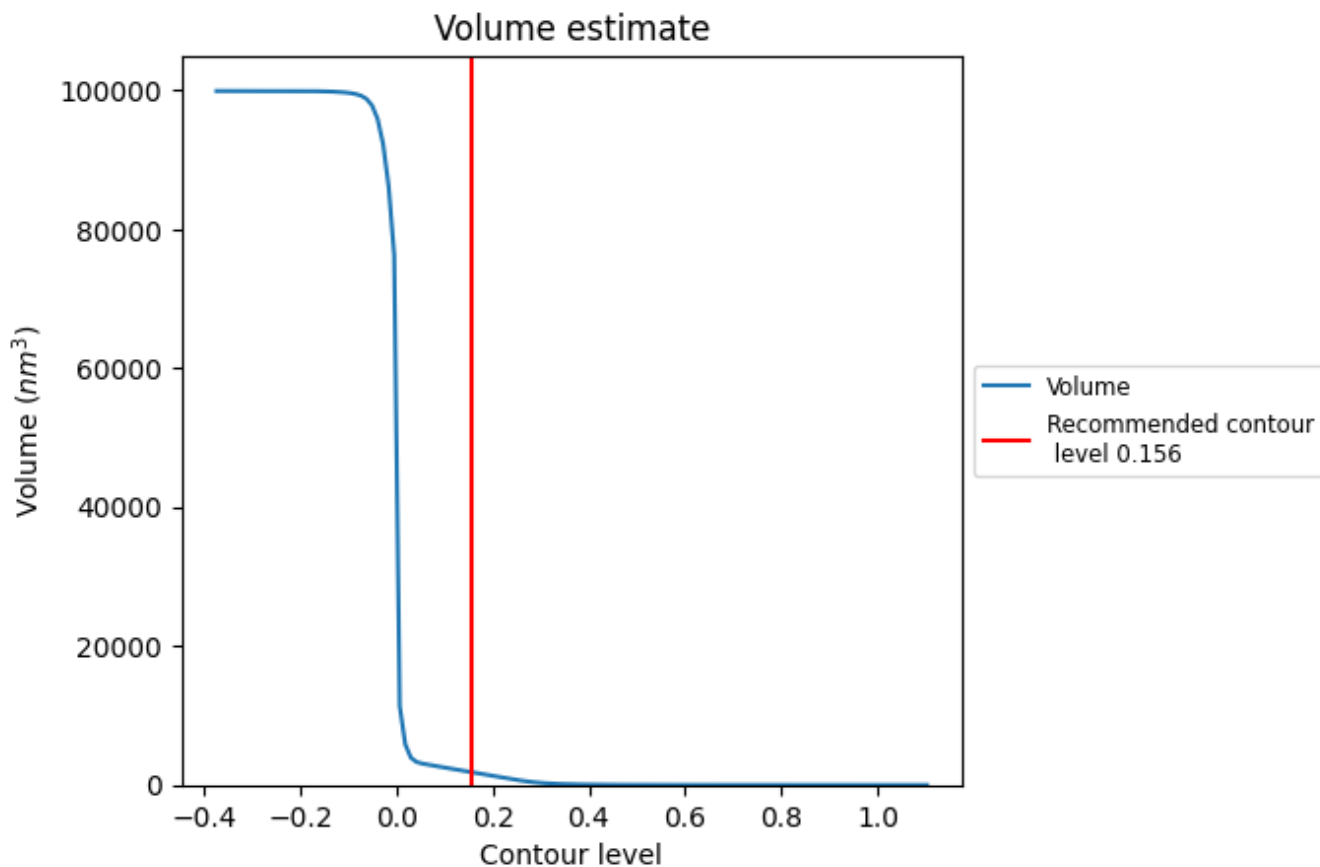
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

