



wwPDB EM Validation Summary Report ⓘ

Nov 8, 2023 – 04:58 AM EST

PDB ID : 8UQ2
EMDB ID : EMD-42458
Title : Structure of human RyR2-S2808D in the subprimed state
Authors : Miotto, M.C.; Marks, A.R.
Deposited on : 2023-10-23
Resolution : 2.98 Å (reported)
Based on initial model : 7UA5

This is a wwPDB EM Validation Summary 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.dev70
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) : 2.36

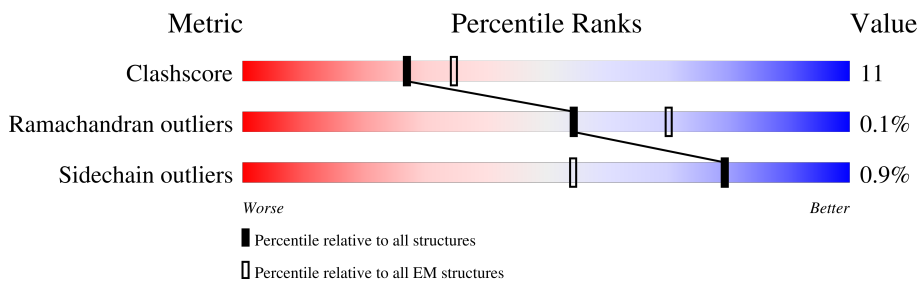
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 2.98 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 ≥ 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	4967	
1	B	4967	
1	C	4967	
1	D	4967	
2	E	108	
2	F	108	
2	G	108	
2	H	108	

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 138608 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 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	4224	33771	21516	5745	6280	230	2	0
1	B	4224	33771	21516	5745	6280	230	2	0
1	C	4224	33771	21516	5745	6280	230	2	0
1	D	4224	33771	21516	5745	6280	230	2	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	2808	ASP	SER	engineered mutation	UNP Q92736
B	2808	ASP	SER	engineered mutation	UNP Q92736
C	2808	ASP	SER	engineered mutation	UNP Q92736
D	2808	ASP	SER	engineered mutation	UNP Q92736

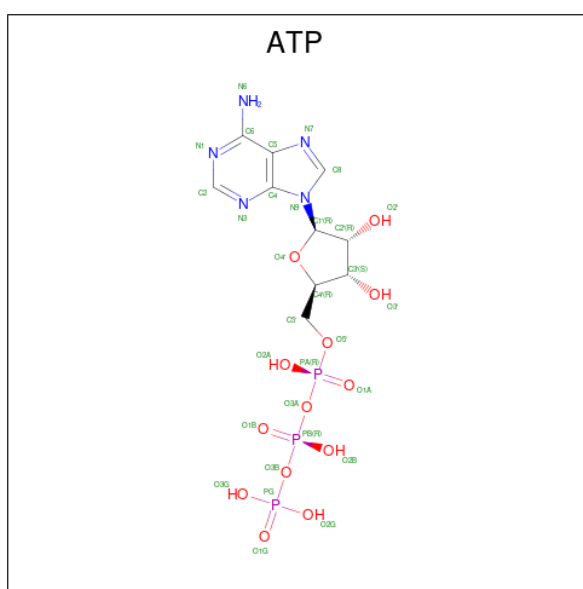
- Molecule 2 is a protein called Peptidyl-prolyl cis-trans isomerase FKBP1B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	E	107	818	516	144	154	4	0	0
2	F	107	818	516	144	154	4	0	0
2	G	107	818	516	144	154	4	0	0
2	H	107	818	516	144	154	4	0	0

- Molecule 3 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

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

- Molecule 4 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	AltConf
4	A	1	Total C N O P 31 10 5 13 3	0
4	A	1	Total C N O P 31 10 5 13 3	0
4	B	1	Total C N O P 31 10 5 13 3	0
4	B	1	Total C N O P 31 10 5 13 3	0
4	C	1	Total C N O P 31 10 5 13 3	0
4	C	1	Total C N O P 31 10 5 13 3	0
4	D	1	Total C N O P 31 10 5 13 3	0

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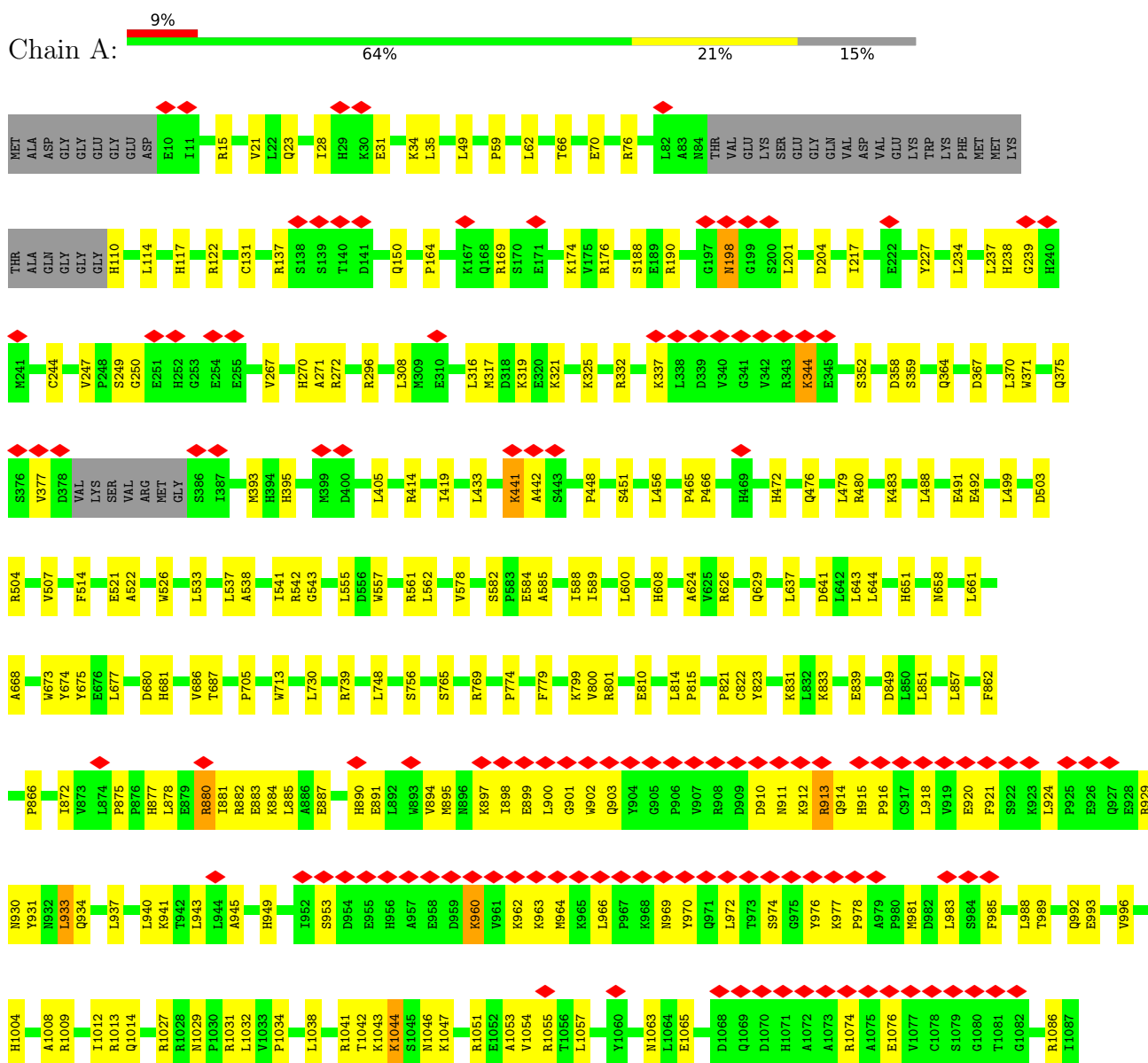
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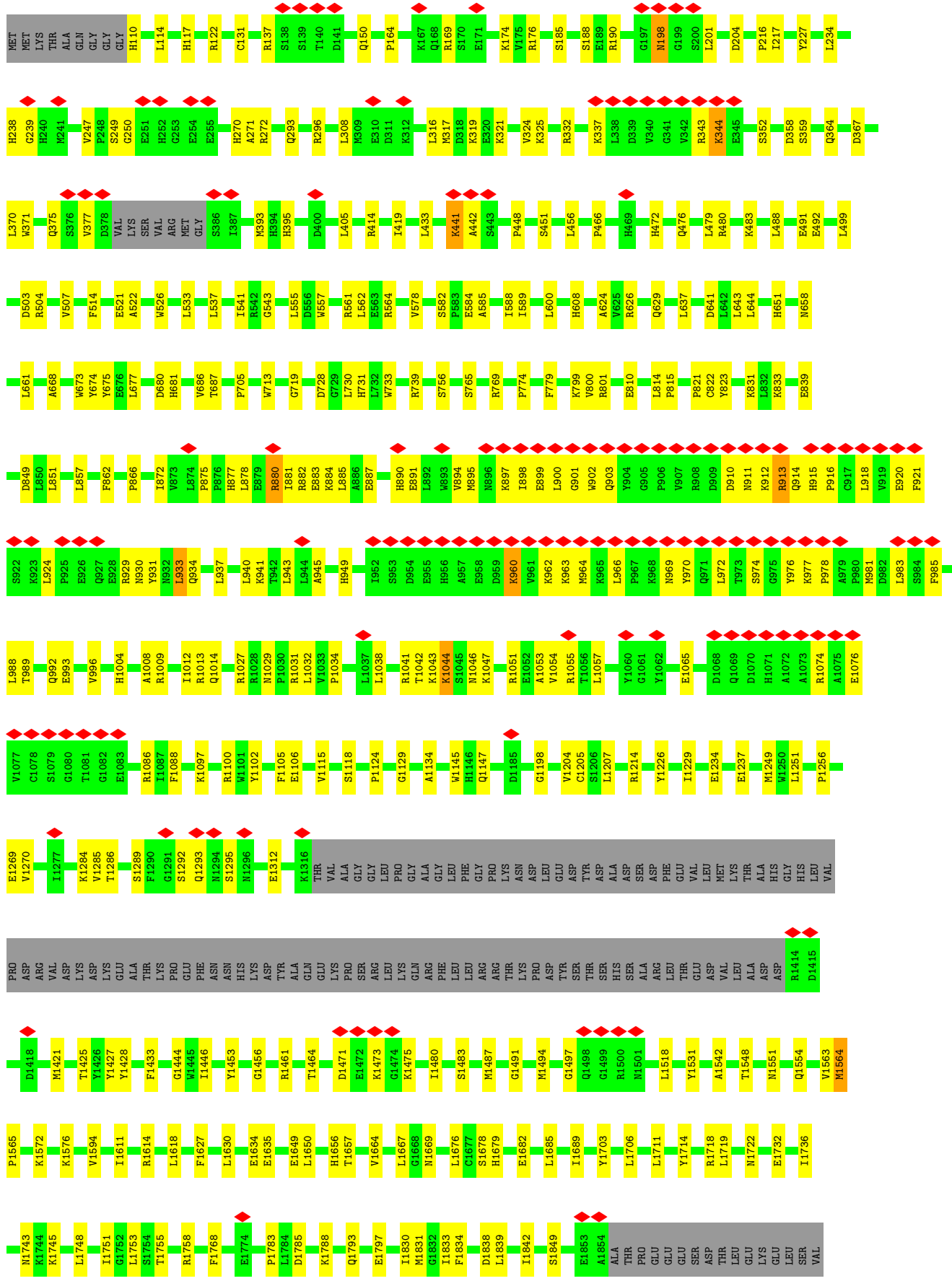
Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
4	D	1	31	10	5	13	3	0

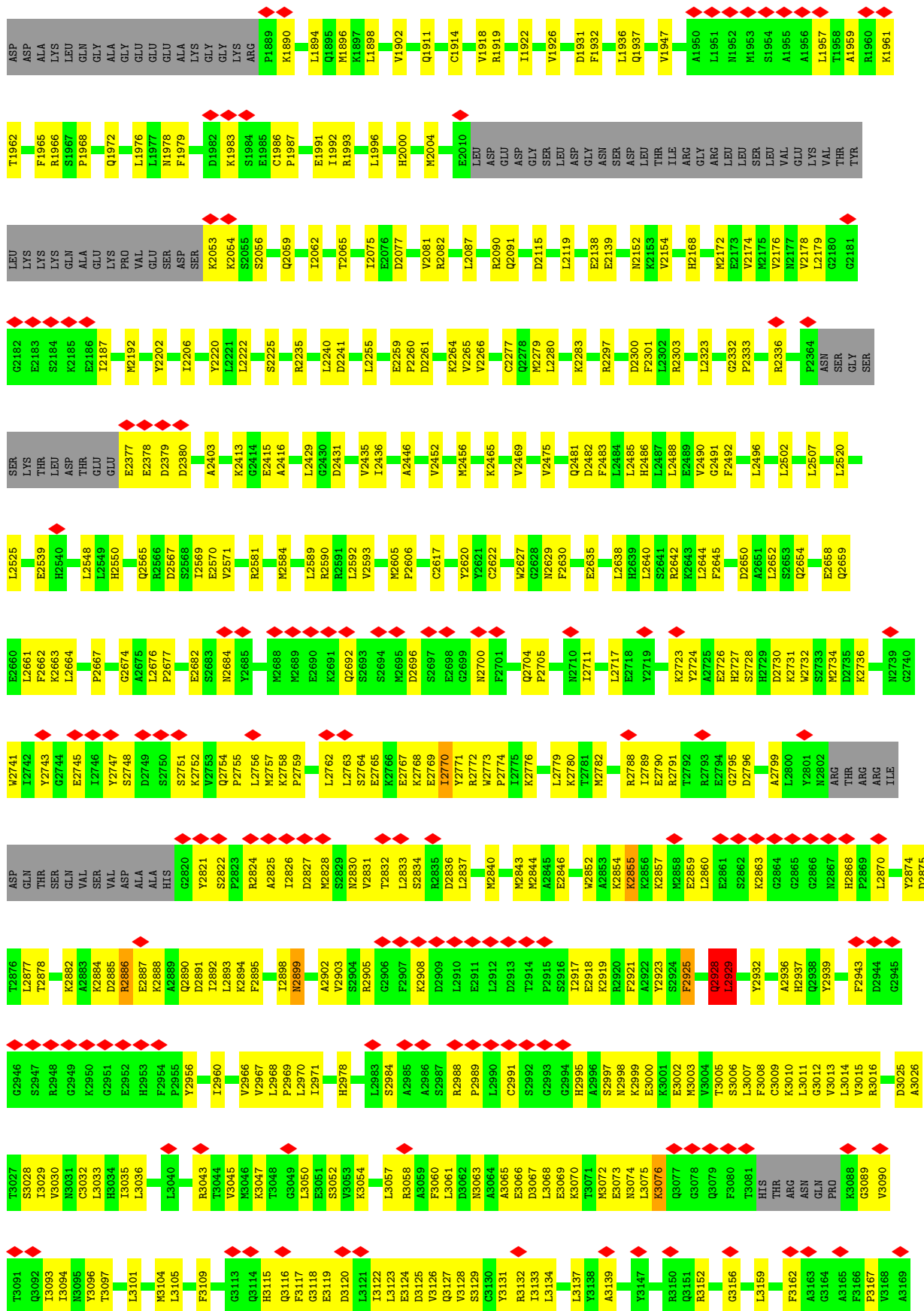
3 Residue-property plots

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.

