



# wwPDB EM Validation Summary Report ⓘ

Nov 29, 2022 – 08:00 PM JST

PDB ID : 7WUB  
EMDB ID : EMD-32827  
Title : Cryo-EM structure of dodecamer P97  
Authors : Liu, S.; Wang, T.  
Deposited on : 2022-02-08  
Resolution : 3.00 Å(reported)

This is a wwPDB EM Validation Summary Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto: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>.

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

EMDB validation analysis : 0.0.1.dev43  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.9  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.31.3

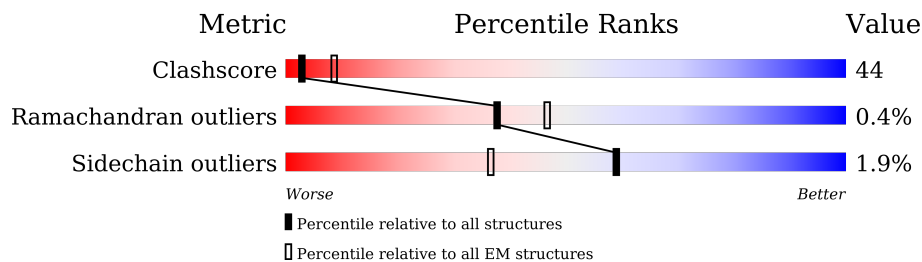
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.00 Å.

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



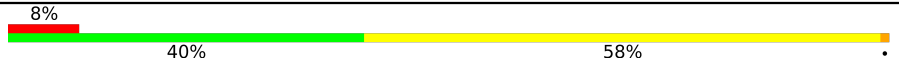

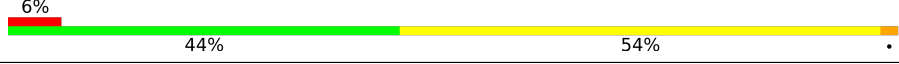
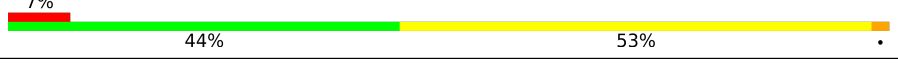
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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	A	755	
1	B	755	
1	E	755	
1	F	755	
1	G	755	
1	H	755	
1	I	755	
1	J	755	

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Mol	Chain	Length	Quality of chain
1	K	755	
1	L	755	
2	C	576	
3	D	576	

## 2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 63739 atoms, of which 480 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 Transitional endoplasmic reticulum ATPase.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	576	4494	2822	795	854	23	0	0
1	B	576	4494	2822	795	854	23	0	0
1	E	576	4494	2822	795	854	23	0	0
1	F	576	4494	2822	795	854	23	0	0
1	G	755	5925	3719	1049	1126	31	0	0
1	H	755	5925	3719	1049	1126	31	0	0
1	I	755	5925	3719	1049	1126	31	0	0
1	J	755	5925	3719	1049	1126	31	0	0
1	K	755	5925	3719	1049	1126	31	0	0
1	L	755	5925	3719	1049	1126	31	0	0

- Molecule 2 is a protein called Transitional endoplasmic reticulum ATPase.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	C	576	4490	2820	793	854	23	0	0

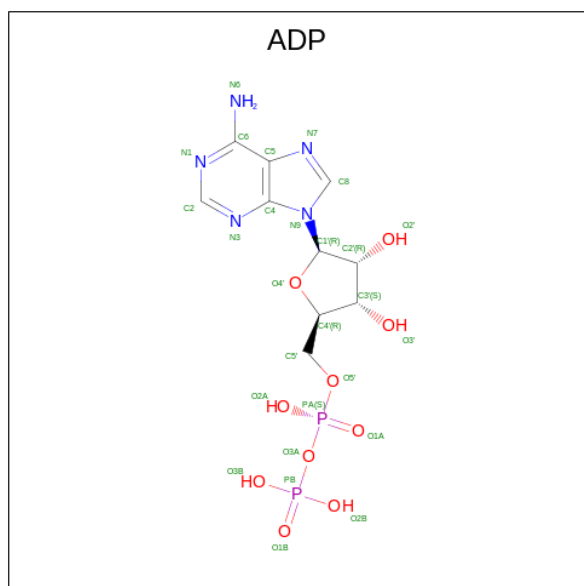
There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	712	GLN	GLU	conflict	UNP P55072
C	713	THR	ARG	conflict	UNP P55072

- Molecule 3 is a protein called Transitional endoplasmic reticulum ATPase.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	D	575	4487	2817	794	853	23	0	0

- Molecule 4 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula:  $C_{10}H_{15}N_5O_{10}P_2$ ).



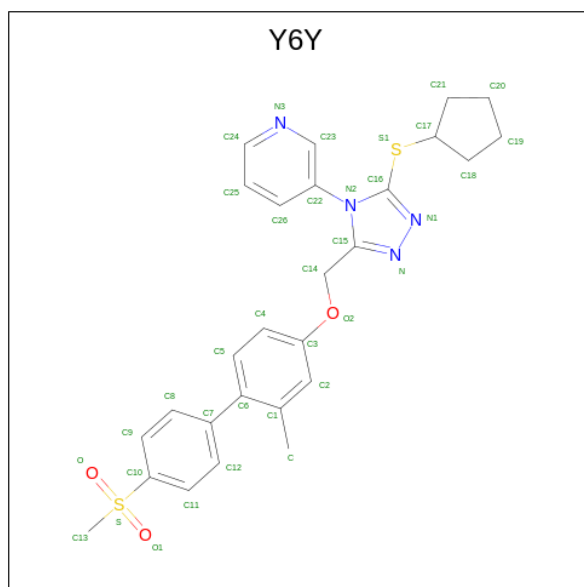
Mol	Chain	Residues	Atoms						AltConf
			Total	C	H	N	O	P	
4	A	1	Total	C	H	N	O	P	0
			39	10	12	5	10	2	
4	B	1	Total	C	H	N	O	P	0
			39	10	12	5	10	2	
4	C	1	Total	C	H	N	O	P	0
			39	10	12	5	10	2	
4	D	1	Total	C	H	N	O	P	0
			39	10	12	5	10	2	
4	E	1	Total	C	H	N	O	P	0
			39	10	12	5	10	2	
4	F	1	Total	C	H	N	O	P	0
			39	10	12	5	10	2	
4	G	1	Total	C	H	N	O	P	0
			39	10	12	5	10	2	
4	H	1	Total	C	H	N	O	P	0
			39	10	12	5	10	2	
4	I	1	Total	C	H	N	O	P	0
			39	10	12	5	10	2	
4	J	1	Total	C	H	N	O	P	0
			39	10	12	5	10	2	

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Mol	Chain	Residues	Atoms					AltConf	
4	K	1	Total	C	H	N	O	P	0
			39	10	12	5	10	2	
4	L	1	Total	C	H	N	O	P	0
			39	10	12	5	10	2	

- Molecule 5 is 3-[3-cyclopentylsulfanyl-5-[[3-methyl-4-(4-methylsulfonylphenyl)phenoxy]methyl]-1,2,4-triazol-4-yl]pyridine (three-letter code: Y6Y) (formula: C<sub>27</sub>H<sub>28</sub>N<sub>4</sub>O<sub>3</sub>S<sub>2</sub>) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf	
5	A	1	Total	C	H	N	O	S	0
			64	27	28	4	3	2	
5	B	1	Total	C	H	N	O	S	0
			64	27	28	4	3	2	
5	C	1	Total	C	H	N	O	S	0
			64	27	28	4	3	2	
5	D	1	Total	C	H	N	O	S	0
			64	27	28	4	3	2	
5	E	1	Total	C	H	N	O	S	0
			64	27	28	4	3	2	
5	F	1	Total	C	H	N	O	S	0
			64	27	28	4	3	2	
5	G	1	Total	C	H	N	O	S	0
			64	27	28	4	3	2	
5	H	1	Total	C	H	N	O	S	0
			64	27	28	4	3	2	

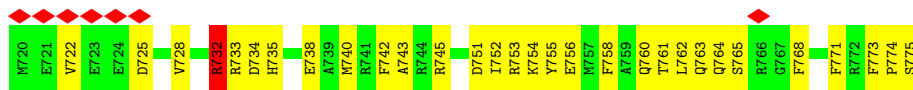
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Mol	Chain	Residues	Atoms					AltConf	
			Total	C	H	N	O		S
5	I	1	Total 64	C 27	H 28	N 4	O 3	S 2	0
5	J	1	Total 64	C 27	H 28	N 4	O 3	S 2	0
5	K	1	Total 64	C 27	H 28	N 4	O 3	S 2	0
5	L	1	Total 64	C 27	H 28	N 4	O 3	S 2	0







• Molecule 1: Transitional endoplasmic reticulum ATPase



ASN	ARG	PRO	ASN	ARG	LEU	ILE	VAL	ASP	GLU	ALA	ASN	ILE	ASN	ASP	VAL	ASP	GLU	LEU	VAL	ASP	GLY	VAL	GLY	VAL	PRO	PRO	LYS	MET	D751	I752	R753	Y754	Y755	E756	M757	F758	F759	Q760	T761	L762	Q763	Q764	S765	R766	G767	F768	F771	R772	F773	P774	S775
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V201	G202	Y203	D204	D205	L206	C209	M210	R211	Q212	L213	I216	K217	E218	R219	M220	E221	L224	R225	H226	F227	A228	L229	F230	K231	A232	L233	G234	V235	K236	R239	L242	L243	Y244	P247	G248	T249	G250	L253	I254	A259	N260	E261	T262	G263	A264	F265	F266	N270	G271	P272
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E273	L274	M275	S276	K277	L278	E281	S282	E283	S284	R285	L286	R287	K288	E291	A299	F302	L306	D307	A308	I309	A310	P311	R312	R313	E314	T316	H317	E321	R322	R323	I324	Q327	L329	T330	L331	M332	K336	Q337	R338	A339	H340	V341	M344	A345	A346	T347	N348
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R349	P350	N351	S352	I353	K354	P355	A356	L357	R358	R359	F360	G361	R362	P363	D364	R365	V367	D368	I371	P372	D373	R377	L378	E379	I380	L381	Q382	L383	K389	L390	A391	D392	D393	V394	D395	L396	E397	V399	A400	N401	E402	T403	H404	G405	H406	V407	G408	A409	D410	E411	L411	S416	A419
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L420	Q421	A422	I423	R424	K425	K426	M427	D428	L429	I430	D431	L432	E433	D434	E435	E436	I437	D438	A439	E440	M442	M443	S444	L445	A446	M449	D450	D451	W454	A455	L456	S457	Q458	S459	M460	P461	S462	A463	L464	R465	E466	V469	P472	W476	D477	D478	I479	G480	G481	L482	E483	D484	V485
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K486	R487	E488	L489	Q490	E491	L492	V493	Q494	Y495	P496	V497	E498	H499	P500	D501	K502	F503	L504	K505	P506	M508	T509	P510	S511	K512	L515	F516	Y517	G518	P519	G522	G523	K524	L527	A528	I531	E534	M538	F539	K615	I540	S541	T542	K543	L547	L548	T549	M550	H551	P552	E556
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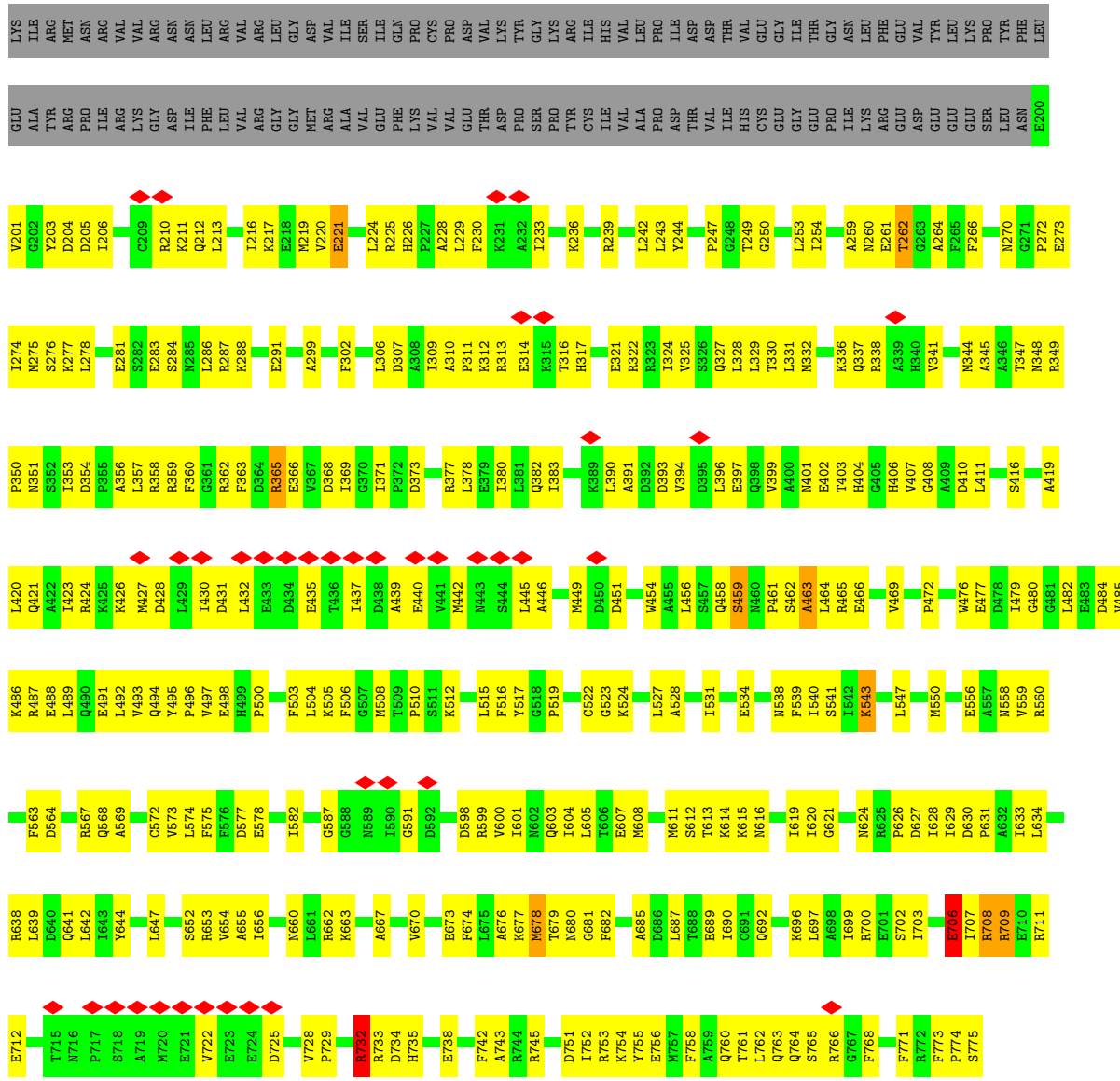
A557	M558	R559	R560	D564	R567	Q568	A569	C572	M573	L574	P575	F576	D577	E578	L579	D580	S581	I582	R586	L587	G587	G588	M589	I590	G591	D598	R599	V600	I601	M602	Q603	I604	L605	T606	E607	M608	M611	S612	T613	K614	E689	K615	M616	I619	I620	G621	A622	T623	N624	R625	P626	D627	I628	I629
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D630	P631	A632	L633	R638	L639	D640	Q641	L642	I643	Y644	L647	S652	R653	M654	A655	I656	N660	L661	R662	K663	A667	V670	E673	F674	L675	A676	K677	M678	T679	M680	G681	F682	A685	D686	L687	T688	E689	I690	K696	L697	A698	I699	R700	E701	S702	I703	P706	I707
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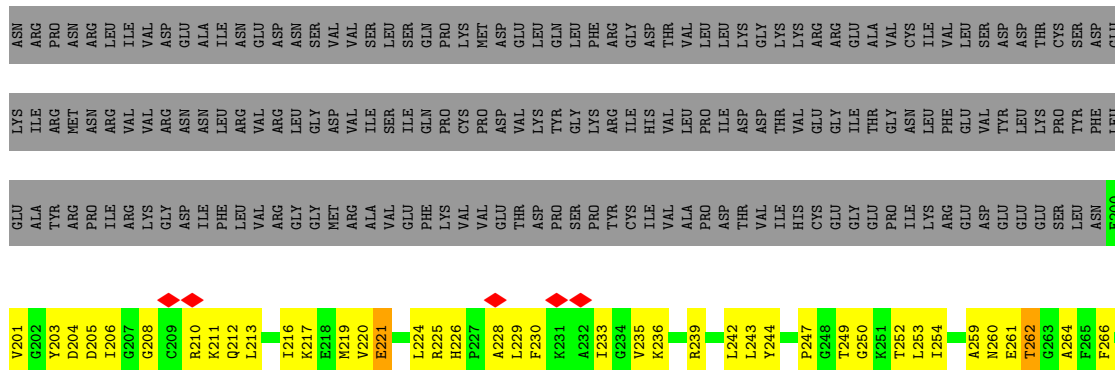
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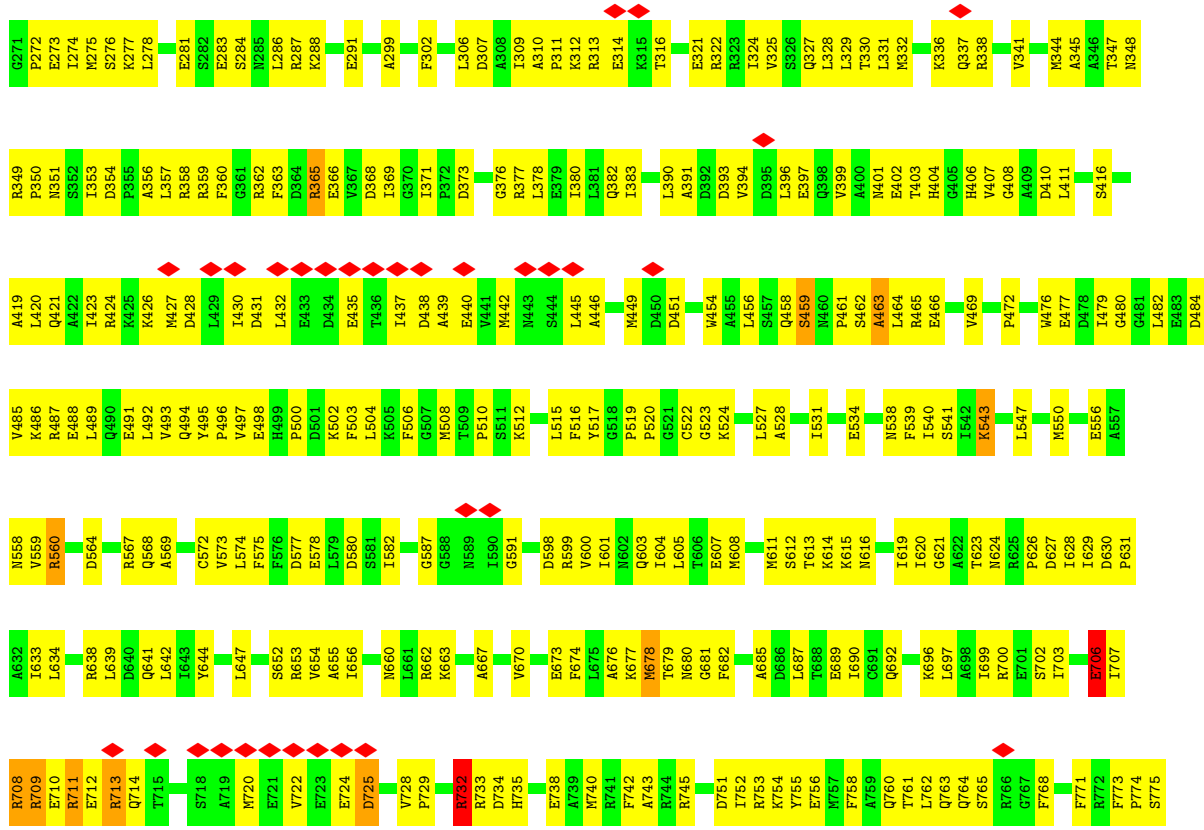