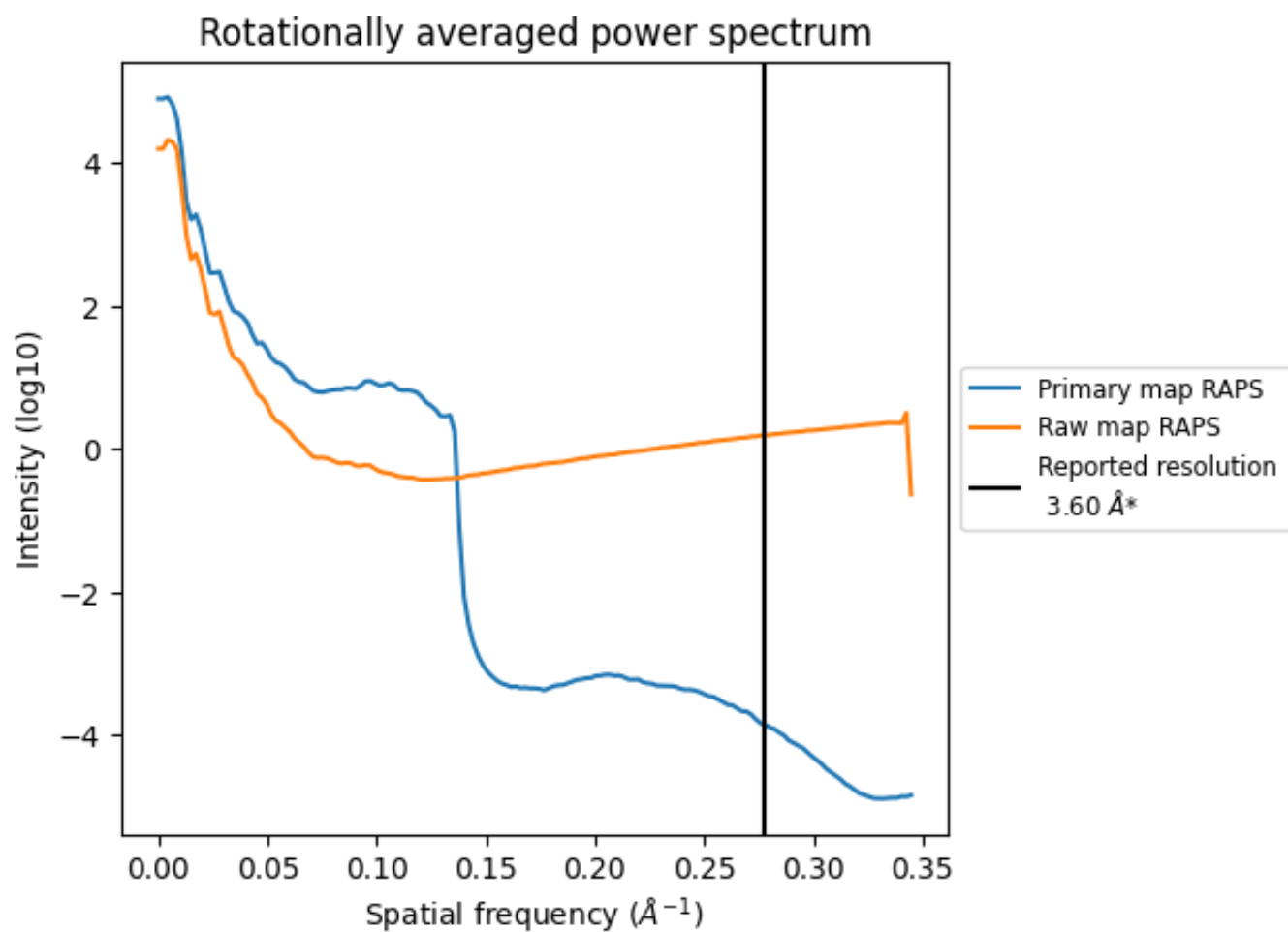
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 1866 nm^3 ; this corresponds to an approximate mass of 1686 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