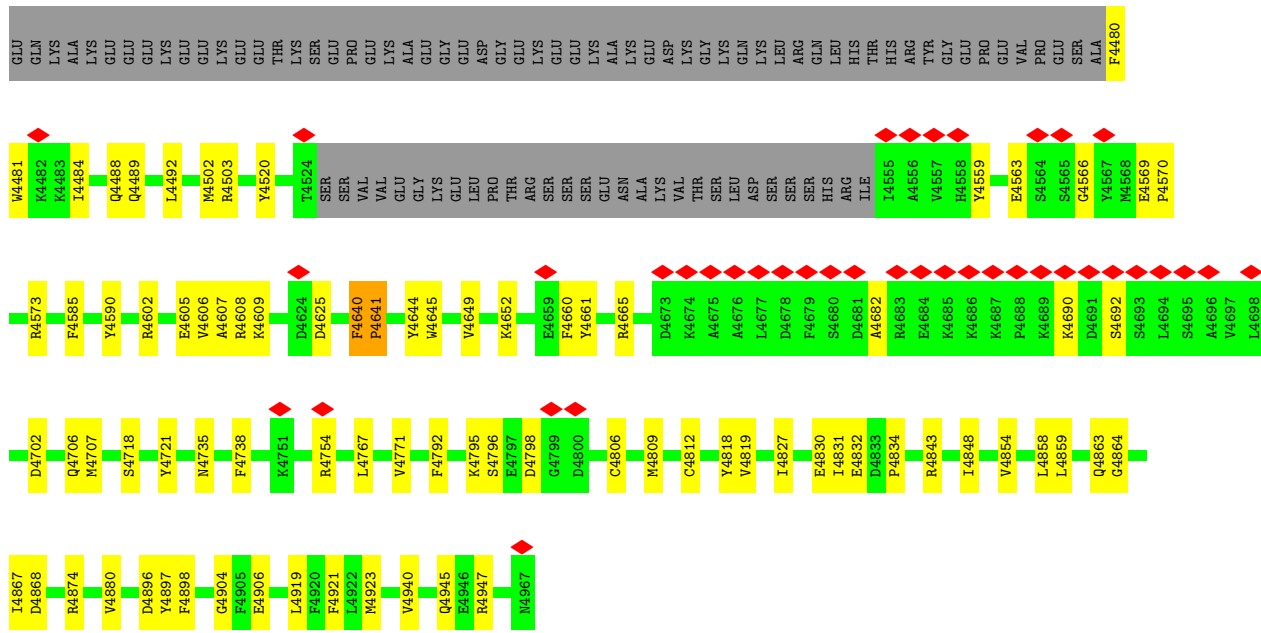
• Molecule 1: Ryanodine receptor 2



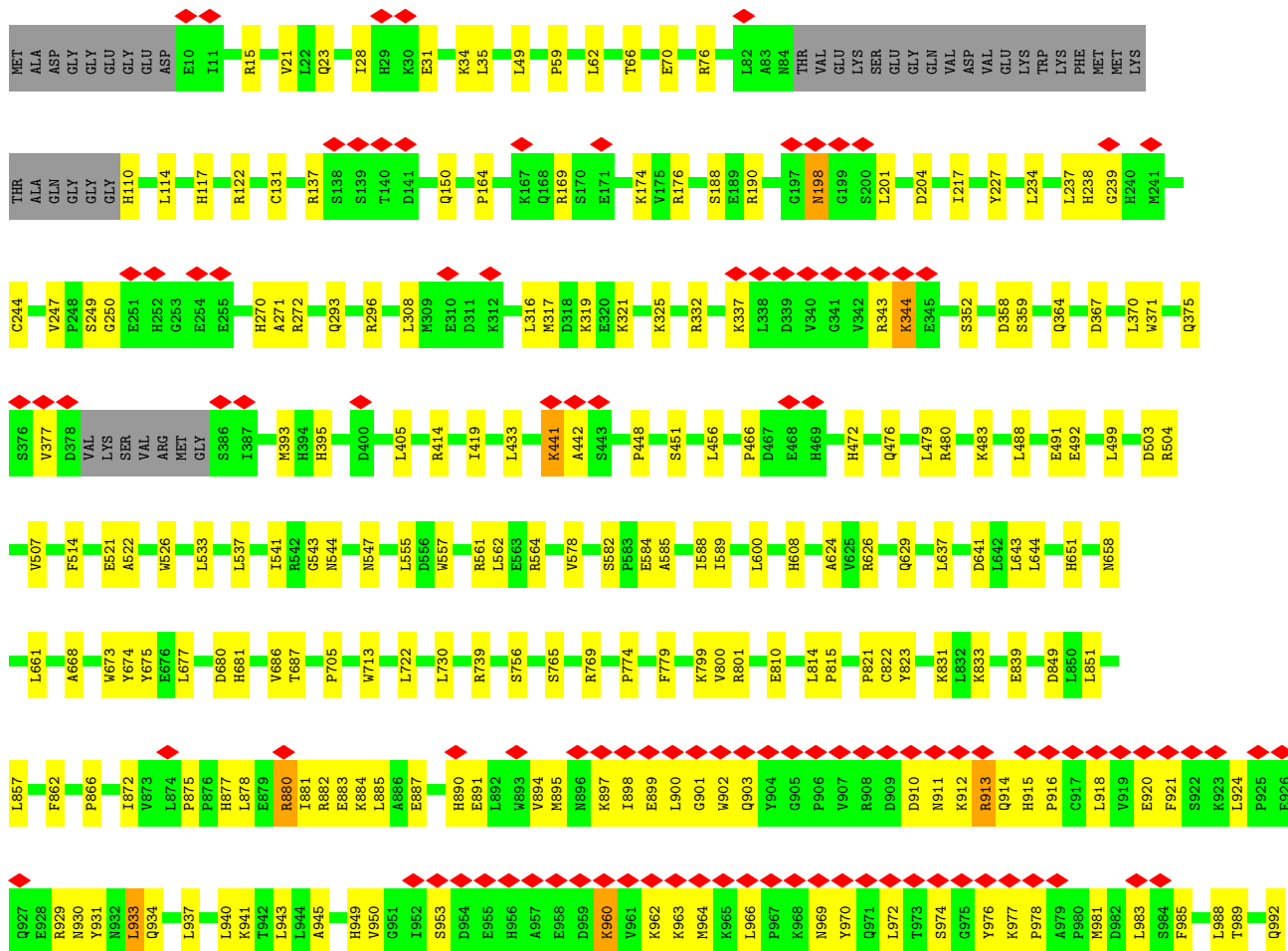


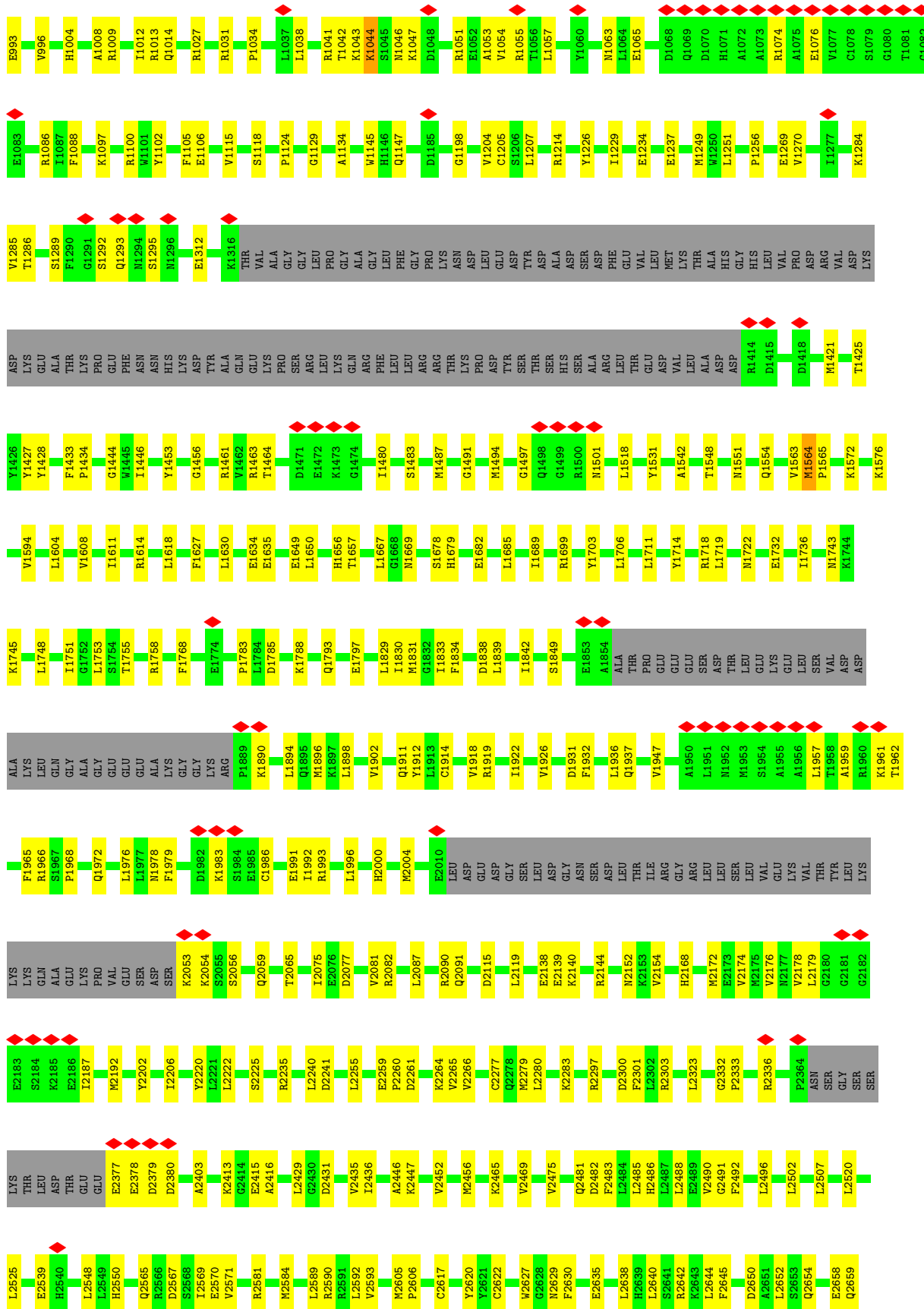


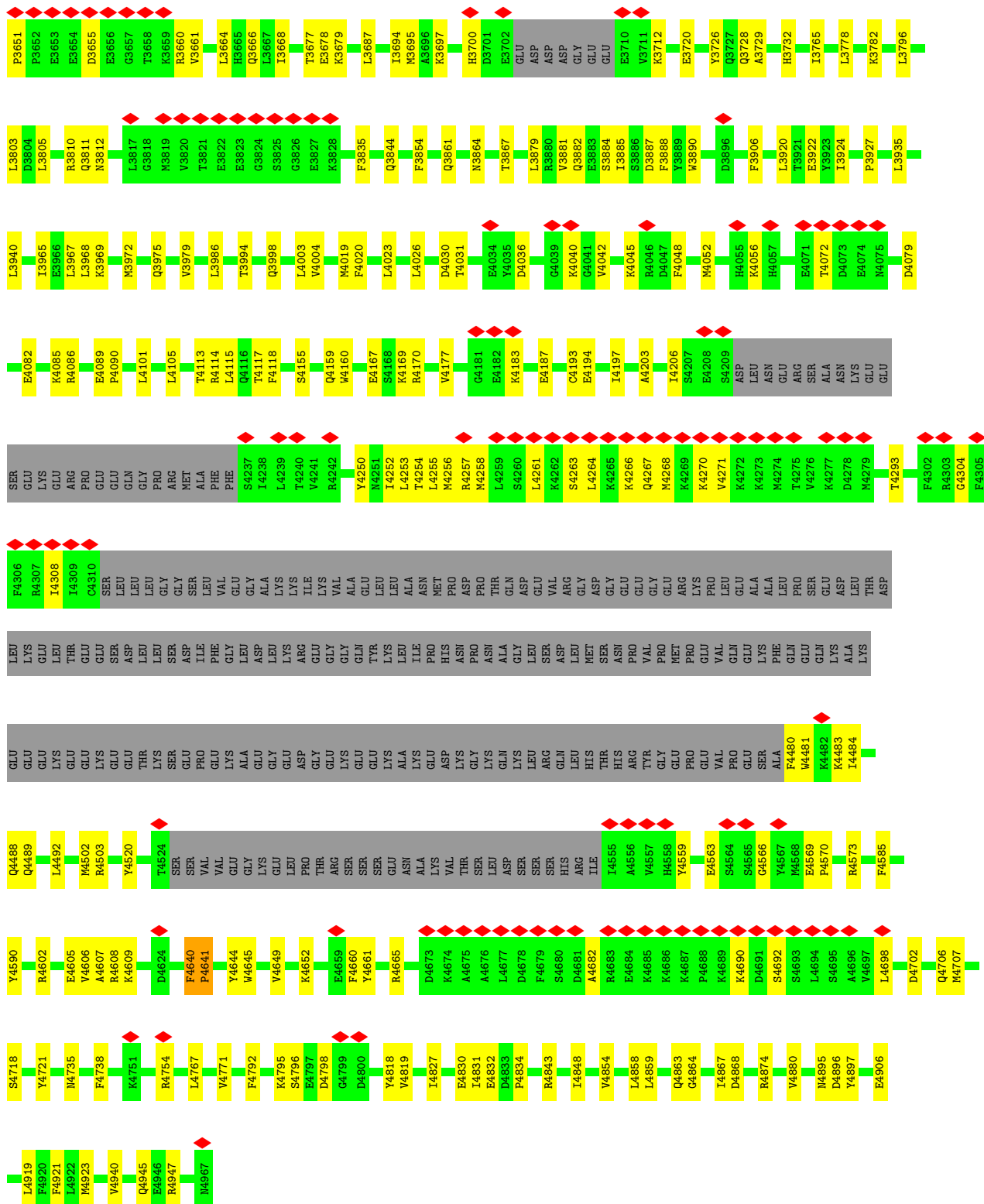
F3170	W3260	K3316	VAL	SER	SER	VAL	VAL	E5642	K3782	P3927	D4074	ALA	F4302	GLU
L3171	E3251	F3319	ASP	LYS	LYS	LEU	LEU	K3646	K3782	L3935	E4074	ASN	R4303	ASP
H3174	E3265	L3320	TYR	THR	THR	HIS	HIS	P3650	L3796	L3940	N4075	GLU	G4304	THR
L3175	N3266	P3321	ARG	ARG	ARG	LEU	LEU	E3650	L3940	L3986	D4079	GLU	F4306	LEU
D3176	E3259	M3323	ALA	ALA	ALA	GLN	GLN	P3651	L3803	I3985	E4082	SER	I4308	LYS
H3178	R3260	K3324	LYS	VAL	VAL	LYS	LYS	P3652	D3804	E3986	E4082	LYS	R4307	GLU
N3179	A3261	K3325	TRP	LEU	LEU	ARG	ARG	E3653	L3805	L3967	K4085	ARG	I4308	THR
Y3184	E3262	L3326	LEU	GLN	GLN	ILE	ILE	E3654	R3810	L3968	R4086	PRO	I4308	GLU
K3187	M3263	K3327	PRO	PRO	PRO	GLY	GLY	D3655	N3812	K3969	E4089	GLU	C4310	SER
S3188	C3264	K3328	ASN	ASN	ASN	ARG	ARG	E3656	L3817	M3972	P4090	GLN		ASP
S3189	T3266	K3329	LYS	LYS	LYS	ARG	ARG	G3657	G3818	Q3975	L4101	GLY		LEU
R3190	A3267	A3330	LYS	LYS	LYS	SER	SER	T3658	M3819	Q3975	L4101	LEU		LEU
E3191	L3268	A3331	ALA	ALA	ALA	HIS	HIS	K3659	M3819	Q3975	L4101	LEU		LEU
R3192	N3269	T3332	GLU	GLU	GLU	TYR	TYR	V3661	V3820	V3979	L4105	ARG		GLY
A3193	S270	V3333	LEU	LEU	LEU	CYS	CYS	V3661	T3821	L3986	L4105	ALA		GLY
A3194	E3271	V3334	PHE	PHE	PHE	VAL	VAL	L3664	E3822	L3986	T4113	ALA		LEU
L3197	M3272	V3335	ARG	ARG	ARG	GLY	GLY	H3665	E3822	L3986	R4114	PHE		VAL
F3198	L3276	S3336	ASP	ASP	ASP	GLU	GLU	Q3666	E3824	T3994	L4115			VAL
N3200	G2778	E3337	HIS	HIS	HIS	PRO	PRO	H3667	Q3824	Q3998	Q4116			GLY
D3203	L3276	ASP	LEU	LEU	LEU	GLU	GLU	L3668	S3825	L4003	F4117			ALA
V3204	G2778	HIS	VAL	VAL	VAL	ASP	ASP	T3677	G3826	V4004	S4155			LYS