ASN	ARG	PRO	ASN	ARG	LEU	ILE	VAL	ASP	GLU	ALA	ASN	ILE	ASN	ASP	VAL	ASP	GLU	LEU	VAL	ASP	GLY	VAL	GLY	VAL	PRO	PRO	LYS	MET	D751	I752	R753	K754	Y755	E756	M757	F758	A759	Q760	T761	L762	Q763	Q764	S765	R766	G767	F768	F771	R772	F773	P774	S775
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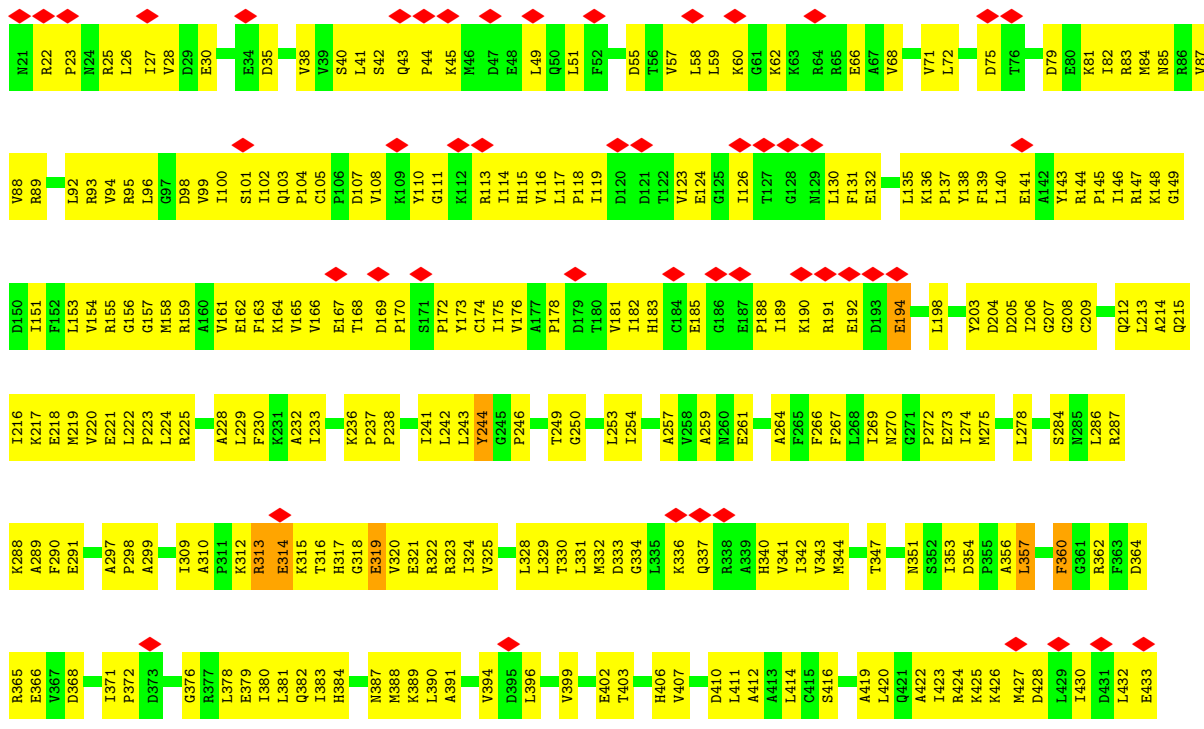


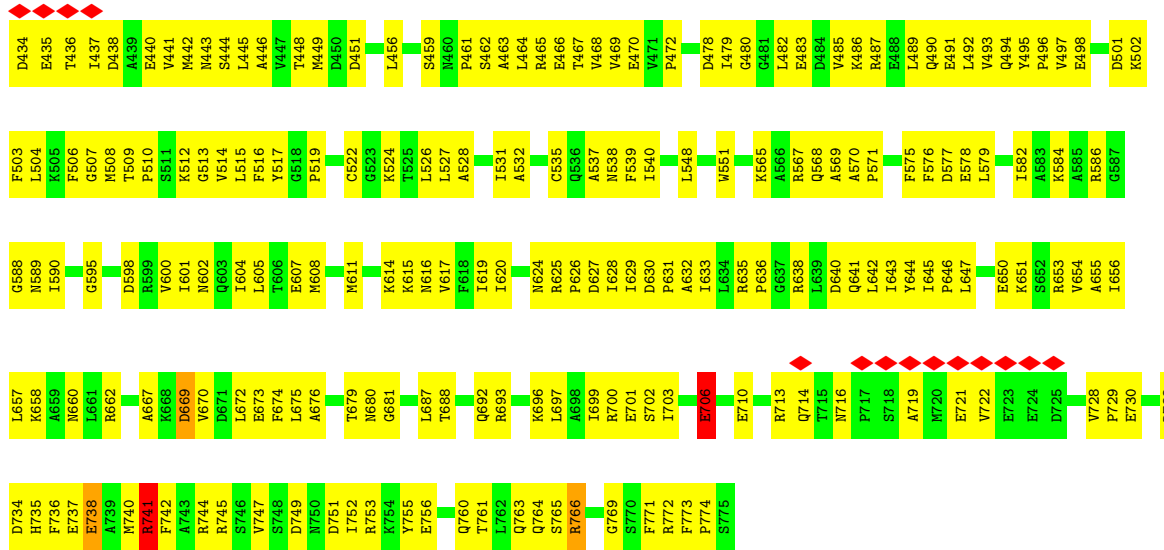
● Molecule 1: Transitional endoplasmic reticulum ATPase



