wwPDB EM Validation Summary Report

Nov 24, 2025 – 01:15 PM EST

PDB ID	:	9OL6 / pdb_00009ol6
EMDB ID	:	EMD-70591
Title	:	Rabbit Ryanodine Receptor 1: DMSO Control Closed Conformation
Authors	:	Molinarolo, S.M.; Van Petegem, F.
Deposited on	:	2025-05-12
Resolution	:	3.11 Å(reported)
Based on initial model	:	7TZC

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:

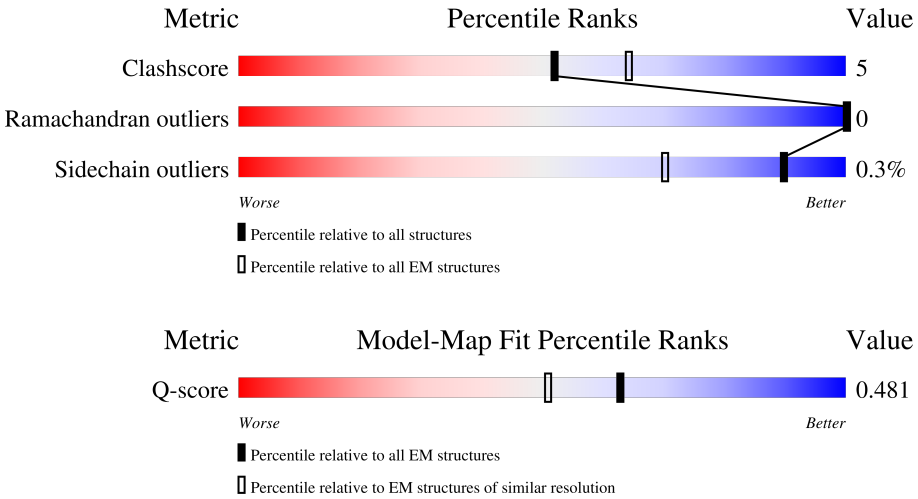
EMDB validation analysis	:	0.0.1.dev129
MolProbity	:	4-5-2 with Phenix2.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.46

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.11 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)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
Q-score	-	25397	14465 (2.61 - 3.61)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion < 40%). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	5037	7% 75% 7% 17%
1	G	5037	7% 76% 7% 17%
1	M	5037	7% 76% 7% 17%
1	S	5037	7% 75% 8% 17%

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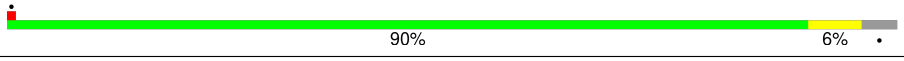
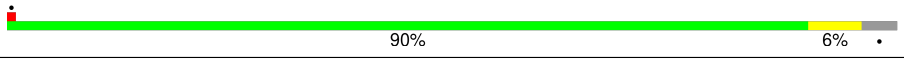
Mol	Chain	Length	Quality of chain
2	B	111	
2	H	111	
2	N	111	
2	T	111	

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 133368 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
1	A	4185	Total 32524	C 20790	N 5626	O 5890	S 218	0	0
1	G	4185	Total 32524	C 20790	N 5626	O 5890	S 218	0	0
1	M	4185	Total 32524	C 20790	N 5626	O 5890	S 218	0	0
1	S	4185	Total 32524	C 20790	N 5626	O 5890	S 218	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	107	Total 816	C 514	N 144	O 154	S 4	0	0
2	H	107	Total 816	C 514	N 144	O 154	S 4	0	0
2	N	107	Total 816	C 514	N 144	O 154	S 4	0	0
2	T	107	Total 816	C 514	N 144	O 154	S 4	0	0

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-3	SER	-	expression tag	UNP P68106
B	-2	ASN	-	expression tag	UNP P68106
B	-1	ALA	-	expression tag	UNP P68106
H	-3	SER	-	expression tag	UNP P68106
H	-2	ASN	-	expression tag	UNP P68106
H	-1	ALA	-	expression tag	UNP P68106
N	-3	SER	-	expression tag	UNP P68106
N	-2	ASN	-	expression tag	UNP P68106
N	-1	ALA	-	expression tag	UNP P68106

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Chain	Residue	Modelled	Actual	Comment	Reference
T	-3	SER	-	expression tag	UNP P68106
T	-2	ASN	-	expression tag	UNP P68106
T	-1	ALA	-	expression tag	UNP P68106

- Molecule 3 is CALCIUM ION (CCD ID: CA) (formula: Ca).

Mol	Chain	Residues	Atoms	AltConf
3	A	1	Total Ca 1 1	0
3	G	1	Total Ca 1 1	0
3	M	1	Total Ca 1 1	0
3	S	1	Total Ca 1 1	0

- Molecule 4 is ZINC ION (CCD ID: ZN) (formula: Zn).

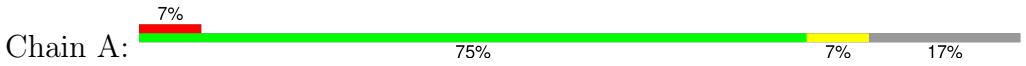
Mol	Chain	Residues	Atoms	AltConf
4	A	1	Total Zn 1 1	0
4	G	1	Total Zn 1 1	0
4	M	1	Total Zn 1 1	0
4	S	1	Total Zn 1 1	0

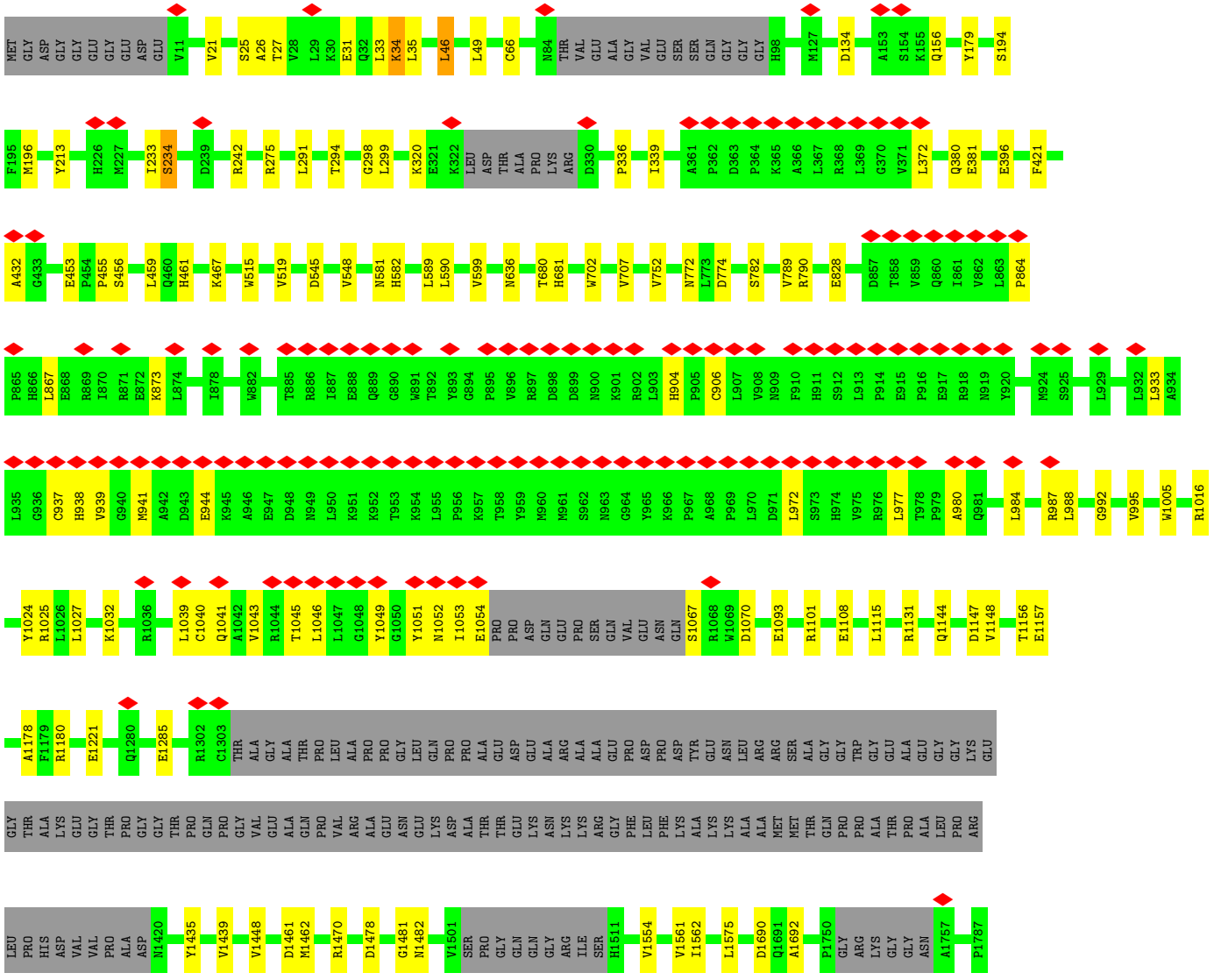
3 Residue-property plots (i)

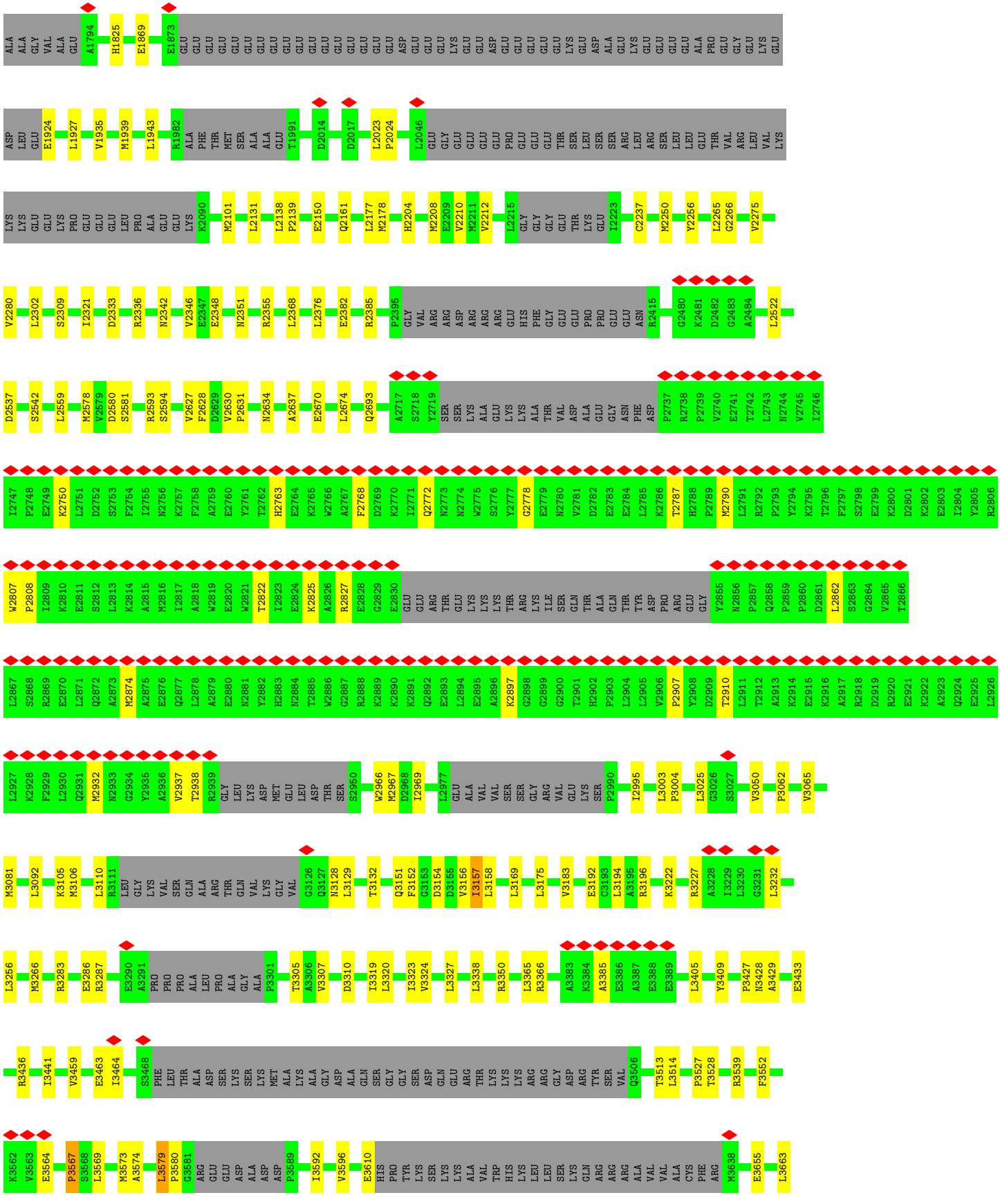
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