N3207	E3278	LEU	GLN	GLN	GLN	SER	SER	E3678	E3827	M4019	Q4159			LYS
L3211	N3280	LEU	VAL	VAL	VAL	LYS	LYS	K3679	K3828	F4020	W4160			ILE
E3212	L3281	ALA	TRP	TRP	TRP	ALA	ALA	L3687	F3835	L4023	E4167			VAL
K3213	K3282	ARG	ILE	ILE	ILE	TRP	TRP	T3677	Q3844	L4026	S4168			GLU
L3214	G2889	GLU	VAL	VAL	VAL	GLN	GLN	E3678	F3854	L4026	R4169			LEU
K3215	I3290	ALA	VAL	VAL	VAL	MET	MET	L3687	A3696	D4030	R4170			ALA
E3216	D3291	GLU	ALA	ALA	ALA	LYS	LYS	H3700	M3694	T4031	V4177			ASN
E3217	E3292	LEU	GLY	GLY	GLY	PRO	PRO	D3701	N3864	E4034	G4181			PRO
I3218	G2893	LEU	ILE	ILE	ILE	ARG	ARG	E3702	T3867	Y4035	E4182			THR
G3225	A3294	LEU	ASN	ASN	ASN	ALA	ALA	GLU	L3879	D4036	K4183			GLN
I3226	W3295	ASP	PHE	PHE	PHE	ASP	ASP	ASP	R3880	G4039	E4187			ASP
R3227	M3296	GLU	VAL	VAL	VAL	ASP	ASP	ASP	V3881	K4040	E4187			VAL
Y3228	K3297	PHE	VAL	VAL	VAL	GLY	GLY	GLY	Q3882	G4041	C4193			ARG
H3233	R3298	THR	GLN	GLN	GLN	GLU	GLU	GLU	E3883	V4042	E4194			GLY
V3234	V3301	THR	THR	THR	THR	PRO	PRO	PRO	I3885	K4045	I4197			GLY
M3235	F3302	LEU	ILE	ILE	ILE	GLY	GLY	GLY	S3886	R4046	A4203			PRO
E3236	S3303	ALA	ASN	ASN	ASN	GLN	GLN	GLN	D3887	D4047	I4206			VAL
V3237	Q3304	ARG	ASN	ASN	ASN	VAL	VAL	VAL	F3888	F4048	I4206			MET
L3238	P3305	LEU	MET	MET	MET	ARG	ARG	ARG	W3890	M4052	I4206			PRO
L3239	I3306	TYR	LEU	LEU	LEU	GLU	GLU	GLU	Y3726	H4055	S4207			GLY
P3240	I3307	ALA	LEU	LEU	LEU	VAL	VAL	VAL	Q3728	K4056	E4208			ARG
M3241	N3308	PHE	ILE	ILE	ILE	VAL	VAL	VAL	A3729	H4057	S4209			GLY
Y3245	K3309	TYR	THR	THR	THR	ASP	ASP	ASP	H3732	E4071	A4209			PRO
M3246	P3312	PRO	THR	THR	THR	ILE	ILE	ILE	E3722	T4072	SER			SER
S3247	Q3313	LEU	THR	THR	THR	ALA	ALA	ALA	I3765					SER
R3248	L3314	LEU	THR	THR	THR	ALA	ALA	ALA	L3778					SER
M3249	L3315	ARG	THR	THR	THR	ASN	ASN	ASN						SER



