



# wwPDB EM Validation Summary Report ⓘ

Oct 20, 2024 – 08:22 PM EDT

PDB ID : 7UMZ  
EMDB ID : EMD-26610  
Title : Cryo-EM structure of rabbit RyR1 in the presence of high Mg<sup>2+</sup> and AMP-PCP in nanodisc  
Authors : Nayak, A.R.; Samso, M.  
Deposited on : 2022-04-08  
Resolution : 3.09 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.dev113  
Mogul : 2022.3.0, CSD as543be (2022)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.39

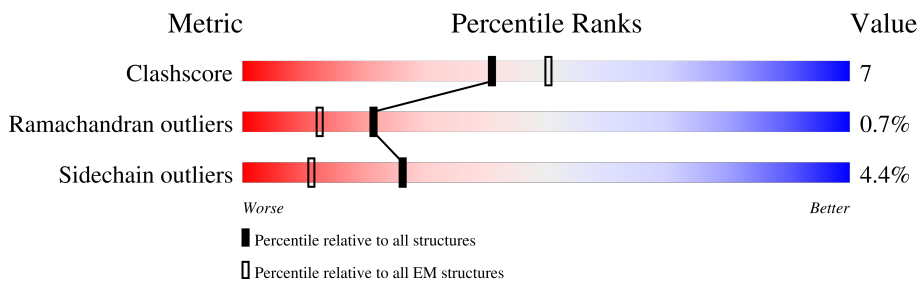
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.09 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	210492	15764
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  $\geq 3$ , 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	5037	
1	B	5037	
1	C	5037	
1	D	5037	

## 2 Entry composition [i](#)

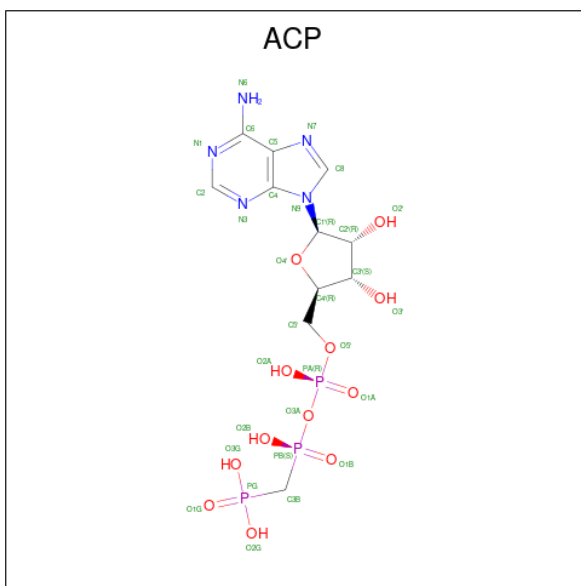
There are 6 unique types of molecules in this entry. The entry contains 111396 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Ryanodine receptor 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	3927	Total	C	N	O	S	0	0
			27759	17494	4909	5192	164		
1	B	3927	Total	C	N	O	S	0	0
			27785	17506	4915	5202	162		
1	C	3927	Total	C	N	O	S	0	0
			27661	17427	4896	5175	163		
1	D	3927	Total	C	N	O	S	0	0
			27670	17436	4891	5180	163		

- Molecule 2 is PHOSPHOMETHYLPHOSPHONIC ACID ADENYLATE ESTER (three-letter code: ACP) (formula:  $C_{11}H_{18}N_5O_{12}P_3$ ).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
2	A	1	Total	C	N	O	P	0
			31	11	5	12	3	
2	B	1	Total	C	N	O	P	0
			31	11	5	12	3	

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Mol	Chain	Residues	Atoms					AltConf
2	C	1	Total	C	N	O	P	0
			31	11	5	12	3	
2	D	1	Total	C	N	O	P	0
			31	11	5	12	3	

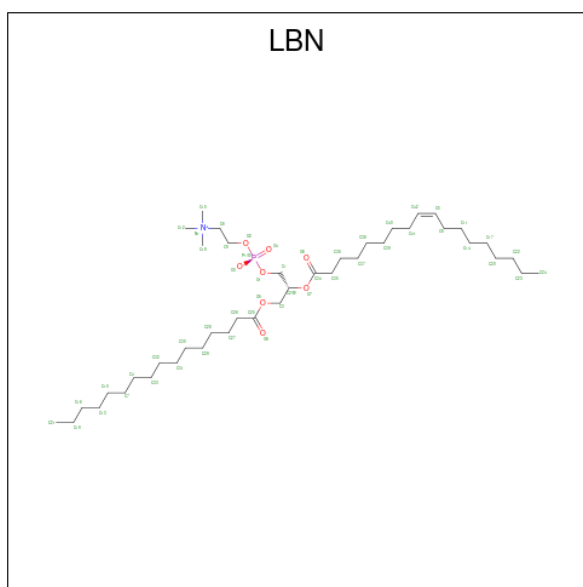
- Molecule 3 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
3	A	1	Total	Zn	0
			1	1	
3	B	1	Total	Zn	0
			1	1	
3	C	1	Total	Zn	0
			1	1	
3	D	1	Total	Zn	0
			1	1	

- Molecule 4 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
4	A	4	Total	Mg	0
			4	4	
4	B	3	Total	Mg	0
			3	3	
4	C	3	Total	Mg	0
			3	3	
4	D	3	Total	Mg	0
			3	3	

- Molecule 5 is 1-palmitoyl-2-oleoyl-sn-glycero-3-phosphocholine (three-letter code: LBN) (formula: C<sub>42</sub>H<sub>82</sub>NO<sub>8</sub>P).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
5	A	1	47	37	1	8	1	0
5	A	1	46	36	1	8	1	0
5	B	1	46	36	1	8	1	0
5	B	1	47	37	1	8	1	0
5	C	1	47	37	1	8	1	0
5	C	1	46	36	1	8	1	0
5	D	1	47	37	1	8	1	0
5	D	1	46	36	1	8	1	0

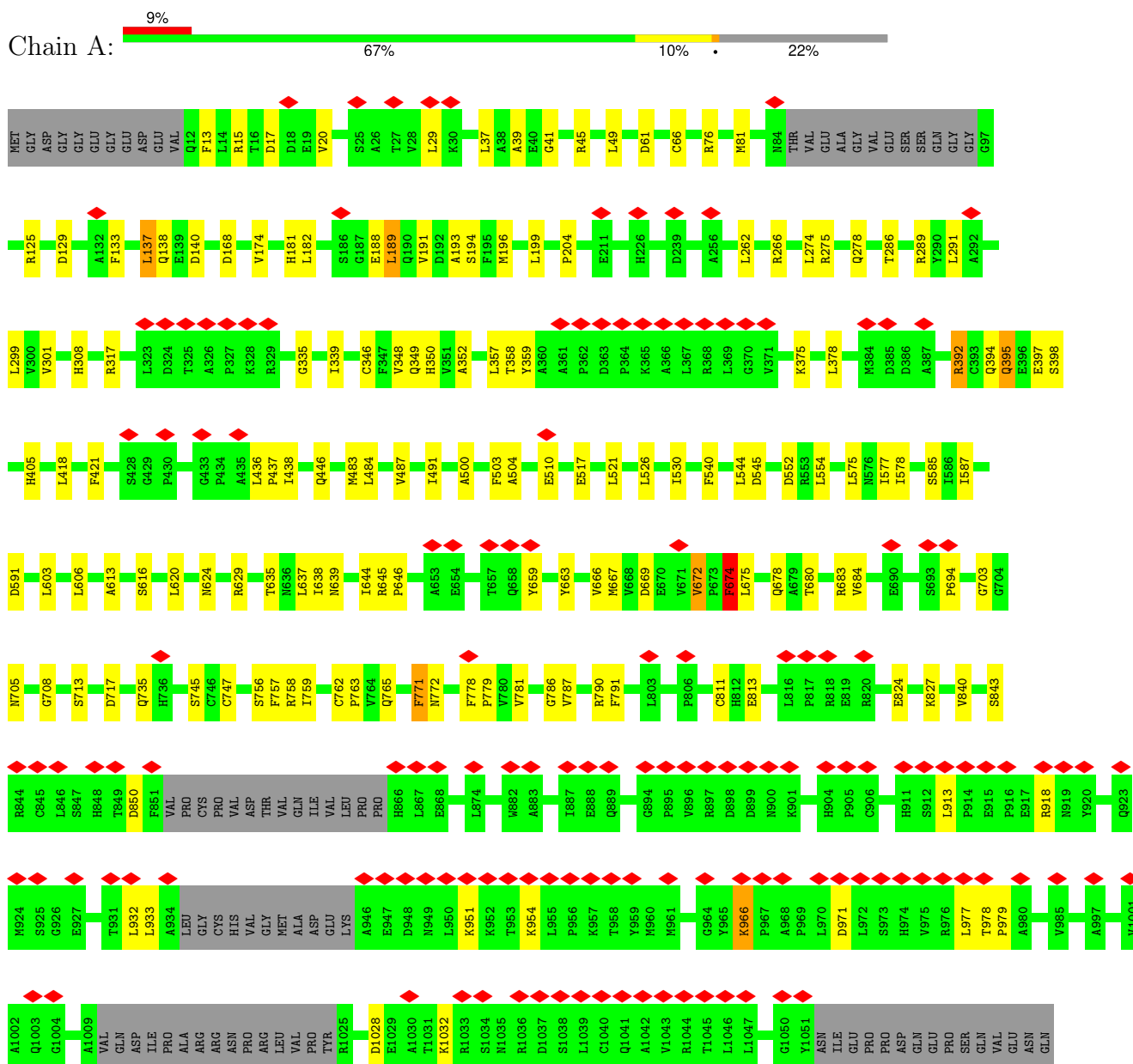
- Molecule 6 is water.

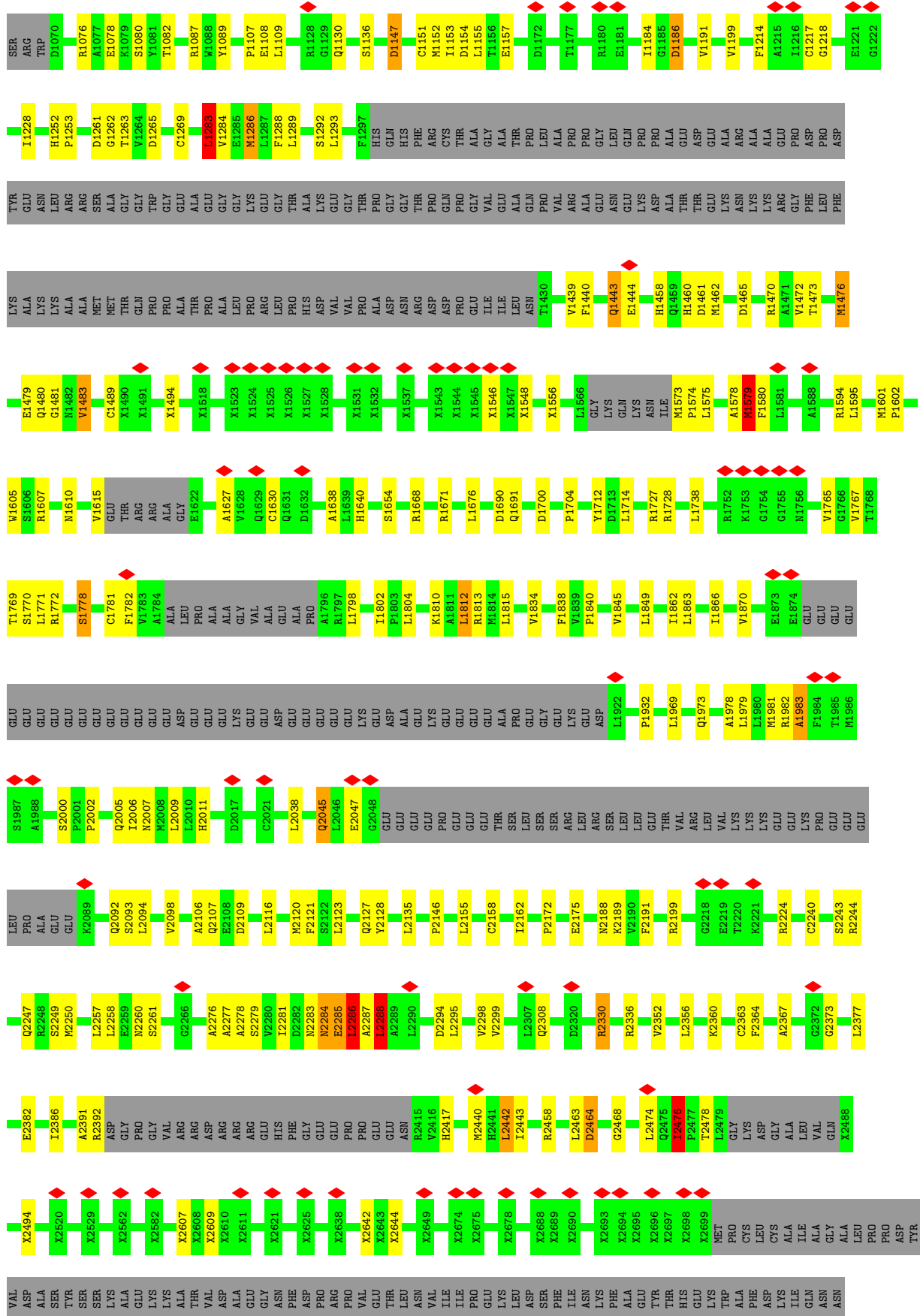
Mol	Chain	Residues	Atoms		AltConf
6	A	2	Total	O	0
			2	2	
6	B	2	Total	O	0
			2	2	
6	C	2	Total	O	0
			2	2	
6	D	2	Total	O	0
			2	2	