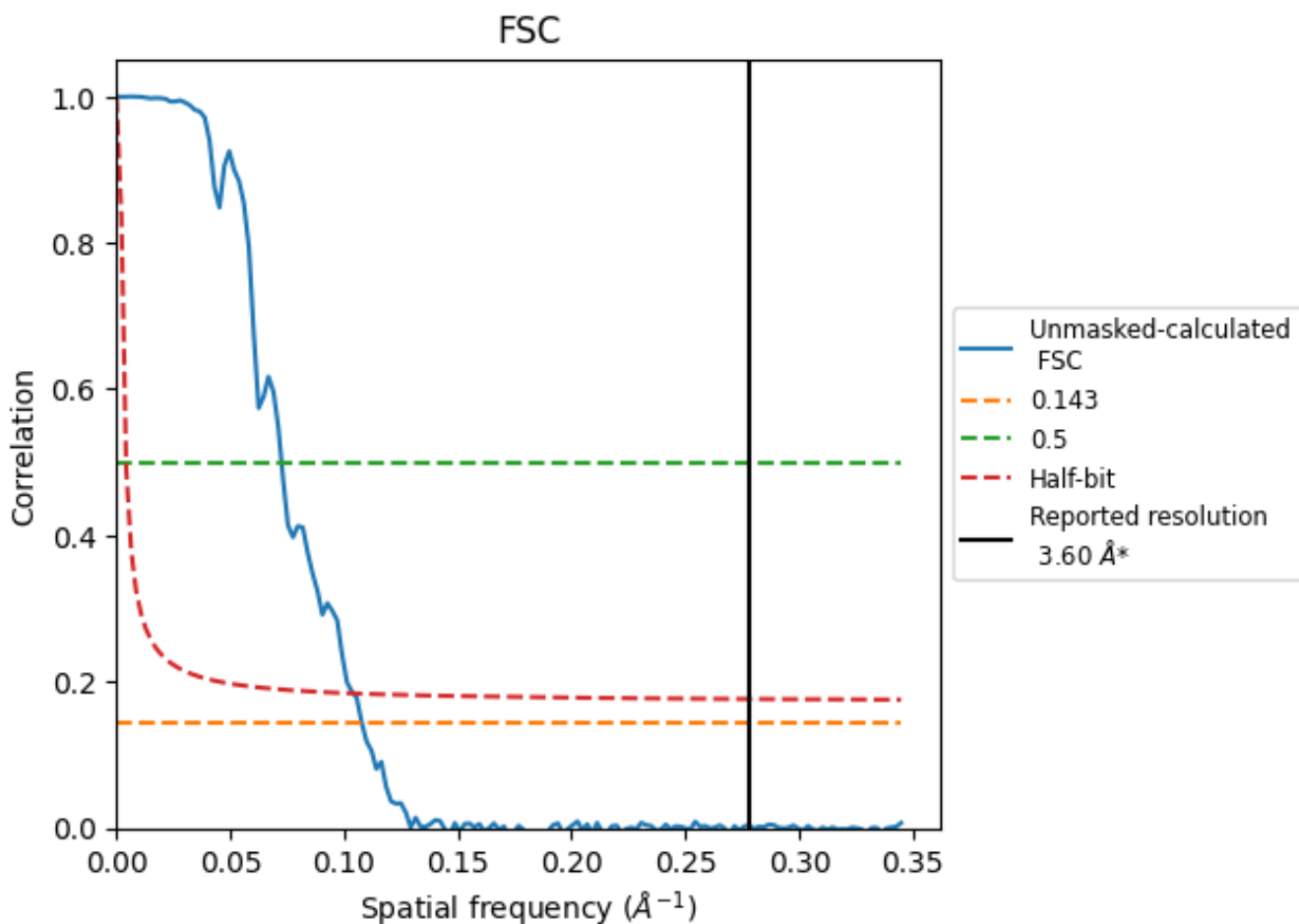


*Reported resolution corresponds to spatial frequency of 0.278 Å⁻¹

8 Fourier-Shell correlation [i](#)

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 [i](#)