● Molecule 1: Ryanodine receptor 2

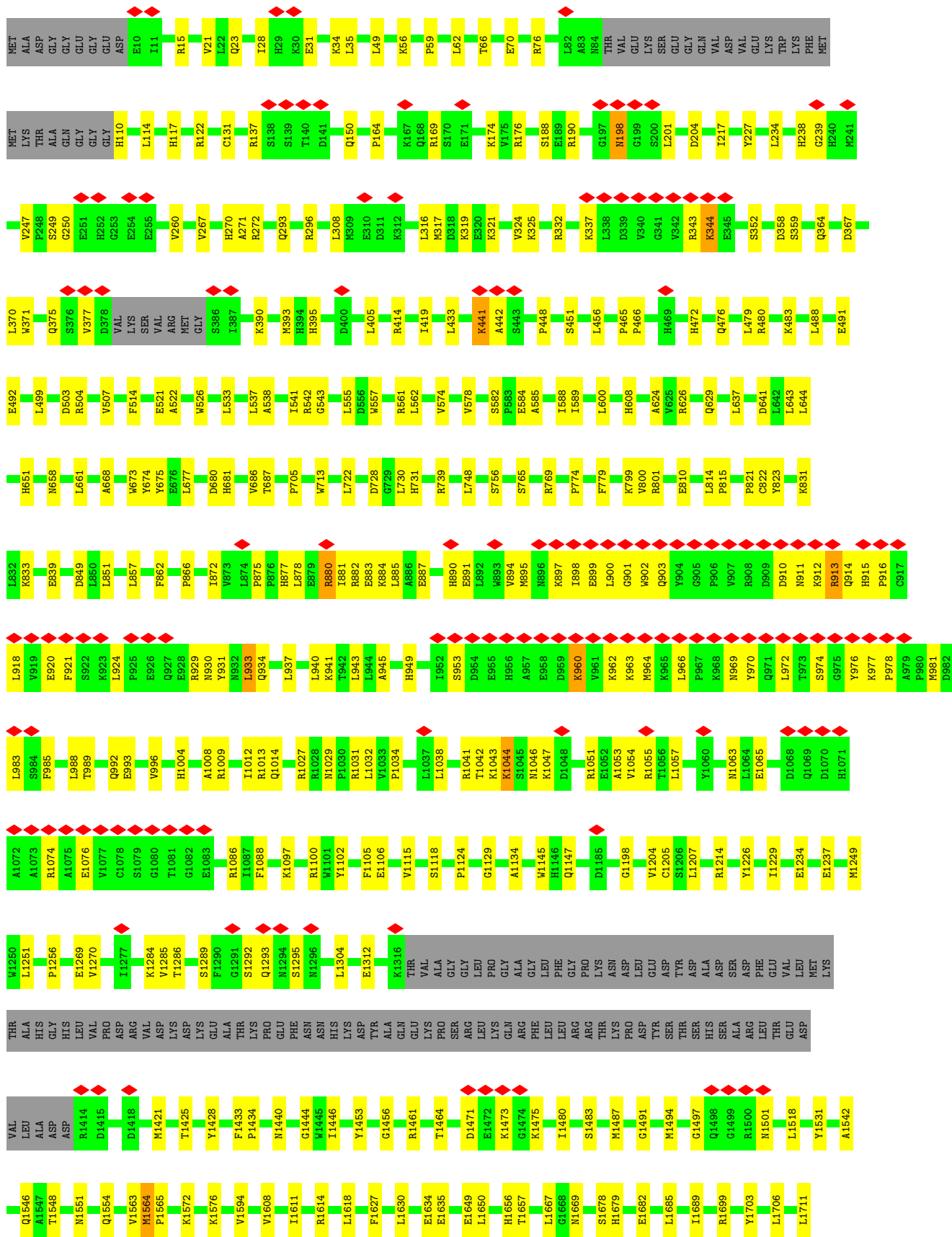


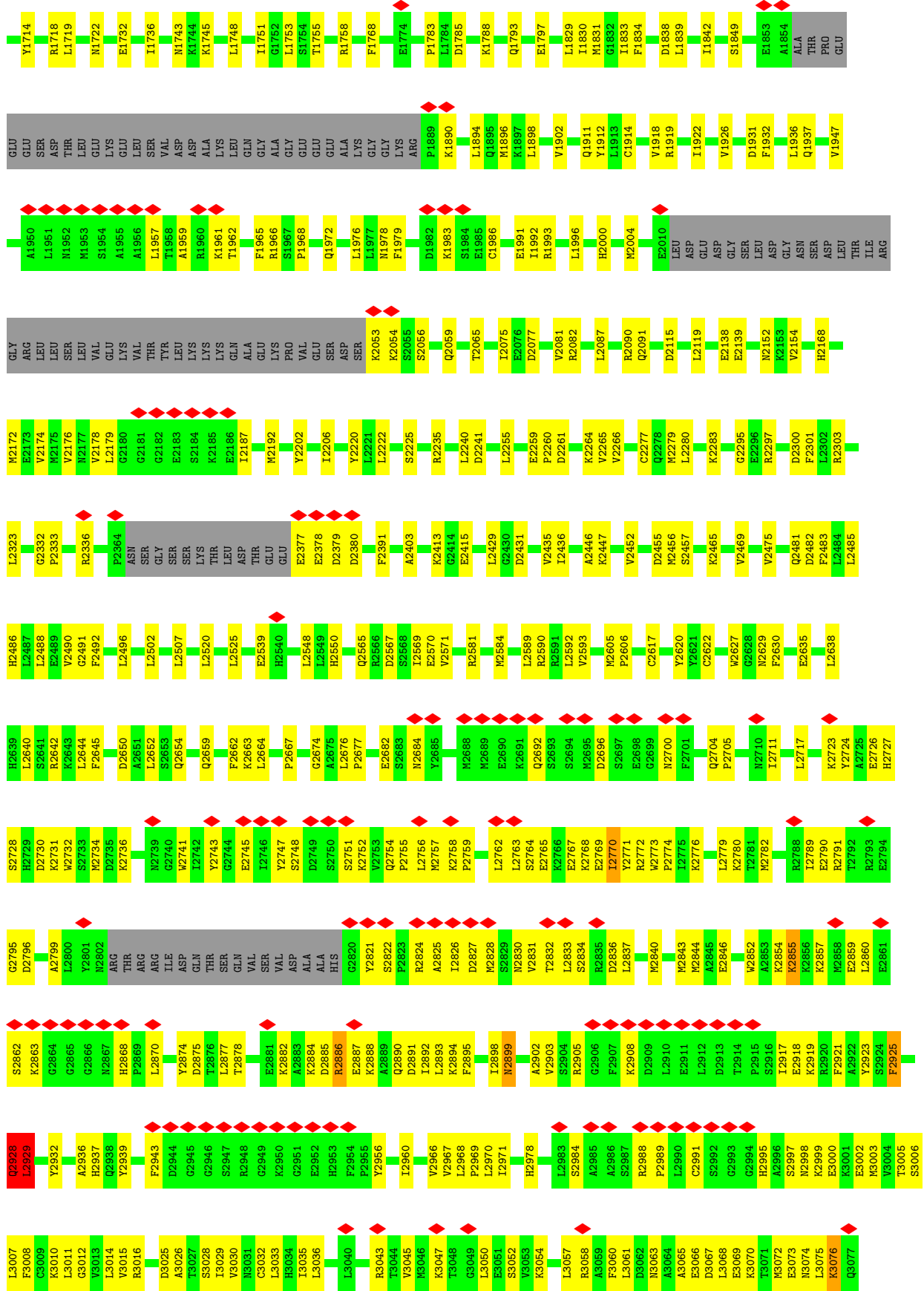




● Molecule 1: Ryanodine receptor 2







4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C4	Depositor
Number of particles used	191898	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 ($e^-/\text{\AA}^2$)	58	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	1200	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.628	Depositor
Minimum map value	-0.021	Depositor
Average map value	0.008	Depositor
Map value standard deviation	0.027	Depositor
Recommended contour level	0.12	Depositor
Map size (Å)	424.96, 424.96, 424.96	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.83, 0.83, 0.83	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, ATP

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	0.26	0/34511	0.51	7/46614 (0.0%)
1	B	0.26	0/34511	0.51	7/46614 (0.0%)
1	C	0.26	0/34511	0.51	7/46614 (0.0%)
1	D	0.26	0/34511	0.51	7/46614 (0.0%)
2	E	0.30	0/834	0.54	0/1123
2	F	0.30	0/834	0.54	0/1123
2	G	0.30	0/834	0.54	0/1123
2	H	0.30	0/834	0.54	0/1123
All	All	0.26	0/141380	0.51	28/190948 (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	3
1	B	0	3
1	C	0	3
1	D	0	3
All	All	0	12

There are no bond length outliers.

The worst 5 of 28 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	2928	GLN	CA-CB-CG	6.25	127.15	113.40
1	B	2928	GLN	CA-CB-CG	6.25	127.15	113.40
1	C	2928	GLN	CA-CB-CG	6.23	127.11	113.40
1	D	2928	GLN	CA-CB-CG	6.23	127.11	113.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	933	LEU	CA-CB-CG	5.72	128.47	115.30

There are no chirality outliers.

5 of 12 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	3227	ARG	Sidechain
1	A	3606	ALA	Peptide
1	A	4640	PHE	Peptide
1	B	3227	ARG	Sidechain
1	B	3606	ALA	Peptide

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	33771	0	33455	752	0
1	B	33771	0	33455	745	0
1	C	33771	0	33455	741	0
1	D	33771	0	33455	752	0
2	E	818	0	821	24	0
2	F	818	0	821	21	0
2	G	818	0	821	23	0
2	H	818	0	821	25	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	62	0	24	0	0
4	B	62	0	24	0	0
4	C	62	0	24	0	0
4	D	62	0	24	0	0
All	All	138608	0	137200	3013	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 11.

The worst 5 of 3013 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:A:2736:LYS:NZ	1:A:2757:MET:SD	2.38	0.97
1:D:2736:LYS:NZ	1:D:2757:MET:SD	2.38	0.97
1:C:2736:LYS:NZ	1:C:2757:MET:SD	2.38	0.97
1:B:2736:LYS:NZ	1:B:2757:MET:SD	2.38	0.96
1:A:901:GLY:HA3	1:A:913:ARG:HH22	1.36	0.90

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	4198/4967 (84%)	4080 (97%)	115 (3%)	3 (0%)	51	83
1	B	4198/4967 (84%)	4081 (97%)	114 (3%)	3 (0%)	51	83
1	C	4198/4967 (84%)	4082 (97%)	113 (3%)	3 (0%)	51	83
1	D	4198/4967 (84%)	4081 (97%)	114 (3%)	3 (0%)	51	83
2	E	105/108 (97%)	100 (95%)	5 (5%)	0	100	100
2	F	105/108 (97%)	100 (95%)	5 (5%)	0	100	100
2	G	105/108 (97%)	100 (95%)	5 (5%)	0	100	100
2	H	105/108 (97%)	100 (95%)	5 (5%)	0	100	100
All	All	17212/20300 (85%)	16724 (97%)	476 (3%)	12 (0%)	54	83

5 of 12 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	3927	PRO
1	A	4641	PRO
1	B	3927	PRO
1	B	4641	PRO

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Mol	Chain	Res	Type
1	C	3927	PRO

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	3708/4358 (85%)	3674 (99%)	34 (1%)	78	91
1	B	3708/4358 (85%)	3674 (99%)	34 (1%)	78	91
1	C	3708/4358 (85%)	3674 (99%)	34 (1%)	78	91
1	D	3708/4358 (85%)	3674 (99%)	34 (1%)	78	91
2	E	88/89 (99%)	87 (99%)	1 (1%)	73	90
2	F	88/89 (99%)	87 (99%)	1 (1%)	73	90
2	G	88/89 (99%)	87 (99%)	1 (1%)	73	90
2	H	88/89 (99%)	87 (99%)	1 (1%)	73	90
All	All	15184/17788 (85%)	15044 (99%)	140 (1%)	79	91

5 of 140 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	1013	ARG
1	D	2053	LYS
1	D	3076	LYS
1	B	1044	LYS
1	B	1013	ARG

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	1593	HIS
1	D	261	HIS
1	C	2654	GLN
1	C	2978	HIS

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Mol	Chain	Res	Type
1	D	1046	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](#)

Of 12 ligands modelled in this entry, 4 are monoatomic - leaving 8 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
4	ATP	A	5002	-	26,33,33	0.59	0	31,52,52	0.75	2 (6%)
4	ATP	C	5002	-	26,33,33	0.60	0	31,52,52	0.76	2 (6%)
4	ATP	C	5003	-	26,33,33	0.60	0	31,52,52	0.73	2 (6%)
4	ATP	B	5003	-	26,33,33	0.60	0	31,52,52	0.73	2 (6%)
4	ATP	B	5002	-	26,33,33	0.59	0	31,52,52	0.75	2 (6%)
4	ATP	D	5002	-	26,33,33	0.60	0	31,52,52	0.75	2 (6%)
4	ATP	D	5003	-	26,33,33	0.61	0	31,52,52	0.74	2 (6%)
4	ATP	A	5003	-	26,33,33	0.60	0	31,52,52	0.74	2 (6%)

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
4	ATP	A	5002	-	-	6/18/38/38	0/3/3/3
4	ATP	C	5002	-	-	6/18/38/38	0/3/3/3
4	ATP	C	5003	-	-	7/18/38/38	0/3/3/3
4	ATP	B	5003	-	-	7/18/38/38	0/3/3/3
4	ATP	B	5002	-	-	6/18/38/38	0/3/3/3
4	ATP	D	5002	-	-	6/18/38/38	0/3/3/3
4	ATP	D	5003	-	-	7/18/38/38	0/3/3/3
4	ATP	A	5003	-	-	7/18/38/38	0/3/3/3

There are no bond length outliers.

The worst 5 of 16 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	C	5002	ATP	C5-C6-N6	2.33	123.89	120.35
4	A	5003	ATP	C5-C6-N6	2.32	123.87	120.35
4	D	5003	ATP	C5-C6-N6	2.31	123.86	120.35
4	B	5003	ATP	C5-C6-N6	2.30	123.84	120.35
4	C	5003	ATP	C5-C6-N6	2.29	123.84	120.35

There are no chirality outliers.

5 of 52 torsion outliers are listed below:

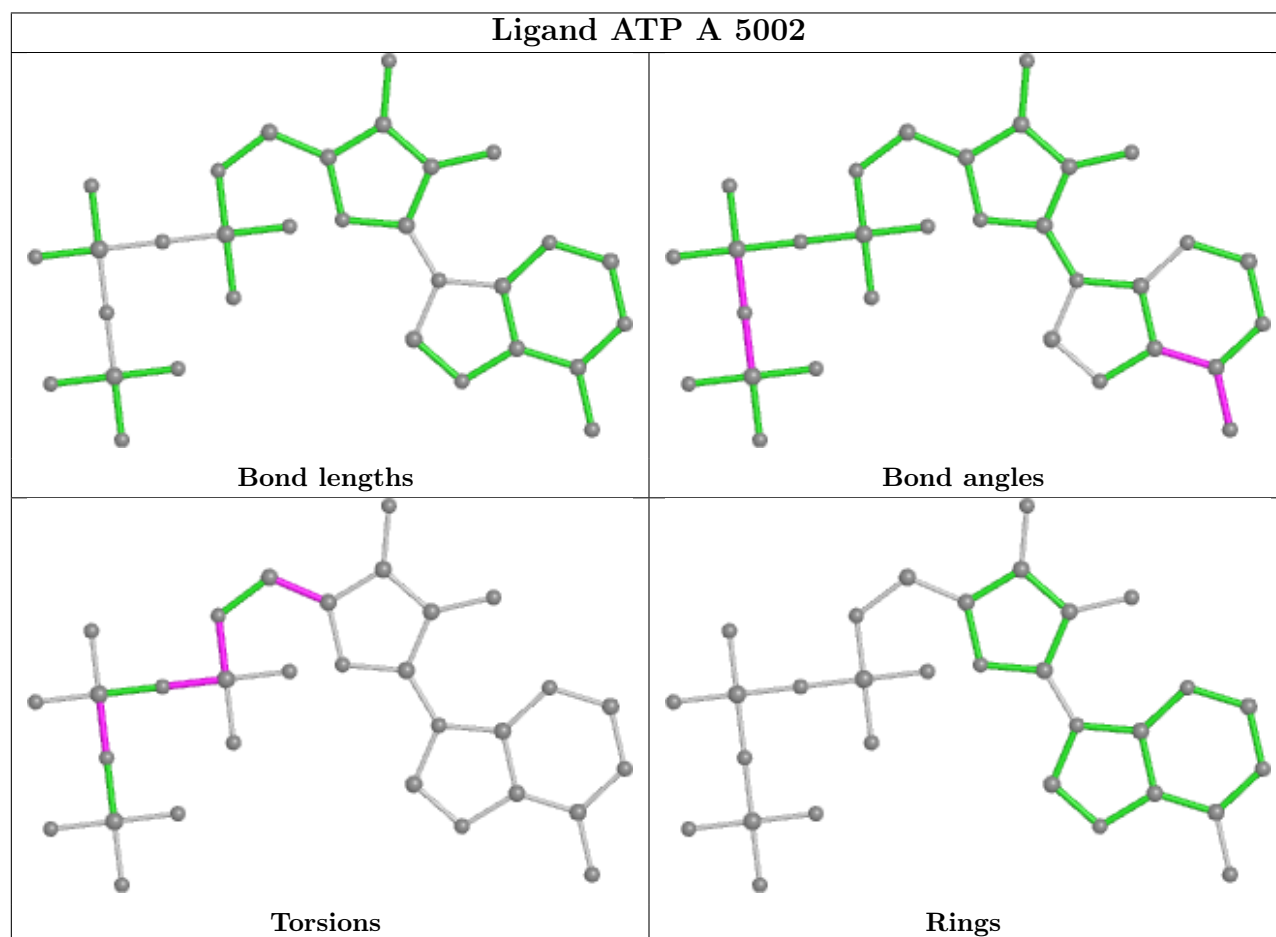
Mol	Chain	Res	Type	Atoms
4	A	5002	ATP	C5'-O5'-PA-O1A
4	A	5003	ATP	PB-O3B-PG-O3G
4	A	5003	ATP	C5'-O5'-PA-O1A
4	A	5003	ATP	C5'-O5'-PA-O2A
4	A	5003	ATP	O4'-C4'-C5'-O5'