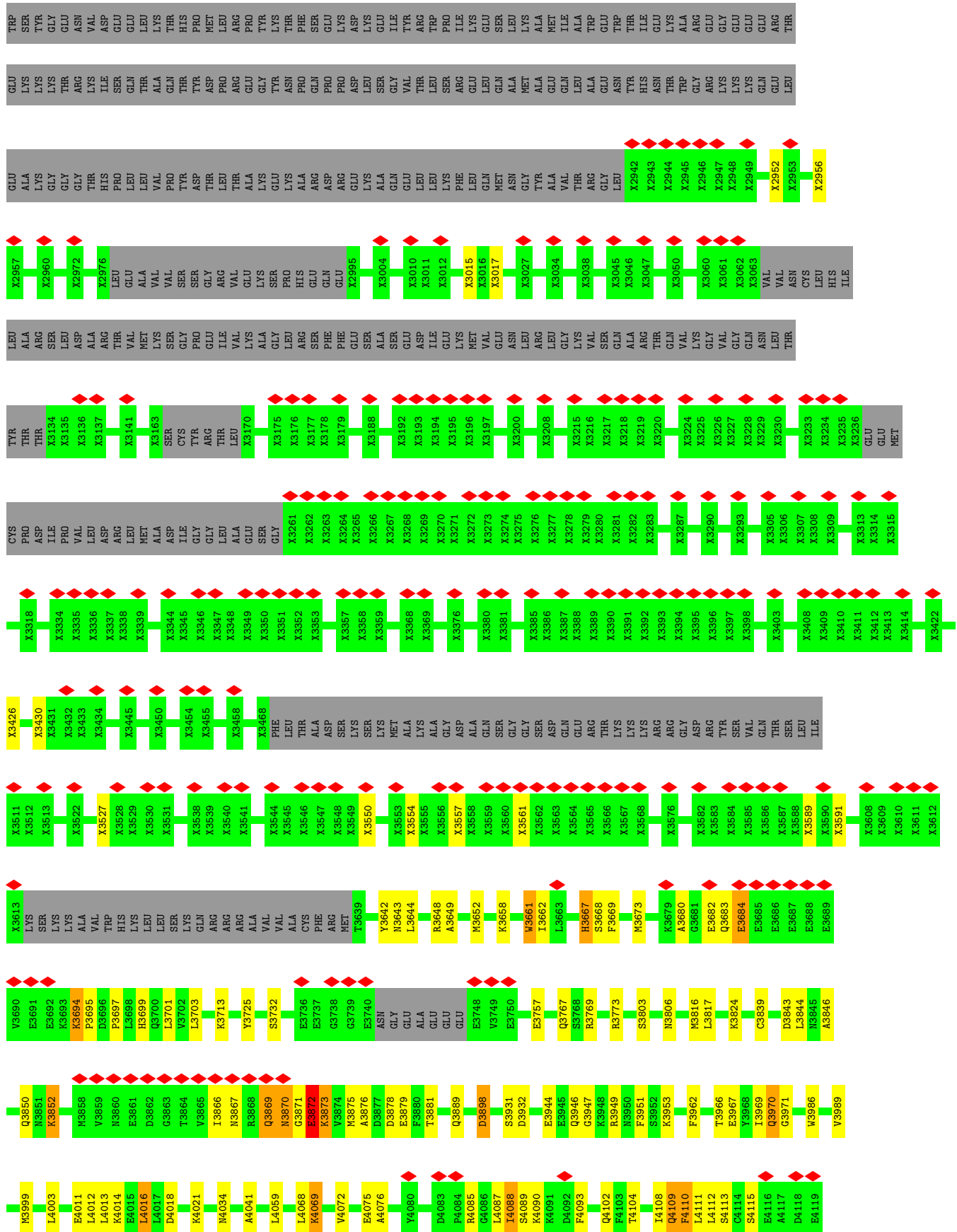
### 3 Residue-property plots

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

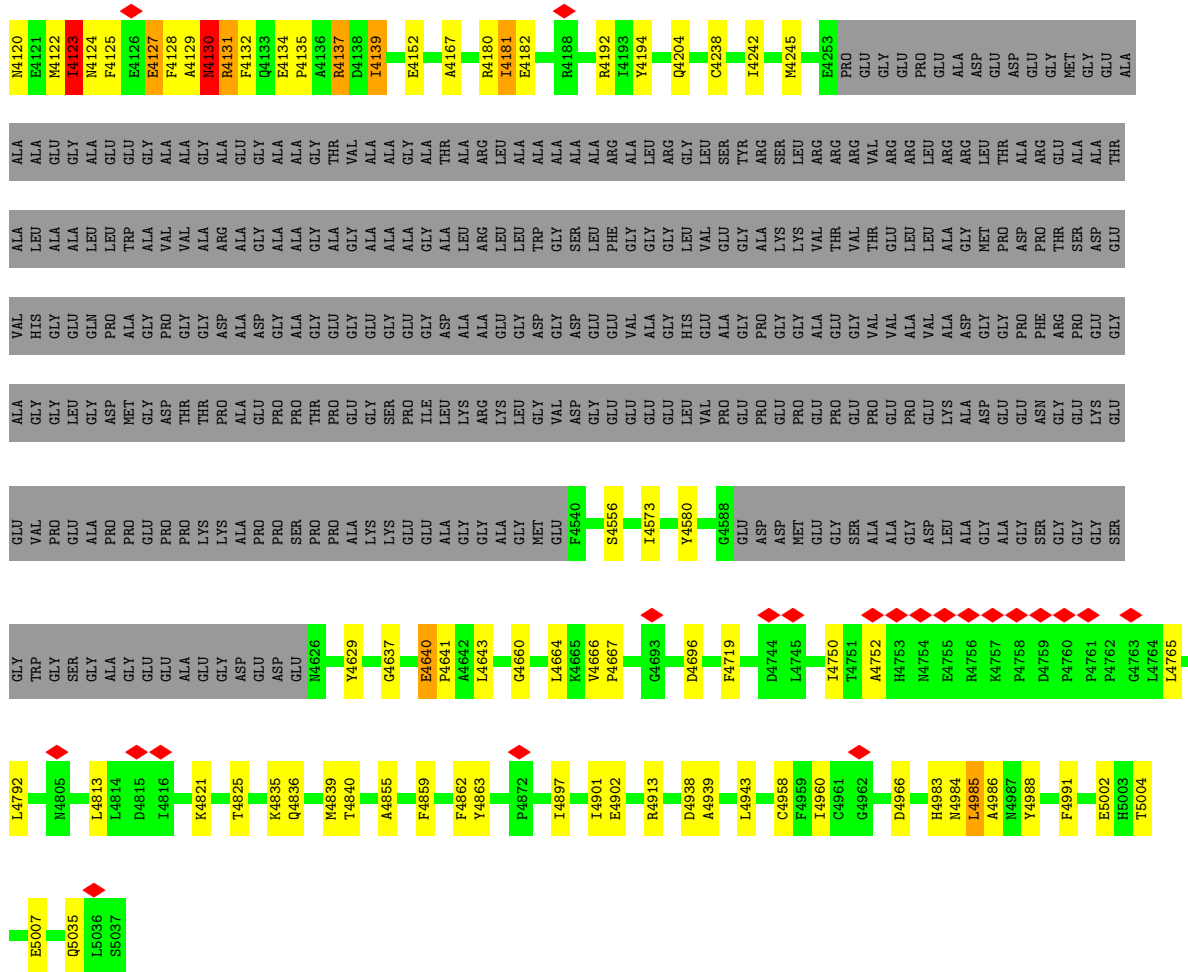
#### • Molecule 1: Ryanodine receptor 1



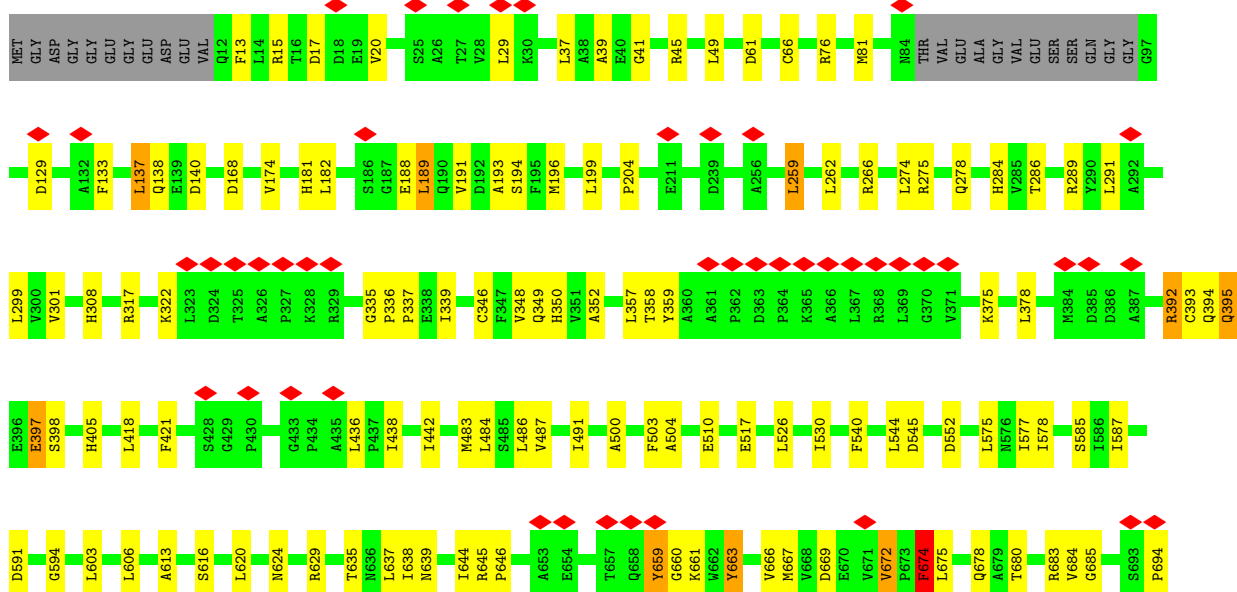




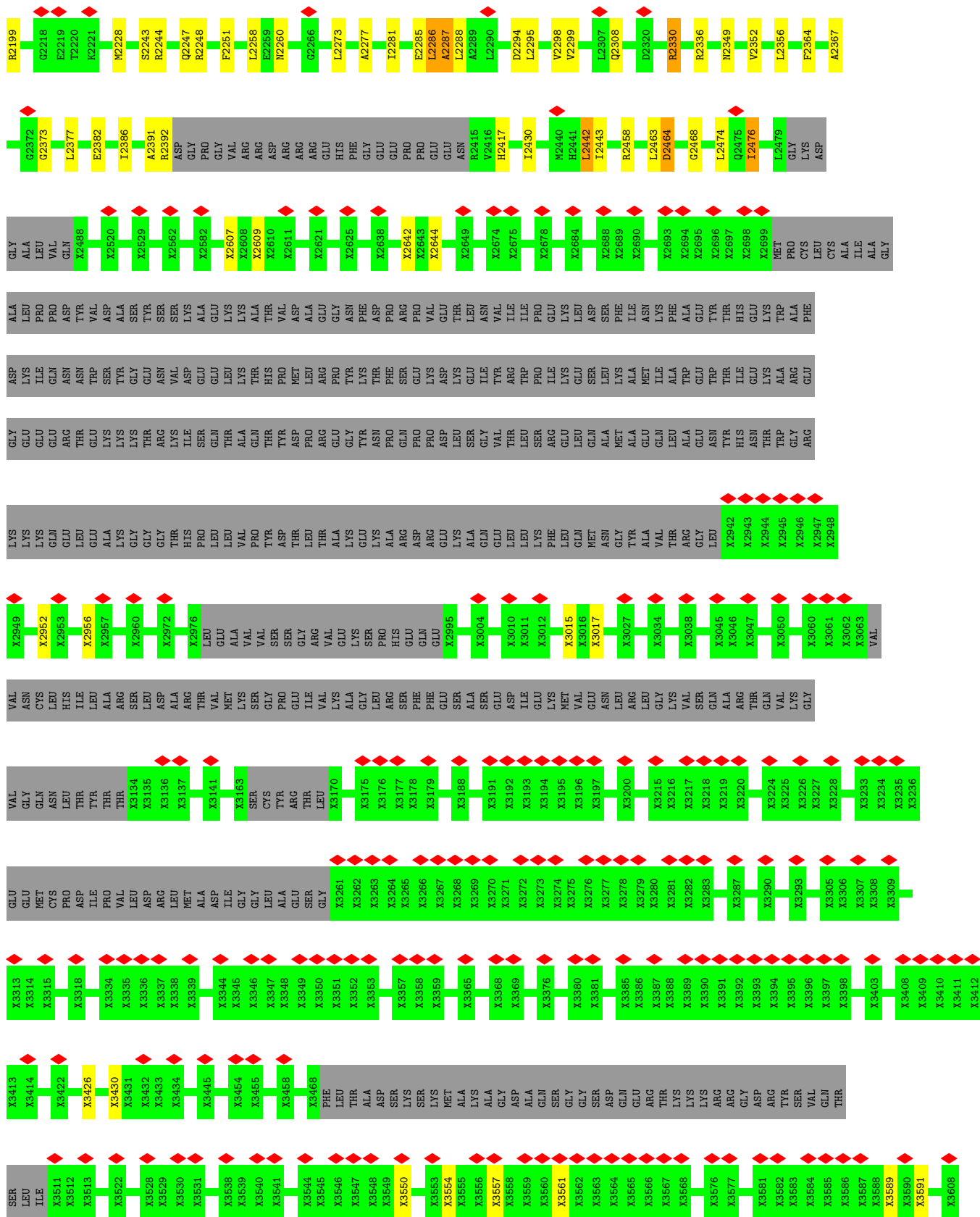


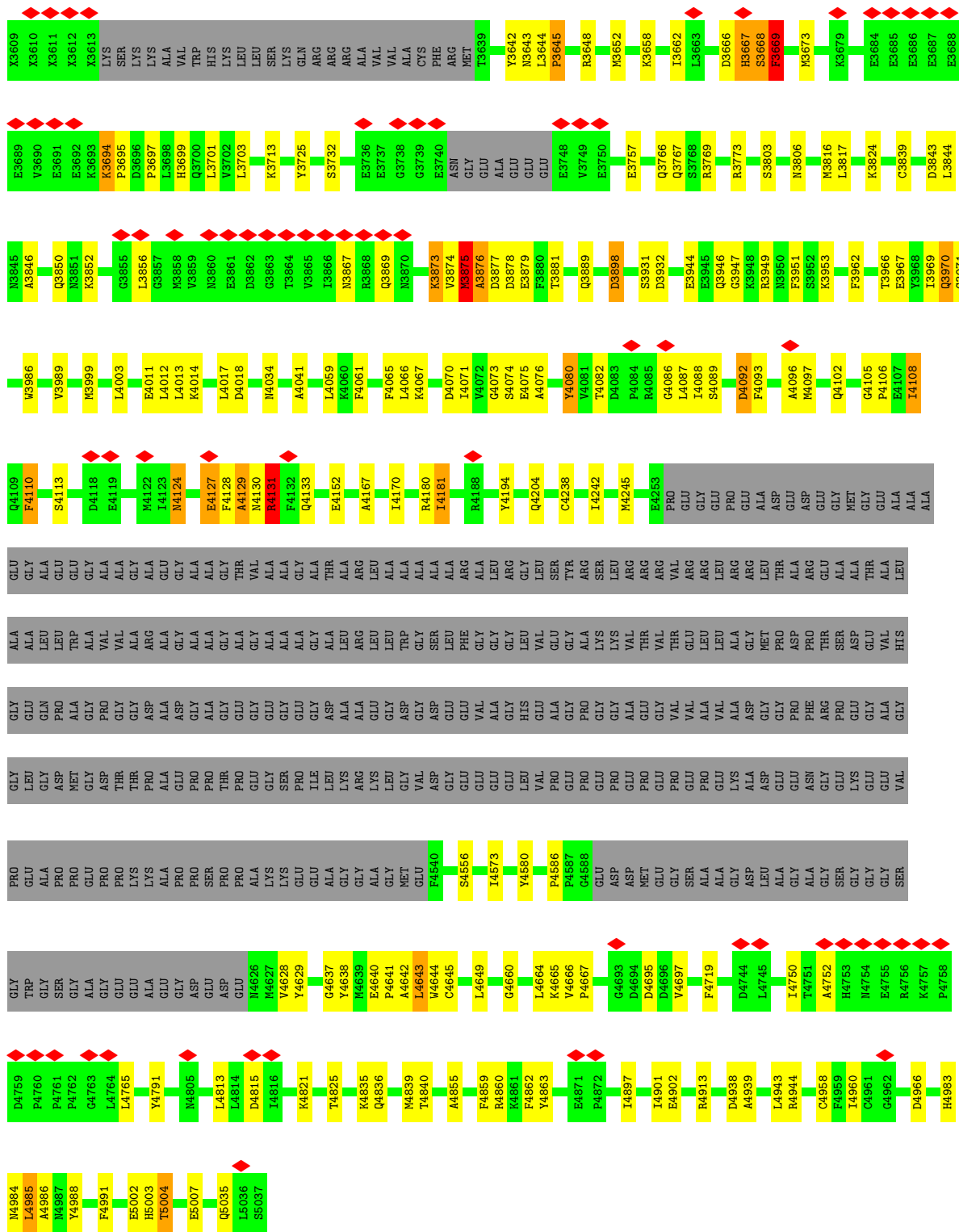


• Molecule 1: Ryanodine receptor 1



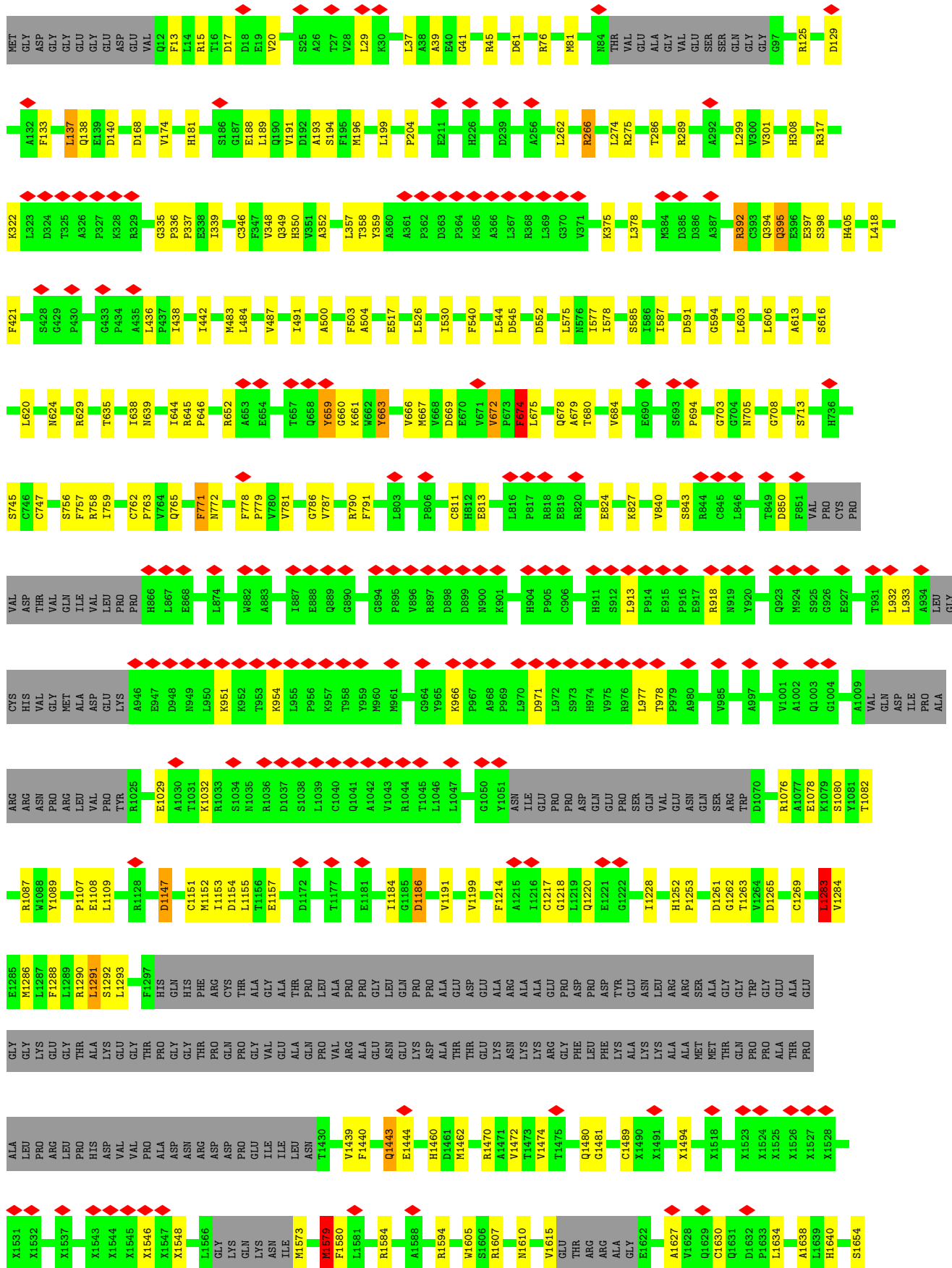
G703	G704	N705	G708	S713	Y714	D717	Q735	H736	S745	C746	C747	S756	F757	R758	I759	C762	P763	P764	Q765	F771	N772	P779	V780	V781	G786	V787	R790	F791	L803	P806	C811	L816	P817	R818	E819	R820	E824	K827	V840																			
S843	R844	C845	L846	T849	F851	VAL	PRO	CYS	PRO	VAL	ASP	THR	VAL	VAL	ILE	PRO	VAL	LEU	ASP	PRO	PRO	H866	L867	E868	L874	N879	W882	A883	I887	E888	Q889	G890	G894	P895	V896	R897	D899	N900	K901	H904	P905	C906	H911	S912	L913	P914	E915	P916	E917	R918	N919							
Y920	Q923	M924	S925	G926	E927	L932	L933	A934	LEU	GLY	CYS	HIS	VAL	GLN	GLY	MET	VAL	ALA	ALA	LEU	PRO	LYS	A946	E947	D948	N949	L950	L951	K952	T953	K954	L955	P956	K957	T958	Y959	M960	M961	S962	N963	G964	Y965	K966	P967	A968	P969	L970	D971	L972	S973	H974	V975	R976	L977	T978	P979	A980	V985
L988	N991	G992	H993	A997	V1001	A1002	Q1003	G1004	A1009	GLN	ASP	THR	VAL	ILE	PRO	ALA	ALA	ARG	ARG	ASN	PRO	ARG	ARG	LEU	VAL	PRO	TYR	R1025	A1030	T1031	K1032	L1033	S1034	M1035	R1036	D1037	S1038	L1039	C1040	Q1041	A1042	V1043	R1044	T1045	L1046	L1047	G1048	Y1049	G1050	Y1051	ASN	ILE	GLU	PRO	ASP	GLN		
GLU	PRO	SER	GLN	VAL	GLU	ASN	GLN	SER	ARG	TRP	D1070	R1076	T1082	R1087	W1088	Y1089	P1107	E1108	GLU	L1109	R1128	G1129	Q1130	S1136	D1147	C1151	M1152	I1153	D1154	L1155	T1156	E1157	D1172	T1177	E1181	I1184	G1185	D1186	V1191	V1199	R1212	F1213	L1214	A1215	I1216													
C1217	G1218	L1219	Q1220	E1221	G1222	L1228	H1262	H1263	V1264	D1265	C1269	R1276	S1279	Q1280	L1283	V1284	M1286	L1287	F1288	L1289	R1290	L1291	S1292	L1293	F1297	HIS	HIS	HIS	PHE	ARG	CYS	THR	ALA	ALA	GLY	THR	THR	GLN	PRO	LEU	ALA	ALA	VAL	VAL	ALA	GLU	ASN	GLU	GLN	PRO								
PRO	ALA	ASP	GLN	GLU	ALA	ARG	ALA	ALA	LYS	ASN	ASP	TYR	GLY	ALA	ASN	LEU	ARG	ARG	ALA	ALA	MET	SER	THR	GLY	GLY	TRP	PRO	PRO	GLY	ALA	ALA	GLY	LYS	ARG	GLY	GLY	GLY	ASP	ASN	ASP	THR	THR	ASN	THR	VAL	VAL	VAL	ALA	GLU	LEU	LYS							
ASP	ALA	THR	THR	GLU	LYS	ASN	LYS	LYS	ALA	ARG	PHE	PHE	LYS	ALA	LYS	LYS	ALA	ALA	ALA	MET	MET	THR	GLN	PRO	PRO	ALA	ALA	THR	ALA	ASP	VAL	VAL	PRO	PRO	ALA	ALA	ASP	ASP	GLY	ILE	LEU	ASN	T1430	V1439	F1440	Q1443	H1458											
G1459	H1460	D1461	M1462	D1465	R1470	A1471	V1472	T1473	V1474	T1475	Q1480	G1481	C1489	X1490	X1491	X1494	X1518	X1523	X1524	X1525	X1526	X1527	X1528	X1531	X1532	X1537	X1543	X1544	X1545	X1546	X1547	X1548	L1566	GLY	LYS	GLN	LYS	ASN	ILE	M1573	K1589	F1590	L1581	K1585	A1588													
R1594	L1595	M1601	P1602	W1605	S1606	R1607	M1610	V1615	GLU	THR	GLU	ARG	ARG	ALA	GLY	E1622	A1627	V1628	C1630	Q1631	D1632	A1638	L1639	H1640	S1654	L1676	D1690	Q1691	A1692	Q1693	L1694	L1695	D1700	P1704	Y1712	R1727	R1728	L1738	L1738	I1862	L1863	I1866	R1752	K1753	G1754	G1755	N1756											
R1759	V1765	G1766	V1767	F1768	T1769	S1770	L1771	R1772	S1778	F1779	P1780	C1781	F1782	A1784	ALA	LEU	PRO	ALA	ALA	GLY	VAL	ALA	ALA	ALA	PRO	R1797	L1798	I1802	P1803	L1804	K1810	L1811	R1813	M1814	L1815	V1834	F1838	V1839	P1840	V1845	I1862	L1863	I1866	V1870	F1871													
T1872	E1873	E1874	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	ASP	ASP	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU										
Q1973	L1979	L1980	M1981	R1982	A1983	F1984	T1985	M1986	S1987	A1988	S2000	P2001	P2002	Q2005	L2006	M2007	M2008	L2009	L2010	H2011	D2017	C2021	P2022	L2023	R2028	L2038	Q2045	E2047	L2046	G2048	GLU	GLU	GLU	GLU	GLU	PRO	GLU	GLU	GLU	THR	SER	LEU	LEU	SER	SER	ARG	LEU	ARG	SER	LEU	LEU	LEU	LEU	THR				
VAL	ARG	VAL	VAL	LYS	LYS	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU		
K2089	Q2092	S2093	L2094	V2098	A2106	D2109	L2116	M2120	F2121	S2122	L2123	Q2127	Y2128	L2135	P2146	L2155	C2158	T2162	P2172	E2175	M2188	K2189	V2190	F2191																																		