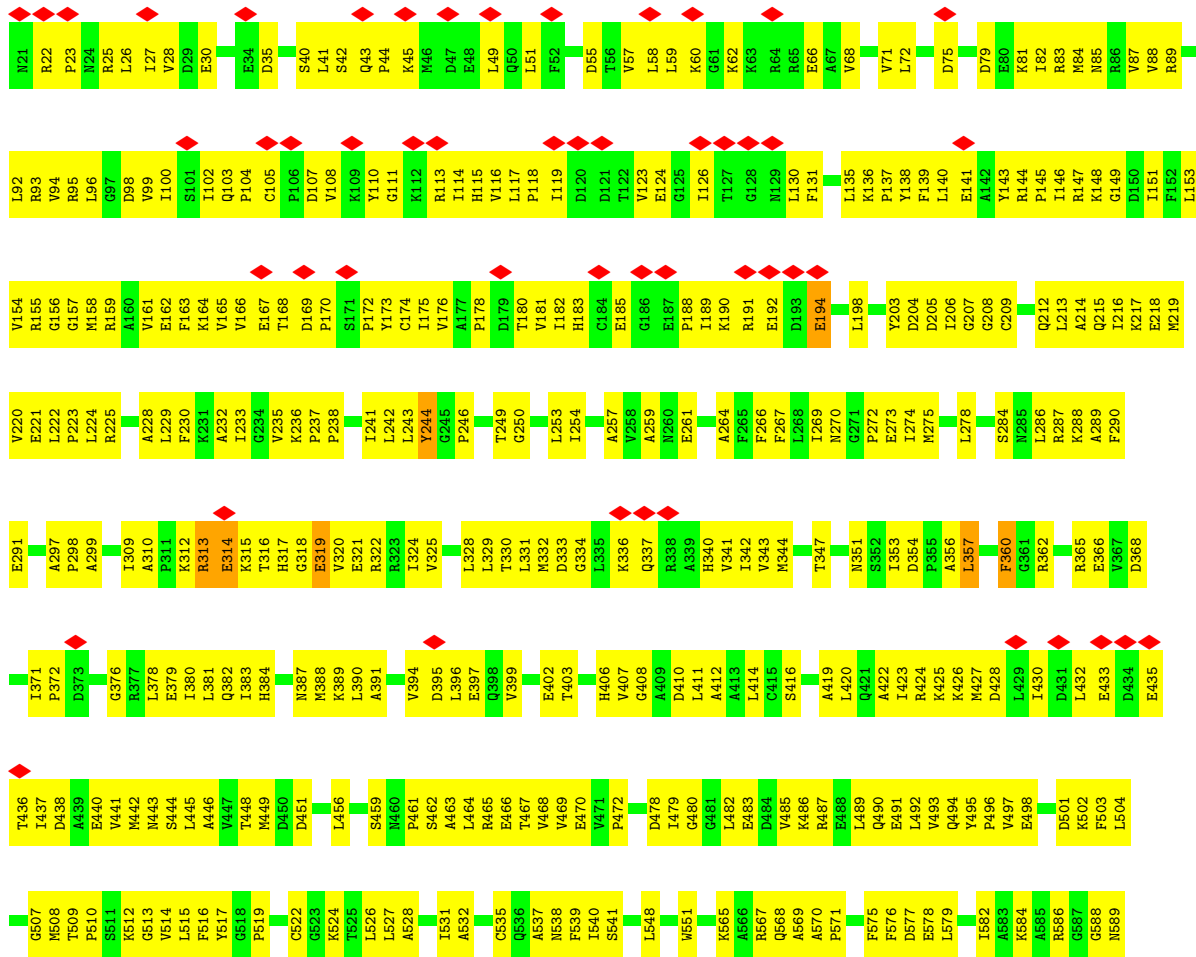


• Molecule 1: Transitional endoplasmic reticulum ATPase



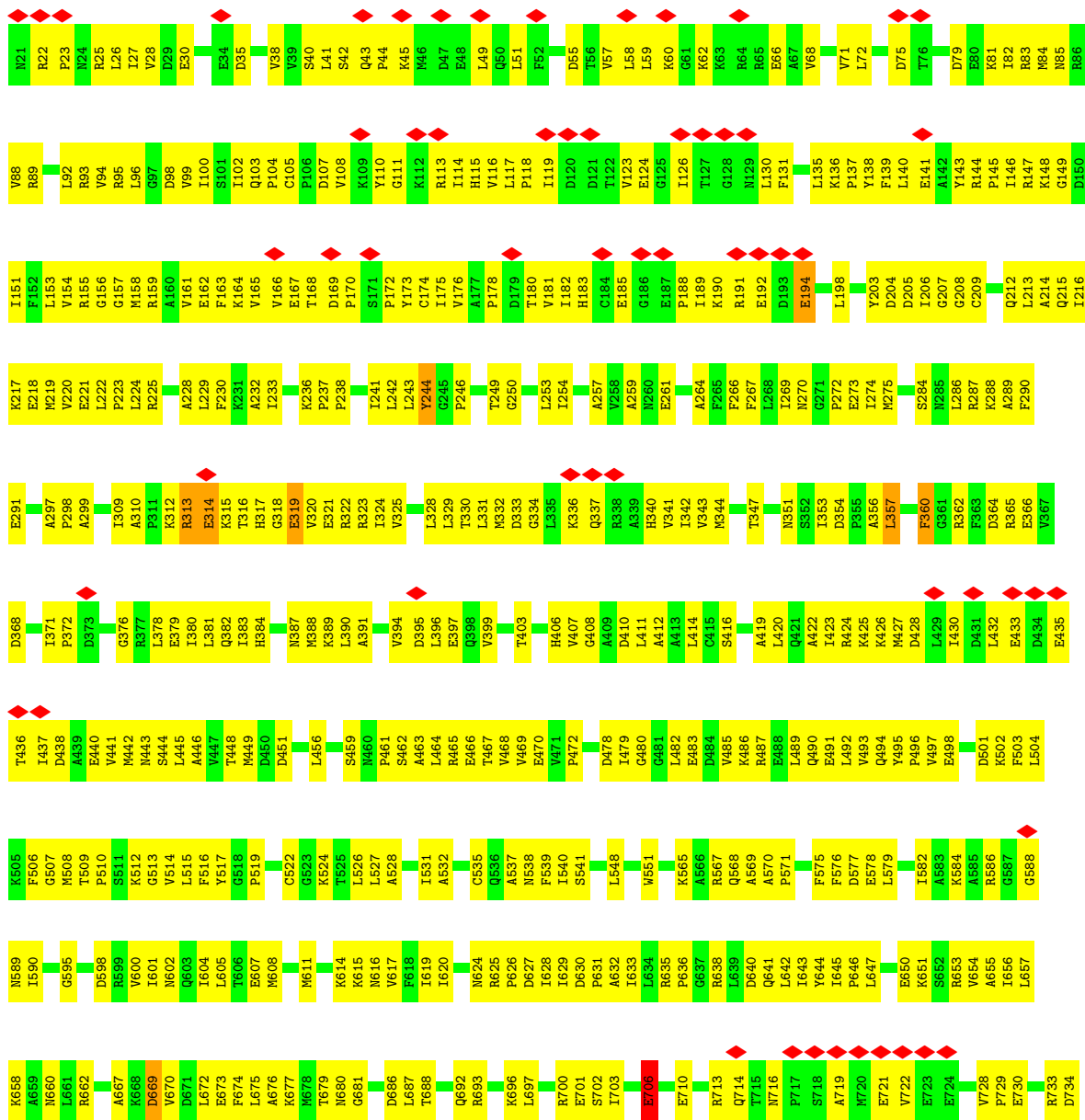


• Molecule 1: Transitional endoplasmic reticulum ATPase



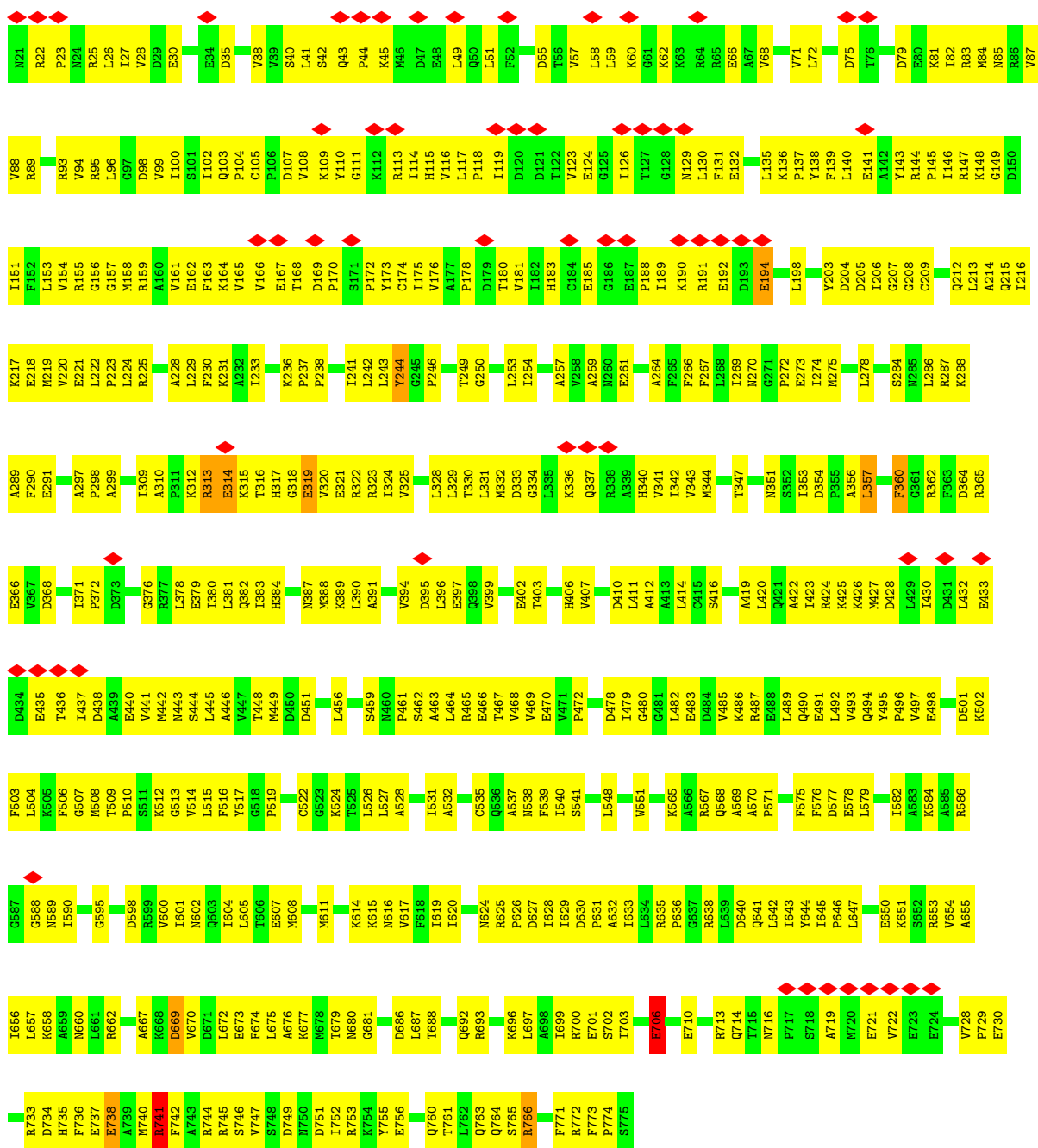


• Molecule 1: Transitional endoplasmic reticulum ATPase



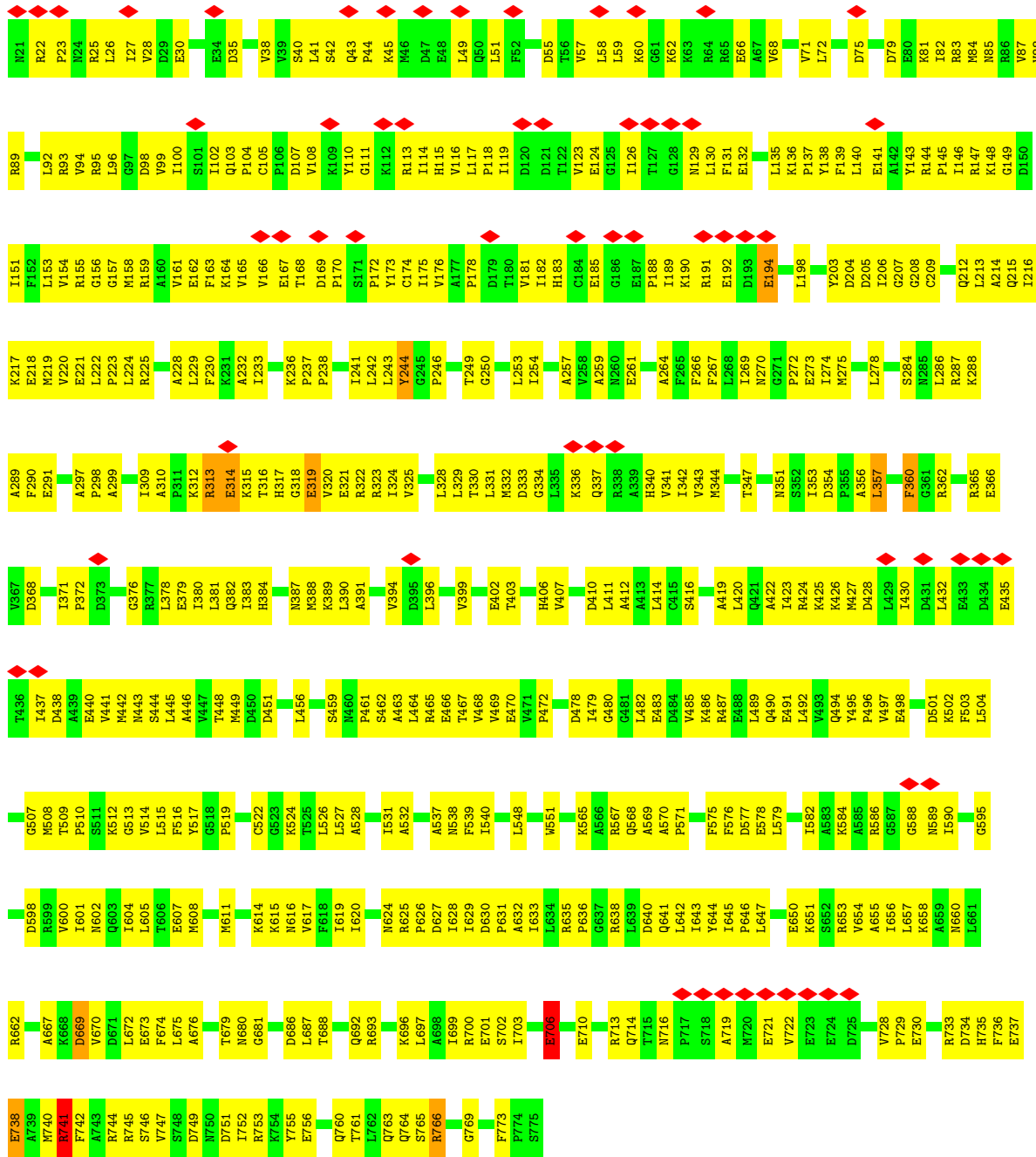


• Molecule 1: Transitional endoplasmic reticulum ATPase

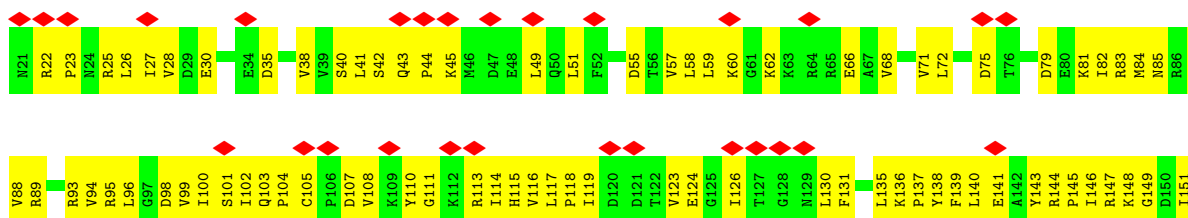


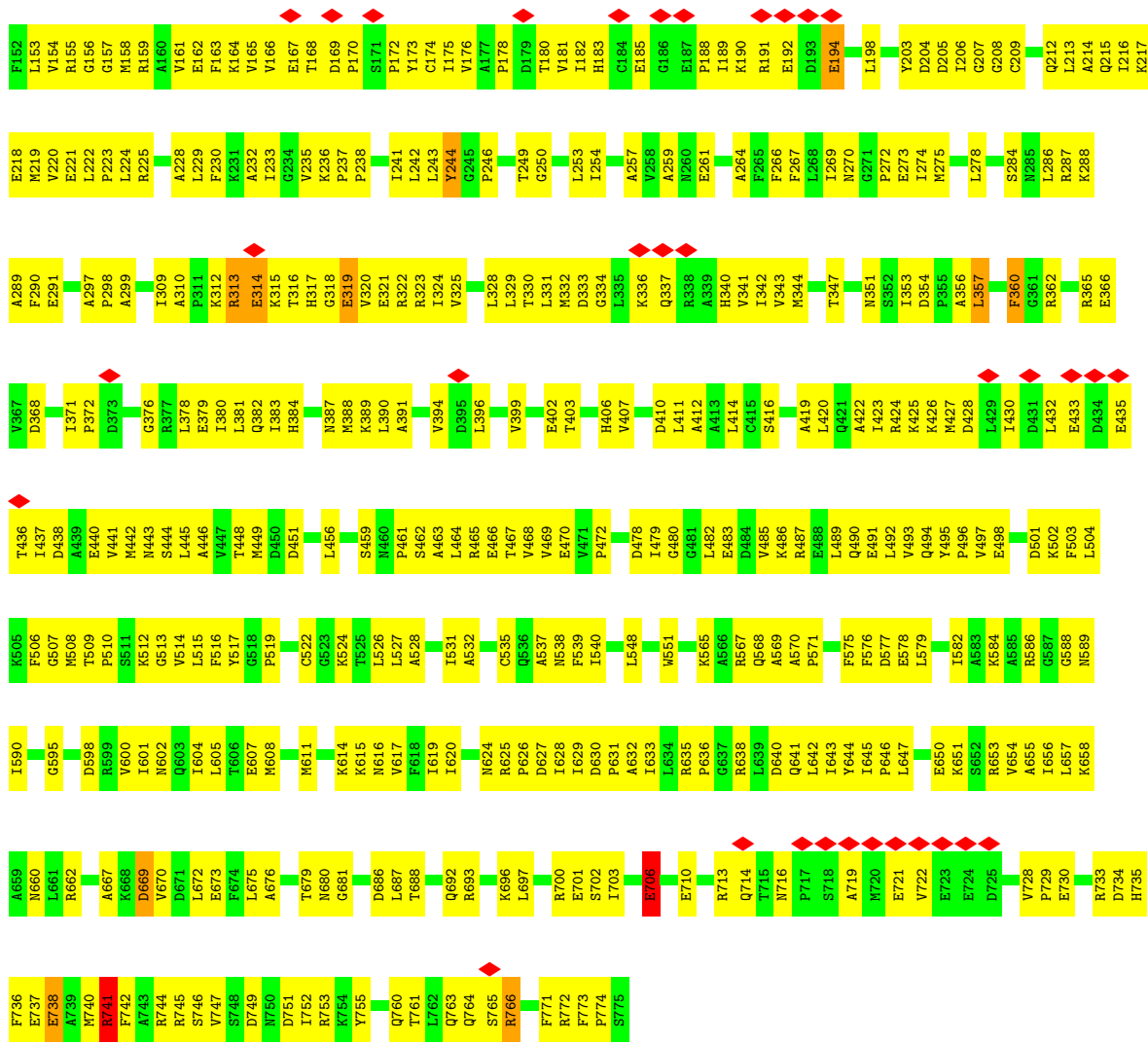
• Molecule 1: Transitional endoplasmic reticulum ATPase



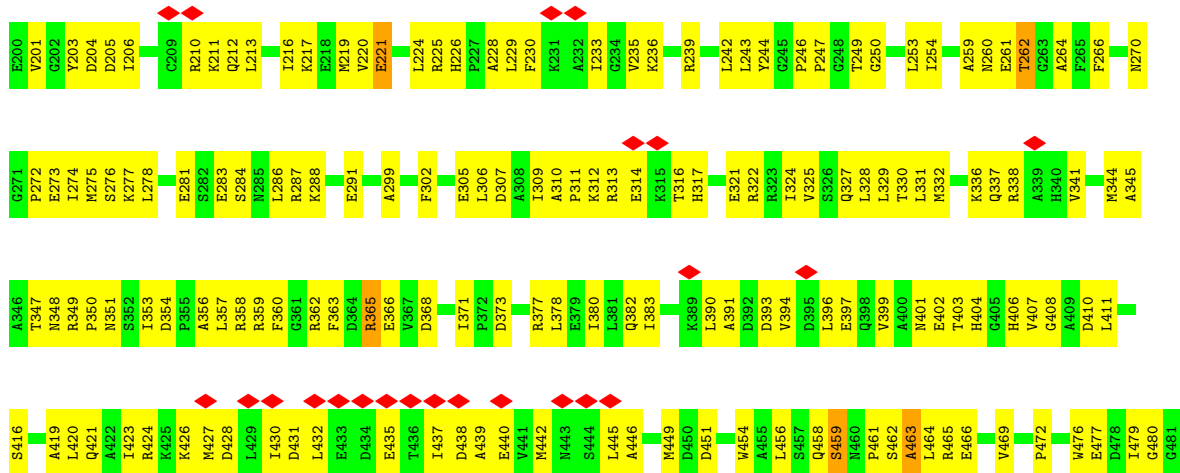
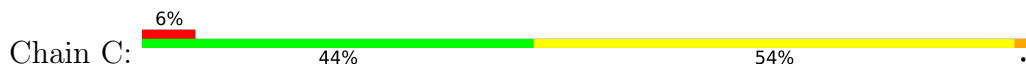


• Molecule 1: Transitional endoplasmic reticulum ATPase

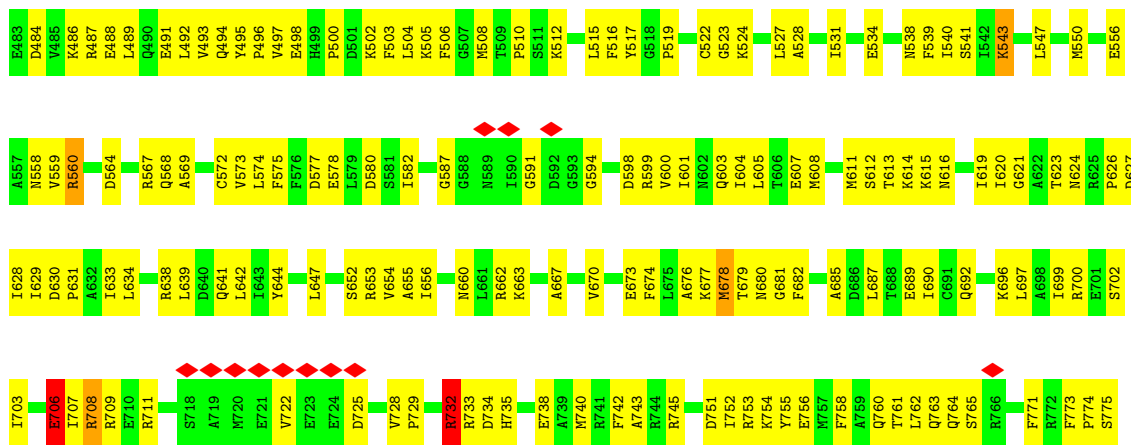




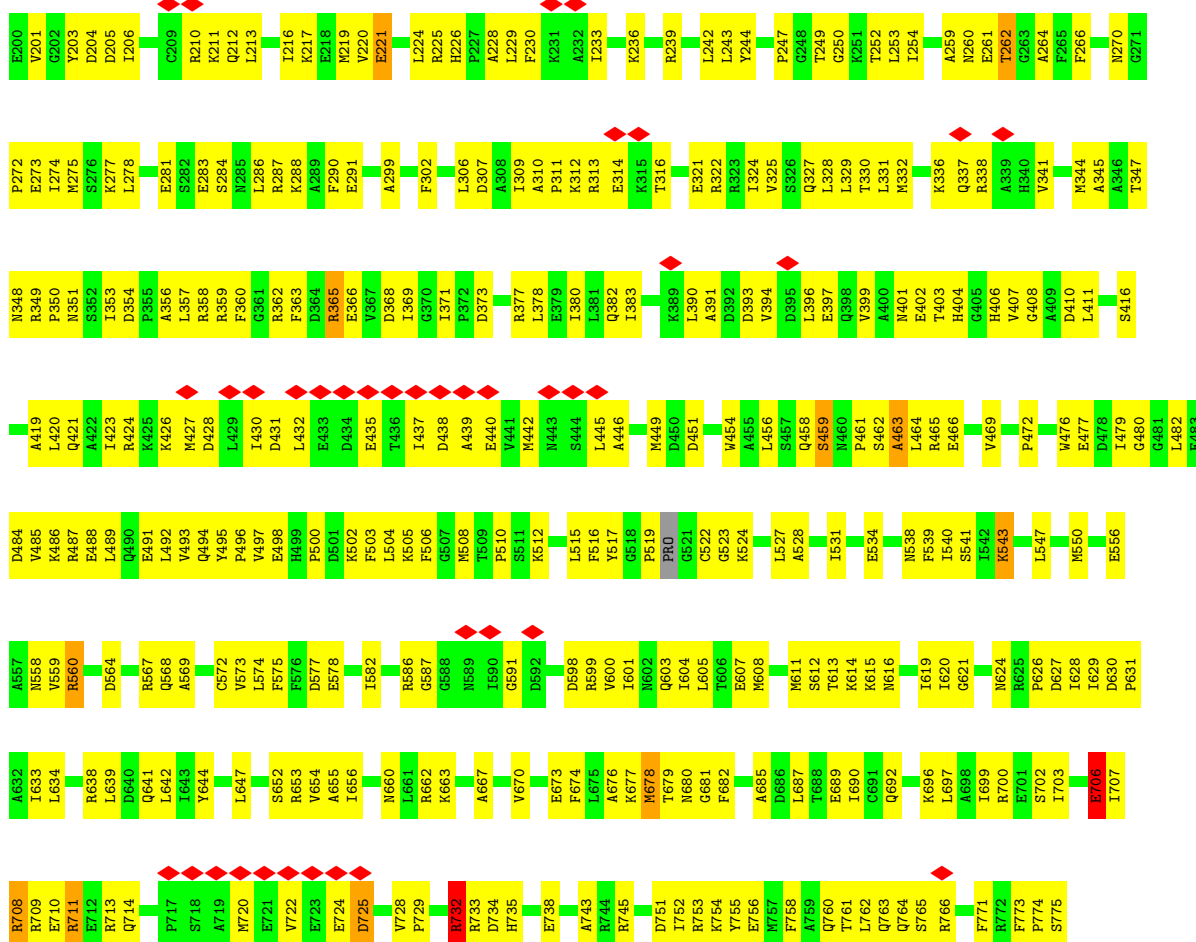
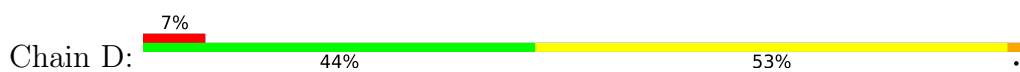
• Molecule 2: Transitional endoplasmic reticulum ATPase







• Molecule 3: Transitional endoplasmic reticulum ATPase



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	157000	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 ( $e^-/\text{\AA}^2$ )	50	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	Not provided	
Image detector	GATAN K2 QUANTUM (4k x 4k)	Depositor
Maximum map value	3.875	Depositor
Minimum map value	-2.388	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.083	Depositor
Recommended contour level	0.331	Depositor
Map size (Å)	531.2, 531.2, 531.2	wwPDB
Map dimensions	640, 640, 640	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.83000004, 0.83000004, 0.83000004	Depositor

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: ADP, Y6Y

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	0.28	0/4570	0.58	4/6167 (0.1%)
1	B	0.28	0/4570	0.58	4/6167 (0.1%)
1	E	0.29	0/4570	0.57	4/6167 (0.1%)
1	F	0.29	0/4570	0.58	5/6167 (0.1%)
1	G	0.27	0/6024	0.57	1/8134 (0.0%)
1	H	0.27	0/6024	0.57	1/8134 (0.0%)
1	I	0.27	0/6024	0.57	1/8134 (0.0%)
1	J	0.27	0/6024	0.57	1/8134 (0.0%)
1	K	0.27	0/6024	0.57	1/8134 (0.0%)
1	L	0.27	0/6024	0.57	1/8134 (0.0%)
2	C	0.28	0/4566	0.57	4/6163 (0.1%)
3	D	0.28	0/4561	0.58	4/6152 (0.1%)
All	All	0.28	0/63551	0.57	31/85787 (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
1	A	0	1
1	B	0	1
1	E	0	1
1	F	0	1
1	G	0	2
1	H	0	2
1	I	0	2
1	J	0	2
1	K	0	2
1	L	0	2
2	C	0	1

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Mol	Chain	#Chirality outliers	#Planarity outliers
3	D	0	1
All	All	0	18

There are no bond length outliers.