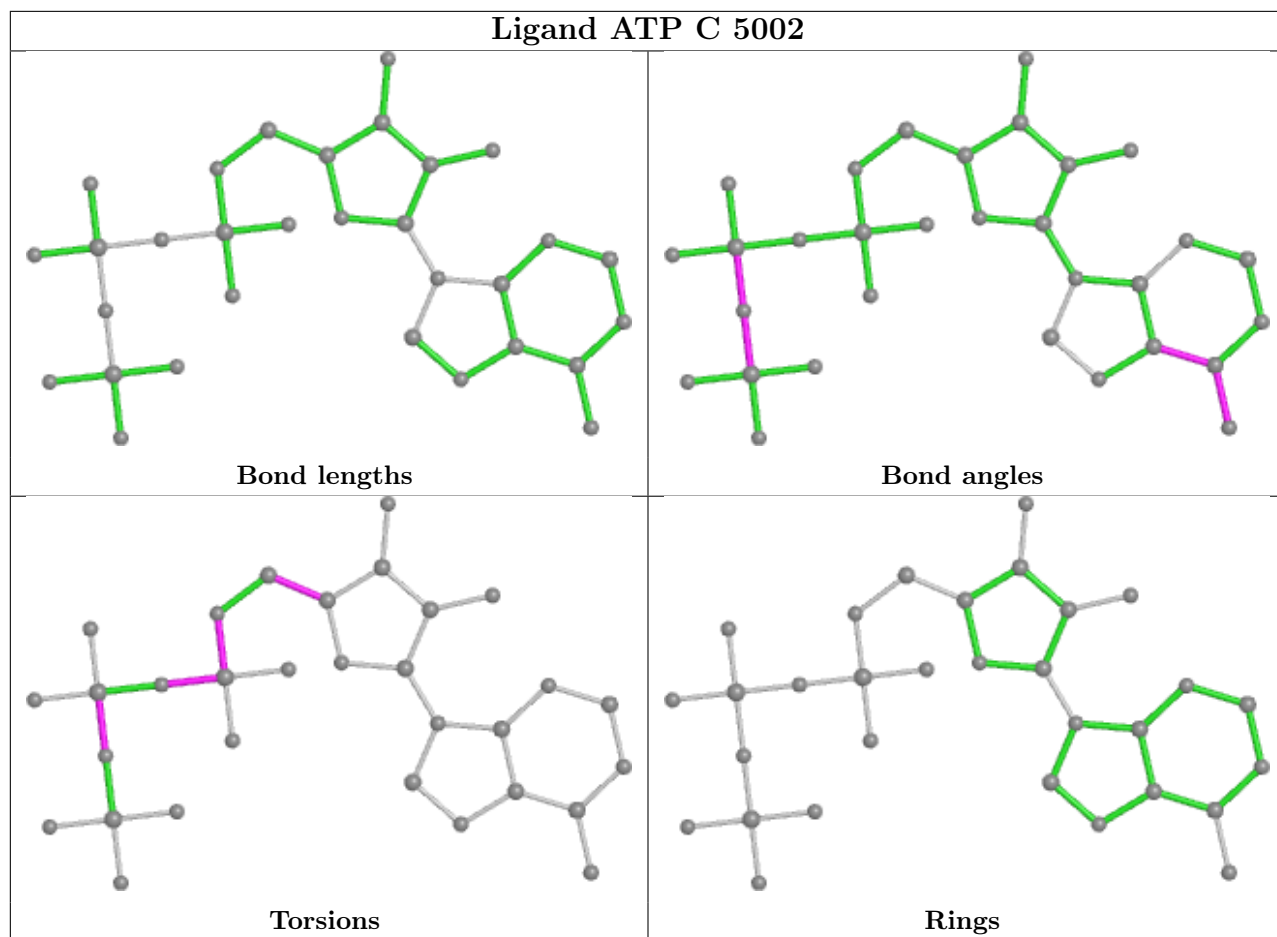
There are no ring outliers.

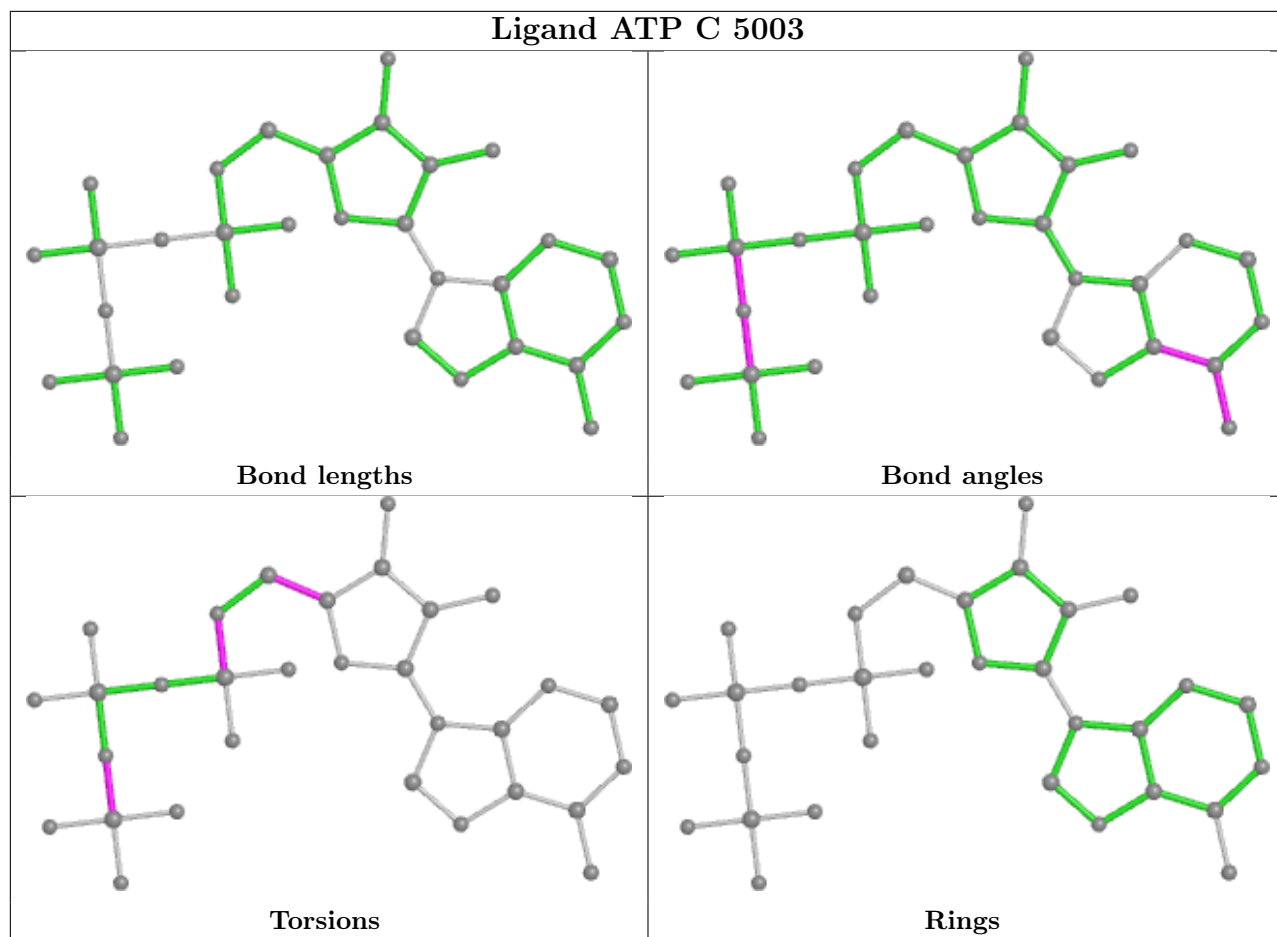
No monomer is involved in short contacts.

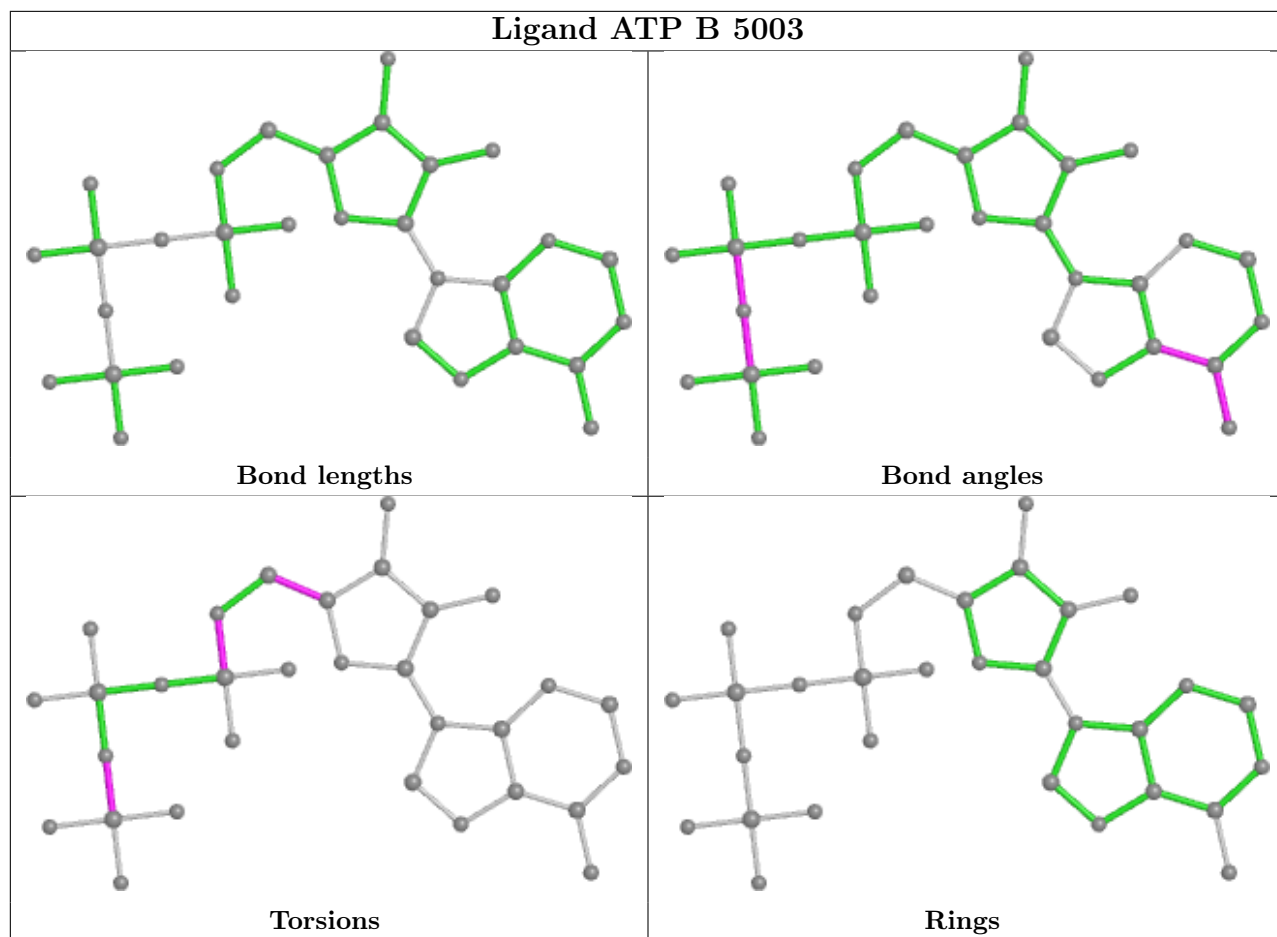
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

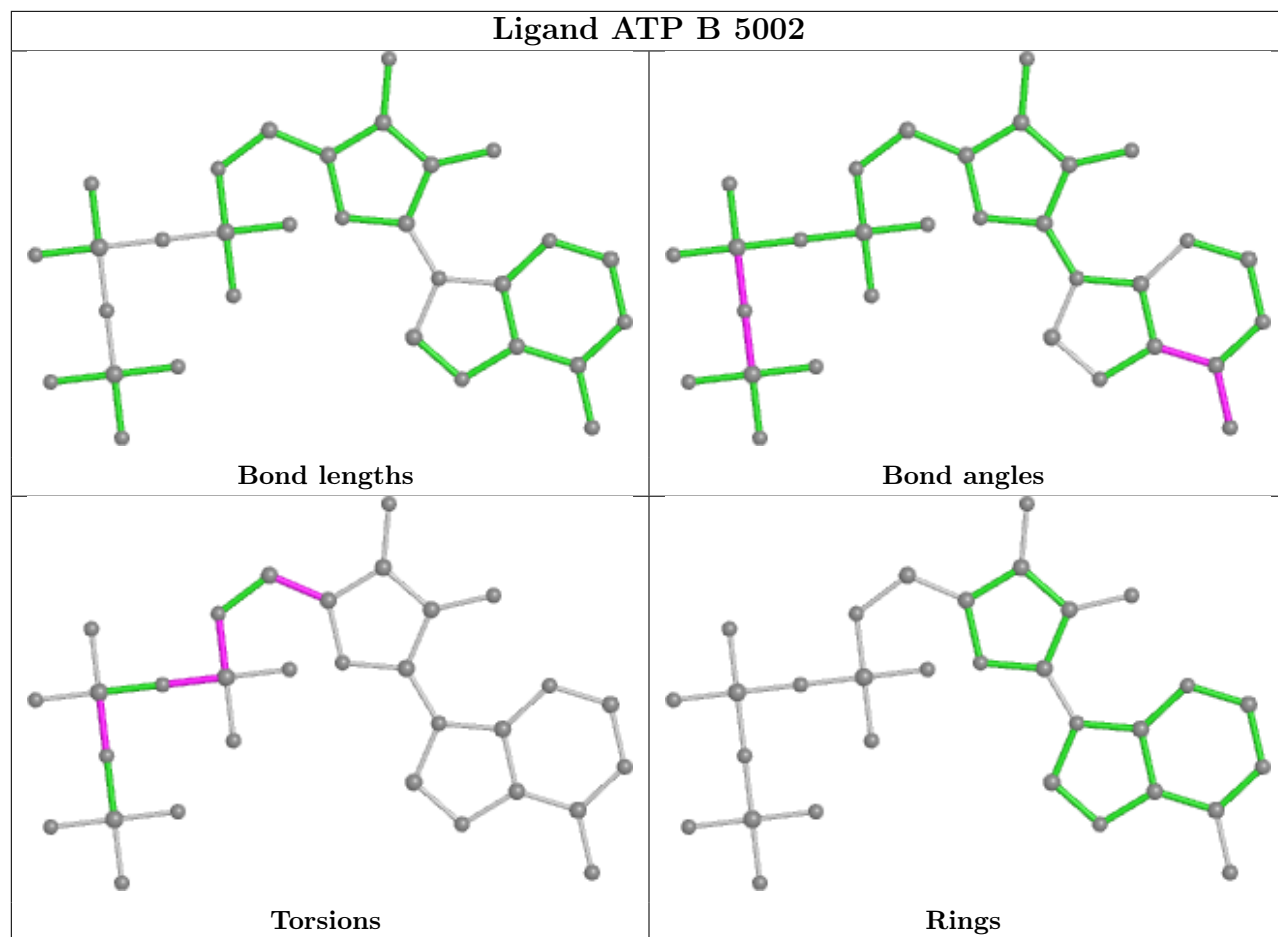
highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified 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.