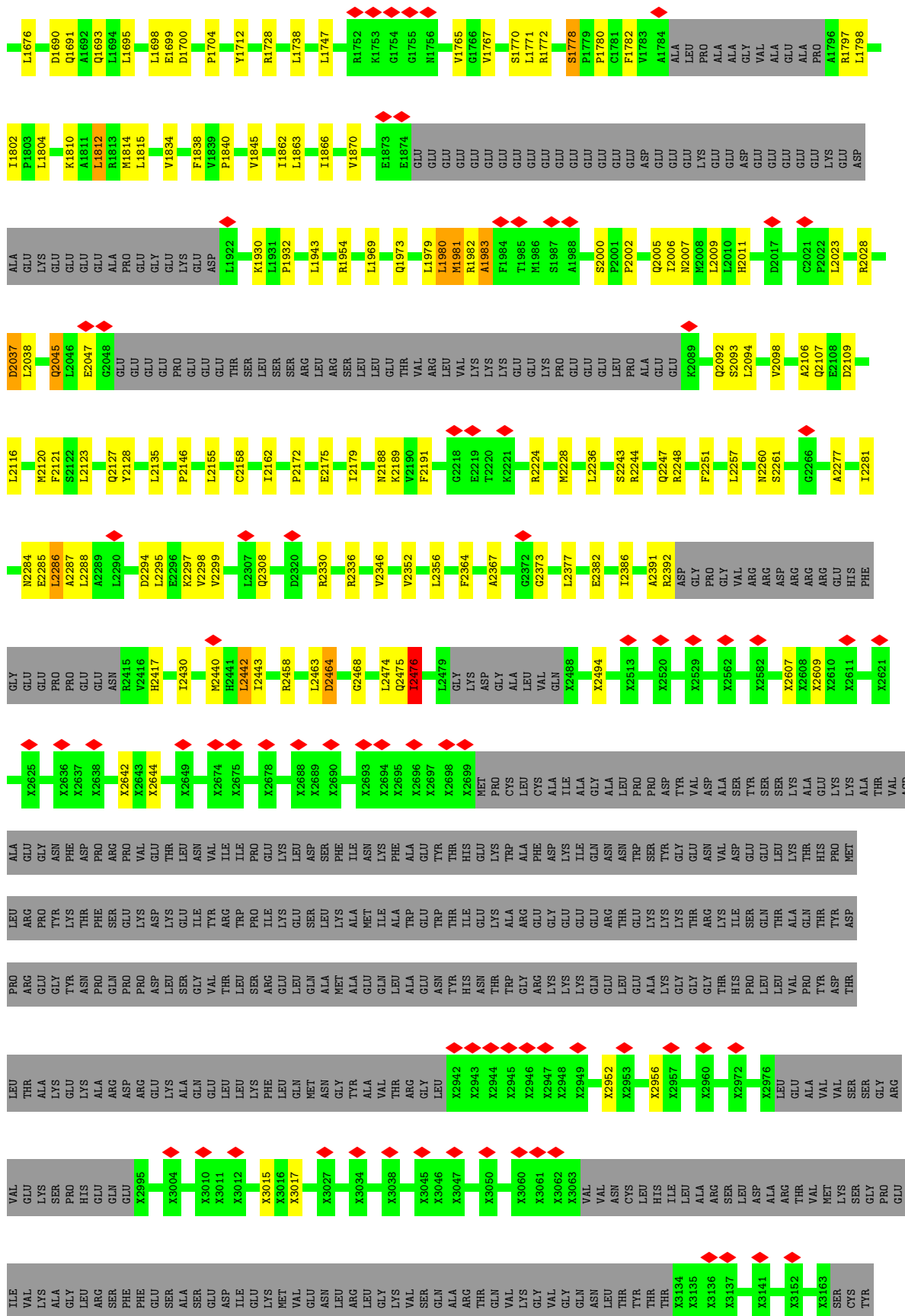




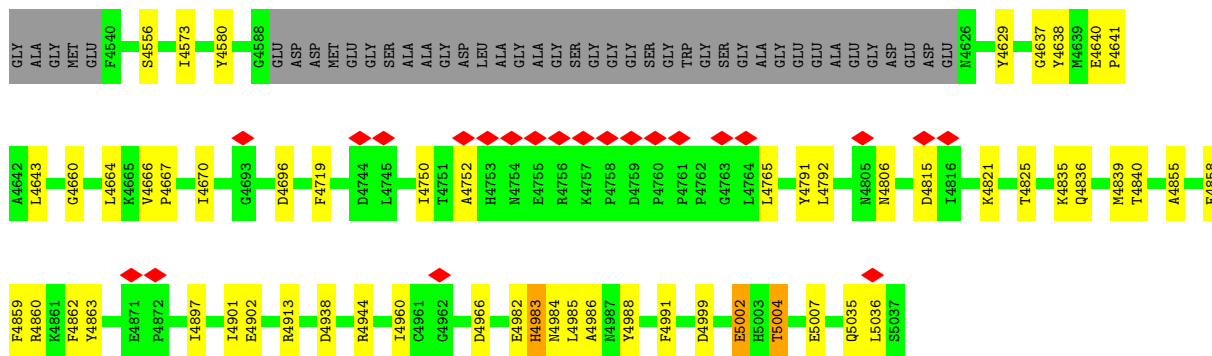
● Molecule 1: Ryanodine receptor 1



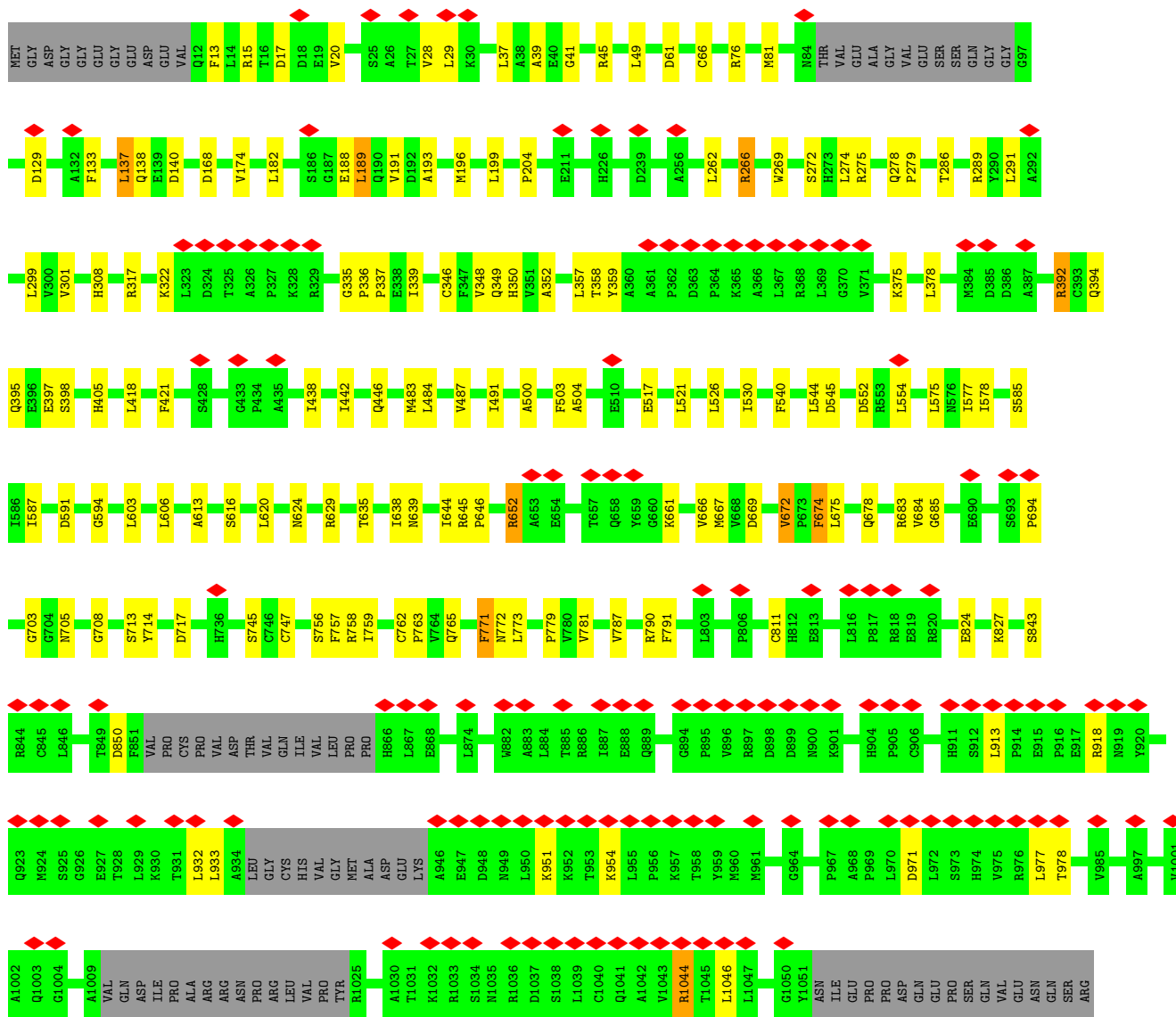




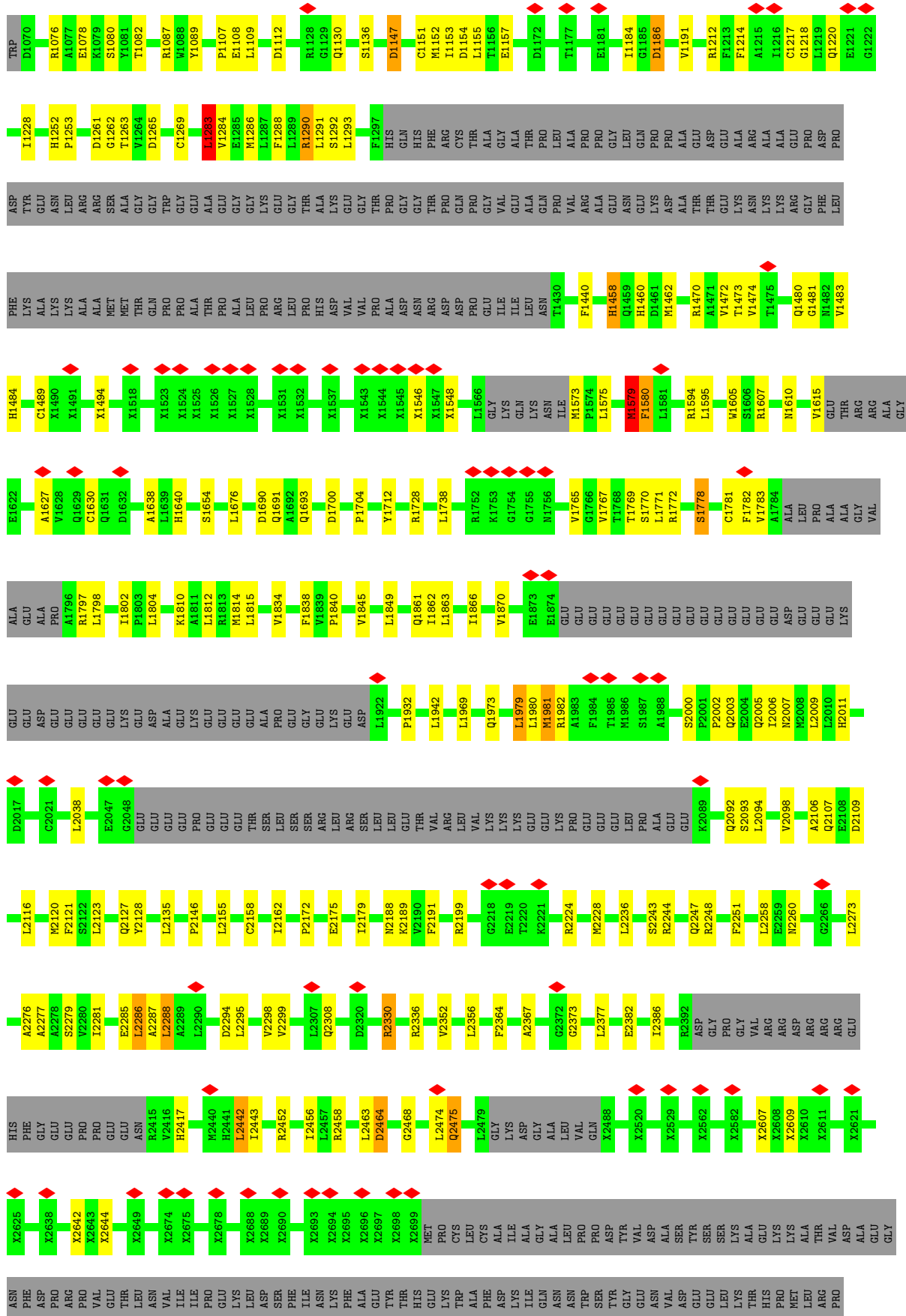


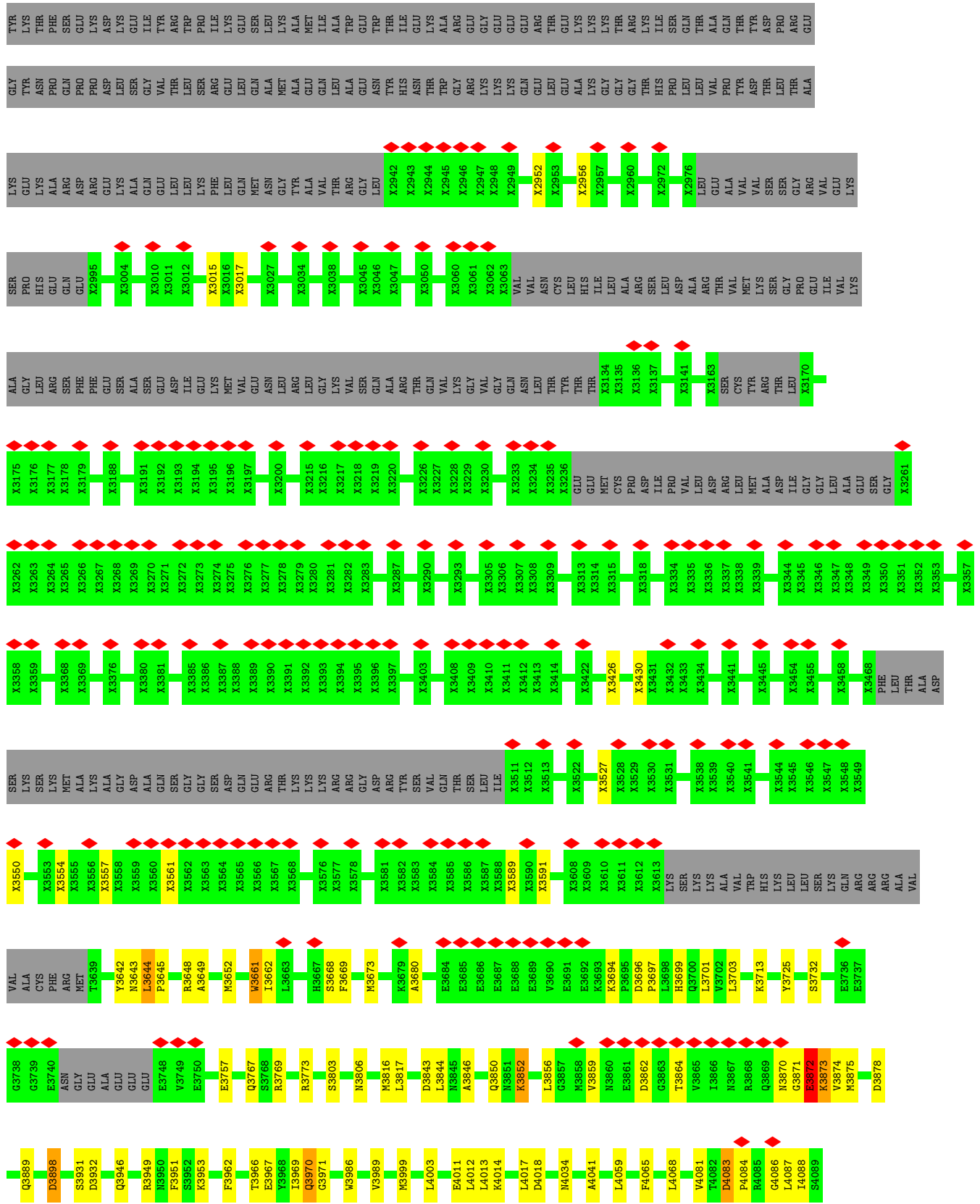


● Molecule 1: Ryanodine receptor 1











## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C4	Depositor
Number of particles used	167778	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 ( $e^-/\text{\AA}^2$ )	60	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	105000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	1.171	Depositor
Minimum map value	-0.700	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.026	Depositor
Recommended contour level	0.09	Depositor
Map size (Å)	474.72, 474.72, 474.72	wwPDB
Map dimensions	552, 552, 552	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.86, 0.86, 0.86	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: ZN, LBN, ACP, MG

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	0.31	0/24263	0.59	16/32920 (0.0%)
1	B	0.30	0/24291	0.57	11/32959 (0.0%)
1	C	0.30	0/24161	0.56	9/32790 (0.0%)
1	D	0.30	0/24170	0.57	9/32806 (0.0%)
All	All	0.30	0/96885	0.57	45/131475 (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	2
1	B	0	1
1	D	0	1
All	All	0	4

There are no bond length outliers.

The worst 5 of 45 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	4139	ILE	C-N-CA	8.47	140.10	122.30
1	A	4137	ARG	CB-CA-C	-8.20	94.00	110.40
1	A	4088	ILE	N-CA-C	-7.85	89.81	111.00
1	D	2308	GLN	CA-CB-CG	5.90	126.37	113.40
1	C	2308	GLN	CA-CB-CG	5.89	126.36	113.40

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	4131	ARG	Sidechain
1	A	4137	ARG	Sidechain
1	B	4131	ARG	Sidechain
1	D	4131	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	27759	0	23608	369	0
1	B	27785	0	23648	356	0
1	C	27661	0	23455	315	0
1	D	27670	0	23479	351	0
2	A	31	0	14	1	0
2	B	31	0	14	1	0
2	C	31	0	14	1	0
2	D	31	0	14	0	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
4	A	4	0	0	0	0
4	B	3	0	0	0	0
4	C	3	0	0	0	0
4	D	3	0	0	0	0
5	A	93	0	0	0	0
5	B	93	0	0	0	0
5	C	93	0	0	3	0
5	D	93	0	0	1	0
6	A	2	0	0	0	0
6	B	2	0	0	0	0
6	C	2	0	0	0	0
6	D	2	0	0	0	0
All	All	111396	0	94246	1382	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 7.

The worst 5 of 1382 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:D:2128:TYR:HB3	1:D:3669:PHE:CZ	1.61	1.35
1:A:2128:TYR:HB3	1:A:3669:PHE:CZ	1.63	1.33
1:D:2128:TYR:CD2	1:D:3673:MET:HE3	1.67	1.28
1:A:2128:TYR:CD2	1:A:3673:MET:HE3	1.73	1.22
1:C:2128:TYR:CG	1:C:3673:MET:CE	2.27	1.18

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	3095/5037 (61%)	2890 (93%)	188 (6%)	17 (0%)	25	58
1	B	3095/5037 (61%)	2880 (93%)	188 (6%)	27 (1%)	14	45
1	C	3095/5037 (61%)	2898 (94%)	178 (6%)	19 (1%)	22	53
1	D	3095/5037 (61%)	2895 (94%)	182 (6%)	18 (1%)	22	53
All	All	12380/20148 (61%)	11563 (93%)	736 (6%)	81 (1%)	21	51

5 of 81 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	674	PHE
1	A	1440	PHE
1	A	1489	CYS