*Reported resolution corresponds to spatial frequency of 0.278 Å⁻¹

8.2 Resolution estimates [i](#)

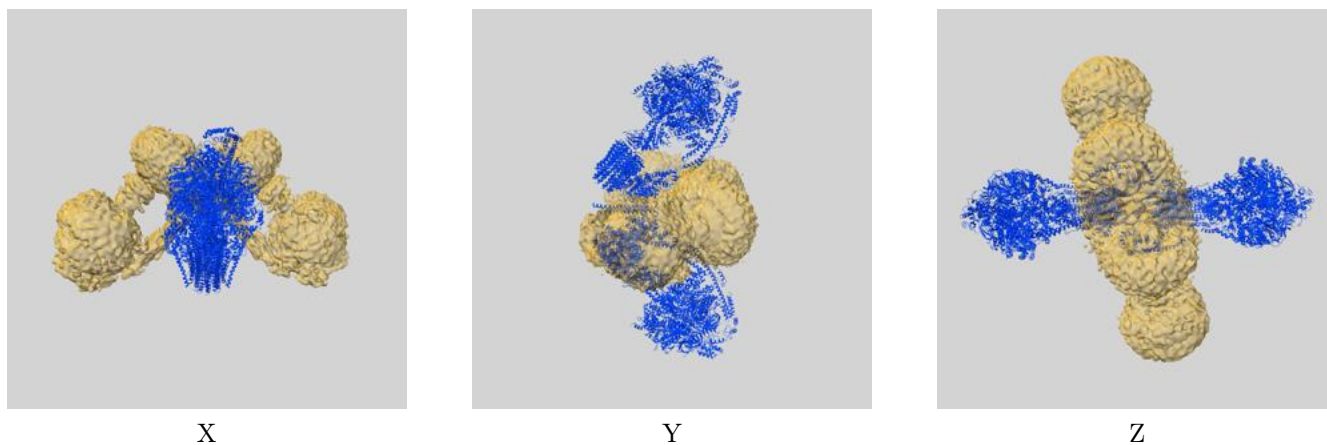
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.60	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	9.28	13.77	9.61

*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 9.28 differs from the reported value 3.6 by more than 10 %

9 Map-model fit [i](#)

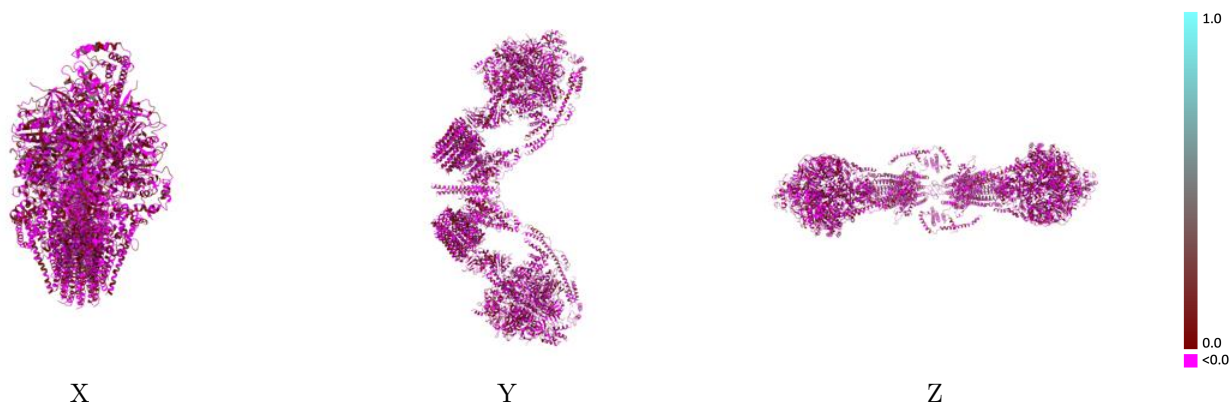
This section contains information regarding the fit between EMDB map EMD-7067 and PDB model 6B8H. Per-residue inclusion information can be found in section 3 on page 12.