The worst 5 of 31 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	F	706	GLU	CA-CB-CG	8.19	131.41	113.40
2	C	706	GLU	CA-CB-CG	8.18	131.39	113.40
1	E	706	GLU	CA-CB-CG	8.17	131.37	113.40
1	A	706	GLU	CA-CB-CG	8.16	131.35	113.40
1	B	706	GLU	CA-CB-CG	8.16	131.35	113.40

There are no chirality outliers.

5 of 18 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	560	ARG	Sidechain
1	B	560	ARG	Sidechain
2	C	560	ARG	Sidechain
3	D	560	ARG	Sidechain
1	E	560	ARG	Sidechain

## 5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	4494	0	4520	416	0
1	B	4494	0	4520	421	0
1	E	4494	0	4520	424	0
1	F	4494	0	4520	428	0
1	G	5925	0	5974	596	0
1	H	5925	0	5974	600	0
1	I	5925	0	5974	612	0
1	J	5925	0	5974	601	0
1	K	5925	0	5974	599	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	L	5925	0	5974	599	0
2	C	4490	0	4516	412	0
3	D	4487	0	4512	425	0
4	A	27	12	11	3	0
4	B	27	12	11	3	0
4	C	27	12	11	3	0
4	D	27	12	11	3	0
4	E	27	12	11	3	0
4	F	27	12	11	3	0
4	G	27	12	11	3	0
4	H	27	12	11	3	0
4	I	27	12	11	3	0
4	J	27	12	11	3	0
4	K	27	12	11	3	0
4	L	27	12	11	3	0
5	A	36	28	0	7	0
5	B	36	28	0	7	0
5	C	36	28	0	7	0
5	D	36	28	0	6	0
5	E	36	28	0	6	0
5	F	36	28	0	7	0
5	G	36	28	0	7	0
5	H	36	28	0	7	0
5	I	36	28	0	7	0
5	J	36	28	0	7	0
5	K	36	28	0	7	0
5	L	36	28	0	7	0
All	All	63259	480	63084	5619	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 44.

The worst 5 of 5619 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:461:PRO:HA	1:H:462:SER:HB3	1.21	1.17
1:I:219:MET:HE2	1:I:365:ARG:HD3	1.24	1.16
1:G:461:PRO:HA	1:G:462:SER:HB3	1.21	1.14
1:I:233:ILE:HD11	1:J:158:MET:HB2	1.28	1.13
1:I:461:PRO:HA	1:I:462:SER:HB3	1.21	1.12

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	574/755 (76%)	543 (95%)	29 (5%)	2 (0%)	41	76
1	B	574/755 (76%)	544 (95%)	28 (5%)	2 (0%)	41	76
1	E	574/755 (76%)	544 (95%)	28 (5%)	2 (0%)	41	76
1	F	574/755 (76%)	542 (94%)	30 (5%)	2 (0%)	41	76
1	G	753/755 (100%)	707 (94%)	43 (6%)	3 (0%)	34	72
1	H	753/755 (100%)	707 (94%)	43 (6%)	3 (0%)	34	72
1	I	753/755 (100%)	707 (94%)	43 (6%)	3 (0%)	34	72
1	J	753/755 (100%)	707 (94%)	43 (6%)	3 (0%)	34	72
1	K	753/755 (100%)	707 (94%)	43 (6%)	3 (0%)	34	72
1	L	753/755 (100%)	707 (94%)	43 (6%)	3 (0%)	34	72
2	C	574/576 (100%)	543 (95%)	29 (5%)	2 (0%)	41	76
3	D	571/576 (99%)	540 (95%)	29 (5%)	2 (0%)	34	72
All	All	7959/8702 (92%)	7498 (94%)	431 (5%)	30 (0%)	38	72

5 of 30 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	463	ALA
1	B	463	ALA
2	C	463	ALA
3	D	463	ALA
1	E	463	ALA

### 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	480/644 (74%)	470 (98%)	10 (2%)	53	82
1	B	480/644 (74%)	471 (98%)	9 (2%)	57	84
1	E	480/644 (74%)	470 (98%)	10 (2%)	53	82
1	F	480/644 (74%)	470 (98%)	10 (2%)	53	82
1	G	644/644 (100%)	633 (98%)	11 (2%)	60	85
1	H	644/644 (100%)	633 (98%)	11 (2%)	60	85
1	I	644/644 (100%)	633 (98%)	11 (2%)	60	85
1	J	644/644 (100%)	633 (98%)	11 (2%)	60	85
1	K	644/644 (100%)	633 (98%)	11 (2%)	60	85
1	L	644/644 (100%)	633 (98%)	11 (2%)	60	85
2	C	480/480 (100%)	470 (98%)	10 (2%)	53	82
3	D	479/480 (100%)	469 (98%)	10 (2%)	53	82
All	All	6743/7400 (91%)	6618 (98%)	125 (2%)	59	84

5 of 125 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	F	709	ARG
1	K	738	GLU
1	H	244	TYR
1	K	706	GLU
1	L	509	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 19 such sidechains are listed below:

Mol	Chain	Res	Type
1	K	443	ASN
1	L	443	ASN
1	L	602	ASN
1	L	317	HIS

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Mol	Chain	Res	Type
1	I	443	ASN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

24 ligands are modelled in this entry.

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
5	Y6Y	A	802	-	37,40,40	6.17	27 (72%)	41,57,57	2.05	6 (14%)
5	Y6Y	L	802	-	37,40,40	5.94	25 (67%)	41,57,57	2.49	7 (17%)
4	ADP	J	801	-	24,29,29	4.33	10 (41%)	29,45,45	1.42	3 (10%)
4	ADP	E	801	-	24,29,29	4.36	10 (41%)	29,45,45	1.46	3 (10%)
5	Y6Y	J	802	-	37,40,40	5.94	25 (67%)	41,57,57	2.49	7 (17%)
4	ADP	B	801	-	24,29,29	4.35	10 (41%)	29,45,45	1.46	3 (10%)
5	Y6Y	D	802	-	37,40,40	6.17	27 (72%)	41,57,57	2.05	6 (14%)
4	ADP	D	801	-	24,29,29	4.36	10 (41%)	29,45,45	1.46	3 (10%)
5	Y6Y	C	802	-	37,40,40	6.17	27 (72%)	41,57,57	2.05	6 (14%)
4	ADP	G	801	-	24,29,29	4.33	10 (41%)	29,45,45	1.42	3 (10%)



Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
5	Y6Y	K	802	-	37,40,40	5.94	25 (67%)	41,57,57	2.49	7 (17%)
4	ADP	F	801	-	24,29,29	4.36	10 (41%)	29,45,45	1.46	3 (10%)
4	ADP	L	801	-	24,29,29	4.34	10 (41%)	29,45,45	1.42	3 (10%)
4	ADP	A	801	-	24,29,29	4.37	10 (41%)	29,45,45	1.46	3 (10%)
5	Y6Y	F	802	-	37,40,40	6.17	27 (72%)	41,57,57	2.05	6 (14%)
4	ADP	K	801	-	24,29,29	4.33	10 (41%)	29,45,45	1.43	3 (10%)
5	Y6Y	B	802	-	37,40,40	6.17	27 (72%)	41,57,57	2.05	6 (14%)
5	Y6Y	E	802	-	37,40,40	6.17	27 (72%)	41,57,57	2.05	6 (14%)
4	ADP	I	801	-	24,29,29	4.33	10 (41%)	29,45,45	1.42	3 (10%)
5	Y6Y	I	802	-	37,40,40	5.94	25 (67%)	41,57,57	2.49	7 (17%)
5	Y6Y	G	802	-	37,40,40	5.94	25 (67%)	41,57,57	2.49	7 (17%)
4	ADP	H	801	-	24,29,29	4.33	10 (41%)	29,45,45	1.42	3 (10%)
4	ADP	C	801	-	24,29,29	4.35	10 (41%)	29,45,45	1.46	3 (10%)
5	Y6Y	H	802	-	37,40,40	5.94	25 (67%)	41,57,57	2.49	7 (17%)

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. '2' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	Y6Y	A	802	-	-	13/19/30/30	0/5/5/5
5	Y6Y	L	802	-	-	11/19/30/30	0/5/5/5
4	ADP	J	801	-	-	3/12/32/32	0/3/3/3
4	ADP	E	801	-	-	5/12/32/32	0/3/3/3
5	Y6Y	J	802	-	-	11/19/30/30	0/5/5/5
4	ADP	B	801	-	-	5/12/32/32	0/3/3/3
5	Y6Y	D	802	-	-	13/19/30/30	0/5/5/5
4	ADP	D	801	-	-	5/12/32/32	0/3/3/3
5	Y6Y	C	802	-	-	13/19/30/30	0/5/5/5
4	ADP	G	801	-	-	3/12/32/32	0/3/3/3
5	Y6Y	K	802	-	-	11/19/30/30	0/5/5/5
4	ADP	F	801	-	-	5/12/32/32	0/3/3/3
4	ADP	L	801	-	-	3/12/32/32	0/3/3/3
4	ADP	A	801	-	-	5/12/32/32	0/3/3/3
5	Y6Y	F	802	-	-	13/19/30/30	0/5/5/5

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	ADP	K	801	-	-	3/12/32/32	0/3/3/3
5	Y6Y	B	802	-	-	13/19/30/30	0/5/5/5
5	Y6Y	E	802	-	-	13/19/30/30	0/5/5/5
4	ADP	I	801	-	-	3/12/32/32	0/3/3/3
5	Y6Y	I	802	-	-	11/19/30/30	0/5/5/5
5	Y6Y	G	802	-	-	11/19/30/30	0/5/5/5
4	ADP	H	801	-	-	3/12/32/32	0/3/3/3
4	ADP	C	801	-	-	5/12/32/32	0/3/3/3
5	Y6Y	H	802	-	-	11/19/30/30	0/5/5/5

The worst 5 of 432 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	K	802	Y6Y	C11-C10	11.50	1.56	1.38
5	G	802	Y6Y	C11-C10	11.47	1.56	1.38
5	H	802	Y6Y	C11-C10	11.46	1.56	1.38
5	J	802	Y6Y	C11-C10	11.46	1.56	1.38
5	L	802	Y6Y	C11-C10	11.45	1.56	1.38

The worst 5 of 114 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	J	802	Y6Y	O1-S-O	-11.24	98.57	117.92
5	I	802	Y6Y	O1-S-O	-11.23	98.58	117.92
5	G	802	Y6Y	O1-S-O	-11.23	98.58	117.92
5	H	802	Y6Y	O1-S-O	-11.22	98.60	117.92
5	K	802	Y6Y	O1-S-O	-11.22	98.60	117.92

There are no chirality outliers.

5 of 192 torsion outliers are listed below:

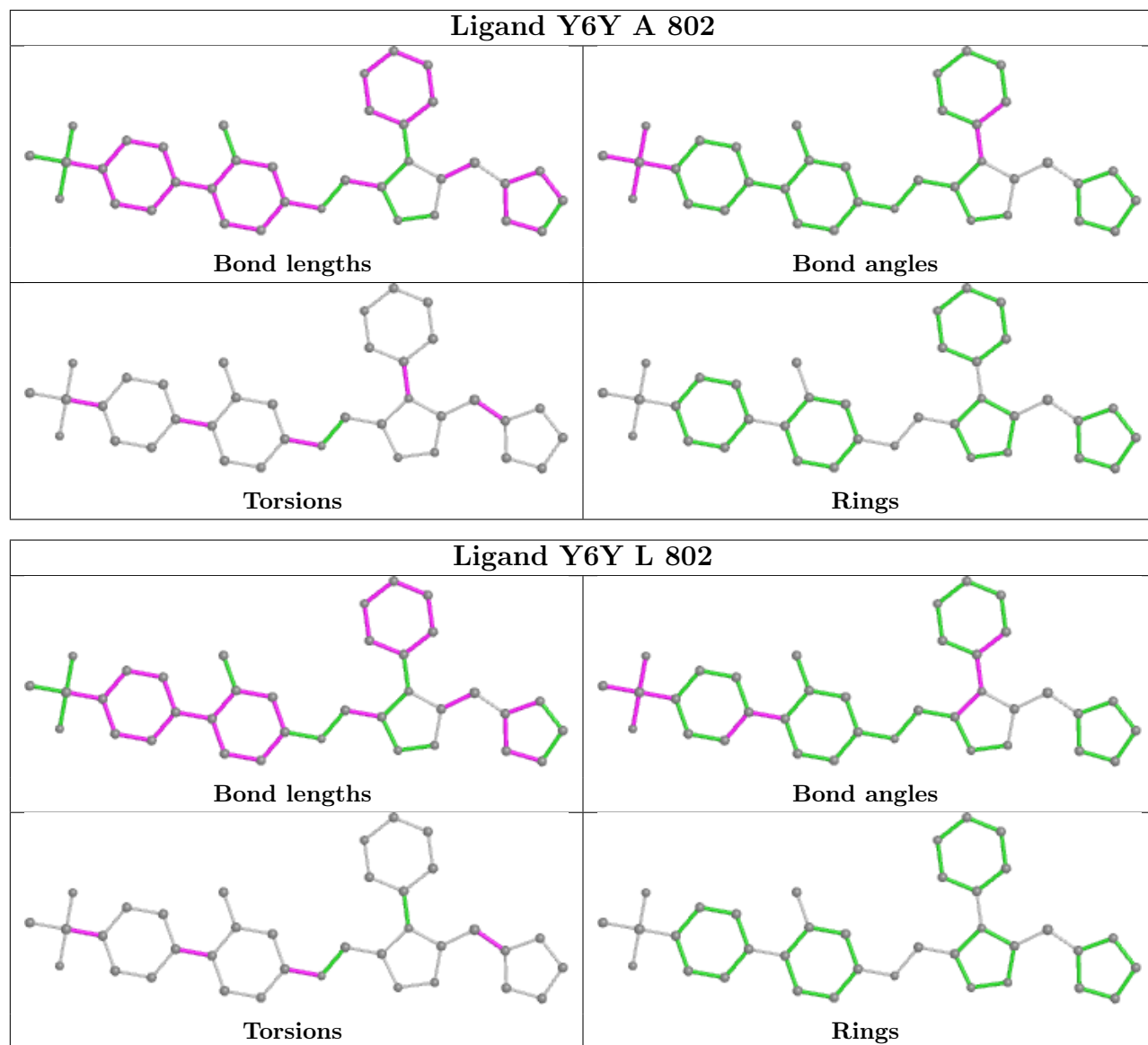
Mol	Chain	Res	Type	Atoms
4	A	801	ADP	C5'-O5'-PA-O1A
4	A	801	ADP	O4'-C4'-C5'-O5'
4	B	801	ADP	C5'-O5'-PA-O1A
4	B	801	ADP	O4'-C4'-C5'-O5'
4	C	801	ADP	C5'-O5'-PA-O1A