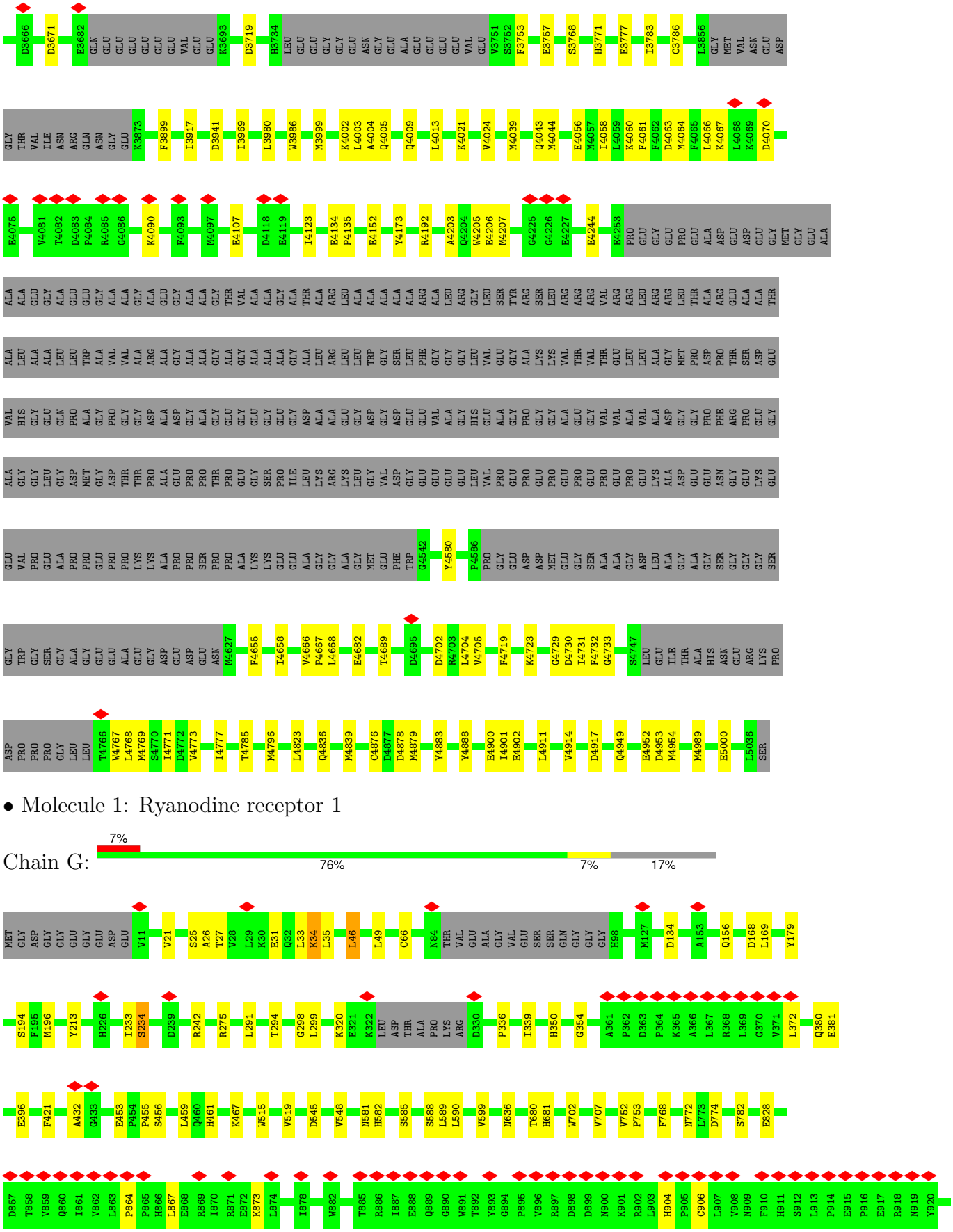
- Molecule 1: Ryanodine receptor 1

Chain A:



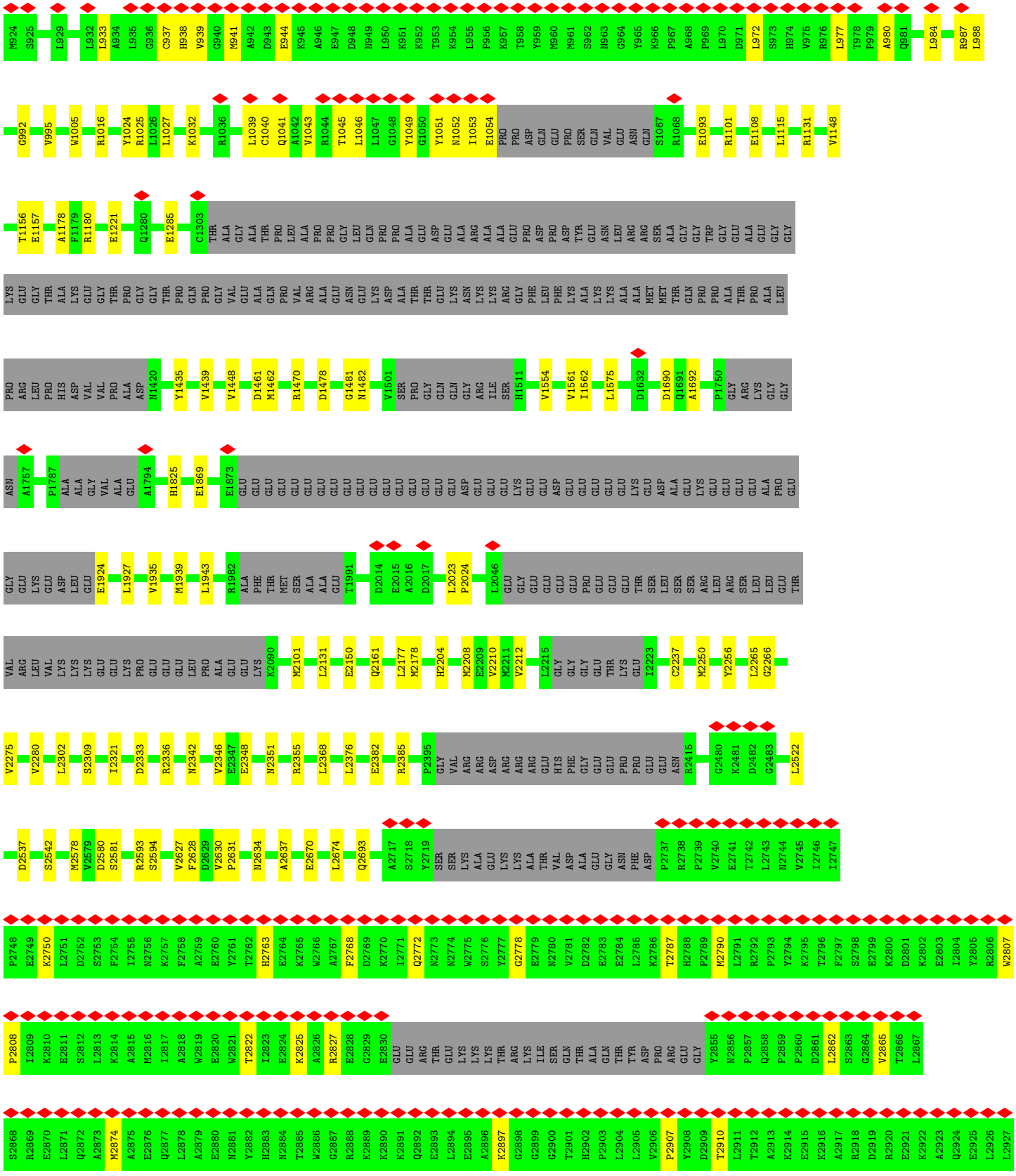






• Molecule 1: Ryanodine receptor 1

Chain G: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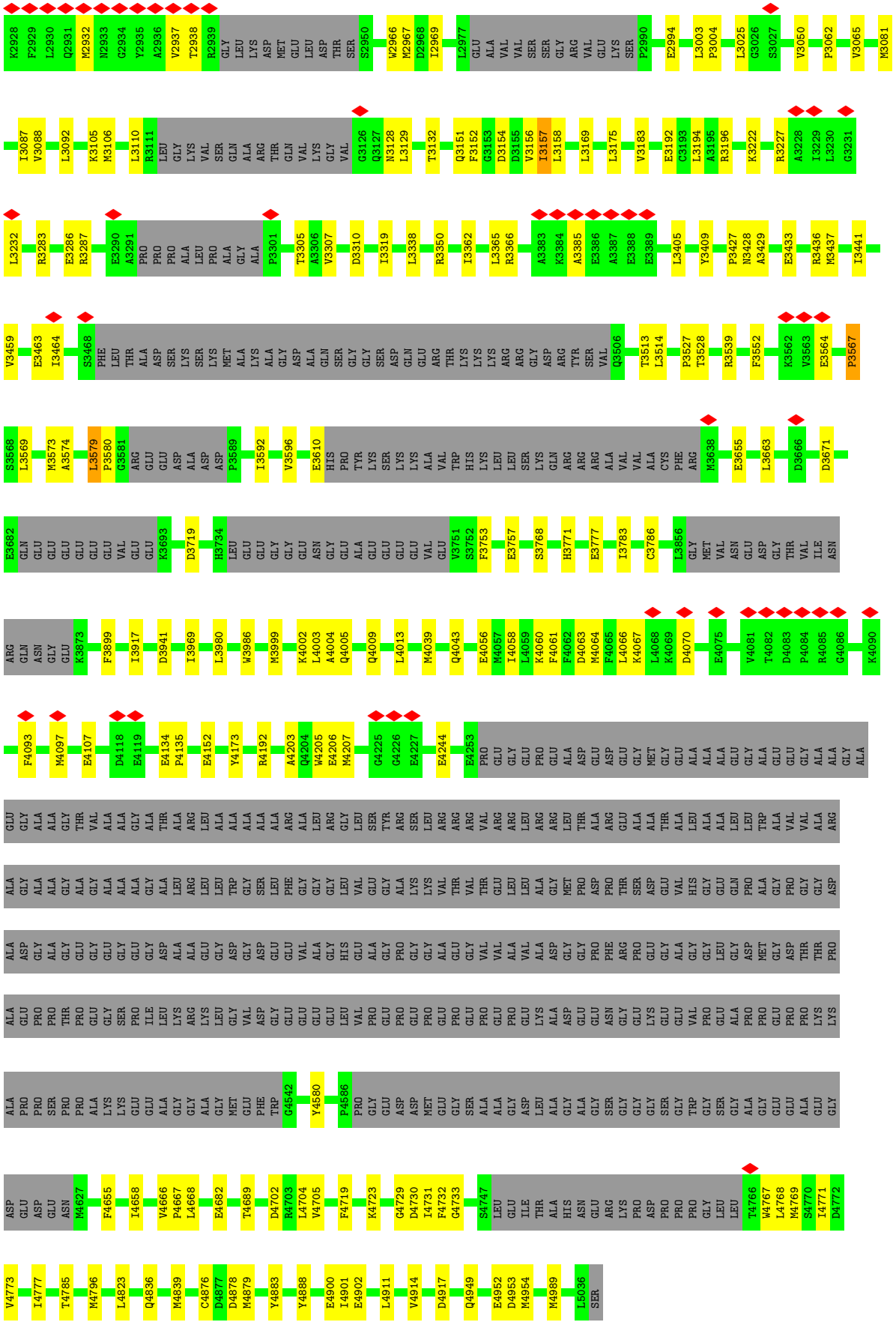
G992 V995 W1005 R1016 Y1024 R1025 L1026 L1027 K1032 R1036 L1039 C1040 Q1041 A1042 V1043 R1044 T1045 L1046 L1047 G1048 Y1049 G1050 Y1051 N1052 I1053 E1054 PRO PRO ASP GLN GLU PRO SER GLN VAL GLU ASN GLN S1067 R1068 E1093 R1101 E1108 L1115 R1131 V1148
T1156 E1157 A1178 F1179 R1180 E1221 Q1280 E1285 C1303 THR ALA GLY ALA THR PRO LEU ALA PRO PRO GLY GLN LEU GLN PRO PRO ALA GLU ASP GLU ALA ARG ALA ALA GLU PRO ASP PRO PRO ASP TYR GLU ASN LEU ARG ARG SER ALA GLY GLY TRP GLY GLU ALA GLU GLY GLY
LYS GLU GLY THR ALA LYS GLU GLY THR PRO GLY GLY THR PRO GLN PRO GLY VAL GLU ALA GLN PRO VAL ARG ALA GLU GLU ASN GLU LYS ASP ALA THR THR GLU LYS ASN LYS LYS ARG GLY PHE LEU PHE LYS ALA LYS LYS ALA ALA MET MET THR GLN PRO PRO ALA THR PRO ALA LEU
PRO ARG LEU PRO HIS ASP VAL VAL PRO ALA ASP N1420 Y1435 V1439 V1448 D1461 M1462 R1470 D1478 G1481 N1482 V1501 SER PRO GLY GLN GLN GLY ARG ILE SER H1511 V1554 V1561 I1562 L1575 D1632 D1690 Q1691 A1692 P1750 GLY ARG LYS GLY GLY
ASN A1757 P1787 ALA ALA GLY VAL ALA GLU A1794 H1825 E1869 E1873 GLU GLU GLU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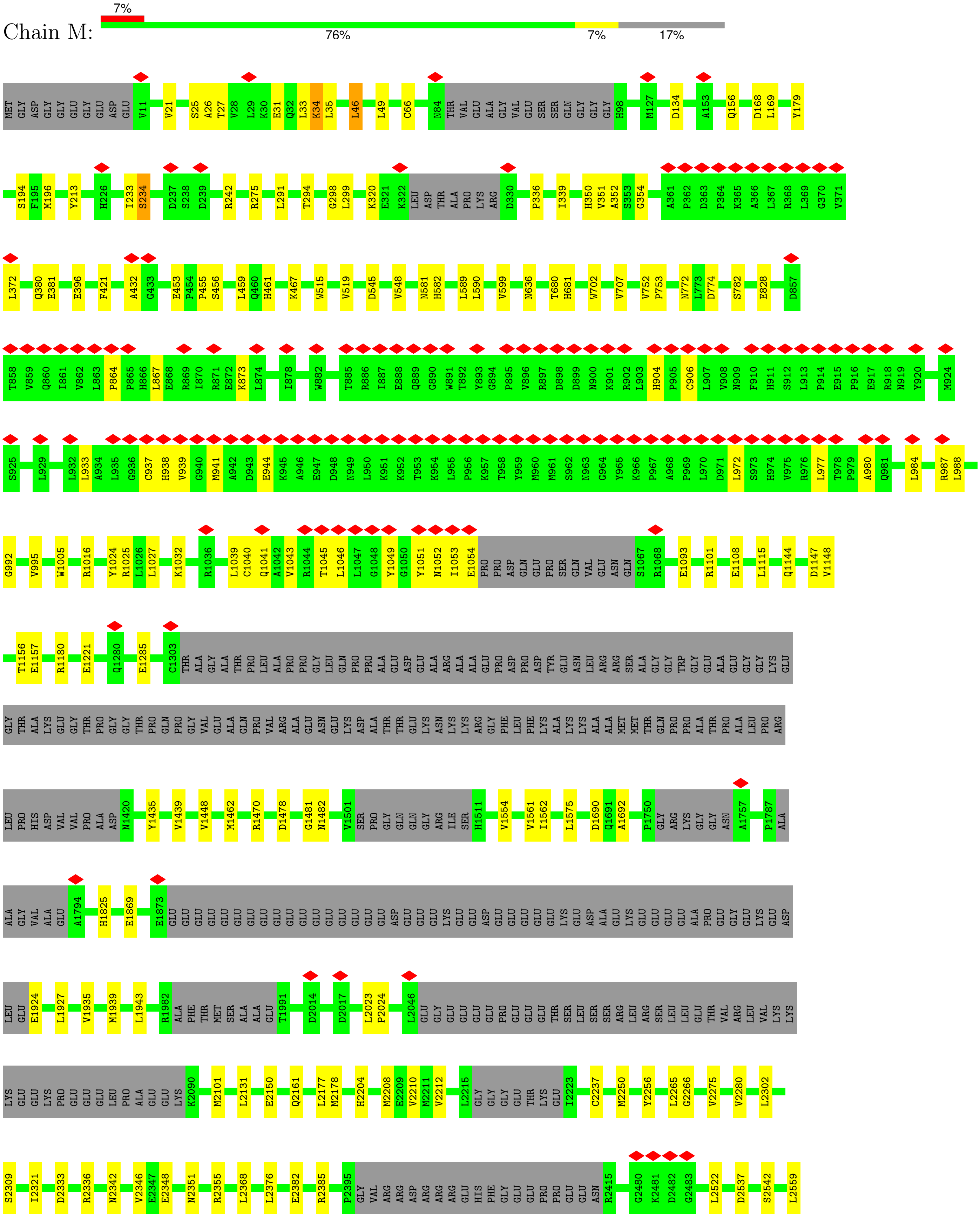
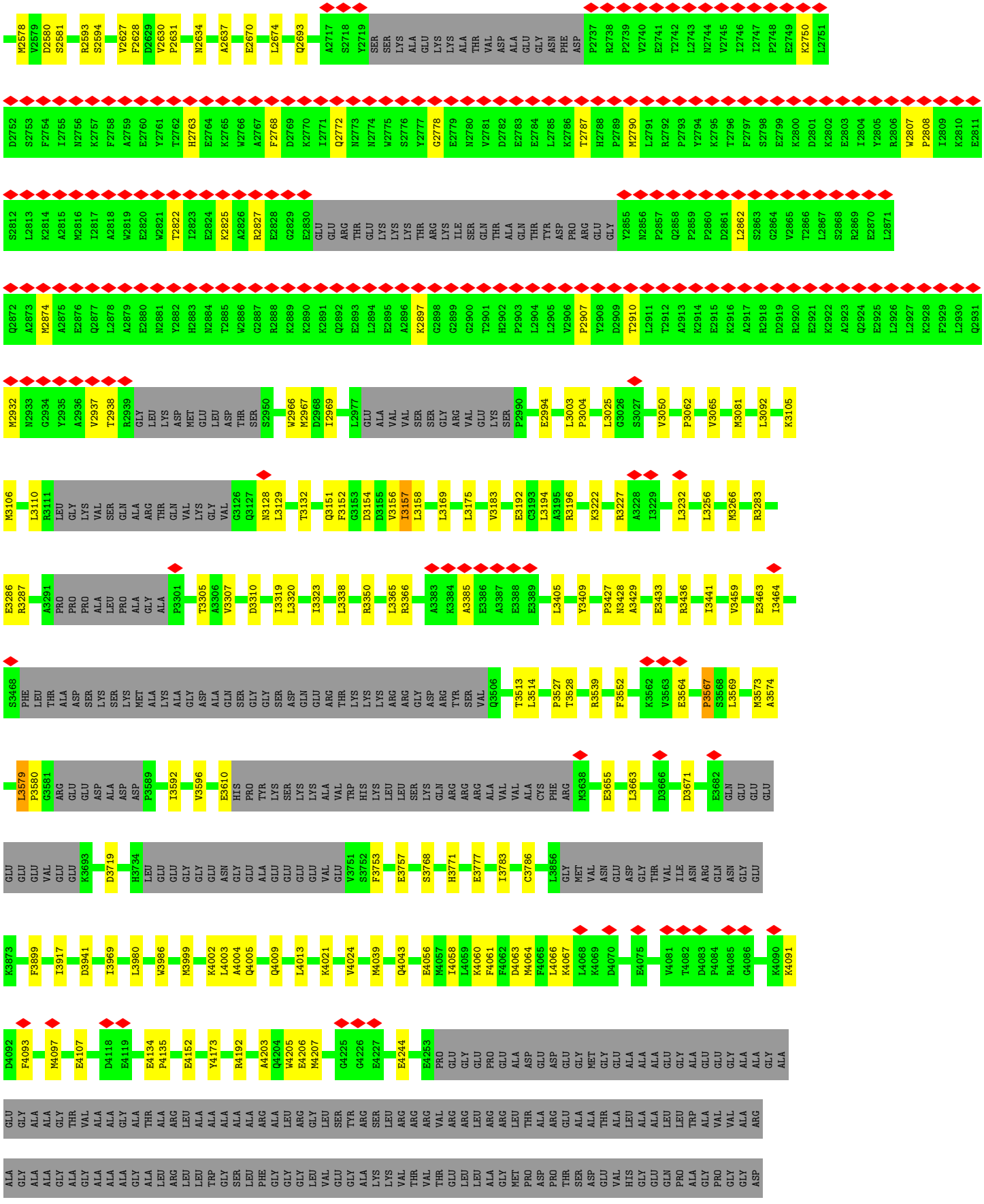
I3087 V3088 L3092 K3105 M3106 L3110 R3111 LEU GLY LYS VAL SER GLN ALA ARG THR GLN VAL LYS GLY VAL G3126 Q3127 N3128 L3129 T3132 Q3151 F3152 G3153 D3154 D3155 V3156 I3157 L3158 L3169 L3175 V3183 E3192 C3193 L3194 A3195 R3196 K3222 R3227 A3228 I3229 L3230 G3231
L3232 R3283 E3286 R3287 E3290 A3291 PRO PRO PRO ALA LEU PRO ALA GLY ALA P3301 T3305 A3306 V3307 D3310 I3319 L3338 R3350 I3362 L3365 R3366 A3383 K3384 A3385 E3386 A3387 E3388 E3389 L3405 Y3409 P3427 N3428 A3429 E3433 R3436 M3437 I3441
V3459 E3463 I3464 S3468 PHE LEU THR ALA ASP SER LYS SER LYS MET ALA LYS ALA GLY ASP ALA GLN SER GLY GLY SER ASP GLN GLU ARG THR LYS LYS LYS ARG ARG GLY ASP ARG TYR SER VAL Q3506 T3513 L3514 P3527 T3528 R3539 F3552 K3562 V3563 E3564 P3567
S3568 L3569 M3573 A3574 L3579 P3580 G3581 ARG GLU GLU ASP ALA ASP ASP P3589 I3592 V3596 E3610 HIS PRO TYR LYS SER LYS LYS ALA VAL TRP HIS LYS LEU LEU SER LYS GLN ARG ARG ARG ALA VAL VAL ALA CYS PHE ARG M3638 E3655 L3663 D3666 D3671