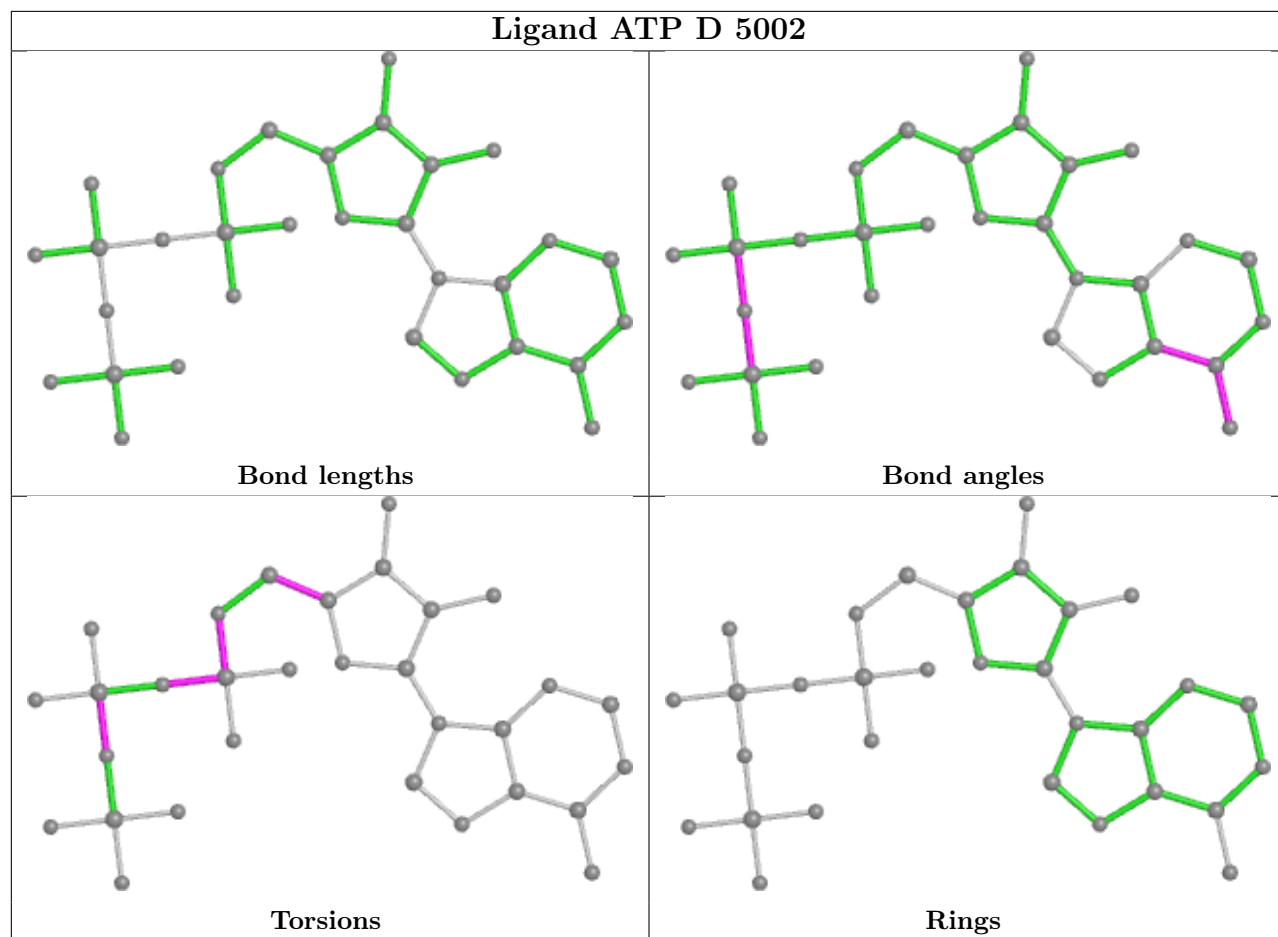


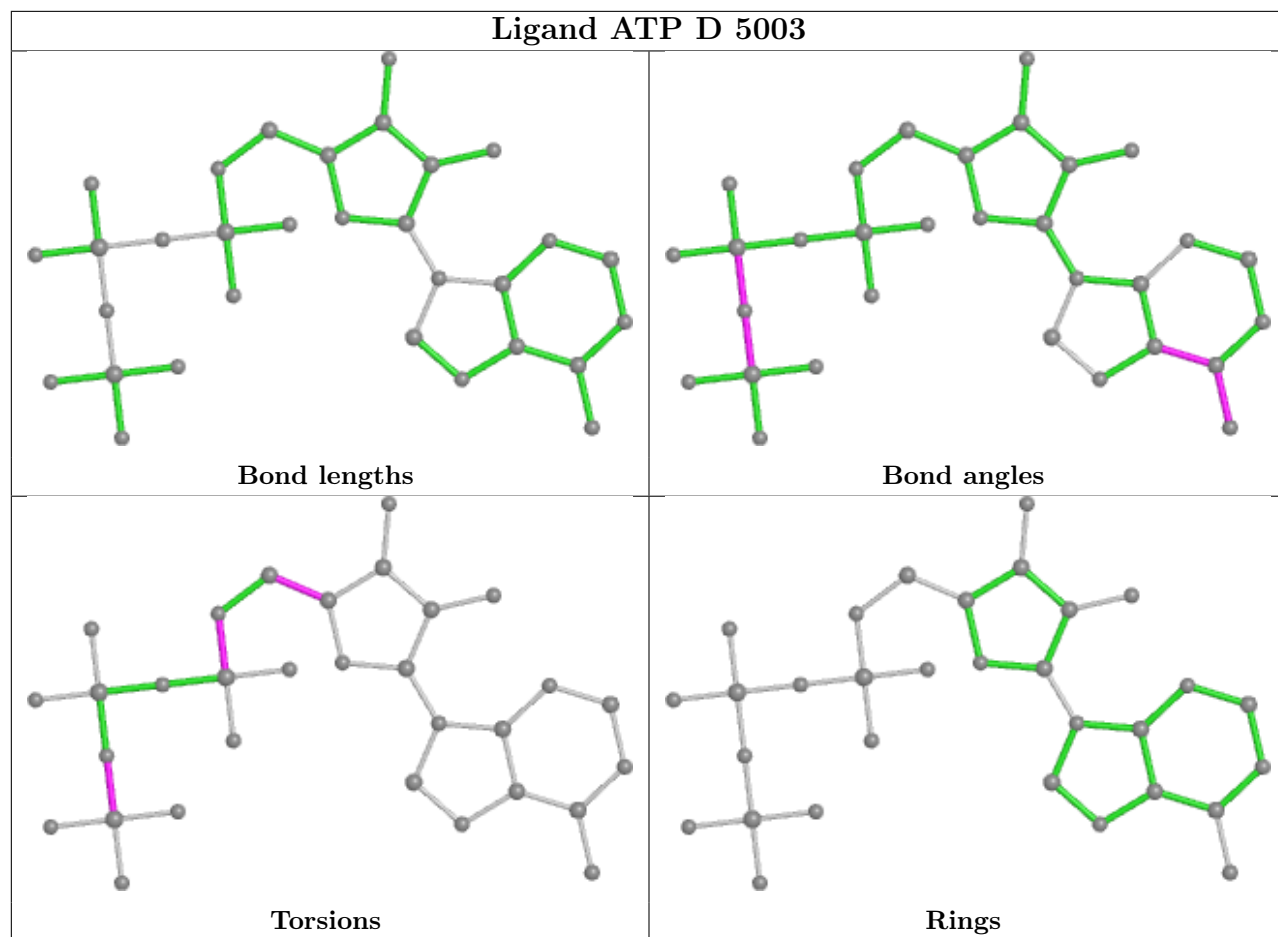


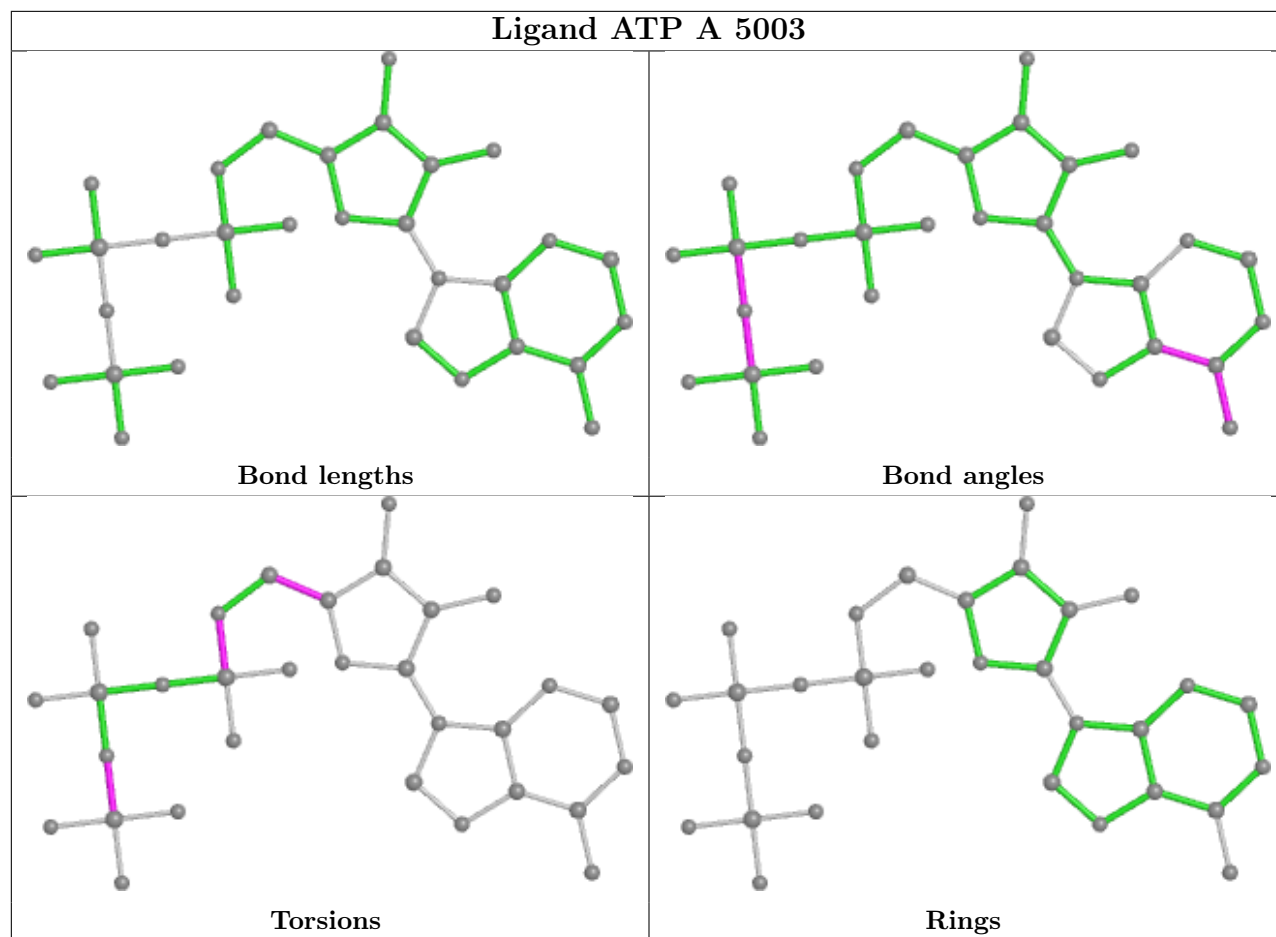












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

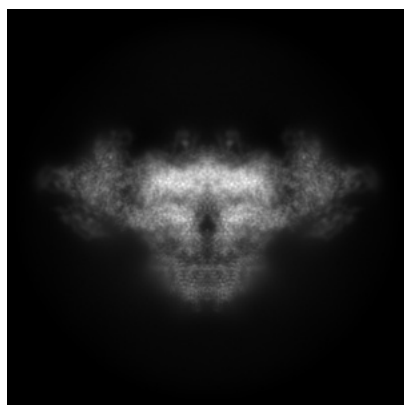
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-42458. These allow visual inspection of the internal detail of the map and identification of artifacts.