1	A	2476	ILE
1	A	3970	GLN

### 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	2435/3579 (68%)	2317 (95%)	118 (5%)	21	51
1	B	2444/3579 (68%)	2328 (95%)	116 (5%)	22	52
1	C	2412/3579 (67%)	2318 (96%)	94 (4%)	27	58
1	D	2418/3579 (68%)	2319 (96%)	99 (4%)	26	57
All	All	9709/14316 (68%)	9282 (96%)	427 (4%)	26	54

5 of 427 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	4966	ASP
1	C	1728	ARG
1	D	3816	MET
1	C	137	LEU
1	C	757	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 46 such sidechains are listed below:

Mol	Chain	Res	Type
1	C	138	GLN
1	C	4034	ASN
1	C	1220	GLN
1	C	3850	GLN
1	D	395	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 29 ligands modelled in this entry, 17 are monoatomic - leaving 12 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
2	ACP	B	5101	4	27,33,33	1.60	5 (18%)	33,52,52	2.34	8 (24%)
5	LBN	A	5108	-	45,45,51	0.32	0	51,53,59	0.31	0
2	ACP	C	5101	4	27,33,33	0.94	1 (3%)	33,52,52	0.82	2 (6%)
5	LBN	B	5107	-	46,46,51	0.33	0	52,54,59	0.33	0
5	LBN	C	5106	-	46,46,51	0.33	0	52,54,59	0.34	0
5	LBN	C	5107	-	45,45,51	0.33	0	51,53,59	0.31	0
5	LBN	A	5107	-	46,46,51	0.32	0	52,54,59	0.34	0
5	LBN	D	5107	-	45,45,51	0.33	0	51,53,59	0.31	0
5	LBN	D	5106	-	46,46,51	0.33	0	52,54,59	0.35	0
2	ACP	D	5101	4	27,33,33	0.96	1 (3%)	33,52,52	0.86	2 (6%)
2	ACP	A	5101	4	27,33,33	1.62	6 (22%)	33,52,52	2.40	7 (21%)
5	LBN	B	5106	-	45,45,51	0.33	0	51,53,59	0.31	0

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
2	ACP	B	5101	4	-	8/15/38/38	0/3/3/3
5	LBN	A	5108	-	-	23/49/49/55	-
2	ACP	C	5101	4	-	3/15/38/38	0/3/3/3
5	LBN	B	5107	-	-	31/50/50/55	-
5	LBN	C	5106	-	-	31/50/50/55	-
5	LBN	C	5107	-	-	29/49/49/55	-
5	LBN	A	5107	-	-	35/50/50/55	-
5	LBN	D	5107	-	-	18/49/49/55	-
5	LBN	D	5106	-	-	22/50/50/55	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	ACP	D	5101	4	-	5/15/38/38	0/3/3/3
2	ACP	A	5101	4	-	6/15/38/38	0/3/3/3
5	LBN	B	5106	-	-	18/49/49/55	-

The worst 5 of 13 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	5101	ACP	PB-O3A	4.23	1.63	1.58
2	B	5101	ACP	PB-O3A	4.00	1.62	1.58
2	A	5101	ACP	PG-O3G	2.83	1.61	1.55
2	B	5101	ACP	PG-O2G	2.83	1.61	1.55
2	B	5101	ACP	PG-O3G	2.82	1.61	1.55

The worst 5 of 19 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	5101	ACP	N3-C2-N1	-7.85	118.02	128.67
2	A	5101	ACP	N3-C2-N1	-7.49	118.50	128.67
2	B	5101	ACP	C1'-N9-C4	-6.03	116.04	126.64
2	A	5101	ACP	C4'-O4'-C1'	-5.73	104.67	109.92
2	A	5101	ACP	C1'-N9-C4	-5.57	116.86	126.64

There are no chirality outliers.

5 of 229 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	5101	ACP	C5'-O5'-PA-O3A
2	A	5101	ACP	O4'-C4'-C5'-O5'
2	A	5101	ACP	C3'-C4'-C5'-O5'
2	B	5101	ACP	PB-C3B-PG-O2G
2	B	5101	ACP	C5'-O5'-PA-O3A

There are no ring outliers.

6 monomers are involved in 7 short contacts:

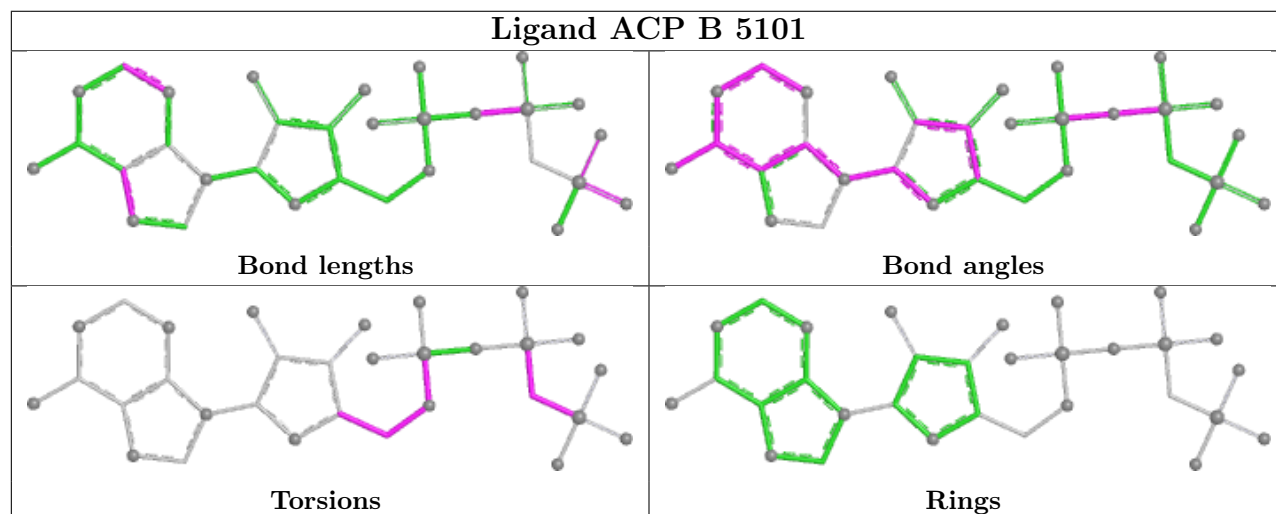
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	5101	ACP	1	0
2	C	5101	ACP	1	0
5	C	5106	LBN	1	0
5	C	5107	LBN	2	0

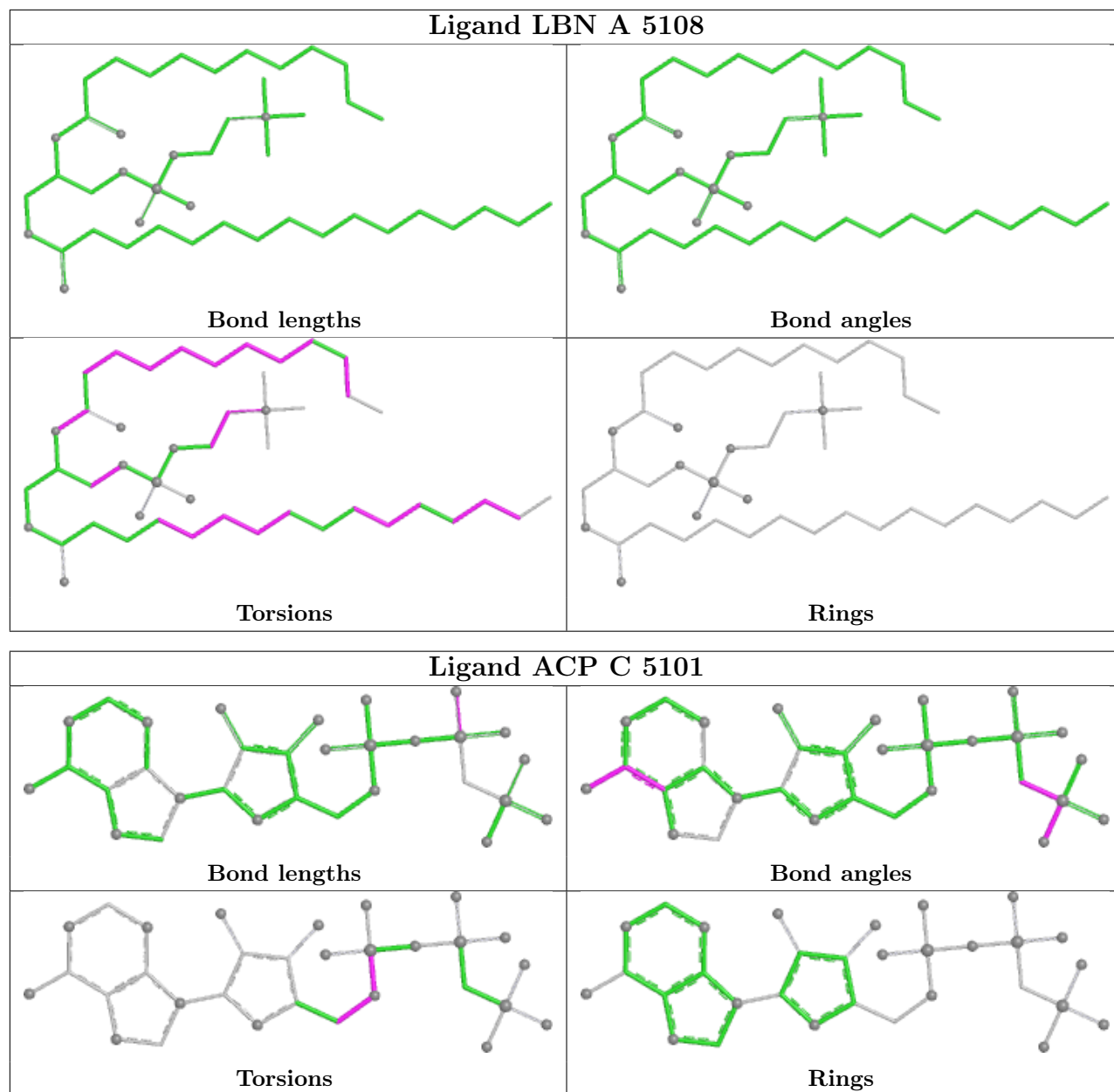
Continued on next page...