E3682 GLN GLU GLU GLU GLU GLU VAL GLU GLU K3693 D3719 H3734 LEU GLU GLU GLY GLY GLU ASN GLY GLU ALA GLU GLU GLU GLU VAL GLU V3751 S3752 F3753 E3757 S3768 H3771 E3777 I3783 C3786 L3856 GLY MET VAL ASN GLU ASP GLY THR VAL ILE ASN
ARG GLN ASN GLY GLU K3873 F3899 I3917 D3941 I3969 L3980 W3986 M3999 K4002 L4003 A4004 Q4005 Q4009 L4013 M4039 Q4043 E4056 M4057 I4058 L4059 K4060 F4061 F4062 D4063 M4064 F4065 L4066 K4067 L4068 K4069 D4070 E4075 V4081 T4082 D4083 P4084 R4085 G4086 K4090
F4093 M4097 E4107 D4118 E4119 E4134 P4135 E4152 Y4173 R4192 A4203 Q4204 W4205 E4206 M4207 G4225 G4226 E4227 E4244 E4253 PRO GLU GLY GLU PRO GLU ALA ASP GLU ASP GLU GLY MET GLY GLU ALA ALA ALA GLU GLY ALA GLU GLU GLY ALA
GLU GLY ALA ALA GLY THR VAL ALA ALA GLY ALA THR ALA ALA ARG LEU ALA ALA ALA ARG ALA ALA ARG LEU ALA ARG GLY LEU SER TYR ARG SER LEU ARG ARG ARG VAL ARG ARG LEU ARG ARG LEU THR ALA ARG GLU ALA ALA THR ALA LEU ALA ALA ALA GLU GLY LEU ALA GLU GLU ALA VAL ALA ARG
ALA GLY ALA ALA GLY ALA GLY ALA GLY ALA ALA LEU ARG LEU PHE GLY GLY GLY LEU VAL GLU GLY ALA LYS LYS VAL THR VAL THR GLU LEU LEU ALA GLY MET PRO ASP PRO THR SER ASP GLU VAL HIS GLY GLU GLN PRO ALA GLY PRO GLY GLY ASP
ALA ASP GLY ALA GLY GLU GLY GLU ALA ALA GLU GLY GLU GLY GLY ALA ALA GLU GLY VAL ALA GLU ALA ALA ASP GLY GLY PRO PHE ARG PRO GLU GLY ALA GLY GLY LEU GLY ASP MET GLY ASP THR THR PRO
ALA GLU PRO PRO THR PRO GLU GLY SER PRO ILE LEU LYS ARG LYS LEU GLY VAL ASP GLY GLU GLU GLY VAL LEU VAL PRO GLU PRO GLU GLU PRO GLU GLU PRO GLU GLU PRO GLU GLU VAL PRO GLU GLU ALA PRO PRO GLU PRO PRO LYS LYS
ALA PRO PRO SER PRO PRO ALA LYS LYS GLU GLU ALA GLY GLY ALA GLY MET GLU PHE TRP G4542 Y4580 P4586 PRO GLY GLU ASP ASP MET GLU GLY SER ALA ALA GLY ASP LEU ALA GLY ALA GLY SER GLY GLY GLY GLY SER GLY TRP GLY TRP GLY SER GLY ALA GLY GLU GLU GLY
ASP GLU ASP GLU PRO ASP PRO PRO PRO GLY LEU LEU T4766 W4767 L4768 M4769 S4770 I4771 D4772 ARG LYS PRO ASP PRO PRO GLY LEU ILE THR ALA HIS ASN GLU ARG S4747 LEU GLU ILE THR ALA HIS ASN GLU ARG E4692 T4689 D4702 R4703 L4704 V4705 F4719 K4723 G4729 D4730 I4731 F4732 G4733
V4773 I4777 T4785 M4796 L4823 Q4836 M4839 C4876 D4877 D4878 M4879 Y4883 Y4888 E4900 I4901 E4902 L4911 V4914 D4917 Q4949 E4952 D4953 M4954 M4989 L5036 SER