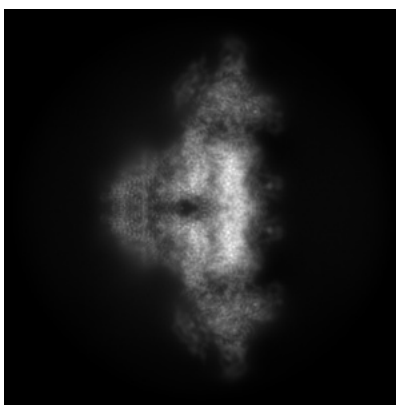
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

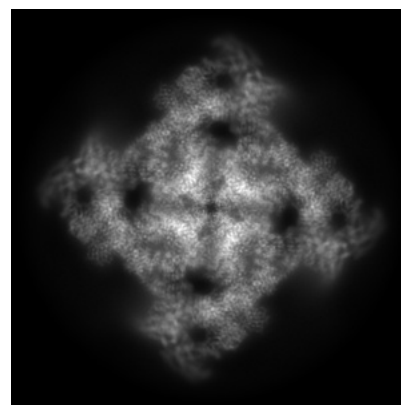
6.1.1 Primary map



X



Y

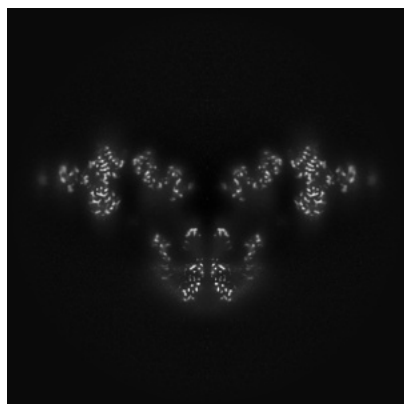


Z

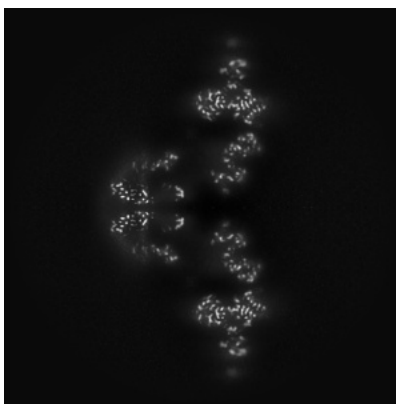
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

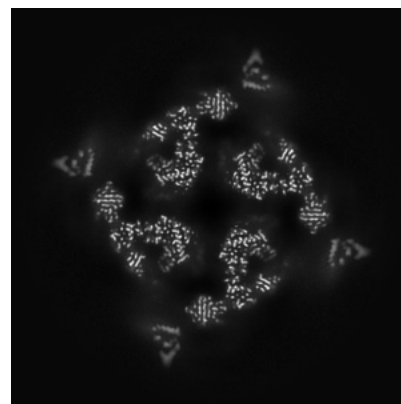
6.2.1 Primary map



X Index: 256



Y Index: 256

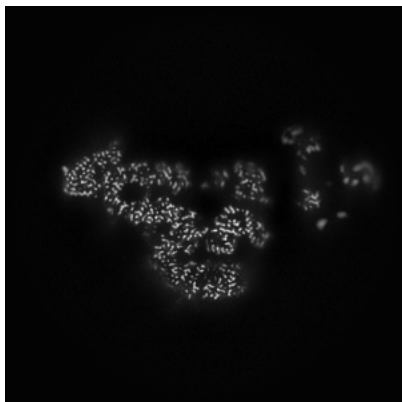


Z Index: 256

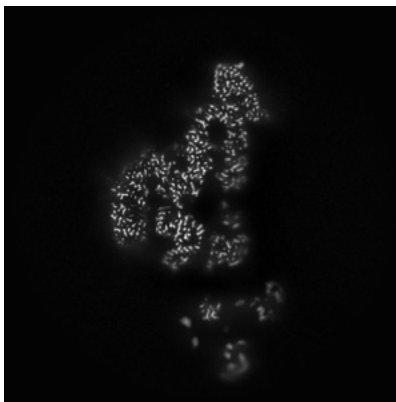
The images above show central slices of the map in three orthogonal directions.

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

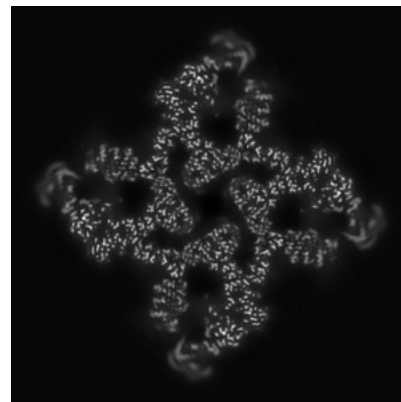
6.3.1 Primary map



X Index: 279



Y Index: 279



Z Index: 290

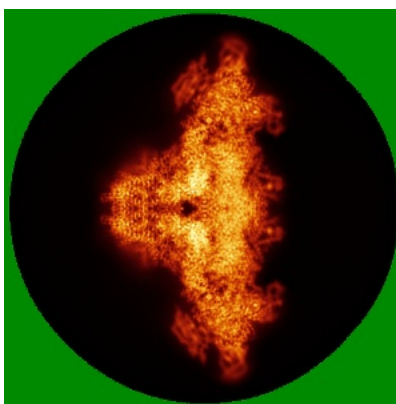
The images above show the largest variance slices of the map in three orthogonal directions.

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

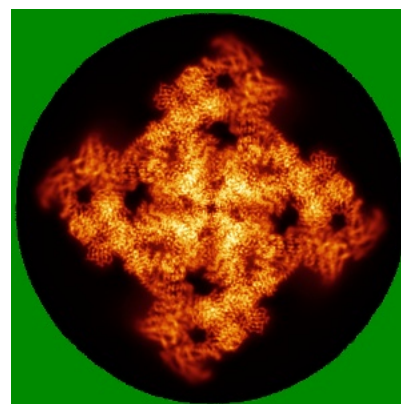
6.4.1 Primary map



X



Y

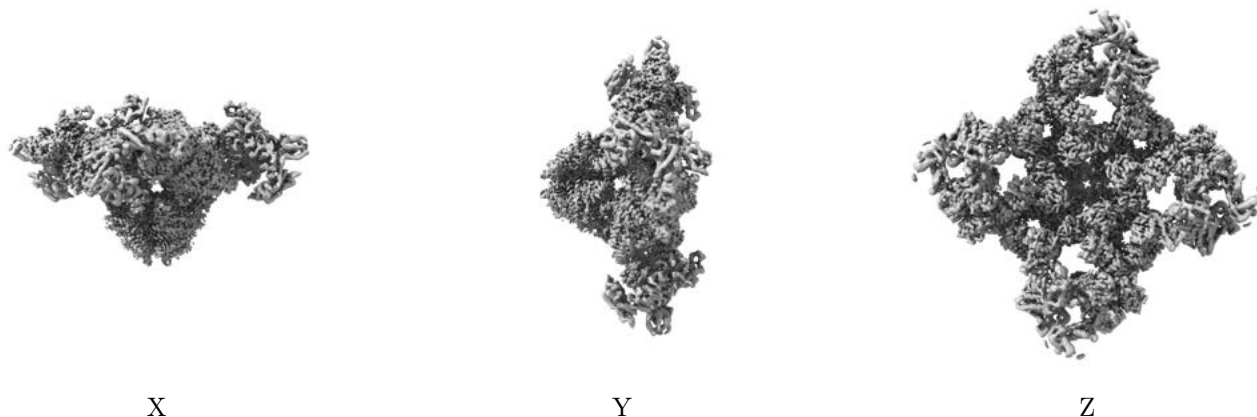


Z

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

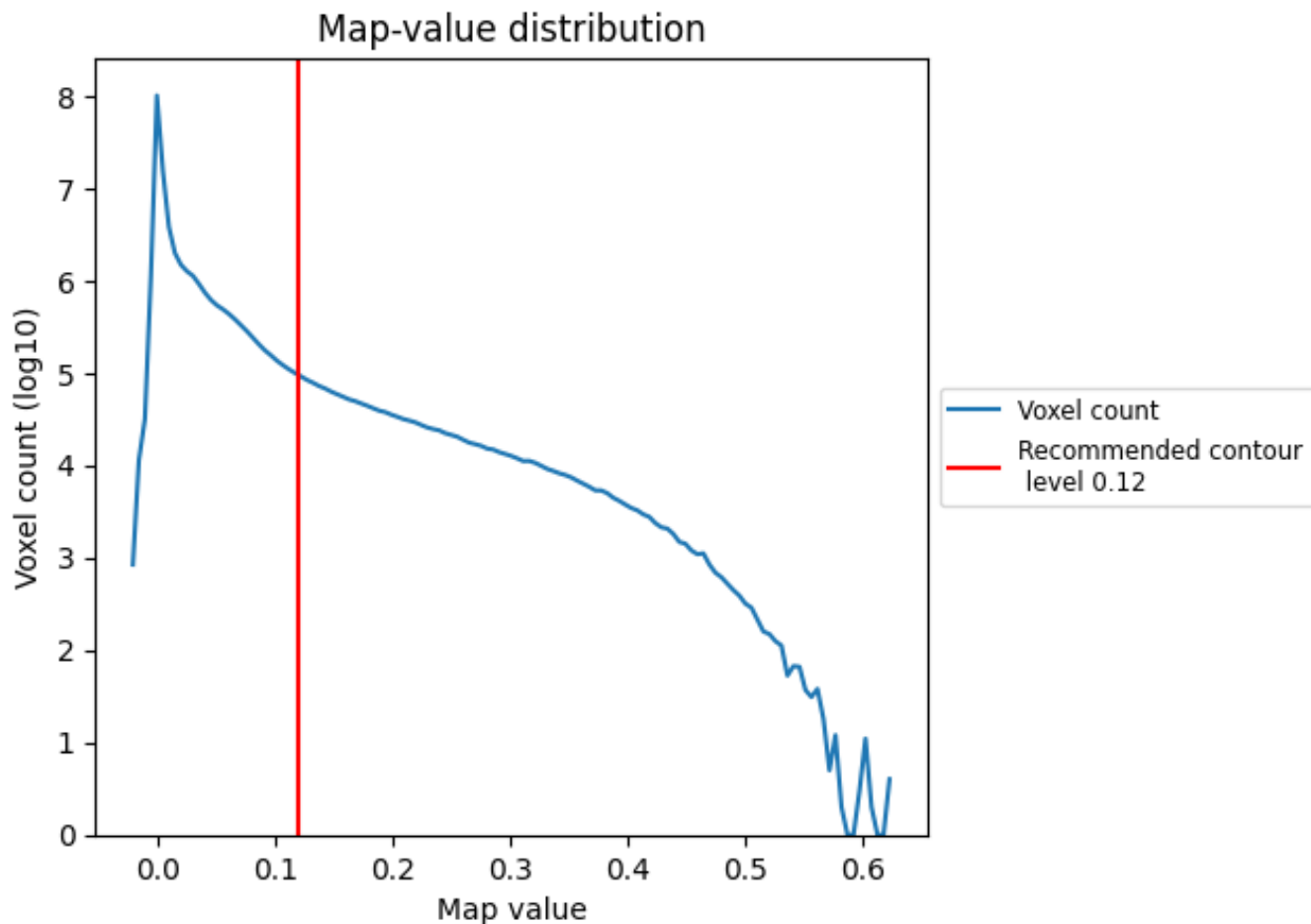
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

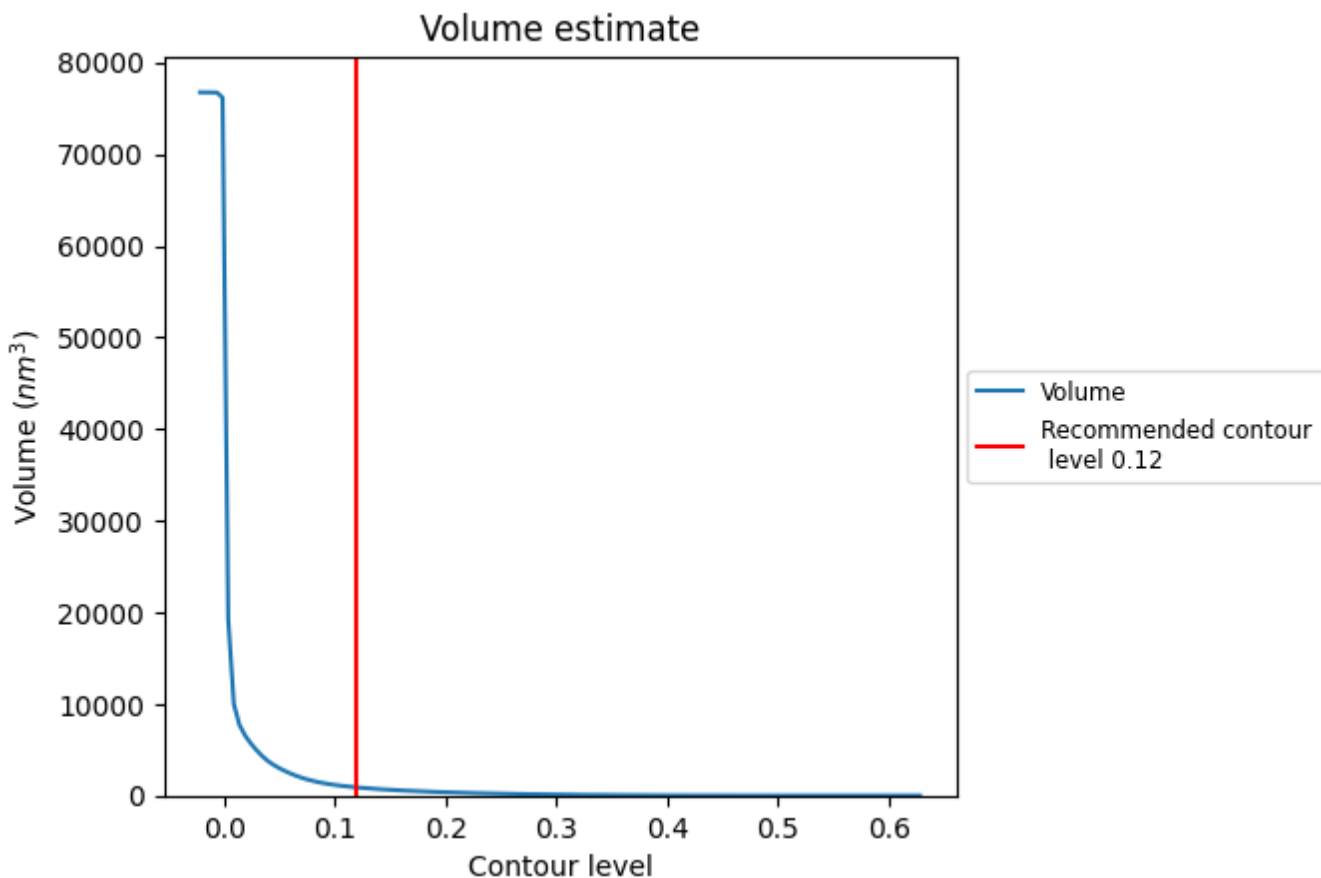
This section contains the results of statistical analysis of the map.