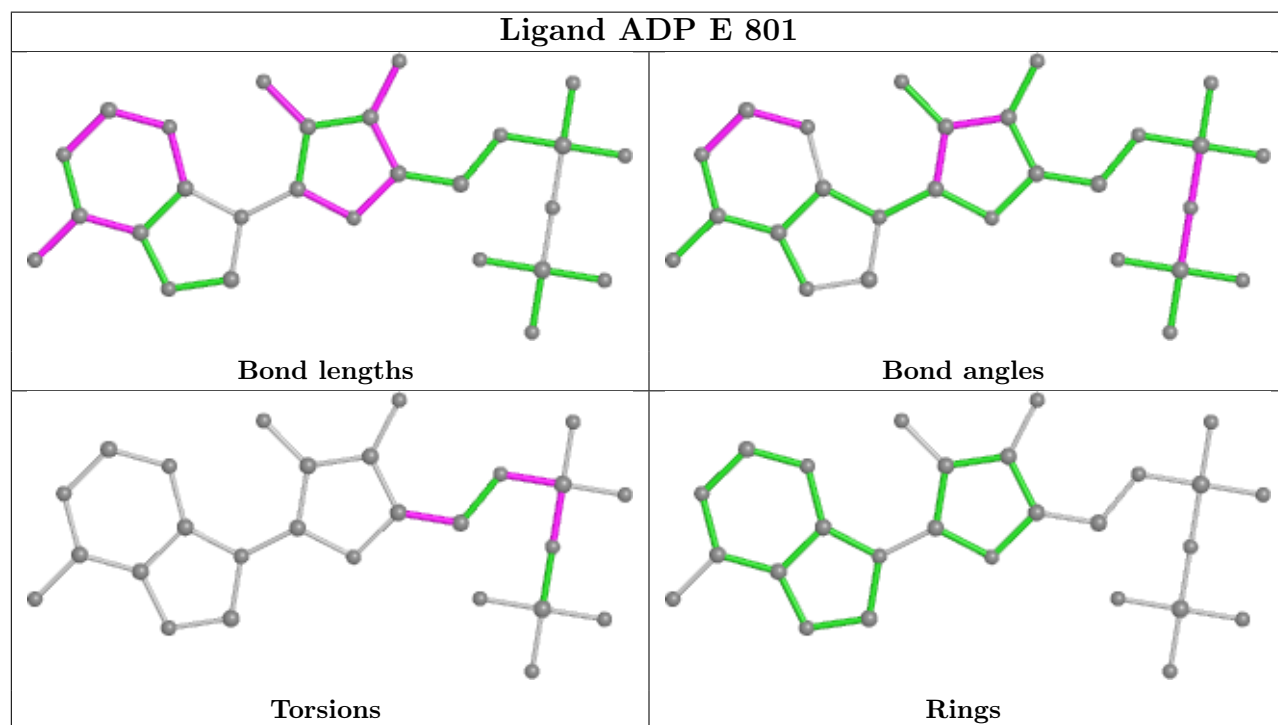
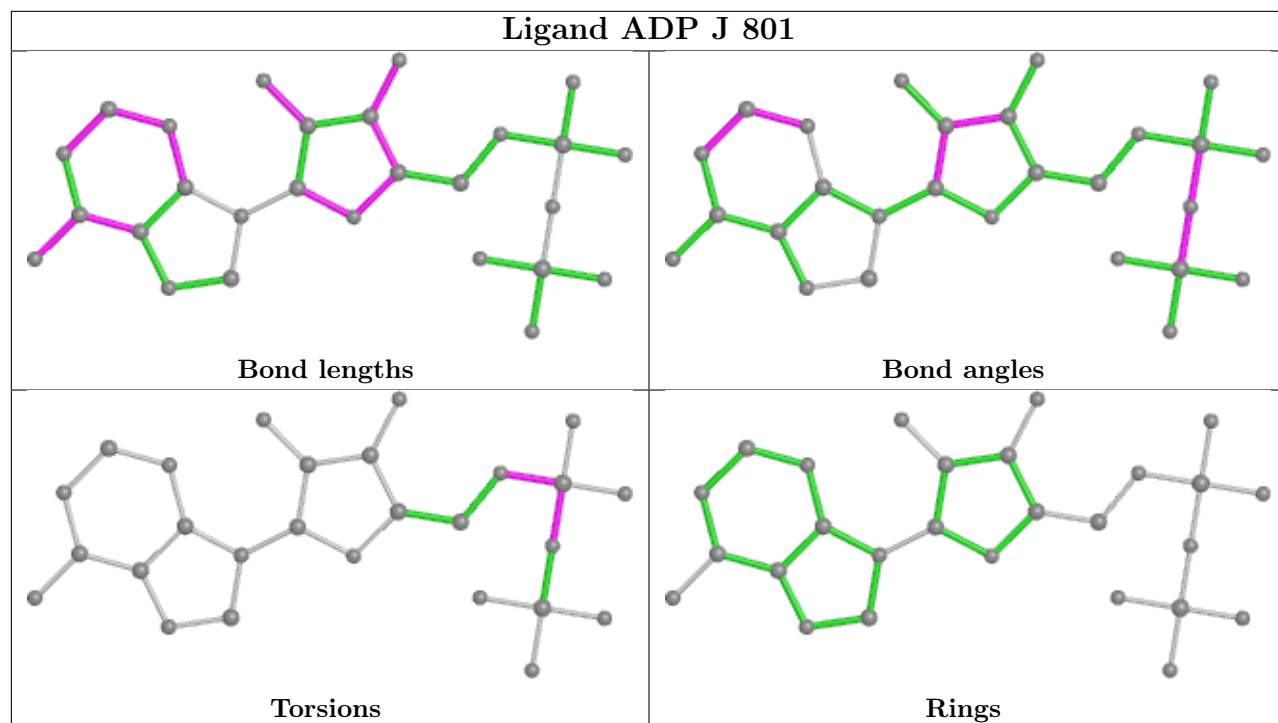
There are no ring outliers.

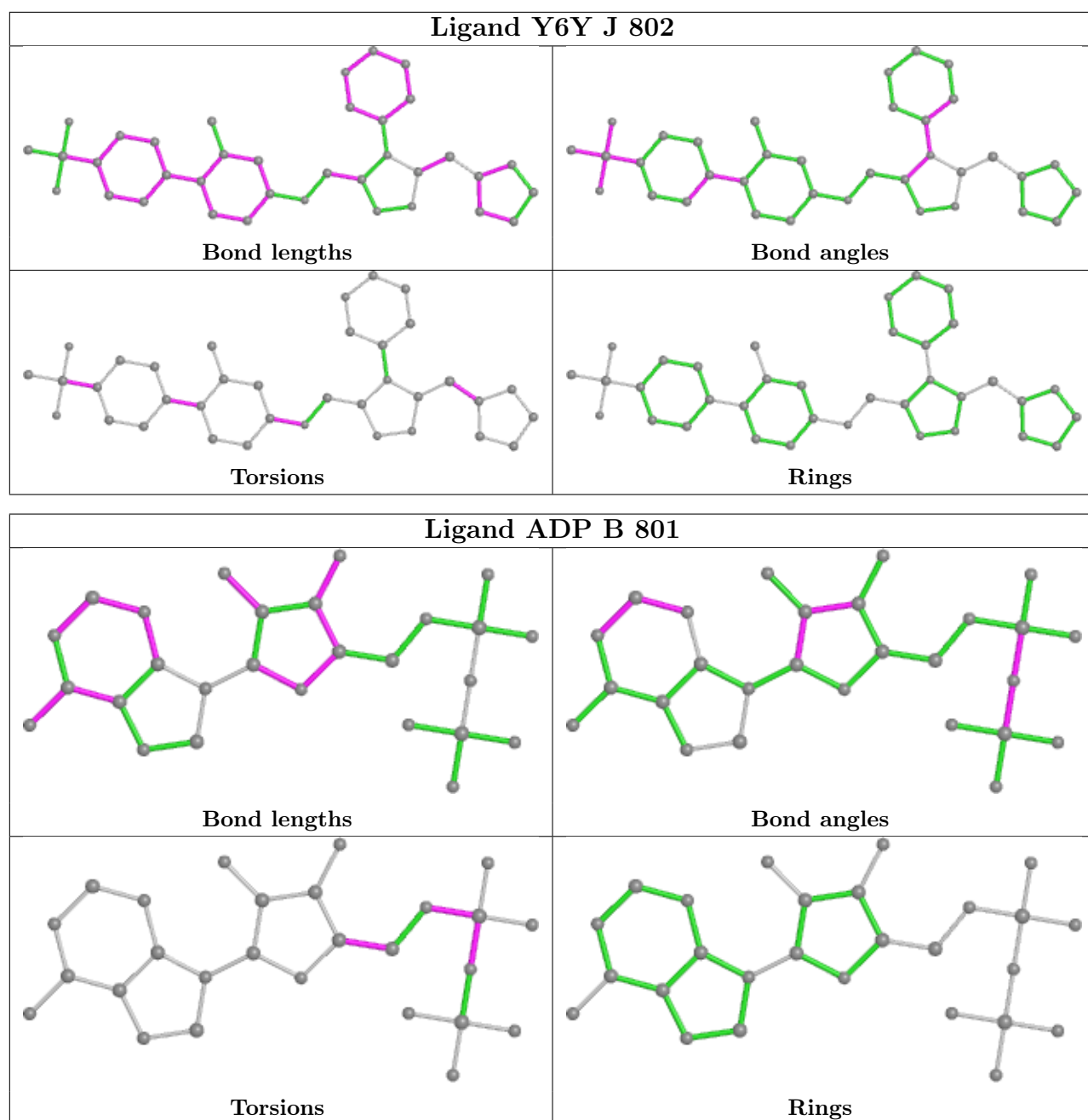
24 monomers are involved in 118 short contacts:

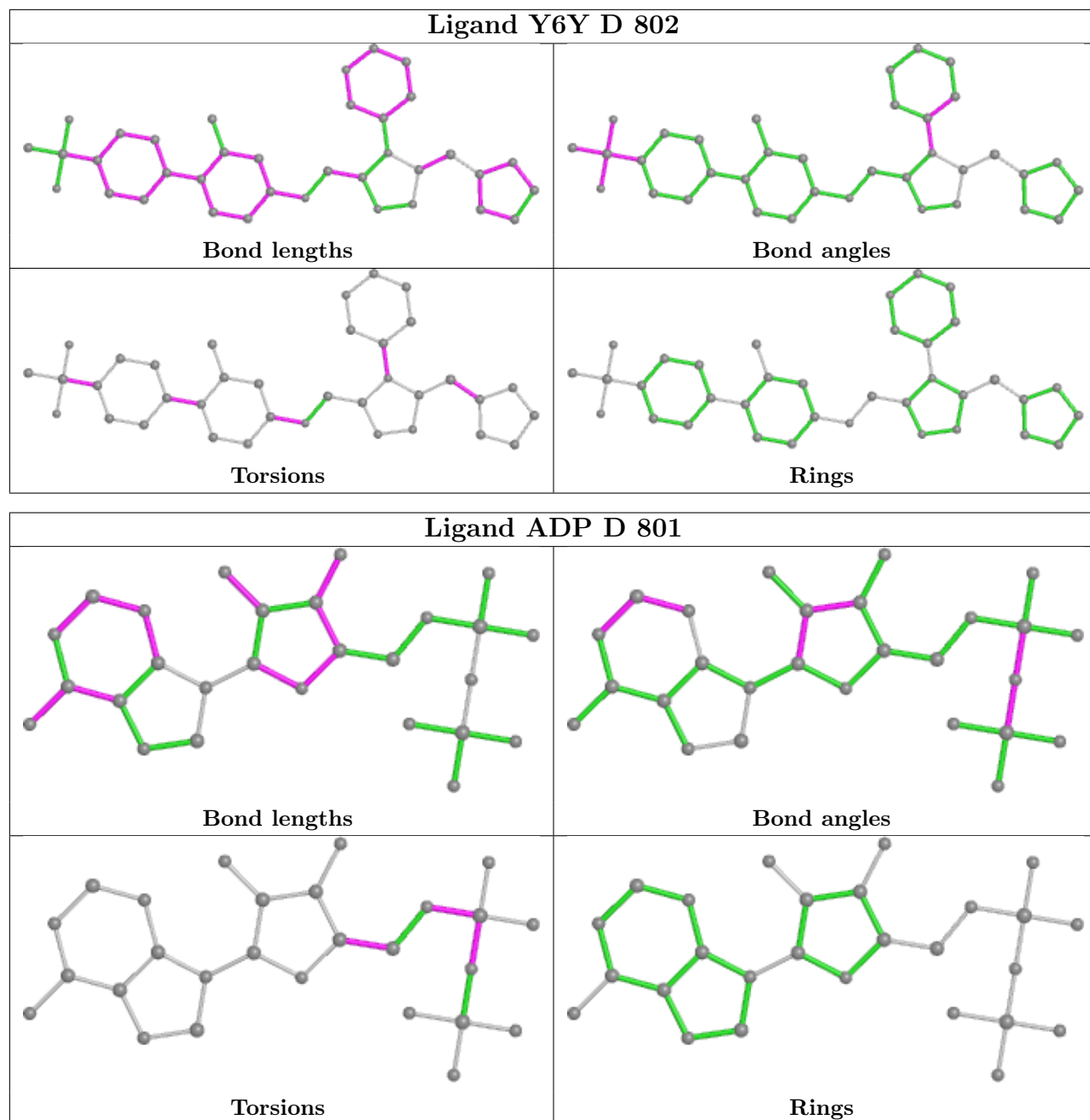
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	802	Y6Y	7	0
5	L	802	Y6Y	7	0
4	J	801	ADP	3	0
4	E	801	ADP	3	0
5	J	802	Y6Y	7	0
4	B	801	ADP	3	0
5	D	802	Y6Y	6	0
4	D	801	ADP	3	0
5	C	802	Y6Y	7	0
4	G	801	ADP	3	0
5	K	802	Y6Y	7	0
4	F	801	ADP	3	0
4	L	801	ADP	3	0
4	A	801	ADP	3	0
5	F	802	Y6Y	7	0
4	K	801	ADP	3	0
5	B	802	Y6Y	7	0
5	E	802	Y6Y	6	0
4	I	801	ADP	3	0
5	I	802	Y6Y	7	0
5	G	802	Y6Y	7	0
4	H	801	ADP	3	0
4	C	801	ADP	3	0
5	H	802	Y6Y	7	0

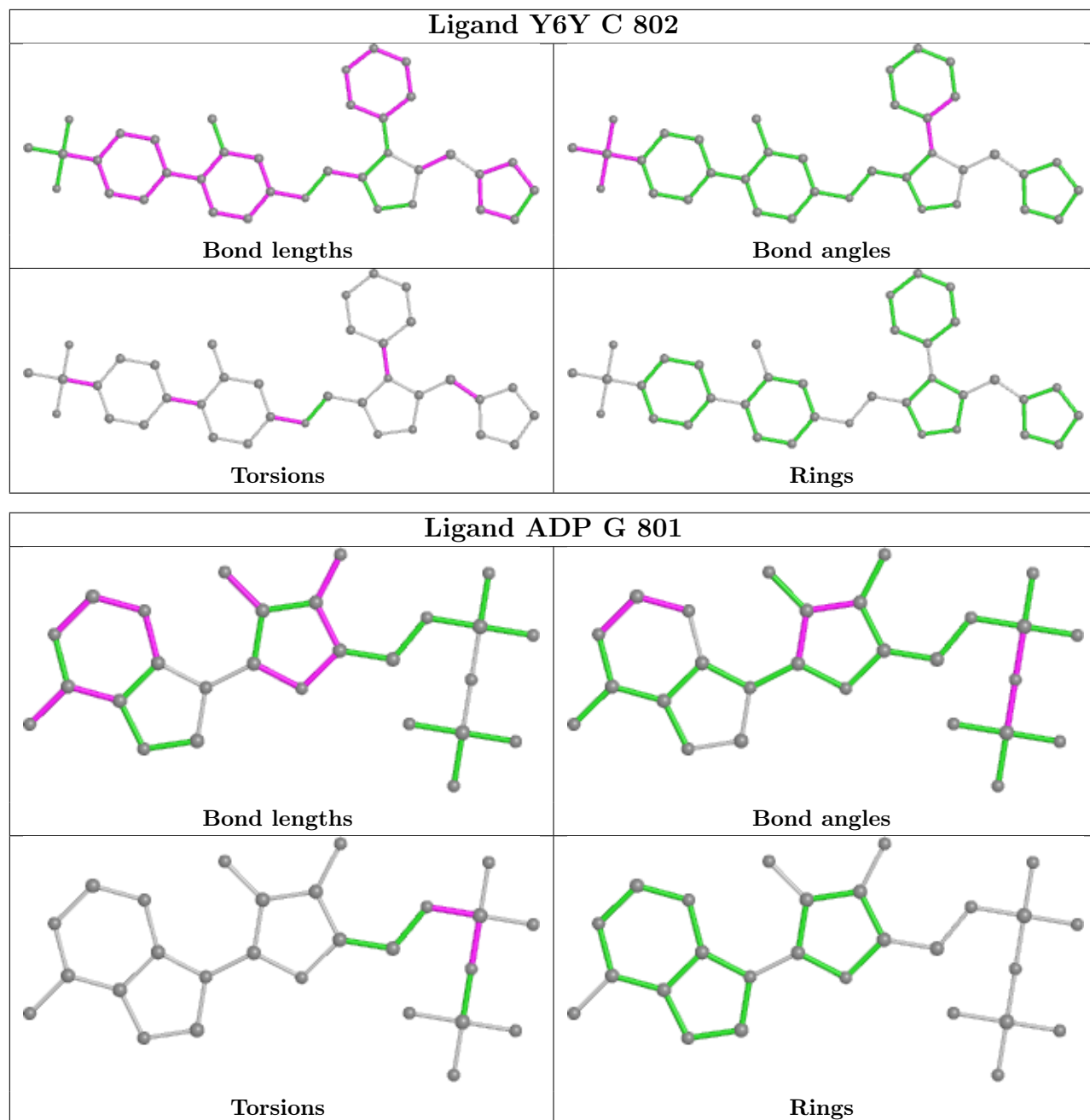
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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