- Molecule 1: Ryanodine receptor 1

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D2752 S2753 F2754 I2755 N2756 K2757 F2758 A2759 E2760 Y2761 T2762 H2763 E2764 K2765 W2766 A2767 F2768 D2769 K2770 I2771 Q2772 N2773 N2774 W2775 S2776 Y2777 G2778 E2779 N2780 V2781 D2782 E2783 E2784 L2785 K2786 T2787 H2788 P2789 M2790 L2791 R2792 P2793 Y2794 K2795 T2796 F2797 S2798 E2799 K2800 D2801 K2802 E2803 I2804 Y2805 R2806 W2807 P2808 I2809 K2810 E2811
S2812 L2813 K2814 A2815 M2816 I2817 A2818 W2819 E2820 W2821 T2822 I2823 E2824 K2825 A2826 R2827 E2828 G2829 E2830 GLU GLU ARG THR GLU LYS LYS LYS THR ARG LYS ILE SER GLN THR ALA GLN THR TYR ASP PRO ARG GLU GLY Y2855 N2856 P2857 Q2858 P2859 P2860 D2861 L2862 S2863 G2864 V2865 T2866 L2867 S2868 R2869 E2870 L2871
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M2932 N2933 G2934 Y2935 A2936 V2937 T2938 R2939 GLY LEU LYS ASP MET GLU LEU ASP THR SER S2950 W2966 M2967 D2968 I2969 L2977 GLU ALA VAL VAL SER SER GLY ARG VAL GLU LYS SER P2990 E2994 L3003 P3004 L3025 G3026 S3027 V3050 P3062 V3065 M3081 L3092 K3105
M3106 L3110 R3111 LEU GLY LYS VAL SER GLN ALA ARG THR GLN VAL LYS GLY VAL G3126 Q3127 N3128 L3129 T3132 Q3151 F3152 G3153 D3154 D3155 V3156 I3157 L3158 L3169 L3175 V3183 E3192 C3193 L3194 A3195 R3196 K3222 R3227 A3228 I3229 L3232 L3256 M3266 R3283
E3286 R3287 A3291 PRO PRO PRO ALA LEU PRO ALA GLY ALA P3301 T3305 A3306 V3307 D3310 I3319 L3320 I3323 L3338 R3350 L3365 R3366 A3383 K3384 A3385 E3386 A3387 E3388 E3389 L3405 Y3409 P3427 N3428 A3429 E3433 R3436 I3441 V3459 E3463 I3464
S3468 PHE LEU THR ALA ASP SER LYS SER LYS MET ALA LYS ALA GLY ASP ALA GLN SER GLY GLY SER ASP SER GLN GLU ARG THR LYS LYS LYS ARG ARG GLY ASP ARG TYR SER VAL Q3506 T3513 L3514 P3527 T3528 R3539 F3552 K3562 V3563 E3564 P3567 S3568 L3569 M3573 A3574
L3579 P3580 G3581 ARG GLU GLU ASP ALA ASP ASP P3589 I3592 V3596 E3610 HIS PRO TYR LYS SER LYS LYS ALA VAL TRP HIS LYS LEU LEU SER LYS GLN ARG ARG ARG ALA VAL VAL ALA CYS PHE ARG M3638 E3655 L3663 D3666 D3671 E3682 GLN GLU GLU GLU
GLU GLU GLU VAL GLU GLU K3693 D3719 H3734 LEU GLU GLU GLY GLY GLU ASN GLY GLU ALA GLU GLU GLU GLU VAL GLU V3751 S3752 F3753 E3757 S3768 H3771 E3777 I3783 C3786 L3856 GLY MET VAL ASN GLU ASP GLY THR VAL ILE ASN ARG GLN ASN GLY GLU
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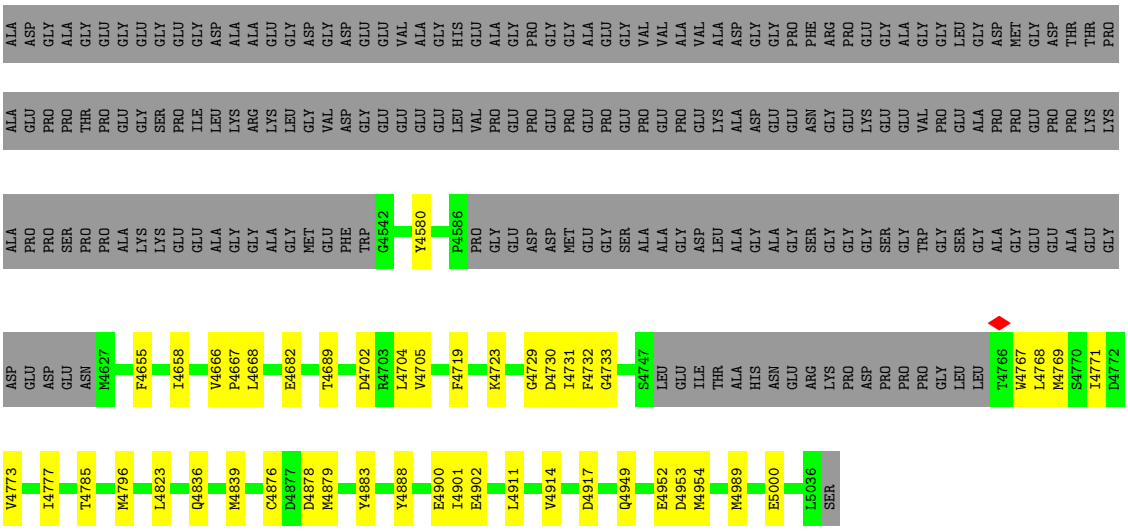
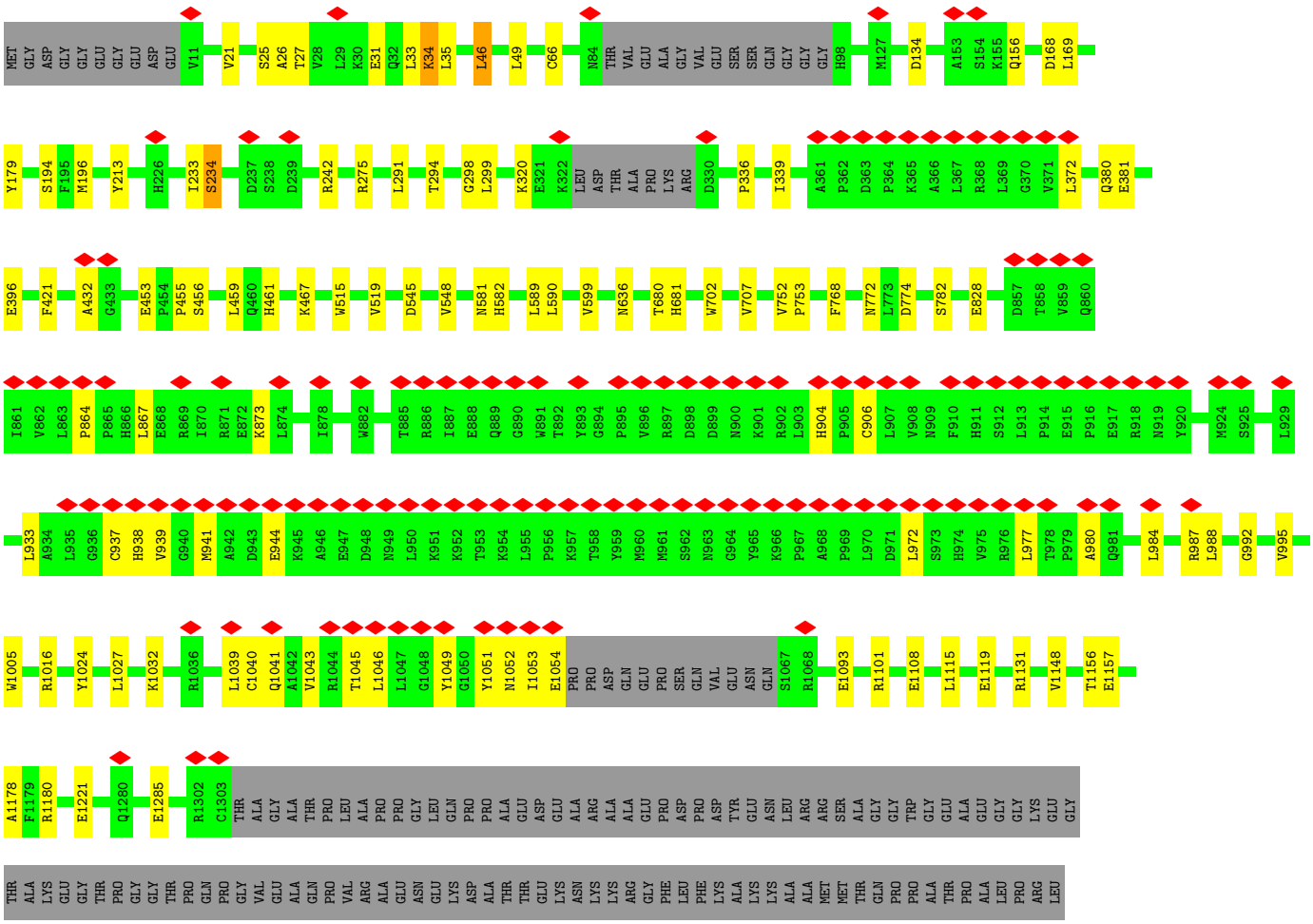
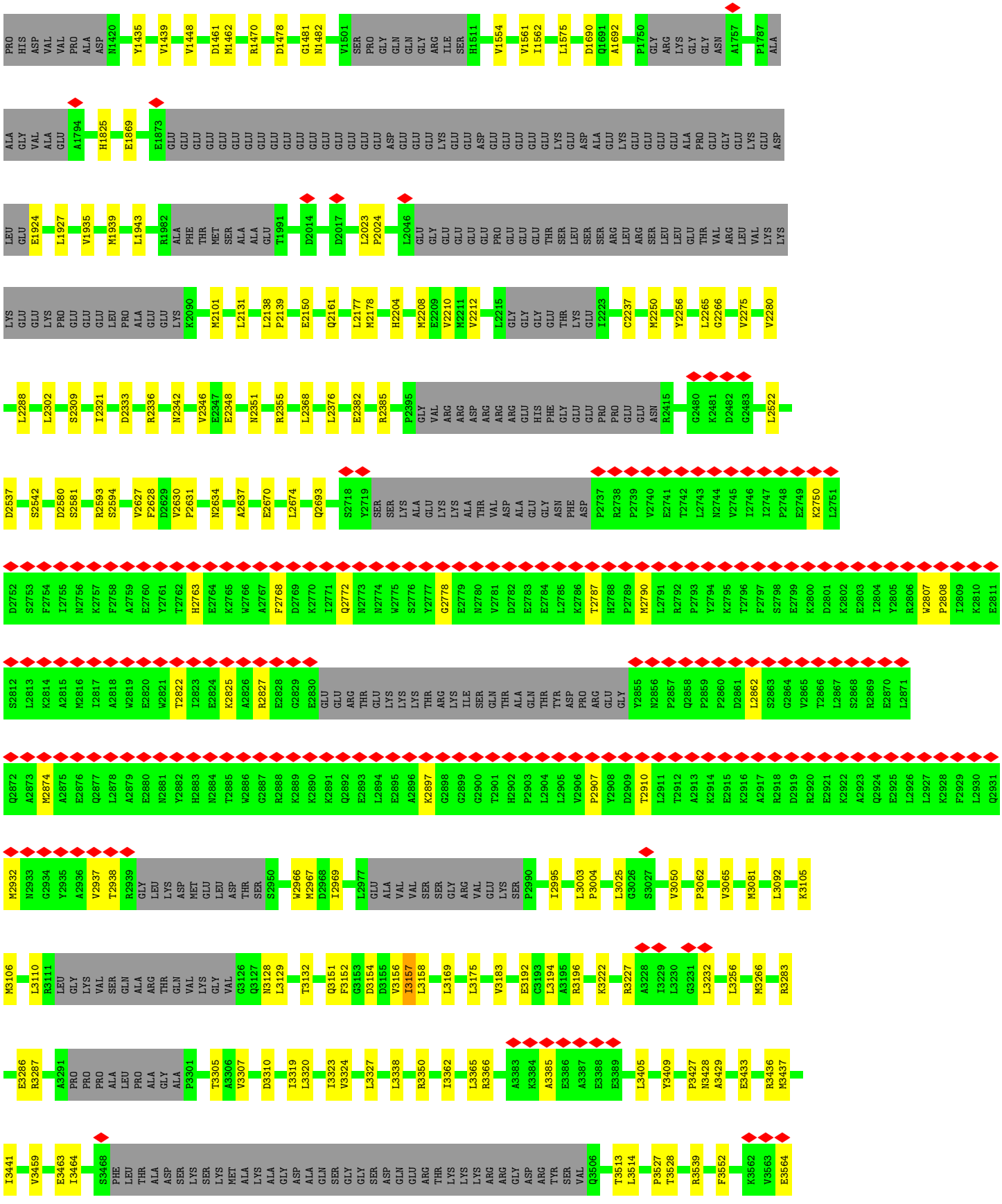
D4092 F4093 M4097 E4107 D4118 E4119 E4134 P4135 E4152 Y4173 R4192 A4203 Q4204 W4205 E4206 M4207 G4225 G4226 E4227 E4244 E4253 PRO GLU GLY GLU PRO GLU ALA ASP GLU ASP GLU GLY MET GLY GLU ALA ALA ALA GLU GLY ALA GLU GLU GLY ALA ALA
GLU GLY ALA ALA GLY THR VAL ALA ALA GLY ALA ALA THR ALA ARG ARG ARG LEU ALA ALA ALA ALA ARG LEU LEU LEU TRP ALA ALA ALA ARG SER LEU ALA ALA ARG ALA ALA LEU SER TYR ARG ALA SER LEU ARG ARG ARG ARG VAL ARG ARG LEU ARG ARG LEU THR ALA ARG GLU ASP PRO THR SER ALA ALA THR ALA LEU ALA ALA ALA ALA GLU GLN LEU LEU TRP ALA GLU GLU GLY VAL VAL ALA ARG
ALA GLY ALA ALA GLY ALA GLY ALA ALA ALA ALA GLY ALA LEU ARG LEU LEU TRP GLY SER LEU PHE GLY GLY GLY LEU VAL GLU GLY ALA LYS LYS VAL THR VAL THR GLU LEU LEU ALA GLY MET PRO ASP PRO THR SER ASP GLU VAL HIS GLY GLU GLN PRO ALA GLY PRO GLY GLY ASP

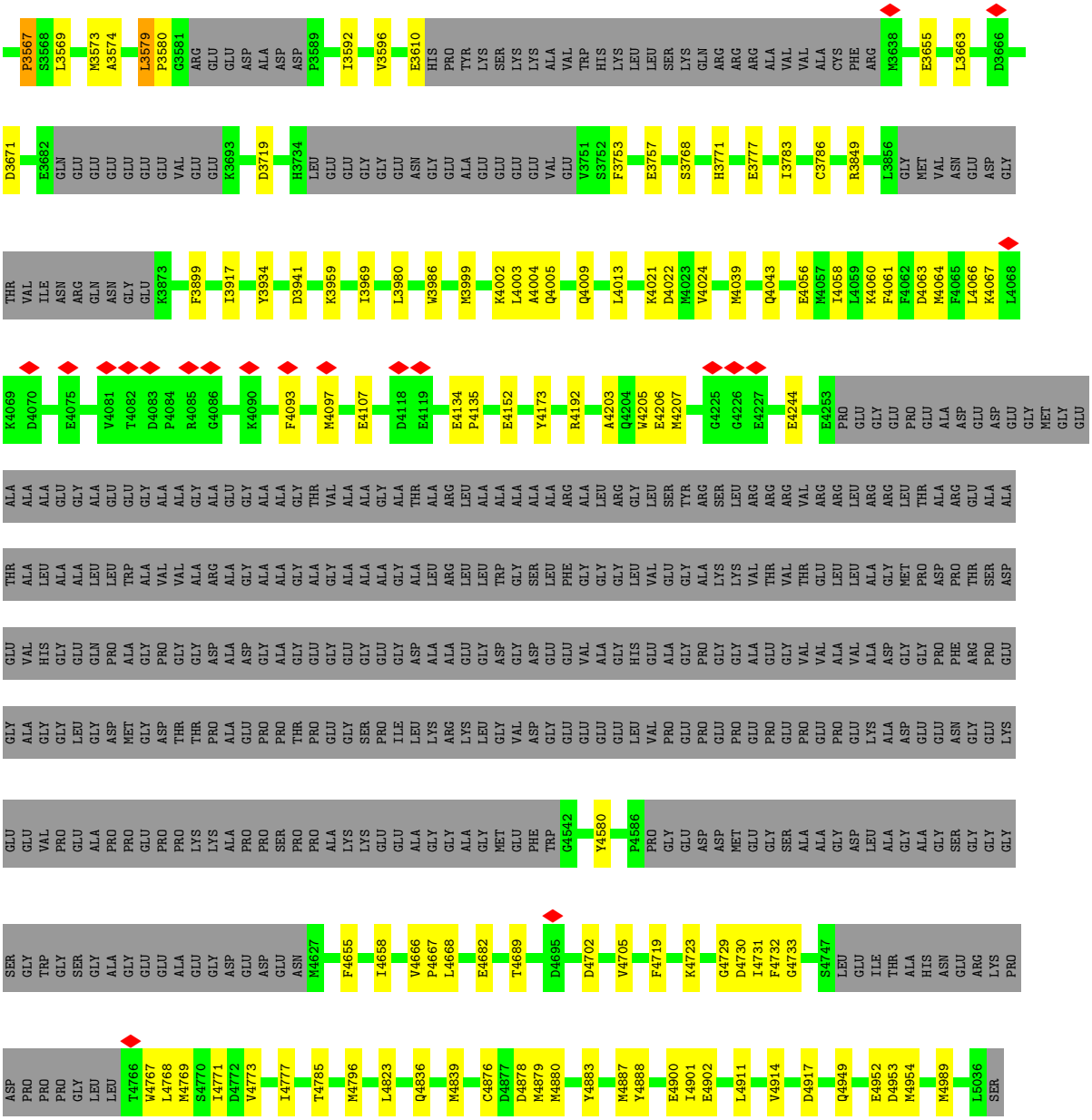


• Molecule 1: Ryanodine receptor 1

Chain S:

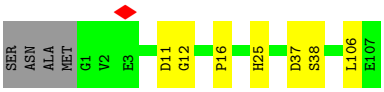






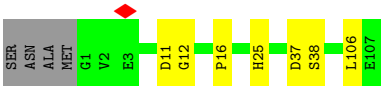
• Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1B

Chain B:



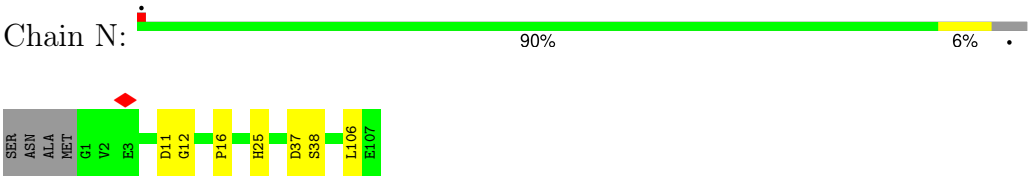
• Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1B

Chain H:



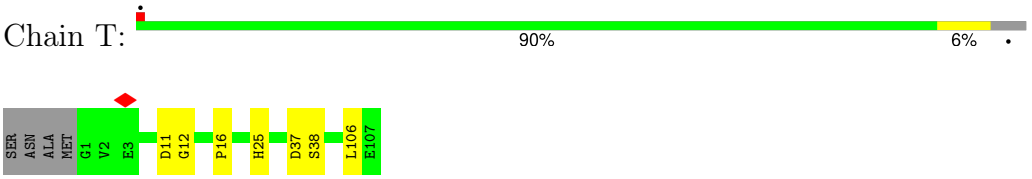
• Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1B

Chain N:



• Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1B

Chain T:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	126217	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	50	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	0.269	Depositor
Minimum map value	0.000	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.008	Depositor
Recommended contour level	0.047	Depositor
Map size (Å)	491.52, 491.52, 491.52	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.96, 0.96, 0.96	Depositor

5 Model quality

5.1 Standard geometry

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

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	0.40	0/33267	0.57	15/45152 (0.0%)
1	G	0.40	0/33267	0.57	16/45152 (0.0%)
1	M	0.40	0/33267	0.57	15/45152 (0.0%)
1	S	0.40	0/33267	0.57	16/45152 (0.0%)
2	B	0.77	0/832	0.70	0/1118
2	H	0.77	0/832	0.70	0/1118
2	N	0.78	0/832	0.70	0/1118
2	T	0.78	0/832	0.70	0/1118
All	All	0.41	0/136396	0.58	62/185080 (0.0%)

There are no bond length outliers.

The worst 5 of 62 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	4005	GLN	N-CA-C	-7.38	103.87	113.17
1	G	4005	GLN	N-CA-C	-7.37	103.88	113.17
1	S	4005	GLN	N-CA-C	-7.36	103.90	113.17
1	M	4005	GLN	N-CA-C	-7.34	103.92	113.17
1	G	3157	ILE	CA-C-O	-6.40	117.06	122.63

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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	32524	0	31610	354	0
1	G	32524	0	31610	351	0
1	M	32524	0	31610	353	0
1	S	32524	0	31610	358	0
2	B	816	0	818	3	0
2	H	816	0	818	3	0
2	N	816	0	818	3	0
2	T	816	0	818	3	0
3	A	1	0	0	0	0
3	G	1	0	0	0	0
3	M	1	0	0	0	0
3	S	1	0	0	0	0
4	A	1	0	0	0	0
4	G	1	0	0	0	0
4	M	1	0	0	0	0
4	S	1	0	0	0	0
All	All	133368	0	129712	1377	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 5.

The worst 5 of 1377 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:939:VAL:HA	1:A:1053:ILE:HG22	1.36	1.08
1:G:939:VAL:HA	1:G:1053:ILE:HG22	1.36	1.07
1:S:939:VAL:HA	1:S:1053:ILE:HG22	1.35	1.03
1:M:939:VAL:HA	1:M:1053:ILE:HG22	1.36	1.01
1:G:3579:LEU:HD12	1:G:3580:PRO:HD3	1.46	0.97

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	4129/5037 (82%)	4034 (98%)	95 (2%)	0	100	100
1	G	4129/5037 (82%)	4034 (98%)	95 (2%)	0	100	100
1	M	4129/5037 (82%)	4034 (98%)	95 (2%)	0	100	100
1	S	4129/5037 (82%)	4035 (98%)	94 (2%)	0	100	100
2	B	105/111 (95%)	102 (97%)	3 (3%)	0	100	100
2	H	105/111 (95%)	102 (97%)	3 (3%)	0	100	100
2	N	105/111 (95%)	102 (97%)	3 (3%)	0	100	100
2	T	105/111 (95%)	102 (97%)	3 (3%)	0	100	100
All	All	16936/20592 (82%)	16545 (98%)	391 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	3402/4276 (80%)	3393 (100%)	9 (0%)	91	95
1	G	3402/4276 (80%)	3394 (100%)	8 (0%)	92	96
1	M	3402/4276 (80%)	3393 (100%)	9 (0%)	91	95
1	S	3402/4276 (80%)	3394 (100%)	8 (0%)	92	96
2	B	87/91 (96%)	86 (99%)	1 (1%)	70	83
2	H	87/91 (96%)	86 (99%)	1 (1%)	70	83
2	N	87/91 (96%)	86 (99%)	1 (1%)	70	83
2	T	87/91 (96%)	86 (99%)	1 (1%)	70	83
All	All	13956/17468 (80%)	13918 (100%)	38 (0%)	90	95

5 of 38 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	N	25	HIS
1	S	4876	CYS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	S	34	LYS
1	S	3025	LEU
2	T	25	HIS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 162 such sidechains are listed below:

Mol	Chain	Res	Type
1	M	3994	HIS
1	S	2194	HIS
1	M	4109	GLN
1	S	736	HIS
1	S	2931	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains

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

5.5 Carbohydrates

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 8 ligands modelled in this entry, 8 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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.

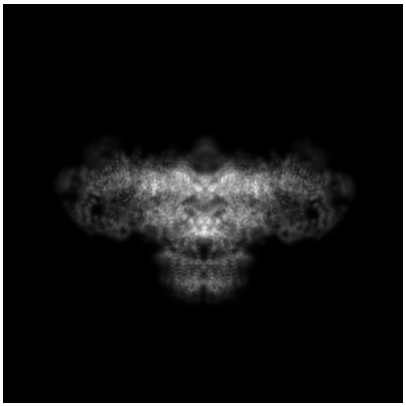
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-70591. These allow visual inspection of the internal detail of the map and identification of artifacts.

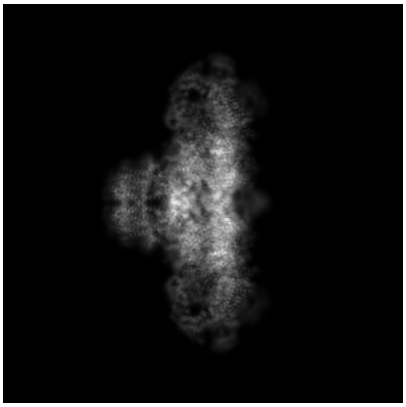
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

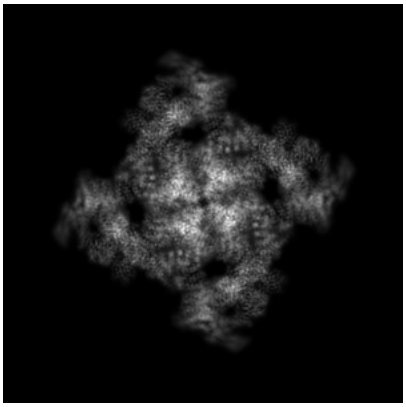
6.1.1 Primary map



X



Y



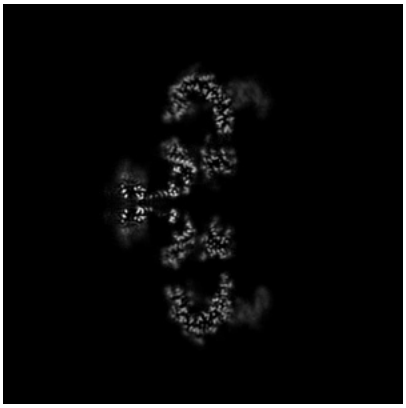
Z

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

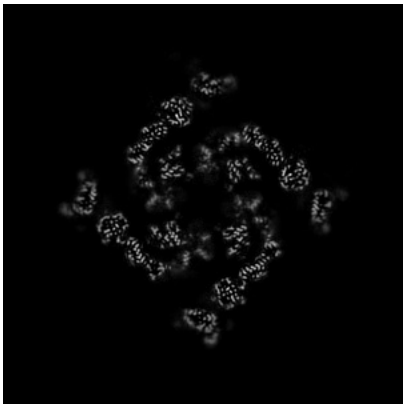
6.2 Central slices

6.2.1 Primary map

X Index: 256



Y Index: 256

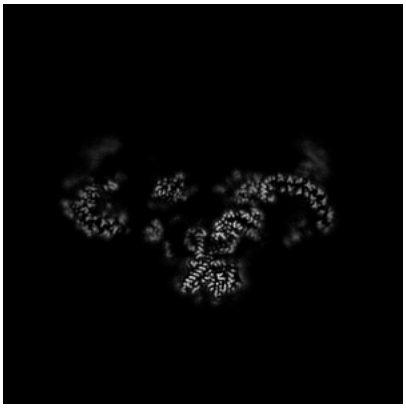


Z Index: 256

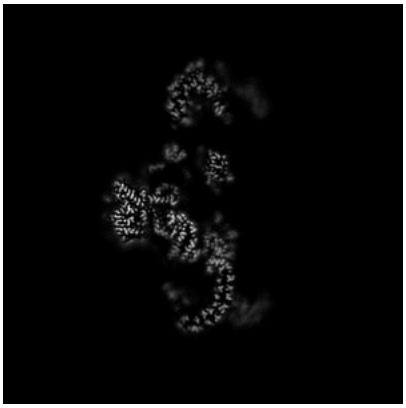
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

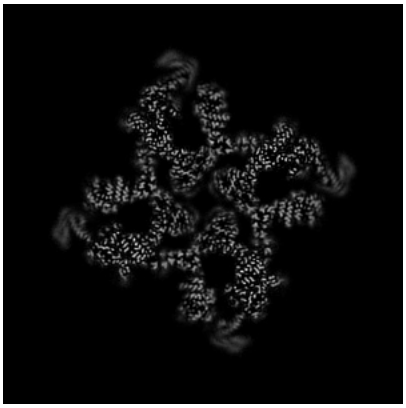
6.3.1 Primary map



X Index: 266



Y Index: 267

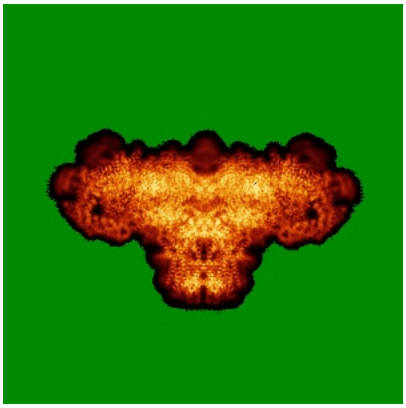


Z Index: 277

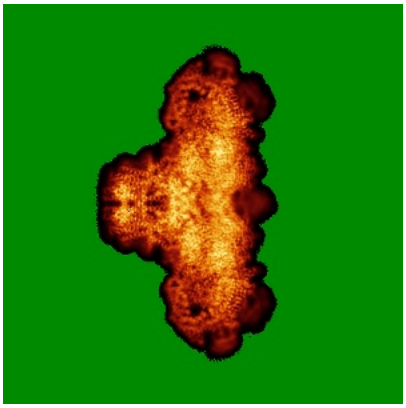
The images above show the largest variance slices of the map in three orthogonal directions.