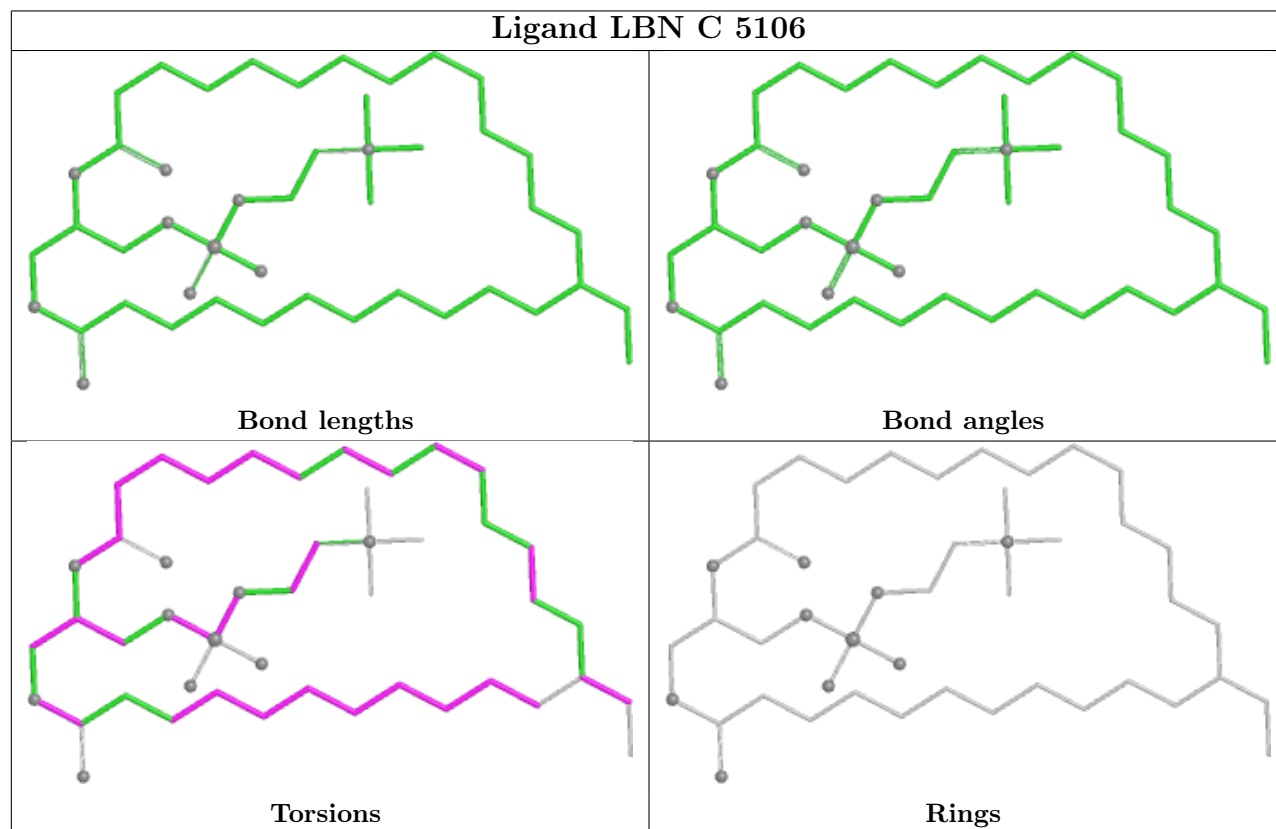
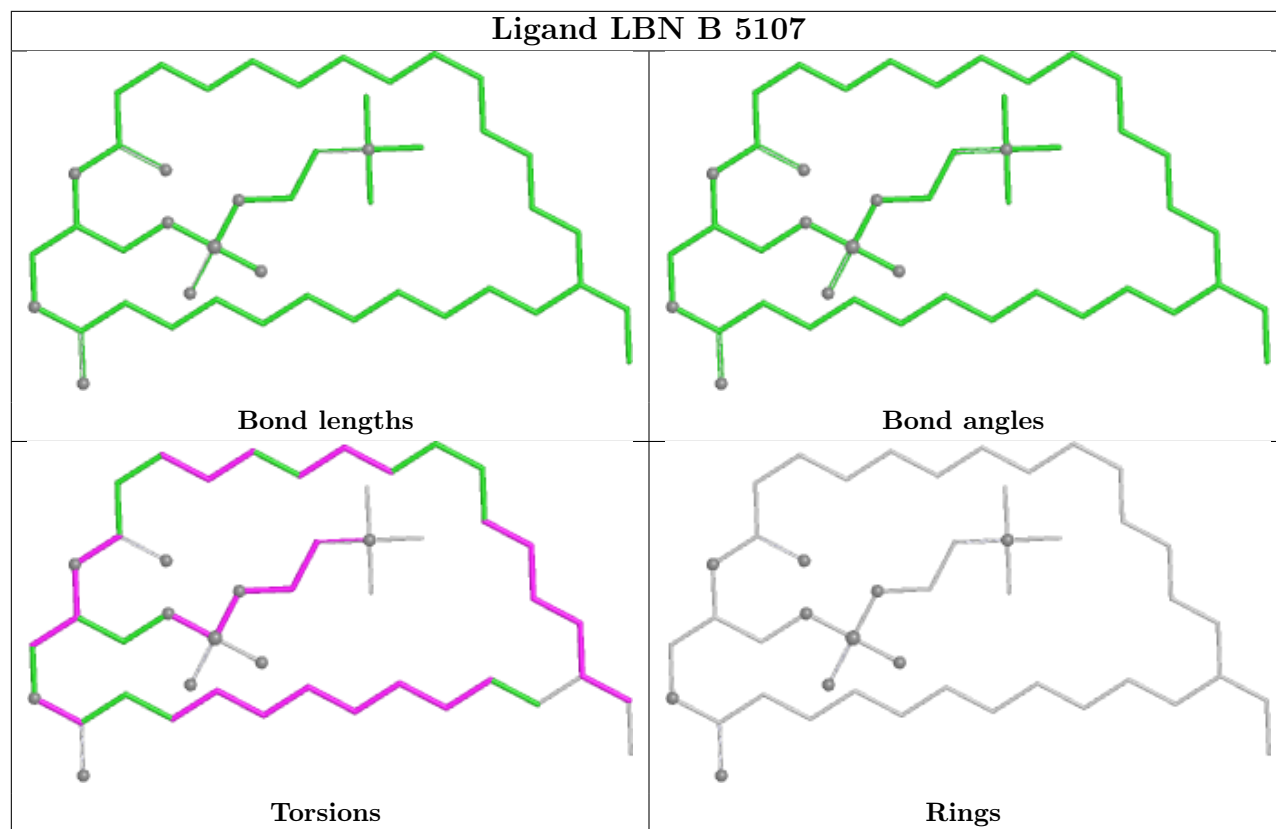
Continued from previous page...

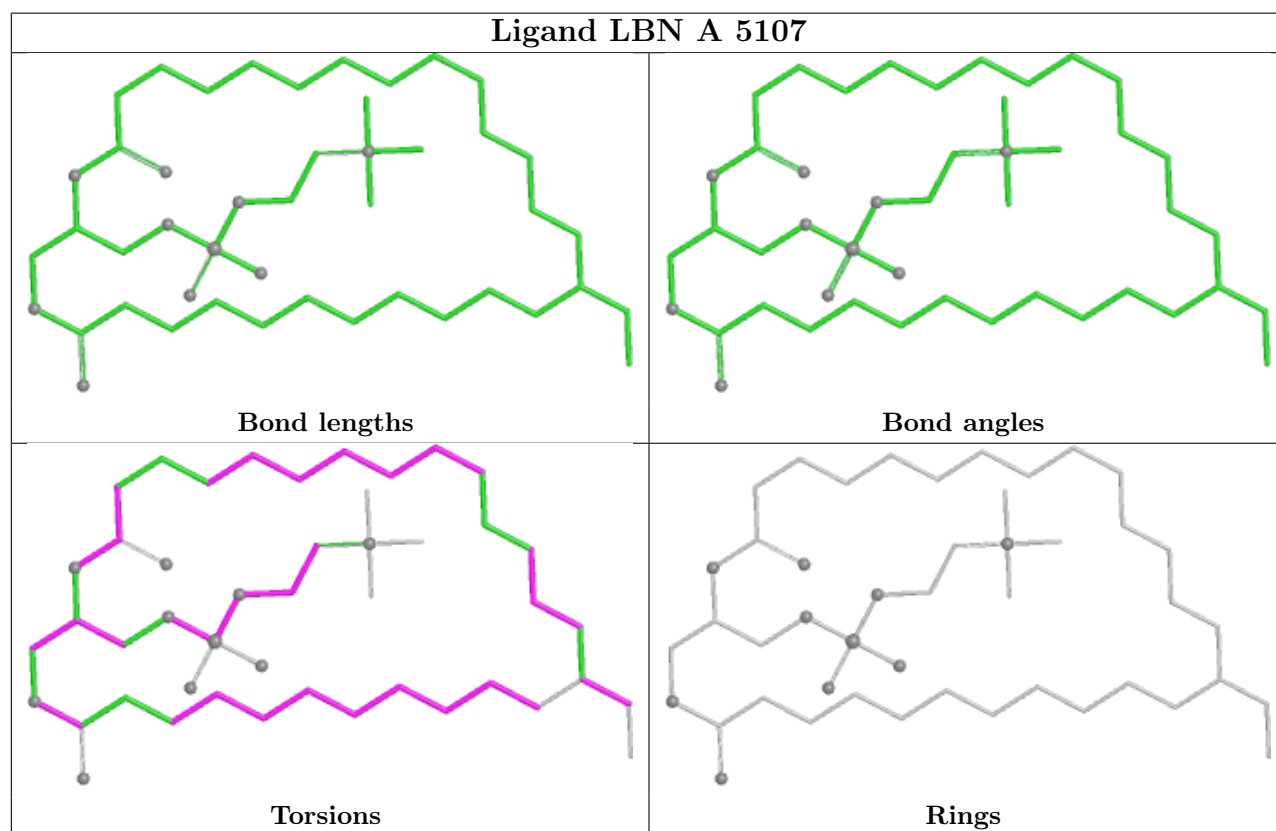
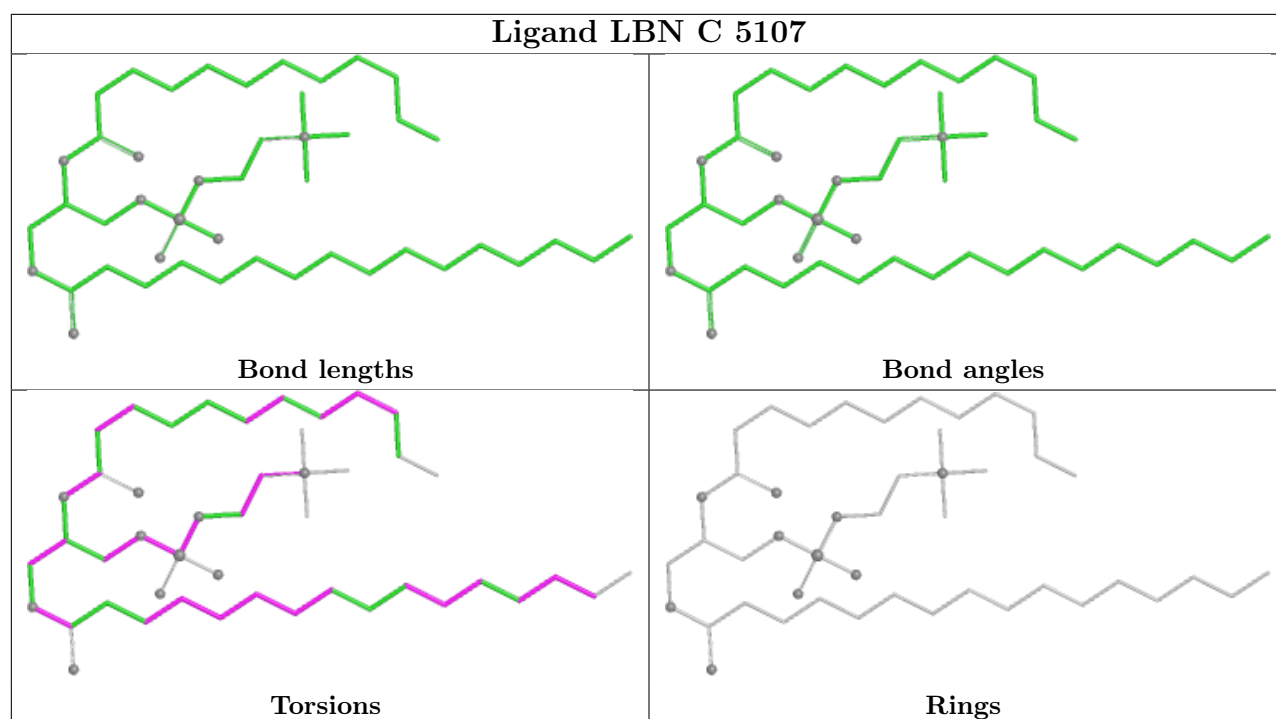
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	D	5106	LBN	1	0
2	A	5101	ACP	1	0

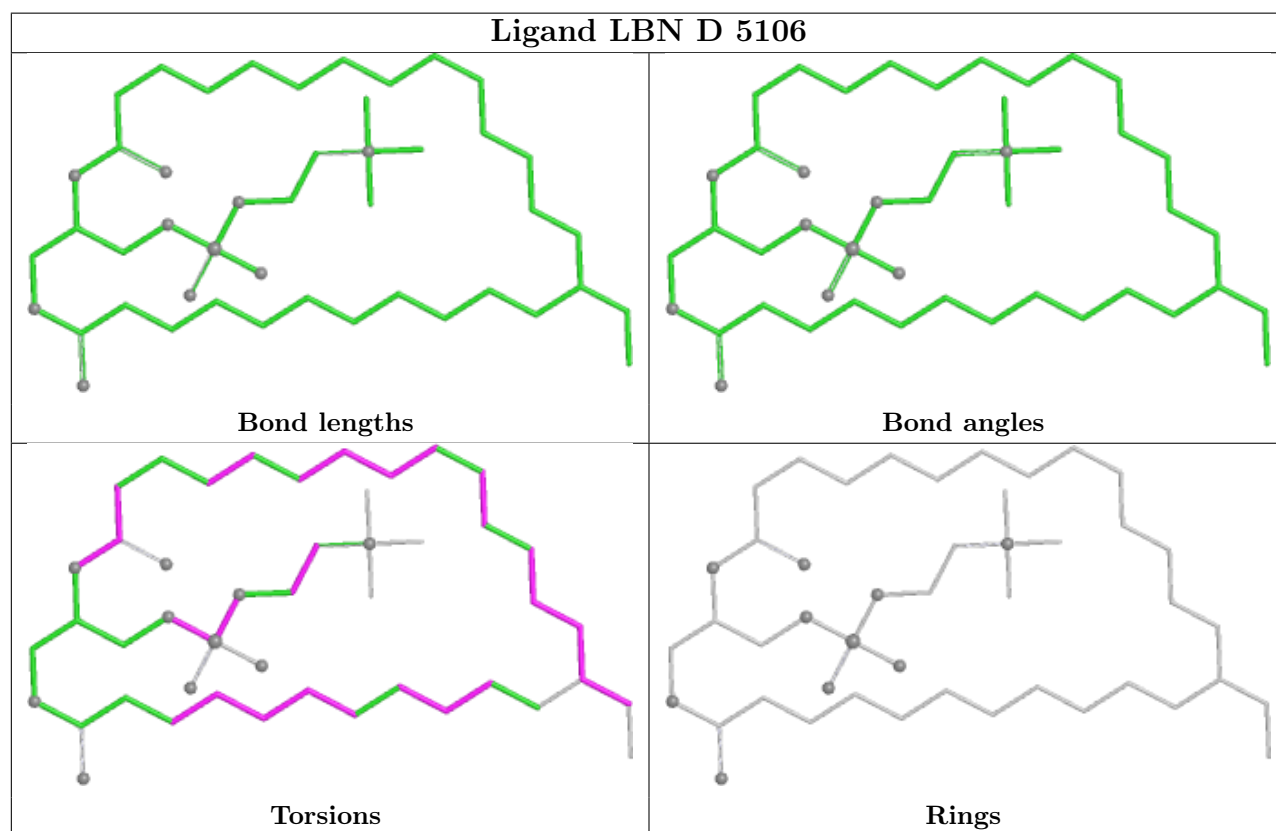
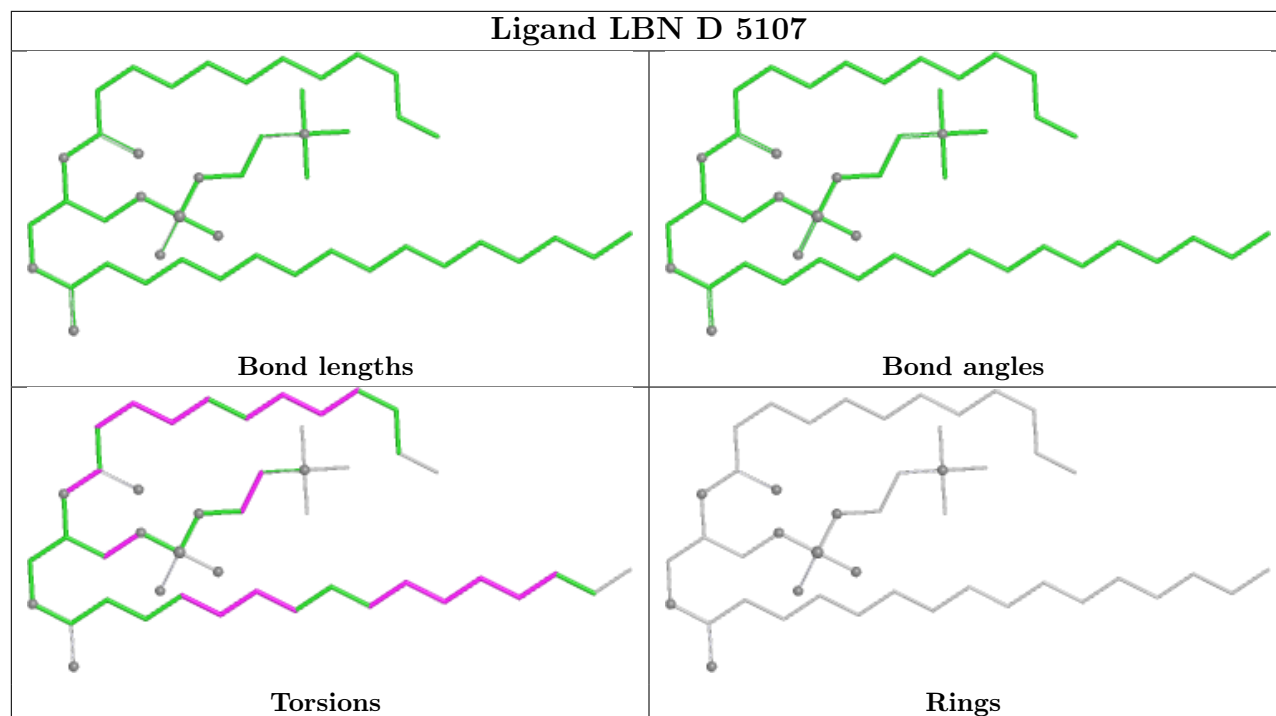
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