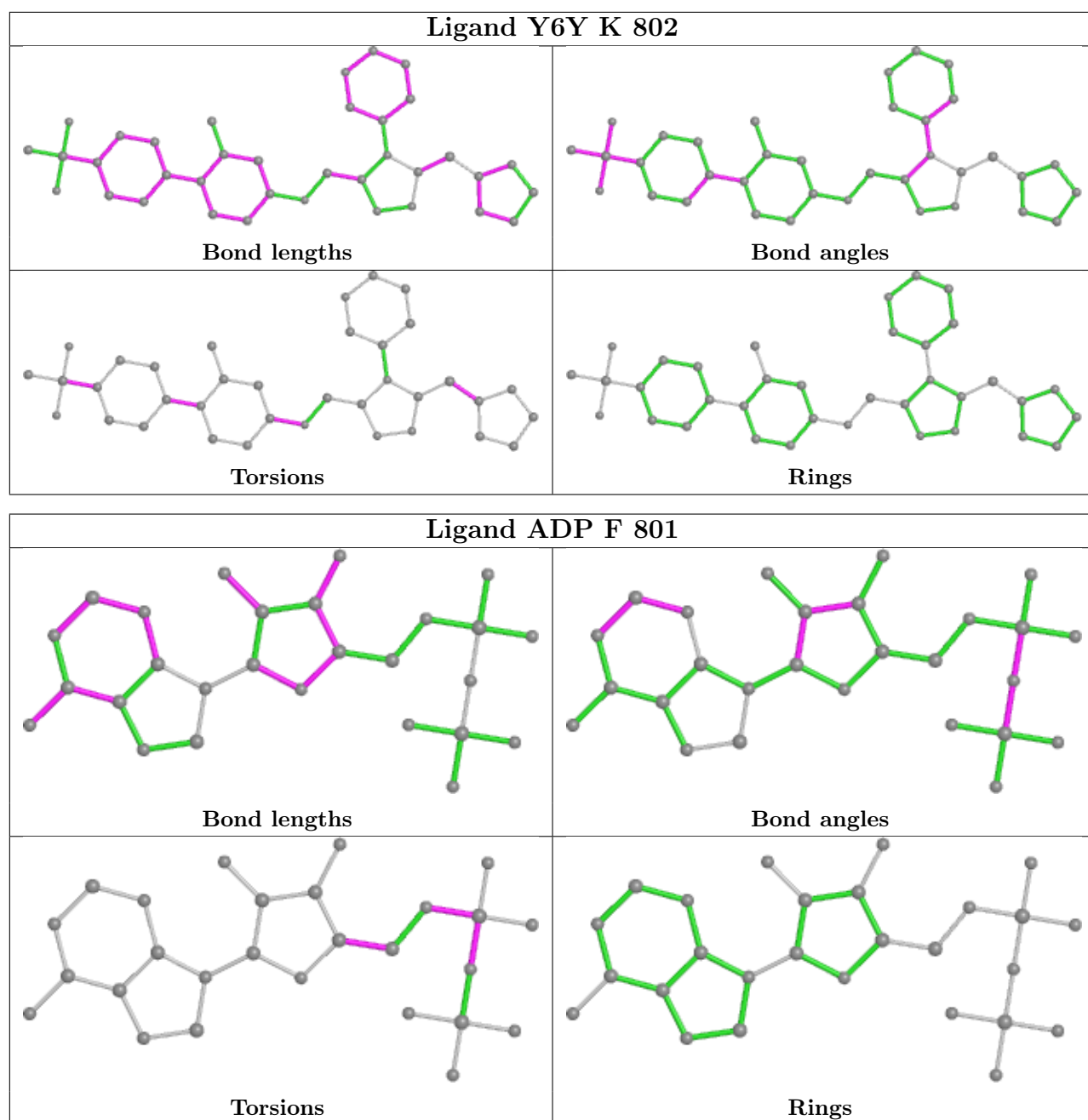


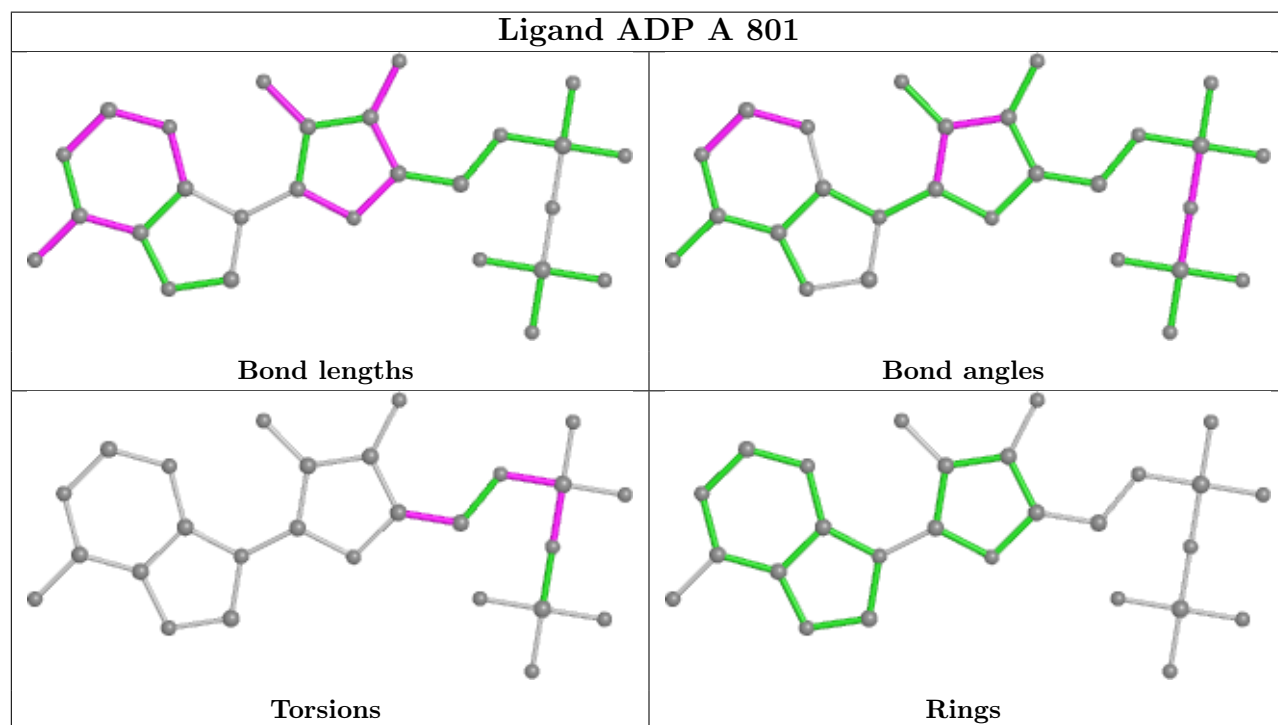
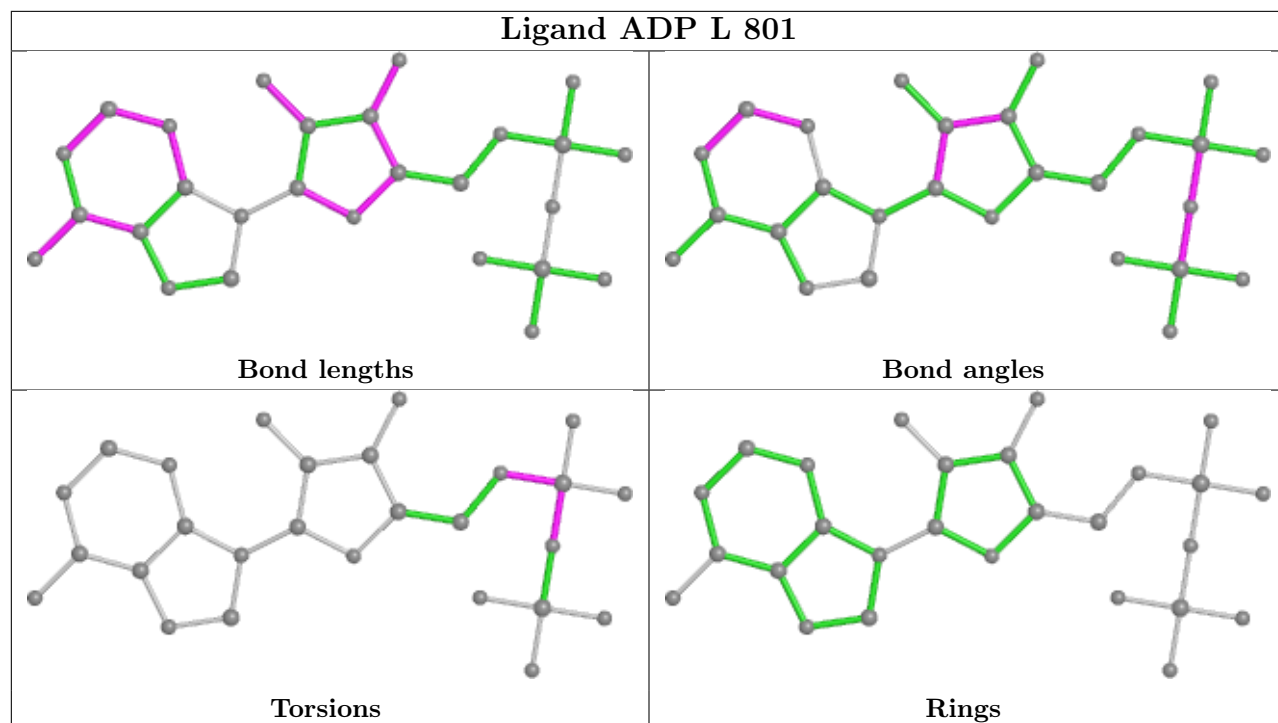