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

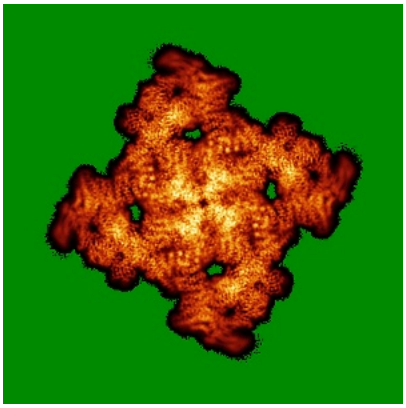
6.4.1 Primary map



X



Y

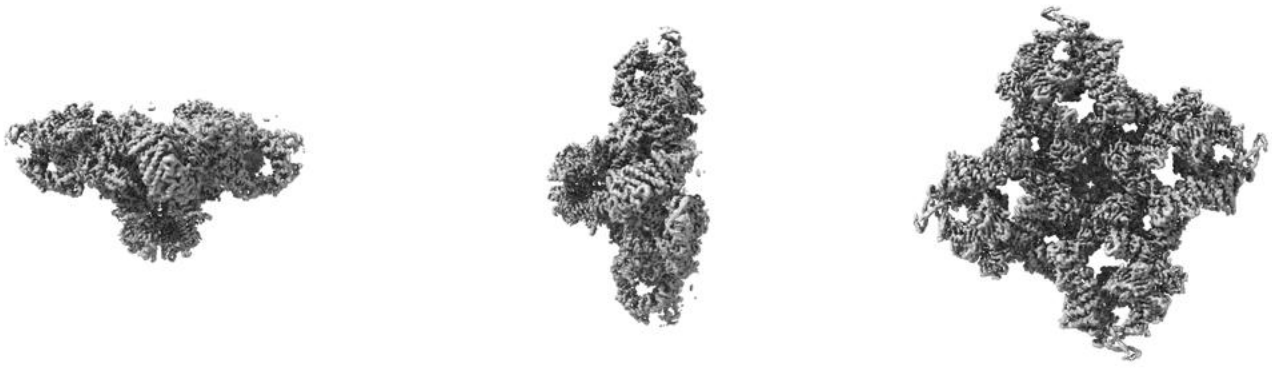


Z

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



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.047. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

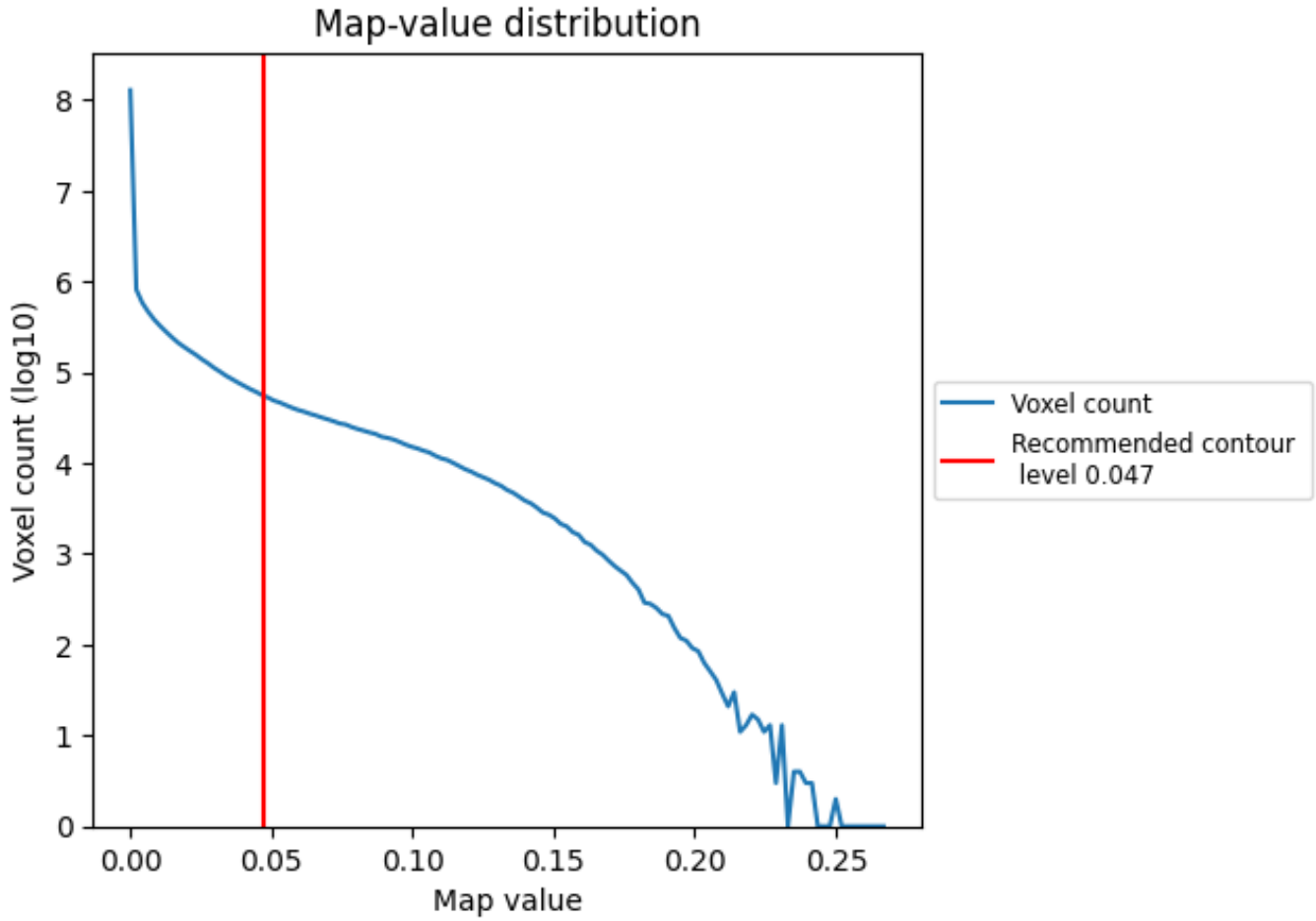
6.6 Mask visualisation (i)

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

7 Map analysis

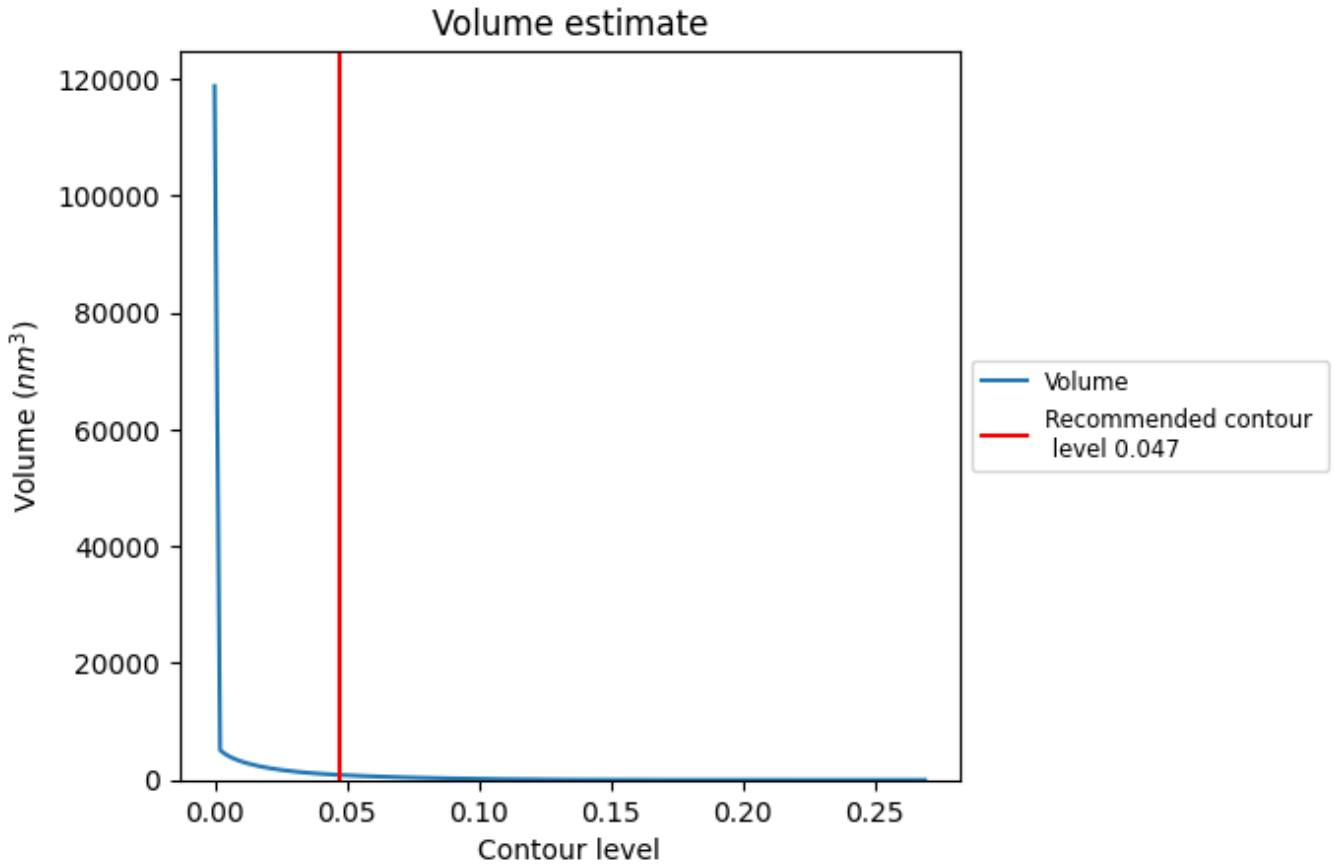
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