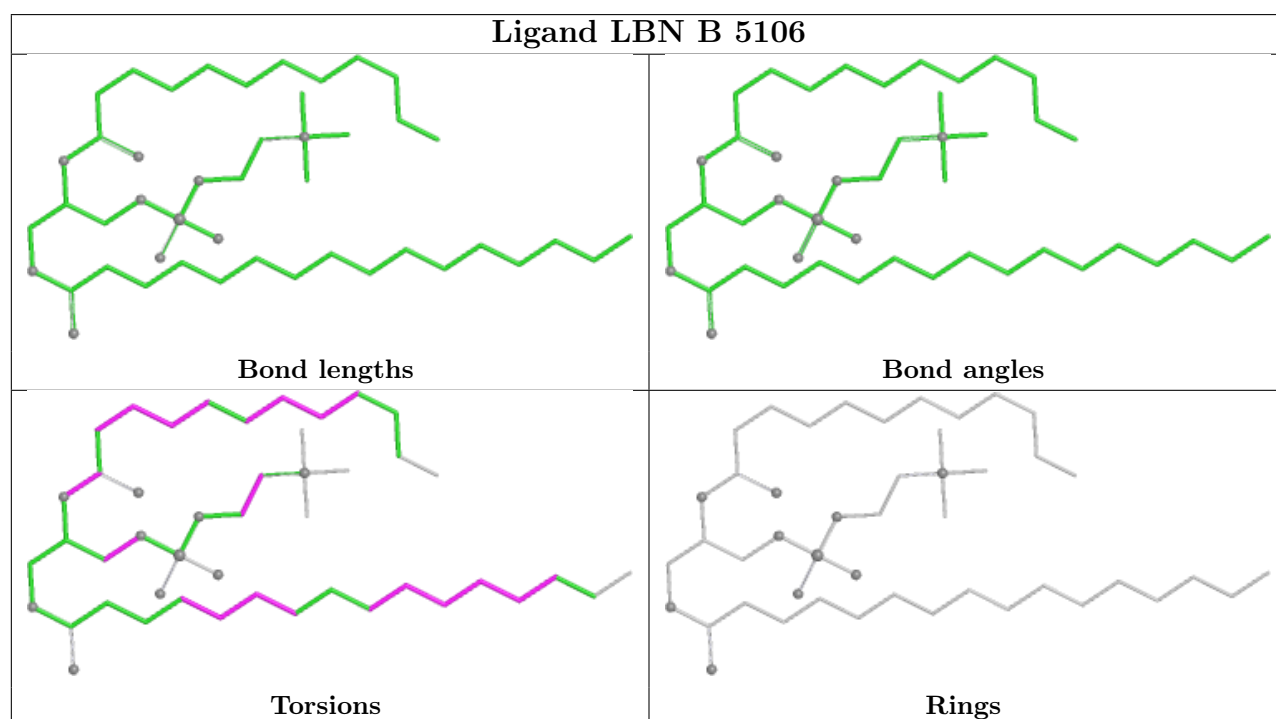
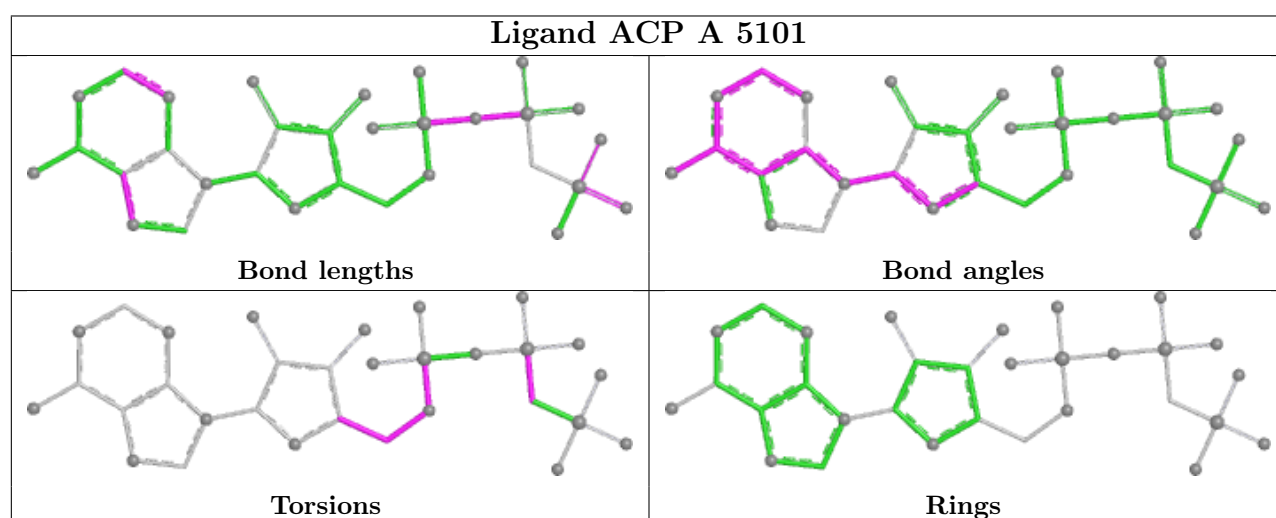
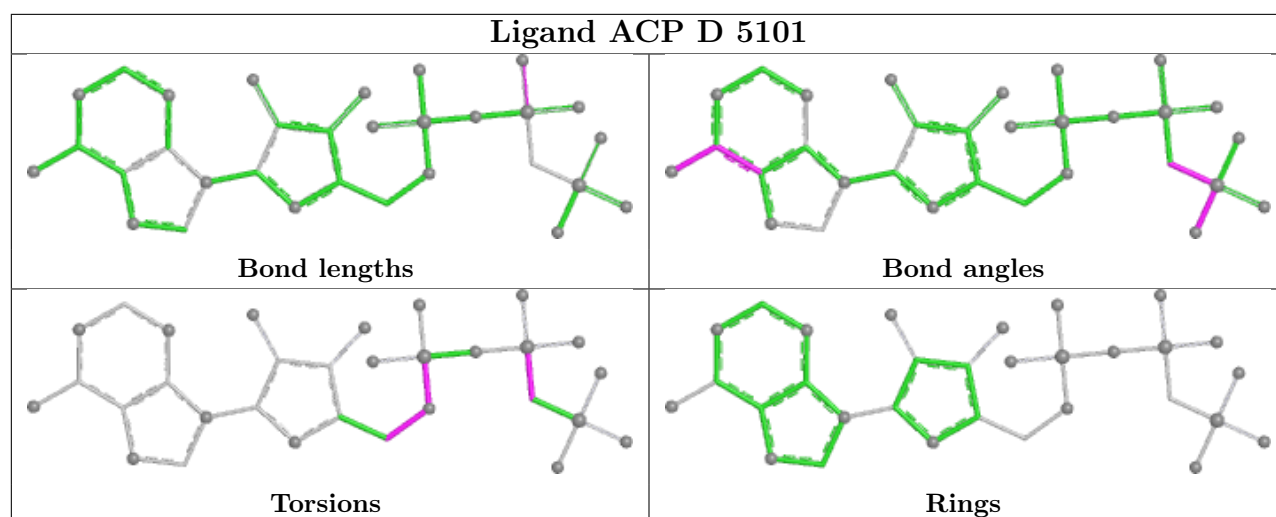














## 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

There are no chain breaks in this entry.

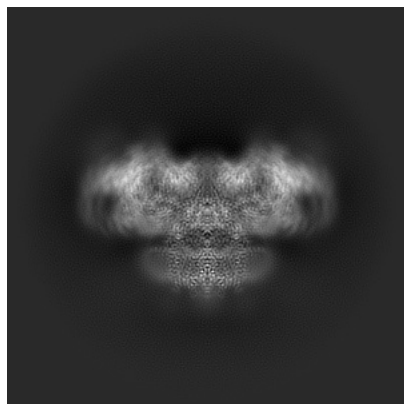
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-26610. These allow visual inspection of the internal detail of the map and identification of artifacts.

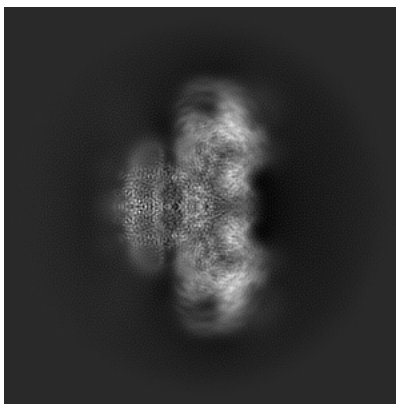
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

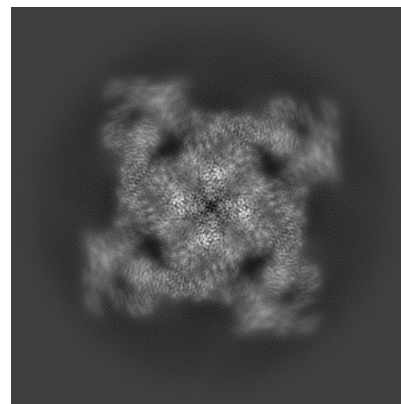
#### 6.1.1 Primary map



X

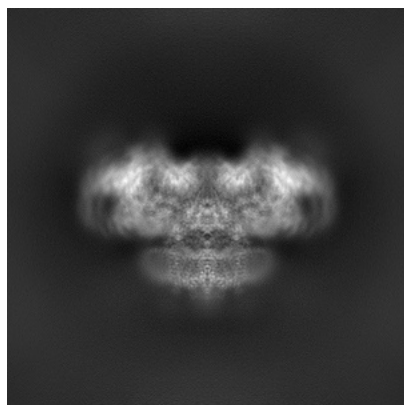


Y

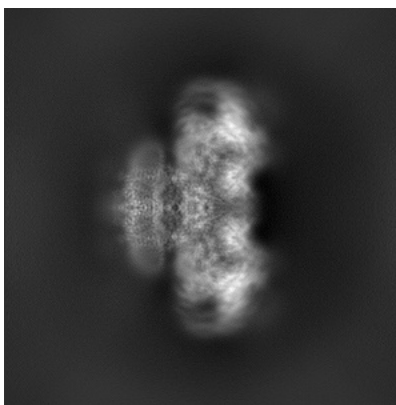


Z

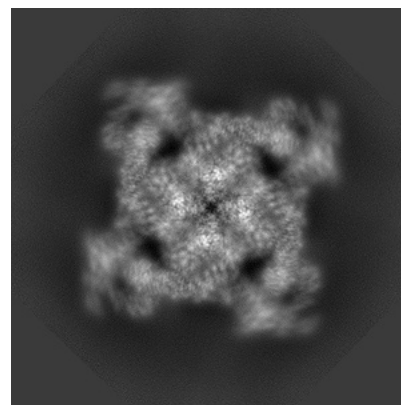
#### 6.1.2 Raw map



X



Y

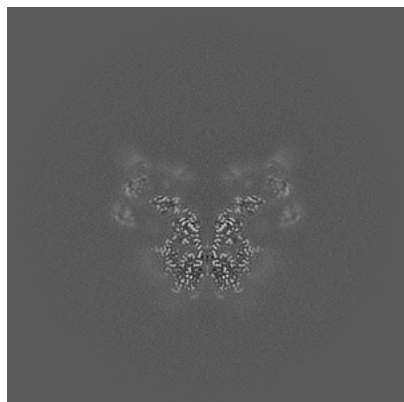


Z

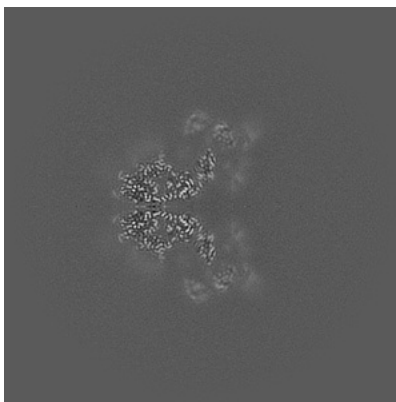
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

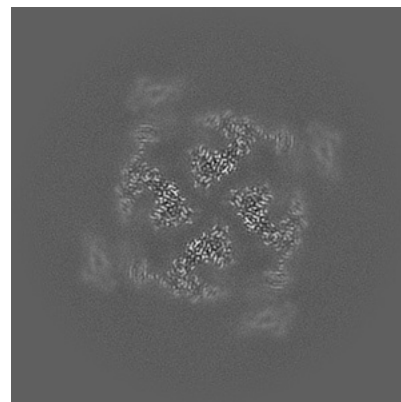
### 6.2.1 Primary map



X Index: 276

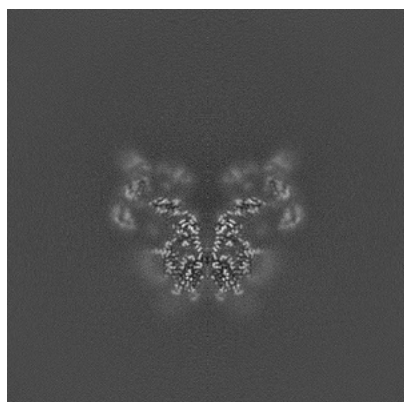


Y Index: 276

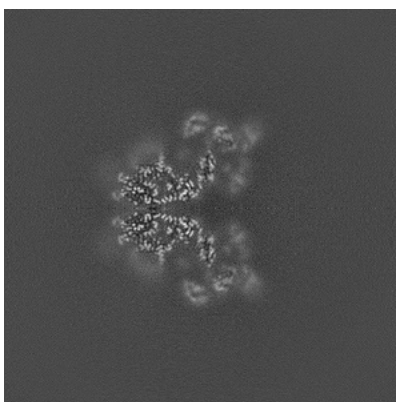


Z Index: 276

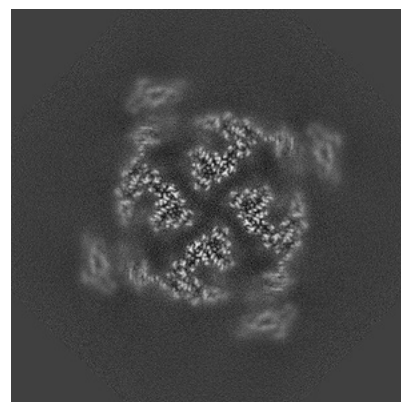
### 6.2.2 Raw map



X Index: 276



Y Index: 276

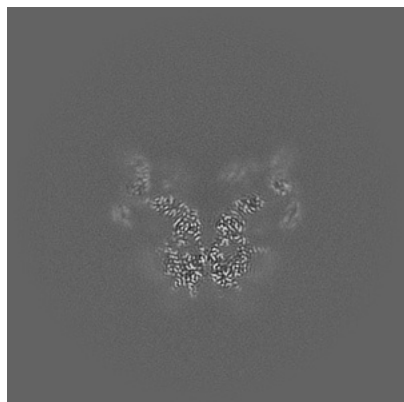


Z Index: 276

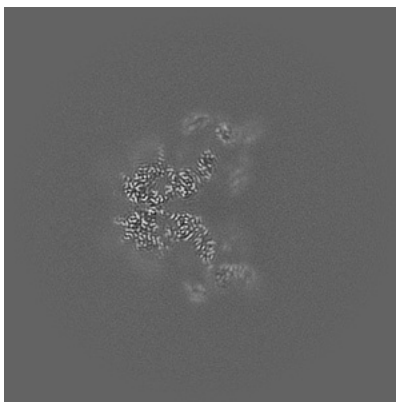
The images above show central slices of the map in three orthogonal directions.