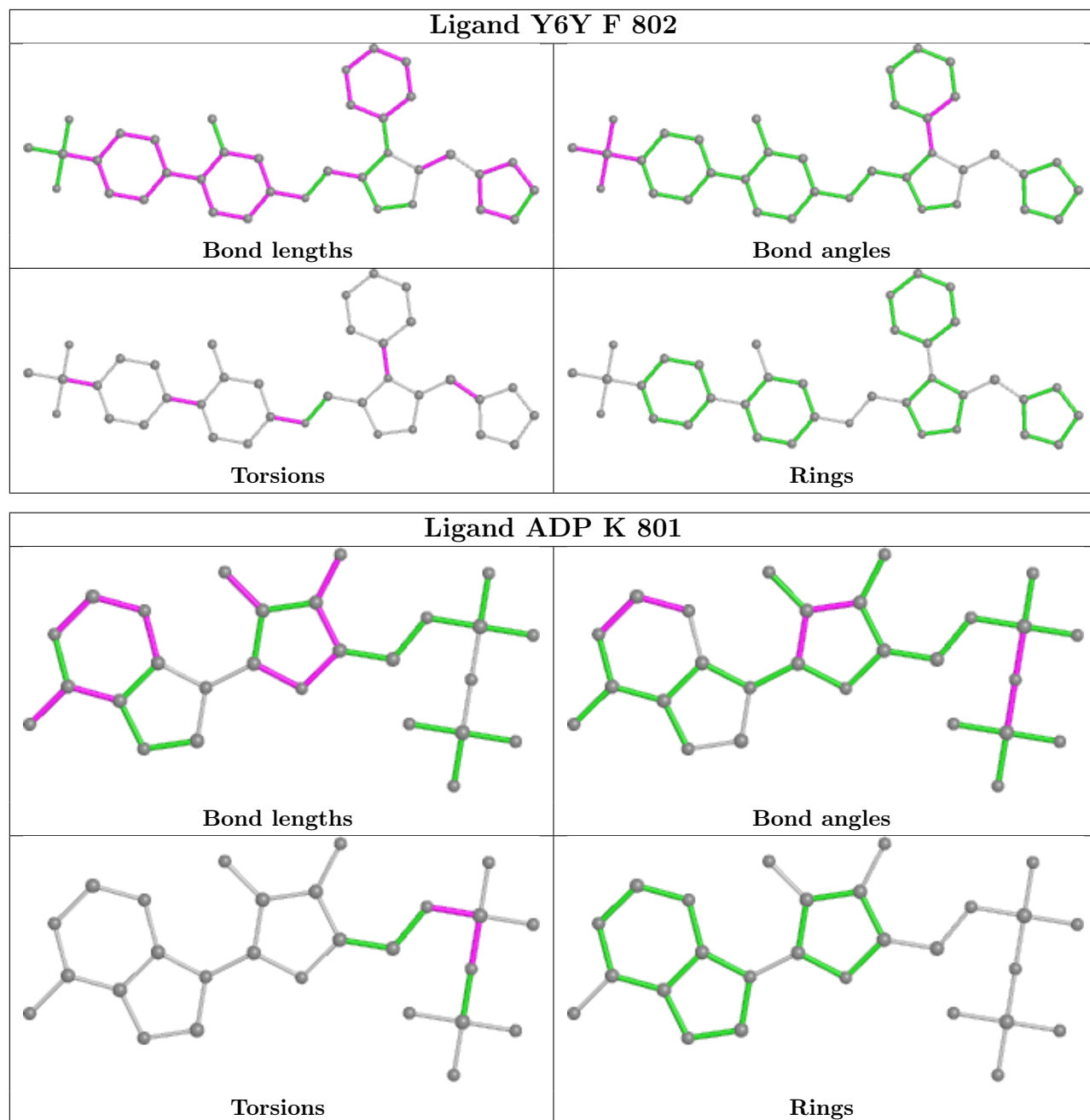


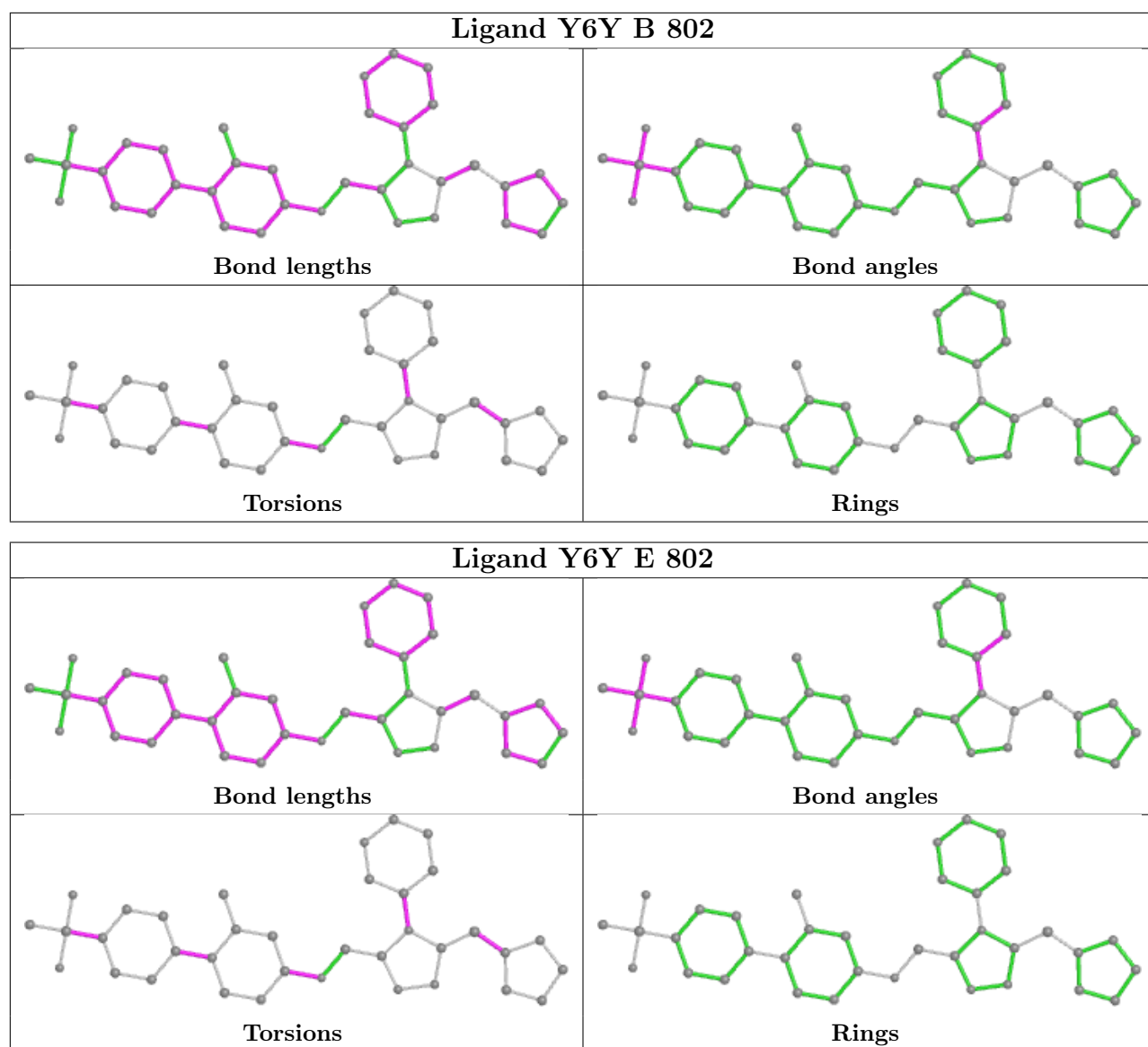


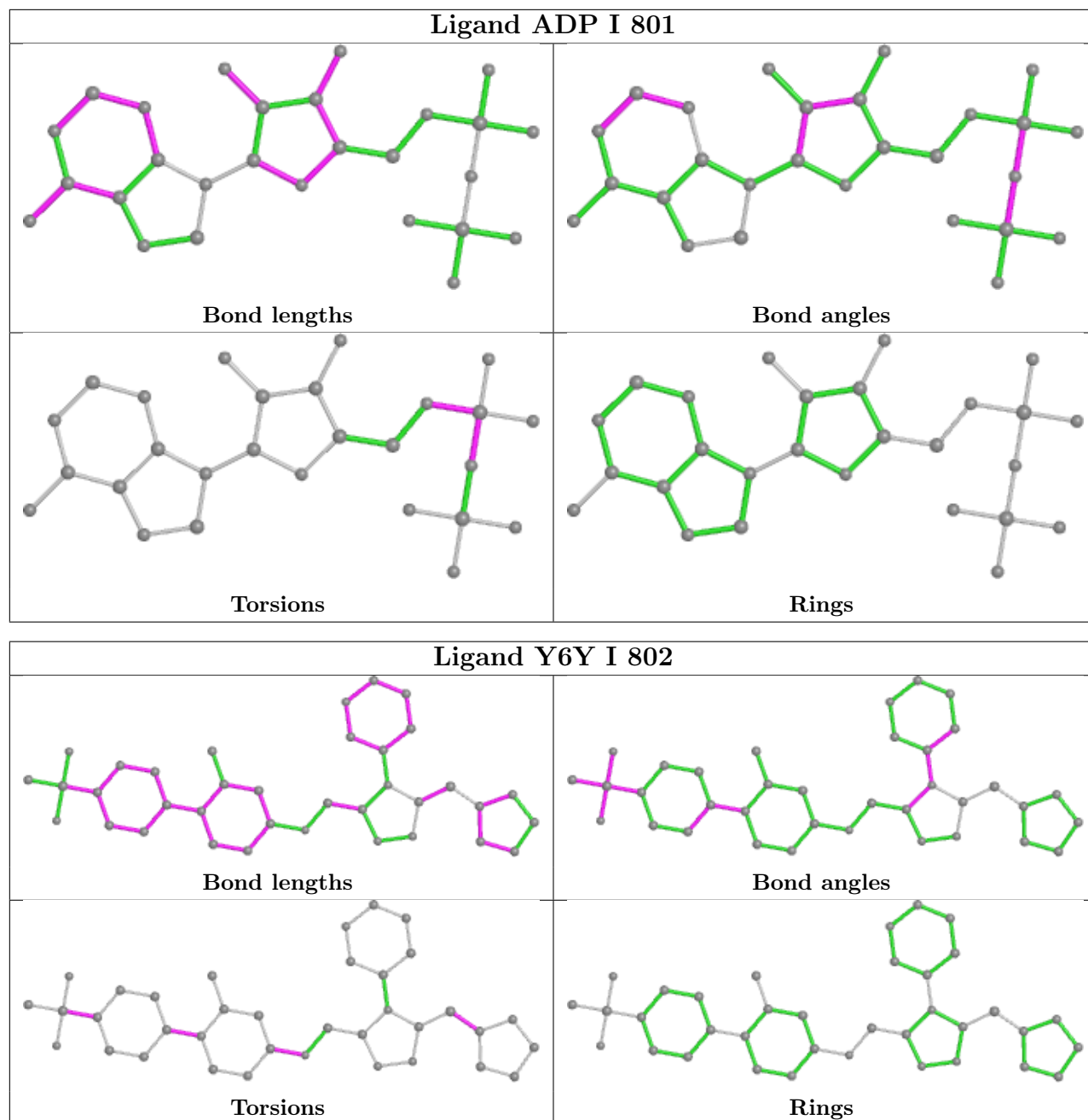


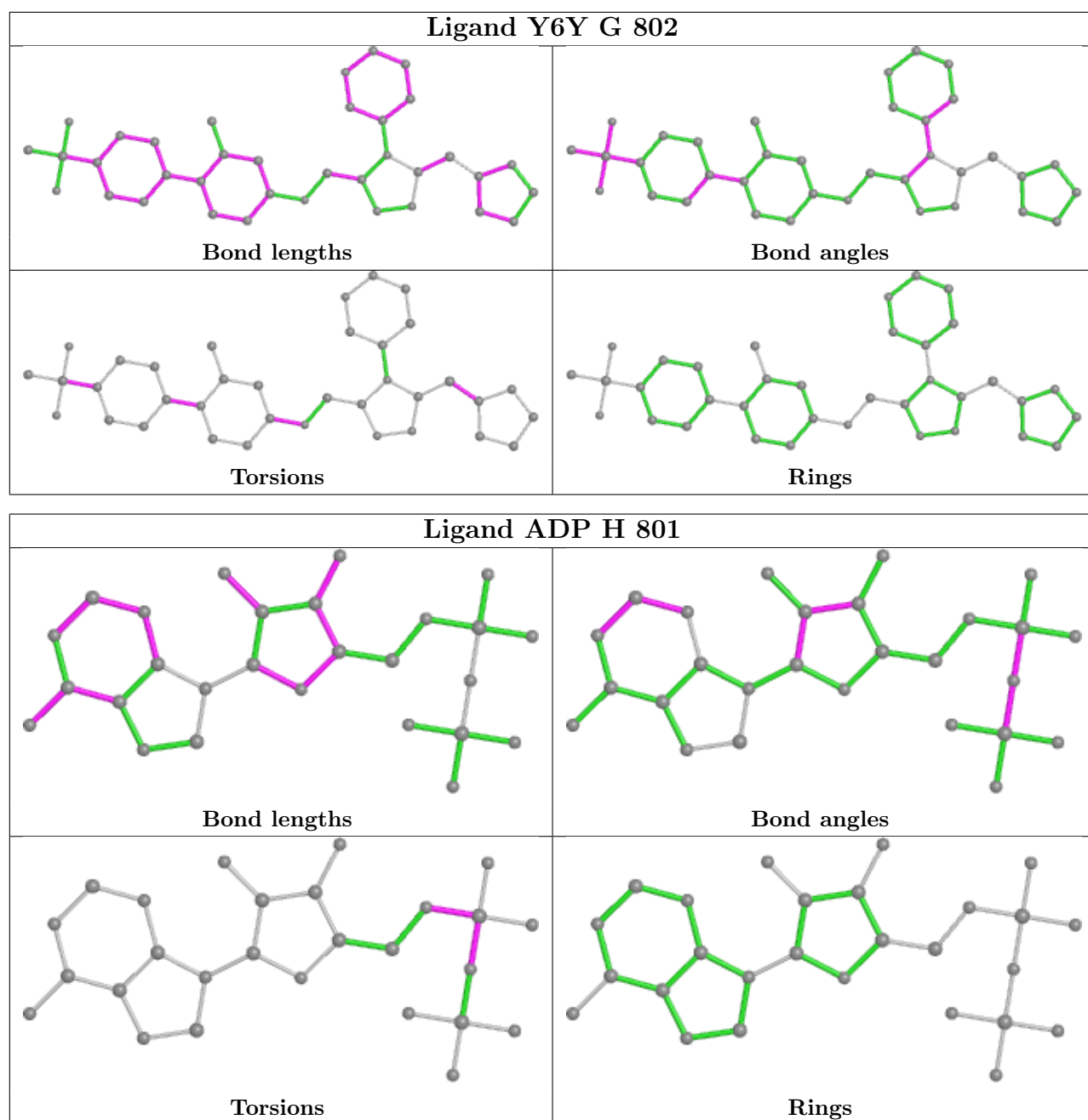


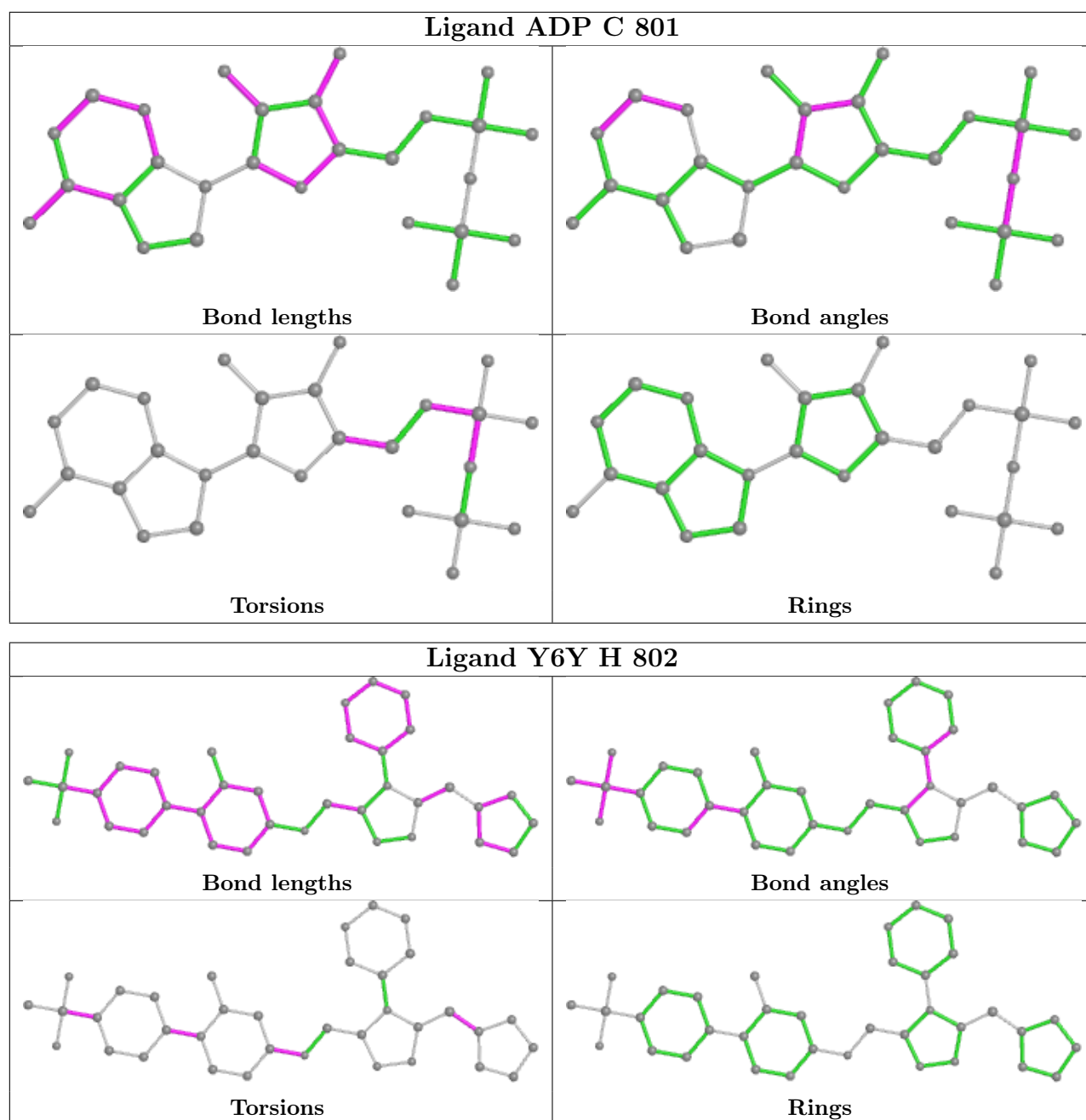












## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

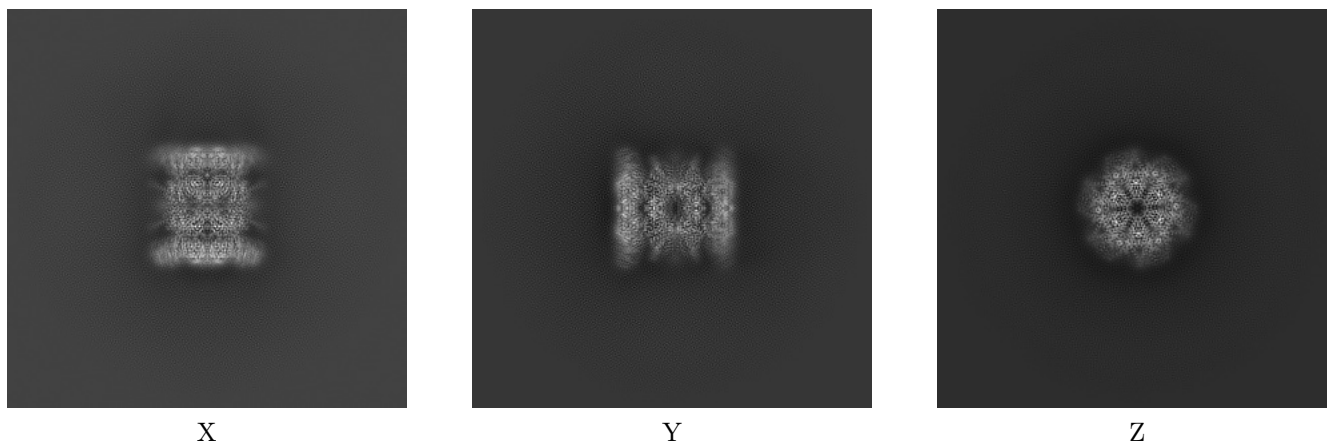
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-32827. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

### 6.1 Orthogonal projections [i](#)

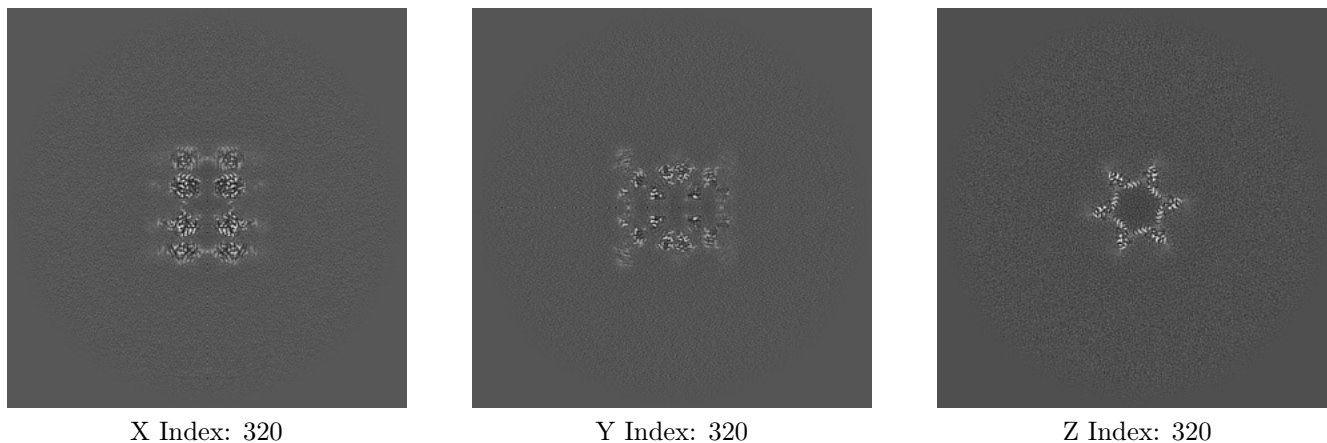
#### 6.1.1 Primary map



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

### 6.2 Central slices [i](#)

#### 6.2.1 Primary map

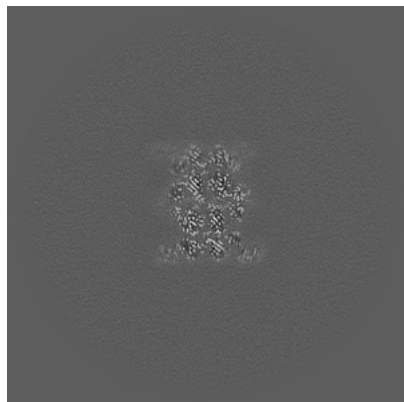




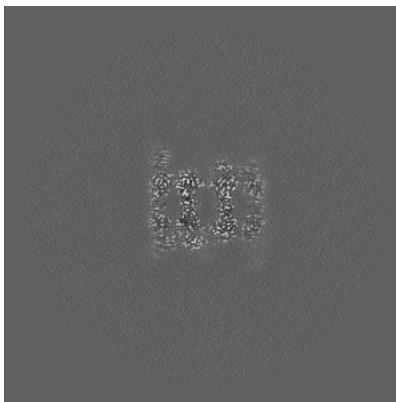
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

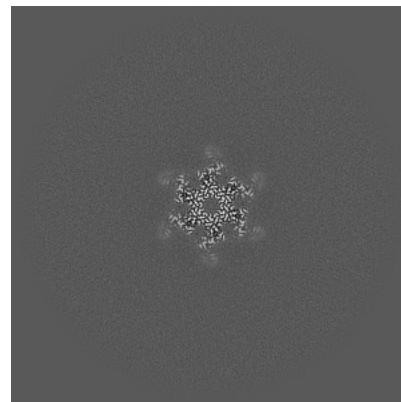
### 6.3.1 Primary map



X Index: 285



Y Index: 303

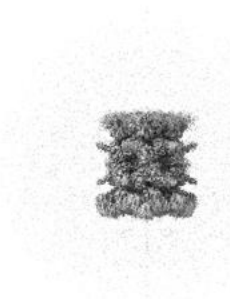


Z Index: 291

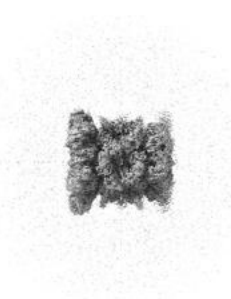
The images above show the largest variance slices of the map in three orthogonal directions.

## 6.4 Orthogonal surface views [i](#)

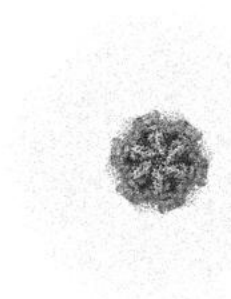
### 6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.331. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