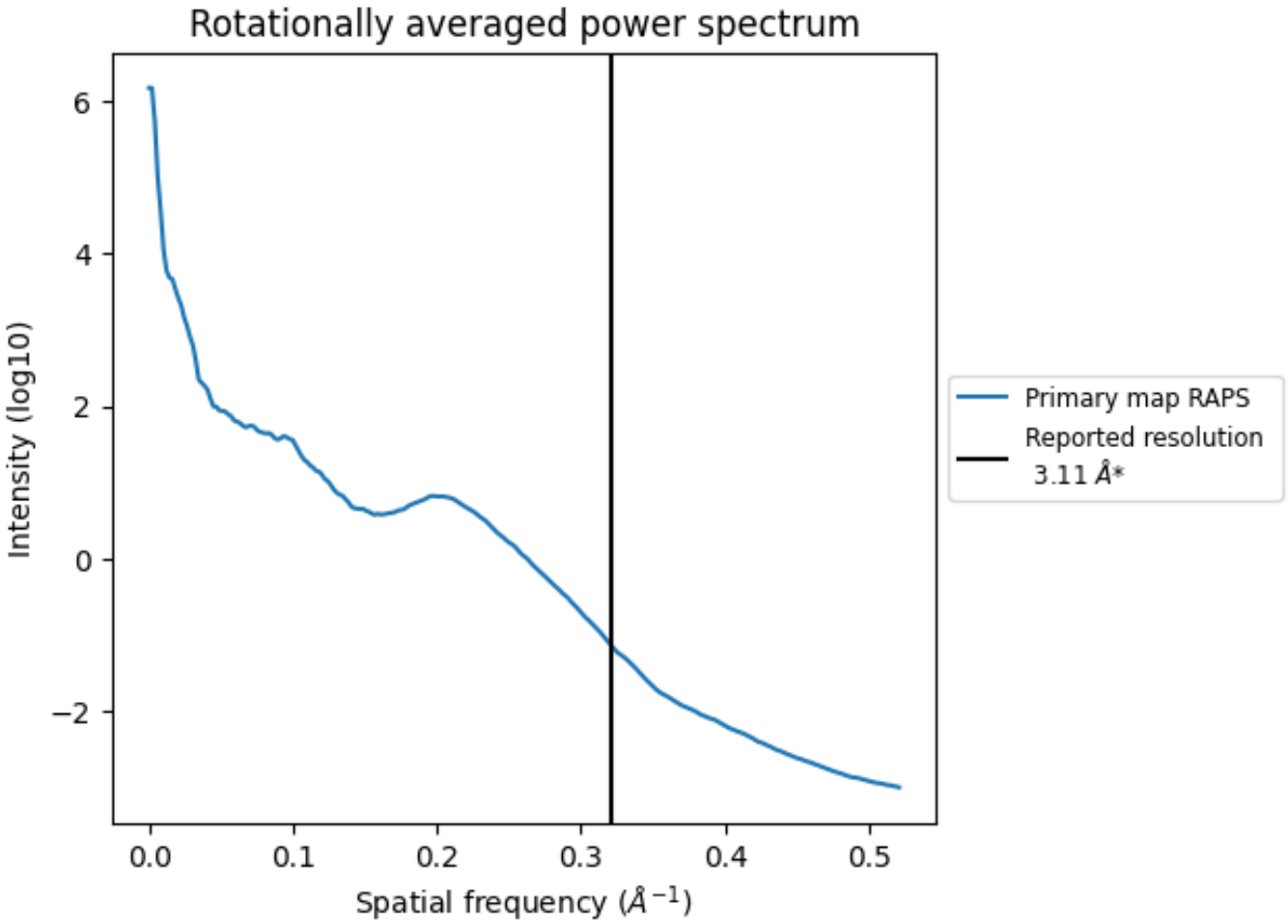
7.2 Volume estimate (i)



The volume at the recommended contour level is 871 nm^3; this corresponds to an approximate mass of 787 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 0.322 $Å^{-1}$

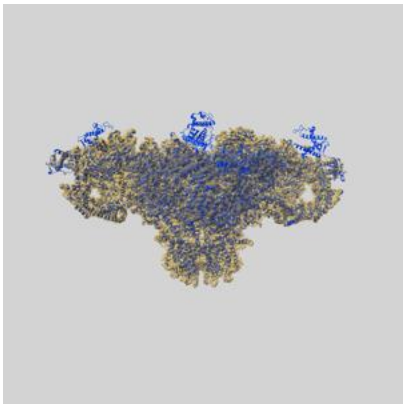
8 Fourier-Shell correlation (i)

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

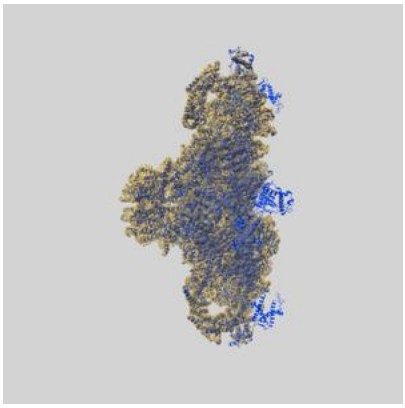
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-70591 and PDB model 9OL6. Per-residue inclusion information can be found in section 3 on page 6.

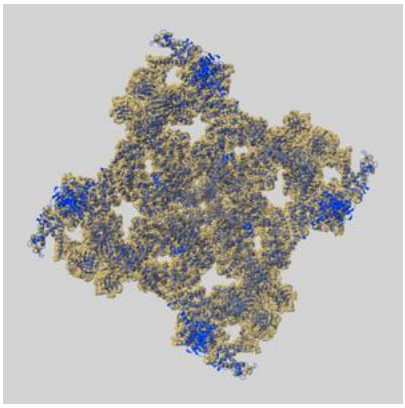
9.1 Map-model overlay



X



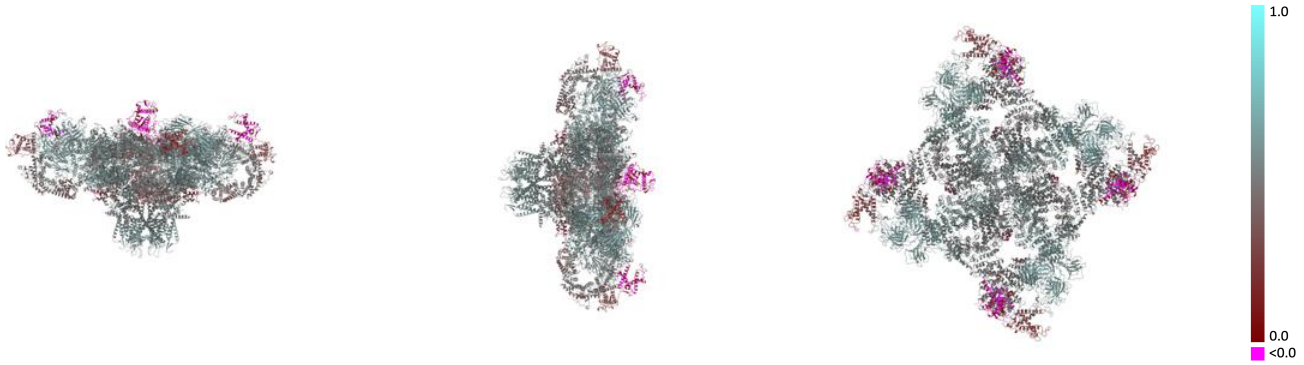
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.047 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

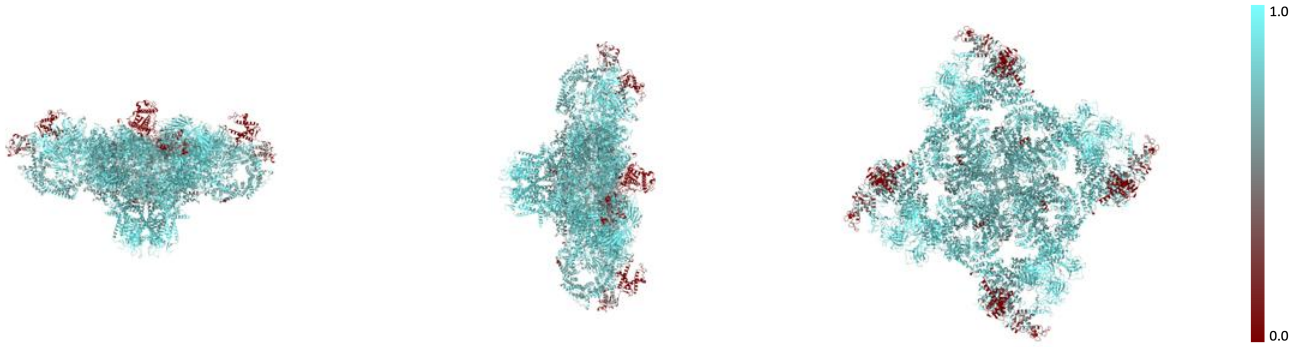
9.2 Q-score mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

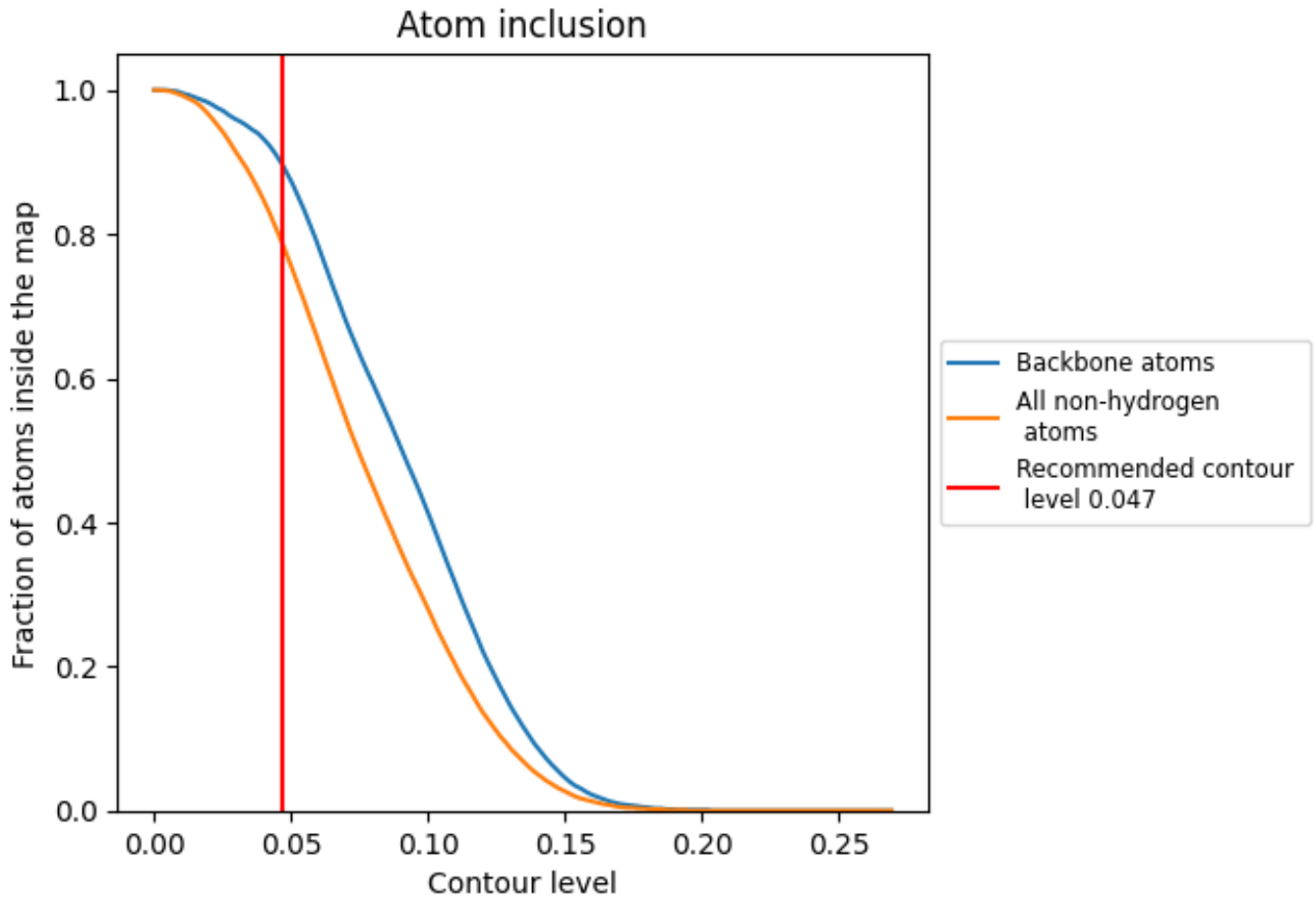
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.047).

9.4 Atom inclusion (i)



At the recommended contour level, 90% of all backbone atoms, 78% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.047) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7850	0.4810
A	0.7820	0.4790
B	0.8660	0.5590
G	0.7830	0.4800
H	0.8690	0.5620
M	0.7830	0.4800
N	0.8690	0.5600
S	0.7820	0.4790
T	0.8680	0.5630