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

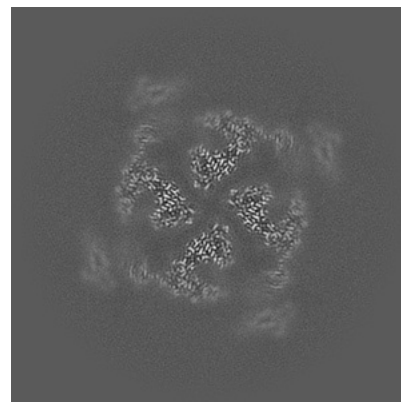
### 6.3.1 Primary map



X Index: 280

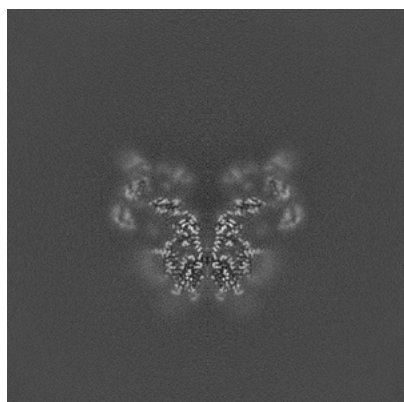


Y Index: 272

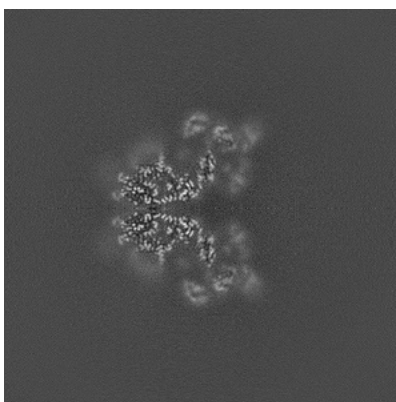


Z Index: 275

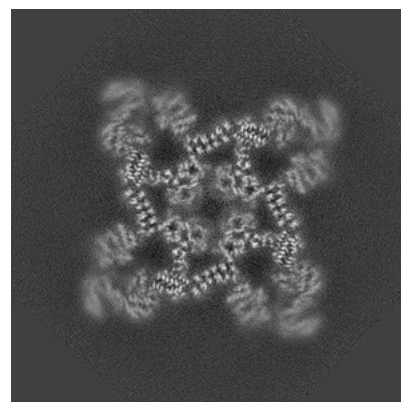
### 6.3.2 Raw map



X Index: 276



Y Index: 276

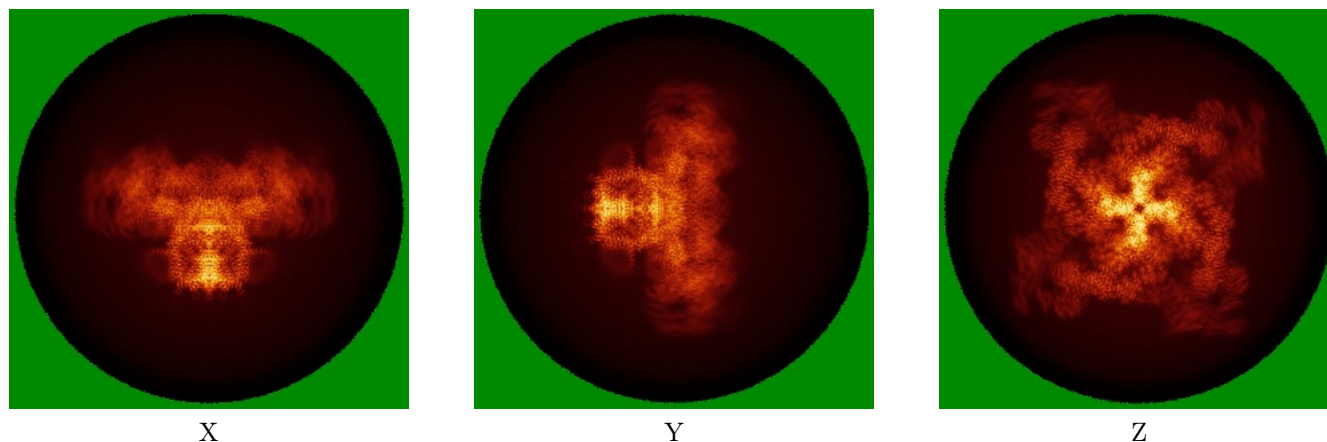


Z Index: 311

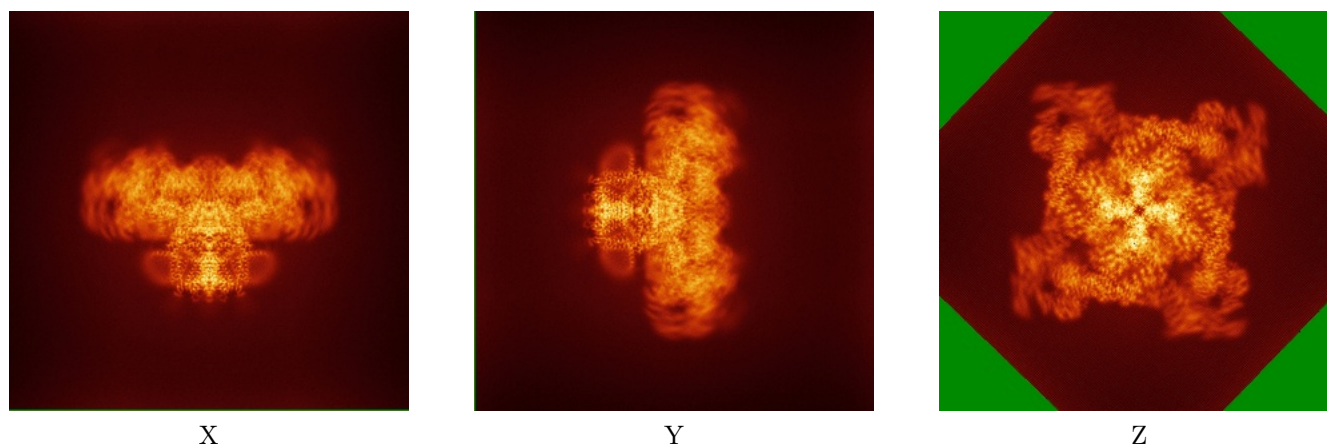
The images above show the largest variance slices of the map in three orthogonal directions.

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

### 6.4.1 Primary map



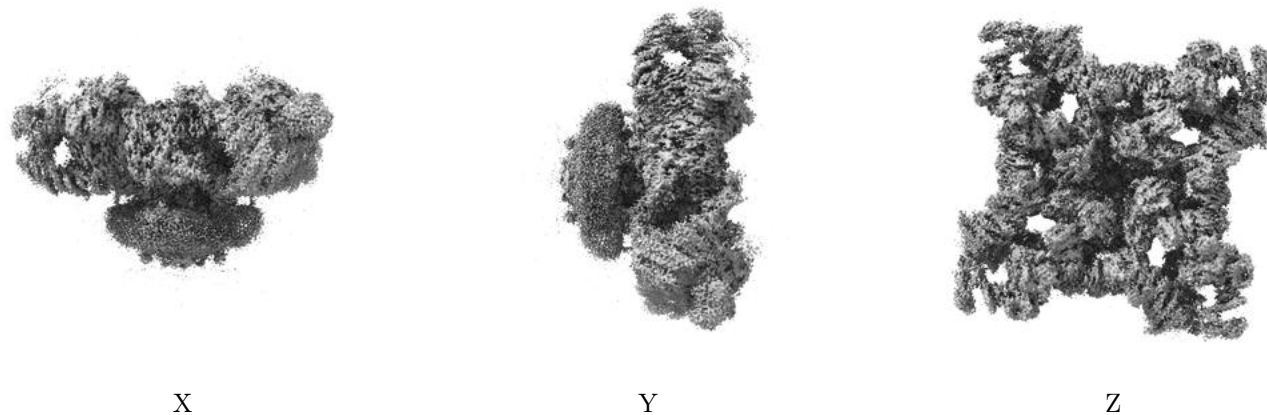
### 6.4.2 Raw map



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.

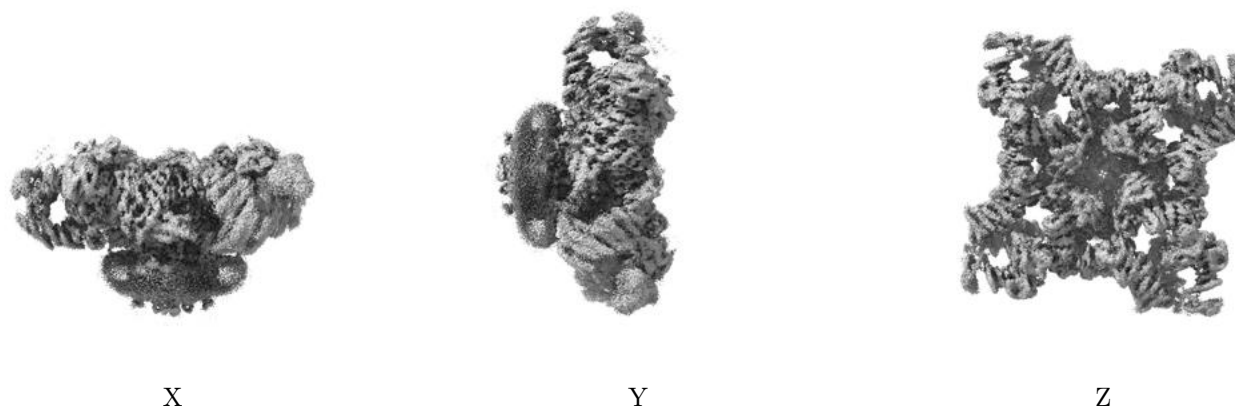
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.09. 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.

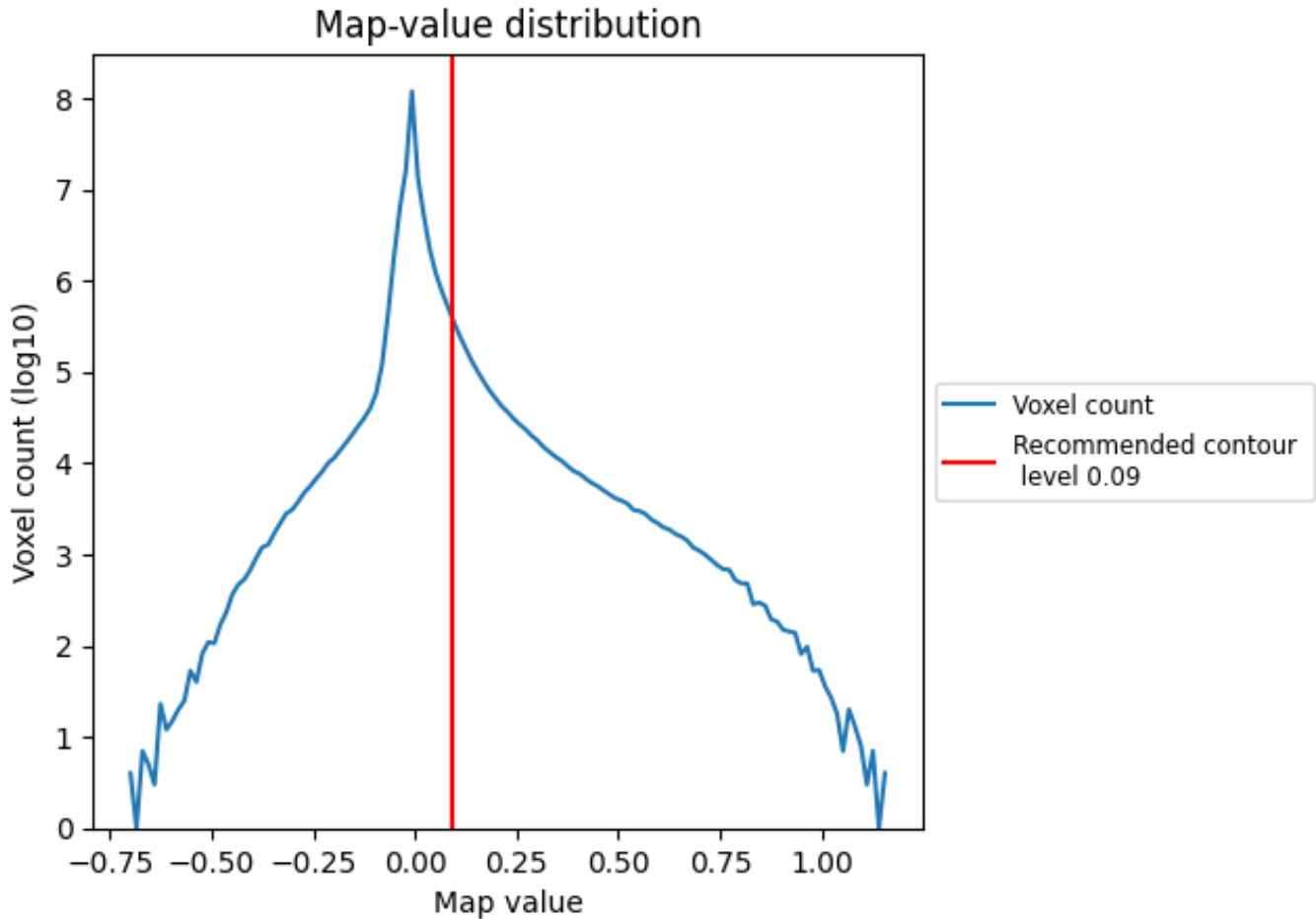
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

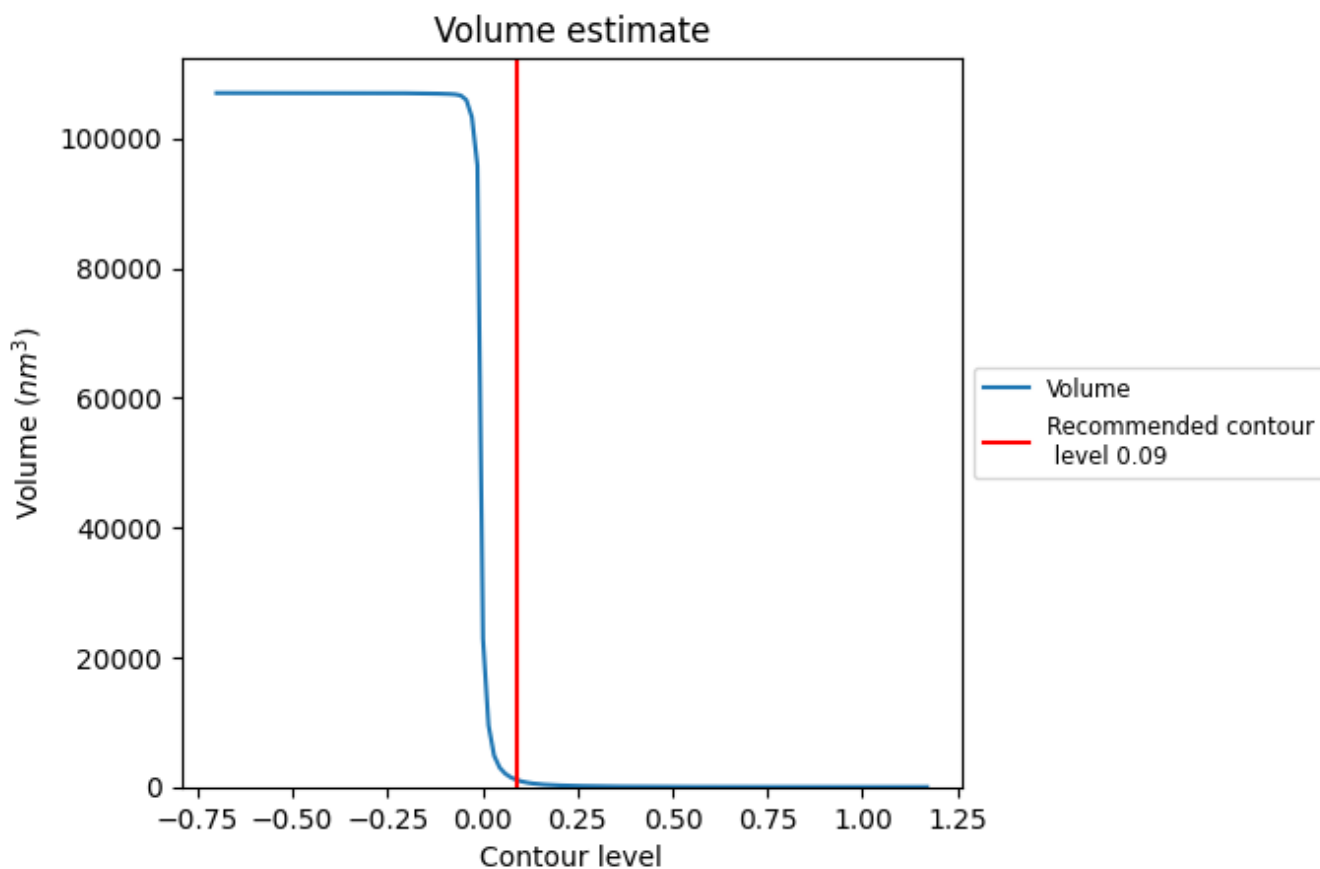
This section contains the results of statistical analysis of the map.