9.1 Map-model overlay [i](#)



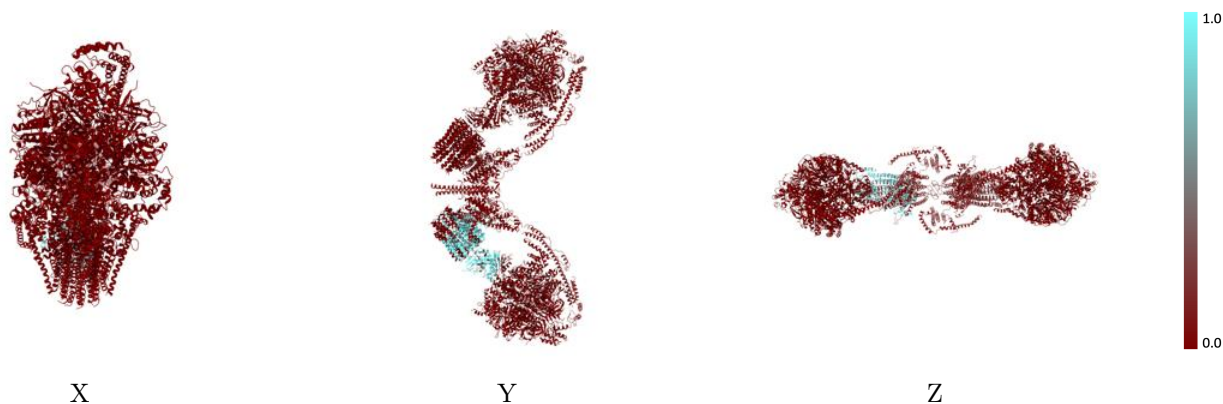
The images above show the 3D surface view of the map at the recommended contour level 0.156 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model [\(i\)](#)



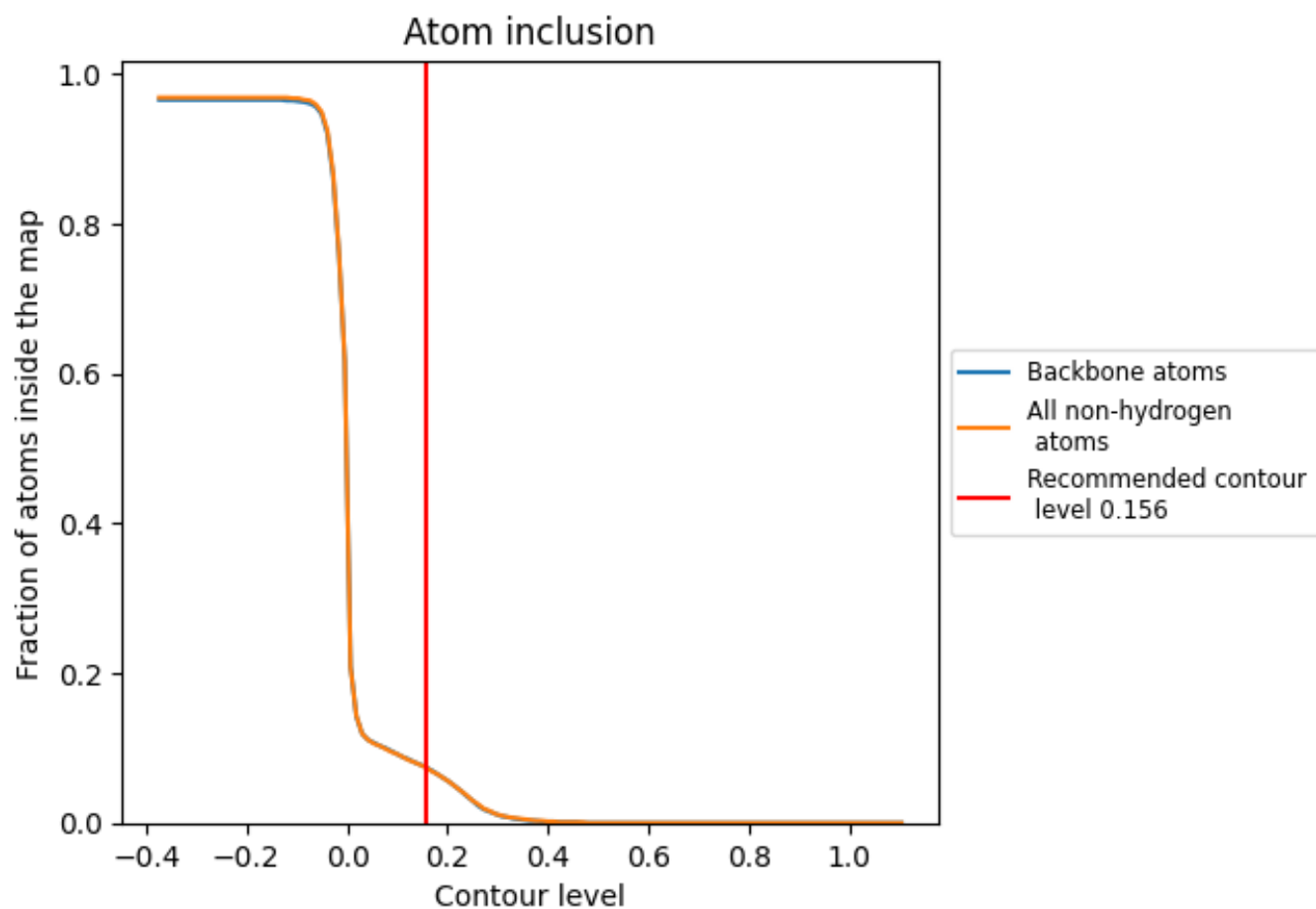
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 [\(i\)](#)