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.

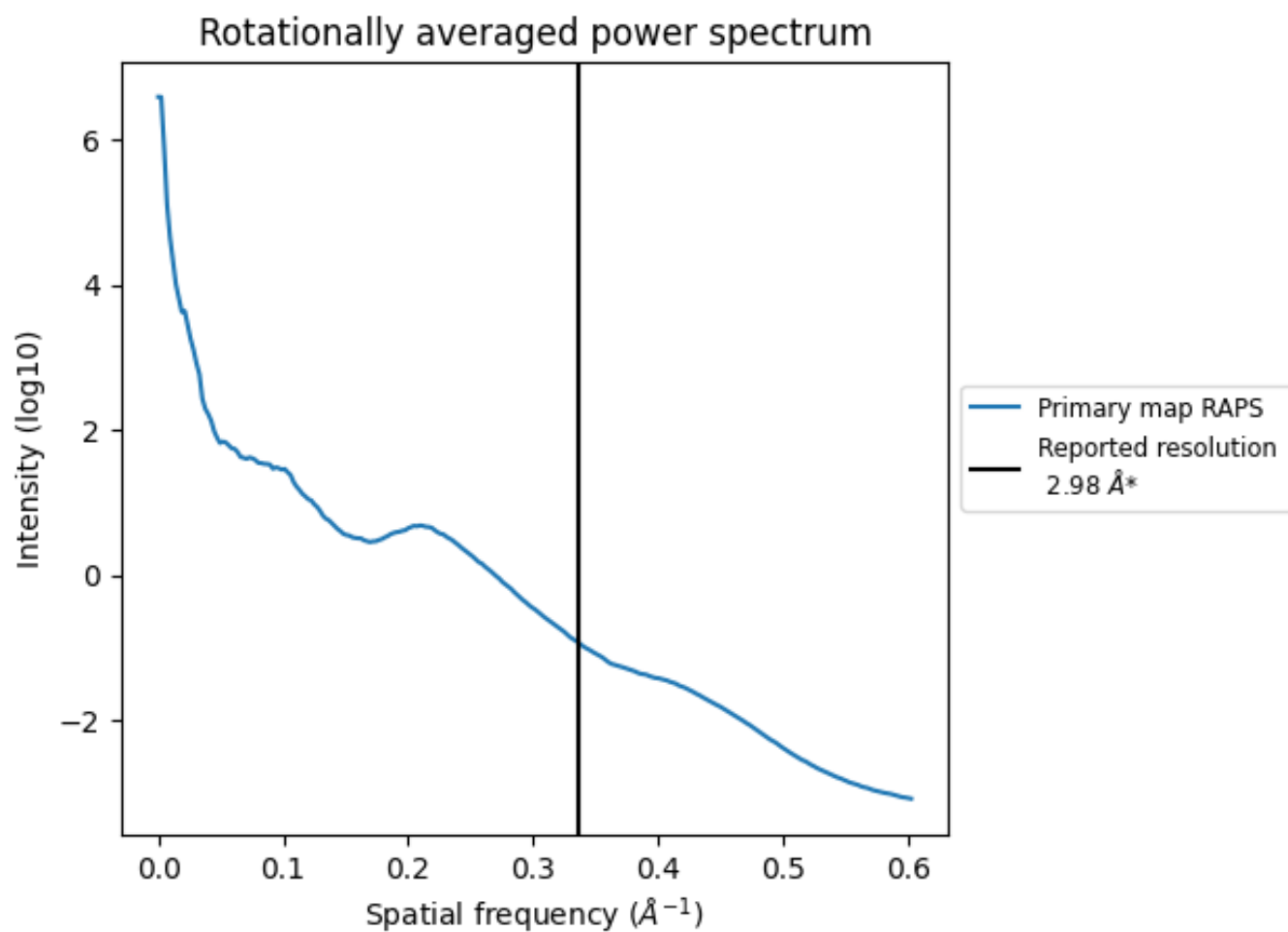
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 891 nm³; this corresponds to an approximate mass of 805 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 0.336 Å⁻¹

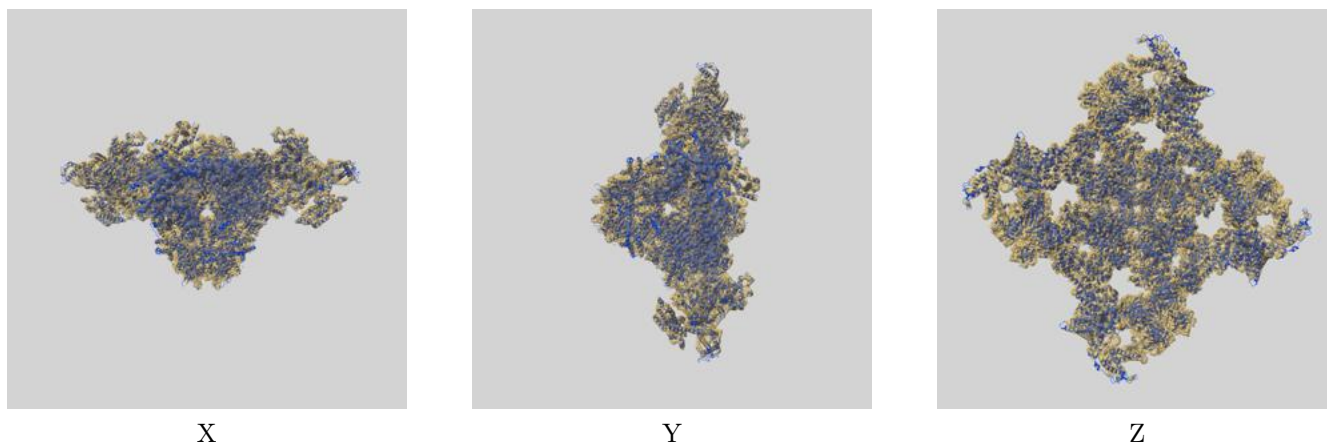
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

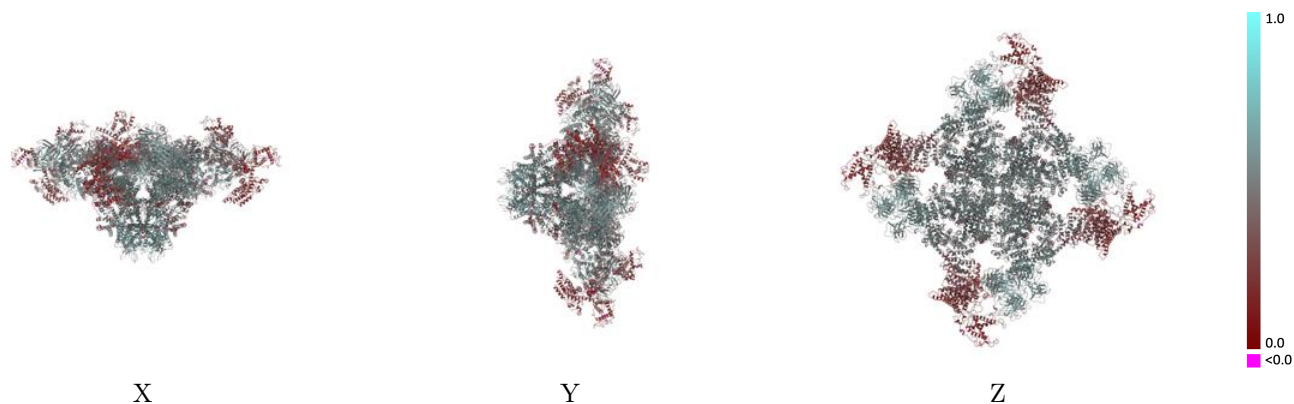
This section contains information regarding the fit between EMDB map EMD-42458 and PDB model 8UQ2. Per-residue inclusion information can be found in section 3 on page 6.

9.1 Map-model overlay [i](#)



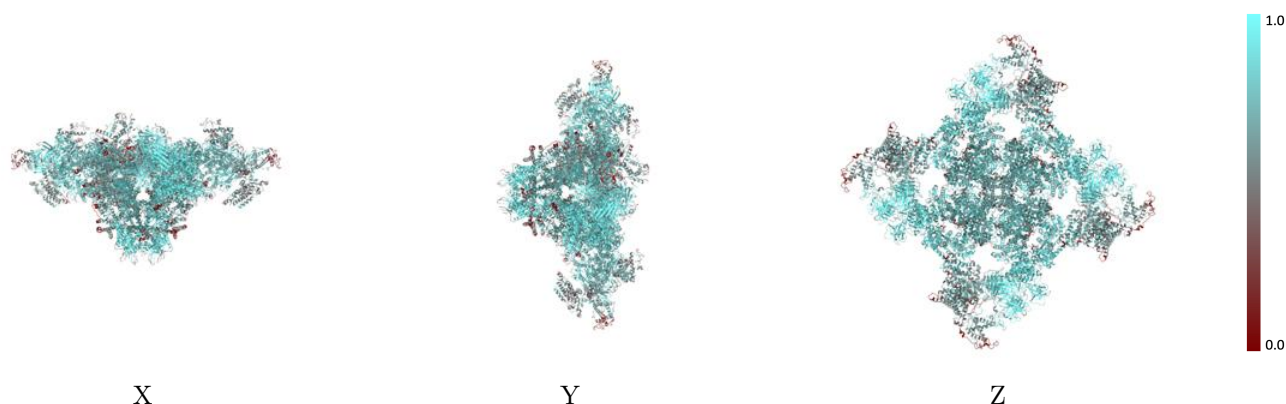
The images above show the 3D surface view of the map at the recommended contour level 0.12 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



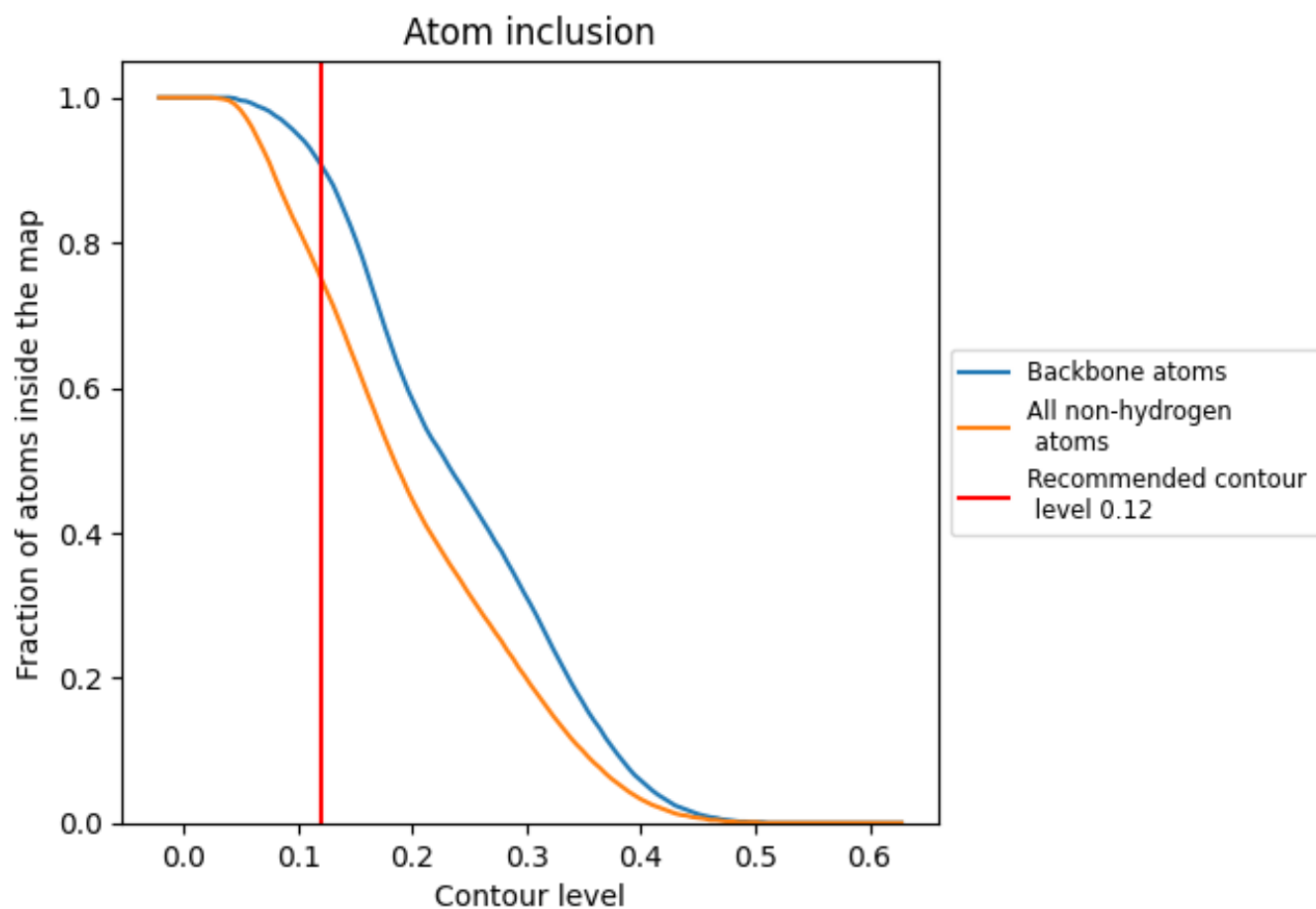
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.12).



















9.4 Atom inclusion [i](#)



At the recommended contour level, 91% of all backbone atoms, 75% 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 (0.12) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7510	 0.4430
A	 0.7490	 0.4400
B	 0.7480	 0.4410
C	 0.7480	 0.4410
D	 0.7490	 0.4410
E	 0.8710	 0.5380
F	 0.8730	 0.5370
G	 0.8730	 0.5370
H	 0.8730	 0.5370