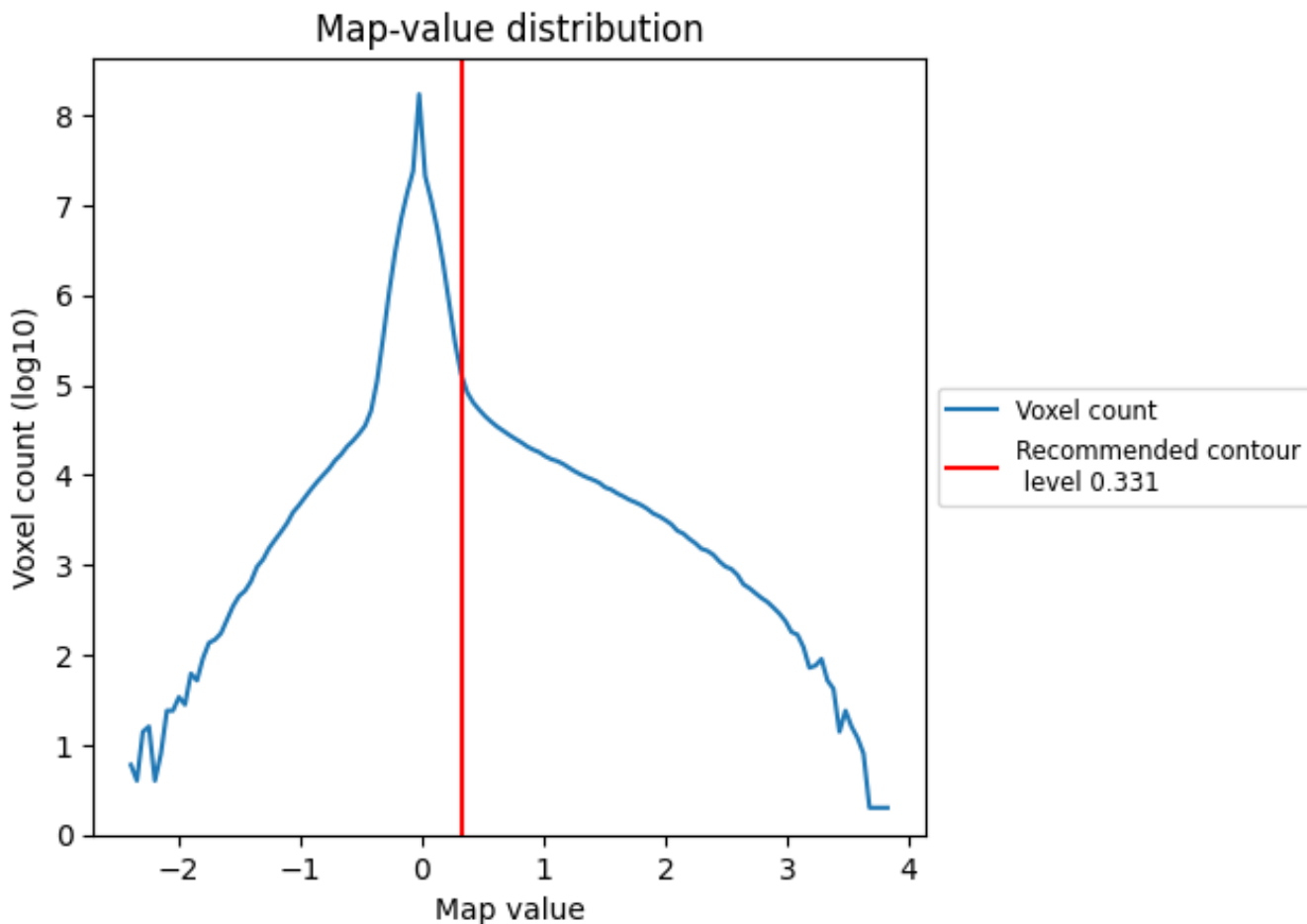
## 6.5 Mask visualisation

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

## 7 Map analysis [i](#)

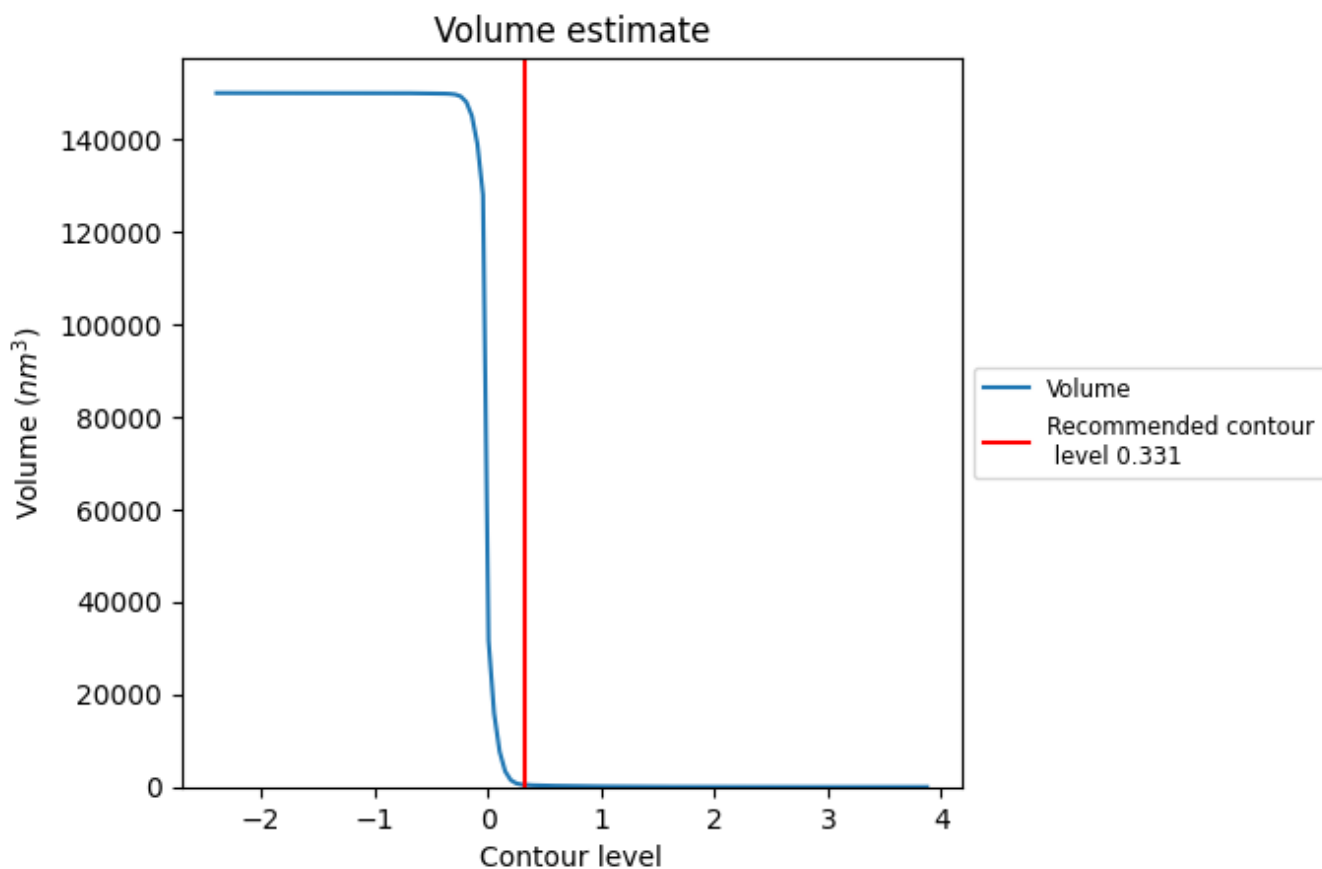
This section contains the results of statistical analysis of the map.

### 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.

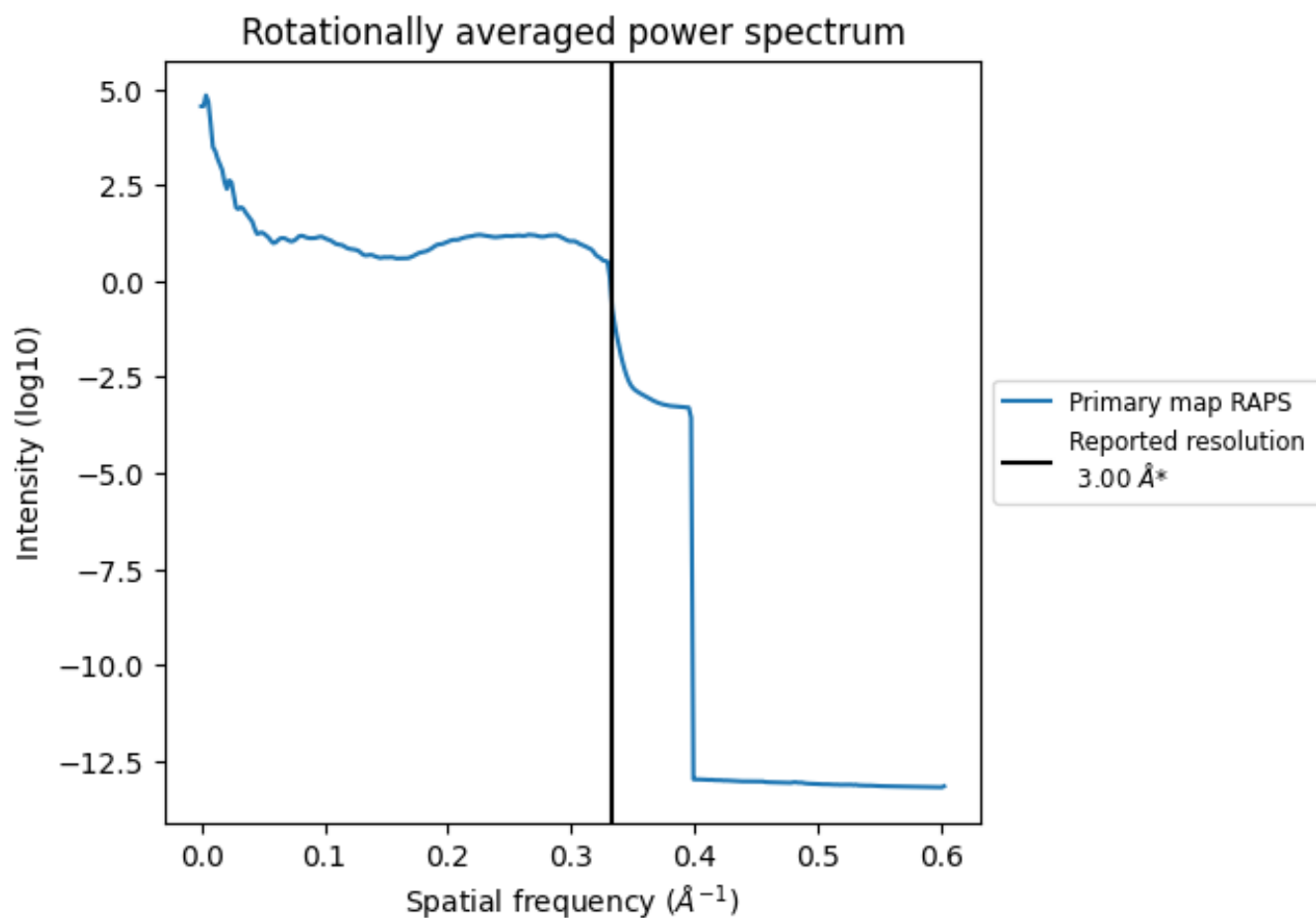
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 459  $\text{nm}^3$ ; this corresponds to an approximate mass of 415 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  $0.333 \text{\AA}^{-1}$

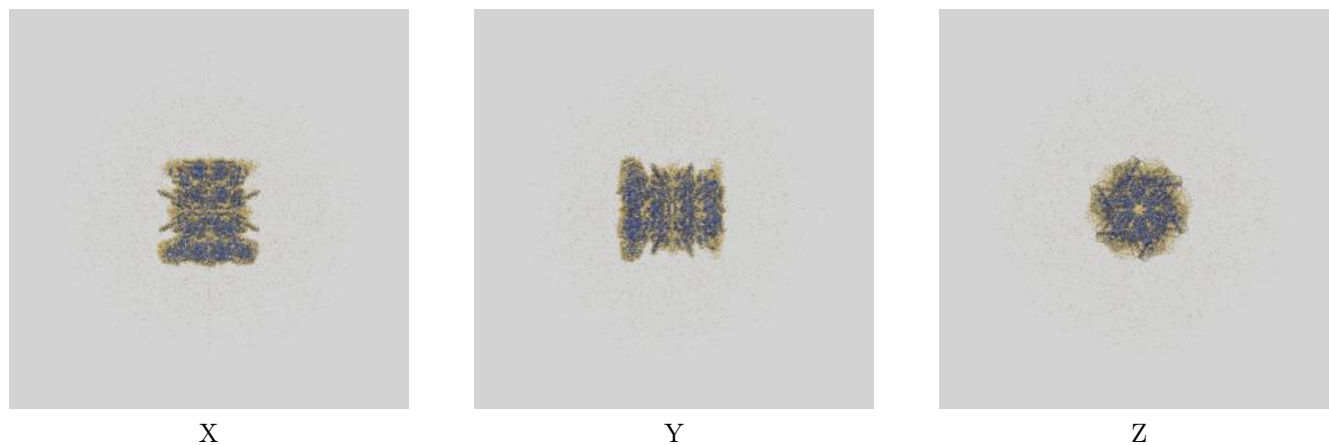
## 8 Fourier-Shell correlation

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

## 9 Map-model fit [i](#)

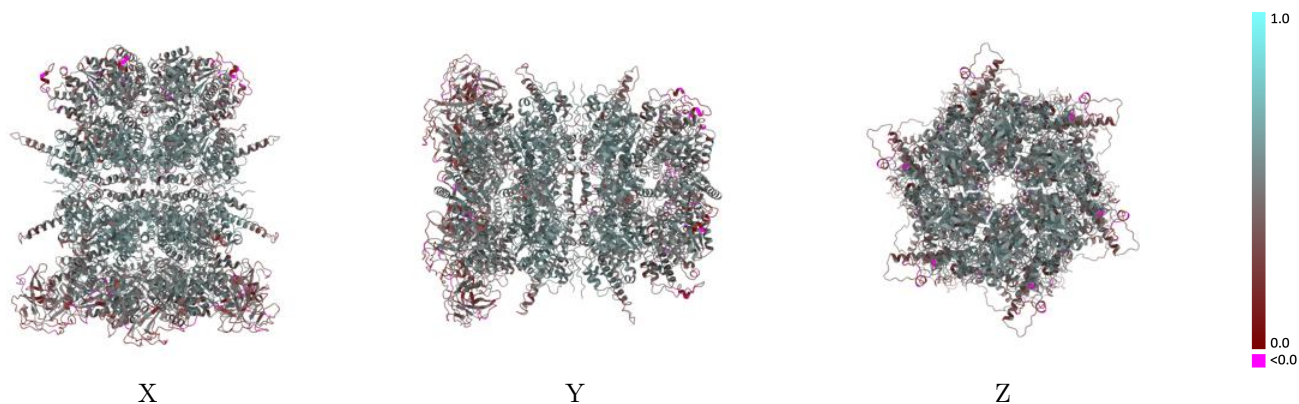
This section contains information regarding the fit between EMDB map EMD-32827 and PDB model 7WUB. Per-residue inclusion information can be found in section [3](#) on page [8](#).

### 9.1 Map-model overlay [i](#)



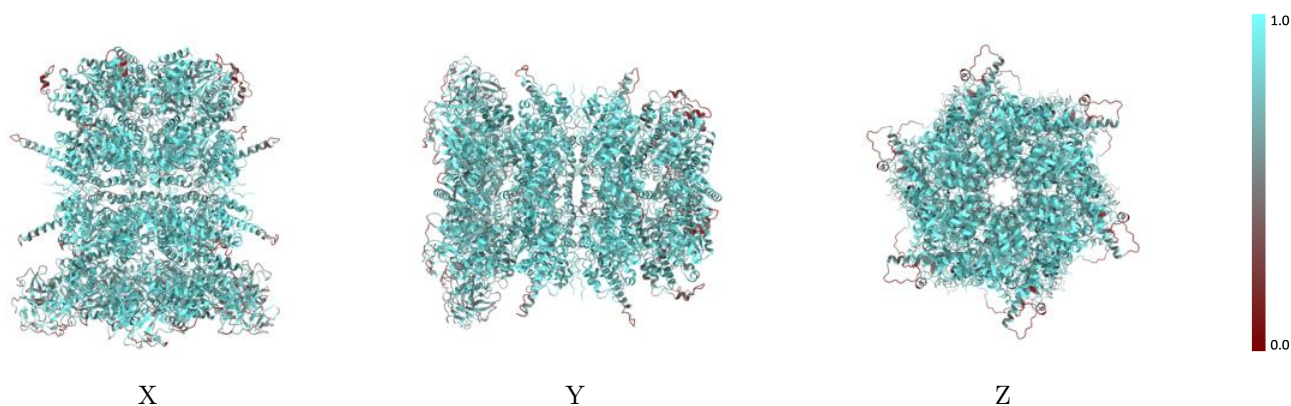
The images above show the 3D surface view of the map at the recommended contour level 0.331 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

## 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.

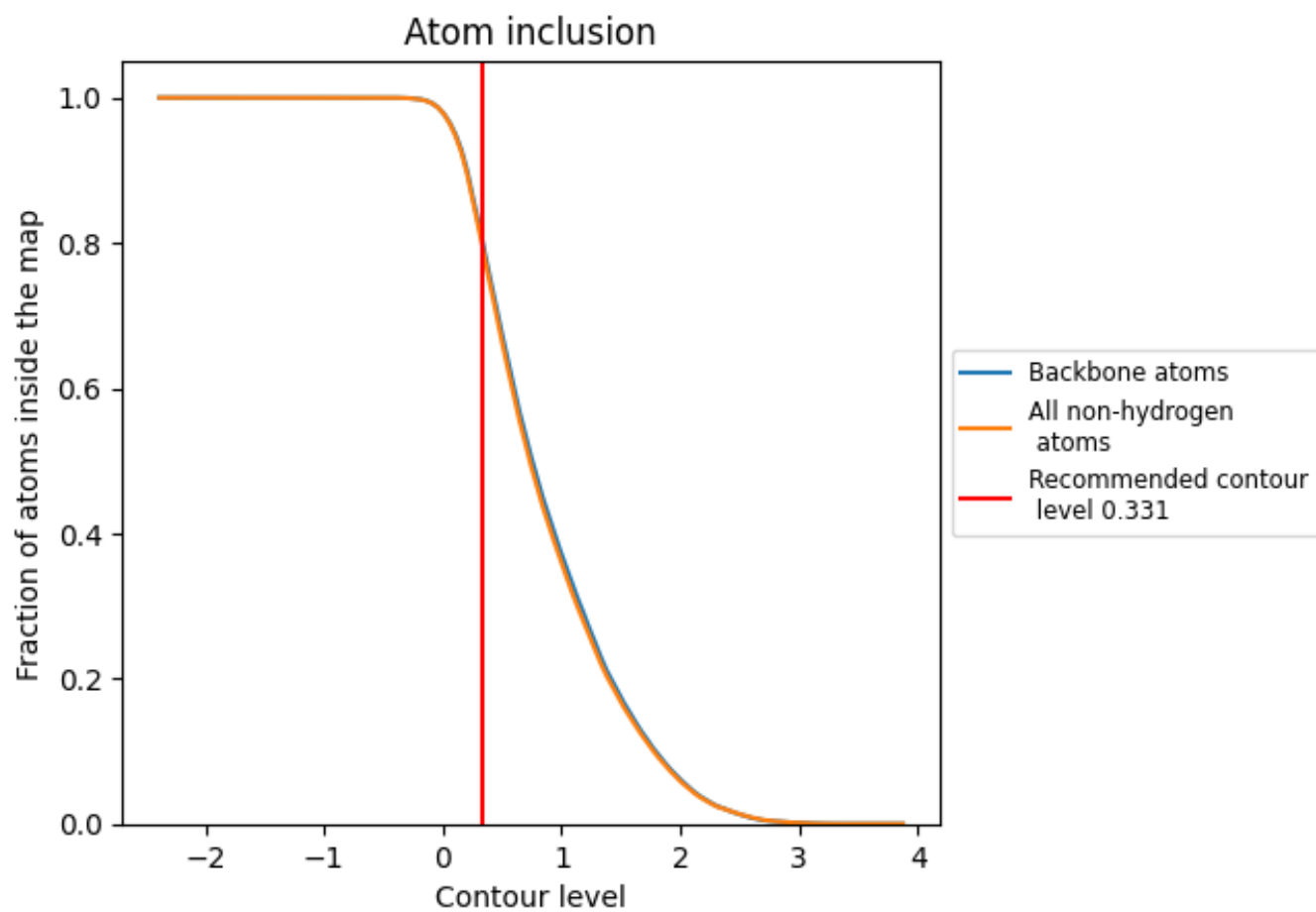
## 9.3 Atom inclusion mapped to coordinate model [i](#)



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 (0.331).





























## 9.4 Atom inclusion [i](#)



At the recommended contour level, 80% of all backbone atoms, 80% 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 (0.331) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7970	 0.4650
A	 0.8078	 0.4750
B	 0.8103	 0.4740
C	 0.8104	 0.4740
D	 0.8057	 0.4710
E	 0.8058	 0.4710
F	 0.8058	 0.4720
G	 0.7998	 0.4610
H	 0.7975	 0.4600
I	 0.7972	 0.4570
J	 0.7982	 0.4590
K	 0.7979	 0.4600
L	 0.7952	 0.4600