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 (0.156).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 8% of all backbone atoms, 7% 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 (0.156) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.0740	 0.0010
0	 0.5750	 -0.0100
1	 0.6350	 0.0120
2	 0.6700	 0.0120
3	 0.7660	 -0.0290
4	 0.6780	 -0.0130
5	 0.6540	 -0.0530
6	 0.5630	 0.0120
7	 0.3080	 -0.0080
8	 0.4190	 0.0180
9	 0.4900	 -0.0090
A	 0.0100	 0.0150
B	 0.0000	 0.0050
C	 0.0000	 -0.0040
D	 0.0000	 -0.0040
E	 0.0010	 0.0140
F	 0.0000	 0.0020
G	 0.4170	 0.0020
H	 0.7950	 0.0290
I	 0.5910	 0.0070
J	 0.0000	 -0.0160
K	 0.0000	 -0.0030
L	 0.0000	 0.0190
M	 0.0000	 0.0340
N	 0.0000	 -0.0280
O	 0.0000	 0.0050
P	 0.0000	 0.0020
Q	 0.0000	 0.0060
R	 0.0000	 -0.0160
S	 0.0000	 0.0000
T	 0.0000	 0.0250
U	 0.0000	 -0.0190
V	 0.0000	 0.0110
W	 0.0000	 -0.0040
X	 0.0000	 -0.0050



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Chain	Atom inclusion	Q-score
Y	0.0000	0.0060
Z	0.0000	0.0020
a	0.3590	-0.0080
b	0.0050	0.0120
c	0.0000	0.0050
d	0.0440	0.0250
e	0.0000	0.0130
f	0.0000	0.0010
g	0.0000	-0.0100
h	0.0000	0.0980
i	0.0000	-0.0340
j	0.0000	0.0040
k	0.4860	0.0580
l	0.0000	0.0020
m	0.0000	-0.0070
n	0.0000	-0.0040
o	0.0000	0.0180
p	0.0000	-0.0150
q	0.0000	0.0040
r	0.0000	-0.0180
s	0.0040	0.0420
t	0.0000	-0.0100
u	0.0000	-0.0330
v	0.0000	0.0890
w	0.0000	0.0140
x	0.0000	-0.0200