### 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](#)

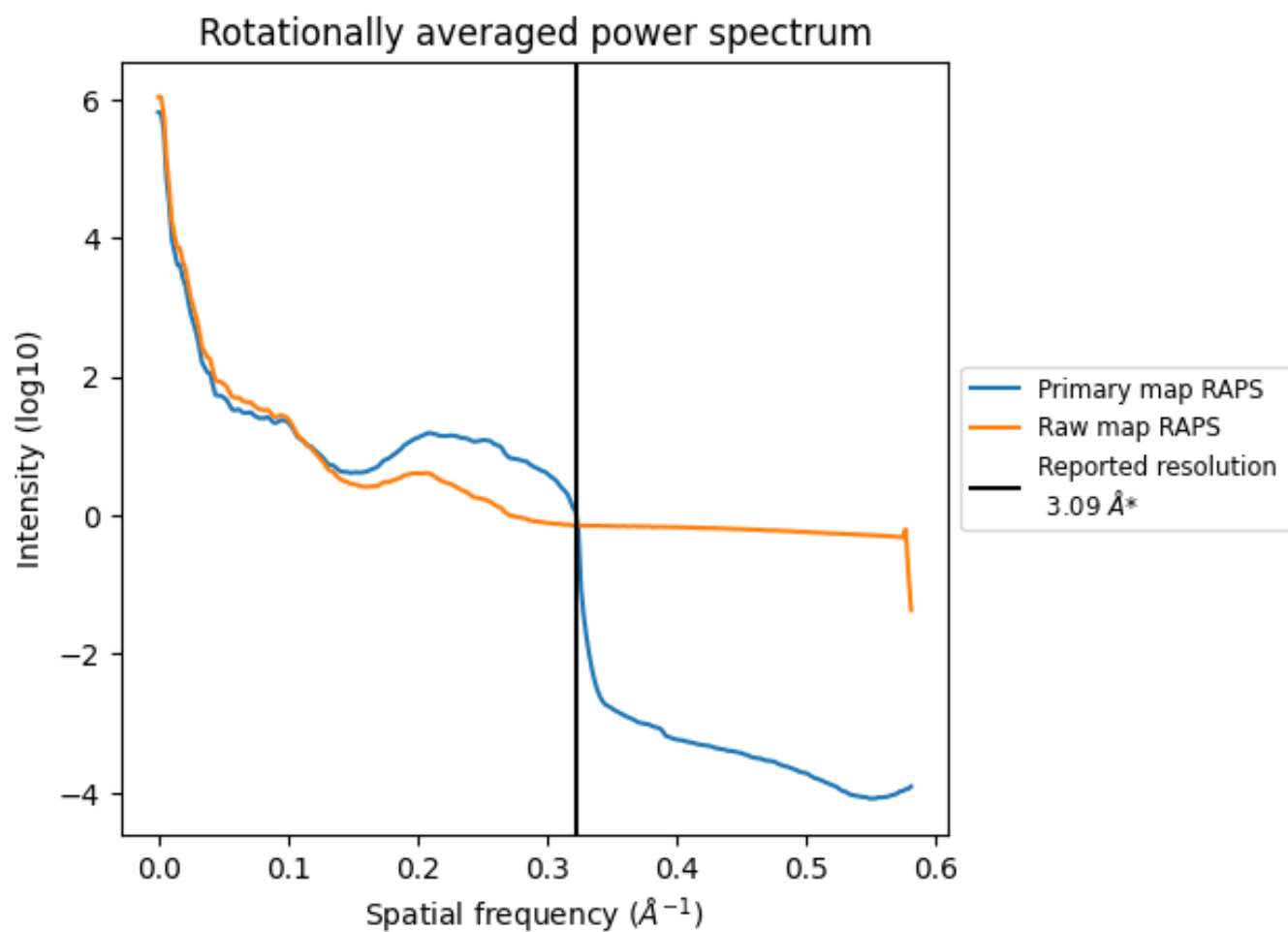


The volume at the recommended contour level is 1086  $\text{nm}^3$ ; this corresponds to an approximate mass of 981 kDa.

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](#)

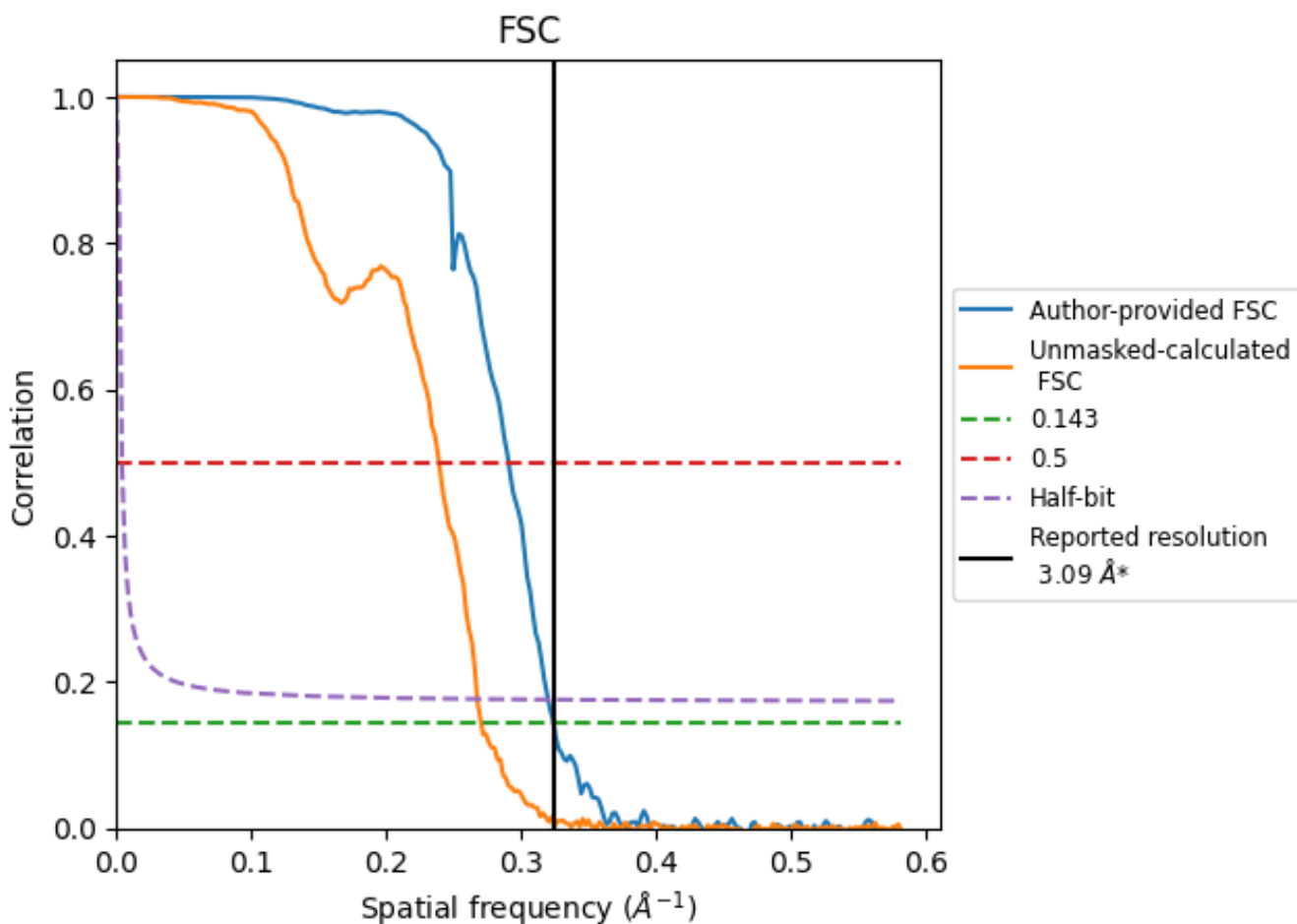


\*Reported resolution corresponds to spatial frequency of 0.324 Å<sup>-1</sup>

## 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 0.324 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

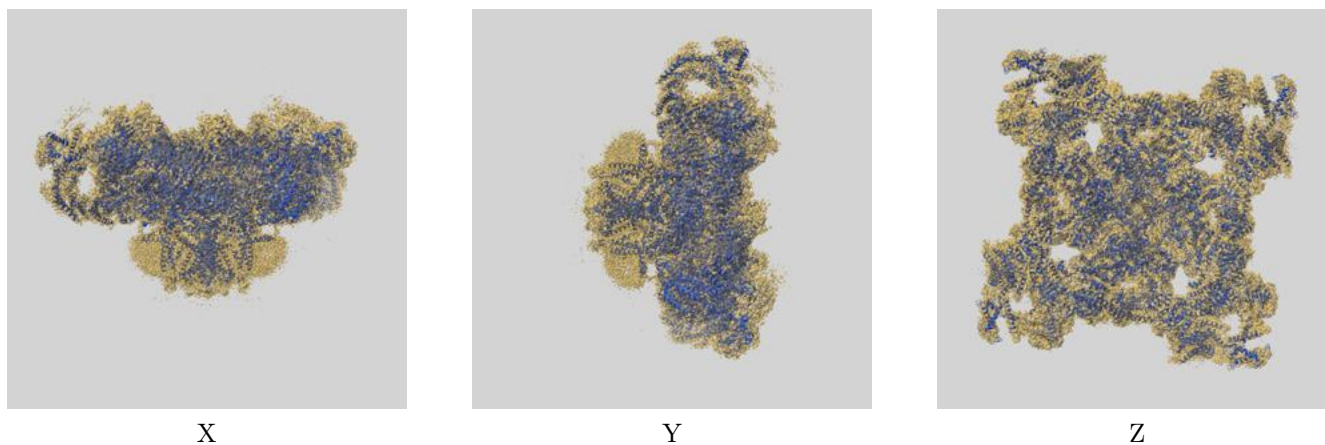
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.09	-	-
Author-provided FSC curve	3.09	3.44	3.13
Unmasked-calculated*	3.70	4.18	3.74

\*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 3.70 differs from the reported value 3.09 by more than 10 %

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

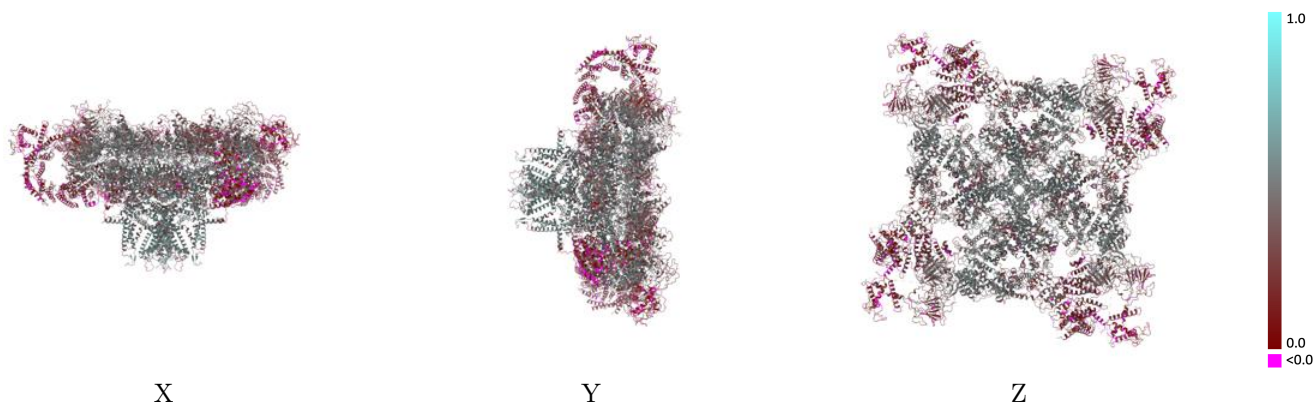
This section contains information regarding the fit between EMDB map EMD-26610 and PDB model 7UMZ. Per-residue inclusion information can be found in section [3](#) on page [6](#).

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



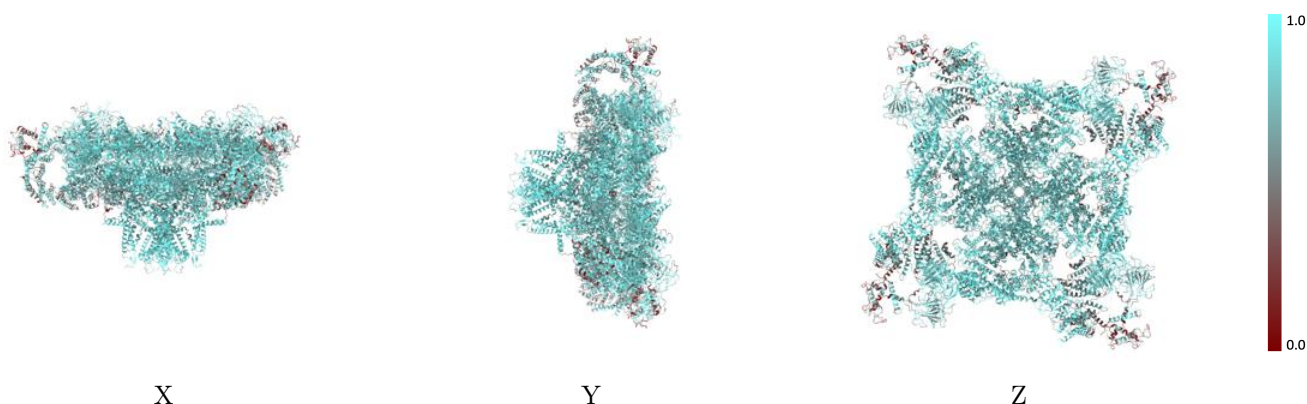
The images above show the 3D surface view of the map at the recommended contour level 0.09 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



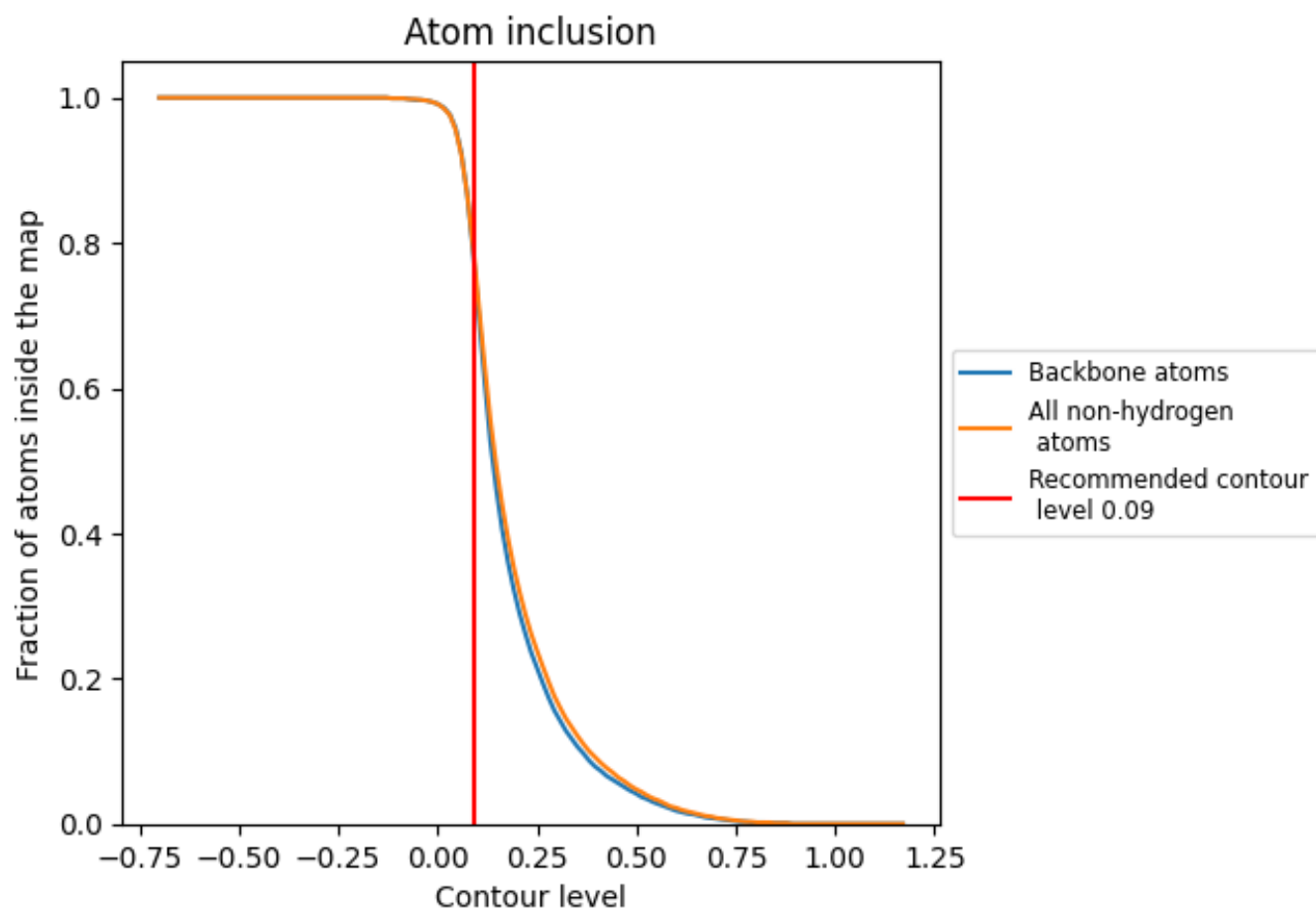
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.09).










## 9.4 Atom inclusion [i](#)



At the recommended contour level, 78% of all backbone atoms, 79% 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 (0.09) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7900	 0.3840
A	 0.7930	 0.3840
B	 0.7910	 0.3840
C	 0.7920	 0.3830
D	 0.7940	 0.3840

